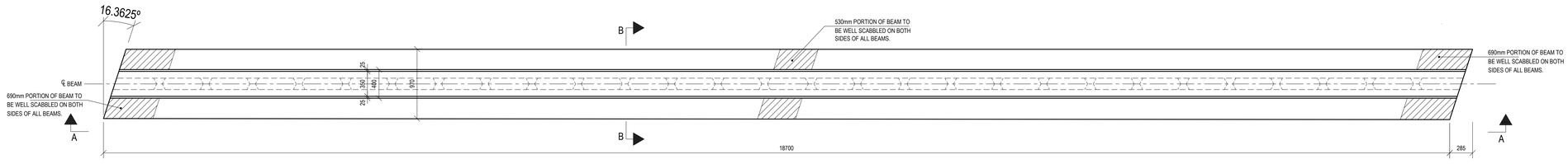


ELEVATION A-A
1:25



TYPICAL PLAN
CONCRETE PRESTRESSED BEAM (32 OFF)
1:25

NOTES FOR PRESTRESSING

GENERAL

1. THE BEAMS ARE PRECAST PRETENSIONED M6 BEAMS.
2. SECTIONAL AREA : 0.9ℳ13m
3. VOLUME CONCRETE : ?.30m /beam.
4. MASS : 19.0t /beam.
5. THE BEAMS ARE DESIGNED AS A CLASS 2 MEMBER WITH 100% OF THE DESIGN LIVE LOADS AND AS A CLASS 1 MEMBER WITH 50% OF THE DESIGN LIVE LOADS.
6. THE DESIGN IS IN ACCORDANCE WITH TMH7 PARTS 1, 2 & 3. APPLICABLE LIVE LOADS ARE NA, NB36 + NC.
7. ULTIMATE CAPACITY OF COMPOSITE SECTION AT MIDSPAN : 3932kNm
8. REQUIRED CAPACITY AT MIDSPAN : 2215kN.m
9. NUMBER OF BEAMS : OUTER BEAMS = 4No.
   INNER BEAMS = 28No.

PRESTRESSING

1. PRESTRESSING STRAND DATA:
   a) NOMINAL STRAND DIAMETER = 15.7mm
   b) NOMINAL AREA OF STRAND = 147.4mm
   c) ULTIMATE STRENGTH OF STRAND = 1798MPa
   d) CHARACTERISTIC BREAKING LOAD : 265kN
   e) MODULUS OF ELASTICITY : 198GPa
   f) STRAND RELAXATION : LOW (2.5%)
2. LAYOUT AND PROCEDURE:
   a) NUMBER OF STRANDS/BEAM : OUTER BEAMS = 19 : INNER BEAMS = 17
   b) DEBONDING AS PER DIAGRAM
   c) CUTTING SEQUENCE TO BE APPROVED BY ENGINEER
   d) STRANDS STRESSED TO 75% OF BREAKING LOAD
   e) STRESSING FORCE PER STRAND = 199kN
   f) TOTAL STRESSING FORCE : OUTER BEAMS = 3781kN
      INNER BEAMS = 3383kN
3. DESIGN PARAMETERS:
   a) CREEP COEFFICIENT : 48x10-6/MPa
   b) SHRINKAGE STRAIN : 350x10-6
4. PRESTRESSING LOSSES:
   a) TRANSFER ELASTIC LOSS : 5.0%
   b) LONG TERM SHRINKAGE CREEP LOSS : 5.1%
   c) LONG TERM CREEP LOSS : 5.6%
   d) LONG TERM RELAXATION LOSS : 2.5%
   e) TOTAL LOSS : 18.2%
   f) FORCE IN STRAND WITH TOTAL LOSSES : 163kN

REINFORCEMENT

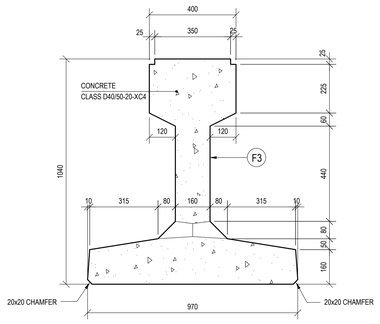
1. HIGH YIELD STRESS STEEL : fy = 450MPa
2. MINIMUM LAP = 43Ø x DIA.
3. MINIMUM CONCRETE COVER = 40mm, EXCEPT WHERE INDICATED OTHERWISE.

CONCRETE

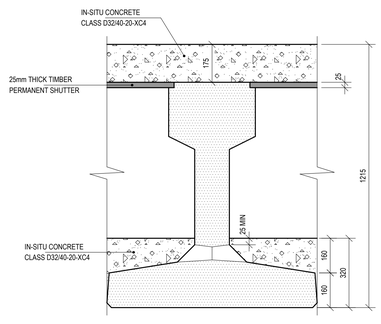
1. CONCRETE GRADE D40/50-20-XC4
2. MINIMUM CONCRETE STRENGTH AT TRANSFER : 40MPa
3. SURFACE FINISH CLASS F3
4. AREAS TO RECEIVE DIAPHRAGM BEAMS TO BE SCABBLED

DEFLECTIONS

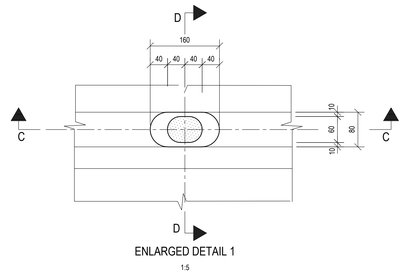
1. AT TRANSFER (DEAD LOAD BEAM + PRESTRESS)
   INNER BEAMS : 5.22mm ↑
   OUTER BEAMS : 8.46mm ↑
2. FOR TOTAL DECK DEFLECTIONS SEE DECK CONCRETE DETAILS



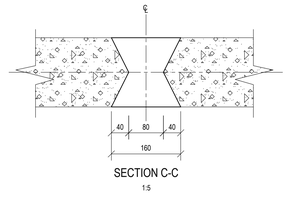
SECTION B-B : CONCRETE
1:10



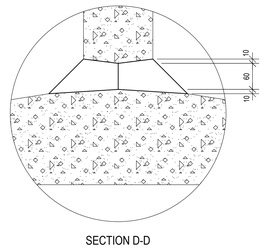
BOTTOM FLANGE IN-FILL DETAIL
1:10



ENLARGED DETAIL 1
1:5



SECTION C-C
1:5



SECTION D-D
1:5

No.	DATE	REVISION	CONSULT. ENG.
V1	30/09/2024	ORIGINAL VERSION	A. MARAIS

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

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

CONSULTANT APPROVAL
Name :
Prof. Reg. No. :
Date :

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SANRAL
SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LTD
Reg.No.1998/009095/30
BUILDING SOUTH AFRICA THROUGH BETTER ROADS

NORTHERN REGION
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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:

THE CONSTRUCTION OF THE BRIDGE OVER RAIL ON DR MOROKA ROAD IN RUSTENBURG

DR MOROKA DRIVE OVER ROAD AND RAIL IN RUSTENBURG, BRIDGE B0655

18.7m PRECAST PRESTRESSED BEAMS - SHEET 1 OF 2

SCALE : AS SHOWN | SHEET 14 OF 26

PROJECT NUMBER	SANRAL S.002-004-2018/1	
DRAWING LOCATION DATA	START	END
ROUTE	DR MORAKA RD	DR MOROKA RD
SECTION	-	-
DRAWING km DISTANCE	1,541	1,605
DRAWING TYPE	STRUCTURES - BRIDGES	
BRIDGE/STRUCTURE No.	B0655	
CONSULTANT DRAWING No.	B0655 / 14	VER
SANRAL DOCUMENT #	-	V1

B0655 / 14