

PLUMBING CONNECTION

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SPRING 2015

COMPANY NAME: Connection Plumbing Co
ADDRESS: 1000 Drainage Road, Mulgrave, Vic, 3170
PHONE: 1300 Drainer

PAID INVOICE

INVOICE NR.: 7171717171

DATE: 1/9/15

TO:
NAME: John Smith
COMPANY NAME: Sammy Smiles Bakery
ADDRESS: 2222 Broad Road, Mulgrave, VIC 3170
PHONE: (03) 9999 9999

SHIP TO:
NAME:
COMPANY NAME:
ADDRESS:
PHONE:

COMMENTS / SPECIAL INSTRUCTIONS:

Remove old oven and stove and replace with new models which are already on-site.

QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL
3 Hours	Old oven removed and taken away for disposal. Reconfiguration of existing gas pipework required to fit new oven in beneath stove top. Install new oven and stove. Test to ensure both are working as as required.	\$100	\$300

WHAT THEY DIDN'T TEACH AT
TRADE SCHOOL

Thank you for your business!



Feeling lefty loosey? Get righty tighty at my website.

Us professionals know that leaving something unattended can end badly. The mind is the same.

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Whether it's you, a mate or a work buddy, check out my website and give Davo's Mind Quiz a squiz.

Cause you never know what you might find out about yourself, like how much you love the sound of a lumpy V8.

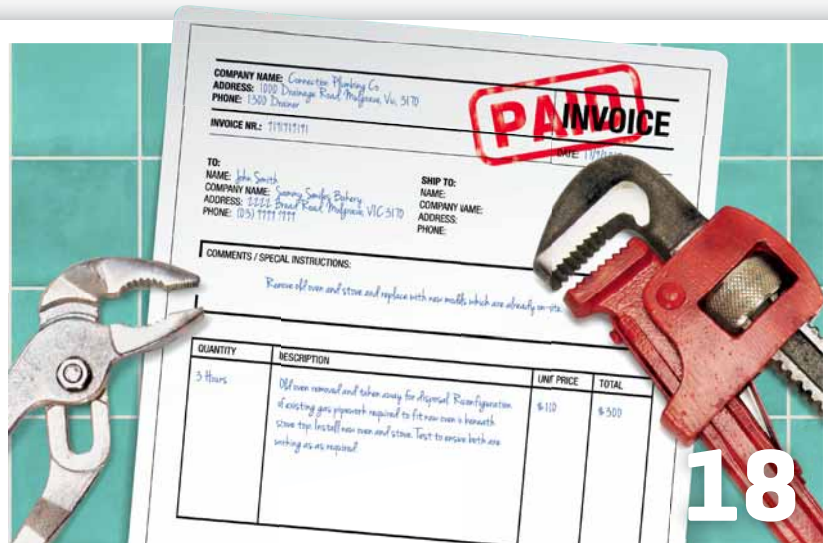
mantherapy.org.au/plumbing



COVER STORY

18 WHAT THEY DIDN'T TEACH YOU AT TRADE SCHOOL

This 4-part section on estimating and debt recovery covers the importance of estimating at a proficient level to win jobs and how best to recover debts owed to your business.



FEATURES

28 THEY WERE ALL YELLOW... OR WERE THEY?

Colours make it easy to identify various pipes and the materials they are suitable to transfer. When it comes to gas though, yellow isn't the be all and end all.

52 A PRO-ACTIVE DRAINAGE MONITORING SOLUTION

Read about Dyteqta, the innovative system that maps and assesses water trap seal vulnerability in building drainage systems.



32 STATE OF THE ART TRAINING

South Australia is experiencing a boom of plumbing apprentices and the trend is expected to continue well into the future. Find out about plumbing training delivery across the state.

58 ASBESTOS - WHAT YOU NEED TO KNOW

Exposure to asbestos is an ongoing concern, but there are some younger members of the industry who have no idea what to look out for.



44 WHEREFORE ART THOU WATERMARK?

The WaterMark Certification Scheme (WMCS) ensures high quality products hit our shores, but what about those that lack this protective blanket?

76 ENGINEERING CHANGE

The Cadetship in Plumbing Engineering knocks a year off the traditional apprenticeship, but what it lacks in duration, it makes up for in intensity. Jacob Harris explains.

48 AN EDUCATED APPROACH

The AHSCA has teamed up with the University of the Sunshine Coast to undertake research that will change the way industry approaches roof drainage systems.

88 DAMNED IF YOU DO, DAMNED IF YOU DON'T

We all agree that each product in the market should conform, but some of the lengths companies must go through to achieve certification is astounding.

Bosch 4000S Internal

A new internal gas continuous flow hot water system that has been specifically developed for the rapidly growing medium density building market. The Bosch 4000S is an extremely compact appliance, with design features facilitating easy installation for the plumber, and the possibility of innovative design solutions for Architects and Specifiers.

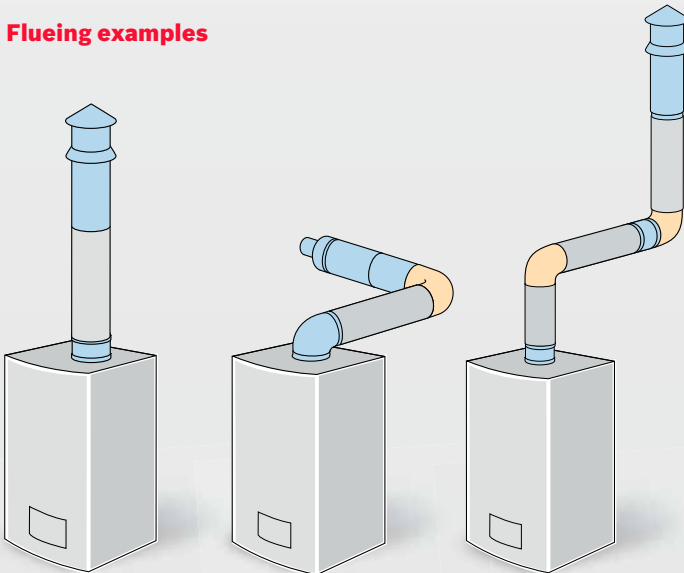
The 4000S Range Offers

- ▶ 12L (90Mj), 16L (120Mj) and 20L (149Mj) options available
- ▶ Inbuilt temperature controller
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- ▶ Compact design

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- ▶ Continued performance under changing conditions

Flueing examples



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BOSCH

Hot Water & Heating

REGULARS

30 SOLAR FIX

Broken evacuated tubes can be hard to repair as original parts are often hard to find. Mathew Briggs describes some simple solutions that can be employed to make the task less difficult.

38 METAL ROOFING

With our changing weather patterns, we can expect to see more rain events that put our gutter systems to the test. But are we all reading from the same technical text book?

46 BUSINESS PROMOTION

Negative commentary is an unavoidable and normal part of business. How you approach that negative commentary will determine how customers, whether past, present or future, will perceive you.

64 PUMP SCHOOL

Understanding pump curves can be quite a difficult task. Ron Astall answers the question: are your pumps running too slowly?

68 HOT WATER NEWS

Plumbing Connection takes a look at what's new in the ever changing hot water sector.

94 STANDARDS WATCH

Standards Australia is the nation's peak non-government standards organisation. Tim Wheeler, National Sector Manager for Building and Construction, provides us with an update on what's happening in the Standards world.

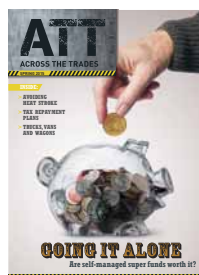


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HORSES FOR COURSES

Industry apprenticeships are a subject that almost everyone across this industry seems to have an 'expert' opinion on. What we have been reporting on in recent editions are the different approaches each State is taking, to suit the peculiarities of their local markets.

Many years back the South Australian market was served by one Adelaide-based college at Regency Park, under the tutelage of the legendary Len Hossack, who co-authored the Plumbing Services series of text books. These days a number of training centres exist and the South Australian Master Plumbers is working very closely with TAFE.

Unfortunately the same can't be said of the relationships between TAFE and the industry in some of the other States. But I am not going to venture an opinion on the why's or wherefores.

We also have a very interesting story on a new NSW Master Plumbers training initiative that fully qualifies apprentices in just three-years. And before you jump to conclusions, read the article first and you will understand the full story – it's quite a revolution.

We were reminded by that story that the MPA NSW (and I'm sure it happens in other States) prefers to get to meet/interview the parents of prospective apprentices – that's a wonderful nurturing aspect of the plumbing industry that says 'we'll take your kids under our arms and treat them with respect and build a career for them'. That's something a lot of other industries could take a leaf out of.

WORLD-LEADING RESEARCH STUDY

Congratulations to the Victorian AHSCA and its particularly energetic president-of-everything Mark Alexander for taking the initiative to undertake a significant research project looking at the hydraulic behaviour of roof water. With changing climates across the globe, the research is certainly timely and will go a long way to dealing with bigger storms and downpours.

This is an enormous project with a sizeable price tag that serves the national interest – and it's funded by industry. That's a great way to invest AHSCA surplus funds back into the industry for the benefit of its members and the industry at large. In time the IP and results which will likely impact Codes and Standards globally will be sold and hopefully the invested funds will come back into the local industry to kick off more projects of a similar ilk.



Check out the introduction to the project on page 48 and in coming editions, we'll track the progress of the research and outcomes.

There are more great stories in this issue by our staff writers and valued contributors – information that you can only find in *Plumbing Connection*. Of particular note is Solar Fix by one of our newest contributors Mathew Briggs. Mathew provides practical advice that aims to make you more proficient in the area of solar hot water repairs. His articles are straight forward and will provide you with a head start over the next guy who comes in under gunned in his assessment.

Enjoy the read.

Jeff Patchell
Jeff Patchell
Publisher



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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 64.



MATHEW BRIGGS

Mathew Briggs has built up a passion for all things related to solar hot water 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 30.



JOHN FENNEL

John Fennell has been the CEO of International Copper Association Australia since 1998 and oversees Oceania and approximately 12 International Copper Association Building Construction Programs across Asia.

See **Copper Connection** on page 80.



BRAD FALLON

Brad Fallon is the Director of Ivy St Plumbing and comes from a generation of plumbers. Brad specialises in maintenance and emergency plumbing, including strata management.

See **Business as Usual** on page 100.



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 82.



JON PALFREY

Jon Palfrey is Rheem Australia's Training Manager and also a qualified plumber. He conducts training to plumbers and specifiers across the southern states, covering the latest water heater technology and key water heating issues facing plumbers.

See **Hot Water Clinic** on page 70.



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VALE ALAN HUMPHREYS (BIG AL) 1957 TO 2015

It is with great sadness that we acknowledge the passing of a colleague, friend and icon of the Plumbing Industry.

Alan tragically passed away in February this year as a result of a motorbike accident.

Alan was the Principal Plumbing Advisory Officer for Building Standards and Occupational Licensing Department of Justice in Tasmania.

Alan served on numerous plumbing standards committees. He was the former Chair of the National Plumbing Regulators Forum (NPRF) and Secretariat of the NPRF's Technical Advisory Committee and recently a member of the Australian Building Codes Board's Plumbing Code Committee.

Alan played an integral part in the development of the Plumbing Code of Australia and contributed significantly to its inclusion in the National Construction Code series. He also chaired the committee responsible for the WaterMark Certification Scheme. He worked tirelessly, often at the expense of his work life balance and played a leading role in the contribution to improving plumbing regulation and in the development of Australian Plumbing standards.

He was an intelligent, kind and hardworking man who had a passion for the plumbing industry. He was well respected and brought integrity to his work.

He had a great sense of humour, enjoyed a glass or two of red especially with his plumbing family.

His family, wife Pam, son Che, daughter Marli, grandchildren and his many friends including his plumbing mates will miss him immensely but never forget him.

As one of his plumbing regulator friends commented watch out if the plumbing in heaven is non-compliant.

May he rest in peace for he well and truly deserves to.

**LASER TRADIES COME TOGETHER FOR SCHOOL PROJECT**

In September, around 400 plumbers and electricians from Australia and New Zealand will descend on Fiji for their annual conference. In line with the company's commitment to being socially responsible, many of the men and women of Laser Group will arrive a day early to take part in the Laser Group Charity Taskforce project.

The Taskforce sees the plumbers and electricians of the Laser Group take on a local project, using their skills to give back to the community hosting the conference. With the conference being held in a different place each year, charities who have received assistance from the Group include Habitat for Humanity in New Zealand as well as the Gold Coast Youth Services and Variety in Australia.

This year's chosen project will focus on children, with the Group working with the Fijian Ministry of Education to help improve two local schools with combined enrolments of almost 2000 students.

The Votualevu Public School currently has 923 students enrolled up to year 7 as well as 115 enrolled at preschool level. Established in 1926, the school is one of Nadi's pioneer schools and has been affected by fire and floods in recent years.

The Laser Group Taskforce will install new roofing on one of the buildings as well as install drainage, a new water pump and trough for the children to drink at. Whilst to most these are basic requirements, the children currently have to move rooms when it rains and straddle a crude drain to access water to drink. At the same time, the Group will be working on the library, painting the walls and installing bookcases for the books which have been donated by Laser Group Members.

Donating their time as well as the tools used, the Taskforce is now in its 7th year and something that Laser Group Managing Director, Steve Keil is very proud of.

Contact: www.lasergroup.com.au

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RHEEM AUSTRALIA LAUNCHES A NEW ROUND OF APPRENTICE PLUMBER GRANTS

Rheem Australia is again extending a helping hand to apprentice plumbers, with the company announcing a new round of Apprentice Plumber Grants. Rheem will award 25 grants worth \$1000 each to encourage some deserving apprentice along their way.

"These apprentices are our next generation of plumbers and we want to help them complete their training," says Rheem Australia CEO Matt Sexton. "There's a significant need for financial assistance among apprentice plumbers, and Rheem is happy to support the plumbing industry wherever it can."

Since the Rheem Apprentice Plumber Grants program was launched in 2012, Rheem has given assistance to 125 apprentice plumbers from all around Australia.

"This year, we are especially looking out for apprentice plumbers who have ambition and drive to make a real difference in their community using their skills," Matt says. "Over the past few years we have seen many applicants showing enormous dedication and continued hard work despite often challenging circumstances."

Previous recipients of a Rheem Apprentice Plumber Grant include a young newlywed man who together with his wife spends holidays volunteering in a third world country; a teenage apprentice who had to commute a further 60km a day to get to work after a fire and flood destroyed the road from his property; a mother of three who started an all-female plumbing business; a hearing impaired apprentice who's not letting his impairment ruin his dream of becoming a qualified plumber; and several ambitious apprentices planning to use their skills to bring adequate plumbing to remote and/or disadvantaged areas.

Twenty two-year-old Christopher Pierce from Hillside, Victoria, was awarded one of Rheem's Apprentice Plumber Grants in 2012 for his admirable ambition to use his plumbing skills to obtain a job in Antarctica - something he is still working towards today.

"As soon as I have all of the requirements, I will keep on applying until I get the gig," Christopher says. "If I

“THERE ARE MANY WHO HAVE USED THE GRANT TO ENHANCE THEIR TOOL COLLECTION, IN ADDITION TO PUTTING IT TOWARDS EDUCATION, BILLS, OR FUEL TO GET TO OR FROM WORK”

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The Rheem Apprentice Plumber Grants program provides assistance to apprentice plumbers like Christopher Pierce every year.

wasn't successful, I would like to work somewhere around Australia in the mines, or even over in Canada. The fact that I can work overseas and assist with government research, not to mention use the facilities that I help build would be amazing."

Chris says the Rheem grant helped him stay on track financially during his apprenticeship.

"My car's transmission blew the week I received the grant, and I really need my car to get to work," he says. "The grant helped me out a great deal with paying for the repair work. I also had to get my wisdom teeth removed around the same time, so the grant certainly kept me out of financial strife."

There are no restrictions placed on the grants, and successful applicants can decide how and when they use it.

"There are many who have used the grant to enhance their tool collection, in addition to putting it towards education, bills, or fuel to get to or from work," Matt says.

Contact: www.rheem.com.au/apprentice



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GWA GROUP LIMITED ANNOUNCES SENIOR MANAGEMENT SUCCESSION

Following implementation of its recent strategy review, sale of assets and return to shareholders, Mr Peter Crowley has advised that he will retire as GWA Group Managing Director on 30 June, 2016.

Separately, Mr Les Patterson the Chief Executive of GWA's Bathrooms and Kitchens business had previously advised of his retirement and left the Group on Tuesday 30 June, 2015.

Mr Patterson has been with the Group for over 11 years and in that time made a significant contribution to the Group, particularly over the past three years as the leader of the Bathrooms and Kitchens Division.

After an extensive search process, GWA is pleased to announce the appointment of Mr Tim Salt.

Mr Salt, who is currently Managing Director of Diageo Australia and New Zealand, joined the GWA Group on 7 September 2015 as Executive General Manager of GWA's Bathrooms and Kitchens business.

He will transition to the position of Managing Director of the GWA Group to succeed Peter Crowley in that role from 1 July 2016. The period from September to June will allow sufficient time for an orderly transition to the Managing Director role.

Mr Crowley will take on the leadership of the Bathrooms and Kitchens business until Mr Salt joins the business in September.

FLUSHABLE WIPES IN THE SPOTLIGHT AGAIN

The city of Wyoming, Minnesota has filed suit against six makers of flushable wipes, arguing that the so-called flushable wipes are clogging their sewers and costing the city big money.

"These flushable wipes do not degrade after flushing," the city of Wyoming's suit says. "Rather, the flushable wipes remain intact long enough to pass through private wastewater drain pipes into the municipal sewer line, causing clogs and other issues for municipal and county sewer systems and wastewater treatment plants, resulting in thousands, if not millions, of dollars of damages."

Industry representatives claim that the flushable wipes aren't the issue, contending that products that aren't meant to be flushed, such as baby wipes, are the real culprits.

This isn't the first lawsuit the wipes industry has faced. In 2014, a New York man sued Kimberly-Clark Corp. and Costco Wholesale Corp. in federal court with a class-action-styled complaint that featured "homeowner horror stories" of "flushable" wipes clogging homes' plumbing.

Wyoming is seeking "a declaration that the defendants' flushable wipes do not degrade and are not sewer safe," an order that the companies stop advertising them as such, and the establishment of a fund to compensate cities for the costs of cleaning and removing wipes from their sewer systems.

"They want to make sure that people know that these things really aren't flushable," Blanchfield said.

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FACING UP TO PLUMBING'S TWO MAJOR CHALLENGES

PLUMBERS ARE OFTEN FACED WITH CHALLENGES TOO GREAT FOR THEM TO OVERCOME ALONE; HOWEVER, THERE ARE A COUPLE OF IMPORTANT BUSINESS CHALLENGES THAT CAN BE TACKLED SINGLE-HANDEDLY PROVIDED A WILLINGNESS TO LEARN EXISTS. **JEFF PATCHELL** EXPLAINS.

When I'm out and about in the industry, I'm often asked what I reckon are the major challenges the plumbing industry faces.

Yes there's non-conforming product, OHS compliance, too much un-enforced regulation, not enough tradesmen fully embracing smart new communications – but let's hold it there for a moment.

None of those things are responsible for the far too many jobs that don't return a profit, or that sizeable industry creditor trail that starts at the contracting level and has a nasty knock-back effect up the supply chain to the merchants/suppliers, ultimately left holding the materials bill.

Quite clearly, the two business issues this industry lacks focus on are Accurate Estimating & Debt Collection.

The effects of this can result in families losing homes, contractors working ridiculous hours to pay off debts and, needless to say, life threatening mental health issues from the pressure of perceived personal failure.

Thus, for good reason, this issue's cover story revolves around those two major issues. But let me say it's also a start to an ongoing commitment by Plumbing Connection to provide more comprehensive ongoing information on these two critically important subjects.

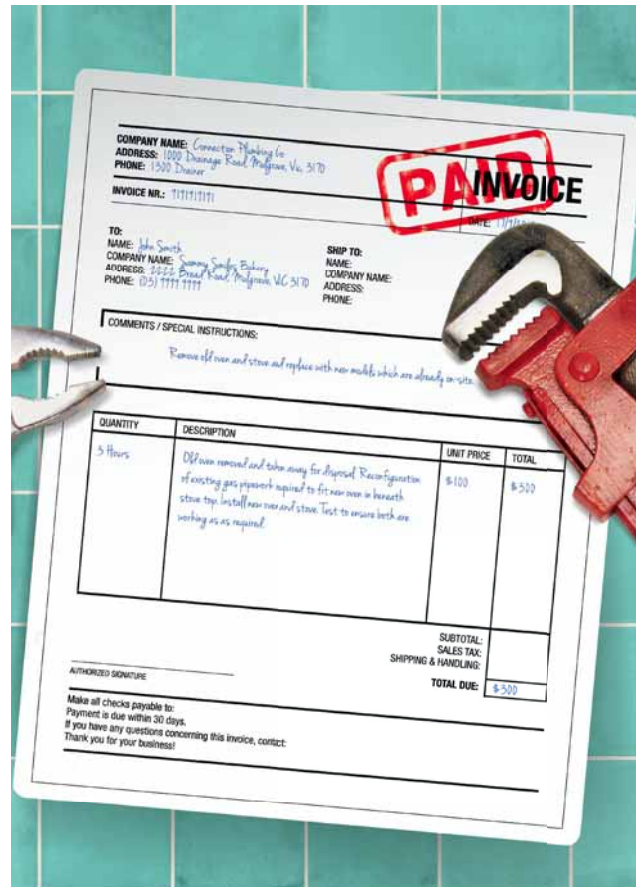
We can't hope to fully cover these issues in one edition but we can commence a process that encourages contractors to put aside time for something that will likely provide them with the greatest upside to their business.

These subjects are not solely the domain of the plumbing sector, the same can be said for electrical and other sub-trades, as well as the builders who ultimately screw down the trades, due in part to their own poor management [either by way of incompetence or intention].

When we started to ask some questions around Australia about what there is in the way of estimating training [at an apprentice and continuing professional development level] as well as debt collection, there was a fairly shallow response.

The industry seems to acknowledge there is a problem but too many pass it off as industry culture and the fact that it's always been that way. Not good enough.

Some want to say it's a TAFE issue – a combination of



text book [as opposed to real world] teaching and lecturers who often have no practical experience. But what has the industry really done to address these problems? Finding anyone with experience to teach others is as rare as hen's teeth.

Due to ignorance, the industry continually pumps out new contractors whose first aim is to undercut the old firm. And few of them have any grasp of what it really costs to run a profitable business these days.

This is the start of a journey and we want you [the industry] to come and get involved.

I know it's not in the nature of contractors to spend money on education but these issues need serious consideration.

Having a start in the plumbing industry is quite a leg up in this day and age. You get paid well to learn on the job in an age when most ~22 year olds coming out of university have gotten by on slim pickings from after-hours retail jobs. They also have a HECS-HELP burden to shoulder for many years and generally pay packets on entering their chosen career (let's put aside law, investment banking and specialist medicine) are fairly mediocre.

In putting this first edition together, I had the privilege of meeting former onsite plumber Andy Farrell, who has turned adversity from a life-threatening sporting accident into a positive outcome for himself and this industry, by producing and marketing a complete estimating kit, something this industry has long been waiting for.

At another level, Plumbing Connection editor Justin Felix caught up with Robert Woolley, whose family has run a successful plumbing business for the past 50 years in and around Melbourne. While Rob is full-time across the business he also makes time to teach estimating at Holmesglen TAFE where he shares some real world

experience and knowledge with the next generation of plumbers and those who are ready to take the next step of running their own business. He's added his valuable knowledge to this story which in many ways seems like basic info... except too many contractors keep ignoring the obvious.

To finish this feature, we introduce you to the debt recovery training services from Anthony Igra, which you can access anytime over the web.

Anthony has developed specialist knowledge courses to assist you and your staff to improve your dealing with customers and smooth out the payment process - without the usual hassles.

We thoroughly recommend you sign up to both service offerings from Andy and Anthony as you will significantly improve your business practices and sleep far better at night.

I'm sure there are also lots of ideas and tips about these two issues hidden away in plumbing offices around the nation - if you have some, feel free to share a few with us for future articles and help lift the standard (and profit) of the industry. ■

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EDUCATING ESTIMATORS

JUSTIN FELIX CAUGHT UP WITH **ROBERT WOOLLEY**, DIRECTOR OF WOOLLEY'S PLUMBING PTY LTD AND TEACHER AT HOLMESGLEN INSTITUTE OF TAFE IN MELBOURNE TO FIND OUT WHAT HE HAD TO SAY ABOUT ESTIMATING AND DISCOVER SOME VALUABLE TIPS FOR PLUMBERS TO TAKE ADVANTAGE OF.

So you've worked on the tools for decades and you're ready to sit behind a desk and make the bigger decisions. Or perhaps you've just knocked over your apprenticeship and have a thirst to learn more. Either way, you'll need to put your head down and bum up because it's time to go back to school.

One of the first things that became clear when delving into the subject of estimating was the variation in the approach to it being taught from state to state and from institution to institution. The delivery methods are numerous too.

It can be delivered face to face in a classroom environment, via correspondence, either paper based or online, blended approach with the use of tutorials or Recognised Prior Learning (RPL). Some Registered Training Organisations (RTOs) offer all options and leave it up to the students depending on their situation or preferred learning method.

The content that is delivered should be the same as it is specified in the unit of competence itself; however this is not always the case as you hear stories of estimating being covered in a few hours at some RTOs.

Lecturer of Plumbing and Building Services Rob Gilman explained that at TAFE SA, estimating was delivered face to face, 3 hours a night spanning 10 nights over a term. Alternatively, it could be delivered externally whereby students were given 10 weeks to complete all requirements and have access to lecturer support on a Thursday evening or via phone and e-mail.

In Victoria, at Holmesglen at least, a similar structure is followed. But, as Robert reiterates, stories of RTOs taking shortcuts are passed along the grapevine.

"I teach estimating in 10 weeks over 40 hours. I've heard that some colleges deliver it in one night though. I don't know how that is possible but there is clearly a lack of consistency across the board."

It seems to come down to a lack of motivation from both teachers and students.

"There are two ways to handle the course as a teacher. One way is to simply fulfil the minimum requirements while the alternative is to impart knowledge and leave a lasting impression."

"A lot of experienced blokes don't want to give away their secrets so it's hard for training colleges to find teachers to deliver the subject.

On the flip side, the attitude of plumbers toward learning



Sub-contractors must learn the art of estimating, not only to win the work but be accurate when quoting too.

about the business side isn't always positive either as Robert explains.

"When I started teaching estimating, I was delivering it to people who had already started their own business and were wanting more information. They wanted to be there. Nowadays, the plumbers feel like they're being forced to do something they don't want to do. They just want to be a plumber... not run their own business. It's a fantastic opportunity for them to learn some really sound business skills that will see them in good stead down the track should they decide to one day become a sub-contractor.

"Once you become a sub-contractor, you are running your own business. You're a business owner, not just a plumber. You need to work out how much time you're going to spend plumbing and how much time you're going to work on your business. Because if you spend 100% of your time doing

plumbing, your business will fail. You need to think of how you will run your business, maintain your cash flow and collect money.”

The object of providing a quote is to win the work, otherwise, why do it? So with that in mind, how do you win the work over the next guy who walks in?

“You don’t always win the work on price, so you have to sell your business and knowledge to your client,” Robert says.

A big part of doing that successfully comes down to how well organised you are with your estimating as it will reflect on your business and character as a whole.

“It is important, when estimating, to understand that a big job is just made up of little tasks that need to be completed.

If you know the time it takes to do the little tasks, you can add them all up and work out the cost of the total job. By doing so and making note of all the little jobs, you will also benefit by having a check list of tasks that can be ticked off as you go along.”

“Sure there’s a bit of wasted time and you need to factor in set up times and breaks etc. You also need to consider whether it will be one person doing the job or multiple. Work out how much of your day you are actually going to contribute to those small tasks. As a general rule of thumb, a lot of experienced people suggest there are 6.7 hours actually dedicated to tasks. If you do service work you might only do four hours of work so you need to charge a service fee to make up for the remaining four hours.”

“If you know what sort of issues you are likely to expect, you are pricing against guys who don’t know what you know so thus you’ll never get the job. You can foresee hurdles and the other guy gets the job because he doesn’t... but in the end he ends up charging more for all the add-ons.”

Like most jobs or projects these days, software exists to make the process of estimating a lot simpler. As Robert explains though, you only get out of it what you put in.

“Software is good. And like anything, you need to spend the time to get to know how to use it which takes time. Once it has been set up though, it’s extremely valuable. Like any technology you buy these days, estimating software is an expensive purchase if you don’t use it.”

Software provides you with the ability to divide every job into smaller, individual blocks. By doing so and itemising all of the labour and materials required for each job, it becomes more of an educated estimate rather than a rough guess. To add to this, software regularly updates to accommodate for pricing changes from merchants.

“If I’m installing a toilet in a house, I know the process

takes around three hours. The parts I need very rarely change but the cost of them does. The cost of me to install it only changes depending on the price of the parts that I use,” Robert says.

“If I want an accurate rate to install PVC pipe and fix it to concrete, I break my cost down to a metre. I know that every six metres I have a join and some clips. If I work out what I need for six metres and divide it by six so each metre has one sixth of a join and a clip I’ve worked out one sixth of what I need for a metre. I then just multiply it out by the length of pipe I need to install.

“I can even include drill bits in there. Let’s say I can drill 50 holes with a drill bit. I know I need half a hole per metre so

I’ll get 100th of a hole with each drill bit. It sounds pedantic but it all adds up and helps to be highly accurate. I can cost out each screw too. I only have to do it once and because the prices keep changing and updating via the software, I know exactly what to charge for big jobs. If I charge at \$10 per metre and the next guy comes in and guesses it at \$20, I’ve already won the job.”

By being pedantic and getting it right the first time, the price that you’re quoting will be accurate, which paves the way for accurate quotes for similar jobs in the future. It also minimises the possibility of having to add thousands of dollars to the cost

of the job after it has been completed. Customers never like to incur extra costs at the end of jobs and admitting that you had forgotten certain inclusions is never a comfortable feeling either.

“When you are estimating, you have to stop thinking like a tradesman and start thinking like an estimator or business owner,” Robert says.

“Get it right the first time and then you’re laughing.” ■

“

**ONCE YOU BECOME A
SUB-CONTRACTOR,
YOU ARE RUNNING
YOUR OWN BUSINESS.
YOU’RE A BUSINESS
OWNER, NOT JUST A
PLUMBER.**

”

ROBERT’S TOP ESTIMATING TIPS

- You have to make quiet time to make estimates
- Have a good system so you’re not wasting your time
- Only accept jobs that you are prepared to follow through and give a quote for
- Do the quote as quickly as possible rather than wait until the last minute
- Know your costs and what the job is going to cost you
- Clearly outline, in words, what you are including and excluding so everyone is on the same page
- Understand how long a job takes to do by breaking it up into smaller steps or task. Don’t look at it globally. I’ve never met an employee who can do a job in the time they reckon they can actually do it.

SYSTEMISE YOUR ESTIMATING

ANDY FARRELL HAS DEVELOPED A BUSINESS-SAVING ESTIMATING SYSTEM THAT TAKES THE GUESS WORK OUT OF QUOTING ON JOBS, AND ALL FROM THE SEAT OF HIS WHEELCHAIR. **JACOB HARRIS** REPORTS.

Many plumbers out there would much prefer to spend their time knee deep in the proverbial than in paperwork. But unfortunately, when it comes to running a successful plumbing business there's a lot more involved than technical know-how. Estimating on jobs is an essential part of contract plumbing, and it's imperative that it's done accurately if you don't want to get burned.

Andy Farrell, in the face of adversity, has developed a system to make it easier for the rest of us. On May 7 2000, Andy, who was then a fourth year apprentice, had an accident that would change his life forever.

"Ever since I was 11 or 12, I competed in water ski racing. When I was 21, I raced in the Bridge to Bridge Water Ski Classic on the Hawkesbury River in Sydney. I had a great start and was coming second, but about three quarters of the way through the race I fell head-first in the water and dislocated my neck. That resulted in me becoming a quadriplegic," Andy says.

Obviously this sort of injury was life changing, and meant he certainly wasn't going to be able to work 'on the tools' any longer. But instead of accepting defeat, Andy started working in a friend's office taking care of the paperwork side of things and helping to quote on a few jobs. This led to Andy meeting, and being mentored by, Paul Funnell who developed the *Sharp Estimator* software, and going on to make a career out of estimating.

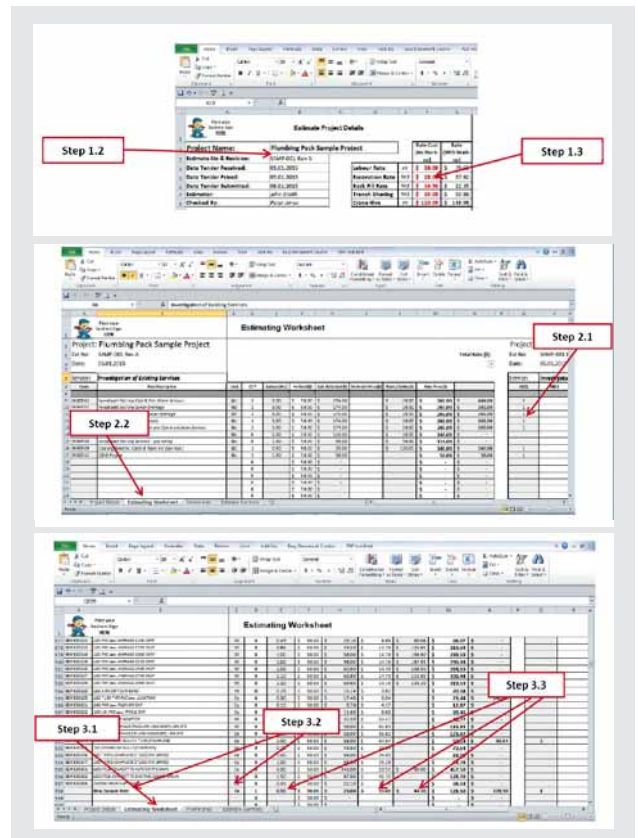
"At first it was just a way for me to make some money and get back into the industry," says Andy. Until, during a stint in hospital, Andy decided to take it a step further, and began to create *The Plumbing Pack*.

"I had to have an operation on my spine, and subsequently spent about three months in hospital for spinal rehab. So while I was there I decided to start making up standard rates. I was getting asked to price people's jobs and if I knew of an easy system for estimating. So I thought I'd create a system that's super easy to use and it just grew from there - that was four years ago now."

The system works on the 'standard rate' method. A standard rate is a unit of measurement that includes labour, materials and expenses broken down into a per metre figure.



Andy Farrell



The Plumbing Pack provides step by step instructions to guide you through the process of estimating.

"To create a standard rate you start by working out the labour, materials and plant costs of a given job. For example, if the rate is for 100mm PVC pipe in a trench that's averaging out at one metre deep, you'd work out how long it would take you to install a metre of that pipe, what materials are involved, and what it would take to excavate/back fill it etc. Now you have a per metre rate for laying 100mm PVC at one metre deep," says Andy.

"If you were going to install 75m of that pipe, all you need to do is enter the rate with a quantity of 75, and that would allow for everything that's required with one quick, easy formula. The biggest bonus of this method is that when the job's done, if for example it took you 10% longer than you'd allowed for, then you can easily add on 10% to your rate. So theoretically the next time you do it, it'll be more accurate."

While, as Andy freely admits, there's no substitute for experience, even an old hand at the estimating game can easily run into trouble if they're not working from a system. A high quote will mean a lost job and a low quote will more than likely mean a loss of income. And with the high levels of competition and tight margins on jobs it can be easy to slip up.

"A lot of plumbers understandably want get their quote in as fast as possible and move on. They're reluctant to put extra time into it. The thing is, once you use the system a few times it actually makes the process quicker and drastically reduces the margin for error.

"I encourage the standard rate system because once you've got all the processes in place, you have confidence in what you're pricing and submitting, and you don't have to worry about what everybody else is doing," says Andy.

"I've had feedback from builders and clients, and found that on a job I've priced at \$1 million for example, some have come in at \$600,000 and others have quoted \$1.4 million. It makes you wonder how they come up with the figures and also, how can there be so much variance on a straightforward job. It's really quite remarkable - and downright scary."

The Plumbing Pack consists of two main systems, one focuses on large residential and commercial work, while the other is designed to suit smaller residential and domestic projects. Together they contain thousands of fully editable standard rates with estimates broken down into labour, material and plant costs.

The Plumbing pack also offers a Job Tracking System that integrates with the Commercial Estimating System and allows you to ensure a project is running to budget and on schedule in real time, and which categories (if any) are running at a loss. In addition to this, a Variation & Schedule of Rates System, and Tendering Documents are available.

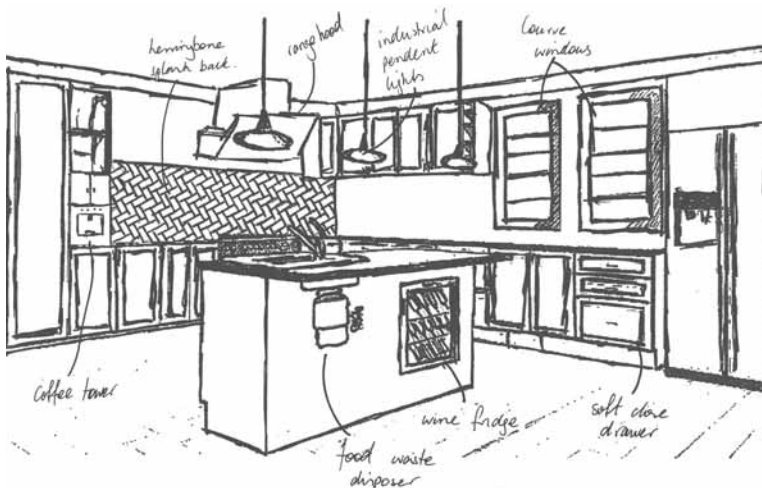
Andy Farrell has put a hell of a lot of work into developing an estimating and management system to make running a plumbing business as simple as possible. He's also made himself available to answer any questions readers might have on estimating. We welcome Andy as a regular contributing columnist to *Plumbing Connection*. ■

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RECOVERING DEBTS

IT'S NOT THAT HARD TO CUT OUT 80% OF YOUR BAD PAYERS. **ANTHONY IGRA** TALKS ABOUT THE SYSTEMS NEEDED TO ENSURE YOU GET PAID.

I know a contractor who was asked to do so much additional work that the value of the variations exceeded the original contract price. When it came to payment time the client flat-out refused to pay any of the variations. It was then that the contractor produced every single variation request, where the work was detailed, numbered and signed off by the client's foreman. The client was furious, and grudgingly paid the whole amount, clearly realising that the weight of evidence was on the contractor's side – it would have been pointless to dispute it.

Another contractor had his client claim that he never gave any instructions to carry out some part of the work. The contractor produced emails showing a direction was given.

I know another who was accused of providing damaged product. But this contractor was able to produce photos of the product when it was delivered, and the signed receipt from the site representative. It was in perfect condition, clearly proving that the damage occurred after delivery. The matter went to adjudication and the contractor's evidence was so conclusive that the client realised that payment was the only option. A cheque for the \$60,000 came the next week.

These are just a few of examples of how paperwork gets you paid. Some people only associate paperwork with delays, red tape and wasted time. Chances are those same people are locked in payment disputes over what was promised, agreed or quoted, and are unable to prove their case.

The fact is that solid paperwork is probably the most effective weapon in defending a payment claim. Good paperwork means that there isn't this great void where neither you nor your client can prove what was promised, agreed or quoted.

But most contractors struggle to get themselves and their businesses organised around simple and solid processes to tighten up on payment documentation. The most common question I get asked after a claim is, 'How do I stop this from happening again?'

So I put together everything I had learned from a decade of payment disputes, and created 'Payment Mastery'. It provides 3.5 hours of content to answer that very question: How can a contractor tighten up on payment practices and avoid 80% of payment problems

Let's look at what this is in more detail.

PAPERWORK IS CONTEMPORANEOUS EVIDENCE

The important feature of paperwork created or completed around a dispute is that it becomes 'contemporaneous'

evidence; coming from the word 'contemporary'. Good contemporaneous evidence will carry significant weight in proving what happened, what was promised, agreed, or quoted. In adjudication, the adjudicator will place weight on this kind of evidence in making a decision if he/she is satisfied as to its quality and credibility.

Far too many disputes come down to the contractor's word against the client's. The easy way to tip the balance in your favour is by including simple record-keeping habits into your work.

In the Documentation Video in 'Payment Mastery', we go into detail about how you can not only create this kind of evidence, but also how you create 'corroborating evidence'; documentation that backs up other documents. For example: a site diary note might back up an email sent that day on the same issue. 'Payment Mastery' also provides 12 complete document template downloads for you to use straight away in your business.

VARIATION MANAGEMENT

VARIATIONS/SITE INSTRUCTIONS (TIME REQUIRED: 30-60 SECONDS)

If you are given a verbal direction to carry out additional work, make sure it ends up in written form. If the client refuses to document the direction, then the contractor should document it in his own 'Site Instruction' form and issue it to the client. I recently prepared an adjudication application where there were nearly 60 directions for additional work. Even though the client's foreman failed to complete a variation advice as required by the contract, the contractor documented each one himself on his own paperwork; the details of the work done, who requested it, and dates and times were all recorded. The result was that he was awarded all these variations because the adjudicator was satisfied that these 'Site Instructions' were valid contemporaneous evidence that work was requested and done.

The hot issue of variations actually has its own dedicated video in 'Payment Mastery'. In that we go into Variation Registers, how to complete them and how to incorporate the register into your payment claims. More importantly though, it covers the three crucial aspects of variations that need to be recorded on any Variation Approval: Scope, Price and Authorisation.

PHOTOS/REPORTS (TIME REQUIRED: 30-60 SECONDS)

Stop talking on your mobile. Take pictures with it



RECOVER WHAT'S RIGHTFULLY YOURS

Are you fed up with chasing your payments every month?



Plumbing Connection is often approached by service providers to promote or sell their offerings to contractors and more often than not, we turn them away.

But, the debt collection advice that Anthony Igra puts out to this industry is in a league of its own.

As a result, the online video training series he has produced is a great investment for you and your staff.

This three-hour, four-part series of online training videos shows you how to handle your debt collections and empowers you to confidently approach your debtors and recover what's rightfully yours.

Upon completion of the course, you will also get access to downloadable forms and templates that you can quickly convert into your own formal documents.

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ANTHONY IGRA
Founder, Contractors Debt Recovery



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instead. In disputes around defective work or damage, take a pile of photos right there and then. If possible, have the work inspected by an expert who can prepare a report shortly after.

Often disputes around defective work occur months before a payment dispute. Only then does the client raise the defect as a reason for non-payment. If the contractor can produce photos and reports about the work from the actual time, this is excellent evidence as to what was or was not defective.

I recently prepared an application where the respondent refused to pay by alleging that much of the fitted equipment was damaged by the contractor. However, the contractor had taken so many photos at the time, together with a detailed report, that clearly showed that the damage was caused by another trade. This type of evidence was impossible to argue with and the contractor got paid.

SITE DIARY (TIME REQUIRED: 60 - 90 SECONDS)

A site diary is useful because it typically captures a whole raft of information. Besides details of work done or directed, it also records weather, any delay details, conversations, staff onsite/offsite and more. This is a single record of each day that can take as much information as you want to include. If you can make completing a site diary page a daily habit then you will be able to produce evidence regarding the dispute. Further, if you can show that this has been a daily habit for a long time, the weight given to your site diary as evidence will drastically increase.

EMAILS/FAXES (TIME REQUIRED: UP TO 20 MINUTES)

Any project will leave behind it a paper-trail of faxes, letters and emails. Keep all of these in a file in chronological order. They can show what happened and when. Furthermore, if a dispute comes up onsite make sure you confirm the details in a fax to your client that day. Remember, verbal recollections of events aren't worth the paper they're written on.

MINUTES OF MEETINGS (TIME REQUIRED: UP TO 30 MINUTES)

Site meetings occur regularly on most projects, especially meetings that are supposed to resolve disputes. Most times the client will not provide any record of the meeting, what was promised or agreed. So this is the contractor's chance to step into that void. There is nothing stopping you from writing up your own record/minutes of the meeting and sending them to the client. Again you are creating a record of events and undertakings that can be useful evidence in the future.

RECONCILIATIONS RULE

This is the most common weakness in contracting payment practices: very few of you prepare a proper reconciliation of what you are owed each month. That is nuts. Amazing as it may seem, many contractors don't actually know what they are owed. Every month your claims must show the breakdown of full work value, variation value, other amendments and the paid-to-date. Again, too many contractors are concerned with the 'certified-to-date' instead. You can't pay your bills with 'certified payments'! A good reconciliation will show you your paid amount so you know exactly what remains 'unpaid'.

Payment Mastery has a complete video taking you through the reconciliation process; making it easy to follow. It also provides a completed reconciliation spreadsheet template to use each month. That way every outstanding dollar can be identified.

THE POWER OF PAPERWORK

The power of good paperwork lies in its credibility and the weight that a court or adjudicator will place on it. Good paperwork very often beats hearsay, statutory declarations, someone's recollections and will often catch out 'invented' evidence. Good paperwork is very hard to argue with and provides adjudicators with sound material upon which to make their decisions about what actually happened in the dispute. Good paperwork helps you prove and support your case for payment.

“
THE POWER OF GOOD PAPERWORK LIES IN ITS CREDIBILITY AND THE WEIGHT THAT A COURT OR ADJUDICATOR WILL PLACE ON IT.
”

SO WHAT DOES ALL THIS MEAN FOR ME?

It means you should start to get very excited about keeping great paperwork. Take a look at the estimated time you need to invest. Most of the time it would not reach 10 minutes a day. Now is 10 minutes a day worth it to protect your ability to recover payment and settle payment disputes? Of course it is.

Never again will you rely on your word against the client's. There will be overwhelming evidence on your side.

Make paperwork a daily habit right now, and rejoice while you're doing it. Don't see it as red tape; see it as money in the bank because that's exactly what it is. ■

Anthony Igra is the General Manager of Contractors Debt Recovery

www.contractorsdebtrecovery.com.au

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COLOUR BLINDED

IT IS COMMONLY ACCEPTED AMONG PLUMBERS THAT COLOURS MAKE IT EASY TO IDENTIFY VARIOUS PIPES AND THE MATERIALS THEY ARE SUITABLE TO TRANSFER. IT IS ALSO COMMON FOR PLUMBERS TO ASSUME THAT ALL GAS PIPES ARE YELLOW... BUT THEY'RE NOT. *PLUMBING CONNECTION REPORTS.*

A standardisation of pipe marking helps prevent possible confusion, injury, and other hazards. This is where the Australian Standard *AS1345 Identification of the contents of pipes, conduits and ducts* comes into play. It pays not to make assumptions when it comes to pipe colours though; especially where gas is involved.

Most gas pipe manufacturers make their composite pipe all yellow so it's easily distinguishable. Using the term 'most' is a scary thought in itself because it means that at least one pipe manufacturer has chosen to do things differently. Not only does this mean that plumbers can be misled, it also makes for a dangerous proposition.

Regulations state that composite gas pipe is generally yellow with black lettering; black pipe with yellow lettering is also acceptable. The pipe markings must include: AS4176, maker's name, gas/pipe size, materials used, date of manufacture and licence number.

The pipe in focus is actually black with yellow print. This, according to the Standard is enough to distinguish the pipe as suitable for gas. The problem with that is the fact that writing on pipes rubs off quite easily. The other problem stems from a lack of product awareness or knowledge that the Standard specifies that yellow writing is all that is needed to identify the product as a gas pipe. When a plumber has only ever known gas pipes to be yellow, it would be fairly easy for them to mistake this product as one.

You can no doubt picture the following scenario: a plumber installing an air conditioner enters a premise and turns the water off at the mains. He drains the taps and climbs into the roof to work on the air con. He cuts the black pipe under the assumption it's for water and then lights a quick cigarette. While some would argue he shouldn't be smoking up there or on the job, it's a very real prospect.

It's a scary thought, isn't it?

This isn't bureaucracy gone mad; it actually hasn't gone mad enough.

Cross connection is always a danger and it does happen more often than installers are prepared to admit! Apart from the ignition danger, water in gas lines or vice versa is a very dangerous and expensive outcome.

"The identification of pipework in general, is an interesting one," Manager, Type A Gas Appliance Safety Energy Safe Victoria Enzo Alfonsetti says.

"When you look at the relevant product standard for composite pipe, it doesn't really specify a colour requirement so composite pipe manufacturers can virtually design their product to whatever colour they want."

The thing is, there is a requirement in the Gas Installation Standard [clause 5.1.12 identification of pipework] that makes things interesting. It states: *except in single occupancy residential premises [domestic dwellings] above ground consumer piping shall be identified when one of the following applies:*

- The operating pressure of the consumer piping exceeds 7kPa
- Where the location of the pipe is such that it is not readily identifiable as consumer piping

This puts the onus back on the installer to decide whether or not the pipe is really identifiable as consumer piping or not.

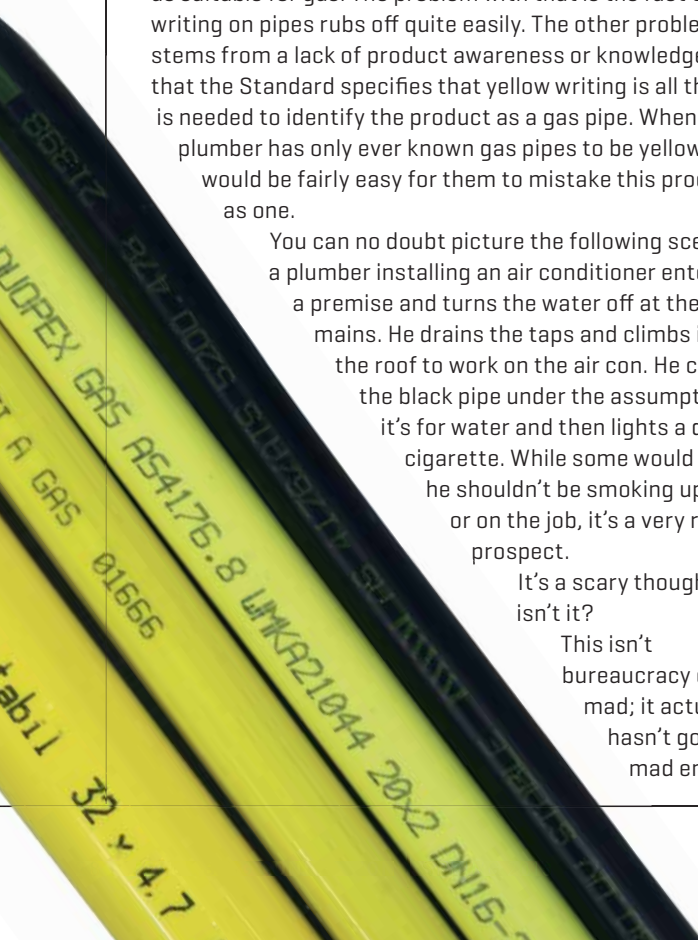
There are requirements in situations other than single residential where the pressure is over 7kPa. Most households won't have to meet those requirements. It is only an issue in commercial buildings and the like. If you were using the black pipe in a commercial environment where the pressure was greater than 7kPa, it would be an issue.

When it comes to the Product Standard for composite pipe, there is no specific requirement for colour.

"If you are using black composite pipe, be wary that if you are using it in a commercial or any installation other than a single occupancy residential premises, that there are specific marking requirements where either the pressure exceeds 7kPa or it's not readily identifiable," Enzo says.

When working with pipes, be sure to check and double check that what you are working with is in fact a gas or water pipe. They're not all yellow after all. ■

LEFT: It's easy to assume that all gas pipes are yellow; however, as shown here, black gas pipes exist too.



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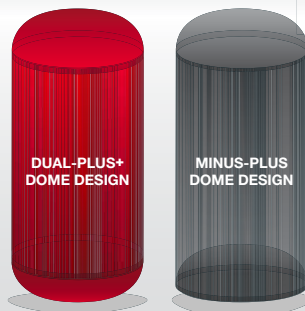
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REPAIRING BROKEN TUBES

BROKEN EVACUATED TUBES CAN BE HARD TO REPAIR AS ORIGINAL PARTS ARE OFTEN HARD TO FIND. **MATHEW BRIGGS** DESCRIBES SOME SIMPLE SOLUTIONS THAT CAN BE EMPLOYED TO MAKE THE TASK LESS DIFFICULT.

Replacing evacuated tubes can always be a challenge, particularly when you can't find the manufacturer who made the original brand of tube you are trying to replace. Solar Hot Water Parts receives a lot of enquiries from people trying to find the exact brand of replacement part. In most cases they're not always available or practical to buy. I hear stories of people calling every plumber in the phonebook in an attempt to find old stock to fix broken evacuated tubes.

There are some simple solutions to repairing a system that is no longer sold and knowing what they are will come in handy when picking up extra repair work from customers who can't find the parts they need.

Sometimes you can get lucky and find a small local manufacturer who stocks replacement tubes. These guys often have a couple of sizes in stock. The unfortunate fact is: you can't easily post individual or small numbers of evacuated tubes. If you know the length and diameter of the tube you're replacing, you will generally be able to find an easy way to fix the problem.

For the purpose of this article we went out on site with a new adjustable evacuated tube holder we just brought into the country. We replaced broken tubes on a Hills Solar system with Apricus evacuated tubes. A local householder had contacted us due to his problem of having had broken tubes on his roof for the past six months. Until then he was unable to find the parts or someone to fix them. This is a fairly common enquiry we receive from people trying to buy replacement tubes.

We measured the outside diameter (OD) and inside diameter (ID) of the Hills tube and the OD and ID of the Apricus tubes and found out they were similar. The Apricus tube was a little longer and had a different end finish to the tube, meaning it didn't fit into the Hills tube holder. The internals of the two tubes are different. But because the ID of the tubes was similar we simply kept the original heat pipe and sputtered aluminium support from the Hills system and slid the new Apricus tube over the top and into position. We added the adjustable version of the Hills cap into the bottom rack on the frame and fitted the tube. The problem was easy to fix and using the Apricus tube was an advantage because they can normally be bought at any plumbing supplier or local reseller and if they don't have them in stock they can normally get them in.

Using the adjustable tube holder, we were able to securely support and fix the tube back into place. The adjustable tube

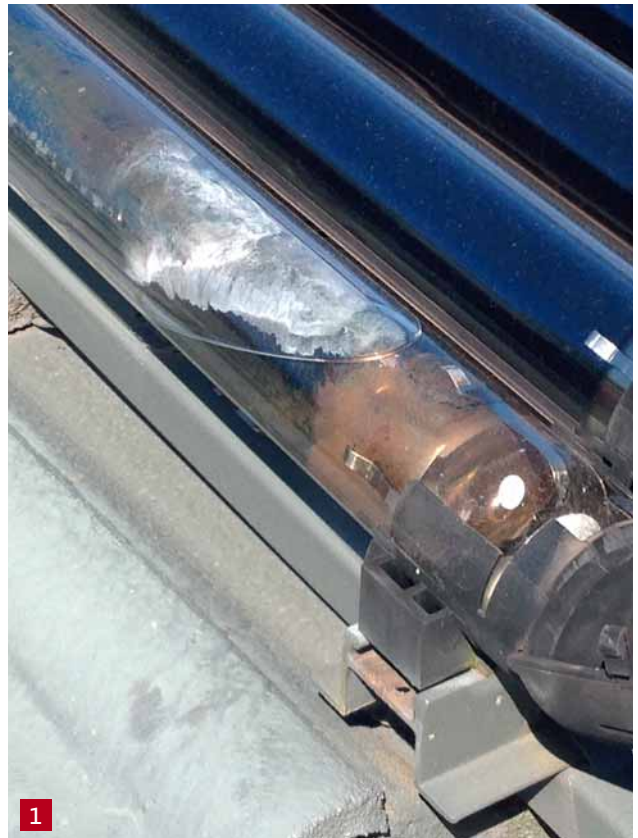


IMAGE 1: Broken Hills tube.

holder works with the original Hills style tubes and other style tubes like the Apricus. The advantage of the adjustable tube holder is it can be posted and easily used to replace a number of tubes. It is simple solution for a sometimes tricky problem. There will always be brands of tube that will be harder to find than others but if you take the time to find a simple solution it can be a good way to generate more repairs for your business. ■

Mathew Briggs is a commercial plumber and director of www.solarhotwaterparts.com.au – specialising in solar hot water replacement parts for all systems.

Solar Hot Water Parts
www.solarhotwaterparts.com.au



IMAGE 2: Apricus tube with the internal sputtered aluminium replacement ready to install in the Hills collector. **IMAGE 3:** Sliding the Apricus tube over the Hills heat rod. **IMAGE 4:** Replacement adjustable tube holder to suit the Hills frame. **IMAGE 5:** Apricus tube fitted [far left tube].

NEW ROOF SENSOR

One of the new solar products about to hit the market is the first solar hot water wireless roof sensor by Kanitti. The wireless sensor works with the new Kanitti Drift2-w controller. Kanitti is an Australian owned company. The Israeli designed controller has been used with the Chromagen system for many years now.



SYSTEM OVERHAUL

This job saw us work alongside an electrician to give his Chromagen system a full service. After five years the pump had packed it in. Being a typical electrician meant he had to have the bells and whistles, including the ability to monitor his solar production via the Internet and from his lounge room. We installed a complete new pump station with the Grundfos 15 20 CII pump and RESOL BS/4 controller. We also added a VBus adaptor, so we could connect the controller to his computer, allowing him to monitor solar production and change his settings either from his PC or remotely. We then installed the smart display and mounted it in the kitchen.

As he chose a complete controller upgrade, a new 30mm x 1/2" MI immersion sleeve from RESOL had to be installed into the roof collector so the new roof sensor could be installed. Once the solar side was taken care of it was time to replace the element, thermostat and anode. You can see by the photos that it was not a simple job but it does highlight why a system needs to be serviced and have anodes replaced.



STATE OF THE ART TRAINING

SOUTH AUSTRALIA IS EXPERIENCING A BOOM OF PLUMBING APPRENTICES AND THE TREND IS EXPECTED TO CONTINUE WELL INTO THE FUTURE. **JUSTIN FELIX** REPORTS ON PLUMBING TRAINING DELIVERY ACROSS THE STATE.

Apprentice training delivery varies greatly around the country and as you might recall, we ran a story last year on the methods being adopted in Melbourne and New South Wales. Industry run bodies such as PICAC in Melbourne and the Master Plumbers in New South Wales have really taken training into their own hands and while TAFE still plays a big role in plumbing training delivery, times are certainly changing.

As we look to South Australia, the contrast is quite vast. The Master Plumbers Association works closely with TAFE South Australia to ensure the best practices are delivered and the close working relationship simply works. This is a sentiment shared by TAFE SA's Plumbing Lecturer Rob Gilman and Group Training Manager, Master Plumber Association of SA's Greg Lyng.

We caught up with Rob and Greg to find out where South Australia was at when it comes to educating plumbers.

"In South Australia TAFE SA Plumbing School delivers Certificate II, III and IV Plumbing qualifications across three campuses. The majority of Certificate III and IV training is completed face-to-face at our new state of the art Tonsley Campus at Clovelly Park and our Certificate II programs run at Elizabeth in the north of Adelaide and Noarlunga in the south. We have a 'case management' approach for students that wish to have on-job assessment for the areas that they cover extensively in the workplace," Rob says.

"The majority of students prefer face-to-face, especially at the more complex Certificate IV level. Our Certificate II program is delivered to both school based students on a part-time basis over 1 or 2 years as well as to those who have left school as a six month full-time program. These programs include a four week work placement for students to gain on-job experience and to demonstrate their skills to prospective employers.

"TAFE SA Plumbing School has an excellent relationship with the Master Plumbers Association of South Australia [MPASA] and we have supported each other with sharing of training resources."

The MPASA currently deliver a Certificate 1 in Construction as well as the Doorways to Construction - Plumbing Plus program to a number of high schools across Adelaide which is supported by the Construction Industry Training Board [CITB]. A point of difference is that the MPASA delivers at the high schools using their own trainer or the school's tech studies teachers. ➤



THE DIFFERENCE BETWEEN CERTIFICATE III AND IV

This is a question we receive a lot at *Plumbing Connection*. We asked Rob to explain it in simple terms:

The Certificate III in Plumbing is the training that plumbing apprentices are required to complete through a Registered Training Organisation [RTO]. The qualification is made up of six streams: Water; Sanitary; Drainage; Gas; Roofing; and Mechanical Services. Of these Water and Sanitary are mandatory and between two and four of the other streams must be completed. In SA our Plumbing Industry Reference Group has recommended that apprentices do all but the Mechanical Services stream, and hence this is what TAFE SA deliver.

Once apprentices have completed the qualification and been signed off by their employer they are eligible to receive a Plumbing Workers license which enables them to work as a licensed plumber for an employer. In other states this is referred to as a Journeyman.

The Certificate IV in Plumbing is the next step for a plumber to be able to work for themselves and become a Plumbing Contractor. In South Australia most Plumbers complete 12 units of competence of the 15 from the qualification. This varies from state to state.

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“With the MPA SA also being a Registered Training Organisation, we are involved in the structure and delivery of courses for Year 10, 11 & 12 students in 5 of the VET schools across the metropolitan area. These are a Certificate I in Construction (with a plumbing focus) and a Doorways to Construction Plumbing Plus course which comprises a cluster of competencies from the Certificate III in Roof Plumbing,” Greg explains.

“Each of the students in these courses are initially interviewed and undertake an aptitude test, both conducted by the Field Officers from the MPA. With assistance from the trainers within the schools combined with the observations of our Field Officers on their regular visits, the top 3-4 students from each school are identified as potential candidates for an apprenticeship. The main criteria used to select the top candidates is skill, ability, attitude and level of commitment. A list containing these names along with any other available existing apprentices is sent to over 400 members of the association each week.”

“The MPASA also run many short courses for qualified plumbers in new technologies and products as well as the Plumbing and Gas Fitting Regulators road shows.”

“ WE CURRENTLY HAVE WHAT WE CONSIDER A HEALTHY NUMBER OF APPRENTICES WHICH REFLECTS THE RESILIENCE OF THE PLUMBING INDUSTRY IN SA. ”

To ensure the curriculum of TAFE SA closely aligns with the beliefs of MPA members, both Greg and Chief Executive Andrew Clarke are members of the Plumbing Industry Reference Group (PIRG).

“Meetings are held at the new TAFE complex at Tonsley at regular intervals throughout the year. The committee comprises members from a wide cross section of the industry including TAFE lecturers, manufacturers, group training organisations, industry regulators and plumbing contractors. Among other industry issues discussed, one of the key elements is to ensure the training and course structures remain relevant and in step with a rapidly changing and evolving industry,” Greg says.

TAFE SA delivers competency based training from the nationally endorsed qualifications from the CPC08 Training package. These qualifications are delivered and recognised across Australia: the Certificate III in Plumbing has a licensing outcome in all states and territories except Victoria.



GREG LYNG SAYS IT'S ALL ABOUT ATTITUDE

I'd like to address students considering entering an apprenticeship. At the beginning of each course in the VET schools when there is a new intake of students, myself, one of our Field Officers and our trainer Rob Kavanagh are invited to speak to the students to provide an overview of the industry and the varying directions that can be taken, which also incorporates the requirements of commencing a career in plumbing.

Some of the key pieces of advice given to the students revolves around exceptional behaviour to create a good and lasting impression, displaying an unwavering level of commitment, a constantly positive attitude and a willingness to listen and learn. In what is an extremely competitive environment, we believe these are vital areas where the students need to excel in order to encourage someone to consider them for an apprenticeship which includes even those that have displayed outstanding skills and job aptitude.

For those already engaged in an apprenticeship, we encourage them to continue their studies following completion by enrolling to undertake all components of the Certificate IV to obtain their contractor's licence. The importance of continuing to enhance their skills and knowledge by attending additional training courses is also strongly reinforced. We also reiterate the importance of continually maintaining the standard and quality of workmanship throughout their career in line with regulations and the ethics expected of those within our industry. Finally, we advocate the adherence to and the observation of safe practices at all times in the workplace with the ultimate aim of ensuring everyone returns home safely each and every day. In summary, the Association considers mentoring, guidance and advice as extremely important components of continual career and personal development.

"All states and territories deliver the same Certificate III in plumbing but there are slight variations from state to state and even from institute to institute. For example: New South Wales and Western Australian TAFE's deliver four streams; Queensland deliver four and a half; South Australia, Tasmania, Northern Territory and the Australian Capital Territory deliver five streams; and Victoria deliver either five or six depending on the institute," Rob says.

"The other main differences are the way apprentices attend their institute. For over 30 years TAFE SA has operated a block release model where students attend for either a one or two week block of training. Our experience has been that this allows for larger projects to be undertaken that more realistically simulates the workplace experience. It also suits regional students who have up to 100s of kilometres of travel to attend the plumbing school," Rob says.

TAFE SA is not resting on its laurels when it comes to training either. They are investing in new infrastructure and technology to ensure its training delivery is up to speed with the rest of the country.

"TAFE SA Plumbing School has recently moved into a

state-of-the-art training facility at Clovelly Park. Completed in early 2014, the new campus has brought together all building and construction trades into the one facility and includes a four storey building that supports collaborative learning among trades," Rob explains.

"Building services such as water, gas, and electrical can be run from simulated mains into the sandpit and up into the structure. The building itself is a learning tool: all construction methodologies and building services are on display for students to learn from [for example: the plant room has a glass wall for viewing] and the interactive BMS allows us to make use of plant and building performance data. The building is unique in its adaptive design and flexible use of space and is often used by our industries for conferences, exhibitions, trade nights and general meetings."

Student learning is enhanced by the use of blended delivery methodology that uses state-of-the-art audio visual technology such as high definition digital cameras in workshops and learning spaces.

"I have been lucky enough through my role on the National Plumbing and Services Training Advisory Group [NPSTAG] ➤

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Once these have been completed plumbers are required to take their results along with their Certificate III in Plumbing to Consumer and Business Services (CBS), complete relevant paper work and pay a fee. This will see them receive a plumbing contractor's license enabling them to work for themselves.

to have visited plumbing training facilities in every state and territory and our new facility is second to none. I would like to think it is the best in the Southern Hemisphere. With this new facility and the wealth of plumbing knowledge held by the teachers, apprentices attending TAFE SA will gain the best possible training."

This positive outlook has been reflected in the number of students enrolling into the course with TAFE SA experiencing a boom in apprentice numbers from the mid to late 2000s with a doubling of students during this period. Due to this boom TAFE SA have a larger number of students wishing to complete the licensing units from the Certificate IV in Plumbing.

"We currently have what we consider a healthy number of apprentices which reflects the resilience of the plumbing industry in SA," Rob says.

TAFE SA's plumbing program is supported through WorkReady, which is a South Australian government initiative that brings together funding for training, employment and skills activities. WorkReady is about targeting training and employment opportunities to the needs of people, strategic industries, such as the plumbing industry, and regions.

Individuals have to meet the course entry requirements and verify their eligibility for enrolment before being enrolled in the government subsidised training places allocated to the plumbing program.

With such a positive relationship between TAFE SA and the MPA, as well as state of the art facilities being built, the future looks bright for plumbing training delivery in South Australia. Rob believes the direction it is taking is one that can be sustained for many years to come.

"I would like to think plumbing training continues in its current guise through an apprenticeship under a contact of training. Plumbing is a complicated industry covering a huge range of areas.

"I like to tell apprentices that plumbers save more lives than doctors through the supply of drinking water and the removal of liquid waste. For this reason it is crucial that our trade is not dumbed-down. It is also critical that students avoid shonky RTOs who use a 'tick and flick' approach that does not adequately give future plumbers the required knowledge. With the implementation of the Australian Skills Quality Authority [ASQA] this may help reduce these unscrupulous RTO's. ■

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PROVISION FOR OVERFLOW IN EXTERNAL EAVES GUTTERS

WITH OUR CHANGING WEATHER PATTERNS, WE CAN EXPECT TO SEE MORE RAIN EVENTS THAT PUT OUR GUTTER SYSTEMS TO THE TEST. BUT ARE WE ALL READING FROM THE SAME TECHNICAL TEXT BOOK? **PETER COLL** OF INTERLINE ROOFING QUESTIONS THE CURRENT UNDERSTANDING OF WHAT IS ACTUALLY THE RIGHT APPROACH TO THIS ISSUE FOR DOMESTIC ROOF/GUTTER INSTALLERS.

The design of external eaves gutters has not changed a lot over the past 150 years and, for the majority of the houses in Australia, they have functioned as intended.

I have personally been in this industry for over 20 years while my family have been in it for the better part of 40 years. Needless to say, we have installed external eaves gutters on thousands of houses and have always known that gutters must have provision for overflow. As you walk around any suburban street though, you will notice that most standard house gutters do not have provision for overflow. Why has this been allowed to happen in a regulated and supposedly well-educated industry?

After the release of AS2180 – 1986 *Metal Rainwater goods – Selection and Installation* we changed the design of our quad guttering to always run with overflow slots as stated in Section 2. *Installation, 2.1.2 High-fronted eaves gutters*. It states:

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.

NOTE: Methods of preventing this backflow are as follows:

- a. *Provision of slots in the front of the guttering.*
- b. *Provision of a lower level weir overflow at some point in the drainage system, e.g. rainhead.*
- c. *Suitable design of flashing and fixing of guttering to the fascia board.*

According to the Australian Bureau of Statistics, in the five year period from July 2009 and June 2014 806,245 houses were approved for construction. Let's be more than fair and assume that only 70% had external eaves gutters – that's 564,372 houses in a five year period that have been built in Australia. Little did anyone know that the 'design' of the external eaves gutter did not comply because AS2180 – 1986 was superseded by AS/NZS 3500.3.2: 1998, and then again by AS/NZS 3500.3: 2003 and now by the new AS/NZS 3500.3: 2015.

AS/NZS 3500.3: 2015 is so riddled with grey areas that it comes as no surprise that no one has picked this up as a compliance issue until now. In addition to this, here in my State there was the move from the industry dedicated



Peter Coll of Interline Roofing isn't sure we're all reading from the same regulatory roofing text book.

regulator the Plumbing Industry Commission (PIC), to the all-encompassing Victorian Building Authority (VBA). As a consequence of that, it appears to have led to a replacement of experienced plumbers/inspectors, with 'book smart' people who had no previous exposure to building, let alone plumbing.

A colleague from another plumbing company contacted me over a month ago to ask if I had been pulled up under the new provision for overflow regulation. I mentioned that I had no idea what he was talking about. Then, coincidentally at the time of writing, in July, I received a call from the VBA, telling me that our business had been picked out for a new snap audit directive which the VBA was now carrying out on plumbing companies. They asked us to supply them with details of 40 houses we had issued a certificate of compliance on. ▶

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As any roofing company is aware, this isn't exactly easy as you have to sift through jobs and make sure you don't send them to any double storey properties as they aren't allowed to audit double storey houses in this State anymore.

This led me to ask, 'what if every job completed was a double storey house?' This isn't a silly question when you think of the continual shrinkage of block sizes and double storey townhouses becoming the norm these days.

Of the 40 jobs they audited they issued one rectification notice for insufficient provision for overflow.

f. For concealed eaves gutters the top edge of the fascia not less than h_f below the top of the back of the gutter, or integral flashing (tail) with the top edge of the flashing not less than h_f above the top of the fascia as shown in Figure G 1 [d]-[weir flow over front of gutter].

The h_f value shall be determined from Table G 1 where the average flow per metre is d determined from the total flow shown in Figure 3.5 divided by the length of the eaves gutter served by the catchment.

RECTIFICATION NOTICE EXTRACT				
Class of Specialised Class of work	Description of the plumbing work	Description of breach	Relevant plumbing law [see note 1]	Rectification work required
ROOF PLUMBING	ROOF PLUMBING	Inadequate overflow provision	AS/NZS 3500.3.2003 Cl 35.3	To install appropriate overflow provision to the eaves gutters, at the new dwelling.

The notice for insufficient provision makes reference to AS3500.3.2003 Cl3.5.3. I am working from AS/NZS 3500.3:2015 Overflow measures.

Note: Examples of overflow measures for eaves gutters are given in Appendix G.

This is the clause that the VBA referred to when they issued this rectification notice, thus it directs us to Appendix G.

Appendix G states the following and shown in G1 are the diagrams opposite:

APPENDIX G
EXAMPLES OF OVERFLOW MEASURES FOR EAVES GUTTERS
(Informative)

G 1 SCOPE

This Appendix sets out examples of overflow measures for eaves gutters [see Clause 3.5].

G 2 FULL LENGTH (CONTINUOUS) OVERFLOWS

Examples of acceptable full -length [continuous] overflows are as follows:

- The front bead not less than the dimension h_f below the top of the fascia board as shown in Figure re G 1[a]-[weir flow over front of gutter].
- The front bead not less than the dimension h_f below the top edge of the back of the gutter-[weir flow over front of gutter].
- Flashing as shown in Figure G 1 [b] with the top edge of the flashing not less than h_f above the bead-[weir flow over front of gutter].
- Combinations of Items [a], [b] or [c].
- The top edge of the back of the gutter not less than h_f below the top of the fascia board as shown in Figure G 1 [c]-[weir flow over back of gutter].

NOTE: Blockages can and do occur anywhere along an eaves gutter causing overtopping that would not be affected by an overflow device located at the outlet of an eaves gutter, e.g. rain head [see Figure 3.7[a]]. The overflow devices given in Paragraph G2 are located along an eaves gutter so that any overtopping is unlikely to cause monetary loss or property damage including damage to contents of a building. The A R Is for eaves gutters given in Table 3.1 assume the provision of appropriate overflow measures.

NOTE: As I understand it h_f stands for freeboard and by my understanding, freeboard is the distance from a maximum waterline and the overflow 'overtopping' point.

G 3 SPECIFICALLY LOCATED OVERFLOWS

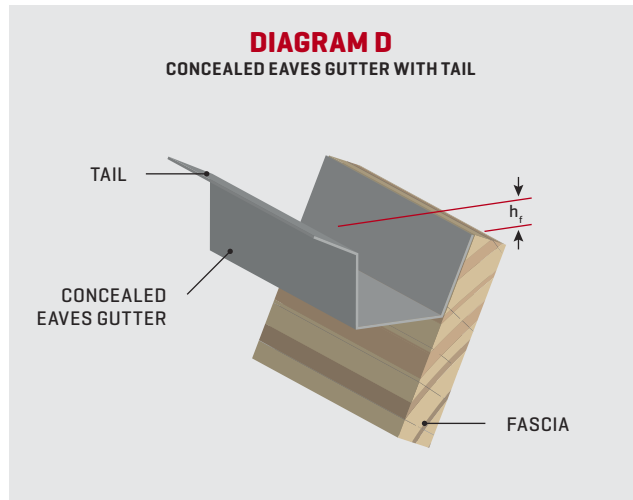
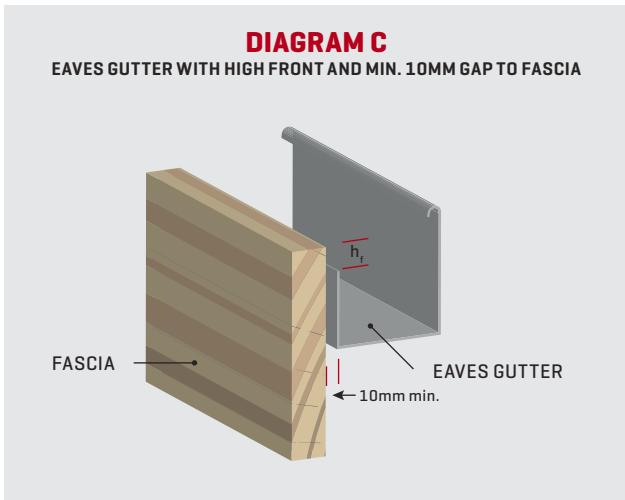
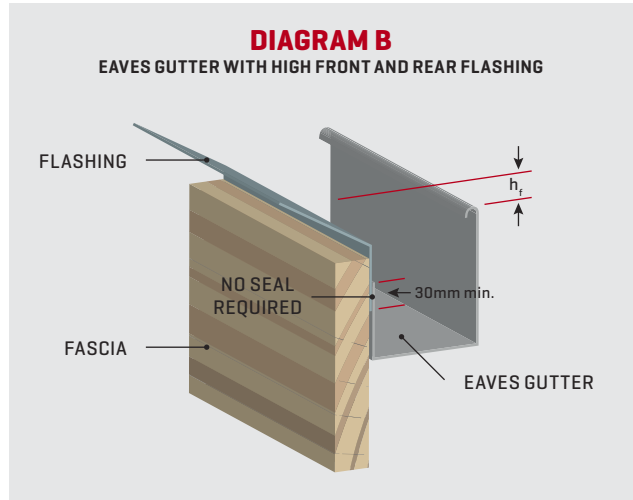
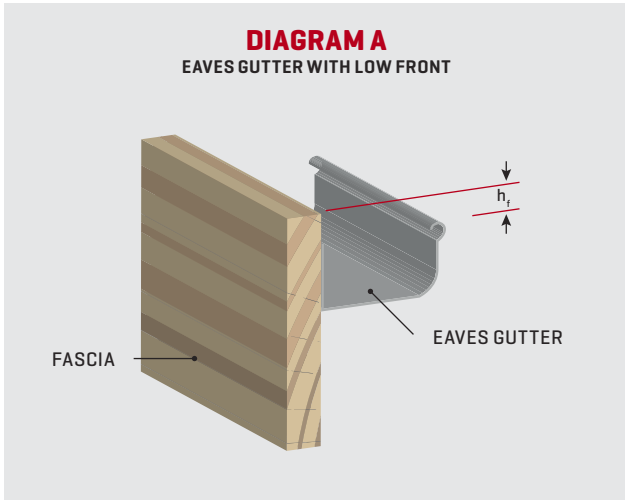
Examples of specifically located overflows are holes and weirs.

TABLE G1
MINIMUM h_f VALUES

Gutter slope	Average inflow per metre of gutter L/s per m				
	0.2	0.4	0.6	0.8	1.0
Level gutter	18	20	22	23	25
Sloping gutter	12	14	16	17	19

Minimum h_f , mm

NOTE: Minimum h_f is based on $100l_5$ for Australia and $50l_{10}$ for New Zealand. Table G1 includes an allowance for water surface undulations and construction tolerances of 19 mm for level gutters and 13 mm for sloping gutters. Available research suggests that surface undulations may be limited to the range 5 mm to 8 mm, provided the discharge from metal cladding for all roof slopes is directed downwards by turning down the outside edge. Figure G2 illustrates the effect.



This table states in the title line, 'holes and weirs'. This is the first real hint to an actual overflow but there is still no reference to sizing or positioning. It also makes reference to 'level gutter'. Now I was taught at trade school that all gutters must be installed with fall and on the VBA Technical Solutions Sheet 0.04 it states the following:

Step 2: Select eaves gutter and gutter slope. The eaves gutter selected is quad spouting with an effective cross sectional area of 6125mm² installed with a slope of 1:500. It also refers to SAA/NZS 114: 1998 Appendix H

Above you will see the examples of 'Provision for overflow' shown in AS/NZS3500.3: 2015.

NOTE: None of the examples have overflow slots.

DIAGRAM A: EAVES GUTTER WITH LOW FRONT

These gutters are still available but are rarely used because they expose the ends of the roofing material.

DIAGRAM B: EAVES GUTTER WITH HIGH FRONT AND REAR FLASHING

This is clearly designed by someone who has never installed a gutter in their life. Yes the rear flashing will stop overtopping but it effectively makes all common bracketry for eaves gutter useless.

DIAGRAM C: EAVES GUTTER WITH MINIMUM 10MM GAP TO FASCIA

This is an effective provision for overflow, it is an extreme level of overkill 12m x 10mm = 120,000mm². Considering that a 100 x 50mm downpipe pop is 5000mm² this provision gives you 24 times the required amount of overflow.

DIAGRAM D: CONCEALED EAVES GUTTER WITH TAIL

Because this is an internal eaves gutter and can be formed from one piece of sheet metal, not only will it work but it will work well, but this type of install are one in a thousand these days. ➤

THIS LED ME TO ASK THE TECHNICAL REPRESENTATIVE FROM THE VBA THE FOLLOWING QUESTIONS:

PETER COLL: What is a level gutter?

VBA: I don't know, as I understand all gutters must have fall!

PETER COLL: Can you please tell me what adequate provision for overflow in external eaves gutter is?

VBA RESPONSE: That's easy, CI 3.5.3.

PETER COLL: Yes and that directs us to Appendix G and the only reference to overflow is the following: The top edge of the back of the gutter not less than h_f below the top of the fascia board as shown in Figure G1 [c]-[weir flow over back of gutter], which is shown in diagram [c].

VBA RESPONSE: Oh well how do you do that? That is going to look horrible isn't it!

PETER COLL: Where is there reference to overflow slots?

VBA RESPONSE: Oh they have taken that out?

PETER COLL: So again what is an adequate provision for overflow in an external eaves gutter?

VBA RESPONSE: Well to tell you the truth, I don't know.

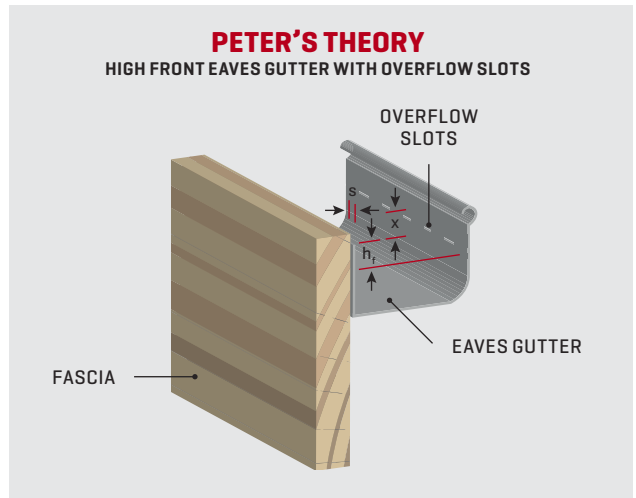
This not only highlights a problem within the VBA but with the Building Professionals Board, QBCC, BCA and any other authoritative body around Australia – but it all starts with Standards Australia.

This is where I put my hand up and admit fault. I was a member of the WS-014-03 committee who was tasked with reviewing and amending HB39 and AS/NZS 3500.3: 2015, which you would have read about in the previous edition of this magazine. I apologise for not reviewing the whole standard and fighting to the end, for what I believe to be right.

The last thing I want is for people to have water backflow/overtopping back into their home and damaging property, or even worse, causing sickness. But let me make this very clear – my family has been working in the roofing industry for 40 years and after installing thousands of gutters we have never had a call back for overtopping.

I wanted to make sure we hadn't just gotten lucky, so through my role as Vice-Chairman, I reached out to all of the members of the Residential Metal Roofing Industry Association of Victoria [RMRAIV] which represent over 60% of the Victorian gutter installs. As it turned out, none of the members had experienced a single case of overtopping. So why has this become an issue?

I suspect this has come into play as a result of an insurance company receiving a claim and passing all of the blame back on the plumber. I am fairly sure it has not happened to any of the companies I have contacted because of the fact they all use slotted gutter 90% of the time. I will try to prove my theory via my diagram above.



I have not studied every gutter on the market so I am basing my assumptions off the Interline Quad gutter and its measurements.

- Distance from the overflow slots to the top of the back of the gutter h_f is 10mm.
- Each overflow slot is 2mm deep x 25mm long, providing 50mm² of overflow each.
- There are 9 overflow slots per metre. Given that the maximum distance between downpipes in domestic dwellings is 12m, we can assume the following: $9 \times 12 = 108$ slots. $108 \times 50\text{mm}^2 = 5400\text{mm}^2$ of overflow between downpipes.
- Area marked on the diagram as [x] on a standard installation with spring clips is 10mm. When added with the h_f , $10\text{mm} + 10\text{mm} = 20\text{mm}$ total. The minimum stated is h_f , 12mm in a sloping gutter.
- Area marked on diagram as [s] is an 'unsealed' gap of 1mm on a standard installation and over 12m between downpipes which provides another 12000mm² of overflow.

I cannot find anywhere in AS/NZS 3500.3: 2015 where it states the minimum size/provision for overflow in an external eaves gutter. I remember it being in there when I was an apprentice and it said something like 'Provision for overflow must at least be equal to or greater than the outlet size.' As is the case with 90% of standard domestic installations, downpipe outlet size is 100mm x 50mm pop with 5000mm² of outlet size. Even if doubled you only have 10,000mm² whereby the gutter allows for 17,400mm².

I admit that I am a plumber and not a hydraulic engineer but I can only go on what is written in the regulations and the mathematics of quad gutter I have used in this case. ■

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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WHEREFORE ART THOU WATERMARK?

PLUMBING PRODUCTS IN AUSTRALIA ARE WELL-KNOWN TO HAVE HIGH STANDARDS COURTESY OF THE MANDATORY WATERMARK CERTIFICATION SCHEME [WMCS]. HOWEVER, WHAT IS NOT AS WELL-KNOWN IS THE NUMBER OF PRODUCTS INTEGRAL TO OUR PLUMBING NETWORK WHICH LACK THIS PROTECTIVE BLANKET. **TERRY NGUYEN** EXPLAINS.

Products such as bath tubs and shower bases are no longer scrutinised as well as they used to be for their on-going compliance with Australian Standards.

Products that are covered under the WMCS are those which have been deemed as having a higher associated risk in terms of maintaining the integrity of our potable water supply, and the safe and effective removal of waste water. The WMCS also exists to ensure products are manufactured to meet minimum quality requirements in Australian Standards so they are fit for purpose once installed. Products which are, and are not, covered by the WaterMark scheme are listed and can be easily found on the Australian Building Codes Board [ABCB] website by navigating through to the WaterMark section.

While there are valid reasons for having products now deregulated from the WMCS, their departure from the scheme has also created some unusual side effects. One problem created actually speaks of the robustness of the WaterMark scheme. There are plumbers who don't realise that products such as baths or shower bases are not covered, as they have been removed from the mandatory certification scheme. The scheme works so well for products it covers



Bath tubs and shower bases are two products now exempt from WaterMark.

that plumbers can easily let their guard down on products which they were unaware had lost that level of protection. It is worth noting that while baths or shower bases are deregulated, the waste outlets [integral or non-integral] fitted to these products must be WaterMark certified.

The unfortunate result is that unknowing plumbers sometimes end up the ones having to face the misdirected wrath of consumers who have, and often at no fault of their own,

purchased a sub-standard product.

As bath tubs and shower bases are two products now exempt from WaterMark, they often fly under the radar as they are not seen as products which pose much threat to the community from a health perspective. Although this is true, they are also two products which often create the largest re-work cost due to product failure. There are horror stories of home owners having to rebuild entire bathrooms only weeks old after faulty built-in fixtures [such as baths and shower bases] required removal, and matching tiles to complete the repairs were then unable to be re-sourced.

Baths and shower bases are susceptible to failures from triggers like thermal shock, impact, chemical and UV exposure just to name a few. Recent times have also seen these

“ WITHOUT A STRUCTURED CERTIFICATION SCHEME, INFERIOR PRODUCTS HAVE THE POTENTIAL TO REACH OUR MARKET THROUGH MULTIPLE AVENUES. ”

fixtures being made from different types of composite materials which has resulted in these failures becoming more prevalent than ever.

Expensive failures in construction usually see manufacturers, consumers and installers all looking to pass the blame where possible. Was the product manufactured to Australian Standards specifications, or simply supplied under a manufacturer's claim that it is fit for purpose? Did the plumber show due diligence when selecting a product for the project? Did the consumer consciously decide to purchase a product far cheaper than all of its competitors and not question its unusually low price tag? PROVE is often involved with assisting in the root cause of product failure, with the only certain winners in these cases being the solicitors.

Without a structured certification scheme, inferior products have the potential to reach our market through multiple avenues. Those who deliberately choose to exploit weaknesses, and those who do not understand how to have their product properly assessed. An important fact is that while these products do not need to demonstrate compliance with Australian Standards through certification, the manufacturers remain accountable for their product under implied Australian consumer law to ensure their product is suitable and fit for purpose. Under Australian law a 'manufacturer' also includes anyone who is responsible for importing a product from overseas.

It is important to do some homework when selecting a product, particularly for large scale projects where the

risk is multiplied by the total amount of fixtures. There are many great products available to the Australian consumer which comfortably meet and exceed minimum performance standards, and it never hurts to request evidence from the manufacturer that their product is in fact all it is claimed to be. Although baths and shower bases have been deregulated, it is comforting to know that there are still a few manufacturers who insist on testing their products to Australian Standards requirements, even when this has been deemed non-mandatory. ■

Contact:

For information on performance requirements of bath tubs and shower bases please contact PROVE Standards & Engineering. www.proveng.com.au

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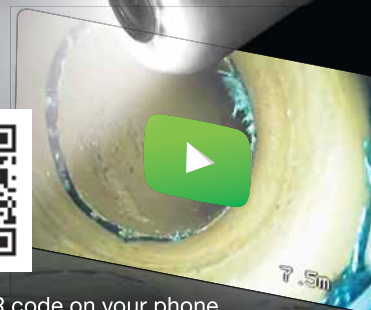
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MANAGING NEGATIVE SENTIMENT

NEGATIVE COMMENTARY IS AN UNAVOIDABLE AND NORMAL PART OF BUSINESS AND LIFE. HOW YOU APPROACH THAT NEGATIVE COMMENTARY WILL DETERMINE HOW CUSTOMERS, WHETHER PAST, PRESENT OR FUTURE, WILL PERCEIVE YOU. **CECELIA HADDAD** EXPLAINS.

What was once a letter in the post directing complaints towards you directly has now become public information with people using the internet as their first port of call when lodging a complaint. If you prefer to bury your head in the sand and not listen to it, then stop reading now. If you want to do something positive with a negative, read on.

There will be a time when you are the target of negative commentary without asking for it. Of course it's hard to listen to, but negative comments should be embraced. Why? Because they help us improve what we do. Because they provide an insight into other people's perceptions of us. Because they can make us a better business person. And because they allow us the opportunity to change ourselves or what others think. What we do with that feedback will determine whether it is helpful or futile.

UNSOLICITED COMMENTARY

Unsolicited commentary is the most common form of negative feedback and can sometimes come as a surprise. Monitoring all sentiment, especially negative, is essential. The most cost efficient way to do this is through Google Alerts – it's free and it will keep you updated on any online mentions, for example, on a review site. Check your social media pages daily. If the comment appears on your social media networks it is tempting to delete it. Don't! Unless it is derogatory, defamatory or uses offensive language, leave it, but address it. First, determine if it is valid. If it is, take responsibility for the problem and communicate the action you are taking to rectify it. If it's not valid, it is still a perception and needs to be addressed. Do this by using facts and evidence to back up your point. You may see their commentary as false, however if one person complains, it is likely others have shared the sentiment.

If you receive a direct complaint, usually by phone or email, respond as quickly as possible. Always acknowledge the issue. When people complain, they want to be heard,

so ignoring negative feedback just adds fuel to the fire. Instead, listening gives people the opportunity to share their story and feel valued, as well as telling you what the problem was, which highlights areas of improvement or perceptions of your business. It's worthwhile to ask clarifying questions if you don't completely understand what the issue is.

SOLICITED COMMENTARY

Solicited comments can help you become a better business person. Wouldn't you prefer to know what people think and address it, rather than find out when they stop using your services? Inviting feedback is essential to the survival of every business.

Think of solicited feedback as a regular check-up at the doctors for your business. It finds problems early on, allowing you to deal with them before they become compounded.

One of the most effective ways to invite feedback is through customer surveys. These can highlight areas of your business that need improvement and issues to be resolved. It will also show your strengths and what you are currently doing that your customers love. Surveys can be distributed to clients after each project, or conducted at regular intervals. They are particularly useful after a recent change to your business, such as offering a new service. Online survey platforms, like SurveyMonkey, make the whole process easy by compiling information for you and helping spot trends among answers. Soliciting comments gives you and your business the chance to understand problems – perceived or real – and address them or make improvements.

A CRISIS SITUATION

If something has gone wrong but you don't know all the facts, you still need to respond quickly. The longer you take, the stronger the rumours. In a crisis situation, respond using the CAP principle – Compassion, Action and Perspective: three simple steps to constructing a message



during a crisis. For example, if someone is critically injured on a worksite you would prepare a message or holding statement for media using the CAP principle:

Compassion: this shows you are human and have empathy for the person or situation.

Action: this demonstrates what action you are taking to fix the situation.

Perspective: this puts the situation in perspective so others don't think this is a regular occurrence and it helps with credibility.

Here is an example of a CAP statement using the scenario above:

We are saddened that Joe Smiths was injured while working on our construction site today and our best wishes go out to him for a speedy recovery.

We are currently working with the authorities to investigate exactly how the incident happened and what, if anything, can be done to prevent this happening again.

During our 10 year history of building we have never had a serious injury and have always ensured safe work practices.

The quicker you respond, the more likely you will minimise damage to your reputation.

CASE STUDY

We were working on a social media campaign with an organisation trying to change people's thoughts and, ultimately, behaviour about a contentious issue. There were two extreme viewpoints [but the law was on our side]. In implementing the campaign we decided to target the fence-sitters, knowing that was where we could make the most impact. The campaign commenced and the client's social media pages were immediately flooded with negative commentary against our campaign.

The client wanted us to shut our Twitter feed and delete the negative comments but we convinced them that it would be better to address the comments with facts and evidence. While we knew we might not be effective in changing the author's opinion, those reading the comments would at least be exposed to our viewpoint. Each comment was responded to publicly with a counter argument based on facts, but one that also acknowledged the perspective of the people who were commenting. This approach worked. Research conducted before and after showed the change in both thoughts and behaviour of the people we were targeting.

There is no avoiding negative commentary but what you do with it makes all the difference. By dealing with both solicited and unsolicited feedback in the right way you can change people's perception and improve your business. ■

Cecelia Haddad is the director of Marketing Elements, which specialises in public relations for the building and environmental sectors. www.marketingelements.com.au



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AN EDUCATED APPROACH TO RESEARCH

THE ASSOCIATION OF HYDRAULIC SERVICES CONSULTANTS AUSTRALIA HAS TEAMED UP WITH THE UNIVERSITY OF THE SUNSHINE COAST TO UNDERTAKE RESEARCH THAT WILL CHANGE THE WAY INDUSTRY APPROACHES ROOF DRAINAGE SYSTEMS. **PLUMBING CONNECTION** WILL CONTINUE TO REPORT ON THE PROJECT ALONG THE WAY.

It was revealed in February that the Association of Hydraulic Services Consultants Australia (AHSCA) and the University of the Sunshine Coast (USC) had signed an agreement to undertake cutting-edge research to investigate, quantify and accurately predict the hydraulic behaviour of roof water in box gutters and downpipes of large buildings.

Both the AHSCA and USC recognised that the current standard referenced in the Building Code of Australia, (AS/NZS 3500.3) has significant limitations that have hampered the broader construction industry for some time.

The specific components of roof drainage systems to be investigated are internal box gutters, overflows and downpipes. The primary focus of the research will be the design restrictions relating to allowable maximum downpipe sizes and the maximum flow rates for box gutters, overflows and downpipes.

Some of the current restrictions include:

- Flow rates for box gutters are limited to 16 l/s.
- Flow rates for downpipes are limited to 16 l/s.
- Downpipe sizes are limited to 150 mm diameter.
- Flow rate for sumps and overflow devices are limited to 16 l/s.
- Recommended overflow configurations are considered to be restrictive and do not reflect industry practice.

These restrictions severely limit the design options that can be considered when designing roof drainage systems for large buildings. As part of its responsibility and commitment to its members, the AHSCA commissioned a comprehensive research study to develop accurate performance and design guidelines for roof drainage systems.

An integral part of the research project included the development of a full-scale box gutter and downpipe test rig at USC. The rig stands at over 25m in length and 7m high and includes a fully-adjustable box gutter system with the capacity for multiple outlets and downpipes. By developing such a large test rig, it is possible for realistic flow conditions of large buildings to be accurately established and simulated.

The design of the rig ensures complete flexibility in the testing parameters and also allows for prototype testing of rainwater products under authentic hydraulic conditions.

It is envisaged that alteration of these design restrictions may substantially reduce the cost of roof drainage systems and significantly minimise the risk of property damage caused by water ingress through system failure.

If roof drainage systems are in fact capable of operating more effectively and with greater capacities than the current design standards allow, this research could lead to significant reductions in unsustainable building practices and construction costs.

RESEARCH

More experimental research is required to accurately evaluate the capacity of conventional roof drainage systems and to investigate how it might change in the future due to expected increases in rainfall intensities resulting from climate change. This is where the vision of Mark Alexander of the AHSCA became integral to the research project taking flight.

Sure, the AHSCA could have gone about the research themselves; however, it was important to them, and their members that project outcomes were both scientifically robust and have practical application. Effectively, the research aims to better the entire industry's knowledge in the area of roof drainage. As a result of this, its members raised some \$300,000 to aid the project.

So, you might be wondering who has the role of conducting all of this research.

Well, as part of the collaboration between the AHSCA and USC, an opening for a PhD scholarship has been created.

The research project includes detailed desktop studies and full-scale physical modelling, including comprehensive analysis and reporting of research results, writing interim industry progress reports, liaison with industry representatives when required, and contribution to the design processes required for new product development.

The project also involves a significant amount of hands-on construction and fabrication activities such as optimising gutter width sizes, gutter slopes, connecting and disconnecting downpipes, installing gutter outlets in the base of gutters, connection and operation of flow monitoring equipment and devices and similar manual and physically-demanding activities.

The testing rig will be designed to accommodate the array of gutter, downpipe and overflow configurations to be investigated as part of this research study. The research will focus on identifying the system configurations with the greatest practical applicability. ➤



The testing rig and pumps will be fed via water collected via custom built water tanks.

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As you can see, it's certainly not a straight forward project and one best suited to someone with a technical trade background or experience in the construction industry. For a lot of students, it might prove a mountain too high to climb. Thankfully a suitable candidate rose to the occasion. Luke Verstraten decided to further his education at the University of the Sunshine Coast after successfully running his own irrigation and landscaping business for over 10 years.

"I graduated from my Bachelor in Environmental Science Degree in 2011 and I received a university commendation for my academic achievements. By the time I finished my undergraduate degree I knew that I had developed a passion for undertaking research projects that are practical and relevant with benefits to industry and society," Luke says.

Since graduating, Luke has worked on several national and international collaborative research projects with the Department of Agriculture, Forestry and Fisheries (Federal and Qld), The Indian Ocean Commission, University of the Sunshine Coast, Griffith University, La Trobe University and the University of Queensland. While working on a national research programme 3-year investigation into Soil Carbon he was able to further his studies by completing his first class Honours degree.

"I was particularly interested when I first heard about the AHSCA project as I saw it as having the ability to expand the current knowledge of roof drainage systems through

realistic physical testing on a scale that has not been attempted before.

"I was therefore very keen on being involved with this cutting-edge research project and I immediately applied for the USC/AHSCA PhD scholarship. Fortunately I was successful with my application and I am pleased to be working with my PhD supervisors, Dr Terry Lucke and Dr Helen Fairweather, who bring to the project a wealth of experience and knowledge.

"Day-to-day activities will vary throughout the project. Currently the construction and design of the testing rig and reviewing of relevant literature are the predominant activities. This is expected to be completed within the next two months," Luke says.

"Once the rig is constructed the experimental phase will begin and we will start by testing a number of gutter, sumps, overflow and down pipe configurations at flow rates of up to 100L/s. To my knowledge this is the first project globally to investigate conventional gutter systems on this scale at these flow rates and much of this capacity is owed to the one off pump designed and built for the project by Grundfos.

"As data is collected we can begin to analyse the performance boundaries of roof drainage and develop models to aid the hydraulic industry in making accurate and informed performance based design choices."

GRUNDFOS PUMPS

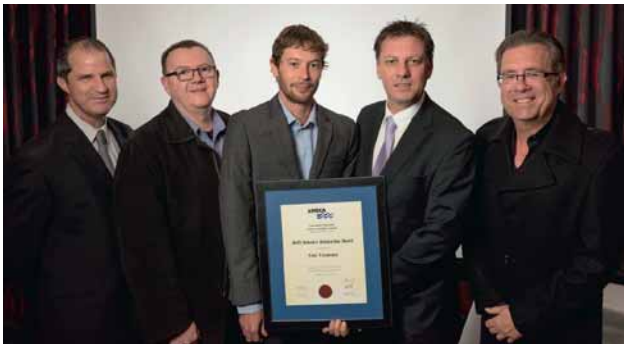
The research could not be achieved without high-performance pumps and the team at BKB Grundfos were both willing and able to deliver a pump system that met the requirements of both the AHSCA and the team at USC.

“What we have developed is a dual pump system which sees both pumps able to simulate up to 50L/s as the research team would like to simulate rainfall collection from 5L/s-100L/s. The main reason for having two pumps is that the flow range of 5-100L/s is too large for one pump to handle. We decided it was better to use two pumps rather than run one horribly inefficiently or overloading it potentially,” Hydraulic Account Manager Grundfos BKB Nick Russ says.

“We’re not expecting the tank to be empty, particularly if the discharge is going back into the tank but there is a float switch there to disable the pumps should they ever be empty and risk running the pumps dry. We have separate suction lines for each pump too.

BKB kindly donated the pumps to the AHSCA, for which their members and the industry as a whole are incredibly grateful.

“We pushed hard and got the majority of the pumps constructed in a week. Needless to say a lot of overtime went in to make it happen but once we have a goal in mind, we can achieve anything here,” Nick says.



Luke [centre] is eager to get stuck into this cutting-edge research project. As are the members of the AHSCA.

“As we are members of the AHSCA ourselves, we felt as though it was good to give something back. At the end of the day, we are doing this so that the industry knows what is required as part of an efficient and satisfactory roof drainage system. They will get something out of it, and we hope that we will too.” ■

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A PRO-ACTIVE DRAINAGE MONITORING SOLUTION, AT LAST

A STUDY INTO THE CAUSES OF THE 2003 SARS OUTBREAK IN HONG KONG, WHICH RESULTED IN NUMEROUS DEATHS AND ILLNESSES, YIELDS THE LESSON THAT WATER TRAP SEALS PLAY A PIVOTAL ROLE IN MINIMISING THE SPREAD OF DEADLY PATHOGENS. **JUSTIN FELIX** REPORTS ON A REVOLUTIONARY DRAINAGE MONITORING SYSTEM.

Viruses can spread like wildfire and as such we're prone to contract one or two in our lifetimes. Thankfully the immune system eventually fends most of them off but it is the deadly ones that are generally toughest to prevent.

It goes without saying then, that a preventative method that can stop the spread of infection before it rears its ugly head is certainly a good thing. The Dyteqta-System provides a pro-active solution to the spread of pathogens via a building's drainage system.

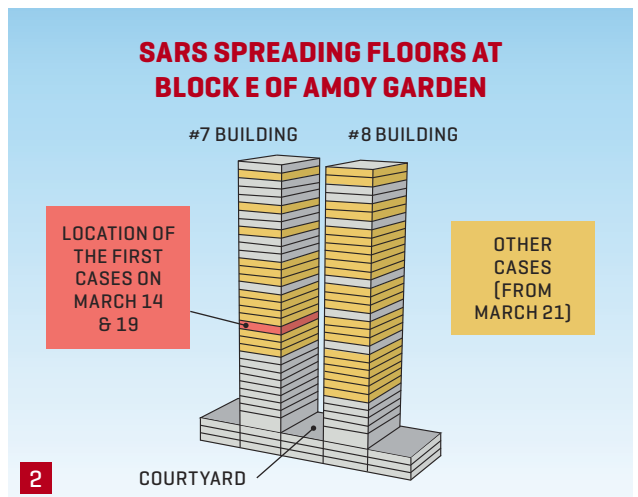
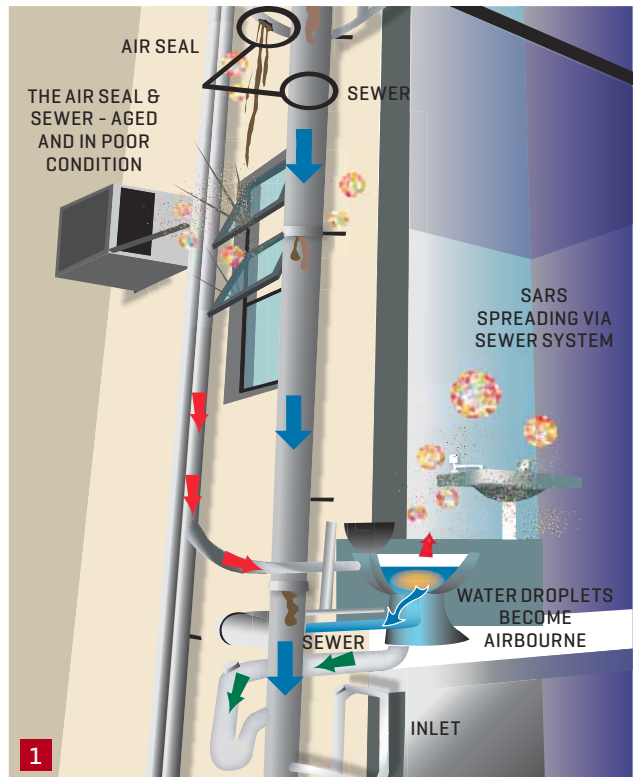
"Building drainage systems are one of only a few engineered fluid carrying systems which link a whole building. If they fail, harmful pathogens may enter the building and spread life-threatening viruses and diseases," Technical Director of Dyteqta, Steven White explains. Such was the case in the 2003 SARS epidemic in Hong Kong.

Poor plumbing and maintenance were identified as a contributory factor and as a result the drainage system became a cross-transmission route for the SARS virus, leading to a dramatic rise in the number of cases in one particular building. There were 321 infected cases and 42 deaths in Amoy Gardens housing estate alone. A tragedy that could have been avoided if it weren't for depleted floor traps.

If such an outbreak had this type of detrimental impact on relatively healthy occupants, a similar event occurring in a hospital or aged care facility, where health is already a concern, could have devastating outcomes.

IMAGE 1: The SARS Coronavirus [CoV] outbreak in Hong Kong in 2003 is believed to have spread from Block E of the Amoy Gardens housing complex. The figure above demonstrates how the loss of a floor drain trap seal, combined with negative pressure in the restroom caused by a mechanical extractor fan, apparently resulted in faecal-droplet transmission [evaporative] of the disease.

IMAGE 2: The spread of the SARS virus through Block E of Amoy Gardens, Hong Kong, was rapid and pervasive. In the space of one week the disease spread to occupants on one floor of Building #7 [red] to numerous floors [yellow] throughout both Buildings #7 and #8.



RESEARCH AND DEVELOPMENT

The Drainage Research Group of Heriot-Watt University, Edinburgh, went to work in 2004 on an innovative system for mapping and assessing water trap seal vulnerability in building drainage systems.

The invention then developed in conjunction with industry and the UK Government, resulting in the ongoing partnership with Dyteqta. Dyteqta is an off-shoot of the same team behind Studor – leader in drainage ventilation technologies. The Dyteqta-System is the result of nearly 10 years of academic work reported in peer reviewed journals and extensive site testing by academics at Heriot-Watt University [Edinburgh] and the Dyteqta Team.

Recent research has sought to identify bioaerosol activity in building drainage systems. Bioaerosols are pathogens which can be transported through air flows, either as airborne pathogens or, as in the case of the building drainage system, virus laden droplets which can be transported in the air via aerosols. Researchers at Heriot-Watt University, led by Dr. Michael Gormley, in collaboration with virologists from the local health board and with support from the Dyteqta team, conducted a series of tests to investigate the extent

to which a drain is contaminated during a norovirus outbreak in a hospital building. In addition to searching for pathogens they also investigated the environmental conditions inside the drain itself. The techniques used were innovative and involved DNA coding of pathogens using a polymerase chain reaction [PCR] technique.

The six-week-long test program drew samples from the collection drain and sought to identify a particularly troublesome virus – norovirus which leads to gastro-intestinal illness, is highly contagious and causes disruptions to hospital management since an outbreak leads to ward closures with disruption to patient care and attendant high costs.

The tests were conducted over a six week period and the results were striking. The PCR technique identified the presence of a significant amount of norovirus GII – strong positives were indicated for the samples from the drain, indicating that the entire drainage system was contaminated during an outbreak.

Investigations into the environmental conditions in the vertical stack revealed that, as expected, the relative humidity was almost 100% for most of the time, ➤



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conditions conducive to virus survival. The temperatures recorded were in the mid-20° Celsius range, and had the combined effect of inducing buoyant air flows and a transport mechanism for the virus. A significant finding from this phase of the research was the confirmation that airflows in vertical stacks are in both directions – both up and down. This mechanism facilitates air travel from one part of the building to another – in effect the drainage system has its own micro climate and there is no isolation of one part of it from another. Ensuring a seal between the internal rooms and the drainage system is therefore essential to prevent virus laden aerosols entering habitable space.

“ TESTING IS BOTH NON-DESTRUCTIVE AND NON-INVASIVE SO BUILDING OCCUPANTS ARE UNAWARES WHILE IT IS OCCURRING. ”

HOW IT WORKS

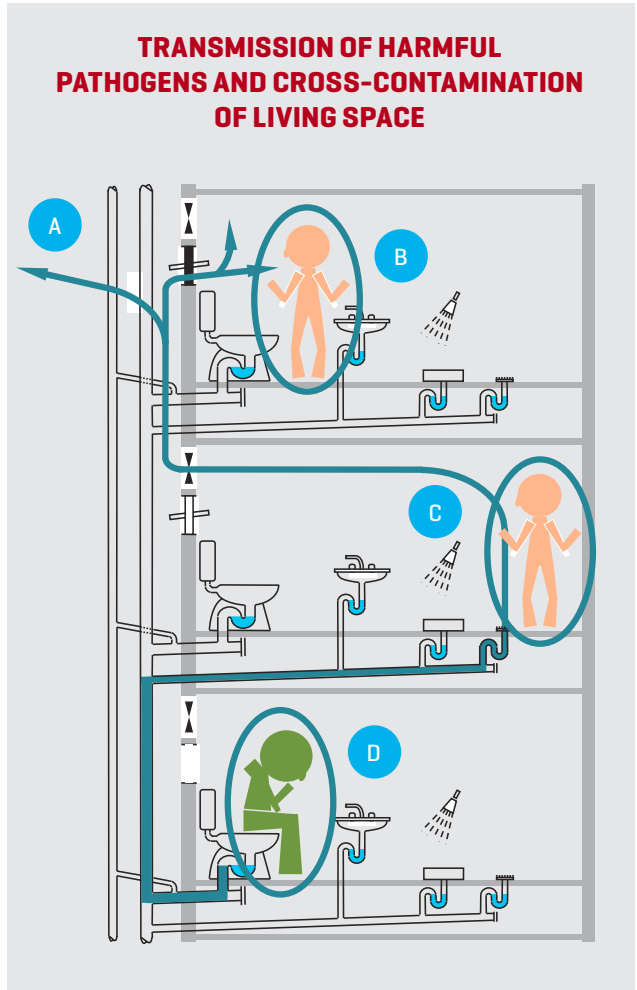
The Dyteqta-System uses innovative sonar technology to monitor a building’s drainage network while detecting any loss in water trap seals which are vulnerable to a number of threats such as evaporation and/or positive and negative pressure surcharges, amongst other reasons.

When these vital seals are lost, sewer gas containing contaminated air and harmful pathogens, in the form of Bioaerosols, present in the drainage and sewer system can enter the building and spread infection and/or foul smells. Most, if not all, have experienced the foul stench that can be experienced when pipes have blocked or backed up and the thought alone is enough to put you off your next cut lunch.

Steven explains that the spread of infection and foul smells can be stopped thanks to Dyteqta’s monitoring system.

“The system uses soundwaves to send a signal into the system to search for the trap seals. If a barrier has been lost, the system will send an alarm and identify where the defective seal is located. By connecting Dyteqta’s testing equipment to a drainage system, we can remotely test all of the traps connected to it from anywhere in the world, as long as it is connected to the internet.

“Detection is accurate to within one metre for partial blockages and 20cm for trap seals.” Once a default is detected, the Dyteqta System sends a message, either via email, SMS or through the buildings Building Management System to alarm facility management.



A: Wind current carries aerosols to adjacent buildings. **B:** Contaminated aerosols transmitted to adjacent apartment. **C:** Infected person introduces virus to drainage system. **D:** Contaminated aerosols created as waste is flushed away.

“Testing is both non-destructive and non-invasive so building occupants are unaware while it is occurring,” Steven explains. “There are various methods for system monitoring too, from a full-time monitored system, fault-finding during system health checks or before a building handover. A prospective buyer or lessee of a building now has an opportunity to detect and rectify drainage problems before they agree to terms. It almost provides the option to try before you buy,” Steven says.

“The trap seal detection device can be installed in new buildings or retrofitted to existing drainage networks to remotely monitor the functionality of water trap seals on a full or part-time basis as required. The system is designed to work with any combination of drainage networks and is ➤

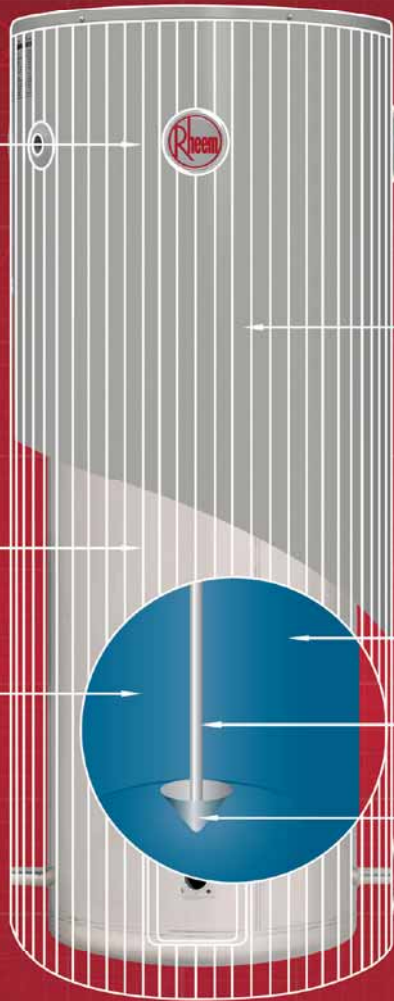
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INSTALL A



versatile enough to be installed on one or multiple stacks to ensure the best possible coverage of the drainage networks.

“Plumbers and HVAC engineers will require a week’s worth of training to establish installation requirements and to conduct the set up test. Installation on a typical 20 stack building will take about two days to complete.”

The system is upgradeable too, so additional stacks can be added as required. As it stands, only one stack is tested at any given time. Testing and installation is carried out on-site, usually in the plant room or the roof area. The Dyteqta team monitors a building remotely; however, a simple user interface can also be accessed by internal building staff. If a defective trap seal is detected, building managers are alarmed and can replace or rectify before the situation becomes critical.

“The user interface is really easy-to-use,” says Steve. “It allows facility managers to prioritise stack testing by setting them as High, Medium or Low which is especially useful for health care facilities that have a high spread of pathogens.”

MEASURE AND MANAGE

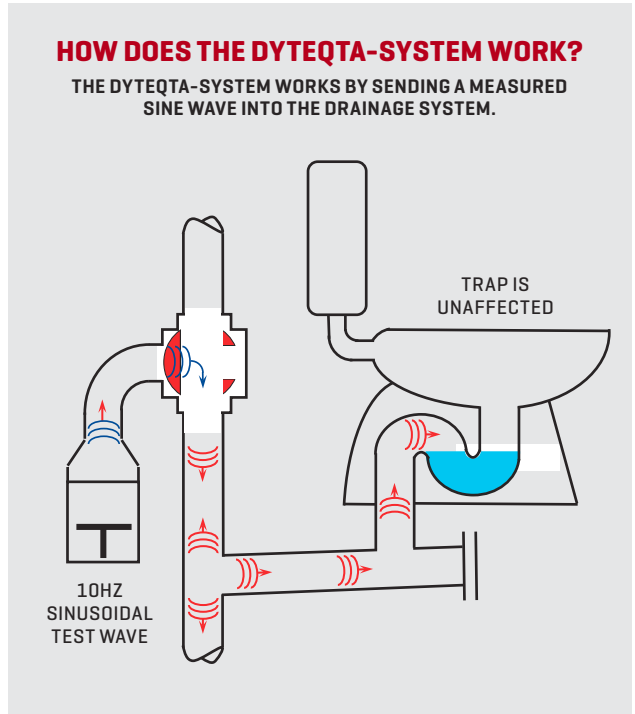
Michael Mekhitarian, Australian Director of Dyteqta adds, “Unlike electrical and gas work, there haven’t been any formal tests for plumbing as such. With the introduction of Dyteqta, this is no longer the case. The ability to test the system after design and throughout a building’s life provides assurance that the building drainage system is working correctly.”

“People tend to look up at air conditioning systems and vents when inspecting buildings. They neglect to look down at the drainage systems and this is a cause for concern,” Michael says.

Current regulations tend to ignore drainage systems as a major concern for the spread of disease or cross contamination. As such, a simple pressure test is all that is required to check the seal between drainage pipes at the time of commissioning. This leaves the potential for inadequate and poorly designed systems. Contrary to this; the water supply, heating, ventilation and air conditioning systems are subject to heavy regulation because of pathogens being linked with these sources. Norovirus, on the other hand, can spread through building drainage systems and enter into rooms through defective traps.

Dyteqta reduces the risk of infection through cross-contamination; contributing to a healthier living environment. In a hospital, for example, the drainage system links every department; from general medical and isolation wards to operating theatres, mortuaries and public waiting rooms.

Hospital acquired infections are a significant cause of concern and it is estimated that over 180,000 patients acquire these infections each year, in Australia alone. In the UK, approximately one in 10 patients’ contract hospital



acquired infections and it gets even worse in the United States. In 2002 alone, there were close to 99,000 deaths associated with hospital acquired infections.

The Dyteqta-System is the first of its kind and marks a major advancement in the battle against transmission of disease through cross contamination and prevention of bad odours; not only in hospitals but across hotels, apartments and offices too.

By taking a pro-active approach, facilities have the ability to better protect the health and safety of building occupants by stopping the spread before it occurs. Plumbers will not only benefit from more facilities adopting the innovative system through increased work; they will also play a pivotal role in enhancing public health security. ■

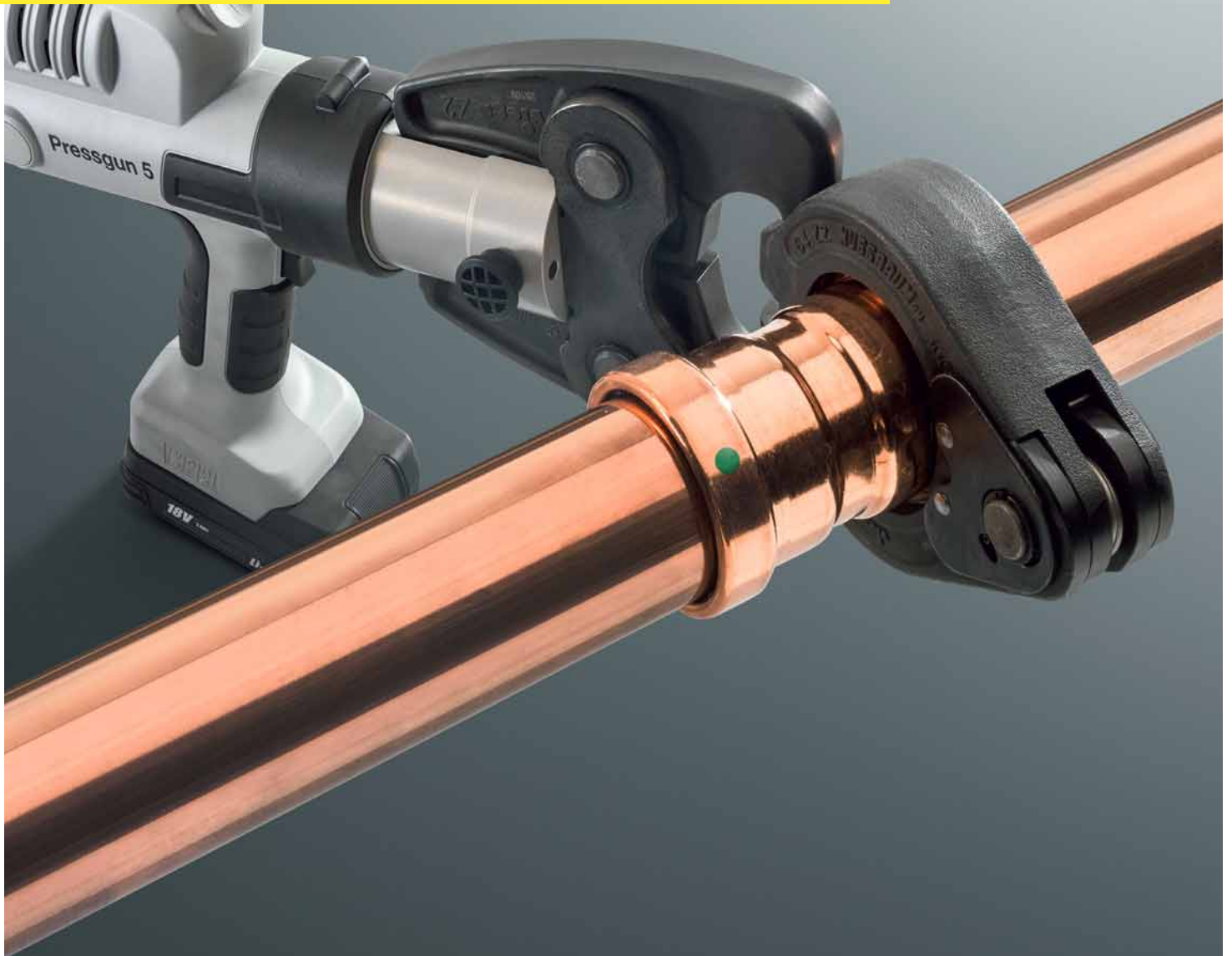
Dyteqta
www.dyteqta.com

DYTEQTA HEADS DOWN UNDER

The Dyteqta-System has arrived down under with the first installation taking place in Melbourne’s Royal Children’s Hospital. This is a great opportunity for the Australian building industry and will allow other facilities to see the many benefits that the detection system provides. A hospital of this magnitude makes for the perfect test project and the Dyteqta-System will go a long way to ensuring the health of the building’s drainage system. *Plumbing Connection* will follow the progress and keep you up-to-date in a future issue.

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ASBESTOS – WHAT YOU NEED TO KNOW

EXPOSURE TO ASBESTOS IS AN ONGOING CONCERN, BUT THERE ARE SOME YOUNGER MEMBERS OF THE INDUSTRY WHO HAVE NO IDEA WHAT TO LOOK OUT FOR. **PAUL SKELTON** REPORTS.

“There is no safe level of exposure to asbestos fibres,” Asbestos Education Committee chairman Peter Dunphy says.

“With at least one in three Australian homes containing asbestos, many home owners, renovators, tradies and handymen are putting their health and the health of their families at risk when doing home renovations, maintenance and demolition if they release dangerous asbestos dust and fibres that can be inhaled and lead to asbestos-related diseases including mesothelioma.”

The scary thing is, despite all the warnings there are members of the plumbing industry who don’t know the signs of asbestos, or the dangers of exposure.

Mesothelioma is a cancer that mostly affects the lining of the lungs and develops between 20-50 years after inhaling asbestos fibres. There is no cure and the average survival time after diagnosis is 10-12 months. Inhaling asbestos fibres may also cause other diseases such as lung cancer, asbestosis and benign pleural disease.

MESOTHELIOMA

Since 2003, approximately 600 Australians have been diagnosed with malignant mesothelioma each year and experts have estimated that there were at least another 1,350 Australians with lung cancer caused by asbestos.

It is estimated that these figures will continue to rise in the coming decades.

“We know that Australia has one of the highest rates of asbestos-related diseases in the world because Australia was among the highest consumers of asbestos products until a complete ban of asbestos came into force in Australia in 2003,” Peter says.

“However, there is still a high volume of asbestos-containing building products used prior to 1987 which remain hidden dangers in homes and buildings such as garages and farm structures so it’s critical that all Australians become asbestos aware.

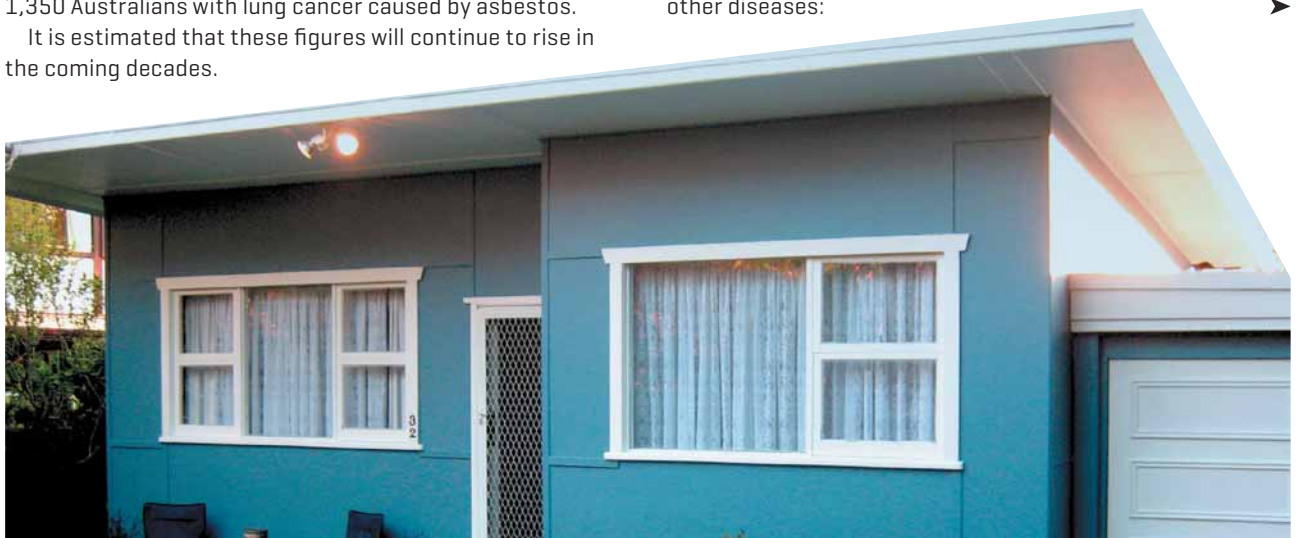
“Many Australians wrongly believe that only fibro homes contain asbestos, with asbestos products still commonly found in and around brick, weatherboard, clad and fibro homes built or renovated before 1987.

OTHER DISEASES

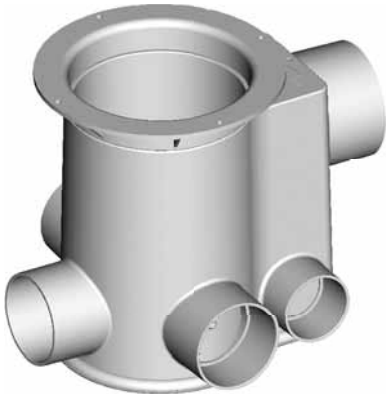
Malignant mesothelioma is the most common of the asbestos-related diseases monitored in Australia. This is because there is a strong causal association between asbestos exposure and the disease.

A total of 11,667 people were newly diagnosed with malignant mesothelioma in Australia between 1982 and 2009, with men making up 85% of all cases.

That said, exposure to asbestos can lead to a number of other diseases: ➤



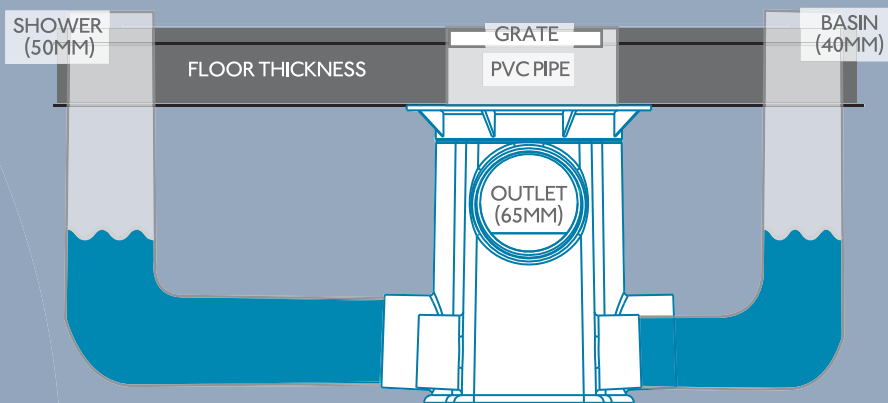
Houses built before 1990 could contain asbestos related products.



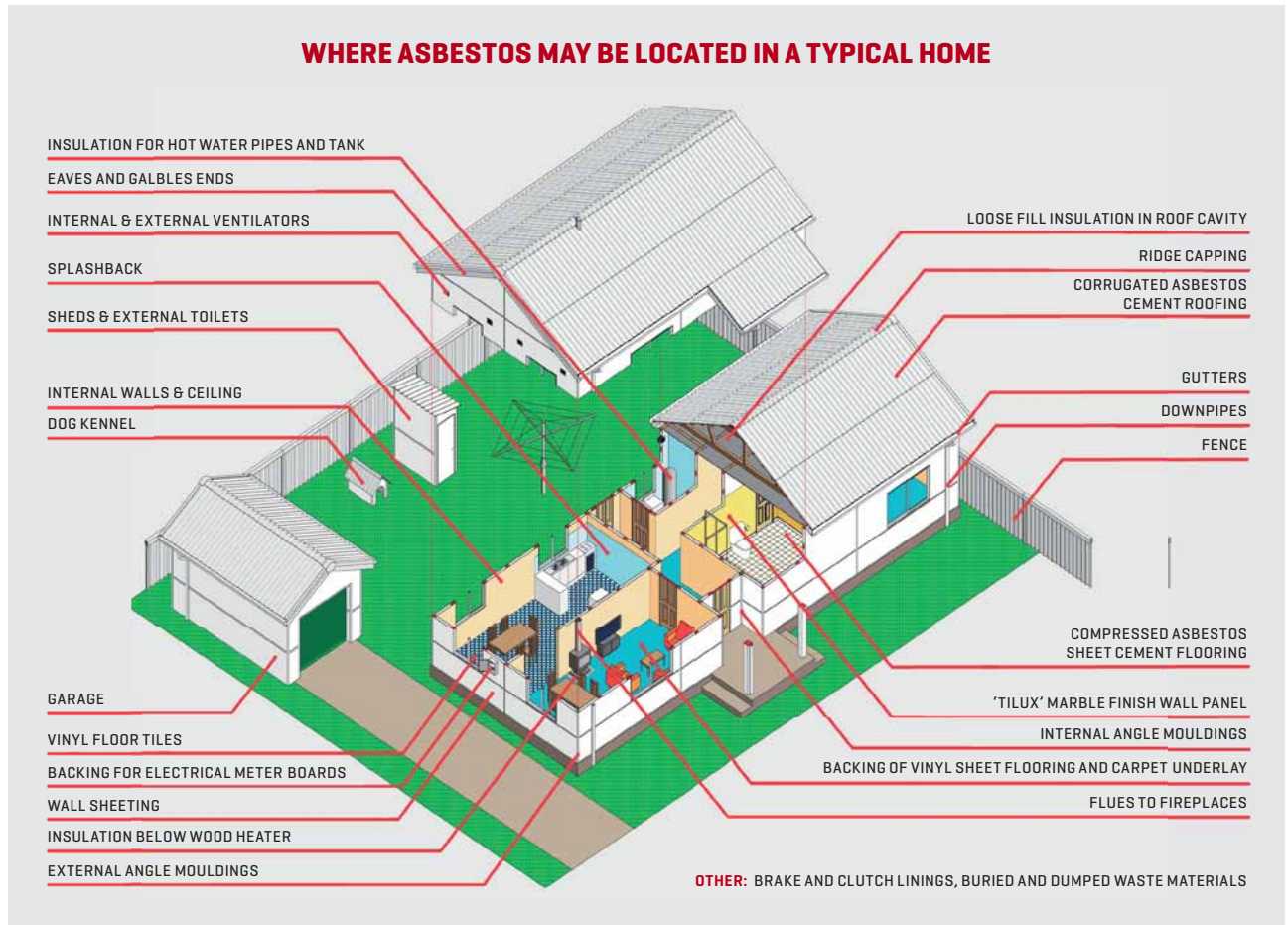
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WHERE ASBESTOS MAY BE LOCATED IN A TYPICAL HOME



Pleural Disease

This is inflammation of the outer lining of the lung – the pleura (where asbestos fibres are deposited). The pleura stiffens and thickens widely (diffuse thickening) or in patches (plaques), and can fill with fluid.

Asbestosis

This is scarring of the lungs by inhalation of large quantities of asbestos fibres: the lung becomes inflamed and scarred (stiff) making breathing progressively more difficult. Symptoms include tightness in the chest, dry cough, and in the later stages, a bluish tinge to the skin caused by lack of oxygen. Asbestosis is usually seen in former asbestos miners, asbestos manufacturing workers and insulation workers, and usually takes a decade or more to develop.

Lung Cancer

Exposure to asbestos fibres greatly increases a person’s risk of developing lung cancer, particularly if they are also a smoker.

HOW TO IDENTIFY ASBESTOS

“No one can tell if a product contains asbestos just by looking at it. Only scientific testing by an accredited National Association of Testing Authorities (NATA) can confirm if asbestos is present,” Peter says.

“So, if people aren’t sure if a product contains asbestos they should treat it as if it is asbestos and take all the necessary precautions to protect themselves.

“To be sure if asbestos is in homes, owners can have properties inspected by a licensed removalist or a licensed asbestos assessor to confirm if asbestos products are present.

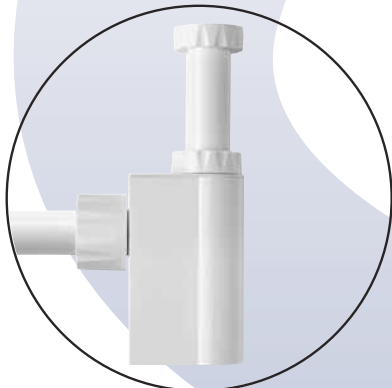
“If in good condition and left undisturbed, asbestos generally doesn’t pose a health risk; however, with the ageing of homes, the popularity of DIY, renovating, knock-down-rebuild and with the redevelopment of old fibro home sites, it’s important that anyone working in or around homes or buildings constructed or renovated before 1987 know the dangers of asbestos and how to manage it safely.”

It’s a scary truth that asbestos could be anywhere: under floor coverings such as carpets, linoleum and vinyl tiles, ➤

Be A Drainage Doctor!

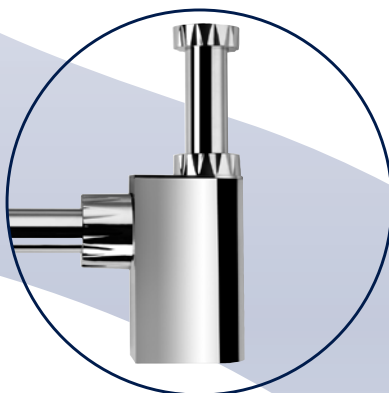
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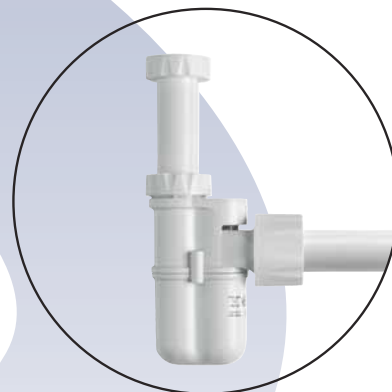


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If you're in any doubt, treat it like it is asbestos — just to be on the safe side.

NSW ASBESTOS REGULATIONS

In NSW, for example, the government has regulations in force to protect you when you are working with asbestos.

These requirements include:

- It is illegal to dispose of asbestos waste in domestic garbage bins.
- It is illegal to re-use or recycle asbestos products.
- It is illegal to dump asbestos products.
- Power tools should not be used unless the dust is captured or suppressed.
- It is illegal to waterblast asbestos cement sheets (fibro).
- Only licensed asbestos removalists can remove asbestos of 10m² or more (10m² is equivalent to the size of a typical bedroom wall in an average home or about the size of a small bathroom or an outside toilet or shed.)
- Only licensed friable asbestos removalists are able to handle or remove friable asbestos.
- Licensed removalists are to notify WorkCover of asbestos removal five days before removing friable or greater than 10m² of non-friable asbestos.
- All licensed contractors have to be able to give you a copy of their licence.
- It is illegal to bury asbestos on your own property.
- All asbestos must be legally disposed of at a lawful landfill site (to find a site near you, visit: www.environment.nsw.gov.au).
- Local councils may also have policies regarding the removal of asbestos so visit your council's website to find out what's required.

behind wall and floor tiles, in cement floors, internal and external walls, ceilings and ceiling space (insulation), eaves, garages, roofs, around hot water pipes, fences, extensions to homes, garages, outdoor toilets, backyard and farm sheds, chook sheds and even dog kennels.

This means plumbers need to be on high alert while working in older buildings.

Asbestos products can also be found buried beneath and around homes leftover from the original construction when it was common practice for builders and labourers to bury broken asbestos materials on building sites which can now be exposed when digging, gardening or redeveloping land.

In many coastal regions, 'weekenders' were often built from fibro (bonded asbestos cement sheeting) as low-cost holiday homes. In rural settings many buildings were constructed from fibro as a cost-effective means of housing farm equipment and stock. It was also widely used to construct 'sleep-out' additions to farmhouses and workers accommodation.

ASBESTOS 101

Asbestos building materials are described as either 'friable' or 'non-friable'.

Friable asbestos is any material containing asbestos and is in the form of a powder or can be crumbled, pulverised or reduced to powder by hand pressure when dry.

Friable asbestos was mainly used in industrial applications.

Non-Friable asbestos is any material (other than friable asbestos) that contains asbestos. Non-friable asbestos cannot be crumbled, pulverised or reduced to a powder by hand pressure when dry.

Common uses for non-friable asbestos in buildings include: flat (fibro), corrugated or compressed asbestos cement sheets; water, drainage and flue pipes; and floor tiles.

Dr Mike Lindsay, the acting director of environmental health for WA Health says most people mistakenly believe asbestos is only found in roofs, fences or walls in older style houses. But, products containing asbestos can also include paper backing material on sheet linoleum, backing panels in meter boxes and vinyl floor tiles.

"These types of products pose little risk to health when they are in good condition and undisturbed. But, people need to take precautions when they are renovating or doing maintenance work to prevent asbestos fibres being released into the air," he says.

"Asbestos containing products can be difficult to identify just by looking at them. So, if in any doubt, treat it like it is asbestos — just to be on the safe side."

WA Health's recommends:

- If doing maintenance, or renovating a house built before 1990, be aware it could have asbestos containing products and treat them with caution.

USEFUL WEBSITES	
NATIONAL	Asbestos Safety And Eradication Agency www.asbestossafety.gov.au
AUSTRALIAN CAPITAL TERRITORY	Asbestos Act www.asbestos.act.gov.au Act Asbestos Taskforce www.act.gov.au/asbestos-response-taskforce
NEW SOUTH WALES	WorkCover www.workcover.nsw.gov.au EPA www.epa.nsw.gov.au/waste/asbestos/index.htm
NORTHERN TERRITORY	Asbestos Management www.health.nt.gov.au/environmental_health/asbestos_management
QUEENSLAND	Asbestos Queensland www.deir.qld.gov.au/asbestos/
SOUTH AUSTRALIA	Sbestos Occupational Health And Safety www.safework.sa.gov.au
TASMANIA	Asbestos Tasmania www.asbestos.tas.gov.au
VICTORIA	Asbestos Victoria www.asbestos.vic.gov.au

- If buying a house, ask that asbestos containing products be assessed as part of the building inspection report.
- Don't use power tools to drill, cut, sand or remove materials containing asbestos, as this will release asbestos fibres.
- Never use a high pressure cleaner to clean asbestos cement roofing or cladding.
- If removing small amounts of asbestos containing products yourself, learn how to safely remove and dispose of them first.

“ ASBESTOS CONTAINING PRODUCTS CAN BE DIFFICULT TO IDENTIFY JUST BY LOOKING AT THEM. SO, IF IN ANY DOUBT, TREAT IT LIKE IT IS ASBESTOS — JUST TO BE ON THE SAFE SIDE ”

- If in doubt, hire a licensed asbestos removalist and check that the work area is free from visible asbestos at the end of the job.
So, when it comes to asbestos it's important to remember: don't cut it, don't drill it, don't drop it, don't sand it, don't saw it, don't scrape it, don't scrub it, don't dismantle it, don't tip it, don't waterblast it, don't demolish it and, whatever you do, don't dump it. ■

Asbestos Awareness

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stainless steel
WCs



stainless steel
Basins



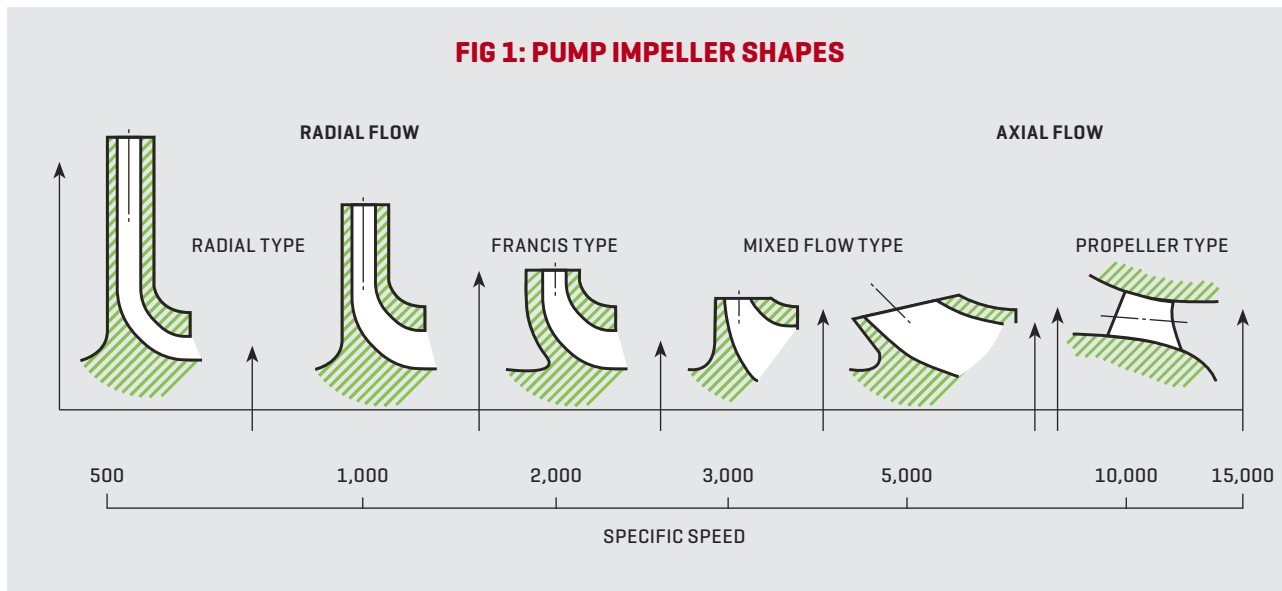
stainless steel
Taps





UNDERSTANDING PUMP CURVES

RON ASTALL ANSWERS THE QUESTION: ARE YOUR PUMPS RUNNING TOO SLOWLY?



Everyone wants more efficient pumps and pumping systems. In some industries, the Engineers and system designers create massive stumbling blocks by specifying a maximum allowable pump running speed.

Putting arbitrary limits on running speeds will often preclude the best pump selection.

For clean liquid services, unless there are difficult suction conditions, there is no reason to fix a maximum limit on pump running speed. Energy efficiency has never been more important and yet we are still stuck with these archaic, dare I say ignorant specifications. Why?

Is it because a slow running pump is perceived to have a “smoother” velocity profile, less turbulence and hence ought to be more efficient? As we will see later, this perception is plain wrong.

Is it because a slow running pump is perceived to have inherently lower

internal wear, better bearing life and improved reliability? This perception is demonstrably equally untrue.

Could it be for reasons of noise and vibration? Yes, these aspects can be worse with a higher running speed, but not always. If these are the real issues, why not simply specify the allowable noise and vibration limits as direct requirements?

If you have read this far, you may be getting a little grumpy because much of this seems counter intuitive. Ought not a slow running pump be less stressed than a high speed unit? The real question ought to be; will a slow running pump of the same performance be less stressed than a higher speed model doing the same duty? For the same flow and same developed head, a slow speed pump will be larger and will be a different shape than a higher speed unit designed for the same hydraulic duty. We are thus comparing different shaped pumps.

Fig 1 shows a range of impeller shapes versus a pump design parameter called “Specific Speed” [Ns]. The formula for Ns is shown in Fig 2.

Ns is primarily a shape factor and this parameter is extremely useful as an aid to understanding why some pumps are more efficient than others.

Here it is. Specific Speed [Ns] is a simple formula involving the RPM, Pump Flowrate at Best Efficiency Point [BEP] and Head per stage at BEP.

In Australia it is most common to use metric units of cubic metres per hour, metres and rpm; however; when comparing pump design data it is important to ensure that you are using the correct units. ➤

FIG 2: SPECIFIC SPEED

FORMULA:

$$N_s = \frac{N \cdot \sqrt{Q}}{H^{3/4}}$$

RPM FLOW RATE
HEAD (PER STAGE)

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FLEXIBLE CONNECTORS

It is effectively the same as the dimensionless pump type factor “K” in the test code standards, except “K” uses cubic metres per second as the flow unit.

Legendary pump designer, A.J. Stepanoff created this chart outlining the various components of pump inefficiency and showed how these vary with specific speed [Fig 3].

From Stepanoff’s chart you can see that casing Hydraulic Losses and Disk Friction vary significantly with changes in Specific Speed. In these metric units the best impeller efficiency is around Ns of 3000.

As we saw from Fig 1, low Ns impellers are larger diameter, narrow radial flow units. Higher values of Ns relate to fatter more open shaped impellers. This makes perfect sense because the fatter, more open shaped impellers will have less disk friction as a percentage of the hydraulic work being done by the impeller.

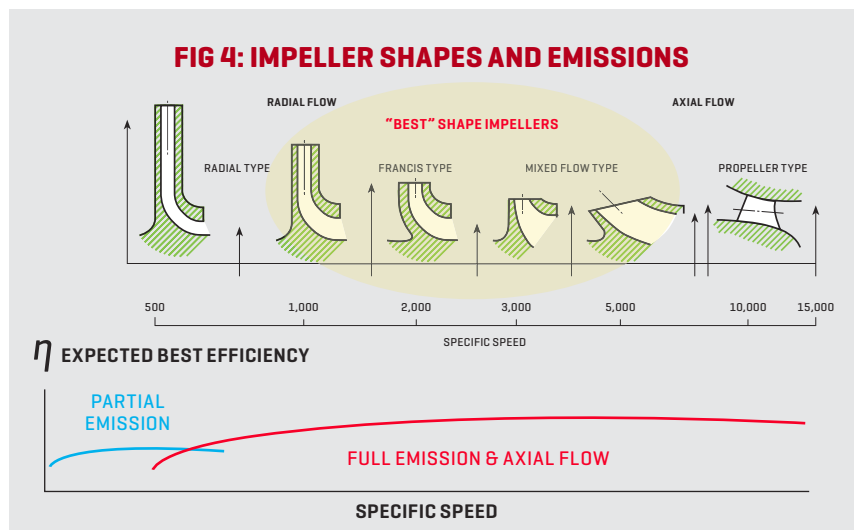
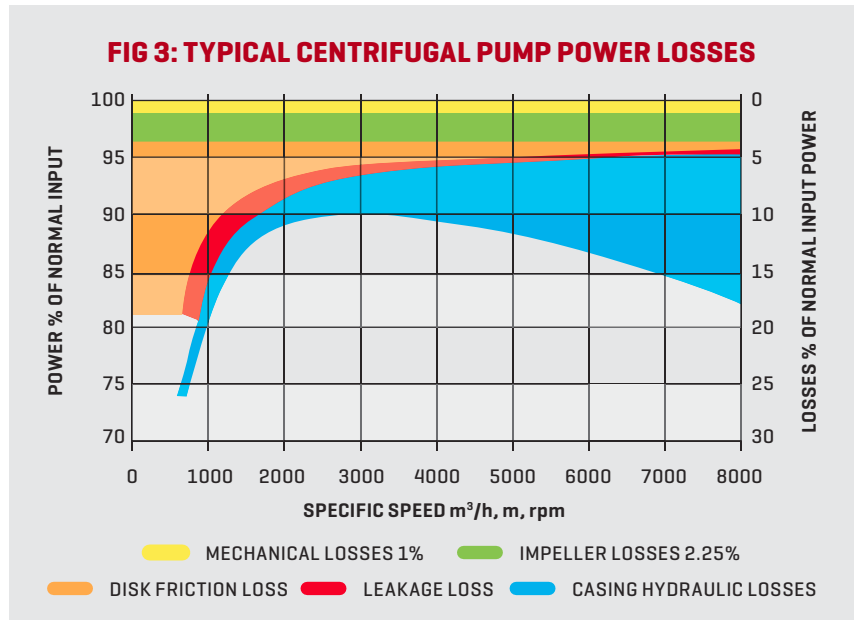
The bottom line is that narrow impellers are less efficient than “fatter” shaped impellers. See Fig 4.

Bearing the above in mind, it makes sense to aim for the best shape impeller when considering what type of pump to select. If you arbitrarily dictate the maximum running speed you may force the pump selection into a low Ns shape and this will mean a more expensive and less efficient pump.

Consider the following pump selections for the same duty but different speeds [Fig 5]:

This is a tangible example of how specifying a maximum running speed of 1500 rpm will in this instance cost the end user dearly; not only in capital cost but in total cost of ownership.

Now some of you may be grumbling about reliability, noise and vibration being also important. Yes they are, but look at the size of the casing on the slower running unit, look at how much heavier its impeller must be and look at the greater surface area available to transmit hydraulic noise. In a later discussion I will look at these aspects



in more detail and show how the faster running pump can indeed be more reliable and can be potentially quieter.

SO WHAT RUNNING SPEED SHOULD YOU SPECIFY?

You should not specify the running speed at all!

A great window on this process is the pump vendor’s range chart. A simple suggestion is to always start with the highest speed range chart. If this does not bear fruit, look at the next speed down. If there is a sensible selection

at a higher speed it is almost certainly going to be a more efficient pump than a lower rpm unit doing the same duty. To illustrate this, in Fig 6 below I have overlaid a 2980 rpm range chart [in red outline] over a 1470rpm range chart for the same manufacturer. Below the red outline you can see the regions where a 1470 rpm pump is going to be a better selection. Inside the red outline, a 2980 selection ought to be better.

Select on the basis of the hydraulic duty and specify your other primary requirements directly; such as noise

FIG 5: POWER COSTS

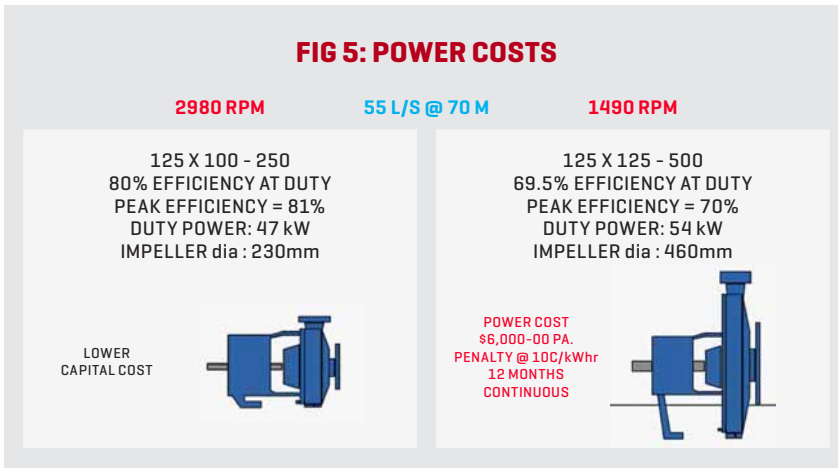
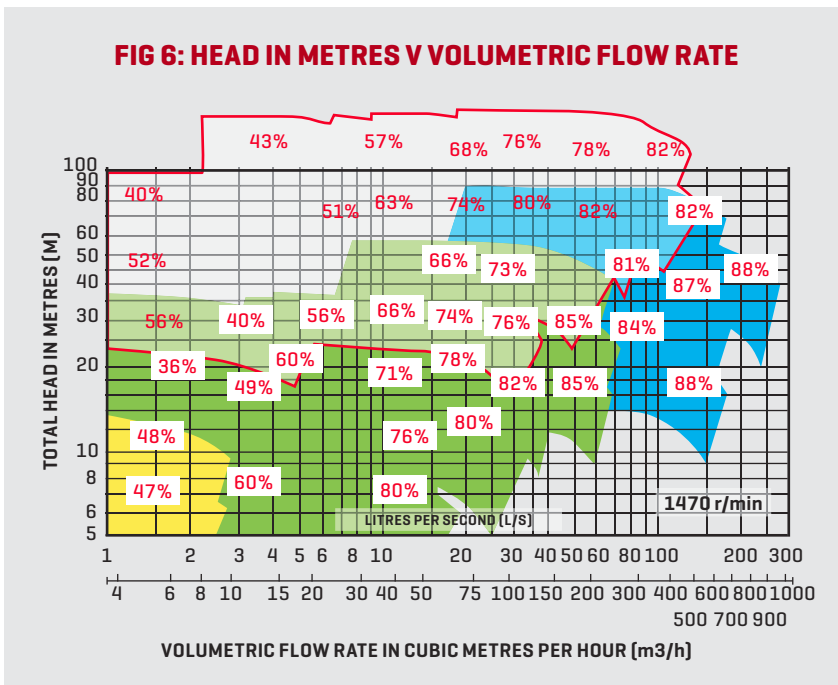


FIG 6: HEAD IN METRES V VOLUMETRIC FLOW RATE



and vibration. Then let the pump vendor select the best pump for the job; unrestrained by silly speed constraints. The best speed may be 2980 or 1450, or 980rpm or even lower. It depends on your hydraulic conditions.

But what about multi-stage pumps and what about the impact of running speed on suction conditions? I will talk about these issues next time. ■

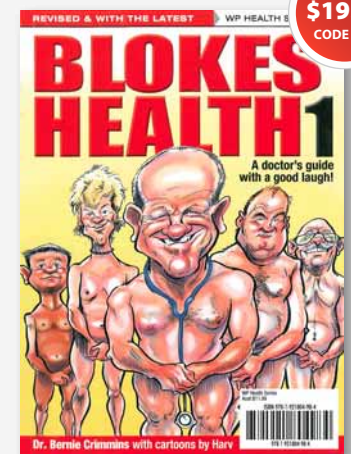
Next article: Are your pumps running too slowly? – the sequel.

ABOUT RON

Ron Astall is a Mechanical Engineer with extensive pump industry experience including Engineering, Contract Management, Applications, Sales, Marketing and Quality Assurance; particularly in the Process and Petrochemical Industries in his role at United Pumps Australia.

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 (PIA) and Contracts Manager at United Pumps Australia.
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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.



A STELLAR ADDITION

Rheem Australia has enhanced its Stellar electric range with the addition of a new 50L stainless steel model – and it combines high thermal efficiency with the purity and performance of a stainless steel cylinder.

The new Rheem Stellar 50L electric stainless steel hot water heater is both compact and lightweight. With a packaged weight of just 17kg, it's 42 per cent [12kg] lighter than the 50L vitreous enamel model, which has a packaged weight of 29kg.

"Given many 50L water heaters are installed in old unit blocks without lifts, the new lightweight design makes it particularly beneficial, especially

if you're carrying the system up multiple flights of stairs," says Ben Murphy, Rheem's Group Manager – Electric & Heat Pump.

And like Rheem's 50L vitreous enamel models, the Stellar 50L model is compact in design [they all have the same dimensions and are among the smallest 50L systems on the market], which enables easier installation into tight cupboard spaces and under benches.

"Generally 50L systems are installed into cupboards where space is an issue, so being lightweight and compact makes the new Stellar 50L model easier to position and manoeuvre," Ben adds.

The system has also been made with the end user firmly in mind. A key feature of the system is a high-temp 80°C thermostat which, when delivering water at a constant showering temperature of 42°C, provides up to an additional 2½ minutes of showering time compared with a 50L vitreous enamel product.

And the Rheem Stellar 50L electric stainless steel model performs 4.8% better than MEPS. Better insulation in the tank ensures water stays hotter for longer. This reduces energy use which is especially important for products like these which are connected to expensive continuous tariff electricity rates.

This model is also very durable. It features a robust stainless steel cylinder and water fittings, which resist corrosion for longer and extend the product life. These are backed by a 10-year cylinder warranty, which is at least three years longer than comparative models on the market.

The addition of the 50L model to the Rheem Stellar electric stainless steel range completes the range, providing a model for all different needs [50L, 80L, 125L, 160L, 250L and 315L].

www.rheem.com.au

BOSCH BOILERS

Bosch has recently announced the Australian introduction of the GB162 Boiler range; a wall hung, high efficiency condensing boiler that is perfectly suited to commercial heating applications.

Available in 65KW or 100KW capacities, the GB162 can be cascaded in any combination up to 8 units. Cascading frame kits can be easily constructed on site and come complete with all necessary pipe work, low loss header, custom fit insulation, and high quality fittings to ensure a fast and reliable install.

The space saving design of the cascade concept allows a 4 boiler 400KW system to occupy an amazingly compact 1m² of floor space.

The GB162 boiler has a controls program to match the requirements of any installation, as well as fluing for either single boiler or cascade boiler configurations.



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EXPANSION CONTROL VALVES

JON PALFREY EXPLAINS THE NEED FOR EXPANSION CONTROL VALVES WHILE ALSO TOUCHING ON PIPING INSULATION AND HEAT TRAPS.

Also known as Cold Water Relief Valves, Expansion Control Valves [ECV] are necessary to be installed in some states in Australia and areas where the water supply has a high saturation index [the saturation index indicates the tendency of water to form or deposit scale]. Water with a high saturation index is referred to as scaling water because calcium carbonate is deposited out of the water and forms a scale on any hot metallic surface.

In scaling water areas, it is possible for the TPR valve fitted to the mains pressure storage tank to eventually become blocked with calcium deposits as the scaling water passes through the hot valve body. If the TPR valve were to become totally blocked, the cylinder would eventually become distorted due to expansion.

To prevent this occurrence, every water heater installed in a scaling water area must have an ECV fitted on the cold water inlet to the water heater. The valve should be fitted after the non-return valve and must be the last valve before the water heater [see diagram].

The pressure relief setting on the ECV is lower than the relief valve setting on the TPR valve; therefore pressure relief within the system will occur through the ECV. As the water that's relieved is cold, the incidence of scale build up in the ECV is reduced dramatically. The TPR valve is therefore not relieving pressure and scale build up will not occur.

The TPR valve must remain installed as normal as it also performs a secondary safety function of relieving heat

energy under high temperature conditions.

Every mains pressure water heater installed in South Australia and Western Australia must have an ECV fitted to comply with local plumbing regulations. Any other supply to a water heater with a saturation index greater than +0.4 needs to be fitted with an ECV to comply with the suppliers' warranty.

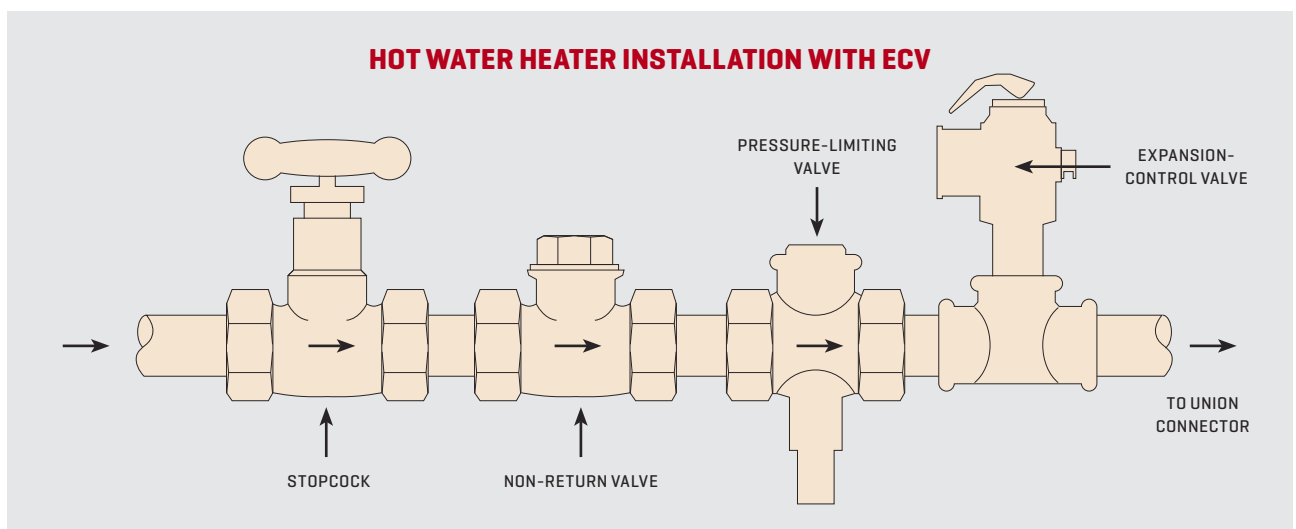
Check your local plumbing regulations for details of the requirements for drainage from the ECV [or refer to the suppliers' water heater installation instructions].

PIPE INSULATION

Heat loss from hot water plumbing can be considerable, particularly if the water heating system is operating on a flow and return loop. To conserve fuel and to minimise running costs, all hot water piping with circulating water should be insulated. ASNZ 3500.4 provides minimum insulation requirements for various geographic zones.

Standard domestic installations should have at least the first two metres of the hot water plumbing insulated. This will reduce the heat lost from conduction through the water and pipe material.

If a circulating pump is installed, a timing device should be fitted to have circulation occur in the domestic dwelling only when hot water is required to fixtures. This timing activation should be discussed with the customer, to ensure its operation suits their hot water usage and requirements.



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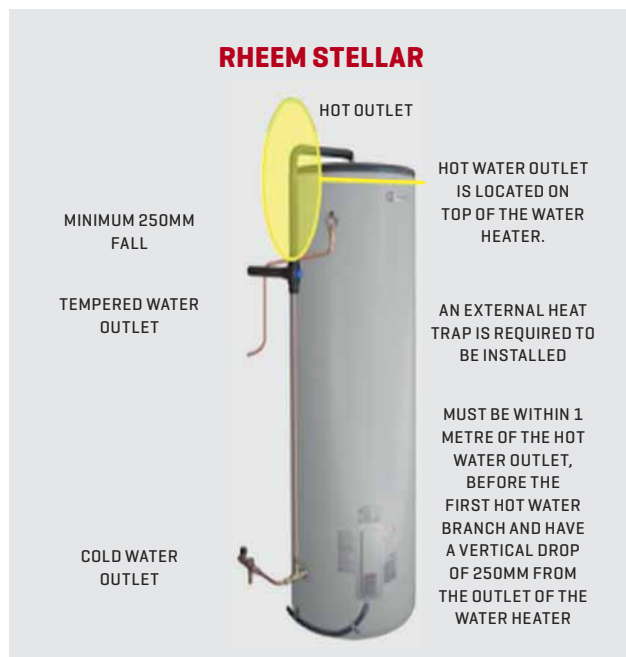
WATER FILTERS

HEAT TRAPS

It is possible on installations where no heat trap is fitted and the hot water outlet/plumbing rises from the water heater connection at the top of the system, for the heated water from the tank to circulate within the pipe.

During periods of no usage in the dwelling heated water rises up the pipe until it cools and then falls back into the water heater due to its increased density. This activity will increase the heat loss from the system and increase running costs.

Most current Rheem models incorporate a dip tube which conveys the hot water from the highest point inside the concave top of the storage cylinder to the outlet connection on the side of the cylinder. The dip tube acts as an integral heat trap by restricting hot water in the cylinder from circulating within the hot water plumbing.



AS3500.4 states that for installation using water heaters with an integral heat trap (dip tube) a further heat trap is not required.

The new Rheem range of electric stainless steel cylinders with the hot water outlet at the top of the tank do require a heat trap to be plumbed when taking the hot water line in an upwards direction and across the dwelling to fixtures. The trap needs to have a loop formed that extends 250mm lower than the outlet at the top and then extends to the fixtures being served [see diagram]. ■

Jon Palfrey is Rheem Australia's Training Manager. He conducts training to plumbers and specifiers across the southern states, covering the latest water heater technology and key water heating issues facing plumbers.



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BACK TO BASICS

PETER MCLENNAN WANTS TO GET BACK TO THE BASICS OF CROSS CONNECTION CONTROL.

So what is backflow prevention and Cross Connection Control all about? – Isn't it about protecting the drinking water supply?

We risk seeing in our industry what always happens when the interests of politics or finance get involved. We see the watering down of regulations and requirements, the use of less effective protection, and the introduction of 'rationalist thinking' to explain and downplay the potential risks.

Let me explain what I mean by rationalist thinking. Wikipedia suggests that rationalists have such a high confidence in reason that proof and physical evidence are unnecessary to ascertain truth – in other words, "there are significant ways in which our concepts and knowledge are gained independently of experience". So in the context of backflow prevention, the risks can be mathematically lowered based on the minimal empirical evidence.

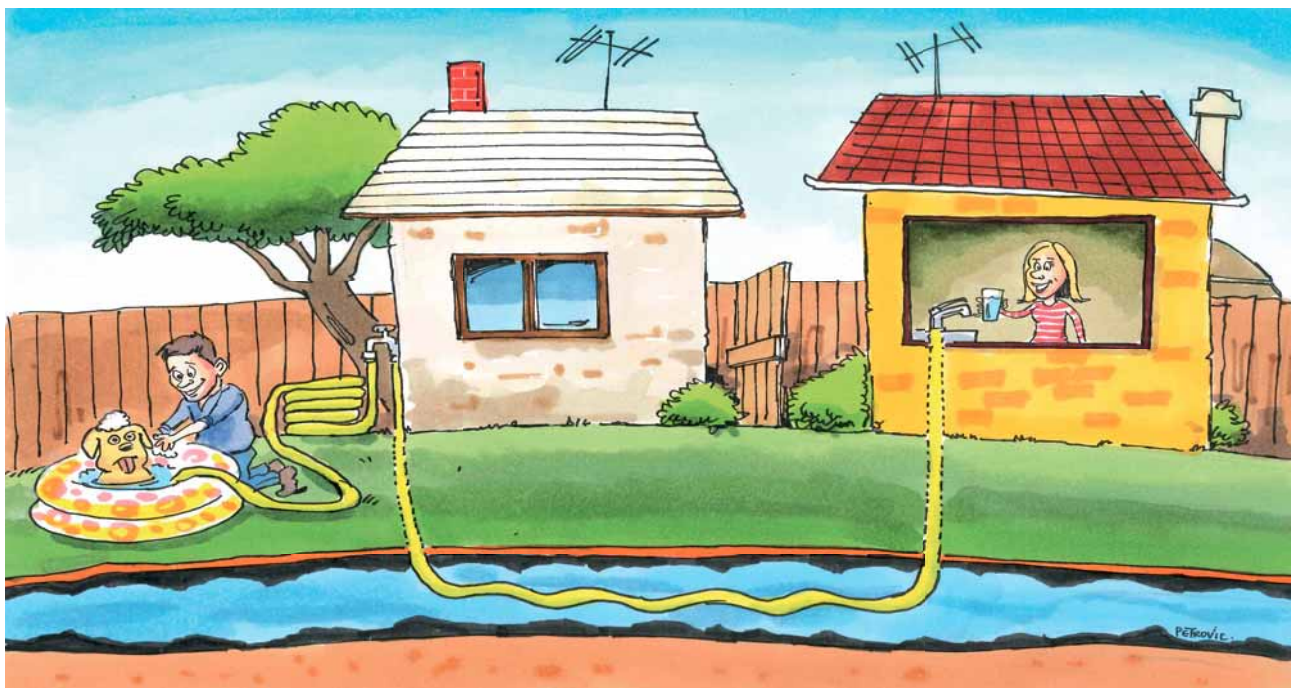
Cross connection control, which utilises a number of methods, including backflow prevention devices to protect the drinking water, is needed in our sophisticated plumbing systems. Cross connection control is everything from the air gap in the toilet cistern to the break in the filling pipe on water tankers to the backflow prevention device in the modern dual check water meter. It is so common, the

general populace does not know it exists or how important it is in keeping them safe.

We know that cross connection control protects the public water supply from possible contamination when a backflow event occurs, and we also know that every time there is a water main break that backsiphonage is evident, and evidence shows that there are approximately two water main breaks every hour in Australia. So why do different water authorities across Australia assess the risks differently?

We now see an almost national approach to residential containment or boundary protection being provided by either dual check water meters or individual dual check valves at the meter set. We understand that a residential connection is generally low hazard and this type of device is suitable, but this falls down as the dual check valve is never tested and only generally replaced at the time of the meter changeover. This differs across Australia, but is in the region of every 8 -12 years.

Recent research out of the United States reveals that the failure rate in the first year for a dual check valve is nearly 8%. This means that the backflow prevention in 8 out of every 100 properties, if subject to a backsiphonage event, could potentially contaminate the drinking water supply. ➤



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There are approximately two water main breaks every hour in Australia.

We can surmise that at the end of the average 10 year life of a water meter, potentially 80% of the residential network no longer has effective backflow protection.

This research has led to the mandatory replacement of the dual check valve components being changed out every year in some regions in the USA. Costly yes, but what is the potential cost of an incident whereby the public drinking water cannot be used, which results in lack of public confidence in the drinking water?

Once we 'fix' residential connections, let's draw our attention to commercial and industrial connections. We see an almost universal approach across Australia where the connection is assessed based on the degree of hazard the process within the property presents and a boundary containment device is stipulated to be installed and tested by the water supplier. The installing plumber is expected to have the device tested to confirm effective operation and the device is registered with the local council against that property.

From this point the management of the ongoing annual testing of the device varies greatly across the country. Some water suppliers maintain the register of devices and send reminders to the property owners when the next test is due, while others register the devices and then take no further action. The onus then falls on the property owner to remember to have the device tested annually – and if they don't the device may remain untested for years. I guess the thinking here is that if there is a backflow event and the device fails and allows contaminants back into the public

water supply, the liability is placed onto the property owner because they have a duty of care and a responsibility to maintain the device in a serviceable condition.

It could be argued that, due to the property owner's lack of expert knowledge in water supply and the ignorance to the chance of a backflow incident occurring, it is the responsibility of the water supplier to manage the annual testing and ensure the property owner complies.

We are lucky in this country to have such a good water supply but as further reduction of services and budgets impact the operations of the water suppliers, we increase the risk of one day seeing a news report where people were poisoned or fatalities have occurred due to an unprotected cross connection allowing contaminants back into the water supply.

Human life relies on a safe water supply and only by fully understanding cross connection control and ensuring it is managed closely can we have confidence that the water is safe to drink. After all safe drinking water is a basic necessity of life. ■

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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ENGINEERING CHANGE

THE CADETSHIP IN PLUMBING ENGINEERING KNOCKS A YEAR OFF THE TRADITIONAL APPRENTICESHIP, BUT WHAT IT LACKS IN DURATION, IT MAKES UP FOR IN INTENSITY. **JACOB HARRIS** EXPLAINS.

A new training model for obtaining a Certificate III in Plumbing has been developed by the Master Plumbers and Mechanical Contractors Association of NSW. While the three year cadetship has been criticised by some as destroying the four year apprenticeship, on closer inspection this intensive training scheme is by no means the 'easy road' and looks set to produce some pretty impressive results.

As of August, the Master Plumbers College of Excellence is home to the Cadetship in Plumbing Engineering. The program turns the traditional four year apprenticeship model on its head with an intensive 18 months of initial institutional training followed by 18 months of paid on-the-job training.

"We had been looking at the process of training and assessment since we became a full trade training provider. We weren't seeing quality outcomes from the current methodology in our state, so we decided to change the model to improve the outcome.

"In September last year we travelled to Europe to have a look at the assessment processes there which, to a certain extent, was the impetus for this model. The key to this model is that when a student completes the institutional delivery they are guaranteed a job in the apprenticeship scheme," says general manager Master Plumbers Association NSW Paul Naylor.

The cadetship will deliver five streams of Certificate III in Plumbing, adding roof plumbing to the four streams offered by TAFE. Prospective cadets will undergo a rigorous, multi-stage selection process before being signed up to the program. This includes aptitude testing, Harrison Assessments [a pre-hire assessment toolkit], a practical orientation to plumbing and multiple interviews with both the cadet and their parents.

"Group training companies have similar recruiting processes but I don't think they're as exhaustive as ours – we've actually increased the extent of the testing that these kids will go through. Because they're going to come to

the college for four and a half days a week for 18 months, it's important to get the right candidates in," Paul says.

The 18 months of college will total 1944 hours of delivery, broken down into 864 hours of Certificate III in Plumbing basic theory and practical, 432 hours of Extra Intensive Assessment, 216 hours of Catch Up Time and an additional 432 hours of Industry Training and Observation.

The cost for the college based delivery [paid by the cadets/parents] is slightly more than the Smart & Skilled scheduled fee for the full Certificate III Plumbing course in NSW, but covers full tuition costs as well as the workplace assessment process.

The Industry Training and Observation component is designed to provide cadets with a comprehensive understanding of the industry and the mechanics and systems that underpin it.

"They'll be looking at how modern technology works in large recycled water systems like Olympic park in Sydney and the sites controlled by Sydney Water. They'll go to the Rheem factory and see how hot water services are made. This will endow them with a much broader perspective of what industry does and what plumbing is about. It

will show them that plumbing is not just changing tap washers. Because of this broader understanding, they'll be a lot more motivated to succeed in the 18 months of the apprenticeship," Paul says.

The key to the cadetship though, and the reason for the allocated 216 hours of Catch Up Time, is the way it is assessed. The Assessment Methodology is a big part of what Paul and his team gleaned from their time in Europe and, as Paul puts it, "introduces the word 'fail' to the system," while adhering to the maxim: he/she who trains does not assess.

Assessment is made up of four levels and culminates in a 3-4 day holistic assessment on all five streams. If for any reason a cadet should fail an assessment - even if it's something they've passed at a previous level - they will be required to go back to the beginning and start the assessment process from scratch.

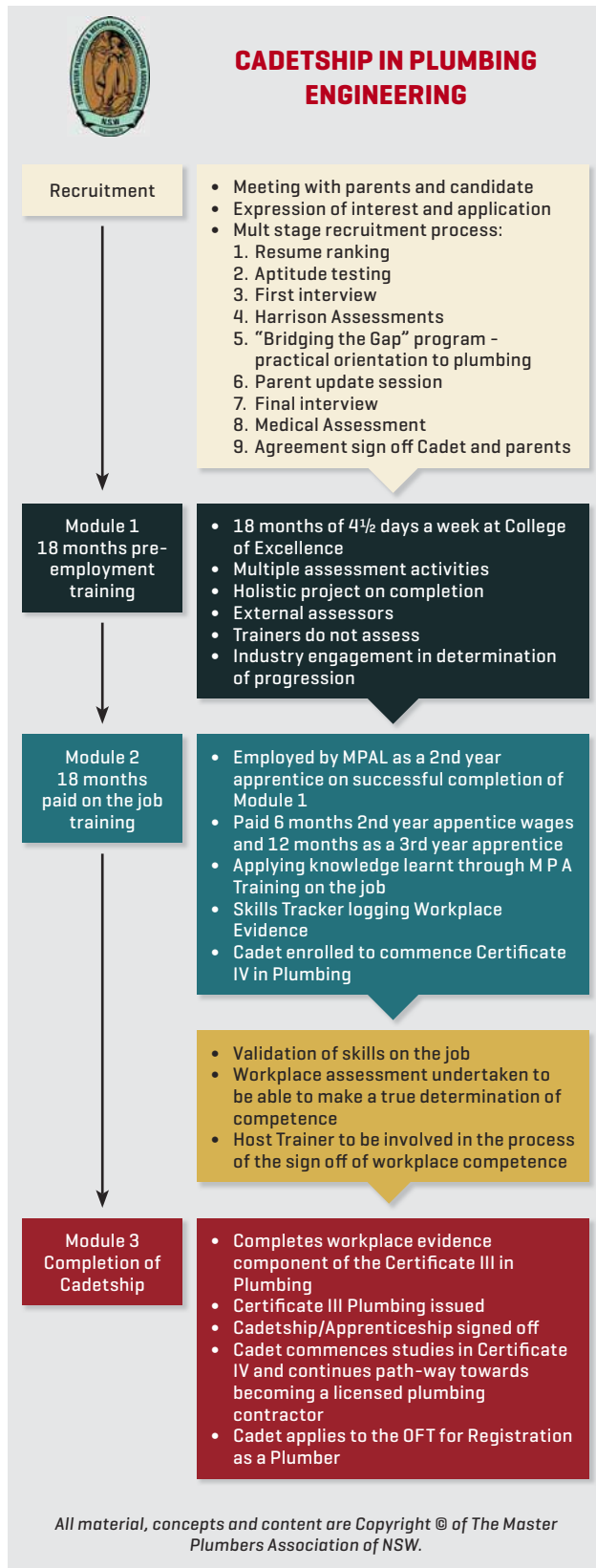
"We're making up for 18 months of practical training the industry says should be done in the traditional apprenticeship. We think that this will be much harder for these kids to learn so only the cream will rise to the top. The others are just going to have to work very hard and that's why the make-up time is there." ➤



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Cadets at the Master Plumbers College of Excellence.

At level two cadets are assessed on both theory and practical elements including their knowledge of the standards and comprehension of specifications. Once they pass that, three of the five streams must be completed before level three [which is all practical] can be attempted. If, for example, they fail at level three they go right back to the beginning and start again.

“That’s the repetitive nature of the work they’re being trained to do on a day-to-day basis when they’re working as apprentices. They have to learn those skills, be able to remember those skills and be able to use those skills in whatever task they’re given. Now that’s completely different to competency based training where you can fail a section of the competency and just go back and do that part again. Here it’s part of an overall process,” Paul says.

Once cadets finish the initial 18 months pre-employment training, they’ll work five days a week on site which Paul believes is much more in line with the needs of employers. They’ll then undergo workplace assessments with host employers to get their competencies signed off.

The Master Plumbers College of Excellence will continue to offer apprenticeships in the traditional model and is aware that for some employers that will still be the best option.

“We realise that there will be some employers who want to employ apprentices themselves and run that model – we don’t have a problem with that at all. But the executive committee is pretty convinced that after we finish the first 18 month program and these boys and girls go out to work as apprentices we’ll see a rise in demand from most employers,” Paul says. ■

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KEEPING YOUR PIPES HEALTHY

IT'S ALL A MATTER OF THE RIGHT PRODUCTS, INVESTMENT AND BALANCE SAYS CEO OF THE INTERNATIONAL COPPER ASSOCIATION AUSTRALIA **JOHN FENNELL**.

A healthy plumbing system has to consider everything from design, installation, and commissioning to the operation of the system for the entirety of its service life. Plumbing systems that are poorly designed, or where the systems operation has changed over time, can lead to poor quality water.

One of the greatest threats to the quality and longevity of a plumbing system is stagnant water. Allowing stagnant water to develop can generate biofilms in the pipes, potentially allowing the growth of pathogens which are harmful to people. Uncirculated water can accumulate toxins from chemical absorbed through plastic pipes or heavy metals being leached from metallic pipes over time.

The Plumbing Code of Australia and Australian Standard AS /NZS 3500 set out requirements and guidelines to ensure that these problems do not arise. For other useful design ideas and methods, download the Hydraulic Services Design Guide from www.copper.com.au.

DESIGN & INSTALLATION

The correct design of a plumbing system is key to healthy, high quality performance. During design, dead leg piping should be avoided or restricted to being as short in length as possible. A flushing facility [tap] should be provided where there is low draw-off and fixtures that are seldom used should be placed on flow lines or close to a regularly used service.

Cross-connections of the drinking water supply to other water supplies, such as rainwater or recycled water, is another potential contamination. All water supply systems must be designed and installed so as to prevent contaminants from entering the drinking water supply.

Where there is a possibility of cross-connection, protection is achieved by the installation of backflow prevention devices and air gaps between supply pipework and storage systems. Identification and marking of non-potable water supplies and colour coding of pipework is another way of reducing the chances of contamination. Section 4 of Australian/New Zealand Standard AS/NZS

3500.1 deals with this aspect and must be strictly adhered to.

Correct pipe sizing during design is also crucial. There needs to be sufficient water for all the intended uses, including peak demand, and if the pipe size is too small the water velocity and friction losses will be too great, potentially causing erosion and wearing of the pipes. If the pipes are excessively oversized however, there will be insufficient flow to minimise biofilm build up and settling of silt.

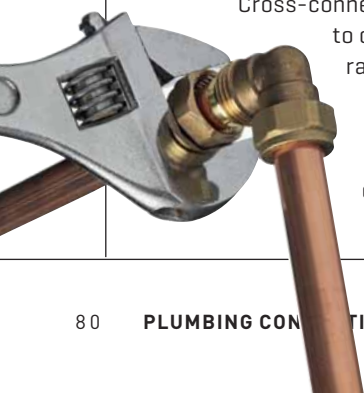
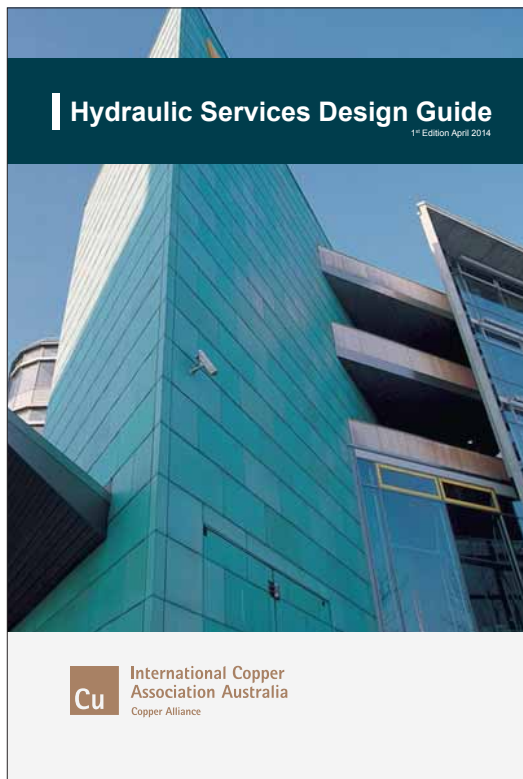
COMMISSIONING & OPERATION

During commissioning all systems shall be thoroughly flushed out as soon as possible after installation to remove foreign matter and should continue until the water runs completely clear. The system can then be pressure tested to the relevant regulation.

Water from reticulated systems (municipal water supply) is usually satisfactory for flushing and testing purposes. Where non-disinfected water is to be used for flushing and testing, water shall be disinfected. A procedure for disinfecting water is outlined in AS 4809 and AS/NZS 3500.1.

If more than 8 weeks between installation and full system use is unavoidable:

- the system shall be kept completely full and clean water shall be flushed frequently [every 2 weeks] from each fixture until the system is used;
- OR



- the system shall be drained completely and dried out by blowing air through the system, then, if practicable, the piping shall be sealed to prevent intrusion of water and foreign matter.

When the system is connected to the permanent water supply with all taps and valves installed all draw-off points should be opened until clear water exits the system. This will assist in the development of the protective internal film within the pipe work and draw fresh disinfected water into the system.

In large installations, the flushing should be performed in sections. Multi-storey buildings should be flushed by commencing on the uppermost floor and working down storey by storey.

Water services used to supply drinking water shall be protected against contamination during installation, commissioning and repairs. If any water supply service is exposed to foreign substances or contaminated supply, the service shall be flushed, chlorinated and tested before being placed in service.

“MULTI-STOREY BUILDINGS SHOULD BE FLUSHED BY COMMENCING IN THE UPPERMOST FLOOR AND WORKING DOWN STOREY BY STOREY.”

After the water system is in operation, special care needs to be given when modification, change in usage patterns or where extensions are added to the systems. The entire system needs to be checked so that all requirements of the Standards and Plumbing Code of Australia are continually being met.

HOW CAN COPPER TUBE HELP?

Copper tubing has been the primary material for Australian and New Zealand plumbing for over 50 years. Design information, including the governing standards, are based around copper and copper pipe sizes.

Taking the extra care and consideration when designing, installing, commissioning and operating a plumbing system will improve the quality, performance and life of the system. Of the utmost importance is the profound effect these steps can have on the quality of water being conveyed in a system. ■

John Fennell, CEO, International Copper Association Australia.

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A BIT EACH WAY

GAS APPLIANCE INSTALLERS NEED CLEAR AND CONCISE INSTRUCTIONS BUT FOR ONE REASON OR ANOTHER, SOME MANUFACTURERS MAKE THINGS DIFFICULT. **ROGER LAMBIE** REPORTS.

The printed material that comes with some appliances is often self-contradictory.

There are statements that the installation must conform to local gas-fitting regulations, and the installer may be urged to refer to AS/NZS 5601. However, many of the instructions in the manual relate to requirements in the country of manufacture.

I won't list the manufacturers or models, as some people may think I'm criticising the appliance (this is not the case).

One set of instructions requires minimum inlet pressure of 1.37kPa for natural gas and 2.74kPa for LPG. It also specifies manifold (burner) pressure of 0.87kPa and 2.74kPa respectively.

For natural gas installations a supply pressure of only 1.13kPa is available, so what effect does this have on the operation of the gas valve and the appliance?

You would like to think it would have no effect, yet on another page in the manual it states that the standard input pressure is to be 1.74kPa – which makes things confusing.

Judging by photographs and drawings in the installation manual, the shut-off valve as supplied is actually fixed to the appliance. A flexible hose is connected to the shut-off valve, which contradicts Clause 6.6.4 of AS/NZS 5601, which states that the means of disconnection shall be downstream of the means of isolation.

What does this mean for installers: do they have to change the location of the shut-off valve to conform to 'local gas-fitting regulations' such as AS/NZS 5601? Then there are flue termination requirements stipulating compliance with AS/NZS 5601.1

The installation manual sets out flue clearances in a similar way to page 118 of AS/NZS 5601. However, it seems to have been converted to metric from the imperial measurements in the original document.

In some cases the measurement differences are minor. In others, such as Item G, a clearance of 500mm is required horizontally from any building structure or obstruction

“ IT IS NOT THE RESPONSIBILITY OF INSTALLERS TO DETERMINE WHAT IS RIGHT OR WRONG IN THE INSTALLATION INSTRUCTIONS. ”



Means of disconnection to be downstream of means of isolation.

facing a terminal, yet the manual requires a minimum clearance of 1219mm from any adjacent building.

Every few lines between the lists of clearances in the manual it states: "Note clearance in accordance with local installation codes and the requirements of the gas supplier."

Where the gas supplier comes into it is anybody's guess.

CONFUSION PLUS

If installers find the above confusing, then certain requirements in AS/NZS 5601–2013 part 1 will not make things any easier.

In Clause 2.6.2 General installation requirements, the first sentence states: "Gas appliances and equipment shall be installed in accordance with the manufacturers' written instructions."

In Clause 6.2.2 Manufacturers' installation instruction, the first sentence states: "Appliances shall be installed in accordance with the requirements of this Standard and the manufacturers' instructions."

In Clause 1.8.102, under definitions of terms, the word 'shall' indicates a mandatory aspect.

Obviously a discrepancy between the above quoted two clauses can be sorted out, but if it is not addressed in unison with Clause 6.2.2 then nothing will be resolved. ➤

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Technik zum Wohlfühlen



Where a permanent pressure gauge is fitted, a provision to fit an alternative test point shall be provided. Where pressures exceed 7kPa, pressure test points shall be of the self-sealing type.

Until March 2014 Victoria and New South Wales were still running with AS 5601-2004 as neither state accepted AS/NZS 5601-2010.

There is a glaring discrepancy in what was Clause 5.2.5, Manufacturers' instructions for installation, in the 2004 version of the Standard where it stated: "Appliances shall be installed in accordance with manufacturers' instructions."

No reference was made to the Standard in that clause as is now required in the 2010 or 2013 editions of the gas installation Standard.

The way the clause is written now means the plumber/gasfitter is the loser all the way. Manufacturers could claim that installers did not follow the product instructions, and the technical regulator could say that installers did not follow the Standard.

Years ago there was clear direction, as in the 2004 Standard. You have to wonder who comes up with clauses that go around in circles.

At the former Gas & Fuel Corporation in Victoria, I supervised a small group of gasfitters who inspected appliances for approval and certification. Any installation manual submitted with such contradictions would have gone back to the manufacturer for rewriting. The appliance would not have been given approval until the documentation was all correct.

Now, we have a Standard that allows manufacturers to have a bit each way.

The second sentence of Clause 6.2.2 in the latest Standard is similar to that in the 2004 and 2010 editions.

"Where there is any conflict between the manufacturer's installation instructions and the requirements of this Standard, the matter shall be referred to, In Australia, to the Technical Regulator."

It helps to protect installers, as they could get a defined ruling on what should apply if there were differences.

From what I understand, the technical regulators in each state and territory sanction the operation of certifying bodies. I wonder how often they carry out audits of these companies to ensure that testing of individual appliances is carried out according to the Standards and documentation is concise and easily interpreted.

We need to obtain the best for the industry and, crucially, for the customer. So who is reviewing manufacturers' documentation to ensure that instructions are practical and installers can carry out the work safely and efficiently?

It is not the responsibility of installers to determine what is right or wrong in the installation instructions. Discrepancies should be resolved when the manual is being prepared. I have looked at just a few pages of this particular installation manual, and there are others in a similar state.

Australia used to have one certification body, but now there are four competing against each other. Competition is supposed to bring improvement, not uncertainty and confusion.

One of the most important pieces of information on a gas appliance is the badge or data plate. Among other things, it shows the approval number, gas operating pressure and gas consumption per hour.

While reviewing a set of instructions for an appliance recently, I discovered that the unit had to be partly dismantled to find the plate.

It was necessary to remove the front glass panel, any fuel bed media, the burners and firebox base to gain access to the plate – which was under another access panel.

However, the fuel bed material may be prone to causing problems with incomplete combustion of the gas and potential generation of carbon monoxide, or sooting as described by the manufacturer. In that case, the warranty would not apply and the plumber/gasfitter would have to resolve the problem.

The gas entry point for this appliance was shown in one drawing to be at the lower right corner near the base, yet in the very next drawing it appears to penetrate the top right hand panel.

PRESSURE TEST POINTS:

Interestingly the manufacturer has called up the requirements of AS/NZS 5601 – 2013 in reference to pressure test points required and their location.

As previously, Victoria and NSW had not adopted AS/NZS 5601- 2010 and in that edition of the Standard there was the requirement for the gasfitter who is either laying a new gas fitting line or is installing an appliance to fit a test point on the gas fitting line prior to any gas appliance where one is not normally available.

I cannot be sure how many plumbers/gasfitters are aware

of some of the latest requirements for the location of test points or have looked at the following two clauses that introduce some new requirements

Clause 2.4.10 Pressure test points:

“Adequate pressure test points shall be provided to ensure all parts of the gas installation can be safely tested and commissioned.

Clause 5.11.4 states that pressure test points shall be accessible and provided at, or adjacent to, the:

- Outlet of gas pressure regulators installed in the gas pipework;
- Inlet and outlet of pressure raising devices installed in the gas pipework;
- Outlet of the venting device of a double block and vent safety shut-off system;
- Inlet of the gas appliance if no appropriate test point is incorporated in the gas appliance.

Where a permanent pressure gauge is fitted, a provision to fit an alternative test point shall be provided.

Where pressures exceed 7kPa, pressure test points shall be of the self-sealing type. ➤

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While some gas valves do not have test points, they do have a plug that can be removed and replaced by a test point as can be seen above.

Note: For pressure exceeding 7kPa, the testing equipment should include a mechanical connection to the test point.

And what does Clause 2.4.10 mean to the plumber/gasfitter? It helps to establish legally that the correct supply pressure of gas is flowing through the gas meter where a test point is located at the head of the gas fitting line.

Some gas meters do incorporate a test point on the outlet of the meter. However, under the Victorian Gas Act of 1997 and similar legislation in other states, this test point is not to be accessed by the plumber/gasfitter. This would be deemed to be tampering with the meter.

If any adjustment of the meter regulator is required, it must not be done by the plumber/gasfitter.

Regarding Clause 5.11.4 – test points are a distinct advantage in establishing that correct supply pressure is flowing to all the gas appliances in the system, with all of them on at the same time.

AS 5601-2004 did not even define what a pressure test point is.

In many cases the test point on the outlet of the appliance regulator indicates the flowing pressure to the appliance burner.

What it does not establish is whether problems in attaining the operating pressure are associated with the inlet supply to the control valve of the appliance (at least 1.13kPa for natural gas).

With the inlet test point before the appliance, this can be verified. Also, the operating pressure from the gas meter can be established at a minimum of 1.2kPa. If this is not the case, there's a supply problem that can be addressed only by the gas distribution company.

Some gas valves do not have test points, but a plug can be removed and a test point inserted.

PRACTICAL OBSERVATION

The extra pressure test points, where required by these clauses, will be an additional cost to the customer, plus materials and installation time.

However, in the installation manual that I looked at, one method of installation shows the 693mm wide appliance placed in a cavity that is only 695mm wide. Where the standoffs are removed for fitting the appliance into a masonry cavity, the overall width is 685mm.

With a clearance of only 1mm or, in the case of removing the standoffs, 5mm either side of the appliance how do you run a 12mm copper gas line plus a test point if required?

In this case the manufacturer – contrary to the Standard for installing the appliance in a residence – also requires an isolating valve as close as possible to the appliance regulator.

Obviously the isolating valve and test point will not fit and will have to go inside the appliance. The next problem will be how to remove the heater with those components inside.

Otherwise, if the installer has to penetrate the wall next to the appliance to accommodate an isolating valve and test point, it may require a screwed access panel to hide them. How will the customer feel about a screwed access panel on what may be a feature wall?

This article is not about the quality or efficiency of any gas appliance. It is about the confusion in installation instructions between what the manufacturer wants and the AS/NZS 5601 gas installation Standard.

Installers need clear, practical methods for placing appliances to the satisfaction of the end user. Accountants can measure almost everything about how a business runs – but not customer dissatisfaction, which may result in commercial failure. ■

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DAMNED IF YOU DO ... DAMNED IF YOU DON'T

AS NON-CONFORMING PRODUCT CONTINUES TO INFILTRATE THE AUSTRALIAN MARKET AT A RATE OF KNOTS, THE NEED FOR CERTIFICATION BODIES TO STEP UP AND TAKE ACTION HAS NEVER BEEN GREATER. AS LONG AS THEIR EFFORTS ARE FOCUSED IN THE RIGHT DIRECTION THAT IS. *PLUMBING CONNECTION* TAKES A LOOK AT A CASE STUDY WHICH HIGHLIGHTS THE EXTENT SOME REPUTABLE BRANDS GO TO FOR CERTIFICATION AND THE RINGS THEY ARE MADE TO LEAP THROUGH TO GET OUTDATED REGULATIONS CHANGED.

On June 25 2015, the Federal Government's Senate referred an inquiry into non-conforming building products (into which plumbing supplies naturally form part of that inquiry) to the Senate Economics References Committee for inquiry, with particular reference to:

The economic impact of non-conforming building products on the Australian building and construction sector;

- (a) the impact of non-conforming building products on:
 - (i) industry supply chains, including importers, manufacturers and fabricators,
 - (ii) workplace safety and any associated risks,
 - (iii) costs passed to customers, including any insurance and compliance costs; and
 - (iv) the overall quality of Australian buildings

- (b) possible improvements to the current regulatory frameworks for ensuring that building products conform to Australian Standards, with particular reference to the effectiveness of:
 - (i) policing and enforcement of existing regulations,
 - (ii) independent verification and assessment of systems,
 - (iii) surveillance and screening of imported building products,
 - (iv) restrictions and penalties imposed on non-conforming building products; and
 - (v) restrictions and penalties imposed on non-conforming building products; and

- (c) any other related matters.

That's all good and well but what, if anything, will it mean to local manufacturers/distributors of product that are already trying to do the right thing but are hampered by archaic processes and regulation?

At times you can't blame some non-conforming product supply culprits for turning a blind eye to regulatory requirements - not that that's an excuse for ignoring the law. We'll come back to that regulatory complexity issue further along in this article.



Outdated Standards inhibit the introduction of innovative products such as the above into the Aussie market.

In the meantime, if you had hoped to express your views to the Senate Review, you've missed the deadline already.

The inquiry was announced on June 23, submissions closed August 3 and the report date to the Senate is October 12, 2015 - all over in a flash unless the report back date is extended.

What will be interesting to see is the depth and quality of submissions from the expected industry sector groups.

Then, what will the Senate review committee actually say? And can what they say be effectively achieved?

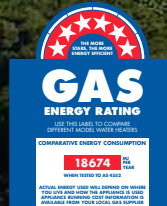
We already know we have too many laws in this country that cannot be effectively policed. And what of the new hyped-up free-trade agreement - will that be the next thing people hide behind? ➤

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<p>Requires that products comply with the ABCB's <i>Procedures for certification of plumbing and drainage products</i> (formerly AS5200.000) as specified in the PCA and are certified under a program in accordance with the principles of ISO/IEC 17065:2012 which includes:</p> <ul style="list-style-type: none"> Assessment of the manufacturer's quality assurance system Testing Assessment Granting of certification Surveillance of the quality system involved. 	<p>Requires that products comply with the ABCB's <i>Procedures for certification of plumbing and drainage products</i> (formerly AS5200.000) as specified in the PCA and are certified under a program in accordance with the principles of ISO/IEC 17065:2012 which includes:</p> <ul style="list-style-type: none"> Testing Assessment Granting of certification
<p>This level of certification is commonly referred to as System 5 Certification and requires design evaluation and independent testing to determine product compliance with the relevant Standard identified as applicable in the WMCS. The certification also requires an assessment and ongoing surveillance of the production processes or quality system, including inspection or testing of samples of product.</p>	<p>This level of certification is commonly referred to as Type Test certification and requires design evaluation and independent testing to determine product compliance with the relevant standard identified as applicable in the WMCS. The certification does not include an assessment and ongoing surveillance of the production processes or quality system in place. The certificate would have duration of three years and may be renewed at expiry.</p>
<p>Typical product groups that fall under this certification level are:</p> <ul style="list-style-type: none"> • Hot and Cold Water – Pipes and Fittings • Water Heaters • Taps and Valves • Sanitary Fixtures – Water Closets pans and cisterns, Bidet/Bidettes • Appliances [High Hazard] • Water Filters and Water Treatment Devices 	<p>Typical product groups that fall under this certification level are:</p> <ul style="list-style-type: none"> • Waste Fittings • Sanitary and Drainage Pipes and Fittings • Sanitary and Drainage Valves • Appliances [Low/Medium Hazard] – Washing Machines • Sanitary Fixtures – Urinals

It's not as though the government is going to put armed militia on the docks to open containers and look for non-DE zincified brass tapware.

This brings us to the present situation, the complex way that suppliers have to go about launching new product/technology on the Australian market.

And why is it important, I hear you ask, that a plumber needs to know anything about this detail? Simple, it is the plumber who is liable for installing any product that doesn't comply with the regulatory requirements. It's not the builder, developer or direct client. It's doubtful a waiver from your client would even hold up in a court of law, as you are the 'qualified' person who should be upholding the law of the land in the first place. Tough luck plumbers.

You're the one who will be chased by the insurance company for rectification and recovery monies for flooded premises, the lost time that a business is closed or the hospital shut down and the consequences of that.

So let's have a detailed look at the product certification system we operate under and the 'big-bang' effect when efficient new technologies meet old Standards. In theory you'd think it would take minimal time and effort to amend the situation – but that simply isn't the case. Here we detail a specific case in question and there are a line-up of others in the 'to be followed up' files at suppliers and product certification organisations.

WHY WE NEED CERTIFICATION

The Plumbing Code of Australia (PCA) identifies that certain plumbing and drainage materials and products require certification in order to be authorised for use in plumbing or drainage installations. Without it, Australia would be open to non-compliant products that fail to meet their intended purposes which could not only cost residents and commercial property users (and plumbers) plenty of money, but they can be dangerous too. Now I know what you're thinking: the market is being flooded with dodgy, sub-standard products from overseas all the time. We're well aware of this and understand it's a massive problem. But imagine the amount that would hit our shores if the PCA and Standards didn't exist at all.

Within the Plumbing Code of Australia is a table that outlines which products require certification. Once a product has been deemed to require certification, the manufacturer must go through what is called the WaterMark Product Certification Scheme. Until February 25 2013 the Scheme was managed by the National Plumbing Regulators Forum (NPRF) and administered by Standards Australia. The Scheme is currently managed and administered by the Australian Building Codes Board (ABCB).

ABCB produced a document called Procedures for certification of plumbing and drainage products. In here, it references a WaterMark certification scheme schedule of specification.

Certified materials and products are identifiable by the WaterMark trademark, which must be displayed on the product or material upon the granting of a WaterMark Certificate of Conformity.

In order to achieve WaterMark Certification, the subject material or product must:

- be tested by a recognised testing laboratory;
- comply with an approved specification (either a relevant existing standard or an approved WaterMark Technical Specification);
- be manufactured in accordance with an approved Quality Assurance Program (WaterMark Level 1); and
- carry a warranty.

HOW MANUFACTURERS SEEK WATERMARK APPROVAL

A manufacturer introducing a new product to market must contact one of the 11 JAS-ANZ accredited WaterMark Conformity Assessment Bodies (WMCAB) (CAB) around the country, who then determine whether or not the product requires certification.

Interestingly, different CAB's appear to have varying viewpoints about which products may need a WaterMark certification – especially if they don't fully comprehend and correctly interpret the Standards.

On the face of it, it appears fairly rudimentary, but it isn't always as straight forward as the manufacturer – or the CAB for that matter – would like.

CASE STUDY: ABEY OFFSET PAN CONNECTOR

To give readers an example in point, we contacted Abey, a respected family business that has been supplying to

the plumbing industry for over 50 years. Abey owner Geoff Anderson reckons he's seen it all and these days he's more frustrated than ever with attempting to bring time-saving globally recognised product onto the local market.

"We are committed to doing the right thing by plumbers but so often in this country we give people free kicks who don't deserve it. It's so frustrating for suppliers to see shady imports being sold and little action taken against anyone, yet on the other hand we are hampered by our own stifling regulatory processes. It's also frustrating to see similar products to ours being granted WaterMark certification when they clearly doesn't comply," Geoff says.

"Our CAB guides us through these processes and we strongly support their belief that something is either approved or not – there are no half way measures."

Abey Australia has been trying to achieve WaterMark certification for a pan connector for a number of years now.

When you consider it, a pan connector is quite a simple product. Its main role is to help solve the nightmare of misaligned pipes, catering for difference between centres. With that being considered, you would think the process of gaining WaterMark approval would be an easy one. Unfortunately for Abey, the opposite has occurred.

Abey applied for WaterMark certification of an off-set pan connector back in 2013 and the process is still ongoing through no fault of Abey or its CAB.

Abey agreed with its CAB's opinion that its off-set pan connectors required WaterMark level 2 certification in accordance with the *WaterMark Certification Scheme Schedule of Specifications*. They also identified that *AS2887:1993 Plastic Waste Fittings* was the Standard by which these products had to adhere. Unfortunately, this ➤

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Standard has not been brought up-to-date to cater for modern technology. It is now 12 years old and a lot of things can happen in two years, let alone 12, when it comes to technology and innovation.

One of the first things a CAB needs to do as a certification body is ensure that the product being assessed for WaterMark certification falls within the Preface and Scope of the identified product Standard.

In this case, the preface of AS2887 identifies that it has been written to allow for any plastic material other than UPVC to be used to manufacture offset pan connectors. UPVC isn't covered in AS2887. Pan connectors and other waste fittings manufactured from UPVC are covered in AS/NZS1260.

Even though you may have identical looking product, if they're made of different materials, they could, such as in this case, fall under two different Standards. The Abey offset pan connector is made from polypropylene; therefore AS 2887 is the applicable product Standard. The offset

[WMTS] is currently being developed for use with such products.

"The simple fact is: a product either complies, or it doesn't, so we decided to take a different route; thinking the issue might be over and done with reasonably quickly – but alas, not so", say Geoff

"Under the WaterMark scheme there is the option of developing a new WaterMark Technical Specification [WMTS] for new innovative products which our current Standards do not cover. The ABCB has a process of going through and developing a new WaterMark technical specification.

We were advised to take this option. Fortunately we were able to convince the ABCB that the normal risk assessment process to determine the appropriate level of WaterMark certification was not required as offset pan connectors were already identified as requiring WaterMark Level 2 certification under the *WaterMark Certification Scheme Schedule of Specifications*."

“ UNDER THE WATERMARK SCHEME THERE IS THE OPTION OF DEVELOPING A NEW WATERMARK TECHNICAL SPECIFICATION (WMTS) FOR NEW INNOVATIVE PRODUCTS WHICH OUR CURRENT STANDARDS DO NOT COVER. ”

requirements for pan connectors in both Standards are identical.

With the Offset pan connector section of AS2887 it states the following:

Angle for DN 100 x DN 80 reducing or DN 100 offset pan connectors of the form shown in Figures 4.3 or 4.4, the angle shall not be greater than 30°.

"The word 'shall' indicates that it is mandatory. If it had said 'should' we might have been able to get away with it", says Geoff.

As frustrating as it is to Abey, there are a number of WC pan offset connectors in the market with an offset angle greater than 30 degrees that currently have WaterMark Certification to either AS/NZS 1260:2009 [Clause 5.4.6] or AS 2887 [Clause 4.4.4.] despite both these specifications nominating a maximum offset angle of 30 degrees to the vertical.

As the current specifications are not appropriate for use in the evaluation for certification of WC pan offset connectors with an offset angle greater than 30 degrees, a new WaterMark Technical Specification

With the assistance of the ABCB and a NATA accredited test laboratory, a draft WMTS was submitted to the ABCB in October 2013 [yes, two years ago]. It has gone back and forth between the ABCB and Abey's CAB with several requests and amendments being exchanged over the two years. The latest revision back from the ABCB suggested Abey conduct a water seal test, even though this product was being produced by a highly reputable UK manufacturer who sells hundreds of thousands of this particular product throughout Europe each year!

The saga continues and Abey says the latest concern raised by the ABCB for offset pan connectors with angles greater than 30 degrees, is that they could act as a partial blockage and possibly siphon some of the connected toilet pans trap seal, resulting in sewer odours entering the room. Thus Abey responded and incorporated a trap seal retention test into their latest draft WMTS. Then they learnt the ABCB was recommending that the offset pan connectors be performance tested, certified and marked with all of the manufacturer's nominated matching pans which the offset pan



connector is deemed to be matched with [an interesting view of the world....].

Offset pan connectors are generally sold in plumbing merchants and major hardware retailers around the country as a plumbing fitting purchased by plumbers to help them out of an installation problem where a small adjustment in alignment is required to fit the toilet pan to the waste system. There are over 2300 water closets models on the market at present. The cost to undertake laboratory performance testing with each and every one of these pans would be cost prohibitive and it is highly unlikely that any manufacturer of offset pan connectors would invest in the huge testing costs to ensure that their pan connectors were performance tested to every model toilet pan on the market!

"Needless to say, we voiced our objection to this recommendation. It is our opinion, as well as our highly respected European supplier that off-set pan connectors need only be tested with one nominated pan model for flushing performance testing. Our CAB also believes that the selection of a single nominated pan model needs to be established to ensure consistency in laboratory testing and

to keep testing costs to an acceptable level. And there are already precedents for this in other areas. The Australian Standard for performance testing of dishwashers AS/NZS 2007.1:2005 identifies a single model for testing comparison purposes, so we can see no reason not to identify one toilet pan model to conduct the offset pan connector performance testing with," say Geoff.

We believe the ABCB is seeking input from other WaterMark CABs for the production of the WMTS. At the time of writing, only one other CAB has agreed to participate, but so to have some regulators.

With the importance of certification and regulation being at the forefront of everyone's minds in the industry, it seems counter-productive to have out-of-date Standards governing new products and technologies. Also of concern is the time it takes to have those Standards amended to suit these innovative products.

Is it any wonder Australia is so behind the likes of Europe when it comes to building products and practices?

"Sounds easy all this, doesn't it. Are there any contractors out there who'd like to get into the product supply sector!" says Geoff. ■

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STANDARDS WATCH

STANDARDS AUSTRALIA IS THE NATION'S PEAK NON-GOVERNMENT STANDARDS ORGANISATION. **TIM WHEELER**, NATIONAL SECTOR MANAGER FOR BUILDING AND CONSTRUCTION, PROVIDES US WITH AN UPDATE ON WHAT'S HAPPENING IN THE STANDARDS WORLD.

A RECIPE FOR AN AUSTRALIAN STANDARD

Ever wondered what goes into the making of an Australian Standard? There are a few "ingredients" involved, such as a rigorous assessment on the net benefit to Australia, and stakeholder support from the industry and community. We rely upon the expertise of our Technical Committee members, who are representatives from industry, government, regulators, and consumer organisations. All Standards are developed on the basis of consensus.

If you have some time today, catch Standards Australia's video on "A Recipe for An Australian Standard" on our YouTube channel. The video showcases the people behind the development of an Australian Standard. You can find this video on Standards Australia's YouTube channel [search for 'Standards Australia' on www.youtube.com]. On the same channel you can also watch our World Plumbing Day video on why standards matter in plumbing.

UPDATED AS/NZS 3500.1, WATER SERVICES, AND AS/NZS 3500.2, SANITARY PLUMBING AND DRAINAGE

The technical committee WS-014, Plumbing and Drainage, has certainly been busy this year. Following the update to AS/NZS 3500 Part 3 in February 2015, WS-014 has completed in June the 2015 editions of AS/NZS 3500, Part 1, Water services, and AS/NZS 3500, Part 2, Sanitary plumbing and drainage. The 2015 editions of these Standards replace the 2003 versions.

The main updates are to take into account new materials, equipment and methods, and aim to provide installers with solutions to comply with the National Construction Code of Australia; Plumbing Code of Australia; and the New Zealand Building Code.

The 2015 edition of AS/NZS 3500, Part 1, Water services specifies requirements for the design, installation and commissioning of cold water services and non-drinking water from a point of connection to the points of discharge.

For AS/NZS 3500, Part 2, Sanitary drainage and plumbing, the 2015 revision specifies requirements for the design and installation of sanitary plumbing and drainage from the fixtures to a sewer, common effluent system or an on-site wastewater management system. It includes requirements for vacuum drainage systems and clarifies types of junctions permitted in drains.

The Technical Committee is now working on a revised edition of AS/NZS 3500, Part 4, Heated water services. The

scope of work includes a substantial revision of the solar water heater installation requirements while reviewing the maximum water velocity for circulatory pipework.

REVIEW OF AGED STANDARDS

With over 7,000 Australian Standards in our catalogue, we constantly strive to keep our catalogue contemporary and relevant. Standards should be living documents and reflect changes in technology and society. This is why we review Standards that are over ten years old [we call these "Aged Standards"], and if they are under the purview of an active Technical Committee, we ask these Technical Committees to consider whether the content of these Standards is still relevant. This process is called "reconfirmation".

In April 2015, the following Standards were reconfirmed:

- AS 1628-1999 Water supply - Metallic gate, globe and non-return valves
- AS 3952-2002 Water supply - Spring hydrant valve for waterworks purposes
- AS/NZS 4158:2003 Thermal-bonded polymeric coatings on valves and fittings for water industry purposes
- AS 4794-2001 Non-return valves - Swing check and tilting disc
- AS 6401-2003 Knife-gate valves for waterworks purposes

For more information on the ongoing review of Aged Standards, please visit our website (www.standards.org.au).

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Keep up to date with Standards Developments and join the Standards Australia Building and Construction LinkedIn group.

The page provides a platform for Standards Australia to communicate with our members, keeping you informed of the work being undertaken, Standards publications and other relevant matters. Documents available for Public Comment will be listed on the group page, along with updates on conferences, forums and events.

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WHAT'S COOL IN AIR CONDITIONING

WITH THE WEATHER ABOUT TO HEAT UP, *PLUMBING CONNECTION* TAKES A LOOK AT DEVELOPMENTS AND NEWS IN THE AIR CONDITIONING MARKET.

The humble air conditioner is the hero of many Australian homes in summer. Manufacturers are constantly updating their offerings to provide Australians the ultimate in climate control – and keep a strong position in the market.

Current trends in residential and small commercial air conditioning can be summed up as: energy and cost efficiency; remote control for the smart home; smaller, quieter units for increased housing density; and cleaner air.

ENERGY AND COST EFFICIENCY

The biggest trend in air conditioning – it always has been and always will be – is energy and cost efficiency. A recent white paper showed that 78.9% of Australian air conditioner owners thought saving money on their electricity bills was 'Important' or 'Very Important'.

'Energy efficiency continues to be one of the most important considerations for consumers looking to purchase an air conditioning product,' states Joe De Bella, Product Marketing Manager for Air Conditioning at Panasonic. 'We do not foresee this trend changing in the future.'

Panasonic's latest release in the air conditioning market – the ECONAVI Reverse Cycle series – gives consumers the ability to reduce their energy consumption without a concerted effort. The entire range uses R32 refrigerant, which is 1.5 times more effective than R410A refrigerant, and offers up to 8.0kW cooling and 9.0kW heating.

Manufacturers aren't just ensuring their units work better – they're making them work smarter. Mitsubishi's MSZ-FH series includes the new 3D i-see Sensor that scans the entire room and delivers cooling when and where it's needed – even powering down if no one is in the room. The Panasonic ECONAVI series measures human activity, sunlight and temperature sensors to intelligently adapt the heating and cooling power according to room conditions.

REMOTE CONTROL / SMART HOMES

One aspect of energy efficiency is home automation. Through smart controls via a central hub or smart device

application, home owners can control their cooling remotely or automatically, only using the cooling when it's needed.

Both Toshiba and Mitsubishi are currently promoting the IntesisHome system, which is also compatible with many other major air conditioning brands available on the Australian market. IntesisHome is a way of controlling home or small business air conditioning wirelessly. An app on the client's phone connects to the universal controller or the air conditioning unit itself, allowing access from anywhere. The client can also program in automatic start or finish times – ensuring the home is cool when they get home or their shop a comfortable temperature when they're ready to open.



SMALLER, QUIETER UNITS FOR INCREASED HOUSING DENSITY

In many of Australia's larger cities, urban density is increasing, with more apartments and townhouses being built. To maintain the liveability of these new, smaller homes, air conditioning units must be smaller and quieter.

Fujitsu and Mitsubishi are both addressing this problem.

The Fujitsu Airstage J-IIS series has a 25% reduction in height compared to previous J-II models, standing just 370mm tall. The SRK-ZMP from Mitsubishi is even smaller, with dimensions of 540x645x275mm.

With people living at closer quarters, noise must also be considered. The J-IIS series has reduced the noise rating by up to -3dB (when the low noise function is in use) through an updated outdoor fan design.

CLEANER, FRESHER AIR

Many of the manufacturers are also addressing people's concerns around the growth and spread of mould, bacteria and viruses. Panasonic's nanoe-G feature eliminates 99% of airborne bacteria, viruses and mould, as well as those on the surfaces and in the filter. The Daiseikai Plasma Air Purifier uses an ionised circuit to force pollutants to adopt a positive electrical charge. These are then attracted to negative electrons in the collection board and removed from the air.

NEW AIR CONDITIONING PRODUCTS



AIR CONDITIONERS FOR MODERN HOMES

Fujitsu's Airstage J-IIS series is compact, quiet and energy-efficient.

When compared to the previous J-II models, the J-II S is 25% reduced in height, ideal for balconies

and courtyards where space is at a premium. It's also quieter, with a noise reduction of up to -3dB, the result of improved design in the fan and airflow grille, and has a low noise function for even quieter operation.

Energy efficiency is delivered by an optimised inverter control, DC fan motor, and a compact, high efficiency heat exchanger. Other enhancements include Fujitsu's specially-designed DC twin rotary compressor, with a high efficiency compressor motor and optimised refrigerant flow design.

The new VRF outdoor systems are available in three capacity sizes and can be connected to the twelve current sizes in the VRF range, resulting in 53 options to choose from for the client's home.

www.fujitsu.com/au/

ADDRESSING AUSTRALIAN HOME OWNERS' NEEDS

Panasonic's new range of ECONAVI Reverse Cycle Inverter air conditioners work in a wide range of temperatures from -15°C-46°C, while delivering considerable savings on energy. With up to 9.0kW heating and 8.0kW cooling, Australians can stay comfortable all year around.

The new wall hung split systems have improved star ratings across most models through design improvements and the use of R32 refrigerant gas. Additionally, the latest ECONAVI technology uses human activity, sunlight and temperature sensors to intelligently adapt the heating and cooling power according to the room conditions.

The range also features iAuto-X, providing faster cooling than ever before, improved directional airflow and reduced direct airflow.



www.panasonic.com/au/

A FOCUS ON ENERGY EFFICIENCY

LG recently conducted a survey that revealed many people felt they didn't fully understand their power bill or how to manage their electricity use effectively.

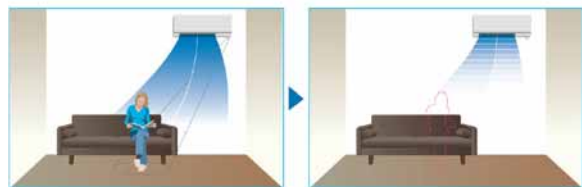
LG has sought to address these issues with two new features.

The first is the Active Energy Control with three levels of reduced power control: 40, 60 and 80%. The user can cap their energy consumption by reducing power consumption at the cooling output. For example, at a 51% cooling capacity, the unit is 33% more efficient.

The second feature is the WiFi Smart Control, available in the LG Premium Series. This app provides energy usage information in real time and alerts the user when usage hits a predetermined limit. Users can also turn the air conditioning on and off remotely.



www.lg.com.au



SMARTER AIR CONDITIONERS

Air conditioners are getting 'smart'. The new Mitsubishi Electric MSZ-FH series has the ability to detect and address different temperature zones within a room.

The detection is carried out by the 3D i-see Sensor, which can scan the entire room, break it down into 752 three-dimensional zones and measure the temperature of each. The air conditioner can then deliver the required airflow to the right part of the room via a unique dual split vane design that can direct air to the left or right, up or down.

The 3D i-see Sensor can also detect changes within the room, such as people leaving. When the Sensor discovers the room is empty, it reduces the systems power consumption automatically - 10% after 10 minutes and 20% after 60 minutes.

www.mitsubishielectric.com.au

WPC HEADS TO SOUTH AFRICA

THE 11TH WORLD PLUMBING COUNCIL CONFERENCE IS SET TO BE HELD IN CAPE TOWN, SOUTH AFRICA FROM 14-16 SEPTEMBER 2016.

The Institute of Plumbing South Africa (IOPSA) won the bid to host the event at the WPC Conference held in Edinburgh, Scotland in 2011. The event will be held at the Cape Town International Conference centre where the theme will be 'Regulations for Sustainable Plumbing' – a case for International Standards, with the platforms being: Water, Environment, Energy and Health.

Institute of Plumbing South Africa (IOPSA) vice-president Lee Goldie said IOPSA received a late invitation from the World Plumbing Council to bid for the World Plumbing Conference (WPC) in 2016 and that the team worked tirelessly to ensure that the conference would head to Africa. South Africa was pitted against Melbourne, which has won the rights to host the event in 2019.

IOPSA plans to change the format of the WPC in 2016.

"We want to attract challenge-driven industry professionals to the conference. We aim to provide them with tangible solutions to meet the challenges of sanitation, plumbing, water safety, training and skills upliftment," said Lee.

More than 650 delegates are expected to attend the conference. It will be a meeting place where African delegates can interact with the World Plumbing Council.

A major theme of WPC 2016 is 'Water for Africa' whereby the issues surrounding the provision of water in Africa will be spotlighted. It is no secret that unsafe drinking water and waterborne diseases are the cause of death for many in Africa and with such a gathering of knowledge, the conference will aim to focus on delivering solutions that work towards eradicating these problems.

It will also address the plumbing role in ensuring, through regulation, that the four pillars in which plumbing operates, namely, Water, Sanitation, Environment and Energy,

are never compromised on the altar of greed and non-compliance.

Each country has its own set of regulations as does each local authority in terms of by-laws that suit the environment but WPC 2016 believes that with an understanding of regulations that are referred to using international standards as a start, will ensure a firm basis for regulations in any application and in any country.

The fact that the world plumbing industry will discuss this through a variety of keynote addresses and breakaway

session means that all governments, official bodies, governmental organisations, training colleges, property owners, architects, quantity surveyors, engineers plumbing system designers and plumbers will have a universal base from which to operate from.

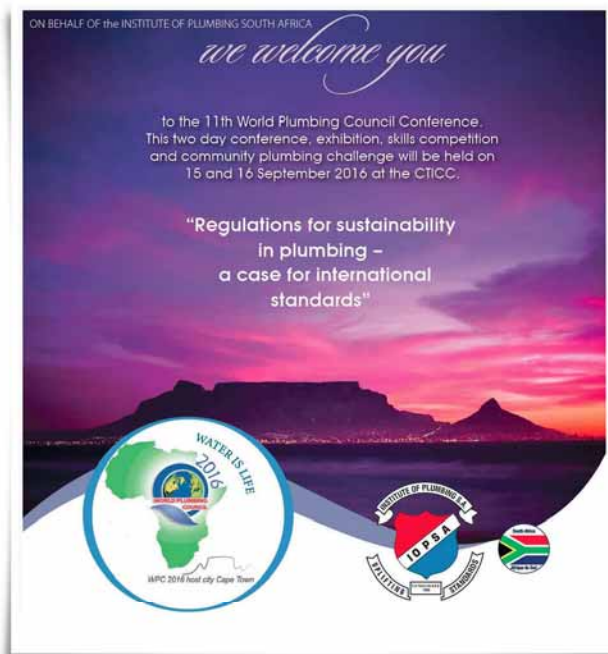
WPC 2016 is a conference to present outcomes that will take delegates to points where they can and will influence others, be they in government or private sector. Work groups will be formed to take the world of plumbing into the legislators and communities.

Concurrent with the conference will be an International exhibition showcasing the local and international products and

services. In keeping with the theme all products on display need to carry, for South African companies, the SABS mark/JASWIC acceptance, and outside companies the recognized standard applicable to their countries.

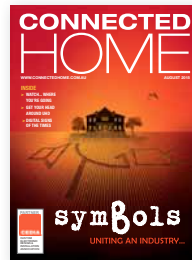
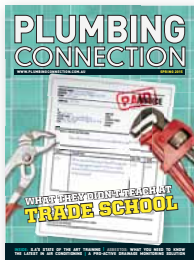
The South African National Plumbing Skills Competition will be held during this period and the winner will represent SA at the International World Skills competition in Abu Dhabi in 2017. ■

To register your interest in attending this event, head over to www.wpc2016.co.za and fill in the registration form.





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SHOULD I HAVE JUST GONE TO UNI?

HAVE YOU EVER WONDERED IF YOU SHOULD HAVE STUDIED HARDER AT SCHOOL AND GONE TO UNIVERSITY? OR DO YOU EVER HAVE DAYS WHEN YOUR BACK IS ACHING AND YOU'VE BEEN COVERED IN SEWERAGE, AND THINK TO YOURSELF, 'I JUST WANT A DESK JOB?' **BRAD FALLON** SUGGESTS YOU RECONSIDER.

Perhaps, it hits you in the middle of winter when it's freezing cold and pouring rain – everyone else seems to be juggling their café latte as they are rushing to get into their warm, dry office and you're scrambling to reschedule work for the day so that you aren't exposed to the elements or sitting around with a team of workers doing nothing.

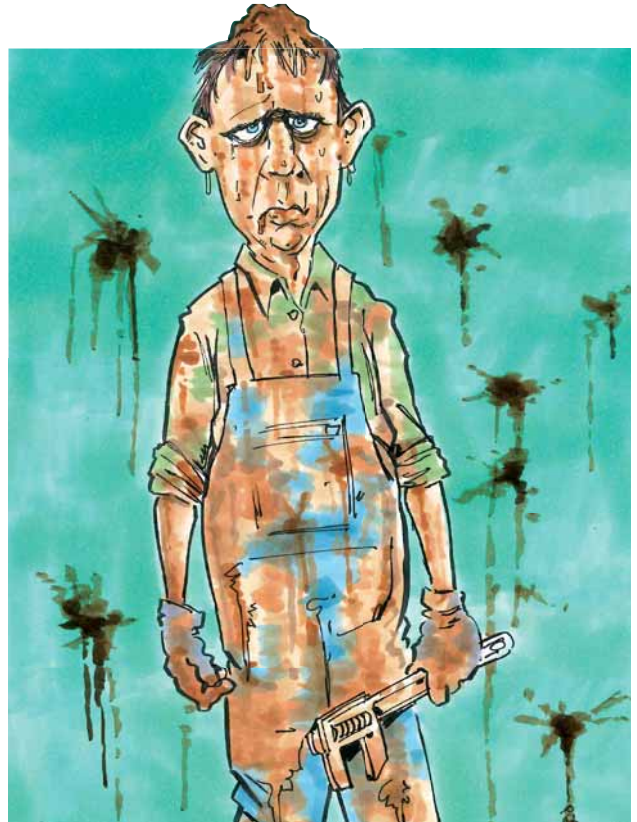
Does anyone else ever feel like this, or is it just me?

Usually, when I feel like this, I talk to my office-based mates – who mostly work for large corporations – and I realise, the grass is not always greener. All jobs have their positives, and in this day and age, the benefits of being a licensed plumber in a world seemingly obsessed with university degrees, are only increasing.

If you don't believe me, maybe you'll be interested in what former New York Mayor and billionaire, Michael Bloomberg had to say to a Wall Street Trade Group in November last year:

"Today if your kid wants to go to college or become a plumber, you've got to think long and hard," said Bloomberg at the annual meeting of Wall Street trade group SIFMA. "If he's not going to go to a great school and he's not super smart academically, but is smart in terms of dealing with people and that sort of thing, being a plumber is a great job because you have pricing power, and you have an enormous skill set." The founder of financial data and news services company Bloomberg L.P. even went as far as to say that students considering Harvard should do the maths. "You could pay \$50,000 to \$60,000 a year to Harvard or you could make that much as an apprentice plumber," he said. [CNNMoney]

Many of my close friends are university-educated, because when I was an apprentice I joined a major university basketball team as a way to meet people my own age and stay fit. It ended up giving me all the advantages of a university 'social and sporting life', without needing to attend the university. Most people probably don't even realise that you don't always have to be enrolled at the university to join the sporting teams. It was actually a pretty good support network too, because while I was working and studying during my apprentice years, so were my mates. The only difference was that I had more money, because of my earnings as an apprentice, and definitely more free time



to attend the social functions, compared to my friends who were paying \$1000-\$3000 per subject at university, along with other costs, and who always seemed stressed about exams and assessments.

One year, I even ended up winning the 'Party Animal of the Year' award due to my regular attendance at social events – with most people not even realising I didn't actually go to university. So, did I miss out on anything? In the short-term it didn't seem like it and now, almost 25 years later, my mates and I still hang out together and we all earn very similar wages. In addition, I am the only one of my friends who owns his own business.

Interestingly enough, many of my friends studied hard and paid a lot of money for degrees that they never used. Only two out of six of my close friends ever used their qualifications for paid work, one is still an engineer and the second used his chemical engineering skills at the beginning of his career before swiftly moving into people

management – the rest pursued other careers immediately – which in most cases required further study and additional financial and time investment. This is not an unusual story for a large number of university graduates. I, on the other hand, went straight into working life, without debt and a lot more job certainty. These days, we have an over-supply of teachers, lawyers, IT specialists and even, for the first time ever, doctors – yet we have an undersupply of all types of tradesmen, especially plumbers.

What this means for plumbers now and in the future is job and financial security, less competition from other plumbing firms, and more profitability because of the issue of ‘high demand and lack of supply’. The downside of course, is that the shortage of plumbers coming through the system means that for small and large plumbing business owners trying to find fully-licensed plumbers, or even committed apprentice plumbers, who excel at what they do is very hard.

We, as plumbers and tradespeople, need to be proud of the work we do and need to encourage others to join the industry. If we don’t represent our industry well, then we will continue to see a decline in the numbers of young people choosing a career that provides great freedom, variety,

physical and mental challenges, as well as great financial security. Already, plumbing is a targeted job for gaining visa entry to the country because of the lack of qualified plumbers within Australia. So if none of us are pursuing the trades, where ever our labour force comes from – it won’t be from Australia. We will have to import all our plumbing labour skills and what a shame that we were all too obsessed with University education to see that the trade of plumbing offers a bright future.

So, if you’re having a bad day on the job and think, ‘should I have gone to university, or should I be pressuring my kids to go to University?’ Just remember, we all have different skills and life needs and at this point in time, and for the foreseeable future, Australia need plumbers - smart, hard-working plumbers. So that’s why when Michael Bloomberg says to a bunch of educated Wall Street highfliers, ‘Today if you want to go to college or become a plumber, you’ve got to think, long and hard.’, I think we should all stop and listen. ■

Contact:

Brad Fallon is the Director of Ivy St Plumbing – specialists in the strata management trade: www.ivystreetplumbing.com.au



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DEVELOPING A SOLUTION – IT’S YOUR CHOICE!

DO YOU NEED HELP LINKING THE PERFORMANCE REQUIREMENTS WITH SOLUTIONS IN THE NATIONAL CONSTRUCTION CODE (NCC)? IS THERE AN ALTERNATIVE SOLUTION TO USING THE DTS PROVISIONS? DO YOU KNOW WHICH PERFORMANCE REQUIREMENTS HAVE A VERIFICATION METHOD? IF YOU NEED ANSWERS TO THESE QUESTIONS, THEN THIS NEWLY RELEASED DOCUMENT, ‘DEVELOPING A SOLUTION USING THE NCC’ CAN HELP YOU.

The NCC contains both Performance Solutions and Prescriptive Solutions. Based on using either of these approaches, ‘Developing a solution using the NCC’, identifies the three key elements to develop a solution, and is supplemented with three quick reference tables, one for each volume of the NCC.

The three key steps in developing a solution involve:

1. The Performance Requirements
2. Developing the solution
3. Documenting your solution with supporting material

The structure of the quick reference tables allow the relationship between the Part or Section in the NCC with the relevant Performance Requirements and the associated Performance Solution [Verification Methods] and Prescriptive Solution [DtS Provisions] contained within the NCC. Regardless of which solution you develop, you have a choice in how to approach it. Performance or Prescriptive, the choice is yours!

WEATHERPROOFING EXAMPLE

As an example of using the document, let’s consider weatherproofing of new homes. NCC Volume Two contains the requirements for new homes.

1. THE PERFORMANCE REQUIREMENTS

To identify the relevant Performance Requirement, you’d simply find the ‘Damp & Weatherproofing’ title and read across the row to the Performance Requirement column. The relevant Performance Requirement is P2.2.2 [see image 1].

The two remaining columns for that row identify solutions contained within the NCC. For weatherproofing, there is both a Performance Solution and Prescriptive Solution available in the NCC. Remember, that regardless of whether or not the NCC

contains a Performance Solution, a Performance Solution may be developed using another Assessment Method [see Part 1 of NCC Volume Two].

2. DEVELOPING THE SOLUTION... IT’S YOUR CHOICE!

The Performance Solution is identified as a Verification Method which partially addresses the Performance Requirement, V2.2.1. As the Verification Method only partially addresses the Performance Requirement, another type of Performance Solution or a partial Prescriptive Solution will be needed to fully meet the Performance Requirement. The NCC contains the full Verification Method including limitations for its use.

In addition, when developing a Performance Solution, the table’s introduction also identifies that other elements from Part 1.0 of NCC Volume Two must be considered. This process identifies the impact of the solution on the Performance Requirements for other elements of the home.

The Prescriptive Solution is identified as a number of Deemed-to-Satisfy Provisions contained within the NCC. These provisions are 3.3.4, 3.5.1, 3.5.3, 3.6 and 3.8.1 [see image 2]. Like the Performance Solution, the NCC contains the full details of the provisions, including

their application and any limitations to their use.

By satisfying these Deemed-to-Satisfy Provisions, the Performance Requirement, P2.2.2 would be met.

3. DEVELOPING YOUR SOLUTION WITH SUPPORTING EVIDENCE

Regardless of which solution you have chosen, evidence of satisfying the Performance Requirements is needed. Part 1.0 and Section A assist in identifying how this can be approached.





NCC Volume Two

The following table provides a link between the NCC Performance Requirements and the relevant Performance Solution (Alternative Solution) and/or Prescriptive Solution (complying with the Deemed-to-Satisfy Provisions) contained within the NCC.

When developing a Performance Solution, other elements of the NCC must be considered as per Part 1.0 of NCC Volume Two. In addition, regardless of whether a Performance or Prescriptive Solution exists, a Performance Solution may still be developed using another Assessment Method such as Comparison with the Deemed-to-Satisfy Provisions, Expert Judgment or other Verification Methods.

Performance Requirement	Performance Solution NCC Verification Methods	Prescriptive Solution NCC D/S Provisions	
General Requirements	Section 1	Section 1	
Structure	P2.1.1 ^{PM}	V2.1.1 (part); V2.1.2 (part) ^{PM}	3.1.1; 3.1.3; 3.2; 3.3.1; 3.3.2; 3.3.3; 3.4.2; 3.4.3; 3.4.4; 3.5.1; 3.5.2; 3.6; 3.9.2; 3.10.1; 3.10.2; 3.11
	P2.1.2	-	3.10.3
	P2.2.1 ¹	-	3.1.2; 3.5.2
Damp & Weatherproofing	P2.2.3	V2.2.1 (part)	3.3.4; 3.5.1; 3.5.3; 3.6; 3.6.1
	P2.2.3	-	3.2; 3.3.4; 3.4.1
	P2.2.4	-	-
	P2.3.1	-	3.7.1
	P2.3.2	-	3.7.2
	P2.3.3	-	3.7.3
Fire Safety	P2.3.4	V2.3.1 ^{PM}	3.7.4
	P2.3.5	-	-
	P2.3.6	-	3.7.5
	P2.4.1	-	3.8.1
	P2.4.2	-	3.8.2
	P2.4.3	-	3.8.3
Health & Amenity	P2.4.4	-	3.8.4
	P2.4.5	V2.4.5 (part) ^{PM}	3.8.5
	P2.4.6	V2.4.6 (part)	3.8.6
	P2.5.1	-	3.9.1; 3.9.2
Safe Movement & Access	P2.5.2	V2.5.1 (part)	3.9.2
	P2.5.3	-	3.9.3
	P2.5.4	-	3.9.4 (3.9.3) ^{PM}
Energy Efficiency	P2.6.1	V2.6.2.1 ^{PM} ; V2.6.2.2	3.12
	P2.6.2 ^{PM}	-	-

Key
^{PM} Proposed for NCC 2016
¹ Qualified Performance Requirement
^{PM} A partially qualified Performance Requirement
(part) Only partially satisfies the Performance Requirement

1

NCC Volume Two

The following table provides a link between the NCC Performance Requirements and the relevant Performance Solution (Alternative Solution) and/or Prescriptive Solution (complying with the Deemed-to-Satisfy Provisions) contained within the NCC.

When developing a Performance Solution, other elements of the NCC must be considered as per Part 1.0 of NCC Volume Two. In addition, regardless of whether a Performance or Prescriptive Solution exists, a Performance Solution may still be developed using another Assessment Method such as Comparison with the Deemed-to-Satisfy Provisions, Expert Judgment or other Verification Methods.

Performance Requirement	Performance Solution NCC Verification Methods	Prescriptive Solution NCC D/S Provisions	
General Requirements	Section 1	Section 1	
Structure	P2.1.1 ^{PM}	V2.1.1 (part); V2.1.2 (part) ^{PM}	3.1.1; 3.1.3; 3.2; 3.3.1; 3.3.2; 3.3.3; 3.4.2; 3.4.3; 3.4.4; 3.5.1; 3.5.2; 3.6; 3.9.2; 3.10.1; 3.10.2; 3.11
	P2.1.2	-	3.10.3
	P2.2.1 ¹	-	3.1.2; 3.5.2
Damp & Weatherproofing	P2.2.3	V2.2.1 (part)	3.3.4; 3.5.1; 3.5.3; 3.6; 3.6.1
	P2.2.3	-	3.2; 3.3.4; 3.4.1
	P2.2.4	-	-
	P2.3.1	-	3.7.1
	P2.3.2	-	3.7.2
	P2.3.3	-	3.7.3
Fire Safety	P2.3.4	V2.3.1 ^{PM}	3.7.4
	P2.3.5	-	-
	P2.3.6	-	3.7.5
	P2.4.1	-	3.8.1
	P2.4.2	-	3.8.2
	P2.4.3	-	3.8.3
Health & Amenity	P2.4.4	-	3.8.4
	P2.4.5	V2.4.5 (part) ^{PM}	3.8.5
	P2.4.6	V2.4.6 (part)	3.8.6
	P2.5.1	-	3.9.1; 3.9.2
Safe Movement & Access	P2.5.2	V2.5.1 (part)	3.9.2
	P2.5.3	-	3.9.3
	P2.5.4	-	3.9.4 (3.9.3) ^{PM}
Energy Efficiency	P2.6.1	V2.6.2.1 ^{PM} ; V2.6.2.2	3.12
	P2.6.2 ^{PM}	-	-

Key
^{PM} Proposed for NCC 2016
¹ Qualified Performance Requirement
^{PM} A partially qualified Performance Requirement
(part) Only partially satisfies the Performance Requirement

2

Carekit™ bathroom solutions

a one stop solution for a compliant accessible bathroom
one kit with all the elements you need - hassle free



‘Developing a solution using the NCC’ can be used by all NCC users, regardless of experience to assist you in becoming more familiar with the relationship between the Performance Requirements and the Performance and Prescriptive Solutions in the NCC. It is now available from the ABCB website. ■

Australian Building Codes Board
www.abcb.gov.au

scan to find our more about our bathroom packages
www.enware.com.au/carekit



For more information:
1300 369 273
www.enware.com.au





INFLATABLE PIPESTOPPERS

These versatile Inflatable Stoppers are used to service a wide variety of industrial applications. As “overnight stoppers” they provide a strong barrier in pipeline activities, to prevent foreign bodies entering the line during down time. In machining applications, they can be inserted below a horizontal flange on a vertical pipe, to prevent machining fluid from falling below into expensive machinery such as pumps and turbines.

www.huntingdonfusion.com



TOUGH TOOL BAGS

Coming in seven different styles, GearWrench’s tool bags are available in a range of shapes and sizes including; tote bags, medium and large general tool bags and bucket style sling bags to name a few. Featuring the finest zippers, buckles, handles, straps and a minimum of 600 denier rip-stop nylon, GearWrench’s tool bags have been to last.

www.gearwrench.com

HANDY TOOLS

Suitable for various HVAC ductwork applications, the new Milwaukee Crimper and Speed Seamer features a forged metal head and over mould handles that accommodate both overhead and underhand use, adding comfort for the user. when completing tedious jobsite applications. The Speed Seamer is also equipped with 10mm and 25mm markings for fast measurement of common HVAC folding widths.



milwaukeetools.com.au

SPECIFY WITH EASE

Ardex Australia has launched a comprehensive specification tool on its website providing complete recommendations for a range of projects. Officially launched at DesignBUILD in late April, the specification tool is the first of its kind and takes a product selector a step further. The tool covers three main categories: waterproofing, tiling and flooring. Users of the tool simply input general information regarding a project and are advised of all the products required. Each Specification document can be easily downloaded, emailed or printed for use, offering a wealth of information at your fingertips.



www.ardexaustralia.com

WIRELESS POWER

Bosch’s Wireless Charging Technology contains similar inductive charging technology to that of the recently launched Apple Watch, induction stovetops and electric toothbrushes. While all Bosch batteries feature an LED charge indicator, checking it will be a thing of the past as tradies across Australia will be able to pick up a tool with confidence, knowing it’s always charged and ready to go. When the charging station is plugged in to a worksite and a compatible wireless battery is placed on it, the charger detects the presence of the battery in under a second and starts emitting a magnetic field.



www.bosch-pt.com.au/professional

FOR A TIGHT GRIP

Locking pliers can be fairly hit and miss and you certainly get what you pay for. Such is the mantra of Irwin and their Vise-Grip range. Their curved jaw locking pliers feature a self-energising lower jaw which provides 3X more gripping power than traditional locking pliers, with no slipping or stripping. Without requiring heavy input pressure the jaw mechanism naturally grips tighter as more torque is applied to the tool. Plumbers will also appreciate the one-handed, triggerless release being 2X easier to open than traditional locking pliers.



www.irwin.com

ATT

ACROSS THE TRADES

SPRING 2015

INSIDE:

- > AVOIDING HEAT STROKE
- > TAX REPAYMENT PLANS
- > TRUCKS, VANS AND WAGONS



GOING IT ALONE

Are self-managed super funds worth it?



GOING IT ALONE

How does the use of a self-managed superannuation fund assist with wealth planning? Gadens partner **David Coombes** investigates.

Subject to strict, legally enforceable rules and sanctions, a self-managed superannuation fund provides a facility that is assisted by tax concessions to accumulate wealth, which is locked away for retirement or death.

There are tax concessions that apply in three main ways. A complying self-managed superannuation fund will generally pay tax at the special rate of 15%. Secondly, tax concessions are awarded to contributors in that they are entitled to limited tax deductions for their contributions. Thirdly, when the superannuation benefits are paid they are taxed concessionally or may even be exempt from tax.

You are rewarded for the contributions that you make to the self-managed superannuation fund by the provision of a capped tax deduction. The funds may not be accessed so that it is a form of forced saving. Subject to some exceptions, the savings cannot be accessed until after 60 years of age and upon retirement. But from 1 July 2007, under the current superannuation regime, most lump sums and income streams paid from a complying self-managed fund will be tax free if the recipient is 60 years of age or more. The tax concessions enable accumulation at a faster rate than other investment entities because there is a compounding effect that is achieved with the low tax applicable to earnings on investments by the superannuation fund.

It is a tax shelter. The tax concessions have been provided as a matter of government policy to individuals so that they will provide for their retirement and so it has the effect of moving a significant part of the population from reliance on the old age pension by self-funding a pension and so relieving the government of that burden.

A self-managed superannuation fund is relatively cheap to establish. It tends to be cost efficient if there is at least \$300,000 to \$400,000 in the fund. The annual costs of both audit and accounting need to be factored into the cost benefit analysis.

It is because the tax concessions have been so favourable and do tend to favour high income earners that the tax concessions available to self-managed superannuation funds have been the subject of constant annual changes, periodical re-writes of the entire superannuation regime and political debate. More recently, the Australian Labor Party (ALP) has indicated that if it is elected to government it will remove the tax concessions for some parts of the population. It proposes to amend the tax law so that income over \$75,000 from a retiree's superannuation fund balance will be taxed at 15% rather than the current zero rating. This would cover approximately 60,000 superannuation accounts with balances over \$1.5 million. Secondly, the ALP proposes that the tax on concessional contributions would rise from 15% to 30% for member contributors earning \$250,000 or more (which is down from the current \$300,000 threshold). So what is all the fuss about, and if it so good, is a self-managed superannuation fund something that you should be using?

WHAT ARE THE TAXATION BENEFITS?

The current superannuation regime commenced after substantial reform on 1 July 2007. The rules remain complex



and it is important to take advice because the stakes are high if you get it wrong. Let us begin by looking at the taxation of superannuation entities.

WHAT ARE THE TAX RATES THAT APPLY TO SELF-MANAGED SUPERANNUATION FUNDS?

If the self-managed superannuation fund is a complying fund, then it will pay tax at 15% on the low tax component comprising income, including realised capital gains and assessable contributions. But that rate will increase to 47% in respect of all non-arms length income. On the other hand, if the superannuation fund is a non-complying self-managed superannuation fund, then it will be taxed at 47%.

Where the self-managed superannuation fund is in retirement phase and is paying a current pension

or is in the transition to retirement phase, then complying self-managed superannuation funds are exempt from tax on so much of their income as is derived from assets used to pay current pensions. The exemption only applies to income earned once the pension has become payable. The exemption does not apply to assessable contributions or to non-arms length income of the fund.

CAPITAL GAINS TAX

Special rules govern the way in which the Capital Gains Tax (CGT) rules apply to self-managed superannuation funds. A complying self-managed superannuation fund is entitled to a one third discount on the capital gain if the CGT asset has been held for at least 12 months. If the CGT asset was acquired before 21 September 1999 and held for at least 12 months, then

the self-managed superannuation fund can choose to use either the one third discount or the indexation method to calculate the amount of the CGT.

THE TAXATION OF SUPERANNUATION BENEFITS

The taxation breaks do not end there and in fact you must examine the taxation of superannuation benefits provided by a self-managed superannuation fund. The tax liability will depend upon the age of the recipient and whether the benefit is provided by way of a lump sum or an income stream.

For recipients who are 60 years and over, a lump sum and an income stream from a taxed source within the superannuation fund will be treated as not assessable and not exempt.

If the age of the recipient is between the preservation age and 59 years of

Task and Job Management Solutions

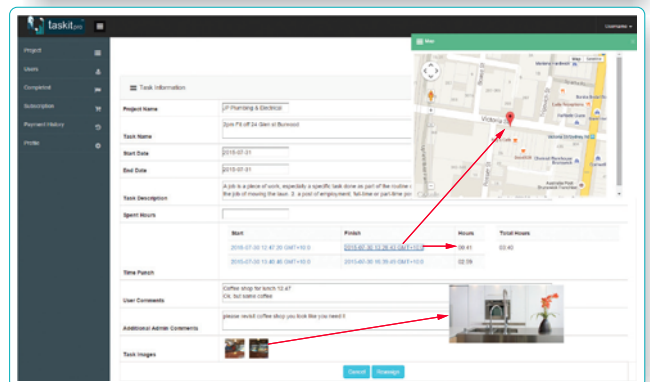
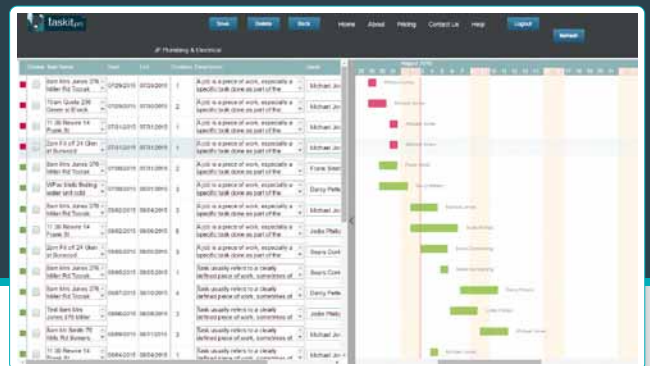
TaskitPro is a task and job management application for service contractors, project managers and businesses.

Features include:

- Create unlimited projects
- Create unlimited jobs and tasks
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www.taskitpro.com

age, and the superannuation benefit is paid from a taxed source in the fund, then there will be no tax on the amount below the sum of \$185,000 for the 2014 to 2015 income year but it will be taxed at a maximum rate of 15% on an amount over that threshold where the amount is paid as a lump sum. Where the amount is paid as an income stream, then it will be taxed at marginal rates eligible for a 15% tax offset. The tax offset can eliminate the tax that would otherwise be payable.

If the recipient is under the preservation age, then a lump sum from a taxed source will be taxed at a maximum rate of 20% and the income stream from a taxed source will be taxed at marginal rates with no tax offset applying.

income year. If the superannuation benefit paid from an untaxed source to a recipient between the preservation age and 59 years of age, then the income stream will be taxed at marginal rates with no tax offset.

Where the superannuation benefit paid from an untaxed source is paid to a recipient under the preservation age, then if it is paid as a lump sum, it will be taxed at a maximum rate of 30% on an amount up to the untaxed plan cap of \$1.355 million for the 2014-2015 year and taxed at 45% on an amount over the untaxed plan cap of \$185,000 for the 2014-2015 year. If the superannuation benefit from an untaxed source is paid to a recipient under the preservation age, by way of an income stream, then it will be taxed at marginal rates with no tax offset.

on that sum is \$5,000, then because Barbara is entitled to a non-refundable tax offset of 15% of the \$40,000 taxable component, that is, \$6,000, Barbara's tax liability is reduced by the tax offset to nil.

INSURANCE THROUGH A SELF-MANAGED SUPERANNUATION FUND

Apart from the somewhat complicated taxation benefits that apply to members, insurance through a self-managed superannuation fund does offer some advantages in that the payment of insurance premiums by a self-managed superannuation for death and disability cover for its members are tax deductible expenses. Those premiums would not be deductible if paid by an individual taxpayer. In that way, a self-managed superannuation fund can be a tax efficient means of providing insurance. However, the fund will be depleted if the fund is used to pay insurance premiums. There will be an advantage where insurance cover or the insured sum is greater than the amount of the superannuation fund held on the premature death or disability of the member especially where the amount that has been accumulated by the member is relatively modest.

CONCLUSION

While the area of superannuation is heavily regulated and the taxation rules that apply to superannuation funds are complex, the tax concessions that are provided mean that a complying self-managed superannuation fund is an effective tax shelter that enables the fund invested to compound and increase in value at a much faster rate than other investment entities. Then, when the superannuation benefits are paid from a complying self-managed superannuation fund to a suitably qualified recipient further tax concessions are conferred so that in many cases the receipt may be tax free. ▲

Gadens
www.gadens.com

What is all the fuss about, and if it so good, is a self-managed superannuation fund something that you should be using?

Where the superannuation benefits are paid from an untaxed source within the superannuation fund to a recipient of 60 years and over, then the lump sum is taxed at a maximum rate of 15% on an amount up to the sum of \$1.355 million and taxed at 45% on an amount over that threshold sum. Where the benefit is paid as an income stream from an untaxed source to a recipient of 60 years and over, then it will be taxed at marginal rates but eligible for a 10% tax offset.

Where the superannuation benefit is paid from an untaxed source to a recipient who is between the preservation age and 59 years of age, then if paid as a lump sum, it will be taxed at a maximum rate of 15% on an amount up to \$1.355 million, taxed at a maximum rate of 30% on an amount above that threshold amount up to the low rate cap amount of \$185,000 and taxed at 45% on an amount over the untaxed plan cap amount of \$185,000. These figures apply for the 2014-2015

EXAMPLE

By way of simple example, assume that Bob and Barbara have their own self-managed superannuation fund. Bob is aged 64 years of age when he retires and takes a \$950,000 superannuation lump sum benefit from the self-managed superannuation fund. Assume that, the lump sum benefit is paid from an element that is taxed in the fund. All of the \$950,000 is non-assessable, non-exempt income. Barbara, who is aged 59, receives an income stream benefit of \$50,000 from the self-managed superannuation fund which is made up of a \$10,000 tax free component and a \$40,000 taxable component. On the basis that Barbara has no other income, then the \$10,000 tax free component is non-assessable, non-exempt income while the \$40,000 taxable component will be included in Barbara's assessable income and taxed at ordinary rates. Assume that for the relevant year, the tax liability



DON'T SUFFER IN SILENCE

For a long time, mental health issues among men has been taboo. Now, beyondblue says enough is enough - men should no longer ignore what's right in front of their faces.

In Australia this week, almost 50 people will die by suicide. Around 36 of these will be men.

The disparity between male and female deaths by suicide is due to men's reluctance to seek support for conditions like depression and anxiety.

They are too proud to ask for help, they do not want to be seen as weak and they don't want to be a burden on others.

The fact that so many men die by suicide, at a rate three times that of women, is unacceptable and must change.

That is why beyondblue launched Davo's Man Therapy in June this year.

It is a campaign starring loveable tradie Davo, who epitomises the typical Aussie bloke with his down-to-earth larrikin attitude.

But it is another one of his classic Aussie traits, a no-nonsense approach, that beyondblue thinks will do the most good.

In television, radio and digital ads, Davo tells men feeling down or stressed out is nothing to be ashamed of and can happen to anyone.

He urges men to visit his website at www.mantherapy.org.au/davo if they're struggling and reminds them that they owe it to themselves and their family to get support.

The website has a Mind Quiz so men can assess their wellbeing, plus more information such as practical advice on how to get support and tales of triumph from men who overcame depression and anxiety.

The website is not just for people who are struggling though. It's also got advice on how to help a mate and tips on how to give yourself the best chance to stay mentally healthy.

The campaign follows the launch two years ago of beyondblue's successful Man Therapy, which used another fictional character, Dr Brian Ironwood, to promote good mental health to men.

Davo's Man Therapy was launched to focus more on men who work in 'blue-collar' jobs and has so far been a success.

In the first month after launching, the website attracted almost 30,000 unique visitors which, given it's targeted at a niche audience, is a huge amount.

There is, however, still a long way to go.

The number of males who die by suicide in Australia each year is almost double the number killed on our roads and suicide is the biggest killer of both males and females aged between 15 and 44.

If you know someone who may be struggling, don't be afraid to have a conversation with them about your concerns. A conversation can make a

difference in helping someone feel less alone and more supported, and for more advice on how to broach what is often a difficult topic visit www.beyondblue.org.au/conversations. Alternatively, you can visit the Man Therapy websites for more information or pass them on to the person you're concerned about.

If you are struggling or feeling 'a bit off' for an extended period of time, the most manly thing you can do is to take steps to get better.

Not only do you deserve to feel well, you owe it your family and friends to be as mentally and physically healthy as possible.

Man Therapy can help you learn how to tackle whatever it is that's getting you down and give you advice on how to stay well.

People are often amazed at how much better they feel once they're on the road to recovery, and wonder why they didn't do something about it sooner. ▲





TOOLS

TAPPER TOOLS

Fein

www.fein.com.au

Fein's range of high performance tapper tools offer an alternative to working by hand and feature a high torque motor with good speed stability for reliable results. With an integrated reversing gear with rapid return action they significantly reduce the time required to cut threads.

The range is comprised of two models, the ASge 636 will tap threads up to M8 while the larger ASge 648 will tackle anything up to M12. A wide range of accessories are available for both models, making them suitable for a range of applications.



IMPACT TOOL

Platypus Outdoor Group

www.platatac.com



As its name suggests, the Ding Dong from Gerber is the perfect, lightweight tool for getting through doors quickly. It's a sledgehammer, ram and pry bar combined into one sturdy, unbreakable piece of equipment.

The Ding Dong's hammerhead features machined cross-hatching that effectively bites into surfaces, minimising slip and maximising impact. The opposite end features a forged pry bar for deconstruction projects and demolition work.

Built in Gerber's homeland of Portland, Oregon, the Ding Dong is fitted with a reinforced fibreglass handle with moulded rings to create a mechanical stop for operator's hands. Measuring 68cm in height and weighing just 5.55kg, the Ding Dong is compact enough to take with you on the move but big enough to produce huge power for effective use.

DUST EXTRACTOR

DeWalt

www.dewalt.com.au

Ideal for dust free drilling up to 16mm in diameter, the Dewalt Cordless Dust Extraction System is powered by an independent motor that maintains maximum hammer performance with no decrease in durability. Its high quality, washable HEPA filter is capable of achieving 99.5% efficiency with dust particles as small as 0.3 microns.

Featuring quick release for easy, tool free assembly, the Dewalt system is tough and versatile with a compact design and low weight to offer excellent comfort and near perfect balance. Maximum extraction is maintained at all times regardless of the hammer speed and the extractor continues to operate for two seconds after the hammer trigger is released to ensure any debris in the telescope or hose is completely removed.



LINE LASERS



Bosch Blue Power Tools

www.bosch-pt.com.au

Bosch Blue's new GLL 5-40 E and GLL 8-40 E line lasers offer $\pm 0.1\text{mm/m}$ accuracy, delivering accurate lines and on-point horizontal and vertical levelling for high precision jobs.

Easy-to-operate and extremely efficient, the Bosch line lasers feature a 360° detachable rotating platform with fine adjustment knob and easy reference bubble vial for precise control of the lasers. For a greater range of measurement, the height adjustable legs ensure tradies can easily manoeuvre the line lasers to suit different working environments, from installation and interior renovation, to laying tiles and flooring.

BULLSEYE

PSR Plastics

www.psrplastics.com.au

Bullseye is the latest innovative design by PSR Plastics. The Bullseye system was originally designed to mark out the location of under slab applications in the plumbing industry. Allowing the user to easily and accurately identify the centre point of any application, it can be used for installing anything from electrical fittings to fence posts. Bullseye is a labour saving device designed to create high productivity and safety. Once you have experienced the ease of the Bullseye system there will be no going back.



HOLE SAWS

Milwaukee Power Tools

www.milwaukeetools.com.au

Milwaukee Power Tools' new Hole Dozer bi-metal hole saw is built to withstand the toughest jobsite conditions and applications, allowing users to cut through almost anything, bringing increased productivity and efficiency to users on the jobsite.

When cutting through any soft or hard materials the teeth must remain in-tact in order to complete the task in an efficient manner. The Hole Dozer features Rip Guard technology, which comprises teeth that are built with more steel and 8% cobalt behind the cutting edge, increasing life and hole quality for multiple applications.

The Hole Dozer will be available in 51 different diameters in a range of 16mm to 152mm.



EXTENSION LADDER RACK

Rhino Rack

www.rhinorack.com.au

No matter what field you're in, very few tradespeople could say that they don't use a ladder almost every day.

Rhino Rack's extension ladder rack is suitable for extension ladders up to 4m and is compatible with Vortex and Heavy Duty roof racks. Constructed from anti-corrosive, high tensile materials, the ladder rack is tough enough to handle any environment; rain, hail or shine.

Including a heavy duty 470mm wide rear roller and multiple slide pads, loading and unloading your ladder is a breeze and helps prevent potential back and shoulder injuries.



THERMAL IMAGER APP

FLIR

www.flir.com.au

The FLIR ONE thermal imager has versions for both iOS and Android device platforms and transforms a mobile device into a powerful thermal imager that sees heat and accurately measures temperature. Providing users with the ability to see temperature variations smaller than a tenth of a degree, the technology enables a host of practical applications, from identifying energy inefficiencies and water leaks in a home, to enabling safe and enjoyable outdoor exploration.





HANDLING THE HEAT

Australia is known for its extreme heat in summer months, but there are a few tips to know to avoid becoming a casualty of heat-related illnesses. **Paul Skelton** reports.

The Australian summer - now just months away - takes its toll on both the health and finances of our tradie workforce, with one in 10 struck down by heat stroke during the course of a sticky summer's day on the job, according to KingGee's Workcool survey.



"Tradies are definitely hit the hardest by the Australian summer, having to undertake extreme physical activity under scorching temperatures," KingGee marketing manager Nadia Zaffino says.

"And, while the trademark tradie with his shirt off may be a sight for sore eyes to onlookers, working shirtless is actually extremely dangerous to a tradie's health and safety on the job, and it should be avoided at all costs.

"Combined with the fact that more than half (70%) of tradies find it harder to concentrate on tasks in the heat, and one in 10 saying they've witnessed more accidents on site during hot weather; it is essential for tradies to arm themselves with clothing that both protects them from the heat and helps them perform."

A 2013 Federal Government report - *The State of Australian Cities 2013* - predicts that heat-related deaths in Australian cities are set to quadruple, with Perth and Brisbane particularly affected.

Other cities will see more than double the number of heat related deaths.

"Heatwaves are the leading cause of fatalities from natural disasters in major cities," the report says.

In addition to health concerns, KingGee's Workcool survey found a hot day also hits the hip pocket, with just over 40% of tradespeople admitting to taking days off as a result of the heat.

Tradies say they are susceptible to a number of health issues when working in the sun all day. One in 10 have been diagnosed with heat stroke and nearly half have suffered through a sweaty summer day to end up feeling weakened (47%) and/or dizzy (44%). One in three are hit with nausea (29%).

Employers and workers need to take extra care during the summer months to avoid the risk of heat stress or the more serious heat stroke, says WorkSafe WA commissioner Lex McCulloch.

"Workplace safety laws require an employer to provide a working environment in which workers are not exposed to hazards and this includes, as far as is practicable, protecting employees from extremes in temperature," he says.

"The increased sweating caused by heat depletes the body's fluids and can lead to tiredness, irritability, inattention and muscular cramps - these are the symptoms of heat stress.

"Apart from the obvious physical discomfort of these symptoms, they may also increase the risk of workplace injuries by taking a worker's attention away from the task at hand, and this is a major concern."

The acting general manager of WorkCover NSW's Work Health and Safety Division, Peter Dunphy, says, "In the three years to July 2011, there were 497 claims (in NSW) for workplace fatigue and heat stroke at a cost of \$4.3 million, so it needs to be taken seriously and managed effectively."

This is just one reason, he says, workers and businesses need to work in partnership to protect themselves from the effects of working in heat.

"If possible, businesses should try to re-schedule work to cooler times of the day such as early morning or late afternoon. If this is not possible, ensure workers have access to plain drinking water, at least 200mL every 15-20 minutes, shaded rest areas and frequent rest breaks.

“Supervision is also important as people can deteriorate quickly if heat affected, so keep an eye out for each other.

“Businesses should set realistic workloads and work schedules and ensure fair distribution of work.

“Further, it is important that workers don’t rely on energy or caffeinated drinks which can have a diuretic effect.”

WorkSafe WA explains that workers in extremely hot environments can lose up to a litre of fluid every hour, and it is vital that this lost fluid is replaced.

The type of clothing worn is also very important – loose clothing allows air to circulate, improving the evaporation of sweat.

KingGee’s Workcool range of workwear, for example, has been purposely built to help tradies beat the heat and keep their cool on the job. The UPF 50+ range is made with lightweight yet strong Ripstop cotton, designed to breathe without sacrificing protection and tear resistance. A collar extension has been added to all shirts for extra sun protection and pants feature 10 multifunctional pockets reinforced with triple stitching.

Heat stroke is a serious condition that must be treated immediately. The signs of heat stroke are cessation in sweating, high body temperature and hot and dry skin. Confusion and loss of consciousness may occur.

If heat stroke is suspected, the person should be treated by a doctor as soon as possible. Until medical treatment is available, the person should be cooled down as quickly as possible by methods such as soaking clothing in cold water and increasing air movement by fanning.

“The effects of extreme or sustained heat can seriously affect a worker’s concentration levels, and the consequences can be very serious,” Lex says.

“Guarding against heat stress and heat stroke is part of providing a safe and healthy workplace, and I urge employers to ensure that preventative measures are in place.” ▲

KingGee
www.kinggee.com.au

IT'S NOT JUST ABOUT YOU...



While you’re taking care of yourself on job sites, keep in mind your mate in the ute.

“Dogs are just as susceptible to heat-related illness as humans,” says Dr David Neck from the Australian Veterinary Association (AVA).

“Vets receive numerous calls from concerned dog owners during heatwaves after seeing worrying signs like lethargy, excessive panting or breathing problems. But there are simple tips that can help to prevent or minimise problems.

“Unlike people, who sweat through skin, dogs cool off through the pads of their feet and tongues. They need to pant to regulate their temperature, and dogs with long hair can be more susceptible to the effects of heat.”

Ten tips to ensuring your best mate makes it through the summer include:

1. Making sure there is cool, fresh water available at all times. Leave this in a shady area.
2. On really hot days, leaving multiple bowls of cool water in the shade that can’t be tipped over.
3. Keeping an eye on older pets as they will be more susceptible to the heat, particularly if they have

problems with their breathing.

4. Dogs love to sit in the sun, but prolonged sun exposure can quickly lead to heat exhaustion and can cause skin cancers, so it’s important to provide them with a shaded area.
5. Filling a kids’ paddling pool with a couple of inches of water and leaving this in a shady spot for your dog to sit in.
6. Tossing a few ice cubes in your dog’s water bowl can help to keep their temperature down.
7. If you don’t have air conditioning, leaving a fan on during those really hot days in the height of summer.
8. Walking your dog in the early morning or the late evening to avoid the hottest part of the day.
9. Putting some treats in the freezer.
10. If you own a long haired dog, giving them a trim to help them cope better with the hotter months.

“It’s important to take your dog to the local vet if they are displaying any symptoms of heat stroke such as heavy panting, fatigue, drooling, vomiting and diarrhoea.

“Watch your dogs carefully on hot days and give them extra care to help them safely enjoy summer.”

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THE BENEFITS OF HIRING AN APPRENTICE



Hiring an apprentice offers significant benefits for businesses, including financial incentives and productivity improvements.

“Apprenticeships offer a mix of on-the-job training and theoretical education to give the apprentice a nationally-recognised trade qualification,” Northern Sydney Institute construction and engineering faculty manager Pat Vella says.

“Because apprentices are paid while they learn the skills they need for their chosen career, they can avoid having a higher education debt and kick-start their career sooner.

“But the master-apprentice relationship is just as rewarding for the employer. It gives experienced tradespeople a chance to mentor a younger person or help a mature-age apprentice change careers. There are also tangible benefits to hiring an apprentice.”

Northern Sydney Institute has

identified six key benefits of hiring an apprentice:

1. Sustainable recruitment: The cost of recruiting and training staff is high. By recruiting an apprentice, businesses can train a person in specific areas and processes that result in greater productivity for the business. This can result in lower staff turnover and, as a result, reduced recruitment costs.

2. Financial rewards: A range of financial incentives may be available to businesses that employ an eligible apprentice. In addition, their pay rate generally reflects the costs to the employer of providing training, which can make apprentices a more cost-effective option, especially considering their ongoing productivity and contribution to the business.

3. Shared resource: Companies that do not have enough work for a full-time staff member can bring in apprentices part-time while they are still at school. Companies can also share an apprentice with another business through a Group Training Organisation (GTO), which

is ideal when the employer does not have the range of work available to ensure that the apprentice gains all the necessary skills.

4. Community contribution: Many business owners are community-minded. Hiring an apprentice gives young people an opportunity to launch their careers and gives them an incentive to work towards a future goal.

5. Increased productivity: Hiring an apprentice requires businesses to examine their policies and processes, which can often result in positive changes that increase productivity. Additionally, the apprentice may offer ideas and information that they have gained through their studies, which can help the business in turn.

6. Skills preservation: Apprentices are the next generation of skilled workers. By hiring an apprentice, business owners gain the opportunity to pass on valuable skills that may otherwise be lost. ▲

Northern Sydney Institute
www.nsi.tafensw.edu.au

HOW TO FIND AN APPRENTICE

Before deciding to hire an apprentice, business owners must first decide on what the job entails and what skills are needed. The role may be full-time, part-time or school-based.

Apprentices can be hired directly by the business or through a GTO. Before selecting a candidate it is important to interview them to make sure they will fit in with the existing team and that they understand the work and attitude that will be required of them.

Business owners need to complete a training contract through the Australian Apprenticeships Centre: www.australianapprenticeships.gov.au.

Businesses can advertise for an apprentice directly through TAFEs, on employment websites and through GTOs.

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THE A-Z OF ATO PAYMENT ARRANGEMENTS

When hit with a tax bill, most small business operators seek out a payment plan. You can do much better than that, writes **John Corias**.

Part of our role as small business accountants is to act as a barrier or intermediary between the tax office and the small businesses of Australia.

It's not that we don't trust the two different interests to get along but it's more about using our experience and knowledge to protect the best interests of the client.

Small business owners will understand the time pressures placed upon them and being caught off-guard by a representative of the tax office can be a genuine issue. Often clients are not able to converse about their business finances in a way that gets the true picture across.

Dealing with payment arrangements for small businesses to pay off overdue debts to the tax office is a daily

occurrence in our office. Some of the reasons for these debts occurring can involve:

- Poor cash flow management.
- Using the wrong legal structure.
- Accounting for GST on the wrong basis.
- Not budgeting for cyclical cash flow.
- Business owners spending unassigned cash in the bank.
- Not using accountants or bookkeepers to monitor future tax amounts to be paid.
- Rarely are these issues caused by 'acts of nature', but this can be a factor as well.

So the issue here is how to deal with the tax office and keep your debts under control once they have happened.

Negotiating a payment arrangement with the tax office is normally the first option clients look to. Our advice is

Always to seek alternative finance to cover ATO debts as they can often be spread over more lenient time frames.

always to seek alternative finance to cover ATO debts as they can often be spread over more lenient time frames.

Sadly, many small businesses think this is where the process stops but this is not the case. Once a payment arrangement is in place it is your obligation to make your regular payments as well as your current lodgements for both income tax and BAS purposes. Should you stick to your arrangement but not lodge and pay your most recent BAS on time then your arrangement defaults? Every time you default it becomes increasingly difficult to negotiate a new arrangement. This is how businesses fall further and further behind.

The key piece of advice in this lesson is not to fall behind. The way to keep on top of your obligations is to know what they are and when they are due. You can only do this by taking up the services of a bookkeeper or accountant from the very start of setting up your small business. So many of our new clients have waited a year or two before seeking help and end up paying two years of tax in one year. This is a recipe for disaster and places further cash flow stress on new small businesses that are already running in a very lean state. ▲



LIVING IN A POWDER KEG

Unfair dismissal is blamed for one in three disputes with staff, new data reveals. Employment relations specialist **Employsure** provides tips to help employers minimise employee claims.

Unfair dismissal is the main reason employees make a formal claim against their employers, and of these claims, nearly a quarter centre around serious misconduct (12%) or misconduct (12%).

The figures were released by Employsure and were taken from 990 inbound calls to the company, from employers, between February 2014 and May 2015. They reveal that over a third of calls were from employers contacting Employsure for the first time, to seek advice on unfair dismissal.

Employsure managing director Edward Mallett says, "Disputes between employers and their staff occur when an employee's conduct is called into question, but they feel wrongly accused. This is a difficult situation and usually the employer has no official guidelines on conduct in place. They then call a service like ours to explore their rights and obligations."

In 2014, 17,806 unfair dismissal claims were lodged by employees with the Fair Work Commission, the highest number of annual claims ever recorded. The figure amounts to 70 claims a day.

"There is no doubt this is a major issue for employers," Edward says.

"Unfair dismissal was brought about to protect employees from unjust employers; however, the number of claims has blown out. The actual figure is considerably higher as not all claims are taken to the Commission, some are settled internally by the company concerned. Because it is such a prevalent issue, employers need to ensure they have robust policies in place to be clear and equitable in these matters."

"Around two thirds of the companies that contact Employsure in the first instance have employment compliance

issues or are involved in a workplace incident and need expert advice and assistance. Around one in five companies in the general business population have workplace issues that result in formal claims being made."

EDWARD MALLETT'S TOP FIVE TIPS TO AVOID EMPLOYEE DISPUTES

1. Have clear descriptions of unacceptable behaviour: Employers need to train staff on good conduct and include clear descriptions of unacceptable behaviour in employee handbooks. This can cover every aspect of employee functions from absenteeism, sick leave, performance and, most importantly, conduct.

Don't make allowances for some staff members or come down hard on other employees. Consistently addressing conduct issues will help your employees to perceive what is appropriate workplace behaviour and what is not.

4. Have meetings before the situation gets out of hand: If an employee is stepping out of your defined code of conduct, you are within your rights to schedule a disciplinary meeting to clearly outline the employee's unacceptable behaviour. Following this meeting, you may be justified in issuing a formal, written warning. If the misconduct is repeated or it constitutes serious

When you have gone to the time and trouble to craft workplace policies, make sure your staff know about them.

2. Don't keep policies in a drawer: When you have gone to the time and trouble to craft workplace policies, make sure your staff know about them. Consider introducing a written or computer test and set the pass mark high to make sure employees have read and understood policies.

misconduct, this could ultimately justify dismissal.

3. Consistency is key: Ensure all disputes are dealt with consistently. Adhere to your own policies and procedures to the letter, in every case.

5. Get the best advice: Employers often don't know how to manage employees effectively and deal with claims by their employees. Get expert advice to develop solid employee contracts, workplace policies and performance management programs to put you in the best position possible. Use your adviser to gain knowledge of your rights and obligations as an employer. ▲

RANKING BY REASON FOR TERMINATION		
1	Unfair Dismissal – Other reasons	43%
2	Serious Misconduct	12%
3	Misconduct	12%
4	Redundancy	10%
5	Performance	7%

* Taken from 990 claims from February 2014 to May 2015.



TOYOTA HILUX

If there is one utility against which all others are benchmarked in Australia, Toyota's HiLux has to be it. Not only the market-leading commercial vehicle in the land, the Thai-built one-tonner is one of the top three biggest-selling vehicles, month in and month out, alongside the Corolla and Mazda3 small cars.

So an all-new HiLux is big news, and prospective buyers have plenty to look forward to when the eighth generation docks Down Under in October.

Full specifications were still to be revealed at the time of writing, but Toyota Australia has outlined key details such as two newly developed turbo-diesel engines – part of a four-tiered powertrain line-up – new six-speed manual and automatic transmissions, a stronger body, locally developed suspension package, major equipment upgrades and new model variants including 'Hi-Rider' 4x2 versions.

The latter will have the ride height and heavy-duty suspension of an equivalent 4x4 model, and form part of a 31-variant line-up – up from 23 today – that again spans two drivelines, three body styles (single, extra and double cab) and three equipment grades (WorkMate, SR and SR5).

Other new entrants include more double cabs, more 4x4 variants, more diesel options and the reintroduction of the 4x4 WorkMate, with tradespeople a key target audience.

Toyota's newly developed GD-series four-cylinder common-rail turbo-diesel family will be offered in 2.8L and 2.4L guise, replacing the current 3.0L oil-burner and offering more power and up to 10% better fuel economy.

The bigger-displacement engine will develop 130kW and 450Nm with the six-speed automatic (peak torque falls to 420Nm when the six-speed manual is specified), while the smaller engine is good for 110kW/400Nm (five-speed manual: 343Nm). The 2.4L will mainly see duty in 4x2 variants.

The 4.0L petrol V6 will continue, while at the entry level the

2.7L four-cylinder petrol engine has received a major overhaul, this 2TR-series unit now producing 122kW/240Nm.

Other headline items on the new HiLux include an increase in towing capacity up to 3,500kg, payloads of up to 1,240kg, more interior space in the dual cab, expanded cargo volume, a larger fuel tank (now 80L) and improved body rigidity via greater use of high-strength steel and additional spot welds.

Toyota has promised that standard features across the range will include seven airbags, hill-start assist, an emergency stop signal system, electronic stability and traction control and ABS brakes. A reversing camera will also be fitted to all pick-up models, and offered as an option on cab chassis variants.

Every HiLux will also carry a touch screen audio display, air conditioning, cruise control and powered windows, mirrors and door locks. ▲

Toyota Australia
www.toyota.com.au





VOLKSWAGEN TRANSPORTER

Volkswagen is preparing to introduce the sixth-generation version of its popular Transporter van in Australia towards the end of the year, following its release in Europe.

Replacing the decade-old T5 and marking 65 years of Volkswagen van production, the new T6 brings sharper looks, a fully redesigned cabin, uprated safety and convenience equipment, more efficient powertrain options and promises of improved vehicle dynamics.

A new family of 'EA288 Nutz' TDI 2.0L turbo-diesel engines makes its debut in the T6, offered in four states of tune in Europe – 62kW, 75kW, 110kW and 150kW – and combining with a five- or six-speed manual gearbox (depending on the variant) or a seven-speed DSG dual-clutch automatic.

A 2.0L 'EA888' petrol engine with either 110kW or 150kW is also available.

VW says the engines will save at least 1L of fuel compared to the previous generation, helped by a standard automatic engine idle-stop system.

The dynamic performance goes up a notch with the development of a new adaptive chassis control system with three selectable driving modes (comfort, normal and sport) for the electronically adjustable shock absorbers.

Driver safety aids such as a radar-based 'front assist' monitoring system, adaptive cruise control, city emergency braking, automatic high/low beam adjustment, reversing camera and driver fatigue monitoring can be specified in Europe, while an automatic post-collision braking system is fitted standard across the range. Electronic trailer stabilisation is also offered.

Infotainment technology moves up a notch with new audio systems, all of which integrate with a Bluetooth hands-free system and most including a touch screen (either 5.0" or 6.3") as standard. Even the most basic audio system in Europe has

an SD card reader, USB port and aux-in socket. Digital radio and more sophisticated functionality kick in at higher grades, including advanced voice control and, for the touch screen, a proximity-sensing function and smart phone-like 'swipe and zoom' hand movement control.

The standard panel van's cargo capacity is 5.8m³, accessible from the tailgate (or optional rear wing doors) and a side sliding door, while specifying a medium-high roof (+276mm) increases this to 6.7m³. A long-wheelbase version (3,400mm, +400mm) is also offered in Europe, stretching total vehicle length to 5,292mm and delivering a 6.7m³ load capacity with the normal roof version – or 7.8m³ with the medium-high roof. A LWB high-roof variant takes this even further, to 9.3m³.

Gross vehicle weight ranges from 2,600-3,200kg, depending on version and engine spec, permitting a maximum payload of 502-1,224kg. Maximum braked towing capacity is 2,500kg.

Cab chassis derivatives are due in Australia next year. ▲

Volkswagen Australia
www.volkswagen.com.au





NISSAN NAVARA

Nissan has launched its crucial new-generation Thai-built Navara in Australia, kicking off with dual cab variants in a rollout that will see single and king cab models – and a full 27-variant range – on sale by the end of the year.

As well as the three body styles, the new Navara – dubbed NP300 and replacing both the decade-old D40 and 18-year-old D22 series – will cover all bases with four trim levels (DX, RX, ST and ST-X), pick-up and cab chassis back ends, 4x2 and 4x4 drivelines, six-speed manual and seven-speed automatic transmission choices, and three powertrains (two turbo-diesels and a petrol) on offer.

Nissan has a lot riding on the all-new version of its top-selling nameplate, pointing to years of development – including testing in rural and metropolitan Australia – and promising plenty with the launch of the dual cab, such as improved performance, reliability and safety, best-in-class diesel fuel economy and equal-best braked towing capacity for the diesels of 3,500kg.

The diesels in question are two new Renault-sourced 2.3L 'YS23' four-cylinder engines, headlined by a twin-turbo unit that produces 140kW at 3,750rpm and 450Nm from 1,500-2,500rpm.

In ST and ST-X 4x2 dual cab manual grades, this engine can return fuel economy of 6.3L/100km on the official combined cycle – not bad for a vehicle that has a GVM of 2,910kg and tare mass of around 1,800-1,900kg, although for sheer grunt the twin-turbo is unable to match the 550Nm (from a 3.0 V6) that was a feature of the previous model.

A single-turbo version of the YS23 is also available,

delivering 120kW/403Nm and similar economy, while at the entry level an upgraded 2.5L 'QR25DE' four-cylinder petrol engine continues, now with 122kW/238Nm and returning 9.7L/100km on the DX 4x2 manual.

Payload ranges from 880-1,112kg, depending on the variant.

Still with a fully boxed ladder frame chassis, the NP300 brings a number of other significant advancements for Nissan, from its "cutting edge" and more aerodynamic design to smart technologies and extra safety features, and claims of improved handling and ride comfort. On the latter, a new coil-sprung five-link rear suspension for dual cab pick-up models is now in service.

In safety terms, seven airbags are fitted standard in the dual cab (including driver's knee airbag), along with electronic stability and traction control, a limited-slip diff and ABS brakes with EBD and brake assist.

Daytime running lights are also fitted, although LED headlights and a rear-view camera are among the equipment reserved for the higher ST and ST-X grades.

There are many other detail points to note throughout the range, so careful study of the specification sheets is recommended. But all dual cabs have air conditioning (with rear air vents), cruise control, a trip computer, electric windows, three 12V power outlets and a six-speaker CD/radio unit with Bluetooth phone and audio streaming and USB/iPod connectivity. ▲

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IVECO DAILY

Long known as a leading heavy commercial vehicle brand, Iveco has moved to improve its standing in the light commercial sector in Australia with the launch of the new-generation Daily large van and cab chassis range.

The company is claiming four class-leading highlights with the new series: largest volume (at up to 20m³), highest horsepower rating (205hp, equivalent to 150kW) and the “most sophisticated full-automatic transmission” – a new eight-speed unit dubbed ‘Hi-Matic’.

Iveco also claims the redesigned Daily is virtually new from the ground up, with 80% new architecture and a host of detail improvements over the previous generation.

The new Daily range spans 18 model variants at launch, with seven different vans, five single and four dual cab chassis options, as well as two 4x4 cab chassis variants at the top of the range.

Gross vehicle mass ranges from 3.8t to 7t across single or dual rear-wheel axles, while towing capacity tops out at 3,500kg.

The vans cover payloads from 1,475kg to 2,767kg, with vehicle lengths stretching across four tiers (5,648mm, 6,048mm, 7,228mm and 7,628mm) and three internal heights (1,545mm, 1,900mm and 2,100mm) for load capacities starting at 9m³ and climbing to 12m³, 16m³, 18m³ and 19.6m³.

Easing the load is a large side sliding door and double-hinged rear doors (opening to 270°), while the rear loading platform has also been lowered by 55mm over the previous model.

The cab chassis range provides the basis for a broad selection of bodies, from basic steel and aluminium trays to tippers, service units, pantechs and more sophisticated bodies needing CAN BUS connections. Three wheelbase lengths are offered: 3,750mm, 4,350mm and 4,750mm, although the latter is not available on the six-seater dual cab. Payloads range from 2,275kg to 4,582kg.

At the heart of the new Daily are three familiar but improved direct-injection diesel powertrain options: a 3.0L unit with

either single or twin turbochargers and, at the entry level, a 2.3L single turbo.

The twin-turbo lays claim to the best-in-class power output of 150kW from 3,100-3,500rpm – peak torque is 470Nm from 1,400-3,000rpm – while the single turbo is no slouch either, developing 125kW at 2,900-3,500rpm and 430Nm from 1,500-2,600rpm.

The 2.3L unit produces 93kW from 3,000-3,600rpm and 320Nm between 1,800-2,500rpm, while Iveco cites range-wide fuel efficiency improvements of around four per cent with various mechanical tweaks, reduced internal friction and a more aerodynamic design, particularly with vans.

The ZF-sourced eight-speed automatic is said to have been extensively tested in Australia and was strengthened for use in light commercial applications. It also has ‘Eco’ and ‘Power’ modes. The standard manual gearbox varies according to the model selected.

A suspension overhaul has brought improved ride and handling, according to Iveco, while braking performance is attended to with disc brakes at both ends, as well as ABS brakes with EBD.

There is also a hill-holder, electronic stability control with trailer sway mitigation, low-level fog lights (with a cornering function), rear parking sensors on vans, and dual front and side curtain airbags, while a variety of other safety features are optional.

Other key standard items include remote locking, automatic air conditioning, cruise control, electric windows/mirrors, a multi-function steering wheel, various purpose-built storage compartments (including phone and tablet holders) and four-speaker audio with 20W amplifier, radio, CD/MP3 player, USB/aux input and Bluetooth connectivity. ▲

Iveco Australia
www.iveco.com.au

RENAULT TRAFIC

Renault's third-generation Traffic delivery van has arrived in Australia, offering a comprehensive redesign inside and out and, not least of all, an all-new 1.6L diesel engine with improved fuel efficiency and performance.

There is no longer an automatic transmission available on Traffic, leaving Renault Australia to soldier on with the new 'R9M' engine family, which is offered in two states of tune but combines only with a six-speed manual gearbox.

Both short and long wheelbase variants remain available – measuring 3,098mm and 3,498mm respectively – with the SWB (dubbed L1H1) offering either engine and the LWB (L2H1) going it alone with the high-output unit.

This top-spec twin-turbocharged 'Energy dCi 140' produces 103kW of power at 3,500rpm and 340Nm of torque from just 1,500rpm (80% of which is available from 1,250rpm). Fuel consumption on the combined cycle comes in at 6.2L/100km, aided by automatic engine idle-stop and regenerative braking systems, among a host of economy-enhancing technical features.

At the entry level, the 'dCi 90' delivers the same economy figures with the lower output, which is 66kW and 260Nm (each produced at the same revs as the dCi 140).

Extended front and rear overhangs have liberated more space throughout the Traffic, with load lengths now stretching to 3,750mm (SWB) or 4,150mm (LWB) via a new bulkhead flap arrangement – establishing "a new benchmark for the market", according to Renault, as longer items extend into the cabin – while the bulkhead itself has been repositioned 30mm further back to liberate more space for passengers.

The cargo area measures 1,387mm high and 1,662mm wide across the range, with access gained through an unglazed left sliding door or, at the back, a conventional glazed tailgate or 180° rear barn doors. Significantly, the cargo area layout

remains the same as the previous generation, enabling tradespeople to transfer customised fittings and equipment over to the new model.

Maximum cargo volume is 5.2m³ on the SWB, and 6.0m³ on the longer version, while payload ranges from 1,235kg to 1,274kg, depending on the variant. Maximum towing capacity is 2,000kg.

Standard features include three-abreast seating, full driver's seat and steering wheel position adjustment, air conditioning, electric windows/mirrors, remote central locking, cruise control (with speed limiter) and Bluetooth audio/phone and USB connectivity.

On the safety front there are dual front airbags, rear parking sensors, hill-start assist, electronic stability and traction control (including an advanced Grip Xtend system), and ABS brakes with EBD and brake assist.

Specifying the high-output engine brings extra equipment, including automatic headlights/wipers, front fog lights (with cornering function), a rear-view camera, leather-clad steering wheel, CD/MP3 radio and dual passenger bench with fold-down centre seat workstation that includes a detachable A4 clipboard, laptop storage and under-seat storage compartment. The aforementioned load-through flaps and rear barn doors also kick in here.

Renault Australia is offering three factory-fit option packs on the twin-turbo models, providing scope for buyers to beef up the comfort, convenience and/or technology specification.

Pricing starts from \$33,490 plus on-road costs for the L1H1 dCi 90, with the dCi 140 adding \$3,500 on the SWB. The LWB L2H1 dCi 140 starts a little further upstream at \$38,490. ▲

Renault Australia
www.renault.com.au



HOLDEN SANDMAN

Utes and recreational pursuits have become so interwoven today that car-makers promote the lifestyle aspects of their commercial vehicles as much as their work ethic.

This is partly due to the rise of the suburban 'weekend warrior' desperate for out-of-hours adventure, but traditional buyers are also naturally drawn to a vehicle's potential as both a tool of the trade and one that fits the bill away from work.

Holden knew this all too well back in the 1970s when it created the Sandman panel van and ute, tapping into surf culture and an Australian psyche that valued freedom and, ahem, free love.

And now the legendary model is back – in name, at least.

The panel van is long gone, and not coming back as Holden prepares to close its Australian car-making operations in 2017, taking the Commodore-based two-door model with it. But for a limited time, the lion brand is aiming to rekindle the Sandman spirit with a special-edition ute and station wagon.

Adding \$2,950 on to the price of SSV and SV6 models, and on sale from June, the Sandman edition comes with some familiar retro decals that contrast with 20" gloss-black wheels and blackened fender vents, grille and sports bars.

Holden's design team has also come up with unique Sandman dashboard stitching, sunshades, floor mats and, for an extra outlay, orange sheepskin seat inserts. An orange shagpile cargo rug was also developed for the wagon (that's Sportwagon these days, not shaggin' wagon) but we see no reason why it couldn't be added to the ute's tray.

Individual build plates are also provided.

The modern-era VF Ute is a far cry from the 1974 HQ Holden, which was the first Sandman series, followed by the HJ (1974-76), HX (1976-77) and HZ (1977). Certainly it is safer, more powerful and far more sophisticated.



But surfboards and larrikins are still a common sight around tradies' utes, and this Sandman-inspired edition could be just the thing to complete the image. ▲

Holden Australia
www.holden.com.au





ISUZU N SERIES

Isuzu Australia Limited has introduced a comprehensive upgrade for its all-important N Series, bringing fresh looks, increased performance on NPR variants and a new electric stability control system to the light-duty truck range.

The 2015 update also heralds a change in nomenclature for the massive 50-plus model range, with the familiar three-letter model codes remaining – NLR, NLS, NNR, NPR, NQR and NPS – but then followed by two numbers that reflect GVM rating (from 4.5t to 8.7t, expressed 45, 87, etc) and a separate number indicating power rating in PS (or metric horsepower).

By way of example, and an illustration of the improved performance, the NPR 65-190 and NPR 75-190 – with 6.5t and 7.5t GVM respectively – now benefit from the high-output 190PS (or 140kW) powertrain previously restricted to the higher-series NQR line.

This is the '4HK1' SiTEC Series III 185 engine – a 5.2L turbo-diesel that develops its maximum power at 2,600rpm and carries 510Nm of torque available from 1,600-2,600rpm. This equates to a 23% increase in power and 22% torque boost compared to the previous SiTEC 155.

It combines with a six-speed manual gearbox, complete with full synchromesh on all forward gears, while a six-speed automated manual transmission (AMT) with both fully automatic and clutch-less manual modes is available.

The 190PS engine is also now offered in the driver's licence category NPR 45-190, the strong performance combining with a 2t payload when fitted with an aluminium tray – a package especially designed to appeal to tradespeople who might otherwise be looking for a diesel utility.

The 2015 N Series is identified by fresh new looks, including revised grille design in paint colour for NLR, NLS, NNR and NPS, and chrome on NPR and NQR variants. The latter also benefit from the 'premium' specification level, picking up fog lamps and automatic climate-control air conditioning (except for Tipper variants).

New seat trim and a smaller steering wheel are now included, and the driver's seat comes with a vibration-absorbing support pad, torsion bar and optimised weight ratio for up to 130kg.

Among other changes to the range, all N Series models bar the NQR have a new 90A alternator (up 10A) that broadens its ability to handle aftermarket accessories, while greater data capacity comes with more information from CAN BUS stored onboard. Isuzu says the latter is important in enabling technicians to "readily access more operational data to diagnose and rectify any issues that may occur".

NNR and NPR 45 and 55 models now have the 'MYY6' transmission with revised ratio set. Third and fourth gear ratios have been revised, effectively narrowing the gap from second to third gear.

A new Isuzu Electronic Stability Control (IESC) system applies to all NLR, NNR and NPR models, constantly monitoring data from a range of sensors to detect and, if required, help correct an unexpected loss of vehicle control. It works in conjunction with a raft of other safety equipment including traction control, hill-start assist and ABS brakes with EBD. ▲

Isuzu Trucks Australia
www.isuzu.com.au



HOLDEN COLORADO Z71

With the all-new Toyota HiLux, Nissan Navara, Mitsubishi Triton and a heavily upgraded Ford Ranger either on sale or almost on the market, Holden has moved to divert our attention its way with the launch of a new flagship version of its Colorado ute, dubbed the Z71.

Based on the MY16 LTZ 4x4 Crew Cab pick-up, the Z71 is pitched at top-end buyers who are looking for some extra flair – in a darker, more aggressive theme – and cabin comfort.

The key exterior additions include 18" gun-metal 'Arsenal Grey' alloy wheels (with 265/60-section tyres), a body coloured sail plane (with Z71 graphic), stylised nudge bar, revised headlights (with a dark chrome mask) and a host of other black elements including bonnet (also with Z71 graphic), body side door mouldings, door handles, roof rails and rear step trim.

Gloss black detailing is also applied to the exterior mirror caps, B-pillars and tailgate handle, while a black soft tonneau cover is fitted. A hard tonneau is available as an option.

The interior, meanwhile, carries leather-appointed seats (heated up front), adding to the full whack of equipment already fitted to the LTZ such as climate-control air conditioning, 7" colour touch screen with Mylink media system, reversing camera and satellite navigation.

Safety features include six airbags, electronic stability and traction control, trailer sway control, hill descent control, hill-start assist and ABS brakes.

There are no mechanical changes, with a 2.8L four-cylinder turbo-diesel engine delivering 147kW and 440Nm when paired with a six-speed manual gearbox, or 500Nm with the optional six-speed automatic.

Pricing starts from \$54,990 plus on-road costs for the manual, or \$57,190 for the auto. ▲

Holden Australia
www.holden.com.au





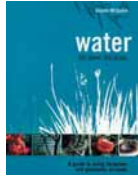
TRADESTUFF



Water: not down the drain

A guide to using rainwater and greywater at home

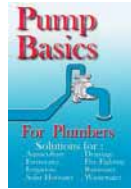
Water Not Down the Drain is a comprehensive guide to sustainable water use around the home. With Australia experiencing one of its driest phases in history, everyone has to think about how they use the water available to them and find ways to reduce their day to day water use.



\$35.95.....CODE 761

A quick reference and solution handbook

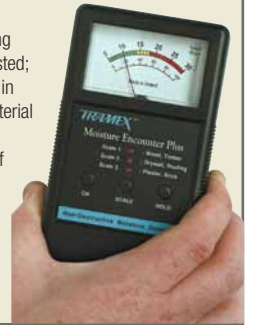
This handbook covers broad topics such as pump types and suitability. Emphasis is directed mainly on centrifugal pumps and their characteristics including capacity, head speed, power and efficiency, supported by charts, tables, formulas and graphs. There is a useful trouble-shooting chart and has installation hints.



\$25.95.....CODE 362

TRAMEX Moisture Encounter Plus Non-Destructive Moisture Meter For Building Inspection.

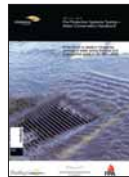
This is an upgraded version of the world's most popular and successful non-destructive moisture meter, the Moisture Encounter. It incorporates all the features and benefits found in the original Moisture Encounter such as: non-destructive moisture measurement of wood, plastic, drywall, block, brick, 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

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

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

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

Domestic Plumbing & Drainage Standard

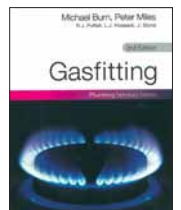
AS/NZS 3500.5:2000 Prepared to provide a suitable Standard for domestic plumbing work associated with buildings not exceeding three floors in height. The objective is to describe in a simplified way the installation requirements for hot and cold water services, sanitary plumbing and drainage and stormwater drainage. This standard is a MUST HAVE if you are involved with any domestic plumbing.



\$131.50.....CODE 521

Gasfitting: Plumbing Services Series

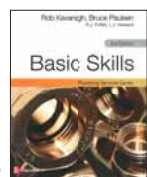
This text assists the licenced gasfitter to understand and correctly interpret the Standards laid down in the current code for the installation of gas burning appliances. This new second edition incorporates thorough and wide ranging revisions to bring it up to date with the requirements of the Plumbing and Services Training Package.



\$69.95.....CODE 165

Basic Skills

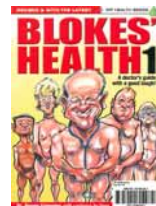
The third edition of Basic Skills has been completely updated to incorporate the wide ranging revisions that meet the requirements of CPC08. New features include a trade maths chapter for applied plumbing, chapters on sustainability, communication and OHS in the workplace, a competency grid to the Training Package, worksheets and interviews with plumbers.



\$59.00.....CODE 604

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

The New Tramex CMEXpert II

The Best Concrete Moisture Measuring Instrument just got Better! The CMEXpert II allows for instant non-destructive moisture tests of concrete. Accessories available are Wood Probes for testing wood flooring prior to installation. Relative Humidity Probes & Sleeves for in-situ and Hoods for surface RH testing of slabs.



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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

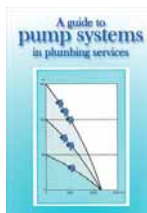
This handbook has been developed to provide practical information for the collection, storage and use of rainwater within an urban environment on private residential property. It outlines the minimum standards and performance requirements criteria for all development works associated with rainwater tank 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

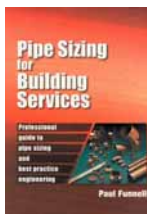
A guide to Pump Systems in Plumbing Services is an Australian first publication specifically written for plumbing designers, practitioners, consultants and specifiers of plumbing installations and equipment involving the use of pumps for all classes of buildings and construction. The content of the handbook 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.

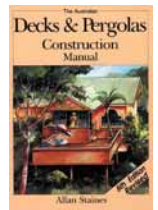


\$218.95CODE 489A

\$150.77CODE 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.

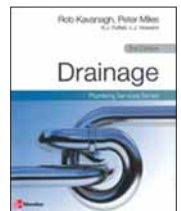


\$28.95CODE 49

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.



\$74.50CODE 392

Little Red Roofing Book

Roof cuts and rafter lengths – Hancock's 10th edition is a very popular, best selling book. With calculations, diagrams and tables it will help you with plumb and side cuts for hip and rafter, down and side purlin cuts and more. Calculations for roof frames, roof cuts and rafter lengths.

This 88-page pocket size edition is in metric, updating all the old calculations, and it is a very easy-to-use roofing guide which you can use with complete confidence. This book will earn its keep.



\$25.95CODE 129

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