

## TEMPERATURE & PRESSURE RELIEF VALVE DRAIN LINE TERMINATION - HEATED WATER UNIT WITH UNCONTROLLED HEAT SOURCE -

### OBJECTIVE

The objective of the four alternative methods for termination of Temperature / Pressure Relief (TPR) Valve is to prevent the scalding of children by water which may discharge from such a valve at excessive temperatures where the heat source for the heated water unit is not thermostatically controlled.

This is proposed to be achieved by:

- (a) Ensuring that no person or child is able to place his or her fingers or hand in the air gap, that is, the space between the outlet of the drain pipework (termination) and the top of the gully trap over which the drain discharges; and
- (b) Terminating the drain pipework in such a manner as to eliminate the potential for the pipework to be dislodged, enabling flow of water from any valve activation to discharge to other than the gully trap, namely, to the surrounding surface thereby allowing potentially hazardous heated water to come in contact with any person in the vicinity.
- (c) Achieve the above listed objectives in addition to the performance requirements of the Standard Plumbing and Drainage Regulation as achieved by compliance with the relevant Australian Standard, current at the time of installation, in relation to visibility of discharge and air gap for backflow prevention.

### REASON FOR PROPOSED REQUIREMENTS ADDITIONAL TO AS3500.4:2003 5.12.2.3 (d)(e)(g)(h)

Two cases of burns injuries to children from solar hot water unit TPR valve discharge occurred in the former Livingstone Shire Council area in 2005.

In one case a young boy was playing on the grass outside his parent's home on a hot day in February 2005. The temperature/pressure relief valve on the roof mounted hot water unit began discharging to the tundish installed to accept this discharge; however the end of the copper drain line had been dislodged from its originally installed position.

The young boy was admitted to hospital for treatment of burns received from the hot water discharge onto the grassed area.

Treatment is ongoing in the form of yearly skin grafts to rectify the burn damage to his feet.

Records of the incident show that the installation complied with the relevant Australian Standard at the time of installation, however as already stated the pipe had been dislodged from its installed position.

In the second case a young girl experienced similar burns to her feet when she walked through a puddle of heated water which resulted from the solar hot water unit TPR valve discharge.

#### ***Past action taken to prevent similar incidents***

The local authority, Livingstone Shire Council passed a policy in relation to the installation of the TPR valve drain line termination in order that any installations from that date would incur "no risk of" "injury to persons." [See AS3500.4:2003 5.12.2.3 (d)].

In 2010, Rockhampton Regional Council adopted a similar policy for the same reasons with such policy continuing for the new Livingstone Shire Council

The design of the termination method did negate the risk of injury to persons, however, it is recognised that there were other elements of AS/NZS 3500.4:2003 5.12.3 which were not addressed adequately, namely visibility of discharge and air gap requirement.



## METHODS ENDORSED BY BUILDING CODES QUEENSLAND AND PLUMBING INDUSTRY COUNCIL

The following methods consisting of four separate designs, as also shown in the accompanying A3 separate drawings entitled "Temperature / Pressure Relief Valve Drain Line Termination - Uncontrolled Heat Source" by Type, all elements of AS/NZS 3500.4:2003 5.12.2.3 have been addressed as well as ease of installation. A method description, including the INSET from each A3 drawing, for installation in SEWERED areas follows:

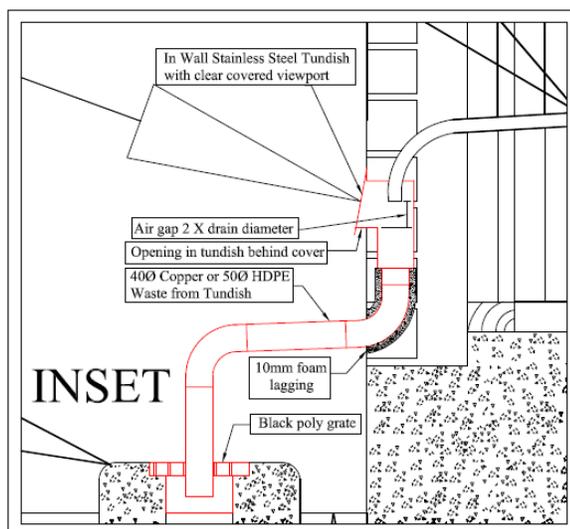
### ENDORSED ALTERNATIVE METHODS

#### METHOD 1 -TUNDISH TYPE TERMINATION

- a) Install stainless steel in wall tundish with clear covered viewport within cavity of wall connected to either a 40mm copper or 50mm HDPE waste pipe. ( Tundish may also be installed externally)
- b) The waste pipe is to discharge to the centre of a 150mm black poly grate fitted to the branch of a disconnector trap. Fix this grate to Finishing Collar
- c) A neat hole is to be made in the centre of the poly grate to accommodate the waste pipe terminating below the underside of the black poly grate. Clip or fix pipework where necessary to ensure pipework cannot be dislodged.
- d) The 15mm or 20mm copper drain line from the TPR valve is to terminate through a neat pipe diameter hole in the top of the tundish allowing at least the minimum air gap from the overflow level of the tundish to the end of the copper drain line required by the current Australian Standard.

Objectives achieved:

- (i) Visibility of discharge is achieved through the clear viewport and down through poly grate of DT.
- (ii) Backflow prevention air gap is achieved by gap between end of pipe and overflow level of tundish.  
There must be a clear gap between bottom of the clear viewport surround and front of tundish body.  
This is generally achieved by the viewport surround being angled out at the bottom approximately 15mm away from the tundish body.
- (iii) Fingers or hands cannot be placed in discharge at tundish nor DT.



## METHOD 2 - AIR BREAK TYPE TERMINATION

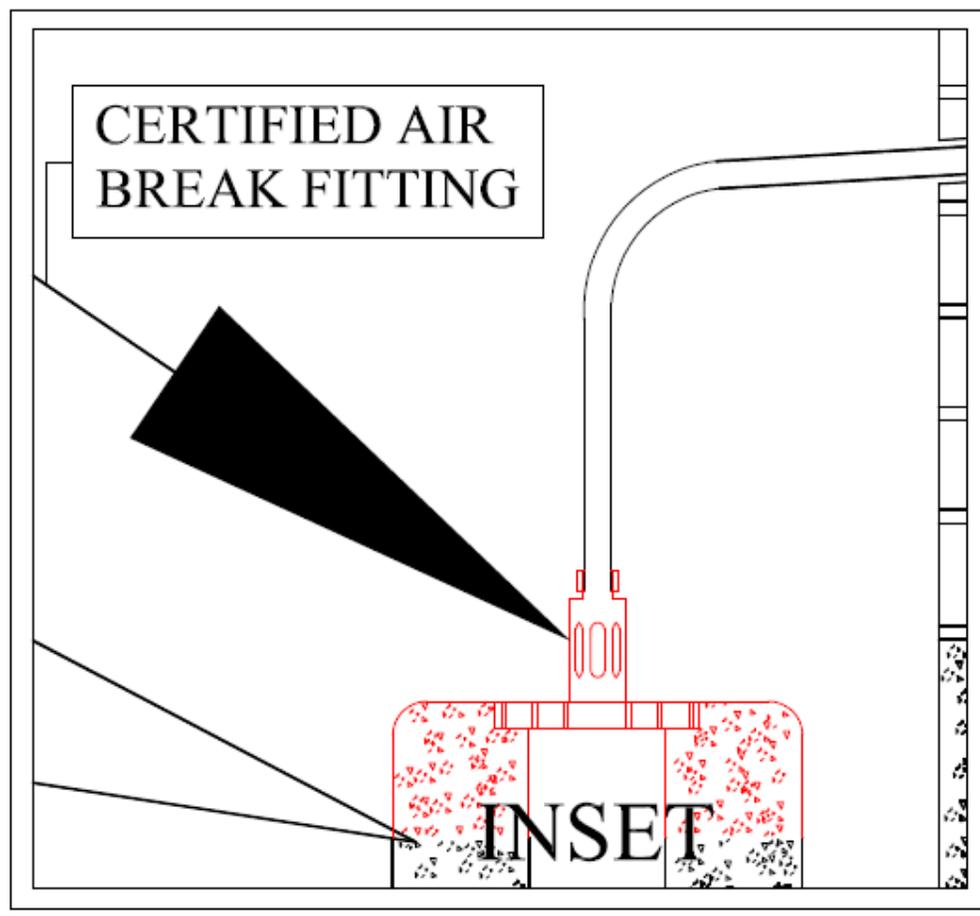
- a) When installing Disconnecter Trap branch, ensure that the top of the branch finishing collar is installed 100mm higher than the level of loose grate and finishing collar directly over the water seal.

Note: This is to minimise the likelihood of debris being forced up into the outlet of the air break in the event of a blockage or surcharge where DT is connected to sewer.

- b) Cut neat hole in black poly grate to suit outlet of certified air break fitting. Outlet of Air Break is to be installed a minimum of 15mm below top of black poly grate. Alternatively the outlet may be extended to a minimum of 15mm below top of grate. Fix this grate to Finishing Collar.
- c) Connect copper TPR drain line to top of air break fitting and clip drain line so that pipework cannot move nor allow outlet of airbreak fitting to discharge other than into DT

Objectives achieved:

- (i) Visibility of discharge is achieved through certified air break fitting and down through poly grate.
- (ii) Backflow prevention air gap is achieved through air gap in certified fitting.
- (iii) Fingers or hands cannot be placed in the discharge stream.



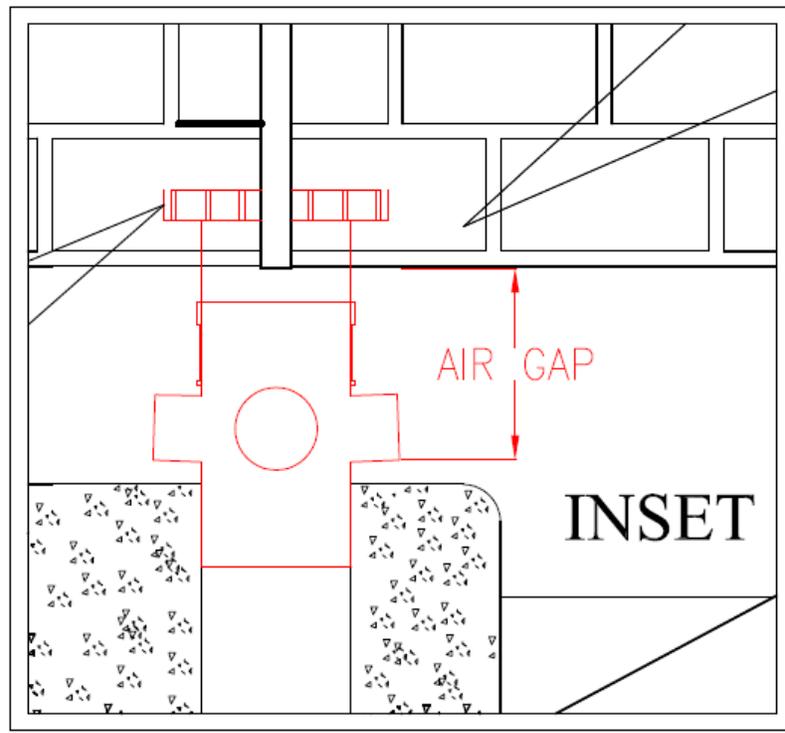
### METHOD 3 - RISER TYPE TERMINATION

- a) Install a 100mm dia x 50 x 40 x 88 deg DWV PVC gully riser to top of branch on DT ensuring that all four branch inlets to the riser have been drilled out with a holesaw. The invert of the lowest branch is to be installed above the top of the grate directly over the water seal of the DT.
- b) Install a 100mm finishing collar on top of the gully riser.
- c) In centre of black poly grate cut a neat hole for the OD of the TPR drain copper pipe. Fix black poly grate to Finishing Collar
- d) Install TPR copper pipe drain through the grate terminating below the grate ensuring that the minimum air gap for the size of the TPR drain is maintained.
- e) Clip pipework so that TPR drain pipework cannot be dislodged.

Objectives achieved:

- (i) Visibility of discharge is achieved through branch hole in riser and through top of grate
- (ii) Backflow prevention air gap is achieved between invert level of lowest riser branch inlet hole and end of TPR drain piping.
- (iii) Hands and fingers cannot be placed in the discharge stream.

**IMPORTANT NOTE:** It is to be noted this method is less pleasing in appearance than other methods due to the socket portions of the riser inlets projecting outward. It is essential that the socket portion of each inlet branch is to be left in place so that the distance between the outermost projection on the riser and the discharge stream is such that even if a small hand or finger is placed in the larger inlet, it will be too far to reach the stream.

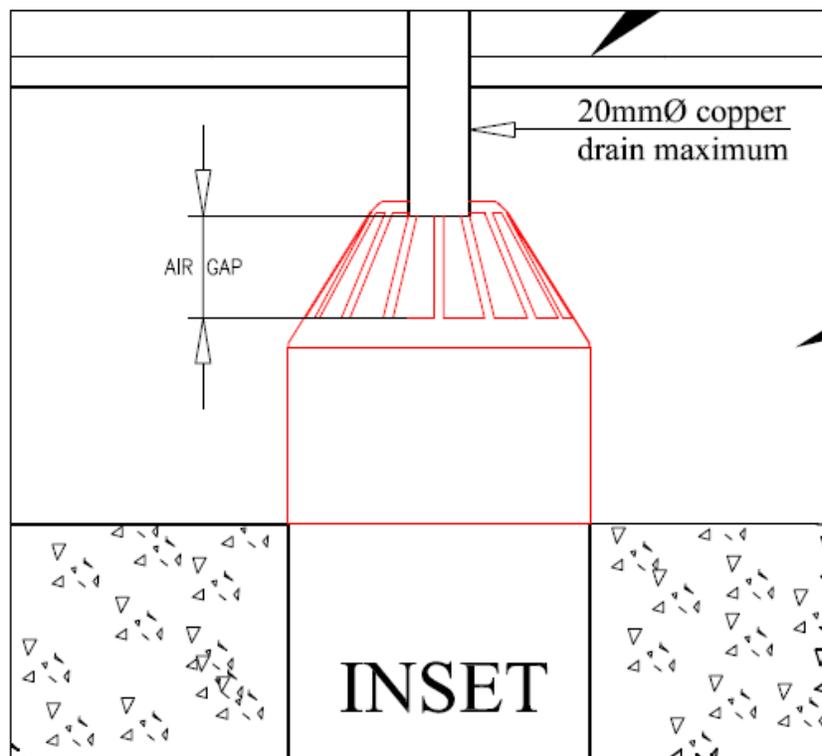


#### METHOD 4 - VENT COWL TYPE TERMINATION

- a) Extend branch of DT to allow 100mm DWV PVC vent cowl to be fitted to top of branch with the bottom edge of the vent cowl fitting level with or above top of finishing collar and grate directly over the DT water seal.
- b) Drill neat hole equal to the OD of the TPR valve drain piping into the centre of top of 100mm vent cowl.
- c) Fit copper TPR valve drain into the top of vent cowl terminating the pipe inside the vent cowl while ensuring that the minimum air gap for the size of TPR drain is maintained.
- d) Fix or clip piping where necessary to prevent piping from being dislodged.

Objectives achieved:

- (i) Visibility of discharge is achieved through slotted openings in vent cowl.
- (ii) Backflow prevention air gap is achieved between invert level of slotted openings and end of TPR drain piping. Installer will need to ensure that the particular brand of vent cowl has slots of sufficient depth to achieve required air gap where 20mm copper drain line is proposed. This method works simply and easily where 15mm copper TPR drain line is proposed.
- (iii) Hand and fingers cannot be placed in the discharge stream.





## NON SEWERED AREAS

For non-sewered areas the disconnecter trap is replaced with a 100mm X 88 degree DWV PVC bend.

A single 100mm DWV pipe riser is installed to rise to ground level with the selected type of termination fitted to the single riser with a concrete surround for protection. The top of the concrete surround is to finish not less than 75mm above finished ground level where installed in grassed, gravel or dirt areas.

A 100mm DWV PVC drain is to be laid at grade 1:60 to a 0.5 cubic metre rubble pit at least 2.0 metres from the building foundations.

Notes:

- (i) This single riser will also indicate that the pipework is not connected to the onsite sewerage facility.
- (ii) The installation of a disconnecter trap to a rubble pit could lead to a waste fixture being incorrectly connected to the rubble pit in the future.

### ENDORSED BY:

- **Building Codes Queensland**
- **Plumbing Industry Council**

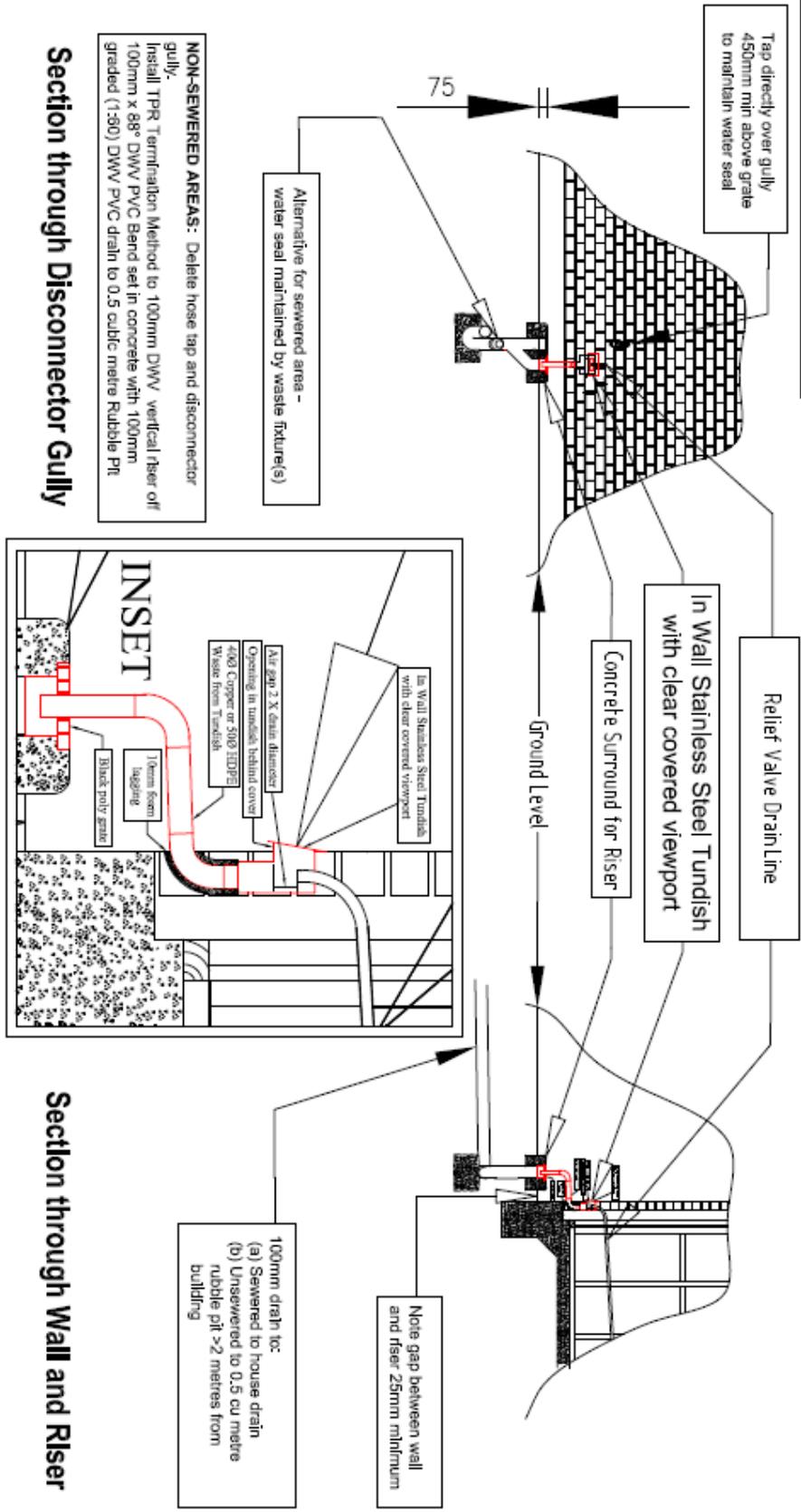
### To comply with:

- ✓ ***Standard Plumbing and Drainage Regulation 2003***
- ✓ **Plumbing Code of Australia**
- ✓ **AS/NZS 3500.4:2003**

**04 November 2010**

# TUNDISH TYPE

**Endorsed by:**  
Building Codes Queensland  
Plumbing Industry Council  
Date: 04 November 2010



**NON-SEWERED AREAS:** Delete hose tap and disconnect gully.  
Install TPR Termination Method to 100mm DWV vertical riser of 100mm x 88° DWV PVC Bend set in concrete with 100mm graded (1:80) DWV PVC drain to 0.5 cubic metre Rubble Pit.

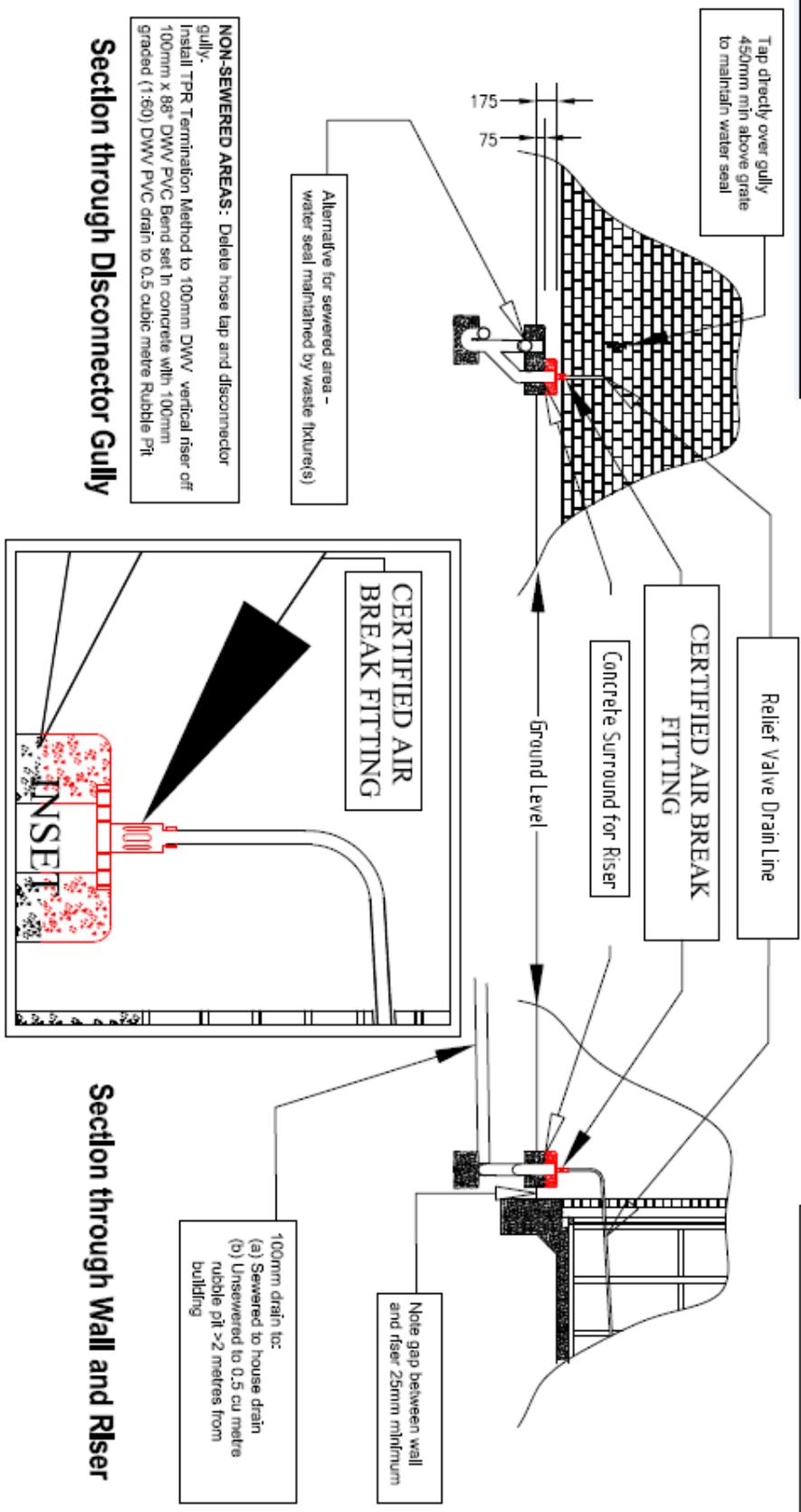
**Section through Disconnector Gully**

**Temperature / Pressure Relief Valve Drain Line Termination**

**- Uncontrolled Heat Source -**

# AIR BREAK TYPE

**Endorsed by:**  
Building Codes Queensland  
Plumbing Industry Council  
Date: 04 November 2010



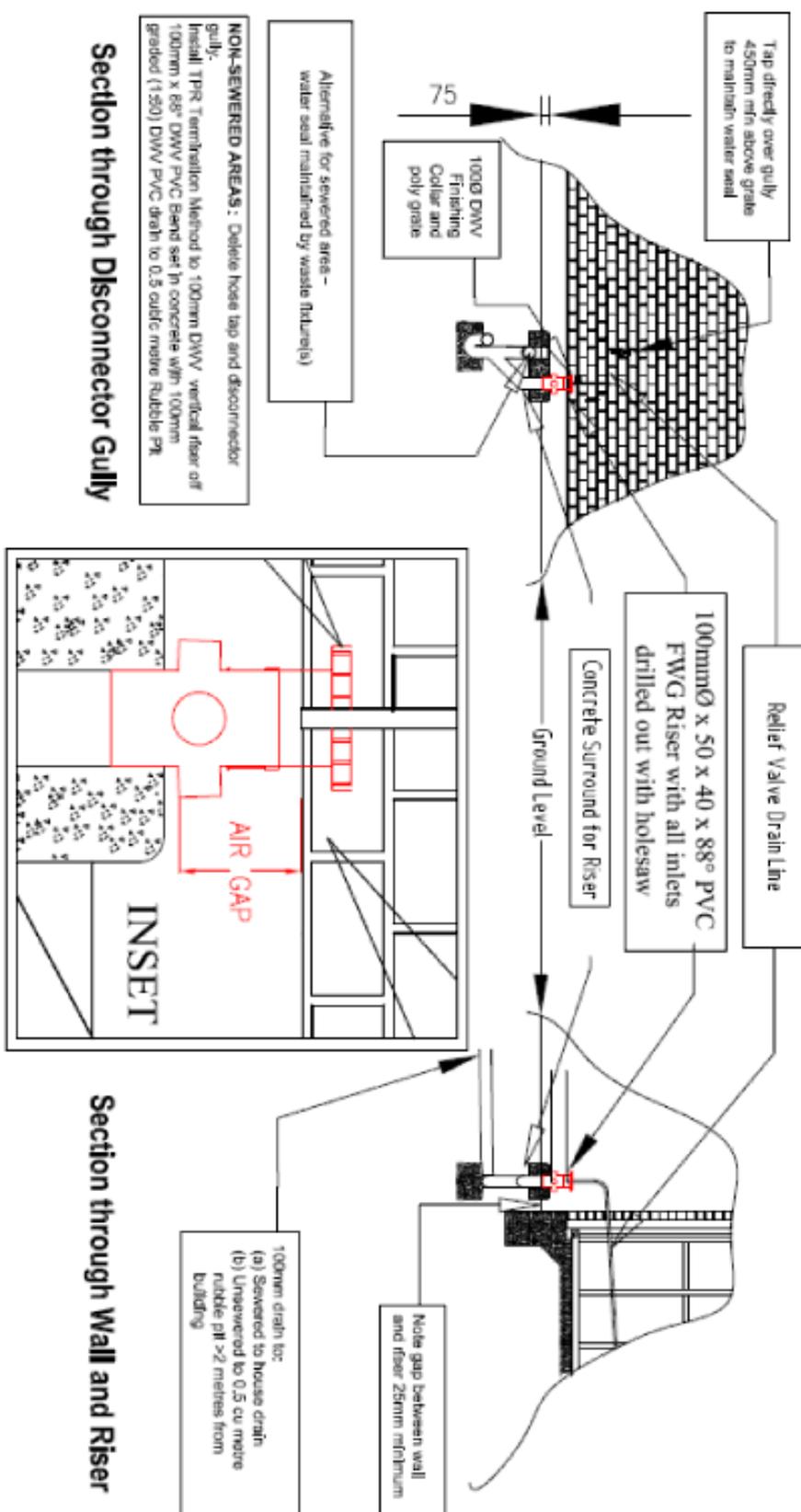
**NON-SEWERED AREAS:** Delete hose tap and disconnect gully.  
Install TPR Termination Method to 100mm DWV vertical riser off 100mm x 88° DWV PVC Bend set in concrete with 100mm graded (1:60) DWV PVC drain to 0.5 cubic metre Rubble Pit

**Section through Wall and Riser**

**Temperature / Pressure Relief Valve Drain Line Termination**  
**- Uncontrolled Heat Source -**

# RISER TYPE

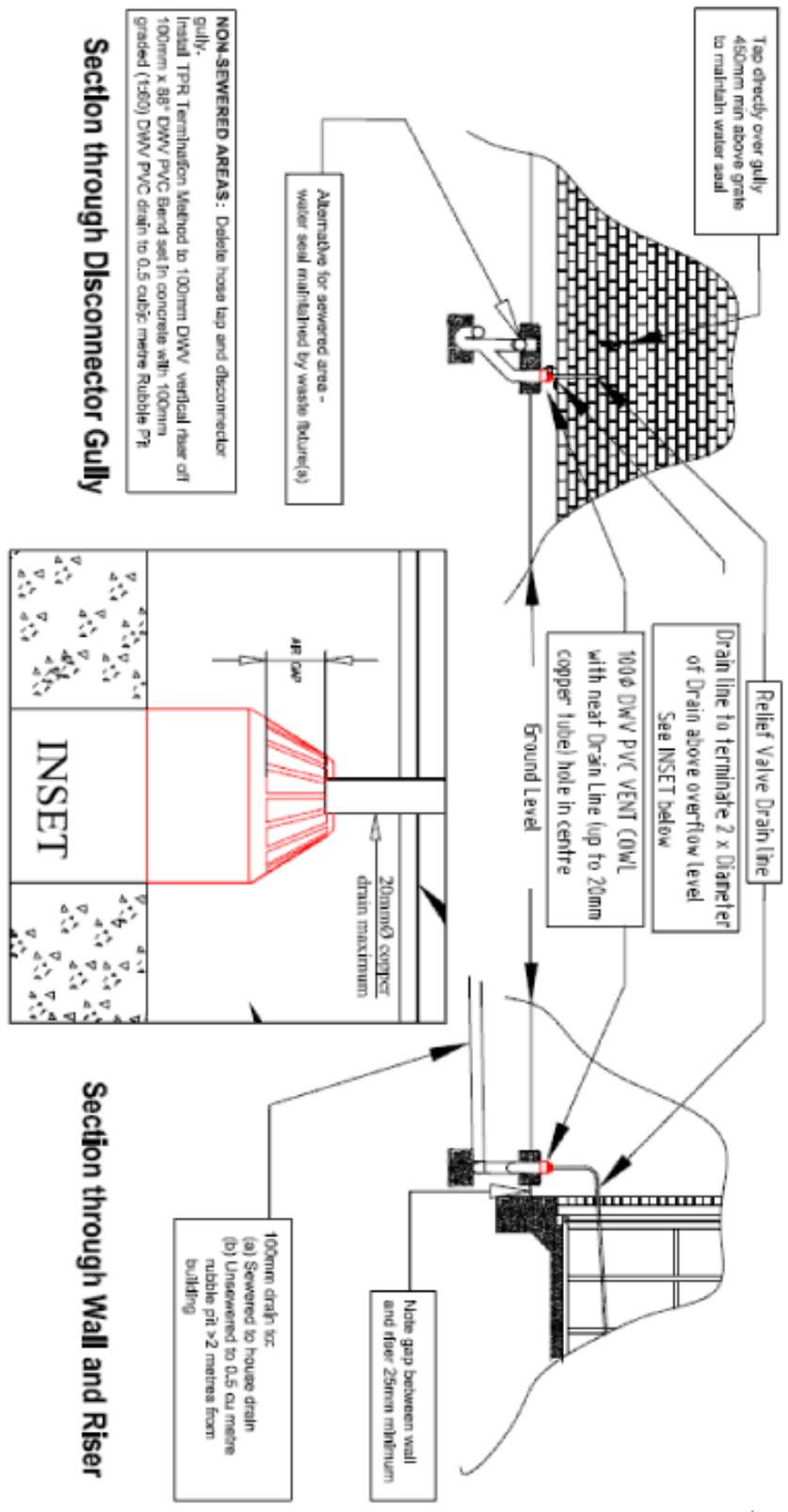
Endorsed by:  
Building Codes Queensland  
Plumbing Industry Council  
Date: 04 November 2010



**Temperature / Pressure Relief Valve Drain Line Termination**  
- Uncontrolled Heat Source -

# VENT COWL TYPE

Endorsed by:  
Building Codes Queensland  
Plumbing Industry Council  
Date: 04 November 2010



**NON-SEWERED AREAS:** Delete hose tap and disconnecter gully.  
Install TPR Termination Method to 100mm DWV vertical riser of 100mm x 88° DWV PVC Bend set in concrete with 100mm graded (1500) DWV PVC drain to 0.5 cubic metre Rubble Pit

## Section through Disconnector Gully

# Temperature / Pressure Relief Valve Drain Line Termination

## - Uncontrolled Heat Source -

