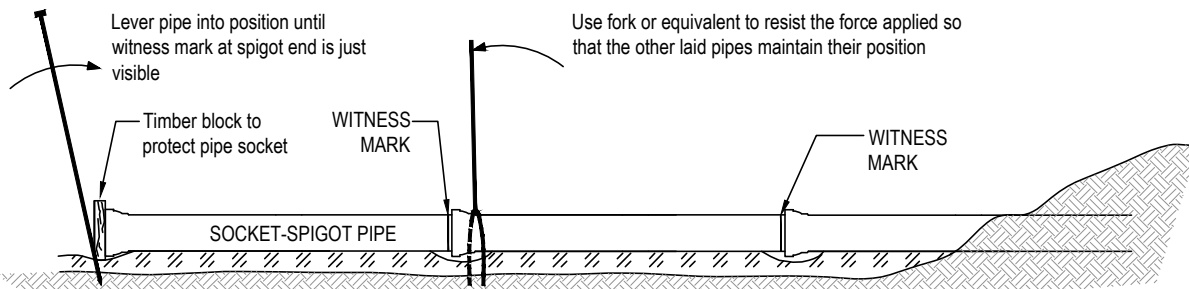


**PVC / DUCTILE IRON (DI) PIPE / FW-GRP SYSTEMS**

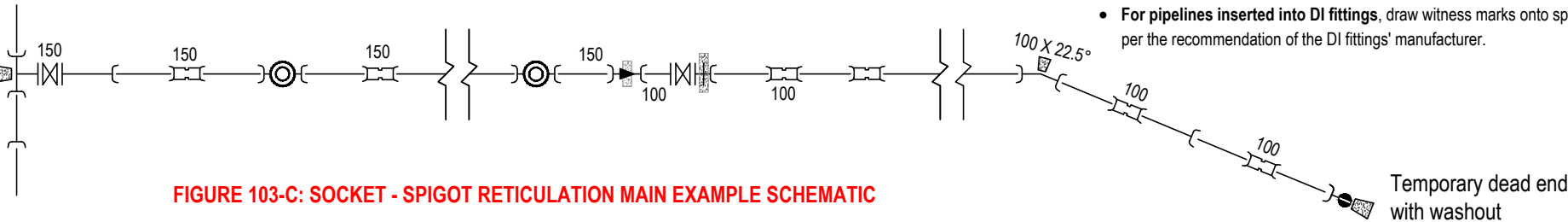
**TABLE 103-A: ACCEPTABLE SERIES 2 PVC / DI NOMINAL SIZES**

CIOD (NOMINAL DIAMETER)	100	150	225	300	375	450	600	750
APPROXIMATE OUTSIDE DIAMETER	122	177	259	345	426	507	667	826
APPROXIMATE PN16 PVC-O INSIDE DIAMETER	115	168	245	326	405	482	634	
APPROXIMATE PN16 PVC-M INSIDE DIAMETER	110	161	235	314	387			
APPROXIMATE PN35 DI INSIDE DIAMETER	102	157	239	322	401	480	636	790
APPROXIMATE PN16 FW-GRP INSIDE DIAMETER <sup>A</sup>				328	410	489	643	797
APPROXIMATE DNPE EQUIVALENT	125	180	280	355, or 400 #	400, or 500 #	560, or 630 #		

<sup>A</sup> THE QUOTED FW-GRP INTERNAL DIAMETERS CORRESPOND TO SN10,000 PIPE



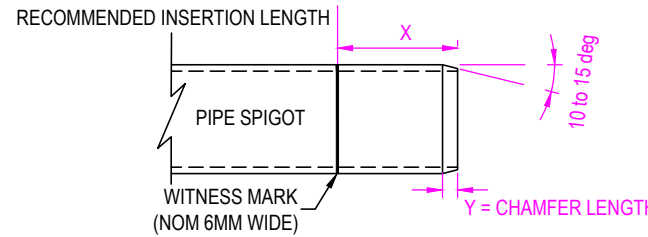
**FIGURE 103-A: SOCKET - SPIGOT PIPE INSTALLATION REQUIREMENTS**



**FIGURE 103-C: SOCKET - SPIGOT RETICULATION MAIN EXAMPLE SCHEMATIC**

**TABLE 103-B: WITNESS MARK & CHAMFER DIMENSIONS FOR PIPE TO PIPE JOINTS**

CIOD (NOMINAL DIAMETER)	100		150		225		300		375		450		600		750	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
PVC-M PIPE DIMENSIONS	152	15	174	18	209	22	234	26	280	30						
PVC-O PIPE DIMENSIONS	146	6	165	9	200	13	218	17								
DI PIPE DIMENSIONS	67	12	80	12	90	12	100	12	110	12	110	12	110	12	140	12
FW-GRP PIPE DIMENSIONS							130	11	130	13	130	15	160	18	160	18



**FIGURE 103-B: WITNESS MARK & CHAMFER REQUIREMENTS**

- Pipe spigots shall be inserted until the witness mark is within 5mm of the socket end while remaining visible.
- Draw witness mark around the full circumference of the pipe with a black, white or yellow permanent marker.
- For pipelines inserted into DI fittings, draw witness marks onto spigot ends as per the recommendation of the DI fittings' manufacturer.

**TABLE 103-E: ACCEPTABLE MILD STEEL (MS) PIPELINE SIZES**

NOMINAL DIAMETER	100	150	200*	225	250*	300	375	450	500*	600	750	825	900	1050	1150
APPROXIMATE OD	114	168	219	257	273	337	419	502	559	660	800	914	972	1125	1200
APPROX MSCL ID	86	140	191	229	245	303	385	468	525	626	756	870	928	1077	1152
MINIMUM THICKNESS	4.8	5	5	5	5	5	5	5	5	6	6	6	6	8	8

\* DENOTES THAT SEW ONLY USES THIS SIZE STEEL PIPE

**TABLE 103-F: PIPELINE SYSTEM PREFERENCES**

DN < 375 PIPEWORK	NORMAL CONDITIONS	CONTAMINATED GROUND RISK	URBAN CENTER OR HIGH RISK
DN < 375 PIPEWORK	Weak ground (ie: AHBP < 50 kPa)	PE, or Restrained joint DI	Restrained joint DI
	Normal ground (ie: AHBP > 50 kPa)	PVC-O, or PVC-M, or PE	DI
DN ≥ 375 PIPEWORK	Weak ground (ie: AHBP < 50 kPa)	PE, or Restrained Joint DI, or Welded MS*	Restrained Joint DI, or Welded MS*
	Normal ground (ie: AHBP > 50 kPa)	PE, or DI, or FW-GRP <sup>A</sup> , or MS (RRJ or Welded*)	DI, or FW-GRP <sup>A</sup> , or MS (RRJ or Welded*)

**NOTES Regarding TABLE 103-F:**

- These are the default pipeline selection options for both DW & NDW systems. Special or unusual situations may require different design solutions in which case the water agency shall be consulted.
- Welded PVC-U can be considered approximately equivalent to PE.
- \* Welded MS (mild steel) water mains shall be constructed with cathodic protection.
- <sup>A</sup> FW-GRP not approved by YVW for water supply at time of this standards publication. <sup>#</sup> FW-GRP shall be constructed of Vinyl Ester resin when used in contaminated ground.
- Potential contaminated ground is that which may have chemical components capable of leeching through PVC or PE pipe (typically petroleum products).
- Urban centers are those areas which have adjacent high rise buildings (buildings with 4 or more stories) or continuous high density retail (eg: Sydney Rd Brunswick, Bridge Rd Richmond).
- High risk mains are those which:
  - Are close to high value assets (eg: Tollways, Vicroads roads, bridges, rail lines, tram ways, hospitals, transport hubs), &/or
  - Have a higher likelihood of being damaged (ie: heavy traffic, building or ground forces, ground susceptible to land slip), &/or
  - Supply a significant group of customers who for a significant period of time will **not** have an alternate source of supply (consult the water agency for advice).
- NDW mains are not generally considered high risk unless the risk of flooding from bursts is high.
- Weak ground is known to exist around estuaries (eg: coode island silt in Docklands, Southbank etc), rubbish tips, land slip areas and swamps etc.
- Contaminated ground is often found near chemical / fuel storage facilities & shall be avoided where practical.
- Where more than one criteria apply, eg: high risk & contaminated ground, a system which complies with both requirements shall be used.

**GENERAL NOTES:**

- The schematics in this drawing are intended to illustrate how component parts of the water supply system can be drawn. The schematics do not describe requirements for locating component parts of the system and are not to be used or quoted in designs.
- Dead ends ≥DN100 (on residential supply) and ≥DN150 (on industrial / commercial supply) are only acceptable on a temporary basis.
- For end of line PE pipework refer to drawing MRWA-W-108.
- Where PE is available off a roll (ie: DN63PE) it shall be used to reduce jointing.
- Storage of pipe and fittings must be kept clean and dry as much as practical. Fittings must be stored in plastic bags or boxed before use.
- Before and after pipe laying, exclusion caps, plugs or blank flanges must be fitted to pipe ends to prevent contamination.
- Connection of PE to CIOD sized mains requires specific design and will sometimes require custom made stub flange &/or backing ring &/or reducer. Refer to MRWA-W-306B for details.

**POLYETHYLENE PIPE SYSTEMS**

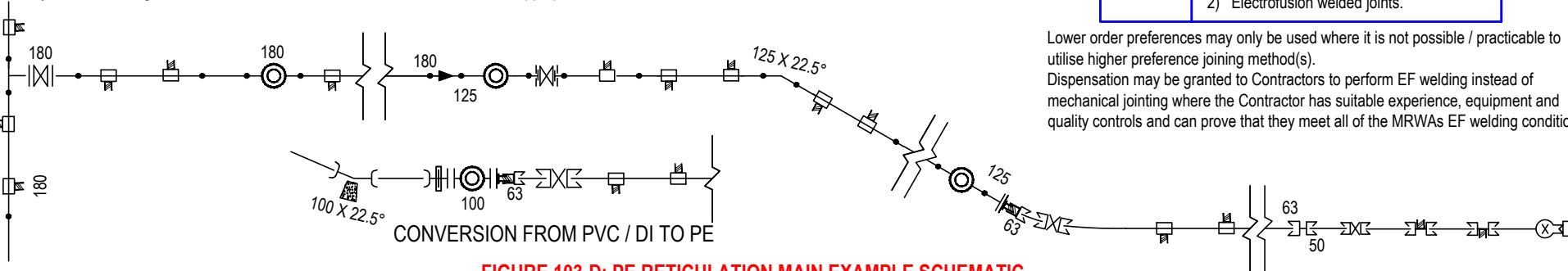
**TABLE 103-C: ACCEPTABLE DN PE NOMINAL SIZES**

DN PE (NOMINAL & OUTSIDE DIAMETER)	25	32	40	50	63	125	180	280	315	355*	400	500	560	630
APPROXIMATE CIOD OR COPPER EQUIVALENT	20	25	32	40	50	100	150	225	-	300	300, or 375 #	375	450	450
APPROXIMATE PE100 PN16 INSIDE DIAMETER	20.2	26.0	32.3	40.5	51.0	102	146	228	256	289	325	407	456	513
PROPERTY SERVICE ACCEPTED*	✓	✓	✓	✓	✓	✓	✓	✓						
DEAD END SUB MAIN ACCEPTED				✓	✓									
RETICULATION / DISTRIBUTION MAIN ACCEPTED						✓	✓	✓	✓	✓	✓	✓	✓	✓

\* Industrial / commercial property service sizes will be determined at the time of application.

<sup>A</sup> Not to be used by CWW without approval.

<sup>#</sup> Hydraulic modeling shall be used to determine which of the two sizes is most appropriate.



**FIGURE 103-D: PE RETICULATION MAIN EXAMPLE SCHEMATIC**

**TABLE 103-D: PE PIPE JOINTING PREFERENCES**

PE PIPE RANGE	JOINTING PREFERENCE
< DN125PE	1) Mechanical compression or push fit joints, 2) Butt welded joints, 3) Electrofusion welded joints.
≥ DN125PE & ≤ DN315PE	1) Butt welded joints, 2) Mechanical compression or push fit joints, 3) Electrofusion welded joints.
> DN315PE	1) Butt welded joints, 2) Electrofusion welded joints.

Lower order preferences may only be used where it is not possible / practicable to utilise higher preference joining method(s). Dispensation may be granted to Contractors to perform EF welding instead of mechanical jointing where the Contractor has suitable experience, equipment and quality controls and can prove that they meet all of the MRWAs EF welding conditions.

MELBOURNE RETAIL WATER AGENCIES



MRWA WATER SUPPLY STANDARDS

PIPE & JOINT REQUIREMENTS

NOT TO SCALE

MRWA-W-103

ISSUED 2012 REVISION NO. 4

REV	DESCRIPTION	DATE	APPROVED
4	INCLUDE FW-GRP PIPE. EXCLUDE PE80	1/12/16	RJ / CP / JT
3	INCLUSION OF MS PIPE TABLE	3/5/12	R. JAGGER
2	PUBLISHED FIRST ISSUE	21/03/12	R. JAGGER
1	PRE PUBLISHED DRAFT FOR COMMENT	12/07/11	R. JAGGER

DESIGNED	DATE	DRAWN	DATE
R. JAGGER	13/04/11	R. JAGGER	13/04/11

CHECKED	NAME	DATE	APPROVED	NAME	DATE
✓ CWW	C. RIVETTE	21/03/12	✓ CWW	R. CARRUTHERS	21/03/12
✓ SEWL	C. PAXMAN	21/03/12	✓ SEWL	G. REYNOLDS	21/03/12
✓ YVW	K. DAWSON	21/03/12	✓ YVW	A. COSHAM	21/03/12