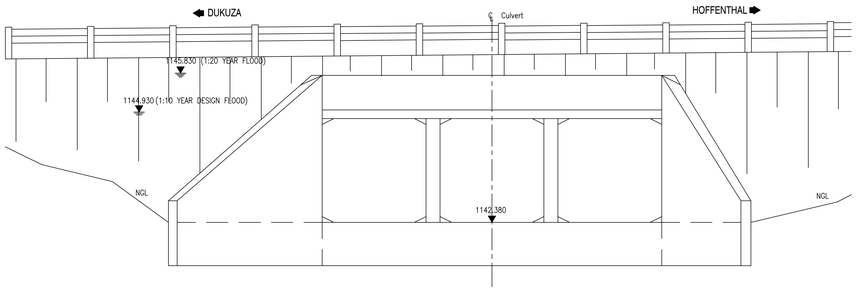
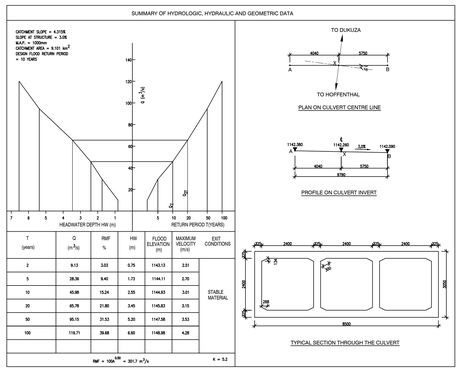
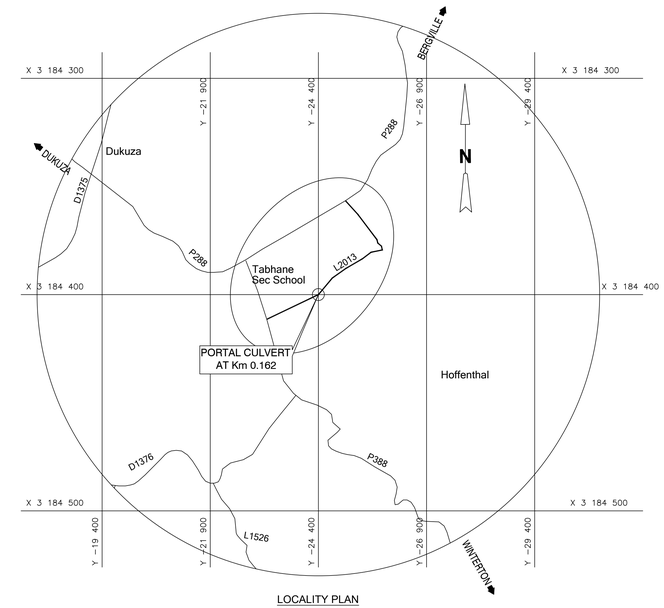


UPSTREAM ELEVATION

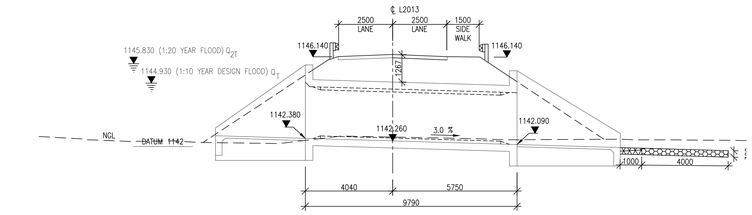
SCALE 1 : 50





LOCALITY PLAN

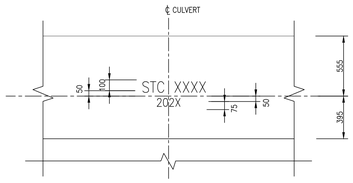
SCALE 1 : 50 000



SECTION THROUGH CENTRE LINE OF CULVERT

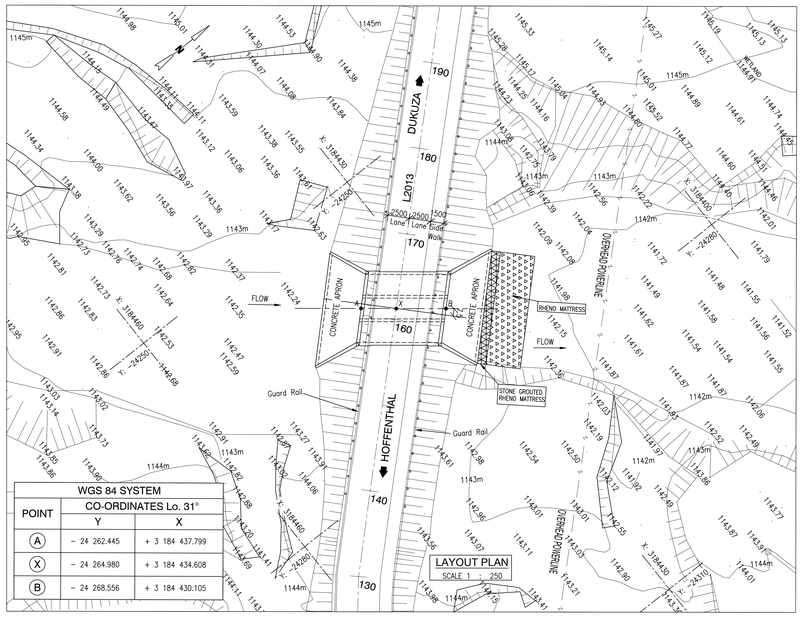
SCALE 1 : 100

DRAWING No.	DESCRIPTION
STC 000/5	BENDING SCHEDULE
STC 000/4	REINFORCEMENT DETAILS
STC 000/3	REINFORCEMENT DETAILS
STC 000/2	CONCRETE DETAILS
STC 000/1	GENERAL ARRANGEMENT
LIST OF DRAWINGS	



CULVERT NUMBER AND YEAR OF CONSTRUCTION

SCALE 1 : 20

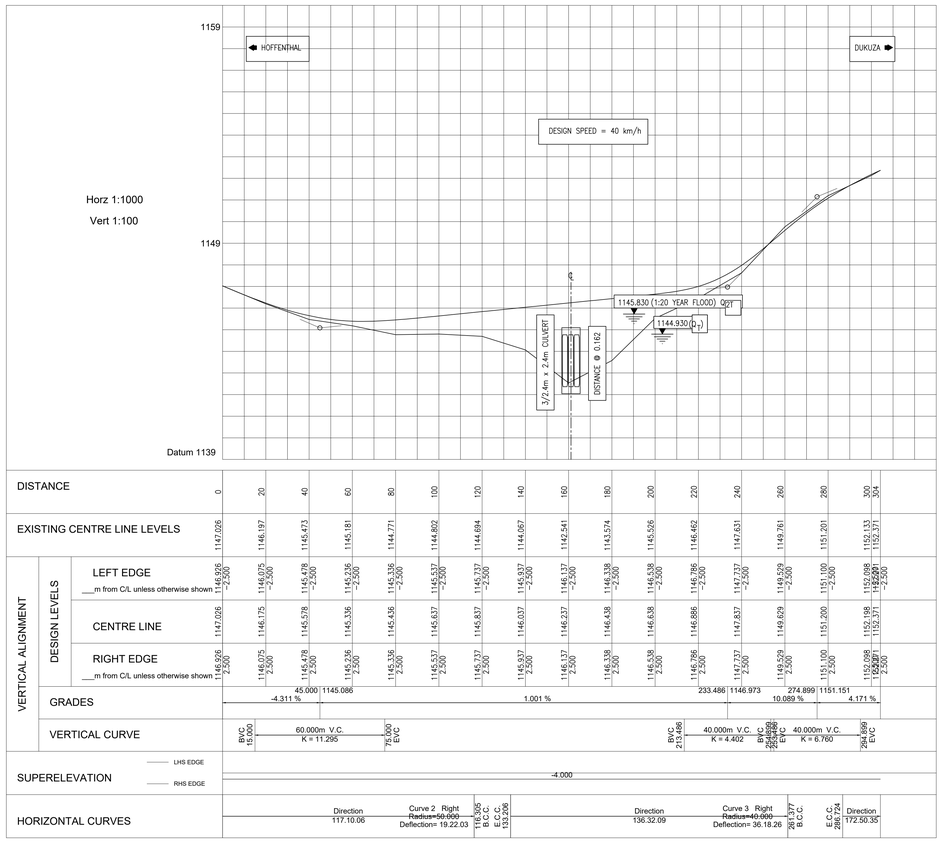


POINT	CO-ORDINATES Lo. 31°	
	Y	X
A	- 24 262.445	+ 3 184 437.799
X	- 24 264.980	+ 3 184 434.608
B	- 24 268.556	+ 3 184 430.105

WGS 84 SYSTEM

LAYOUT PLAN

SCALE 1 : 250



LONGITUDINAL SECTION OF L2013

VERTICAL SCALE 1 : 100, HORIZONTAL SCALE 1 : 1000

NOTES :

1. DESIGN:

   DESIGNED IN ACCORDANCE WITH THE DEPARTMENT OF TRANSPORT'S DESIGN MANUAL FOR STANDARD BOX CULVERTS

2. LOADING:

   THE LOADING IS IN ACCORDANCE WITH TMH 7 : PARTS 1 & 2 : 1981 (REVISED DECEMBER 1988). THE FOLLOWING LOADING & DESIGN VARIABLES HAVE BEEN USED.

   2.1 LIVE LOAD..... NA, NB 36 TRAFFIC LOADING

   2.2 DEAD LOAD..... REINFORCED CONCRETE = 24.5 kN/m^3

   2.3 EARTH PRESSURE BEHIND EARWING & BARREL WALLS BASED ON 'COULOMB' THEORY
   DENSITY OF SOIL..... 1885kg/m^3
   ANGLE OF INTERNAL FRICTION..... 30°

   2.4 SATURATION OF THE FILL FOR A DEPTH OF 1.0m ABOVE THE CULVERT CAN BE TOLERATED.

   2.5 DESIGN FILL HEIGHT 1.5m.

   2.6 ASSUMED SETTLEMENT CONDITION..... r_{sd} ρ = 0.5

   2.7 BARREL CHECKED FOR GEOSTATIC LOADS.

3. DESIGN PARAMETERS:

   3.1 YOUNG'S MODULUS OF ELASTICITY
   CONCRETE (SHORT TERM).....IN ACCORDANCE WITH TABLE 3 OF BS 5400 : 1984
   REINFORCING STEEL.....210GPa

   3.2 CO-EFFICIENT OF THERMAL
   EXPANSION FOR CONCRETE.....12 x 10^{-6}/°C

4. CHARACTERISTIC STRENGTH OF MATERIALS:

   4.1 CONCRETE (fcu)
   BLINDING.....15MPa
   CANTILEVER WINGWALLS.....25MPa
   BARREL & EARWALLS.....25MPa

   4.2 STEEL BAR REINFORCEMENT (fy) (IN ACCORDANCE WITH S.A.B.S. 920)
   HOT ROLLED HIGH-YIELD-STRESS
   DEFORMED BARS (Y – BARS).....450MPa
   HOT ROLLED MILD STEEL BARS
   OF ROUND CROSS SECTION (R BARS).....250MPa

5. GENERAL NOTES:

   5.1 SURFACE FINISHES:–

   5.1.1 FORMED SURFACES
   ALL CONCEALED SURFACES..... CLASS F1
   ALL EXPOSED SURFACES..... CLASS F2

   5.1.2 UNFORMED SURFACES
   TOP OF BARREL..... CLASS U1
   TOP OF WALLS, INVERT OF BARREL
   AND TOP OF APRON SLABS..... CLASS U2

   5.2 ALL EXTERNAL CORNERS SHALL BE CHAMFERED TO 25mm x 25mm.

   5.3 CONCRETE COVER TO REINFORCEMENT SHALL BE 40mm.

   5.4 FOUNDING MATERIAL:–

   5.4.1 TYPE OF FOUNDING MATERIAL.....SANDSTONE

   5.4.2 PERMISSIBLE BEARING PRESSURE.....350 kPa.

   5.4.3 DESIGN BEARING PRESSURE.....150 kPa.

   5.4.4 ANTICIPATED SETTLEMENT LESS THAN 5mm.

   5.5 ALL LEVELS TO BE VERIFIED BY ENGINEER ON SITE BEFORE CONSTRUCTION COMMENCES.

6. METHOD OF ANALYSIS:

   6.1 THE CULVERT HAS BEEN ANALYSED ELASTICALLY USING THE SLOPE-DEFLECTION EQUATIONS FOR NON-PRISMATIC SECTIONS.

7. CULVERT NUMBER:

   7.2 10mm RECESSED LETTERING TO BE PAINTED WITH TWO COATS OF BLACK ALKALI RESISTANT PAINT.

8. GABIONS:

   8.1 RHENO MATTRESS STONE GROUTED WITH CONCRETE ONTO GALVANISED BARS PROTRUDING FROM APRON SLAB AND CUT-OFF WALL FOR THE FIRST ONE METRE, REMAINING MATTRESS TO BE FILLED WITH STONES ONLY.

FOR PRELIMINARY APPROVAL ONLY

Symbol	Date	Description	Checked	Signed
AMENDMENTS				

AS BUILT

Supervising Engineer ..... Date

Supervising Authority

CAD File Ref:-		Designed by:-	N. Mbatha
File Ref:-	L2013/1	Checked by:-	T. Baloyi
Cross Section No:-		Drawn by:-	T. Nkosi
Longitudinal Section No:-		Checked by:-	N. Mbatha
Survey Plan No:-		Date of Approval:-	

PROVINCE OF KWAZULU-NATAL
DEPARTMENT OF TRANSPORT

VUMESA Engineers

SIGNATURE ..... DATE

Bridge Engineer

Head: Transport

GRAVEL ROAD L2013 : HOFFENTHAL - DUKUZA
S 28 46 32.57 E 29 14 54.47

3/2.4m x 2.4m BOX CULVERT
GENERAL ARRANGEMENT

Staked km distance	Sheet 01
Km 0.162	of 05
Scale: As Shown	Plan No.:- STC0000/1

STC0000/1