

Code of Practice: Build in the Vicinity of Sewer Mains

This Code of Practice has two purposes:

1. It sets out the requirements when building in the vicinity of sewer mains to ensure public and private assets are protected from damage.
2. To ensure that the assessment of applications to build adjacent to or over Council's sewers are processed in line with relevant legislation and Council policy.

This Code is reviewed every four years. The next review will be in 2021, so keep this booklet as a handy reference tool.

Disclaimer:

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1. Clearances from structures

To allow access to sewer mains for repairs or renewal, an access corridor 3 metres wide over the sewer alignment is preferred.

1.1 Emergency access requirements

We require that all sewer access structures be accessible at all times in case of urgent maintenance, such as clearing sewer blockages. Sewer access structures include manholes, maintenance shafts and sewer dead ends. Any proposed structure shall not prevent future access to sewer access structures.

A minimum horizontal clearance of 1 metre is required around sewer access structures as well as a minimum vertical clearance of 3 metres. The horizontal clearance shall increase to 2 metres if two or more sides of an access structure are built around. A fourth side must be open and accessible at all times.

Developments on properties with sewer manholes or dead ends must provide a minimum 0.9 metre wide clear access to the sewer structures (eg along the boundary between fence and building). This is necessary to allow our staff access with their tools of trade such as lid lifting and sewer cleaning equipment.

Developments that locate sewer manholes in security areas must make suitable arrangements for access by our staff for maintenance or emergency work.

2. Zone of influence

The zone of influence is that part of the ground where:

- Settlement or disturbance of the ground surrounding the pipe or trench excavation may cause damage to adjacent buildings or structures, and
- Loads from buildings or structures may have an impact on the buried pipe.

The zone of influence shall be determined by extending a line at an angle of 2 (horizontal) to 1 (vertical) to the surface, starting from a point 150mm below the invert of the sewer main and half of the trench width measured horizontally from the pipes centreline, as shown in Figure 1.

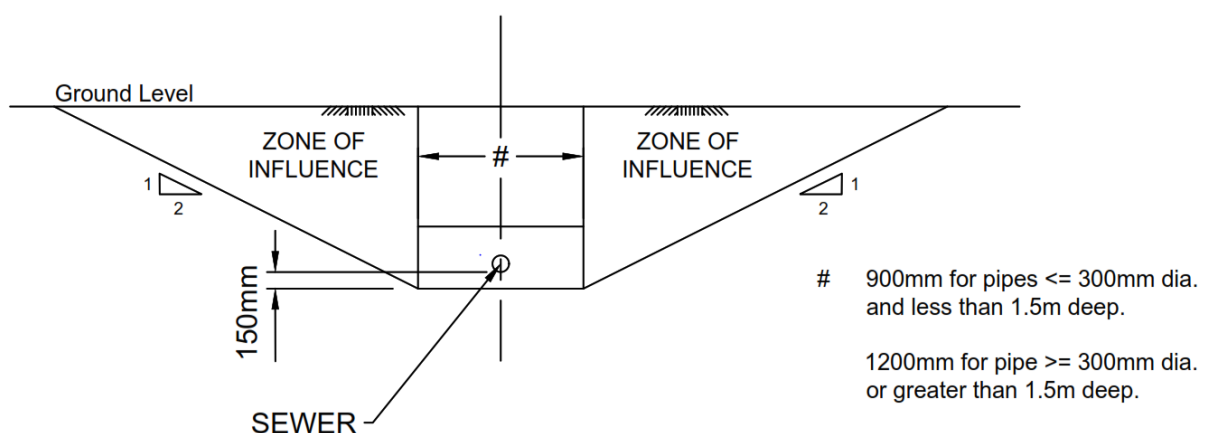


Figure 1: Zone of Influence

It is at our discretion whether to consider a steeper angle of repose (max 1H:1V) for stiff soils (clays etc). Geotechnical investigations and a report from a suitably qualified and experienced geotechnical engineer must be provided by the applicant to support such requests.

3. Category of structures

Consideration of build in the vicinity of sewer requests should take into account the potential additional costs of accessing the sewer main for repairs and renewal. For guidance, the following categories of structures require different degrees of protection:

- Heavy or permanent structures
- Light weight or semi-permanent structures
- Miscellaneous structures.

3.1 Category 1 – Heavy or permanent structures

These structures are typically constructed from masonry, brick, steel, timber and concrete and it is neither reasonable nor practical to remove or dismantle the structure for the purpose of carrying out sewer repairs or renewal.

Examples of structures in this category include:

- Houses
- Factories
- Warehouses
- Enclosed garages / workshops
- Structures that are permanently habitable or used as a work place
- In-ground swimming pools
- Brick fences
- Rainwater tanks > 10,000L or where constructed on a concrete slab, frame or other permanent base.

The requirements for protection of and access to the existing sewerage network detailed in this code of practice must be followed where Category 1 structures are proposed to be built in the vicinity of sewers.

Where Category 1 structures are proposed within 2 metres of a sewer main alignment, Council's Director of Infrastructure Services or Water and Sewer Manager shall be consulted prior to a consent being issued.

3.2 Category 2 – Lightweight or semi-permanent structures

These structures are typically of a type of construction that would make it reasonable to remove/dismantle and re-erect if access to the main, by excavation, is required.

Examples of structures in this category include:

- Pergolas
- Garden sheds
- Above ground pools (restrictions apply)
- Carports
- Glass houses / aviaries
- Rainwater tanks < 10,000L and constructed on natural ground, road base or paving.

These structures must be readily removable in the case of work being required on Council assets. Asset protection measures as outlined in Section 6 may still apply to certain structures within this category.

Any costs arising from the requirement to remove and subsequently reassemble these structures, if directed by us, will be at the full cost of the owner.

3.3 Category 3 – Miscellaneous

Structures in this category do not normally require protection of the sewer mains.

Structures in this category include:

- Fences (timber, steel, aluminium)
- Driveways (concrete, asphalt, gravel, etc)
- Paved areas.

As long as minimum cover requirements for sewer mains have been met, no special protection measures for the sewer main should be required. The minimum cover requirements are:

- Private residential property, not subject to vehicular loading – 600mm
- Private residential property, subject to vehicular loading – 750mm
- Non-residential property – 750mm.

However, if uncertainty exists in cases of anticipated high loadings or where sewer mains are less than minimum depth, advice shall be sought from our staff. Any special conditions applied to Category 3 structures would be on a case-by-case basis. The requirements for access to the existing sewerage network outlined in this code of practice apply.

If we require access to the sewer pipe for repairs or renewal, and we cause damage to Category 3 structures when carrying out the work, we will arrange reinstatement to pre-access condition as far as practicable.

4. Construction not permitted

Category 1 structures will not be permitted to be built within Council easements or over the following:

- Sewer rising mains, surcharge mains or critical gravity mains (generally all sewer mains of 300mm diameter or greater and/or deemed to be excessively deep ie. greater than 2.5 metres), as determined by us (note that approximately 88% of all existing sewers are less than 2.5 metres deep).
- Sewer manholes, maintenance points and junctions.

5. Consideration of build in the vicinity of sewer requests

Any application to build over a sewer or within 2 metres of a sewer main alignment will only be considered if the alternative options outlined below are found to be not viable.

Our approach to 'build in the vicinity of sewer' requests is to:

1. Relocate the proposed structure
2. Relocate Council's affected assets
3. Provide protection measures and build over or close to the asset.

It is the developer's responsibility to investigate and document the above options, in consultation with our staff. Some guidance regarding the above options is provided in the sections 5.1, 5.2 and 5.3.

5.1 Relocation of proposed building

In all instances, the first option considered should be to relocate proposed structures away from existing sewer assets.

If this is not feasible due the position of the sewer main on the property adversely restricting the use of the land, relocation of assets may be considered.

5.2 Relocation of assets

We will only consider relocation of existing sewer assets if the applicant can demonstrate that building away from the sewer significantly restricts the use of the land.

Where approval to relocate a sewer is granted the developer/applicant will be required to submit designs that comply with Council's Water and Sewerage Design and Construction Specification. The developer/applicant may be required to acquire/provide an easement in accordance with our requirements.

You may obtain a copy of the Water and Sewerage Design and Construction Specification on our website.

Relocating the sewer is required before construction of the proposed structure can commence. Connection of new sewers to existing sewers shall be carried out by our staff, as we do not permit private contractors to carry out work on our live sewer assets.

A Works As Executed plan, prepared by a suitably qualified surveyor, is to be submitted to us within 28 days of completion.

The developer/applicant is responsible for all costs associated with the relocation of assets including the cost of work carried out by us.

5.3 Building over or close to the sewer

We will only consider approving structures over the sewer main or within 2 metres of a sewer main alignment in exceptional circumstances and then only if the applicant can demonstrate that relocating the structure and/or relocating the sewer is not feasible.

Where a structure is permitted over a sewer main, protection against ground movement from pipe bursting in lieu of trench excavation for asset renewal is to be considered.

The developer/applicant is responsible for all costs associated with this work.

6. Asset protection measures

Where construction of Category 1 or Category 2 structures will impose a load within an existing sewer assets zone of influence (see Section 2), we may request the developer to carry out any combination of the following protection measures:

- Concrete encasement
- Piering of foundations.

Concrete encasement may also be required due to inadequate cover over sewer mains.

6.1 Concrete encasement

Concrete encasement of a sewer main may be required for the protection of sewer pipes from additional loads imposed by structures. Concrete encasement may also be required if the minimum cover requirements cannot be met.

Any concrete encasement is to comply with the WSAA Standard Drawing (SEW 1205) and the following specifications:

- Category 1 structure built over sewers – a sewer manhole shall be constructed on each side of the structure with a clearance between the outside rim of the manhole entry point of 2 metres minimum and 5 metres maximum. The sewer pipe between the two manholes shall be replaced with a minimum 225mm diameter PVC Class SN10 sewer pipe. Type 12 support shall be used. This work will be carried out by our staff, as we do not permit private contractors to work on our live sewer assets.
- Type 12 support shall be used for concrete encasement required to accommodate additional loads imposed by structures.
- Type 13 support shall be used for concrete encasement required to provide additional protection where minimum cover requirements are not met.
- In trenches of material other than rock, encasing is to extend 150mm under, on both sides and on top of the pipe barrel. For trenches in rock, encasing is to extend 100mm under the pipe barrel, 150mm on top of the pipe barrel and for the full width of the excavated trench.
- Only rubber ring jointed PVC pipes may be encased in concrete.
- Unless otherwise specified, all flexible pipe joints are to be maintained. The minimum length of the encasement will be the total length of the sewer that is affected plus a minimum of 1 metre on each side plus any additional length to ensure encasement starts and finishes at a flexible joint (subject to soil conditions and depth of sewer this length may increase).
- If a manhole is less than 2 metres from the end of encasement, as required above, the encasement is to be extended up to and not beyond the second flexible joint from that manhole.
- Backfilling of the trench must not commence until at least 48 hours after placing the concrete.
- Concrete encasement shall not be poured integral with any other foundation or structure.
- Sewer junctions that are permitted to be incorporated in proposed concrete encasement are to be upgraded to a rubber ring jointed junction in order to maintain flexibility at the junction branch. Sewer junction upgrades shall be carried out by our staff, as we do not permit private contractors to carry out work on our live sewer assets.
- Where the encasing of sewers in adjoining properties is required, written approval from the adjoining owner to enter the property to carry out the works will be required prior to approval being granted for works to commence.

All costs associated with concrete encasements are to be funded by the developer. Our works inspector must be present when encasement work is being carried out.

6.2 Piering of foundations

Piering of the proposed structures foundations to transfer loads outside an assets zone of influence may be requested. A certified design prepared by a suitably qualified and experienced engineer will be required to accompany foundation designs. The plan shall detail the design of all footings, beams and piers and shall show the ground level, the location of the sewer and any sewer access structures relative to the proposed structure. The plan shall clearly note required clearances and nominated soil classifications.

The following requirements apply to foundation piering:

- The building and its foundations are to be designed in such a way that no building loads are transmitted to the utility's sewer and the pipe can be repaired or replaced at any time without affecting the stability of the building.
- Foundations within an assets zone of influence will require piering to a minimum depth of 150mm below the zone of influence of the affected asset or until solid rock is encountered.
- A minimum horizontal clearance of 1 metre is required between any piers and the sewer main.
- The use of displacement and screw pile construction methods will require Council approval and may require additional clearances to existing assets.

7. Existing encumbrances

Where structures have been built over a sewer without Council approval then we may require that the structure be demolished, moved or substantially modified so that it complies with this code of practice.

Where it is necessary to access a sewer for maintenance or repair work, Council will not be liable for the cost of restoring any illegal structures and the property owner may be required to fund any additional work required due to the illegal structure.

Where we have previously granted permission for a structure to be built over a sewer main, no further extensions, additions or reconstructions will be allowed without further assessment.

8. Swimming pools

8.1 Above-ground swimming pool

Above ground pools without floor decking around the pool, and not constructed of concrete or fibreglass, are considered to be semi-permanent structures that are able to be removed on request to enable access to the sewer.

Special sewer protection provisions are not required for these pools provided that they are placed on the existing natural ground levels and minimum cover requirements to the sewer are met. Clearances to sewer access structures described in Section 1 still apply. All costs associated with removal and reinstatement of the pool for access to the sewer main will be at the owner's cost.

Above ground pools with permanent decking are considered to be permanent structures and are subject to the conditions outlined in Section 8.2.

8.2 In-ground swimming pool

If a pool is constructed within the zone of influence (Figure 1) of a sewer main, it should be designed and certified as being self-supporting with foundations founded below the zone of influence.

A minimum horizontal clearance of 1.5 metres is required between the pool structure and the sewer main or maintenance structure.

9. Earthworks over and adjacent to sewer mains

9.1 Filling over sewers

The allowable depth of fill that can be placed over a sewer main depends on the material type and stiffness class of the existing pipe. Site filling that increases the depth of the sewer main to more than 2.5m will require an application to Council and subsequent approval.

The placing of fill to excessive depths over Council's main is not permitted (4 metres is a maximum depth for practical access) regardless of the structural capacity of the pipe.

No fill is to be placed over sewer manholes and manholes are to be raised in conjunction with any site filling. The raising of manholes shall be carried out by our staff as we do not permit private contractors to carry out work on our live sewer assets.

9.2 Excavation over sewers

Excavations over a sewer main should not reduce the earth cover over the main to less than:

- 600mm for private residential property, not subject to vehicular loading
- 750mm for private residential property, subject to vehicular loading
- 750mm for non-residential property.

Any proposal to reduce cover over a sewer to less than the above will require an application to Council and subsequent approval. Asset protection measures as outlined in Section 6 may be required.

If the lowering of a manhole is needed, we will carry out this work as private contractors are not permitted to work on our live sewer assets.

9.3 Excavation adjacent to sewers

There is potential that excavations adjacent to an existing sewer main could present a risk of land slip or erosion of soil providing cover and/or side support to the sewer main.

Any proposed excavation adjacent to an existing sewer main should not disturb the assets zone of stability.

The zone of stability shall be determined by extending a line at an angle of 3 (horizontal) to 1 (vertical) to the surface, starting from a point 1 metre from the pipes centreline and the minimum cover over the pipe, as shown in Figure 2.

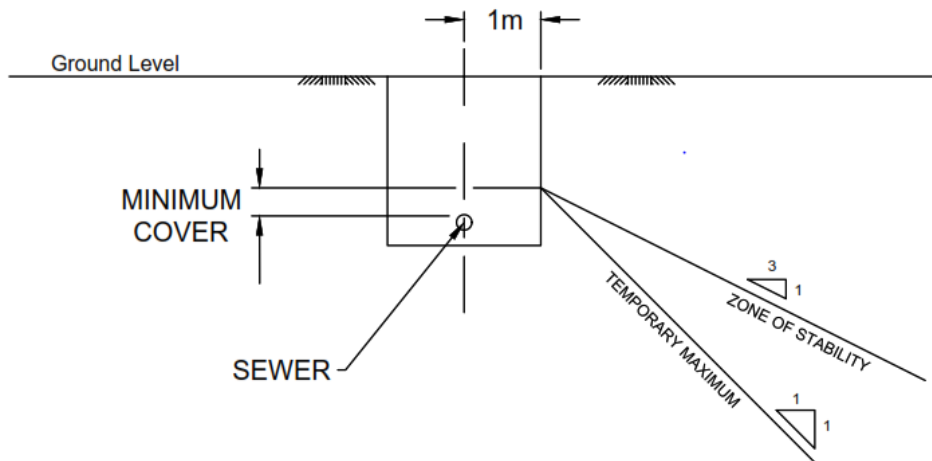


Figure 2. Zone of Stability

Excavation within the zone of stability will be permitted only where a suitably qualified and experienced geotechnical engineer has certified that the excavation will not jeopardise the stability of the sewer main.

The angle of repose may be increased (max 1H:1V) for temporary earthworks.

Retaining walls may be required to provide support down slope of existing sewer mains if substantial regrading is proposed.

10. Retaining walls

The construction of retaining walls is subject to the following requirements:

- Clearances to sewer access structures outlined in Section 1 are maintained.
- Where the footings of a wall would encroach on the zone of influence, the wall is to be designed in accordance with Section 6.
- Any retaining wall crossing over a sewer main must cross at an angle of at least 45 degrees and must be supported over the main with a reinforced concrete foundation designed in accordance with Section 6 to ensure that loads from the wall are not transferred to the sewer main.
- Where the sewer main is to be located behind the retaining wall, a minimum horizontal clearance of 1.5 metres is required.
- Where the sewer main is to be located in front of the retaining wall, the wall shall be designed so that excavation to access the main for repair or renewal does not jeopardise the stability of the wall. A certified design prepared by a suitably qualified and experienced engineer will be required to accompany foundation designs.
- A retaining wall less than 1 metre in height will be permitted over or within the zone of influence without the requirement for an engineer's design provided that:
 - ✓ the requirements of Section 9.1 Filling over Sewers and Section 9.2 Excavation over Sewers are met
 - ✓ the wall is at least 3 metres from an adjoining property or building/structure
 - ✓ the wall would not be subject to vehicle loadings.

11. Planting over sewers

Tree roots can penetrate into sewerage pipes through joints or damaged sections of pipe, causing blockages and subsequent overflows. As a result, certain species are not recommended to be planted near sewer mains. Please refer to Appendix A for a list of the highest risk species.

12. Abandoned mains

Pressure or gravity mains which have been abandoned due to relocation to suit a particular development may remain in the ground providing the abandoned mains are capped to prevent the movement of water. We may require certain abandoned mains to be backfilled with grout depending on size, material type and proximity to other structures.

Alternatively, the abandoned mains are to be removed and the trench backfilled and compacted to at least 98% standard compaction.

Note that WorkCover requirements will govern the handling of any Asbestos Cement materials.

13. Costs

The developer/applicant will be responsible for all costs associated with:

- Investigation and design, and any costs associated with seeking approval
- If approval is granted then all construction costs
- Repairing any damage to a sewer main or associated sewer infrastructure caused by construction over or near an existing sewer
- The raising or lowering of sewer access structures.

If we decide to upsize a sewer main that has to be relocated to accommodate development, then a cost sharing arrangement may be agreed to between both parties where Council will fund the additional costs associated with installing a larger diameter main at the time of relocation. Note this will not apply where the increased capacity is required due to the subject development.

APPENDIX A - Plants to avoid near sewer mains

Botanical Name	Common Name	Damage Rating
Cinnamomum camphora	Camphor Laurel	Extreme
Ficus species	Fig Trees and Rubber Plants	Extreme
Populus species	Poplars	Extreme
Salix species	Willows	Extreme
Erythrina species	Coral Trees	Very High
Eucalyptus species	Gum Trees	Very High
Jacaranda mimosifolia	Jacaranda	Very High
Liquidambar styraciflua	Liquidambar	Very High
Araucaria species	Norfolk Island and Bunya Pines	Very High
Brachychiton acerifolius	Illawarra Flame Tree	Very High
Casuarina species	Casuarinas	Very High
Melia azedarach	Australian White Cedar	Very High
Pinus species	Pine Trees	Very High
Platanus acerifolia	Plane Tree	Very High
Schinus molle	Pepper Tree	Very High
Ulmus species	Elms	Very High
Bougainvillea species	Bougainvilleas	High
Cortaderia species	Pampas Grass	High
Grevillea robusta	Silky Oak	High
Ilex species	Holly	High
Lagunaria patersonii	Norfolk Island Hibiscus	High
Ligustrum species	Privets	High
Magnolia species	Magnolias	High
Nerium oleander	Oleander	High
Phoenix canariensis	Canary Island Date Palm	High
Phyllostachys species	Bamboo	High
Toxicodendron species	Rhus Trees	High
Lophostemon confertus	Brush Box, Tristania	High
Wisteria species	Wisteria	High