

AS BUILT INFORMATION:  
 TEMPERATURE (°C) AT TIME OF INSTALLATION : \_\_\_\_\_ °C  
 EXPANSION JOINT GAP : \_\_\_\_\_ mm

### INSTALLATION TEMPERATURE RANGE ARMoured NOSING TYPE JOINT WITH 80mm MAXIMUM MOVEMENT

#### NOTES :

##### 1. GENERAL

- 1.1 ALL STEEL ARMoured AND MULTI ELEMENT JOINTS SHALL BE AGRÉMENT SA APPROVED.
  - 1.2 FOR EXISTING WORK REQUIRING JOINT REPLACEMENT THE POSITIONS OF THE BENDS IN THE EXPANSION JOINT SYSTEM SHALL MATCH THE JOINT LAYOUT AND BRIDGE DECK PROFILE OF THE INDIVIDUAL BRIDGES. IN NO CASE SHALL THE RADIUS OF A BEND BE LESS THAN 100mm FOR VERTICAL BENDS AND 150mm FOR HORIZONTAL BENDS.
- COMBINED VERTICAL AND HORIZONTAL BENDS SHOULD BE AVOIDED BY PROVIDING DEEPER RECESSES INTO PARAPET AND/OR KERB FACES TO ACCOMMODATE THE BENT-UP SECTIONS OF THE JOINT PROFILES.

##### 2. DESIGN LOADINGS

- 2.1 THE EXPANSION JOINT SYSTEM SHALL BE DESIGNED IN ACCORDANCE WITH THE BRITISH DEPARTMENT OF TRANSPORT DEPARTMENTAL STANDARD BD 33/88 TO WITHSTAND THE COMBINATION OF THE FOLLOWING NOMINAL LOADS :
  - 2.1.1 VERTICAL
 

THE NOMINAL LOAD SHALL BE TAKEN EITHER AS A SINGLE WHEEL LOAD OF 100kN OR A 200kN AXLE WITH A 1.8m TRACK. THE LOAD FROM EACH WHEEL SHALL BE UNIFORMLY DISTRIBUTED OVER A CIRCULAR AREA ASSUMING AN EFFECTIVE PRESSURE OF 1.1 N/mm<sup>2</sup> (ie 340mm DIAMETER). IT SHALL BE APPLIED SEPARATELY TO EITHER EDGE OF THE JOINT TO DETERMINE WHICH GIVES THE MORE SEVERE EFFECT.
  - 2.1.2 HORIZONTAL
 

THE NOMINAL TRAFFIC LOAD SHALL BE TAKEN AS A UNIFORMLY DISTRIBUTED HORIZONTAL LOAD OF 80 kN/m LENGTH OF JOINT, ACTING AT RIGHT ANGLES TO THE JOINT AT CARRIAGEWAY LEVEL.
- 2.1.3 DESIGN LOAD EFFECTS
 

THE FOLLOWING FACTORS SHALL APPLY :

	WHEEL LOADS	HORIZONTAL LOADS
ULTIMATE LIMIT STATE :	1.5 x 1.1 = 1.65	1.25 x 1.0 = 1.25
SERVICEABILITY LIMIT STATE :	1.20 x 1.0 = 1.2	1.0 x 1.0 = 1.0

##### 2.2 DESIGN FOR FATIGUE SHALL BE IN ACCORDANCE WITH BS 5400 PART 10 AS IMPLEMENTED BY THE BRITISH DEPARTMENT OF TRANSPORT DEPARTMENTAL STANDARD BA 961 AND BO 981. THE DESIGN LIFE FOR FATIGUE SHALL BE NOT LESS THAN 25 YEARS.

##### 3. GUARANTEES AND DETAIL DRAWINGS

- 3.1 TENDERERS SHALL SUBMIT CERTIFICATES WITH THEIR TENDERS CONFIRMING THAT THE PROPOSED EXPANSION JOINT SYSTEMS ARE AGRÉMENT APPROVED AND FULFILL THE GUARANTEE REQUIREMENT OF THE PROJECT SPECIFICATIONS.
- 3.2 THE CONTRACTOR SHALL SUBMIT DETAIL DRAWINGS OF HIS PROPOSED EXPANSION JOINT SYSTEM TO THE ENGINEER FOR APPROVAL IN ACCORDANCE WITH CLAUSE 1221 NOT LESS THAN FOUR WEEKS BEFORE HE INTENDS TO COMMENCE WITH THE MANUFACTURE OF THE PROPOSED SYSTEMS.

##### 4. MATERIALS AND MANUFACTURING

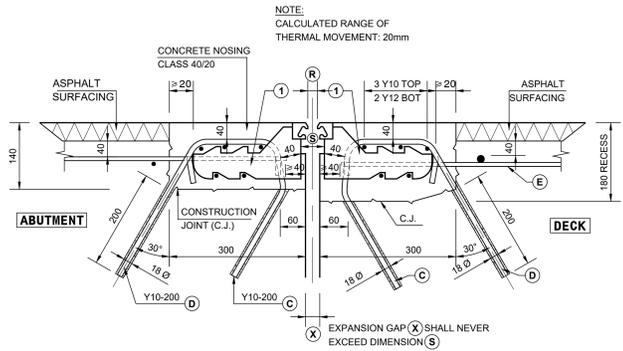
- 4.1 STRUCTURAL STEEL SHALL BE GRADE 300W IN ACCORDANCE WITH SANS 1431, STAINLESS STEEL GRADE 316, 314 OR CORROSION RESISTANT STEEL 3CR12.
- 4.2 WELDING SHALL BE CARRIED OUT IN ACCORDANCE WITH THE REQUIREMENTS OF BS 5135.
- 4.3 ROUND BAR USED FOR ANCHORAGES SHALL BE MILD STEEL BARS COMPLYING WITH THE REQUIREMENTS OF SANS 920 (fy = 250MPa)
- 4.4 THE EXPANSION UNITS MAY BE MANUFACTURED IN LENGTHS TO SUIT THE MANUFACTURER AND THE CONTRACTOR PROVIDED THE FOLLOWING ARE COMPLIED WITH :
  - 4.4.1 EXPANSION UNITS WITH A TOTAL LENGTH LESS THAN 6.0m SHALL BE MANUFACTURED AND SUPPLIED IN ONE CONTINUOUS LENGTH.
  - 4.4.2 EXPANSION UNITS WITH A TOTAL LENGTH BETWEEN 6.0m AND 12.0m MAY BE MANUFACTURED IN TWO EQUAL LENGTHS AND COUPLED.
  - 4.4.3 EXPANSION UNITS WITH A TOTAL LENGTH IN EXCESS OF 18.0m MAY BE MANUFACTURED IN EQUAL LENGTHS OF NOT LESS THAN 6.0m AND COUPLED.
- 4.5 ANCHORAGES OF THE JOINT PROFILES SHALL BE NORMAL TO THE CENTRE LINE OF THE JOINT WITH THE EXCEPTION OF THE ANCHORAGES LOCATED OVER SIDEWALKS AND MEDIANS FOR SKEW BRIDGES WHERE SERVICE DUCTS AND OTHER DETAILS PROHIBIT THE ABOVE. THE ANCHORAGES AND JOINT PROFILES SHALL BE TO THE INDIVIDUAL MANUFACTURER'S DETAILS.

##### 5. CORROSION PROTECTION

- 5.1 ALL STEEL SURFACES OF THE DECK EXPANSION UNITS (EXCLUDING STAINLESS STEEL AND CORROSION RESISTANT STEEL (3CR12), LOCATED WITHIN 50mm OF THE EXPOSED STEEL AND/OR EXPOSED CONCRETE FACES SHALL BE PROTECTED AGAINST CORROSION.
- THE DETAILS OF THE CORROSION PROTECTION SHALL BE AS SPECIFIED ON THE DETAIL DRAWINGS OF THE JOINT MANUFACTURER AND GUARANTEED BY THE CONTRACTOR FOR FIVE YEARS AFTER EXPIRY OF THE MAINTENANCE LIABILITY PERIOD AND SHALL COMPLY WITH THE FOLLOWING :
- THE DESIGN AND DETAILS OF THE MANUFACTURER SHALL MAKE FULL ALLOWANCE FOR THE LOSS IN BOND BETWEEN THE ANCHORAGES OF THE DECK EXPANSION UNITS AND THE CONCRETE NOSINGS RESULTING FROM THE CORROSION PROTECTIVE COATINGS.

#### LEGEND :

- Ⓐ, Ⓑ, Ⓒ, Ⓓ : REINFORCING STEEL PROTRUDING INTO NOSING RECESSES.
- Ⓔ : DEPTH OF NOSING RECESS MEASURED FROM TOP OF ASPHALT SURFACING (WHERE APPLICABLE) AS SPECIFIED BY THE MANUFACTURER OF THE EXPANSION JOINT.
- Ⓕ : 20mm Ø uPVC WEEPHOLES AS SHOWN ON THE DETAIL DRAWINGS OF THE INDIVIDUAL BRIDGES.
- Ⓖ : 40mm WIDE x 600mm LONG STRIPS OF STAINLESS STEEL WIRE MESH SECURED TO DECK SURFACE WITH CONCRETE NAILS. MESH REF 8 - 0.8mm Ø WIRE MESH WITH 2.38mm x 2.38mm OPENINGS.
- Ⓗ : ASPHALT SURFACING (WHERE INDICATED ON THE DETAIL DRAWINGS).
- Ⓙ : LONGITUDINAL BARS AS INDICATED ON THE JOINT MANUFACTURER'S DETAIL DRAWINGS. LAPS IN BARS SHALL BE NOT LESS THAN 30 x BAR DIAMETER.
- Ⓚ : 3 Y10 AT APPROXIMATE EQUAL SPACINGS. LAPS IN BAR SHALL BE NOT LESS THAN 300mm.
- Ⓛ : EXPANSION GAP FORMED DURING CONSTRUCTION OF THE BRIDGE. WIDTH Ⓛ SHOULD NEVER EXCEED DIMENSION Ⓛ.
- Ⓜ : EXPANSION GAP TO SUIT THE TEMPERATURE AT TIME OF INSTALLATION AS PER THE ENGINEERS WRITTEN INSTRUCTIONS. GAP Ⓜ SHALL NEVER BE LESS THAN THE INSTALLATION GAP SPECIFIED BY THE MANUFACTURER OF THE EXPANSION UNIT.
- Ⓝ : DIMENSION VARIES FOR DIFFERENT EXPANSION JOINT SYSTEMS AND SHALL BE AS INDICATED ON THE JOINT MANUFACTURER'S DETAIL DRAWINGS.



### TYPICAL CROSS SECTION EXISTING JOINT REPLACEMENT SCALE 1:5

#### CONSTRUCTION NOTES:

1. GENERAL
  - 1.1 THE MATERIAL, WORK AND INSTALLATION OF THE EXPANSION UNITS SHALL COMPLY WITH ALL THE RELEVANT CLAUSES OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE WORKS, PROJECT SPECIFICATIONS, REQUIREMENTS OF SANRAL STANDARD PLAN NO TD-S-J-501 AND AS DESCRIBED BELOW.
  - 1.2 BEFORE COMMENCING WITH ANY WORK, SAMPLES OF THE CONSTITUENT MATERIALS AND A STATEMENT OF THE MIX PROPORTIONS OF THE CONCRETE TO BE USED IN THE NOSINGS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.

- CONCRETE - CLASS D32/40-14-XC4 (CLASS D32/40-20-XC4 MAY BE USED WHERE RECESSES ARE DEEPER THAN 180mm).
- SLUMP - NOT LESS THAN 40mm, NOT GREATER THAN 60mm.
- CEMENT CONTENT - NOT MORE THAN 500kg PER CUBIC METRE.
- LOW SHRINKAGE DESIGN MIX

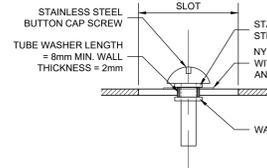
#### 2. CONSTRUCTION PROCEDURE

- 2.1 REMOVE THE EXISTING EXPANSION JOINT AND COVER PLATES IF PROVIDED AND ESTABLISH THE PRESENCE AND DEPTH OF EXISTING REINFORCEMENT WITHIN THE CONFINES OF THE PROPOSED NEW CONCRETE NOSINGS.
  - 2.2 IN THE CASES WHERE OPEN SERVICE DUCTS ARE PRESENT AT SIDEWALKS AND THE PAVING SLABS EXTEND OVER THE EXPANSION JOINT WITHOUT EDGE BEAMS, CONCRETE NOSING SHALL BE PROVIDED TO FORM EDGE BEAMS.
  - 2.3 SAW-CUT AND REMOVE A STRIP OF ASPHALT SURFACING AND/OR CONCRETE CENTRED OVER THE JOINT AND CORRESPONDING TO THE WIDTHS AND DEPTHS OF THE PROPOSED NEW CONCRETE NOSINGS.
- THE NECESSARY PRECAUTION AND CARE SHALL BE EXERCISED NOT TO DAMAGE THE EXISTING REINFORCEMENT, STRUCTURAL MEMBERS, SERVICES AND/OR SERVICE DUCTS DURING ANY SAW-CUTTING AND BREAKING OUT OF THE CONCRETE.
- 2.4 "WEAK" CONCRETE EXPOSED IN THE RECESSES SHALL BE REMOVED AND/OR REPAIRED AS DESCRIBED IN THE PROJECT SPECIFICATIONS OR AS INSTRUCTED BY THE ENGINEER.
  - 2.5 CLEAR THE EXPANSION GAP OF ALL JOINTING AND/OR FOREIGN MATERIAL OVER THE FULL WIDTH AND DEPTH OF THE DECK SLAB.
  - 2.6 WHERE EXISTING REINFORCEMENT EXPOSED IN THE NOSING RECESSES DOES NOT COMPLY WITH THE DETAILS OR IS LESS THAN THE SPECIFIED AREAS OVER ANY ONE METRE LENGTH OF THE JOINT, Y10 ANCHOR BARS SHALL BE INSTALLED AS DESCRIBED BELOW EXCEPT WHERE OTHERWISE SPECIFIED IN THE PROJECT SPECIFICATIONS.
    - a) DRILL 14mm TO 20mm Ø BY 200mm DEEP HOLES FOR Y10 ANCHOR BARS.
    - b) CLEAR THE HOLES OF DRILL SPOIL AND ENSURE THAT THE HOLES ARE SOUND, DRY AND FREE OF GREASE, OIL OR ANY FOREIGN MATTER.
    - c) TEST-FIT THE PRE-BENT Y10 ANCHOR BARS AND ADJUST THE LENGTH AND/OR SHAPE OF THE BARS WHERE NECESSARY.
    - d) PRIME THE HOLES AND PLACE SUFFICIENT GROUTING COMPOUND IN EACH HOLE TO ENSURE THAT THE HOLES ARE FILLED TO THEIR FULL DEPTHS ON INSTALLATION OF THE Y10 ANCHOR BARS WITHOUT SUBSEQUENT TOPPING UP.
    - e) INSTALL THE Y10 ANCHOR BARS ENSURING THAT THE BARS EXTEND TO THE FULL DEPTHS OF THE DRILLED HOLES. FOR BARS NOT PRE-BENT (SEE NOTE 2.6 c) THE GROUT SHALL BE ALLOWED TO CURE BEFORE BENDING TO FORM STIRRUPS.
  - ANCHOR BARS - Y10 HIGH-YIELD-STRESS-STEEL DEFORMED BARS TO SANS 920

- 2.7 PROCEED WITH THE PREPARATION OF THE RECESSES, INSTALLATION OF THE EXPANSION UNITS, CONCRETING AND CURING OF THE CONCRETE NOSINGS AND INSTALLATION OF THE STEEL COVER PLATES AS DESCRIBED FOR NEW INSTALLATIONS.
- 2.8 WHERE SPECIFIED IN THE PROJECT SPECIFICATIONS THE CONCRETE NOSINGS SHALL BE PROTECTED BY TEMPORARY STEEL BRIDGING SYSTEMS AS DIRECTED BY THE ENGINEER. THE COVER PLATES SHALL NOT BE REMOVED BEFORE THE CONCRETE IN THE NOSINGS HAS ATTAINED A CHARACTERISTIC CUBE STRENGTH OF 30MPa.

BRIDGE EXPANSION JOINT	
DATE	
TYPE	
REF. No	
TEL. No	
SUPPLIER NAME	
JOINT TYPE	
Certificate YEAR/No.	
AGREEMENT SOUTH AFRICA	

#### AGRÉMENT PLAQUE N.T.S.

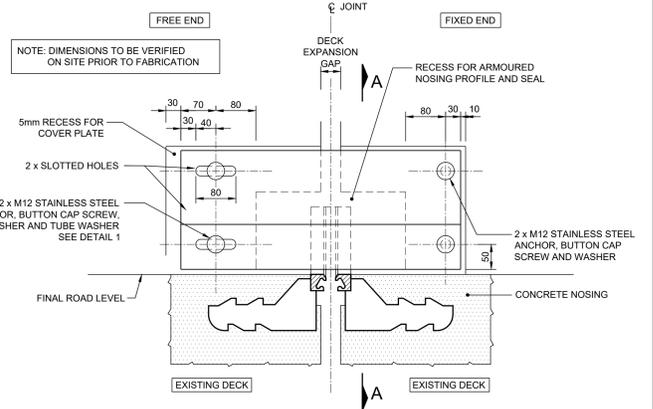


#### DETAIL 1 SCALE 1:2

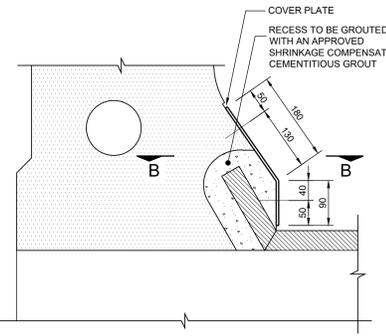
#### LEGEND :

- Ⓧ : EXPANSION GAP FORMED DURING CONSTRUCTION OF THE BRIDGE. WIDTH Ⓧ SHOULD NEVER EXCEED DIMENSION Ⓧ.
- Ⓜ : EXPANSION GAP TO SUIT THE TEMPERATURE AT TIME OF INSTALLATION AS PER THE ENGINEERS WRITTEN INSTRUCTIONS. GAP Ⓜ SHALL NEVER BE LESS THAN THE INSTALLATION GAP SPECIFIED BY THE MANUFACTURER OF THE EXPANSION UNIT.
- Ⓐ, Ⓑ, Ⓒ, Ⓓ : REINFORCING STEEL PROTRUDING INTO NOSING. (SEE NOTE 2.3 & 2.6)
- Ⓛ : ANCHORAGES
- Ⓜ : PROFILES

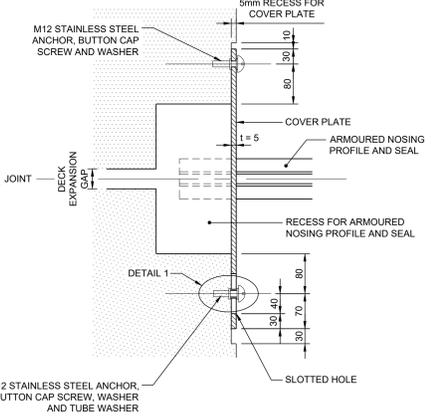
NOTE: ALL LEVELS AND DIMENSIONS TO BE CONFIRMED ON SITE PRIOR TO CONSTRUCTION.



### ELEVATION OF COVER PLATE AT NEW BARRIER/ F-SHAPED PARAPET AND PEDESTRAIN HANDRAIL SCALE 1:5



#### SECTION A - A SCALE 1:5



#### SECTION B - B SCALE 1:5

CONSTRUCTION RECORD (AS-BUILT) WORKS CONTRACT ENGINEER Name: _____ Prof. Reg. No.: _____ Date: _____		<b>SNA</b> CIVIL AND STRUCTURAL ENGINEERS (Pty) LTD P. O. Box 72727 LYNNWOOD RIDGE 0040 Tel: 012-842 0000 Fax: 012-803 4429 e-mail: -pta@sna.co.za		<b>KGAREBANA</b> CIVIL & STRUCTURAL ENGINEERS 11 VLOTTENBURG ROAD EQUESTRIA PRETORIA 0184 Tel: 012-542-0069 Fax: 071-254-4108 e-mail: kba.m@kase.co.za		DESIGNED BY NAME: M CHRISTODOULOU Prof. Reg. No.: 81824Z CHECKED BY NAME: KG MALCOMSON Prof. Reg. No.: 81824Z DRAWN BY NAME: M WATTS		CONSULTANT APPROVAL Name: KG MALCOMSON Prof. Reg. No.: 81824Z Date: 02/12/2019		HEAD OFFICE 48 Tambotie Avenue Val de Grace Pretoria 0184 PO Box 415 Pretoria 0001 South Africa Tel: (012) 844 8000		<b>SANRAL</b> SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LTD BUILDING SOUTH AFRICA THROUGH BETTER ROADS NORTHERN REGION 38 Ida Street Menlo Park Pretoria 0081 Private Bag X17 Lynnwood Ridge 0040 Tel: (012) 426 6200		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: _____		MSBBR: REPAIRS TO BRIDGE PARAPETS: R40 NELSPRUIT B0064 AND R33 PIET RETIEF B3297 EMERGENCY REPAIR FOR BRIDGE B3297 ON R033/06N AT km 27.5 JOINT DETAILS SCALE : AS SHOWN		PROJECT NUMBER DRAWING LOCATION DATA ROUTE SECTION DRAWING km DISTANCE DRAWING TYPE BRIDGE/STRUCTURE No. CONSULTANT DRAWING No. SANRAL DOCUMENT #		NRA X.002-063-2018/01-C05 START R033 06N 27.5 STRUCTURES-BRIDGES B3297 TP1916-2/B3297/08 18971390		SHEET 08 OF 10 VER V2 DRAWING No.: TP1916-2/B3297/08	
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