

APPENDIX H

DRAWINGS



REFERENCE DRAWINGS		REVISIONS			
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.
		A	28/01/11	FOR INFORMATION	PLR

DESIGNED:	D VAN COLLER	PROJECT ENGINEER:	P LE ROUX
DRAWN:	D VAN COLLER	TCTA:	
CHECKED:	J MULDER		
CHIEF DESIGNER:		SCALE:	1:1000

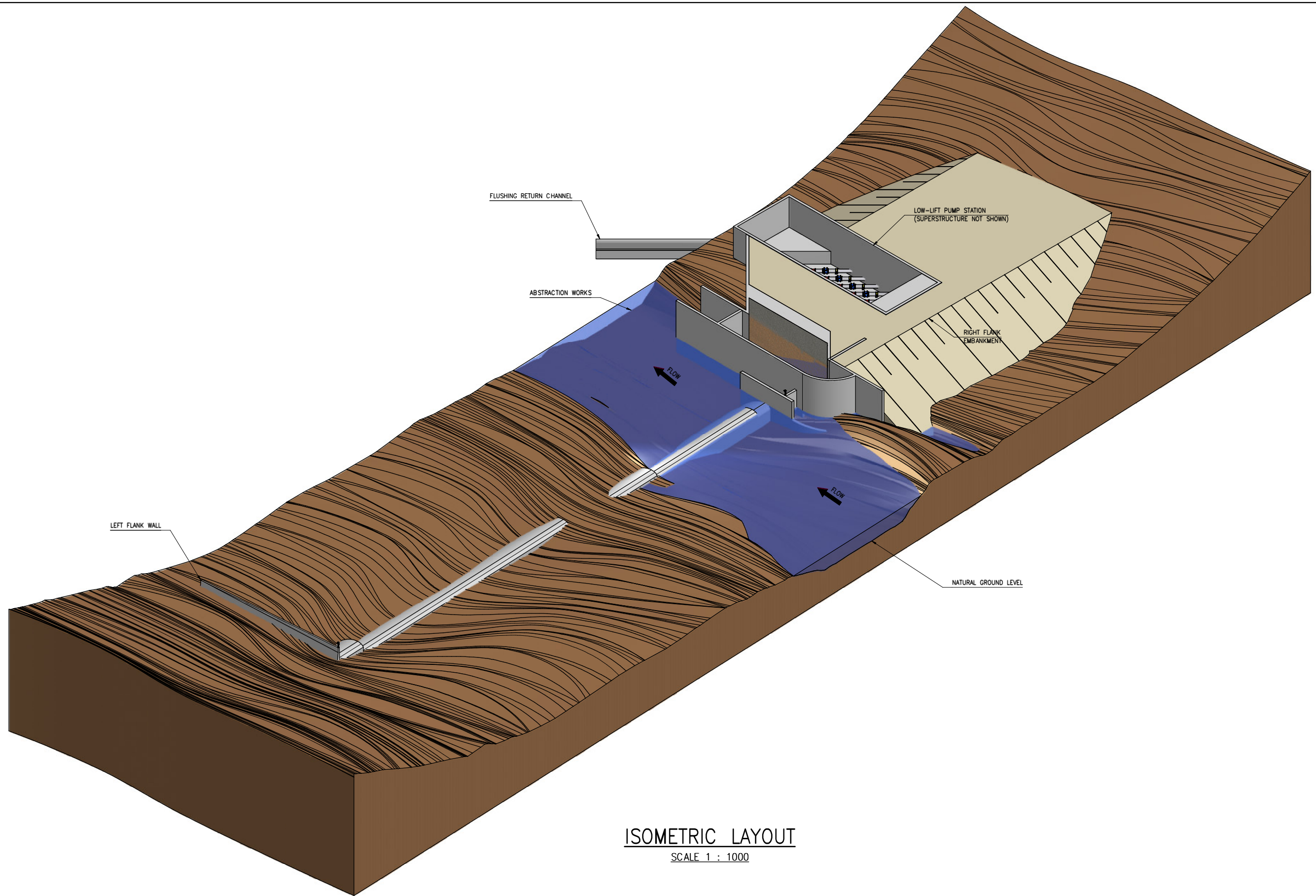
SCALE 1 : 1000

MOKOLO CROCODILE
Consultants




MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)

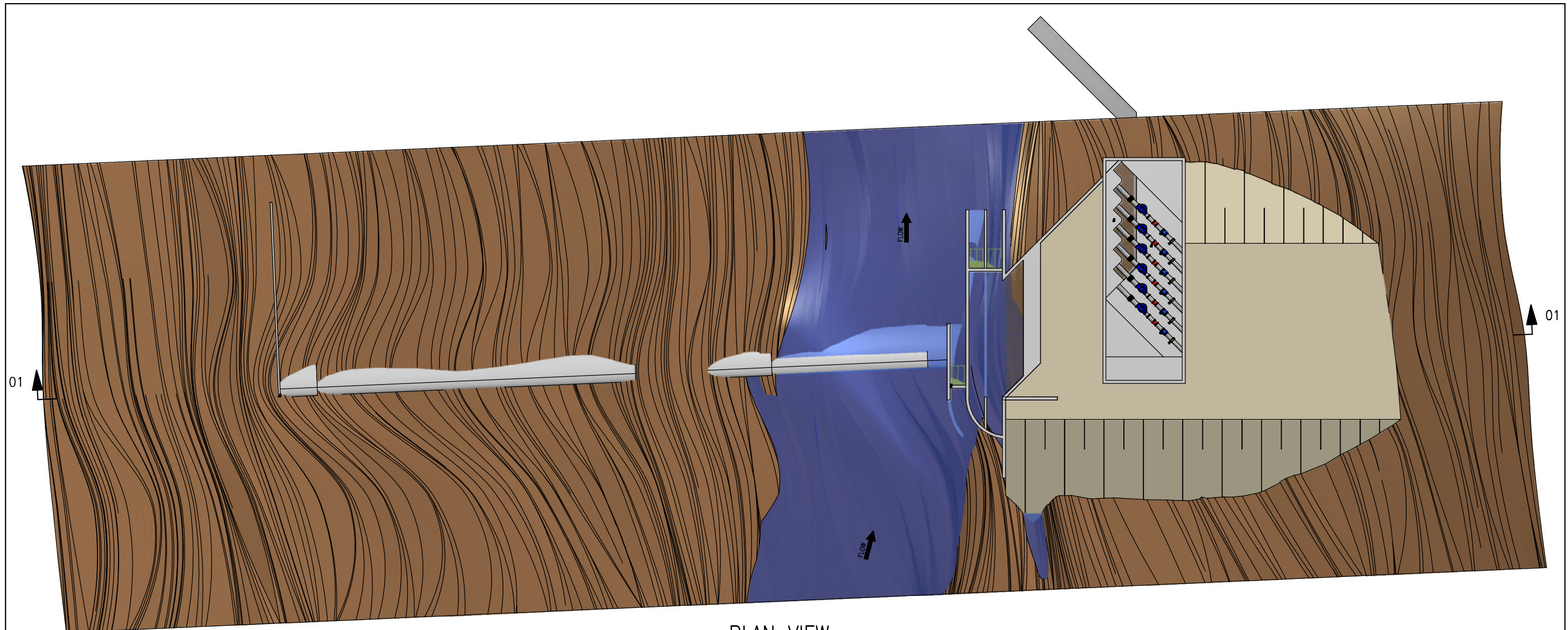
VLIEEPOORT ABSTRACTION WORKS
GENERAL LAYOUT

A3 DWAF DRG. No. DRAWING NUMBER 2B - C3 - 001 REV No. A



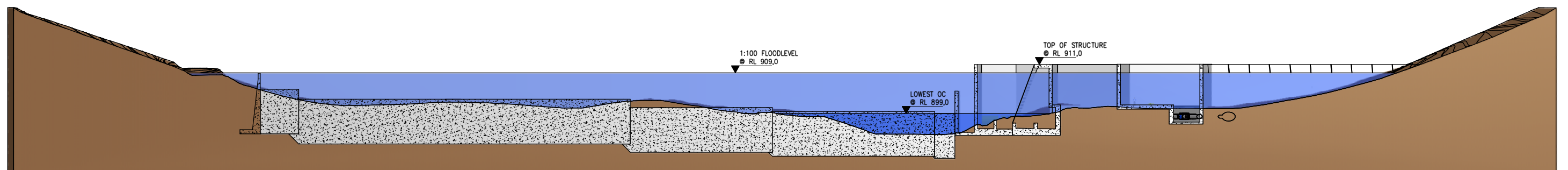
ISOMETRIC LAYOUT
SCALE 1 : 1000

REFERENCE DRAWINGS		REVISIONS			DESIGNED:	D VAN COLLER	PROJECT ENGINEER:	P LE ROUX	  A new word for water	MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP) VLIEPOORT ABSTRACTION WORKS GENERAL LAYOUT ISOMETRIC VIEW		
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	D VAN COLLER	TCTA:				
		A	28/01/11	FOR INFORMATION	PLR	CHECKED:	J MULDER					
						CHIEF DESIGNER:		SCALE:			1:1 000	
					SCALE 1 : 1 000 					A3 DWAF DRG. No.	DRAWING NUMBER 2B-C5-001	REV No. A





PLAN VIEW

SCALE 1 : 1000

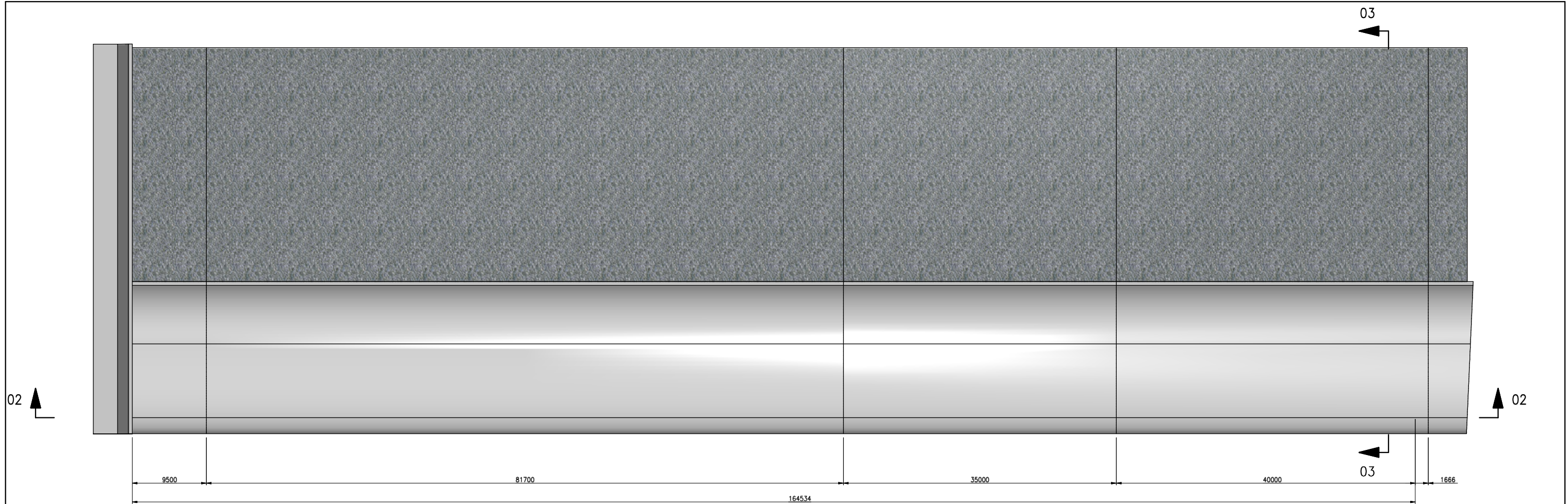


SECTION 01-01

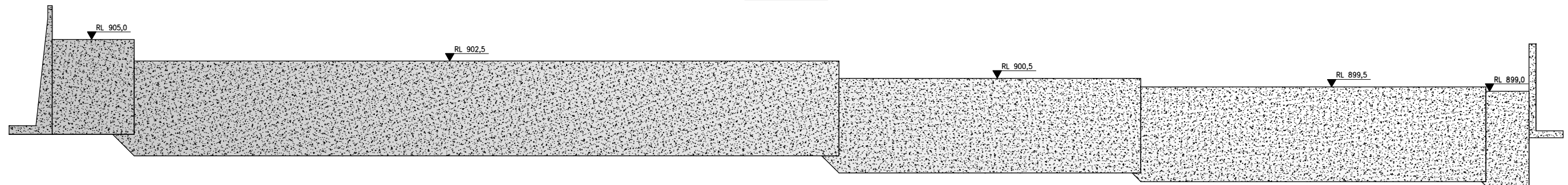
SCALE 1 : 1000

REFERENCE DRAWINGS		REVISIONS			DESIGNED:	D VAN COLLER	PROJECT ENGINEER:	P LE ROUX	  A new word for water	MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP) VLEEPOORT ABSTRACTION WORKS GENERAL LAYOUT PLAN AND SECTION			A3 DWAF DRG. No.	DRAWING NUMBER 2B-C5-002	REV No. A
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	D VAN COLLER	TCTA:							
						CHECKED:	J MULDER								
						CHIEF DESIGNER:		SCALE:		1:1000					

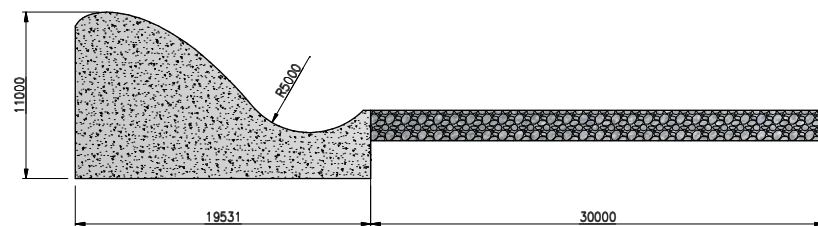
SCALE 1 : 1 000 0 5 10 15 20 25 50





WEIR LAYOUT PLAN
SCALE 1 : 500

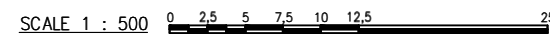


WEIR LONG SECTION 02-02
SCALE 1 : 500



WEIR CROSS SECTION 03-03
SCALE 1 : 500

REFERENCE DRAWINGS		REVISIONS			DESIGNED:	D VAN COLLER	PROJECT ENGINEER:	P LE ROUX	  A new word for water	MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)		
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	D VAN COLLER	TCTA:				
		A	28/01/11	FOR INFORMATION	PLR	CHECKED:	J MULDER					
						CHIEF DESIGNER:		SCALE:		1:500		

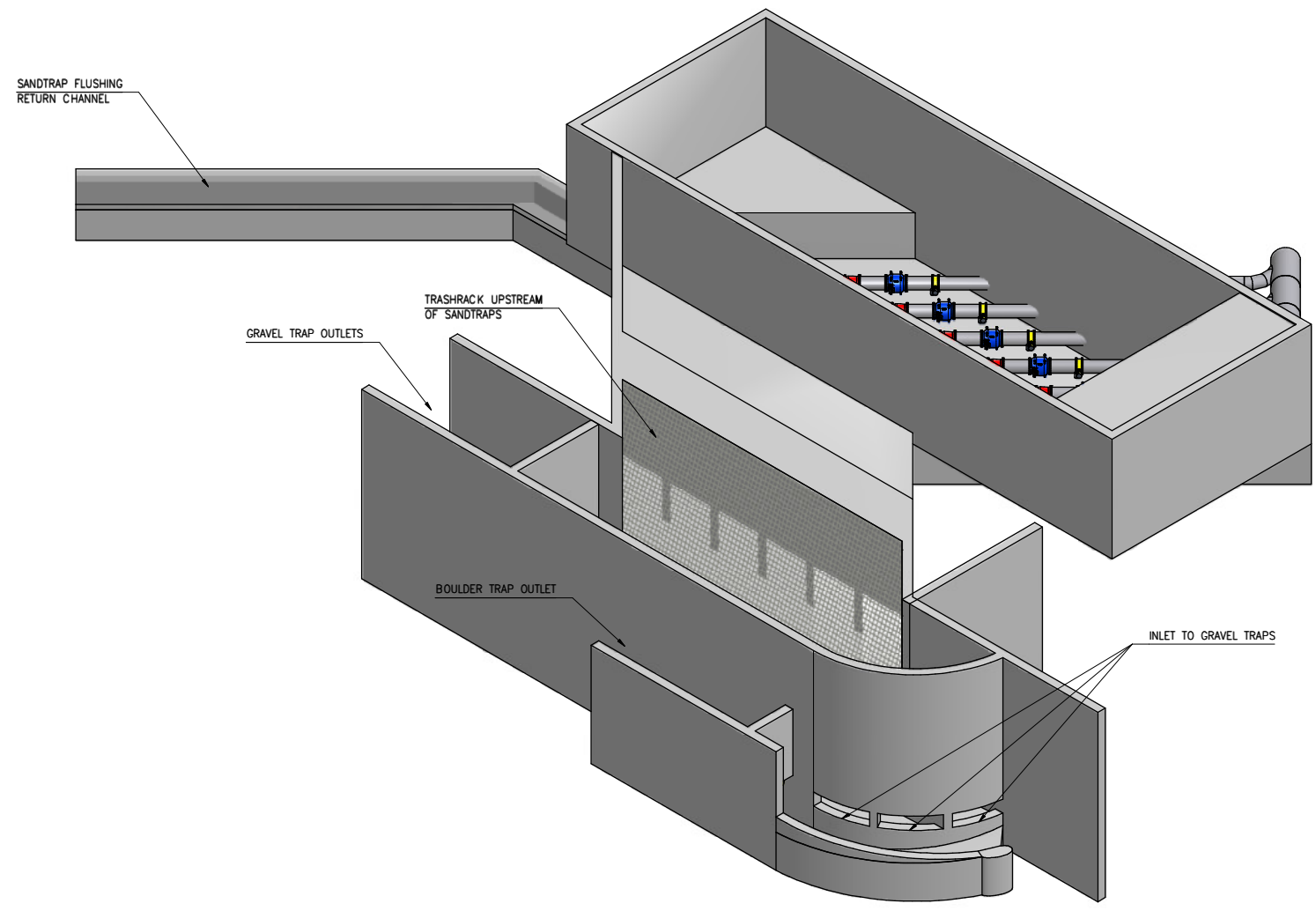
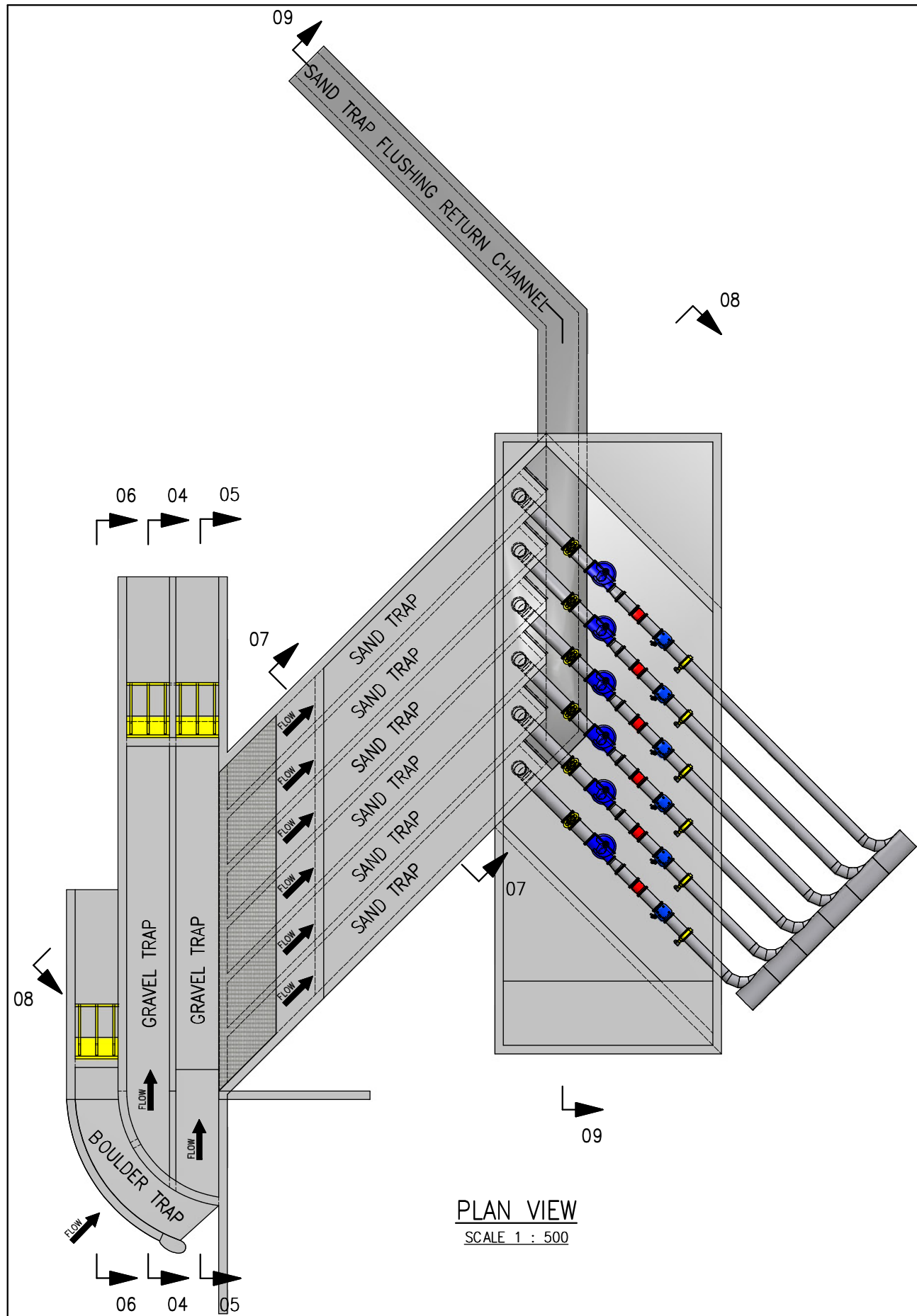


A3

DWAF
DRG. No.

DRAWING
NUMBER 2B-C5-003

REV No.
A



REFERENCE DRAWINGS		REVISIONS		
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION
		A	28/01/11	FOR INFORMATION

DESIGNED:	D VAN COLLER	PROJECT ENGINEER:	P LE ROUX
DRAWN:	D VAN COLLER	TCTA:	
CHECKED:	J MULDER		
CHIEF DESIGNER:		SCALE:	1:500

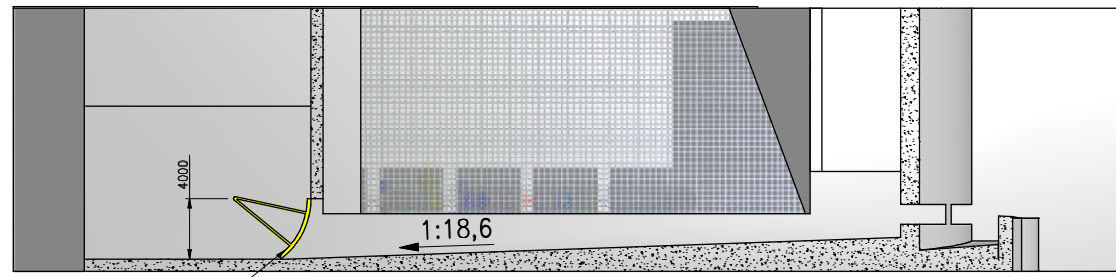
SCALE 1 : 500

MOKOLO CROCODILE
Consultants

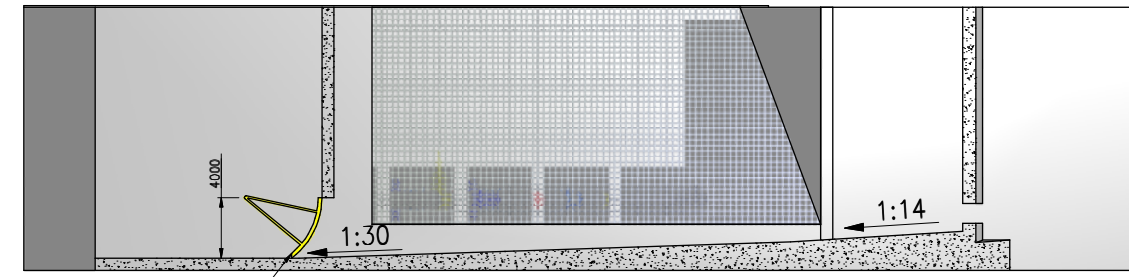
MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)

VLIEEPOORT ABSTRACTION WORKS
ABSTRACTION WORKS
LAYOUT AND ISOMETRIC VIEW

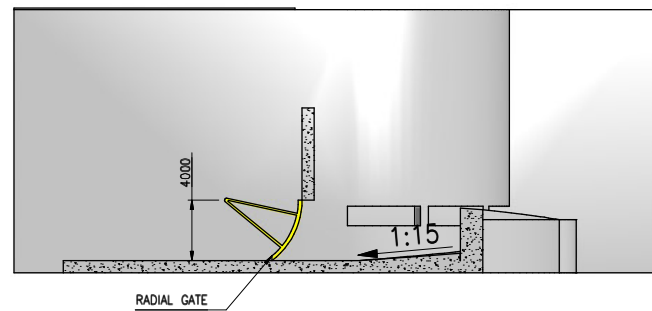
A3 DWAF DRG. No. DRAWING NUMBER 2B-C5-004 REV No. A



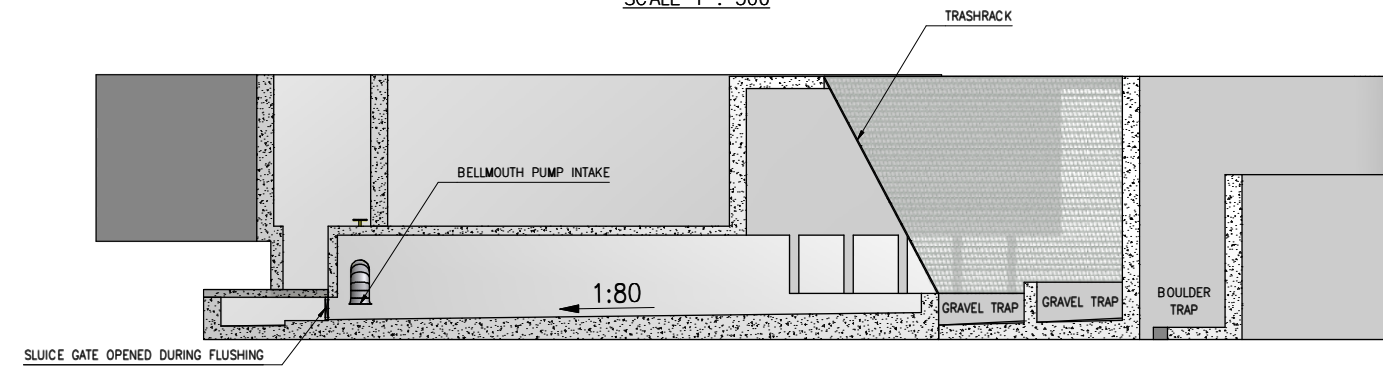
SECTION 04-04
THROUGH GRAVEL TRAP 1
SCALE 1 : 500



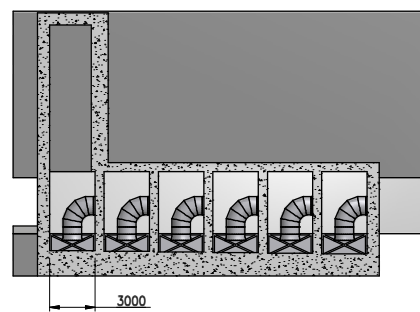
SECTION 05-05
THROUGH GRAVEL TRAP 2
SCALE 1 : 500



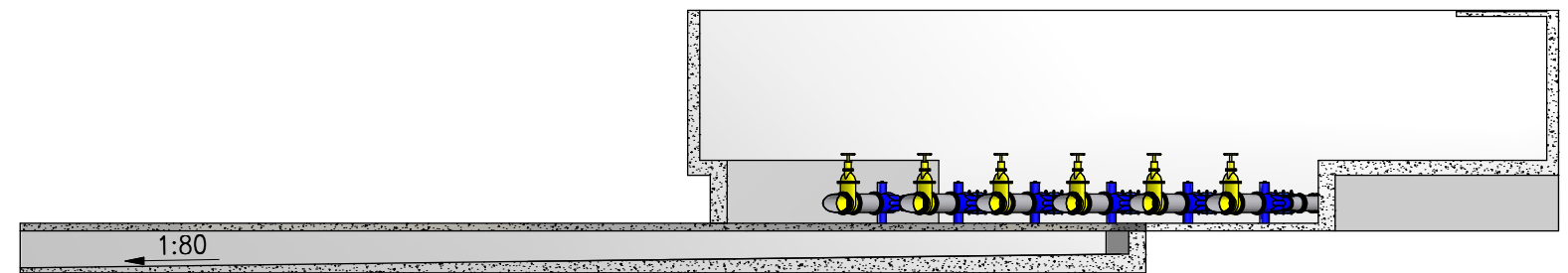
SECTION 06-06
THROUGH BOULDER TRAP
SCALE 1 : 500



SECTION 08-08
THROUGH SAND TRAP CHANNEL
SCALE 1 : 500

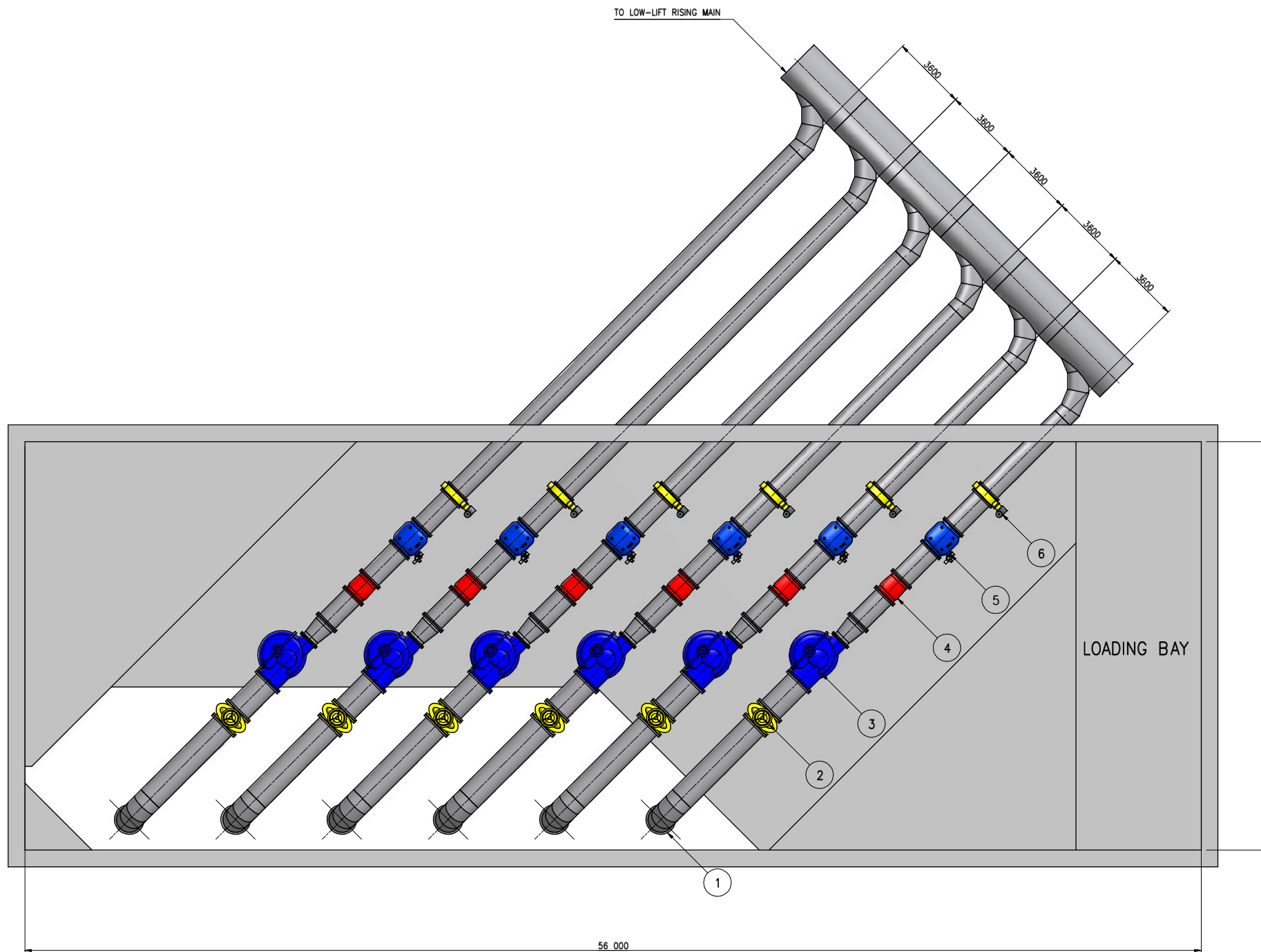


SECTION 07-07
ACROSS SAND TRAP CHANNELS
SCALE 1 : 500






SECTION 09-09
THROUGH FLUSHING CHANNEL
SCALE 1 : 500

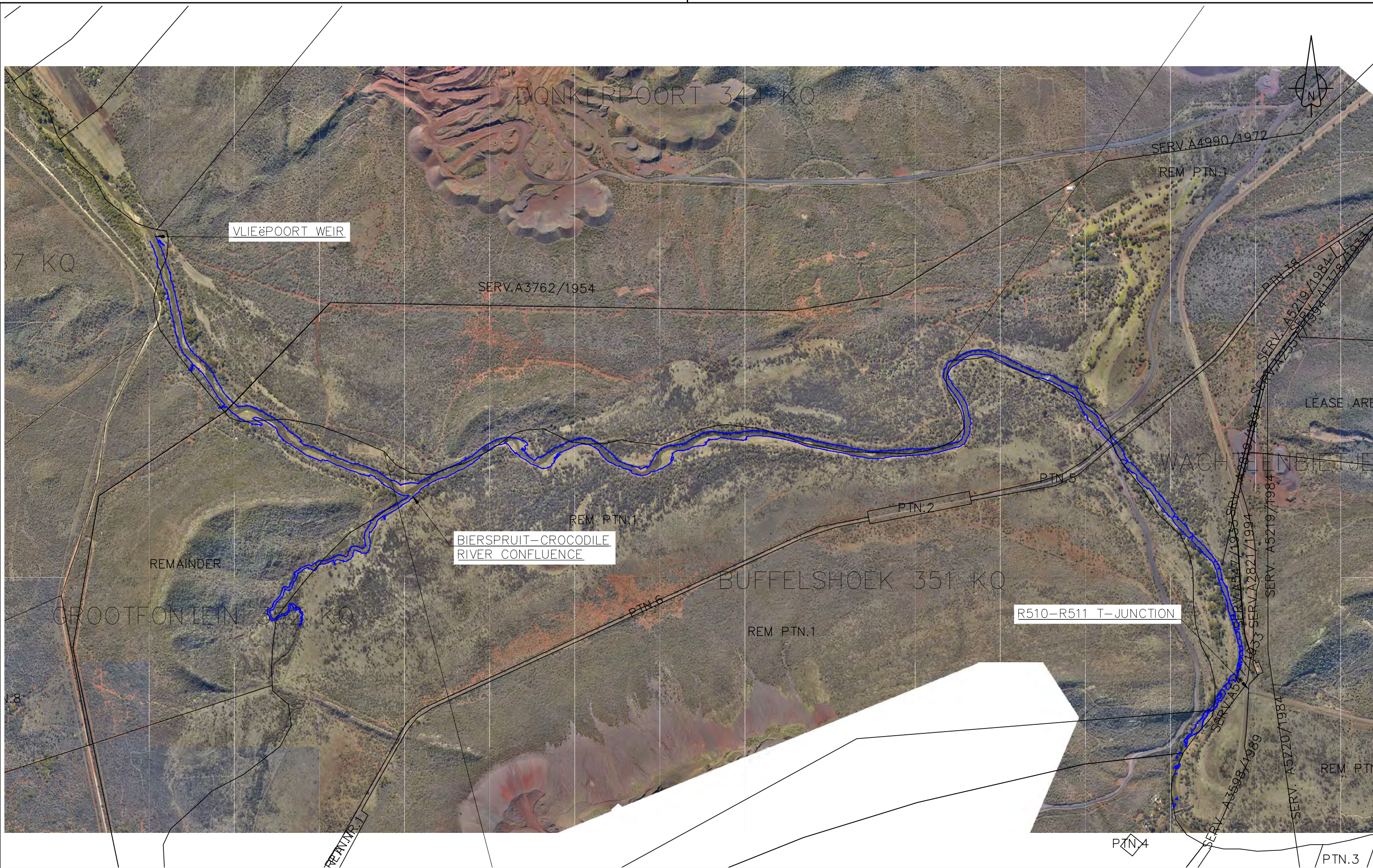
REFERENCE DRAWINGS		REVISIONS			DESIGNED:	D VAN COLLER	PROJECT ENGINEER:	P LE ROUX	MOKOLO CROCODILE Consultants		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)								
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	D VAN COLLER	TCTA:		VLIEPOORT ABSTRACTION WORKS									
		A	28/01/11	FOR INFORMATION	PLR	CHECKED:	J MULDER			ABSTRACTION WORKS									
						CHIEF DESIGNER:		SCALE:	1:500	SECTIONS									
					SCALE 1 : 500														
												A3		DWF DRG. No.		DRAWING NUMBER 2B-C5-005		REV No. A	



LOW-LIFT PUMP STATION LAYOUT
SCALE 1 : 250

PARTS LIST		
ITEM	QTY	DESCRIPTION
1	6	BELLMOUTH INTAKE
2	6	DN1200 PN16 WEDGE GATE VALVE
3	6	LOW-LIFT PUMP (VERTICAL MOTOR MOUNT)
4	6	DN1000 PN16 NOZZLE CHECK VALVE
5	6	DN1000 PN16 CONTROL VALVE
6	6	DN1000 PN16 BUTTERFLY VALVE

REFERENCE DRAWINGS		REVISIONS			DESIGNED:	D VAN COLLER	PROJECT ENGINEER:	P LE ROUX	 	MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)				
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	D VAN COLLER	TCTA:		VLIEPOORT ABSTRACTION WORKS				
		A	28/01/11	FOR INFORMATION	PLR	CHECKED:	J MULDER			LOW-LIFT PUMP STATION				
						CHIEF DESIGNER:		SCALE:		1:250	LAYOUT AND MECHANICAL DETAILS			
					SCALE 1 : 250						A3	DWAF DRG. No.	DRAWING NUMBER 2B-C5-006	REV No. A

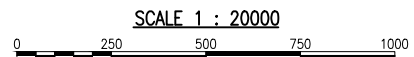


REFERENCE DRAWINGS		REVISIONS			
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.

DESIGNED:	PROJECT ENGINEER:
DRAWN:	TCTA:
CHECKED:	SCALE: AS SHOWN
CHIEF DESIGNER:	SCALE: 1 : 20000

MOKOLO CROCODILE
Consultants

MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)		
A3	DWAF DRG. No.	DRAWING NUMBER
		REV No.





LEGEND:	
	CHAINAGE MARKER (PLAN ONLY)
	JUNCTION
	POINT OF INTERSECTION (PI)
	PUMP STATION
	NON RETURN VALVE
	AIR VALVE
	CONTROL VALVE
	SCOUR VALVE
	ISOLATING VALVE
	FARM TAKE-OFF
	SURVEY BEACON
	PIPELINE SERVITUDE BOUNDARY
	WORKING AREA BOUNDARY
	SERVITUDES
	PIPELINE
	PMF FLOODLINE
	RMF FLOODLINE
	1:200 FLOODLINE
	1:100 FLOODLINE

REFERENCE DRAWINGS		REVISIONS			
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.
		A	11/03/11	FOR INFORMATION	PLR
		B	21/11/17	ADD WORKSHOP, OFFICES AND STORES FOOTPRINT	PLR

DESIGNED:	D VAN COLLER	PROJECT ENGINEER:	P LE ROUX
DRAWN:	D VAN COLLER	TCTA:	
CHECKED:	J MULDER		
CHIEF DESIGNER:	E SERFONTEIN	SCALE:	1:5000

SCALE: 1:5000

MOKOLO CROCODILE
Consultants

MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)

VLIEEPOORT ABSTRACTION WORKS
BALANCING DAM AND HIGH-LIFT PUMP STATION
GENERAL LAYOUT

A3 DWAF DRG. No. DRAWING NUMBER 2B - C3 - 002 REV No. B

BREAK PRESSURE RESERVOIR DETAILS

DESCRIPTION	VALUE
NON SPILL OVER CREST	1105.00 mASL
BASE LEVEL	1097.96 mASL
	1100.00 mASL
EMBANKMENT HEIGHT	6.34 m (MAXIMUM)
	1.62 m (MINIMUM)
SLOPES	SIDE SLOPES 1 : 2
	FLOOR 1 : 100
COMPARTMENT VOLUME	50 000 m ³
WATER LEVEL	1104.00 mASL
FREE BOARD	1 m
WATER DEPTH	6.04 m (MAXIMUM)
	5.00 m (MINIMUM)
SPILLWAY DEPTH	0.6 m
SPILLWAY WIDTH	12 m



REFERENCE DRAWINGS		REVISIONS			
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.
		A	15/12/10	FOR INFORMATION	PLR

DESIGNED:	N JORDAAN	PROJECT ENGINEER:	P LE ROUX
DRAWN:	N JORDAAN	TCTA:	
CHECKED:	J MULDER		
CHIEF DESIGNER:	E SERFONTEIN	SCALE:	AS SHOWN
SCALE 1 : 2000			

MOKOLO CROCODILE
Consultants

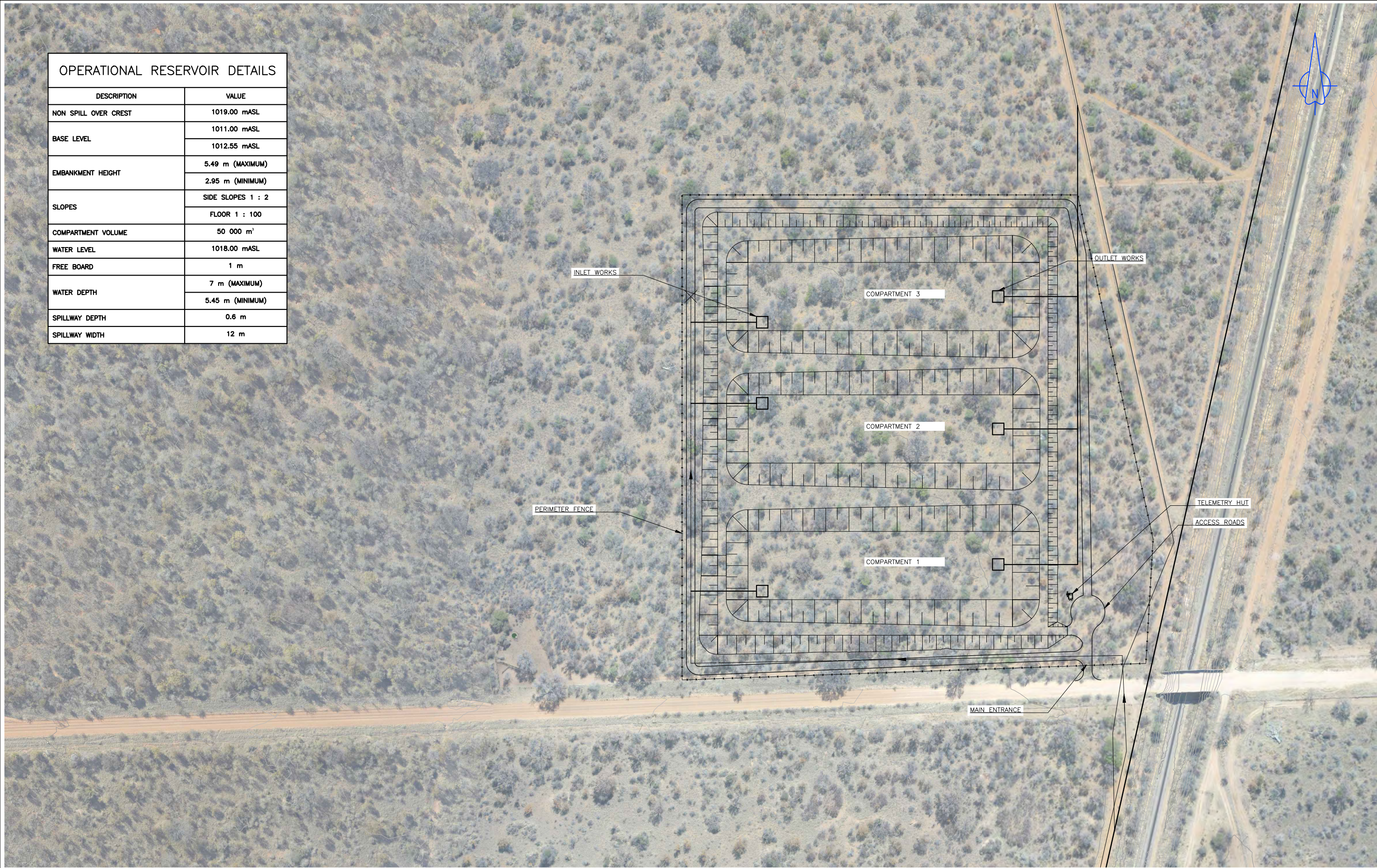
MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)



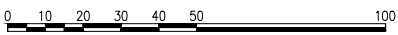
BREAK PRESSURE RESERVOIR
GENERAL LAYOUT

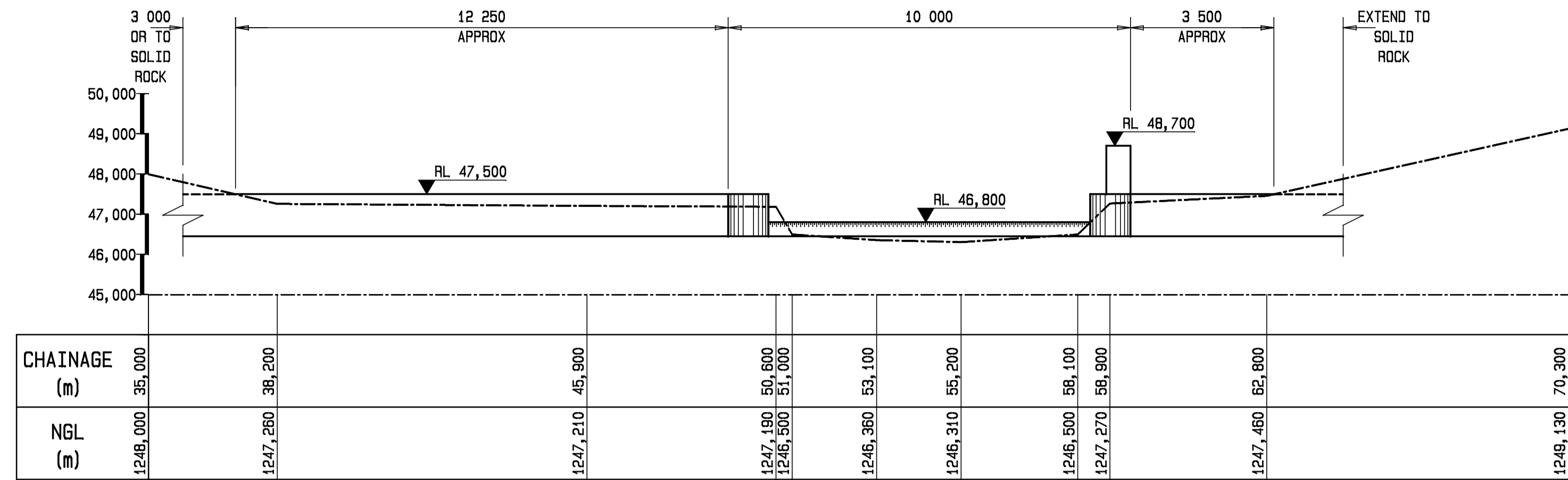
A3	DWAf DRG. No.	DRAWING NUMBER 2D - C3 - 001	REV No. A
----	------------------	------------------------------------	--------------

OPERATIONAL RESERVOIR DETAILS

DESCRIPTION	VALUE
NON SPILL OVER CREST	1019.00 mASL
BASE LEVEL	1011.00 mASL
	1012.55 mASL
EMBANKMENT HEIGHT	5.49 m (MAXIMUM)
	2.95 m (MINIMUM)
SLOPES	SIDE SLOPES 1 : 2
	FLOOR 1 : 100
COMPARTMENT VOLUME	50 000 m ³
WATER LEVEL	1018.00 mASL
FREE BOARD	1 m
WATER DEPTH	7 m (MAXIMUM)
	5.45 m (MINIMUM)
SPILLWAY DEPTH	0.6 m
SPILLWAY WIDTH	12 m

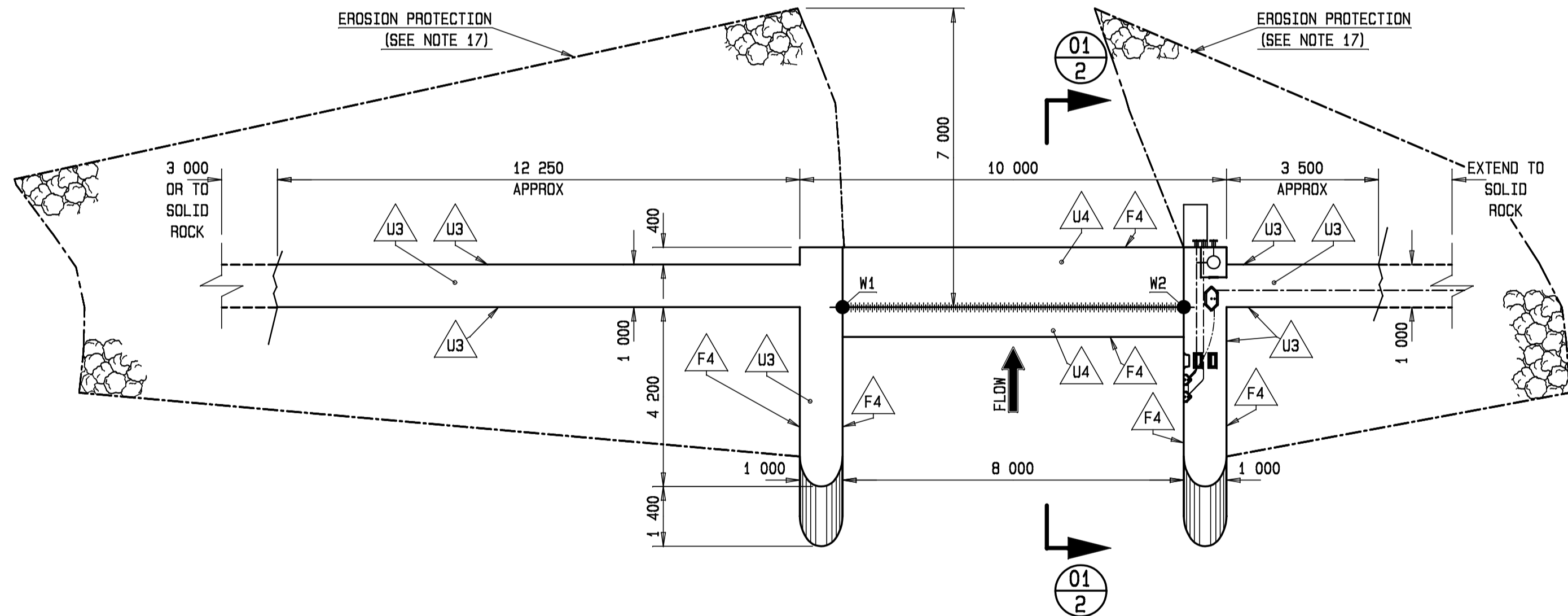


REFERENCE DRAWINGS		REVISIONS				DESIGNED:	J MULDER	PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)					
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	J MULDER	TCTA:			OPERATIONAL RESERVOIR					
		A	07/12/10	FOR INFORMATION	PLR	CHECKED:	E SERFONTEIN	SCALE:	AS SHOWN	GENERAL LAYOUT						
						CHIEF DESIGNER:	E SERFONTEIN				A3	DWAF DRG. No.	DRAWING NUMBER	2D - C3 - 010	REV No.	A
						SCALE 1 : 2000										



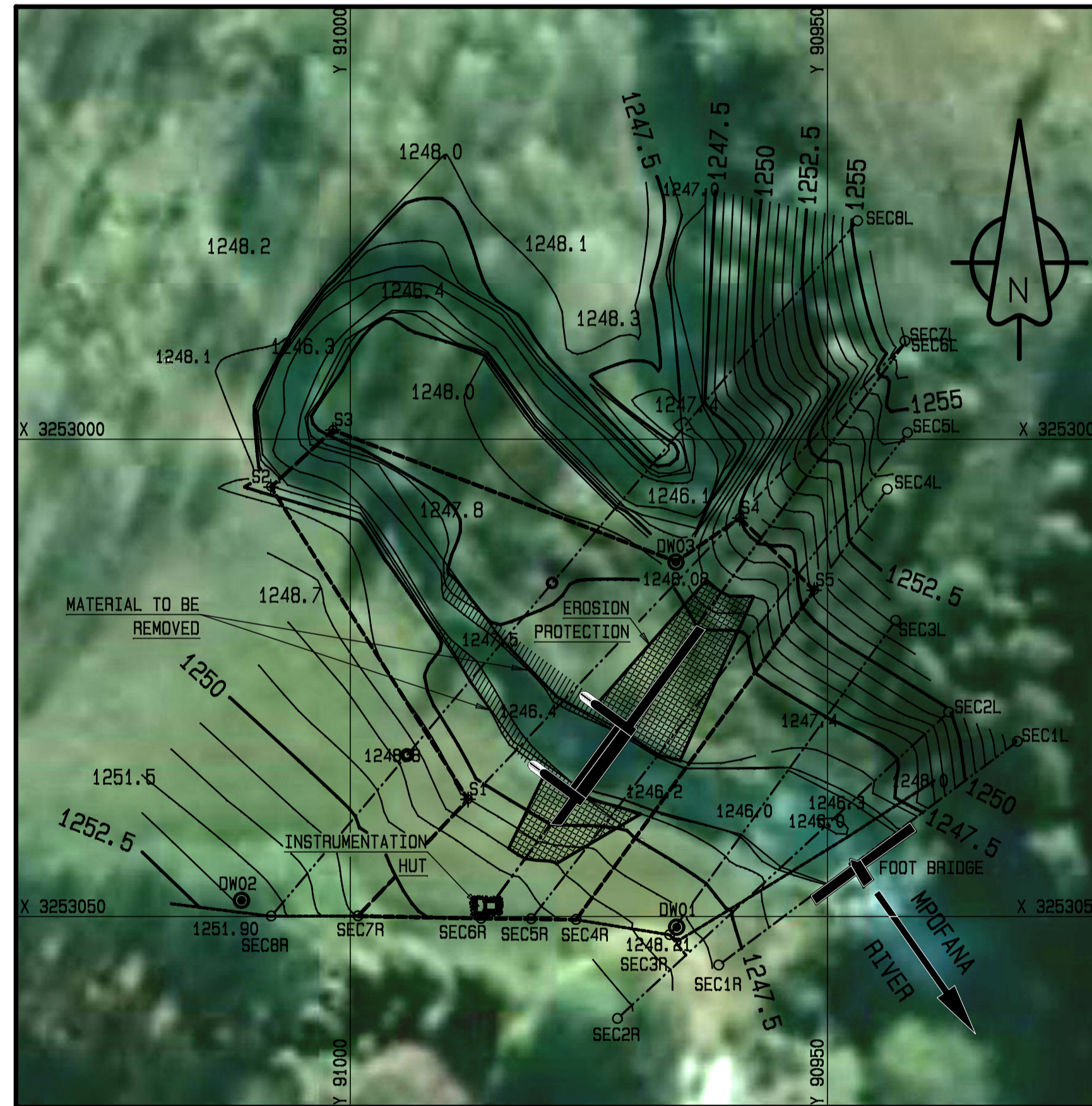
UPSTREAM ELEVATION

SCALE 1:100



PLAN

SCALE 1:100



LOCALITY PLAN

SCALE 1:500

CONCRETE TOLERANCE			
SURFACE IRREGULARITIES			
CLASS OF FINISH	TOLERANCES IN mm		
	A	B	
CAST AGAINST FORMWORK	F1	10	20
	F2	5	10
	F3	2	7
	F4	NIL	5
NOT CAST AGAINST FORMWORK	U1	10	20
	U2	NIL	10
	U3	NIL	7
	U4	NIL	5

A IS THE MAXIMUM ALLOWABLE ABRUPT IRREGULARITY
B IS THE MAXIMUM ALLOWABLE GRADUAL IRREGULARITY

SECTION		
SECTION NUMBER	SHEET NUMBER	
07	3	

CO-ORD SYSTEM: L031 HARTEBESHOEK			
RL FROM DMS: 1 198,14 m ABOVE MSL			
BMS	Y	X	
BM55	1198,18	88 270,92	3 256 088,95
STATION	RL	Y	X
DW1	1248,21	90 965,79	3 253 051,11
DW2	1251,90	91 011,39	3 253 048,30
DW3	1248,08	90 965,87	3 253 012,87
STRUCTURE	RL	Y	X
M1	1246,80	90 971,68	3 253 030,34
M2	1246,80	90 976,43	3 253 036,78
SERVITUDE	Y	X	
SEC4R	90 976,33	3 253 050,30	
SEC7R	90 999,18	3 253 049,92	
S1	90 987,65	3 253 037,71	
S2	91 008,31	3 253 004,97	
S3	91 001,81	3 252 999,01	
DW03	90 965,87	3 253 012,87	
S4	90 959,18	3 253 008,22	
S5	90 951,37	3 253 015,79	

NOTES:

- ANY DEVIATIONS FROM THE DESIGN DRAWINGS NEED TO BE APPROVED BY THE DESIGN ENGINEER PRIOR TO PLACING OF CONCRETE.
- NEW CONCRETE GRADE 25/19 (UNLESS SPECIFIED OTHERWISE).
- CAPACITY $Q = 8,0$ CUMecs, $H = 0,635$ m, SUBMERGENCE = 71%
- MINIMUM CONCRETE COVER = 70 mm (UNLESS SPECIFIED OTHERWISE).
- 15 x 15 mm CHAMFERS TO BE USED ON ALL EXPOSED CONCRETE CORNERS.
- ALL CONCRETE FINISHES SHALL BE AS FOLLOWS EXCEPT WHERE OTHERWISE SPECIFIED:
 - CLASSES F1 AND U1 TO SURFACES AGAINST WHICH BACKFILL OR FURTHER CONCRETE WILL BE PLACED
 - CLASSES F4 AND U4 FOR ALL SURFACES OVER OR AGAINST WHICH WATER WILL FLOW
 - UNFORMED SURFACE PREPARATION AND FINISH (ON WEIR CRESTS):
 - FIRST WOOD FLOAT
 - STEEL FLOAT WHILST PRESSING HARD (AFTER BLEEDING WATER HAS EVAPORATED UNTILL SMOOTH FINISH HAS BEEN ACHIEVED)
 - APPLY STEEL TROWEL SURFACE FINISH
 - MOIST CURE FOR 10 DAYS WITHOUT USE OF ANY CURING AGENTS
 - APPLY VERMI RADCON FORMULA #7 OR EQUIVALENT OVER ALL THE NOTCHES AND SIDEWALLS OVER OR AGAINST WHICH WATER WILL FLOW
 - CLASSES F2 AND U2 TO SURFACES EXPOSED TO VIEW OVER OR AGAINST WHICH NO WATER FLOW WILL OCCUR (UNLESS SPECIFIED OTHERWISE)
 - TOLERANCES FOR ALL FINISHES ARE INDICATED IN CONCRETE TOLERANCE TABLE
- ALL VERTICAL DOWELS SHALL BE GROUTED WITH A SHRINKAGE COMPENSATED CEMENTITIOUS GROUT 0,4:1 W/C RATIO (BY MASS) OR BASF-SUPERFLOW BEDDING GROUT OR EQUIVALENT.
- WET TO DRY EPOXY TO BE APPLIED ON ALL OLD EXISTING CONCRETE SURFACES BEFORE PLACEMENT OF NEW CONCRETE (ACCORDING TO MANUFACTURER'S SPECIFICATIONS). ALL SEALANTS USED AT CONSTRUCTION JOINTS TO BE APPLIED ACCORDING TO MANUFACTURER'S SPECIFICATIONS.
- THE FOLLOWING TOPICS WILL BE DECIDED ON SITE IN CONSULTATION WITH THE DESIGN ENGINEERS:
 - ROUTE OF ACCESS ROAD.
 - EXTENT AND EXACT LAYOUT OF CUT-OFF WALLS.
 - FINAL POSITION OF THE RECORDER HUT.
 - EXTENT OF EROSION PROTECTION OF THE EMBANKMENTS.
- CONDUIT PIPES (90 mm NOM. Ø HOPE 80 PN 6 PIPE) TO BE LAID WITH 6 mm SKI ROPE INSIDE FOR LATER INSTALLATION OF DATA CABLES. CONDUIT PIPES MAY ONLY BE JOINED USING A DRAW BOX. MAXIMUM DISTANCE ALLOWED BETWEEN DRAW BOXES IS 35m. DRAW BOXES SHOULD BE INSTALLED AT ANY 90° CHANGE IN CONDUIT PIPE DIRECTION.
- INSTRUMENTATION (EG. GAUGE PLATES, SOLAR PANEL, LOGGER AND PRESSURE PROBES ETC.) SHOULD COMPLY WITH STANDARDS SET BY HYDROLOGICAL SERVICES. PRESSURE PROBES, LOGGERS AND SOLAR PANELS TO BE INSTALLED BY HYDROLOGY REGIONAL STAFF. ALL CONDUIT PIPE OPENINGS TO BE SEALED OFF AFTER INSTALLATION OF INSTRUMENTATION.
- INSTRUMENTATION- AND DRAW BOXES, FLUSH STEPS AND SECURITY DOORS WITH ALL REQUIRED PARTS AND CONNECTIONS OBTAINABLE FROM INTERLOCK SYSTEMS (AS PER CONTRACT W 9257). CONTACT TEL NUMBER: (012) 664-2647.
- PERMANENT BENCH MARKS TO BE INSTALLED ON LEFT AND RIGHT BANK CUT-OFF WALLS.
- ROCK SURFACE, DIRECTLY RECEIVING CONCRETE, SHALL BE PROPERLY CLEANED AND PREPARED PRIOR TO CONCRETE CASTING. ALL ORGANIC MATERIAL AND LOOSE STONES MUST BE REMOVED. ALL FOUNDATIONS AND FOUNDATION PREPARATION NEED TO BE APPROVED BY THE DESIGN ENGINEER OR ON-SITE DESIGN REPRESENTATIVE BEFORE PLACEMENT OF CONCRETE.
- DETAIL OF PROPOSED RIVER DIVERSION NEED TO BE SUBMITTED FOR EVALUATION AND APPROVAL TO THE DESIGN ENGINEER OR ON-SITE DESIGN REPRESENTATIVE BEFORE COMMENCEMENT OF DIVERSION WORKS.
- TOLERANCE ON STAINLESS STEEL ANGLE ON CRUMP CREST TO BE +0 mm TO 1 mm.
- EXTENT OF EROSION PROTECTION TO BE FINALISED ON SITE IN CONSULTATION WITH DESIGN ENGINEER.
- SEE ALSO ADDITIONAL NOTES ON OTHER SHEETS WHERE APPLICABLE.

SHEET	DESCRIPTION	OTHER No.	REG. No.
4/4	INSTRUMENTATION HUT	X	157 480/09
3/4	INSTRUMENTATION	X	157 479/09
2/4	SECTIONS AND DETAIL	X	157 478/09
1/4	PLAN, DETAIL AND LOCALITY	X	157 477/09

LIST OF DRAWINGS

HYDROLOGICAL SERVICES

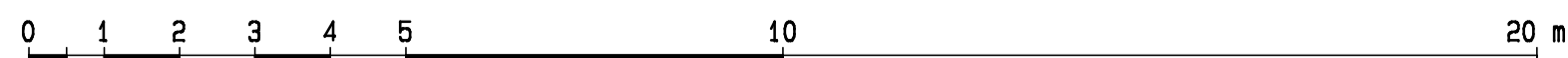
MPOFANA RIVER GAUGING WEIR
(SPRING GROVE DAM)
PLAN, DETAIL AND LOCALITY

PROVINCE: -	DISTRICT: -	KEYCODES: HYD W66 - - - -	OTHER NUMBER: -
LOCALITY No. 1: -	TENDER/ CONTRACT No.: -	SHEET: 1 OF 4	REG. No.: 157 477/09
CALCULATION FILE: -			REV. -

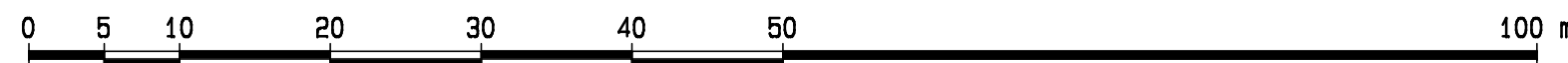
REVISION			
MOD No.	DATE	DESCRIPTION	DWA

DEPARTMENT OF WATER AFFAIRS AND FORESTRY REPUBLIC OF SOUTH AFRICA			
HEAD OFFICE CIVIL ENGINEERING PRIVATE BAG X313 PRETORIA 0001		SEDIBENG BUILDING 185 SCHODMAN STREET PRETORIA (012) 338-7500	
CHECKED:	DATE:	DESIGN: P. WESSELS	DRAWN: A.A. VAN DER WALT
ENGINEER:	DATE:	EXTERNAL APPROVAL:	DATE:
CHIEF ENGINEER / APP (Pr. Eng):	DATE:	ACTING DIRECTOR (Pr. Eng):	DATE:

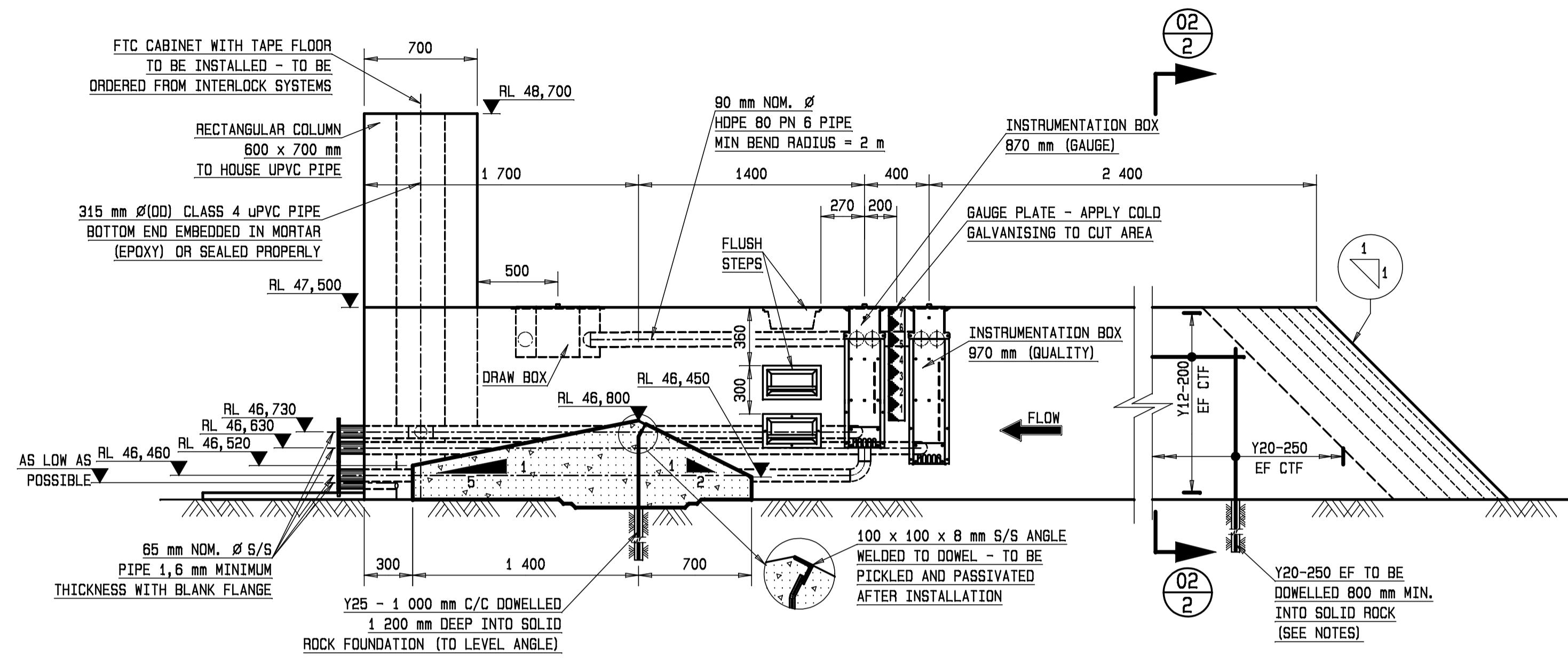
SCALE 1:100



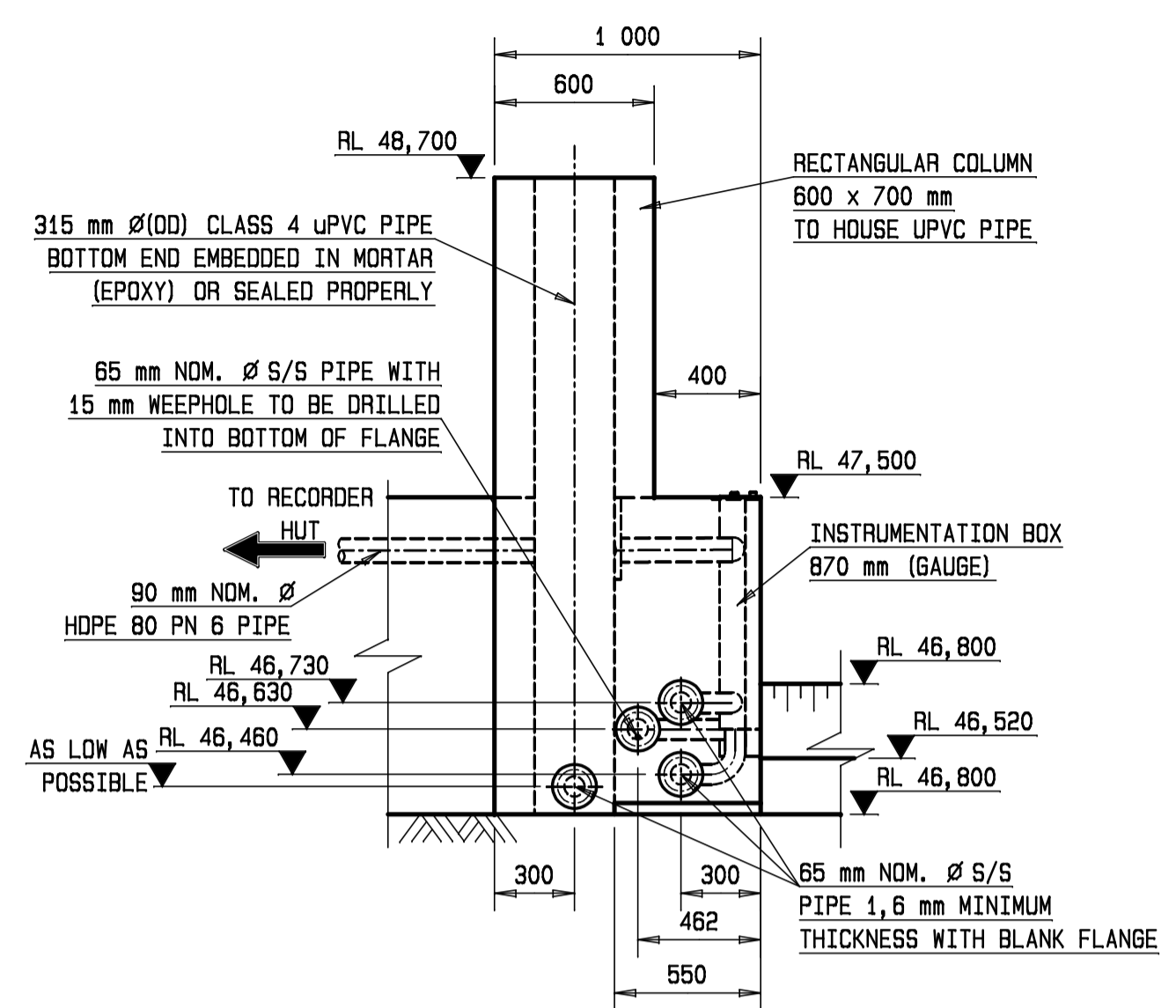
SCALE 1:500



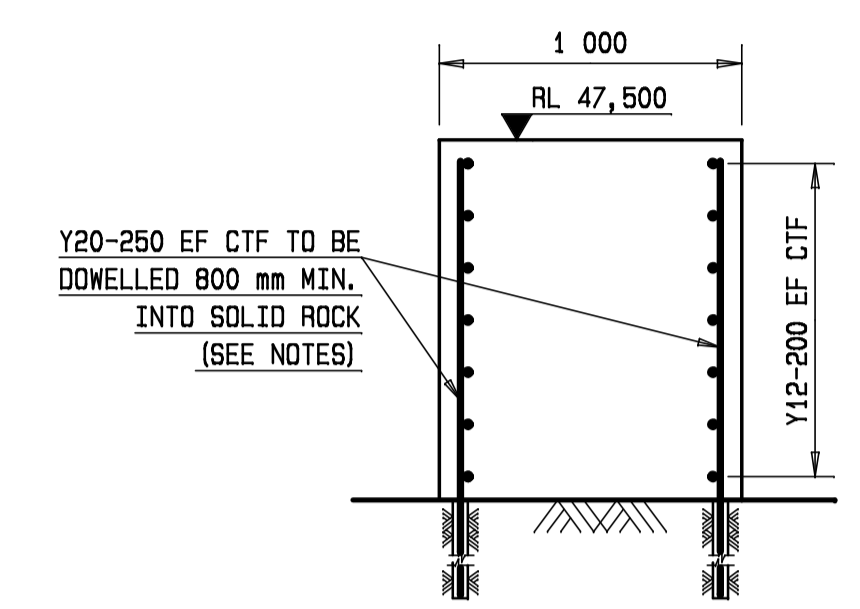
SECTION
SECTION NUMBER
07
3
SHEET NUMBER



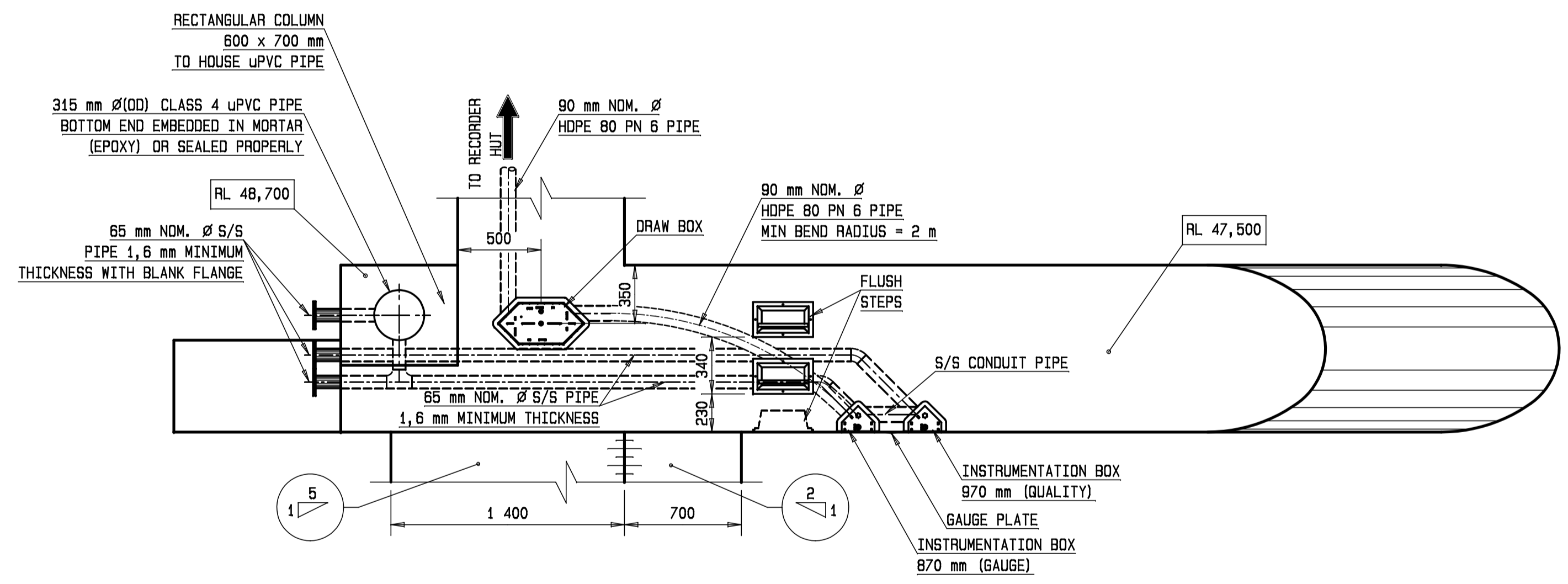
SECTION 01-01
SCALE 1:25



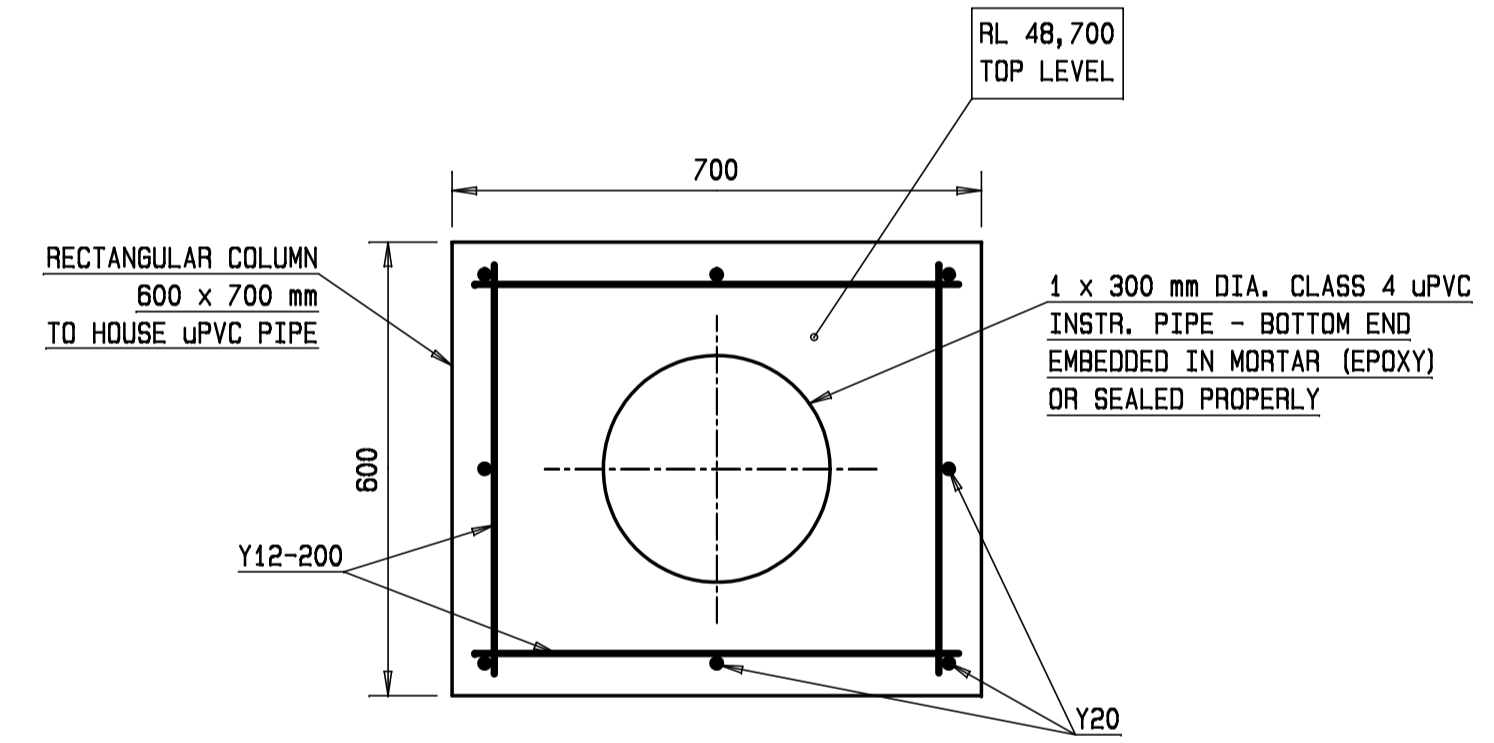
D/S ELEVATION (SECTION 01-01)
SCALE 1:25



SECTION 02-02
SCALE 1:25



PLAN (SECTION 01-01)
SCALE 1:25



WET WELL REINFORCEMENT
SCALE 1:10

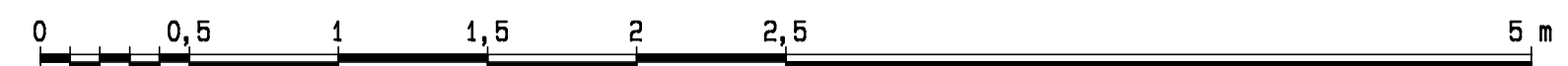
NO.	DESCRIPTION	OTHER No.	REV. No.
4/4	INSTRUMENTATION HUT	X	157 480/09
3/4	INSTRUMENTATION	X	157 479/09
2/4	SECTIONS AND DETAIL	X	157 478/09
1/4	PLAN, DETAIL AND LOCALITY	X	157 477/09
SHEET	DESCRIPTION	OTHER No.	REV. No.

LIST OF DRAWINGS

SCALE 1:10



SCALE 1:25



REVISION		DATE	DESCRIPTION	DKA

DEPARTMENT OF WATER AFFAIRS AND FORESTRY
REPUBLIC OF SOUTH AFRICA

HEAD OFFICE
CIVIL ENGINEERING
PRIVATE BAG X313
PRETORIA 0001

SEDIBENG BUILDING
185 SCHODMAN STREET
PRETORIA
(012) 338-7500

P. YAKO
DIRECTOR GENERAL

DESIGN: P. WESSELS
DRAWN: A.A. VAN DER WALT

CHECKED: DATE: ENGINEER: DATE: EXTERNAL APPROVAL: DATE: CHIEF ENGINEER / APP (Pr. Eng): DATE: ACTING DIRECTOR (Pr. Eng): DATE:

HYDROLOGICAL SERVICES

MPOFANA RIVER GAUGING WEIR
(SPRING GROVE DAM)
SECTIONS AND DETAIL

PROVINCE: - DISTRICT: - KEYCODES: HYD W66 - - - OTHER NUMBER -

LOCALITY No.1: - TENDER/ CONTRACT No.: - SHEET REG. No. 2 OF 4

CALCULATION FILE: -

157 478/09

