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August 2013 WP002

Wavin: Range 315 Inspection Chambers

Product Technical Guide

Contents

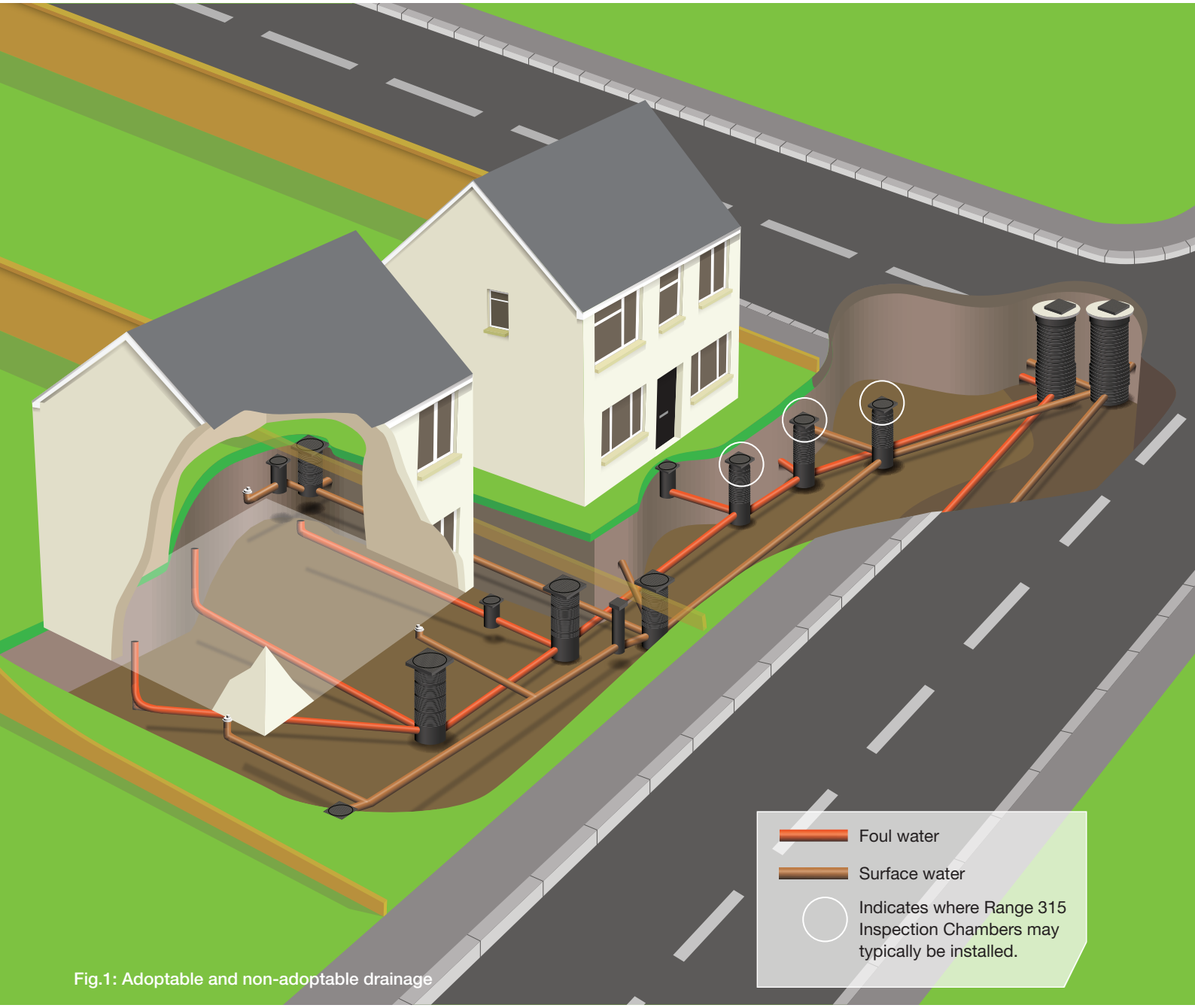


Fig.1: Adoptable and non-adoptable drainage

Adoptable drainage: scope

Lateral drains and sewers that serve two or more properties, and connect to the UK public sewerage network, are now the responsibility of the relevant Water and Sewerage Company [WASC].

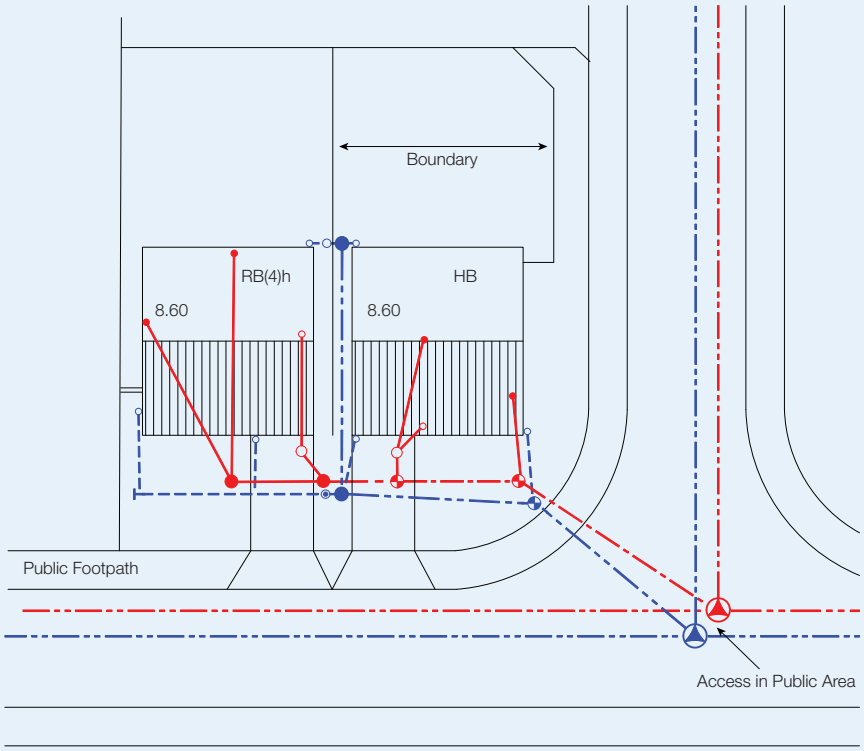
See Figs.1 and 2 for typical layouts according to the principles of Sewers for Adoption 7th edition [SfA7].

For regulations and typical details specifically applicable to Inspection Chambers in adoptable applications, *see pages 4-5.*

Non-adoptable drainage

Drains that only serve individual properties remain the responsibility of each house-holder. These are still subject to Building Regulations Part H1, *see page 4.*

Fig.2: Lateral sewers and drains: typical SfA7 layout example



Key

	Foul Water	Surface Water
Private drain run		
Osma SIC/MBIC (0.6>0.9m deep)		
Osma UIC (<1.2m deep)		
Adoptable Sewer		
Wavin Range 200 (SfA7 – Type 4)		
Wavin Range 315 (SfA7 – Type 4)		
Wavin Range 600 (SfA7 – Type 3)		

New rules for access chambers

Key changes affecting design and specification

Design and installation of inspection chambers in adoptable applications are now subject to the following:

NEW 7th edition of Sewers for Adoption (SfA7) published 2012

SfA7 standardises all relevant performance criteria, newly-defined design detailing, and installation standards for all adoptable drainage networks – including manholes and inspection chambers.

Flexible (plastic) deep inspection chambers now authorised

SfA7 now incorporates Typical Access Chamber Details for flexible material (= plastic) versions of **Chamber Type 4** *(see* **Fig.3***)*.

Rigid traditional concrete chambers are no longer the only authorised type that may be used for adoptable drainage installations down to 3 metres.

NEW standards for chamber design specifications

Inspection Chambers manufactured from plastics are now required to comply fully with BS EN 13598

- **Part 1** – for installations down to maximum 1.2* metres invert depth
- **Part 2** – for installations down to maximum 3 metres invert depth

*NOTE: For chambers with 450mm minimum diameter.
For smaller chambers (min. dia. 190mm) max invert depth is 0.9m.

Chambers for adoptable areas

Typical details

Wavin chambers for Sewers for Adoption (Type 4) installations can fully comply with all relevant specifications within the standard details reproduced here *(see* **Fig.3***)*.

These include requirements for correct installation of covers and frames suitable for the anticipated loading of each location, in accordance with Classifications under BS EN 124.

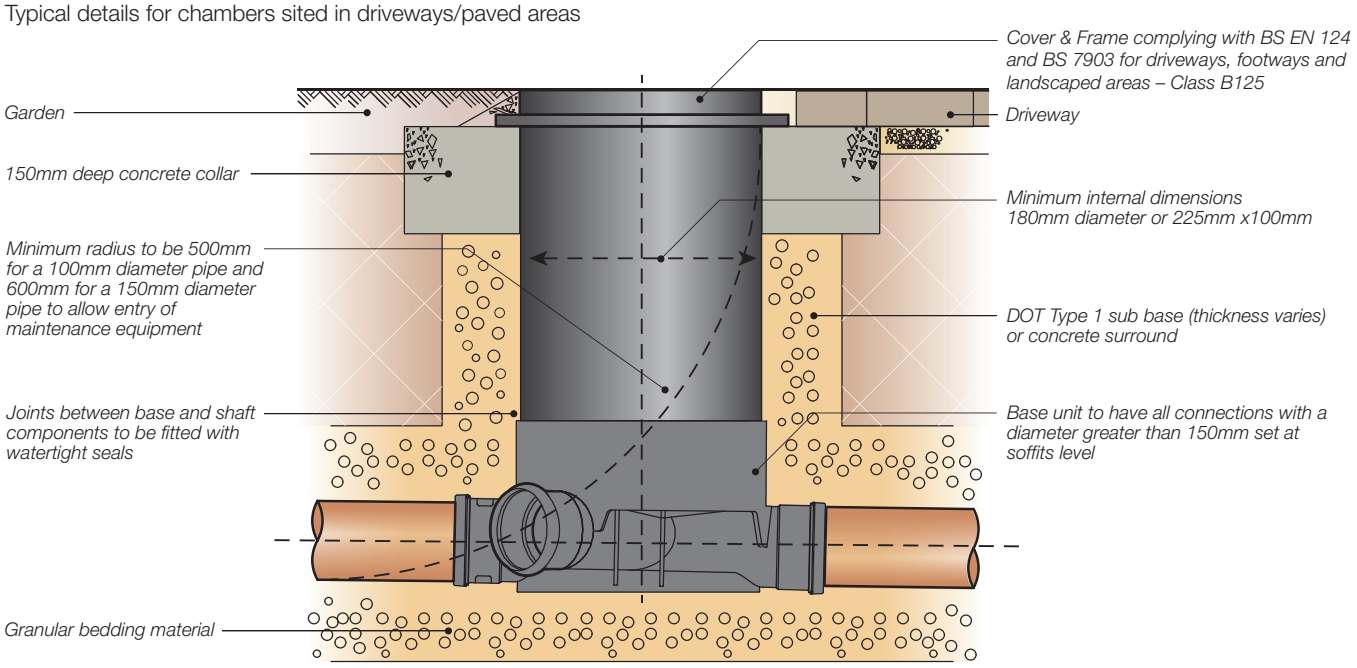
For installation guidance specifically applicable to Range 315 Inspection Chambers, see page 9 – General Installation, page 12 – Backdrops.

For typical details and installation guidance specifically applicable to Covers & Frames options, see pages 10-11.

Fig.3: Typical Access Chamber Detail – Type 4 (Flexible material detail)

Maximum depth from cover level to soffit of pipe 2m, non entry

Typical details for chambers sited in driveways/paved areas



Chambers for non-adoptable areas

Non-adoptable drainage: Building Regulations still apply

For drains that are not part of the newly-extended adoptable areas, Part H1 of the Building Regulations is still applicable.

These include minimum dimensions for circular inspection chambers, and for covers, as follows:

Type	Depth to invert from cover level (m)	Internal size (mm)	Cover sizes	
			Length x width (mm)	Circular (mm)
Shallow	0.6 or less	190*	–	190
	1.2 or less	450	430 x 430	430
Deep	> 1.2	450	300 x 300**	Restricted access to max. 350mm**

** Drains up to 150mm*

*** Size restricted for Health & Safety reasons. Larger openings may be used in conjunction with a restricted access.*

Range 315 Inspection Chambers

Description

315mm diameter polypropylene inspection chambers for adoptable and non-adoptable applications. Compliant with *Sewers for Adoption* 7th edition [SfA7].

Choice of eight base configurations for equal pipe connections.

For use directly with either 110/160mm plastic pipework or 100/150mm clay pipework and for use with 150mm UltraRib systems via the appropriate adaptor.

315mm diameter shaft may be cut to length to achieve required invert up to maximum 2000mm.

Applications

- For above ground access and maintenance inspection of buried pipework up to 2 metres deep
- For loading applications:
  – A15 (1.5 tonnes)
  – B125 (12.5 tonnes) *
  – D400 (40 tonnes) *

  * With cover & frame supported by concrete plinth

Key Dimensions

- Invert depth of base:
  – 238mm [for 110mm system]
  – 290mm [for 160mm system]
- External shaft diameter: 315mm
- Shaft length: up to 2m
- Maximum installation depth: 2m

Key Features & Benefits

- Fast, easy installation: no wet trades
- Lightweight: no lifting equipment required
- Reinforcing ribs on underside to withstand groundwater pressure
- Shaft can be cut to required length
- No additional trench excavation required

Compliance

Range 315 chambers comply with the following standards and regulations

– BS EN 13598-2:2009

– SfA7 Typical Chamber Detail – Type 4: (Non-entry. Maximum depth from cover level to soffit of pipe: 2m)

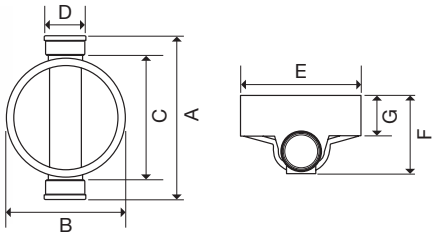
– Building Regulations – Part H1 (shallow only to max. 0.6m depth)

Reinforcing ribs to withstand groundwater pressure

Range 315 chamber assembly

Bases

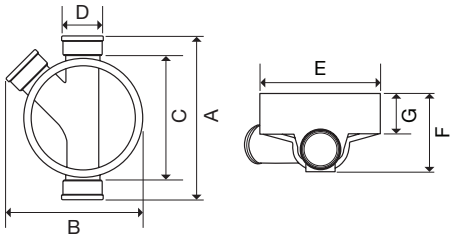
All Range 315 bases are polypropylene and supplied with a base-to-shaft sealing ring.
When used in adoptable applications, maximum invert depth 2m.



D/S Equal Inspection Chamber Base – straight channel only

- 315mm dia. base incorporating straight channel and single inlet
- For use with 110/160mm plastic pipework
- Also for use with 100/150mm clay pipework, using **Adaptor SA15/1** (100mm) or **Adaptor SA15/2** (150mm), or for use with 150mm UltraRib, using **Adaptor 6UR141**

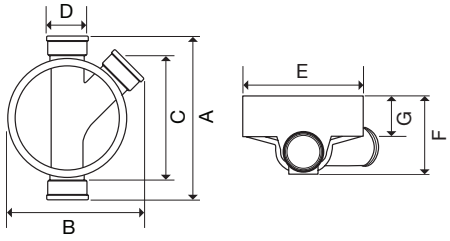
Nominal Size (mm)	Part Number	Dimensions (mm)						
		A	B	C	D	E	F*	G
110	**34NE300**	514	369	387	110	357	238	103
160	**36NE300**	564	369	391	160	357	290	103



D/S Equal Inspection Chamber Base – straight channel with single branch (left)

- 315mm dia. base incorporating straight channel and 2 inlets, including 45° left-hand equal branch inlet
- For use with 110/160mm plastic pipework
- Also for use with 100/150mm clay pipework, using **Adaptor SA15/1** (100mm) or **Adaptor SA15/2** (150mm), or for use with 150mm UltraRib, using **Adaptor 6UR141**

Nominal Size (mm)	Part Number	Dimensions (mm)						
		A	B	C	D	E	F*	G
110	**34NE301**	514	424	387	110	357	238	103
160	**36NE301**	564	495	391	160	357	290	103



D/S Equal Inspection Chamber Base – straight channel with single branch (right)

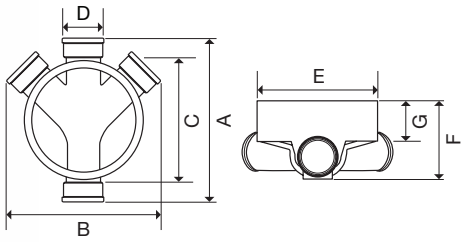
- 315mm dia. base incorporating straight channel with 2 inlets, including 45° right-hand equal branch inlet
- For use with 110/160mm plastic pipework
- Also for use with 100/150mm clay pipework, using **Adaptor SA15/1** (100mm) or **Adaptor SA15/2** (150mm), or for use with 150mm UltraRib, using **Adaptor 6UR141**

Nominal Size (mm)	Part Number	Dimensions (mm)						
		A	B	C	D	E	F*	G
110	**34NE302**	514	424	387	110	357	238	103
160	**36NE302**	564	495	391	160	357	290	103

Range 315 Inspection Chambers Product Details

Bases

All Range 315 bases are polypropylene and supplied with a base-to-shaft sealing ring.
When used in adoptable applications, maximum invert depth 2m.



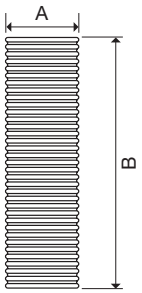
D/S Equal Inspection Chamber Base – straight channel with two branches (left and right)

- 315mm dia. base incorporating straight channel with 3 inlets, including 2 x 45° equal branch inlets
- For use with 110/160mm plastic pipework
- Also for use with 100/150mm clay pipework, using **Adaptor SA15/1** (100mm) or **Adaptor SA15/2** (150mm), or for use with 150mm UltraRib, using **Adaptor 6UR141**

Nominal Size (mm)	Part Number	Dimensions (mm) A	B	C	D	E	F*	G
110	**34NE303**	514	479	387	110	357	238	103
160	**36NE303**	564	622	391	160	357	290	103

*Dimension F = height at centre point of base (all bases have a 15° inlet-to-outlet fall)

Shaft

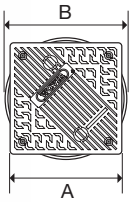


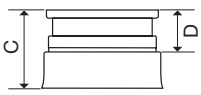
P/E Inspection Chamber Shaft

- 315mm dia. plain-ended corrugated shaft. Length: 2 metres
- For use with all Range 315 bases

Nominal Size (mm)	Part Number	Dimensions (mm) A	B
315	**30NE002**	315	2000

Cover & Frame





Square Cover & Frame – A15 (Polypropylene)

- For non-trafficked/landscaped locations
- Sealed
- For loadings up to 15kN (1.5 tonnes) when supported by a concrete plinth

Nominal Size (mm)	Part Number	Dimensions (mm) A	B	C	D
–	**30NE015**	110	116	72	45

Range 315 Inspection Chambers Product Details

Accessories

Connector Kit

- For connecting 110/160mm plastic pipework to Range 315 Inspection Chamber shaft

Nominal Size (mm)	Part Number
110	NE950
160	NE960

Chamber Shaft Cutter components

- For cutting 110/160mm connection holes to receive plastic pipework in Range 315 Inspection Chamber shaft

Nominal Size (mm)	Part Number
110	NE955
160	NE965

Adaptors for clay pipe

- For connecting 100/150mm clay pipe to chamber base

Nominal Size (mm)	Part Number
100	SA15/1
150	SA15/2

Adaptor for UltraRib pipe

- For connecting 150mm UltraRib pipe to chamber base

Nominal Size (mm)	Part Number
150	6UR141

Spares

Chamber Base to Shaft Seal

- 315mm diameter for use with **30NE002** – at foot of shaft

Nominal Size (mm)	Part Number	Dimensions (mm) dia.
–	30NE200	315

Cover & Frame Seal to Shaft

- 315mm diameter for use with **30NE002** – at top of shaft

Nominal Size (mm)	Part Number	Dimensions (mm) dia.
–	12TW117	315

Screws

- Pack of 4 for securing **30NE015** cover to its frame

Nominal Size (mm)	Part Number
–	30NE205

Square Cover – polypropylene

- Spare for use with **30NE015** frame

Nominal Size (mm)	Part Number	Dimensions (mm)
–	30NE203	106x106

Transportation, handling and storage

Transportation

If chambers are carried on vehicles with a flat bed, ensure that:

- The bed is free from nails and other projections.
- Chambers are adequately secured.

Handling

Range 315 polypropylene chambers are lighter than other, more traditional materials, yet have excellent strength and impact characteristics. So they are easier to handle and less likely to be damaged.

However, to minimise risk of damage:

- Load/unload chambers by hand: avoid use of mechanical handling equipment if possible.
- If mechanical equipment employed, use special hoist equipment with textile straps. Do NOT use metal hooks or chains.
- Do not drop chambers onto hard surfaces or drag them along the ground.

Storage

Store chambers on level ground that is free of stones and sharp objects. Exercise reasonable care to avoid damage prior to their installation.

Installation guidance: chamber and shaft

NOTE: *The following is a summary of installation procedures following selection of a suitable Base for the required number of inlets.*

The Range 315 inspection chamber may be installed in the same minimum trench width as required for standard 110mm or 160mm drainage pipework. NO extension of trench width is required.

All elements are lightweight: may be handled/installed by a single person.

Preparation

- Prepare and compact 100mm regulating bed of granular material in trench bottom.

Positioning/connection

- Position Base on regulating bed. Check outlet is facing in the correct direction.

NOTE: *On 34NE300/36NE300 Straight Bases, a flow indication arrow is inscribed*

- Ensure all inlets/outlet are free from dirt or grit.
- If connecting to 100/150mm clay pipework or 150mm UltraRib, insert the appropriate adaptors into the required inlet/outlet as follows:
  – 100mm Clay use Adaptor SA15/1
  – 150mm Clay use Adaptor SA15/2
  – 150mm UltraRib use Adaptor 6UR141
- Use standard jointing sequence to connect 100/110mm or 150/160mm pipes to inlets/outlet. Push Blank-off Plugs into any unused inlets.

NOTE: *The main through channel MUST be used. Bends up to 45° may be used on any inlet or outlet.*

Backfill

- Using same material as bedding, backfill around Base in 150mm layers up to underside of shaft socket. Ensure inside of Base is free of debris.

Preparing shaft

- Cut corrugated shaft to approx. Invert depth of Chamber.
  RECOMMENDATION: leave extra 300mm depth to allow for possible final site changes.
- Locate sealing ring between 2nd and 3rd ribs from shaft bottom. Ensure ring is seated correctly/not twisted.

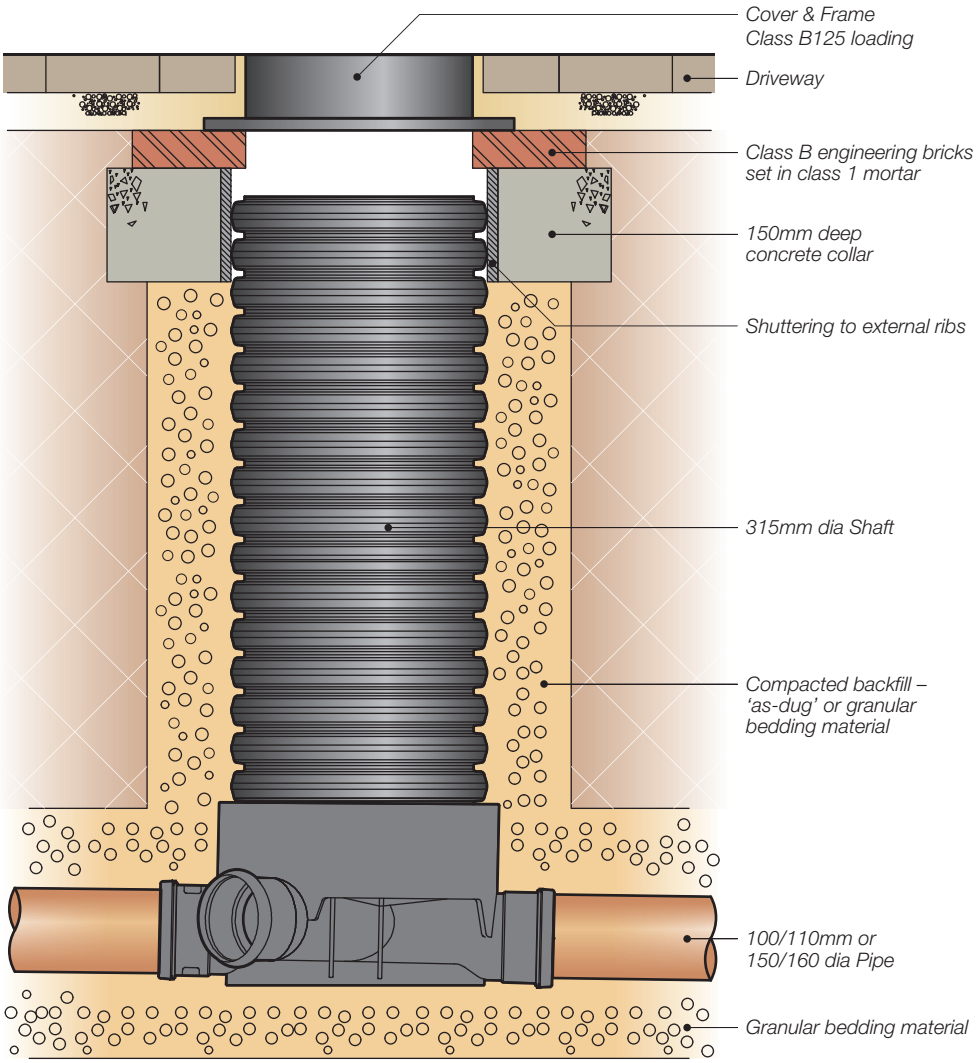


Fig. 4: Typical installation detail: Range 315 Inspection Chamber. Type 4.

- Clean inside of Base socket and lubricate this entire area.
- Position shaft at 45° angle into Base socket. Vertically push home manually or, if required, with mechanical assistance (if so, protect top of shaft).

Backfill trench

- Before starting backfill, cover top of shaft with cap provided.

Trafficked application (e.g. roadway)

- Follow Highway Specification: use Type 1 or similar backfill, and compact.

Non-trafficked application (e.g. garden area)

- Use "as-dug" material (*excluding* stones >40mm dia., frozen or vegetable matter) in 300mm layers. Tamp mechanically around full circumference of Base so that current conditions re ground and water table, and anticipated future loading, can be supported.
  RECOMMENDED SPD LEVELS:
  – Green areas 90%
  – Paved areas/limited traffic load 95%
  – Roads/heavy traffic loads 98%
- Avoid knocking shaft during backfilling – and keep free of debris.
- Backfill to formation level. Then trim shaft to required height using fine-toothed saw.

NOTE: *If finished ground level is not yet known, leave shaft proud of surface and keep open end covered until final completion.*

Installation guidance: A15 cover and frame

Use the appropriate Cover and Frame to suit application area/function:

A15 – non-loaded green/landscaped areas only accessible to pedestrians and bicycles

B125 – paved areas with limited traffic load, where heavy vehicles do not have access

D400 – roads with heavy duty traffic loads

A15 polypropylene cover and frames

30NE015 uses a dual fixing system for additional safety. The cover is pre-fixed to the frame using screws.

RECOMMENDATION: use self-tapping screws [not supplied] to secure the frame to the shaft.

For installation in areas not subject to loading, such as domestic gardens, no concrete plinth support is required. *(See* **Fig. 5***)*.

For A15 applications subject to occasional/ temporary vehicle loading up to 15kN (1.5 tonnes) such as domestic driveways, the frame should be supported by a concrete plinth. *(See* **Fig. 6***)*.

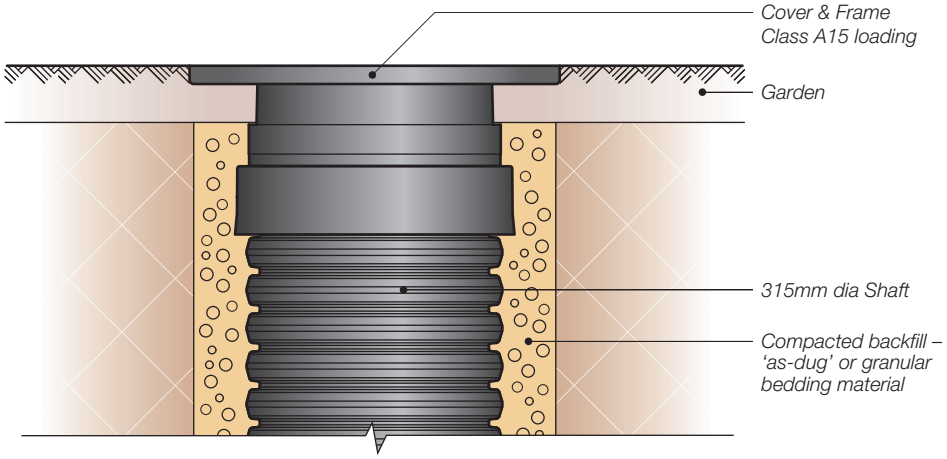


Fig.5. Installation detail – green areas (non-loaded)

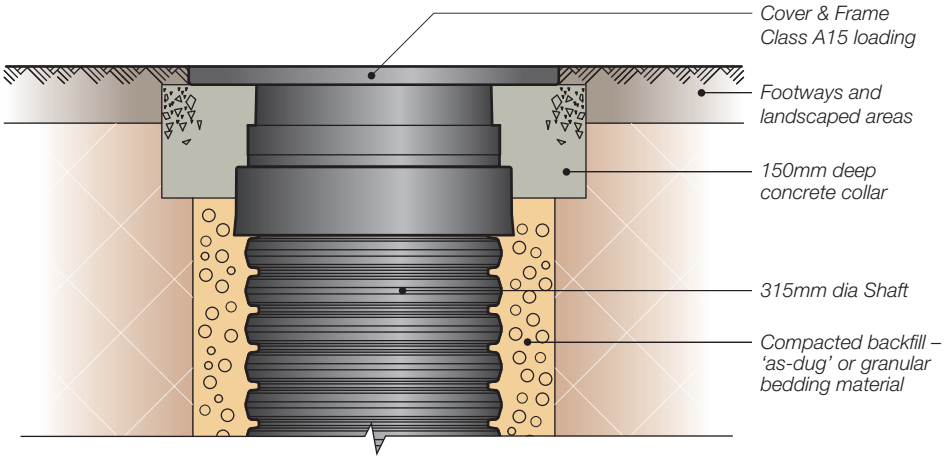


Fig.6. Installation detail A15 – areas subject to occasional vehicle loading up to 15kN (1.5 tonnes)

Installation procedures:

For green areas and pedestrian areas NOT* subject to vehicle loading *(See* Fig.5*)*

EXAMPLE: domestic gardens

- Trim shaft section at last stage of construction. Ensure unit is at correct height.

*For A15 applications subject to occasional vehicle loading up to 15kN (1.5 tonnes) *(See* Fig.6*)*

EXAMPLE: domestic driveways

- Leave top 150mm of shaft clear of backfill.
- Lay 150mm thick slab of pre-cast or in situ concrete around top of shaft chamber

For all A15 applications

- Clean outside of shaft section between first and second rib.
- Locate sealing ring ensuring it is seated correctly/not twisted.
- Prepare polypropylene A15 Cover and Frame [**30NE015**] for installation onto shaft:
  – clean inside of frame socket area
  – apply lubricant to entire surface area.
- Position the cover and frame socket over the shaft section and push home.
- Screw frame to shaft using self-tapping screws [not provided].

Installation guidance: B125 & D400 cover and frame

Ductile iron cover and frames

Ductile iron options are recommended for heavier loaded applications:

Class **B125** – with medium duty loading capacity of 125kN (12.5 tonnes) where the frame is supported by a concrete plinth. Suitable for applications such as car parks and service roads.

Class **D400** classification – with loading capability of up to 400kN (40 tonnes) where supported by a concrete plinth. Suitable for carriageways and roads subject to motor vehicle trafficking.

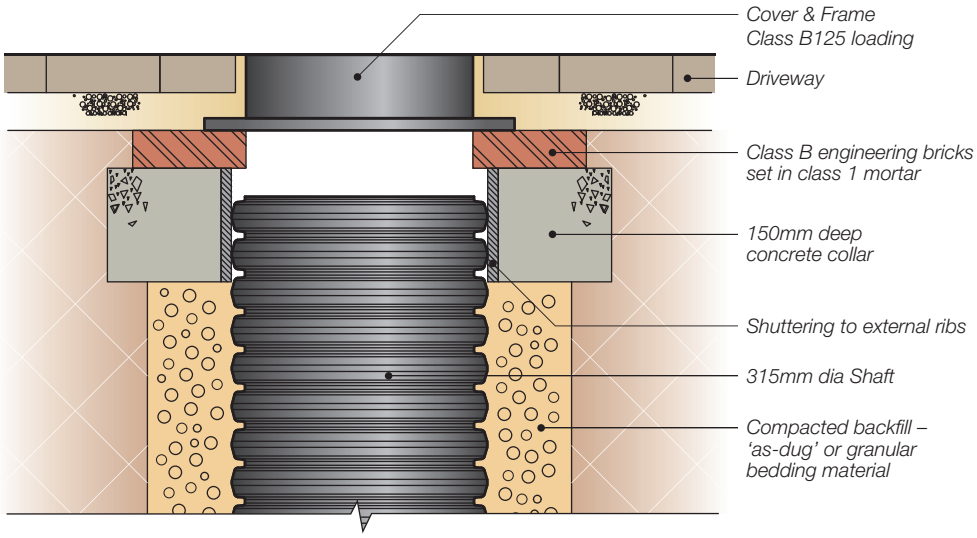


Fig.7. Installation detail for B125 loading: paved areas with limited traffic load and for D400 loading: roads with heavy traffic loads

Installation procedures:

For B125 applications *(See* **Fig.7***)*

EXAMPLE: car parks and service roads

and for D400 applications

EXAMPLE: roads with heavy traffic loads

- Trim shaft section at last stage of construction. Ensure unit is at correct height.
- Protect shaft from traffic loading by shuttering its external ribs.
- Lay 150mm thick slab of pre-cast or in situ concrete around top of shaft chamber with minimum opening 450mm x 450mm – or 450mm diameter – to ensure that any loads are distributed away from the shaft.
- On top of slab, construct Class B engineering brickwork OR concrete blocks OR pre-cast concrete seating rings up to required height.
- According to required loading application, position Ductile Iron B125 Cover and Frame or D400 Cover and Frame on top of slab. *(See* **Fig.7***)*

Installation guidance: backdrop connections

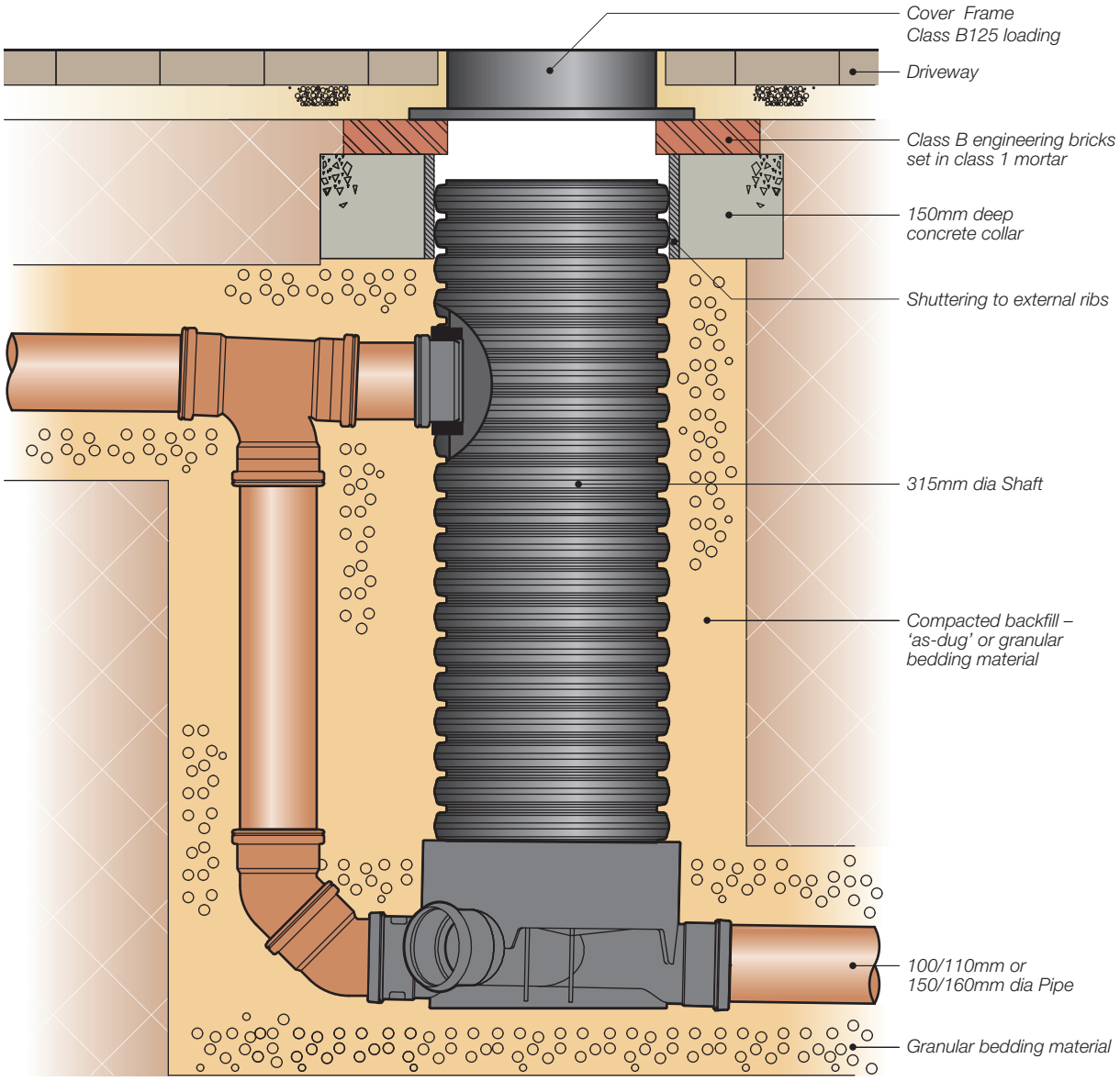


Fig.8. Installation detail – typical backdrop situation

Installation of backdrop connections

A chamber which has substantially different invert levels will require backdrop connection of one or more drains. This operation can be done externally on site. *(See* **Fig.8***)*

Use a combination of Backdrop Kit [**NE950** or **NE960**], with associated 100/110mm or 150/160mm fittings, for in situ connection to a 315 shaft, as follows:

- Drill required opening into corrugated shaft section at appropriate place
- Clean and remove any swarf from the opening
- Install the special 110mm or 160mm seal into the opening
- Fully lubricate around the entire internal surface of the seal
- Insert specially designed "in-situ" socket connector into the seal opening
- Lubricate the outside surface of the spigot pipe to be connected and insert into the socket connector
- Make remaining connections in the same way as for standard jointing of 110mm or 160mm pipes and or fittings

Testing

All testing of these non-man entry chambers and connecting pipework must be undertaken at ground level.

For guidance, please use the following:

Air Testing using remote test bags: equipment required

- 3 x 1 metre x 8mm Steel Drainage Rods
- 50mm Double Worm Screw for use with Steel Drainage Rods
- PVC sealing bags fitted with Schrader Valve and 6 metre hose.
- Steel drain plug with testing point
- Bicycle Pump
- Tyre pressure gauge to ensure correct inflation pressure of the test bags.

Air Testing procedure

1. Assemble drain rods to 2 metres in length with double worm attachment on end.
2. Remove as much air as possible from the PVC Sealing Bag.

   Method: hold valve open and squeeze bag flat.

   Tip: folding the bag in half to make it as small as possible will make it easier to locate.
3. Twist neck of PVC Sealing Bag into double worm attachment until it has firm grip on bag.
4. Ensure valve end of hose is secure with no danger of falling down the chamber.
5. Hold drain rods and hose from the PVC Sealing Bag together. Start to lower the test bag into the base.

   Tip: Keep hose tight while lowering bag. This helps to keep bag in place.
6. When bag is in chamber base, position it into the channel of the run to be tested.
7. By using the channel as a guide, slide test bag into the mouth of the pipe, and as far as possible into the pipe.

   Method: use rods to push bag into position.
8. Leave rods attached (this ensures bag is held in position). Start to pump the bag up using a bicycle pump.

   NOTE: When inflating the test bags, follow manufacturer's instructions to ensure pressure is not exceeded. Use tyre pressure valve to monitor bag pressure.
9. If required, remove rods by twisting them in an anti-clockwise direction to release the double worm. Check the valve end of hose is safely positioned.
10. Place a similar sealing bag or a steel drain plug at the other end of the pipe length to be tested.

    (This could be another chamber or a terminal access point.) Both bag and steel drain plug must include a suitable testing point.
11. Attach a manometer. Carry out required air test method.
12. Remove sealing bag

    Method: twist double worm attachment around the hose at ground level. Lower it down the hose, guiding the rods to the bottom of the chamber and once again grip the bag.

    NOTE: No requirement to grip bag tightly. This is simply to aid its removal.

    Release as much air as possible from bag. Then slide bag back out the pipe with the rods.

    When this is done, lift/remove all test equipment out of the chamber.

Maintenance

As with all Wavin Chambers, the smooth interior bore of chamber channels and associated pipe systems will aid the flow of water and waste through the system.

Because man-entry of Wavin chambers is not possible, maintenance work such as Rodding, Jetting and CCTV inspection must be undertaken at ground level.

Always follow the Health & Safety and Operational procedures of equipment suppliers.

Wavin Chambers

Comprehensive choice

Wavin Range 315 is part of a comprehensive portfolio of inspection chambers that can provide the optimum solution for every adoptable and non-adoptable situation.

Base Type	Max Invert Depth* (m)	Base Dia. (mm)	SfA7 Type	No. of Inlets			Inlet Sizes (mm OD)				
				1	2-3	4-5	100/110	150/160	160	225	300
Shallow	0.6	250	4*		●		○				
Multi-Base	0.9	300	4*		●		○				
Mini-Access	0.9	315	4		●		○				
Universal	1.2	450	4*		●	●	○	○	○		
PPIC	1.2	475	4		●	●	○	○	○		
Range 200	2.0	200	4	●			○		○		
Range 315	2.0	315	4	●	●		○		○		
Range 450	3.0	450	3, 4	●	●	●	○	○	○		
Range 600	3.0	600	3, 4	●	●			○		○	○

*** NOTE:** *Maximum invert depths shown are for individual base types.*
Under SfA7 and Building Regulations, maximum permitted depth can be less.

Wavin total solutions

Wavin systems are integrated to provide a total solution for above and below ground drainage, water management, plumbing and surface heating and cooling for the Building and Construction markets.

Wavin is Europe's leading supplier of effective solutions for essential needs of daily life: safe distribution of drinking water; sustainable management of rainwater and waste water; energy-efficient heating and cooling for buildings.

Associated systems

Contact Wavin Technical Design Department for further details regarding:

- Below Ground Drainage systems
- Surface Water Drainage systems
- Stormwater Management systems

Other Wavin systems

- Hep$_2$O Flexible Plumbing system
- Hep$_2$O Underfloor Heating and Cooling systems
- Rainwater systems
- Soil & Waste systems

Technical advice and further Information

Our Inspection Chambers are backed by Wavin's comprehensive technical advice service. This is available to provide expert assistance at every stage of a project, from planning and product selection to installation and maintenance.

Contact Wavin Technical Design Department:

Tel: **0844 856 5165**

Fax: **01249 766653**

Email: **technical.design@wavin.co.uk**

or via online enquiry at **www.wavin.co.uk**

Wavin: Range 315 Inspection Chambers

Product Technical Guide

Wavin provides effective solutions for essential needs of daily life: safe distribution of drinking water; sustainable management of rainwater and waste water; energy efficient heating and cooling for buildings.

Wavin's European leadership, local presence, commitment to innovation and technical support, all benefit our customers. We consistently achieve the highest sustainability standards and ensure total reliability of supply to support our customers to achieve their objectives.

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