

# Pipes under Retaining Walls

## Technical Addendum

Technical Addendum Number: SEW TA SEW-04 – Revision 3

**Sewerage Code of Australia - MRWA Edition Version 1.0**

**Water Supply Code of Australia - MRWA Edition Version 2.0**

### Background

With the use of retaining walls in new developments becoming more prominent, this Technical Addendum has been prepared to clarify the design requirements and parameters to be adopted within South East Water's (SEW) district.

The MRWA Customer guide document- *'Guidelines for Proposed Works Over/Adjacent to Water Authority Assets up to and including 225mm diameter'* sets out principles and requirements for the construction of structures such as retaining walls in the vicinity of **existing** gravity sewers and water mains. This Technical Addendum outlines the requirements for the design of new gravity sewer pipeline and pressurised water mains in the vicinity of existing and proposed retaining walls based on the principles set out in the MRWA document.

Please note that the scope of this document does not apply to water and sewer pipelines in the vicinity of retained ground or temporary ground support activities, which are subject to specific engineering assessment. For the construction of structures and works near existing water authority assets, build over approval based on the requirements set out in the MRWA Customer guide document *'Guidelines for Proposed Works Over/Adjacent to Water Authority Assets up to and including 225mm diameter'* still apply.

## 1. Submission Requirements

The design of new gravity sewer and water pipelines shall address the impact of proposed retaining wall structures on the works, along with the impact of the works on existing structures and retaining walls. The designer shall ensure that the structural integrity and performance of both the Water Agency infrastructure and retaining wall are not adversely affected, and that future access to the Water Agency infrastructure is provided.

1.1 At the design stage, the following shall be submitted:

- Location of retaining walls to be clearly shown on the sewer/water design drawings. Footings and retaining structures are to also be detailed in section views. **(See Figure 1)**
- List of property connections located under retaining walls in a table/schedule shown on the drawings. The table shall list the height of the retaining wall, depth of footing, retaining wall type, offset and depth of the connection. **(See Figure 2)**
- Details of proposed retaining wall and foundation design to be submitted to South East Water accompanying the design.
- Details demonstrating that the retaining wall design allows for a minimum 1.0 metre wide trench to be excavated adjacent to and underneath the retaining wall without impact on the retaining wall structure (where pier and beam foundations are not used). This shall be confirmed in writing and signed off by an appropriately qualified engineer.
- Pipe structural calculations including construction live loads and long term additional surcharge loads from the retaining wall when the retaining wall is over 600mm high (this requirement does not apply when pier and beam foundations transferring retaining wall load to the ground below the level of the pipe).

## 2. General Principles

The designer shall consider the following general principles when determining the suitability of sewer and water pipelines in the vicinity of retaining walls and developing a suitable design:

- The pipe assets are not to be overstressed during construction and in service.
- Future operations and maintenance access shall not be impeded (24 hour access is required).
- Design of retaining wall and pipe assets to make allowance for future safe operations and maintenance access and in the case of property connections also safe access for plumbers,
- Design of retaining wall and pipe assets to allow for safe excavation of pipe assets.
- Design of retaining wall and pipe assets to allow for potential failure and of pipe assets and consequences of this (e.g. burst water main and erosion).
- Pipe to be located above the angle of repose of the retaining wall foundations where possible.
- Where the pipe asset is constructed first and piles/piers are required, use of bored piles rather than driven piles is required.
- Principles and requirements for retaining walls apply regardless of the location (eg: private property, reserves, etc.).
- All retaining walls over 800mm high shall be designed in accordance with AS 4678 *Earth Retaining Structures*.

## 3. Traversing Retaining Wall

All new gravity sewers exceeding 3.5 metres in depth, sewer rising mains, vacuum and pressure sewer pipelines, water mains (excluding residential property connections) or other water authority pipeline assets greater than 225mm diameter in size shall not be located beneath a retaining wall.

- 3.1 Gravity Sewers  $\leq 225\text{mm}$  in size and 3.5 metres in depth (**See Figure 3**) are permitted to traverse below a retaining wall  $\leq 2.0$  metres in height subject to the following minimum requirements:
- The pipe to traverse beneath the retaining wall at a 90 degree angle (+/- 10 degrees).
  - A 600mm minimum vertical clearance between the retaining wall foundations and top of pipe to be provided.
  - Sewer property connections to have the end fitting located at least 1.0 metre from the outer extent of the retaining wall structure and foundation. The property connection fitting shall also be above the angle of repose from the retaining wall foundations and may need to be extended further in some instances to achieve this.
  - Retaining wall pier and beam foundations are preferred with the pipe to be located within 600-1000mm of the footing pier and above the angle of repose of the foundation (to avoid additional loading on the pipe from the retaining wall). However where pier and beam foundations are not used, the design of the retaining wall foundation shall allow for a minimum 1.0 metre wide trench to be excavated adjacent to and underneath the retaining wall to access the pipe without impact on the retaining wall structure.
- 3.2 Water property connections (**See Figure 4**) are permitted to traverse below a retaining wall  $\leq 2.0$  metres in height subject to the following minimum requirements:
- The service pipe shall traverse beneath the retaining wall at a 90 degree angle (+/- 10 degrees).
  - A 150mm minimum vertical clearance is suggested between the retaining wall foundations and top of pipe.
  - A sleeve pipe shall be installed underneath and past the retaining wall structure. It is preferable that the ends of the sleeve be sealed around the service pipe to prevent debris and water ingress.
  - Retaining wall pier and beam foundations are preferred with the pipe to be located above the angle of repose of the foundation (to avoid additional loading on the pipe from the retaining wall). However where pier and beam foundations are not used, the design of the retaining wall foundation shall allow for a minimum 1.0 metre wide trench to be excavated adjacent to and underneath the retaining wall to access the pipe without impact on the retaining wall structure.

Water Agency approval is required for a property connection located beneath a retaining wall exceeding 2.0 metres in height.

## 4. Adjacent To Retaining Wall

- 4.1 For new gravity sewer and water pipelines located adjacent to a retaining wall, the following minimum horizontal clearance to the outer extent of the retaining wall footing shall be provided:
- 1.0 metre for sewers and water mains up to and including 225mm diameter.\*
  - 1.5 metres for sewers greater than 225mm diameter.\*
  - 1.5 metres for water mains greater than 225mm and up to and including 300mm diameter.\*
  - 2.0 metres for water mains larger than 300mm diameter.\*
- \* Water Agency approval is required for a reduction in horizontal clearances.
- 4.2 Surface structures and fittings shall be provided with the following minimum horizontal clearance to the retaining wall to provide sufficient room for access:

- 1.0 metre for sewer Maintenance Hole (MH) covers where clearance is derived from the outer extent of the cover surround. **(See Figure 5)** A layout of the maintenance hole location showing the cover location shall be provided on the design drawings when a sewer is located within 2.0 metres of a retaining wall.\*
- 800mm for sewer maintenance shaft covers.\*
- 1.0 metre for other pit covers or above ground pipework (eg pressure reducing valves, control valves, etc.). The layout of the pit or above ground pipework shall be shown on the design drawings when within 2.0 metres of a retaining wall.

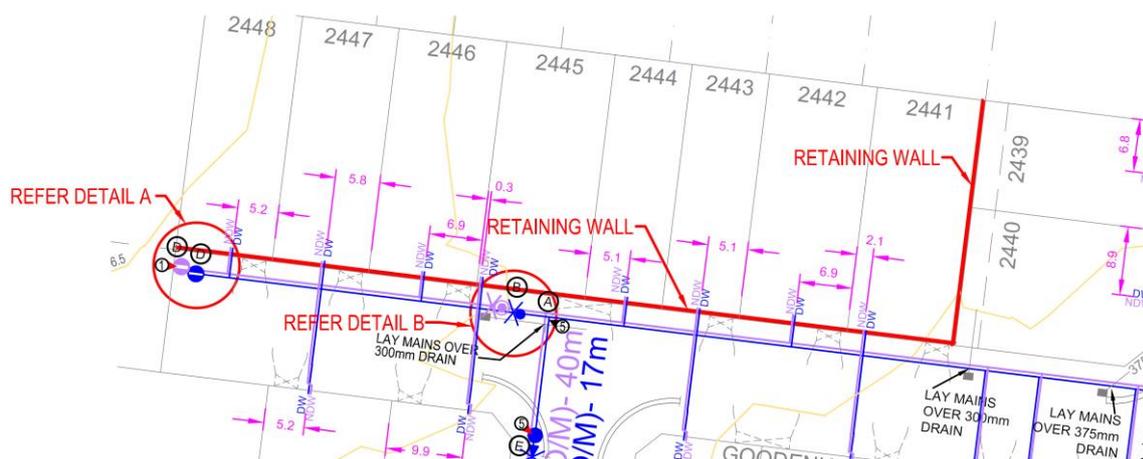
\* Water Agency approval required for a reduction in horizontal clearances.

The preferred location for sewer and water infrastructure adjacent to a retaining wall is above the angle of repose from the bottom of the foundations. Where this cannot be achieved, the design of the retaining wall foundation shall allow for a minimum 1m wide trench to be excavated adjacent to the retaining wall to access the pipe without impact on the retaining wall structure.

## 5. Other

Alternative designs which vary from the requirements set out in this document will be assessed by South East Water on a case by case basis. Any alternative design submission must address key issues of accessibility to the water or sewer asset for future maintenance and loading on the pipe from the retaining wall.

Further information regarding this Technical Addendum can be directed to Colin Paxman at [colin.paxman@sew.com.au](mailto:colin.paxman@sew.com.au) or [standardsissues@sew.com.au](mailto:standardsissues@sew.com.au)



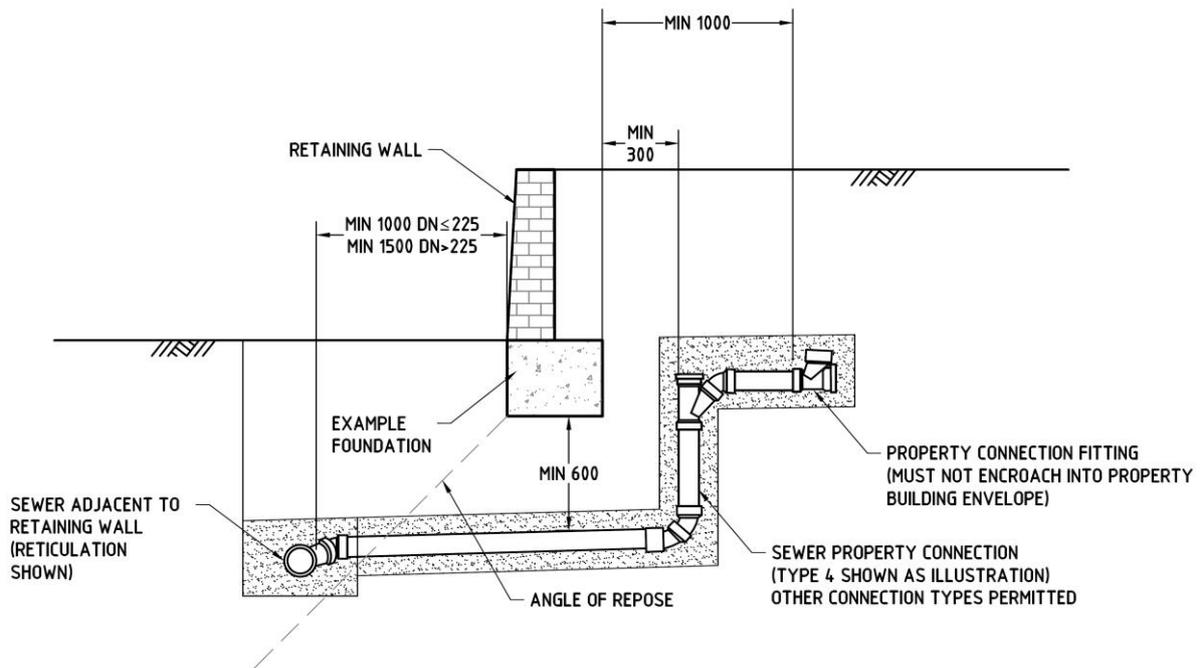
**FIGURE 1 – Example Detail Plan Showing Retaining Wall location**  
(Water main example shown)

RETAINING WALL SCHEDULE

Location	Retaining Wall Height	Footing Depth	Retaining Wall Type	Connection Offset	Connection Depth (under foundation)
Lot 2441 - side	0.8m	0.3m	Block	2.8m	0.6m
Lot 2441 - front	0.4m	0.2m	Block	2.8m	0.6m
Lot 2442 - front	0.5m	0.2m	Block	2.8m	0.6m
Lot 2443 - front	1.0m	0.3m	Block	2.8m	0.6m
Lot 2444 - front	0.8m	0.3m	Block	2.8m	0.6m
Lot 2445 - front	0.8m	0.3m	Block	2.8m	0.6m
Lot 2446 - front	1.3m	0.4m	Block	2.8m	0.6m
Lot 2447 - front	0.4m	0.2m	Block	2.8m	0.6m
Lot 2448 - front	0.4m	0.2m	Block	2.8m	0.6m

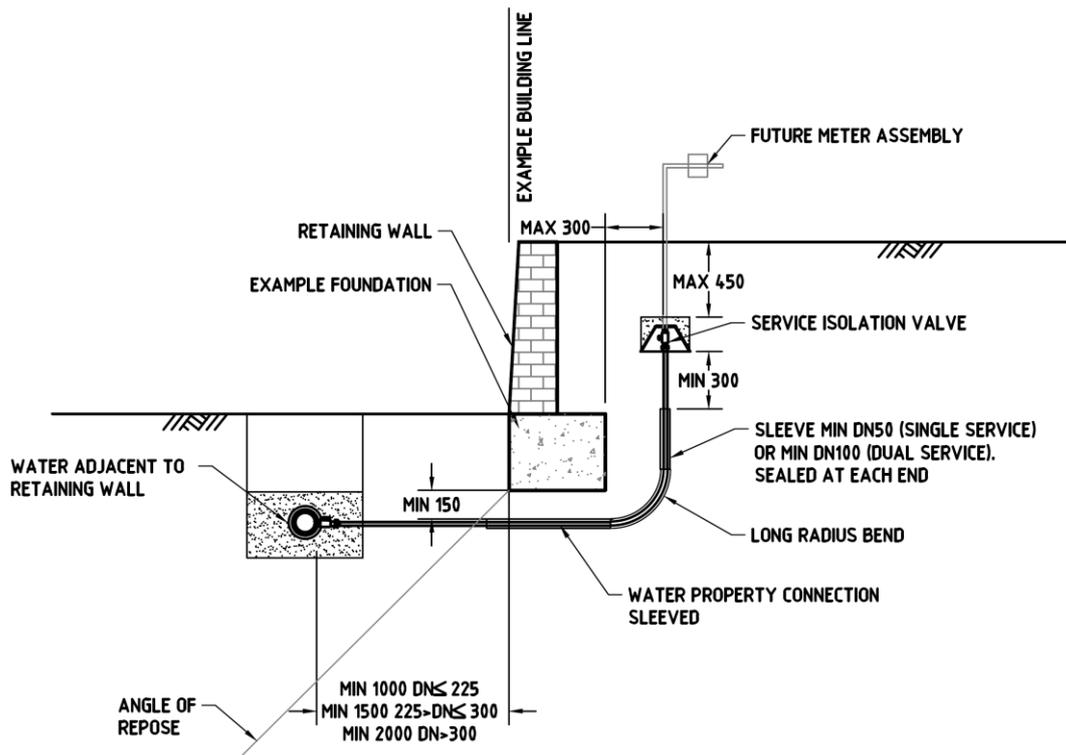
Note: The connection depth column is expected to have a greater variation for sewer property connections compared to water as shown

**FIGURE 2 – Example Retaining Wall Schedule (Water Example shown)**



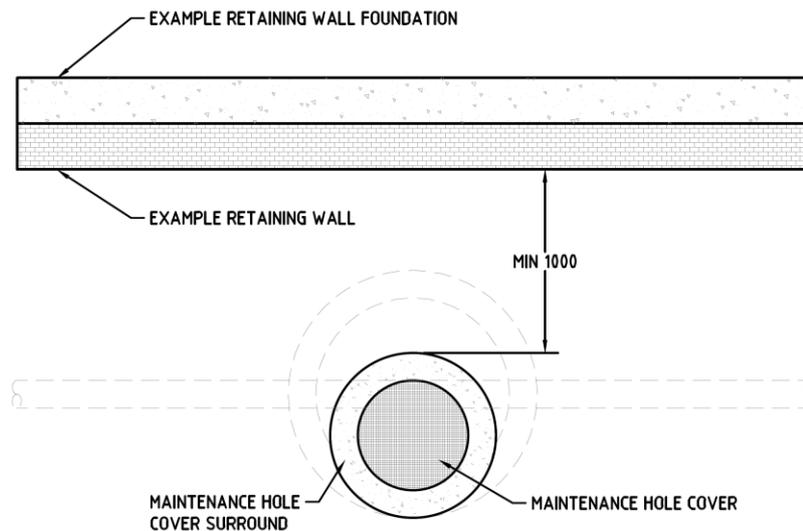
**FIGURE 3 – Example Gravity Sewer Property connection arrangement**

(Diagram shows the reticulation sewer is adjacent to the retaining wall and the property connection Traversing beneath the retaining wall)



**FIGURE 4 – Example Water Property connection arrangement**

(Diagram shows the reticulation water main is adjacent to the retaining wall and the property connection Traversing beneath the retaining wall)



**FIGURE 5 – Example Maintenance Hole Structure adjacent to Retaining Wall**

(Diagram shows minimum clearance from retaining wall to MH cover surround)