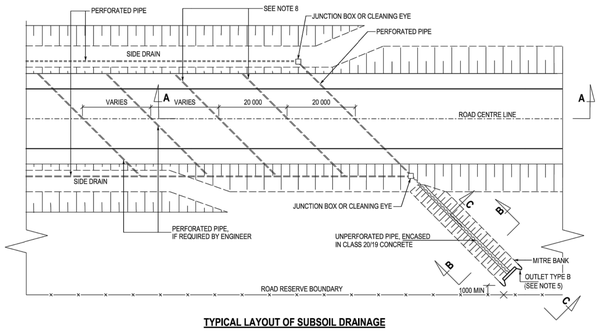
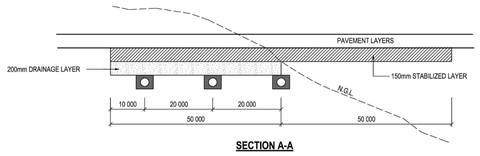


TYPICAL LAYOUT OF SUBSOIL DRAINAGE

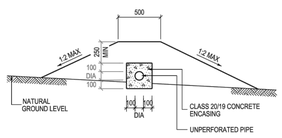
SCALE 1:500



SECTION A-A

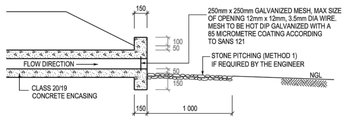
SUBGRADE DRAINAGE AT CUT TO FILL TRANSITION

N.T.S

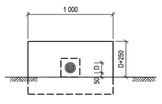


SECTION B-B

SCALE 1:20



SECTION C-C



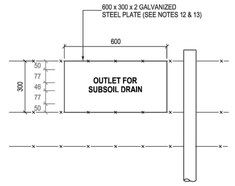
FRONT ELEVATION

(TYPE B OUTLET STRUCTURE)

OUTLET TYPE B

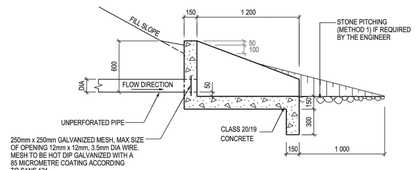
(SEE NOTE 5)

SCALE 1:20



SUBSOIL OUTLET MARKER BOARD

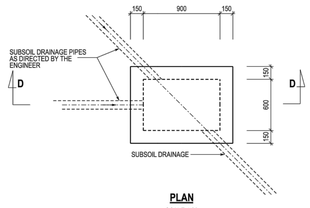
SCALE 1:10



SECTION E-E

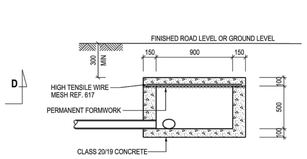
(WHERE $\alpha = 90^{0}$)

SCALE 1:20



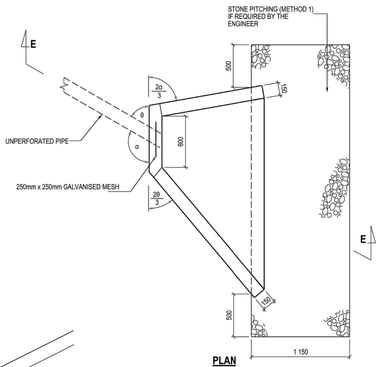
PLAN

SCALE 1:20



SECTION D-D

SCALE 1:20



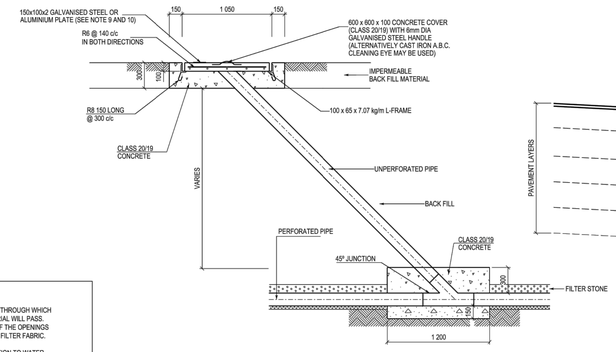
PLAN

SCALE 1:20

OUTLET TYPE A

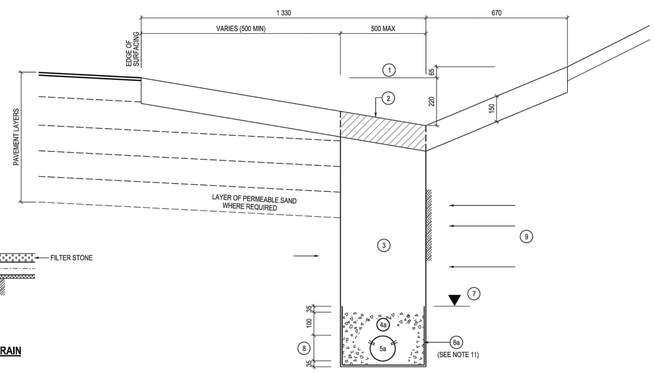
(SEE NOTE 5)

JUNCTION BOX



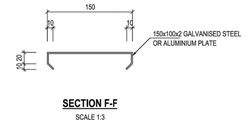
CLEANING EYE IN SUBSOIL DRAIN

SCALE 1:20



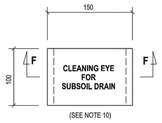
SUBSOIL DRAIN WITH POLYETHYLENE LINING

SCALE 1:10



SECTION F-F

SCALE 1:3



PLAN

SCALE 1:3

DETAIL OF PLATE

FILTER CRITERIA

A. "D x" IS THE SIZE OF SIEVE THROUGH WHICH x % OF THE FILTER MATERIAL WILL PASS. $D^{(G)}$(GF) = AVERAGE SIZE OF THE OPENINGS OF THE SYNTHETIC FIBRE FILTER FABRIC.

B. FILTER SAND (FS) IN RELATION TO WATER BEARING STRATA (WS)

1. FOR $D^{(F)}$(WS) > 0.05mm:
   (a) TO PREVENT BLOCKING OF FILTER SAND: $D^{(15)}$(FS) < 5 x $D^{(15)}$(WS)
   $D^{(15)}$(FS) < 25 x $D^{(15)}$(WS)
   (b) FOR PERMEABILITY OF FILTER SAND: $D^{(15)}$(FS) > 5 x $D^{(15)}$(WS)
2. FOR $D^{(F)}$(WS) < 0.05mm:
   (a) TO PREVENT BLOCKING OF FILTER SAND: $D^{(15)}$(FS) < 0.25mm
   $D^{(15)}$(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: $D^{(15)}$(FSN) < 5 x $D^{(15)}$(FS)
$D^{(15)}$(FSN) < 25 x $D^{(15)}$(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: $D^{(15)}$(FSN) > 1.2 x DIAMETER OF ROUND PERFORATIONS
$D^{(15)}$(FSN) > 1.2 x WIDTH OF SLOTS

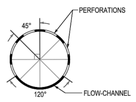
E. SYNTHETIC FIBRE FILTER FABRIC (SF) IN RELATION TO FILTER SAND (FS)

(a) TO PREVENT CLOGGING OF SYNTHETIC FIBRE FILTER FABRIC: $O^{(F)}$(SF) < $D^{(F)}$(FS)
(b) FOR PERMEABILITY OF SYNTHETIC FIBRE FILTER FABRIC: $O^{(F)}$(SF) > $D^{(F)}$(FS)

NOTES:

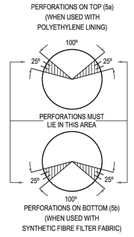
1. ALL CRITERIA ASSUMES THAT FILTER SAND AND FILTER STONE ARE CONTINUOUSLY GRADED FROM COARSE TO FINE.
2. USE THE ENVELOPE CURVES FOR THE WATER BEARING STRATA, FILTER SAND AND FILTER STONE GRADINGS AND APPLY TO MOST CRITICAL COMBINATIONS.
3. IF REQUIRED BY THE ENGINEER, SUBSOIL DRAINAGE MUST ALSO BE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

No	DESCRIPTION
1	THIS DIMENSION MAY BE REDUCED TO A MINIMUM OF PIPE DIAMETER + 200mm PROVIDED THAT THE CROSS-SECTIONAL AREA IS ADEQUATE (SEE SUB CLAUSE 2104(b) OF THE STANDARD SPECIFICATIONS).
2	IMPERMEABLE BACK FILL 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 SUB CLAUSE 2104(a)(ii) OF THE STANDARD SPECIFICATIONS).
5a 5b 5c	PERFORATED / SLOTTED SUBSOIL DRAINAGE PIPES.
5a	POLYETHYLENE 0.15mm THICKNESS.
6b	SYNTHETIC FIBRE FILTER FABRIC (GRADE 2 OR APPROVED EQUIVALENT).
7	LEVEL TO WHICH SURROUNDING AREA IS TO BE DRAINED.
8	INTERNAL PIPE DIAMETER: 100mm OR 150mm.
9	WATER BEARING STRATA.



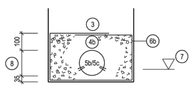
(8 SECTORS OF 45°) WITH PERFORATIONS IN 6 OF THE 8 AS INDICATED

POSITION OF PERFORATIONS (HDPE - PIPES) (5c)



POSITION OF PERFORATIONS

N.T.S.



SUBSOIL DRAIN WITH SYNTHETIC FIBRE FILTER FABRIC

SCALE 1:10

FOR TENDER

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PROJECT:

CONTRACT No. :

UPGRADING OF GRAVEL ROADS AND STORMWATER IN MOORDKOPPIE CLUSTER MOLEKANE VILLAGE

DESIGN COORDINATOR APPROVAL:

SIGNATURE DATE

PROJECT MANAGER APPROVAL:

SIGNATURE DATE

CLIENT APPROVAL:

SIGNATURE DATE

REV	DATE	DESCRIPTION	DRAWN
A	SEP. 2020	ISSUED FOR TENDER PURPOSE ONLY	MLM

REVISIONS

DRAWN: ML. MATHEGA | CHECKED: S. SITHOLE | DESIGNED: A. JUBA

SCALES: AS SHOWN | DATE: SEPTEMBER 2020

DRAWING TITLE: MOLEKANE VILLAGE: STANDARD DETAILS, SHEET 7 OF 7

SIZE: A0 | PROJECT No.

REV No. A | DRAWING No. ROMH-042-07-06-07

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