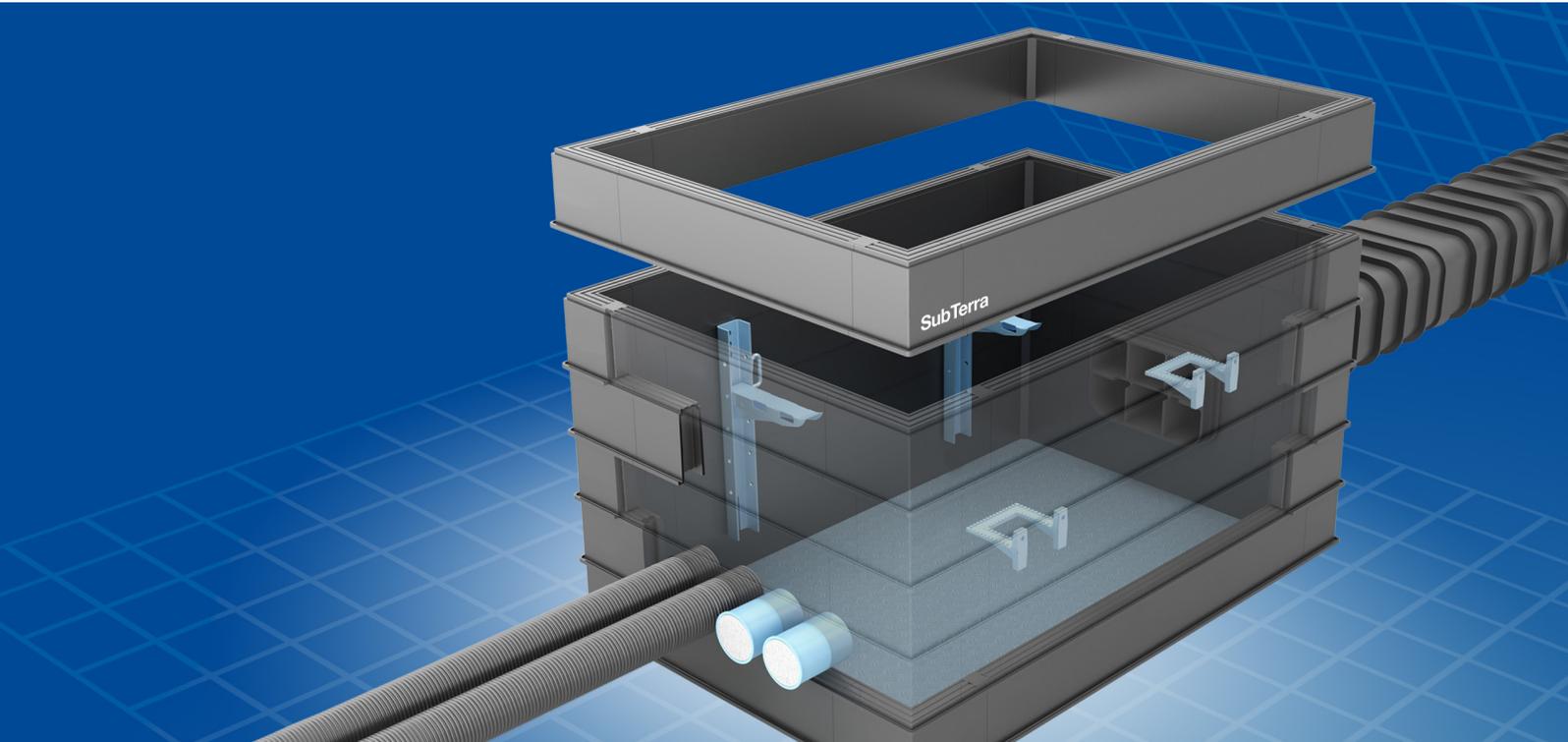


SubTerra Axess-PP



Installation Guide

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This document is a general installation guide for SubTerra Axess-PP, please contact us at civilsenquiries@polypipe.com if you require any further information.

Introduction

The correct installation of the SubTerra Axess-PP chamber system is detailed in this guide. The guide is a general outline of the installation, this may vary slightly each time due to site conditions and project specifications. Polypipe reserves the right to review and update this document as required.

Please contact Polypipe to discuss and agree any changes that may be required to the recommended installation on site.

Installation Classification Guidance

This installation guide is for the SubTerra Axess-PP chamber system for installation in areas classed as Groups 1, 2, 3 or 4 in accordance with European Standard BS EN 124:2015

Group 1: A15 Classification

Areas which can only be used by pedestrians and pedal cyclists.

Group 2: B125 Classification

Pedestrian areas and comparable areas, car parks or parking decks.

Group 3: C250 Classification

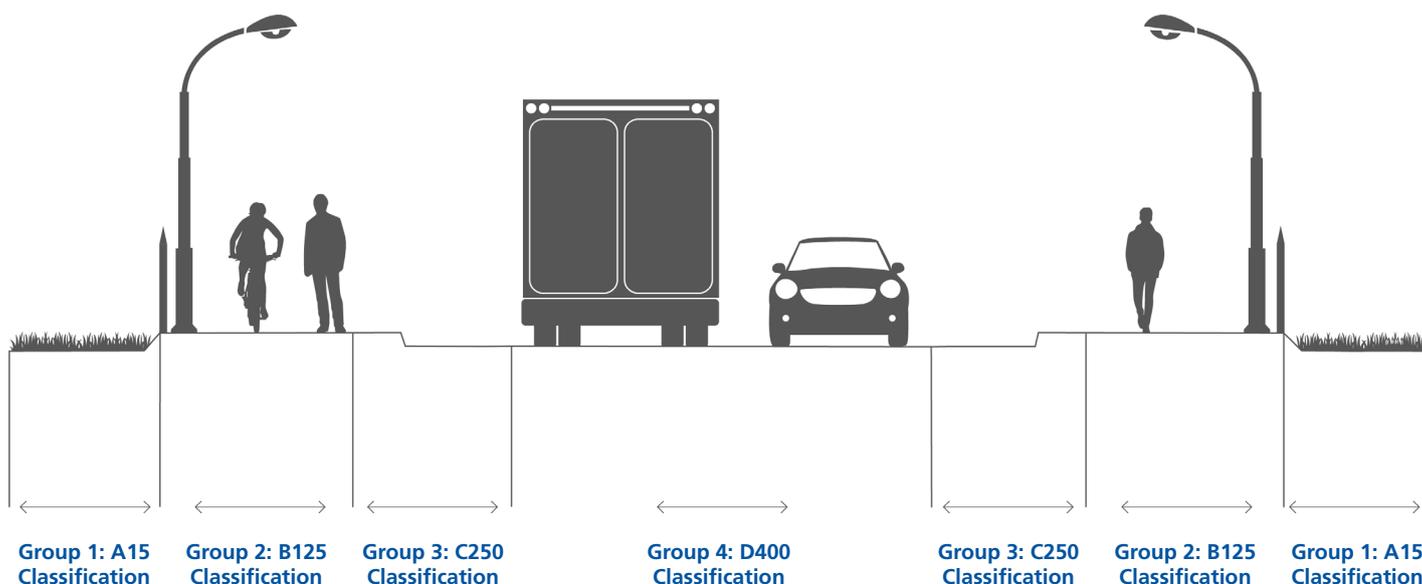
Areas which when measured from the kerb edge extend a maximum of 0.5m into the carriageway and a maximum of 0.2m into the pedestrian area.

Group 4: D400 Classification

Carriageway of roads (including pedestrian streets), hard shoulders and parking areas for all types of road vehicles.

This means that Subterra Axess-PP chambers can be situated in either pedestrian areas or the road, depending on how they are installed and the specification that they follow. Both of these situations are addressed and covered within this document.

Diagram 1



Equipment and Materials

To effectively install SubTerra Access-PP, you will need additional equipment and materials as listed below.

Materials

- Base materials as shown in Table B.
- Bedding materials such as mortar cement or epoxy resin bedding mortar.
- Backfill materials as shown in Table B.

Equipment

- Equipment for excavating a hole; pneumatic hammer, digger etc. Depending on the condition of the ground and location the chamber is being installed into.
- Shovel.
- Means of compacting the material surrounding the chamber and the base.

Please refer to the Specification for the Reinstatement of Openings in Highways - Table A8.1 (Page 10 of this document)

- Handsaw
- Measuring tape
- Floats and trowels for working and finishing cement and concrete.
- Drill bits if required to move any furniture positions.
- Spirit level and straight edge.
- Power drill and hole saw to suit duct diameter and chamber wall thickness if required.

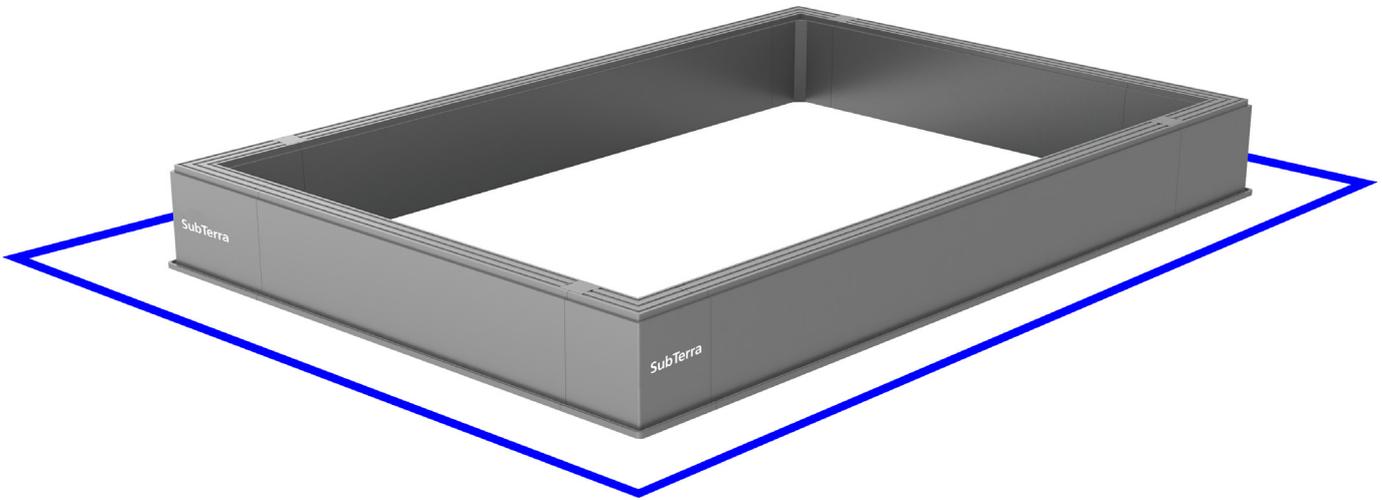
Health and Safety

- Contractor should have Risk Assessment and Method Statement for the works being carried out.
- Appropriate PPE should be worn on site relative to the task being carried out.
- Any interface with public access should be signed and guarded in accordance with the Safety at Street Works and Road Works code of practice (NRSWA 1991) or equivalent standard.
- Extreme care should be taken at all times when excavating, procedures should be put in place to protect all existing services.

Chamber Installation Process

Excavation

- Place the chamber on the location you wish it to be installed and mark the ground around it, allowing for backfill minimum thickness as stated later in table B, or the width of the compaction plant, whichever is greater.



Mark a line around chamber for excavation footprint.

- Excavate to the required depth, remember to allow for the depth of the base required and the depth of the cover & frame with bedding mortar as well as the overall chamber depth.

Base

- Make sure the bottom of the excavation is firm by using suitable compaction equipment. Any soft spots should be removed. Some chamber installations will require a concrete base and some will only require a compacted Type 1 granular base, this is normally dependent on the location and loading expected on the chamber. Ensure the base is firm and level for the chamber to be installed. A piece of pipe may need to be set in the base to form a soakaway or drainage connection.

- It is important to spend the time to get the base right as mistakes at this stage with the depth / level will only lead to problems later in the process.

- Once the base is done you can now start to install the chamber sections. They are 150mm deep and stack on top of each other. You need to gently tap the section down onto the one below to ensure it locks together properly.

- Always ensure the vertical joints are staggered like brick-work on each separate ring that is installed. The chambers sent out will have different size corner pieces to allow for alternate rings to be installed and this will ensure the entire chamber has staggered vertical joints. Build the chamber up to the required height by using the appropriate number of rings and always allow for the final cover & frame and bedding mortar.

Chamber Installation Process

Duct Entries

- We recommend using a good quality drill and bi-metal hole saw to make appropriate size duct entry holes in the chamber. Always check the outside diameter of your duct and drill the hole slightly bigger. Bellmouths can be supplied if required.
- Leave a minimum of 30mm gap between duct entries and 50mm away from internal corner of chamber.

DUCT ENTRIES AND CHAMBER ASSEMBLY



Chamber Installation Process

Wall Accessories

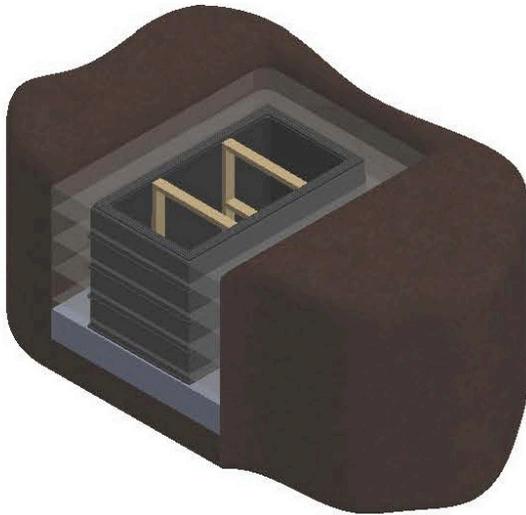
- Install any Cable Management Brackets / Bearers and Step Irons at this stage and prior to backfilling. Drill holes in the chamber wall where required and bolt through the cable management / step accessories using the backplate supplied as necessary.

Backfilling

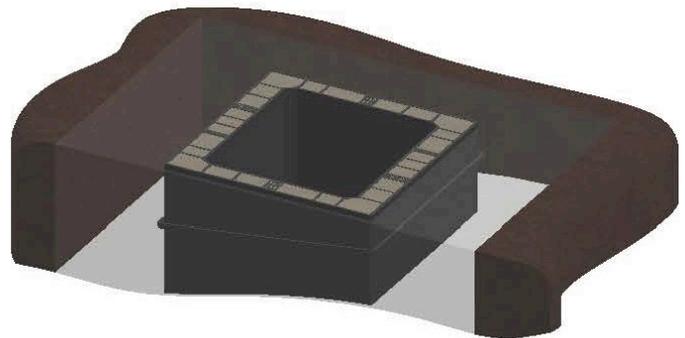
When the chamber is fully installed to its required depth, wall accessories fitted and duct entries formed, the backfill surround of the chamber can go ahead. Care should be taken when backfilling and compacting around the chamber. See Table B for correct backfill materials to be used. Some larger sized chambers will need internal bracing to protect the long sidewall during the backfill process. Backfill material should be placed carefully and evenly around all four sides of the chamber and in layer thicknesses relative to the compaction equipment being used. See Table A8.1.

Please refer to the "Specification for the Reinstatement of Openings in Highways - Appendix A8" for the number of passes and layers required for each material and compaction method used.

BACKFILLING AND FINISHING TOUCHES



Example of bracing in a larger sized chamber



Example of a 600 x 600mm chamber

Chamber Installation Process

Covers & Frames

The cover & frame can be installed once the chamber is backfilled fully.

Remove the cover and set aside safely. Use the frame to check the finished levels. Position the frame on top of the chamber and check the level with the finished ground level, the top of the Frame should be approx 10mm - 30mm below the finished ground level, this is to allow for bedding mortar between the top of the chamber and the underside of the frame.

Once all levels are checked, remove the frame and place the approved bedding mortar material all around the top ring of the chamber to the required thickness. If necessary, use a screwdriver or similar to prise down the external grout lugs around the corners of the frame to a horizontal position for setting into the mortar bedding and haunching of the frame.

Position the frame carefully on to the mortar bed, making sure the inside faces of the frame are in line with the edges of the chamber. This should happen automatically if using a rising frame.

To level the frame, gently tap the frame into the mortar bed until the desired level is achieved, checking the frame is still in a coplanar state.

Remove excess mortar that has entered the chamber, and trowel mortar over exterior grout lugs/flanges at a 45° angle away from the frame.

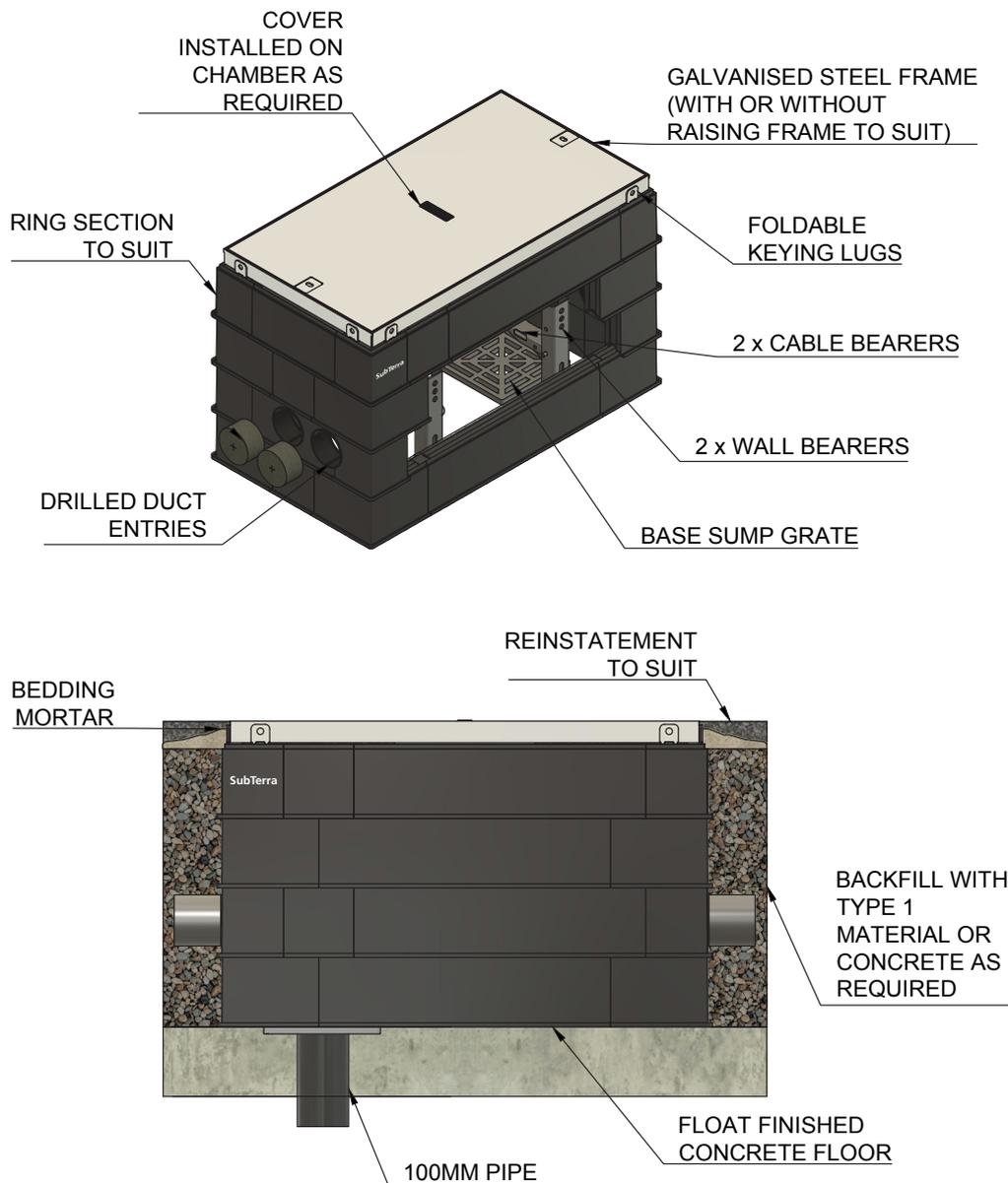
Once the bedding mortar has cured sufficiently, the covers can be placed inside the frame. For carriageway locations and / or where quicker installations are required, an epoxy resin mortar or similar could be used.

Reinstatement

- Reinstatement the finished surface around the chamber and cover.



Typical SubTerra Chamber Installation Detail



INSTALLATION NOTES (APPLICABLE TO ALL SIZES):

1. Reinstatement to comply with the requirements of the New Roads and Street Works Act (subject to category).
2. All duct ends to be finished with bellmouth where required or finished 50mm from edge of interior wall.
3. All materials and workmanship to be in accordance with the specification.
4. Refer to Table B for base requirements. Any concrete base slab to be placed, tamped and surface finished.
5. Duct entries vary in number, grouping and orientation. Duct entry positions should be checked prior to construction.
6. Draw lines shall be secured inside chambers by tying off to a suitable fixture or by tying to an approved batten.
7. Refer to Table B for backfill requirements.
8. For full build guidelines, please refer to all other information in this Installation Guide.

Table A8.1 Specification for the Reinstatement of Openings in Highways - Compaction requirements for granular, cohesive and cement bound materials

Compaction plant and weight category	Cohesive material (less than 20% granular content)			Granular material (20% or more granular content including cement bound material)		
	Minimum passes/lift for compacted lift thickness up to			Minimum passes/lift for compacted lift thickness up to		
	100mm	150mm	200mm	100mm	150mm	200mm
Vibrotamper						
50kg minimum	4	8#	NP	4	8	NP
Vibrating Roller Single Drum						
600 - 1000 kg/m	NP	NP	NP	12	NP	NP
1000 - 2000 kg/m	8	NP	NP	6	NP	NP
2000 - 3500 kg/m	3	6	NP	3	5	7
Over 3500 kg/m	3	4	6#	3	4	6
Twin Drum						
600 - 1000 kg/m	NP	NP	NP	6	NP	NP
1000 - 2000 kg/m	4	8	NP	3	6	NP
Over 2000 kg/m	2	3	5#	2	3	4
Vibrating Plate						
1400 - 1800 kg/m ²	NP	NP	NP	5	NP	NP
Over 1800 kg/m ²	3	6	NP	3	5	7
All Above Plant	For maximum and minimum compacted lift thickness see Specification for the Reinstatement of Openings in Highways Table A2.5					
Compaction of small excavations and narrow trenches must comply with Specification for the Reinstatement of Openings in Highways S6.5						
Vibrotamper 25kg minimum	Minimum of 6 compaction passes Maximum of 10mm compacted lift thickness					
Percussive Rammer 10kg minimum						
<p>Notes for Table A8.1:</p> <p>1) NP = Not Permitted.</p> <p>2) # = Not Permitted on wholly cohesive material i.e. clay and/or silt with no particles > 0.063mm.</p> <p>3) Single drum vibrating rollers are vibrating rollers providing vibration on only one drum.</p> <p>4) Twin drum vibrating rollers are vibrating rollers providing vibration on two separate drums.</p> <p>5) Hydraulically bound materials must be compacted in accordance with Specification for the Reinstatement of Openings in Highways A10.2</p>						

Table B

EN 124 Group	Recommended Minimum Cover Class*	Maximum Chamber Depth (mm)	Excavation Footprint	Base Material	Backfill
1	A15	2400	150mm or width of compacting equipment**	50mm of compacted stone (MOT1)	Sidewall length < 1500mm: as dug (if granular) is suitable, otherwise compacted MOT1 stone. Sidewall length of 1500mm: compacted MOT1 stone.
2	B125	2400	150mm or width of compacting equipment**	150mm of lean mix concrete (C30)	Sidewall length < 1200mm: as dug (if granular) is suitable, otherwise compacted MOT1 stone. Sidewall length 1200mm to 1500mm: compacted MOT1 stone.
3	C250	2400	150mm or width of compacting equipment**	150mm of lean mix concrete (C30)	Sidewall length < 1000mm: as dug (if granular) is suitable, otherwise compacted MOT1 stone. Sidewall length 1000mm to 1500mm: compacted MOT1 stone.
4	D400	2400	200mm or width of compacting equipment**	200mm of lean mix concrete (C30) reinforced with A393 mesh.	Sidewall length < 800mm: as dug (if granular) is suitable, otherwise compacted MOT1 stone. Sidewall length 800mm to 1500mm: compacted MOT1 stone.

* Cover class refers to the recommended minimum cover & frame for the EN124 group.

Maximum Chamber Depth is excluding height of cover & frame. If installing chambers beyond the depth specified, please contact Polypipe for further information.

** Whichever is greater.

Backfill requirements are as per EN124 Group, see Diagram 1 for reference.

The backfill conditions are related to where the chamber is installed (EN124 Group).

SubTerra Axxess-PP chambers can be utilised in areas subject to E600 or F900 loading criteria. Please contact the Polypipe Technical Team on 01509 615100 to confirm installation requirements in advance of any works being undertaken.

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SubTerra Axess-PP

Installation Guide



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