



***A question of skill:  
increasing capacity for RHS***

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The Future of Rainwater Harvesting Systems in  
Buildings

**Friday 21st January 2011**

Exeter University

What skills are needed to install a RHS?

What level of skill is needed in the various trades and professions?

Who has the skills?

Can supply match demand – is there a Cowboy gap?

What is being done to address the skills issue?

What benchmarks, standards, assessments exist?

What are the barriers to the provision of appropriate skilled personnel?

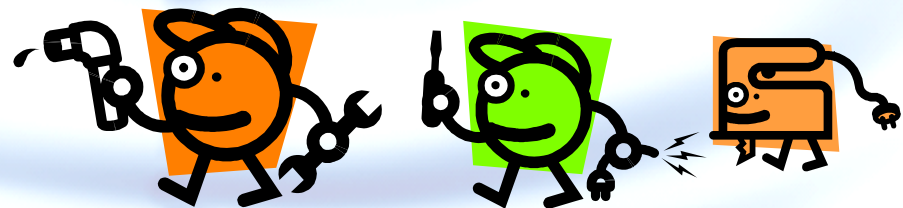
What should and can be done to address the issues?

Conclusions



## What skills are needed to install a RHS?

**Plumbing**  
**Building / excavation**  
**Electrical**  
**Electronics**  
**Drainage**  
**Thermal insulation**  
**Decoration / making good**





## What level of skill is needed in the various trades and professions?

Plumbing	C&G level 2 or above
Building / excavation	FCA? (foundation construction award)
Electrical	DISQ
Electronics	Basic soldering and earthing knowledge
Drainage	Installation of gutters and downpipes
Thermal insulation	Access to WRc guide
Decoration /making good	Honed DIY tiling and painting skills





## Who has the skills?

GreenPlumbers  
Industry trained personnel  
College trained personnel?  
Future college trained personnel?





# Plumbers Qualifications (C&G)

## Plumbing qualifications

Our plumbing qualifications help people at all levels develop the skills needed to work as a fully qualified domestic plumber, or as a plumber doing commercial or industrial installations.

Qualifications <span style="float: right;">?</span>				
Level	No.	Last reg.		
	<b>+</b>	<b>Award in Environmental Technologies</b>	2, 3	2399 31/10/2015
	<b>+</b>	<b>Certificate/Diploma in Access to Building Services Engineering</b>	1	2000
	<b>+</b>	<b>NVQ Diploma in Plumbing and Domestic Heating</b>	2,3	6189
	<b>+</b>	<b>NVQ in Mechanical Engineering Services - Plumbing</b>	2, 3	6024
	<b>+</b>	<b>Certificate in Plumbing</b>	2, 3	6129 01/04/2011
	<b>+</b>	<b>Award in Plumbing Industrial and Commercial Installation</b>	3	6129-66
	<b>+</b>	<b>NVQ in Mechanical Engineering Services - Plumbing (Domestic)</b>	3	6089 31/12/2013



## Electricians qualifications (C&G)

Qualifications <span>?</span>				
Level	No.	Last reg.		
+	Electrical and Electronic Servicing	2,3	1687	
+	Certificate in Electrotechnical Technology	2, 3	2330	01/04/2011
+	Electrotechnical Services NVQ	3	2356	31/03/2011
+	Diploma in Electrotechnical Technology	3	2357	31/10/2015
+	Certificate in Installing and Testing Domestic Photovoltaic Systems	Entry 3	2372	01/04/2011
+	Code of Practice for In-Service Inspection and Testing of Electrical Equipment	3	2377	01/04/2011
+	Certificate in the Requirements for Electrical Installations	3	2382, 2382-20, 2382-10	01/04/2011
+	Certificate in Inspection, Testing and Verification of Electrical Installations	3	2391, 2391-10, 2391-20	01/04/2011
+	Certificate in Fundamental Inspection, Testing and Initial Verification	2	2392	01/04/2011
+	Certificate in the Building Regulations for Electrical Installations in Dwellings	3	2393	31/12/2011
+	Award in Environmental Technologies	2, 3	2399	31/10/2015
+	Higher Professional Diploma in Building Services Engineering	4	4467	
+	Progression Award in Electrical and Electronics Servicing	2, 3	6958	31/12/2010



## Builders qualifications (C&G)

Qualifications <span style="float: right;">?</span>			
Level	No.	Last reg.	
+	Certificate/Diploma in Access to Building Services Engineering	1	2000
+	Advanced Professional Certificate in Construction	3	4444
+	Higher Professional Diploma in Construction	4	4444
+	Master Professional Diploma in Construction	7	4444
+	Higher Professional Diploma in Building Services Engineering	4	4467
+	Construction Crafts Supplementary Studies	3,4	6000
+	Diplomas for Non-Domestic Energy Assessors and in Display Energy Certificates	3-4	6020
+	Mastercrafts Diploma in Building Conservation Restoration and New Work		6154
+	Certificates in Basic Construction Skills	1	6217 31/12/2010
+	Award/Certificate/Diploma in Basic Construction Skills	1	6218
+	Foundation Certificate in Building Craft Occupations	1	6313-01
+	Intermediate Construction Award (Paper based)	2	6313-02
+	Foundation Construction Award	1	6313-11
+	Intermediate Construction Award (GOLA)	2	6313-12
+	Advanced Construction Award	3	6313-13
+	Foundation Certificate in Maintenance of Construction Plant	1	6313-14
+	Intermediate Certificate in Maintenance of Construction Plant	2	6313-15
+	Advanced Certificate in Maintenance of Construction Plant	3	6313-16
+	Diplomas in Construction	1, 2, 3	6314





## Closer look at electrical issues



### **Electrical Considerations for water recycling or harvesting systems.**

- For both systems there is likely only to be a unit which does the pumping and treatment of the water and one for controlling with a user display.
- For a domestic retrofit scenario the treatment unit, which can range in physical size from a small fridge up to a large fridge freezer, would normally be provided with a plug and powered directly from the nearest socket outlet.
- The power of the pump will depend on the amount of water the unit is expected to handle, for example some of the larger domestic systems can handle 30 litres per minute, and the pump might be rated at 1kW.
- For small systems it's even possible for the unit to be powered by a single solar panel rated at up to 12 watts!
- The controls are likely to be low voltage and may even be wireless.



In new builds and for some retrofits the unit might be connected by a Fused Connection Unit via either a radial circuit or off a spur from ring circuit.

Here the fuse rating should be suitably selected for the rating of the equipment and must not exceed 13 amperes.

The usual requirements for RCD protection should be observed for cables concealed 50mm from the surface of a wall or partition or if the unit is installed in a special installation or location which may have specific requirements.





## Water reuse systems

### Vary in:

Application

Size

Location

Layout

Power requirements and supplies

Complexity

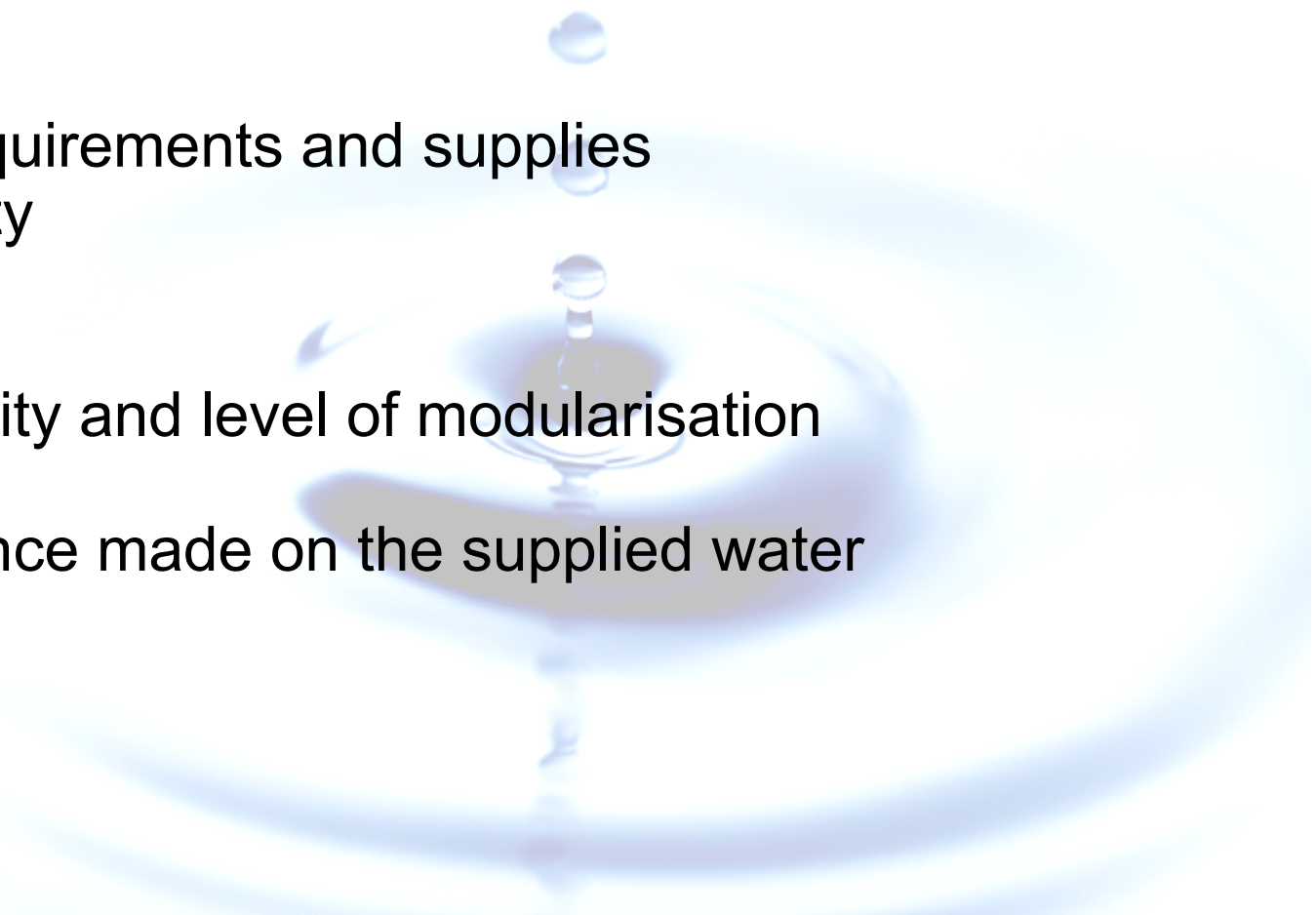
Age

Design

Build quality and level of modularisation

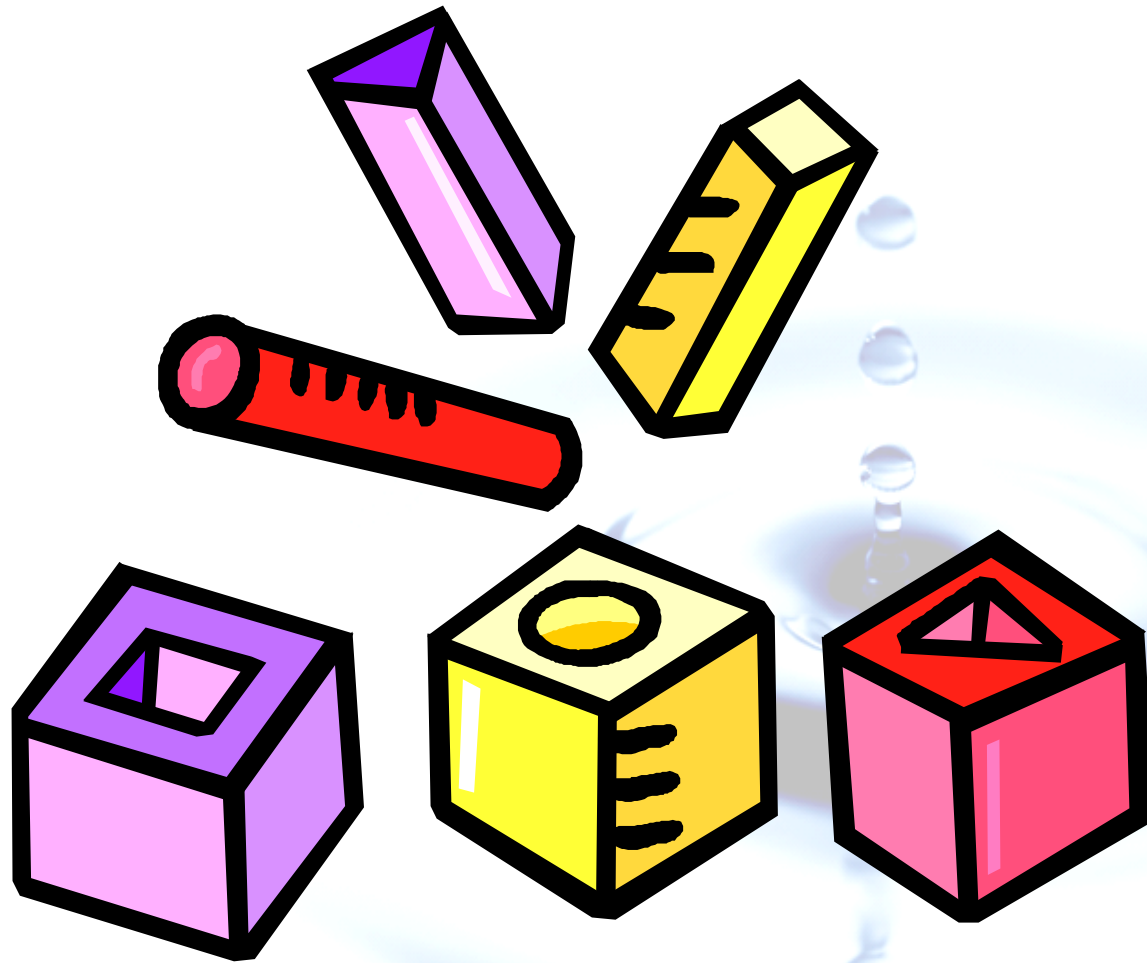
Value

Dependence made on the supplied water





Can one size of qualification fit all?





**Can supply match demand –  
is there a Cowboy gap?**

**What training is out there now?  
How good is it?**



**Rainwater Harvesting and Greywater Recycling** will become more prevalent with the introduction of maximum per head usage figures for new build properties as defined by Part G of the Building Regulations and the Code for Sustainable Homes. Both of these documents allow the use of Rainwater and Greywater for non-potable uses such as toilet flushing and garden watering.

The BPEC course will introduce installers to the different types of rainwater harvesting, greywater recycling and point of use systems that they may encounter in the UK marketplace. It must be noted that such a course will emphasise common system configurations that most installers are likely to encounter. The syllabus covers information required by qualified building services engineers or plumbers to install these systems and will include legal and safety issues and will enable installers to comply with the requirements of the Code for Sustainable Homes.



This package was developed in conjunction with the UK Rainwater Harvesting Association.

The training and assessments are currently available at many of the BPEC approved centres throughout the country. To find your nearest centre please use the postcode search by clicking [here](#).

T	F	S	S
		1	2
6	7	8	9
13	14	15	16
20	21	22	23
27	28	29	30

T	F	S	S
3	4	5	6
10	11	12	13
17	18	19	20
24	25	26	27

T	F	S	S
3	4	5	6
10	11	12	13
17	18	19	20



## What is being done to address the skills issue?

**New Qualifications**

**Potential Competent Persons Schemes**

**CIPHE GreenPlumb**







What is being done to address  
the skills issue?

**Level 2/3 awards in  
environmental  
technologies (2399)  
Information Sheet**

Draft qualification development  
information



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[www.cityandguilds.com](http://www.cityandguilds.com)  
July 2010  
Version 1.2

Environmental technology teaching and assessing are also being developed. Installation-only qualifications and maintenance qualifications of the following subject

- a broad knowledge and

### What is the aim of these qualifications?

The aim of the level 2 award is to give learners:

- a broad knowledge and understanding of the environmental technology industry
- the ability to communicate and provide basic advice on suitable environmental technology systems
- encourage progression to the technology specific qualifications

### Who are they for?

The Level 2 Award in Environmental Technologies is designed for anyone training or working in building services engineering who wants to know more about environmental technologies.

The Level 3 Award is for qualified electricians, plumbers and mechanical engineers who want to broaden their skills to install and maintain environmental technology systems.

3 technology specific qualifications

demonstrate they have the skills to install (and maintain if specific environmental technology need national standard.

### How will they be assessed?

to be a combination of practical tests.



## What benchmarks, standards, assessments exist?

### DISQ

#### Domestic Installer Scheme Qualification

-offering different levels depending on the amount of electrical installation work that the contractor will be carrying out.

It also enables registration with the competent person scheme in accordance with **Part P of the Building Regulations.**



## What benchmarks, standards, assessments exist?

### **CITY AND GUILDS 2393 - CERTIFICATE IN THE BUILDING REGULATIONS FOR ELECTRICAL INSTALLATIONS IN DWELLINGS**

The City and Guilds have also launched qualifications around the Building Regulations known as the 2393.

The the idea behind this qualification is to enable **the allied trades** and existing electricians working in the domestic environment to gain an understanding on how the Building Regulations impacts on electrical installations.

It is a 20 question multiple choice paper completed within 40 minutes and covers the following:

- Building Regulations
- Building Work
- Approved Documents
- Building Control
- Compliance with Approved Documents A to M

It is a short course and usually delivered in one day or over 2 evenings.



## What is being done to address the skills issue?

### **Competent Persons Schemes**

Technically schemes already exist and can be authorized by DCLG under schedule 3 of the Building Regulations, Water Reuse comes under the heading supply of non-wholesome water and goes hand in hand with the inclusions within part G 2010.

The exact text from Schedule 3 of the Building Regulations is :

***Installation of a supply of non-wholesome water to a sanitary convenience fitted with a flushing device which does not involve work on shared or underground drainage.***



# What is being done to address the skills issue?

## Competent Persons Schemes

There are currently a small number of Competent Person Schemes listed in Schedule 3 of the Building Regulations as operating such schemes.

Period: APRIL 2010 to SEPTEMBER 2010

SCHEMES	APHC	BESCA	BINDT	BSI	CERTASS	CORGI	ELECSA	FENSA	HETAS	NAPIT	NICEIC	OFTEC	TOTALS
TOTAL MEMBERSHIP OF ALL SCHEMES EXCLUDING PART P	155	111	188	13	1,884	683	24	9,102	1,569	499	53	9,850	23,943
TOTAL NOTIFICATIONS ISSUED OF ALL SCHEMES EXCLUDING PART P	432	1,015	4444	797	16,526	2,252	25	405,832	24,609	12,145	34	9,065	472,732
<b>PART P MEMBERS</b>													
PART P FULL COMPETENCE ONLY				156			6,294			6,606	23,911		36,967
PART P DEFINED COMPETENCE ONLY	59					734	40			220	67	16	1,136
<b>PART P NOTIFICATIONS</b>													
PART P FULL COMPETENCE ONLY				1,080			115,869			41,133	433,015		591,097
PART P DEFINED COMPETENCE ONLY	33					1,264	304			26,936	7,860	1	36,398

Each scheme may need accreditation against a Standard (such as BS EN ISO/IEC 17024:2003 Conformity Assessment. General requirements for bodies operating certification of persons) and employ a number of inspectors to carry out yearly inspections of any members of the scheme.



## Authorised schemes by types of building work

- **Air-Pressure testing of buildings**
- **Cavity wall insulation in an existing building**
- **Combustion appliances**
- **Electrical installations**
- **Heating and hot water systems**
- **Mechanical ventilation and air-conditioning systems**
- **Plumbing and water supply systems**
  - (a) *Wholesome and softened wholesome water supply*
  - (b) *Non-wholesome water supply to a sanitary convenience with a flushing mechanism (not involving work on shared or underground drainage)*
  - (c) *Sanitary Conveniences, sinks, washbasins, fixed baths, showers, or bathrooms in dwellings (Not involving work on shared or underground drainage)*
- **Replacement windows, doors, roof windows or rooflights in existing dwellings**
- **Replacement of roof coverings on a pitched and flat roofs as a necessary additional work (not including the installation of solar panels)**
- **Microgeneration and renewable technologies**





## Competent Persons Schemes

Although schemes are listed in Schedule 3, **this does not necessarily mean that schemes have registered companies to undertake this work** and could just mean that schemes have been accepted by DCLG for the purpose, as part of an extension to their existing scheme.

If a person wanted to join such a scheme they would need to satisfy DCLG via a scheme that they meet the competency requirements set out in the MTC (minimum technical competency ) document, which sets out the competences required by companies to self certify controlled installations under the building regulations.

The MTC document is not yet complete, however, the NOS (National Occupational Standards) that are used within the document are complete as they were developed by SummitSkills last year.



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<a href="#">Title</a>	<a href="#">Suite(s)</a>	<a href="#">Originator Suite</a>
<a href="#">Contribute to environmental conservation in active leisure and learning</a>	1	Operational Services Incremental change 2007 ( <a href="#">SkillsActive</a> )
<a href="#">Unit 4: Promote Efficient Water Usage within Sustainable Business Practice</a>	1	Sustainable Business Practice ( <a href="#">Cogent</a> )
<a href="#">Unit 8: Control Water Usage Efficiency within Sustainable Business Practice</a>	1	Sustainable Business Practice ( <a href="#">Cogent</a> )

Results page: 1

**REFINE SEARCH**


Keyword search within  
**Search Results for 'water reuse'**

water reuse

Suite  
[no filter]


Originator  
[no filter]

**Need help?**



[Help me find..](#)

**Feedback**



Tell us what you [think](#)



T  
C  
a



This section outlines the knowledge and understanding an individual must demonstrate in order to meet the standards in this area.



cogent

## Performance C

In achieving this:

1. Obtain and
2. Inform other promote ef
3. Ensure wa requiremer
4. Ensure wo
5. Monitor the
6. Support ot
7. Encourage efficiency
8. Provide tra
9. Identify op
10. Identify an responsibil
11. Develop ar
12. Present ck an appropri

## Knowledge and Understanding

Within the limits of your responsibility you must demonstrate that you know and understand:

1. The role of water efficiency in achieving sustainability
2. The impact of water usage on the environment
3. How the effective management of water supports sustainable business practices
4. Organisational water quality standards
5. How legislation impacts on the organisation water extraction, usage and disposal
6. How water is obtained, treated, used and discharged by the organisation
7. Organisational targets for water usage and efficiency
8. The benefits of efficient water usage to the organisation
9. How and why water usage is monitored and controlled within area of responsibility
10. How the effective management and organisation of work can help minimise water usage
11. How staff training and development can help to maintain the effective utilisation of water
12. Organisational procedures for water extraction, storage, treatment, recycling, reuse and discharge
13. How to identify and control potential sources of water pollution within area of responsibility
14. How water usage is controlled and minimised within area of responsibility
15. How the actions of others can impact on water usage
16. The barriers that can limit the impact of water management and how these barriers can be overcome
17. How failure to meet organisational quality specifications can impact on water usage
18. Effective methods of communication for area of responsibility



## GreenPlumb

### Who can join?

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GreenPlumb is open to those members of the CIPHE who are practising in the plumbing and heating industry at the level of Member or Fellow.

The CIPHE will continue to develop a database of training providers and course details to enable efficient access to [training and CPD](#), to assist the requirements of GreenPlumb members, and aspirant members.

The initial pre-requisites are as follows:

Corporate member at MCIPHE or FCIPHE level who has undertaken the following:

- ▶ Energy Efficiency Certificate
- ▶ Water Regulations Certificate

Plus at least one of the following accredited (where applicable) courses:

- ▶ Solar Thermal
- ▶ Ground Source Heat Pumps
- ▶ Air Source Heat Pumps
- ▶ Grey Water Harvesting / Recycling
- ▶ Rain Water Harvesting / Recycling
- ▶ Biomass
- ▶ Water Efficiency





## What are the barriers to the provision of appropriate skilled personnel?

- Numerous courses for different sectors of the construction industry
- Often based upon one manufacturer's products
- Costly for trades people in terms of money, time, lost work, investment
- A developing education and qualification framework for renewables and other 'new' green technologies
- Prescribed Skills, Knowledge and Understanding may not be appropriate
- Basic trades education may not cover non-traditional installations
- Changing and developing Government Policy and initiatives





## What should and can be done to address the issues?

As RHS develop the need for new training will be needed. Training needs to have a core of fundamentals such as:

- Plumbing of non-wholesome water supplies,
- Use of low and mains voltage equipment,
- Safe excavation for tanks and safe installation of cisterns
- Awareness of relevant Building Regulations and current British Standards
- Awareness of likely developments in RHS and how to top-up basic training.

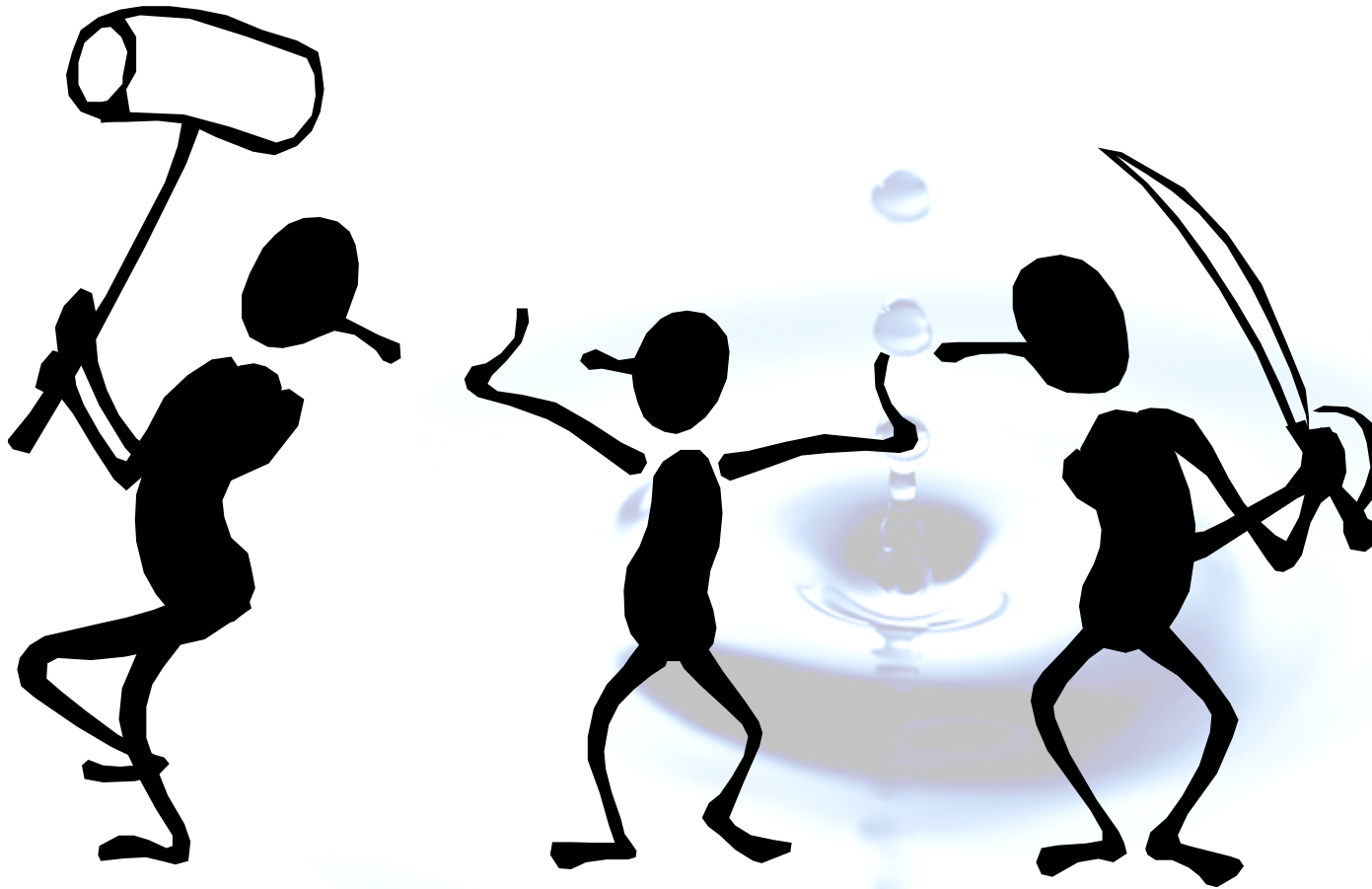
**Current state of flux presents opportunities and dangers**

**Links need to be made with training providers, accreditators, awarding bodies and Government bodies to develop appropriate training and competency schemes that will encourage on-going learning.**

**All training has to be robust and viable for the trainee as well as the provider**



## What we need to avoid



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FRIDAY, 24 SEPTEMBER 2010

### Rainwater harvesting – a damp squib?

Rainwater harvesting is encouraged by the Code for Sustainable Homes and, since April 2010, Part G of the Building Regulations has also begun to address water efficiency. Both the Code and Part G apply universally regardless of whether homes are being built in watery Kendal with its 1500mm annual rainfall or arid Chelmsford with its mere 625mm. Is that logical?



Whilst we may all agree that it makes sense to save water, is rainwater harvesting really the best way to do it?

Some thoughts:

- Chelmsford and the parts of the UK where much of the new development is taking pace are already 'water-stressed' and so rainwater harvesting should make sense. But the trouble is that there's not enough rain falling throughout the year in these places to make harvesting viable.
- A report recently published by the Environment Agency (supported by the NHBC Foundation and the Energy Saving Trust) concludes that rainwater harvesting systems add to homes' energy use and CO2 emissions.
- The carbon emitted during manufacture and installation, added to the ongoing energy used by the systems' pumps, means that these systems consume more energy and emit more CO2 than







[www.ciphe.org.uk](http://www.ciphe.org.uk)

A large, semi-transparent blue water drop is positioned in the center of the slide, with a smaller droplet falling from its apex. The background is a light, hazy blue gradient.

**Ciphe**