



WORLD PLUMBING COUNCIL 2012 SCHOLARSHIP

TITLE:

**SIMILAR BUT
DIFFERENT**

**A REFLECTIVE VIEW
INTO HOW UK AND
IRISH PLUMBERS
ARE TRAINED AND
WHAT THEY DO.**

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RECIPIENT FOR 2013.**

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Introduction

As the title of this report suggests my research of training and practices throughout the United Kingdom and Ireland identified many similarities but at the same time highlighted certain differences. Part of my role as head teacher of Plumbing at the Centre of Learning and Innovation, St Leonard's Campus NSW Australia, is processing recognition of prior learning (RPL) for overseas applicants.

When the opportunity came to apply for the scholarship it seemed only natural for me to visit the UK and Ireland to see first-hand their plumbing training and practices, as this is where the majority of our overseas applicants come from. The scholarship has given me the opportunity to see first-hand the training received by these applicants and how the industry operates within the UK and Ireland. I would like to thank the World Plumbing Council for the opportunity afforded me through the scholarship program and for their support of Plumbing worldwide. This is indicative of the brotherhood that we **all** share as Plumbers.

During my scholarship I visited training providers in England, Scotland, Wales and Ireland and also had the opportunity to speak to students in each of the countries, as well as plumbers from various areas. In many of the major cities there were street works where aging mains were being replaced, as I witnessed in London, Glasgow, Dublin and Paris. Metallic mains are systematically being replaced worldwide with plastics, another global sign of changing technologies and financial considerations.

I must take this opportunity to thank the many people who assisted me in my quest. Again, a huge thanks to the World Plumbing Council and Stuart Henry for affording me the opportunity to undertake this project. Their support of the Plumbing industry as well as WorldSkills is an inspiration to all. It is so satisfying to meet Plumbers from around the world who share the same passion for their industry and training as you do. It was also surprising for me to realise that as educators of the next generation of plumbers we face the similar challenges even though we are on opposite sides of the globe and also to witness how great the effect of globalisation is.

I would also like to thank Dave Pollard from BPEC for organising my visits in England, Robert Burgon from SNIPEF for organising my visits in Scotland and John Smartt for organising my visits in Ireland. Their assistance, input and advice was invaluable and without it I would not have been able to complete my mission.



The insights I gained through my visits and many conversations provided me with valuable information on which to base my findings. To the plumbers I spoke to, if you are reading this, thank you. I am sure that many of them thought “What is that Aussie guy doing?”. During my pilgrimage I thought I may have stumbled upon the Plumbing utopia, but it seems that all roads lead to PLUMBLAND!!!!!! But how/why? Easy; as we all know, plumbers are the health of the nation and I believe that being charged with this responsibility creates a close fraternity of not only Plumbers, but Plumbing teachers as well,

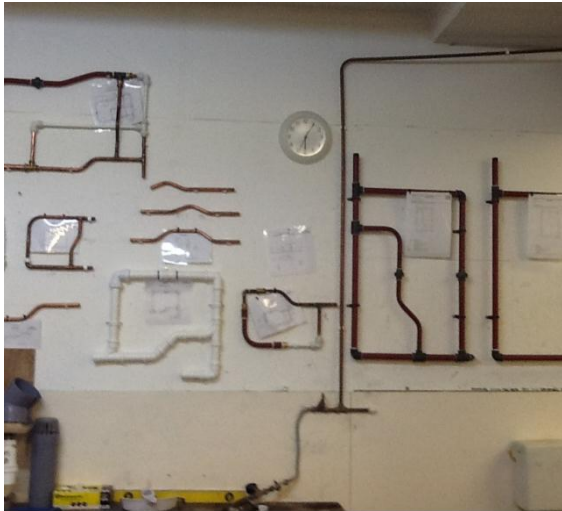
after all we are all Plumbers both those who practice, those who teach and of course those who do both.

To the colleges and organisations I visited thanks for making me feel welcome and allowing me to talk with your students. The following is a brief run down on the training providers and organisations I visited. Training aspects are expanded on further into the report.

Training providers

OCLI – Is one of the largest private training providers in the UK. They have a facility in inner London which they have developed to service central Londoners. The facility may be cramped but like all the facilities I saw they make the most of what they have. OCLI London train non-apprentices as well as conducting assessments for gas certification. Other OCLI

training centres have apprentices as well. Thanks to Steve Palmer for allowing access to the facility and showing us around. Steve travelled all the way from Wales for my visit which I greatly appreciate.



Example of basic skill exercises



Water heating display

College of North West London – is a large public training institution with a recently constructed purpose built state of the art educational facility. The plumbing section is quite large, one of the largest in the college and in the UK. They train apprentices as well as conducting gas training and certification. I would have liked to have brought the gas training area back with me, but even if I could they would not have let it go! Martin Biron demonstrated to me his second life virtual plumbing resource. He would have to be the most dedicated person I have ever seen (except maybe for Cookie!). When you see it you just go, “Wow, does he have any spare time!” Well worth a visit the BPEC website to check it out.



Classroom computers cleverly concealed in the desks



Macerator installation

Right – Portable gas appliance/meter commissioning module. Module connects to pull down overhead gas supply.

Below – Water heater display used for demonstration.



InTAplumb – another private college committed to quality education. InTAplumb focuses on apprenticeship training and gas assessment. As with most colleges they have had to develop their own resources and facilities and they do this with a passion only displayed by the most dedicated teachers. I had the opportunity to speak with a 2nd year class who asked more questions than I did, but it gave me valuable additional insight into what plumbers do in the workplace. The majority were involved in maintenance which is reflective of the older buildings all over London and thanks to their teacher Chris for allowing me the opportunity to participate. I could have stayed all day. Thanks also to Neil Samuels and Peter Mayes for their hospitality and lunch!



Fixture installation and connection area



Electrical training room

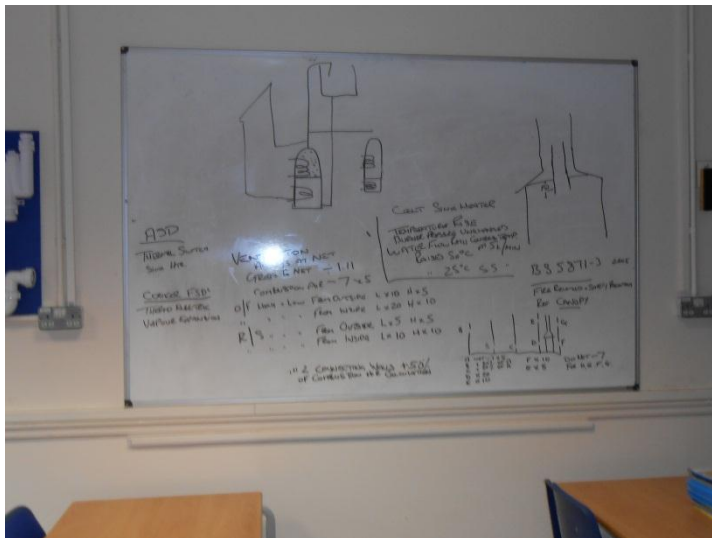


Left - Peter Mayes and Neil Samuels in one of the classrooms at InTAPlumb.

Below - Practical area for heating pipework and radiator installation.



Bexley College – an example of the close relationship that exists between private and public providers is when Peter Mayes from InTAPlumb drove me over to Bexley College (an FE



A familiar site in both the UK and Australia

college) to introduce me to Tony Adams from the Bexley plumbing section. InTAPlumb and Bexley have a close working relationship rather than a rivalry and both have the same aim of providing high quality education to our industry. There was a class completing bench jobs during my visit which reminded me of classes back in Australia. I was tempted to assist

with the class (more likely butting in) as most teachers would, but time wouldn't allow and I didn't have my safety gear! I had a run-down of UK apprenticeships from the college apprenticeship unit and found that the system is very similar to ours. Marketing took

advantage of my visit and ran a press release on it for the month of June, another good news story for our industry. Thanks to Tony Adams for his hospitality.



Tony Adams and myself in one of the workshops

(Photo courtesy of Bexley College)



Industrial burner train module

CK Training and Assessment – private training provider educating mainly adult learners.

They also have a limited number of apprentices. As with all colleges one person teaches and another assesses. Keith was just back from a break and my appearance was somewhat of a surprise, even so he welcomed me and allowed me access to the training facility. I found Keith's approach similar to mine in that he wanted the students to learn "how to be plumbers" and in doing so would automatically cover what is required by the course rather than just delivering the course. Thanks to Keith and Brett for showing me around the facility and introducing me to the class. Judging by their interest I think there may be a few more plumbers coming to Australia in the not too distant future.



*Left - Brett from CK
proudly displaying their
boosted pressure system*

*Below - Part of gas CKs
assessment area*



Moray College – Leadwork has been retained in the Scottish Modern Apprenticeship and nowhere does it better than Moray College at Elgin. Moray College could be classified as the lead capital of the world. There are examples of craftsmanship in lead throughout the college which gives it a definite 'trade' theme. Training is via an apprenticeship based pathway on a day release basis similar to Australia. The students complete pipe jobs and work in bays running pipe work and connecting appliances. As with other colleges the staff at Moray were glad to show me how they trained their students. It was an opportune time to be there as they were hosting the National Skills Competition which allowed me to meet students and teachers from around Scotland in one venue. Thanks to Jim McKinnon and his staff; for showing me around the college and for inviting me to be an observer of the skills competition.



Training bay at Moray College



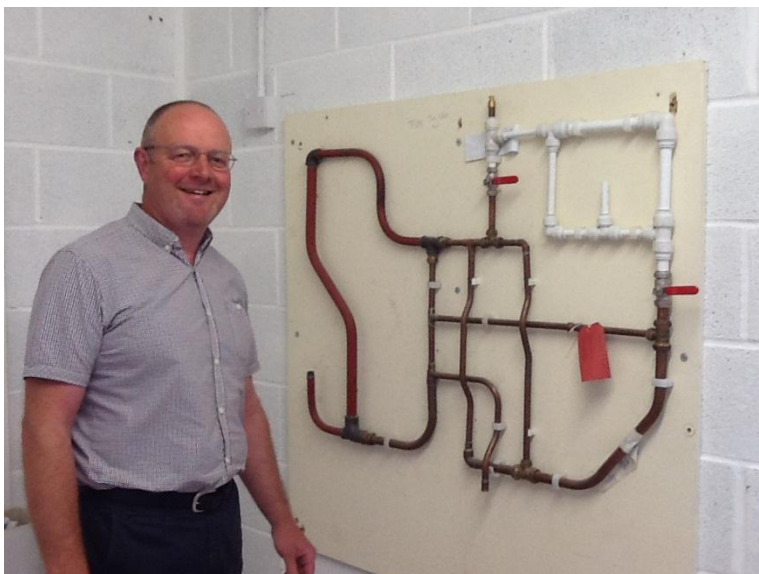
Simulated LPG tank installation

Cardonald College – Cardonald has benefited from an injection of funds not so long ago and has an impressive facility. Being in Scotland they also only train apprentices. As with other colleges electrical is a big part of the final year and training facilities had to be developed to meet the inclusion of the electrical component. As part of the new facilities they have included emergent technologies such as solar, heat pump, ground source energy and rainwater harvesting. They were extremely proud of their solar and alternative fuel training facilities. It just goes to show that training can be, and is, at the forefront of the latest technology particularly when supported by the appropriate funding and/or support from industry. Thanks to Graeme McDonald for sharing his facility with me.



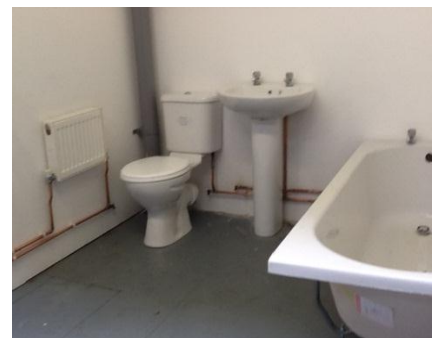
The photos above demonstrate the complexity of installation for heating systems

Cardiff and Vale – this was the only Welsh college I visited and it was just around the corner from where I stayed, purely a coincidence. I must start by thanking Ceri Jones as I just dropped in out of the blue and even though they were short of staff Ceri welcomed me and brought me into the class. It was good to speak to the students as to what type of work they were doing and their view of training. Some were doing maintenance, others a variety of work including renewables. Some of the students find it difficult to gain work experience in all areas and need to actively pursue it. Each learning outcome is assessed by an online test, assignment, on-site portfolio and practical exercises at the college. The facility is relatively new and as normal they had to build most of teaching resources themselves. They deliver the gas training and assessment as well. Whilst in Wales I was lucky enough to hear the Welsh language being spoken when we called into a tea room for refreshment.

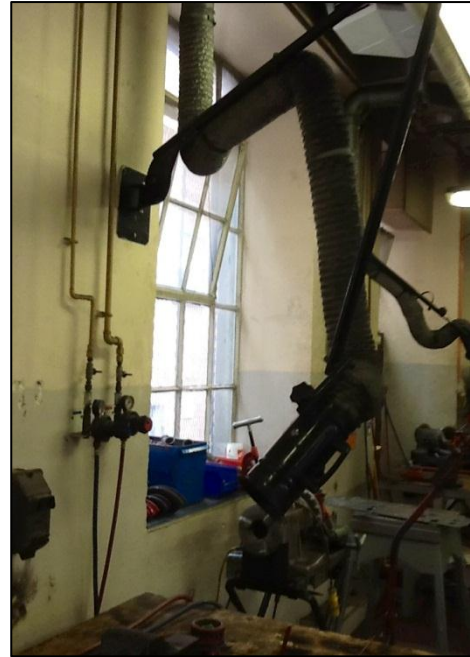


Left – Ceri Jones and one of their pipe exercises

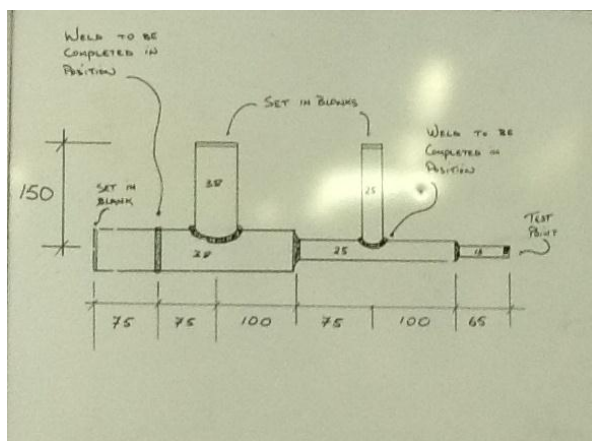
Below – Practical appliance connection exercise



Dublin CIT Bolton Street – the Institutes of Technology deliver phase 4 and 6 of the craft of plumbing. Similar to the UK they teach pipework and installation skills in a simulated workplace, but they also teach welding and steel pipe fabrication. Underground drainage is also part of their training. There are similarities of what is delivered in the UK but the major difference is the apprenticeship structure. This is expanded upon further on in this report. It didn't matter where I went the enthusiasm for teaching and the industry remained the same and Dublin CIT is no different.



Dublin CIT - Welding Bay

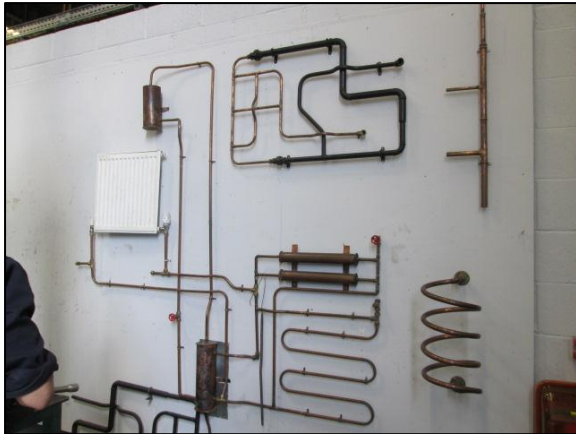


Steel pipe exercise, similar to what we do



NSW steel pipe exercise n progress

Dublin FAS – the FAS colleges deliver the phase 2 section of the craft of Plumbing. As in other colleges the students were completing basic skill type jobs similar to Australian training. Whilst I was there they were working on a threaded steel pipe job. There was more emphasis on threaded steel in training, and more use in the industry then in Australia. I had the opportunity to speak to some of the students in the workshop and they could see the advantage of having the work experience they gained in phase 1 prior to starting college. The college has also developed a phase 7 project to allow out of work apprentices the opportunity to complete their apprenticeship, an unfortunate sign of the times.



Display of pipe exercises



Cold water feed tank for phase 7 project

Cork CIT – as with Dublin CIT they also deliver phases 4 and 6. They have a dedicated welding area, installation bays and electrical work area. As it was at the end of the term classes had finished but the completed steel exercises I viewed were similar to what we do in our welding and steel pipe fabrication units. Pat O’Riordon took time out of his busy schedule to show me around which was greatly appreciated, particularly as he was also coaching the Irish international WorldSkills competitor. I felt a bit guilty taking up his time, but there was no need to worry as he gained gold in the international competition!!!!!!!!!!!!!! Go Cairan!



Central heating bay



Past student exercises on display

Organisations

I also spoke with the following organisations to help me develop an industry perspective of the Plumbing Industry:

BPEC – British Plumber Employers Council is a multi-faceted organisation involved in the advancement of training and technology of the Plumbing industry. The Awarding Body function is just one area of BPEC which is an integral part of the education system. Steve Ward provided me with an overview of BPEC's role and the industry in general which is quite complex indeed. He also briefed me on the role of the awarding body, thanks Steve. The organisation is committed to the continual improvement of the Plumbing industry not just in England but across the world as well. Their charter is to provide quality training and assessment and certification services, which they do. BPEC is highly regarded by the training providers for the quality of their resources.

More information on BPEC can be found at: www.bpec.org.uk

SNIEF – Scottish and Northern Ireland Employers Federation are heavily involved with all aspects of Scottish and Northern Ireland apprenticeships and training as well as being an integral part of the awarding body. They are also part of the group responsible for setting standards in partnership with the Scottish Qualifications Authority in addition to providing resources, setting assessments and awarding qualifications. As with BPEC this organisation provides a platform through which multi-lateral communication can occur between all levels of plumbing including educators, students, employers and union. Thanks to Robert Burgon and Duncan Wilson for their time.

More information on SNIEF can be found at: www.snief.org/index.htm

APHC – the Association of Plumbing and Heating Contractors is an employer association with a multi-faceted function similar to our Master Plumbers Association in NSW. They keep employers informed of developments within the industry and provide a collective bargaining platform when making representation to government on issues affecting the industry. I met with Graeme Dryden from the APHC who gave me an overview of the system. Graeme met me at the BPEC office which is another example of the close relationship that exists between all facets of the plumbing industry. Thanks Graeme for taking time out of your busy schedule to meet with me.

More information on APHC can be found at: www.aphc.org.uk

SummitSkills – similar to an Australian skills sector council they are the drivers behind the standards. They have an employer led approach to ensure that standards and qualifications meet the requirements of industry. SummitSkills is another example of the communication that occurs across all aspects of the industry. It is basically the backbone of the qualifications and courses. As with the other organisations they are also involved in different aspects of the industry. Neil Collishaw and I spoke about all things Plumbing and the future of the industry including changing technologies. Thanks Neil for your time.

More information on SummitSkills can be found at: www.summitskills.org.uk

So how are things similar/different?

Look at the following images of basin connections. Can you tell what country they are from?



Image 1



Image 2



Image 3



Image 4

Neither can I !

Luckily the camera dates the photographs so I can work out where they are:

Image 1 – Singapore.

Image 2 – England

Image 3 – Ireland

Image 4 – France

Look at the next 2 images. What is the main difference?



Image 1



Image 2

Correct, the one on the left is soft soldered and the other hard soldered. This is one of the differences in practices between our countries in that most plumbers in the UK and Ireland soft solder capillary fittings and most in Australia hard solder, a few though do both! So even though some things seem the same, certain practices may be and are different.

The one thing that impressed me most when visiting training institutions across the UK and Ireland was the dedication of the trainers I met. I found they had very similar philosophies to mine, in particular how they all want their students to be the best that they can be, to be the best plumbers that they can be. It became obvious that it takes a particular type of person to become a teacher and how it is more a vocation rather than a job. There is an overwhelming want throughout the teaching fraternity worldwide to give back to our chosen profession and industry through the education of our students and a longing to raise the standard of plumbing across the world. This global dedication and philosophy has given me confidence in the quality of training delivered in both the UK and Ireland. Likewise the Plumbers have similar philosophies in protecting the standards of their industry.

It was interesting to see that the main challenges that training institutions face in Australia is no different to the challenges faced by other countries, namely reduced funding and the problems (some would say challenges) that this brings with it such as more with less. There is also the problem of seemingly ever-changing courses without perceived adequate development of resources and the complexity of students who are caught between these courses. As we do in Australia, the teachers in the UK and Ireland make the system work despite any failings it may have, and are actively involved in the development of resources to make it all work.

Plumbing Education in England and Wales.

Plumbing education begins with a NVQ2 Diploma usually in Plumbing and Heating. It takes 2 years to complete and covers basic skill type outcomes such as industry awareness, communication, safety, tools, as well as, pipework skills, hot and cold water, central heating, rainwater and above ground drainage systems. Training and assessment comprises of both theory and practical components. Each outcome is assessed using a variety of methods such as online theory assessments, assignments, practical exercises and portfolio.

Upon completion of the intermediate level NVQ2 Diploma students then complete an advanced level NVQ3 Diploma which also takes 2 years to complete and builds on the knowledge gained in the NVQ2 Diploma. In the final year students choose one of 3 optional pathways either alternative fuels, gas-fired warm air appliances or gas-fired water and central heating. The majority of students choose pathway 3 as it is the most rewarding option both financially and workwise. Training is completed either in blocks or day release.

Due to the financial crisis the majority of people trained in England are non-apprentices and are usually not working in the industry. Without employment though they cannot complete the full Diploma and don't reach NVQ status. They are awarded a technical certificate (old qualification) or Diploma in foundation studies. Upon obtaining employment they can then complete the full Diploma in Plumbing and Heating. This training is completed in blocks as opposed to day release for apprentices. I visited both public and private institutions and witnessed a similar level and quality of training.

The training institutions deliver the training/courses based on the requirements of the qualification but the Diploma itself is awarded by an external awarding body such as BPEC, City and Guilds, or EAL. The awarding bodies produce training resources including theory texts and online knowledge assessments, which provides uniformity across the training providers and is a system that I believe, would definitely benefit training in Australia. Texts are also supplemented by additional theoretical information and formative assessments developed by the training providers. Physical resources for practical exercises are mostly developed by the training providers in partnership with industry through donations of equipment and materials.

Some of the training providers benefited from an injection of funds to construct purpose built training rooms. I stood in awe of these facilities and the ingenuity displayed by our overseas brothers in how they develop and utilise these resources. North West London is one such college to benefit from this funding. Their gas training



North West London has purpose built facilities

facility is one of the best and utilises portable training modules (basically meters and appliances on wheels) where students can connect appliances to services from pull-down overhead head supplies. This keeps the training area open and accessible at all times whilst providing up to date appliances for students to work on. Unfortunately most of the colleges' resources are showing signs of age (similar to many in Australia) but as in Australia the teachers make the most of the physical resources they have and still deliver quality training.

Glasgow and Cardiff also benefitted from recent updating of facilities which provides a fresh look to the facility and as with NW London up to date appliances. One disadvantage of modern appliances though as we have found is that they are usually pre-set and are no longer adjustable. Colleges were often trying to source older appliances to allow for adjustment especially with the gas training and assessment/certification. It was encouraging

to see the dedication to the profession and students that was displayed by the teachers and the obvious effort they put into developing resources. It was not uncommon during my visits to see projects in development to meet the changing requirements of new courses and improvement of facilities.

Theory is delivered in the classroom with certain exercises needed to be completed before attempting practical. Practical in the first year of level 2 is made up of basic skill building exercises such as pipe jobs in plastic, steel and copper. These are very similar to what we do in Australia. I felt very at home in the colleges and could have joined in quite readily. I would like to thank the teachers for allowing me to speak with their students. I believe they got as much out of it as I did and I may see them in Australia when they immigrate and need to convert to our qualifications!



Student completing project work

In the second year practical is completed in cubicles where students complete projects installing pipework and appliances, often working in pairs. The layout for the cubical needs to meet national standards and are consistent between colleges whether public or private. This is in contrast to what we do in NSW where we separate roughing in (first fix) from the fit out (second fix) as it suits

our unit based training better although I would like to integrate the whole job concept into our training.

Level three is quite different though as students complete a rather large electrical component including practical exercises because they work on appliances connected to electricity (as do we). They still cover water, waste and gas in level 3 but not to the extent that our certificate four units do. When I explained what we did the comment was, “that was how we used to do it”. I felt that there was a consensus that it was a better approach and sensed a longing to return to that level of training. In level 3 there is an emphasis on problem recognition and solving, and commissioning, which ensures understanding

particularly with the gas components. This is another aspect that we could incorporate into our training but probably more so in the certificate 3 (NVQ 2) which is something that we had already been discussing in our college.

Plumbing Education in Scotland and Northern Ireland

One of the main differences between Scotland/Northern Ireland and England/Wales is the retention of sheet lead flashing in the course. When you look around Scotland and the extensive use of lead flashing you can understand why. Another major difference is that you must be an apprentice to undertake plumbing training and unlike England they don't offer level 2 but enrol straight into a Modern Apprenticeship in Domestic Plumbing SVQ Level 3. Training lasts for 3 years and the apprenticeship for 4. The units are similar to the Diploma of Plumbing and Heating delivered in England as both are based on the standards set by SummitSkills.

The lead working units do not go towards the gaining of the SVQ qualification but are a mandatory part of the Modern Apprenticeship in direct response to industry requirements. The extent of delivery of the lead units varies between colleges and is reflective of local requirements. Leadwork is a great platform for developing hand skills even though the students may not recognise it at the time. In Elgin there was a greater emphasis on leadwork than other colleges but when lead is everywhere of roofs in Elgin why wouldn't it be. As with England there is a close relationship with industry most likely due to the awarding body structure. It is a much closer relationship than we have in New South Wales and one that we should try and develop more.



Student completing lead dressing

Early training is spent in skill development with lead work and pipework skills. Some of the lead work that was on display in Elgin was actually mind blowing and cut through to the roots of being a plumber as one who works in lead. The pipework skills exercises are similar to ours and England's and I felt right at home once again. Students then move onto the plumbing modules installing pipework and fixtures in similar standard work rooms as in England as well completing another lead unit. The standardisation is again due to adherence to the National Standards recommended by Summit Skills and industry requirements. As in England there is a large section of electrical training and in the final year the students choose from the optional fuel units of, gas, oil, solid fuel or emergent technologies. Most students select the gas option as it leads to gas safe registration.

The assessment regime consists of theory and practical assessments. Online theory assessments are delivered by the college similar to the system in England which helps maintain uniformity between colleges. The colleges also run formative assessments leading up to these "milestones" to prepare the students and check knowledge prior to assessment. There is a close working relationship between the colleges as well as with the employers. These relationships are nurtured by the having a centralised Modern Apprenticeship Programme which is administered by the Scottish and Northern Ireland Employers Federation (SNIPEF), who act as managing agents and training provider (SNIPEF training) on behalf of Skills Development Scotland, the Governments training agency. SNIPEF use the colleges to deliver this training.

A joint awarding body made up of the Scottish Qualification Authority (SQA) and the Scottish and Northern Ireland Joint Industry Board (SNIJIB) which is a partner of SNIPEF, awards the Scottish Vocational Qualification (SVQ) Level 3 in Plumbing. The completion of the lead units in addition to the SVQ entitles the apprentice to a Modern Apprentice Certificate. The SQA also develops the online theory assessments which as in England provide uniformity in assessment between colleges. The SQA is also involved in standard setting usually adopting the SummitSkills recommendations.

There is probably more emphasis on threaded steel piping then what we have in New South Wales and no fusion or electric arc welding of mild steel or branch fabrication. Underground

drainage is also covered but not to the same extent as in our courses in Australia, which is reflective of the industry practice of both countries.

Plumbing Education in Ireland

Education methods in Ireland vary greatly from the UK. Plumbing apprenticeships and training is regulated by Foras Aiseanna Saothair (FAS) the Irish Training and Employment Authority. Ireland has a seven phase system for Plumbing training which includes 4 on the job phases (working for an employer) and 3 off the job (in college) phases. As in Scotland training is via an apprenticeship pathway and students have to successfully finish all seven phases to complete the craft of Plumbing and their apprenticeship.

The training is part of the 10 level National Framework of Qualifications. The off the job components are full time for periods of up to 20 weeks, i.e. when in college they do not attend work and when at work they do not attend college. This allows for more project type work to be carried out and intensifies the training. It also forces a close relationship between the employers and colleges as one supplements the other. It seems to be a system that works well.

The basic skill training is similar to the UK but also includes steel welding, arc welding and steel pipe fabrication. It also includes below ground drainage. There is no lead work taught in Ireland as is the case in England and Wales. Phase 2 is usually completed at an FAS college and allows entry into the second year program at an Institute of Technology



Dublin student completing the final stages of his exercise

for phases 4, 6 and in some cases phase 7. Phase 7 is usually an on the job component which now can be completed off the job at an Institute of Technology. This is a reflection of the

downturn in industry that Ireland is experiencing at the moment where apprentices cannot secure employment for this final on the job phase. Let's look at more detail into the phases

Phase 1 of the training is spent in employment gaining valuable experience. This provides the student with an introduction to the industry and gives them a real world basis to link their phase 2 training to. This means that the students already have a relatively substantial experience in the industry prior to attending off the job training. I can definitely see the advantage of this experience to remove some of the bewilderment that students often experience when being thrown straight into training. Students also cover safety in these early stages and cover very similar components as we do, which seems to be a worldwide trend. We have more sheetmetal in our basic skill training and include trench support and working safely on roofs early in their training.

Phase 2 is what we would call basic skills or as now referred to common units i.e. common to all the streams in our plumbing course. My observation of the types of projects undertaken by the students in phases 2 and 4 was that they were very similar to some of the tasks we would do. Phases 3 and 5 provide the on the job experience needed in pipework skills and plumbing and heating systems for phases 4 and 6.

Phase 4 moves into what I would term systems training for hot and cold water and heating systems and is delivered at an institute of Technology as the FAS centres do not have accreditation to deliver level 6 courses. The install rooms, where the practical piping and appliance installation takes place is very similar to the UK where students run pipework and connect fixtures. As in the UK the setup of these rooms is guided by the national standards. Phase 4 also include pipe work jobs and steel fabrication as a lead up to the installation and systems training.

Phase 6 is where the student selects an optional fuel unit. As in the UK students usually select the gas option which is delivered in an Institute of Technology and has a more theoretical content. A phase 7 project has been developed to allow students to complete their apprenticeship so as not be held back because they can no longer secure employment. It is basically a set-up which mirrors a whole house installation where the students complete

the installation over a period of time. This allows them the opportunity to demonstrate competency in their plumbing skills and allow them to complete their apprenticeship. The phase 7 concept may be one that could be incorporated into our RPL program.

Apprentices are paid an allowance by FAS whilst completing the off the job phases. This is a cost to the government but eases the burden on employers as the apprentices are away from the workplace for periods up to 20 weeks. Each phase is supported by a detailed syllabus outlining what is required by the students and how it is to be assessed. It is a system that I would like to see implemented in Australia. Apprentices in Australia are released for three years usually one day per week to complete their certificate three in plumbing and attend in their own time for the licensing units. Some regional training institutions in Australia deliver the training in blocks to an equivalent amount of time.

SkillPlumb/WorldSkills

Whilst in Scotland I was lucky enough to attend the national SkillPlumb competition. It was similar to our WorldSkills competitions at home except for the lead work and radiators! The students displayed a high level of dedication and skill with the mix of success that you would expect anywhere else in the world when working in a high pressure situation. As in Australia the participants were supported by their employer and trainer (teacher). Moray College Elgin in Scotland's north hosted the competition and also organised a spectacular demonstration of lead work which was second to none.

Past competition winners lead teams of students flashing a lead dome and constructing a lead box gutter, rainwater head and downpipe. The bossing and welding seemed to be relentless to achieve a common goal within a deadline which was interrupted as I spoke to the students and answered their questions. They seemed just as interested in how the industry operated in Australia as I was in how the Scottish industry operated.

The event was organised through SNIPEF and Paul Johnston did a remarkable job of pulling it all together ably assisted by the staff at Moray College. All the material was donated by industry with Worcester being the main sponsor.



Lead dome being constructed



Displays in foyer at Elgin



Winner of the Scottish Competition

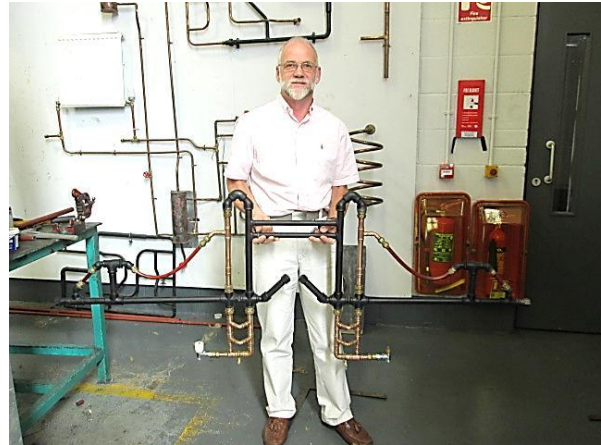


One of the lead demonstration displays

At Cork Institute I witnessed Ciaran Coady training for the international competition. He was kind enough to afford me some of his time to discuss 'all things plumbing'. He was training out in one of the main foyers to help him get used to the public observing him in the competition mode. It seemed to work as he was the gold medallist in the international competition. Congratulations Ciaran as we all know an achievement like this does not come without a lot of hard work and of course natural talent. Hope to see you in Australia some time! Congratulations to Pat O'Riordon as well, Ciaran's trainer and mentor, it is great feeling when it all comes together!



***Pat O'Riordon and Ciaran Coady
Mentor and 2013 world champion!***



***John Smart and his Tower Bridge project which was
part of a project for the Skill 15 (Plumbing and
Heating) Competition at WorldSkills 2011, London.***

Plumbing practices

One of the first things you notice when arriving in the UK is the lack of water pressure. This is one of the reasons why cold water break tanks are installed in most premises. With globalisation and the desire to have 'good' water pressure many installations now utilise pumps to boost the water pressure. This has been incorporated into the plumbing courses to reflect what happens in industry. Training facilities have installation training bays incorporating a plastic break tank from which the students run their pipework to the fixtures in a simulated workplace. New builds tend to utilise the pump booster system and in response training facilities have at least one room set up with a simulated pump booster system if not more. Having stayed in accommodation using the booster system it has problems of its own in the noise that it generates (wrrrrrr – boink) and the simple fact that it is a mechanical device which can break down.



Cardiff and Vale – Pump booster system

My first misconception was that plumbers in the UK specialised in either heating or gas. This to some extent is true but many of the plumbers did a variety of work including heating, gas, gutters, downpipes, water plumbing and maintenance. Due to the age of everything



Gutter training at Bexley

most interested in how things worked in Australia and how they could best get there! They were very similar to my students back in Australia.

maintenance is a big part of their industry. The irony is that the same misconception of specialisation was reflected in the view of Australian plumbers by those in the UK. It is true that some firms in Australia do specialise but the majority of small businesses work across a broad range of the plumbing spectre. I had the privilege to talk to some of the classes that I visited and the UK students were

The biggest and most significant difference in Plumbing practice is that you do not need to be licensed to run a Plumbing business in the UK or Ireland. This makes it hard to control the industry and the free travel between the UK and Europe exasperates this situation. Gas on the other hand is more regulated then in Australia with practitioners needing to be registered with GASAFE and in England they are also required to be re-assessed every 5 years. This re-assessment is at the applicants own expense. Even with the expense of certification and re-certification most students choose the optional gas units in their final year of training as this provides a lot of work and is more likely to generate a higher profit.

There is a large usage of plastic piping for water, heating, gas and above ground drainage as well as a significant amount of steel. In Australia plastic is becoming increasingly popular as well but steel is almost a thing of the past apart from large mechanical and fire service work. Most of the plastic piping in the UK and Ireland seemed to be of a composite nature using an aluminium central core for strength and are either push-fit or crimped jointed. Copper is being used less and less throughout the world due to availability problems and economic reasons. In the UK and Ireland copper is mostly soft soldered whereas silver (hard) solder is more widespread in Australia. Press fit jointing of copper is also taking hold and has similar limitation to its use in UK/Ireland as in Australia, e.g. you must use the proprietary tool and can't mix tools and fittings between brands.

Plastic is being used to replace aging infra-structure across the world and I witnessed replacement of mains in England, Ireland and France. Rusting cast iron and excavations look the same wherever they are. Ductile is also being used where the need arises for the strength of metallic pipe and is the same product that we use here in Australia.



Plastic watermain replacement in London



Excavated cast iron main in Paris



PE gas main in Glasgow



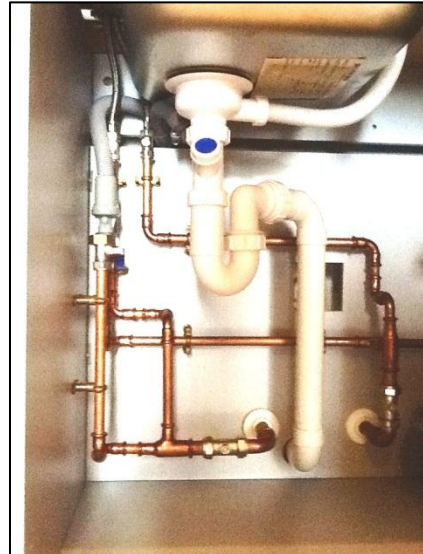
Replacement of cast iron with ductile iron in Edinburgh

There is also an extensive use of compression fittings on copper in lieu of soldered fittings in the UK and Ireland. It is not unusual to see an installation entirely of compression fittings for

water piping with little use of solder! The use of compression fittings on copper is very limited in Australia and is something that an overseas plumber would need to adapt to when working in Australia as is having to silver solder, rather than soft solder. Personally I quite like soft soldering but as I said it is not the preferred method of jointing copper used by most plumbers in Australia and also not a permitted method of jointing copper for gas systems in Australia.



Cork CIT trained plumber using steel for gas



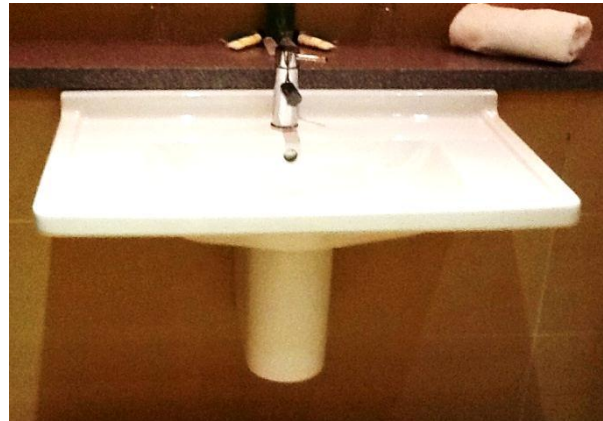
Press fit fittings

One of my English RPL students assured me that not all plumbers in England ‘overuse’ compression fittings for copper installations and showed me a photo of an installation he did in England to prove it. The type of work done and the methods of doing it vary throughout the UK and Ireland as they do in Australia. Larger work in the UK requires silver (hard) soldering so not all plumbers are restricted to soft solder and compression fittings. Changing technology though is on the increase in all our countries and plastics are becoming more popular in part due to financial considerations.

Another major difference is that underground drainage is usually completed by “ground workers” in the UK. Plumbers run the above ground sanitary plumbing from turn ups left by the ground workers. I was aware of this before I arrived but was surprised to find that the ground workers in many cases also run the property service from the water meter to the house and the Plumber then runs the water service from the stop tap left by the ground

worker. Even in Ireland where plumbers do install below ground drainage I found contractors who choose to use ground workers, so experience in drainage varies in Ireland as well, depending upon the preference of the individual.

Single lever taps are also everywhere throughout the UK and Ireland. As in Australia these need a form of isolation and the UK uses an inline isolating ball valve with compression fitting either side which are turned on and off by a flathead screwdriver, in Australia we usually use a loose valve mini cistern tap. Something that was prevalent throughout my visit and very



Single lever basin tap

rare in Australia is the use of power showers. These were installed with varying success. I found that they did not work as well with water saving showers which made them hard to regulate. Some of them just boosted the pressure whilst others heated the water as well.

Something that is seen in Australia as more of a luxury and in some way a novelty is central heating and under floor heating. In the UK and Ireland central heating is a **must** and nearly every room at the very least has radiators on the wall, even in the bathrooms! Floor heating



Radiators are even in bathrooms

seemed more popular in newer construction and I often found the buildings too hot, I know that sounds unbelievable for someone coming from Australia! As you would expect central heating plays a significant role in the plumbing training in the UK and Ireland. The skills and principles learnt are transferrable to Australia. The central heating aspect adds additional piping to a hot water system

installation with a lot of installations using combi/condensing boilers. In Australia there are a lot of continuous flow gas water heaters which are similar to a combi-boiler but without the central heating connections, which means that for an overseas plumber the installation

of a continuous flow water heater would be an easier process when compared to the installation of a water heating system that includes central heating.

Plumbers were surprised to hear that we don't use expansion tanks on our domestic hot water system installations but instead rely on the temperature and pressure relief valve to relieve expanded water. When I mentioned this to my class in Australia one of them responded, "that is how you know it is working", which is quite true. We also don't usually install cold water expansion valves on the inlet to the water heater in NSW as the water quality is high and not prone to calcification. In other states of Australia though, cold water expansion valves are mandatory due to a higher mineral content causing calcification of fittings and/or the pipework.

I didn't witness much drainage work in the UK but from what I did see the laying practices seem very similar.

The main difference is the use of junction boxes as opposed to junction fittings but the principles of levelling and pipe support remain consistent. Another difference is the part use of rubber ring joins on the drainage system as opposed to it all being solvent cemented as in



Root intrusion at a property in Bournemouth. The plumber was discussing with the builder whether they should relay or reline.

Australia. Again the principles of pipelaying remain the same and solvent cementing is still used, so adapting to Australian conditions should be a simple process. The use of rubber rings in the UK allows for movement and you can twist the pipe to attain a certain angle. When it is all glued as in Australia it has to be right the first time because as once the glue takes it can't be easily moved. One thing that remains the same is that tree roots continue to damage VCP drainage pipes. There is hardly a plumber in the world who has not cleared a drain!



*Left – Stormwater drains being laid.
Note each fitting has at least one
rubber ring join.*

*Below – PVC-U stack on a relatively
new installation*



The same can be said for sanitary stackwork where it also is partially glued and partially compression joined which again allows for twisting of fittings to allow easier alignment. With a completely glued fitting it needs to be correctly aligned the first time. The distances that pipework can run unvented also varies between Australia and the UK/Ireland as does the sizing of pipework. An example of different sizing is the use of 32mm for basin connection as opposed to 40 mm in Australia although, we used to use 32 and New Zealand still does. Also kitchen wastes were piped in 40mm and ours in 50. These are minor differences though which can be overcome by learning the local regulations.

All our waste pipes have a maximum length of 2.5 m for above ground pipe work whereas in the UK the length varies according to the size of the pipe. This allows for upgrading of pipe size to increase maximum length where we would either redesign the installation to comply with the maximum length or use a trap vent (trap vents cannot be used on fixtures running through a floor waste). I find the floorwaste gully invaluable in design as you can run up to 2.5m to the floorwaste then up to 2.5m from the floorwaste to the stack, a total of 5 metres. I noticed an increasing use of polyethylene for sanitary pipework and other services jointed by electrofusion fittings in the UK and Ireland.

I found walking into a bathroom and not seeing a floorwaste quite unusual. It is common practice in NSW to install a floor waste gully in a bathroom even though it may not be required by the Building Code of Australia. I said NSW as not all states in Australia use floor wastes in bathrooms except for what is commonly referred to as wet rooms such as in a commercial property or where overflow can enter someone else's premises. Having a floorwaste requires a hard floor surface such as tiles but with no floorwaste many floors in the UK and Ireland (as in Victoria, Australia) are timber or even carpeted. I suppose it is what you are used to, but when a flexi breaks under the basin it is sure handy to have the floor waste there! I find that a floor waste simplifies the installation of a stack by allowing waste fixtures to be connected to the floor waste gully riser rather than directly to the stack itself thereby cutting down on the number of junctions in the stack.

Our baths usually penetrate the floor and run through the floorwaste but in the UK and Ireland they are usually trapped directly under the bath above the floor using a special squat bath trap. This pushes the height of the bath up which I personally found unnerving particularly when stepping out of a wet bath to a floor at a lower level, often up to 150 mm lower than the bath. When the waste penetrates the floor to connect to the floor waste it allows the bath to virtually sit on the floor, this permits easier ingress and egress. Baths in NSW usually are bedded on a mix of sand and cement and installed by the plumber or sometimes the builder. UK baths from my observation are mostly on a frame which personally I prefer.



Under bath trapping

Shower floors in the UK/Ireland are usually a prefabricated shower base or a shower over the bath. Most of our showers use a waterproofing membrane applied directly to the floor and ceramic tiles laid over the membrane on sand and cement bed. I can see the advantage of a base and realise that it suits retrofitting in older buildings which are often difficult to retrofit and the base provides a waterproof structure without too much fuss and alteration to the building. Shower bases and showers over baths are also used in Australia but not to the same extent as in the UK and Ireland.



***Shower bases have been around for a long time
This one is at Edinburgh Castle!***

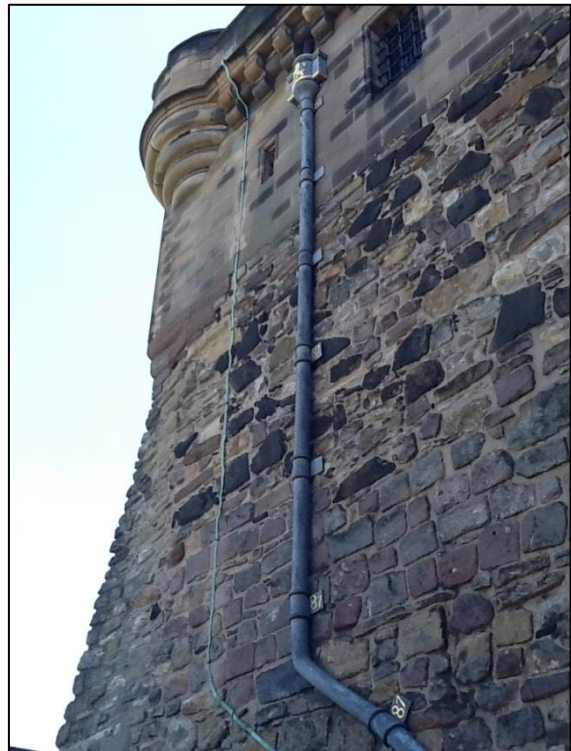


Showers over the bath are a common sight

The use of lead for roofing in Scotland is rather unique. You see it on slate roof ridges, hips and valleys as well as box gutters. I viewed older heritage buildings with lead rainwater heads and downpipes dating back hundreds of years which I found amazing! It was not surprising then to stumble across a lead museum in the Scottish highlands at Wanlockhead the highest village in Scotland. Those tradesmen were our early Plumbers the true the “workers of lead “, and it is pleasing to see this tradition still alive and well in Scotland.



Lead rainwater head and downpipe and bracket on display in the lead museum 1848



Lead rainwater head and downpipe on a building in Scotland dating back to 1887

Emergent Technologies

In a world of energy and resource conservation there is a drive towards using different fuel sources. It was interesting to see solar energy being used as you would not think that the UK



Evacuated solar tubes being installed in Ireland

climate would be suitable for it. Most plumbers assumed that Australia would be full of solar water heaters but when I explained how the cost often made it prohibitive they said it was the same there. Heat pumps were another alternative as was ground source energy albeit at a cost. These emerging technologies are included

in the training centres throughout the UK and Ireland. In England they are looking at phasing out gas water heaters from 2016 due to the uncertainty of supply and dwindling resources. Here in Australia gas water heaters are

considered low energy appliances and gain valuable environmental points for the building application process.

Sustainable practices and environmental awareness is a worldwide phenomenon and has been incorporated into the training systems throughout the UK and Ireland. The cost of the technology as in Australia has prevented it being embraced as standard practice. Bio-mass fuel is an alternative that I had not witnessed before.



Emergent technologies at NW London and Cardonald



Solar training – Cork CIT



Bio mass boiler – Cork CIT

Implications of research

Even though I visited many colleges and spoke to a variety of people I cannot categorically state that I have a **thorough** understanding of the system of training in the UK and Ireland. I am not sure if many do as with our system it is fairly complex and constantly changing. To have a thorough understanding I would need to live and work with the system for a much longer time than I had, many teachers I spoke to thought a teacher exchange program would be good (now there's a thought). Even so I now have a greater understanding of plumbing in the UK and Ireland and my research will definitely impact on my practice. My main objective was to see the standard of training and what areas were covered rather than know all of the ins and outs of the system. Why?

Because systems change but the dedication and the standards of the teaching usually remain the same, despite the system. The level of dedication and the standard of teaching I observed in the UK and Ireland has given me confidence in the training that is and has been delivered. As I mentioned before it takes a certain kind of person to stick at teaching, one who wants to give back to the industry which they work in and cares about the standard of that industry. Both in Australia and the UK/Ireland I have witnessed these qualities, which makes me proud to be part of this fraternity.

What is different though is what we cover and what is practiced in the workplace. The most obvious gap is underground drainage. Underground drainage may be covered in Ireland but is not practiced by all plumbers so what does this mean? It means that most plumbers from the UK and some from Ireland will have a definite gap of underground drainage. This means that it is a stream of our course where they can start gap training almost immediately depending upon availability at the time. Plumbers from Ireland would need to be interviewed about their experience and what evidence they have as some may only need updating on the theoretical and design concepts due to their practical experience. I was aware of this before I left through my contact with overseas applicants but was pleased to have this confirmed during my visit. It also confirmed that this is a good approach and a starting point for updating their qualification to a NSW certificate three.

The NSW certificate three in Plumbing contains 57 units of competency whereas in England and Wales there are 25 learning outcomes. Ireland also has similar number of units albeit different to the UK. Scotland has even less units with formative and summative practical components plus one optional unit in fuel systems; it also has the additional units for lead as part of the Modern Apprenticeship. Not that this means that we have twice as much in our Certificate Three in Plumbing as it has 864 nominal hours whereas the UK Level 3 NVQ Diploma in Plumbing and Heating for example has 1034. Obviously you can't just go by titles of learning outcomes or units alone but need to open the unit and look at the detail inside. I am rather envious though, of having fewer larger units as it simplifies the assessment process and cuts down on paperwork!

Reading through the BPEC learning outcomes for the new Diploma takes me back to when we used syllabi in NSW which was also based on learning outcomes. I am not saying that this is old fashion rather a system that works well and is not as complicated as our current unit of competency structure. The learning outcomes and units of competency need to be cross referenced to map them for equivalency for the RPL process. The centralised assessment through online theory tests developed by the awarding bodies is also another aspect of training that I am impressed by and would like to emulate but due to the structure of our system it is not possible to do so.

The skills demonstrated by plumbers in the UK and Ireland are definitely transferrable to Australian conditions. We all have pipework skills such as measuring, cutting, soldering, bending, gluing etc. and we also install fixtures, clear drains and put taps on the wall. The list goes on but it does relate to what experience one has. I found when speaking with plumbers working in the field that I could have been talking to a plumber in Australia, apart from the accent of course (I didn't realise that I had one!).

Basically fixtures are the same, a toilet looks similar, a basin looks similar, a bath looks similar except higher. Piping is slightly different though in relation to size and maximum unvented length but a solvent cemented join is the same overseas as it is in Australia! The use of rubber rings differs though as I said before we do not make use of rubber rings for sanitary work as do plumbers in the UK and Ireland except to allow for expansion. The skills

used in soft soldering can be utilised and built upon to update to skills needed for hard soldering, although some overseas Plumbers come with this skill already.

Where to from here

In my application, apart from seeing first-hand what occurs in the UK and Ireland in regards to training and work practices I also wanted to be able to integrate my observations into the RPL program to make it a more streamlined process. So how can I achieve this? Firstly let's look at how the program currently works.

Step 1 Applicant completes pre-assessment form and supplies copies of qualifications.

This helps the assessor to develop a picture of the applicants plumbing experience and also gives the applicant an understanding of what is in the course. The pre-assessment is based on the units of competency (all 57 of them) and uses terminology consistent with our training package which can sometimes provide some confusion. I have tried to incorporate terms such as first and second fix to make it more user friendly.

Step 2 Interview process

In the interview further questioning is undertaken around the units contained within the course in addition to information already provided by applicant. This is where the assessor can ask more probing questions to clarify any points and allow the applicant to provide further information especially for questions that they did not understand in the pre-assessment

Step 3 Practical assessment

Practical assessment is not usually necessary at this point as applicants can demonstrate practical capability during the identified gap training but it is still an option.

Step 4 Gap Training Plan developed

The gap training plan identifies the units where there is either little or no evidence and what additional evidence needs to be gathered. Usually most units need some form of additional evidence as applicants for the most part don't have any Australian

experience. The training package requires direct observation as part of the evidence gathering procedure.

Step 5 Gap Training Delivered

So how has my research changed my view on how best to implement this program? Well for many applicants they feel as though they have no direction as there is no 'specific course' as each one is different and require an individualised plan. This is true to some extent in that the program is different for each applicant depending upon their level of training, workplace experience and time spent in the industry. This means that I can't say up front what they need to do without going through the preliminary procedures. I have had applicants who have run their own business in the UK for 20 years and others basically straight out of training with minimal workplace experience and everything else in between. Obviously their needs vary greatly but they all still would like to know "what course do I need to do".

One of my objectives was the possibility of developing a course so we can say, "this is the course you need to do to update to a NSW Certificate Three in Plumbing". This may just be a pipe dream (pardon the pun) due to the differences between applicants and the fact that 'one size does not fit all' as we used to do in the past with the Plumbing Overseas Conversion Course. My observation during my visit confirms that in the UK and Ireland, as in Australia, individuals do vary greatly in their experience, knowledge and skill base and as such what they need to do to convert also varies greatly. Even so there is some common ground which I can explore.

The practical plumbing skills are similar between the UK/Ireland and Australia, in particular pipework and appliance installation skills. Because of this I can see the value in developing an underpinning knowledge based course of what is required by the Australian standards for at least the water and gas stream. This course could be undertaken in conjunction with the RPL application to provide Australian competency evidence and would help to make the process more streamlined due providing observable Australian evidence. Applicants may even complete this course prior to applying for RPL and ideally it could even be an online course that may be completed overseas with final assessment conducted upon arrival.

This would also provide a pathway for applicants to commence the RPL process and no matter who was applying they could start with this standards appreciation course and then move on from there. Once in the system and with further explanation of the requirements applicants would have a better understanding of the course and what needs to be done to gain a Certificate Three in Plumbing at a much earlier stage. So let's get back to the steps of the program for another look.

Step 1 the pre-assessment is still an important part of the process but may now be preceded by the standards awareness course and possibly step 3. This course would also need to include installation requirements such as heights and types of taps etc., basically procedures that differ from what is done overseas. As already mentioned the pre-assessment is an important part of the process for both the assessor and the applicant alike.

Step 2 the interview, still another important step, but rather than base it on the pre-assessment it needs to be centred on the applicants overall overseas and where applicable Australian plumbing experience in general, more of a 'chat' about their experience and preferable recorded rather than taking notes. This would allow for a more informal "professional conversation" where the applicant would be more likely to open up. I found that when I have conducted the interview in our training area where the applicant could refer to appliances etc. they were more at ease when discussing their experience and were able to articulate more readily as they had tangible objects to refer to.

Step 3 Practical assessments, may need to be conducted earlier as already mentioned to provide observable evidence particularly in conjunction with the standards awareness course. Practical assessment when coupled with standards awareness course could then be used to provide Australian and observable evidence for RPL which would shorten the gap training process.

Steps 4 and 5, the gap training plan and gap training would be a more streamlined due to additional evidence gathered prior to applying for RPL into the certificate three in plumbing.

The next step

The next step is more like a staircase as there are many things to do. My research has not only confirmed some of my preconceived ideas and practices but has also identified changes that I would like implement to improve the program for the future applicants. Changes and additions I would to make are:

1. Retain the pre-assessment which now needs to be updated to reflect the new course numbers which commenced July 2013. The units are basically the same but with sustainability added and a new unit number and in some cases slightly different title. Courses are constantly changing overseas as well; this is our fourth course in the last 5 years, makes you wonder if it is sustainable!
2. Re-design the interview question base to allow the applicants to open up about their overseas experience rather than have it based on the course units. I would still need to ask questions about aspects such as welding and sheetmetal experience that would not necessarily be expanded on in a conversation concentrating on the workplace. I have found that most applicants have only done welding at college if at all and also have very little experience in sheetmetal. *I had an Irish gentleman ring me today with whom I can trial the interview process with; so have started already before even finishing this report!*
3. Cross reference units from UK, Scottish and Irish courses against our units of competency. This will be an ongoing project as it is an enormous job but would start with the obvious ones such as communication and health and safety. This process would never end as courses in both countries change at least every 5 years. We have two new trade courses coming on line at the present moment.
4. Develop standards and specific installation requirement courses for at least the water and gas streams. Another huge step.

I left the course development step to last as it will obviously be the largest task to be undertaken. Cross referencing of the learning outcomes and units (point 3 above) will help with the development of this course as I will be able to extract the data from our local units of competency that are not properly addressed by overseas training and experience.

For example:

An applicant may have extensive experience in installing hot water heating systems. Their UK or Irish experience (verified portfolio) would provide them with evidence for the practical side of the unit but they would not have an understanding of the theoretical requirements of the unit. My observation of the installation of hot water heating systems in the UK and Ireland, is that the installation is more complex (due to the central heating connections) than in Australia so it would easily satisfy the practical skill requirement of the unit. The gap for the unit would be in the underpinning knowledge required for Australian competency. By updating the applicant with the requirements of the Australian Standards and then assessing this understanding through an assignment and theory assessment the applicant would then have three forms of evidence to demonstrate competency in the unit. So one down only 56 to go!

Another example is commissioning gas appliances. Applicants with GASAFE registration have undergone a rigorous assessment and in some cases re-certification process to gain or maintain their GASAFE status. As with the hot water heating unit the practical skill requirement would be adequately met but the underpinning knowledge is the gap. The difference in this unit though is that gasfitters in the UK and Ireland soft solder their copper gas piping whereas in Australia it is hard soldered. Most applicants don't have experience in hard soldering so will need updating in this skill.

There is no reason why the underpinning knowledge course cannot be studied remotely from overseas and the assignment completed prior to coming to Australia. This would just leave the final theory assessment and hard soldering to be completed in Australia. I already have a project for the installation and commissioning of an appliance which could be adapted to satisfy this unit along with other gas units such as purging a gas system. Wow 2 down only 55 to go! You can see why, I left this to the last as it is not an easy, nor a quick process!

Conclusion

The objective of my project was to gain a deeper understanding of the training and practice of plumbers in England and Ireland and incorporate this into my RPL program. As I said in my application in relation to undertaking this research it would: *“enable me to see first-hand the training and practice of plumbing in these countries to gain further insights into their respective industry. These insights will help me gain a more in-depth and intimate knowledge of both training, and plumbing practice. It will either, confirm, change or add to the picture I have already formulated through my contact with the applicants”*.

Through the scholarship I gained a deeper understanding of training and practices in the England and Ireland. I was also able to expand the scope of my research to include Scotland and Wales through the contacts that Stuart Henry gave me, thank you Stuart. I realised that the world is smaller than I first thought, the similarities are more and the differences are less. I will be making changes to my own practices in reflection on what I have learnt through my research of plumbing training and practices throughout the UK and Ireland.

There is now a lot to do. Standardisation may not be as easy as I first hoped due to the differences in individuals' experiences. Two statements made to me during my visit stick in my mind. The first was from Ceri Jones when we were discussing the responsibility of educating our students he said, “Where else will they learn it”, which is typical of the responsibility we have as teachers to pass on the knowledge required for our students “to be the best that they can be”. The second was stated by Neil Collishaw when he said “experience counts for a lot in RPL” which made me realise that there is a need for individualisation and customisation in the RPL process. But I also kept hearing the applicants asking, “What course do I need to do?” That is why I want to develop a standards appreciation course as a starting point for applicants.

My research has confirmed, changed and added to the picture I had already formulated. It confirmed the need for individualisation in RPL although identified a need for targeted courses, changed my perspective of training and practices in the UK and Ireland, and added

to the picture of training and work practices that I left with. This may be the conclusion of this report but in reality it is just the beginning.

Let's try this one more time, can you tell what country this WC is installed in?

Neither can I !!!!!!!

For those of you who must have an answer the date on the photo tells me it was in Scotland, actually it is at Arduaine Scotland, a most picturesque and tranquil part of the world. We were lucky enough to be Scotland for their summer, what a week!

