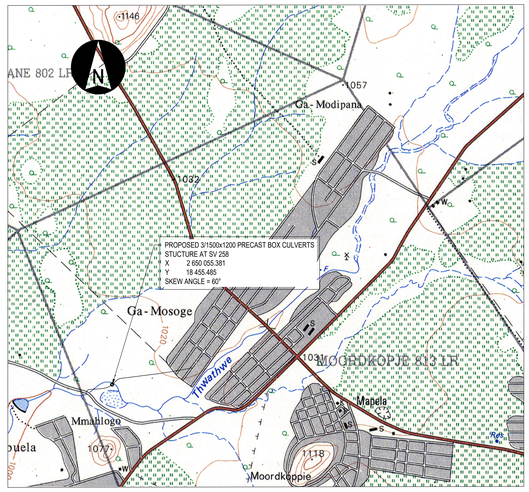
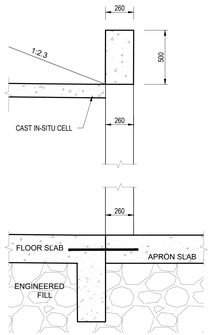
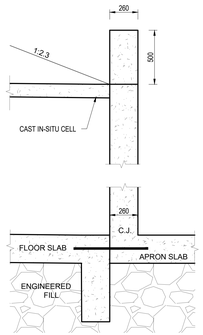
PLAN VIEW
1:100



KEY PLAN
1:50 000

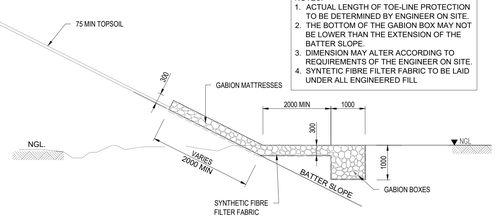


SECTION D-D
1:20

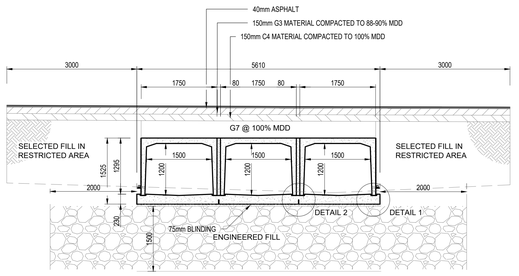


SECTION E-E
1:20

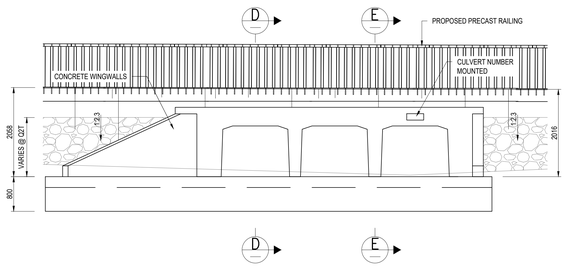
NOTES:
1. ACTUAL LENGTH OF TOE-LINE PROTECTION TO BE DETERMINED BY ENGINEER ON SITE.
2. THE BOTTOM OF THE GABION BOX MAY NOT BE LOWER THAN THE EXTENSION OF THE BATTER SLOPE.
3. DIMENSION MAY ALTER ACCORDING TO REQUIREMENTS OF THE ENGINEER ON SITE.
4. SYNTETIC FIBRE FILTER FABRIC TO BE LAID UNDER ALL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



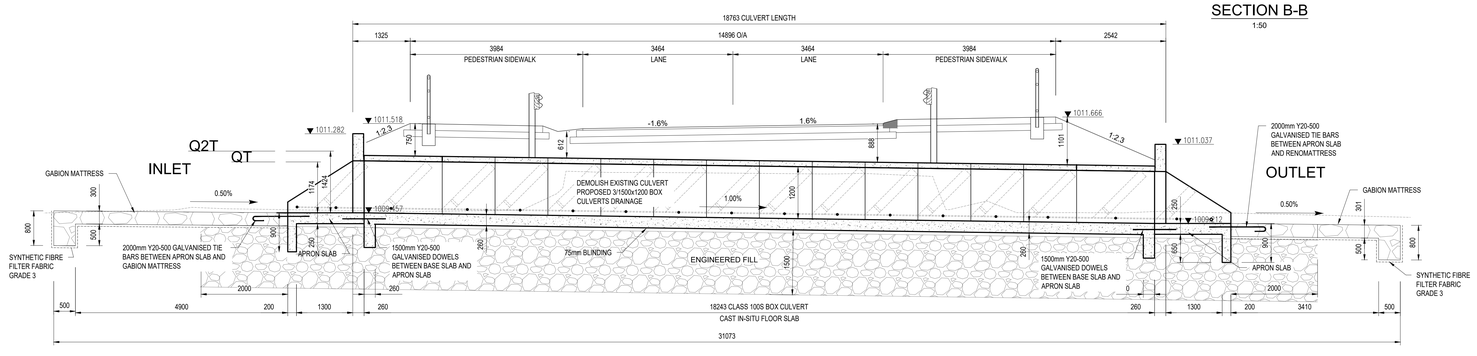
TYPICAL DETAIL OF GABION TOE-LINE PROTECTION
1:50



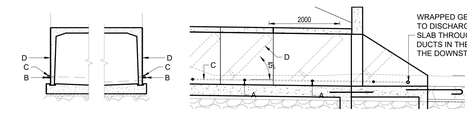
SECTION B-B
1:50



UPSTREAM ELEVATION C-C
1:50



SECTION A-A (30° SKEW)
1:50



NOTE:
FOR A DETAILED REPRESENTATION OF DRAINAGE SYSTEM SEE DRAWING: ROMH-042-07-10-003

A : 50mm DIA. PVC WEEPHOLES AT 2M CENTRES TO SLOPE AT 1 : 20.
B : 200 X75 MASS CONCRETE STRIP
C : 65mm Ø. GEOPIPE BEDDED ON A 200mm WIDE x 75mm THICK CONCRETE LAYER WRAPPED IN GRADE 2 GEOFABRIC EXTENDED TO 1100 DISCHARGE PIPE
D : 300mm WIDE BY 1.6mm THICK DRAINAGE STRIPS WRAPPED IN STITCHED GRADE 2 GEOFABRIC SLEEVES. (SLEEVES FOLDED 200mm OVER DRAINAGE STRIPS ENDS).

TYPICAL DRAINAGE DETAIL
1:5

GENERAL NOTES:

1. THE PROPOSED CONCRETE BOX CULVERT STRUCTURE, SITUATED IN GA-MOSOGE WHICH IS TO BE UPGRADED COMPRISE PRECAST CONCRETE BOX STRUCTURES WITH CANTILEVER TYPE WINGWALLS.
   THE EXISTING ARMCO ARCHED CULVERT STRUCTURES ARE TO BE REPLACED BY PRECAST CONCRETE BOX STRUCTURES. SIZE AND APPOXIMATE 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 TMH7 PARTS1-3 CODE OF PRACTICE FOR DESIGN OF HIGHWAY BRIDGES AND CULVERTS IN SOUTH AFRICA, AS AMENDED IN 1988.
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 COULOB 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.
4. MATERIAL DENSITIES:
   (1) SOIL = 2000 kg/m³ WITH INTERNAL ANGLE OF FRICTION OF 30 DEGREES
   (2) CONCRETE = 2600 kg/m³
5. 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 UNSUITABLE 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.
6. CONCRETE CLASSES AND YOUNG'S MODULUS

DESCRIPTION	CLASS	E-MODULUS
MASS CONCRETE	15/38	-
CONCRETE SCREED	15/19	-
WINGWALLS & SLABS	W30/19	31GPa

REINFORCEMENT
REINFORCEMENT TO SABS 920 (1985) AND SABS 1024 (1991)
WITH YIELD STRESS FOR:
- HOT ROLLED MILD STEEL PLAIN ROUND ROUND BARS ("R" BARS) 250MPa
- HOT ROLLED HIGH-YIELD STRESS STEEL DEFORMED BARS ("Y" BARS) 450MPa

HYDRAULIC INFORMATION:
1. CATCHMENT AREA: 5.75km²
2. DESIGN RETURN PERIOD T: (RM3 1 : 10 YR)
3. DESIGN FLOW Q7 & Q2T: (Q7: 12.13m³/s; Q2T: 14.93 m³/s)
4. Hw AT Q7: 1174mm
5. Hw AT Q2T: 1424mm
6. FLOW VELOCITY : 3.96m/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.

   EMBANKMENT PROTECTION
   GABION PROTECTION SHOWN IS SUBJECT TO SITE CONDITIONS AND ENGINEERS APPROVAL.
6. 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	258	18 457.919	2 650 045.105
2	258	18 457.520	2 650 046.790
3	258	18 455.485	2 650 055.381
4	258	18 453.169	2 650 065.159
5	258	18 452.770	2 650 066.835

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

DRAWING SCHEDULE	
DRAWING No.	DESCRIPTION
ROMH-042-07-01	GENERAL ARRANGEMENT
ROMH-042-07-02	CONCRETE DETAIL
ROMH-042-07-03	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:
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54 Retief Street
Mokopane
0601
TEL: (015) 491 9600
FAX: (015) 491 9638

PROJECT:

CONTRACT No. :

UPGRADING OF GRAVEL ROADS AND STORMWATER IN MOORDKOPPIE CLUSTER AT MABUSELA AND MASOGE VILLAGES

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	SQ

REVISIONS

DRAWN: S. QUZA | CHECKED: S. SITHOLE | DESIGNED: P. SEOPA
SCALES: AS SHOWN | DATE: SEPTEMBER 2020
DRAWING TITLE: GENERAL ARRANGEMENT MASOGE MAJOR CULVERT
SIZE: A0 | PROJECT No.
REV No. A | DRAWING No. ROMH-042-07-10-01

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