



THE SOUTH AFRICAN NATIONAL ROADS AGENCY LIMITED

CONTRACT NO. X.003-022-2018/1-C6

FOR

AD-HOC STRUCTURAL AND DRAINAGE SERVICES IN THE SOUTHERN REGION – EMERGENCY
BRIDGE REPAIR WORKS (REPAIR OF BRIDGES ALONG THE N2 SECTIONS 16)

DRAWINGS FOR STRUCTURES

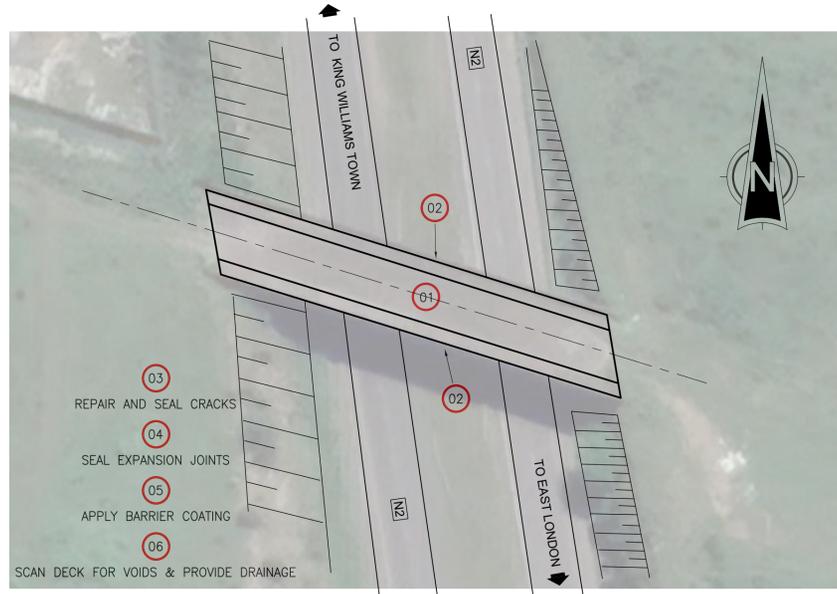
N2 SECTION 16

AUGUST 2023

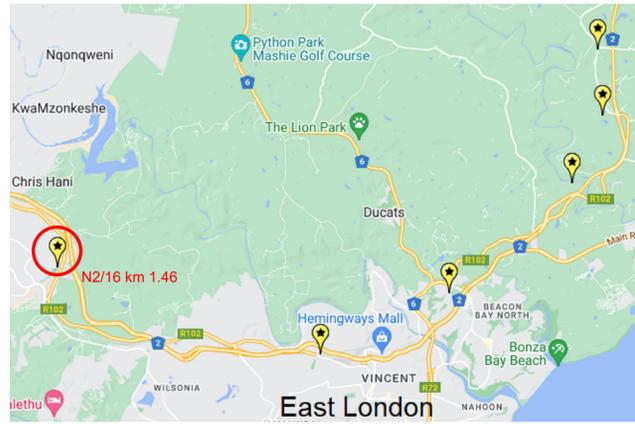
VOLUME 5
BOOK 1 OF 1

ISSUED BY:

CHIEF EXECUTIVE OFFICER
THE SOUTH AFRICAN NATIONAL ROADS AGENCY
SOUTHERN REGION
20 SHOREWARD DRIVE
BAYWEST
PORT ELIZABETH



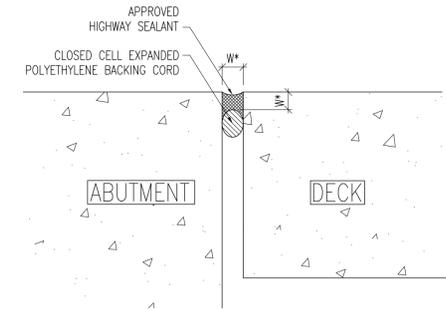
PLAN ON BRIDGE B1244 – (N2/16 @ km 1.46)
NTS



LOCALITY

ITEM	DESCRIPTION
01	CLEAN DECK AND REMOVE VEGETATION.
02	REPAIR LOCAL SPALLS ALONG DECK EDGE AND PARAPETS.
03	REPAIR AND SEAL CRACKS TO DECK AND ABUTMENTS.
04	SEAL EXPANSION JOINTS.
05	APPLY APPROVED CEMENTITIOUS BARRIER COATING, IF SIGNS OF ASR ARE FOUND, TREAT WITH SILANE.
06	SCAN DECK WITH GROUND PENETRATING RADAR (GPR) TO DETERMINE THE PRESENCE & LOCATION OF DECK VOIDS & PROVIDE DRAINAGE TO VOIDS IF PRESENT.

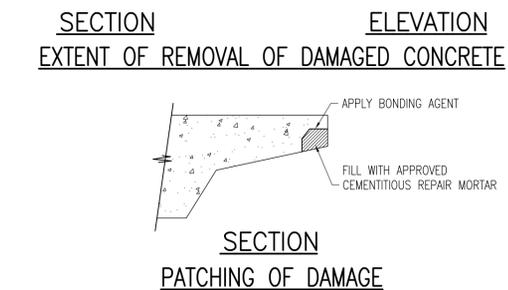
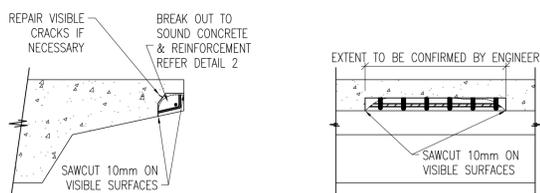
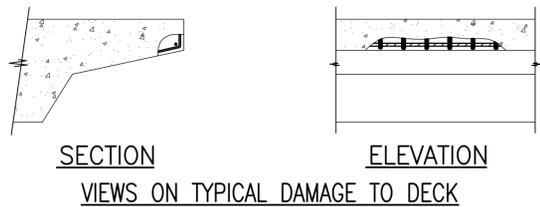
TYPICAL DETAIL – LONGITUDINAL JOINT DETAIL



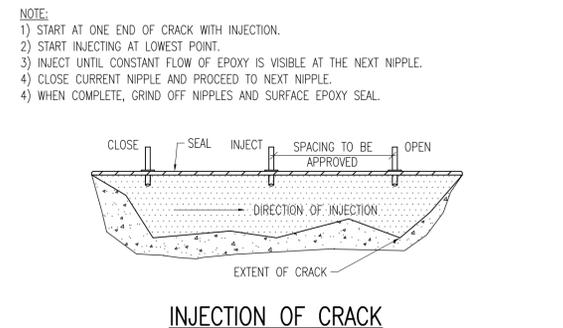
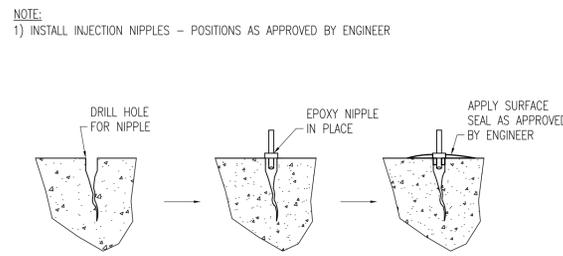
NOTE:
* DIMENSION "W" TO BE DETERMINED ON SITE.

SECTION

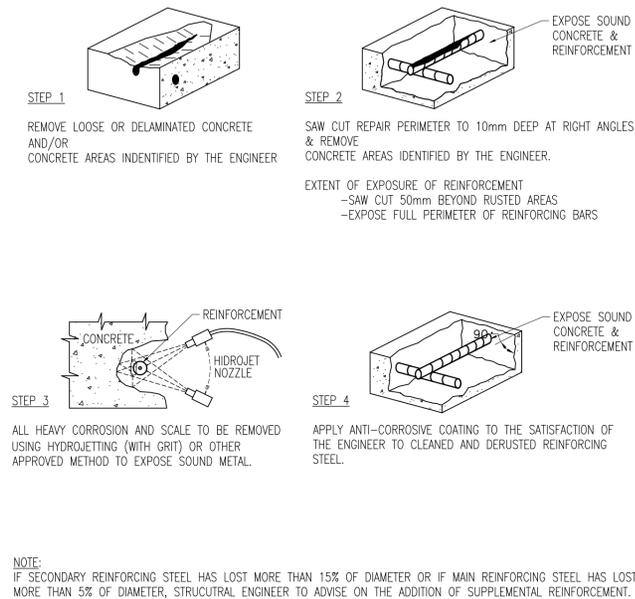
TYPICAL DETAIL – CONCRETE REPAIR



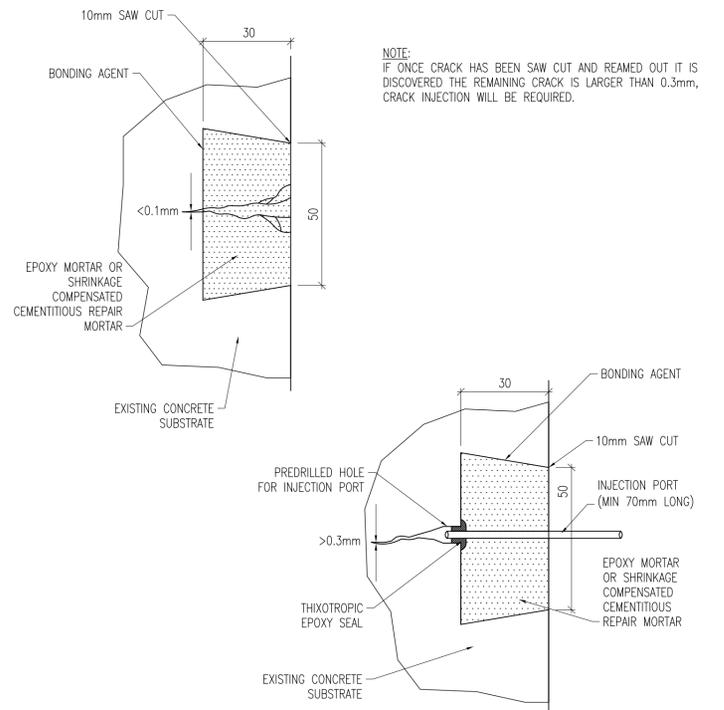
TYPICAL DETAIL – CRACK REPAIR (>0.5mm)



TYPICAL DETAIL – TREATMENT OF REINFORCEMENT



TYPICAL DETAIL – LARGE CRACK REPAIR



No.	DATE	REVISION	CONSULT. ENG.

CONSTRUCTION RECORD
WORKS CONTRACT ENGINEER

Name :
Prof. Reg. No. :
Date :

SANRAL PROJECT MANAGER

Name :
Prof. Reg. No. :
Date :

DESIGNED BY

NAME :
Prof. Reg. No. :
CHECKED BY

NAME :
Prof. Reg. No. :
DRAWN BY

NAME :

CONSULTANT APPROVAL

Name :
Prof. Reg. No. :
Date :

HEAD OFFICE
48 Tambotie Avenue
Vai de Grace
Pretoria
0184
PO Box 415
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SANRAL
SOUTH AFRICAN NATIONAL ROADS AGENCY (S.A.) LTD.
BUILDING SOUTH AFRICA
THROUGH BETTER ROADS

SOUTHERN REGION
20 Shoreward Drive
Baywest
Port Elizabeth
6025
P.O. Box 27230
Greenacres
6057
Tel: (041) 398 3200
Fax: (041) 398 3222

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 CEO: SA NATIONAL ROADS AGENCY LTD.
Date :

PROJECT DESCRIPTION
AD-HOC STRUCTURAL AND DRAINAGE SERVICES IN THE SOUTHERN REGION – EMERGENCY BRIDGE REPAIR WORKS

DRAWING TITLE
N2 SECTION 16 km 1.46
BRIDGE REPAIRS - LAYOUT AND DETAILS

SCALE : AS SHOWN

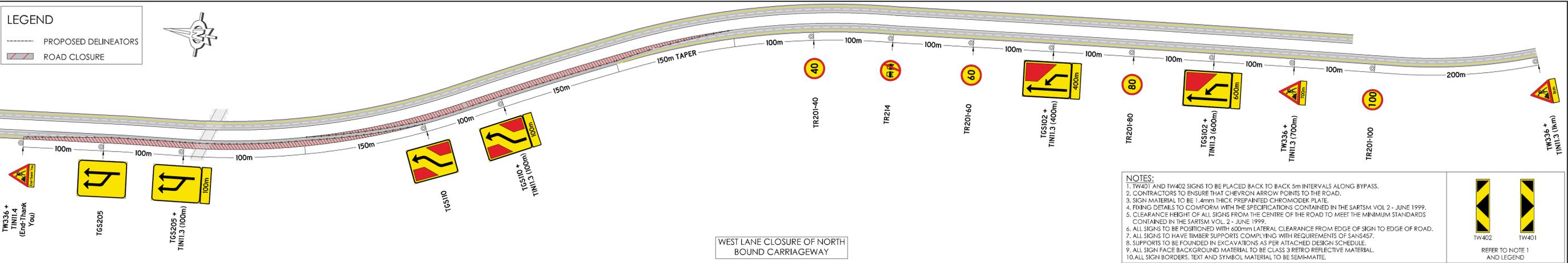
PROJECT NUMBER
X.003-022-2018/1-C6

DRAWING LOCATION DATA	START	END
ROUTE	N2	N2
SECTION	16	16
DRAWING km DISTANCE	KM 1.46	KM 1.46
DRAWING TYPE	STRUCTURES - BRIDGES	
BRIDGE/STRUCTURE No.	B1244	
CONSULTANT DRAWING No.	201931-N2-16-01-00	
SANRAL DOCUMENT #	#####	

VER VA

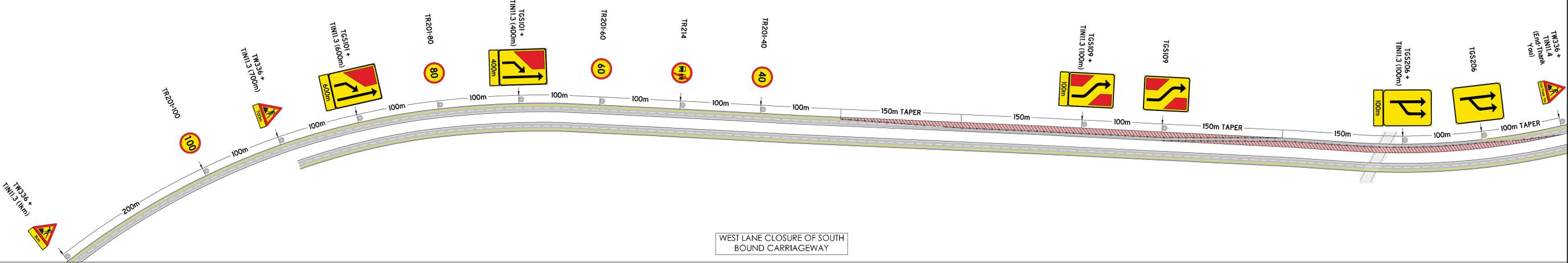
LEGEND

- PROPOSED DELINEATORS
- ROAD CLOSURE

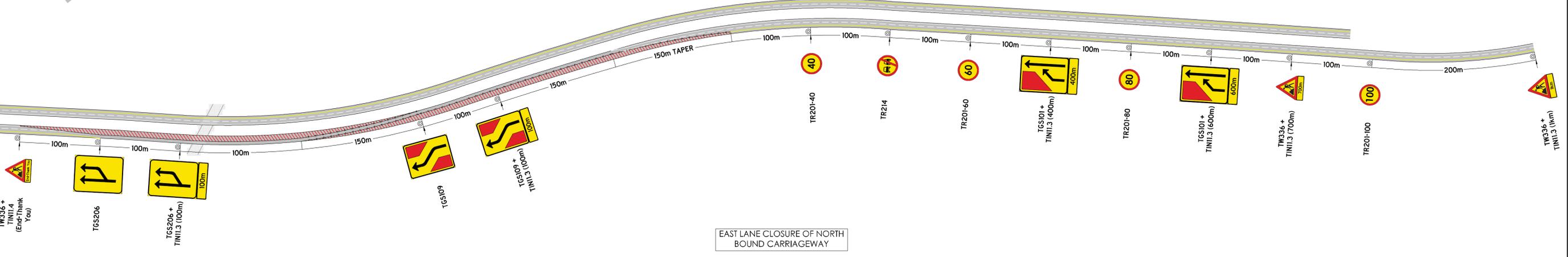


WEST LANE CLOSURE OF NORTH BOUND CARRIAGEWAY

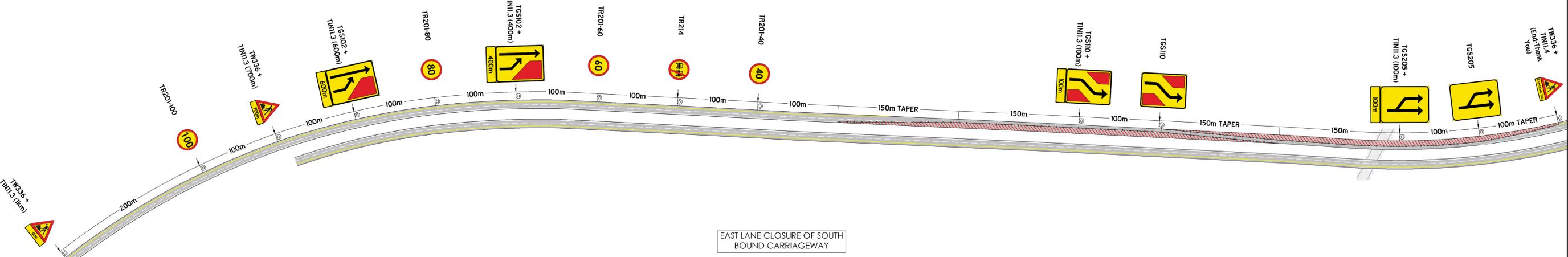
- NOTES:**
- TW401 AND TW402 SIGNS TO BE PLACED BACK TO BACK 5m INTERVALS ALONG BYPASS.
 - CONTRACTORS TO ENSURE THAT CHEVRON ARROW POINTS TO THE ROAD.
 - SIGN MATERIAL TO BE 1.4mm THICK PREPARED CHROMOXIDE PLATE.
 - FIXING DETAILS TO CONFORM WITH THE SPECIFICATIONS CONTAINED IN THE SARTSM VOL 2 - JUNE 1999.
 - CLEARANCE HEIGHT OF ALL SIGNS FROM THE CENTRE OF THE ROAD TO MEET THE MINIMUM STANDARDS CONTAINED IN THE SARTSM VOL 2 - JUNE 1999.
 - ALL SIGNS TO BE POSITIONED WITH 400mm LATERAL CLEARANCE FROM EDGE OF SIGN TO EDGE OF ROAD.
 - ALL SIGNS TO HAVE TIMBER SUPPORTS COMPLYING WITH REQUIREMENTS OF SANS457.
 - SUPPORTS TO BE FOUNDED IN EXCAVATIONS AS PER ATTACHED DESIGN SCHEDULE.
 - ALL SIGN FACE BACKGROUND MATERIAL TO BE CLASS 3 RETRO REFLECTIVE MATERIAL.
 - ALL SIGN BORDERS, TEXT AND SYMBOL MATERIAL TO BE SEMI-MATTE.



WEST LANE CLOSURE OF SOUTH BOUND CARRIAGEWAY

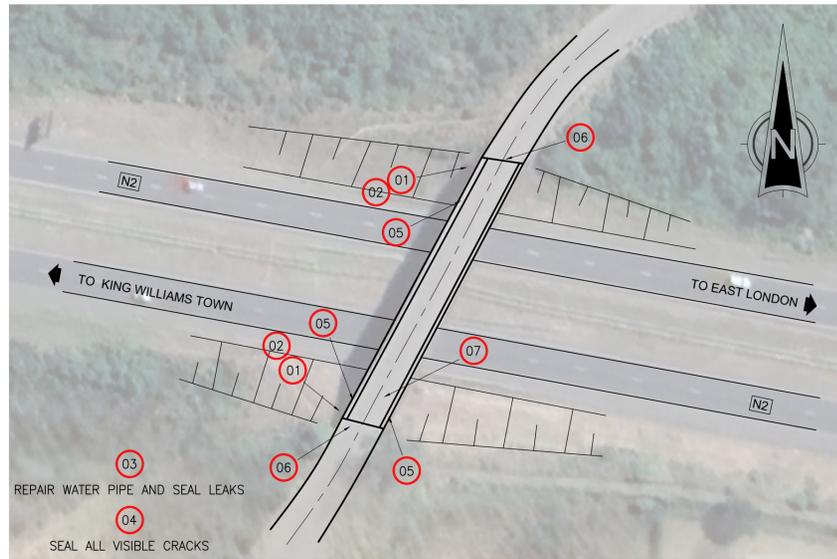


EAST LANE CLOSURE OF NORTH BOUND CARRIAGEWAY



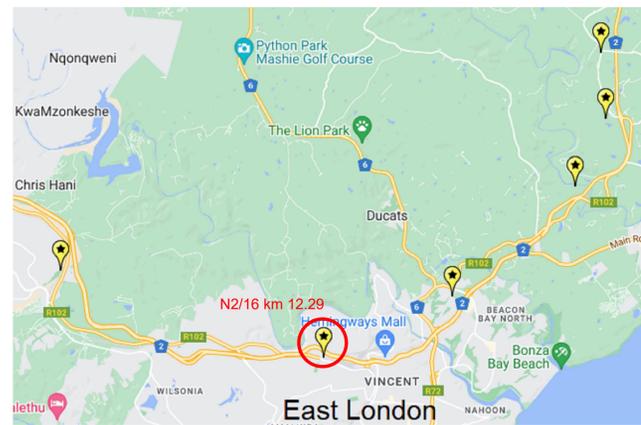
EAST LANE CLOSURE OF SOUTH BOUND CARRIAGEWAY

<p>FOR TENDER ONLY</p>		<p>DESIGNED BY</p> <p>NAME</p> <p>Prof. Reg. No.</p>	<p>CONSULTANT APPROVAL</p> <p>NAME</p> <p>Prof. Reg. No.</p> <p>Date</p>	<p>HEAD OFFICE</p> <p>48 Tambotie Avenue Val de Grace Pretoria 0184 PO Box 415 Pretoria 0001 South Africa Tel: (012) 844 8000</p> <p>SANRAL SOUTH AFRICAN NATIONAL ROADS AGENCY (OCC) LTD BUILDING SOUTH AFRICA THROUGH BETTER ROADS</p>	<p>SOUTHERN REGION</p> <p>20 Shoreward Drive Baywest Port Elizabeth 6025 P.O. Box 27230 Greenacres 6057 Tel: (041) 398 3200 Fax: (041) 398 3222</p>	<p>ACCEPTANCE</p> <p>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.</p> <p>for CEO: SA NATIONAL ROADS AGENCY LTD. Date:</p>	<p>PROJECT DESCRIPTION</p> <p>AD-HOC STRUCTURAL AND DRAINAGE CONSULTING ENGINEERING AND SUPERVISION SERVICES</p> <p>DRAWING TITLE</p> <p>N2 SECTION 16 KM 1.46 BRIDGE REPAIRS - ACCOMMODATION OF TRAFFIC DETAILS</p> <p>SCALE: 1:2500</p>	<p>PROJECT NUMBER</p> <p>X.003-022-2018/1-C6</p> <p>DRAWING LOCATION DATA</p> <p>ROUTE N2 N2</p> <p>SECTION 16 16</p> <p>DRAWING km DISTANCE KM 1.46 KM 1.46</p> <p>DRAWING TYPE STRUCTURES - BRIDGES</p> <p>BRIDGE/STRUCTURE No. B1244</p> <p>CONSULTANT DRAWING No. 201931-N2-16-01-01</p> <p>SANRAL DOCUMENT #</p>	<p>START END</p> <p>N2 N2</p> <p>16 16</p> <p>KM 1.46 KM 1.46</p> <p>STRUCTURES - BRIDGES</p> <p>B1244</p> <p>201931-N2-16-01-01</p> <p>VER</p>
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PLAN ON BRIDGE B1252 – (N2/16 @ km 12.29)
NTS

ITEM	DESCRIPTION
01	JACK UP BRIDGE AND REPLACE ELASTOMERIC BEARINGS
02	REFURBISH OR REPLACE DIRECTIONAL GUIDES
03	REPAIR WATER PIPE & SEAL WATER LEAKS, PRESSURE CLEAN ABUTMENTS AFTER
04	SEAL ALL VISIBLE CRACKS
05	REPAIR DAMAGED SIDEWALKS
06	REPLACE EXPANSION JOINTS
07	REPAIR LOCAL DAMAGE TO ROAD SURFACE

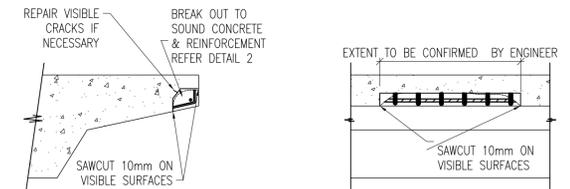


LOCALITY

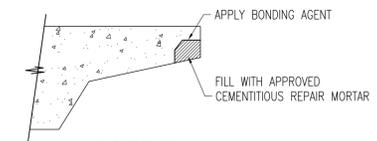
TYPICAL DETAIL – CONCRETE REPAIR



SECTION ELEVATION
VIEWS ON TYPICAL DAMAGE TO DECK



SECTION ELEVATION
EXTENT OF REMOVAL OF DAMAGED CONCRETE



SECTION
PATCHING OF DAMAGE

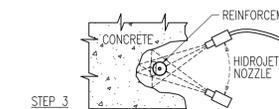
TYPICAL DETAIL – TREATMENT OF REINFORCEMENT



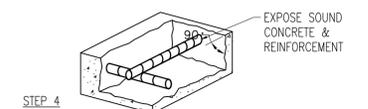
STEP 1
REMOVE LOOSE OR DELAMINATED CONCRETE AND/OR CONCRETE AREAS IDENTIFIED BY THE ENGINEER

STEP 2
SAW CUT REPAIR PERIMETER TO 10mm DEEP AT RIGHT ANGLES & REMOVE CONCRETE AREAS IDENTIFIED BY THE ENGINEER.

EXTENT OF EXPOSURE OF REINFORCEMENT
-SAW CUT 50mm BEYOND RUSTED AREAS
-EXPOSE FULL PERIMETER OF REINFORCING BARS



STEP 3
ALL HEAVY CORROSION AND SCALE TO BE REMOVED USING HYDROJETTING (WITH GRIT) OR OTHER APPROVED METHOD TO EXPOSE SOUND METAL.



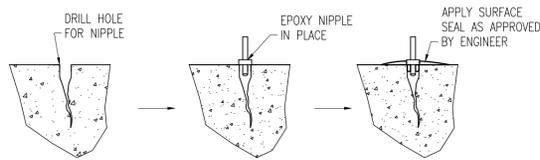
STEP 4
APPLY ANTI-CORROSIVE COATING TO THE SATISFACTION OF THE ENGINEER TO CLEANED AND DERUSTED REINFORCING STEEL.

NOTE:
IF SECONDARY REINFORCING STEEL HAS LOST MORE THAN 15% OF DIAMETER OR IF MAIN REINFORCING STEEL HAS LOST MORE THAN 5% OF DIAMETER, STRUCTURAL ENGINEER TO ADVISE ON THE ADDITION OF SUPPLEMENTAL REINFORCEMENT.

CONSTRUCTION RECORD WORKS CONTRACT ENGINEER Name : Prof. Reg. No. : Date : SANRAL PROJECT MANAGER Name : Prof. Reg. No. : Date :		DESIGNED BY NAME : Prof. Reg. No. : CHECKED BY NAME : Prof. Reg. No. : DRAWN BY NAME :		CONSULTANT APPROVAL Name : Prof. Reg. No. : Date :		HEAD OFFICE 48 Tambotie Avenue Val de Grace Pretoria 0184 PO Box 415 Pretoria 0001 South Africa Tel: (012) 844 8000		SOUTHERN REGION 20 Shoreward Drive Baywest Port Elizabeth 6025 P.O. Box 27230 Greenacres 6057 Tel: (041) 398 3200 Fax: (041) 398 3222		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 CEO: SA NATIONAL ROADS AGENCY LTD. Date :		PROJECT DESCRIPTION AD-HOC STRUCTURAL AND DRAINAGE SERVICES IN THE SOUTHERN REGION – EMERGENCY BRIDGE REPAIR WORKS DRAWING TITLE N2 SECTION 16 km 12.29 BRIDGE REPAIRS - LAYOUT AND DETAILS SCALE : AS SHOWN		PROJECT NUMBER X.003-022-2018/1-C6 DRAWING LOCATION DATA ROUTE SECTION DRAWING km DISTANCE DRAWING TYPE BRIDGE/STRUCTURE No. CONSULTANT DRAWING No. SANRAL DOCUMENT #		START N2 16 KM 12.29 STRUCTURES - BRIDGES B1252 201931-N2-16-12-00 #####		END N2 16 KM 12.29 VER VA	
FOR TENDER ONLY																			
No.	DATE	REVISION	CONSULT. ENG.									SHEET 1 OF 1							

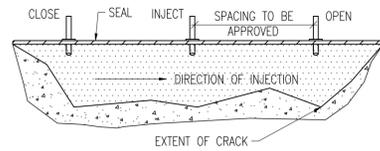
TYPICAL DETAIL – CRACK REPAIR (>0.5mm)

NOTE:
1) INSTALL INJECTION NIPPLES – POSITIONS AS APPROVED BY ENGINEER



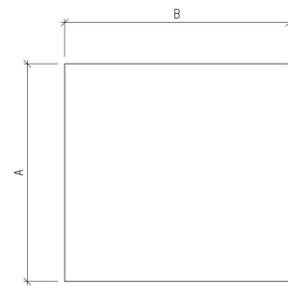
PREPARATION OF CRACK

NOTE:
1) START AT ONE END OF CRACK WITH INJECTION.
2) START INJECTING AT LOWEST POINT.
3) INJECT UNTIL CONSTANT FLOW OF EPOXY IS VISIBLE AT THE NEXT NIPPLE.
4) CLOSE CURRENT NIPPLE AND PROCEED TO NEXT NIPPLE.
4) WHEN COMPLETE, GRIND OFF NIPPLES AND SURFACE EPOXY SEAL.

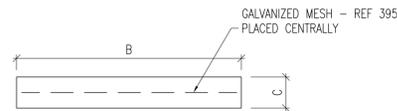


INJECTION OF CRACK

PRECAST PANEL DETAILS



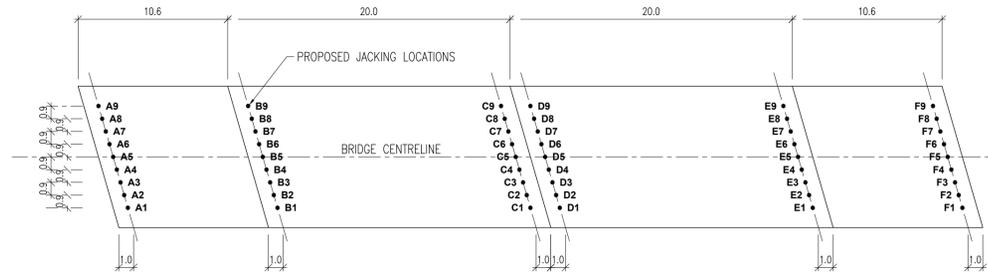
PLAN



SECTION

- NOTES:
1. REMOVE ALL PRECAST SIDEWALK PANELS
 2. UNCOVER WATER PIPES TO IDENTIFY DAMAGED AREAS AND FIX ALL LEAKS
 3. IDENTIFY ALL DAMAGED PANELS AND CONFIRM DIMENSIONS.
 4. PLACE SAND FILL AROUND PIPES AND REPLACE PANELS

LIFTING AND BEARING REPLACEMENT



Location	A1/F9	A2/F8	A3/F7	A4/F6	A5/F5	A6/F4	A7/F3	A8/F2	A9/F1
DL	122	80	74	71	70	69	69	74	122
NA _{max}	57	82	85	86	81	86	85	83	61
60% of NA _{max}	35	50	51	52	49	52	51	50	37
EST JACKING FORCE	157	130	125	123	119	121	120	124	159
Location	B1/E9	B2/E8	B3/E7	B4/E6	B5/E5	B6/E4	B7/E3	B8/E2	B9/E1
DL	401	302	288	283	283	285	291	306	413
NA _{max}	153	154	155	151	138	150	154	153	158
60% of NA _{max}	92	93	93	91	83	90	93	92	95
EST JACKING FORCE	493	395	381	374	366	375	384	398	508
Location	C1/D9	C2/D8	C3/D7	C4/D6	C5/D5	C6/D4	C7/D3	C8/D2	C9/D1
DL	299	203	189	184	180	176	173	170	214
NA _{max}	197	172	165	157	147	156	162	167	186
60% of NA _{max}	119	104	99	95	89	94	98	101	112
EST JACKING FORCE	418	307	288	279	269	270	271	271	326

INDICATIVE JACKING VALUES (kN)

POSITION	No OFF	VERTICAL LOADS				MAX HORIZONTAL LOAD (kN)	MAX HORIZONTAL DISPLACEMENT (kN)	
		DEAD LOADS (kN)	MAX. LOAD (kN)	MIN. LOAD (kN)	LONGITUDINAL (mm)		TRANSVERSE (mm)	
ABUTMENT A & E								
A1 - A9 & E1 - E9	18	87	151	28	5	3.5	1	
PIER B & D								
B1 - B9 & D1 - D9	18	443	631	302	5	3.5	1	
PIER C								
C1 - C9	9	536	744	139	5	3.5	1	

NOTES

1. THE PROPOSED METHODOLOGY SHOULD ONLY BE TAKEN AS A GUIDE. THE CONTRACTOR SHALL AVAIL HIMSELF OF THE CONDITIONS ON SITE.
2. THE CONTRACTOR SHALL SUBMIT A DETAILED METHOD STATEMENT INCLUDING DETAILS OF TEMPORARY WORKS, DESIGNED BY A SUITABLY QUALIFIED COMPETENT PERSON.
3. THE INDICATIVE JACKING FORCES ARE BASED ON MEASUREMENTS ON SITE AND ACTUAL VALUES MAY DIFFER. TRAFFIC WILL BE USING THE BRIDGE DURING JACKING. THE SPEED OF THE TRAFFIC SHALL BE REDUCED AND IT SHALL BE ENSURED THAT NO CONGESTION OCCURS DURING JACKING. THE JACKING FORCE MAY HAVE TO ACCOMMODATE UP TO 60% OF FULL NA LOADING.

PROPOSED BEARING PLACEMENT METHODOLOGY

STAGE 1

- 1.1. REMOVE EXISTING EXPANSION JOINTS IN HALF WIDTHS
- 1.2. ENSURE THAT THE JOINT BETWEEN THE DECK AND THE BALLAST WALL IS CLEAN AND ALLOWS FREE MOVEMENT OF THE DECK

STAGE 2

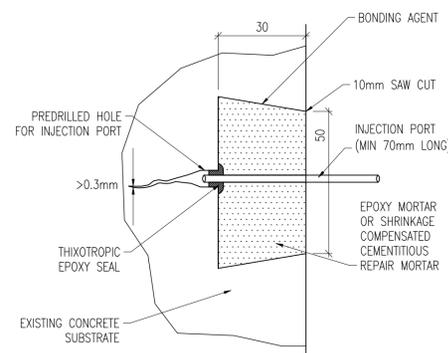
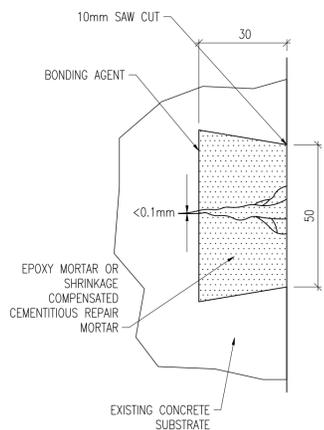
- 2.1. RAISE THE DECK AT ALL SUPPORT LOCATIONS SIMULTANEOUSLY. IT IS FORESEEN THAT THE JACKS WILL BE PLACED ON TEMPORARY SUPPORTS FOUNDED ON THE EXISTING BRIDGE FOUNDATIONS.
- 2.2. LIMIT THE SPEED OF TRAFFIC TO BELOW 60km/h AND LIMIT THE NUMBER OF VEHICLES USING THE BRIDGE AT ANY ONE TIME TO ENSURE NO CONGESTION DURING JACKING AND RAISE THE DECK SUFFICIENTLY TO REMOVE THE EXISTING BEARINGS.
- 2.3. SUPPORT THE DECK ON TEMPORARY BEARINGS AT THE REQUIRED LEVEL.
- 2.4. PROVIDE TEMPORARY ASPHALT RAMP TO ALLOW TRAFFIC TO USE THE BRIDGE AT REDUCED SPEED.
- 2.5. CLOSE THE SHOULDERS OF THE BRIDGE TO ONLY ALLOW TWO LANES OF TRAFFIC BEFORE OPENING THE ROAD.
- 2.7. REPEAT STEPS 2.1 TO 2.6 FOR THE REMAINING ABUTMENTS

STAGE 3

- 3.1. WHILE THE BRIDGE IS SUPPORTED ON TEMPORARY SUPPORTS, THE EXISTING BEARINGS CAN BE REMOVED.
- 3.2. THE BEARING SEATINGS SHALL THEN BE PREPARED FOR REPLACEMENT BEARINGS. PLEASE NOTE THAT THE PLINTHS MAY HAVE TO BE DEMOLISHED TO CREATE ROOM FOR THE NEW BEARINGS.
- 3.3. THE TOP LEVEL OF THE NEW BEARINGS SHALL BE WITHIN 1mm OF THE EXISTING BEARINGS.
- 3.4. AFTER THE NEW BEARINGS ARE IN PLACE, A THIN LAYER OF EPOXY MORTAR SHALL BE PLACED ON TOP OF THE BEARING, BEFORE THE DECK IS LOWERED DURING ANOTHER ROAD CLOSURE FOR A CHOSEN ABUTMENT. THE DECK SHALL BE LOWERED UNTIL THE EPOXY MORTAR IS SQUEEZED OUT ALL AROUND. THE DECK SHALL THEN BE SUPPORTED AT THIS LEVEL UNTIL THE MORTAR HAS GAINED SUFFICIENT STRENGTH. THIS IS TO ACCOMMODATE SURFACE IRREGULARITIES AND ENSURE EQUAL LOAD DISTRIBUTION.
- 3.6. REMOVE TEMPORARY ASPHALT RAMPS AND OPEN BRIDGE TO TRAFFIC

TYPICAL DETAIL – LARGE CRACK REPAIR

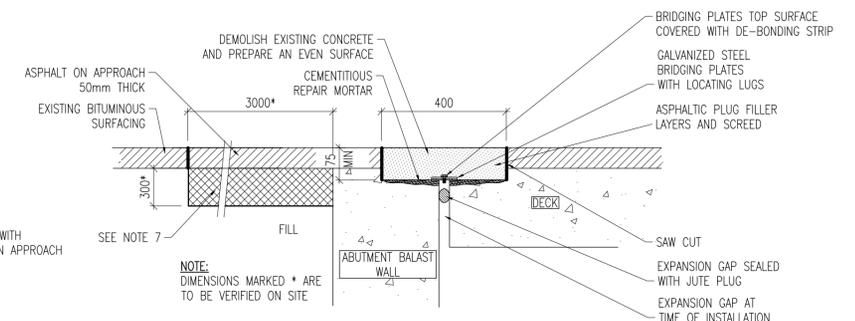
NOTE:
IF ONCE CRACK HAS BEEN SAW CUT AND REAMED OUT IT IS DISCOVERED THE REMAINING CRACK IS LARGER THAN 0.3mm, CRACK INJECTION WILL BE REQUIRED.



TYPICAL DETAIL – ASPHALTIC PLUG JOINT AT ABUTMENTS

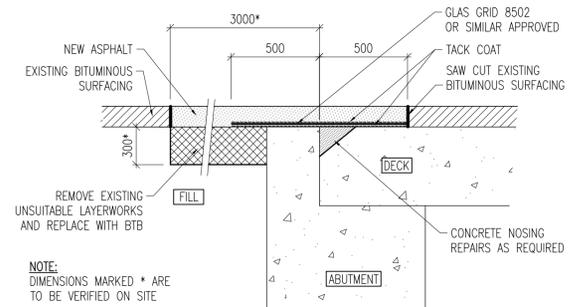
EXPANSION JOINT NOTES:

1. EXPANSION JOINT TO BE 400x75 ASPHALTIC PLUG JOINTS
2. INSTALLATION TO BE DONE UNDER TRAFFIC CONDITIONS
3. THESE JOINTS SHALL BE INSTALLED BY SPECIALISTS OR UNDER THE SUPERVISION OF THE MANUFACTURER.
4. THE JOINTS MUST BE AGREEMENT SA APPROVED WITH IDENTIFICATION DETAILS
5. SEAL PARAPET JOINTS IN LINE WITH ASPHALTIC PLUG JOINTS WITH AN APPROVED SILICON SEALANT
6. REMOVAL OF UNSUITABLE PAVEMENT LAYERS AND REPLACE WITH BTB COMPACTED IN LAYERS AT DAMAGED ROAD SURFACE ON APPROACH



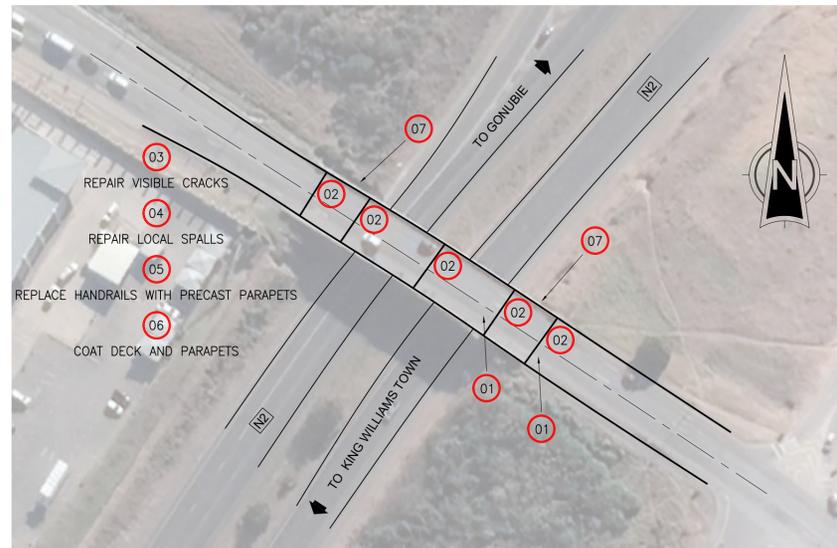
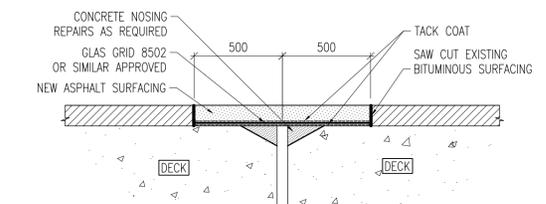
CONSTRUCTION RECORD		DESIGNED BY		CONSULTANT APPROVAL		HEAD OFFICE		SOUTHERN REGION		ACCEPTANCE		PROJECT DESCRIPTION		PROJECT NUMBER	
WORKS CONTRACT ENGINEER		NAME		NAME		48 Tambotie Avenue Vai de Grace Pretoria		20 Shoreward Drive Baywest Port Elizabeth 6025		THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATSOEVER CAUSE OR HOWEVER ARISING		AD-HOC STRUCTURAL AND DRAINAGE SERVICES IN THE SOUTHERN REGION – EMERGENCY BRIDGE REPAIR WORKS		X.003-022-2018/1-C6	
Name		CHECKED BY		NAME		PO Box 415 Pretoria 0001 South Africa		P.O. Box 27230 Greenacres 6057		DRAWING TITLE		DRAWING LOCATION DATA		START	
Date		NAME		NAME		Tel: (012) 944 8000		Tel: (041) 398 3200 Fax: (041) 398 3222		N2 SECTION 16 km 12.29 BRIDGE REPAIRS - DETAILS		ROUTE		END	
SANRAL PROJECT MANAGER		Prof. Reg. No. :		Prof. Reg. No. :						N2		N2			
Name		Date		Date						16		16			
Date		Date		Date						DRAWING km DISTANCE		KM 12.29		KM 12.29	
FOR TENDER		CONSULT. ENG.		DRAWN BY						DRAWING TYPE		STRUCTURES - BRIDGES			
REVISION		Date		NAME						BRIDGE/STRUCTURE No.		B1252			
										CONSULTANT DRAWING No.		201931-N2-16-12-01		VER	
										SCALE :		AS SHOWN		SHEET 1 OF 1	
										SANRAL DOCUMENT #		#####		VA	

TYPICAL DETAIL – BURIED TYPE JOINT AT ABUTMENTS

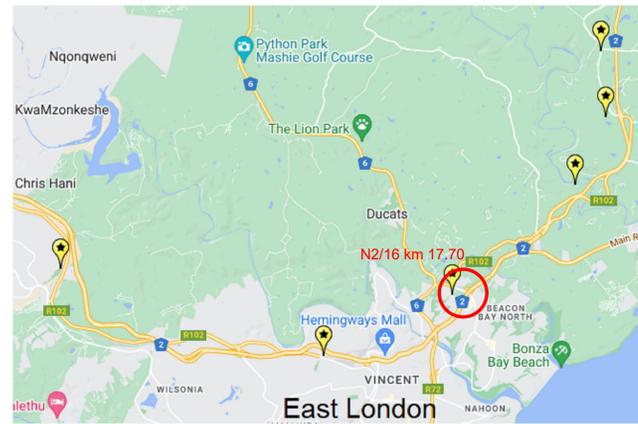


NOTE: DIMENSIONS MARKED * ARE TO BE VERIFIED ON SITE

TYPICAL DETAIL – BURIED TYPE JOINT AT PIERS IN ROADWAY



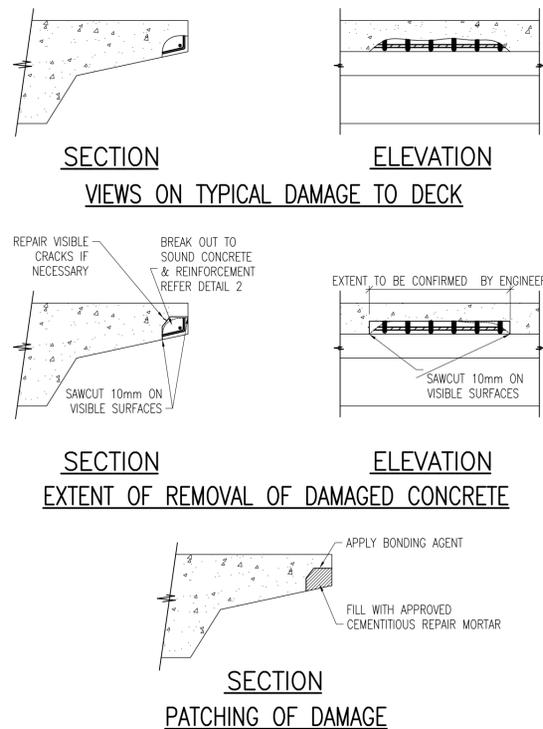
PLAN ON BRIDGE B4084 – (N2/16 @ km 17.70)
NTS



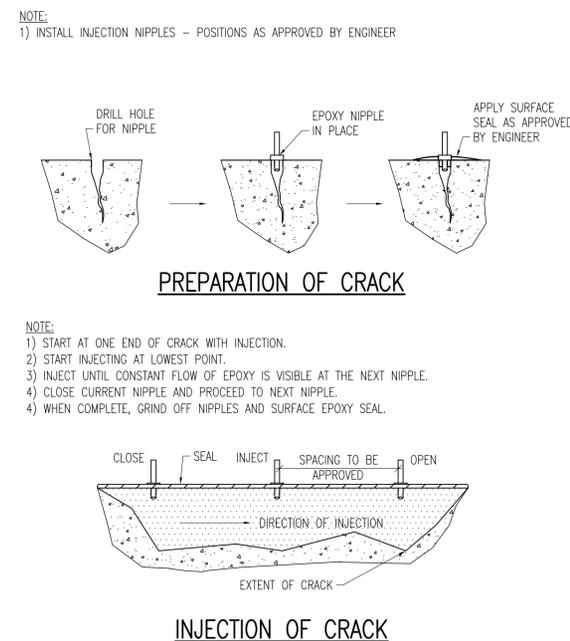
LOCALITY

ITEM	DESCRIPTION
01	REPAIR ROAD SURFACING
02	REPLACE BRIDGE EXPANSION JOINTS
03	SEAL ALL VISIBLE CRACKS
04	REPAIR LOCAL SPALLS
05	REMOVE METAL HANDRAIL AND REPLACE WITH PRECAST CONCRETE PARAPETS
06	COAT DECK AND PARAPETS WITH APPROVED BARRIER COATING
07	CLEAN ABUTMENTS WITH HIGH PRESSURE WATER JETTING AND TREAT WITH APPROVED BARRIER COATING. IF SIGNS OF ASR ARE FOUND, TREAT WITH SILANE.

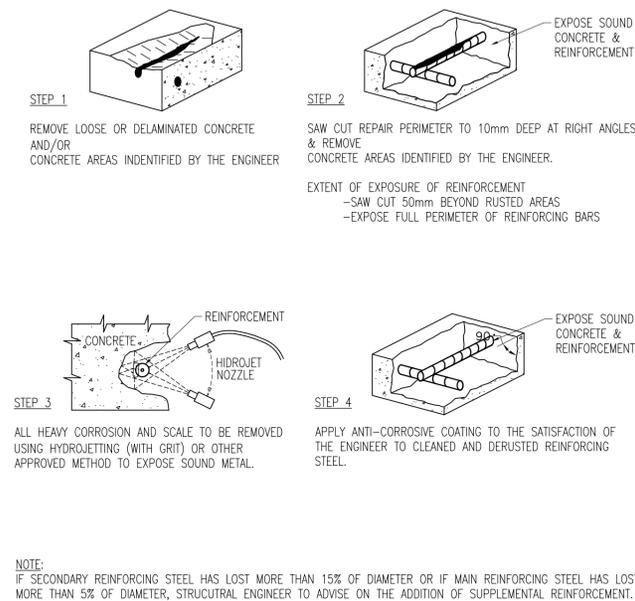
TYPICAL DETAIL – CONCRETE REPAIR



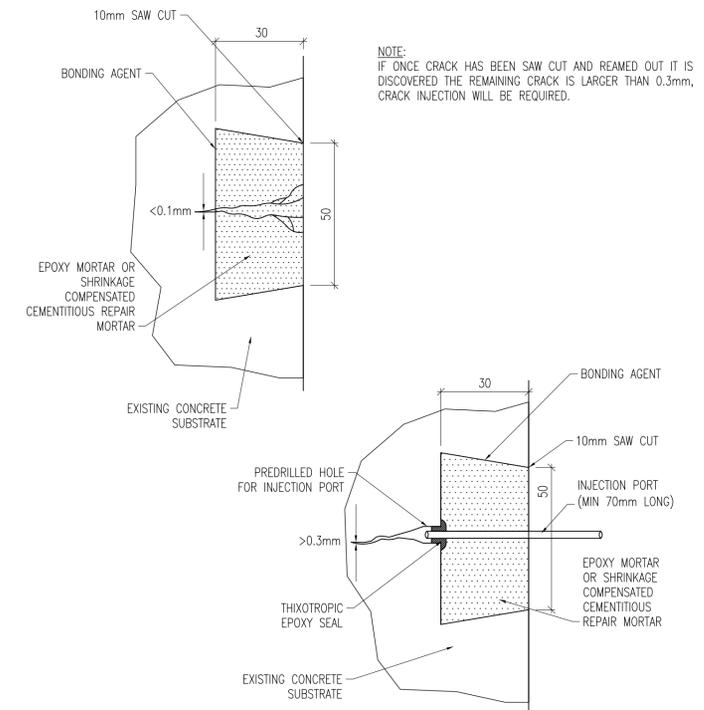
TYPICAL DETAIL – CRACK REPAIR (>0.5mm)



TYPICAL DETAIL – TREATMENT OF REINFORCEMENT



TYPICAL DETAIL – LARGE CRACK REPAIR



No.	DATE	REVISION	CONSULT. ENG.

CONSTRUCTION RECORD	
WORKS CONTRACT ENGINEER	
Name	
Prof. Reg. No.	
Date	
SANRAL PROJECT MANAGER	
Name	
Prof. Reg. No.	
Date	

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

CONSULTANT APPROVAL	
NAME	
Prof. Reg. No.	
DATE	

ACCEPTANCE	
NAME	
Prof. Reg. No.	
DATE	

PROJECT DESCRIPTION	
AD-HOC STRUCTURAL AND DRAINAGE SERVICES IN THE SOUTHERN REGION – EMERGENCY BRIDGE REPAIR WORKS	
DRAWING TITLE	
N2 SECTION 16 km 17.70 BRIDGE REPAIRS - LAYOUT AND DETAILS	

PROJECT NUMBER	
X.003-022-2018/1-C6	
DRAWING LOCATION DATA	
ROUTE	N2
SECTION	16
DRAWING km DISTANCE	KM 17.70
DRAWING TYPE	STRUCTURES - BRIDGES
BRIDGE/STRUCTURE No.	B4084
CONSULTANT DRAWING No.	201931-N2-16-18-00
SANRAL DOCUMENT #	#####

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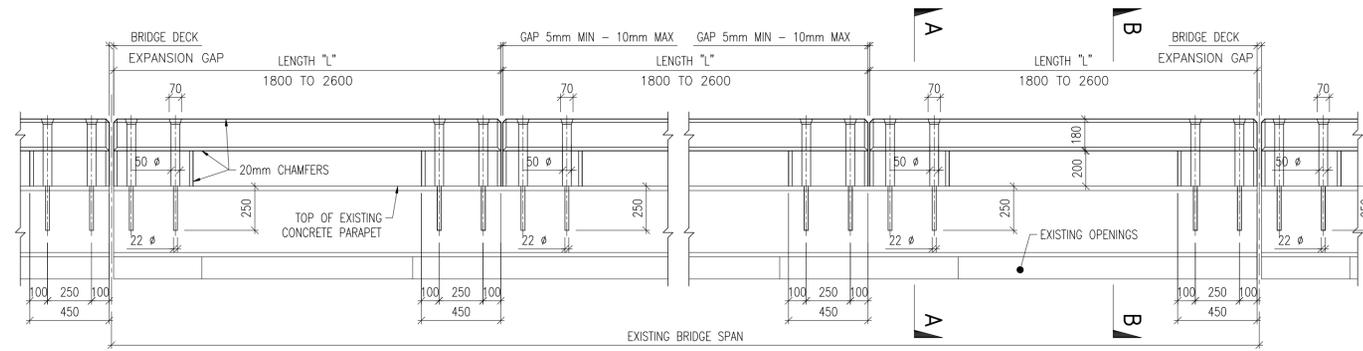


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Date:

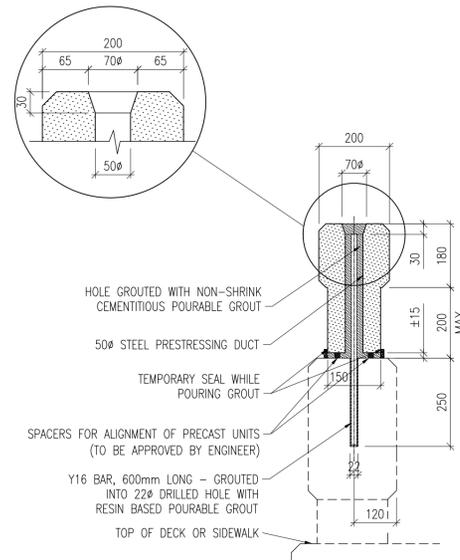
SCALE: AS SHOWN SHEET 1 OF 1

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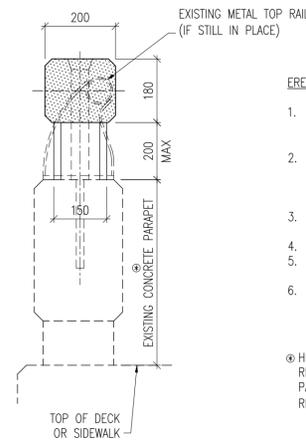
PARAPET REPAIR – TYPICAL ELEVATION

1:20



SECTION A-A

1:10

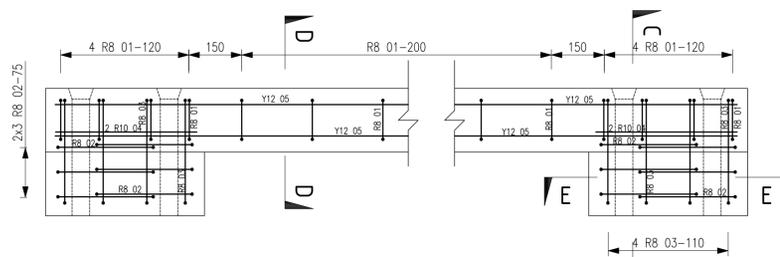


SECTION B-B

1:10

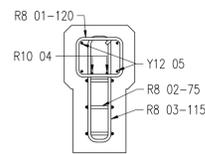
ERECTION PROCEDURE

1. REMOVE ANY EXISTING BRACKETS & PATCH BOLT HOLES (REFER REPAIR PRODUCTS LIST)
 2. DRILL 22mm ϕ HOLES INTO EXISTING PARAPET AS PER DETAIL, IF HOLES ARE CORED, HOLES TO BE SCABBLED TO ENSURE GROUT ADHESION.
 3. CLEAN GROUT CONTACT SURFACES AS PER PRODUCT SPECIFICATIONS.
 4. PLACE AND GROUT Y16 DOWEL BARS
 5. PLACE PRECAST UNITS AND ENSURE ALIGNMENT
 6. GROUT HOLES IN PRECAST UNITS & GAP BETWEEN UNITS AND EXISTING PARAPETS WITH CEMENTITIOUS POURABLE GROUT.
- ϕ HEIGHT TO BE CHECKED TO COMPLY WITH HEIGHT REQUIREMENT FOR CLASS 1 BALUSTRADE TO TMH7 PARTS 1 & 2, 1981 AS AMENDED 1988. REFER TO CLAUSE 3.5.1.2, Fb' = 15kN, FIG. 5



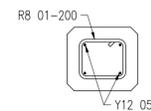
TYPICAL ELEVATION OF PRECAST UNIT (SHOWING REINFORCEMENT)

NTS



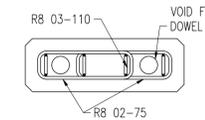
SECTION C-C

NTS



SECTION D-D

NTS



SECTION E-E

NTS

NOTES

1. GENERAL:
 - 1.1 PARAPET DESIGNED ACCORDING TO TMH7, PARTS 1 & 2, 1981 AS AMENDED 1988 REFER TO CLAUSE 3.5.1.2, Fb' = 15kN, FIG. 5
 - 1.2 THE REQUIRED LENGTH OF PARAPET, LAYOUT AND THE REQUIRED UNIT QUANTITIES & LENGTHS SHALL BE DETERMINED ON SITE.
2. MATERIAL AND FINISHES:

THE MATERIAL AND WORK SHALL COMPLY WITH THE RELEVANT CLAUSES OF SERIES 6000 AND 7000 OF THE STANDARD SPECIFICATIONS, THE PROJECT SPECIFICATIONS AND SHALL INCLUDE THE FOLLOWING.

 - 2.1 CHARACTERISTIC STRENGTH OF MATERIALS:
 - 2.1.1 REINFORCEMENT:

DESCRIPTION	CHARACTERISTIC STRENGTH (MPa)	YOUNG'S MODULUS (GPa)
MILD STEEL BARS	250	200
HIGH TENSILE STEEL	450	200
 - 2.1.2 CONCRETE:

DESCRIPTION	CHARACTERISTIC STRENGTH (MPa)	CONCRETE CLASS (MPa/mm)	YOUNG'S MODULUS (GPa)
TOP RAIL	W50	50/13	28
 - 2.2 SURFACE FINISHES:

CLASS F3	–	STEEL SHUTTER FINISH
CLASS U3	–	STEEL TROWEL FINISH
 - 2.3 MINIMUM CONCRETE COVER : 40mm (TOP RAIL)
 - 2.4 MINIMUM LAP LENGTH = 43 DIA. : 30mm (COLUMNS)
 - 2.5 ALL EXPOSED SHARP CORNERS SHALL BE CHAMFERED 20mm x 20mm
3. MANUFACTURE :
 - 3.1 THE PRECAST PARAPET UNITS SHALL CONFORM TO ALL DETAILS, INCLUDING DIMENSIONAL TOLERANCES SHOWN ON DETAIL DRAWINGS.
 - 3.2 THE FOLLOWING IDENTIFICATION MARKING SHALL APPEAR ON END OF EACH UNIT:
 - a) THE MOULD NUMBER, TYPE OF UNIT AND BRIDGE NUMBER (WHERE APPLICABLE)
 - b) THE DATE OF CASTING
 - 3.3 TOLERANCES :

THE SHUTTER SHALL BE MANUFACTURED TO TOLERANCES THAT WILL ENSURE THAT UNITS AFTER CASTING COMPLY WITH THE FOLLOWING TOLERANCES:

4.1 DIMENSIONS:	
TRANSVERSAL	: +5mm – 0mm
LONGITUDINAL	: +0mm – 5mm
4.2 SURFACE IRREGULARITIES AND WARP MEASURED BY MEANS OF A STRAIGHT EDGE:	
TRANSVERSE	: –2mm
LONGITUDINAL	: –3mm OVER LENGTH OF UNIT
4.3 SQUARENESS OF ENDS:	
NO DIMENSIONS SHALL DEVIATE BY MORE THAN 3mm FROM THE THEORETICAL SQUARE PLANE CORRESPONDING TO THE FURTHEST PROJECTING CONCRETE.	
4.4.1 DIMENSION FROM SETTING OUT LINE TO FRONT FACES:	
10mm OUTWARDS, 0mm INWARDS	
4.4.2 STEPS IN CONCRETE FRONT FACES AT ABUTTING UNITS :	3mm
4.4.3 DEVIATION FROM LINE AND LEVEL MEASURED OVER ANY 5 UNITS :	5mm
 - 4.5 ERECTION OF PARAPET UNITS
 - 5.1 GENERAL:
 - 5.1.1 NON-SHRINK CEMENTITIOUS GROUT AND EPOXY GROUT AS APPROVED BY THE ENGINEER.
 - 5.1.2 DURABILITY OF CONCRETE WITHIN 5km OF COAST NEEDS SPECIAL ATTENTION.
 - 5.1.3 NO UNIT SHALL BE TRANSPORTED OR ERECTED BEFORE IT HAS ATTAINED A CHARACTERISTIC CONCRETE STRENGTH OF 20MPa.
 - 5.1.4 IN ORDER TO ACHIEVE GOOD ALIGNMENT WITH A UNIFORM APPEARANCE THE FOLLOWING PROCEDURE IS RECOMMENDED FOR EACH INDIVIDUAL BRIDGE:
 - a) ONLY UNITS OF MATCHING COLOUR FINISH FROM ONE MOULD TO BE USED IN A PARTICULAR PARAPET.
 - b) LINING UP OF THE PARAPET UNITS SHALL BE COMPLETED OVER THE FULL LENGTH OF THE BRIDGE PRIOR TO GROUTING.
 - 5.1.5 THE PREPARATION OF THE CONCRETE SURFACES PRIOR TO THE PLACING AND GROUTING IN OF THE UNITS AND THE GROUTING OPERATION SHALL BE AS SPECIFIED IN CLAUSE 6408(b) OF THE STANDARD SPECIFICATIONS AND SHALL INCLUDE THE RECOMMENDATION OF THE GROUT MANUFACTURER.

No.	DATE	REVISION	CONSULT. ENG.

CONSTRUCTION RECORD	
WORKS CONTRACT ENGINEER	
Name	
Prof. Reg. No.	
Date	
SANRAL PROJECT MANAGER	
Name	
Prof. Reg. No.	
Date	

FOR TENDER ONLY

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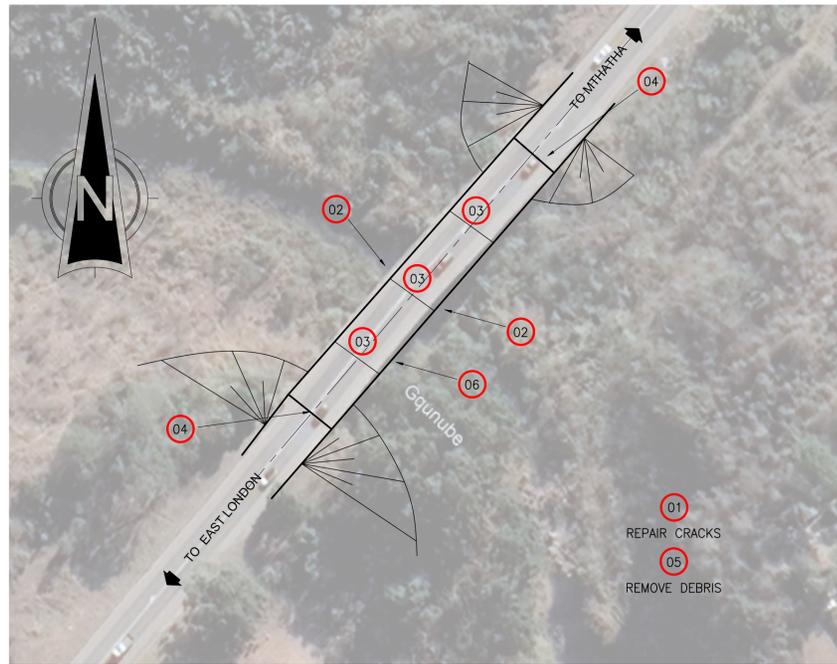


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Date:

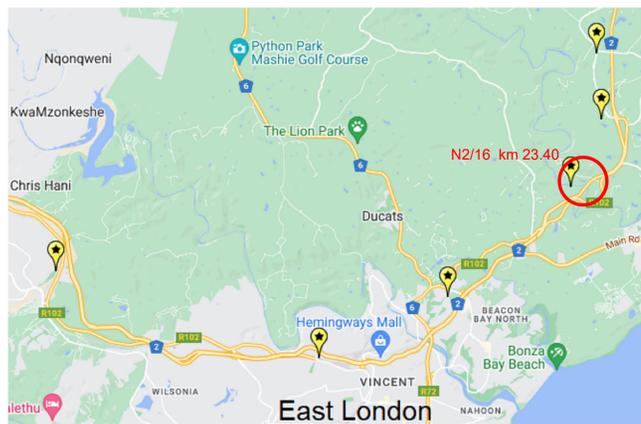
PROJECT DESCRIPTION	
AD-HOC STRUCTURAL AND DRAINAGE SERVICES IN THE SOUTHERN REGION – EMERGENCY BRIDGE REPAIR WORKS	
DRAWING TITLE	
N2 SECTION 16 km 17.70 BRIDGE REPAIRS - PARAPET DETAILS	
SCALE :	AS SHOWN

PROJECT NUMBER		X.003-022-2018/1-C6	
DRAWING LOCATION DATA	START	END	
ROUTE	N2	N2	
SECTION	16	16	
DRAWING km DISTANCE	KM 17.70	KM 17.70	
DRAWING TYPE	STRUCTURES - BRIDGES		
BRIDGE/STRUCTURE No.	B4084		
CONSULTANT DRAWING No.	201931-N2-16-18-01		
SANRAL DOCUMENT #	#####		
	SHEET	1	OF 1



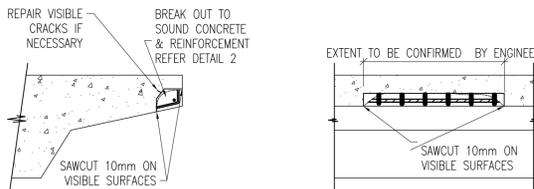
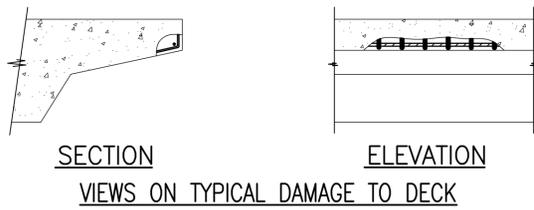
PLAN ON BRIDGE B1264 – (N2/16 @ km 23.40)
NTS

ITEM	DESCRIPTION
01	REPAIR AND SEAL CRACKS IN ABUTMENTS AND PARAPETS
02	REMOVE VEGETATION FROM TOP OF PIERS
03	REPLACE EXISTING EXPANSION JOINTS WITH ASPHALTIC PLUG TYPE JOINTS
04	REPLACE EXISTING EXPANSION JOINTS AT APPROACH SLAB ENDS WITH BURIED TYPE JOINT
05	REMOVE VEGETATION AND DEBRIS FROM WATERWAY
06	REPAIR/REPLACE DAMAGED PARAPET BY REMOVING COMPLETE EXISTING TOP RAIL OF DAMAGED PARAPET AND REPLACE WITH PRECAST TOP RAIL
07	SCAN DECK WITH GROUND PENETRATING RADAR (GPR) TO DETERMINE THE PRESENCE AND LOCATION OF DECK VOIDS AND PROVIDE DRAINAGE TO VOIDS IF PRESENT
08	COAT EXPOSED CONCRETE SURFACES WITH AN APPROVED BARRIER COATING.

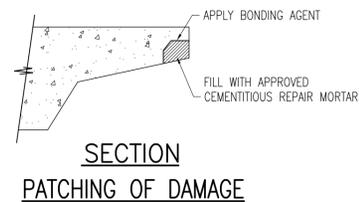


LOCALITY

TYPICAL DETAIL – CONCRETE REPAIR

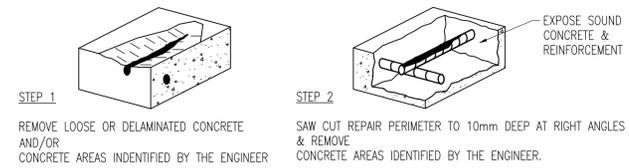


SECTION ELEVATION
EXTENT OF REMOVAL OF DAMAGED CONCRETE

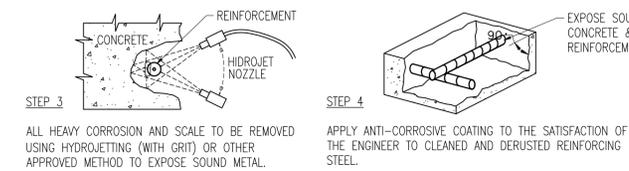


SECTION
PATCHING OF DAMAGE

TYPICAL DETAIL – TREATMENT OF REINFORCEMENT

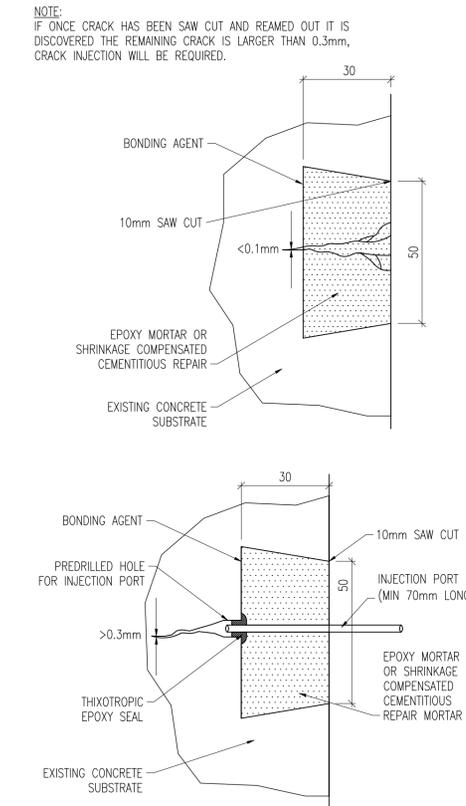


EXTENT OF EXPOSURE OF REINFORCEMENT
-SAW CUT 50mm BEYOND RUSTED AREAS
-EXPOSE FULL PERIMETER OF REINFORCING BARS



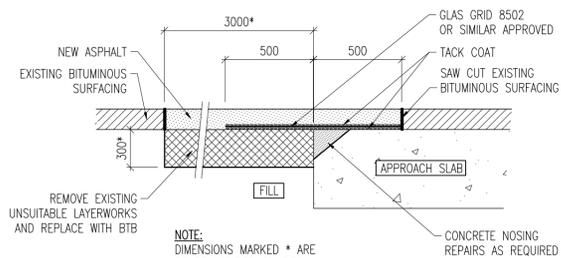
NOTE:
IF SECONDARY REINFORCING STEEL HAS LOST MORE THAN 15% OF DIAMETER OR IF MAIN REINFORCING STEEL HAS LOST MORE THAN 5% OF DIAMETER, STRUCTURAL ENGINEER TO ADVISE ON THE ADDITION OF SUPPLEMENTAL REINFORCEMENT.

TYPICAL DETAIL – LARGE CRACK REPAIR



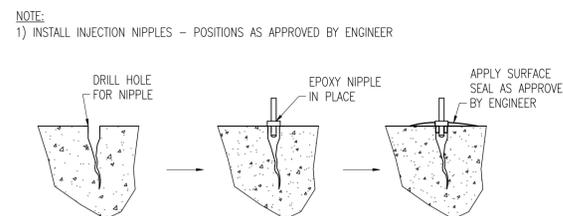
NOTE:
IF ONCE CRACK HAS BEEN SAW CUT AND REAMED OUT IT IS DISCOVERED THE REMAINING CRACK IS LARGER THAN 0.3mm, CRACK INJECTION WILL BE REQUIRED.

TYPICAL DETAIL – BURIED TYPE JOINT@ APPROACH SLAB ENDS



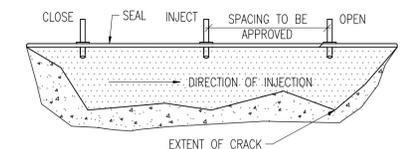
NOTE:
DIMENSIONS MARKED * ARE TO BE VERIFIED ON SITE

TYPICAL DETAIL – CRACK REPAIR (>0.5mm)



PREPARATION OF CRACK

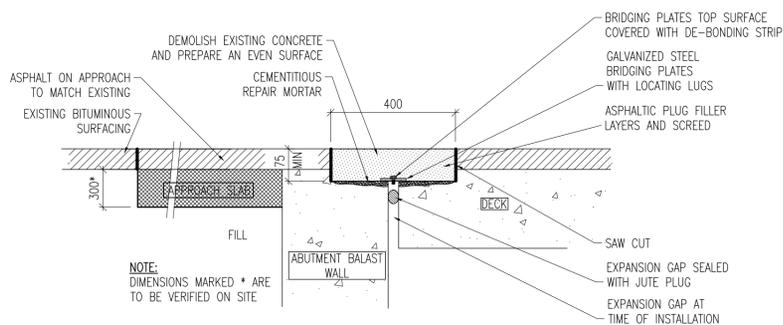
NOTE:
1) START AT ONE END OF CRACK WITH INJECTION.
2) START INJECTING AT LOWEST POINT.
3) INJECT UNTIL CONSTANT FLOW OF EPOXY IS VISIBLE AT THE NEXT NIPPLE.
4) CLOSE CURRENT NIPPLE AND PROCEED TO NEXT NIPPLE.
4) WHEN COMPLETE, GRIND OFF NIPPLES AND SURFACE EPOXY SEAL.



INJECTION OF CRACK

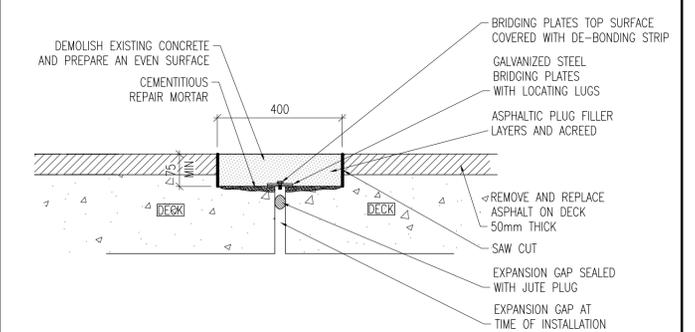
TYPICAL DETAIL – ASPHALTIC PLUG JOINT AT ABUTMENTS

- EXPANSION JOINT NOTES:
- EXPANSION JOINT TO BE 400x75 ASPHALTIC PLUG JOINTS
 - INSTALLATION TO BE DONE UNDER TRAFFIC CONDITIONS
 - THESE JOINTS SHALL BE INSTALLED BY SPECIALISTS OR UNDER THE SUPERVISION OF THE MANUFACTURER.
 - THE JOINTS MUST BE AGREEMENT SA APPROVED WITH IDENTIFICATION DETAILS
 - SEAL PARAPET JOINTS IN LINE WITH ASPHALTIC PLUG JOINTS WITH AN APPROVED SILICON SEALANT



NOTE:
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TYPICAL DETAIL – ASPHALTIC PLUG JOINT



No.	DATE	REVISION

CONSTRUCTION RECORD	
WORKS CONTRACT ENGINEER	
Name	
Prof. Reg. No.	
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SANRAL PROJECT MANAGER	
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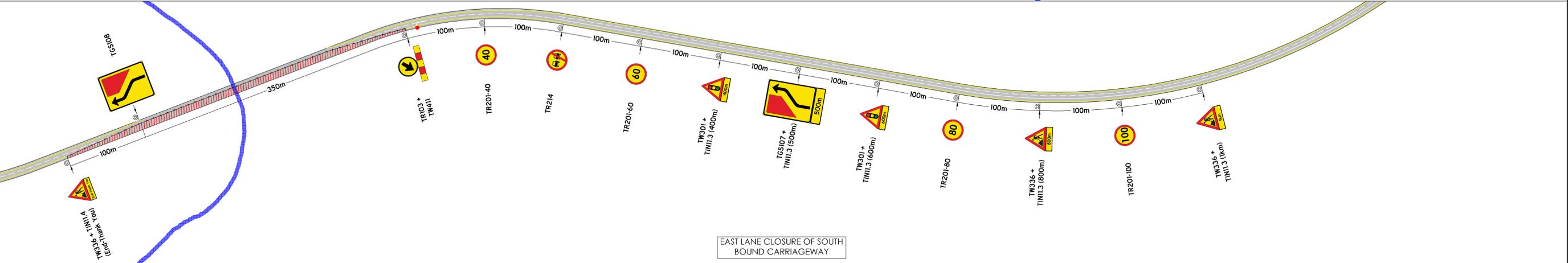
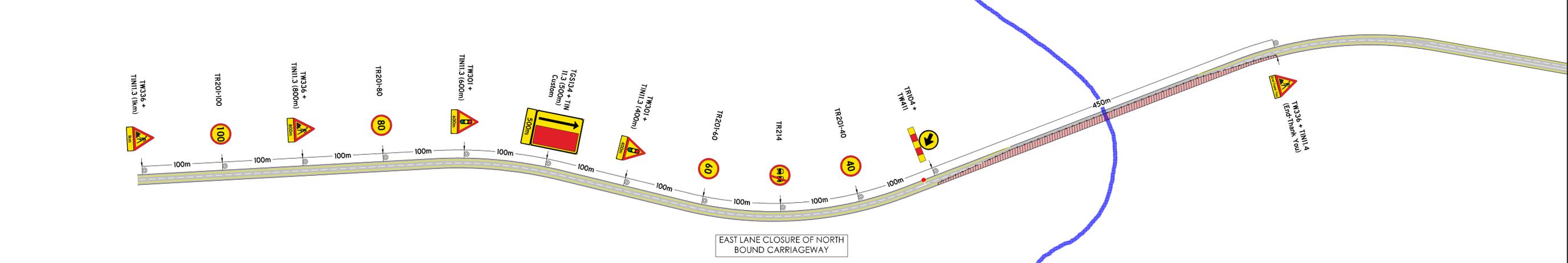
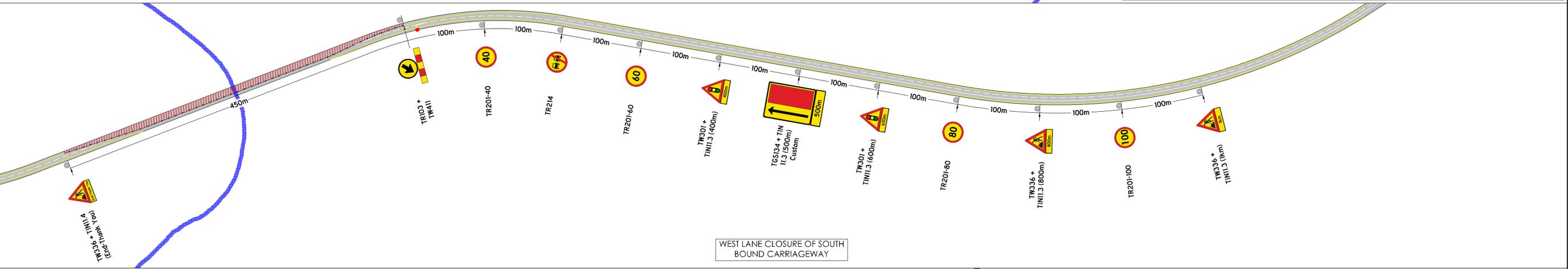
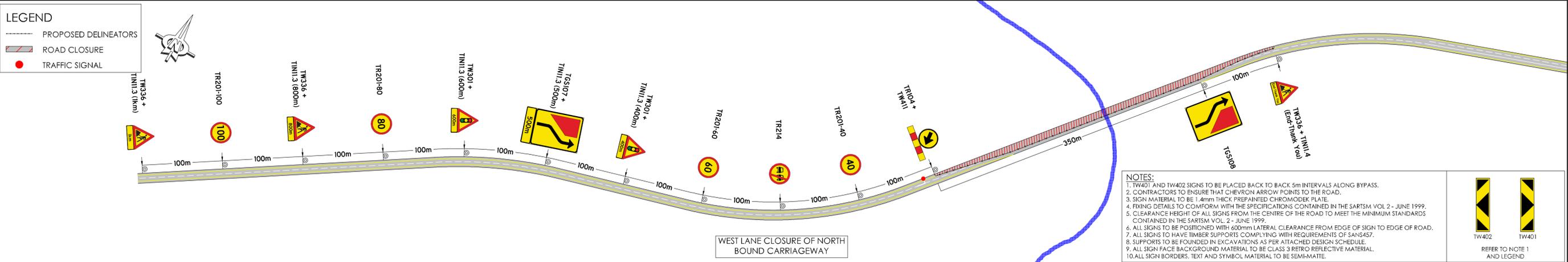


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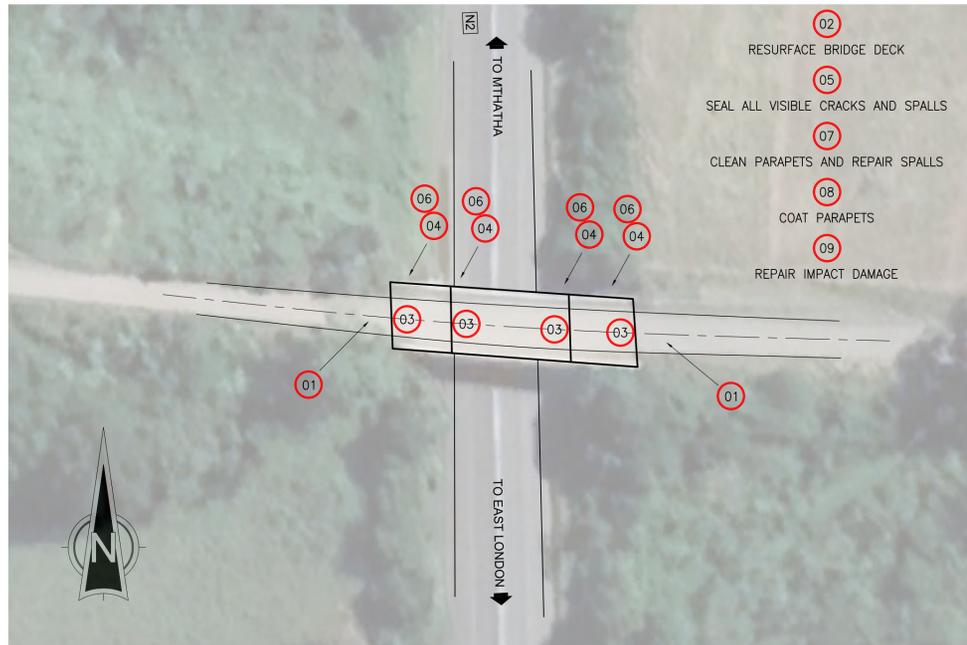
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PROJECT DESCRIPTION
AD-HOC STRUCTURAL AND DRAINAGE SERVICES IN THE SOUTHERN REGION – EMERGENCY BRIDGE REPAIR WORKS
DRAWING TITLE
N2 SECTION 16 km 23.40
BRIDGE REPAIRS - LAYOUT AND DETAILS
SCALE: AS SHOWN
SHEET 1 OF 1

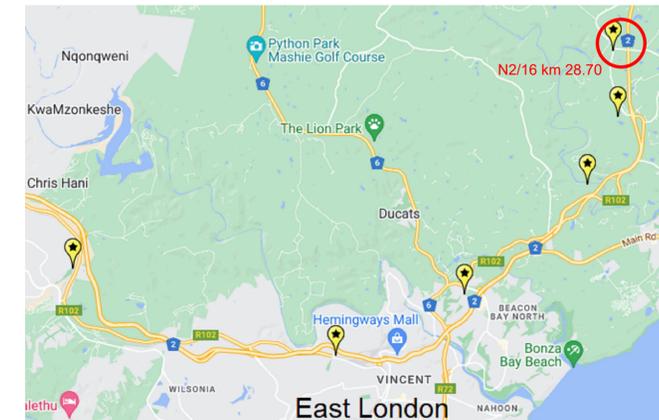
PROJECT NUMBER	X.003-022-2018/1-C6	
DRAWING LOCATION DATA	START	END
ROUTE	N2	N2
SECTION	16	16
DRAWING km DISTANCE	KM 23.40	KM 23.40
DRAWING TYPE	STRUCTURES - BRIDGES	
BRIDGE/STRUCTURE No.	B1264	
CONSULTANT DRAWING No.	201931-N2-16-23-00	
SANRAL DOCUMENT #	#####	



FOR TENDER ONLY		DESIGNED BY NAME: _____ Prof. Reg. No.: _____ CHECKED BY NAME: _____ Prof. Reg. No.: _____ DRAWN BY NAME: _____	CONSULTANT APPROVAL NAME: _____ Prof. Reg. No.: _____ Date: _____	HEAD OFFICE 48 Tambotie Avenue Val de Grace Pretoria 0184 PO Box 415 Pretoria 0001 South Africa Tel: (012) 844 8000	SOUTHERN REGION 20 Shoreward Drive Baywest Port Elizabeth 6025 P.O. Box 27230 Greenacres 6057 Tel: (041) 398 3200 Fax: (041) 398 3222	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 CEO: SA NATIONAL ROADS AGENCY LTD. Date: _____	PROJECT DESCRIPTION AD-HOC STRUCTURAL AND DRAINAGE CONSULTING ENGINEERING AND SUPERVISION SERVICES DRAWING TITLE N2 SECTION 16 KM 23.40 BRIDGE REPAIRS - ACCOMMODATION OF TRAFFIC DETAILS SCALE: 1:2500	PROJECT NUMBER X.003-022-2018/1-C6 DRAWING LOCATION DATA ROUTE: N2 SECTION: 16 KM 23.40 DRAWING TYPE: STRUCTURES - BRIDGES BRIDGE/STRUCTURE No.: B1264 CONSULTANT DRAWING No.: 201931-N2-16-23-02 SANRAL DOCUMENT #	START N2 16 KM 23.40 STRUCTURES - BRIDGES B1264 201931-N2-16-23-02 ##### END N2 16 KM 23.40 STRUCTURES - BRIDGES B1264 201931-N2-16-23-02 ##### VER VA
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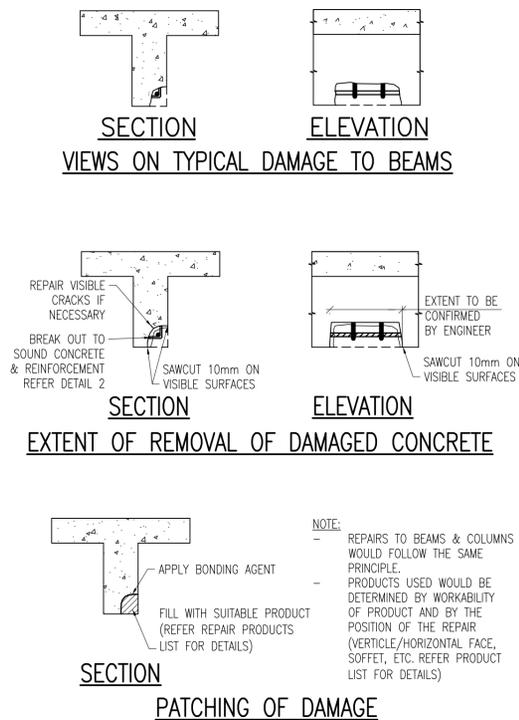
ITEM	DESCRIPTION
01	REPAIR ROAD SURFACING AT APPROACHES
02	RESURFACE DECK
03	REPLACE JOINTS WITH ASPHALTIC PLUG EXPANSION JOINTS
04	CLEAN ABUTMENTS AND PIERS WITH HIGH PRESSURE WATER JETTING
05	SEAL ALL VISIBLE CRACKS AND REPAIR LOCAL SPALLS
06	TREAT ABUTMENTS AND PIERS WITH APPROVED BARRIER COATING. IF SIGNS OF ASR ARE FOUND, TREAT WITH SILANE.
07	CLEAN PARAPETS WITH HIGH PRESSURE WATER JETTING BEFORE REPAIRING SPALLS AND CRACKS
08	COAT PARAPETS WITH APPROVED BARRIER COATING
09	REPAIR IMPACT DAMAGE AND VISIBLE SPALLS



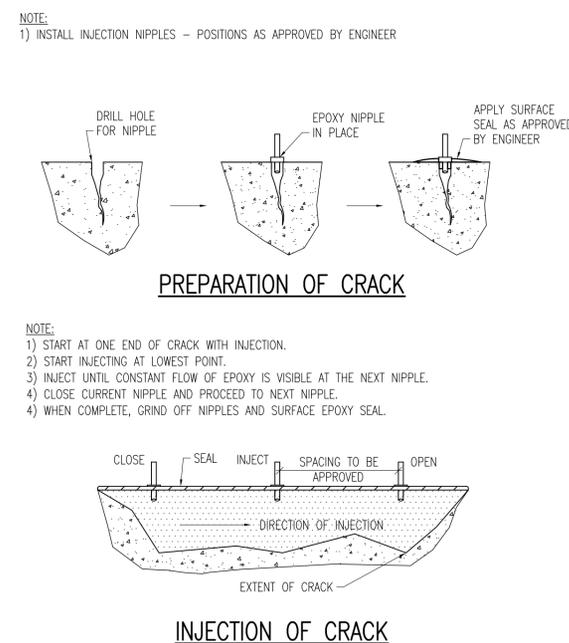
LOCALITY

PLAN ON BRIDGE B1265 – (N2/16 @ km 28.70)
NTS

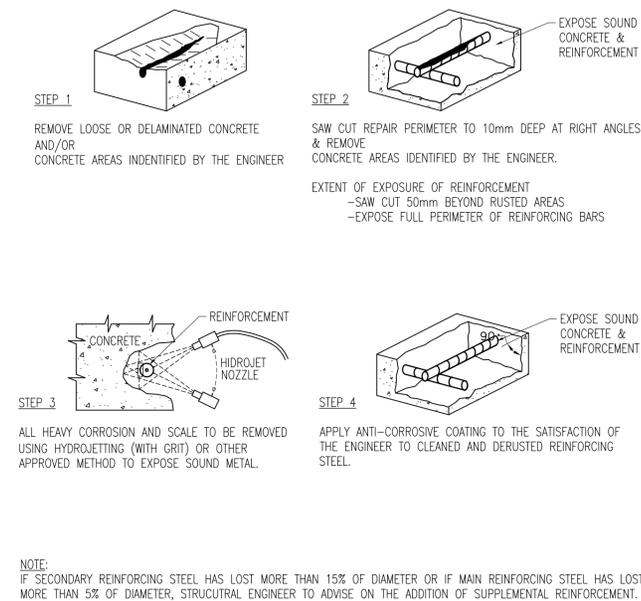
TYPICAL DETAIL – CONCRETE REPAIR



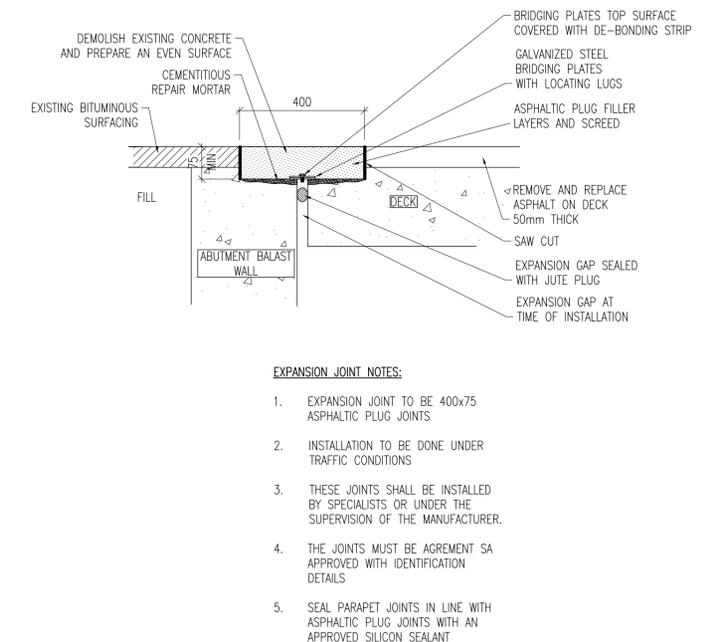
TYPICAL DETAIL – CRACK REPAIR (>0.5mm)



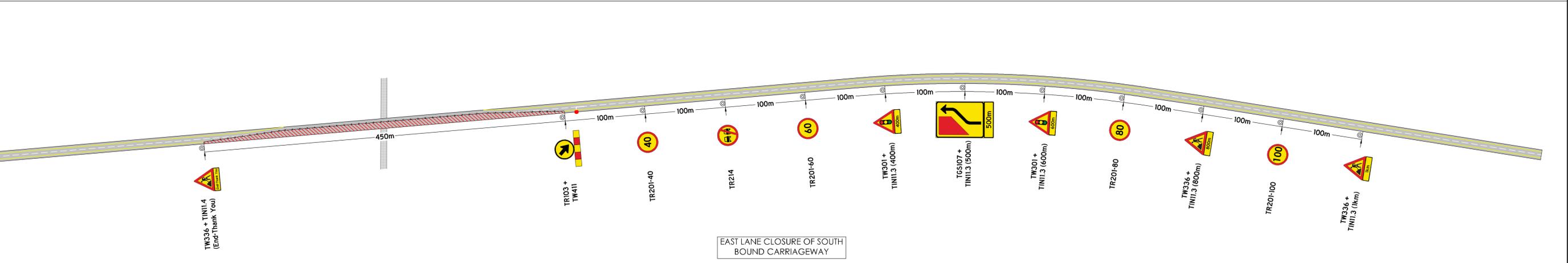
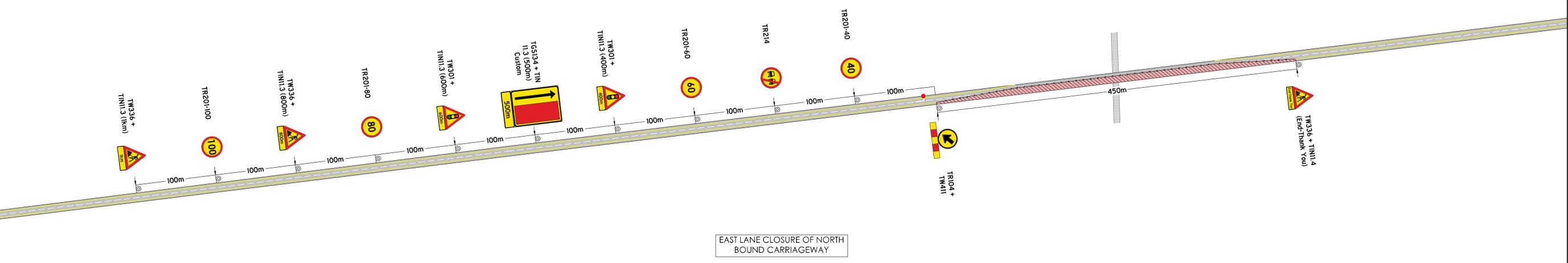
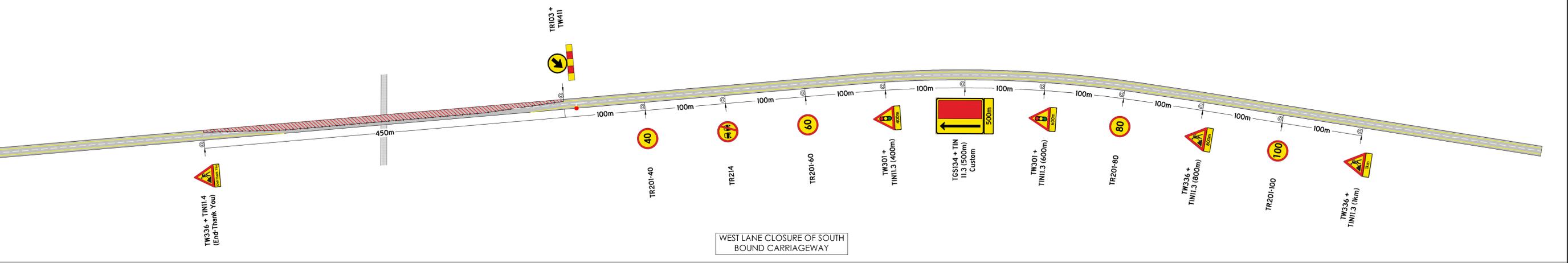
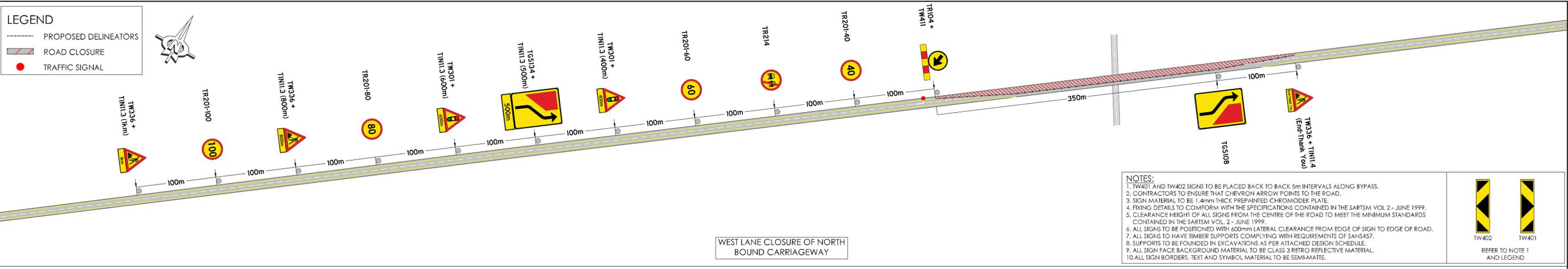
TYPICAL DETAIL – TREATMENT OF REINFORCEMENT



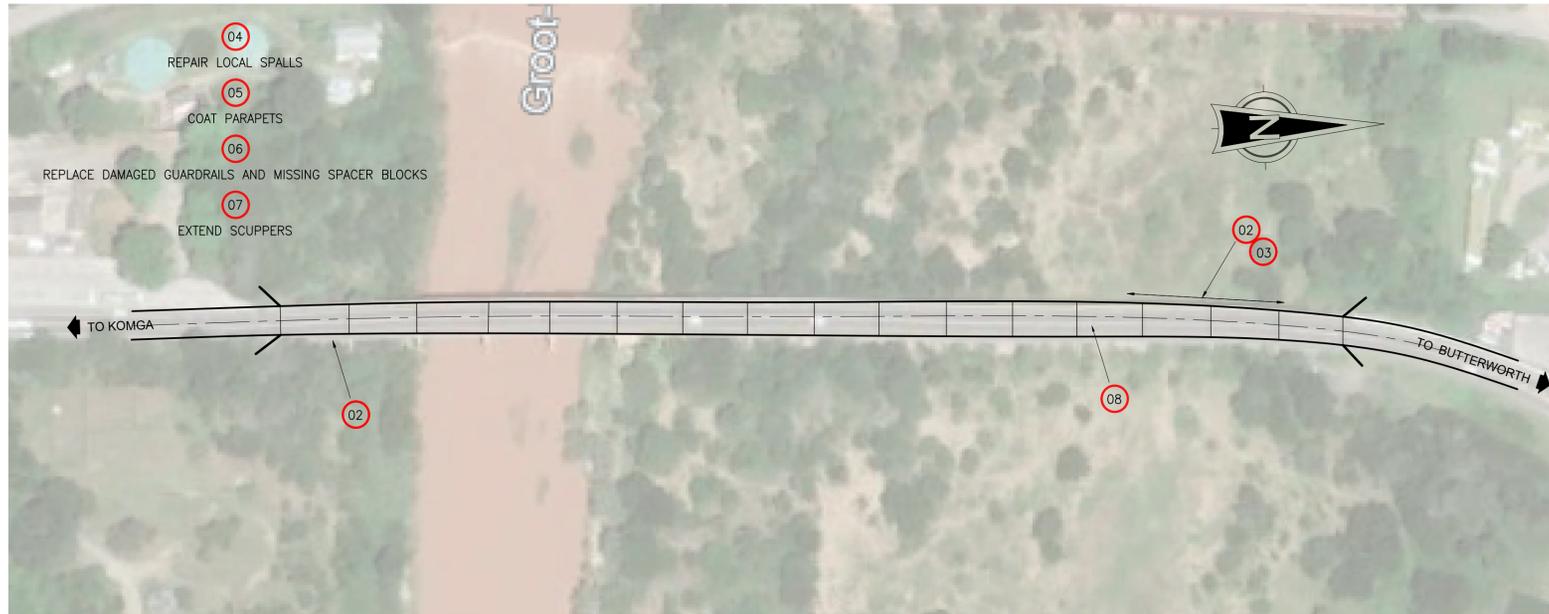
TYPICAL DETAIL – ASPHALTIC PLUG JOINT AT ABUTMENTS



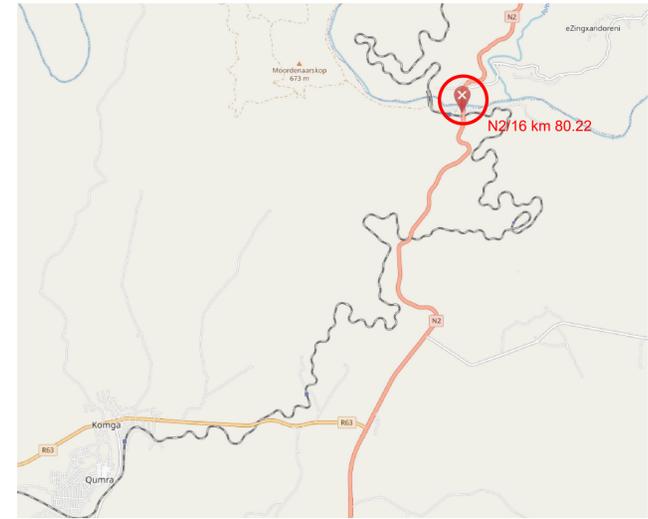
CONSTRUCTION RECORD WORKS CONTRACT ENGINEER Name: _____ Prof. Reg. No.: _____ Date: _____ SANRAL PROJECT MANAGER Name: _____ Prof. Reg. No.: _____ Date: _____		DESIGNED BY NAME: _____ Prof. Reg. No.: _____ CHECKED BY NAME: _____ Prof. Reg. No.: _____ DRAWN BY NAME: _____		CONSULTANT APPROVAL Name: _____ Prof. Reg. No.: _____ Date: _____		HEAD OFFICE 48 Tambotie Avenue Val de Grace Pretoria 0184 PO Box 415 Pretoria 0001 South Africa Tel: (012) 844 8000		SOUTHERN REGION 20 Shoreward Drive Baywest Port Elizabeth 6025 P.O. Box 27230 Greenacres 6057 Tel: (041) 398 3200 Fax: (041) 398 3222		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 CEO: SA NATIONAL ROADS AGENCY LTD. Date: _____		PROJECT DESCRIPTION AD-HOC STRUCTURAL AND DRAINAGE SERVICES IN THE SOUTHERN REGION – EMERGENCY BRIDGE REPAIR WORKS DRAWING TITLE N2 SECTION 16 km 28.70 BRIDGE REPAIRS - LAYOUT AND DETAILS		PROJECT NUMBER X.003-022-2018/1-C6 DRAWING LOCATION DATA ROUTE SECTION DRAWING km DISTANCE DRAWING TYPE BRIDGE/STRUCTURE No. CONSULTANT DRAWING No. SANRAL DOCUMENT #		START N2 16 KM 28.70 STRUCTURES - BRIDGES B1265 201931-N2-16-28-00 #####		END N2 16 KM 28.70 VER VA	
FOR TENDER ONLY		SCALE: AS SHOWN		SHEET 1 OF 1		DATE: _____		REVISION		CONSULT. ENG.		DATE: _____		REVISION					



FOR TENDER ONLY		DESIGNED BY NAME: _____ Prof. Reg. No.: _____		CONSULTANT APPROVAL NAME: _____ Date: _____		HEAD OFFICE 48 Tambotie Avenue Val de Grace Pretoria 0184 PO Box 415 Pretoria 0001 South Africa Tel: (012) 844 8000		SOUTHERN REGION 20 Shoreward Drive Baywest Port Elizabeth 6025 P.O. Box 2730 Greenacres 6057 Tel: (041) 398 3200 Fax: (041) 398 3222		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 CEO: SA NATIONAL ROADS AGENCY LTD. Date: _____		PROJECT DESCRIPTION AD-HOC STRUCTURAL AND DRAINAGE CONSULTING ENGINEERING AND SUPERVISION SERVICES DRAWING TITLE N2 SECTION 16 KM 27.70 BRIDGE REPAIRS - ACCOMMODATION OF TRAFFIC DETAILS		PROJECT NUMBER X.003-022-2018/1-C6	
CONSTRUCTION RECORD WORKS CONTRACT ENGINEER Name: _____ Prof. Reg. No.: _____ Date: _____		CHECKED BY NAME: _____ Prof. Reg. No.: _____		DATE NAME: _____ Prof. Reg. No.: _____		GENERAL PROJECT MANAGER Name: _____ Prof. Reg. No.: _____ Date: _____		CONTRACTOR Name: _____ Prof. Reg. No.: _____ Date: _____		PROJECT LOCATION DATA ROUTE: N2 SECTION: 16 DRAWING DISTANCE: KM 28.70 DRAWING TYPE: STRUCTURES - BRIDGES BRIDGE/STRUCTURE No.: B1265 CONSULTANT DRAWING No.: 201931-N2-16-28-01 SANRAL DOCUMENT #		START N2 16 KM 28.70		END N2 16 KM 28.70	
No.	DATE	FOR TENDER	REVISION	CONSULT. ENG.	SCALE: 1:2500 SHEET 1 OF 1		VER *****		VA						



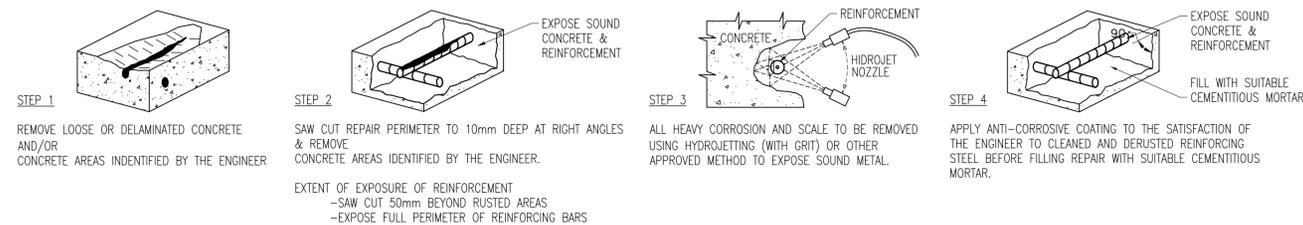
PLAN ON BRIDGE B149 – (N2/16 @ km 80.22)
NTS



LOCALITY

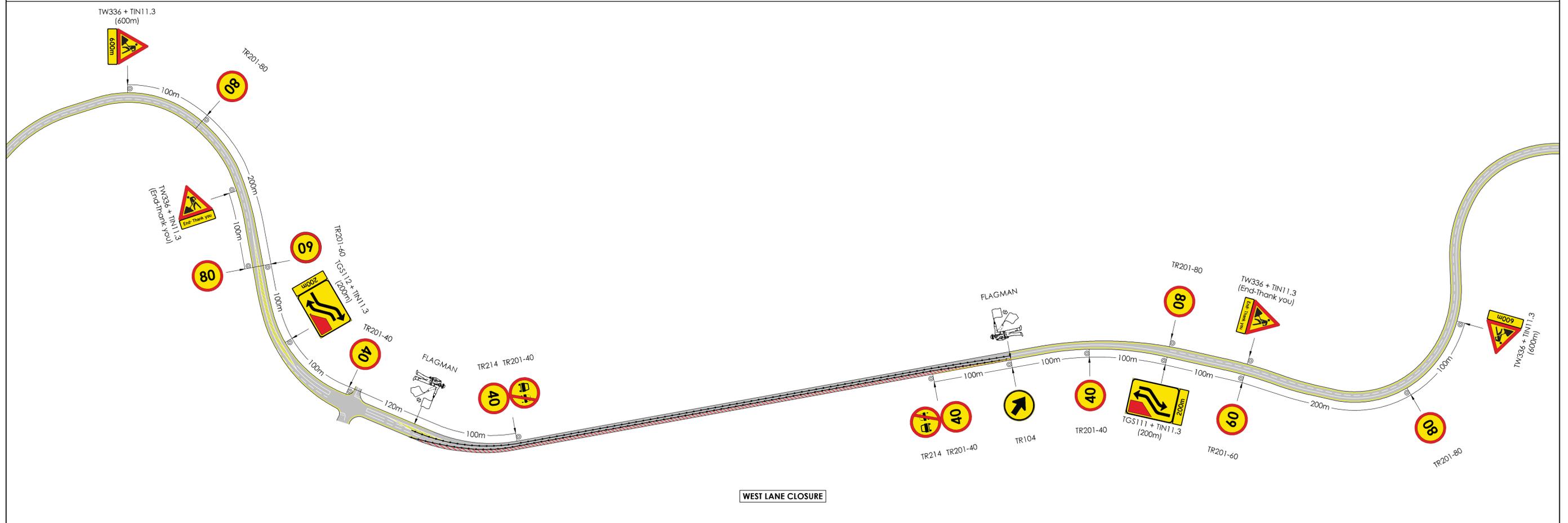
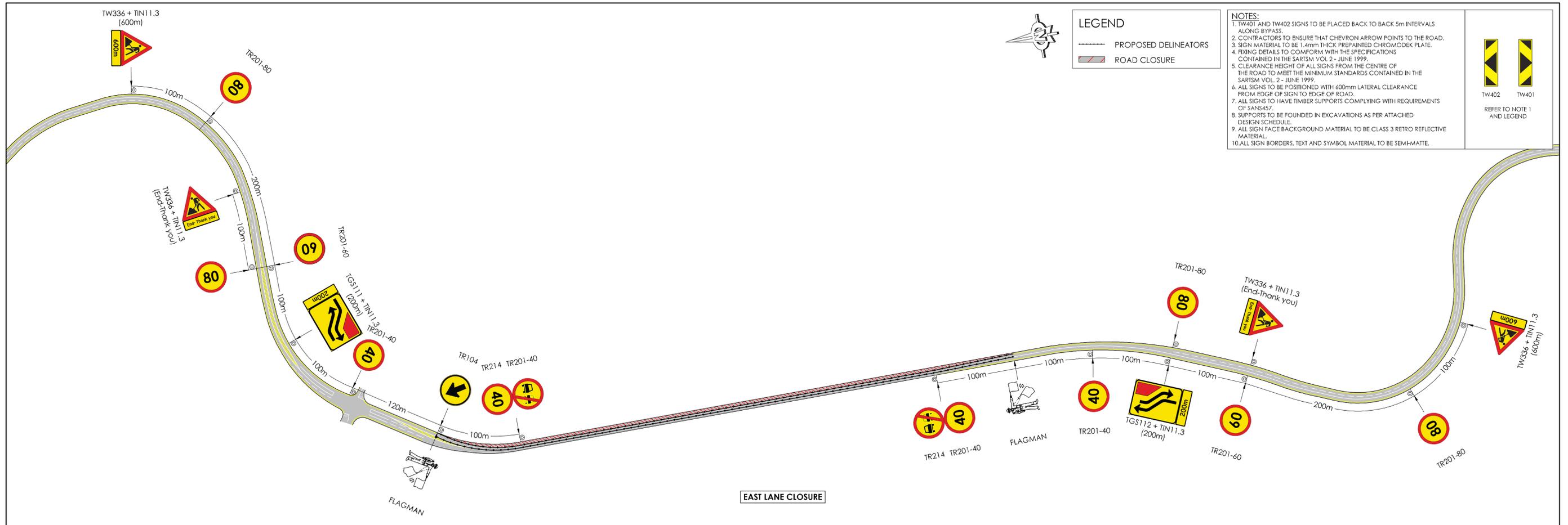
ITEM	DESCRIPTION
01	REMOVE GUARDRAIL OVER ENTIRE LENGTH OF BRIDGE TO ALLOW FOR REPAIRS TO PARAPETS
02	REPLACE ACCIDENT DAMAGED PRECAST CONCRETE BALUSTRADE AND DAMAGED GUARDRAIL.
03	REPAIR DAMAGED CONCRETE TO LOWER PORTION OF PARAPET
04	REPAIR LOCAL SPALLS
05	COAT ENTIRE PARAPET WITH CORROSION INHIBITOR AND BARRIER COATING
06	REPLACE DAMAGED GUARDRAILS AND SPACER BLOCKS, RE-ATTACH GUARDRAILS
07	EXTEND SCUppers
08	UNDERTAKE LOCAL REPAIRS TO ASPHALT ON BRIDGE

TYPICAL DETAIL CONCRETE REPAIR DETAIL



NOTE:
IF SECONDARY REINFORCING STEEL HAS LOST MORE THAN 15% OF DIAMETER OR IF MAIN REINFORCING STEEL HAS LOST MORE THAN 5% OF DIAMETER, STRUCTURAL ENGINEER TO ADVISE ON THE ADDITION OF SUPPLEMENTAL REINFORCEMENT.

CONSTRUCTION RECORD		DESIGNED BY		CONSULTANT APPROVAL		HEAD OFFICE		SOUTHERN REGION		ACCEPTANCE		PROJECT DESCRIPTION		PROJECT NUMBER		X.003-022-2018/1-C6	
WORKS CONTRACT ENGINEER		NAME		NAME		48 Tambotie Avenue Val de Grace Pretoria		20 Shoreward Drive Baywest Port Elizabeth 6025		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		AD-HOC STRUCTURAL AND DRAINAGE SERVICES IN THE SOUTHERN REGION – EMERGENCY BRIDGE REPAIR WORKS		DRAWING LOCATION DATA		START	
Name		Prof. Reg. No.		Prof. Reg. No.		Pretoria		P.O. Box 27230 Greenacres 6057		DATE		ROUTE		N2		N2	
Date		CHECKED BY		Date		0184 PO Box 415 Pretoria 0001 South Africa		Tel: (041) 398 3200 Fax: (041) 398 3222		for CEO: SA NATIONAL ROADS AGENCY LTD.		SECTION		16		16	
SANRAL PROJECT MANAGER		NAME		NAME		Tel: (012) 844 8000		BUILDING SOUTH AFRICA THROUGH BETTER ROADS		DATE		DRAWING km DISTANCE		KM 80.220		KM 80.220	
Name		Prof. Reg. No.		Prof. Reg. No.		Tel: (012) 844 8000		BUILDING SOUTH AFRICA THROUGH BETTER ROADS		DATE		DRAWING TYPE		STRUCTURES - BRIDGES		BRIDGE/STRUCTURE No.	
Date		DRAWN BY		DRAWN BY		Tel: (012) 844 8000		BUILDING SOUTH AFRICA THROUGH BETTER ROADS		DATE		BRIDGE REPAIRS - LAYOUT AND DETAILS		CONSULTANT DRAWING No.		201931-N2-16-80-00	
Name		NAME		NAME		Tel: (012) 844 8000		BUILDING SOUTH AFRICA THROUGH BETTER ROADS		DATE		SCALE :		AS SHOWN		SHEET 1 OF 1	
Date		DRAWN BY		DRAWN BY		Tel: (012) 844 8000		BUILDING SOUTH AFRICA THROUGH BETTER ROADS		DATE		DRAWING TITLE		CONSULTANT DRAWING No.		201931-N2-16-80-00	
Name		NAME		NAME		Tel: (012) 844 8000		BUILDING SOUTH AFRICA THROUGH BETTER ROADS		DATE		DRAWING TITLE		CONSULTANT DRAWING No.		201931-N2-16-80-00	
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Date		DRAWN BY		DRAWN BY		Tel: (012) 844 8000		BUILDING SOUTH AFRICA THROUGH BETTER ROADS		DATE		DRAWING TITLE		CONSULTANT DRAWING No.		201931-N2-16-80-00	
Name		NAME		NAME		Tel: (012) 844 8000		BUILDING SOUTH AFRICA THROUGH BETTER ROADS		DATE		DRAWING TITLE		CONSULTANT DRAWING No.		201931-N2-16-80-00	
Date		DRAWN BY		DRAWN BY		Tel: (012) 844 8000		BUILDING SOUTH AFRICA THROUGH BETTER ROADS		DATE		DRAWING TITLE		CONSULTANT DRAWING No.		201931-N2-16-80-00	
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CONSTRUCTION RECORD WORKS CONTRACT ENGINEER		DESIGNED BY		CONSULTANT APPROVAL		HEAD OFFICE 48 Tambotie Avenue Val de Grace Pretoria 0184 PO Box 415 Pretoria 0001 South Africa Tel: (012) 844 8000		SOUTHERN REGION 20 Shoreward Drive Baywest Port Elizabeth 6025 P.O. Box 27230 Greenacres 6057 Tel: (041) 398 3200 Fax: (041) 398 3222		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 CEO: SA NATIONAL ROADS AGENCY LTD. Date:		PROJECT DESCRIPTION AD-HOC STRUCTURAL AND DRAINAGE CONSULTING ENGINEERING AND SUPERVISION SERVICES		PROJECT NUMBER X.003-022-2018/1	
Name: _____ Prof. Reg. No.: _____ Date: _____		NAME: _____ Prof. Reg. No.: _____ Date: _____		NAME: _____ Prof. Reg. No.: _____ Date: _____		SANRAL PROJECT MANAGER		SANRAL PROJECT MANAGER		DRAWING LOCATION DATA		START		END	
Name: _____ Prof. Reg. No.: _____ Date: _____		NAME: _____ Prof. Reg. No.: _____ Date: _____		NAME: _____ Prof. Reg. No.: _____ Date: _____		DRAWING TITLE N2 SECTION 16 KM 80.22 BRIDGE REPAIRS - ACCOMMODATION OF TRAFFIC DETAILS		DRAWING TITLE		DRAWING km DISTANCE		START		END	
Name: _____ Prof. Reg. No.: _____ Date: _____		NAME: _____ Prof. Reg. No.: _____ Date: _____		NAME: _____ Prof. Reg. No.: _____ Date: _____		DRAWING TYPE		DRAWING TYPE		DRAWING km DISTANCE		START		END	
Name: _____ Prof. Reg. No.: _____ Date: _____		NAME: _____ Prof. Reg. No.: _____ Date: _____		NAME: _____ Prof. Reg. No.: _____ Date: _____		STRUCTURES - BRIDGES		STRUCTURES - BRIDGES		DRAWING km DISTANCE		START		END	
Name: _____ Prof. Reg. No.: _____ Date: _____		NAME: _____ Prof. Reg. No.: _____ Date: _____		NAME: _____ Prof. Reg. No.: _____ Date: _____		CONSULTANT DRAWING No.		CONSULTANT DRAWING No.		DRAWING km DISTANCE		START		END	
Name: _____ Prof. Reg. No.: _____ Date: _____		NAME: _____ Prof. Reg. No.: _____ Date: _____		NAME: _____ Prof. Reg. No.: _____ Date: _____		SANRAL DOCUMENT #		SANRAL DOCUMENT #		DRAWING km DISTANCE		START		END	
Name: _____ Prof. Reg. No.: _____ Date: _____		NAME: _____ Prof. Reg. No.: _____ Date: _____		NAME: _____ Prof. Reg. No.: _____ Date: _____		SCALE: 1:2500		SCALE: 1:2500		DRAWING km DISTANCE		START		END	
Name: _____ Prof. Reg. No.: _____ Date: _____		NAME: _____ Prof. Reg. No.: _____ Date: _____		NAME: _____ Prof. Reg. No.: _____ Date: _____		SHEET 1 OF 1		SHEET 1 OF 1		DRAWING km DISTANCE		START		END	
Name: _____ Prof. Reg. No.: _____ Date: _____		NAME: _____ Prof. Reg. No.: _____ Date: _____		NAME: _____ Prof. Reg. No.: _____ Date: _____		VER		VER		DRAWING km DISTANCE		START		END	
Name: _____ Prof. Reg. No.: _____ Date: _____		NAME: _____ Prof. Reg. No.: _____ Date: _____		NAME: _____ Prof. Reg. No.: _____ Date: _____		VA		VA		DRAWING km DISTANCE		START		END	