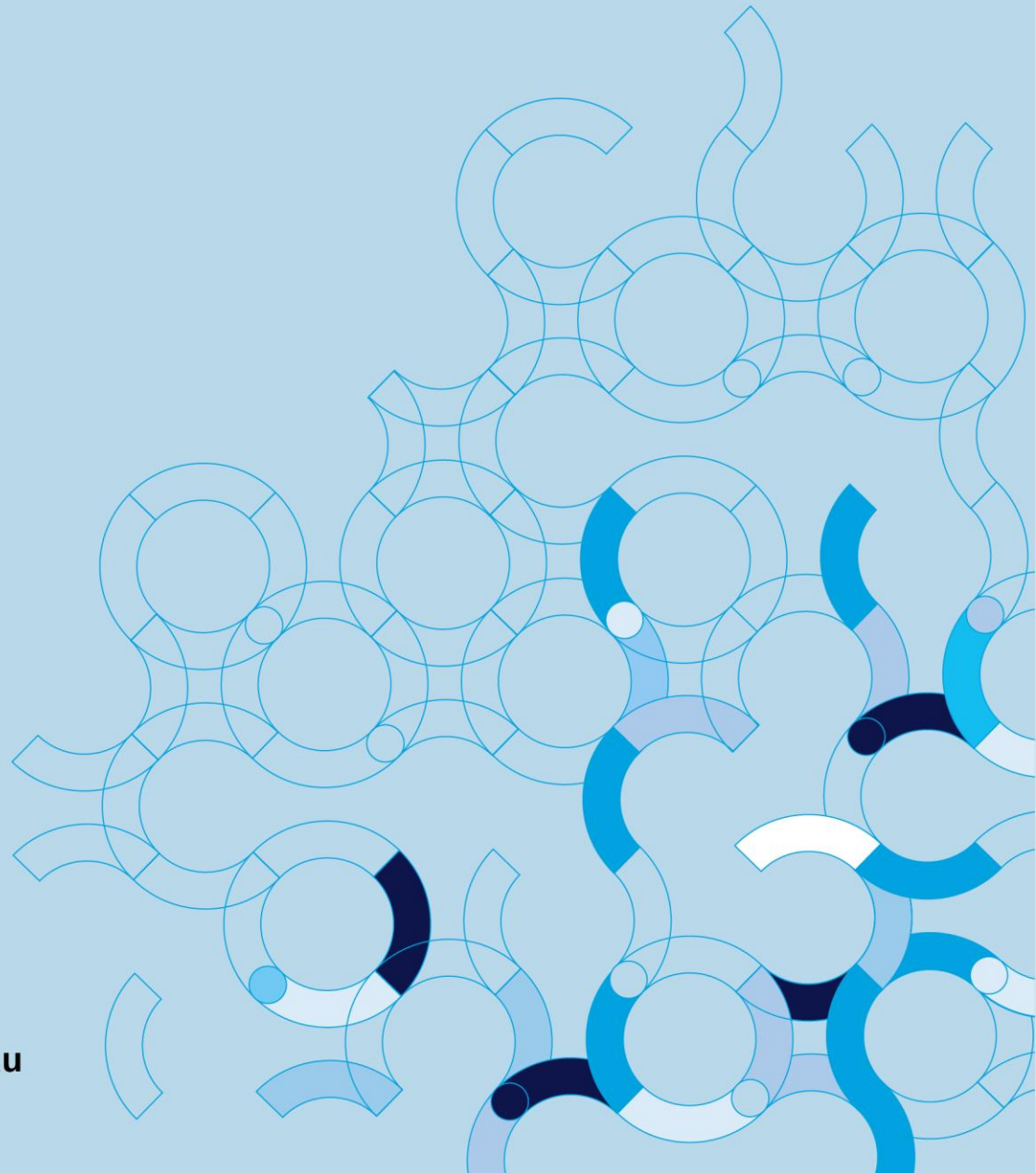
STD-SPE-G-025

Technical Specification

REQUIREMENTS FOR WORKING NEAR ASSETS

September 2025



iconwater.com.au

Disclaimer

This document has been prepared for Icon Water Limited for the Icon Water Purposes only. Icon Water does not make any warranties or representations in relation to or assume any duty of care with respect to and is otherwise not responsible for the suitability of this document for any purpose other than the Icon Water Purposes.

talktous@iconwater.com.au | (02) 6248 3111 | **iconwater.com.au**

Document management

Document authorisation table

Issue	Date	Author	Reviewer	Approver
A	13/09/23	P. Deb Roy	Various	N/A
B	23/09/25	P. Deb Roy	P. Ngan R. Bhandari	S. Asadollahi

Version control table

Issue	Date	Reason for issue
A	13/09/23	Draft for internal comments
B	23/09/25	For external consultation

Document applicability table

Asset area	Applicable (Yes/No)	Asset area	Applicable (Yes/No)
Dams (DAM)	**No***	Water Network (WAT)	**Yes**
Bulk Water Supply (BWS)	**Yes**	Sewerage Network (SEW)	**Yes**
Water Treatment Plants (WTP)	**No***	Sewage Pump Stations (SPS)	**No***
Water Pump Stations (WPS)	**No***	Sewage Treatment Plants (STP)	**No***
Reservoirs (RES)	**No***	Recycled Water Systems (REC)	**Yes**

* This specification is primarily intended for application within the water, sewerage and recycled water network system. However, the requirements of this specification may be adopted for local or individual systems found within facilities as applicable.

Contents

Abbreviations

Acronym	Full form
ACT	Australian Capital Territory
AS	Australian Standard
AS/NZS	Joint Australian and New Zealand Standard
BSM	Bulk Supply Mains
BYDA	Before You Dig Australia (Formerly known as Dial Before You Dig)
DM	Distribution Mains
DN	"Diameter Nominal" (Nominal Pipe Size)
GIS	Geographic Information System
GRP	Glass Reinforced Plastic
IL	Invert Level
m	Metre(s)
mm	Millimetre(s)
NSW	New South Wales
PPE	Pipe Protection Envelope
PVC	Polyvinyl Chloride
RC	Reinforced Concrete
WAE	Work as Executed
WMS	Work Method Statement
WSA, WSAA	Water Services Association of Australia
ZOI	Zone of Influence

Definitions

Keyword	Definition
Hold point	A milestone when acceptance is required from Icon Water, prior to commencing the subsequent construction activity. Acceptance from Icon Water must be obtained by providing all necessary documentation as required by Icon Water specification. Hold Points shall apply prior to commencement of designated work lots or work items. Hold points have been identified in Icon Water Standard specifications as a **guide** and shall be established within the boundaries of the contractor scope and context.
Icon Water Representative	The nominated person or organisation that has written authority to act on Icon Water's behalf. This may be an Icon Water employee (or employees) such as an Icon Water Inspector or Icon Water Site Surveillance Officer, or a Third Party engaged to act on Icon Water's behalf.
Include	Means including but not limited to and is used to provide clarification or examples of the type and nature of items intended.
Pipe Protection Envelope	The unhindered space required to ensure Icon Water's water and sewer networks can be safely accessed, operated, repaired and replaced.
Pressurised mains	Water mains and sewer rising mains that operate under pressure.
Registered Engineer	According to the Professional Engineers Act 2023, a professional engineer is an individual registered under the Act to carry out professional engineering services in one or more areas of engineering including civil, electrical, fire safety, mechanical, and structural. Registered engineers in the ACT are registered with the Professional Engineers Registrar, which is part of the ACT government. This Registrar manages the registration process, including assessing applications, maintaining the register of professional engineers, and ensuring compliance with the Act.
Shall / Must	Indicates that a statement is mandatory.
Should	Indicates a recommendation.
Subcontractors	An individual, partnership, corporation, joint-venture, or other legal entity having a direct contract with the Third Party or with any other Subcontractor for the performance of a part of the Work at the Site.
Third Party	For the purpose of this specification, the Third Party is an individual, group of people or organisation distinct from those affiliated with Icon Water that is planning to engage in works near Icon Water asset.
Witness Point	Witness Point means an identified point in a process where the Contractor is required to give Icon Water prior notice with the option to observe an activity based on the contract requirements. Witness points have been identified in Icon Water Standard specifications as a **guide** and shall be established within the boundaries of the contractor scope and context.
Works	Includes any activity/work that causes changes to ground conditions or has the potential to negatively impact or damage Icon Water assets.

Keyword	Definition
WorkSafe	Refers directly to the requirements of WorkSafe ACT but shall also imply the requirements of WorkCover NSW (for Icon facilities within NSW) and SafeWork Australia (where appropriate).
Zone of Influence	The space around an Icon Water asset, within which a structure and/or construction activities can have an impact on the asset.

1 Introduction

1.1 Background

Icon Water is responsible for the safe and efficient management of water and sewer infrastructure across the ACT and surrounding regions, ensuring the uninterrupted delivery of essential services to the community. It is of vital importance Third Parties avoid undertaking high-risk construction works near water and sewer mains and associated structures without Icon Water approval, as such activities may compromise the integrity of these assets and lead to potential failures.

High-risk construction activities include any works that have the potential to negatively impact or damage Icon Water assets. The following are examples of what Icon Water considers high-risk construction works when carried out in proximity to assets; however, the list is not exhaustive:

- Locating buried assets without using non-destructive technologies.
- Conducting above and below-ground construction works.
- Services crossing over and under Icon Water pipelines.
- Performing excavation or trenching.
- Engaging in building activities such as piling, auguring, boring, rock anchoring and soil nailing.
- Establishing construction site operations, such as laydown areas, stockpiles, and temporary structures.
- Operating heavy machinery and vehicles at construction sites.
- Carrying out construction works that cause substantial vibrations, like blasting, drilling, road compaction or construction.
- Undertaking roadworks and landscaping projects.
- Planting or removing trees or vegetation.

High-risk construction activities near Icon Water assets may result in the following consequences:

- Failure of a water or sewer main, leading to significant damage to the environment, harm to nearby infrastructure and properties, service disruptions, costly repairs, and potential financial liabilities.
- Impediments to carrying out emergency repairs and maintenance of the assets.

The damage may not be immediately apparent during the construction phase, but could contribute to subsequent failure over time, compromising long term performance and resilience of the assets. For instance, a leak originating from one of Icon Water's damaged assets might jeopardise the integrity of a nearby building. If not promptly addressed, even a minor leak over time has the potential to cause the adjacent structure's foundation to deteriorate leading to structural failure and collapse.

1.2 Liability of damage

Third Parties undertaking construction works near Icon Water's assets will be held responsible for any damage resulting from their construction activities. When planning to work near Icon Water assets, Third Parties must ensure the safety and operational functionality of Icon Water's sewer and water mains that are within proximity of their works. In the event of damage to Icon Water's assets, remedial action will take one of two forms:

- Rectified by Icon Water at the Third Party's expense or
- Rectified by the Third Party or their Sub-contractor(s) under supervision of Icon Water at the Third Party's expense.

To ensure the assets are suitably safeguarded based on agreed methodologies, Icon Water will require the presence of an Icon Water Representative for inspection and quality assurance of the works.

1.2.1 Legislative requirement

Third parties must comply with all applicable laws, including the Utilities Technical Regulation Act 2014. The Act protects regulated utility networks, including Icon Water water and wastewater networks. It prohibits interference with these networks and sets penalties for offences.

1.2.2 Icon Water’s requirement

In addition to legislative requirements, Icon Water’s Design and Engineering Standards, required by the Utilities (Technical Regulation) Act, provide guidance on items such as but not limited to:

- Requirements for Third Parties to avoid interference with network assets.
- Requirements for access and protection of network asset.
- Requirements for proposed designs to not result in additional operating or maintenance costs for Icon Water, either now or in the future.
- Responsibilities of Third Parties to determine the location, depth and nature of the assets that may be affected by the works.
- Requirements for proposed designs to not create situations where safe public conditions or safe work practices are not easily achievable.

1.3 Purpose

High-risk construction activities can have detrimental effects on Icon Water's assets, potentially resulting in unexpected failures, physical damage (such as to coatings or linings of pipeline, deformation, cracking) or restricted access for emergency maintenance or repairs.

This specification has been developed to provide guidance to Third Parties - including consultants, contractors, and utilities, who intend to engage in high-risk construction works near Icon Water assets. Its main purpose is to assist those planning to undertake work near Icon Water's assets by outlining specific requirements for high-risk construction activities commonly undertaken near Icon Water assets.

1.3.1 Objective

The objective of this specification is to provide guidance on the necessary requirements and to ensure the following conditions are met when high-risk activities are undertaken near Icon Water assets:

- The structural integrity of the asset is not compromised.
- Maintenance, operational and emergency access is not impeded.
- The activity does not contribute to the future deterioration of the asset.

1.3.2 Icon Water asset failures and consequences

Figure 1.3.1 to Figure 1.3.6 below present examples of failures in Icon Water mains, along with associated impacts on the surrounding environment, nearby infrastructure and operational performance.

Figure 1.3.1 Burst DN600 water main and damage to the surrounding

Figure 1.3.2 Damage to infrastructure and environment due to burst water main

Figure 1.3.3 Damaged sewer main caused by horizontal directional drilling

Figure 1.3.4 Tree roots impeding access to water main

Figure 1.3.5 Service crossing resulting in damaged thrust block

Figure 1.3.6 Impact of damaged water main on nearby infrastructure

1.4 Referenced documents

All works carried out shall be in accordance with the requirements of:

- This specification, including all documents referenced by each section of the specification:
- The documents listed in Table 1.4.1 Referenced documents.
- The relevant Icon Water Work Instructions (which will be provided where applicable on a project-by-project basis).
- The relevant WorkSafe ACT, WorkCover NSW and SafeWork Australia codes of practice.

The work shall also comply with the requirements of all relevant legislation, bodies and codes. The order of precedence for this specification, from highest to lowest are:

- Legislative requirements
- Icon Water Specifications
- WSAA standards
- Australian Standards

The Third Party (as applicable) shall notify the Icon Water Representative of any ambiguity or discrepancy discovered. In the event of an ambiguity or discrepancy, the Icon Water Representative shall direct the Third Party as to the interpretation to be followed in carrying out the work.

Where there is no suitable Australian Standard available, an agreed international standard and/or industry current best practice shall be adopted. If an international standard is proposed in lieu of an Australian Standard, the Third Party shall submit to the Icon Water Representative for approval a detailed assessment to show that the proposed standard is equivalent or superior to the relevant Australian standard.

The documents listed in Table 1.4.1 Referenced documents are either referenced by within this specification or shall be read in-conjunction with this specification and be complied with.

Table 1.4.1 Referenced documents

Item	Document Number	Title
Acts		
1	A2014-60	Utilities (Technical Regulation) Act 2014
Australian Standards		
2	AS/NZS 1170	Structural Design Actions
3	AS 1289	Methods of Testing Soils for Engineering Purposes
4	AS 1726	Geotechnical Site Investigations
5	AS 3600	Concrete Structures

Item	Document Number	Title
6	AS 4133	Methods of Testing Rocks for Engineering Purposes
7	AS 5100	Bridge Design
8	AS/NZS 2566	Buried Flexible Pipelines
9	AS/NZS 4058	Precast Concrete Pipes (Pressure and Non-pressure)
10	AS/NZS 3725	Design for Installation of Buried Concrete Pipes
WSAA Codes and Publications		
11	WSA 02	Gravity Sewerage Code of Australia
12	WSA 03	Water Supply Code of Australia
13	WSA 04	Sewage Pumping Station Code of Australia
Icon Water Standard Specifications and Drawings		
14	STD-SPE-G-017	Service & Installation Rules (To be updated and renamed)
15	-	Building Requirements for Icon Water Approval
16	Various	SD Series Drawings

Note: The documents shall be the latest publication at the time of award of contract for execution of the works unless noted otherwise in the project specific documentation.

1.5 Designer qualifications and experience

According to the Professional Engineers Act 2023, a professional engineer is an individual registered under the Act to carry out professional engineering services in one or more areas of engineering including civil, electrical, fire safety, mechanical, and structural. Registered engineers in the ACT are registered with the Professional Engineers Registrar, which is part of the ACT government. This Registrar manages the registration process, including assessing applications, maintaining the register of professional engineers, and ensuring compliance with the Act.

The Designer, or the engineer directly supervising the Designer, must be a professional Engineer registered under the **ACT Professional Engineers Registration Scheme** in the relevant area of Engineering (known herein as a **Registered Engineer**) and hold chartered status with Engineers Australia. The engineer holding such status must be able to demonstrate that they are suitably experienced, and they shall certify in writing that the design complies with the relevant codes, standards, legislative requirements and the requirements of this specification.

2 Icon Water assets

2.1 Water assets

Water supply pipelines at Icon Water operate under pressure and can be classified into 3 categories.

2.1.1 Water Transfer Mains

Water Transfer Mains also known as Water Bulk Supply Mains (BSMs) are generally the larger diameter water mains between dams and water treatment plants, and downstream mains between the water treatment plants and town water service reservoirs. There are approximately 260 km of Water Transfer Mains in the water supply network. These pipelines are considered critical due to the lack of redundancy and failure of these pipelines could result in severe operational, environmental, and financial impacts.

2.1.2 Water Distribution Mains

Water Distribution Mains (DMs) are water mains that are used to interconnect the town service reservoirs and to provide water to the water reticulation system. There are approximately 450 km of water distribution mains in the water network.

2.1.3 Water Reticulation Mains

Water reticulation mains are water mains that are equal to and smaller than DN225 and are used to supply water from distribution mains to service lines.

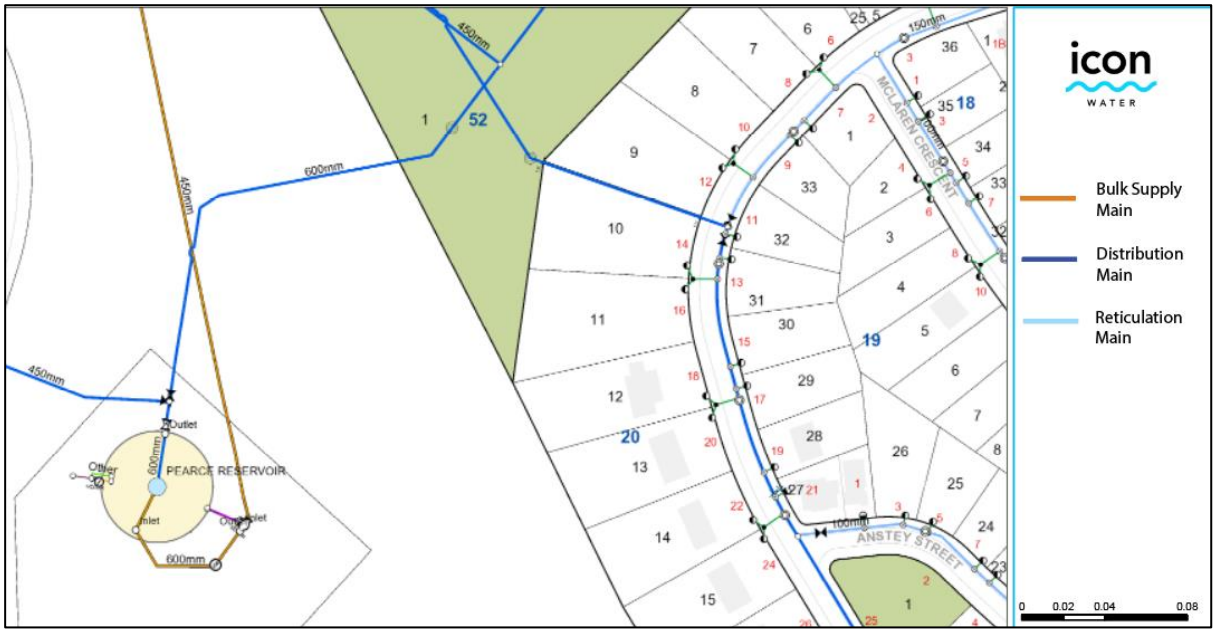


Figure 2.1.1 Example water network GIS map

2.2 Wastewater assets

2.2.1 Tunnels and Major Trunk Sewers

Tunnels and Major Trunk Sewers are classified as DN1200 and above wastewater pipelines that collect wastewater from the trunk sewers and conveys the wastewater by gravity to a treatment plant.

2.2.2 Trunk Sewers

Medium sized trunk sewers are wastewater pipelines and typically range in size between DN375 to DN1050 used to convey wastewater from sewer reticulation mains to tunnels or major trunk sewers.

2.2.3 Sewer Reticulation Mains

Sewer reticulation mains are pipelines ranging from DN100 to DN300 that are used to convey wastewater from individual properties to the trunk sewers.

2.2.4 Sewer Rising Mains

Sewer rising mains are pipelines ranging from DN80 to DN500 that are used to convey wastewater under pressure from a pumping station to a point of discharge. There are approximately 30 kms of Sewer Rising Mains in the wastewater network.

Figure 2.2.1 Example sewer network GIS map

3 Third Party responsibility & clearance requirements

Third Parties planning to undertake construction works are responsible for the equipment and methods used in their works and for ensuring that all necessary precautions are taken to prevent damage to Icon Water assets.

3.1 Zone of Influence

The zone of influence (ZOI) is the area that extends both transversely and longitudinally for a buried pipeline, within which a structure, or construction works can have an impact on the pipeline. A 45-degree angle of repose is the default angle used by Icon Water for soils common to the Canberra region as shown in Figure 3.2.1. The ZOI of an asset is determined according to the diameter and depth of the asset.

Building structures and heavy construction equipment loads must not be applied to the ZOI of a water or sewerage asset (irrespective of whether those assets are located inside or outside the lease or property boundary).

3.2 Pipe Protection Envelope

A pipe protection envelope (PPE) is the unhindered space required to ensure Icon Water's water and sewer networks can be safely accessed, operated, repaired, and replaced.

A mandatory PPE runs above, to both sides and covers the entire length of all water and sewerage networks as depicted in Figure 3.2.1. The width and height of a PPE is typically determined according to the diameter, depth, category, and criticality of the asset. These requirements are outlined in Icon Water Technical Specification *STD-SPE-G-017* and the *Building Requirements for Icon Water Approval* document.

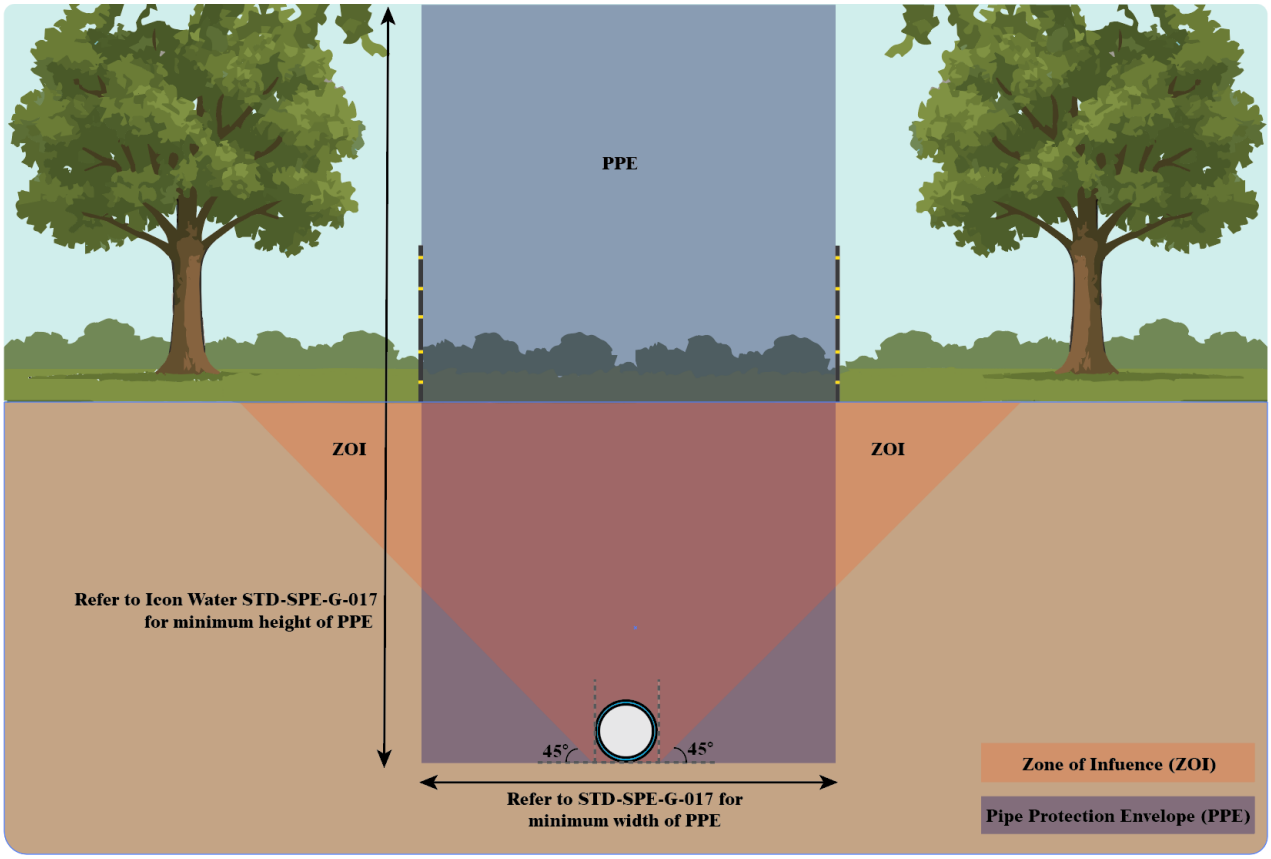


Figure 3.2.1 Pipe protection envelope and zone of influence

3.3 Access to Icon Water assets

Icon Water assets shall remain available for operational and emergency management purposes during the proposed works. All Icon Water equipment and network assets must be protected and made accessible in a manner consistent with the Utilities Act (including relevant codes), Section 5 of this document, and the pipe protection rules and principles in Icon Water Standard Specification *STD-SPE-G-017*.

Icon Water staff and contractors may require access to assets for maintenance and emergency activities which include but are not limited to:

- Trench excavation
- Battering, benching, shoring of the trench excavation
- Stockpiling the excavated material
- Retrieving CCTV or other inspection equipment stuck in the sewer main.

For details on access and PPE requirements relating to water and sewer assets, refer to Icon Water Specification *STD-SPE-G-017* and the *Building Requirements for Icon Water Approval* document.

3.4 Clearance requirements

For water and sewer mains up to and including DN300, Icon Water requires that all proposed high-risk works (excluding blasting–refer to section 5.4.1 for further guidance) to be outside of the PPE of

the asset. Where this is not feasible and the proposed works encroach into the PPE, the Third Party shall seek formal approval from Icon Water prior to undertaking any works within the PPE of the asset.

For water and sewer mains greater than DN300, all proposed high-risk works (excluding blasting– refer to section 5.4.1 for further guidance) shall maintain either a clearance of either 3 meters from the outer edge of the asset or comply with the clearance requirements dictated by the PPE of the asset, whichever is greater. Where these criteria cannot be met, the Third Party is required to obtain formal approval from Icon Water prior to commencing any works.

Note that, for water mains and pressurised sewer mains the vertical PPE clearance height above the mains is infinite.

4 Requirements for working near sewer & water mains

Third Parties planning to undertake high-risk works near an Icon Water asset are required to obtain formal approval before commencing work where the clearance requirements in section 3 cannot be satisfied.

Third Parties planning to engage in construction works near Icon Water's assets shall adhere to the steps outlined in Figure 3.4.1 to seek approval from Icon Water. These measures will ensure the integrity of Icon Water's assets remain uncompromised from the proposed works. Refer to Figure 9.1.1 for a detailed flow chart for the framework for working near Icon Water assets.

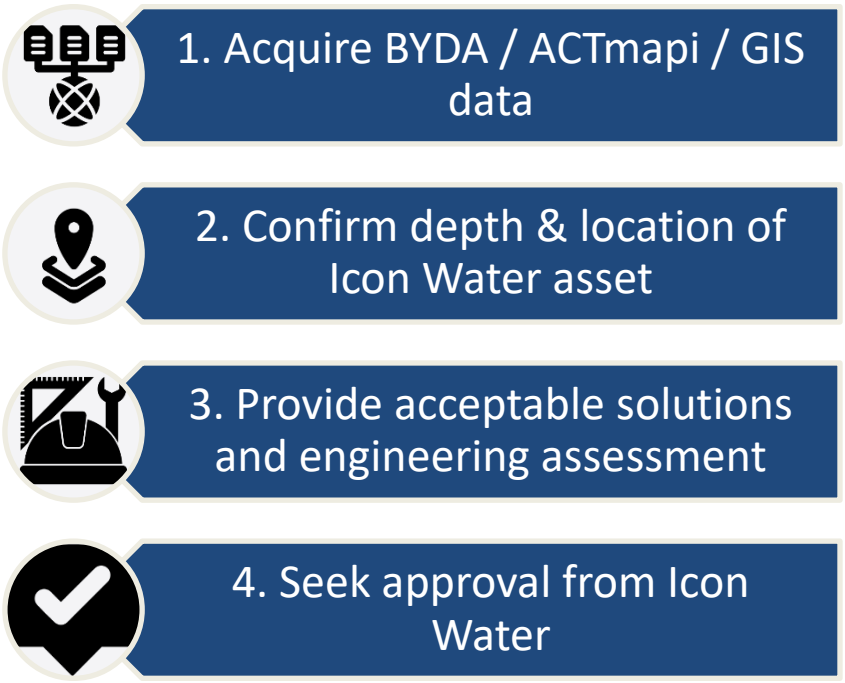


Figure 3.4.1 Framework for working near Icon Water assets

4.1 Before You Dig Australia / GIS

When planning for or engaging in works near Icon Water sewer and water mains, the Third Party carrying out the works shall request to access BYDA maps to help identity any buried assets in the vicinity of the works. These maps provide guidance on underground assets including water, wastewater, electrical, gas, stormwater, and communications.

Alternatively, the Third Party may access Icon Water network maps from ACTmapi or request Icon Water to provide preliminary information in the form of plans and GIS layouts. However, it is the Third Party's responsibility to accurately verify the location of the asset to ensure the proposed works will not interfere with continuity of supply and cause damage to Icon Water assets. Third Parties are required to conduct a thorough physical review of the intended work location in order to assess the work environment and detect any indications of Icon Water buried assets such as surface boxes, which would aid in locating the assets.

4.2 Potholing

If an Icon Water asset is in the vicinity of the proposed construction works, the Third Party shall be responsible for identification and verification of the location of the asset during the design or investigation phase before any construction or excavation activities are undertaken near these assets. The Third Party shall use non-destructive technologies such as hydro-vacuum potholing or manual excavation in line with BYDA outcomes, to precisely determine the asset's location and depth.

4.2.1 Hydro-vacuum

Hydro-vacuum or hydrovac excavators use high pressure water to expose the asset without damaging the underground main. The water excavated material shall be disposed of at an approved and agreed disposal facility licensed to accept liquid or slurry waste. The Third Party carrying out the works shall not dispose of the excavated material in the wastewater network.

Figure 4.2.1 Hydrovac potholing in progress

Figure 4.2.2 Hydrovac potholed water main

Figure 4.2.3 Hydrovac potholed gate valve and telecommunication cable

4.2.2 Requirements for potholing

Witness Point 1 – An Icon Water Representative to be present on-site during service location activities

Icon Water's requirements for potholing are as follows:

a. During potholing, no additional loads shall be applied within the ZOI of the pipe. Hydro-vacuum potholing shall be used to expose and remove the pipe embedment material.

b. Depending on the scale and potential impact of the proposed work, multiple potholes may be required to confirm the depths of the asset. Where multiple potholes are required, the length of mains between potholes shall not span longer than 10 metres.

c. Where the direction of the main changes, the location shall be identified and marked out.

d. Where the installation of a service (either by open excavation or trenchless methods) crosses a pipeline, each crossing shall be potholed.

e. The Third Party conducting the works shall be responsible for the operating water pressure of the hydro-vacuum operation, and the specified pressure must not damage the pipe coating and associated wrapping and sleeves. The recommended pressure for hydro-vacuum operation is between 1500 – 2000 psi. The maximum allowable pressure will vary based upon the pipe material and shall not exceed 2000 psi. When conducting potholing using hydrovac, the Third Party must ensure a minimum clearance of 150 mm is always maintained between the Icon Water asset and the tip of the pressure washer wand. In addition, the vacuum hose end must have a neoprene/plastic lip to avoid damage to the pipes' coatings and seals, as well as to avoid displacement of existing lead joints.

f. The pothole shall be marked, and the marking must show the type of asset and the depth e.g., a DN100 PVC pipe to be inserted to the pothole to maintain visibility of the asset.

g. An Icon Water Representative shall be present on-site when the potholing is being undertaken.

h. Once the potholing has been completed, the Third Party shall provide evidence of investigations to confirm the location of the asset to Icon Water.

If it is not practicable to pothole the Icon Water asset, it must be pegged out using as constructed drawings and a registered surveyor shall mark them on-site at the Third Party's expense.

4.2.3 Backfilling the pothole locations

Potholes must be backfilled once the survey work has been completed, and clean sand bedding material should be used over the first 300 mm directly above the exposed asset. Following backfilling, the Third Party shall ensure the surface is reinstated to its original condition.

4.2.4 Discrepancies found compared to GIS data

In the event discrepancies are found between the GIS information and the physical location of the asset, the Third Party carrying out the potholing shall inform Icon Water of all the discrepancies in writing (e.g., asset location, asset type, asset material, asset size).

4.3 Provide acceptable solutions and engineering assessment

Where a service location has been undertaken and the clearance requirements in section 3 cannot be satisfied, the Third Party shall consider and provide Icon Water with the following possible solutions/assessments.

4.3.1 Option 1: Adjust design

In all scenarios, the most desirable option would be for the Third Party working near Icon Water asset to redesign and adjust the proposed work, so the proposed works meets the clearance requirements laid out in section 3. Applicants shall provide Icon Water with sufficient information on the options that have been considered for redesign of the proposed works if the “Adjust design” option is to be discounted.

4.3.2 Option 2: Relocate Icon Water asset

Hold Point 1 – Third Party to relocate asset with Icon Water approval to avoid undertaking high-risk works near asset

If adjusting the design is not an option, Icon Water assets may be raised, relocated or reconfigured at the Third Party’s expense to achieve the clearance requirements in section 3. The Third Party shall engage a Registered Engineer to design any proposed deviation or relocation. Any relocation works must ensure all Icon Water required design standards are achieved and the capacity of the relocated asset will not be reduced.

All proposed relocations shall be in accordance with current editions of applicable Icon Water specifications, WSAA Codes and Australian Standards. For relocation applications of mains DN300 and larger, an engineering assessment will be required which shall be prepared by a Registered Engineer. Depending on the complexity of the works, Icon Water may require the design to be reviewed and verified by an independent consultant.

The assessment at minimum shall take into account and include the following items:

a. Details of the proposed activity
b. List of Icon Water assets in the vicinity of the proposed works area
c. Geotechnical investigation including ground condition and ground water levels
d. Civil and structural assessment
e. Available information and as constructed/WAE drawings
f. Relevant Icon Water requirements from Icon Water specification *STD-SPE-G-017* and *Building Requirements for Icon Water Approval* document.
g. Electrical assessment for metallic pipelines.
h. Predicted impacts on Icon Water assets including asset failure, emergency repair, required maintenance activities.
i. Monitoring of the proposed works near the Icon Water assets and a contingency plan.

4.3.3 Option 3: Protect Icon Water asset

Hold Point 2 – Third Party to submit asset protection measures to seek Icon Water approval

Where redesigning the works and relocating the asset are not feasible, Icon Water may approve a Third Party to work near an asset if it can be demonstrated the proposed works will not damage the asset or cause a risk to the environment, people, and properties in the vicinity. Depending on the size and criticality of the asset, Icon Water may require the Third Party to conduct an investigation of the condition of the existing asset both before and after undertaking the high-risk works. Additionally, temporary, and permanent measures shall be taken to protect the Icon Water asset from the proposed works. Refer to section 5 for detailed asset protection requirements.

4.4 Seek approval from Icon Water

No works shall be carried out near an Icon Water asset prior to receiving a formal approval from Icon Water. The Third Party shall incorporate all the comments and requirements specified by Icon Water into the design and construction relevant documents and seek approval via the “Deviation from Standards” form. Refer to Figure 9.1.1 for the framework outlining the required steps.

4.4.1 Deviation from Standards

Icon Water requires sufficient information to assess non-standard requests and their potential impacts on nearby assets. The applicant shall seek approval from Icon Water by submitting a completed *Deviation from Standards* form along with all relevant design and construction documents.

5 Asset protection measures

5.1 Earthworks and excavation

Hold Point 3 - Third Party shall seek Icon Water approval prior to excavation in the PPE of an asset

No excavation works are to be carried out within the PPE of an Icon Water main unless an approval has been obtained from Icon Water. Additionally, no excavation works are to be carried out in the area below the main without measures being taken to ensure the alignment of the assets will not shift or the integrity of the asset will not be compromised. The stability of the asset must be verified and confirmed in writing (Icon Water may require supporting computations) by a Registered Engineer of the relevant discipline and approved by Icon Water in writing.

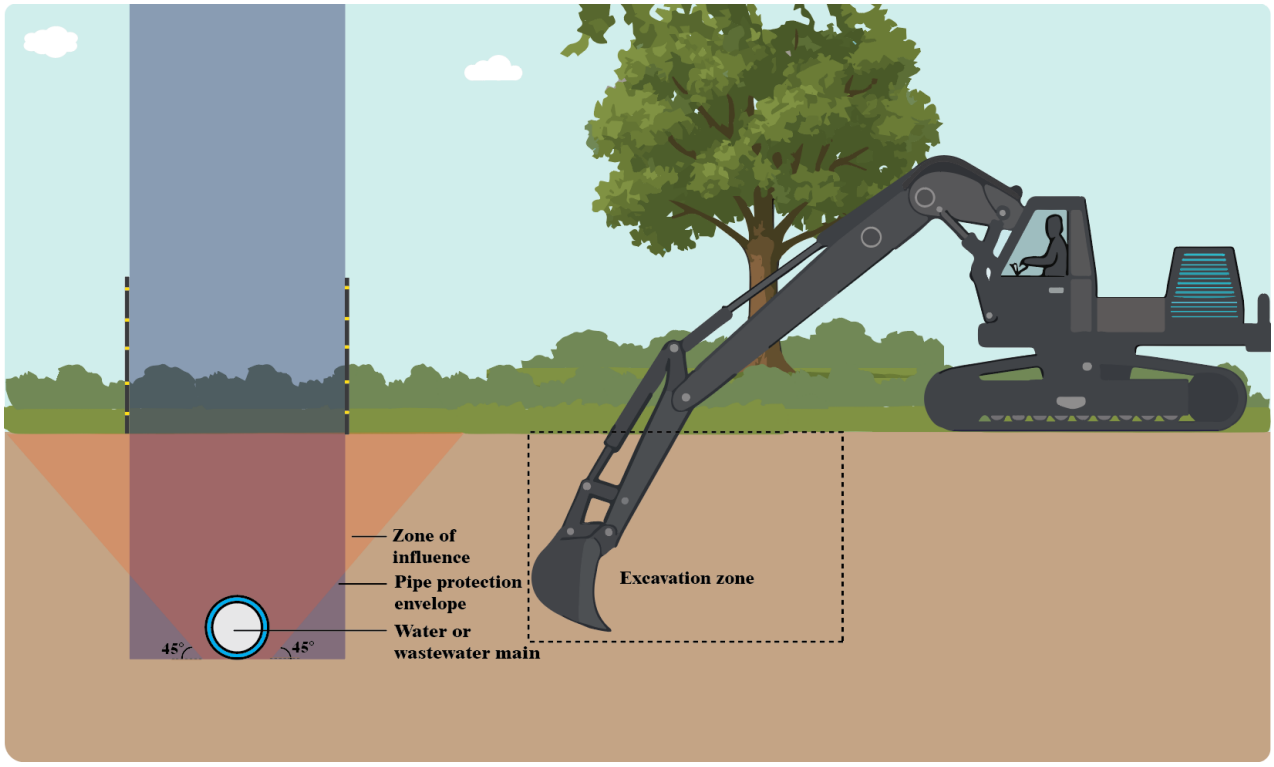


Figure 5.1.1 Clearance requirements for excavations

5.1.1 Before starting work

The Third Party undertaking excavation works near an Icon Water asset shall bear the responsibility of conducting a risk assessment to ensure that:

- All hazards have been identified and assessed.
- All members of the work crew are aware of the hazards and that appropriate controls have been put in place to mitigate the hazards.
- Safety of the public, workers and environment has been ensured.
- A written approval has been acquired for any excavation work being carried out near Icon Water assets.

- Maintenance and emergency access passage to Icon Water assets is not hindered or blocked.

5.1.2 Excavation works

Witness Point 2 – An Icon Water Representative shall be present on-site when excavating in the PPE of an asset

The Third Party shall ensure the use of only non-destructive technology to carry out excavation works within the PPE of an Icon Water asset. This may include, hydrovac, vacuum or hand excavation as shown in Figure 5.1.2. An Icon Water Representative shall be present on-site when excavating in the PPE of an Icon Water asset.

The Third Party may choose to employ mechanical excavation when an asset is located at a significant depth in the ground until they reach a clearance depth of 600 mm from the asset. Beyond this point, only non-destructive technologies shall be utilised for any subsequent excavations. An Icon Water Representative shall be present on site to witness the use of any mechanical excavations such as an excavator within the PPE of an asset.

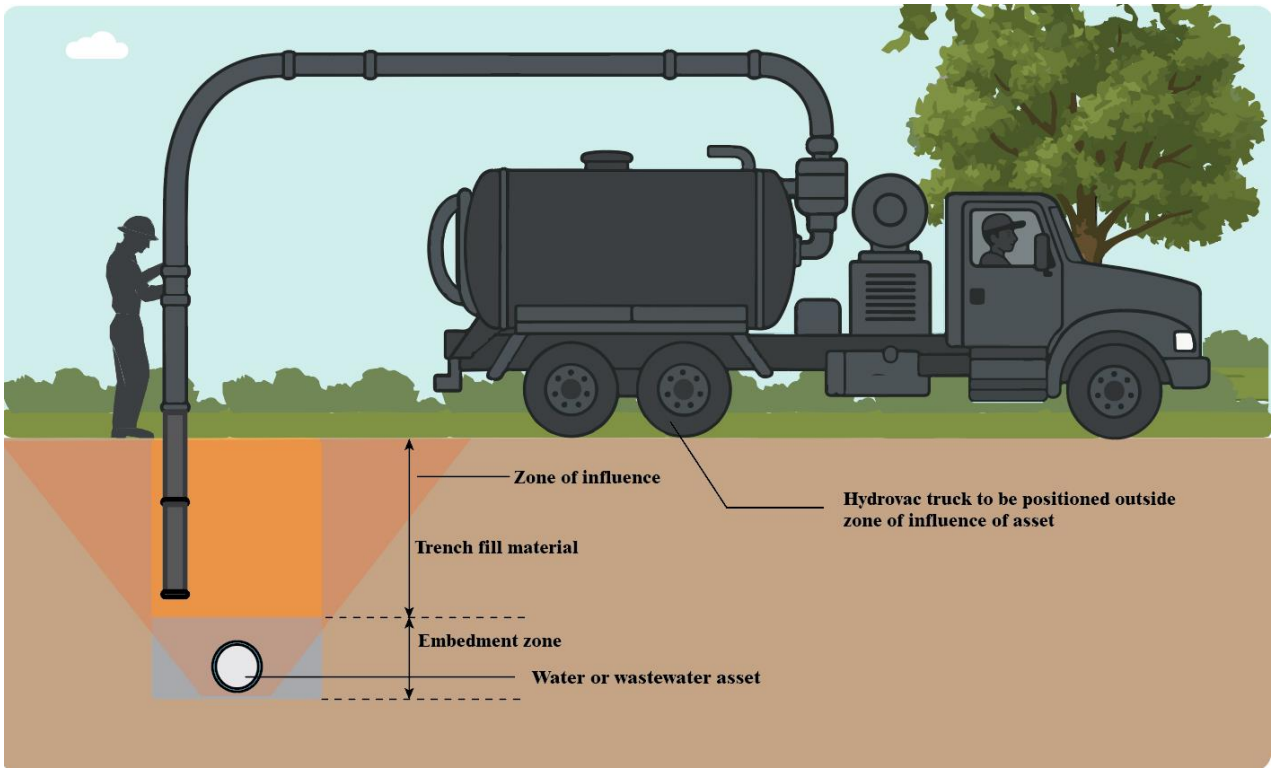


Figure 5.1.2 Hydrovac excavation requirements

For detailed requirements on potholing near Icon Water assets, refer to section 4.2.

5.1.3 Cut and fill

Cutting and filling over existing mains is not permitted unless a prior written approval has been obtained from Icon Water. For details regarding cut and fill requirements in the PPE of an asset, refer to *Building Requirements for Icon Water Approval* document.

5.1.4 Backfilling

Witness Point 3 – An Icon Water Representative shall witness backfilling works in the PPE of an asset

When backfilling, mechanical compaction of the fill material directly above the pipe must not commence until sufficient cover has been placed to ensure the pipeline is protected. Prior to compaction, a minimum depth of 200 mm of fill shall be achieved before the use of hand-held compactors. Following the initial layer, the back fill material shall be placed in layers not exceeding 150 mm.

Once a minimum cover of 450 mm has been achieved over the main, Third Parties may use ride on compaction equipment such as light rollers under 5 tonnes. Refer section 5.4.2 for additional backfilling and compaction requirements over assets.

5.2 Underground structures

No permanent underground structures are allowed to be built within the PPE of an Icon Water asset. A Third Party planning to engage in construction works may seek approval to install underground structures such as the following near an Icon Water asset:

- Bridge abutments/piers
- Stormwater ponds and below ground tanks
- Basements.

These applications will be assessed on a case-by-case basis and for any proposed permanent structure to be installed, the Third Party at minimum shall comply with all of the following requirements:

- The structure shall be outside the PPE of the Icon Water asset.
- The structure shall not impede maintenance and emergency access to the Icon Water asset.
- The existing ground conditions must be able to support the proposed structure without having any impact on the Icon Water asset. This shall be confirmed via geotechnical investigation and the assessment shall be reviewed and signed off by a Registered Engineer in the relevant discipline.
- The structure shall be designed to be self-supporting to ensure that future excavation around the Icon Water asset does not compromise the structural integrity of the footing or the associated structure. Additionally, the structure shall not contribute any additional loading to the Icon Water asset's ZOI. This shall be verified and signed off by a Registered Engineer. Refer to Figure 5.2.1 for requirements for footings near Icon Water assets and Figure 5.2.2 for requirements for stormwater ponds near Icon Water assets.

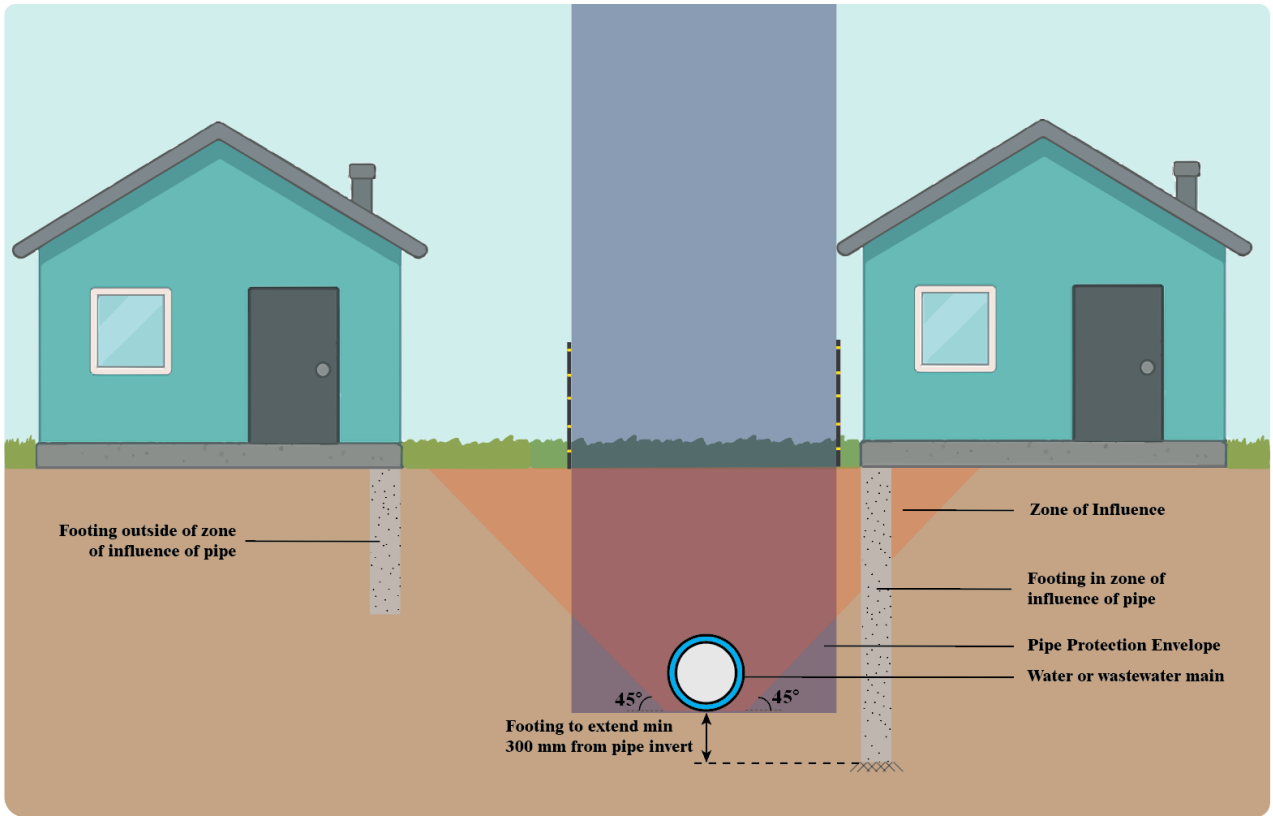


Figure 5.2.1 Requirements for footings near Icon Water assets

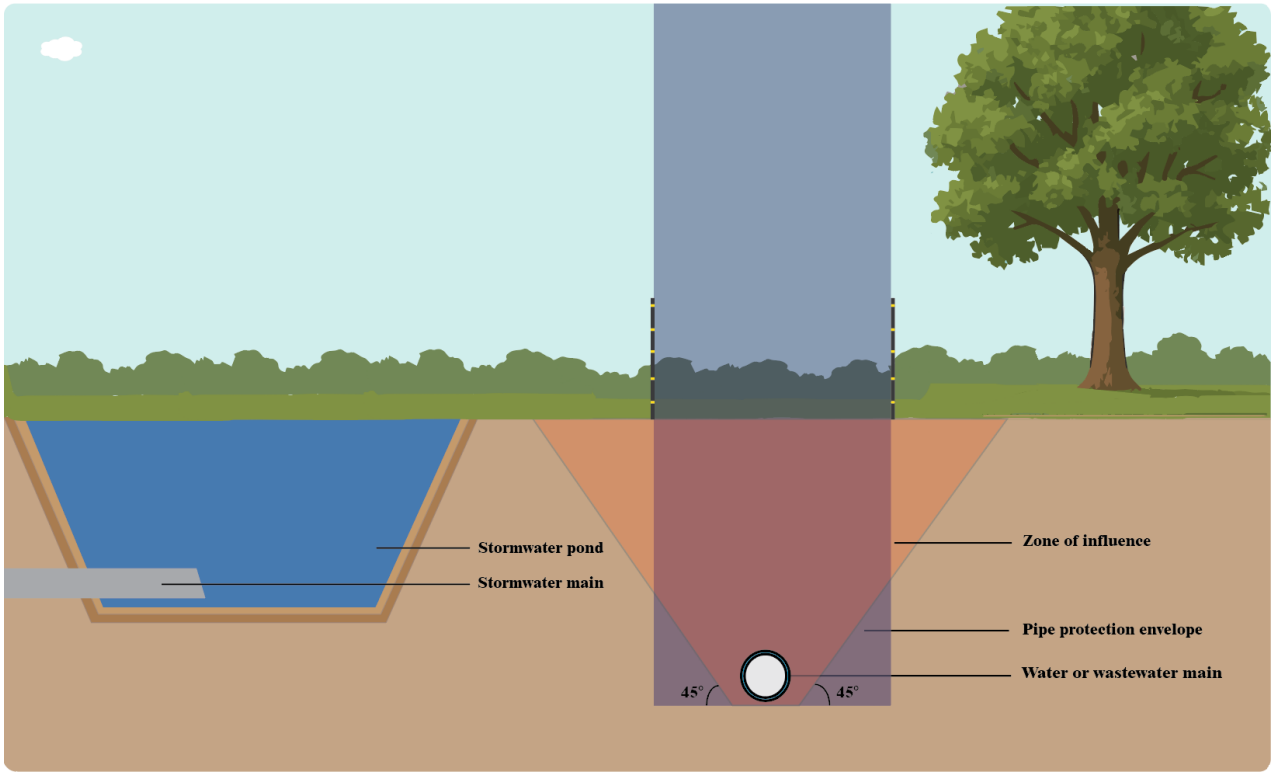


Figure 5.2.2 Requirements for stormwater pond

5.3 Heavy vehicles and construction plant

Hold Point 4 – Third Parties to seek approval prior to heavy vehicles and plant crossing over Icon Water asset

Ideally, plant and heavy vehicles must not be positioned within the ZOI of Icon Water mains. Heavy vehicles which can be driven on open roads and can be categorised within legal load limits can cross over Icon Water mains up to and including DN300 if the following conditions are satisfied:

- Minimum cover outlined within Icon Water's standard drawing *SD-2106-D*.
- The vehicle crossing over does not exceed the legal load limits.

For mains DN375 and above, construction plant shall not cross over buried mains other than the designated and agreed cross over locations formally approved by Icon Water. These agreed cross over locations shall be clearly marked in the design drawings and all potential cross over locations shall be fenced off. When seeking approval to cross over Icon Water asset, the Third Party must be able to demonstrate that at minimum, the following conditions will be satisfied:

- Minimum cover outlined within Icon Water's standard drawing *SD-2106-D* can be achieved.
- If plant or heavy vehicles are required to traverse over an Icon Water asset, an engineering assessment must be undertaken to demonstrate that the additional loading will not adversely impact the asset. The engineering assessment shall be carried out by a competent Registered Engineer and must take into account the age and condition of the asset.
- Detailed calculations of the structural assessment of the pipeline shall be undertaken in accordance with relevant Australian Standards (e.g. AS/NZS 2566, AS/NZS 3725 etc) and submitted to Icon Water for review and approval. Based on the age and criticality of key mains such as bulk supply water mains, major trunk sewers, tunnels etc, Icon Water may require the assumed structural capacity of the pipe to be reduced to 50% as a conservative approach, due to the potential consequences of failure and the risk of significant disruption to the community.
- Where the engineering assessment indicates that the additional loading could negatively impact the Icon Water asset, the Third Party must implement appropriate temporary protection measures to ensure the Icon Water asset is protected. These measures shall be included in the engineering assessment and submitted to Icon Water for review and approval.
- The temporary access over the main shall not impact access for Icon Water emergency and maintenance activities.

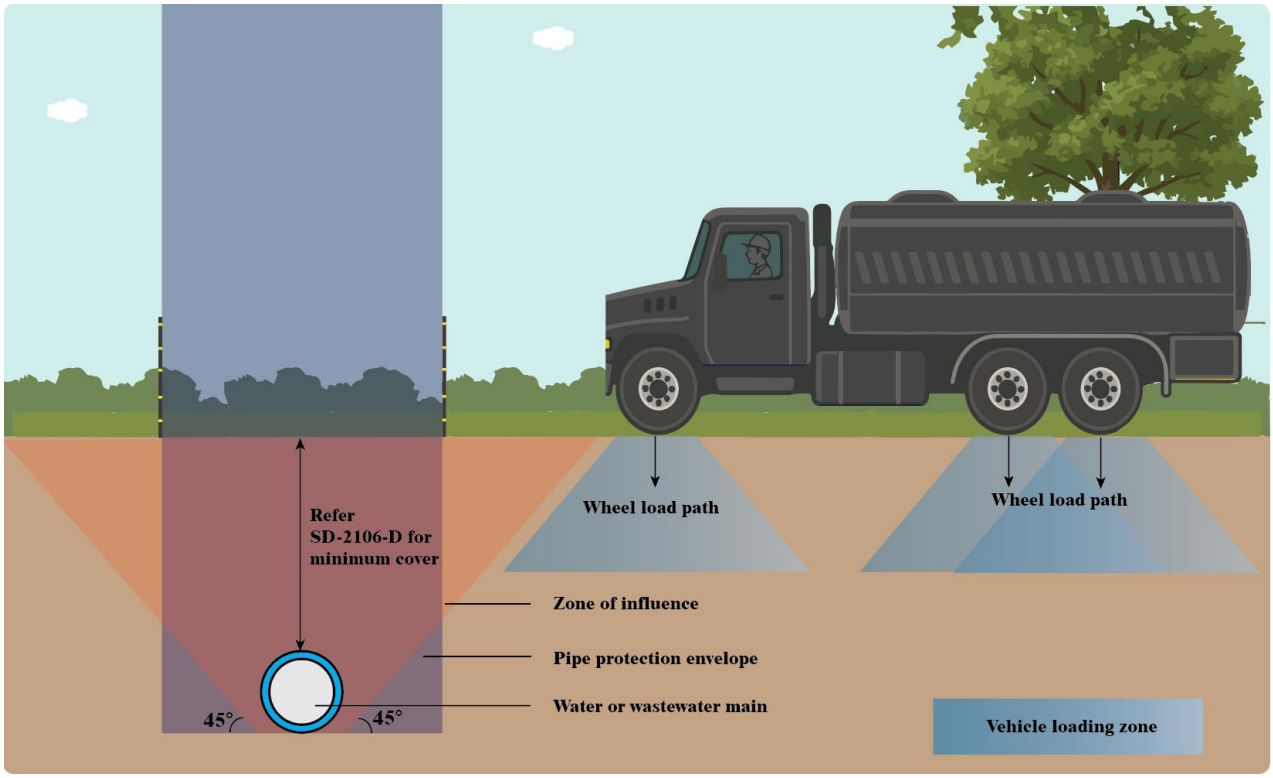


Figure 5.3.1 Requirement for heavy vehicles near Icon Water assets

5.4 Vibration limits

Witness Point 4 – An Icon Water Representative to be present on-site during works that generate vibration near an asset

Construction activities such as blasting, pile driving, vibratory ground compaction, heavy vehicle movement etc, can result in unacceptable levels of vibration impacts if not conducted properly. Excessive levels of induced structural vibration generated by ground vibrations from construction activities can cause substantial damage to structures e.g., cracking of brittle pipes and internal lining. In certain instances, this can even lead to failure of the asset. As a result, Icon Water does not allow the use of vibratory rollers in the PPE of water and wastewater mains.

Where vibration from construction works may adversely impact the structural integrity of the asset, the Third Party shall consider asset protection measures. The following table provides limits for maximum allowable vibration limits near an Icon Water asset. Vibration generated during high-risk activities undertaken near Icon Water assets shall be monitored by the Third Party in the presence of an Icon Water Representative.

Table 5.4.1 Safe vibration limits (PPV)

Vibration type	Maximum safe vibration limit for brittle pipelines (AC, RC, VC, CI)	Maximum safe vibration limit for flexible pipelines	Critical assets (e.g. tunnels, oviforms, unreinforced concrete lined sewers
Continuous	5 mm/s	10 mm/s	2 mm/s
Intermittent or transient	10 mm/s	20 mm/s	

Note: For detailed requirements on vibration, refer to British Standard BS 5228-2:2009 Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration.

5.4.1 Blasting

Hold Point 5 – Third Party shall seek approval from Icon Water prior to undertaking any blasting within 150 meters of an asset

Third Parties are required to obtain approval from Icon Water prior to undertaking any blasting activities within 150 metres of water and wastewater network assets, as illustrated in Figure 5.4.2. All vibrations generated during blasting shall comply with the maximum allowable vibration limits specified in Table 5.4.1.

Sufficient time and advance notice must be provided to Icon Water to allow for a thorough review of the proposed works. At minimum, the following information must be submitted and the conditions outlined adhered to for the request to be considered.

5.4.1.1 Pre-blast requirements

A comprehensive Blast Management Plan must be submitted to Icon Water for review and approval prior to the commencement of any blasting works. As a minimum, the plan shall include:

a. A brief summary and background of the proposed blasting woks.

b. Details and certification of the shotfirer(s), as well as information on other key personnel involved, for record keeping purposes.

c. The exact blast location, the radius of influence and the location of nearby Icon Water assets.

d. A blast risk assessment, identifying hazards and associated risks.

e. A vibration monitoring plan; including any modelling used to predict vibrational impact on the Icon Water asset. The monitoring plan must include the instrument type and all relevant calibration records.

   Note: If the vibrations generated during the blast are anticipated to exceed the limits in Table 5.4.1, the Third Party will be required to revise the blast methodology accordingly.

To ensure accurate measurement and assessment of vibration levels during blasting, it is recommended that a minimum of two vibration monitoring instruments is utilised in the vicinity of the works with at least one monitor directly placed over the Icon Water asset. This arrangement enables cross-verification of recorded data to ensure accuracy and provides valuable insight into the variation in vibration intensity between monitoring points.

Figure 5.4.1 Example vibration monitoring instrument and certification for calibration

Depending on the criticality of the Icon Water asset, the Third Party may also be required to submit a Contingency Plan consisting of the following information as a minimum:

- Details of personnel of the Third Party and their Sub-contractors involved in the blast.
- Contact details of Icon Water personnel e.g. Icon Water Representative, Operations.
- Proposed responses and actions in the event the vibration levels exceed the limits in Table 5.4.1.
- Incident response measures, including steps for mitigating potential damage to Icon Water assets and restoring affected services to the satisfaction of Icon Water Operations team.
- Consideration of required repair materials and any necessary bypass arrangements in the event of asset failure.

For critical assets-such as tunnels and major trunk sewers, Icon Water may additionally require the Third Party to undertake pre- and post-blast CCTV condition assessments to verify that the blasting has not impacted the main. Further details on CCTV requirements are provided in section 6.

5.4.1.2 During the blast

The Third Party must provide Icon Water sufficient advance notice to ensure an Icon Water Representative is present on-site throughout the duration of the blast. The Third Party is responsible for monitoring vibrations near the Icon Water asset and ensuring the accuracy and integrity of this data.

If vibration levels exceed the maximum allowable limits specified in Table 5.4.1 Safe vibration limits (PPV), the Third Party shall:

- Immediately cease blasting operations and inform the Icon Water Representative.
- Undertake immediate inspection of the Icon Water asset in coordination with the Icon Water Representative.
- Suspend further blasting activities until a risk assessment has been completed and the Third Party can demonstrate that the blasting activities can be adjusted to lower vibration impact on the Icon Water asset.

- Implement any additional mitigation measures as directed by Icon Water.
- Submit an incident report detailing the blast parameters, vibration monitoring data and any observed impact on the Icon Water asset.

In the event that blasting causes damage to Icon Water infrastructure, the Third Party shall bear full responsibility for all associated costs, including but not limited to: required repair works, bypass arrangement and service disruptions.

5.4.1.3 Post-blasting requirements

Within 10 business days of completing the blasting works, the Third Party must submit a Blast Report to Icon Water. At a minimum, the report must include:

a. Number and exact locations of blast events.
b. Exact locations and distances of vibration monitors relative to the blast site and the Icon Water asset.
c. Type of vibration monitoring instruments used, including any calibration records.
d. Time and duration of each blast event.
e. Time and duration of vibration monitoring.
f. Maximum recorded vibration for each blast event.
g. Statement of compliance with the vibration limits outlined in Table 5.4.1.

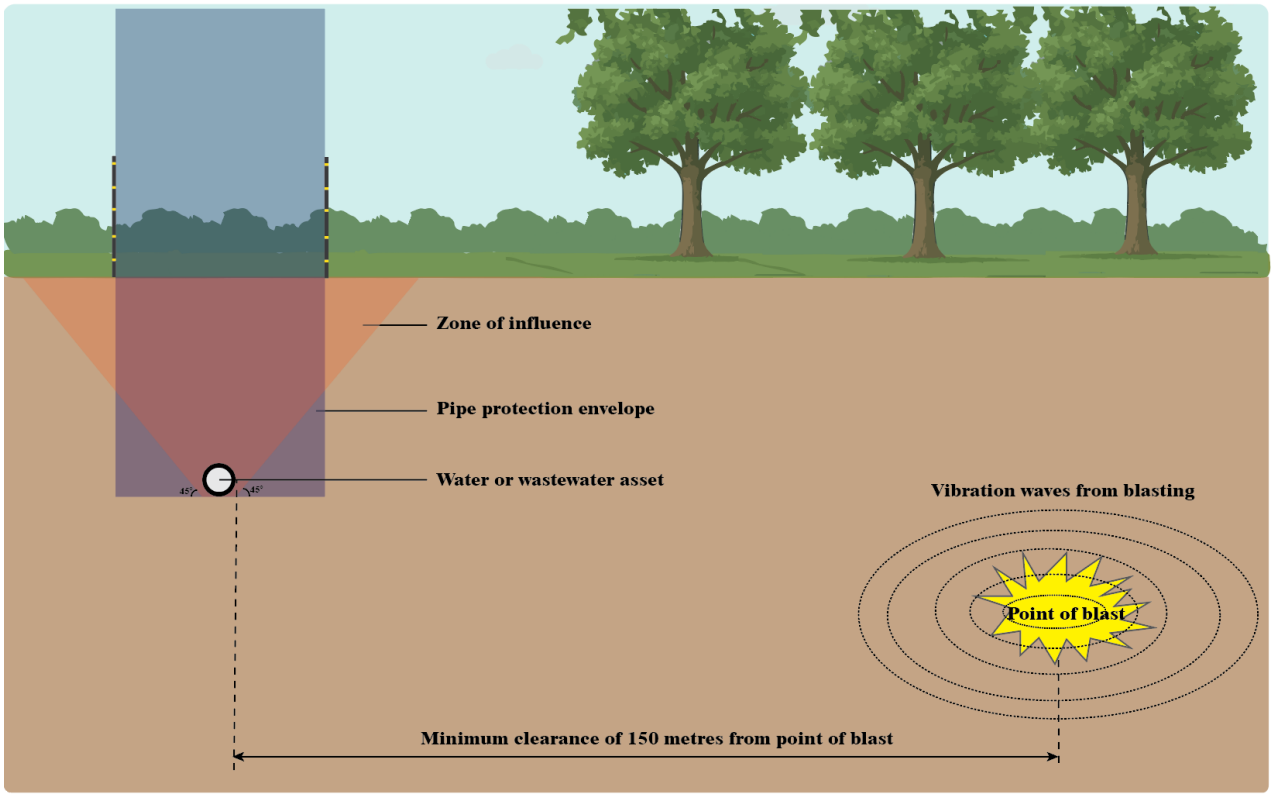


Figure 5.4.2 Requirements for blasting

5.4.2 Compaction

Hold Point 6 – Third Parties shall seek approval prior to undertaking compaction over assets

Compaction over Icon Water assets has the potential to cause excessive vibration and damage to the assets. Third Parties intending to engage in construction works near an Icon Water asset must confirm there is sufficient cover over the asset and where feasible low vibration techniques shall be considered. This can be achieved via the use of plate compactors and light rollers and via the selection of static compaction equipment.

Third Parties shall only use handheld compactors up to a minimum cover of 450 mm has been achieved over the main. Once a minimum cover of 450 mm has been achieved, Third Parties may use ride on compaction such as light rollers up to 5 tonnes over the main. It is recommended the work is carried out in shallower layers of 150 mm once a minimum cover of 450 mm has been achieved, to generate lesser vibrations.

The use of vibratory roller equipment is not permitted within the PPE of Icon Water assets. This restriction is in place because the vibrations generated during compaction can cause ground movement or settlement, which may lead to damage such as cracking, joint displacement, or misalignment of buried pipelines. The proposed use of oscillation rollers will be assessed on a case-by-case, and depending on the criticality of the main, the Third Party may be required to submit a detailed methodology to Icon Water for review and approval.

5.5 Piling

Hold Point 7 – Third Parties shall seek approval prior to undertaking piling in the PPE of an asset

Piling is not permitted within the PPE of an Icon Water asset. Icon Water requires the depth and alignment of the wastewater and water assets to be confirmed prior to the commencement of piling. If the depth of the asset makes excavation and potholing difficult, other means of survey shall be used e.g., manual excavation, electronically traced equipment.

For all piling works in the vicinity of an Icon Water asset, the Third Party shall ensure the greater clearance of 3 meters or PPE clearance is maintained between the outer edge of the asset and the outside face of the pile at all times as shown in Figure 5.5.1.

Witness Point 5 – An Icon Water Representative to witness piling works in the PPE or ZOI of an asset

Icon Water does not allow piling to be conducted within the ZOI or PPE of pressure mains. For gravity mains, if there are no alternative and piles are required to be located within the ZOI or PPE, the Third Party shall seek formal approval from Icon Water prior to undertaking of the piling. Additionally, prior and post construction CCTV inspection of the wastewater main (refer section 6 for detailed requirements) shall be carried out to ensure that piling has not impacted the integrity of the asset. Piling works within the ZOI or PPE of a main shall be carried out in the presence of an Icon Water Representative on-site.

Third Parties planning to undertake piling near an Icon Water asset shall do so via bored or augured piling systems. Driven piles shall not be used near Icon Water assets.

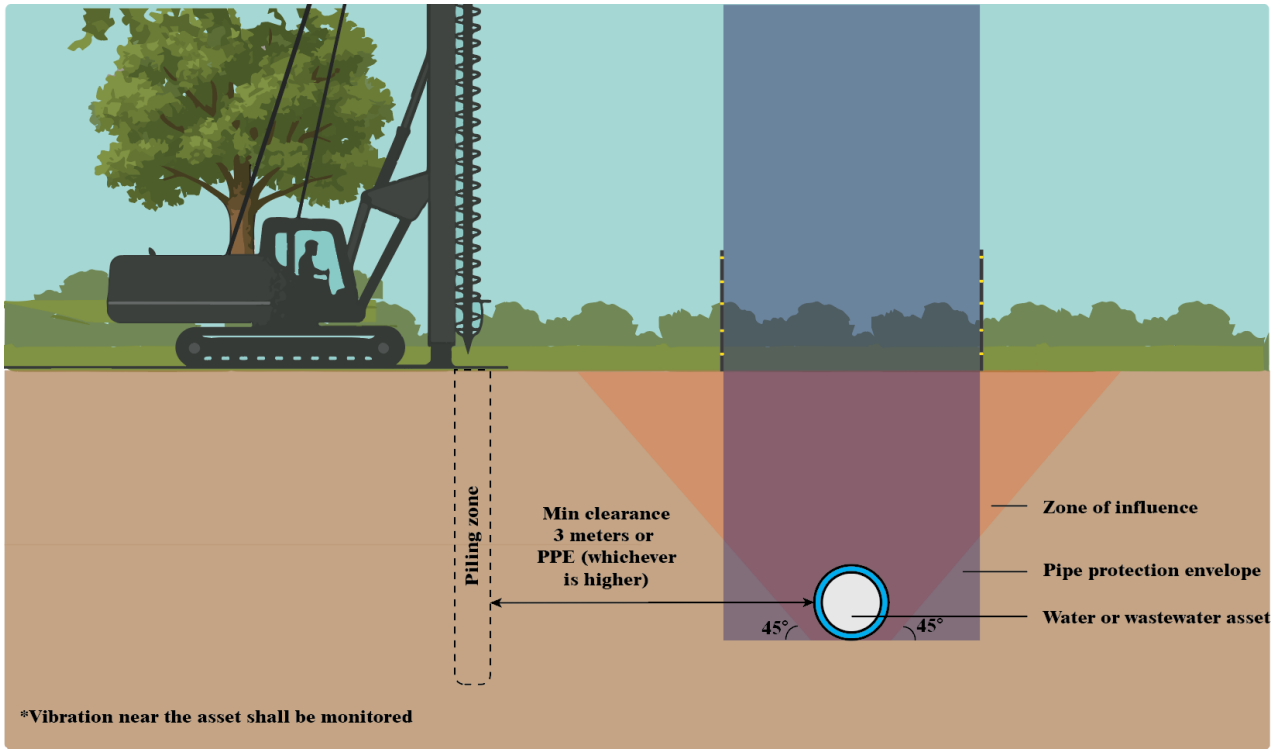


Figure 5.5.1 Requirements for horizontal directional drilling

5.6 Micro-tunnelling and trenchless construction

Hold Point 8 – Third Parties shall seek approval prior to undertaking trenchless construction near an asset

Third Parties may seek approval to utilise trenchless technologies for installing services that cross perpendicular to Icon Water assets.

For Icon Water mains up to and including DN300, where the drill rod path runs under an asset, the minimum clearance requirements outlined in *WSA 02* and *WSA 03* documents shall be met. Where the path of the drill rod passes above an Icon Water sewer gravity main, the minimum clearance between the reamer and the top of the pipe as specified in *WSA 02*, shall be maintained, as illustrated in Figure 5.6.1.

For mains DN375 and above, requests for trenchless services crossing an Icon Water main will be assessed on a case-by-case basis. Based on the age and criticality of the main, and the site conditions, Icon Water will require greater service crossing clearances than those specified in *WSA 02* and *WSA 03* documents.

At minimum, the following requirements shall be satisfied before the Third Party can commence works on site:

- The Icon Water asset location shall be identified via potholing.
- A work methodology shall be developed and submitted to Icon Water for approval to ensure the minimum clearances from proposed works shown in Figure 5.6.1 will be maintained.
- A tracking system shall be utilised to ensure the bore follows the required installation profile and achieves the required clearances to Icon Water assets as shown in Figure 5.6.1.

- A formal approval has been obtained from Icon Water.

Witness Point 6 Icon Water Representative to be present on site when undertaking trenchless works near asset

An Icon Water Representative shall be present during the service crossing works.

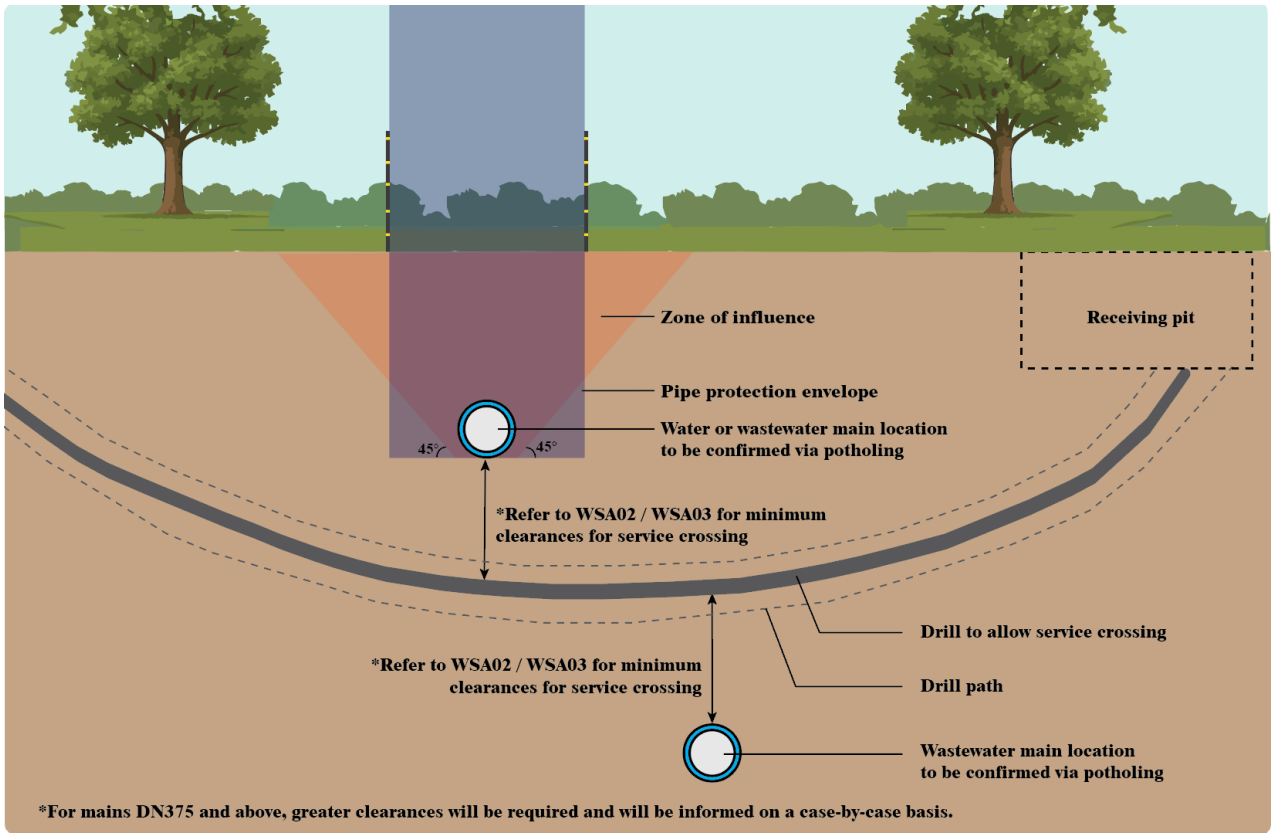


Figure 5.6.1 Requirements for horizontal directional drilling

5.7 Temporary protection

Icon Water assets are generally not designed to carry/sustain additional external loading. As a result, risk of additional loading on the assets shall be investigated on case-by-case basis as it can cause long-term deterioration of the assets.

Temporary protection measures must not remain over an asset for an extended period of time. The design and submission of any temporary protection measures shall consider the following:

- Loading over the pipe
- Condition of the existing pipe
- Engineering assessment of the protection measure.

5.7.1 Thrust blocks

Even a properly designed and constructed thrust block is susceptible to failure if the soil behind the block is disturbed. For reticulation mains, the minimum clearance of any excavation works from the

thrust block shall be 1.5 metres as shown in Figure 5.7.1. For all other mains, this clearance shall be a minimum of 3 metres.

For any excavation works behind thrust blocks, where maintaining the minimum clearances mentioned above is not feasible, the Third Party shall consider providing temporary support to the thrust block and shall seek approval from Icon Water. Additionally, for critical mains, Icon Water may request the thrust blocks to be inspected and the ZOI of the block to be confirmed by a Geotechnical Engineer.

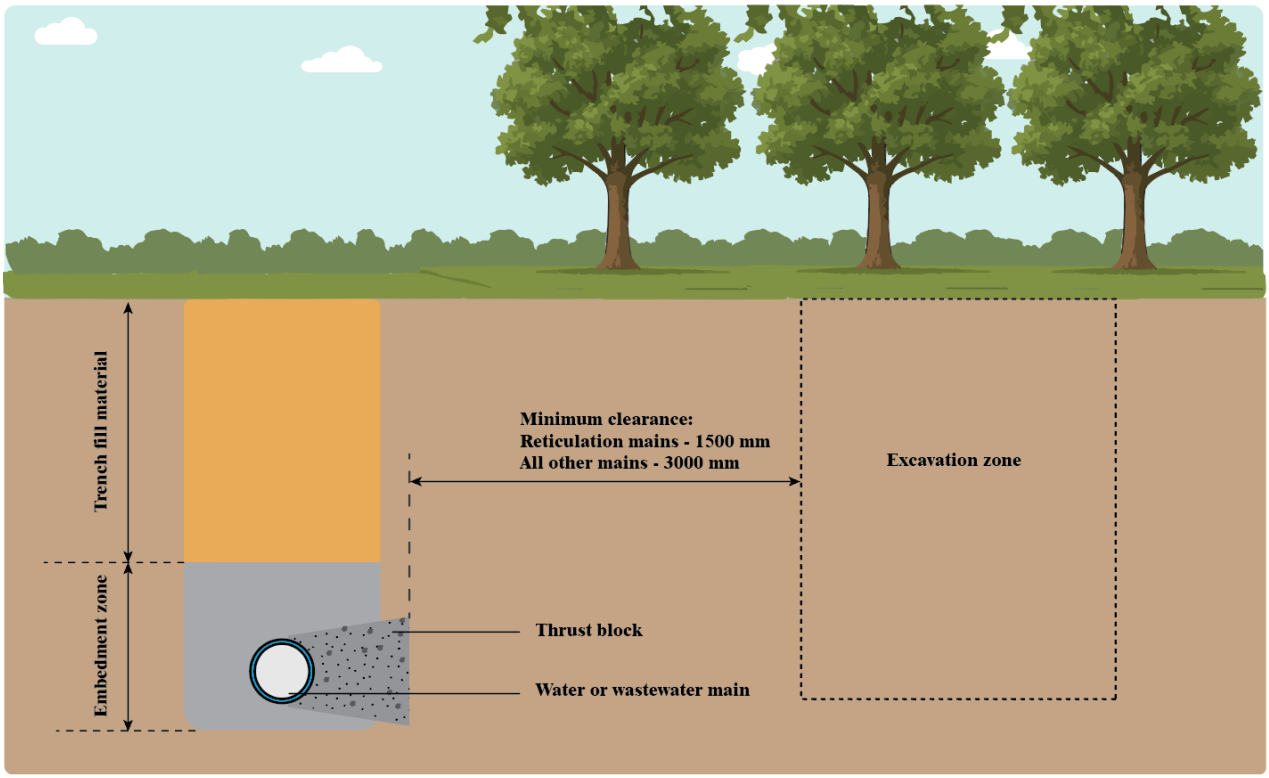


Figure 5.7.1 Requirements for working near thrust blocks

5.7.2 Drainage

For drainage outlet location, appropriate scour protection shall be installed from headwall to downstream side of the asset.

5.8 Permanent protection

The Third Party shall engage a Registered Engineer for the design of permanent protection works over Icon Water assets. The design of the protection works shall be compliant with current Icon Water standards and relevant Australian Standards.

The designer shall be responsible for considering the requirements for protection of the water and sewer assets from the proposed works. This shall be consistent with the installation treatments nominated in relevant WSAA codes and Icon Water standard drawings.

5.8.1 Enveloper pipe

An enveloper pipe is usually installed as a protective measure for a pipe that goes under railway or road-crossings. Icon Water will consider enveloper pipe as a means of permanent protection due to the following benefits:

- Enveloper pipe prevents damage to the road, light rail and railway. If the pipe crossing without an enveloper pipe were to fail, there is a potential for the road and railway foundation to subsequently settle and collapse.
- If the carrier pipe needs to be replaced, it is economical to replace the carrier pipe inside the enveloper rather than a new installation.

The pipe that carries water and wastewater inside the enveloper pipe is the carrier pipe which is not subject of this document. It shall be noted that, to provide support to the carrier pipe, sufficient support shall be provided at the ends of the enveloper pipe to minimise the differential settlement.

Icon Water may consider an enveloper pipe to be installed by open cut or boring methods. The Third Party shall submit the construction procedure, design package, design drawings along with the following as a minimum for approval:

- Site layout
- Receiving and launching pits (plan and sections)
- Pipe enveloper cross-sections identifying dimensions such as inner and outer diameter of the enveloper pipe.

The material for the enveloper pipe used for pipe protection is limited to Concrete or GRP jacking pipe.

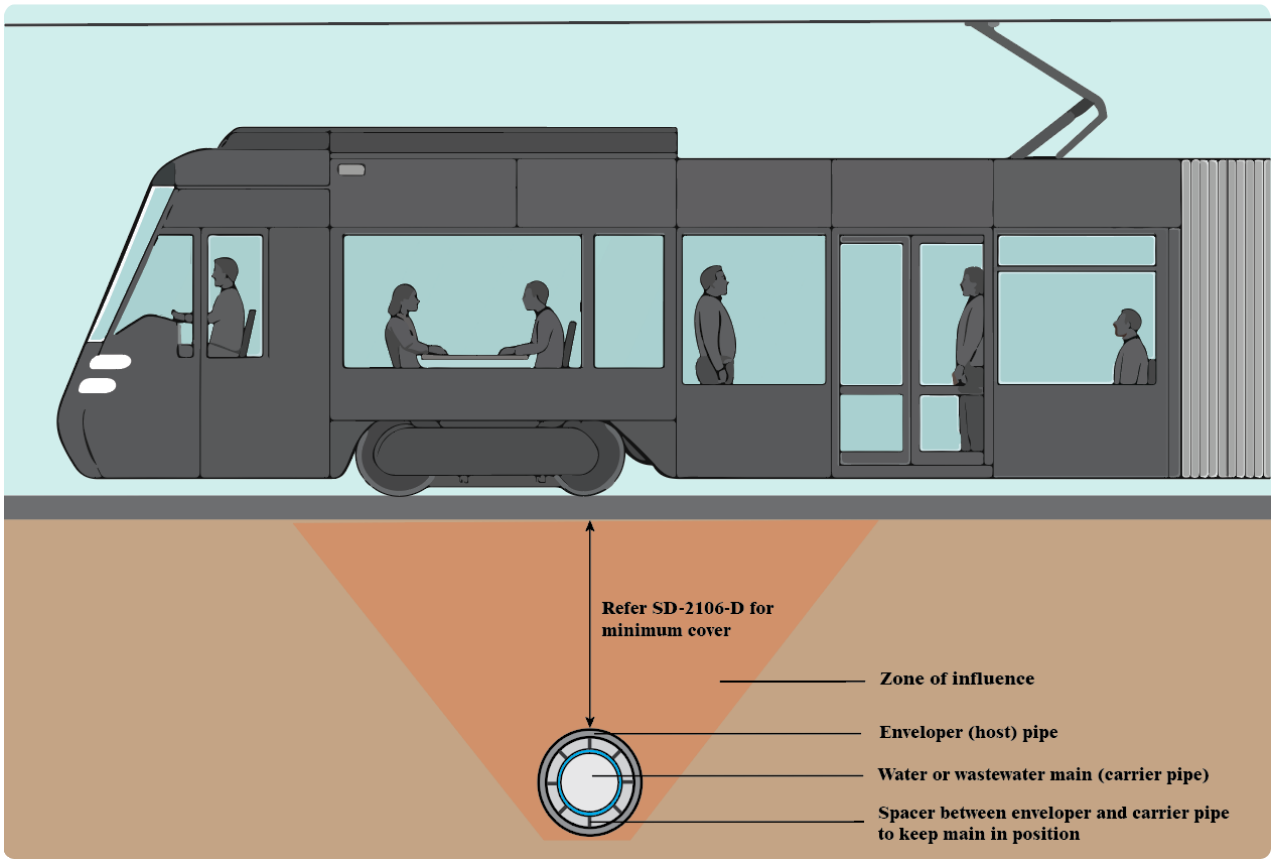


Figure 5.8.1 Enveloper pipe requirements

5.8.2 Concrete encasement

A concrete encasement may be used as an alternative embedment for open cut construction method where there is a need to protect the main and to reduce the need for future maintenance activities. Based on Icon Water specification *STD-SPE-G-017*, Icon Water does not permit concrete encasement of pipe to carry loads transferred from structures.

Third Parties may seek approval to concrete encase Icon Water mains to protect the mains from construction activities and where services (such as stormwater pipe) crossing over the main do not satisfy the minimum vertical clearances specified in *WSA 02* and *WSA 03*. Proposal for concrete encasement is subject to discussions with and approval by Icon Water.

Cast iron pipes, asbestos-cement pipes, flange joints, service connections, hydrants and valves must not be concrete encased. It is also not a viable option to concrete encase mains located in areas that are prone to subsidence.

To avoid damage to pipe adjacent to the concrete encasement, the design shall include flexible joints (rocker pipes) and consider high stiffness bedding such as stabilised sand next to the concrete encasement. The concrete for the encasement shall be poured from one side of the trench till the concrete has achieved the required height compliant with Icon Water standard drawings.

When encasing is required at crossings, the concrete shall extend a minimum of 1 metre beyond the edge of the asset (on either side) that it is crossing. Prior to backfilling, yellow marker tapes shall be placed on the concrete encased section (as shown in Figure 5.8.2 and Figure 5.8.3) so Icon Water crews are able to identify the main in the future.

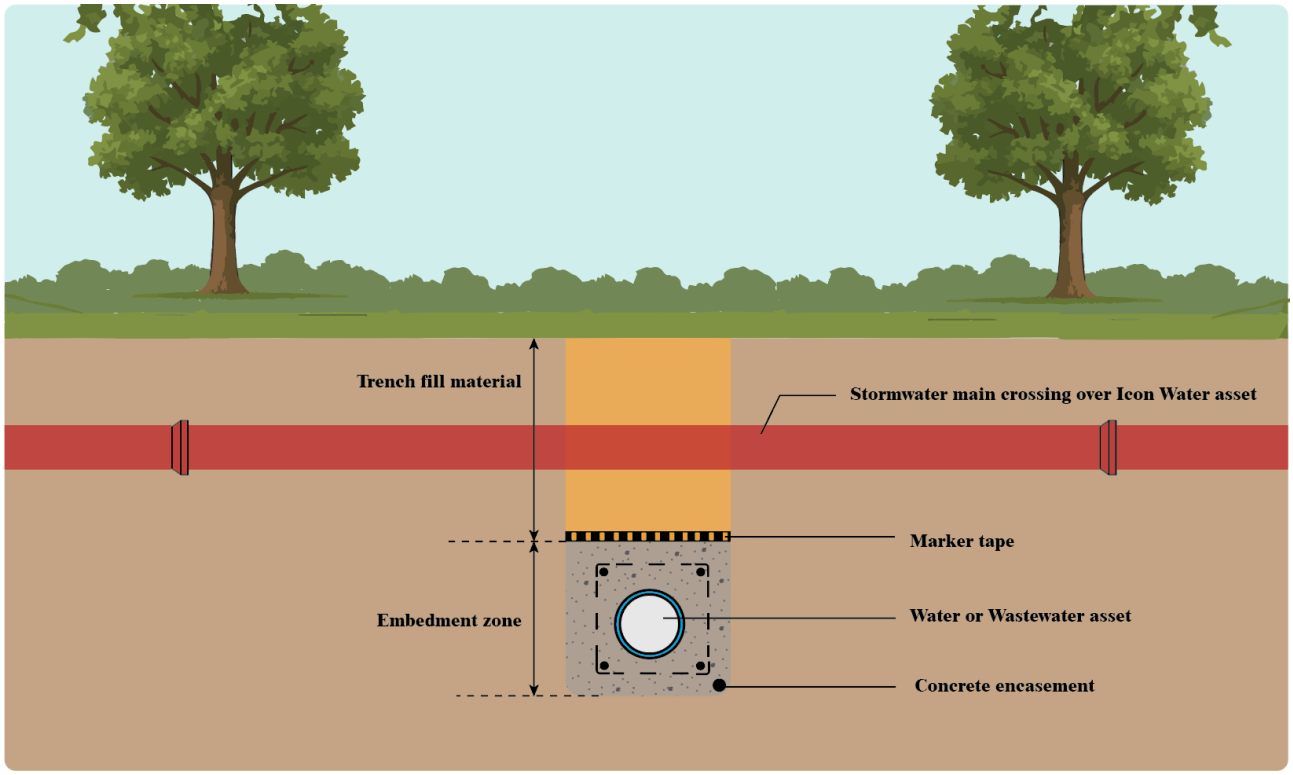


Figure 5.8.2 Requirements for concrete encasing (section)

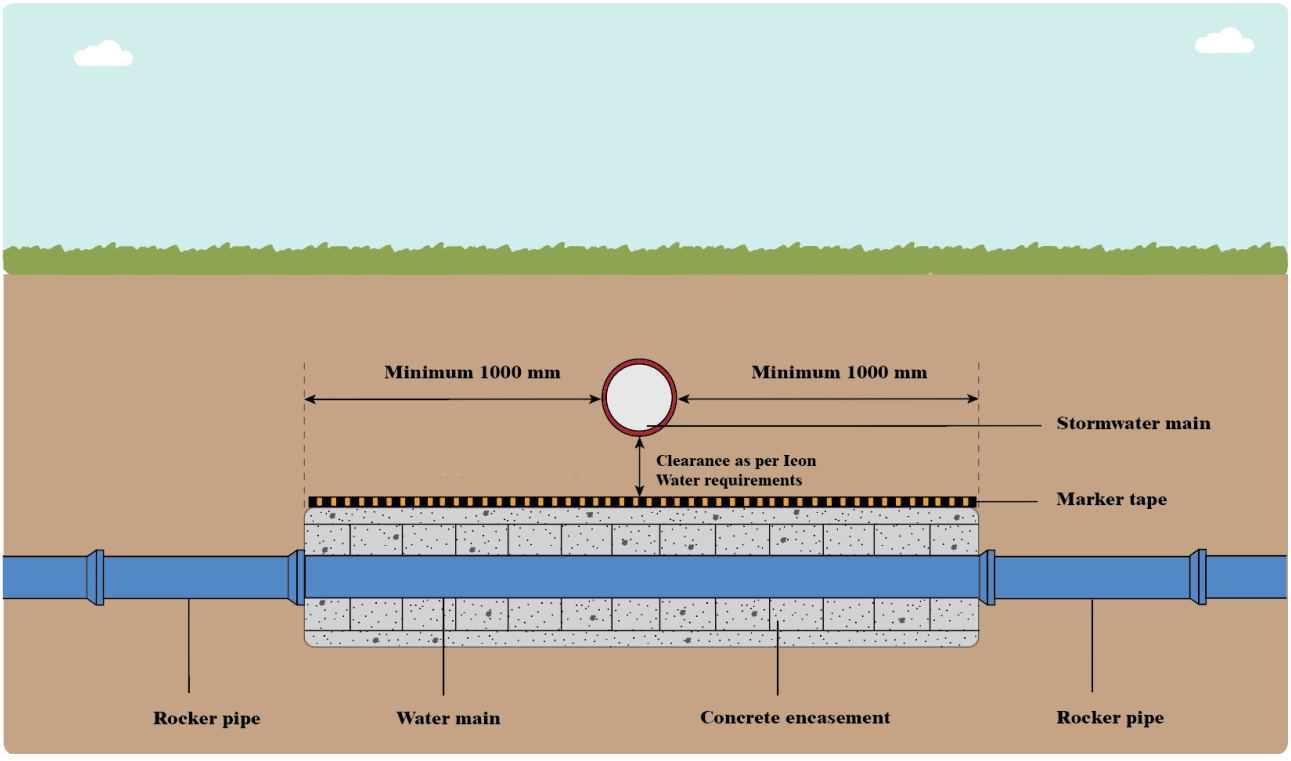


Figure 5.8.3 Requirements for concrete encasing

Figure 5.8.4 Concrete encased asset

5.8.3 Bridging slab

Protection bridging slabs shall not be used as a permanent solution to prevent impact due to additional loading as it will impede the access for Icon Water staff to carry out emergency works on the asset. Icon Water approval will be required if a bridging slab is the only suitable option for permanent protection of the main. At minimum, the following requirements shall be complied for Icon Water approval:

- The concrete slab structures shall be separated by the use of joints to permit removal of the slabs without damage to adjacent structures.
- Where the thickness of the reinforced concrete slab exceeds 100mm, the slab shall be designed in consultation with Icon Water. The slabs shall be designed in panels to bridge across the ZOI of the asset. These panels shall be fitted with points to facilitate lifting of these panels when access is required. The thickness of the bridging slab shall not exceed 300mm.
- The concrete slab shall be installed on concrete supports. The weight of the concrete slab shall be kept to a minimum so Icon Water staff can remove the slab with available maintenance vehicles. This can be achieved by reducing the thickness and widths of the slab. The designer shall provide the detailed design report including all calculations justifying size, weight and lifting methodology of the slab for future maintenance.
- The designer of the precast concrete slab shall provide Icon Water with shop drawings including the calculations and design for the lifting provisions. Icon Water prefers the use of cast-in Reid Swiftlift with a recess former placed at a sufficient distance from the edge of the

slab to prevent shear failure. The lifting arrangement shall be four-point lift configuration and the lifting points shall be sufficiently protected from corrosion.

- The protective measure shall be reviewed and verified by a Registered Engineer of the relevant discipline. The assessment shall consider all the stresses and strains over the pipeline and the design shall ensure there will be no additional loading on the buried asset.
- The designer shall consider the final loading condition and any other scenarios which can result in critical loading on the asset during its lifetime e.g., construction plant movements, shallow cover over the pipe etc.
- The design loading and design of the structure shall comply with *AS/NZS 1170*, *AS 5100*, and *AS 3600* series.
- The concrete shall be placed on a 50 mm compressive material.
- Clearance between the Icon Water asset and the bottom of the compressive material under the concrete slab shall be minimum 500 mm to avoid damage by excavation machinery. Refer to Figure 5.8.5.
- The clearance between the piers and footings and the asset shall provide safe and effective access and Icon Water will not accept any adverse impact or compromise to the integrity of the asset.
- The concrete piers shall extend a minimum of 300 mm below the IL of the pipe to ensure the pipe does not sustain additional loading from the slabs. A Registered Engineer shall confirm the allowable bearing capacity and the depth of extension of the piers. All geotechnical investigation and testing shall be in accordance with *AS 1726, AS 1289, AS 4133* and all other relevant Australian Standards.
- Access to the pipeline for emergency repair works shall be considered and the concrete piers must be located at a minimum of 1.5 metres from the edge of the pipeline. Future access and maintenance requirements must be discussed with Icon Water and included in the detailed design report.
- Marker tapes shall be placed over the concrete slab so the buried asset can be located at a later stage.
- The Third Party shall survey the location of joints and include this in the design, so Icon Water has access to this information in the event the slab has to be removed for emergency repair works.

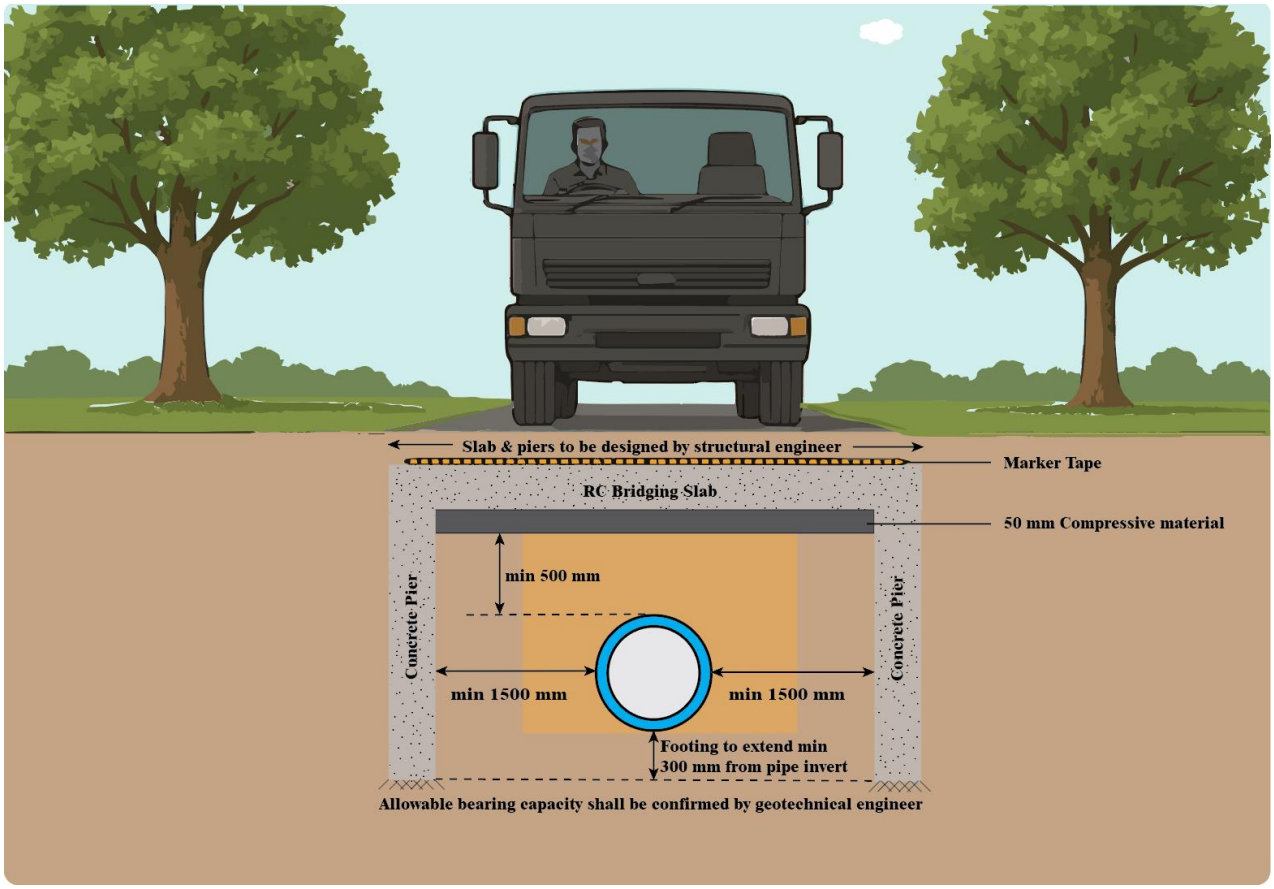


Figure 5.8.5 Requirements for bridging slab

Figure 5.8.6 Bridging slab (under construction)

Figure 5.8.7 Bridging slab (under construction)

Figure 5.8.8 Bridging slab over asset

6 Asset condition investigation

Witness Point 7 – Icon Water Representative to be present on-site for asset condition investigation activities

Prior to commencing any works on-site, Icon Water may require the Third Party to conduct an assessment of pre-construction condition of the surrounding area which will likely be impacted by construction activities and heavy vehicle movement. The condition assessment report must capture the condition of Icon Water access roads, landscaping, surface fittings (e.g., water and wastewater surface features, valve surface box, manhole access cover, hydrant box) etc.

For gravity sewer mains DN375 and above, where a proposed construction activity is located near the main, Icon Water may require the condition of the main to be assessed by CCTV both before and after the high-risk activity. For water mains and sewer rising mains based on the criticality of the asset, Icon Water may require leak detection before and after the construction activities. In cases where an asset needs to be exposed, an Icon Water Representative shall be present on-site to witness the inspections.

Where a condition assessment investigation is required, no construction works near the asset are to be undertaken until the condition assessment report has been provided to and accepted by Icon Water. The condition assessment shall evaluate the current structural condition of the pipe and include the nature, extent, and severity of any defect or deterioration that may have an impact on the structure's load-carrying capacity, or its remaining useful life.

The designer shall certify that, based on the outcomes of the condition report, the design assumptions made are valid and the Icon Water asset is able to withstand any additional loading (from the proposed works) without compromising the operational and structural integrity of the asset.

6.1 Requirements for CCTV inspection

6.1.1 Methodology

Where a CCTV inspection is required, the Third Party shall provide a detailed methodology of the works to seek approval from Icon Water to conduct inspection of the asset. The methodology at minimum shall address the access requirements, monitoring of gases, flow isolation/diversion procedure, flow patterns, timing of the works, cleaning procedure and removal of debris from the main.

6.1.2 Capability

The condition assessment and reporting shall be compliant with *WSA 05* Conduit Inspection Reporting Code of Australia.

The CCTV operator carrying out the works shall be suitably qualified and must be experienced in undertaking similar works. The personnel involved in CCTV operation shall possess the required knowledge and experience of the equipment to facilitate a detailed report in compliance with *WSA 05*. Icon Water may require the Third Party to provide a copy of all relevant and recognised qualifications of the personnel involved in the inspection.

Based on the significance of the asset's importance, Icon Water may provide the Third Party with a list of preferred suitably qualified service providers that possess prior familiarity with Icon Water assets to undertake the CCTV inspection.

6.1.3 Notice of intending works

Once a formal approval has been obtained, the Third Party shall provide Icon Water with ample notice (e.g. 3 business days) to undertake the CCTV inspection. An Icon Water Representative shall be present on-site to witness the inspection.

7 Engineering assessment reports

For mains DN375 and larger, and for any works within the ZOI or PPE of an Icon Water asset, an Engineering Assessment Report may be required. The report must show there will be no adverse impact on Icon Water assets. It must include background and survey results to confirm the asset location and condition, a geotechnical interpretive report, a structural assessment, and any numerical analysis used to support the findings.

The report must set impact and vibration limits, describe the asset protection measures, and include an instrumentation and monitoring plan. It must also include a WMS focused on protecting the asset, and a contingency plan to manage any incident so the community is not affected.

The report must be prepared and signed by ACT registered civil and geotechnical engineers. They must provide evidence of capability in this area and show they have completed similar assessments. This is to ensure Icon Water assets are protected from the works.

7.1 Geotechnical investigation

Icon Water may require a site-specific geotechnical investigation of the ground conditions to establish the required inputs for further engineering assessments. The assessment shall be based on geotechnical investigation comprising of investigation boreholes, in situ testing as required for Engineering Assessment work.

7.2 Finite element analysis

Where works are proposed close to an Icon Water asset, particularly for mains larger than DN375, a finite element analysis may be required depending on risk, ground conditions, staging, or geometry. The analysis must use recognised software such as PLAXIS.

The assumptions adopted in the analysis are critical. They must be justified with supporting data, and selected conservatively to ensure the assessment does not under predict adverse impacts. This includes geotechnical parameters, structural properties, groundwater levels, load cases, and construction staging. Both cross sectional and longitudinal impacts are to be assessed under short term and long term conditions.

Sensitivity analysis shall be carried out to test the influence of key assumptions and parameters on predicted outcomes. This is to ensure that the results are robust and not overly dependent on a single set of input values.

The model must reflect the actual condition of the pipe, including known defects, deterioration, and age with proper derating factors as needed. All input and output files, including PLAXIS files where used, must be provided for review.

7.3 Impact assessment report

Additionally, Icon Water may require the Third Party to conduct an impact assessment to ensure that no adverse impacts would arise from the proposed works within the pipe's ZOI or PPE. Where an impact assessment is required, the Third Party shall be able to demonstrate the proposed works will

not undermine the integrity and stability of Icon Water assets. The engineering impact assessment shall consider all the potential causes that can affect Icon Water assets including:

- Static and dynamic loading over the pipeline
- Ground settlement
- Vibration
- Impact of any temporary structures
- Changes to ground water level conditions.

7.4 Capability and review

The consultant engaged by the Third Party to undertake these studies shall be experienced in undertaking similar studies and investigations and shall be Registered Engineers in their respective disciplines. All studies and reports shall also be reviewed by an independent Registered Engineer prior to submitting to Icon Water.

Depending on the complexity of the project, Icon Water may engage/appoint its own specialist consultant to review the submitted design and reports for assessment of the proposed works. The specialist consultant engaged by Icon Water may seek additional assessment and studies to be conducted for them to thoroughly review the proposal.

7.5 Contingency Plan

For pipelines larger than DN375 Icon Water requires the Third Party to submit a contingency plan. The plan shall cover all provisions to mitigate the adverse impacts on the community and associated consequences in the event of an unlikely failure. The contingency plan shall be submitted with sufficient details and shall include a workplace risk assessment and any site-specific constraints. All required repair material and bypass arrangements shall be included, including the contact details of individuals and their role in the project.

8 Witness and Hold points

Witness and Hold Points have been nominated at various points in this specification as a guide and are denoted by the following example:

Hold Point 1 – Submission of surveyor's qualifications prior to commencement of any works.

The definition of the hold or witness point is designated in the title. The detailed requirements of the particular hold or witness point are then elaborated in the proceeding sentence, paragraph or section below the hold or witness point. It is the Third Party's responsibility to identify all hold and witness points and make themselves familiar with the specific requirements required to fulfil the hold and witness points.

8.1 Hold point

- A milestone when acceptance is required from Icon Water, prior to commencing the subsequent construction activity. Acceptance from Icon Water must be obtained by providing all necessary documentation as required by the Icon Water specification.
- Hold Points shall apply prior to commencement of designated work lots or work items. Hold points have been identified in Icon Water Standard specifications and shall be established within the boundaries of the Third Party's scope and context.

Table 8.1.1 Hold points

Hold Point	Section Reference
Hold Point 1 – Third Party to relocate asset with Icon Water approval to avoid undertaking high-risk works near asset	4.3.2
Hold Point 2 – Third Party to submit asset protection measures to seek Icon Water approval	4.3.3
Hold Point 3 - Third Party shall seek Icon Water approval prior to excavation in the PPE of an asset	5.1
Hold Point 4 – Third Parties to seek approval prior to heavy vehicles and plant crossing over Icon Water asset	5.1.2
Hold Point 5 – Third Party shall seek approval from Icon Water prior to undertaking any blasting within 150 meters of an asset	5.3
Hold Point 6 – Third Parties shall seek approval prior to undertaking compaction over assets	5.4.1
Hold Point 7 – Third Parties shall seek approval prior to undertaking piling in the PPE of an asset	5.4.2
Hold Point 8 – Third Parties shall seek approval prior to undertaking trenchless construction near an asset	5.6

8.2 Witness point

Witness Point means an identified point in a process where the Third Party is required to give Icon Water prior notice with the option to observe an activity.

- Witness Point means an identified point in a process where the Third Party is required to give Icon Water prior notice with the option to observe an activity based on the contract requirements.
- Provide a minimum of 48 hours' notice (Monday to Friday) to Icon Water of a witness point being reached.

Table 8.2.1 Witness points

Witness Points	Section Reference
Witness Point 1 – An Icon Water Representative to be present on-site during service location activities	4.2.2
Witness Point 2 – An Icon Water Representative shall be present on-site when excavating in the PPE of an asset	5.1.2
Witness Point 3 – An Icon Water Representative shall witness backfilling works in the PPE of an asset	5.1.4
Witness Point 4 – An Icon Water Representative to be present on-site during works that generate vibration near an asset	5.4
Witness Point 5 – An Icon Water Representative to witness piling works in the PPE or ZOI of an asset	5.5
Witness Point 6 Icon Water Representative to be present on site when undertaking trenchless works near asset	5.6
Witness Point 7 – Icon Water Representative to be present on-site for asset condition investigation activities	5.8.2

9 Framework for working near assets

9.1 Framework

Prior approval must be obtained by any Third Party intending to carry out works near an Icon Water asset where there is potential for damage or adverse impact on the asset's operation or accessibility. The Third Party is also responsible for ensuring full compliance with the conditions of the approval.

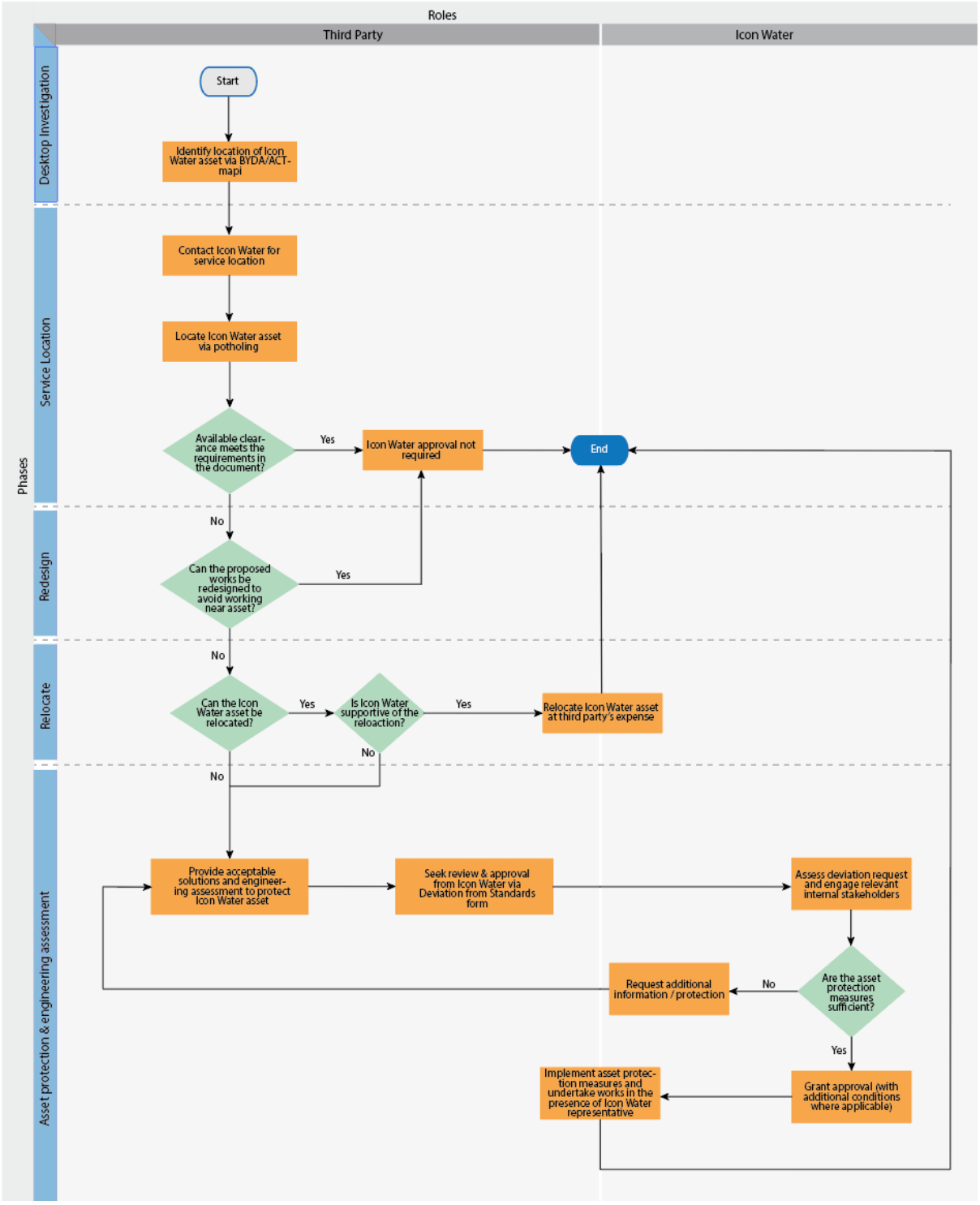


Figure 9.1.1 Framework for working near Icon Water assets

References

- BS 5228-2:2009 Code of Practice for noise and vibration control on construction and open sites – Part 2: Vibration
- Water Corporation Protection of Assets: Technical Guidelines.
- SA Water Technical Standard TS 0136 – Pipework Access and Protection
- Yarra Valley Water Asset Protection Guidelines
- SEQ Water Guidelines D-GDE-STD-001 Seqwater Network Consent
- Barwon Water Build Over Consent Guidelines
- Sydney Water Building Over and Adjacent to Pipe Assets.

Appendix A – Technical Specification update history

A.1 Update History

Issue A (11/08/17): *Original work by P Deb Roy (2023) for internal review.*

Issue B (23/09/25): *For external consultation.*

A.2 Issue 2 Updates (future use)

Section	Update	Description

iconwater.com.au