

TABLE 205-A: TRENCHSTOP & BULKHEAD PLACEMENT AND PIPELINE SELECTION CRITERIA

SLOPE	MAXIMUM TRENCHSTOP SPACING			
	< 1 in 20	> 1 in 20	> 1 in 15	> 1 in 10
SOC MAIN (RRJ PVC / PP / GRP)	NOT REQUIRED	100m	75m	50m
WELDED MAIN (PE / SCJ PVC)	NOT REQUIRED	200m	150m	100m

NOTES Regarding Trenchstops:

- A. Mains at < 1 in 20 slope do not typically require trenchstops or bulkheads.
- B. Where welded PE mains are used for steep slopes, these shall be constructed in accordance with Figure 205-A.
- C. When socketed mains are laid at >1 in 20 slope in areas that are likely to have high ground water, cement stabilised embedment shall be used as per MRWA-S-202.
- D. For details of trenchstop design, refer to MRWA-S-206.
- E. Where the sloped main is less than the spacing nominated, a trenchstop or bulkhead is only required at the bottom of the slope.
- F. Where the slope length is < 1/2 the spacing nominated, no trenchstop is required.
- G. Trenchstops are required on both sides of any road crossing where there is a slope > 1 in 20 slope on either side of the road.
- H. Where trenchstops or bulkheads are to be used, Type B embedment system shall be used as per MRWA-S-202.

TABLE 205-B: SAFE MAXIMUM GRADES

PIPE DN	100 & 150	225	300	375	450	525	600	750	900	> 900
MAXIMUM SAFE GRADE	1 in 10	1 in 15	1 in 30	1 in 40	1 in 45	1 in 55	1 in 60	1 in 75	1 in 90	1 in Ø/10

NOTES Regarding Table 205-B:

- a. Velocities shall be kept to below 3 m/s.
- b. The nominated grades are unlikely to lead to deterioration of the sewerage system through the formation of hydraulic jumps.
- c. Where the grade nominated in Table 205-B is to be exceeded, supercritical and sub critical grades will need to be calculated.
- d. Where supercritical / sub critical grade is exceeded, controls to limit the damage from hydraulic jumps shall be implemented.

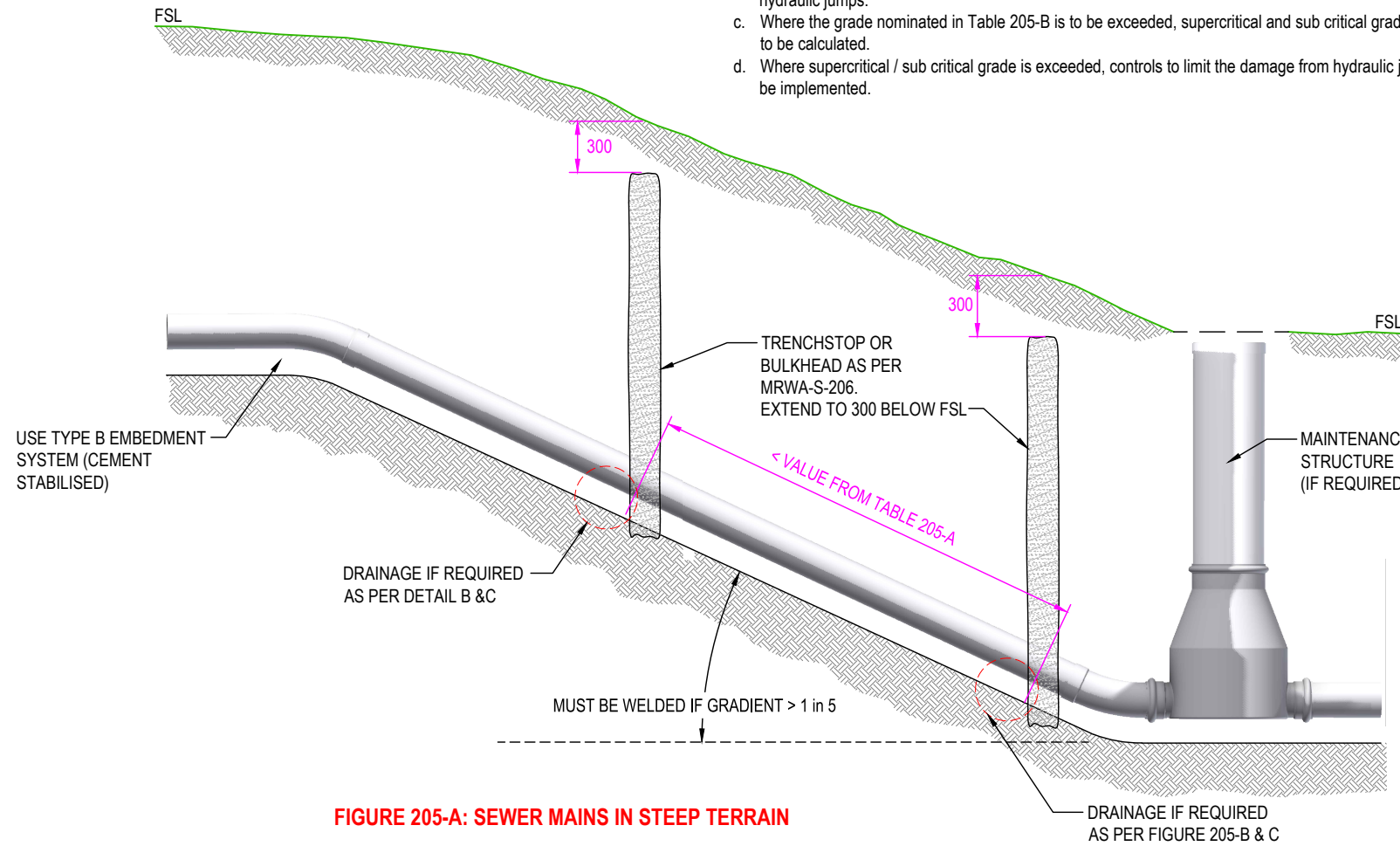


FIGURE 205-A: SEWER MAINS IN STEEP TERRAIN

NOTES on Figure 205-A:

If the main is welded PE, thrust restraints or maintenance hole connections to counteract shrinkage will be required at both ends of the PE main. Refer to drawing MRWA-W-205-A or Figure 310-F for details.

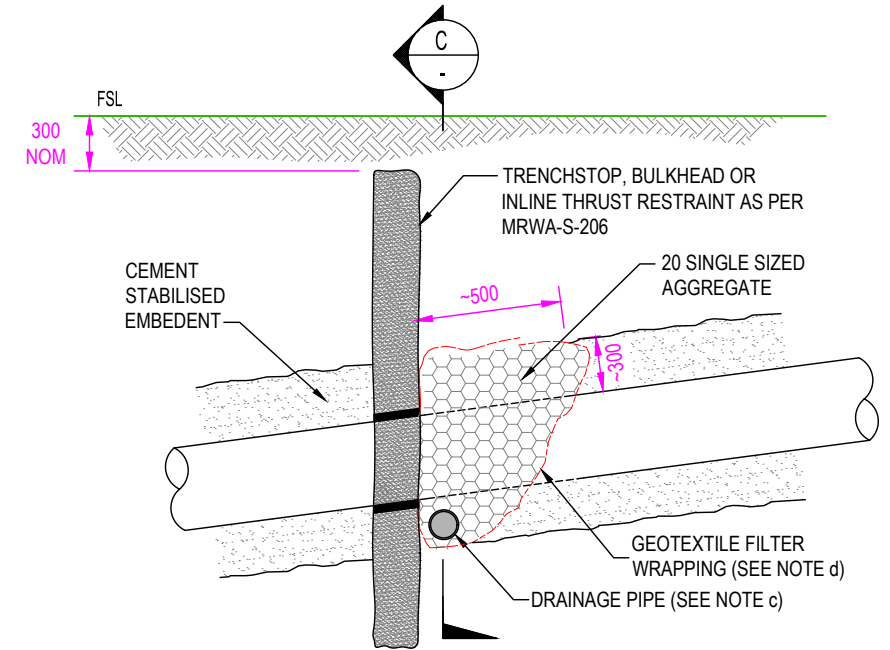


FIGURE 205-B: TRENCHSTOP WITH DRAIN (SECTION)

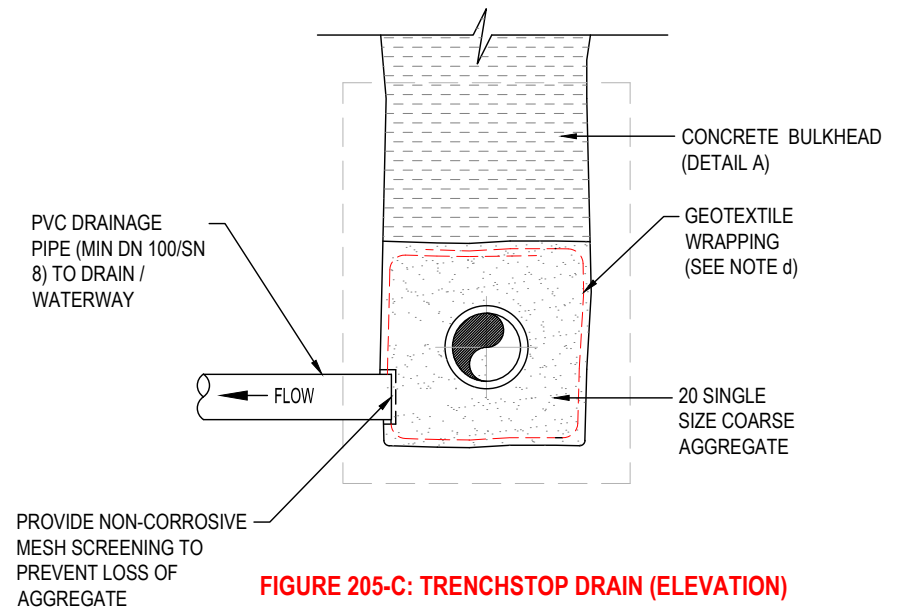


FIGURE 205-C: TRENCHSTOP DRAIN (ELEVATION)

Notes on Figures 205-B & C:

- a. Trenchstops and bulkheads shall be drained as shown where the location is likely (or is known) to have high ground water or the surface water is not directed away from the sewer alignment. The designer shall nominate all required drainage points and drainage arrangements.
- b. Provide a restricted (to slow the flow of ground water) continuous drainage path between drainage points.
 - through bulkheads and trenchstops.
 - around maintenance structures.
 - along embedment.
- c. Drainage pipes to discharge ground water into authorised water discharge areas (as agreed by the drainage authority) shall be shown in the design drawings.
- d. Lay geotextile filter fabric in trench such that it fully encapsulates the drainage material (coarse aggregate). Provide minimum of 250 overlap at all filter fabric joints.

REV	DESCRIPTION	DATE	APPROVED
2	PUBLISHED FIRST ISSUE	01/10/15	CP / JT / KD / RJ
1	PRE-PUBLISHED DRAFT	01/03/15	CP / JT / KD / RJ

DESIGNED: R. JAGGER	DATE: 1 JULY 2015
DRAWN: R. JAGGER	DATE: 1 JULY 2015
CHECKED: NAME DATE	APPROVED: NAME DATE
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ISSUED 2015	VERSION 1

MELBOURNE RETAIL WATER AGENCIES

MRWA SEWERAGE STANDARDS

SLOPING MAINS AND TRENCH DRAINAGE

NOT TO SCALE		
MRWA-S-205		
Planning	Design	Construction
✓	✓	✓