


DOCUMENT AMENDMENT RECORD SHEET (Revision History)

[illegible]

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|  | Procedure : SPECIFICATION FOR DUCTILE IRON (D.I.) LONG COLLAR FITTINGS | | |
| | Department : Material Evaluation Technical Committee (METC) | | |
| | Document No: PBA/D.I.LONG COLLAR/FITTINGS | Revision No : 00 | |
| | Classification : PUBLIC | Effective Date : 24 March 2025 | |

1.0 General Description

- 1.1 All Ductile Iron Long Collars shall conform to the following standards.
- 1.2 The test requirements shall conform to BS EN 545:2010, the dimensions shall follow as the drawings from Appendix A - E. However, tolerances of the thickness shall follow BS EN 545:2010 (Ductile iron pipes, fittings, accessories and their joints for water pipelines - Requirements and test methods) Clause 4.2.1.4.
- 1.3 The flange dimensions shall follow PN 16 ratings and conforms to BS EN 1092-2:2023 starting from DN 200 - DN 300. For size DN 100 - DN 150, refer to PN 16 table.

2.0 Material

- 2.1 The materials used for the manufacture of the castings shall be good quality Ductile Iron complying with BS EN 545:2010 materials Class K9.
- 2.2 Nuts, Bolts and washers shall be hot-dip galvanized complied to BS EN ISO 1461:2022 from approved source as listed in Approved Material List (**Appendix D**)
- 2.3 Rubber ring must be from EPDM materials of grade 70 hardness complied to MS 672:2022 or AS 1646:2007 or equivalent. The approved sources are as below:
 - a) Gulf Rubber (Malaysia)
 - b) Selangor Rubber Factory Sdn. Bhd. (Malaysia)


*Dimension shall follow **Appendix C**.

3.0 Tests and Inspection

- 3.1 Nominal operating pressure of fittings shall be 16 bars. Nominal hydrostatic test pressure shall be 1.5 times of the 16 bar.

4.0 Mandatory Markings

- 4.1 Each casting shall be marked with the following information:
 - a) Name of manufacturer

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- b) Spheroidal Graphite material and to be embossed as SG
- c) Nominal diameter (ie. DN...)
- d) The marking for the rubber ring (e.g; EPDM) shall comply with MS 672:2022 Clause 1.8.

5.0 Dimension and Tolerance

- 5.1 The Ductile Iron fittings shall be designated by the normal size and shall conform to the outside diameters and other dimensions as in the **Appendix A.**

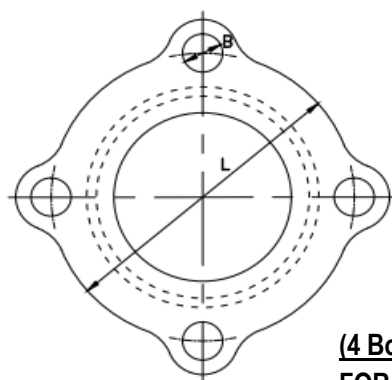
6.0 Coating

- 6.1 Metallic surface preparation prior to application of the coating shall conform to the requirement of ISO 8501-1: 2007 (E) Clause 4.2 of the Standard on Blast Cleaning to SA 2 ½ Standard classified 'very through blast-cleaning' shall be applicable.
- 6.2 Blasting to be done through grit blast to the roughness of between 2.0 G/S 76 to 3.0 GS 76 using Keane-Tator Profile Comparator on grit blast disc for comparison.
- 6.3 All fittings after manufacturing and testing shall be thoroughly cleaned and coated both internally and externally by approved fusion bonded epoxy coating of minimum 300 micron.
- 6.4 The finished surface of the coating shall be free from bubbles blistering, peelings, uneven coating or adhesion to foreign material.

7.0 Appendixes:

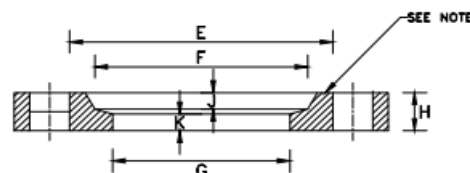
- Appendix A: D.I. Long Collar Sleeve and Flange Dimensions
- Appendix B: Details of Sleeve for Long Collar
- Appendix C: Dimensions for Rubber Rings for Long Collars
- Appendix D: Dimensions of Bolt and Nuts for Long Collars

Appendix A - D.I Long Collar Sleeve and Flange Dimensions

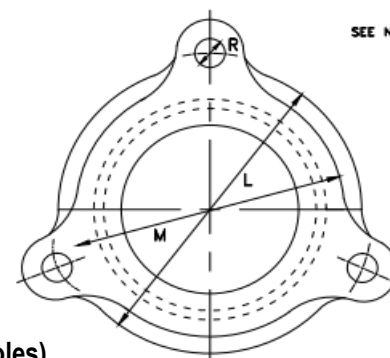


(4 Bolts Holes)
FOR PIPE SIZE
≥ DN 200

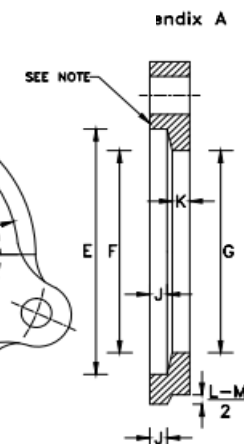
FLANGE
TWO OFF PER JOINT



(3 Bolts Holes)
FOR PIPE SIZE
≤ DN 150



FLANGE
TWO OFF PER JOINT



| SIZE OF PIPE | SLEEVE | | | | | | FLANGE | | | | | | | | BOLT HOLE DIA. |
|-----------------|-------------------|-------------------|--------------------|-----------|-----------|-------|-----------------|-----------------|------------------|-------|-----------------|----|-------------------------|----|----------------------|
| | Ø OUTSIDE DIA. | Ø OUTSIDE DIA. | Ø INTERNAL DIA. | THICKNESS | THICKNESS | WIDTH | OUTSIDE DIA. | OUTSIDE DIA. | INTERNAL DIA. | WIDTH | INTERNAL GROOVE | | OUTER FLANGE DIA. | | |
| | A | B | C | M = B-C | N | D | E | F | G | H | J | K | L | | |
| 50 | 102 | 97 | 80 | 8.5 | 7.0 | 100 | 100 | 97 | 80 | 25 | 13 | 8 | 127 | 18 | |
| 80 | 125 | 117 | 100 | 8.5 | 7.0 | 100 | 125 | 121 | 100 | 27 | 14 | 10 | 159 | 18 | |
| 100 | 163 | 152 | 130 | 11.0 | 7.2 | 112 | 160 | 155 | 130 | 29 | 16 | 11 | 187 | 18 | |
| 150 | 219 | 209 | 185 | 12.0 | 7.8 | 125 | 271 | 213 | 185 | 35 | 19 | 13 | 270 | 18 | |
| 200 | 273 | 264 | 239 | 12.5 | 8.4 | 150 | 273 | 270 | 239 | 38 | 19 | 16 | 311 | 18 | |
| 225* | 311 | 301 | 267 | 17.0 | 9.0 | 162 | 311 | 305 | 267 | 35 | 21 | 11 | 333 | 18 | |
| 250* | 337 | 327 | 291 | 18.0 | 9.0 | 162 | 337 | 330 | 291 | 35 | 21 | 11 | 359 | 18 | |
| 300 | 402 | 389 | 352 | 18.5 | 9.6 | 175 | 402 | 392 | 352 | 38 | 22 | 12 | 430 | 22 | |

* Only applicable to Penang Island

N. B. Refer to Details in Appendix B for Sleeve Dimension

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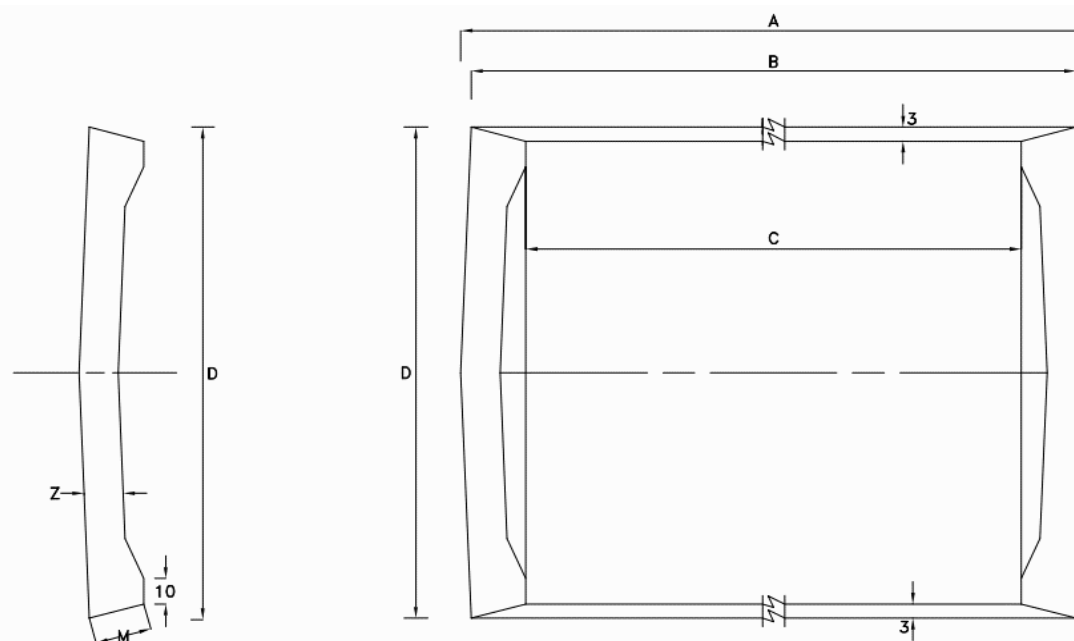
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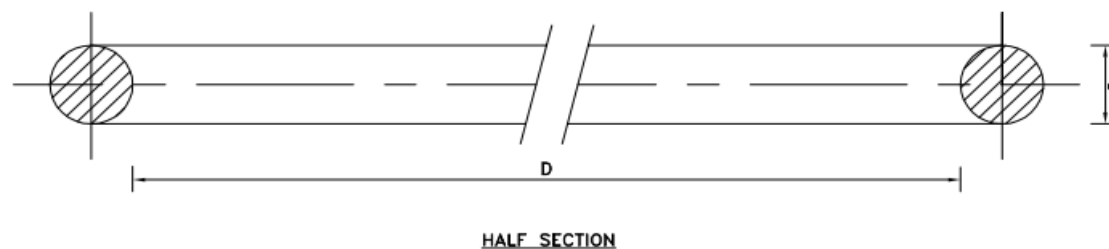
Appendix B - Details of Sleeve for Long Collar



DETAILS OF SLEEVE FOR LONG COLLAR

Appendix C - Dimensions for Rubber Rings for Long Collars

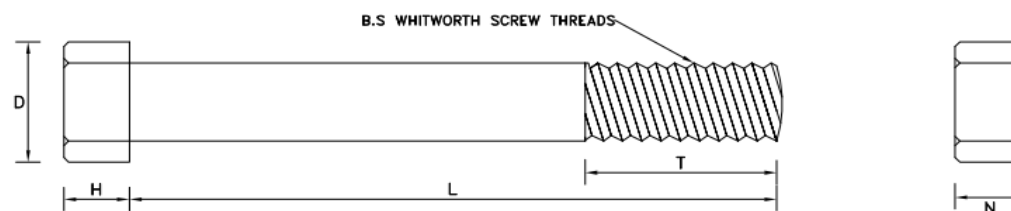
DIMENSION FOR RUBBER RINGS FOR LONG COLLARS



| NOMINAL SIZE | INSIDE DIAMETER D | CROSS SECTION DIAMETER d |
|--------------|----------------------|--------------------------------|
| 80 | 76 | 14 |
| 100 | 105 | 16 |
| 150 | 155 | 16 |
| 200 | 209 | 16 |
| 225* | 248 | 21 |
| 250* | 276 | 21 |
| 300 | 333 | 22 |

* For Penang Island maintenance use only.

Appendix D - Dimensions of Bolt and Nuts for Long Collars



BOLTS & NUTS

| SIZE OF PIPE (mm) | HEIGHT OF HEAD (mm) H | LENGTH OF BOLT (mm) L | WIDTH ACROSS FLAT (mm) D | THREAD (mm) T | THICKNESS OF NUT (mm) N | SIZE OF BOLT DIAMETER (mm) |
|----------------------|-----------------------------|-----------------------------|--------------------------------|---------------------|-------------------------------|----------------------------------|
| 80 | 10 | 164 | 24 | 50 | 13 | 16 |
| 100 | 10 | 178 | 24 | 50 | 13 | 16 |
| 150 | 10 | 195 | 24 | 50 | 13 | 16 |
| 200 | 10 | 226 | 24 | 50 | 13 | 16 |
| 225* | 10 | 254 | 24 | 50 | 13 | 16 |
| 250* | 10 | 257 | 30 | 50 | 16 | 20 |
| 300 | 13 | 280 | 30 | 63 | 16 | 20 |

NOTE : ALL BOLTS, NUTS AND WASHERS SHALL BE HOT DIP GALVANIZED.

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