



- NOTES**
- GENERAL**
 - STRUCTURAL SYSTEM: SINGLE-SPAN PREFABRICATED PRE-TENSIONED CONCRETE BEAMS WITH AN IN-SITU CAST CONCRETE TOP SLAB
 - DESIGN METHOD: LIMIT STATES DESIGN IN ACCORDANCE WITH TMH7 CODE OF PRACTICE FOR THE DESIGN OF HIGHWAY BRIDGES AND CULVERTS IN SOUTH AFRICA
 - SOFTWARE USED:
 - PROKON SUITE OF STRUCTURAL ANALYSIS SOFTWARE
 - STRAP STRUCTURAL ANALYSIS SOFTWARE
 - SINOTECH HYDROLOGICAL SOFTWARE
 - HEC-RAS HYDRAULIC ANALYSIS SOFTWARE
 - DESIGN LOADINGS**
 - SELF WEIGHT:
 - REINFORCED CONCRETE = 25 kN/m³
 - POST-TENSIONED CONCRETE = 26 kN/m³
 - IMPOSED DEAD LOADS
 - TRAFFIC BARRIER – 11,7 kN/m
 - BITUMINOUS SURFACING – 24 kN/m²
 - LIVE LOADS (TMH7 PART 2 (1988))
 - NA
 - NB36
 - NC-30x5x40
 - BARRIER IMPACT LOAD: 100 kN
 - VEHICLE BRAKING AND OTHER SECONDARY LIVE LOAD EFFECTS AS SPECIFIED IN TMH7
 - ACCIDENTAL IMPACT LOAD AS SPECIFIED IN TMH7
 - TEMPERATURE EXPANSION COEFFICIENT – 12x10⁻⁶ mm/m°C
 - EARTH PRESSURE – 5,6 kN/m²/m
 - FLOOD ACTION AS SPECIFIED IN TMH7
 - MATERIAL SPECIFICATION**

CONCRETE IN:	CLASS	CHARACTERISTIC STRENGTH	YOUNG'S MODULUS
(a) PREFABRICATED DECK BEAMS	W40/20	40 MPa	30 GPa
(b) DECK TOP SLAB	W30/20	30 MPa	28 GPa
(c) SUBSTRUCTURE (EXPOSED)	W30/20	30 MPa	28 GPa
(d) SUBSTRUCTURE (HIDDEN)	30/20	30 MPa	28 GPa
(e) TRAFFIC BARRIER	W30/20	30 MPa	28 GPa
(f) MASS CONCRETE	15/20	15 MPa	23 GPa
(g) BLINDING	15/20	15 MPa	23 GPa

REINFORCEMENT (SANS 282-2011)	YIELD STRENGTH	YOUNG'S MODULUS
(a) MILD STEEL BARS (R)	250 MPa	200 GPa
(b) HIGH TENSILE BARS (Y)	450 MPa	200 GPa

 - PRESTRESSING STEEL:
 - ULTIMATE STRENGTH = 1798 MPa
 - MODULUS OF ELASTICITY = 198 GPa
 - TRANSFER STRESS = 70% MAX OF ULTIMATE STRENGTH
 - STEEL RELAXATION = 2,5% (1000 HOURS)
 - SHRINKAGE = 250x10⁻⁶ mm/m
 - CREEP = 36x10⁻⁶ mm/m/MPa
 - BEARINGS: ELASTOMERIC RUBBER BEARINGS
 - EXPANSION JOINTS: ASPHALTIC PLUG-TYPE JOINTS – AGREEMENT APPROVED
 - PARAPETS: IN-SITU CAST F-TYPE CONCRETE TRAFFIC BARRIERS
 - CONSTRUCTION DETAILS**
 - FOUNDING
 - FOUNDING MATERIAL: MEDIUM HARD ROCK DIAMICTITE
 - FOUNDING TYPE: PERCUSSION BORED PILES
 - PILES TO BE SOCKETED MINIMUM 3m INTO MEDIUM HARD ROCK. PILE LENGTH TO BE CONFIRMED ON SITE
 - MINIMUM END BEARING CAPACITY: 3 000 kPa
 - ALL VISIBLE CORNERS MUST BE CHAMFERED 25mm x 25mm UNLESS SHOWN OTHERWISE
 - CONCRETE COVER (EXPOSURE CLASS XC2)
 - PILES – 50 mm
 - ELSEWHERE – 40mm
 - CONCRETE FINISH
 - VISIBLE SURFACES – F2 (SMOOTH)
 - NON-VISIBLE SURFACES – F1 (ROUGH)
 - PARAPET AND ENDBLOCKS – F3 (VERY SMOOTH)
 - EXISTING WINGWALLS TO BE DEMOLISHED
 - EXISTING ROAD EMBANKMENT TO BE STABILIZED AND REINFORCED DURING WINGWALL DEMOLITION AND EXCAVATIONS FOR EXTENDED ABUTMENTS
 - EXISTING REINFORCED CONCRETE DECK TO BE DEMOLISHED IN PHASES AND REPLACED WITH A NEW BEAM-AND-SLAB DECK
 - BRIDGE TO BE CONSTRUCTED IN PHASES, IN ACCORDANCE WITH THE APPROVED TRAFFIC ACCOMMODATION PLAN
 - HEALTH AND SAFETY
 - HEALTH AND SAFETY ON SITE IS GOVERNED BY THE OCCUPATIONAL HEALTH AND SAFETY ACT NO 95 OF 1993 AND THE CONSTRUCTION REGULATIONS OF 2003.
 - A HEALTH AND SAFETY PLAN SHALL BE COMPILED, INCORPORATING A RISK ASSESSMENT, IDENTIFICATION OF ALL SITE-SPECIFIC RISKS, THE PROVISION OF SUITABLE SAFETY EQUIPMENT AND A SAFE WORKING ENVIRONMENT.
 - FALSEWORK AND TEMPORARY EMBANKMENT SUPPORT SHALL BE APPROVED BY THE ENGINEER PRIOR TO ERECTION AND IMPLEMENTATION
 - HYDROLOGY AND HYDRAULICS**
 - CATCHMENT AREA – 60,2 km²
 - HYDROLOGICAL ASSESSMENT METHOD - STANDARD DESIGN FLOOD METHOD (SDF)
 - HYDRAULIC ROAD CLASS - CLASS R1
 - DESIGN FLOOD RECURRENCE INTERVAL (Q₁₋₁) - 50 YEARS
 - DESIGN PEAK FLOW – 430 m³/s
 - BACKWATER LEVEL – 627,590 m
 - DESIGN FLOW VELOCITY INSIDE BRIDGE – 6,7 m/s
 - Q₁₀₀ BACKWATER / SOFFIT FREEBOARD – 0,05 m MIN (0,19 m AVERAGE) [WITH EXISTING UMGENI VALVE CHAMBER DOWNSTREAM]
 - Q₁₀₀ BACKWATER / SOFFIT FREEBOARD – 0,52 m MIN (0,66 m AVERAGE) [UMGENI VALVE CHAMBER RELOCATED OUT OF RIVERBED]
 - Q₁₀₀ BACKWATER / ROAD LEVEL FREEBOARD – 0,07 m [UMGENI VALVE CHAMBER]
 - Q₁₀₀ BACKWATER / ROAD LEVEL FREEBOARD – 0,58 m [UMGENI VALVE CHAMBER RELOCATED]

CONSTRUCTION RECORD WORKS CONTRACT ENGINEER Name: _____ Prof. Reg. No.: _____ Date: _____ SANRAL PROJECT MANAGER Name: _____ Date: _____		DESIGNED BY NAME: JJ RAUTENBACH Prof. Reg. No.: 912052 CHECKED BY: JJ JANSE VAN RENSBURG Prof. Reg. No.: 050018 DRAWN BY: D VENTER		CONSULTANT APPROVAL Name: N K NATHOO Prof. Reg. No.: 020096 Date: /-/-		HEAD OFFICE 48 Tambolet Avenue Val de Grace Pretoria 0184 PO Box 415 Pretoria 0001 South Africa Tel: (012) 844 8000		EASTERN REGION 58 Van Eck Place Mkonjeni Pietermaritzburg 3200 PO Box 100410 Scottsville 3209 Tel: (033) 392 8100 Fax: (033) 386 3365		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: _____		PROJECT DESCRIPTION UPGRADING OF NATIONAL ROUTE 3, SECTIONS 2 AND 3, FROM LYNNFIELD PARK (N3/2- KM 30.6) TO ASHBURTON INTERCHANGE (N3/3- KM 1.5) UMPUSHINI SPRUIT BRIDGE B1018 GENERAL ARRANGEMENT : SHEET 2		PROJECT NUMBER DRAWING LOCATION DATA ROUTE: N3 SECTION: 3 DRAWING km DISTANCE: 0.44 DRAWING TYPE: STRUCTURES-BRIDGES BRIDGE/STRUCTURE No.: B1018 CONSULTANT DRAWING No.: 15013-B1018-04 SANRAL DOCUMENT # _____		NRA N003-023-2017/1F START: N3 END: N3 SECTION: 3 DISTANCE: 0.52 STRUCTURES-BRIDGES B1018 15013-B1018-04 VER 1	
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DRAWING ON ORIGINAL DRAWING