

# Gravity Wastewater Network Approved Materials List

June 2023

# Introduction

The gravity wastewater network approved materials list covers all materials for projects on Christchurch City Council (Council) owned gravity wastewater infrastructure or gravity wastewater infrastructure to be vested in Council. The approved materials list both states the manufacturing standard, size and performance requirements for all commonly used gravity wastewater product types and lists specific products meeting the manufacturing, performance and quality assurance requirements.

This list applies only to the gravity sections of the wastewater network. Gravity wastewater assets are those which are open to the atmosphere and at atmospheric pressure. Presence of manholes, inspection chambers, rodding eyes and vents indicates the wastewater network is a gravity network.

Selection of materials and products for installation in a specific location shall consider the particular, site-specific design constraints in conjunction with Council's Infrastructure Design Standards (IDS), Construction Standard Specification (CSS) and approved materials list.

Where installation of materials or products not holding approval occurs, Council retains the right to require replacement with approved products at the cost of the designer, contractor or developer responsible.

# Applying For and Maintaining Approval

## Applying for Approval

Send applications for material approval to [approvedmaterials@ccc.govt.nz](mailto:approvedmaterials@ccc.govt.nz)

Each application for material approval must:

1. State the network or networks where the material is suitable for use
2. State the product type for each product. Product types should be those listed on the approved materials list
3. List the brand name, manufacturer and suppliers for each product
4. Include a third party certificate, complete with accompanying schedule, showing the product complies with the manufacturing standard for the product type as listed on the approved materials list.
5. Include a third party certificate showing the manufacturers quality assurance system complies with ISO 9001.

Material approvals expire on the earliest certification expiry date, that is whichever is earlier of the expiry dates of the manufacturing standard certification or the ISO 9001 certification. Where a certificate is open ended and has no expiry date, we will assume a one-year timeframe for that certificate.

The approved materials committee aims to meet monthly for discussion and consideration of new applications. Approval of applications for existing product types, where the application includes all required information, typically occurs within one to five weeks dependent on when we receive the application relative to the meeting. Where we need more information or approval requires creation of a new product type, longer timeframes will be involved.

## Updating Expired Approvals

Approval expires due to certifications becoming out of date. To re-activate the approval and extend the expiry date, send new manufacturing certificates (including schedules) and/or ISO 9001 certificates to [approvedmaterials@ccc.govt.nz](mailto:approvedmaterials@ccc.govt.nz)

Updates do not require a committee meeting and therefore have shorter periods. Publishing and upload to the Council website of the updated approved materials list occurs eleven times a year on the last day of every month except December. For inclusion in the updated approved materials list new certificates must arrive a minimum of three working days before the end of the month.

Preferably updates should occur before approval expiry. On reaching 3 months past approval expiry, update is no longer possible and approval will require a new application.

# Definitions

## Approval Type Definitions

The approved materials list contains only those products that hold approval or restricted approval for use in Council networks or networks that will be vested in Council. For all approval types the approval applies only for the stated sizes/diameters, pressure ratings, materials and coatings. The following sub-sections list the approval types and conditions applying to each approval type.

### Products listed below approved for use as permitted by IDS and CSS

Products with this approval type hold approval Where a product type has this approval type the specific models and brands listed may be installed where their use is in compliance with Council Infrastructure Design Standards (IDS) and Construction Standard Specifications (CSS).

This approval size only applies up to and including a diameter of 600mm. Sizes larger than 600mm nominal diameter require project specific approval as per section 2.1.2.

### Project specific approval required to use products listed below

Use of products with this approval type requires approval from the Council project manager or subdivision engineer. Prior to issuing approval the Council project manager or subdivision engineer may require evidence showing that the proposed product type provides benefits over product types holding approval for general use as per 2.1.1. Use of these products shall comply with the IDS and CSS.

Where a product holds general approval as per 2.1.1 but the project requires sizes greater than 600mm nominal bore, Council project managers or subdivision engineers will assess the proposed size meets future network requirements and is consistent with sizes already in use.

### Products listed below approved for use as specials only

Use of products approved for use as specials only is limited to short sections as required to avoid service clashes, avoid hazards, or required to be fabricated on-site. Use of these products shall comply with the IDS and CSS.

### Products listed below approved for use during repairs only

Some products preferred for use when installing new infrastructure are not able to be used when conducting maintenance on the network due to the conditions in the trench. Products listed as for use during repairs only provide an alternative solution to permit completion of works.

Use of products approved for use during repairs only shall occur only when conducting planned or reactive works on the existing network. These products shall not be used during the installation of new infrastructure.

For all approval types only the listed makes and models are approved, and only up until the expiry date shown.

## Product Type Definitions

A separate page lists approved makes and models for each product type. Terminology referring to the individual product types can be confusing, to remove confusion we give the following definitions of commonly used terms:

## **Adaptor**

A straight-through fitting with different connection types at each end. Reducers and bends can also act as adaptors but are listed as a reducer or bend. Threaded fittings and fittings incorporating mechanical joints are listed separately.

## **Bend**

Any fitting incorporating a directional change.

## **Branch Saddle**

Electrofusion fitting that requires later tapping of the branch connection, using a separate tool.

## **Coupler**

Straight-through fitting with no diameter change for connecting similar diameter pipes.

## **Diamètre Nominal/Durchmesser Nach Norm (DN)**

Typically used in the designation of PE pipes or fittings, DN is used to indicate the nominal external diameter of pipe.

## **Double Check Valve Backflow Preventer**

Backflow preventor for medium hazard protection. A double check valve Backflow Preventer incorporates two check valves in series and incorporates ports for testing.

## **Dual Check Device Backflow Preventer**

Backflow preventor for low hazard protection. A dual check device backflow preventer incorporates two check valves in series but is not testable.

## **Gate Valve**

Valve that closes by dropping a plate or wedge into the flow. A gate valve has a slot in the invert that the plate or wedge drops into.

## **Nominal Bore (NB)**

NB is used to indicate the nominal or rounded internal diameter of the pipe.

## **Reduced Pressure Zone (RPZ)**

Backflow preventor for high hazard protection. A RPZ incorporates two check valves separated by a pressure monitored chamber capable of venting excess pressure. RPZs incorporate test ports.

## **Reducer**

Tapered or stepped fitting to change the pipe diameter.

## **Sluice Valve**

Valve that closes by dropping a plate or wedge into the flow. A sluice valve has a continuous invert and the plate or wedge matches the shape of and seals against the invert.

## **Stop Cock**

A ball valve specifically for the individual customer connection on each lateral.

## **Tapping Band**

A ring clamped around a pipe allowing the connection of a branch pipe or fitting.

## **Tapping Saddle**

Electrofusion fitting that incorporates a mechanism for tapping the branch connection.

## **Threaded Transition**

Adaptor with a British Standard Pipe (BSP) thread at one end and an alternative connection type at the other. Threaded transitions may be straight-through or incorporate a change in direction.

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# Section 1

## Pipes

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# Approved Materials List

**Network:** Wastewater (Gravity)  
**Product Type:** PVC Pipe  
**Material:** PVC-U

**Approval Type:** Products listed below approved for use as permitted by IDS and CSS

## Performance Requirements

**Manufacturing Standard:** AS/NZS 1260  
**Material Specification:** Pipe: Unplasticised Polyvinyl Chloride (PVC-U)  
 Rubber Rings: EPDM or Nitrile Rubber to AS 1646, AS 681.1 and AS 681.2  
**Coating Specification:** N/A  
**Stiffness Ratings:** As required by site specific design. Min SN16 ( $\leq 175\text{NB}$ ) or SN8 ( $> 175\text{NB}$ )  
**Approved Sizes:** 100 (Laterals only), 150, 175, 225, 300, 375, 475 and 600 nominal bore.  
**Operational Life:** 100 years  
**Other Requirements:**

- Colour: Pipe exterior shall be Pearl Grey coloured no lighter than the colour N11 and no darker than the colour N22 of AS2700. Bore shall be a CCTV appropriate colour.
- Refer to Appendix 2 - PVC Witness Mark memo.
- Diameters greater than 600NB require project specific approval.

Brand Name	Manufacturer	Supplier	Approval Expires
Novadrain	Iplex Pipelines Ltd	Humes, Hynds	3/02/2024
Sewer-Lock	RX Plastics Ltd	RX Plastics Ltd	18/03/2024
Optim RJ	RX Plastics Ltd	Marley	18/03/2024
Restrain (laterals only)	Iplex Pipelines Ltd	Humes, Hynds	3/02/2024
ER PVC DWV Pipe	FuJian XiangLong Plastic Co. Ltd.	Solo Plastics Ltd	28/06/2025

# Approved Materials List

**Network:** Wastewater (Gravity)  
**Product Type:** Polyethylene pipe - Solid Wall  
**Material:** Polyethylene (PE)

**Approval Type:** Products listed below approved for use as permitted by IDS and CSS

## Performance Requirements

**Manufacturing Standard:** AS/NZS 5065  
**Material Specification:** PE100 to AS/NZS 4131.

**Coating Specification:** N/A  
**Stiffness Ratings:** DN110-180: SDR17/SN16. DN250 and greater: SDR21/SN8.  
**Approved Sizes:** DN110, DN125, DN180, DN200, DN250, DN355, DN450, DN560 and DN710  
**Operational Life:** 100 years  
**Other Requirements:**

- DN110 size pipes for lateral pipe bursting use only.
- Pipe shall be plain ended.
- Colour: Pipe exterior shall have minimum 4 No. Pearl Grey stripes coloured no lighter than the colour N11 and no darker than the colour N22 of AS2700. Bore shall be a CCTV appropriate colour.
- Refer to Appendix 1 - PE Manufacturers Actions memo.
- Diameters greater than 600NB require project specific approval.

Brand Name	Manufacturer	Supplier	Approval Expires
Vision	Waters and Farr	Hynds	14/10/2025
J-Pipe	RX Plastics Ltd	RX Plastics Ltd	18/03/2024

# Approved Materials List

**Network:** Wastewater (Gravity)  
**Product Type:** Polypropylene Pipe - Solid Wall  
**Material:** Polypropylene (PP)

**Approval Type:** Project specific approval required to use products listed below

## Performance Requirements

**Manufacturing Standard:** AS/NZS 5065  
**Material Specification:** Pipe: Polypropylene (PP)  
 Rubber Rings: EPDM or Nitrile Rubber to AS 1646.  
**Coating Specification:** N/A  
**Stiffness Ratings:** DN125-180: SDR17/SN16. DN250 and greater: SDR21/SN8.  
**Approved Sizes:** DN125, DN180, DN200, DN250, DN355, DN450, DN560 and DN710  
**Operational Life:** 100 years  
**Other Requirements:**

- DN125 size pipes for laterals only.
- End Configurations: Rubber ring joints to AS/NZS 5065.
- Colour: Pipe exterior shall have minimum 4 No. Pearl Grey stripes coloured no lighter than the colour N11 and no darker than the colour N22 of AS2700. Bore shall be a CCTV appropriate colour.

Brand Name	Manufacturer	Supplier	Approval Expires

# Approved Materials List

**Network:** Wastewater (Gravity)  
**Product Type:** RCRR Pipe  
**Material:** Vertically Cast or Spun Reinforced Concrete

**Approval Type:** Products listed below approved for use as permitted by IDS and CSS

## Performance Requirements

**Manufacturing Standard:** AS/NZS 4058  
**Material Specification:** Pipe: Cement to NZS 3122. Reinforcing: Steel to AS/NZS 4761.  
 Rubber Rings: EPDM or Nitrile Rubber to AS 1646.  
**Coating Specification:** N/A  
**Stiffness Ratings:** As required by site specific design. Minimum Class 4 (Z).  
**Approved Sizes:** 225NB, 300NB, 375NB, 450NB, 525NB and 600NB  
**Operational Life:** 120 years.  
**Other Requirements:**

- Cement shall cure for a minimum of 7 days before delivery.
- Short pipes shall be as per SD341 of the CSS.
- Maximum length of 225NB pipes shall be 1.83m
- Requires protection from hydrogen sulphide attack in sewer applications, by plastic lining or selection of appropriate cement additives to meet life requirements.
- Diameters greater than 600NB require project specific approval.

Brand Name	Manufacturer	Supplier	Approval Expires
Titan	Humes Pipeline Systems	Humes	27/04/2025
Hyspec	Hynds Pipe Systems Ltd	Hynds	7/04/2024
Elepipe	McDonald Concrete Group Ltd	McDonald Concrete	27/10/2025

# Approved Materials List

**Network:** Wastewater (Gravity)  
**Product Type:** Ductile Iron (DI) Pipe  
**Material:** Cement Mortar Lined Ductile Iron (MLDI)

**Approval Type:** Products listed below approved for use as specials only

## Performance Requirements

**Manufacturing Standard:** AS/NZS 2280

**Material Specification:** Pipe: Ductile Iron to AS/NZS 2280.  
 Rubber Rings: EPDM or Nitrile Rubber to AS 1646.

**Coating Specification:** AS/NZS 2280, AS/NZS 4158 and/or AS/NZS 4793.

**Pressure Ratings:** PN20 or PN35.

**Approved Sizes:** 150NB, 225NB, 300NB and 475NB.

**Operational Life:** 120 years.

**Other Requirements:**

- Diameters greater than 600NB require project specific approval.
- End Configurations: Rubber ring, mechanical compression or flange joints.
- Flanges: Shall meet full requirements of AS/NZS 4087.
- Compression Joints: Shall be certified to AS/NZS4998.
- Pipe shall be installed in a pearl grey PE sleeve.
- Diameters greater than 600NB require project specific approval.

Brand Name	Manufacturer	Supplier	Approval Expires
Tyton	PAM Saint-Gobain	Asmuss	14/11/2023
TytonXcel	Xinxing DI Pipes Co Ltd	Viadux Pty Ltd	31/07/2024
TytonXcel Z+	Xinxing DI Pipes Co Ltd	Viadux Pty Ltd	31/07/2024
TytonXceed Z+	Xinxing DI Pipes Co Ltd	Viadux Pty Ltd	31/07/2024

# Approved Materials List

**Network:** Wastewater (Gravity)  
**Product Type:** Cement Lined Steel Pipe  
**Material:** Cement Mortar Lined Steel (CLS)

**Approval Type:** Products listed below approved for use as specials only

### Performance Requirements

**Manufacturing Standard:** AS/NZS 4442.  
**Material Specification:** Pipe: Steel to AS/NZS 4442.  
 Lining: Cement Mortar to AS/NZS 4442.  
**Coating Specification:** AS/NZS 2312.  
**Pressure Ratings:** Minimum PN16.  
**Approved Sizes:** 150NB, 225NB, 300NB and 475NB.  
**Operational Life:** 120 years.  
**Other Requirements:**

- Diameters greater than 600NB require project specific approval.
- End Configurations: Rubber ring, mechanical compression or flange joints.
- Flanges: Shall meet full requirements of AS/NZS 4087.
- Compression Joints: Shall be certified to AS/NZS4998.
- Pipe shall be installed in a pearl grey PE sleeve.
- Diameters greater than 600NB require project specific approval.

Brand Name	Manufacturer	Supplier	Approval Expires

# Approved Materials List

**Network:** Wastewater (Gravity)  
**Product Type:** GRP Pipe  
**Material:** Glass Reinforced Thermosetting Plastics (GRP)

**Approval Type:** Project specific approval required to use products listed below

**Performance Requirements**

**Manufacturing Standard:** AS 3571.1  
**Material Specification:** Pipe: Glass Reinforced Thermosetting Plastics (GRP) to AS 3571.1.  
 Rubber Rings: EPDM or Nitrile Rubber to AS 1646.  
**Coating Specification:** N/A  
**Pressure Ratings:** PN12, PN15.  
**Approved Sizes:** 300NB, 375NB, 450NB, 600NB.  
**Operational Life:** 100 years.  
**Other Requirements:**

- Diameters greater than 600NB require project specific approval.
- End Configurations: Rubber ring joints.
- Colour: Bore shall be a CCTV appropriate colour.

Brand Name	Manufacturer	Supplier	Approval Expires

# Section 2

## Access & Inspection Chambers

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### **Notes on Manhole Sizes:**

- Circular manholes are 1000mm (plastic) or 1050mm (reinforced concrete) in diameter and suitable for pipes up to 400mm outer diameter.
- Square manholes are 1200mm x 1200mm in external dimension, fabricated from reinforced concrete and suitable for pipes up to 750mm outer diameter passing straight through or up to 675mm diameter where direction changes.
- Larger pipes require a site specific design as per IDS Section 6.6.3.



# Approved Materials List

**Network:** Wastewater (Gravity)  
**Product Type:** Circular Manhole Lid (SD303)  
**Material:** Reinforced Concrete

**Approval Type:** Products listed below approved for use as permitted by IDS and CSS

## Performance Requirements

**Manufacturing Standard:** PS3 producer statement certifying manufacture to NZS 3109  
**Material Specification:** Precast Reinforced Concrete. Steel Reinforcing.

**Coating Specification:** N/A  
**Stiffness Ratings:** Design Loading to HN-HO-72  
**Approved Sizes:** 1050 diameter  
**Operational Life:** 100 years.  
**Other Requirements:**

- Concrete Finish: to CSS: Part 3 clause 12.9.
- Exposure Classification: External surfaces to B1 internal surfaces to B2 NZS 3101.
- Not suitable for environments with >0.2ppm H2S.
- Dimensions: As detailed on SD 303 of CSS: Part 3
- Name Plate IE branding: As per AS/NZS 4058.

Brand Name	Manufacturer	Supplier	Approval Expires
Humes Precast Manhole	Humes Pipeline Systems	Humes	11/08/2025
Hyspec	Hynds Pipe Systems Ltd	Hynds	7/04/2024
ELE 1050 Manhole Lid	McDonald Concrete Group Ltd	McDonald Concrete	27/10/2025

# Approved Materials List

**Network:** Wastewater (Gravity)  
**Product Type:** Circular Manhole Riser (SD303)  
**Material:** Reinforced Concrete

**Approval Type:** Products listed below approved for use as permitted by IDS and CSS

## Performance Requirements

**Manufacturing Standard:** AS/NZS 4058  
**Material Specification:** Precast, Vertically Cast or Spun Reinforced Concrete. Steel Reinforcing.

**Coating Specification:** N/A

**Stiffness Ratings:** Design Loading to HN-HO-72

**Approved Sizes:** 1050 diameter

**Operational Life:** 100 years.

**Other Requirements:**

- Concrete Finish: to CSS: Part 3 clause 12.9.
- Exposure Classification: External surfaces to B1 internal surfaces to B2 NZS 3101.
- Not suitable for environments with >0.2ppm H2S.
- Dimensions: As detailed on SD 303 of CSS: Part 3
- Name Plate IE branding: As per AS/NZS 4058.
- Risers shall key into base, lid and other risers. Keyed joints shall create a watertight seal with or without a sealant.

Brand Name	Manufacturer	Supplier	Approval Expires
Humes Precast Manhole	Humes Pipeline Systems	Humes	27/04/2025
Hyspec	Hynds Pipe Systems Ltd	Hynds	7/04/2024
ELE 1050 Manhole Riser	McDonald Concrete Group Ltd	McDonald Concrete	27/10/2025

# Approved Materials List

**Network:** Wastewater (Gravity)  
**Product Type:** Circular Manhole Base (SD303)  
**Material:** Reinforced Concrete

**Approval Type:** Products listed below approved for use as permitted by IDS and CSS

## Performance Requirements

**Manufacturing Standard:** PS3 producer statement certifying manufacture to NZS 3109

**Material Specification:** Precast and Spun Reinforced Concrete. Steel Reinforcing.

**Coating Specification:** N/A

**Stiffness Ratings:** Design Loading to HN-HO-72

**Approved Sizes:** 1050 diameter

**Operational Life:** 100 years.

**Other Requirements:**

- Concrete Finish: to CSS: Part 3 clause 12.9.
- Exposure Classification: External surfaces to B1 internal surfaces to B2 NZS 3101.
- Not suitable for environments with >0.2ppm H2S.
- Dimensions: As detailed on SD 303 of CSS: Part 3
- Name Plate IE branding: As per AS/NZS 4058.

Brand Name	Manufacturer	Supplier	Approval Expires
Humes Precast Manhole	Humes Pipeline Systems	Humes	11/08/2025
Hyspec	Hynds Pipe Systems Ltd	Hynds	7/04/2024
ELE 1050 Manhole Base	McDonald Concrete Group Ltd	McDonald Concrete	27/10/2025

# Approved Materials List

**Network:** Wastewater (Gravity)  
**Product Type:** Square Manhole Lid (SD302)  
**Material:** Reinforced Concrete

**Approval Type:** Products listed below approved for use as permitted by IDS and CSS

## Performance Requirements

**Manufacturing Standard:** PS3 producer statement certifying manufacture to NZS 3109  
**Material Specification:** Precast Reinforced Concrete. Steel Reinforcing.

**Coating Specification:** N/A  
**Stiffness Ratings:** Design Loading to HN-HO-72  
**Approved Sizes:** Approx 1200 square. Refer CSS Part 3 SD303.  
**Operational Life:** 100 years.  
**Other Requirements:**

- Concrete Finish: to CSS: Part 3 clause 12.9.
- Exposure Classification: External surfaces to B1 internal surfaces to B2 NZS 3101.
- Not suitable for environments with >0.2ppm H2S.
- Dimensions: As detailed on SD 302 of CSS: Part 3
- Name Plate IE branding: As per AS/NZS 4058.

Brand Name	Manufacturer	Supplier	Approval Expires
CCC 900 Square Manhole	Humes Pipeline Systems	Humes	11/08/2025
CCC 900 Square Manhole	Hynds Pipe Systems Ltd	Hynds	7/04/2024

# Approved Materials List

**Network:** Wastewater (Gravity)  
**Product Type:** Square Manhole Riser (SD303)  
**Material:** Reinforced Concrete

**Approval Type:** Products listed below approved for use as permitted by IDS and CSS

**Performance Requirements**

**Manufacturing Standard:** PS3 producer statement certifying manufacture to NZS 3109  
**Material Specification:** Precast Reinforced Concrete. Steel Reinforcing.

**Coating Specification:** N/A

**Stiffness Ratings:** Design Loading to HN-HO-72

**Approved Sizes:** Approx 1200 square. Refer CSS Part 3 SD303.

**Operational Life:** 100 years.

- Other Requirements:**
- Concrete Finish: to CSS: Part 3 clause 12.9.
  - Exposure Classification: External surfaces to B1 internal surfaces to B2 NZS 3101.
  - Not suitable for environments with >0.2ppm H<sub>2</sub>S.
  - Dimensions: As detailed on SD 303 of CSS: Part 3
  - Name Plate IE branding: As per AS/NZS 4058.
  - Risers shall key into base, lid and other risers. Keyed joints shall create a watertight seal with or without a sealant.

Brand Name	Manufacturer	Supplier	Approval Expires
CCC 900 Square Manhole	Humes Pipeline Systems	Humes	11/08/2025
CCC 900 Square Manhole	Hynds Pipe Systems Ltd	Hynds	7/04/2024

# Approved Materials List

**Network:** Wastewater (Gravity)  
**Product Type:** Square to Circular Manhole Transition (SD303)  
**Material:** Reinforced Concrete

**Approval Type:** Products listed below approved for use as permitted by IDS and CSS

## Performance Requirements

**Manufacturing Standard:** PS3 producer statement certifying manufacture to NZS 3109

**Material Specification:** Precast Reinforced Concrete. Steel Reinforcing.

**Coating Specification:** N/A

**Stiffness Ratings:** Design Loading to HN-HO-72

**Approved Sizes:** Approx 1200 square. Refer CSS Part 3 SD303.

**Operational Life:** 100 years.

**Other Requirements:**

- Concrete Finish: to CSS: Part 3 clause 12.9.
- Exposure Classification: External surfaces to B1 internal surfaces to B2 NZS 3101.
- Not suitable for environments with >0.2ppm H2S.
- Dimensions: As detailed on SD 303 of CSS: Part 3
- Name Plate IE branding: As per AS/NZS 4058.
- Joints shall create a watertight seal with or without a sealant.

Brand Name	Manufacturer	Supplier	Approval Expires
CCC 900 Square Manhole	Humes Pipeline Systems	Humes	11/08/2025
CCC 900 Square Manhole	Hynds Pipe Systems Ltd	Hynds	7/04/2024

# Approved Materials List

**Network:** Wastewater (Gravity)  
**Product Type:** Square Manhole Base (SD303)  
**Material:** Reinforced Concrete

**Approval Type:** Products listed below approved for use as permitted by IDS and CSS

## Performance Requirements

**Manufacturing Standard:** PS3 producer statement certifying manufacture to NZS 3109

**Material Specification:** Precast Reinforced Concrete. Steel Reinforcing.

**Coating Specification:** N/A

**Stiffness Ratings:** Design Loading to HN-HO-72

**Approved Sizes:** Approx 1200 square. Refer CSS Part 3 SD303.

**Operational Life:** 100 years.

- Other Requirements:**
- Concrete Finish: to CSS: Part 3 clause 12.9.
  - Exposure Classification: External surfaces to B1 internal surfaces to B2 NZS 3101.
  - Not suitable for environments with >0.2ppm H2S.
  - Dimensions: As detailed on SD 303 of CSS: Part 3
  - Name Plate IE branding: As per AS/NZS 4058.
  - Joints shall create a watertight seal with or without a sealant.

Brand Name	Manufacturer	Supplier	Approval Expires
CCC 900 Square Manhole	Humes Pipeline Systems	Humes	11/08/2025
CCC 900 Square Manhole	Hynds Pipe Systems Ltd	Hynds	7/04/2024

# Approved Materials List

**Network:** Wastewater (Gravity)  
**Product Type:** Moulded Plastic Manhole  
**Material:** Polyethylene (PE) or Polypropylene (PP)

**Approval Type:** Products listed below approved for use as permitted by IDS and CSS

## Performance Requirements

**Manufacturing Standard:** EN 13598-2:2016, ISO 13272 or WSA 137  
**Material Specification:** Polyethylene (PE) or Polypropylene (PP)

**Coating Specification:** N/A  
**Stiffness Ratings:** Shall meet HN-HO-72 when installed with a Load Distribution Ring.  
**Approved Sizes:** 1000 and 1050mm diameters  
**Operational Life:** 100 years  
**Other Requirements:**

- Ground Conditions: For use in TC1 and TC2 category land only.
- Other: Ladders/steps (if included) shall have the same life-span as the chamber.
- A reinforced concrete Load distribution ring (LDR) meeting the requirements in IDS Section 6.6 shall be installed around the chamber opening to support the manhole cover and protect the chamber from traffic loadings.

Brand Name	Manufacturer	Supplier	Approval Expires
Romold DN1000	Romold GmbH	Australasia Moulding Ltd	27/07/2024
1050 SmartPit	SmartStream Technology	Hynds	4/07/2024



# Approved Materials List

**Network:** Wastewater (Gravity)  
**Product Type:** Moulded Plastic Inspection Chamber  
**Material:** Polyethylene (PE) or Polypropylene (PP)

**Approval Type:** Project specific approval required to use products listed below

## Performance Requirements

**Manufacturing Standard:** EN 13598-2:2016, ISO 13272 or WSA 137  
**Material Specification:** Polyethylene (PE) or Polypropylene (PP)

**Coating Specification:** N/A

**Stiffness Ratings:** Shall meet HN-HO-72 when installed with a Load Distribution Ring.

**Approved Sizes:** 600mm diameter.

**Operational Life:** 100 years

**Other Requirements:**

- Shall only be installed on mains 300NB and smaller.
- Ground Conditions: For use in TC1 and TC2 category land only.
- Other: Ladders/steps (if included) shall have the same life-span as the chamber.
- When installed in trafficked areas a reinforced concrete Load distribution ring (LDR) meeting the requirements in IDS Section 6.6 shall be installed around the chamber opening to support the manhole cover and protect the chamber from traffic loadings.

Brand Name	Manufacturer	Supplier	Approval Expires
Romold DN600	Romold GmbH	Australasia Moulding Ltd	27/07/2024
600 MiniPit	SmartStream Technology	Hynds	Expired

# Approved Materials List

**Network:** Wastewater (Gravity)  
**Product Type:** Manhole Starter Pipe  
**Material:** U-PVC - Gritted.

**Approval Type:** Products listed below approved for use as permitted by IDS and CSS

## Performance Requirements

**Manufacturing Standard:** AS/NZS 1260

**Material Specification:** Pipe: Unplasticised Polyvinyl Chloride (PVC-U)  
 Rubber Rings: EPDM or Nitrile Rubber to AS 1646, AS 681.1 and AS 681.2

**Coating Specification:** Gritted

**Stiffness Ratings:** DN100-175: SN16. DN225 and larger: SN8.

**Approved Sizes:** 100NB, 150NB, 175NB, 225NB, 300NB, 375NB, 475NB and 600NB

**Operational Life:** 100 years

**Other Requirements:**

- End configurations: spigot or rubber ring joint
- AS/NZS 1260 certification not required where product is constructed from certified pipe.
- Third party AS/NZS 1260 certification required where product is constructed from non-certified pipe or moulded from raw PVC.

Brand Name	Manufacturer	Supplier	Approval Expires
Gritted Manhole Starter	TD Plastics Ltd	TD Plastics Ltd	11/05/2024
Gritted manhole finisher	Strata Plastics	Humes, Hynds, Plumbing World	19/08/2023
Gritted manhole starter	Strata Plastics	Humes, Hynds, Plumbing World	19/08/2023
Gritted manhole starter	Solo Plastics	Solo Plastics	16/12/2023

# Approved Materials List

**Network:** Wastewater (Gravity)  
**Product Type:** Circular Manhole Cover and Frame (600 diameter)  
**Material:** Ductile Iron (DI)

**Approval Type:** Products listed below approved for use as permitted by IDS and CSS

## Performance Requirements

**Manufacturing Standard:** AS 3996  
**Material Specification:** Ductile Iron to AS 1831

**Coating Specification:** N/A  
**Stiffness Ratings:** AS 3996 Class D  
**Approved Sizes:** 600mm diameter clear circular opening.  
**Operational Life:** 100 years  
**Other Requirements:**

- Lid shall be hinged.
- Ventilated, unsealed and sealed versions permitted.
- Weight: Maximum lift 30kg
- Covers and frames shall provide for fitment of galvanised safety grills and flood trays.
- Markings: In addition to AS 3996 clause 1.6 markings covers shall be permanently marked "WW" 25mm high and display the manufacturers batch number

Brand Name	Manufacturer	Supplier	Approval Expires
Korum	PAM Saint-Gobain	Pipe and Infrastructure	27/01/2023
Maestro	E J Picardie	Hynds	31/01/2023
Twino SR Vented	E J Picardie	Hynds	31/01/2023

# Approved Materials List

**Network:** Wastewater (Gravity)  
**Product Type:** Rectangular Manhole Cover and Frame (SD301)  
**Material:** Grey Cast Iron (DI)

**Approval Type:** Project specific approval required to use products listed below

## Performance Requirements

**Manufacturing Standard:** AS 3996  
**Material Specification:** Grey Cast Iron T220

**Coating Specification:** N/A  
**Stiffness Ratings:** AS 3996 Class D  
**Approved Sizes:** 562mm x 434mm  
**Operational Life:** 100 years  
**Other Requirements:** • Dimensions: As per SD 301 of CSS.

Brand Name	Manufacturer	Supplier	Approval Expires
SD301 Rectangular	Unknown	Hynds	Expired

# Approved Materials List

**Network:** Wastewater (Gravity)  
**Product Type:** Manhole Safety Grate  
**Material:** 316 Stainless Steel or galvanised mild steel.

**Approval Type:** Project specific approval required to use products listed below

## Performance Requirements

**Manufacturing Standard:** AS 3996 2.2(b)  
**Material Specification:** 316 Stainless Steel or galvanised mild steel.

**Coating Specification:** N/A  
**Stiffness Ratings:** AS 3996 Class A  
**Approved Sizes:** To fit 600mm circular manhole cover and frame.  
**Operational Life:** 100 years  
**Other Requirements:**

- Dimensions: To fit 600mm circular manhole cover and frame.
- Opening Dimensions: 210mm maximum for mesh, 100mm for parallel bars.
- Grate shall be stable under asymmetrical load.
- Grates shall be lift-out designs.
- Stainless steel grates shall be used where there is a corrosion risk.

Brand Name	Manufacturer	Supplier	Approval Expires

# Section 3

## Mechanical Couplers & Adaptors

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Restrained Mechanical Couplers and Flange Adaptors for PE Pipe	27
Elastomeric Metal Banded Coupler	28

# Approved Materials List

**Network:** Wastewater (Gravity)  
**Product Type:** Unrestrained Mechanical Coupler  
**Material:** Ductile Iron (DI)

**Approval Type:** Products listed below approved for use as permitted by IDS and CSS

## Performance Requirements

**Manufacturing Standard:** AS/NZS 4998 OR EN 14525  
**Material Specification:** Body: Ductile Iron to AS1831. Seals: EPDM or Nitrile Rubber to AS1646. Bolts and nuts as per approved materials listing.  
**Coating Specification:** Thermally bonded polymeric to AS/NZS 4158  
**Pressure Ratings:** PN12 minimum.  
**Approved Sizes:** 100-600NB.  
**Operational Life:** 100 years  
**Other Requirements:**

- End configuration: Mechanical - Mechanical OR Mechanical - Flange. Flanges to meet full requirements of AS/NZS 4087 Figure B5.
- Stainless bolts, where used, shall have an anti-galling coating.
- Nominal size, maximum angle of deflection, nominal pipe setting gap and tightening torque shall be marked on each item.
- Unrestrained jointing of AC, CLS, CI, DI, PVC and Steel pipes 100 mm and above. Not to be used on PE pipe.

Brand Name	Manufacturer	Supplier	Approval Expires
Super-Gib Series 601	AVK	Humes	14/02/2024
Series 603	AVK	Humes	14/02/2024
MultiJoint 3000+	Georg Fisher Waga NV	Hynds	27/05/2024
MultiJoint 3050+	Georg Fisher Waga NV	Hynds	27/05/2024
MaxiFit Coupling	Viking Johnson	Hynds	25/08/2023
MaxiFit Adaptor	Viking Johnson	Hynds	25/08/2023

# Approved Materials List

**Network:** Wastewater (Gravity)  
**Product Type:** Restrained Mechanical Coupler  
**Material:** Ductile Iron (DI)

**Approval Type:** Products listed below approved for use as permitted by IDS and CSS

## Performance Requirements

**Manufacturing Standard:** AS/NZS 4998 OR EN 14525

**Material Specification:** Body: Ductile Iron to AS1831. Seals: EPDM or Nitrile Rubber to AS1646.  
 Bolts and nuts as per approved materials listing.

**Coating Specification:** Thermally bonded polymeric to AS/NZS 4158

**Pressure Ratings:** PN16

**Approved Sizes:** 100-600NB.

**Operational Life:** 100 years

**Other Requirements:**

- End configuration: Mechanical - Mechanical OR Mechanical - Flange. Flanges to meet full requirements of AS/NZS 4087 Figure B5.
- Stainless bolts, where used, shall have an anti-galling coating.
- Nominal size, maximum angle of deflection, nominal pipe setting gap and tightening torque shall be marked on each item.
- Restrained jointing of AC, CLS, CI, DI, PVC and Steel pipes 100 mm and above. Not to be used on PE pipe.

Brand Name	Manufacturer	Supplier	Approval Expires
Super-Maxi Series 631	AVK	Humes	14/02/2024
Super-MaxiSeries 633	AVK	Humes	14/02/2024
MultiJoint 3007+	Georg Fisher Waga NV	Hynds	27/05/2024
MultiJoint 3057+	Georg Fisher Waga NV	Hynds	27/05/2024
System 2000 Coupler	E Hawle Armaturenwerke GmbH	Hynds	31/03/2024
System 2000 Adaptor	E Hawle Armaturenwerke GmbH	Hynds	31/03/2024



# Approved Materials List

**Network:** Wastewater (Gravity)  
**Product Type:** Restrained Mechanical Coupler for PE Pipe  
**Material:** Ductile Iron (DI)

**Approval Type:** Products listed below approved for use during repairs only.

## Performance Requirements

**Manufacturing Standard:** EN 14525  
**Material Specification:** Body: Ductile Iron to AS1831. Seals: EPDM or Nitrile Rubber to AS1646. Bolts and nuts as per approved materials listing.  
**Coating Specification:** Thermally bonded polymeric coating to AS/NZS 4158  
**Pressure Ratings:** PN16  
**Approved Sizes:** 100-600NB.  
**Operational Life:** 100 years  
**Other Requirements:**

- End configuration: Mechanical - Mechanical OR Mechanical - Flange. Flanges to meet full requirements of AS/NZS 4087 Figure B5.
- Stainless bolts, where used, shall have an anti-galling coating.
- Nominal size, maximum angle of deflection, nominal pipe setting gap and tightening torque shall be marked on each item.
- Shall be designed specifically for use on PE pipes.
- Stainless steel support liners shall be installed in pipes.

Brand Name	Manufacturer	Supplier	Approval Expires
Super-Maxi Series 621	AVK	Humes	14/02/2024
Super-MaxiSeries 623	AVK	Humes	14/02/2024
Synoflex Coupler	E Hawle Armaturenwerke GmbH	Hynds	31/03/2024
Synoflex Adaptor	E Hawle Armaturenwerke GmbH	Hynds	31/03/2024

# Approved Materials List

**Network:** Wastewater (Gravity)  
**Product Type:** Elastomeric Metal Banded Coupler  
**Material:** Elastomeric Polymer and Stainless Steel

**Approval Type:** Products listed below approved for repairs only.

## Performance Requirements

**Manufacturing Standard:** AS/NZS 4327  
**Material Specification:** Sleeve: Elastomer to BS EN 295.4 Type 2A or AS 681.1.  
Shear Band: 304 or 316 Stainless Steel.

**Coating Specification:** N/A

**Stiffness Ratings:** N/A

**Approved Sizes:** 65NB - 600NB

**Operational Life:** 50 years

**Other Requirements:**

- Sealing Pressure: Elastomeric sealing pressure to DIN EN 14741.
- Use only to connect repairs where adjacent PVC, cementitious or metallic pipe life is less than 30yrs.
- Insertion depth  $\geq$  socket of connecting pipe.
- 316 Stainless steel shear bands shall be used in areas of aggressive groundwater.

Brand Name	Manufacturer	Supplier	Approval Expires
Awadukt FlexConnect	Rehau Pty Ltd	Rehau	28/06/2021
Flexseal	Fernco (Australia) Pty Ltd	Hynds	4/04/2024

# Section 4

## Rubber Ring Joint (RRJ) Fittings

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Moulded PVC-PE Adaptor	36
Fabricated RRJ Bend	37

# Approved Materials List

**Network:** Wastewater (Gravity)  
**Product Type:** Moulded RRJ Bend  
**Material:** Unplasticised Polyvinyl Chloride

**Approval Type:** Products listed below approved for use as permitted by IDS and CSS

## Performance Requirements

**Manufacturing Standard:** AS/NZS 1260  
**Material Specification:** Body: PVC-U to AS/NZS 1260.  
 Seals: EPDM or Nitrile Rubber to AS 1646.  
**Coating Specification:** N/A  
**Stiffness Ratings:** SN6  
**Approved Sizes:** 100NB  
**Operational Life:** 100 years  
**Other Requirements:**

- Approved deflections: 11.25, 22.5 and 45.
- End configurations: rubber ring socket - rubber ring socket.
- Variants: Both plain bends and bends with an access opening are permitted. Access openings shall be fitted with a threaded cap.
- Note: AS/NZS1260 section 5.1 "Injection-moulded plain walled Class SN6 fittings are suitable for use in systems using up to Class SN16 pipe."

Brand Name	Manufacturer	Supplier	Approval Expires
Optim RJ	RX Plastics Ltd	Marley	18/03/2024
NovaDrain 1500 Series	Iplex Pipelines Ltd	Humes, Hynds	3/02/2024
SN16 RRJ Bend	Strata Plastics	Humes, Hynds, Plumbing World	19/08/2023

# Approved Materials List

**Network:** Wastewater (Gravity)  
**Product Type:** Moulded Large RRJ Bend  
**Material:** Unplasticised Polyvinyl Chloride

**Approval Type:** Project specific approval required to use products listed below

## Performance Requirements

**Manufacturing Standard:** AS/NZS 1260

**Material Specification:** Body: PVC-U to AS/NZS 1260.  
 Seals: EPDM or Nitrile Rubber to AS 1646.

**Coating Specification:** N/A

**Stiffness Ratings:** SN6

**Approved Sizes:** 150NB, 225NB, 300NB and 375NB.

**Operational Life:** 100 years

**Other Requirements:**

- Approved deflections: 11.25, 22.5 and 45.
- End configurations: rubber ring socket - rubber ring socket.
- Variants: Both plain bends and bends with an access opening are permitted. Access openings shall be fitted with a threaded cap.
- Note: AS/NZS1260 section 5.1 "Injection-moulded plain walled Class SN6 fittings are suitable for use in systems using up to Class SN16 pipe."

Brand Name	Manufacturer	Supplier	Approval Expires
Optim RJ	RX Plastics Ltd	Marley	18/03/2024
NovaDrain 1500 Series	Iplex Pipelines Ltd	Humes, Hynds	3/02/2024
SN16 RRJ Bend	Strata Plastics	Humes, Hynds, Plumbing World	19/08/2023
SN16 RRJ Formed Bend	Strata Plastics	Humes, Hynds, Plumbing World	19/08/2023

# Approved Materials List

**Network:** Wastewater (Gravity)  
**Product Type:** Moulded Slip Coupler  
**Material:** Unplasticised Polyvinyl Chloride

**Approval Type:** Products listed below approved for use as permitted by IDS and CSS

## Performance Requirements

**Manufacturing Standard:** AS/NZS 1260  
**Material Specification:** Body: PVC-U to AS/NZS 1260.  
 Seals: EPDM or Nitrile Rubber to AS 1646.  
**Coating Specification:** N/A  
**Stiffness Ratings:** SN6  
**Approved Sizes:** 100NB, 150NB, 225NB, 300NB, 375NB, 450NB and 575NB.  
**Operational Life:** 100 years  
**Other Requirements:**

- End configurations: rubber ring socket - rubber ring socket.
- Note: AS/NZS1260 section 5.1 "Injection-moulded plain walled Class SN6 fittings are suitable for use in systems using up to Class SN16 pipe."

Brand Name	Manufacturer	Supplier	Approval Expires
NovaDrain 1500 Series	Iplex Pipelines Ltd	Humes, Hynds	3/02/2024
Optim RJ	RX Plastics Ltd	Marley	18/03/2024
DZ Slip Coupler	TD Plastics	TD Plastics	5/11/2023
SN16 RRJ Slip Coupling	Strata Plastics	Humes, Hynds, Plumbing World	19/08/2023
SN16 Moulded Slip Coupler	Solo Plastics	Solo Plastics	16/12/2023

# Approved Materials List

**Network:** Wastewater (Gravity)  
**Product Type:** Moulded Coupler  
**Material:** Unplasticised Polyvinyl Chloride

**Approval Type:** Products listed below approved for use as permitted by IDS and CSS

## Performance Requirements

**Manufacturing Standard:** AS/NZS 1260  
**Material Specification:** Body: PVC-U to AS/NZS 1260.  
 Seals: EPDM or Nitrile Rubber to AS 1646.  
**Coating Specification:** N/A  
**Stiffness Ratings:** SN6  
**Approved Sizes:** 100NB, 150NB, 225NB, 300NB and 375NB.  
**Operational Life:** 100 years  
**Other Requirements:**

- End configurations: rubber ring socket - rubber ring socket.
- Note: AS/NZS1260 section 5.1 "Injection-moulded plain walled Class SN6 fittings are suitable for use in systems using up to Class SN16 pipe."

Brand Name	Manufacturer	Supplier	Approval Expires
NovaDrain 1500 Series	Iplex Pipelines Ltd	Humes, Hynds	3/02/2024
Optim RJ	RX Plastics Ltd	Marley	18/03/2024
DZ Slip Coupler	TD Plastics	TD Plastics	5/11/2023
SN16 RRJ Plain Coupling	Strata Plastics	Humes, Hynds, Plumbing World	19/08/2023
SN16 RRJ Moulded Coupler	Solo Plastics	Solo Plastics	16/12/2023

# Approved Materials List

**Network:** Wastewater (Gravity)  
**Product Type:** Moulded Inspection Pipe  
**Material:** Unplasticised Polyvinyl Chloride

**Approval Type:** Products listed below approved for use as permitted by IDS and CSS

## Performance Requirements

**Manufacturing Standard:** AS/NZS 1260

**Material Specification:** Body: PVC-U to AS/NZS 1260.  
 Seals: EPDM or Nitrile Rubber to AS 1646.

**Coating Specification:** N/A

**Stiffness Ratings:** SN6

**Approved Sizes:** 100NB, 150NB, 225NB, 300NB and 375NB.

**Operational Life:** 100 years

**Other Requirements:**

- End configurations: rubber ring socket - rubber ring socket.
- Access openings shall be fitted with a threaded cap.
- Note: AS/NZS1260 section 5.1 "Injection-moulded plain walled Class SN6 fittings are suitable for use in systems using up to Class SN16 pipe."

Brand Name	Manufacturer	Supplier	Approval Expires
NovaDrain 1500 Series	Iplex Pipelines Ltd	Humes, Hynds	3/02/2024
Optim RJ	RX Plastics Ltd	Marley	18/03/2024



# Approved Materials List

**Network:** Wastewater (Gravity)  
**Product Type:** Moulded PVC-EW Adaptor  
**Material:** Unplasticised Polyvinyl Chloride

**Approval Type:** Products listed below approved for use as permitted by IDS and CSS

## Performance Requirements

**Manufacturing Standard:** AS/NZS 1260

**Material Specification:** Body: PVC-U to AS/NZS 1260.  
 Seals: EPDM or Nitrile Rubber to AS 1646.

**Coating Specification:** N/A

**Stiffness Ratings:** SN6

**Approved Sizes:** 100NB, 150NB and 200NB.

**Operational Life:** 100 years

**Other Requirements:**

- End configurations: rubber ring socket - rubber ring socket.
- Note: AS/NZS1260 section 5.1 "Injection-moulded plain walled Class SN6 fittings are suitable for use in systems using up to Class SN16 pipe."

Brand Name	Manufacturer	Supplier	Approval Expires
NovaDrain 1500 Series	Iplex Pipelines Ltd	Humes, Hynds	3/02/2024
Optim RJ	RX Plastics Ltd	Marley	18/03/2024
PVC/EW Adaptor	TD Plastics	TD Plastics	5/11/2023
Moulded PVC-EW Adaptor	Strata Plastics	Humes, Hynds, Plumbing World	19/08/2023
Moulded PVC-EW Adaptor	Solo Plastics	Solo Plastics	16/12/2023

# Approved Materials List

**Network:** Wastewater (Gravity)  
**Product Type:** Moulded PVC-PE Adaptor  
**Material:** Polyethylene (PE)

**Approval Type:** Products listed below approved for use as permitted by IDS and CSS

## Performance Requirements

**Manufacturing Standard:** AS/NZS 4129

**Material Specification:** Body: PE100 to AS/NZS 4131.  
Seals: EPDM or Nitrile Rubber to AS 1646.

**Coating Specification:** N/A

**Stiffness Ratings:** SDR17

**Approved Sizes:** 100NB, 150NB and 200NB.

**Operational Life:** 100 years

**Other Requirements:**

- End configurations: PE spigot - rubber ring socket.
- Refer to PE Manufacturers Actions memo  
<https://ccc.govt.nz/assets/Documents/Consents-and-Licences/construction-requirements/design-memos/PEMANUFACTURERRECTIONS.pdf>

Brand Name	Manufacturer	Supplier	Approval Expires
PE RRJ Adaptor	Strata Precision Plastics	Humes, Hynds	19/08/2023
PE/PVC Drain Adaptor	Solo Plastics	Humes	16/12/2023

# Approved Materials List

**Network:** Wastewater (Gravity)  
**Product Type:** Fabricated RRJ Bend  
**Material:** Unplasticised Polyvinyl Chloride

**Approval Type:** Products listed below approved for use as permitted by IDS and CSS

## Performance Requirements

**Manufacturing Standard:** AS/NZS 1260

**Material Specification:** Body: PVC-U to AS/NZS 1260.  
 Seals: EPDM or Nitrile Rubber to AS 1646.

**Coating Specification:** N/A

**Stiffness Ratings:** SN6

**Approved Sizes:** 150NB, 225NB, 300NB and 375NB.

**Operational Life:** 100 years

**Other Requirements:**

- Approved deflections: 11.25, 22.5 and 45.
- End configurations: rubber ring socket - rubber ring spigot.
- Variants: Both plain bends and bends with an access opening are permitted. Access openings shall be fitted with a threaded cap.
- Fabricated bends shall use AS/NZS1260 pipe that is either bent following heating or mitre cut and plastic welded.

Brand Name	Manufacturer	Supplier	Approval Expires
SN16 RRJ Formed Bend	Strata Precision Plastics	Humes, Hynds, Plumbing World	19/08/2023
SN16 RRJ Mitred Bend	Strata Precision Plastics	Humes, Hynds, Plumbing World	19/08/2023
SN16 DWV RRJ Segmented Bend	Solo Plastics	Humes	16/12/2023
SN16 DWV RRJ Formed Bend	Solo Plastics	Humes	16/12/2023

# Section 5

## Electrofusion Fittings

<b>Fitting Type</b>	<b>Page</b>
Electrofusion Bend	39
Electrofusion Coupler (DN110)	40
Electrofusion Coupler (DN180-DN450)	41
Stub Flange for Electrofusion Connection to Pipe	42

# Approved Materials List

**Network:** Wastewater (Gravity)  
**Product Type:** Electrofusion Bend  
**Material:** Polyethylene (PE)

**Approval Type:** Products listed below approved for use as permitted by IDS and CSS

## Performance Requirements

**Manufacturing Standard:** AS/NZS 4129  
**Material Specification:** PE100 to AS/NZS 4131

**Coating Specification:** N/A  
**Pressure Ratings:** PN16 SDR11  
**Approved Sizes:** DN110  
**Operational Life:** 100 years  
**Other Requirements:**

- Approved Deflections: 15, 30 and 45 degrees.
- End configurations: Electrofusion Socket - Electrofusion Socket.
- Refer to Appendix 1 - PE Manufacturers Actions memo.

Brand Name	Manufacturer	Supplier	Approval Expires
AGRU	Agru Kunststofftechnik Gmbh	Hynds	9/02/2017
Frialen	Friatec Aktiengesellschaft	Humes, Marley	31/08/2023
Fusamatic	Fusion Group Ltd	Hynds, UPG	5/11/2023
+GF+	Georg Fischer Piping Systems Ltd	Hynds	27/05/2024
Smartfuse	Plasson Ltd	Humes	3/02/2024
Plastitalia Electrofusion	Plastitalia S.p.a.	Water Supply Products Ltd	2/11/2023

# Approved Materials List

**Network:** Wastewater (Gravity)  
**Product Type:** Electrofusion Couplers (DN110)  
**Material:** Polyethylene (PE)

**Approval Type:** Products listed below approved for use as permitted by IDS and CSS

## Performance Requirements

**Manufacturing Standard:** AS/NZS 4129  
**Material Specification:** PE100 to AS/NZS 4131

**Coating Specification:** N/A  
**Stiffness Ratings:** PN16 SDR11  
**Approved Sizes:** DN110  
**Operational Life:** 100 years  
**Other Requirements:**

- End configurations: Electrofusion Socket - Electrofusion Socket.
- Refer to Appendix 1 - PE Manufacturers Actions memo.

Brand Name	Manufacturer	Supplier	Approval Expires
AGRU	Agru Kunststofftechnik GmbH	Hynds	9/02/2017
Frialen	Friatec Aktiengesellschaft	Humes, Marley	31/08/2023
Fusamatic	Fusion Group Ltd	Hynds, UPG	5/11/2023
+GF+	Georg Fischer Piping Systems Ltd	Hynds	27/05/2024
Smartfuse	Plasson Ltd	Humes	3/02/2024
Plastitalia Electrofusion	Plastitalia S.p.a.	Water Supply Products Ltd	2/11/2023

# Approved Materials List

**Network:** Wastewater (Gravity)  
**Product Type:** Electrofusion Couplers (DN180-DN450)  
**Material:** Polyethylene (PE)

**Approval Type:** Project specific approval required to use products listed below

## Performance Requirements

**Manufacturing Standard:** AS/NZS 4129  
**Material Specification:** PE100 to AS/NZS 4131

**Coating Specification:** N/A  
**Stiffness Ratings:** PN16 SDR11  
**Approved Sizes:** DN180, DN250, DN355 and DN450.  
**Operational Life:** 100 years  
**Other Requirements:**

- End configurations: Electrofusion Socket - Electrofusion Socket.
- Refer to Appendix 1 - PE Manufacturers Actions memo.

Brand Name	Manufacturer	Supplier	Approval Expires
AGRU	Agru Kunststofftechnik Gmbh	Hynds	9/02/2017
Frialen	Friatec Aktiengesellschaft	Humes, Marley	31/08/2023
Fusamatic	Fusion Group Ltd	Hynds, UPG	5/11/2023
+GF+	Georg Fischer Piping Systems Ltd	Hynds	27/05/2024
Smartfuse	Plasson Ltd	Humes	3/02/2024
Plastitalia Electrofusion	Plastitalia S.p.a.	Water Supply Products Ltd	2/11/2023

# Approved Materials List

**Network:** Wastewater (Gravity)  
**Product Type:** Stub Flange for Electrofusion Connection to Pipe  
**Material:** Polyethylene (PE)

**Approval Type:** Project specific approval required to use products listed below

## Performance Requirements

**Manufacturing Standard:** AS/NZS 4129  
**Material Specification:** PE100 to AS/NZS 4131

**Coating Specification:** N/A  
**Stiffness Ratings:** PN16 SDR11  
**Approved Sizes:** DN180, DN250, DN355 and DN450.  
**Operational Life:** 100 years  
**Other Requirements:**

- End configurations: Electrofusion Spigot (long) - Flange.
- Backing rings shall be installed on each stub flange.
- Refer to Appendix 1 - PE Manufacturers Actions memo.
- Refer to Appendix 3 - CCC Stub Flange and Backing Rings Table.

Brand Name	Manufacturer	Supplier	Approval Expires
Long Spigot Stub Flange	Strata Precision Plastics	Humes, Hynds, Plumbing World	19/08/2023
PE Slim Flange	Strata Precision Plastics	Humes, Hynds, Plumbing World	19/08/2023
PE Extended Stub Flange	Solo Plastics	Humes	16/12/2023



# Section 6

## Butt-Weld Fusion Fittings

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Fabricated Bend	44
Stub Flange for Butt-Weld Connection to Pipe	45

# Approved Materials List

**Network:** Wastewater (Gravity)  
**Product Type:** Fabricated Bend  
**Material:** Polyethylene (PE)

**Approval Type:** Project specific approval required to use products listed below

**Performance Requirements**

**Manufacturing Standard:** AS/NZS 4129  
**Material Specification:** PE100 to AS/NZS 4131

**Coating Specification:** N/A  
**Stiffness Ratings:** SN8 following re-rating as per AS/NZS 4129  
**Approved Sizes:** DN355, DN400, DN450, DN560 and DN710.  
**Operational Life:** 100 years  
**Other Requirements:**

- End configurations: spigot-spigot.
- Fabricated bends shall use AS/NZS4130 pipe that is either bent following heating or mitre cut and welded.
- Refer to Appendix 1 - PE Manufacturers Actions memo.

Brand Name	Manufacturer	Supplier	Approval Expires
PN16 Segmented Bends	Strata Precision Plastics	Humes, Hynds, Plumbing World	19/08/2023

# Approved Materials List

**Network:** Wastewater (Gravity)  
**Product Type:** Stub Flange for Butt-Fusion Connection to Pipe  
**Material:** Polyethylene (PE)

**Approval Type:** Project specific approval required to use products listed below

## Performance Requirements

**Manufacturing Standard:** AS/NZS 4129  
**Material Specification:** PE100 to AS/NZS 4131

**Coating Specification:** N/A  
**Stiffness Ratings:** PN16 SDR11  
**Approved Sizes:** DN180, DN250, DN355 and DN450.  
**Operational Life:** 100 years  
**Other Requirements:**

- End configurations: Electrofusion Spigot (short) - Flange.
- Backing rings shall be installed on each stub flange.
- Refer to Appendix 1 - PE Manufacturers Actions memo.
- Refer to Appendix 3 - CCC Stub Flange and Backing Rings Table.

Brand Name	Manufacturer	Supplier	Approval Expires
Short Spigot Stub Flange	Strata Precision Plastics	Humes, Hynds, Plumbing World	19/08/2023
PE Slim Flange	Strata Precision Plastics	Humes, Hynds, Plumbing World	19/08/2023
PE Slim Flange	Solo Plastics	Solo Plastics	16/12/2023

# Section 7

## Junctions and Take-Off Fittings

<b>Fitting Type</b>	<b>Page</b>
Moulded Junction	47
Welded Junction	48
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PVC Saddle Junction	50
Mechanical Junction	51
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Fabricated Wye Junction	53

# Approved Materials List

**Network:** Wastewater (Gravity)  
**Product Type:** Moulded Junction  
**Material:** Unplasticised Polyvinyl Chloride

**Approval Type:** Products listed below approved for use as permitted by IDS and CSS

## Performance Requirements

**Manufacturing Standard:** AS/NZS 1260  
**Material Specification:** Body: PVC-U to AS/NZS 1260.  
 Seals: EPDM or Nitrile Rubber to AS 1646.  
**Coating Specification:** N/A  
**Stiffness Ratings:** SN6  
**Approved Sizes:** 100NB, 150NB, 225NB, 300NB, 375NB and 475NB.  
**Operational Life:** 100 years  
**Other Requirements:**

- Approved Branch Sizes: 100NB.
- End configurations (pipe): rubber ring socket -rubber ring socket or rubber ring socket - spigot.
- End configurations (branch): rubber ring socket.
- Approved Deflections: 11.25, 22.5 and 45 degrees.
- Note: AS/NZS1260 section 5.1 "Injection-moulded plain walled Class SN6 fittings are suitable for use in systems using up to Class SN16 pipe."

Brand Name	Manufacturer	Supplier	Approval Expires
Optim RJ	RX Plastics Ltd	Marley	18/03/2024
NovaDrain 1500 Series	Iplex Pipelines Ltd	Humes, Hynds	3/02/2024
SN16 RRJ Wye Junction	Strata Precision Plastics	Humes, Hynds, Plumbing World	19/08/2023
SN16 RRJ Lunden Junction	Strata Precision Plastics	Humes, Hynds, Plumbing World	19/08/2023

# Approved Materials List

**Network:** Wastewater (Gravity)  
**Product Type:** Welded Junction  
**Material:** Unplasticised Polyvinyl Chloride

**Approval Type:** Products listed below approved for use as permitted by IDS and CSS

**Performance Requirements**

**Manufacturing Standard:** AS/NZS 1260  
**Material Specification:** Body: AS/NZS 1260 or fabricated from AS/NZS 1260 certified pipe.  
 Seals: EPDM or Nitrile Rubber to AS 1646.

**Coating Specification:** N/A  
**Stiffness Ratings:** SN6  
**Approved Sizes:** 100NB and 150NB.  
**Operational Life:** 100 years  
**Other Requirements:**

- Approved Branch Sizes: 100NB.
- End configurations (pipe): rubber ring socket -rubber ring socket or rubber ring socket - spigot.
- End configurations (branch): rubber ring socket.
- Approved Deflections: 11.25, 22.5 and 45 degrees.
- Note: AS/NZS1260 section 5.1 "Injection-moulded plain walled Class SN6 fittings are suitable for use in systems using up to Class SN16 pipe."
- Manufactured junction strength shall be confirmed through the provision of test results demonstrating compliance with BS EN ISO 13264:2017. Tests shall be carried out on a fabricated junction with a 100mm branch connecting to a 150mm main pipe.

Brand Name	Manufacturer	Supplier	Approval Expires
Welded Junction	TD Plastics	TD Plastics	5/11/2023
SN16 Welded Junction	Solo Plastics	Solo Plastics	16/12/2023

# Approved Materials List

**Network:** Wastewater (Gravity)  
**Product Type:** Pulled-Through Junction  
**Material:** Unplasticised Polyvinyl Chloride

**Approval Type:** Products listed below approved for use as permitted by IDS and CSS

**Performance Requirements**

**Manufacturing Standard:** AS/NZS 1260  
**Material Specification:** Body: AS/NZS 1260 or fabricated from AS/NZS 1260 certified pipe.  
 Seals: EPDM or Nitrile Rubber to AS 1646.  
**Coating Specification:** N/A  
**Stiffness Ratings:** SN6  
**Approved Sizes:** 100NB, 150NB, 225NB, 300NB, 375NB and 475NB.  
**Operational Life:** 100 years  
**Other Requirements:**

- Approved Branch Sizes: 100NB.
- End configurations (pipe): rubber ring socket -rubber ring socket or rubber ring socket - spigot.
- End configurations (branch): rubber ring socket.
- Approved Deflections: 11.25, 22.5 and 45 degrees.
- Note: AS/NZS1260 section 5.1 "Injection-moulded plain walled Class SN6 fittings are suitable for use in systems using up to Class SN16 pipe."
- Manufactured junction strength shall be confirmed through the provision of test results demonstrating compliance with BS EN ISO 13264:2017. Tests shall be carried out on a fabricated junction with a 100mm branch connecting to a 150mm main pipe.

Brand Name	Manufacturer	Supplier	Approval Expires
Pulled-Through Junction	TD Plastics	TD Plastics	5/11/2023

# Approved Materials List

**Network:** Wastewater (Gravity)  
**Product Type:** PVC Saddle Junction  
**Material:** Unplasticised Polyvinyl Chloride

**Approval Type:** Project specific approval required to use products listed below

## Performance Requirements

**Manufacturing Standard:** AS/NZS 1260

**Material Specification:** Body: PVC-U to AS/NZS 1260.  
Seals: EPDM or Nitrile Rubber to AS 1646.

**Coating Specification:** N/A

**Stiffness Ratings:** SN6

**Approved Sizes:** 150NB, 225NB, 300NB, 375NB and 475NB.

**Operational Life:** 100 years

**Other Requirements:**

- Approved Branch Sizes: 100NB.
- End configurations (branch): Spigot.
- Approved Deflections: 11.25, 22.5 and 45 degrees.
- Note: AS/NZS1260 section 5.1 "Injection-moulded plain walled Class SN6 fittings are suitable for use in systems using up to Class SN16 pipe."

<b>Brand Name</b>	<b>Manufacturer</b>	<b>Supplier</b>	<b>Approval Expires</b>
1504S Saddle	TD Plastics	TD Plastics	5/11/2023
SN16 RRJ Saddle Junction	Solo Plastics	Solo Plastics	16/12/2023









# Section 8

## Miscellaneous

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Steel Backing Flange	55
Galvanised Nuts, Bolts and Washers	56
Stainless Nuts, Bolts and Washers	56
Flange Gaskets	57



# Approved Materials List

**Network:** Wastewater (Gravity)  
**Product Type:** Nuts, Bolts and Washers  
**Material:** Carbon Steel

**Approval Type:** Any product meeting the performance requirements may be used.

## Performance Requirements

**Manufacturing Standard:** AS 4291.1  
**Material Specification:** Carbon Steel

**Coating Specification:** Hot Dip Galvanising to AS/NZS 4680.  
**Pressure Ratings:** N/A  
**Approved Sizes:** N/A  
**Operational Life:** 100 years  
**Other Requirements:**

- Tensile Class: 8.8
- Washers shall be installed under nut and bolt head (where the heads are not encapsulated). Washer Thickness: 3mm minimum, 5mm minimum for M24 or larger bolts.
- All exposed metal surfaces including bolt heads and nuts shall be wrapped using a four part system including primer, mastic, petrolatum impregnated tape and tape overwrap.
- Bolt torque shall be between 60-65% of proof stress.

**Network:** Wastewater (Gravity)  
**Product Type:** Nuts, Bolts and Washers  
**Material:** Stainless Steel

**Approval Type:** Any product meeting the performance requirements may be used.

## Performance Requirements

**Manufacturing Standard:** AS 4291.1  
**Material Specification:** 316 or A4 Stainless Steel

**Coating Specification:** N/A  
**Pressure Ratings:** N/A  
**Approved Sizes:** N/A  
**Operational Life:** 100 years  
**Other Requirements:**

- Washers shall be installed under nut and bolt head (where the heads are not encapsulated). Washer Thickness: 3mm minimum, 5mm minimum for M24 or larger bolts.
- All exposed metal surfaces including bolt heads and nuts shall be wrapped using a four part system including primer, mastic, petrolatum impregnated tape and tape overwrap.
- Bolt torque shall be between 60-65% of proof stress.

# Approved Materials List

**Network:** Wastewater (Gravity)  
**Product Type:** Flange Gasket  
**Material:** EPDM or Nitrile Rubber

**Approval Type:** Any product meeting the performance requirements may be used.

## Performance Requirements

**Manufacturing Standard:** WSA 109  
**Material Specification:** Ethylene Propylene Diene Monomer (EPDM) or Nitrile Butadiene Rubber (NB)

**Coating Specification:** N/A  
**Pressure Ratings:** N/A  
**Approved Sizes:** 80NB, 100NB, 150NB, 200NB, 300NB, 375NB, 450NB and 600NB.  
**Operational Life:** 100 years  
**Other Requirements:**

- Product shall be certified to AS/NZS 4020 or DWI (UK).
- Elastomeric gaskets shall be 3 mm or greater thick.
- Elastomeric gaskets shall be reinforced

# **Appendix 1**

## **PE Manufacturers Action Memo**



# Polyethylene Pipe and Fitting Manufacturer

## Actions Memorandum

PE pipe and any approved striping shall only be manufactured from 100% virgin raw materials.

### Quality Assurance records

The manufacturer shall provide quality assurance records, particularly Melt flow rate and Thermal stability testing results, to the Engineer with each batch of pipe and fittings.

The Melt flow rate (MFR) test shall be determined in accordance with ISO 1133. A batch is as defined in clause A3.2 of AS/NZS 4130. The results can be for the resin from which the pipe batch was manufactured.

The MFR of the black or coloured compound shall not deviate by more than 30% from the value nominated by the compound manufacturer in accordance with cl 4.1.2 AS/NZS 4131.

Thermal stability shall be confirmed by determining the oxidation induction time (OIT) of a test specimen taken from the inside surface of the PE pipe and tested in accordance with ISO 11357-6 using oxygen at a test temperature of 200 deg C.

The OIT shall be equal to or greater than 20 minutes in accordance with cl 10.3 AS/NZS 4130.

### Pre-supply Compatibility testing

Prior to the delivery of pipes and fittings, the manufacturer or supplier shall have the following complying tests undertaken by an accredited laboratory with all test results being forwarded to the Engineer.

The tests will apply to each pipe batch (and batch of fittings as applicable) and include two butt fusion welds, two electrofusion joint welds, two electrofusion saddle joint welds and two stub flange butt weld joints, with results being identified by pipe batch number. Where the weld type is not required by the project, testing for that weld type is not required.

- Tensile tests shall be in accordance with ISO 13953
- Peel decohesion tests shall be in accordance with ISO 13954 for pipe diameters 90mm and larger.
- Crushing decohesion tests shall be in accordance with ISO 13955 for pipe diameters smaller than 90mm.
- Saddle decohesion test shall be in accordance with ISO 13956

### Compatibility Statement, welding parameters and witness mark measurements for electrofusion couplers

The following information shall be supplied by the manufacturer or supplier to the Engineer prior to delivery of pipe and fittings.

- The manufacturer shall state which fittings and batches of fittings have been tested as compatible with their PE pipe with reference to pipe batch numbers. This testing can apply to more than one project if the two projects are supplied from the same batch.
- Welding parameters for butt fusion and electrofusion couplers which have been confirmed by testing as applicable and compatible for the pipe and fittings shall be supplied, along with the welding plant model details.
- Witness mark measurements for the supplied electrofusion couplers shall be supplied by the manufacturer.

# **Appendix 2**

## **PVC Witness Mark Memo**

# PVC Witness Mark Memorandum

## Background

During restoration of the gravity wastewater and waste water infrastructure following the September and February earthquakes it has become apparent that the design of the socket and spigot joints between pipes is critical to the pipe's seismic performance.

It has been observed that joints which allow a greater range of movement are better able to accommodate ground movements. Essentially socket dimensions control the amount of elongation or compression that can be accommodated within the joint.

*AS/NZS 1254 PVC-U pipes and fittings for stormwater and surface water applications and AS/NZS 1260 PVC-U pipes and fittings for drain, waste and vent application* specify the Effective Sealing Length to be equal to the insertion depth plus the clearance between the end of the spigot and the base of the socket. Clause 4.7 also states: "the witness mark shall be provided for the full circumference of the pipe at a distance from the pipe end equivalent to the insertion depth +0-5 mm". (..) NOTE: The insertion depth/witness mark location may vary from manufacturer to manufacturer depending in the socket/joint design".

## Purpose of this Memorandum

The purpose of this memorandum is to specify minimum socket dimensions and to clarify for suppliers and contractors what is required by Christchurch City Council (Council) for minimum socket dimensions and witness marking on approved Polyvinylchloride (PVC) pipes.

## Performance Required

Witness marks on PVC pipes are required under AS/NZS 1254 and AS/NZS 1260 and are an established construction technique for ensuring the correct depth of engagement of socketed pipes. The correct alignment and insertion of the spigot into the socket allows the pipe to expand and contract under test and operating pressures, and allows the pipe to elongate and contract due to changes in operating temperature. Adopting a suitable insertion depth and clearance (gap between end of spigot and base of socket) will allow the pipe to elongate and compress when ground movement occurs.

Council require that socket dimensions be standardised to provide the deepest insertion length and clearance that can reasonably be formed by all manufacturers.

## Recommendation for Witness mark

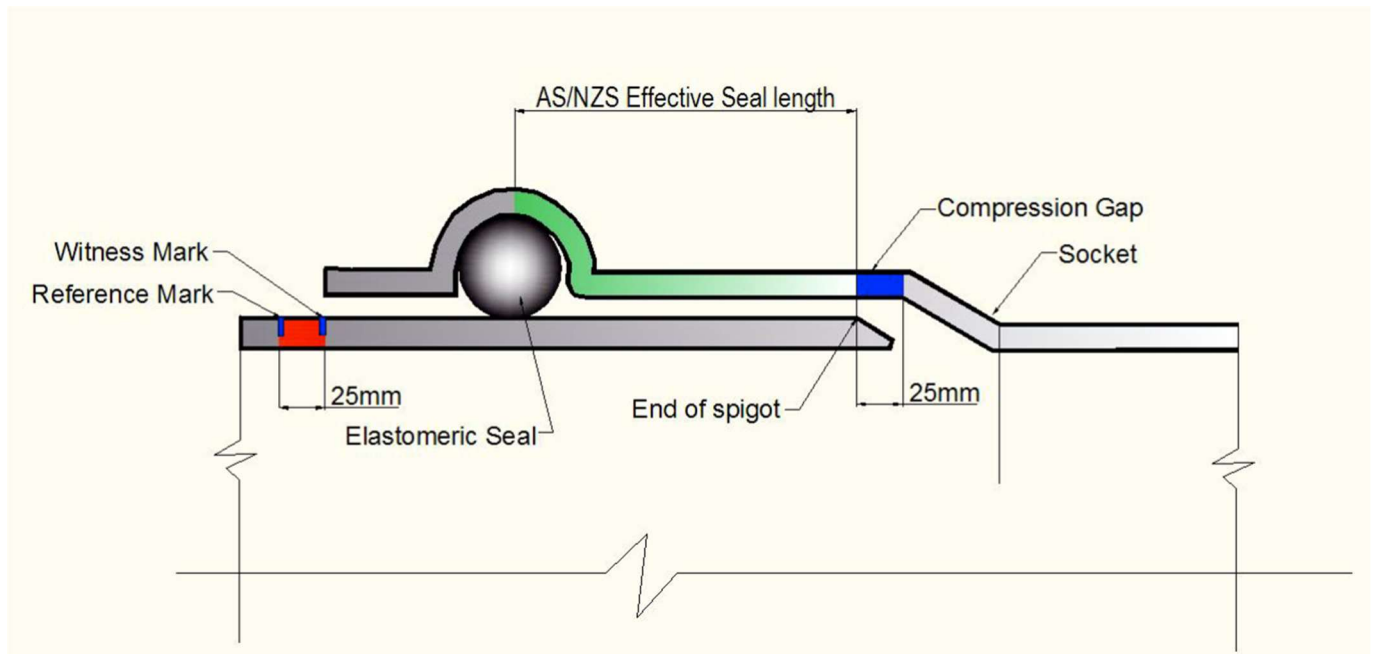
After consultation with the industry Council has adopted socket dimensions that are 25 mm longer than the minimum Effective Sealing Length specified by AS/NZS 12540 and AS/NZS 1260 (see sketch below).

The **Witness Mark** shall be placed so that there is a clearance (to act as a compression gap) of 25 mm between the end of the spigot and base of the socket.

A **Reference Mark** shall be placed 25 mm from the witness mark so that when the pipe is pushed home in the socket the reference mark is visible and 25 mm from the end of the pipe socket. The reference mark may be a band of clearly legible colour 25 mm wide and bordering the witness mark.

PVC Pipe Sizes NB (mm)	Minimum Effective Sealing Length (mm)
150	55
225	75
300	85
375	95

The following sketch illustrates the requirements.



### Additional information to assist pipe installers:

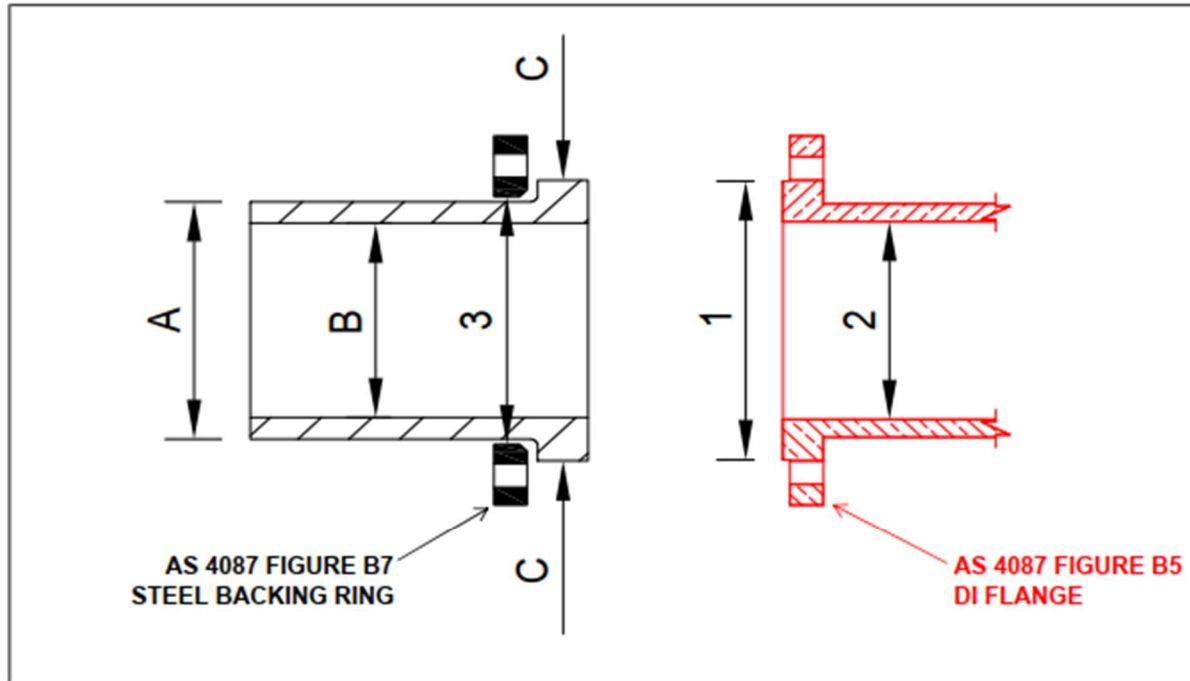
- Each witness mark must be placed around the circumference of the pipe barrel.
- All socketed/pipe connections must have a specific witness mark to match the correct socket depth.
- Each pipe spigot shall not be over-inserted or pushed beyond the witness mark (make sure the reference mark can be seen).
- Placing a witness mark around the circumference of the pipe barrel after pipe insertion is not permitted.

# **Appendix 3**

## **Stub Flange and Backing Ring Table**

# Stub Flange and Backing Ring Tables

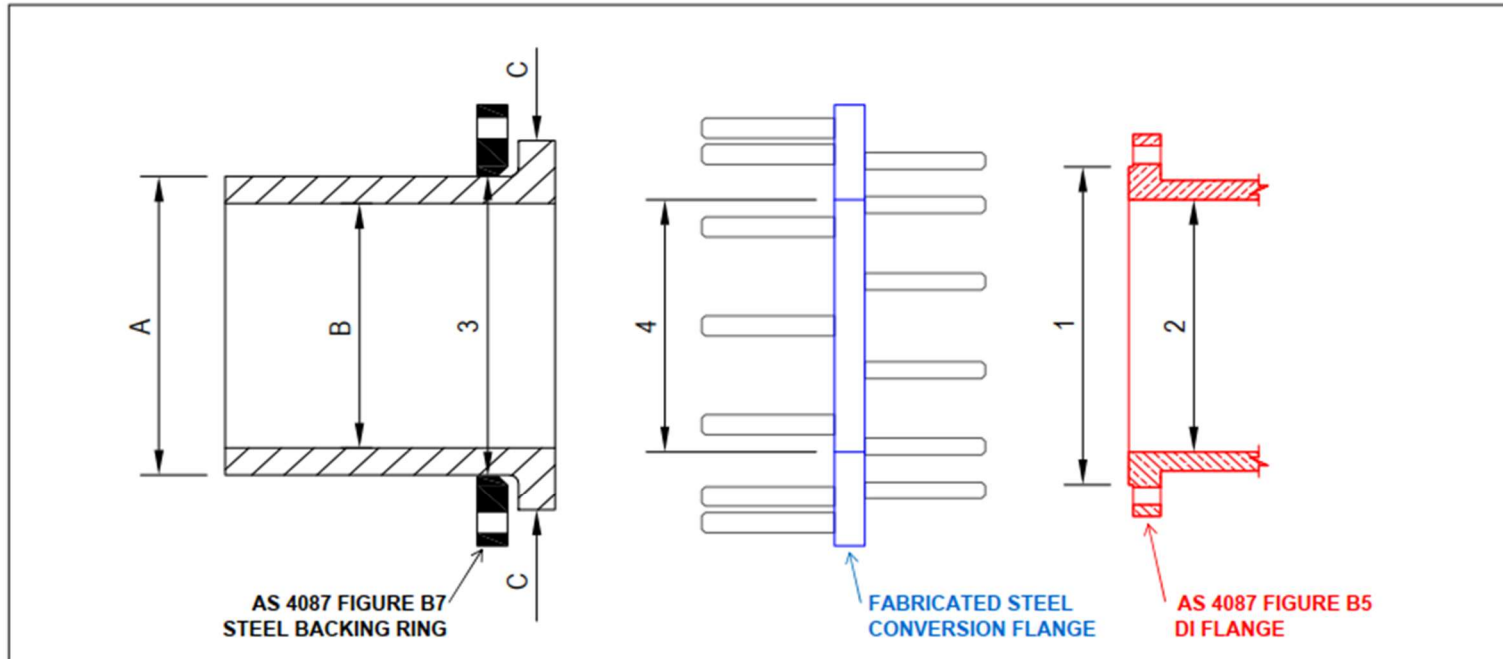
## Conventional PE Stub Flange and Backing Ring



Nominal Bore	A (OD of PE)	SDR	B (ID of PE)	Back. Ring Flange Size* (see notes)	C (OD of PE Flange)	1 (OD of 4087 Raised Face)	% of Raised Face Engaged by PE Flange	2 (ID of Fitting)	Step in Bore	3 Backing Ring ID (from POP007)
100	125	13.6	106.6	100	164	154	99%	100	negligible	135
100	125	11.0	102.3	100	164	154	99%	100	negligible	135
150	180	13.6	153.5	150	220	211	99%	150	negligible	188
150	180	11.0	147.3	150	220	211	100%	150	negligible	188

\* Note: Steel Backing Rings Shall Comply With AS 4087 Figure B7

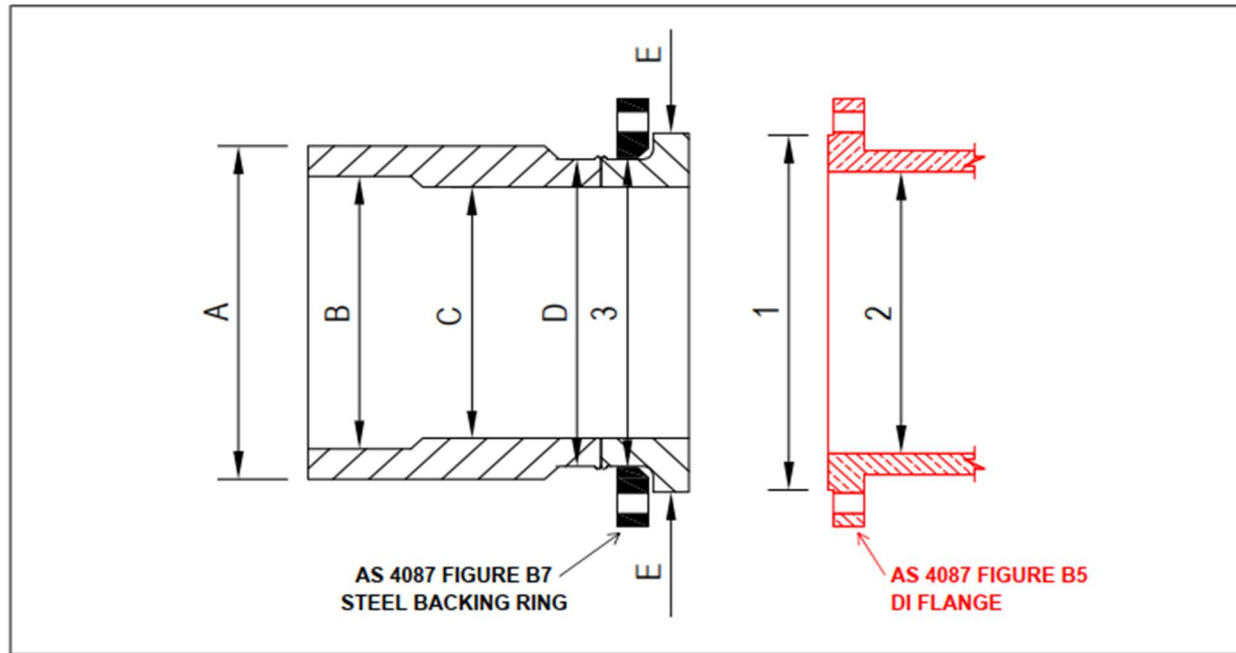
# Conventional PE Stub Flange and Backing Ring with Conversion Flange



Nominal Bore	A (OD of PE Pipe)	SDR	B (ID of PE Pipe)	Back. Ring Flange Size* (from POP007) (see notes)	3 Back. Ring Flange ID (from POP007)	C (OD of PE Flange)	4 (ID of Conversion Flange)	Thickness of Conversion Flange	1 (OD of 4087 Raised Face)	% of Raised Face Engaged by PE Flange	Backing Ring ID (from POP007)	2 (ID of Fitting)	Step in Bore	Conversion Flange
100	125	13.6	106.6	100	135	164	N/A	N/A	154	99%	128	100	negligible	not required
100	125	11.0	102.3	100	135	164	N/A	N/A	154	99%	128	100	negligible	not required
150	180	13.6	153.5	150	188	220	N/A	N/A	211	99%	188	150	negligible	not required
150	180	11.0	147.3	150	188	220	N/A	N/A	211	100%	188	150	negligible	not required
200	250	13.6	213.2	250	288	332	200	30 mm	268	100%	288	200	approx. 12 mm	250 x 200
200	250	11.0	204.5	250	288	332	200	30 mm	268	100%	288	200	approx. 10 mm	250 x 200
300	355	13.6	302.8	350	376	442	300	30 mm	378	100%	376	300	negligible	350 x 300
300	355	11.0	290.5	350	376	442	300	30 mm	378	100%	376	300	approx. 10 mm	350 x 300
300	400	13.6	341.2	400	430	491	300	30 mm	378	100%	430	300	approx. 30 mm	
300	400	11.0	327.3	400	430	491	300	30 mm	378	100%	430	300	approx. 25 mm	
375	450	13.6	383.8	450	470	556	375	30 mm	463	100%	470	375	negligible	
375	450	11.0	368.2	450	470	556	375	30 mm	463	100%	470	375	negligible	

\* Note: Steel Backing Rings Shall Comply With AS 4087 Figure B7

# TYCO Pattern Slimline PE Stub Flange and Backing Ring



Nominal Bore	A (OD of PE Pipe)	SDR	B (ID of PE Pipe)	D (OD of Stub Flange - Flange End)	C (ID of Stub Flange - Flange End)	E (OD of PE Flange)	Back. Ring Flange Size* (see notes)	1 (OD of 4087 Raised Face)	% of Raised Face Engaged by PE Flange	3 Backing Ring ID (from Tyco)	2 (ID of Fitting)	Step in Bore	Conversion Flange
100	125	13.6	106.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
100	125	11.0	102.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
150	180	13.6	153.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
150	180	11.0	147.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
200	250	13.6	213.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
200	250	11.0	204.5	233.0	190.6	271.0	200	268	100%	237	200	approx. 10 mm	not required
300	355	13.6	302.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300	355	11.0	290.5	327.0	267.5	382.0	300	378	100%	331	300	approx. 30 mm	not required
300	400	13.6	341.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300	400	11.0	327.3	327.0	267.5	382.0	300	378	100%	331	300	approx. 30 mm	not required
375	450	13.6	383.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
375	450	11.0	368.2	439.0	359.0	465.0	375	463	100%	443	375	approx. 16 mm	not required

Note: red text indicates size is estimated by GHD - not designed by Tyco

\* Note: Steel Backing Rings Shall Comply With AS 4087 Figure B7



## PE to DI Conversion Flange

DN	OD - Flange		OD - Raised Face		PCD		Number of Bolts		Fastener		Hole Size	
	AS 4087	BS10 Table D	AS 4087	BS10 Table D	AS 4087	BS10 Table D	AS 4087	BS10 Table D	AS 4087	BS10 Table D	AS 4087	BS10 Table D
100	215	215	154	154	178	178	4	4	M16	M16	18	18
150	280	280	211	211	235	235	8	8	M16	M16	18	18
200	335	335	268	268	292	292	8	8	M16	M16	18	18
250 <sup>1</sup>	405	405	328	328	356	356	8	8	M20	M20	22	22
300	455	455	378	378	406	406	12	12	M20	M20	22	22
350 <sup>2</sup>	525	525	438	438	470	470	12	12	M24	M24	26	26
375 <sup>3</sup>	550	N/A	463	N/A	495	N/A	12	N/A	M24	N/A	26	N/A
400	580	580	489	489	521	521	12	12	M24	M24	26	26

- Notes:
- <sup>1</sup> used with DN 250 stub flange
  - <sup>2</sup> used with DN355 stub flange
  - <sup>3</sup> there is no DN375 in BS10 Table D

