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United Kingdom

appointed according to Article 29 of Construction Products Regulation 2011 as amended by the Construction Products (Amendment etc.) (EU Exit) Regulations 2019 and the Construction Products (Amendment etc.) (EU Exit) Regulations 2020

## UK Technical Assessment

**0843-UKTA-24/0039**  
of 30/09/2024

### Technical Assessment Body Issuing the UKTA:

UL International (UK) Ltd

### Trade name of the construction product

Astro HPE Sealant

### Product family to which the construction product belongs

Fire Stopping and Fire Sealing Products – Penetration Seals

### Manufacturer

Astroflame Fireseals Ltd  
Unit 8, The I.O. Centre  
Stephenson Road  
Segensworth  
Fareham  
Hampshire  
PO15 5RU

### Manufacturing plant(s)

A/008

### This UK Technical Assessment contains

49 pages including 2 Annexes which form an integral part of this assessment.

### This UK Technical Assessment\* is issued, on the basis of

EAD 350454-00-1104, September 2017

Translations of this UK Technical Assessment in other languages shall fully correspond to the original issued document and should be identified as such.

Communication of this UK Technical Assessment, including transmission by electronic means, shall be in full. However, partial reproduction may be made, with the written consent of the issuing Technical Assessment Body. Any partial reproduction shall be identified as such.

\* in accordance with Construction Products Regulation 2011 as amended by the Construction Products (Amendment etc.) (EU Exit) Regulations 2019 and the Construction Products (Amendment etc.) (EU Exit) Regulations 2020

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## I. SPECIFIC PARTS OF THE UK TECHNICAL ASSESSMENT

### 1 Technical description of the product

- 1) Astro HPE Sealant is an acrylic based graphite sealant used to reinstate the fire resistance performance of wall and floor constructions where they have been provided with apertures for the penetration of single or multiple services.
- 2) Astro HPE Sealant is gun applied to annular space around the service(s) to the required depth (for details see Annex C)
- 3) Astro HPE Sealant is supplied in 330ml cartridges and 400ml foils.
- 4) Astro HPE can be installed in conjunction with Astro Batt in accordance with UKTA-24/0040.

### 2 Specification of the intended uses of the product in accordance with the applicable UK Assessment Document (Pre-Exit European Assessment Document): EAD 350454-00-1104: 2017

Detailed information and data is given in Annex A.

- 1) The intended use of Astro HPE Sealant is to reinstate the fire resistance performance of rigid and flexible walls and rigid floor constructions where they are penetrated by various cables, cable trays and plastic and insulated metallic pipes.
- 2) The specific elements of construction that the system Astro HPE Sealant may be used to provide a penetration seal in, are as follows:
  - Rigid walls: The wall must have a minimum thickness of at least 100 mm and comprise concrete, aerated concrete or masonry, with a minimum density of 650 kg/m<sup>3</sup>.
  - Rigid floors: The floor must have a minimum thickness of at least 150 mm and comprise concrete, aerated concrete or masonry, with a minimum density of 650 kg/m<sup>3</sup>.
  - Flexible walls: The wall must have a minimum thickness of at least 100 mm and comprise timber or steel studs lined on both faces with minimum 2 layers of 12.5 mm thick, gypsum boards according to EN 520. In timber stud walls, no part of the penetration shall be closer than 100 mm to a stud, the cavity must be closed between the penetration seal and the stud and minimum 100 mm of insulation of class A1 or A2 according to EN 13501-1, is provided within the cavity between the penetration seal and the stud.

The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.

- 3) The Astro HPE Sealant may be used to provide a penetration seal with plastic and insulated metallic pipes, and cables and cable trays (for details see Annex C).
- 4) The total amount of cross sections of services (including insulation) should not exceed 60% of the penetration area.
- 5) The Astro HPE Sealant may be used to seal apertures in the wall separating element up to 100mm wide by 300mm high. The Astro HPE Sealant may be used to seal apertures in the floor separating element up to 250mm wide by 250mm high. The minimum permitted separation between adjacent seals/apertures is 200mm.
- 6) Pipes must be installed singular, cables require no minimum separation.

- 7) Services in walls and floors shall be supported at the distances specified in Annex C from the face of the separating element.
- 8) The provisions made in this UK Technical Assessment are based on an assumed working life of the Astro HPE Sealant of 10 years, provided that the conditions laid down in the product data sheet for the packaging/transport/ storage/installation/use/repair are met. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.
- 9) Type Z<sub>1</sub>: Intended for use in internal conditions with humidity equal to or higher than 85% RH excluding temperatures below 0°C, without exposure to rain or UV.

### 3 Performance of the product and references to the methods used for its assessment

Product-type: Sealant (reactive)		Intended use: Penetration Seal
Basic requirement for construction work	Basic Requirement	Basic requirement for construction work
<b>BWR 1 Mechanical resistance and stability</b>		
-	None	-
<b>BWR 2 Safety in case of fire</b>		
EN 13501-1	Reaction to fire	Class F
EN 13501-2	Resistance to fire	Annex A
<b>BWR 3 Hygiene, health and environment</b>		
EN 1026:2000	Air permeability (material property)	Annex B
EAD 350454-00-1104, Annex C	Water permeability (material property)	No performance determined
Declaration of manufacturer	Release of dangerous substances	Declaration of manufacturer
<b>BWR 4 Safety in use</b>		
EOTA TR 001:2003	Mechanical resistance and stability	No performance determined
EOTA TR 001:2003	Resistance to impact/movement	No performance determined
EOTA TR 001:2003 ISO 11600	Adhesion	No performance determined
<b>BWR 5 Protection against noise</b>		
EN 10140-2/ EN ISO 717-1	Airborne sound insulation	Rw (C;Ctr)= 52(-1;-6)
EN 10140-3/ EN ISO 717-2	Impact sound insulation	No performance determined
<b>BWR 6 Energy economy and heat retention</b>		
EN 12664, EN 12667 or EN 12939	Thermal properties	No performance determined
EN ISO 12572 EN 12086	Water vapour permeability	No performance determined
<b>General aspects relating to fitness for use</b>		
ISO 8339: 2005, ISO 9046: 2004 & ISO 7389: 2003	Durability and serviceability	Z <sub>1</sub>
<b>BWR 7 Sustainable use of natural resources</b>		
-	-	No performance determined

**4 ASSESSMENT AND VERIFICATION OF CONSTANCY OF PERFORMANCE (HEREINAFTER AVCP) SYSTEM APPLIED, WITH REFERENCE TO ITS LEGAL BASE**

According to the Statutory Instrument 2019 No. 465 – made 5<sup>th</sup> March 2019 and cited as the Construction Products (Amendment etc.) (EU Exit) Regulations 2019 and coming into force on exit day and Statutory Instrument 2020 No. 1359 – made 26<sup>th</sup> November 2020 and cited as the Construction Products (Amendment etc.) (EU Exit) Regulations 2020 and coming into force immediately before the 2019 Regulations come into force, on the procedure for attesting the conformity of construction products as regards fire stopping, fire sealing and fire protective products, published as ‘Pre-Exit’ European Assessment Documents, (see <https://www.gov.uk/guidance/pre-exit-european-assessment-documents-construction-products>), the system of assessment and verification of constancy of performance (see Annex V to Construction Products Regulation 2011 as amended by the Construction Products (Amendment etc.) (EU Exit) Regulations 2019 and the Construction Products (Amendment etc.) (EU Exit) Regulations 2020) given in the following table(s) apply.

<b>Product(s)</b>	<b>Intended use(s)</b>	<b>Level(s) or class(es)</b>	<b>System(s)</b>
Fire stopping and Fire Sealing Products	For fire compartmentation and/or fire protection or fire performance	Any	1

**5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD**

Tasks of the manufacturer:

Factory production control

The manufacturer shall exercise permanent internal control of production. All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures, including records of results performed. This production control system shall ensure that the product is in conformity with this UK Technical Assessment.

The manufacturer may only use initial / raw / constituent materials stated in the technical documentation of this UK Technical Assessment.

The factory production control shall be in accordance with the Control Plan of 18/10/2022 relating to the UK Technical Assessment 0843-UKTA-24/0039 issued on 30/09/2024 which is part of the technical documentation of this UK technical Assessment. The "Control Plan" is laid down in the context of the factory production control system operated by the manufacturer and deposited at UL International (UK) Ltd.

The results of factory production control shall be recorded and evaluated in accordance with the provisions of the Control Plan.

Other tasks of the manufacturer

Additional information

The manufacturer shall provide a technical data sheet and an installation instruction with the following minimum information:

(a) Technical data sheet:

- Field of application:
- Building elements for which the penetration seal is suitable, type and properties of the building elements like minimum thickness, density, and - in case of lightweight constructions – the construction requirements.
- Limits in size, minimum thickness etc. of the penetration seal
- Construction of the penetration seal including the necessary components and additional products (e.g. backfilling material) with clear indication whether they are generic or specific.
- Services which the penetration seal is suitable, type and properties of the services like material, diameter, thickness etc. in case of pipes including insulation materials; necessary/allowed supports/fixings (e.g. pipe trays)

(b) Installation instruction:

- Steps to be followed
- Procedure in case of retrofitting
- Stipulations on maintenance, repair and replacement

**6 Issued on:**

**30<sup>th</sup> September 2024**

Report by:



P. Foster  
Project Engineer Associate  
Built Environment

Reviewed by:



C. Johnson  
Senior Staff Engineer  
Built Environment

**For and on behalf of UL International (UK) Ltd.**

# ANNEX A – Resistance to Fire Classification – Astro HPE Sealant

## A.1 Flexible or Rigid Walls Minimum Thickness 100 mm

### A.1.1 Plastic pipes

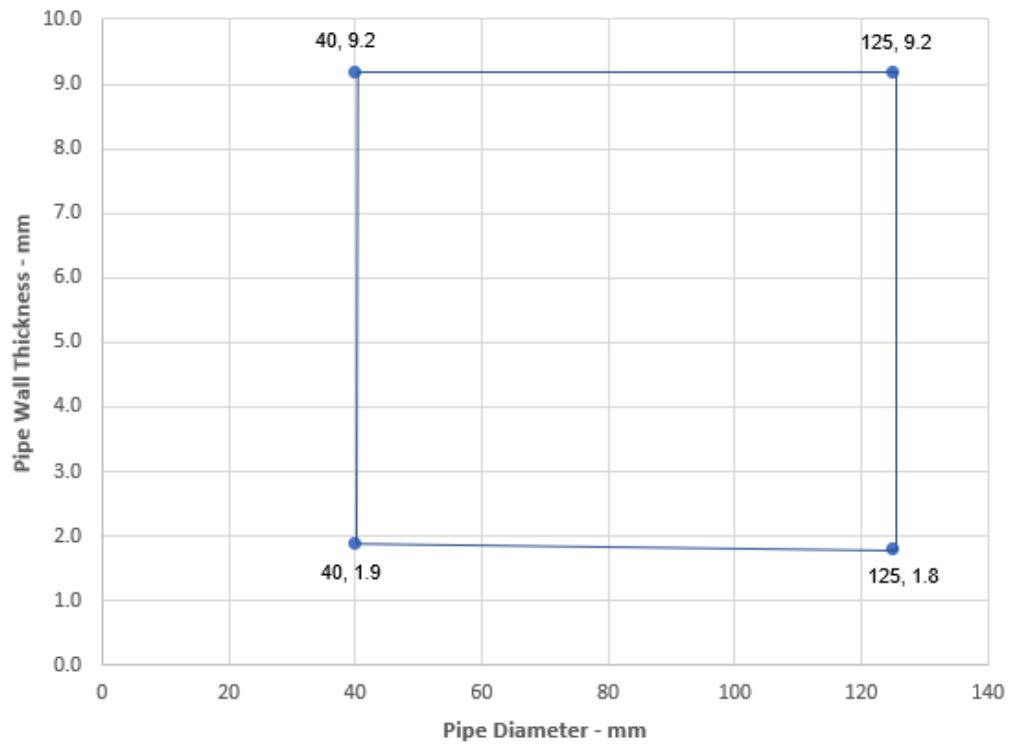
Flexible or Rigid Walls $\geq 100$ mm				
				<b>Key</b> 1. Astro HPE 2. Plastic pipe 3. Flexible wall
Penetration Service	Depth (mm)	Annular Space (mm)	Backing Material	Classification
PVC pipe 40 – 125 mm $\varnothing$ , 1.9 – 9.2 mm wall thickness*	25 (with 10 mm fillet protruding wall)	20	N/A	EI 45 C/U, U/C, C/C
PVC pipe 40 mm $\varnothing$ , 1.9 mm wall thickness				EI 120 - C/U, U/C, C/C
ABS pipe 40 mm $\varnothing$ , 1.9 mm wall thickness				EI 120 - C/U, U/C, C/C
PP pipe 40 mm $\varnothing$ , 2 mm wall thickness				EI 120 - C/U, U/C, C/C

\*Typical pipe diameters shown, see below graph for intermediate sizes

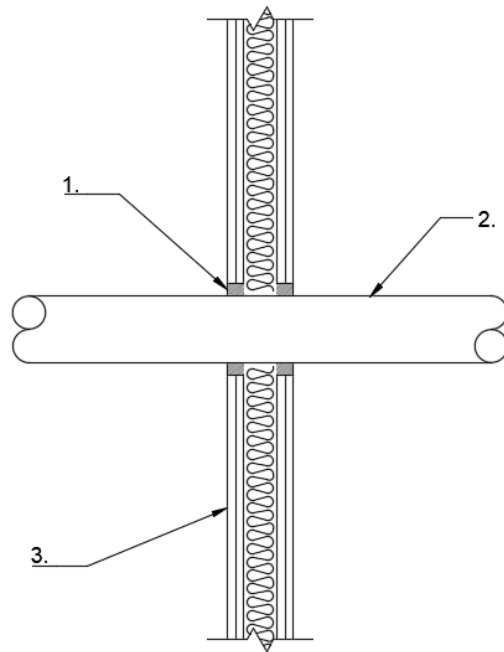
All services supported with 'Unistrut' pipe supports at 260 mm from both faces of the wall.



### PVC-U Pipes - EI 45 C/U



Flexible or Rigid Walls  $\geq 100$  mm



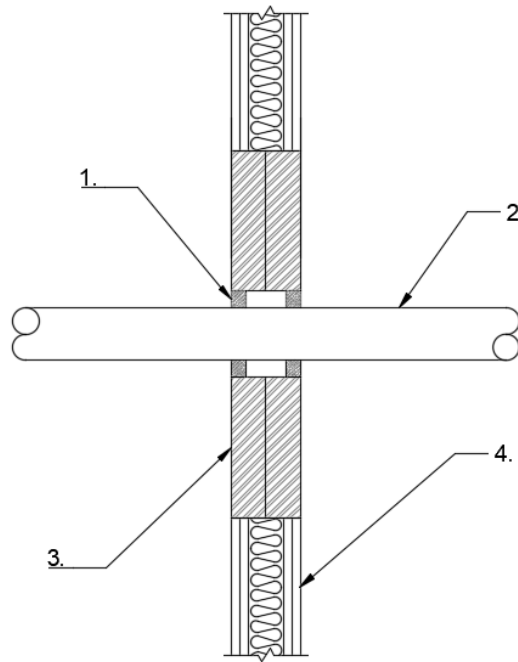
Key

1. Astro HPE
2. Plastic pipe
3. Flexible wall

Penetration Service	Depth (mm)	Annular Space (mm)	Backing Material	Classification
Blazemaster CPVC Sprinkler Pipe 27 – 89 mm $\phi$ , 2.5 – 7.2 mm wall thickness	25	20	N/A	EI 120 – U/U, C/U, U/C, C/C

All services supported with pipe and cable supports at 425 mm from both faces of the wall.

Flexible or Rigid Walls ≥100 mm



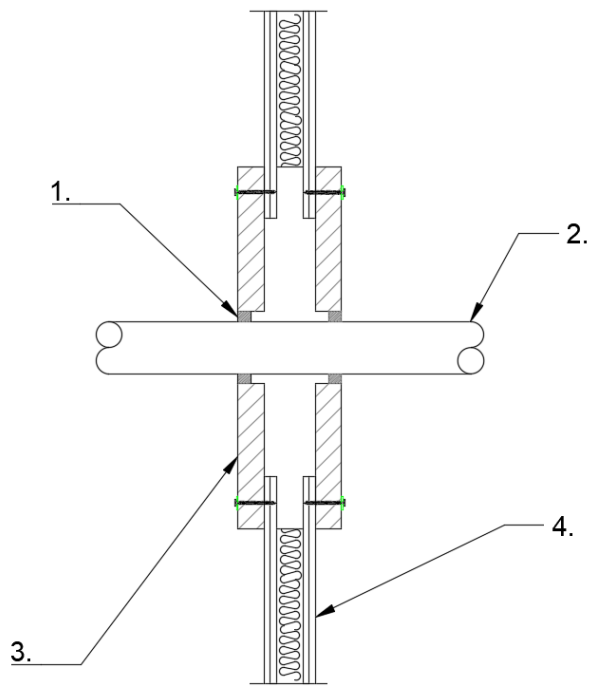
Key

1. Astro HPE
2. Plastic pipe
3. Astro Batt
4. Flexible Wall

Penetration Service	Astro HPE		Astro Batt Maximum Aperture Size (mm)	Classification
	Annular Space (mm)	Min. Depth (mm)		
Lubrizol CPVC Sprinkler Pipe 20 – 80 mm Ø, 2.5 – 7.9 mm wall thickness	20	25	1200 x 730	EI 90 – C/U, U/C, C/C
			2600 x 2600	EI 60 – C/U, U/C, C/C

All services supported with pipe and cable supports at 425 mm from both faces of the wall.

Flexible or Rigid Walls ≥100 mm Insulated or uninsulated



Key

- 1. Astro HPE
- 2. Plastic pipe
- 3. Astro Batt
- 4. Flexible Wall

Penetration Service	Astro HPE		Astro Batt Maximum Aperture Size (mm)	Classification
	Annular Space (mm)	Min. Depth (mm)		
Blazemaster CPVC Sprinkler Pipe 27 – 89 mm Ø, 2.5 – 7.0 mm wall thickness	20	25	1200 x 750	EI 120 – U/C, C/U, U/C, C/C

All services supported with pipe and cable supports at 425 mm from both faces of the wall.

### A.1.2 Cables, Metallic Pipes, Insulated metallic pipes

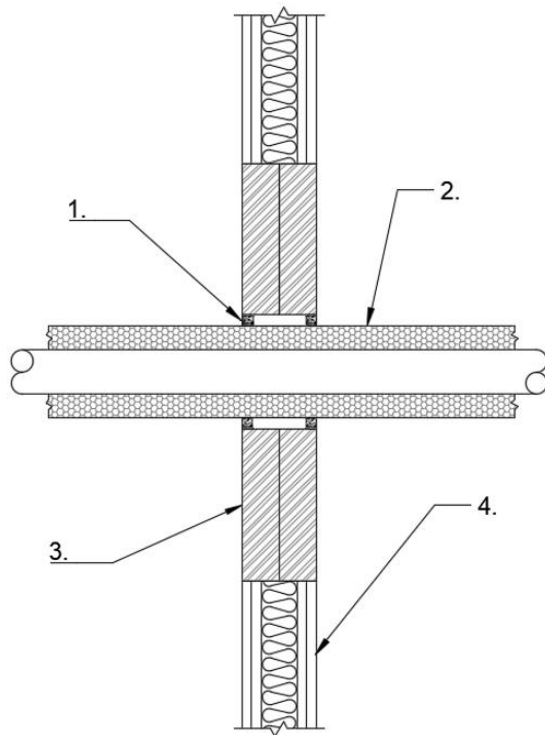
Flexible or Rigid Walls ≥100 mm				
				<p><b>Key</b></p> <ol style="list-style-type: none"> <li>1. Astro HPE</li> <li>2. Insulated metal pipe</li> <li>3. Flexible wall</li> </ol>
Penetration Service	Depth (mm)	Annular Space (mm)	Backing Material	Classification
Copper 159 mm Ø, 2 -14.2 mm wall thickness with ≥30 mm thick ≥80kg/m <sup>3</sup> foil faced glass wool (LS*, CS**)	25 (with 10 mm fillet protruding wall)	20	N/A	E 120, EI 30 – C/U, C/C
Copper 40 – 159 mm Ø, 2 -14.2 mm wall thickness with 32 mm thick 96kg/m <sup>3</sup> Armaflex pipe insulation (LS*, CS**)				

All services supported with 'Unistrut' pipe supports at 260 mm from both faces of the wall.

\* Continuous through seal and extending minimum 650 mm from both faces of the seal (LS)

\*\* Continuous through seal and full length of the pipe (CS)

Flexible or Rigid Walls ≥100 mm



Key

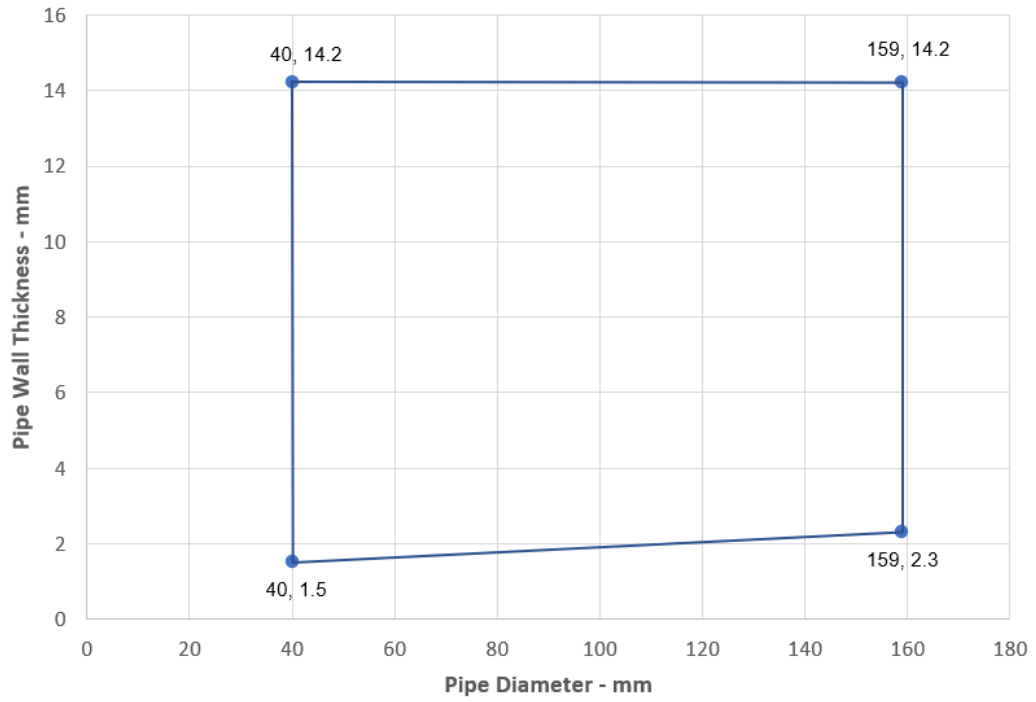
1. Astro HPE
2. Insulated metal pipe
3. Astro Batt
4. Flexible wall

Penetration Service	Astro HPE		Astro Batt Maximum Aperture Size (mm)	Classification
	Annular Space (mm)	Min. Depth (mm)		
Copper/Steel pipe 40 mm $\phi$ 1.5 mm – 14.2 mm wall thickness, insulated with $\geq 20$ mm thick foil faced glass wool insulation $\geq 80\text{kg/m}^3$ (CS) Continued Sustained	15	15	2600 x 2600	EI 60 - C/C
Copper/Steel pipe 40mm – 159mm $\phi$ 1.5mm – 14.2 mm wall thickness*, insulated with $\geq 30$ mm thick foil faced glass wool insulation $\geq 80\text{kg/m}^3$ (CS) Continued Sustained	15	15	1200 x 730	EI 60 - C/C

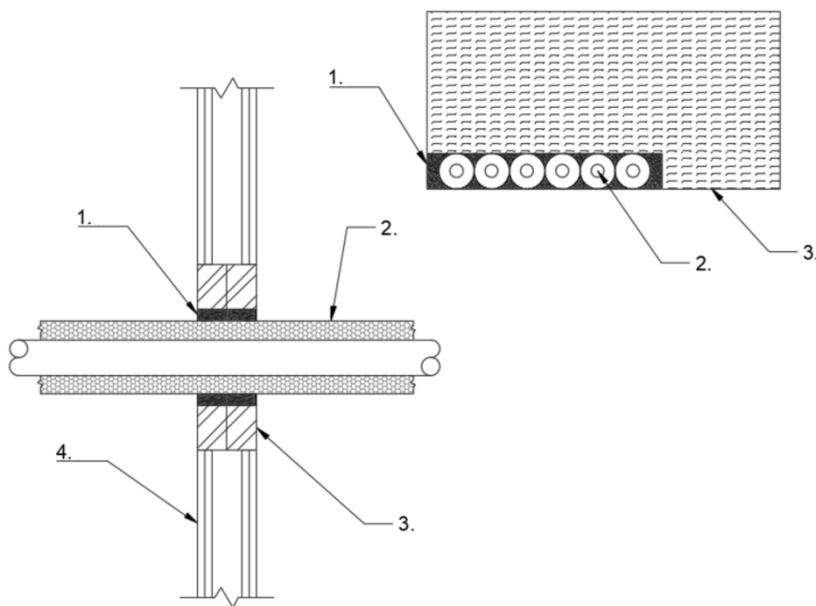
\*Typical pipe diameters shown, see below graph for intermediate sizes

All services supported with pipe and cable supports at 250 mm from both faces of the wall.

### Copper or Steel Pipes with Glass Wool Insulation EI 60 C/C



Flexible or Rigid Walls ≥100 mm Insulated or uninsulated



Key

1. Astro HPE
2. Insulated metal pipe
3. Astro Batt
4. Flexible wall

Penetration Service	Astro HPE		50 mm Astro Batt Maximum Aperture Size (mm)	Separating Distance		Classification
	Annular Space (mm)	Min. Depth (mm)		Between Services	Aperture Edge	
6x ø22 mm, 0.9 mm - 14.2 wall thickness Copper pipes with 20 mm thick Kooltherm FM insulation (LS*, CS**)	0mm above and below service, 20 mm on each side of service	full depth	Double layer 2600 mm x 2600 mm	≥0 mm	≥0 mm	EI 30 - C/U, C/C
6x ø22 mm, 0.9-14.2 mm wall thickness Copper pipes with 19 mm thick Armaflex Class 'O' insulation (LS*, CS**)						E 90, EI 60 - C/U, C/C

All services supported with 'Unistrut' pipe and cable supports at 400 mm from both faces of the wall.

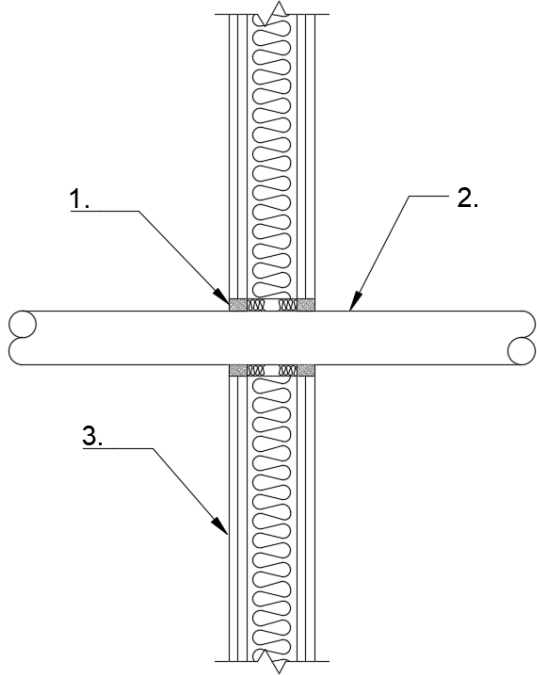
\* Continuous through seal and extending minimum 450 mm from both faces of the seal (LS)

\*\* Continuous through seal and full length of the pipe (CS)



## A.2 Flexible or Rigid Walls Minimum Thickness 120 mm

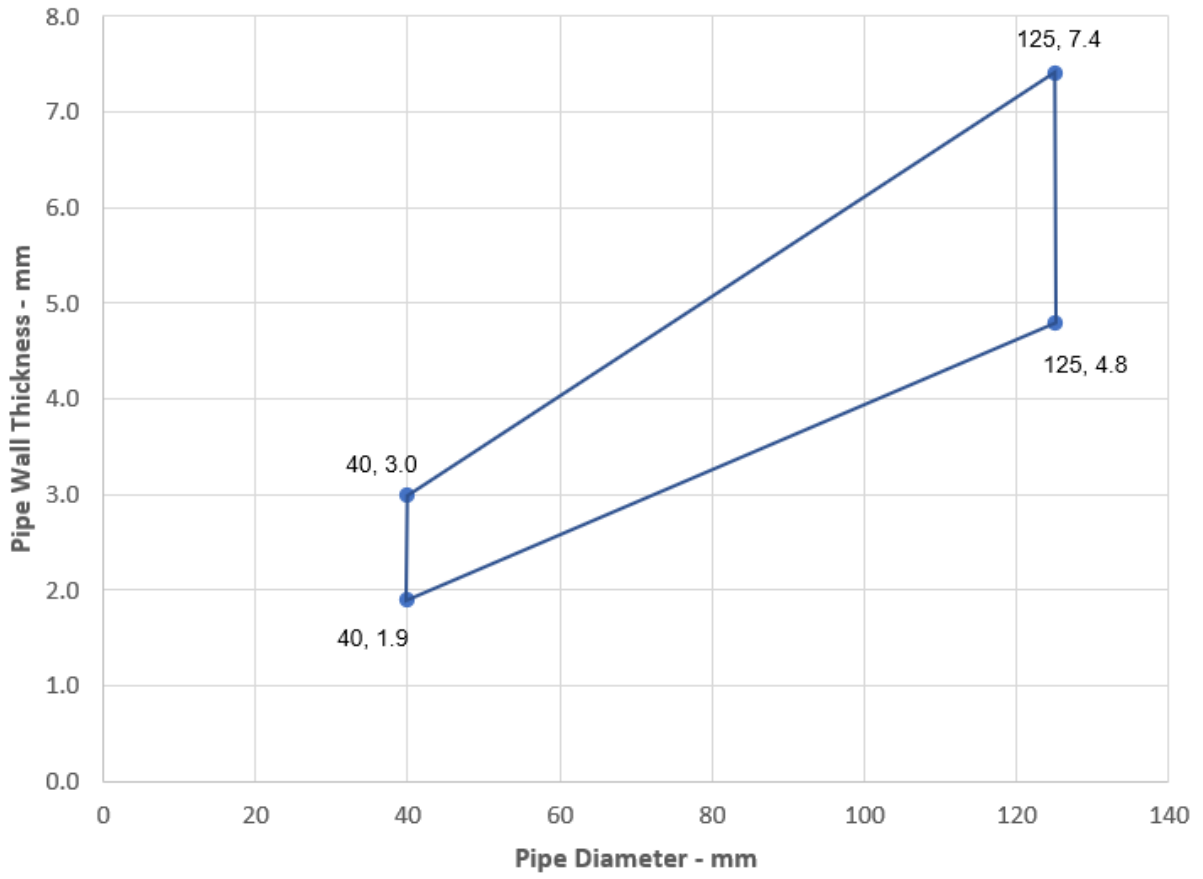
### A.2.1 Plastic pipes

Flexible or Rigid Walls $\geq 120$ mm				
				<p><b>Key</b></p> <ul style="list-style-type: none"> <li>1. Astro HPE Sealant</li> <li>2. Plastic pipe</li> <li>3. Flexible Wall</li> </ul>
Penetration Service	Depth (mm)	Annular Space (mm)	Backing Material	Classification
PVC pipe 40 – 125 mm $\varnothing$ , 1.9 – 7.4 mm wall thickness*	25	16	$\geq 30$ mm deep $\geq 80\text{kg/m}^3$ Stone wool	EI 120 - U/C, C/C

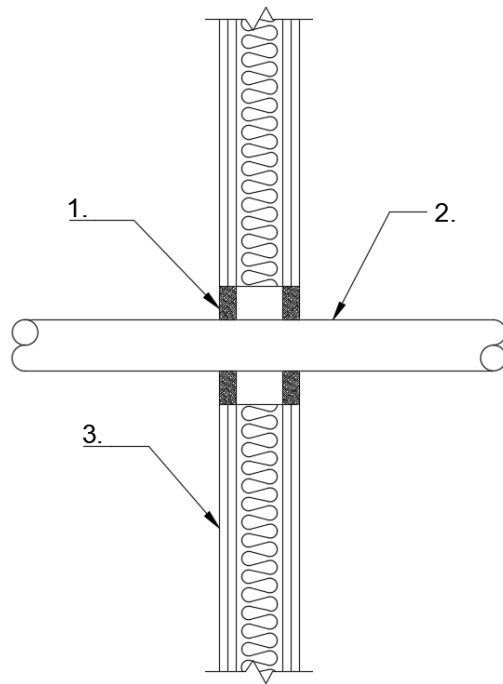
\*Typical pipe diameters shown, see below graph for intermediate sizes

All services supported with 'Unistrut' pipe supports at 150 mm from both faces of the wall.

### PVC-U Pipes - EI 120 U/C



Flexible or Rigid Walls ≥120 mm



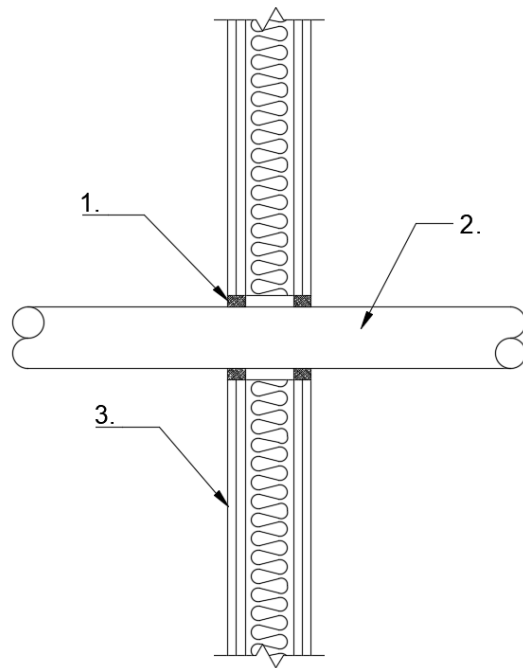
Key

- 1. Astro HPE
- 2. Plastic pipe
- 3. Flexible Wall

Penetration Service	Depth (mm)	Maximum Aperture Size (mm)	Annular Space (mm)	Backing Material	Classification
HDPE pipe 63 mm $\varnothing$ 7.2 mm wall thickness	25	300 x 100	12.5	n/a	EI 120 - U/C, C/C

All services supported with 'Unistrut' pipe supports at 150 mm from both faces of the wall.

Flexible or Rigid Walls ≥120 mm



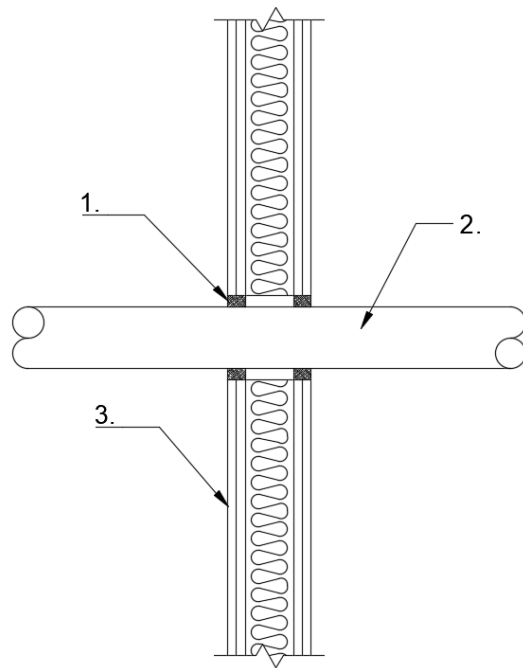
Key

- 1. Astro HPE
- 2. Plastic pipe
- 3. Flexible Wall

Penetration Service	Depth (mm)	Annular Space (mm)	Backing Material	Classification
HDPE pipe 90 mm Ø 9.2 mm wall thickness	25	12.5	n/a	EI 120 - U/C, C/C

All services supported with 'Unistrut' pipe and cable supports at 150 mm from both faces of the wall.

Flexible or Rigid Walls  $\geq 120$  mm



Key

- 1. Astro HPE
- 2. Plastic pipe
- 3. Flexible Wall

Penetration Service	Depth (mm)	Annular Space (mm)	Backing Material	Classification
ABS pipe 90 mm $\varnothing$ 6.0 mm wall thickness	25	12.5	n/a	EI 120 - U/C, C/C

All services supported with 'Unistrut' pipe and cable supports at 150 mm from both faces of the wall.

## A.2.2 Insulated metallic pipes

Flexible or Rigid Walls $\geq 120$ mm				
				<p><u>Key</u></p> <ol style="list-style-type: none"> <li>1. Astro HPE</li> <li>2. Plastic pipe</li> <li>3. Flexible Wall</li> <li>4. Armaflex Insulation</li> </ol>
Penetration Service	Depth (mm)	Annular Space (mm)	Backing Material	Classification
Copper/Steel pipe 60 mm $\varnothing$ 0.8 mm – 14.2 mm wall thickness, insulated with 32 mm 'Armaflex' Continued Sustained (CS)	25	20	n/a	E 120, E 190 - C/U, C/C
Copper/Steel pipe 15 mm $\varnothing$ 0.8 mm – 7 mm wall thickness, insulated with 13 mm 'Armaflex' Continued Sustained (CS)	25	12	n/a	EI 120 - C/U, C/C

All services supported with 'Unistrut' pipe and cable supports at 150 mm from both faces of the wall.

### A.3 Rigid Walls Minimum Thickness 150 mm

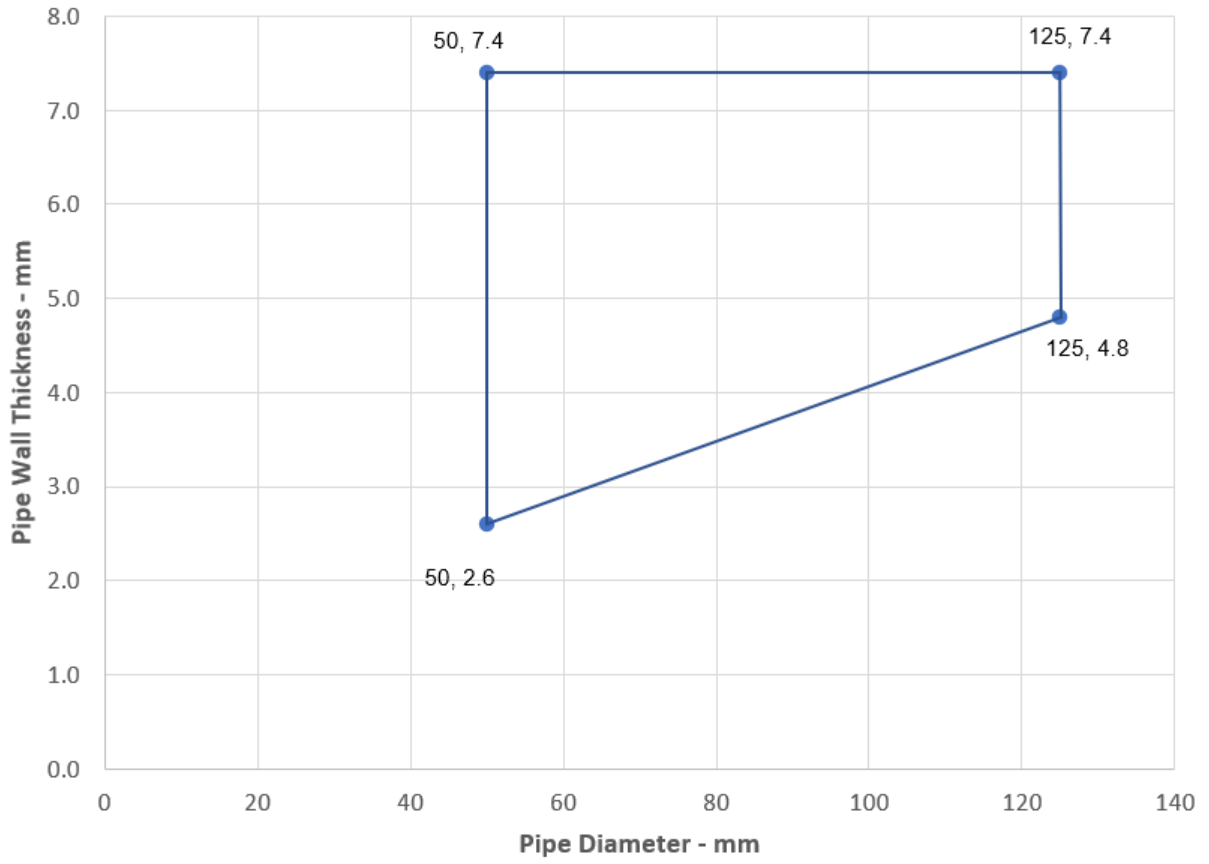
#### A.3.1 Plastic pipes

Rigid Walls $\geq 150$ mm				
				<p><u>Key</u></p> <ol style="list-style-type: none"> <li>1. Astro HPE</li> <li>2. Plastic pipe</li> <li>3. Astro Batt</li> <li>4. Rigid wall</li> </ol>
Penetration Service	Astro HPE		Penetration Seal Maximum Aperture Size (mm)	Classification
	Annular Space (mm)	Min. Depth (mm)		
PVC Pipe 50 mm $\varnothing$ 2.6 wall thickness	20	25 - both sides of wall	1100 x 750	EI 45 - U/C, C/C
PVC Pipe 50 mm $\varnothing$ 2.6 – 3.7 wall thickness	20	25 - both sides of wall	1100 x 750	E 45, EI 30 - U/C, C/C
PVC Pipe 50 mm – 125 mm $\varnothing$ 2.6 – 7.4 wall thickness*	20	25 - both sides of wall	1100 x 750	EI 30 - U/C, C/C

\*Typical pipe diameters shown, see below graph for intermediate sizes

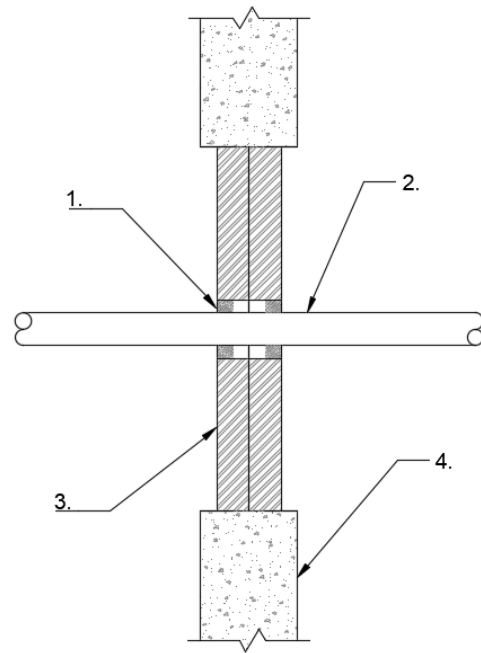
All services supported with 'Unistrut' pipe and cable supports at 400 mm from both faces of the wall.

### PVC-U Pipes - EI 30 U/C





Rigid Walls  $\geq 150$  mm



Key

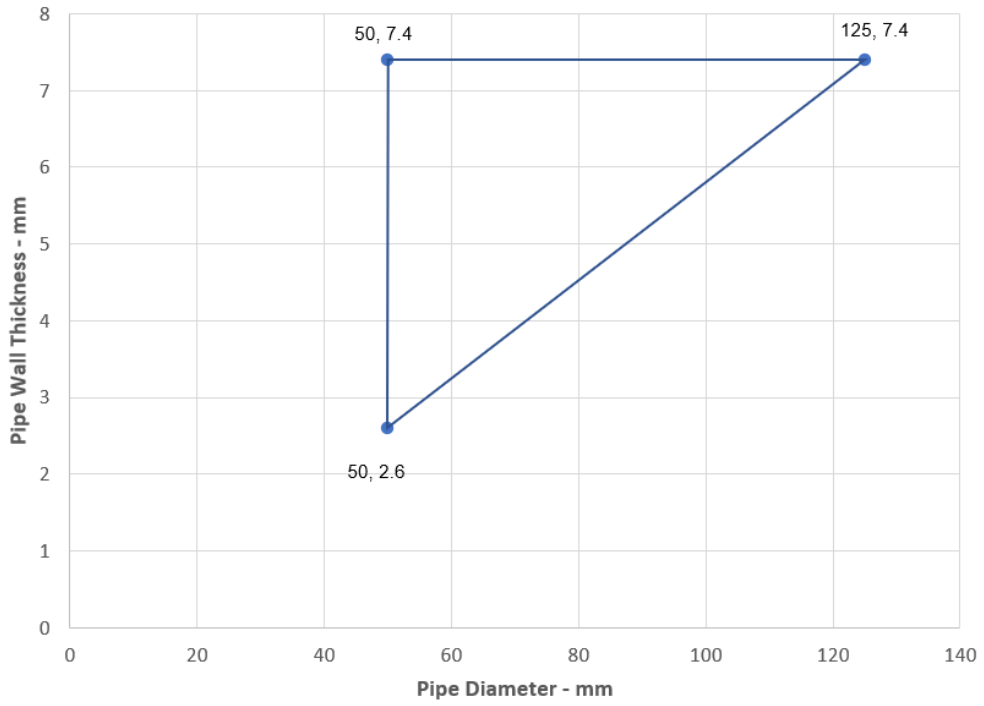
1. Astro HPE
2. Plastic pipe
3. Astro Batt
4. Rigid wall

Penetration Service	Astro HPE		Penetration Seal Maximum Aperture Size (mm)	Classification
	Annular Space (mm)	Min. Depth (mm)		
PVC Pipe 50 mm $\varnothing$ 2.6 – 7.4 mm wall thickness*	20	25 - both sides of wall	1200 x 730	EI 120 - U/C, C/C
PVC Pipe 125 mm $\varnothing$ 7.4 mm wall thickness				
PVC Pipe 50 mm – 125 mm $\varnothing$ 2.6 – 7.4 mm wall thickness*				E 120, EI 90 - U/C, C/C
PVC Pipe 50 mm $\varnothing$ 2.6 – 7.4 mm wall thickness	20	25 - both sides of wall	2600 x 2600	EI 60 - U/C, C/C
PVC Pipe 125 mm $\varnothing$ 7.4 mm wall thickness				
PVC Pipe 50 mm – 125 mm $\varnothing$ 2.6 – 7.4 mm wall thickness*				

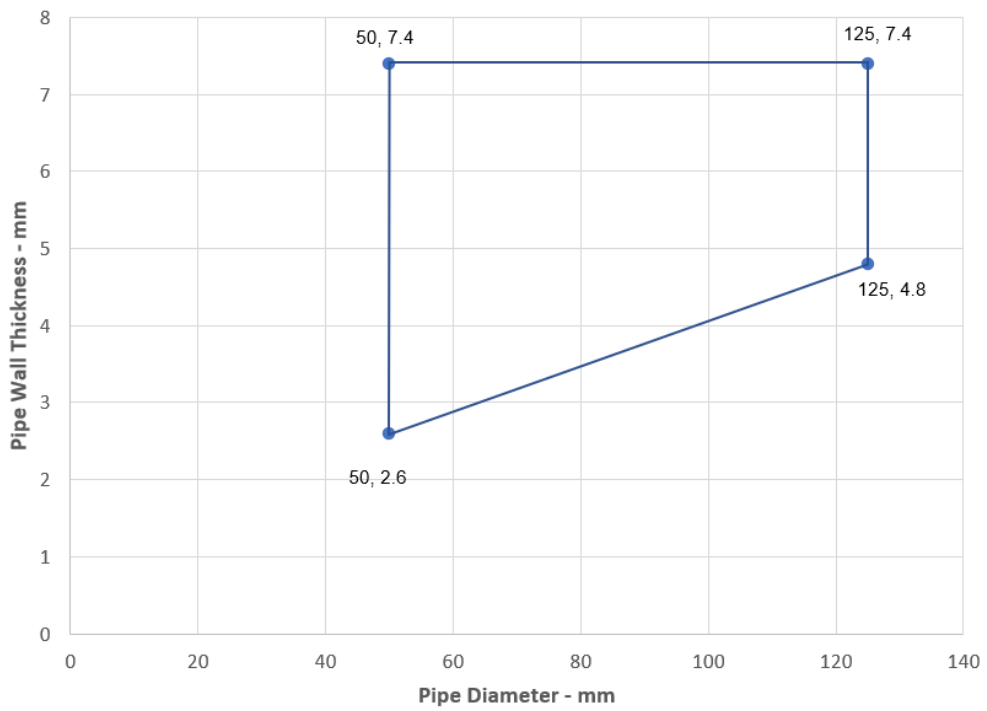
\*Typical pipe diameters shown, see below graph for intermediate sizes

All services supported with 'Unistrut' pipe and cable supports at 400 mm from both faces of the wall.

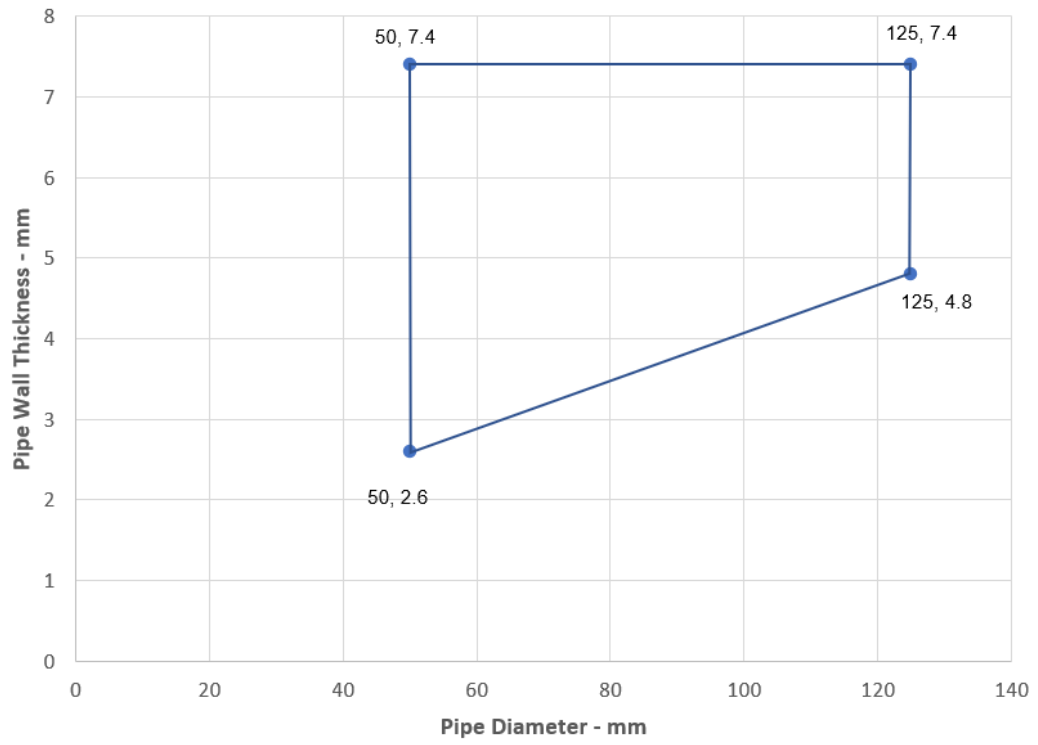
### PVC-U Pipes - EI 120 U/C



### PVC-U Pipes - E 120, EI 90 U/C

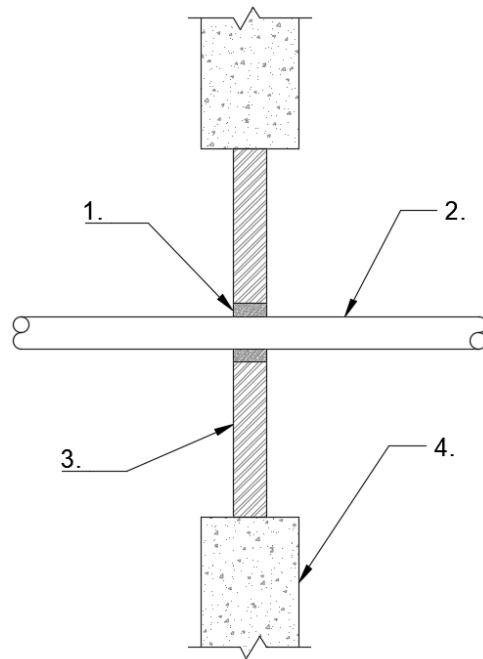


### PVC-U Pipes - EI 60 U/C



### A.3.2 Multi layered pipes

Rigid Walls $\geq 150$ mm				Key
Penetration Service	Astro HPE		Penetration Seal Maximum Aperture Size (mm)	
	Annular Space (mm)	Min. Depth (mm)		
Uponor MLC (Multi-Layer Composite) Pipe 40 mm – 110 mm $\varnothing$ 4 mm – 10 mm wall thickness*	20	25 - both sides of wall	1100 x 750	E 45, EI30 - C/U, U/C & C/C

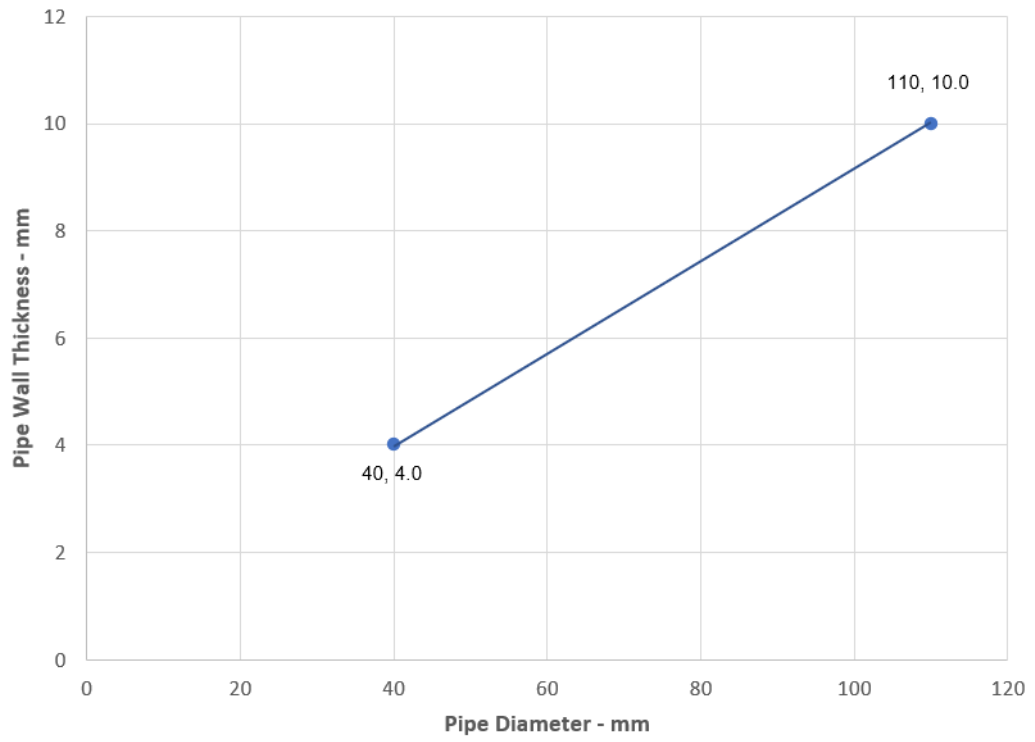


- Key
1. Astro HPE
  2. MLC pipe
  3. Astro Batt
  4. Rigid wall

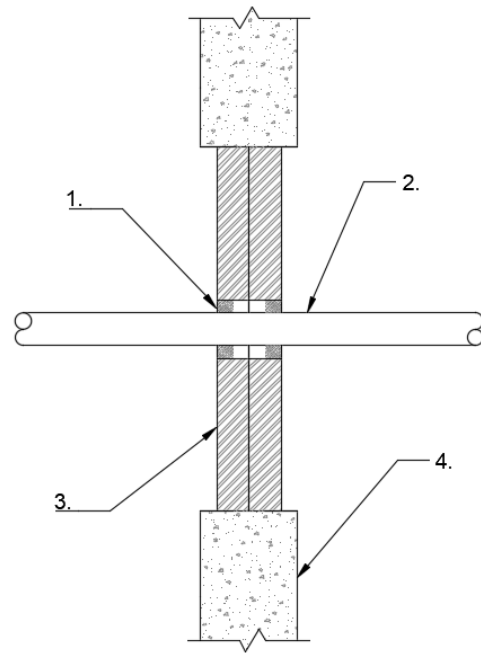
\*Typical pipe diameters shown, see below graph for intermediate sizes

All services supported with 'Unistrut' pipe and cable supports at 400 mm from both faces of the wall.

### MLC Pipes - E 45, EI 30 C/U



Rigid Walls  $\geq 150$  mm



Key

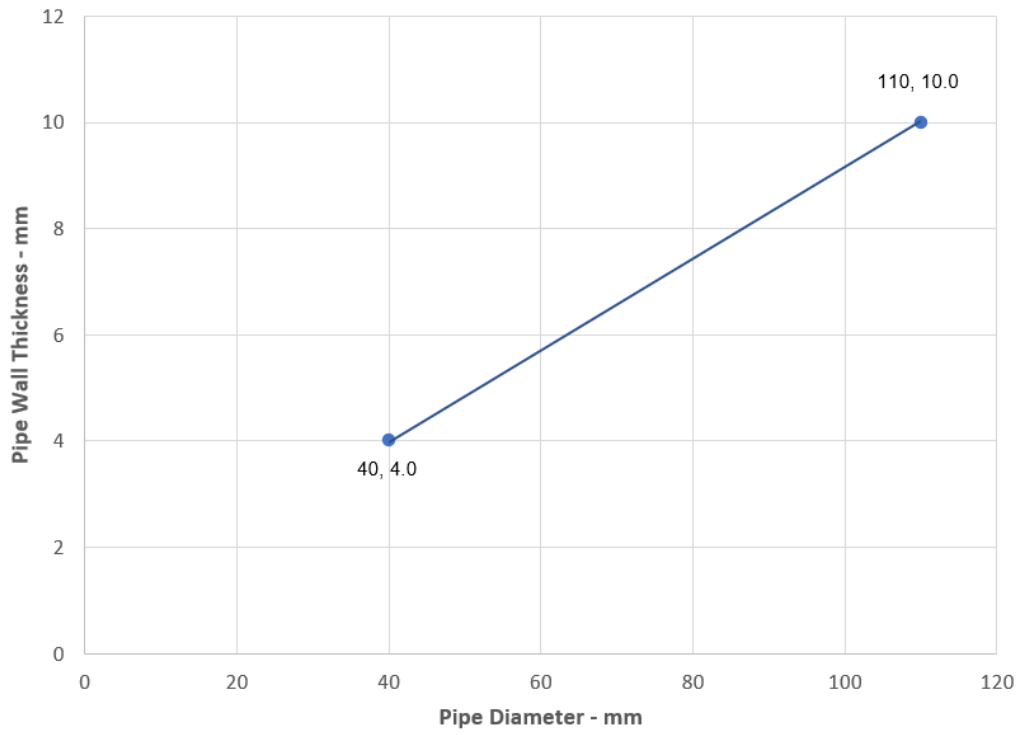
1. Astro HPE
2. Plastic pipe
3. Astro Batt
4. Rigid wall

Penetration Service	Astro HPE		Penetration Seal Maximum Aperture Size (mm)	Classification
	Annular Space (mm)	Min. Depth (mm)		
Uponor MLC (Multi-Layer Composite) Pipe 40 mm – 110 mm $\varnothing$ 4 mm – 10 mm wall thickness*	20	25 - both sides of wall	1200 x 730	EI 120 – U/C, C/C
			2600 x 2600	EI 60 - U/C, C/C

\*Typical pipe diameters shown, see below graph for intermediate sizes

All services supported with 'Unistrut' pipe and cable supports at 400 mm from both faces of the wall.

### MLC Pipes - U/C



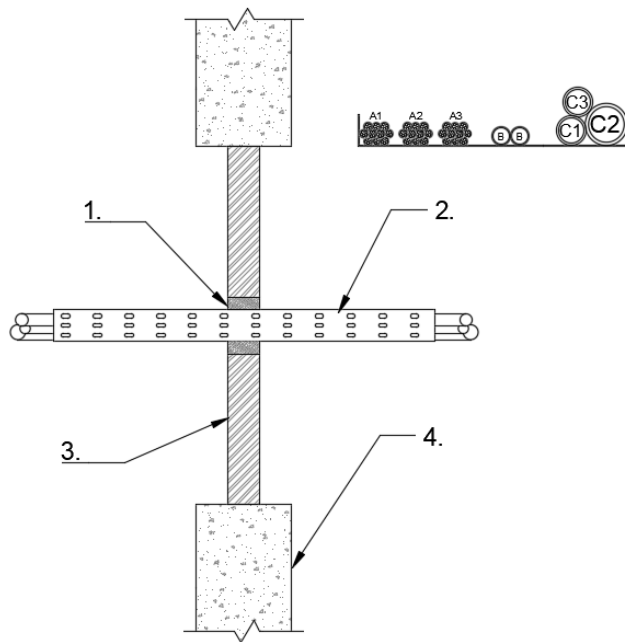
### A.3.3 Cables

Rigid Walls $\geq 150$ mm					
					<p><b>Key</b></p> <ol style="list-style-type: none"> <li>1. Astro HPE</li> <li>2. Backing material</li> <li>3. Cables</li> <li>4. Rigid wall</li> </ol>
Penetration Service	Depth (mm)	Maximum Aperture Size (mm)	Backing Material	Minimum Distance to Edge of Aperture (mm)	Classification
Telecomms. Cable bunch $\leq 100$ mm $\varnothing$	25	180 x 180	Stone wool or ceramic wool (20mm $45\text{kg/m}^3$ )	10	EI 240
PVC conduits $\leq 16$ mm $\varnothing$					E 240, EI 45
Steel/Copper conduits $\leq 16$ mm $\varnothing$					E 240, EI 90
Cables $\leq 21$ mm $\varnothing$					E 180, EI 45
Cables $\leq 50$ mm $\varnothing$					E 180, EI 45
Cables $\leq 80$ mm $\varnothing$					E 180, EI 45

All services supported with 'Unistrut' pipe and cable supports at 400 mm from both faces of the wall.



Rigid Walls ≥150 mm



Key

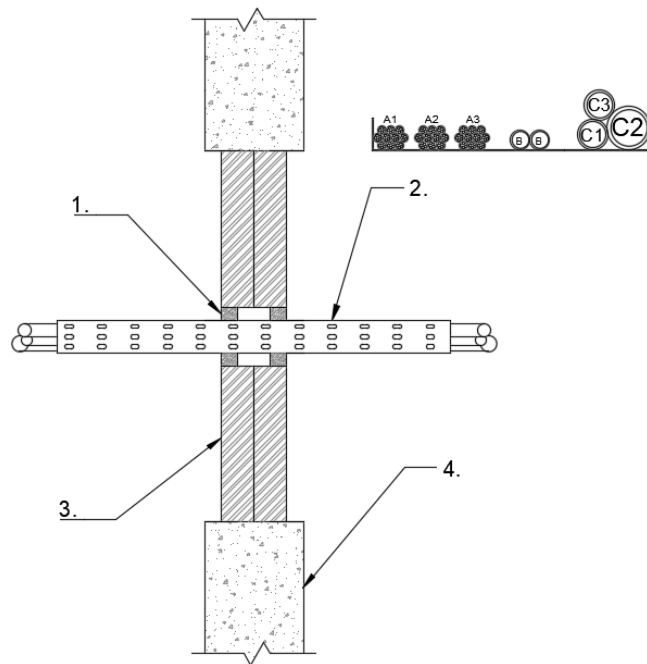
1. Astro HPE
2. 500mm perforated cable tray
3. Astro Batt
4. Rigid wall

Penetration Service	Astro HPE		Penetration Seal Maximum Aperture Size (mm)	Classification
	Annular Space (mm)	Min. Depth (mm)		
*500 mm perforated cable tray	20	25 - both sides of wall	1100 x 750	EI 30
*Electrical cables up to 21 mm Ø				
Cable bunch comprising 1no. C1, 1no. C2 and 1no. C3 cables				

\*All cables coated with 2mm DFT Astro PS Coat 300mm along the cables both sides of the seal

All services supported with pipe and cable supports at 400 mm from both faces of the wall.

Rigid Walls  $\geq 150$  mm



Key

1. Astro HPE
2. 500mm perforated cable tray
3. Astro Batt
4. Rigid wall

Penetration Service	Astro HPE		Penetration Seal Maximum Aperture Size (mm)	Classification
	Annular Space (mm)	Min. Depth (mm)		
*500 mm perforated cable tray	20	25 - both sides of wall	1200 x 730	EI 120
*Electrical cables up to 21 mm $\varnothing$				E 120, EI 90
*Cable bunch comprising 1no. C1, 1no. C2 and 1no. C3 cables			2600 x 2600	EI 60
*500 mm perforated cable tray				
*Electrical cables up to 21 mm $\varnothing$				
*Electrical cables up to 50 mm $\varnothing$				

\*All cables coated with 2mm DFT Astro PS Coat 300mm along the cables both sides of the seal

All services supported with pipe and cable supports at 400 mm from both faces of the wall.

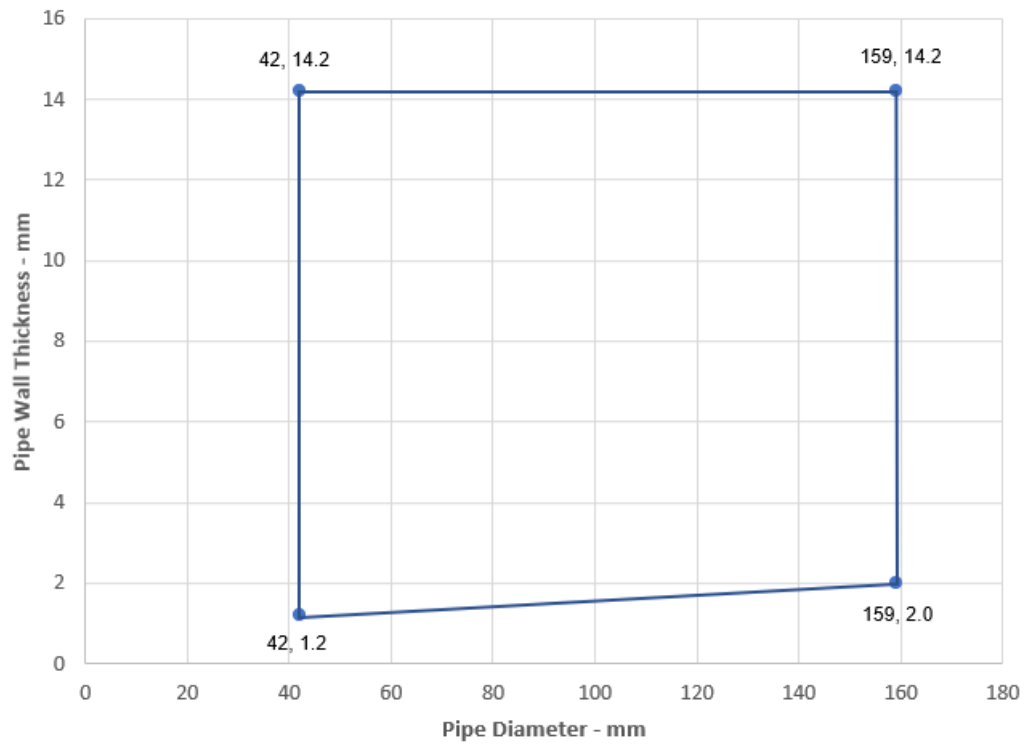
### A.3.4 Metallic pipes

Rigid Walls $\geq 150$ mm				
				<p><u>Key</u></p> <ol style="list-style-type: none"> <li>1. Astro HPE</li> <li>2. Metal pipe</li> <li>3. Astro Batt</li> <li>4. Rigid wall</li> </ol>
Penetration Service	Astro HPE		Penetration Seal Maximum Aperture Size (mm)	Classification
	Annular Space (mm)	Min. Depth (mm)		
Copper/Steel pipe 40 mm – 159mm $\varnothing$ 1.2mm – 14.2 mm wall thickness*	20	25 - both sides of wall	1100 x 750	E 45, EI 20 – C/U, C/C
Copper/Steel pipe 40 mm $\varnothing$ 1.2mm – 14.2 mm wall thickness				EI 45 - C/U, C/C

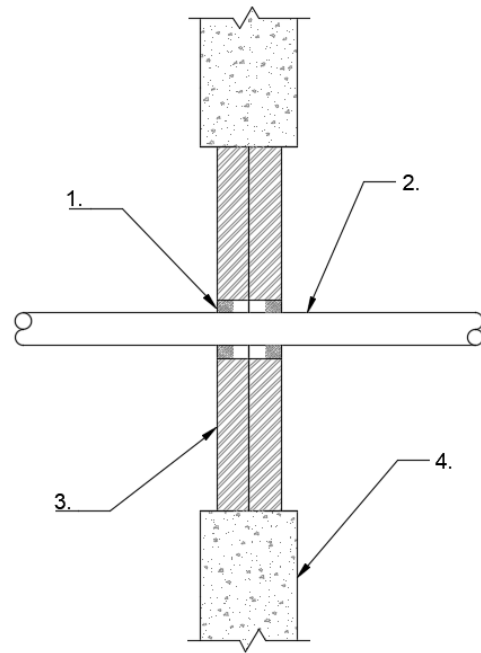
\*Typical pipe diameters shown, see below graph for intermediate sizes

All services supported with 'Unistrut' pipe and cable supports at 400 mm from both faces of the wall.

### Copper Pipes - C/U



Rigid Walls  $\geq 150$  mm



Key

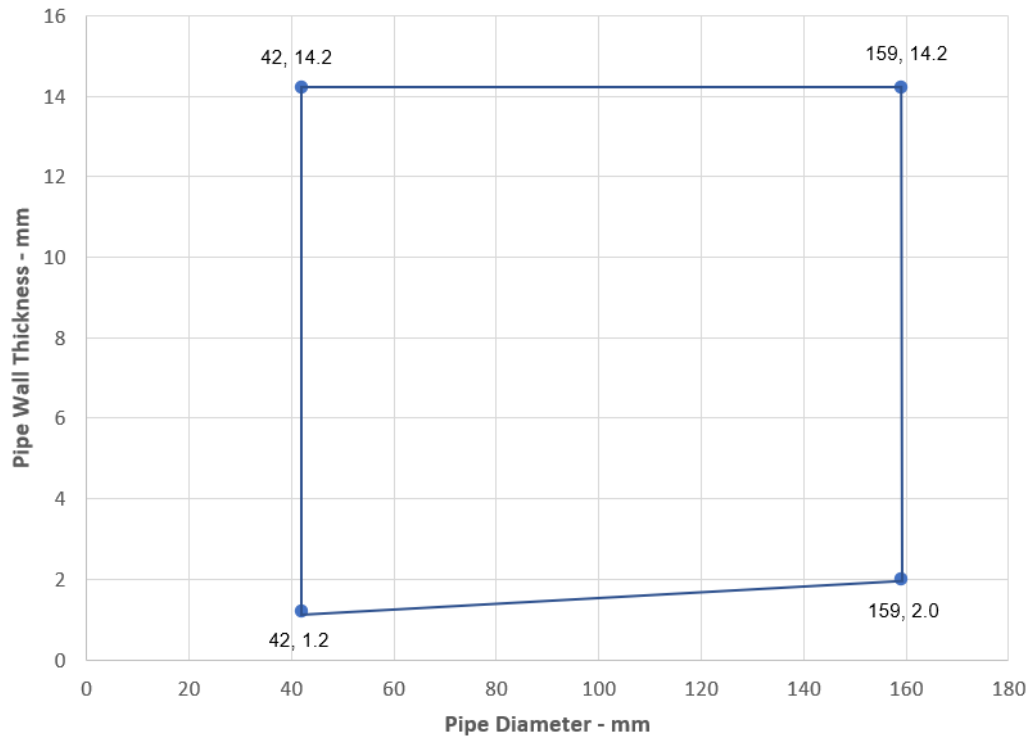
- 1. Astro HPE
- 2. Metal pipe
- 3. Astro Batt
- 4. Rigid wall

Penetration Service	Astro HPE		Penetration Seal Maximum Aperture Size (mm)	Classification
	Annular Space (mm)	Min. Depth (mm)		
Copper/Steel pipe 42 mm – 159mm $\varnothing$ 1.2mm – 14.2 mm wall thickness*	20	25 - both sides of wall	1100 x 750	E 120, EI 30 – C/U, C/C
Copper/Steel pipe 42 mm $\varnothing$ 1.2 mm – 14.2 mm wall thickness				E 120, EI 60 – C/U, C/C
Copper/Steel pipe 42 mm – 159 mm $\varnothing$ 1.2 mm – 14.2 mm wall thickness			2600 x 2600	EI 60 – C/U, C/C

\*Typical pipe diameters shown, see below graph for intermediate sizes

All services supported with pipe and cable supports at 400 mm from both faces of the wall.

### Copper Pipes - C/U



## A.4 Rigid Floors Minimum Thickness 150 mm

### A.4.1 Plastic pipes

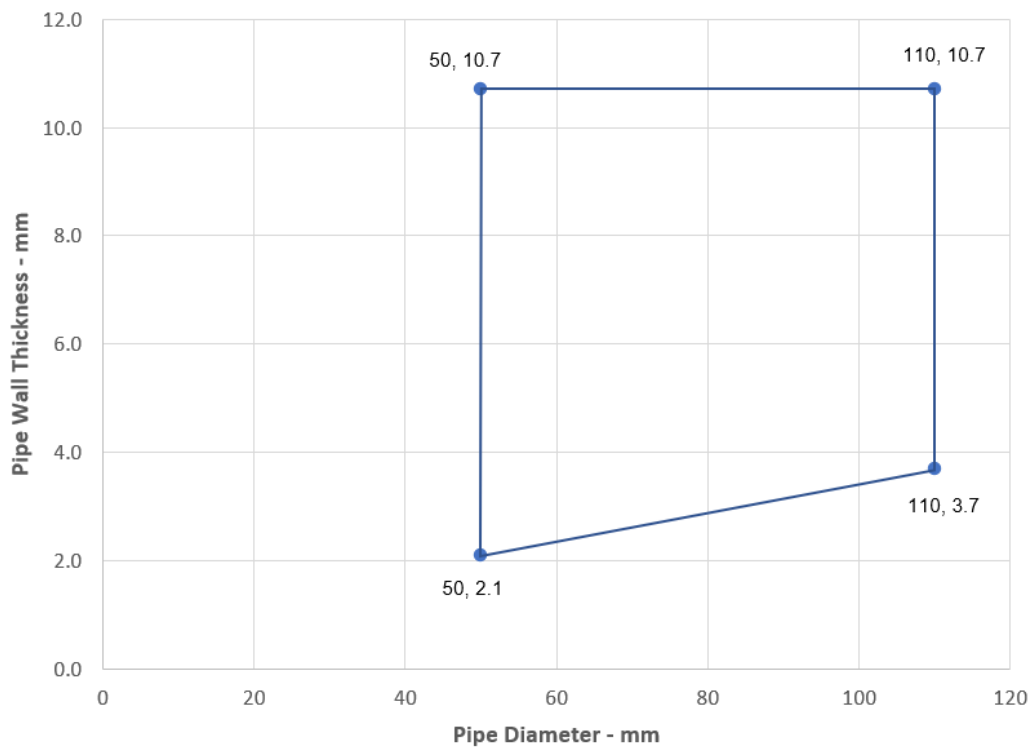
Flexible Floor ≥150mm				
				<p><u>Key</u></p> <ol style="list-style-type: none"> <li>1. Astro HPE</li> <li>2. Backing material</li> <li>3. Plastic pipe</li> <li>4. Rigid floor</li> </ol>
Penetration Service	Astro HPE Depth (mm)	Annular Space (mm)	Backing Material	Classification
PP Pipe 110 mm Ø 3.7 mm wall thickness	≥25 (both sides of floor)	20mm	≥100mm ≥45 kg/m <sup>3</sup> stone wool	EI 30 - U/C, C/C
PP Pipe 110 mm Ø 10.7 mm wall thickness				EI 120 - U/C, C/C
PP Pipe 50 mm Ø 2.1 mm wall thickness				EI 240 - U/C, C/C
PP Pipe 50 – 110 mm Ø 2.1 – 10.7 mm wall thickness*				EI 30 - U/C, C/C
PVC Pipe 40 mm Ø 2 mm wall thickness				EI 240 - U/C, C/C
PVC Pipe 114 mm Ø 3.6 mm wall thickness				E 90, EI 45 - U/C, C/C
PVC Pipe 114 mm Ø 8.1 mm wall thickness				E 120, EI 30 - U/C, C/C
PVC Pipe 40 – 114 mm Ø 2 – 8.1 mm wall thickness*				E 90, EI 30 - U/C, C/C

Penetration Service	Astro HPE Depth (mm)	Annular Space (mm)	Backing Material	Classification
PE Pipe 40 mm Ø 4.1 mm wall thickness	≥25 (both sides of floor)	15	≥100mm ≥45 kg/m <sup>3</sup> stone wool	EI 240 - U/C, C/C
PE Pipe 125 mm Ø 7.6 mm wall thickness				EI 60 - U/C, C/C
PE Pipe 125 mm Ø 11.4 mm wall thickness				EI 90 - U/C, C/C
PE Pipe 40 – 125 mm Ø 4.1 – 11.4 mm wall thickness*				EI 60 - U/C, C/C

\*Typical pipe diameters shown, see below graph for intermediate sizes

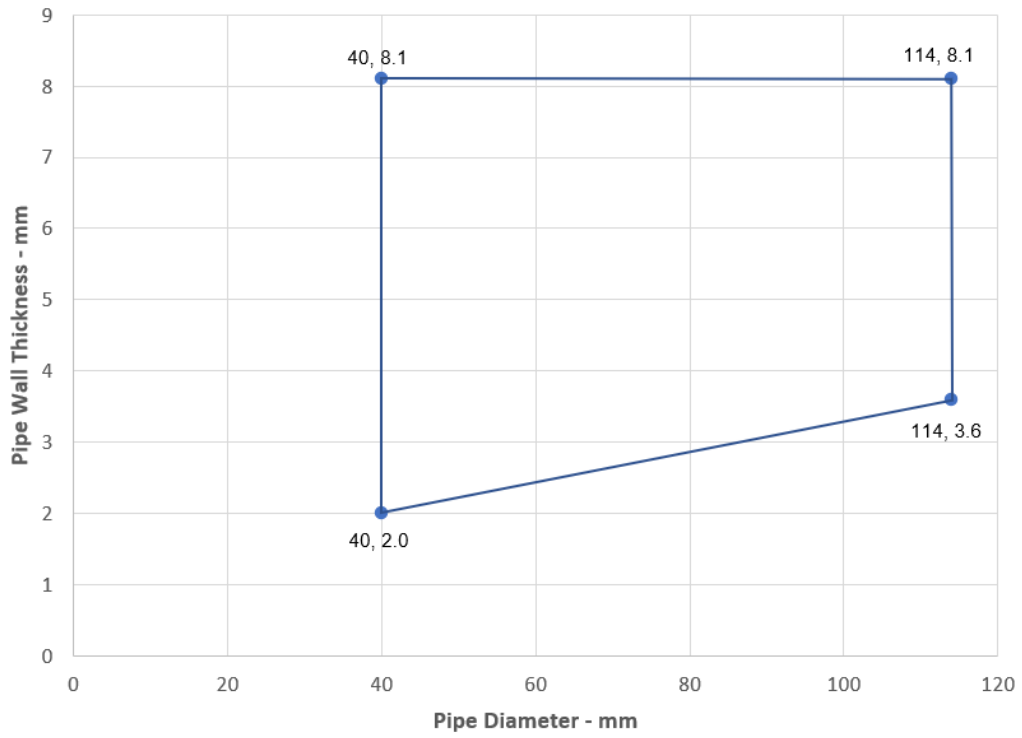
All services supported with pipe and cable supports at 250 mm from upper face of the floor.

### PP Pipes - EI 30 U/C

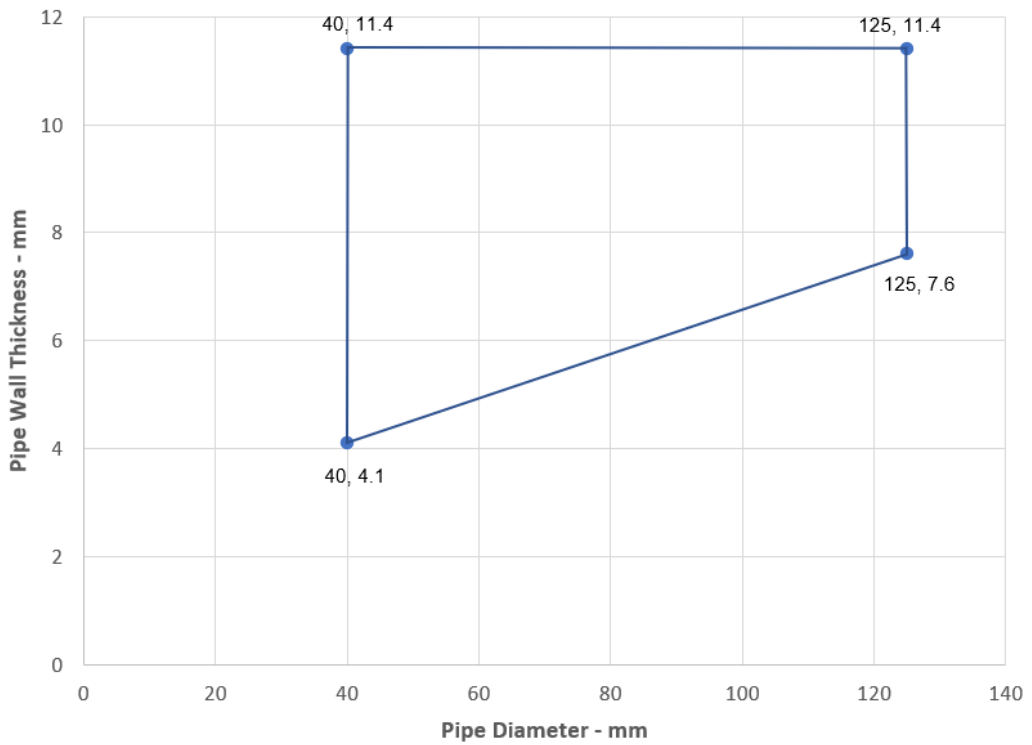




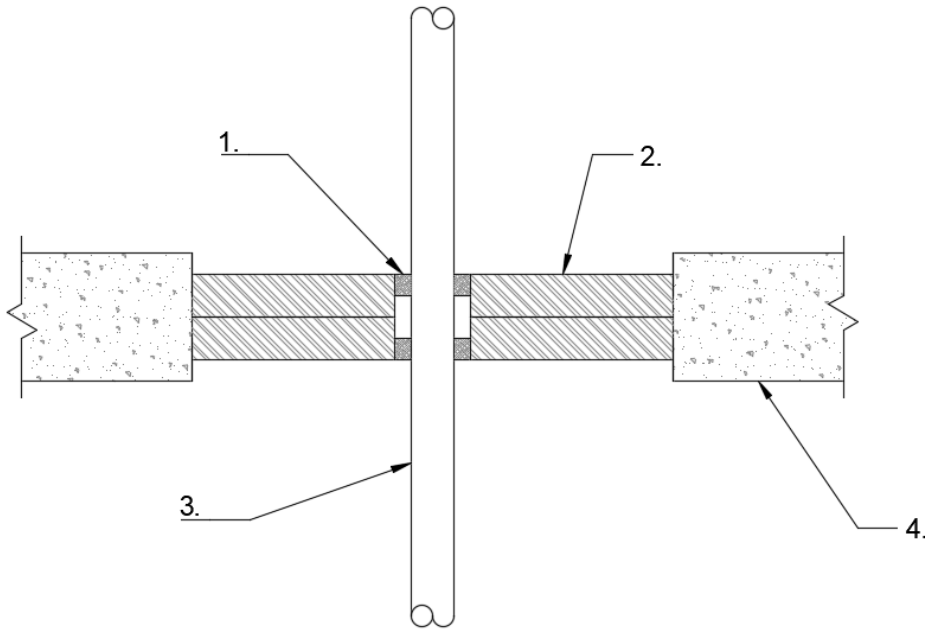
### PVC Pipes - E 90, EI 45 U/C



### PE Pipes - EI 60 U/C



Rigid Floor  $\geq 150$  mm



Key

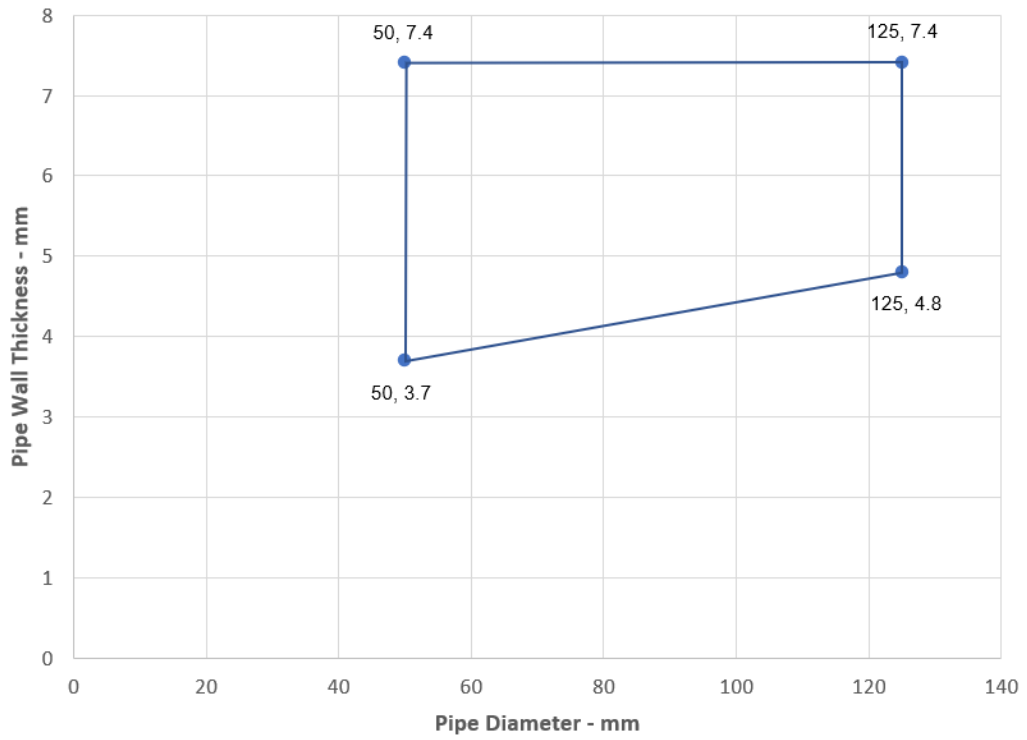
1. Astro HPE
2. Astro Batt
3. Plastic pipe
4. Rigid floor

Penetration Service	Astro HPE		50mm Astro Batt Maximum Aperture Size (mm)	Classification
	Annular Space (mm)	Min. Depth (mm)		
PVC Pipe 50 mm – 125 mm $\varnothing$ 2.6 – 7.4 mm wall thickness*	20	25 - both sides of floor	Double layer 1500 x 1000	EI 60 - U/C, C/C

\*Typical pipe diameters shown, see below graph for intermediate sizes

All services supported with pipe and cable supports at 400 mm from upper face of the floor.

### PVC Pipes - U/C



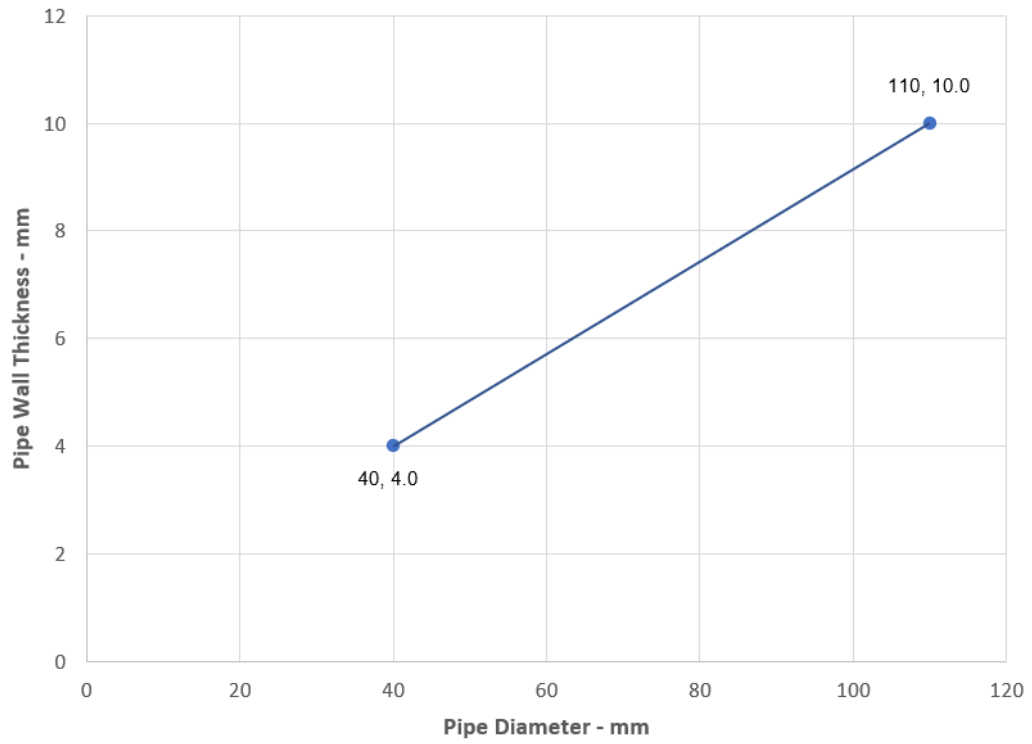
### A.4.2 Multi layered pipes

Rigid Floor $\geq 150$ mm				
				<p><u>Key</u></p> <ol style="list-style-type: none"> <li>1. Astro HPE</li> <li>2. Astro Batt</li> <li>3. MLC pipe</li> <li>4. Rigid floor</li> </ol>
Penetration Service	Astro HPE		50mm Astro Batt Maximum Aperture Size (mm)	Classification
	Annular Space (mm)	Min. Depth (mm)		
Uponor MLC (Multi-Layer Composite) Pipe 40 mm – 110 mm $\varnothing$ 4 mm – 10 mm wall thickness	20	25 - both sides of floor	Double layer 1500 x 1000	EI 60 - U/C, C/C

\*Typical pipe diameters shown, see below graph for intermediate sizes

All services supported with pipe and cable supports at 400 mm from upper face of the floor.

### MCL Pipes - U/C

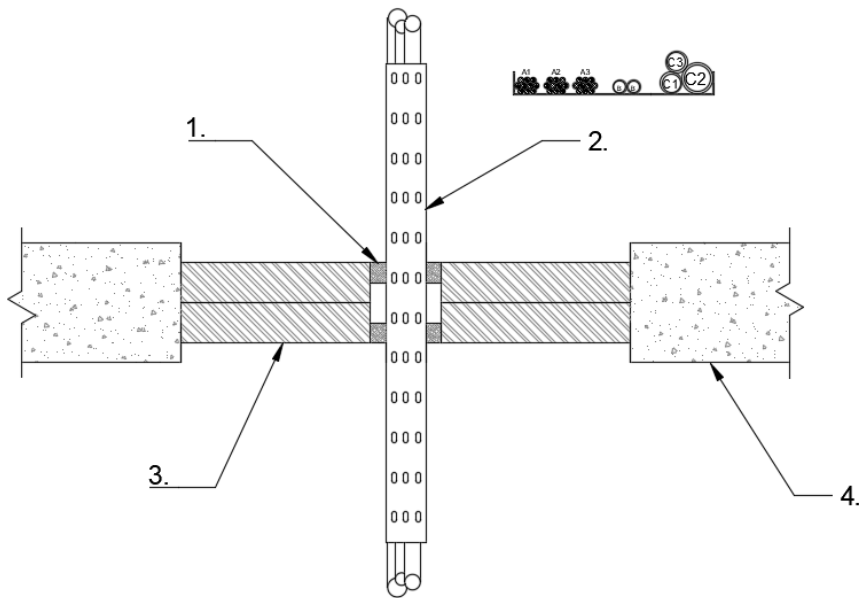


### A.4.3 Cables

Rigid Floor $\geq 150$ mm				
				<p><u>Key</u></p> <ol style="list-style-type: none"> <li>1. Astro HPE</li> <li>2. Backing material</li> <li>3. Cables</li> <li>4. Rigid floor</li> </ol>
Penetration Service	Astro HPE Min. Depth (mm)	Aperture Size (mm)	50mm Astro Batt Maximum Aperture Size (mm)	Classification
Electrical Cables $\leq 21$ mm $\varnothing$	$\geq 25$ (installed upper face only)	Max 200 x 200 Min 50 x 50	$\geq 100$ mm $\geq 45$ kg/m <sup>3</sup> stone wool	E 180, EI 30
Electrical Cables $\leq 80$ mm $\varnothing$				E 120, EI 20
Non sheathed electrical cables 0-24 mm $\varnothing$				E 180, EI 20

All services supported with pipe and cable supports at 400 mm from upper face of the floor.

Rigid Floor  $\geq 150$  mm



Key

1. Astro HPE
2. 500mm perforated cable tray
3. Astro Batt
4. Rigid wall

Penetration Service	Astro HPE		50mm Astro Batt Maximum Aperture Size (mm)	Classification
	Annular Space (mm)	Min. Depth (mm)		
*500 mm perforated cable tray	20	25 - both sides of floor	Double layer 1500mm x 1000	EI 60
*Electrical cables up to 21 mm $\varnothing$				
*Cable bunch comprising 1no. C1, 1no. C2 and 1no. C3 cables				

\*All cables coated with 2 mm DFT Astro PS Coat 300 mm along the cables both sides of the seal

All services supported with pipe and cable supports at 400 mm from upper face of the floor.

#### A.4.4 Insulated metal pipes

Rigid Floor $\geq 150$ mm				
				<p><u>Key</u></p> <ol style="list-style-type: none"> <li>1. Astro HPE</li> <li>2. Backing material</li> <li>3. Copper/Steel pipe</li> <li>4. Rigid floor</li> </ol>
Penetration Service	Astro HPE Min. Depth (mm)	Annular Space (mm)	Backing Material	Classification
Copper/Steel pipe 41-159 mm $\varnothing$ 2.5 mm - 14.2 mm wall thickness, insulated with 13 mm – 32 mm 'Armaflex' (CS) Continued Sustained	$\geq 25$ (installed upper face only)	20mm	$\geq 100$ mm $\geq 45$ kg/m <sup>3</sup> stone wool	EI 20 - U/C, C/U & C/C
Copper/Steel pipe 41 mm $\varnothing$ 1.4 mm - 14.2 mm wall thickness, insulated with 13 mm 'Armaflex' (CS) Continued	$\geq 25$ (both sides of floor)			E 240, EI 60 - U/C, C/U, C/C

All services supported with pipe and cable supports at 250 mm from upper face of the floor.



## ANNEX B – Air Permeability – Astro HPE Sealant

<b>Astro HPE Sealant: Air Permeability according to BS EN 1314-1</b>				
<b>Pressure (Pa)</b>	<b>Results under positive chamber pressure</b>		<b>Results under negative chamber pressure</b>	
	<b>Leakage (m<sup>3</sup>/h)</b>	<b>Leakage (m<sup>3</sup>/m<sup>2</sup>/ h)</b>	<b>Leakage (m<sup>3</sup>/h)</b>	<b>Leakage (m<sup>3</sup>/m<sup>2</sup>/ h)</b>
50	0.2	5.6	0.3	8.3
100	0.4	11.1	0.6	16.7
150	0.7	19.4	0.9	25.0
200	1.0	27.8	1.2	33.3
250	1.1	30.6	1.6	44.4
300	1.2	33.3	1.9	52.8
450	2.2	61.1	2.7	75.0
600	2.4	66.7	3.4	94.4