

CONSTRUCTION MANUAL

CHEZY



PP Inspection Chambers

EN1253-4: 2000

EN 13598-1: 2003

- UV Stabilized
- Tough
- Impact Resistant
- Leak Proof
- Built To Last For Generations



UNRIVALLED QUALITY IN THE UNDERGROUND DRAINAGE MARKET

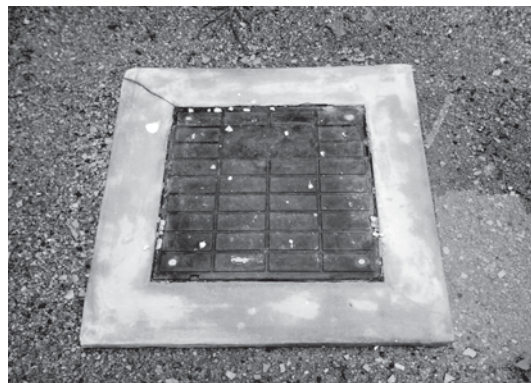
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01 List of Approvals from Local Authorities / SIRIM / SPAN

Kementerian Perumahan dan Kerajaan Tempatan

- ◆ Perbadanan Putrajaya
 - ◆ Majlis Bandaraya Shah Alam
 - ◆ Majlis Perbandaran Selayang
 - ◆ Majlis Perbandaran Ampang Jaya
 - ◆ Majlis Perbandaran Kajang
 - ◆ Majlis Perbandaran Subang Jaya
 - ◆ Majlis Daerah Kuala Selangor
 - ◆ Majlis Perbandaran Klang
 - ◆ Majlis Perbandaran Sepang
 - ◆ Majlis Daerah Kuala Langat
 - ◆ Majlis Bandaraya Petaling Jaya
 - ◆ Majlis Perbandaran Seremban
 - ◆ Majlis Perbandaran Nilai
 - ◆ Majlis Bandaraya Melaka Bersejarah
 - ◆ Majlis Perbandaran Johor Bahru Tengah
 - ◆ Majlis Bandaraya Johor Bahru
 - ◆ Majlis Perbandaran Pasir Gudang
 - ◆ Majlis Bandaraya Alor Star
 - ◆ Majlis Perbandaran Kota Bharu
 - ◆ Majlis Bandaraya Kuala Terengganu
 - ◆ Majlis Perbandaran Kuantan
 - ◆ Majlis Bandaraya Ipoh
 - ◆ Majlis Perbandaran Taiping
 - ◆ Majlis Perbandaran Seberang Perai
 - ◆ Dewan Bandaraya Kota Kinabalu
 - ◆ Majlis Perbandaran Sandakan
 - ◆ Jabatan Alam Sekitar Negeri Sarawak
 - ◆ Majlis Perbandaran Padawan
 - ◆ Kementerian Pembangunan Negara Brunei Darussalam
-
- ◆ SIRIM – PRODUCT CERTIFICATION LICENSE – PC043701
 - ◆ SIRIM – PRODUCT CERTIFICATION LICENSE – PC043702
 - ◆ SPAN – SPAN/KPP/COO – ¼ Jld.2(8)



02 How to Specify The Inspection Chamber

PP Inspection Chamber

The sub-contractor shall construct the inspection chamber as shown on the accompanying drawings.

Every inspection chamber shall have a 150mm central channel and an outlet of minimum internal bore of diameter 150mm. The inspection chamber should be of ample size to accommodate all sewers and to sizes specified in the plans.

The inspection chamber body shall be made of polypropylene and the cover and collar of UV stabilized ABS. The inspection chamber used shall be SIRIM certified to EN 13598-1:2003 and the cover and frame to EN 1253-4:2003. The inspection chamber used shall have a UD rating and the frame and cover a BT rating.

All joints with incoming and outgoing pipes shall be of rubber ring type. Joints between the sections of the body shall also be made by rubber ring jointing.

UV stabilized locked down ABS frame and cover shall be set on each inspection chamber, level with the ground. The frame shall be properly bedded and fixed. An air tight gasket shall be provided wherever necessary.

The frame shall have a minimum concrete surround of 50mm x 50mm flush with the ground level in turf areas and a 150mm x 150mm concrete surround if subject to vehicular traffic.

The minimum internal dimensions shall be as follows:-

SIZE OF INSPECTION CHAMBER
315mm

MAXIMUM DEPTH OF INVERT
1.25m

For Bill of Quantities

PP Inspection Chamber

Pre-formed Plastic Inspection Chambers comes with chamber base, body, risers, frame & cover, and other accessories to complete the system inclusive of all concreting works and all other necessary works as per engineer's drawing specifications & manufacturer's construction manual.

Excavation and Backfilling

This Sub-Contractor shall be responsible for the construction of necessary trenches for the piping works including excavation, backfilling work, turving, making good and general decoration.

When pipe trenches are opened, all pipes shall be laid and the trenches shall be backfilled within 24 hour. At all times, safety precautions, warning notices, etc, shall be taken and arrangement made to prevent damage to the pipes.

Turf and top soil shall be removed carefully and preserved for reinstatement in their original positions. Broken land drains and damage to other services shall be reported and indicated. The excavation shall be kept free of water and properly shored up. Other services uncovered shall be adequately supported by slings or other means and protected.

Before the pipes are laid, the bottoms of the trench shall be evenly graded, cleared of loose stone and then filled with 4 inches layer of sand and tamp. Backfill with sand around and over the pipe to a minimum depth of 4 inches and tamp. The next layer of the backfill shall be to a minimum of 1ft and shall be of material free of stones and rocks, etc. The remainder of the trench shall be filled with available material in an approved manner. The top soil and turving are then re-instated and the ground made good and generally decorated to the same situation before excavation to the requirements of the Consulting Engineer.

No pipe trenches shall be backfilled unless the buried pipe systems have been inspected and tested to the requirements of the relevant authorities and to the specification.



Testing

The Consulting Engineer reserves the right to request for water and air or smoke test for hydraulic performance tests. These tests are to be carried out by the Sub-Contractor at his expense including the furnishing of the necessary equipment.

1. Water Test

The water test of drains shall be carried out as follows:

- i) All openings below the top section shall be hermetically sealed, and, if considered necessary by the Consulting Engineer, tested to an additional static head of 15 feet.
- ii) The system shall be filled with water to the highest point.
- iii) The water level shall be maintained by the system at its filled height for a period of fifteen (15) minutes.
- iv) The quantity of water added to maintain the water level must not exceed three (3) measured gallons for every fifty (50) joints, proportionately more or less for a lesser or greater number of joints.
- v) Every pipe and joint shall be carefully examined for leaks while the system is filled with water.

2. Smoke Test

The smoke test shall be carried out in the following manner:

- i) Smoke from a "Smoke Generator" shall be forced into the system under pressure not less than the equivalent of 1" water gauge.
- ii) Each opening where the smoke appears shall be sealed until all openings are closed.
- iii) The pressure on the smoke shall be maintained for five (5) minutes after the last closure is made.

3. Air Test

Air test may be performed by inserting expanding rubber testing plugs in the lower and upper ends of the main soil pipe and main ventilating pipes and sealing the plugs with water where necessary.

The testing plug at the upper end of the ventilating pipe should be fitted with a tee-piece with a cock on each branch. A flexible tube manometer should be fixed to one branch, while air pressure is being introducing into the system through the other branch until the pressure is indicated on the manometer scale.

The applied pressure should be equal to 1½" water gauge and should remain at that pressure for a minimum of three (3) minutes to prove the soundness of installation.

Hydraulic Performance

Hydraulic performance discharge tests shall be made from all appliances, singly and collectively. Obstruction in any of the pipe lines shall be traced and the whole system examined for proper hydraulic performance, including the retention of an adequate water seal in each trap.

Defective Material and Workmanship

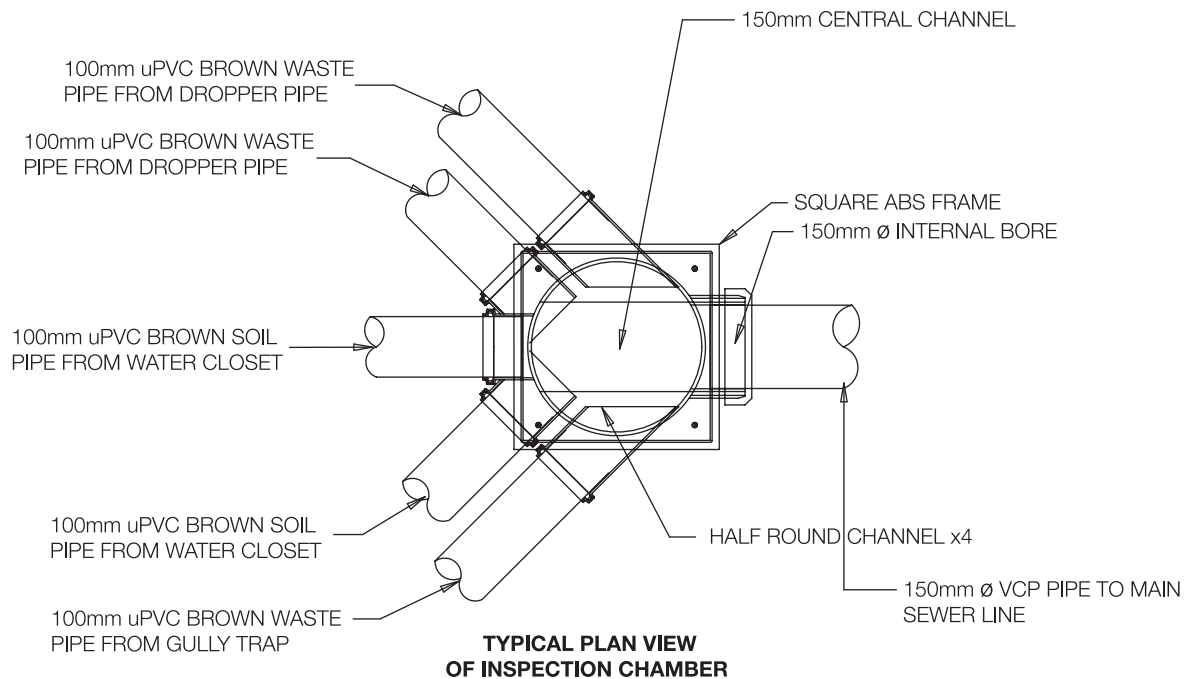
Should, in the process of site inspection, tests or later use (during the guarantee period), the Consulting Engineer and/or Inspection of applicable Authority, deem any material, equipment, installation, workmanship, etc. to be defective, this Sub-Contractor shall immediately replace the rejected item at his own expense. The ruling of the Authority and/or the Consulting Engineer is final.



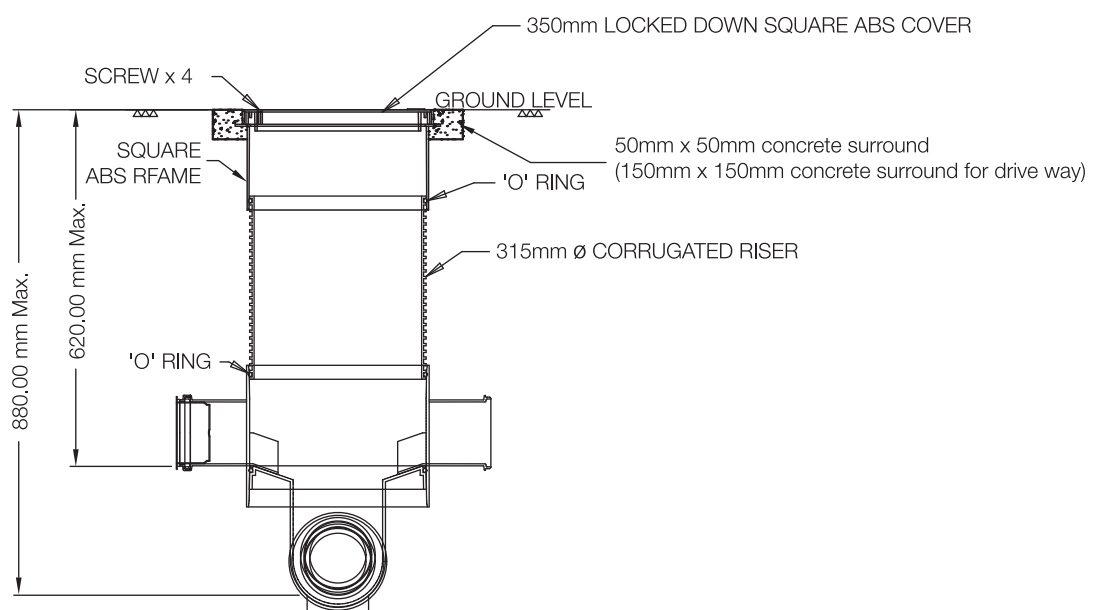
03 Technical Details

A. Measurements, Dimensions and Depths of The Chezy Inspection Chamber

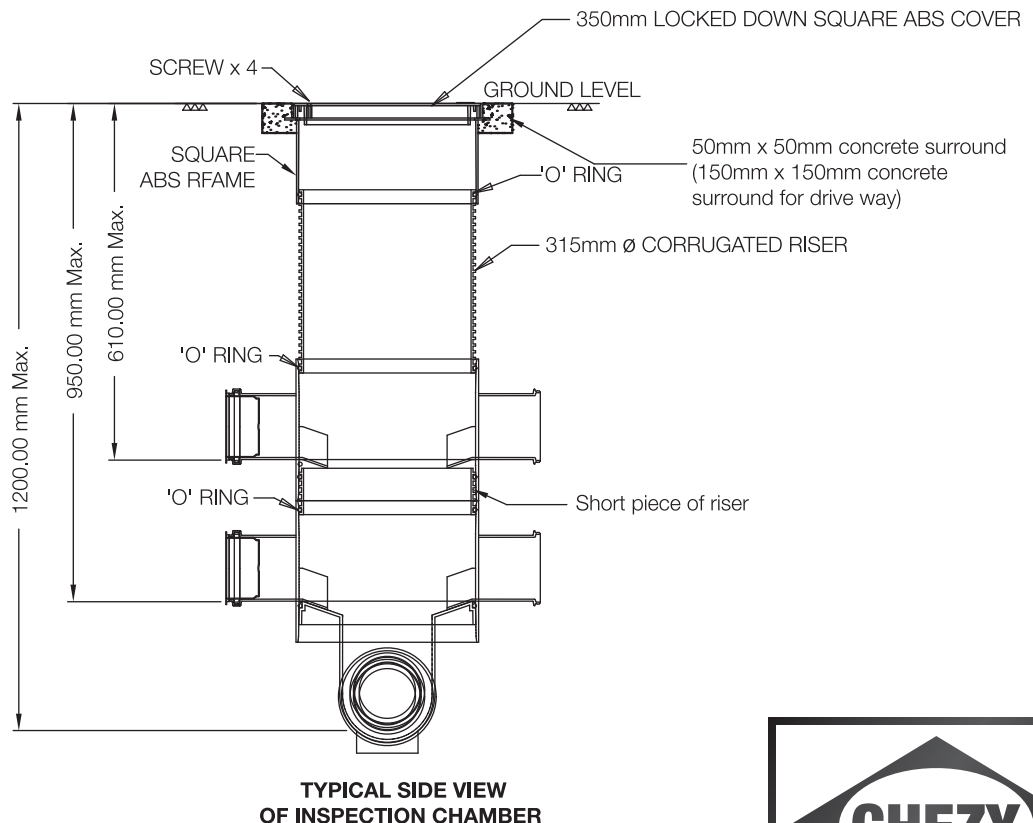
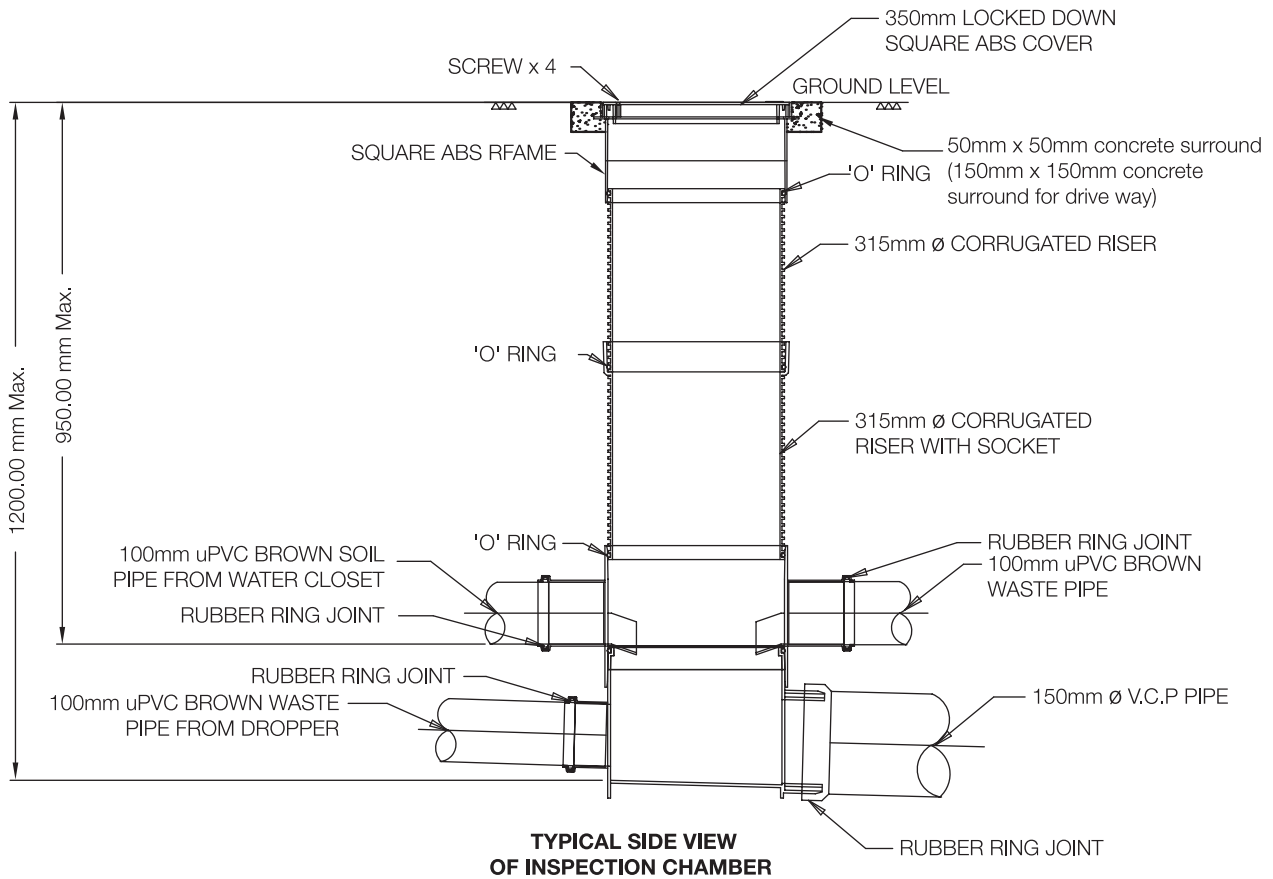
PLAN VIEW



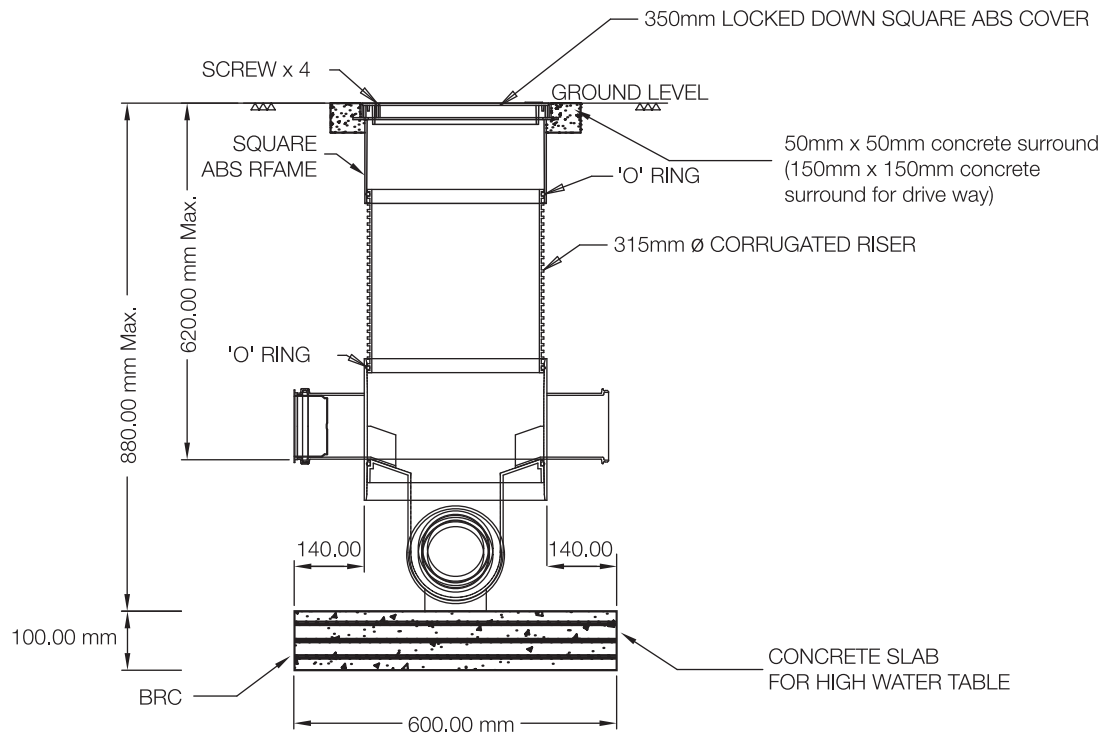
FOR FIRM, SOFT OR YEILDING GROUND



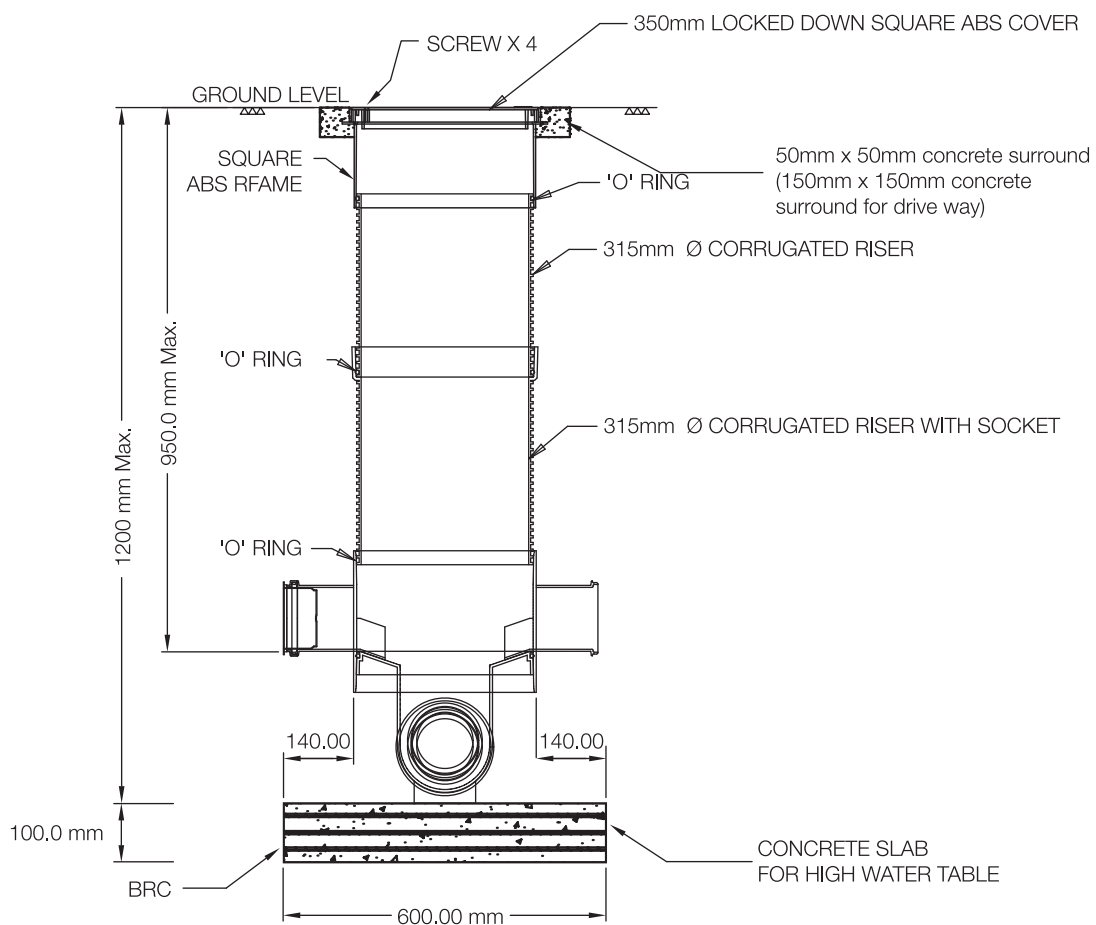
FOR FIRM, SOFT OR YEILDING GROUND



FOR GROUND WITH HIGH WATER TABLE



**TYPICAL SIDE VIEW
OF INSPECTION CHAMBER**



B. Installation Of uPVC Pipes Below Ground

Bedding Material

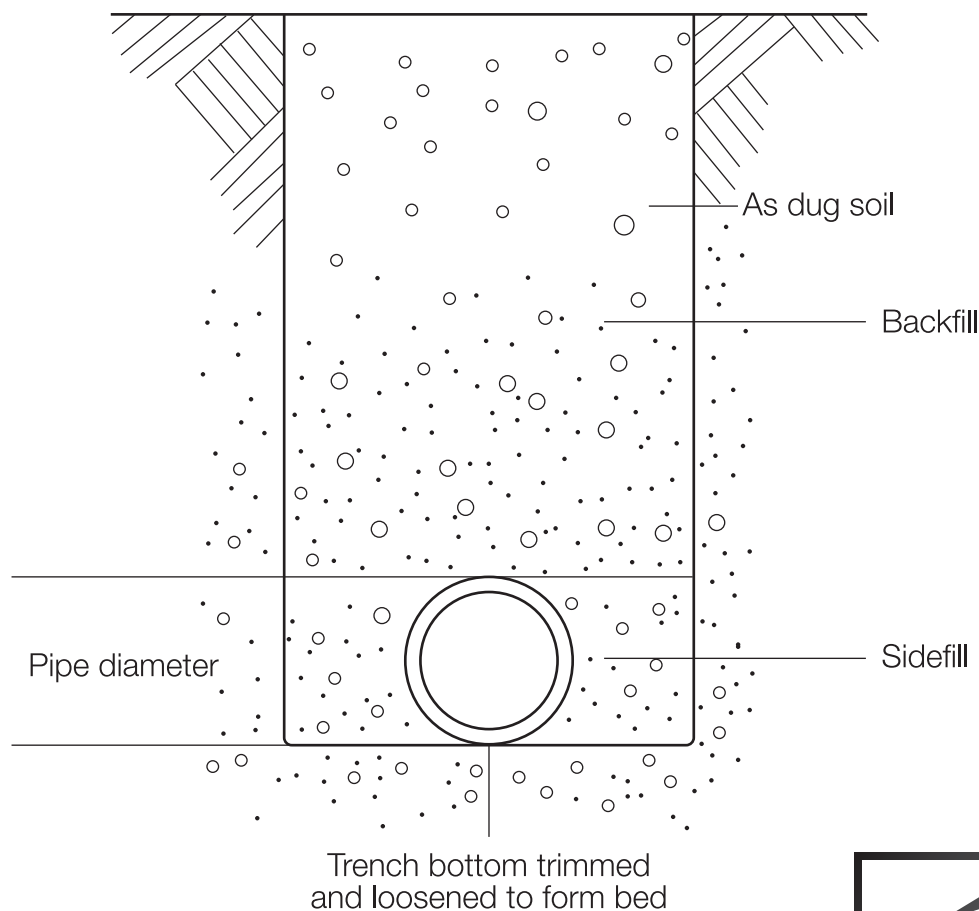
The pipe bedding material should be material as specified and then approved by the installation engineer. Unless otherwise specified, one of the following materials may be used as bedding material:

- Suitable sand, free from rock or other hard or sharp objects that would be retained on a 13.2mm sieve.
- Crushed rock or gravel of approved grading up to a maximum size of 14mm.
- The excavated material may provide a suitable pipe underlay if it is free from rock or hard matter and is broken up so that it contains no soil lumps greater than 75mm which would prevent adequate compaction of the bedding.

Unless otherwise specified, the side support and pipe overlay material must be identical with the pipe underlay material.

Backfill Material

Unless otherwise specified, excavated material from the site should constitute the backfill.



Pipe Installation in a Trench

Provision of Trench

The trench should be excavated, trimmed to the required grade and should be as narrow as practicable. The bed width should not be less than 200mm wider than the outside diameter of the pipe for pipes of 100mm nominal size and above. Where required, the trench should be wide enough for inspection purposes.

Underlay Preparation

Unless otherwise specified, a graded continuous cushion of underlay material of minimum thickness 75mm should be provided on the bottom of trench. Chases may have to be excavated in the bedding to prevent any sockets, flanges or similar projections from bearing on the bedding.

Pipes of any diameter may be laid on the bottom of the trench without underlay provided that:

- i. The trench bottom will give uniform and adequate support to the pipeline; and
- ii. The trench is free from hard objects such as stones, sharp projecting rocks or tree roots.

Pre - Assembly and Laying

Pipes may be joined at ground level and then lowered into position without being dropped, care being taken to void straining the pipes or pipe joints. If rubber ring joints have been used for jointing they should be checked after the pipe is positioned to ensure that the witness mark is still correctly positioned. The pipes should be positioned along the centreline of the trench.

Sufficient pipe side support and pipe overlay material should be placed in the trench and compacted to restrain the pipes. Joints should be left uncovered for inspection and testing unless otherwise specified.

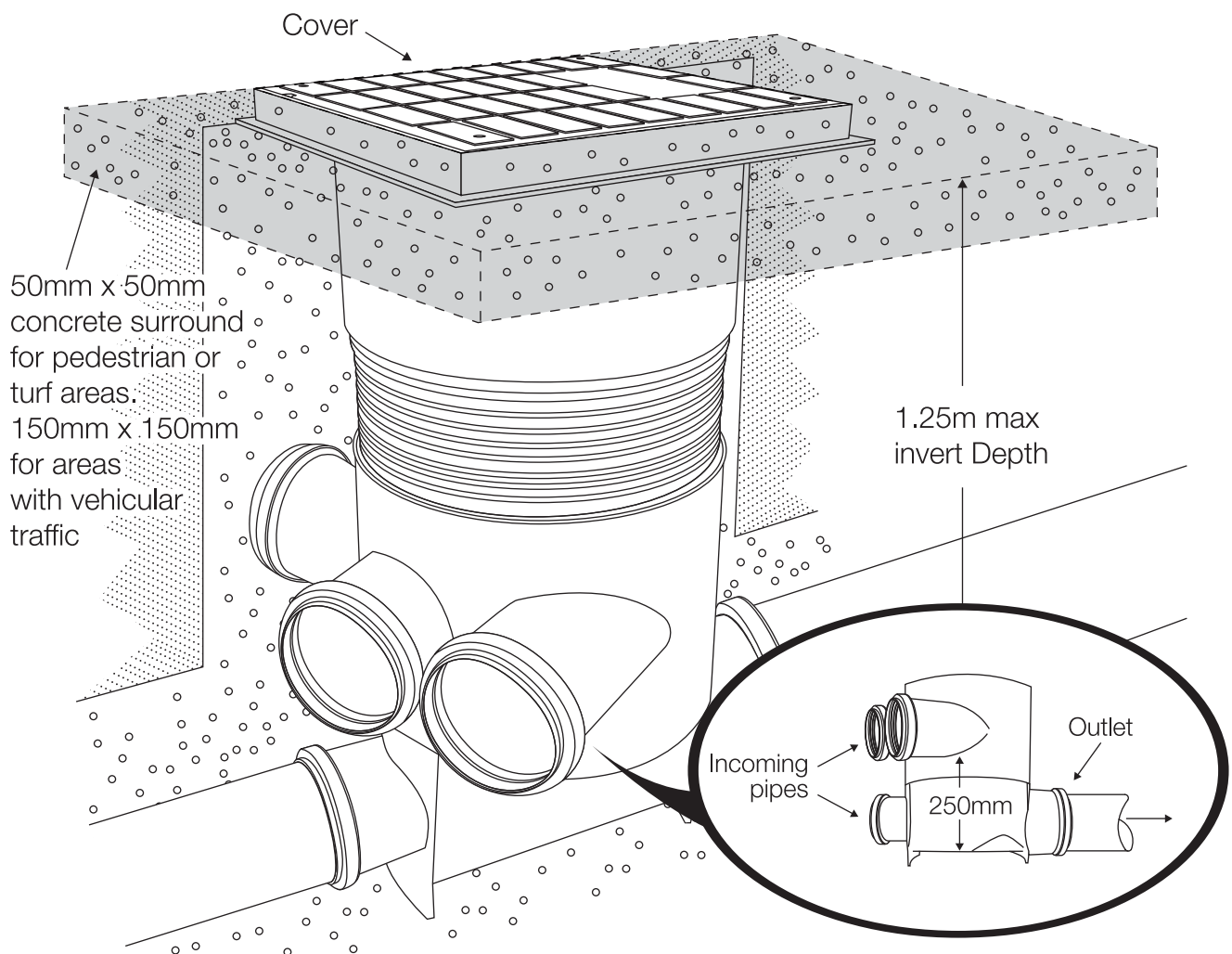
Pipe Side Support and Pipe Overlay

Pipe side support material should be thoroughly compacted in layers of not more than 150mm. The pipe overlay material should be levelled and compacted in layers to a minimum height of 150mm above the top of the pipe in the trench, or as specified, care being taken to preserve the correct alignment and grade of the pipeline.

C. CHEZY PP Inspection Chambers

Bedding and Backfilling (Firm, Soft or Yielding Ground)

- 1.1** Where the invert depth is up to 1.25 meters and on firm, soft or yielding ground, the PP Inspection Chamber shall be placed on at least 100 mm compacted granular materials (10mm max particle size). Granular material for bedding shall be of such size ranging from 3mm to 10mm or a free running coarse sand.
- 1.2** As dug material can be used as back fill material provided it is free of stones and of particle size less than 10mm. Back fill material shall be placed over pipes and compacted in layers not exceeding 150mm in depth till the top of the trench.
- 1.3** Concrete surround the outside of the collar of the inspection chamber to a width of 75mm and depth of 75mm, for pedestrian and turf areas. **A concrete surround of 150mm x 150mm is required for areas with vehicular traffic (drive ways etc).**



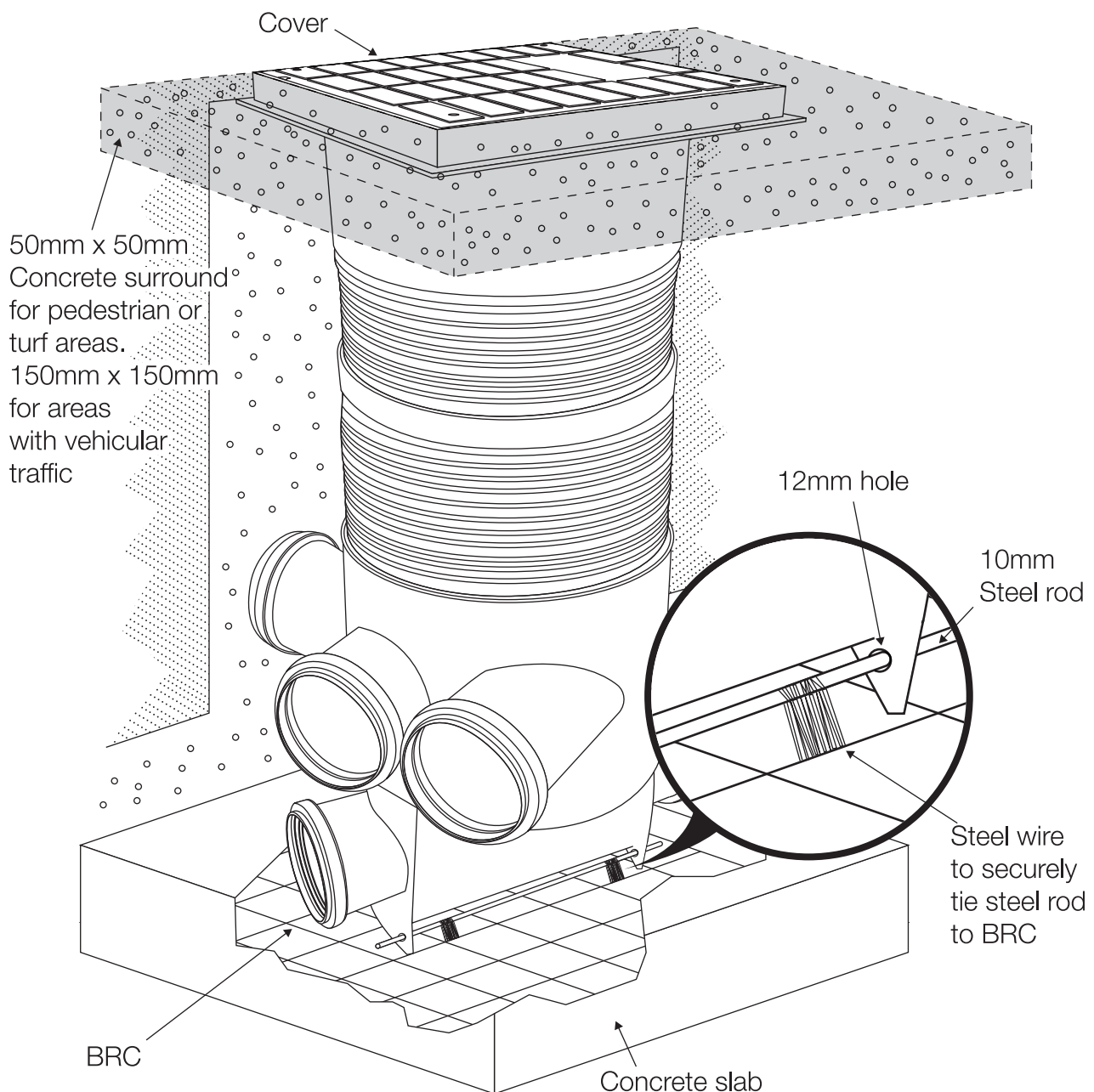
FIRM, SOFT OR YIELDING GROUND



Bedding and Backfilling (High Water Table Ground)

1.4 In high water table ground, procedures 1.1, 1.2 and 1.3 on the previous page should be followed. In addition to the above procedures, as a result of high water table in the ground, there will be buoyancy forces acting on the chamber.

To counter this up thrust, the base of the chamber has to be anchored to a concrete slab of width not less than 600mm x 600mm. The concrete slab shall be of minimum thickness 100mm and reinforced with A8 BRC. Drill a 12mm hole into the legs of the base and insert a 10mm steel rod. Anchor or tie the 10mm rod to the A8 BRC of the slab. Cast the slab and **ensure that there is 50mm cover of concrete above the 10mm steel rod.**



D. Inspection Chamber and Ventilation

1. Every inspection chamber of the sanitary drainage system shall have a minimum depth of 750mm from surface level wherever practicable.
2. The first inspection chamber shall be provided with a ventilating stack of not less than 100mm in diameter. The ventilating stack shall have an untrapped opening in the inspection chamber and no bend or angle, except where unavoidable, shall be formed in any such stack. However, ventilating stack for the first inspection chamber need not be provided for guard house and bin centre.
3. A discharge stack at the first inspection chamber shall constitute a sufficient opening for such ventilation. (Singapore - Code of Practise)
4. The inspection chamber shall be fitted with an airtight collar (frame) and cover. **In drive ways and car parks, a heavy duty cover (load bearing capacity of 1500kg) shall be used and the collar (frame) shall have a concrete surround of not less than 150mm x 150mm.** Medium duty covers (load bearing capacity of 300kg) can be used in non-vehicular areas and have a concrete surround of 75mm x 75mm.
5. No inspection chamber shall be sited within the areas where food is prepared, cooked, stored or served; or other areas where they are likely to give rise to nuisance conditions.

Gradients

Recommended gradients for water are shown below (minimum flow velocities of 0.76 meters per second should be used to avoid the possibility of solid waste being deposited).

Pipe Size	Minimum Gradient	Maximum Capacity (litres per second)
110mm	1 : 80	6.3
160mm	1 : 150	15

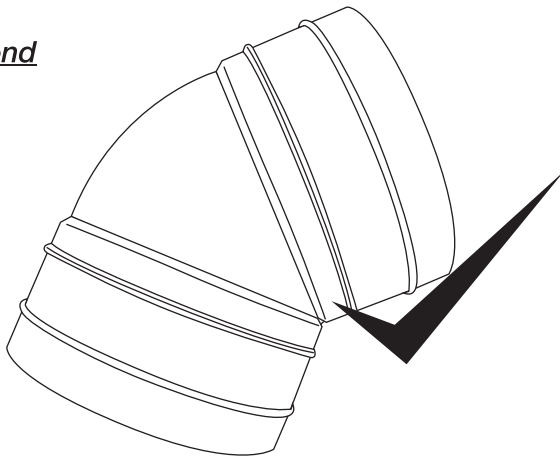


E. Use Of Bends With Inspection Chambers – The Building Regulations 2000 (U.K) – Document H

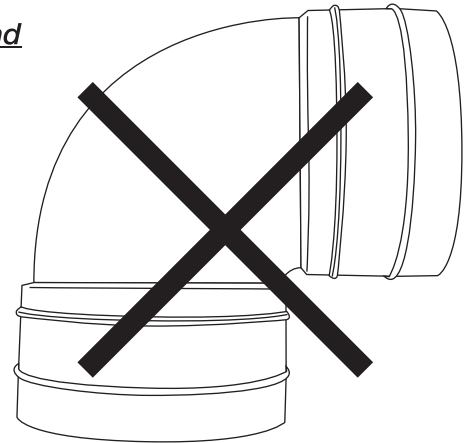
“Pipes should also be laid in straight lines where practicable but may be laid to slight curves if these can still be cleared of blockages. **Any bends should be limited to positions in or close to inspection chambers or manholes.**” - Extracted from Document H (UK)

The use of 90° bend is not recommended, use 45° bend or the Chezy Flexible Joint.

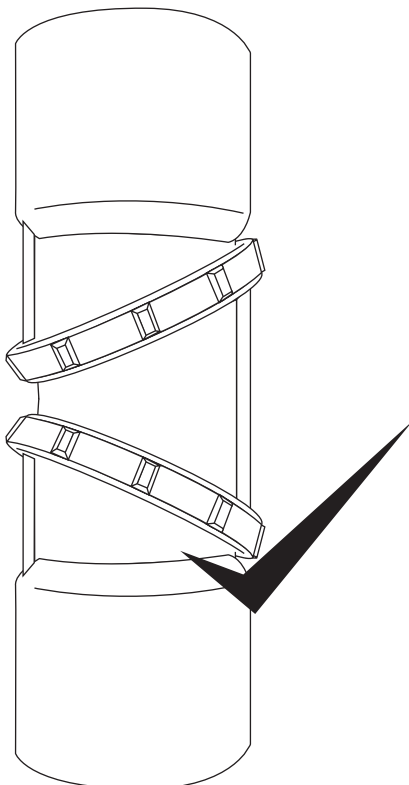
45° bend



90° bend

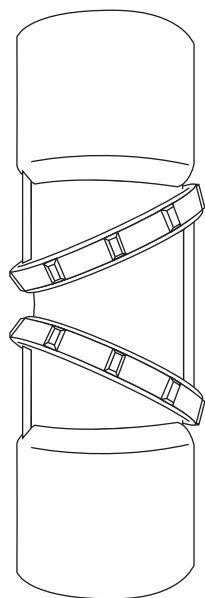
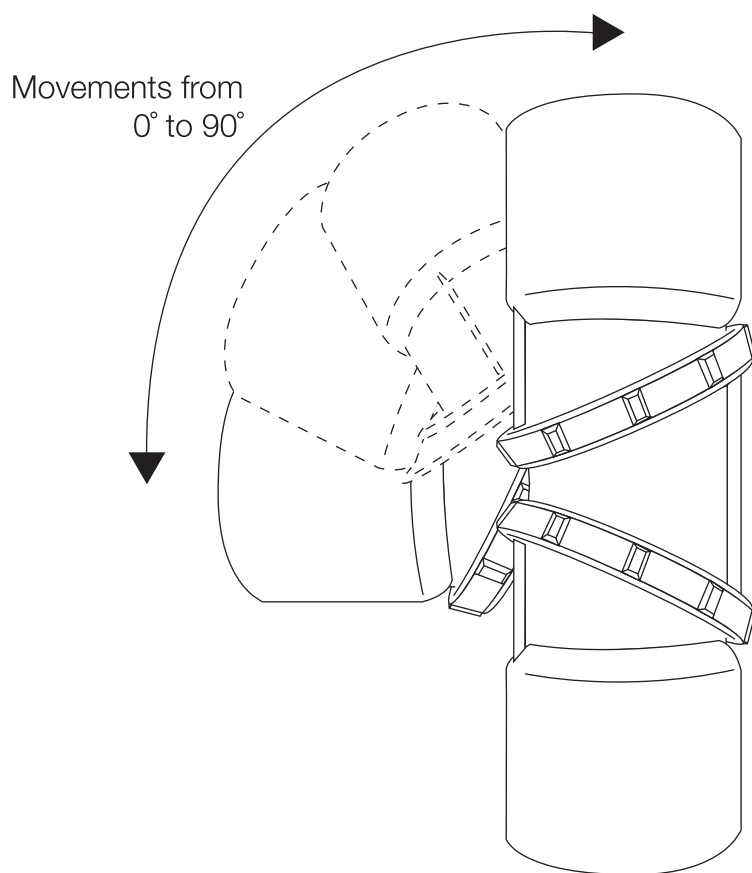


Chezy
Flexible
Joint

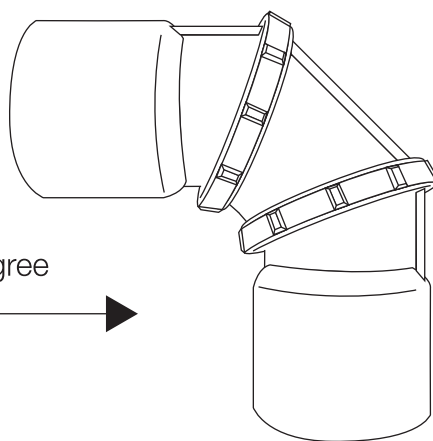


F. Flexible Joint

The only bend that you will ever need.



0 degree flexible joint



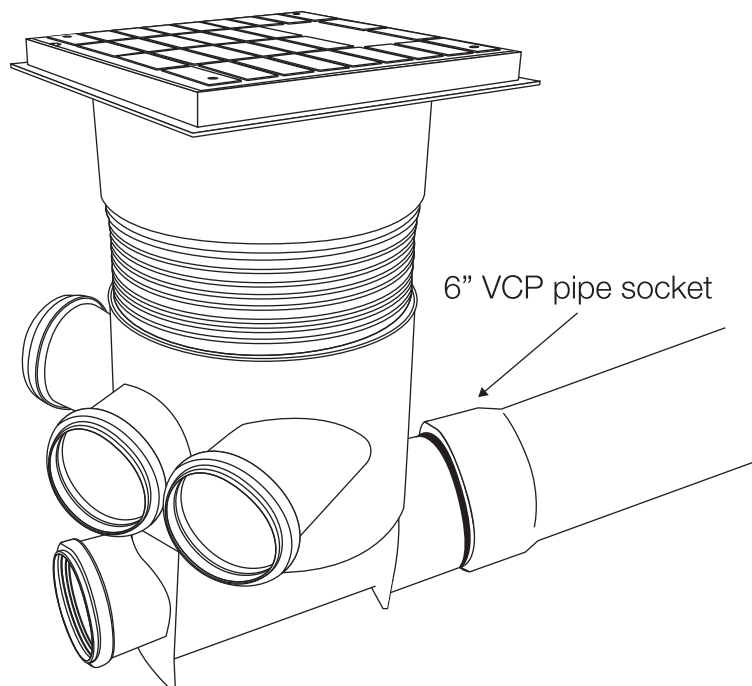
90 degree flexible joint

0 degree rotate to 90 degree

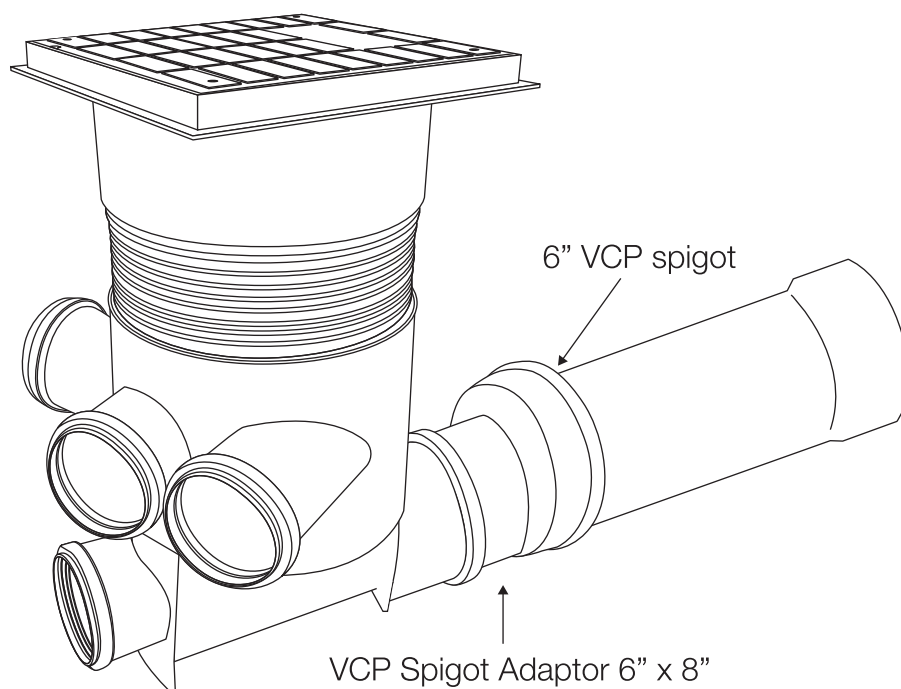


G. Outlet Connections (Side Outlet) to Pipes of Different Materials

Side outlet connections to 6 inch (150mm) VCP pipe (VCP socket)

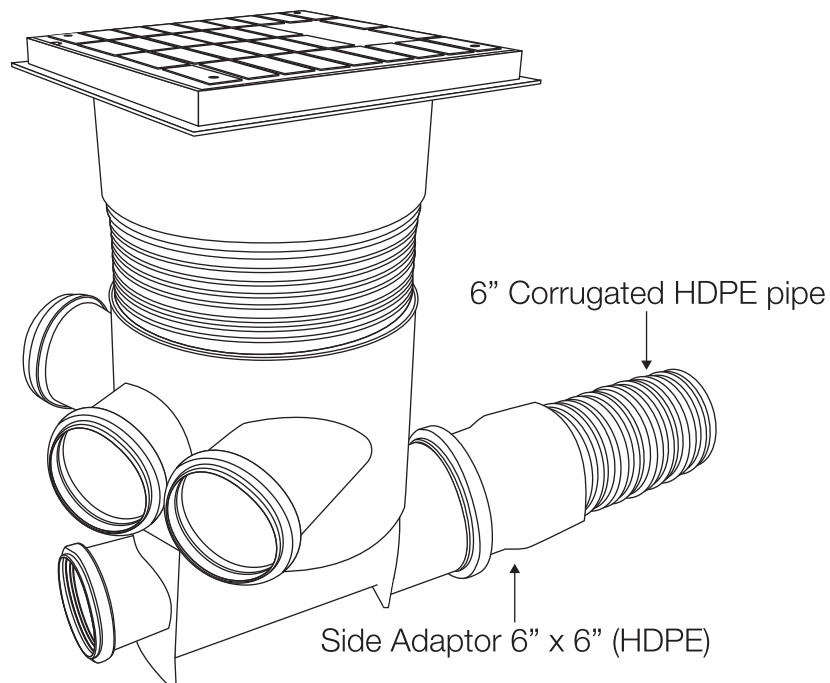


Side outlet connections to 6 inch (150mm) VCP pipe (VCP spigot)

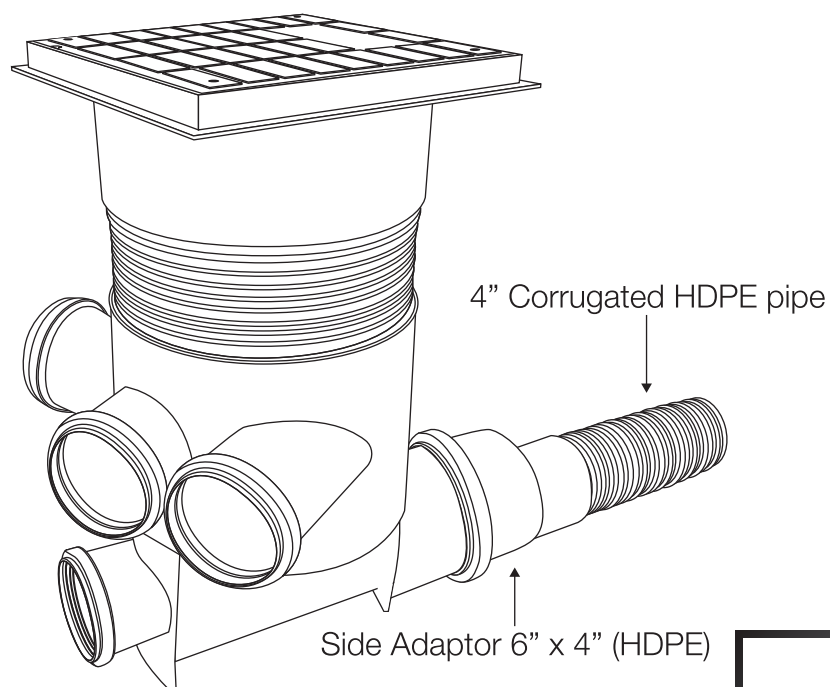


G. Outlet Connections (Side Outlet) to Pipes of Different Materials

Side outlet connections to 6 inch (150mm) corrugated HDPE pipe

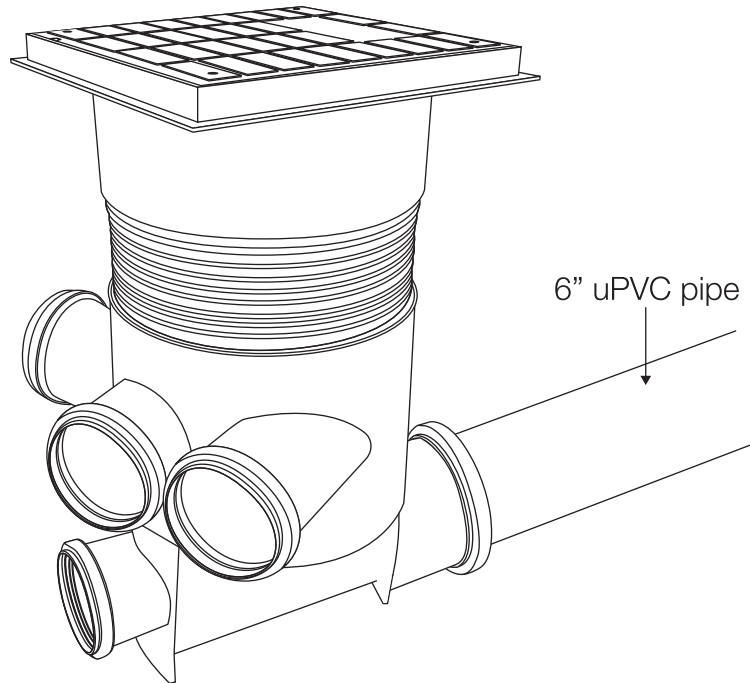


Side outlet connections to 4 inch (110mm) corrugated HDPE pipe

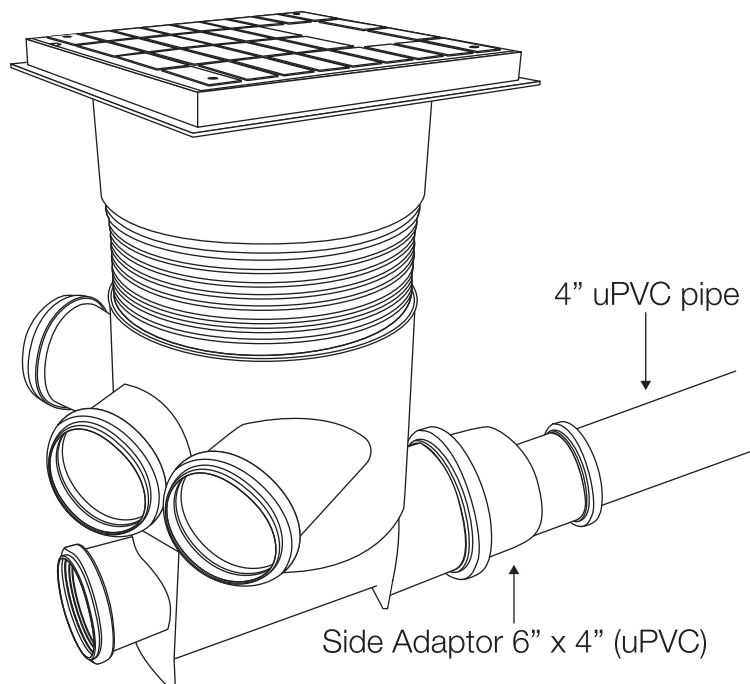


G. Outlet Connections (Side Outlet) to Pipes of Different Materials

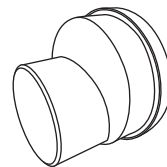
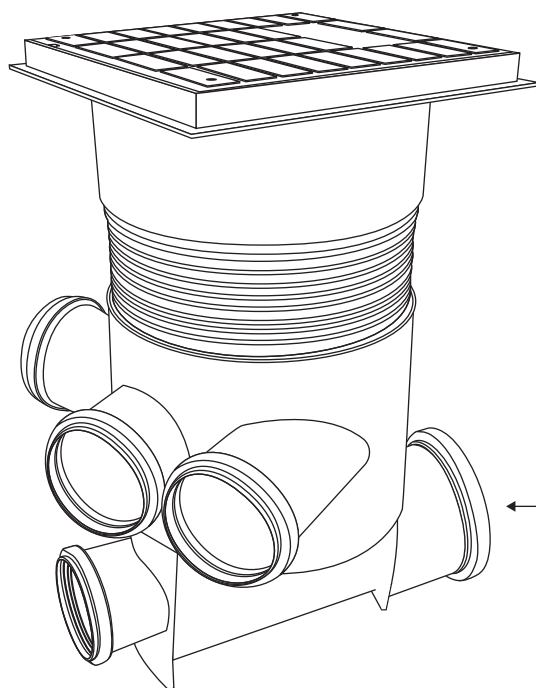
Side outlet connections to 6 inch (150mm) uPVC pipe



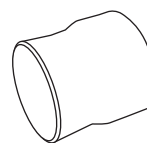
Side outlet connections to 4 inch (110mm) uPVC pipe



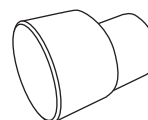
G. Use of Adaptors with Side Outlet Inspection Chamber



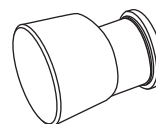
VCP Spigot Adaptor 6" x 8"



Side Adaptor 6" x 6" (HDPE)



Side Adaptor 6" x 4" (HDPE)

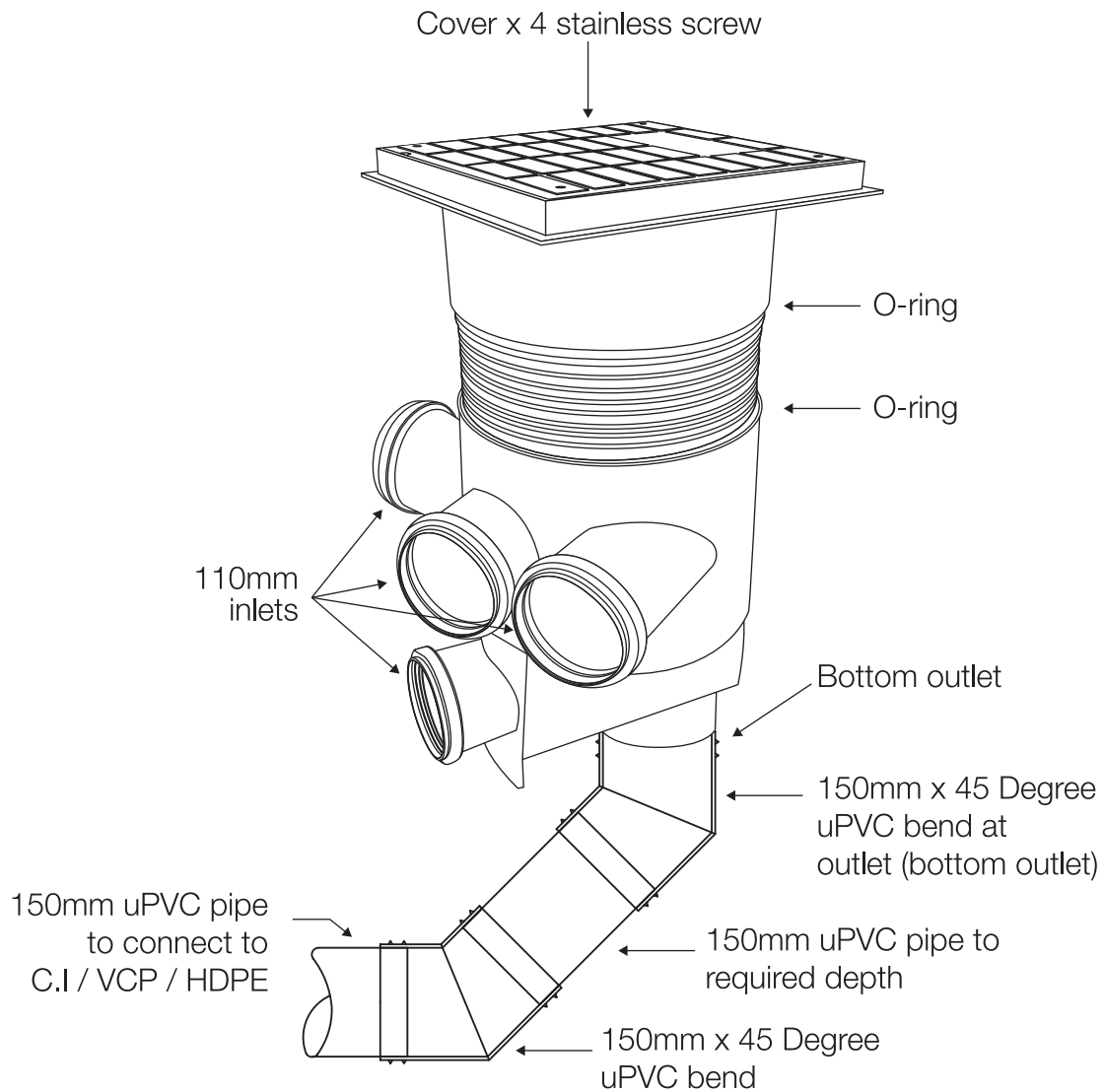


Side Adaptor 6" x 4" (uPVC)



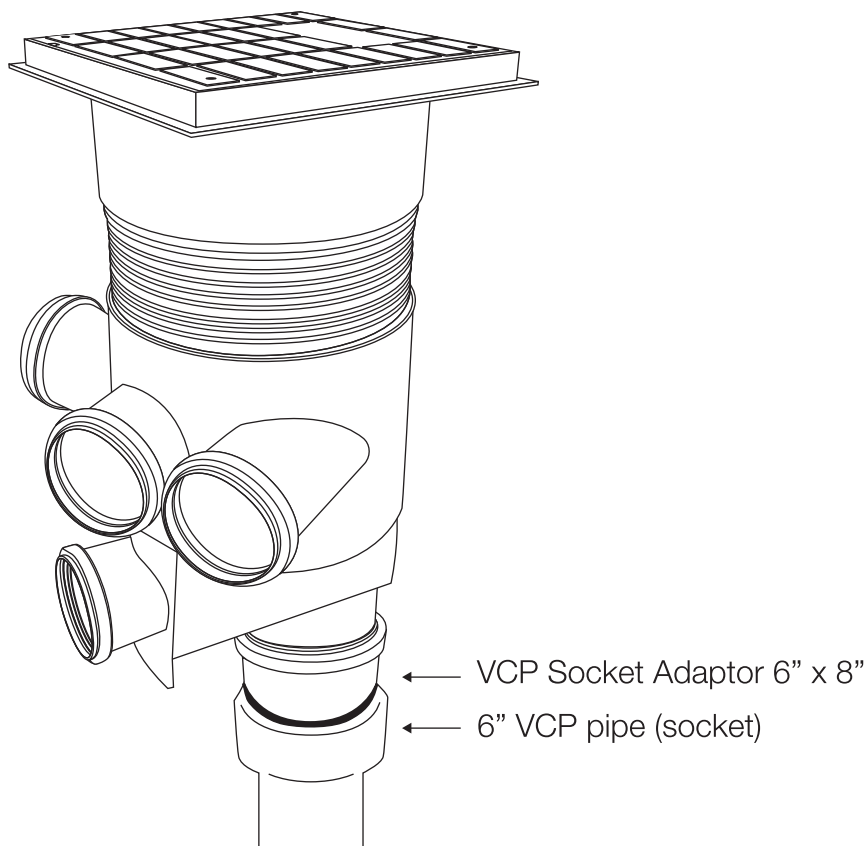
H. Outlet Connections (Bottom Outlet) to Pipes of Different Materials

Bottom outlet connections for 6 inch (150mm) uPVC pipe

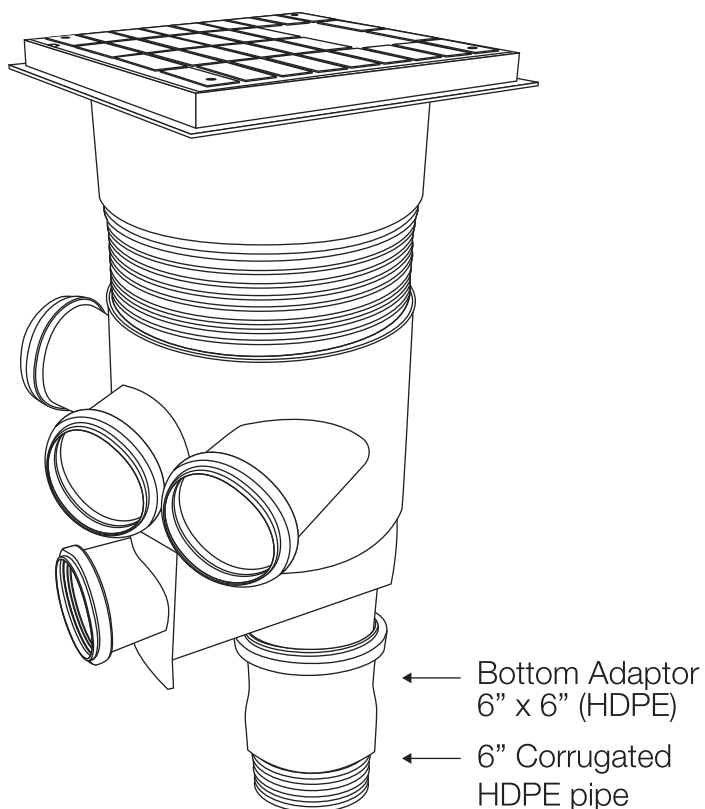


H. Outlet Connections (Bottom Outlet) to Pipes of Different Materials

Bottom outlet connections to 6 inch (150mm) VCP pipe (socket)

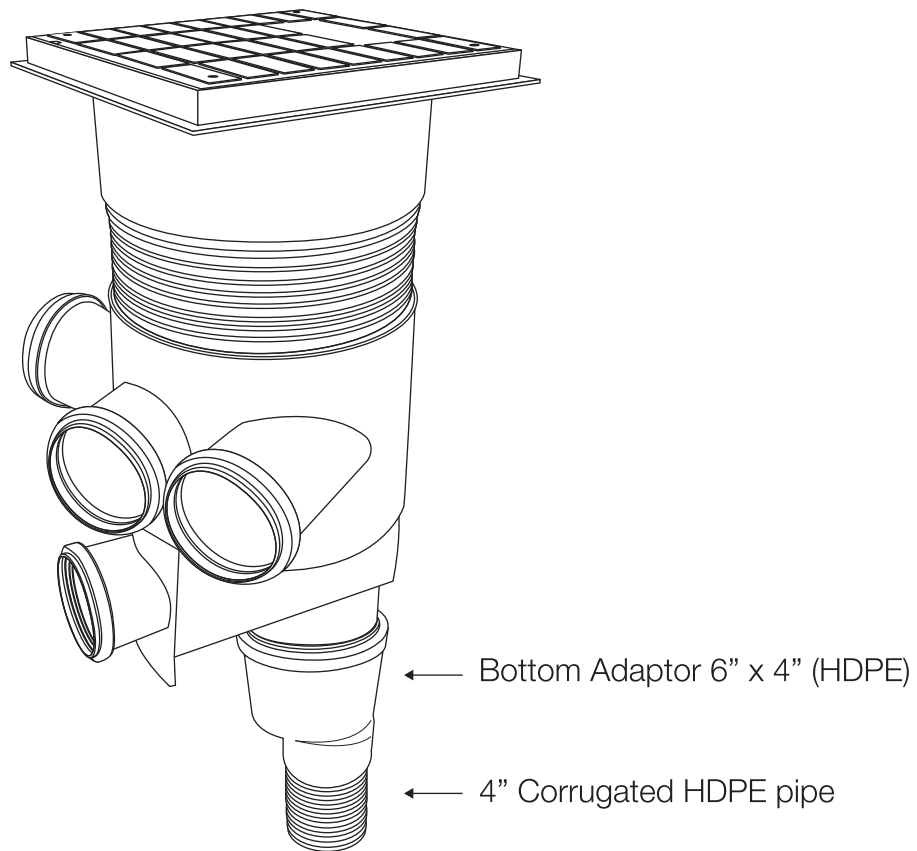


Bottom outlet connections to 6 inch (150mm) corrugated HDPE pipe

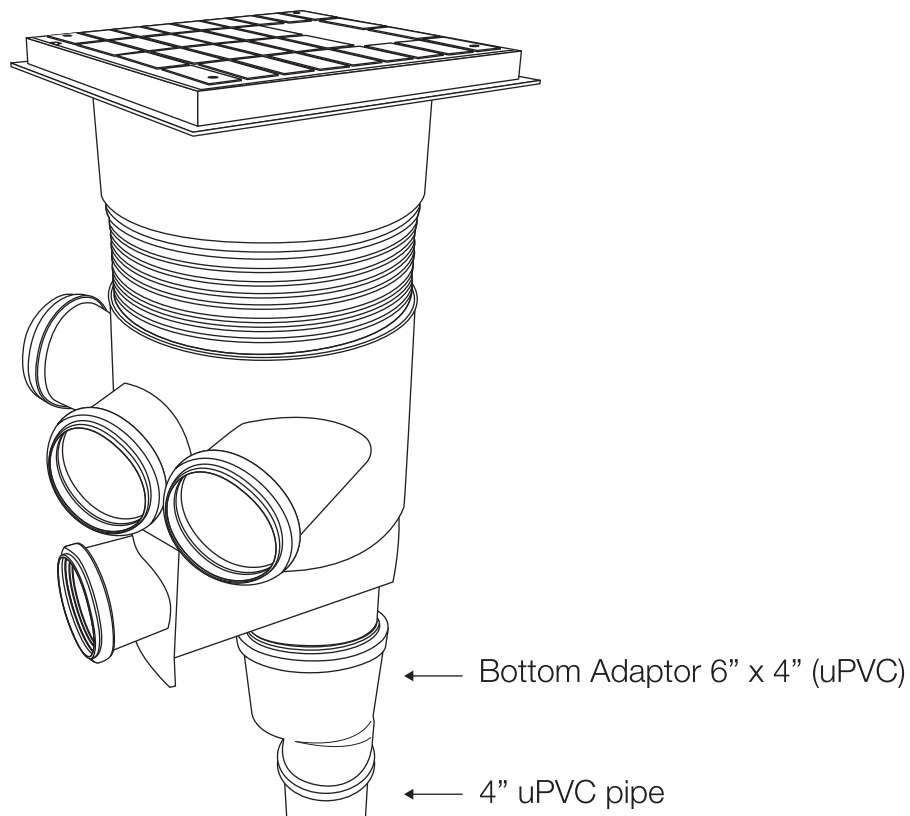


H. Outlet Connections (Bottom Outlet) to Pipes of Different Materials

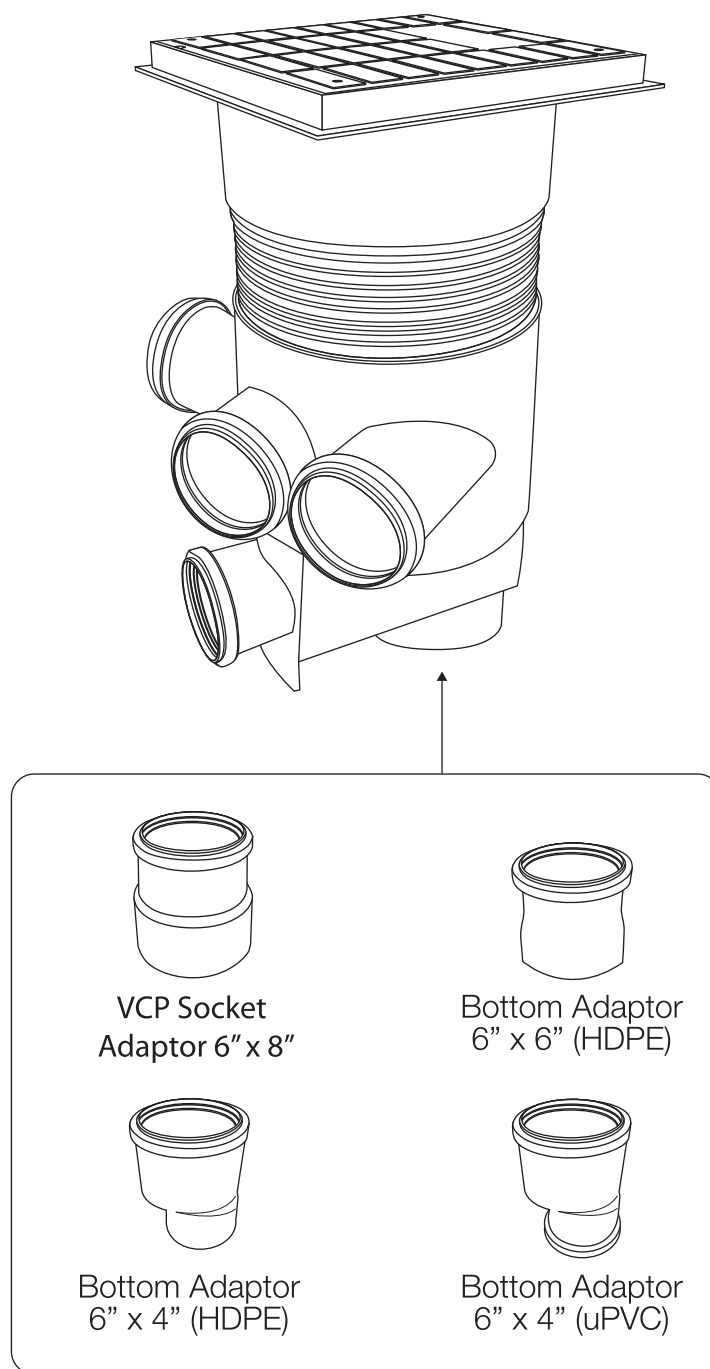
Bottom outlet connections to 4 inch (110mm) HDPE corrugated pipe



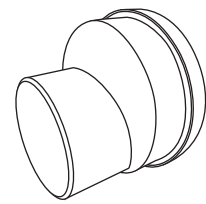
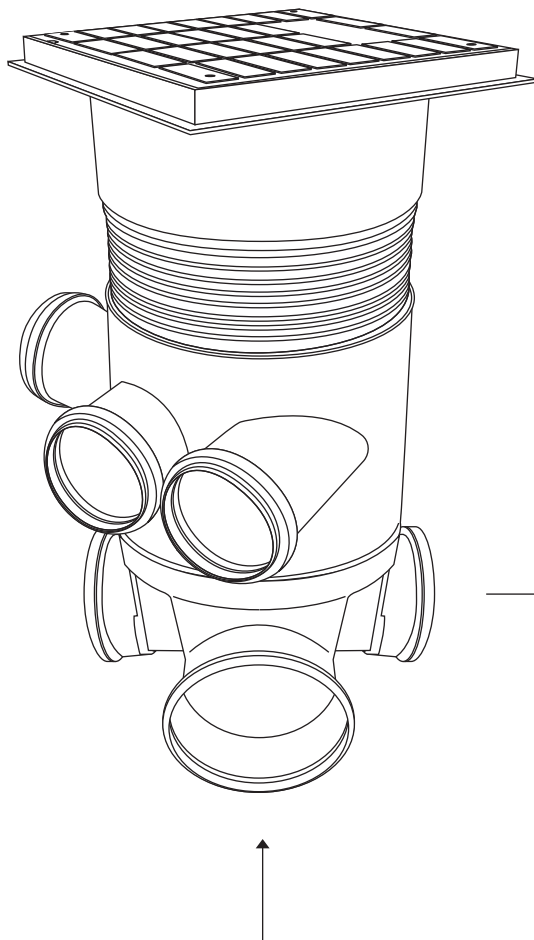
Bottom outlet connections to 4 inch (110mm) uPVC pipe



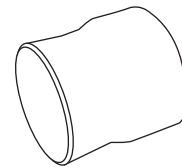
H. Use of Adaptors with Bottom Outlet Inspection Chambers



I. Use of Adaptors with T-Base Outlet Inspection Chamber to Pipes of Different Materials



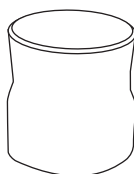
VCP Spigot
6" x 8" Adaptor



Side Adaptor
6" x 6" (HDPE)



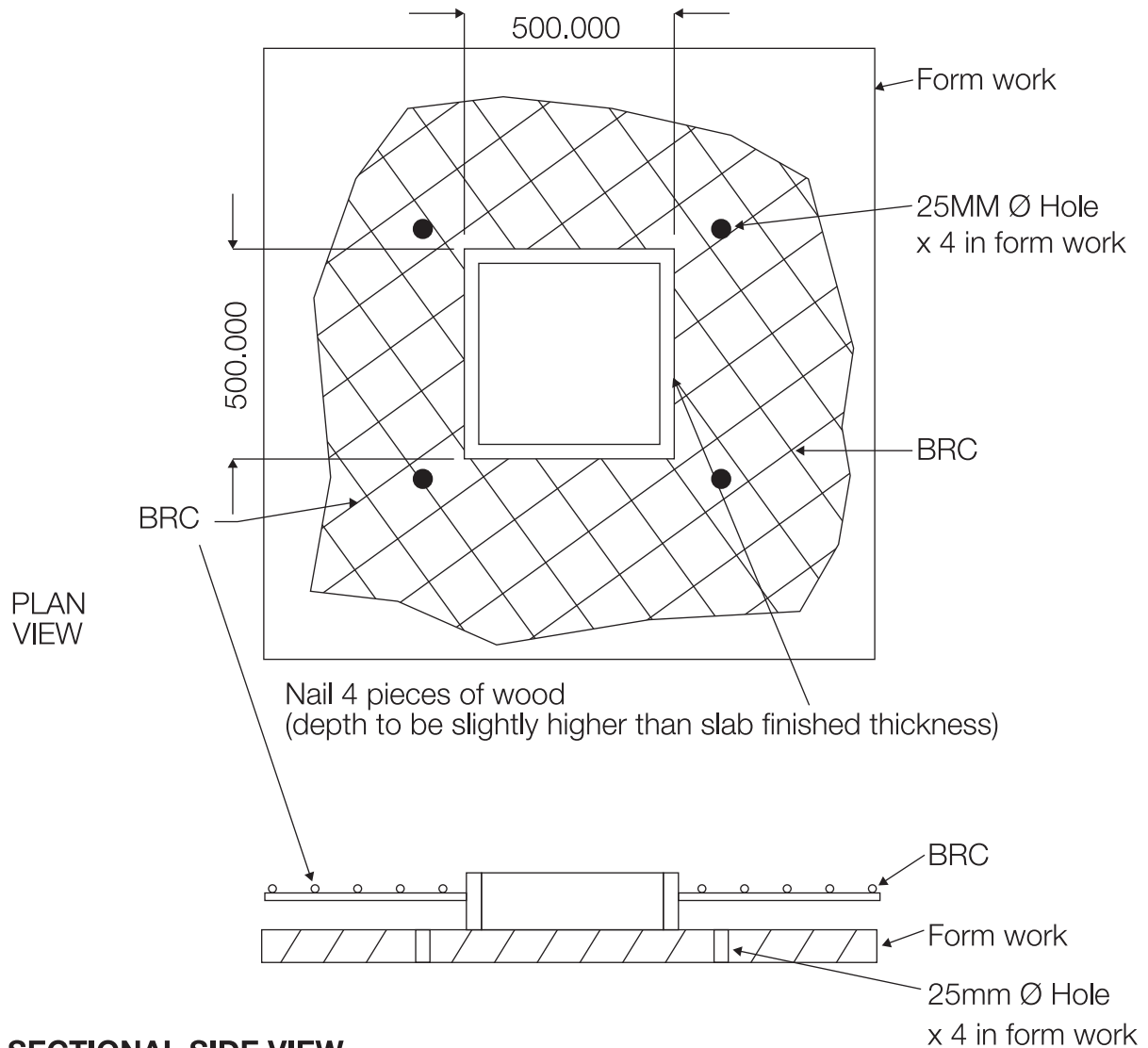
VCP Socket
6" x 8" Adaptor



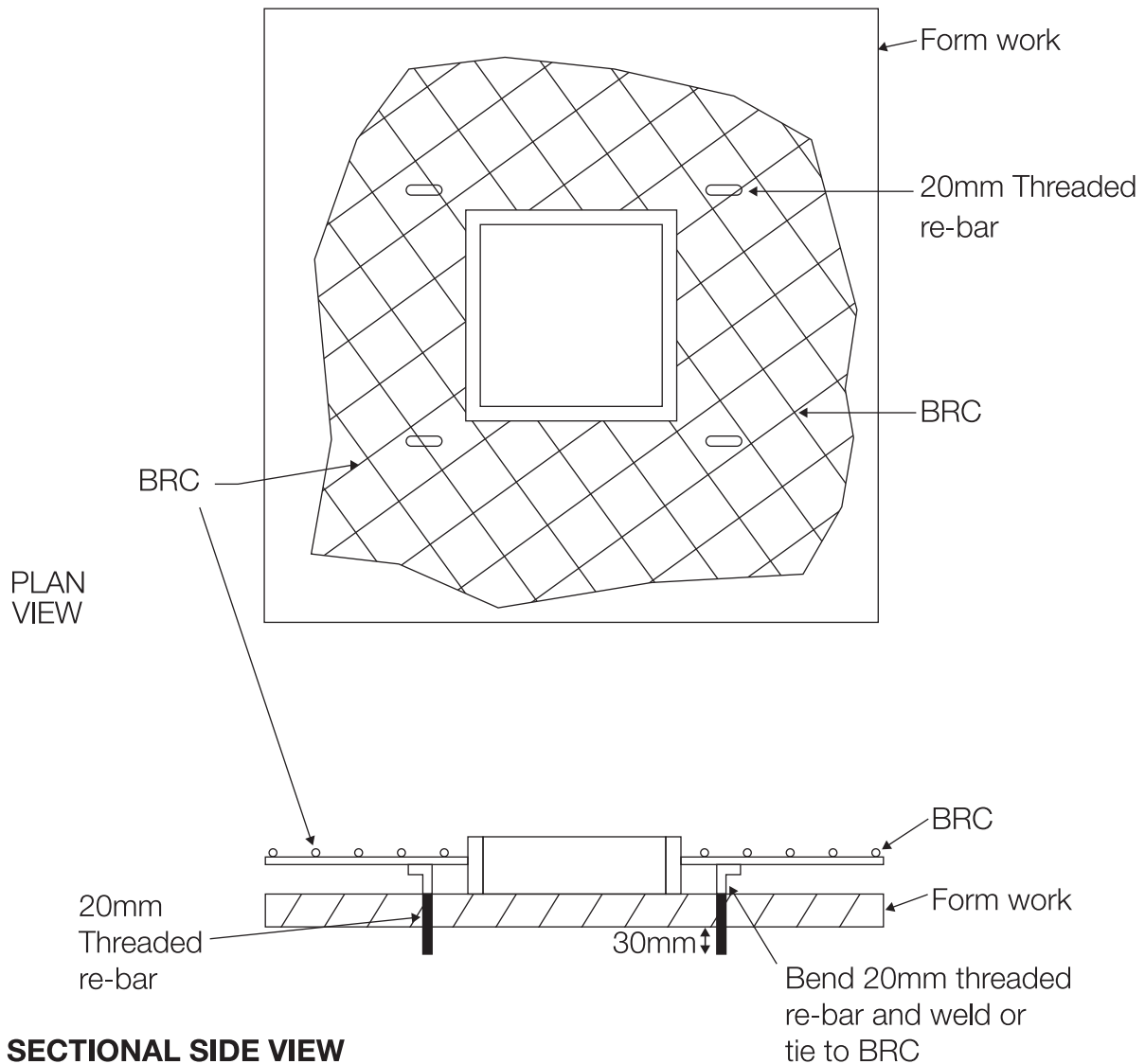
Side Adaptor
6" x 6" (HDPE)

K. Suspended PP Inspection Chambers

Step 1

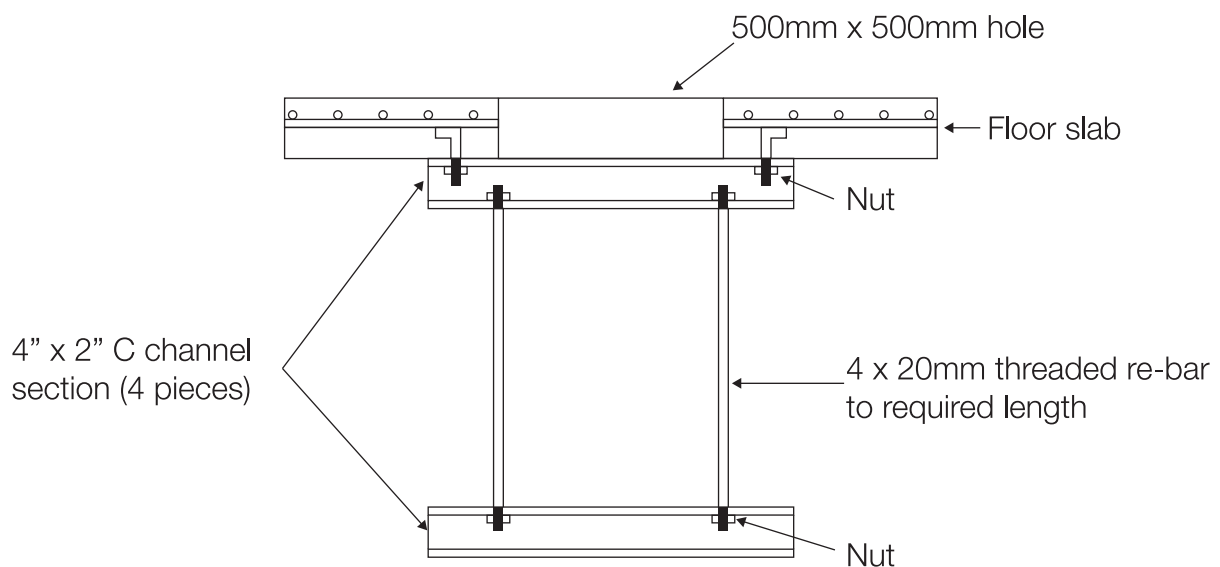
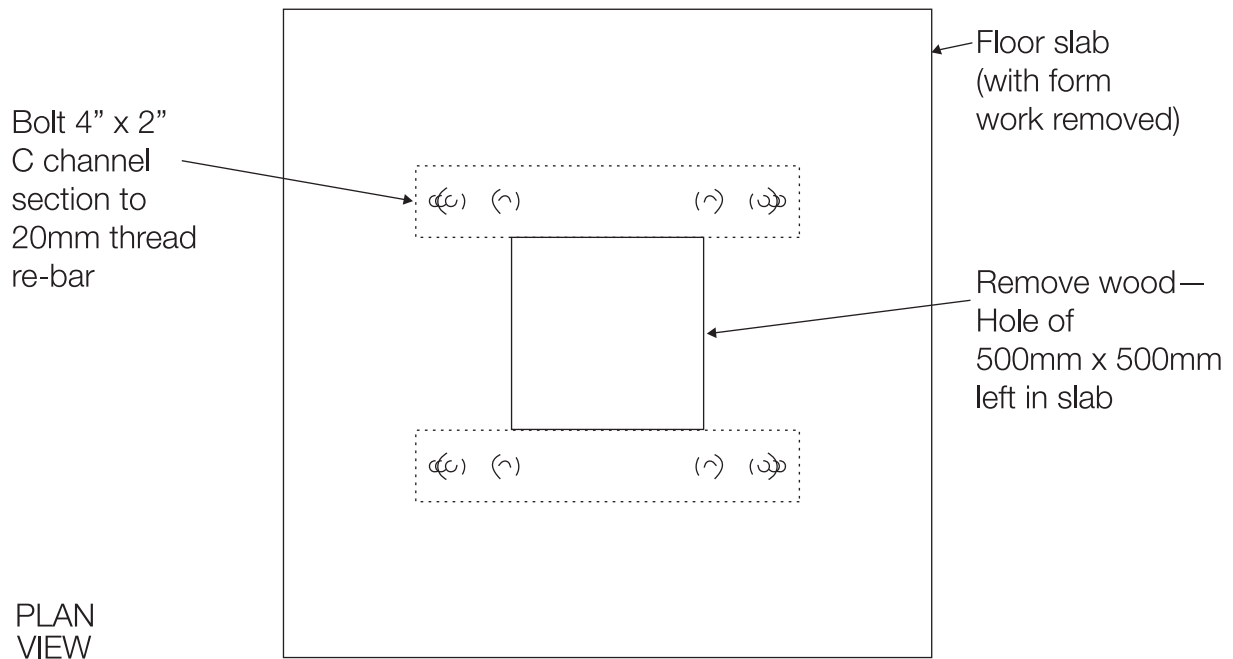


Locate position of chamber and nail 4 pieces of wood to the form work to prevent cement from entering the location of the chamber during pouring of concrete.
Drill four 25mm diameter hole in the form work, 75mm from the 4 pieces of wood.

K.**Step 2**

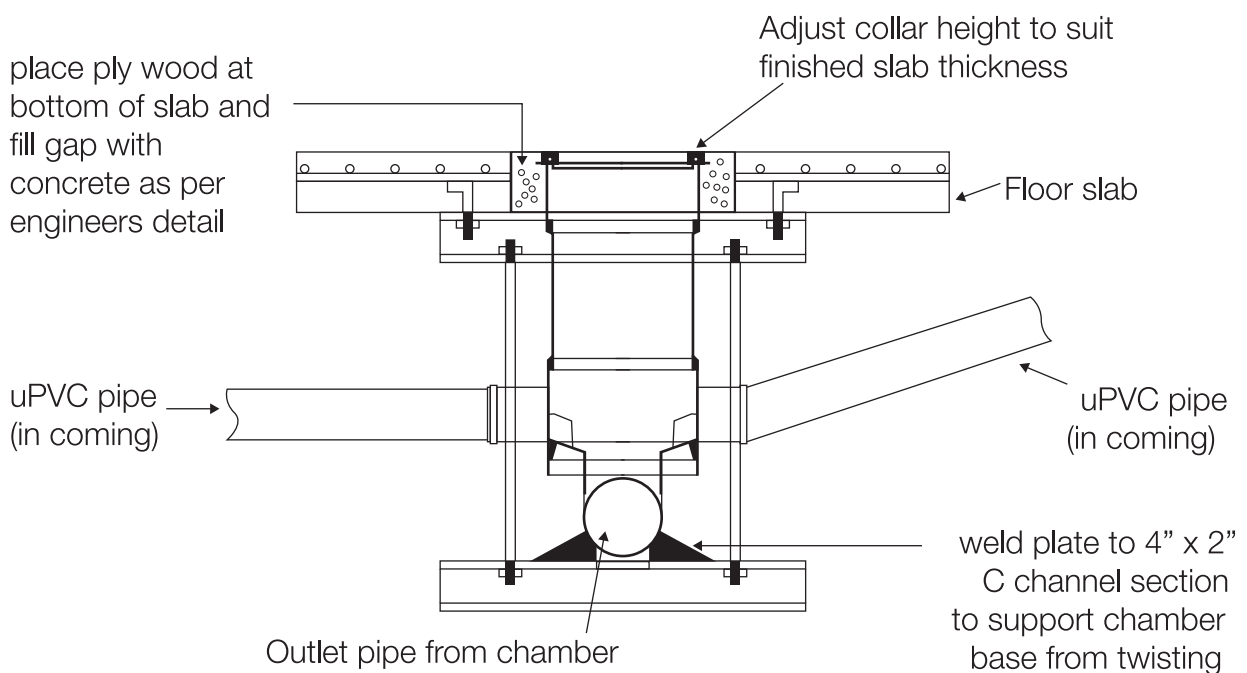
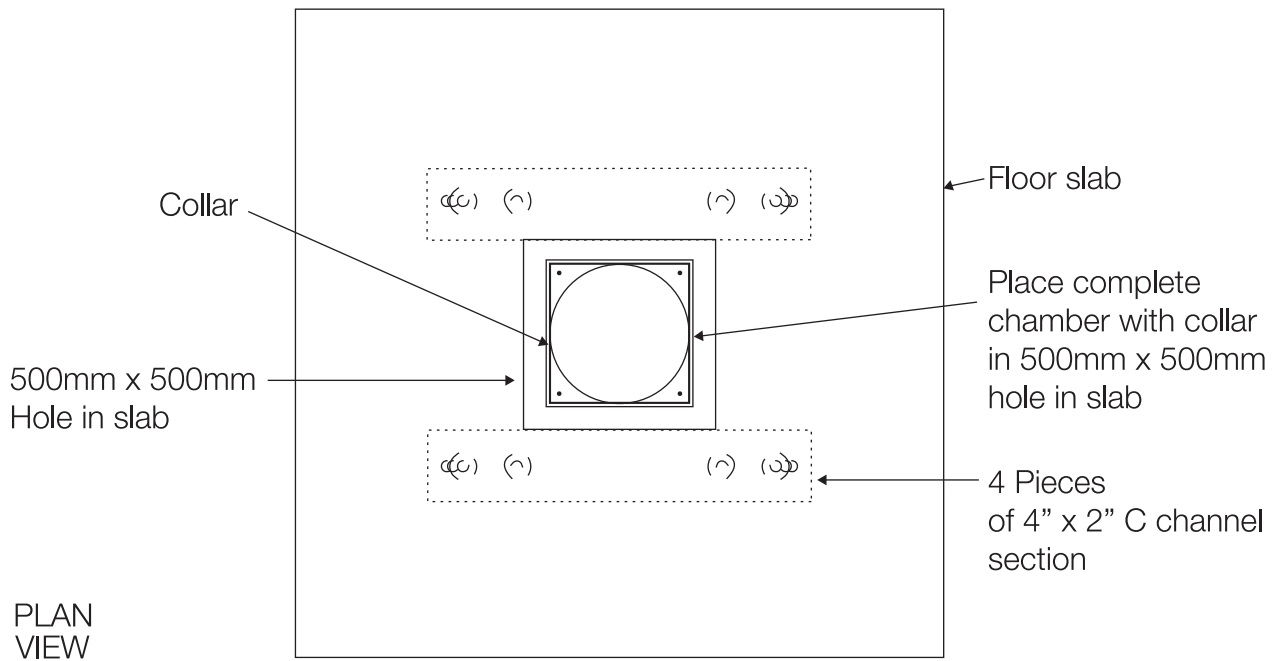
Bend 4 numbers of 20mm thread re-bar and stick into the 4 x 25mm $\varnothing$ holes drilled into the form work. Tie or weld the threaded re-bars to the BRC. Thread re-bars should stick out about 30mm below the form work. Pour concrete to form the slab after this step.





SECTIONAL SIDE VIEW

Bolt 2 pieces of 4" x 2" C channel sections to bent 20mm re-bar. Complete assembly as shown in the diagram.

K.**Step 4**

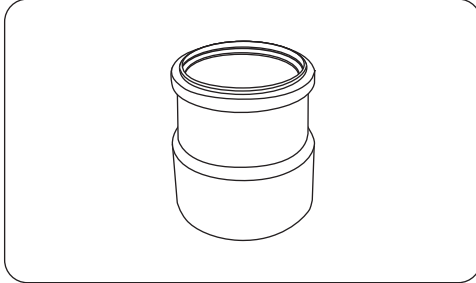
Complete Chezy PP inspection chamber installation for suspended chambers as shown in the drawings.



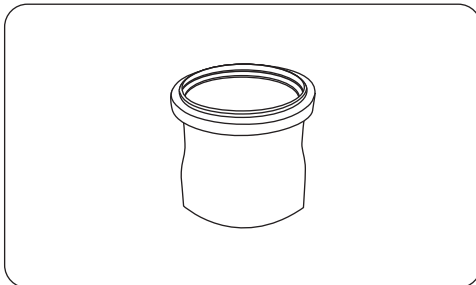
L. Adaptors for Jointing

Various adaptors can be used for joining the Chezy Inspection Chamber to different incoming and outgoing pipes (VCP, HDPE twin wall corrugated and uPVC pipes)

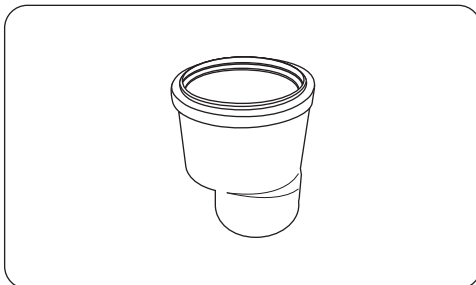
Bottom Adaptors



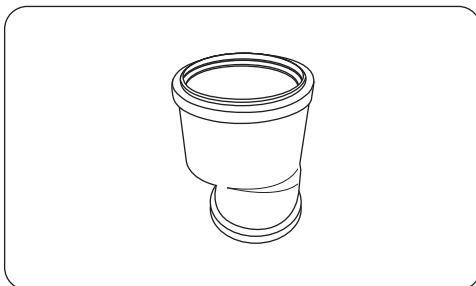
VCP Socket Adaptor 6" x 8"



Bottom Adaptor 6" x 6" (HDPE)

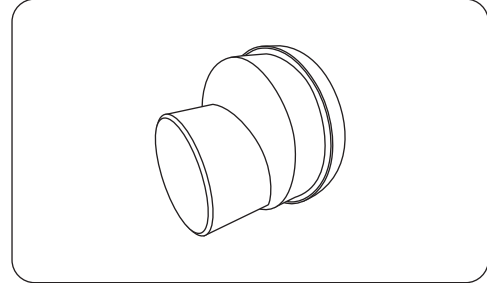


Bottom Adaptor 6" x 4" (HDPE)

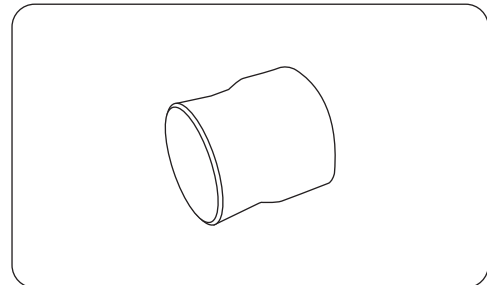


Bottom Adaptor 6" x 4" (uPVC)

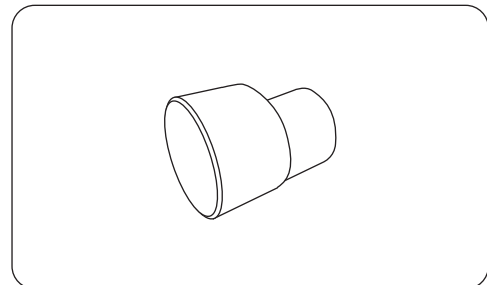
Side Adaptors



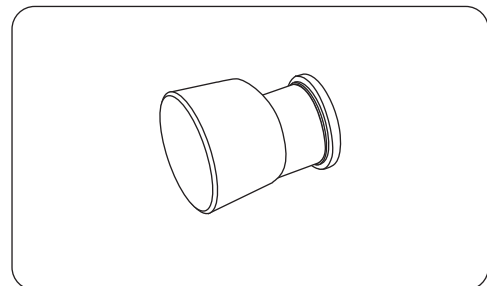
VCP Spigot Adaptor 6" x 8"



Side Adaptor 6" x 6" (HDPE)



Side Adaptor 6" x 4" (HDPE)

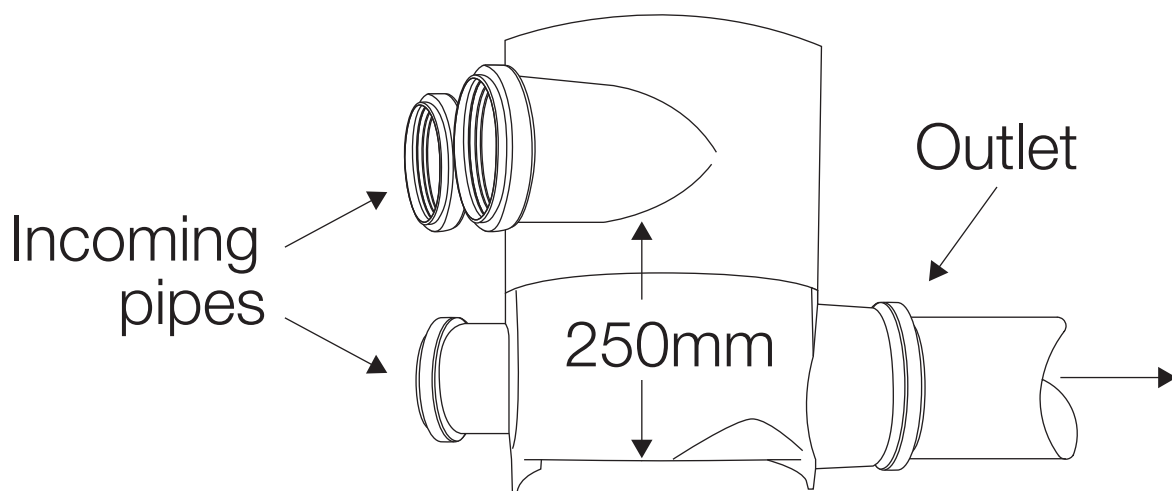


Side Adaptor 6" x 4" (uPVC)



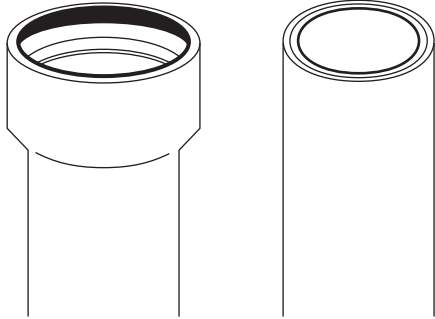
M. Installation Method When The Main Line is Not Installed

1. Locate position of inspection chamber. Dig to the required depth, ensuring that position and level of the inspection chamber is according to the engineers drawing. Place chamber base and body at the required position.
2. Locate the position of pipes going to the chamber and dig trenches sufficiently wide and deep to pass below the ground beam. Rotate the body of the inspection chamber to the most suitable position, where the incoming pipes are able to meet the sockets of the chamber. Trenches that are not in line with the sockets can be joined with the use of 45° bends or the Chezy flexible joint. Ensure that these bends are placed as close as possible to the inspection chamber.
3. Push pipes into socket, block outlet of the inspection chamber with inflatable balloon or with other suitable means.
4. Place riser back on. Use liquid level gauge to ensure that the inspection chamber is level at the top. Back fill the earth as per instructions on pages 11 to 13. Place suitable protection on top of the riser (ply wood etc). Place indicator, protection, etc, to ensure that lorries, excavators, etc do not go over the plywood.
5. At the end of construction period, remove the plywood and place collar and cover to the required height.

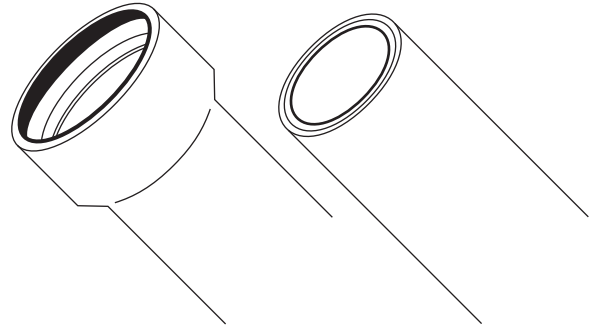


N. Installation Method When The Main Line is Installed

1. Locate branch pipe from main sewer line and dig to the required depth. The branch pipe from the main sewer line should either be facing vertically up or at 45° to the chamber outlet. Use suitable adaptors to connect (this depends on type of pipe used for the branch line).

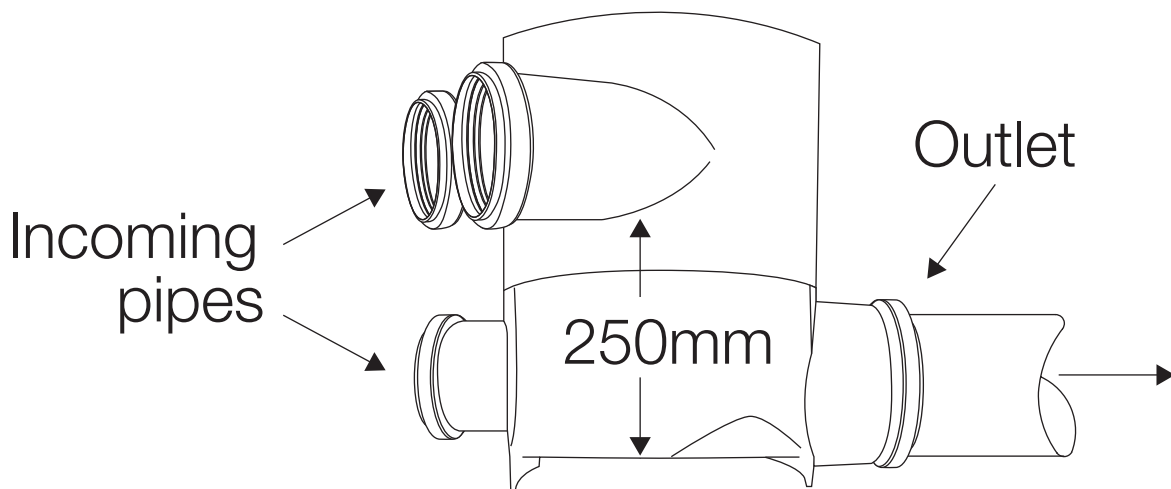


VCP, HDPE or uPVC branch main line pipes
facing vertically up for bottom outlet inspection chamber



VCP, HDPE or uPVC branch main line pipes
at 45° to outlet of inspection chamber

2. Compact ground where inspection chamber will be placed. If ground has high water table, concrete bedding is required. Refer to pages 11 to 13 for recommended installation.
3. Identify invert level of inspection chamber to connect to branch of the main line. After identifying invert level, ensure that bottom of incoming pipes from the house are 250mm (10 inches) from this level.
4. Connect chamber base to branch pipe of main sewer line. The bottom outlet or side outlet of the Chezy PP inspection chamber can be used, depending on the site requirement.



O. List of Do's and Dont's

Do's

1. Remember that 4 of the inlets are 250mm (10 inches) above the outlet of the chamber. Calculate accordingly for the proper invert level for connection to other inspection chambers or the main line.
2. **Use a liquid level gauge to ensure that the level is flat on the top of the chamber before backfilling.**
3. Lubricate rubber rings using silicone, soap water or other suitable lubricants when joining to the incoming or outgoing pipes.
4. Place the Chezy inspection chamber first, than run the pipes into the building. This will ensure connections with as little bends as possible are used (Recommended). Other methods can be used, depending on construction stage and site requirements.
5. Follow bedding and installation methods on pages 11 to 13.
6. Use 45° bends and not 90° bends if required to do so. The use of our flexible bend is recommended.
7. **Do ensure sufficient protection is made on to inspection chamber during the construction process. Ensure that sufficient protection and indicators, etc are placed to prevent lorries, excavators, etc from crossing over the inspection chamber during the construction process.**

Dont's

1. **Do not force pipe into connections of inspection chamber. If there is resistance into joining with the chamber, it means that there is not enough lubricant on the rubber rings or insufficient chamfer on the pipe.**
2. Do not backfill with granular material having particle size larger than 10mm.
3. Ensure that stones, pieces of wood, brick, etc do not press against the chamber body after back filling.



P. Testing the Installed System

1. *Testing for incoming pipe lines into the chamber (underground pipes).*

- Plug all incoming pipes into the chamber by inserting rubber test plugs, inflatable balloons or by other suitable means.
- The individual pipes shall be filled with water to the highest point.
- The water level shall be maintained by the system at its filled height for a period of fifteen (15) minutes.
- Every pipe and joint shall be carefully examined for leaks while the system is filled with water.

2. *Testing for outgoing pipe line from the chamber (underground pipes).*

MIRROR TEST (for straight line connections)

- Tie a torch light to a 1.5m long piece of timber and lower it into the Chezy PP inspection chamber outlet. Place a mirror at the other end to check if the pipe line is straight.

WATER TIGHTNESS TEST

- Plug incoming pipes into the main line manhole with inflatable rubber balloon, test plugs, rubber bungs or any other suitable sealing device.
- Fill the system with water up to the top of the central channel of the inspection chamber. The water level shall be maintained by the system for a period of fifteen (15) minutes.
- The quantity of water added to maintain the water level must not exceed three (3) measured gallons for every fifty (50) joints, proportionally more or less for a lesser or greater number of joints.

WATER TIGHTNESS OF INSPECTION CHAMBER

- Plug all inlets and outlets with inflatable rubber balloon test plugs or by other suitable means and fill the chamber with water to the top.
- There should be no drop in the water level after one hour.

Q. Chemical Resistance of the Chezy PP Inspection Chambers

KEY:

G - good resistance
P - poor resistance

Acetaldehyde 40% - G	Amyl acetate - P	Butyl acetate - P
Acetaldehyde 100 % - P	Amyl alcohol - G	Butyric acid - G
Acetic acid 10% - G	Amyl chloride - P	Calcium carbonate - G
Acetic acid 20% - G	Aniline - P	Calcium chlorate - G
Acetic acid 80% - G	Aniline chlorohydrate - P	Calcium chloride - G
Acetic acid, glacial - G	Aniline hydrochloride - P	Calcium hydroxide - G
Acetic anhydride - P	Antimony trichloride - G	Calcium hypochlorite - G
Acetone - P	Aqua regia - G	Calcium nitrate - G
Adipic acid - G	Aromatic hydrocarbons - P	Calcium oxide - G
Allyl alcohol 96% - G	Arsenic acid 80% - G	Calcium sulphate - G
Allyl chloride - P	Arylsulphonic acid - G	Carbon disulphide - P
Alum - G	Barium carbonate - G	Carbon dioxide - G
Aluminium alum - G	Barium chloride - G	Carbon monoxide - G
Aluminium chloride - G	Barium hydroxide - G	Carbon tetrachloride - G
Aluminium nitrate - G	Barium sulphate - G	Carbonic acid - G
Aluminium sulphate - G	Barium sulphide - G	Castor oil - G
Ammonia gas (dry) - G	Beer - G	Caustic potash - G
Ammonia, liquid - P	Beer sugar liquors - G	Caustic soda - G
Ammonium acetate - G	Benzaldehyde 10% - G	Chloroacetic acid - G
Ammonium alum - G	Benzaldehyde, above 10% - P	Choric acid 20% - G
Ammonium carbonate - G	Benzene - P	Chlorine (dry) - P
Ammonium chloride - G	Benzine - G	Chlorine (wet) - P
Ammonium fluoride 25% - G	Benzoic acid - G	Chlorine water - G
Ammonium hydroxide - G	Bleach 12% Cl - G	Chlorobenzene - P
Ammonium nitrate - G	Borax - G	Chloroform - P
Ammonium persulphate - G	Boric acid - G	Chlorosulphonic acid - G
Ammonium phosphate - G	Bromic acid - G	Chrome alum - G
Ammonium sulphate - G	Bromine liquid - P	Chromic acid 10% - G
Ammonium sulphide - G	Bromine water - G	Chromic acid 50% - P
	Butadiene - G	
	Butane - G	
	Butanol normal - G	



Q. Chemical Resistance of the Chezy PP Inspection Chambers

Citric acid - G	Fluoboric acid - G	Molasses - G
Copper carbonate - G	Fluorine gas (wet) - G	Monochloroacetic acid - G
Copper chloride - G	Fluorine gas (dry) - G	Muriatic acid - G
Copper cyanide - G	Iodine - P	Naphtha - G
Copper fluoride - G	Kerosene - G	Napthalene - P
Copper nitrate - G	Ketones - P	Natural gas - G
Copper sulphate - G	Lactic acid 25% - G	Nickel chloride - G
Cottonseed oil - G	Lauric acid - G	Nickel nitrate - G
Crude oil - G	Lead acetate - G	Nickel sulphate - G
Cupric fluoride - G	Lead chloride - G	Nicotine - G
Cupric sulphate - G	Lead sulphate - G	Nicotine acid - G
Cyclohexanol - P	Linoleic acid - G	Nitric acid, anhydrous - P
Cyclohexanone - P	Linseed oil - G	Nitric acid 10% - G
Detergents - G	Lubricating oil - G	Nitric acid 60% - G
Dextrin - G	Machine oil - G	Nitric acid 68% - G
Dextrose - G	Magnesium carbonate - G	Nitrobenzene - P
Diglycolic acid - G	Magnesium chloride - G	Nitrous oxide - G
Dimethylamine - G	Magnesium hydroxide - G	Oils and fats, vegetable - G
Disodium phosphate - G	Magnesium nitrate - G	Oleic acid - G
Distilled water - G	Magnesium sulphate - G	Oleum - P
Esters - P	Maleic acid - G	Oxalic acid - G
Ethyl acetate - P	Malic acid - G	Oxygen - G
Ethyl alcohol - G	Mercuric chloride - G	Ozone - G
Ethylene dichloride - P	Mercury - G	Palmitic acid - G
Ethylene glycol - G	Methyl alcohol - G	Paraffin - G
Ethylene oxide - P	Methyl bromide - P	Perchloric acid 10% - G
Fatty acids - G	Methyl chloride - P	Perchloric acid 15% - G
Ferric chloride - G	Methylene chloride - P	Perchloric acid 70% - G
Ferric hydroxide - G	Methylsulphate - G	Petrol - G
Ferric nitrate - G	Methyl sulphuric acid - G	Petrol high octane - G
Ferric sulphate - G	Milk - G	Phenol - G
Ferrous chloride - G	Mineral oils - G	

Q. Chemical Resistance of the Chezy PP Inspection Chambers

Phenylhydrazine - P	Sewage - G	Sulphur dioxide (dry) - G
Phosgene gas - G	Sillicic acid - G	Sulphur dioxide (wet) - G
Phosgene liquid - P	Silver cyanide - G	Sulphur trioxide - G
Phosphoric acid 10% - G	Silver nitrate - G	Sulphuric acid 3% - G
Phosphoric acid 85% - G	Silver plating solution - G	Sulphuric acid 70% - G
Phosphoric acid yellow) - G	Silver sulphate - G	Sulphuric acid 80% - G
Phosphorus pentachloride - G	Soaps - G	Sulphuric acid 85% - P
Phosphorus trichloride - P	Sodium acetate - G	Sulphurous acid - G
Photographic solutions - G	Sodium alum - G	Tall oil - G
Pictic acid - P	Sodium benzoate - G	Tannic acid - G
Potassium alum - G	Sodium bicarbonate - G	Tartaric acid - G
Potassium bicarbonate - G	Sodium bisulphate - G	Tanning liquors - G
Potassium bromide - G	Sodium bromide - G	Toluene - P
Potassium carbonate - G	Sodium carbonate - G	Transformer oil - G
Potassium chromate - G	Sodium chlorate - G	Trimethyl propane - G
Potassium chlorate - G	Sodium chloride - G	Turpentine - G
Potassium chloride - G	Sodium cyanide - G	Urea - G
Potassium cyanide - G	Sodium dichromate - G	Urine - G
Potassium dichromate - G	Sodium fluoride - G	Water - deionized - G
Potassium fluoride - G	Sodium hydroxide 10% - G	Water - distilled - G
Potassium hydroxide - G	Sodium hydroxide 50% - G	Water - demineralized - G
Potassium nitrate - G	Sodium hypochlorite - G	Water - salt - G
Potassium permanganate 10% - G	Sodium nitrate - G	Whiskey - G
Potassium permanganate 25% - G	Sodium peroxide - G	Wines - G
Potassium sulphate - G	Sodium sulphate - G	Xylene - P
Propane liquid - G	Sodium sulphide - G	Yeast - G
Propane gas - G	Sodium sulphite - G	Zinc chloride - G
Propyl alcohol - G	Stannic chloride - G	Zinc nitrate - G
Plating solutions - G	Stannous chloride - G	Zinc sulphate - G
Rochelle salts - G	Starch - G	
Sea water - G	Stearic acid - G	
Selenic acid - G	Sulphur - G	



04 Frequently Asked Questions (FAQ's)

1. What material is the chamber made of?

The collar and cover is made of UV Stabilized ABS - ABS has very high impact strength. The riser and body are made of PP (polypropylene) - this material is very resistant to chemicals. The piping systems for most laboratories use PP as it is able to withstand very strong acids and alkalis. Our chamber has even been tested by SIRIM with hot water flowing through it at 90 degrees Celsius.

2. Why should I use a plastic inspection chamber instead of the normal brick chamber?

Traditional Brick Chamber	Chezy PP Inspection Chamber
Ugly cast iron cover – which rusts after a few years, has no sealing properties and is easily stolen.	Aesthetically pleasing cover (300kg or 1500 kg load). Cover is locked down with 4 stainless steel screws and is sealed by means of a rubber gasket – air and water tight.
Average weight of brick chamber is around 150 – 180 kg, very prone to sinking as it is heavy. It will crack, leak etc when it sinks or when it is used in soft ground.	Weight is only 10kg, will not sink or float as the incoming and outgoing pipes are strong enough to support the chamber. It will not sink
All joints for incoming and outgoing pipes are made with concrete. These joints WILL DEFINITELY CRACK (hair line cracks) as PVC and VCP pipes do not bond to concrete. This leads to leakage, in and out of the brick chamber.	All joints for incoming and outgoing pipes are made with EPDM rubber rings which are UV and Ozone resistant. Minimum life span of 50 years. Tested by SIRIM not to leak at 0.5bar (15 feet head of water) pressure. Rubber ring joints allow for 3° deflection of the pipe and are still water tight.
Bad workmanship and prone to cheating. Inside face of brick chamber is to be plastered with ½ inch thick of high Alumina cement. 99% of contractors use normal cement and skim coat only. Very poor workmanship. Inside face of chamber is very rough and prone to pitting as the corrosive nature of sewage will attack normal cement. Good breeding ground for cockroaches.	Internal surfaces, dimensions etc comply with British Standards. Mirror finish does not allow for breeding of cockroaches. Very, very chemical resistant and does not rust or corrode. Very long life span as PP (Polypropylene) is chemically inert. The Chezy chamber will last longer than the incoming our outgoing pipes. It will last for generations.
Expensive and labour intensive.	Very economical, cheaper by at least RM50 per chamber and takes 60% less time to install than the brick chamber.

3. How many inlets are allowed into the chezy PP Inspection Chamber?

Our chamber comes with five inlets for uPVC pipes (100mm) and it has one outlet. The outlet allows for connection to uPVC, HDPE corrugated pipe or vitrified clay pipes of diameter 150mm.

4. What if there are more than 5 incoming pipes into the chamber?

The Chezy Inspection Chamber can have more inlets by placing an additional body in the chamber. The top layer should be used for gulleys. The overall depth of the chamber will be increased if an additional body is used. Take note that the depth is calculated from the top of the cover to bottom of the base (outgoing pipes). The inlet pipes are 250mm above the outlet pipes.

5. To what maximum depth (buried) can the Chezy Inspection Chamber be used?

It can be used to a depth of 1.25 meters (4 feet) safely.

6. How do we control / adjust the depth of the chamber?

The depth is controlled by cutting the riser (with a saw) at the required depth. The depth of the chamber can be increased by joining the riser with riser with socket; this is done by means of the rubber rings supplied.

7. All joints in the Chezy PP Inspection Chamber are made by rubber rings, will they leak? What is the life span of the rubber rings?

No. The Chezy PP Inspection Chamber has been tested by SIRIM under positive and negative pressures of 0.5 bar (15 feet head of water) and found not to leak. The material used for the rubber rings is EPDM (ethylene propylene diene Monomer (M-class) rubber) which is ozone and UV resistant, this material is used for rubber rings in pressured piping systems and has a minimum life span of AT LEAST 50 years.

8. What is the life span of the Chezy Inspection Chamber?

Plastic does not rot or corrode. The Chezy Inspection Chamber will last for generations. The material used is Polypropylene which is very chemically inert; it can easily withstand ground and household chemicals. The Chezy PP inspection chamber will easily out live the incoming and outgoing pipes.

9. How do we service the Inspection Chamber if there is a blockage?

Unscrew the four stainless steel screws on the cover and lift the cover up. Use a flexible rod to clear any blockages. You can check on our video link for a demonstration on how it is done at our website (<http://www.chezy.com.my>).

10. What load can the cover of the Chezy Inspection Chamber take?

We have 2 types of cover (both are plastic).

- Medium duty – 300kg (not subject to light vehicular traffic – behind the house, garden, etc)
- Heavy duty – 1500kg (subject to light vehicular traffic – in the house drive way)

11. Are the outlets suitable for all kinds of underground pipes?

Yes. Our Inspection Chamber can be used with VC Pipes, uPVC and twin wall corrugated (HDPE) pipes.

12. What if we do not need to use all inlets into the chamber?

The Chezy Inspection Chamber comes with 2 free plugs to blank off unused inlets. Additional plugs can be purchased if more inlets need to be plugged.

13. Your Chamber has a diameter of 315mm. Is this size sufficient for maintenance, etc?

Yes. There is no problem for Roding and the clearance of blockages, etc. Please click on the video link for a demonstration at our website (<http://www.chezy.com.my>).

14. Is there a gradient in the central channel of the chamber?

Yes. There is an in built gradient of 1.5 degrees (1:80). All liquid and waste entering the chamber will easily flow out of the chamber. There will be no backflow of liquid to occur.

15. Do you have a straight through inspection chamber without inlets?

Yes. You can view it at our website (<http://www.chezy.com.my>) and click on the various configuration sections and look at picture No.3.

16. Do we need to concrete surround the frame / collar at the top of the chamber?

In areas not subject to light vehicular traffic, it is not necessary, but it is recommended to have a 2 inches x 2 inches concrete surround for aesthetic appearance, for areas subject to light vehicular traffic, a concrete surround of 6 inches x 6 inches must be used.

17. What type of bedding is required for the Chezy PP Inspection Chamber?

Normal Ground - 100mm layer of compacted granular material (max 10mm particle size) below the central channel of the inspection chamber. High Water Table - The chamber base is to be placed on a 100mm (4inches) concrete slab. Please refer to page 11 and 12 for a more detail information.

18. Do we need to vent the inspection chamber?

Generally, the Chezy PP inspection chamber is meant for buildings up to 4 stories high (where the main stack is 100mm – 4inches in size). The main stack entering the chamber acts as the venting stack and is sufficient to vent the inspection chamber. No additional venting is required.



List of Developers that have used the Chezy PP Inspection Chambers

Sime Darby Properties Bhd
IOI Properties Bhd
Gamuda Land Bhd
Mah Sing Group Bhd
LBS Bina Group Bhd
Paramount Property Development Sdn Bhd
Perbadanan Kemajuan Negeri Selangor (PKNS)
SP Setia Berhad Group
Sunway City Berhad
IJM Land Bhd
UEM Land Holdings Bhd
I&P Group Bhd
Malton Bhd
TTDI Jaya Sdn Bhd
Glomac Berhad
Yuk Tung Development Sdn Bhd
Sagna Development (Subsidiary of Hong Leong Group)
Johor Land Berhad
Subang Alam Sdn Bhd
Fairview Development Sdn Bhd
LEH Construction Sdn Bhd
Impiana Prisma Sdn Bhd
Worldwide Holdings Bhd
YTL Land & Development Bhd
LSL Properties Sdn Bhd
Mentari Properties Sdn Bhd
Projek Perumahan PR1MA



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