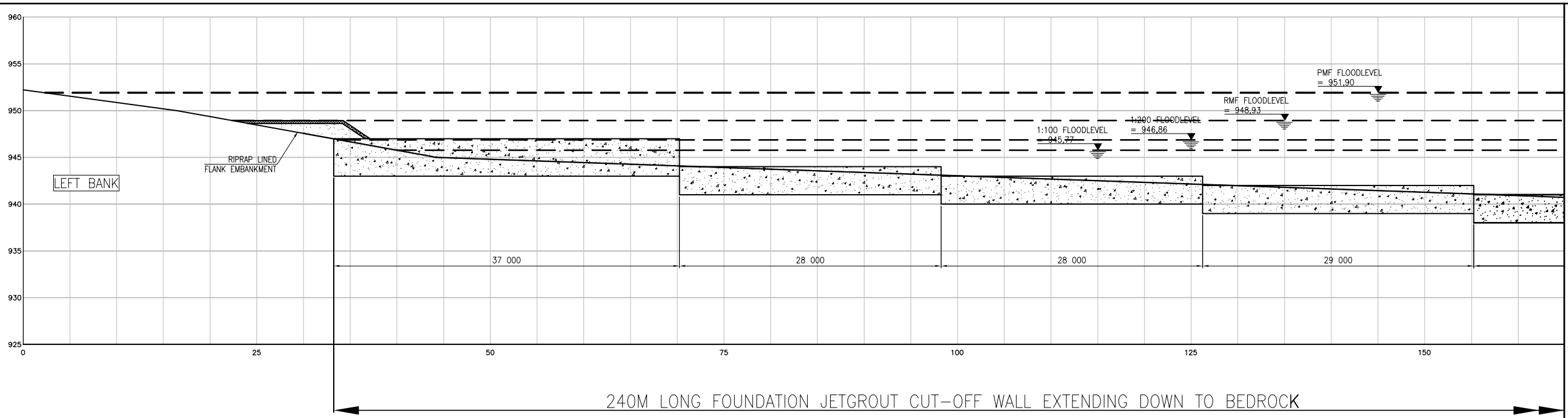
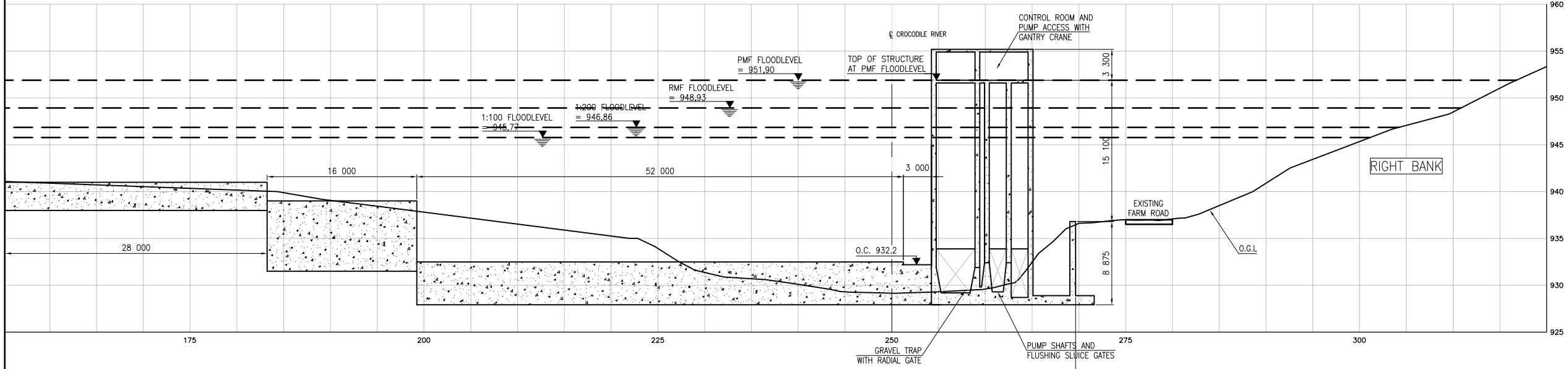


SECTIONAL ELEVATION ALONG WEIR CENTRELINE: OPTION 1

SCALE 1: 250

FLOOD DATA		
RETURN PERIOD	FLOWRATE	WATER LEVEL
PMF	9558 m^3/s	951.90
RMF	6372 m^3/s	948.93
1:200	4779 m^3/s	946.86
1:100	4142 m^3/s	945.77



SECTIONAL ELEVATION ALONG WEIR CENTRELINE: OPTION 1

SCALE 1: 250

NOTES:

1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE SHOWN.
2. ALL LEVELS IN METRES ABOVE SEA LEVEL. (M.A.S.L.)
3. THE REQUIRED TOP OF STRUCTURE LEVEL FOR RRD IS 947.25 MASL WHICH INCLUDES FREEBOARD OF 1.48 M

Africon VELAVKE KV3

AFRICON IN ASSOCIATION WITH VELAVKE AND KWEZI V3

Date:	Designed:	Drawn:	Checked:	Appr:

SHEET	DESCRIPTION	OTHER No.	REG. No.

LIST OF DRAWINGS

SCALES:

SCALE 1:250
0 5 10 15 20 25

SETTING OUT POINTS:

LOCATION / NUMBER	Y	X	LEVEL (masl)

REVISION

MOD No.	DATE	DESCRIPTION	FOR	DWAF
A	06/11/08	PREFEASIBILTY DRAWING	BCV	

DEPARTMENT OF WATER AFFAIRS AND FORESTRY
HEAD OFFICE
DIRECTORATE: OPTIONS ANALYSIS
PRIVATE BAG X313
PRETORIA 0001

P. YAKO
DIRECTOR GENERAL

DESIGN:	TRACED:
DRAWN:	CHECKED:
APPROVED SIGNATURE / RANK	ENGINEER:
DIRECTOR	CHIEF ENGINEER

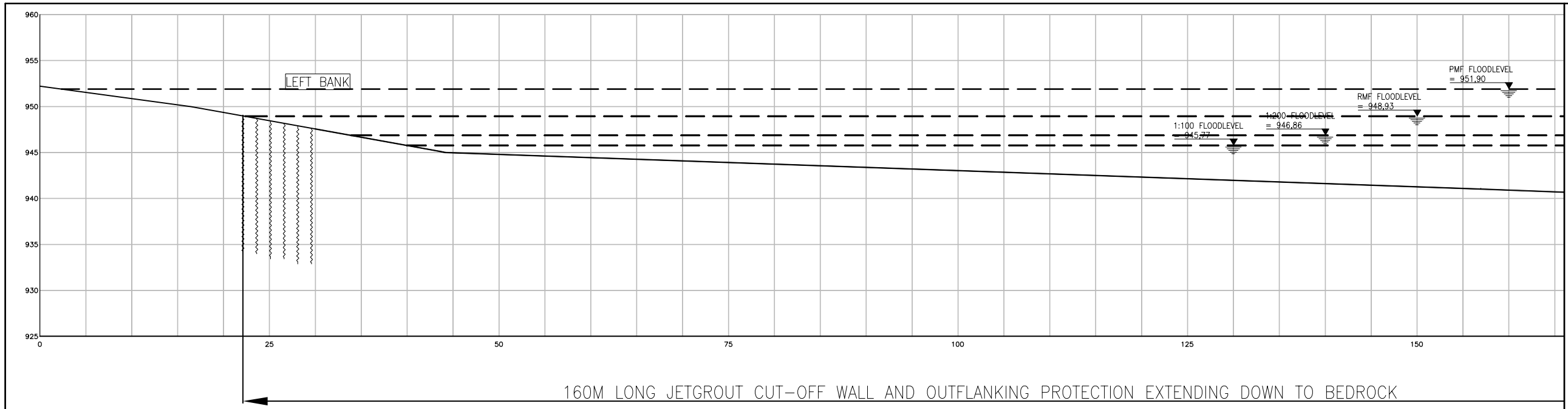
DEPARTMENT OF WATER AFFAIRS AND FORESTRY
REPUBLIC OF SOUTH AFRICA

MOKOLO–CROCODILE WATER AUGMENTATION PROJECT

BOSCHKOP WEIR

SECTIONAL ELEVATION – OPTION 1

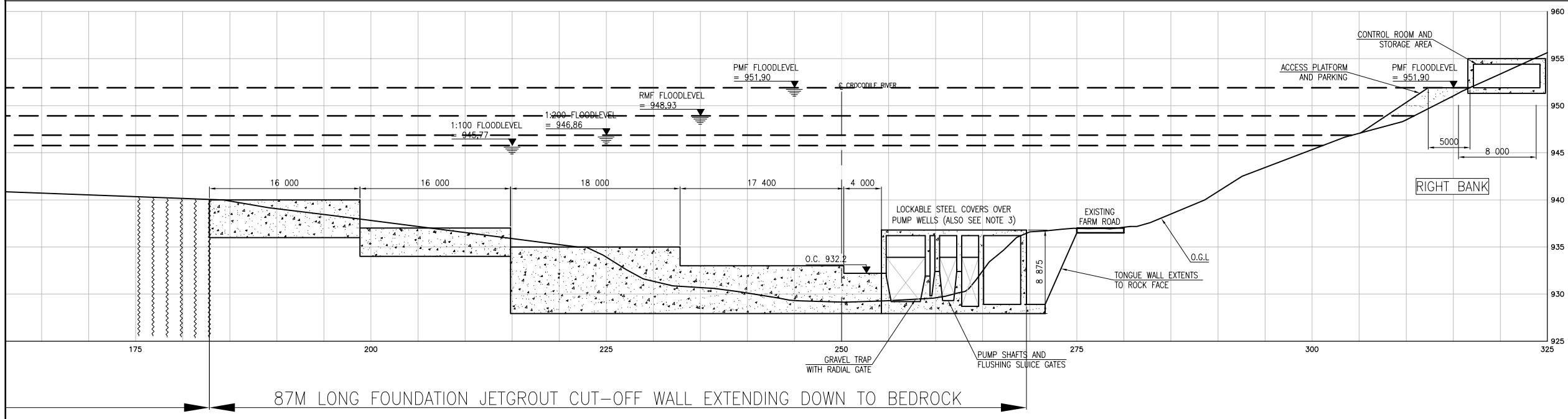
PROVINCE: LIMPOPO	DISTRICT: WATERBERG	KEYCODES:	OTHER No. DD/BKW/001
	TENDER No. .	CONTRACT No. WP9528	SHEET 1 OF 1
	CALCULATION FILE: J4210/03/04		REG. No.



SECTIONAL ELEVATION ALONG WEIR CENTRELINE: OPTION 2

SCALE 1: 250

FLOOD DATA		
RETURN PERIOD	FLOWRATE	WATER LEVEL
PMF	9 558 m^3/s	951.90
RMF	6 372 m^3/s	948.93
1:200	4 779 m^3/s	946.86
1:100	4 142 m^3/s	945.77



SECTIONAL ELEVATION ALONG WEIR CENTRELINE: OPTION 2

SCALE 1: 250

NOTES:

1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE SHOWN.
2. ALL LEVELS IN METRES ABOVE SEA LEVEL. (M.A.S.L.)
3. STEEL COVERS TO BE WATERTIGHT. CRANE RAILS PROVIDED FOR MOBILE CRANE BEAMS. SOCKETS PROVIDED FOR PORTABLE HANDRAILING.

Africon VELAVKE KV3

AFRICON IN ASSOCIATION WITH VELAVKE AND KWEZI V3

Date:	Designed:	Drawn:	Checked:	Appr:

SHEET	DESCRIPTION	OTHER No.	REG. No.

LIST OF DRAWINGS

SCALES:

SCALE 1:250
0 5 10 15 20 25

SETTING OUT POINTS:

LOCATION / NUMBER	Y	X	LEVEL (masl)

REVISION

MOD No.	DATE	DESCRIPTION	FOR	DWAF
A	06/11/08	PREFEASIBILTY DRAWING	BCV	

DEPARTMENT OF WATER AFFAIRS AND FORESTRY
HEAD OFFICE
DIRECTORATE: OPTIONS ANALYSIS
PRIVATE BAG X313
PRETORIA 0001

P. YAKO
DIRECTOR GENERAL

DESIGN:	TRACED:
DRAWN:	CHECKED:
APPROVED SIGNATURE / RANK	ENGINEER:
	CHIEF ENGINEER
	DIRECTOR

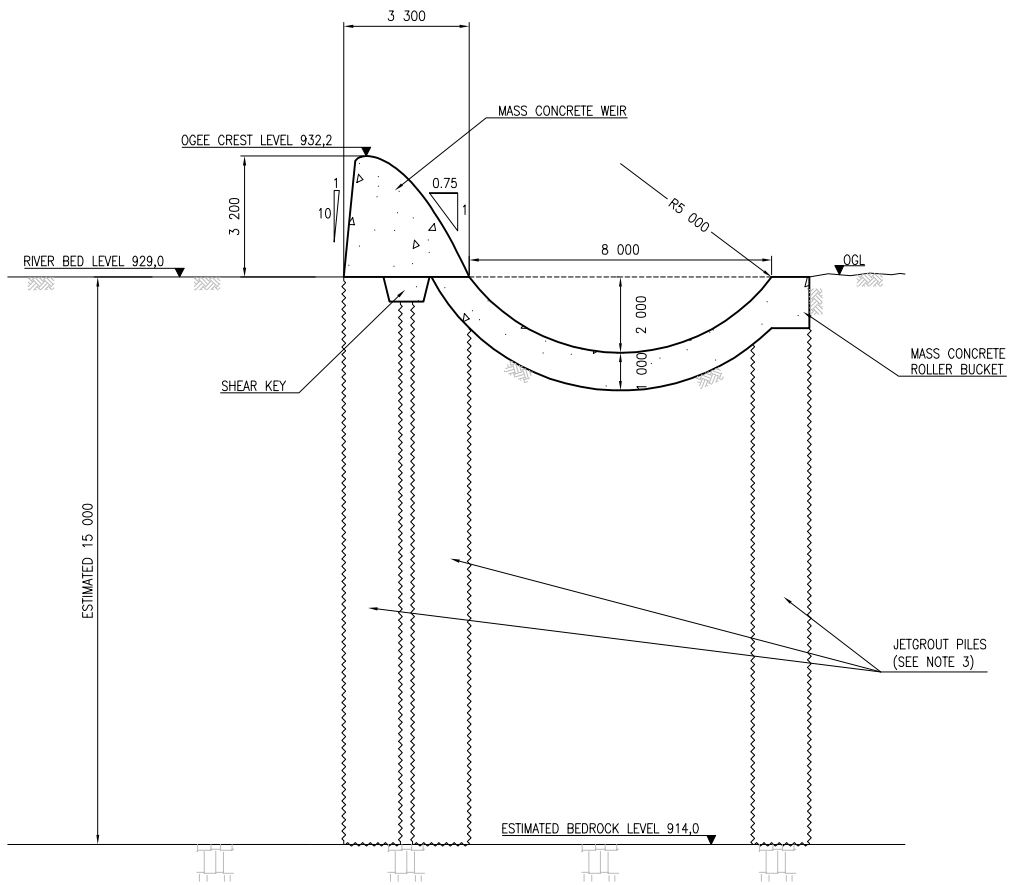
DEPARTMENT OF WATER AFFAIRS AND FORESTRY
REPUBLIC OF SOUTH AFRICA

MOKOLO-CROCODILE WATER AUGMENTATION PROJECT

BOSCHKOP WEIR

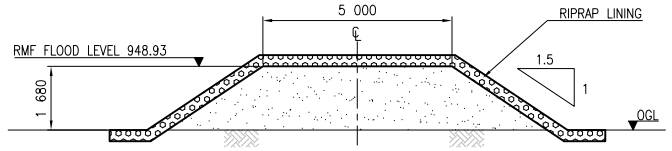
SECTIONAL ELEVATION – OPTION 2

PROVINCE: LIMPOPO	DISTRICT: WATERBERG	KEYCODES:	OTHER No. DD/BKW/002
	TENDER No. .	CONTRACT No. WP9528	SHEET 1 OF 1
	CALCULATION FILE: J4210/03/04		REG. No. .....



SECTION A–A THROUGH O.C.

SCALE 1:100



SECTION C–C (THROUGH FLANK EMBANKMENT)

SCALE 1:100

NOTES:

1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE SHOWN.
2. ALL LEVELS IN METRES ABOVE SEA LEVEL. (M.A.S.L.)
3. JETGROUT PILES TO EXTEND DOWN TO BEDROCK LEVEL. PILES ARE APPROXIMATELY 1.0 TO 1.5 M IN DIAMETER, DEPENDING ON SOIL CONDITIONS.

AFRICON IN ASSOCIATION WITH VELAVKE AND KWEZI V3

Date:	Designed:	Drawn:	Checked:	Appr:

SHEET	DESCRIPTION	OTHER No.	REG. No.

LIST OF DRAWINGS

SCALES:

SETTING OUT POINTS:

LOCATION / NUMBER	Y	X	LEVEL (masl)

REVISION

MOD No.	DATE	DESCRIPTION	FOR	DWAF
A	06/11/08	PREFEASIBILTY DRAWING	BCV	

DEPARTMENT OF WATER AFFAIRS AND FORESTRY
HEAD OFFICE
DIRECTORATE: OPTIONS ANALYSIS
PRIVATE BAG X313
PRETORIA 0001

P. YAKO
DIRECTOR GENERAL

DESIGN:	TRACED:
DRAWN:	CHECKED:
APPROVED SIGNATURE / RANK	ENGINEER:
	CHIEF ENGINEER

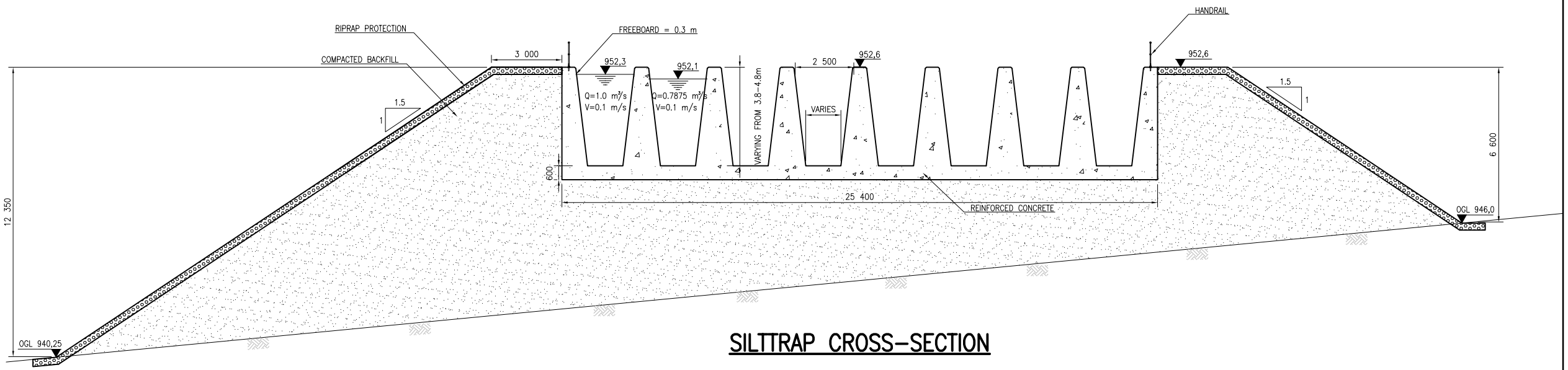
DEPARTMENT OF WATER AFFAIRS AND FORESTRY
REPUBLIC OF SOUTH AFRICA

MOKOLO–CROCODILE WATER AUGMENTATION PROJECT

BOSCHKOP WEIR

SECTION DETAILS

PROVINCE: LIMPOPO	DISTRICT: WATERBERG	KEYCODES:	OTHER No. DD/BKW/003
DIRECTOR	TENDER No. .	CONTRACT No. WP9528	SHEET 1 OF 1
	CALCULATION FILE: J4210/03/04		REG. No.



SILTTRAP CROSS–SECTION

SCALE 1:100

NOTES:

1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE SHOWN.
2. ALL LEVELS IN METRES ABOVE SEA LEVEL. (M.A.S.L.)

AFRICON IN ASSOCIATION WITH VELAVKE AND KWEZI V3

Date:	Designed:	Drawn:	Checked:	Appr:

SHEET	DESCRIPTION	OTHER No.	REG. No.

LIST OF DRAWINGS

SCALES:

SCALE 1:100
0 1 2 3 4 5 10

SETTING OUT POINTS:

LOCATION / NUMBER	Y	X	LEVEL (masl)

REVISION

MOD No.	DATE	DESCRIPTION	FOR	DWAF
A	06/11/08	PREFEASIBILTY DRAWING	BCV	

DEPARTMENT OF WATER AFFAIRS AND FORESTRY
HEAD OFFICE
DIRECTORATE: OPTIONS ANALYSIS
PRIVATE BAG X313
PRETORIA 0001

P. YAKO
DIRECTOR GENERAL

DESIGN:	TRACED:
DRAWN:	CHECKED:
APPROVED SIGNATURE / RANK	ENGINEER:

CHIEF ENGINEER

DIRECTOR

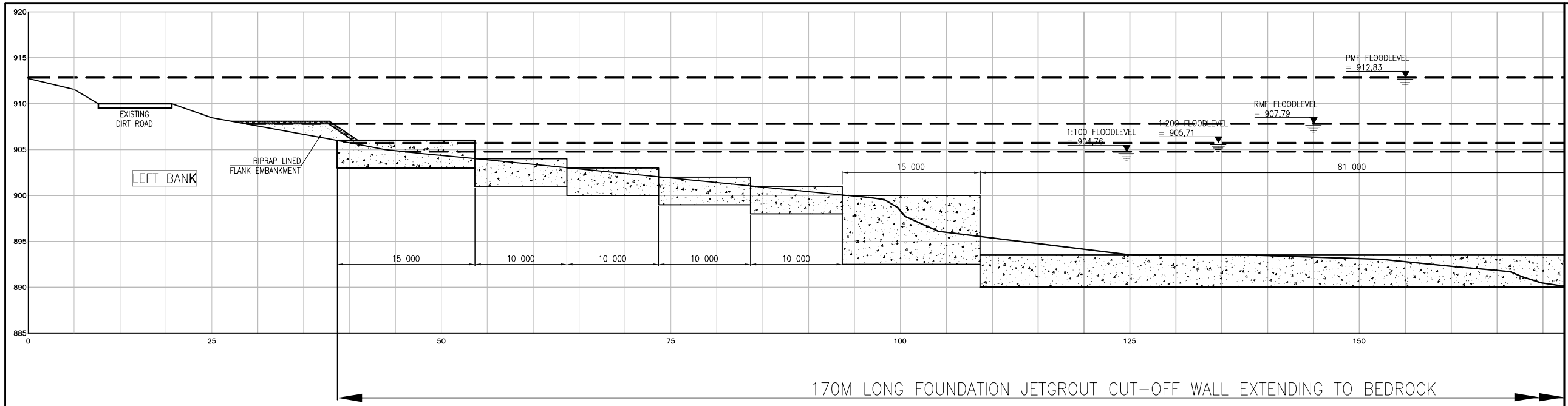
DEPARTMENT OF WATER AFFAIRS AND FORESTRY
REPUBLIC OF SOUTH AFRICA

MOKOLO–CROCODILE WATER AUGMENTATION PROJECT

BOSCHKOP WEIR

SILTTRAP CROSS SECTION

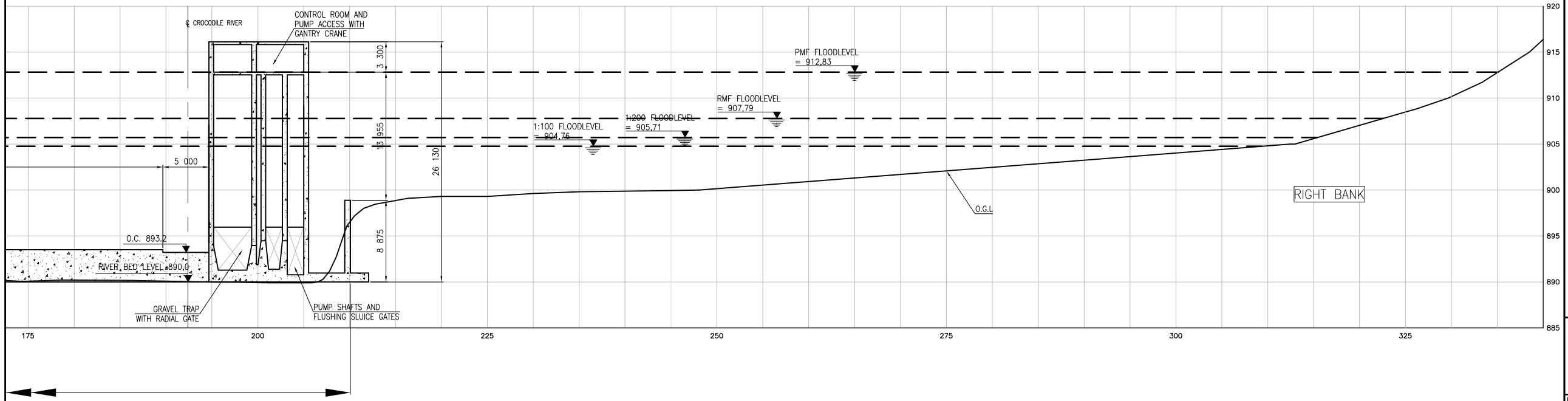
PROVINCE: LIMPOPO	DISTRICT: WATERBERG	KEYCODES:	OTHER No. DD/BKW/004
	TENDER No. .	CONTRACT No. WP9528	SHEET 1 OF 1
	CALCULATION FILE: J4210/03/04		REG. No. .....



SECTIONAL ELEVATION ALONG WEIR CENTRELINE: OPTION 1

SCALE 1: 250

FLOOD DATA		
RETURN PERIOD	FLOWRATE	WATER LEVEL
PMF	10 789 m³/s	912,83
RMF	7 456 m³/s	907.79
1:200	5 741 m³/s	905.71
1:100	4 995 m³/s	904.76



SECTIONAL ELEVATION ALONG WEIR CENTRELINE: OPTION 1

SCALE 1: 250

NOTES:

1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE SHOWN.
2. ALL LEVELS IN METRES ABOVE SEA LEVEL. (M.A.S.L.)

Africon VELAVKE KV3

AFRICON IN ASSOCIATION WITH VELAVKE AND KWEZI V3

Date:	Designed:	Drawn:	Checked:	Appr:

SHEET	DESCRIPTION	OTHER No.	REG. No.

LIST OF DRAWINGS

SCALES:

SCALE 1:250
0 5 10 15 20 25

SETTING OUT POINTS:

LOCATION / NUMBER	Y	X	LEVEL (masl)

REVISION

MOD No.	DATE	DESCRIPTION	FOR	DWAF
A	06/11/08	PREFEASIBILITY DRAWING	BCV	

DEPARTMENT OF WATER AFFAIRS AND FORESTRY
HEAD OFFICE
DIRECTORATE: OPTIONS ANALYSIS
PRIVATE BAG X313
PRETORIA 0001

P. YAKO
DIRECTOR GENERAL

DESIGN:	TRACED:
DRAWN:	CHECKED:
APPROVED SIGNATURE / RANK	ENGINEER:
	CHIEF ENGINEER
	DIRECTOR

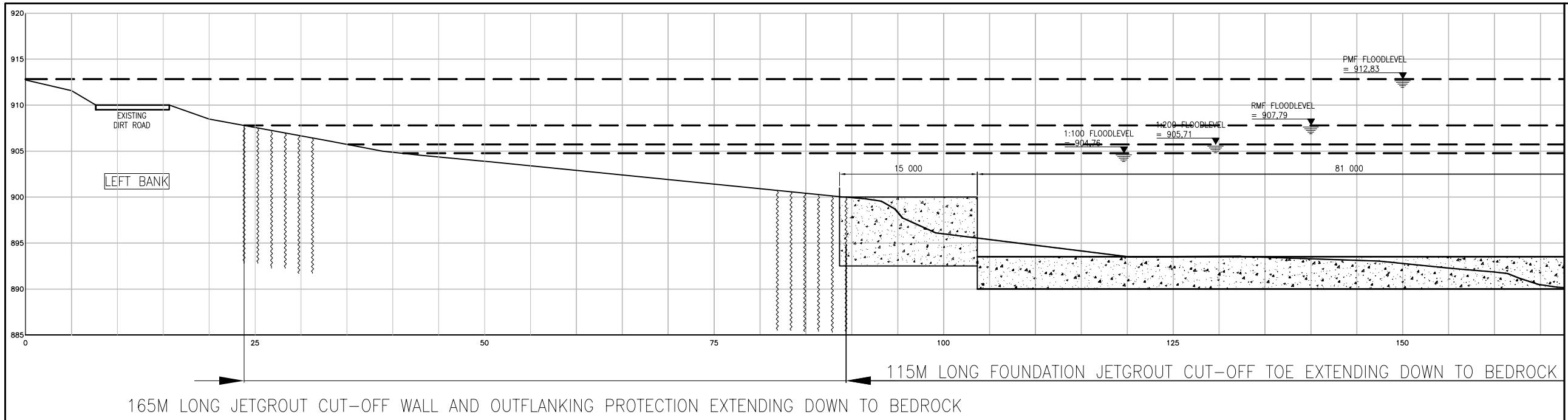
DEPARTMENT OF WATER AFFAIRS AND FORESTRY
REPUBLIC OF SOUTH AFRICA

MOKOLO-CROCODILE WATER AUGMENTATION PROJECT

VLIEEPOORT WEIR

SECTIONAL ELEVATION – OPTION 1

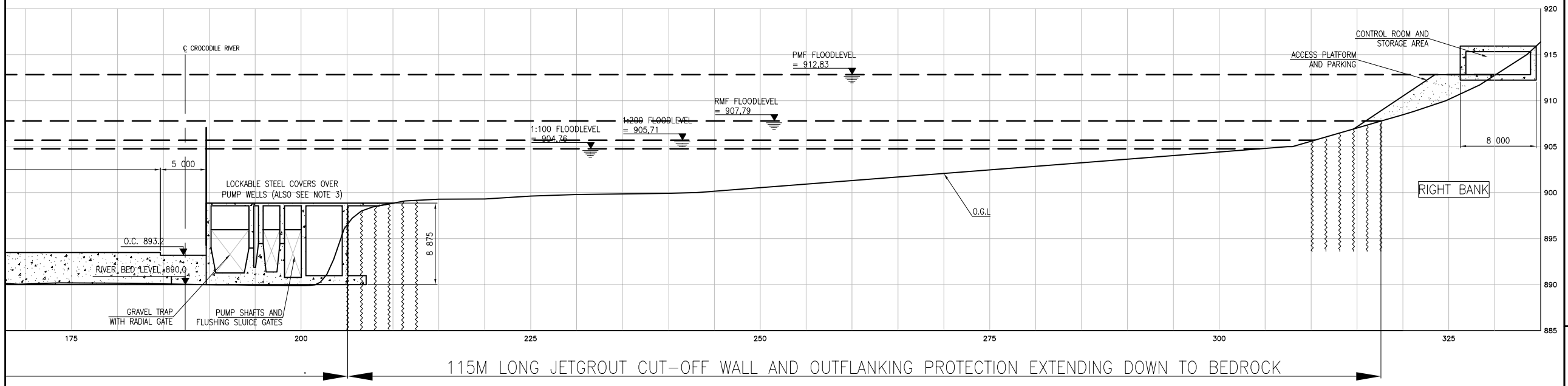
PROVINCE: LIMPOPO	DISTRICT: WATERBERG	KEYCODES:	OTHER No. DD/VPW/001
	TENDER No. .	CONTRACT No. WP9528	SHEET 1 OF 1
	CALCULATION FILE: J4210/03/04		REG. No.



SECTIONAL ELEVATION ALONG WEIR CENTRELINE: OPTION 1

SCALE 1: 250

FLOOD DATA		
RETURN PERIOD	FLOWRATE	WATER LEVEL
PMF	10 769 m³/s	912,83
RMF	7 456 m³/s	907.79
1:200	5 741 m³/s	905.71
1:100	4 995 m³/s	904.76



SECTIONAL ELEVATION ALONG WEIR CENTRELINE: OPTION 1

SCALE 1: 250

NOTES:

1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE SHOWN.
2. ALL LEVELS IN METRES ABOVE SEA LEVEL. (M.A.S.L.)
3. STEEL COVERS TO BE WATERTIGHT. CRANE RAILS PROVIDED FOR MOBILE CRANE BEAMS. SOCKETS PROVIDED FOR PORTABLE HANDRAILING.

Africon VELAVKE KV3

AFRICON IN ASSOCIATION WITH VELAVKE AND KWEZI V3

Date:	Designed:	Drawn:	Checked:	Appr:

SHEET	DESCRIPTION	OTHER No.	REG. No.

LIST OF DRAWINGS

SCALES:

SCALE 1:250

0 5 10 15 20 25

SETTING OUT POINTS:

LOCATION / NUMBER	Y	X	LEVEL (masl)

REVISION

MOD No.	DATE	DESCRIPTION	FOR	DWAF
A	06/11/08	PREFEASIBILITY DRAWING	BCV	

DEPARTMENT OF WATER AFFAIRS AND FORESTRY

HEAD OFFICE
DIRECTORATE: OPTIONS ANALYSIS
PRIVATE BAG X313
PRETORIA 0001

P. YAKO
DIRECTOR GENERAL

DESIGN:	TRACED:
DRAWN:	CHECKED:
APPROVED SIGNATURE / RANK	ENGINEER:
CHIEF ENGINEER	
DIRECTOR	

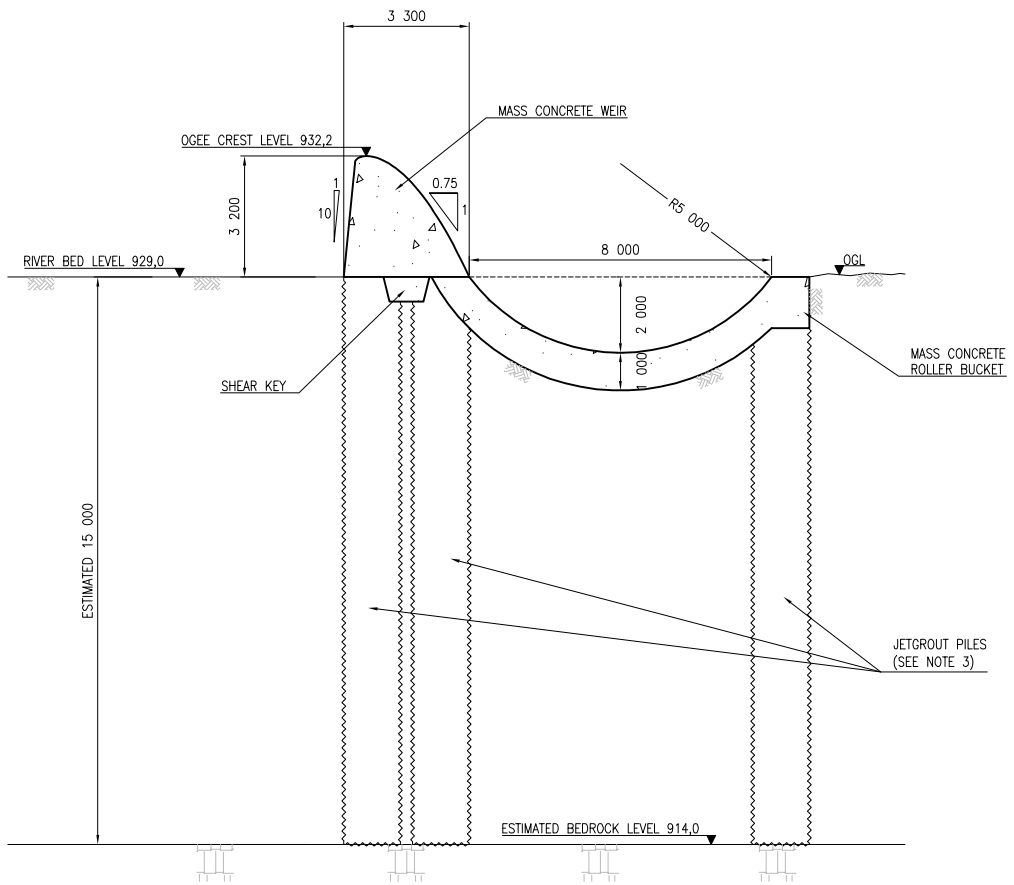
DEPARTMENT OF WATER AFFAIRS AND FORESTRY
REPUBLIC OF SOUTH AFRICA

MOKOLO-CROCODILE WATER AUGMENTATION PROJECT

VLIEEPOORT WEIR

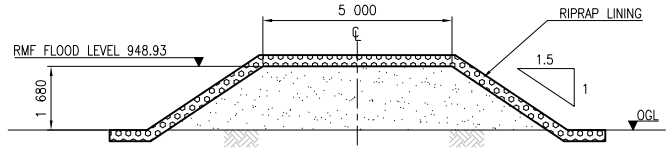
SECTIONAL ELEVATION – OPTION 2

PROVINCE: LIMPOPO	DISTRICT: WATERBERG	KEYCODES:	OTHER No. DD/VPW/002
	TENDER No. .	CONTRACT No. WP9528	SHEET 1 OF 1
	CALCULATION FILE: J4210/03/04		REG. No. .....



SECTION A–A THROUGH O.C.

SCALE 1:100



SECTION C–C (THROUGH FLANK EMBANKMENT)

SCALE 1:100

NOTES:

1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE SHOWN.
2. ALL LEVELS IN METRES ABOVE SEA LEVEL. (M.A.S.L.)
3. JETGROUT PILES TO EXTEND DOWN TO BEDROCK LEVEL. PILES ARE APPROXIMATELY 1.0 TO 1.5 M IN DIAMETER, DEPENDING ON SOIL CONDITIONS.

AFRICON IN ASSOCIATION WITH VELAVKE AND KWEZI V3

Date:	Designed:	Drawn:	Checked:	Appr:

SHEET	DESCRIPTION	OTHER No.	REG. No.

LIST OF DRAWINGS

SCALES:

SETTING OUT POINTS:

LOCATION / NUMBER	Y	X	LEVEL (masl)

REVISION

MOD No.	DATE	DESCRIPTION	FOR	DWAF
A	06/11/08	PREFEASIBILTY DRAWING	BCV	

DEPARTMENT OF WATER AFFAIRS AND FORESTRY
HEAD OFFICE
DIRECTORATE: OPTIONS ANALYSIS
PRIVATE BAG X313
PRETORIA 0001

P. YAKO
DIRECTOR GENERAL

DESIGN:	TRACED:
DRAWN:	CHECKED:
APPROVED SIGNATURE / RANK	ENGINEER:
	CHIEF ENGINEER

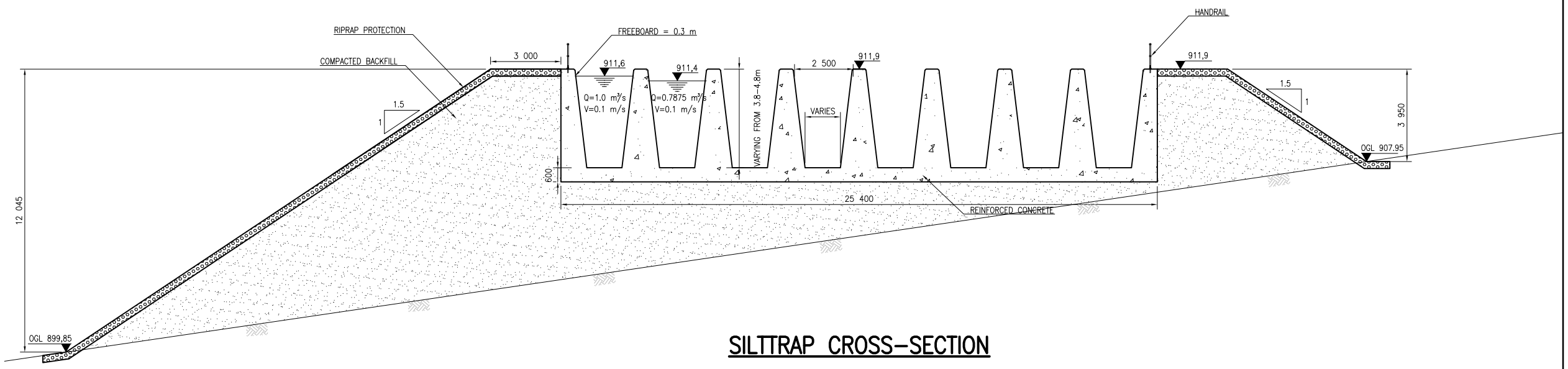
DEPARTMENT OF WATER AFFAIRS AND FORESTRY
REPUBLIC OF SOUTH AFRICA

MOKOLO–CROCODILE WATER AUGMENTATION PROJECT

VLIEEPOORT WEIR

SECTION DETAILS

PROVINCE: LIMPOPO	DISTRICT: WATERBERG	KEYCODES:	OTHER No. DD/VPW/003
DIRECTOR	TENDER No. .	CONTRACT No. WP9528	SHEET 1 OF 1
	CALCULATION FILE: J4210/03/04		REG. No.



SILTTRAP CROSS–SECTION

SCALE 1:100

NOTES:

1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE SHOWN.
2. ALL LEVELS IN METRES ABOVE SEA LEVEL. (M.A.S.L.)

Africon VELAVKE KV3

AFRICON IN ASSOCIATION WITH VELAVKE AND KWEZI V3

Date:	Designed:	Drawn:	Checked:	Appr:

SHEET	DESCRIPTION	OTHER No.	REG. No.

LIST OF DRAWINGS

SCALES:

SCALE 1:100

0 1 2 3 4 5 10

SETTING OUT POINTS:

LOCATION / NUMBER	Y	X	LEVEL (masl)

REVISION

MOD No.	DATE	DESCRIPTION	FOR	DWAF
A	06/11/08	PREFEASIBILTY DRAWING	BCV	

DEPARTMENT OF WATER AFFAIRS AND FORESTRY

HEAD OFFICE
DIRECTORATE: OPTIONS ANALYSIS
PRIVATE BAG X313
PRETORIA 0001

P. YAKO
DIRECTOR GENERAL

DESIGN:	TRACED:
DRAWN:	CHECKED:
APPROVED SIGNATURE / RANK	ENGINEER:
	CHIEF ENGINEER
	DIRECTOR

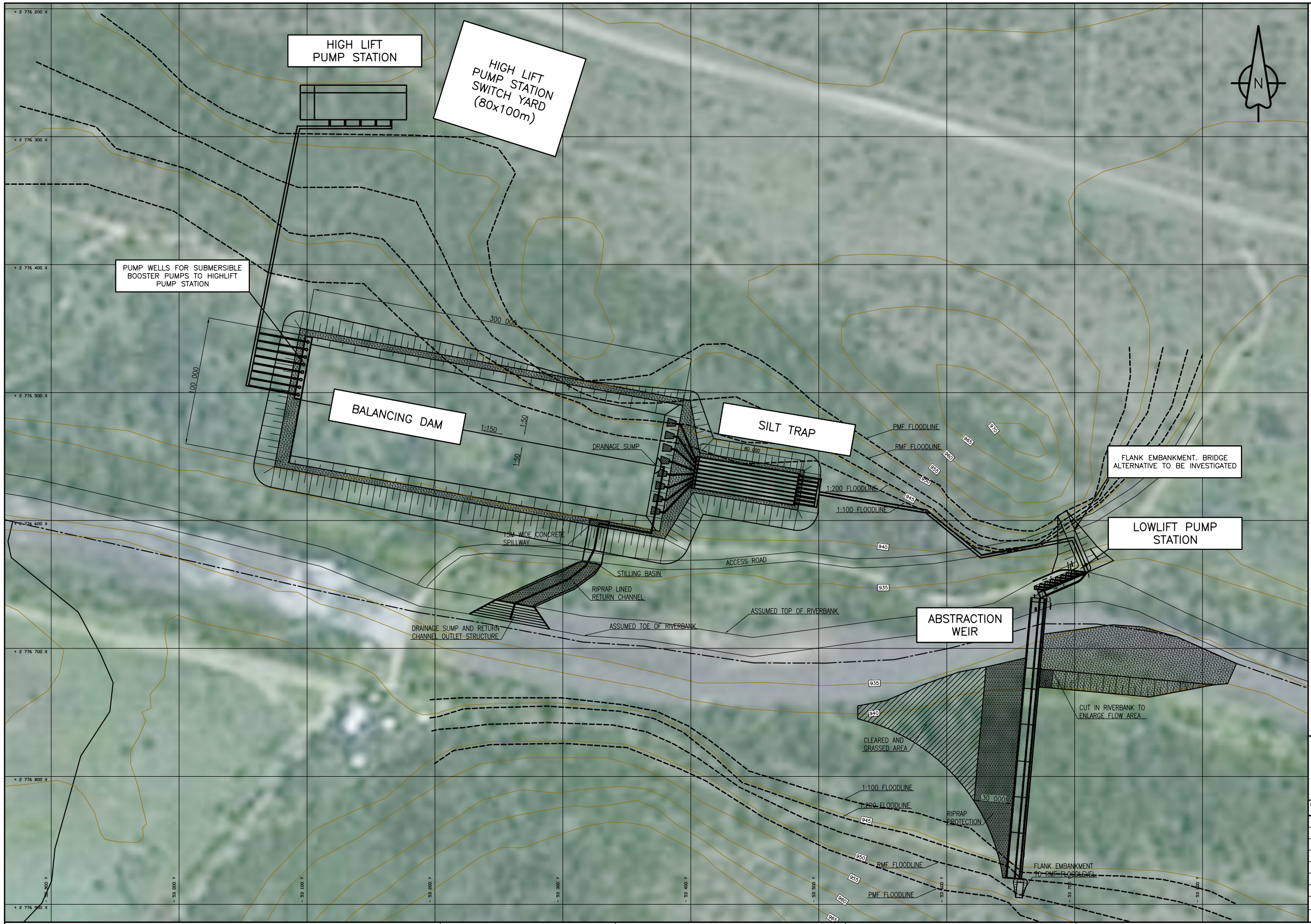
DEPARTMENT OF WATER AFFAIRS AND FORESTRY
REPUBLIC OF SOUTH AFRICA

MOKOLO–CROCODILE WATER AUGMENTATION PROJECT

VLIEEPOORT WEIR

SILTTRAP CROSS SECTION

PROVINCE: LIMPOPO	DISTRICT: WATERBERG	KEYCODES:					OTHER No. DD/VPW/004
	TENDER No. .	CONTRACT No. WP9528		SHEET 1 OF 1		REG. No.	
	CALCULATION FILE: J4210/03/04						



NOTES:

1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE SHOWN.
2. ALL LEVELS IN METRES ABOVE SEA LEVEL. (M.A.S.L.)
3. COORDINATE SYSTEM BASED ON LO27 HARTBEESTHOEK 94

Africon | VELAVKE | KV3

AFRICON IN ASSOCIATION WITH VELAVKE AND KWEZI V3

Date:	Designed:	Drawn:	Checked:	Appr:

SHEET	DESCRIPTION	OTHER No.	REG. No.

LIST OF DRAWINGS

SCALES:

SCALE 1:1 500
0 10 50 100 150

SETTING OUT POINTS:

LOCATION / NUMBER	Y	X	LEVEL (masl)

REVISION

MOD No.	DATE	DESCRIPTION	FOR	DWAF
A	06/11/08	PREFEASIBILTY DRAWING	BCV	

DEPARTMENT OF WATER AFFAIRS AND FORESTRY
HEAD OFFICE
DIRECTORATE: OPTIONS ANALYSIS
PRIVATE BAG X313
PRETORIA 0001

P. YAKO
DIRECTOR GENERAL

DESIGN:	TRACED:
DRAWN:	CHECKED:
APPROVED SIGNATURE / RANK	ENGINEER:
	CHIEF ENGINEER
	DIRECTOR

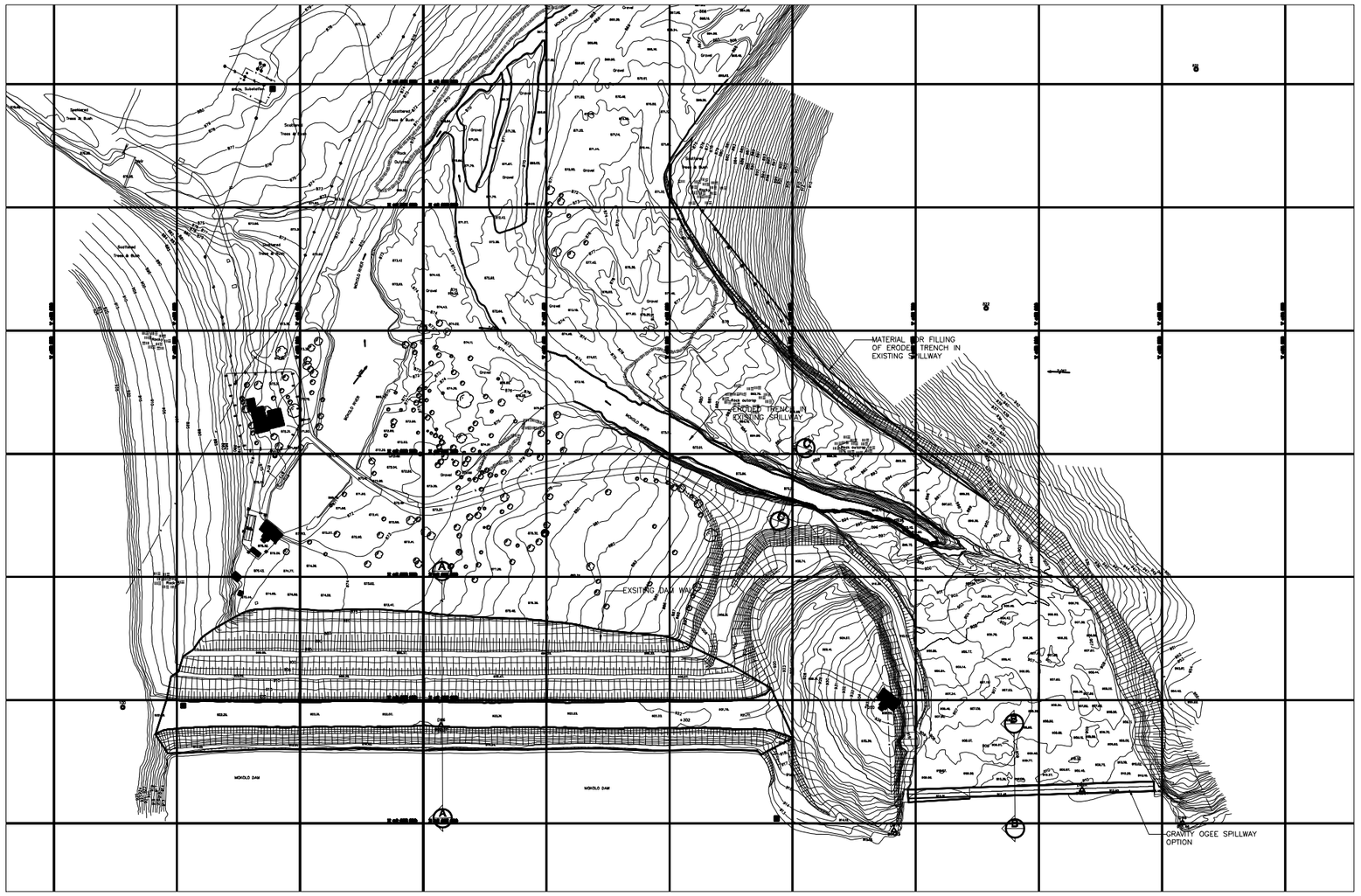
DEPARTMENT OF WATER AFFAIRS AND FORESTRY
REPUBLIC OF SOUTH AFRICA

MOKOLO–CROCODILE WATER AUGMENTATION PROJECT

BOSCHKOP WEIR

SITE LAYOUT PLAN

PROVINCE: LIMPOPO	DISTRICT: WATERBERG	KEYCODES:	OTHER No. LD/BKW/001
	TENDER No. .	CONTRACT No. WP9528	SHEET 1 of 1
	CALCULATION FILE: J4210/03/04		REG. No. .....



PLAN

SCALE 1:2000

NOTES:

AFRICON IN ASSOCIATION WITH VELAVKE AND KWEZI V3

Date:	Designed:	Drawn:	Checked:	Appr:

SHEET	DESCRIPTION	OTHER No.	REG. No.

LIST OF DRAWINGS

SCALES:

SCALE 1:2000

0 50m 100m 150m 200m 250m 300m

SETTING OUT POINTS:

LOCATION / NUMBER	Y	X	LEVEL (masl)

REVISION

MOD No.	DATE	DESCRIPTION	FOR	DWAF

DEPARTMENT OF WATER AFFAIRS AND FORESTRY
HEAD OFFICE
DIRECTORATE: OPTIONS ANALYSIS
PRIVATE BAG X313
PRETORIA 0001

P. YAKO
DIRECTOR GENERAL

DESIGN: TRACED:
DRAWN: CHECKED:
APPROVED
SIGNATURE RANK ENGINEER:
CHIEF ENGINEER

DEPARTMENT OF WATER AFFAIRS AND FORESTRY
REPUBLIC OF SOUTH AFRICA

MOKOLO–CROCODILE WATER AUGMENTATION PROJECT

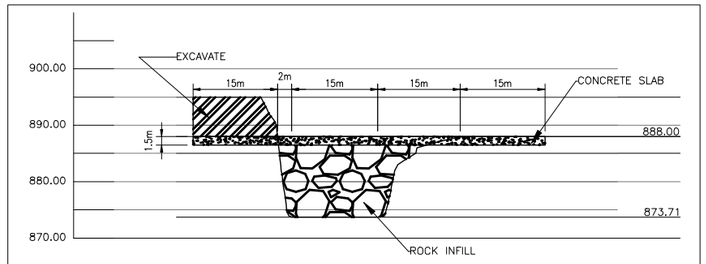
GENERAL LAYOUT

PROVINCE: LIMPOPO DISTRICT: WATERBERG KEYCODES: OTHER No. LD/MD/001

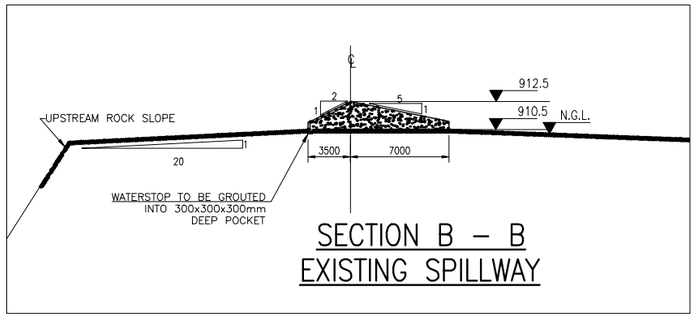
TENDER No. . CONTRACT No. WP9528 SHEET 1 OF 4 REG. No. .....

DIRECTOR CALCULATION FILE: J4210/03/04

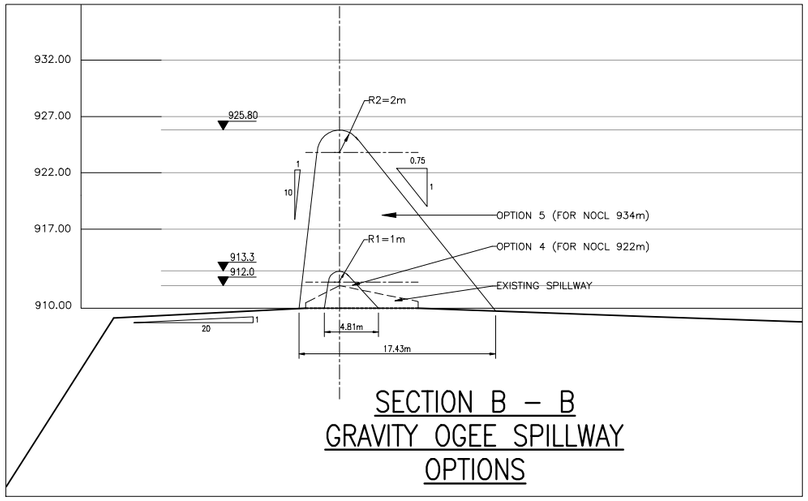
FILLING OF ERODED TRENCH IN EXISTING SPILLWAY TYPICAL SECTION



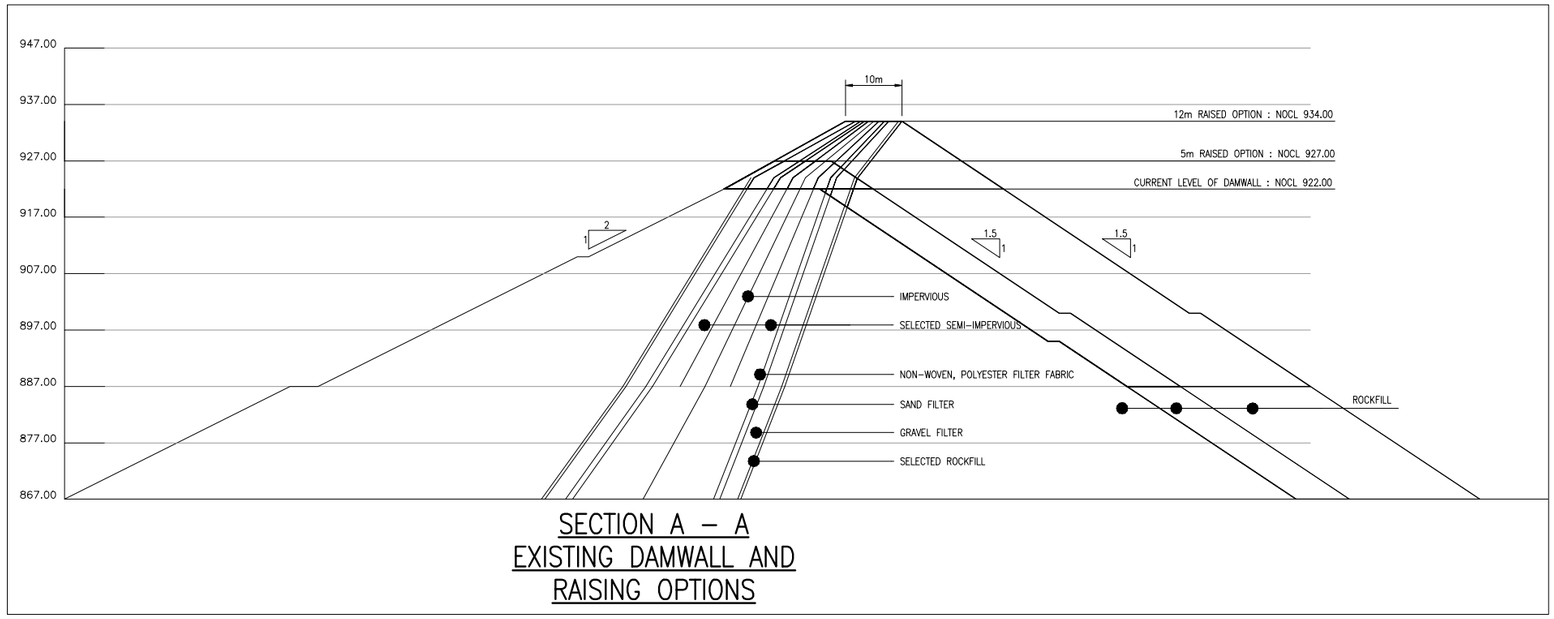
SECTION C – C



SECTION B – B
EXISTING SPILLWAY



SECTION B – B
GRAVITY OGEE SPILLWAY
OPTIONS



SECTION A – A
EXISTING DAMWALL AND
RAISING OPTIONS

NOTES:

AFRICON IN ASSOCIATION WITH VELAVKE AND KWEZI V3

Date:	Designed:	Drawn:	Checked:	Appr:

SHEET	DESCRIPTION	OTHER No.	REG. No.

LIST OF DRAWINGS

SCALES:

SCALE 1:250

0 10m 20m 30m 40m

SCALE 1:500

0 10m 20m 30m 40m 50m 60m 70m 80m

SETTING OUT POINTS:

LOCATION / NUMBER	Y	X	LEVEL (masl)

REVISION

MOD No.	DATE	DESCRIPTION	FOR	DWAF

DEPARTMENT OF WATER AFFAIRS AND FORESTRY
HEAD OFFICE
DIRECTORATE: OPTIONS ANALYSIS
PRIVATE BAG X313
PRETORIA 0001

P. YAKO
DIRECTOR GENERAL

DESIGN:	TRACED:
DRAWN:	CHECKED:
APPROVED: SIGNATURE / RANK	ENGINEER:

CHIEF ENGINEER

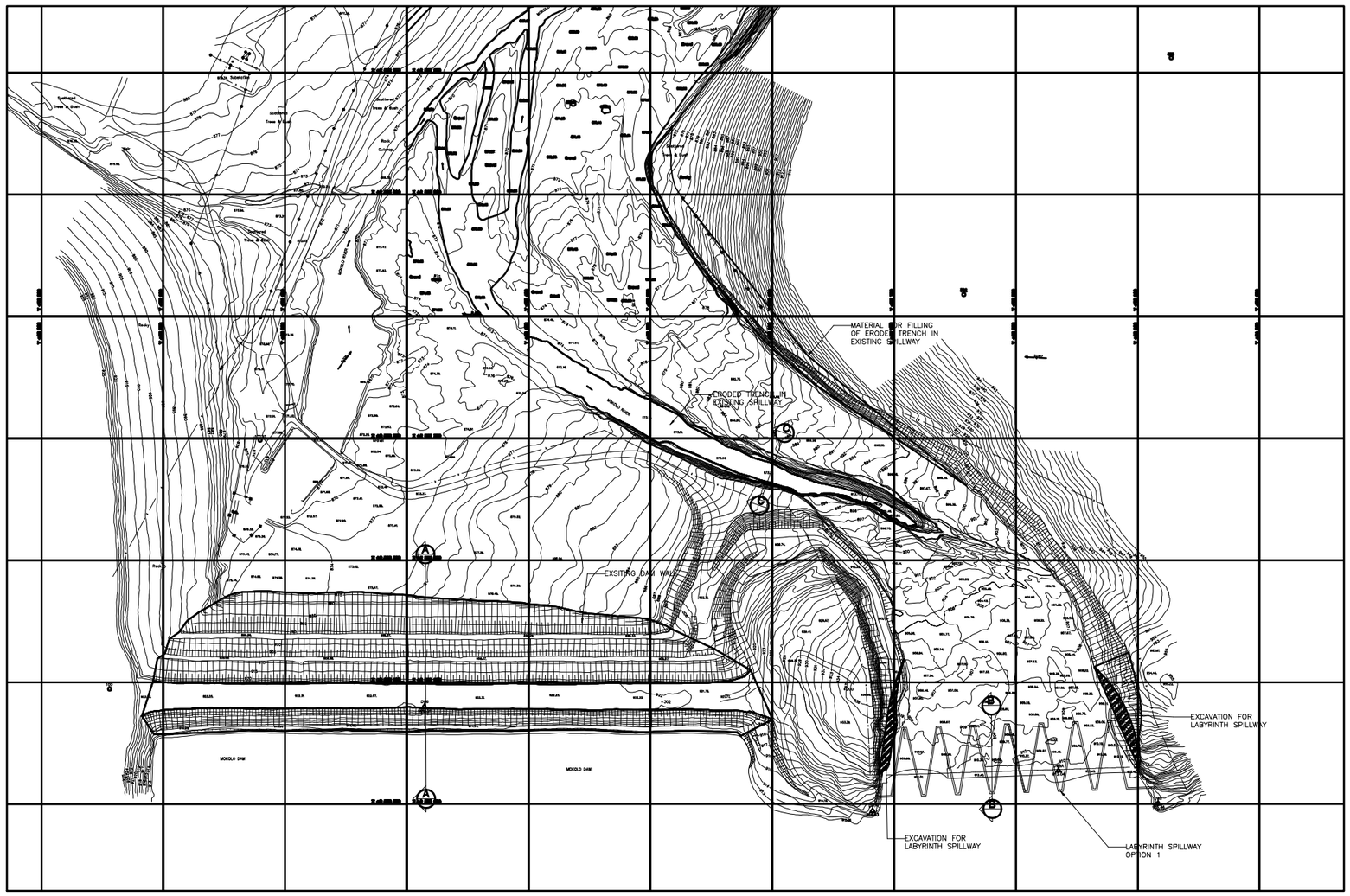
DIRECTOR

DEPARTMENT OF WATER AFFAIRS AND FORESTRY
REPUBLIC OF SOUTH AFRICA

MOKOLO–CROCODILE WATER AUGMENTATION PROJECT

SECTIONS AND DETAILS

PROVINCE: LIMPOPO	DISTRICT: WATERBERG	KEYCODES:						OTHER No. LD/MD/002
	TENDER No. .	CONTRACT No. WP9528					SHEET 2 OF 4	REG. No. .....
	CALCULATION FILE: J4210/03/04							



PLAN
SCALE 1:2000

NOTES:

Africon | VELAVKE | KV3

AFRICON IN ASSOCIATION WITH VELAVKE AND KWEZI V3

Date:	Designed:	Drawn:	Checked:	Appr:

SHEET	DESCRIPTION	OTHER No.	REG. No.

LIST OF DRAWINGS

SCALES:

SCALE 1:2000
0 50m 100m 150m 200m 250m 300m

SETTING OUT POINTS:

LOCATION / NUMBER	Y	X	LEVEL (masl)

REVISION

MOD No.	DATE	DESCRIPTION	FOR	DWAF

DEPARTMENT OF WATER AFFAIRS AND FORESTRY
HEAD OFFICE
DIRECTORATE: OPTIONS ANALYSIS
PRIVATE BAG X313
PRETORIA 0001

P. YAKO
DIRECTOR GENERAL

DESIGN:	TRACED:
DRAWN:	CHECKED:
APPROVED	ENGINEER:
SIGNATURE / RANK	

CHIEF ENGINEER

DIRECTOR

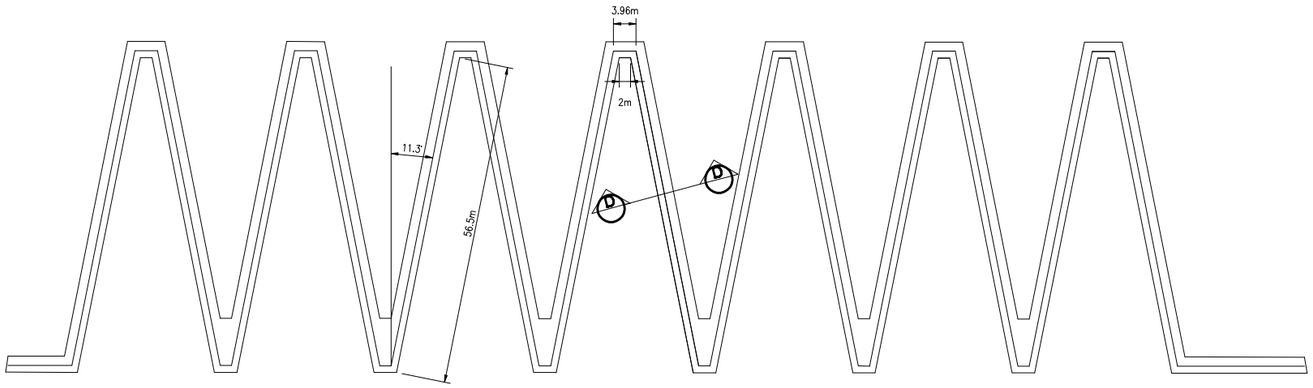
DEPARTMENT OF WATER AFFAIRS AND FORESTRY
REPUBLIC OF SOUTH AFRICA

MOKOLO–CROCODILE WATER AUGMENTATION PROJECT

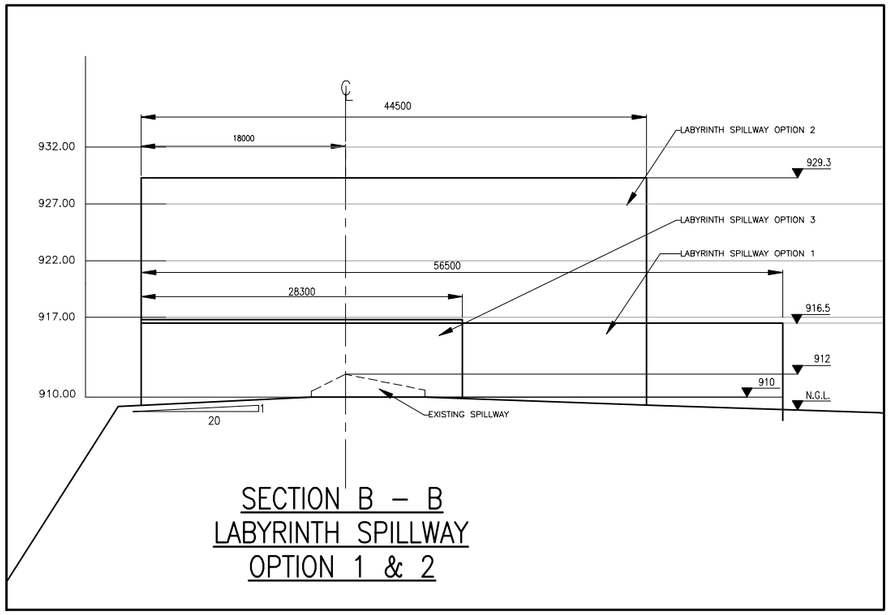
LABYRINTH SPILLWAY POSITION

PROVINCE: LIMPOPO	DISTRICT: WATERBERG	KEYCODES:							OTHER No. LD/MD/003
	TENDER No. .	CONTRACT No. WP9528						SHEET 3 OF 4	REG. No. .....
	CALCULATION FILE: J4210/03/04								

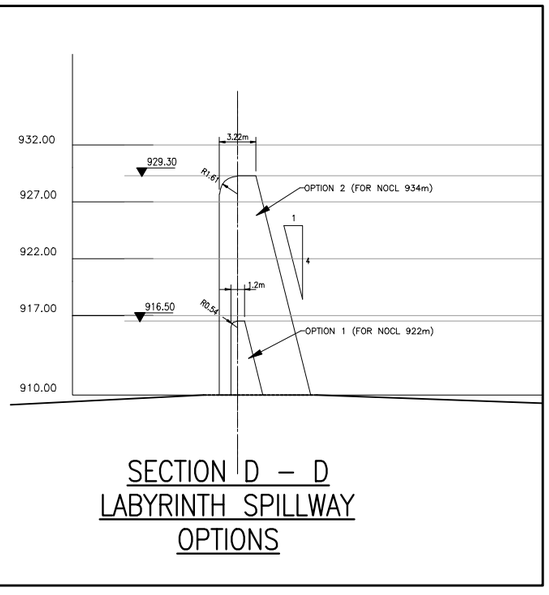
NOTES:



PLAN ON
LABYRINTH SPILLWAY OPTION 1
FOR NOCL 922m



SECTION B – B
LABYRINTH SPILLWAY
OPTION 1 & 2



SECTION D – D
LABYRINTH SPILLWAY
OPTIONS

Africon VELAVKE KV3

AFRICON IN ASSOCIATION WITH VELAVKE AND KWEZI V3

Date:	Designed:	Drawn:	Checked:	Appr:

SHEET	DESCRIPTION	OTHER No.	REG. No.

LIST OF DRAWINGS

SCALES:

SCALE 1:250

0 10m 20m 30m 40m

SCALE 1:500

0 10m 20m 30m 40m 50m 60m 70m 80m

SETTING OUT POINTS:

LOCATION / NUMBER	Y	X	LEVEL (masl)

REVISION

MOD No.	DATE	DESCRIPTION	FOR	DWAF

DEPARTMENT OF WATER AFFAIRS AND FORESTRY
HEAD OFFICE
DIRECTORATE: OPTIONS ANALYSIS
PRIVATE BAG X313
PRETORIA 0001

P. YAKO
DIRECTOR GENERAL

DESIGN:	TRACED:
DRAWN:	CHECKED:
APPROVED SIGNATURE / RANK	ENGINEER:

CHIEF ENGINEER

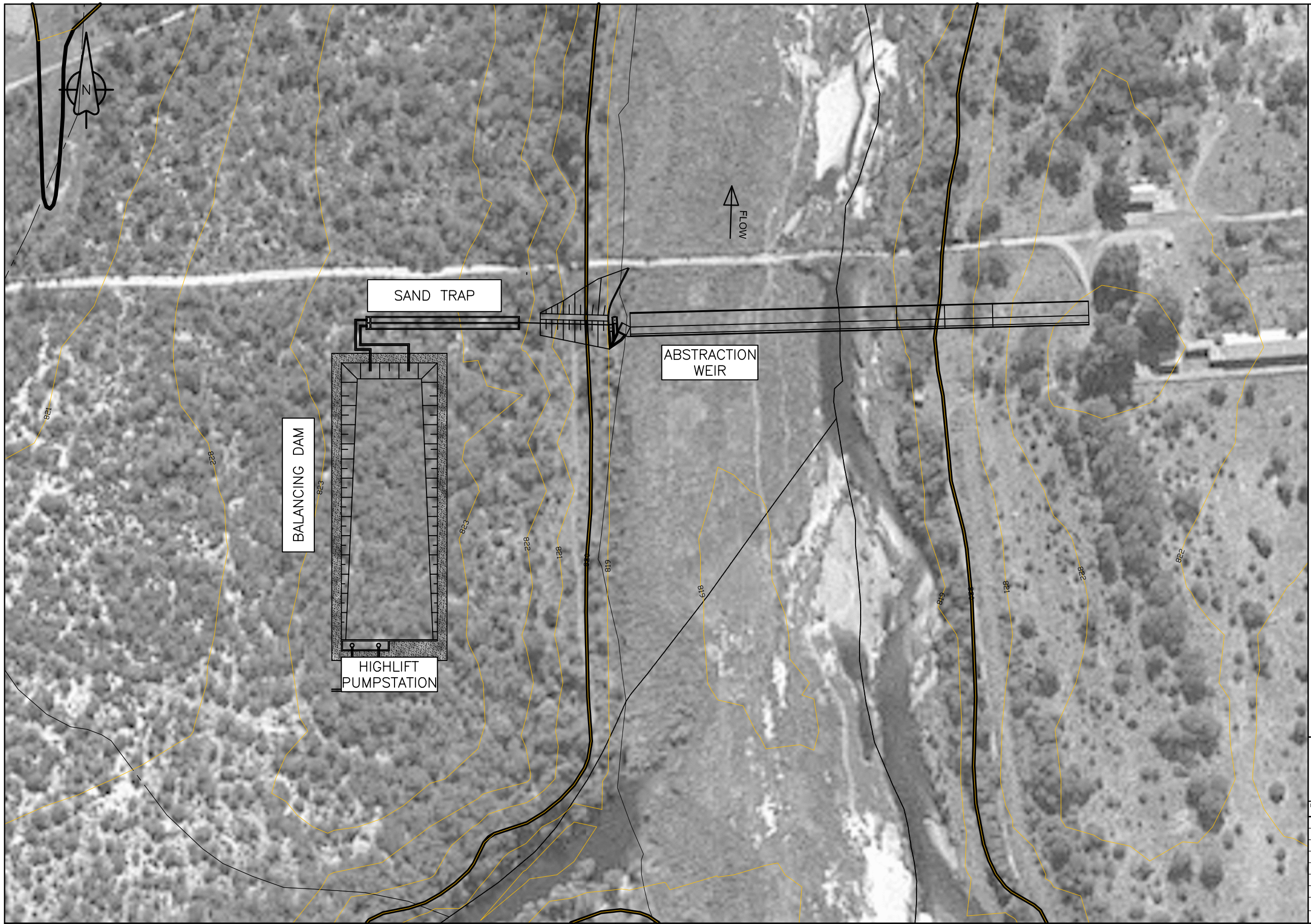
DIRECTOR

DEPARTMENT OF WATER AFFAIRS AND FORESTRY
REPUBLIC OF SOUTH AFRICA

MOKOLO–CROCODILE WATER AUGMENTATION PROJECT

LABYRINTH SPILLWAY OPTIONS AND SECTIONS

PROVINCE: LIMPOPO	DISTRICT: WATERBERG	KEYCODES:	OTHER No. LD/MD/004
	TENDER No. .	CONTRACT No. WP9528	SHEET 4 OF 4
	CALCULATION FILE: J4210/03/04		REG. No. .....



NOTES:

1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE SHOWN.
2. ALL LEVELS IN METRES ABOVE SEA LEVEL. (M.A.S.L.)
3. COORDINATE SYSTEM BASED ON LO27 HARTBEESTHOEK 94

Africon | VELAVKE | KV3

AFRICON IN ASSOCIATION WITH VELAVKE AND KWEZI V3

Date:	Designed:	Drawn:	Checked:	Appr:

SHEET	DESCRIPTION	OTHER No.	REG. No.

LIST OF DRAWINGS

SCALES:

SCALE 1:1 000

0 5 10 20 30 40 50 100

SETTING OUT POINTS:

LOCATION / NUMBER	Y	X	LEVEL (masl)

REVISION

MOD No.	DATE	DESCRIPTION	FOR	DWAF
A	06/11/08	PREFEASIBILTY DRAWING	BCV	

DEPARTMENT OF WATER AFFAIRS AND FORESTRY

HEAD OFFICE
DIRECTORATE: OPTIONS ANALYSIS
PRIVATE BAG X313
PRETORIA 0001

P. YAKO
DIRECTOR GENERAL

DESIGN: | TRACED:
DRAWN: | CHECKED:
APPROVED: SIGNATURE / RANK | ENGINEER:

CHIEF ENGINEER

DIRECTOR

DEPARTMENT OF WATER AFFAIRS AND FORESTRY
REPUBLIC OF SOUTH AFRICA

MOKOLO–CROCODILE WATER AUGMENTATION PROJECT

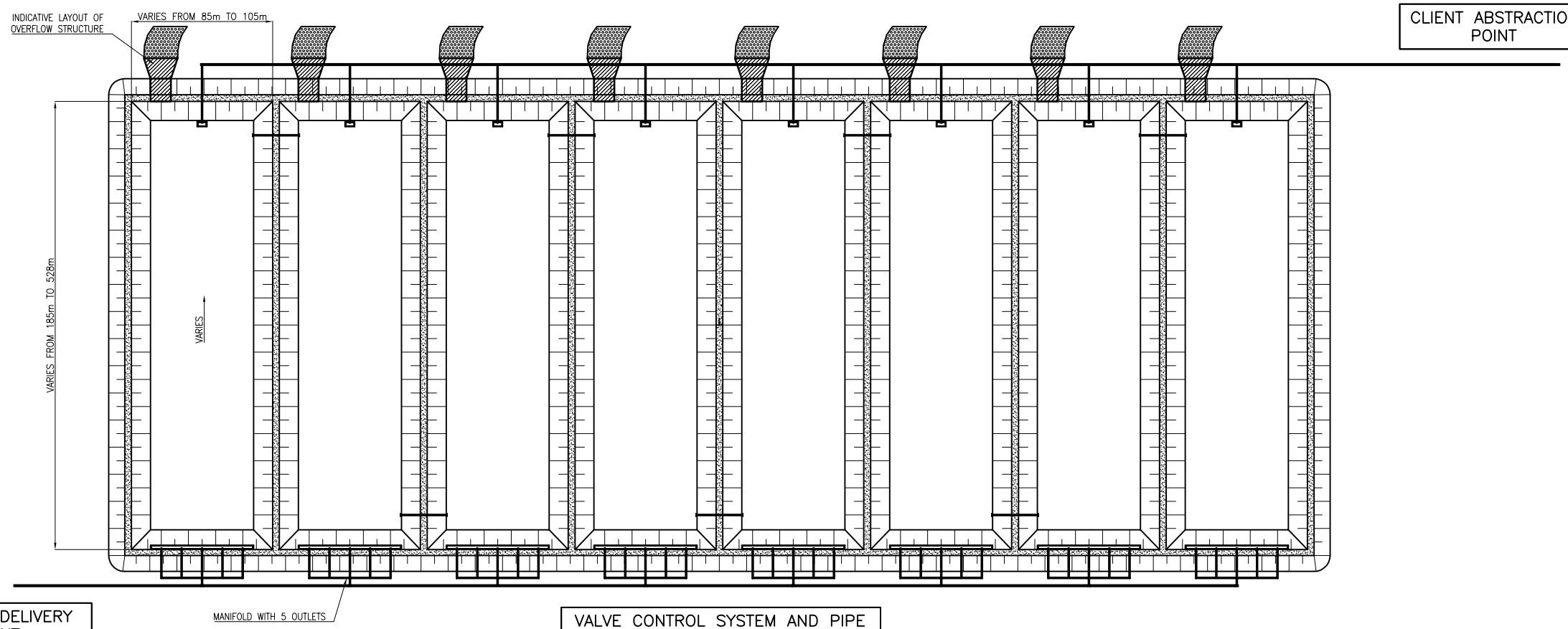
BOSKOPWEIR

SITE LAYOUT PLAN

PROVINCE: LIMPOPO | DISTRICT: WATERBERG | KEYCODES: | OTHER No. LD/MD/003

TENDER No. . | CONTRACT No. WP9528 | SHEET 1 OF 1 | REG. No.

CALCULATION FILE: J4210/03/04



CLIENT BALANCING DAM LAYOUT

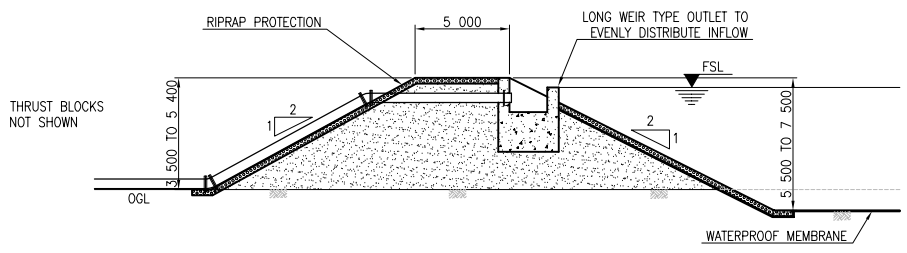
SCALE 1:2000

CLIENT BALANCING DAM DATA

	CLIENT	VOLUME	NR. OF BAYS	BAY SIZE (WxL)	DEPTH
1	MUNICIPAL DEMAND LEPHALALE	624 067 m^3	7	85 x 260 m	5.5 m
2	INDUSTRIAL EXXARO LEPHALALE	1 090 800 m^3	8	88 X 313 m	6.5 m
3	INDUSTRIAL ESKOM LEPHALALE	880 000 m^3	8	86 x 307 m	5.5 m
4	MUNICIPAL DEMAND STEENBOKPAN	1 396 405 m^3	8	99 x 353 m	6.5 m
5	INDUSTRIAL EXXARO STEENBOKPAN	306 000 m^3	5	90 x 185 m	5.5 m
6	INDUSTRIAL SASOL	3 700 000 m^3	11	104 x 528 m	7.5 m
7	INDUSTRIAL ESKOM STEENBOKPAN	2 250 000 m^3	9	102 x 415 m	7.5 m

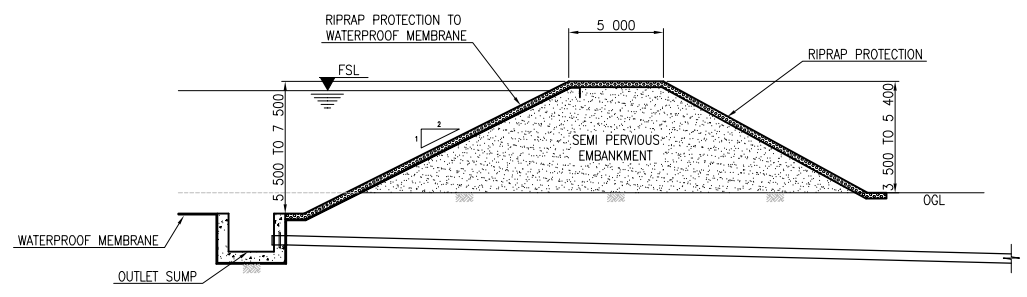
NOTES:

1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE SHOWN.
2. ALL LEVELS IN METRES ABOVE SEA LEVEL. (M.A.S.L.)
3. VALVE CONTROL SYSTEM AND PIPE LAYOUT DETAILS NOT SHOWN.
4. THRUST BLOCKS AT PIPE BENDS ETC. NOT SHOWN.
5. THE DAMS HAVE 18 DAY STORAGE CAPACITIES WITH ONE ADDITIONAL BAY ADDED TO ALLOW FOR MAINTENANCE.



BALANCING DAM INLET CROSS SECTION

SCALE 1:200



BALANCING DAM OUTLET CROSS SECTION

SCALE 1:200

Africon VELAVKE KV3

AFRICON IN ASSOCIATION WITH VELAVKE AND KWEZI V3

Date:	Designed:	Drawn:	Checked:	Appr:

SHEET	DESCRIPTION	OTHER No.	REG. No.

LIST OF DRAWINGS

SCALES:

SCALE 1:200
0 5 10 15 20

SCALE 1:2 000
0 50 100 150 200

SETTING OUT POINTS:

LOCATION / NUMBER	Y	X	LEVEL (masl)

REVISION

MOD No.	DATE	DESCRIPTION	FOR	DWAF
A	12/11/08	PREFEASIBILTY DRAWING	BCV	

DEPARTMENT OF WATER AFFAIRS AND FORESTRY

HEAD OFFICE
DIRECTORATE: OPTIONS ANALYSIS
PRIVATE BAG X313
PRETORIA 0001

P. YAKO
DIRECTOR GENERAL

DESIGN:	TRACED:
DRAWN:	CHECKED:
APPROVED SIGNATURE / RANK	ENGINEER:

CHIEF ENGINEER

DIRECTOR

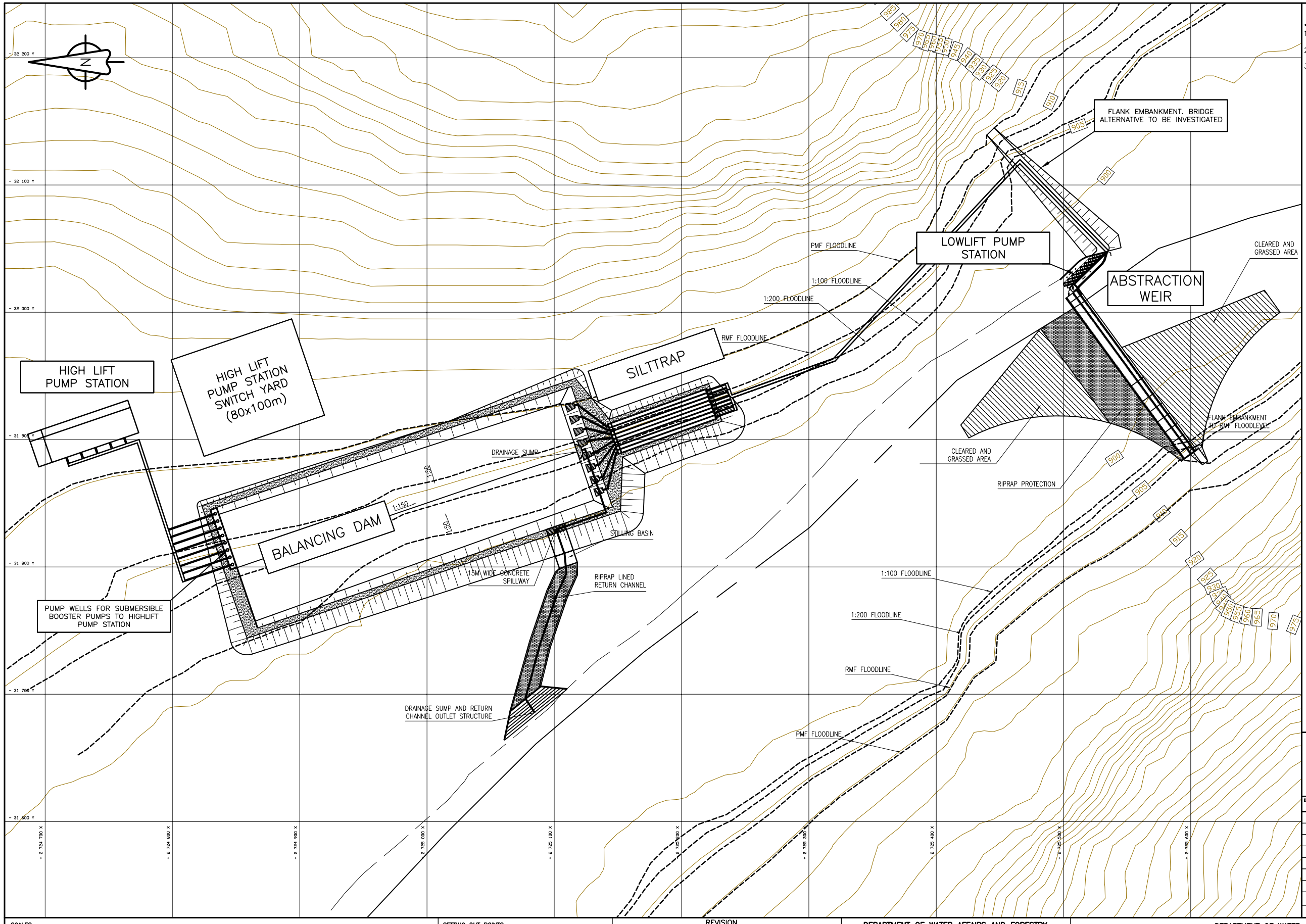
DEPARTMENT OF WATER AFFAIRS AND FORESTRY
REPUBLIC OF SOUTH AFRICA

MOKOLO–CROCODILE WATER AUGMENTATION PROJECT

CLIENT BALANCING DAMS

LAYOUT AND DETAILS

PROVINCE: LIMPOPO	DISTRICT: WATERBERG	KEYCODES:					OTHER No. LD/TR /001
	TENDER No. .	CONTRACT No. WP9528			SHEET 1 OF 1		REG. No. .....
	CALCULATION FILE: J4210/03/04						



NOTES:

1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE SHOWN.
2. ALL LEVELS IN METRES ABOVE SEA LEVEL. (M.A.S.L.)
3. COORDINATE SYSTEM BASED ON LO27 HARTBEESTHOEK 94

Africon | VELAVKE | KV3

AFRICON IN ASSOCIATION WITH VELAVKE AND KWEZI V3

Date:	Designed:	Drawn:	Checked:	Appr:

SHEET	DESCRIPTION	OTHER No.	REG. No.

LIST OF DRAWINGS

SCALES:

SCALE 1:1 500

0 10 50 100 150

SETTING OUT POINTS:

LOCATION / NUMBER	Y	X	LEVEL (masl)

REVISION

MOD No.	DATE	DESCRIPTION	FOR	DWAF
A	06/11/08	PREFEASIBILITY DRAWING	BCV	

DEPARTMENT OF WATER AFFAIRS AND FORESTRY

HEAD OFFICE
DIRECTORATE: OPTIONS ANALYSIS
PRIVATE BAG X313
PRETORIA 0001

P. YAKO
DIRECTOR GENERAL

DESIGN:	TRACED:
DRAWN:	CHECKED:
APPROVED SIGNATURE / RANK	ENGINEER:
DIRECTOR	CHIEF ENGINEER

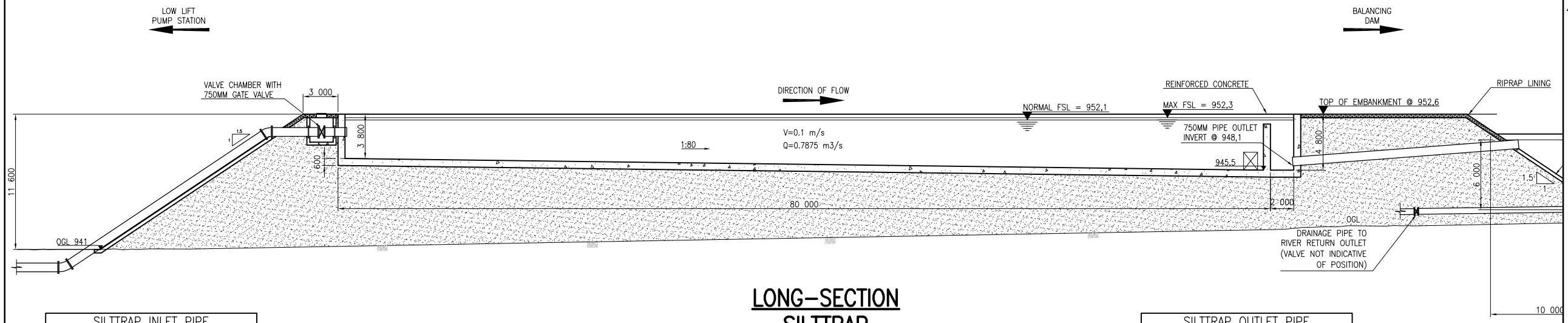
DEPARTMENT OF WATER AFFAIRS AND FORESTRY
REPUBLIC OF SOUTH AFRICA

MOKOLO-CROCODILE WATER AUGMENTATION PROJECT

VLIEEPOORT WEIR

SITE LAYOUT PLAN

PROVINCE: LIMPOPO	DISTRICT: WATERBERG	KEYCODES:					OTHER No. LD/VPW/001
	TENDER No. .	CONTRACT No. WP9528		SHEET 1 OF 1	REG. No.		
	CALCULATION FILE: J4210/03/04						

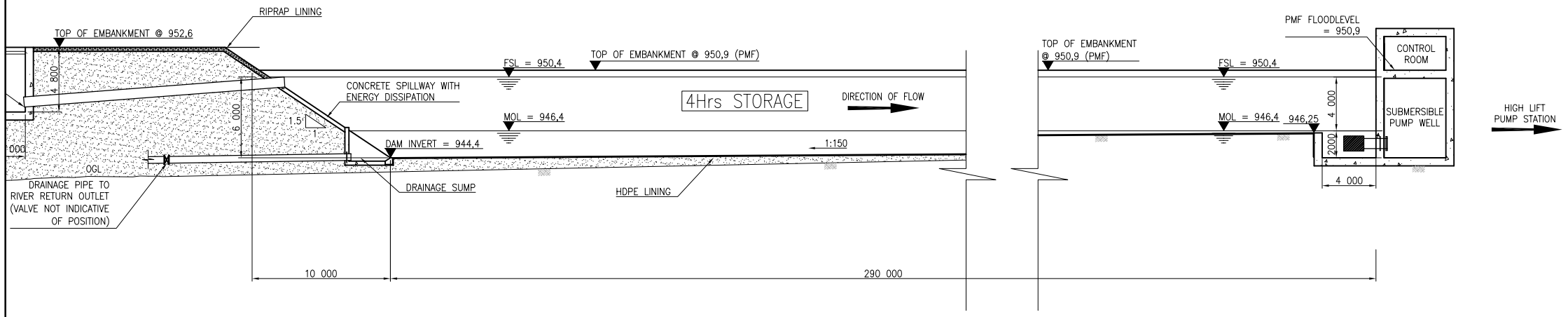


LONG-SECTION SILTTRAP

SCALE 1:200

SILTTRAP INLET PIPE DESIGN DATA		
	NORMAL	MAXIMUM
FLOWRATE	0.7875 m^3/s	1.0 m^3/s
VELOCITY	1.8 m/s	2.2 m/s
DIAMETER	750 mm	750 mm
Hstatic	? m	? m

SILTTRAP OUTLET PIPE DESIGN DATA		
	NORMAL	MAXIMUM
FLOWRATE	0.7875 m^3/s	1.0 m^3/s
VELOCITY	1.8 m/s	2.2 m/s
DIAMETER	750 mm	750 mm
Hstatic	0.4 m	0.62 m



LONG-SECTION BALANCING DAM

SCALE 1:200

DRAINAGE SUMP DESIGN DATA	
FLOWRATE	0.4 m^3/s
VELOCITY	2.0 m/s
DIAMETER	500 mm
TIME TO DRAIN	1 WEEK

BALANCING DAM – DESIGN DATA	
VOLUME	240 000m^3
FILLING TIME @ 7.6 m^3/s =	10Hrs
TIME TO DRAIN @ 0.4 m^3/s =	1 WEEK
4Hrs STORAGE RECOVERY TIME =	5 DAYS

SUBMERSIBLE PUMP WELL INTAKE DESIGN DATA		
	NORMAL	MAXIMUM
FLOWRATE	0.7875 m^3/s	0.95 m^3/s
VELOCITY	1.8 m/s	2.1 m/s
DIAMETER	750 mm	750 mm
Hstatic	8.0 m	8.0 m

NOTES:

1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE SHOWN.
2. ALL LEVELS IN METRES ABOVE SEA LEVEL. (M.A.S.L.)
3. FREEBOARD IN SILTTRAP = 0.3M
4. FREEBOARD IN BALANCING DAM = 0.5M

AFRICON IN ASSOCIATION WITH VELAVKE AND KWEZI V3

Date:	Designed:	Drawn:	Checked:	Appr:

SHEET	DESCRIPTION	OTHER No.	REG. No.

LIST OF DRAWINGS

SCALES:

SCALE 1:200
0 5 10 15 20

SETTING OUT POINTS:

LOCATION / NUMBER	Y	X	LEVEL (mast)

REVISION

MOD No.	DATE	DESCRIPTION	FOR	DWAF
A	06/11/08	PREFEASIBILTY DRAWING	BCV	

DEPARTMENT OF WATER AFFAIRS AND FORESTRY
HEAD OFFICE
DIRECTORATE: OPTIONS ANALYSIS
PRIVATE BAG X313
PRETORIA 0001

P. YAKO
DIRECTOR GENERAL

DESIGN: TRACED:
DRAWN: CHECKED:
APPROVED
SIGNATURE RANK
ENGINEER:
CHIEF ENGINEER
DIRECTOR

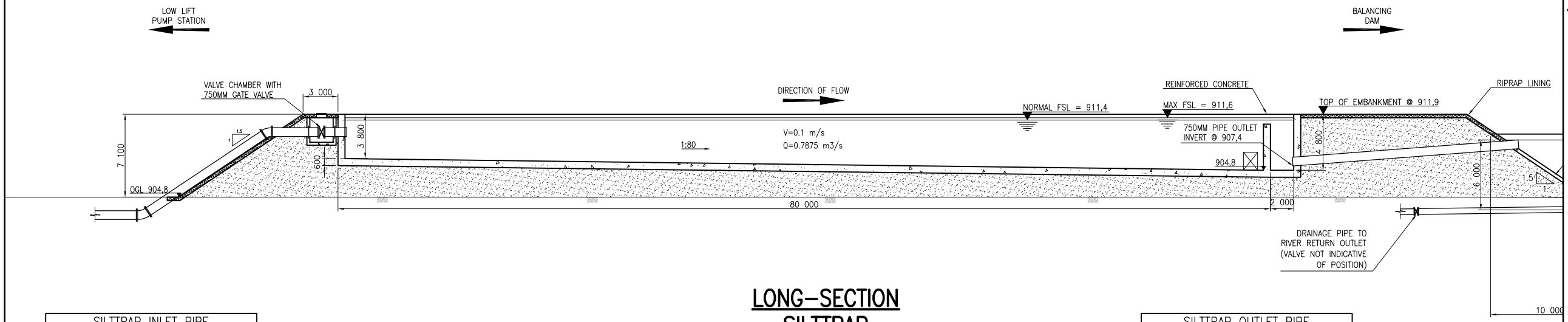
DEPARTMENT OF WATER AFFAIRS AND FORESTRY
REPUBLIC OF SOUTH AFRICA

MOKOLO-CROCODILE WATER AUGMENTATION PROJECT

BOSCHKOP WEIR

SILTTRAP AND BALANCING DAM LONG SECTION

PROVINCE: LIMPOPO DISTRICT: WATERBERG KEYCODES: OTHER No. LS/BKW/001
TENDER No. . CONTRACT No. WP9528 SHEET 1 OF 1 REG. No.
CALCULATION FILE: J4210/03/04

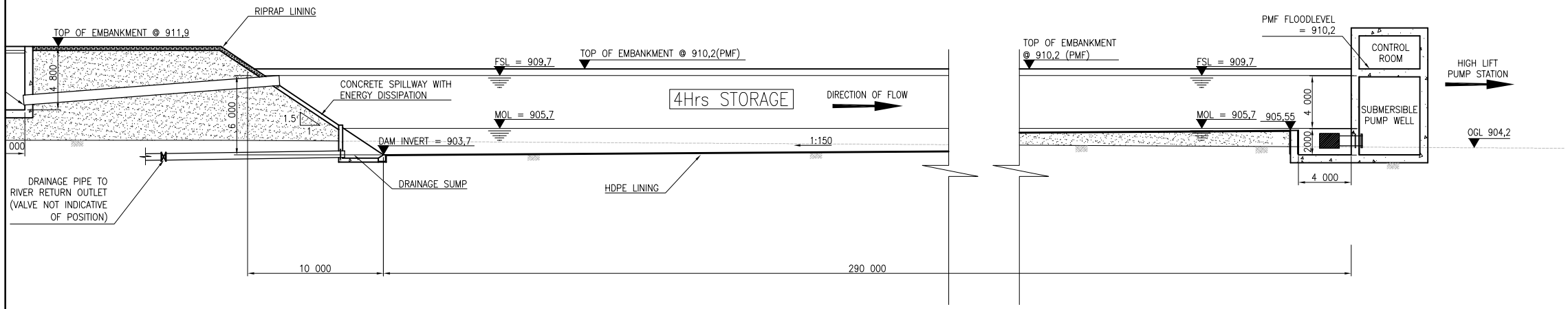


LONG-SECTION
SILTTRAP

SCALE 1:200

SILTTRAP INLET PIPE DESIGN DATA		
	NORMAL	MAXIMUM
FLOWRATE	0.7875 m^3/s	1.0 m^3/s
VELOCITY	1.8 m/s	2.2 m/s
DIAMETER	750 mm	750 mm
Hstatic	? m	? m

SILTTRAP OUTLET PIPE DESIGN DATA		
	NORMAL	MAXIMUM
FLOWRATE	0.7875 m^3/s	1.0 m^3/s
VELOCITY	1.8 m/s	2.2 m/s
DIAMETER	750 mm	750 mm
Hstatic	0.4 m	0.62 m



LONG-SECTION
BALANCING DAM

SCALE 1:200

DRAINAGE SUMP DESIGN DATA	
FLOWRATE	0.4 m^3/s
VELOCITY	2.0 m/s
DIAMETER	500 mm
TIME TO DRAIN	1 WEEK

BALANCING DAM – DESIGN DATA	
VOLUME	240 000m^3
FILLING TIME @ 7.6 m^3/s =	10Hrs
TIME TO DRAIN @ 0.4 m^3/s =	1 WEEK
4Hrs STORAGE RECOVERY TIME =	5 DAYS

SUBMERSIBLE PUMP WELL DESIGN DATA		
	NORMAL	MAXIMUM
FLOWRATE	0.7875 m^3/s	0.95 m^3/s
VELOCITY	1.8 m/s	2.1 m/s
DIAMETER	750 mm	750 mm
Hstatic	2.0 m	2.0 m

NOTES:

1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE SHOWN.
2. ALL LEVELS IN METRES ABOVE SEA LEVEL. (M.A.S.L.)
3. FREEBOARD IN SILTTRAP = 0.3M
4. FREEBOARD IN BALANCING DAM = 0.5M

Africon VELAVKE KV3

AFRICON IN ASSOCIATION WITH VELAVKE AND KWEZI V3

Date:	Designed:	Drawn:	Checked:	Appr:

SHEET	DESCRIPTION	OTHER No.	REG. No.

LIST OF DRAWINGS

SCALES:

SCALE 1:200
0 5 10 15 20

SETTING OUT POINTS:

LOCATION / NUMBER	Y	X	LEVEL (mast)

REVISION

MOD No.	DATE	DESCRIPTION	FOR	DWAF
A	06/11/08	PREFEASIBILTY DRAWING	BCV	

DEPARTMENT OF WATER AFFAIRS AND FORESTRY

HEAD OFFICE
DIRECTORATE: OPTIONS ANALYSIS
PRIVATE BAG X313
PRETORIA 0001

P. YAKO
DIRECTOR GENERAL

DESIGN:	TRACED:
DRAWN:	CHECKED:
APPROVED SIGNATURE / RANK	ENGINEER:
	CHIEF ENGINEER
	DIRECTOR

DEPARTMENT OF WATER AFFAIRS AND FORESTRY
REPUBLIC OF SOUTH AFRICA

MOKOLO-CROCODILE WATER AUGMENTATION PROJECT

VLIEEPOORT WEIR

SILTTRAP AND BALANCING DAM LONG SECTION

PROVINCE: LIMPOPO	DISTRICT: WATERBERG	KEYCODES:	OTHER No. LS/VPW/001
	TENDER No. .	CONTRACT No. WP9528	SHEET 1 OF 1
	CALCULATION FILE: J4210/03/04		REG. No. .....