

**Document WCM 02 2010**



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O I D E A C H A I S | E D U C A T I O N  
A G U S S C I L E A N N A | A N D S K I L L S



TO: PRIMARY AND POST PRIMARY SCHOOL AUTHORITIES

**Devolved Capital Grants for Water Conservation Measures in  
Primary and Post Primary School Buildings**

**Contractors Code of Practice  
&  
Standards and Specifications Guidelines**



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### GLOSSARY OF TERMS

**Contractor** – The lead contractor appointed by the School Authority to complete the works, must be a fully qualified Plumbing and Heating Contractor, hold a valid Tax Clearance Certificate, have Public, Products and Employers Liability insurance cover which meets or exceeds the requirements specified by the funding agency and be able to carry out the works in line with the guidelines set out by the funding agency. Where electrical works may be required with respect to mains power provision to automatic urinal controls, these works **must be carried out** by a qualified Electrical Contractor registered with one of the two Licensed Regulatory Bodies for electrical contractors in Ireland either the Electrical Contractors Safety & Standards Association (ECSSA) or the Regulatory Body for Electrical Contracting RECI.

**School Authority** – A School Board of Management who have applied for support from the Scheme.

**The Scheme** – Devolved capital grants for Water Conservation measures in Primary and Post Primary School Buildings

**The funding agency** - The Department of Education and Skills

### DISCLAIMER

This document is a reference for Qualified Contractors who wish to carry out works supported by the devolved capital grants for Water Conservation measures in Primary and Post Primary School Buildings (the “Scheme”). It sets out the general competence that Contractors should possess, and the standards and specifications that must be adhered to, in carrying out works supported by the Scheme.

The funding agency and its Agents do not provide any warranty or guarantee concerning the completeness, effectiveness, reliability, accuracy or otherwise of such standards or any work carried out on foot of such standards. The provision of goods and/or services by Contractors to School Authorities in this Scheme is entirely a matter between the Contractor and the School Authority. The funding agency and its Agents accept no liability or responsibility, whether for breach of contract, negligence, health and safety violations or otherwise, in respect of any dispute, claim or cause of action arising out of, or in relation to, any product, equipment, work, system or installation supplied or carried out by the installer under the scheme. The Contractor is entirely responsible for all such matters.

## 1 INTRODUCTION TO THE SCHEME

The Minister for Education and Skills announced last year details of a new water conservation scheme for 2010 for primary and post primary school buildings.

The school to which you are tendering have agreed to participate in the scheme.

Water Conservation Measures (WCM) is a Devolved Scheme. This means that, School Authority will be provided with funding from the Department to carry out and manage the works, including cost control, with guidance from and minimal interaction with the Department.

The Scheme allows School Authorities to apply for funding, on a once off basis, for specific works to enhance water conservation in existing School buildings.

These measures will improve water conservation, reduce costs and contribute to the Government's national targets of reducing carbon dioxide emissions.

It is intended that the works will be carried out during holidays or at a time suitable to School Authorities.

There is generally no need to require the services of a consultant on this scheme, though the School Authority may do so at their own expense if so desired. The remedial measures are relatively simple and can best be designed and installed by the tendering Contractors.

**The scheme is established on a design and install basis such that the tendering contractor having visited the School and inspected the required works will propose the best solution for the School, taking into account all the requirements of the scheme and the water services installations in the School, especially available water pressure and the pressure drop that can exist with respect to various suppliers equipment.**

The School Authority will select Contractors to tender for and carry out the measures supported. In order to successfully qualify for funding, the works must be carried out in accordance with the guidance set out in this document.

The School Authority is not obligated to accept any or all tenders and the cost of tendering shall be carried by the contractors. The works considered in this tender will not proceed unless the requirements of the funding agency are complied with. The School Authority therefore reserves the right to accept or reject any tender received.

The conservation measures funded include:

- Installing automatic flushing systems
- Water dams and displacement devices in WC's or Variable flushing devices
- Self-closing percussion taps
- **Thermostatic Mixing Valves (TMV)** can ensure that water is blended and delivered at the required temperature.

Additional information on water conservation in Schools is available in Circular 0046/2008 Guide to water efficiency in Schools which is available at [www.energyeducation.ie](http://www.energyeducation.ie).

## 2 GENERAL REQUIREMENTS

### 2.1 GENERAL CONTRACTOR REQUIREMENTS & COMPETENCY

To be able to tender to complete works under this Scheme, the contractor must meet the general requirements as shown below.

Each Contractor must provide to the School Authority proof that they:

- are fully qualified Plumbing Contractors
- hold a valid Tax Clearance Certificate
- have Public and Products liability insurance with a minimum cover of €3.5 million
- have Employers Liability insurance cover, where applicable, of €13.5 Million
- are able to carry out the works in line with the guidelines set out by the funding agency or its Agents
- will submit to performance audits, their works and review of same with the School Authority by the funding agency or their Agents
- will have in place with the School Authority a contract which meets or exceeds the terms set out in this document.

The Contractor must provide a competent workforce to carry out the works. This includes all relevant training and certification as appropriate to each element of works being carried out. All nominated personnel must have relevant professional training or product specific manufacturer training if required to carry out the works as appropriate. Relevant training records and certificates must be maintained by the Contractor and may be subject to inspection by the funding agency and/or its agents.

The specific competency standards relating to each of the measures supported by the Scheme are detailed further in this document.

Where electrical works are required with respect to mains power provision to the automatic urinal controls, these works **must be carried out** by a qualified Electrical Contractor registered with one of the two Licensed Regulatory Bodies for electrical contractors in Ireland either the Electrical Contractors Safety & Standards Association (ECSSA) or the Regulatory Body for Electrical Contracting RECI.

Note: all works to be properly bonded and the integrity of the school electrical bonding system maintained when works are completed.

### 2.2 GENERAL PRODUCT STANDARDS

In general, all products used must be fit for purpose, improve the water conservation of the building and have no detrimental impact on the use, quality or safety of the school's operation.

All products must meet relevant product standards. Adherence to applicable standards must be followed in relation to materials that are used, and their installation.

### 2.3 GENERAL INSTALLATION STANDARDS

Prior to the installation of any measure:

- the School water services must be assessed to ensure that it is suitable for the measure proposed, of key importance here is the pressure loss across any of the installed

technologies such as valves, taps and controls and the pressure available in the water distribution system. **Note - High pressure drop fittings must not be installed.**

- the installation of said measure will not have any detrimental effect upon the integrity and operation of the School
- the installation of the recommended measure will achieve the desired effect in terms of water conservation

In general, all works should be carried out in accordance with the best practice and technical guidance documents outlined herein and available including the following:

- Building Regulations Technical Guidance Documents [www.environ.ie](http://www.environ.ie)
- The System Supplier/ Product Manufacturer Guidelines
- Department of Education Technical Guidance Documents TGD 001, TGD 002, TGD 003 and all associated addenda available at [www.energyeducation.ie](http://www.energyeducation.ie)
- Local Authorities' water regulations
- Irish, British or European Standards Guides

In each case, the Irish Standard should be considered the primary certification and preferred guidance.

Where Building Regulations are referred to within this document, it is the most recent amendment to and version of those Regulations which must be adhered to by the Contractor at all times.

In all instances where the manufacturer, supplier or system supplier supplies a Good Practice Guides, Installation Guidance Notes or a Technical Guidance Document, the works must be installed in accordance with those guidance documents.

### **Handover Documentation.**

Prior to the demonstration of the equipment and systems funded under this scheme, operation and maintenance literature in English shall be provided to the school authority which clearly indicates in non technical terms all aspects of operating and routine operation and maintenance checks along with postal, telephone and email contact details for suppliers of replacement parts.

### **Inspection, testing and commissioning.**

Commissioning of installation shall be carried out in accordance with the procedures, checks and tolerances given in the relevant BSRIA application Guides and achieve the Standards set in the CIBSE Commissioning Codes and prevailing standards.

### **Training and Demonstration**

After the Contractor is satisfied that all equipment and systems installed as part of the scheme are operating satisfactorily, training and demonstration shall take place.

Adequate notice shall be given to the School Authority and the contractor will demonstrate in non technical terms the satisfactory operation of all systems and any routine operation and maintenance checks that may be required. A 12 month warranty from satisfactory completion on all components, labour and parts and operation will be deemed to be part of the scheme and included in the tenders received.

### 3 CODE OF CONDUCT

The funding agency expects all contractors to behave professionally at all times and to maintain the high standards expected of the scheme. Performance checking, carried out by the funding agency or their agents, will not only establish the quality of physical works carried out under the scheme but also the level of professionalism with which they were completed.

As a minimum level of performance the funding agency expects, under the following areas, that:

#### Professionalism and Behaviour

- Contractors must carry a form of photographic identification (Drivers Licence or Passport). This must concur with the contact name provided by the Contractor when initially arranging the works or site visit. Full contact details (business address and telephone number as a minimum) for the Contractor must be provided to the School Authority prior to installation.
- Contractors must maintain a professional appearance and attitude to the School Authority at all times. When communicating with School Authority, Contractors should be polite, patient and informative.
- Agreed appointment dates and times must be adhered to (as far as reasonably possible) and the School Authority must be informed as soon as possible in the event that an appointment will be missed.
- The Contractor is responsible for recommending to the School Authority the most appropriate and optimum solution for their property. As a competent professional, it is a duty of the Contractor to provide the necessary information to a School Authority to allow them to make an informed decision regarding their property and the practical measures best suited to same. This should extend to contractors advising a School Authority where measures they have been requested to implement would be inappropriate or unsuitable.
- The Contractor must complete the specific return form of tender for their tender to be considered in the tendering process.
- As appropriate to the specific measure being installed, the Contractor must be able to supply the School Authority with the relevant warranties and commitment of after sales service and any operation and maintenance documentation and commissioning certificates.

#### Administration and Responsibility

- The Contractor must, in all instances, after visiting the School and inspecting the required works provide a detailed written quotation specifying all costs of works including making good. This quotation must be laid out in a clear, concise and specific manner using language that can be readily understood by the School Authority and include all proposed works and associated cost and applicable VAT rates. The Contractor must also agree a procedure with the School Authority on any alterations or omissions within the original quotation and the method by which the Contractor will be paid. In addition to any detailed and itemised written quotation **Form WCM 03 MUST also to be used by Contractors to submit their form of tender to schools under the Water Conservation Scheme 2010.**

- The Contractor must obtain written consent of the School Authority and this requirement extends to landlords when carrying out works in privately rented or leased properties.
- The Contractor shall indemnify and keep indemnified the funding agency and their Agents from and against all costs, claims, demands, liabilities, expenses, damages or losses in accordance with the specified insurance terms for registration as a contractor (including without limitation any direct or indirect consequential losses, loss of profit and loss of reputation, and all interest, penalties and legal and other professional costs and expenses) arising out of or in connection with the Contractor's failure to obtain such consents or their failure in ensuring these consents were in place as appropriate to the works.
- Any installation works shall only be carried out by a suitably qualified and competent employee. This includes all works supported by the Scheme including, but not limited to, working at heights and the operation and storage of machinery and plant.
- On completion of works a detailed invoice, including a copy of the original quotation, and subsequent receipt for payment must be provided to the School Authority along with any other forms deemed necessary by the funding agency.

#### Service Delivery

- All Contractors must make sure that their staff take every reasonable precaution to protect the property on which they are working, and leave the property clean and tidy. All excess materials, packaging, dust and debris must be removed from the School's premises, and any adjacent premises affected by the works, by the Contractor.
- Where works are completed over a number of days, the property must be left in an appropriate condition, minimising the impact to the School and surrounding properties and having regard to all Health and Safety and security Requirements.
- Contractors must make good, to the satisfaction of the School Authority, any accidental damage sustained by a property where this is a direct result of their work or installation.
- All works are to be completed and finished to the School Authorities' satisfaction and requirements.
- In the event of a School Authority not being satisfied with the works completed, Contractors must make every reasonable effort to resolve the complaint to the School Authority and the funding agency's satisfaction.
- The funding agency or its Agent will conduct random quality and performance checks with regard to works supported by this Scheme. In the event of the funding agency or its Agent not being satisfied with the service provided to the School Authority, Contractors must make every reasonable effort to resolve the issue in line with the funding agency defined process.
- The requirements relating to the installation of the specific measures detailed further in this document must be adhered to by the Contractor.

## **4 HEALTH & SAFETY REQUIREMENTS**

It is the sole responsibility of the Contractor to ensure that they comply with all relevant Health and Safety Legislation, Regulation and appropriate Guidelines and that their staff are appropriately trained to operate to these standards.

In addition to the above it is required that any Contractor performing works which are supported by the Scheme:

- has a current, written Health and Safety Statement available for inspection if required.

- follows safe working practices for both employees, Schools and the public at all times in accordance with Health & Safety Authority guidelines.
- uses equipment safely and in accordance with manufacturers instructions and stores materials and equipment properly.

### Asbestos

**Contractors appointed to carry out works must be made aware of and be requested to review the School Safety File to establish the position relating to any health and safety issues, such as the presence of asbestos.**

It is critical that the School has had an Asbestos check and that you request to see the register prior to signing the contract.

If the School has not been tested for Asbestos, **this must be done prior** to a contract being signed. This is a matter for the School to attend to.

## **5 SPECIFIC MEASURES – STANDARDS & SPECIFICATIONS**

### **5.0 General**

Contractors must show evidence that products used have Water Regulations Advisory Scheme (WRAS) approval or other independent test laboratory accredited to ISO 17025. Alternatively supplier companies accredited to ISO 9001 may provide a declaration of conformity with the regulations.

All equipment and fittings must be installed in accordance with the local Authorities' water regulations and any specifications laid out by the equipment manufacturers and suppliers and in accordance with the relevant Irish, British and European standards and those specified below.

Ballofix type isolation valves must be installed on all systems as indicated in the schematics included in this document in section 5.5.

**Note that it is possible to get Urinal Control units, percussion taps and thermostatic mixing valves with different pressure drops and if ones with a particularly high pressure drop are specified then they may not work with a gravity system.**

**Note the cold water supplies in a School must be gravity based, pumped systems are not permitted as the School toilets must be capable of operation in the event of a power failure.**

**If an installed system does not operate satisfactorily with the School's gravity system then it will need to be corrected by the Contractor at no additional cost to the School Authority.**

#### **Electric water Heaters.**

Care must be taken when considering connection of percussion taps or thermostatic mixing valves to existing electric water heater installations. There are 3 types commonly installed in schools.

##### (1) Vented or point of use water heaters

These are typically over sink units with a spout outlet or undersink units serving a single basin. These units rely on an open outlet to displace the expansion of hot water and should not be fitted with any type of thermostatic mixing valve (TMV). Only percussion taps designed specifically for use with that manufacture of water heater may be used

### (2) Cistern Type

Cistern type water heaters are served from the cold water supply and incorporate an integral open vent to deal with hot water expansion. The main area of caution is that these systems operate on a very low pressure head and hence will not be tolerant of increased pressure loss. It may be appropriate to connect thermostatic mixing valves or percussion taps to these units if acceptable to the manufacturer's recommendations and once the contractor is satisfied that the proposed materials will not detrimentally affect the normal and safe operation of the system. Any modifications afterwards to pipe work to introduce adequate means for the accommodation of expansion must be addressed by the contractor at no cost to the school authority

### (3) Unvented Type

Unvented type water heaters are served from the cold water supply and incorporate a valve set and occasionally an expansion vessel to deal with hot water expansion. These installations are found serving multiple outlets. It may be appropriate to connect thermostatic mixing valves or percussion taps to these units if acceptable to the manufacturer's recommendations and once the contractor is satisfied that the existing installation complies fully with the relevant standards and that the expansion control devices are fully operational. Any modifications afterwards to pipe work to introduce adequate means for the accommodation of expansion must be addressed by the contractor at no cost to the school authority.

## 5.1 AUTOMATIC URINAL CONTROLS

Older Schools that do not have any control devices on their urinal cisterns will benefit considerably by installing cistern flush controllers. A urinal without controls will simply keep filling and flushing water 24 hours, seven days a week and are very wasteful. Urinal controls are based on presence detection and only flush the urinals after use (they will also have a setback programme to ensure minimum flushing for hygiene purposes during School holidays).

The automatic urinal controls systems supported under this scheme must be based on passive infrared detection, the units can be either battery powered or mains powered via a fused spur for power and must have the sensor installed in a way that it is out of the reach of students at high level preferably wall mounted or ceiling mounted at the junction of the wall and ceiling and have a setback programme to ensure minimum flushing for hygiene purposes during School holidays. **It must be agreed with the school prior to tendering which unit they want i.e battery or electrical.** It should be pointed out to schools by the Contractor that the battery units will require battery replacement every two to three years depending on use and that a battery failure alarm will be a feature of the proposed unit, it should also be pointed out to schools that typically the mains powered unit will require manual resetting at the sensor unit in the event of a mains electrical failure.

Where required, all electrical work must be carried out by a qualified electrician acting as a sub contractor to the plumbing contractor as detailed in section 2.1 of this document. All cabling must be fitted in conduit clipped at 900mm centres.

## 5.2 WATER DISPLACEMENT DEVICES & VARIABLE FLUSHING DEVICES

There are two options available to help reduce water when flushing toilets. Both options are available for funding under this scheme but the School Authority must choose which option they wish to use, both options will not be simultaneously funded under the scheme.

- **Option 1 - Variable flushing devices**

These are retrofitted type devices, which depending on their principle of operation either, a) allow pupils, having flushed the toilet, to press a button when the toilet bowl is clear, the depressed button will then interrupt the flush and stop unnecessary water wastage, or b) only maintain the full flush if pupils continue to hold the lever down. If the bowl is clear the pupil may break the flushing cycle by releasing the handle. These devices are relatively easy to fit, requiring no significant plumbing or maintenance. Some are not suitable for concealed or built-in toilet cisterns or on dual flush toilets (these are toilets that have a small flush and a large flush option). Care should be taken when selecting the fittings that they suit the application.

- **Option 2 - Water dams and displacement devices in WC's**

Water dams and displacement devices reduce the amount of water that can fill the cistern and thus act as a water displacement device (the volume of the immersed object will be equal to the volume of the displaced fluid). They are appropriate for older toilet cisterns.

The displacement devices installed should be selected such that they reduce the flush amount by 3 litres on 9 litre cistern, reduce the flush amount by 1.5 litres on 7.5 litre cisterns. They should not be used on modern low volume 6 litre cisterns and may not be appropriate in some cases where drains may be in poor condition.

If the school's cistern has been installed since 2000 it will probably have a maximum flush of 6 litres per flush or is a dual flush cistern. In this case it is not recommended that a cistern displacement device is installed as this could result in double flushing and thus water wastage.

The table below gives an overview and identifies appropriate use under this scheme.

Types of Cisterns	Variable flushing devices	Water dams and displacement devices in WC's
Pre 1993 Toilet Cisterns	Yes	Yes
7 to 9 litre flush (usually installed 1993-1999)	Yes	Yes
Concealed or built-in toilet cisterns	Possibly, depends on device	Yes
Dual flush toilets	No	No
Cistern with a maximum flush of 6 litres per flush	Yes if not dual flush	No

### 5.3 PUSH TYPE PERCUSSION SPRAY TAPS

Push type percussion spray taps require the user to push down gently on the tap head to deliver flow. The tap automatically closes off after a delay period. Aerators restrict the flow of water from the tap without reducing water pressure.

Where existing wash hand basins have a central hot and tank fed cold water supply these should be piped through a thermostatic mixing valve (TMV see 5.4 below) and a single blended supply taken from the mixing valve to a single low pressure drop percussion spray type tap fitted on the basin. If the existing wash hand basin has two existing taps just remove the second tap and blank off the hole using a proprietary plug, or alternately leave the existing tap unconnected in place.

It may also be possible to just change the tap head without having to disturb the tap body or wash hand basin plumbing.

Note, infrared or ultrasound sensors are not eligible for support under this scheme, likewise thermostatic mixing taps.

All automatic shut-off taps must be of a commercial quality suitable for use in Schools, **must be suitable for the system head pressure available**, be Die Cast DZR brass body with chrome finish and must also meet the following criteria.

Contractors must show evidence of the products used have Water Regulations Advisory Scheme (WRAS) approval or other independent test laboratory accredited to ISO 17025. Alternatively supplier companies accredited to ISO 9001 may provide a declaration of conformity with the regulations.

Part II Requirements – Paragraph 4 ‘Requirements for water fittings etc’

Schedule 2 – Requirements for water fittings, paragraph 2 ‘Materials and substances in contact with water’ (Note: This would be demonstrated by approval through WRAS (or equivalent independent product certification body) or a declaration that all non-metallic materials in contact with the water comply with BS 6920)

Schedule 2 – Requirements for water fittings, paragraphs 3, 4 and 5 ‘Requirements for water fittings’ (Note: This would be demonstrated by approval through WRAS (or equivalent independent product certification body) or a declaration of compliance with the following regulators’ specifications)

6001.1 – Identification or Clause 5 of BS EN 816:1997

1111.1 – Closure test (water tightness) or Clause 9 of BS EN 816:1997

1112.1 – Porosity test (pressure resistance) or Clause 10 of BS EN 816:1997

1113.1 – Joint effectiveness (mechanical strength) or Clause 12 of BS EN 816:1997

1211.2 – Endurance test (mechanical endurance) or Clause 13 of BS EN 816:1997

Hydraulic Characteristics: When tested using the method and apparatus described in section 11 of BS EN 816:1997, but using dynamic pressures at the inlet to the tap at up to and including 5 bar +/- 0.2 bar pressure, the measured flow rate shall not exceed 6 litres /minute and the duration of flow shall not exceed 20 seconds.

If a flow regulator is required to be fitted to the automatic shut off tap to limit the flow rate to 6 litres /minute at 5 bar pressure, the tap and the flow regulator must be sold as one product.

Where the tap is supplied with a flow straightening fitting, the two components must be sold as one product.

**Important note on tap and thermostatic point of use blending valve pressure drops.**

**Note that it is possible to get percussion taps and TMV with different pressure drops and if ones with a particularly high pressure drop are specified then they may not work with a gravity system.**

**The typical flow rate that the Scheme will require from a wash hand basin tap is 0.1 l/s, this is the same as 6 litres/minute.**

**If the pressure drop of a selected thermostatic blending valve is say 0.12 bar (1.2m) and the selected automatic closing tap has a pressure drop of say 0.2 bar (2.0m), then the total pressure drop across the terminal is therefore  $1.2+2.0 = 3.2$  metres**

**This means that the pressure provided by the cold water storage tank must be greater than this and what ever pressure drop is produced by the distribution pipe work.**

**Note the cold water supplies in a School must be gravity based, pumped systems are not permitted as the School wc's must be capable of operation in the event of a power failure.**

#### **5.4 THERMOSTATIC MIXING VALVE TMV3**



A Thermostatic Mixing Valve (TMV) is a valve that blends hot water (stored and distributed at temperatures high enough to kill bacteria) with cold water to ensure increased user comfort because the hot-water temperature remains constant, they also shut-off rapidly in the event of a hot or cold supply failure to prevent scalding or thermal shock.

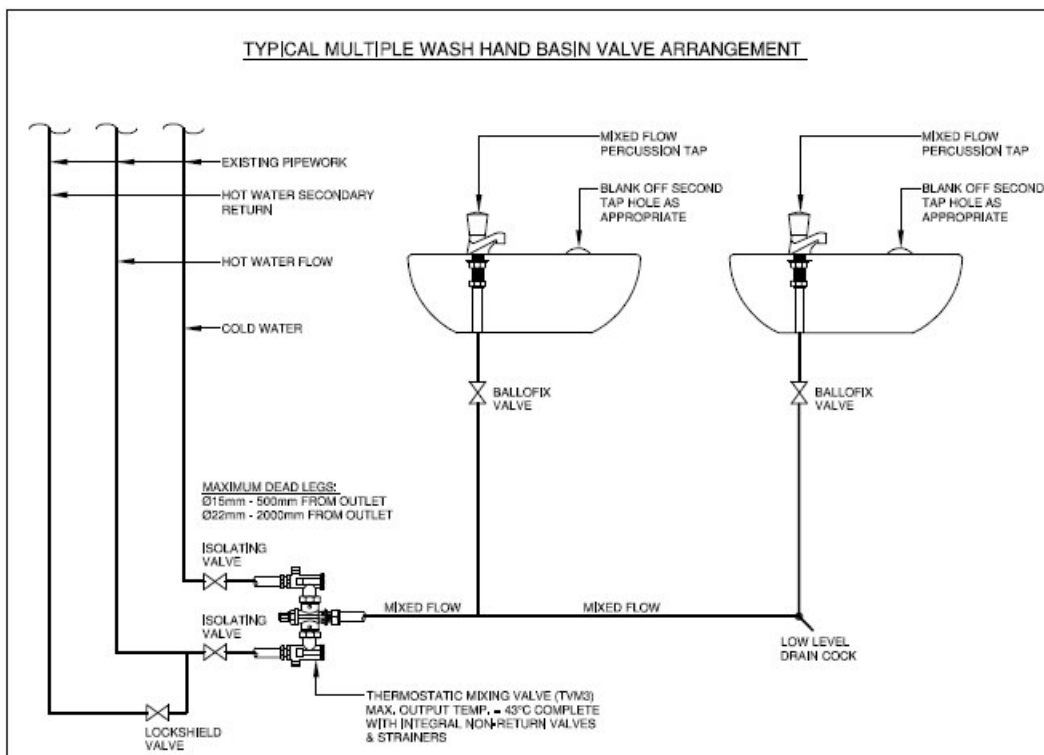
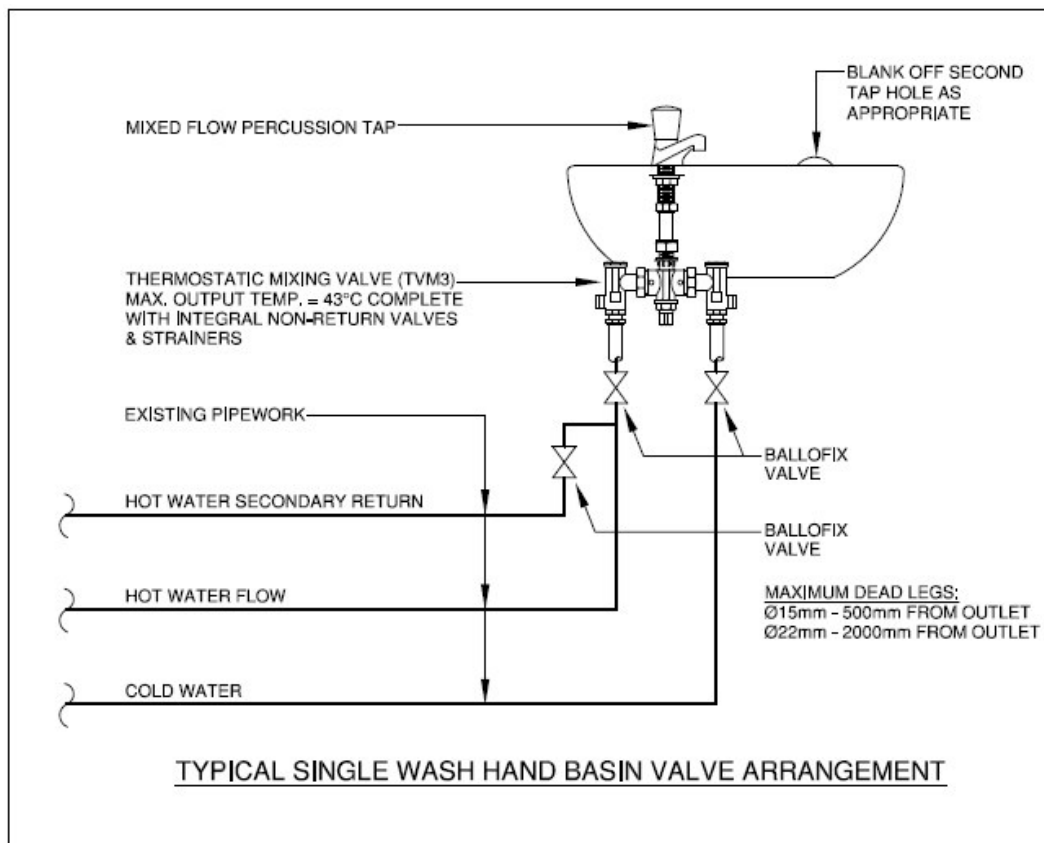
TMV supported under this scheme **must be of a TMV3 standard** with fail safe lockable thermostatic blending valves limiting the temperature to 42 / 43° Celsius. Where wash hand basins are adjoining or back to back these Whb's shall be combined to one blender unit in accordance with manufacturer's instructions.

TMV must be suitable for the system head pressure available, comply with BS EN 1287 for low pressure, be suitable for under basin installation, provide safe thermostatic shutdown, be complete with isolation valves, check valves and easily removable strainers, and have tamper proof temperature adjustment and lockdown.

Valves serving wash hand basins should be selected to give a flow rate of 0.1 l/s at an inlet head of 1.5m. All valves shall be tested for shut-off in the event of loss of the cold water supply and test certificates forwarded to the Principal prior to handover.

Where existing kitchen type sinks have a central hot and tank fed cold water supply these should be piped through a thermostatic mixing valve and the blended supply taken from the under sink mixing valve to the hot water tap or manual kitchen sink type mixer on the sink (which ever is fitted). Note so as not to contaminate the mains water supply, separate taps or a manual mixing tap (where the hot and cold water only mixes at the outlet) should only be used with mains water.

## 5.5 TYPICAL SCHEMATIC DETAILS



END.