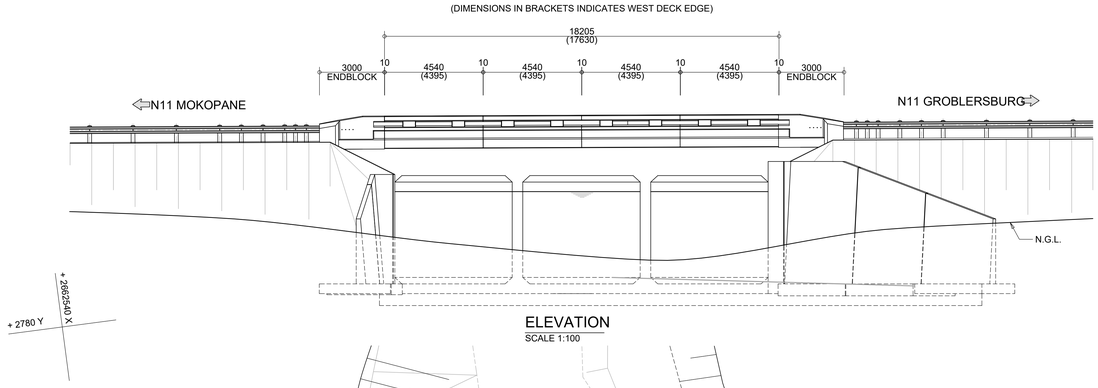
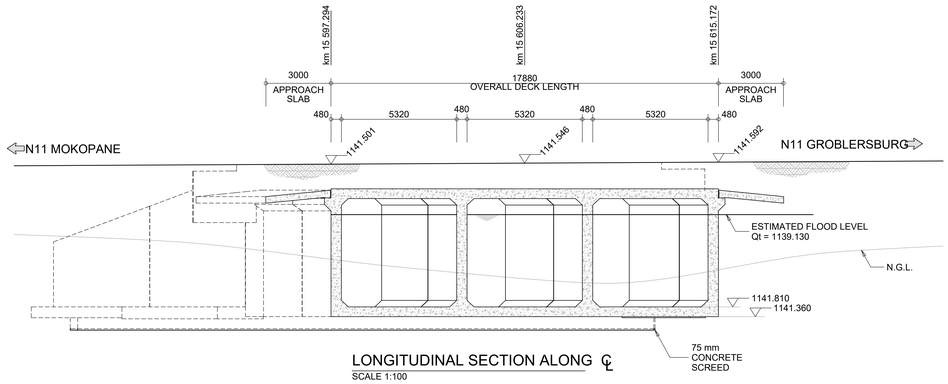
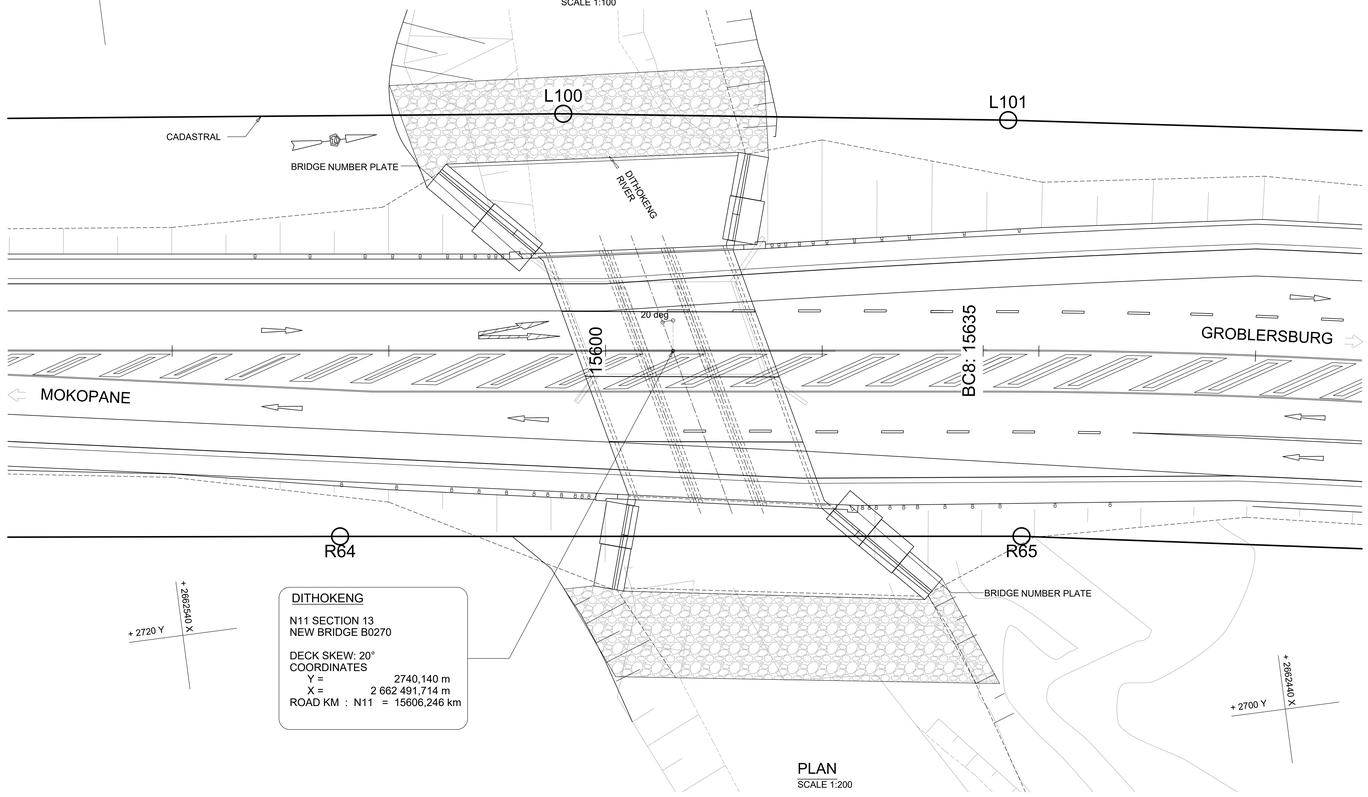


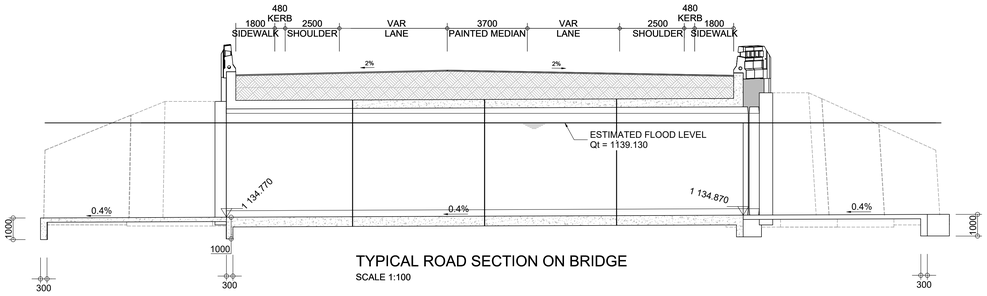
ELEVATION
SCALE 1:100



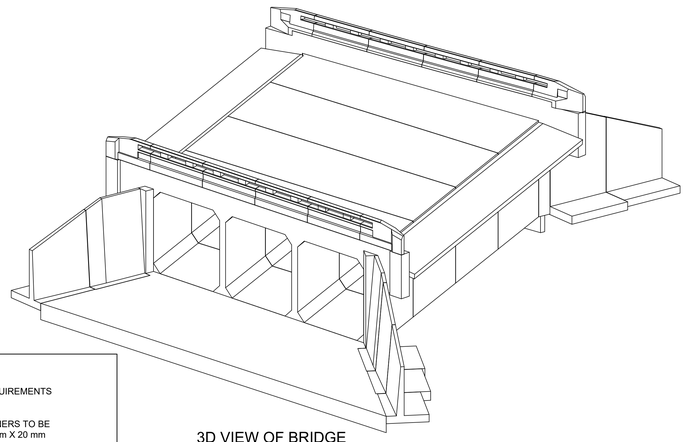
LONGITUDINAL SECTION ALONG ℄
SCALE 1:100



PLAN
SCALE 1:200



TYPICAL ROAD SECTION ON BRIDGE
SCALE 1:100



3D VIEW OF BRIDGE
NOT TO SCALE

GENERAL ARRANGEMENT NOTES

1. DESCRIPTION OF THE STRUCTURE

1.1. EXISTING BRIDGE
THE EXISTING STRUCTURE WAS DESIGNED BY TPA AND CONSTRUCTED IN 1952, AND COMPRISES THE FOLLOWING:
3-SPAN SIMPLY SUPPORTED SOLID NORMAL REINFORCED SOLID DECK AT 20° SKEW.
HYDRAULIC OPENING OF 3 / 4,0 X 4,2 m HIGH AND 10 m LONG.
TWO SOLID WALL TYPE PIERS BATTERED BOTH SIDES
BOX TYPE ABUTMENTS WITH 45° FLARING RETURN WALLS.
ALL FOUNDATIONS SHALLOW SPREAD FOOTINGS.

1.2. PROPOSED ALTERATIONS / UPGRADE
THE N11 WILL BE WIDENED FROM THE EXISTING 9,6 m BETWEEN PARAPETS (8,51 m CARRIAGEWAY PLUS TWO 0,56 m RAISED WALKWAYS) TO NEARLY 25 m TO ACCOMMODATE THE FOLLOWING:
3,70 m MEDIAN, AND TO BOTH DIRECTIONS
3,50 m LANE
VARIABLE TAPER TO ADDITIONAL TURNING LANE
2,50 m SHOULDER
0,48 m KERB
1,80 m WALKWAY

THE EXISTING STRUCTURE WILL BE DEMOLISHED, AND REPLACED BY A 3 / 5,0 X 5,0 m TRIPPLE BOX AT 20° SKEW AND ABOUT 25 m LONG, WITH FLARING WINGWALLS.

1.3. TRAFFIC ACCOMMODATION DURING CONSTRUCTION.
BRIDGE WILL BE CONSTRUCTED IN HALF-WIDTHS, AND TRAFFIC WILL BE ACCOMMODATED AS DUAL DIRECTION (ONE LANE PER DIRECTION).

2. DESIGN CRITERIA

2.1. DESIGN CODES
2.1.1. SANRAL CODE OF PROCEDURE FOR THE PLANNING AND DESIGN OF HIGHWAY AND ROAD STRUCTURES IN SOUTH AFRICA (Feb 2002).
2.1.2. COTO STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE WORKS FOR SOUTH AFRICAN ROAD AUTHORITIES (2020)
2.1.3. COMMITTEE OF STATE ROAD AUTHORITIES TMH7 PARTS 1,2 (1988) AND PART 3 (1989) CODE OF PRACTICE FOR THE DESIGN OF HIGHWAY BRIDGES AND CULVERTS IN SOUTH AFRICA
2.1.4. THE SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LIMITED DRAINAGE MANUAL (2013 6 th EDITION).

2.2. LOADING STATEMENT
2.2.1. SELF WEIGHTS:
- REINFORCED CONCRETE 25.5 kN/m3
- ROAD SURFACING 23.0 kN/m3

2.2.2. HORIZONTAL EARTH PRESSURE
- SOIL DENSITY 20 kN/m3
- Ka (YIELDING ELEMENTS) 0,33
- Ko(UN-YIELDING ELEMENTS) 0,50

2.2.3. VERTICAL LIVE LOADING
- NA NORMAL TRAFFIC
- NB36 ABNORMAL TRAFFIC
- PEDESTRIAN 5.0 kPa/m2

2.2.4. IMPACT LOADING
- ROAD IMPACT LOADS ON BRIDGE SUPPORTS ARE TWICE THOSE SPECIFIED UNDER 3.7.2

2.2.5. WIND LOADING TO TMH7 METHOD A
2.2.6. EARTHQUAKE LOADING TO TMH7 METHOD A

3. STRUCTURAL ANALYSIS AND PARAMETERS

3.1. METHOD OF ANALYSIS
3.1.1. DESIGN IS DONE IN TERM OF A LIMIT STATE CODE, AND THE FOLLOWING LIMITS ARE CHECKED FOR:
* SERVICEABILITY LIMIT STATE (SLS) FOR STRESSES, DEFLECTIONS AND CRACK WIDTHS.
* ULTIMATE LIMIT STATE (ULS) FOR STRENGTH ISSUES.

3.2. DESIGN PARAMETERS
3.2.1. YOUNG'S MODULUS
* CONCRETE IN-SITU (40 MPa) 30 GPa
* REBAR 200 GPa

3.2.2. STRAIN LOADING
* SHRINKAGE 0.2 mm/m
* TEMPERATURE RANGE +-20°C
* THERMAL COEFFICIENT 0.012 mm/m/°Ø

3.2.3. DESIGN METHODS AND AIDS:
* 2-D LINE MODELS
* 3-D MODELS Dlubal RFEM

4. MATERIALS

4.1. FOUNDING
SPREAD FOOTINGS IN HIGHLY WEATHRED SOFT ROCK DIABAS AT 200 kPa ALLOWABLE BEARING PRESSURE.

4.2. CONCRETE CLASS AND COVER

FILL AND SCREED LAYERS	C12/15-20	N/A
BASES	D25/30-20	50 mm
SUB-STRUCTURES AND DECK	D25/30-20	50mm TOP
PARAPETS	D32/40-21	40mm
		50mm ELSEWHERE

4.3. NORMAL REINFORCEMENT
MILD STEEL (R - BARS) fy = 250 MPa
TENSILE (Y - BARS) fy = 450 MPa

4.4. BEARINGS
3 LAYERS 3- PLY ROOFING FELT TO JOCKEY SLABS

4.5. MOVEMENT JOINTS
NOT APPLICCABLE, BURIED ROLL-OVER JOINTS AT CULVERT ENDS

5. CONSTRUCTION REQUIREMENTS

5.1. ARRISES
ALL VISIBLE CORNERS TO BE CHAMFERED 20 mm X 20 mm

5.2. CONCRETE SURFACE FINISHES
5.2.1. FORMED SURFACES
* UNEXPOSED F1
* EXPOSED F2
* PARAPETS & END BLOCKS F3

5.2.2. UNFORMED SURFACES
* DECK TOP U1
* UNEXPOSED U1
* EXPOSED U2

FOR TENDER PURPOSES ONLY

SCALE FOR REDUCED PLAN
100mm ON ORIGINAL PLAN
0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m

No.	DATE	REVISION	CONSULT. ENG.
V0	11/03/2021	ORIGINAL VERSION	

CONSTRUCTION RECORD (AS-BUILT)
WORKS CONTRACT ENGINEER
Name :
Prof. Reg. No. :
Date :
SANRAL PROJECT MANAGER
Name :
Date :

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

DESIGNED BY
NAME
Prof. Reg. No.
CHECKED BY
NAME
Prof. Reg. No.
DRAWN BY
NAME

CONSULTANT APPROVAL
Name :
Prof. Reg. No. :
Date : 11/03/2021

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SANRAL
SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LTD
Reg.No. 1998/009884/30
BUILDING SOUTH AFRICA THROUGH BETTER ROADS

EASTERN REGION
58 van Eck Place
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3201

PO Box 100410
Scottsville
3209

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ACCEPTANCE
THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATSOEVER CAUSE OR HOWEVER ARISING
for the SA NATIONAL ROADS AGENCY SOC LTD.
Date:

REHABILITATION OF NATIONAL ROUTE N11 SECTION 13 FROM R518 INTERSECTION(km 8.340) TO GROOTSANDSLOOT RIVER(km 24.280)

DITHOKENG RIVER BRIDGE B0270 AT km 15.606

GENERAL ARRANGEMENT

SCALE : AS SHOWN
SHEET 03 OF 22

PROJECT NUMBER	NRA N.011-130-2010/1
DRAWING LOCATION DATA	
ROUTE	N11 / N11
SECTION	13 / 13
DRAWING km DISTANCE	15.58 / 15.62
DRAWING TYPE	STRUCTURES-BRIDGES
BRIDGE/STRUCTURE No.	B0270
CONSULTANT DRAWING No.	BCD/B0270/03
SANRAL DOCUMENT #	V0