



DESIGN DATA

GENERAL DESIGN NOTES:

1) THE CULVERT CONSISTS OF 1/2.40m x 0.90m CELL OF IN-SITU CAST CONCRETE

2) DESIGN METHOD: LIMIT STATE

3) DESIGN CODE: TM47:PART 3 - 1989

DESIGN LOADINGS:

1) DESIGN CODES: TM47 - PARTS 1 AND 2, CODE OF PRACTICE FOR THE DESIGN OF HIGHWAY BRIDGES AND CULVERTS IN SOUTH AFRICA (AS AMENDED IN 1988) *

2) LIVE LOADS: TYPE NA LOADING TYPE NB-36 LOADING AND NC35 x 5 x40

3) DEAD LOADS: IN-SITU CONCRETE - 25.0kN/m³ FRESHLY-CAST CONCRETE - 24kN/m³ COMPACTED EARTH FILL - 20kN/m³

4) DESIGN FILL HEIGHT: 0.8m

5) INTERNAL ANGLE OF FRICTION OF BACKFILL MATERIAL - 30° EARTH PRESSURE DUE TO BACKFILL MATERIAL 10 kPa/m (UNYIELDING STRUCTURE)

6) COMPUTER PROGRAM: PROKON

7) REFER TO THE COTO STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE WORKS FOR SOUTH AFRICAN ROAD AUTHORITIES (DRAFT STANDARD OCTOBER 2020)

DESIGN PARAMETERS

1) YOUNG'S MODULUS (E): PLAIN CONCRETE (f_{cu}=30MPa) =286GPa REINFORCING STEEL =200GPa

MATERIALS

1) FOUNDING

FOUNDING MATERIAL - CLAYEY SAND PERMISSIBLE BEARING PRESSURE - 250kPa DESIGN BEARING PRESSURE - 180kPa

2) CONCRETE CHARACTERISTIC STRENGTHS (95%)

STRUCTURAL ELEMENT	f _{cu} (MPa)	CLASS
BLINDING LAYERS	15	C12/15-20
FLOOR AND APRON SLABS	30	C25/30-XC3 (100)-20
WALLS AND WING WALLS	30	C25/30-XC3 (100)-20
DECK SLAB AND HEAD WALLS	30	C25/30-XC3 (100)-20

2.1) COEFFICIENT OF EXPANSION OF CONCRETE - 0.012mm/m/°C

3) REINFORCING CHARACTERISTIC STRENGTHS

DESCRIPTION	f _y (MPa)
MILD STEEL	250
HIGH TENSILE STEEL (SABS 920 1985)	450

GENERAL

1) CONCRETE FINISH:

1.1 SHUTTERED SURFACES: FOUNDATIONS - F1 UNEXPOSED SURFACES - F2 EXPOSED SURFACES - F2

1.2 UNSHUTTERED SURFACES: TOP OF FLOOR SLABS - U2 TOP OF WALLS - U2 TOP OF ACCESS COVER SLAB - U2

2) CONCRETE COVER : 50mm

3) ALL VISIBLE CORNERS MUST BE CHAMFERED - 25mmx25mm

STRUCTURE NUMBER PLATES

- (1) LETTERS AND NUMERALS SHALL BE TYPE "B" LETTERS TO DIN 1451 PART 2.
- (11) THE DATE ON THE CULVERT NUMBER PLATE SHALL BE THE YEAR IN WHICH THE CULVERT WAS COMPLETED.
- (111) THE CULVERT NUMBER SHALL HAVE A WHITE BACKGROUND WITH BLACK LETTERS, NUMERALS AND BORDER.

MANUFACTURE OF NUMBER PLATES

TYPE 1 NUMBER PLATE

- (1) THE NUMBER PLATES SHALL BE MANUFACTURED FROM NON-METALLIC, UV RESISTANT MATERIAL WITH EPOXY BLACK LETTERING

CONSTRUCTION OF NUMBER PLATES

TYPE 1 NUMBER PLATE

- (1) THE CULVERT NUMBER PLATES SHALL BE POSITIONED AS SHOWN.

- (11) THE NUMBER PLATE SHALL BE SECURELY FASTENED TO THE INSIDE FACE OF THE SHUTTER BY MEANS OF M10 ANCHOR BOLTS. THE PROTRUDING THREADS OF THE BOLTS SHALL BE COATED WITH AN APPROVED DEBONDING AGENT. ONCE THE CONCRETE HAS SET AND PRIOR TO STRIPPING THE SHUTTER THE M10 BOLTS SHALL BE REMOVED. THE BOLT HOLES SHALL BE MADE GOOD WITH EPOXY FILLER AND THE PAINT WORK TOUCHED UP.

CULVERT HYDRAULICS

1. CATCHMENT AREA (km²): 6.574
2. RETURN PERIOD (yr): 20
3. DESIGN Q (m³/s): 18.37
4. HEADWATER: 1.32
5. DESIGN FLOOD LEVEL: 78.170
6. FREEBOARD (m): 0.94
7. FLOW VELOCITY (m/s): 2.49
8. AVE. SLOPE OF STREAMBED (m/m): 0.007
9. METHOD OF ANALYSIS: SDF

SCALE FOR REDUCED PLAN
0 25 50 75 100m ON ORIGINAL PLAN

FOR TENDER PURPOSES ONLY