



Government of South Australia
Department of Health

D R A F T C O D E

Standard for Connection to a Reticulated Community Wastewater System

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Draft Standard for Connection to a Reticulated
Community Wastewater System

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Preface

This Draft Code has been prepared as the
“Standard for Connection to a Reticulated
Community Wastewater System” under the
Public & Environmental Health Act, 1987.

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Foreword

This Code, *Standard for Connection to a Reticulated Community Wastewater System* has been developed pursuant to the provisions of the Public and Environmental Health Act 1987 (P&EH Act). The P&EH Act requires the Department of Health and the Public and Environmental Health Council to keep public health legislation under review for the purpose of accommodating the changing community needs and practices, facilitating the day-to-day administration of the legislation and protecting public health.

Policies and guidelines relating to septic tank effluent disposal systems (STEDS) have been in existence since the early 1960s. In recent years a number of other types of community collection and treatment systems have evolved, including septic tank effluent pumping systems (STEPS), sewerage systems, sewage pumping systems (SPS) and vacuum systems.

This Code has been compiled to assist the relevant authorities with processing applications for approval to connect individual property systems to community wastewater systems.

The Code also provides information to assist consultants, the building and plumbing industry, property owners and occupiers on:

- the technical requirements to be considered in the planning stages of the connection of a property wastewater system to the Reticulated Community Wastewater System (CWWS);
- the requirements for design of the sanitary plumbing and drainage systems;
- the procedures for the submission of applications for approval to connect to the CWWS; and
- the installation and ongoing operation and maintenance of the property wastewater system when connected to a CWWS.

In accordance with the Public and Environmental Health (Wastewater Systems) Regulations 2007, this Code is a *prescribed* code; non-compliance with its provisions is deemed to be an offence and the relevant authority may institute legal proceedings.

Glossary of Terms

Unless a provision explicitly states otherwise, the following abbreviations, terms, and phrases, as used in this Code shall have the meaning hereinafter designated.

Air Admittance Valve	A valve designed to allow entry of air into the plumbing and drainage system when negative pressures occur.
All waste septic tank	A septic tank receiving the waste discharges from all the sanitary fixtures within a premises, i.e. a combination of blackwater and greywater.
All wastewater:	The combined <i>blackwater</i> and <i>greywater</i> from a dwelling or premises.
AWTS	Aerobic Wastewater Treatment System.
AS/NZS	Australian/New Zealand Standard.
AS/NZS 3500	Australian/New Zealand Standard. Plumbing and Drainage.
Authority	Is the Council or other agency, or party who owns, or operates and or maintains the CWWS on behalf of the owner of the CWWS.
Blackwater:	Wastewater discharged from the human body direct to either a toilet or urinal.
CWWS	Community Wastewater System for a community, subdivision or town (also referred to as Reticulated Community Wastewater System) consisting of wastewater collection drains, and other components directing wastewater to a common treatment plant and disposal or irrigation area.
Domestic Wastewater	Waterborne waste derived from human activity and can consist of faecal matter, urine and liquid wastes from water closets pans, kitchen sinks, dish washing machines, baths, basins, laundry troughs, washing machines and other sanitary fixtures designed for use in private domestic residential premises. It is usually a combination of blackwater and greywater, however it may also be either.
DH	Department of Health.
Effluent:	The liquid discharged from a wastewater treatment process / unit.
EPA	Environment Protection Authority
Greywater:	The domestic wastewater from baths, showers, basins, laundries and kitchen sinks / dishwashers specifically excluding water closet and urinal wastes. Also see <i>all wastewater</i> .
Hydraulic Flow – Domestic	The amount of liquid waste discharged from a single residential premises to the CWWS.
Infrastructure	That part of the CWWS under the care and control of the authority and includes the connection point provided to each property.
Non-standard Domestic Wastewater Fixture Discharges	Includes the discharge from non-standard domestic plumbing fixtures e.g. a spa pool (capacity greater than 680 litres); backwash water from a swimming pool; any pressure relief valve from other plant and or equipment; condensate or other discharges from other appliances or equipment.
P&EH Act, or the Act	Public and Environmental Health Act
Pre-treatment , Pre-treatment Tank	See treatment tank or treatment apparatus
Prohibited Discharges	A substance or matter not permitted to be discharged to the CWWS.

Property Connecting Drains or Apparatus	Is any part of a wastewater system located on private property or public premises that is under the care and control of the property owner, or occupier of the premises or other agency and is deemed by the relevant authority not to be part of the CWWS infrastructure.
Relevant Authority	The Council for the area where the CWWS is installed, or the Minister where the CWWS is installed in an area not subject to local government control (out districts).
Restricted Discharge	A discharge that is specifically permitted by the relevant authority and subject to stringent approval conditions including limitations on quantity and quality and subject to additional charges for the increased operating and maintenance cost associated with the management of the CWWS resulting from such discharge.
Reticulated Community Wastewater system	Reticulated CWWS – see definition for CWWS.
Rising Main	A pipe operating under pressure and conveys the discharge from the pump outlet and discharges to a point usually higher than the pump.
Sanitary drainage system	An assembly of pipes, fittings and apparatus, which is used to collect and convey the discharge from the sanitary plumbing system, together with discharges from fixtures directly connected to the drain to the onsite wastewater system or CWWS. Usually located below ground level.
Sanitary plumbing system	An assembly of pipes, fittings, fixtures and appliances, which is used to collect and convey sewage to the sanitary drainage system.
Septic Tank	A single or multiple chambered tank through which wastewater is allowed to flow slowly to permit suspended matter to settle and be retained and that organic matter contained therein can be partially decomposed (digested) by anaerobic bacterial action. The term covers the tanks that are used to treat all wastewater, greywater and blackwater.
Septic Tank Effluent	Is the resultant discharge from a septic tank following primary treatment or settlement of blackwater and greywater.
Sewage	Refers to the combination of blackwater and greywater when conveyed through a sewer drain or rising main.
Sewerage System	A type of Community Wastewater System that receives sewage from multiple locations, and then transports it to a central treatment system (e.g. treatment lagoon or aerobic wastewater treatment plant). This Code is applicable to all community wastewater systems outside SA Water administered areas.
SPS	Sewage pumping system. A CWWS incorporating the pumping of blackwater and greywater in combination from a pump station situated on each property served by the scheme and discharging into a common pressurised rising main discharging to a treatment facility prior to disposal.
STEDS	Septic Tank Effluent Drainage Scheme. A reticulated CWWS generally incorporating gravitational collection system, a treatment system, and a disposal system for septic tank effluent. In some cases a pump system may be required to lift the effluent to the property connection point.
STEPS	Septic Tank Effluent Pumping System. A CWWS incorporating a pumped discharge from the septic tank of each property served by the scheme and discharging into a common pressurised rising main which discharges effluent to a treatment facility prior to disposal.
Storm, Roof, or Surface Water Flows	Any flow of water derived, following or resulting from any form of natural precipitation.
The Minister	The Minister of the Crown to whom the administration of the Public and Environmental Health Act is for the time being committed. (The Minister for Health).

Trade Waste	Any liquid or solid waste conveyed as wastewater in a water carriage system from any commercial, industrial, manufacturing, or other similar premises. It normally excludes blackwater and greywater.
Treatment Tank or Treatment Apparatus	A treatment tank includes any tank or device where a form of treatment is provided or takes place, it may include a biological or chemical action, settlement, separation or other forms of treatment for the purpose of pre treating trade waste to allow connection to a reticulated CWWS.
Vacuum System	A reticulated CWWS where the property connections are discharged into a collection chamber and the contents are removed by negative pressure into collecting mains discharging to a treatment facility prior to disposal. The discharge from the premises to the property collecting chambers is normally by gravity flow but in some cases it may be by pumping.
Wastewater	The liquid waste that is normally collected and transported through a CWWS and it may contain blackwater and greywater. Wastewater may include discharges from domestic, commercial or other premises and can include a trade waste discharge.
Wastewater Regulations	The Public and Environmental Health (Wastewater Systems) Regulations 2007, under the Public and environmental Health Act 1987.
WWS	A wastewater system providing for the collection, treatment and or disposal of human, commercial or industrial wastewaters. It includes the fixtures, fittings, appliances, plant and processes (biological, chemical, or artificial means) associated with such a system or part thereof situated on any premise. It may be an individual property system or part thereof, or it can be reticulated CWWS or part thereof, or it may be a product for use in a wastewater system.
WC Only Septic Tank	A septic tank receiving the discharge from water closets and or urinal only (blackwater waste only).

1. Introduction

This Code details the various requirements to be considered in the planning for connection of the individual property wastewater system to a reticulated Community Wastewater System (CWWS). It also addresses the requirements relating to application, approval, installation, operation and maintenance of the individual property wastewater system when connecting to and or after connection to the reticulated CWWS. It does not apply to the installation of the reticulated CWWS by the relevant authority or agency responsible for the ownership, operation and maintenance of that system.

This Code is to be read in conjunction with the Public and Environmental Health (Wastewater Systems) Regulations 2007, and the relevant prescribed Codes under the said regulations.

Where a sewerage scheme is under the care and control of the South Australian Water Corporation and is situated in a proclaimed drainage area pursuant to the Sewerage Act, this Code does not apply.

A reticulated CWWS provides for the collection and carriage of septic tank effluent, or blackwater and greywater, or sewage by either gravity flow or by pumping either with positive or negative pressures (vacuum), to a treatment facility that is owned, operated and maintained by the local council, or other agency.

A reticulated CWWS includes a Septic Tank Effluent Drainage Scheme (STEDS), a Septic Tank Effluent Pumping System (STEPS), a Sewerage System, a Sewage Pumping System (SPS), or a Vacuum System (VS).

Currently in SA the most common reticulated CWWS is a STEDS. These schemes comprise a gravity collection system and generally provide a connection to each property at a depth to allow connection of the property wastewater system by gravity and may receive the discharge from a septic tank and or a greywater treatment tank or other approved treatment processes on the property.

A sewerage CWWS will allow the direct connection of the discharges from the sanitary fixtures and plumbing fittings (blackwater and greywater) including treatment apparatus (e.g. grease arrestor) located within the property to the sewerage system. In a sewerage system, septic tanks and greywater treatment tanks are not required.

Where the reticulated CWWS connection to the property does not permit connection of the property wastewater system by gravity flow, it will be necessary for the property owner to install a pump and pump chamber to discharge the septic tank effluent, blackwater or greywater to the CWWS. Therefore, in the case of a STEPS and a SPS, the discharge of septic tank effluent or blackwater and greywater from the property wastewater system will be by gravity to an individual pumping chamber on the property, with a pumped discharge to a common pressurised rising main forming part of the CWWS.

Another reticulated CWWS type is a vacuum operated system where the property wastewater system is connected by gravity flow to a common receiving chamber where the contents are removed through a negative pressure valve to a common main, forming part of the vacuum reticulation system. In some cases the discharge from the property to the common receiving chamber may be by means of a pumped discharge. The system may collect blackwater and greywater or it may collect septic tank effluent.

The Public and Environmental Health (Wastewater Systems) Regulations 2007, provide the legislative framework for Wastewater Systems. Further information on the installation of wastewater systems can be obtained from:

- The South Australian Onsite Wastewater Systems Code.
- AS/NZS 3500 Australian/New Zealand Standard. Plumbing and Drainage
- The Plumbing Code of Australia
- South Australian Water Corporation Variations to AS/NZS 3500.

1.1. Trade Waste Connections

Technical information contained in the SA Water document listed below shall be used in the design and determination of requirements for connection of trade waste systems discharge to the reticulated CWWS.

- “Physical Characteristics”, “Chemical Characteristics”, “Prohibited substances” and “Notes” sections of the document called “Standards of Acceptance of Liquid Waste to Sewer.” Any referrals mentioned to this document to SA Water do not apply to the Standards for Connection to a Reticulated Community Wastewater System Code or its requirements.
- SA Water Trade Waste General Policy and Guidelines.

However, in the above documents in all matters relating to a “relevant authority”, the local council or the Department of Health is to be considered the relevant authority as per the Public and Environmental Health Act (Wastewater Systems) Regulations 2007.

Technical criteria can be used by designers, installers of the trade waste connection systems and the relevant authority approving such connections.

The requirements of this Code and the Wastewater Systems Regulations override the information contained in the above standards or Codes in case of any conflicting information in the said documents. If revisions of any of the above documents differ considerably, the relevant authority will determine which approach best meets the required performance outcomes.

1.2. Infrastructure Design, Construction and Operation Criteria for Reticulated CWWS and Reuse Systems

Under the Public and environmental Health (Wastewater Systems) Regulations 2007, The Minister is the relevant authority for approval of all reticulated CWWS and reuse systems and any extensions thereto. Persons wishing to install such systems are required to submit an application with the appropriate fee to The Minister prior to any installation work taking place. Penalties apply for non compliance with this requirement.

Approvals of sanitary plumbing and sanitary drainage for all buildings are to be by local councils in accordance with AS/NZS 3500 and connections to a CWWS in accordance with this Code.

In unincorporated areas where local councils do not exist, the approving authority for underfloor plumbing and connections to a CWWS is the Minister.

For the infrastructure design, construction and operation of community wastewater systems, the following Codes, Standards and Guidelines are to be followed:

- The following Water Services Association of Australia Codes of Practice:
 - ❖ WSA 02-2002, Sewerage Code of Australia
 - ❖ WSA 03-2002, Water Supply of Australia
 - ❖ Dual Water Supply Systems. A Supplement to Water Supply Code (WSA 03-2002)
 - ❖ WSA 04-2005, Sewage Pumping Station Code of Australia
 - ❖ WSA 06-2004, Vacuum Sewerage Code
 - ❖ WSA 07-2005, Pressure Sewerage Code of Australia.
- The following SA Water Corporation Codes of Practice:
 - ❖ SA Water Corporation Code of Practice for the Design of Sewerage Systems (DS11 (a))
 - ❖ SA Water Corporation Standard Specifications for the Construction of Sewer Systems (DS11 (b)).
- Standard Form, Technical Specification for Construction of Septic Tank Effluent Drainage Schemes. Department of Health and Local Government Association of SA.
- Septic Tank Effluent Drainage Scheme Design Criteria. Department of Health and Local Government Association of SA.

- South Australian Biosolids Guidelines, for the Safe Handling, Reuse or Disposal of Biosolids. Environment Protection Authority.
- South Australian Reclaimed Water Guidelines. Treated Effluent, Department of Health and Environment Protection Agency.
- National Guidelines for Water Recycling: Managing Health and Environmental Risks. Natural Resource Management Ministerial Council, Environmental Protection and Heritage Council, Australian Health Ministers' Conference.

2. Information and Enquiries

This section provides details of the agencies to be contacted to find out the necessary information about the requirements to connect the premise wastewater system to a reticulated Community Wastewater System (CWWS).

Any enquiries concerning requirements of this Code should be directed to the Environmental Health Officer at the local council; or the Applied Environmental Health of the Department of Health, who can:

- Provide information on the reticulated CWWS and the conditions applicable to the existing wastewater system on the property. This may entail a site inspection to determine the status of the existing wastewater system on the property and the location and depth of the connection point.
- Advise on the procedures and information to be followed in submitting an application.
- Provide information on possible approval conditions as well as indicating who may carry out the work.
- Advise of any changes associated with an application and subsequent inspections; the provision of an application form; and other relevant information.

In some older premises, the standards for the sanitary plumbing, drainage and treatment tanks or other apparatus will vary from the current standards. However, they may be acceptable where the relevant authority considers the existing sanitary plumbing, drainage, and treatment tanks are in a sound condition, or determines by inspection or appropriate testing or by requesting certificates of compliance, suitability for connection to the CWWS. They must not pose a risk to the health of the property occupants, the premises, or present a risk to the safe operation of the reticulated CWWS. Where this is not the case the relevant authority may require upgrading of part of or all of the sanitary plumbing, drainage, and or the treatment tanks or other apparatus serving the premises.

3. Legal Requirements

The enabling legislation applicable to Wastewater Systems connected to a reticulated CWWS are covered under the:

- Public and Environmental Health Act and more specifically the Public and Environmental Health (Wastewater Systems) Regulations 2007.
- The Local Government Act 1934, Section 530c (subject to change), and the Local Government Act 1999.

3.1. Australian Standards

Where requirements of this Code appear in Australian/New Zealand Standards (AS/NZS) and there is any conflicting information, this Code overrides any AS/NZS requirement.

3.2. Local Government Act 1934

Section 530c of the Local Government Act details the procedural process a council is required to follow when proposing the installation of a STEDS and provides for connection to it at the request of the Council. This Act is planned to be repealed and provisions transferred to the Public and Environmental Health Act.

3.3. Local Government Act 1999

Section 177 of the Local Government Act 1999 provides the power for a Council to apply a service rate and or an annual service charge for a prescribed service such as a reticulated CWWS.

3.4. Relevant Authority

For the purpose of this Code the relevant authority with regard to the connection of the individual property wastewater system to the CWWS:

- is the local council where a reticulated CWWS is installed in an area subject to local government control and covered by a SAHC Code including sanitary plumbing and drainage.
- is the Minister of Health where the reticulated CWWS is installed in an area not subject to local government control including sanitary plumbing and drainage.

The relevant authority with regard to infrastructure including the reticulated wastewater collection treatment and reuse or disposal is the Minister of Health C/- The Department of Health. This includes extensions to existing schemes (see also Section 1.2).

3.5. Other Legislation

The information contained in this Code does not remove the obligation to comply with other legislative provisions.

The Public and Environmental Health Act (Wastewater Systems) Regulations 2007, generally provide penalties for non-compliance, and include expiation offence provisions. Some legislation does not specifically reference expiation offence provisions. However, the Expiation Offences Act indicates that where the legislation has an offence provision, then the provisions of the Expiation Offences Act can be applied.

3.6. Application

Prior to connecting the property wastewater system to a reticulated a CWWS it is necessary to submit an application to and receive approval from the relevant authority (*refer to Section 3.4 for*

further details). The appropriate application form can be obtained from the relevant authority including details of the information to be provided.

Information to be provided with the application includes:

- location of the installation;
- owner and applicant details;
- details of the sanitary fixtures and other plumbing fittings;
- number of occupants;
- details and capacities of septic tanks, pre-treatment system, other apparatus, pumping sumps, pumps and alarm systems;
- details of daily hydraulic load (blackwater and greywater); and
- declaration and signatures.

Site Layout Plan drawn to a scale of 1:500 showing:

- block dimensions;
- location of the premises including other relevant structures on the site;
- position and capacities of new and/or existing septic or other treatment tanks and/or pumping sump and pump/s;
- location of the connection drains and or rising mains as applicable; and
- location of the construction authority connection point, including the check valve box, or vacuum chamber as applicable.

Some premises may carry out activities deemed by the relevant authority to be a trade waste and therefore additional provisions apply which may include pre-treatment, regular monitoring of the trade waste discharge and additional costs based on the quality and quantity of the discharge to the reticulated CWWS. The relevant authority may require independent certification as to the nature of the trade waste and the treatment process required to meet the relevant trade waste local Acceptance Criteria (such as the local authority and/or other agency requirements for the system they own and operate). This may include reference to SA Water Standards of Acceptance of Liquid Waste to Sewer.

Please check with relevant authority as trade waste discharges to the reticulated CWWS may not be permitted. Where a trade waste discharge is permitted to be connected into the reticulated CWWS, the applicant is also required to consult with the relevant authority to determine the information required. Where a trade waste cannot be connected to the reticulated CWWS the relevant authority may require the waste to be contained into a separate containment tank for removal from the site by tankerage.

In accordance with the provisions of the Wastewater Systems Regulations the relevant authority may require the applicant to provide certification with the application confirming that the design of the wastewater system complies with the relevant standards as referenced within this or other Codes, or documents.

3.7. Wastewater System Fees

The Wastewater Systems Regulations enable the relevant authority to charge a fee for approval to connect to a reticulated CWWS. Powers exist for the relevant authority to reduce or remit the fee.

For information on fee requirements contact the relevant authority, as applications for approval to connect to the reticulated CWWS received without the correct fee may be delayed until the required amount is received.

In addition to an application fee the relevant authority may impose additional ongoing charges where a trade waste discharge is permitted. This charge may relate to the quantity and quality of

the trade waste discharge. An approval to discharge a trade waste to a reticulated CWWS may be subject to annual renewal at the discretion of the relevant authority.

3.8. Approval

Approval of applications submitted with insufficient or incorrect information may be withheld until the required details are provided.

Applications will be assessed and where applicable the relevant authority may carry out a site inspection prior to granting approval. Approval is granted conditional upon:

- information submitted with the application,
- compliance with any notation by the relevant authority shown on the approved plans and other supporting documentation,
- details outlined in the installation plans and/or other attachments,
- the general requirements of this Code and/or the provision of the Wastewater Systems Regulations, or other nominated documents,
- all the conditions indicated in the approval letter by the relevant authority,
- all work being correctly installed by a person or persons authorised to carry out plumbing and drainage work and in compliance with the requirements of the relevant authority.

In accordance with the provisions of the Wastewater Systems Regulations the relevant authority may require the applicant as a condition of approval to provide certification on completion of the wastewater system that it has been constructed in accordance with the approval conditions.

The work must not be varied from that shown on the approved plan, attachments and the conditions of the approval letter without prior written approval from the relevant authority. This may require submission of amended plans appropriately endorsed by the owner.

Note: *Penalties apply for the provision of false or misleading information, or for the installation or alteration of a wastewater system without approval. The relevant authority has the power under the Wastewater Systems Regulations to require rectification of incorrectly or illegally installed Wastewater Systems and or disconnection from the reticulated CWWS.*

3.9. Figures 1 to 14

Figures 1 to 14 show typical details of the various requirements outlined in this Code and indicate the type of information to be provided on the plans to be submitted with an application to connect to a reticulated CWWS. Typical examples are provided for connection to a STEDS, STEPS, SPS, Vacuum Systems and Gravity Sewerage Systems as well as variations that may require a pumped discharge to the reticulated CWWS.

4. Connection Requirements

Connection requirements for the various type of CWWS system differ according to the type of system and for a:-

- **Septic Tank Effluent Drainage Scheme (STEDS).** The drains from the premises discharge to a septic tank of an approved type and capacity before connection to the reticulated CWWS (refer to Figures 1 to 5). Pre-treatment of any trade waste may be required prior to any connection to a septic tank. See also section 3.6.
- **Septic Tank Effluent Pumping System (STEPS).** In addition to discharging to a septic tank, requires the provision a pumping chamber and pump to discharge the wastewater to the reticulated CWWS (refer to Figures 6 and 7).
- **Sewerage System.** The property sewer drain can discharge directly to the CWWS connection point and septic tanks as described above are not required (refer to Figures 8 and 9). However, in some cases specific treatment tanks or apparatus may be required for specific wastes, eg grease arrester. Where the connection cannot be made by gravity then a pumping system is required (refer to Figure 9).
- **Sewage Pumping System (SPS).** The drains from the premises discharge into a pumping chamber and the sewage is pumped to the reticulated CWWS connection point (refer to Figure 10).
- **Vacuum System.** The drain either discharge to a septic tank with the resultant effluent flowing to the authority vacuum chamber (refer to Figure 11), or where the vacuum system collects sewage without a septic tank, the property drain connects directly to the authority vacuum chamber (refer to Figure 12).

Figure 13 shows a typical vacuum valve chamber, whereas Figure 14 shows a typical pump chamber.

The relevant authority may in certain cases require the installation of a reflux valve to prevent the backflow of effluent or sewage from the reticulated CWWS to the property wastewater system.

4.1. General Provisions

- 4.1.1. Where the relevant authority issues a notice under the Public and Environmental Health Act or under the provisions of the Local Government Act, the owner of the premises must have the premises connected to the CWWS.
- 4.1.2. Approval must be obtained from the relevant authority before connecting to the reticulated CWWS. This requires the submission of an application to the relevant authority and obtaining the required approval before commencing any work.

Note: *Specific provisions may apply with regard to trade waste type discharges, refer to the relevant authority for specific requirements.*
- 4.1.3. Buildings under separate ownership (i.e. on separate titles) shall not connect to the CWWS by means of a common drain. All drains and treatment tanks must be located on the same allotment as the building and or under the same title.
- 4.1.4. Connecting drains and other plumbing work must be installed by a person authorised as a Plumbing Contractor and or a Plumbing Worker under the provisions of the Plumbers, Gasfitters and Electricians Act of 1995, and all work must be done in a workman-like manner and be in accordance with:
 - the requirements of this Code,
 - the provisions of the South Australian Code *Onsite Wastewater Systems* and or the provisions of other Codes as outlined in the approval,
 - other specific approval conditions as required by the relevant authority,

- the requirements of the Wastewater Systems Regulations including provision of certificates of compliance for work carried out by licensed plumbing contractors,
 - Other requirements stipulated by the relevant authority for a trade waste discharge to the reticulated CWWS.
- 4.1.5.** The connection to the reticulated CWWS must be made directly from the septic tanks for septic tank effluent, or from the drain lines for all wastewater, blackwater and greywater without a septic tank where the reticulated CWWS is a sewerage system, or as appropriate from the relevant pumping chamber (*refer to Figures 1 to 14*). For details on backfilling of existing septic or treatment tanks refer to Section 6.2. Existing on-site subsurface disposal systems, for example, soakage trenches, beds, wells or pits must not be connected to the reticulated CWWS (*refer to Figure 1*). They must be disconnected, however it is not normally necessary to backfill disused on-site subsurface disposal systems unless they are dangerous, create an insanitary condition or the relevant authority requires it to be done. Connecting drains are not permitted to pass through septic or treatment tanks, soakage wells, or similar structures, or other unstable areas unless of a material and supported as required by AS/NZS 3500.
- 4.1.6.** Where existing on-site subsurface disposal systems need to be backfilled, they shall be pumped dry and filled with a friable soil or equivalent, or other material as permitted by the relevant authority.
- 4.1.7.** Existing septic, greywater or other treatment tank/s that are permitted by the relevant authority to be retained (may be subject to testing and or modifications) are required to be desludged prior to connecting to the reticulated CWWS. Refer to Sections 6.2 and 6.6 for other information regarding existing treatment tanks and their maintenance.
- 4.1.8.** The contents of a desludged septic, greywater or other treatment tank/s, or the contents of the on-site subsurface disposal system must not be discharged into the reticulated CWWS. Offenders are liable to prosecution plus costs for restitution of damage to the reticulated CWWS.
- 4.1.9.** The contents of a desludged septic, greywater or other treatment tank/s, or the contents of the on-site subsurface disposal system must be disposed of in a manner as indicated by the relevant authority. The South Australian Environmental Protection Authority publication, *SA Biosolids Guidelines for the Safe Handling and Reuse or Disposal of Biosolids* contains information on the disposal of the contents of desludged septic, greywater or other treatment tank/s.
- 4.1.10.** The sanitary plumbing and drainage system for premises connected to the reticulated CWWS must be provided with an overflow relief gully. The exception being where the only sanitary fixture is a water closet connected to a WC only septic tank system, then an overflow relief gully is not required.

Figure 1. Typical site layout plan showing STEDS connection details for an all wastewater septic tank system

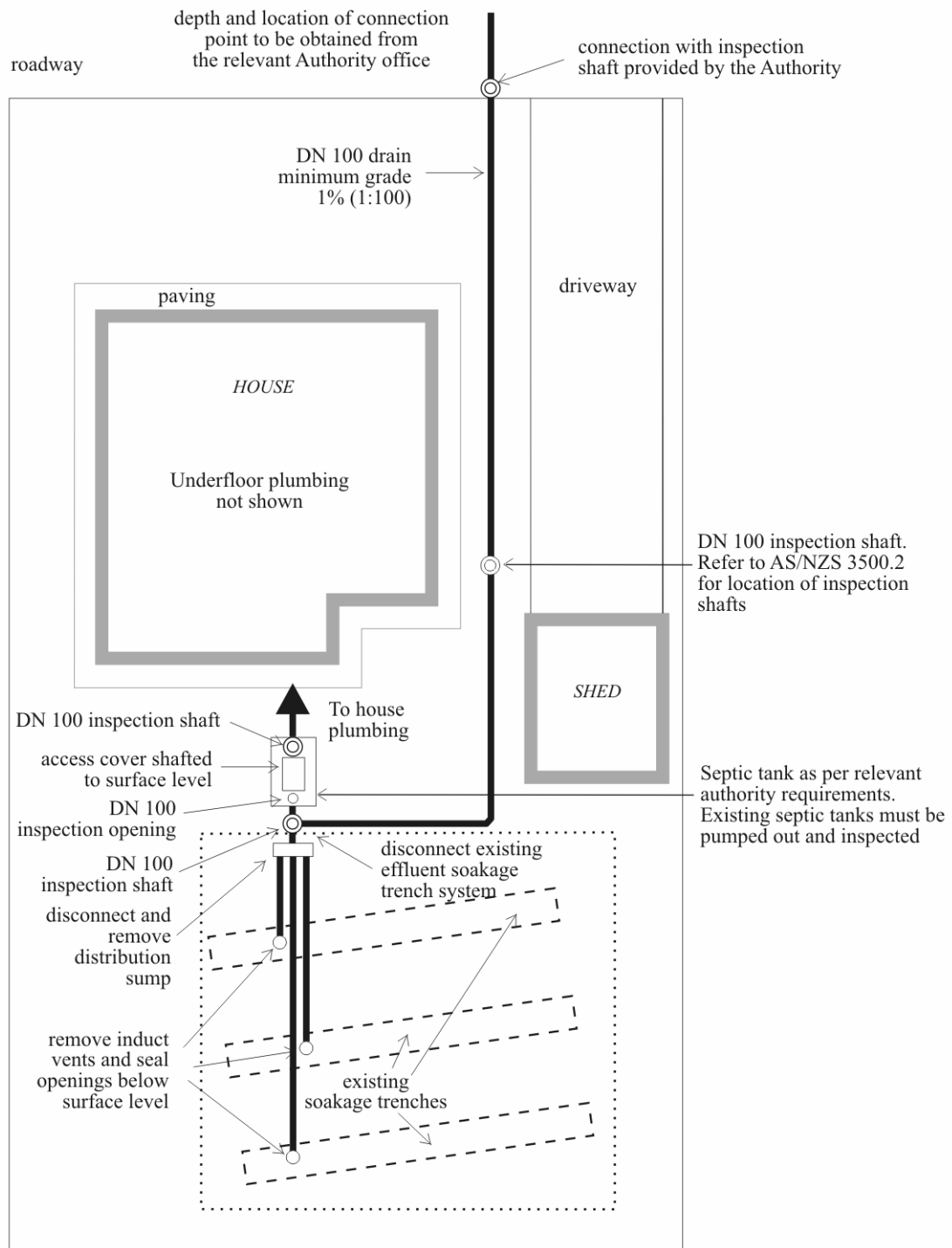
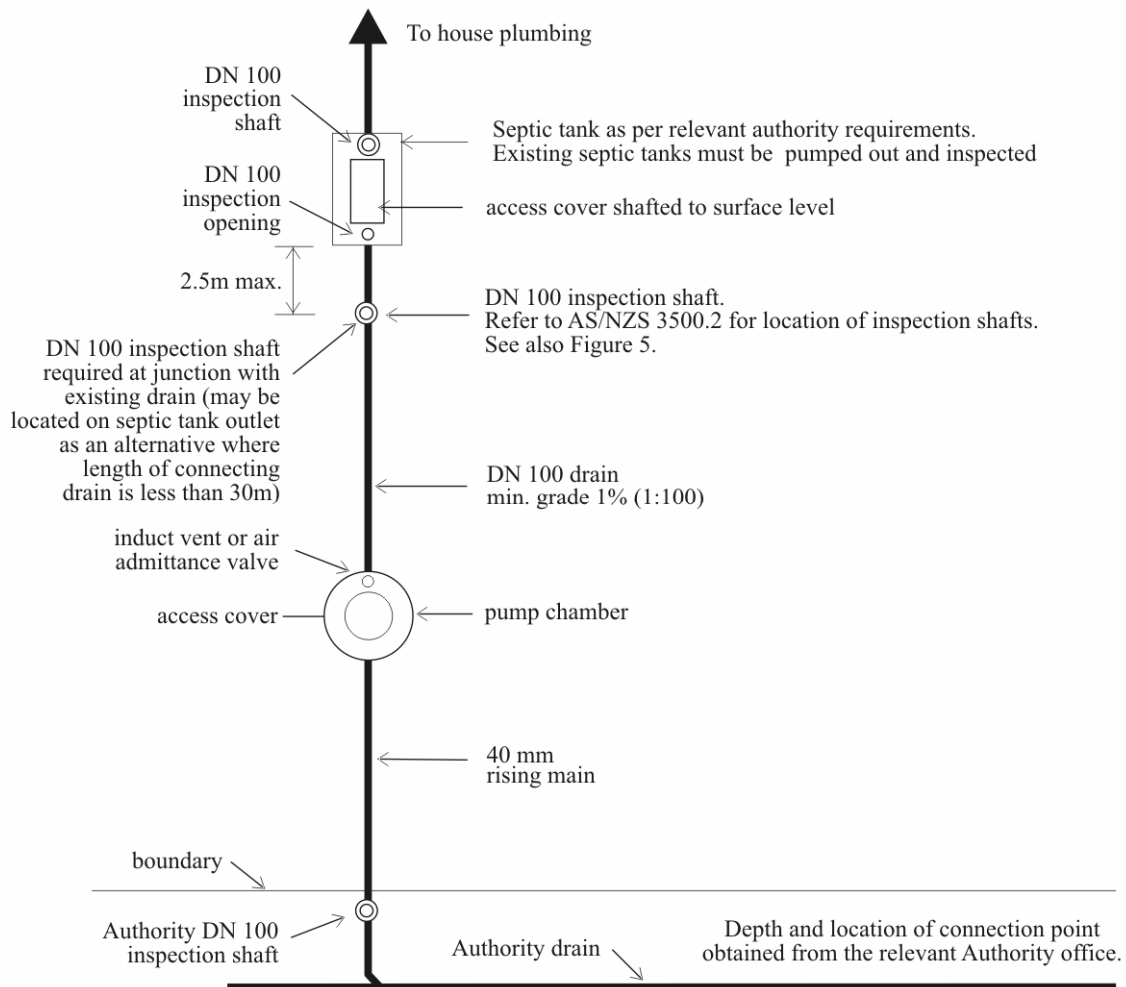


Figure 2. Typical STEDS connection details for pumped discharge to a gravity connection



4.2. Prohibited or Restricted Discharges

4.2.1. The following prohibited substances are not permitted to be discharged into the reticulated CWWS, whereas restricted substances may be permitted at the discretion of the relevant authority and subject to strict installation and operating conditions as determined by the relevant authority:

Prohibited Substances include:

- any stormwater, including roof catchment waters and rainwater tank overflows, ground surface and subsurface drainage or seepage waters; and
- any disinfectant, or similar or other product or substance that will impact on the efficient operation of the reticulated CWWS.
- any substance deemed a prohibited substance by The SA Water Corporation, Trade Waste Branch "Standards of Acceptance of Liquid Waste to Sewer."

Restricted Substances include:

- any backwash and or drainage waters from a spa bath including the capacities in excess of 680 litres, or a spa pool or a swimming pool;
- any pressure relief or safety valve release from a hot water service (excluding domestic dwellings) or boiler or pressure vessel or other plant and equipment and or apparatus;
- any process wastewater, or washdown water, or other backwash or drainage waters (excluding domestic dwelling water softeners) from within the premises; and

- any other substance as determined by the relevant authority.

- 4.2.2.** The discharge of material into the connecting drains or into the CWWS as detailed in Section 4.2.1. above and other than domestic sewage, septic tank effluent, blackwater, or greywater, as the case may be, unless otherwise limited by quantity and or quality by the relevant authority, is prohibited or is restricted. Persons illegally discharging prohibited substances to the CWWS or exceeding set restricted discharge requirements as defined by quantity and or quality parameters determined by the relevant authority as a condition of approval are liable to prosecution and recovery of costs for any necessary maintenance and or damage to the reticulated CWWS as a result of the illegal or excessive discharge.
- 4.2.3.** Where restricted discharges as indicated in Section 4.2.1. above are permitted, the relevant authority may impose additional connection requirements and or charges to recover increased operational cost associated with the acceptance of the increased quantity and or quality discharges.
- 4.2.4.** Where the restricted discharge is not appropriate with regard to the quality and or quantity for the septic tank or treatment apparatus capacity, the relevant authority may require the connection for the restricted discharge to enter into the connection drain on the down side of a blackwater or greywater treatment tank or other device or apparatus. This will require a specific approval by the relevant authority. See also *Note* below.
- 4.2.5.** In cases as provided for in 4.2.4. above the connection is to be made in accordance with standard plumbing and drainage principles including the installation of overflow relief gullies, venting etc. There must be at least one open upstream vent as required pursuant to AS/NZS 3500.
- 4.2.6.** In some cases the relevant authority may impose additional requirements for restricted discharges, such as flow balancing and or treatment tanks, treatment devices or apparatus, and or time and controlled discharge flow rates to prevent surcharge into the reticulated CWWS and subsequent overloading of downstream drain lines and or pump stations. In some cases such as commercial premises it may be necessary to control the temperature of restricted discharges.

Note: *The relevant authority should act with caution when permitting restricted discharges to the reticulated CWWS, and should only do so when it is known that the reticulated CWWS has the capacity to handle the additional quantity and quality of such restricted discharges without harm to the system, or any product or produce or the environment where the treated wastewaters from the reticulated CWWS is to be re-used.*

Restricted discharges should not be permitted to flow into a treatment tank or treatment device or apparatus that is of insufficient capacity to handle the increased quality and quantity associated with the discharge.

Figure 3. Typical STEDS connection details for a septic tank and greywater tank system

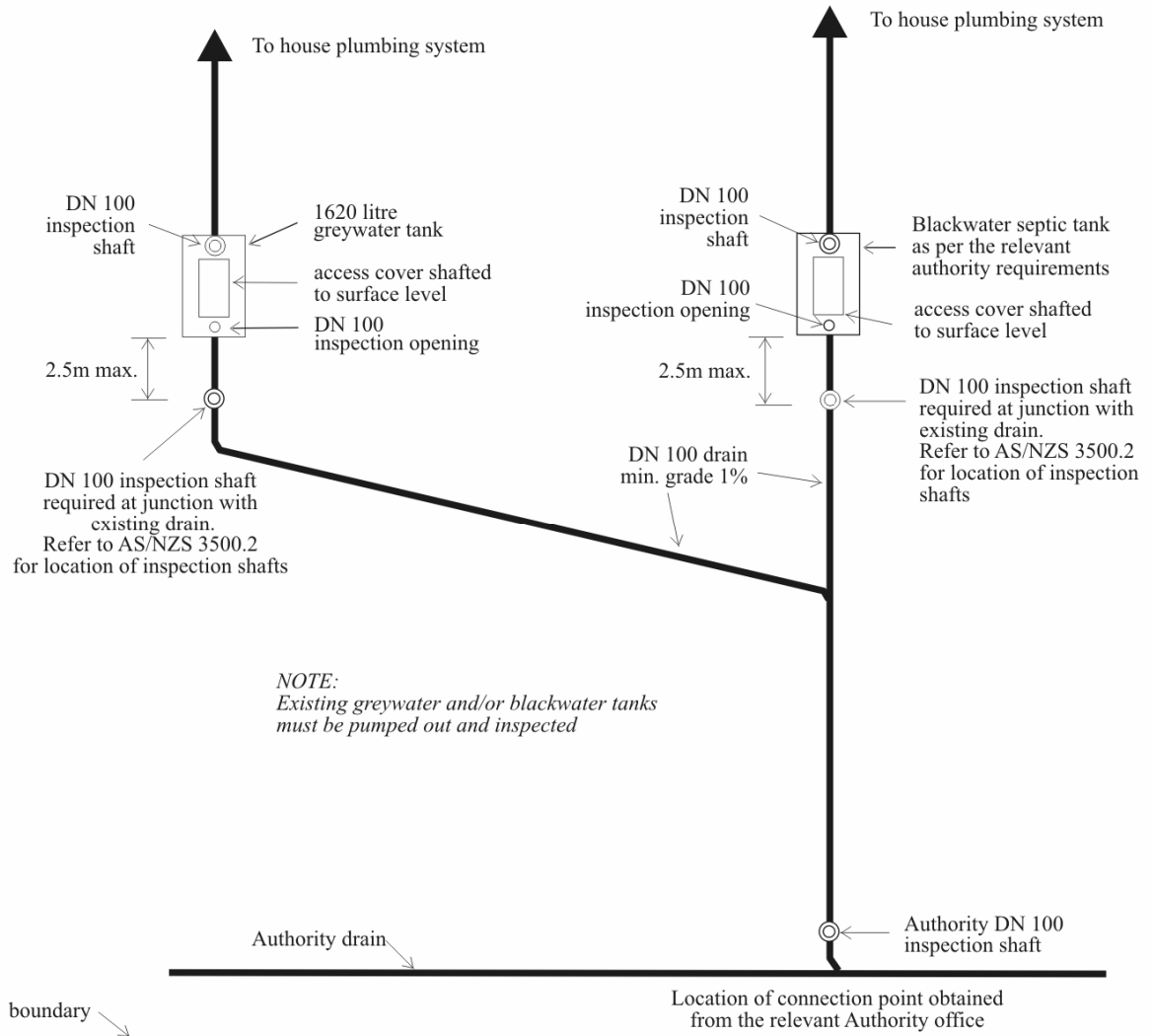


Figure 4. STEDS greywater treatment tank details – minimum capacity 1620 litres

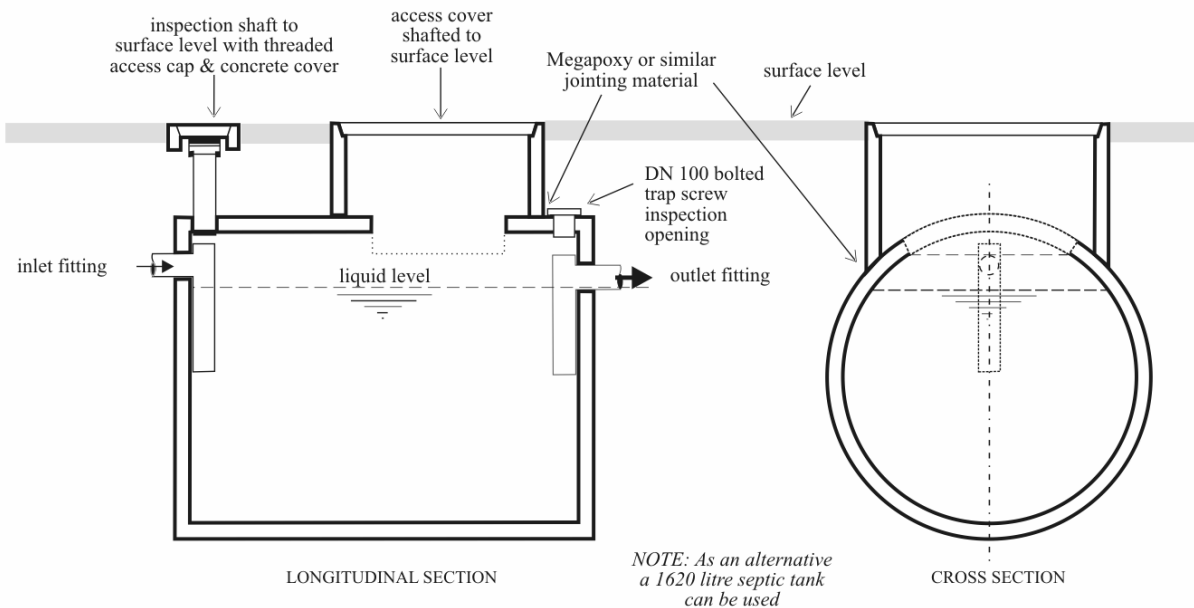
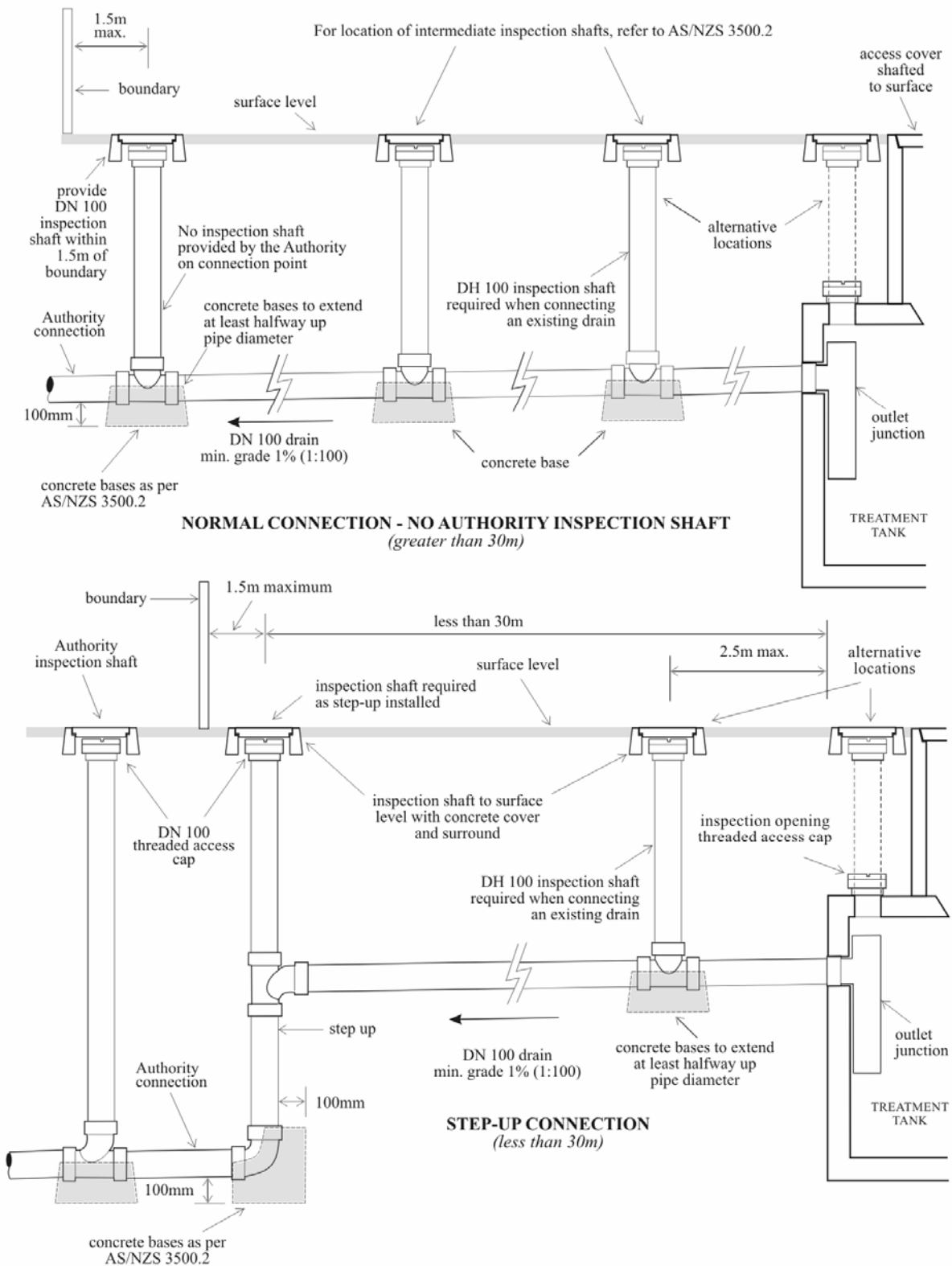


Figure 5. Typical STEDS Connection Details



5. Connection of the Property Wastewater System to the Reticulated CWWS

The following requirements outline the specific provisions for the various types of reticulated CWWS and the internal property wastewater system (WWS) drains or pipelines connecting to the CWWS connection point.

5.1. Connection to a Septic Tank Effluent Drainage Scheme (STEDS)

(Refer to Figures 1 to 5)

- 5.1.1.** Inspection shafts on drains prior to the septic tank or the treatment tank are to be located in accordance with AS/NZS 3500.
- 5.1.2.** Connecting drains from the septic tank/s to the STEDS shall be installed with authorised materials as detailed in AS/NZS 3500.2 Section 2, Materials and Products, unless otherwise permitted by the relevant authority or as excluded by any SA variations to the above standards by SA Water.
- 5.1.3.** The connecting drain is to be laid with an even fall and have a minimum grade of 1% unless otherwise permitted by the relevant authority.
- 5.1.4.** All trade waste connections to a CWWS must be approved by the relevant authority. Where a treatment tank or apparatus for treatment of trade wastes is required to be installed (e.g grease arrester), it must be fitted prior to the septic tank unless otherwise permitted by the relevant authority.
- 5.1.5.** Inspection shafts must be provided on the connecting drain/s as follows:
- (a) Where an inspection shaft has not been provided on the STEDS connection drain, a DN100 inspection shaft shall be provided on the connecting drain and be located within 1.5m from the boundary, or where the authority drain passes through the property the inspection shaft is to be situated on the connecting drain and be located within 1.5m from the authority drain *(refer to Figure 5)*;
 - (b) Where the connecting drain exceeds 30m in length additional inspection shafts shall be provided, one either on the septic tank outlet inspection point on top of the septic tank or within 2.5m of the septic, greywater or other treatment tank outlet/s and others equally spaced in accordance with AS/NZS 3500 *(refer to Figures 1, 3 and 5)*;
 - (c) At major changes in direction where specifically required by the relevant authority or AS/NZS 3500;
 - (d) At any jump up *(refer to Figure 5)*;
 - (e) To ensure access for inspection, maintenance and monitoring purposes by the property owner the relevant authority may, where the connecting drain is less than 30m and the authority inspection shaft is located on authority land, require the provision of an inspection shaft either on the septic tank outlet inspection point on top of the septic tank or within 2.5m from the septic, greywater or other treatment tank/s outlets *(refer to Figure 5)*;
 - (f) All inspection shafts on the STEDS property connection drain within the property and the property connecting drains must be maintained so as to permit access by the relevant authority for inspection, maintenance or monitoring purposes;
 - (g) All inspection shafts are to be constructed so as to terminate at the finished surface ground level and be provided with a concrete base and an approved threaded access cap, concrete block and covers, *(refer to Figure 5)* to ensure access to the drain for inspection, maintenance and/or monitoring purposes;
 - (h) All concrete blocks and covers are to be installed and supported in such a manner as to prevent transmission of live loads onto the drain or the riser shaft.

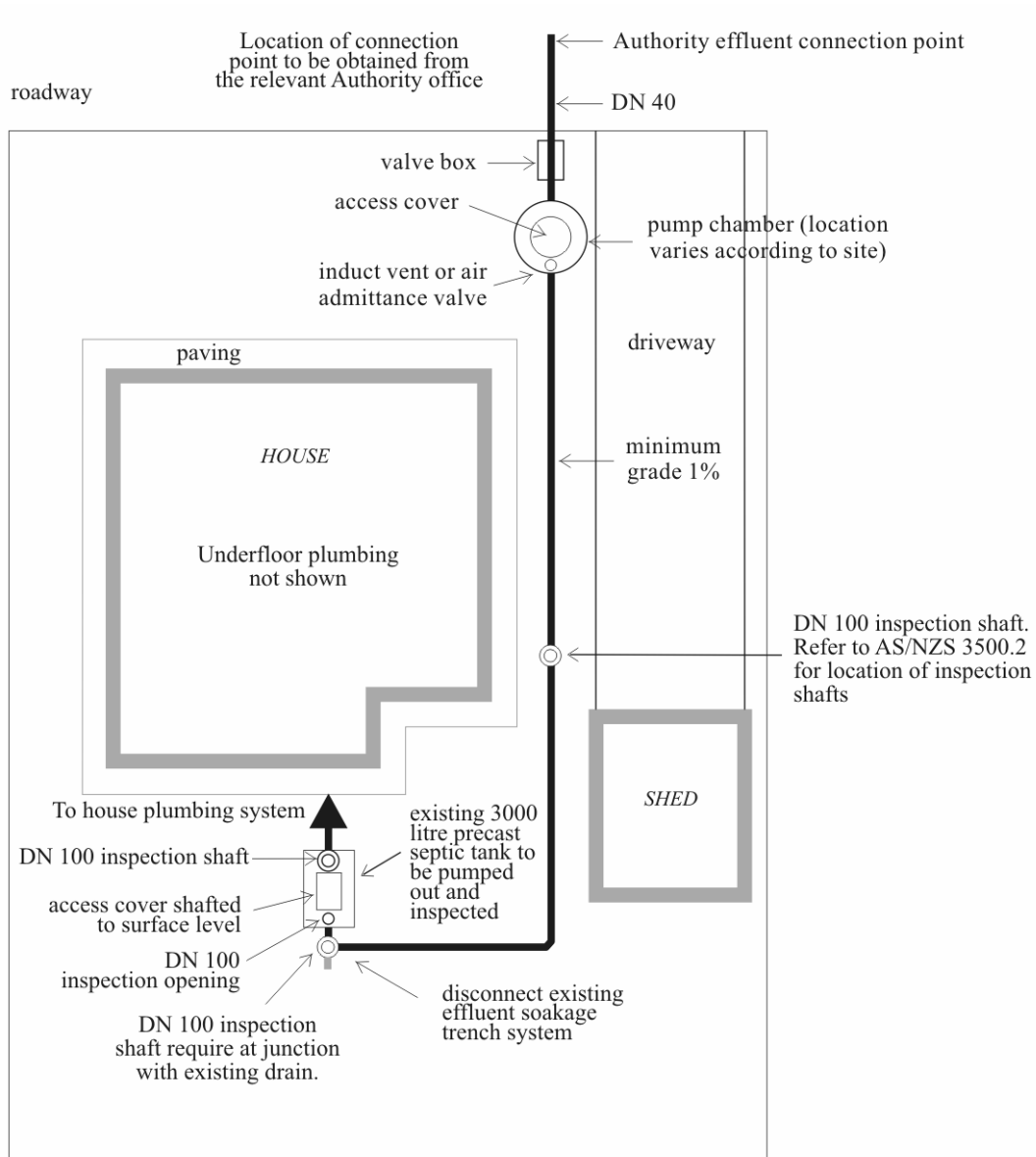
- 5.1.6. Induct vents** are not required on the connecting drain from the septic tank to the STEDS. Existing induct vents must be removed and the opening sealed, or alternatively it can be converted to a DN100 inspection shaft if located within 2.5m of the treatment tank.
- 5.1.7. Pumped Connections** - Where the authority STEDS connection point provided to the property is at a level higher than the septic or treatment tank outlet it will be necessary to pump the effluent to the connection (*refer to Figure 2*). In these circumstances it will be necessary to install a pump chamber and pump as detailed in Section 6.9 and comply with the following:
- (a) The discharge from all sanitary fixtures and other plumbing fittings shall pass through an approved septic tank as described under the section on treatment tanks (see Section 6), before discharging into the pump chamber. For systems incorporating trade waste flows, further treatment may be necessary. Connections of trade waste flows to the CWWS must be approved by the relevant authority,
 - (b) Construction and sizing of the pump chamber and pump is to be in accordance with the requirements as detailed in Section 6.9 or as otherwise approved by the Minister pursuant to the Wastewater Systems Regulations. The relevant authority may require the installation of an air admittance valve or an induct vent on the top cover of the pump chamber (*refer to Figures 2 and 14*);
 - (c) For normal domestic premises of up to 10 persons a single pump is required to be installed and must be suitable for use with septic tank effluent. The pump is to be installed with unions on the inlet and/or outlet pipework to facilitate ease of removal for repairs or replacement;
 - (d) As determined by the relevant authority larger installations (residential, commercial or industrial premises and excluding trade waste discharges) with more than 10 persons or 1500 litres per day will be required to provide two pumps (duty and standby and wired to operate alternately).

5.2. Connection to Septic Tank Effluent Pumping System (STEPS)

(Refer to Figures 6 and 7)

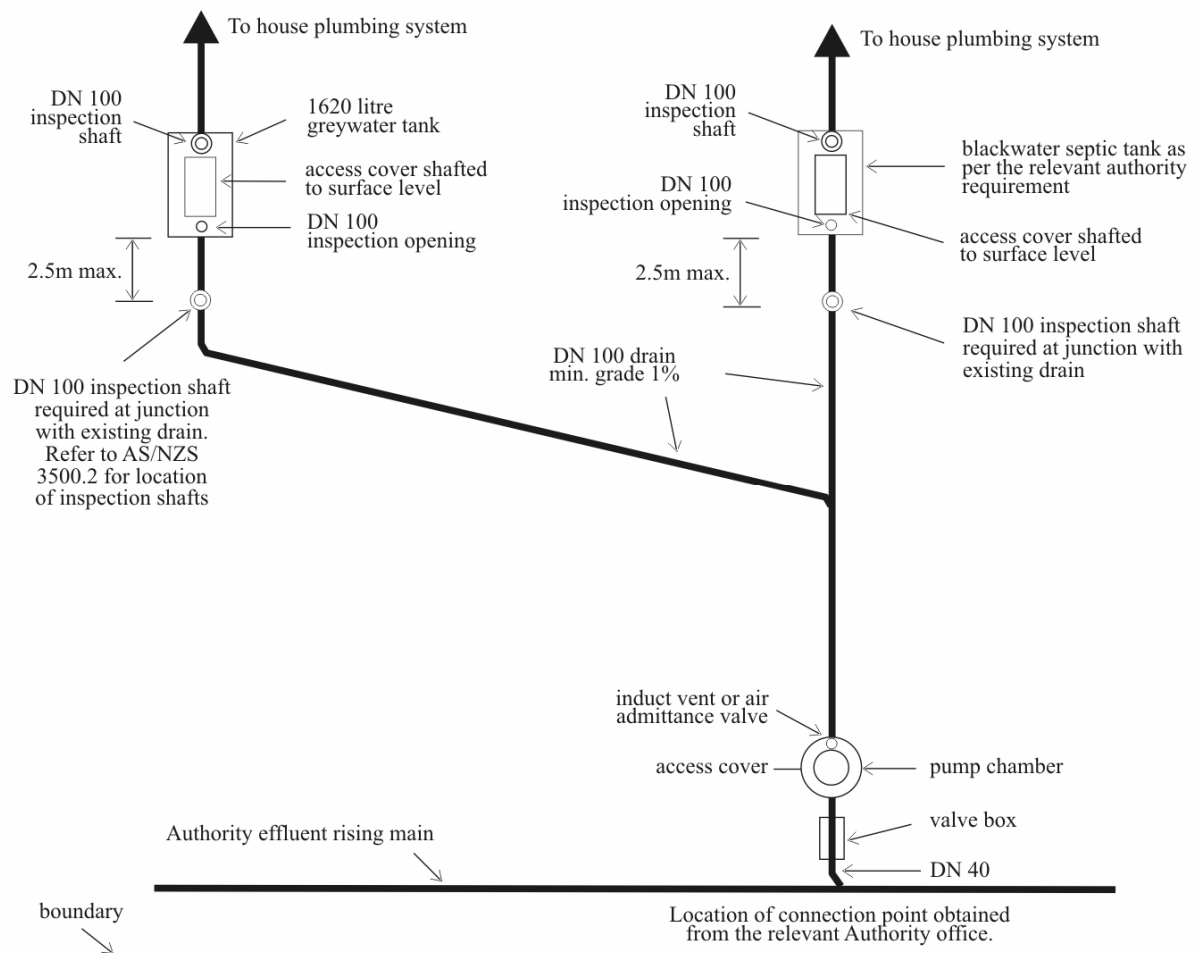
- 5.2.1. Rising mains** from the pumping chamber discharging septic tank effluent (blackwater, greywater or all wastewater) effluent and or greywater to the STEPS must be at least DN 40 uPVC class 9 solvent welded or rubber ringed jointed pipe or equivalent. Note that any trade waste flows into the system must be approved by the relevant authority
- 5.2.2.** As a condition of approval the relevant authority requires that all rising mains on the property be tested and inspected prior to back-filling.
- 5.2.3.** Where the rising main changes direction a concrete thrust block, or other suitable measures, are required to provide adequate support to prevent movement of the bend.
- 5.2.4. Connection point valve box** – A valve box shall be located at the boundary or at the terminal end of the authority connection point. The STEPS connection point is to be provided with a PVC 40mm ball valve and two brass spring assisted check valves or similar located within the valve box. The valve box shall be raised to surface level and provided with a removable interlocking cover and not be exposed to vehicular traffic.

Figure 6. Typical site layout plan showing STEPS connection details



- 5.2.5. All check valve boxes and covers are to be installed and supported in such a manner as to prevent transmission of live loads onto the rising main and connection.
- 5.2.6. An **Induct vent** or air admittance valve is required on the discharge pipe from the septic or other treatment tank prior to its discharge to the pumping chamber.
- 5.2.7. **Sanitary plumbing and drainage** requirements upstream from the septic tank to the premises are to be installed in accordance with the requirements of the SA Onsite Wastewater Systems Code. Refer to Section 7.2 for information relating to Wastewater Systems installed pursuant to earlier plumbing and drainage standards.
- 5.2.8. The property septic tanks and or pre-treatment devices are required to discharge into the STEPS pumping chamber located on each allotment. Pumping from a treatment tank or device directly to the reticulated CWWS connection is not permitted,

Figure 7. Typical STEPS connection details for a blackwater septic tank and greywater tank system



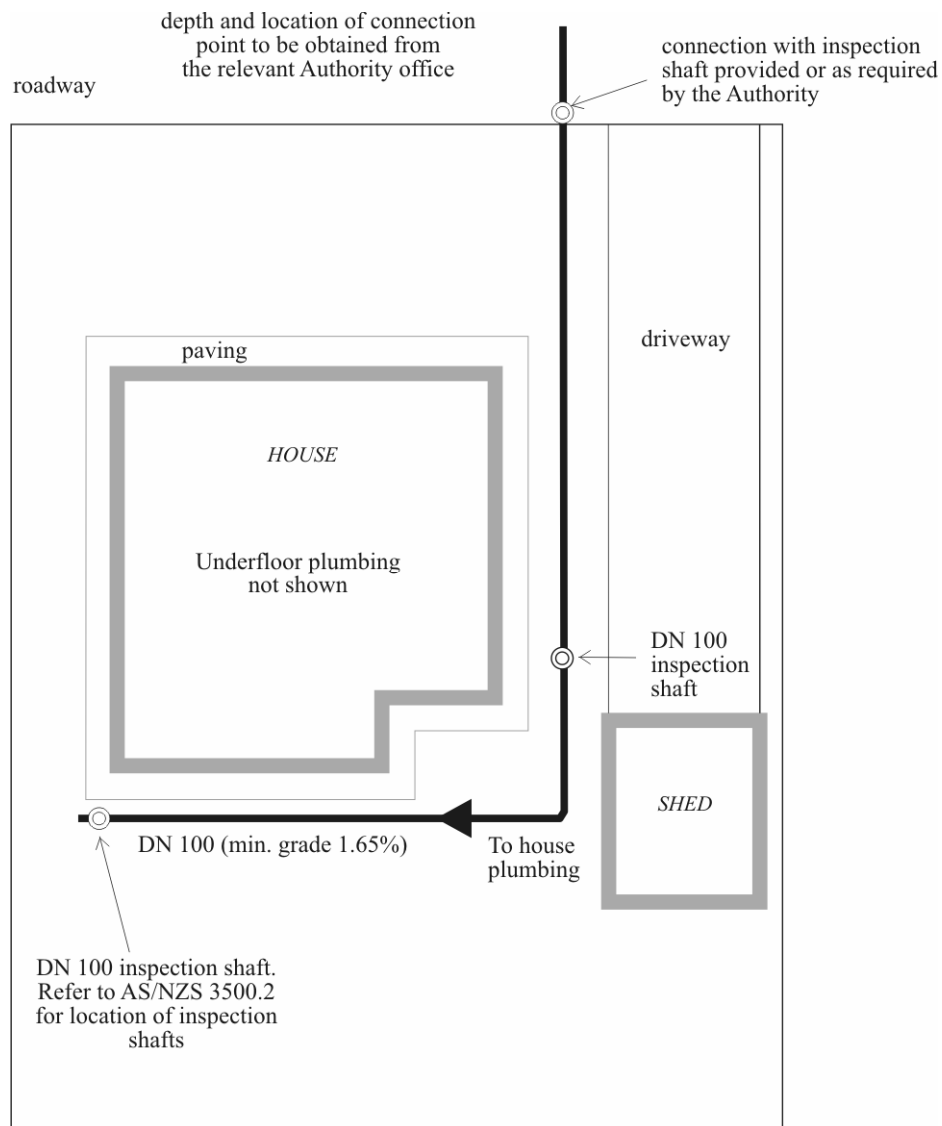
5.3. Connection to a Sewerage System

(Refer to Figures 8 to 10)

- 5.3.1. Connecting drains** from the sanitary fixtures and plumbing to the authority sewerage system connection point shall be installed with authorised materials as detailed in AS/NZS 3500.2 Section 2 Materials and Products, unless otherwise permitted by the relevant authority or as excluded by any SA Variations to the above standards by SA Water. Trade waste discharges must be approved by the relevant authority.
- 5.3.2.** The connecting drain is to be laid with an even fall and have a minimum grade of 1.65% unless otherwise permitted by the relevant authority.
- 5.3.3. Inspection shafts** must be provided on the connecting drain/s as follows:
- Where the constructing authority has not provided an inspection shaft on the connection, a DN100 inspection shaft shall be provided on the connecting drain and be located within 1.5m from the boundary, or where the authority drain passes through the property the inspection shaft is to be situated on the connecting drain and be located within 1.5m from the authority drain (refer to Figure 5).
 - At least one inspection shaft shall be provided on the connecting drain where the length does not exceed 30m and it shall be located at the point where the existing and new property connection drains join. This excludes the inspection shaft located at the connection point (refer to Figure 5).

- (c) An inspection shaft is required immediately at or upstream of the upper bend of a jump up (refer to Figure 5).
- (d) An inspection opening may be required at major changes in direction (greater than 45°) as specifically required by the relevant authority.
- (e) The inspection shaft on the reticulated CWWS property connection point and on the property connecting drains must be maintained so as to permit access by the relevant authority for inspection, maintenance or monitoring purposes.
- (f) All inspection shafts are to be constructed so as to terminate at the finished surface ground level and be provided with a concrete base and an approved threaded access cap, concrete block and covers, (refer to Figure 5) to ensure access to the drain for inspection, maintenance and/or monitoring purposes.
- (g) All concrete blocks and covers are to be installed and supported in such a manner as to prevent transmission of live loads onto the drain or the riser shaft.

Figure 8. Typical site layout plan showing connection details for a gravity sewer



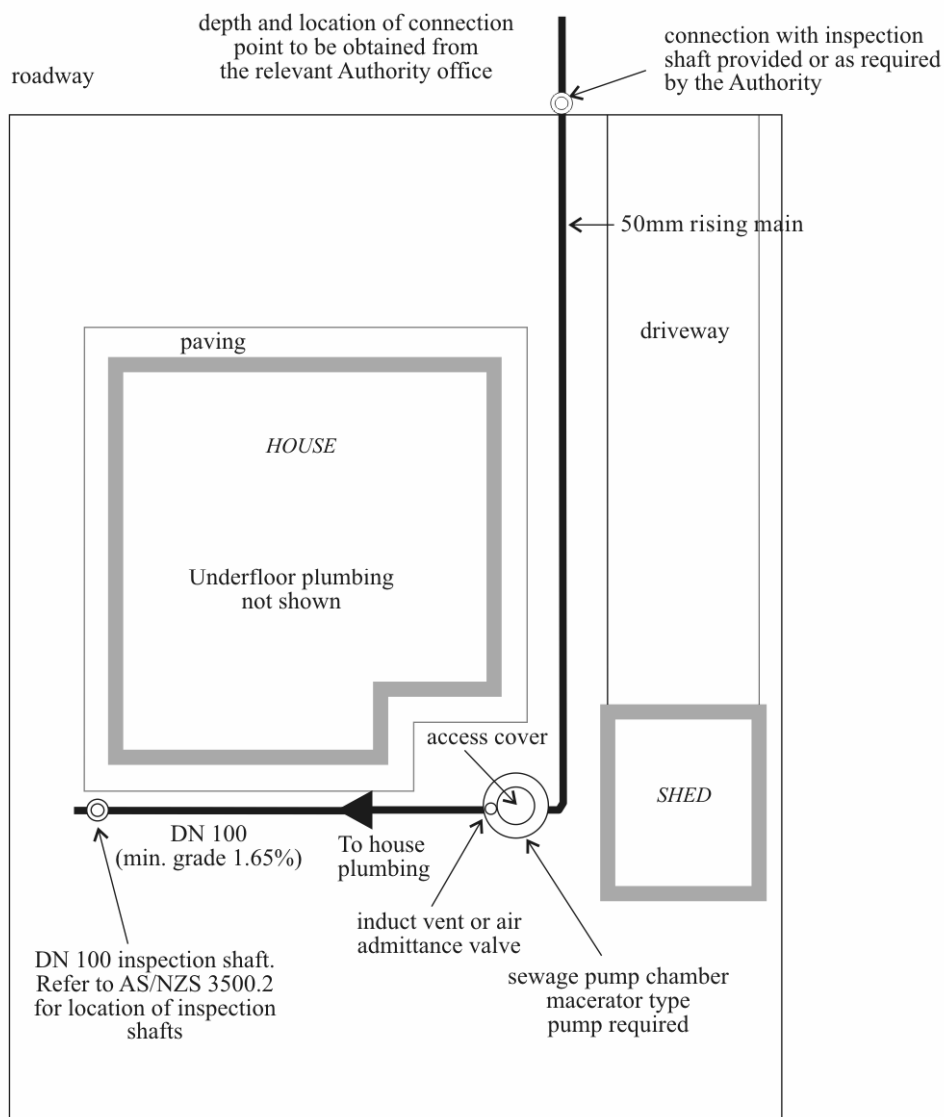
5.4. Connection to a Septic Tank Effluent Vacuum System

(Refer to Figure 11)

- 5.4.1. Inspection shafts on drains prior to the septic tank or treatment tank are to be located in accordance with AS / NZS 3500.
- 5.4.2. **Connecting drains** from the septic tank/s, in the case of a gravity effluent connection to a vacuum collecting chamber, shall be installed with authorised materials as detailed in AS/NZS 3500.2 Section 2, Materials and Products, unless otherwise permitted by the relevant authority or as excluded by any SA Variations to the above standards by SA Water. Trade waste discharges must be approved by the relevant authority.
- 5.4.3. The connecting drain is to be laid with an even fall and have a minimum grade of 1% unless otherwise permitted by the relevant authority.
- 5.4.4. Jump ups should be avoided.
- 5.4.5. **Inspection shafts** must be provided on the connecting drain/s as follows:
- (a) An inspection shaft is to be installed within 1.5m from the side of the authority collecting chamber or where the authority vacuum chamber is external to the property an inspection shaft is required in the property and within 1.5m from the boundary *(refer to Figures 11 and 12)*.
 - (b) The inspection shaft required in clause (a) above shall be constructed with a sweep junction located at the base of the inspection shaft and installed against the grade of the drain to prevent rodding into the authority vacuum chamber *(refer to Figure 13)*.
 - (c) Where the connecting drain exceeds 30m in length additional inspection shafts shall be provided in accordance with AS/NZS 3500 *(refer to Figures 1, 3, 5, 11 and 12)*.
 - (d) At major changes in direction where specifically required by the relevant authority.
 - (e) In addition to the inspection shaft as required in clause (a) and where the connecting drain is less than 30m the authority may require another inspection shaft to be located on the drain to ensure access for inspection , maintenance and monitoring purposes *(refer to Figures 5 and 11)*.
 - (f) All inspection shafts on the property connecting drains must be maintained so as to permit access by the relevant authority for inspection, maintenance or monitoring purposes.
 - (g) All concrete blocks and covers are to be installed and supported in such a manner as to prevent transmission of live loads onto the drain or the riser shaft.
- 5.4.6. An **induct vent** or **air admittance valve** is required on the septic tank outlet inspection point or immediately downstream of the septic tank outlet *(refer to Figure 11)*.
- 5.4.7. **Overflow relief gully** - Where more than one property drain is connected to the vacuum collection chamber, the spill level of the overflow gully on each premises is to be installed at the same level wherever possible. In all cases the overflow or spill level will be such so as to prevent the discharge of blackwater or greywater internally within any of the premises connected to the vacuum collection chamber and be installed in accordance with AS/NZS 3500. The relevant authority may require the installation of a reflux valve to prevent backflow from the authority vacuum chamber to the property wastewater system.
- 5.4.8. **Drain vents** - A DN100 open upstream vent pipe is to be installed at the head of the property sewer drain. In any case where the vacuum operation impacts on the water seals of any fixture trap or floor waste gully trap within the premises an air admittance valve may need to be installed on the branch serving the effected water seal on the fixture or floor waste gully trap.
- 5.4.9. **Pumped connections** - Where the authority vacuum chamber connection point provided to the property is at a level higher than the septic tank outlet it will be necessary to pump the effluent to the connection. In these circumstances it will be necessary to install a pump chamber and pump as detailed in Section 6.9 and comply with the following:

- (a) The discharge from all sanitary fixtures and other plumbing fittings shall pass through an approved septic tank as described under the section on treatment tanks, before discharging into the pump chamber. For systems incorporating trade waste flows, further treatment may be necessary and this must be approved by the relevant authority,
- (b) Construction and sizing of the pump chamber and pump is to be in accordance with the requirements detailed in Section 6.9 or as otherwise approved by the relevant authority pursuant to the Wastewater Systems Regulations (*refer to Figure 14*).
- (c) For normal domestic premises of up to 10 persons a single pump is required to be installed and must be suitable for use with septic tank effluent. The pump is to be installed with unions on the inlet and/or outlet pipework to facilitate ease of removal for repairs or replacement and also be fitted with a non-return valve in accordance with the manufacturer's directions.
- (d) As determined by the relevant authority larger installations (residential, commercial or industrial premises) with more than 10 persons or 1500 litres per day will be required to provide two pumps (duty and standby and wired to operate alternately).

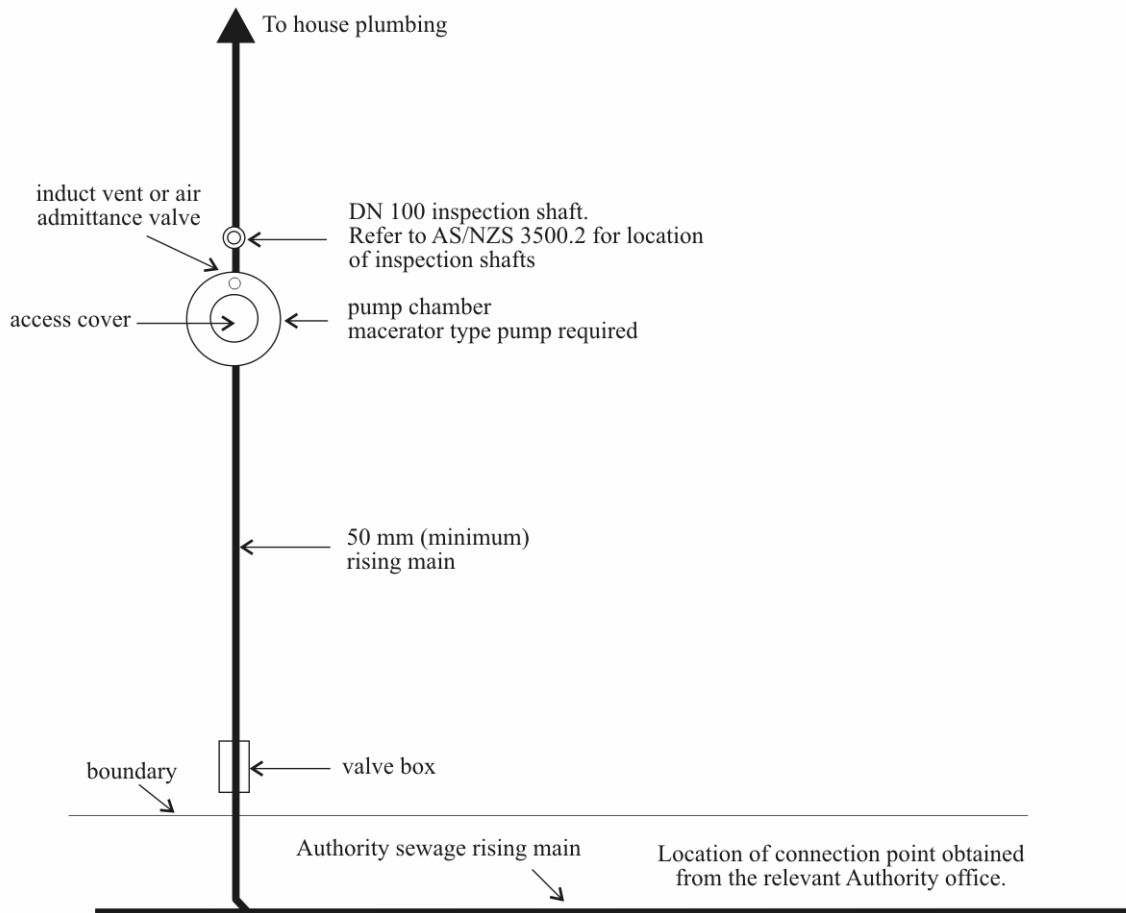
Figure 9. Typical site layout plan showing connection details for a pumped discharge to a gravity sewer



5.5. Connection to a Sewage Vacuum System

(Refer to Figure 12)

- 5.5.1. Connecting drains** from the sanitary plumbing fixtures, in the case of a gravity sewage connection to a vacuum CWWWS, shall be installed with authorised materials as detailed in AS/NZS 3500.2 Section 2, Materials and Products, unless otherwise permitted by the relevant authority or as excluded by any SA Variations to the above standards by SA Water. Trade waste discharges must be approved by the relevant authority.
- 5.5.2.** The connecting drain is to be laid with an even fall and have a minimum grade of 1.65% unless otherwise permitted by the relevant authority.
- 5.5.3.** Jump ups should be avoided.
- 5.5.4. Inspection shafts** must be provided on the connecting sewer drain/s as follows:
- (a) An inspection shaft is to be installed within 1.5m from the side of the authority vacuum chamber or where the authority vacuum chamber is external to the property an inspection shaft is required in the property and within 1.5m from the boundary (*refer to Figure 12*).
 - (b) The inspection shaft required in clause (a) above shall be constructed with a sweep junction located at the base of the inspection shaft and installed against the grade of the drain to prevent rodding into the authority vacuum chamber (*refer to Figure 13*).
 - (c) Where the connecting drain exceeds 30m in length, additional inspection shafts shall be provided in accordance with AS/NZS 3500 (*refer to Figures 1, 2, 3, 5, 11 and 12*).
 - (d) In addition to the inspection shaft as required in clause (a) and where the connecting drain is less than 30m the authority may require another inspection shaft to be located on the drain to ensure access for inspection, maintenance and monitoring purposes (*refer to Figure 5*).
 - (e) All inspection shafts on the property connecting drains must be maintained so as to permit access by the relevant authority for inspection, maintenance or monitoring purposes.
 - (f) All concrete blocks and covers are to be installed and supported in such a manner as to prevent transmission of live loads onto the drain or the riser shaft.
- 5.5.5. Venting in accordance with AS/NZS 3500** is required to be installed on the sewer drain immediately upstream from the inspection shaft adjacent to the vacuum chamber (*refer to Figure 12*). Additional venting may be required in accordance with the scheme design engineer's requirements.
- 5.5.6. Overflow relief gully** - Where more than one property drain is connected to the vacuum collection chamber, the spill level of the overflow gully on each premises is to be installed at the same level wherever possible. In all cases the overflow or spill level will be such so as to prevent the discharge of blackwater or greywater internally within any of the premises served by the connection point or connection point from the vacuum chamber. The relevant authority may require the installation of a reflux valve to prevent backflow from the vacuum collection chamber to the property wastewater system.
- 5.5.7. Drain vents** - A DN100 upstream vent pipe is to be installed at the head of the property sewer drain. In any case where the vacuum operation impacts on the water seals of any fixture trap or floor waste gully trap an air admittance valve may need to be installed on the branch serving the effected water seal on the fixture or floor waste gully trap.

Figure 10. Typical connection details for a pressurised sewage system

5.5.8. Pumped connections - Where the authority sewage vacuum chamber connection point provided to the property is at a level higher than the treatment tank outlet it will be necessary to pump the effluent to the connection. In these circumstances it will be necessary to install a pump chamber and pump as detailed in Section 6.9 and comply with the following:

- (a) The construction and sizing of the pump chamber and pump is to be in accordance with the requirements detailed in Section 6.9, or as otherwise approved by the relevant authority pursuant to the Wastewater Systems Regulations, (*refer to Figure 14*).
- (b) For normal domestic premises of up to 10 persons a single pump is required to be installed and must be suitable for use with sewage. The pump is to be installed with unions on the inlet and/or outlet pipework to facilitate ease of removal for repairs or replacement and also be fitted with a non-return valve in accordance with the manufacturer's directions.
- (c) As determined by the relevant authority larger installations (residential, commercial or industrial premises and excluding trade waste discharges) with more than 10 persons or 1500 litres per day will be required to provide two pumps (duty and standby and wired to operate alternately).

5.6. Connection to a Sewage Pumping System (SPS)

(Refer to Figure 10)

5.6.1. Rising mains from the pumping chamber, in the case of a SPS, and discharging sewage to the reticulated C W W S must be at least DN 50 uPVC class 9 solvent welded or rubber ringed jointed pipe or equivalent or, alternatively, shall be installed with authorised materials as detailed in AS/NZS 3500.2 Section 2 Materials and Products.

- 5.6.2. As a condition of approval the relevant authority requires that all rising mains on the property be tested and inspected prior to back-filling.
- 5.6.3. Where the **rising main** changes direction a thrust block is required to provide adequate support to prevent movement of the bend.
- 5.6.4. **Isolating and check valves box** at the boundary or at the authority connection point within the property is to be provided with a full diameter PVC 50mm ball valve and full diameter ball type PVC check valves or equivalent or other authorised materials as per AS/NZS 3500.2 *Section 2 Materials and Products*. These valves are to be located in a valve box which is raised to surface level and provided with a removable interlocking cover and not be exposed to vehicular traffic.
- 5.6.5. All check valves boxes and covers are to be installed and supported in such a manner as to prevent transmission of live loads onto the rising main and connection.
- 5.6.6. An **Induct vent** or **air admittance valve** is required on the top of the pumping chamber or the sewer drain discharging into the pumping chamber from the property sanitary plumbing and drainage fixtures.
- 5.6.7. **Sanitary plumbing and drainage** requirements upstream from the pumping chamber to the premises are to be installed in accordance with the requirements of the Wastewater Systems Regulations and AS/NZS 3500. Any trade waste discharges must be approved by the relevant authority. Refer to Section 7.2 for information relating to wastewater systems installed pursuant to earlier plumbing and drainage standards.

5.7. Testing of Connecting Drains or Pipework

As a condition of approval the relevant authority can require that all drains and or connecting pipes be tested and be inspected before being backfilled in accordance with AS/NZS 3500. Where water testing is carried out, the drain is to remain full until the backfill process is completed.

Figure 11. Plan showing connection details for an effluent vacuum system

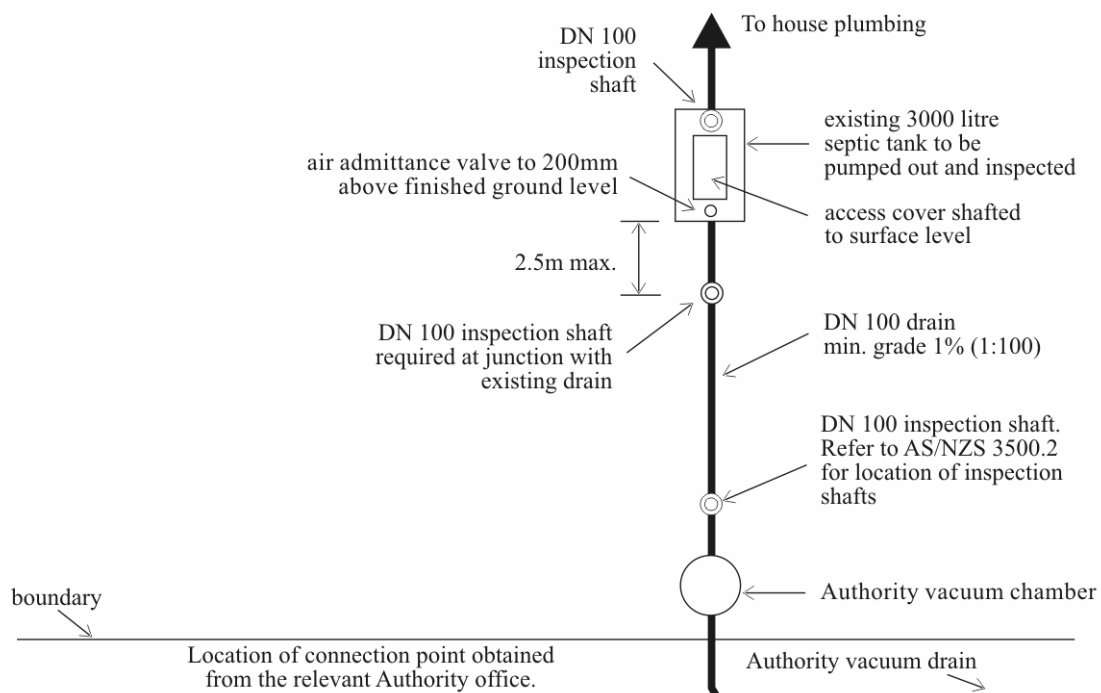


Figure 12. Plan showing connection details for a sewage vacuum system

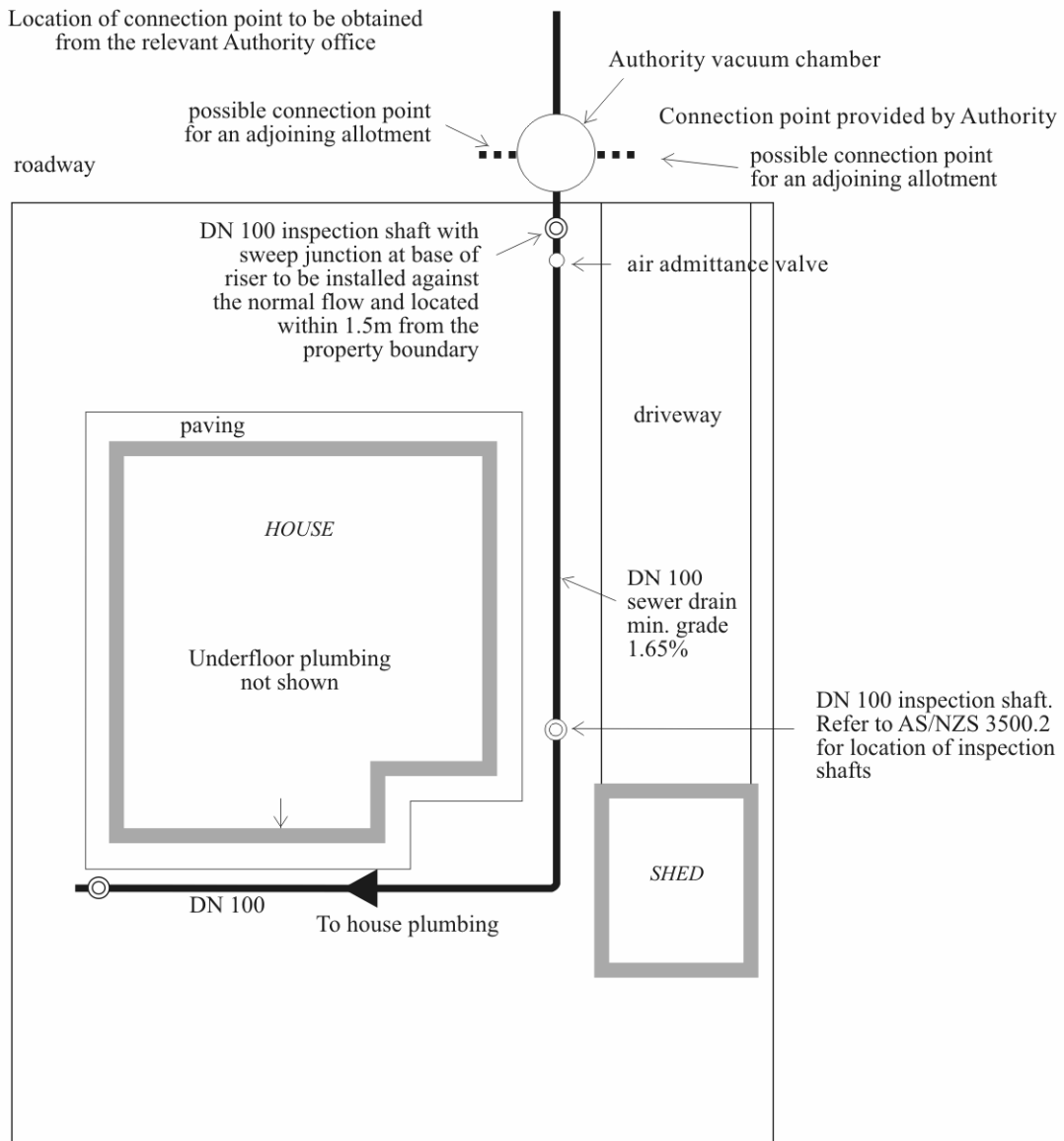


Figure 13. Typical vacuum valve chamber and inspection shaft detail

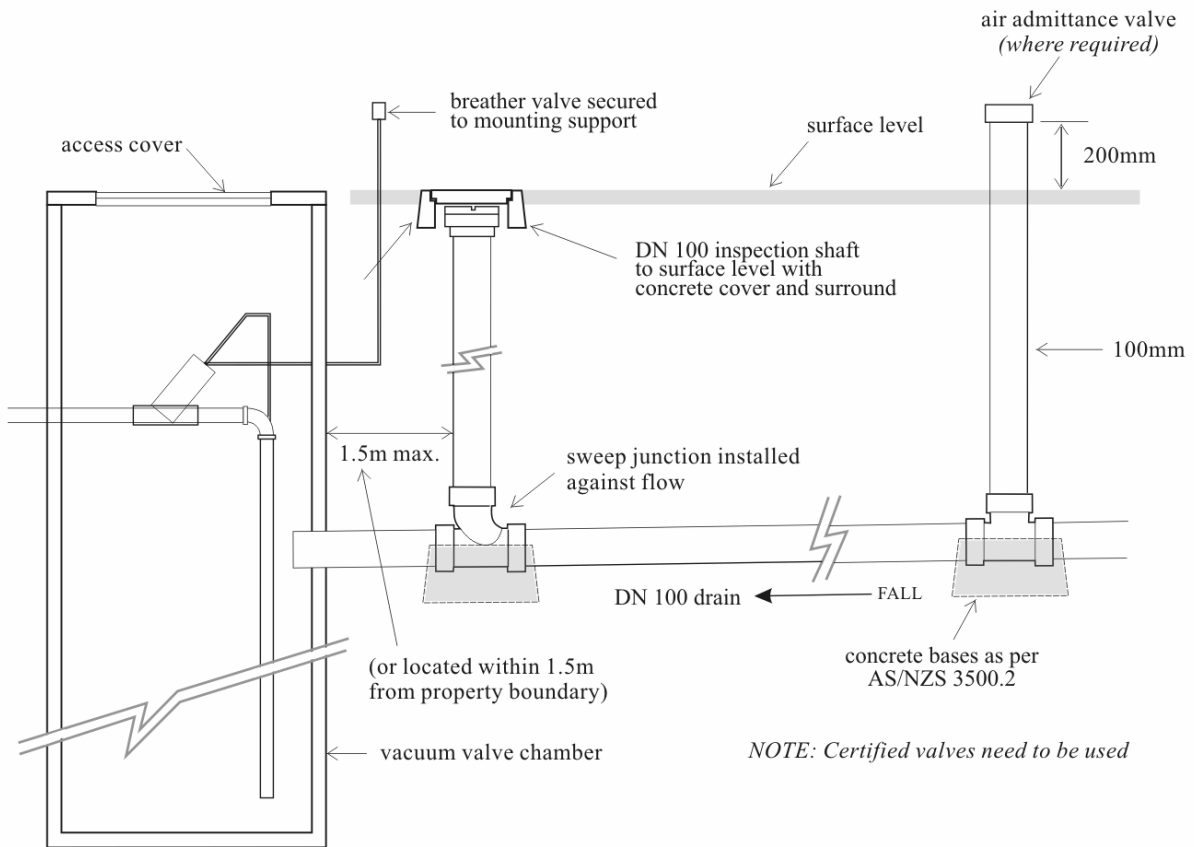
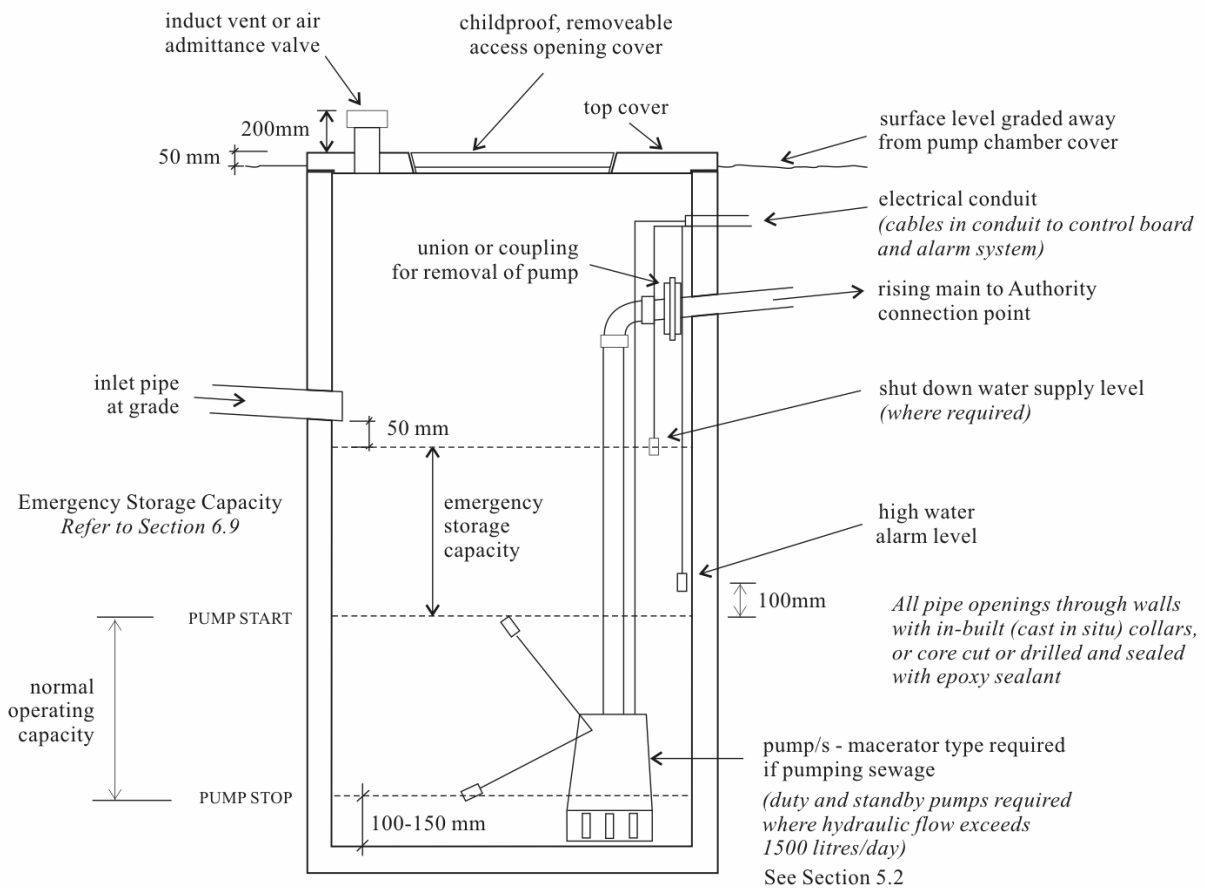


Figure 14. Typical pump chamber detail



6. Septic Tanks, Treatment Tanks, Treatment Apparatus, Pump Chambers and Pumps

6.1. General

Specific approval is required from the Minister for the manufacture and sale of precast manufactured septic, blackwater or greywater tanks, other treatment tanks treatment devices or apparatus and or pump chambers when connected to a wastewater system. Where the relevant authority permits in-situ construction of treatment tanks or devices they must comply with the provisions as detailed in AS/NZS 1546 *Onsite Domestic Wastewater Treatment Units Part 1, Septic Tanks*.

The relevant authority reserves the right to require engineering certification of the design and or installation for any constructed in-situ treatment tank, pump chamber, treatment device or apparatus.

A septic tank may be:

- an all waste septic tank receiving the discharge from all sanitary fixtures and other plumbing fittings in the premises (blackwater and greywater) (*refer to Figures 1 and 2*);
- a WC only (blackwater tank) receiving the discharge from water closet or urinal type fixtures only (*refer to Figure 3*); and/or
- a greywater tank receiving the discharge from greywater fixtures only (*refer to Figures 3 and 4*);

In some cases, an aerobic wastewater system may also be present receiving the discharge from an all waste septic tank (blackwater and greywater) or a greywater tank;

A treatment or pre-treatment tank or apparatus may be:

- a grease arrestor or other pre-treatment apparatus or device receiving the discharge from the kitchen of a restaurant or other commercial premises generating a greasy or other unsuitable wastewater discharge;
- an oil or similar type arrestor (pre-treatment apparatus or device) where the premises produce wastewater with constituents that are likely to be harmful to the reticulated C W W S; or
- any other treatment tank, device or apparatus including a pumping chamber, that treats trade waste before discharge to the reticulated C W W S.

The relevant authority may require the installation of specially designed treatment apparatus such as grease arrestors, screens, clarifiers, treatment tanks, other treatment systems or devices and or surge balancing tanks etc. where it is considered that the wastewater discharge is of such nature as to cause detriment or harm to the reticulated C W W S infrastructure or its operation. The relevant authority may also require the applicant, property owner or occupier of the premise to provide independent engineering certification for the design, operation and maintenance of such treatment systems or components.

Where a special treatment apparatus or system is required to treat a trade waste discharge the relevant authority may require a separate trade waste application.

6.2. New Septic Tanks, Pretreatment Apparatus or Wastewater System

In some cases where the existing septic tanks or wastewater systems are inadequate, the relevant authority may require that a septic tank, treatment tank or wastewater system, device or apparatus be installed prior to connecting to the reticulated C W W S. All wastewater systems including new all waste septic tanks (blackwater and greywater combined); aerobic wastewater treatment systems; devices, apparatus, water closet only (blackwater) tanks, greywater treatment tanks and pump chambers, are to be constructed and sized in accordance with the provisions as detailed in this

Code, or the South Australian Code *Onsite Wastewater Systems* and or as otherwise required by the relevant authority.

6.3. Existing Septic Tanks

Existing 1620 litre all waste septic tanks (blackwater & greywater combined) or 540 litre septic (blackwater) tanks and or greywater tanks may be connected to the STEDS or STEPS subject to the following:

- 6.3.1. The relevant authority may require replacement of 540 litre and 1620 litre blackwater or greywater septic tanks and or other treatment tanks found to be in a poor state of repair or where the tank capacity is inadequate, or will result in an increased hydraulic or biological load on the reticulated CWWS collection and or treatment system, or are considered by the relevant authority to present a risk to the reticulated CWWS;
- 6.3.2. Existing 540 and 1620 litre tanks may require more frequent desludging, and this may be 2 yearly in lieu of 4 yearly, or as indicated clause 6.6.1 of this ;
- 6.3.3. All existing septic tanks of 540 and 1620 litre capacity or septic tanks for larger commercial premises and designed on the sizing criteria in place prior to 1988 are to be subject to inspection and testing before being authorised to connect to the reticulated CWWS. They are to be exposed and opened for inspection to determine condition and capacity, be deslugged and cleaned out, and repaired where necessary as determined by the relevant authority, before being connected to the STEDS, STEPS or effluent vacuum system;
- 6.3.4. In all cases of a STEPS connection to the reticulated CWWS, the property septic or treatment tanks will discharge into the STEPS pumping chamber located on each allotment. Pumping from a septic tank , treatment tank, device or apparatus directly to the reticulated CWWS connection is not permitted; and
- 6.3.5. Where an existing septic tank is to be disconnected the relevant authority may, where applicable, stipulate conditions as to its retention in the ground, eg contents pumped out and carted away, tank backfilled with specified material, or they may require it to be removed and disposed of off-site.

Note: *Some of the earlier STEDS (1960s) had greywater tanks of approx 450 litres and if operating satisfactory in cases of system alterations they could remain, however if they result in excessive solids discharge to the STEDS the relevant authority may require replacement with 1620 litre septic tanks.*

6.4. Septic Tank Sizing

The minimum capacity of a septic tank (i.e. blackwater and greywater combined, or a blackwater tank or a greywater tank) must be sized for 6 persons for residential premises.

- 6.4.1. For residential premises the minimum capacity for a new all wastewater septic tank is 3000L (see section 6.2 for existing septic tanks).
- 6.4.2. For residential premises the minimum capacity for a new greywater tank, or a blackwater tank is 1620 L.
- 6.4.3. Septic tanks (all wastewater, greywater or blackwater tanks) for larger residential and/or non-residential premises are to be sized in accordance with the *Onsite Wastewater Systems Code*.

6.5. Septic Tank Access Shafts

All new blackwater or greywater tanks or other treatment tanks are required to have the access openings shafted to the surface level

The relevant authority can, by notice or as a condition of approval to connect to the reticulated CWWS, require an existing blackwater, greywater or all wastewater septic tank or other treatment

tank to be shafted to surface level as indicated above for maintenance purposes such as desludging, testing, inspection etc.

6.6. Positioning of Septic and Treatment Tanks

All septic or treatment tanks and/or pump chambers are to be positioned as required by the *Onsite Wastewater Systems Code* or as required by the relevant authority.

6.7. Maintenance of Septic Tanks, Treatment Tanks and or Pumping Chambers

6.7.1. Domestic Use Wastewater System Premises

To ensure the reticulated CWWWS operation is not jeopardised and is correctly maintained the relevant authority can, by notice, require maintenance of a wastewater system connected to the scheme. This maintenance may include regular desludging of the septic tanks or pumping chambers. This is normally done on a four year cycle for 3000 litre all waste septic tanks, however, smaller septic tanks installed before 1988, or pumping chambers may require more frequent desludging, for example, 2 yearly for 1620 litre all waste septic (blackwater & greywater combined) tanks or 540 litre WC only (blackwater) septic tank, or more frequently for 540 litre greywater tanks.

The relevant authority may determine the frequency of septic tank desludging which may vary according to the design parameters of the CWWWS and its operating and maintenance requirements.

6.7.2. Commercial Use Wastewater Systems or other Premises

For grease and oil arrestors, settlement and or other non-standard treatment tanks, devices or appurtenances the relevant authority may impose stringent trade waste operating and maintenance conditions of approval and may include pumping out at more frequent intervals to prevent risk or harm to the reticulated CWWWS (collection, treatment, disposal or reuse system). In such cases cart-notes confirming the frequency of pump out intervals and quantity shall be provided to the relevant authority. Penalties apply where an operator fails to adequately maintain a wastewater system and its operation impacts adversely on the reticulated CWWWS. The penalties could include rectification costs and disconnection from the reticulated CWWWS.

6.7.3. General Maintenance Provisions

The frequency of pumping out of septic tanks and pumping chambers will depend on the operating capacity, throughput and or quality of the discharge material to the reticulated CWWWS and its capacity. In such cases cart-notes confirming the quantity and frequency of pump out intervals shall be provided to the relevant authority.

The relevant authority may arrange to have this work undertaken by contract and recover the costs through an annual charge provision under the Local Government Act and or under the Public and Environmental Health Act.

After cleaning out and inspected where required by the relevant authority, the septic or treatment tank shall be filled with water to a level above the transfer openings located in the division wall or at least to half the operating liquid depth. In some areas it may be necessary to immediately fill the tanks to the operating level to prevent displacement by fresh, saline or tidal ground water. Special conditions may apply to treatment tanks constructed of lightweight materials refer to the Minister's approval conditions and or the manufacturers recommendations.

It is not necessary to remove all of the sludge scum from the domestic use septic tanks as a small amount of residue left on the walls and the floor will assist with the re-seeding and normal operation of the septic tank.

In the case of a domestic septic tank some odour may be experienced during the initial operation of the septic tank after cleaning out. The addition of 5 kg of lime in solution form, or the use of proprietary enzymes in accordance with the manufacturer's directions, may assist with the correct functioning of the treatment tank. It may be necessary to repeat the lime dosing weekly for several weeks to obtain the optimum operating conditions.

6.8. Provisions Relating to Aerobic Wastewater Treatment Units

Some premises may have a wastewater system incorporating an all-wastewater septic tank and an aerobic wastewater treatment unit. These systems may be of either one, two or more tank (or unit) configuration and be treating the wastewater to a standard suitable for surface irrigation.

The relevant authority may grant conditional approval for the retention of the aerobic system for continued application of reclaimed water for surface irrigation. Where retention of the system is permitted it may be subject to such conditions as the relevant authority requires which may include:

- (a) the system is a complying system;
- (b) testing of the system on a regular basis to ensure compliance with all relevant standards
- (c) the system has the capacity to treat all wastes from the sanitary plumbing and drainage system installed within the premises;
- (d) maintenance of the system by the manufacturer, accredited agent, or other competent person with the necessary knowledge, skills and equipment to ensure the system operates under optimum operating conditions;
- (e) provision of maintenance certificates;
- (f) desludging of the septic tank/treatment tank at specified frequencies;
- (g) all year round surface irrigation onto the site; or
- (h) summer irrigation onto the site, with winter discharge to the CWWS. Where winter discharge to the CWWS is permitted it will be necessary to continue to maintain the aerobic wastewater unit in accordance with the manufacturer's recommendations to ensure various components are not damaged by untreated effluent,

Note: *Failure to correctly operate and maintain the system, may require the discharge from the septic tank to be connected directly to the reticulated CWWS and the remainder of the system de-commissioned.
Heavy penalties apply for the illegal discharge of wastewater into a public place or onto another private property.
The connection requirements from the above treatment tanks or systems are the same as any other wastewater system as indicated in this Code*

6.9. Provisions Relating to Alternative Systems

The relevant authority may where an alternative system is installed such as a compost toilet and a greywater wastewater system require all of the system to be connected to the reticulated CWWS or it may require a portion only. The relevant authority may impose such conditions as it deems appropriate within the meaning of the Wastewater Systems Regulations, Local Government Act requirements and any of the relevant conditions listed in Section 6.7 above or similar.

6.10. Provisions relating to Pumping Chambers and Pumps

(Refer to Figure 14)

6.10.1. Pump chamber requirements:

- (a) **Construction** to be of a material suitable for the intended use, and not subject to structural failure, or distortion under hydrostatic or other environmental pressures when empty or full, and or as approved by the Minister.
- (b) If in a vehicle access area the pump chamber is to be constructed so as to handle vehicle loadings likely to be encountered, otherwise the area must be protected with bollards to prevent load onto the pump chamber cover.
- (c) It shall be designed to withstand environmental loadings including soil and or hydrostatic as the case may be.

- (d) The top cover of the pump chamber must finish at least 50mm above the finished ground or surface level, or if at surface level be sealed to prevent ingress of surface water.
- (e) The pump chamber and cover shall be installed so as to be waterproof and prevent the egress of effluent or sewage leaking from within or the ingress of ground or surface water seepage into the pump chamber.
- (f) The top cover of the pump chamber must be provide with a removable access cover providing a clear access opening of at least 500mm diameter or 500 x 500mm and when fitted be watertight. The access cover must also be secured in such a manner as to be child proof.
- (g) Any increment risers necessary to raise the pump chamber to the required surface level shall be installed with interlocking joints, and sealed with an approved jointing compound.
- (h) Any work carried out within a pump chamber is to be undertaken with regard to a confined and hazardous location and in compliance with Occupational Health, Safety and Welfare provisions.
- (i) **Emergency storage capacity** - the minimum effective emergency storage capacity below the inlet pipe discharging into the pump chamber and between the normal operating level shall be not less than 450 litres or 50% of the hydraulic flow per day, whichever is the greater, unless as otherwise permitted by the relevant authority.
- (j) **Isolation of water supply** - in some cases the relevant authority may require the installation of solenoid valves on the water supply system within the property to prevent overload, backflow into the septic tank, and or discharge from the property wastewater system in the event of power outages. The solenoid switch is to be wired to the pump chamber and operated by float or similar switch to cut off the water supply to the premises when it reaches the invert level of the inlet pipe into the pump chamber.
- (k) **Pipework connections** to the pump chamber are to be made with uPVC collars cast integrally within the walls of the pump chamber, or the pipe openings shall be core cut or drilled and sealed with an approved water proof jointing material (such as ferropro or megapoxy or similar) for the full depth of the pump chamber wall. No pipework connections are permitted within or through the top cover of the pump chamber unless specifically permitted by the relevant authority. Under no circumstances will pipework, electrical connections, vents etc be permitted in the access opening cover.
- (l) **Induct vents or air admittance valves** - unless otherwise indicated by the relevant authority all inlet drains from a septic or treatment tank to the pump chamber must be provided with an induct vent or air admittance valve. The induct vent or admittance valve may be located on the drain discharging into the pump chamber or they may be installed in the top cover of the pump chamber (*Refer to Figures 6, 7, 9, 10, 11 and 12*). All vents must be accessible and be provided with sufficient airflow and be installed in accordance with the requirements of AS/NZS 3500.
- (m) **Appurtenances** situated on the top of the pump chamber cover must be protected against damage from vehicles or other means.

6.10.2. Pump Requirements

- (a) **Pumps** must be of a kind suitable for the required duty and be either a submersible or surface mounted type, they may be of a centrifugal or positive displacement type, and when used for pumping sewage they are to be a macerator type pump and be sized to handle a minimum sized solid object under normal operating conditions, and be suitable for operation under all operating conditions.
- (b) All connections to the pump are to be such as to enable disconnection from suction and or discharge lines by means of a union or flange type couplings.
- (c) The pump capacity shall be designed to ensure the discharge is three times the average dry weather flow or in accordance with the relevant authority requirements. For commercial or other premises the hydraulic flow is to be determined in accordance with the design

parameters as in Appendix E of the Onsite Wastewater Systems Code. In no case should the pump capacity be rated at less than three times the average dry weather flow.

- (d) The pump should have a minimum warranty of at least 2 years.
- (e) In the case of a STEPS or a SPS the type of pump installed will be either of the centrifugal operation type, or be a positive displacement type and must be rated in accordance with the design requirements for the STEPS or PS rising main flow dynamics and the Minister's requirements.
- (f) The design of the pump system must be able to handle the full load as a result of all pumps operating simultaneously after a power outage.
- (g) Where the reticulated CWWS is a SPS the pumps are also to be of the macerator cutter type.
- (h) The pump is to be statically mounted and permanently wired to operate automatically.
- (i) In cases where the premises are of a commercial or supported residential type premises and serving more than 10 persons or the hydraulic flow into the pump chamber exceeds 1500 litres per day the relevant authority will require duty and standby pumps to be installed and wired to alternate the duty cycle automatically. The electrical controls shall facilitate operation of the standby pump in the event of the duty pump malfunction and provide the necessary alarm condition to warn of a pump malfunction.
- (j) In the case where the pump is surface mounted it shall be contained within a waterproof ventilated housing in such a manner to protect the pump and motor and electrical controls from adverse ambient conditions. In addition the pump housing is to be protected against damage from vehicles and or other impacts.
- (k) **Electrical connections** in all cases surface mounted switch gear and controls, and surface mounted or submersible pumps are to have waterproof electrical connections and be rendered safe and child proof.
- (l) The electrical wiring and installation of the switchgear and pumps shall be carried out by an electrician licensed pursuant to the Plumbers, Gasfitters and Electricians Act and all work shall be in accordance with the supply authority requirements.
- (m) **Alarm system** - the pump must be provided with an audible and visible alarm system, which is activated when the liquid level reaches the high liquid level. Muting facilities may be provided for the audible component.
- (n) The location of the alarm system is to be such that it will provide indication to the occupants of the premise of an alarm condition under normal occupancy conditions. Depending on the pump chamber and pump location the relevant authority may require duplicate indicators eg one internally within the premise and one external to the premises in cases where the premises are not attended 24 hours a day.
- (o) See Section 5 for STEPS and SPS for check and isolating valve requirements.

6.11. Containment for Offsite Disposal

Where the wastewater is not permitted to be discharged to the CWWS e.g. trade wastes, the relevant authority will require that an on-site holding tank be provided. In such cases the relevant authority will require that the contained waste be removed by a licenced contractor for offsite disposal at a suitable location as required by the relevant authority and or other agencies such as the Environment Protection Authority. The on-site holding tank must be a product approved by the Minister and installed in accordance with relevant authority requirements.

6.12. Non-Standard Systems

Where the system is a non-complying or non-standard system the relevant authority may impose additional requirements to the above provisions as the situation and or circumstances requires.

7. Plumbing Standards

7.1. New Sanitary Plumbing and Drainage Work

All new sanitary plumbing and drainage work must comply with the requirements of the Wastewater Systems Regulations, AS/NZS 3500, the South Australian Variations and/or Additional Provisions to the Australian/New Zealand Standard Plumbing and Drainage issued by SA Water, any other the requirements as set out in this Code and or as otherwise indicated with the approval.

7.2. Existing Sanitary Plumbing and Drainage

Due to changes in plumbing standards over the years the method of connecting sanitary fixtures and other plumbing fittings on the premises to be connected to the CWWWS may differ from current standards as set out in AS/NZS 3500 and variations issued by SA Water. In most cases the relevant authority will not require changes to the existing sanitary fixtures and other plumbing fittings and drains provided it complied with relevant standards and was legally installed at the time of installation, is of a sound standard and does not pose a risk to health or cause offensive conditions.

Where the existing plumbing and drainage is inadequate or inappropriate and poses a risk to health, or causes offensive conditions the relevant authority under the provisions of the Wastewater Systems Regulations and as a condition of approval will require rectification and or upgrading of the existing plumbing and drainage to ensure a satisfactory standard and prevent or remove insanitary conditions. For example, drain vents, an overflow relief gully and fixture traps will be required to prevent the flow of sewer drain gas or backflow of raw sewage or greywater into the premises. Inspection openings and or inspection shafts may also be required to ensure access to the drains for maintenance of the system.

The specific requirements will be determined by the relevant authority when processing the application for approval to connect to the CWWWS. For this purpose the relevant authority may inspect and require testing of the system prior to granting approval.

7.3. Drain, Pump Chamber and Treatment Tank Venting

All drains are to be vented as per the requirements of AS/NZS 3500 and South Australian variations and/or Additional Provisions to the Australian/New Zealand Standard Plumbing and Drainage issued by SA Water. Venting of gravity flow CWWWS is through the open upstream vent on each property and it is important to ensure the air flow is maintained throughout the drains pre-treatment apparatus and treatment tanks. The open upstream property vents need to be maintained so as to prevent nuisance and or offensive conditions. All vents are to be screened to prevent mosquito access into the property WWS.

Specific provisions apply with regard to gravity drains connecting into a pumping chamber and or where the drains are connected into a vacuum system, (*Refer to Figures 2, 6, 7, 9 10, 11, 12, 13 and 14*).

7.4. Trade Waste

All trade waste flows to a CWWWS must be approved by the relevant authority (*see Sections 1.1 and 3.6*).

- For venting requirements relating to trade waste treatment apparatus or systems refer to specific requirements as detailed in the SA Water Trade Waste General Policy and Guidelines.

7.5. Certificates of Compliance

All Sanitary plumbing and drainage work including connection of the dwelling to the reticulated CWWS must be carried out by a licensed plumbing contractor. At the completion of the work , a Certificate of Compliance on a form approved by the Department of Health is to be provided to the relevant authority by the licensed contractor responsible for carrying out the work in accordance with the Public and Environmental Health (Wastewater Systems) Regulations 2007, AS/NZS 3500 and the South Australian Variations and/or Additional Provisions to the Australian/New Zealand Standard Plumbing and Drainage issued by SA Water.

These forms can be obtained from SA Water which provides such information for the plumbing industry in SA.