SINGLETON COUNCIL

BUILDING IN THE VICINITY OF SEWER AND TRUNK WATER MAINS

Policy | Water and Sewer

A guideline for proposed development where approval is required to build in the vicinity of Council's sewer and water mains. This policy will ensure Council's water and sewer assets are protected.

Policy No:	POL/26013	**Version:**	4
Service Unit:	Water and Sewer		
Responsible Officer:	Manager Water and Sewer		
Responsible Director:	Director Infrastructure and Planning		
Authorisation Date:	17 May 2022	**Review Date:**	17 May 2026
Minute No:	87/22		

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1 Background

1.1 Title of the Policy and Commencement Date

The Building in the Vicinity of Sewer and Trunk Watermains Policy takes effect from the date of adoption by the elected Council. Please refer to Policy Register information provided on the cover page.

This policy is based on Council Minute 463/76 of 22 November 1988. Council reaffirmed the policy in its revised format in accordance with the policy register details on the cover page.

1.2 Purpose of the Policy

This policy has been prepared to guide proposed development(s) in the vicinity of Council's gravity sewer mains, trunk water assets and their zones of influence, including any proposed works that may be exempt from development approval. The implementation of this policy is to:

- nominate Council's sewer and water pipelines and easements over which construction is permitted, conditionally permitted and not permitted and, where construction is permitted, provides guidelines and limitations, and
- reduce conflicts over access and damage to pipeline assets, improve customer service and reduce Council's risk.

Applications for construction adjacent to and over Council's assets will only be considered if it can be clearly demonstrated that the applicant has investigated all other options for development. Council will treat each application on its merits, but it should not be assumed that consent for construction over or near the sewer or water mains will be automatically granted.

This Policy is divided into two parts:

Part 1 – Building in the Vicinity of Sewer Mains

Provides policy positions on building over or adjacent to gravity sewer infrastructure.

Part 2 – Building in the Vicinity of Trunk Water Mains

Provides policy positions on building in the vicinity of trunk water mains.

The policy is based on the model policy and information contained in the Water Directorate's Building in the Vicinity of Sewer and Trunk Water Mains Guidelines, 2019.

2 Objective

2.1 Objectives and Coverage of the Policy

Improper construction practices in the vicinity of sewer and water mains may cause pipes and joints to deform, fracture and/or burst leading to infiltration and exfiltration, tree root intrusion, blockages and other operational problems. Ingress of pipe embedment and the surrounding soil into the sewer or water main failure and

subsequent flooding may cause subsidence leading to damage to the Owners' structure. The principal objectives of this policy are:

- To prevent structural damage to the buried asset resulting from the Owner's construction works or imposed loads from the Owner's structure;
- To prevent consequential damage to the Owner's structure;
- To have free and unrestricted access by the Council to the pipeline or easement at all times to install, operate and maintain the buried asset without potential harm to any Owner's built over or adjacent structure;
- To maintain the amenity (functional use) of the property and allow the occupant use of the property without unnecessary constraints; and
- To adopt best practice for both construction and maintenance e.g. application of trenchless technology to construction and repair can significantly reduce access requirements necessary for open trenching construction and repair.

3 Application

3.1 Application of this Policy

Council's first position is that structures not be constructed over sewer or water mains or within their zone of influence.

Any application to Council to building adjacent/over water and sewer mains will only be considered if alternative options outlined below are found not to be viable:

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

The Building in the Vicinity of Sewer and Trunk Watermains Policy applies to the following three structure types:

1. Heavy or Permanent Structures;
2. Light Weight or Demountable Structures; and
3. Miscellaneous Structures.

The policy addresses low risk commonly encountered situations nominating requirements for the construction of minor structures built over or near an easement. The policy applies to sewer up to and including DN 225 (225mm inside diameter pipes) as well as associated vent(s) or maintenance structure(s) and guidance on larger structures. The policy also applies to trunk water mains DN200 and some DN150 water mains.

4 Definitions

For the purposes of this policy:

Term	Meaning
Approved	Acceptable to, authorised by or approved by Council.
Building Adjacent to Sewer	Where a structure is proposed to be built in the zone of influence but not over the sewer. The structure is likely to impact on Council sewers and associated structures.
Building Over Sewer	The erection of a structure over and within the zone of influence of the sewer.
CCTV	Closed Circuit Television
Council	Singleton Council
Easement to Drain Sewage	A legal entitlement placed over a parcel of land for the purpose of the provision, operation and maintenance of sewer infrastructure.
Encasement	The protection of a sewer pipe by encasing all around with concrete to Council standards.
Guidelines	Building in the Vicinity of Sewer of Trunk Water Mains Guidelines
Heavy / Permanent Structures	Any approved structure typically constructed from masonry, brick, steel, timber or concrete and it is neither reasonable or practical to remove or dismantle the structure for the purpose of carrying out sewer repairs or refurbishment. Some examples are dwelling houses, garages, onsite cabins.
Improvements	Are deemed to include but not be limited to pavements, shrubs, gardens, retaining walls, fences and all other structures.
Lamphole	A vertical pipe or shaft between maintenance holes into which a light may be lowered for inspecting sewer.
Lightweight / Demountable Structures	Any approved structure that can, at the owner's risk and expense, be easily and readily dismantled and re-erected at the request of Council, if access to the main (by excavation) was required. Some examples are domestic carports, small tool or garden sheds, pergola.
Maintenance Shaft	Allows a sewer system to be inspected, cleaned and repaired from the surface.
Maintenance Hole	A covered hole, through which a person may access an underground or enclosed structure; such as the sewer.
Miscellaneous Structures	Any approved structure where no special protection measures for the sewer main should be required as long as the minimum clearance requirements have been met. Some examples are rainwater tanks, driveways or retaining walls.

Term	Meaning
Not Fully Enclosed	Means where at least one side of the carport/verandah is completely open or two sides are partly open. Doors of any type are to be considered as closed sides.
Owner	The Agency, Authority, Board, Company, Controlling Authority, Corporation, Council, Department, Individual, Regulator, Utility or other legal entity who is the Owner or lessee of the property and/or who has responsibly for the property.
PSS	Pressure Sewer System
Pressure Sewer System (PSS) Boundary Unit	A Council installed valve box located on the pressure sewer main at the property boundary.
Pressure Sewer System Discharge Pipe	The pipe running from the pressure sewer unit to the boundary kit.
Sewer	An asset owned by Council used for the conveyancing of sewage, whether raw or treated. A sewer may be live or disused.
Sewer Line / Main / Pipe	An asset owned by Council, controlled and maintained by the Water and Sewer Group, used for the conveying of sewage (raw or treated). A sewer may be operational or disused.
Trunk Water Main	A trunk water main is deemed to be a water main of greater than or equal to 200mm diameter and some 150mm watermains.
Vent Shaft	Also known as a ventilation shaft or vent stack is a tall shaft designed for the safe release of gases built up in the sewers.
Water Main	An asset owned by Council, controlled and maintained by the Water and Sewer Group, used for the conveying of water (raw or treated). A water main may be operational or disused.
Works	All those Works being sewers, maintenance structures, vents, pumping stations, pressure mains and accessories and shall include valve chambers and storage facilities as shown on the Design Drawings and includes any part or parts of the Works.
Zone of Influence	The ‘zone of influence’ is that area of soil/strata above a water or sewer main that is likely to be influenced by building loads. Factors that determine the ‘zone of influence’ include trench width and depth and soil classification (by qualified structural engineer as per AS 2870) and Groundwater / level of the water table. The boundary of the ‘zone of influence’ coincides with the angle of repose of the strata encountered (including

Term	Meaning
	cut/fill). This boundary shall commence at the bottom corner of the trench nearest the proposed foundation. If the trench is partly in rock or shale the boundary shall commence at the top of the rock or shale strata. In heterogeneous soil the angle of repose may differ. The above criteria do not apply to water charged strata. Foundations in water charged ground are to be designed by a structural engineer and approved by Council.

5 Part 1 – Building in the Vicinity of Sewer Mains

5.1 Procedural Statement

Building over or adjacent to sewer by residents, commercial or industrial business' can be problematic for Council and the land owner, especially when sewer maintenance or repairs are required.

5.2 Consideration of Build Over Sewer Requests

Each case will be assessed on its merits after lodgement of a development or other application with consideration being given, but not limited to the loads imposed on the sewer, accessibility to sewer mains, the criticality and type of the sewer. On application Council will consider the following in the below order:

- Relocation of the proposed building/structure;
- Relocation of services; or
- Building over or adjacent to the sewer.

It is the responsibility of the developer, applicant or owner to investigate and document the above options in consultation with Council.

If the option to building over or adjacent to the sewer is determined, a CCTV inspection prior to and following the construction will be required to ensure no damage to the sewer infrastructure is sustained. The costs associated with the CCTV inspections and rectification works as a result of the building over or adjacent to sewer will be at the expense of the applicant/owner.

An encumbrance will be registered by Council over the property to enable any future purchaser to be aware of the conditions under which approval for the construction of the structure over the sewer was given including any specific conditions.

5.2.1 Relocation of Proposed Building or Structure

In all instances, the first option considered should be the relocation of the proposed building or structure away from existing sewer assets.

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

5.2.2 Relocation of Assets

Council will only consider relocation of existing sewer assets if the developer can demonstrate that building away from the sewer adversely restricts the use of the land. Any relocation works need to ensure all required design standards (cover, grade, position) are still met and that the capacity or functionality of the assets is not reduced. All costs associated with the relocation of assets are to be funded by the developer.

5.2.2.1 Relocation – Gravity Mains

Where approval to relocate a sewer is granted the developer will be required to submit plans in accordance with Council's Development Specifications. Relocating the sewer, following approval, is required before construction of the proposed building/structure can commence. The applicant will need to liaise with Council regarding the bypassing of live sewage flows.

5.2.2.2 Relocation – Rising Mains

Where approval to relocate a rising main is granted the developer will be required to submit plans in accordance with Council's Development Specifications. Following approval, the developer is required to relocate and ensure proper function of the rising main before construction of the building/structure can commence. The applicant will need to liaise with Council regarding the bypassing of live sewage flows.

5.2.2.3 Relocation – Easements

The developer will be required to acquire/provide an easement in accordance with Council requirements over a relocated gravity and/or rising main.

5.2.3 Construction Not Permitted

Structures and/or construction will **not** be permitted to be built over and/or in close proximity to the following:

- Sewer rising mains, surcharge mains and critical gravity mains (generally all sewer mains of greater diameter than 300mm mains and/or deemed to be excessively deep i.e.. greater than 3.0 metres), as determined by Council.
- An easement containing a pressurised sewer (rising main or pressure sewer or vacuum sewer) or within 1 metre from any point on the outside edge of Council's water main, pressurised sewer or associated vent or maintenance structure.
- Where sufficient clearances to sewer maintenance holes, inspection shafts, lampholes, maintenance points and junctions cannot be achieved (eg for maintenance).
- A sewer access point or property sewer connection point (For exceptions refer the Council's Building Over or Adjacent to Sewer Infrastructure Guideline). This also includes situations where it is considered that a future requirement to gain access to a section of sewer, for example, to construct a sewer connection off this section of sewer to serve a further land division, exists.
- Concrete pipes, asbestos cement pipes or vitreous clay pipes. They are often cracked and have leaking joints and require rehabilitation or replacement before construction to minimise the likelihood of any problems or structural failure. If local

conditions permit, these pipes can be replaced with alternative pipe materials, subject to approval by Council.

- Any gravity sewer that, in the opinion of Council, may be or is in poor condition. In these instances the condition of the sewer must be determined by CCTV inspection, its structural condition assessed and as appropriate rehabilitation works may be required. The costs associated with the CCTV inspection are to be at the applicant/owner's expense. A copy of the CCTV footage and report shall be provided to Council for review.
- Within 1 metre of a sewer connection servicing an adjoining property.
- Where the driving of piles of any description in an easement or within 1 metre measured from the outside diameter of the sewer is proposed. Approval may be considered where CCTV inspections are carried out, at the applicant/owner's expense, prior to and following the installation of the piles and the applicant accepts the liability for any damage to the sewer as a result of this work.

5.3 Building Over Sewer

Council will only consider a building/structure over the sewer main in exceptional circumstances and then only if the applicant can demonstrate that relocating the building/structure and/or relocation of the sewer is not feasible.

The developer shall consider an integrated approach and demonstrate that all associated risks can be managed with marginal costs if building over a sewer main is to be considered and accepted by Council. All costs associated with the works are to be funded by the developer.

Council may require applications to build over a sewer to include a CCTV inspection of the subject sewer, undertaken by a contractor qualified and with the necessary experience to do so, or by Council at the applicant's expense. The inspection shall be completed and condition/ defects recorded in accordance with the Water Services Association of Australia Conduit Inspection Reporting Code WSA 05-2013 - Version 3.1. or its replacement. The results of the CCTV inspection are to be submitted to Council with the application. The inspection may be used as a dilapidation survey, with the developer required to fully fund any repair work required to rectify damage caused by their development.

Depending on the results of the CCTV inspection, Council may require the developer to:

- Reconstruct the sewer main in its existing location using construction materials as specified by Council and in accordance with requirements set down within Council's Technical Specifications and approved plans; or

- Reline the existing sewer main by the engagement of contractors qualified to undertake such work. The name of contractor and the relining technique to be utilised will be submitted to Council for approval prior to work commencing.

All works on gravity sewer mains must be completed for the full extent between maintenance holes.

5.3.1 Permitted Structures

In most circumstances, Council will permit the following structures to be built over easements/Council sewers up to and including DN225 provided the specified provisions are met (Refer also to Council's Building Over or Adjacent to Sewer Infrastructure Guidelines):

- Landscaped or terraced gardens;
- Concrete or decorative paving;
- Class 10 non-habitable buildings or structures as classified in the Building Code of Australia (BCA). Class 10a includes a non-habitable building being a private garage, carport, shed or the like. Class 10b includes a structure being a fence, mast, antenna, retaining or free-standing wall, swimming pool or the like.
- Demountable structures such as garages, carports, verandas, pergolas, above-ground swimming pools and spas and prefabricated garden sheds, tool sheds, shade houses, aviaries and the like.

In certain cases, such as driveways over sewers, Council may require that a design be prepared by appropriately qualified consultants and certification of the design following construction. This may include additional compaction test results, subgrade inspections and other measures deemed necessary by the designer.

5.3.2 In-ground and Non-Demountable Swimming Pools and Spas

Construction of in-ground and non-demountable swimming pools and spas adjacent to the line of the sewer provided a minimum of 1.5 metre horizontal clearance is maintained between the outside edge of the pool/spa and the outside edge of the sewer and no additional load is placed on the sewer.

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

Construction of in-ground and non-demountable swimming pools and spas over or within 1.5 metres of access points, such as maintenance structures, inspection and vent shafts, is not permitted.

5.3.3 Above-ground Demountable Swimming Pools and Spas

Above-ground pools without floor decking around the pool, and not constructed of concrete or fibreglass, are considered to be semipermanent structures that are able to be removed on request to enable access to the sewer. Above-ground pools with permanent decking are considered to be permanent structures and are subject to the conditions outlined in section 5.3.2.

Construction of above-ground demountable swimming pools within the easement area and above the sewer provided 600mm vertical clearance is maintained from the top edge of the sewer to the underside of the pool and subject to the following:

- There is no other location in which the pool can reasonably be sited having regard to safety (viewing and fencing), aesthetics and costs associated with alternative locations.

- Any special precautionary measures required by Council regarding the load transmitted to the sewers are met.
- Council is absolved from responsibility for any damage to the pool in the event of soil movement, or as a result of Council or its contractor's activities within the easement.
- Council or its contractor shall have the right to empty the pool in conjunction with its activities in the easement, and there shall be no compensation payable for the water so removed or the water used by the Owner or occupier in refilling the pool.

Construction of above-ground demountable swimming pools and spas over sewer access points such as maintenance structures, vent shafts, inspection opening sand inspection points are not permitted.

5.3.4 Demountable Structures

Demountable structures such as garages, carports, verandahs, pergolas, and prefabricated garden sheds, toolsheds, shade houses, aviaries and the like, may be constructed over an easement provided such structures are not located over any access points except as permitted in below.

Council cannot be held responsible for any damage to the structure and its contents as a result of Council activities within the easement. The costs associated with Council repairing damage to a sewer caused demountable structures over an easement will be at the expense of the owner.

5.3.5 Carports and Verandahs

Carports or verandahs which are not fully enclosed may be constructed over an access point provided that:

- The riser is inspected by Council and the surface fitting or marker is adjusted to the correct level where necessary prior to the commencement of any building work and prior to the laying of any paving;
- The Owner is advised that the carport, pergola or verandah shall not be enclosed now or in the future unless the appropriate requirements are met; and
- An encumbrance certificate is issued over the property which includes a condition that the structure shall not be fully enclosed.

5.3.6 Underground Cables and Pipes

Construction of sanitary drains (private property sewers), storm water drains ≤ 300mm, gas and water mains, electricity and telephone cables within easements under the following conditions, where;

- Pipes, conduits and telecommunication cables are required to cross a sewer, lay at 90 ± 15º to the sewer and maintain a minimum vertical clearance of 150mm from the outside edge of the sewer.
- Pipes, conduits and telecommunication cables are laid within an easement and parallel to the sewer, maintain a minimum horizontal clearance of 300mm from the outside edge of the sewer.

- Electricity conduits and telecommunication cables are required to cross a sewer, lay at 90 ± 15º to the sewer and maintain a minimum vertical clearance of 225mm from the outside edge of the sewer.
- Electricity conduits and telecommunication cables are laid within an easement parallel to the sewer, maintain a minimum horizontal clearance of 500mm from the outside edge of the sewer.
- Pipes, conduits and telecommunication cables where they cross the sewer (e.g. by concrete or recycled plastic slabs) are protected, so that during any work on the sewer the likelihood of damage to the pipes conduits or cables and injury to Council or contractor personnel is reduced.
- The location of pipes, conduits and cables above-ground are marked with permanent visible markers.

5.3.7 Tennis Courts

Tennis courts, paved or otherwise improved areas and the like, may be constructed over a sewer and access points provided the Owner accepts that Council is not responsible for any damage caused to the court or surrounds in the event that access to the sewer is required.

The costs associated with Council repairing damage to a sewer caused by the construction of a tennis court will be at the expense of the owner.

5.3.8 Paved and Other Improved Surfaces

For paved surfaces and other improved surfaces such as tennis courts constructed over maintenance structures, surface fittings must be flush with the finished surface level.

In cases where the Owner does not want a surface fitting located in the paved area or other improved surfaces, subject to investigation to determine suitability, it may be possible to construct a new maintenance structure nearby at the Owner's cost.

5.3.9 Rainwater Tanks

Rainwater tanks that are to be constructed on concrete slabs, frames or other permanent bases, will for the purposes of this policy, be classified as permanent load bearing structures and will be subject to the provisions of this policy in regard to access and load bearing upon Council's sewers.

Rainwater tanks of a size 10,000 litres or less, constructed from plastic or other flexible material and to be situated upon natural ground or a base of sand, road base or similar material, and where it can be demonstrated that the tank can be readily emptied and moved (without damage to the tank) will be classified as demountable structures and not be subject to the provisions of this policy.

5.3.10 Filling Over Sewer Mains - Alteration of Surface Levels over Assets

The allowable depth of fill that can be placed over a sewer main depends on the material type and stiffness class, as well as the native soil and standard of backfilling.

Applications for significant filling to alter the original surface level over easements and above Council sewers must include certification form a suitably experienced qualified civil, structural or geotechnical engineer that the:

- Loading imposed will not adversely affect the underlying sewer; or
- Remediation work proposed will prevent any adverse loading on the underlying sewer.

Fill increasing the depth of fill to greater than 2.5 metres above the top edge of the sewer is considered significant.

The placing of fill in excessive depths over a sewer main is not permitted, even if there are no structural issues. A maximum depth to the sewer main, being 5 metres, is required for practical access. No fill is to be placed over maintenance structures, inspection openings and inspection points. These assets may need to be raised in conjunction with any site filling, any costs associated with this works will be at the applicant/owner's expense.

The costs associated with Council repairing damage to a sewer caused by alterations of surface levels by the owner will be at the expense of the owner.

5.3.11 Excavations Over and Adjacent to Mains

Generally, excavations over or adjacent to a sewer main are not to reduce the earth cover over the main to less than the minimum limits as detailed in Council's Technical Specifications.

Any proposal to reduce cover over a sewer to less than the limits imposed in these guidelines will require an application to Council and subsequent approval. Any application must include, amongst other things, certification from a suitably experienced qualified civil, structural or geotechnical engineer that the:

- Loading imposed will not adversely affect the underlying sewer, or
- Remediation work proposed will prevent any adverse loading on the underlying sewer.

On sloping sites there is potential that earthworks down slope of an existing sewer main could present a risk for land slip or erosion of soil providing cover and/or side support to an existing sewer main.

Any proposed regrading of land immediately down slope of an existing sewer main should be designed with a slope no steeper than 3 (horizontal) to 1 (vertical) to ensure future erosion and/or land slip does not reduce cover and/or support to the existing sewer main. Steeper embankments would be permitted where the embankment is certified by a suitably experienced qualified civil, structural or geotechnical engineer and approved by Council.

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

5.3.12 Retaining Walls

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

- Where the footings of a wall would encroach on the zone of influence, the wall is to be designed in accordance with section 5.3.15.
- Generally, walls more than 1metre in height would not be permitted within 1metre of the main.
- Minimum cover over the main is to be maintained or an Engineer's assessment is required for protection of the main.
- The wall is to be set back at a minimum of 1.5metre from the centre of a sewer maintenance structures.
- A retaining wall less than 1metre in height may be permitted over or within the zone of influence without the requirement for an Engineer's design provided that:
    - the wall is at least 3metre from an adjoining property or building/structure;
    - The wall would not be subject to vehicle loadings.
- Any retaining wall crossing a sewer main must be supported over the main with a reinforced concrete foundation designed in accordance with section 5.3.15 to ensure no loads from the wall are transferred to the sewer main i.e. bridging slab foundation.

5.3.13 Planting of Trees and Shrubs

Tree roots can penetrate into sewer pipes through joints or damaged sections of pipes, causing blockages and subsequent overflows. A list of high hazard species is provided in the Council's Building Over or Adjacent to Sewer Infrastructure Guidelines).

The costs associated with Council repairing damage to a sewer caused by trees, shrubs and plants, planted or maintained by the owner will be at the expense of the owner.

5.4 Clearances

To ensure all sewer infrastructure is protected from damage and to enable maintenance, minimum clearances are required to be maintained from proposed structures. **Any arrangements involving access to a sewer through the floor of any building is NOT permitted.**

5.4.1 Sewer Mains and Pipes

- Where a proposed building is permitted to be constructed over a sewer there shall be a minimum 250mm vertical clearance between underside of the foundations/beam and the top edge of the pipe concrete encasement. Where 250mm clearance cannot be achieved or in special circumstances alternative construction methods may be considered, upon application. Vertical clearances of less than 100mm will **not** be permitted.
- Where the zone of influence is 1H:1V and sewer trenches are less than 2.5 metres deep, the face of any foundations should be a minimum 1,200mm clear of the outside edge of the sewers. In special circumstances these clearances may be reduced to 600mm but only if the trench depth is less than 1.5 metres and in rock

or clay and the piers are constructed by open excavation. For deeper sewers greater than 2.5 metres deep; the horizontal clearance shall be a minimum of 2.0 metres.

- Where the zone of influence is greater (flatter) than 1H:1V horizontal clearances from the face of piers to the outside edge of sewer of less than 1,200mm will not be permitted.
- Where the zone of influence is 1H:1V and for sewer depths of between 2.5 metres and 3.0 metres minimum clearance from the outside edge of the sewer and shall vary on a pro-rata basis from 1200mm (2.5 metres deep) to 2,000mm (3.0 metres deep).
- Where the zone of influence is other than 1H:1V, for sewers at depths greater than 2.5 metres the minimum clearance from the outside edge of the sewer shall be 2.0 metres.
- See below table for minimum cover over sewer pipes:

Minimum Cover Requirements for Sewer	
Location of Pipe	**Gravity Sewers – All Pipes**
Areas not subject to vehicular loading	450mm
Areas Subject to vehicular loading;	
Not in a roadway	600mm
In a sealed roadway	750mm
In an unsealed roadway	750mm

Table 5-1 – Minimum cover for sewer pipes

5.4.2 Maintenance holes, Lampholes, and Maintenance Shafts

Unrestricted access to all maintenance holes, junctions, lampholes and/or maintenance shaft to be provided and maintained at all times. The following minimum clearances from these access points are required.

a. No building, wall or other improvement will be permitted within 1,200mm horizontal radius from the centre of a maintenance hole or maintenance shaft and within 750mm horizontal radius of a junction, lamphole or terminal maintenance shaft. It should be noted that these distances may be increased in certain circumstances.

b. A minimum vertical clearance of 2,400mm is to be maintained for all structures.

c. Where a building is proposed to extend across the whole frontage of the building block, provision will be made to ensure that access for machinery to the maintenance holes, lampholes, maintenance shafts and terminal maintenance shafts at the rear of the building is available at all times. Access from adjoining properties, unless they are public reserves, can only be relied on if an easement leads to the subject property to provide permanent access.

5.5 Asset Protection Measures

Where construction of any heavy/permanent structures or lightweight/demountable structures will impose a load within an existing sewer asset's zone of influence (see section 5.5.3), Council may request the developer to carry out any combination of the following protection measures:

- Concrete encasement; and/or
- Piering of foundations

The protection measures may also be required due to other factors affecting the asset such as available cover.

5.5.1 Concrete Encasement

Concrete encasement of the sewer main is required for the protection of the affected pipe and any associated infrastructure due to the vertical loads imposed by the works and as a result of loss of access. Concrete encasement is also required where the cover of the strata over the pipes does not meet the minimum cover requirements. Refer refer section 5.4.1.

Concrete encasement is to comply with the following specification:

- Only rubber ring jointed vitrified clay and PVC pipes may be encased in concrete. Permission may also be given to replace other types of pipes with PVC pipes prior to encasement depending upon the location and criticality of the lines.
- In trenches of material other than rock, encasing is to extend 150mm under, on both sides and on top of the pipe barrel. The maximum width of the encasement is not to exceed 600mm. 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.
- 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 1000mm 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 maintenance hole is less than 2 metres from the end of encasement, as required above, the encasement is to be extended up to the second flexible joint from that maintenance hole.
- The applicant/developer will be required to locate the main, excavate the trench in accordance with Work Cover guidelines, identify the type of pipe to ensure encasement is possible, supply and construct any formwork required and supply and place the concrete (minimum 28-day strength of 20 MPa) in accordance with relevant standards and provide evidence of meeting this requirement. If the pipe has to be replaced in order to encase, the cost associated with these works are to be at the applicants' expense. Prior to any works commencing, Council's Water and Sewer Group need to be notified and allowed to inspect as required.
- If asbestos pipes are to be replaced, removal and disposal of the pipes and any other asbestos cement material is to be undertaken in accordance with WHS guidelines at the applicants' expense.
- Backfilling of the trench with suitable material as per specification 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.
- 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.

5.5.2 Piering and Foundation Requirements

Design of a structure's foundations can be enhanced to transfer loads outside the sewer assets zone of influence. This approach can reduce the need to structurally strengthen the sewer main through measures such as encasement, and ensures the structure is self-supporting in the event of a collapse of the sewer main, or excavation of the sewer main. A certified design prepared by a suitably qualified and experienced Engineer will be required to accompany foundation designs. The plan shall show the design of all footings, beams and piers and clearly note required clearances, ground levels and nominated soil classifications.

Piering and/or foundations is to comply with the following specification:

- The foundations of any structure at/and within 1,200mm horizontal clearance from a sewer shall extend a minimum 150mm below the zone of influence of the sewer or on sound rock. Concrete encasement of the sewer is required in accordance with section 5.5.1.
- The foundations of any structure greater than 1,200mm horizontal clearance and within the zone of influence of the sewer shall be a minimum 150mm below the zone of influence relative to the trench.
- The building and its foundations are to be designed in such a way that no building loads are transmitted to Council's sewer and where possible, the pipe can be repaired or replaced at any time without affecting the stability of the building.
- Displacement piles or shoring will not be permitted within 5.0 metres of a sewer.
- A minimum horizontal clearance of 1 metre is required between any piers and the face of a sewer main.
- Screw piles will be permitted no closer than 2.0 metres to a sewer. Screw piles permitted to be located between 2.0 metres and 5.0 metres offset from the sewer are to be cored (min. ¾ diameter of helix) to a level 300mm below the invert of the sewer.
- Certified Engineers design/construction details are required to show the design of footings, piers and beams with specified clearances, ground levels, together with soil classification.

5.5.3 Zone of Influence

The 'zone of influence' is an area extending both horizontally and longitudinally along the alignment of an underground asset. This area is considered as that part of the ground where:

- Settlement or disturbance of the ground surrounding the pipe may cause damage to buildings or structures on the surface above.

- Loads from buildings or structures on the surface 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): 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. See figure below.

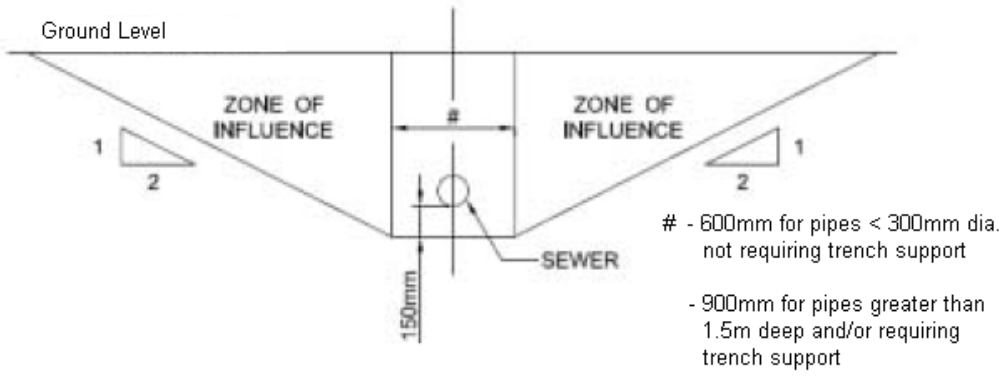

Figure 5-2 – Zone of Influence

A steeper angle of repose (max 1H:1V) for stiff soils (clays etc) considered subject to the approval of the Development Engineer Water and Sewer. Geotechnical investigations and a report from a suitably qualified and experienced Geotechnical Engineer need to be provided by the applicant to support such requests.

5.5.4 General Considerations

- It is the applicant's/developer's responsibility to locate all services within the vicinity of any sewer infrastructure prior to excavation.
- Rebuilding of any premises is subject to the same conditions as would be imposed in respect of an entirely new building/structure or part thereof.
- Where satisfactory arrangements for building over a sewer cannot be provided, realignment of the sewer at the owner's expense where practicable, may be considered. Generally, each case must be treated on its merits having regard to the type and importance of the sewer, the nature of the strata, feasibility of re-designing or relocating the existing sewer and/or the proposed building etc.
- Where excavation works for sewer encasement are likely to affect adjacent structures either on the subject property or on adjoining lands, underpinning or other approved methods of support of these structures will be required.
- Pressure sewer systems are to be treated in a similar fashion to normal gravity sewer in regard to building over sewer conditions. The zone of influence is to commence from a point 150mm below and 150mm horizontally away from the base of the pressure unit. No building, wall, foundations or other improvement will be permitted any closer horizontally than 1,200mm to the unit. Foundations at 1,200mm offset are to be founded a minimum 150mm below the base of the unit. A minimum vertical clearance over the unit of 2,400mm is to be maintained. Access to the unit for maintenance and repairs is to be maintained at all times. No structures are to be constructed over the sewer pressure mains running from the unit to the boundary kit. If required, and subject to application, relocation of the pressure main from the unit to the boundary kit may be approved.

5.5.4.1 Costs

The developer will be responsible for all costs associated with:

- Investigation and design and any costs associated with seeking approval
- Construction costs (in the event the approval is granted)
- Repairing any damage to a sewer main or associated sewer infrastructure caused by construction over or near an existing sewer.

The developer, applicant or owner must also pay for all works associated with the relocation of proposed buildings, existing assets and costs associated with any strengthening works or foundation enhancements required.

All costs associated with rectification works of damaged sewer infrastructure caused by building over or adjacent to sewers, or illegal building works over or adjacent to sewers will be at the expense of the developer, applicant or owner.

The developer will have no claim on Council for any costs incurred in the event that approval is not granted.

5.5.4.2 Exceptions

Some lightweight structures may be exempt from certain conditions set down in this policy, as noted below:

- If the proposed structure approved by Council is a readily demountable structure and can be easily dismantled by the owner at their own risk and expense, at any time, as requested by Council. The applicant may need to provide information confirming the above.
- If the proposed structure does not place a superimposed load on the sewer main and do not prevent reasonable access to the sewer main either at the stage of construction or in the foreseeable future (owing to alteration of the structure).

In general, each case will be assessed on its merits after lodgement of a development or other application with consideration being given (but not limited to) the loads imposed on the sewer, accessibility to sewer mains, the criticality and type of sewer.

5.5.4.3 Audit inspections

Audit inspections of all works to verify compliance with the conditions of approval will be mandatory. In the event of non-compliance Council will take appropriate action to minimise the impact on the asset, at the expense of the owner.

5.5.4.4 Reinstatement

Even though approval to encroach into an easement may state that Council cannot be held responsible for any damage caused to the encroachment, paths, etc. it is often in the best interests of Council and the Owner to minimise amount of damage that is likely to occur as a result of operation and maintenance within an easement.

Given that reasonable reinstatement works are sometimes carried out by Council or its contractor to concrete floors, paving, etc. that may be damaged as a result of its operations and maintenance, exercise caution when expensive or unusual surface

improvements, for example, concrete with special finishes, will require reinstatement because matching colour and/or texture between repaired and original finishes can be very difficult.

5.5.4.5 Unused Easements

Instances sometimes arise where approval is sought to encroach into a Council easement wherein no Council asset presently exits.

Where an easement has been verified by Council as no longer being required, Council may agree to the easement being extinguished. The Owner would be responsible to pay all legal fees, Land Titles Office registration fees and, if required, survey costs.

5.6 Unapproved Encroachments

Unauthorised encroachments on easements where no approval has been granted by Council, will be investigated. The severity of the encroachment will determine the action to be taken.

Where approval would have been given had it been sought, approval is granted in retrospect subject to the normal conditions that would have applied if the correct procedure had been followed, including any additional requirements, and payment of associated costs and charges.

5.6.1 Over a Maintenance Structure

If the encroachment is over a maintenance structure, the Owner must remove the encroachment at the Owner's expense within a specified time. Following a Council engineering assessment, if any appropriate courses of action are available, these may be considered at Council's discretion.

5.6.2 Over an Inspection Opening

If the encroachment is over an inspection opening (used for inspection only), which is still partly accessible, approval can be granted in retrospect subject to the normal conditions that would have applied if the correct procedure had been followed, including any additional requirements, and payment of associated costs and charges. If the encroachment is to remain in place, the owner is to agree to accept all risks associated with operations and maintenance at the inspection opening.

5.6.3 Outside Council's Requirements

If the positioning of the encroachment is not fully in accordance with Council requirements, for example, the side of the shed is too close to the centre line of the sewer, the encroachment is permitted to remain provided the Owner accepts the consequences and is prepared to accept all risk associated with operations and maintenance at encroachment. This acceptance must be in writing.

5.6.4 Permanent Structures

Where a house, shop, unit, office, factory or other structure has been constructed over a sewer and/or access points within an easement, a risk assessment is to be

conducted to determine the most appropriate remedy. Any costs incurred in this process are at the owners cost.

Remedies at the Owner's expense may include:

- Rehabilitating of the sewer,
- Construction of a new maintenance hole, main shaft or other access point clear of the offending structure,
- Relaying the sewer clear of the offending structure,
- Enlarging the easement to allow for future maintenance or construction.

6 Part 2 – Building in the Vicinity of Trunk Water Mains

6.1 Procedural Statement

Building over or adjacent to trunk water mains by residents, commercial or industrial business' can be problematic for Council and the land owner, especially when water main maintenance or repairs are required.

Building in the vicinity of pumped sewer mains may also be assessed in line with the requirements of Part 2 – Building in the Vicinity of Trunk Water Mains at the discretion of the Development Engineer Water and Sewer.

6.2 Consideration of Build Over Water Main Requests

Each case will be assessed on its merits after lodgement of a development or other application with consideration being given, but not limited to the loads imposed on the water main, accessibility to water mains, the criticality and type of the water main. On application Council will consider the following in the below order:

- Relocation of the proposed building/structure;
- Relocation of services; or
- Building over or adjacent to the water.

It is the responsibility of the developer, applicant or owner to investigate and document the above options in consultation with Council.

Refer sections 5.2.1 and 5.2.2 for additional information.

6.2.1 Construction Not Permitted

Council does not allow building over or adjacent to trunk water mains. A trunk water main is deemed to be a main of greater than or equal to 200mm diameter and some 150mm watermains.

Buildings are also not permitted within 4 metres of reticulation water mains and are not permitted within a water main easement. Refer sections 5.2.1 and 5.2.2 for additional information regarding asset protection that may need to be taken in the event that a building/structure imposes a load within an existing water main's zone of influence.

6.3 Building in the Vicinity of Water Mains

Council will only consider a building/structure in the vicinity of a trunk main in exceptional circumstances and then only if the applicant can demonstrate that relocating the building/structure and/or relocation of the trunk water main is not feasible.

The developer shall consider an integrated approach and demonstrate that all associated risks can be managed with marginal costs if building in the vicinity of a trunk water main is to be considered and accepted by Council. All costs associated with the works are to be funded by the developer.

6.3.1 Risk Assessment

Given that failure of a water main, particularly a trunk water main, has the potential to cause significant damage to structures and assets of all kinds (including destruction) and potentially injury to residents/ occupants, a thorough risk assessment should be carried out, in considering the safety and integrity of structures/assets (whether existing or proposed) in the event of a main bursting. This may require consideration by specialist consultants (Structural Engineers and/or Hydraulic Specialists).

As well as an appraisal of the impacts discussed above, such a risk assessment should also consider the condition of existing pipes and nearby structures.

6.3.2 Clearances

Where water mains are located within private property the generally accepted clearance criteria for water mains is a minimum of 2.4 metres from the property boundary and a clearance of 6 metres from other structures. This clearance may be varied at the discretion of the Development Engineer Water and Sewer based on guidelines provided in the table below.

Operating Pressure	Clearance
< 60m,	5m
60m to 80m	10m
> 80m	20m

6.3.3 Asset Protection Measures

Refer to section 5.5 of this policy.

6.3.4 Zone of Influence

Refer section 5.5.3 of this policy.

6.3.5 General Considerations

Refer section 5.5.4 of this policy.

6.4 Existing Structures in the Vicinity of Existing Mains

The options to be considered where an historic situation applies; that is an existing main in the vicinity of an existing structure are:

Reroute, replace or relocate the water main in easements or road reserves.

Wherever possible and feasible, this is considered the best option, but noting that this may be very expensive.

Purchase, relocate and/or demolish the existing building.

This may be difficult and would require extensive consultation with the property owner(s) and may be a very costly and/or undesirable choice. Where there is sufficient land, consideration could be given to relocation of the dwelling or structure. This may also include the acquisition of land and/or creation of an appropriate width easement.

- **Expose main and concrete encase (where possible)**

This will need to be designed by an experienced, competent Structural Engineer. Depending on the Risk Assessment, this may need to be reinforced concrete encasement. Concrete encasement is considered undesirable where pipe(s):

- are old cast iron pipes with internal corrosion;
- joints are mechanical couplings, lead joints or flanged joints;
- are in an instable area, are externally damaged or have external corrosion; and/or
- are too deep (cost prohibitive).

- **Expose main and build reinforced bridging slab over main**

This will need to be designed by an experienced, competent Structural Engineer. The zone of influence will dictate the width of the slab. Council may require the slab be constructed over a layer of compressive material

- **Lining of main**

This involves installation of an internal lining to prevent pipe wall deterioration by corrosion. Consideration could be given to installation of a structural lining. This is to be designed by an appropriately qualified and experienced Structural Engineer.

Piering of foundations
Where there is sufficient clearance, consideration could be given to piering, to protect both the water main and the affected structure. This will need to be designed by an experienced, competent Structural Engineer.

7 Relevant Legislation

This policy is to be made available for public viewing as required under the *Government Information (Public Access) Act, 2009*.

8 Document Information

Related documents and reference information in this section provides a single reference point to develop and maintain site compliance information.

8.1 Related Documents

Related documents, listed below, are external documents directly related to or referenced from this document.

- Water Directorate Guidelines Building in the Vicinity of Sewer and Trunk Water Mains Guidelines 2019
- WSA 02-2014 Gravity Sewerage Code of Australia
- WSA 03-2011 Water Supply Code of Australia
- Plumbing Code of Australia 2016
- Australian Standard AS/NZS 3500 – Plumbing and Drainage Set
- NSW Guidelines for Best Practice Management of Water Supply and Sewerage 2007

Related documents, listed in ***Table 8-1*** below, are internal documents directly related to or referenced from this document.

Number	Title
POL/26030	Policy – Sewer Services
POL/26031	Policy – Water Supply Services
21/25692	Technical Specification – Design and Construction – Water Infrastructure – November 2020
21/25693	Technical Specification – Design and Construction – Sewer Infrastructure – November 2020
19/16792	Building in the Vicinity of Sewer & Trunk Water Mains Guidelines

Table 8-1 – Related documents

9 Responsible Officer / Policy Owner

The implementation and ownership of this policy rests with the Manager Water and Sewer, unless appropriately delegated to another officer.

The Development Engineer Water and Sewer is responsible for the adherence to this Policy. The following officers may provide support and advice on this policy:

- Manager - Water and Sewer
- Development Engineer – Water and Sewer
- Coordinator Strategy and Compliance

- Coordinator Water and Sewer Delivery; and
- Coordinator Utilities Engineering.

10 Responsibilities

Parties or Persons	Responsibilities
Manager Water and Sewer	• Ensure compliance of policy and all relevant procedures and supporting documents are current and communicated to all relevant stakeholders. • Review policy regularly to ensure currency of principles.
Manager Development and Environment	• Ensure all Development and Environment staff understands the principles of the policy and all relevant procedures and supporting documents applicable to the development process.
Development Assessment Planners and Health and Building Surveyors	• Consider principles of the policy when assessing development applications and providing advice to customers. • Refer all relevant applications or enquiries to Utilities Engineer - Projects and Development when need identified.
Water and Sewer People Leaders	• Provide direction to staff and ensure compliance with the policy. • Provide expert knowledge of the policy and its principles to Council staff, its customers and other stakeholders.
Water and Sewer Staff	• Ensure understanding of principles of the policy and all relevant procedures and supporting documents. • Undertake all duties in accordance with the policy and supporting procedures in a safe manner.
GIS Business unit	• Ensure accurate mapping available, showing all relevant sewer infrastructure.
Frontline Staff	• Awareness and understanding of principles of the policy. • Consider implications when discussing or dealing with customers or Council matters relating to building, renovating or developing land and sewer services.

It is the responsibility of all Council employees and any person contracted to or acting on behalf of Council to have knowledge of, and to ensure compliance with this policy.

11 Approval

As per cover sheet.

12 Monitoring

This policy will be monitored by the Manager – Water and Sewer and the Water and Sewer Groups' Utilities Engineer to ensure compliance.

13 Review Date

This policy, once adopted, is to remain in force until it is reviewed by Council. This policy is to be reviewed approximately every four (4) years to ensure that it meets legislative requirements.

In accordance with section 165 (4) of the *Local Government Act 1993*, this policy will be reviewed within one year of the election of every new Council.

14 Last Review Date

This policy was last reviewed on 18 May 2020.

15 Record Keeping, Confidentiality and Privacy

All records received, created or supporting this policy will be kept on Council's Corporate Computer Systems in accordance with *State Records Act 1998, NSW* and will retain confidentiality and privacy in accordance with *Privacy and Personal Information Protection Act 1998, NSW* and Council Policy. Council is required to release certain information in accordance with *Government Information (Public Access) 2009, NSW*.

This policy is to be made available for public viewing as required under the *Government Information (Public Access) 2009, NSW*.

16 Breaches and Sanctions

Any breaches of this Policy will be referred to the General Manager for appropriate action.

17 Document History

The below table provides a summary of changes and amendments to this document.

Version	Date Amended	Author	Comment (e.g. reasons for review)
4		Development Engineer – Water and Sewer	• Biennial review • Added document history

Version	Date Amended	Author	Comment (e.g. reasons for review)
	April 2022		• Document references updated from Council Development Specifications to Council Technical Specifications • Maintenance Hole used to replace the traditional term Manhole. • Requirement for CCTV inspection by qualified personnel and in accordance with the Water Services Association of Australia Conduit Inspection Reporting Code WSA 05-2013 - Version 3.1. • Requirement for additional subgrade preparation, compaction and engineering input into designs for driveways over sewers • Changed review period to every four years