

1.

GEOTECHNICAL INVESTIGATION:

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WHERE THE SOIL CLASSIFICATION IS SAND OR SOFT CLAY OR WHERE GROUNDWATER IS PRESENT A GEOTECHNICAL INVESTIGATION SHALL BE PERFORMED PRIOR TO COMMENCEMENT OF CONSTRUCTION TO DETERMINE THE GROUND CONDITIONS ALONG THE PROPOSED ROUTE OF THE SEWER.

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ANY GROUNDWATER SHALL BE CONTROLLED BEFORE AND/OR DURING EXCAVATION AND PIPE LAYING.

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THE GEOTECHNICAL INVESTIGATION SHALL EXTEND TO MIN 1 m BELOW PROPOSED TRENCH FLOOR LEVEL.

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TEST PITS ARE USUALLY SIMPLER AND MAY PROVIDE BETTER INFORMATION THAN TRIAL HOLES. IN SOME AREAS A VISUAL INSPECTION BY AN EXPERIENCED PERSON MIGHT SUFFICE.

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SCREENINGS SHALL NOT BE PLACED DIRECTLY ON OR AGAINST THE SAND OR SOFT CLAY. THE SCREENINGS SHALL BE SEPARATED FROM THE SOIL BY A LAYER OF GEOTEXTILE.
2.

GROUNDWATER CONTROL:

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ALL GROUNDWATER INFLOW SHALL BE CONTROLLED PRIOR TO PLACING ANY BEDDING MATERIAL.

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WHERE WATER IS ENTERING THE TRENCH SLOWLY, A GEOTEXTILE-WRAPPED GRAVEL DRAIN ON THE TRENCH FLOOR MAY BE SUFFICIENT. IF SO, OVER-EXCAVATE THE TRENCH FLOOR BY 100 mm, PLACE GEOTEXTILE ON THE FLOOR AND UP THE SIDES, FILL TO A DEPTH OF 100 mm WITH SCREENINGS, WRAP THE GEOTEXTILE OVER THE SCREENINGS, AND DRAIN TOWARDS A PUMP SUMP IN THE TRENCH. DRAINAGE TO THE SUMP MAY BE ASSISTED BY INCLUDING AN AGRICULTURAL DRAINAGE PIPE IN THE SCREENINGS (REFER FIGURE 2).

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WHERE THE STABILITY OF A TRENCH IS LIKELY TO BE COMPROMISED, OR WHERE THE INFLOW CANNOT BE CONTROLLED, WELLPOINT DEWATERING MAY BE REQUIRED. THE WELLPOINT SYSTEM SHALL LOWER THE GROUNDWATER TO BELOW THE FLOOR OF THE TRENCH.

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DEWATERING SYSTEM(S) SHALL OPERATE UNTIL SUCH TIME AS THERE IS NO DANGER OF FLOTATION OF THE NEWLY LAID PIPES AND THE TRENCH HAS BEEN BACKFILLED TO NOT LESS THAN 150 mm ABOVE NORMAL GROUNDWATER LEVEL.
3.

TRENCH FLOOR PREPARATION:

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THE DESIGN TRENCH FLOOR LEVEL LIMITS SHALL BE MIN 100 mm TO MAX 150 mm BELOW THE BOTTOM OF THE PIPE.

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ANY OVER-EXCAVATION SHALL BE MADE GOOD BY INCREASING THE THICKNESS OF THE BEDDING SCREENINGS, NOT BY USE OF ANY OTHER MATERIALS.

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IF THE TRENCH FLOOR IS:

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WHOLLY IN ROCK IT MAY BE LEFT IRREGULAR AND THE BEDDING MAY PLACED DIRECTLY ON IT.

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IN FIRM, STIFF OR HARD CLAY SOIL. TRIM IT SMOOTH. REMOVE ALL LOOSE MATERIAL AND PLACE THE BEDDING SCREENINGS DIRECTLY ON IT.

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IN SOFT CLAY SOIL OR SAND. PLACE A LAYER OF GEOTEXTILE ACROSS THE FLOOR AND UP THE WALLS TO EMBEDMENT LEVEL (REFER FIGURE 2).

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WHOLLY OR PARTIALLY VERY SOFT CLAY, OLD FILL REFUSE, OR HAS IRREGULAR OUTCROPS OF ROCK IN IT, OR HAS BEEN DISTURBED BY GROUNDWATER INFLOW. THE CONTRACTOR SHALL SEEK SPECIALIST GEOTECHNICAL ADVICE TO ENSURE ZERO POST INSTALLATION TOTAL AND/OR DIFFERENTIAL SETTLEMENT.

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IF A SEWER IS TO BE LAID IN OR BELOW NEW FILL, THE CONTRACTOR SHALL SEEK SPECIALIST GEOTECHNICAL ADVICE FOR THE DESIGN OF THE FILL. DESIGN THE FILL TO ENSURE ZERO POST-INSTALLATION SETTLEMENT OF THE SEWER. LAY THE SEWER IN A TRENCH DUG INTO THE FILL AFTER THE FILL HAS BEEN BROUGHT UP TO NOT LESS THAN 500 mm ABOVE THE TOP OF THE SEWER.
4.

BEDDING PLACEMENT:

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SIMPLY PLACE THE BEDDING SCREENINGS ON THE PREPARED TRENCH FLOOR (REFER 3) AND RAKE TO GRADE. ADDITIONAL COMPACTION IS NOT NECESSARY.
5.

PIPE INSTALLATION:

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WHERE PIPE SOCKETS ARE LOCATED, EXCAVATE POCKETS IN THE BEDDING TO CLEAR THE SOCKET.

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HOME THE PIPE AND ENSURE THAT THE PIPE IS SUPPORTED UNIFORMLY ALONG ITS BARREL BY ATTEMPTING TO PASS A HAND UNDER THE PIPE.

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IF VOIDS ARE PRESENT, REMOVE THE PIPE AND REGRADE THE BEDDING. ALTERNATIVELY HAND-PACK ADDITIONAL SCREENINGS UNDER THE PIPE.
6.

SIDE SUPPORT AND OVERLAY PLACEMENT AND COMPACTION:

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REMOVE OR RAISE SHORING BEFORE PLACING ANY SIDE SUPPORT OR OVERLAY SCREENINGS.

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PLACE AND COMPACT THE SIDE-SUPPORT AND OVERLAY SCREENINGS USING A METHOD THAT ENSURES THE REDUCTION OF THE INTERNAL VERTICAL DIAMETER OF THE PIPE IS NOT MORE THAN 3% AT THE END OF INSTALLATION (IE AFTER THE TRENCH HAS BEEN BACKFILLED TO THE SURFACE). NOTE THAT CAREFULLY BRINGING UP THE SCREENINGS UNIFORMLY ON BOTH SIDES OF THE PIPE IN ONE SMOOTH OPERATION WILL NORMALLY ACHIEVE THIS WITHOUT THE NEED FOR ADDITIONAL MECHANICAL COMPACTION. SCREENINGS SHOULD ACHIEVE ID 70% COMPACTION AS PER AS 1289.5.6.1.

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WHERE COMPACTION IS REQUIRED, USE HAND TAMPERS OR INTERNAL VIBRATORS. THE LIFT THICKNESS SHALL NOT EXCEED 150 mm OR HALF THE PIPE DIAMETER, WHICHEVER IS GREATER.

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THE MINIMUM FINISHED THICKNESS OF THE OVERLAY IS 300 mm.

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WHERE SAND IS TO BE USED AS TRENCH FILL ABOVE THE OVERLAY, PLACE A LAYER OF GEOTEXTILE OVER THE SCREENINGS AND MIN 150 mm UP THE TRENCH WALLS (REFER FIGURE 2).
7.

GEOTEXTILE:

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A MEDIUM-WEIGHT, NON-WOVEN, NEEDLE-PUNCHED FILTER FABRIC SHALL BE USED, EG. BIDIM A24 OR EQUIVALENT.
8.

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FOR SCREENING & SAND REQUIREMENTS REFER 4005-20003-01.

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REFER 4005-20002-01 TO 4005-20002-03 FOR GENERAL NOTES.

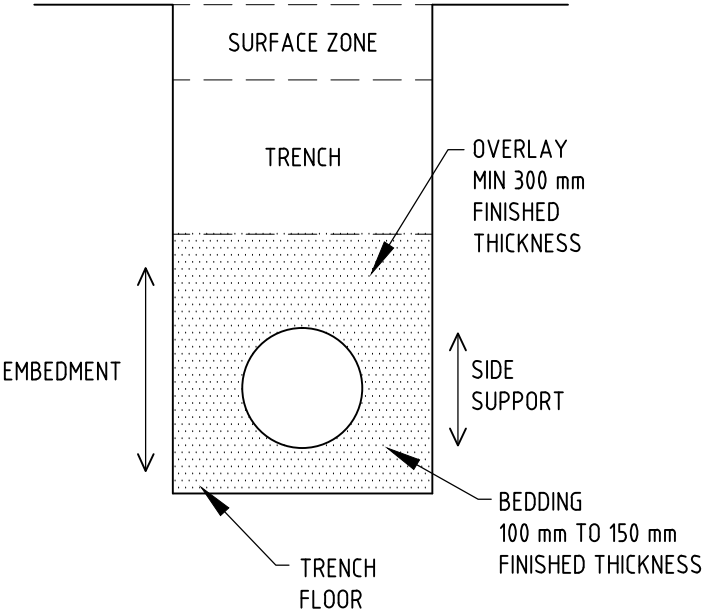


FIGURE 1:
TERMINOLOGY

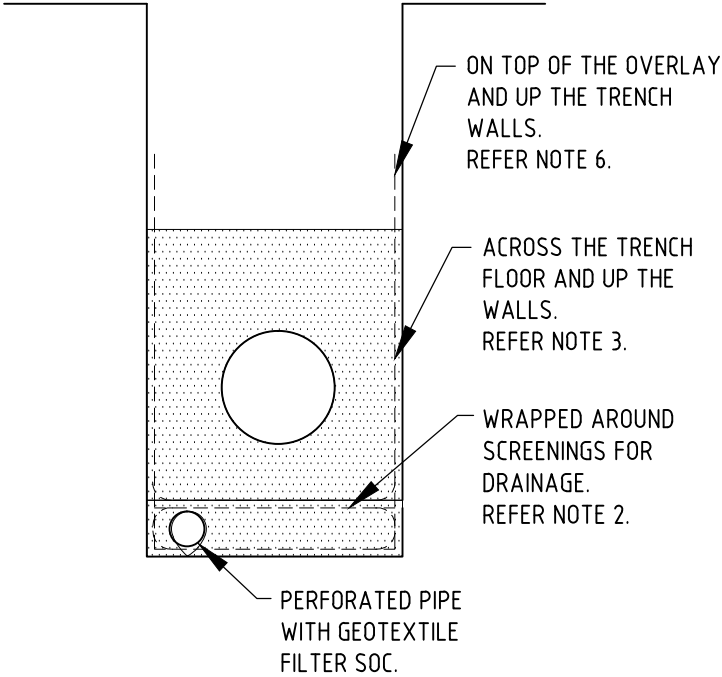





FIGURE 2:
POSSIBLE GEOTEXTILE LOCATIONS

REVISION PANEL						DESIGN PANEL			 		SA WATER STANDARD DRAWINGS SEWER CONSTRUCTION MANUAL TRENCH EXCAVATION & EMBEDMENT POOR SOIL CONDITIONS REQUIRING GEOTECHNICAL EVALUATION			A3 SHT SIZE		1 REVISION	
REV	DATE	DRN	DETAILS	APR	CURRENT REV	DESIGNED: 03/08/15	AUTHORISED: 31/03/16	 SOUTH AUSTRALIAN WATER CORPORATION This drawing is the property of the and shall not be copied or modified in part or in whole without authorization.				TOTAL SHEETS:					
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