

TABLE 208-A: TRENCHSTOP & BULKHEAD PLACEMENT AND PIPELINE SELECTION CRITERIA

SLOPE	MIN TRENCHSTOP SPACING				MIN BULKHEAD SPACING			
	5%	10%	15%	20%	25%	30%	35%	40%
SOC MAIN (PVC / DI)	100m	50m	30m	24m	N/A	N/A	N/A	N/A
WELDED MAIN (PE / MS)	200m	100m	60m	45m	38m	32m	27m	24m

NOTES Regarding Trenchstops & Bulkheads:

- A. Mains < 5% slope do not typically require trenchstops or bulkheads.
- B. Spacing may be linearly interpolated between the values provided in Table 208-A.
- C. Any approved pipeline system may be used for slopes < 20%.
- D. Trenchstops are preferred to concrete bulkheads for slopes < 20%.
- E. Concrete bulkheads are required for slopes > 20%.
- F. Only welded mains may be used for slopes > 20%. These shall be constructed in accordance with Figure 208-A.
- G. When Trenchstops or Bulkheads are used, cement stabilised embedment shall be used as per Type B of MRWA-W-203.
- H. For details of trenchstop and bulkhead design, refer to MRWA-W-209.
- I. Where the sloping main length is less than the spacing length nominated, a trenchstop or bulkhead is only required at the bottom of the slope.
- J. Where the sloping main length is less than 1/2 the spacing length nominated, no trenchstop or bulkhead is required.
- K. Trenchstops or bulkheads (as per Table 208-A) are required on both sides of any road crossing where there is a slope > 5% across the road.
- L. Slopes greater than 40% must be designed in consultation with the Water Agency.

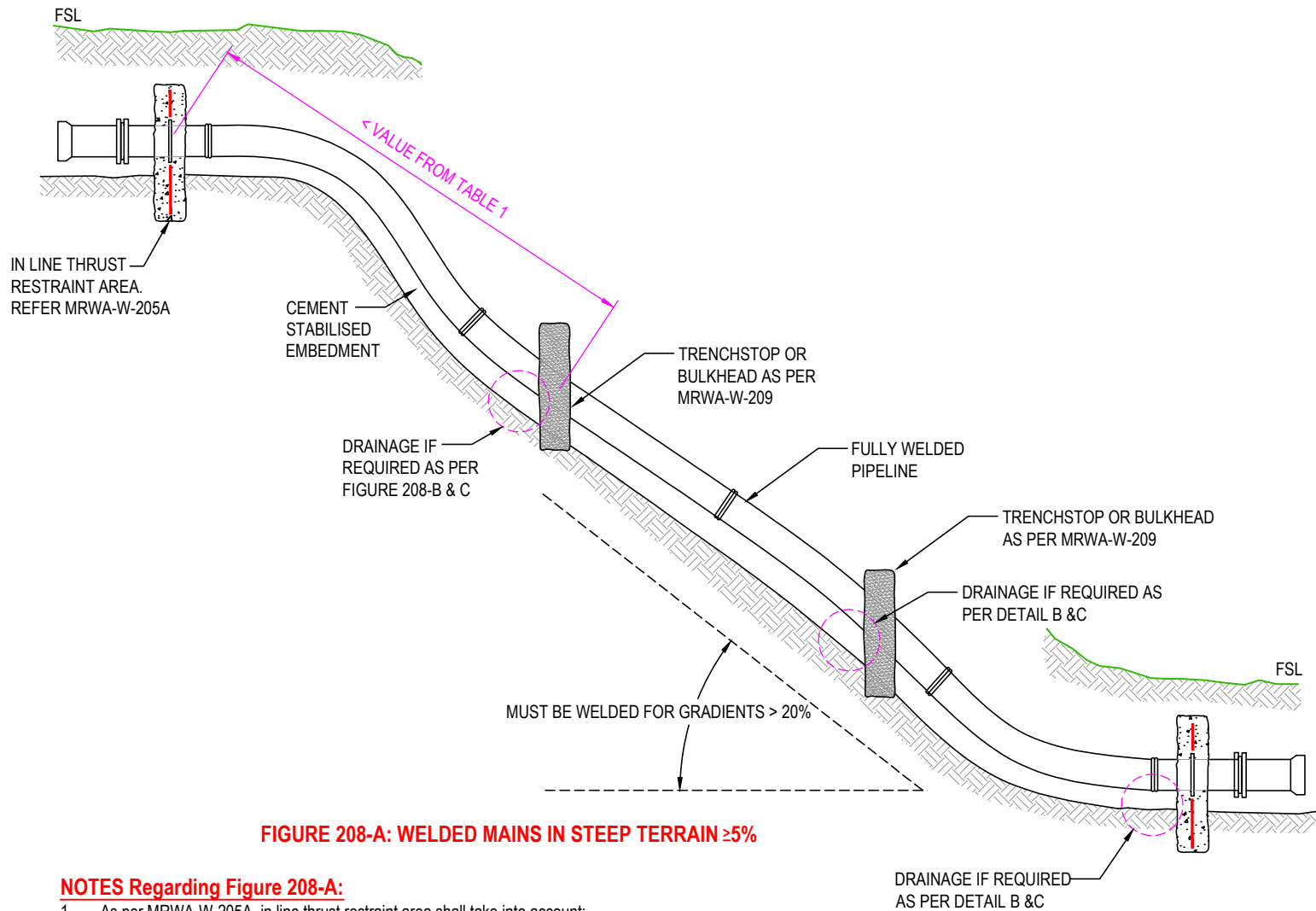


FIGURE 208-A: WELDED MAINS IN STEEP TERRAIN ≥5%

NOTES Regarding Figure 208-A:

1. As per MRWA-W-205A, in line thrust restraint area shall take into account:
 - 1.1. thermal shrinkage of main,
 - 1.2. Poisons Effect, and
 - 1.3. any thrust due to valves located adjacent.
2. Where the sloped main length is less than the spacing nominated in Table 208-A, no trenchstops or bulkheads would be required. The in line thrust restraints (which are required in all cases) at the top and bottom of the slope shall suffice in such cases.

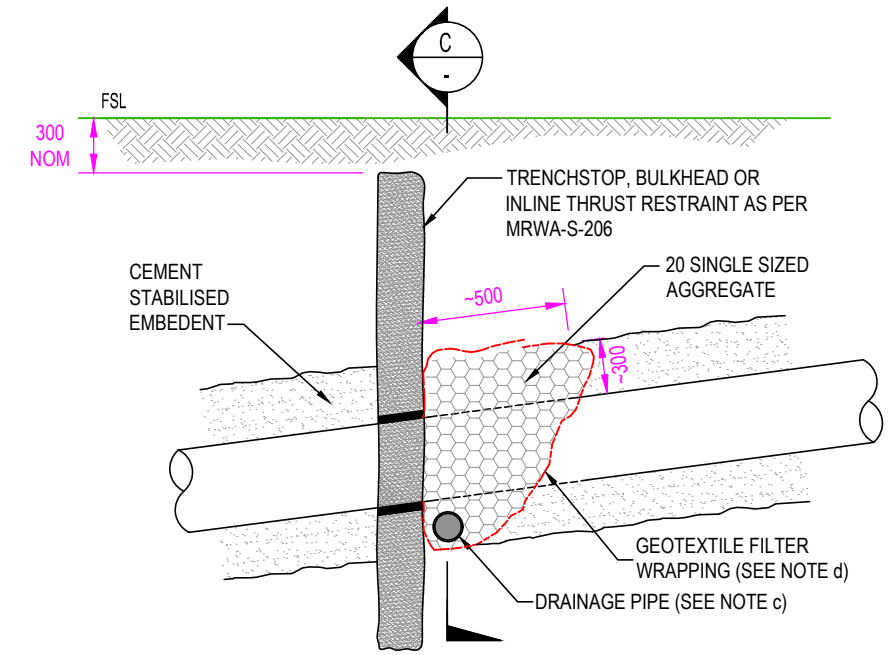


FIGURE 208-B: TRENCHSTOP WITH DRAIN (SECTION)

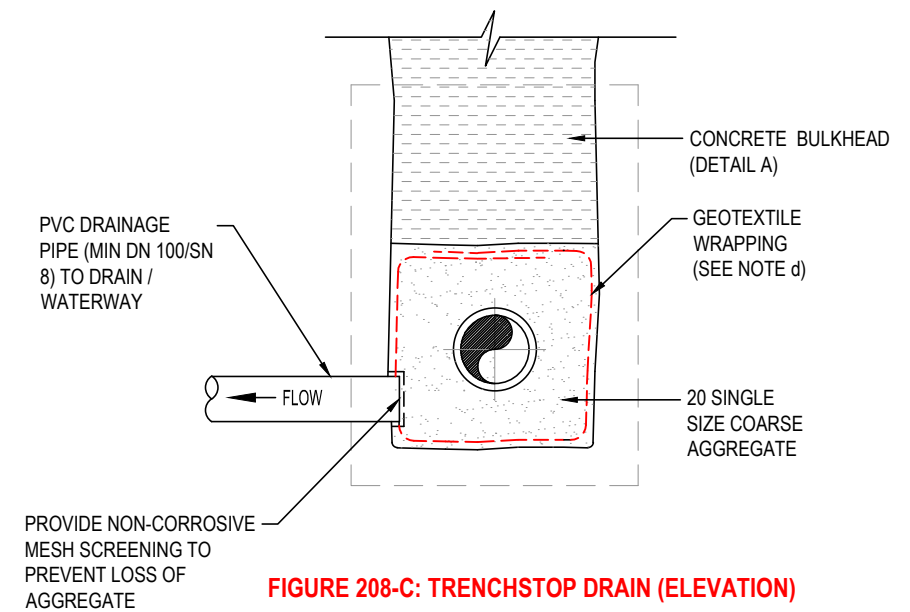


FIGURE 208-C: TRENCHSTOP DRAIN (ELEVATION)

NOTES on Figures 208-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 water main alignment. The designer shall nominate all required trench 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 shall discharge ground water into authorised water discharge areas (as agreed by the drainage authority) and 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.

DESIGNED	R. JAGGER	DATE	15/06/2011
DRAWN	R. JAGGER	DATE	15/06/2011
CHECKED	NAME	DATE	APPROVED
<input checked="" type="checkbox"/> CWW	R. JAGGER	23/03/12	<input checked="" type="checkbox"/> CWW R. CARRUTHERS
<input checked="" type="checkbox"/> SEWL	C. PAXMAN	23/03/12	<input checked="" type="checkbox"/> SEWL G. REYNOLDS
<input checked="" type="checkbox"/> YVW	S. TAN	23/03/12	<input checked="" type="checkbox"/> YVW A. COSHAM

MELBOURNE RETAIL WATER AGENCIES



MRWA WATER SUPPLY STANDARDS

NOT TO SCALE

SLOPING MAINS AND TRENCH DRAINAGE

MRWA-W-208

ISSUED 2012 REVISION NO. 3