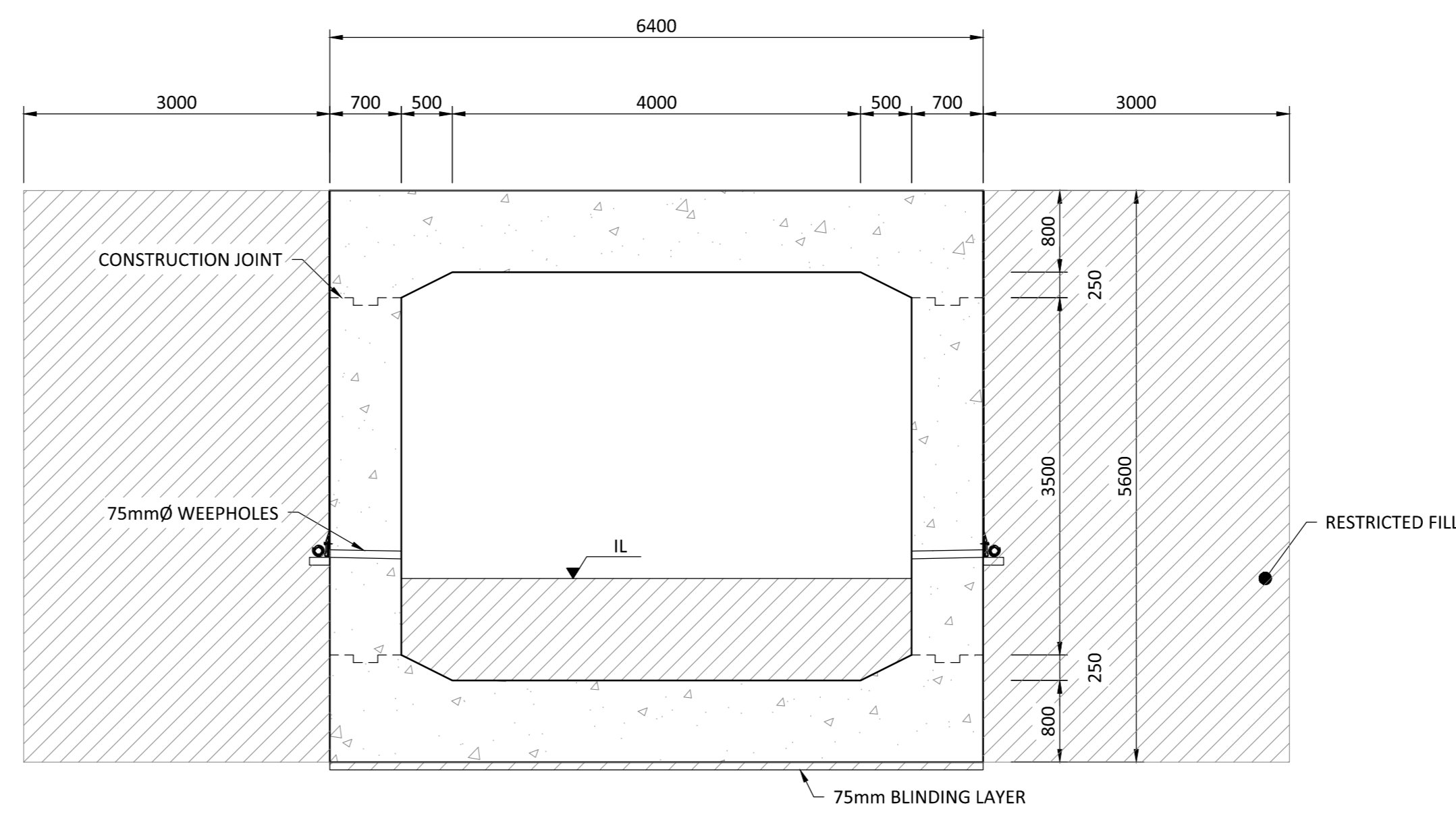
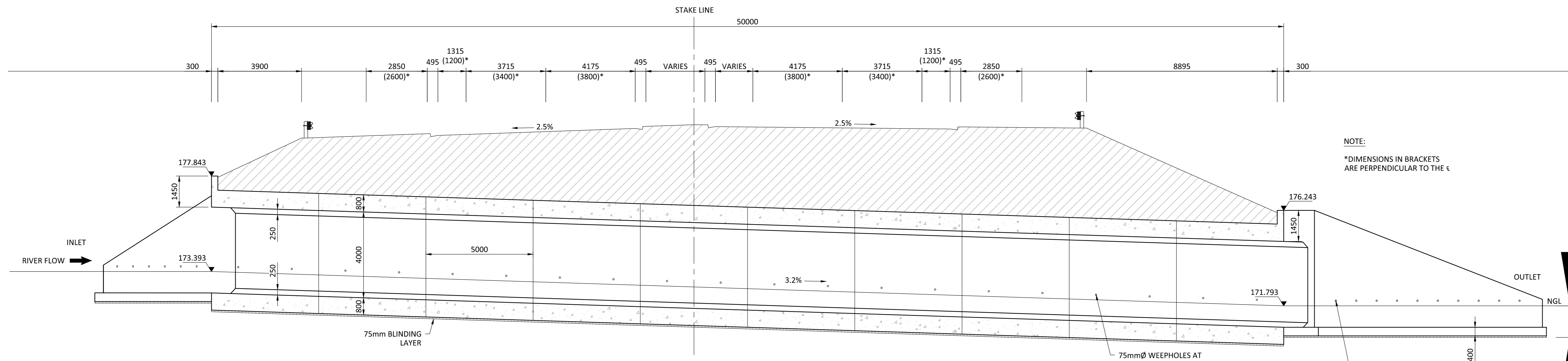


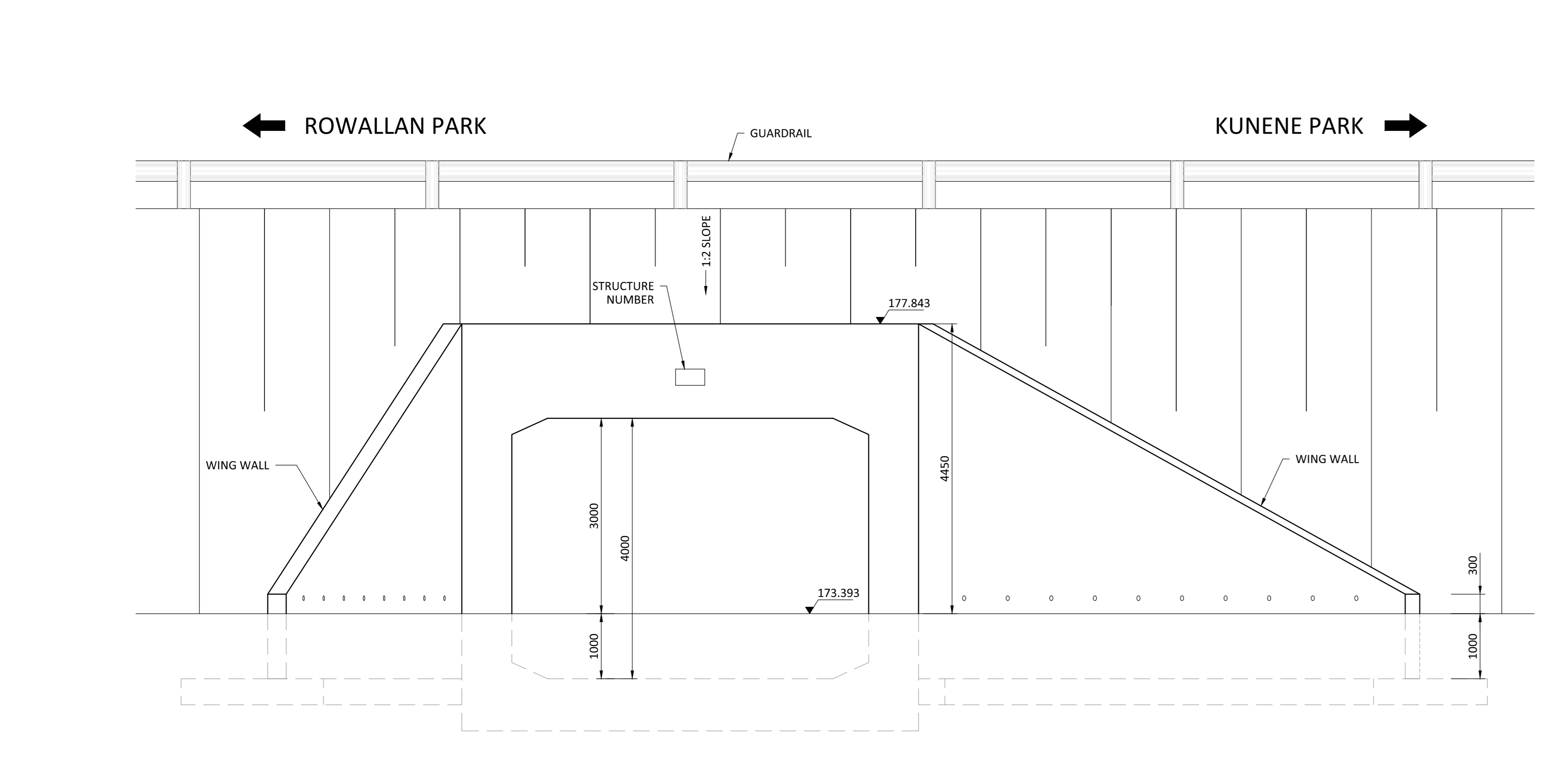
PLAN
SCALE 1:200



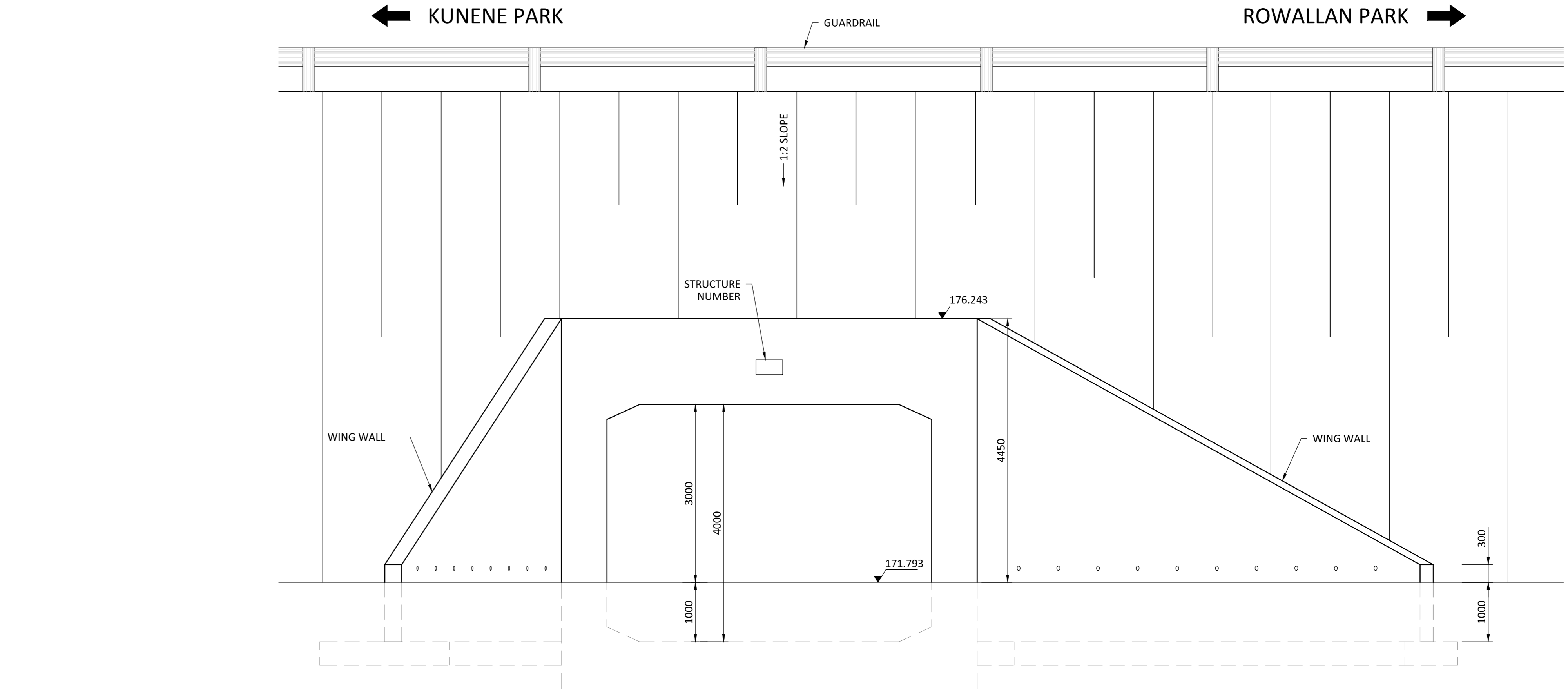
CROSS SECTION
SCALE 1:50



LONGITUDINAL SECTION ALONG €
SCALE 1:100



INLET ELEVATION
SCALE 1:50



OUTLET ELEVATION
SCALE 1:50

NOTES

1. GENERAL
 - 1.1 DESIGN OF THE STRUCTURE IS IN ACCORDANCE WITH "CODE OF PROCEDURE FOR THE PLANNING AND DESIGN OF HIGHWAY AND ROAD STRUCTURES IN SOUTH AFRICA" FEBRUARY 2002 AND "TMH7-CODE OF PRACTICE FOR THE DESIGN OF HIGHWAY BRIDGES AND CULVERTS IN SOUTH AFRICA" 1981 AND AMENDMENTS TO DATE.
2. DESCRIPTION OF STRUCTURE
 - 2.1 SINGLE CELL 5.0m x 4.0m REINFORCED CONCRETE CULVERT
 - 2.2 THE STRUCTURE IS FOUNDED ON HARD ROCK.
 - 2.3 ALLOWABLE BEARING PRESSURE = TBC
 - 2.4 DESIGN BEARING PRESSURE = 150 kPa
3. DESIGN LOADS
 - 3.1 DESIGN LIVE LOAD
 - (a) NA
 - (b) NB36
 - (c) NC
 - 3.2 UNIT WEIGHTS OF MATERIAL:
 - (a) FILL MATERIAL = 20 kN/m³
 - (b) REINFORCED CONCRETE = 25 kN/m³
 - (c) ASPHALT = 21 kN/m³
 - 3.3 EARTH PRESSURE ON RETAINING STRUCTURES (IN ACCORDANCE WITH TMH 7, PART 2.4.2):
 - (a) EARTH = 20 kN/m² PER METER DEPTH.
 - (b) NA, NB36 AND NC SURCHARGE
 - (c) NO ADDITIONAL PRESSURE DUE TO WATER HAS BEEN ALLOWED FOR (SUBSOIL DRAINAGE HAS BEEN PROVIDED).
 - 3.4 SUPPLEMENTARY ACTIONS, WHERE APPLICABLE, ARE IN ACCORDANCE WITH TMH7 PARTS 1 AND 2.
4. MATERIAL AND FINISHES
 - 4.1 THE MATERIAL AND WORK SHALL COMPLY WITH THE RELEVANT CLAUSES OF SERIES 2000, 3000, 5000, 6000 AND 7000 OF THE STANDARD SPECIFICATIONS. THE PROJECT SPECIFICATIONS AND SHALL INCLUDE THE FOLLOWING.
 - 4.2 CHARACTERISTIC STRENGTH OF MATERIALS:
 - 4.2.1 REINFORCEMENT:

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

DESCRIPTION	CHARACTERISTIC STRENGTH (MPa)	CONCRETE CLASS (MPa/mm)
SLAB	30	W30/26
WALLS	30	W30/26
WINGWALLS	30	W30/26
BLINDING/MASS CONCRETE	15	15/19
 - 4.3 SURFACE FINISHES:

EXPOSED SURFACES	FORMED	UNFORMED
CONCEALED SURFACES	F2	U2
	F1	U1
 - 4.4 MINIMUM CONCRETE COVER : 50mm
 - 4.5 ALL EXPOSED SHARP CORNERS SHALL BE CHAMFERED 25mm x 25mm.
 - 4.6 JOINTS TO BE SEALED USING DOW CORNING 888 OR EQUIVALENT (INSIDE) AND BITUMIN IMPREGNATED STRIPS (OUTSIDE).
 - 4.7 BACKFILL AND BEDDING MATERIAL REQUIREMENTS AS SPECIFIED.
5. CONSTRUCTION
 - 5.1 FOUNDING:
 - 5.1.1 FOUNDING CONDITIONS NEED TO BE CHECKED ON SITE BEFORE COMMENCEMENT OF CONSTRUCTION. ADVANCE NOTICE TO BE GIVEN TO THE ENGINEER SHOULD BEARING CAPACITY BE LESS THAN IS REQUIRED.
 - 5.1.2 UNSUITABLE FOUNDING MATERIAL SHALL BE REMOVED TO A DEPTH AS INDICATED BY THE ENGINEER AND REPLACED WITH APPROVED FOUNDATION FILL OR MASS CONCRETE.
 - 5.2 NEW IN-SITU CULVERT
 - 5.2.1 ALL CONSTRUCTION JOINTS MUST BE PREPARED STRICTLY IN ACCORDANCE WITH SECTION 6408 OF THE SPECIFICATION.
 - 5.2.2 CONSTRUCTION JOINTS, OTHER THAN THOSE INDICATED, SHALL NOT BE ALLOWED UNLESS APPROVED APPROVED BY THE ENGINEER.
6. HYDRAULIC DATA
 - 6.1 EFFECTIVE CATCHMENT AREA = 9.7 Km²
 - 6.2 DESIGN FLOOD (Q) RECURRENCE INTERVAL = 25 yrs
 - 6.3 DESIGN FLOOD LEVELS:

FLOOD	RECURRENCE INTERVAL	FLOOD (m ³ /s)	VELOCITY FLOW (m/s)
Q ₂	25	38.0	2.5
Q _T	50	47.0	4.9
 - 6.4 FREEBOARD TO SHOULDER BREAK POINT BASED ON Q_T = 6.55m

<p>CONSTRUCTION RECORD WORKS CONTRACT ENGINEER</p> <p>Name : Prof. Reg. No. : Date :</p> <p>SANRAL PROJECT MANAGER</p> <p>Name : Prof. Reg. No. : Date :</p>		<p>PORT ELIZABETH OFFICE 2 FORT STREET CENTRAL 6000</p> <p>TEL: +27 (0)41 585 2514 FAX: +27 (0)41 585 8478 REG. No. 1966/006628/07</p>	<p>DESIGNED BY</p> <p>NAME : E.N. ARENDSSE Prof. Reg. No. : CHECKED BY</p> <p>NAME : E.J. SMUTS Prof. Reg. No. : 950324 DRAWN BY</p>	<p>CONSULTANT APPROVAL</p> <p>Name : Prof. Reg. No. : Date :</p>	<p>HEAD OFFICE 48 Tambotie Avenue Val de Grace Pretoria 0184</p> <p>PO Box 415 Pretoria 0001 South Africa Tel: (012) 844 8000</p>		<p>SOUTHERN REGION SANRAL House Southern Life Gardens 70 2nd Avenue Newton Park Port Elizabeth 6045</p> <p>PO Box 27230 Greenacres 6067</p> <p>Tel: (041) 398 3200</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 NATIONAL ROUTE N2 SECTION 11: NEW REDHOUSE CHELSEA INTERCHANGE</p> <p>DRAWING DESCRIPTION REDHOUSE CHELSEA ARTERIAL - CYCLOPIA CULVERT (No C0314) GENERAL ARRANGEMENT</p>	<p>PROJECT NUMBER DRAWING LOCATION DATA</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>ROUTE</th> <th>START</th> <th>END</th> </tr> <tr> <td>N2</td> <td>N2</td> <td>N2</td> </tr> <tr> <th>SECTION</th> <td>11</td> <td>11</td> </tr> <tr> <th>DRAWING km DISTANCE</th> <td>NA</td> <td>NA</td> </tr> <tr> <th>DRAWING TYPE</th> <td colspan="2">STRUCTURES - BRIDGES</td> </tr> <tr> <th>BRIDGE/STRUCTURE No.</th> <td colspan="2">C0314</td> </tr> <tr> <th>CONSULTANT DRAWING No.</th> <td>PD</td> <td>J00488-00-11-2002</td> </tr> <tr> <th>SANRAL DOCUMENT #</th> <td colspan="2">VER 11</td> </tr> </table>	ROUTE	START	END	N2	N2	N2	SECTION	11	11	DRAWING km DISTANCE	NA	NA	DRAWING TYPE	STRUCTURES - BRIDGES		BRIDGE/STRUCTURE No.	C0314		CONSULTANT DRAWING No.	PD	J00488-00-11-2002	SANRAL DOCUMENT #	VER 11		<p>NRA N.002 - 110 - 2012/1</p> <p>SCALE : AS SHOWN</p> <p>SHEET 01 OF 01</p>
ROUTE	START	END																																	
N2	N2	N2																																	
SECTION	11	11																																	
DRAWING km DISTANCE	NA	NA																																	
DRAWING TYPE	STRUCTURES - BRIDGES																																		
BRIDGE/STRUCTURE No.	C0314																																		
CONSULTANT DRAWING No.	PD	J00488-00-11-2002																																	
SANRAL DOCUMENT #	VER 11																																		