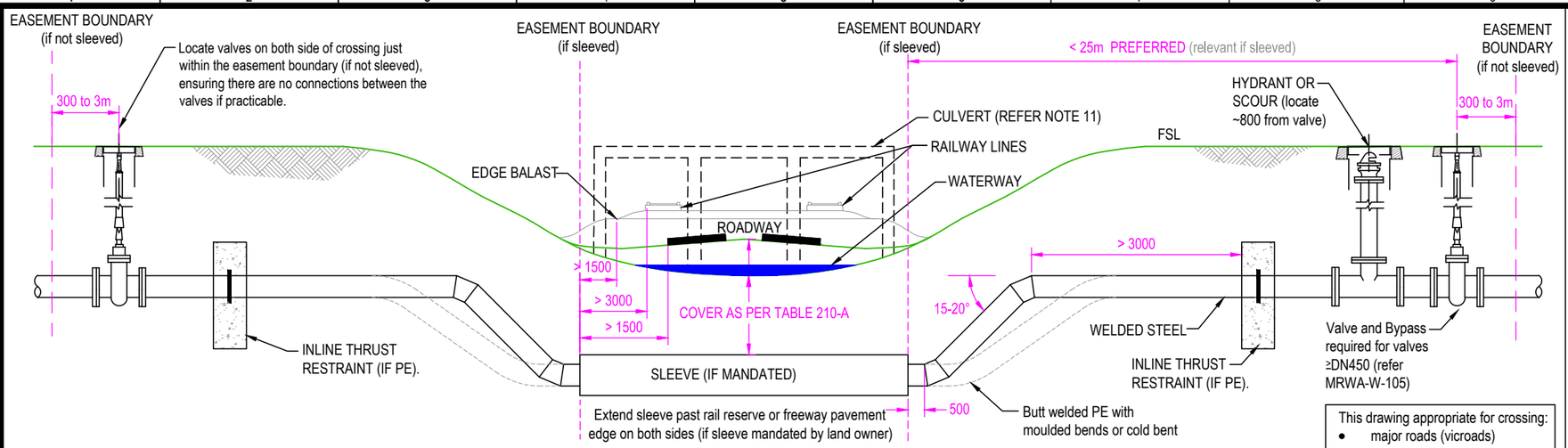

FIGURE 210-A: MAJOR ROAD / RAILWAY / TRAM / WATERWAY CROSSING (SECTION VIEW)

This drawing appropriate for crossing:
- major roads (vicroads)
- railways & tramways
- wetlands, creeks & rivers

TABLE 210-A: COVER REQUIREMENTS

CROSSING	WATER MAIN COVER / CLEARANCE
RAILWAY LINES	> 1600 below rail level, and > 600 below formation level (ground level immediately below ballast), and > 2000 between rail level and a bore hole
WATER WAYS	1000
TRAMWAYS	1200 (top of rail to top of pipe)
MAJOR ROADS	1200

TABLE 210-B: OTHER CROSSING REQUIREMENTS

CROSSING	REQUIREMENT
Regional drains (ie: Melbourne Water)	As per Figure 210-A, except valves at sides of crossing & hydrant / scour are not required.
• local drains (ie: council), • other services, • local streets.	Any approved pipeline system which satisfies structural, clearance, cover and MRWA-W-212 requirements. Joints under crossing to be minimised. Pipeline maximum lengths shall comply with Table 213-B. Flanged joint crossing pipelines shall be ≤10m. Joint(s) other than welded joints shall be horizontally offset from any service being crossed.

NOTES Regarding Major Crossings:

1. All >DN250 major crossings to be constructed from fully welded MS or butt welded PE.
2. For ≤DN250 mains, other pipelines may be permitted on approval of the Water Agency, provided there is a maximum of 25m under the structure being crossed.
3. Refer MRWA-W-213 for details of trenchless construction requirements.
4. Land owner requirements (eg: Vicrail, Melbourne Water) take precedence over these requirements.
5. Concrete encased pipework is not preferred.
6. Steel pipe joints to be either plain ends with welded collar, ball and socket or slip in welded joints.
7. All steel pipework is to be fabricated and protected as per MRWA-W-400 drawing, water agency specifications and AS2832 (cathodic protection).
8. All bend lengths and angles to be specified in the design drawings.
9. Locate a hydrant or scour (depending on topography and size of main) on the low side of the crossing (between the 2 divide valves) to facilitate de-watering of the main. Hydrants preferred for smaller mains or where the main has a steep (> 1 in 50) rise on both sides of the crossing.
   Where a scour is to be installed, a hydrant or air valve shall in addition be located on the high side of the crossing to facilitate air removal from the main (refer MRWA-W-304).
10. For scour design, refer to drawing MRWA-W-307.
11. Minimum cover to be specified within the design drawing.
12. Water mains may cross waterways above culverts, provided that minimum cover and embedment requirements are met.

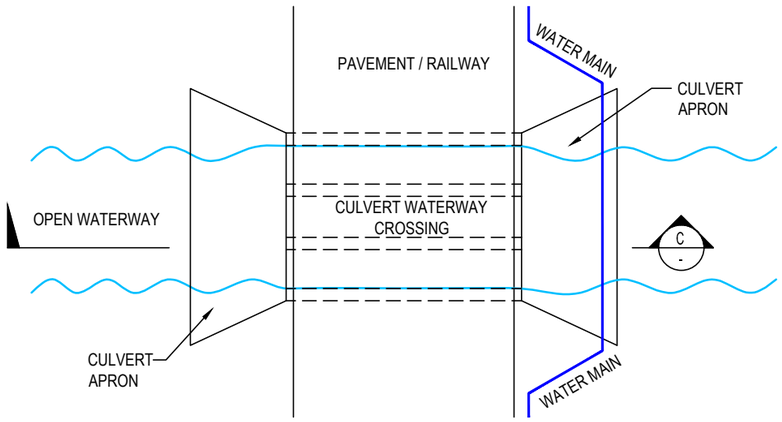

FIGURE 210-B: WATERWAY CROSSING (PLAN VIEW)

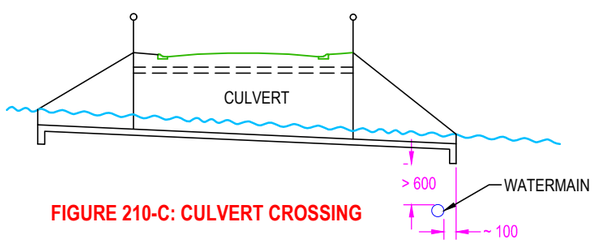

FIGURE 210-C: CULVERT CROSSING

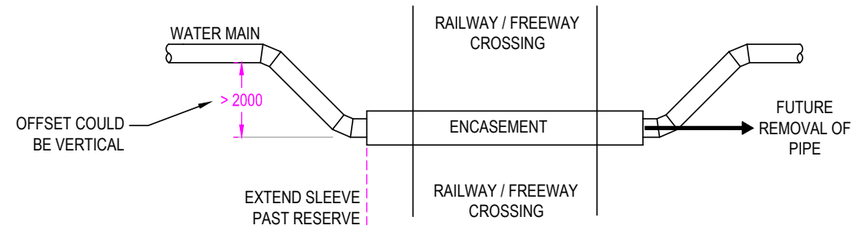

FIGURE 210-D: PLAN VIEW: RAILWAY / FREEWAY CROSSING

Sleeve required to enable the pipe within to be removed in future.
Water assets within rail reserves to be designed in accordance with AS4799.

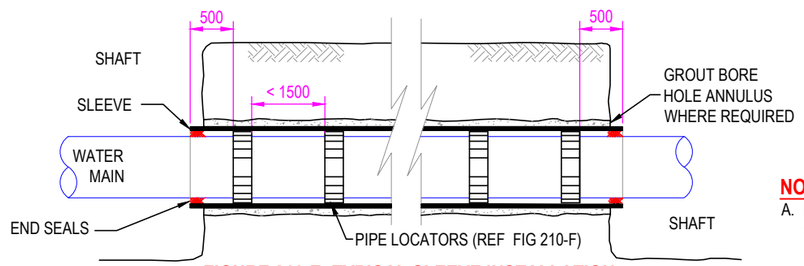

FIGURE 210-E: TYPICAL SLEEVE INSTALLATION

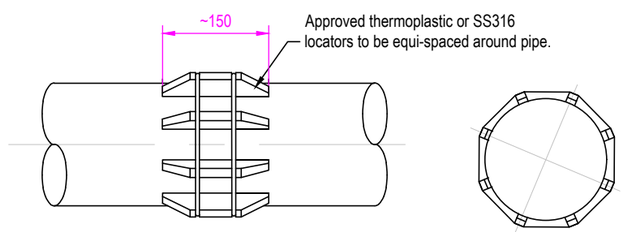

FIGURE 210-F: PIPE LOCATOR DETAIL

NOTES Regarding Sleeves :

A. Pipes only to be sleeved where mandated by the landowner.
   Sleeves usually mandated to prevent leaks and bursts from affecting above ground assets.
   They also enable water mains to be removed and replaced without affecting critical services.
   It is therefore preferred that void space between water mains and sleeves is **not** grouted.
B. Sleeves to consist of a high joint strength pipe (refer Table 213-B). Non metallic sleeve preferred.
C. Sleeve for cathodically protected MS main shall be concrete (as it is conductive) and unconnected to the MS main.
D. Where steel sleeves and end seals are required, they shall be specifically designed by a senior corrosion consultant and designed for a service life of 100 years.
E. Once a MS water main is inserted into the sleeve, a coating integrity check of the water main must be completed via a camera inspection.
   Footage must be provided to the water agency and any damage reported.
F. Water main supports (as shown in Figure 210-F) must be firmly fastened and not move or damage the water main once attached.
G. When annulus (void space between sleeve & borehole) > 30, grout as per WSA03 MRWA edition.
   Sleeve to be grouted in place with a flowable grout, eg: liquafill or bentonite.
H. Ensure grouting pressures do not exceed the buckling capability of the pipe when empty.
I. Water mains to be supported using slippers (pipe centralises) within sleeves.
   Slippers may be omitted in the case of welded PE mains.

REV	DESCRIPTION	DATE	APPROVED
3	MINOR CLARIFICATIONS	1/12/16	RJ / CP / JT
2	PUBLISHED FIRST ISSUE	23/03/12	R.JAGGER
1	PRE PUBLISHED DRAFT FOR COMMENT	12/07/11	R.JAGGER

	NAME	DATE
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CHECKED: CWW	C. RIVETTE	23/03/12
CHECKED: SEWL	C.PAXMAN	23/03/12
CHECKED: YVW	K.DAWSON	23/03/12
APPROVED: CWW	R.CARRUTHERS	23/03/12
APPROVED: SEWL	G.REYNOLDS	23/03/12
APPROVED: YVW	A.COSHAM	23/03/12

MELBOURNE RETAIL WATER AGENCIES

City West Water™ · South East Water · Yarra Valley Water

MRWA WATER SUPPLY STANDARDS

UNDERGROUND CROSSINGS

NOT TO SCALE

MRWA-W-210

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