Government of **Western Australia**
Department of **Mines, Industry Regulation and Safety**

Building Commission

Separation of common services (above and below ground)

The purpose of this industry bulletin is to remind building practitioners of their responsibilities to comply with minimum separation distances specified in the relevant Australian Standards when installing multiple services such as water, gas and electrical services in close proximity to each other.

Services that are improperly installed in close proximity to each other increase the risk of property damage arising from service failures which may result in the death of or injury to a person attempting to access or repair a faulty service.

Background

The Building Commission has noted that where multiple services are installed in the same trench, duct, wall chase or roof space, the required separation distances (both horizontally and vertically) are not being complied with. The minimum separation requirements for the various services are set out in several Australian Standards.

Requirements for the separation of distributed gas and water systems from low voltage wiring systems are provided in the AS/NZS 5601 series for gas services and AS/NZS 3500 series for water services. AS/NZS 3000 Electrical installations provide minimum distances between electrical services and other services, including telecommunication cables. Requirements for the separation of telecommunications cables from low voltage and high voltage systems is provided in AS/CA S009.

In order to avoid potential risks associated with installing multiple services in close proximity to each other, builders should be checking with their subcontractors that installers are aware of the specific requirements regarding proximity of services and checking completed installations to ensure that the minimum separation distances are being maintained.

Separation distances

Separation distances referred to in this industry bulletin are those identified by Building Commission inspectors as those most frequently found to be non-compliant. Separation distances quoted have been sourced from current Australian Standards.

The following is a summary of some of the important separation requirements set out in the abovementioned Australian Standards. They are an indicative summary only and should not be used as a substitute for referring directly to the applicable Australian Standards.

Proximity of services – below ground

Any service trench that contains more than one individual service is generally referred to as a shared or common trench. Common trenches are a practical solution for the conveyance of multiple services and appear to be more commonly used within multi-unit developments.

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1. The separation between any underground drain or water service pipe with an electrical supply cable shall be at least:

    a. 100mm for water service pipe not greater than DN65, provided the electrical supply cable is indicated along its length with orange marker tape complying with AS/NZS 2648.1 and is mechanically protected; or

    b. 300mm, where the water service pipe is greater than DN65 and the electrical supply cable is indicated along its length with marker tape complying with the requirements of AS/NZS 2648.1 and is mechanically protected; or

    c. 600mm where the electrical supply cable is neither indicated nor protected.

2. All underground wiring systems suitably marked with warning tape shall be spaced not less than 100mm from other underground services.

3. The separation between any underground drain or water service pipe with an electrical earthing electrode, for an electrical supply not exceeding 1000V, shall be at least 500mm. For an electrical supply exceeding 1000V, the relevant authority shall be contacted for a ruling.

4. The separation between any underground drain or water service pipe and consumer gas pipes shall be at least:

    a. 100mm provided the consumer gas pipe is indicated along its length with marker tape complying with the requirements of AS/NZS 2648.1 laid 150mm above the installed pipe and is mechanically protected; or

    b. 300mm, where the water service is greater than DN65 and the consumer gas pipe is indicated along its length with marker tape complying with the requirements of AS/NZS 2648.1 laid 150mm above the installed pipe and is mechanically protected; or

    c. 600mm where the consumer gas pipe is neither indicated nor mechanically protected.

5. The separation between any underground consumer gas pipe and a low voltage electrical service indicated along its length with marker tape complying with the requirements of AS/NZS 2648.1 and is mechanically protected shall be at least 100mm.

6. The separation between any underground drain and a water service shall be at least 100mm horizontally and the underside of the water pipe is at least 100mm above the top of the drain.

7. The separation between any underground drain or water service pipe (both cold and heated) and a communication cable shall be at least 100mm.

8. The separation of any underground drain and a stormwater drain not exceeding DN100 shall be at least 100mm and at least 300mm from a stormwater drain exceeding DN100.

9. The separation of a non-drinking water service pipe and any parallel drinking water service pipe shall be at least 300mm.

Note 1: *Mechanical protection is provided by any of the following: Concrete slabs, continuous pour, or bricks designed for protecting electrical supply cables.*

Table 1: Indicative summary of separation distances (in mm) between different below ground services

Below ground services (general advice only)		Water service (drinking water supply)			Under-ground sanitary drain	Storm-water drain not greater than DN100	Storm-water drain greater than DN100	Electical supply cable	Consumer gas pipe	Communi-cation cable
		Cold water		Heated water						
		Not greater than DN65	Greater than DN65							
Non-drinking water		300	300	300	100	100	300	100 for </= DN65 or 300 for > DN65	100 for </= DN65 or 300 for > DN65	100
Consumer gas pipe	Indicated with orange marker tape laid 150mm above the installed pipe to AS/NZS2648.1 and mechanically protected	100	300	100	100	100	100	100	N/A	100
	Neither indicated nor mechanically protected	600	600	600	600	600	600	300	N/A	100
Electrical supply cable	Indicated with orange marker tape laid 150mm above the installed pipe to AS/NZS2648.1 and mechanically protected	100	300	100	100	100	100	N/A	100	100
	Neither indicated nor mechanically protected	600	600	600	600	600	600	N/A	300	300
Underground sanitary drain		100	100	100	100	100	300	N/A	N/A	100
Electrical earthing rod for an electrical supply not exceeding 1000V		500	500	500	500	600	600	N/A	500	N/A
Communication cable		100	100	100	100	100	100	N/A	N/A	N/A

Note 2: *While reasonable care is taken in relation to the creation of the tables contained in this industry bulletin, the Building Commission does not guarantee or warrant the accuracy, reliability, completeness or currency of the information contained within them. Changes in circumstances after the publication of this material or information may impact upon its accuracy, and users of this table are responsible for assessing its relevance and verifying the accuracy of the content. Before acting on any advice contained within the tables you should refer to the relevant utilities authority and Australian Standards to confirm the details are correct.*

Proximity of services – above ground

Service ducts, wall chases and roof spaces

Building Commission inspectors have noted that water, electrical and gas services are sometimes run in the same wall chase and or the same conduit installed under a floor slab. Where the same duct or chase is used for different services the minimum required separation distance must be maintained.

1. A separation distance of at least 25mm shall be maintained between any above ground cold water service and an electrical conduit, electrical wire or cable and consumer gas pipes.

2. A separation distance of at least 100mm shall be maintained between any above ground pipework associated with heated water service and electrical cables, gas pipes or other services.

3. A separation distance of at least 100mm shall be maintained between any above ground drain or discharge pipes and an electrical conduit, electrical wire or cable, consumer gas pipes or water services.

4. A separation distance of at least 100mm shall be maintained between any above ground site stormwater downpipe and an electrical conduit, electrical wire or cable, consumer gas pipes, or water services.

Table 2: Indicative summary of separation distances (in mm) between different above ground services*

Above ground services (general advice only)	Water service (drinking water supply)			Storm-water pipes (down-pipes)	LV electrical supply cable	Consumer gas pipe	Communi-cation cable
	Cold water		Heated water				
	Not greater than DN65	Greater than DN65					
Non-drinking water (not installed in pipe duct or structurally separated)	100	100	100	100	25	25	50
Consumer gas pipe	25	25	100	100	25	N/A	150
Electrical supply cable	25	25	100	100	N/A	25	50
Sanitary drain (drainage pipe)	100	100	100	N/A	100	100	100
Communication cable	50	50	150	100	50	150	N/A
Note: LV Voltage exceeding 50V a.c. but not exceeding 1000V a.c.							

***Refer to 'Note 2' on page 3 of this industry bulletin.**

Crossover of other services

Separation distances need to be maintained where services cross over each other in all situations. Non-compliance in this area is practically prevalent in roof spaces where services are run in all directions and in many case lay upon each other (see example in photograph 1).

Photo 1: Minimum of 25mm separation required between cold water services, gas pipes and electrical cables. 100mm minimum separation required between heated water services, gas pipes and electrical cables.

Photo 2: Minimum 100mm separation required between the heated water service (middle grey pipe) and gas (yellow pipe). Minimum separation of 100mm is required between heated water service pipe and electrical cables. Minimum 25mm separation between the electrical cable and the gas service pipes.

Photo 3: Minimum 600mm separation required between water services (grey pipe) and gas (yellow pipe), because there is no indicator tape or mechanical protection to the gas service.

Photo 4: Minimum 100mm separation required between water services and electrical cable.

Non-compliant separation of services

Instances where electrical cables, water and gas pipes overlay each other and separation is not maintained (as depicted in the photographs above) will be considered non-compliant.

Service identification

The contents of pipes, conduits, ducts and sheathing used to contain fluids or for the distribution of electrical or communications services must be identified by the use of colours, words and symbols, in accordance with AS 1345 *Identification of the contents of pipes, conduits and ducts*.

Who to contact for further information

Builders or licensed tradespersons who have any questions regarding the separation of plumbing and drainage services in common service trenches or above ground in floors, walls or roof spaces where they are in close proximity to other services, should call the Plumbers Technical Advice Line on 1300 360 897 or email at plumbers@dmirs.wa.gov.au.

Builders or licensed tradespersons who have any questions regarding the separation of electrical or gas services in common service trenches or above ground in floors, walls or roof spaces, where they are in close proximity to other services, should contact Energy Safety on 6251 1900 or email at energysafety@dmirs.wa.gov.au.

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