



**CONSULTANCY SERVICES TO CONDUCT SURVEYS AND DEVELOPMENT OF DESIGNS FOR  
KYUSO ROCK CATCHMENT WATER SUPPLY PROJECT IN KITUI COUNTY UNDER ENDING  
DROUGHT EMERGENCIES-CLIMATE PROOFED INFRASTRUCTURE IN ASAL (EDE-CPIRA)  
PROGRAMME**

**CONTRACT NO: WSTF/EU/RFP/09/2022-2023**

**TENDER DRAWINGS**

---

CONSULTANT:



---

DATE:

---



KYUSO ROCK CATCHMENT WATER SUPPLY PROJECT

# KYUSO PROPOSED WATER SYSTEM



## KYUSO ROCK CATCHMENT WATER SUPPLY PROJECT

### TENDER DOCUMENTS: BOOK OF DRAWINGS

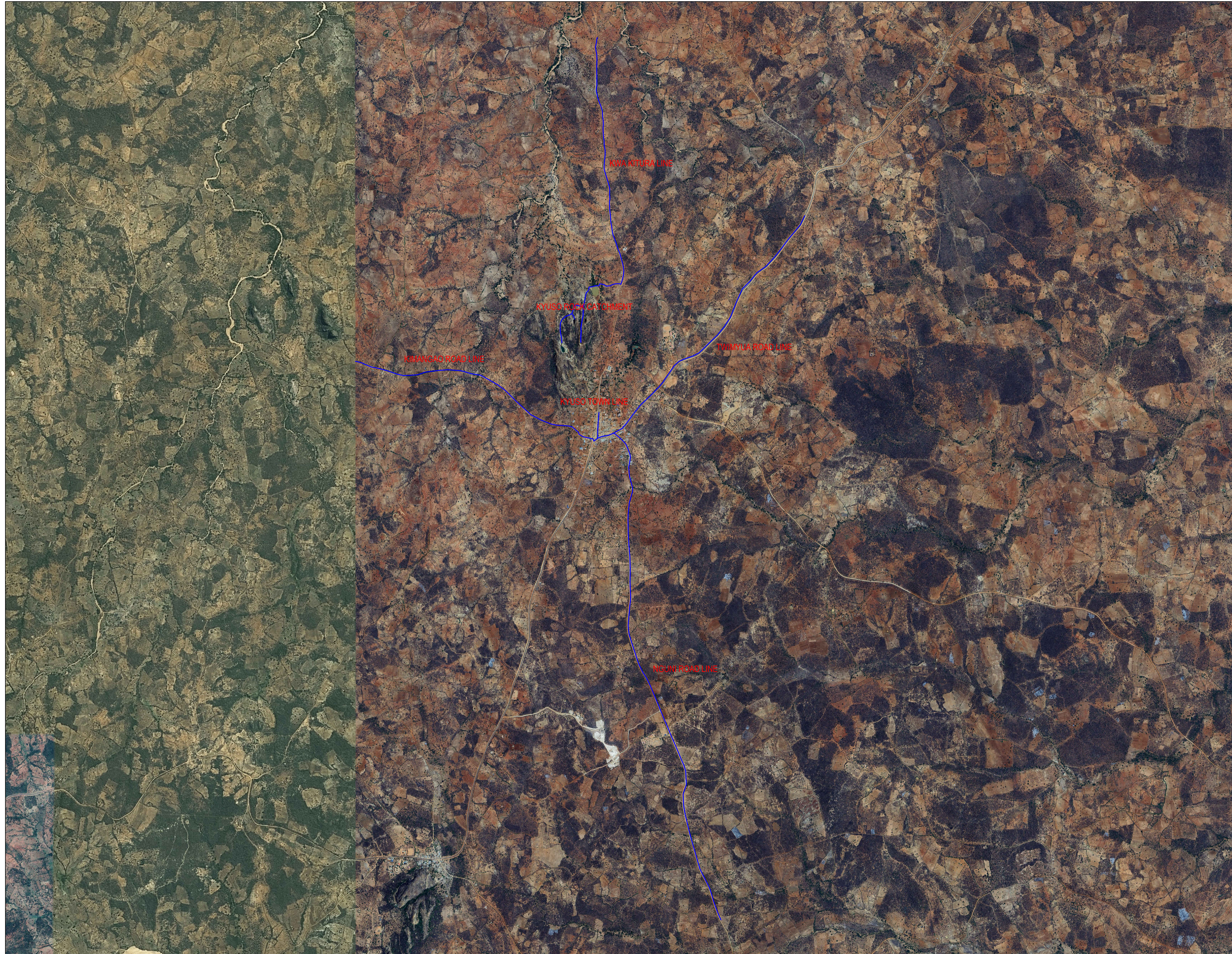
#### DRAWING INDEX: KYUSO PROPOSED WATER SYSTEM

No.	Drawing No.	Drawing Title
<b>KYUSO WATER PIPELINES</b>		
1.	KYUSO/ WATERLINES-KYUSO/00	KYUSO OVERALL PLAN WATER (Plan and Profile Sheet 1 of 1)
2.	KYUSO/ WATERLINES-KIMANGAO/01	KYUSO KIMANGAO ROAD LINE (Plan and Profile Sheet 1 of 6)
3.	KYUSO/ WATERLINES-KIMANGAO/02	KYUSO KIMANGAO ROAD LINE (Plan and Profile Sheet 2 of 6)
4.	KYUSO/ WATERLINES-KIMANGAO/03	KYUSO KIMANGAO ROAD LINE (Plan and Profile Sheet 3 of 6)
5.	KYUSO/ WATERLINES-KIMANGAO/04	KYUSO KIMANGAO ROAD LINE (Plan and Profile Sheet 4 of 6)
6.	KYUSO/ WATERLINES-KIMANGAO/05	KYUSO KIMANGAO ROAD LINE (Plan and Profile Sheet 5 of 6)
7.	KYUSO/ WATERLINES-KIMANGAO/06	KYUSO KIMANGAO ROAD LINE (Plan and Profile Sheet 6 of 6)
8.	KYUSO/ WATERLINES-KITURA/01	KYUSO KWA KITURA LINE (Plan and Profile Sheet 1 of 7)
9.	KYUSO/ WATERLINES-KITURA/02	KYUSO KWA KITURA LINE (Plan and Profile Sheet 2 of 7)
10.	KYUSO/ WATERLINES-KITURA/03	KYUSO KWA KITURA LINE (Plan and Profile Sheet 3 of 7)
11.	KYUSO/ WATERLINES-KITURA/04	KYUSO KWA KITURA LINE (Plan and Profile Sheet 4 of 7)
12.	KYUSO/ WATERLINES-KITURA/05	KYUSO KWA KITURA LINE (Plan and Profile Sheet 5 of 7)
13.	KYUSO/ WATERLINES-KITURA/06	KYUSO KWA KITURA LINE (Plan and Profile Sheet 6 of 7)
14.	KYUSO/ WATERLINES-KITURA/07	KYUSO KWA KITURA LINE (Plan and Profile Sheet 7 of 7)
15.	KYUSO/ WATERLINES-KYUSO/T/01	KYUSO KYUSO TOWN LINE (Plan and Profile Sheet 1 of 1)
16.	KYUSO/ WATERLINES-NGUNI/01	KYUSO NGUNI ROAD LINE (Plan and Profile Sheet 1 of 11)

No.	Drawing No.	Drawing Title
17.	KYUSO/ WATERLINES-NGUNI/02	KYUSO NGUNI ROAD LINE (Plan and Profile Sheet 2 of 11)
18.	KYUSO/ WATERLINES-NGUNI/03	KYUSO NGUNI ROAD LINE (Plan and Profile Sheet 3 of 11)
19.	KYUSO/ WATERLINES-NGUNI/04	KYUSO NGUNI ROAD LINE (Plan and Profile Sheet 4 of 11)
20.	KYUSO/ WATERLINES-NGUNI/05	KYUSO NGUNI ROAD LINE (Plan and Profile Sheet 5 of 11)
21.	KYUSO/ WATERLINES-NGUNI/06	KYUSO NGUNI ROAD LINE (Plan and Profile Sheet 6 of 11)
22.	KYUSO/ WATERLINES-NGUNI/07	KYUSO NGUNI ROAD LINE (Plan and Profile Sheet 7 of 11)
23.	KYUSO/ WATERLINES-NGUNI/08	KYUSO NGUNI ROAD LINE (Plan and Profile Sheet 8 of 11)
24.	KYUSO/ WATERLINES-NGUNI/09	KYUSO NGUNI ROAD LINE (Plan and Profile Sheet 9 of 11)
25.	KYUSO/ WATERLINES-NGUNI/10	KYUSO NGUNI ROAD LINE (Plan and Profile Sheet 10 of 11)
26.	KYUSO/ WATERLINES-NGUNI/11	KYUSO NGUNI ROAD LINE (Plan and Profile Sheet 11 of 11)
27.	KYUSO/ WATERLINES-TWIMYUA/01	KYUSO TWIMYUA ROAD LINE (Plan and Profile Sheet 1 of 7)
28.	KYUSO/ WATERLINES-TWIMYUA/02	KYUSO TWIMYUA ROAD LINE (Plan and Profile Sheet 2 of 7)
29.	KYUSO/ WATERLINES-TWIMYUA/03	KYUSO TWIMYUA ROAD LINE (Plan and Profile Sheet 3 of 7)
30.	KYUSO/ WATERLINES-TWIMYUA/04	KYUSO TWIMYUA ROAD LINE (Plan and Profile Sheet 4 of 7)
31.	KYUSO/ WATERLINES-TWIMYUA/05	KYUSO TWIMYUA ROAD LINE (Plan and Profile Sheet 5 of 7)
32.	KYUSO/ WATERLINES-TWIMYUA/06	KYUSO TWIMYUA ROAD LINE (Plan and Profile Sheet 6 of 7)
33.	KYUSO/ WATERLINES-TWIMYUA/07	KYUSO TWIMYUA ROAD LINE (Plan and Profile Sheet 7 of 7)
<b>COMPOSITE FILTRATION UNIT</b>		
34.	KYUSO/CFU-LAYOUT/01	COMPOSITE FILTRATION UNIT PLAN ( Sheet 1 of 1)
35.	KYUSO/CFU-LAYOUT/02	COMPOSITE FILTRATION UNIT FILTER MEDIA DETAILS ( Sheet 1 of 1)
36.	KYUSO/CFU-LAYOUT/03	COMPOSITE FILTRATION UNIT SECTION DETAILS ( Sheet 1 of 1)
37.	KYUSO/CFU-LAYOUT/04	COMPOSITE FILTRATION UNIT PLAN&SECTION DETAILS ( Sheet 1 of 1)
<b>CONTROL ROOM_PUMP HOUSE</b>		

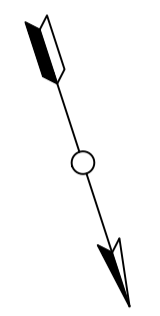
No.	Drawing No.	Drawing Title
38.	KYUSO/CONTROL ROOM_PUMP HOUSE/01	CONTROL ROOM_PUMP HOUSE (Sheet 1 of 5)
39.	KYUSO/CONTROL ROOM_PUMP HOUSE/02	CONTROL ROOM_PUMP HOUSE (Sheet 2 of 5)
40.	KYUSO/CONTROL ROOM_PUMP HOUSE/03	CONTROL ROOM_PUMP HOUSE (Sheet 3 of 5)
41.	KYUSO/CONTROL ROOM_PUMP HOUSE/04	CONTROL ROOM_PUMP HOUSE (Sheet 4 of 5)
42.	KYUSO/CONTROL ROOM_PUMP HOUSE/05	CONTROL ROOM_PUMP HOUSE (Sheet 5 of 5)
<b>50 M3 MASONRY TANK</b>		
43.	KYUSO/50 M3 MASONRY TANK - BPT/01	SLAB PLAN AND DETAILS (Sheet 1 Of 1)
44.	KYUSO/50 M3 MASONRY TANK - BPT/02	TANK SECTION DETAILS (Sheet 1 Of 1)
45.	KYUSO/50 M3 MASONRY TANK - BPT/03	SECTION DETAILS (Sheet 1 Of 2)
46.	KYUSO/50 M3 MASONRY TANK - BPT/04	SECTION DETAILS (Sheet 2 Of 2)
47.	KYUSO/50 M3 MASONRY TANK - BPT/05	PIPEWORK SCHEDULE (Sheet 1 Of 1)
48.	KYUSO/50 M3 MASONRY TANK - BPT/06	MISCELLANEOUS DETAILS (Sheet 1 Of 1)
<b>GUARD HOUSE</b>		
49.	KYUSO/PROPOSED GUARD HOUSE - /01	PLAN, SECTION AND DETAILS (Sheet 1 of 1)
50.	KYUSO/PROPOSED GUARD HOUSE - /02	ELEVATION, SECTION AND DETAILS (Sheet 1 of 1)
51.	KYUSO/PROPOSED GUARD HOUSE - /03	PLAN, SECTION AND DETAILS (Sheet 1 of 1)
<b>LATRINE</b>		
52.	KYUSO/PROPOSED LATRINE - /01	PLAN, SECTION AND DETAILS (Sheet 1 of 1)
53.	KYUSO/PROPOSED LATRINE - /02	ELEVATION, SECTION AND DETAILS (Sheet 1 of 1)
54.	KYUSO/PROPOSED LATRINE - /03	PLAN, SECTION AND DETAILS (Sheet 1 of 1)
<b>SEPTIC TANK</b>		
55.	KYUSO/SEPTIC TANK DETAILS – LAYOUT/01	SEPTIC TANK DETAILS (Sheet 1 of 1)
<b>WATER KIOSK</b>		
56.	KYUSO/WATER KIOSK - /01	PLAN, SECTION AND DETAILS (Sheet 1 of 1)

No.	Drawing No.	Drawing Title
57.	KYUSO/WATER KIOSK - /02	ELEVATION, SECTION AND DETAILS (Sheet 1 of 1)
58.	KYUSO/WATER KIOSK - /03	PLAN, SECTION AND DETAILS (Sheet 1 of 1)
59.	KYUSO/WATER KIOSK - /04	ELEVATION, SECTION AND DETAILS (Sheet 1 of 1)
60.	KYUSO/WATER KIOSK - /05	PLAN, SECTION AND DETAILS (Sheet 1 of 1)
<b>STANDARD DRAWINGS</b>		
61.	KYUSO/ WSP STDs-CROSSINGS/01	RIVER AND ROAD OVERCROSSING (Sheet 1 of 2)
62.	KYUSO/ WSP STDs-CROSSINGS/02	RAIL CROSSING & RIVER UNDERCROSSING (Sheet 2 of 2)
63.	KYUSO/ WSP STDs-FENCING GATE/03	FENCING GATE (Sheet 1 of 1)
64.	KYUSO/ WSP STDs-MARKER POST/04	MARKER POST (Sheet 1 of 1)
65.	KYUSO/ WSP STDs-VALVE CHAMBERS/04	VALVE CHAMBERS (Sheet 1 of 2)
66.	KYUSO/ WSP STDs-VALVE CHAMBERS/05	VALVE CHAMBERS (Sheet 2 of 2)
67.	KYUSO/ WSP STDs-WASHOUT CHAMBERS/06	WASHOUT CHAMBERS (Sheet 1 of 2)
68.	KYUSO/ WSP STDs-WASHOUT CHAMBERS/07	WASHOUT CHAMBERS (Sheet 2 of 2)
69.	KYUSO/ WSP STDs-SURFACE BOX/08	SURFACE BOX (Sheet 1 of 1)
70.	KYUSO/ WSP STDs-THRUST BLOCKS/09	THRUST BLOCKS (Sheet 1 of 3)
71.	KYUSO/ WSP STDs-THRUST BLOCKS/10	THRUST BLOCKS (Sheet 2 of 3)
72.	KYUSO/ WSP STDs-THRUST BLOCKS/11	THRUST BLOCKS (Sheet 3 of 3)
73.	KYUSO/ WSP STDs-BEDDING/12	BEDDING (Sheet 1 of 1)
74.	KYUSO/ WSP STDs-GMS LADDER/13	GMS LADDER (Sheet 1 of 1)



**NOTES**

1. ALL DIMENSIONS/LEVELS ARE IN METRES UNLESS NOTED OTHERWISE.
2. PIPES ARE TO BE LAID TO EVEN GRADIENTS WITH A MINIMUM COVER OF 1.0m AND 1.2m FOR TRAFFICKED AREAS. WHERE COVER IS LESS THAN THIS, PIPE TO BE SURROUNDED WITH CONCRETE.
3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH OTHER RELATED DRAWINGS. ANY DISCREPANCIES TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.
4. PRECISE ROUTES TO BE DETERMINED ON SITE.



- LEGEND:**
- - EXISTING GROUND PROFILE
  - - WATER LINES (EXISTING)
  - - WATER LINES (PROPOSED)
  - - RIVER/STREAM
  - - STATIC HEAD
  - - HYDRAULIC GRADE LINE
  - SINGLE ORIFICE AIR VALVE
  - WASHOUT

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			

**Client**

**Financier**

**Project**  
**KYUSO ROCK CATCHMENT WATER PROJECT**

**Design Consultants.**

15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 798 352 533  
Email: info@lmsmanagement.com

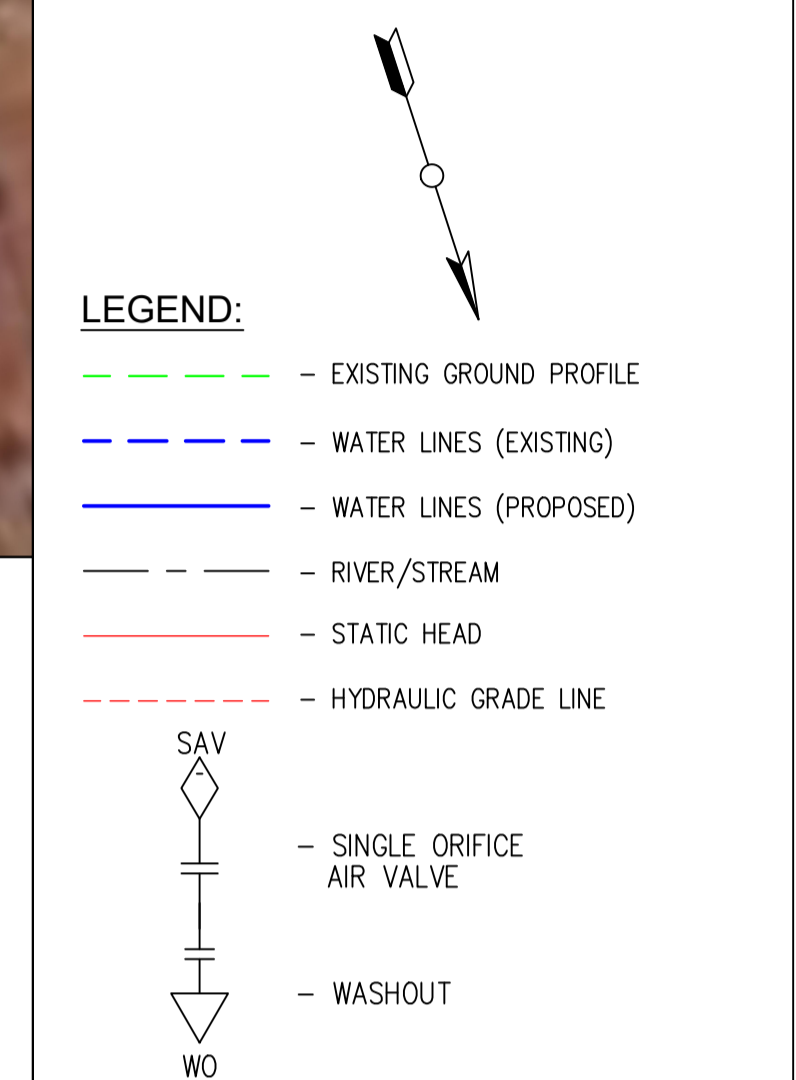
**Drawing Title**  
**PROPOSED KYUSO WATER LINES PLAN**  
**General Layout**

Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1,000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO
0 STATUS	DWG. No.	SHEET 1 OF 1	0 REV



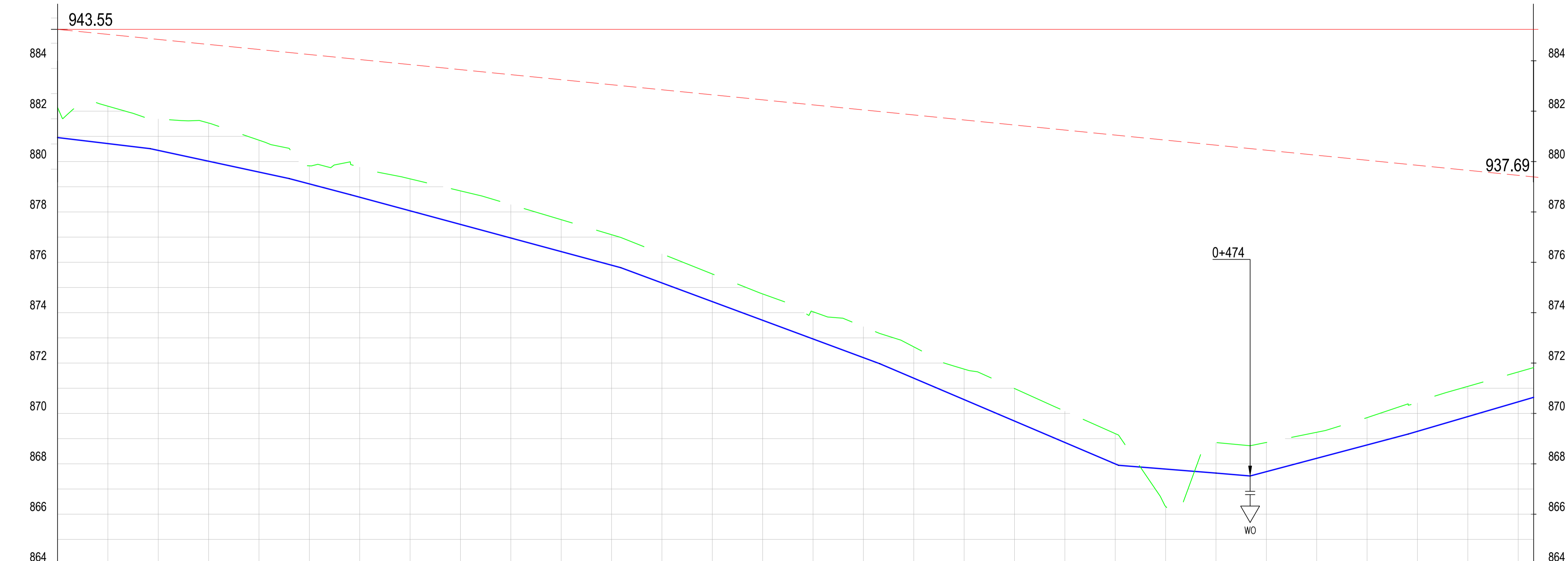
**NOTES**

1. ALL DIMENSIONS/LEVELS ARE IN METRES UNLESS NOTED OTHERWISE.
2. PIPES ARE TO BE LAID TO EVEN GRADIENTS WITH A MINIMUM COVER OF 1.0m AND 1.2m FOR TRAFFICKED AREAS. WHERE COVER IS LESS THAN THIS, PIPE TO BE SURROUNDED WITH CONCRETE.
3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH OTHER RELATED DRAWINGS. ANY DISCREPANCIES TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.
4. PRECISE ROUTES TO BE DETERMINED ON SITE.



PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			



CHAINAGE (Km+m)	0+000	0+020	0+040	0+060	0+080	0+100	0+120	0+140	0+160	0+180	0+200	0+220	0+240	0+260	0+280	0+300	0+320	0+340	0+360	0+380	0+400	0+420	0+440	0+460	0+480	0+500	0+520	0+540	0+560	0+580	0+586	
GROUND LEVELS (Masl)	882.15	882.20	881.69	881.53	880.85	879.83	879.78	879.31	878.83	878.29	877.69	877.10	876.34	875.54	874.74	874.04	873.44	872.64	871.76	870.99	870.09	869.20	866.31	868.84	868.85	869.25	869.83	870.42	871.07	871.65	871.82	
INVERT LEVELS (Masl)	880.95	880.71	880.44	880.01	879.58	879.11	878.58	878.04	877.50	876.97	876.43	875.89	875.18	874.44	873.70	872.96	872.22	871.40	870.55	869.70	868.85	868.00	866.79	867.63	867.69	868.22	868.75	869.29	870.07	870.46	870.64	
EXCAVATION DEPTH (m)	1.20	1.49	1.25	1.52	1.27	0.72	1.19	1.27	1.33	1.32	1.27	1.21	1.15	1.10	1.05	1.08	1.23	1.24	1.21	1.29	1.24	1.20	-1.48	1.21	1.16	1.03	1.08	1.13	1.20	1.19	1.18	
SIZE/TYPE OF PIPE & HGL	←————— OD 50 HDPE —————→																															
PIPE FITTINGS	←————— TO BE DETERMINED ON SITE —————→																															
SLOPE (%)	-1.20%	-2.15%	-2.63%	-2.70%	-3.71%	-4.25%	-0.90%	-0.84%	2.65%	2.93%																						

**Client**

**Financier**

**Project**  
**KYUSO ROCK CATCHMENT WATER PROJECT**

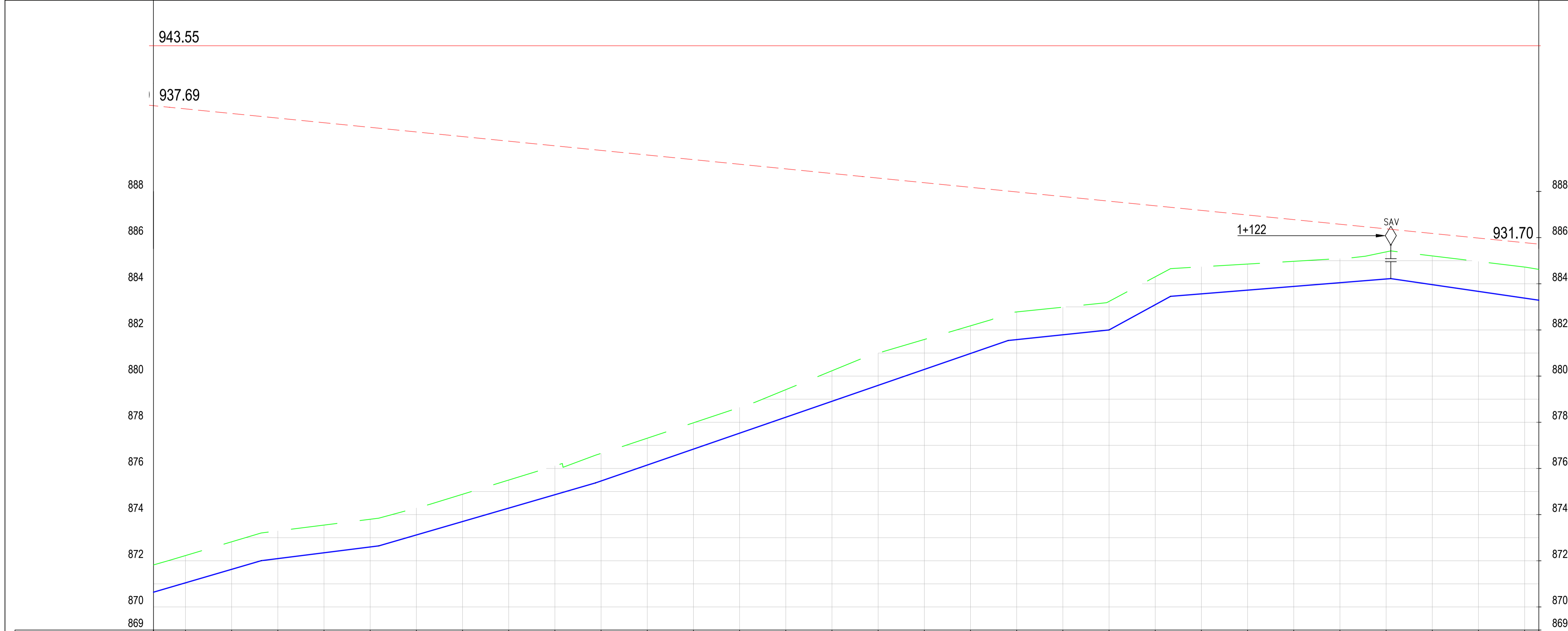
**Design Consultants.**

15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 718 352 533  
Email: info@lossmanagement.com

**Drawing Title**  
**PROPOSED KYUSO WATER LINES**  
**PLAN AND PROFILE**  
**Kimungao Road Line**

Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1,000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO
STATUS	DWG. No.	SHEET 1 OF 6	REV





CHAINAGE (Km+m)	0+556	0+600	0+620	0+640	0+660	0+680	0+700	0+720	0+740	0+760	0+780	0+800	0+820	0+840	0+860	0+880	0+900	0+920	0+940	0+960	0+980	1+000	1+020	1+040	1+060	1+080	1+100	1+120	1+140	1+160	1+186		
GROUND LEVELS (Masl)	871.82	872.23	872.82	873.29	873.55	873.80	874.29	874.88	875.50	876.11	876.65	877.31	877.98	878.64	879.41	880.23	881.00	881.59	882.18	882.78	882.99	883.24	884.30	884.74	884.85	884.97	885.09	885.38	885.21	884.97	884.72	884.62	
INVERT LEVELS (Masl)	870.64	871.04	871.63	872.09	872.35	872.60	873.12	873.70	874.28	874.86	875.46	876.15	876.84	877.53	878.22	878.91	879.60	880.29	880.98	881.58	881.79	882.00	883.09	883.56	883.72	883.89	884.05	884.21	883.96	883.67	883.38	883.29	
EXCAVATION DEPTH (m)	1.18	1.18	1.19	1.20	1.20	1.20	1.17	1.18	1.22	1.25	1.19	1.16	1.14	1.12	1.19	1.32	1.40	1.30	1.20	1.20	1.20	1.24	1.21	1.17	1.13	1.09	1.05	1.17	1.25	1.30	1.35	1.34	
SIZE/TYPE OF PIPE & HGL	OD 50 HDPE																																
PIPE FITTINGS	TO BE DETERMINED ON SITE																																
SLOPE (%)	2.93%			1.26%			2.91%			3.45%			1.05%			5.47%			0.80%			-1.46%											

**NOTES**

1. ALL DIMENSIONS/LEVELS ARE IN METRES UNLESS NOTED OTHERWISE.
2. PIPES ARE TO BE LAID TO EVEN GRADIENTS WITH A MINIMUM COVER OF 1.0m AND 1.2m FOR TRAFFICKED AREAS. WHERE COVER IS LESS THAN THIS, PIPE TO BE SURROUNDED WITH CONCRETE.
3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH OTHER RELATED DRAWINGS. ANY DISCREPANCIES TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.
4. PRECISE ROUTES TO BE DETERMINED ON SITE.

**LEGEND:**

- EXISTING GROUND PROFILE
- WATER LINES (EXISTING)
- WATER LINES (PROPOSED)
- RIVER/STREAM
- STATIC HEAD
- HYDRAULIC GRADE LINE
- SAV
- SINGLE ORIFICE AIR VALVE
- WO
- WASHOUT

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY CHECKED			
	BY CHECKED			
	BY CHECKED			
	BY CHECKED			

**Client**

**Financier**

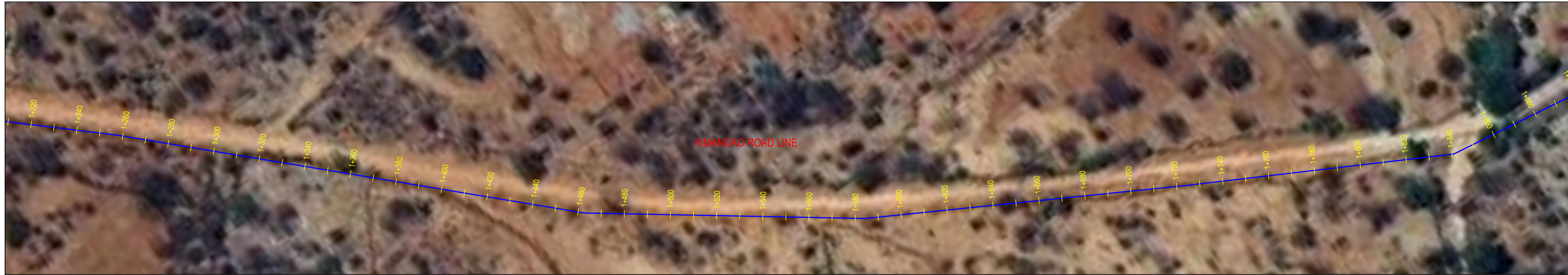
**Project**  
KYUSO ROCK CATCHMENT WATER PROJECT

**Design Consultants.**

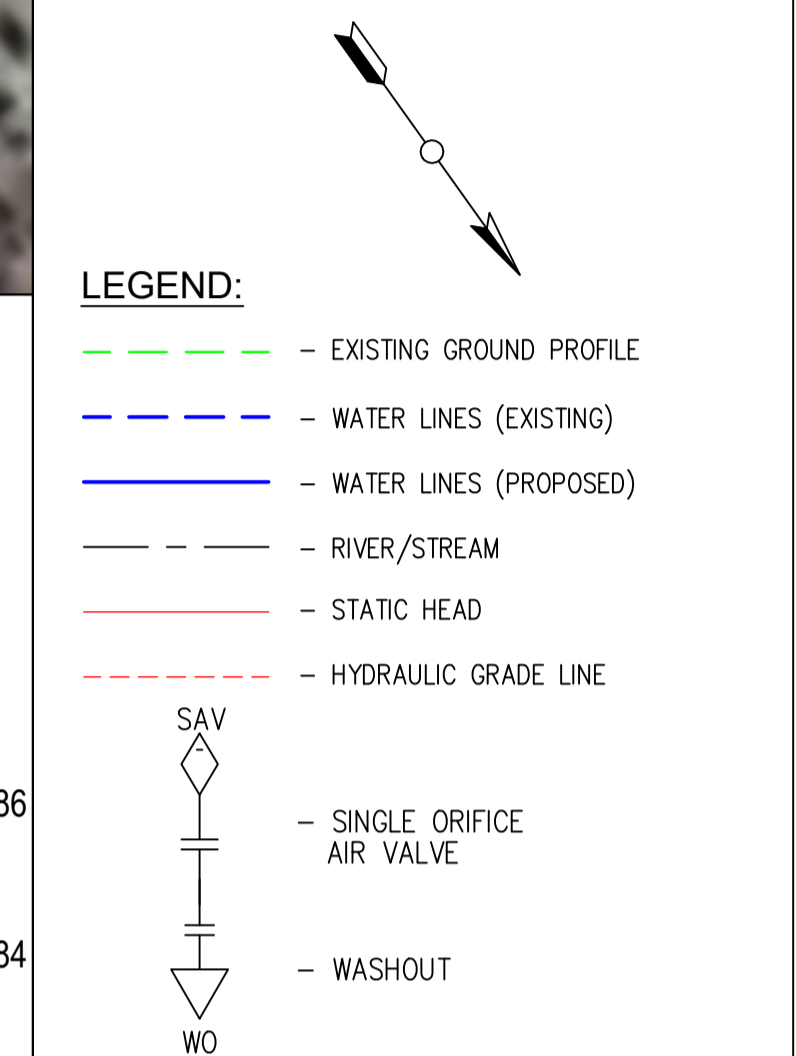
15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 788 352 533  
Email: info@lossmanagement.com

**Drawing Title**  
PROPOSED KYUSO WATER LINES  
PLAN AND PROFILE  
KIMUNGAO ROAD LINE

Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1,000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO
STATUS	DWG. No.	SHEET 2 OF 6	REV



- NOTES**
1. ALL DIMENSIONS/LEVELS ARE IN METRES UNLESS NOTED OTHERWISE.
  2. PIPES ARE TO BE LAID TO EVEN GRADIENTS WITH A MINIMUM COVER OF 1.0m AND 1.2m FOR TRAFFICKED AREAS. WHERE COVER IS LESS THAN THIS, PIPE TO BE SURROUNDED WITH CONCRETE.
  3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH OTHER RELATED DRAWINGS. ANY DISCREPANCIES TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.
  4. PRECISE ROUTES TO BE DETERMINED ON SITE.



PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY CHECKED			
	BY CHECKED			
	BY CHECKED			
	BY CHECKED			

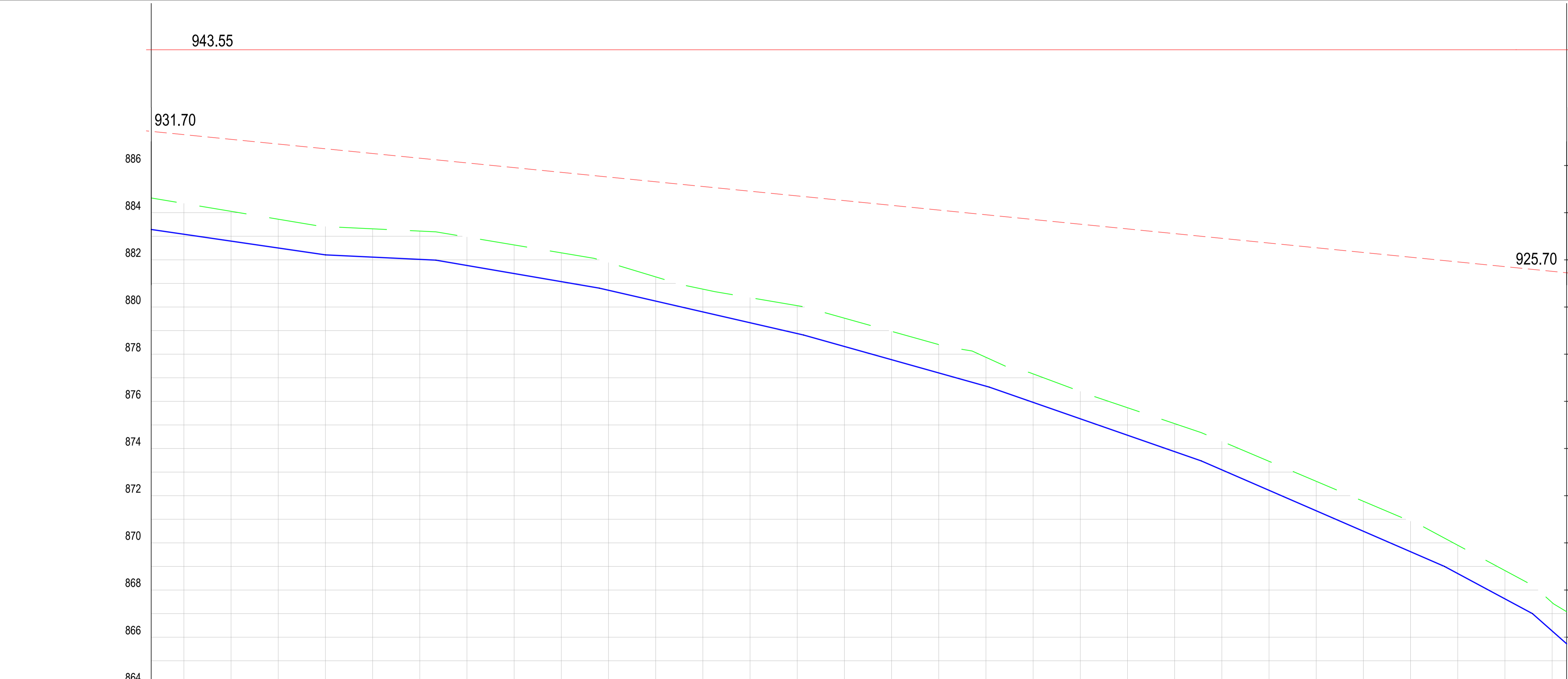


**Project**  
**KYUSO ROCK CATCHMENT WATER PROJECT**

**Design Consultants.**  
15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 788 352 533  
Email: info@lossmanagement.com

**Drawing Title**  
**PROPOSED KYUSO WATER LINES**  
**PLAN AND PROFILE**  
**KIMANGAO ROAD LINE**

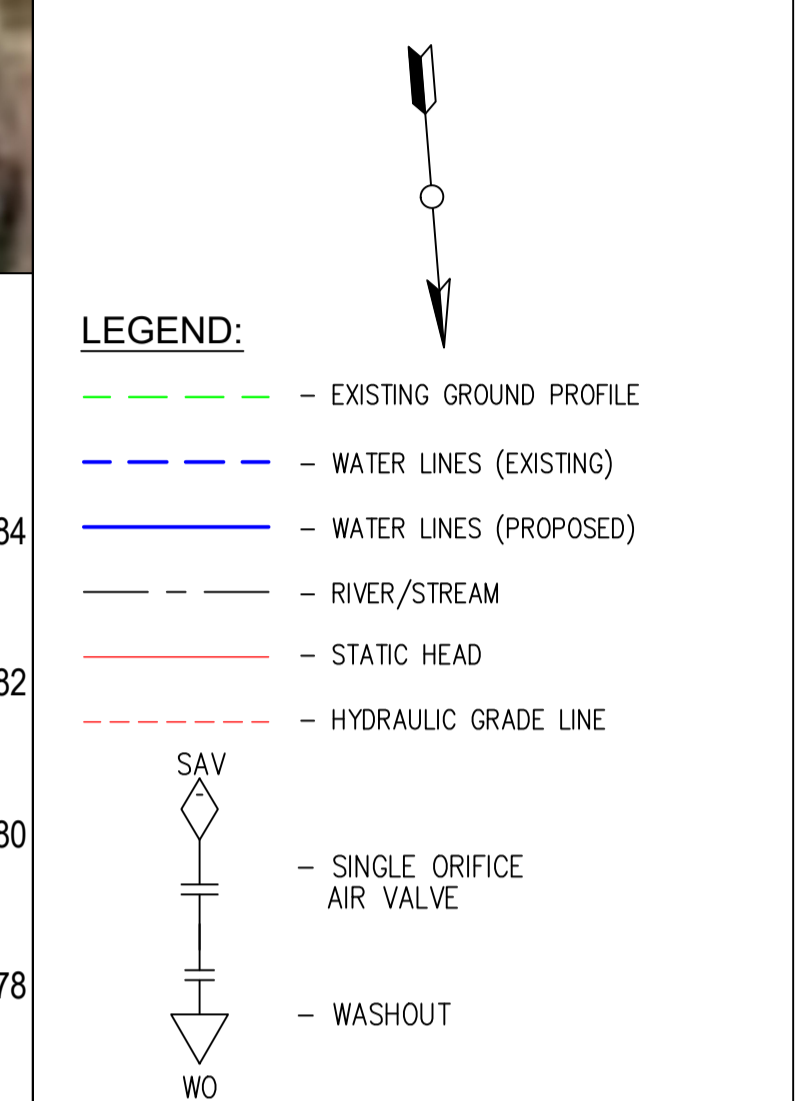
Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO
0 STATUS	DWG. No.	SHEET 3 OF 6	0 REV



CHAINAGE (Km+m)	GROUND LEVELS (Masl)	INVERT LEVELS (Masl)	EXCAVATION DEPTH (m)	SIZE/TYPE OF PIPE & HGL	PIPE FITTINGS	SLOPE (%)
1+166	884.62	883.29	1.34	OD 50 HDPE	TO BE DETERMINED ON SITE	-1.46%
1+200	884.39	883.09	1.31			
1+220	884.06	882.79	1.26			
1+240	883.72	882.50	1.22			
1+260	883.41	882.21	1.20			
1+280	883.32	882.12	1.20			
1+300	883.22	882.02	1.20			
1+320	882.97	881.76	1.21			
1+340	882.63	881.42	1.21			
1+360	882.30	881.08	1.22			
1+380	881.88	880.71	1.17			
1+400	881.28	880.25	1.03			
1+420	880.76	879.79	0.97			
1+440	880.40	879.33	1.06			
1+460	880.06	878.87	1.18			
1+480	879.53	878.33	1.20			
1+500	878.97	877.77	1.20			
1+520	878.41	877.21	1.20			
1+540	877.87	876.64	1.22			
1+560	877.17	875.96	1.21			
1+580	876.42	875.26	1.16			
1+600	875.73	874.56	1.17			
1+620	875.05	873.87	1.19			
1+640	874.30	873.10	1.21			
1+660	873.46	872.23	1.23			
1+680	872.61	871.36	1.25			
1+700	871.76	870.49	1.27			
1+720	870.92	869.62	1.29			
1+740	869.90	868.70	1.20			
1+760	868.83	867.63	1.20			
1+780	867.47	866.26	1.21			
1+786	867.08	865.72	1.36			



- NOTES**
1. ALL DIMENSIONS/LEVELS ARE IN METRES UNLESS NOTED OTHERWISE.
  2. PIPES ARE TO BE LAID TO EVEN GRADIENTS WITH A MINIMUM COVER OF 1.0m AND 1.2m FOR TRAFFICKED AREAS. WHERE COVER IS LESS THAN THIS, PIPE TO BE SURROUNDED WITH CONCRETE.
  3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH OTHER RELATED DRAWINGS. ANY DISCREPANCIES TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.
  4. PRECISE ROUTES TO BE DETERMINED ON SITE.



PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY CHECKED			
	BY CHECKED			
	BY CHECKED			
	BY CHECKED			



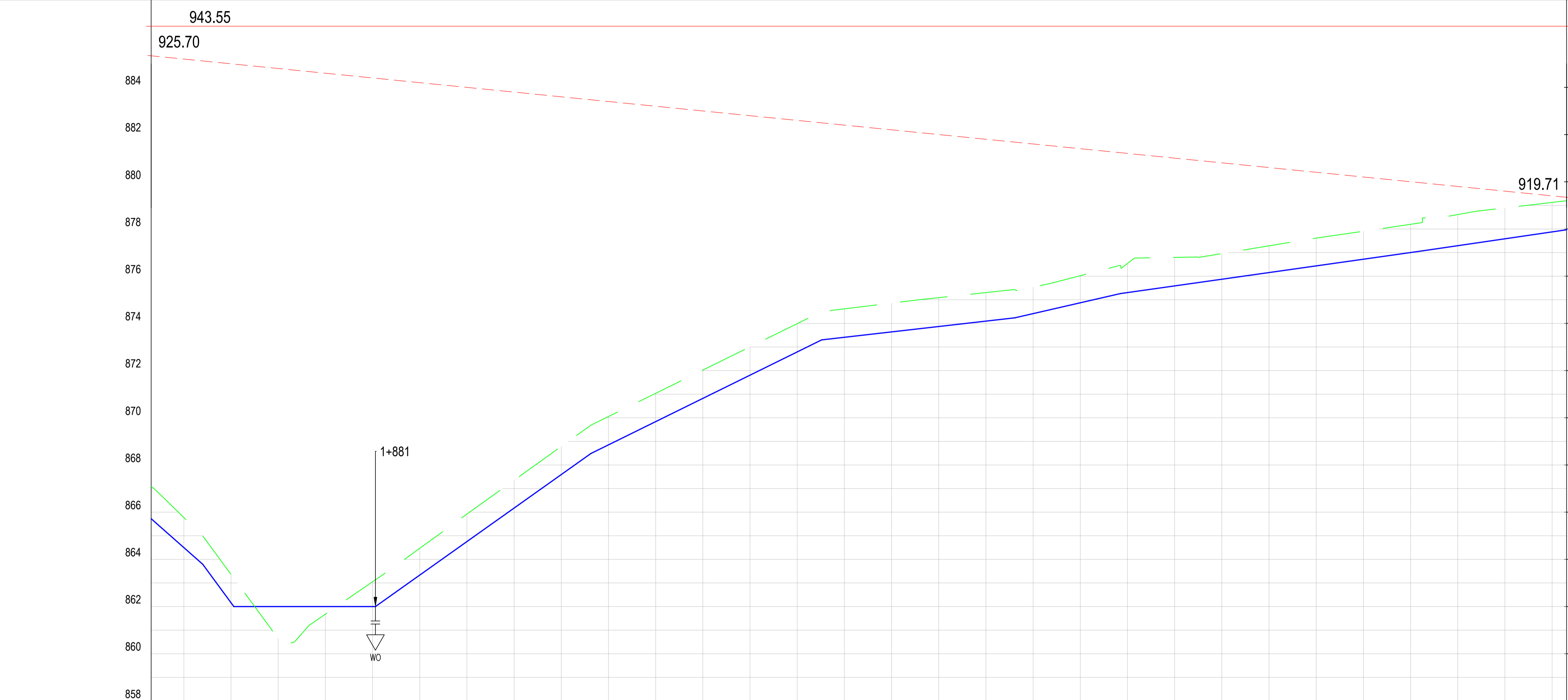
**Project**  
**KYUSO ROCK CATCHMENT WATER PROJECT**

**Design Consultants.**

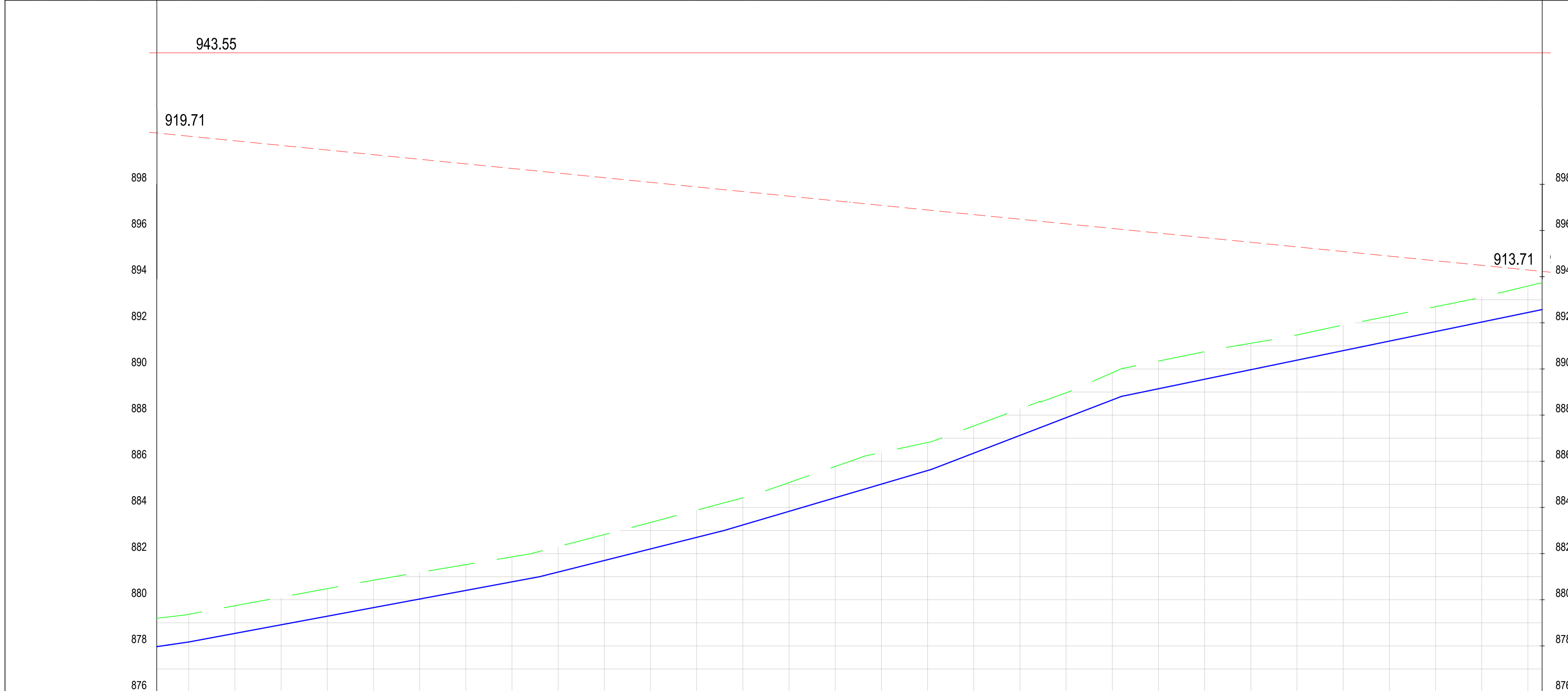
15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 788 352 533  
Email: info@lossmanagement.com

**Drawing Title**  
**PROPOSED KYUSO WATER LINES**  
**PLAN AND PROFILE**  
**KIMANGAO ROAD LINE**

Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1,000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO
STATUS	DWG. No.	SHEET 4 OF 6	REV

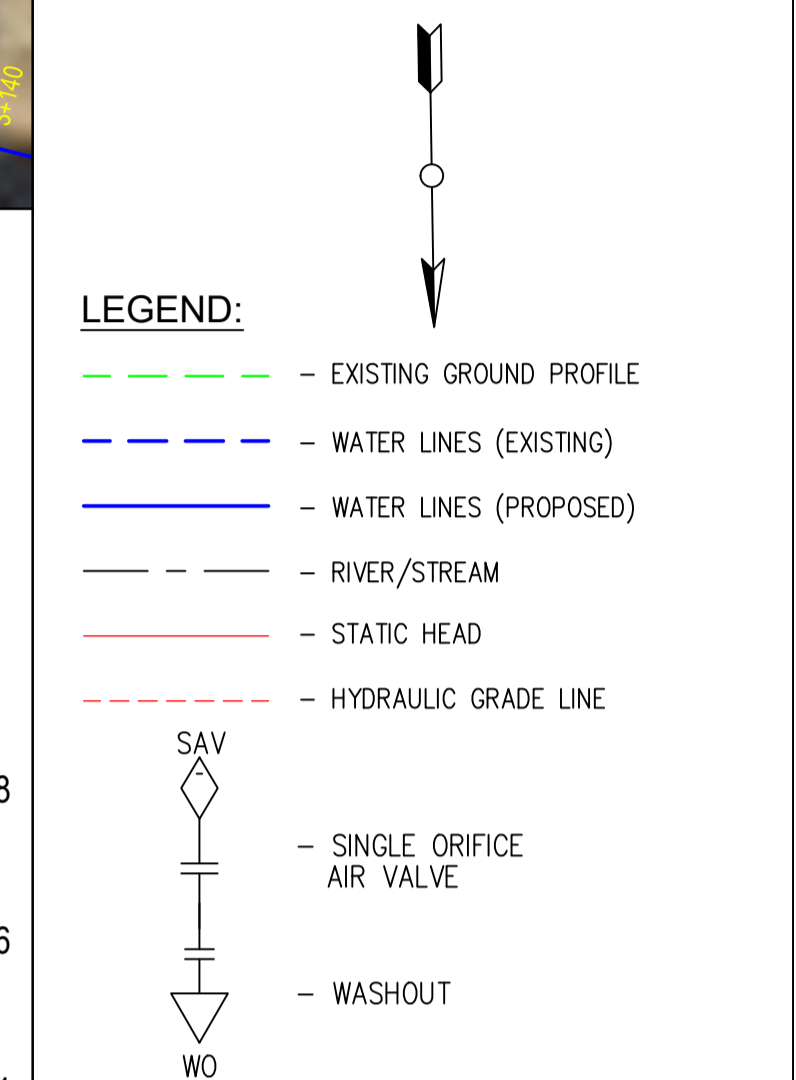


CHAINAGE (Km+m)	GROUND LEVELS (Masl)	INVERT LEVELS (Masl)	EXCAVATION DEPTH (m)	SIZE/TYPE OF PIPE & HGL	PIPE FITTINGS	SLOPE (%)
1+786	867.08	865.72	1.36	←	←	-8.83%
1+800	865.77	864.50	1.27			
1+820	863.36	862.16	1.20	←	←	13.60%
1+840	860.64	862.00	-1.36			
1+860	861.68	862.00	-0.32	←	←	0.00%
1+880	863.05	862.00	1.05			
1+900	864.47	863.33	1.13	←	←	7.10%
1+920	865.92	864.75	1.17			
1+940	867.35	866.17	1.18	←	←	4.92%
1+960	868.79	867.59	1.19			
1+980	870.05	868.85	1.20	←	←	1.14%
2+000	871.04	869.84	1.20			
2+020	872.02	870.82	1.20	←	←	2.30%
2+040	873.01	871.81	1.20			
2+060	873.99	872.79	1.20	←	←	1.46%
2+080	874.62	873.41	1.21			
2+100	874.86	873.64	1.22	←	←	
2+120	875.09	873.87	1.22			
2+140	875.30	874.10	1.21	←	←	
2+160	875.54	874.41	1.12			
2+180	876.02	874.87	1.15	←	←	
2+200	876.54	875.31	1.23			
2+220	876.80	875.59	1.21	←	←	
2+240	876.96	875.87	1.09			
2+260	877.29	876.15	1.13	←	←	
2+280	877.61	876.44	1.18			
2+300	877.90	876.72	1.18	←	←	
2+320	878.20	877.00	1.20			
2+340	878.61	877.29	1.32	←	←	
2+360	878.89	877.58	1.31			
2+380	879.13	877.88	1.25	←	←	
2+386	879.20	877.97	1.23			



CHAINAGE (Km+m)	GROUND LEVELS (Masl)	INVERT LEVELS (Masl)	EXCAVATION DEPTH (m)	SIZE/TYPE OF PIPE & HGL	PIPE FITTINGS	SLOPE (%)
2+386	879.20	877.97	1.23	OD 50 HDPE	TO BE DETERMINED ON SITE	1.46%
2+400	879.37	878.17	1.20			
2+420	879.74	878.54	1.20			
2+440	880.11	878.91	1.20			
2+460	880.48	879.29	1.19			
2+480	880.85	879.66	1.19			
2+500	881.19	880.03	1.15			
2+520	881.52	880.40	1.12			
2+540	881.86	880.78	1.08			
2+560	882.30	881.20	1.10			
2+580	882.82	881.70	1.12			
2+600	883.35	882.20	1.15			
2+620	883.88	882.70	1.18			
2+640	884.42	883.24	1.17			
2+660	885.08	883.83	1.25			
2+680	885.78	884.42	1.35			
2+700	886.38	885.01	1.37			
2+720	886.81	885.60	1.21			
2+740	887.53	886.35	1.18			
2+760	888.27	887.12	1.15			
2+780	888.97	887.89	1.08			
2+800	889.84	888.66	1.18			
2+820	890.34	889.14	1.20			
2+840	890.75	889.56	1.20			
2+860	891.11	889.97	1.14			
2+880	891.47	890.38	1.09			
2+900	891.90	890.79	1.11			
2+920	892.30	891.21	1.09			
2+940	892.70	891.62	1.08			
2+960	893.11	892.03	1.08			
2+980	893.59	892.45	1.15			
2+986	893.74	892.57	1.17			

- NOTES**
1. ALL DIMENSIONS/LEVELS ARE IN METRES UNLESS NOTED OTHERWISE.
  2. PIPES ARE TO BE LAID TO EVEN GRADIENTS WITH A MINIMUM COVER OF 1.0m AND 1.2m FOR TRAFFICKED AREAS. WHERE COVER IS LESS THAN THIS, PIPE TO BE SURROUNDED WITH CONCRETE.
  3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH OTHER RELATED DRAWINGS. ANY DISCREPANCIES TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.
  4. PRECISE ROUTES TO BE DETERMINED ON SITE.



PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED



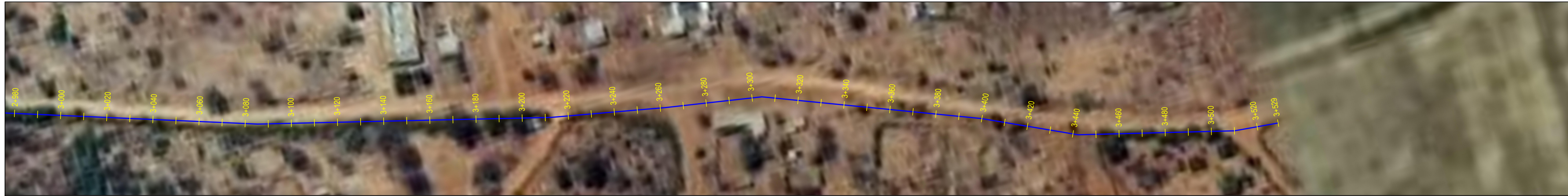
**Project**  
**KYUSO ROCK CATCHMENT WATER PROJECT**

**Design Consultants.**

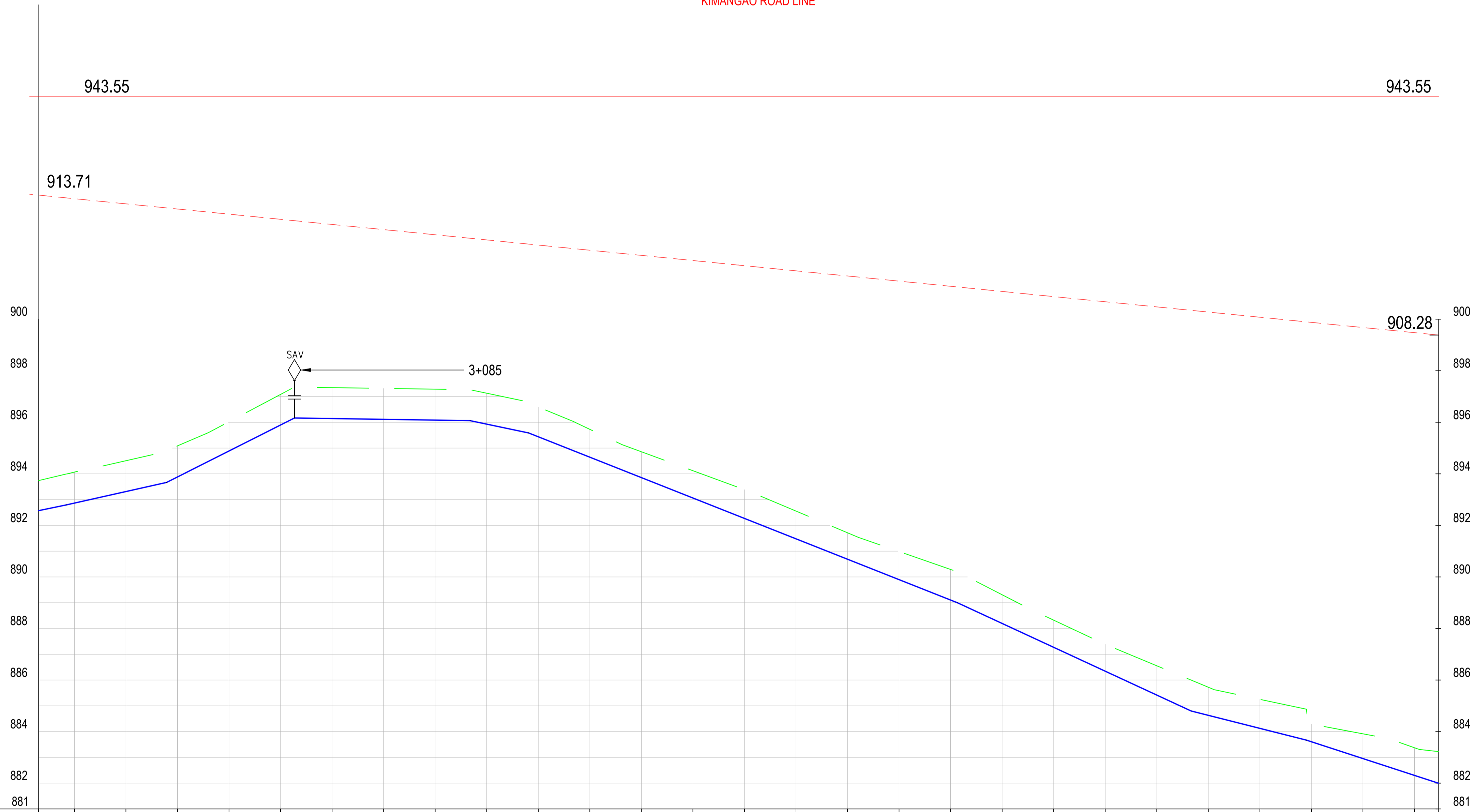
15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 788 352 533  
Email: info@lossmanagement.com

**Drawing Title**  
**PROPOSED KYUSO WATER LINES**  
**PLAN AND PROFILE**  
**KIMANGAO ROAD LINE**

Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1,000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO
STATUS	DWG. No.	SHEET 5 OF 6	REV



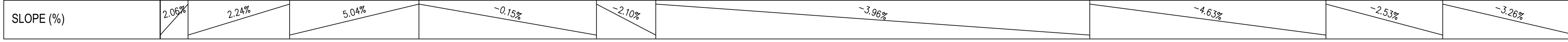
**KIMUNGAO ROAD LINE**



CHAINAGE (Km+m)	GROUND LEVELS (Masl)	INVERT LEVELS (Masl)	EXCAVATION DEPTH (m)
2+986	893.74	892.57	1.17
3+000	894.07	892.86	1.20
3+020	894.51	893.31	1.20
3+040	895.08	893.88	1.21
3+060	896.02	894.89	1.13
3+080	897.08	895.89	1.19
3+100	897.34	896.14	1.20
3+120	897.31	896.11	1.20
3+140	897.28	896.08	1.20
3+160	897.13	895.93	1.20
3+180	896.59	895.44	1.15
3+200	895.73	894.65	1.08
3+220	894.86	893.85	1.00
3+240	894.12	893.06	1.06
3+260	893.39	892.27	1.12
3+280	892.56	891.48	1.08
3+300	891.71	890.69	1.03
3+320	890.99	889.90	1.09
3+340	890.29	889.10	1.19
3+360	889.31	888.20	1.11
3+380	888.32	887.27	1.05
3+400	887.39	886.34	1.04
3+420	886.55	885.42	1.14
3+440	885.72	884.63	1.09
3+460	885.25	884.13	1.13
3+480	884.29	883.61	0.88
3+500	883.91	882.95	0.96
3+520	883.37	882.30	1.07
3+529	883.23	882.00	1.23

OD 50 HDPE

TO BE DETERMINED ON SITE



**NOTES**

1. ALL DIMENSIONS/LEVELS ARE IN METRES UNLESS NOTED OTHERWISE.
2. PIPES ARE TO BE LAID TO EVEN GRADIENTS WITH A MINIMUM COVER OF 1.0m AND 1.2m FOR TRAFFICKED AREAS. WHERE COVER IS LESS THAN THIS, PIPE TO BE SURROUNDED WITH CONCRETE.
3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH OTHER RELATED DRAWINGS. ANY DISCREPANCIES TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.
4. PRECISE ROUTES TO BE DETERMINED ON SITE.

**LEGEND:**

- - - - - EXISTING GROUND PROFILE
- - - - - WATER LINES (EXISTING)
- - - - - WATER LINES (PROPOSED)
- - - - - RIVER/STREAM
- - - - - STATIC HEAD
- - - - - HYDRAULIC GRADE LINE

SAV

- SINGLE ORIFICE AIR VALVE

WO

- WASHOUT

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED

**Client**

WaterFund  
Financing the Water Sector

**Financier**

EUROPEAN UNION  
GOVERNMENT OF KENYA  
MINISTRY OF WATER AND SANITATION

**Project**  
**KYUSO ROCK CATCHMENT WATER PROJECT**

**Design Consultants.**

15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 788 352 533  
Email: info@lossmanagement.com

**Drawing Title**  
**PROPOSED KYUSO WATER LINES**  
**PLAN AND PROFILE**  
**KIMUNGAO ROAD LINE**

Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO
STATUS	DWG. No.	SHEET 6 OF 6	REV



CHAINAGE (Km+m)	0+000	0+020	0+040	0+060	0+080	0+100	0+120	0+140	0+160	0+180	0+200	0+220	0+240	0+260	0+280	0+300	0+320	0+340	0+360	0+380	0+400	0+420	0+440	0+460	0+480	0+500	0+520	0+540	0+560	0+580		
GROUND LEVELS (Masl)	847.12	845.28	844.92	844.95	844.99	845.02	844.59	844.24	844.75	844.34	846.83	847.86	848.74	849.61	850.36	850.07	850.62	850.93	851.42	851.71	852.73	853.52	854.02	854.55	854.18	854.04	853.99	853.94	853.90	853.86		
INVERT LEVELS (Masl)	845.92	844.01	843.82	843.85	843.87	843.82	843.39	843.00	843.52	844.34	845.33	846.32	847.32	848.41	849.18	848.80	849.28	849.75	850.23	850.83	851.49	852.15	852.81	853.35	853.01	852.86	852.80	852.75	852.70	852.65		
EXCAVATION DEPTH (m)	1.20	1.27	1.10	1.10	1.12	1.20	1.20	1.24	1.23	1.34	1.50	1.54	1.42	1.20	1.18	1.27	1.34	1.18	1.19	0.87	1.24	1.37	1.21	1.20	1.17	1.18	1.18	1.19	1.20	1.21		
SIZE/TYPE OF PIPE & HGL	OD 50 HDPE																															
PIPE FITTINGS	TO BE DETERMINED ON SITE																															
SLOPE (%)	-0.88%	-4.52%	0.14%	-2.12%	2.55%	4.97%	6.78%	-3.44%	2.38%	3.30%	-1.72%	-0.26%																				

**NOTES**

1. ALL DIMENSIONS/LEVELS ARE IN METRES UNLESS NOTED OTHERWISE.
2. PIPES ARE TO BE LAID TO EVEN GRADIENTS WITH A MINIMUM COVER OF 1.0m AND 1.2m FOR TRAFFICKED AREAS. WHERE COVER IS LESS THAN THIS, PIPE TO BE SURROUNDED WITH CONCRETE.
3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH OTHER RELATED DRAWINGS. ANY DISCREPANCIES TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.
4. PRECISE ROUTES TO BE DETERMINED ON SITE.

**LEGEND:**

- EXISTING GROUND PROFILE
- WATER LINES (EXISTING)
- WATER LINES (PROPOSED)
- RIVER/STREAM
- STATIC HEAD
- HYDRAULIC GRADE LINE
- SAV
- SINGLE ORIFICE AIR VALVE
- WO

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY CHECKED			
	BY CHECKED			
	BY CHECKED			
	BY CHECKED			

**Client**

**Financier**

**Project**  
**KYUSO ROCK CATCHMENT WATER PROJECT**

**Design Consultants.**

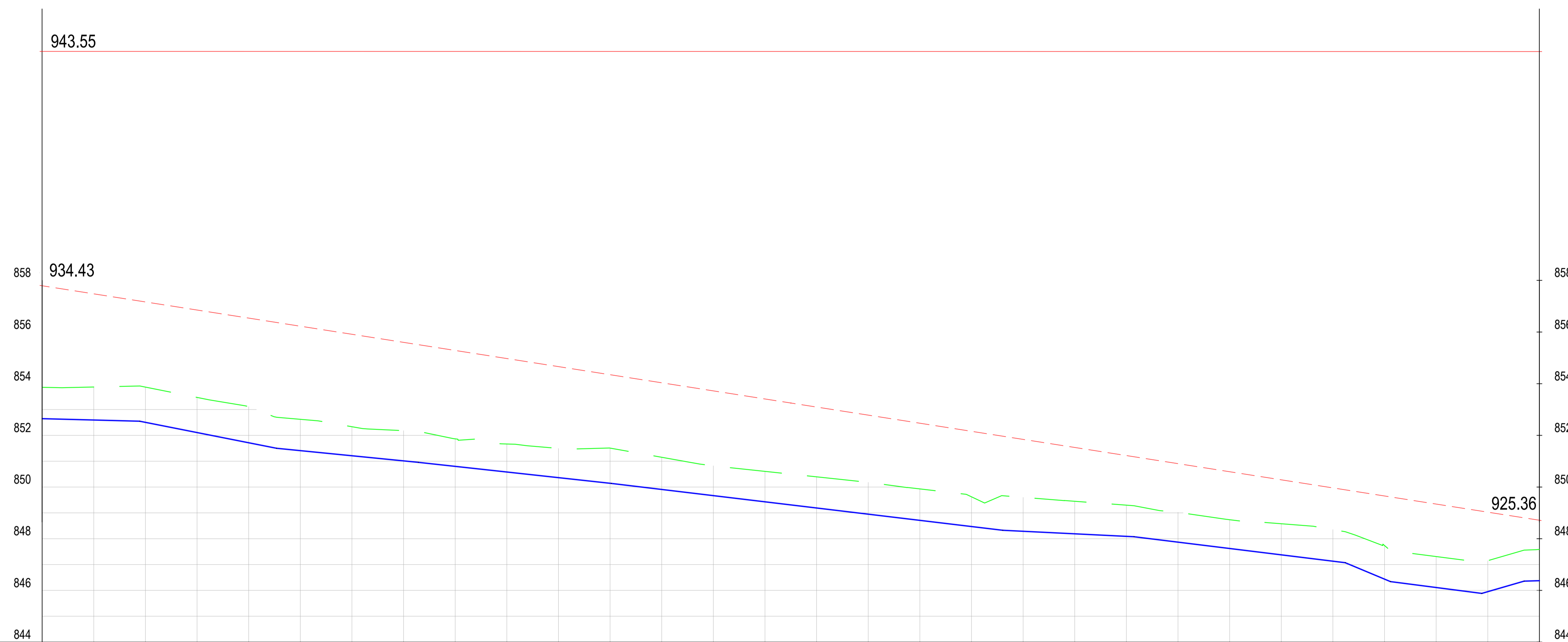
15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 718 362 533  
Email: info@lossmanagement.com

**Drawing Title**  
**PROPOSED KYUSO WATER LINES PLAN AND PROFILE**  
**KWA KITURA LINE**

Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1,000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO
STATUS	DWG. No.	SHEET 1 OF 7	REV

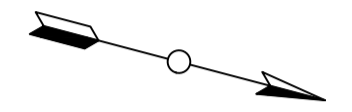


KWA KITURA LINE



CHAINAGE (Km+m)	GROUND LEVELS (Masl)	INVERT LEVELS (Masl)	EXCAVATION DEPTH (m)	SIZE/TYPE OF PIPE & HGL	PIPE FITTINGS	SLOPE (%)
0+560	853.86	852.65	1.21	OD 50 HDPE	TO BE DETERMINED ON SITE	-0.26%
0+600	853.87	852.59	1.28			-1.96%
0+620	853.87	852.50	1.36			-0.99%
0+640	853.47	852.11	1.36			-1.09%
0+660	853.12	851.71	1.40			-1.20%
0+680	852.62	851.41	1.21			-0.49%
0+700	852.34	851.21	1.12			-1.23%
0+720	852.18	851.01	1.17			-4.17%
0+740	851.87	850.80	1.07			-1.29%
0+760	851.67	850.58	1.08			2.90%
0+780	851.50	850.36	1.13			0.28%
0+800	851.51	850.15	1.36			
0+820	851.15	849.91	1.24			
0+840	850.82	849.67	1.15			
0+860	850.61	849.43	1.18			
0+880	850.40	849.19	1.21			
0+900	850.18	848.95	1.23			
0+920	849.93	848.71	1.22			
0+940	849.62	848.47	1.15			
0+960	849.60	848.29	1.31			
0+980	849.45	848.19	1.26			
1+000	849.30	848.09	1.21			
1+020	849.02	847.87	1.15			
1+040	848.74	847.62	1.11			
1+060	846.58	847.38	1.20			
1+080	848.35	847.13	1.22			
1+100	847.74	846.44	1.30			
1+120	847.31	846.11	1.20			
1+140	847.15	845.95	1.20			
1+160	847.59	846.38	1.21			

- NOTES**
1. ALL DIMENSIONS/LEVELS ARE IN METRES UNLESS NOTED OTHERWISE.
  2. PIPES ARE TO BE LAID TO EVEN GRADIENTS WITH A MINIMUM COVER OF 1.0m AND 1.2m FOR TRAFFICKED AREAS. WHERE COVER IS LESS THAN THIS, PIPE TO BE SURROUNDED WITH CONCRETE.
  3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH OTHER RELATED DRAWINGS. ANY DISCREPANCIES TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.
  4. PRECISE ROUTES TO BE DETERMINED ON SITE.



- LEGEND:**
- EXISTING GROUND PROFILE
  - WATER LINES (EXISTING)
  - WATER LINES (PROPOSED)
  - RIVER/STREAM
  - STATIC HEAD
  - HYDRAULIC GRADE LINE
  - SAV
  - SINGLE ORIFICE AIR VALVE
  - WO
  - WASHOUT

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			

**Client**

**Financier**

**Project**  
KYUSO ROCK CATCHMENT WATER PROJECT

**Design Consultants.**

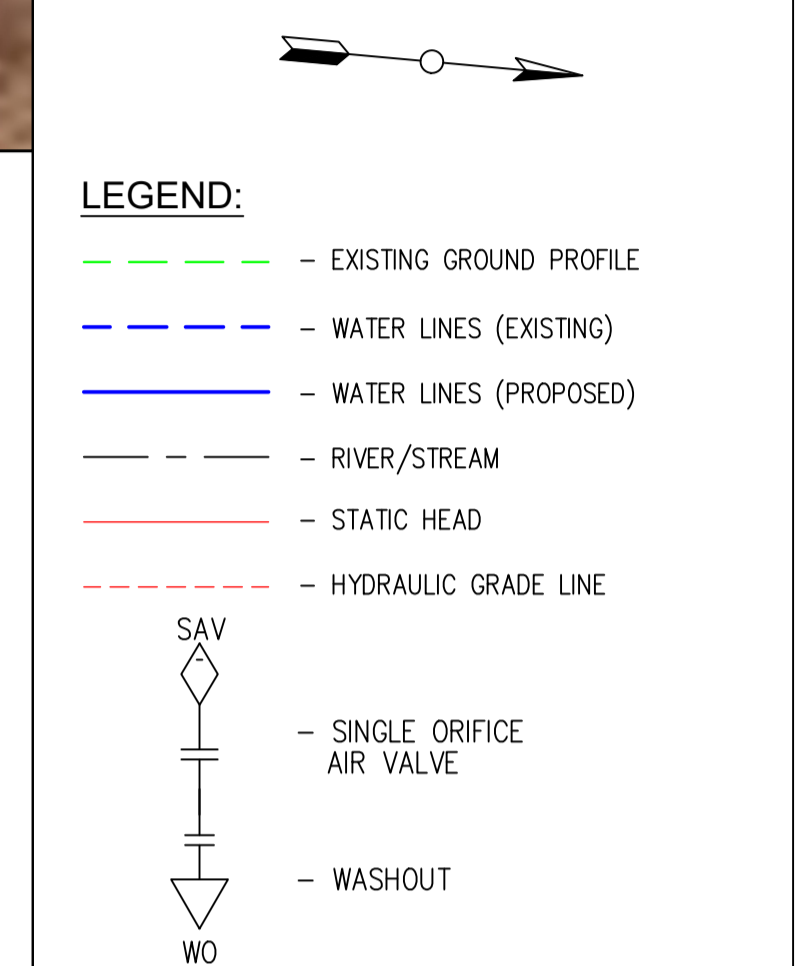
15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 788 352 533  
Email: info@lossmanagement.com

**Drawing Title**  
PROPOSED KYUSO WATER LINES  
PLAN AND PROFILE  
KWA KITURA LINE

Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1,000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO
STATUS	DWG. No.	SHEET 2 OF 7	REV



- NOTES**
1. ALL DIMENSIONS/LEVELS ARE IN METRES UNLESS NOTED OTHERWISE.
  2. PIPES ARE TO BE LAID TO EVEN GRADIENTS WITH A MINIMUM COVER OF 1.0m AND 1.2m FOR TRAFFICKED AREAS. WHERE COVER IS LESS THAN THIS, PIPE TO BE SURROUNDED WITH CONCRETE.
  3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH OTHER RELATED DRAWINGS. ANY DISCREPANCIES TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.
  4. PRECISE ROUTES TO BE DETERMINED ON SITE.



PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY CHECKED			
	BY CHECKED			
	BY CHECKED			
	BY CHECKED			

**Client**

**Financier**

**Project**  
**KYUSO ROCK CATCHMENT WATER PROJECT**

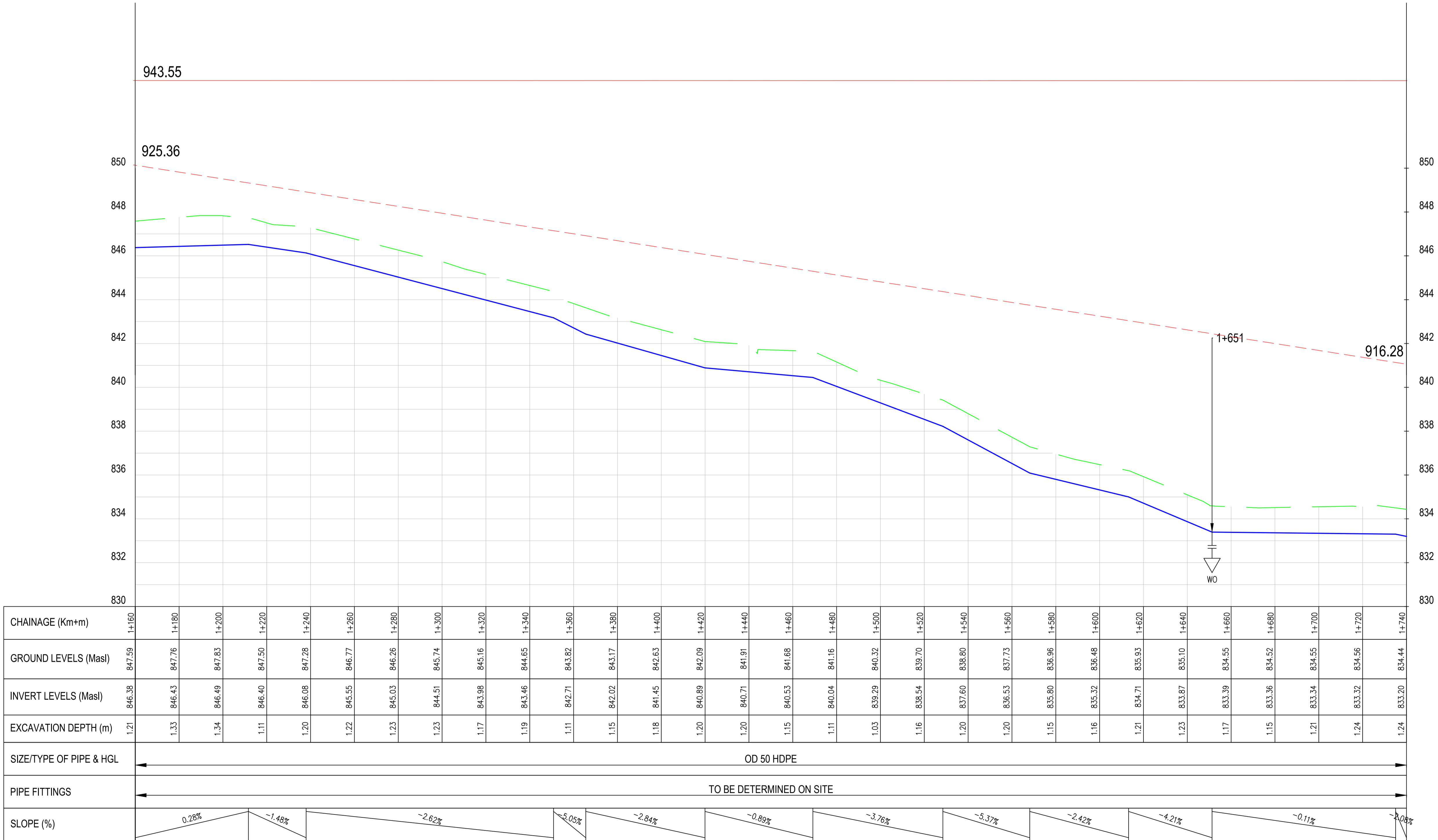
**Design Consultants.**

15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 718 352 533  
Email: info@lossmanagement.com

**Drawing Title**  
**PROPOSED KYUSO WATER LINES**  
**PLAN AND PROFILE**  
**KWA KITURA LINE**

Designed by JMM    Drawn by KCK  
Checked by JN    Approved by JR  
Scale H = 1:1,000    Date NOV 2023  
V = 1:100  
Job No.    ACAD File: KYUSO

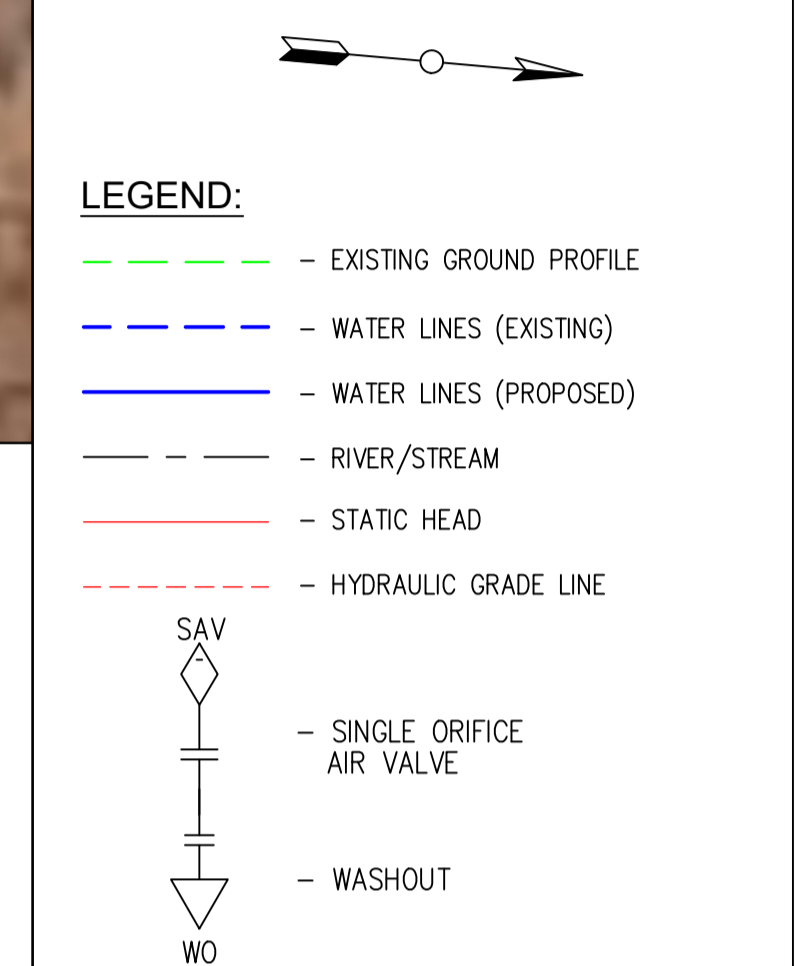
0 STATUS    DWG. No.    SHEET 3 OF 7    0 REV







- NOTES**
1. ALL DIMENSIONS/LEVELS ARE IN METRES UNLESS NOTED OTHERWISE.
  2. PIPES ARE TO BE LAID TO EVEN GRADIENTS WITH A MINIMUM COVER OF 1.0m AND 1.2m FOR TRAFFICKED AREAS. WHERE COVER IS LESS THAN THIS, PIPE TO BE SURROUNDED WITH CONCRETE.
  3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH OTHER RELATED DRAWINGS. ANY DISCREPANCIES TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.
  4. PRECISE ROUTES TO BE DETERMINED ON SITE.



PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			



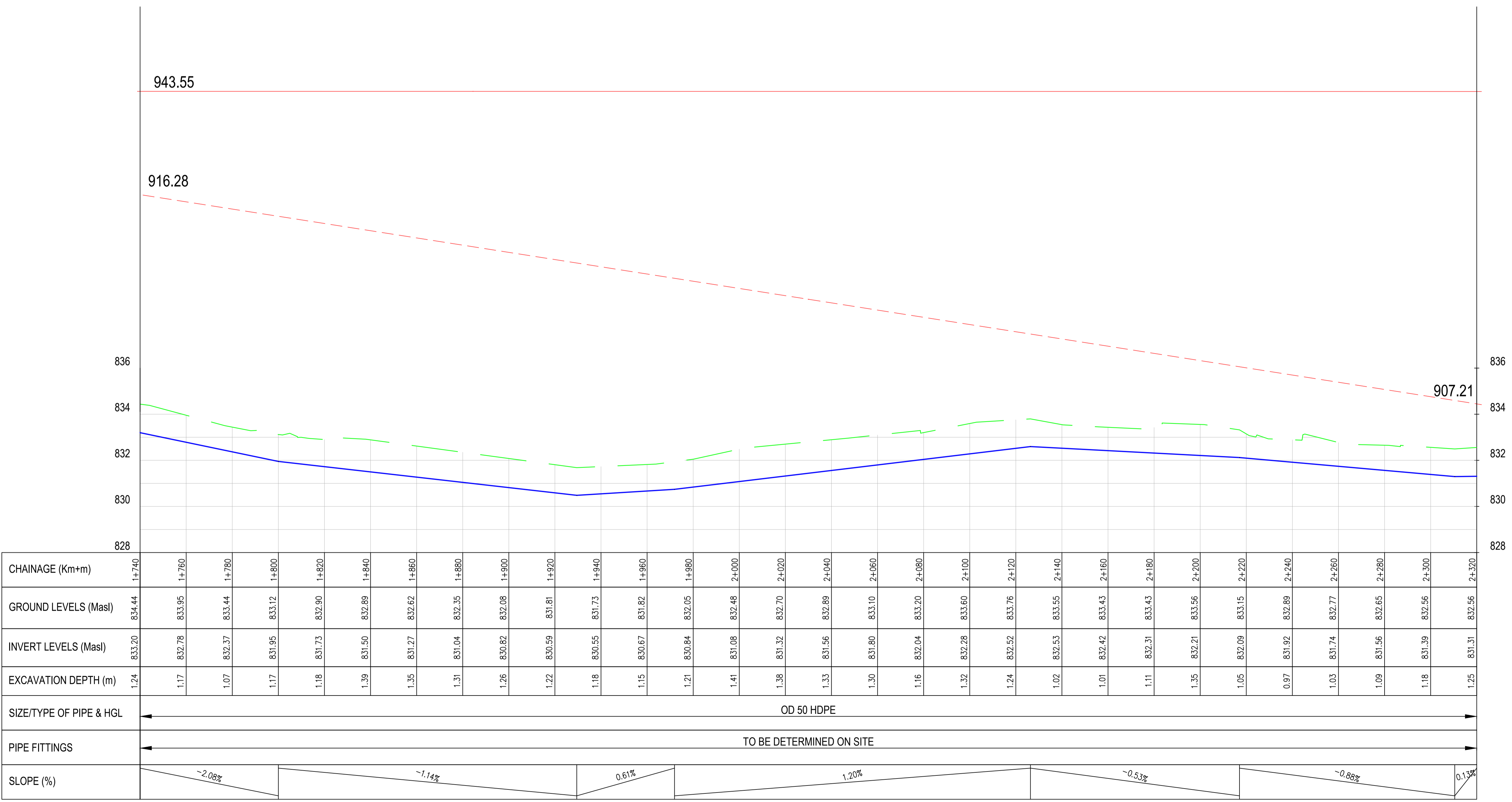
**Project**  
**KYUSO ROCK CATCHMENT WATER PROJECT**

**Design Consultants.**

15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 788 352 533  
Email: info@losaimanagement.com

**Drawing Title**  
**PROPOSED KYUSO WATER LINES PLAN AND PROFILE**  
**KWA KITURA LINE**

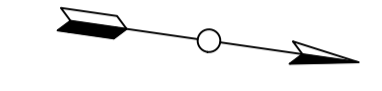
Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1,000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO
0 STATUS	DWG. No.	SHEET 4 OF 7	0 REV



CHAINAGE (Km+m)	GROUND LEVELS (Masl)	INVERT LEVELS (Masl)	EXCAVATION DEPTH (m)
1+740	834.44	833.20	1.24
1+760	833.95	832.78	1.17
1+780	833.44	832.37	1.07
1+800	833.12	831.95	1.17
1+820	832.90	831.73	1.18
1+840	832.89	831.50	1.39
1+860	832.62	831.27	1.35
1+880	832.35	831.04	1.31
1+900	832.08	830.82	1.26
1+920	831.81	830.59	1.22
1+940	831.73	830.55	1.18
1+960	831.82	830.67	1.15
1+980	832.05	830.84	1.21
2+000	832.48	831.08	1.41
2+020	832.70	831.32	1.38
2+040	832.89	831.56	1.33
2+060	833.10	831.80	1.30
2+080	833.20	832.04	1.16
2+100	833.60	832.28	1.32
2+120	833.76	832.52	1.24
2+140	833.55	832.53	1.02
2+160	833.43	832.42	1.01
2+180	833.43	832.31	1.11
2+200	833.56	832.21	1.35
2+220	833.15	832.09	1.05
2+240	832.89	831.92	0.97
2+260	832.77	831.74	1.03
2+280	832.65	831.56	1.09
2+300	832.56	831.39	1.18
2+320	832.56	831.31	1.25



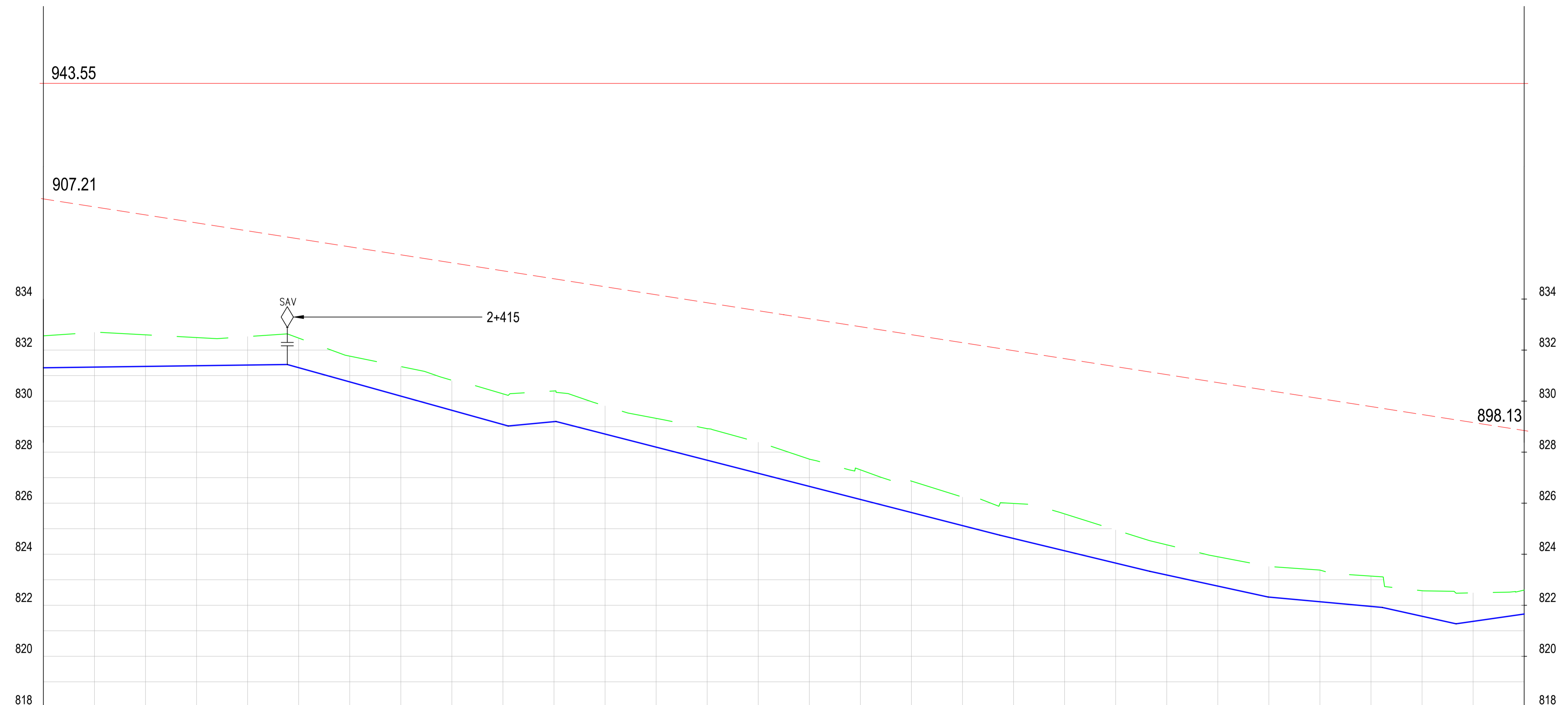
- NOTES**
1. ALL DIMENSIONS/LEVELS ARE IN METRES UNLESS NOTED OTHERWISE.
  2. PIPES ARE TO BE LAID TO EVEN GRADIENTS WITH A MINIMUM COVER OF 1.0m AND 1.2m FOR TRAFFICKED AREAS. WHERE COVER IS LESS THAN THIS, PIPE TO BE SURROUNDED WITH CONCRETE.
  3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH OTHER RELATED DRAWINGS. ANY DISCREPANCIES TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.
  4. PRECISE ROUTES TO BE DETERMINED ON SITE.



- LEGEND:**
- - - - - EXISTING GROUND PROFILE
  - - - - - WATER LINES (EXISTING)
  - — — — WATER LINES (PROPOSED)
  - - - - - RIVER/STREAM
  - — — — STATIC HEAD
  - - - - - HYDRAULIC GRADE LINE
  - SAV
  - SINGLE ORIFICE AIR VALVE
  - WO
  - WASHOUT

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			



CHAINAGE (Km+m)	2+320	2+340	2+360	2+380	2+400	2+420	2+440	2+460	2+480	2+500	2+520	2+540	2+560	2+580	2+600	2+620	2+640	2+660	2+680	2+700	2+720	2+740	2+760	2+780	2+800	2+820	2+840	2+860	2+880	2+900		
GROUND LEVELS (Masl)	832.56	832.89	832.60	832.49	832.53	832.47	831.76	831.35	830.80	830.29	830.40	829.81	829.32	828.92	828.39	827.73	827.31	826.87	826.24	825.99	825.58	824.95	824.37	823.90	823.52	823.38	823.14	822.57	822.49	822.60		
INVERT LEVELS (Masl)	831.31	831.33	831.36	831.39	831.41	831.31	830.75	830.20	829.64	829.08	829.20	828.71	828.20	827.68	827.17	826.66	826.15	825.63	825.12	824.62	824.14	823.65	823.19	822.75	822.32	822.14	821.95	821.57	821.37	821.66		
EXCAVATION DEPTH (m)	1.25	1.36	1.24	1.10	1.12	1.16	1.01	1.16	1.16	1.20	1.20	1.10	1.13	1.24	1.22	1.07	1.16	1.23	1.12	1.37	1.45	1.30	1.18	1.15	1.20	1.24	1.19	1.00	1.12	0.94		
SIZE/TYPE OF PIPE & HGL	OD 50 HDPE																															
PIPE FITTINGS	TO BE DETERMINED ON SITE																															
SLOPE (%)	0.13%		-2.78%			0.95%		-2.56%					-2.41%			-2.17%		-0.91%		-2.22%		1.44%										



Project  
**KYUSO ROCK CATCHMENT WATER PROJECT**

Design Consultants.

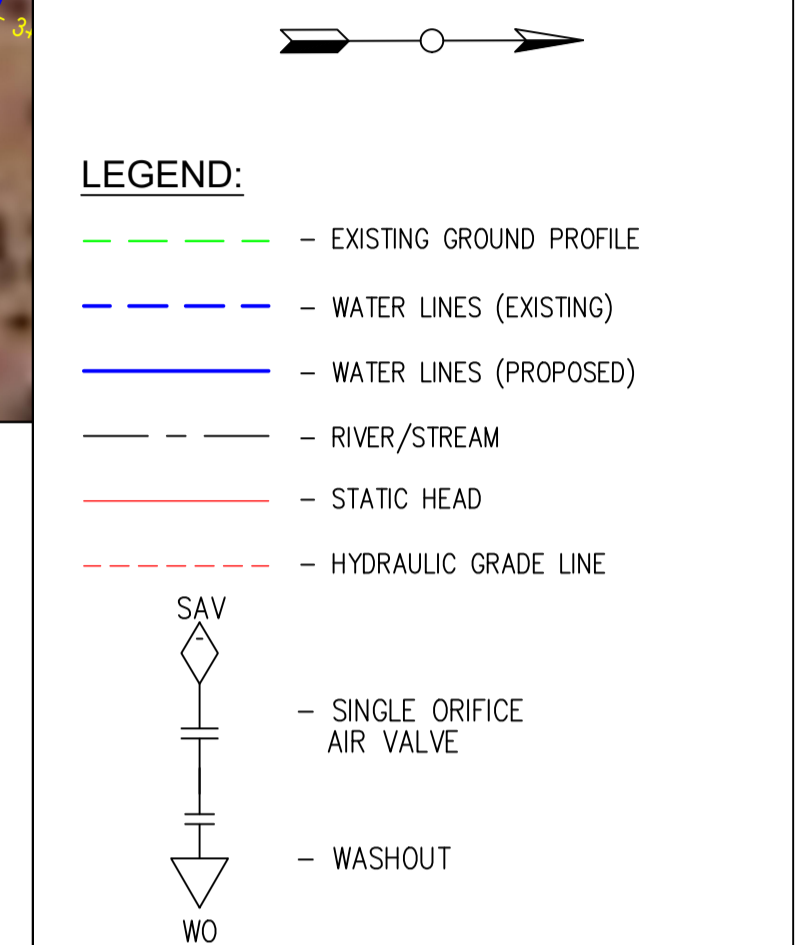
15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 788 352 533  
Email: info@lossmanagement.com

Drawing Title  
**PROPOSED KYUSO WATER LINES PLAN AND PROFILE KWA KITURA LINE**

Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1,000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO
STATUS	DWG. No.	SHEET 5 OF 7	REV



- NOTES**
1. ALL DIMENSIONS/LEVELS ARE IN METRES UNLESS NOTED OTHERWISE.
  2. PIPES ARE TO BE LAID TO EVEN GRADIENTS WITH A MINIMUM COVER OF 1.0m AND 1.2m FOR TRAFFICKED AREAS. WHERE COVER IS LESS THAN THIS, PIPE TO BE SURROUNDED WITH CONCRETE.
  3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH OTHER RELATED DRAWINGS. ANY DISCREPANCIES TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.
  4. PRECISE ROUTES TO BE DETERMINED ON SITE.



PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY CHECKED			
	BY CHECKED			
	BY CHECKED			
	BY CHECKED			



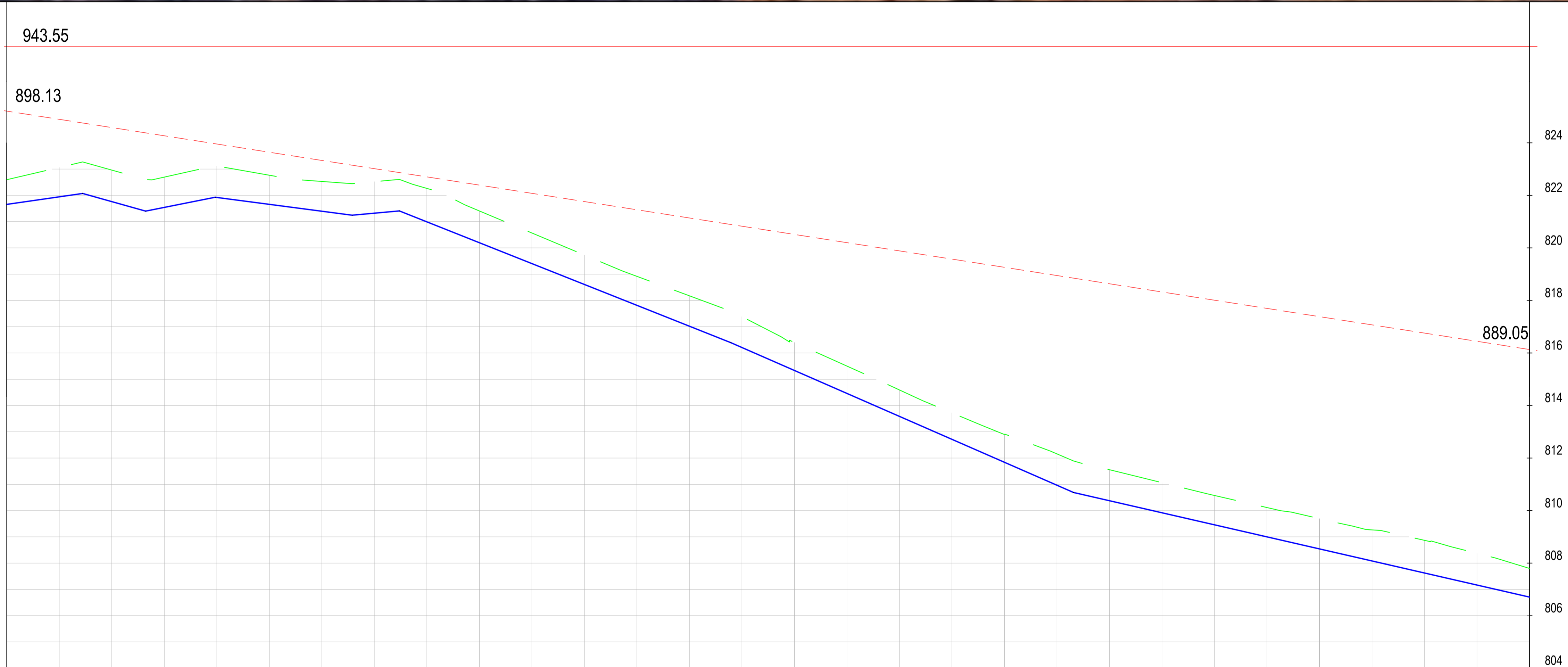
**Project**  
**KYUSO ROCK CATCHMENT WATER PROJECT**

**Design Consultants.**

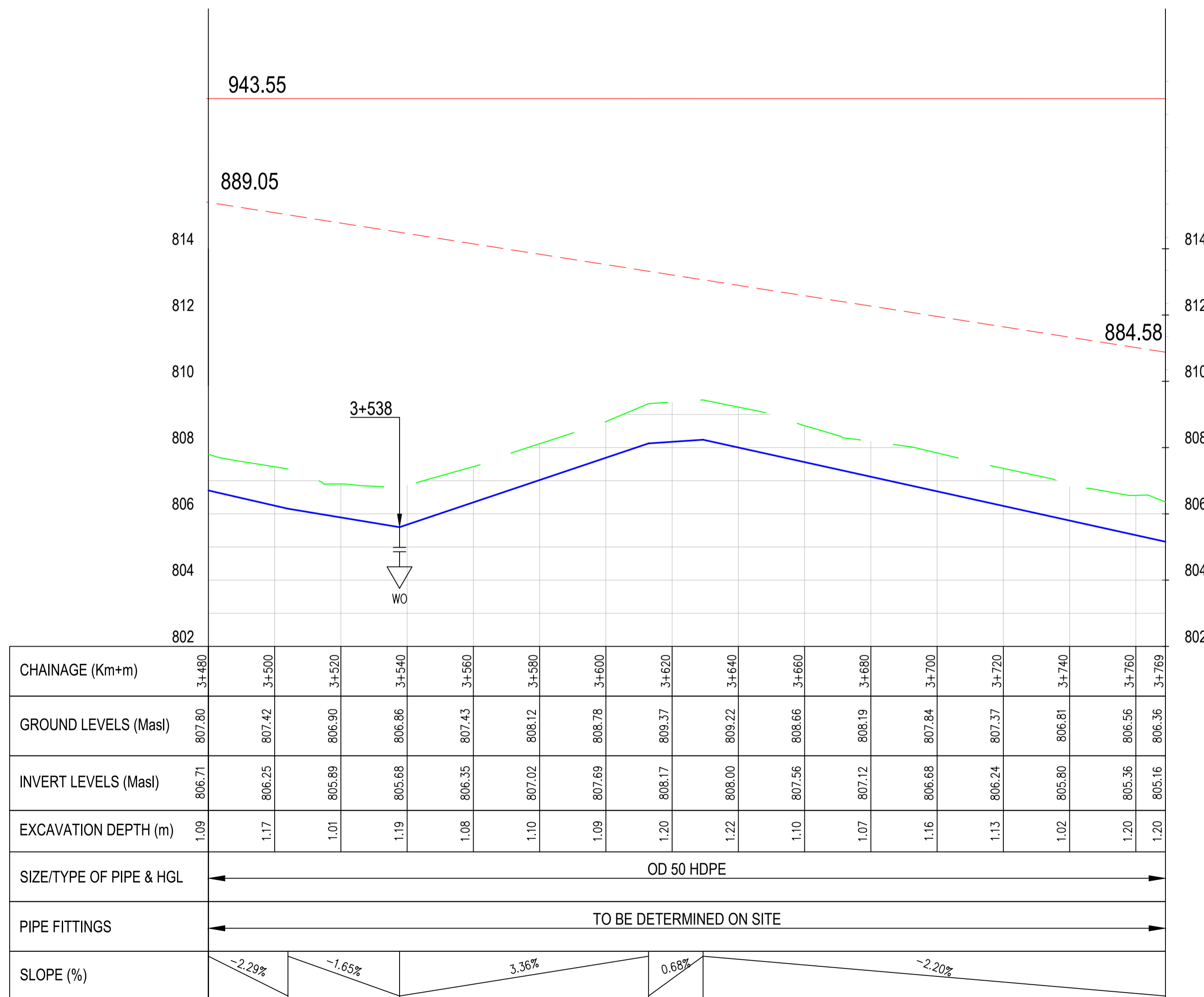
15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 718 352 533  
Email: info@lossmanagement.com

**Drawing Title**  
**PROPOSED KYUSO WATER LINES**  
**PLAN AND PROFILE**  
**KWA KITURA LINE**

Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1,000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO
STATUS	DWG. No.	SHEET 6 OF 7	REV

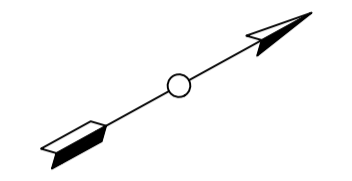


CHAINAGE (Km+m)	GROUND LEVELS (Masl)	INVERT LEVELS (Masl)	EXCAVATION DEPTH (m)	SIZE/TYPE OF PIPE & HGL	PIPE FITTINGS	SLOPE (%)
2+900	822.60	821.66	0.94	OD 50 HDPE	TO BE DETERMINED ON SITE	1.44%
2+920	823.06	821.94	1.12			-2.80%
2+940	822.96	821.76	1.20			1.99%
2+960	822.69	821.54	1.15			-1.31%
2+980	823.12	821.92	1.20			0.91%
3+000	822.77	821.66	1.11			-3.97%
3+020	822.53	821.40	1.13			0.91%
3+040	822.52	821.32	1.20			-3.97%
3+060	822.27	820.99	1.27			-4.37%
3+080	821.41	820.20	1.21			-2.29%
3+100	820.57	819.40	1.16			-2.29%
3+120	819.73	818.61	1.12			-2.29%
3+140	818.92	817.81	1.10			-2.29%
3+160	818.18	817.02	1.16			-2.29%
3+180	817.38	816.21	1.18			-2.29%
3+200	816.40	815.34	1.06			-2.29%
3+220	815.50	814.46	1.04			-2.29%
3+240	814.59	813.59	1.01			-2.29%
3+260	813.72	812.71	1.01			-2.29%
3+280	812.90	811.84	1.06			-2.29%
3+300	812.16	810.97	1.19	-2.29%		
3+320	811.56	810.38	1.18	-2.29%		
3+340	811.06	809.92	1.15	-2.29%		
3+360	810.58	809.46	1.12	-2.29%		
3+380	810.12	809.00	1.12	-2.29%		
3+400	809.69	808.54	1.15	-2.29%		
3+420	809.26	808.08	1.18	-2.29%		
3+440	808.87	807.62	1.24	-2.29%		
3+460	808.37	807.17	1.21	-2.29%		
3+480	807.80	806.71	1.09	-2.29%		



**NOTES**

1. ALL DIMENSIONS/LEVELS ARE IN METRES UNLESS NOTED OTHERWISE.
2. PIPES ARE TO BE LAID TO EVEN GRADIENTS WITH A MINIMUM COVER OF 1.0m AND 1.2m FOR TRAFFICKED AREAS. WHERE COVER IS LESS THAN THIS, PIPE TO BE SURROUNDED WITH CONCRETE.
3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH OTHER RELATED DRAWINGS. ANY DISCREPANCIES TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.
4. PRECISE ROUTES TO BE DETERMINED ON SITE.



**LEGEND:**

- EXISTING GROUND PROFILE
- WATER LINES (EXISTING)
- WATER LINES (PROPOSED)
- RIVER/STREAM
- STATIC HEAD
- HYDRAULIC GRADE LINE
- SAV - SINGLE ORIFICE AIR VALVE
- WO - WASHOUT

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			

**Client**

**Financier**

**Project**  
**KYUSO ROCK CATCHMENT WATER PROJECT**

**Design Consultants.**

15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 788 352 533  
Email: info@lossmanagement.com

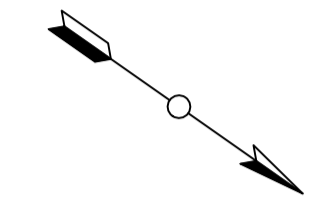
**Drawing Title**  
**PROPOSED KYUSO WATER LINES**  
**PLAN AND PROFILE**  
**KWA KITURA LINE**

Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1,000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO



**NOTES**

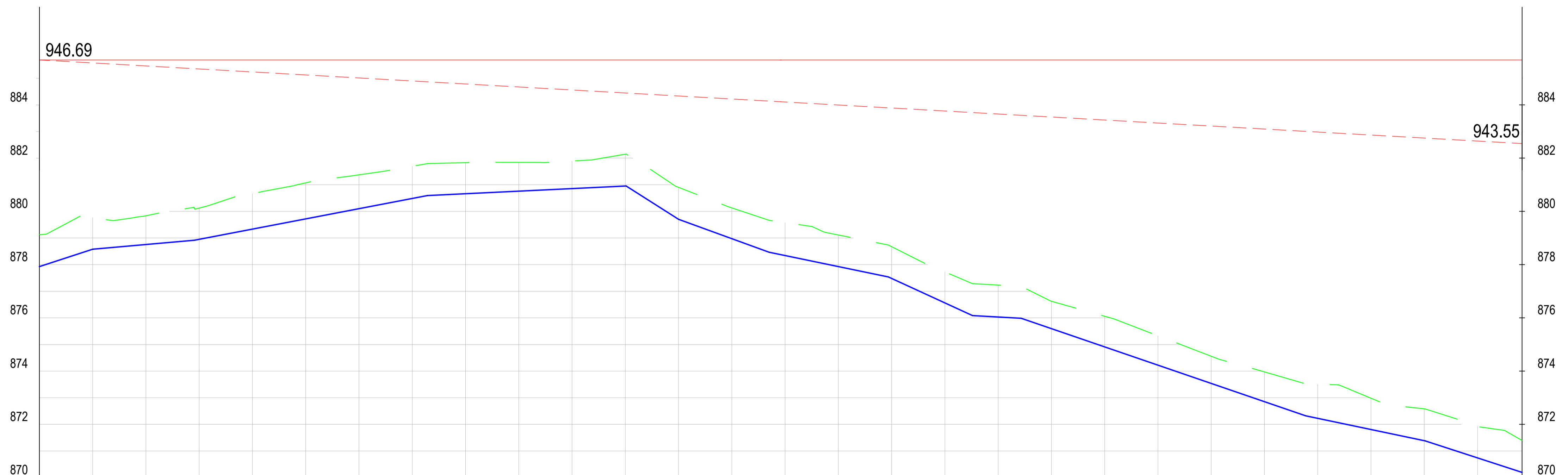
1. ALL DIMENSIONS/LEVELS ARE IN METRES UNLESS NOTED OTHERWISE.
2. PIPES ARE TO BE LAID TO EVEN GRADIENTS WITH A MINIMUM COVER OF 1.0m AND 1.2m FOR TRAFFICKED AREAS, WHERE COVER IS LESS THAN THIS, PIPE TO BE SURROUNDED WITH CONCRETE.
3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH OTHER RELATED DRAWINGS. ANY DISCREPANCIES TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.
4. PRECISE ROUTES TO BE DETERMINED ON SITE.



**LEGEND:**

- EXISTING GROUND PROFILE
- WATER LINES (EXISTING)
- WATER LINES (PROPOSED)
- RIVER/STREAM
- STATIC HEAD
- HYDRAULIC GRADE LINE
- SAV
- SINGLE ORIFICE AIR VALVE
- WO
- WASHOUT

PRELIMINARY ISSUE  
Signed: Team Leader .....



CHAINAGE (Km+m)	GROUND LEVELS (Masl)	INVERT LEVELS (Masl)	EXCAVATION DEPTH (m)	SIZE/TYPE OF PIPE & HGL	PIPE FITTINGS	SLOPE (%)
0+000	879.12	877.92	1.20	OD 90 HDPE	TO BE DETERMINED ON SITE	3.26%
0+020	879.77	878.58	1.19			-0.66%
0+040	879.83	878.75	1.08			0.08%
0+060	880.12	878.95	1.17			0.19%
0+080	880.66	879.33	1.33			0.62%
0+100	881.07	879.72	1.35			0.40%
0+120	881.37	880.10	1.27			0.37%
0+140	881.69	880.48	1.21			0.21%
0+160	881.83	880.66	1.17			0.17%
0+180	881.84	880.76	1.08			0.08%
0+200	881.89	880.85	1.04			0.09%
0+220	882.15	880.95	1.20			0.20%
0+240	880.90	879.70	1.20			-1.20%
0+260	880.13	878.97	1.16			-0.73%
0+280	879.58	878.34	1.24			-0.64%
0+300	879.11	877.93	1.19			-0.41%
0+320	878.67	877.48	1.19			-0.55%
0+340	877.73	876.56	1.16			-1.17%
0+360	877.23	876.03	1.20			-0.56%
0+380	876.62	875.59	1.03			-0.56%
0+400	876.06	874.91	1.15			-0.77%
0+420	875.33	874.22	1.10			-0.69%
0+440	874.56	873.54	1.02			-0.68%
0+460	873.97	872.85	1.12			-0.79%
0+480	873.51	872.23	1.28			-0.62%
0+500	872.98	871.81	1.18			-0.42%
0+520	872.58	871.39	1.20			-0.42%
0+540	871.91	870.74	1.18			-0.75%
0+557	871.40	870.20	1.20	-0.58%		

REV	REVISIONS	SIGN	DATE	APPROVED
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			

**Client**

**Financier**

**Project**  
KYUSO ROCK CATCHMENT WATER PROJECT

**Design Consultants.**

15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 788 352 533  
Email: info@losaimanagement.com

**Drawing Title**  
PROPOSED KYUSO WATER LINES  
PLAN AND PROFILE  
KYUSO TOWN LINE

Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1000 V = 1:100	Date	NOV 2023
Job No.	ACAD File:	KYUSO	



**NOTES**

1. ALL DIMENSIONS/LEVELS ARE IN METRES UNLESS NOTED OTHERWISE.
2. PIPES ARE TO BE LAID TO EVEN GRADIENTS WITH A MINIMUM COVER OF 1.0m AND 1.2m FOR TRAFFICKED AREAS, WHERE COVER IS LESS THAN THIS, PIPE TO BE SURROUNDED WITH CONCRETE.
3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH OTHER RELATED DRAWINGS. ANY DISCREPANCIES TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.
4. PRECISE ROUTES TO BE DETERMINED ON SITE.

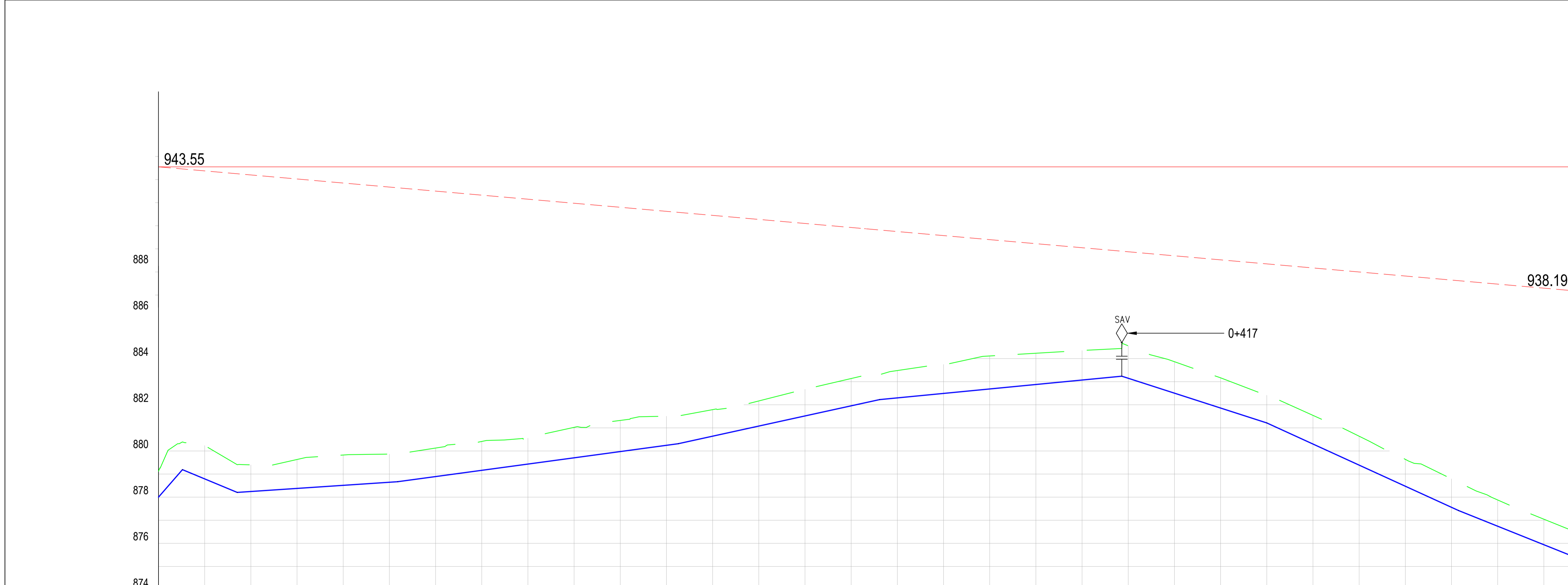
**LEGEND:**

- - EXISTING GROUND PROFILE
- - WATER LINES (EXISTING)
- - WATER LINES (PROPOSED)
- - RIVER/STREAM
- - STATIC HEAD
- - HYDRAULIC GRADE LINE

SAV  
 - SINGLE ORIFICE AIR VALVE  
 WO  
 - WASHOUT

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			



CHAINAGE (Km+m)	GROUND LEVELS (Masl)	INVERT LEVELS (Masl)	EXCAVATION DEPTH (m)	SIZE/TYPE OF PIPE & HGL	PIPE FITTINGS	SLOPE (%)
0+000	879.12	878.00	1.12	OD 63 HDPE	TO BE DETERMINED ON SITE	11.48%
0+020	880.24	878.79	1.44			-4.16%
0+040	878.40	878.25	1.15			0.67%
0+060	879.63	878.38	1.25			1.35%
0+080	879.82	878.51	1.31			2.19%
0+100	879.86	878.64	1.22			0.97%
0+120	880.13	878.89	1.24			-3.22%
0+140	880.41	879.16	1.25			-4.57%
0+160	880.55	879.43	1.12			-4.01%
0+180	881.02	879.70	1.32			
0+200	881.32	879.97	1.35			
0+220	881.50	880.24	1.26			
0+240	881.79	880.64	1.15			
0+260	882.17	881.08	1.09			
0+280	882.67	881.52	1.15			
0+300	883.14	881.95	1.18			
0+320	883.48	882.30	1.18			
0+340	883.75	882.49	1.26			
0+360	884.11	882.88	1.43			
0+380	884.23	882.88	1.35			
0+400	884.35	883.07	1.28			
0+420	884.55	883.15	1.41			
0+440	885.86	882.50	1.36			
0+460	883.17	881.86	1.31			
0+480	882.41	881.21	1.20			
0+500	881.54	880.30	1.24			
0+520	880.64	879.39	1.25			
0+540	879.64	878.47	1.16			
0+560	878.79	877.56	1.23			
0+580	877.88	876.74	1.14			
0+600	877.05	875.94	1.11			
0+612	875.56	875.46	1.10			

**Client**

**Financier**

**Project**  
 KYUSO ROCK CATCHMENT WATER PROJECT

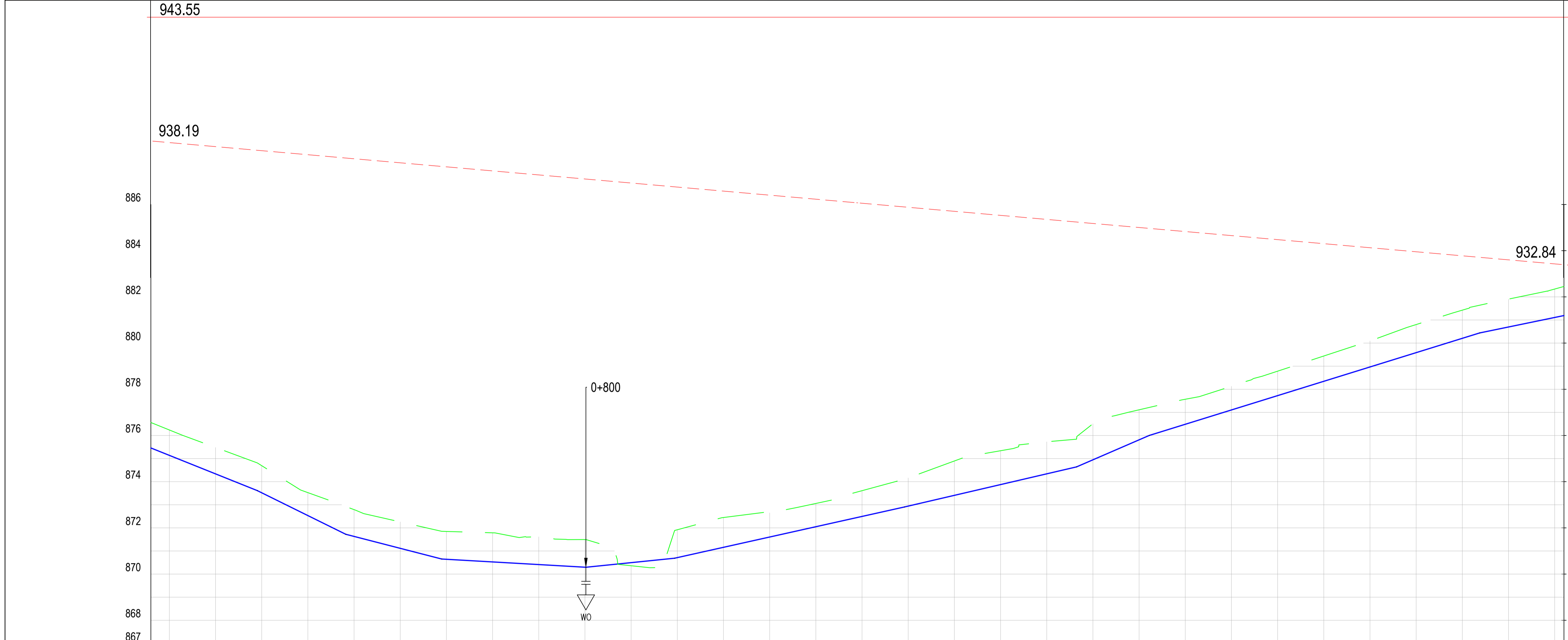
**Design Consultants.**

15 Westlands Road, Westland  
 P.O Box 30337-00100 Nairobi, Kenya  
 Tel: +254 718 875 310  
 +254 788 352 533  
 Email: info@lossmanagement.com

**Drawing Title**  
 PROPOSED KYUSO WATER LINES  
 PLAN AND PROFILE  
 NGUNI ROAD LINE

Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1,000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO

0	DWG. No.	SHEET 1 OF 11	0
STATUS			REV

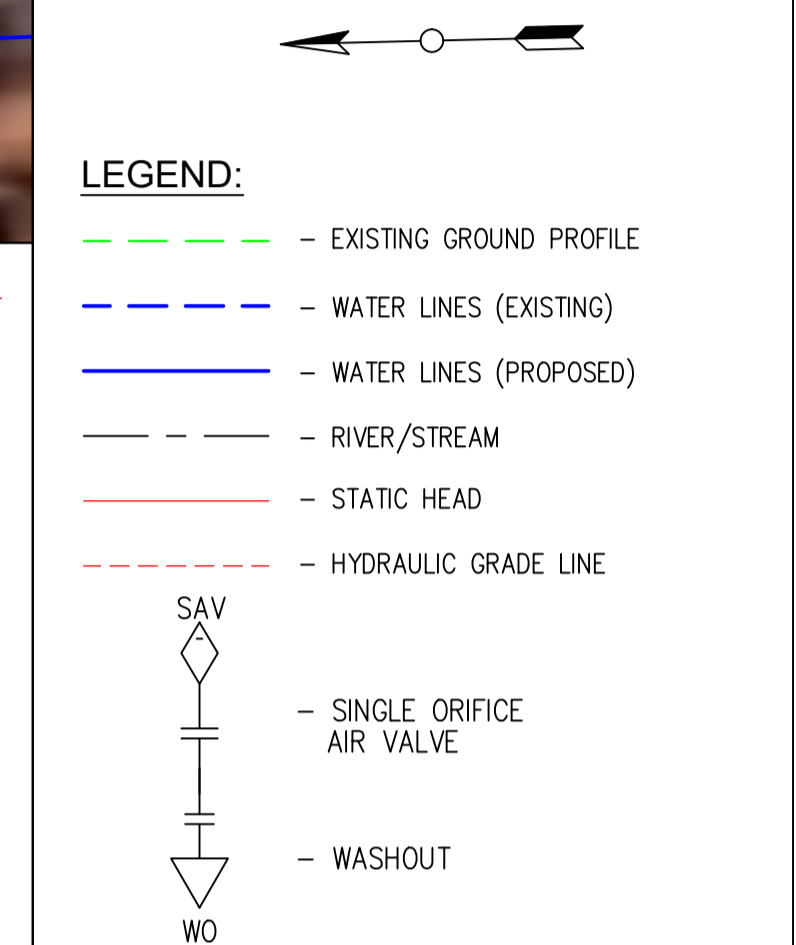


CHAINAGE (Km+m)	GROUND LEVELS (Masl)	INVERT LEVELS (Masl)	EXCAVATION DEPTH (m)
0+612	876.56	875.46	1.10
0+620	876.24	875.14	1.10
0+640	875.48	874.34	1.14
0+660	874.69	873.52	1.17
0+680	873.53	872.53	0.99
0+700	872.79	871.63	1.16
0+720	872.26	871.11	1.14
0+740	871.85	870.64	1.21
0+760	871.79	870.53	1.26
0+780	871.61	870.41	1.20
0+800	871.50	870.30	1.20
0+820	870.36	870.49	-0.13
0+840	871.92	870.71	1.21
0+860	872.45	871.16	1.29
0+880	872.65	871.60	1.05
0+900	873.06	872.05	1.01
0+920	873.61	872.50	1.11
0+940	874.16	872.94	1.22
0+960	874.90	873.41	1.49
0+980	875.34	873.87	1.47
1+000	875.73	874.34	1.39
1+020	876.51	874.95	1.56
1+040	877.11	875.81	1.30
1+060	877.57	876.48	1.08
1+080	878.13	877.11	1.02
1+100	878.78	877.73	1.06
1+120	879.44	878.35	1.10
1+140	880.09	878.97	1.13
1+160	880.80	879.59	1.22
1+180	881.43	880.21	1.22
1+200	881.90	880.70	1.21
1+220	882.34	881.11	1.23
1+224	882.45	881.19	1.26

SIZE/TYPE OF PIPE & HGL	← OD 63 HDPE →	
PIPE FITTINGS	← TO BE DETERMINED ON SITE →	
SLOPE (%)	← -4.01%   -4.93%   -2.58%   -0.57%   1.02%   2.23%   2.33%   4.32%   3.10%   2.06% →	

**NOTES**

1. ALL DIMENSIONS/LEVELS ARE IN METRES UNLESS NOTED OTHERWISE.
2. PIPES ARE TO BE LAID TO EVEN GRADIENTS WITH A MINIMUM COVER OF 1.0m AND 1.2m FOR TRAFFICKED AREAS. WHERE COVER IS LESS THAN THIS, PIPE TO BE SURROUNDED WITH CONCRETE.
3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH OTHER RELATED DRAWINGS. ANY DISCREPANCIES TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.
4. PRECISE ROUTES TO BE DETERMINED ON SITE.



PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED

**Client**  
  
Empowering the Water Sector

**Financier**  
  
GOVERNMENT OF KENYA  
MINISTRY OF WATER AND IRRIGATION

**Project**  
**KYUSO ROCK CATCHMENT WATER PROJECT**

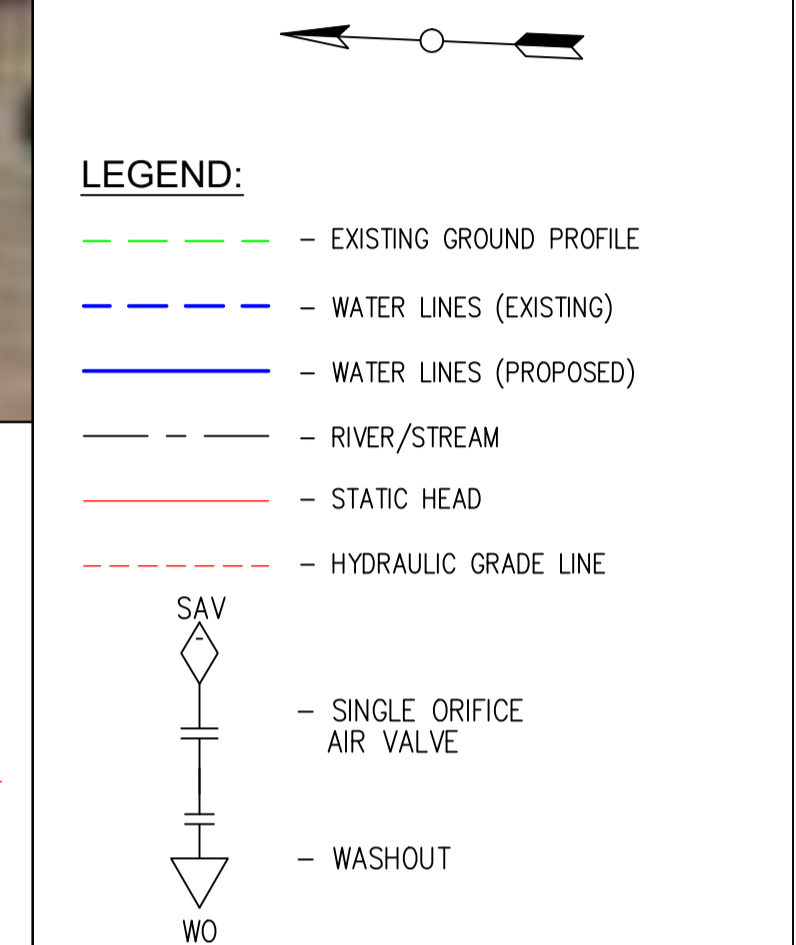
**Design Consultants.**  
  
15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 788 352 533  
Email: info@lossmanagement.com

**Drawing Title**  
**PROPOSED KYUSO WATER LINES**  
**PLAN AND PROFILE**  
**NGUNI ROAD LINE**

Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO
0 STATUS	DWG. No.	SHEET 2 OF 11	0 REV

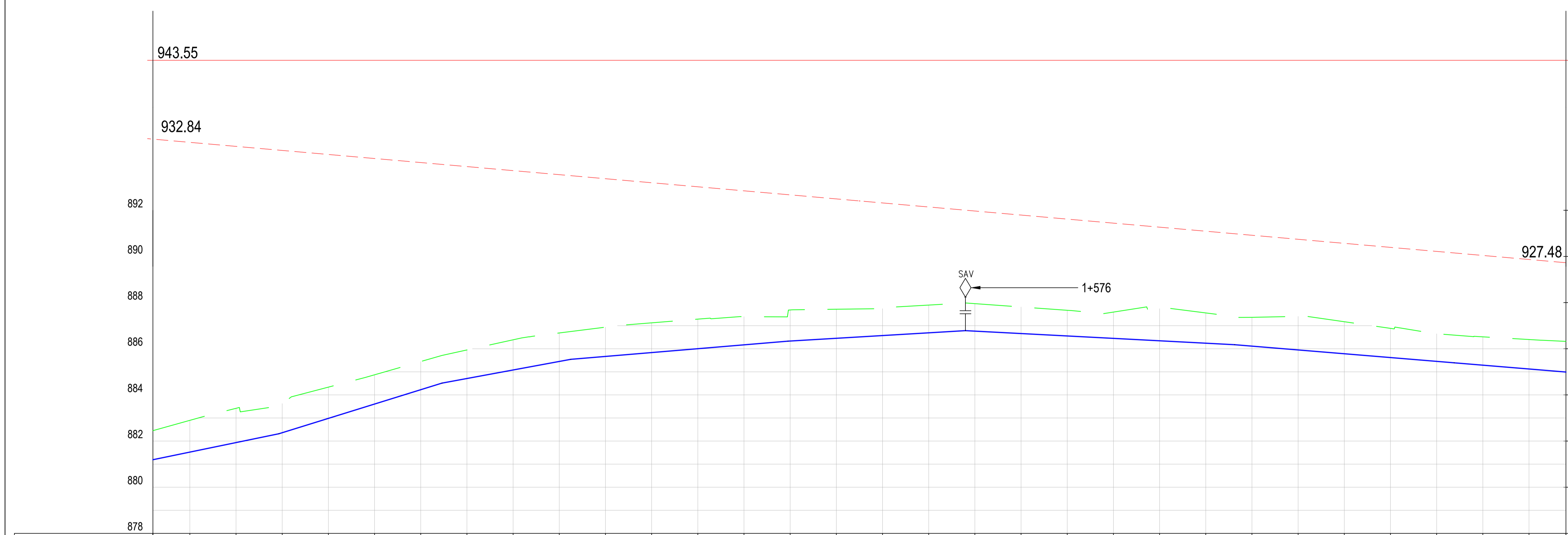


- NOTES**
1. ALL DIMENSIONS/LEVELS ARE IN METRES UNLESS NOTED OTHERWISE.
  2. PIPES ARE TO BE LAID TO EVEN GRADIENTS WITH A MINIMUM COVER OF 1.0m AND 1.2m FOR TRAFFICKED AREAS. WHERE COVER IS LESS THAN THIS, PIPE TO BE SURROUNDED WITH CONCRETE.
  3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH OTHER RELATED DRAWINGS. ANY DISCREPANCIES TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.
  4. PRECISE ROUTES TO BE DETERMINED ON SITE.



PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			



CHAINAGE (Km+m)	GROUND LEVELS (Masl)	INVERT LEVELS (Masl)	EXCAVATION DEPTH (m)
1+224	882.45	881.19	1.26
1+240	882.90	881.52	1.38
1+260	883.42	881.93	1.48
1+280	883.62	882.36	1.26
1+300	884.34	882.98	1.35
1+320	884.87	883.60	1.27
1+340	885.45	884.23	1.22
1+360	885.95	884.71	1.24
1+380	886.39	885.08	1.31
1+400	886.68	885.45	1.24
1+420	886.93	885.67	1.27
1+440	887.12	885.83	1.29
1+460	887.28	886.00	1.28
1+480	887.39	886.17	1.22
1+500	887.68	886.33	1.35
1+520	887.71	886.45	1.26
1+540	887.74	886.57	1.17
1+560	887.89	886.69	1.20
1+580	887.96	886.76	1.19
1+600	887.81	886.66	1.15
1+620	887.67	886.55	1.11
1+640	887.59	886.45	1.14
1+660	887.74	886.35	1.39
1+680	887.55	886.24	1.31
1+700	887.36	886.11	1.25
1+720	887.40	885.95	1.45
1+740	887.17	885.78	1.39
1+760	886.88	885.62	1.27
1+780	886.65	885.45	1.20
1+800	886.52	885.29	1.23
1+820	886.40	885.12	1.28
1+836	886.32	884.99	1.33

SIZE/TYPE OF PIPE & HGL	← OD 63 HDPE →	
PIPE FITTINGS	← TO BE DETERMINED ON SITE →	
SLOPE (%)	2.06%	3.11%
	1.85%	0.84%
	0.59%	-0.52%
	-0.83%	-0.82%

**Client**

**Financier**

**Project**  
KYUSO ROCK CATCHMENT WATER PROJECT

**Design Consultants.**

15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 788 352 533  
Email: info@lossmanagement.com

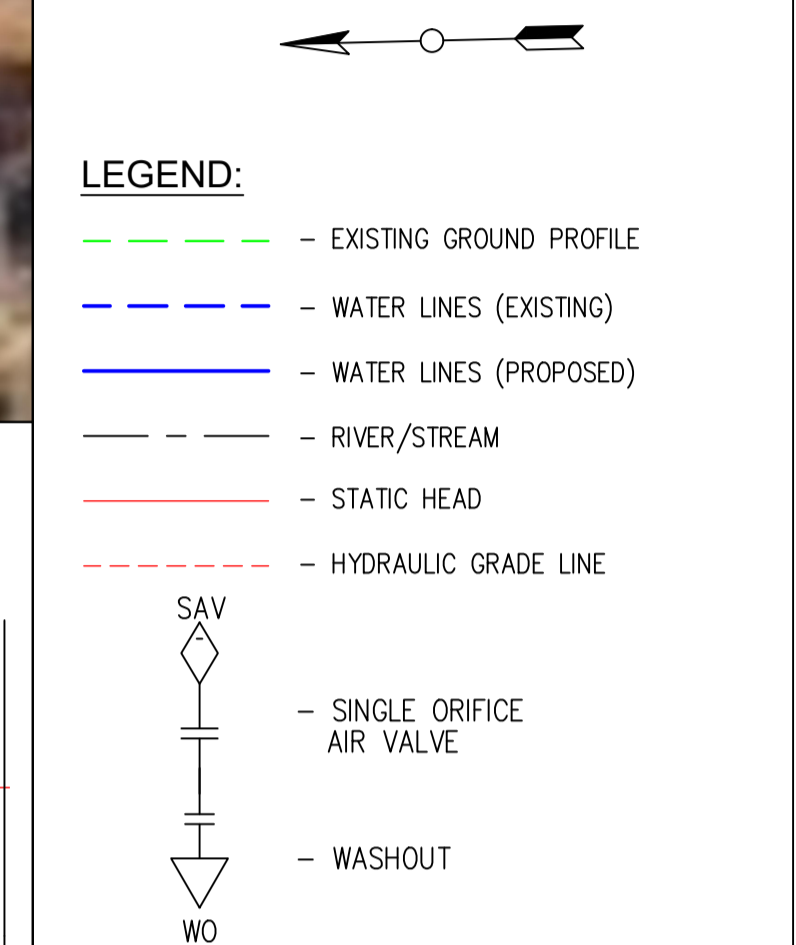
**Drawing Title**  
PROPOSED KYUSO WATER LINES  
PLAN AND PROFILE  
NGUNI ROAD LINE

Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1,000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO
STATUS	DWG. No.	SHEET 3 OF 11	REV



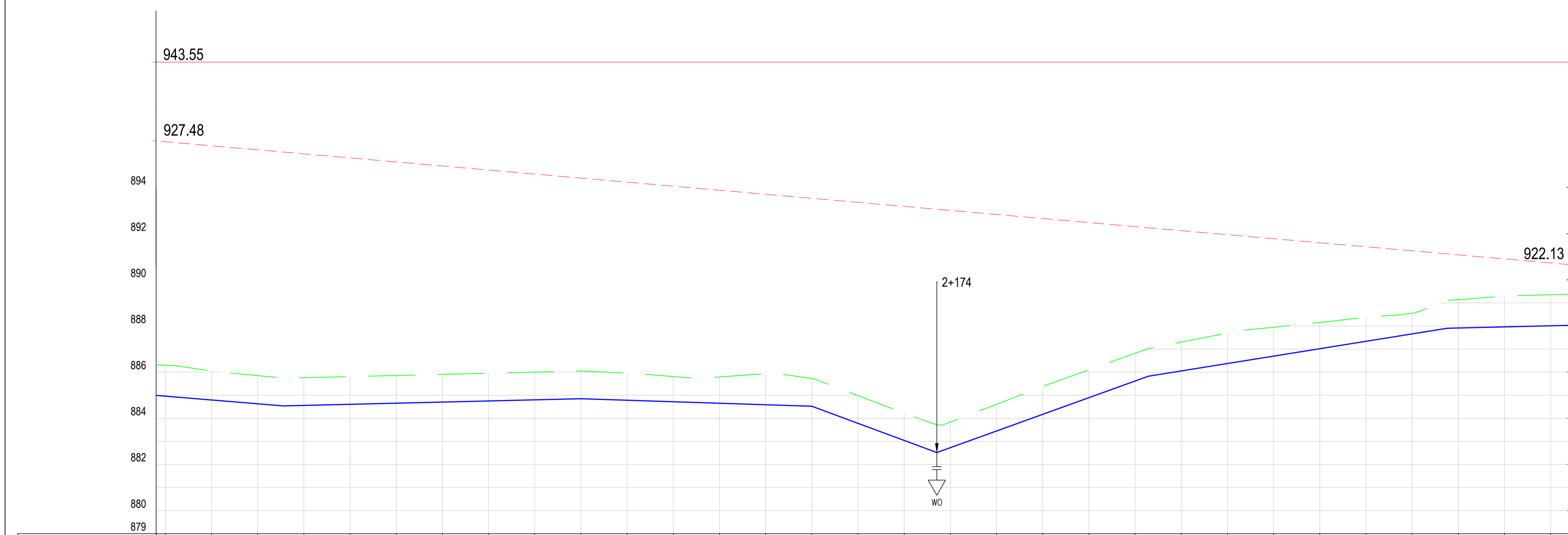


- NOTES**
1. ALL DIMENSIONS/LEVELS ARE IN METRES UNLESS NOTED OTHERWISE.
  2. PIPES ARE TO BE LAID TO EVEN GRADIENTS WITH A MINIMUM COVER OF 1.0m AND 1.2m FOR TRAFFICKED AREAS. WHERE COVER IS LESS THAN THIS, PIPE TO BE SURROUNDED WITH CONCRETE.
  3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH OTHER RELATED DRAWINGS. ANY DISCREPANCIES TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.
  4. PRECISE ROUTES TO BE DETERMINED ON SITE.

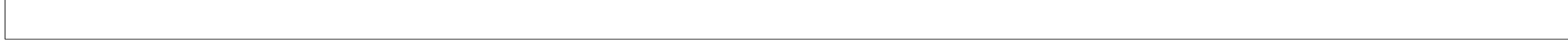


PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			



CHAINAGE (Km+m)	GROUND LEVELS (Masl)	INVERT LEVELS (Masl)	EXCAVATION DEPTH (m)
1+836	886.32	884.99	1.33
1+840	885.30	884.96	1.34
1+860	886.05	884.79	1.25
1+880	885.85	884.63	1.22
1+900	885.76	884.56	1.20
1+920	885.81	884.61	1.20
1+940	885.85	884.65	1.20
1+960	885.90	884.70	1.20
1+980	885.95	884.75	1.20
2+000	886.00	884.80	1.20
2+020	886.05	884.85	1.20
2+040	885.96	884.78	1.17
2+060	885.81	884.72	1.09
2+080	885.79	884.65	1.14
2+100	885.93	884.59	1.35
2+120	885.72	884.52	1.20
2+140	884.98	883.78	1.20
2+160	884.22	883.04	1.18
2+180	883.84	882.73	1.11
2+200	884.61	883.45	1.16
2+220	885.38	884.17	1.20
2+240	886.10	884.89	1.21
2+260	886.82	885.62	1.20
2+280	887.30	886.05	1.25
2+300	887.69	886.37	1.32
2+320	887.95	886.69	1.25
2+340	888.15	887.01	1.14
2+360	888.38	887.34	1.04
2+380	888.55	887.66	0.90
2+400	889.14	887.91	1.23
2+420	889.29	887.96	1.33
2+440	889.35	888.01	1.35
2+448	889.38	888.03	1.35



**Client**  
WaterFund  
Financing the Water Sector

**Financier**  
European Union  
GOVERNMENT OF KENYA  
MINISTRY OF WATER AND SANITATION

**Project**  
KYUSO ROCK CATCHMENT WATER PROJECT

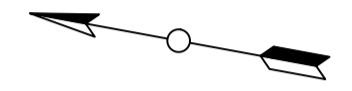
**Design Consultants.**  
15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 788 352 533  
Email: info@ossmanagement.com

**Drawing Title**  
PROPOSED KYUSO WATER LINES  
PLAN AND PROFILE  
NGUNI ROAD LINE

Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1,000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO
STATUS	DWG. No.	SHEET 4 OF 11	REV



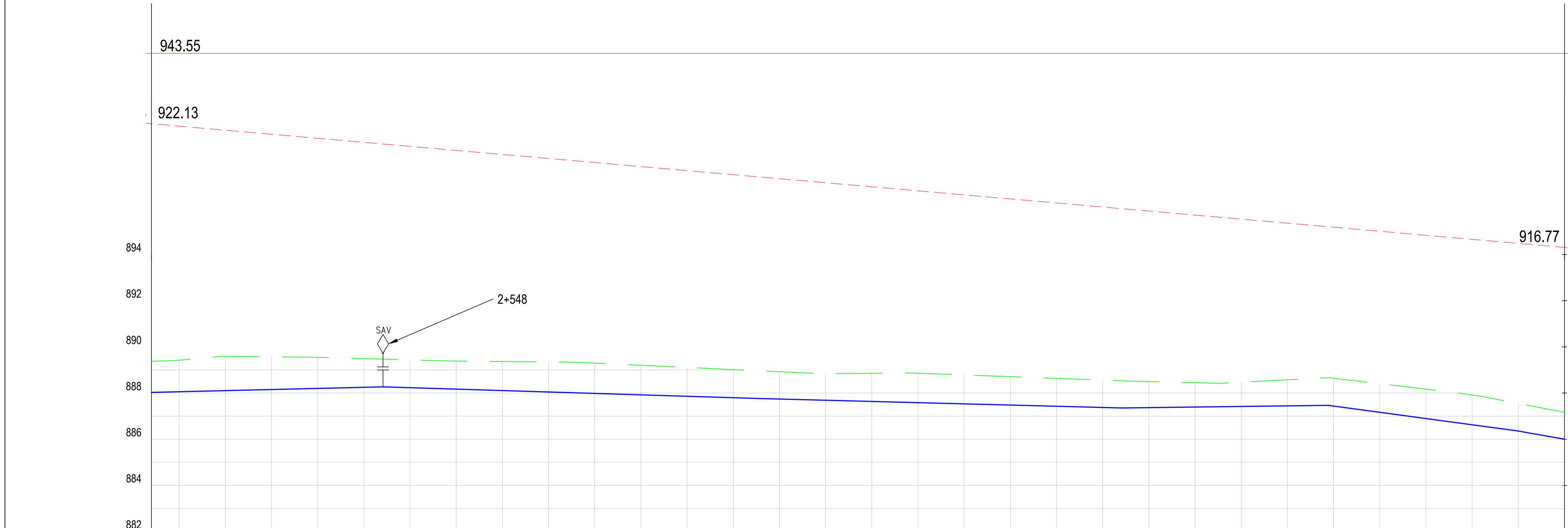
- NOTES**
1. ALL DIMENSIONS/LEVELS ARE IN METRES UNLESS NOTED OTHERWISE.
  2. PIPES ARE TO BE LAID TO EVEN GRADIENTS WITH A MINIMUM COVER OF 1.0m AND 1.2m FOR TRAFFICKED AREAS. WHERE COVER IS LESS THAN THIS, PIPE TO BE SURROUNDED WITH CONCRETE.
  3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH OTHER RELATED DRAWINGS. ANY DISCREPANCIES TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.
  4. PRECISE ROUTES TO BE DETERMINED ON SITE.



- LEGEND:**
- - - - - EXISTING GROUND PROFILE
  - - - - - WATER LINES (EXISTING)
  - - - - - WATER LINES (PROPOSED)
  - - - - - RIVER/STREAM
  - - - - - STATIC HEAD
  - - - - - HYDRAULIC GRADE LINE
  - SAV (Symbol) - SINGLE ORIFICE AIR VALVE
  - WO (Symbol) - WASHOUT

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			



CHAINAGE (Km+m)	GROUND LEVELS (Masl)	INVERT LEVELS (Masl)	EXCAVATION DEPTH (m)	SIZE/TYPE OF PIPE & HGL	PIPE FITTINGS	SLOPE (%)
2+446	889.38	888.03	1.35	OD 63 HDPE	TO BE DETERMINED ON SITE	0.24%
2+460	889.42	888.06	1.37			
2+480	889.59	888.10	1.48			
2+500	889.57	888.15	1.42			
2+520	889.55	888.20	1.35			
2+540	889.49	888.25	1.24			
2+560	889.43	888.23	1.20			
2+580	889.38	888.17	1.22			
2+600	889.37	888.11	1.26			
2+620	889.35	888.05	1.30			
2+640	889.30	887.98	1.31			
2+660	889.20	887.92	1.28			
2+680	889.11	887.86	1.25			
2+700	889.02	887.80	1.22			
2+720	888.92	887.74	1.18			
2+740	888.84	887.69	1.15			
2+760	888.86	887.64	1.22			
2+780	888.86	887.58	1.27			
2+800	888.78	887.53	1.25			
2+820	888.71	887.48	1.23			
2+840	888.63	887.43	1.21			
2+860	888.56	887.38	1.19			
2+880	888.50	887.37	1.13			
2+900	888.45	887.39	1.05			
2+920	888.47	887.42	1.05			
2+940	888.57	887.44	1.13			
2+960	888.64	887.44	1.20			
2+980	888.40	887.17	1.24			
3+000	888.17	886.90	1.27			
3+020	887.92	886.62	1.29			
3+040	887.55	886.35	1.20			
3+060	887.16	886.00	1.16			

**Client**

**Financier**

**Project**  
KYUSO ROCK CATCHMENT WATER PROJECT

**Design Consultants.**

15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 788 352 533  
Email: info@lossmanagement.com

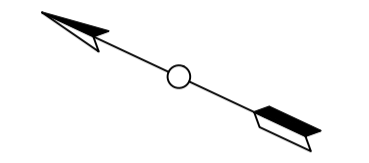
**Drawing Title**  
PROPOSED KYUSO WATER LINES  
PLAN AND PROFILE  
NGUNI ROAD LINE

Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1,000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO
STATUS	DWG. No.	SHEET 5 OF 11	REV



**NOTES**

1. ALL DIMENSIONS/LEVELS ARE IN METRES UNLESS NOTED OTHERWISE.
2. PIPES ARE TO BE LAID TO EVEN GRADIENTS WITH A MINIMUM COVER OF 1.0m AND 1.2m FOR TRAFFICKED AREAS. WHERE COVER IS LESS THAN THIS, PIPE TO BE SURROUNDED WITH CONCRETE.
3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH OTHER RELATED DRAWINGS. ANY DISCREPANCIES TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.
4. PRECISE ROUTES TO BE DETERMINED ON SITE.



**LEGEND:**

- EXISTING GROUND PROFILE
- WATER LINES (EXISTING)
- WATER LINES (PROPOSED)
- RIVER/STREAM
- STATIC HEAD
- HYDRAULIC GRADE LINE
- SAV
- SINGLE ORIFICE AIR VALVE
- WASHOUT

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			

**Client**

**Financier**

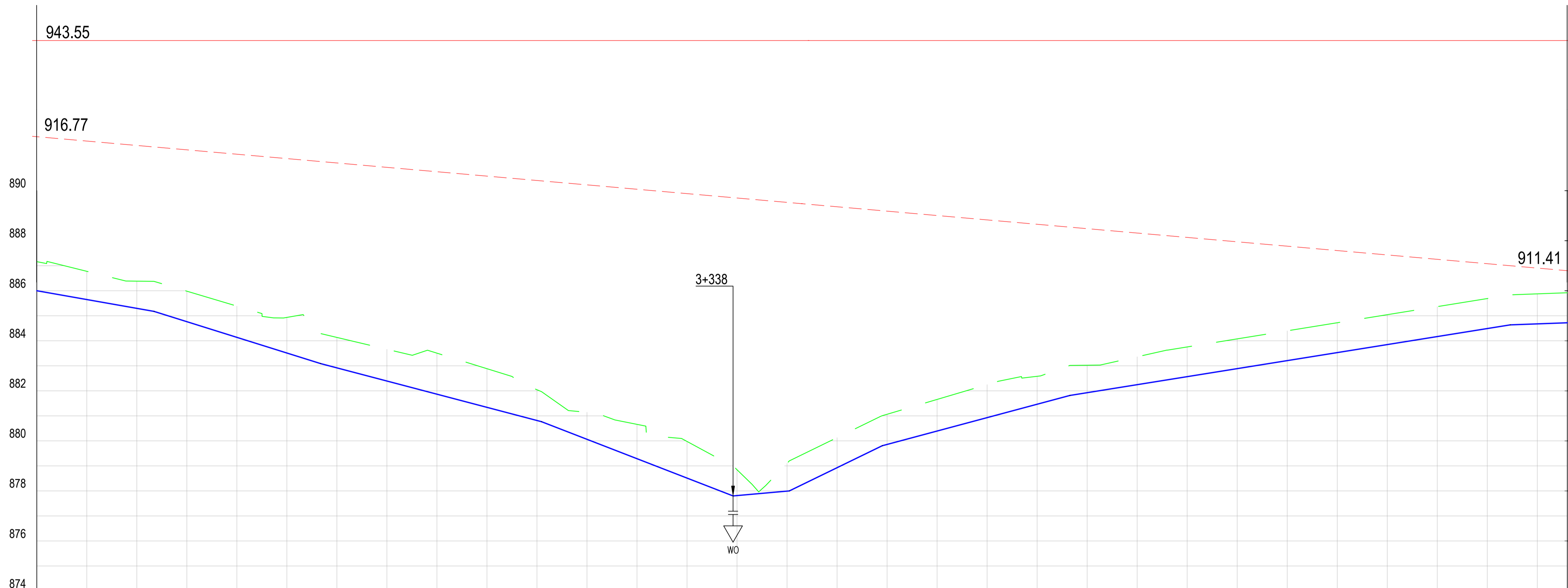
**Project**  
**KYUSO ROCK CATCHMENT WATER PROJECT**

**Design Consultants.**

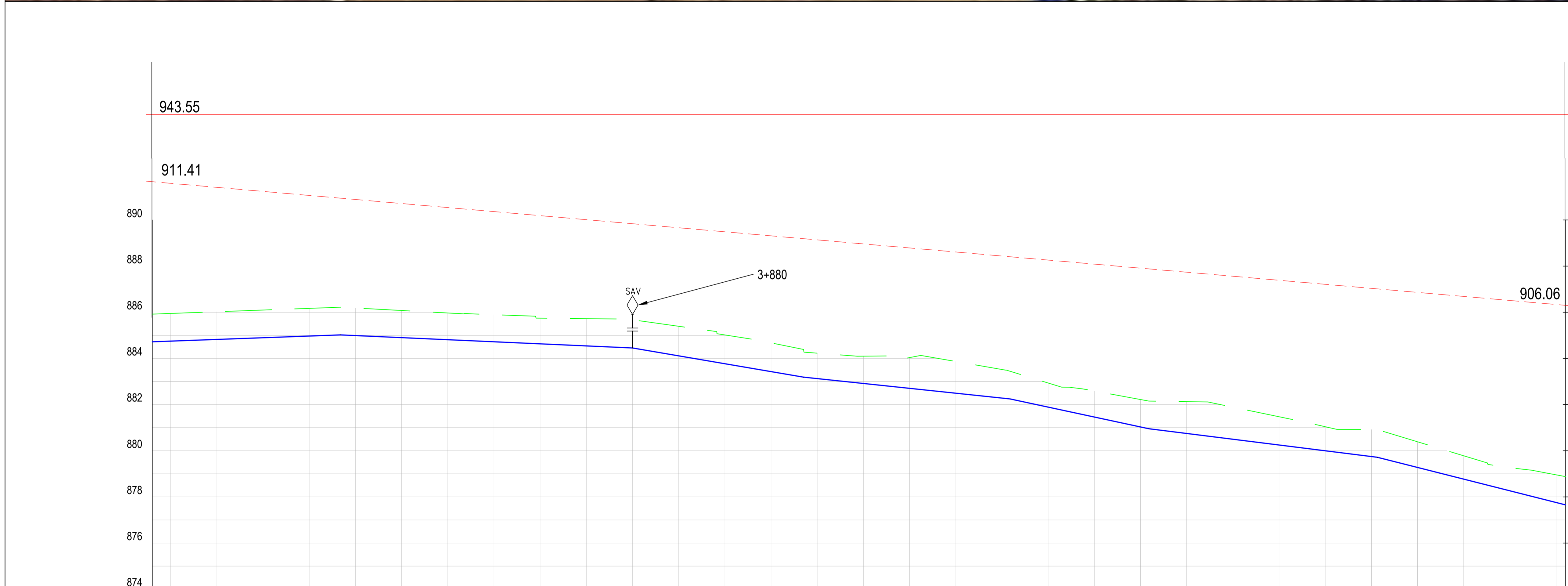
15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 788 352 533  
Email: info@lossmanagement.com

**Drawing Title**  
**PROPOSED KYUSO WATER LINES**  
**PLAN AND PROFILE**  
**NGUNI ROAD LINE**

Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1,000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO
STATUS	DWG. No.	SHEET 6 OF 11	REV



CHAINAGE (Km+m)	GROUND LEVELS (Masl)	INVERT LEVELS (Masl)	EXCAVATION DEPTH (m)	SIZE/TYPE OF PIPE & HGL	PIPE FITTINGS	SLOPE (%)
3+060	887.16	886.00	1.16	OD 63 HDPE	TO BE DETERMINED ON SITE	-1.76%
3+080	886.78	885.65	1.13			
3+100	886.38	885.30	1.09			
3+120	885.98	884.76	1.22			
3+140	885.39	884.14	1.25			
3+160	884.94	883.51	1.42			
3+180	884.14	882.92	1.22			
3+200	883.66	882.39	1.27			
3+220	883.51	881.87	1.64			
3+240	882.89	881.34	1.55			
3+260	882.04	880.82	1.23			
3+280	881.14	880.06	1.08			
3+300	880.66	879.29	1.37			
3+320	879.98	878.51	1.46			
3+340	878.85	877.81	1.03			
3+360	879.11	877.99	1.11			
3+380	880.13	878.93	1.20			
3+400	881.06	879.86	1.21			
3+420	881.66	880.39	1.26			
3+440	882.25	880.93	1.32			
3+460	882.58	881.46	1.12			
3+480	883.02	881.93	1.10			
3+500	883.36	882.25	1.12			
3+520	883.75	882.57	1.19			
3+540	884.08	882.89	1.19			
3+560	884.40	883.21	1.19			
3+580	884.72	883.53	1.19			
3+600	885.04	883.85	1.20			
3+620	885.37	884.17	1.20			
3+640	885.69	884.49	1.20			
3+660	885.88	884.68	1.20			
3+672	885.92	884.72	1.20			



CHAINAGE (Km+m)	GROUND LEVELS (Masl)	INVERT LEVELS (Masl)	EXCAVATION DEPTH (m)	SIZE/TYPE OF PIPE & HGL	PIPE FITTINGS	SLOPE (%)
3+700	885.92	884.72	1.20	OD 63 HDPE	TO BE DETERMINED ON SITE	0.37%
3+720	885.95	884.75	1.20			
3+740	886.02	884.82	1.20			
3+760	886.10	884.90	1.20			
3+780	886.17	884.97	1.20			
3+800	886.18	884.99	1.19			
3+820	886.08	884.90	1.18			
3+840	885.97	884.81	1.16			
3+860	885.89	884.72	1.17			
3+880	885.74	884.63	1.11			
3+900	885.39	884.11	1.28			
3+920	885.02	883.77	1.25			
3+940	884.67	883.43	1.24			
3+960	884.23	883.13	1.10			
3+980	884.10	882.92	1.18			
4+000	884.04	882.70	1.33			
4+020	883.87	882.49	1.37			
4+040	883.52	882.28	1.24			
4+060	882.94	881.89	1.04			
4+080	882.59	881.46	1.13			
4+100	882.22	881.03	1.19			
4+120	882.13	880.75	1.38			
4+140	881.89	880.50	1.39			
4+160	881.47	880.25	1.22			
4+180	881.04	880.00	1.04			
4+200	880.92	879.75	1.17			
4+220	880.39	879.28	1.11			
4+240	879.78	878.77	1.01			
4+260	879.27	878.26	1.01			
4+280	878.96	877.76	1.20			
4+284	878.88	877.68	1.22			

- NOTES**
- ALL DIMENSIONS/LEVELS ARE IN METRES UNLESS NOTED OTHERWISE.
  - PIPES ARE TO BE LAID TO EVEN GRADIENTS WITH A MINIMUM COVER OF 1.0m AND 1.2m FOR TRAFFICKED AREAS. WHERE COVER IS LESS THAN THIS, PIPE TO BE SURROUNDED WITH CONCRETE.
  - THIS DRAWING IS TO BE READ IN CONJUNCTION WITH OTHER RELATED DRAWINGS. ANY DISCREPANCIES TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.
  - PRECISE ROUTES TO BE DETERMINED ON SITE.

**LEGEND:**

- EXISTING GROUND PROFILE
- WATER LINES (EXISTING)
- WATER LINES (PROPOSED)
- RIVER/STREAM
- STATIC HEAD
- HYDRAULIC GRADE LINE
- SAV --- SINGLE ORIFICE AIR VALVE
- WO --- WASHOUT

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY CHECKED			
	BY CHECKED			
	BY CHECKED			
	BY CHECKED			

**Client**

**Financier**

**Project**  
KYUSO ROCK CATCHMENT WATER PROJECT

**Design Consultants.**

15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 718 352 533  
Email: info@lossmanagement.com

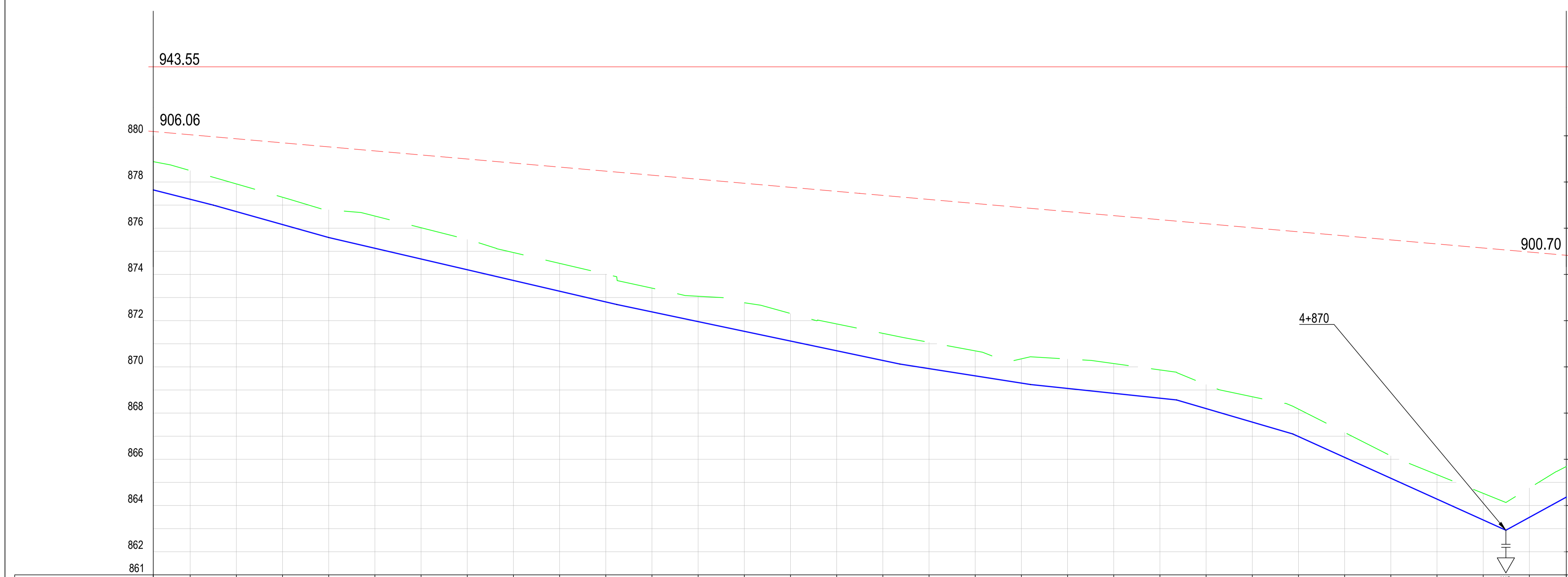
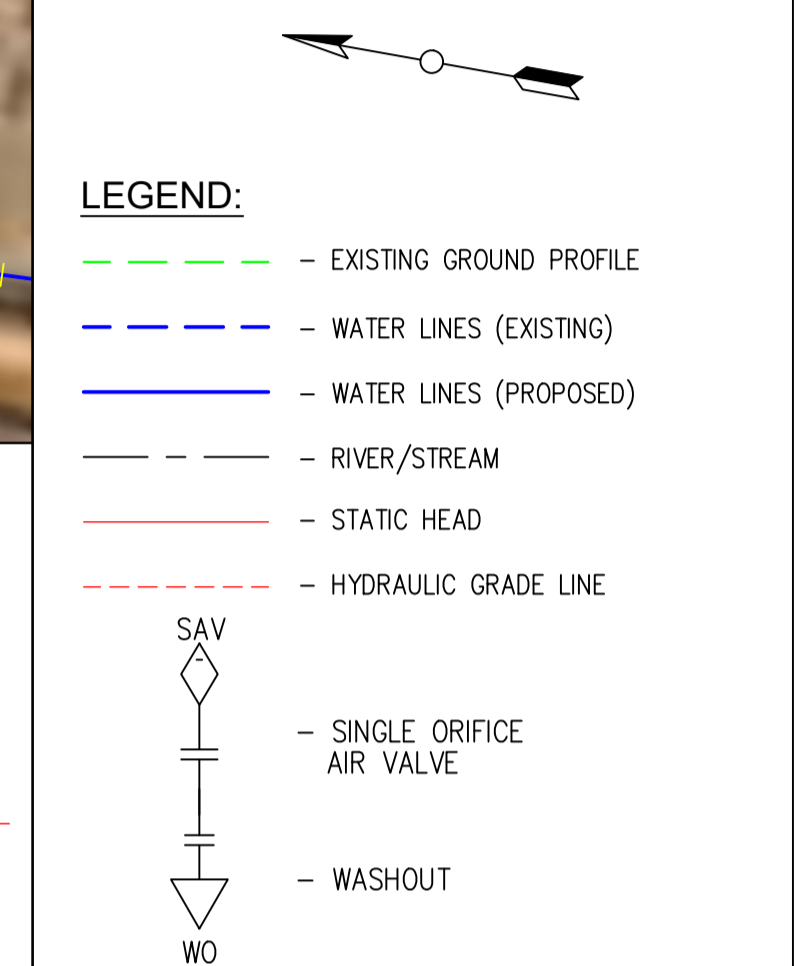
**Drawing Title**  
PROPOSED KYUSO WATER LINES  
PLAN AND PROFILE  
NGUNI ROAD LINE

Designed by JMM    Drawn by KCK  
Checked by JN    Approved by JR  
Scale H = 1:1,000    Date NOV 2023  
V = 1:100  
Job No.    ACAD File: KYUSO

0 STATUS    DWG. No.    SHEET 7 OF 11    0 REV



- NOTES**
1. ALL DIMENSIONS/LEVELS ARE IN METRES UNLESS NOTED OTHERWISE.
  2. PIPES ARE TO BE LAID TO EVEN GRADIENTS WITH A MINIMUM COVER OF 1.0m AND 1.2m FOR TRAFFICKED AREAS. WHERE COVER IS LESS THAN THIS, PIPE TO BE SURROUNDED WITH CONCRETE.
  3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH OTHER RELATED DRAWINGS. ANY DISCREPANCIES TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.
  4. PRECISE ROUTES TO BE DETERMINED ON SITE.



CHAINAGE (Km+m)	GROUND LEVELS (Masl)	INVERT LEVELS (Masl)	EXCAVATION DEPTH (m)	SIZE/TYPE OF PIPE & HGL	PIPE FITTINGS	SLOPE (%)
4+284	878.88	877.66	1.22	OD 63 HDPE	TO BE DETERMINED ON SITE	-2.53%
4+300	878.49	877.25	1.24			
4+320	877.92	876.72	1.20			
4+340	877.34	876.16	1.18			
4+360	876.80	875.60	1.20			
4+380	876.53	875.13	1.39			
4+400	876.02	874.67	1.35			
4+420	875.52	874.20	1.31			
4+440	874.95	873.74	1.21			
4+460	874.48	873.27	1.20			
4+480	874.01	872.81	1.20			
4+500	873.41	872.38	1.03			
4+520	873.06	871.96	1.10			
4+540	872.77	871.54	1.24			
4+560	872.31	871.12	1.19			
4+580	871.86	870.70	1.16			
4+600	871.45	870.28	1.17			
4+620	871.06	869.92	1.14			
4+640	870.69	869.61	1.08			
4+660	870.35	869.30	1.05			
4+680	870.34	869.07	1.27			
4+700	870.14	868.86	1.29			
4+720	869.87	868.64	1.22			
4+740	869.23	868.19	1.04			
4+760	868.71	867.61	1.10			
4+780	868.17	866.99	1.19			
4+800	867.16	866.08	1.08			
4+820	866.15	865.18	0.97			
4+840	865.34	864.28	1.06			
4+860	864.53	863.38	1.15			
4+880	864.76	863.49	1.27			
4+896	865.69	864.36	1.32			

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED



Project  
**KYUSO ROCK CATCHMENT WATER PROJECT**

Design Consultants.

15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 788 352 533  
Email: info@lossmanagement.com

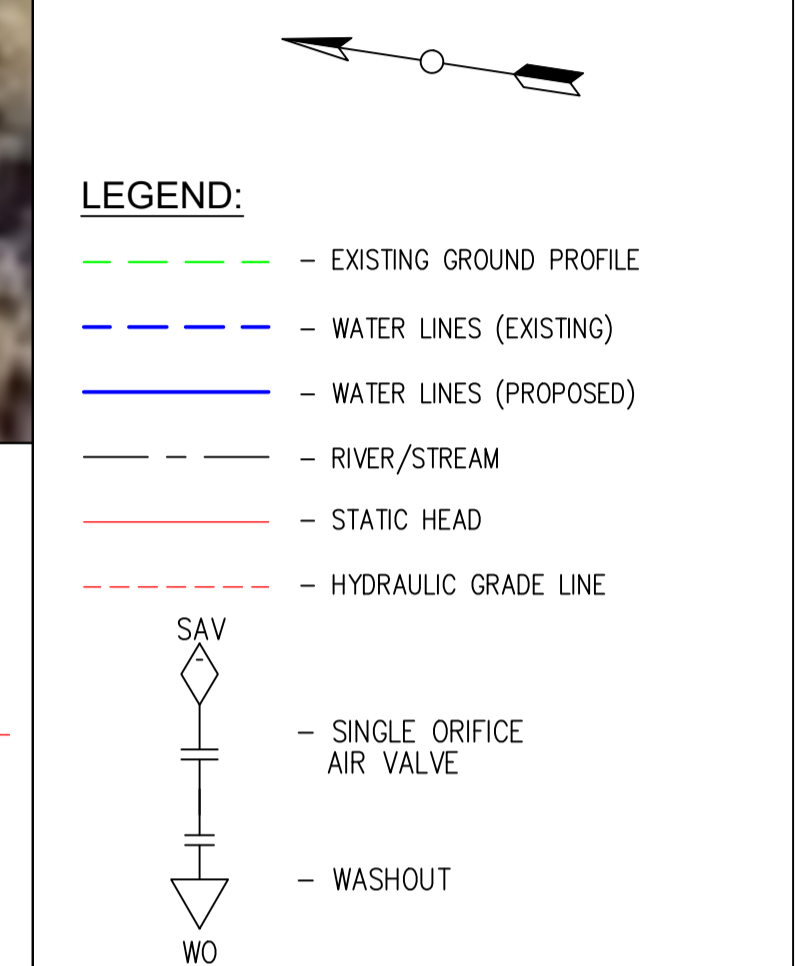
Drawing Title  
**PROPOSED KYUSO WATER LINES PLAN AND PROFILE NGUNI ROAD LINE**

Designed by JMM    Drawn by KCK  
Checked by JN    Approved by JR  
Scale H = 1:1,000    Date NOV 2023  
V = 1:100  
Job No.    ACAD File: KYUSO

0    DWG. No.    SHEET 8 OF 11    0  
STATUS    REV

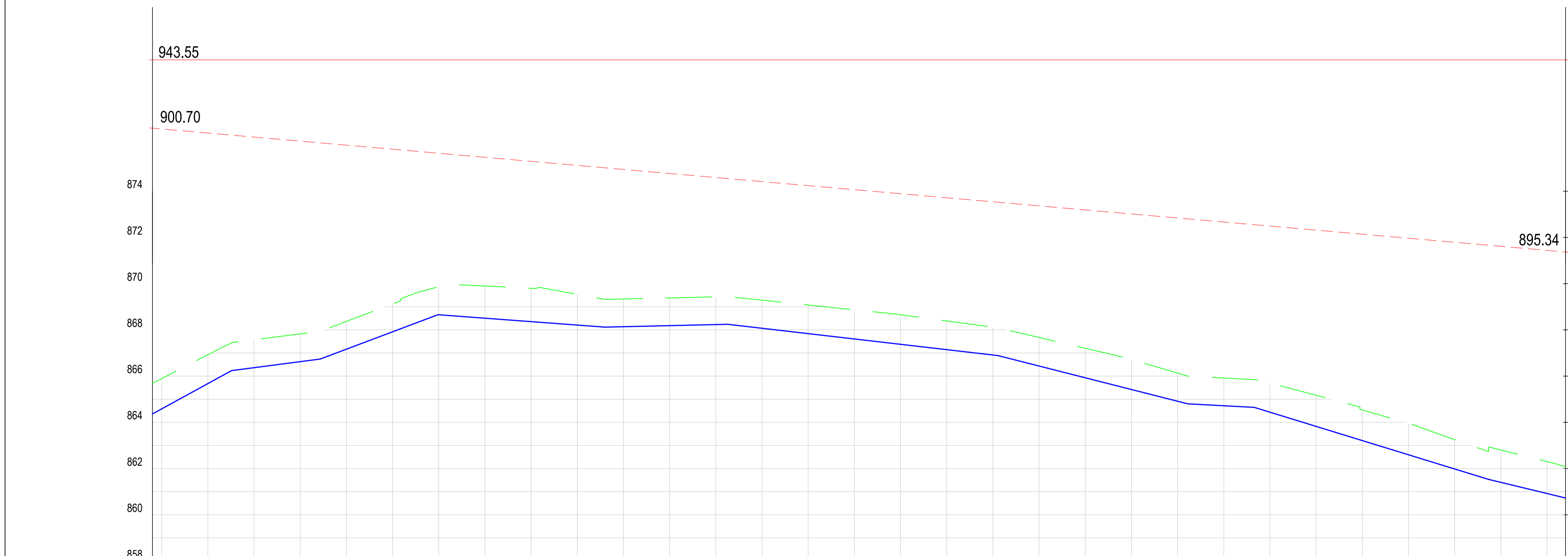


- NOTES**
1. ALL DIMENSIONS/LEVELS ARE IN METRES UNLESS NOTED OTHERWISE.
  2. PIPES ARE TO BE LAID TO EVEN GRADIENTS WITH A MINIMUM COVER OF 1.0m AND 1.2m FOR TRAFFICKED AREAS. WHERE COVER IS LESS THAN THIS, PIPE TO BE SURROUNDED WITH CONCRETE.
  3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH OTHER RELATED DRAWINGS. ANY DISCREPANCIES TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.
  4. PRECISE ROUTES TO BE DETERMINED ON SITE.



PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			



CHAINAGE (Km+m)	GROUND LEVELS (Masl)	INVERT LEVELS (Masl)	EXCAVATION DEPTH (m)	SIZE/TYPE OF PIPE & HGL	PIPE FITTINGS	SLOPE (%)		
4+896	865.69	864.36	1.32	OD 63 HDPE	TO BE DETERMINED ON SITE	5.47%		
4+900	865.69	864.38	1.31					
4+920	866.92	865.68	1.25					
4+940	867.57	866.36	1.21				-0.74%	0.23%
4+960	867.83	866.63	1.20					
4+980	868.37	867.17	1.20				-1.16%	-2.54%
5+000	869.12	867.92	1.20					
5+020	869.86	868.65	1.21				-0.53%	-3.07%
5+040	869.90	868.51	1.39					
5+060	869.80	868.36	1.44				-2.42%	
5+080	869.54	868.21	1.33					
5+100	869.34	868.14	1.20					
5+120	869.38	868.18	1.20					
5+140	869.43	868.23	1.20					
5+160	869.29	868.07	1.22					
5+180	869.08	867.84	1.24					
5+200	868.87	867.61	1.26					
5+220	868.66	867.38	1.28					
5+240	868.39	867.14	1.24					
5+260	868.12	866.91	1.20					
5+280	867.67	866.44	1.24					
5+300	867.21	865.93	1.28					
5+320	866.72	865.42	1.30					
5+340	866.13	864.91	1.22					
5+360	865.92	864.72	1.20					
5+380	865.70	864.44	1.26					
5+400	865.17	863.82	1.35					
5+420	864.54	863.21	1.32					
5+440	863.96	862.60	1.36					
5+460	863.25	861.98	1.27					
5+480	862.80	861.40	1.40					
5+500	862.30	860.92	1.38					
5+508	862.07	860.73	1.35					



**Project**  
**KYUSO ROCK CATCHMENT WATER PROJECT**

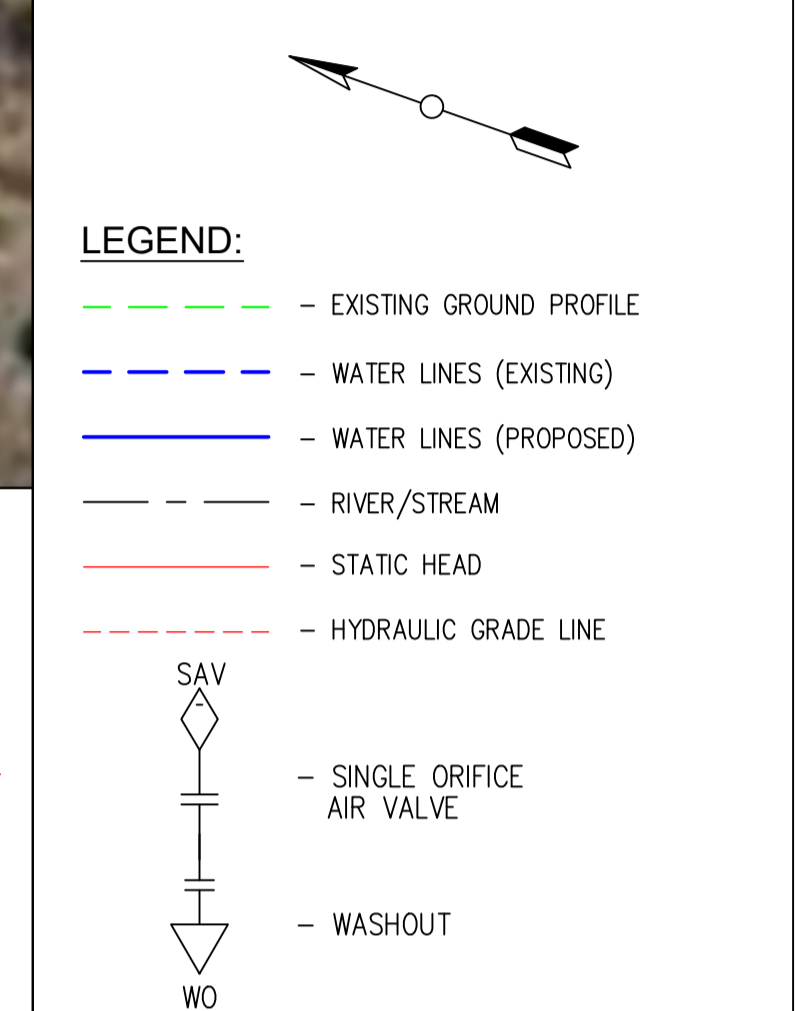
**Design Consultants.**  
15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 788 352 533  
Email: info@lossmanagement.com

**Drawing Title**  
**PROPOSED KYUSO WATER LINES**  
**PLAN AND PROFILE**  
**NGUNI ROAD LINE**

Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1,000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO
STATUS	DWG. No.	SHEET 9 OF 11	REV



- NOTES**
1. ALL DIMENSIONS/LEVELS ARE IN METRES UNLESS NOTED OTHERWISE.
  2. PIPES ARE TO BE LAID TO EVEN GRADIENTS WITH A MINIMUM COVER OF 1.0m AND 1.2m FOR TRAFFICKED AREAS. WHERE COVER IS LESS THAN THIS, PIPE TO BE SURROUNDED WITH CONCRETE.
  3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH OTHER RELATED DRAWINGS. ANY DISCREPANCIES TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.
  4. PRECISE ROUTES TO BE DETERMINED ON SITE.



PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY CHECKED			
	BY CHECKED			
	BY CHECKED			
	BY CHECKED			



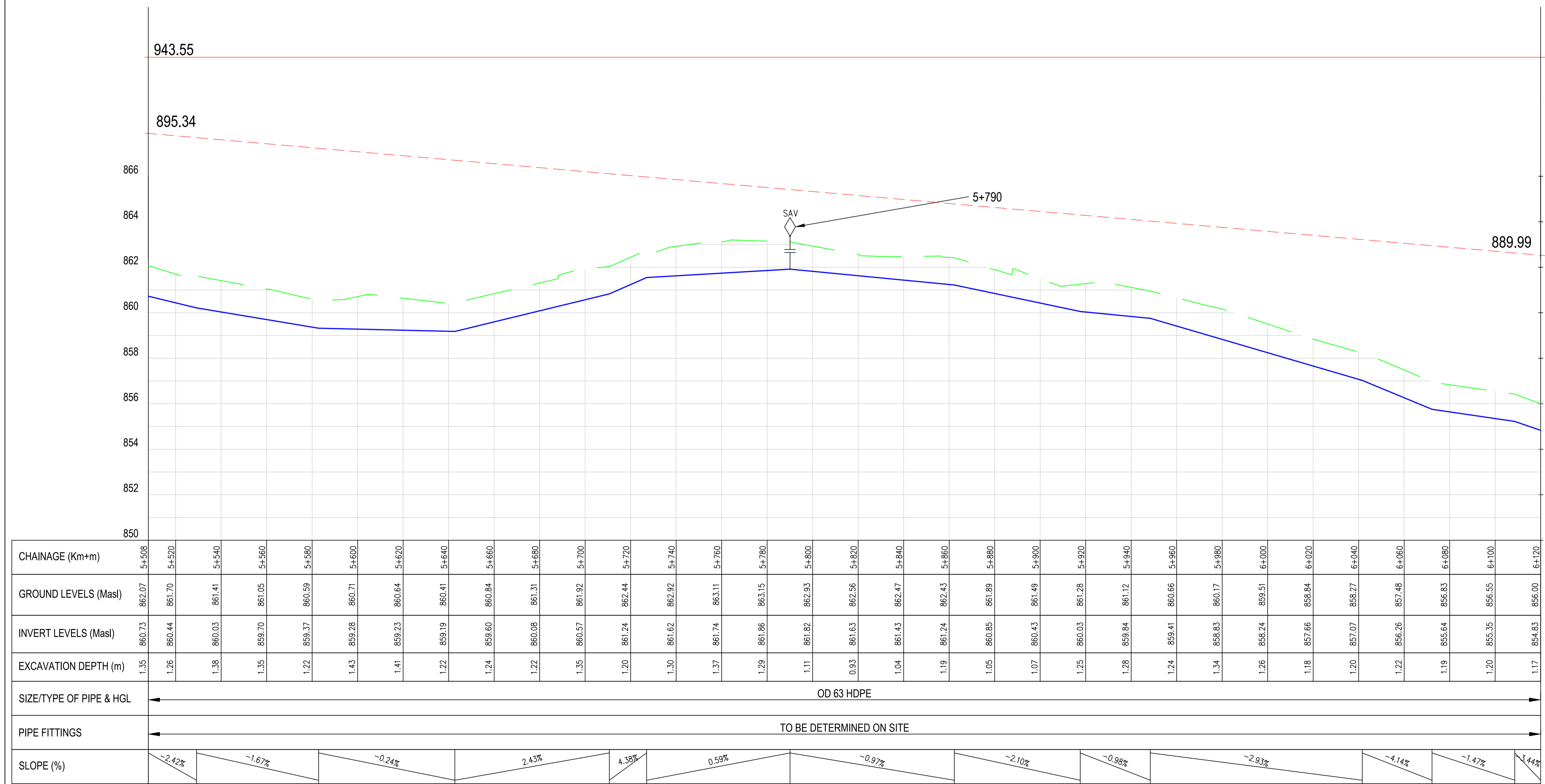
**Project**  
**KYUSO ROCK CATCHMENT WATER PROJECT**

**Design Consultants.**

15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 788 352 533  
Email: info@ossaimanagement.com

**Drawing Title**  
**PROPOSED KYUSO WATER LINES PLAN AND PROFILE**  
**NGUNI ROAD LINE**

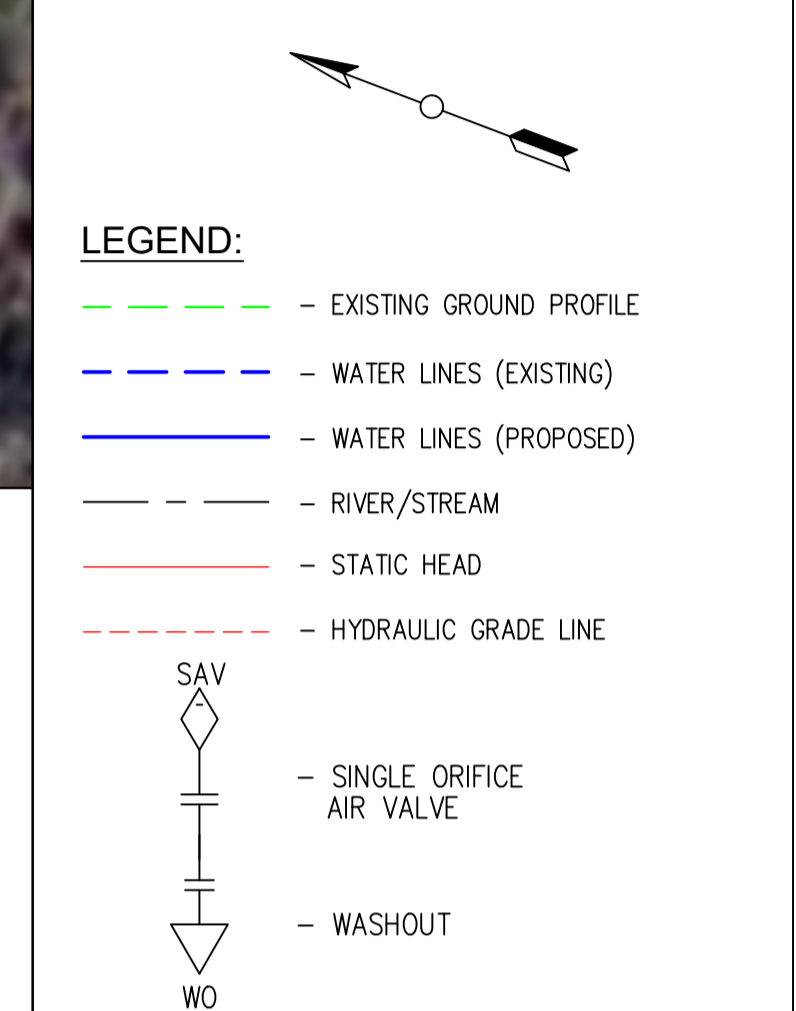
Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1,000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO
0 STATUS	DWG. No.	SHEET 10 OF 11	0 REV



CHAINAGE (Km+m)	GROUND LEVELS (Masl)	INVERT LEVELS (Masl)	EXCAVATION DEPTH (m)	SIZE/TYPE OF PIPE & HGL	PIPE FITTINGS	SLOPE (%)
5+508	862.07	860.73	1.35	OD 63 HDPE	TO BE DETERMINED ON SITE	-2.42%
5+520	861.70	860.44	1.26			-1.67%
5+540	861.41	860.03	1.38			-0.24%
5+560	861.05	859.70	1.35			2.43%
5+580	860.59	859.37	1.22			4.38%
5+600	860.71	859.28	1.43			0.59%
5+620	860.64	859.23	1.41			-0.97%
5+640	860.41	859.19	1.22			-2.10%
5+660	860.84	859.60	1.24			-0.98%
5+680	861.31	860.08	1.22			-2.93%
5+700	861.92	860.57	1.35			-4.14%
5+720	862.44	861.24	1.20			-1.47%
5+740	862.92	861.62	1.30			3.44%
5+760	863.11	861.74	1.37			
5+780	863.15	861.86	1.29			
5+800	862.93	861.82	1.11			
5+820	862.56	861.63	0.93			
5+840	862.47	861.43	1.04			
5+860	862.43	861.24	1.19			
5+880	861.89	860.85	1.05			
5+900	861.49	860.43	1.07			
5+920	861.28	860.03	1.25			
5+940	861.12	859.84	1.28			
5+960	860.66	859.41	1.24			
5+980	860.17	858.83	1.34			
6+000	859.51	858.24	1.26			
6+020	858.84	857.66	1.18			
6+040	858.27	857.07	1.20			
6+060	857.48	856.26	1.22			
6+080	856.83	855.64	1.19			
6+100	856.55	855.35	1.20			
6+120	856.00	854.83	1.17			



- NOTES**
1. ALL DIMENSIONS/LEVELS ARE IN METRES UNLESS NOTED OTHERWISE.
  2. PIPES ARE TO BE LAID TO EVEN GRADIENTS WITH A MINIMUM COVER OF 1.0m AND 1.2m FOR TRAFFICKED AREAS. WHERE COVER IS LESS THAN THIS, PIPE TO BE SURROUNDED WITH CONCRETE.
  3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH OTHER RELATED DRAWINGS. ANY DISCREPANCIES TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.
  4. PRECISE ROUTES TO BE DETERMINED ON SITE.



PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY CHECKED			
	BY CHECKED			
	BY CHECKED			
	BY CHECKED			



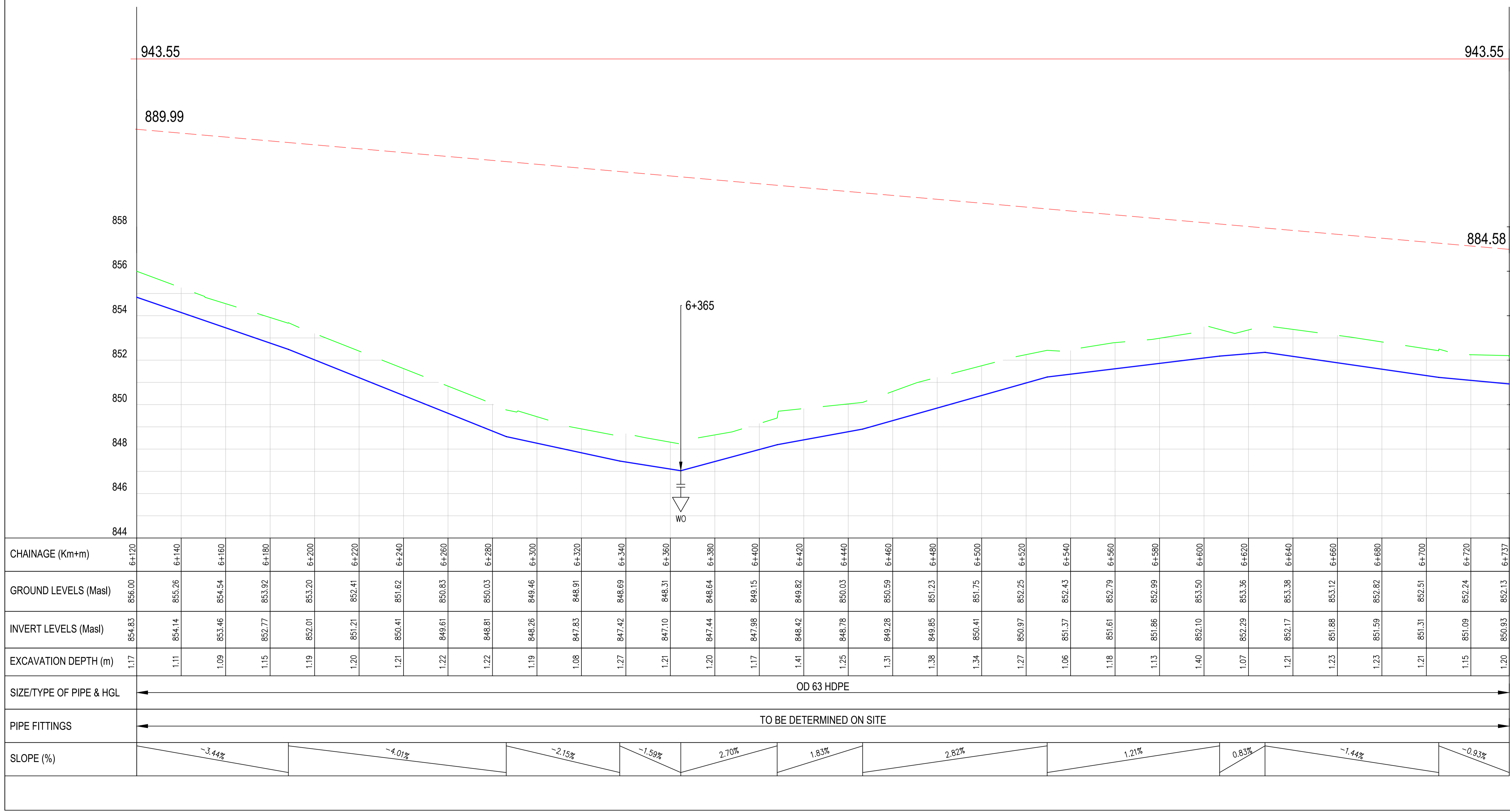
**Project**  
**KYUSO ROCK CATCHMENT WATER PROJECT**

**Design Consultants.**

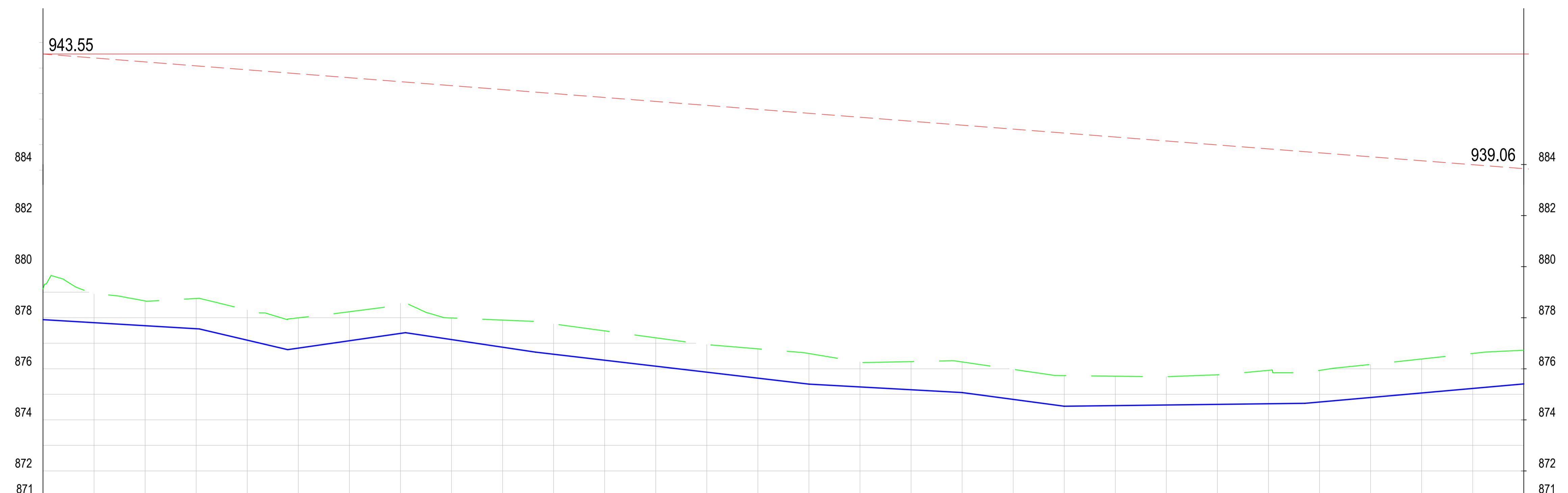
15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 788 352 533  
Email: info@lossmanagement.com

**Drawing Title**  
**PROPOSED KYUSO WATER LINES PLAN AND PROFILE NGUNI ROAD LINE**

Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1,000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO
STATUS	DWG. No.	SHEET 11 OF 11	REV

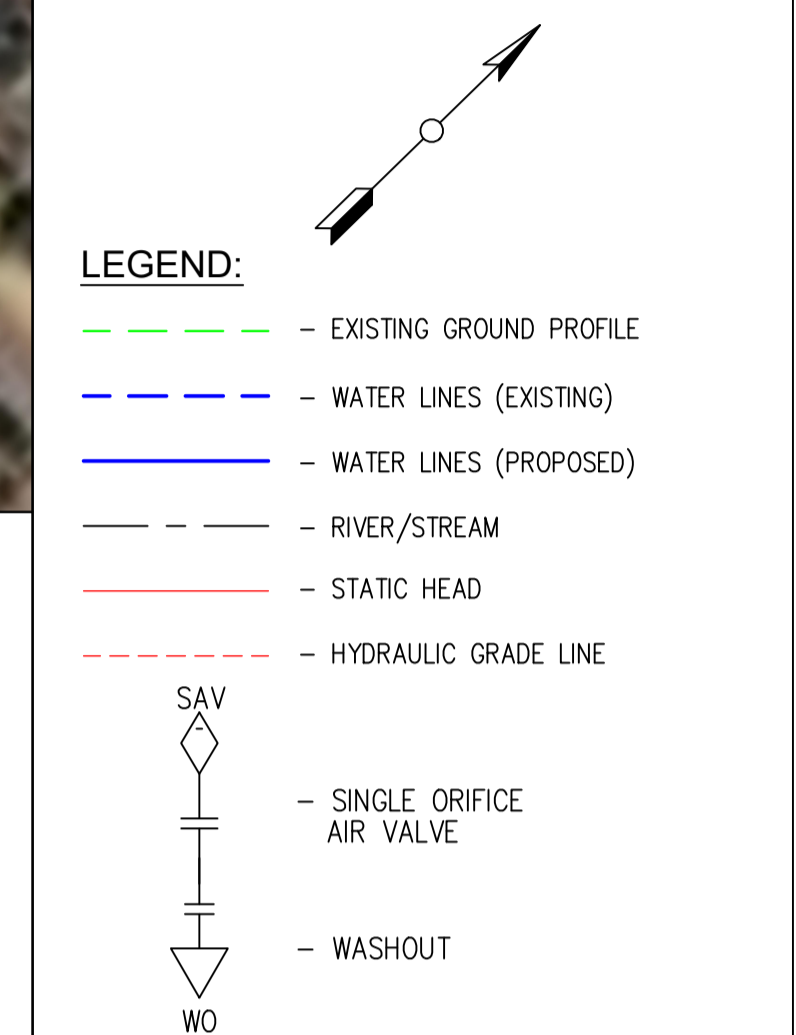






CHAINAGE (Km+m)	0+000	0+020	0+040	0+060	0+080	0+100	0+120	0+140	0+160	0+180	0+200	0+220	0+240	0+260	0+280	0+300	0+320	0+340	0+360	0+380	0+400	0+420	0+440	0+460	0+480	0+500	0+520	0+540	0+560	0+580			
GROUND LEVELS (Masl)	879.12	878.92	878.66	878.75	878.30	878.00	878.24	878.56	877.99	877.91	877.76	877.49	877.21	876.95	876.78	876.60	876.27	876.28	876.27	875.98	875.73	875.71	875.69	875.77	875.94	875.94	876.17	876.38	876.60	876.73			
INVERT LEVELS (Masl)	877.92	877.81	877.69	877.57	877.12	876.81	877.10	877.39	877.14	876.85	876.57	876.34	876.10	875.87	875.63	875.40	875.29	875.18	875.07	874.80	874.53	874.56	874.58	874.61	874.63	874.70	874.88	875.05	875.23	875.41			
EXCAVATION DEPTH (m)	1.20	1.12	0.97	1.19	1.18	1.19	1.14	1.18	0.85	1.06	1.19	1.15	1.11	1.08	1.15	1.20	0.98	1.10	1.20	1.18	1.20	1.15	1.11	1.16	1.31	1.24	1.30	1.33	1.37	1.32			
SIZE/TYPE OF PIPE & HGL	OD 50 HDPE																																
PIPE FITTINGS	TO BE DETERMINED ON SITE																																
SLOPE (%)	-0.59%		-2.34%		1.44%		-1.49%		-1.17%				-0.55%		-1.34%		0.12%		0.89%														

- NOTES**
1. ALL DIMENSIONS/LEVELS ARE IN METRES UNLESS NOTED OTHERWISE.
  2. PIPES ARE TO BE LAID TO EVEN GRADIENTS WITH A MINIMUM COVER OF 1.0m AND 1.2m FOR TRAFFICKED AREAS, WHERE COVER IS LESS THAN THIS, PIPE TO BE SURROUNDED WITH CONCRETE.
  3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH OTHER RELATED DRAWINGS. ANY DISCREPANCIES TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.
  4. PRECISE ROUTES TO BE DETERMINED ON SITE.



PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			



**Project**  
**KYUSO ROCK CATCHMENT WATER PROJECT**

**Design Consultants.**

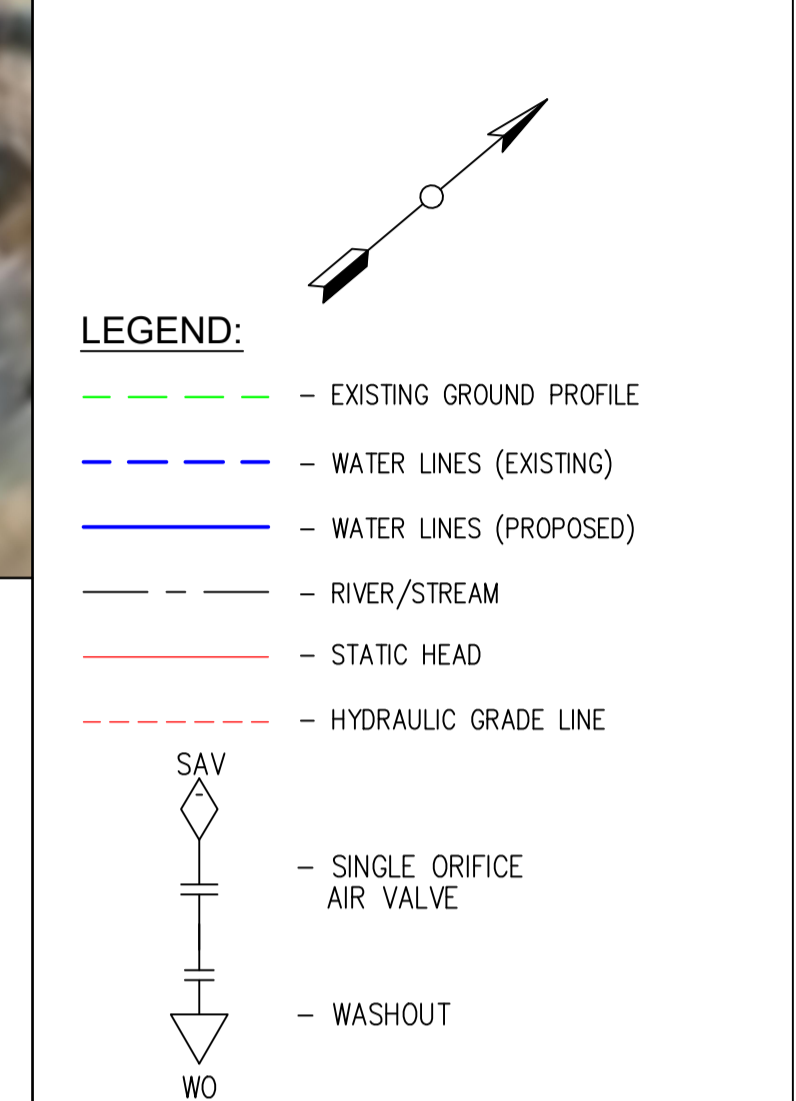
15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 718 362 533  
Email: info@losaimanagement.com

**Drawing Title**  
**PROPOSED KYUSO WATER LINES**  
**PLAN AND PROFILE**  
**TWIMIYUA ROAD LINE**

Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1,000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO
STATUS	DWG. No.	SHEET 1 OF 7	REV

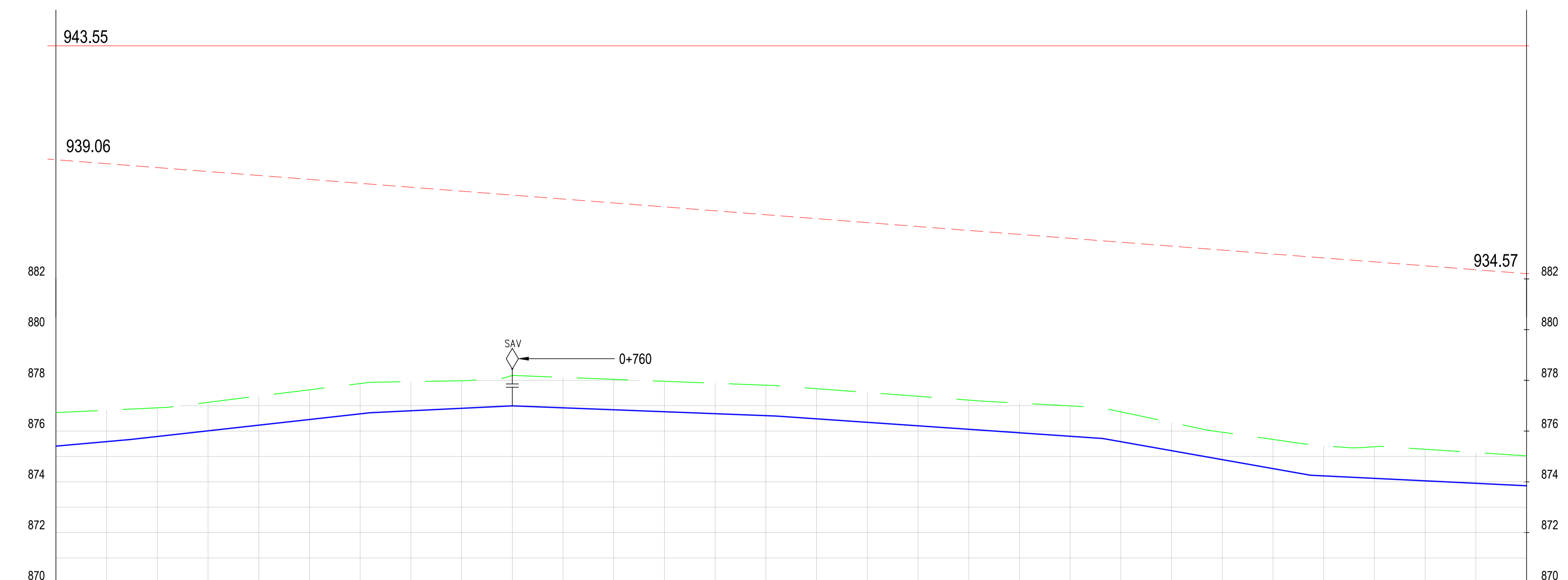


- NOTES**
1. ALL DIMENSIONS/LEVELS ARE IN METRES UNLESS NOTED OTHERWISE.
  2. PIPES ARE TO BE LAID TO EVEN GRADIENTS WITH A MINIMUM COVER OF 1.0m AND 1.2m FOR TRAFFICKED AREAS. WHERE COVER IS LESS THAN THIS, PIPE TO BE SURROUNDED WITH CONCRETE.
  3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH OTHER RELATED DRAWINGS. ANY DISCREPANCIES TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.
  4. PRECISE ROUTES TO BE DETERMINED ON SITE.



PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY CHECKED			
	BY CHECKED			
	BY CHECKED			
	BY CHECKED			



CHAINAGE (Km+m)	GROUND LEVELS (Masl)	INVERT LEVELS (Masl)	EXCAVATION DEPTH (m)
0+580	876.73	875.41	1.32
0+600	876.82	875.58	1.24
0+620	876.92	875.79	1.13
0+640	877.13	876.01	1.12
0+660	877.38	876.23	1.15
0+680	877.63	876.46	1.17
0+700	877.87	876.68	1.20
0+720	877.95	876.80	1.15
0+740	877.98	876.90	1.09
0+760	878.19	877.00	1.20
0+780	878.12	876.92	1.20
0+800	878.04	876.84	1.20
0+820	877.96	876.76	1.20
0+840	877.89	876.69	1.20
0+860	877.81	876.61	1.20
0+880	877.67	876.48	1.19
0+900	877.52	876.35	1.18
0+920	877.37	876.21	1.16
0+940	877.22	876.07	1.15
0+960	877.10	875.93	1.17
0+980	876.99	875.80	1.20
1+000	876.76	875.58	1.18
1+020	876.34	875.23	1.11
1+040	875.95	874.87	1.08
1+060	875.67	874.52	1.15
1+080	875.42	874.23	1.19
1+100	875.38	874.14	1.25
1+120	875.28	874.04	1.24
1+140	875.15	873.94	1.21
1+160	875.03	873.84	1.18

SIZE/TYPE OF PIPE & HGL	← OD 50 HDPE →
PIPE FITTINGS	← TO BE DETERMINED ON SITE →
SLOPE (%)	← 0.89% 1.12% 0.48% -0.39% -0.69% -1.77% -0.49% →

**Client**  
WaterFund  
Financing the Water Sector

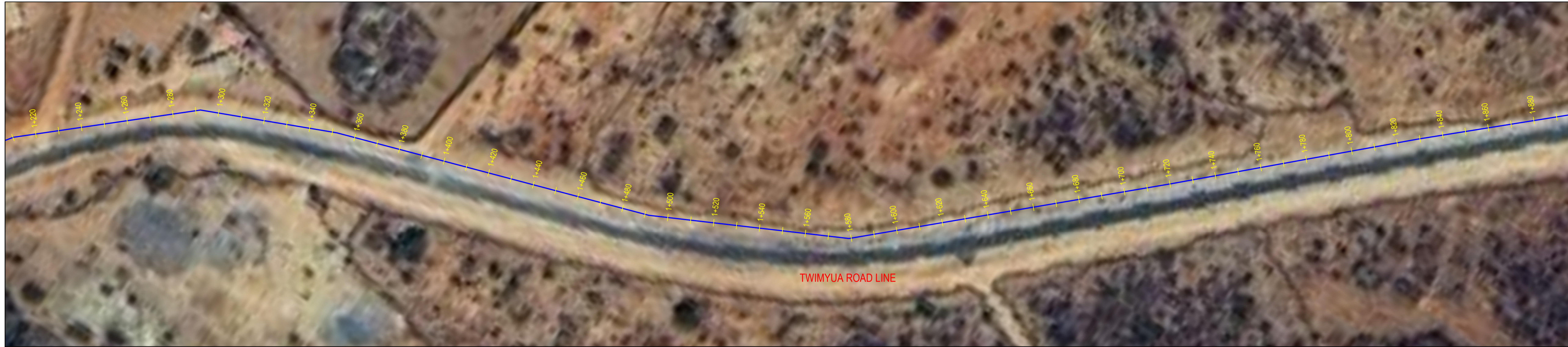
**Financier**  
European Union  
GOVERNMENT OF KENYA  
MINISTRY OF WATER AND IRRIGATION

**Project**  
KYUSO ROCK CATCHMENT WATER PROJECT

**Design Consultants.**  
15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 718 352 533  
Email: info@losaimanagement.com

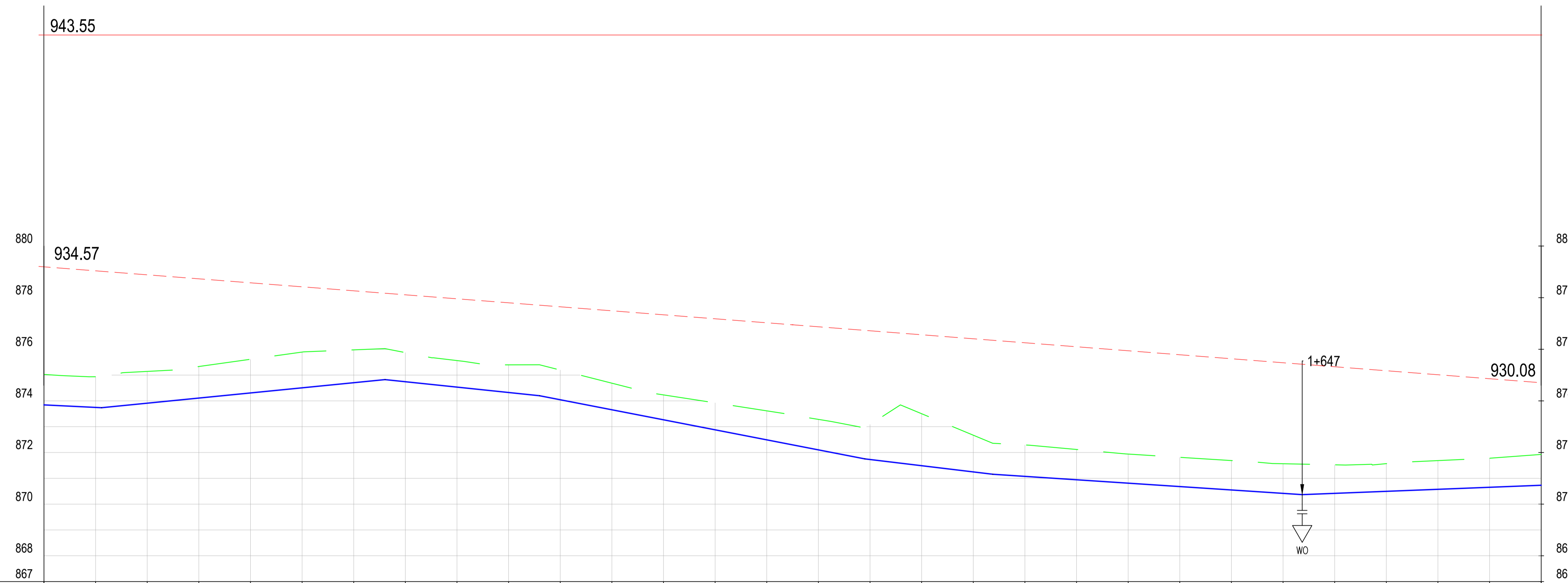
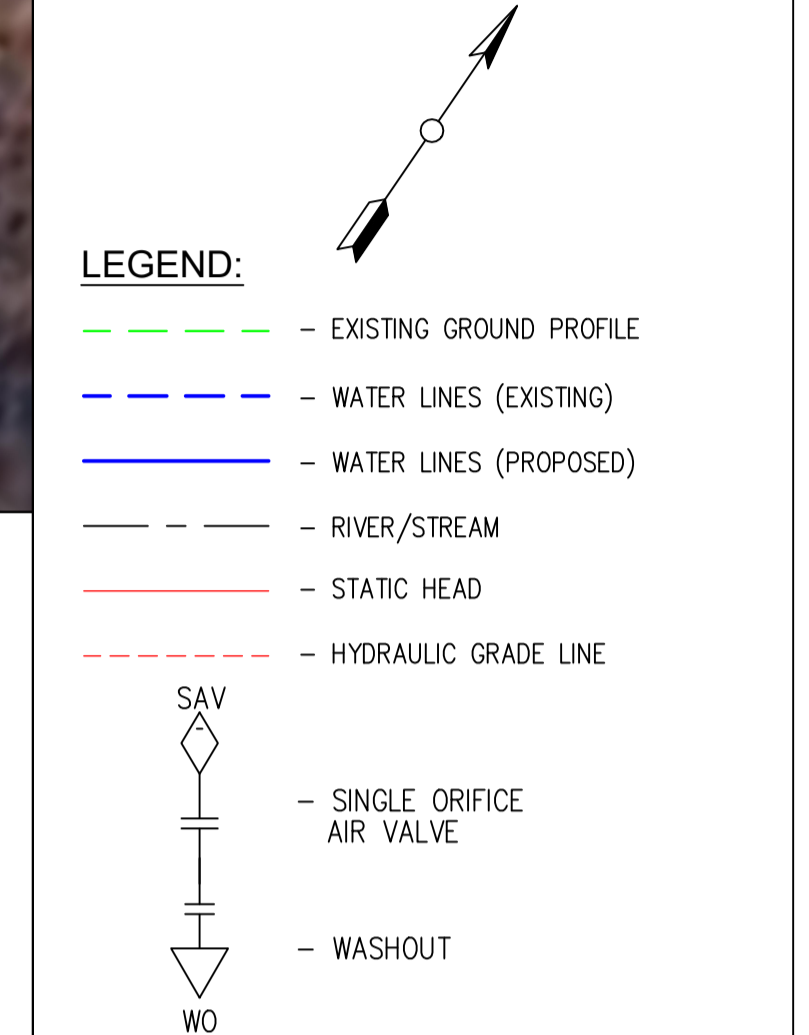
**Drawing Title**  
PROPOSED KYUSO WATER LINES  
PLAN AND PROFILE  
TWIMYUA ROAD LINE

Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1,000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO
STATUS	DWG. No.	SHEET 2 OF 7	REV



**NOTES**

1. ALL DIMENSIONS/LEVELS ARE IN METRES UNLESS NOTED OTHERWISE.
2. PIPES ARE TO BE LAID TO EVEN GRADIENTS WITH A MINIMUM COVER OF 1.0m AND 1.2m FOR TRAFFICKED AREAS. WHERE COVER IS LESS THAN THIS, PIPE TO BE SURROUNDED WITH CONCRETE.
3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH OTHER RELATED DRAWINGS. ANY DISCREPANCIES TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.
4. PRECISE ROUTES TO BE DETERMINED ON SITE.



CHAINAGE (Km+m)	GROUND LEVELS (Masl)	INVERT LEVELS (Masl)	EXCAVATION DEPTH (m)	SIZE/TYPE OF PIPE & HGL	PIPE FITTINGS	SLOPE (%)
1+160	875.03	873.84	1.18	OD 50 HDPE	TO BE DETERMINED ON SITE	-0.49%
1+180	874.94	873.75	1.19			0.99%
1+200	875.14	873.91	1.23			-1.04%
1+220	875.33	874.11	1.22			-1.94%
1+240	875.61	874.31	1.30			-1.20%
1+260	875.69	874.51	1.39			-0.66%
1+280	875.98	874.70	1.27			0.39%
1+300	875.87	874.74	1.13			
1+320	875.56	874.53	1.03			
1+340	875.40	874.32	1.07			
1+360	875.20	874.04	1.15			
1+380	874.69	873.66	1.03			
1+400	874.23	873.27	0.97			
1+420	873.92	872.88	1.05			
1+440	873.61	872.49	1.12			
1+460	873.28	872.10	1.18			
1+480	873.09	871.73	1.36			
1+500	873.50	871.49	2.01			
1+520	872.67	871.25	1.42			
1+540	872.29	871.08	1.22			
1+560	872.12	870.94	1.17			
1+580	871.94	870.81	1.13			
1+600	871.81	870.68	1.13			
1+620	871.69	870.55	1.14			
1+640	871.57	870.42	1.15			
1+660	871.52	870.42	1.11			
1+680	871.57	870.50	1.07			
1+700	871.69	870.57	1.11			
1+720	871.78	870.65	1.13			
1+740	871.93	870.73	1.19			

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY CHECKED			
	BY CHECKED			
	BY CHECKED			
	BY CHECKED			

**Client**

**Financier**

**Project**  
KYUSO ROCK CATCHMENT WATER PROJECT

**Design Consultants.**

15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 718 352 533  
Email: info@lossmanagement.com

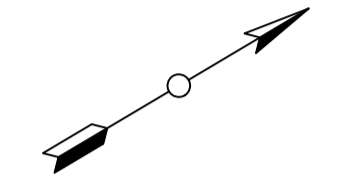
**Drawing Title**  
PROPOSED KYUSO WATER LINES  
PLAN AND PROFILE  
TWIMYUA ROAD LINE

Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1,000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO
0 STATUS	DWG. No.	SHEET 3 OF 7	0 REV



**NOTES**

1. ALL DIMENSIONS/LEVELS ARE IN METRES UNLESS NOTED OTHERWISE.
2. PIPES ARE TO BE LAID TO EVEN GRADIENTS WITH A MINIMUM COVER OF 1.0m AND 1.2m FOR TRAFFICKED AREAS. WHERE COVER IS LESS THAN THIS, PIPE TO BE SURROUNDED WITH CONCRETE.
3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH OTHER RELATED DRAWINGS. ANY DISCREPANCIES TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.
4. PRECISE ROUTES TO BE DETERMINED ON SITE.

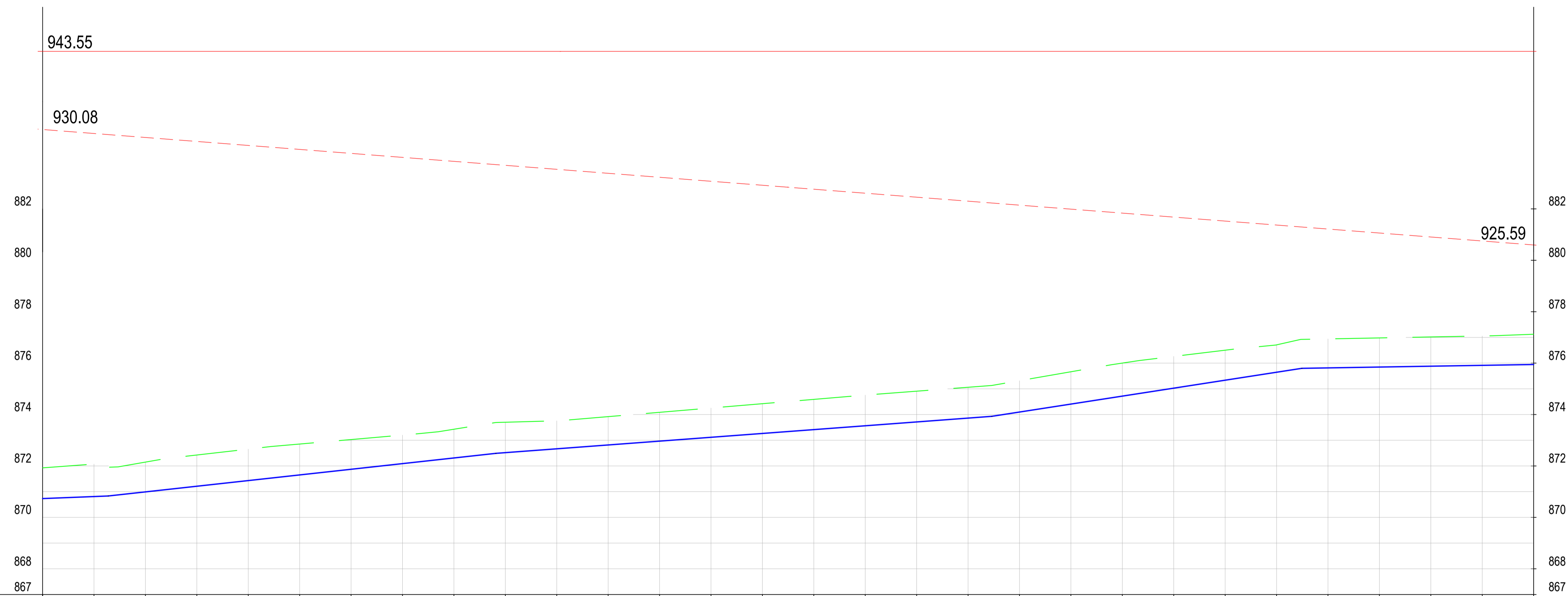


**LEGEND:**

- EXISTING GROUND PROFILE
- WATER LINES (EXISTING)
- WATER LINES (PROPOSED)
- RIVER/STREAM
- STATIC HEAD
- HYDRAULIC GRADE LINE
- SAV
- SINGLE ORIFICE AIR VALVE
- WO
- WASHOUT

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			



CHAINAGE (Km+m)	GROUND LEVELS (Masl)	INVERT LEVELS (Masl)	EXCAVATION DEPTH (m)	SIZE/TYPE OF PIPE & HGL	PIPE FITTINGS	SLOPE (%)
1+740	871.93	870.73	1.19	OD 50 HDPE	TO BE DETERMINED ON SITE	0.39%
1+760	872.07	870.81	1.26			
1+780	872.15	870.99	1.16			
1+800	872.43	871.21	1.22			
1+820	872.65	871.43	1.22			
1+840	872.85	871.65	1.20			
1+860	873.03	871.87	1.16			
1+880	873.20	872.09	1.11			
1+900	873.43	872.31	1.12			
1+920	873.70	872.52	1.18			
1+940	873.76	872.67	1.09			
1+960	873.92	872.82	1.10			
1+980	874.09	872.97	1.12			
2+000	874.25	873.12	1.14			
2+020	874.42	873.26	1.16			
2+040	874.59	873.41	1.18			
2+060	874.76	873.56	1.19			
2+080	874.91	873.71	1.20			
2+100	875.06	873.86	1.20			
2+120	875.32	874.10	1.22			
2+140	875.66	874.41	1.26			
2+160	876.00	874.72	1.28			
2+180	876.26	875.03	1.24			
2+200	876.50	875.34	1.17			
2+220	876.71	875.65	1.07			
2+240	876.94	875.81	1.13			
2+260	876.98	875.85	1.13			
2+280	877.02	875.88	1.14			
2+300	877.06	875.91	1.14			
2+320	877.12	875.95	1.18			

**Client**

**Financier**

**Project**  
**KYUSO ROCK CATCHMENT WATER PROJECT**

**Design Consultants.**

15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 718 862 533  
Email: info@losaimanagement.com

**Drawing Title**  
**PROPOSED KYUSO WATER LINES PLAN AND PROFILE TWIMYUA ROAD LINE**

Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1,000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO
STATUS	DWG. No.	SHEET 4 OF 7	REV



**NOTES**

1. ALL DIMENSIONS/LEVELS ARE IN METRES UNLESS NOTED OTHERWISE.
2. PIPES ARE TO BE LAID TO EVEN GRADIENTS WITH A MINIMUM COVER OF 1.0m AND 1.2m FOR TRAFFICKED AREAS. WHERE COVER IS LESS THAN THIS, PIPE TO BE SURROUNDED WITH CONCRETE.
3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH OTHER RELATED DRAWINGS. ANY DISCREPANCIES TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.
4. PRECISE ROUTES TO BE DETERMINED ON SITE.

**LEGEND:**

- - - - - EXISTING GROUND PROFILE
- - - - - WATER LINES (EXISTING)
- — — — WATER LINES (PROPOSED)
- - - - - RIVER/STREAM
- — — — STATIC HEAD
- - - - - HYDRAULIC GRADE LINE

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY CHECKED			
	BY CHECKED			
	BY CHECKED			
	BY CHECKED			

**Client**

**Financier**

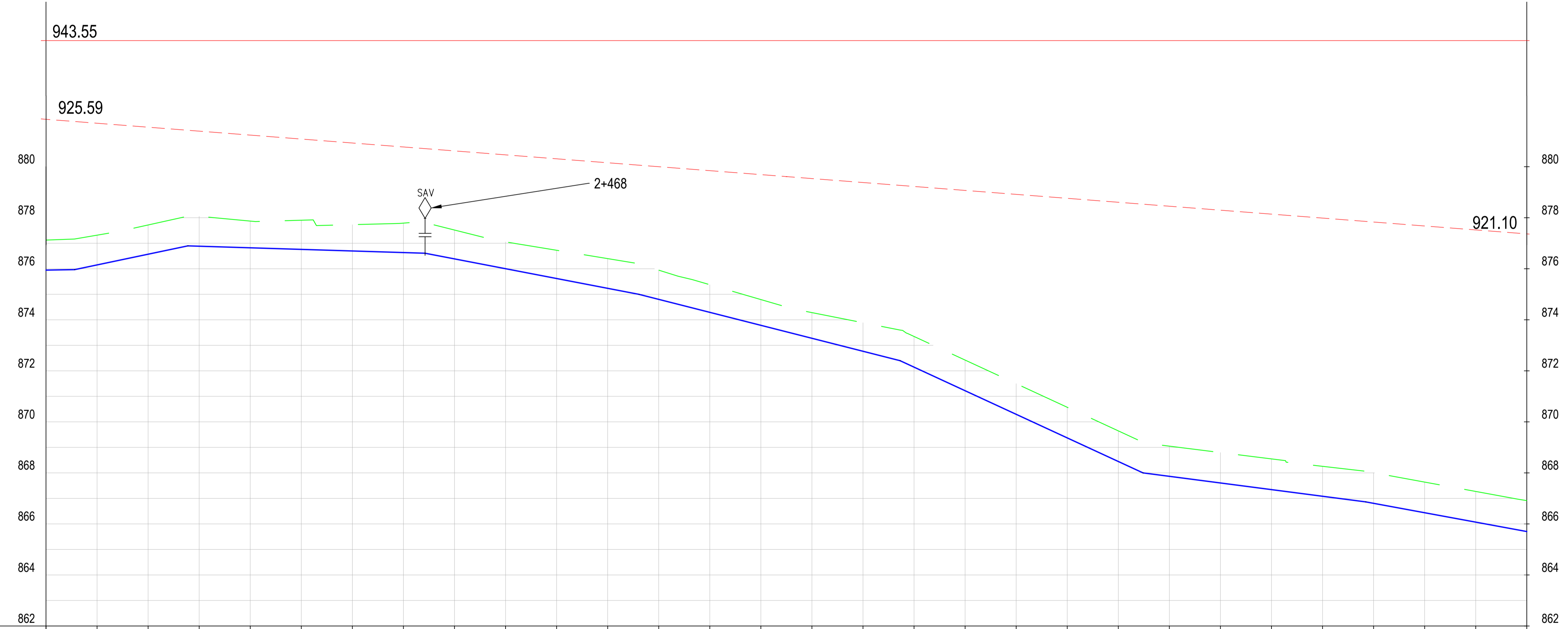
**Project**  
**KYUSO ROCK CATCHMENT WATER PROJECT**

**Design Consultants.**

15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 788 352 533  
Email: info@ossmanagement.com

**Drawing Title**  
**PROPOSED KYUSO WATER LINES**  
**PLAN AND PROFILE**  
**TWIMYUA ROAD LINE**

Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1,000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO
0 STATUS	DWG. No.	SHEET 5 OF 7	0 REV

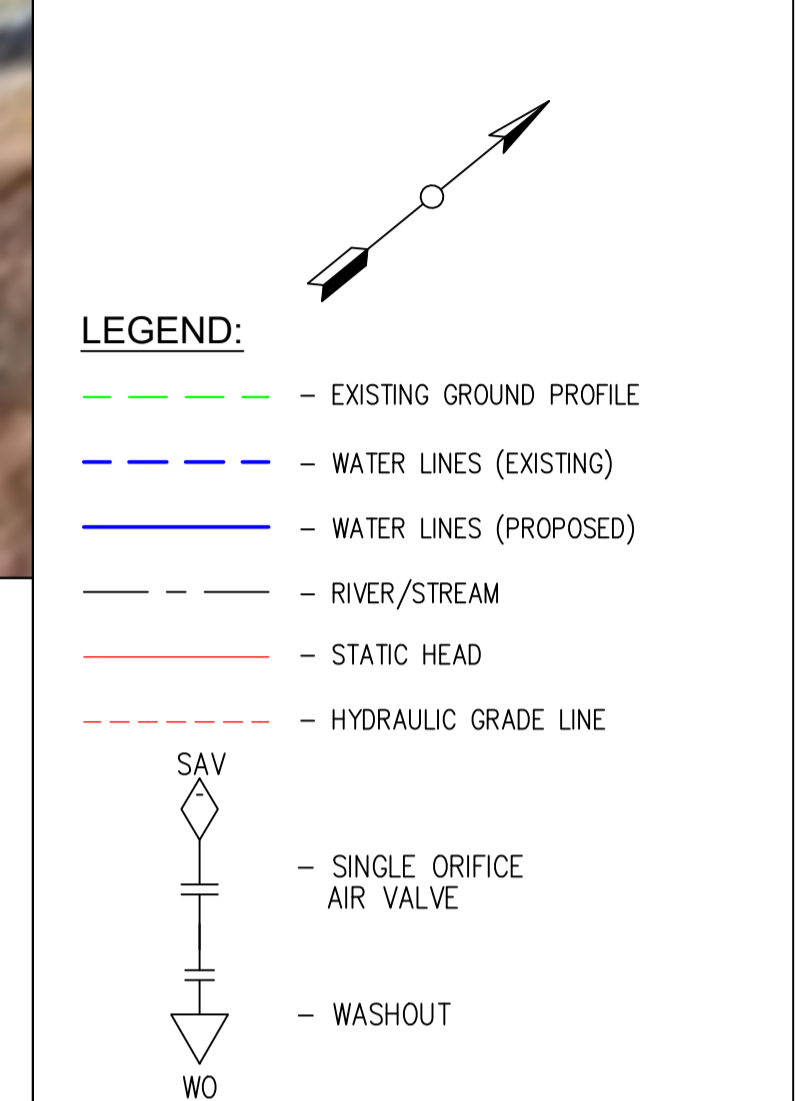


CHAINAGE (Km+m)	GROUND LEVELS (Masl)	INVERT LEVELS (Masl)	EXCAVATION DEPTH (m)
2+320	871.12	875.95	1.18
2+340	877.32	876.15	1.17
2+360	877.72	876.57	1.15
2+380	876.06	876.88	1.17
2+400	877.87	876.82	1.05
2+420	877.90	876.76	1.14
2+440	877.73	876.70	1.03
2+460	877.79	876.63	1.15
2+480	877.52	876.39	1.13
2+500	877.05	876.00	1.05
2+520	876.73	875.62	1.11
2+540	876.40	875.23	1.17
2+560	875.95	874.80	1.15
2+580	875.38	874.29	1.08
2+600	874.79	873.78	1.01
2+620	874.28	873.27	1.01
2+640	873.89	872.77	1.12
2+660	873.35	872.14	1.20
2+680	872.42	871.22	1.20
2+700	871.50	870.30	1.20
2+720	870.57	869.37	1.20
2+740	869.65	868.45	1.20
2+760	869.05	867.87	1.18
2+780	868.80	867.60	1.19
2+800	868.55	867.34	1.20
2+820	868.26	867.08	1.17
2+840	868.01	866.81	1.20
2+860	867.64	866.44	1.20
2+880	867.27	866.07	1.20
2+900	866.91	865.70	1.21

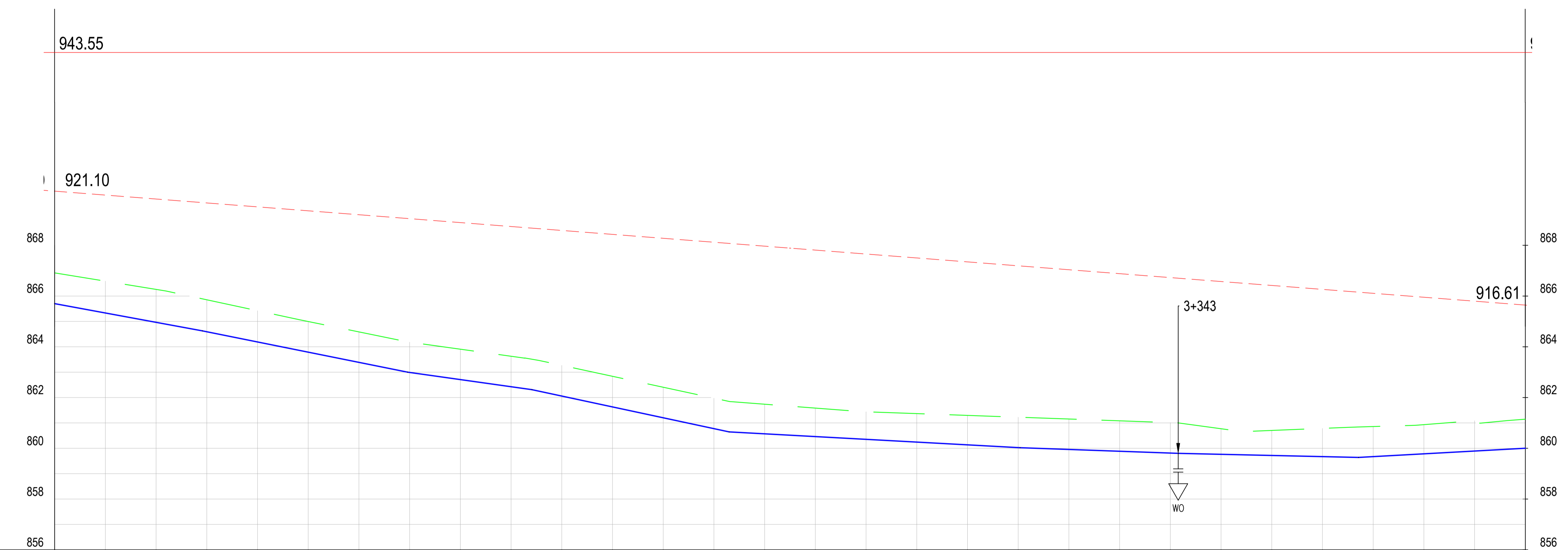
SIZE/TYPE OF PIPE & HGL	← OD 50 HDPE →	
PIPE FITTINGS	← TO BE DETERMINED ON SITE →	
SLOPE (%)		



- NOTES**
1. ALL DIMENSIONS/LEVELS ARE IN METRES UNLESS NOTED OTHERWISE.
  2. PIPES ARE TO BE LAID TO EVEN GRADIENTS WITH A MINIMUM COVER OF 1.0m AND 1.2m FOR TRAFFICKED AREAS. WHERE COVER IS LESS THAN THIS, PIPE TO BE SURROUNDED WITH CONCRETE.
  3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH OTHER RELATED DRAWINGS. ANY DISCREPANCIES TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.
  4. PRECISE ROUTES TO BE DETERMINED ON SITE.



PRELIMINARY ISSUE  
Signed: Team Leader .....



CHAINAGE (Km+m)	2+900	2+920	2+940	2+960	2+980	3+000	3+020	3+040	3+060	3+080	3+100	3+120	3+140	3+160	3+180	3+200	3+220	3+240	3+260	3+280	3+300	3+320	3+340	3+360	3+380	3+400	3+420	3+440	3+460	3+480		
GROUND LEVELS (Masl)	866.91	866.59	866.26	865.85	865.42	865.00	864.59	864.18	863.91	863.63	863.27	862.84	862.41	861.98	861.74	861.58	861.44	861.37	861.30	861.23	861.15	861.08	861.01	860.77	860.70	860.78	860.86	860.93	861.09	861.15		
INVERT LEVELS (Masl)	865.70	865.33	864.96	864.59	864.19	863.79	863.39	862.99	862.71	862.43	862.06	861.63	861.20	860.77	860.57	860.46	860.35	860.24	860.14	860.03	859.95	859.88	859.81	859.76	859.72	859.67	859.67	859.78	859.89	860.00		
EXCAVATION DEPTH (m)	1.21	1.25	1.30	1.26	1.23	1.21	1.20	1.20	1.20	1.20	1.21	1.21	1.20	1.20	1.17	1.12	1.09	1.12	1.16	1.20	1.20	1.20	1.20	1.01	0.99	1.11	1.19	1.15	1.20	1.14		
SIZE/TYPE OF PIPE & HGL	OD 50 HDPE																															
PIPE FITTINGS	TO BE DETERMINED ON SITE																															
SLOPE (%)	-1.84%		-2.01%			-1.41%		-2.14%				-0.54%				-0.36%		-0.23%		0.55%												

REV	REVISIONS	SIGN	DATE	APPROVED
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			

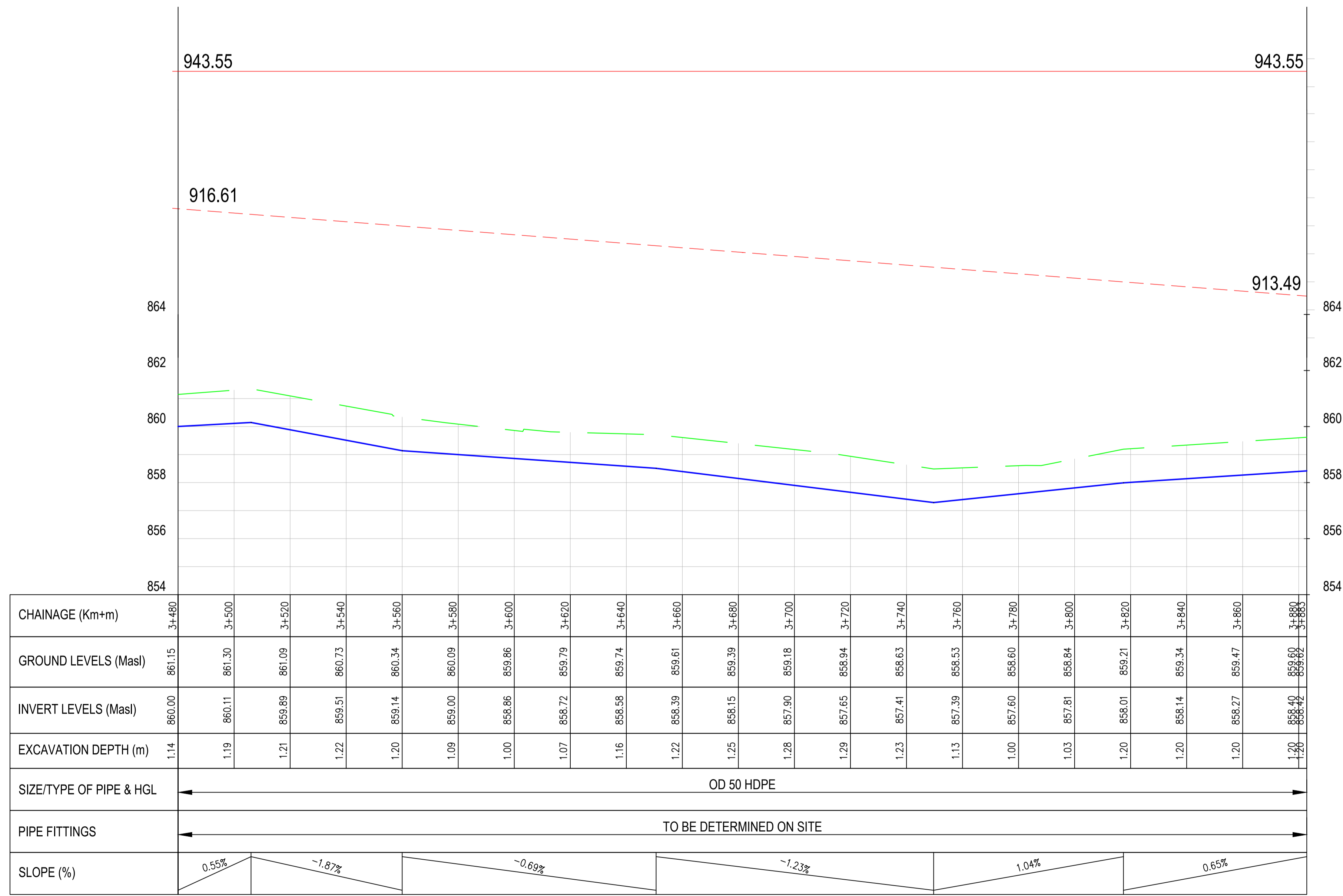


**Project**  
KYUSO ROCK CATCHMENT WATER PROJECT

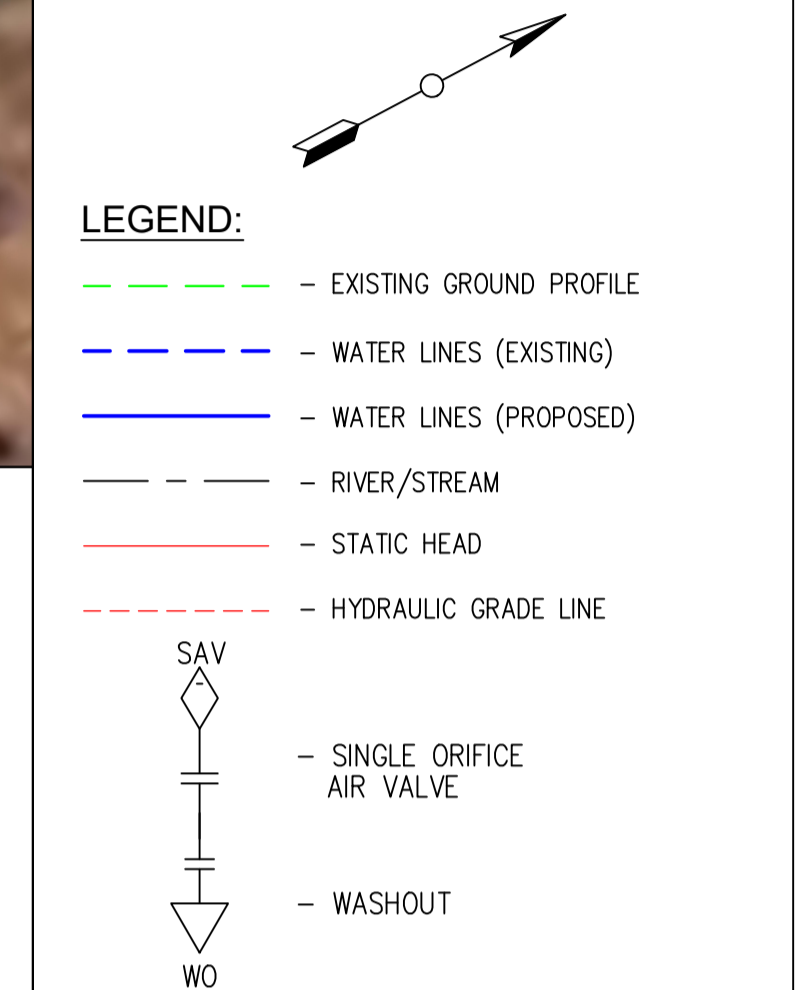
**Design Consultants.**  
15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 718 352 533  
Email: info@lossmanagement.com

**Drawing Title**  
PROPOSED KYUSO WATER LINES  
PLAN AND PROFILE  
TWIMYUA ROAD LINE

Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1,000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO
STATUS	DWG. No.	SHEET 6 OF 7	REV



- NOTES**
1. ALL DIMENSIONS/LEVELS ARE IN METRES UNLESS NOTED OTHERWISE.
  2. PIPES ARE TO BE LAID TO EVEN GRADIENTS WITH A MINIMUM COVER OF 1.0m AND 1.2m FOR TRAFFICKED AREAS. WHERE COVER IS LESS THAN THIS, PIPE TO BE SURROUNDED WITH CONCRETE.
  3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH OTHER RELATED DRAWINGS. ANY DISCREPANCIES TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.
  4. PRECISE ROUTES TO BE DETERMINED ON SITE.



PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED

**Client**

**Financier**

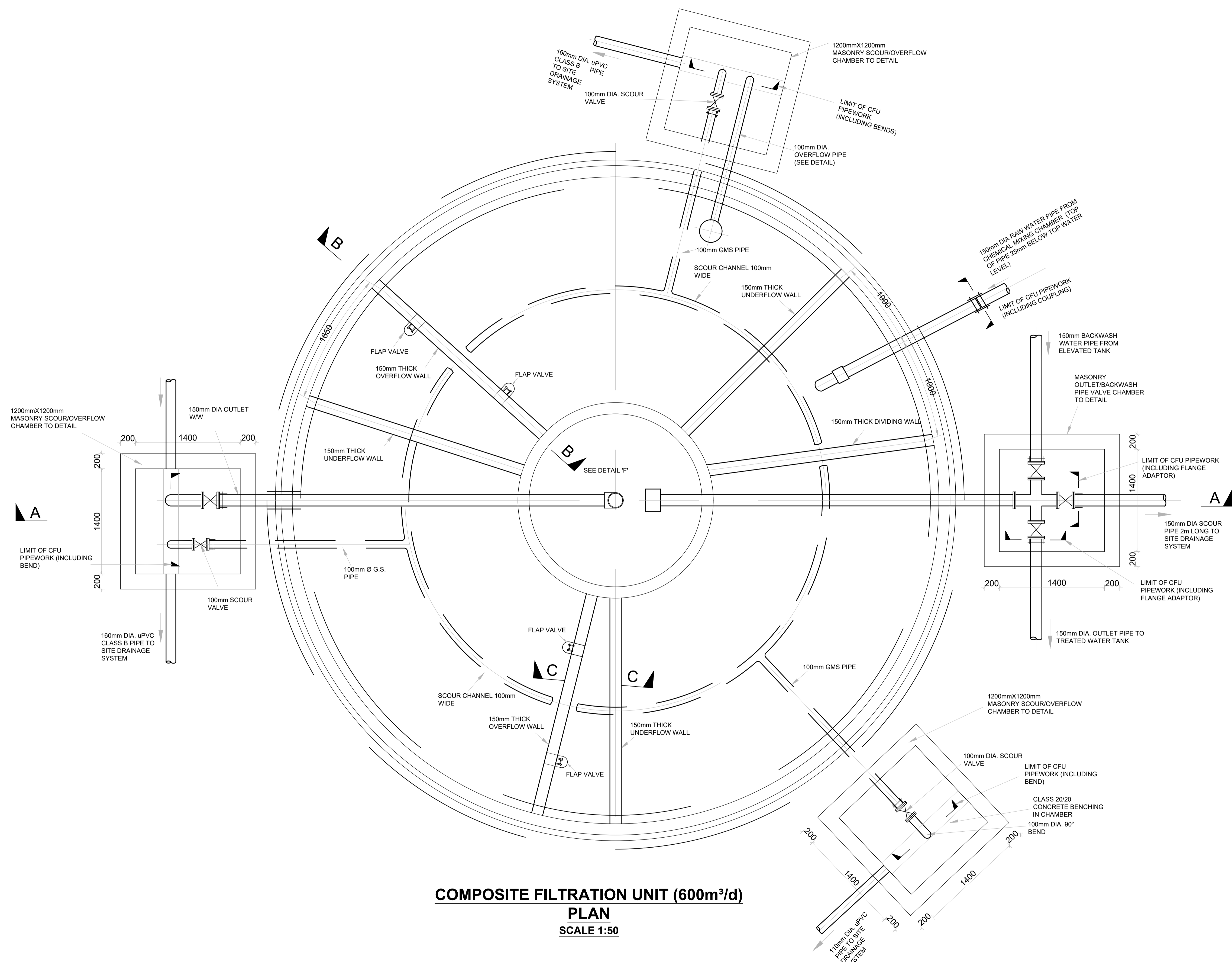
**Project**  
KYUSO ROCK CATCHMENT WATER PROJECT

**Design Consultants.**

15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 788 352 533  
Email: info@losaimanagement.com

**Drawing Title**  
PROPOSED KYUSO WATER LINES  
PLAN AND PROFILE  
TWIMYUA ROAD LINE

Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1,000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO
STATUS	DWG. No.	SHEET 7 OF 7	REV



**COMPOSITE FILTRATION UNIT (600m<sup>3</sup>/d)**  
**PLAN**  
**SCALE 1:50**

**NOTES**

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.

PRELIMINARY ISSUE  
 Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			

Client

Financier

Project  
**KYUSO ROCK CATCHMENT WATER PROJECT**

Design Consultants.

15 Westlands Road, Westland  
 P.O. Box 30337-00100 Nairobi, Kenya  
 Tel: +254 718 875 310  
 +254 788 352 333  
 Email: info@losmanagement.com

Drawing Title  
 KYUSO LAYOUT PLAN  
 TREATMENT WORKS  
 COMPOSITE FILTRATION UNIT

Designed by JMM	Drawn by KCK
Checked by JN	Approved by JR
Scale H = 1:1,000 V = 1:100	Date NOV 2023
Job No.	ACAD File: kyuso
0 STATUS	DWG. No. SHEET 1 OF 4
	0 REV

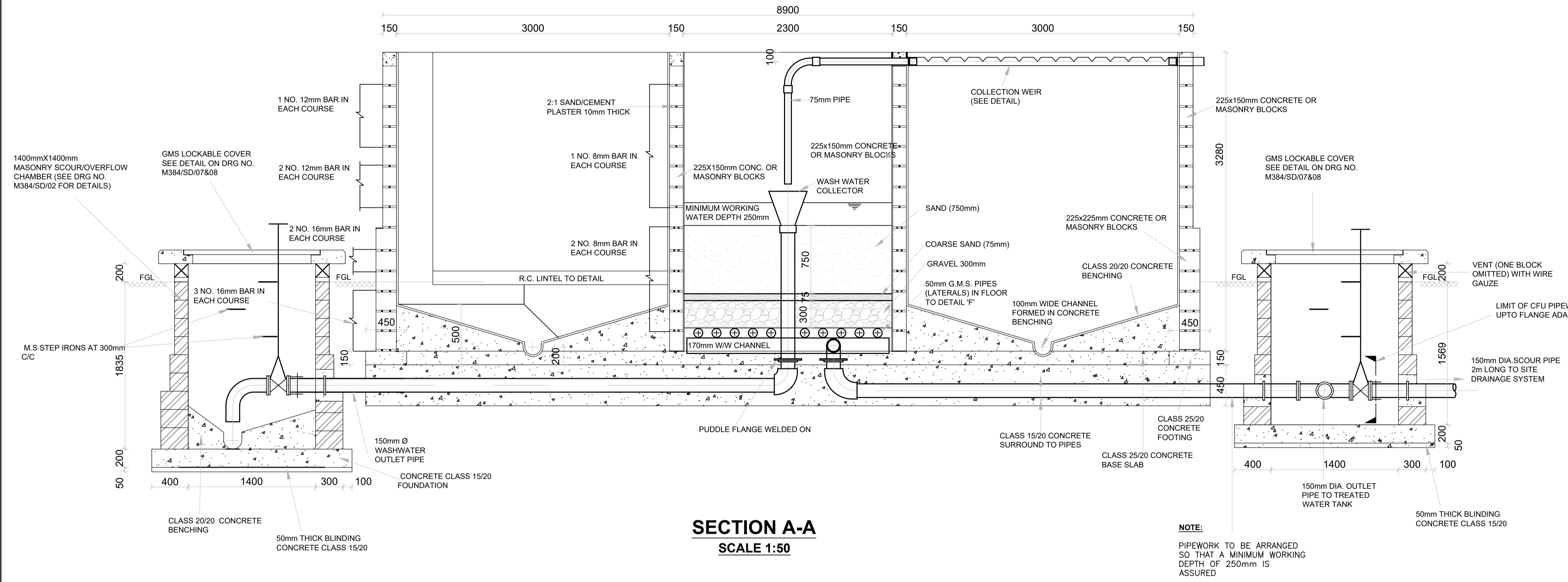


**NOTES**

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.

**NOTES**

1. DIMENSIONS IN MM UNLESS OTHERWISE SPECIFIED
2. ABBREVIATIONS:  
W/W - WASHWATER  
G.M.S - GALVANISED MILD STEEL
3. REINFORCEMENT BARS ARE MILD STEEL ROUND BARS TO B.S. 4449
4. ALL PIPE DIAMETERS ARE NOMINAL SIZES
5. ALL PIPEWORK WITHIN THE CFU UPTO THE LIMITS SHOWN TO BE QUANTIFIED WITH THE CFU PIPES AND FITTINGS TO BE APPROVED LINED FERROUS PIPES AND FITTINGS
6. FOR CONSTRUCTION DETAILS OF MASONRY CHAMBERS SEE DRG NO. M384/SD/02
7. FOR DETAILS OF GMS LOCKABLE COVERS SEE DRG NO. M384/SD/07&08



**SECTION A-A**  
SCALE 1:50

**NOTE:**  
PIPEWORK TO BE ARRANGED SO THAT A MINIMUM WORKING DEPTH OF 250mm IS ASSURED

**FILTER MEDIA DETAILS**

MATERIAL	DIAMETER (mm)	DEPTH IN mm	LOCATION
GRAVEL	38-20	75	BOTTOM
	20-12	75	"
	12-5	75	"
	5-2	75	"
COARSE SAND EFFECTIVE SIZE	1.0	75	MIDDLE
SAND EFFECTIVE SIZE	0.5		
UNIFORMITY COEFFICIENT	1.5	750	TOP
<b>TOTAL THICKNESS OF FILTER BED</b>		<b>1125</b>	

**DETAILS OF LATERALS**

50mm G.M.S. PIPES REQUIRED		
OVERALL LENGTH	NO. OF HOLES PER PIPES	NO. REQUIRED
900	5	4
1300	7	2
1700	9	2
2100	11	4
<b>REQUIRED 96 NOZZLES IN ALL</b>		

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE APPROVED
	BY		
	CHECKED		
	BY		
	CHECKED		
	BY		
	CHECKED		
	BY		
	CHECKED		

Client

Financier

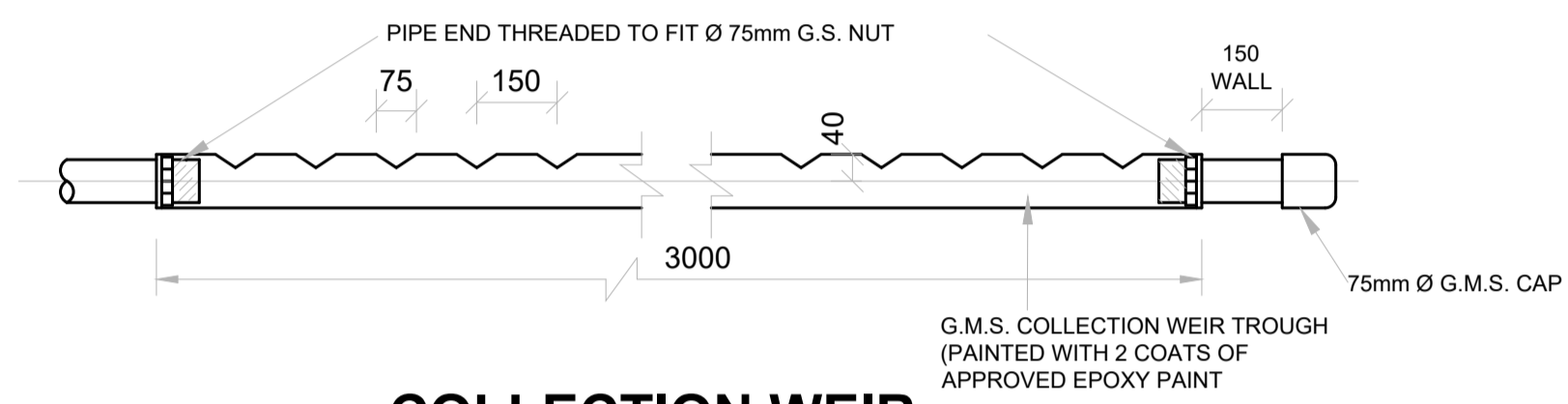
Project  
**KYUSO ROCK CATCHMENT WATER PROJECT**

Design Consultants.

15 Westlands Road, Westland  
P.O. Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 975 310  
+254 788 932 533  
Email: info@losimangement.com

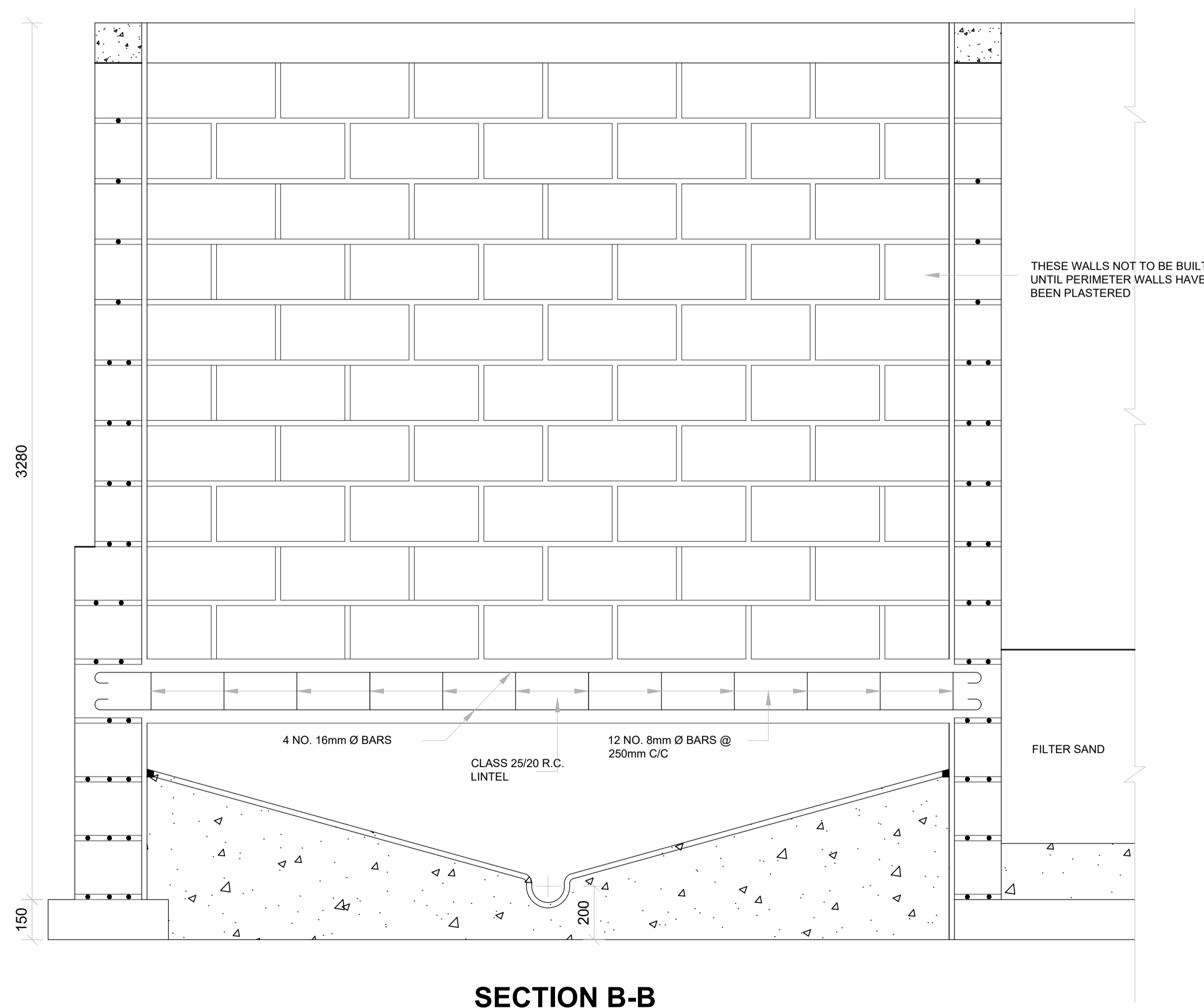
Drawing Title  
**KYUSO LAYOUT PLAN  
TREATMENT WORKS  
COMPOSITE FILTRATION UNIT**

Designed by JMM	Drawn by KCK
Checked by JN	Approved by JR
Scale H = 1:1,000 V = 1:100	Date NOV 2023
Job No.	ACAD File: kyuso
0 STATUS	DWG. No. SHEET 2 OF 4
	0 REV

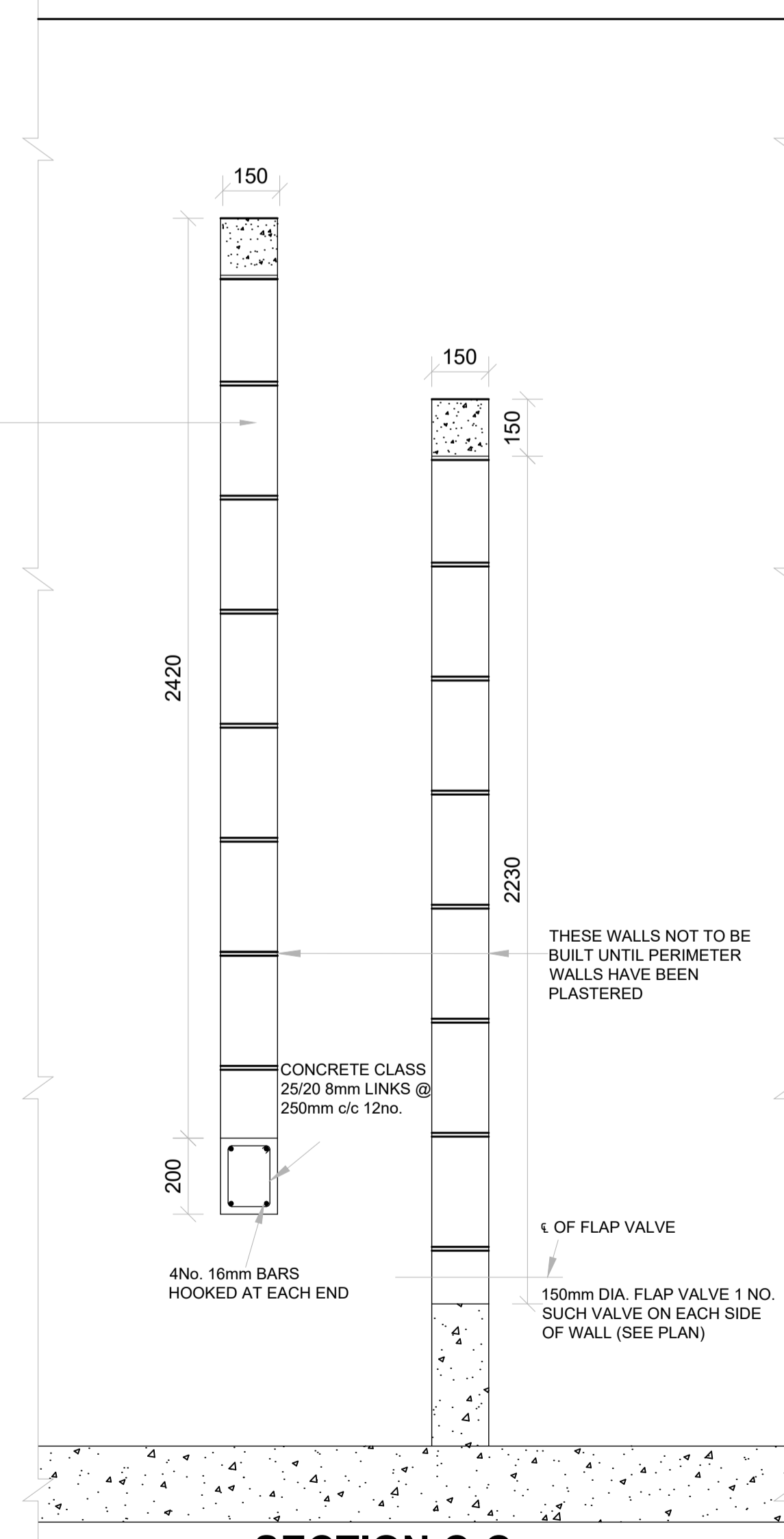


**COLLECTION WEIR**

(INLET PIPE TO BE SET AT LEAST 25mm ABOVE OUTLET PIPE)



**SECTION B-B**



**SECTION C-C**

**NOTES**

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			



Client  
WaterFund  
Financing the Water Sector

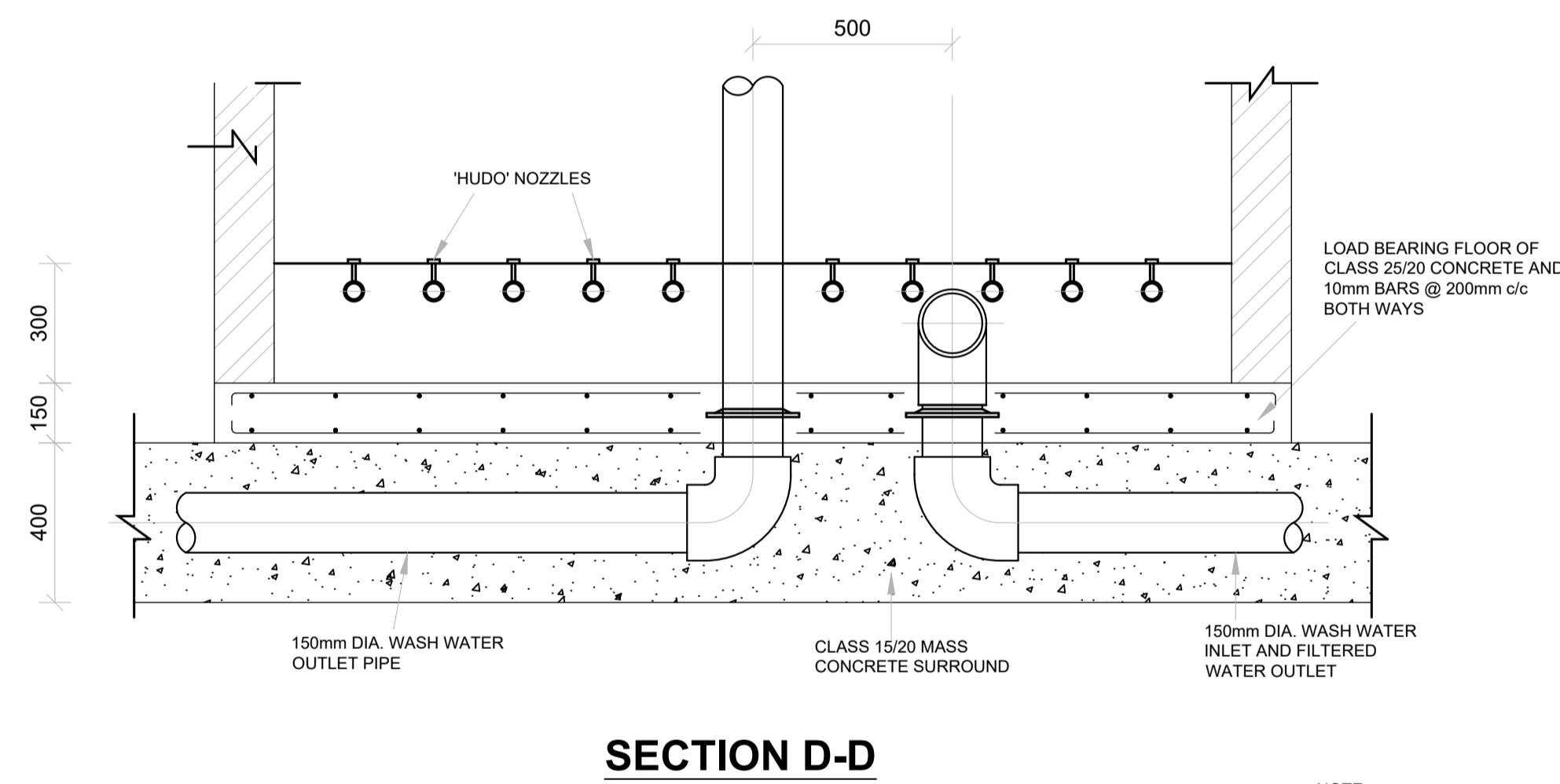
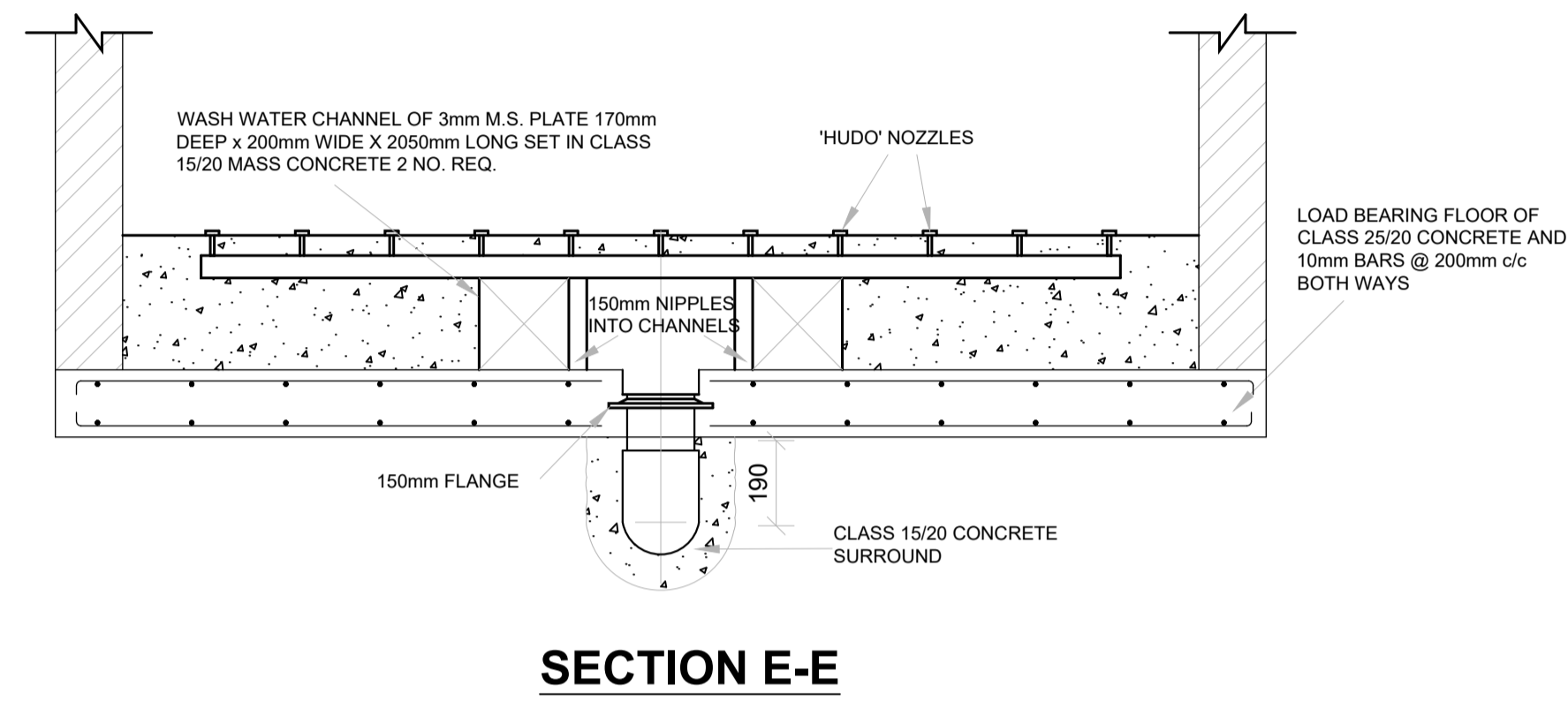
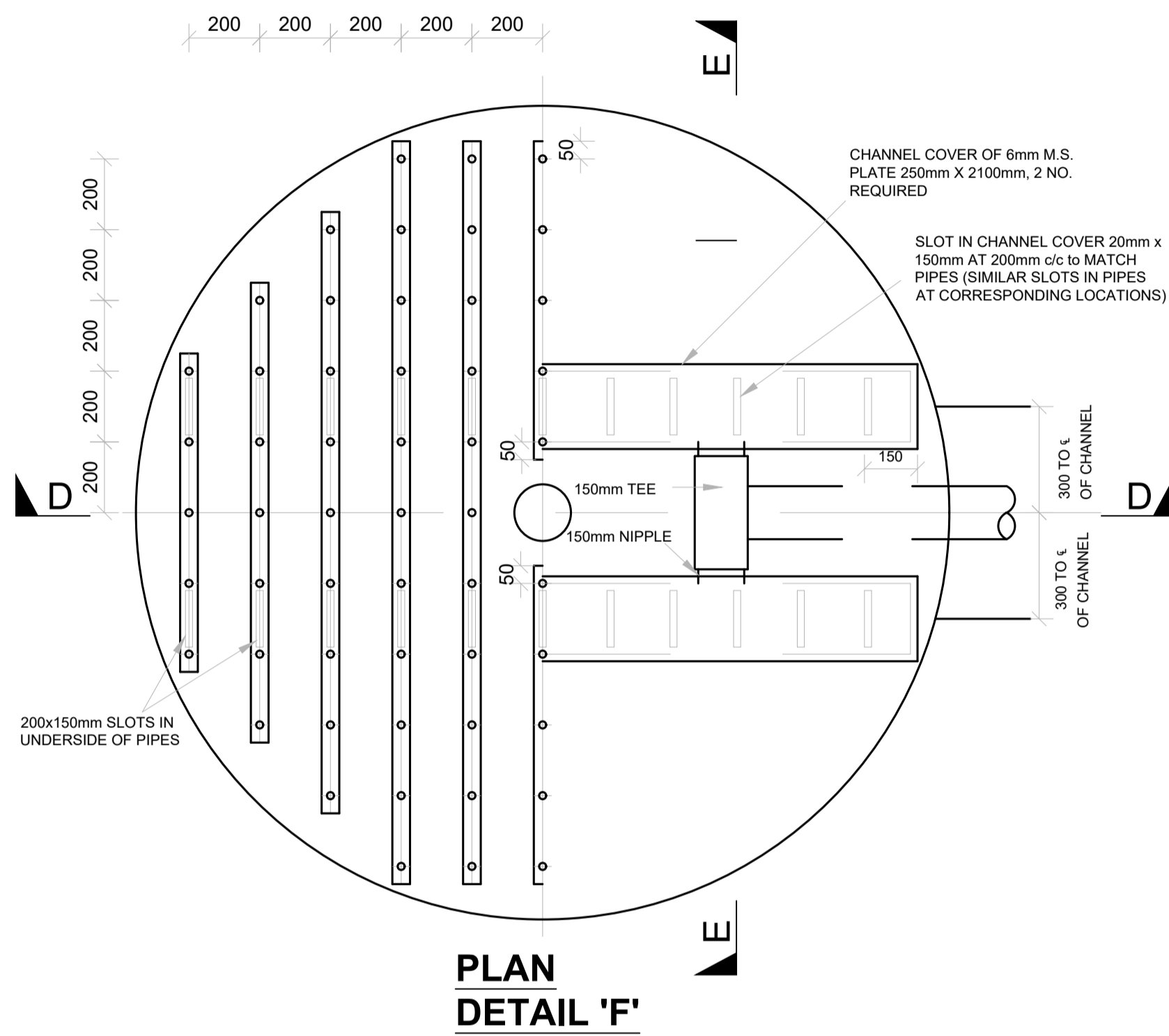
Financier  
European Union  
GOVERNMENT OF KENYA

Project  
**KYUSO ROCK CATCHMENT WATER PROJECT**

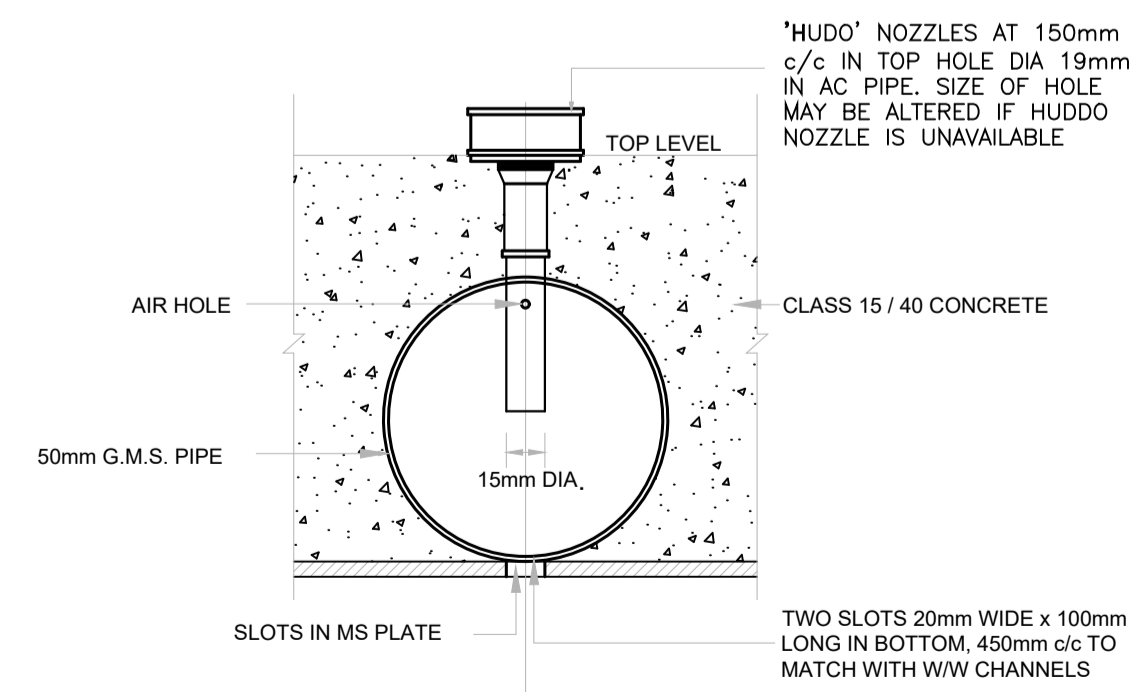
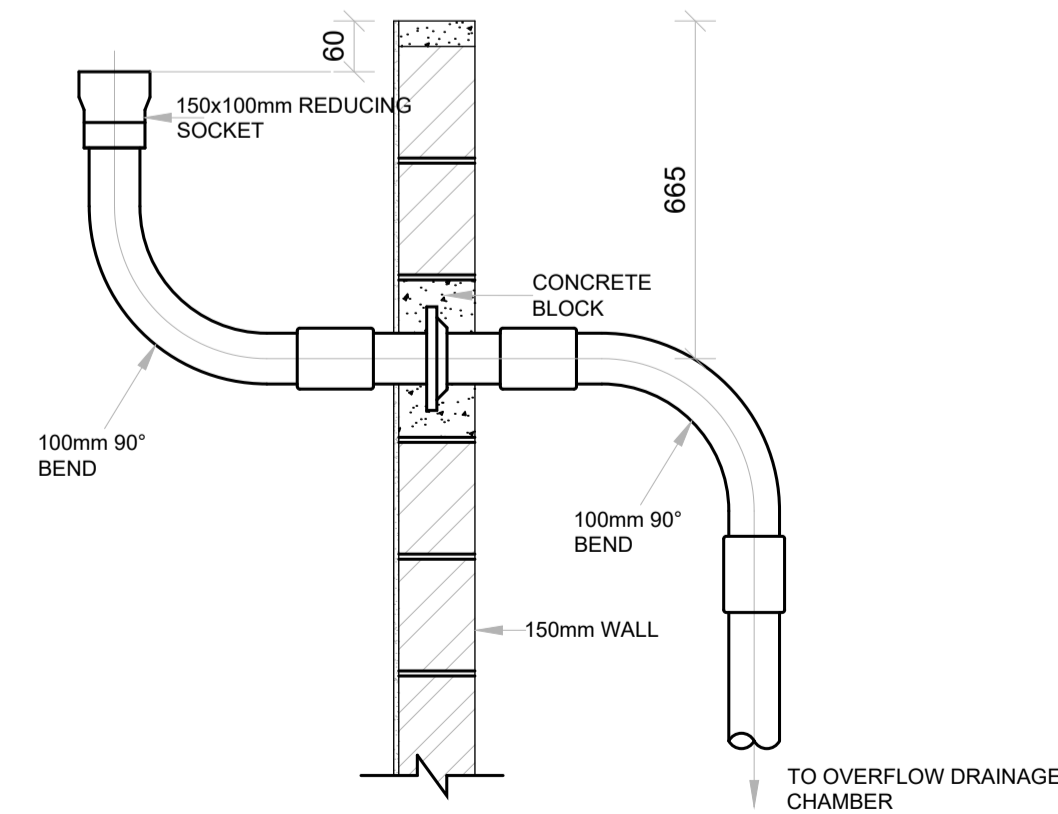
Design Consultants.  
Lokal  
15 Westlands Road, Westland  
P.O. Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 788 352 533  
Email: info@lksmanagement.com

Drawing Title  
**KYUSO LAYOUT PLAN  
TREATMENT WORKS  
COMPOSITE FILTRATION UNIT**

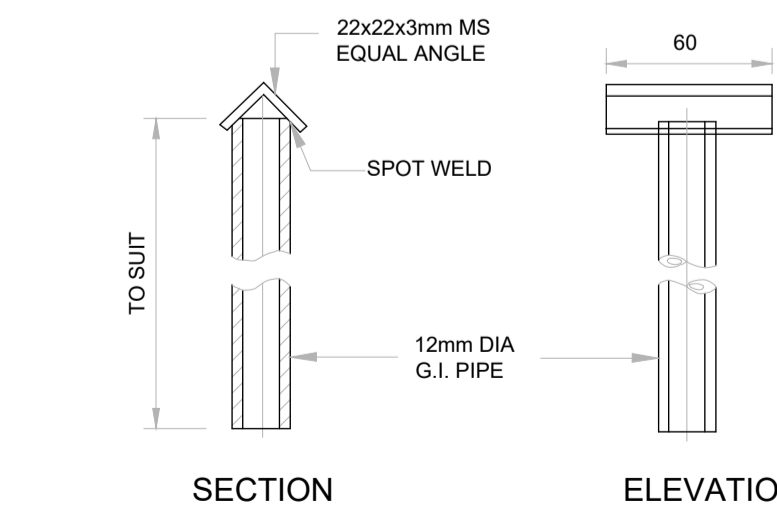
Designed by JMM	Drawn by KCK
Checked by JN	Approved by JR
Scale H = 1:1,000 V = 1:100	Date NOV 2023
Job No.	ACAD File: kyuso
0 STATUS	DWG. No. SHEET 3 OF 4
	0 REV



NOTE:  
UNDERDRAIN PIPES AND CHANNELS TO BE SECURED AS DIRECTED BY THE ENGINEER WITH NO. 8 GAUGE WIRE STIRRUPS PRIOR TO PLACEMENT OF MASS CONCRETE



N.T.S.



N.T.S.

**NOTES**

1. DIMENSIONS IN MM UNLESS OTHERWISE SPECIFIED
2. ABBREVIATIONS:  
W/W - WASHWATER  
G.M.S - GALVANISED MILD STEEL

**NOTES**

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			

Client



Financier



Project

**KYUSO ROCK CATCHMENT WATER PROJECT**

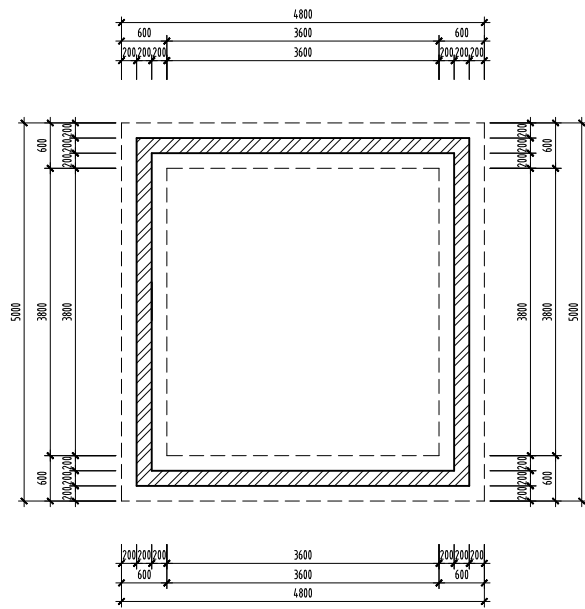
Design Consultants.



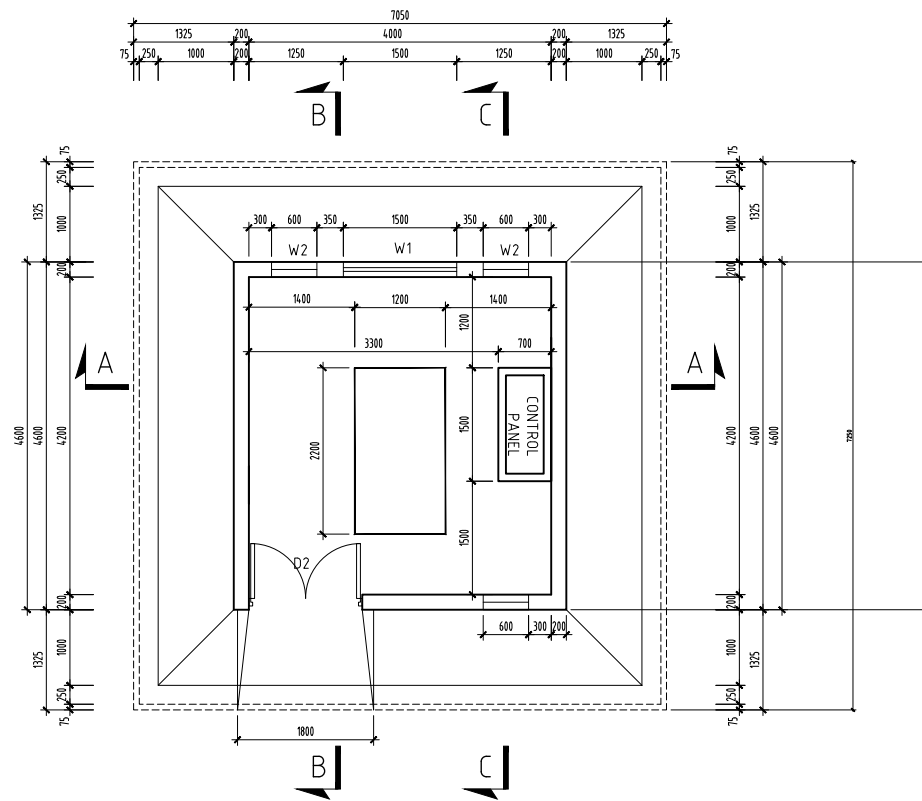
Drawing Title

**KYUSO LAYOUT PLAN  
TREATMENT WORKS  
COMPOSITE FILTRATION UNIT**

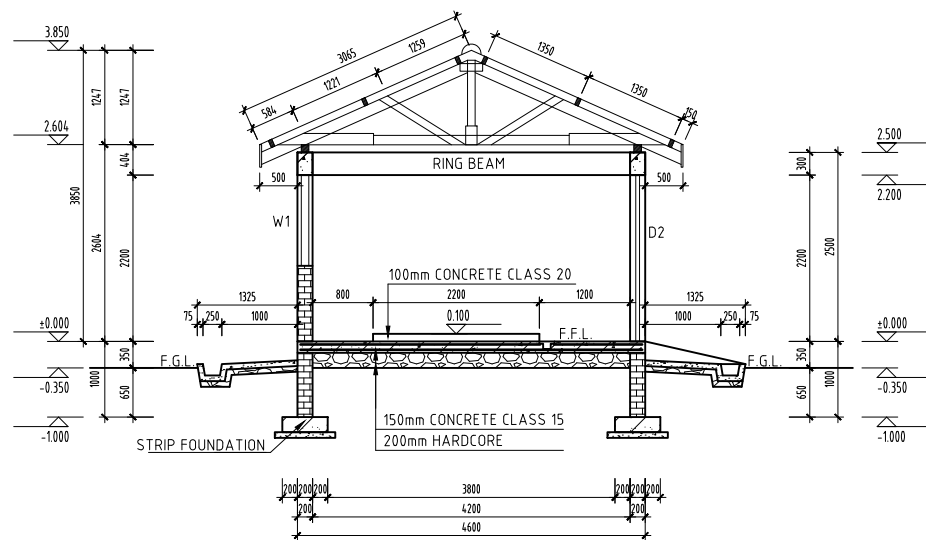
Designed by JMM	Drawn by KCK
Checked by JN	Approved by JR
Scale H = 1:1,000 V = 1:100	Date NOV 2023
Job No.	ACAD File: kyuso
0 STATUS	DWG. No. SHEET 4 OF 4
	0 REV



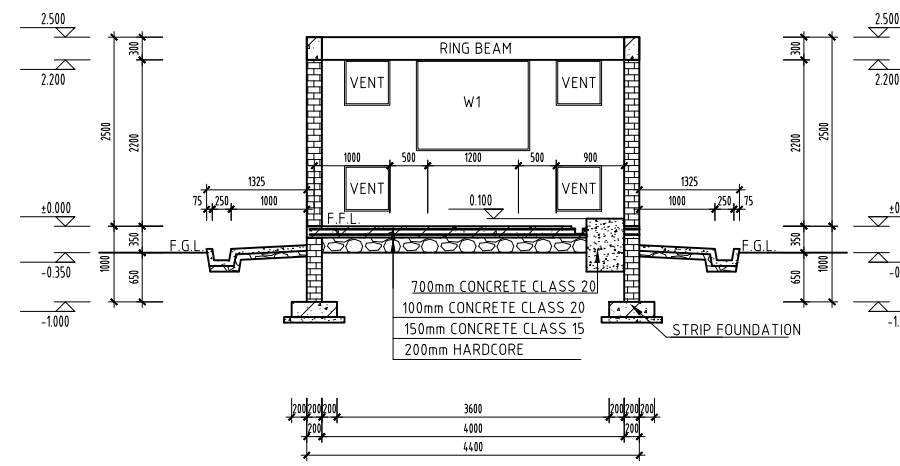
FOUNDATION PLAN  
Scale: 1:100



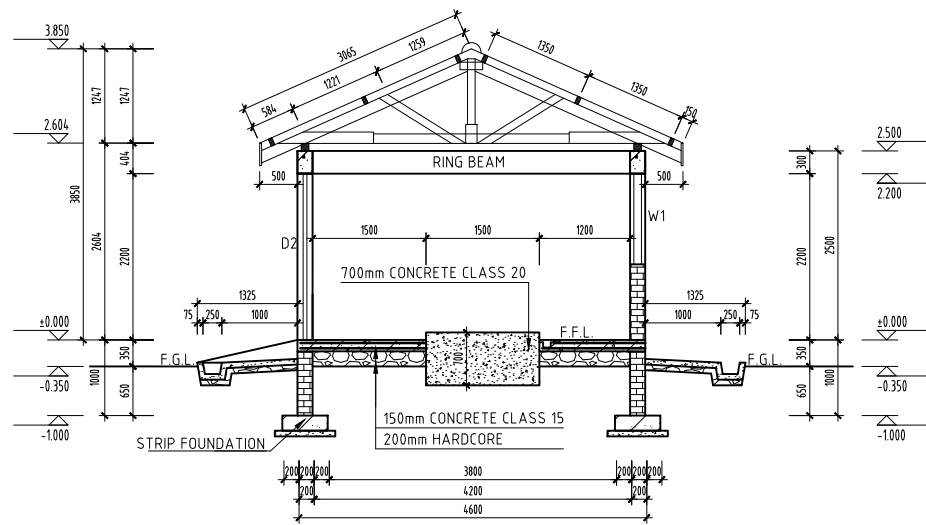
FLOOR PLAN  
Scale: 1:100



SECTION B-B  
Scale: 1:100



SECTION A-A  
Scale: 1:100



SECTION C-C  
Scale: 1:100

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	BY	SIGN	DATE	APPROVED
		CHECKED			
		CHECKED			
		CHECKED			
		CHECKED			

Client



Financier



Project

**KYUSO ROCK CATCHMENT  
WATER PROJECT**

Design Consultants.

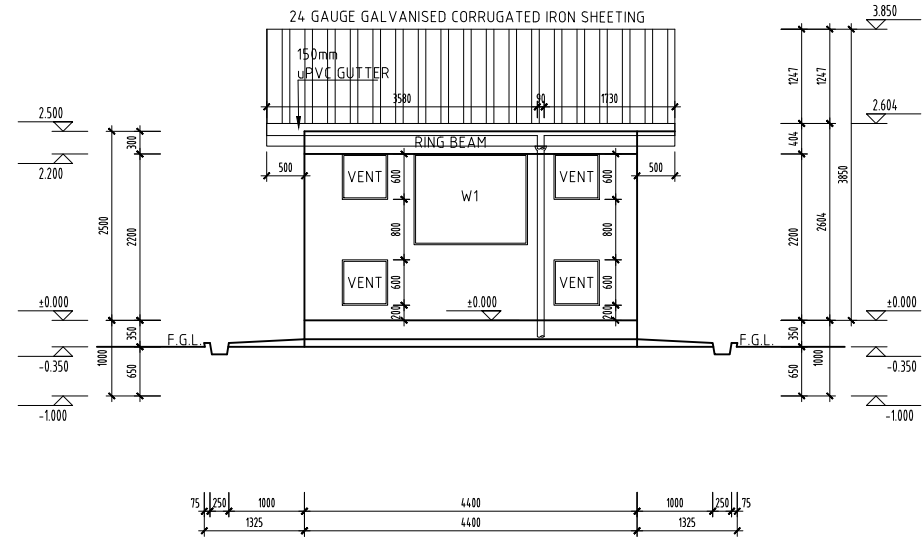


15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 7188 352 533  
Email: info@lossmanagement.com

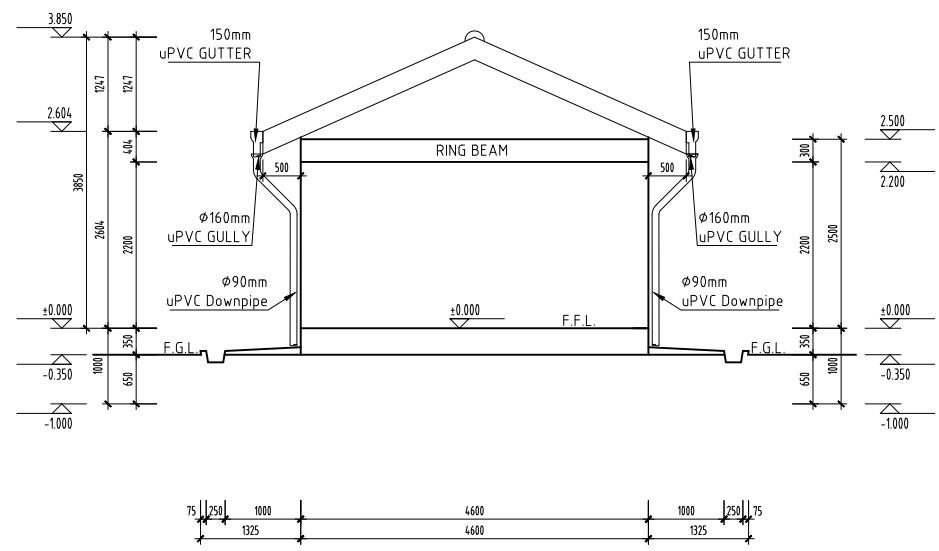
Drawing Title

**DETAILED DESIGN  
CONTROL ROOM\_PUMP HOUSE**

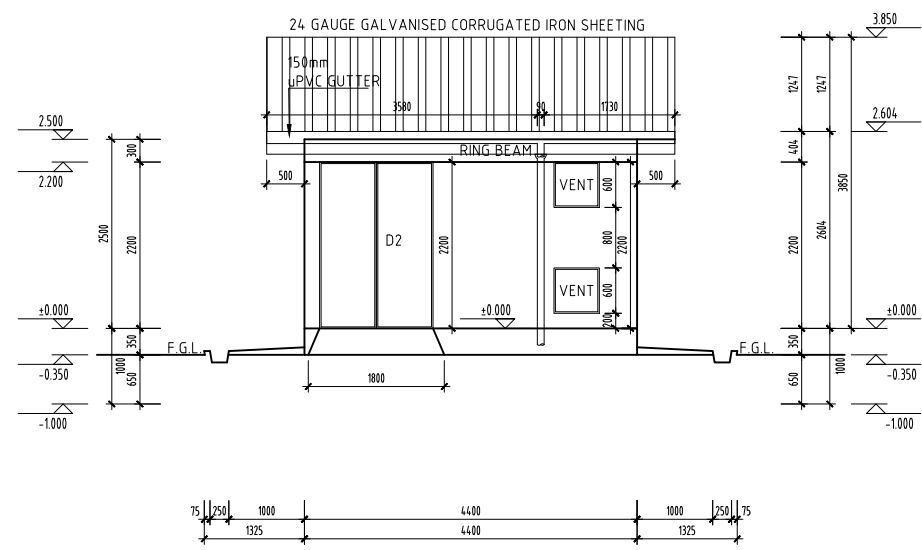
Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO
0 STATUS	DWG. No.	SHEET 1 OF 1	0 REV



REAR VIEW  
Scale: 1:100



SIDE VIEW  
Scale: 1:100



FRONT VIEW  
Scale: 1:100

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	BY	SIGN	DATE	APPROVED
		CHECKED			
		CHECKED			
		CHECKED			
		CHECKED			



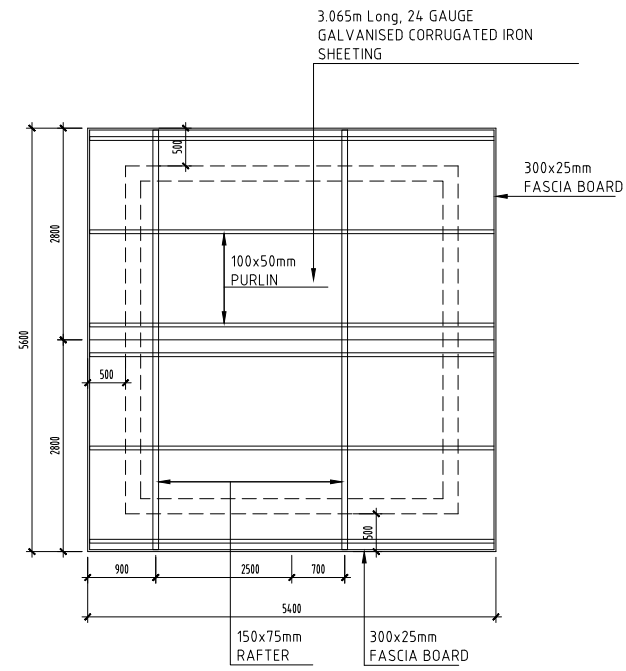
Project  
**KYUSO ROCK CATCHMENT WATER PROJECT**

Design Consultants:  

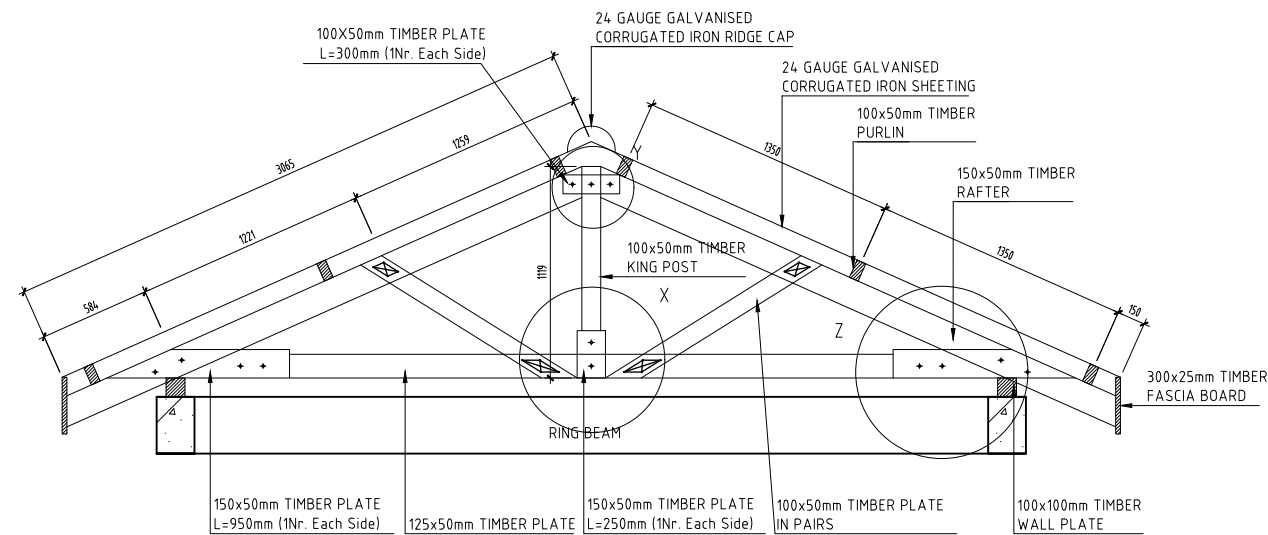
 15 Westlands Road, Westland  
 P.O Box 30337-00100 Nairobi, Kenya  
 Tel: +254 718 875 310  
 +254 788 352 533  
 Email: info@lossmanagement.com

Drawing Title  
**DETAILED DESIGN CONTROL ROOM\_PUMP HOUSE**

Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO
0 STATUS	DWG. No.	SHEET 1 OF 1	0 REV



ROOF PLAN  
Scale: 1:100



DETAIL OF ROOF  
Scale: 1:20

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			

Client



Financier



Project

**KYUSO ROCK CATCHMENT  
WATER PROJECT**

Design Consultants.

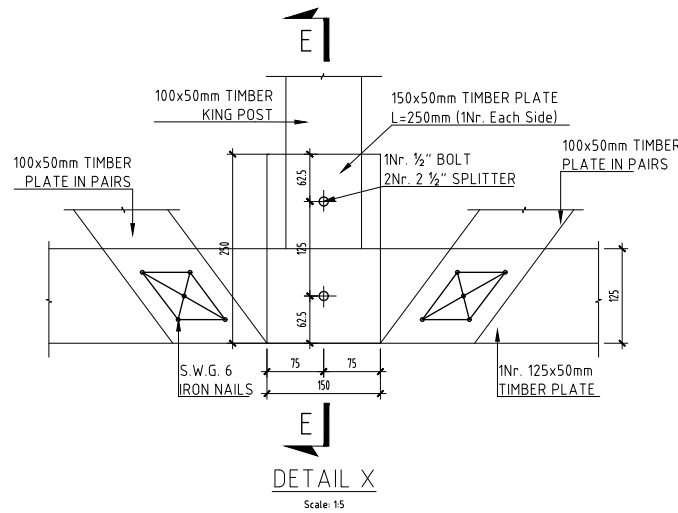


15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 798 352 533  
Email: info@lossmanagement.com

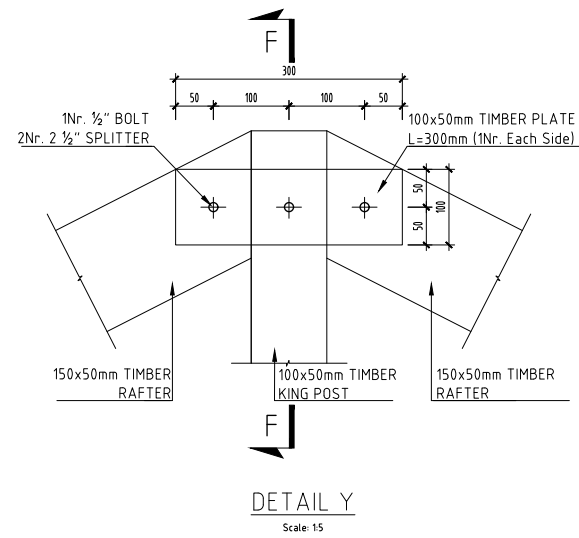
Drawing Title

**DETAILED DESIGN  
CONTROL ROOM\_PUMP HOUSE**

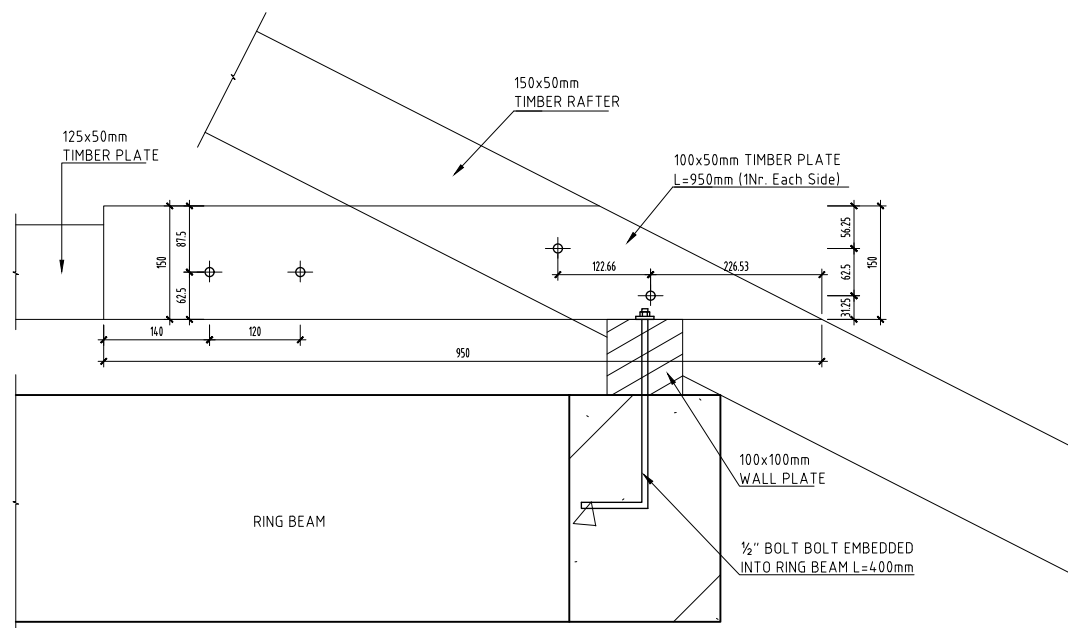
Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H=1:1000 V=1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO
0 STATUS	DWG. No.	SHEET 1 OF 1	0 REV



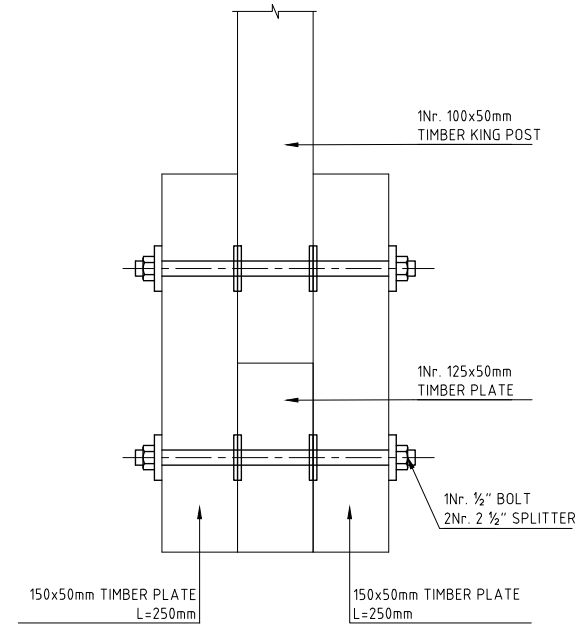
DETAIL X  
Scale: 15



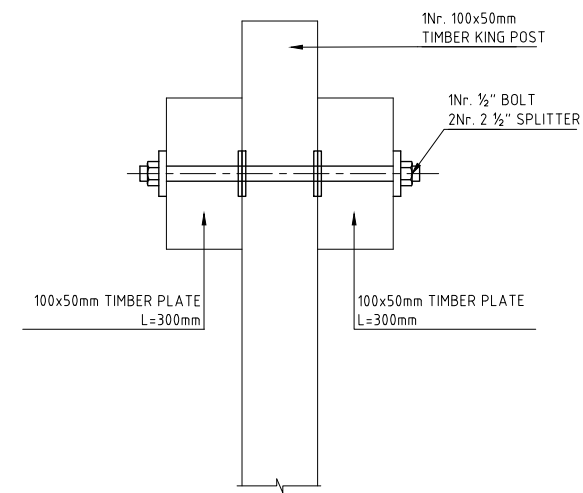
DETAIL Y  
Scale: 15



DETAIL Z  
Scale: 1:10



SECTION E-E  
Scale: 15



SECTION F-F  
Scale: 15

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			



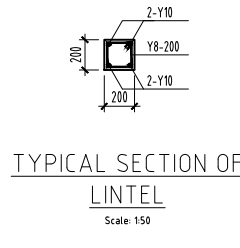
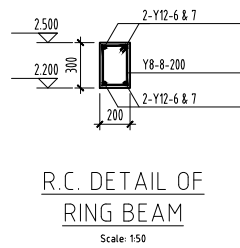
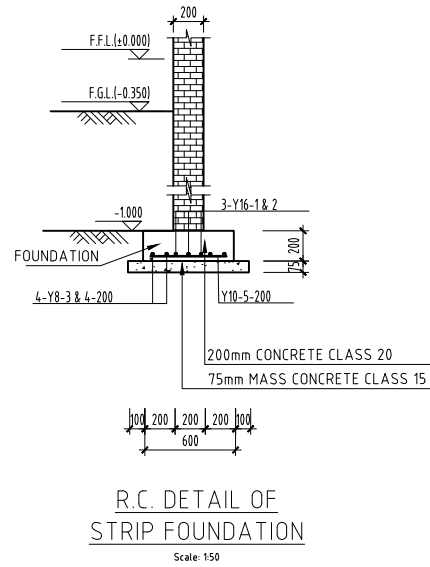
Project  
**KYUSO ROCK CATCHMENT WATER PROJECT**

Design Consultants.

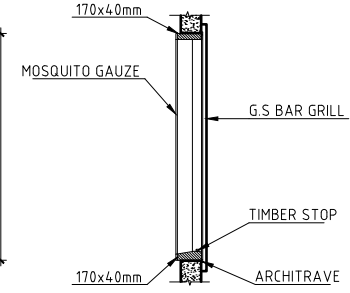
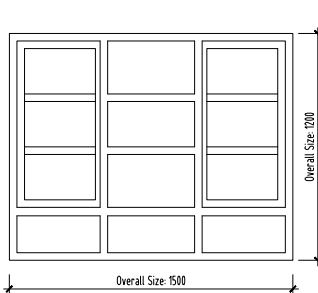
15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 798 352 533  
Email: info@lossmanagement.com

Drawing Title  
**DETAILED DESIGN CONTROL ROOM\_PUMP HOUSE**

Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO
0 STATUS	DWG. No.	SHEET 1 OF 1	0 REV

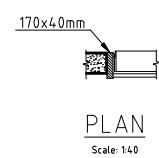


DETAIL OF W1 WINDOW WITH GLOSS PAINT FINISH



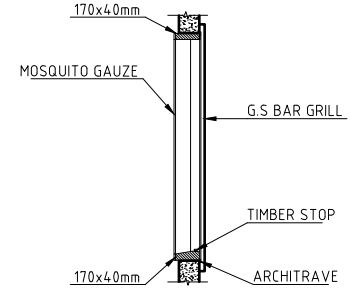
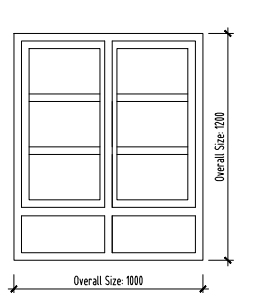
ELEVATION Scale: 1:40

SECTION Scale: 1:40



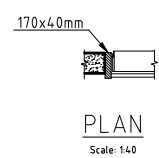
PLAN Scale: 1:40

DETAIL OF W2 WINDOW WITH GLOSS PAINT FINISH



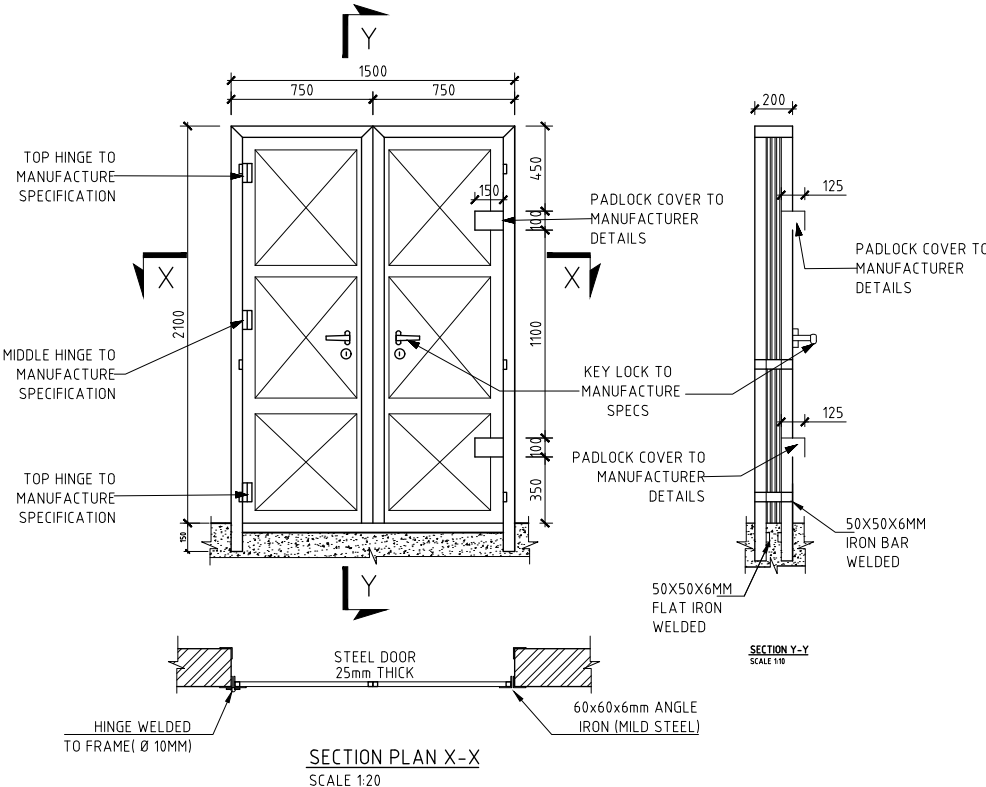
ELEVATION Scale: 1:40

SECTION Scale: 1:40



PLAN Scale: 1:40

**NOTE:-**  
 1.PROGRAMME, METHOD OF CONSTRUCTION AND SETTING OUT OF WORK TO BE APPROVED BY THE ENGINEER BEFORE COMMENCEMENT OF WORK.  
 2.CONSTRUCTION JOINTS:- THE POSITION AND NUMBER OF INTERMEDIATE JOINTS TO BE AS DIRECTED BY THE ENGINEER. OR AS SHOWN IN THE DRAWING. BEFORE PLACING FRESH CONCRETE THE OLD SURFACE SHALL BE ROUGHENED AND ALL LAITANCE AND LOOSE MATERIAL REMOVED. THE SURFACE SHALL BE THOROUGHLY WATERED BUT EXCESS WATER SHOULD BE REMOVED SO THAT THE CONSTRUCTION JOINTS ARE IN A SATURATED BUT SURFACE DRY CONDITION.  
 3.REINFORCEMENT:-  
 1)REINFORCEMENT TO BE HIGH YIELD SQUARE TWISTED BARS TO B.S. 4461;  
 2)BENDING DIMENSION TO B.S. 4466;  
 3)LAP REQUIREMENT:-  
 a) MINIMUM LAP FOR 16 MM DIA. BARS = 800 MM;  
 b) MINIMUM LAP FOR 12 MM DIA. BARS = 600 MM;  
 c) MINIMUM LAP FOR 10 MM DIA. BARS = 500 MM;  
 d) MINIMUM LAP FOR FABRIC MESH A252 = TWO SQUARES.  
 e) ALL LAPS TO BE STAGGERED.  
 4.CONCRETE:-  
 1)CEMENT TO BE ORDINARY PORTLAND CEMENT TO B.S. 12;  
 2)CONCRETE AGGREGATES TO COMPLY WITH B.S. 882;  
 3)WATER IN CONCRETE MIXES TO B.S. 3148;  
 4)CONCRETE MIXES TO BE AS FOLLOWS:-  
 a) MASS CONCRETE FILL AND BLINDING MIX: 1:4:8;  
 b) MASS CONCRETE SURROUND TO PIPEWORK AND ROOF SCREED MIX: 1:3:6;  
 c) MINIMUM CEMENT CONTENT 290KG/M3 IF CONCRETE IS TO BE SITUATED WEIGHT IT IS EXPOSED TO SULPHATE ATTACK THEN SULPHATE RESISTING PORTLAND OR SUPER SUPHATE CEMENT IS REQUIRED. ADMIXTURES MAY ONLY BE USED WITH THE PRIOR APPROVAL OF THE ENGINEER.  
 5)MINIMUM COVER TO ALL REINFORCEMENT TO BE:-  
 a) ROOF SLAB AND WALL SHALL BE 40MM;  
 b) FLOOR SLAB AND BASE SHALL BE 50MM.



**IRONMONGERY:-**  
 1. 1/2 SETS OF 100mm BOLT HINGES  
 2. 1Nr. RIM LOCK

**NOTE:-**  
 IRONMONGERY FOR COATS AREAS SHOULD BE OF SUITABLE ANTI CORROSIVE QUALITY APPROPRIATE TO THE CLIMATIC CONDITIONS.

**IRONMONGERY:-**  
 1. 1/2 SETS OF 100mm BOLT HINGES  
 2. 2Nr. RIM LOCK



DOOR "D2" DETAIL

**NOTES**

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.

PRELIMINARY ISSUE  
 Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			

Client  
  
 Financier  



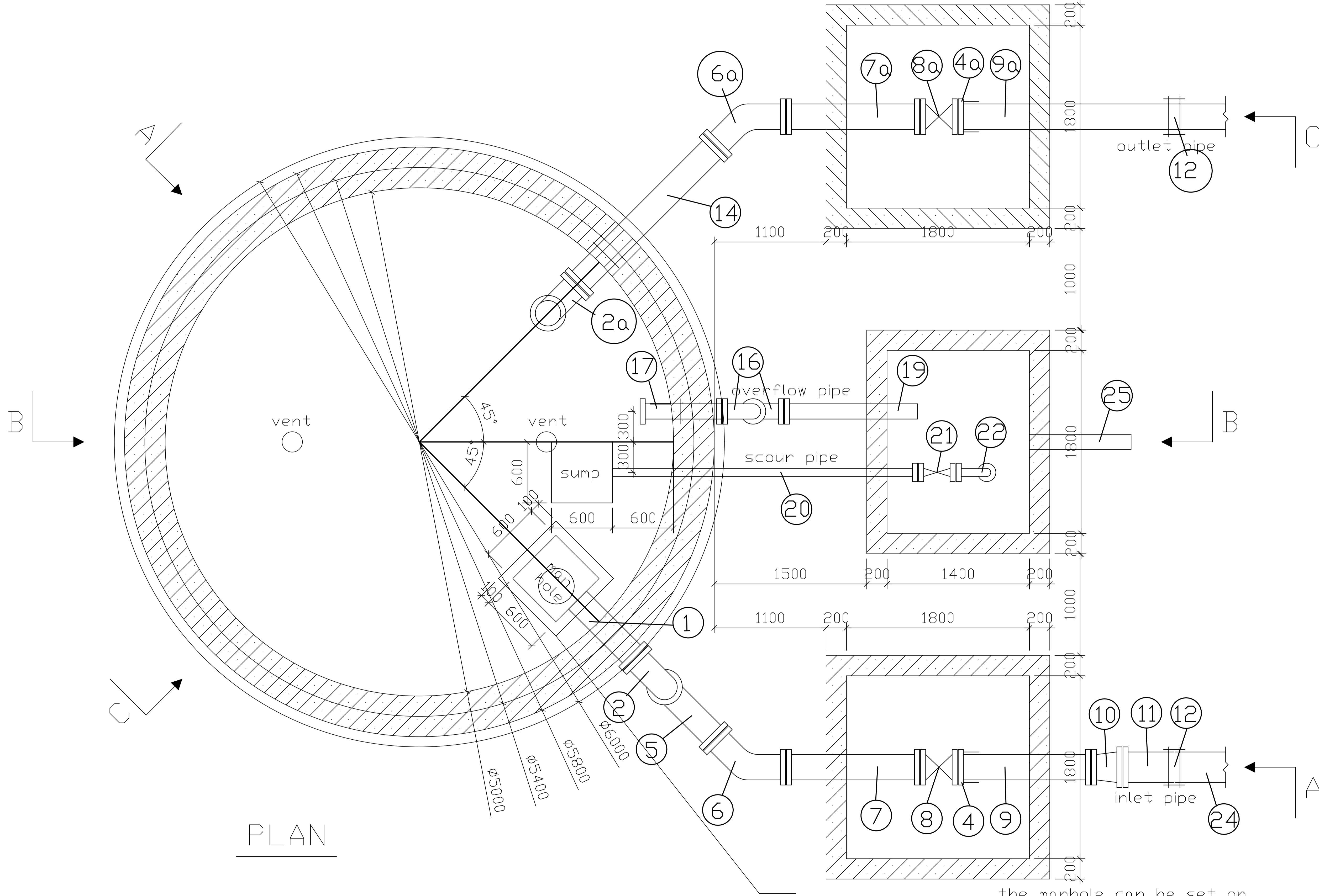
Project  
**KYUSO ROCK CATCHMENT WATER PROJECT**

Design Consultants.  
 15 Westlands Road, Westland  
 P.O Box 30337-00100 Nairobi, Kenya  
 Tel: +254 718 875 310  
 +254 788 352 533  
 Email: info@lossmanagement.com

Drawing Title  
**DETAILED DESIGN CONTROL ROOM\_PUMP HOUSE**

Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO
0 STATUS	DWG. No.	SHEET 1 OF 1	0 REV





PLAN

the manhole can be set on ground, allowing space for the inlet

**NOTES**

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			

Client

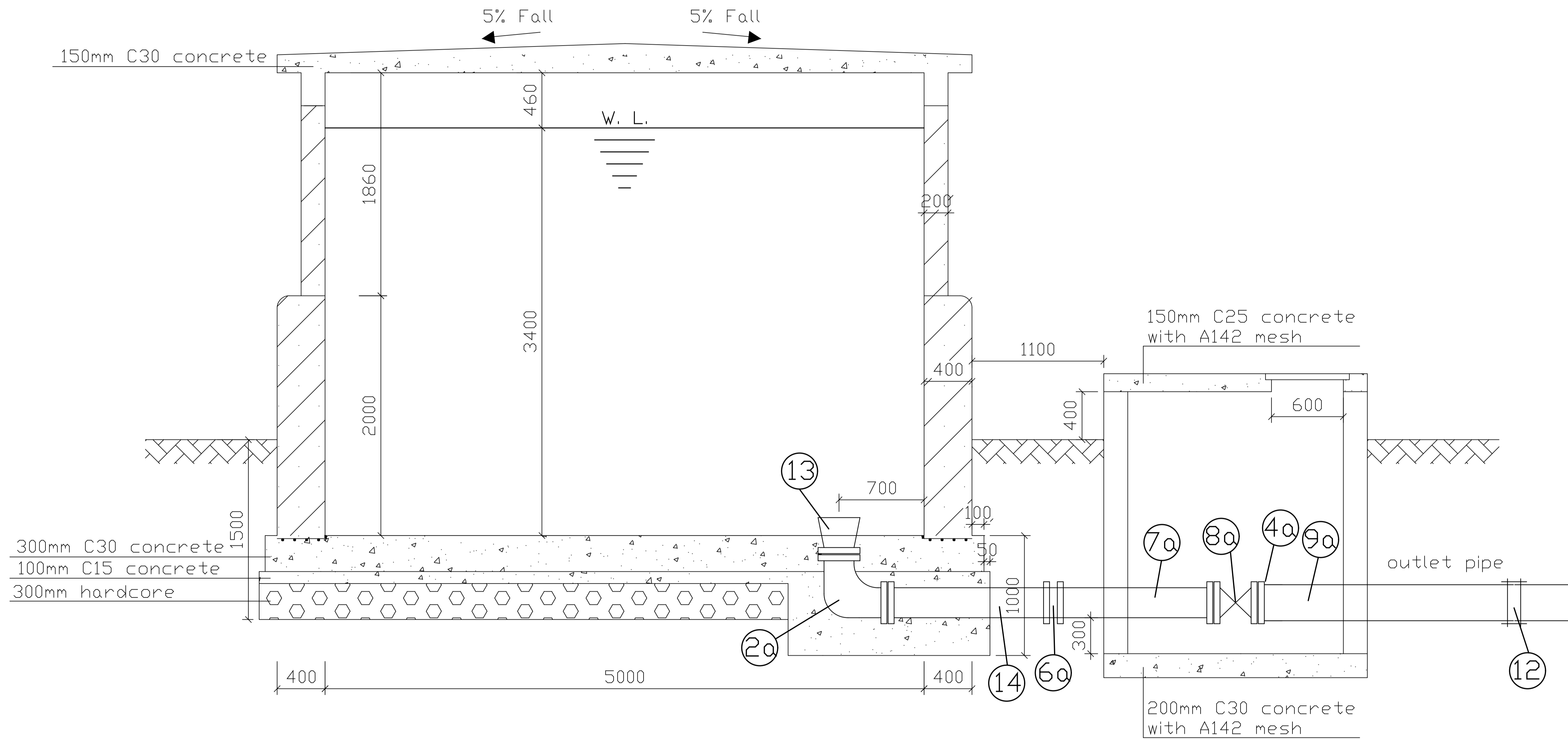
Financier

Project  
**KYUSO ROCK CATCHMENT WATER PROJECT**

Design Consultants.  
 15 Westlands Road, Westland  
P.O. Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 788 352 533  
Email: info@iosaimanagement.com

Drawing Title  
**50 M3 MASONRY WATER TANK (BPT)  
SLAB PLAN AND DETAILS**

Designed by JMM	Drawn by KCK
Checked by JN	Approved by JR
Scale H = 1:1,000 V = 1:100	Date NOV 2023
Job No.	ACAD File: kruso
0 STATUS	DWG. No. SHEET 1 OF 1



SECTION C-C

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

PRELIMINARY ISSUE

Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			

Client



Financier



Project

**KYUSO ROCK CATCHMENT  
WATER PROJECT**

Design Consultants.

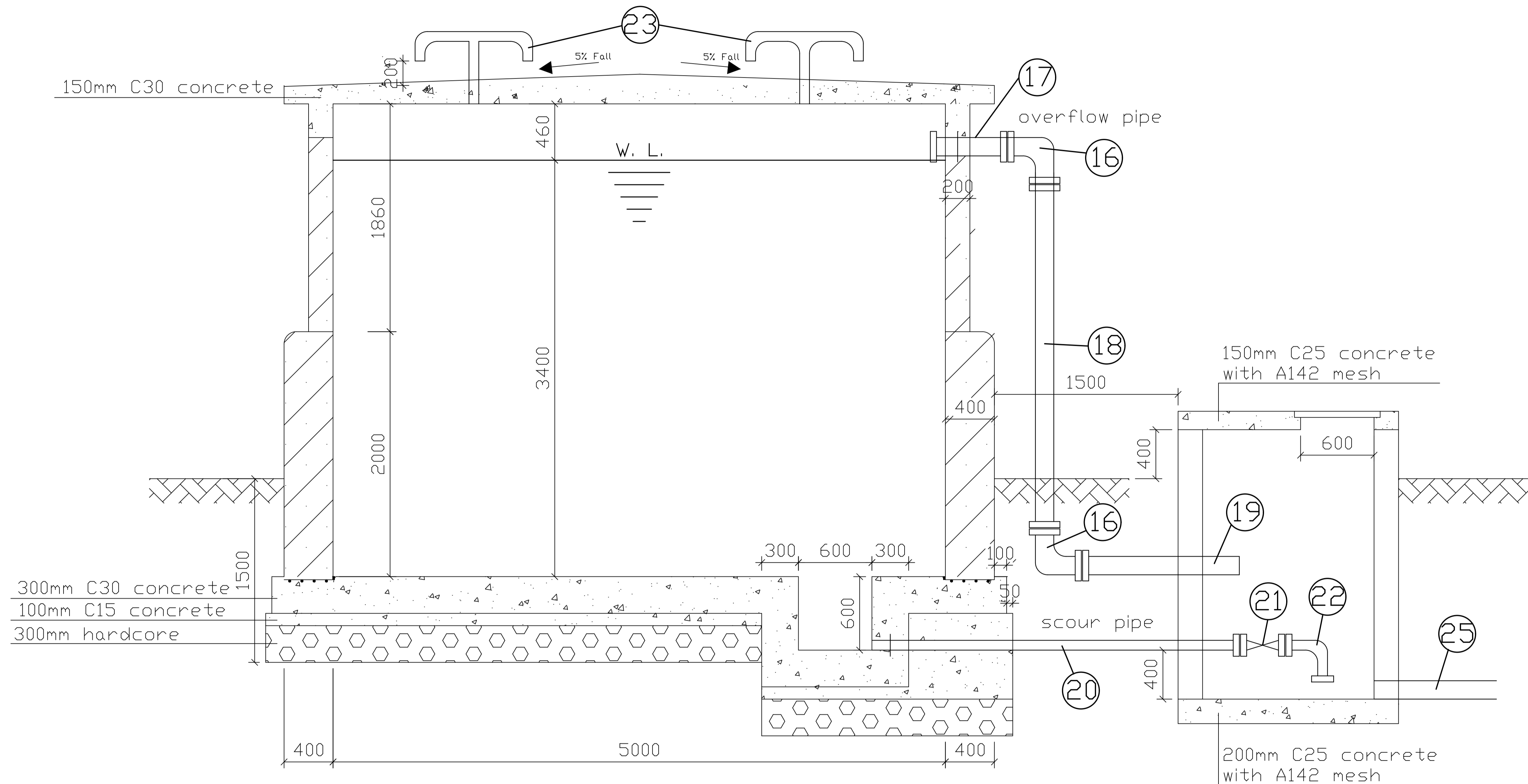


15 Westlands Road, Westland  
P.O. Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 788 352 533  
Email: info@losaimanagement.com

Drawing Title

**50 M3 MASONRY WATER TANK (BPT)  
TANK SECTION DETAILS**

Designed by JMM	Drawn by KCK
Checked by JN	Approved by JR
Scale H = 1:1,000 V = 1:100	Date NOV 2023
Job No.	ACAD File: kruso
0 STATUS	DWG. No. SHEET 1 OF 1
	0 REV



SECTION B-B

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			

Client



Financier



Project

**KYUSO ROCK CATCHMENT  
WATER PROJECT**

Design Consultants.

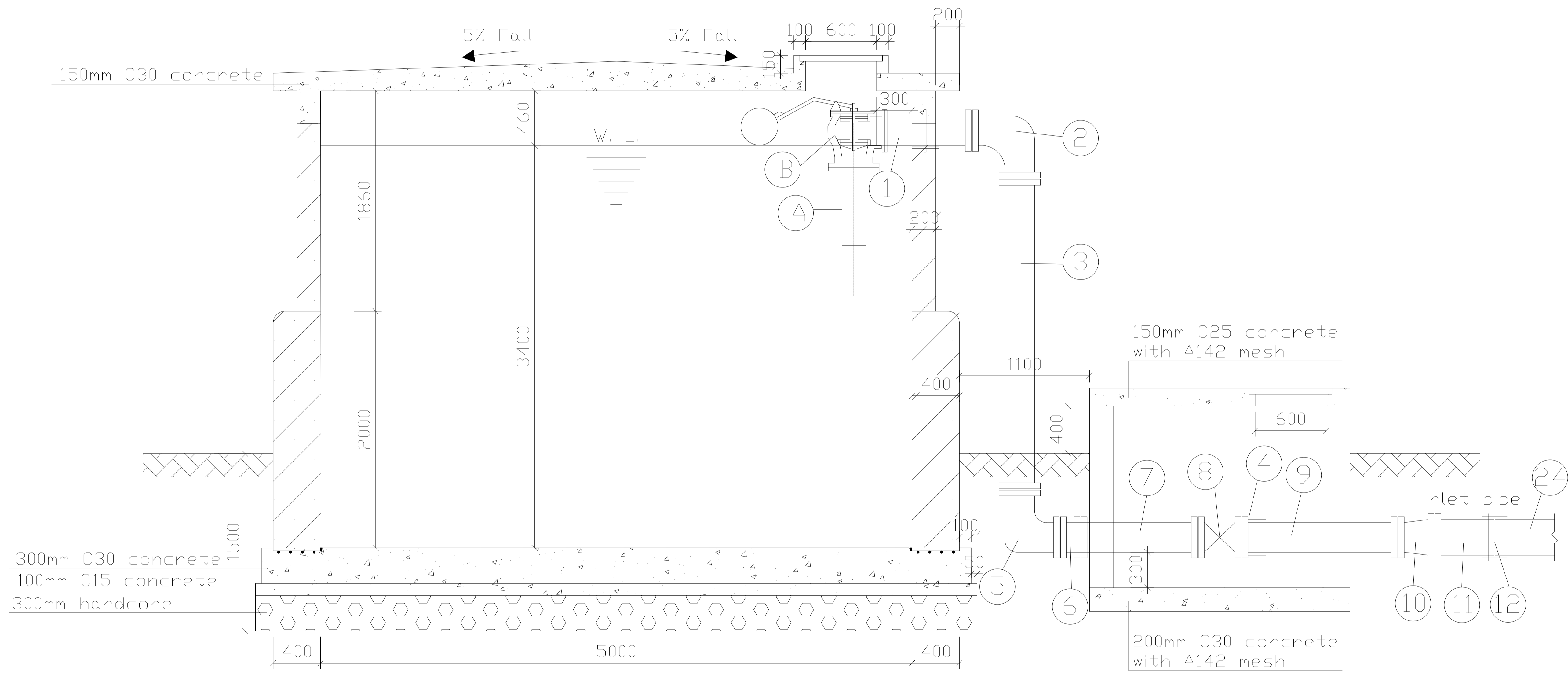


15 Westlands Road, Westland  
P.O. Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 788 352 533  
Email: info@losalmanagement.com

Drawing Title

**50 M3 MASONRY WATER TANK (BPT)  
SECTION DETAILS**

Designed by JMM	Drawn by KCK
Checked by JN	Approved by JR
Scale H = 1:1,000 V = 1:100	Date NOV 2023
Job No.	ACAD File: kruso
0 STATUS	DWG. No. SHEET 1 OF 1



SECTION A-A

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			



Project  
**KYUSO ROCK CATCHMENT WATER PROJECT**

Design Consultants.

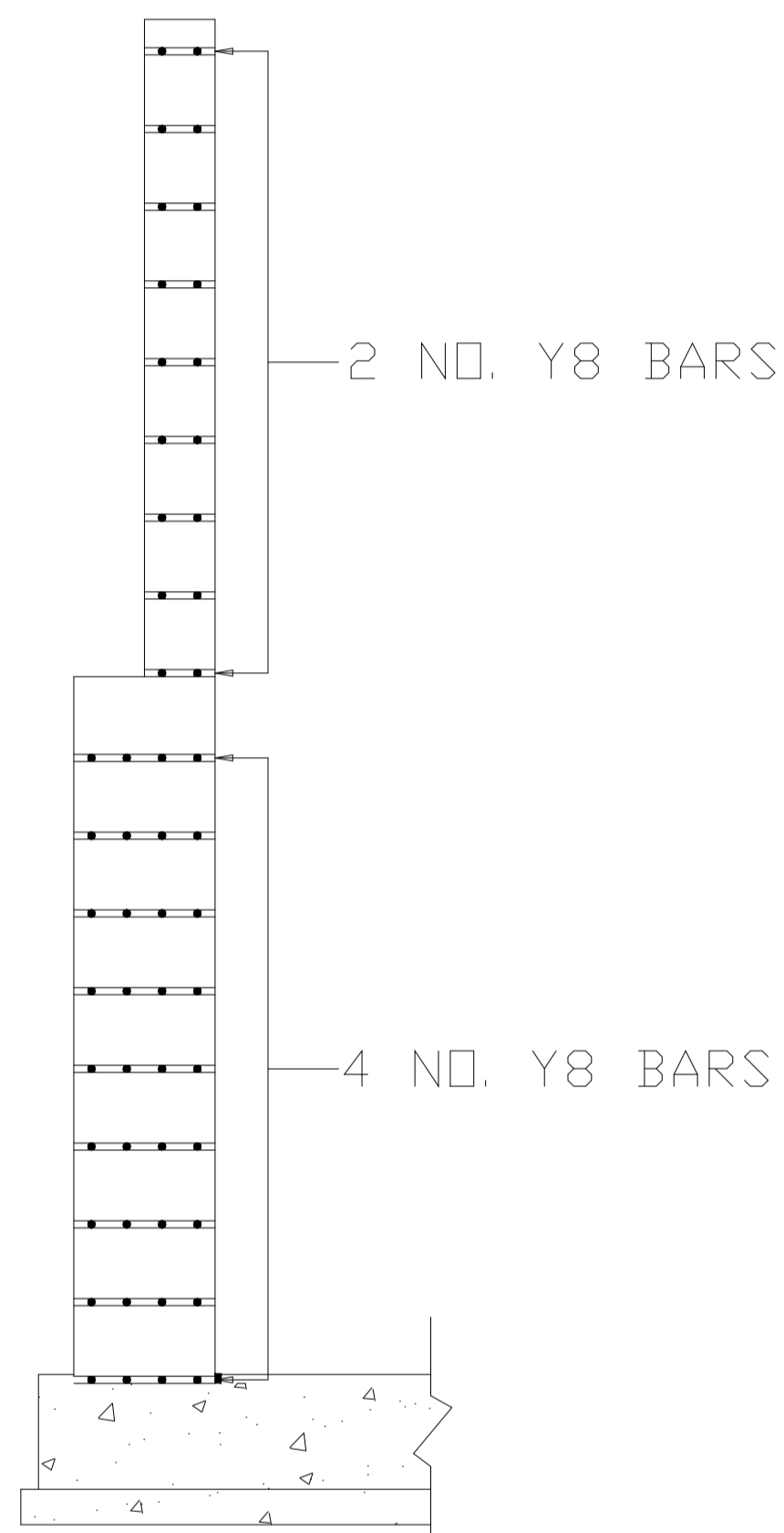
15 Westlands Road, Westland  
P.O. Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 788 352 533  
Email: info@losalmanagement.com

Drawing Title  
**50 M3 MASONRY WATER TANK (BPT)  
SECTION DETAILS**

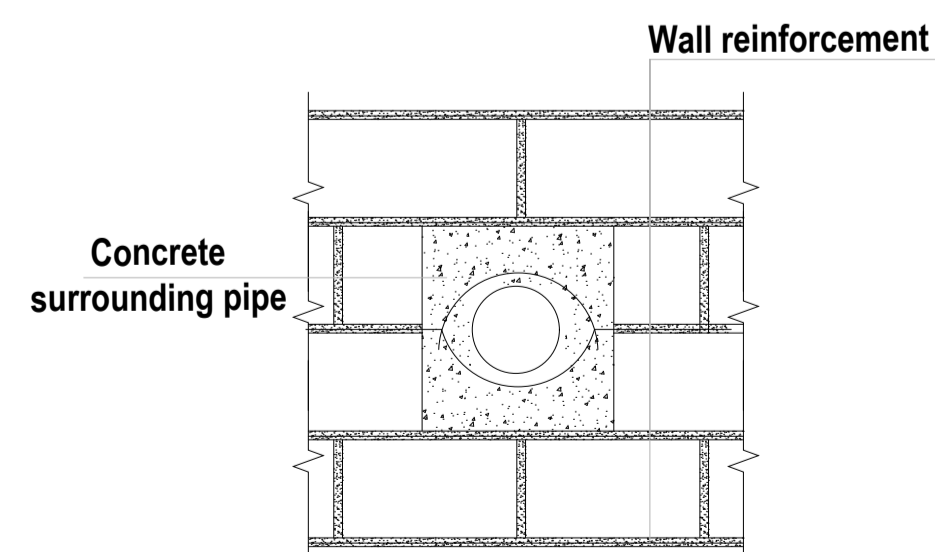
Designed by JMM	Drawn by KCK
Checked by JN	Approved by JR
Scale H = 1:1,000 V = 1:100	Date NOV 2023
Job No.	ACAD File: kruso
0 STATUS	DWG. No. SHEET 1 OF 1
	0 REV

# BPT PIPEWORK SCHEDULE

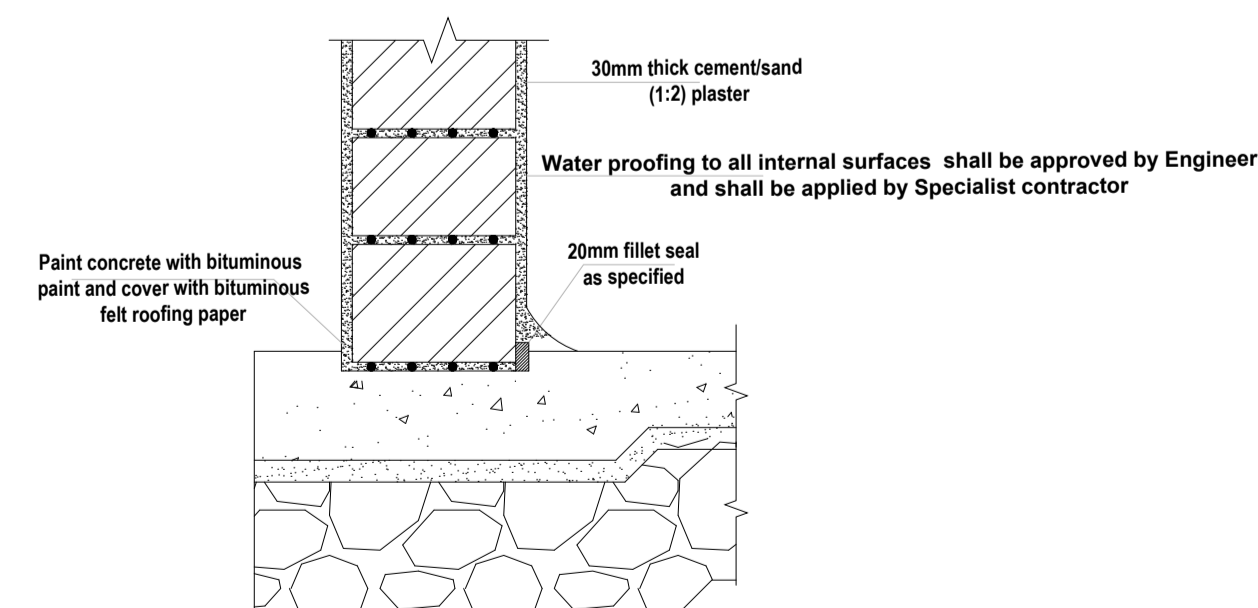
ITEM NO.	DESCRIPTION	DIA(mm)	LENGTH(mm)	QUANTITY
A	SINGLE FLANGED PIPE WITH PUDDLE FLANGED	50	L=400	1
B	FLANGED BEAT EQUILIBRIUM FLOAT VALVE	50		1
1	SINGLE FLANGED PIPE WITH CENTRAL PUDDLE FLANGE	50	L=800	1
2	90° DOUBLE FLANGED BEND	50	400*400	1
2a	90° DOUBLE FLANGED BEND	50	400*400	1
3	DOUBLE FLANGED PIPE	50	L=2610	1
4/4a	FLANGED ADAPTOR	50/50		2
5	90° DOUBLE FLANGED BEND	50	400*700	1
6/6a	45° DOUBLE FLANGED BEND	50/ 50	400*400	2
7/7a	DOUBLE FLANGED PIPE	50/ 50	L=1310	2
8/8a	ALL FLANGED GATE VALVE	50/ 50	L=360	2
9/9a	SINGLE FLANGED PIPE	50/ 50	L=1250	2
10	DOUBLE FLANGED CONCENTRIC TAPER	50*50	L=300	2
11	SINGLE FLANGED PIPE	50	L=500	2
12	V.J. STEPPED COUPLING	50/50		2
13	SINGLE FLANGED BELL MOUTH	50	L=300	1
14	DOUBLE FLANGED PIPE	50	L=1920	1
16	90° DOUBLE FLANGED BEND	50	300*300	2
17	DOUBLE FLANGED PIPE WITH PUDDLE FLANGED	50	L=200	1
18	DOUBLE FLANGED PIPE	50	L=1980	1
19	SINGLE FLANGED PIPE	50	L=1300	1
20	SINGLE FLANGED PIPE WITH PUDDLE FLANGED	50	L=3000	1
21	ALL FLANGED GATE VALVE	50	L=360	1
22	90° DOUBLE FLANGED BEND	50	300*300	1
23	G.S. VENT	100		2
24	HDPE PIPE	50		
25	UPVC PIPE	50		1



SECTION THRO' WALL



DETAIL OF PIPE THROUGH MASONRY WALL  
SCALE 1:25



DETAIL OF JOINT BETWEEN FLOOR SLAB AND WALL  
SCALE 1:10

**NOTES**

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

PRELIMINARY ISSUE

Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			

Client



Financier



Project

**KYUSO ROCK CATCHMENT WATER PROJECT**

Design Consultants.

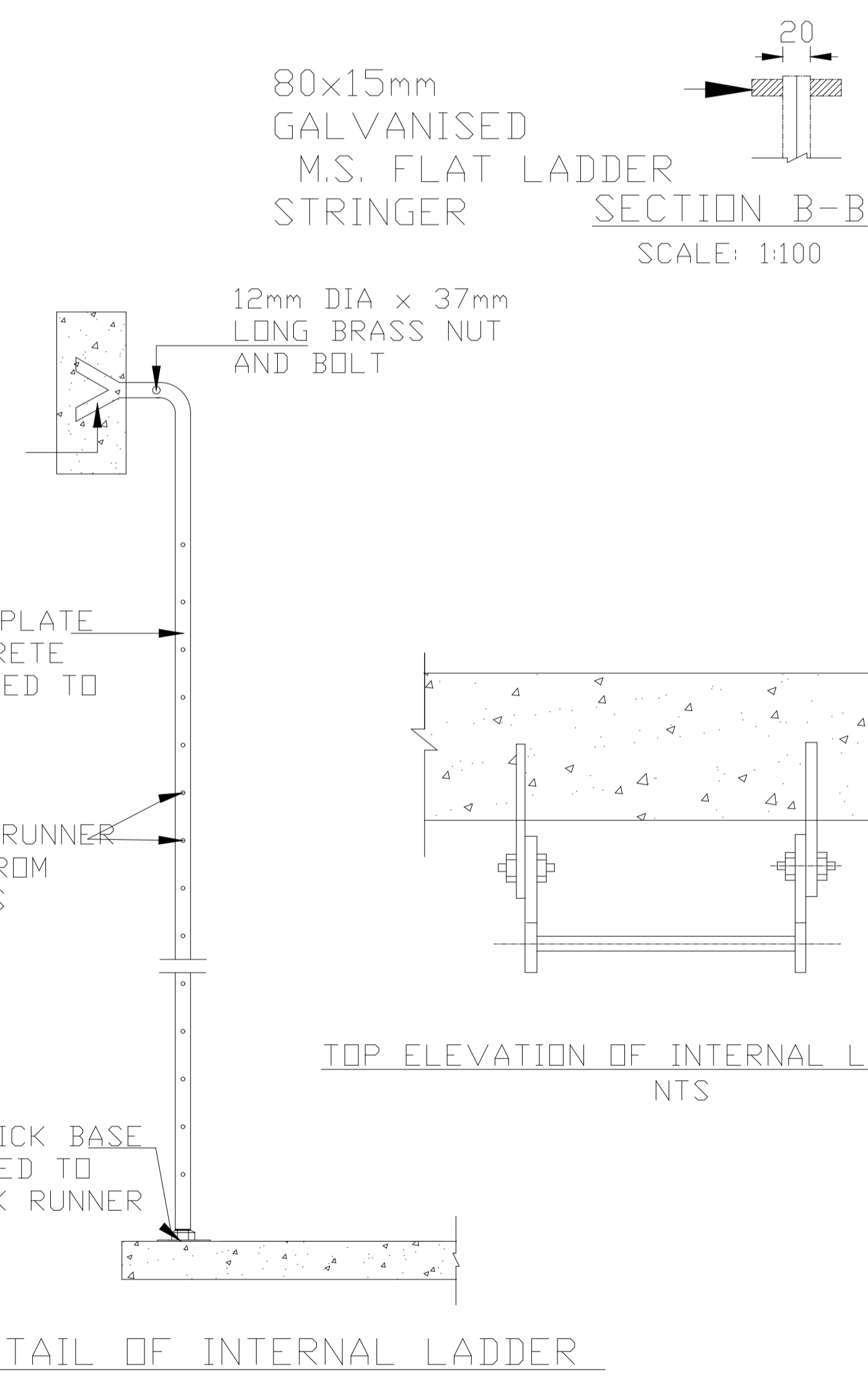
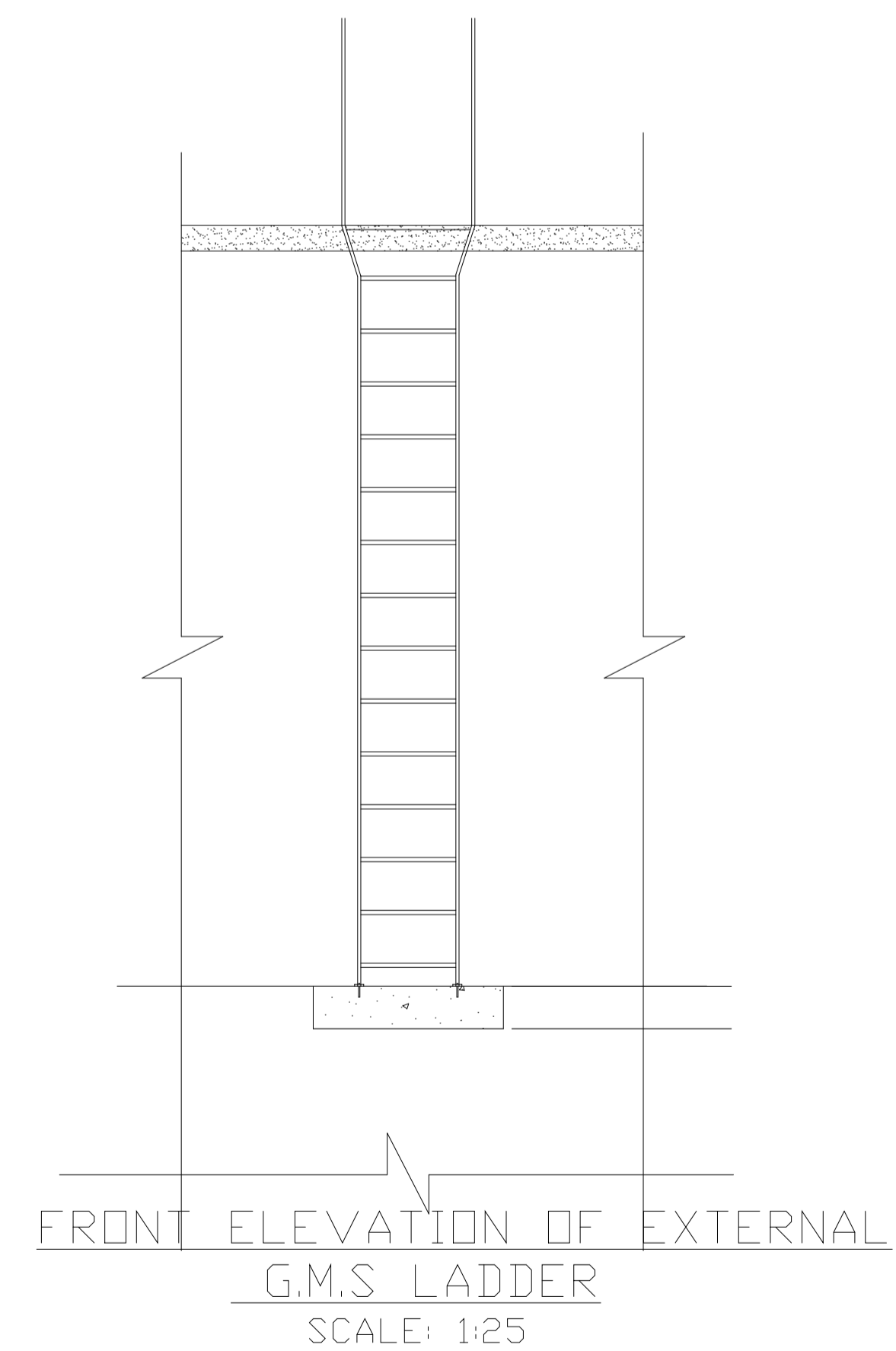
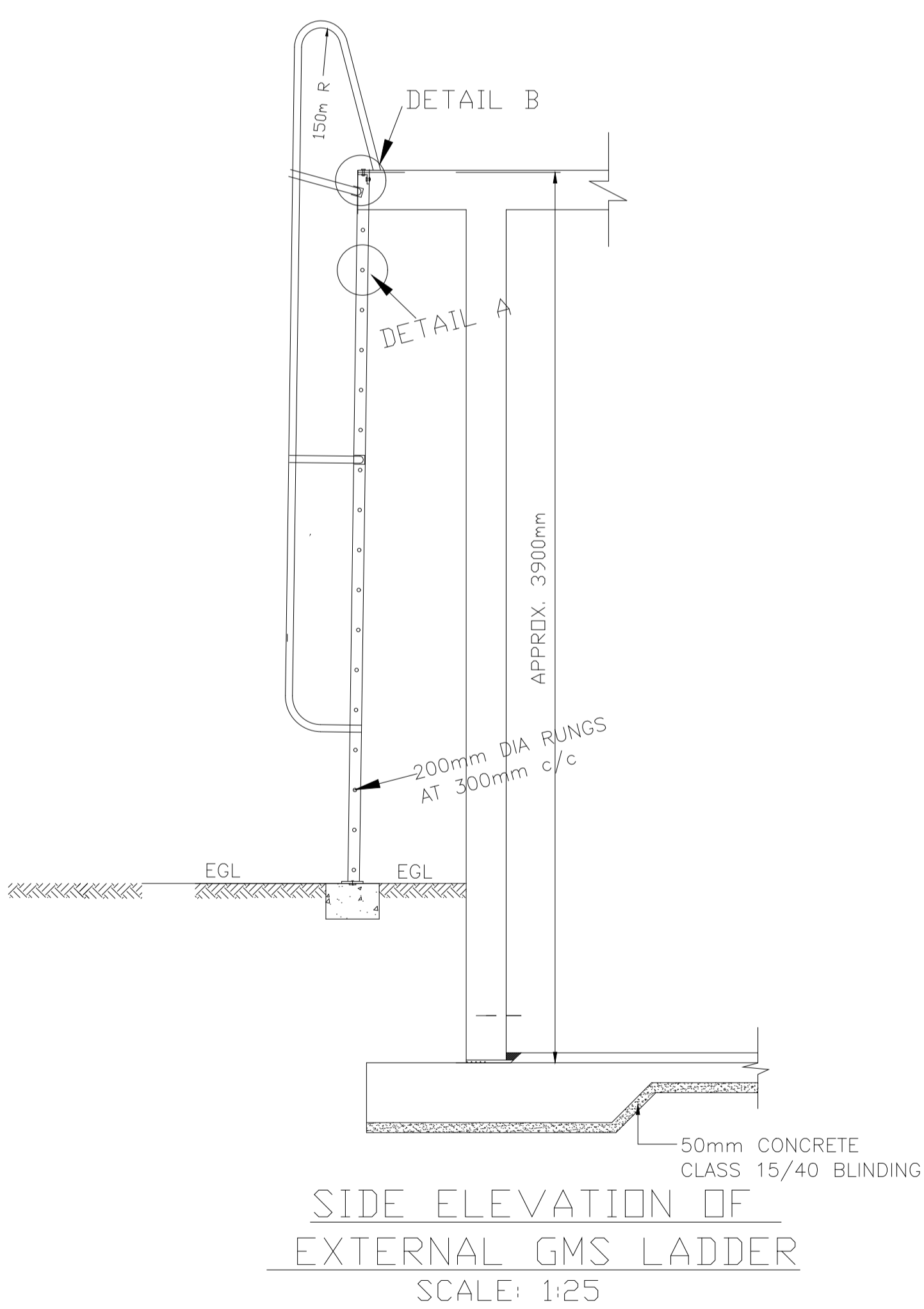
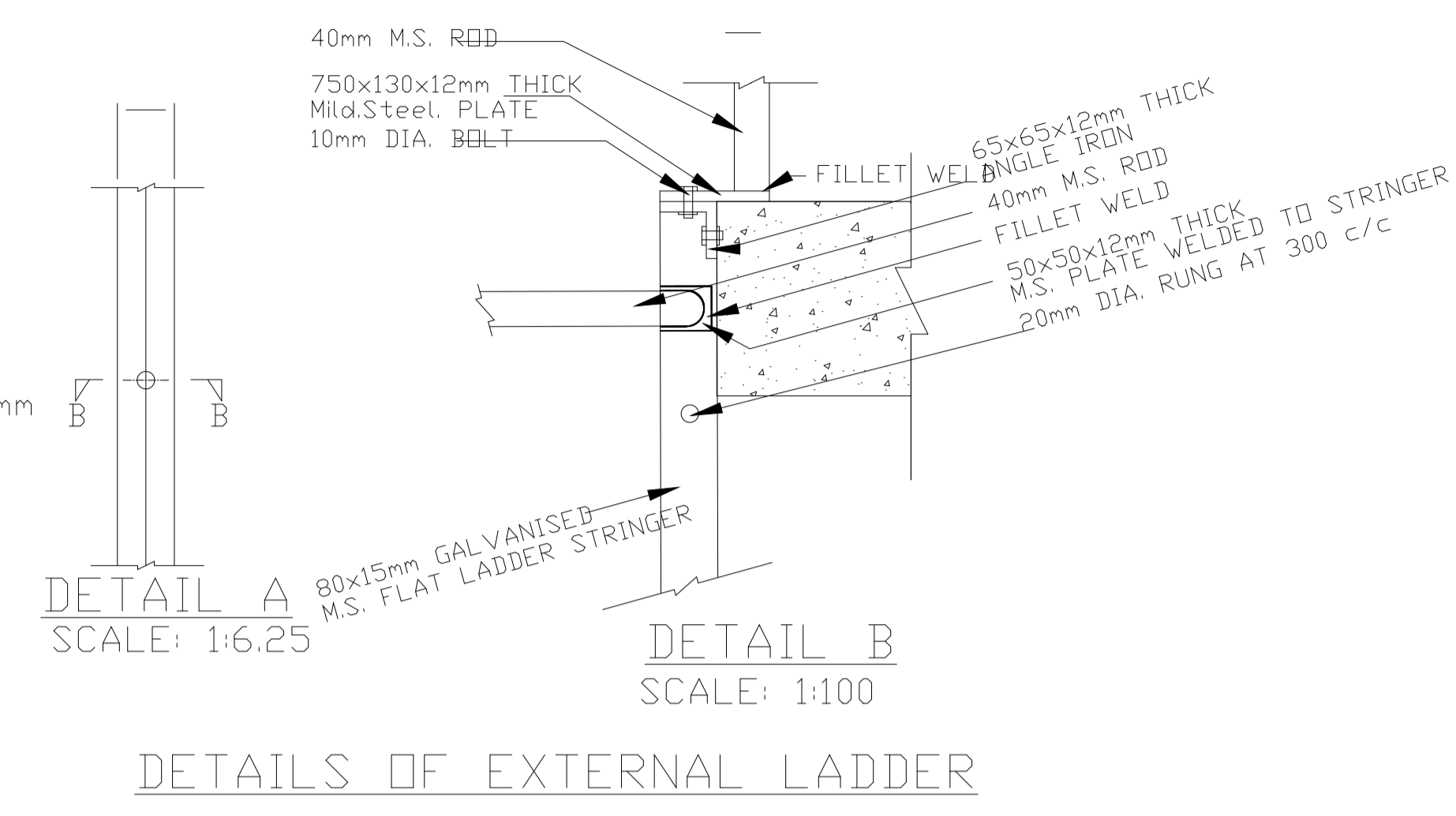


15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 788 352 533  
Email: info@losalmanagement.com

Drawing Title

**50 M3 MASONRY WATER TANK (BPT) PIPEWORK SCHEDULE**

Designed by JMM	Drawn by KCK
Checked by JN	Approved by JR
Scale H = 1:1,000 V = 1:100	Date NOV 2023
Job No.	ACAD File: kruso
0 STATUS	DWG. No. SHEET 1 OF 1
	0 REV



**NOTES**

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

**PRELIMINARY ISSUE**

Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			

Client

Financier

Project

**KYUSO ROCK CATCHMENT WATER PROJECT**

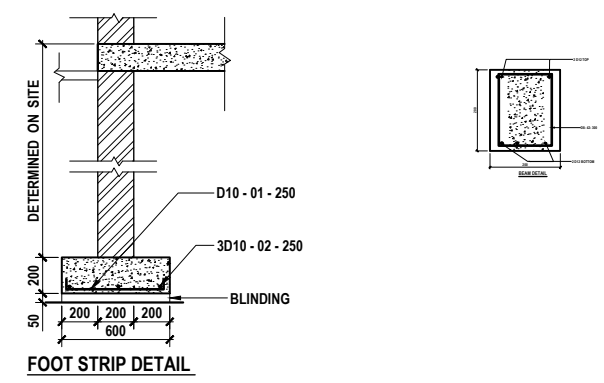
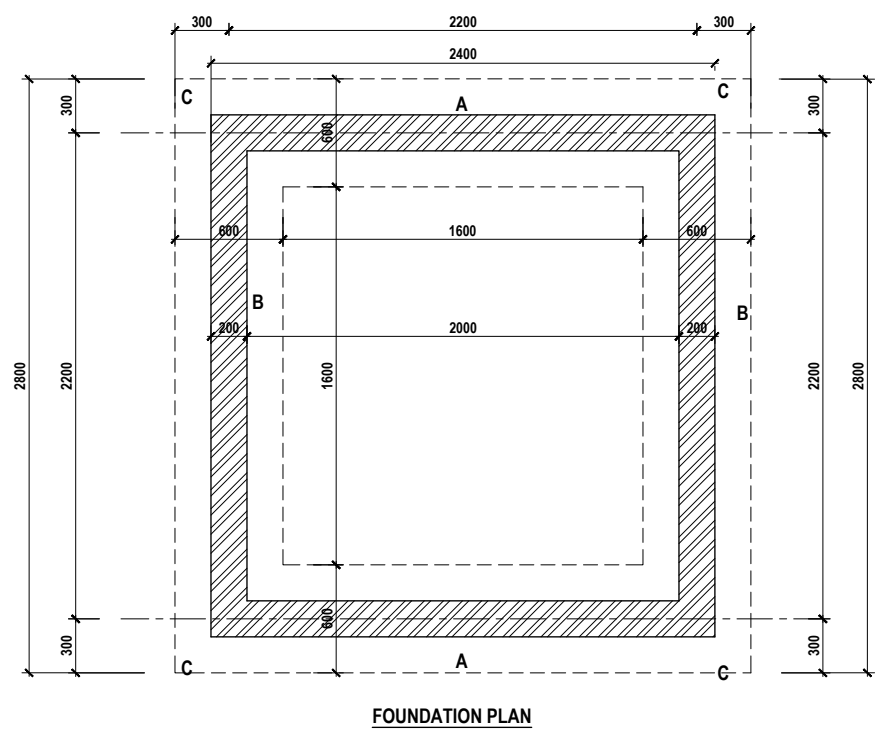
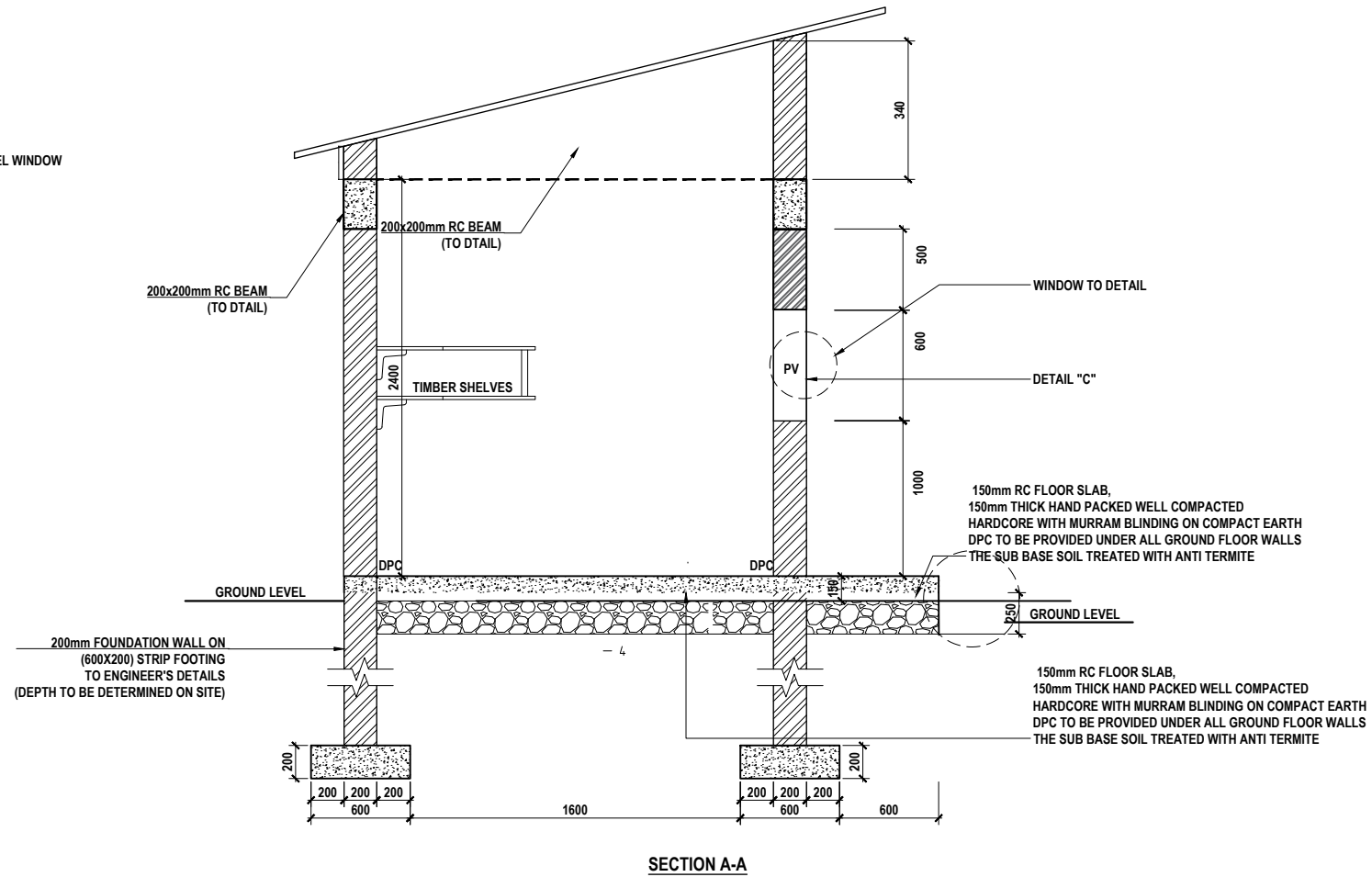
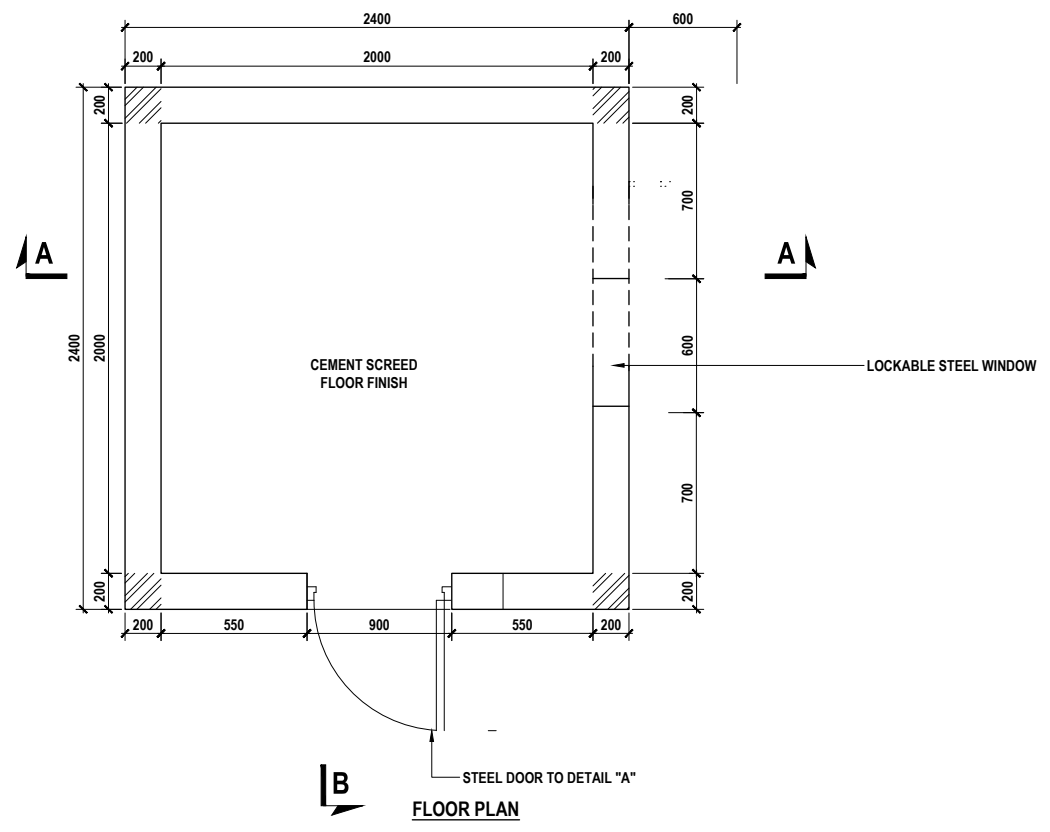
Design Consultants.

15 Westlands Road, Westland  
P.O. Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 788 352 533  
Email: info@losalmanagement.com

Drawing Title

**50 M3 MASONRY WATER TANK (BPT) MISCELLANEOUS DETAILS**

Designed by JMM	Drawn by KCK
Checked by JN	Approved by JR
Scale H = 1:1,000 V = 1:100	Date NOV 2023
Job No.	ACAD File: kruso
0 STATUS	DWG. No. SHEET 1 OF 1
	0 REV



**NOTES**

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

PRELIMINARY ISSUE

Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY CHECKED			
	BY CHECKED			
	BY CHECKED			
	BY CHECKED			

Client

Financier

Project

**KYUSO ROCK CATCHMENT WATER PROJECT**

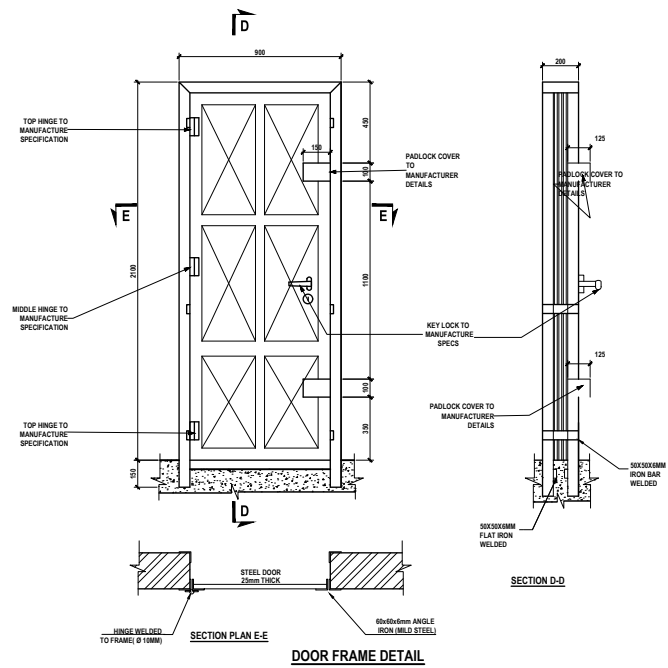
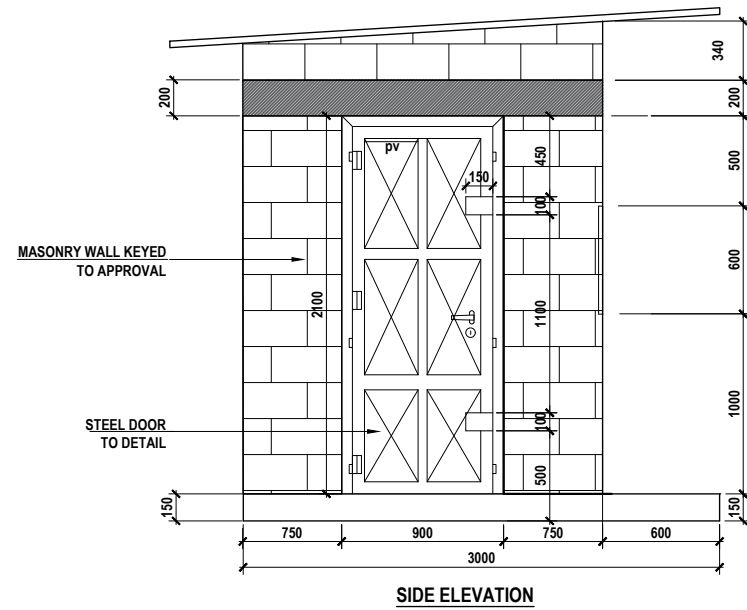
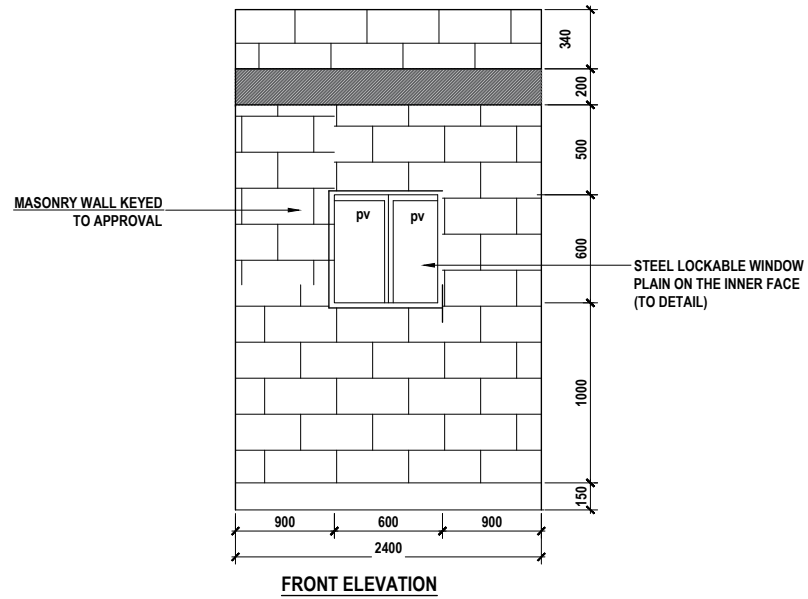
Design Consultants.

15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 788 352 533  
Email: info@lossmanagement.com

Drawing Title

**PROPOSED GUARD HOUSE SLAB PLAN AND DETAILS**

Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H=1:1,000 V=1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO
A STATUS	DWG. No.	SHEET 1 OF 1	0 REV



**NOTES**

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY CHECKED			
	BY CHECKED			
	BY CHECKED			
	BY CHECKED			
	BY CHECKED			



Project  
**KYUSO ROCK CATCHMENT WATER PROJECT**

Design Consultants.  

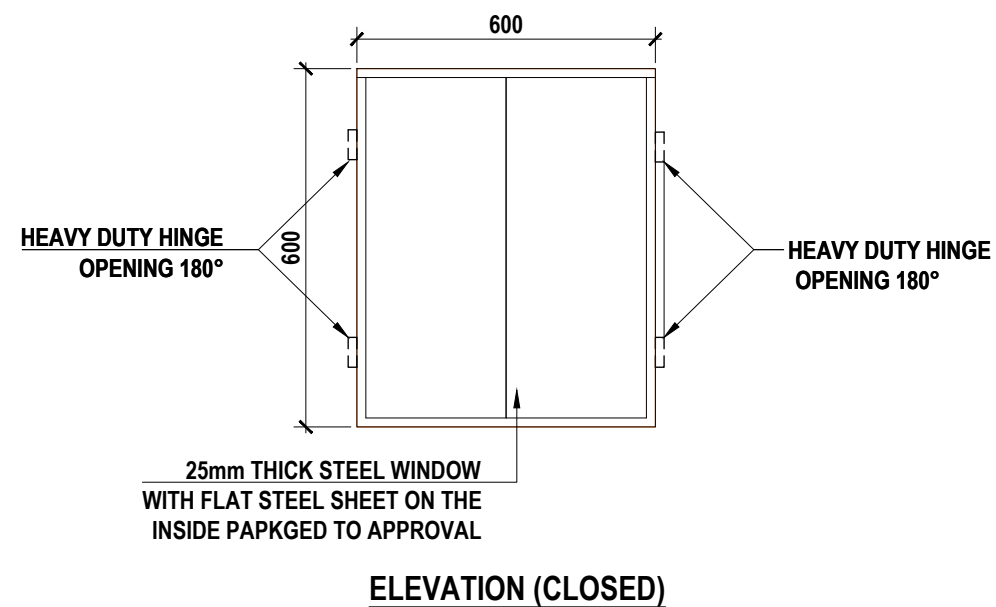
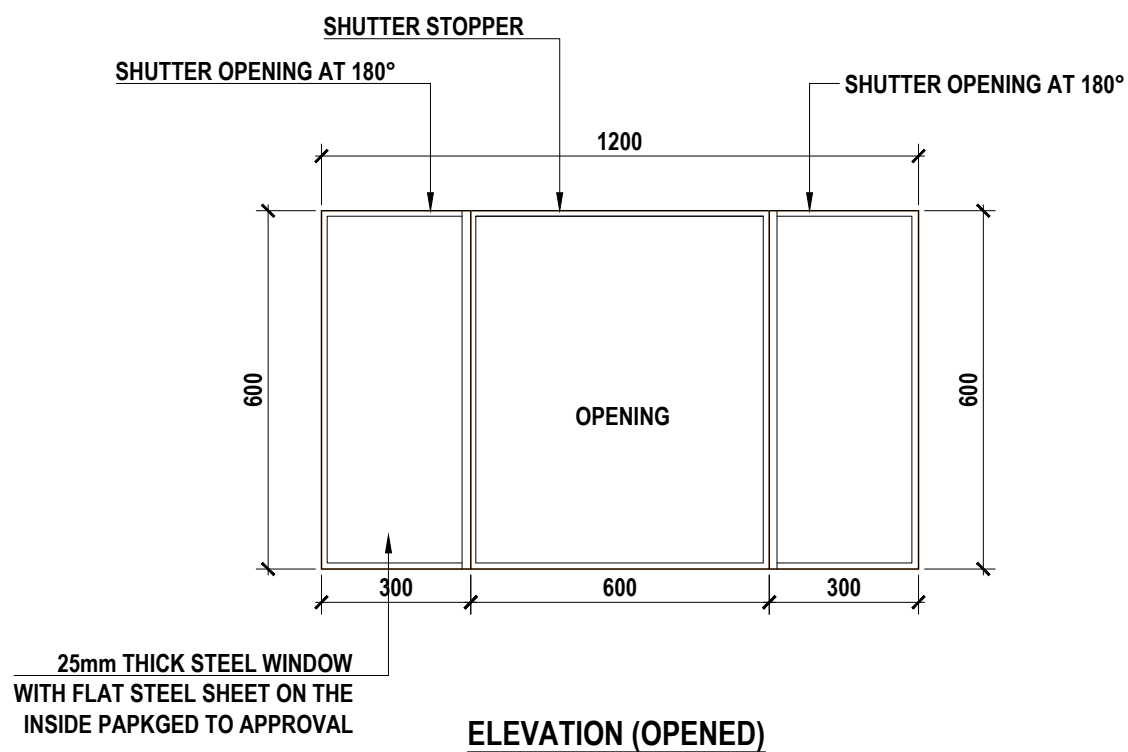
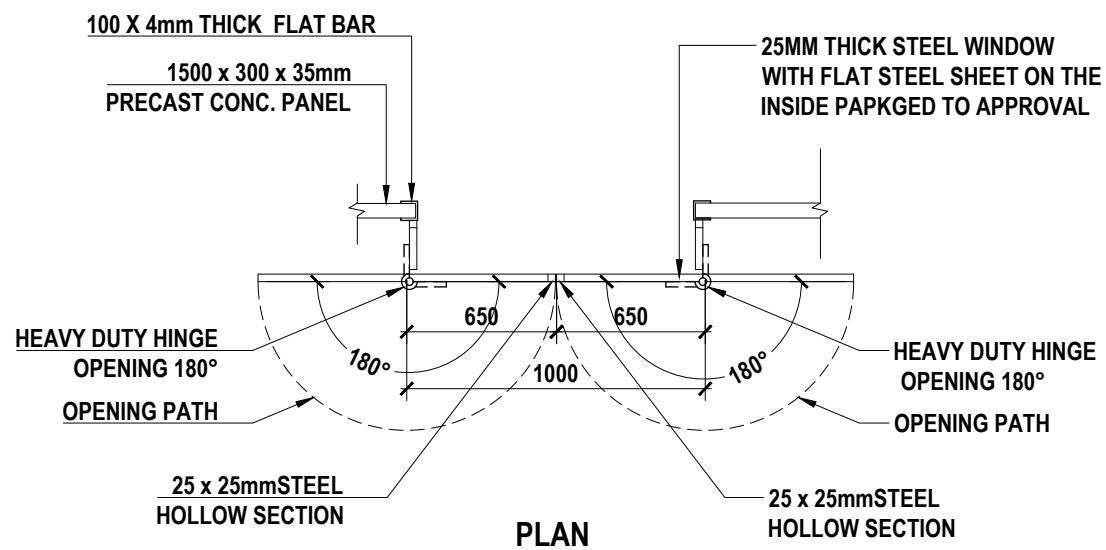
 15 Westlands Road, Westland  
 P.O Box 30337-00100 Nairobi, Kenya  
 Tel: +254 718 875 310  
 +254 788 352 533  
 Email: info@lossmanagement.com

Drawing Title  
**PROPOSED GUARD HOUSE ELEVATION, SECTION AND DETAILS**

Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H=1:1,000 V=1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO

A	DWG. No.	SHEET 1 OF 1	0
STATUS			REV





### SHUTTER DETAIL

#### NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			

Client

Financier

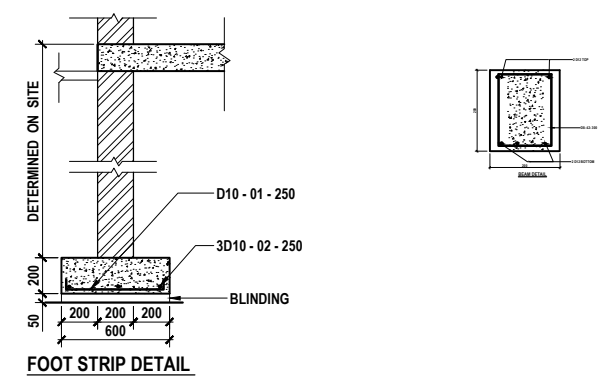
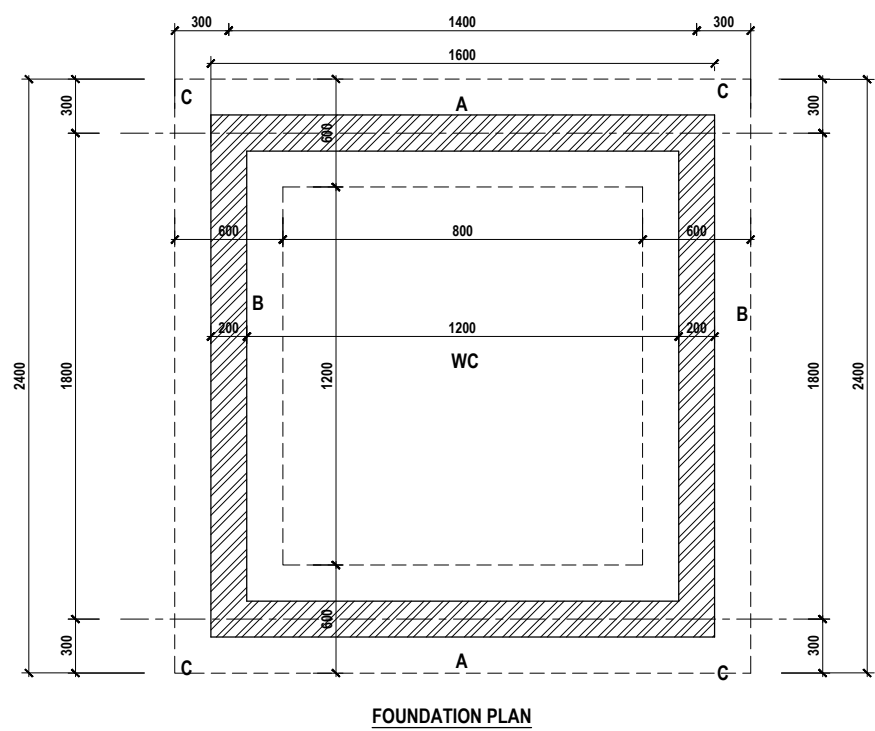
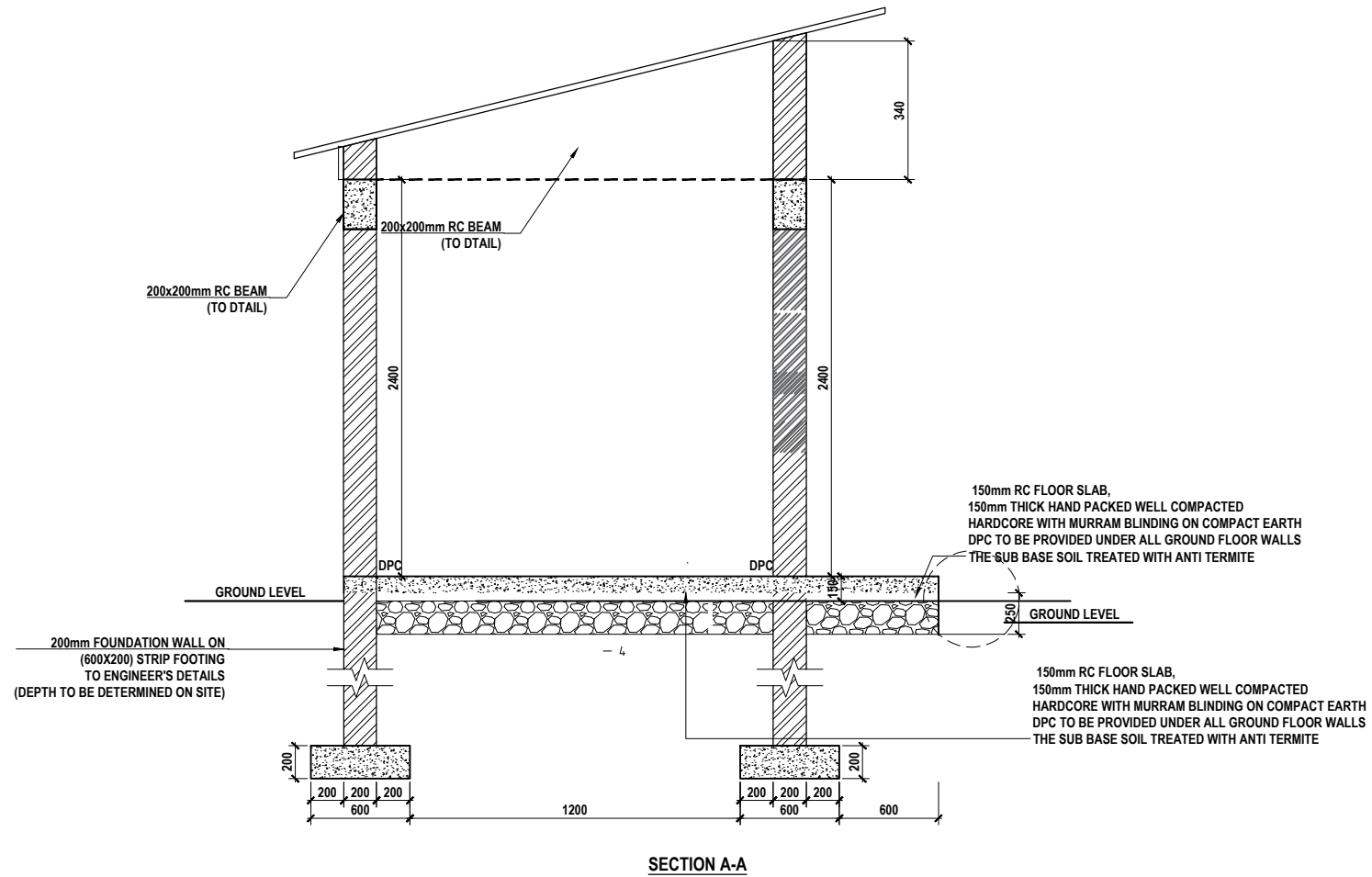
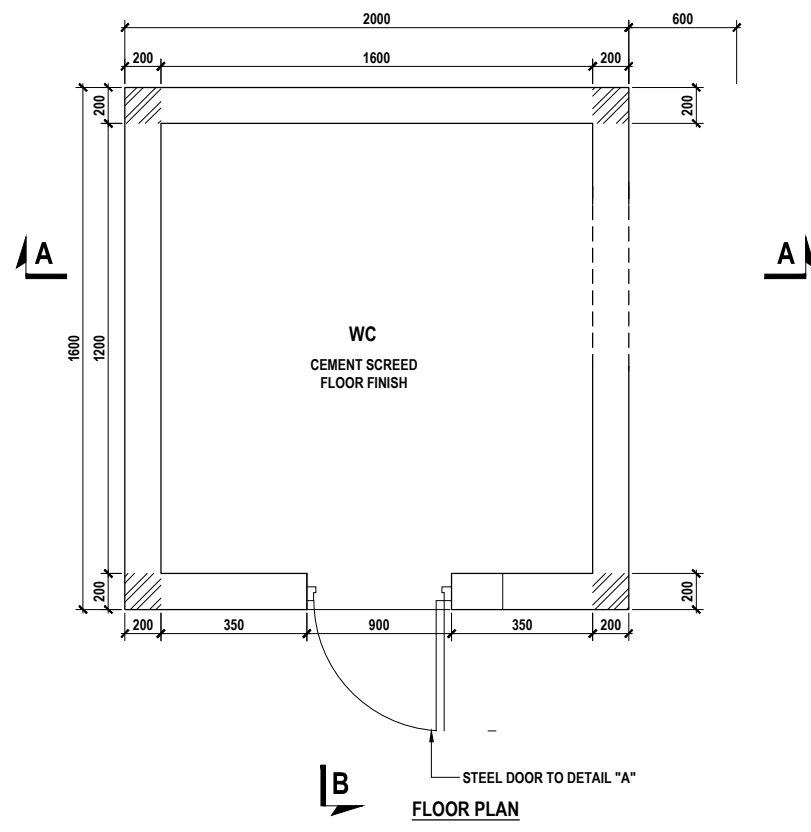
Project  
**KYUSO ROCK CATCHMENT WATER PROJECT**

Design Consultants.

15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 788 352 533  
Email: info@lossmanagement.com

Drawing Title  
**PROPOSED GUARD HOUSE  
PLAN, SECTION AND DETAILS**

Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H=1:1,000 V=1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO
0 STATUS	DWG. No.	SHEET 1 OF 1	0 REV





**NOTES**

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.


PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	BY	CHECKED	SIGN	DATE	APPROVED

Client  
**WaterFund**  
Theming the Water World

Financier  

  
 GOVERNMENT OF KENYA  
 MINISTRY OF WATER AND IRRIGATION

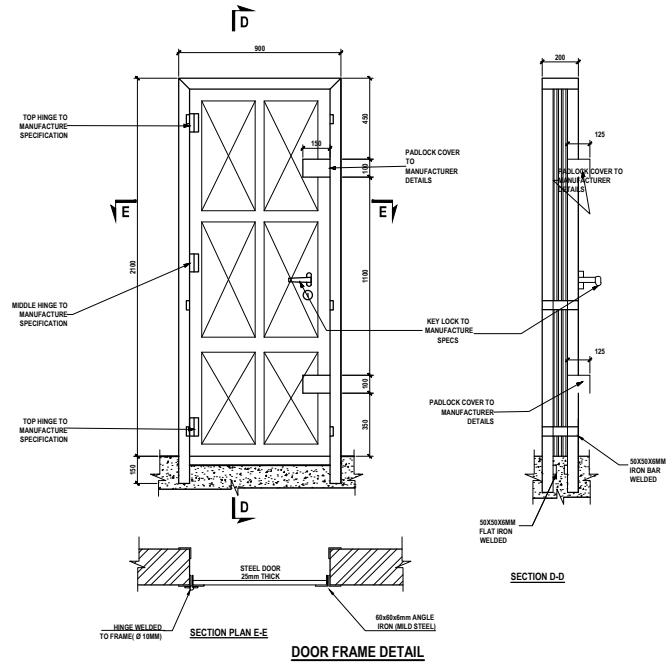
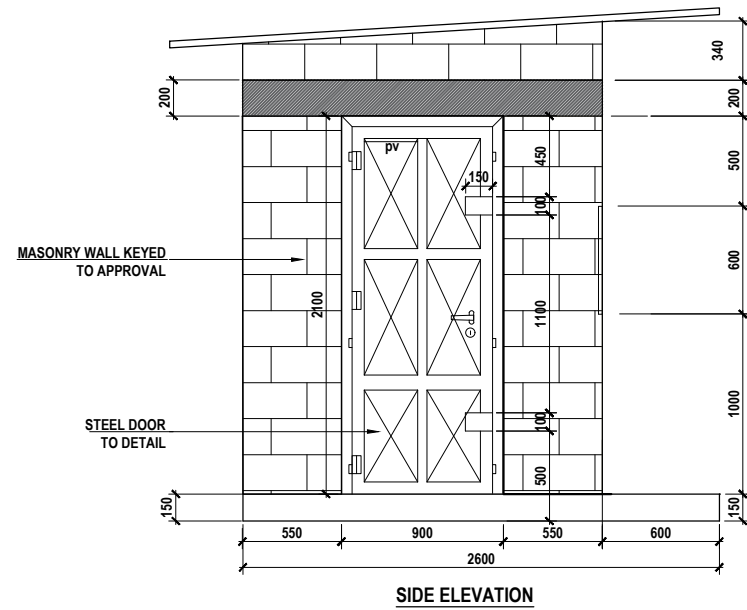
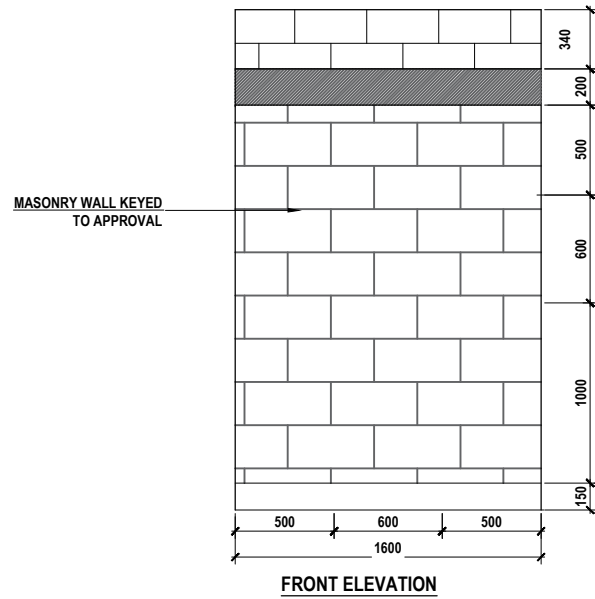
Project  
**KYUSO ROCK CATCHMENT WATER PROJECT**

Design Consultants.  

 15 Westlands Road, Westland  
 P.O Box 30337-00100 Nairobi, Kenya  
 Tel: +254 718 875 310  
 +254 788 352 533  
 Email: info@locusmanagement.com

Drawing Title  
**PROPOSED LATRINE PLAN, SECTION AND DETAILS**

Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1,000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO

0	DWG. No.	SHEET 1 OF 1	0
STATUS			REV



**NOTES**

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY CHECKED			
	BY CHECKED			
	BY CHECKED			
	BY CHECKED			
	BY CHECKED			

Client

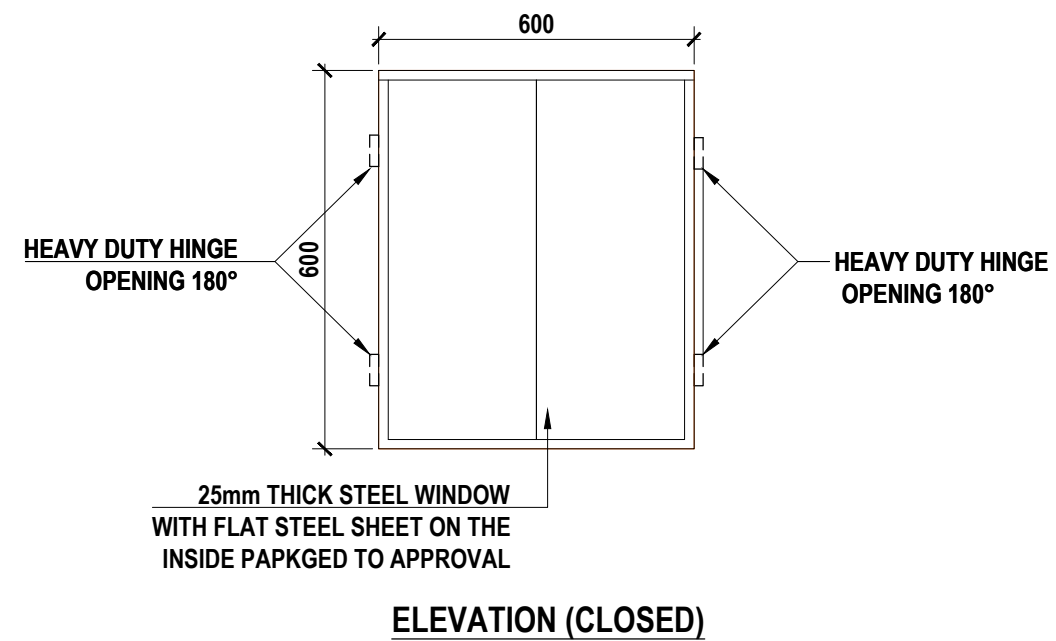
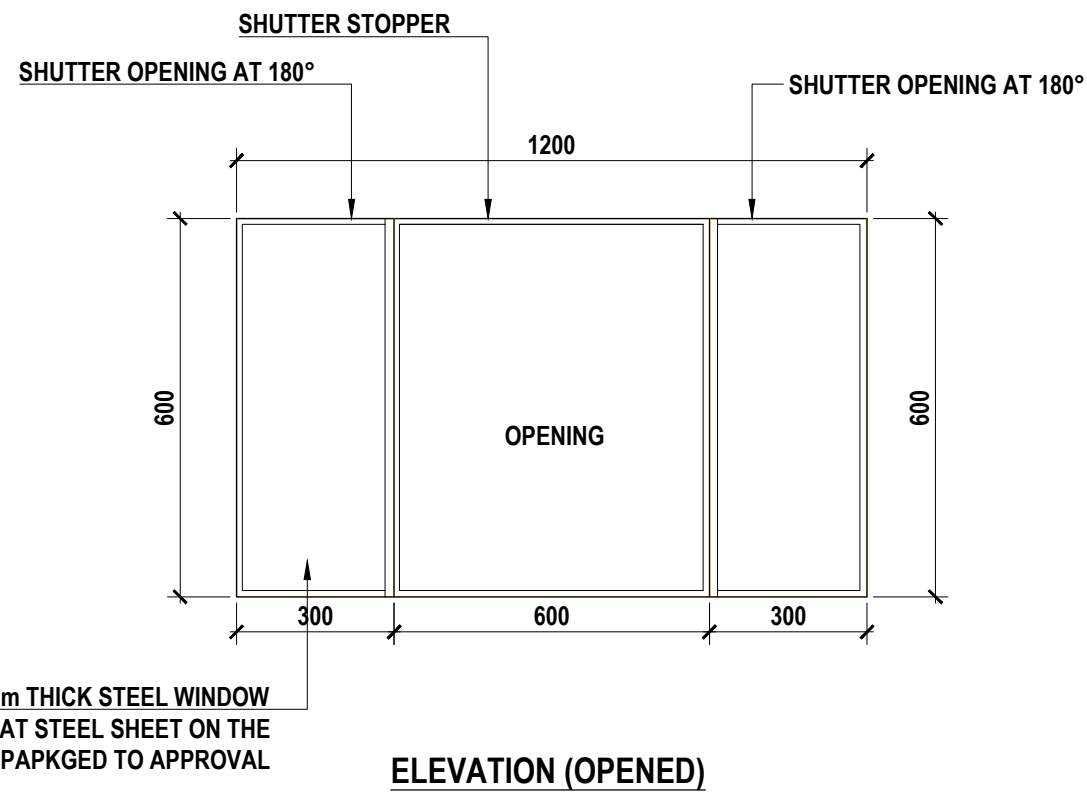
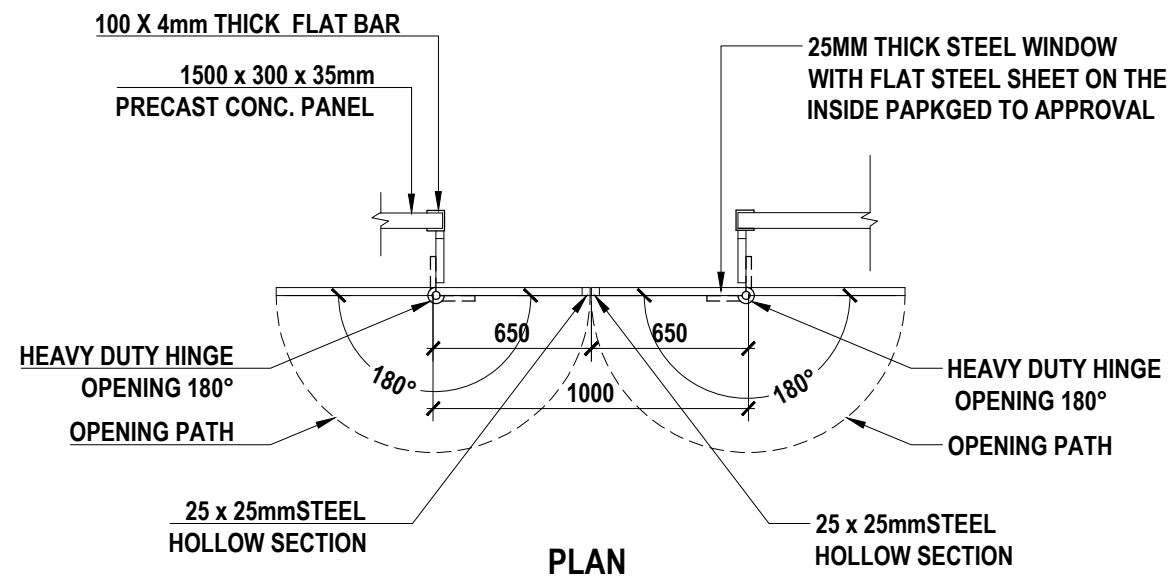
Financier

Project  
**KYUSO ROCK CATCHMENT WATER PROJECT**

Design Consultants.  
  
15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 788 352 533  
Email: info@osaimanagement.com

Drawing Title  
**PROPOSED LATRINE ELEVATION, SECTION AND DETAILS**

Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1,000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO
0 STATUS	DWG. No.	SHEET 1 OF 1	0 REV



**SHUTTER DETAIL**

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			

Client

Financier

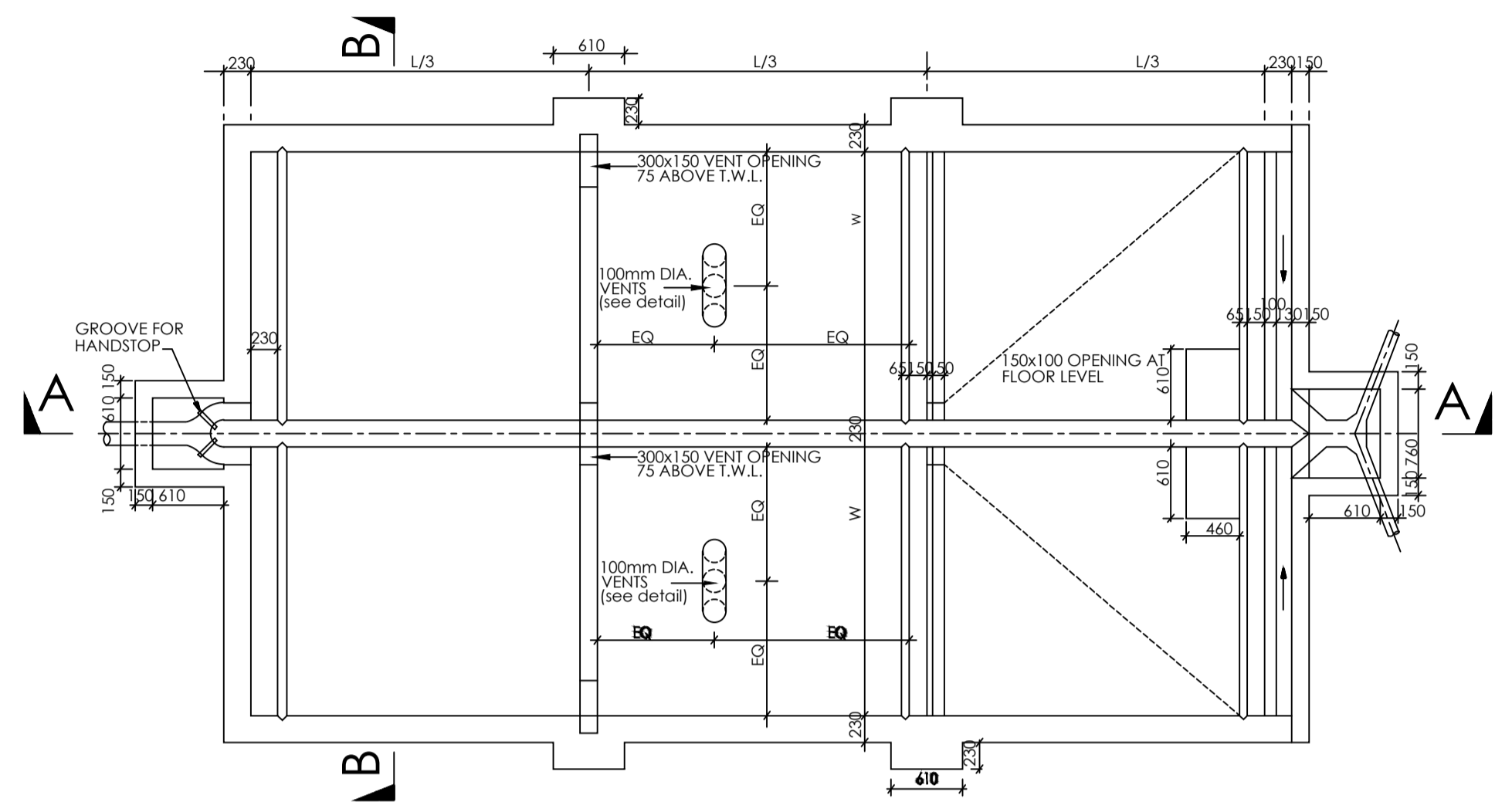
Project  
**KYUSO ROCK CATCHMENT  
WATER PROJECT**

Design Consultants.

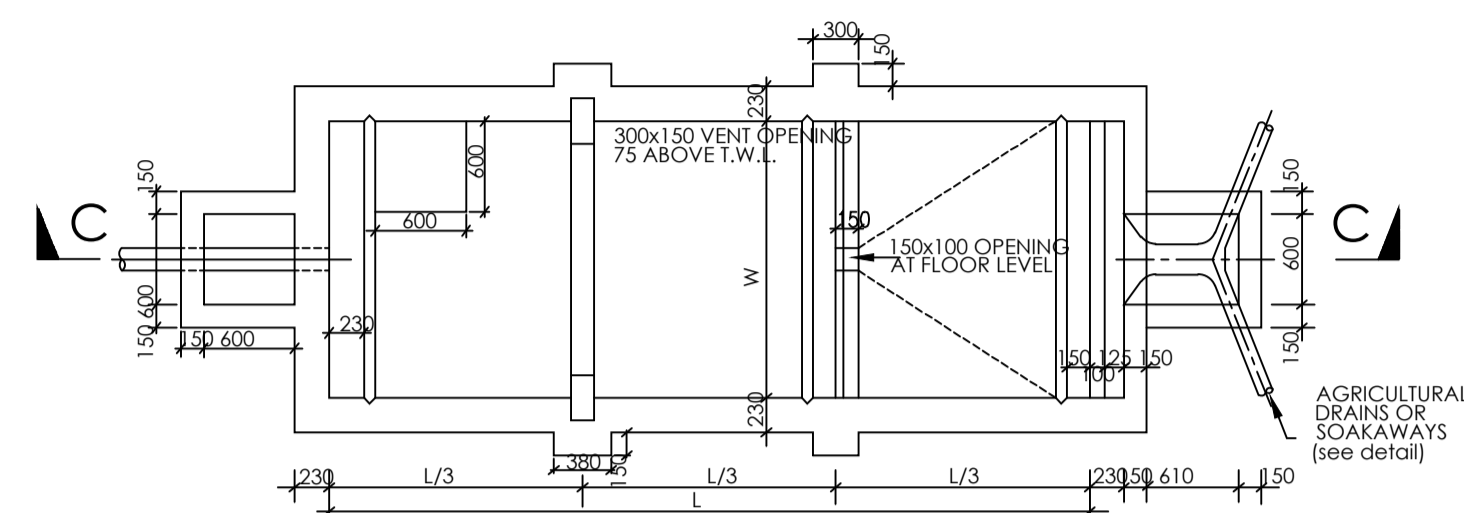
15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 788 352 533  
Email: info@losaimanagement.com

Drawing Title  
**PROPOSED LATRINE  
PLAN, SECTION AND DETAILS**

Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1,000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO
0 STATUS	DWG. No.	SHEET 1 OF 1	0 REV



**PLAN OF TWIN SEPTIC TANK**  
SCALE: 1:75



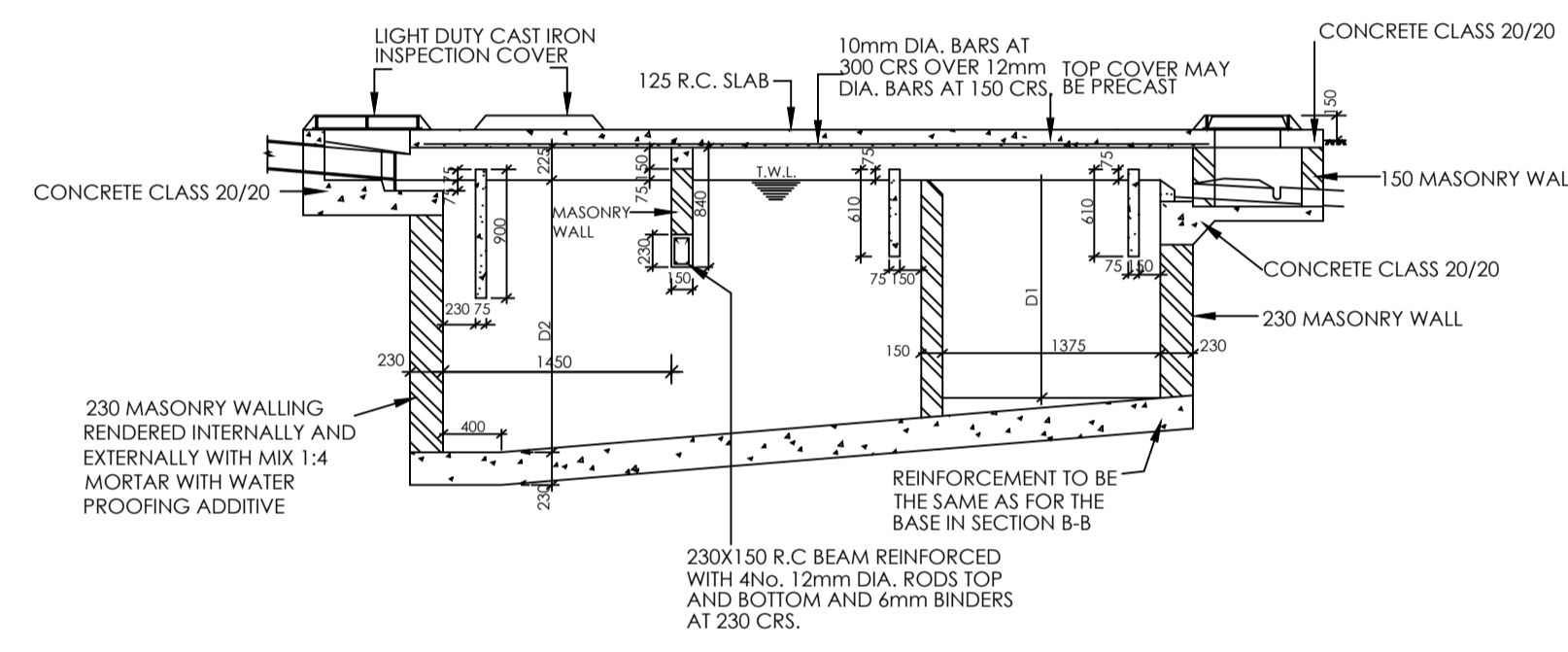
**PLAN OF SINGLE SEPTIC TANK**  
SCALE: 1:75

**NOTES**

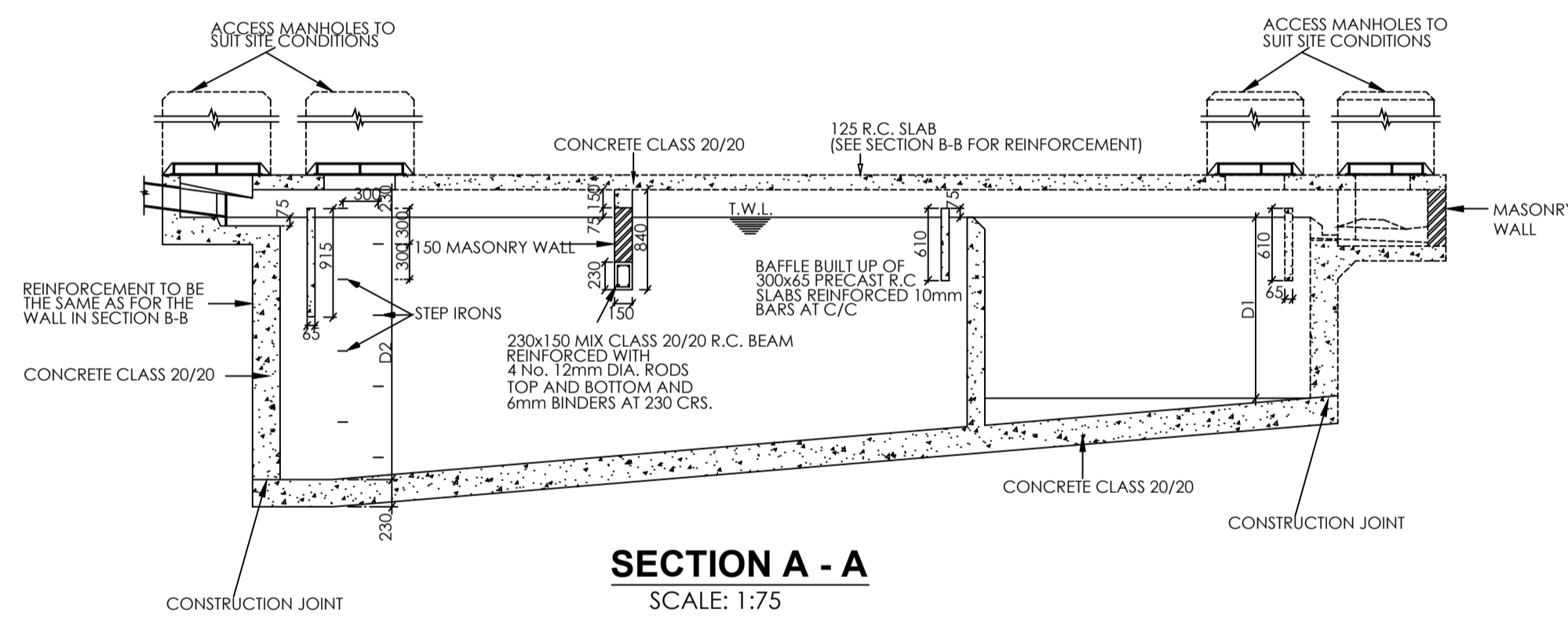
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED
2. ALL CONCRETE TO BE CLASS 20/20
3. ALL PRECAST CONCRETE UNITS TO BS 556
4. CONCRETE FILLING CLASS 25/20 VIBRATED AND CURED IN ACCORDANCE WITH THE APPROPRIATE SPECIFICATION CLAUSES.
5. TOLERANCE ON OVERALL SIZE 3mm
6. ALL HAUNCHES ARE CLASS 15/40 CONCRETE AS INDICATED ON THE SPECIFICATION OVER EXCAVATION TO BE MADE GOOD IN CONCRETE CLASS 15/40.

**ABBREVIATIONS**

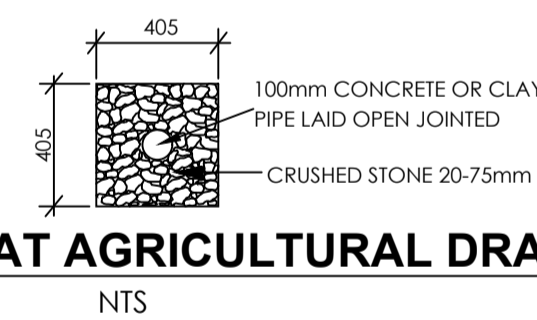
- n.e - NOT EXCEEDING
- c/c - CENTRE TO CENTRE
- MIN - MINIMUM
- G.L - GROUND LEVEL
- mm - MILLIMETER
- m - METER
- EXT. DIA - EXTERNAL DIAMETER
- O.D - OUTSIDE DIAMETER
- ND - NOMINAL DIAMETER
- RC - REINFORCED CONCRETE
- T10 - TWISTED BAR 10mm SIZE
- NIS - NOT TO SCALE
- CI - CAST IRON
- CU.M PER LIN. METER - CUBIC METER PER LINEAR METER



**SECTION C - C**  
SCALE: 1:75



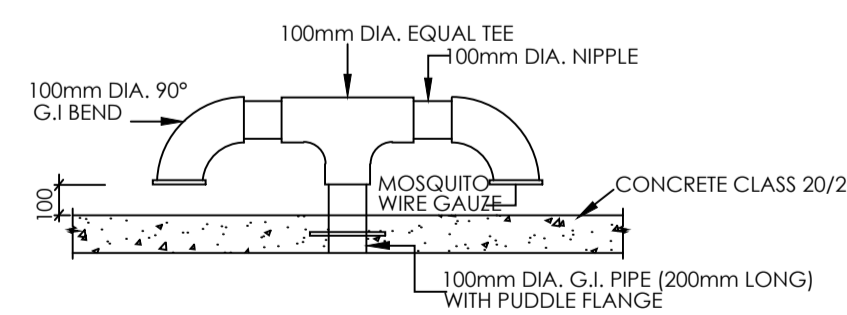
**SECTION A - A**  
SCALE: 1:75



**SECTION AT AGRICULTURAL DRAIN**  
NTS

**NOTES**

1. ALL CONCRETE TO BE CLASS 20/20.
2. COVERS TO MAIN REINFORCEMENT 38mm.

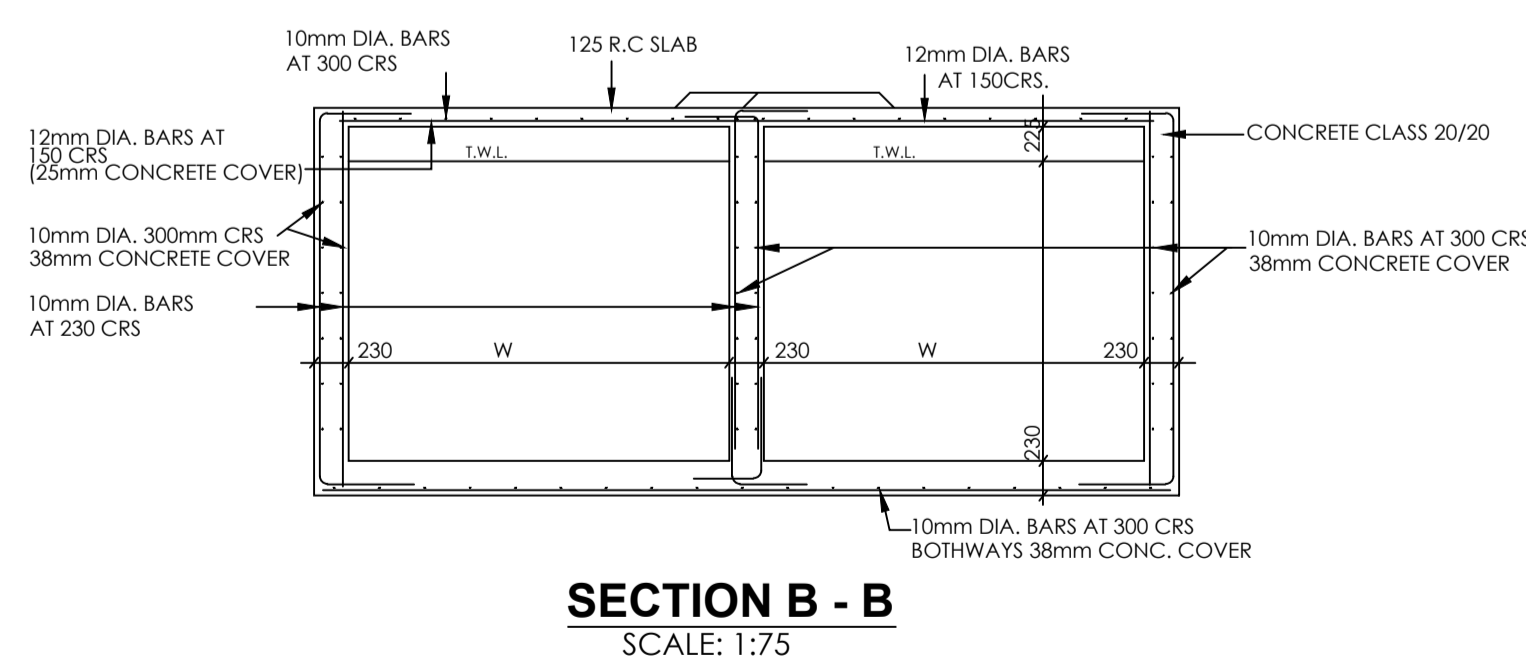


**VENT PIPE DETAIL**  
NTS

SINGLE TANK CAPACITY CU METRES	TWIN TANK CAPACITY CU METRES				
	L/3	W	D1	D2	
4.75	915	1070	1525	1715	9.50
6.50	1070	1220	1525	1755	13.00
8.40	1220	1220	1525	1790	16.80
10.50	1370	1525	1525	1830	21.00
13.15	1525	1675	1525	1865	26.30
15.90	1675	1830	1525	1905	31.80
18.85	1830	1980	1525	1940	37.70
21.50	1980	2055	1525	1980	43.00
24.30	2135	2135	1525	2020	48.60
27.25	2210	2210	1525	2060	54.50
30.45	2440	2285	1525	2095	60.90
33.65	2570	2360	1525	2135	67.30
37.30	2740	2440	1525	2170	74.60
41.00	2895	2515	1525	2210	82.00
44.80	3050	2590	1525	2245	89.60
48.45	3200	2665	1525	2285	97.70

**NOTES**

1. ALL CONCRETE MIX TO BE CLASS 20/20 UNLESS OTHERWISE SPECIFIED
2. COVER TO ALL REINFORCEMENT 40mm WALLS AND BASE, 25mm ROOF SLAB.



**SECTION B - B**  
SCALE: 1:75

**NOTES**

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.

PRELIMINARY ISSUE

Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED

Client



Financier



Project

**KYUSO ROCK CATCHMENT WATER PROJECT**

Design Consultants.

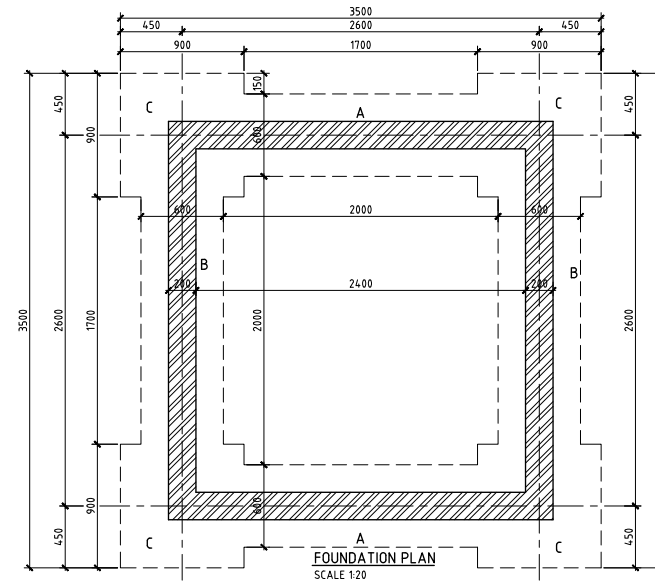
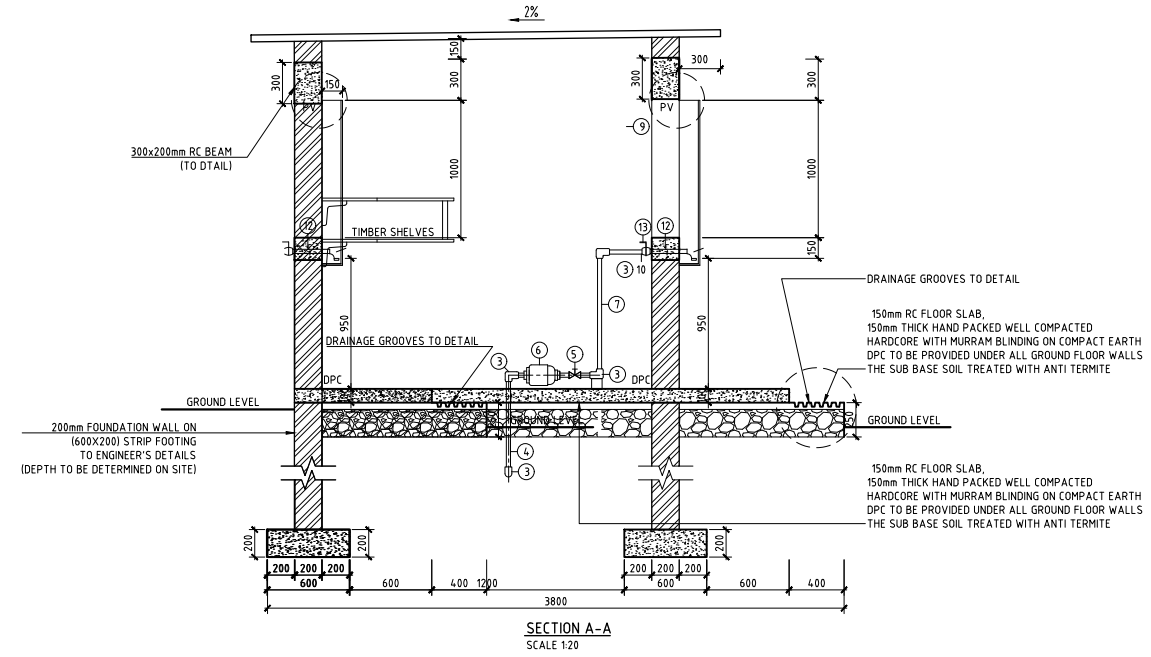
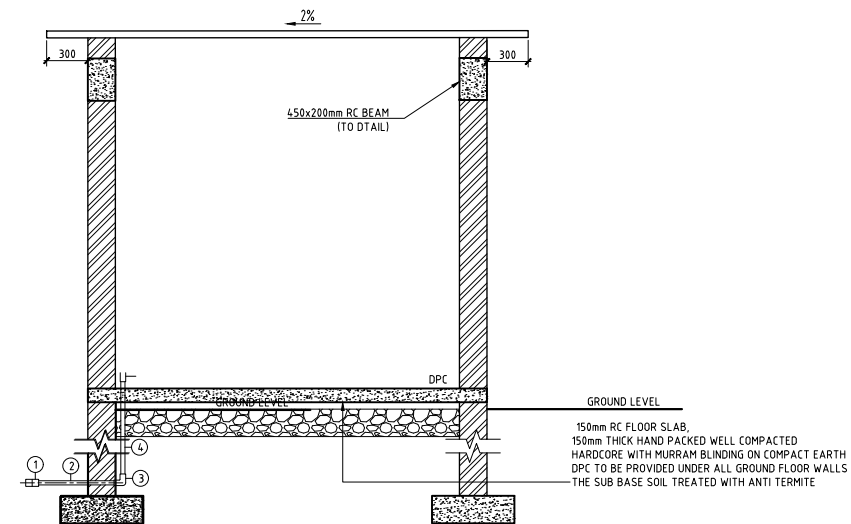
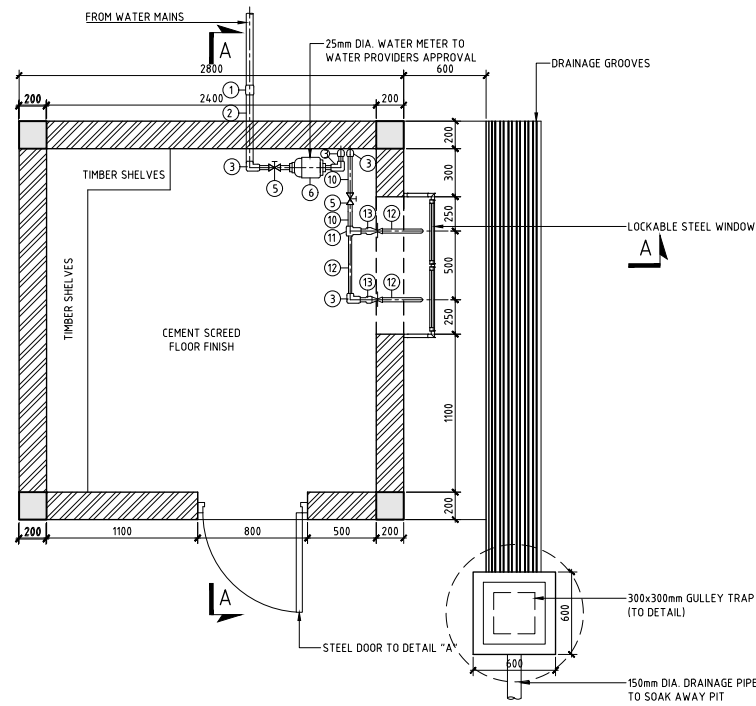


15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 788 352 533  
Email: info@lossmanagement.com

Drawing Title

**SEPTIC TANK DETAILS**

Designed by JMM	Drawn by KCK
Checked by JN	Approved by JR
Scale H = 1:1,000 V = 1:100	Date NOV 2023
Job No.	ACAD File: kyuso
0 STATUS	DWG. No. SHEET 1 OF 1
0	0 REV




**NOTES**

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY CHECKED			
	BY CHECKED			
	BY CHECKED			
	BY CHECKED			

Client  
**WaterFund**  
*Financing the Water Sector*

Financier  

  
 GOVERNMENT OF KENYA  
MINISTRY OF WATER AND SANITATION

Project  
**KYUSO ROCK CATCHMENT WATER PROJECT**

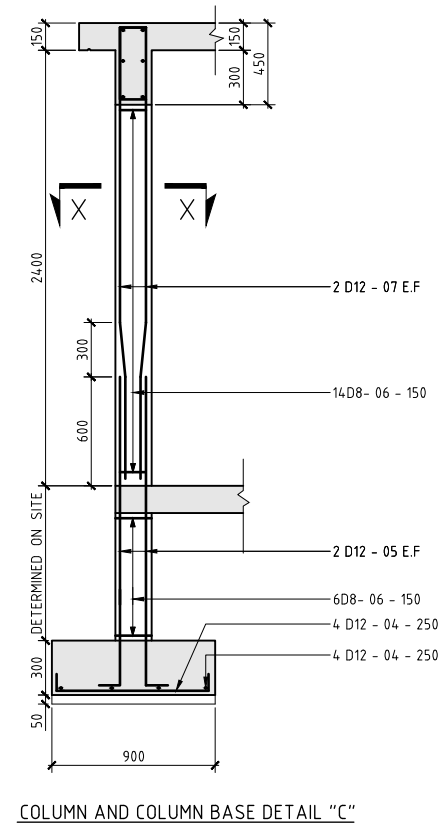
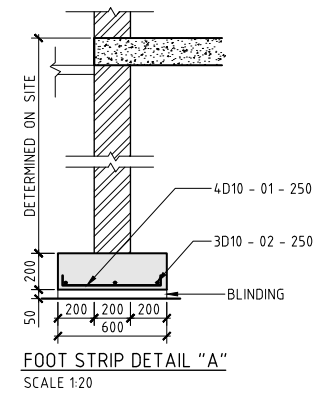
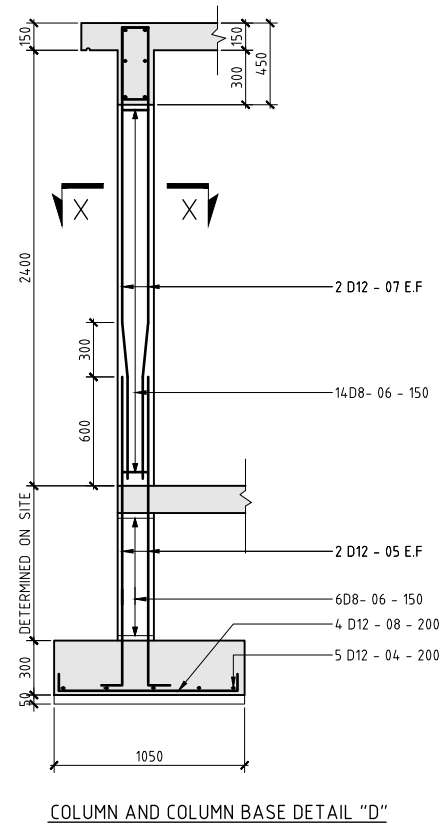
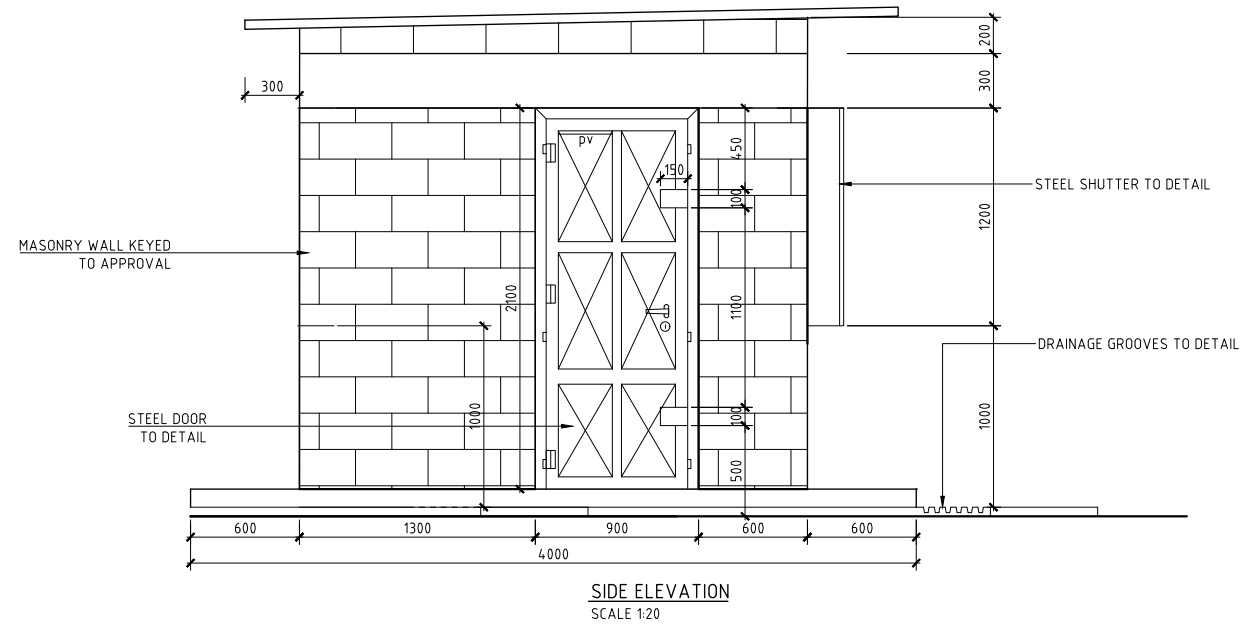
Design Consultants  

 15 Westlands Road, Westland  
 P.O Box 30337-00100 Nairobi, Kenya  
 Tel: +254 718 875 310  
 +254 788 352 533  
 Email: info@lossaia.com

Drawing Title  
**WATER KIOSK  
PLAN, SECTION AND DETAILS**

Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1000 V = 1:80	Date	NOV 2023
Job No.		ACAD File:	KYUSO

0	DWG. No.	SHEET 1 OF 1	0
STATUS			REV



**NOTES**

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	BY	SIGN	DATE	APPROVED
		CHECKED			
		CHECKED			
		CHECKED			
		CHECKED			
		CHECKED			

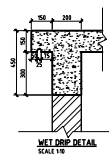
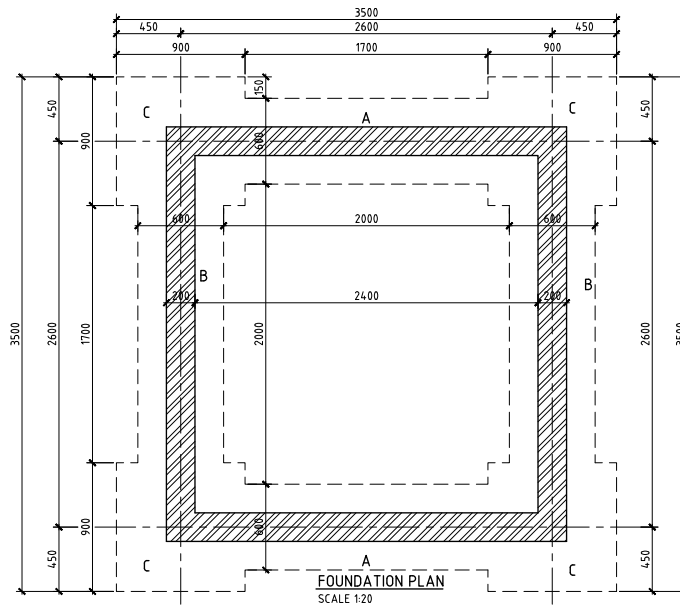
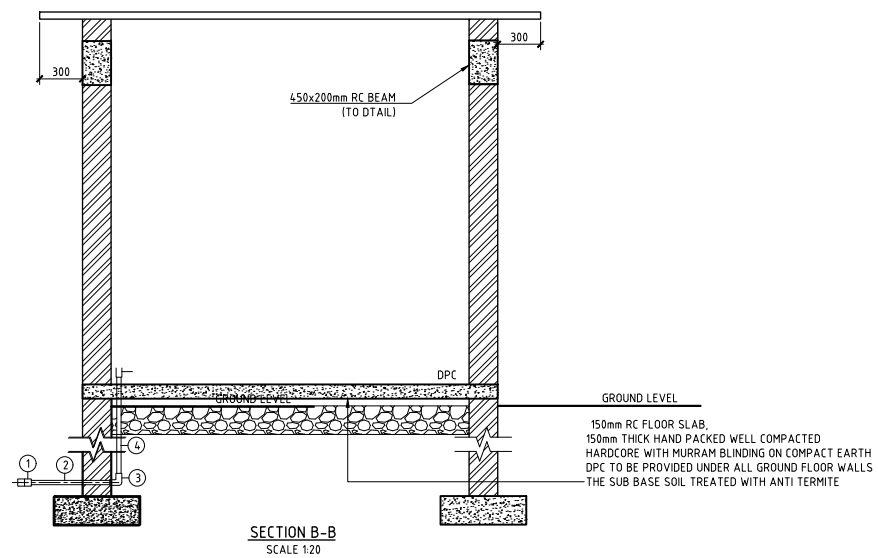
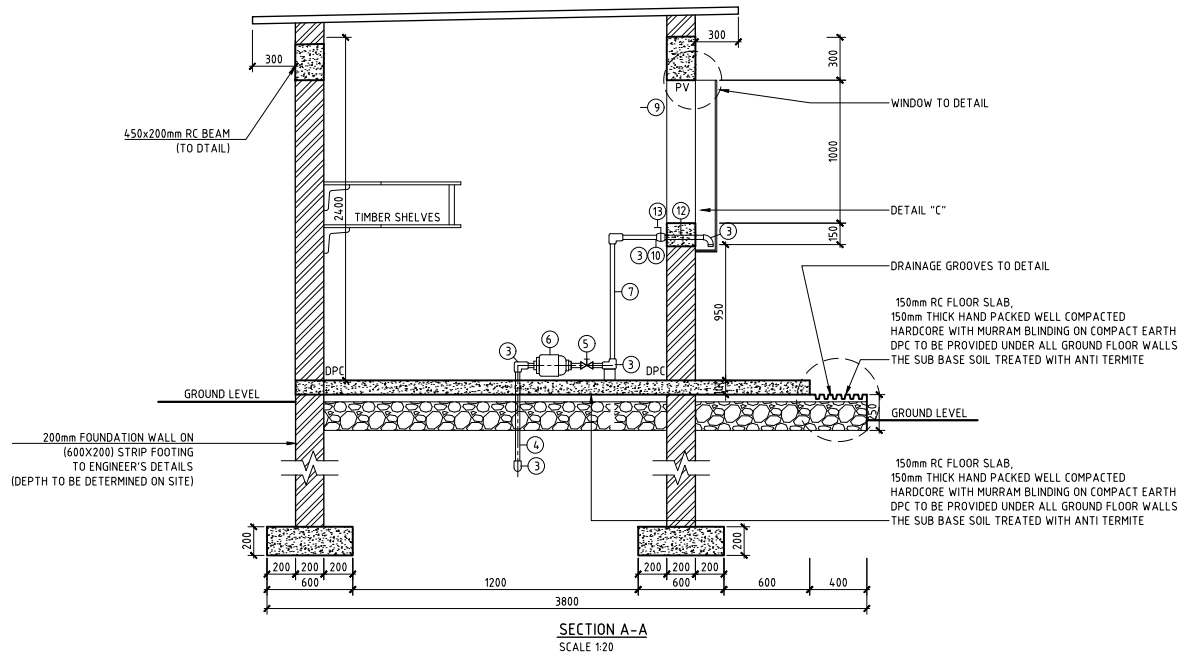
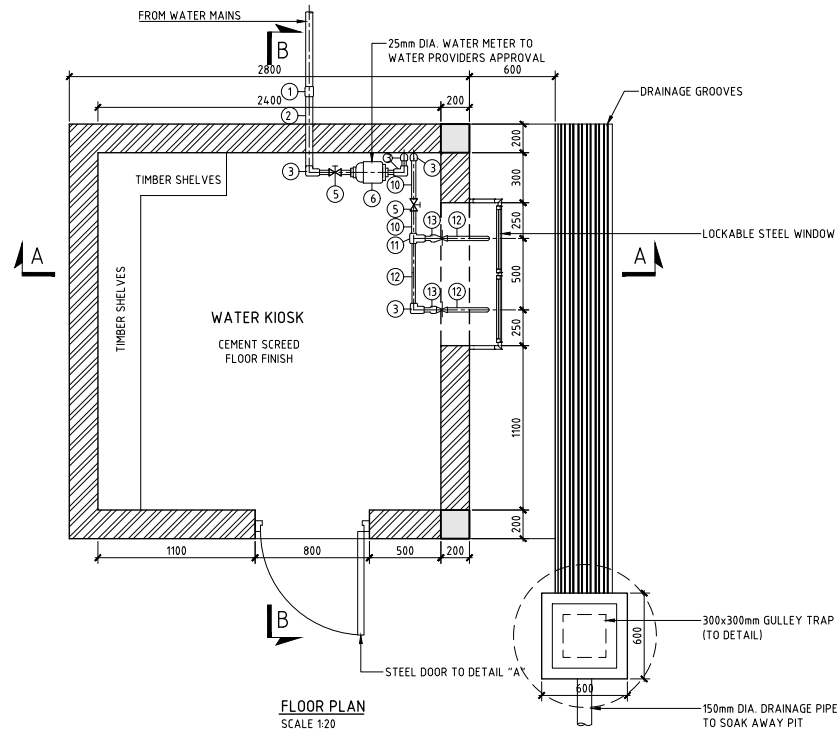


Project  
**KYUSO ROCK CATCHMENT WATER PROJECT**

Design Consultants.  
 15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 788 352 533  
Email: info@lossamanagement.com

Drawing Title  
**WATER KIOSK**  
**PLAN, SECTION AND DETAILS**

Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1000 V = 1:80	Date	NOV 2023
Job No.		ACAD File:	KYUSO
0 STATUS	DWG. No.	SHEET 1 OF 1	0 REV



**NOTES**

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	BY	SIGN	DATE	APPROVED
		CHECKED			
		CHECKED			
		CHECKED			
		CHECKED			

Client

Financier

Project  
**KYUSO ROCK CATCHMENT WATER PROJECT**

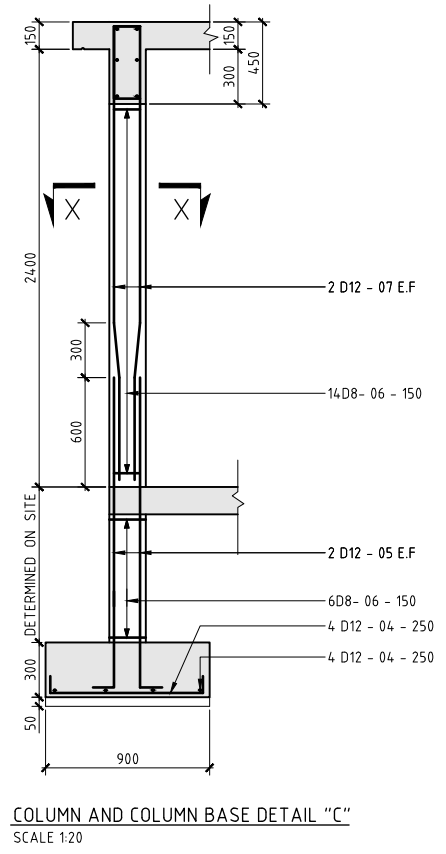
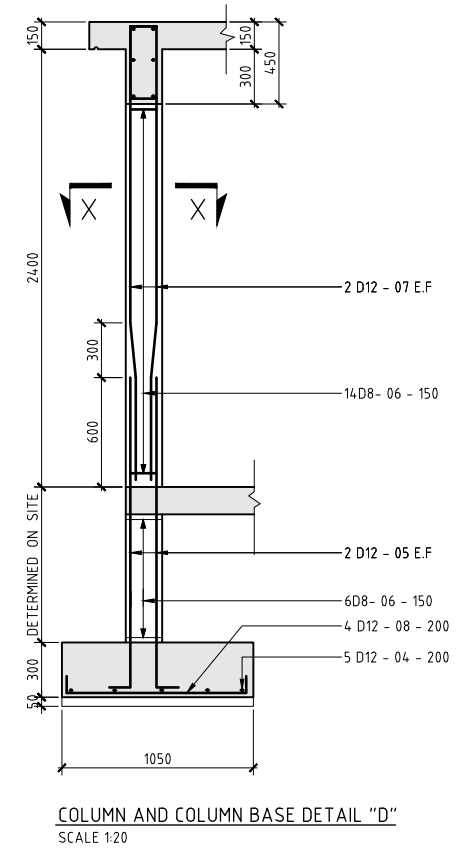
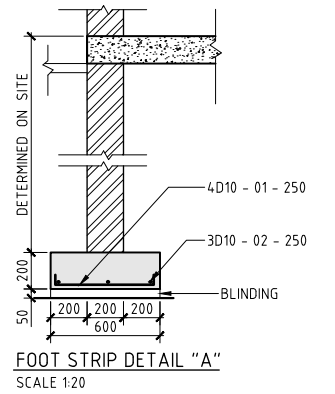
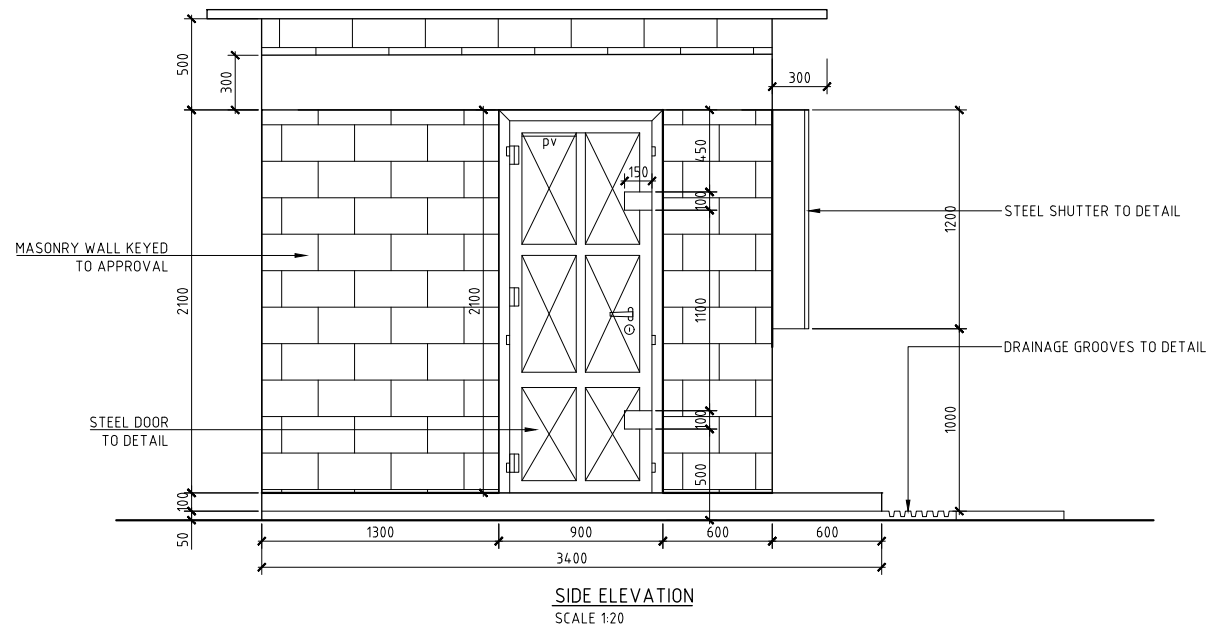
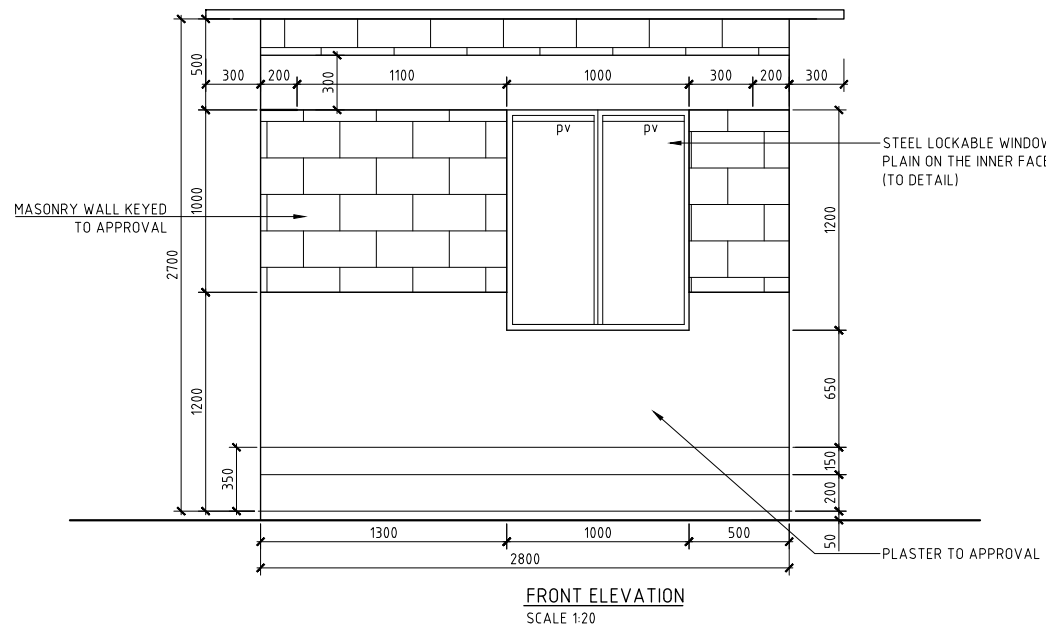
Design Consultants.

15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 788 352 533  
Email: info@lossmanagement.com

Drawing Title  
**WATER KIOSK  
PLAN, SECTION AND DETAILS**

Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	kyuso
0 STATUS	DWG. No.	SHEET 1 OF 1	0 REV





**NOTES**  
1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	BY	CHECKED	SIGN	DATE	APPROVED
		BY	CHECKED			
		BY	CHECKED			
		BY	CHECKED			
		BY	CHECKED			



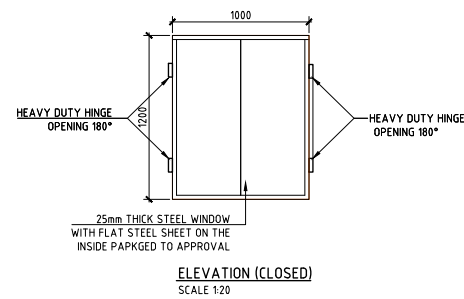
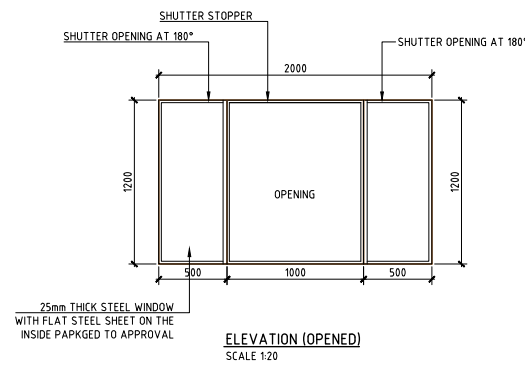
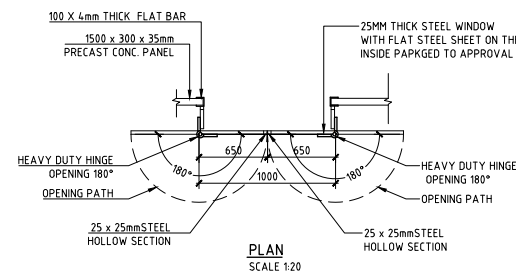
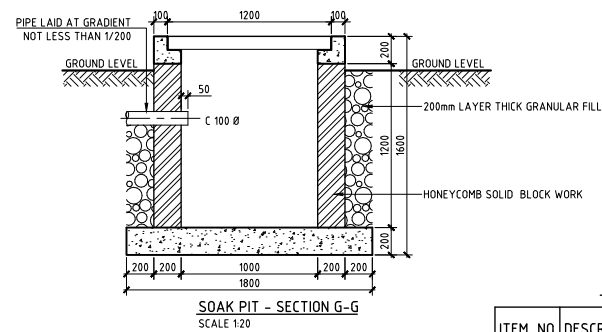
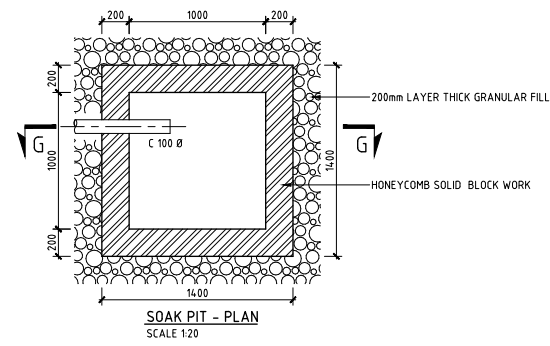
Project  
**KYUSO ROCK CATCHMENT WATER PROJECT**

Design Consultants:  

 15 Westlands Road, Westland  
 P.O Box 30337-00100 Nairobi, Kenya  
 Tel: +254 718 875 310  
 +254 788 352 533  
 Email: info@lossmanagement.com

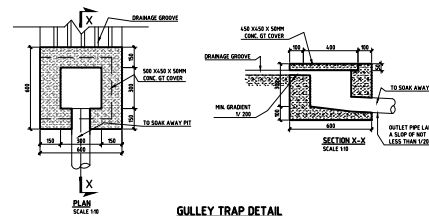
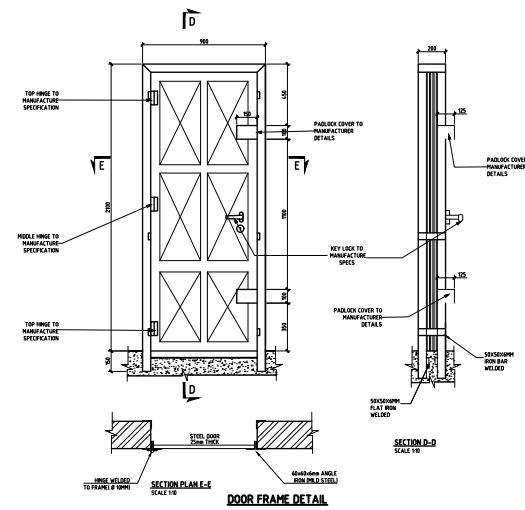
Drawing Title  
**WATER KIOSK**  
**PLAN, SECTION AND DETAILS**

Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO
0 STATUS	DWG. No.	SHEET 1 OF 1	0 REV



**PIPEWORK SCHEDULE**

ITEM NO.	DESCRIPTION (ALL 25mm DIA)	QTY
1	GALVANISED IRON UNION	3
2	GALVANISED IRON CLASS B PIPE - 500mm	1
3	GALVANISED IRON BEND	7
4	GALVANISED IRON CLASS B PIPE - 700mm	1
5	GALVANISED IRON GATE VALVE	2
6	WATER METER	1
7	GALVANISED IRON CLASS B PIPE - 4000mm	1
8	GALVANISED IRON ELBOW	1
9	GALVANISED IRON CLASS B PIPE - 1500mm	1
10	GALVANISED IRON CLASS B NIPPLE - 125mm	10
11	GALVANISED IRON EQUAL TEE	1
12	GALVANISED IRON CLASS B PIPE - 425mm	3
13	WATER TAPS	2

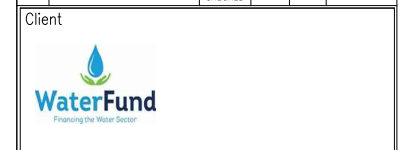


**NOTES**

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			

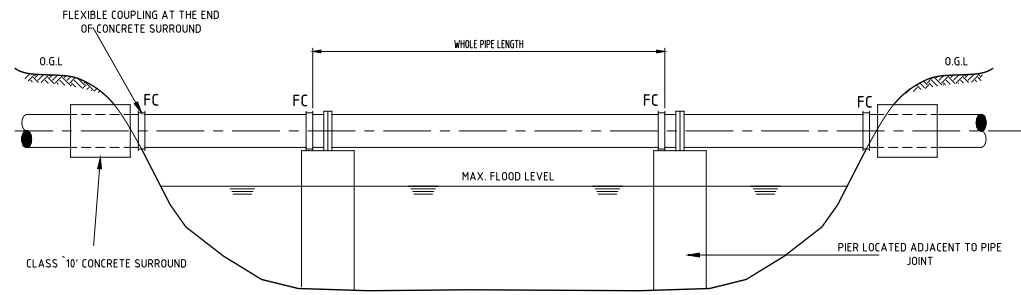


Project  
**KYUSO ROCK CATCHMENT WATER PROJECT**

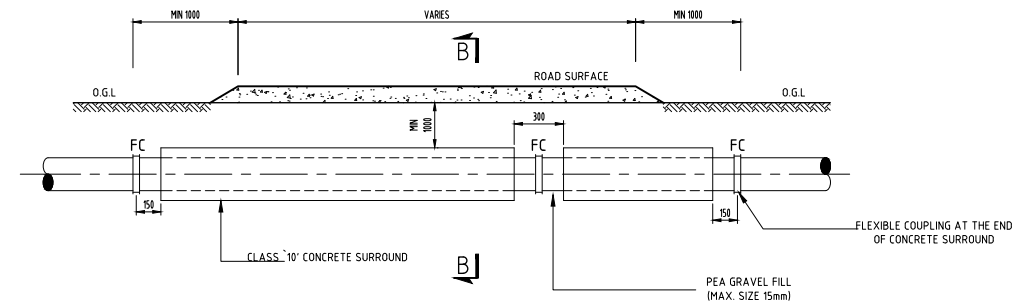
Design Consultants:  
 15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 788 352 533  
Email: info@lossmanagement.com

Drawing Title  
**WATER KIOSK**  
**PLAN, SECTION AND DETAILS**

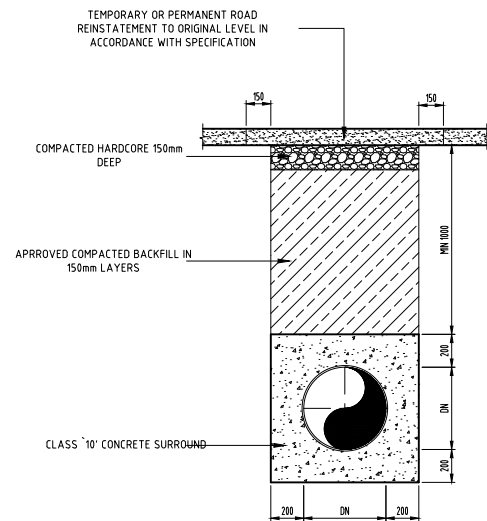
Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO
0 STATUS	DWG. No.	SHEET 1 OF 1	0 REV



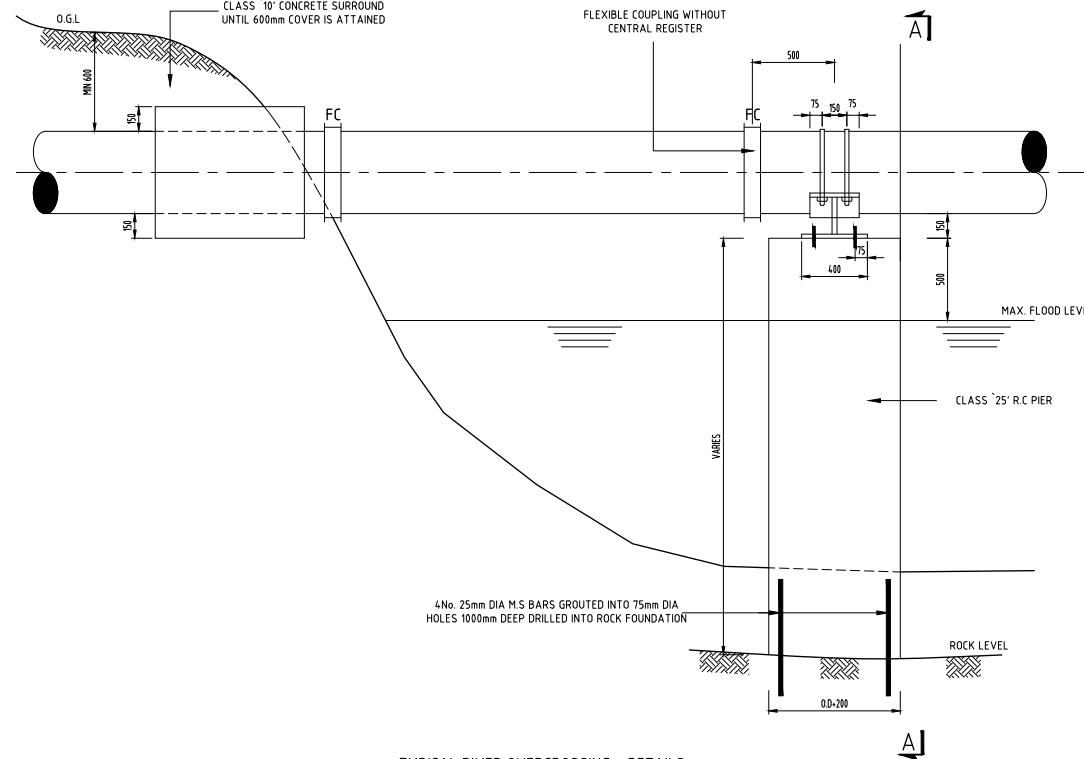
TYPICAL RIVER OVERCROSSING  
N.T.S.



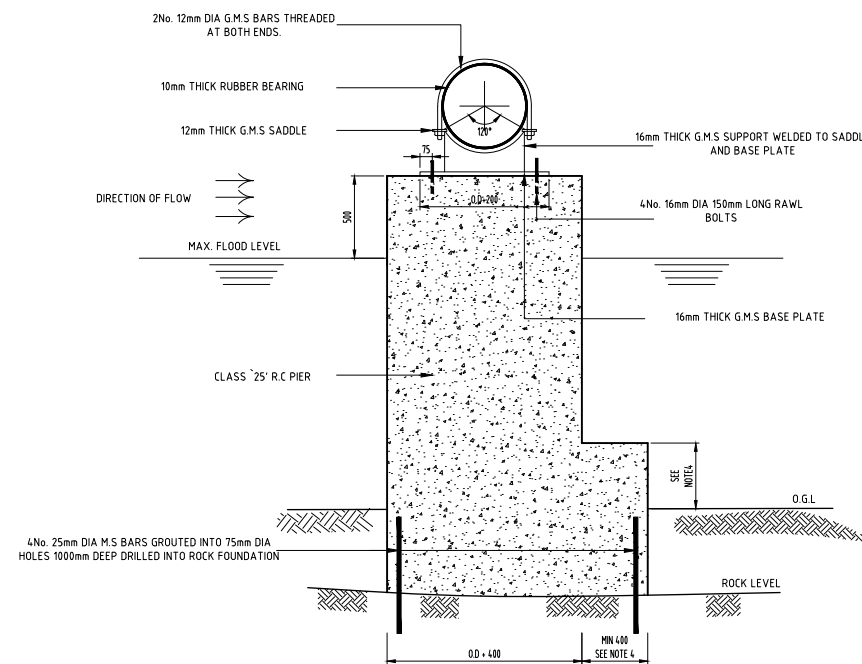
TYPICAL ROAD CROSSING  
N.T.S.



SECTION B-B  
N.T.S.



TYPICAL RIVER OVERCROSSING - DETAILS  
N.T.S.



SECTION N A-A  
N.T.S.

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			

Client



Financier



Project

KYUSO ROCK CATCHMENT WATER PROJECT

Design Consultants.



15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 718 352 533  
Email: info@esammanagement.com

Drawing Title

DETAILED DESIGN  
STANDARD DRAWINGS  
CROSSING DETAILS - 1

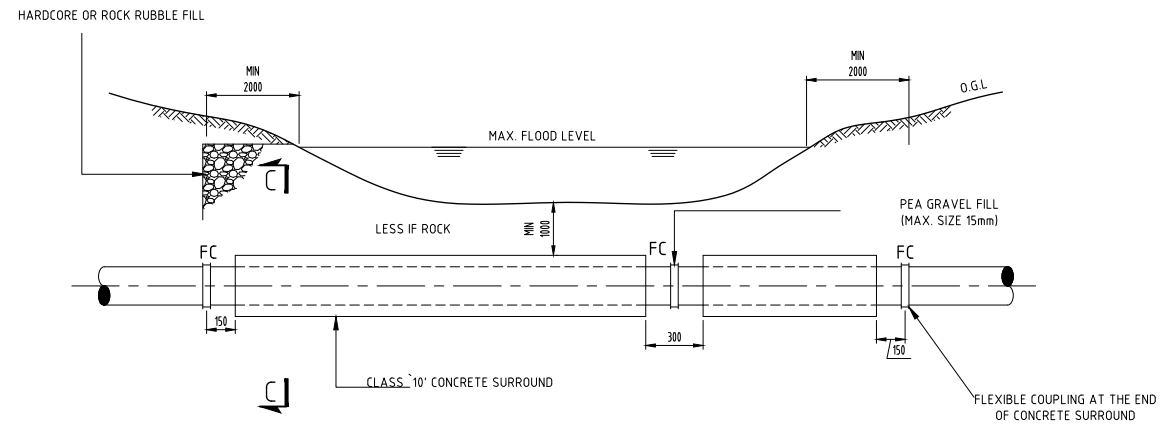
Designed by JMM Drawn by KCK

Checked by JN Approved by JR

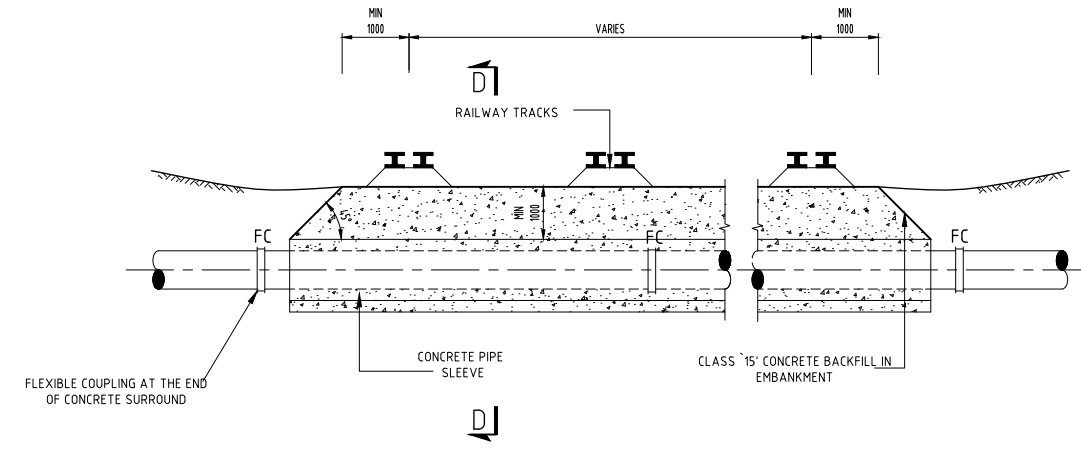
Scale H = 1:1,000 V = 1:100 Date NOV 2023

Job No. ACAD File: KYUSO

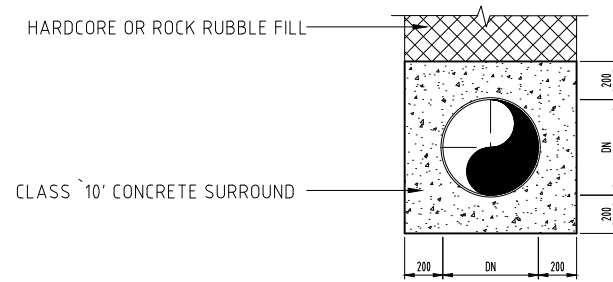
0 STATUS DWG. No. SHEET 1 OF 1 0 REV



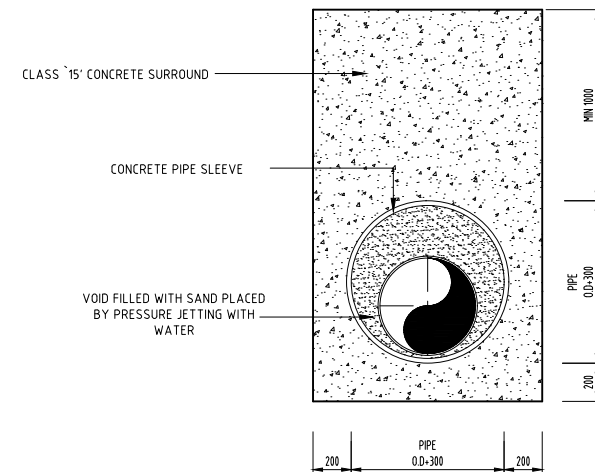
TYPICAL RIVER UNDERCROSSING  
N.T.S



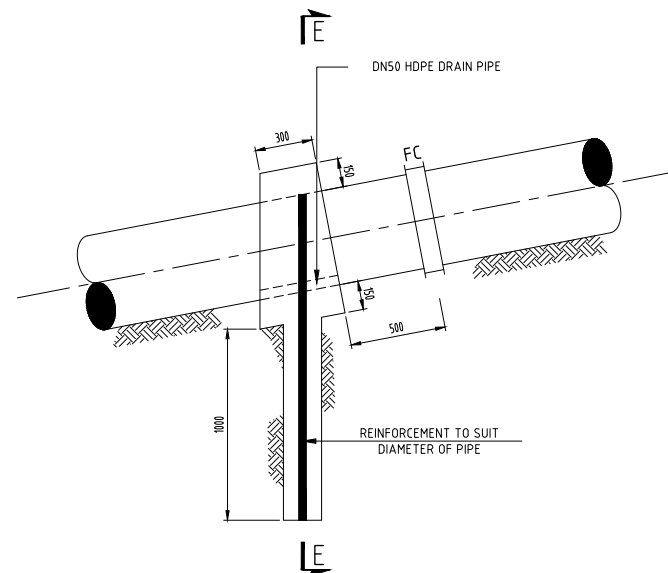
TYPICAL RAILWAY CROSSING  
N.T.S



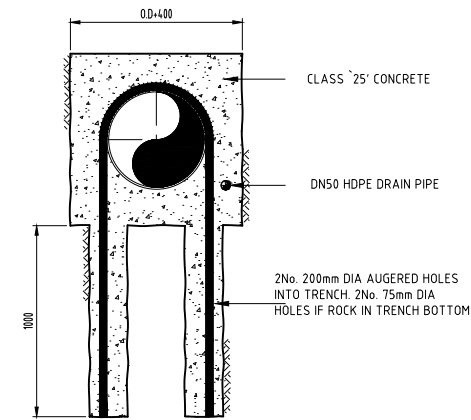
SECTION C-C  
N.T.S



SECTION D-D  
N.T.S



SLIP ANCHOR DETAIL  
N.T.S



SECTION E-E  
N.T.S

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			

Client

Financier

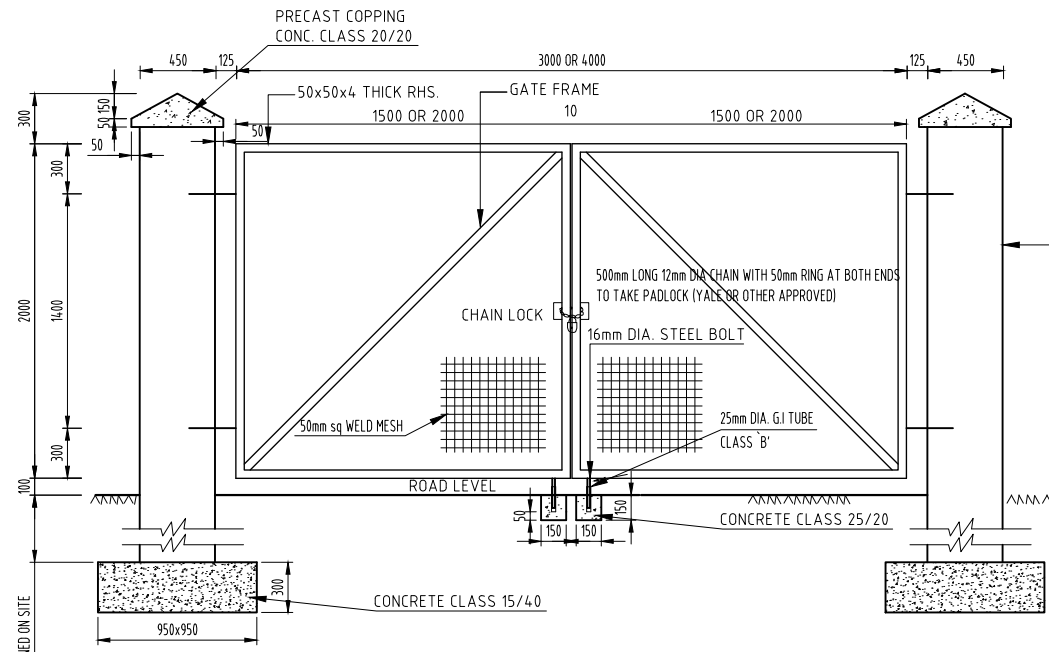
Project  
**KYUSO ROCK CATCHMENT WATER PROJECT**

Design Consultants.

15 Westlands Road, Westland  
P.O. Box 30337-40100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 788 352 533  
Email: info@losaimanagement.com

Drawing Title  
**DETAILED DESIGN  
STANDARD DRAWINGS  
CROSSING DETAILS - 2**

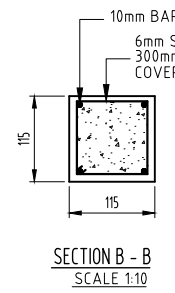
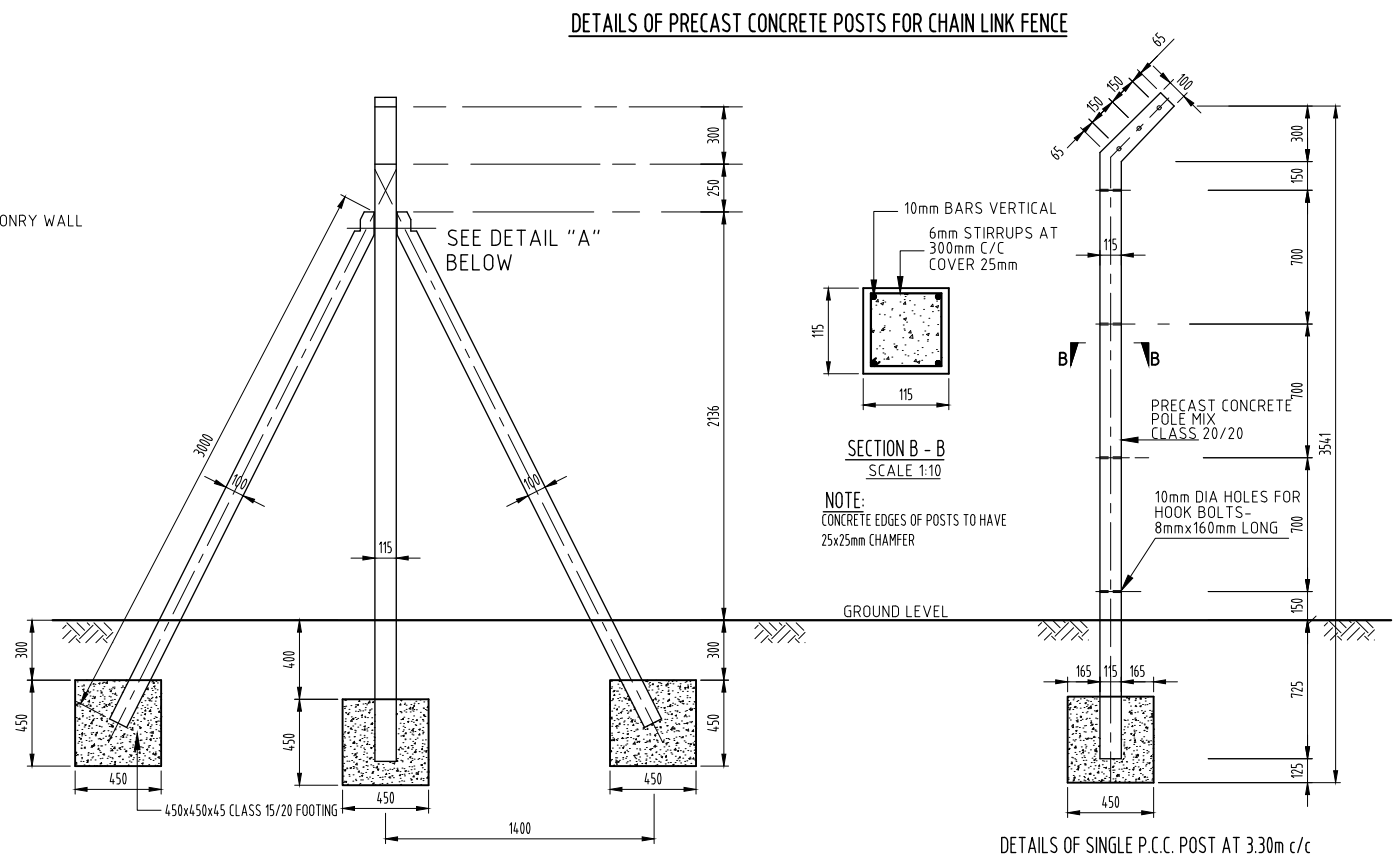
Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1,000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	kyuso
0 STATUS	DWG. No.	SHEET 1 OF 1	0 REV



NOTE  
ALL STEEL WORK TO BE CLEANED OFF RUST AND PAINTED WITH LEAD PAINT AND TWO COAT ENAMEL PAINT OF APPROVED COLOUR.

ELEVATION  
NTS

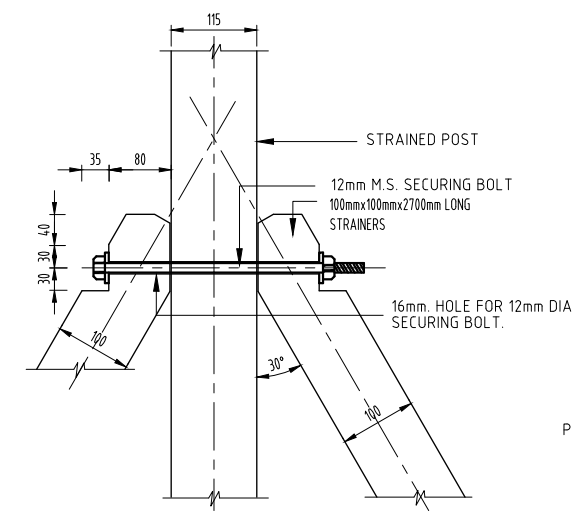
DETAILS OF 3m & 4m WIDE GATE



NOTE:  
CONCRETE EDGES OF POSTS TO HAVE 25x25mm CHAMFER

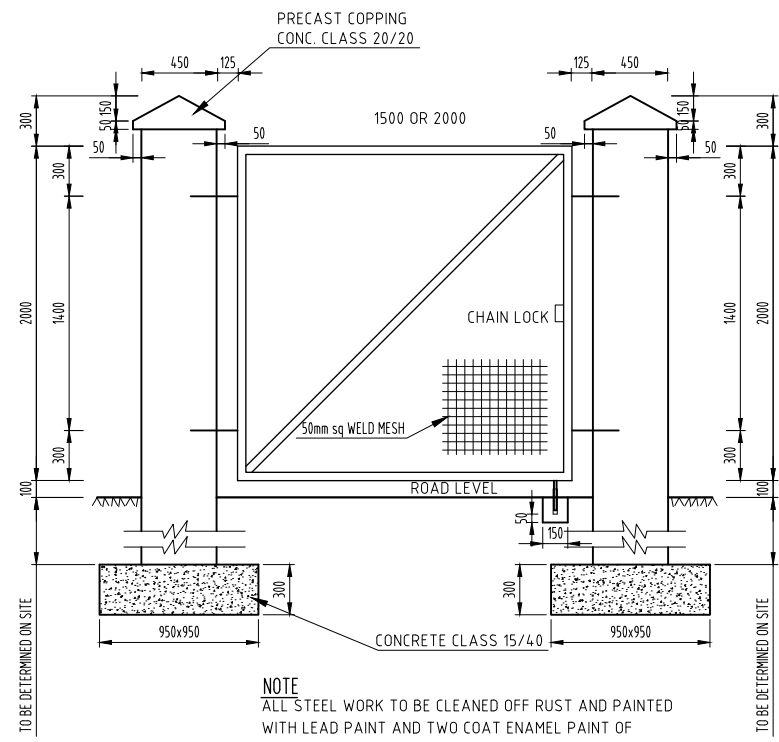
DETAILS OF SINGLE P.C.C. POST AT 3.30m c/c  
NTS

DETAILS OF STRAINING POST FOR CHAIN LINK FENCE AT 33.3m c/c  
NTS



DETAIL 'A'  
NTS

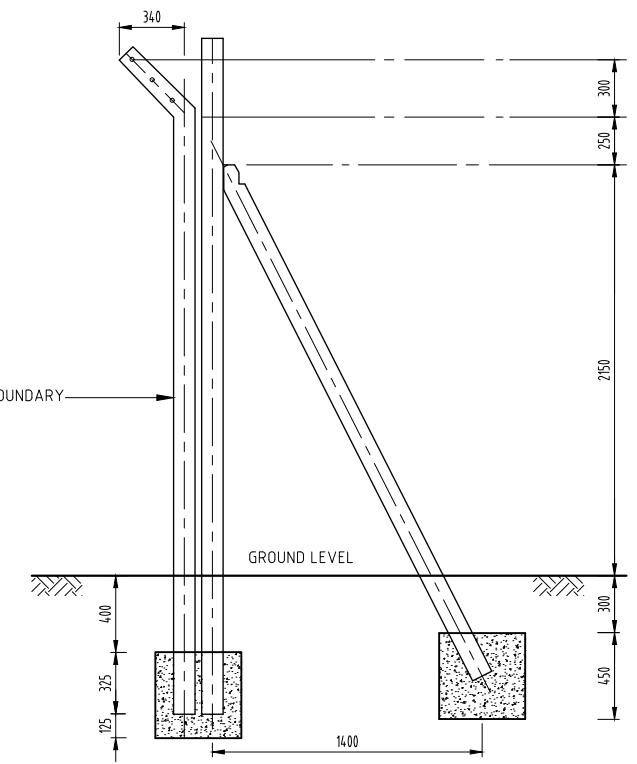
- NOTES
- a) APPROXIMATELY EVERY 10th POST AND ALL CORNER POST TO BE STRAINED
  - b) POST TO BE AT 3300mm CENTRES
  - c) TOP OF ALL POSTS TO BE KEPT IN UNIFORM LINE.



NOTE  
ALL STEEL WORK TO BE CLEANED OFF RUST AND PAINTED WITH LEAD PAINT AND TWO COAT ENAMEL PAINT OF APPROVED COLOUR.

ELEVATION  
NTS

DETAILS OF 1m WIDE & 2m WIDE GATE



DETAILS OF CORNER POSTS  
NTS

**NOTES**

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			

Client

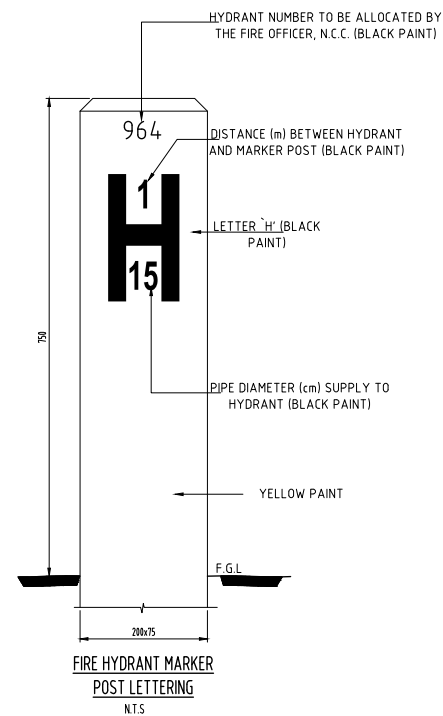
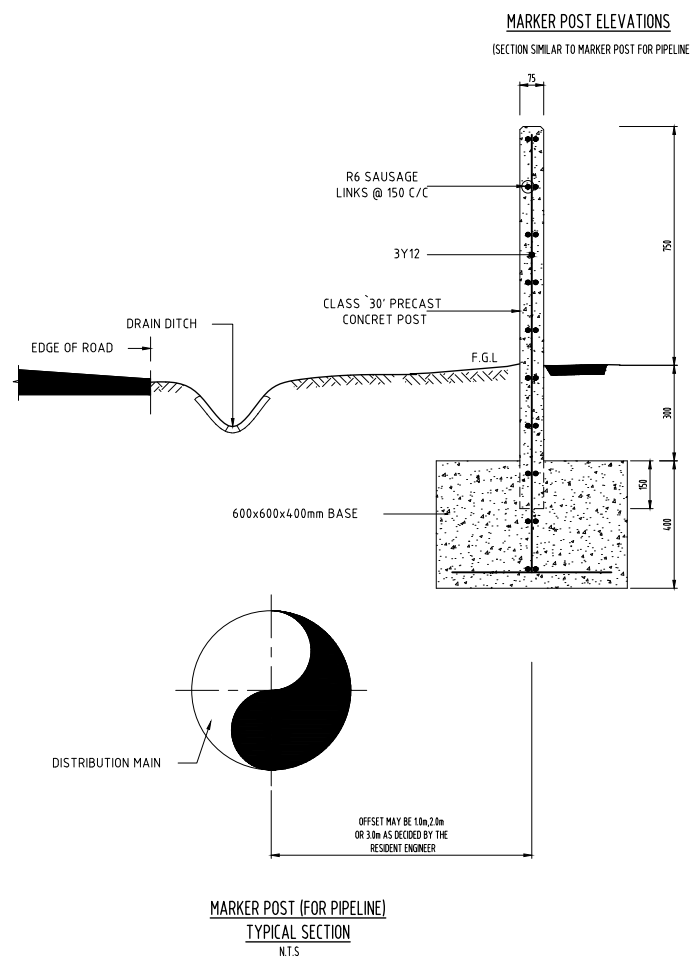
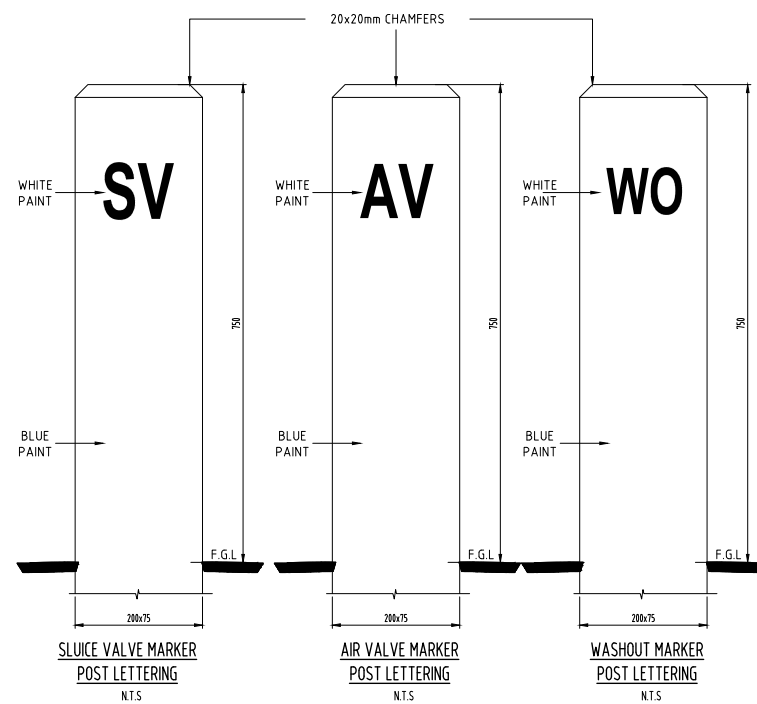
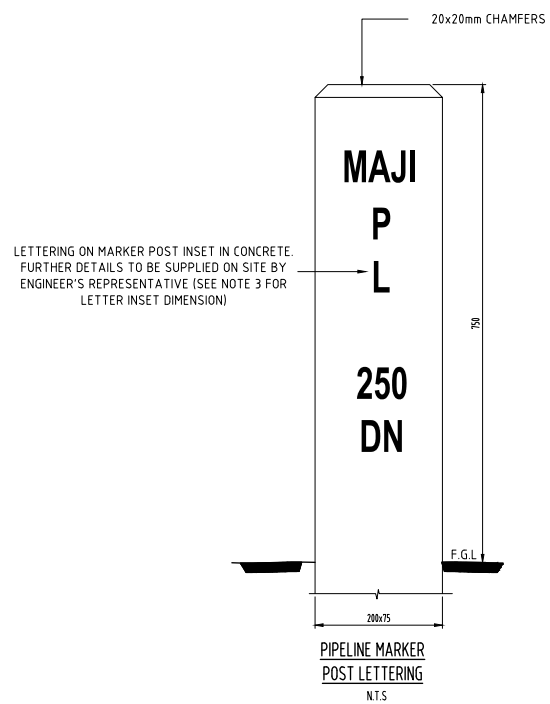
Financier

Project  
**KYUSO ROCK CATCHMENT WATER PROJECT**

Design Consultants.  
 15 Westlands Road, Westland  
P.O. Box 30337-0100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 788 352 533  
Email: info@losaimanagement.com

Drawing Title  
**DETAILED DESIGN  
STANDARD DRAWINGS  
FENCING & GATE DETAILS**

Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1,000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	kyuso
STATUS	0	DWG. No.	SHEET 1 OF 1
			0 REV



NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			

Client

Financier

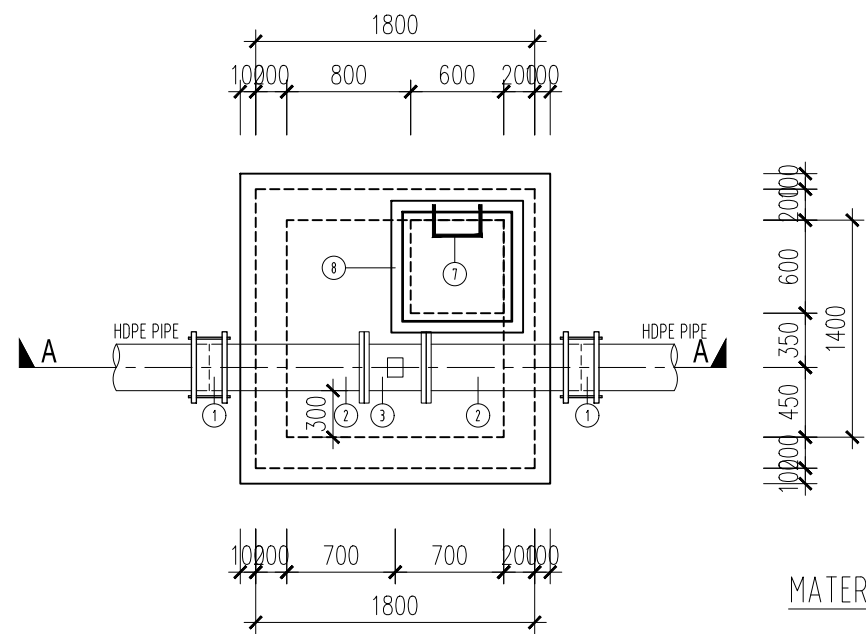
Project  
**KYUSO ROCK CATCHMENT WATER PROJECT**

Design Consultants.

15 Westlands Road, Westland  
P.O. Box 30337-0100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 788 352 533  
Email: info@kosalmanagement.com

Drawing Title  
**DETAILED DESIGN  
STANDARD DRAWINGS  
MARKER POST DETAILS**

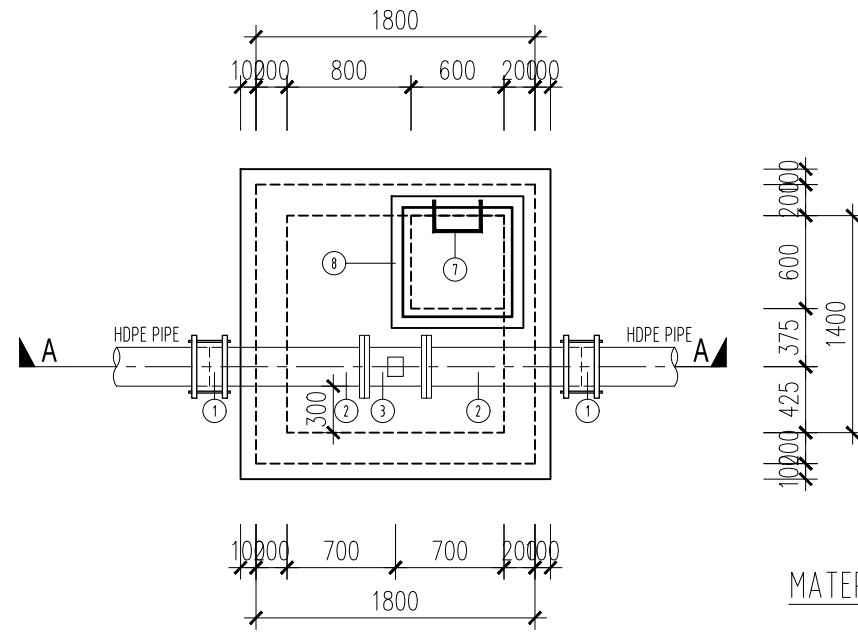
Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1,000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO
0 STATUS	DWG. No.	SHEET 1 OF 1	0 REV



HDPE OD315MM PIPE  
AIR VALVE CHAMBER  
SCALE: 1:100

MATERIAL LIST

ITEM No.	Q'TY	DIA. (mm)	DESCRIPTION	SIZE/SKETCH
1	2	300	V.J. STEPPED COUPLING	OD315xOD323mm
2	2	300	SINGLE FLANGED PIPE	
3	1	300x100	ALL FLANGED TEE	
4	1	100x80	ALL FLANGED CONCENTRIC TAPER	L=300mm
5	1	80	ALL FLANGED GATE VALVE	BS 5163, PN16 L=205mm
6	1	80	DOUBLE ORIFICE AIR VALVE	PN16
7	6		P.P. MANHOLE LADDER STEPS	280x200x20mm
8	1		COMPOSITE MATERIAL MANHOLE COVER WITH FRAME	700x700x45mm
9	1		CONCRETE SUPPORT (CLASS 15)	300x200x300mm



HDPE OD250MM PIPE  
AIR VALVE CHAMBER  
SCALE: 1:100

MATERIAL LIST

ITEM No.	Q'TY	DIA. (mm)	DESCRIPTION	SIZE/SKETCH
1	2	250	V.J. STEPPED COUPLING	OD250xOD273mm
2	2	250	SINGLE FLANGED PIPE	
3	1	250x100	ALL FLANGED TEE	
4	1	100x50	ALL FLANGED CONCENTRIC TAPER	L=300mm
5	1	50	ALL FLANGED GATE VALVE	BS 5163, PN16 L=180mm
6	1	50	DOUBLE ORIFICE AIR VALVE	PN16
7	6		P.P. MANHOLE LADDER STEPS	280x200x20mm
8	1		COMPOSITE MATERIAL MANHOLE COVER WITH FRAME	700x700x45mm
9	1		CONCRETE SUPPORT (CLASS 15)	300x200x250mm

NOTES  
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY CHECKED			
	BY CHECKED			
	BY CHECKED			
	BY CHECKED			

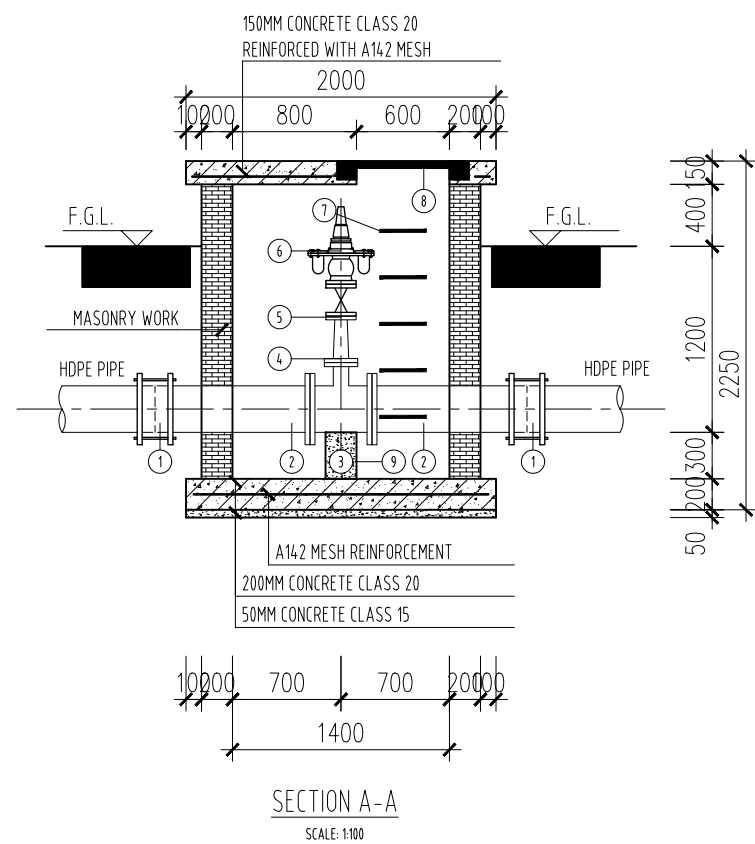


Project  
**KYUSO ROCK CATCHMENT WATER PROJECT**

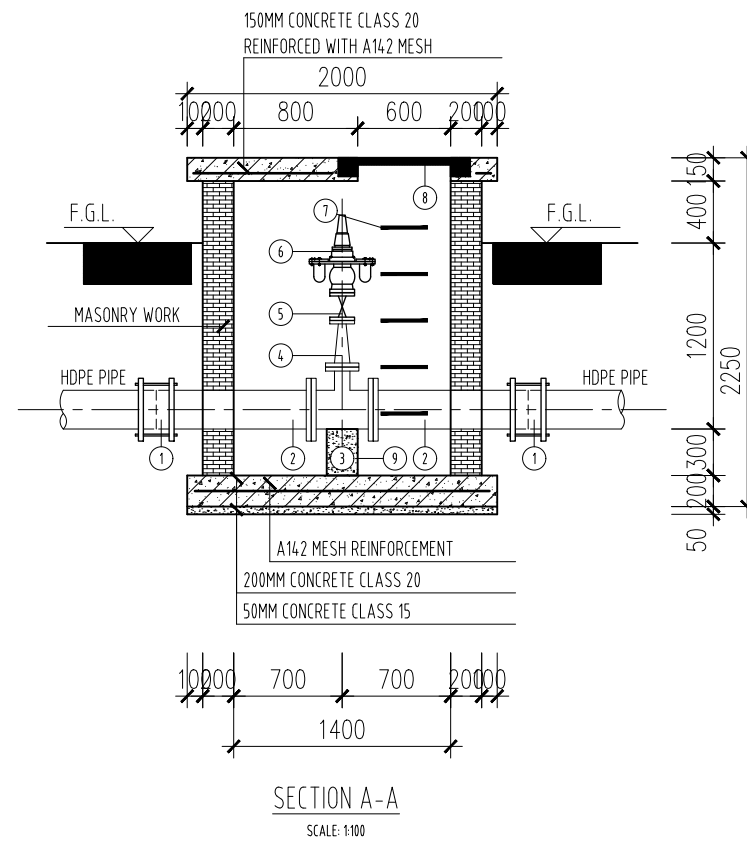
Design Consultants.  
 15 Westlands Road, Westland  
P.O. Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 788 352 533  
Email: info@kosammanagement.com

Drawing Title  
**DETAILED DESIGN  
STANDARD DRAWINGS  
AIR VALVE CHAMBERS - 1**

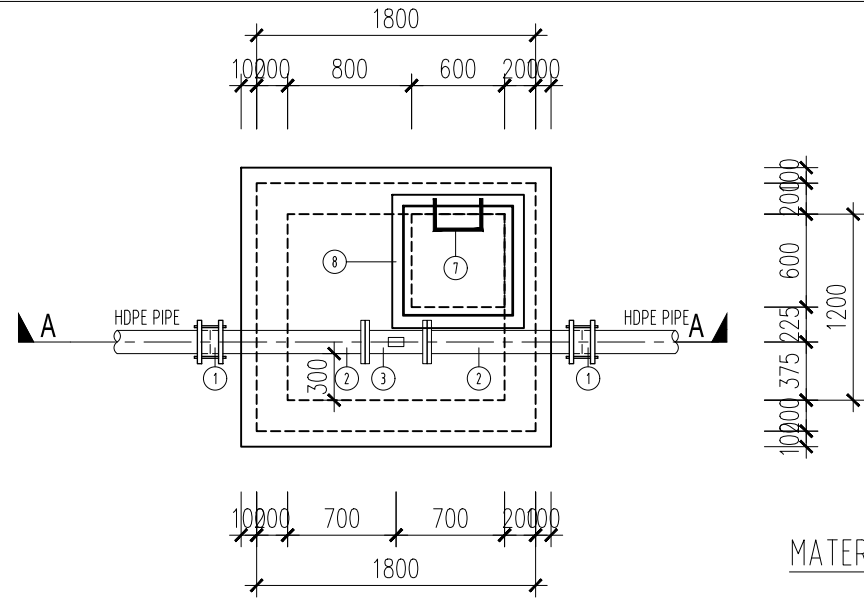
Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1,000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	kyuso
STATUS	DWG. No.	SHEET 1 OF 1	REV



SECTION A-A  
SCALE: 1:100

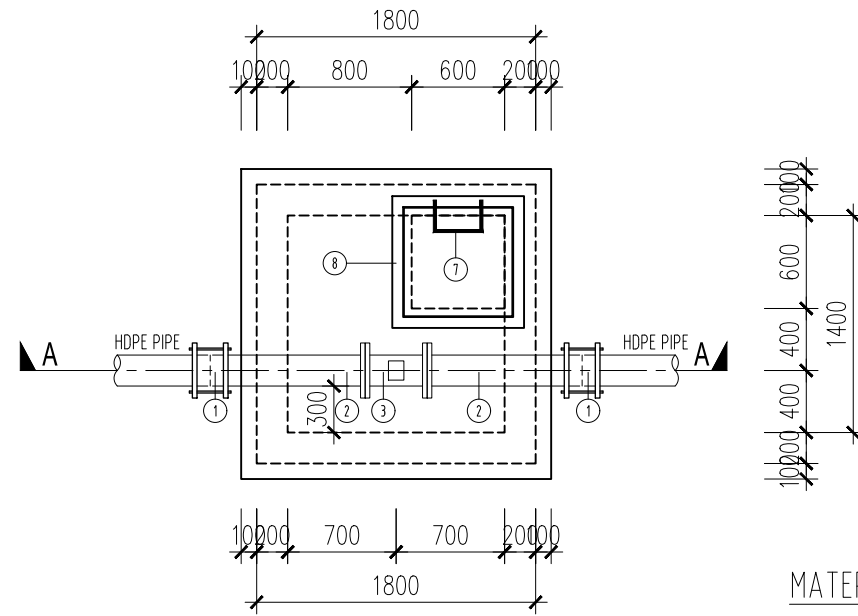


SECTION A-A  
SCALE: 1:100



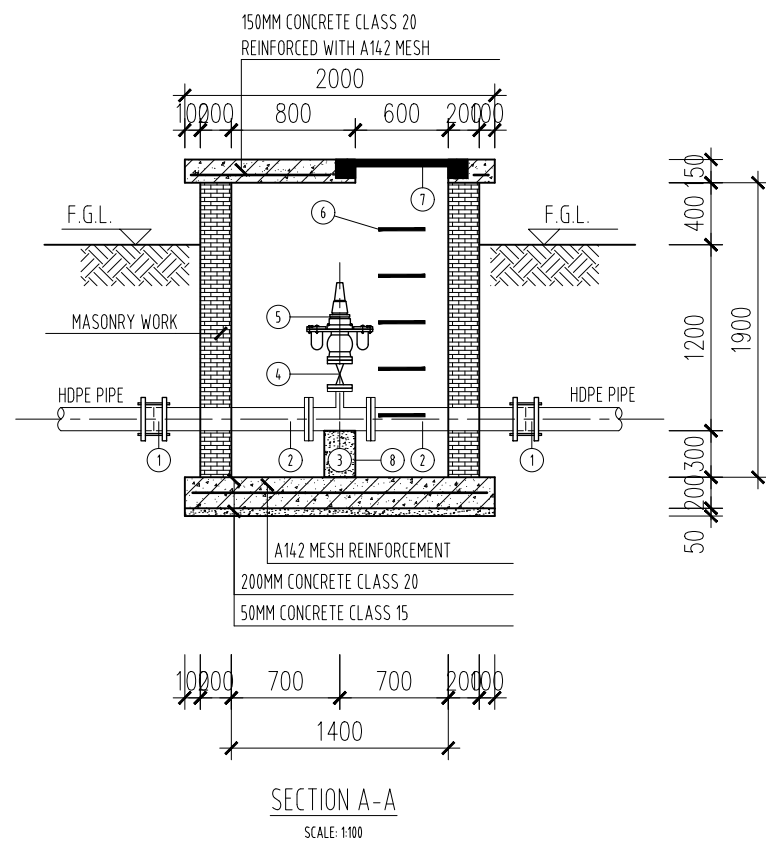
HDPE OD160MM PIPE  
AIR VALVE CHAMBER  
SCALE: 1:100

ITEM No.	Q'TY	DIA. (mm)	DESCRIPTION	SIZE/SKETCH
1	2	150	V.J. FLEXIBLE COUPLING	OD160xOD168mm
2	2	150	SINGLE FLANGED PIPE	
3	1	150x50	ALL FLANGED TEE	
4	1	50	ALL FLANGED GATE VALVE	BS 5163, PN16 L=180mm
5	1	50	DOUBLE ORIFICE AIR VALVE	PN16
6	6		P.P. MANHOLE LADDER STEPS	280x200x20mm
7	1		COMPOSITE MATERIAL MANHOLE COVER WITH FRAME	700x700x45mm
8	1		CONCRETE SUPPORT (CLASS 15)	300x200x150mm

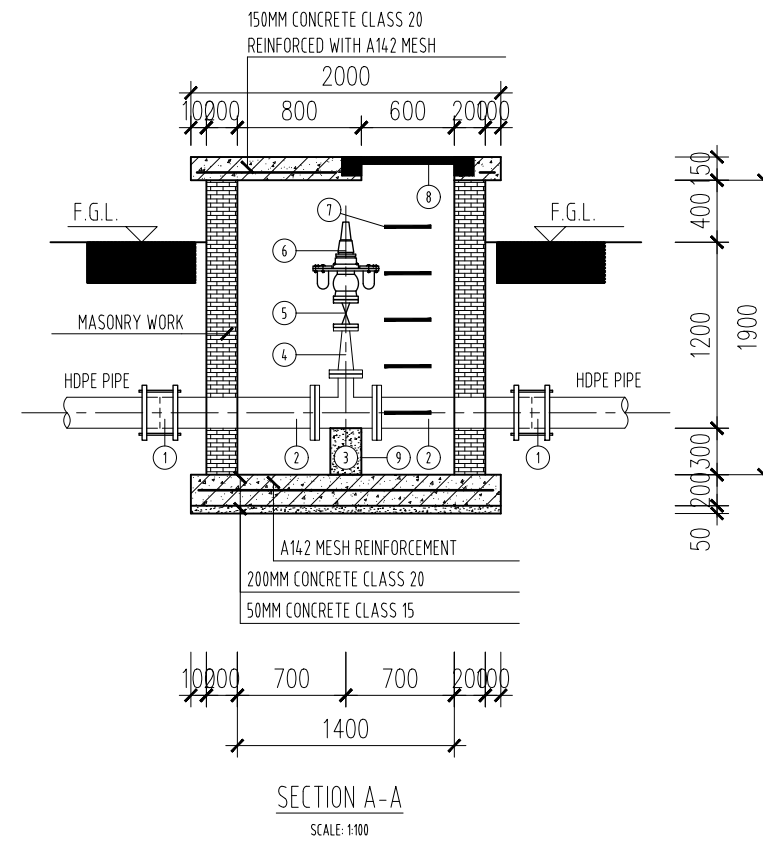


HDPE OD200MM PIPE  
AIR VALVE CHAMBER  
SCALE: 1:100

ITEM No.	Q'TY	DIA. (mm)	DESCRIPTION	SIZE/SKETCH
1	2	200	V.J. STEPPED COUPLING	OD200xOD219mm
2	2	200	SINGLE FLANGED PIPE	
3	1	200x100	ALL FLANGED TEE	
4	1	100x50	ALL FLANGED CONCENTRIC TAPER	L=300mm
5	1	50	ALL FLANGED GATE VALVE	BS 5163, PN16 L=180mm
6	1	50	DOUBLE ORIFICE AIR VALVE	PN16
7	6		P.P. MANHOLE LADDER STEPS	280x200x20mm
8	1		COMPOSITE MATERIAL MANHOLE COVER WITH FRAME	700x700x45mm
9	1		CONCRETE SUPPORT (CLASS 15)	300x200x200mm



SECTION A-A  
SCALE: 1:100



SECTION A-A  
SCALE: 1:100

NOTES  
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	BY	SIGN	DATE	APPROVED
		CHECKED			
		BY			
		CHECKED			
		BY			
		CHECKED			
		BY			
		CHECKED			



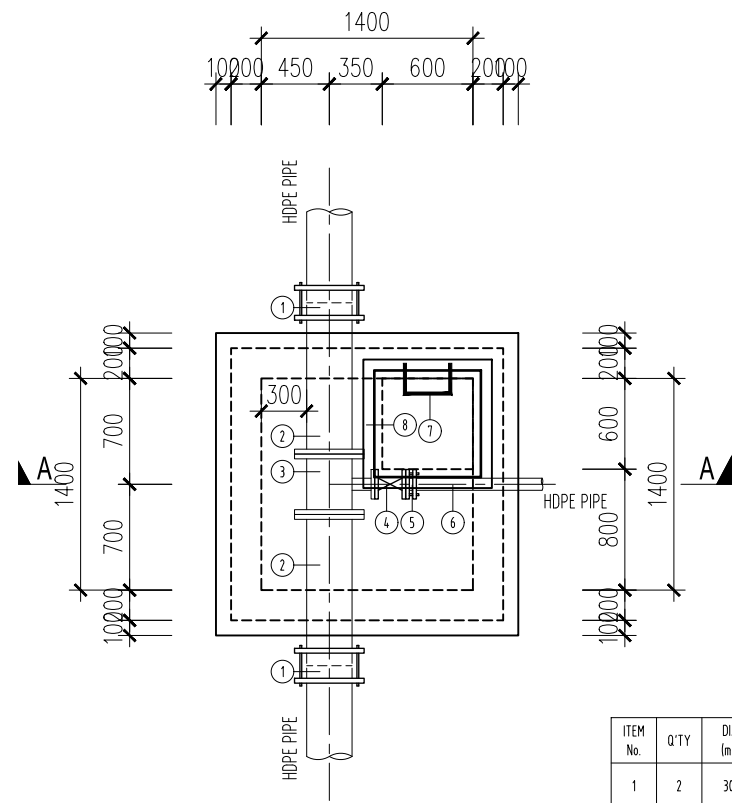
Project  
**KYUSO ROCK CATCHMENT WATER PROJECT**

Design Consultants:  
 15 Westlands Road, Westland  
P.O. Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 788 352 533  
Email: info@kwsammanagement.com

Drawing Title  
**DETAILED DESIGN  
STANDARD DRAWINGS  
AIR VALVE CHAMBER - 2**

Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1,000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	kyuso
0 STATUS	DWG. No.	SHEET 1 OF 1	0 REV

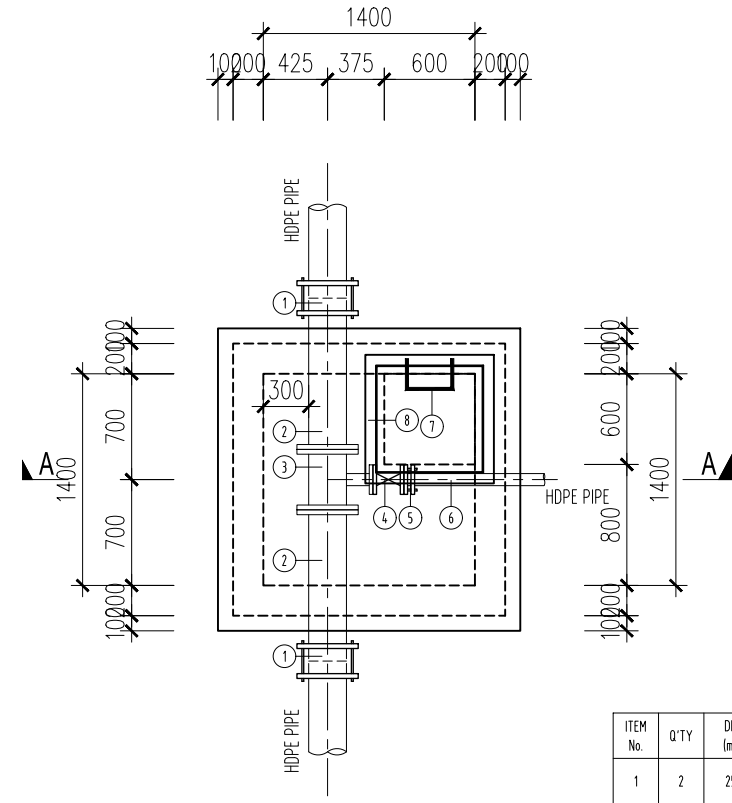




MATERIAL LIST

ITEM No.	Q'TY	DIA. (mm)	DESCRIPTION	SIZE/SKETCH
1	2	300	V.J. STEPPED COUPLING	OD315xOD323mm
2	2	300	SINGLE FLANGED PIPE	
3	1	300x80	ALL FLANGED LEVEL INVERT TEE	
4	1	80	ALL FLANGED GATE VALVE	BS 5163, PN16 L=205mm
5	1	80	V.J. FLANGE ADAPTOR	DN80xOD90mm
6	1	90	HDPE PIPE	CLASS B
7	6		P.P. MANHOLE LADDER STEPS	280x200x20mm
8	1		COMPOSITE MATERIAL MANHOLE COVER WITH FRAME	700x700x45mm
9	1		VALVE STOOL (CLASS 15)	300x100x100mm
10	1		THRUST BLOCKS (CLASS 15)	

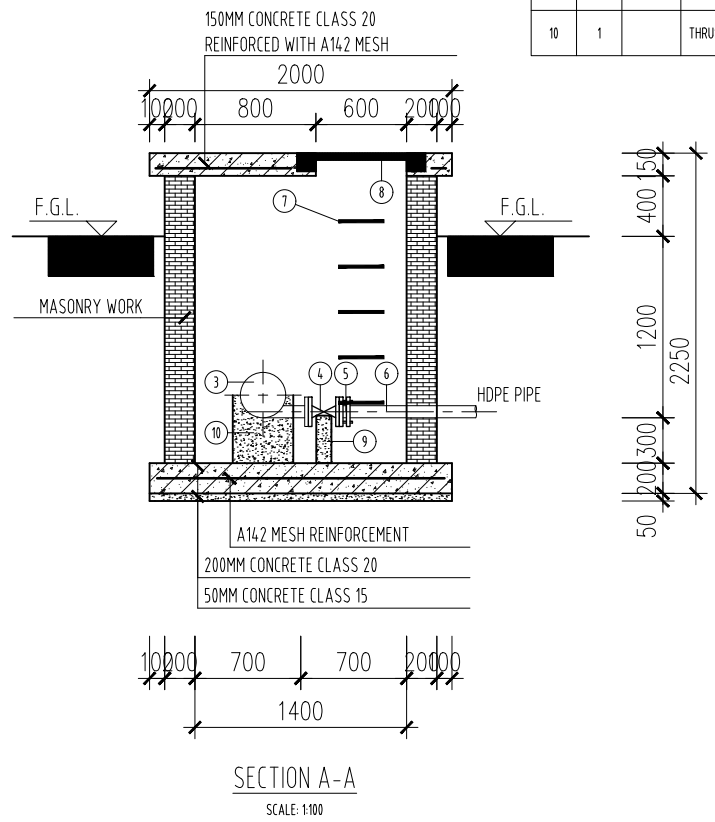
HDPE OD315MM PIPE WASHOUT CHAMBER  
SCALE: 1:100



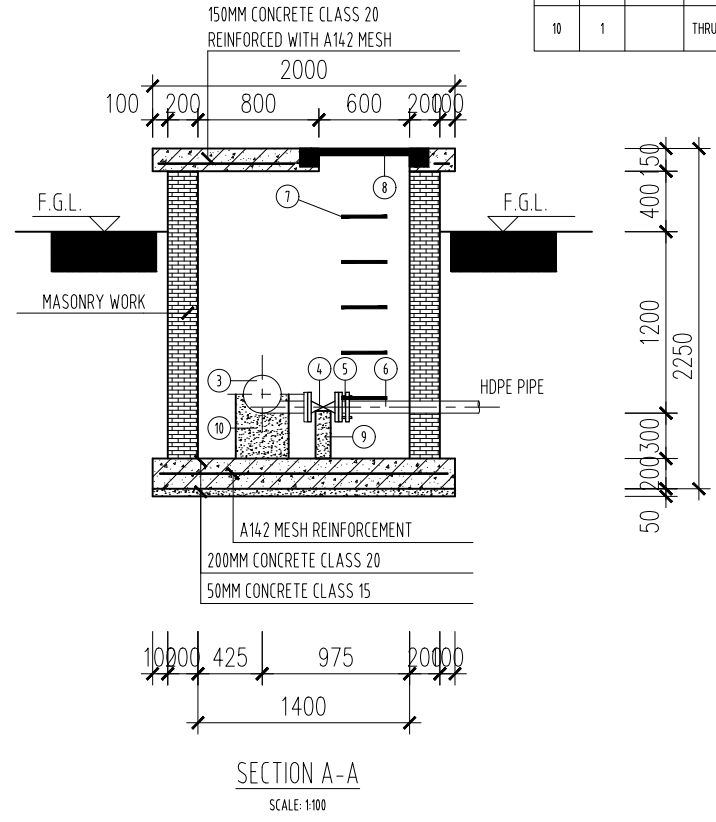
MATERIAL LIST

ITEM No.	Q'TY	DIA. (mm)	DESCRIPTION	SIZE/SKETCH
1	2	250	V.J. STEPPED COUPLING	OD250xOD273mm
2	2	250	SINGLE FLANGED PIPE	
3	1	250x80	ALL FLANGED LEVEL INVERT TEE	
4	1	80	ALL FLANGED GATE VALVE	BS 5163, PN16 L=205mm
5	1	80	V.J. FLANGE ADAPTOR	DN80xOD90mm
6	1	90	HDPE PIPE (CLASS B)	
7	6		P.P. MANHOLE LADDER STEPS	280x200x20mm
8	1		COMPOSITE MATERIAL MANHOLE COVER WITH FRAME	700x700x45mm
9	1		VALVE STOOL (CLASS 15)	300x100x100mm
10	1		THRUST BLOCKS (CLASS 15)	

HDPE OD250MM PIPE WASHOUT CHAMBER  
SCALE: 1:100



SECTION A-A  
SCALE: 1:100



SECTION A-A  
SCALE: 1:100

**NOTES**

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			

Client

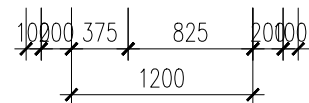
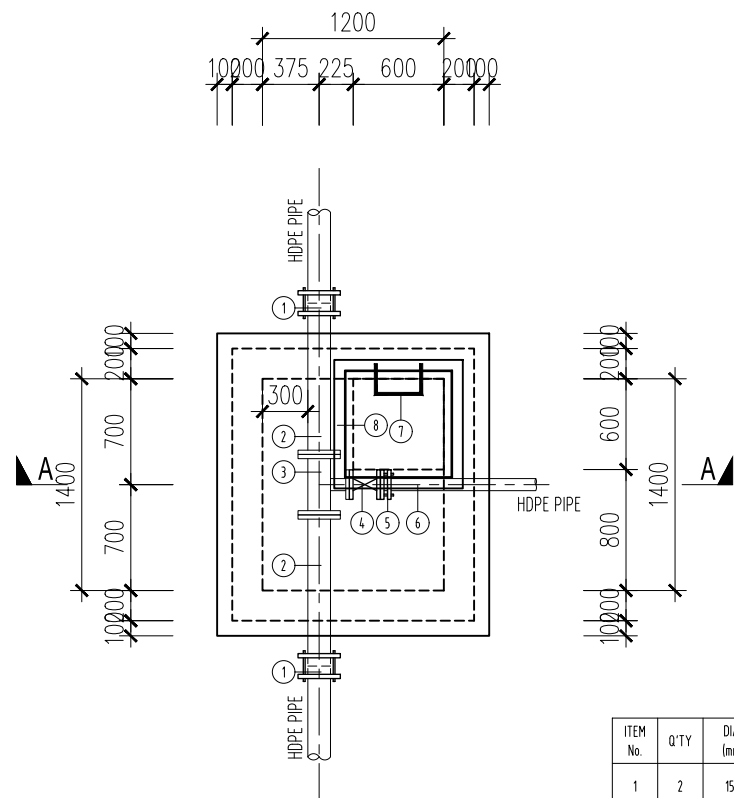
Financier

Project  
**KYUSO ROCK CATCHMENT WATER PROJECT**

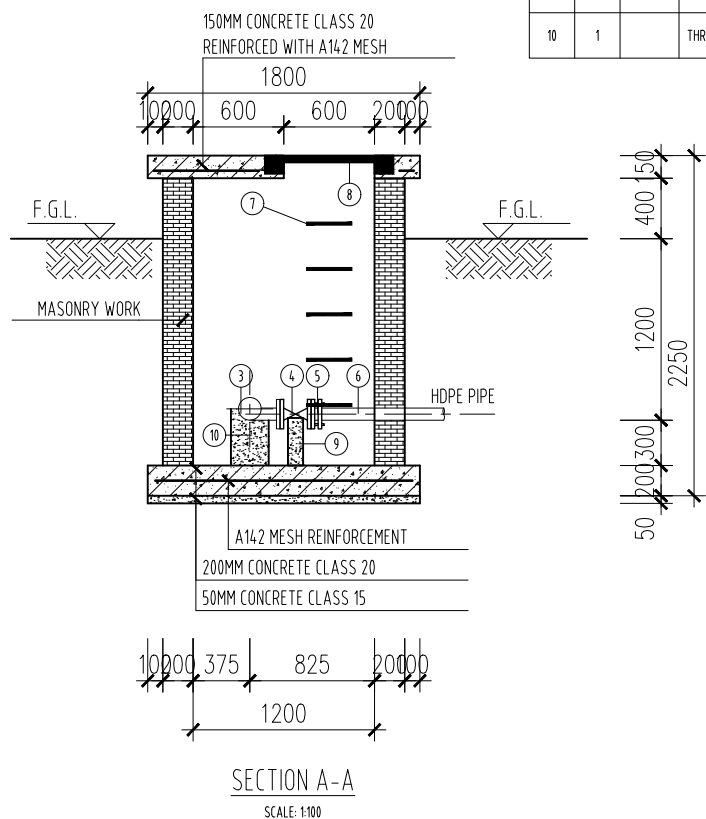
Design Consultants.  
 15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 788 352 533  
Email: info@locusmanagement.com

Drawing Title  
**DETAILED DESIGN  
STANDARD DRAWINGS  
WASHOUTS - 1**

Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1,000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO
0	DWG. No.	SHEET 1 OF 1	0
STATUS			REV



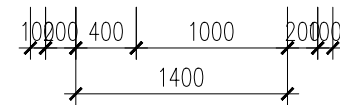
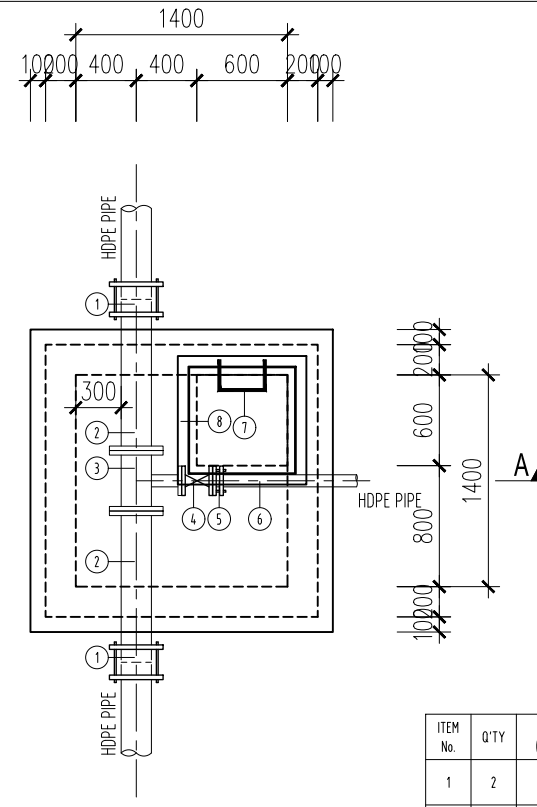
HDPE OD160MM PIPE  
WASHOUT CHAMBER  
SCALE: 1:100



SECTION A-A  
SCALE: 1:100

MATERIAL LIST

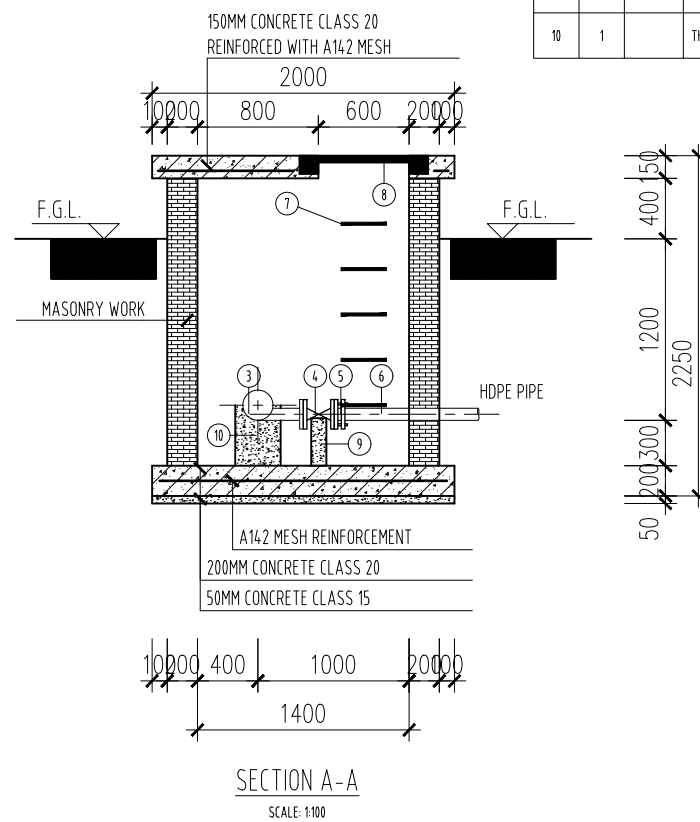
ITEM No.	Q.TY	DIA. (mm)	DESCRIPTION	SIZE/SKETCH
1	2	150	V.J. FLEXIBLE COUPLING	OD160xOD168mm
2	2	150	SINGLE FLANGED PIPE	
3	1	150x80	ALL FLANGED LEVEL INVERT TEE	
4	1	80	ALL FLANGED GATE VALVE	BS 5163, PN16 L=205mm
5	1	80	V.J. FLANGE ADAPTOR	DN80xOD90mm
6	1	90	HDPE PIPE (CLASS B)	
7	6		P.P. MANHOLE LADDER STEPS	280x200x20mm
8	1		COMPOSITE MATERIAL MANHOLE COVER WITH FRAME	700x700x45mm
9	1		VALVE STOOL (CLASS 15)	300x100x100mm
10	1		THRUST BLOCKS (CLASS 15)	



HDPE OD200MM PIPE  
WASHOUT CHAMBER  
SCALE: 1:100

MATERIAL LIST

ITEM No.	Q.TY	DIA. (mm)	DESCRIPTION	SIZE/SKETCH
1	2	200	V.J. STEPPED COUPLING	OD200xOD219mm
2	2	200	SINGLE FLANGED PIPE	
3	1	200x80	ALL FLANGED LEVEL INVERT TEE	
4	1	80	ALL FLANGED GATE VALVE	BS 5163, PN16 L=205mm
5	1	80	V.J. FLANGE ADAPTOR	DN80xOD90mm
6	1	90	HDPE PIPE (CLASS B)	
7	6		P.P. MANHOLE LADDER STEPS	280x200x20mm
8	1		COMPOSITE MATERIAL MANHOLE COVER WITH FRAME	700x700x45mm
9	1		VALVE STOOL (CLASS 15)	300x100x100mm
10	1		THRUST BLOCKS (CLASS 15)	



SECTION A-A  
SCALE: 1:100

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			

Client

Financier

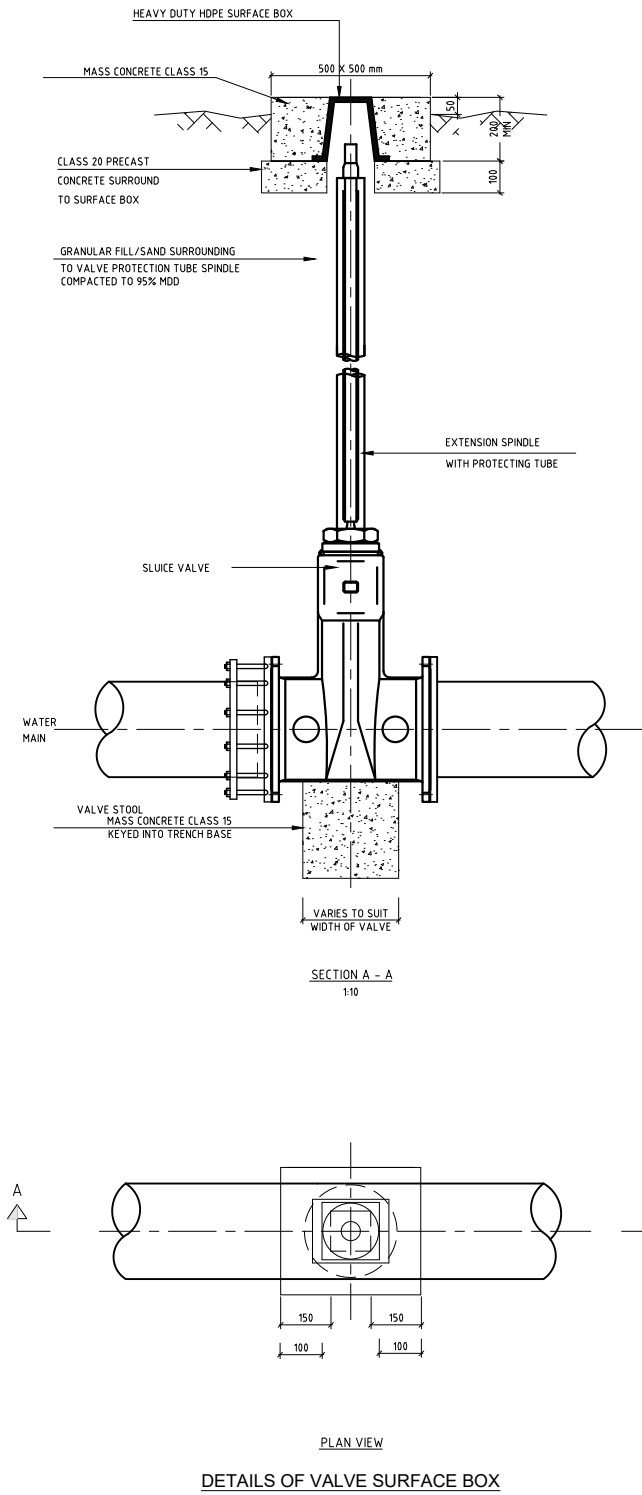
Project  
**KYUSO ROCK CATCHMENT WATER PROJECT**

Design Consultants.

15 Westlands Road, Westland  
P.O. Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 788 352 533  
Email: info@locusmanagement.com

Drawing Title  
**DETAILED DESIGN  
STANDARD DRAWINGS  
WASHOUTS - 2**

Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1,000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO
0 STATUS	DWG. No.	SHEET 1 OF 1	0 REV



**NOTES**

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			



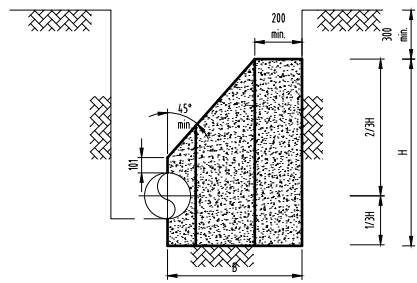
Project  
**KYUSO ROCK CATCHMENT WATER PROJECT**

Design Consultants.

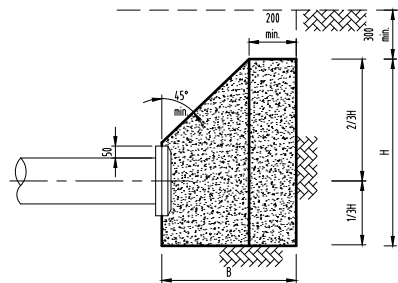
15 Westlands Road, Westland  
P.O. Box 30337-40100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 788 352 533  
Email: info@lomaengineering.com

Drawing Title  
**DETAILED DESIGN  
STANDARD DRAWINGS  
VALVE SURFACE BOX DETAILS**

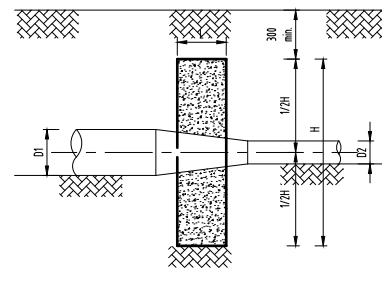
Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1,000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	kyuso



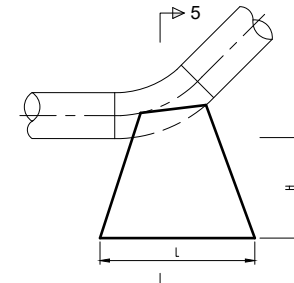
SECTION 1-1



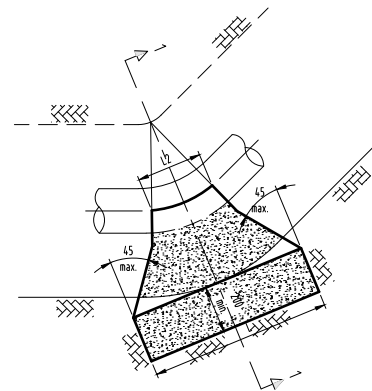
SECTION 3-3



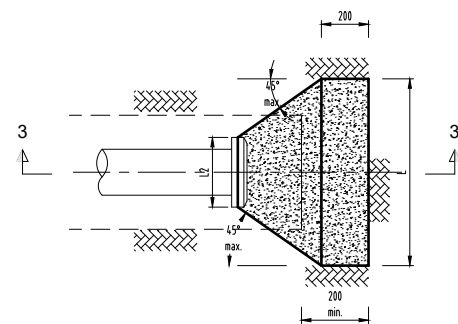
SECTION 4-4



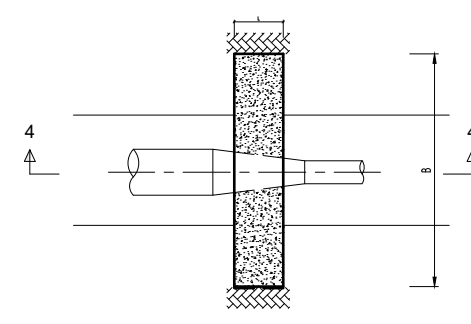
ELEVATION



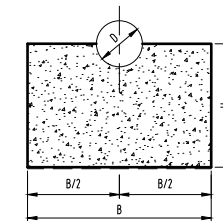
PLAN



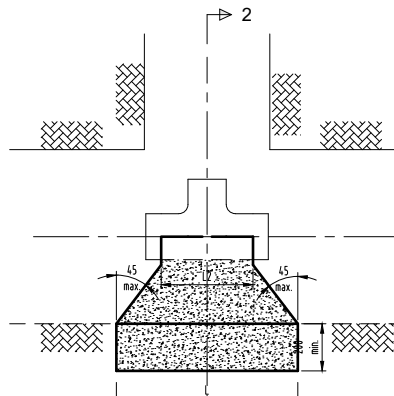
PLAN



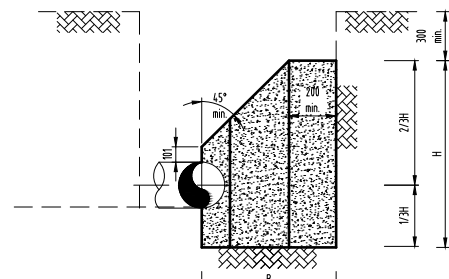
PLAN



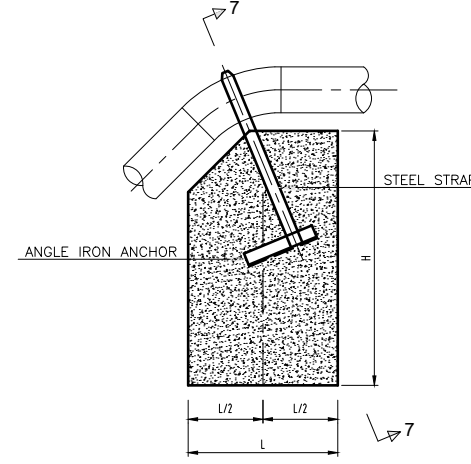
SECTION 5-5



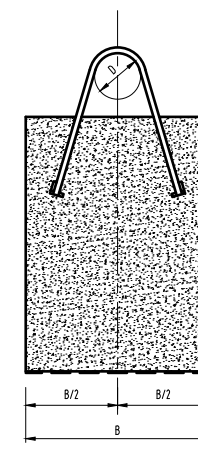
PLAN



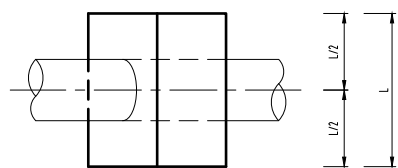
SECTION 2-2



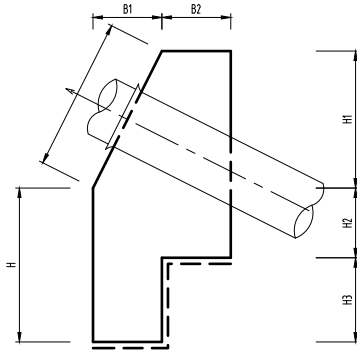
ELEVATION



SECTION 7-7

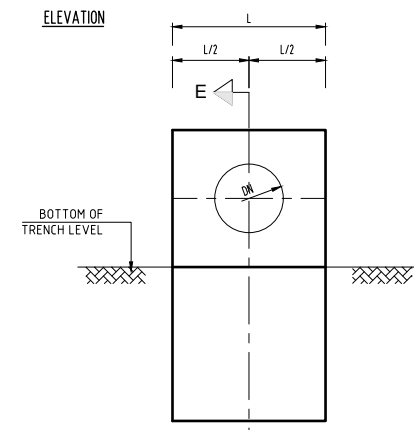


PLAN



SECTION E - E

ANCHOR BLOCKS ON GRADIENTS (TYPE GD)



FRONT VIEW

GRADIENT	SPACING OF ANCHOR BLOCKS (m)
1 IN 2	5.5
1 IN 3	11.0
1 IN 4	11.0
1 IN 5	16.5
1 IN 6	22.0
1 IN 7 - 10	27.5

PIPE DIAMETER DN (mm)	DIMENSIONS (m)							
	A	L	H	H1	H2	H3	B1	B2
200	0.8	0.8	0.8	0.7	0.35	0.45	0.35	0.35
300	0.9	1.0	1.0	0.8	0.4	0.6	0.4	0.4
400	1.0	1.0	1.0	0.9	0.45	0.55	0.45	0.45
500	1.1	1.2	1.2	1.0	0.5	0.7	0.5	0.5
600	1.2	1.2	1.2	1.1	0.55	0.65	0.55	0.55
800	1.4	1.4	1.4	1.3	0.65	0.75	0.65	0.65

NOTE  
1. ANCHOR BLOCK TO BE POSITIONED BEHIND COLLAR AS SHOWN

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	BY	SIGN	DATE	APPROVED
		CHECKED			
		CHECKED			
		CHECKED			
		CHECKED			

Client

Financier

Project  
**KYUSO ROCK CATCHMENT WATER PROJECT**

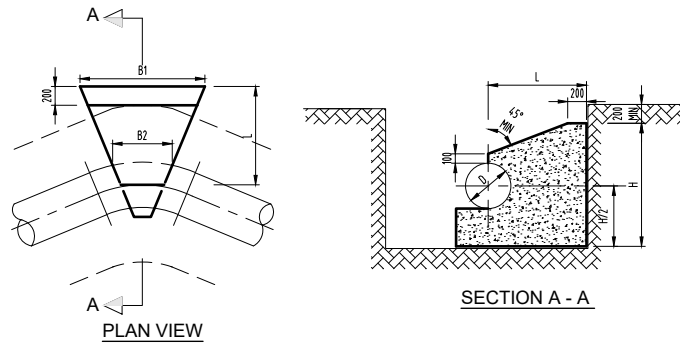
Design Consultants.  
 15 Westlands Road, Westland  
P.O. Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 788 352 533  
Email: info@kwsamanagement.com

Drawing Title  
**DETAILED DESIGN  
STANDARD DRAWINGS  
THRUST BLOCKS - 1**

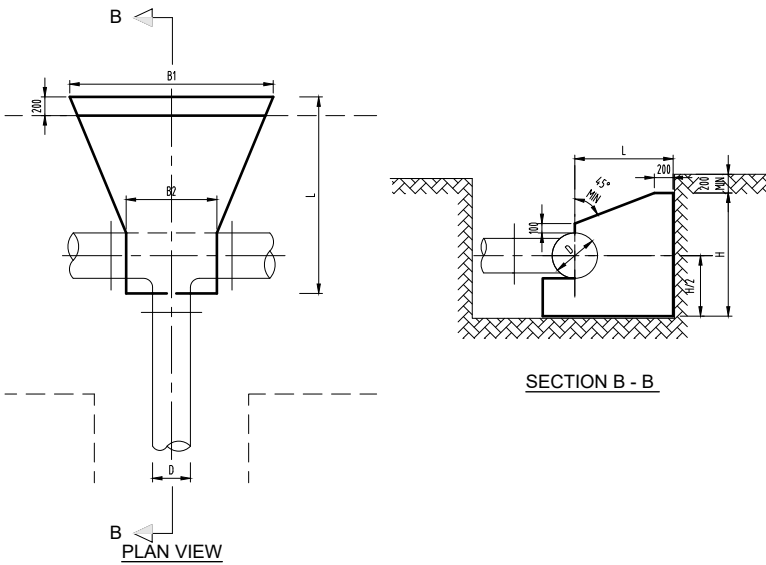
Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1,000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO

0	DWG. No.	SHEET 1 OF 1	0
STATUS			REV

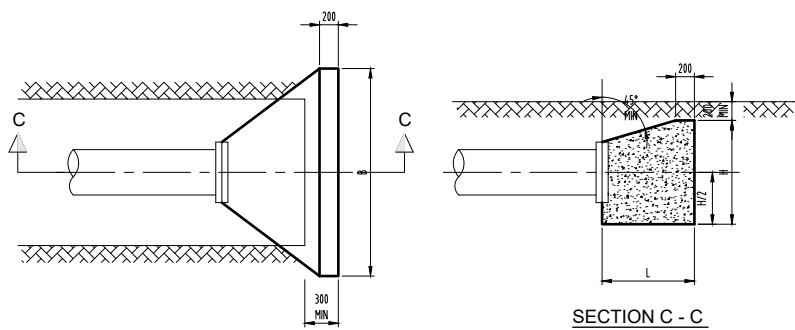
**ANCHOR BLOCKS FOR BURIED SERVICES**



ANCHOR BLOCKS AT HORIZONTAL BENDS (TYPE HB)



ANCHOR BLOCKS AT TEES (TYPE TY)



ANCHOR BLOCKS AT END CAPS (TYPE EC)

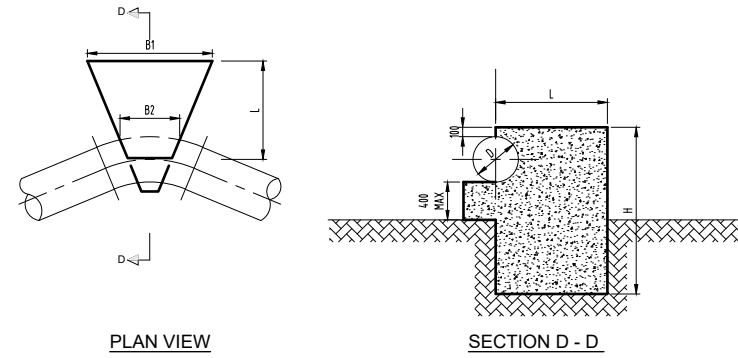
**DIMENSIONS OF ANCHOR BLOCKS FOR BURIED SERVICES**

PIPE DIAMETRE (mm)	OPERATING PRESSURE (BAR)	TEST PRESSURE (BAR)	H (m)	B1 (m)	B2 (m)	L (m)
<b>BENDS (TYPE HB) - 90°</b>						
350	16	24	1.6	3.5	0.6	1.8
	25	37.5	2.0	4.0	0.6	1.8
<b>BENDS (TYPE HB) - 60°</b>						
350	16	24	1.5	2.8	0.45	1.6
	25	37.5	1.8	3.4	0.45	1.8
<b>BENDS (TYPE HB) - 45°</b>						
350	16	24	1.3	2.6	0.45	1.4
	25	37.5	1.7	3.0	0.45	1.7
<b>BENDS (TYPE HB) - 22.5°</b>						
350	16	24	1.2	1.5	0.2	1.2
	25	37.5	1.4	2.0	0.2	1.4
<b>BENDS TYPE HB - 11.25°</b>						
350	16	24	0.9	1.0	0.2	1.2
	25	37.5	1.2	1.2	0.2	1.2
<b>TEE (TYPE TY)</b>						
350	16	24	1.5	2.8	0.45	1.6
	25	37.5	1.8	3.4	0.45	1.8
<b>END CAPS (TYPE EC)</b>						
350	16	24	1.5	2.8	-	1.6
	25	37.5	1.8	3.4	-	1.8

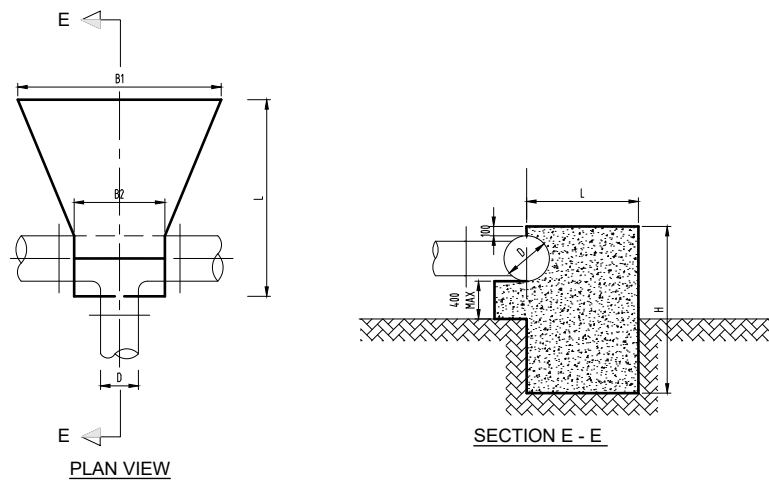
**DIMENSIONS OF ANCHOR BLOCKS FOR ABOVE GROUND SERVICES**

PIPE DIAMETRE (mm)	OPERATING PRESSURE (BAR)	TEST PRESSURE (BAR)	H (m)	B1 (m)	B2 (m)	L (m)
<b>BENDS (TYPE AHB) - 90°</b>						
350	16	24	3.0	3.0	0.6	3.5
	25	37.5	3.5	3.5	0.6	4.0
<b>BENDS (TYPE AHB) - 60°</b>						
350	16	24	3.0	2.5	0.45	3.0
	25	37.5	3.0	3.5	0.45	3.5
<b>BENDS (TYPE AHB) - 45°</b>						
350	16	24	2.5	2.5	0.45	3.0
	25	37.5	3.0	3.0	0.45	3.0
<b>BENDS (TYPE AHB) - 22.5°</b>						
350	16	24	2.0	2.0	0.2	2.5
	25	37.5	2.5	2.5	0.2	2.5
<b>TEES (TYPE ATY)</b>						
350	16	24	3.0	2.5	0.45	3.0
	25	37.5	3.0	3.5	0.45	3.5

**ANCHOR BLOCKS FOR ABOVE GROUND SERVICES**



ANCHOR BLOCKS AT HORIZONTAL BENDS (TYPE AHB)



ANCHOR BLOCKS AT TEES (TYPE ATY)

**NOTES**

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	BY	SIGN	DATE	APPROVED
		CHECKED			
		CHECKED			
		CHECKED			
		CHECKED			
		CHECKED			

Client

Financier

Project  
**KYUSO ROCK CATCHMENT WATER PROJECT**

Design Consultants.  
 15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 718 352 533  
Email: info@esammanagement.com

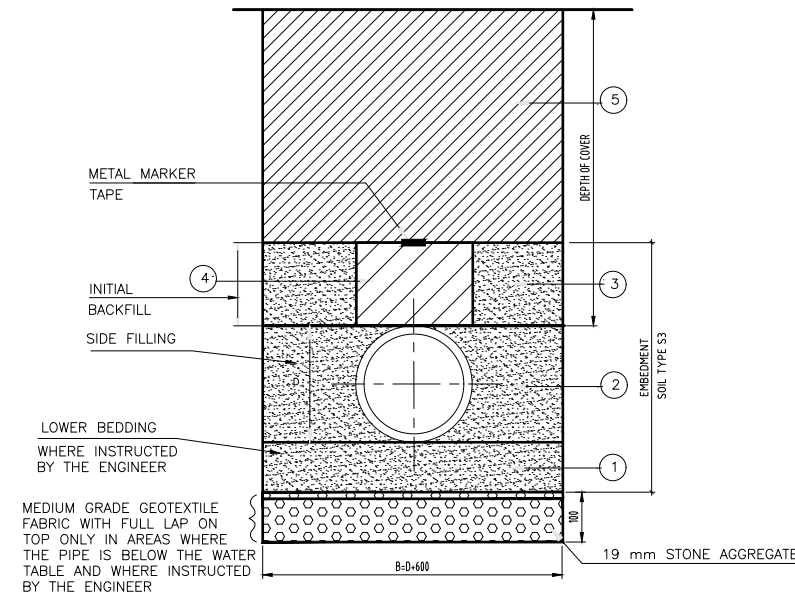
Drawing Title  
**DETAILED DESIGN  
STANDARD DRAWINGS  
THRUST BLOCKS - 2**

Designed by JMM Drawn by KCK  
Checked by JN Approved by JR  
Scale H = 1:1,000 Date NOV 2023  
V = 1:100  
Job No. ACAD File: KYUSO

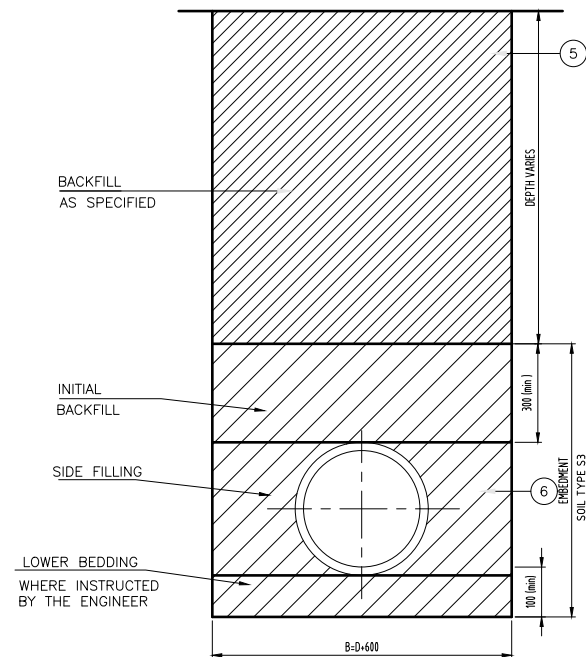
0 STATUS DWG. No. SHEET 1 OF 1 0 REV



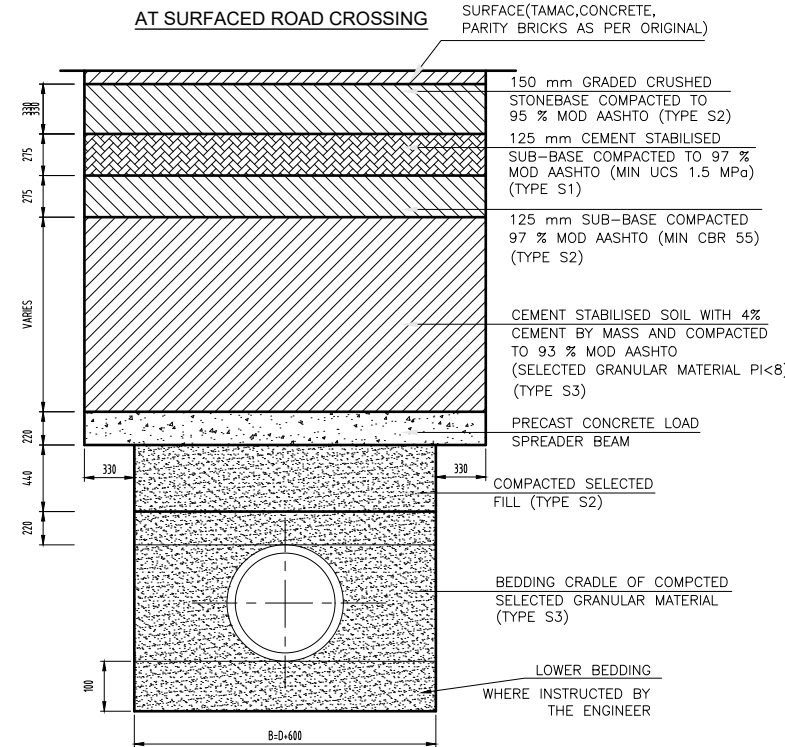
**TYPICAL TRENCH EXCAVATION AND BACKFILLING FOR PE/HDPE PIPES**



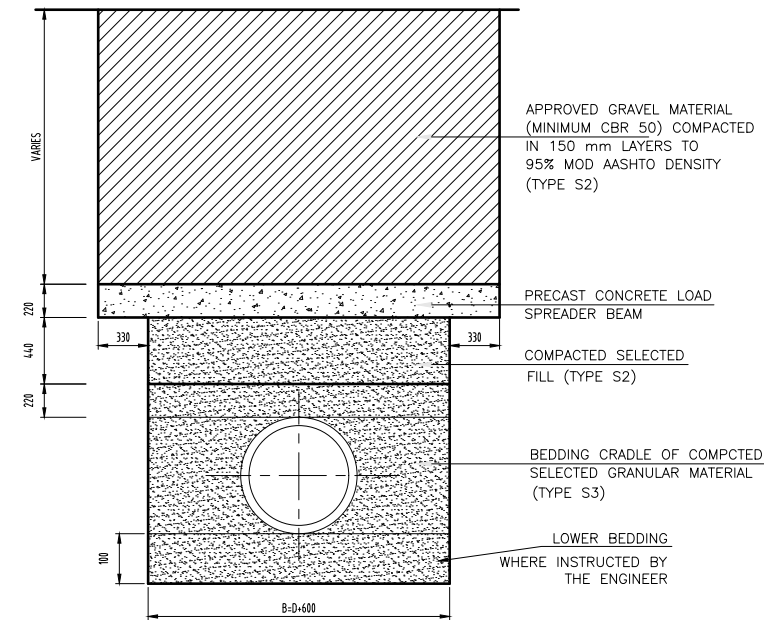
**TYPICAL TRENCH EXCAVATION AND BACKFILLING FOR FERROUS PIPES**



**PIPE PROTECTION AT SURFACED ROAD CROSSING**



**PIPE PROTECTION AT UNSURFACED ROAD CROSSING**



**TYPICAL TRENCH WIDTHS FOR PIPES**

NOMINAL DIAMETER D (mm)	80	100	160	200	250	300	600
WIDTH OF TRENCH B (m)	0.70	0.70	0.76	0.80	0.85	0.90	1.20

$B = D + 0.6 \text{ m (LIMITED TO A MINIMUM OF 0.6 m)}$

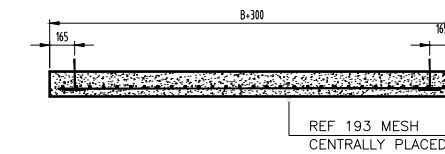
**TABLE 1 : MATERIAL DESCRIPTION CHART**

SOIL TYPE	DESCRIPTION	GROUP SYMBOL
S1	GRAVEL - SINGLE SIZE	GW
S2	GRAVEL - GRADED	GP
S3	SAND AND COARSE GRAINED SOILS WITH LESS THAN 12% FINES.	GF

**LEGEND :**

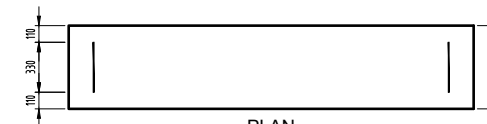
- D PIPE OUTSIDE DIAMETER
- B TRENCH WIDTH (SEE TABLE)
- ① LOWER BEDDING COMPRISING OF APPROVED GRANULAR BEDDING MATERIAL (SAND) COMPACTED TO 90 % MPD IN 50 mm LAYERS TO A THICKNESS OF 100 mm (min.) OR AS DIRECTED BY THE ENGINEER'S REPRESENTATIVE.
- ② APPROVED GRANULAR BEDDING MATERIAL TYPE S3 COMPACTED IN LAYERS AS PER NOTE 2. CAREFUL TAMPING ON EITHER SIDE OF THE PIPE SHOULD BE MAINTAINED TO ENSURE EQUAL PRESSURE ON BOTH SIDES OF THE PIPE.
- ③ APPROVED GRANULAR BEDDING MATERIAL TYPE S3 COMPACTED IN SHALLOW LAYERS TO A MAXIMUM OF 150 mm THICK.
- ④ AS IN ③ ABOVE, BUT EXCESSIVE TAMPING TO BE AVOIDED.
- ⑤ NORMAL BACKFILL MATERIAL PROPERLY RAMMED IN LAYERS. NOT EXCEEDING 150 mm THICK.

**PRECAST CONCRETE LOAD SPREADER BEAM**



**SECTION THROUGH SPREADER BEAM**

1:10



**PLAN**

1:10

**NOTE**

INSTEAD OF A CONCRETE SPREADER BEAM, A CONCRETE OR STEEL PIPE WITH SUFFICIENT INTERNAL BORE TO FACILITATE INSERTION OF PIPES SHOULD BE USED IF INSTRUCTED BY THE ENGINEER.

**TABLE 2 : COMPACTION CHART GUIDE**

% MPD	SOIL TYPE	COMPACTION METHOD	
		THICKNESS OF LAYER (max.)	No. OF PASSES
90	S1	150	1
	S2	150	2
	S3	50	2

**NOTES**

- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY CHECKED			
	BY CHECKED			
	BY CHECKED			
	BY CHECKED			

Client

Financier

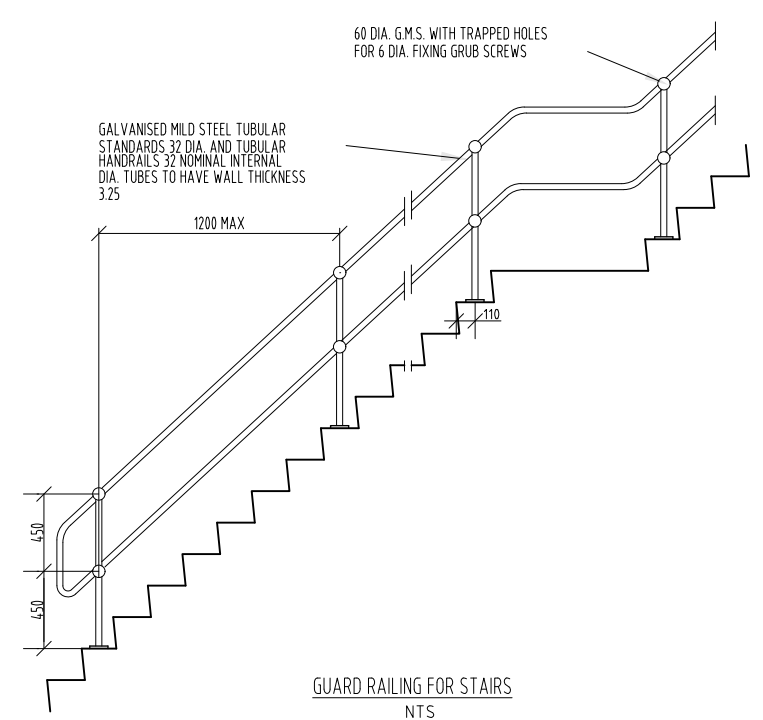
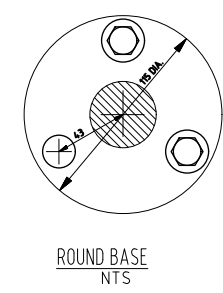
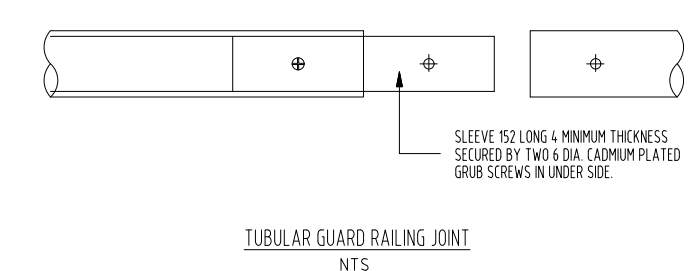
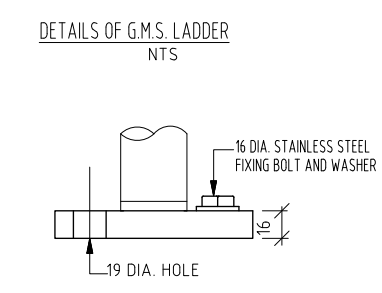
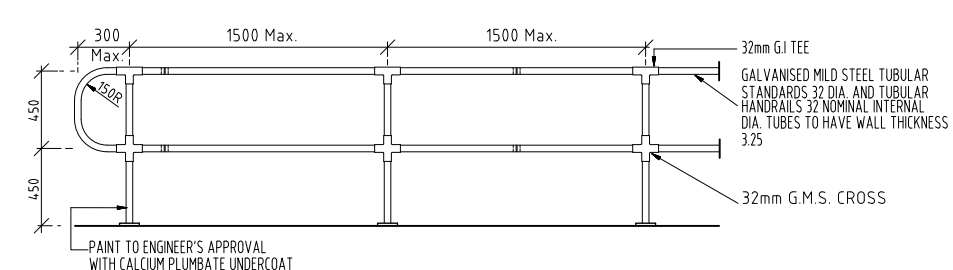
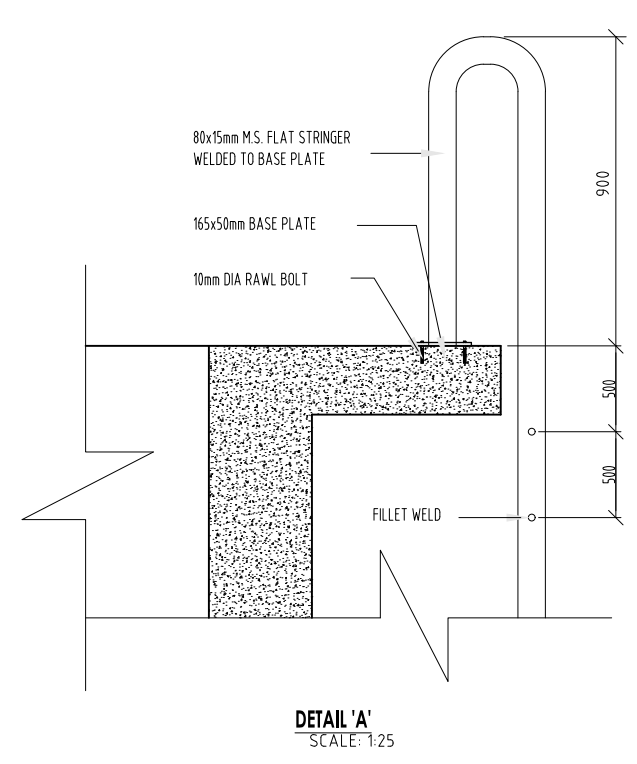
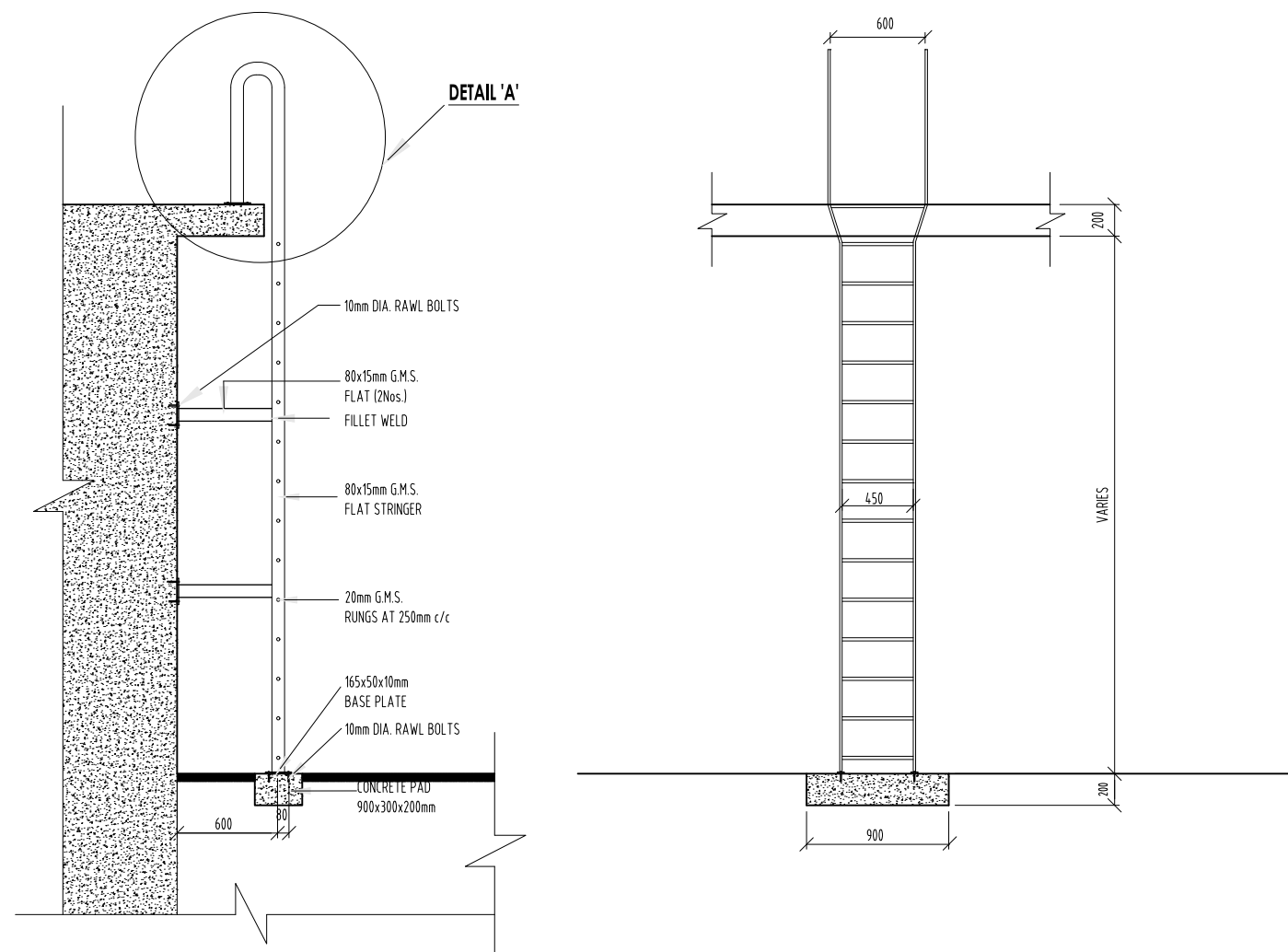
**Project**  
**KYUSO ROCK CATCHMENT WATER PROJECT**

Design Consultants.

15 Westlands Road, Westland  
P.O Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 788 352 533  
Email: info@kosammanagement.com

Drawing Title  
**DETAILED DESIGN**  
**STANDARD DRAWINGS**  
**PIPE BEDDING DETAILS**

Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1,000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO
0 STATUS	DWG. No.	SHEET 1 OF 1	0 REV



**NOTES**

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			

Client

Financier

Project  
**KYUSO ROCK CATCHMENT WATER PROJECT**

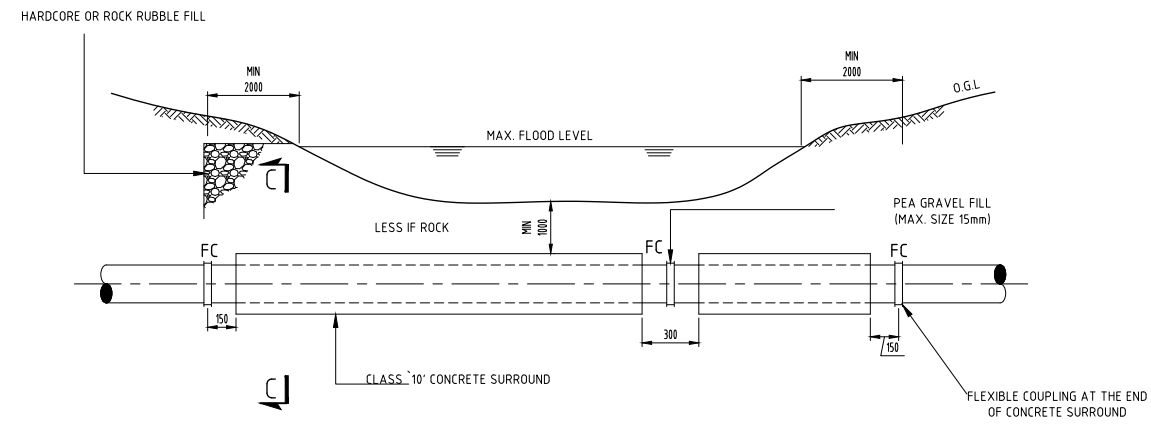
Design Consultants.

15 Westlands Road, Westland  
P.O. Box 30337-00100 Nairobi, Kenya  
Tel: +254 718 875 310  
+254 788 352 533  
Email: info@resammanagement.com

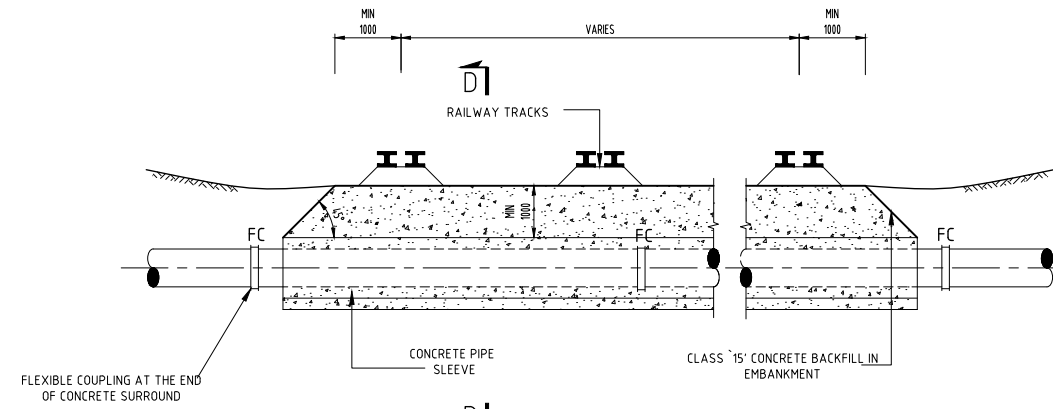
Drawing Title  
**DETAILED DESIGN  
STANDARD DRAWINGS  
GMS LADDER DETAILS**

Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1,000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	kyuso
STATUS	DWG. No.	SHEET 1 OF 1	REV

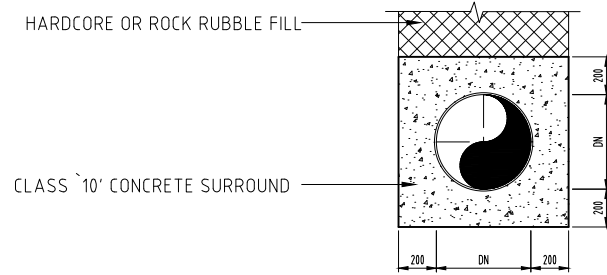




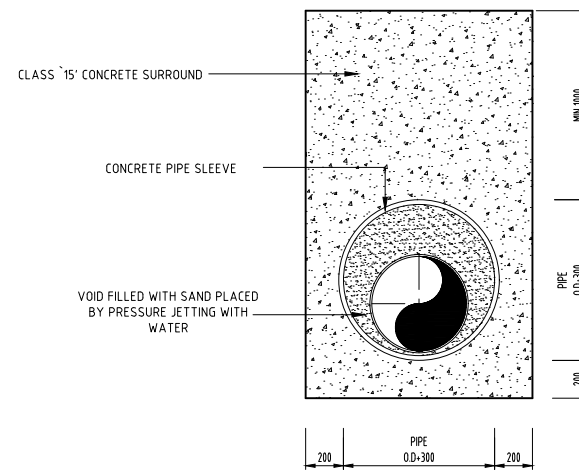
TYPICAL RIVER UNDERCROSSING  
N.T.S



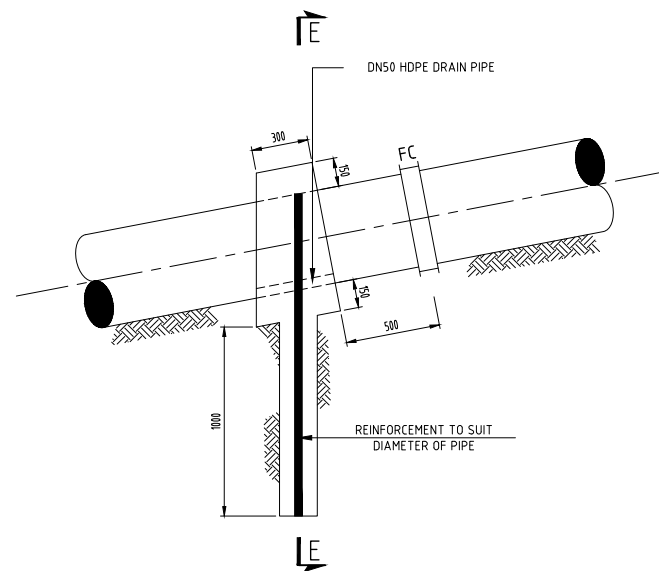
TYPICAL RAILWAY CROSSING  
N.T.S



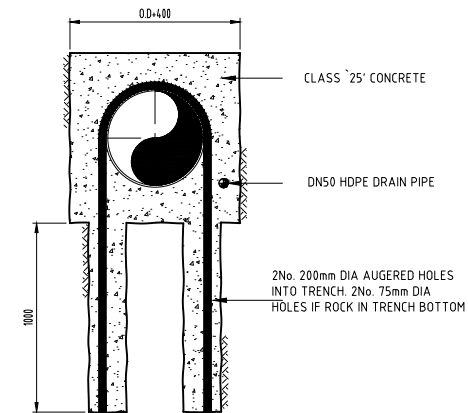
SECTION C-C  
N.T.S



SECTION D-D  
N.T.S



SLIP ANCHOR DETAIL  
N.T.S



SECTION E-E  
N.T.S

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.

PRELIMINARY ISSUE  
Signed: Team Leader .....

REV	REVISIONS	SIGN	DATE	APPROVED
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			



Project  
**KYUSO ROCK CATCHMENT WATER PROJECT**

Design Consultants.  

 15 Westlands Road, Westland  
 P.O Box 30337-00100 Nairobi, Kenya  
 Tel: +254 718 875 310  
 +254 788 352 533  
 Email: info@kwsamanagement.com

Drawing Title  
**DETAILED DESIGN  
 STANDARD DRAWINGS  
 CROSSING DETAILS - 2**

Designed by	JMM	Drawn by	KCK
Checked by	JN	Approved by	JR
Scale	H = 1:1,000 V = 1:100	Date	NOV 2023
Job No.		ACAD File:	KYUSO
STATUS	DWG. No.	SHEET 1 OF 1	0 REV