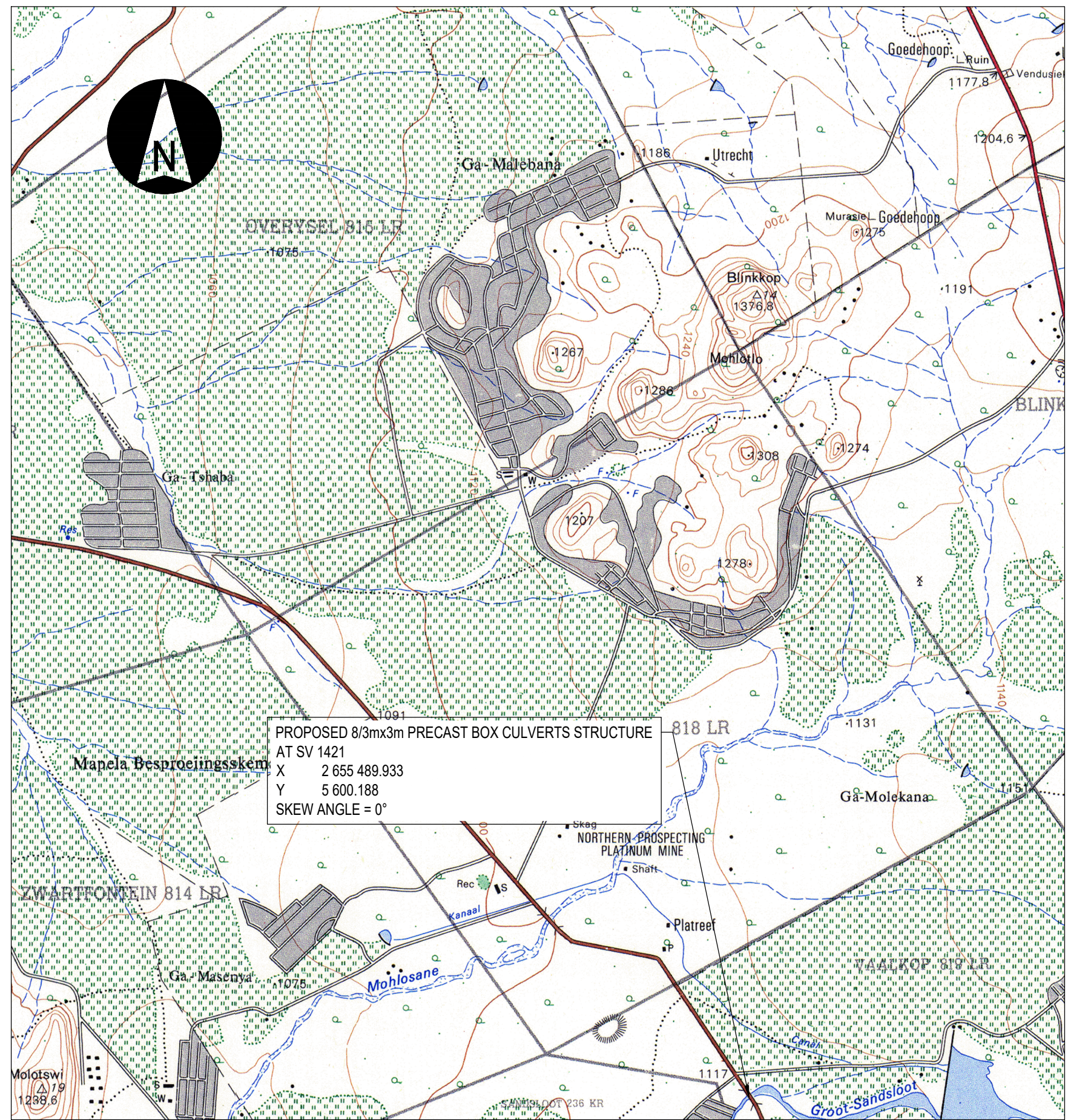
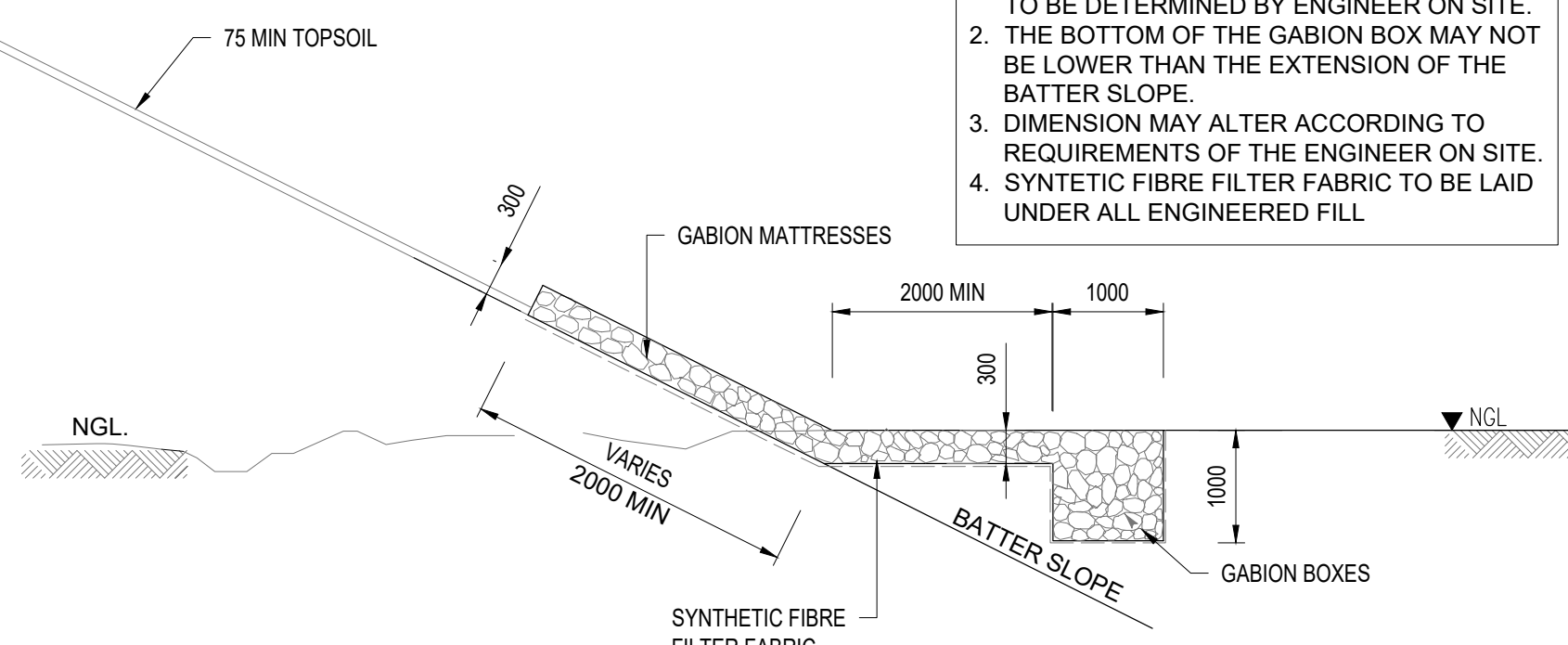


PLAN VIEW
1:250

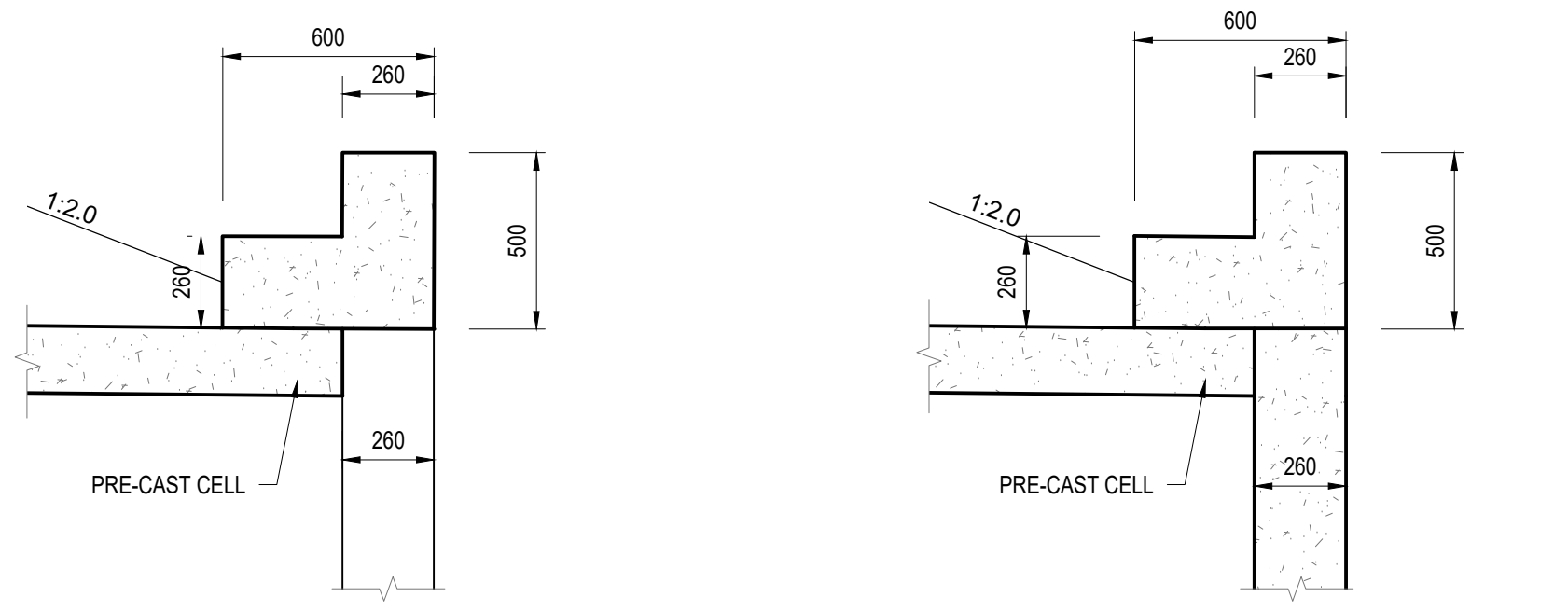


KEY PLAN
1:50 000

- NOTES:
1. ACTUAL LENGTH OF TOE-LINE PROTECTION TO BE DETERMINED BY ENGINEER ON SITE.
 2. THE BOTTOM OF THE GABION BOX MAY NOT BE LOWER THAN THE EXTENSION OF THE BATTER SLOPE.
 3. DIMENSION MAY ALTER ACCORDING TO REQUIREMENTS OF THE ENGINEER ON SITE.
 4. SYNTHETIC FIBRE FILTER FABRIC TO BE LAID UNDER ALL ENGINEERED FILL.

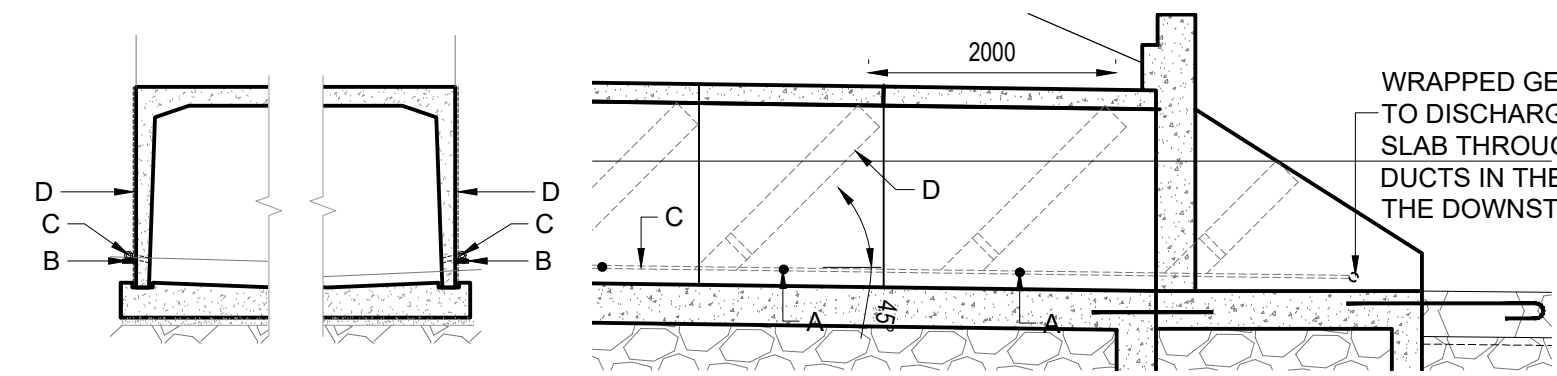
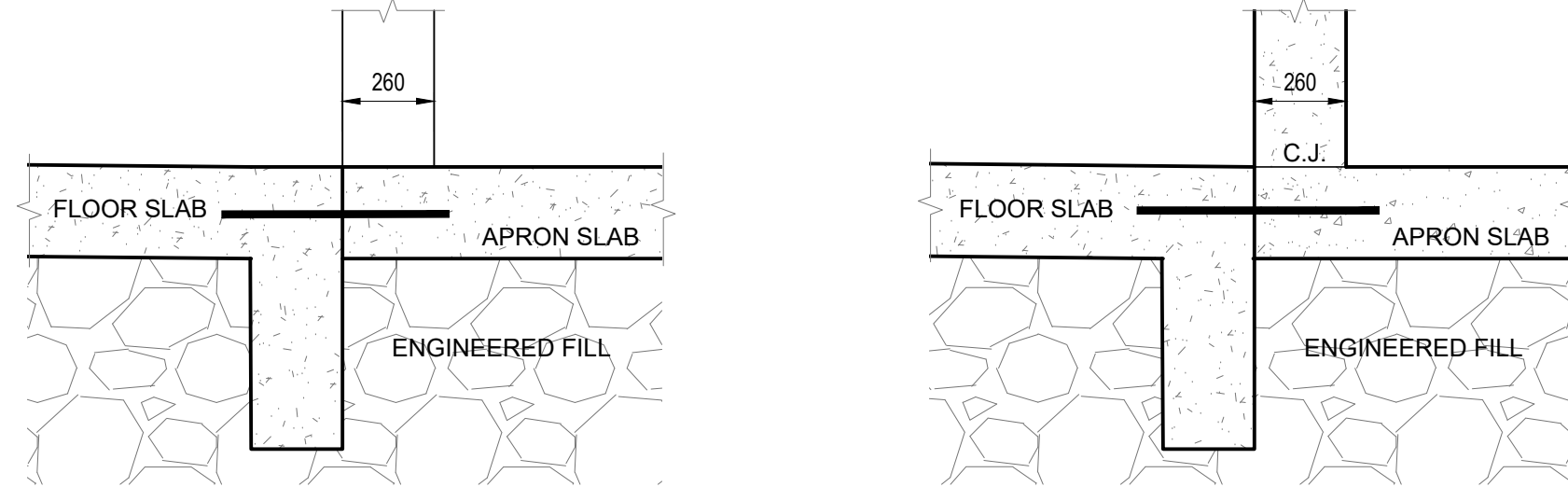


TYPICAL DETAIL OF GABION TOE-LINE PROTECTION
1:50



SECTION D-D
1:5

SECTION E-E
1:5



TYPICAL DRAINAGE DETAIL
1:5

GENERAL NOTES:

1. THE PROPOSED STRUCTURES, SITUATED IN MOLOKANE WHICH IS TO BE UPGRADED COMPRISE PRECAST CONCRETE BOX CULVERT STRUCTURES WITH CANTILEVER TYPE WINGWALLS. THE EXISTING ARMED ARCHED CULVERT STRUCTURES ARE TO BE REPLACED BY PRECAST CONCRETE BOX STRUCTURES. SIZE AND APPROPRIATE LENGTH AND SKEW ARE SHOWN ON PLAN. NEW FILL HEIGHTS VARY BETWEEN 0.6 AND 1.2m. EROSION PROTECTION COMPRISES GABION BOXES AND MATTRESSES AT BOTH THE INLET AND OUTLET. THE CULVERTS ARE DESIGNED ACCORDING TO TMH PART 3-3 CODE OF PRACTICE FOR DESIGN OF HIGHWAY BRIDGES AND CULVERTS IN SOUTH AFRICA, AS AMENDED IN 1986.
2. METHOD OF ANALYSIS: LINEAR ELASTIC ANALYSIS AND LIMIT STATE DESIGN METHODS ARE IN ACCORDANCE WITH TMH7 FOR REINFORCED CONCRETE SECTIONS. ACTIVE EARTH PRESSURE ON WINGWALLS IS BASED ON THE COULLOB THEORY TAKING INTO ACCOUNT THE SLOPING BACKFILL.

DESIGN LOADING AND PARAMETERS

1. LOADING ON CULVERTS PER (TMH7 PART 2.2.6.6):

- (1) NA LOADING
- (2) NB 36 LOADING
- (3) NC LOADING

2. VERTICAL EARTH LOADING ON CULVERTS (TMH7 PART 2.2.3.3):

- (1) FILL HEIGHT FROM 0.6 TO 1.1 METERS ABOVE TOP OF CULVERT

3. HORIZONTAL EARTH PRESSURE ON CULVERTS (TMH7 PART 2.2.4):

- (1) EARTH PRESSURE PER METER DEPTH
- (2) SURCHARGE PRESSURE OF NA, NB36 AND NC HIGHWAY TRAFFIC LOADING
- (3) NO ALLOWANCE WAS MADE FOR HORIZONTAL WATER PRESSURE BEHIND THE WALLS AND SHOULD BE RELIEVED BY MEANS OF A PROPER DRAINAGE SYSTEM AND WEEPHOLES.

MATERIAL DENSITIES:

- (1) SOIL = 2000 kg/m³ WITH INTERNAL ANGLE OF FRICTION OF 30 DEGREES
- (2) CONCRETE = 2600 kg/m³

FOUNDING CONDITIONS:

- (1) CULVERTS WERE DESIGNED BOTH FOR YIELDING AND UNYIELDING FOUNDATION CONDITIONS
- (2) THE MAXIMUM DESIGN EARTH PRESSURES UNDER THE FOOTING WERE 240 kPa AND SHALL NOT EXCEED THE SAFE BEARING CAPACITY OF THE FOUNDING MATERIAL
- (3) FINAL FOUNDING LEVELS TO BE APPROVED BY THE ENGINEER
- (4) FOUNDATION IMPROVEMENTS AS DIRECTED BY THE ENGINEER. REMOVE ANY UNDESIRABLE MATERIAL AND REPLACE WITH SELECTED MATERIAL WHICH SHALL BE ROCK, GRAVEL OR OTHER APPROVED MATERIAL TO PROVIDE A DENSE AND STABLE BEDDING. THE MATERIAL SHALL BE PLACED IN LAYERS OF 150mm AND COMPACTED TO 92% MOD AASHTO DENSITY.

CONCRETE CLASSES AND YOUNG'S MODULUS

- | DESCRIPTION | CLASS | E-MODULUS |
|-------------------|-------|-----------|
| MASS CONCRETE | 15/19 | 31GPa |
| CONCRETE SCREED | 15/19 | |
| WINGWALLS & SLABS | W3019 | 31GPa |
- REINFORCEMENT TO SABS 920 (1985) AND SABS 1024 (1991)
- WITH YIELD STRESS FOR:
- HOT ROLLED MILD STEEL PLAIN ROUND BARS ("R" BARS) 250MPa
 - HOT ROLLED HIGH-YIELD STRESS STEEL DEFORMED BARS ("Y" BARS) 450MPa

HYDRAULIC INFORMATION:

1. CATCHMENT AREA: 153.54km²
2. DESIGN RETURN PERIOD (T): (SOF 1:10 YR)
3. DESIGN FLOW Q_T & Q_{2T}: (Q_T: 141.57m³/s, Q_{2T}: 208.55m³/s)
4. H_u AT Q_T: 2614mm
5. H_u AT Q_{2T}: 3404mm
6. FLOW VELOCITY: 4.41m/s

CONSTRUCTION:

1. ALL EXPOSED SHARP EDGES TO HAVE 25 x 25mm CHAMFERS
2. CONCRETE COVER TO REINFORCING: 50mm FOR ALL STRUCTURAL ELEMENTS
3. SURFACE FINISHES:

TYPE OF SURFACE	FORMED SURFACES	UNFORMED SURFACE
- UNEXPOSED	CLASS F1	CLASS U1
- EXPOSED TO VIEW	CLASS F2	CLASS U2
- TOP OF INVERT & APRON SLAB	N/A	CLASS U2
4. 75mm BLINDING LAYER (CLASS 15/19) CONCRETE TO BE CAST UNDER ALL REINFORCED SLABS.
5. BACKFILLING: BACKFILLING AGAINST OR OVER STRUCTURAL MEMBERS SHALL NOT COMMENCE UNTIL THE CONCRETE HAS REACHED 20MPa. BACKFILLING SHALL BE PLACED SIMULTANEOUSLY ON BOTH SIDES OF THE BOX STRUCTURE IN 150mm COMPACTED LAYERS. COMPACTION OF LAYERWORKS WITHIN 450mm ABOVE THE BOX STRUCTURE SHALL BE DONE USING SMALL MACHINERY.
6. EMBANKMENT PROTECTION: GABION PROTECTION SHOWN IS SUBJECT TO SITE CONDITIONS AND ENGINEERS APPROVAL.
7. CULVERT NUMBER IS TO BE RECESSED 10mm DEEP IN 100mm LETTERS AND NUMERALS WITH THE YEAR OF CONSTRUCTION. CENTRALLY ORIENTED BELOW IN 75mm NUMERALS. CENTRALLY POSITIONED ON THE DOWNSTREAM FACE OF THE OUTLET HEADWALL. ALL NUMBERS AND LETTERING ARE TO BE CAREFULLY PAINTED WITH TWO COATS OF BLACK ALKALI RESISTANT PAINT.

THIS DRAWING TO BE READ IN CONJUNCTION WITH SECTION 6000 OF THE COLTO DOCUMENT "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE WORKS FOR STATE ROAD AUTHORITIES".

SETTING OUT POINTS

POINT ID	CHAINAGE	Y-COORDINATE	X-COORDINATE
METRIC Lo 29° WGS84			
1	1421	5 589 005	2 655 485 961
2	1421	5 594 112	2 655 487 780
3	1421	5 600 188	2 655 489 933
4	1421	5 607 416	2 655 492 511
5	1421	5 612 520	2 655 494 336

MATERIAL SPECIFICATION

CONCRETE POSITION	CLASS	CHARACTERISTIC STRENGTH (MPa)	MIN CEMENTITIOUS CONTENTS
BLINDING LAYER	15 / 19		15
SLABS AND WALLS	30 / 19		30 300 kg/m ³

DRAWING No.	DESCRIPTION
ROMH-042-07-07	GENERAL ARRANGEMENT
ROMH-042-07-08	CONCRETE DETAIL
ROMH-042-07-09	REINFORCEMENT DETAIL
ROMH-042-07-10	DETAIL SHEET 1
ROMH-042-07-11	DETAIL SHEET 2
ROMH-042-07-12	DETAIL SHEET 3

FOR TENDER

CLIENT:



MOGALAKWENA MUNICIPALITY

54 Relief Street
Mokopane
0801

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	JUL. 2020	ISSUED FOR TENDER PURPOSE ONLY	SO
REVISIONS			

DRAWN: S. QUZA

CHECKED: S. SITHOLE

DESIGNED: P. SEOPA

SCALES:

AS SHOWN

DATE: SEPTEMBER 2020

DRAWING TITLE:

GENERAL ARRANGEMENT
MOLEKANE MAJOR CULVERT

SIZE:

A0

PROJECT No.

REV No.

A

DRAWING No.

ROMH-042-07- 10-07

CONSULTANTS:



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