

SCALE FOR REDUCED PLAN  
0 10 20 30 40 50  
50MM ON ORIGINAL DRAWING

NOTES

SURVEY:

- COORDINATE SYSTEM: WGS 84 Lo 29


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All dimensions to be checked on site before any work is put in hand. Refer any discrepancies to the engineer.  
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APPROVED DESIGN

AMENDMENT

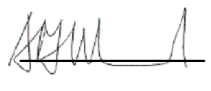
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DESIGNED	DRAWN	CHECKED
P.d.C.	J.B.	N.W.

N. WELLAND  
PR. 940268  
CONSULTING ENGINEER

  
DATE

CLIENT  
DATE



RAND WATER

PROJECT

CLOSURE DESIGN OF  
ZUIKERBOSCH PUMPING  
STATION WASTE  
DISPOSAL SITE

DRAWING DESCRIPTION

STATUS QUO LAYOUT  
PLAN

SCALE  
1:1250  
ORIGINAL DWG SIZE A1

DATE  
FEBRUARY 2017

DRAWING NUMBER

16-1346-D01-0







HDPE GEOMEMBRANES

ALL MATERIALS TO BE IN ACCORDANCE WITH GRI GM 13 AND THE FOLLOWING PROJECT SPECIFIC AMENDMENTS

A. THICKNESS, TO BE MINIMUM TESTED AS PER ASTM D5199.

B. MINIMUM ASPERITY HEIGHT 0.9mm TESTED AS PER ASTM D7446

C. TEXTURING IS TO BE CO-EXTRUDED OR EMBOSSED USING THE SAME POLYMER BATCH.

D. BREAK ELONGATION TO BE MINIMUM 400% TESTED AS PER ASTMD6693 TYPE IV.

E. PUNCTURE RESISTANCE TO BE MINIMUM 450 N FOR 1.5mm

F. STANDARD OIT TO BE 200 MINUTES AS PER ASTM D3895.

G. HP OIT TO BE 600 MINUTES AS PER ASTM D5885.

H. NO PLASTICISERS TO BE USED – ASH CONTENT = MAX. 2.5%.

I. ONLY FLAT DYE CAST PRODUCTS

J. THE FOLLOWING CONFORMANCE TESTS TO BE DONE AND APPROVED PRIOR TO SHIPMENT AND ALSO ON ARRIVAL OF MATERIAL ON SITE:

PARAMETER METHOD

THICKNESS ASTM D5994  
DENSITY ASTM D1505  
CARBON BLACK CONTENT ASTM D1603  
CARBON BLACK DISPERSION ASTM D5596  
STRESS CRACK RESISTANCE ASTM D5397  
TENSILE PROPERTIES ASTM D6693  
OXIDATIVE INDUCTION TIME (OIT) ASTM D3895  
HIGH PRESSURE OIT ASTM D5885  
ASPERITY HEIGHT ASTM D7466  
ASH CONTENT TEST ASTM D4218

K. THE FOLLOWING DURABILITY TESTS TO BE CONDUCTED AS SOON AS MATERIAL IS MANUFACTURED:

- STANDARD OIT 55% RETAINED AFTER 90 DAYS (ASTM D3895)
- HIGH PRESSURE OIT 80% RETAINED AFTER 90 DAYS (ASTM D5885)
- UV RESISTANCE HIGH PRESSURE OIT 50% RETAINED AFTER 1600 HRS (ASTM D5885)

GEOTEXTILES

GEOTEXTILES TO CONFORM TO GEOTEXTILES TO CONFORM TO GRI GT12(A)

A. THE FOLLOWING CONFORMANCE TESTS TO BE DONE:

PARAMETER METHOD  
MASS PER UNIT AREA ASTM D5261

ALL EDGES OF THE GT & GCL MUST BE THERMALLY BONDED WITH A HEAT GUN AT ON SITE TO ENSURE CONTACT WITH THE ADJACENT LAYER.

GEOSYNTHETIC CLAY LINER (GCL)

A. GCL TO CONFORM TO GRI-GCL3 & 5.

B. BENTONITE TO BE NATURAL SODIUM BENTONITE POWDER

C. POLYMER COATED CGL. POLY,ER 0.9mm ON WASTE SIDE.

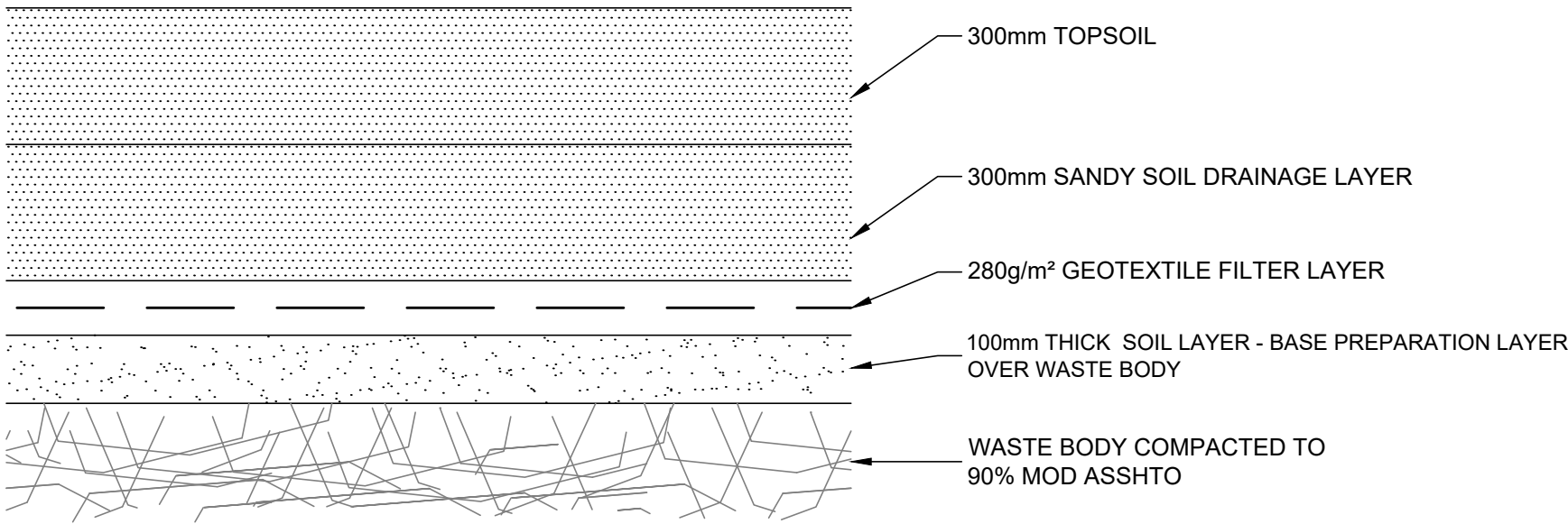
ALL EDGES OF THE GT & GCL MUST BE THERMALLY BONDED WITH A HEAT GUN AT ON SITE TO ENSURE CONTACT WITH THE ADJACENT LAYER.

TOPSOIL LAYER

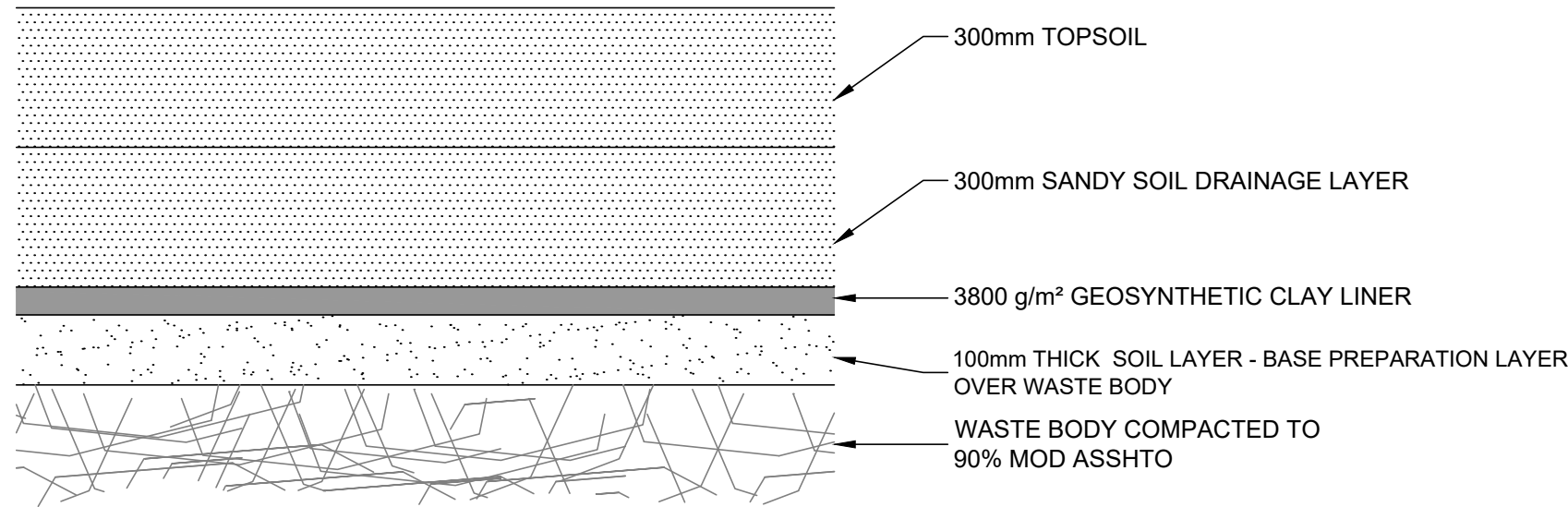
SOURCED FROM LOCATION IN CLOSE PROXIMITY TO THE SITE.  
THE MAJOR SOIL TYPES ENCOUNTERED WITHIN THE SITE INCLUDE THOSE OF THE ORTHIC PHASE HUTTON, GRIFFIN AND CLOVELLY AND THE HYDROMORPHIC FORMS GLENCOE, DRESDEN AND GLENROSA.  
COHESIVE SILTY SANDS WITH THE POTENTIAL FOR PLANT GROWTH AND USCS CLASS - SW/SM.  
MAX. PARTICLE SIZE 20MM.  
NO COMPACTION - LAYER TO BE ROUGH, SCARIFIED AND SEEDED WITH NATURAL GRASS SEEDS.  
SEEDING MAY BE WITH OR WITHOUT HYDRO SEEDING AND SOIL GROWTH ADDITIVES.

DRAINAGE LAYER

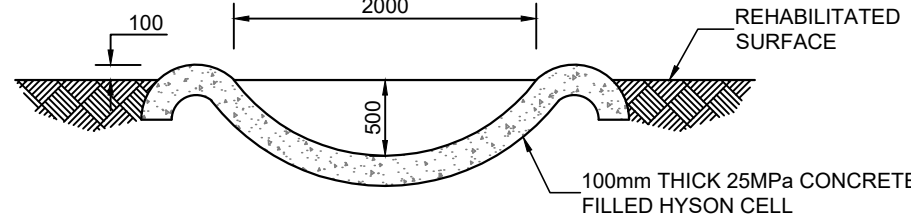
THE DRAINAGE LAYER SHOULD CONSIST OF SAND, PARTICLE SIZE RANGING FROM 0.06mm TO 2mm, IT MAY BE ROUNDED TO ANGULAR IN SHAPE, NO PLASTICITY, AND ANGULAR PARTICLES ARE PREFERRED DUE TO HIGHER FRICTIONAL RESISTANCE.  
MINIMUM THICKNESS OF 300mm AND A MINIMUM SITE SLOPE OF 3%.  
HYDRAULIC CONDUCTIVITY SHOULD NOT BE LESS THAN 3 x 10<sup>-5</sup> cm/sec AND THE MATERIAL SHOULD CONTAIN NO FINES THAT COULD EXCESSIVELY CLOG OR MIGRATE WITHIN THE LAYER TO CLOG THE OUTLET AREA.  
THE CONTRACTOR SHOULD SUBMIT PERFORMANCE TESTING RESULTS OF THE MATERIALS BEFORE IT WOULD BE APPROVED FOR USE.



CAPPING DETAIL - SIDE SLOPE

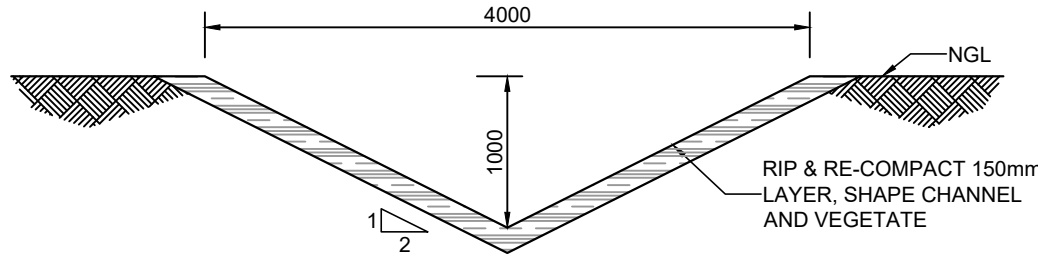


CAPPING DETAIL - CREST



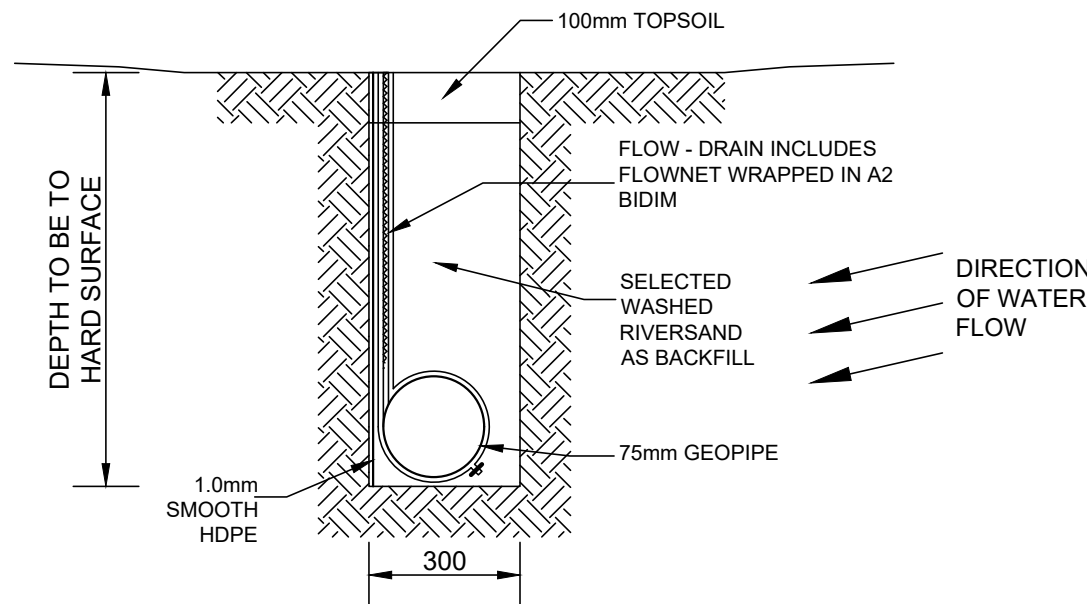
STORM WATER DOWN CHUTE DETAIL

SCALE 1:50



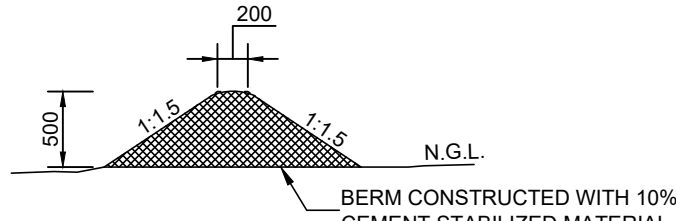
OPEN CHANNEL TOE DRAIN

SCALE 1:50



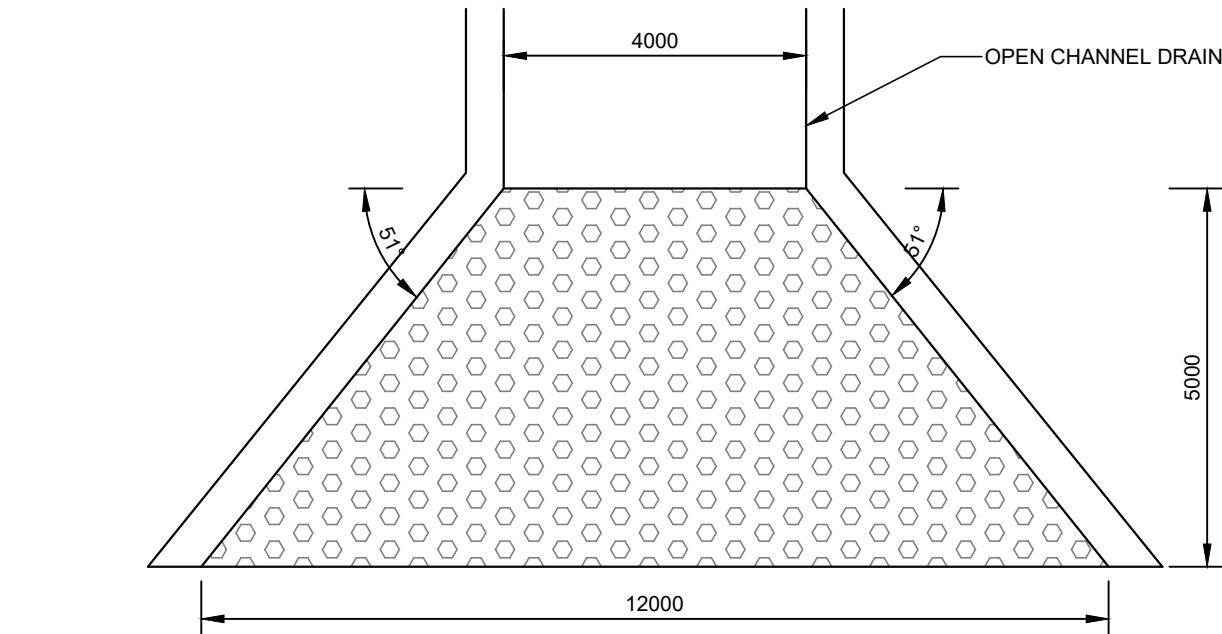
CURTAIN DRAIN - SUBSOIL DRAINAGE DETAIL

SCALE 1:15



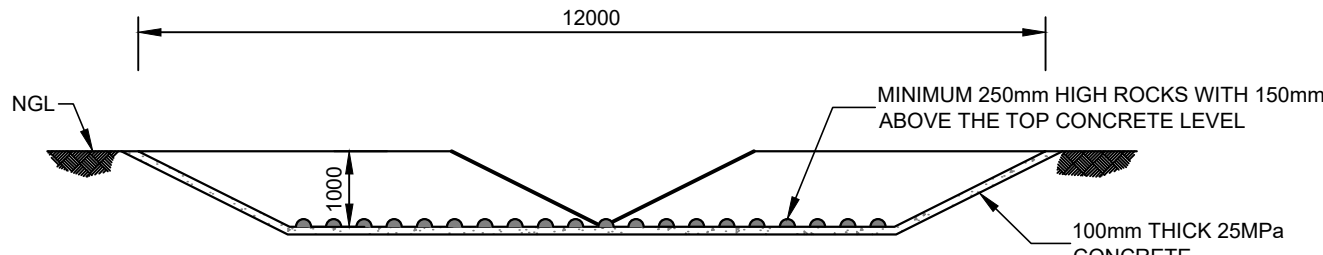
STORM WATER CONTROL BERM

SCALE 1:50



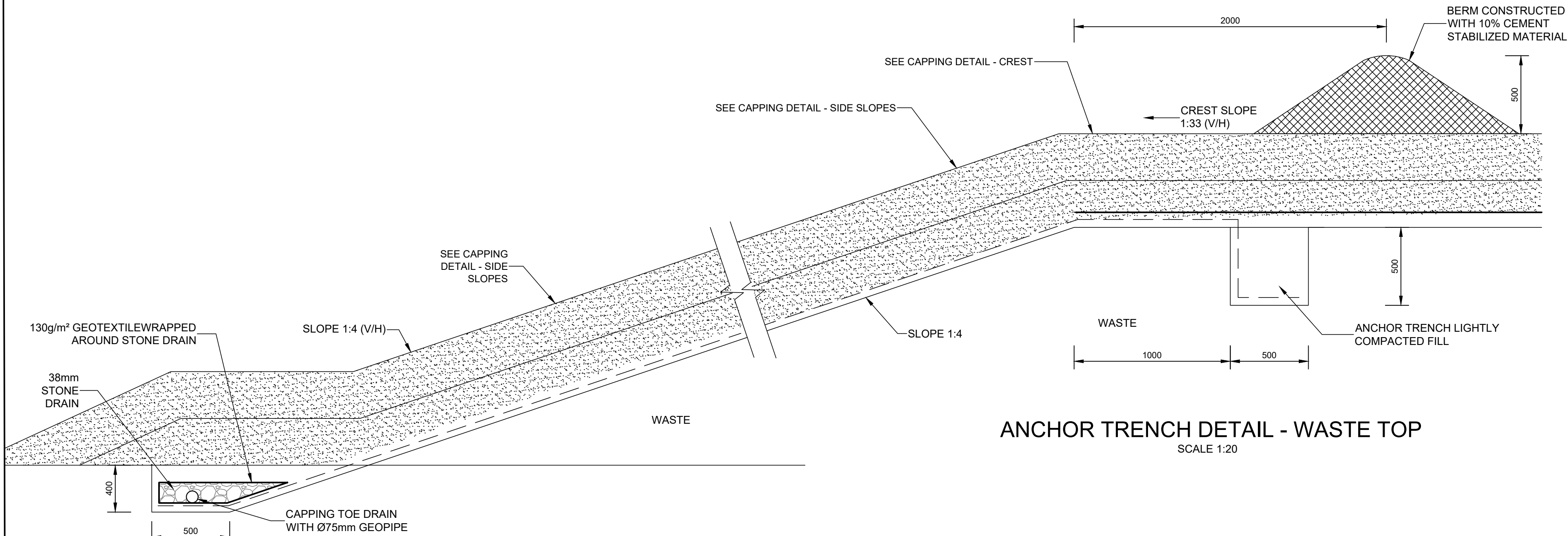
ENERGY DISSIPATER - PLAN VIEW

SCALE 1:100



ENERGY DISSIPATER - SECTION DETAIL

SCALE 1:100

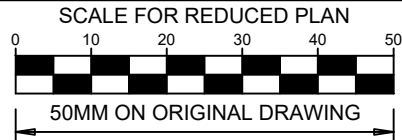


ANCHOR TRENCH DETAIL - WASTE TOP

SCALE 1:20

ANCHOR TRENCH DETAIL - WASTE TOE

SCALE 1:20



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CONSULTING ENGINEER  
2017/03/13  
DATE

CLIENT	DATE



PROJECT  
CLOSURE DESIGN OF  
ZUIKERBOSCH PUMPING  
STATION WASTE  
DISPOSAL SITE

DRAWING DESCRIPTION  
LNING SPECIFICATIONS  
AND  
SECTIONS & DETAILS

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