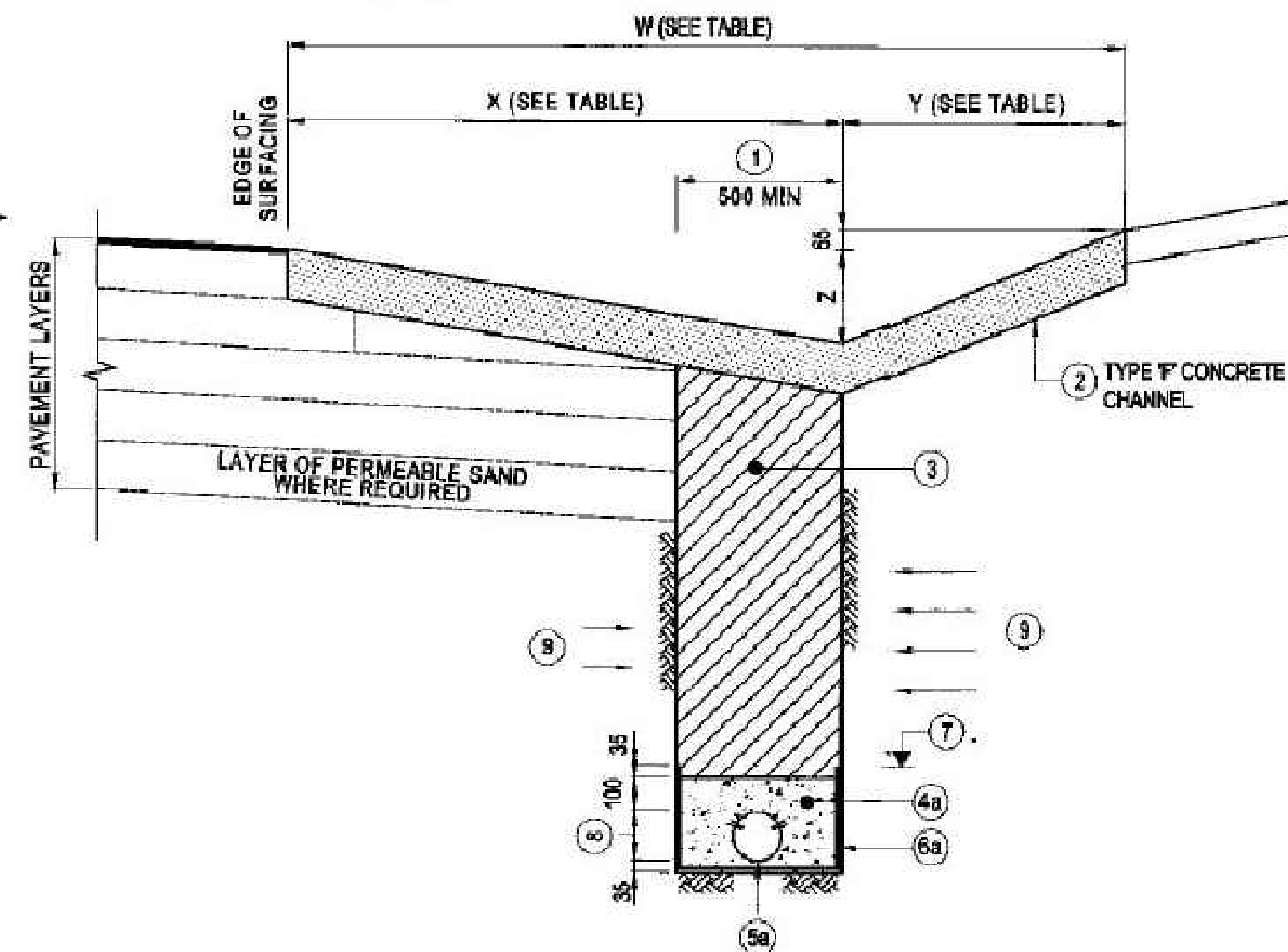


SUBSOIL DRAIN WITH SYNTHETIC FIBRE FILTER FABRIC  
SCALE 1:20



SUBSOIL DRAIN WITH POLYETHYLENE LINING  
SCALE 1:20

No	DESCRIPTION
1	THIS DIMENSION MAY BE REDUCED TO A MINIMUM OF PIPE DIAMETER + 200mm PROVIDED THAT THE CROSS-SECTIONAL AREA IS ADEQUATE (SEE SUBCLAUSE 2104(b) OF THE STANDARD SPECIFICATIONS).
2	IMPERMEABLE BACKFILL MATERIAL. (MIN 150mm THICK) TAKEN TO TOP OF WATER BEARING LAYER IN CASES WHERE NO CONCRETE SIDE DRAIN IS PROVIDED.
3	FILTER SAND OF APPROVED SOURCE AND GRADE.
4a 4b	FILTER STONE: FINE OR COARSE GRADE AS REQUIRED. (SEE SUBCLAUSE 2104(a)(ii) OF THE STANDARD SPECIFICATIONS).
5a 5b 5c	PERFORATED / SLOTTED SUBSOIL DRAINAGE PIPES. (POSITION OF PERFORATIONS INDICATED).
6a	POLYETHYLENE 0.15mm THICKNESS.
6b	SYNTHETIC FIBRE FILTER FABRIC WITH 200mm OVERLAP (GRADE 2 OR APPROVED EQUIVALENT).
7	LEVEL TO WHICH SURROUNDING AREA IS TO BE DRAINED.
8	INTERNAL PIPE DIAMETER: 110mm OR 150mm.
9	WATER BEARING STRATA.

#### NOTES:

- ALL CRITERIA ASSUMES THAT FILTER SAND AND FILTER STONE ARE CONTINUOUSLY GRADED FROM COARSE TO FINE.
- USE THE ENVELOPE CURVES FOR THE WATER BEARING STRATA, FILTER SAND AND FILTER STONE GRADINGS AND APPLY TO MOST CRITICAL COMBINATIONS.
- IF REQUIRED BY THE ENGINEER, SUBSOIL DRAINAGE MUST ALSO BE PROVIDED ON THE INSIDE OF BENCHING, WHERE USED.
- WHERE SUBSOIL DRAINAGE IS INSTALLED IN SOLID ROCK THE POLYETHYLENE LINING MAY BE OMITTED.
- TYPE A OUTLET PREFERABLY TO BE USED WHERE THE NATURAL GROUND LEVELS ALLOW IT. OUTLETS MAY ALSO BE COMBINED WITH CULVERT IN-OR OUTLETS.
- ALL CONCRETE SHALL BE CLASS 20/19.
- SPACING OF CLEANING EYES TO BE AS FOLLOWS:  
(a) 100m MAX ON STRAIGHT SECTIONS.  
(b) AT ALL BENDS.  
(c) OR AS DIRECTED BY THE ENGINEER.
- TRANSVERSE SUBSOIL DRAINAGE TO BE PROVIDED AT ALL CUT TO FILL TRANSITIONS.
- PLATE WITH THE INSCRIPTION "CLEANING EYE FOR SUBSOIL DRAIN". STAMPED ON TO BE AFFIXED TO CONCRETE COVER.
- LETTER SIZE ON PLATE: 10mm SERIES C, CAPITAL LETTERS.
- SYNTHETIC FIBRE FILTER FABRIC TO BE REPLACED WITH POLYETHYLENE LINING IN THE FOLLOWING INSTANCES:  
(a) WHERE THE SURROUNDING SOIL IS VERY PERVIOUS.  
(b) WHERE THE SURROUNDING SOIL HAS A HIGH FINES CONTENT WHICH COULD LEAD TO CLOGGING OF FILTER FABRICS.
- STEEL PLATE TO BE FIXED TO TOP PORTION OF FENCE LINE OPPOSITE THE SUBSOIL OUTLET STRUCTURE.
- BACKGROUND : MATT-WHITE  
TEXT : DIN A, MATT-BLACK

W	X	Y	Z	D UNREINFORCED	D REINFORCED
1000	670	330	110	125	100
1500	1000	500	170	125	100
2000	1330	670	220	150	100
2500	1670	830	280	150	100

## DIMENSIONS OF TYPE 'F' CONCRETE CHANNEL

### FILTER CRITERIA

A. 'D x' IS THE SIZE OF SIEVE THROUGH WHICH x % OF THE FILTER MATERIAL WILL PASS.  
O<sub>50</sub>(SF) = AVERAGE SIZE OF THE OPENINGS OF THE SYNTHETIC FIBRE FILTER FABRIC.

#### B. FILTER SAND (FS) IN RELATION TO WATER

##### BEARING STRATA (WS)

- FOR D<sup>85</sup>(WS) > 0.05mm:  
(a) TO PREVENT BLOCKING OF FILTER SAND:  
D<sup>15</sup>(FS) < 5 x D<sup>85</sup>(WS)  
D<sup>50</sup>(FS) < 25 x D<sup>50</sup>(WS)  
(b) FOR PERMEABILITY OF FILTER SAND:  
D<sup>15</sup>(FS) > 5 x D<sup>15</sup>(WS)
- FOR D<sup>85</sup>(WS) < 0.05mm:  
(a) TO PREVENT BLOCKING OF FILTER SAND:  
D<sup>15</sup>(FS) < 0.25mm  
D<sup>05</sup>(FS) > 0.075mm  
(b) PERMEABILITY REQUIREMENTS NOT NECESSARY

#### C. FILTER STONE (FSN) IN RELATION TO

##### FILTER SAND (FS)

- (a) TO PREVENT BLOCKING OF FILTER STONE:  
D<sup>15</sup>(FSN) < 5 x D<sup>85</sup>(FS)  
D<sup>50</sup>(FSN) < 25 x D<sup>50</sup>(FS)  
(b) PERMEABILITY: FILTER STONE MUST BE COARSER THAN SAND AT ALL PERCENTAGES

#### D. FILTER STONE (FSN) IN RELATION TO

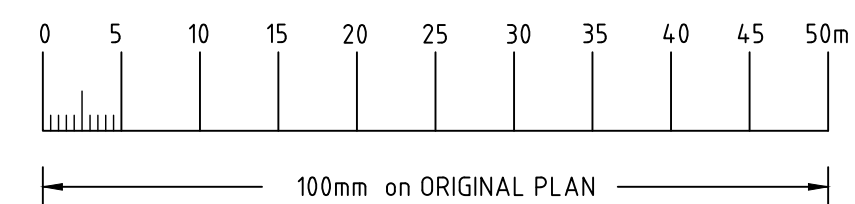
##### PERFORATIONS IN PIPES

- TO PREVENT BLOCKING OF PERFORATIONS IN PIPES:  
D<sup>85</sup>(FSN) > 1.2 x DIAMETER OF ROUND PERFORATIONS  
D<sup>85</sup>(FSN) > 1.2 x WIDTH OF SLOTS

#### E. SYNTHETIC FIBRE FILTER FABRIC (SF) IN

##### RELATION TO FILTER SAND (FS)

- (a) TO PREVENT CLOGGING OF SYNTHETIC FIBRE FILTER FABRIC:  
O<sub>50</sub>(SF) < D<sup>85</sup>(FS)  
(b) FOR PERMEABILITY OF SYNTHETIC FIBRE FILTER FABRIC:  
O<sub>50</sub>(SF) > D<sup>15</sup>(FS)



FOR TENDER ONLY

				CONSTRUCTION RECORD (AS-BUILT)				DESIGNED BY				CONSULTANT APPROVAL				HEAD OFFICE				EASTERN REGION				ACCEPTANCE				PROJECT DESCRIPTION				PROJECT NUMBER		N.006-070-2024/1RF			
				WORKS CONTRACT ENGINEER				NAME				Name				48 Tambotie Avenue Val de Grace Pretoria 0184				58 Van Eck Place Mkondeni Pietermaritzburg 3212				THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATSOEVER CAUSE OR HOWEVER ARISING				THE PERIODIC MAINTENANCE OF THE NATIONAL ROUTE N6 SECTION 7, FROM SMITHFIELD (KM 0.41) TO PARYSHOOGTE (KM 32.4).				DRAWING LOCATION DATA		START		END	
				Name				Prof. Reg. No.				Prof. Reg. No.				PO Box 415 Pretoria 0001 South Africa				P.O. Box 100410 Scottsville 3209				Date				ROUTE				N6		N6			
				Date				CHECKED BY				Date				Tel: (012) 844 8000				Tel: (033) 392 8100				CAUSE OR HOWEVER ARISING				SECTION				7		7			
				SANRAL PROJECT MANAGER				NAME				Date				P.O. Box 100410 Scottsville 3209				Date				DRAWING km DISTANCE				-		-							
				Name				Prof. Reg. No.				Date				Tel: (012) 844 8000				Tel: (033) 392 8100				for the SA NATIONAL ROADS AGENCY SOC. LTD.				DRAWING DESCRIPTION				DRAWING TYPE		DRAINAGE			
				Date				DRAWN BY				Date				Tel: (012) 844 8000				Tel: (033) 392 8100				Date				SURBSURFACE DRAINAGE				BRIDGE/STRUCTURE No.		-			
				NAME				Date				Tel: (012) 844 8000				Tel: (033) 392 8100				Date				CONSULTANT DRAWING No.				2024 04_TP_12/0		VER							
				ORIGINAL VERSION				CONSULT. ENG.				Date				Tel: (012) 844 8000				Tel: (033) 392 8100				Date				SANRAL DOCUMENT #				-		V1			
No.				DATE				REVISION				Date				Tel: (012) 844 8000				Tel: (033) 392 8100				Date				SCALE :				NTS		SHEET 1 OF 3			