



Building Over and Adjacent to Assets Technical Guide

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Adopted: 28/11/2022

File: 33249E

Review Date: 31/10/2025

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1 PURPOSE

The aim of this document is to provide technical information to those proposing to build over/adjacent to our water and sewerage assets. It is not an automatic approval to just comply with this document. Do not assume that consent for construction over and/or near our water and/or sewerage assets will be approved.

These technical guidelines should be read in conjunction with:

- Shoalhaven Waters' "Building Over Water or Sewer Pipelines Policy"
- Water Services Association of Australia NSW Regional Water Supply and Sewerage Codes

This technical document does not cover Council's stormwater pipes and channels. For information on stormwater assets, refer to Council's Development Engineering Department.

Shoalhaven Water will treat each application on its merits.

2 Building Over and/or Adjacent to Assets

2.1 Overview

When you build over, adjacent, close to or under Shoalhaven Water (SW) pipe assets, your work must not:

- obstruct full and free access to our assets, and
- cause physical damage to our assets, and
- weaken our assets leading to future damage, and
- increase the likelihood of a hazardous situation (for example, induced voltages onto our pipelines).

These guidelines are to help professional advisors (including architects, engineers and designers) and applicants/developers to better plan and construct works that are near to our assets.

2.2 What are building over and/or adjacent to works?

Any building works likely to adversely impact on our water and sewerage assets are regarded as 'building over and/or adjacent to' works. "Building over and adjacent to" means over, under, or next to.

2.3 What are Temporary protection works?

Temporary protection works are those required to protect our water and sewerage assets during your construction works. They may include supports, barriers or other construction control measures.

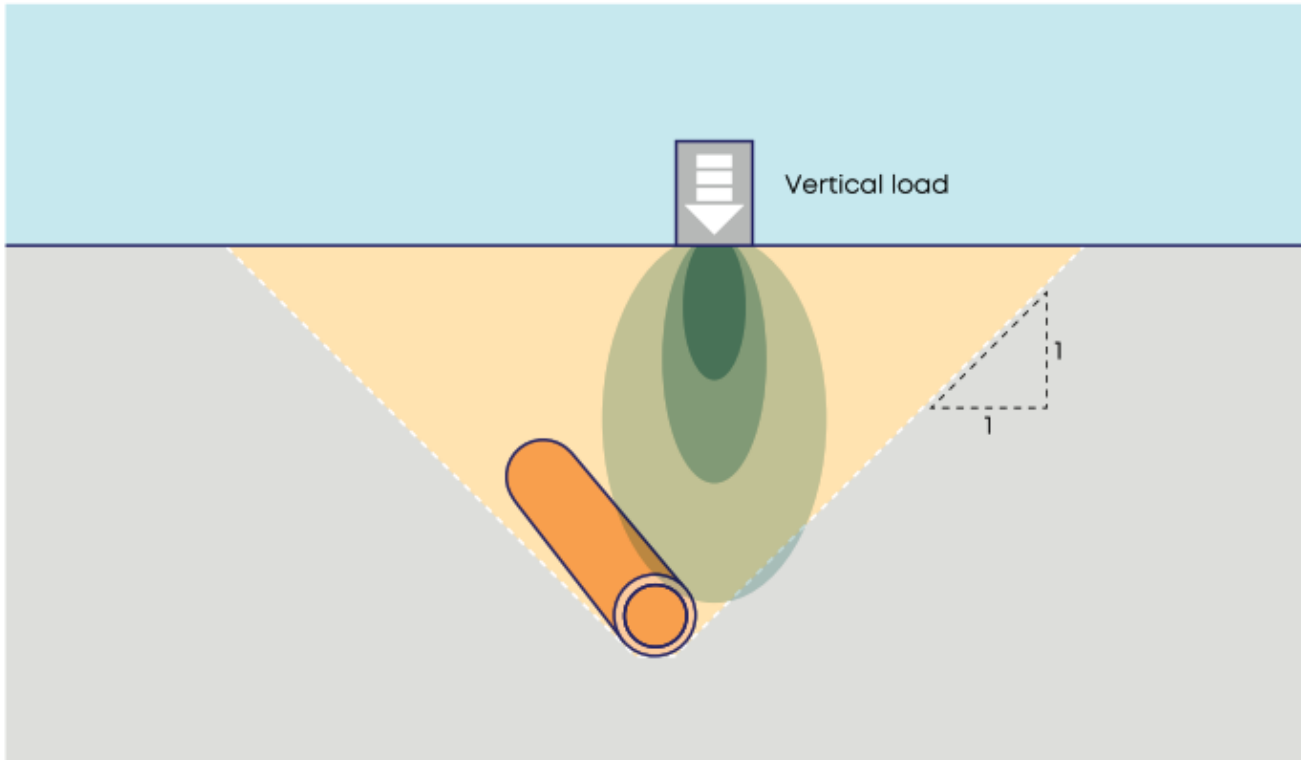
2.4 What are permanent protection works?

Permanent protection works are those required to be constructed to protect our water and sewerage assets on a permanent basis. They may include strengthening or rehabilitation works and will remain after construction is complete.

2.5 What is the Zone of Influence?

The zone of influence (ZOI) for external loading is the notional envelope within which an external vertical load would exert stress on a pipe or structure (**Figure 1**).

Figure 1



The 'zone of influence' of a water or sewerage asset is that area of soil/strata that is likely to be influenced by building loads. Factors that determine the 'zone of influence' include:

- Width of trench (See to Figure 2)
- Depth of trench (See to Figure 2)
- Soil classification by a suitably qualified Engineer as per AS 2870 (as amended)
- Groundwater / level of the water table (See to Figure 2)

Figure 2

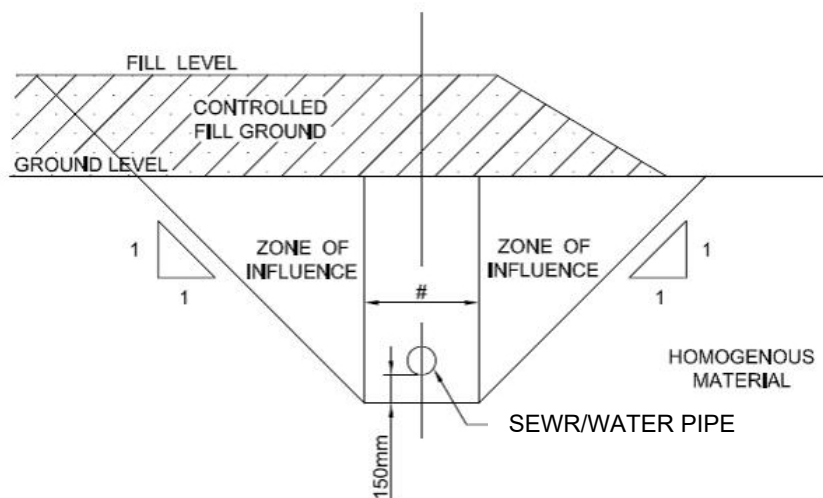


DIAGRAM 1 - ZONE OF INFLUENCE - CLAY, COMPACTED SOIL, ETC.

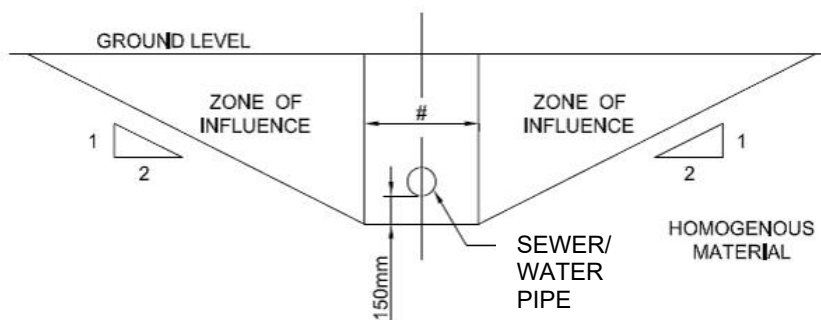


DIAGRAM 2 - ZONE OF INFLUENCE - SAND, FILLED GROUND, LOAM, ETC.

NOTE: IN WATER CHARGED GROUND, THE ZONE OF INFLUENCE MAY EXTEND FURTHER FROM THE ASSET.

- # (A) 600 mm - TYPICAL FOR PIPES UP TO 300 mm DIAMETER NOT REQUIRING TRENCH SUPPORT.
- (B) 900 mm - FOR PIPES GREATER THAN 1.5m DEEP AND/OR WHERE TRENCH SUPPORT MAY BE REQUIRED.

3 SUBMISSION REQUIREMENTS

3.1 General

A written application to Shoalhaven Water including the following is to be provided:

- a) One (1) electronic copy of the approved Building (architectural) plans, and
- b) One (1) electronic copy of the certified engineering plans, indicating protection requirements of the water or sewer asset and proposed/existing structure(s), and
- c) Site survey plan accurately showing the location of the existing water or sewer asset dimensioned both vertically and horizontally with respect to the proposed structure(s). Details to include offsets (perpendicular from the asset) and chainages at those offsets, grade of the asset, AHD invert levels and surface levels at the affected footprint of the building/structure. All dimensions indicated on the plan should be established by site survey and levels to AHD and not copied from Council's records.
- d) Any other documentation relevant to the works which is required for Shoalhaven Water to take into account as part of its assessment prior to making a determination on the proposed works.
- e) In certain circumstances Shoalhaven Water will require a work method statement showing the sequence of construction and method of protecting the asset.

For electronic applications please submit all the information using:

<https://shoalwater.nsw.gov.au/planning-building/developers-consultants/water-development-notice/information-support-documentation-submission>

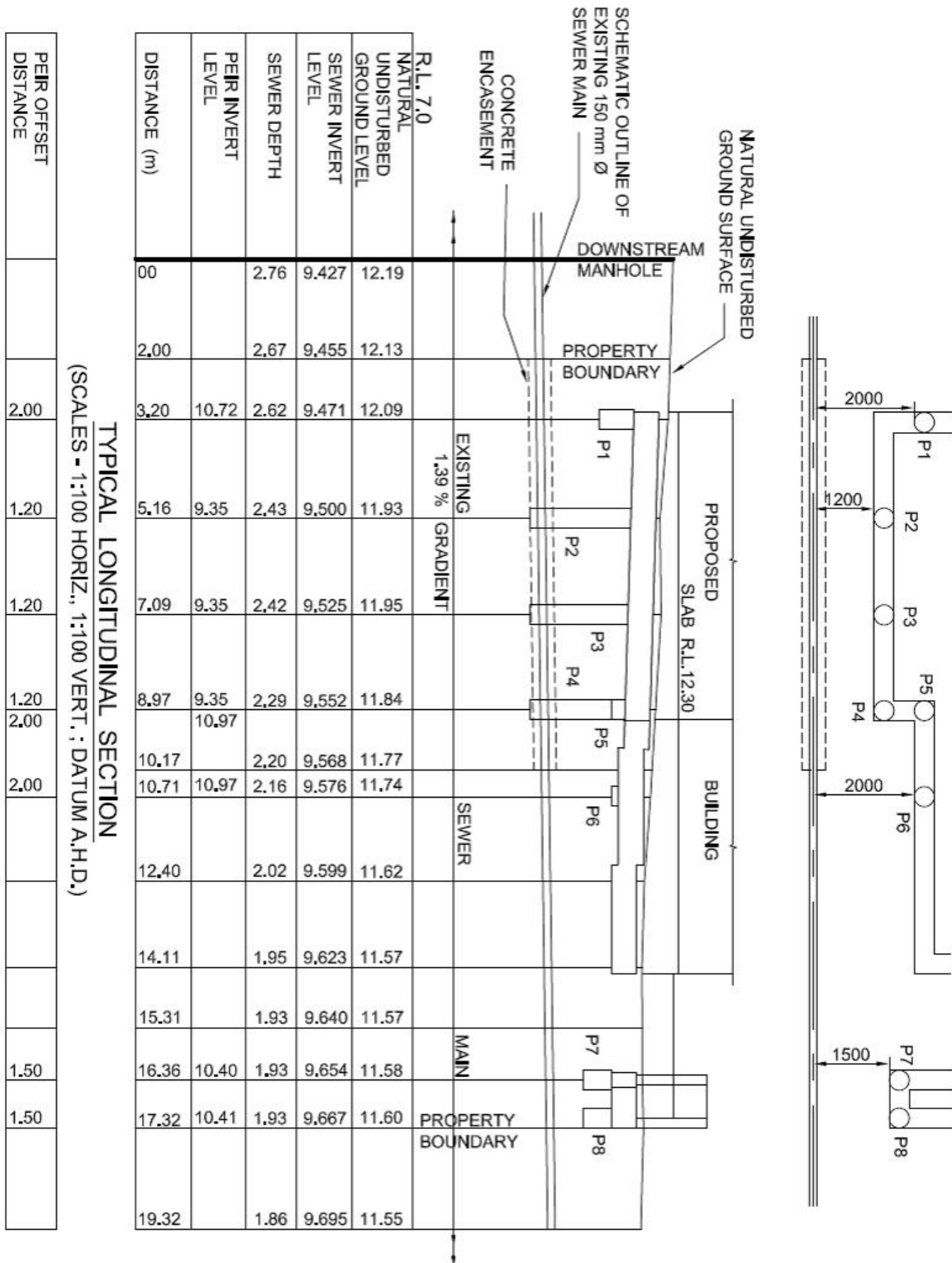
3.2 Structural Engineering Plan Requirements

The structural engineering plans must clearly indicate:

- a) Offsets from affected assets to structures/face of piers and adjoining buildings (if deemed to affect the asset), existing/finished surface levels at the building/structure and over the asset, and invert levels of the affected asset.
- b) The manner of construction and the type of material to be used for the protection of the water and sewer asset(s).
- c) Proposed or existing concrete encasement of the asset and compliance with protection, clearance and access requirements, plus any other conditions as indicated on the Water Development Notice,
- d) Long sections showing cut / fill of site, invert levels of the asset(s), pier depths, floor levels, finished and /or natural surface levels and levels of underside of foundations with appropriate clearances. (See Figure 3)
- e) Site soil classification as per AS 2870 (as amended) for the proposed development lot,
- f) All levels shall be to AHD.
- g) All plans shall include detailed construction notes.

It is the applicant's responsibility to ensure accuracy of all information provided.

Figure 3



4 SHOALHAVEN WATER PRINCIPLES

4.1 Clearances

To ensure all water and sewer assets are protected from damage and to enable maintenance, minimum clearances are required to be maintained from existing and proposed structures in accordance with these guidelines.

4.1.1 Manholes, Lampholes, Maintenance Shafts, Pressure Sewer Units and Terminal Maintenance Shafts

Unrestricted access to all manholes, lampholes, maintenance shafts, pressure sewer units and terminal maintenance shafts 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 1200mm horizontal radius from the centre of a manhole 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 2400mm 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 manholes, 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.
- d) No building, wall, foundations or other improvement will be permitted any closer horizontally than 1200mm to the edge of any pressure sewer unit.

Note: Any arrangements involving access to a sewer asset through the floor of any building/structure is NOT permitted.

4.1.2 Water and Sewer mains/pipes

- a) 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 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.
- b) Where the zone of influence is 1H:1V and sewer trenches are less than 2.5m deep, the face of any foundations should be a minimum 1200mm clear of the centreline of small pipes (150mm or 225mm dia) or a minimum 1200mm clear of the outside face of larger sewers. In special circumstances these clearances may be reduced to 600mm but only if the trench depth is less than 1.5m and in rock or clay and the piers are constructed by open excavation. For deeper sewers ie. greater than 2.5m deep; the horizontal clearance shall be a minimum of 2.0m.

- c) Where the zone of influence is greater (flatter) than 1H:1V horizontal clearances from the face of piers to the centreline of sewer of less than 1200mm will not be permitted.
- d) Where the zone of influence is 1H:1V and for sewer depths of between 2.5m and 3.0m minimum clearance from the centre of the main for pipe sizes 150mm and 225mm or from the external face of pipe for larger sizes, shall vary on a pro-rata basis from 1200mm (2.5m deep) to 2000mm (3.0m deep).
- e) Where the zone of influence is other than 1H:1V, for sewers at depths greater than 2.5m the minimum clearance from the centre of the main for pipe sizes 150mm and 225mm or from the external face of pipe for larger sizes, shall be 2.0m.
- f) No building, wall, foundations or other improvement will be permitted within 5.0 metres of a water main(s) or surface fitting(s) in private land.

4.2 Concrete Encasement

Concrete encasement of the sewer asset is required for the protection of the affected asset, and any associated infrastructure, due to the vertical loads imposed by the works and as a result of loss of access.

NOTE: Water assets and Sewer Rising Mains are not permitted to be encased in concrete.

Concrete encasement is required when:

- a) A building/structure (or part of) is built directly over the sewer asset and is impeding future open-cut excavation access to the sewer asset.
- b) The foundations of any structure are less than 1200mm horizontal clearance from a sewer asset.
- c) Where the cover of the strata over the pipe does not meet the minimum cover requirements (Figure 4)

Figure 4

Minimum Cover Requirements for Sewers	
Location of Pipe	Gravity Sewers – All Pipes
Private and Public lots not subject to vehicular loading	600mm
Private lots zoned residential subject to vehicular	750mm
Footways, nature strips, industrial and commercial lots, sealed road pavements other than major roads subject to vehicular loading	900mm
Unsealed road carriageways	1200mm
Major road carriageways	1200mm
Future road, rail and tram pavements	1200mm

4.2.1 Replacement Assets

Concrete encasement of concrete, asbestos cement or vitreous clay pipes or any sewer asset that (in the opinion of SW), is in a poor condition is not permitted. Where local conditions permit, replacement of these pipe types is required prior to encasement, subject to approval by SW. In most cases SW will

provide alternative replacement pipes. Removal and disposal of the sewer asset(s) are to be undertaken in accordance with WH&S Guidelines and are at the applicants' full expense.

4.2.2 Specifications

Concrete encasement is to comply with the following specifications:

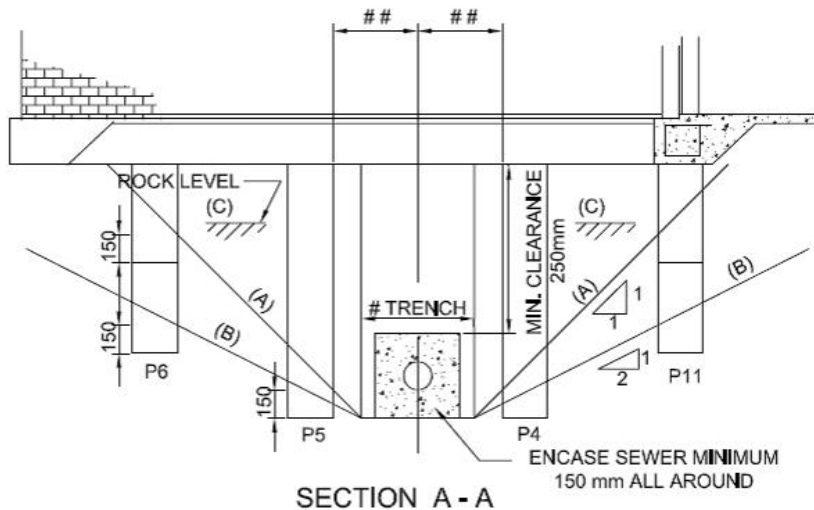
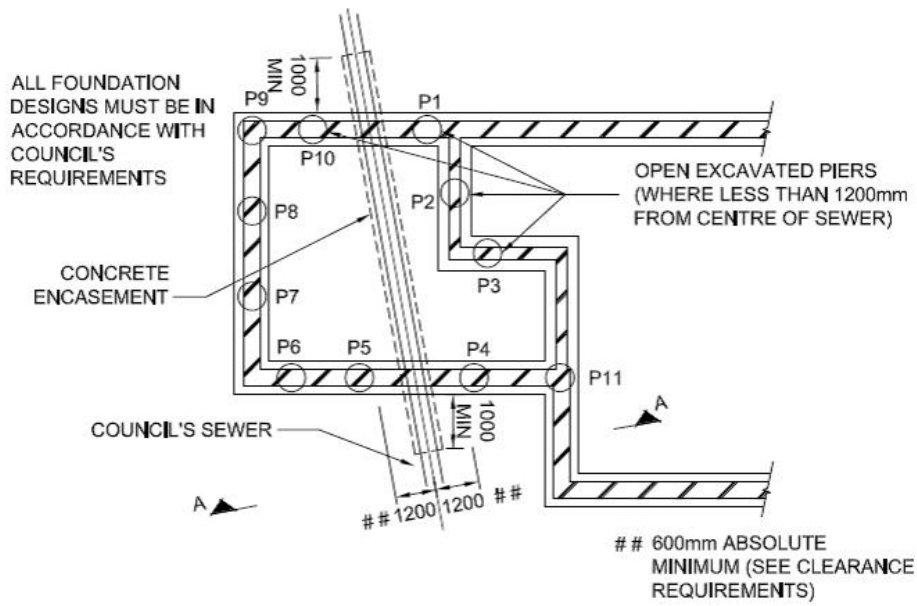
- a) In trenches of material other than rock, encasing is to extend 150mm under, on both sides and on top of the pipe barrel. The maximum width of the encasement is not to exceed 600mm. For trenches in rock, encasing is to extend 100mm under the pipe barrel, 150mm on top of the pipe barrel and for the full width of the excavated trench.
- b) Unless otherwise specified, all flexible pipe joints are to be maintained and expansion joints provided at each rubber ring joint (refer to Water Services Association of Australia NSW Regional Gravity Sewerage Code drawing SEW-1205). The minimum length of the encasement will be the total length of the sewer that is affected plus a minimum of 1000mm on the 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)
- c) If a manhole 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 manhole.
- d) 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, provide expansion joints at each rubber ring joint and supply and place the concrete (minimum 28 day strength of 20 MPa) in accordance with Water Services Association of Australia NSW Regional Gravity Sewerage Code.
- e) If Asbestos pipes are to be replaced, removal and disposal of the pipes and any other AC material is to be undertaken in accordance with WH & S guidelines at the applicants' expense.
- f) Backfilling of the trench with suitable material as per specification must not commence until at least 24 hours after placing the concrete.
- g) Concrete encasement shall not be poured integral with any other foundation or structure.
- h) Sewer junctions that are permitted to be incorporated in proposed concrete encasement are to be upgraded to a rubber ring jointed junction to maintain flexibility at the junction branch and expansion joints as per (b) above.
- i) 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.
- j) High Density Polyethylene Pipes (HDPE) that have been approved to be encased by Shoalhaven Water, are to be wrapped in a compressible material prior to the placing of concrete in accordance with manufacturers specifications.

4.3 Foundation requirements

- a) The foundations of any structure at and within 1200mm horizontal clearance from a sewer shall be founded minimum 150mm below the invert of that sewer or on sound rock. (See Figure 5 and 6).
- b) The foundations of any structure greater than 1200mm horizontal clearance and within the zone of influence of a sewer shall be founded minimum 150mm below the zone of influence relative to the trench (See Figure 5 and 6).

- c) 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.
- d) Displacement piles or shoring will not be permitted within 5 metres of a sewer.
- e) Screw piles will be permitted no closer than 2.0m to a sewer. Screw piles permitted to be located between 2.0m and 5.0m offset from the sewer are to be cored (min. $\frac{3}{4}$ dia of helix) to a level 300mm below the zone of influence.
- f) Foundations in water charged ground are to be designed by a Structural Engineer and approved by Shoalhaven Water.

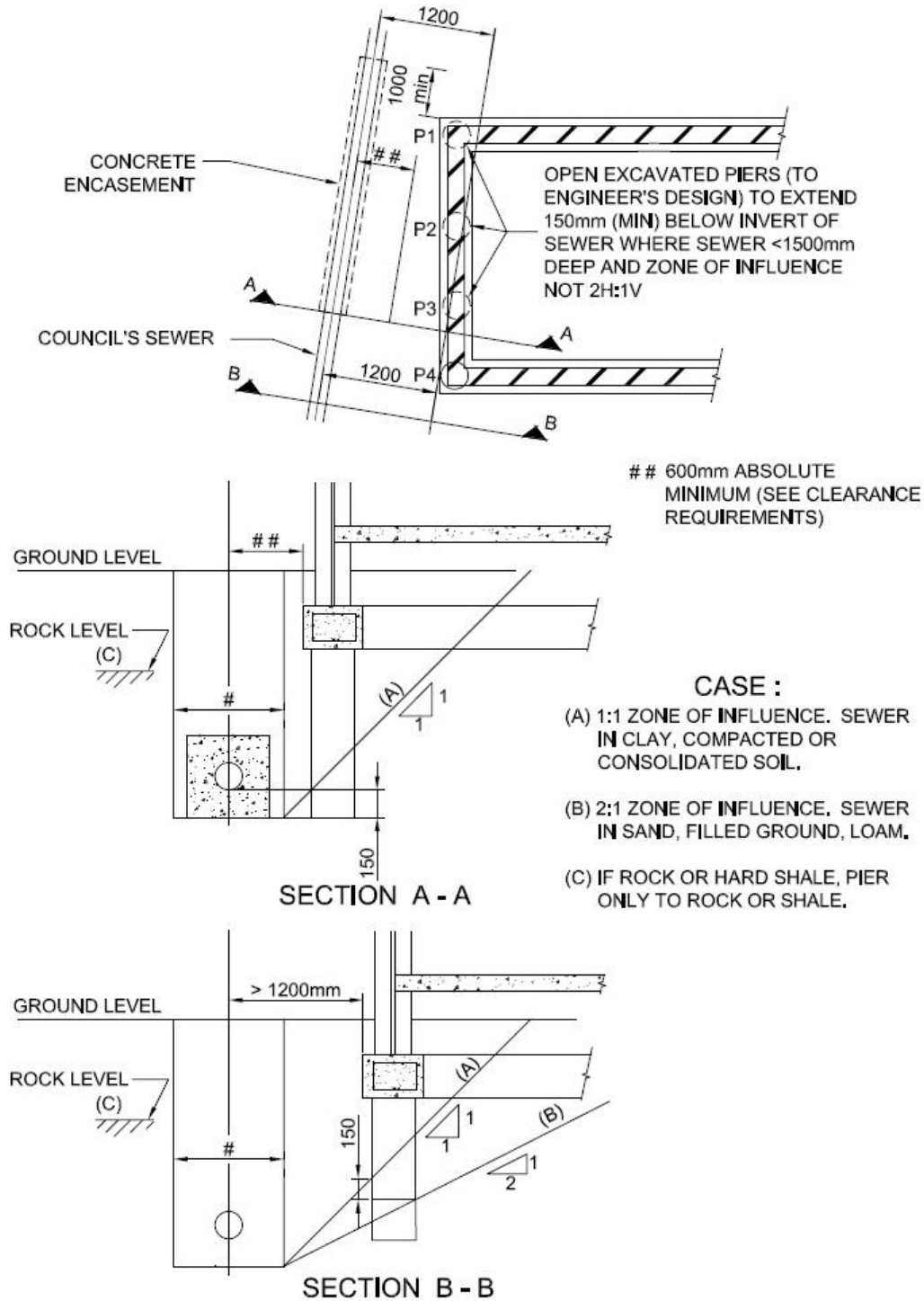
Figure 5



- (A) 1:1 ZONE OF INFLUENCE. SEWER IN CLAY, COMPACTED/CONSOLIDATED SOIL
- (B) 2:1 ZONE OF INFLUENCE. SEWER IN SAND, FILLED GROUND, LOAM, ETC.
- (C) IF ROCK OR HARD SHALE. PIER TO ROCK OR SHALE.

Refer to Figure 2 for dimensions

Figure 6



Refer to Figure 2 for dimensions

4.4 Rainwater Tanks

Rainwater tanks that are to be constructed on concrete slabs, frames or other permanent bases, will for the purposes of these guidelines, be classified as permanent load bearing structures and will be subject to the provisions of these guidelines 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, roadbase 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 these guidelines.

4.5 Pressure Sewer Systems

Pressure sewer systems are to be treated in a similar fashion to normal gravity sewer assets 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. Foundations at 1200mm offset are to be founded a minimum 150mm below the base of the unit. A minimum vertical clearance over the unit of 2400mm 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 to SW, relocation of the pressure main from the unit to the boundary kit may be approved.

4.6 General

- a) The placing of fill to excessive depths over sewers is not permitted (5.0 m is a maximum depth for practical access to a sewer). Additional filling to increase the depth to greater than 2.5 m above the sewer asset will require review for loading on the asset and approval by SW.
- b) It is the applicants/developers responsibility to locate all services within the vicinity of any water and sewerage assets prior to excavation.
- c) 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.
- d) Where satisfactory arrangements for building over a sewer cannot be provided, deviation 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.
- e) 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.

4.7 Inspection and Certification

All approved concrete encasement works are to be carried out in the presence of and to the satisfaction of Shoalhaven Water's staff. Inspection for any works should be arranged and confirmed at least 48 hours in advance as advised in the Approval Letter. Applicants are to contact Shoalhaven Water to determine the number of inspections and at what stage/s these are required prior to commencing any works.

It is a requirement for Council's inspecting Building Surveyor (where Council is the nominated PCA) or Certifier/Consulting Engineer (where a Private Certifier is nominated PCA) to carry out an inspection at the time of pier/screw pile placement, ensuring that the piers/screw piles are being placed at the designated locations/clearances to the sewer and are inserted to the required depths as detailed on the approved Structural Engineers details.

Certification (and signing off Shoalhaven Water's Development Notice) by Consulting Engineer/Private Certifier/Council Building Surveyor is required, verifying that all piers/screw piles and footings have been constructed to the approved Structural Engineers details.

5 GLOSSARY

Boundary kit means a Council installed valve box located on the sewer pressure main at the property boundary.

Building adjacent to Assets means where a structure is proposed to be built in the zone of influence but not over the asset. The structure is likely to impact on SW assets.

Building over Assets means the erection of a structure (temporary or permanent) over and within the zone of influence of the asset.

Easement to drain sewage means a legal entitlement placed over a parcel of land for the purposes of the provision, operation and maintenance of sewer infrastructure.

Encasement means the protection of a sewer pipe by encasing all around with concrete to SW standards

Lightweight/demountable structures means any approved structure (by Council's City Development Group) that can at the owners risk and expense be easily and readily dismantled and removed at the request of Shoalhaven Water. Some examples may include domestic carports, some small tool or garden sheds.

Pressure sewer unit means a Council owned and maintained individual lot sewer pressure pump unit.

Pressure Sewer system means a Council owned and maintained pressure sewer pump unit, pressure main and boundary kit.

Sewer means an asset owned by Council used for the conveyancing of sewage, whether raw or treated. A sewer may be 'live' or disused.

Sewer Manhole/Lamphole/Maintenance Shaft/Vent means an asset owned by Shoalhaven City Council, controlled and maintained by Shoalhaven Water Group, used for accessing the sewer mains. Note: A sewer manhole/lamphole/maintenance shaft/vent may be in operation or disused.

Sewer line/main/pipe means an asset owned by Shoalhaven City Council, controlled and maintained by Shoalhaven Water Group, used for the conveying of sewage whether raw or treated. Note: A sewer may be in operation or disused.

Sewer pressure main means the pipe running from the pressure sewer unit to the boundary kit.

Sewer survey / peg-out means the process where SW assets are located and correctly documented by a Registered Surveyor

Small Retaining Wall means retaining walls with a maximum height of 600mm.

Water mains/Water assets means an asset owned by Council used for the supply of potable water.

Water surface fitting means an asset owned by Council used for the supply of potable water (eg Air Valve, Stop Valve, etc).

Zone of influence means the area associated with SW assets that, if built within or over, could cause undue loading on the asset. See appendix A for general calculations of zone of influence

6 REVIEW

These guidelines will be reviewed within one year of the election of every new Council, or earlier should circumstances change to warrant a review.