Message from the Technical Regulator:

Welcome to Issue 42 of Regulation Roundup.

As always, this edition contains many useful and informative articles for the electrical, gas and plumbing trades.

No More Paper Certificates of Compliance

Paper certificates of compliance were discontinued as of 1 July 2018.

Since launch in January 2017, I’ve seen more than 9,000 workers and contractors in the electrical, gas fitting and plumbing industries sign up and start to submit their certificates electronically via eCoC.

I’m pleased to see that industry has continued to adopt eCoC and that more than 22,000 certificates were submitted in July alone.

Since January 2017, more than 90,000 eCoCs have been submitted online.

Our developers have been hard at work incorporating improvements and suggestions from industry into the system, and we will be releasing some major updates to eCoC soon.

The first will update the user interface in all areas of the eCoC system, leading to vastly improved compatibility with phones and other mobile devices, and much reduced loading times. Many small bugs have also been addressed as part of this update.

Following that, a widely anticipated second update will be released adding the ability for users to work within eCoC using several licences. This will be particularly useful to electricians, gas fitters and plumbers who utilise one licence to certify their work as a worker, and another licence to complete the contractor’s section of the certificate.

eCoC is free for electrical, gas and plumbing contractors and workers, and enables them to complete, submit, store and refer to certificates of compliance online. This can be done through the internet from either desktop or mobile devices.

eCoC saves the progress of certificates as they are prepared, meaning workers don’t need to complete the certificate all at once. Certificates are delivered via email and can either be sent to the customer electronically or printed for those who don’t have access to email.

If a contractor or worker notes non-compliant or potentially dangerous installations at a worksite, these can be recorded in the system. This serves an important role in ensuring the safety of the public.

If you are a plumber, gas fitter, electrician, or if you contract in any of these industries, you will need to register for eCoC. The best time to do so is now, and you’ll need your licence number, its correct expiry date and some contact information.

To register and for further information and support visit www.sa.gov.au/otr/ecoc

I encourage you all to take the time to read this edition. The information and advice we provide could be invaluable to your work.

Robert Faunt, Technical Regulator
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In this issue
Message from the Technical Regulator 1
No More Paper Certificates of Compliance 1
Electrical Bulletin 2
Product Safety Recall – Solar Inverter 2
Upcoming Changes to Certification of Generators, Solar and Battery Systems 2
New Proclaimed Energy Products 3
Passive Infrared (PIR) Sensor 3
New Wiring Rules – Standards Australia Release 3
Leave It Compliant! 3
OTR Electrical Expiations Issued 4
Electric Shock Report Incidents 5
Electric Shocks Experienced by Apprentice Plumbers 6
Gas Bulletin 7
Safety Testing, Approval and Labelling of Uncertified Type A Gas Appliances 7
Owner/Operator Obligations to Ensure Compliance with the Gas Act 7
New Arrangements for Safety Assessments of Uncertified Type A Gas Appliances 7
Spillage Testing When Commissioning and Servicing Gas Appliances 8
Height of Regulators Above LPG Cylinder Valves 8
Vent Terminal Location 8
BBQ’s in Quasi-Outdoor Areas 9
Enclosed Outdoor Appliances 9
Location of External Appliances Under Covered Areas – YES, THIS AGAIN 10
Appliance Connections 11
Pressure Testing 11
Marker Tape for Composite Pipe 11
Elevated Pressure Installations–How to Get the Gas On for New Connections 11
Common Trenching 12
Plumbing Bulletin 13
Invitation to a Seminar on Backflow Prevention 13
Renovation of Sanitary Plumbing and Drainage Pipework 14
Understanding Plumbing Registration Terms 15
Contact List 16

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Upcoming Changes to Certification of Generators, Solar and Battery Systems
As the landscape of South Australia’s electrical systems changes with the rise of home battery systems and the continuing march of home owners and businesses installing solar PV systems, it is increasingly apparent that these systems could be better understood. AEMO will begin to collect detailed information on Distributed Energy Resources from 2019 and the Technical Regulator will begin to collect additional information on eCoCs that relate to new solar and battery installations via eCoC later this year to assist in this process. We’ll aim to make this simple for the installer to declare on their eCoC, and we will send out further information on what’s required via eCoC in the coming months.

SOFAR SOLAR MASS ENERGY PV INVERTERS
Serial numbers 1st and 2nd digits SA/SB/SC/SD/SG.
9th and 10th digits G8/G9/GA/GB/GC/
H1 to H9/HA/HB/HC/J1/J2/J3

Defect:
The inverter can exceed voltage limits, and may not switch off when required. Also, the Inverter is not labelled to warn of a hot surface.

Hazards:
If the inverter continues operating in the event of variations in the power grid voltage, there is a small risk that electrical products in the premises could fail in an unsafe manner resulting in electric shock and/or fire. Contact with hot surfaces of the inverter may cause burns.

What Consumers should do:
Consumers should contact Sofar Solar at service@sofarsolar.com alternatively contact Fortends at info@fortends.com or call 0410 682 044 and provide the model number and the serial number of your inverter, which is printed on the left hand side of the single phase inverters and right hand side of 3 phase inverters. A technician will be scheduled to install new firmware and to ensure settings are correct for use in Australian networks. A hot surface warning label will also be applied to the inverter.

See productsafety.gov.au for Australian product recall information

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New Proclaimed Energy Products

From 30 June 2018 the following energy products became proclaimed, and now require the mandatory Australian certification and approval mark prior to sale:

- **Electric hot water bottle** – Certified to AS/NZS 60335.2.81
- **DC isolator** – Certified to AS/NZS 60947.3
- **Glue gun** – Certified to 60335.2.45
- **Light emitting semiconductor lamp (Self-ballasted)** – Certified to AS/NZS 62560
- **Nightlight – mains socket-outlet mounted** – Certified to AS/NZS 60598.2.12
- **Over blanket / Duvet / wrap** – Certified to AS/NZS 60335.2.17

Additionally, some existing proclaimed product definitions have been amended.

For further information regarding proclaimed energy products, including the definitions and recognised approval marks, search ‘Proclaimed products’ in the following web link: [www.sa.gov.au](http://www.sa.gov.au)

Passive Infrared (PIR) Sensor

Energy Safety Victoria have published a safety alert in relation to PIR sensors, which are commonly installed in commercial and industrial premises.

On some models, when the cover is removed to adjust the sensor settings, a sensor module that is live is exposed and accessible to touch:

Maintenance and adjustments to the settings must be carried out with the power isolated, and by licensed electrical workers only.


Example: external construction (left) and internal view (centre, right) highlighting areas of exposed live parts.

Leave It Compliant!

In the past, it has been common practice to leave the MEN out for the connections officer on a new connection, so they can perform their required tests.

MEN connection left out on a live installation

The OTR has found several installations that have been energised at the meter isolator by SAPN, and the MEN has been removed ready for the meter installer to perform their tests.

The issue that arises is that the board is LIVE and potentially has no fault protection.

A simple fix to this problem is to leave your work compliant and ready to energise when you leave, with the MEN intact.

**IMPORTANT INFORMATION - Have You Changed Your Address?**

Contact Consumer and Business Services (CBS) for any change of address or licence details: Level 3, 91-97 Grenfell Street, Adelaide 5000

Phone: 131 882

Email: occupational@sa.gov.au

Only contact the Office of the Technical Regulator for change of address notification if you do not hold a trade licence but wish to continue to receive Regulation Roundup.

Purchase the new Standard from: SAI Global (see above), your industry body, or contact your electrical wholesaler.
<table>
<thead>
<tr>
<th>Worker/Contractor</th>
<th>Non-Compliance</th>
<th>Breach</th>
<th>Expiation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contractor</td>
<td>Live cables exposed–kitchen renovation wiring</td>
<td>Section 61 (1) (a) Electricity Act 1996</td>
<td>$375</td>
</tr>
<tr>
<td></td>
<td>Examinations and tests not fully carried out as required</td>
<td>Section 61 (1) (b) Electricity Act 1996</td>
<td>$375</td>
</tr>
<tr>
<td>Contractor</td>
<td>Unauthorised meter relocation</td>
<td>Section 59 (1) Electricity Act 1996</td>
<td>$375</td>
</tr>
<tr>
<td>Contractor</td>
<td>No RCD or circuit breaker installed–site supply power outlet</td>
<td>Section 61 (1) (a) Electricity Act 1996</td>
<td>$375</td>
</tr>
<tr>
<td></td>
<td>Examinations and tests not fully carried out as required</td>
<td>Section 61 (1) (b) Electricity Act 1996</td>
<td>$375</td>
</tr>
<tr>
<td>Contractor</td>
<td>Certificate of compliance not issued as required–PV solar system</td>
<td>Section 61 (1) (c) Electricity Act 1996</td>
<td>$375</td>
</tr>
<tr>
<td>Contractor</td>
<td>Live parts exposed–kitchen renovation wiring</td>
<td>Section 61 (1) (a) Electricity Act 1996</td>
<td>$375</td>
</tr>
<tr>
<td></td>
<td>Examinations and tests not fully carried out as required</td>
<td>Section 61 (1) (b) Electricity Act 1996</td>
<td>$375</td>
</tr>
<tr>
<td>Contractor</td>
<td>Multiple breaches identified–installation of automated gate</td>
<td>Section 61 (1) (a) Electricity Act 1996</td>
<td>$375</td>
</tr>
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<tr>
<td>Contractor</td>
<td>Incorrect connections created unsafe installation–meter changeover</td>
<td>Section 61 (1) (a) Electricity Act 1996</td>
<td>$375</td>
</tr>
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<td>Contractor</td>
<td>Incorrect connections created unsafe installation–meter changeover</td>
<td>Section 61 (1) (a) Electricity Act 1996</td>
<td>$375</td>
</tr>
<tr>
<td>Contractor</td>
<td>Multiple breaches identified–installation of new main switchboard</td>
<td>Section 61 (1) (a) Electricity Act 1996</td>
<td>$375</td>
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<tr>
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<td>Multiple breaches identified–installation of PV solar system</td>
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<td>Contractor</td>
<td>Unsafe connection of generator to house–supply lead with two male plugs</td>
<td>Section 61 (1) (a) Electricity Act 1996</td>
<td>$375</td>
</tr>
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<td>Owner/Operator</td>
<td>Failing to ensure a safe electrical installation</td>
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<tr>
<td>Shock Source</td>
<td>Cause</td>
<td>Contributing Factors</td>
<td>Injuries</td>
</tr>
<tr>
<td>--------------</td>
<td>-------</td>
<td>----------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Flexible cord extension set.</td>
<td>Damaged socket.</td>
<td>Construction site worker failed to check condition of flexible extension cord set before connecting it to jackhammer.</td>
<td>Worker received electric shock to right hand.</td>
</tr>
<tr>
<td>Batten holder.</td>
<td>Shattered lamp in batten holder.</td>
<td>Home owner attempted to remove broken lamp with the power still connected to the lighting circuit.</td>
<td>Home owner received electric shock to hand.</td>
</tr>
<tr>
<td>Controls for dishwasher.</td>
<td>Water ingress.</td>
<td>Bar worker went to turn on dishwasher and did not realise water had entered broken switch.</td>
<td>Worker received electric shock to hand.</td>
</tr>
<tr>
<td>Socket outlets in commercial kitchen.</td>
<td>Water ingress.</td>
<td>Chef was washing wall down with bucket of soapy water where the socket outlets were installed.</td>
<td>Worker received electric shock between hands and leg that was contacting earthed fridge.</td>
</tr>
<tr>
<td>Bench grinder.</td>
<td>Damaged on/off switch.</td>
<td>Worker went to turn on grinder but didn’t realise switch was damaged and contacted live contacts.</td>
<td>Worker received electric shock to hand.</td>
</tr>
<tr>
<td>Manufacturing assembly plant.</td>
<td>L.E.D. lamp and holder.</td>
<td>Worker went to replace 24 Volt lamp without isolating equipment. The wrong globe had been previously installed in the 130 Volt system.</td>
<td>Worker received electric shock to hand as he changed globe.</td>
</tr>
<tr>
<td>Vandalised light fitting at school.</td>
<td>Live cable end hanging out of wall where light was removed.</td>
<td>Victim was winding up basketball ring when they contacted the damaged wire from the light fitting.</td>
<td>Victim received electric shock across their body.</td>
</tr>
<tr>
<td>3D printer transformer.</td>
<td>Exposed live contacts.</td>
<td>Student removed power supply from printer to use it as a portable battery charger. The charger was not designed for this and had accessible live contacts when connected to the mains.</td>
<td>Student received electric shock between his hands.</td>
</tr>
<tr>
<td>Metal storm water drain crossing footpath.</td>
<td>Stove circuit short to earth.</td>
<td>Stove circuit had shorted to earth. Earthing was not effective and in turn livened up metal gutters, downpipes and metal footpath drain.</td>
<td>Dog being walked in street received electric shock.</td>
</tr>
<tr>
<td>Metering enclosure.</td>
<td>Damaged underground submains cable supplying unearthed meter enclosure.</td>
<td>Farm sheep pens were causing electric shocks due to the damaged underground cable and the moisture in the conduit tracking to the unearthed meter enclosure.</td>
<td>Farmer received electric shock to hands when using sheep yards.</td>
</tr>
<tr>
<td>Bookbinder.</td>
<td>Machine operator accessed an area with live parts.</td>
<td>Operator using machine was tightening a loose screw when the screwdriver they were using contacted a live terminal.</td>
<td>Operator received electric shock to hands.</td>
</tr>
<tr>
<td>Poultry stunner.</td>
<td>Water ingress to controller.</td>
<td>Abattoir worker went to raise height of stunner by operating the control switch not realising water had entered the device.</td>
<td>Worker received electric shock to hands.</td>
</tr>
</tbody>
</table>
Electric Shock Report Incidents (continued)

<table>
<thead>
<tr>
<th>Shock Source</th>
<th>Cause</th>
<th>Contributing Factors</th>
<th>Injuries</th>
<th>Action to make safe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motel bathroom wall light.</td>
<td>Cable entering wall light had shorted to the metallic cover.</td>
<td>Maintenance worker was replacing globe in light fitting. The cable entry method had pierced the cable and earth connection had not been completed.</td>
<td>Maintenance worker received electric shock to hands.</td>
<td>Electrical contractor isolated lighting circuit and correctly terminated light fitting.</td>
</tr>
<tr>
<td>Commercial kitchen egg cooker.</td>
<td>Flexible cord for unit damaged.</td>
<td>Worker accidently knocked egg cooker off bench. When they placed it back onto the benchtop they contacted the now damaged cord.</td>
<td>Worker received electric shock to hands.</td>
<td>Egg cooker taken out of service and electrical contractor repaired damaged flexible cord caused by the fall.</td>
</tr>
<tr>
<td>50 litre storage hot water system.</td>
<td>Faulty system.</td>
<td>Hot water system had corroded and water was contacting supply terminals.</td>
<td>Home owner received electric shocks to hands when touching taps.</td>
<td>Network operator disconnected hot water system until it could be replaced or repaired.</td>
</tr>
</tbody>
</table>

Electric Shocks Experienced by Apprentice Plumbers

Recently, three of South Australia’s group training organisations, PEER, TAPS and MPA, joined together to look at what can be done to make the construction trades industry safer for apprentices, and have collated incidents of electric shocks to plumbing apprentices. In the final six months of last year there were nearly a dozen incidents where plumbing apprentices received an electric shock. Some incidents include:

- An apprentice received an electric shock from his personal battery drill charger.
- An apprentice received an electric shock from the lead of an arc welder whilst working on a new construction. The insulation on the lead had deteriorated leaving exposed wires.
- An apprentice received an electric shock whilst removing the cover plate from an electric hot water tank. The tank had not been isolated.
- An apprentice received an electric shock while using an electric jackhammer. The handle broke exposing the internal wiring and the apprentice's hand made contact with the terminals.
- An apprentice received an electric shock while holding a piece of copper pipe against the wall to measure the required length. He received the shock the moment his pipe made contact with the water pipe system.
- An apprentice received an electric shock when hacksawing into a downpipe. Inside the downpipe were six sets of live electrical cables, where his hacksaw blade cut into three of them (see photo right).

These are only a small sample of incidents that are present out in the industry. The full list is exhaustive and each one containing a lesson to be learnt.

Recommendations include:

- The need to tag and test all electrical equipment, including personal tools used on the jobsite. All electrical equipment is required to be tested every three months when working on construction sites. Contractors and builders need to ensure this also covers personal tools and equipment (even mobile phone chargers and cords for personal radios).
- Always check equipment is de-energised and isolated prior to working on it.
- Under AS/NZS 3000, the plumbing system must be bonded to the main earth of the electrical wiring system to prevent the possibility of a rise of voltage on the water pipes.
- In the event you find a rise of voltage, please contact:
  - SA Power Networks, to resolve any potential high resistance neutral in the street or at the electricity meter.
  - If SA Power Networks does not identify an issue on their end, please engage a licensed electrical worker to rectify the fault.
- Wearing protective gloves offers a degree of insulation from electrical energy sources, however it is only a small degree of protection.
- Never be reliant on just PPE or the word of others. Check equipment yourself, and ensure you have all available PPE, in order to reduce the risk of electric shocks.
## Owner/Operator Obligations to Ensure Compliance with the Gas Act

Section 55 in the Gas Act is your best friend.

How? It points out the responsibility of the owner/operator.

This can be particularly handy when you are called out to repair an appliance or gas installation and you find existing non-compliances.

Simply put, owners/operators of an installation are responsible for taking reasonable steps to ensure the installation is compliant, safe, and safely operated.

If you find a dangerous, potentially dangerous, or non-compliant installation, you must advise the owner and make them aware of their responsibility.

If the issue is immediately or potentially dangerous then you have an obligation to make safe then and there.

### New Arrangements for Safety Assessments of Uncertified Type A Gas Appliances

Until recently the OTR had an arrangement with Gassupport Pty Ltd to administer safety assessments and approval of uncertified Type A appliances. Gassupport have elected to consolidate operations and step away from that role.

The OTR appreciates the contribution made by Gassupport towards ensuring appliance safety.

To cater for ongoing industry demand, the OTR will accredit several specialist gas contractors to assess a limited range of uncertified Type A gas appliances and produce test reports on behalf of the equipment owner for review by the OTR.

Owners of uncertified equipment will have to demonstrate that their equipment is safe and fit for purpose by having it independently safety assessed to a test plan determined by the OTR.

Owners will have the choice which accredited safety assessor they engage to test their appliance. The assessor must test the appliance and complete the approved report for review by the OTR.

The OTR will review submitted reports and if technically acceptable, will approve the appliance for use in South Australia subject to certain conditions.

The testing of appliances by recognised gas contractors will be a commercial fee-for-service arrangement between the assessor and equipment owner.

The OTR accepts no liability for any commercial matters or negligence on behalf of the safety assessor.

Where an owner of an uncertified gas appliance wishes to have that appliance installed, gas contractors/workers will need to advise their client that the appliance must be certified to meet the requirements of the Gas Act before being operated. The OTR will allow the temporary connection of the appliance to enable commissioning and testing to attain approval.

### The appliance is not to be operated until approval is given.

Gas contractors are reminded to advise clients of the requirements before temporarily installing/commissioning the appliance. The gas should be turned off to uncertified appliances and the appliance tagged until it is tested and certified. eCoC’s should reflect this so the owner has written notification of the above requirement. Once approved, the appliance can then be legally operated.

The OTR has produced a Bulletin on the revised process for low volume uncertified Type A appliances, ie commercial catering equipment, domestic cookers and gas BBQ’s. This is available on request.

If you wish to become an accredited safety assessor, you can forward an email to the OTR on otr@sa.gov.au addressing the competency and equipment criteria mentioned below, together with any relevant experience and work history in appliance testing.

Contractors wishing to undertake this work will be expected to have:

- an unrestricted gas license in SA with CBS (Consumer and Business Services)
- appropriate indemnity insurance
- access to a calibrated combustion analyser, manometers, temperature measurement equipment, stopwatch and mm drill set for measuring injectors.

Contractors must also be familiar with:

- the properties and characteristics of gases, combustion principles, appliance operation and determining gas rates.

Contractors will need to have a good understanding of:

- the appliance standards
- appliance and component certification protocols
- preparing concise test reports and maintain records.

Accredited Type A appliance safety assessors will be periodically audited by the OTR to ensure compliance with the above.
Spillage Testing When Commissioning and Servicing Gas Appliances

Gas contractors please note that commissioning and combustion spillage testing must be performed on all new installations of natural draft internal (open flued) gas appliances.

When servicing internal (open flued) gas appliances, it is advisable to first carefully inspect the heat exchanger for cracks - a cracked heat exchanger signals that it is time to replace the heater.

Once a heater has been serviced the appliance must be recommissioned and a combustion spillage test undertaken to verify the safe operation of the flue system.

Appendix R in AS/NZS 5601 provides the steps for this process.

The spillage test verifies if appliances with natural draft, (open flued) systems operate normally when all internal exhaust fans are running. If spillage of combustion product occurs and the heat exchanger is okay, then ventilation in the dwelling is not adequate to provide sufficient make-up air to replace that expelled by the exhaust fans. Additional permanent ventilation will need to be installed to prevent negative indoor air pressure.

Spillage testing on some appliances may be conducted with a tracer smoke tube discharging a small smoke stream adjacent to the draft diverter, if access can be gained. This is to see if the smoke is induced into the draft diverter (normal) or blown back into the room (spills).

If access to the draft diverter is not possible then a portable combustion analyser with a remote sensing probe can be used to measure carbon monoxide (CO) in parts per million (PPM), if combustion products are spilling into the room adjacent to the draft diverter.

Servicing gas appliances as per the manufacturer's requirements at least every two years is the best way keep appliances operating safely and efficiently.

Height of Regulators Above LPG Cylinder Valves

The OTR still comes across installations where regulators are mounted too low in relation to LPG cylinder valves. The requirement in the AS/NZS 5601.1 Standard for fixed LPG installations is that the first stage regulator outlet shall be higher than the cylinder valve.

Please note in Part 2 of the Standard (for Caravans, Motorhomes and Boats) the height is measured from the cylinder valve to the regulator inlet.

Non-compliant LPG installation.

Vent Terminal Location

This article only applies to relief vents and not breather vents.

The exclusion zone nominated by the ‘Vent Terminal Location’ figure 5.3, which has been super-imposed in the example, shown left, must not have any ignition sources or openings into the buildings. In this example, the opening of the window is within the 500 mm radius behind the direction of the relief vent, and is therefore non-compliant.

In this example, it may have been a simple solution of fitting an elbow to the vent terminal at the regulator, and direct the elbow forward, facing away from the building. The end of this elbow must be constructed to prevent entry and accumulation of water, birds, insects or other materials that could cause blockage.

In some cases, if the vent’s grate has been removed, it may be re-used within the elbow to help prevent obstructions as described.

If an elbow were to be applied, then the green regulator may have needed to be raised and the red regulator lowered to ensure the window opening and the under-building openings (slats) are outside of the 500 mm radius.

(a) Vent terminal exclusion zone with no object in the discharge direction

Figure 5.3
BBQ’s in Quasi-Outdoor Areas

AS/NZS5601.1:2013 definitions

1.8.62 Indoor(s)
Within a building, as defined by the appropriate national building code, or within a structure that is enclosed on all sides, as distinct from quasi-outdoor areas, balconies and the like.

(Refer to definitions of outdoors and quasi-outdoors).

1.8.80 Outdoor(s)
An above-ground open-air situation with natural ventilation, without stagnant areas, and where gas leakage and products of combustion are rapidly dispersed by wind and natural convection.

Note: Appendix I provides diagrammatical representations of outdoor areas.

1.8.93 Quasi-outdoor(s)
An outdoor area sufficiently weatherproofed to allow the installation of an appliance certified for indoors without affecting its safety, combustion or integrity.

Generally, quasi areas will have some areas open to the garden or side of the building to give the impression that while undercover (pergola, veranda, carport or balcony) and semi-closed in, you are outdoors.

Unless these openings conform to the criteria as defined in clause 1.8.80 and Appendix I, then this area is quasi-outdoor and will have insufficient openings for ventilation and dispersal of combustion products to allow for outdoor appliances to be used, such as BBQs and patio heaters. Outdoor hot water heaters must not be installed in these areas unless it is a continuous flow hot water heater and installed as per clause 6.9.4 and 6.2 (see page 10).

If your client is persistent in wanting to use a BBQ in a quasi-outdoor area, then strict criteria must be met. Some key criteria are:

- At least an area equaling 10% of the combined four walls is permanently open
- A suitable range hood is installed over a certified BBQ
- An air flow switch is interlocked to an approved gas solenoid to prevent supply of gas unless the range hood air flow is proven
- If the BBQ has no flame safeguards (thermocouples to all burners) then a pressure proving system must be applied
- BBQ, range hood, gas installation and electrical installation must comply with relevant standards and installed by licensed persons

Bulletin 34 has been developed to provide the criteria in detail for BBQs in quasi-outdoor installations and is available upon request.

Quasi-outdoor with BBQ (unapproved)
This is a trolley BBQ modified to fit into a benchtop. These modifications were not approved by the manufacturer. The BBQ is installed within a quasi-outdoor location - again, for which it is not approved.

Enclosed Outdoor Areas

An outdoor gas appliance may only be installed in an outdoor area as defined by clause 1.8.80 and Appendix I. Openings within these areas must allow for free, unrestricted ventilation for the gas appliance and the enclosure. Free and unrestricted ventilation ensures that waste products, gas, dust, and fumes do not accumulate on or around the appliance, and provides fresh air for appliance combustion.

For the purposes of ventilation, the openings in a space cannot be covered with materials which may restrict the flow of air. Materials which restrict the flow of air include shade cloth, flyscreen, café blinds, and any similar materials.

Openings in outdoor areas must be left completely open. Please refer to Appendix I of AS/NZS 5601.1:2013 for examples of sufficiently ventilated outdoor areas.

If unsure about the installation location of an outdoor gas appliance, please seek advice from the OTR by calling 8226 5722.
Location of External Appliances Under Covered Areas – YES, THIS AGAIN!

Despite the inclusion of this and similar articles in previous editions, and in Roadshow presentations, gas fitters are still not complying with regulations!

With land becoming scarce and expensive, developers have quickly adapted to building townhouses and high-density apartments. As a result, it can be difficult for some architects, consultants, builders and trades to correctly place external continuous flow gas hot water systems in safe compliant locations.

In many recent cases they have been incorrectly located in semi-recessed balconies where 50% of the total area is not open to atmosphere. This can lead to the products of combustion accumulating in the balcony and then entering the apartment through any open doors or windows.

Apartment owners often have shade blinds or café blinds fitted after occupancy to achieve better weather proofing or privacy. By doing this they end up fully enclosing the balcony, and unintentionally creating a dangerous situation.

AS/NZS 5601 provides guidance on where to place external continuous flow gas hot water systems on balconies. The OTR suggests that if the manufacturer’s flue diverter elbow is attached to an external continuous flow hot water heater, the heater is located such that the terminal of the diverter elbow is flush with the external corner (edge of the building). This will prevent the installation of shade or café blinds in front of the flue terminal discharge.

NOTE: There shall be no other flue terminals, gas meters, electricity meters, fuse boxes or openings into the building along the wall within the 500mm distance as shown by shaded area.

FIGURE 6.2 (in part) LOCATION OF THE FLUE TERMINALS OF BALANCED FLUE, ROOM-SEALED, FAN-ASSISTED OR OUTDOOR APPLIANCES

Non-compliant hws location. Relocated to compliant location.

Compliant – open on two sides. Non-compliant after blinds installed.
Appliance Connections

The use of composite pipe with a valve and union is not acceptable. The composite pipe should have transitioned to copper before entering into the recess wall box.

As pictured, the composite pipe is at risk of damage on the outer layer when it is disconnected and moved to permit appliance removal.

Marker Tape for Composite Pipe

We all know that PE (polyethylene) tiger pipe and polyamide (nylon) pipe both require marker tape to be laid over them to indicate that there is a gas pipe buried below.

But did you know that this also applies to multilayered (composite) pipe? Whenever plastic (ie PE tiger pipe, polyamide nylon, or composite pipes) are installed in open cut trenches, they require marker tape, (and tracer wire or tape on larger installations), to be laid above them. The marker tape and tracer wire should be laid between 150 mm to 300 mm below the finished ground surface.

The OTR recommends that the marker tape/tracer wire be laid at least 100 mm above the gas pipes.

Reference clause 5.4.6: 5.4.6 Marker tape

Marker tape complying with the requirements of AS/NZS 2648.1 shall be laid above plastic and multilayer consumer piping when installed in an open-cut trench.

NOTE: The marker tape should be between 150 mm and 300 mm below finished ground level. Detectable marker tape may be preferred on large installations eg, schools, factory complexes, etc, or non-detectable marker tape and a continuous insulated singe core tracer wire along the pipe, terminating above ground at each riser.

Pressure Testing

Recent audits have found a considerable amount of LPG installations are left operating with gas escapes to the outlet service. It is believed that pressure tests are being performed with cylinders still connected and without de-pressurising the high-pressure lines between the cylinders and first stage regulator.

The pressure of between 700 and 1200 kPa can be held in this section of pipework which readily supplements a small gas leak on the outlet. In addition to this, the cylinder valve may not be gas tight at the time of performing the test.

An additional volume of gas at 70 kPa will be held between the first and second stage regulator.

One method to ensure the pressure test is conducted accurately is to disconnect the POL fittings from the cylinders and cap off to prevent a reverse flow through the regulators while performing the soundness test.

Elevated Pressure Installations – How to Get the Gas On for New Connections

New natural gas installations that will be provided with a metered supply pressure of above 3 kPa will require a submission to be presented to the OTR for review of its proposed design, risk assessment, testing for soundness and method of introducing gas in to the pipework.

Gas supply will generally not be provided by APA until the following criteria have been satisfactorily addressed:

- OTR has reviewed and considered the design of the outlet service having met the intent of the requirements of AS/NZS601.1:2013
- Pressure testing and purging procedures have been developed and provided with the submission documentation
- Detailed justification for wanting to convey elevated pressure within a building, supported by a risk assessment detailing the controls in place to prevent a dangerous occurrence
- A gas installation eCoC once the installation is completed
- In the event Type B appliances are being installed, a Type B commissioning letter produced by an Authorised Certifier

As with all new outlet installations, whether LPG or NG, an eCoC is required to be presented before the supplier provides gas. This is their assurance that an appropriately licensed gas contractor has accepted responsibility for the installation being installed as per AS/NZS601.1:2013 and this service had been tested for soundness at the required duration and pressure limits.

Bulletin 41 has been developed to provide the criteria in detail of an above 3 kPa submission and is available upon request. The details outlined within this bulletin for submission to the OTR must be provided for review during the design stage to prevent:

- delays in having the gas supply turned on, and
- additional expense in the event the service must be modified to meet with compliance.

The OTR will require at least two weeks to review the details provided. Clear and detailed content in the submission will mean quicker processing of the application.

It is important to remember that Type B appliances will require a commissioning letter, and to acquire this, a submission as per AS3814 will need to be provided to an Authorised Certifier well in advance to requiring gas supply. Bulletin 52 will provide the necessary information to ensure conformity to this application.
Common Trenching

There seems to be a trend in Adelaide’s suburbs where developers are opting to build high density housing on traditional sized blocks of land. This can create problems for contractors when laying services and utilities. OTR inspectors have seen common trenches with pipework installed that does not comply with the requirements of AS/NZS 5601.1:2013.

Often a “first in, best dressed” approach is taken and very little consideration given to correct separation requirements.

OTR gas inspectors will be pro-actively inspecting common trenches prior to backfilling and will be focusing on:

- Depth of cover
- Separation from other services
- Installation of marker tape and trace wire
- Quality of backfill

Below is a quick guide for underground services.

<table>
<thead>
<tr>
<th>Depth</th>
<th>Separation from other services up to 65 mm OD</th>
<th>100 mm separation from protected electrical cable</th>
<th>300 mm depth of cover (foot traffic)</th>
<th>450 mm depth of cover (vehicle)</th>
<th>Marker tape required</th>
<th>Trace wire required</th>
<th>Pipe to be wrapped</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper</td>
<td>✅</td>
<td>✅</td>
<td>✅</td>
<td>✅</td>
<td>✅</td>
<td>✅</td>
<td>✅ (when in concrete)</td>
</tr>
<tr>
<td>Multilayer (comp)</td>
<td>✅</td>
<td>✅</td>
<td>✅</td>
<td>✅</td>
<td>✅</td>
<td>✅</td>
<td>See manufacturer’s instructions</td>
</tr>
<tr>
<td>PE</td>
<td>✅</td>
<td>✅</td>
<td>✅</td>
<td>✅</td>
<td>✅</td>
<td>✅</td>
<td>✅</td>
</tr>
<tr>
<td>Galv</td>
<td>✅</td>
<td>✅</td>
<td>✅</td>
<td>✅</td>
<td>✅</td>
<td>✅</td>
<td>✅</td>
</tr>
</tbody>
</table>

For a more comprehensive guide please refer to AS5601.1:2013 Clause 5.4.

Finished ground level: If vehicles are using the driveway prior to “final finished ground level” is completed, (ie delivering materials) then a minimum of 450 mm depth of cover will have to be achieved before final cover is laid.

Non-compliant installation.  
Great idea! Compliant PE installation held in with sand bags prior to backfilling.
YOU ARE INVITED TO A SEMINAR ON

BACKFLOW PREVENTION

To be held at:
4:30pm–7:00pm
23rd October, 2018
TAFE SA
Tonsley Campus

Guest speakers including:

- **Jeff Clark** – Office of the Technical Regulator (regulating backflow prevention in South Australia)
- **Peter McLennan** – President, Backflow Prevention Association Australia
- **Scott Murray** – Operational Sustainability Officer, Onkaparinga Council (backflow prevention self-management program)
- **Mick Brown** – ValvCheQ by Emerson (manufacturing backflow prevention devices)
- **Michaela Hobby** – Manager, Health Protection Programs SA Health
- **Rick Castellan** – Backflow Specialist (issues related to backflow prevention devices).

The seminar will also feature:

- Product testing and demonstrations.
- Tours of the TAFE SA facility
- BBQ and drinks (kindly provided by FireCorp and ValvCheQ by Emerson)

To register or for further information, visit:

backflow.eventbrite.com.au

KEEPING OUR DRINKING WATER SAFE
Renovation of Sanitary Plumbing and Drainage Pipework
Plumbing Advisory Note – Issued June 2018

The aim of this Advisory Note is to clarify the requirements when carrying out renovations to existing sanitary plumbing and drainage pipework using the Cured in Place Pipe (CIPP) technique, to ensure compliance with the National Construction Code Volume Three (Plumbing Code of Australia).

Renovation Techniques

Cured in place pipe

CIPP renovation is the lining of a drain or plumbing pipe with a flexible tube impregnated with a thermosetting resin. CIPP produces a rigid pipe after the resin has cured.

Cured in place pipe liners are required to be WaterMarked to conform with WaterMark Technical Specification WMTS-518.

Other renovation techniques

Other renovation techniques are:

- Lining with discrete pipes which are jointed to form a continuous pipe, one by one, during insertion
- Lining with continuous pipes made prior to insert ion where the diameter of the lining remains unchanged
- Lining with close fit pipes, where the pipe is reduced to facilitate installation then expanded after installation to provide a close fit to the existing pipe
- Lining with spirally-wound pipes, spirally wound to form a continuous pipe after installation.

For further information, see AS/NZS 3500.2 Clause 3.16, Appendix G.

Legislative requirements

The National Construction Code Series Volume Three, Plumbing Code of Australia - C2 specifies the requirements for designing, constructing, installing, replacing, repairing, altering and maintaining any part of a sanitary plumbing and drainage system.

The performance requirements for sanitary plumbing and drainage pipework installations are satisfied by compliance with AS/NZS 3500.2:2018.

A new lining installed to seal a crack in a damaged pipeline.

Relining Procedure

1. Perform a CCTV inspection to identify if the pipework is suitable for renovation.
2. Clean the pipe with a high pressure jetter.
3. Roughen or mechanically etch the internal surface using sanding disks or wire brushes.
4. Flush to remove any debris.
5. Conduct a second CCTV inspection.
6. Insert the liner.
7. Conduct a third CCTV inspection to ensure the liner is correctly installed.
8. Reinstate the laterals by opening to the full internal diameter of the lateral, alternatively install a one piece lateral junction liner.
9. Perform a fourth CCTV inspection to confirm the integrity of the renovation and satisfactory conditions of all laterals.
10. Perform hydrostatic testing of the renovation. This is particularly crucial for major or complete system renovations.

All renovations of plumbing and drainage pipework must be booked for auditing with the Office of Technical Regulator (OTR). Additionally, an eCoC must be submitted to the OTR and the property owner within 7 days of completing the work.
Understanding plumbing registration terms.

A guide from the Office of the Technical Regulator

Plumbing workers must be licensed and registered to legally perform plumbing work.

Consumer and Business Services are responsible for plumbing licenses. To obtain a license, a plumbing worker must be qualified and competent to carry out plumbing work.

Plumbing work must be certified in accordance with the Scheme issued under Section (69)2 of the Water Industry Act 2012. Depending on the plumbing worker’s level of registration, they may be able to certify plumbing works with an Electronic Certificate of Compliance (eCoC).

<table>
<thead>
<tr>
<th>Level of registration</th>
<th>Approved activities</th>
<th>Ability to certify</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Advanced Plumber</strong></td>
<td>Can perform any plumbing work without direction or supervision.</td>
<td>✅ Able to certify relevant section of eCoC.</td>
</tr>
</tbody>
</table>
| **Restricted Advanced Plumber** | Can perform plumbing work restricted to a group or particular stream of plumbing activities without direction or supervision. For example:  
  - Water Plumbing Work  
  - Draining Work  
  - Backflow Prevention  
  May be able to perform other plumbing work while under the direction of an appropriately registered Plumber or Advanced Plumber who is authorised to carry out such plumbing work. | ✅ May be able to certify relevant section of eCoC for particular streams of plumbing work. |
| **Plumber**                   | Can perform any plumbing work under the direction of an appropriately registered Advanced Plumber who is authorised to carry out such plumbing work. | ❌ Not able to certify.                                                               |
| **Restricted Plumber**        | Can perform plumbing work while under a registered contract of training. Supervision must be provided by an appropriately registered Advanced Plumber or Plumber who is authorised to carry out such plumbing work. | ❌ Not able to certify.                                                               |


Government of South Australia  
Department for Energy and Mining
# Contact list

## Electrical Technical Advice
**Office of the Technical Regulator**  
Level 8, 11 Waymouth Street, Adelaide  
Phone: (08) 8226 5518 (8:30am-4:30pm)  
Fax: (08) 8226 5529  
Email: otrmail@sa.gov.au

## Gas Technical Advice
**Office of the Technical Regulator**  
Level 8, 11 Waymouth Street, Adelaide  
Phone: (08) 8226 5722 (8:00am–5:00pm)  
Email: otr@sa.gov.au

## Plumbing Technical Advice
**Office of the Technical Regulator**  
Level 8, 11 Waymouth Street, Adelaide  
Phone: 1300 760 311 (8:30am-4:30pm)  
Email: otr.plumbenquiries@sa.gov.au  
www.sa.gov.au/otrplumbing

## General Information
**Licence and Address Change**  
Consumer & Business Services  
Phone: 131 882  
Email: occupational@sa.gov.au

**Appointments and Information**  
SA Power Networks  
Builders & Contractors Line  
Phone: 1300 6500 14  
Fax: 1300 6500 16

**Australian Standards**  
Standards Australia  
www.standards.com.au

**AGA**  
Phone: (03) 9580 4500  
www.gas.asn.au

## Training
**Gas**

- **Master Plumbers Association**  
  1 South Road, Thebarton  
  Phone: (08) 8292 4000  
  Fax: (08) 8292 4040

- **Technical Advisory Centre P/L**  
  4/543 Churchill Road, Kilburn  
  Phone: (08) 8162 5640  
  Fax: (08) 8162 5638  
  www.techad.com.au

- **Gastrain**  
  U1, 61-65 Tapleys Hill Road, Hendon 5014  
  (PO Box 83, Royal Park 5014)  
  Phone: (08) 8447 7783  
  Phone: 1300 955 583  
  Fax: (08) 8447 7753  
  www.gastrain.com.au

**Electrical and Gas**

- **TAFE info** (for all training enquiries)  
  Phone: 1800 882 661

- **Peer Veet**  
  Rescue and Resuscitation, First Aid & other Industry related courses:  
  1042 Port Road, Albert Park  
  Phone: (08) 8348 1200  
  www.peer.com.au

**Electrical**

- **ATEC (Adelaide Training and Employment Centre)**  
  Electrical Rescue & Resuscitation Certificate  
  Phone: (08) 8240 1233  
  www.atec.asn.au

## Power Lines/Cables
**Clearance Zones**  
Between vegetation and power lines or building/structures and power lines contact the  
**Office of the Technical Regulator**  
Phone: (08) 8226 5667  
**SA Power Networks (SAPN)**  
Phone: 13 12 61

**For locations of Gas, Electricity or Telecommunications**

- **“Dial Before You Dig”**  
  This service is still available when doing emergency excavations at short notice.  
  Phone: 1100  
  www.dialbeforeyoudig.com.au

## For after-hours locations or gas emergency (including LPG)
- Origin Energy LPG: 1800 808 526  
- Kleenheat: 1800 093 336  
- Elgas: 1800 819 783  
- APA Group Gas leaks: 1800 427 532 (1800 GAS LEAK)

## For gas or electrical major incident reporting 24 hours / 7 days (South Australia only)
- **Office of the Technical Regulator**  
  Phone: 1800 558 811  
  This number also appears in the 24-hour emergency numbers section at the front of the South Australian White Pages

## Gas Trade contact
**APA Group**  
Gas Distribution Network Operator  
Phone: 1300 001 001

## Additional websites for further information
- South Australian Parliament for Acts and Regulations  
  www.legislation.sa.gov.au
- SafeWork SA  
  www.safework.sa.gov.au
- Australian Liquefied Petroleum Gas Association (ALPGA)  
  www.alpga.asn.au
- Australian Competition and Consumer Commission (ACCC)  
  www.accc.gov.au
- Australian Gas Networks Ltd (formerly Envestra)  
  www.australianasnetworks.com.au
- Elgas  
  www.elgas.com.au
- Origin Energy  
  www.originenergy.com.au
- Kleenheat  
  www.kleenheat.com.au
- Australian Standards  
  www.infostore.saiglobal.com/store/