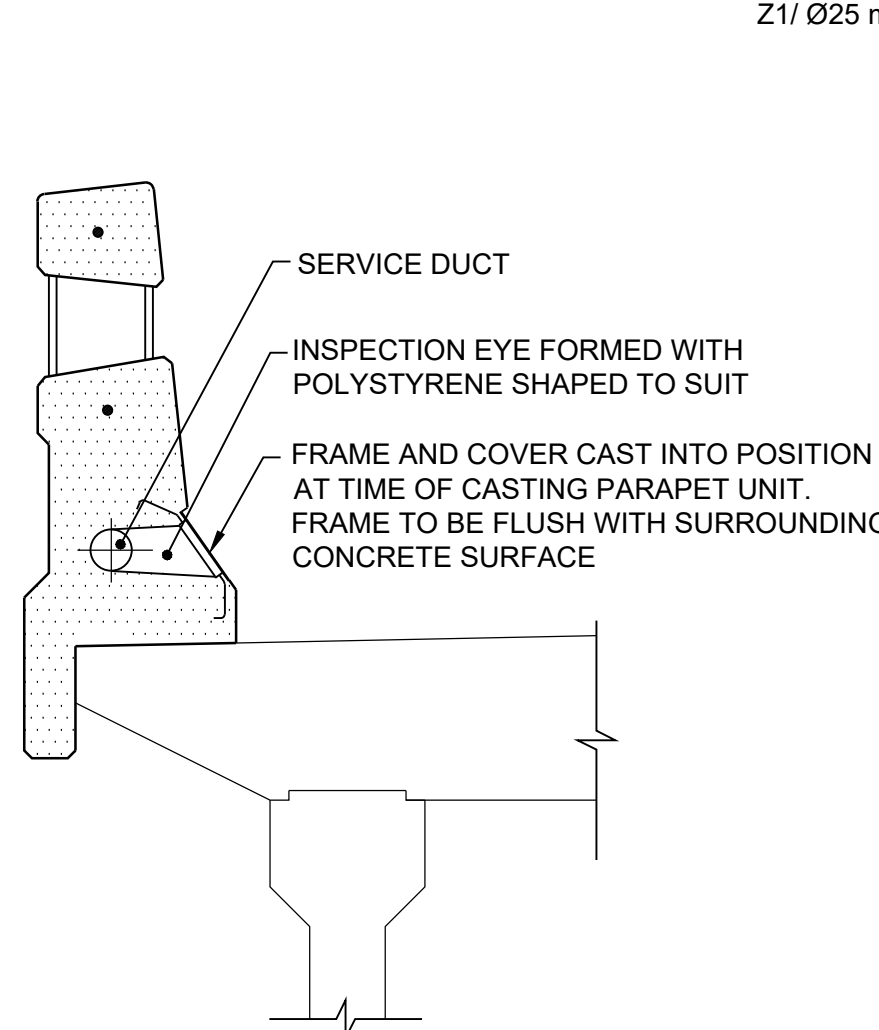
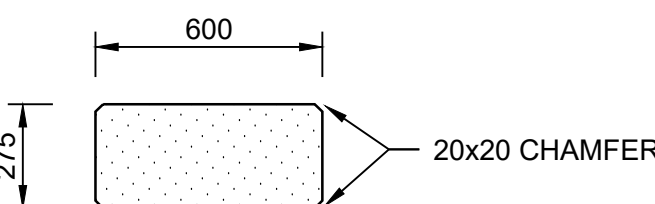


SECTION A - A  
SCALE 1:20

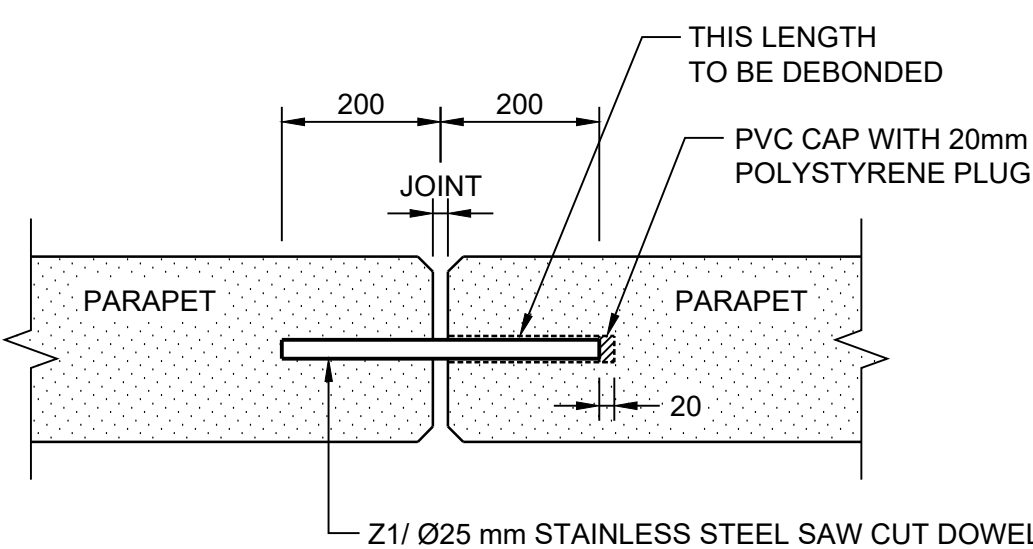
SECTION B - B  
SCALE 1:20



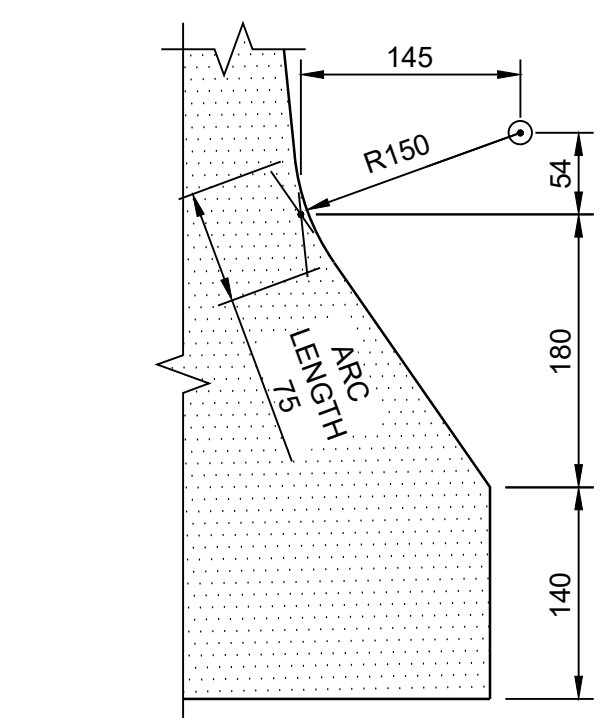
SECTION C - C  
SCALE 1:20



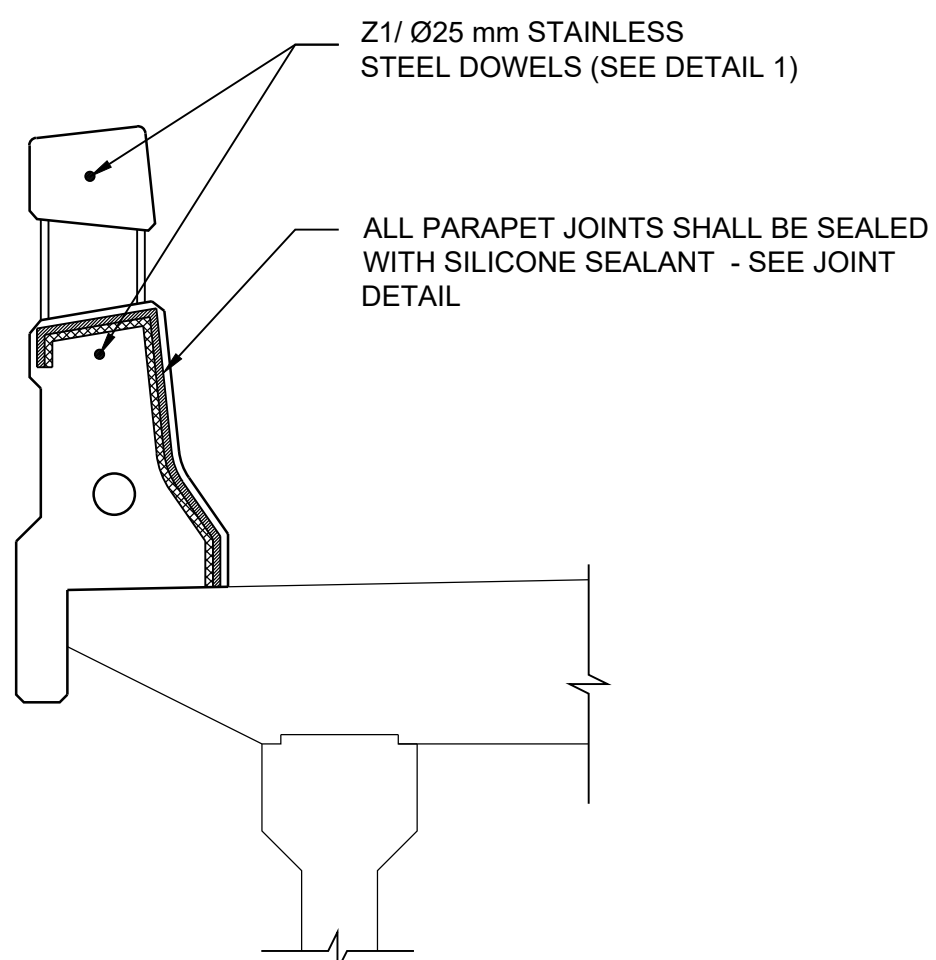
SECTION D - D  
SCALE 1:20



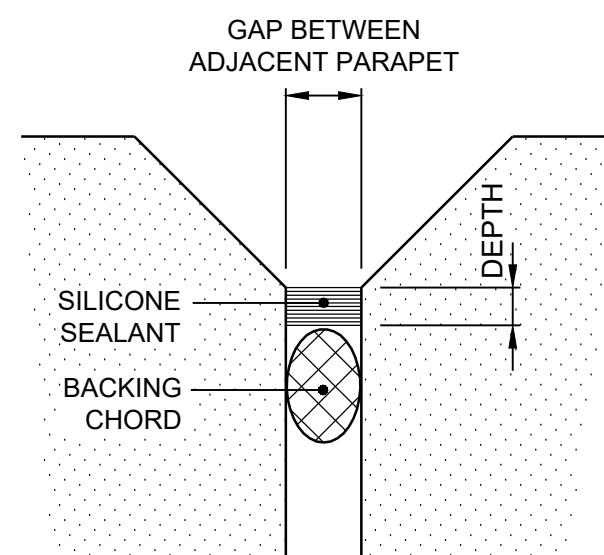
DETAIL 1  
STAINLESS STEEL DOWEL DETAIL  
SCALE 1 : 10



RADIUS DETAIL  
SETTING OUT DETAILS  
SCALE 1:5

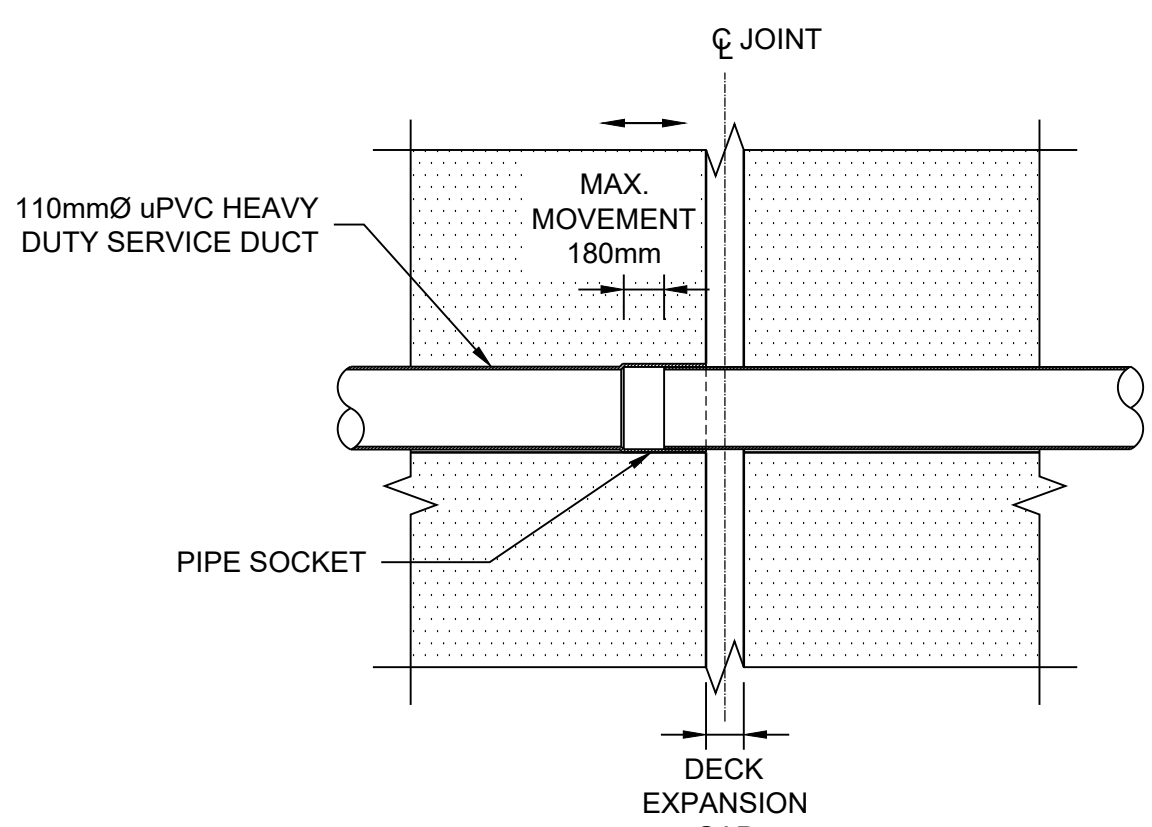


DETAIL OF PARAPET JOINT  
SCALE 1:20

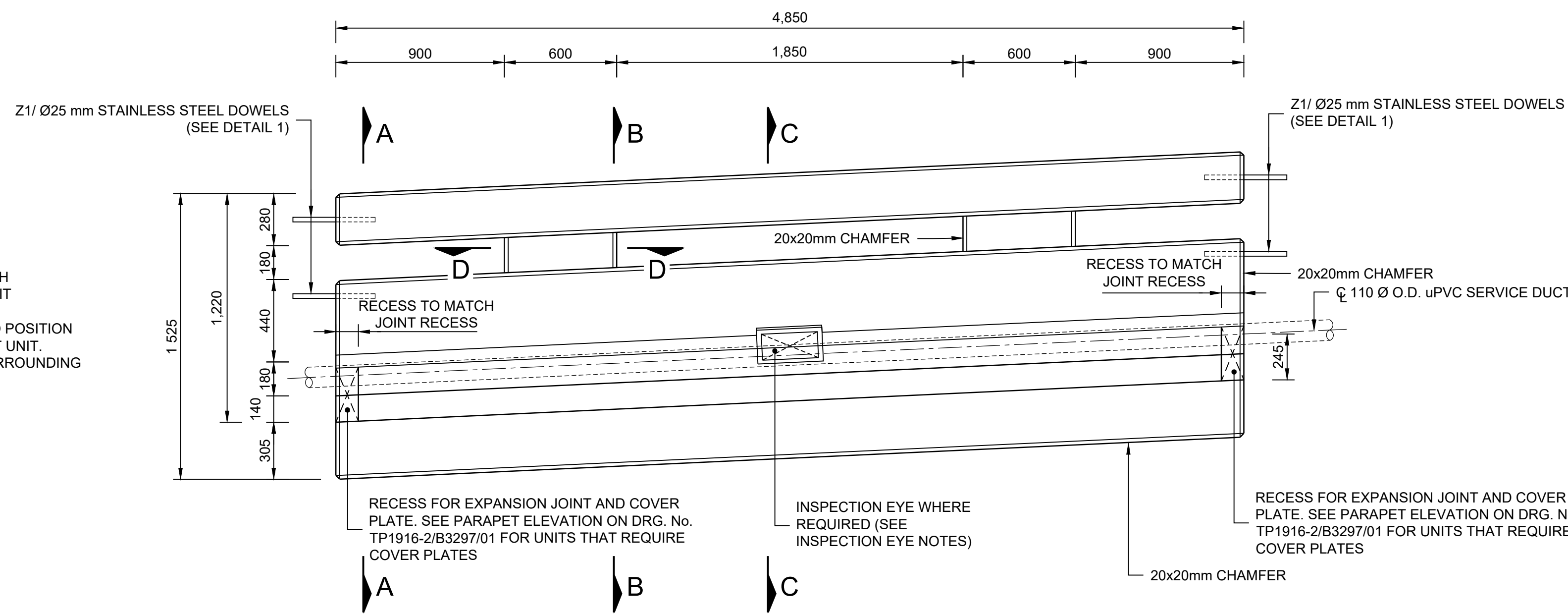


DETAIL OF PARAPET JOINT  
SCALE 1:1

PARAPET JOINTS		
GAP (mm)	DEPTH (mm)	BACKING CHORD Ø (mm)
10-14	8	15
15-19	10	20
20	12	25

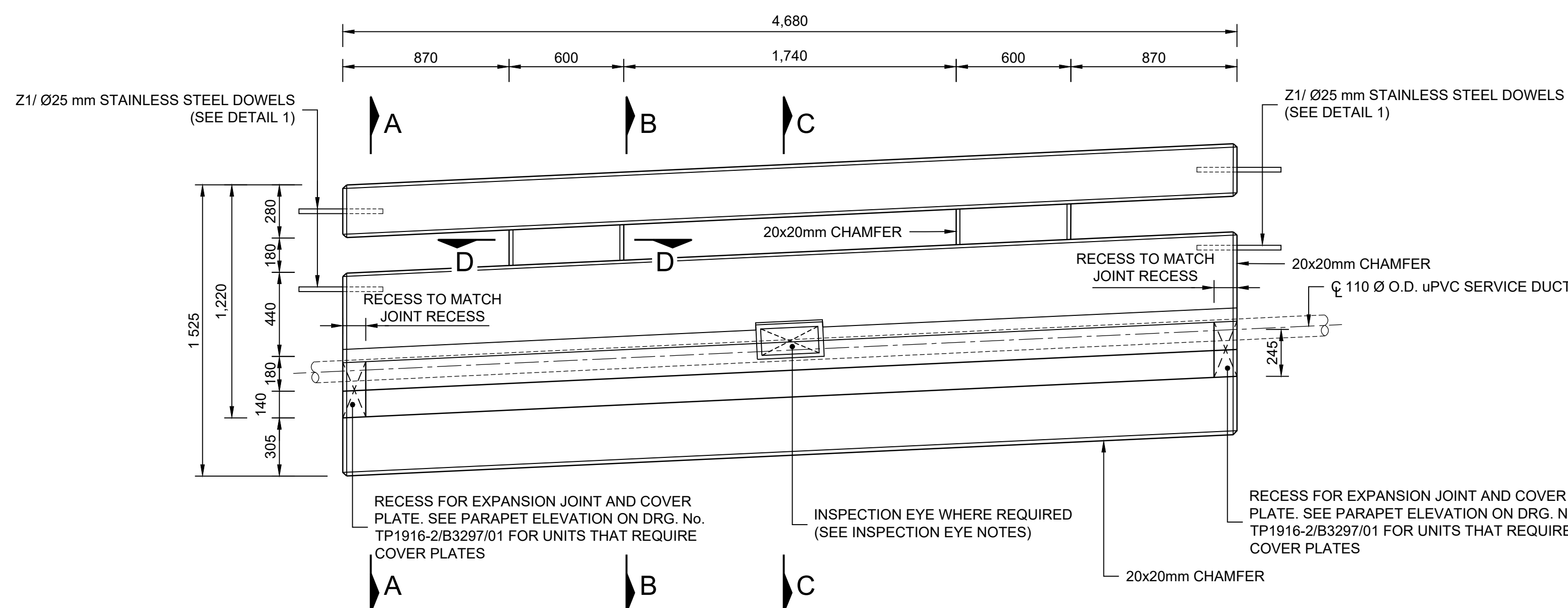


SERVICE DUCT DETAIL AT EXPANSION JONTS  
SCALE 1:10

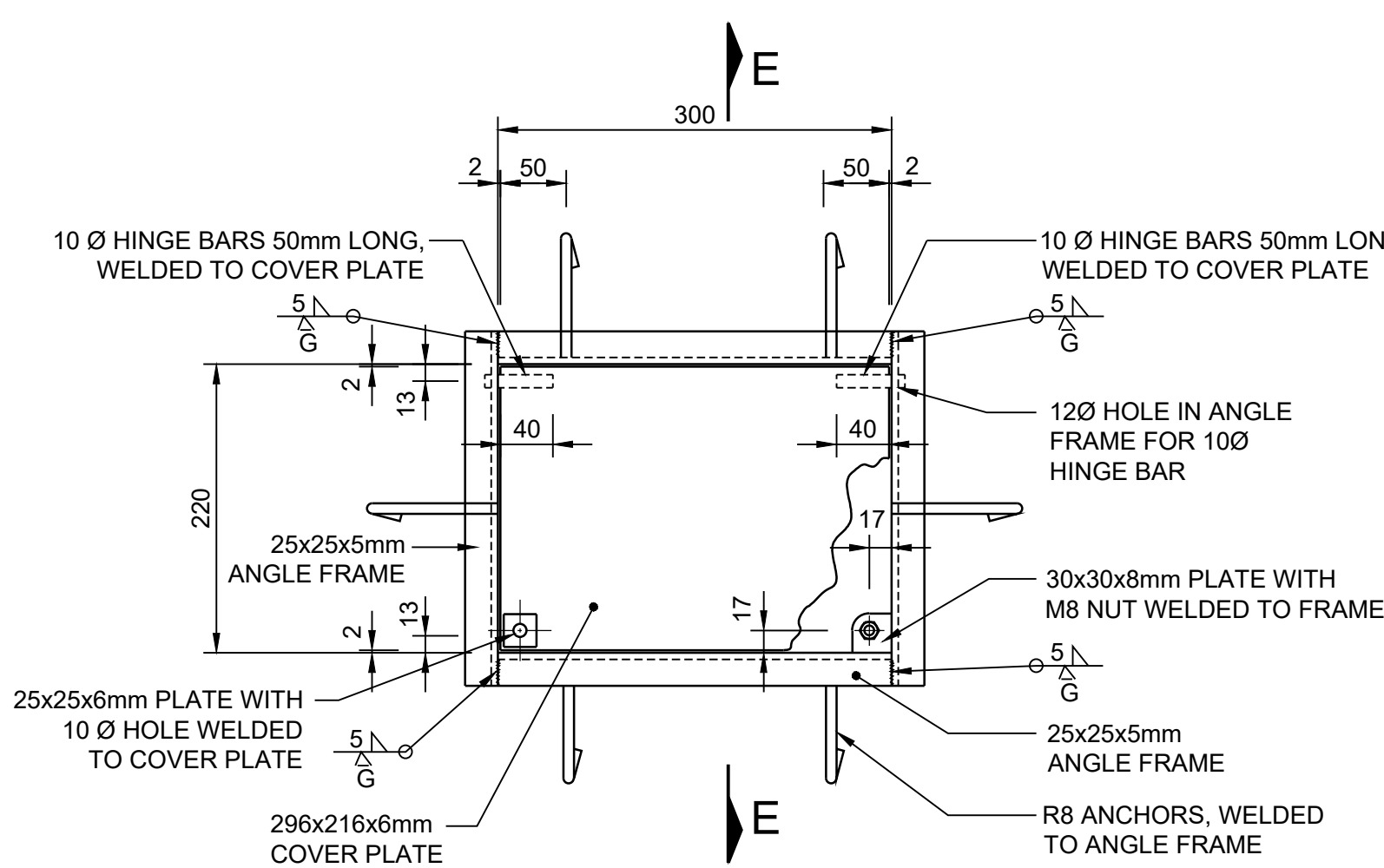


INSIDE ELEVATION OF PARAPET TYPE A (100kN)  
PARAPET UNITS (02) TO (15)  
SCALE 1 : 20

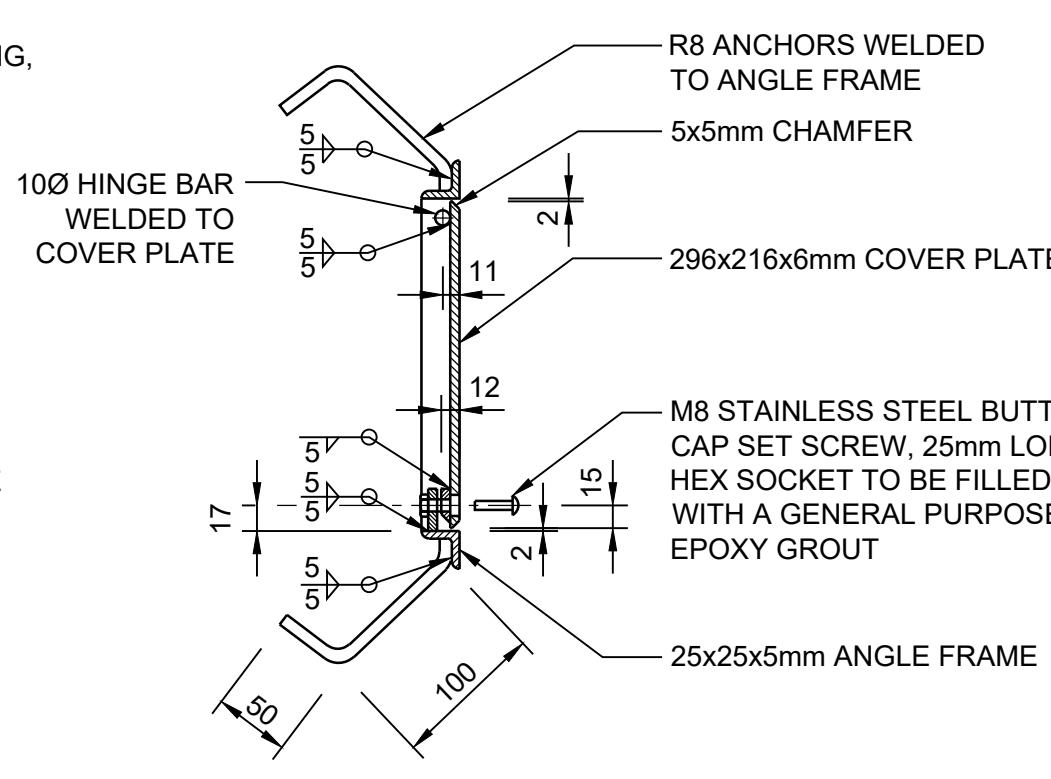
NOTE:  
• ALL EXPOSED SHARP EDGES CHAMFERED 20x20mm UNLESS INDICATED OTHERWISE.  
• TOP CORNERS ROUNDED 20mm.



INSIDE ELEVATION OF PARAPET TYPE A (100kN)  
PARAPET UNITS (16) TO (28) AND (31) TO (57)  
SCALE 1 : 20



PLAN  
SCALE 1:5



SECTION E - E  
SCALE 1:5

DETAIL OF INSPECTION EYE FRAME AND COVER

No.	DESCRIPTION	CONSULTANT DOCUMENT No.	SANRAL DOCUMENT No.
10	BENDING SCHEDULES	TP1916-2/B3297/10	18972041
09	DRAINAGE DETAILS	TP1916-2/B3297/09	18972234
08	JOINT DETAILS	TP1916-2/B3297/08	18971390
07	MISCELLANEOUS DETAILS	TP1916-2/B3297/07	18972147
06	ENDBLOCK REINFORCEMENT DETAILS	TP1916-2/B3297/06	18970874
05	ENDBLOCK CONCRETE DETAILS	TP1916-2/B3297/05	18972235
04	ENDBLOCK SUPPORT WALL DETAILS	TP1916-2/B3297/04	18970769
03	PARAPET REINFORCEMENT	TP1916-2/B3297/03	18971948
02	PARAPET DETAILS	TP1916-2/B3297/02	18972347
01	PARAPET LAYOUT	TP1916-2/B3297/01	18972146

LIST OF DRAWINGS

#### INSPECTION EYE NOTES

- MATERIALS**
  - STRUCTURAL MILD STEEL SHALL BE GRADE S275JR AND COMPLY WITH THE REQUIREMENTS OF SANS 50025. OTHER GRADES OF STRUCTURAL STEEL SHALL NOT BE USED WITHOUT THE WRITTEN APPROVAL FROM THE ENGINEER.
  - A CERTIFICATE FROM THE STEEL MANUFACTURER ON WHICH THE GRADE OF STRUCTURAL STEEL IS VERIFIED SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO FABRICATION.
  - BUTTON CAP SCREWS AND NUTS SHALL BE STAINLESS STEEL (SCREW = GRADE 316, NUT = GRADE 304)
- FABRICATION AND ASSEMBLY**
  - THE FABRICATION, ERECTION AND BOLTING PRACTICE OF THE STRUCTURAL STEELWORK SHALL BE DONE IN ACCORDANCE WITH SANS 2001-CS1.
  - WELDS TO BE CARRIED OUT IN ACCORDANCE WITH THE REQUIREMENTS OF BSEN 10111 AND AWS D1.1.
- CORROSION PROTECTION**

THE SURFACE PREPARATION AND CORROSION PROTECTION OF THE STRUCTURAL STEEL MEMBERS SHALL BE AS FOLLOWS:-

  - BY MANUFACTURER PRIOR TO DISPATCH TO THE WORKS:
    - DESIGN, FABRICATION AND INSPECTION SHALL COMPLY WITH THE RECOMMENDATIONS OF SANS 121200. NOTE THE APPENDIX DEALING WITH THE EFFECT OF CHEMICAL COMPOSITION OF STEEL.
    - AFTER MANUFACTURE THE COMPLETE ASSEMBLY SHALL BE HEAVY DUTY HOT-DIP GALVANISED IN ACCORDANCE WITH SANS 121200 TO A ZINC COAT THICKNESS OF NOT LESS THAN 105 MICRONS.
  - ON-SITE:

THE EXPOSED FACES OF THE FRAME AND COVER SHALL BE "DUPLEX COATED" IN ACCORDANCE WITH SAHDGA 01-1990. (THE SOUTH AFRICAN HOT-DIP GALVANISERS ASSOCIATION).

    - SURFACE PREPARATION:**

SURFACES TO BE PAINTED SHALL BE VERY THOROUGHLY DEGREASED BY USING AN APPROVED WATER EMULSIFIABLE SOLVENT BASED DEGREASER APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. FOLLOWED BY WASHING WITH CLEAN POTABLE WATER. IF THE SURFACE IS NOT "WATER BREAK FREE", THE PROCESS SHALL BE REPEATED.
    - PRIMING:**

APPLY AN APPROVED TWO COMPONENT EPOXY PRIMER DESIGNED FOR APPLICATION TO GALVANISED STEEL.
    - TOP COAT:**

APPLY ONE COAT OF AN APPROVED TWO COMPONENT ACRYLIC MODIFIED ALIPHATIC POLYURETHANE, MIXED AND APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS TO A DRY FILM THICKNESS OF 35 ±10 MICRONS. THE COLOUR OF THE TOP COAT SHALL BE G29 LIGHT GREY TO SANS 1091:2004.

#### GENERAL NOTES

- GENERAL**
  - THE COTO STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE WORKS FOR SOUTH AFRICAN ROAD AUTHORITIES TOGETHER WITH THE PROJECT SPECIFICATIONS SHALL APPLY.
  - THE CONTRACTOR SHALL CHECK ALL CO-ORDINATES, LEVELS AND DIMENSIONS ON SITE BEFORE CONSTRUCTION COMMENCES. ANY DISCREPANCIES SHALL BE REPORTED TO THE ENGINEER AS SOON AS POSSIBLE.
- PARAPETS**
  - ALL JOINTS BETWEEN PANELS AND ALL VERTICAL DIMENSIONS SHOWN SHALL BE PERPENDICULAR TO THE ROAD SURFACE IN ALL CASES.
  - ALL EXPOSED EDGES CHAMFERED 20mm x 20mm UNLESS OTHERWISE SHOWN.
  - PULLOUT TEST MUST BE PERFORMED ON SELECTED GROUTED ANCHORS.
  - THE TOP RAIL OF THE PARAPET MAY ONLY BE CONSTRUCTED ONCE THE LOWER SECTION HAS BEEN CAST.
  - SERVICE DUCTS : 110 Ø uPVC NORMAL DUTY (SDR 51) PIPES TO SANS 791:2004.
  - SERVICE DUCTS MUST BE PROVIDED WITH DRAW WIRES IN ONE CONTINUOUS LENGTH, EXTENDING NOT LESS THAN 3m BEYOND THE END FACE OF THE STRUCTURE. THE DRAW WIRE SHALL BE TWO STRANDS OF 2.5mmØ GALVANISED STEEL WIRE AND SHALL BE THREADED THROUGH EACH DUCT.
  - STAINLESS STEEL DOWELS SHALL BE 18/8 AUSTENITIC STAINLESS STEEL (AISI TYPE 304)
  - ALL STAINLESS STEEL DOWELS TO BE SAWCUT.
  - THE RECESSES FOR EXPANSION JOINT CONSTRUCTION AND THE EXPANSION JOINT COVER PLATES ARE SUBJECT TO THE DETAILS OF THE EXPANSION JOINT SYSTEM FINALLY APPROVED. THE CONTRACTOR SHALL CONFIRM THE DIMENSIONS OF THE RECESS.
  - RECESS FOR INSPECTION EYES AND EXPANSION JOINTS SHALL BE FORMED TO SUIT JOINT SIZE.
- DESIGN LOADING**
  - PARAPETS ARE DESIGNED FOR A NOMINAL POINT LOAD OF 100kN ACTING AT A HEIGHT OF 700mm ABOVE ROAD SURFACE.
- CONCRETE NOTES**

THE MATERIAL AND WORK SHALL COMPLY WITH THE RELEVANT CLAUSES OF CHAPTERS 13, 14 & 20 OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE WORKS FOR SOUTH AFRICAN ROAD AUTHORITIES, THE PROJECT SPECIFICATIONS AND SHALL INCLUDE THE FOLLOWING:

  - CONCRETE CLASSES:

CONCRETE CLASSES:	CHARACTERISTIC STRENGTH (MPa)	CLASS (MPa/mm)
PARAPETS	40	D32/40-20-XC4
ENDBLOCKS	40	D32/40-20-XC4
ENDBLOCK SUPPORT WALL	30	D25/30-20-XC3
  - CONCRETE FINISHES:
    - ALL UNEXPOSED FORMED SURFACES: F1
    - EXPOSED SURFACES - STEEL SHUTTER FINISH: F3
    - EXPOSED SURFACES - STEEL TROWEL FINISH: U3
  - CURING:
    - PARAPETS ARE TO BE CURED AS SPECIFIED BY EITHER METHOD (iv), (v) OR (vi) OF COTO CLAUSE A13.4.7.12(h), AS AGREED WITH ENGINEER.
  - STEEL REINFORCING BARS SHALL COMPLY WITH SANS 920:2005  
HIGH YIELD BARS : MIN YIELD STRESS 450 MPa.  
MILD STEEL BARS : MIN YIELD STRESS 250 MPa.  
ALL REINFORCING TO BE HOT DIPPED GALVANISED.
  - MINIMUM CONCRETE COVER TO REINFORCEMENT : 40mm.

No.	DATE	REVISION	CONSULT. ENG.
V2	12/11/2020	SCANNED ORIGINAL WITH SIGNATURE	KG MALCOMSON
V1	12/11/2020	ORIGINAL VERSION	KG MALCOMSON

CONSTRUCTION RECORD (AS-BUILT)	
WORKS CONTRACT ENGINEER	
Name :	
Prof. Reg. No. :	
Date :	
SANRAL PROJECT MANAGER	
Name :	
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 : - pla@sna.co.za	<b>KGAREBANA</b> CIVIL & STRUCTURAL ENGINEERS 11 VLOTENBURG ROAD EQUESTRIA PRETORIA 0184 Tel: - 012-542-0069 Fax: - 071-254-4108 e-mail : - kea.m@ksee.co.za
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DESIGNED BY	
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Prof. Reg. No.	010242
CHECKED BY	
NAME	KG MALCOMSON
Prof. Reg. No.	080542
DRAWN BY	
NAME	M WATTS

CONSULTANT APPROVAL	
Name	KG MALCOMSON
Prof. Reg. No.	080542
Date	02/12/2019

<b>HEAD OFFICE</b> 48 Tambotie Avenue Val de Grace Pretoria 0184 PO Box 415 Pretoria 0001 South Africa Tel: (012) 844 8000
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<b>SANRAL</b> SOUTH AFRICAN NATIONAL ROADS AGENCY (Pty) LTD BUILDING SOUTH AFRICA THROUGH BETTER ROADS
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<b>NORTHERN REGION</b> 38 Ida Street Menlo Park Pretoria 0081 Private Bag X17 Lynnwood Ridge 0040 Tel: (012) 426 6200
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<b>ACCEPTANCE</b> 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:
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<b>MSBBR: REPAIRS TO BRIDGE PARAPETS: R40 NELSPRUIT B0064 AND R33 PIET RETIEF B3297</b>
<b>EMERGENCY REPAIR FOR BRIDGE B3297 ON R033/06N AT km 27.5</b>
<b>PARAPET DETAILS</b>
SCALE : AS SHOWN
SHEET 02 OF 10

PROJECT NUMBER		NRA X.002-063-2018/01-C05	
DRAWING LOCATION DATA	START	END	
ROUTE	R033	R033	
SECTION	06N	06N	
DRAWING km DISTANCE	27.5	27.5	
DRAWING TYPE	STRUCTURES-BRIDGES		
BRIDGE/STRUCTURE No.	B3297		
CONSULTANT DRAWING No.	TP1916-2/B3297/02	VER	
SANRAL DOCUMENT #	18972347		V2