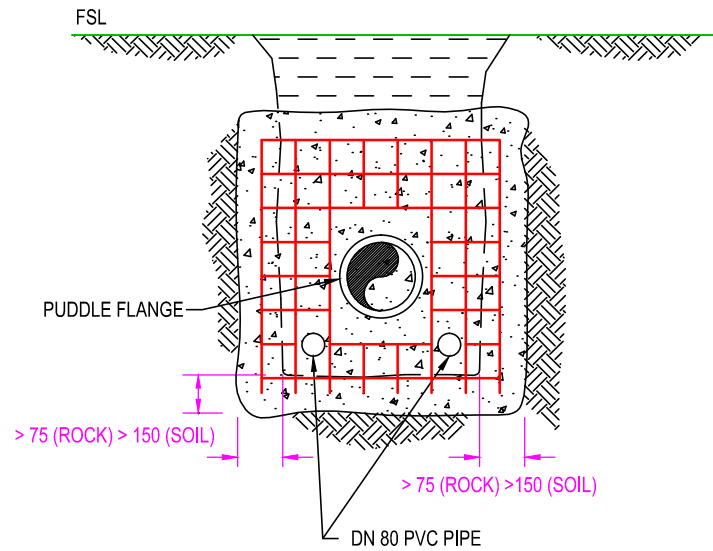


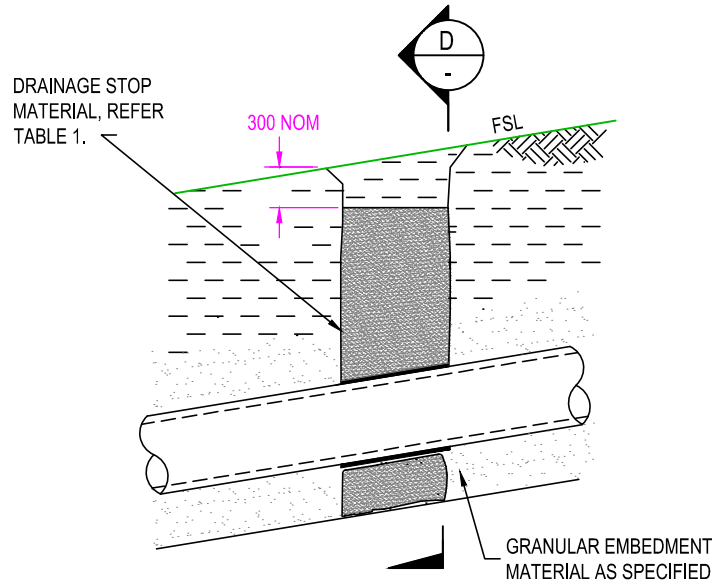
DETAIL A: CONCRETE BULKHEAD DETAIL



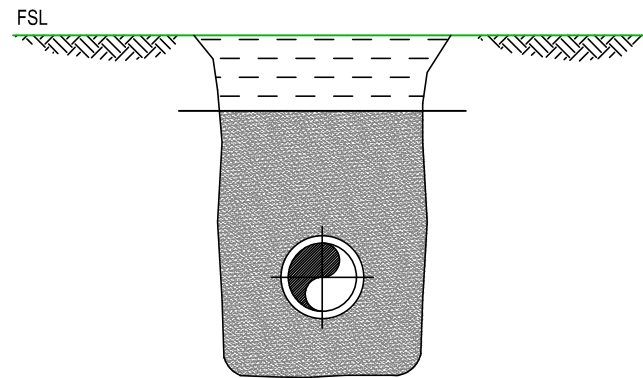
DETAIL B: SECTION, CONCRETE BULKHEAD

NOTES on Details A & B:

1. CONCRETE BULKHEADS ARE PREFERRED FOR SLOPES > 20%.
2. BULKHEAD AT A RETAINING WALL TO BE UNDER THE WALL.
3. KEY CONCRETE BULKHEADS INTO SIDES AND BOTTOM OF TRENCH AGAINST A BEARING SURFACE OF UNDISTURBED SOIL.
4. CONCRETE TO BE CLASS N20.
5. DO NOT DEFORM PIPES DURING PLACEMENT OF CONCRETE.
6. FOR BULKHEADS ADJACENT TO KERBS, A POLYSTYRENE MEMBRANE AT LEAST 10mm THICK SHALL BE USED.
6. FOR BULKHEADS AND TRENCHSTOPS ON SLOPES, AN ELASTOMERIC MEMBRANE AT LEAST 3mm THICK SHALL BE USED.
7. COMPRESSIBLE MEMBRANE AROUND PIPE TO BE 10 THICK POLYSTYRENE FOR BULKHEADS ADJACENT TO KERBS AND 3 THICK RUBBER FOR BULKHEADS AND TRENCH STOPS ON SLOPES.
8. CONCRETE BULKHEAD REINFORCEMENT IS TO CONSIST OF MIN SL81 GRADE MESH AND N10 GRADE BAR (AS PER AS/NZS 4671).



DETAIL C: EARTHWORK TRENCH STOP DETAIL



DETAIL D: SECTION, EARTHWORK TRENCHSTOP

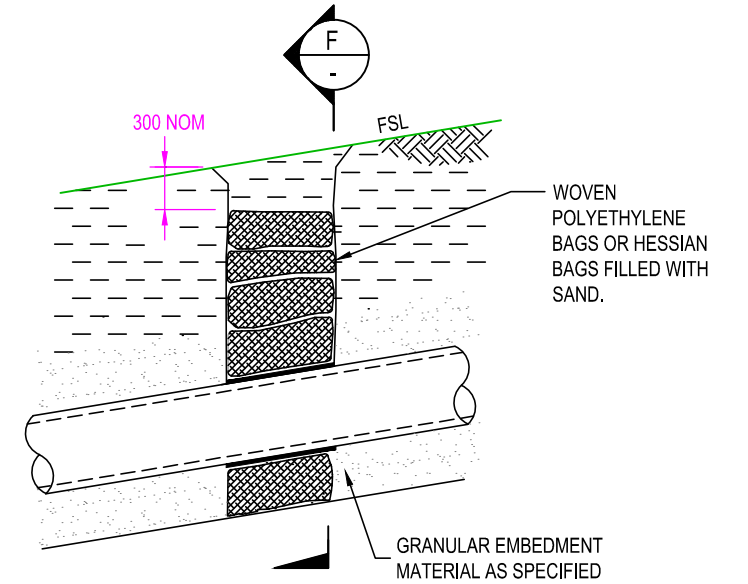
TABLE 1: DRAINAGE STOP MATERIAL

MATERIAL	* PROPORTION
BENTONITE	1 (4%)
CEMENT	1 (4%)
CONCRETE SAND	23 (92%)

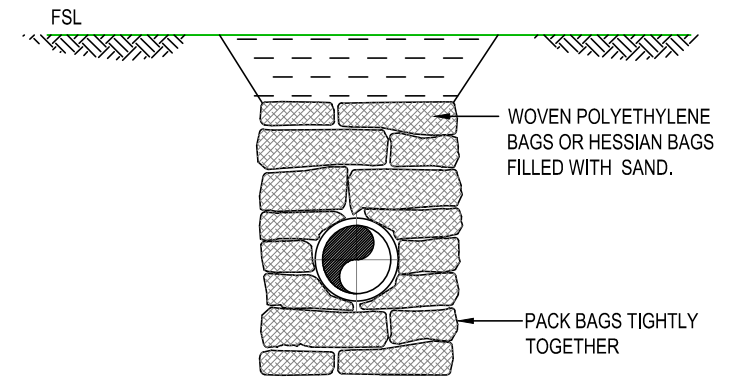
OR

COMPACTED CLAY	95% R
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* PROPORTION BY VOLUME OF DRY MATERIALS.



DETAIL E: BAGGED TRENCH STOP DETAIL



DETAIL F: SECTION, BAGGED TRENCHSTOP

GENERAL NOTES:

1. CONSTRUCT CONCRETE BULKHEADS AND TRENCH STOPS AT LOCATIONS SPECIFIED IN DESIGN DRAWINGS.
2. TRENCHSTOPS ARE PREFERRED FOR SLOPES < 20%, CONCRETE BULKHEADS PREFERRED FOR SLOPES > 20%.
3. SEAL BAGS TO PREVENT LEAKAGE OF CONTAINED MATERIAL.
4. PROVIDE A CONTINUOUS DRAINAGE PATH
 - THROUGH BULKHEADS AND TRENCHSTOPS
 - AROUND VALVE CHAMBERS.
10. COMPRESSIBLE MEMBRANE AROUND PIPE TO BE 10 THICK POLYSTYRENE FOR BULKHEADS ADJACENT TO KERBS AND 3 THICK RUBBER FOR BULKHEADS AND TRENCHSTOPS ON SLOPES.
11. FOR SLOPES > 20° REFER TO MRWA-W-208.

DESIGNED:	R. JAGGER	DATE:	15/06/2011
DRAWN:	D. TOLENTINO	DATE:	15/06/2011
CHECKED:	NAME	DATE	APPROVED: NAME
<input checked="" type="checkbox"/> CWW	C. RIVETTE	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	K.DAWSON	23/03/12	<input checked="" type="checkbox"/> YVW A.COSHAM

MELBOURNE RETAIL WATER AGENCIES

WITH ACKNOWLEDGEMENT TO WATER SERVICES ASSOCIATION of Australia

MRWA WATER SUPPLY STANDARD DRAWINGS

NOT TO SCALE

TRENCH BULKHEADS AND TRENCHSTOPS

MRWA-W-209

ISSUED 2012 VERSION 2