Athi Water Works Development Agency	Tanathi Water Works Development Agency	African Development Bank

Kenya Towns Sustainable Water Supply & Sanitation Programme

CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

CONTRACT NO.:AWSB/KTSWSSP/CS/10/2018

FINAL DESIGN REVIEW REPORT-KITUI WATER SUPPLY AND SEWERAGE
BOOK OF DRAWINGS

JULY 2020

SUBMITTED BY

JOINT VENTURE BETWEEN

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KITUI WATER SUPPLY PROJECT LIST OF DRAWINGS

DRAWING NO.	TITLE	SHEET NO.
PROJECT INFORMATION		
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KITUI- WL-P&P-001	OVERVIEW MAP	1 OF 4
KITUI- WL-P&P-002	OVERVIEW MAP	2 OF 4
KITUI- WL-P&P-003	OVERVIEW MAP	3 OF 4
KITUI- WL-P&P-004	OVERVIEW MAP	4 OF 4
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KITUI-WS-STD-005	PIPE PROTECTION DETAILS	5 OF 11
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KITUI-WS-STD-008	SERVICE CONNECTION	8 OF 11
KITUI-WS-STD-009	RIVER CROSSING DETAILS	9 OF 11
KITUI-WS-STD-010	SERVICE CONNECTION	10 OF 11
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KITUI-WS-WK-003	NOTICE BOARD, SOAK PIT, PLUMBING DETAILS, DOOR AND GREESE TRAP DETAILS	3 OF 3
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KITUI-SL-P&P-001	KITUI SEWER LINE PROFILES ALIGNMENT K1; KM 0+000-0+659	1 OF 1
KITUI-SL-P&P-002	KITUI SEWER LINE PROFILES ALIGNMENT K2:KM 0+000-0+406; K2A: KM 0+000-0+142	1 OF 1
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KITUI-SL-P&P-004	KITUI SEWER LINE PROFILES ALIGNMENT K4: KM 0+000-0+848	1 OF 1
KITUI-SL-P&P-005	KITUI SEWER LINE PROFILES ALIGNMENT K5: KM 0+000-0+219; K6: KM 0+000-0+423	1 OF 1
KITUI-SL-P&P-006	KITUI SEWER LINE PROFILES ALIGNMENT K6A: KM 0+000-0+103; K7: KM 0+000-0+451	1 OF 1
KITUI-SL-P&P-007	KITUI SEWER LINE PROFILES ALIGNMENT K8: KM 0+000-0+257; K9: KM 0+000-0+170	1 OF 1
KITUI-SL-P&P-008	KITUI SEWER LINE PROFILES ALIGNMENT K10: KM 0+000-0+200; K11: KM 0+000-0+234	1 OF 1
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KITUI-SL-P&P-011	KITUI SEWER LINE PROFILES ALIGNMENT K15A:KM 0+000-0+243;K15B: 0+000-0+143; K15C: KM 0+000-0+280	1 OF 1
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KITUI-SL-P&P-015	KITUI SEWER LINE PROFILES ALIGNMENT K20:KM 0+000-0+175; K21: KM 0+000-0+178	1 OF 1
KITUI-SL-P&P-016	KITUI SEWER LINE PROFILES ALIGNMENT K22:KM 0+000-0+175; K22: KM 0+000-0+560	1 OF 2
KITUI-SL-P&P-016	KITUI SEWER LINE PROFILES ALIGNMENT K22:KM 0+000-0+175; K21: KM 0+560-0+980	2 OF 2
STANDARD DRAWINGS- SEWER TRUNKS		
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GUARD HOUSE		
KITUI-WS-GH-03	FLOOR PLANS, ELEVATION AND FOUNDATION DETAILS	1 OF 1

DRAWING NO.	TITLE	SHEET NO.
ADMINSTRATION OFFIC- RESIDENT ENGINEER'S OFFICE BUILDING		
KITUI-AO-RE-001	FLOOR PLAN, ELEVATIONS, STRUCTURAL DETAILS AND TRUSS SECTION	1 OF 2
KITUI-AO-RE-002	SEPTIC TANK DETAILS, MANHOLE AND ELECTRICAL DRAWINGS	2 OF 2
STANDARD DRAWINGS- SEWER TRUNKS		
KITUI-SL-STD-001	COLLECTOR SEWER DETAILS	1 OF 3
KITUI-SL-STD-002	INSPECTION CHAMBER- SECTION DETAILS	2 OF 3
KITUI-SL-STD-003	STANDARD MANHOLE-SECTION DETAILS	3 OF 3
KITUI-SL-STD-004	INSPECTION CHAMBER DETAILS	4 OF 3
KITUI-SL-STD-005	MANHOLE COVERS AND CHAMBER DETAILS	5 OF 3
GUARD HOUSE		
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ADMINSTRATION OFFIC- RESIDENT ENGINEER'S OFFICE BUILDING		
KITUI-AO-RE-001	FLOOR PLAN, ELEVATIONS, STRUCTURAL DETAILS AND TRUSS SECTION	1 OF 2
KITUI-AO-RE-002	SEPTIC TANK DETAILS, MANHOLE AND ELECTRICAL DRAWINGS	2 OF 2

REVISIONS	
DESCRIPTION	DATE

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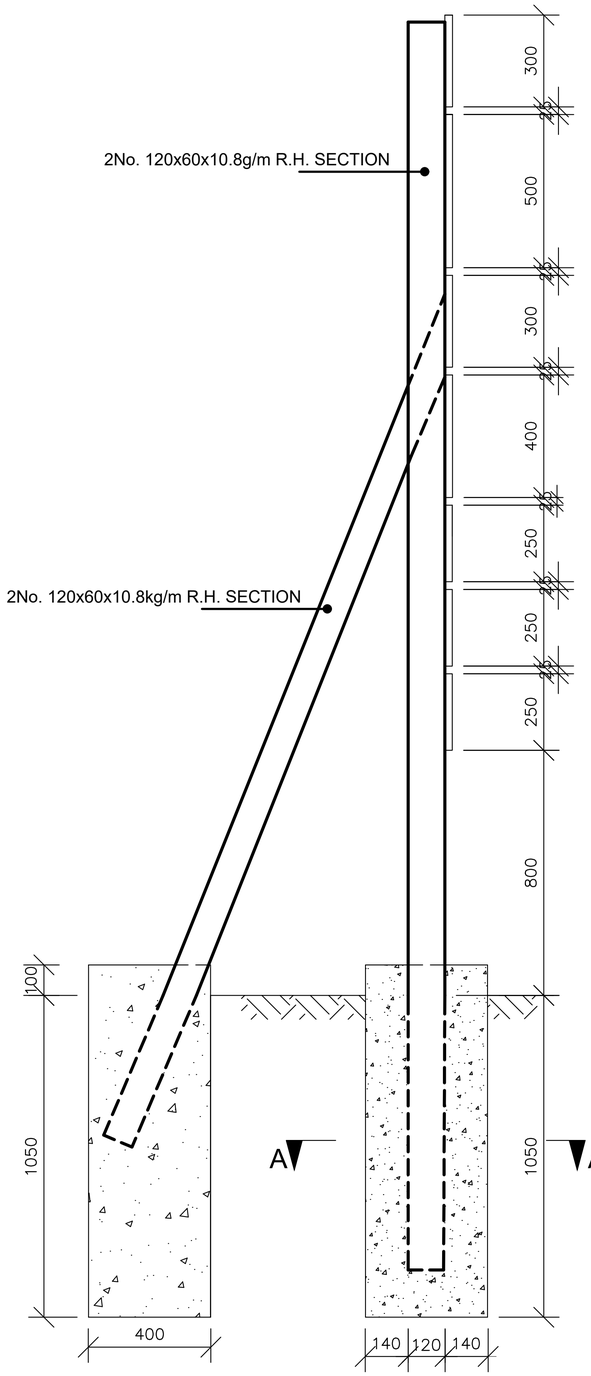
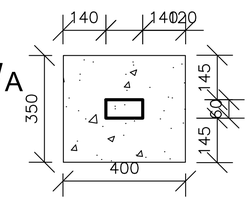
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KITUI WATER SUPPLY AND SEWER DRAWING INDEX

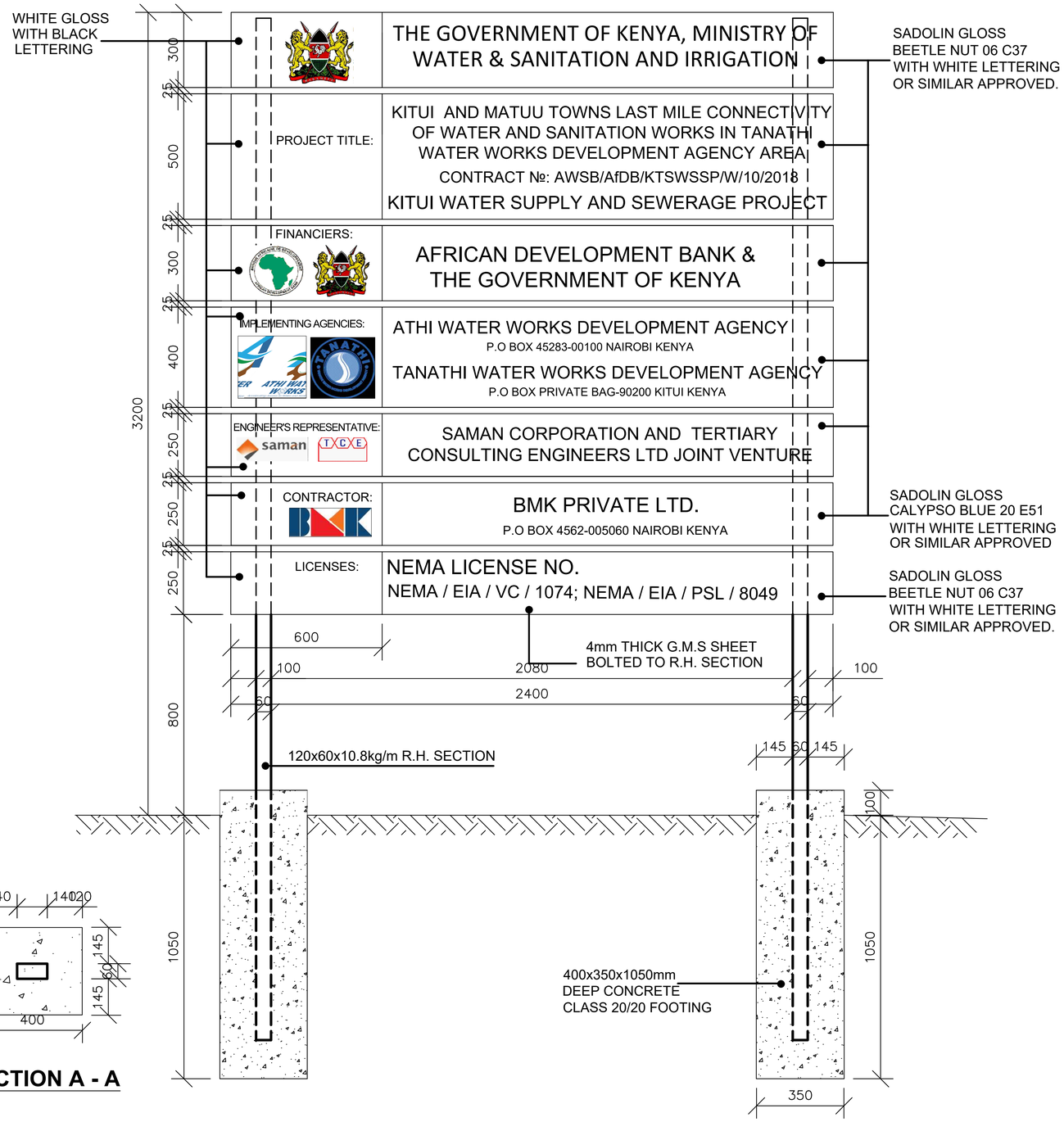
Stage:	FINAL DETAILED DESIGN
Date:	MARCH 2020
Drawing No	MAT–AB–01
Scale:	NOT TO SCALE
Sheet No.	1 of 1
Index No.	



SIDE ELEVATION



SECTION A - A



FRONT ELEVATION

NOTES:

1. FINAL WORDING ON SIGN BOARD AS APPROVED BY THE EMPLOYER.
2. DIMENSIONS ARE IN mm UNLESS OTHERWISE STATED.
3. THE EXACT LOCATION FOR THE SIGNBOARD ERECTION TO BE APPROVED ON SITE.

Revisions	
Description	Date
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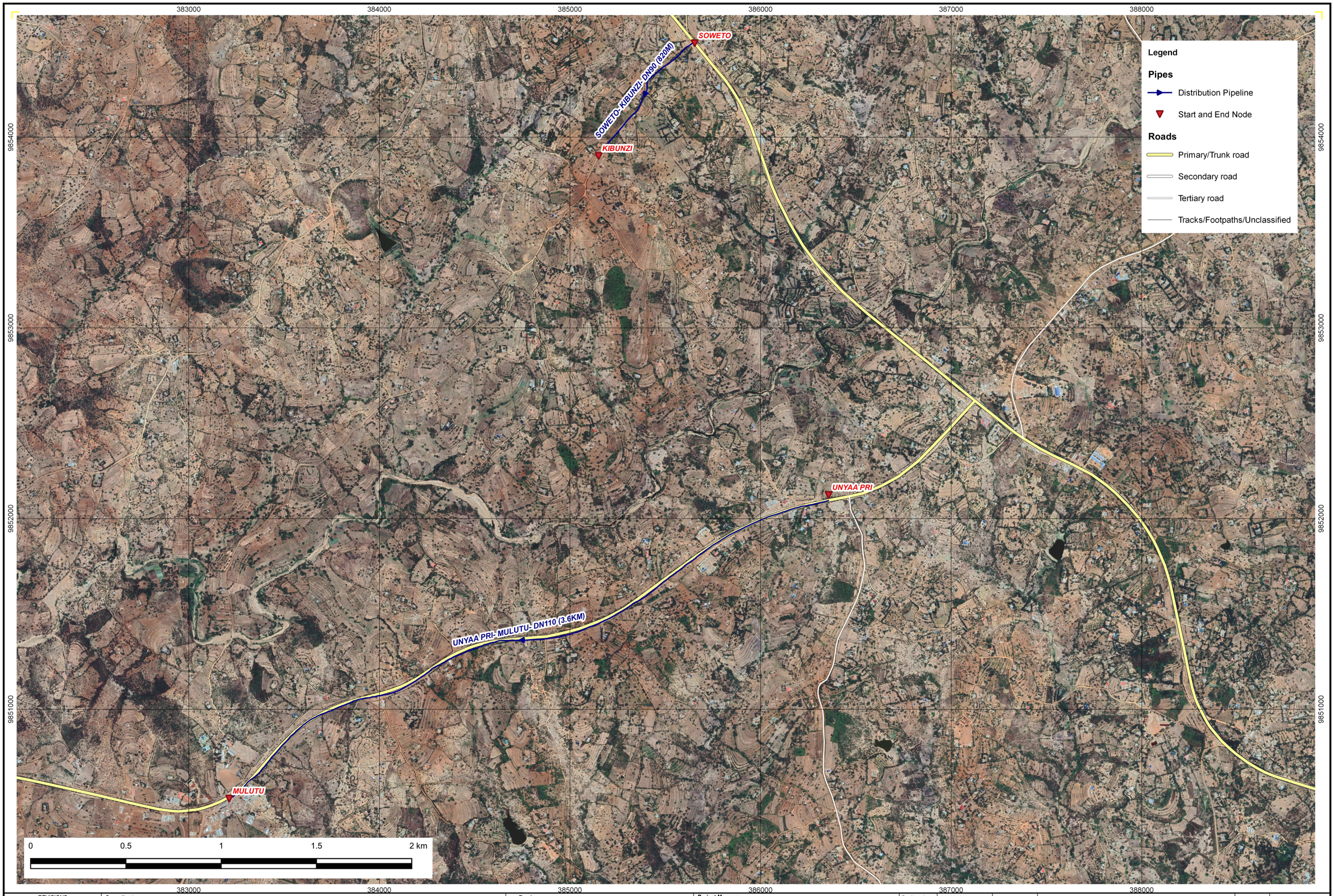
Checked:	D. LIAMBILA
Approved:	B. KIM

Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KITUI WATER SUPPLY AND SANITATION PROJECT

PUBLICITY SIGNBOARD

Stage :	FINAL DESIGN REVIEW
Date :	JULY 2020
Drawing No. :	KITUI-WS-PSB-001
Scale :	1:10
Sheet Size :	A1
Sheet No. :	1 of 1
Index No. :	



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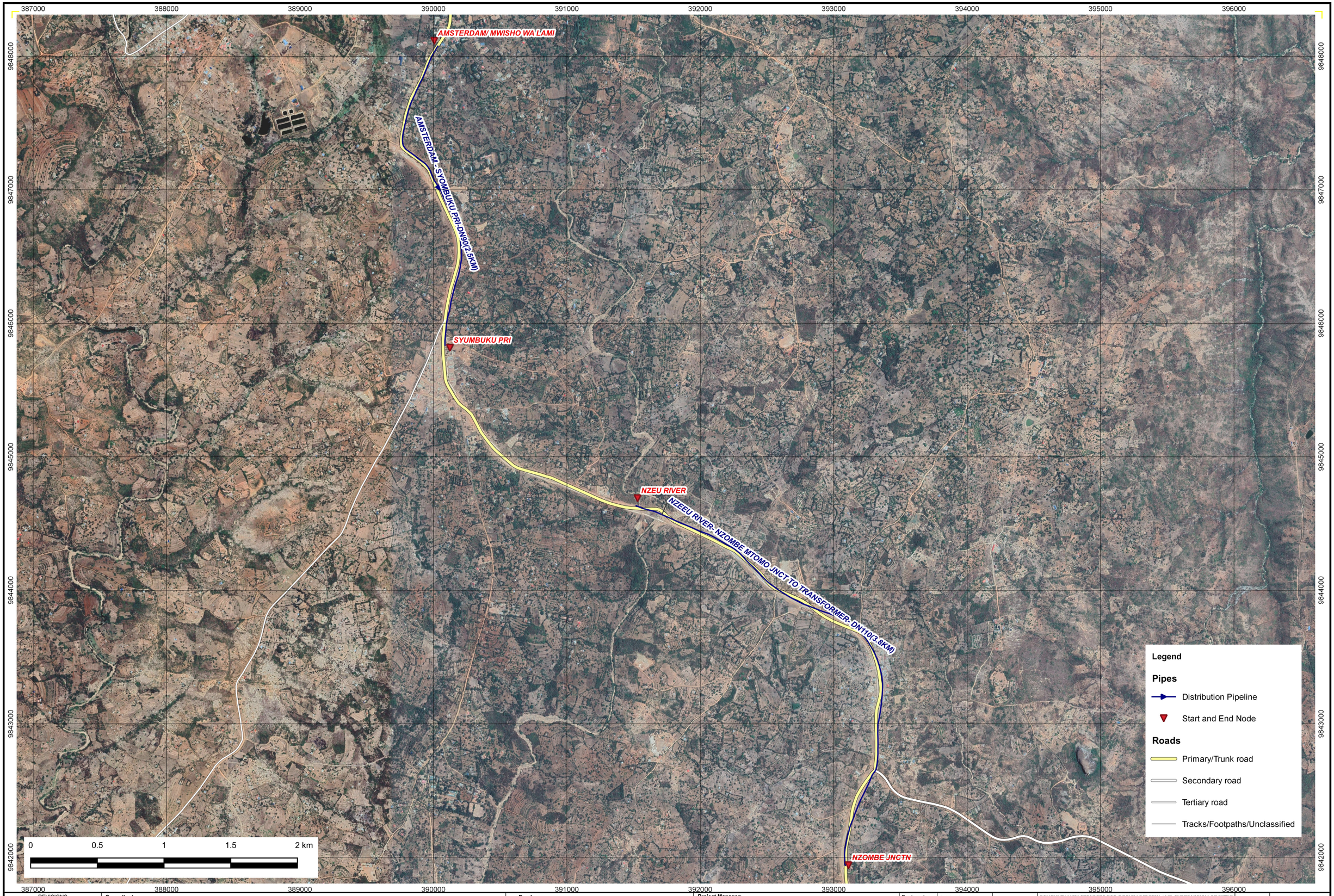
Drawn:	K. KAKA		
Checked:	D. LIAMBILA	Drawing title:	KITUI WATER DISTRIBUTION SYSTEM OVERVIEW MAP
Approved:	B. KIM		

Stage:	FINAL DETAILED DESIGN
Date:	MARCH 2020
Drawing No.	TCE-KM-WL-P&P-001
Scale	1:17,500
Sheet No.	1 of 4
Index No.	



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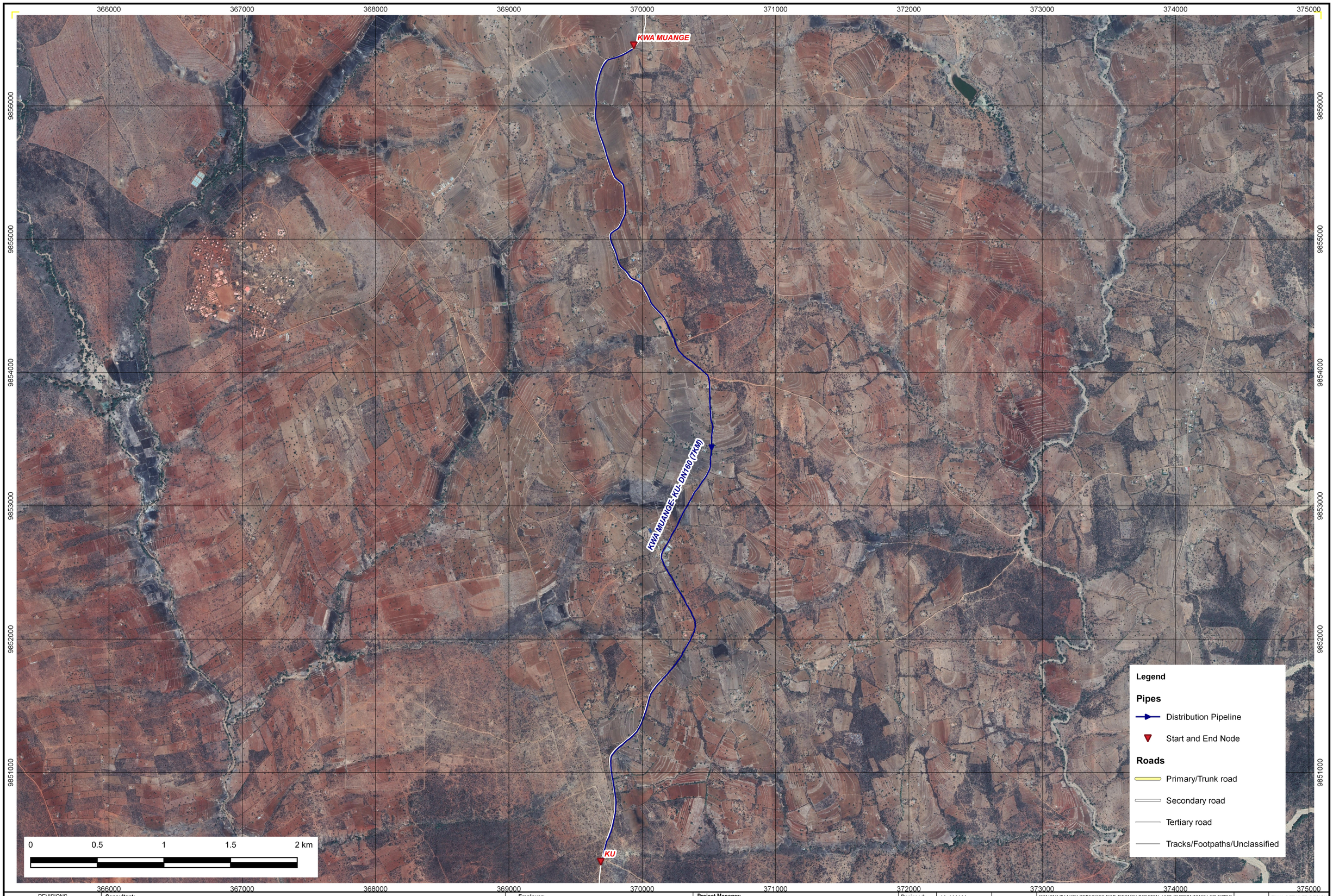
Drawn:	K. KAKA		
Checked:	D. LIAMBILA	Drawing title:	KITUI WATER DISTRIBUTION SYSTEM OVERVIEW MAP
Approved:	B. KIM		

Stage:	FINAL DETAILED DESIGN
Date:	MARCH 2020
Drawing No.	TCE-KM-WL-P&P-001
Scale	1:25,000
Sheet No.	2 of 4
Index No.	



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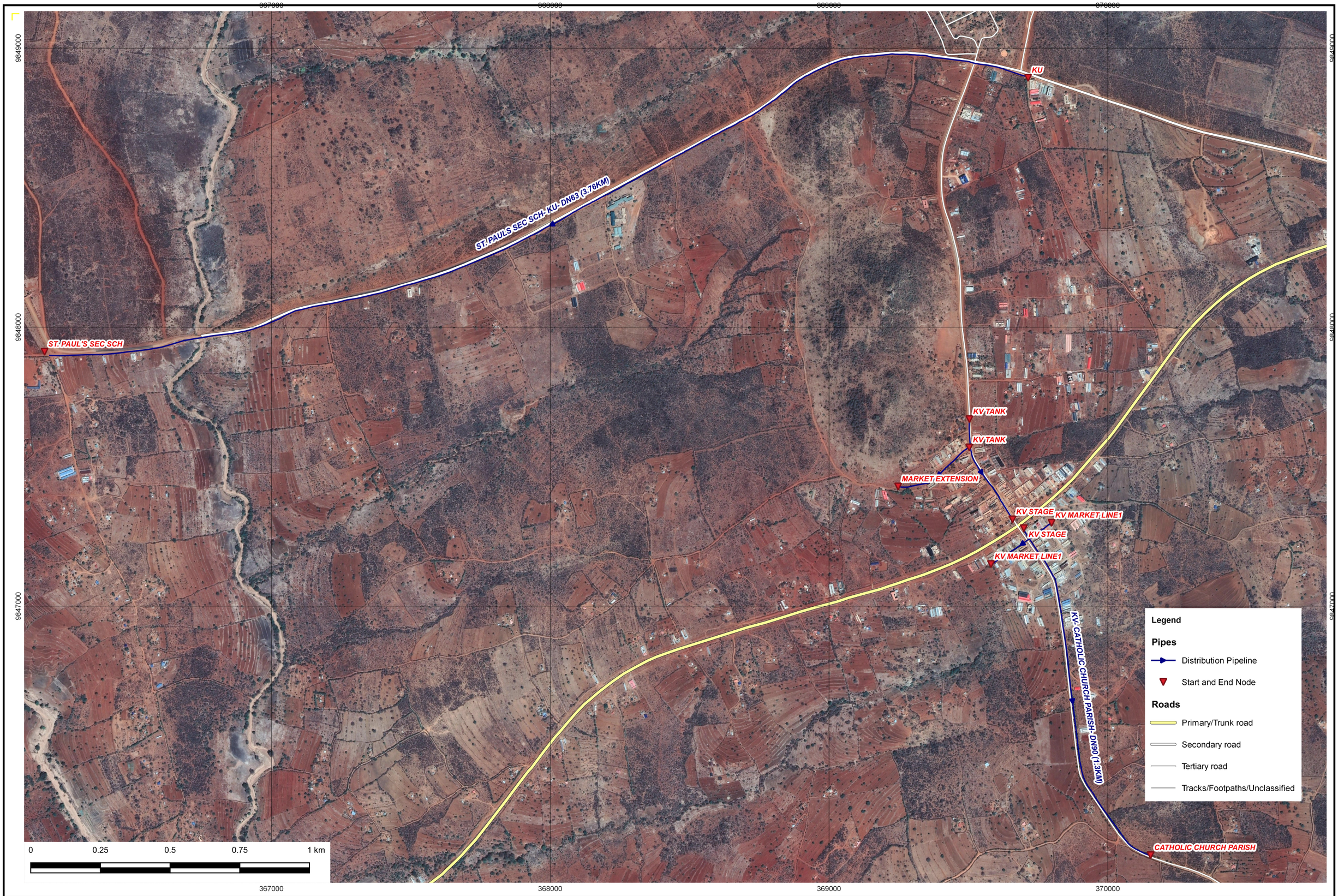
Drawn:	K. KAKA		
Checked:	D. LIAMBILA	Drawing title:	KITUI WATER DISTRIBUTION SYSTEM OVERVIEW MAP
Approved:	B. KIM		

Stage:	FINAL DETAILED DESIGN
Date:	MARCH 2020
Drawing No.	TCE-KM-WL-P&P-001
Scale	1:25,000
Sheet No.	3 of 4
Index No.	



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Drawn:	K. KAKA		
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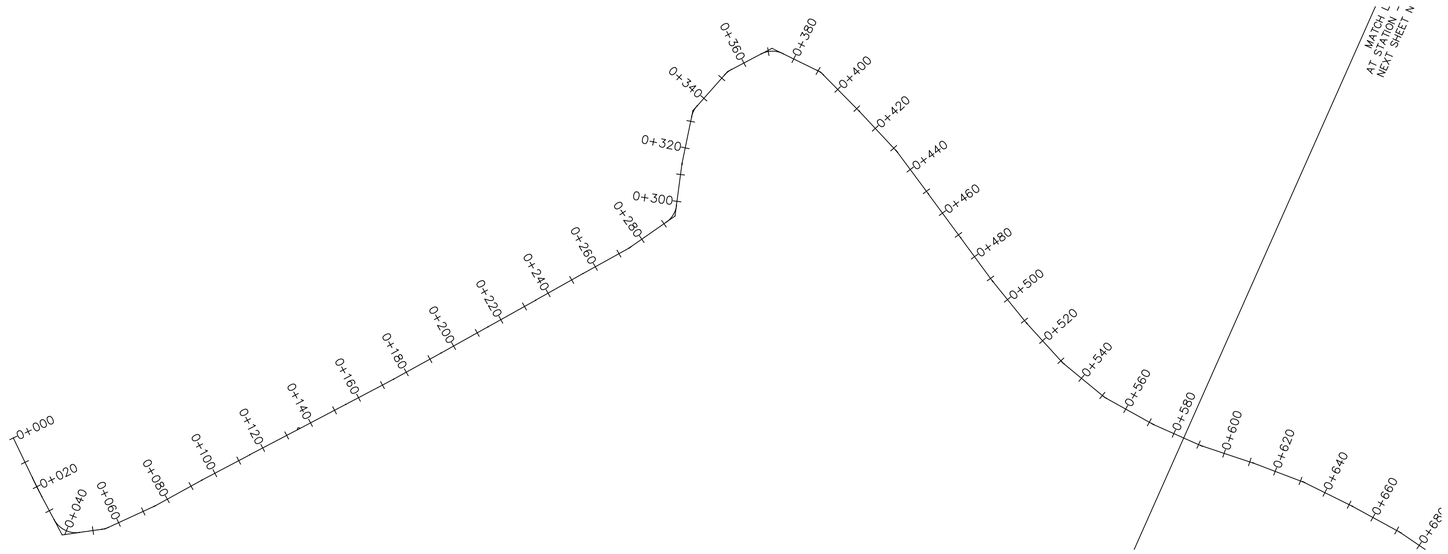
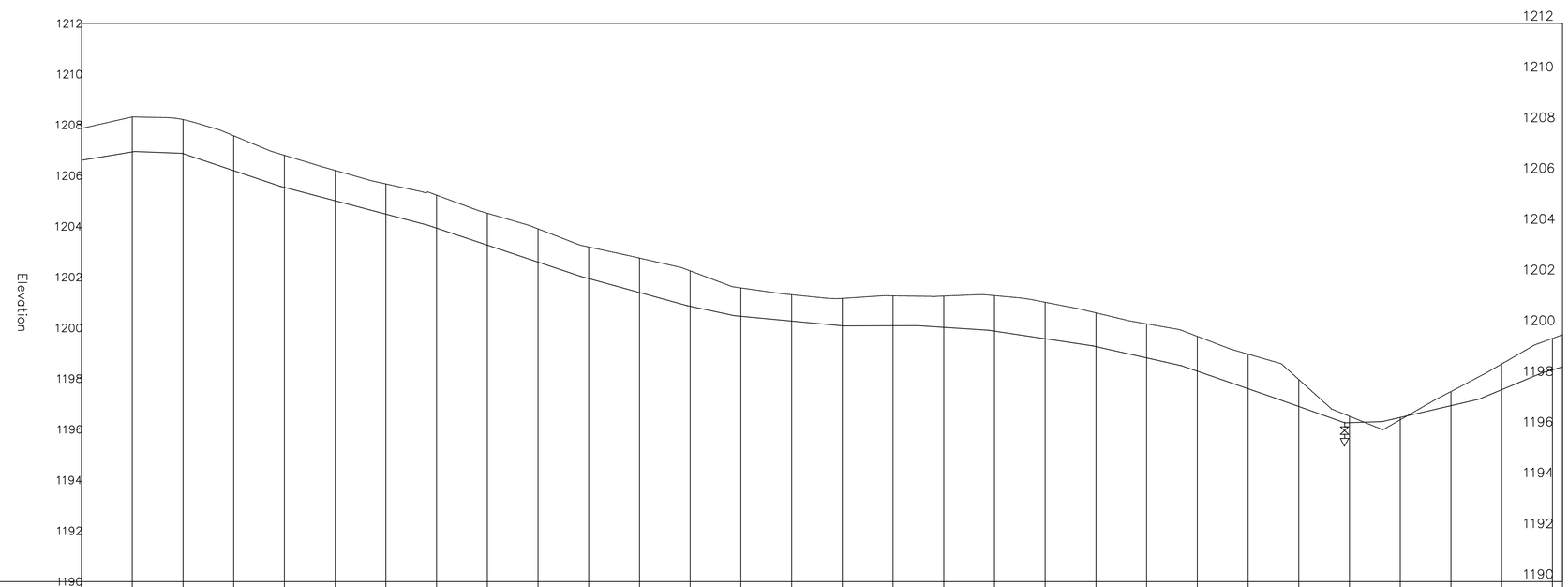
Approved:	B. KIM		

Stage:	FINAL DETAILED DESIGN
Date:	MARCH 2020
Drawing No.	TCE-KM-WL-P&P-001
Scale	1:12,000
Sheet No.	4 of 4
Index No.	



Kabati Reticulation 2 Alignment PROFILE



CHAINAGE		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
ORIGINAL GROUND LEVEL (m.a.s.l)	1207.86	1208.31	1208.21	1207.57	1206.80	1206.21	1205.67	1205.23	1204.52	1203.90	1203.19	1202.75	1202.25	1201.58	1201.31	1201.16	1201.26	1201.25	1201.27	1201.01	1200.59	1200.16	1199.67	1198.97	1197.97	1196.52	1196.38	1197.49	1198.58	1199.58 1199.73
PIPELINE INVERT LEVEL (m.a.s.l)	1206.61	1206.93	1206.87	1206.20	1205.54	1205.01	1204.48	1203.93	1203.26	1202.59	1201.94	1201.39	1200.85	1200.46	1200.27	1200.08	1200.09	1200.02	1199.87	1199.57	1199.26	1198.82	1198.29	1197.60	1196.90	1196.26	1196.47	1196.93	1197.56	1198.35 1198.46
TRENCH DEPTH (m)	1.25	1.38	1.34	1.37	1.26	1.20	1.19	1.30	1.26	1.31	1.25	1.36	1.40	1.12	1.04	1.08	1.18	1.23	1.40	1.44	1.33	1.34	1.37	1.36	1.06	0.25	−0.09	0.56	1.01	1.23 1.26
PIPE DATA	PIPE DIAMETER AND MATERIAL: HDPE DN 63mm													GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD																

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH-OUT (W.O)

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

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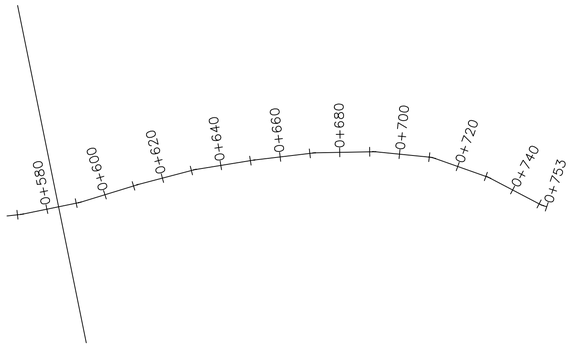
Checked:	D. Liambila
Approved:	B. Kim

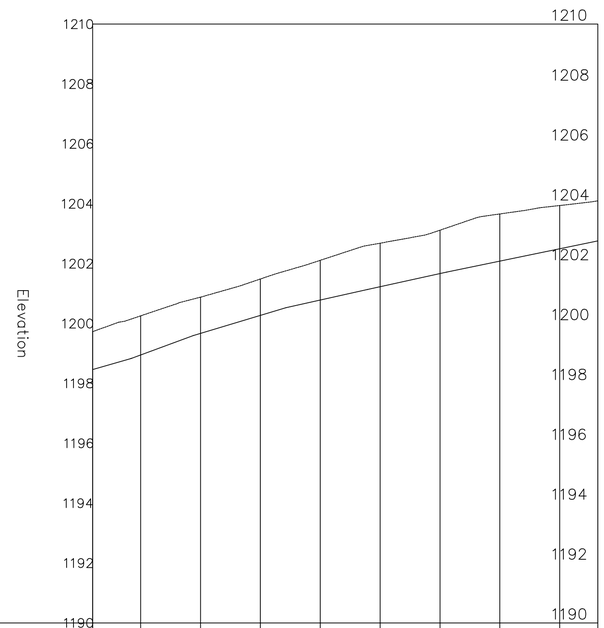
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KABATI RETICULATION 2 DISTRIBUTION PIPELINE PROFILE, DN 63mm.

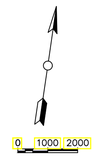
Stage:	FINAL DETAILED DESIGN
Date:	DECEMBER 2021
Drawing No.	TCE-KDP-KR2-001
Scale:	VERT-1:200 HOR-1:2000
Sheet No.	1 of 2
Index No.	



Kabati Reticulation 2 Alignment PROFILE



CHAINAGE		0+600	0+620	0+640	0+660	0+680	0+700	0+720	0+740	
ORIGINAL GROUND LEVEL (m.a.s.l)	1199.73	1200.26	1200.88	1201.49	1202.11	1202.68	1203.12	1203.66	1203.94	1204.10
PIPELINE INVERT LEVEL (m.a.s.l)	1198.46	1198.95	1199.67	1200.27	1200.78	1201.23	1201.67	1202.08	1202.50	1202.76
TRENCH DEPTH (m)	1.26	1.31	1.21	1.22	1.33	1.45	1.45	1.58	1.45	1.34
PIPE DATA	PIPE DIAMETER AND MATERIAL: HDPE DN 63mm GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD									



NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH-OUT (W.O)

START CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

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Project Manager:

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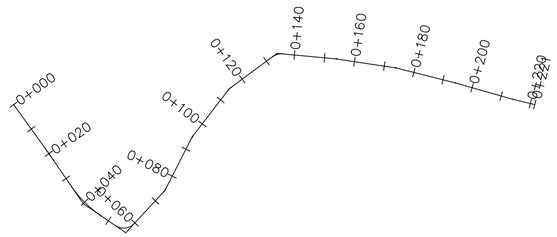
email: info@tanathi.go.ke

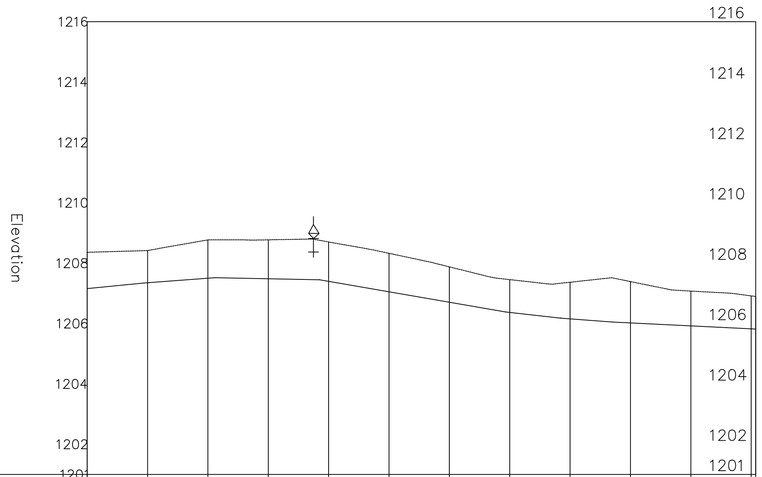
Designed:	D. Liambila
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

Project:	CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA
Drawing Title:	KABATI RETICULATION 2 DISTRIBUTION PIPELINE PROFILE, DN 63mm.

Stage:	FINAL DETAILED DESIGN
Date:	DECEMBER 2021
Drawing No.	TCE-KDP-KR2-002
Scale:	VERT-1:200 HOR-1:2000
Sheet No.	2 of 2
Index No.	



Kabati Reticulation 2A Alignment PROFILE



CHAINAGE		0+020	0+040	0+060	0+080	0+100	0+120	0+140	0+160	0+180	0+200	0+220
ORIGINAL GROUND LEVEL (m.a.s.l)	1208.36	1208.42	1208.77	1208.77	1208.70	1208.33	1207.88	1207.45	1207.37	1207.39	1207.08	1206.83
PIPELINE INVERT LEVEL (m.a.s.l)	1207.16	1207.35	1207.50	1207.48	1207.40	1207.05	1206.70	1206.37	1206.16	1206.02	1205.92	1205.82
TRENCH DEPTH (m)	1.20	1.07	1.27	1.29	1.30	1.28	1.17	1.09	1.21	1.37	1.15	1.09
PIPE DATA	PIPE DIAMETER AND MATERIAL: HDPE DN 63mm GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD											

0 1000 2000

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH-OUT (W.O)

REVISIONS	
DESCRIPTION	DATE

Consultant:

saman

SAMAN CORPORATION
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Project Manager:

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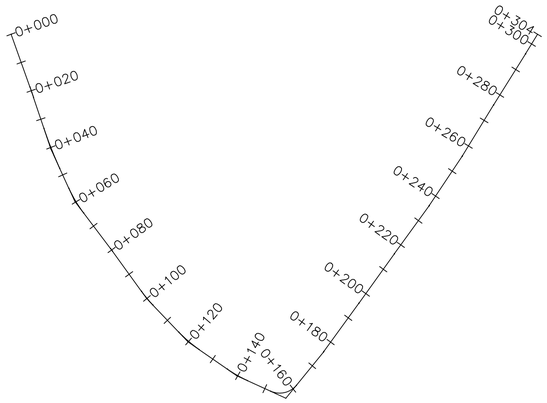
Designed:	D. Liambila
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KABATI RETICULATION 2A DISTRIBUTION PIPELINE PROFILE, DN 63mm.

Stage:	FINAL DETAILED DESIGN
Date:	DECEMBER 2021
Drawing No.	TCE-KDP-KR2A-001
Scale:	VERT-1:200 HOR-1:2000
Sheet No.	1 of 1
Index No.	



Kabati Reticulation 2B Alignment PROFILE

CHAINAGE		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
ORIGINAL GROUND LEVEL (m.a.s.l)	1208.93	1208.88	1209.21	1209.29	1209.15	1209.14	1208.92	1208.77	1208.50	1208.55	1208.65	1208.73	1208.49	1208.09	1207.78	1207.15 1206.77
PIPELINE INVERT LEVEL (m.a.s.l)	1207.63	1207.66	1207.81	1207.97	1207.93	1207.86	1207.70	1207.44	1207.32	1207.29	1207.26	1207.23	1207.03	1206.77	1206.49	1206.25 1206.22
TRENCH DEPTH (m)	1.30	1.22	1.40	1.32	1.22	1.29	1.22	1.33	1.18	1.26	1.39	1.49	1.46	1.32	1.29	0.91 0.55
PIPE DATA	PIPE DIAMETER AND MATERIAL: HDPE DN 63mm							GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD								

0 1000 2000

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH-OUT (W.O)

REVISIONS	
DESCRIPTION	DATE

Consultant:

saman

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Project Manager:

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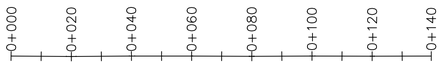
Designed:	D. Liambila
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

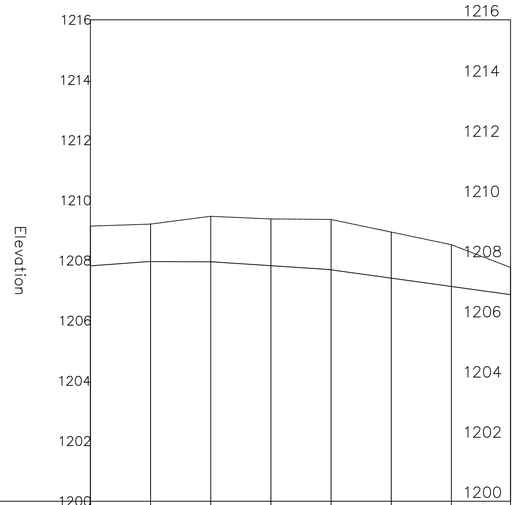
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KABATI RETICULATION 2B DISTRIBUTION PIPELINE PROFILE, DN 63mm.

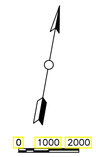
Stage:	FINAL DETAILED DESIGN
Date:	DECEMBER 2021
Drawing No.	TCE-KDP-KR2B-001
Scale:	VERT-1:200 HOR-1:2000
Sheet No.	1 of 1
Index No.	



Kabati Reticulation 2C Alignment PROFILE



CHAINAGE		0+020	0+040	0+060	0+080	0+100	0+120	
ORIGINAL GROUND LEVEL (m.a.s.l)	1209.14	1209.21	1209.47	1209.38	1209.36	1208.94	1208.52	1207.77
PIPELINE INVERT LEVEL (m.a.s.l)	1207.82	1207.96	1207.96	1207.83	1207.69	1207.41	1207.14	1206.87
TRENCH DEPTH (m)	1.32	1.25	1.51	1.55	1.67	1.53	1.39	0.90
PIPE DATA	PIPE DIAMETER AND MATERIAL: HDPE DN 63mm GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD							



NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH-OUT (W.O)

REVISIONS	
DESCRIPTION	DATE

Consultant:

saman

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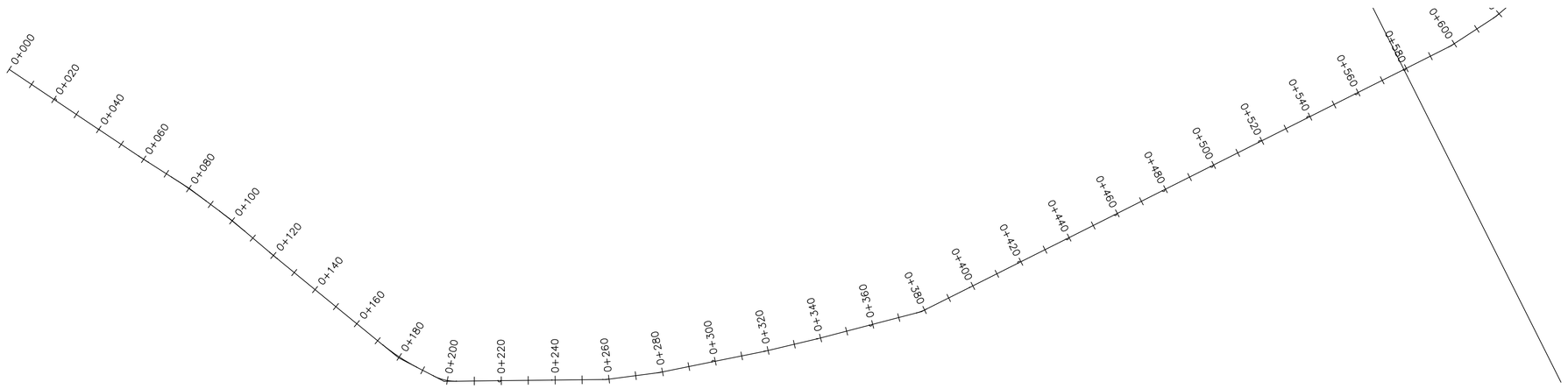
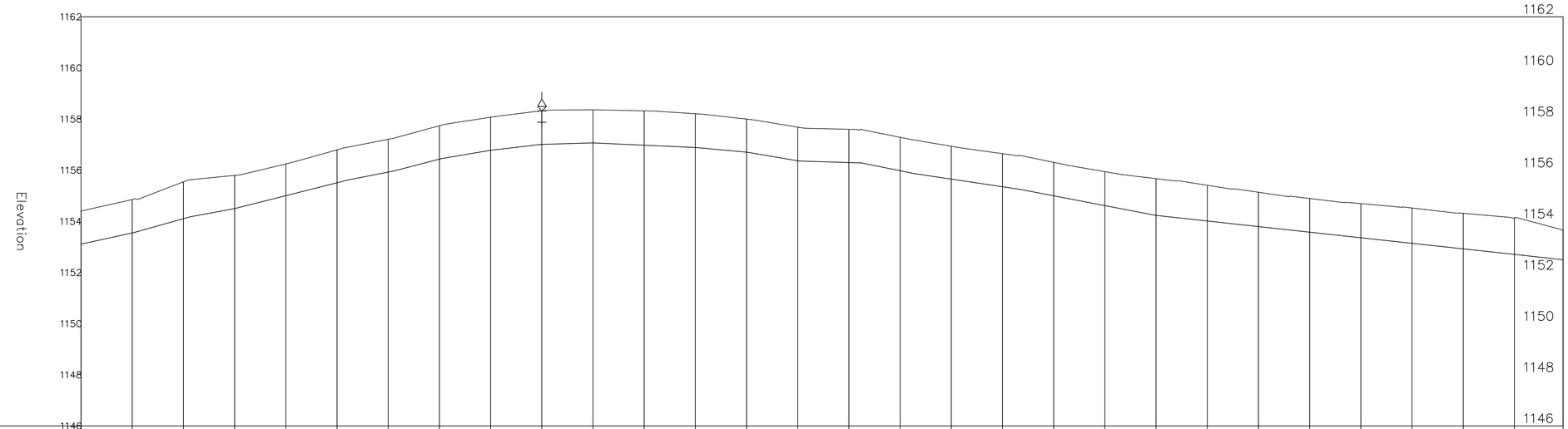
Designed:	D. Liambila
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

Project:	CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA
Drawing Title:	KABATI RETICULATION 2C DISTRIBUTION PIPELINE PROFILE, DN 63mm.

Stage:	FINAL DETAILED DESIGN
Date:	DECEMBER 2021
Drawing No.	TCE-KDP-KR2C-001
Scale:	VERT-1:200 HOR-1:2000
Sheet No.	1 of 1
Index No.	



KwaMwange to KU Alignment PROFILE



CHAINAGES		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	
ORIGINAL GROUND LEVEL (m.a.s.l)	1154.40	1154.85	1155.55	1155.80	1156.25	1156.80	1157.21	1157.74	1158.07	1158.32	1158.36	1158.32	1158.21	1158.00	1157.69	1157.60	1157.29	1156.94	1156.65	1156.31	1155.94	1155.67	1155.41	1155.14	1154.90	1154.70	1154.52	1154.32	1154.14	1153.66
PIPELINE INVERT LEVEL (m.a.s.l)	1153.11	1153.55	1154.10	1154.50	1155.00	1155.51	1155.93	1156.44	1156.78	1157.01	1157.07	1156.98	1156.89	1156.71	1156.37	1156.30	1155.98	1155.65	1155.36	1155.00	1154.62	1154.24	1154.02	1153.80	1153.58	1153.36	1153.14	1152.93	1152.71	1152.50
TRENCH DEPTH (m)	1.30	1.31	1.44	1.30	1.24	1.29	1.28	1.30	1.29	1.31	1.29	1.34	1.32	1.29	1.32	1.30	1.31	1.28	1.29	1.31	1.33	1.43	1.40	1.34	1.32	1.34	1.38	1.39	1.43	1.16
PIPE DATA		PIPE DIAMETER AND MATERIAL: HDPE DN 160mm													GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD															

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH-OUT (W.O)

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

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Project Manager:

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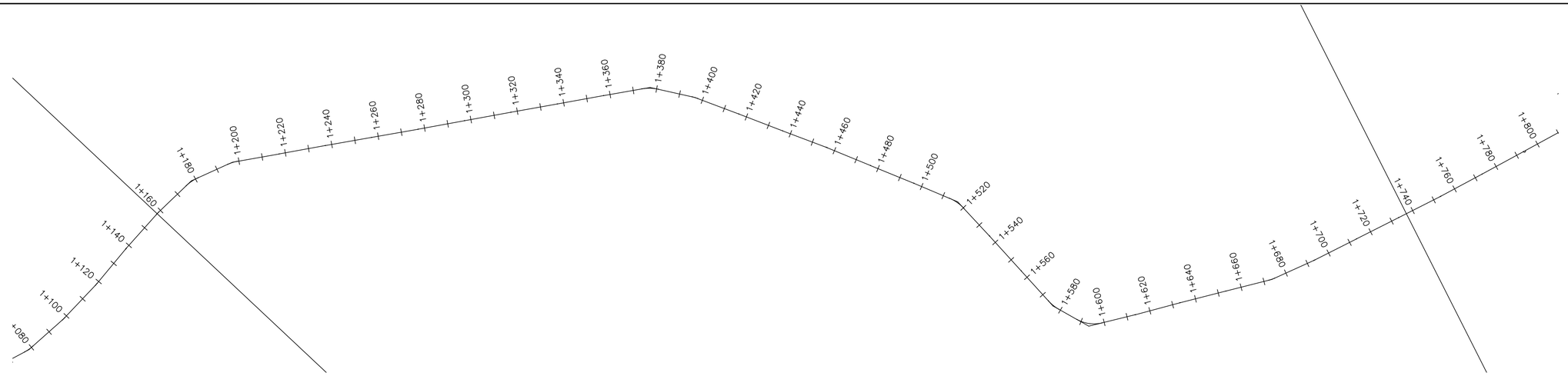
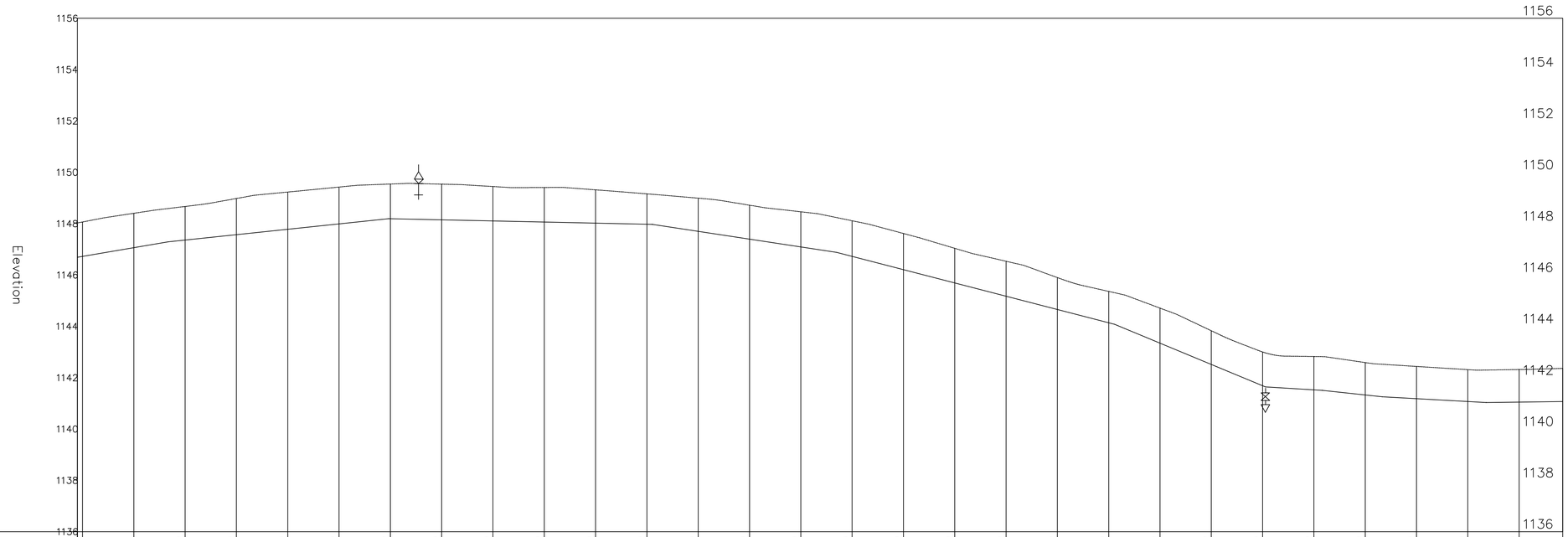
Designed:	D. Liambila
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

Project:	CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA
Drawing Title:	KWA MWANGE TO KU DISTRIBUTION PIPELINE PROFILE DN 160mm

Stage:	FINAL DETAILED DESIGN
Date:	NOVEMBER 2021
Drawing No.	TCE-KDP-KMKU-001
Scale:	VERT-1:200 HOR-1:2000
Sheet No.	1 of 14
Index No.	



KwaMwange to KU Alignment PROFILE



CHAINAGES	1+160	1+180	1+200	1+220	1+240	1+260	1+280	1+300	1+320	1+340	1+360	1+380	1+400	1+420	1+440	1+460	1+480	1+500	1+520	1+540	1+560	1+580	1+600	1+620	1+640	1+660	1+680	1+700	1+720
ORIGINAL GROUND LEVEL (m.a.s.l)	1148.03	1148.40	1148.67	1148.98	1149.23	1149.43	1149.54	1149.54	1149.45	1149.41	1149.32	1149.16	1148.99	1148.72	1148.46	1148.11	1147.62	1147.04	1146.54	1145.90	1145.36	1144.71	1143.83	1143.00	1142.82	1142.59	1142.44	1142.31	1142.32
PIPELINE INVERT LEVEL (m.a.s.l)	1146.69	1147.06	1147.36	1147.57	1147.78	1147.99	1148.19	1148.15	1148.11	1148.06	1148.02	1147.98	1147.70	1147.40	1147.09	1146.73	1146.21	1145.69	1145.17	1144.66	1144.14	1143.35	1142.52	1141.69	1141.53	1141.33	1141.18	1141.07	1141.05
TRENCH DEPTH (m)	1.34	1.34	1.31	1.41	1.45	1.43	1.35	1.39	1.34	1.34	1.30	1.18	1.29	1.32	1.37	1.39	1.41	1.35	1.36	1.24	1.22	1.36	1.31	1.31	1.30	1.26	1.26	1.24	1.27

CHAINAGES	1+720	1+740
ORIGINAL GROUND LEVEL (m.a.s.l)	1142.32	1142.36
PIPELINE INVERT LEVEL (m.a.s.l)	1141.05	1141.07
TRENCH DEPTH (m)	1.27	1.29

PIPE DATA: PIPE DIAMETER AND MATERIAL: HDPE DN 160mm — GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH-OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

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email: info@tanathi.go.ke

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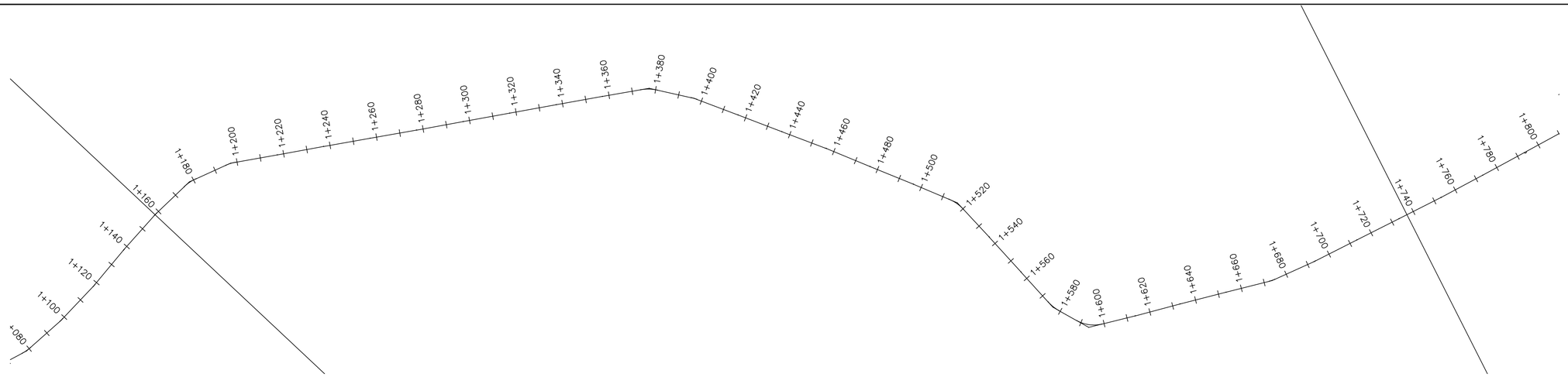
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

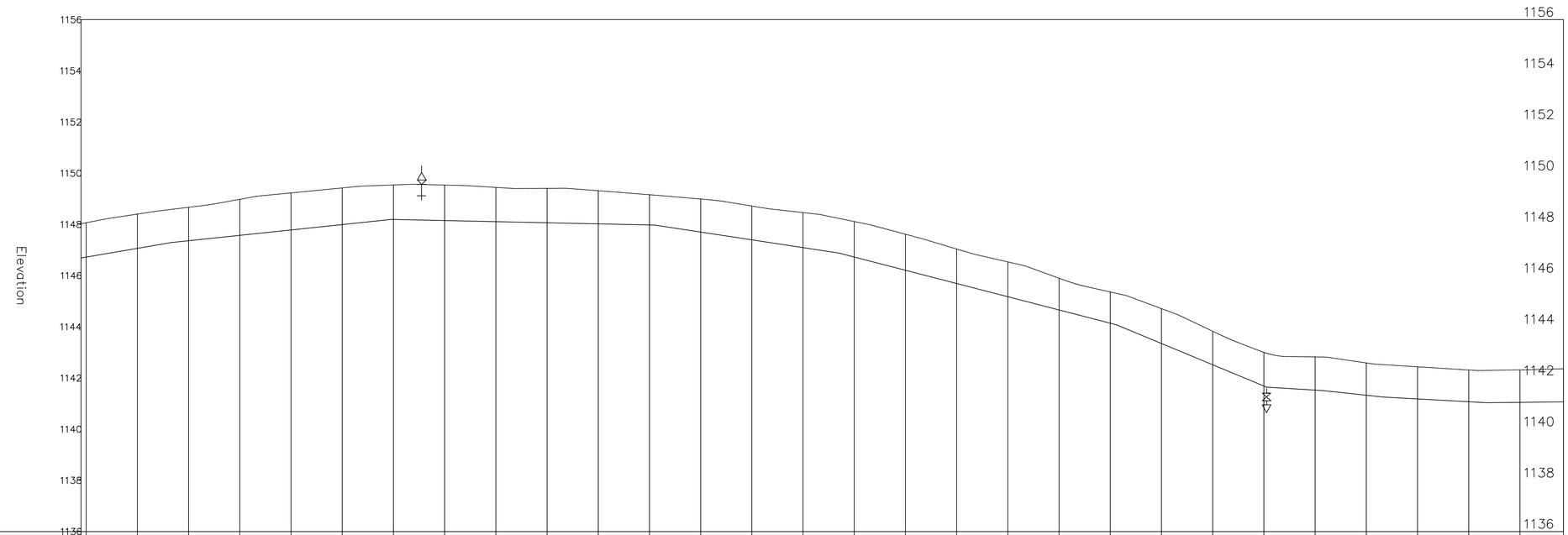
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KWA MWANGE TO KU DISTRIBUTION PIPELINE PROFILE DN 160mm

Stage:	FINAL DETAILED DESIGN
Date:	NOVEMBER 2021
Drawing No.	TCE-KDP-KMKU-003
Scale:	VERT-1:200 HOR-1:2000
Sheet No.	3 of 14
Index No.	



KwaMwange to KU Alignment PROFILE



CHAINAGES	1+160	1+180	1+200	1+220	1+240	1+260	1+280	1+300	1+320	1+340	1+360	1+380	1+400	1+420	1+440	1+460	1+480	1+500	1+520	1+540	1+560	1+580	1+600	1+620	1+640	1+660	1+680	1+700	1+720
ORIGINAL GROUND LEVEL (m.a.s.l)	1148.63	1148.40	1148.67	1148.98	1149.23	1149.43	1149.54	1149.54	1149.45	1149.41	1149.32	1149.16	1148.99	1148.72	1148.46	1148.11	1147.62	1147.04	1146.54	1145.90	1145.36	1144.71	1143.83	1143.00	1142.82	1142.59	1142.44	1142.31	1142.32
PIPELINE INVERT LEVEL (m.a.s.l)	1146.69	1147.06	1147.36	1147.57	1147.78	1147.99	1148.19	1148.15	1148.11	1148.06	1148.02	1147.98	1147.70	1147.40	1147.09	1146.73	1146.21	1145.69	1145.17	1144.66	1144.14	1143.35	1142.52	1141.69	1141.53	1141.33	1141.18	1141.07	1141.05
TRENCH DEPTH (m)	1.34	1.34	1.31	1.41	1.45	1.43	1.35	1.39	1.34	1.34	1.30	1.18	1.29	1.32	1.37	1.39	1.41	1.35	1.36	1.24	1.22	1.36	1.31	1.31	1.30	1.26	1.26	1.24	1.27
PIPE DATA	PIPE DIAMETER AND MATERIAL: HDPE DN 160mm															GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD													

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH-OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

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Project Manager:

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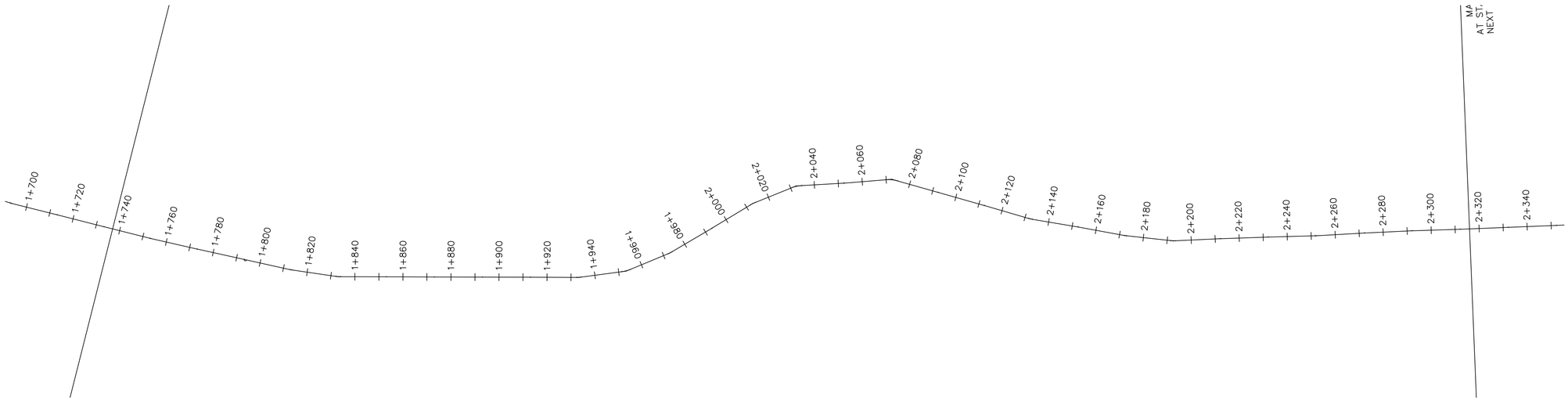
Designed:	D. Liambila
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

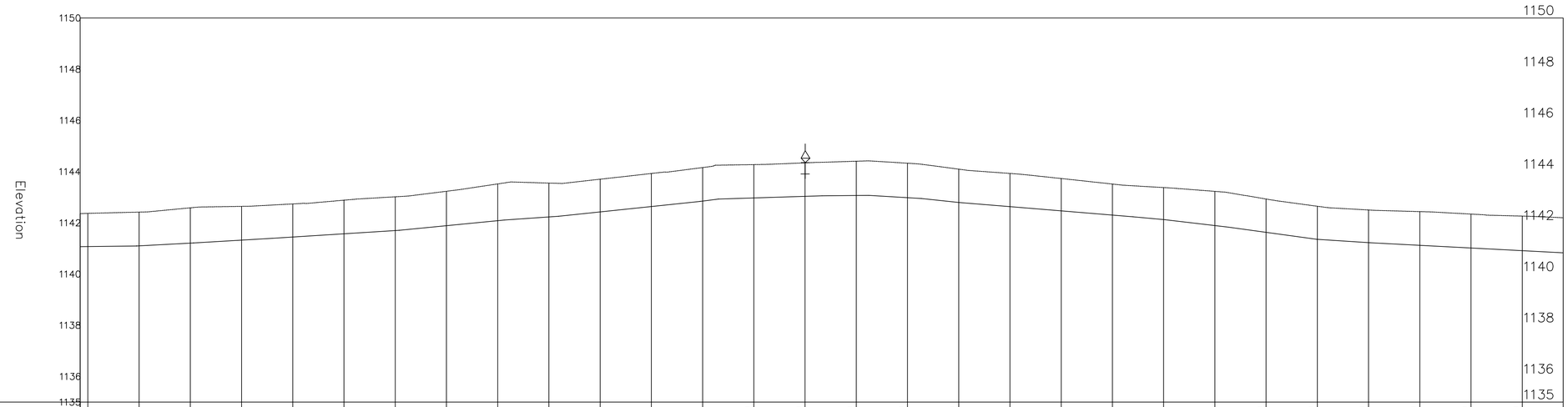
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KWA MWANGE TO KU DISTRIBUTION PIPELINE PROFILE DN 160mm

Stage:	FINAL DETAILED DESIGN
Date:	NOVEMBER 2021
Drawing No.	TCE-KDP-KMKU-003
Scale:	VERT-1:200 HOR-1:2000
Sheet No.	3 of 14
Index No.	



KwaMwange to KU Alignment PROFILE



CHAINAGES	ORIGINAL GROUND LEVEL (m.a.s.l)	PIPELINE INVERT LEVEL (m.a.s.l)	TRENCH DEPTH (m)
1+700	1142.36	1141.07	1.29
1+720	1142.37	1141.07	1.30
1+740			
1+760	1142.42	1141.10	1.32
1+780	1142.59	1141.21	1.38
1+800	1142.64	1141.32	1.32
1+820	1142.74	1141.45	1.29
1+840	1142.88	1141.57	1.31
1+860	1143.02	1141.70	1.32
1+880	1143.23	1141.89	1.34
1+900	1143.52	1142.08	1.44
1+920	1143.55	1142.23	1.32
1+940	1143.70	1142.43	1.28
1+960	1143.93	1142.64	1.29
1+980	1144.16	1142.85	1.31
2+000	1144.27	1142.97	1.30
2+020	1144.34	1143.03	1.31
2+040	1144.41	1143.07	1.34
2+060	1144.33	1142.98	1.35
2+080	1144.10	1142.79	1.30
2+100	1143.93	1142.63	1.30
2+120	1143.73	1142.47	1.26
2+140	1143.51	1142.30	1.21
2+160	1143.38	1142.13	1.25
2+180	1143.23	1141.89	1.34
2+200	1142.93	1141.63	1.30
2+220	1142.65	1141.35	1.29
2+240	1142.50	1141.23	1.28
2+260	1142.44	1141.12	1.32
2+280	1142.34	1141.02	1.33
2+300	1142.26	1140.91	1.35
2+320	1142.20	1140.83	1.37
2+340			

PIPE DATA: PIPE DIAMETER AND MATERIAL: HDPE DN 160mm

GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH-OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

saman

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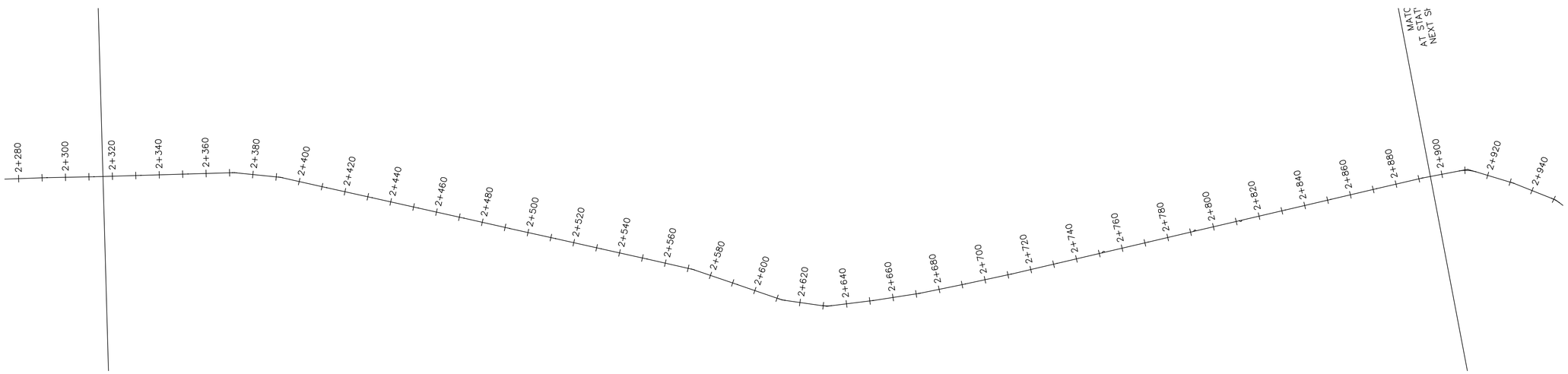
Designed:	D. Liambila
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

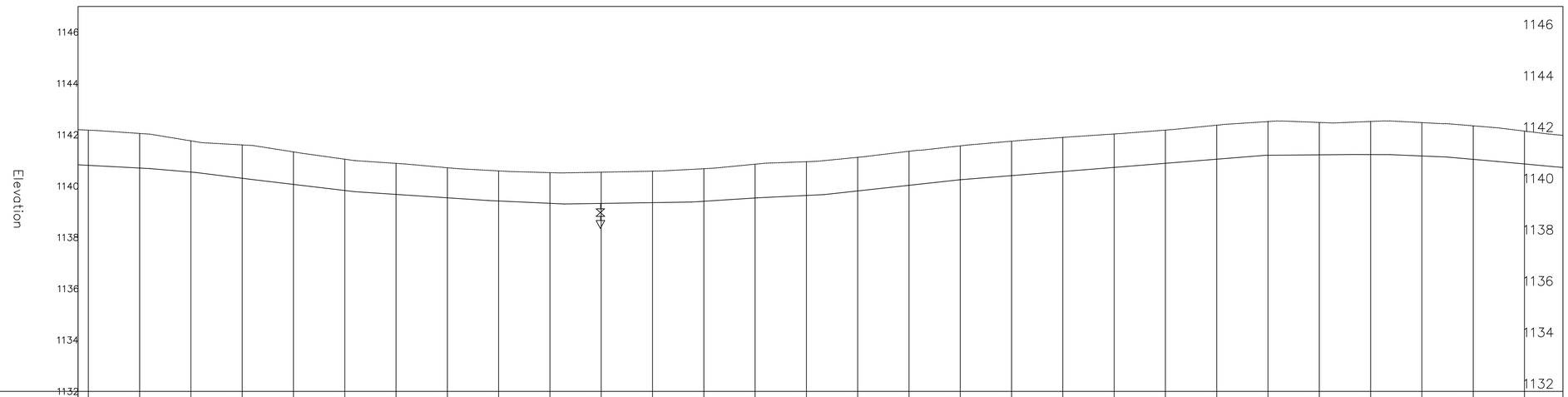
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KWA MWANGE TO KU DISTRIBUTION PIPELINE PROFILE DN 160mm

Stage:	FINAL DETAILED DESIGN
Date:	NOVEMBER 2021
Drawing No.	TCE-KDP-KMKU-004
Scale:	VERT-1:200 HOR-1:2000
Sheet No.	4 of 14
Index No.	



KwaMwange to KU Alignment PROFILE



CHAINAGES	ORIGINAL GROUND LEVEL (m.a.s.l)	PIPELINE INVERT LEVEL (m.a.s.l)	TRENCH DEPTH (m)
2+320	1142.18	1140.81	1.37
2+340	1142.05	1140.70	1.35
2+360	1141.76	1140.55	1.21
2+380	1141.60	1140.31	1.30
2+400	1141.33	1140.07	1.27
2+420	1141.05	1139.83	1.22
2+440	1140.89	1139.68	1.21
2+460	1140.72	1139.55	1.17
2+480	1140.59	1139.42	1.17
2+500	1140.52	1139.33	1.20
2+520	1140.54	1139.33	1.22
2+540	1140.58	1139.36	1.23
2+560	1140.68	1139.41	1.27
2+580	1140.85	1139.54	1.32
2+600	1140.95	1139.64	1.32
2+620	1141.12	1139.81	1.31
2+640	1141.36	1140.03	1.33
2+660	1141.57	1140.25	1.32
2+680	1141.75	1140.41	1.34
2+700	1141.90	1140.57	1.33
2+720	1142.03	1140.73	1.30
2+740	1142.18	1140.89	1.29
2+760	1142.37	1141.05	1.32
2+780	1142.52	1141.20	1.31
2+800	1142.48	1141.22	1.26
2+820	1142.52	1141.23	1.29
2+840	1142.47	1141.17	1.30
2+860	1142.35	1141.04	1.31
2+880	1142.14	1140.86	1.28
		1140.73	1.25

PIPE DATA		
	PIPE DIAMETER AND MATERIAL: HDPE DN 160mm	GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH-OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

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Project Manager:

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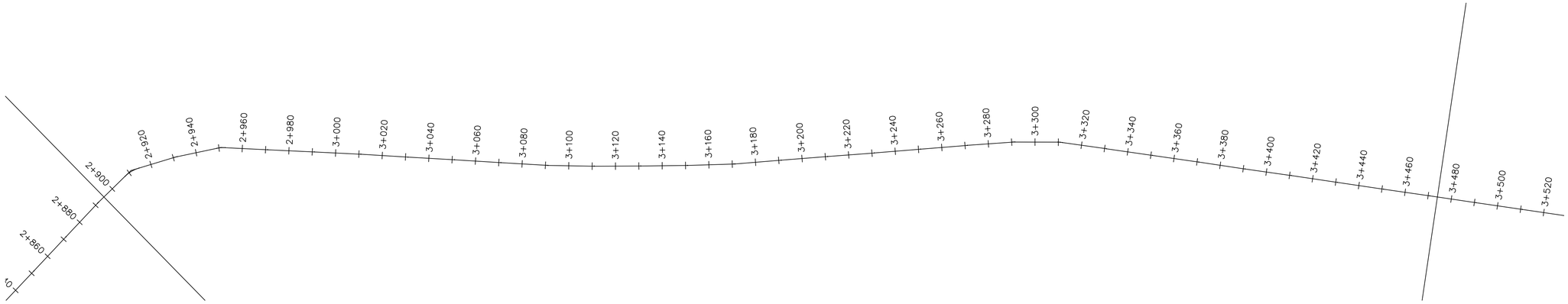
Designed:	D. Liambila
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

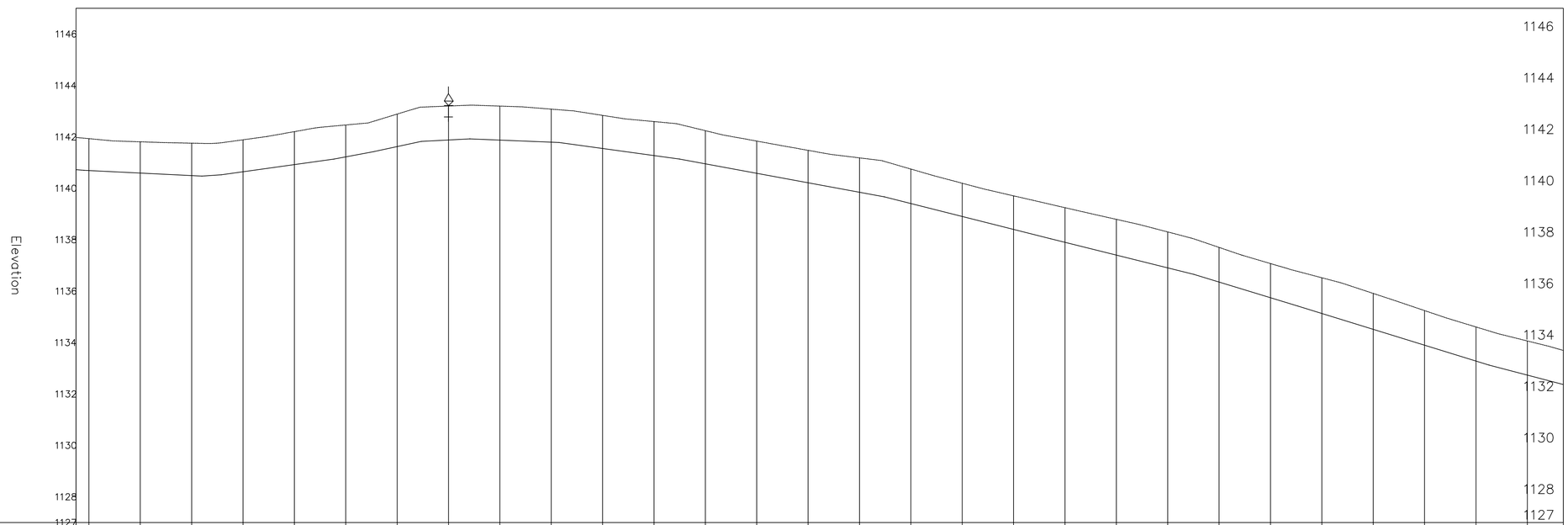
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KWA MWANGE TO KU DISTRIBUTION PIPELINE PROFILE DN 160mm

Stage:	FINAL DETAILED DESIGN
Date:	NOVEMBER 2021
Drawing No.	TCE-KDP-KMKU-005
Scale:	VERT-1:200 HOR-1:2000
Sheet No.	5 of 14
Index No.	



KwaMwange to KU Alignment PROFILE



CHAINAGES	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
ORIGINAL GROUND LEVEL (m.a.s.l)	1141.98	1141.81	1141.75	1141.88	1142.20	1142.46	1142.89	1143.20	1143.20	1143.08	1142.83	1142.59	1142.24	1141.84	1141.48	1141.18	1140.75	1140.20	1139.71	1139.25	1138.79	1138.30	1137.70	1137.07	1136.52	1135.91	1135.24	1134.61	1134.06
PIPELINE INVERT LEVEL (m.a.s.l)	1140.73	1140.59	1140.49	1140.64	1140.92	1141.22	1141.62	1141.88	1141.87	1141.79	1141.55	1141.27	1140.95	1140.58	1140.21	1139.85	1139.41	1138.90	1138.40	1137.90	1137.40	1136.90	1136.35	1135.74	1135.13	1134.51	1133.90	1133.28	1132.73
TRENCH DEPTH (m)	1.25	1.22	1.26	1.24	1.28	1.24	1.26	1.32	1.32	1.28	1.29	1.32	1.29	1.25	1.26	1.34	1.34	1.29	1.31	1.35	1.39	1.40	1.35	1.33	1.39	1.40	1.35	1.33	1.33
PIPE DATA	PIPE DIAMETER AND MATERIAL: HDPE DN 160mm														GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD														

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH-OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

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Project Manager:

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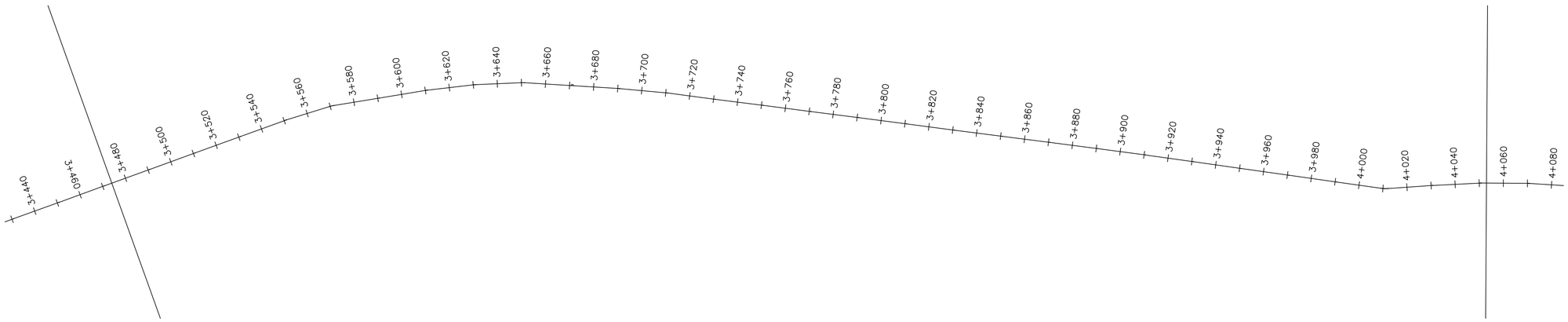
email: info@tanathi.go.ke

Designed:	D. Liambila
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

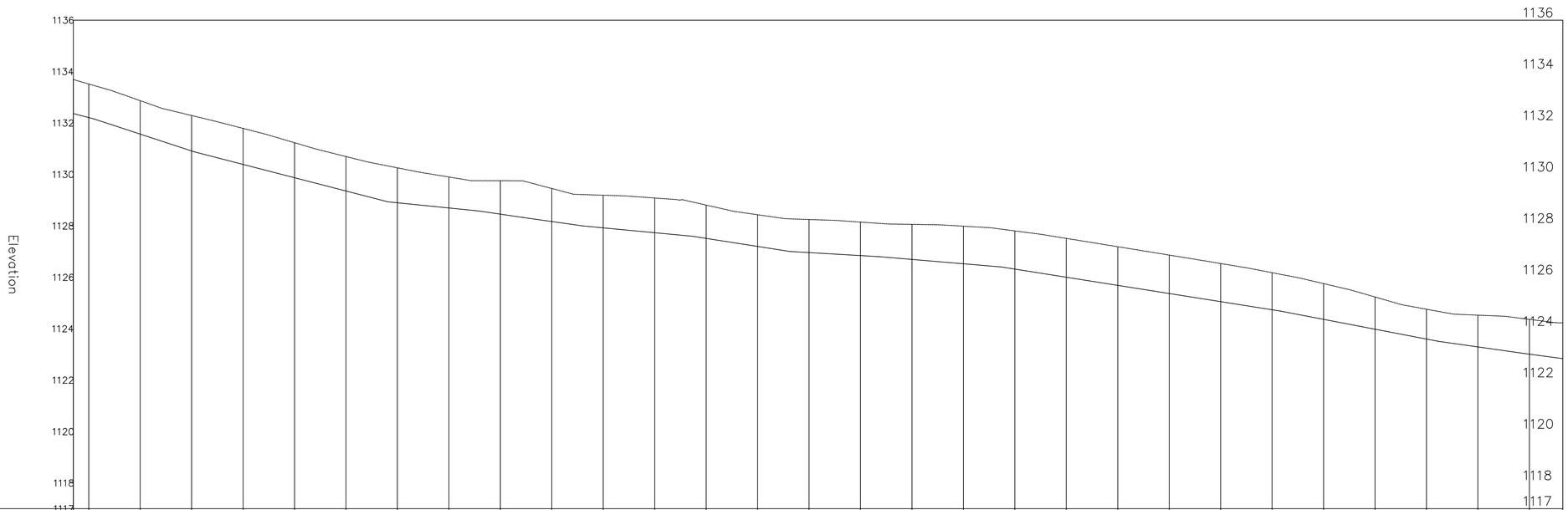
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KWA MWANGE TO KU DISTRIBUTION PIPELINE PROFILE DN 160mm

Stage:	FINAL DETAILED DESIGN
Date:	NOVEMBER 2021
Drawing No.	TCE-KDP-KMKU-006
Scale:	VERT-1:200 HOR-1:2000
Sheet No.	6 of 14
Index No.	



KwaMwange to KU Alignment PROFILE



CHAINAGES	ORIGINAL GROUND LEVEL (m.a.s.l)	PIPELINE INVERT LEVEL (m.a.s.l)	TRENCH DEPTH (m)
3+480	1133.69	1132.37	1.32
3+500	1133.52	1132.21	1.31
3+520	1132.87	1131.57	1.30
3+540	1132.29	1130.92	1.38
3+560	1131.79	1130.39	1.40
3+580	1131.24	1129.87	1.36
3+600	1130.70	1129.36	1.34
3+620	1130.26	1128.90	1.36
3+640	1129.90	1128.70	1.21
3+660	1129.76	1128.46	1.30
3+680	1129.45	1128.17	1.28
3+700	1129.19	1127.92	1.27
3+720	1129.08	1127.73	1.35
3+740	1128.81	1127.51	1.29
3+760	1128.43	1127.20	1.23
3+780	1128.25	1126.96	1.29
3+800	1128.15	1126.84	1.30
3+820	1128.06	1126.69	1.36
3+840	1127.99	1126.53	1.46
3+860	1127.80	1126.32	1.49
3+880	1127.51	1126.00	1.51
3+900	1127.19	1125.69	1.50
3+920	1126.86	1125.37	1.49
3+940	1126.54	1125.05	1.48
3+960	1126.18	1124.74	1.44
3+980	1125.76	1124.37	1.39
4+000	1125.23	1123.98	1.25
4+020	1124.76	1123.60	1.16
4+040	1124.53	1123.29	1.23
4+060	1124.36	1123.01	1.35
4+080	1124.23	1122.84	1.39

PIPE DATA: PIPE DIAMETER AND MATERIAL: HDPE DN 160mm

GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH-OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

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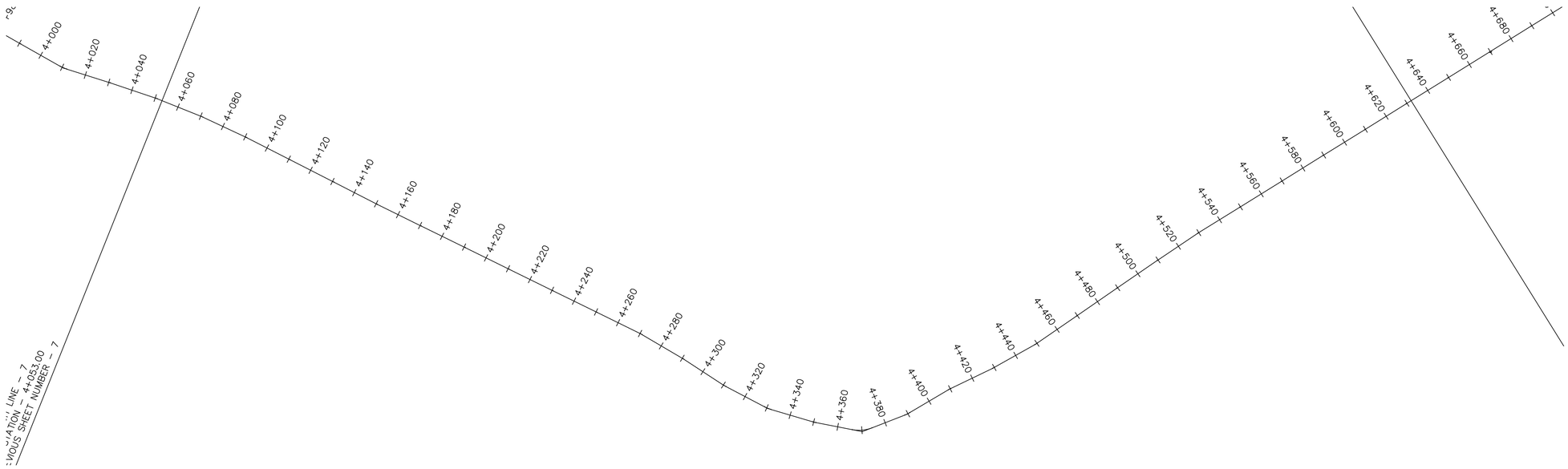
Approved:	B. Kim

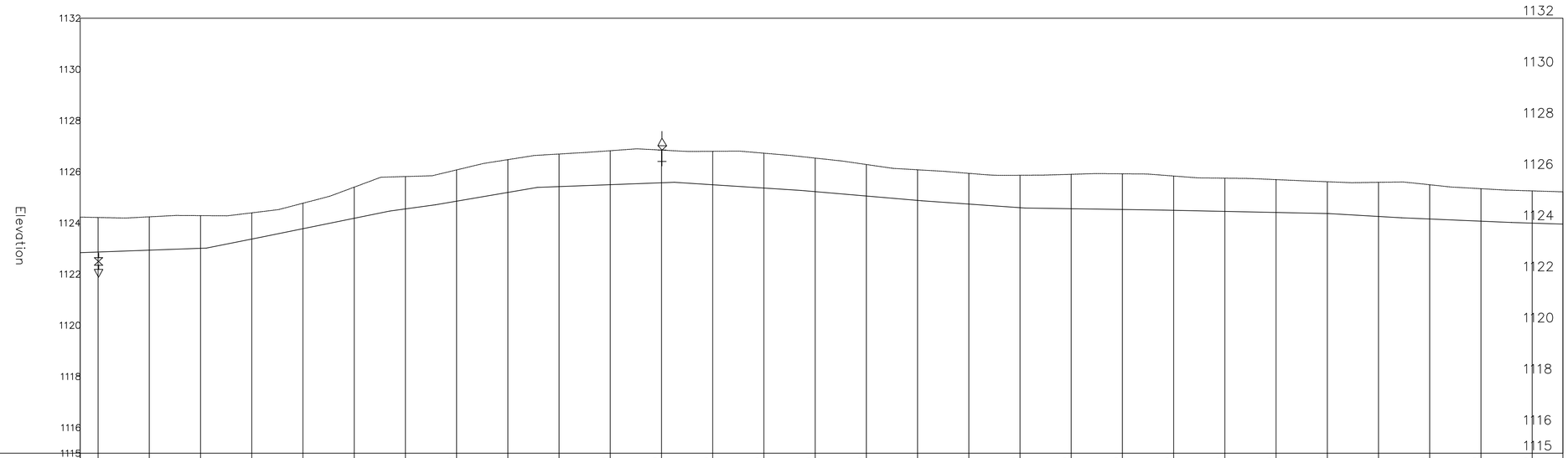
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KWA MWANGE TO KU DISTRIBUTION PIPELINE PROFILE DN 160mm

Stage:	FINAL DETAILED DESIGN
Date:	NOVEMBER 2021
Drawing No.	TCE-KDP-KMKU-007
Scale:	VERT-1:200 HOR-1:2000
Sheet No.	7 of 14
Index No.	



KwaMwange to KU Alignment PROFILE



CHAINAGES	ORIGINAL GROUND LEVEL (m.a.s.l)	PIPELINE INVERT LEVEL (m.a.s.l)	TRENCH DEPTH (m)
4+060	1124.21	1122.86	1.35
4+080	1124.24	1122.93	1.30
4+100	1124.29	1123.01	1.28
4+120	1124.39	1123.37	1.03
4+140	1124.77	1123.77	1.00
4+160	1125.40	1124.18	1.22
4+180	1125.81	1124.55	1.27
4+200	1126.07	1124.85	1.22
4+220	1126.47	1125.19	1.28
4+240	1126.69	1125.42	1.27
4+260	1126.82	1125.49	1.33
4+280	1126.85	1125.57	1.28
4+300	1126.80	1125.49	1.31
4+320	1126.73	1125.36	1.36
4+340	1126.53	1125.22	1.31
4+360	1126.28	1125.05	1.23
4+380	1126.08	1124.88	1.20
4+400	1125.94	1124.74	1.20
4+420	1125.86	1124.59	1.27
4+440	1125.90	1124.55	1.35
4+460	1125.92	1124.52	1.39
4+480	1125.83	1124.49	1.34
4+500	1125.75	1124.45	1.30
4+520	1125.69	1124.41	1.28
4+540	1125.61	1124.37	1.24
4+560	1125.59	1124.25	1.33
4+580	1125.49	1124.15	1.34
4+600	1125.34	1124.07	1.27
4+620	1125.25	1123.99	1.26
	1125.22	1123.95	1.26

PIPE DATA: PIPE DIAMETER AND MATERIAL: HDPE DN 160mm

GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH-OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

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Employer:

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Project Manager:

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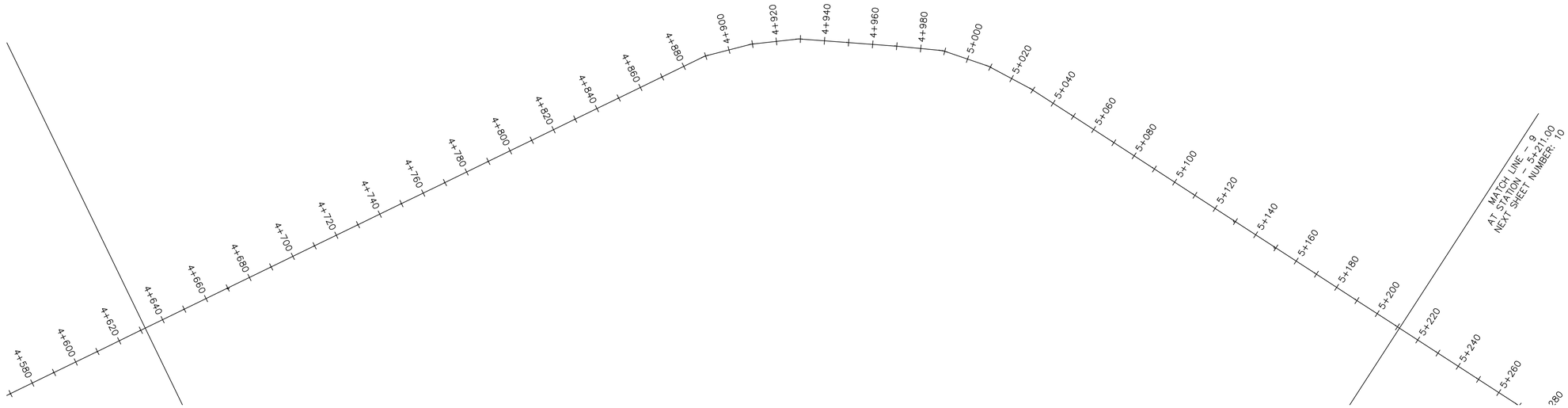
Along Kalawa Road, Kitui-Kenya
Tel: +254 712351104
email: info@tanathi.go.ke

Designed:	D. Liambila
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

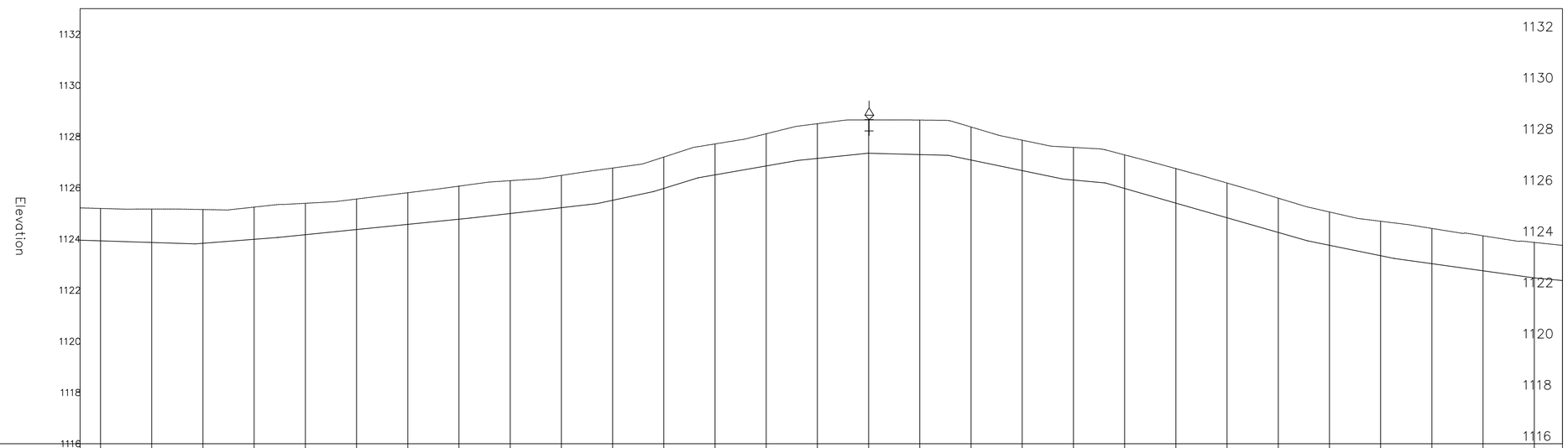
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KWA MWANGE TO KU DISTRIBUTION PIPELINE PROFILE DN 160mm

Stage:	FINAL DETAILED DESIGN
Date:	NOVEMBER 2021
Drawing No.	TCE-KDP-KMKU-008
Scale:	VERT-1:200 HOR-1:2000
Sheet No.	8 of 14
Index No.	



KwaMwange to KU Alignment PROFILE



CHAINAGES	4+640	4+660	4+680	4+700	4+720	4+740	4+760	4+780	4+800	4+820	4+840	4+860	4+880	4+900	4+920	4+940	4+960	4+980	5+000	5+020	5+040	5+060	5+080	5+100	5+120	5+140	5+160	5+180	5+200
ORIGINAL GROUND LEVEL (m.a.s.l)	1125.19	1125.17	1125.15	1125.25	1125.40	1125.56	1125.81	1126.06	1126.28	1126.48	1126.77	1127.20	1127.71	1128.11	1128.51	1128.65	1128.65	1128.38	1127.86	1127.58	1127.29	1126.75	1126.19	1125.60	1125.06	1124.69	1124.41	1124.12	1123.87
PIPELINE INVERT LEVEL (m.a.s.l)	1123.93	1123.86	1123.83	1123.99	1124.17	1124.37	1124.57	1124.77	1124.99	1125.22	1125.51	1125.98	1126.50	1126.85	1127.15	1127.35	1127.30	1127.09	1126.67	1126.30	1125.97	1125.40	1124.83	1124.26	1123.75	1123.35	1123.04	1122.76	1122.48
TRENCH DEPTH (m)	1.27	1.31	1.32	1.26	1.23	1.19	1.24	1.29	1.28	1.26	1.26	1.23	1.21	1.26	1.36	1.30	1.35	1.29	1.19	1.27	1.31	1.35	1.36	1.34	1.30	1.34	1.38	1.37	1.39
PIPE DATA	PIPE DIAMETER AND MATERIAL: HDPE DN 160mm														GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD														

CHAINAGES	5+220	5+240	5+260
ORIGINAL GROUND LEVEL (m.a.s.l)	1123.75		
PIPELINE INVERT LEVEL (m.a.s.l)	1122.38		
TRENCH DEPTH (m)	1.37		

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH-OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

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Project Manager:

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Along Kalawa Road, Kitui-Kenya
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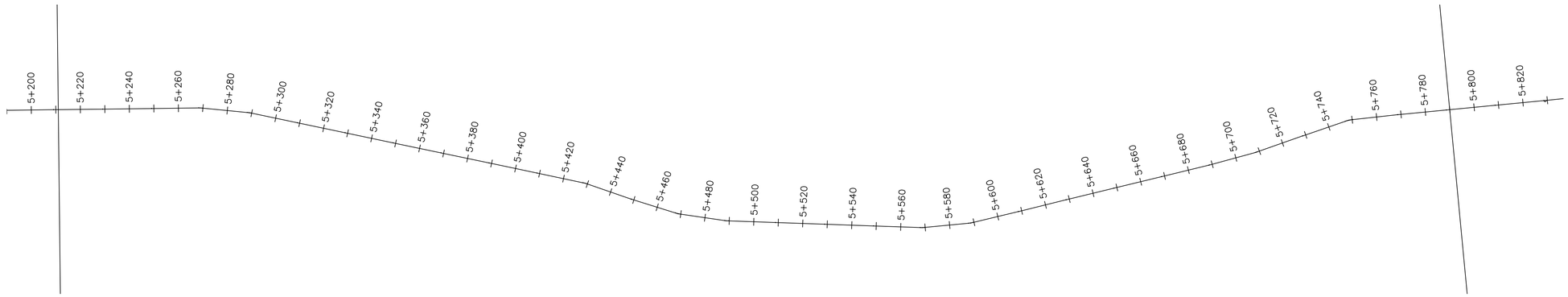
email: info@tanathi.go.ke

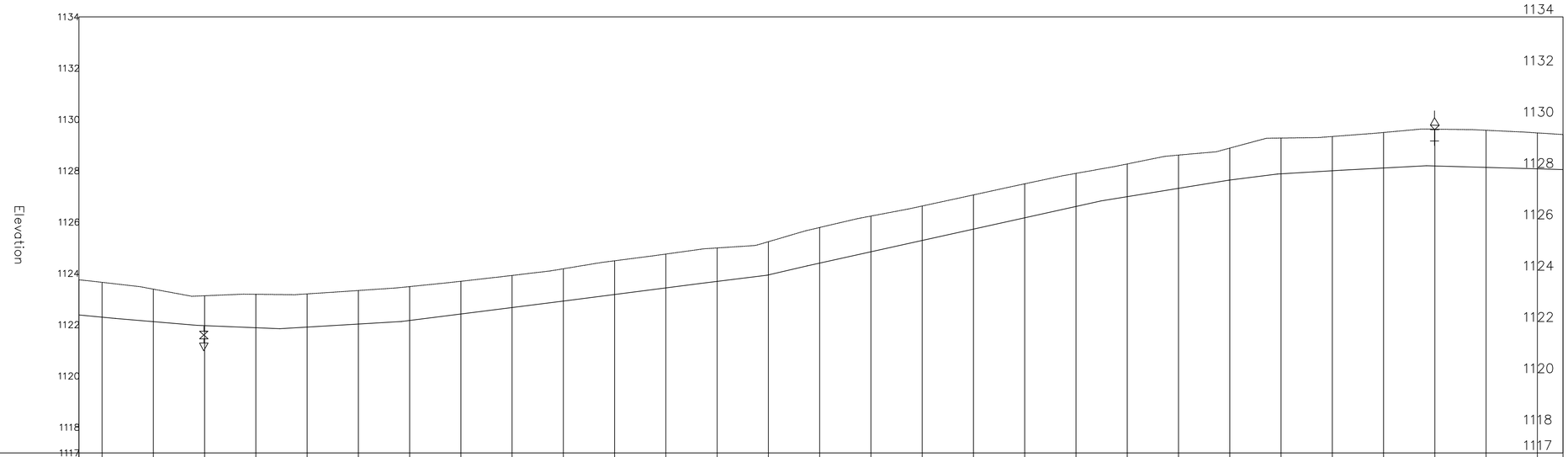
Designed:	D. Liambila
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

Project:	CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA
Drawing Title:	KWA MWANGE TO KU DISTRIBUTION PIPELINE PROFILE DN 160mm

Stage:	FINAL DETAILED DESIGN
Date:	NOVEMBER 2021
Drawing No.	TCE-KDP-KMKU-009
Scale:	VERT-1:200 HOR-1:2000
Sheet No.	9 of 14
Index No.	



KwaMwange to KU Alignment PROFILE



CHAINAGES		5+220	5+240	5+260	5+280	5+300	5+320	5+340	5+360	5+380	5+400	5+420	5+440	5+460	5+480	5+500	5+520	5+540	5+560	5+580	5+600	5+620	5+640	5+660	5+680	5+700	5+720	5+740	5+760	5+780	
ORIGINAL GROUND LEVEL (m.a.s.l)	1123.75	1123.65	1123.39	1123.13	1123.18	1123.20	1123.33	1123.48	1123.69	1123.92	1124.18	1124.49	1124.75	1124.99	1125.24	1125.79	1126.23	1126.63	1127.06	1127.49	1127.90	1128.27	1128.61	1128.88	1129.28	1129.34	1129.49	1129.62	1129.58	1129.48	1129.41
PIPELINE INVERT LEVEL (m.a.s.l)	1122.38	1122.29	1122.12	1121.96	1121.88	1121.90	1122.02	1122.16	1122.42	1122.67	1122.92	1123.18	1123.43	1123.69	1123.94	1124.40	1124.84	1125.28	1125.73	1126.17	1126.61	1126.99	1127.31	1127.64	1127.88	1128.00	1128.11	1128.19	1128.13	1128.08	1128.05
TRENCH DEPTH (m)	1.37	1.36	1.27	1.17	1.31	1.30	1.31	1.32	1.28	1.25	1.26	1.31	1.32	1.30	1.29	1.39	1.39	1.34	1.33	1.32	1.29	1.27	1.30	1.25	1.40	1.34	1.39	1.44	1.45	1.40	1.37
PIPE DATA		PIPE DIAMETER AND MATERIAL: HDPE DN 160mm														GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD															

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH-OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

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Employer:

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Project Manager:

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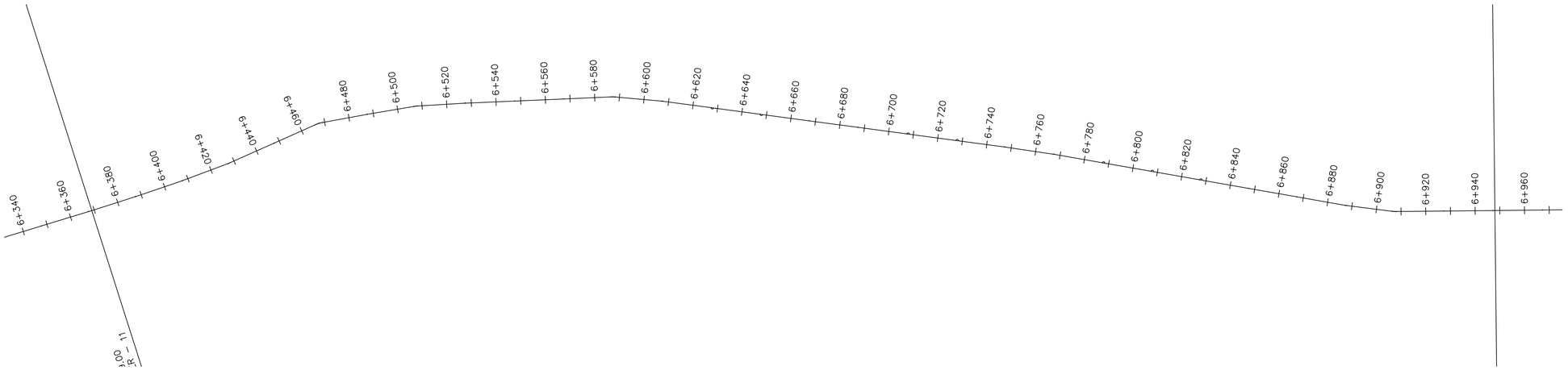
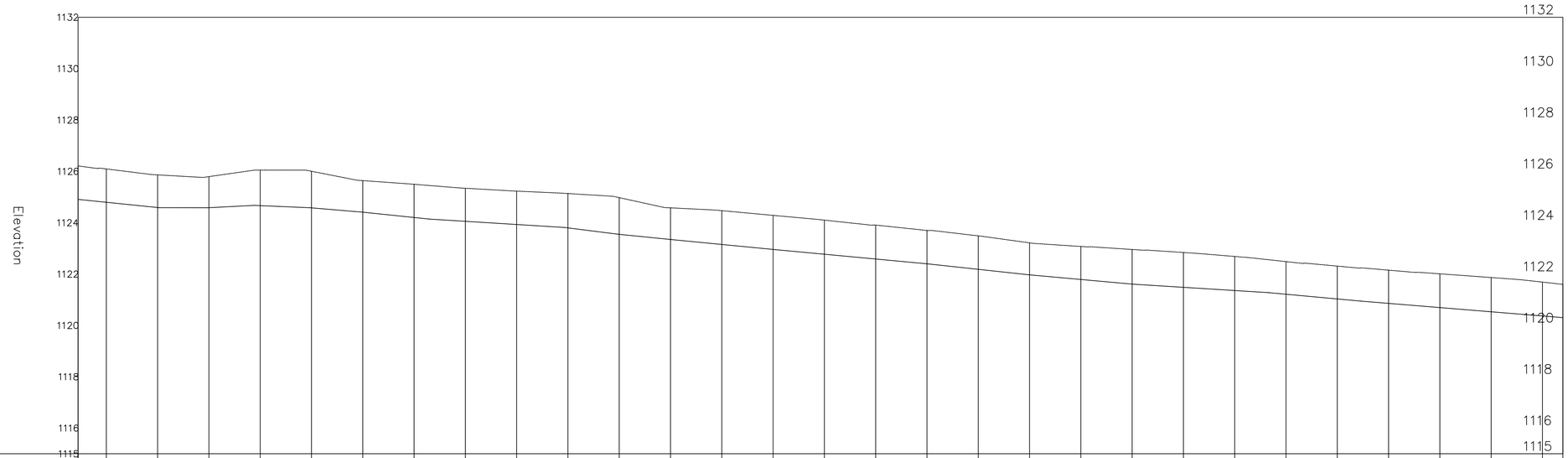
Designed:	D. Liambila
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

Project:	CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA
Drawing Title:	KWA MWANGE TO KU DISTRIBUTION PIPELINE PROFILE DN 160mm

Stage:	FINAL DETAILED DESIGN
Date:	NOVEMBER 2021
Drawing No.	TCE-KDP-KMKU-10
Scale:	VERT-1:200 HOR-1:2000
Sheet No.:	10 of 14
Index No.:	



KwaMwange to KU Alignment PROFILE



CHAINAGES		6+380	6+400	6+420	6+440	6+460	6+480	6+500	6+520	6+540	6+560	6+580	6+600	6+620	6+640	6+660	6+680	6+700	6+720	6+740	6+760	6+780	6+800	6+820	6+840	6+860	6+880	6+900	6+920	6+940	
ORIGINAL GROUND LEVEL (m.a.s.l)	1126.21	1126.09	1125.86	1125.79	1126.05	1126.00	1125.64	1125.50	1125.34	1125.23	1125.14	1124.98	1124.58	1124.47	1124.29	1124.10	1123.91	1123.70	1123.49	1123.22	1123.07	1122.96	1122.84	1122.69	1122.48	1122.31	1122.15	1122.01	1121.86	1121.69	1121.60
PIPELINE INVERT LEVEL (m.a.s.l)	1124.91	1124.79	1124.59	1124.59	1124.67	1124.58	1124.41	1124.20	1124.05	1123.93	1123.80	1123.55	1123.35	1123.15	1122.96	1122.77	1122.58	1122.40	1122.18	1121.97	1121.79	1121.61	1121.48	1121.36	1121.21	1121.03	1120.86	1120.70	1120.53	1120.37	1120.30
TRENCH DEPTH (m)	1.31	1.30	1.27	1.21	1.38	1.42	1.23	1.29	1.29	1.30	1.34	1.43	1.23	1.32	1.33	1.33	1.32	1.30	1.30	1.25	1.29	1.35	1.36	1.33	1.27	1.28	1.29	1.31	1.33	1.32	1.29
PIPE DATA		PIPE DIAMETER AND MATERIAL: HDPE DN 160mm													GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD																

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH-OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

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Project Manager:
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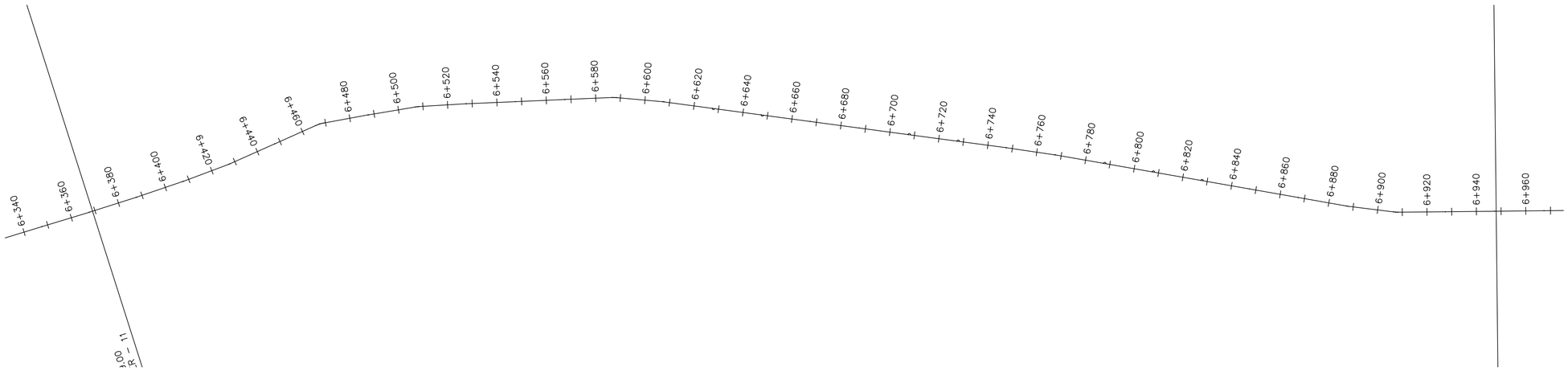
Designed:	D. Liambila
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

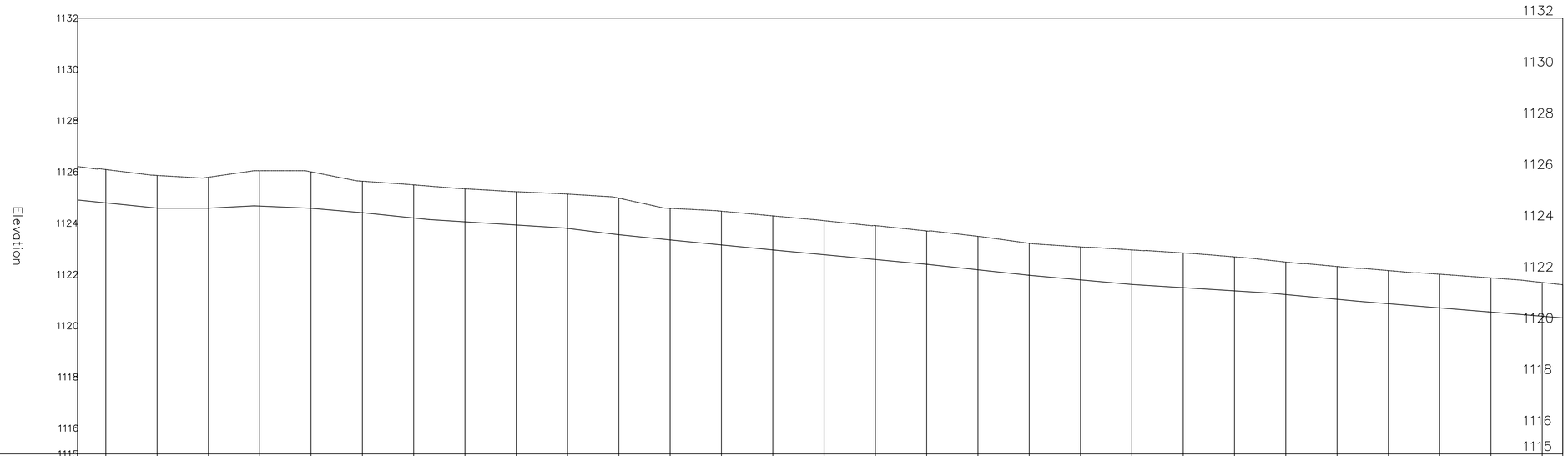
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KWA MWANGE TO KU DISTRIBUTION PIPELINE PROFILE DN 160mm

Stage:	FINAL DETAILED DESIGN
Date:	NOVEMBER 2021
Drawing No.	TCE-KDP-KMKU-12
Scale:	VERT-1:200 HOR-1:2000
Sheet No.	12 of 14
Index No.	



KwaMwange to KU Alignment PROFILE



CHAINAGES		6+380	6+400	6+420	6+440	6+460	6+480	6+500	6+520	6+540	6+560	6+580	6+600	6+620	6+640	6+660	6+680	6+700	6+720	6+740	6+760	6+780	6+800	6+820	6+840	6+860	6+880	6+900	6+920	6+940	
ORIGINAL GROUND LEVEL (m.a.s.l)	1126.21	1126.09	1125.86	1125.79	1126.05	1126.00	1125.64	1125.50	1125.34	1125.23	1125.14	1124.98	1124.58	1124.47	1124.29	1124.10	1123.91	1123.70	1123.49	1123.22	1123.07	1122.96	1122.84	1122.69	1122.48	1122.31	1122.15	1122.01	1121.86	1121.69	1121.60
PIPELINE INVERT LEVEL (m.a.s.l)	1124.91	1124.79	1124.59	1124.59	1124.67	1124.58	1124.41	1124.20	1124.05	1123.93	1123.80	1123.55	1123.35	1123.15	1122.96	1122.77	1122.58	1122.40	1122.18	1121.97	1121.79	1121.61	1121.48	1121.36	1121.21	1121.03	1120.86	1120.70	1120.53	1120.37	1120.30
TRENCH DEPTH (m)	1.31	1.30	1.27	1.21	1.38	1.42	1.23	1.29	1.29	1.30	1.34	1.43	1.23	1.32	1.33	1.33	1.32	1.30	1.30	1.25	1.29	1.35	1.36	1.33	1.27	1.28	1.29	1.31	1.33	1.32	1.29
PIPE DATA		PIPE DIAMETER AND MATERIAL: HDPE DN 160mm													GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD																

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH-OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

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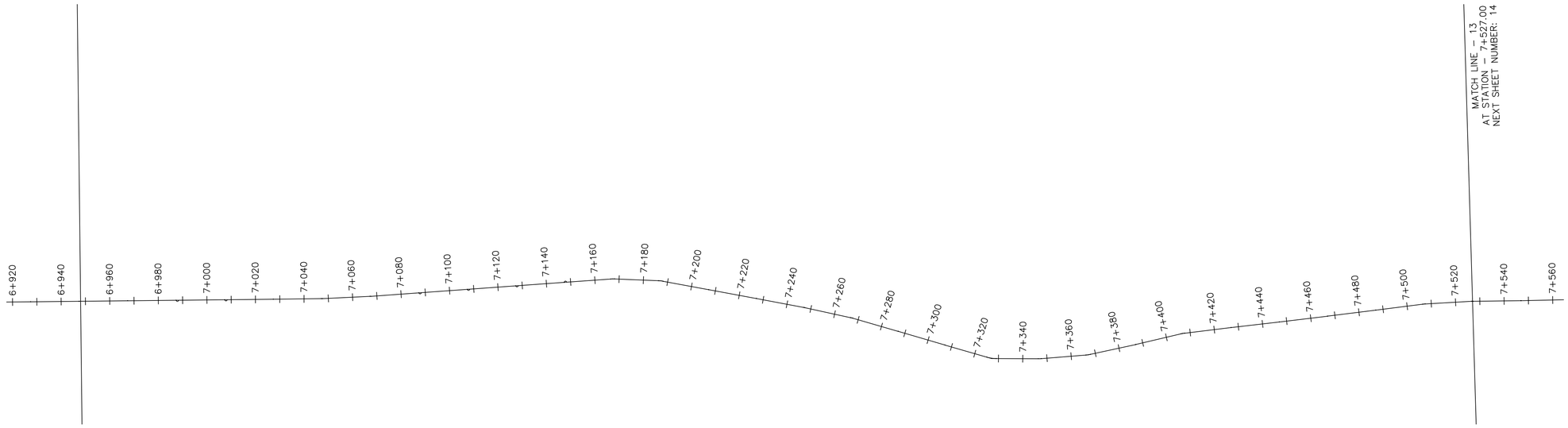
Designed:	D. Liambila
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

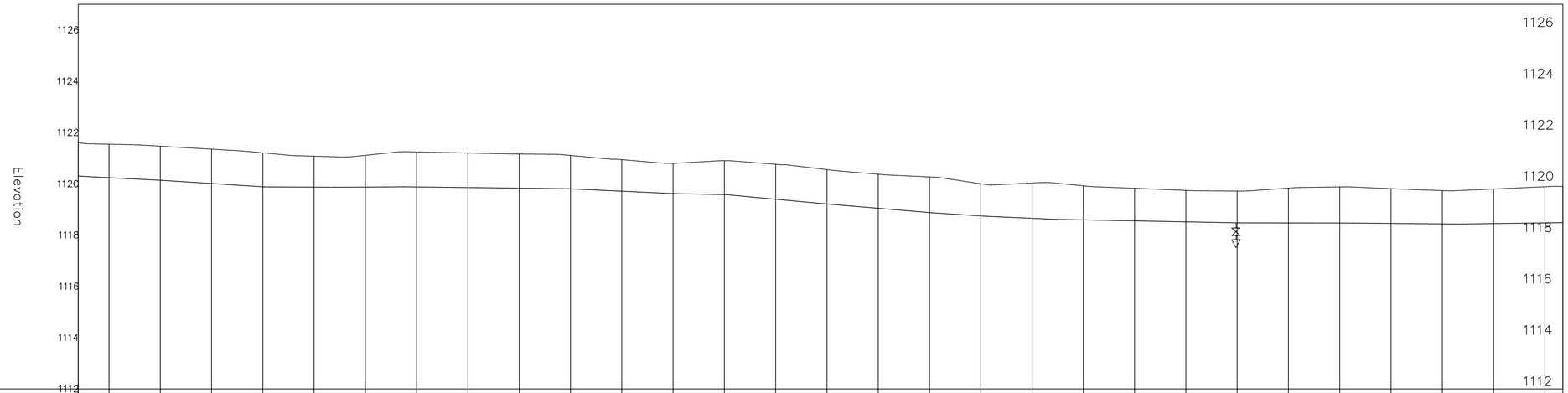
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KWA MWANGE TO KU DISTRIBUTION PIPELINE PROFILE DN 160mm

Stage:	FINAL DETAILED DESIGN
Date:	NOVEMBER 2021
Drawing No.	TCE–KDP–KMKU–12
Scale:	VERT–1:200 HOR–1:2000
Sheet No.	12 of 14
Index No.	



KwaMwange to KU Alignment PROFILE



CHAINAGES		6+960	6+980	7+000	7+020	7+040	7+060	7+080	7+100	7+120	7+140	7+160	7+180	7+200	7+220	7+240	7+260	7+280	7+300	7+320	7+340	7+360	7+380	7+400	7+420	7+440	7+460	7+480	7+500	7+520	
ORIGINAL GROUND LEVEL (m.a.s.l)	1121.60	1121.54	1121.46	1121.35	1121.20	1121.07	1121.11	1121.24	1121.20	1121.16	1121.10	1120.94	1120.79	1120.90	1120.76	1120.55	1120.37	1120.27	1120.00	1118.03	1119.92	1119.82	1119.74	1119.71	1119.83	1119.87	1119.81	1119.73	1119.79	1119.88	1119.89
PIPELINE INVERT LEVEL (m.a.s.l)	1120.30	1120.24	1120.14	1120.01	1119.88	1119.87	1119.87	1119.87	1119.85	1119.83	1119.80	1119.71	1119.62	1119.57	1119.39	1119.21	1119.04	1118.87	1118.74	1118.65	1118.59	1118.55	1118.51	1118.48	1118.47	1118.47	1118.45	1118.43	1118.45	1118.47	1118.48
TRENCH DEPTH (m)	1.29	1.30	1.33	1.34	1.32	1.20	1.24	1.36	1.35	1.33	1.30	1.23	1.18	1.32	1.36	1.34	1.33	1.39	1.25	1.38	1.33	1.27	1.23	1.24	1.36	1.41	1.35	1.30	1.35	1.41	1.41
PIPE DATA		PIPE DIAMETER AND MATERIAL: HDPE DN 160mm													GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD																

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH-OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

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Employer:

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Project Manager:

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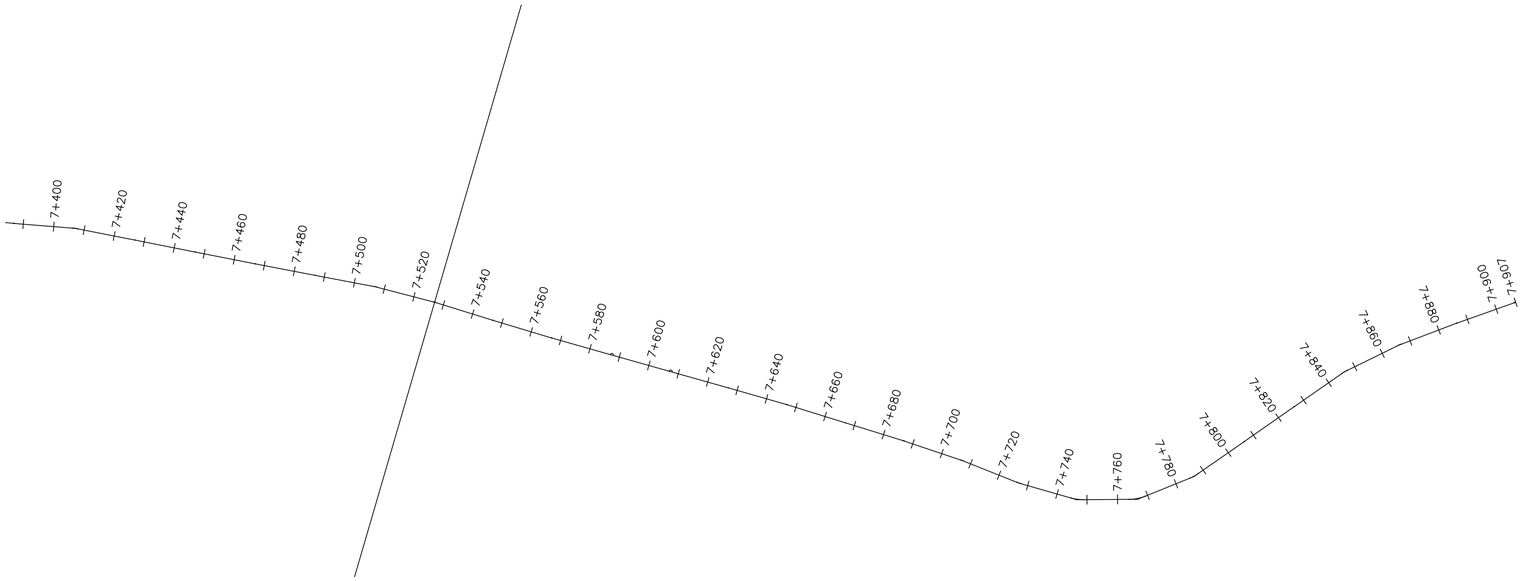
Designed:	D. Liambila
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

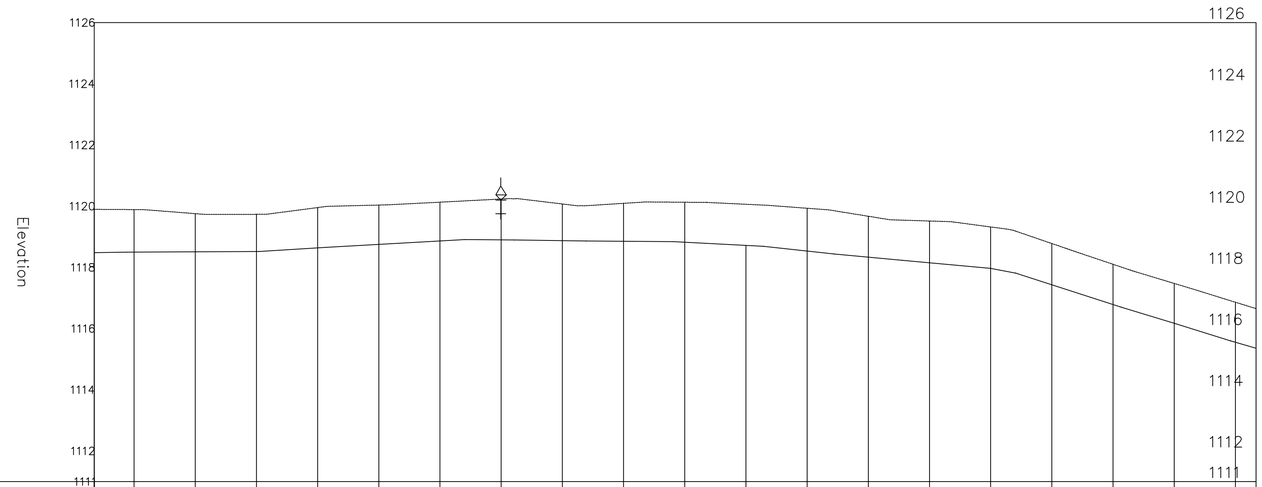
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KWA MWANGE TO KU DISTRIBUTION PIPELINE PROFILE DN 160mm

Stage:	FINAL DETAILED DESIGN
Date:	NOVEMBER 2021
Drawing No.	TCE-KDP-KMKU-13
Scale:	VERT-1:200 HOR-1:2000
Sheet No.	13 of 14
Index No.	



KwaMwange to KU Alignment PROFILE



CHAINAGES		7+540	7+560	7+580	7+600	7+620	7+640	7+660	7+680	7+700	7+720	7+740	7+760	7+780	7+800	7+820	7+840	7+860	7+880	7+900	
ORIGINAL GROUND LEVEL (m.a.s.l)	1119.89	1119.89	1119.75	1119.73	1119.95	1120.04	1120.13	1120.23	1120.07	1120.09	1120.13	1120.06	1119.93	1119.67	1119.51	1119.32	1118.78	1118.10	1117.47	1116.86	1116.65
PIPELINE INVERT LEVEL (m.a.s.l)	1118.48	1118.50	1118.51	1118.52	1118.64	1118.75	1118.86	1118.90	1118.87	1118.85	1118.82	1118.72	1118.53	1118.33	1118.15	1117.96	1117.43	1116.79	1116.17	1115.55	1115.35
TRENCH DEPTH (m)	1.41	1.39	1.25	1.21	1.32	1.29	1.27	1.34	1.20	1.24	1.31	1.35	1.40	1.34	1.37	1.36	1.35	1.31	1.30	1.31	1.30
PIPE DATA		PIPE DIAMETER AND MATERIAL: HDPE DN 160mm									GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD										

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH-OUT (W.O)

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

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Project Manager:

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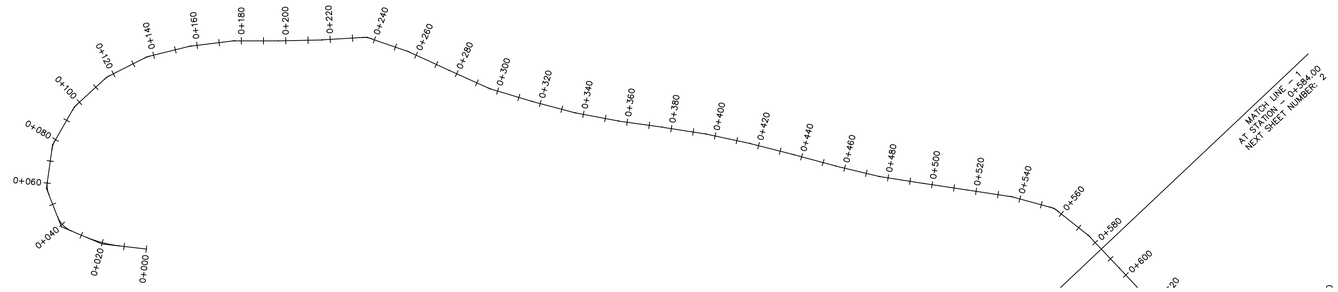
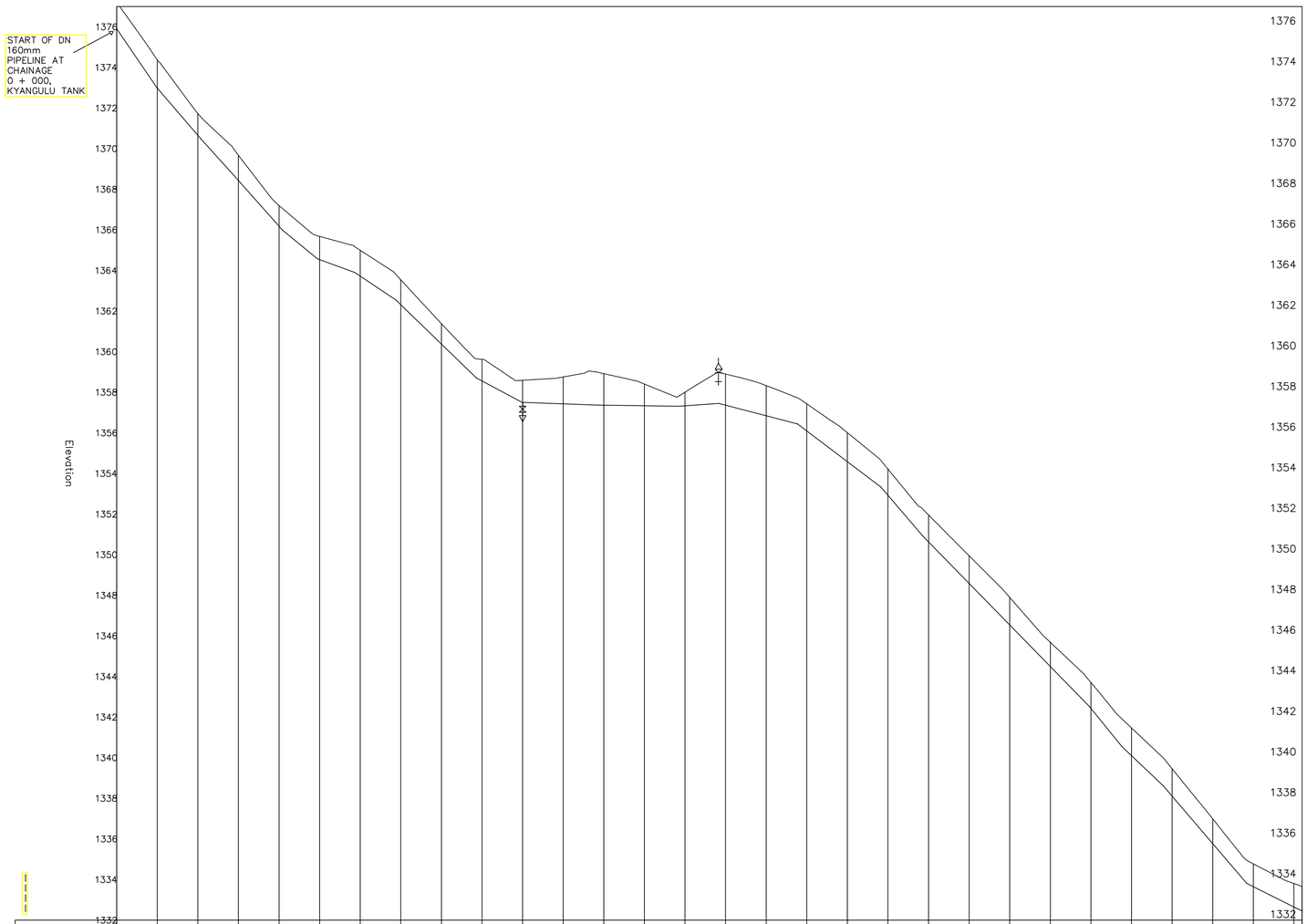
Designed:	D. Liambila
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

Project:	CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA
Drawing Title:	KWA MWANGE TO KU DISTRIBUTION PIPELINE PROFILE DN 160mm

Stage:	FINAL DETAILED DESIGN
Date:	NOVEMBER 2021
Drawing No.	TCE-KDP-KMKU-14
Scale:	VERT-1:200 HOR-1:2000
Sheet No.	14 of 14
Index No.	





CHAINAGE	ORIGINAL GROUND LEVEL (m.a.s.l)	PIPELINE INVERT LEVEL (m.a.s.l)	TRENCH DEPTH (m)
0+000		1375.89	1.30
0+020	1374.37	1372.99	1.38
0+040	1371.73	1370.66	1.08
0+060	1369.67	1368.43	1.24
0+080	1367.20	1366.18	1.02
0+100	1365.68	1364.54	1.14
0+120	1365.00	1363.72	1.27
0+140	1363.54	1362.31	1.23
0+160	1361.38	1360.38	1.00
0+180	1359.62	1358.56	1.06
0+200	1358.59	1357.50	1.09
0+220	1358.76	1357.43	1.33
0+240	1358.92	1357.37	1.55
0+260	1358.41	1357.34	1.07
0+280	1358.01	1357.34	0.67
0+300	1358.90	1357.37	1.53
0+320	1358.33	1356.85	1.48
0+340	1357.43	1356.10	1.33
0+360	1356.01	1354.59	1.43
0+380	1354.22	1352.93	1.29
0+400	1351.96	1350.63	1.33
0+420	1349.95	1348.59	1.36
0+440	1347.90	1346.54	1.36
0+460	1345.69	1344.50	1.19
0+480	1343.71	1342.44	1.27
0+500	1341.47	1340.10	1.37
0+520	1339.46	1338.11	1.35
0+540	1336.99	1335.77	1.22
0+560	1334.77	1333.65	1.12
0+580	1333.81	1332.65	1.16
0+584		1332.46	1.20

PIPE DATA: PIPE DIAMETER AND MATERIAL: HDPE DN 160mm AND 110mm

GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD

0 1000 2000

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH-OUT (W.O)

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

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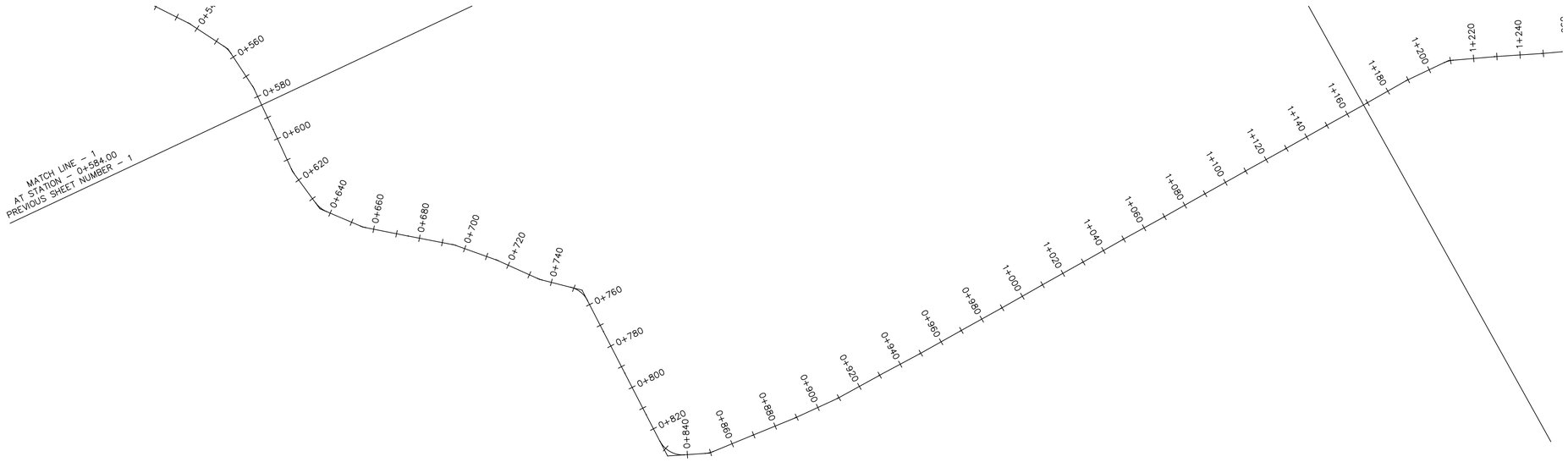
Designed:	D. Liambila
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

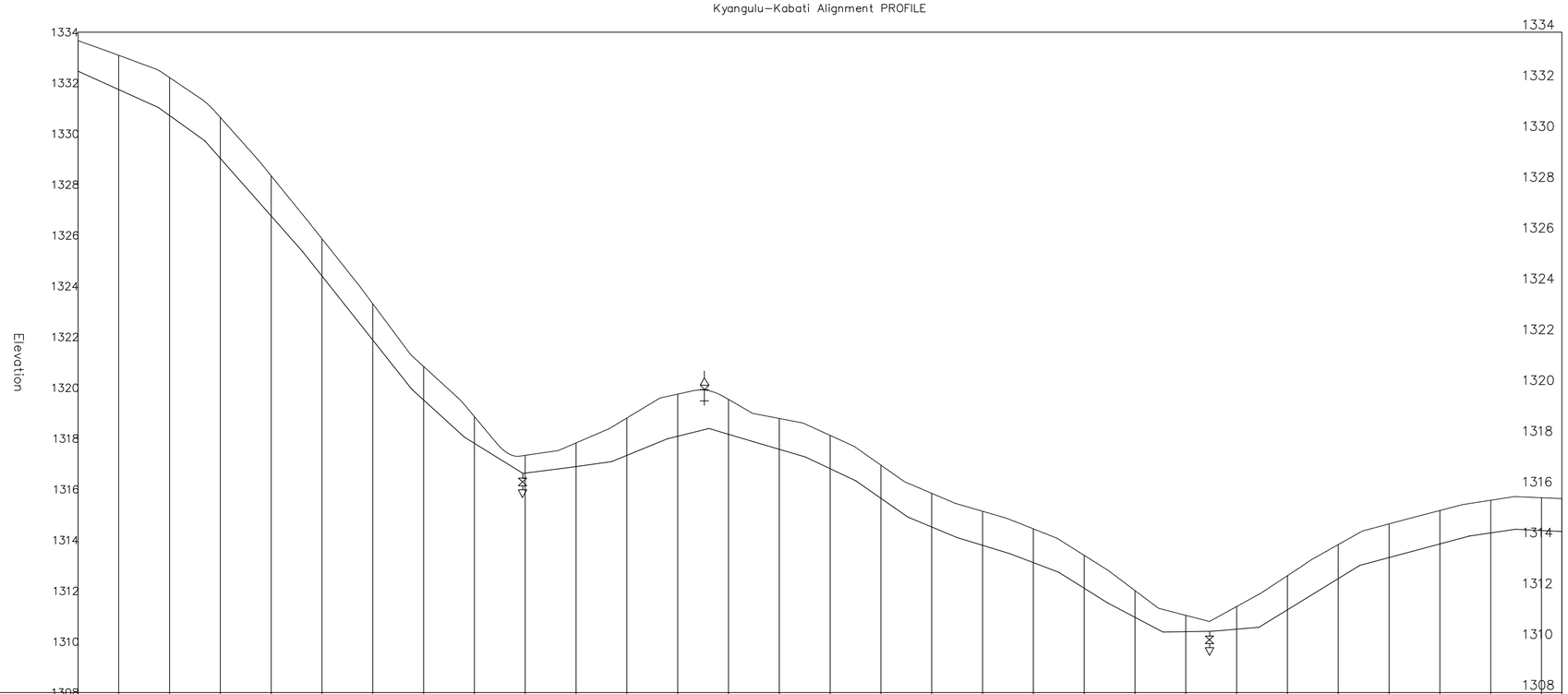
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KYANGULU TO KABATI DISTRIBUTION PIPELINE PROFILE, DN 160mm AND 110mm

Stage:	FINAL DETAILED DESIGN
Date:	DECEMBER 2021
Drawing No.	TCE-KDP-KK-001
Scale:	VERT-1:200 HOR-1:2000
Sheet No.	1 of 17
Index No.	



Kyangulu–Kabati Alignment PROFILE



CHAINAGE	0+584	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+168
ORIGINAL GROUND LEVEL (m.a.s.l)		1333.09	1332.21	1330.64	1328.35	1325.87	1323.31	1320.84	1318.86	1317.34	1317.83	1318.81	1319.75	1319.54	1318.79	1318.13	1316.95	1315.84	1315.14	1314.44	1313.40	1312.01	1311.04	1311.39	1312.60	1313.83	1314.64	1315.17	1315.57	1315.67	
PIPELINE INVERT LEVEL (m.a.s.l)	1332.46	1331.74	1330.72	1329.03	1326.76	1324.40	1321.88	1319.52	1317.81	1316.64	1316.90	1317.34	1318.09	1318.17	1317.58	1316.82	1315.65	1314.52	1313.80	1313.11	1312.11	1310.96	1310.40	1310.49	1311.26	1312.49	1313.32	1313.85	1314.29	1314.38	1314.34
TRENCH DEPTH (m)	1.20	1.35	1.49	1.61	1.58	1.47	1.43	1.32	1.05	0.70	0.93	1.47	1.66	1.37	1.21	1.31	1.30	1.32	1.34	1.33	1.29	1.05	0.64	0.89	1.34	1.34	1.33	1.32	1.29	1.29	1.30
PIPE DATA	PIPE DIAMETER AND MATERIAL: HDPE DN 160mm AND 110mm														GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD																

0 1000 2000

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH–OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

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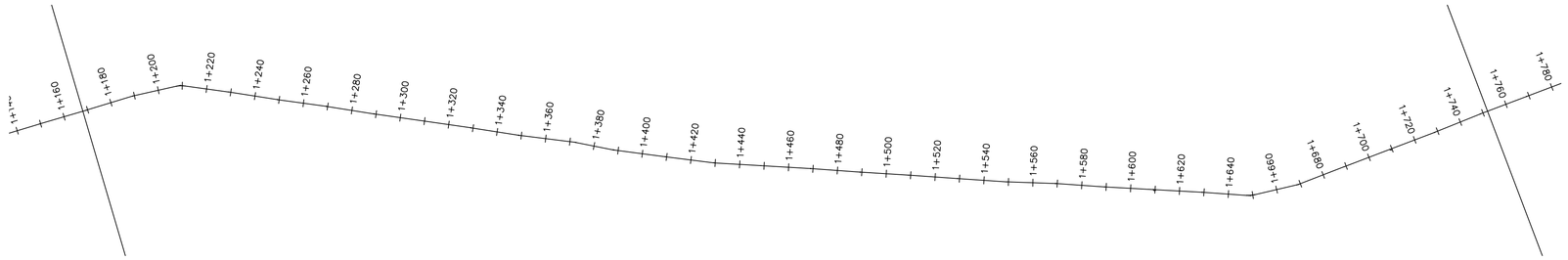
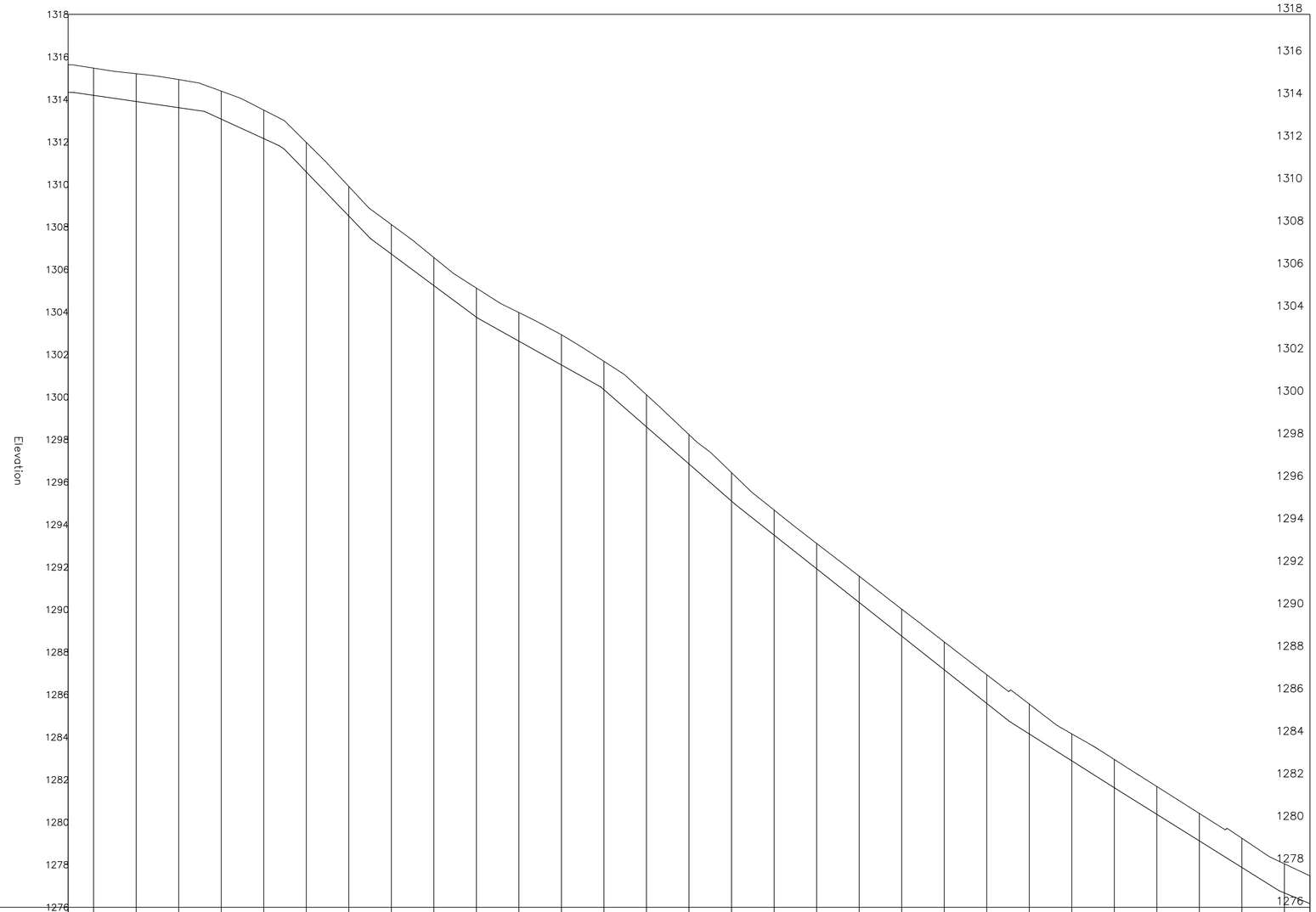
Designed:	D. Liambila
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

Project:	CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA
Drawing Title:	KYANGULU TO KABATI DISTRIBUTION PIPELINE PROFILE DN 160mm AND DN 110mm

Stage:	FINAL DETAILED DESIGN
Date:	DECEMBER 2021
Drawing No.	TCE–KDP–KK–002
Scale:	VERT–1:200 HOR–1:2000
Sheet No.	2 of 17
Index No.	



Kyangulu–Kabati Alignment PROFILE



CHAINAGE	1+168	1+180	1+200	1+220	1+240	1+260	1+280	1+300	1+320	1+340	1+360	1+380	1+400	1+420	1+440	1+460	1+480	1+500	1+520	1+540	1+560	1+580	1+600	1+620	1+640	1+660	1+680	1+700	1+720	1+740	1+752
ORIGINAL GROUND LEVEL (m.a.s.l)		1315.47	1315.21	1314.94	1314.39	1313.50	1311.98	1309.91	1308.12	1306.56	1305.13	1303.98	1302.93	1301.68	1300.11	1298.23	1296.44	1294.69	1293.12	1291.57	1290.02	1288.48	1286.94	1285.56	1284.16	1282.95	1281.68	1280.41	1279.24	1278.04	
PIPELINE INVERT LEVEL (m.a.s.l)	1314.34	1314.19	1313.90	1313.61	1313.08	1312.16	1310.60	1308.52	1306.73	1305.24	1303.76	1302.63	1301.51	1300.34	1298.60	1296.85	1295.11	1293.51	1291.92	1290.34	1288.76	1287.17	1285.59	1284.15	1282.89	1281.62	1280.37	1279.12	1277.87	1276.67	1276.17
TRENCH DEPTH (m)	1.30	1.28	1.31	1.32	1.32	1.34	1.38	1.39	1.39	1.32	1.37	1.35	1.42	1.34	1.51	1.38	1.34	1.18	1.19	1.23	1.27	1.31	1.35	1.40	1.27	1.33	1.31	1.29	1.37	1.37	1.31
PIPE DATA	PIPE DIAMETER AND MATERIAL: HDPE DN 160mm AND 110mm														GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD																

0 1000 2000

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH–OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

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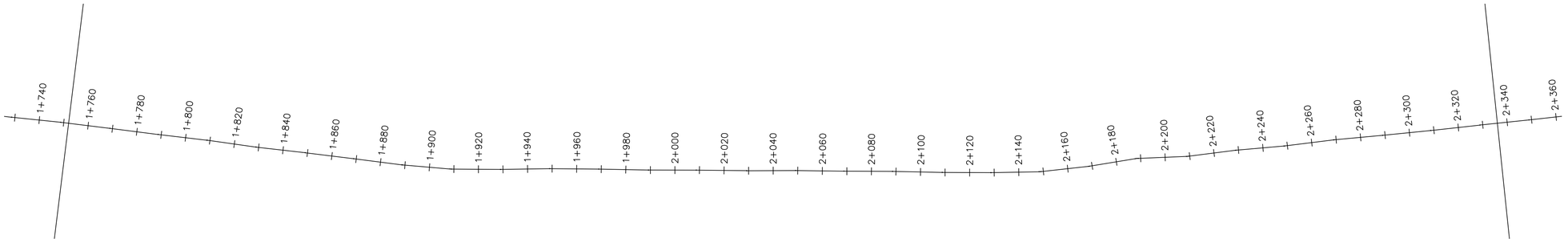
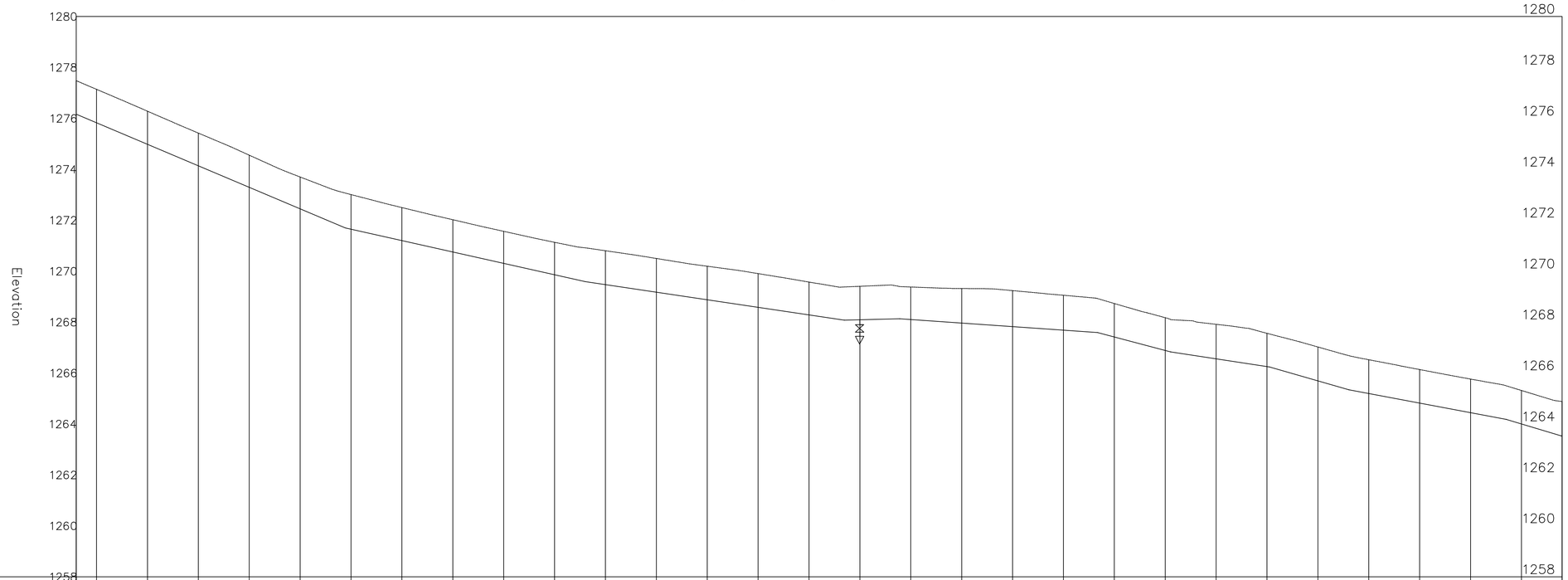
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KYANGULU TO KABATI DISTRIBUTION PIPELINE PROFILE DN 160mm AND DN 110mm

Stage:	FINAL DETAILED DESIGN
Date:	DECEMBER 2021
Drawing No.	TCE–KDP–KK–003
Scale:	VERT–1:200 HOR–1:2000
Sheet No.	3 of 17
Index No.	



Kyangulu–Kabati Alignment PROFILE



CHAINAGE	ORIGINAL GROUND LEVEL (m.a.s.l)	PIPELINE INVERT LEVEL (m.a.s.l)	TRENCH DEPTH (m)
1+752		1276.17	1.31
1+760	1277.14	1275.83	1.31
1+780	1276.28	1274.98	1.30
1+800	1275.42	1274.14	1.28
1+820	1274.56	1273.29	1.26
1+840	1273.70	1272.45	1.25
1+860	1273.01	1271.65	1.36
1+880	1272.50	1271.20	1.30
1+900	1272.02	1270.76	1.27
1+920	1271.57	1270.31	1.26
1+940	1271.14	1269.86	1.27
1+960	1270.80	1269.47	1.33
1+980	1270.50	1269.18	1.32
2+000	1270.20	1268.88	1.32
2+020	1269.91	1268.58	1.32
2+040	1269.58	1268.29	1.29
2+060	1269.41	1268.09	1.31
2+080	1269.38	1268.10	1.28
2+100	1269.32	1267.96	1.36
2+120	1269.24	1267.82	1.41
2+140	1269.06	1267.69	1.37
2+160	1268.73	1267.42	1.31
2+180	1268.18	1266.89	1.29
2+200	1267.91	1266.56	1.35
2+220	1267.56	1266.25	1.31
2+240	1267.03	1265.69	1.33
2+260	1266.52	1265.20	1.33
2+280	1266.14	1264.82	1.32
2+300	1265.77	1264.45	1.32
2+320	1265.32	1264.00	1.31
2+336		1263.53	1.35

PIPE DATA: PIPE DIAMETER AND MATERIAL: HDPE DN 160mm AND 110mm (1+752 – 2+320); GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD (2+020 – 2+336)

0 1000 2000

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH–OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:
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SAMAN CORPORATION
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Project Manager:
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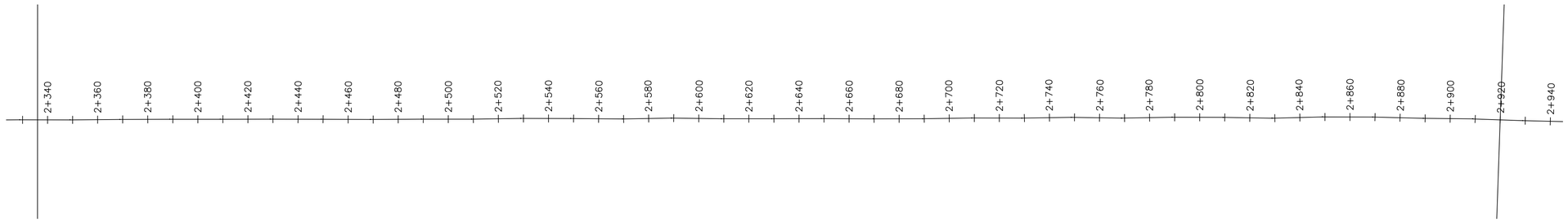
Designed:	D. Liambila
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

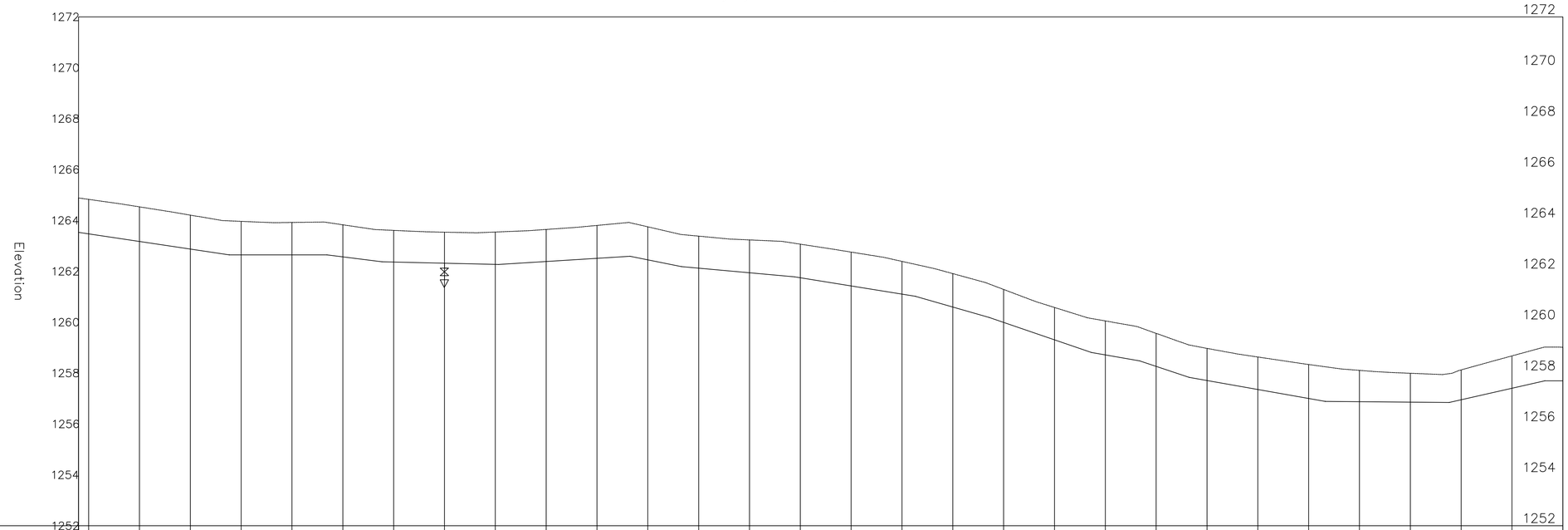
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KYANGULU TO KABATI DISTRIBUTION PIPELINE PROFILE DN 160mm AND DN 110mm

Stage:	FINAL DETAILED DESIGN
Date:	DECEMBER 2021
Drawing No.	TCE–KDP–KK–004
Scale:	VERT–1:200 HOR–1:2000
Sheet No.	4 of 17
Index No.	



Kyangulu–Kabati Alignment PROFILE



CHAINAGE	2+336	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	2+920
ORIGINAL GROUND LEVEL (m.a.s.l)		1264.83	1264.53	1264.21	1263.96	1263.92	1263.83	1263.61	1263.54	1263.54	1263.64	1263.80	1263.75	1263.38	1263.23	1263.07	1262.75	1262.39	1261.91	1261.29	1260.58	1260.05	1259.56	1258.97	1258.63	1258.34	1258.11	1257.99	1258.12	1258.68	
PIPELINE INVERT LEVEL (m.a.s.l)	1263.53	1263.47	1263.17	1262.87	1262.65	1262.64	1262.57	1262.36	1262.32	1262.27	1262.38	1262.51	1262.45	1262.12	1261.94	1261.74	1261.42	1261.10	1260.59	1259.99	1259.31	1258.71	1258.26	1257.71	1257.36	1257.00	1256.88	1256.86	1256.95	1257.40	1257.70
TRENCH DEPTH (m)	1.35	1.36	1.36	1.33	1.32	1.27	1.26	1.24	1.22	1.27	1.26	1.29	1.30	1.26	1.29	1.32	1.33	1.29	1.31	1.30	1.27	1.34	1.30	1.26	1.28	1.33	1.23	1.13	1.17	1.27	1.32
PIPE DATA	PIPE DIAMETER AND MATERIAL: HDPE DN 160mm AND 110mm															GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD															

0 1000 2000

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH–OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:
saman
SAMAN CORPORATION
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Project Manager:
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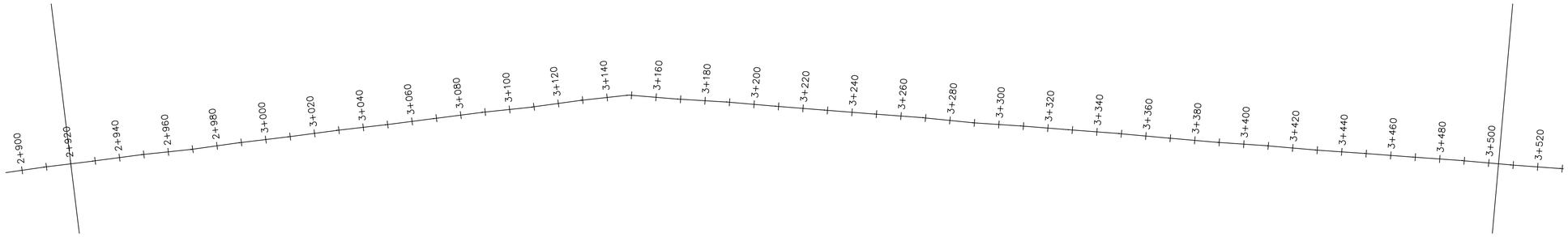
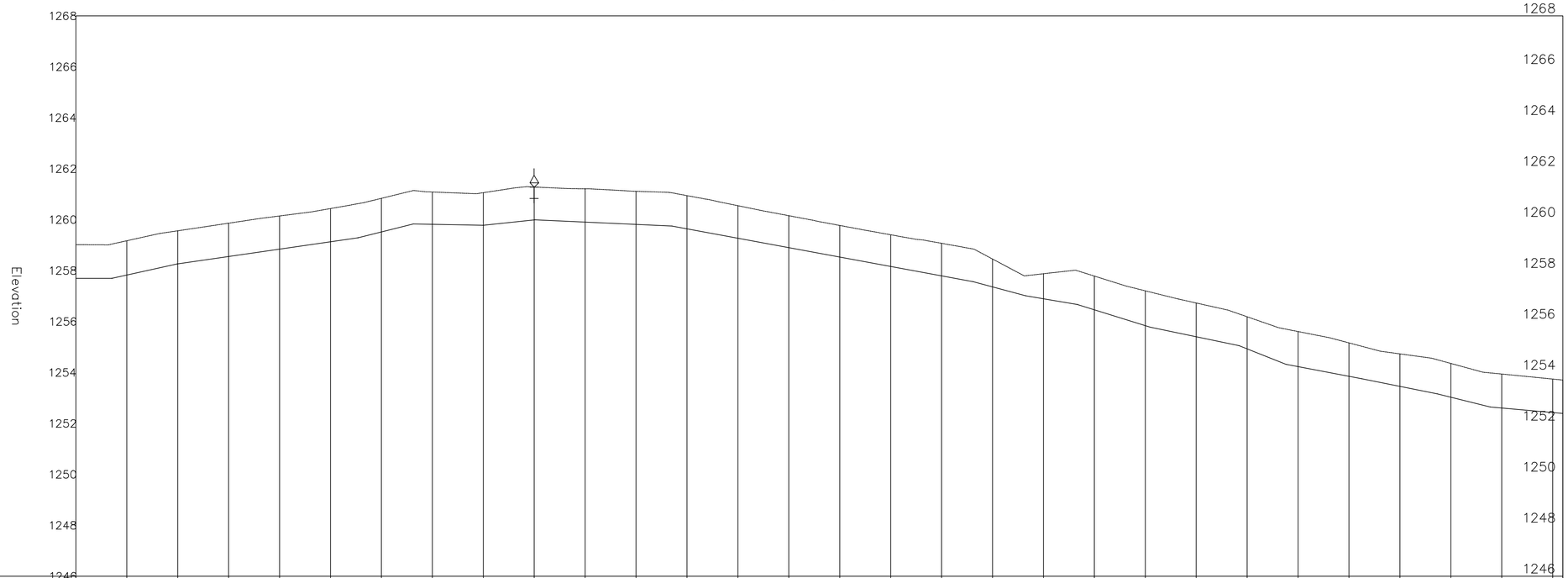
Designed:	D. Liambila
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

Project:	CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA
Drawing Title:	KYANGULU TO KABATI DISTRIBUTION PIPELINE PROFILE DN 160mm AND DN 110mm

Stage:	FINAL DETAILED DESIGN
Date:	DECEMBER 2021
Drawing No.	TCE–KDP–KK–005
Scale:	VERT–1:200 HOR–1:2000
Sheet No.	5 of 17
Index No.	



Kyangulu–Kabati Alignment PROFILE



CHAINAGE	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	3+500	3+504
ORIGINAL GROUND LEVEL (m.a.s.l)		1259.17	1259.56	1259.86	1260.14	1260.44	1260.84	1261.09	1261.06	1261.28	1261.21	1261.11	1260.94	1260.55	1260.15	1259.77	1259.41	1259.07	1258.45	1257.88	1257.78	1257.21	1256.73	1256.19	1255.61	1255.16	1254.73	1254.35	1253.94	1253.74	
PIPELINE INVERT LEVEL (m.a.s.l)	1257.70	1257.83	1258.27	1258.55	1258.84	1259.13	1259.52	1259.82	1259.78	1259.99	1259.90	1259.81	1259.64	1259.27	1258.90	1258.53	1258.16	1257.79	1257.36	1256.89	1256.46	1255.84	1255.40	1254.93	1254.23	1253.85	1253.45	1253.03	1252.61	1252.43	1252.39
TRENCH DEPTH (m)	1.32	1.35	1.30	1.31	1.30	1.30	1.32	1.27	1.28	1.29	1.31	1.30	1.30	1.28	1.25	1.24	1.24	1.28	1.09	0.98	1.32	1.37	1.33	1.26	1.38	1.31	1.28	1.33	1.33	1.32	1.31
PIPE DATA	PIPE DIAMETER AND MATERIAL: HDPE DN 160mm AND 110mm													GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD																	

0 1000 2000

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH–OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

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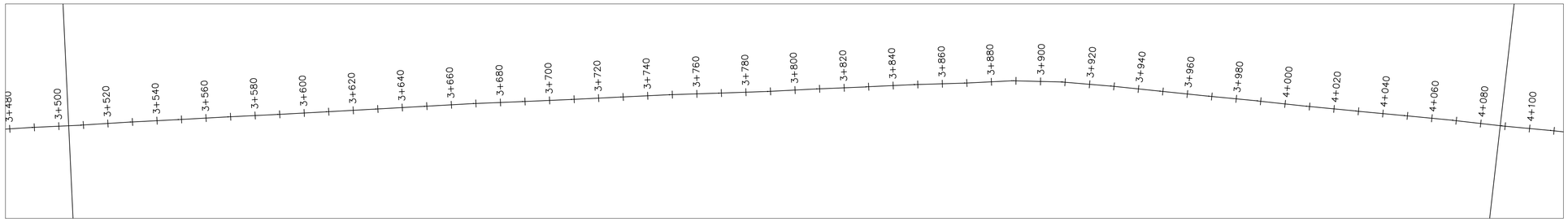
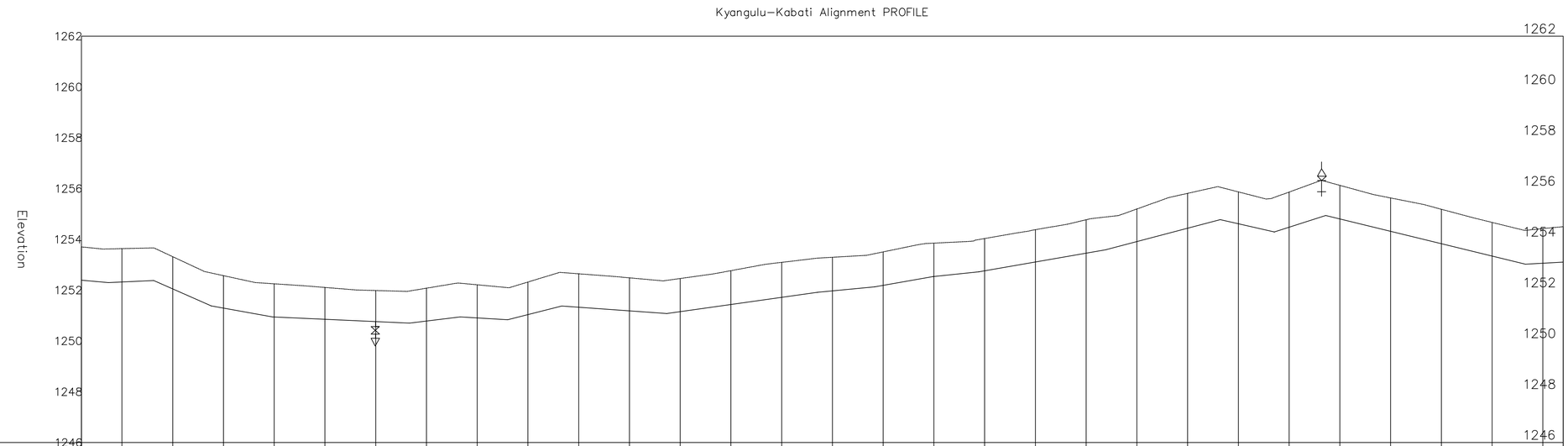
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KYANGULU TO KABATI DISTRIBUTION PIPELINE PROFILE DN 160mm AND DN 110mm

Stage:	FINAL DETAILED DESIGN
Date:	DECEMBER 2021
Drawing No.	TCE–KDP–KK–006
Scale:	VERT–1:200 HOR–1:2000
Sheet No.	6 of 17
Index No.	





CHAINAGE	ORIGINAL GROUND LEVEL (m.a.s.l)	PIPELINE INVERT LEVEL (m.a.s.l)	TRENCH DEPTH (m)
3+504		1252.39	1.31
3+520	1253.63	1252.32	1.31
3+540	1253.32	1252.05	1.27
3+560	1252.57	1251.29	1.28
3+580	1252.25	1250.94	1.31
3+600	1252.11	1250.85	1.25
3+620	1251.98	1250.76	1.22
3+640	1252.08	1250.78	1.29
3+660	1252.21	1250.90	1.31
3+680	1252.32	1251.04	1.28
3+700	1252.64	1251.33	1.32
3+720	1252.48	1251.18	1.30
3+740	1252.46	1251.15	1.31
3+760	1252.77	1251.43	1.33
3+780	1253.09	1251.71	1.38
3+800	1253.29	1251.97	1.32
3+820	1253.51	1252.19	1.32
3+840	1253.85	1252.54	1.31
3+860	1254.03	1252.76	1.27
3+880	1254.38	1253.11	1.27
3+900	1254.77	1253.45	1.32
3+920	1255.19	1253.91	1.28
3+940	1255.81	1254.44	1.37
3+960	1255.87	1254.61	1.26
3+980	1255.86	1254.48	1.39
4+000	1256.13	1254.80	1.32
4+020	1255.63	1254.31	1.32
4+040	1255.18	1253.83	1.36
4+060	1254.67	1253.34	1.33
4+080	1254.42	1253.06	1.36
4+088		1253.10	1.39

PIPE DATA: PIPE DIAMETER AND MATERIAL: HDPE DN 160mm AND 110mm — GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD

0 1000 2000

NOTES

Elevations in meters unless otherwise stated

LEGEND

- PIPELINE WITH CHAINAGE
- PROFILE
- ORIGINAL GROUND LEVEL
- PIPELINE INVERT LEVEL
- AIR VALVE
- WASH–OUT (W.O)
- START CHAINAGE
- END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:
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Project Manager:
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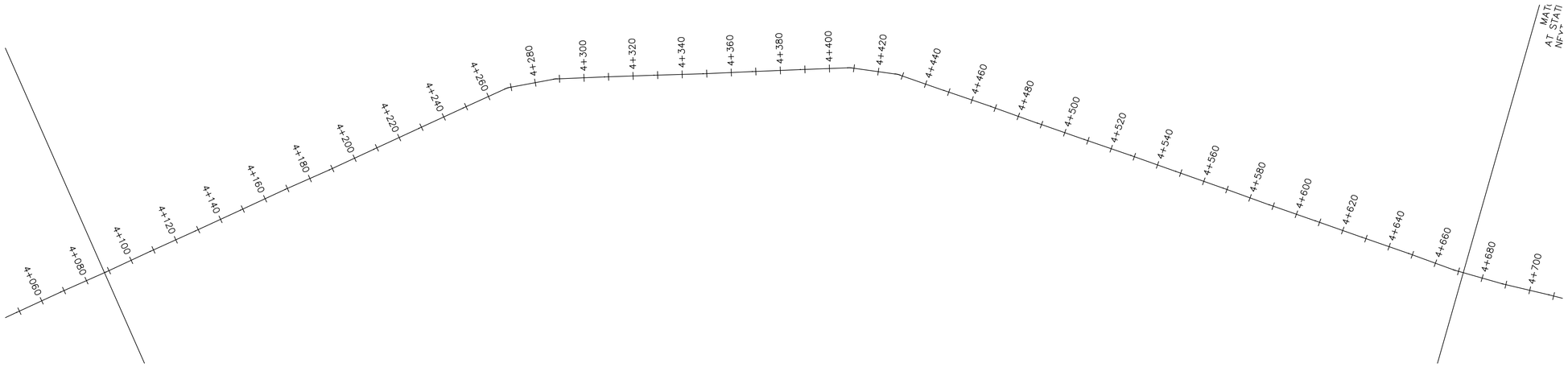
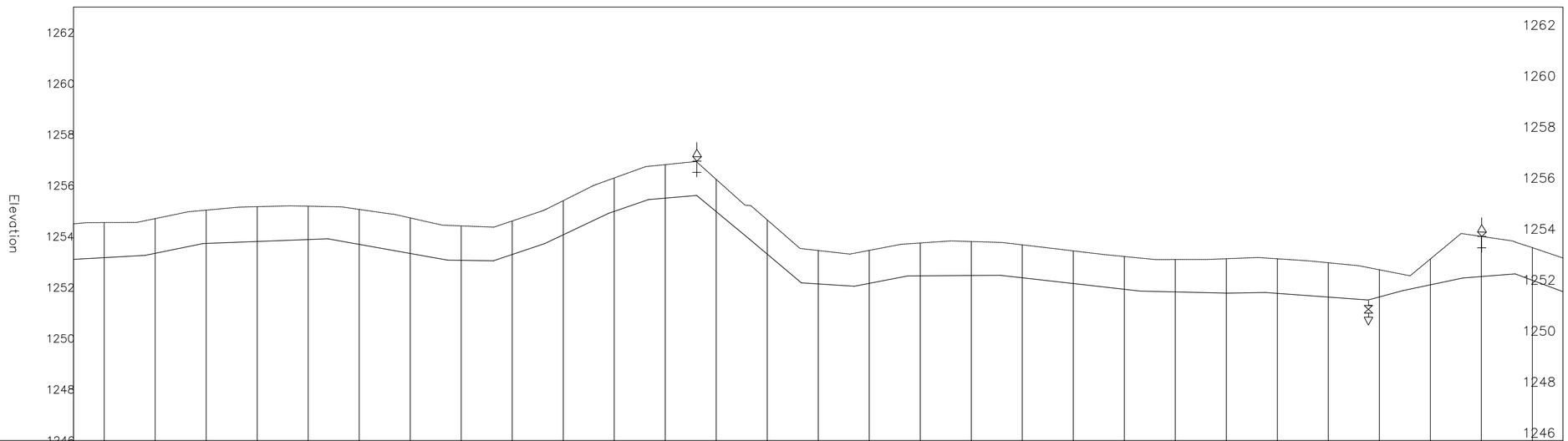
Designed:	D. Liambila
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

Project:	CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA
Drawing Title:	KYANGULU TO KABATI DISTRIBUTION PIPELINE PROFILE DN 160mm AND DN 110mm

Stage:	FINAL DETAILED DESIGN
Date:	DECEMBER 2021
Drawing No.	TCE–KDP–KK–007
Scale:	VERT–1:200 HOR–1:2000
Sheet No.	7 of 17
Index No.	



Kyangulu–Kabati Alignment PROFILE



CHAINAGE	4+088	4+100	4+120	4+140	4+160	4+180	4+200	4+220	4+240	4+260	4+280	4+300	4+320	4+340	4+360	4+380	4+400	4+420	4+440	4+460	4+480	4+500	4+520	4+540	4+560	4+580	4+600	4+620	4+640	4+660	4+672
ORIGINAL GROUND LEVEL (m.a.s.l)		1254.55	1254.70	1255.04	1255.17	1255.19	1255.06	1254.73	1254.42	1254.61	1255.41	1256.30	1256.82	1256.24	1254.65	1253.45	1253.46	1253.75	1253.80	1253.68	1253.44	1253.22	1253.10	1253.13	1253.13	1252.97	1252.70	1253.12	1254.01	1253.57	
PIPELINE INVERT LEVEL (m.a.s.l)	1253.10	1253.17	1253.34	1253.73	1253.81	1253.88	1253.69	1253.34	1253.07	1253.30	1254.07	1254.99	1255.51	1254.98	1253.31	1252.14	1252.16	1252.46	1252.47	1252.38	1252.16	1251.93	1251.83	1251.78	1251.77	1251.62	1251.63	1252.11	1252.43	1252.28	1251.84
TRENCH DEPTH (m)	1.39	1.38	1.36	1.31	1.37	1.31	1.37	1.39	1.35	1.32	1.34	1.31	1.32	1.27	1.34	1.31	1.29	1.29	1.33	1.29	1.28	1.28	1.27	1.35	1.36	1.35	1.07	1.01	1.57	1.28	1.32
PIPE DATA	PIPE DIAMETER AND MATERIAL: HDPE DN 160mm AND 110mm														GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD																

0 1000 2000

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH–OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

saman

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Project Manager:

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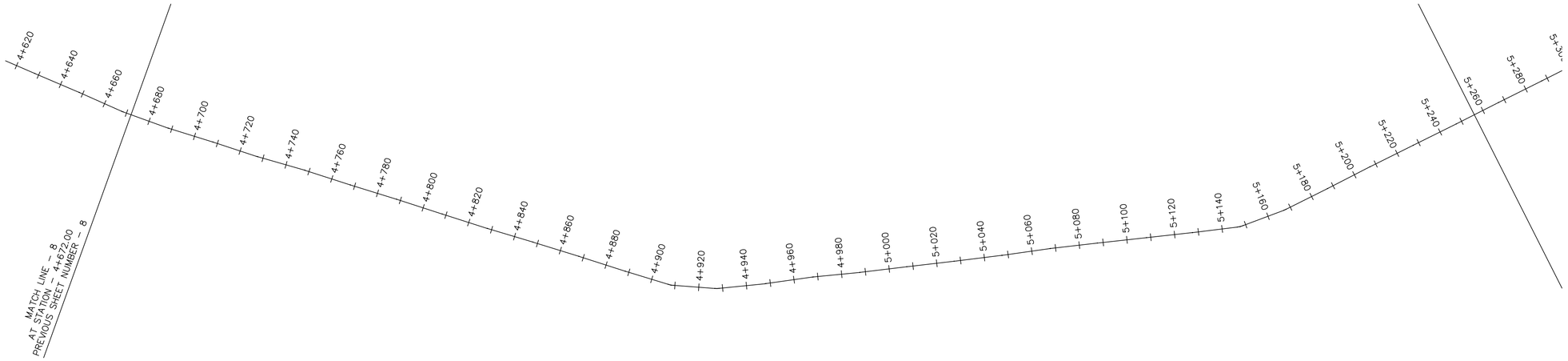
Designed:	D. Liambila
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

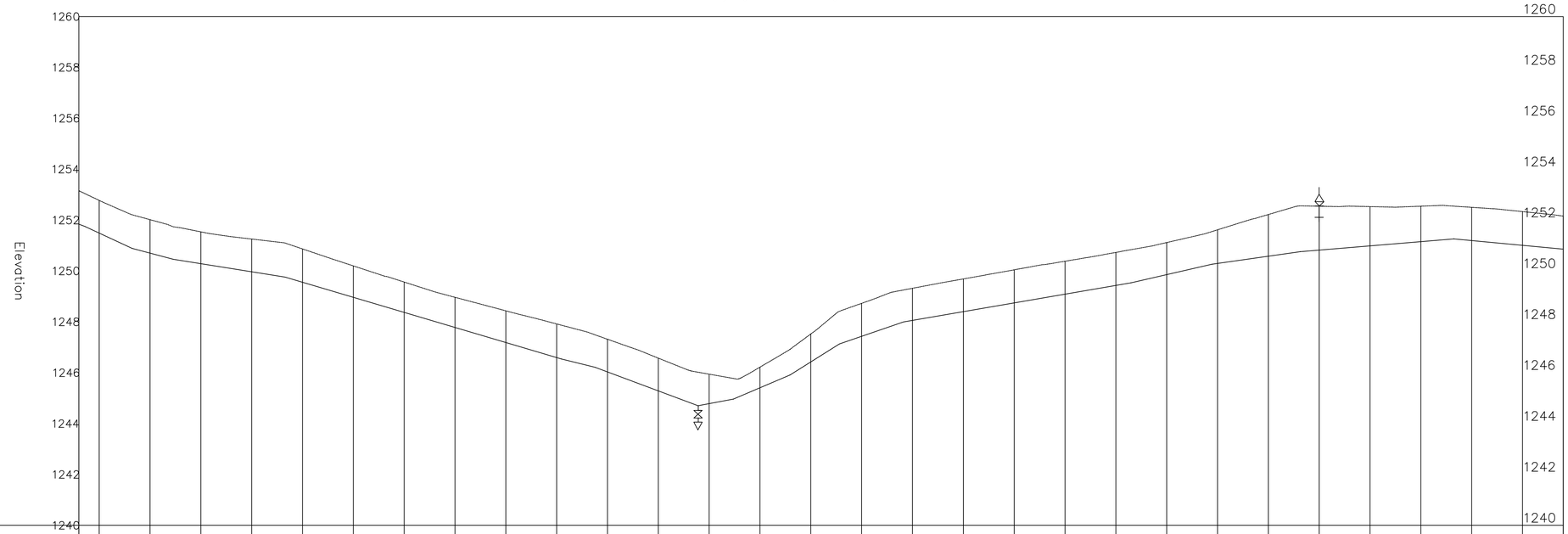
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KYANGULU TO KABATI DISTRIBUTION PIPELINE PROFILE DN 160mm AND DN 110mm

Stage:	FINAL DETAILED DESIGN
Date:	DECEMBER 2021
Drawing No.	TCE–KDP–KK–008
Scale:	VERT–1:200 HOR–1:2000
Sheet No.	8 of 17
Index No.	



Kyangulu–Kabati Alignment PROFILE



CHAINAGE	4+672	4+680	4+700	4+720	4+740	4+760	4+780	4+800	4+820	4+840	4+860	4+880	4+900	4+920	4+940	4+960	4+980	5+000	5+020	5+040	5+060	5+080	5+100	5+120	5+140	5+160	5+180	5+200	5+220	5+240	5+256
ORIGINAL GROUND LEVEL (m.a.s.l)		1252.77	1252.02	1251.54	1251.25	1250.87	1250.20	1249.56	1248.96	1248.43	1247.92	1247.32	1246.57	1245.94	1246.22	1247.52	1248.73	1249.32	1249.69	1250.04	1250.38	1250.73	1251.12	1251.62	1252.22	1252.54	1252.53	1252.55	1252.50	1252.33	
PIPELINE INVERT LEVEL (m.a.s.l)	1251.84	1251.49	1250.70	1250.28	1249.97	1249.55	1248.96	1248.37	1247.78	1247.19	1246.59	1246.03	1245.28	1244.78	1245.41	1246.42	1247.43	1248.06	1248.40	1248.74	1249.09	1249.43	1249.86	1250.29	1250.58	1250.82	1250.99	1251.15	1251.20	1251.01	1250.86
TRENCH DEPTH (m)	1.32	1.29	1.32	1.25	1.29	1.31	1.24	1.19	1.19	1.25	1.32	1.29	1.29	1.16	0.81	1.10	1.30	1.26	1.29	1.30	1.29	1.30	1.26	1.32	1.64	1.72	1.54	1.39	1.31	1.33	1.30
PIPE DATA	PIPE DIAMETER AND MATERIAL: HDPE DN 160mm AND 110mm														GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD																

0 1000 2000

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH–OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

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Employer:

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Project Manager:

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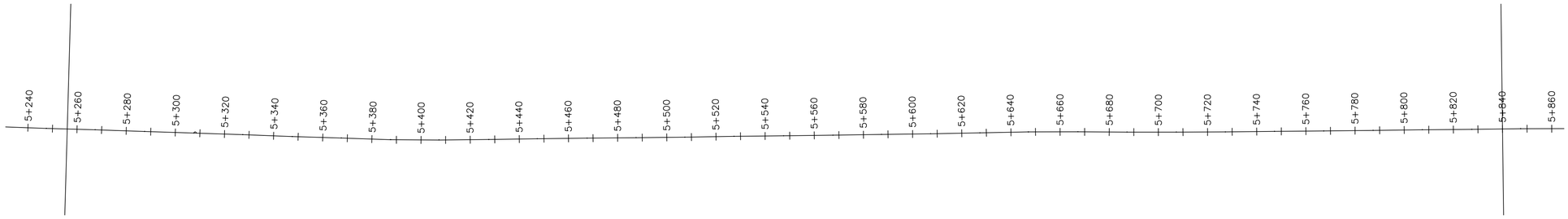
email: info@tanathi.go.ke

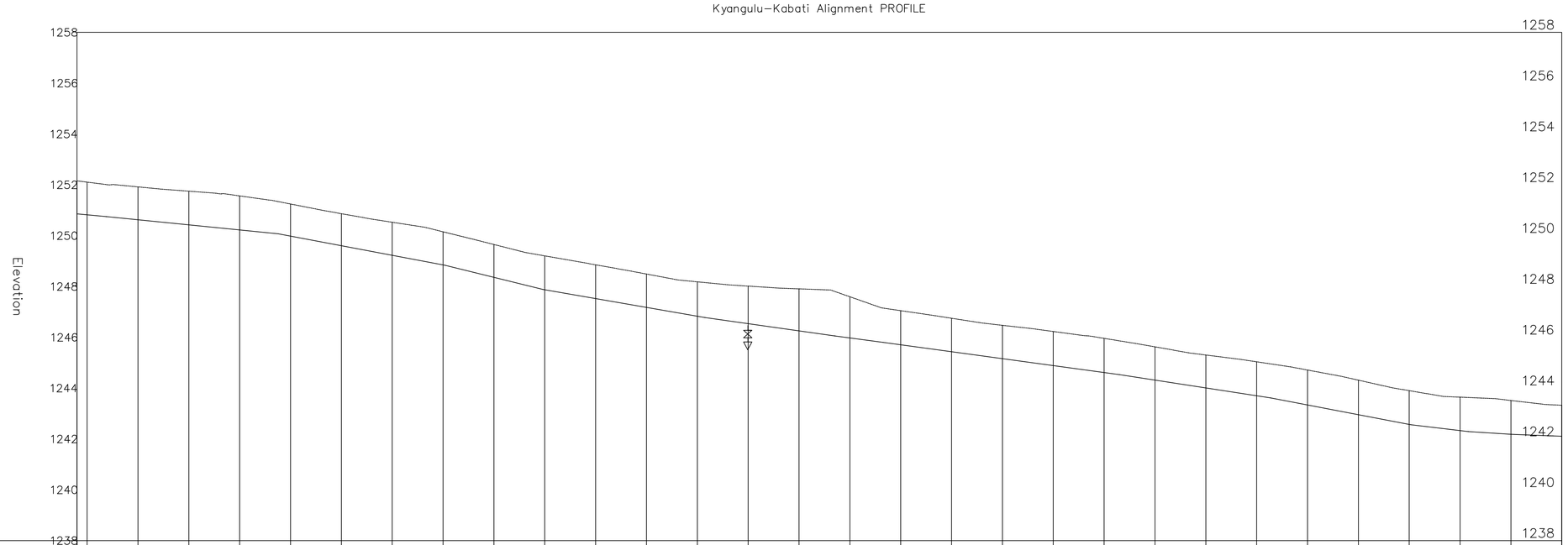
Designed:	D. Liambila
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

Project:	CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA
Drawing Title:	KYANGULU TO KABATI DISTRIBUTION PIPELINE PROFILE DN 160mm AND DN 110mm

Stage:	FINAL DETAILED DESIGN
Date:	DECEMBER 2021
Drawing No.	TCE–KDP–KK–009
Scale:	VERT–1:200 HOR–1:2000
Sheet No.	9 of 17
Index No.	



Kyangulu–Kabati Alignment PROFILE



CHAINAGE	5+256	5+260	5+280	5+300	5+320	5+340	5+360	5+380	5+400	5+420	5+440	5+460	5+480	5+500	5+520	5+540	5+560	5+580	5+600	5+620	5+640	5+660	5+680	5+700	5+720	5+740	5+760	5+780	5+800	5+820	5+840
ORIGINAL GROUND LEVEL (m.a.s.l)		1252.11	1251.92	1251.75	1251.56	1251.25	1250.87	1250.53	1250.15	1249.65	1249.21	1248.85	1248.49	1248.18	1248.02	1247.91	1247.60	1247.05	1246.75	1246.47	1246.23	1245.96	1245.63	1245.30	1245.04	1244.71	1244.31	1243.90	1243.65	1243.51	
PIPELINE INVERT LEVEL (m.a.s.l)	1250.86	1250.62	1250.62	1250.42	1250.23	1249.98	1249.60	1249.23	1248.85	1248.36	1247.87	1247.52	1247.18	1246.83	1246.54	1246.25	1245.98	1245.71	1245.44	1245.16	1244.89	1244.62	1244.32	1244.01	1243.70	1243.34	1242.96	1242.57	1242.33	1242.19	1242.11
TRENCH DEPTH (m)	1.30	1.29	1.30	1.33	1.34	1.26	1.26	1.30	1.30	1.29	1.33	1.33	1.31	1.35	1.48	1.65	1.62	1.34	1.32	1.31	1.34	1.34	1.31	1.30	1.34	1.38	1.36	1.33	1.31	1.33	1.22
PIPE DATA	PIPE DIAMETER AND MATERIAL: HDPE DN 160mm AND 110mm														GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD																

0 1000 2000

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH–OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

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5,Byeoryangsangga3(sam)-ro,
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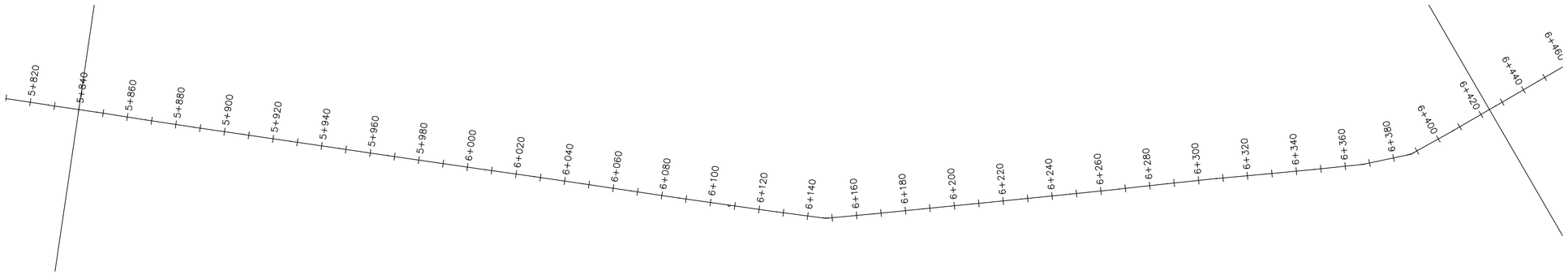
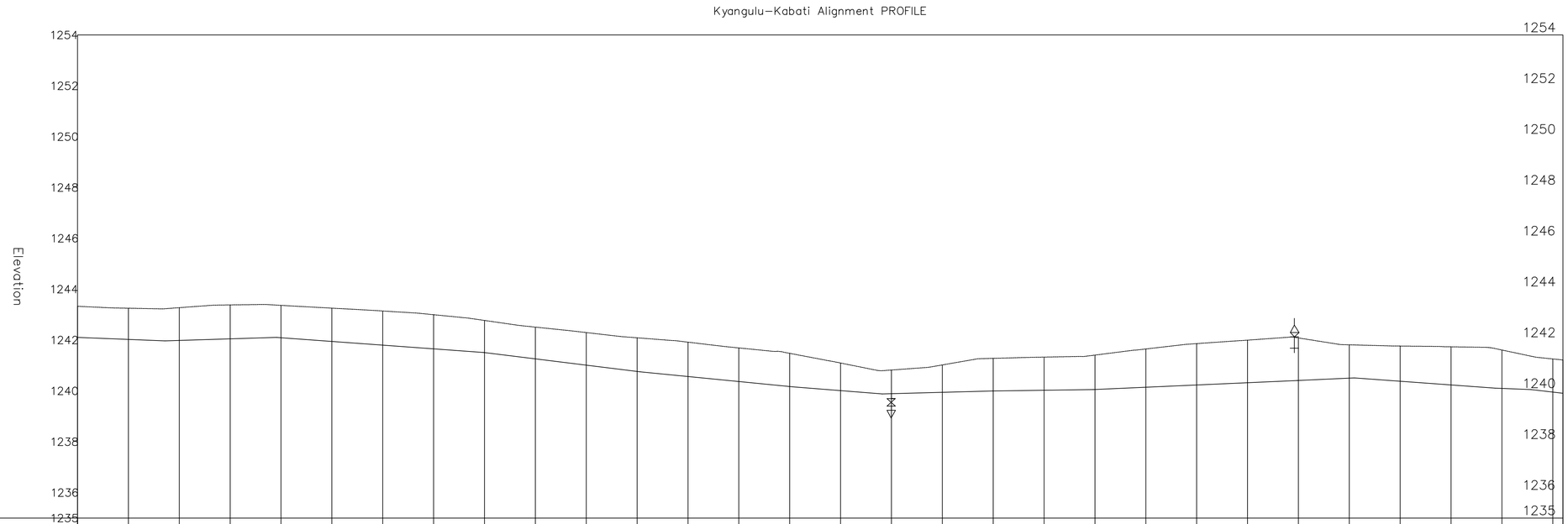
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KYANGULU TO KABATI DISTRIBUTION PIPELINE PROFILE DN 160mm AND DN 110mm

Stage:	FINAL DETAILED DESIGN
Date:	DECEMBER 2021
Drawing No.	TCE–KDP–KK–010
Scale:	VERT–1:200 HOR–1:2000
Sheet No.	10 of 17
Index No.	





CHAINAGE	5+840	5+860	5+880	5+900	5+920	5+940	5+960	5+980	6+000	6+020	6+040	6+060	6+080	6+100	6+120	6+140	6+160	6+180	6+200	6+220	6+240	6+260	6+280	6+300	6+320	6+340	6+360	6+380	6+400	6+420	6+424
ORIGINAL GROUND LEVEL (m.a.s.l)		1243.25	1243.27	1243.38	1243.36	1243.25	1243.14	1243.00	1242.77	1242.51	1242.29	1242.09	1241.92	1241.69	1241.48	1241.10	1240.82	1241.02	1241.28	1241.33	1241.41	1241.65	1241.86	1242.00	1242.08	1241.81	1241.76	1241.73	1241.61	1241.26	
PIPELINE INVERT LEVEL (m.a.s.l)	1242.11	1242.03	1241.99	1242.05	1242.09	1241.94	1241.80	1241.65	1241.51	1241.26	1241.01	1240.77	1240.57	1240.37	1240.17	1240.01	1239.89	1239.94	1240.00	1240.02	1240.05	1240.14	1240.23	1240.32	1240.41	1240.50	1240.38	1240.23	1240.10	1239.95	1239.91
TRENCH DEPTH (m)	1.22	1.23	1.29	1.33	1.27	1.31	1.34	1.34	1.27	1.25	1.28	1.32	1.35	1.32	1.31	1.09	0.93	1.08	1.28	1.30	1.35	1.51	1.63	1.67	1.67	1.31	1.38	1.50	1.51	1.30	1.31
PIPE DATA	PIPE DIAMETER AND MATERIAL: HDPE DN 160mm AND 110mm													GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD																	

NOTES

Elevations in meters unless otherwise stated

PIPELINE WITH CHAINAGE

LEGEND

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH–OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

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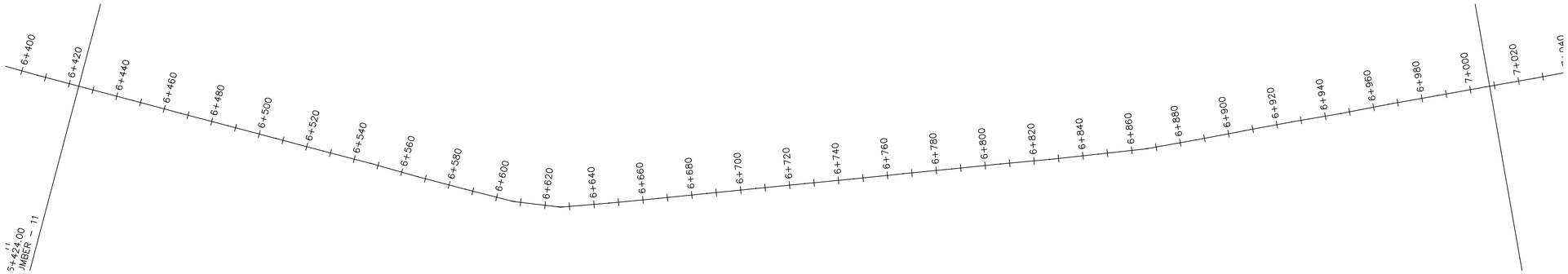
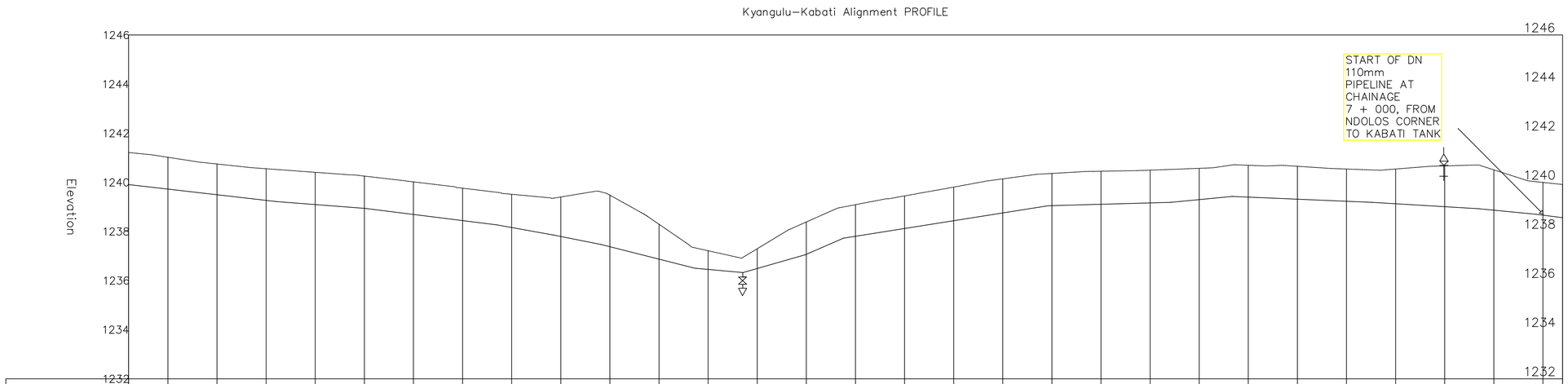
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KYANGULU TO KABATI DISTRIBUTION PIPELINE PROFILE DN 160mm AND DN 110mm

Stage:	FINAL DETAILED DESIGN
Date:	DECEMBER 2021
Drawing No.	TCE–KDP–KK–011
Scale:	VERT–1:200 HOR–1:2000
Sheet No.	11 of 17
Index No.	





CHAINAGE	6+424	6+440	6+460	6+480	6+500	6+520	6+540	6+560	6+580	6+600	6+620	6+640	6+660	6+680	6+700	6+720	6+740	6+760	6+780	6+800	6+820	6+840	6+860	6+880	6+900	6+920	6+940	6+960	6+980	7+000	7+008
ORIGINAL GROUND LEVEL (m.a.s.l)		1241.02	1240.75	1240.56	1240.41	1240.26	1240.02	1239.76	1239.51	1239.40	1239.48	1238.29	1237.22	1237.30	1238.39	1239.09	1239.45	1239.81	1240.14	1240.36	1240.45	1240.50	1240.57	1240.70	1240.65	1240.54	1240.54	1240.67	1240.51	1240.00	
PIPELINE INVERT LEVEL (m.a.s.l)	1239.91	1239.72	1239.49	1239.26	1239.10	1238.94	1238.69	1238.44	1238.16	1237.80	1237.38	1236.87	1236.46	1236.49	1237.07	1237.81	1238.12	1238.44	1238.76	1239.05	1239.11	1239.16	1239.30	1239.40	1239.32	1239.23	1239.13	1239.01	1238.87	1238.66	1238.56
TRENCH DEPTH (m)	1.31	1.30	1.25	1.29	1.31	1.31	1.33	1.32	1.36	1.61	2.10	1.42	0.76	0.80	1.32	1.29	1.32	1.37	1.39	1.31	1.34	1.33	1.27	1.30	1.34	1.31	1.41	1.66	1.64	1.33	1.35
PIPE DATA	PIPE DIAMETER AND MATERIAL: HDPE DN 160mm AND 110mm														GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD																

0 1000 2000

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH-OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

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Project Manager:

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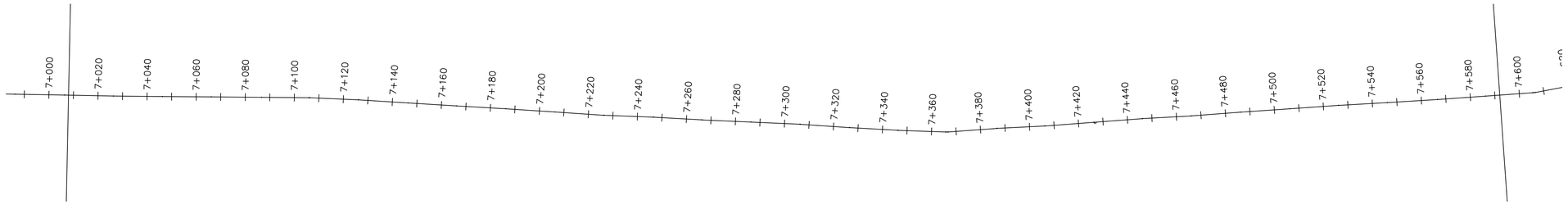
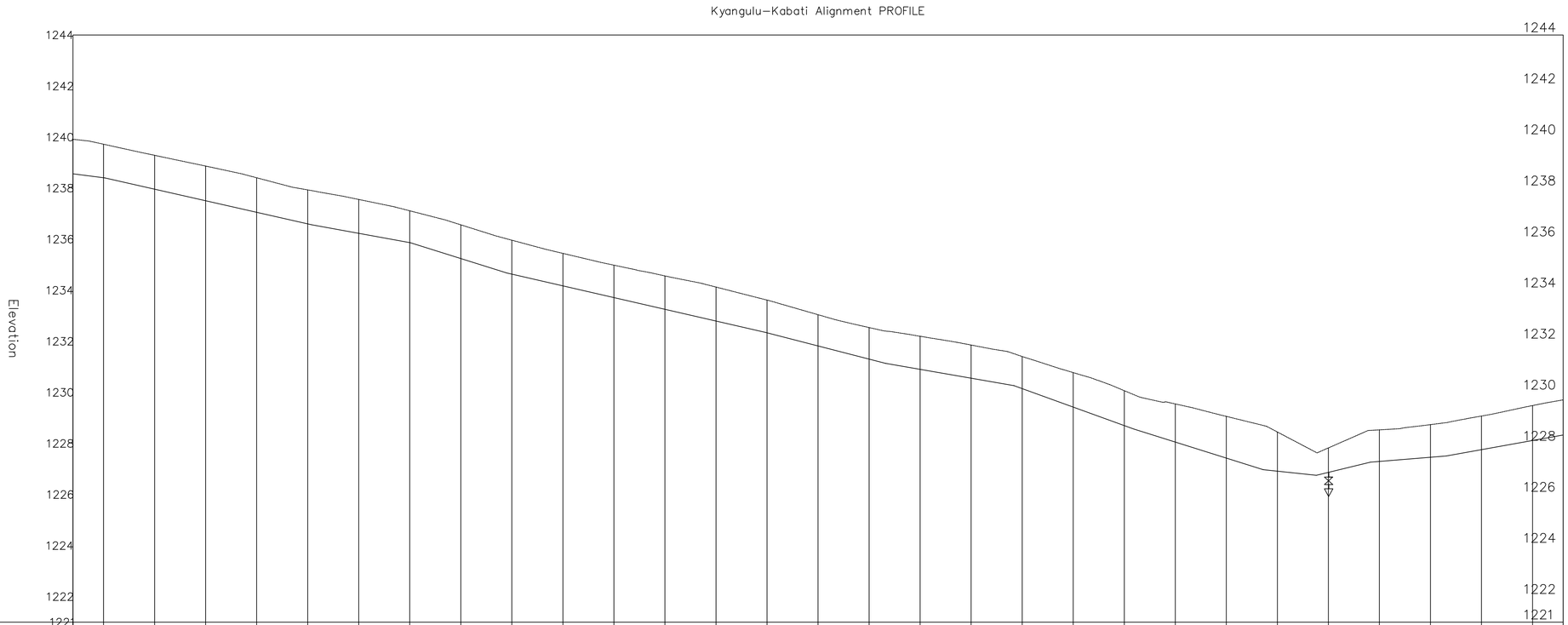
Designed:	D. Liambila
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KYANGULU TO KABATI DISTRIBUTION PIPELINE PROFILE DN 160mm AND DN 110mm

Stage:	FINAL DETAILED DESIGN
Date:	DECEMBER 2021
Drawing No.	TCE–KDP–KK–012
Scale:	VERT–1:200 HOR–1:2000
Sheet No.	12 of 17
Index No.	





CHAINAGE	7+008	7+020	7+040	7+060	7+080	7+100	7+120	7+140	7+160	7+180	7+200	7+220	7+240	7+260	7+280	7+300	7+320	7+340	7+360	7+380	7+400	7+420	7+440	7+460	7+480	7+500	7+520	7+540	7+560	7+580	7+592
ORIGINAL GROUND LEVEL (m.a.s.l)		1239.72	1239.29	1238.87	1238.41	1237.93	1237.56	1237.11	1236.56	1235.96	1235.45	1234.98	1234.56	1234.13	1233.62	1233.04	1232.54	1232.20	1231.85	1231.40	1230.77	1230.07	1229.55	1229.06	1228.45	1227.82	1228.53	1228.74	1229.07	1229.48	
PIPELINE INVERT LEVEL (m.a.s.l)	1238.56	1238.41	1237.96	1237.51	1237.05	1236.60	1236.23	1235.87	1235.24	1234.63	1234.17	1233.71	1233.25	1232.80	1232.33	1231.82	1231.30	1230.90	1230.56	1230.15	1229.43	1228.70	1228.06	1227.43	1226.91	1226.87	1227.30	1227.46	1227.76	1228.12	1228.33
TRENCH DEPTH (m)	1.35	1.31	1.33	1.36	1.35	1.33	1.33	1.25	1.32	1.33	1.27	1.27	1.31	1.33	1.28	1.22	1.24	1.30	1.30	1.26	1.35	1.37	1.49	1.63	1.53	0.96	1.24	1.28	1.32	1.37	1.38
PIPE DATA	PIPE DIAMETER AND MATERIAL: HDPE DN 160mm AND 110mm														GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD																

0 1000 2000

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH–OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

SAMAN CORPORATION
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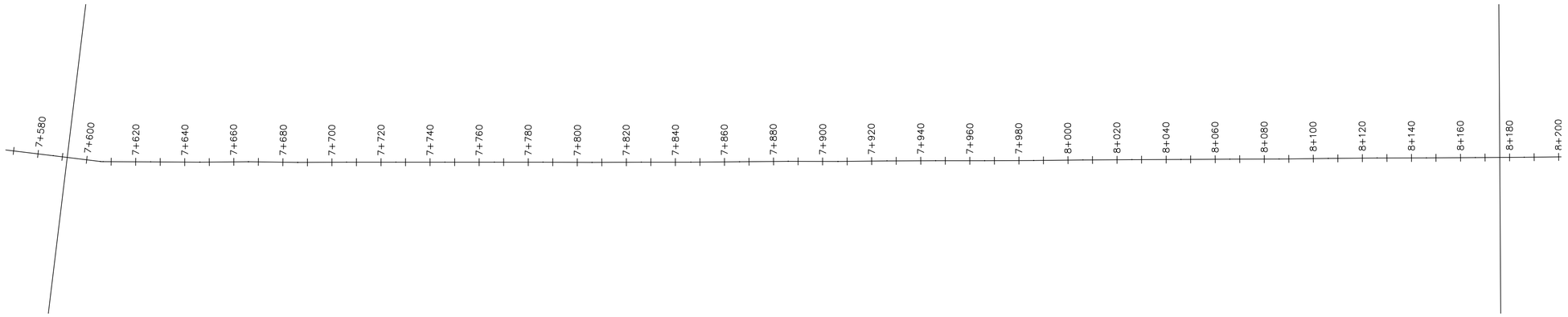
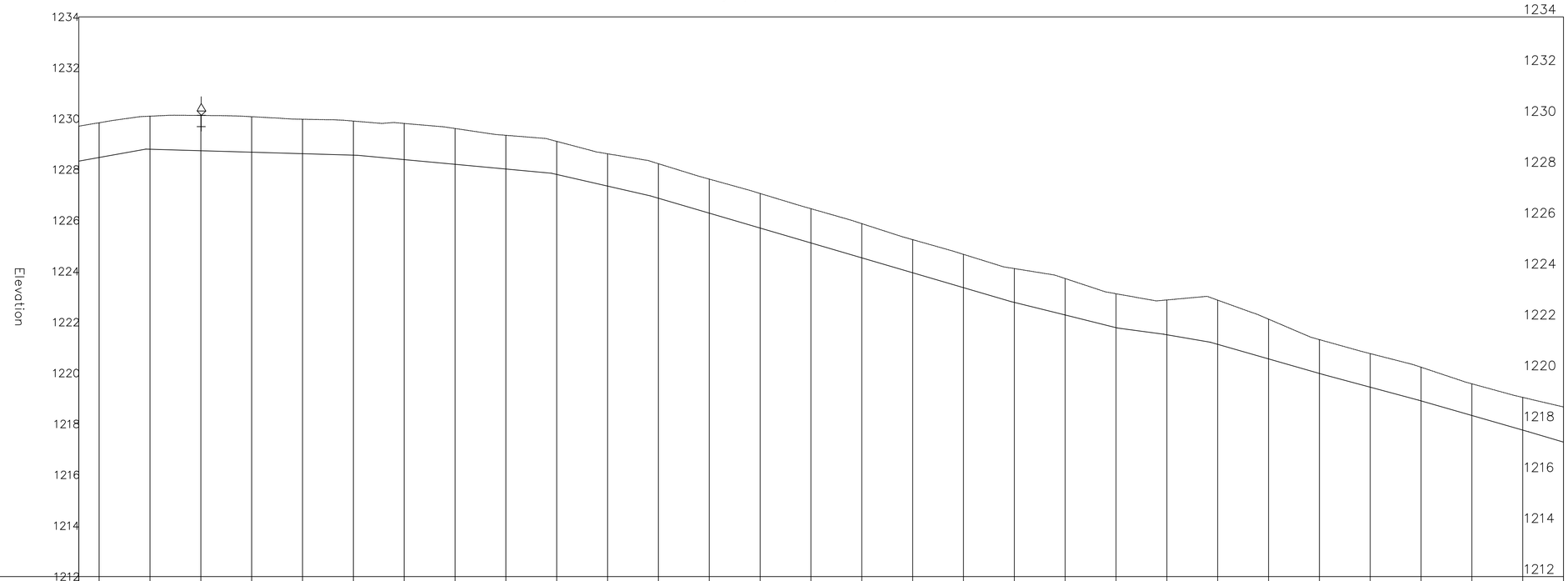
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KYANGULU TO KABATI DISTRIBUTION PIPELINE PROFILE DN 160mm AND DN 110mm

Stage:	FINAL DETAILED DESIGN
Date:	DECEMBER 2021
Drawing No.	TCE–KDP–KK–013
Scale:	VERT–1:200 HOR–1:2000
Sheet No.	13 of 17
Index No.	



Kyangulu–Kabati Alignment PROFILE



CHAINAGE	7+592	7+600	7+620	7+640	7+660	7+680	7+700	7+720	7+740	7+760	7+780	7+800	7+820	7+840	7+860	7+880	7+900	7+920	7+940	7+960	7+980	8+000	8+020	8+040	8+060	8+080	8+100	8+120	8+140	8+160	8+176
ORIGINAL GROUND LEVEL (m.a.s.l)		1229.84	1230.10	1230.13	1230.08	1229.98	1229.91	1229.81	1229.61	1229.35	1229.11	1228.62	1228.23	1227.62	1227.06	1226.46	1225.87	1225.25	1224.67	1224.11	1223.72	1223.12	1222.87	1222.87	1222.12	1221.32	1220.77	1220.23	1219.58	1219.04	
PIPELINE INVERT LEVEL (m.a.s.l)	1228.33	1228.47	1228.80	1228.74	1228.68	1228.62	1228.57	1228.39	1228.21	1228.02	1227.81	1227.35	1226.87	1226.29	1225.70	1225.11	1224.53	1223.94	1223.36	1222.78	1222.29	1221.79	1221.51	1221.13	1220.56	1219.98	1219.45	1218.91	1218.33	1217.76	1217.29
TRENCH DEPTH (m)	1.38	1.37	1.30	1.39	1.40	1.35	1.34	1.42	1.41	1.32	1.30	1.27	1.36	1.34	1.36	1.35	1.35	1.30	1.31	1.33	1.43	1.33	1.37	1.74	1.56	1.33	1.32	1.32	1.24	1.29	1.38
PIPE DATA	PIPE DIAMETER AND MATERIAL: HDPE DN 160mm AND 110mm														GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD																

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH–OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

SAMAN CORPORATION
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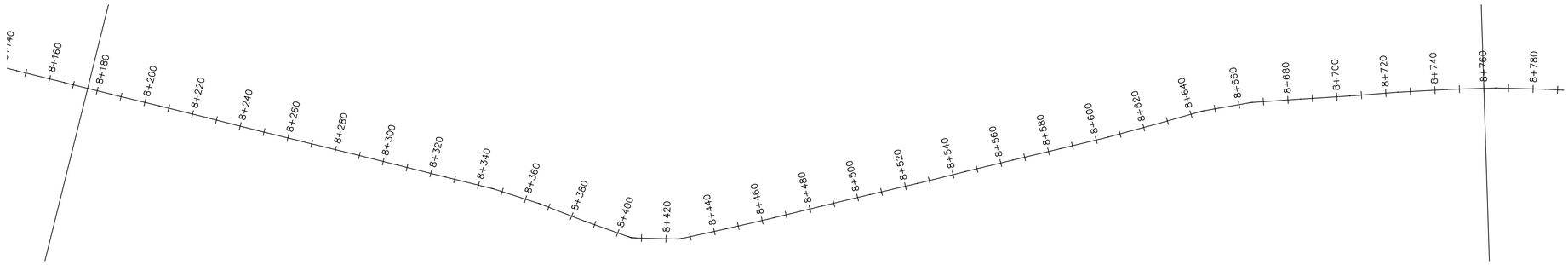
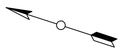
Drawing Title: KYANGULU TO KABATI DISTRIBUTION PIPELINE PROFILE DN 160mm AND DN 110mm

Stage:	FINAL DETAILED DESIGN
Date:	DECEMBER 2021
Drawing No.	TCE–KDP–KK–014
Scale:	VERT–1:200 HOR–1:2000
Sheet No.	14 of 17
Index No.	





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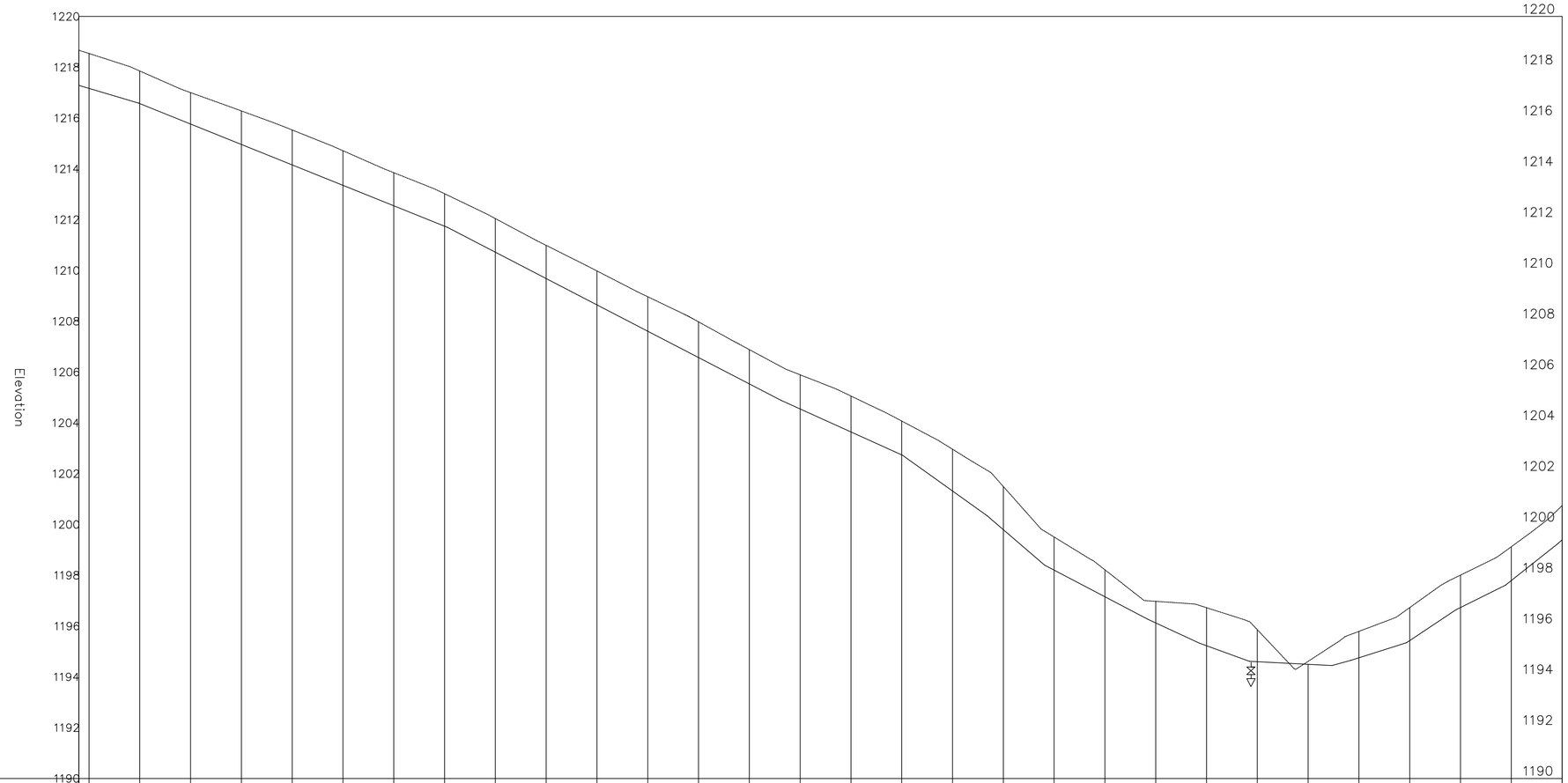
Kyangulu–Kabati Alignment PROFILE



CHAINAGE	ORIGINAL GROUND LEVEL (m.a.s.l)	PIPELINE INVERT LEVEL (m.a.s.l)	TRENCH DEPTH (m)
8+176		1217.29	1.38
8+180	1218.54	1217.17	1.37
8+200	1217.85	1216.57	1.28
8+220	1217.00	1215.76	1.24
8+240	1216.28	1214.96	1.32
8+260	1215.53	1214.16	1.37
8+280	1214.71	1213.35	1.36
8+300	1213.85	1212.55	1.30
8+320	1213.02	1211.74	1.28
8+340	1212.04	1210.72	1.32
8+360	1210.99	1209.68	1.31
8+380	1209.98	1208.64	1.33
8+400	1208.96	1207.61	1.36
8+420	1207.98	1206.57	1.40
8+440	1206.88	1205.54	1.35
8+460	1205.89	1204.55	1.34
8+480	1205.06	1203.64	1.41
8+500	1204.07	1202.74	1.33
8+520	1202.96	1201.32	1.64
8+540	1201.49	1199.79	1.70
8+560	1199.50	1198.20	1.30
8+580	1198.21	1197.15	1.06
8+600	1196.97	1196.12	0.85
8+620	1196.72	1195.22	1.50
8+640	1195.86	1194.59	1.26
8+660	1194.61	1194.49	0.12
8+680	1195.79	1194.75	1.04
8+700	1196.73	1195.43	1.30
8+720	1198.01	1196.73	1.28
8+740	1199.12	1197.79	1.33
8+760		1199.40	1.34

PIPE DATA: PIPE DIAMETER AND MATERIAL: HDPE DN 160mm AND 110mm (8+176 – 8+460); GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD (8+460 – 8+760)

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH–OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

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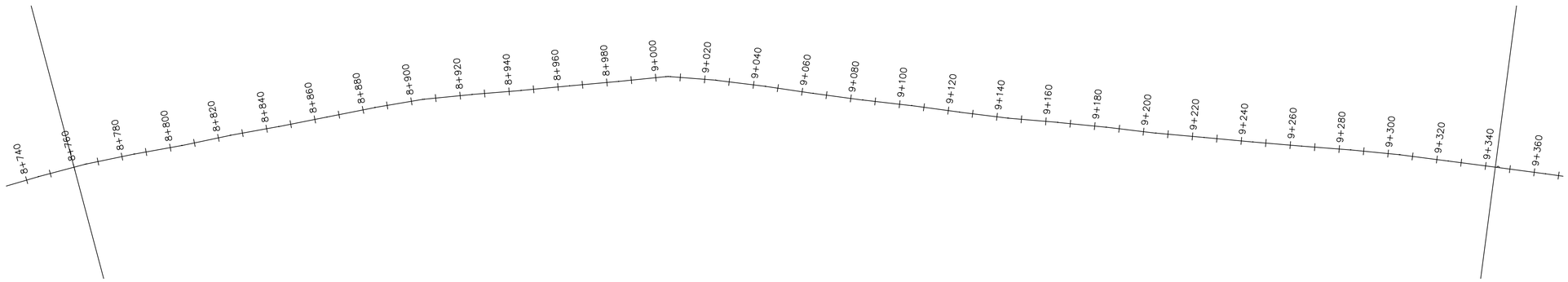
Designed:	D. Liambila
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

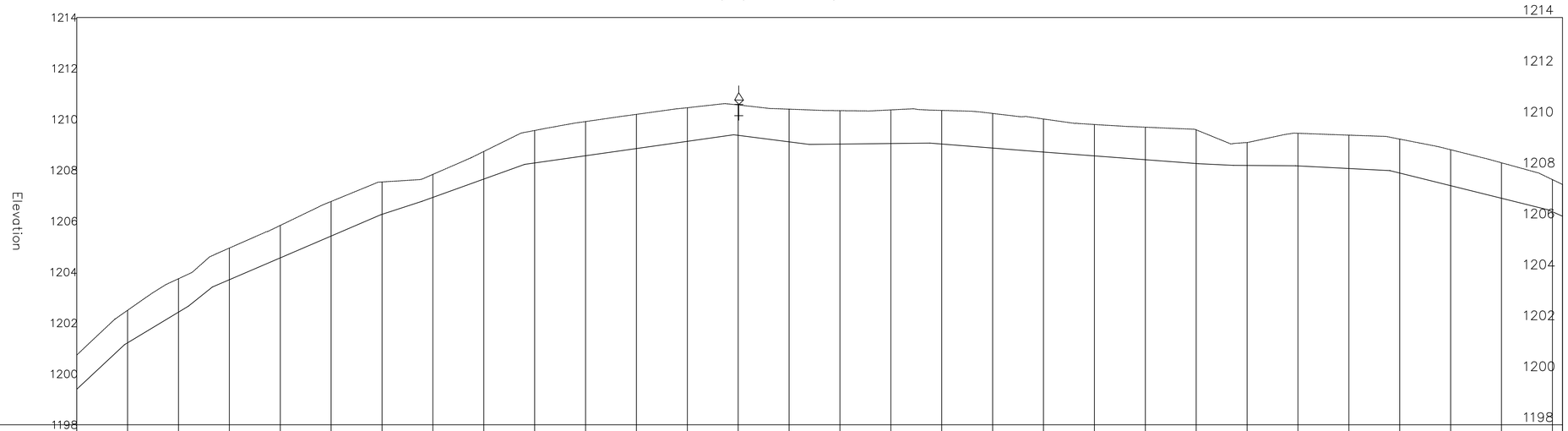
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KYANGULU TO KABATI DISTRIBUTION PIPELINE PROFILE DN 160mm AND DN 110mm

Stage:	FINAL DETAILED DESIGN
Date:	DECEMBER 2021
Drawing No.	TCE–KDP–KK–015
Scale:	VERT–1:200 HOR–1:2000
Sheet No.	15 of 17
Index No.	



Kyangulu–Kabati Alignment PROFILE



CHAINAGE	ORIGINAL GROUND LEVEL (m.a.s.l)	PIPELINE INVERT LEVEL (m.a.s.l)	TRENCH DEPTH (m)
8+760		1199.40	1.34
8+780	1202.50	1201.22	1.28
8+800	1203.74	1202.43	1.31
8+820	1204.94	1203.70	1.24
8+840	1205.83	1204.56	1.27
8+860	1206.77	1205.42	1.36
8+880	1207.54	1206.27	1.27
8+900	1207.84	1206.93	0.91
8+920	1208.74	1207.65	1.09
8+940	1209.56	1208.28	1.28
8+960	1209.91	1208.57	1.34
8+980	1210.19	1208.85	1.34
9+000	1210.46	1209.13	1.32
9+020	1210.57	1209.37	1.20
9+040	1210.40	1209.11	1.28
9+060	1210.34	1209.03	1.31
9+080	1210.37	1209.05	1.32
9+100	1210.35	1209.03	1.32
9+120	1210.23	1208.87	1.36
9+140	1210.01	1208.71	1.30
9+160	1209.80	1208.56	1.23
9+180	1209.69	1208.41	1.28
9+200	1209.59	1208.26	1.32
9+220	1209.09	1208.19	0.90
9+240	1209.45	1208.17	1.28
9+260	1209.38	1208.07	1.31
9+280	1209.22	1207.89	1.33
9+300	1208.81	1207.39	1.41
9+320	1208.29	1206.90	1.39
9+340	1207.63	1206.37	1.26
9+344		1206.19	1.25

PIPE DATA	PIPE DIAMETER AND MATERIAL: HDPE DN 160mm AND 110mm	GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD

0 1000 2000

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH–OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

saman

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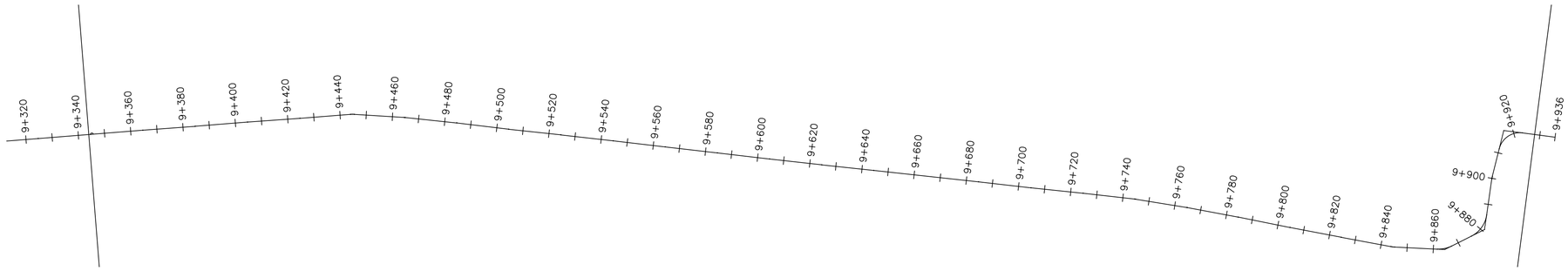
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

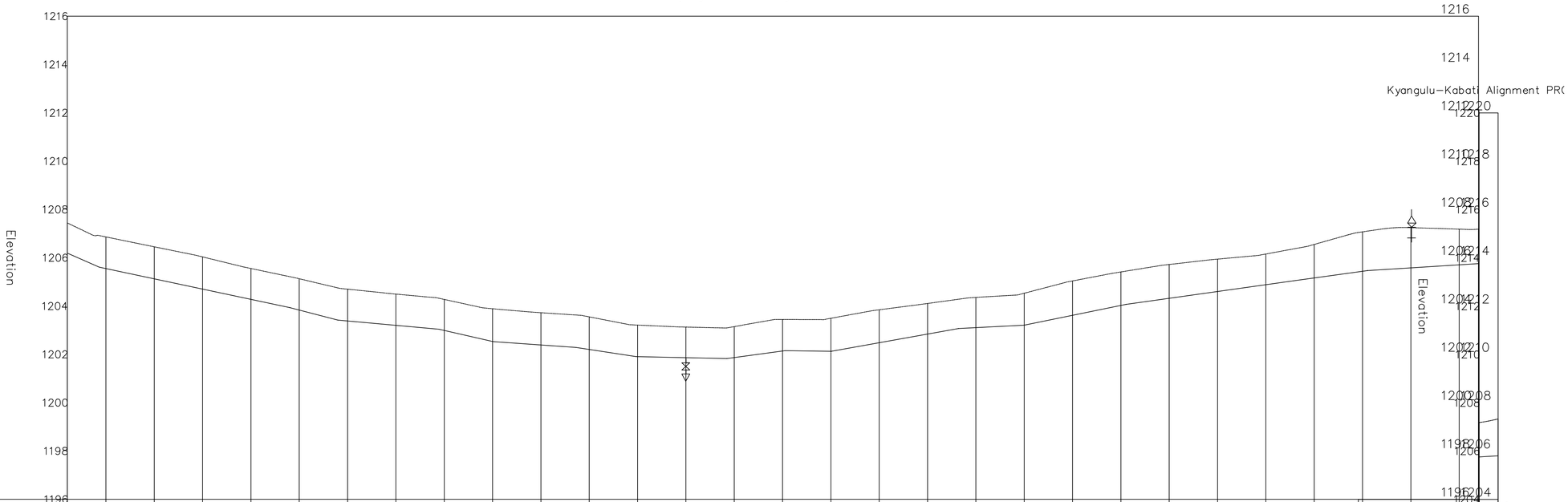
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KYANGULU TO KABATI DISTRIBUTION PIPELINE PROFILE DN 160mm AND DN 110mm

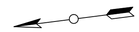
Stage:	FINAL DETAILED DESIGN
Date:	DECEMBER 2021
Drawing No.	TCE–KDP–KK–016
Scale:	VERT–1:200 HOR–1:2000
Sheet No.	16 of 17
Index No.	



Kyangulu–Kabati Alignment PROFILE



CHAINAGE	9+344	9+360	9+380	9+400	9+420	9+440	9+460	9+480	9+500	9+520	9+540	9+560	9+580	9+600	9+620	9+640	9+660	9+680	9+700	9+720	9+740	9+760	9+780	9+800	9+820	9+840	9+860	9+880	9+900	9+920	**9+928**	9+935.85
ORIGINAL GROUND LEVEL (m.a.s.l)		1206.86	1206.45	1206.03	1205.55	1205.13	1204.70	1204.49	1204.27	1203.89	1203.72	1203.55	1203.21	1203.13	1203.15	1203.44	1203.49	1203.84	1204.11	1204.36	1204.53	1205.04	1205.41	1205.72	1205.94	1206.15	1206.55	1207.07	1207.24	1207.18		
PIPELINE INVERT LEVEL (m.a.s.l)	1206.19	1205.55	1205.12	1204.70	1204.28	1203.83	1203.38	1203.20	1202.99	1202.53	1202.39	1202.20	1201.90	1201.86	1201.87	1202.14	1202.13	1202.48	1202.84	1203.11	1203.21	1203.62	1204.03	1204.32	1204.60	1204.88	1205.16	1205.44	1205.58	1205.71	**1205.76**	1205.80
TRENCH DEPTH (m)	1.25	1.31	1.33	1.33	1.28	1.30	1.32	1.29	1.28	1.36	1.34	1.35	1.31	1.27	1.28	1.31	1.37	1.36	1.27	1.25	1.32	1.42	1.38	1.40	1.34	1.27	1.39	1.63	1.65	1.48	**1.43**	1.53
PIPE DATA	PIPE DIAMETER AND MATERIAL: HDPE DN 160mm AND 110mm														GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD																	



0 1000 2000

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH–OUT (W.O)

END CHAINAGE

START CHAINAGE

REVISIONS

DESCRIPTION	DATE

Consultant:

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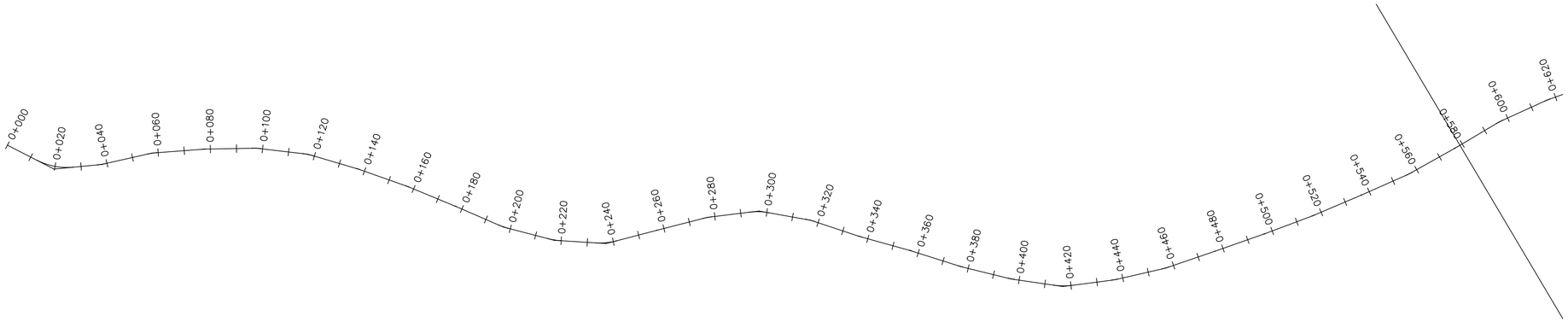
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

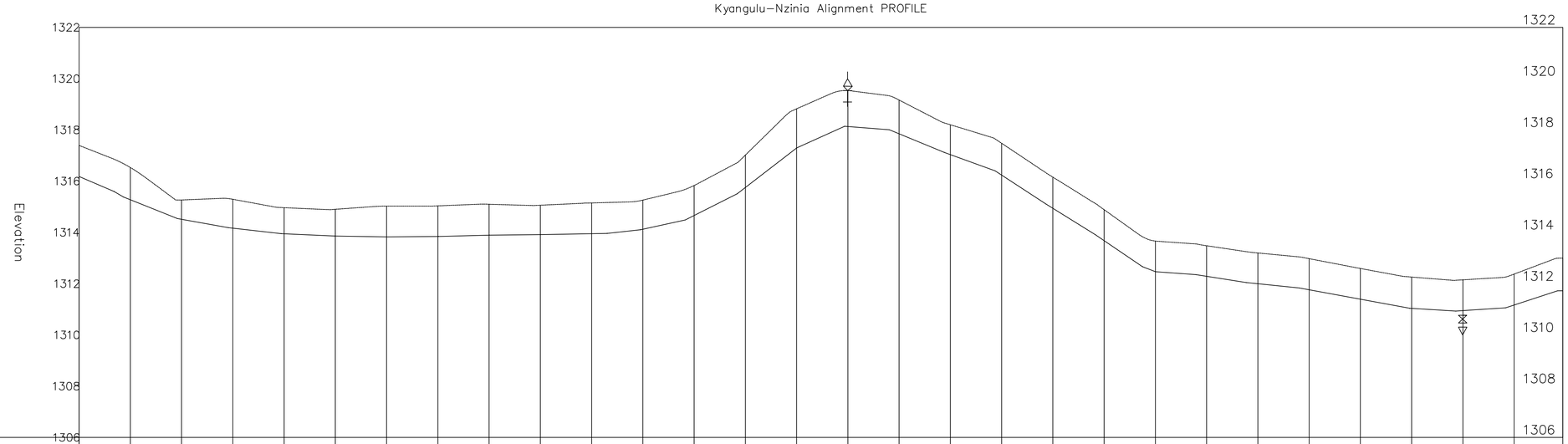
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KYANGULU TO KABATI DISTRIBUTION PIPELINE PROFILE DN 160mm AND DN 110mm

Stage:	FINAL DETAILED DESIGN
Date:	DECEMBER 2021
Drawing No.	TCE–KDP–KK–017
Scale:	VERT–1:200 HOR–1:2000
Sheet No.	17 of 17
Index No.	



Kyangulu–Nzinia Alignment PROFILE



CHAINAGE	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
ORIGINAL GROUND LEVEL (m.a.s.l) 1317.39	1316.53	1315.26	1315.29	1314.96	1314.90	1315.03	1315.04	1315.10	1315.06	1315.15	1315.26	1315.83	1317.02	1318.82	1319.53	1319.16	1318.20	1317.48	1316.16	1314.89	1313.66	1313.48	1313.20	1312.98	1312.59	1312.26	1312.15	1312.37
PIPELINE INVERT LEVEL (m.a.s.l)	1315.27	1314.51	1314.16	1313.95	1313.86	1313.82	1313.84	1313.89	1313.92	1313.95	1314.12	1314.66	1315.75	1317.29	1318.13	1317.85	1317.04	1316.24	1314.94	1313.68	1312.47	1312.28	1311.99	1311.76	1311.39	1311.03	1310.95	1311.16
TRENCH DEPTH (m)	1.26	0.76	1.13	1.02	1.04	1.20	1.19	1.21	1.15	1.20	1.14	1.17	1.27	1.53	1.40	1.32	1.16	1.24	1.22	1.21	1.20	1.19	1.20	1.22	1.20	1.22	1.20	1.21

PIPE DATA																												
	PIPE DIAMETER AND MATERIAL: HDPE DN 110mm														GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD													

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH–OUT (W.O)

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

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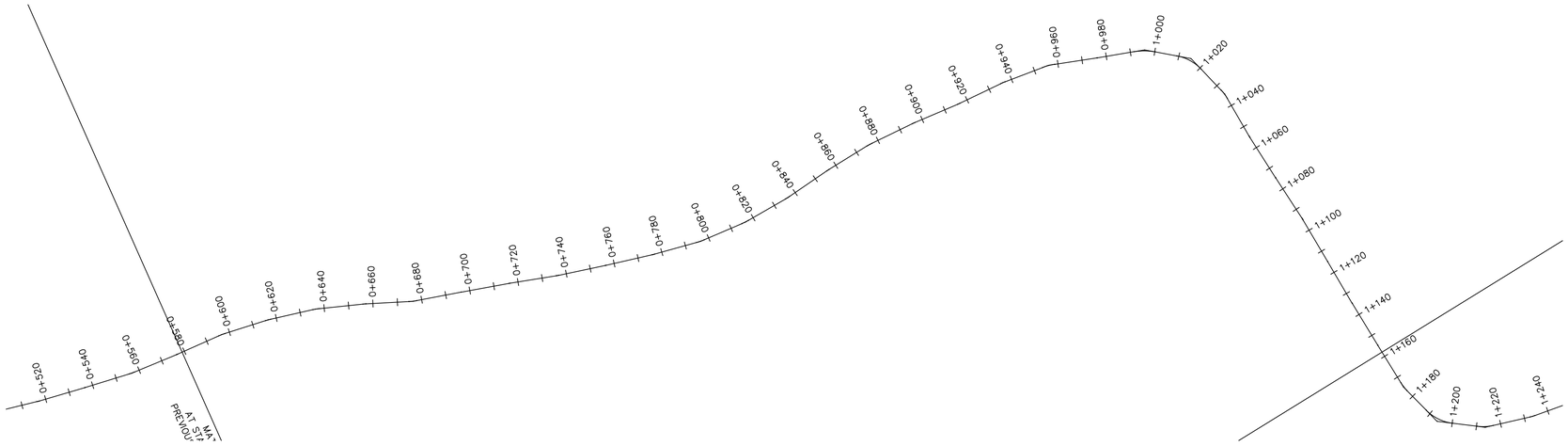
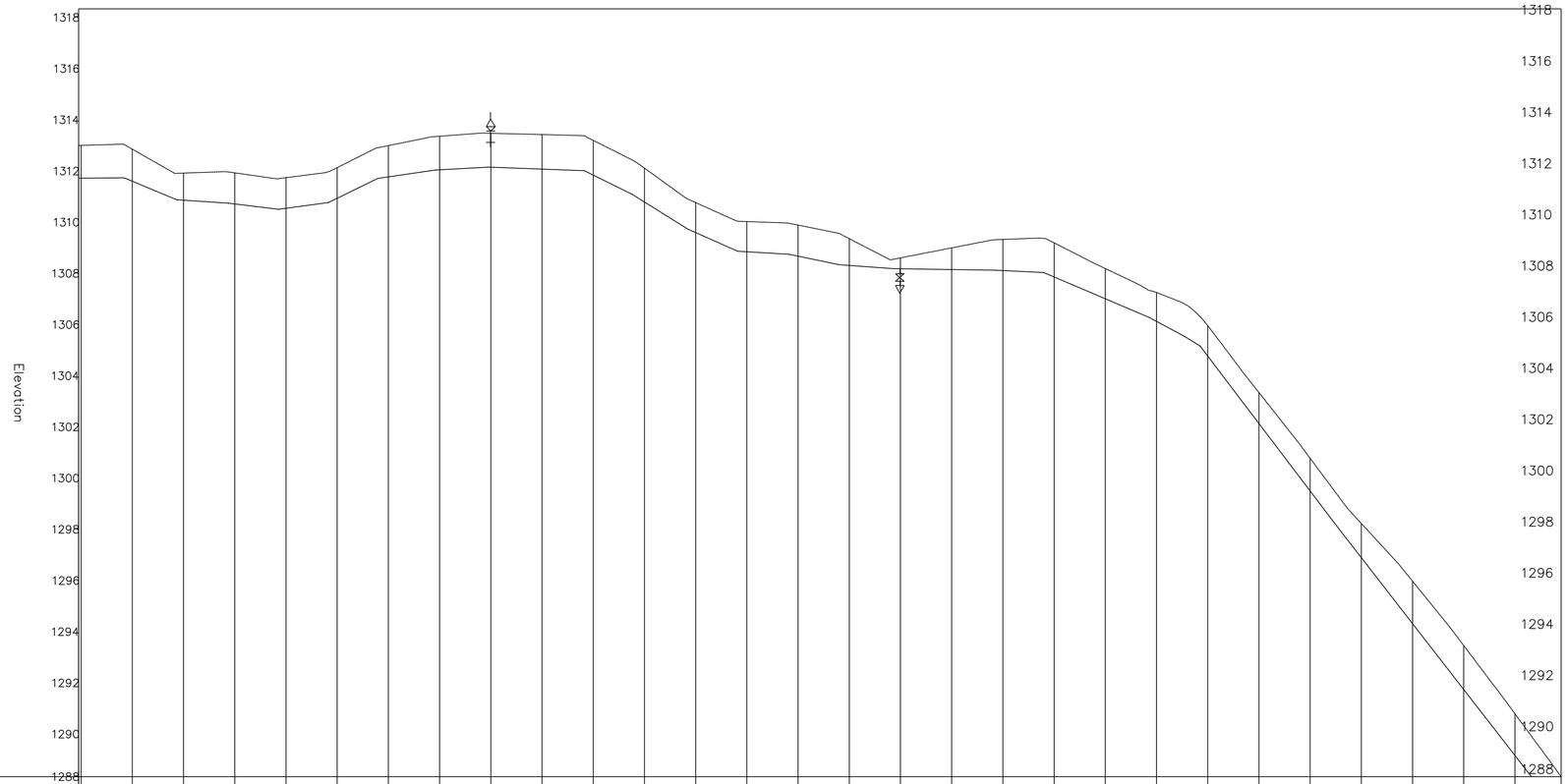
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

Project:	CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA
Drawing Title:	KYANGULU TO NZINIA DISTRIBUTION PIPELINE PROFILE DN 110mm

Stage:	FINAL DETAILED DESIGN
Date:	NOVEMBER 2021
Drawing No.	TCE–KDP–KN–001
Scale:	VERT–1:200 HOR–1:2000
Sheet No.	1 of 6
Index No.	



Kyangulu–Nzinia Alignment PROFILE



CHAINAGE	ORIGINAL GROUND LEVEL (m.a.s.l)	PIPELINE INVERT LEVEL (m.a.s.l)	TRENCH DEPTH (m)
0+580	1313.00	1311.72	1.28
0+600	1312.85	1311.60	1.25
0+620	1311.92	1310.86	1.06
0+640	1311.93	1310.71	1.22
0+660	1311.74	1310.54	1.20
0+680	1312.13	1310.94	1.20
0+700	1312.99	1311.77	1.22
0+720	1313.36	1312.05	1.31
0+740	1313.47	1312.15	1.33
0+760	1313.43	1312.07	1.35
0+780	1313.20	1311.84	1.36
0+800	1312.11	1310.79	1.32
0+820	1310.77	1309.59	1.17
0+840	1310.02	1308.84	1.18
0+860	1309.89	1308.67	1.22
0+880	1309.36	1308.31	1.05
0+900	1308.61	1308.18	0.43
0+920	1309.00	1308.15	0.85
0+940	1309.33	1308.11	1.21
0+960	1309.19	1307.86	1.34
0+980	1308.19	1307.01	1.18
1+000	1307.25	1306.13	1.13
1+020	1305.96	1304.77	1.19
1+040	1303.34	1302.13	1.21
1+060	1300.77	1299.49	1.28
1+080	1298.23	1296.89	1.34
1+100	1295.97	1294.31	1.66
1+120	1293.45	1291.74	1.72
1+140	1290.79	1289.16	1.63
	1288.33	1286.84	1.49

PIPE DATA: PIPE DIAMETER AND MATERIAL: HDPE DN 110mm

GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH–OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS

DESCRIPTION	DATE

Consultant:

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Project Manager:

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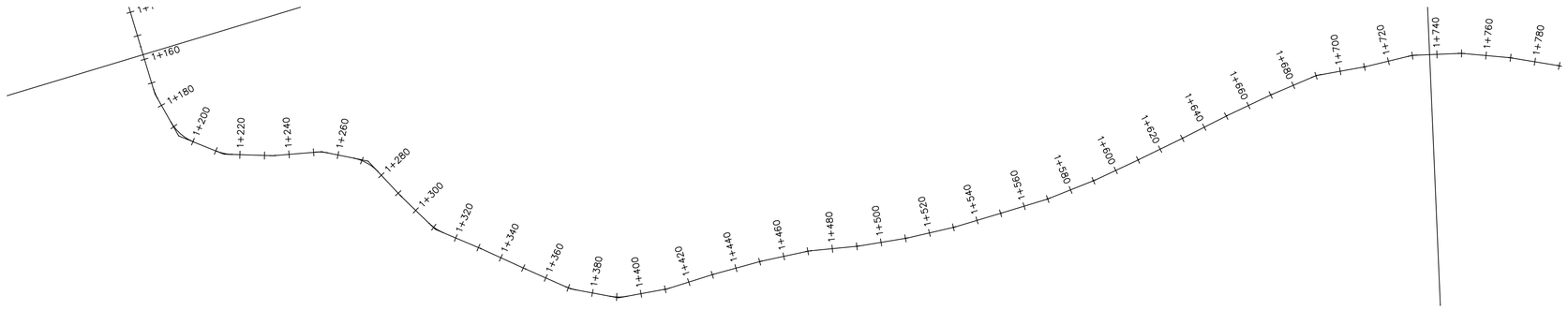
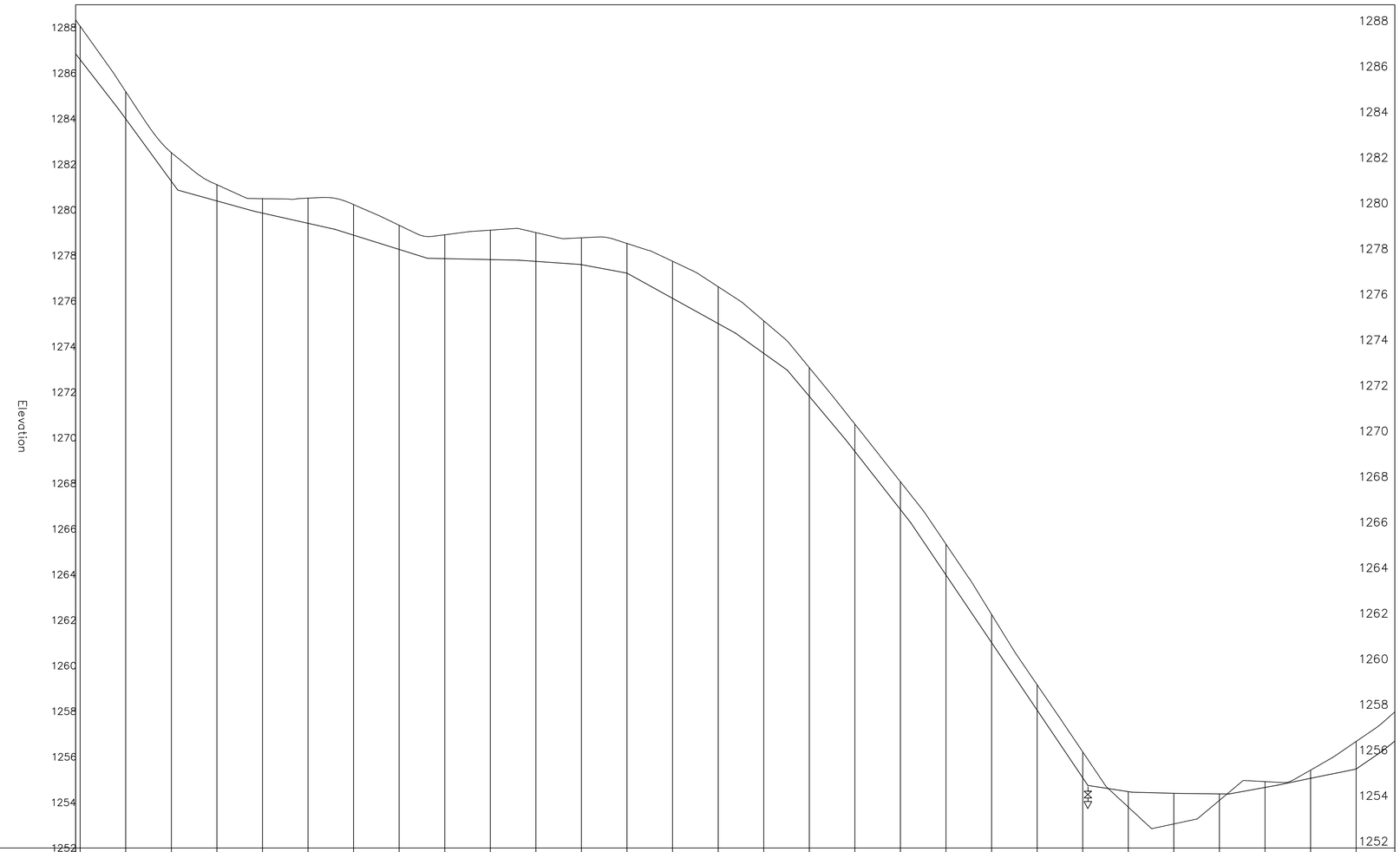
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

Project:	CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA
Drawing Title:	KYANGULO TO NZINIA DISTRIBUTION PIPELINE PROFILE DN 110mm

Stage:	FINAL DETAILED DESIGN
Date:	NOVEMBER 2021
Drawing No.	TCE–KDP–KN–002
Scale:	VERT–1:200 HOR–1:2000
Sheet No.	2 of 6
Index No.	



Kyangulu–Nzinia Alignment PROFILE



CHAINAGE	ORIGINAL GROUND LEVEL (m.a.s.l)	PIPELINE INVERT LEVEL (m.a.s.l)	TRENCH DEPTH (m)
1+160	1288.73	1288.84	1.49
1+180	1285.18	1283.98	1.20
1+200	1282.51	1281.26	1.25
1+220	1281.10	1280.39	0.71
1+240	1280.49	1279.86	0.63
1+260	1280.51	1279.41	1.10
1+280	1280.23	1278.89	1.34
1+300	1279.32	1278.26	1.06
1+320	1278.90	1277.86	1.05
1+340	1279.11	1277.82	1.29
1+360	1279.00	1277.74	1.26
1+380	1278.77	1277.59	1.18
1+400	1278.52	1277.22	1.30
1+420	1277.74	1276.12	1.63
1+440	1276.63	1275.01	1.62
1+460	1275.13	1273.71	1.43
1+480	1273.08	1271.82	1.26
1+500	1270.60	1269.40	1.20
1+520	1268.07	1266.85	1.22
1+540	1265.33	1263.98	1.35
1+560	1262.25	1261.01	1.24
1+580	1259.16	1258.04	1.12
1+600	1256.22	1255.08	1.14
1+620	1253.79	1254.47	−0.68
1+640	1253.06	1254.40	−1.34
1+660	1254.09	1254.37	−0.28
1+680	1254.91	1254.66	0.26
1+700	1255.42	1255.06	0.36
1+720	1256.67	1255.47	1.21
	1257.97	1256.69	1.29

PIPE DATA: PIPE DIAMETER AND MATERIAL: HDPE DN 110mm — GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH–OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS

DESCRIPTION	DATE

Consultant:
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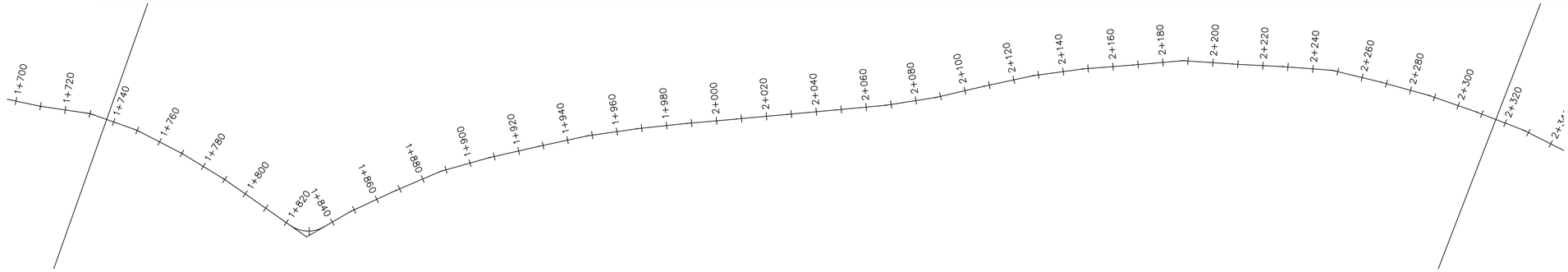
Designed:	D. Liambila
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

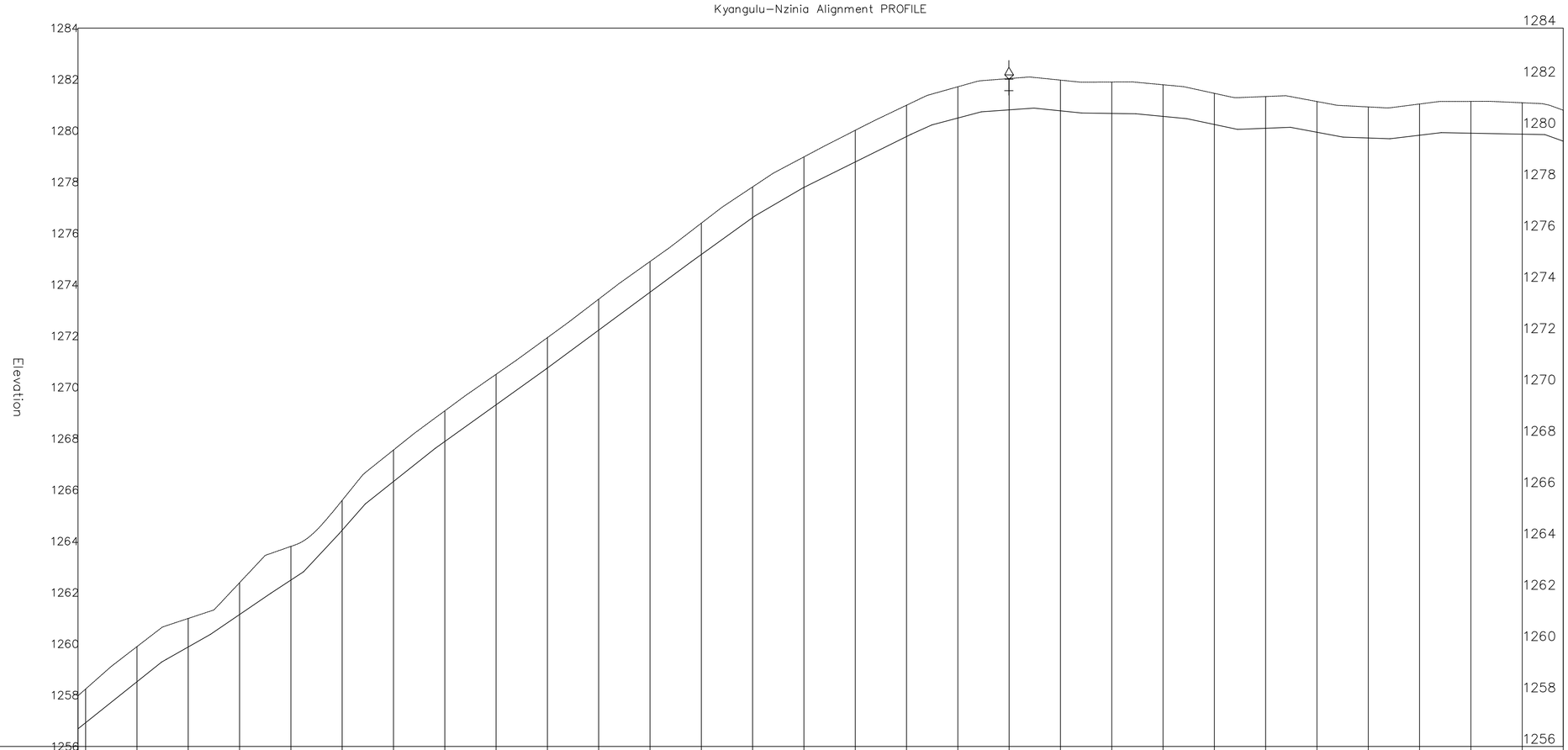
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KYANGULO TO NZINIA DISTRIBUTION PIPELINE PROFILE DN 110mm

Stage:	FINAL DETAILED DESIGN
Date:	NOVEMBER 2021
Drawing No.	TCE–KDP–KN–003
Scale:	VERT–1:200 HOR–1:2000
Sheet No.	3 of 6
Index No.	



Kyangulu–Nzinia Alignment PROFILE



CHAINAGE	ORIGINAL GROUND LEVEL (m.a.s.l)	PIPELINE INVERT LEVEL (m.a.s.l)	TRENCH DEPTH (m)
1+740	1257.87	1256.89	1.29
1+760	1259.89	1258.52	1.37
1+780	1260.99	1259.88	1.11
1+800	1262.38	1261.14	1.24
1+820	1263.80	1262.48	1.31
1+840	1265.59	1264.43	1.17
1+860	1267.55	1266.33	1.23
1+880	1269.08	1267.89	1.19
1+900	1270.50	1269.32	1.19
1+920	1271.93	1270.75	1.18
1+940	1273.43	1272.23	1.21
1+960	1274.90	1273.70	1.20
1+980	1276.39	1275.17	1.22
2+000	1277.81	1276.61	1.20
2+020	1278.98	1277.79	1.19
2+040	1280.01	1278.78	1.23
2+060	1280.99	1279.77	1.22
2+080	1281.71	1280.49	1.22
2+100	1282.03	1280.81	1.22
2+120	1281.97	1280.77	1.20
2+140	1281.90	1280.67	1.23
2+160	1281.79	1280.55	1.23
2+180	1281.45	1280.24	1.21
2+200	1281.33	1280.09	1.24
2+220	1281.14	1279.94	1.20
2+240	1280.92	1279.72	1.21
2+260	1281.04	1279.82	1.22
2+280	1281.14	1279.90	1.24
2+300	1281.09	1279.86	1.23
	1280.80	1279.59	1.21

PIPE DATA: PIPE DIAMETER AND MATERIAL: HDPE DN 110mm

GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH–OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

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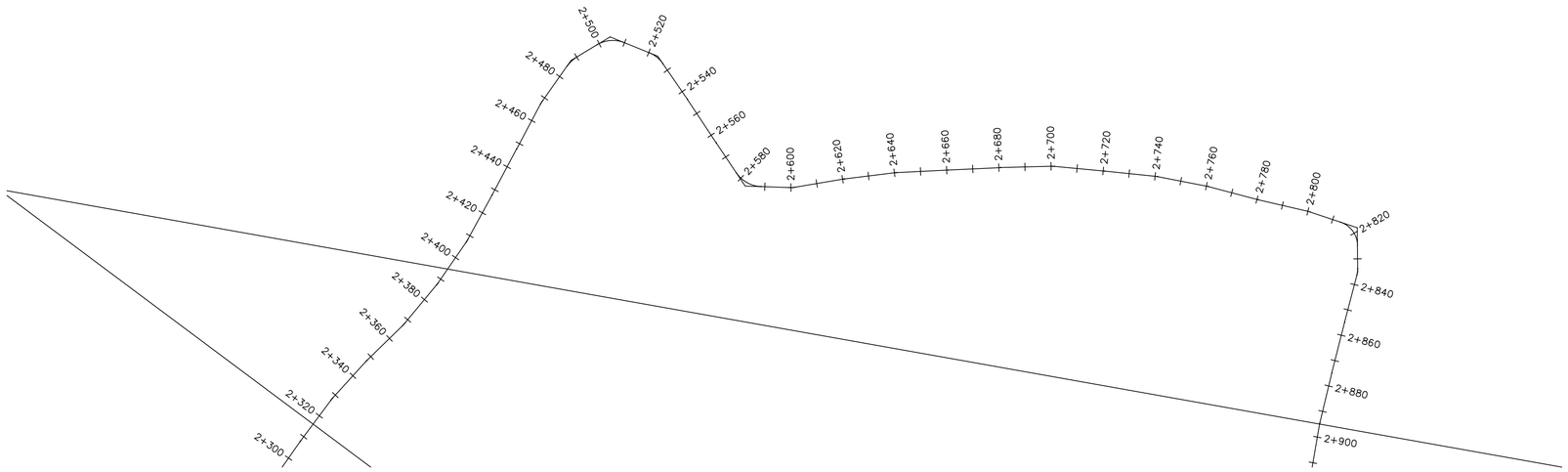
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

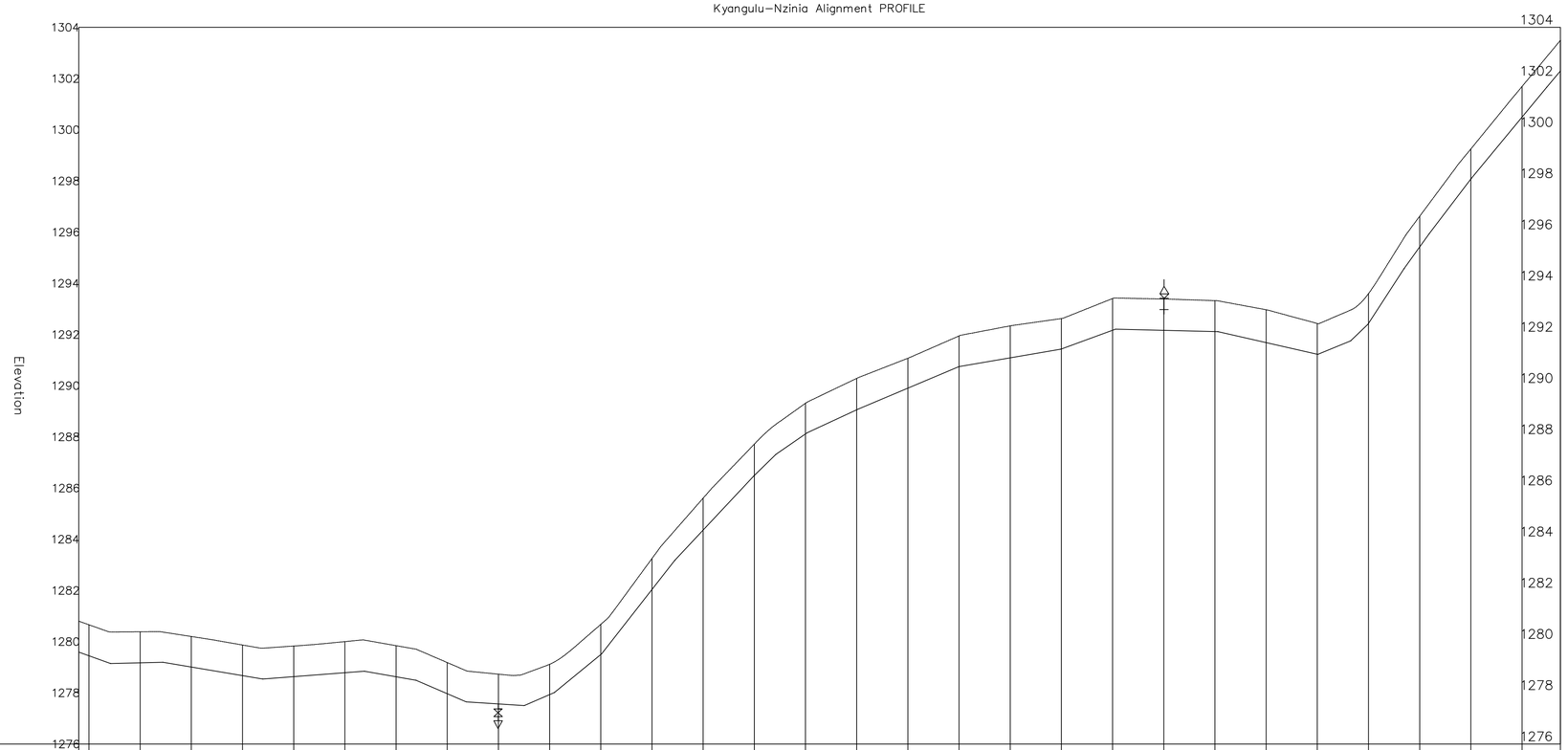
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KYANGULU TO NZINIA DISTRIBUTION PIPELINE PROFILE DN 110mm

Stage:	FINAL DETAILED DESIGN
Date:	NOVEMBER 2021
Drawing No.	TCE–KDP–KN–004
Scale:	VERT–1:200 HOR–1:2000
Sheet No.	4 of 6
Index No.	



Kyangulu–Nzinia Alignment PROFILE



CHAINAGE	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	
ORIGINAL GROUND LEVEL (m.a.s.l)	1280.80	1280.38	1280.20	1279.87	1279.83	1280.00	1279.84	1279.18	1278.73	1279.11	1280.67	1283.25	1285.61	1287.72	1289.31	1290.28	1291.07	1291.94	1292.34	1292.62	1293.41	1293.39	1293.32	1292.97	1292.43	1293.60	1296.62	1299.25	1301.69	1303.49
PIPELINE INVERT LEVEL (m.a.s.l)	1279.59	1279.17	1279.01	1278.67	1278.63	1278.78	1278.63	1277.97	1277.57	1277.93	1279.49	1282.04	1284.36	1286.49	1288.11	1289.06	1289.90	1290.74	1291.09	1291.43	1292.17	1292.16	1292.11	1291.68	1291.22	1292.43	1295.42	1298.07	1300.49	1302.30
TRENCH DEPTH (m)	1.21	1.21	1.19	1.19	1.20	1.22	1.21	1.21	1.16	1.18	1.18	1.21	1.25	1.22	1.20	1.23	1.17	1.20	1.25	1.19	1.24	1.22	1.21	1.28	1.20	1.17	1.20	1.18	1.20	1.20
PIPE DATA	PIPE DIAMETER AND MATERIAL: HDPE DN 110mm														GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD															

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH–OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

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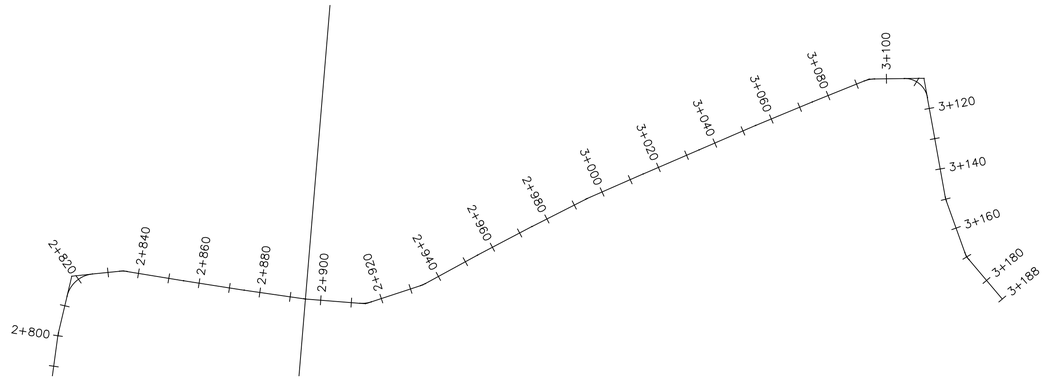
email: info@tanathi.go.ke

Designed:	D. Liambila
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

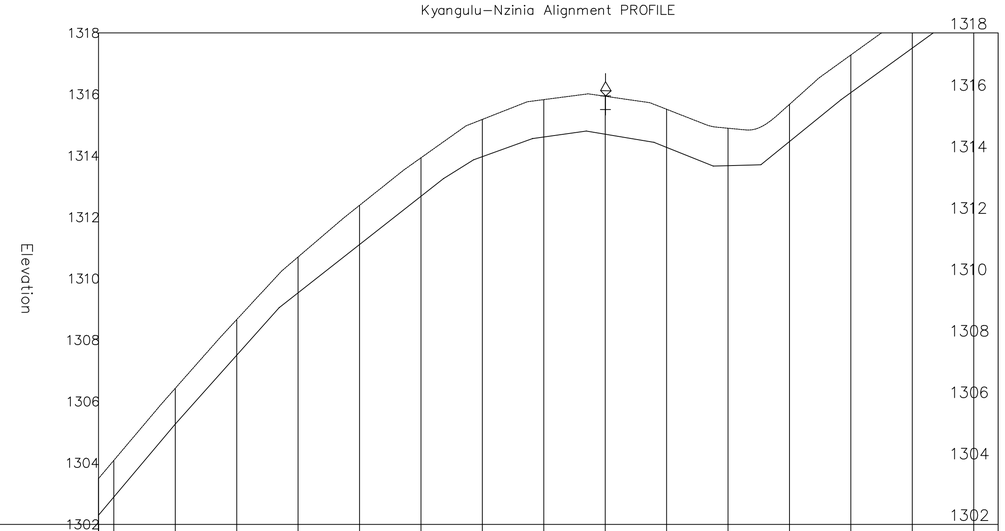
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KYANGULU TO NZINIA DISTRIBUTION PIPELINE PROFILE DN 110mm

Stage:	FINAL DETAILED DESIGN
Date:	NOVEMBER 2021
Drawing No.	TCE–KDP–KN–005
Scale:	VERT–1:200 HOR–1:2000
Sheet No.	5 of 6
Index No.	



Kyangulu–Nzinia Alignment PROFILE



CHAINAGE	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	
ORIGINAL GROUND LEVEL (m.a.s.l)	1303.49 1304.08	1306.43	1308.67	1310.71	1312.39	1313.93	1315.18	1315.83	1315.94	1315.51	1314.90	1315.67	1317.28	1318.73	1319.85	1320.15
PIPELINE INVERT LEVEL (m.a.s.l)	1302.30 1302.89	1305.27	1307.51	1309.54	1311.11	1312.68	1313.97	1314.61	1314.70	1314.27	1313.68	1314.46	1316.06	1317.51	1318.64	1318.95
TRENCH DEPTH (m)	1.20 1.19	1.16	1.16	1.17	1.28	1.25	1.21	1.22	1.23	1.24	1.22	1.21	1.22	1.22	1.21	1.21
PIPE DATA	PIPE DIAMETER AND MATERIAL: HDPE DN 110mm							GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD								

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH–OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

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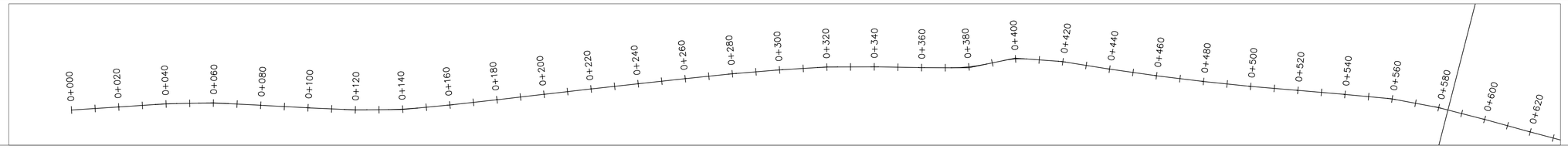
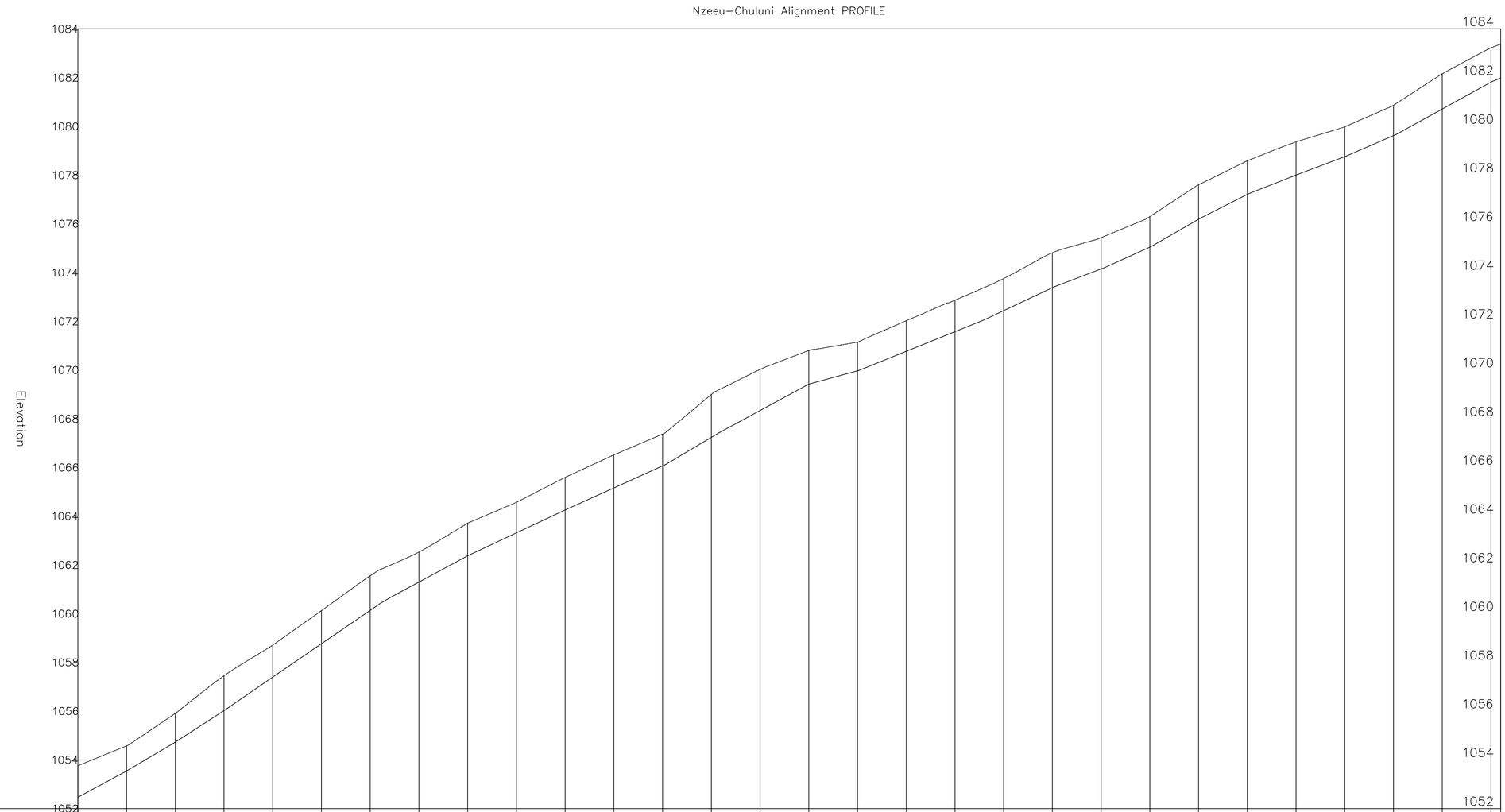
Checked:	D. Liambila
Approved:	B. Kim

Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KYANGULU TO NZINIA DISTRIBUTION PIPELINE PROFILE DN 110mm

Stage:	FINAL DETAILED DESIGN
Date:	NOVEMBER 2021
Drawing No.	TCE–KDP–KN–006
Scale:	VERT–1:200 HOR–1:2000
Sheet No.	6 of 6
Index No.	





CHAINAGE		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	
ORIGINAL GROUND LEVEL (m.a.s.l)	1053.76	1054.57	1055.91	1057.45	1058.71	1060.12	1061.56	1062.53	1063.72	1064.57	1065.60	1066.51	1067.37	1068.99	1070.02	1070.80	1071.14	1072.02	1072.86	1073.75	1074.81	1075.43	1076.30	1077.60	1078.59	1079.37	1079.98	1080.87	1082.16	1083.22	1083.38
PIPELINE INVERT LEVEL (m.a.s.l)	1052.46	1053.55	1054.73	1056.02	1057.40	1058.76	1060.13	1061.30	1062.38	1063.32	1064.25	1065.16	1066.07	1067.24	1068.34	1069.42	1069.97	1070.77	1071.57	1072.44	1073.38	1074.15	1075.04	1076.19	1077.21	1078.00	1078.76	1079.62	1080.71	1081.81	1081.99
TRENCH DEPTH (m)	1.29	1.03	1.18	1.43	1.31	1.36	1.42	1.23	1.34	1.25	1.34	1.35	1.31	1.76	1.68	1.38	1.18	1.26	1.29	1.32	1.43	1.28	1.25	1.41	1.37	1.36	1.22	1.25	1.45	1.41	1.39
PIPE DATA		PIPE DIAMETER AND MATERIAL: HDPE DN 90mm														GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD															

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH–OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

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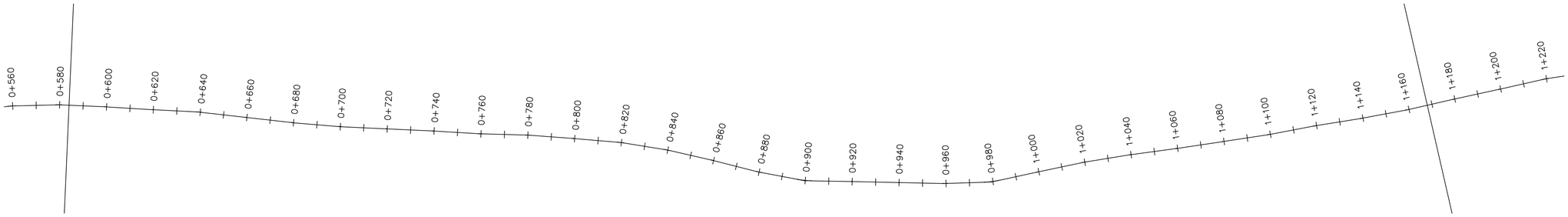
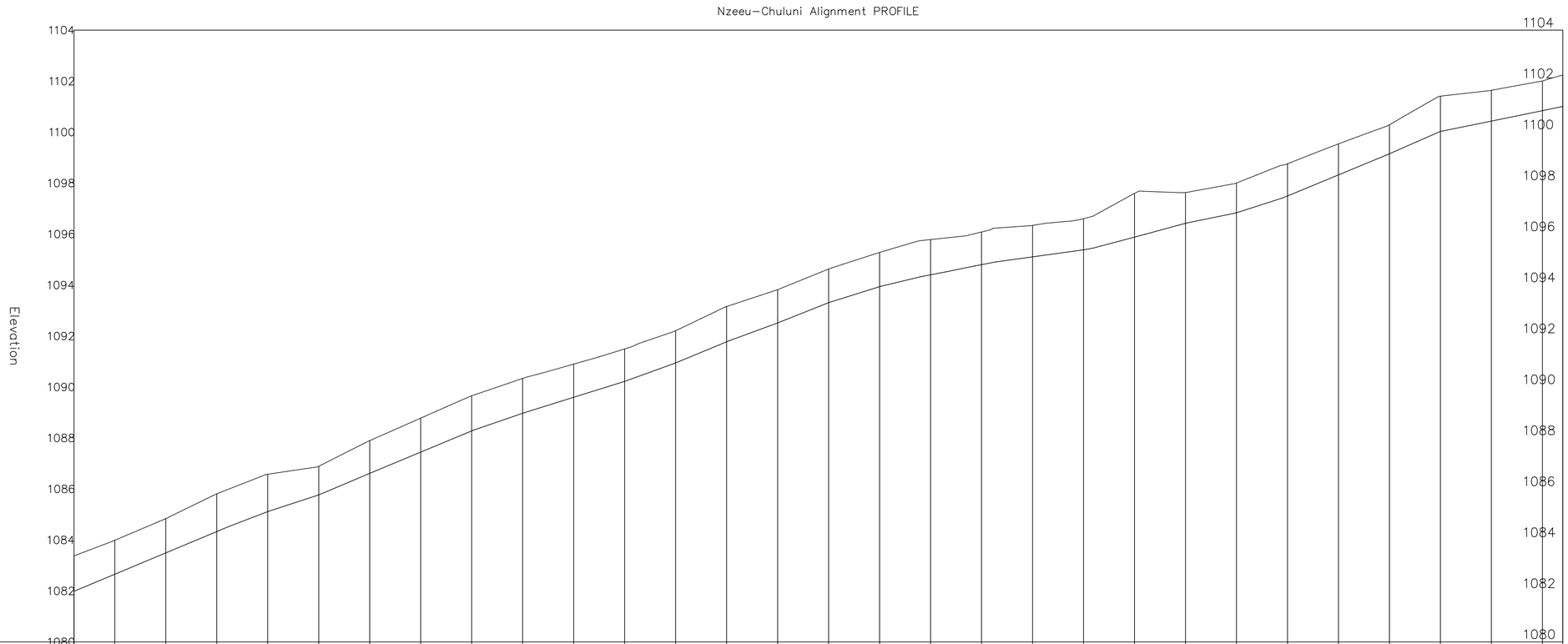
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: NZEU RIVER TO CHULUNI 1 DISTRIBUTION PIPELINE PROFILE DN 90mm

Stage:	FINAL DETAILED DESIGN
Date:	NOVEMBER 2021
Drawing No.	TCE–KDP–NC1–001
Scale:	VERT–1:200 HOR–1:2000
Sheet No.	1 of 5
Index No.	





CHAINAGE		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	
ORIGINAL GROUND LEVEL (m.a.s.l)	1083.38	1083.99	1084.84	1085.81	1086.58	1086.89	1087.90	1088.78	1089.66	1090.34	1090.90	1091.49	1092.21	1093.16	1093.82	1094.63	1095.28	1095.78	1096.08	1096.34	1096.60	1097.60	1097.63	1098.00	1098.76	1099.54	1100.29	1101.41	1101.64	1102.01	1102.24
PIPELINE INVERT LEVEL (m.a.s.l)	1081.99	1082.65	1083.49	1084.33	1085.11	1085.77	1086.61	1087.45	1088.28	1088.97	1089.59	1090.22	1090.94	1091.77	1092.51	1093.31	1093.93	1094.40	1094.80	1095.11	1095.38	1095.88	1096.42	1096.83	1097.49	1098.32	1099.15	1100.03	1100.43	1100.84	1101.01
TRENCH DEPTH (m)	1.39	1.33	1.34	1.48	1.46	1.12	1.28	1.33	1.38	1.37	1.30	1.27	1.27	1.38	1.30	1.32	1.34	1.38	1.28	1.23	1.22	1.72	1.21	1.17	1.26	1.22	1.14	1.38	1.21	1.16	1.23
PIPE DATA		PIPE DIAMETER AND MATERIAL: HDPE DN 90mm														GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD															

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH–OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS

DESCRIPTION	DATE

Consultant:

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Project Manager:

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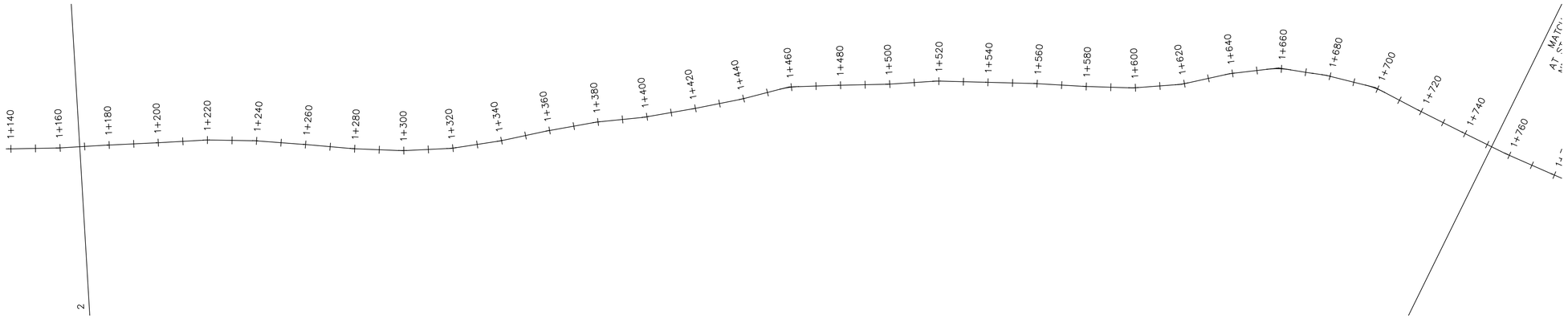
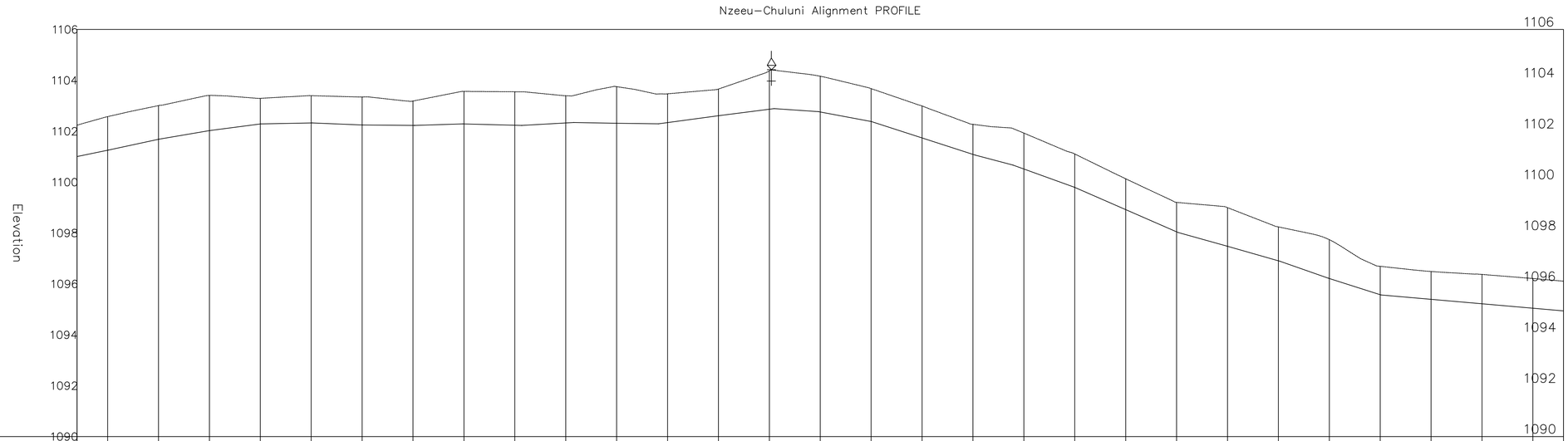
Designed:	D. Liambila
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: NZEU RIVER TO CHULUNI 1 DISTRIBUTION PIPELINE PROFILE DN 90mm

Stage:	FINAL DETAILED DESIGN
Date:	NOVEMBER 2021
Drawing No.	TCE–KDP–NC1–002
Scale:	VERT–1:200 HOR–1:2000
Sheet No.	2 of 5
Index No.	





CHAINAGE	1+180	1+200	1+220	1+240	1+260	1+280	1+300	1+320	1+340	1+360	1+380	1+400	1+420	1+440	1+460	1+480	1+500	1+520	1+540	1+560	1+580	1+600	1+620	1+640	1+660	1+680	1+700	1+720	1+740	
ORIGINAL GROUND LEVEL (m.a.s.l) 1102.24	1102.57	1103.01	1103.41	1103.29	1103.40	1103.35	1103.19	1103.57	1103.55	1103.40	1103.75	1103.47	1103.66	1104.37	1104.16	1103.67	1103.00	1102.27	1101.93	1101.11	1100.13	1099.20	1099.00	1098.24	1097.74	1096.69	1096.49	1096.37	1096.21	1096.11
PIPELINE INVERT LEVEL (m.a.s.l) 1101.01	1101.25	1101.68	1102.03	1102.29	1102.33	1102.25	1102.23	1102.29	1102.24	1102.33	1102.31	1102.34	1102.61	1102.86	1102.76	1102.38	1101.74	1101.09	1100.51	1099.79	1098.92	1098.05	1097.48	1096.91	1096.21	1095.58	1095.39	1095.22	1095.04	1094.94
TRENCH DEPTH (m) 1.23	1.32	1.32	1.38	1.01	1.07	1.10	0.96	1.28	1.32	1.07	1.44	1.13	1.05	1.51	1.41	1.29	1.26	1.18	1.41	1.31	1.21	1.16	1.52	1.33	1.53	1.12	1.09	1.15	1.17	1.17
PIPE DATA	PIPE DIAMETER AND MATERIAL: HDPE DN 90mm														GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD															

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH–OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

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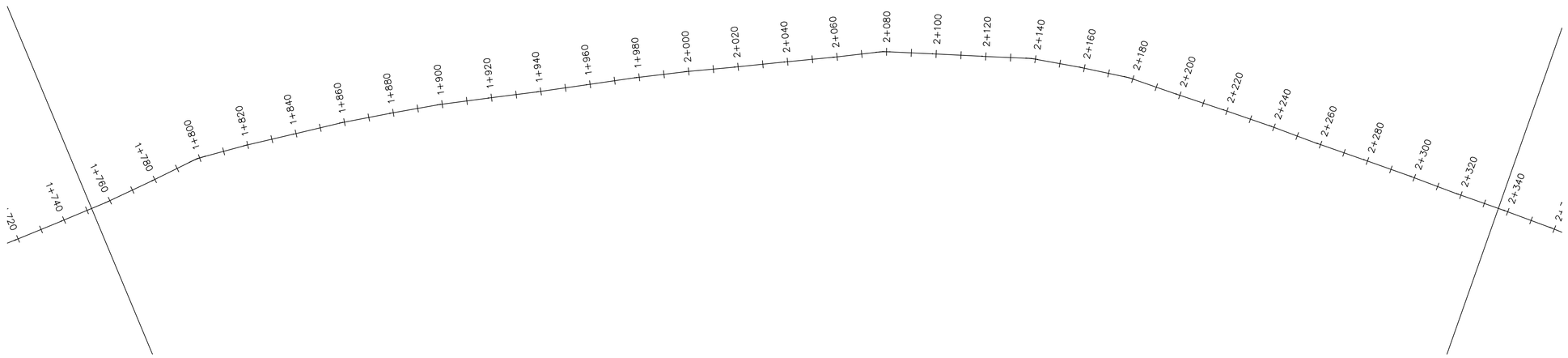
Designed:	D. Liambila
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

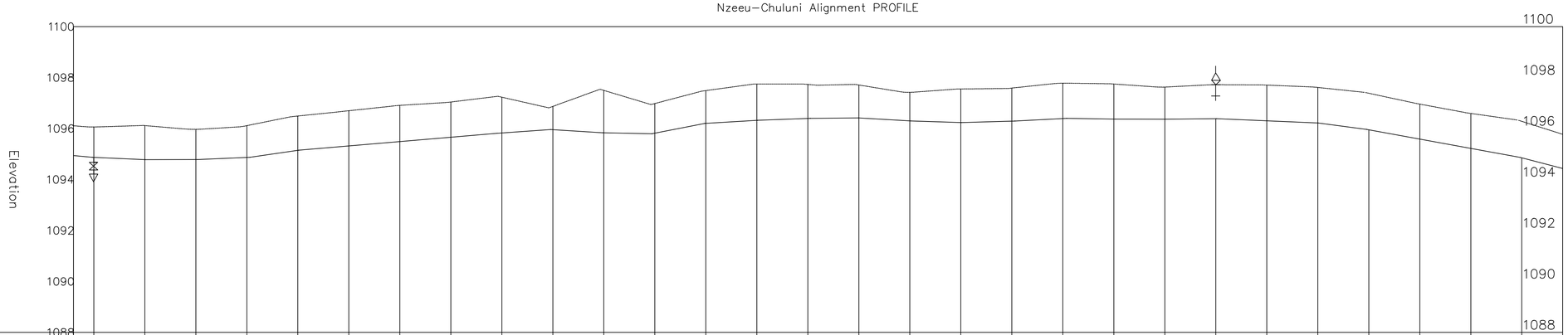
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: NZEU RIVER TO CHULUNI 1 DISTRIBUTION PIPELINE PROFILE DN 90mm

Stage:	FINAL DETAILED DESIGN
Date:	NOVEMBER 2021
Drawing No.	TCE–KDP–NC1–003
Scale:	VERT–1:200 HOR–1:2000
Sheet No.	3 of 5
Index No.	



Nzeeu–Chuluni Alignment PROFILE



CHAINAGE	1+760	1+780	1+800	1+820	1+840	1+860	1+880	1+900	1+920	1+940	1+960	1+980	2+000	2+020	2+040	2+060	2+080	2+100	2+120	2+140	2+160	2+180	2+200	2+220	2+240	2+260	2+280	2+300	2+320
ORIGINAL GROUND LEVEL (m.a.s.l)	1096.06	1096.12	1095.97	1096.11	1096.49	1096.70	1096.91	1097.04	1097.23	1096.87	1097.50	1096.98	1097.49	1097.74	1097.73	1097.71	1097.42	1097.55	1097.59	1097.78	1097.75	1097.63	1097.72	1097.70	1097.61	1097.38	1096.96	1096.59	1096.28
PIPELINE INVERT LEVEL (m.a.s.l)	1094.87	1094.78	1094.78	1094.87	1095.14	1095.32	1095.49	1095.66	1095.83	1095.95	1095.83	1095.82	1096.20	1096.32	1096.40	1096.42	1096.30	1096.23	1096.29	1096.39	1096.37	1096.36	1096.38	1096.30	1096.22	1095.95	1095.59	1095.22	1094.85
TRENCH DEPTH (m)	1.19	1.34	1.19	1.25	1.35	1.38	1.42	1.38	1.40	0.91	1.66	1.17	1.28	1.42	1.33	1.29	1.12	1.32	1.30	1.39	1.38	1.26	1.33	1.40	1.40	1.43	1.37	1.37	1.43
PIPE DATA	PIPE DIAMETER AND MATERIAL: HDPE DN 90mm														GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD														

1.17	1.34	1.43	1.34

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH–OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

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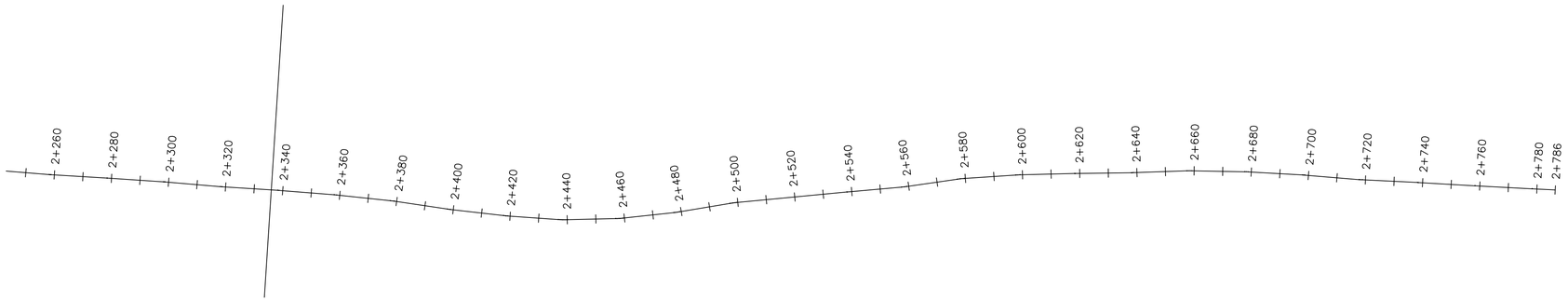
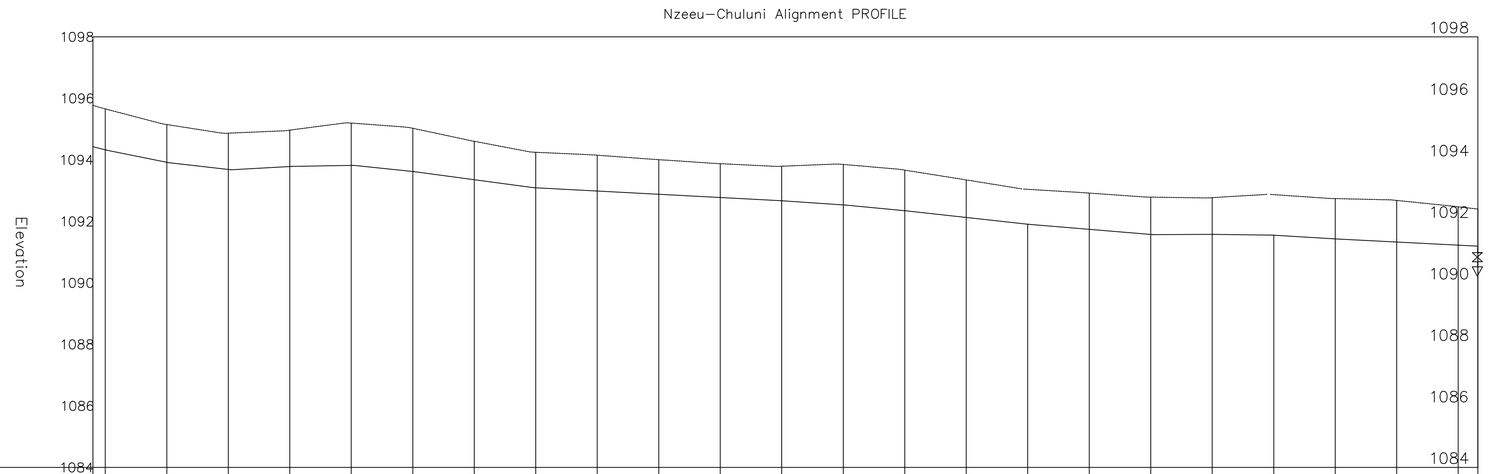
Designed:	D. Liambila
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: NZEU RIVER TO CHULUNI 1 DISTRIBUTION PIPELINE PROFILE DN 90mm

Stage:	FINAL DETAILED DESIGN
Date:	NOVEMBER 2021
Drawing No.	TCE–KDP–NC1–004
Scale:	VERT–1:200 HOR–1:2000
Sheet No.	4 of 5
Index No.	





CHAINAGE	ORIGINAL GROUND LEVEL (m.a.s.l)	PIPELINE INVERT LEVEL (m.a.s.l)	TRENCH DEPTH (m)
2+340	1095.77 / 1095.66	1094.43 / 1094.33	1.34 / 1.33
2+360	1095.15	1093.92	1.23
2+380	1094.87	1093.69	1.18
2+400	1094.97	1093.78	1.19
2+420	1095.20	1093.82	1.38
2+440	1095.03	1093.62	1.40
2+460	1094.60	1093.36	1.25
2+480	1094.25	1093.09	1.15
2+500	1094.15	1092.99	1.16
2+520	1094.01	1092.88	1.13
2+540	1093.88	1092.78	1.10
2+560	1093.79	1092.67	1.12
2+580	1093.85	1092.53	1.32
2+600	1093.67	1092.35	1.32
2+620	1093.35	1092.13	1.22
2+640	1093.04	1091.91	1.14
2+660	1092.92	1091.74	1.18
2+680	1092.79	1091.58	1.21
2+700	1092.77	1091.58	1.19
2+720	1092.87	1091.55	1.32
2+740	1092.74	1091.43	1.31
2+760	1092.68	1091.33	1.35
2+780	1092.47 / 1092.40	1091.23 / 1091.19	1.25 / 1.21

PIPE DATA	PIPE DIAMETER AND MATERIAL: HDPE DN 90mm	GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH–OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

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Project Manager:

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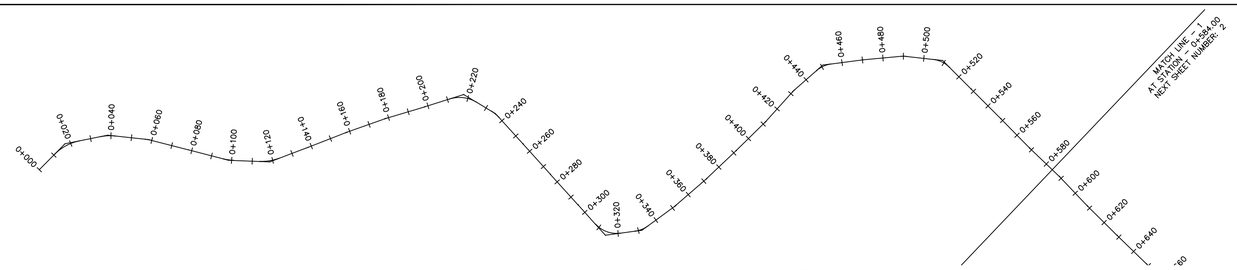
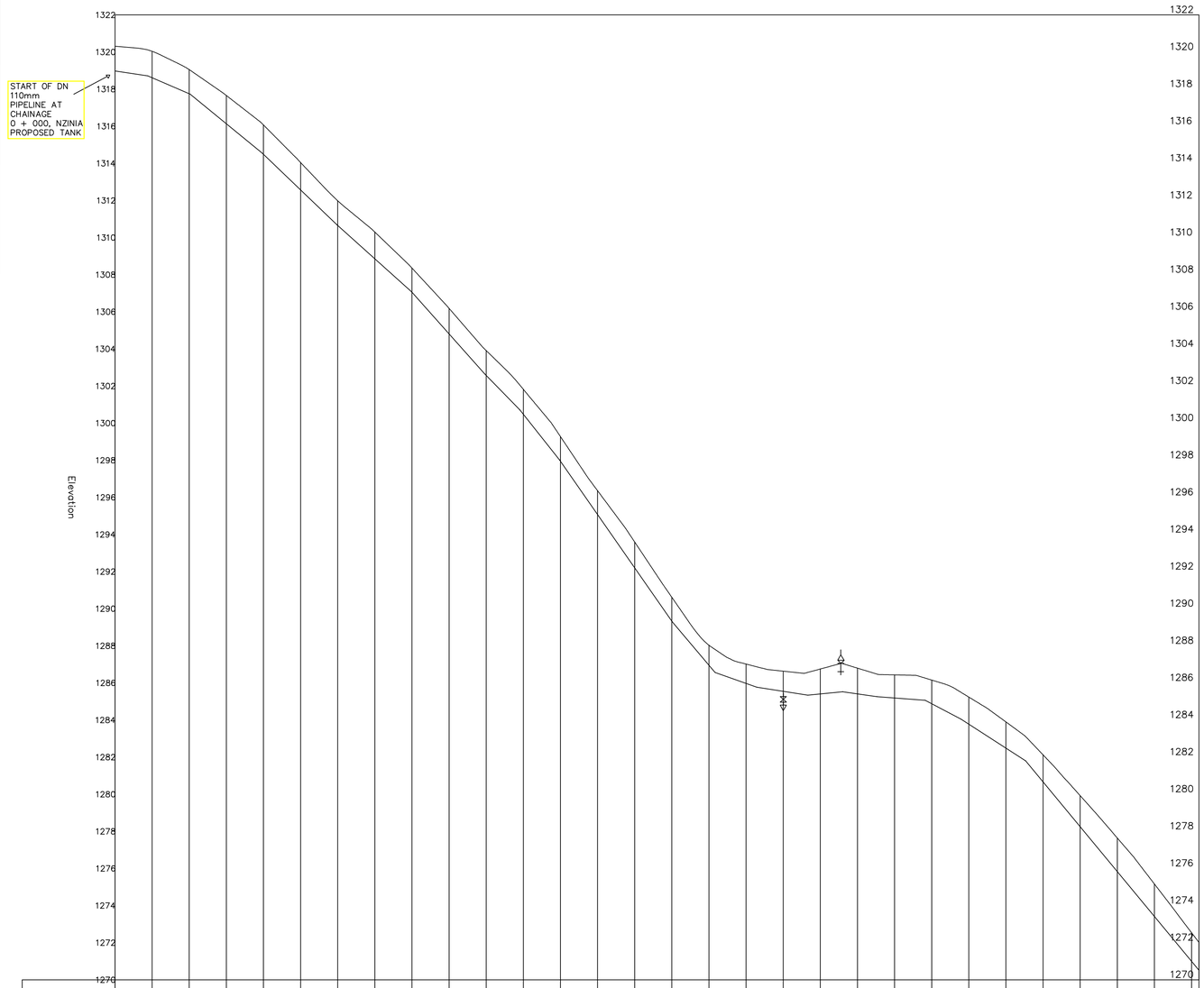
Designed:	D. Liambila
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

Project:	CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA
Drawing Title:	NZEU RIVER TO CHULUNI 1 DISTRIBUTION PIPELINE PROFILE DN 90mm

Stage:	FINAL DETAILED DESIGN
Date:	NOVEMBER 2021
Drawing No.	TCE–KDP–NC1–005
Scale:	VERT–1:200 HOR–1:2000
Sheet No.	5 of 5
Index No.	



Nzinia–Kalmbya Alignment PROFILE



CHAINAGE		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
ORIGINAL GROUND LEVEL (m.a.s.l)	1320.31	1320.04	1319.05	1317.66	1316.07	1314.04	1311.98	1310.29	1308.36	1306.18	1303.91	1301.82	1299.27	1296.36	1293.59	1290.61	1288.03	1287.01	1286.63	1286.75	1286.80	1286.43	1286.15	1285.24	1283.90	1282.12	1279.92	1277.64	1275.16	1272.54 1272.01
PIPELINE INVERT LEVEL (m.a.s.l)	1318.98	1318.62	1317.75	1316.13	1314.48	1312.57	1310.65	1308.85	1307.05	1304.81	1302.57	1300.47	1297.94	1295.07	1292.20	1289.33	1286.95	1285.97	1285.55	1285.40	1285.41	1285.19	1284.88	1283.77	1282.48	1280.67	1278.25	1275.83	1273.42	1271.00 1270.52
TRENCH DEPTH (m)	1.33	1.42	1.30	1.53	1.58	1.48	1.33	1.44	1.30	1.37	1.34	1.35	1.33	1.29	1.39	1.29	1.08	1.04	1.09	1.34	1.38	1.24	1.27	1.46	1.41	1.46	1.67	1.81	1.74	1.54 1.50
PIPE DATA	PIPE DIAMETER AND MATERIAL: HDPE DN 110mm, 90, AND 63mm														GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD															

0 1000 2000

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH–OUT (W.O)

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

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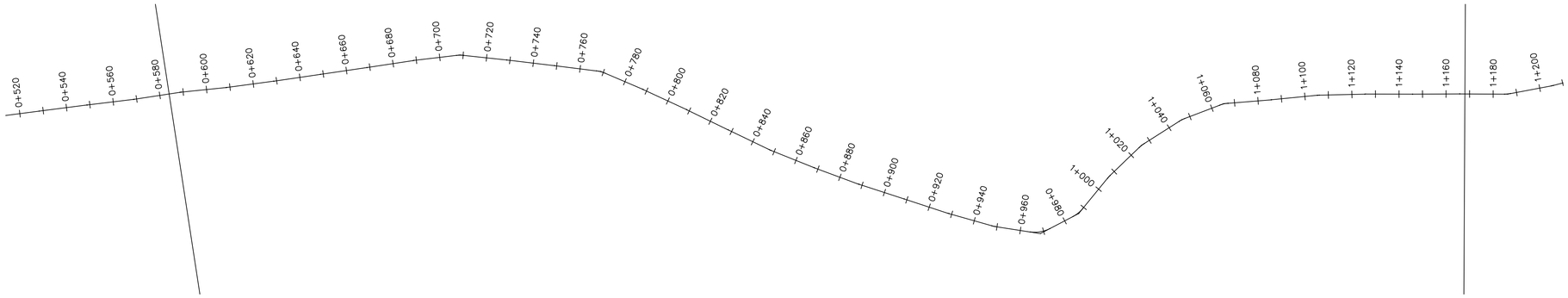
Designed:	D. Liambila
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

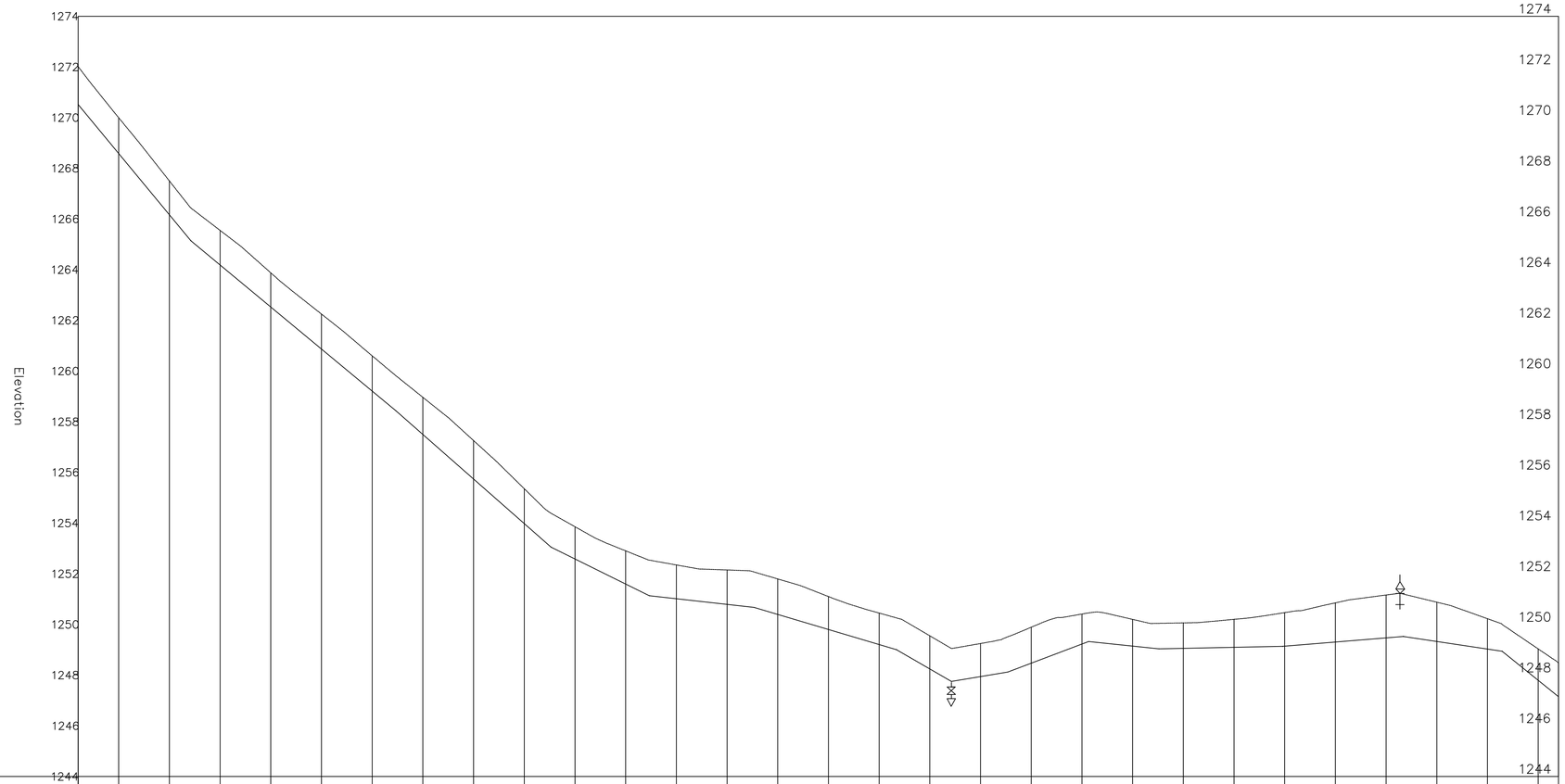
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: NZINIA–KAKEANI–KALAMBYA DISTRIBUTION PIPELINE PROFILE, DN 110, 90 AND 63mm

Stage:	FINAL DETAILED DESIGN
Date:	DECEMBER 2021
Drawing No.	TCE–KDP–NKK–001
Scale:	VERT–1:200 HOR–1:2000
Sheet No.	1 of 18
Index No.	



Nzinia–Kalmbya Alignment PROFILE



CHAINAGE		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	
ORIGINAL GROUND LEVEL (m.a.s.l)	1272.01	1270.00	1267.50	1265.55	1263.87	1262.25	1260.60	1258.96	1257.26	1255.36	1253.86	1252.90	1252.35	1252.15	1251.80	1251.10	1250.45	1249.55	1249.25	1249.89	1250.41	1250.20	1250.06	1250.20	1250.47	1250.85	1251.16	1250.88	1250.23	1249.03	1248.48
PIPELINE INVERT LEVEL (m.a.s.l)	1270.52	1268.58	1266.17	1264.19	1262.53	1260.87	1259.21	1257.50	1255.74	1253.98	1252.58	1251.59	1251.01	1250.79	1250.39	1249.80	1249.21	1248.24	1247.94	1248.47	1249.23	1249.15	1249.06	1249.10	1249.14	1249.31	1249.47	1249.33	1249.03	1247.80	1247.15
TRENCH DEPTH (m)	1.50	1.41	1.34	1.37	1.35	1.38	1.39	1.46	1.52	1.38	1.27	1.31	1.33	1.36	1.40	1.30	1.24	1.31	1.31	1.42	1.18	1.05	1.00	1.11	1.33	1.55	1.69	1.55	1.20	1.24	1.33
PIPE DATA	PIPE DIAMETER AND MATERIAL: HDPE DN 110mm, 90, AND 63mm														GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD																

0 1000 2000

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH–OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

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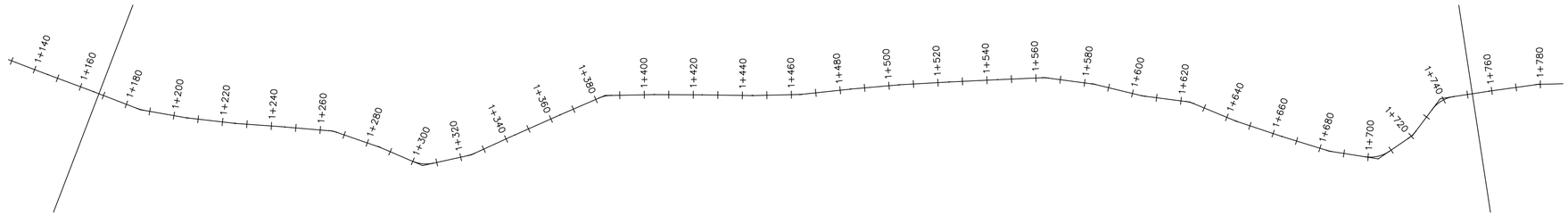
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

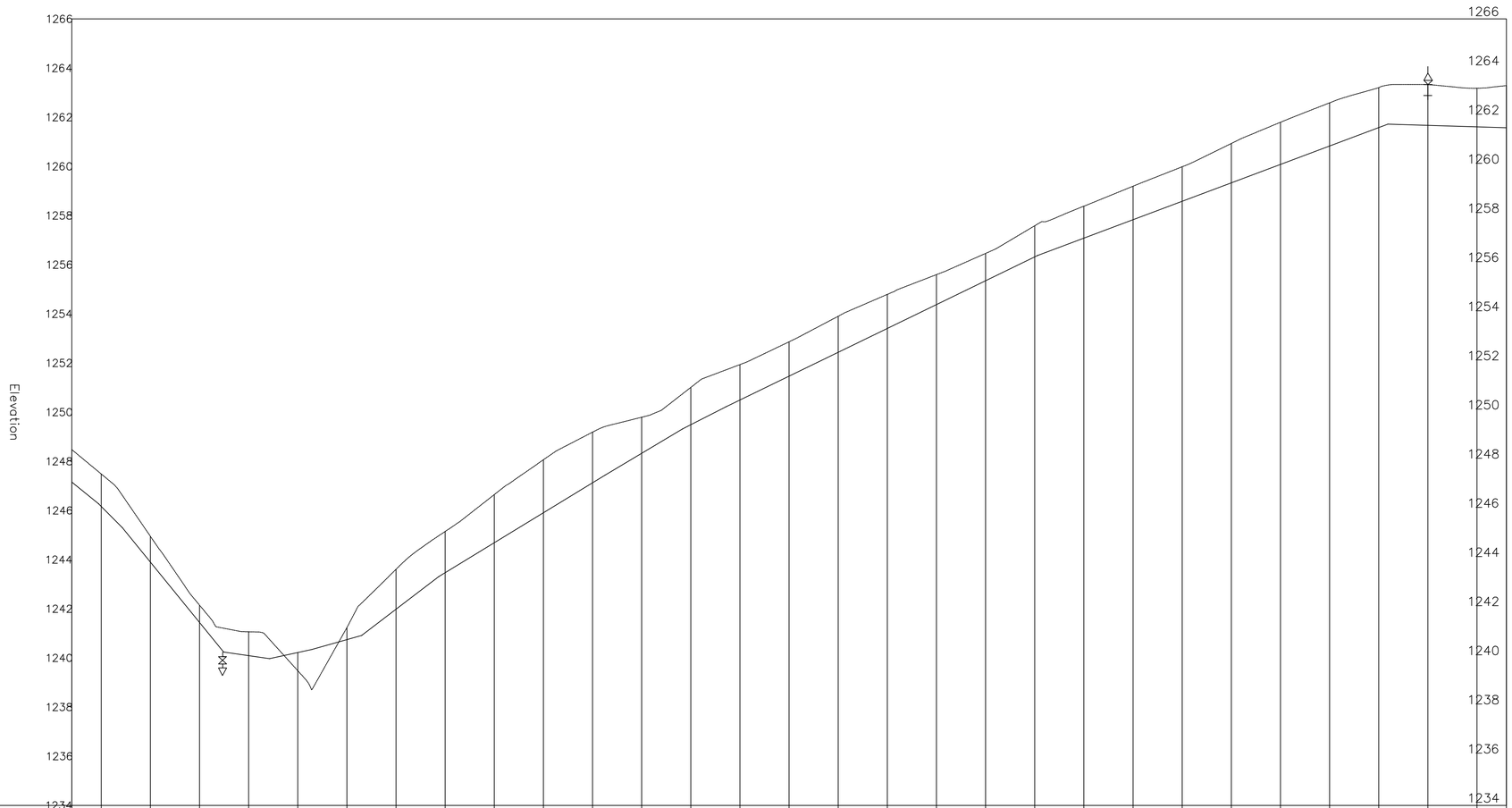
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: NZINIA–KAKEANI–KALAMBYA DISTRIBUTION PIPELINE PROFILE, DN 110mm, 90 AND 63mm

Stage:	FINAL DETAILED DESIGN
Date:	DECEMBER 2021
Drawing No.	TCE–KDP–KKK–002
Scale:	VERT–1:200 HOR–1:2000
Sheet No.	2 of 18
Index No.	



Nzinia–Kalmbya Alignment PROFILE



CHAINAGE		1+180	1+200	1+220	1+240	1+260	1+280	1+300	1+320	1+340	1+360	1+380	1+400	1+420	1+440	1+460	1+480	1+500	1+520	1+540	1+560	1+580	1+600	1+620	1+640	1+660	1+680	1+700	1+720	1+740	
ORIGINAL GROUND LEVEL (m.a.s.l)	1248.48	1247.48	1244.94	1242.15	1241.06	1239.48	1241.24	1243.61	1245.14	1246.65	1248.06	1249.19	1249.79	1251.01	1251.93	1252.86	1253.90	1254.79	1255.59	1256.46	1257.58	1258.38	1259.19	1259.98	1260.93	1261.79	1262.58	1263.20	1263.32	1263.18	1263.28
PIPELINE INVERT LEVEL (m.a.s.l)	1247.15	1246.16	1243.90	1241.44	1240.09	1240.22	1240.74	1241.98	1243.47	1244.69	1245.91	1247.13	1248.32	1249.49	1250.49	1251.47	1252.44	1253.41	1254.38	1255.35	1256.32	1257.08	1257.83	1258.58	1259.33	1260.08	1260.83	1261.58	1261.67	1261.61	1261.57
TRENCH DEPTH (m)	1.33	1.32	1.05	0.70	0.97	−0.74	0.49	1.63	1.68	1.96	2.16	2.06	1.47	1.52	1.44	1.40	1.47	1.38	1.22	1.11	1.27	1.30	1.36	1.40	1.60	1.71	1.75	1.63	1.65	1.57	1.72
PIPE DATA	PIPE DIAMETER AND MATERIAL: HDPE DN 110mm, 90, AND 63mm														GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD																

0 1000 2000

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH–OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

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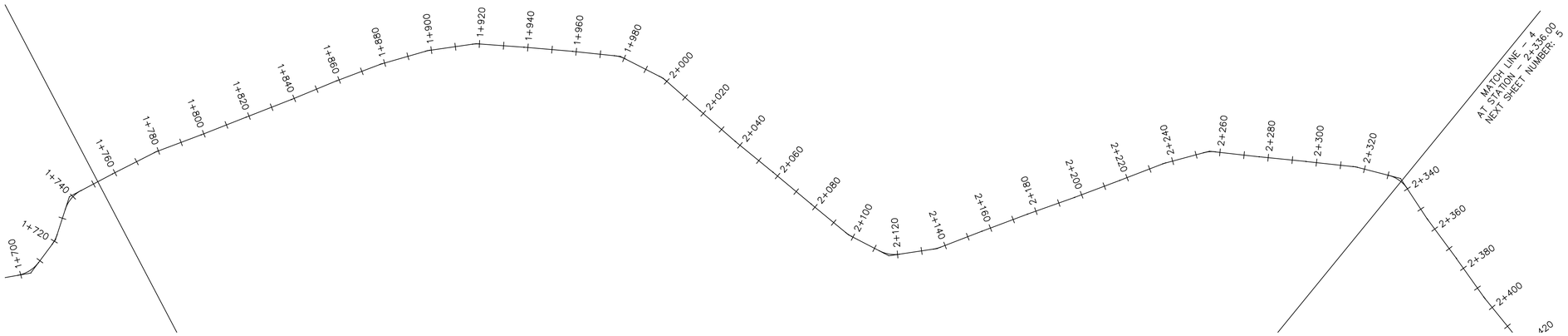
Checked:	D. Liambila
Approved:	B. Kim

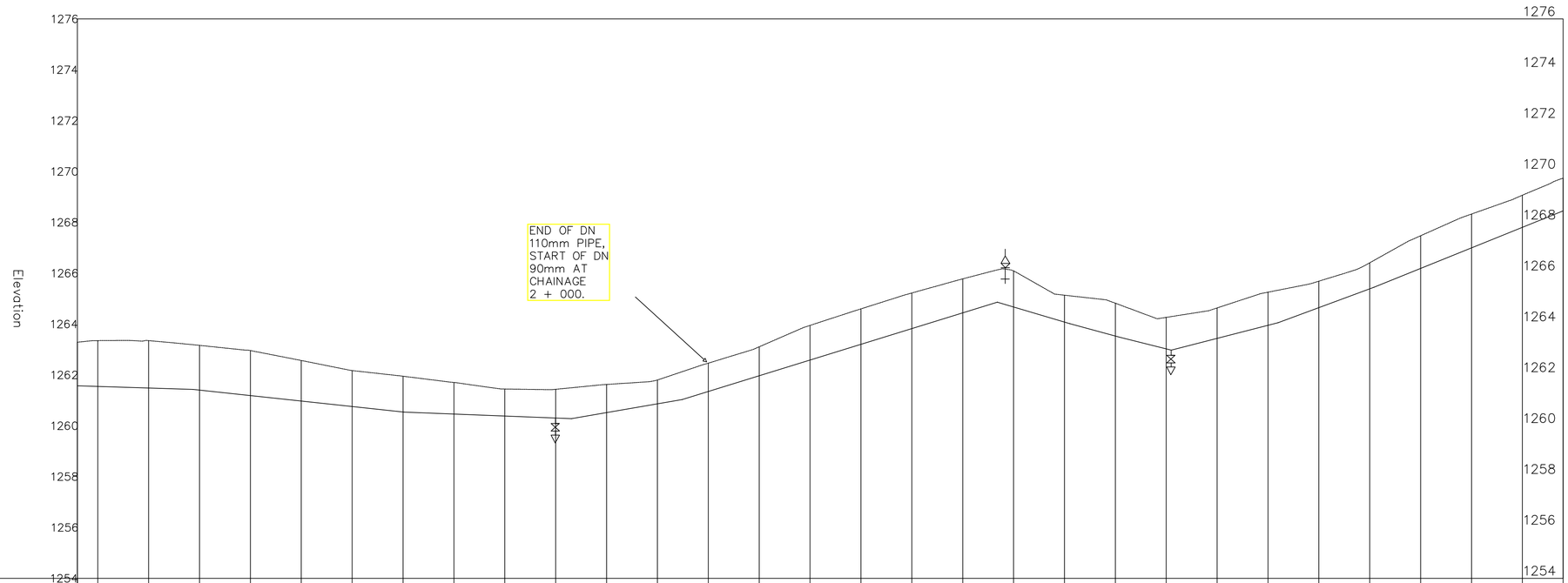
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: NZINIA–KAKEANI–KALAMBYA DISTRIBUTION PIPELINE PROFILE, DN 110, 90 AND 63mm

Stage:	FINAL DETAILED DESIGN
Date:	DECEMBER 2021
Drawing No.	TCE–KDP–KKK–003
Scale:	VERT–1:200 HOR–1:2000
Sheet No.	3 of 18
Index No.	



Nzinia–Kalmbya Alignment PROFILE



CHAINAGE	1+760	1+780	1+800	1+820	1+840	1+860	1+880	1+900	1+920	1+940	1+960	1+980	2+000	2+020	2+040	2+060	2+080	2+100	2+120	2+140	2+160	2+180	2+200	2+220	2+240	2+260	2+280	2+300	2+320
ORIGINAL GROUND LEVEL (m.a.s.l)	1263.28	1263.35	1263.35	1263.16	1262.96	1262.57	1262.17	1261.95	1261.70	1261.45	1261.43	1261.62	1261.80	1262.46	1263.10	1263.95	1264.60	1265.22	1265.78	1266.09	1265.13	1264.82	1264.26	1264.63	1265.25	1265.69	1266.41	1267.47	1268.33	1269.07	1269.74
PIPELINE INVERT LEVEL (m.a.s.l)	1261.57	1261.54	1261.48	1261.40	1261.19	1260.97	1260.76	1260.54	1260.46	1260.38	1260.30	1260.52	1260.86	1261.35	1261.97	1262.58	1263.20	1263.82	1264.44	1264.67	1264.08	1263.53	1263.02	1263.44	1263.95	1264.65	1265.38	1266.19	1267.00	1267.80	1268.45
TRENCH DEPTH (m)	1.72	1.80	1.87	1.76	1.77	1.60	1.41	1.41	1.24	1.06	1.13	1.11	0.94	1.12	1.14	1.36	1.39	1.40	1.34	1.42	1.06	1.29	1.24	1.20	1.30	1.04	1.03	1.29	1.33	1.26	1.29
PIPE DATA	PIPE DIAMETER AND MATERIAL: HDPE DN 110mm, 90, AND 63mm														GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD																

0 1000 2000

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH–OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

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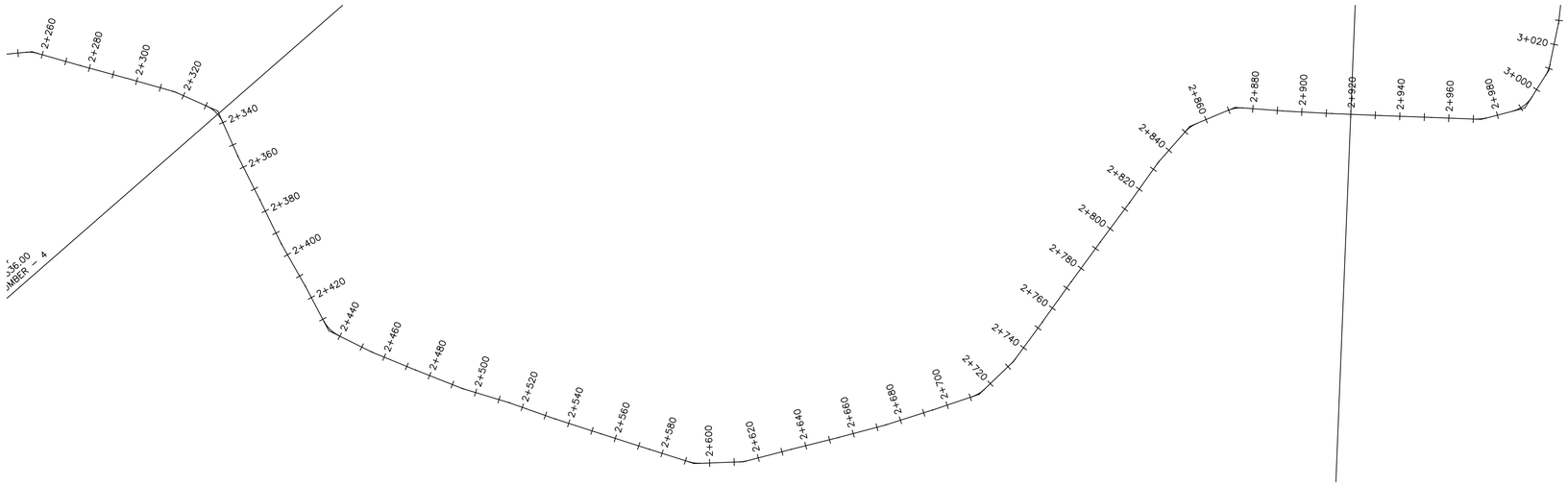
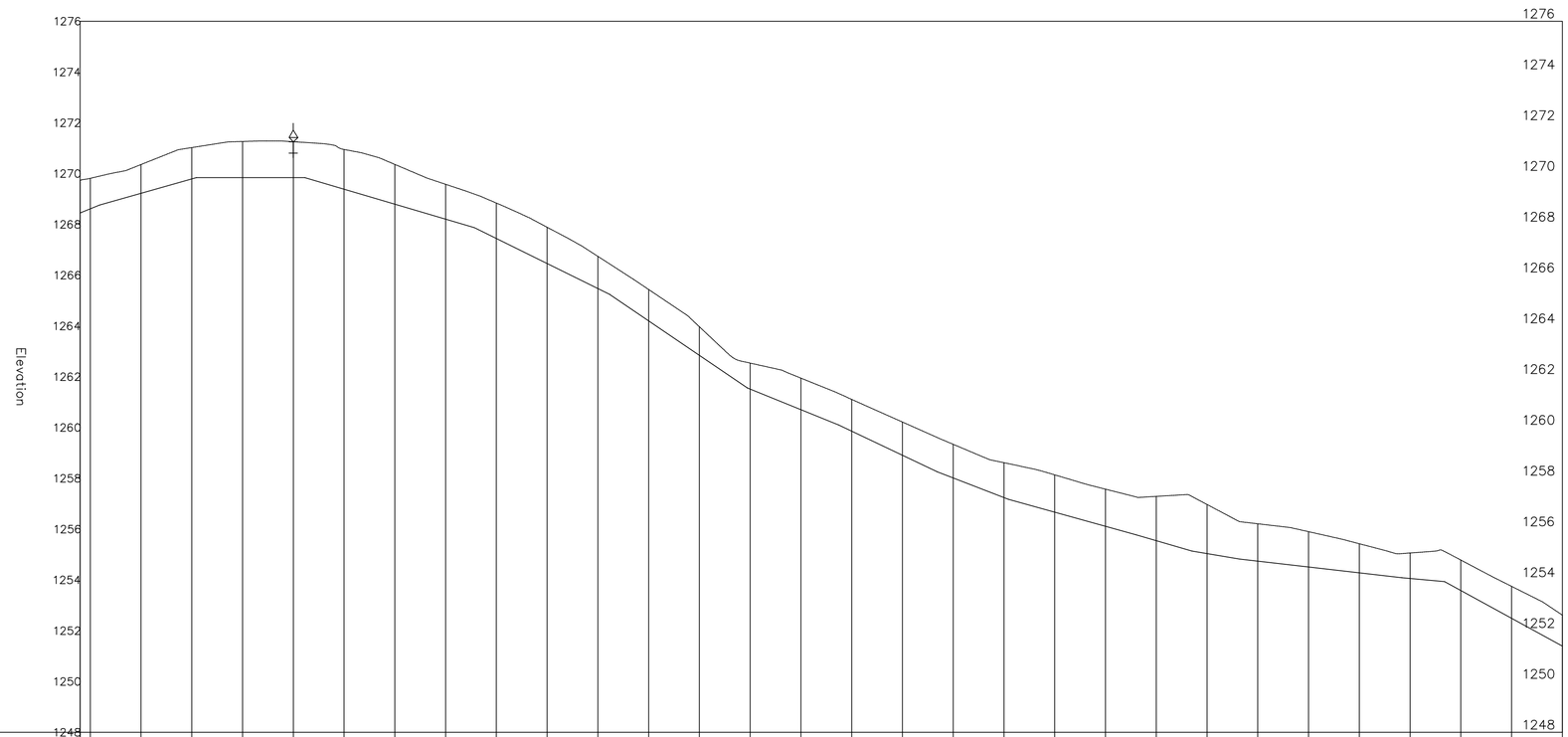
Approved:	B. Kim

Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: NZINIA–KAKEANI–KALAMBYA DISTRIBUTION PIPELINE PROFILE, DN 110mm, 90 AND 63mm

Stage:	FINAL DETAILED DESIGN
Date:	DECEMBER 2021
Drawing No.	TCE–KDP–KKK–004
Scale:	VERT–1:200 HOR–1:2000
Sheet No.	4 of 18
Index No.	





CHAINAGE	ORIGINAL GROUND LEVEL (m.a.s.l)	PIPELINE INVERT LEVEL (m.a.s.l)	TRENCH DEPTH (m)
2+340	1269.74	1268.45	1.29
2+360	1269.81	1268.61	1.20
2+380	1270.36	1269.22	1.13
2+400	1271.02	1269.79	1.24
2+420	1271.26	1269.84	1.42
2+440	1271.26	1269.84	1.41
2+460	1270.95	1269.38	1.57
2+480	1270.36	1268.79	1.57
2+500	1269.58	1268.20	1.38
2+520	1268.84	1267.44	1.40
2+540	1267.89	1266.46	1.43
2+560	1266.74	1265.47	1.27
2+580	1265.44	1264.20	1.24
2+600	1263.97	1262.84	1.12
2+620	1262.54	1261.52	1.02
2+640	1261.95	1260.70	1.24
2+660	1261.11	1259.86	1.25
2+680	1260.22	1258.91	1.31
2+700	1259.34	1258.01	1.33
2+720	1258.62	1257.24	1.37
2+740	1258.14	1256.67	1.47
2+760	1257.57	1256.11	1.46
2+780	1257.29	1255.54	1.75
2+800	1256.97	1255.04	1.93
2+820	1256.21	1254.74	1.47
2+840	1255.90	1254.51	1.39
2+860	1255.42	1254.28	1.14
2+880	1255.06	1254.06	1.00
2+900	1254.78	1253.58	1.20
	1253.75	1252.49	1.26
	1252.61	1251.39	1.22

PIPE DATA: PIPE DIAMETER AND MATERIAL: HDPE DN 110mm, 90, AND 63mm

GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD

0 1000 2000

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH–OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

saman

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Project Manager:

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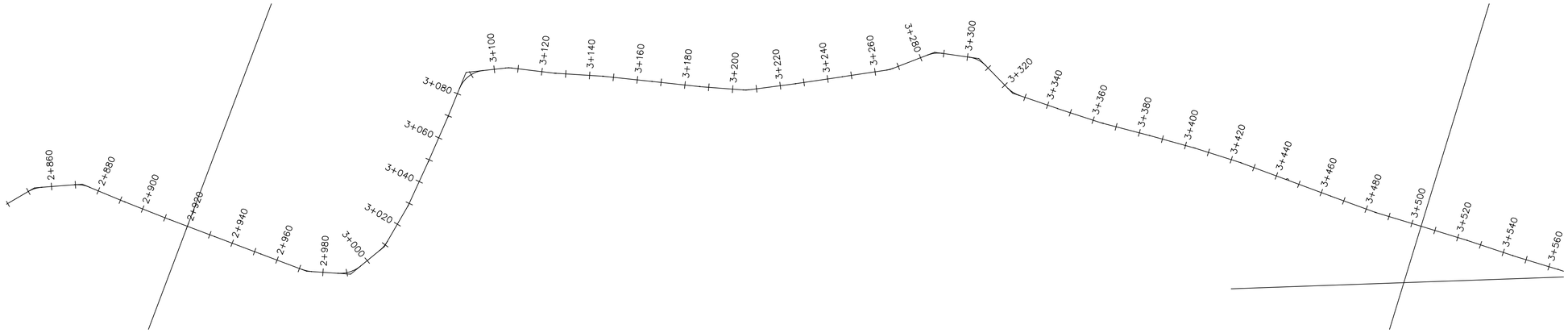
email: info@tanathi.go.ke

Designed:	D. Liambila
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

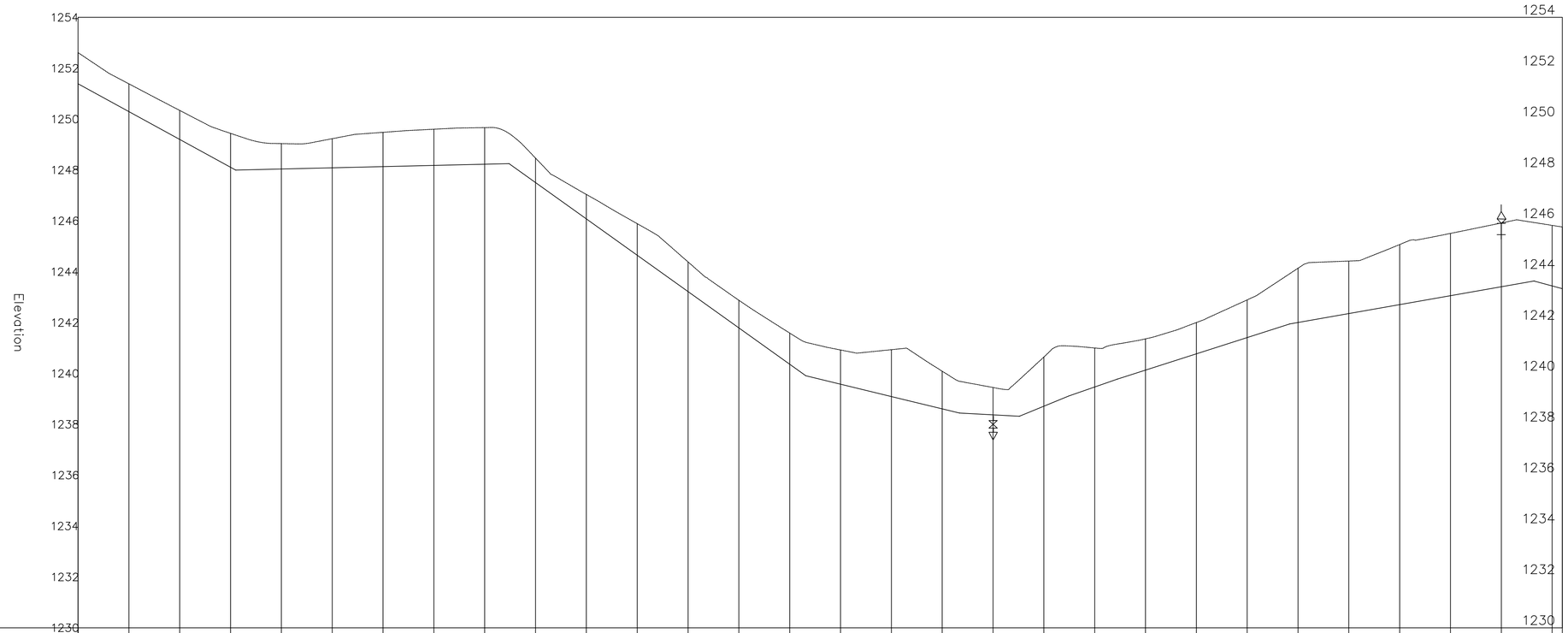
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: NZINIA–KAKEANI–KALAMBYA DISTRIBUTION PIPELINE PROFILE, DN 110mm, 90 AND 63mm

Stage:	FINAL DETAILED DESIGN
Date:	DECEMBER 2021
Drawing No.	TCE–KDP–KKK–005
Scale:	VERT–1:200 HOR–1:2000
Sheet No.	5 of 18
Index No.	



Nzinia–Kalmbya Alignment PROFILE



CHAINAGE		2+940	2+960	2+980	3+000	3+020	3+040	3+060	3+080	3+100	3+120	3+140	3+160
ORIGINAL GROUND LEVEL (m.a.s.l)	1252.61	1251.39	1250.34	1249.44	1249.04	1249.23	1249.48	1249.60	1249.67	1248.47	1247.03	1245.89	1244.38
PIPELINE INVERT LEVEL (m.a.s.l)	1251.39	1250.30	1249.20	1248.11	1248.04	1248.09	1248.13	1248.18	1248.23	1247.51	1246.08	1244.65	1243.22
TRENCH DEPTH (m)	1.22	1.09	1.14	1.33	1.00	1.14	1.35	1.42	1.44	0.96	0.96	1.24	1.17
PIPE DATA	PIPE DIAMETER AND MATERIAL: HDPE DN 110mm, 90, AND 63mm												

CHAINAGE	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	3+500
ORIGINAL GROUND LEVEL (m.a.s.l)	1242.88	1241.59	1240.92	1240.93	1240.09	1239.45	1240.64	1241.00	1241.36	1242.00	1242.89	1244.14	1244.42	1245.07	1245.51	1245.91	1245.82 1245.76
PIPELINE INVERT LEVEL (m.a.s.l)	1241.79	1240.36	1239.58	1239.09	1238.61	1238.37	1238.71	1239.47	1240.13	1240.77	1241.41	1242.00	1242.36	1242.71	1243.06	1243.41	1243.44 1243.33
TRENCH DEPTH (m)	1.09	1.23	1.35	1.84	1.48	1.07	1.93	1.53	1.23	1.23	1.48	2.13	2.06	2.36	2.45	2.51	2.38 2.42
PIPE DATA	GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD																

0 1000 2000

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH–OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

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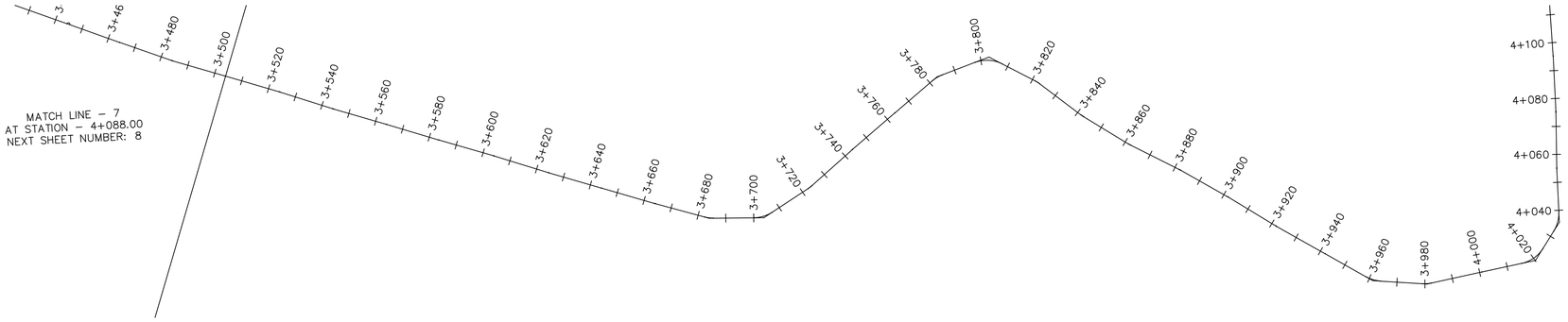
Designed:	D. Liambila
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

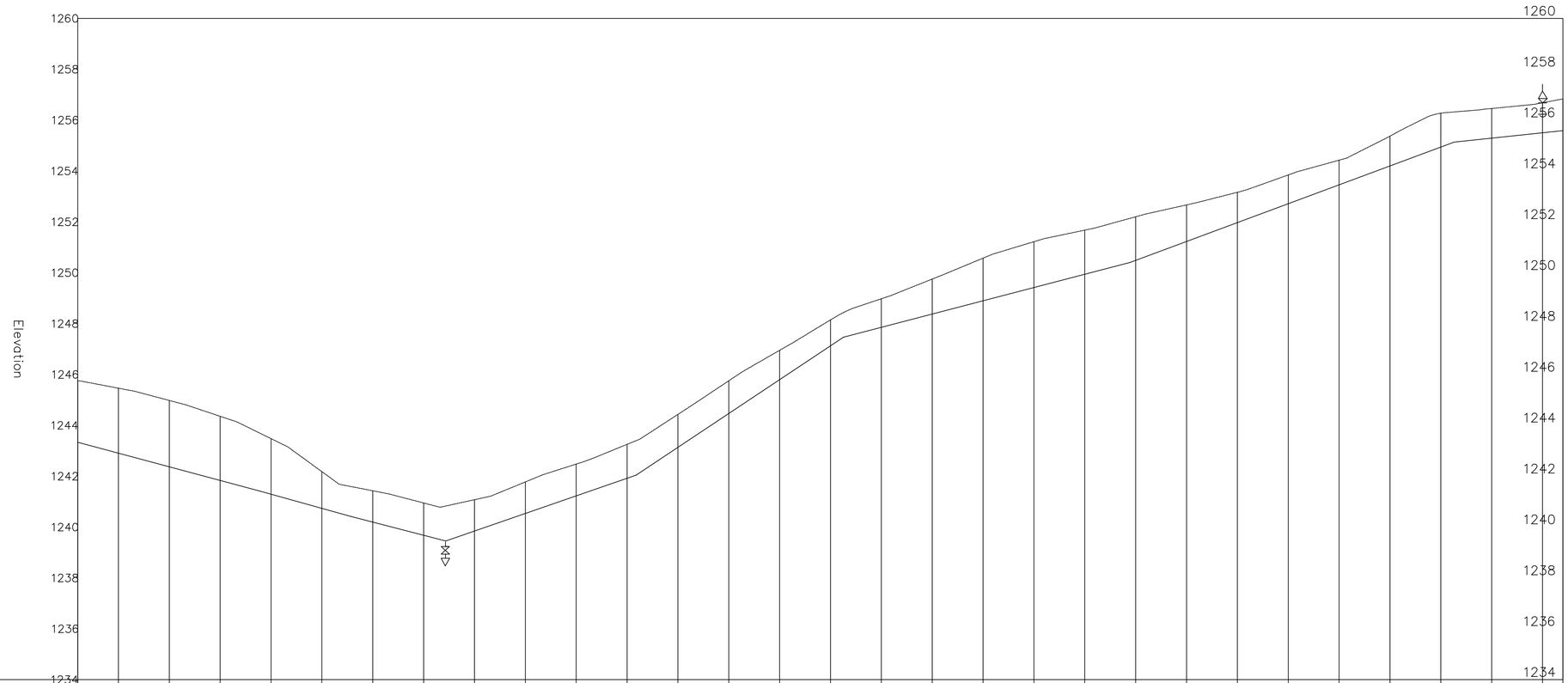
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: NZINIA–KAKEANI–KALAMBYA DISTRIBUTION PIPELINE PROFILE, DN 110mm, 90 AND 63mm

Stage:	FINAL DETAILED DESIGN
Date:	DECEMBER 2021
Drawing No.	TCE–KDP–KKK–006
Scale:	VERT–1:200 HOR–1:2000
Sheet No.	6 of 18
Index No.	



Nzinia–Kalmbya Alignment PROFILE



CHAINAGE		3+520	3+540	3+560	3+580	3+600	3+620	3+640	3+660	3+680	3+700	3+720	3+740	3+760	3+780	3+800	3+820	3+840	3+860	3+880	3+900	3+920	3+940	3+960	3+980	4+000	4+020	4+040	4+060	4+080	
ORIGINAL GROUND LEVEL (m.a.s.l)	1245.76	1245.46	1244.98	1244.35	1243.48	1242.18	1241.43	1240.95	1241.08	1241.77	1242.48	1243.25	1244.43	1245.75	1246.95	1248.15	1248.98	1249.75	1250.57	1251.22	1251.67	1252.20	1252.67	1253.16	1253.84	1254.42	1255.37	1256.27	1256.46	1256.68	1256.83
PIPELINE INVERT LEVEL (m.a.s.l)	1243.33	1242.90	1242.37	1241.83	1241.29	1240.73	1240.19	1239.68	1239.84	1240.53	1241.23	1241.92	1243.14	1244.47	1245.80	1247.13	1247.85	1248.37	1248.90	1249.42	1249.94	1250.48	1251.23	1251.97	1252.71	1253.45	1254.20	1254.94	1255.29	1255.50	1255.58
TRENCH DEPTH (m)	2.42	2.55	2.61	2.52	2.19	1.44	1.23	1.27	1.23	1.24	1.25	1.33	1.29	1.29	1.15	1.02	1.12	1.38	1.68	1.80	1.74	1.72	1.44	1.19	1.13	0.97	1.17	1.33	1.17	1.18	1.25
PIPE DATA	PIPE DIAMETER AND MATERIAL: HDPE DN 110mm, 90, AND 63mm													GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD																	

0 1000 2000

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH–OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

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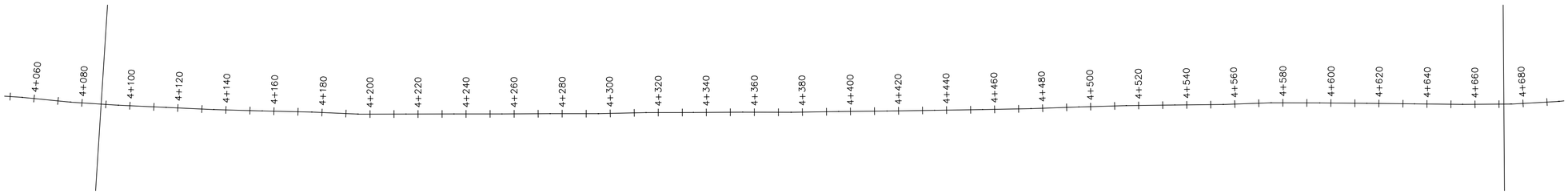
Designed:	D. Liambila
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

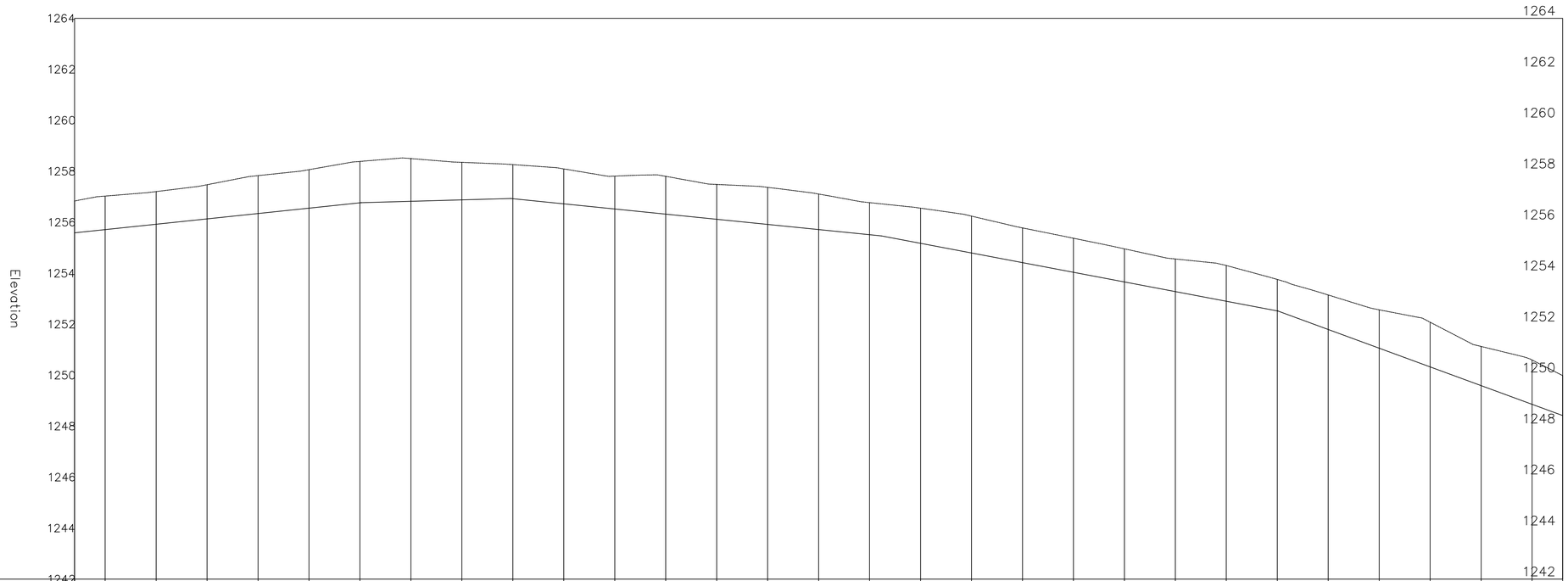
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: NZINIA–KAKEANI–KALAMBYA DISTRIBUTION PIPELINE PROFILE, DN 110, 90 AND 63mm

Stage:	FINAL DETAILED DESIGN
Date:	DECEMBER 2021
Drawing No.	TCE–KDP–KKK–007
Scale:	VERT–1:200 HOR–1:2000
Sheet No.	7 of 18
Index No.	



Nzinia–Kalmbya Alignment PROFILE



CHAINAGE		4+100	4+120	4+140	4+160	4+180	4+200	4+220	4+240	4+260	4+280	4+300	4+320	4+340	4+360	4+380	4+400	4+420	4+440	4+460	4+480	4+500	4+520	4+540	4+560	4+580	4+600	4+620	4+640	4+660	
ORIGINAL GROUND LEVEL (m.a.s.l)	1256.83	1257.03	1257.20	1257.47	1257.83	1258.06	1258.38	1258.50	1258.35	1258.26	1258.09	1257.81	1257.80	1257.48	1257.37	1257.10	1256.77	1256.55	1256.24	1255.78	1255.37	1254.96	1254.56	1254.30	1253.76	1253.15	1252.56	1252.08	1251.13	1250.59	1249.98
PIPELINE INVERT LEVEL (m.a.s.l)	1255.58	1255.71	1255.92	1256.13	1256.34	1256.55	1256.76	1256.82	1256.88	1256.92	1256.72	1256.52	1256.32	1256.11	1255.91	1255.71	1255.51	1255.17	1254.79	1254.41	1254.04	1253.66	1253.28	1252.90	1252.52	1251.79	1251.06	1250.33	1249.59	1248.86	1248.42
TRENCH DEPTH (m)	1.25	1.31	1.28	1.34	1.49	1.51	1.62	1.68	1.47	1.34	1.37	1.29	1.48	1.37	1.46	1.39	1.26	1.38	1.45	1.36	1.34	1.30	1.28	1.40	1.23	1.35	1.50	1.75	1.53	1.74	1.57
PIPE DATA	PIPE DIAMETER AND MATERIAL: HDPE DN 110mm, 90, AND 63mm														GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD																

0 1000 2000

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH–OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

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Project Manager:

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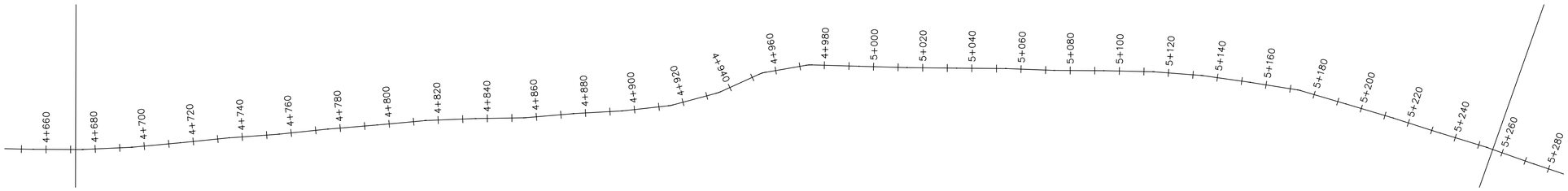
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

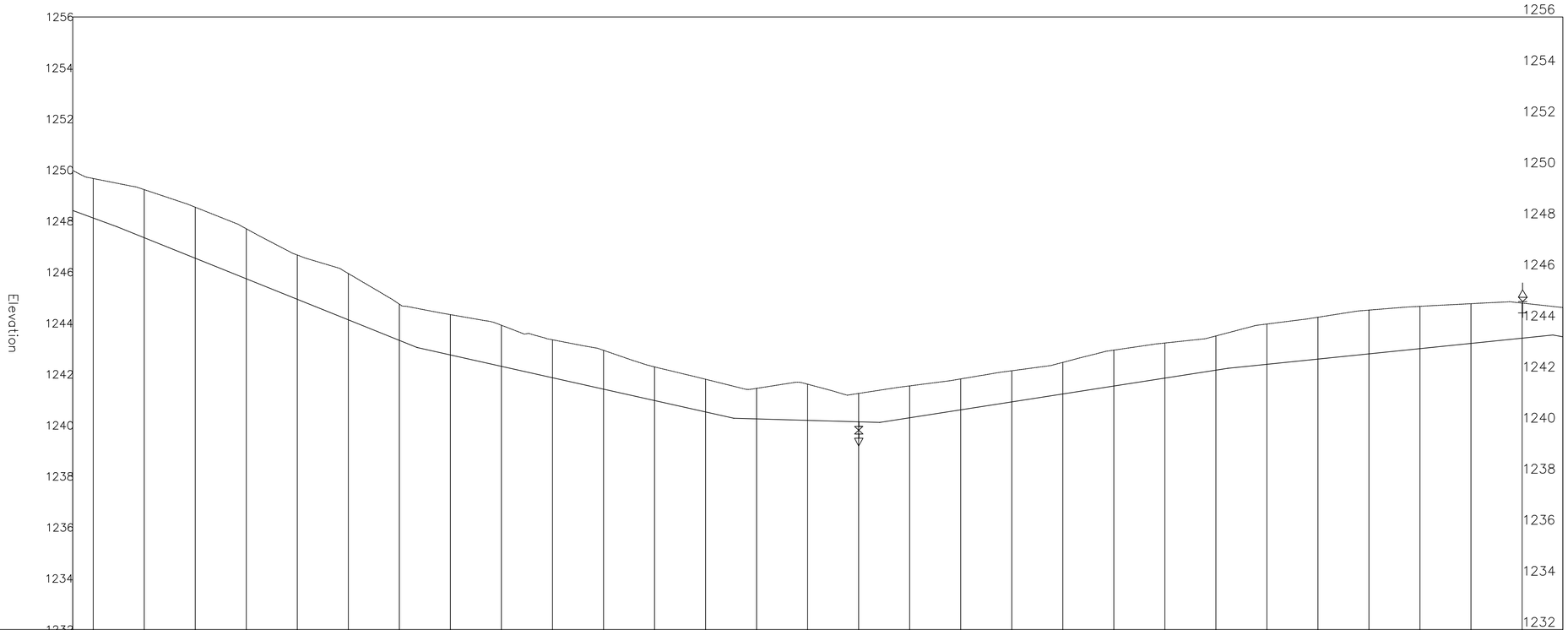
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: NZINIA–KAKEANI–KALAMBYA DISTRIBUTION PIPELINE PROFILE, DN 110mm, 90 AND 63mm

Stage:	FINAL DETAILED DESIGN
Date:	DECEMBER 2021
Drawing No.	TCE–KDP–KKK–008
Scale:	VERT–1:200 HOR–1:2000
Sheet No.	8 of 18
Index No.	



Nzinia–Kalmbya Alignment PROFILE



CHAINAGE		4+680	4+700	4+720	4+740	4+760	4+780	4+800	4+820	4+840	4+860	4+880	4+900	4+920	4+940	4+960	4+980	5+000	5+020	5+040	5+060	5+080	5+100	5+120	5+140	5+160	5+180	5+200	5+220	5+240	
ORIGINAL GROUND LEVEL (m.a.s.l)	1249.98	1249.67	1249.23	1248.55	1247.70	1246.67	1245.95	1244.75	1244.34	1243.92	1243.35	1242.94	1242.29	1241.81	1241.45	1241.61	1241.25	1241.55	1241.82	1242.14	1242.47	1242.95	1243.23	1243.50	1243.97	1244.24	1244.52	1244.66	1244.77	1244.79	1244.62
PIPELINE INVERT LEVEL (m.a.s.l)	1248.42	1248.13	1247.35	1246.55	1245.74	1244.94	1244.13	1243.33	1242.76	1242.31	1241.86	1241.42	1240.97	1240.52	1240.25	1240.19	1240.14	1240.30	1240.61	1240.92	1241.23	1241.54	1241.85	1242.16	1242.39	1242.60	1242.80	1243.01	1243.21	1243.42	1243.47
TRENCH DEPTH (m)	1.57	1.55	1.88	2.00	1.96	1.73	1.81	1.42	1.58	1.61	1.49	1.52	1.32	1.28	1.20	1.42	1.11	1.25	1.21	1.22	1.24	1.41	1.38	1.34	1.58	1.64	1.72	1.66	1.56	1.38	1.15
PIPE DATA	PIPE DIAMETER AND MATERIAL: HDPE DN 110mm, 90, AND 63mm																GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD														

NOTES

0 1000 2000

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH–OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

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Project Manager:

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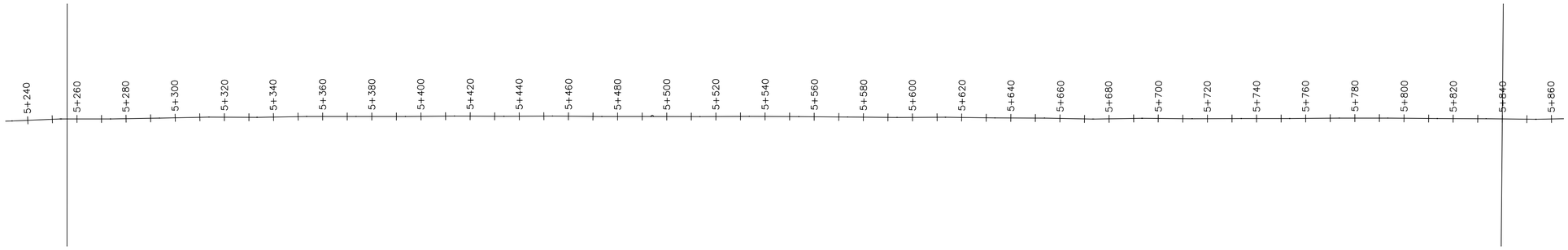
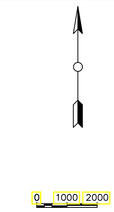
Designed:	D. Liambila
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: NZINIA–KAKEANI–KALAMBYA DISTRIBUTION PIPELINE PROFILE, DN 110mm, 90 AND 63mm

Stage:	FINAL DETAILED DESIGN
Date:	DECEMBER 2021
Drawing No.	TCE–KDP–KKK–009
Scale:	VERT–1:200 HOR–1:2000
Sheet No.	9 of 18
Index No.	





NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

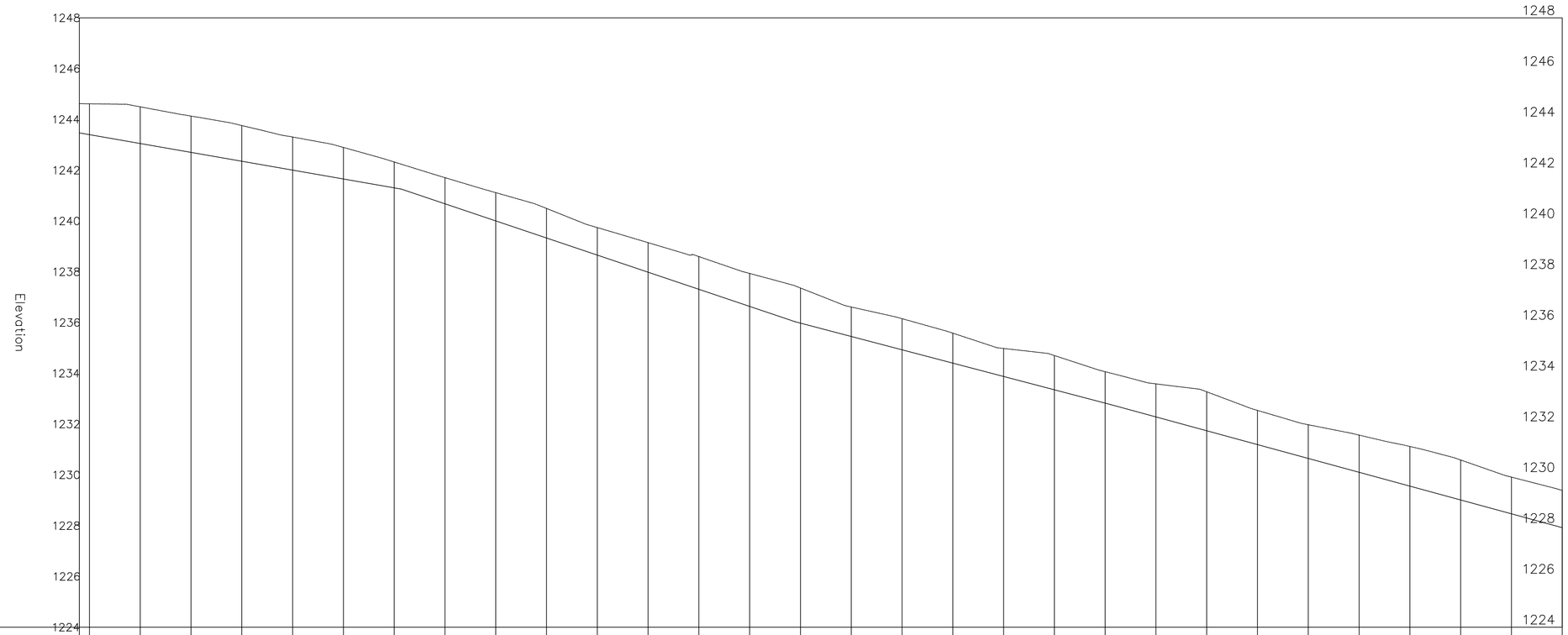
AIR VALVE

WASH-OUT (W.O)

START CHAINAGE

END CHAINAGE

Nzinia-Kalmbya Alignment PROFILE



CHAINAGE	5+260	5+280	5+300	5+320	5+340	5+360	5+380	5+400	5+420	5+440	5+460	5+480	5+500	5+520	5+540	5+560	5+580	5+600	5+620	5+640	5+660	5+680	5+700	5+720	5+740	5+760	5+780	5+800	5+820	
ORIGINAL GROUND LEVEL (m.a.s.l)	1244.62 1244.62	1244.50	1244.13	1243.76	1243.31	1242.90	1242.32	1241.71	1241.12	1240.49	1239.74	1239.15	1238.60	1237.93	1237.36	1236.61	1236.15	1235.58	1234.98	1234.70	1234.06	1233.58	1233.27	1232.54	1231.97	1231.57	1231.12	1230.59	1229.91	1229.39
PIPELINE INVERT LEVEL (m.a.s.l)	1243.47 1243.40	1243.05	1242.70	1242.35	1242.00	1241.65	1241.30	1240.67	1240.00	1239.33	1238.66	1237.98	1237.31	1236.64	1235.98	1235.45	1234.93	1234.40	1233.88	1233.35	1232.82	1232.28	1231.74	1231.19	1230.65	1230.10	1229.56	1229.01	1228.47	1227.92
TRENCH DEPTH (m)	1.15 1.21	1.44	1.43	1.41	1.31	1.24	1.02	1.03	1.11	1.16	1.08	1.16	1.29	1.30	1.38	1.16	1.23	1.18	1.10	1.35	1.24	1.30	1.54	1.35	1.33	1.47	1.56	1.57	1.45	1.47

PIPE DATA: PIPE DIAMETER AND MATERIAL: HDPE DN 110mm, 90, AND 63mm | GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD

REVISIONS	
DESCRIPTION	DATE

Consultant:

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Project Manager:

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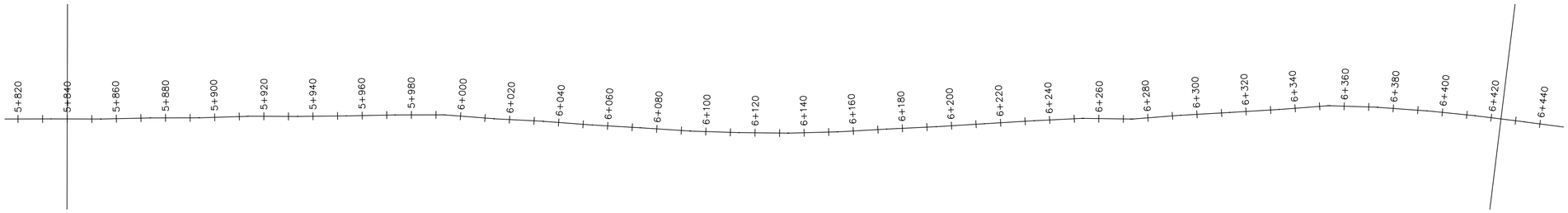
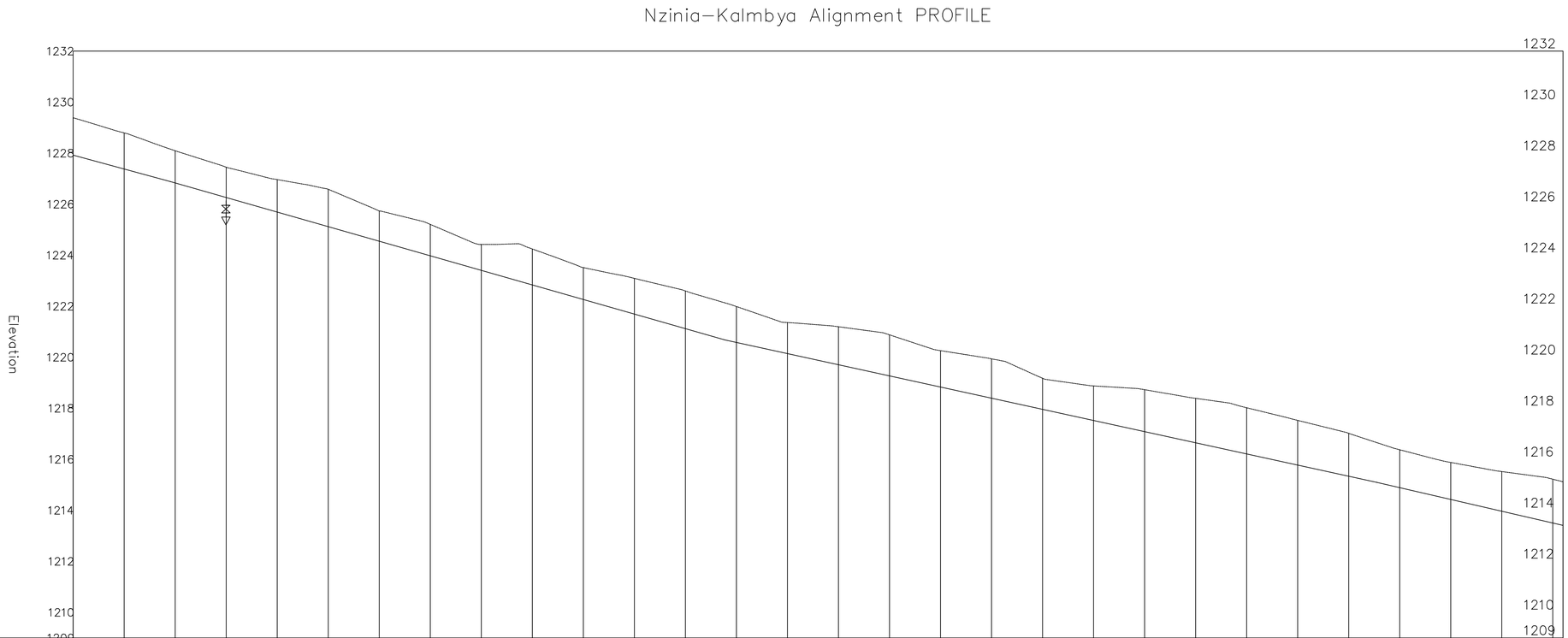
Designed:	D. Liambila
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: NZINIA-KAKEANI-KALAMBYA DISTRIBUTION PIPELINE PROFILE, DN 110mm, 90 AND 63mm

Stage:	FINAL DETAILED DESIGN
Date:	DECEMBER 2021
Drawing No.	TCE-KDP-KKK-010
Scale:	VERT-1:200 HOR-1:2000
Sheet No.	10 of 18
Index No.	





CHAINAGE		5+860	5+880	5+900	5+920	5+940	5+960	5+980	6+000	6+020	6+040	6+060	6+080	6+100	6+120	6+140	6+160	6+180	6+200	6+220	6+240	6+260	6+280	6+300	6+320	6+340	6+360	6+380	6+400		6+420
ORIGINAL GROUND LEVEL (m.a.s.l)	1229.39	1228.79	1228.09	1227.45	1226.96	1226.58	1225.73	1225.21	1224.42	1224.24	1223.51	1223.09	1222.60	1221.99	1221.36	1221.20	1220.88	1220.26	1219.94	1219.18	1218.88	1218.73	1218.39	1218.02	1217.53	1217.02	1216.37	1215.88	1215.52	1215.22	1215.12
PIPELINE INVERT LEVEL (m.a.s.l)	1227.92	1227.38	1226.83	1226.26	1225.69	1225.12	1224.55	1223.98	1223.40	1222.83	1222.26	1221.69	1221.12	1220.58	1220.14	1219.71	1219.27	1218.83	1218.40	1217.96	1217.52	1217.08	1216.65	1216.21	1215.77	1215.34	1214.89	1214.43	1213.97	1213.51	1213.41
TRENCH DEPTH (m)	1.47	1.42	1.26	1.19	1.27	1.47	1.19	1.23	1.02	1.41	1.25	1.40	1.48	1.41	1.22	1.49	1.61	1.43	1.54	1.22	1.36	1.64	1.74	1.81	1.75	1.68	1.49	1.45	1.55	1.72	1.71
PIPE DATA	PIPE DIAMETER AND MATERIAL: HDPE DN 110mm, 90, AND 63mm													GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD																	

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH–OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

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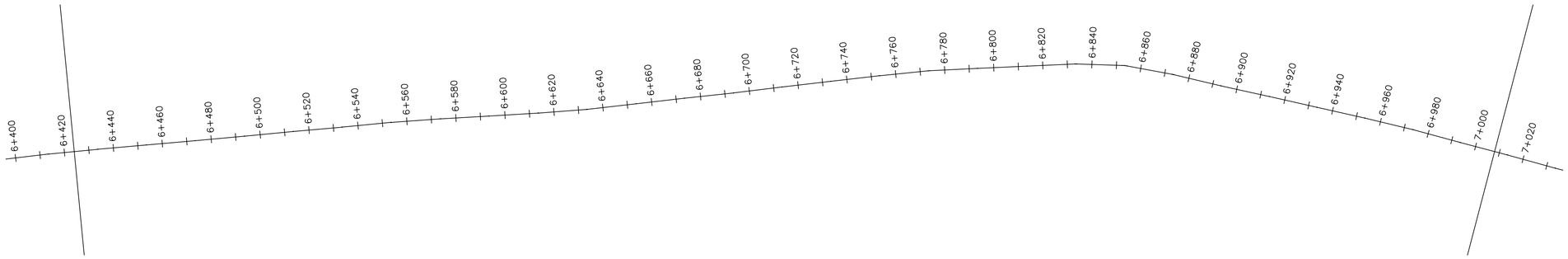
Checked:	D. Liambila
Approved:	B. Kim

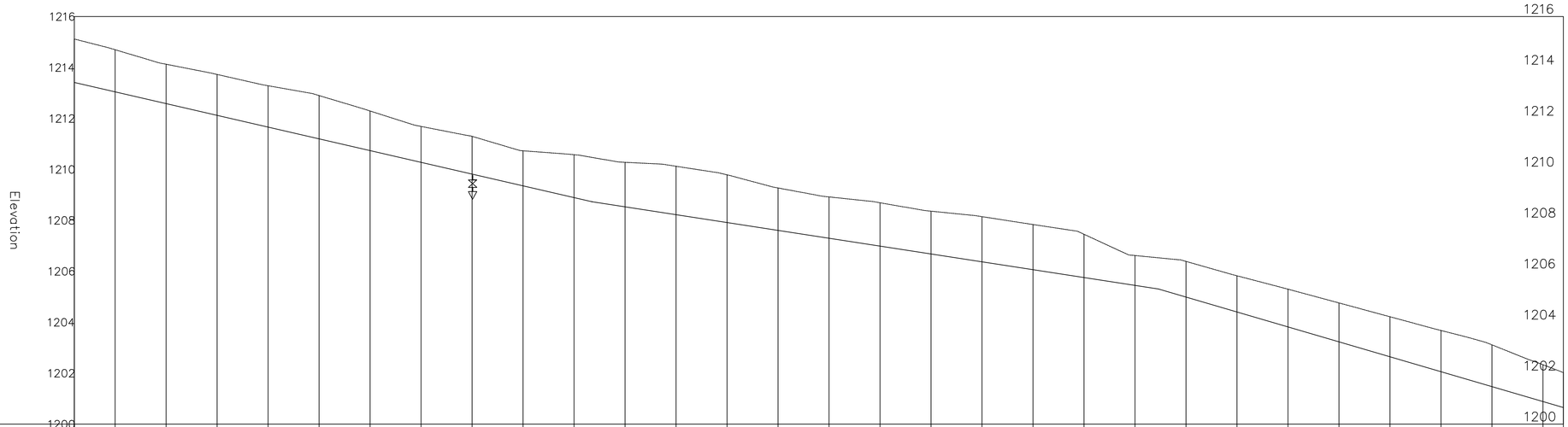
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: NZINIA–KAKEANI–KALAMBYA DISTRIBUTION PIPELINE PROFILE, DN 110mm, 90 AND 63mm

Stage:	FINAL DETAILED DESIGN
Date:	DECEMBER 2021
Drawing No.	TCE–KDP–KKK–11
Scale:	VERT–1:200 HOR–1:2000
Sheet No.	11 of 18
Index No.	



Nzinia–Kalmbya Alignment PROFILE



CHAINAGE		6+440	6+460	6+480	6+500	6+520	6+540	6+560	6+580	6+600	6+620	6+640	6+660	6+680	6+700	6+720	6+740	6+760	6+780	6+800	6+820	6+840	6+860	6+880	6+900	6+920	6+940	6+960	6+980	7+000	
ORIGINAL GROUND LEVEL (m.a.s.l)	1215.12	1214.70	1214.13	1213.73	1213.29	1212.90	1212.29	1211.69	1211.30	1210.73	1210.58	1210.28	1210.12	1209.79	1209.27	1208.92	1208.69	1208.36	1208.15	1207.84	1207.45	1206.62	1206.39	1205.82	1205.30	1204.76	1204.22	1203.68	1203.11	1202.33	1202.03
PIPELINE INVERT LEVEL (m.a.s.l)	1213.41	1213.04	1212.58	1212.12	1211.66	1211.20	1210.74	1210.28	1209.82	1209.36	1208.89	1208.53	1208.22	1207.91	1207.61	1207.30	1206.99	1206.68	1206.37	1206.06	1205.76	1205.45	1204.99	1204.40	1203.82	1203.23	1202.64	1202.06	1201.47	1200.89	1200.65
TRENCH DEPTH (m)	1.71	1.65	1.55	1.61	1.63	1.70	1.56	1.41	1.48	1.38	1.68	1.75	1.90	1.87	1.67	1.62	1.70	1.68	1.77	1.77	1.70	1.17	1.40	1.42	1.48	1.53	1.57	1.62	1.64	1.45	1.37
PIPE DATA	PIPE DIAMETER AND MATERIAL: HDPE DN 110mm, 90, AND 63mm													GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD																	

0 1000 2000

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH–OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

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Project Manager:

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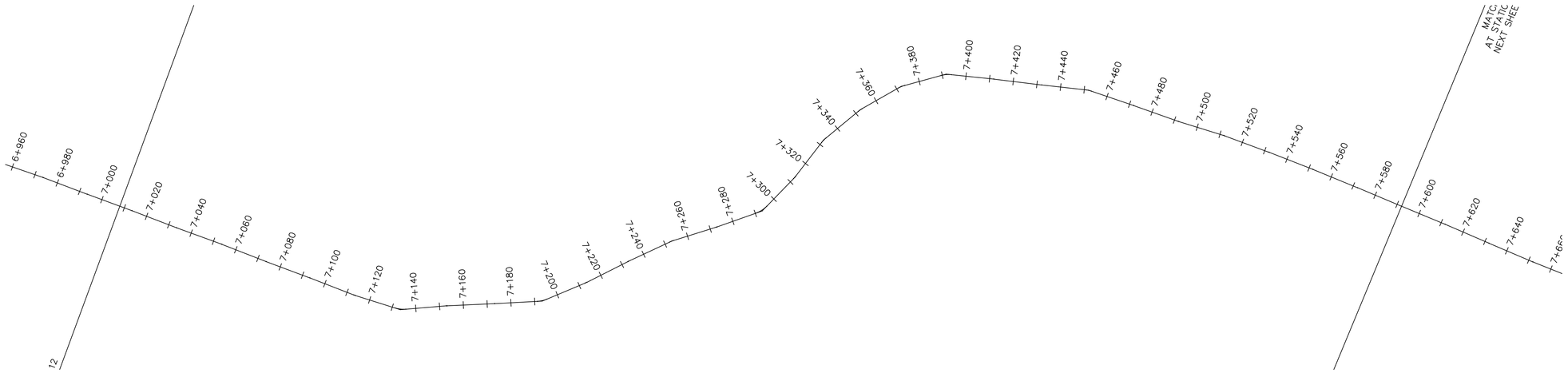
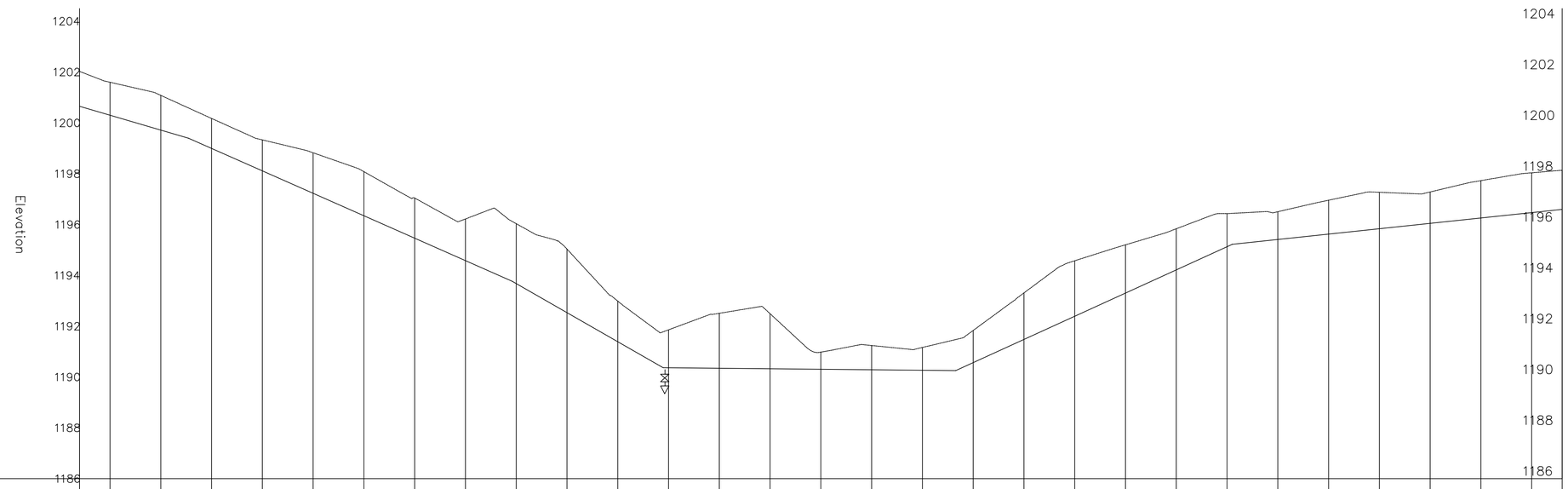
Designed:	D. Liambila
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

Project:	CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA
Drawing Title:	NZINIA–KAKEANI–KALAMBYA DISTRIBUTION PIPELINE PROFILE, DN 110mm, 90 AND 63mm

Stage:	FINAL DETAILED DESIGN
Date:	DECEMBER 2021
Drawing No.	TCE–KDP–KKK–012
Scale:	VERT–1:200 HOR–1:2000
Sheet No.	12 of 18
Index No.	





CHAINAGE		7+020	7+040	7+060	7+080	7+100	7+120	7+140	7+160	7+180	7+200	7+220	7+240	7+260	7+280	7+300	7+320	7+340	7+360	7+380	7+400	7+420	7+440	7+460	7+480	7+500	7+520	7+540	7+560	7+580	
ORIGINAL GROUND LEVEL (m.a.s.l)	1202.03	1201.60	1201.08	1200.17	1199.33	1198.82	1198.08	1197.04	1196.22	1196.03	1195.04	1192.99	1191.86	1192.51	1192.49	1190.98	1191.24	1191.16	1191.83	1193.31	1194.57	1195.20	1195.83	1196.43	1196.50	1196.96	1197.27	1197.28	1197.73	1198.03	1198.14
PIPELINE INVERT LEVEL (m.a.s.l)	1200.65	1200.30	1199.71	1198.99	1198.11	1197.23	1196.35	1195.46	1194.58	1193.68	1192.53	1191.39	1190.36	1190.34	1190.32	1190.31	1190.29	1190.27	1190.57	1191.48	1192.39	1193.30	1194.21	1195.13	1195.41	1195.62	1195.84	1196.05	1196.26	1196.47	1196.60
TRENCH DEPTH (m)	1.37	1.30	1.37	1.18	1.22	1.59	1.73	1.58	1.64	2.36	2.50	1.60	1.49	2.16	2.17	0.67	0.95	0.90	1.26	1.83	2.18	1.90	1.62	1.30	1.09	1.33	1.43	1.23	1.47	1.56	1.54

PIPE DATA	PIPE DIAMETER AND MATERIAL: HDPE DN 110mm, 90, AND 63mm	GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD

0 1000 2000

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH-OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

SAMAN CORPORATION
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Project Manager:

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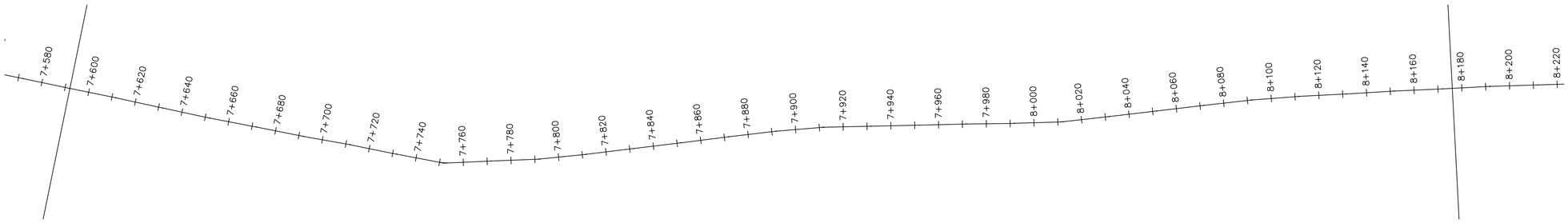
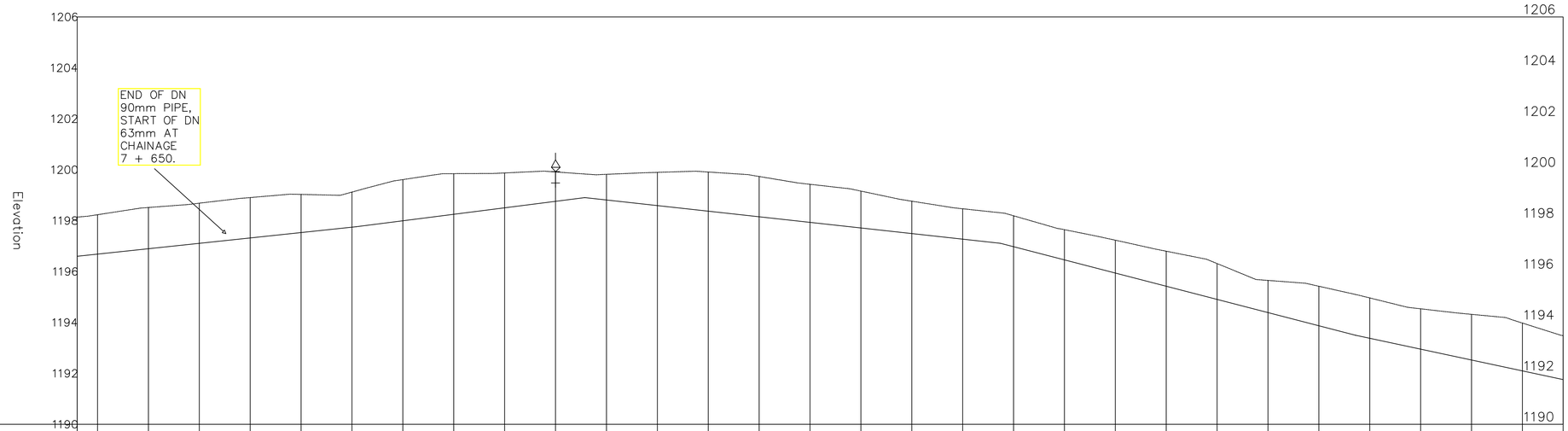
Designed:	D. Liambila
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

Project:	CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA
Drawing Title:	NZINIA–KAKEANI–KALAMBYA DISTRIBUTION PIPELINE PROFILE, DN 110mm, 90 AND 63mm

Stage:	FINAL DETAILED DESIGN
Date:	DECEMBER 2021
Drawing No.	TCE–KDP–KKK–013
Scale:	VERT–1:200 HOR–1:2000
Sheet No.	13 of 18
Index No.	



Nzinia–Kalmbya Alignment PROFILE



CHAINAGE	7+600	7+620	7+640	7+660	7+680	7+700	7+720	7+740	7+760	7+780	7+800	7+820	7+840	7+860	7+880	7+900	7+920	7+940	7+960	7+980	8+000	8+020	8+040	8+060	8+080	8+100	8+120	8+140	8+160
ORIGINAL GROUND LEVEL (m.a.s.l)	1198.14	1198.23	1198.51	1198.68	1198.90	1199.03	1199.12	1199.61	1199.84	1199.87	1199.91	1199.82	1199.89	1199.91	1199.73	1199.43	1199.16	1198.76	1198.46	1198.19	1197.64	1197.23	1196.80	1196.31	1195.65	1195.42	1194.96	1194.54	1194.32	1193.98	1193.48
PIPELINE INVERT LEVEL (m.a.s.l)	1196.60	1196.68	1196.89	1197.11	1197.32	1197.53	1197.74	1197.99	1198.25	1198.50	1198.76	1198.81	1198.59	1198.37	1198.15	1197.93	1197.71	1197.49	1197.27	1196.97	1196.46	1195.94	1195.42	1194.90	1194.39	1193.87	1193.38	1192.95	1192.52	1192.10	1191.75
TRENCH DEPTH (m)	1.54	1.55	1.62	1.58	1.59	1.50	1.38	1.62	1.60	1.37	1.16	1.01	1.31	1.54	1.58	1.50	1.45	1.27	1.19	1.22	1.19	1.29	1.38	1.41	1.26	1.55	1.59	1.59	1.80	1.88	1.73
PIPE DATA	PIPE DIAMETER AND MATERIAL: HDPE DN 110mm, 90, AND 63mm														GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD																

0 1000 2000

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH–OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

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Project Manager:

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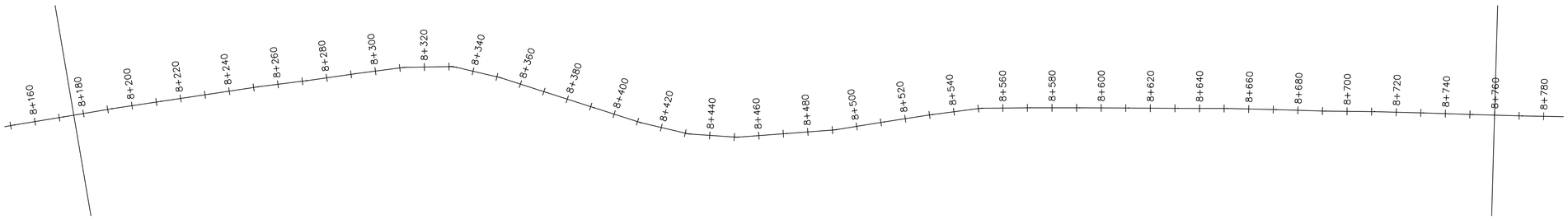
email: info@tanathi.go.ke

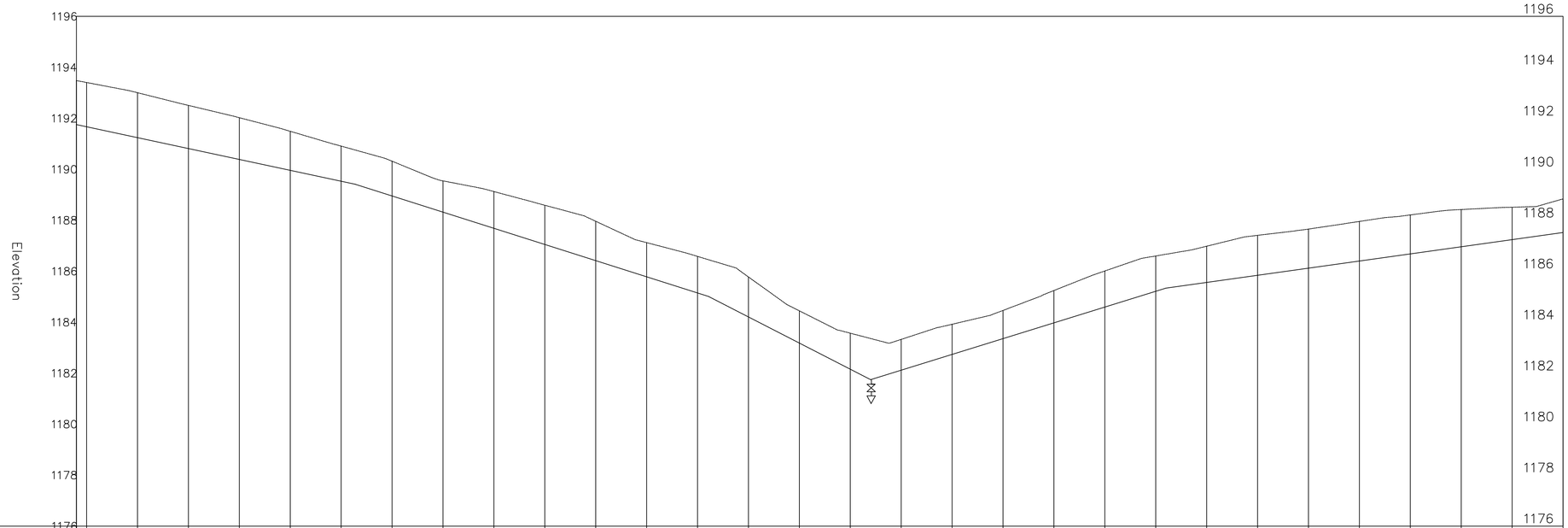
Designed:	D. Liambila
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

Project:	CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA
Drawing Title:	NZINIA–KAKEANI–KALAMBYA DISTRIBUTION PIPELINE PROFILE. DN 110mm, 90 AND 63mm

Stage:	FINAL DETAILED DESIGN
Date:	DECEMBER 2021
Drawing No.	TCE–KDP–KKK–014
Scale:	VERT–1:200 HOR–1:2000
Sheet No.	14 of 18
Index No.	



Nzinia–Kalmbya Alignment PROFILE



CHAINAGE	ORIGINAL GROUND LEVEL (m.a.s.l)	PIPELINE INVERT LEVEL (m.a.s.l)	TRENCH DEPTH (m)
8+180	1193.48	1191.75	1.73
	1193.41	1191.67	1.74
8+200	1193.01	1191.24	1.76
8+220	1192.51	1190.81	1.69
8+240	1192.03	1190.39	1.64
8+260	1191.49	1189.96	1.53
8+280	1190.91	1189.53	1.38
8+300	1190.32	1188.96	1.36
8+320	1189.55	1188.32	1.23
8+340	1189.13	1187.69	1.44
8+360	1188.59	1187.05	1.54
8+380	1187.96	1186.42	1.55
8+400	1187.12	1185.78	1.34
8+420	1186.58	1185.15	1.44
8+440	1185.78	1184.21	1.57
8+460	1184.45	1183.18	1.27
8+480	1183.57	1182.16	1.41
8+500	1183.33	1182.12	1.21
8+520	1183.92	1182.74	1.18
8+540	1184.46	1183.36	1.11
8+560	1185.24	1183.98	1.27
8+580	1186.01	1184.59	1.42
8+600	1186.60	1185.21	1.39
8+620	1186.98	1185.56	1.42
8+640	1187.41	1185.84	1.57
8+660	1187.66	1186.12	1.53
8+680	1187.95	1186.40	1.55
8+700	1188.21	1186.68	1.53
8+720	1188.42	1186.96	1.46
8+740	1188.51	1187.24	1.27
	1188.84	1187.52	1.32

PIPE DATA: PIPE DIAMETER AND MATERIAL: HDPE DN 110mm, 90, AND 63mm — GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD

0 1000 2000

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH–OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

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Project Manager:

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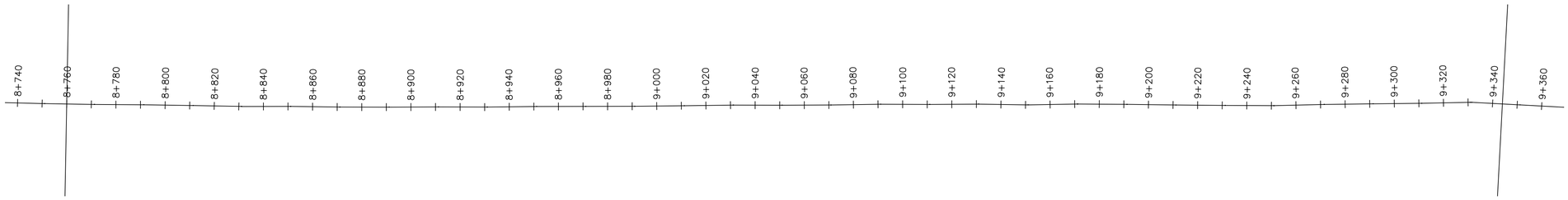
email: info@tanathi.go.ke

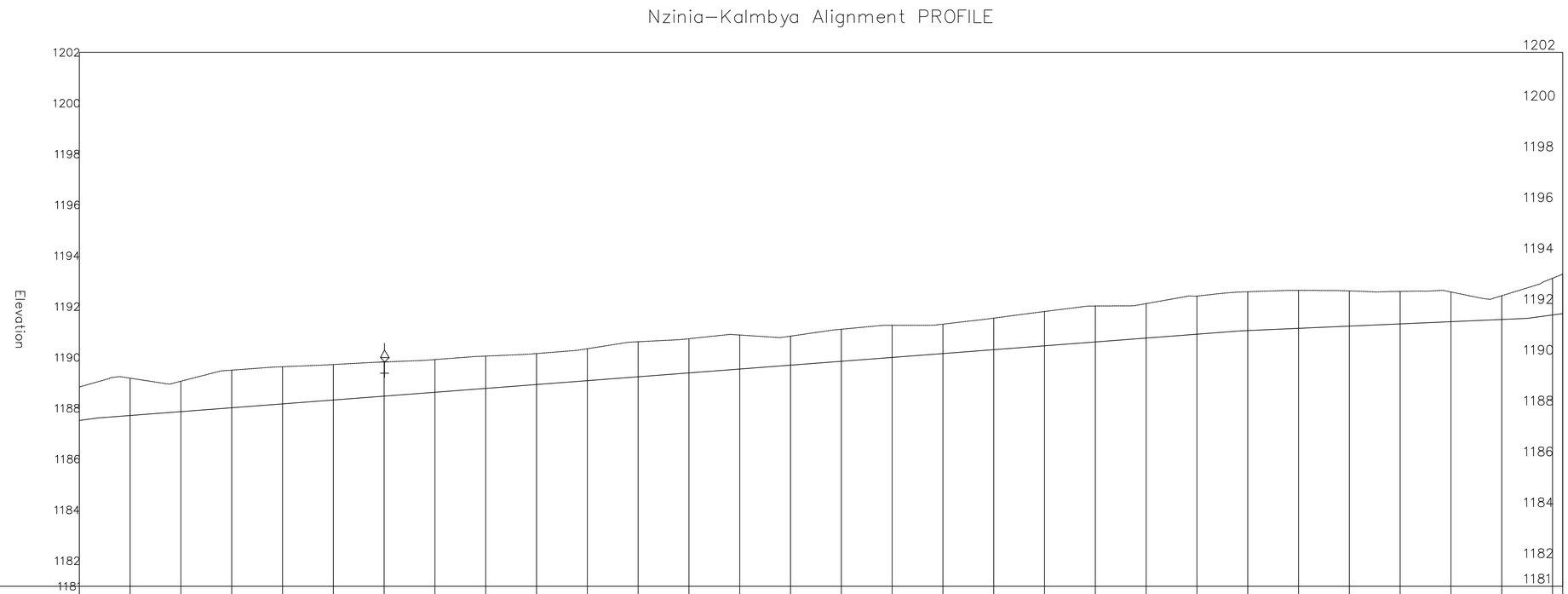
Designed:	D. Liambila
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: NZINIA–KAKEANI–KALAMBYA DISTRIBUTION PIPELINE PROFILE, DN 110mm, 90 AND 63mm

Stage:	FINAL DETAILED DESIGN
Date:	DECEMBER 2021
Drawing No.	TCE–KDP–KKK–015
Scale:	VERT–1:200 HOR–1:2000
Sheet No.	15 of 18
Index No.	





CHAINAGE		8+780	8+800	8+820	8+840	8+860	8+880	8+900	8+920	8+940	8+960	8+980	9+000	9+020	9+040	9+060	9+080	9+100	9+120	9+140	9+160	9+180	9+200	9+220	9+240	9+260	9+280	9+300	9+320	9+340
ORIGINAL GROUND LEVEL (m.a.s.l)	1188.84	1189.19	1189.07	1189.50	1189.64	1189.72	1189.82	1189.92	1190.05	1190.15	1190.34	1190.62	1190.74	1190.88	1190.84	1191.11	1191.27	1191.31	1191.55	1191.81	1192.02	1192.12	1192.41	1192.58	1192.64	1192.62	1192.60	1192.57	1192.43	1193.12 1193.28
PIPELINE INVERT LEVEL (m.a.s.l)	1187.52	1187.72	1187.87	1188.02	1188.18	1188.33	1188.48	1188.63	1188.78	1188.94	1189.09	1189.24	1189.39	1189.55	1189.70	1189.85	1190.00	1190.15	1190.31	1190.46	1190.61	1190.76	1190.92	1191.06	1191.15	1191.23	1191.32	1191.41	1191.49	1191.67 1191.73
TRENCH DEPTH (m)	1.32	1.47	1.19	1.48	1.46	1.39	1.34	1.28	1.27	1.22	1.25	1.38	1.34	1.34	1.14	1.26	1.26	1.16	1.24	1.35	1.41	1.35	1.50	1.52	1.49	1.38	1.28	1.17	0.93	1.45 1.55
PIPE DATA	PIPE DIAMETER AND MATERIAL: HDPE DN 110mm, 90, AND 63mm													GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD																

0 1000 2000

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH–OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

saman

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Designed:	D. Liambila
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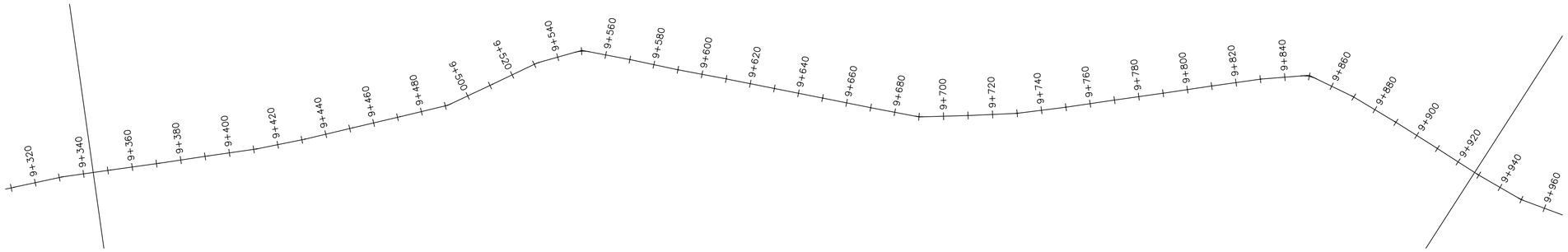
Checked:	D. Liambila
Approved:	B. Kim

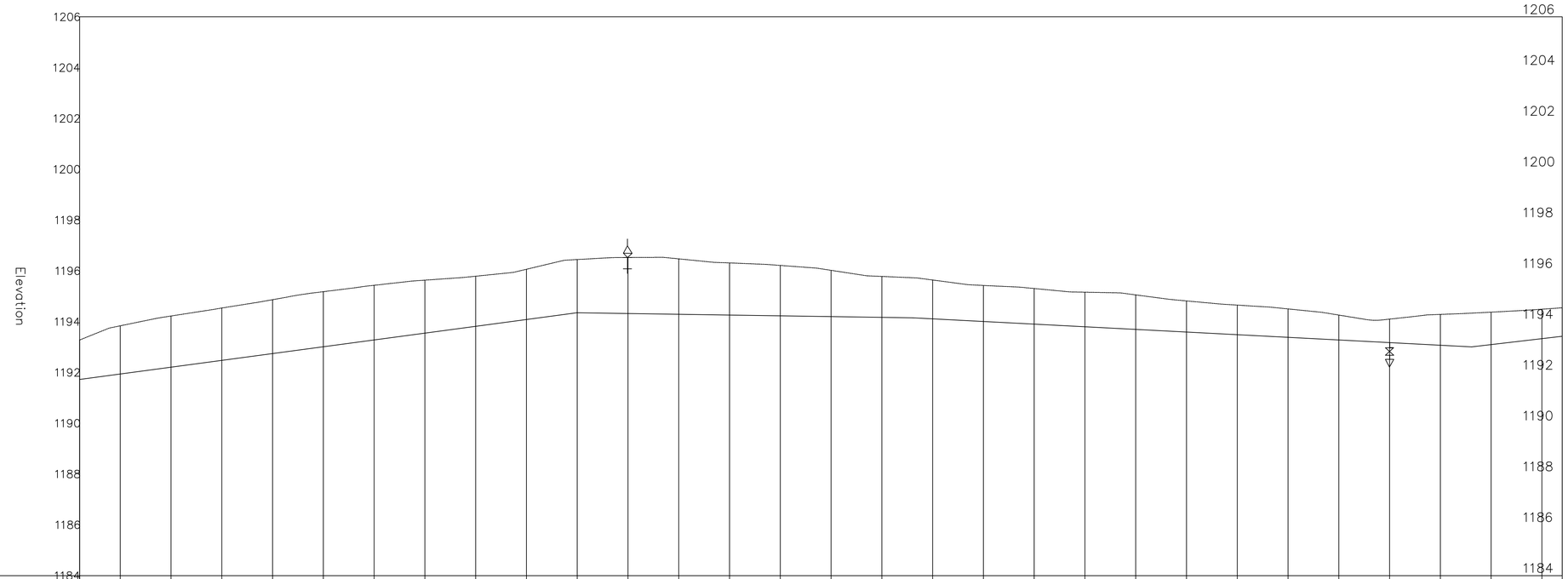
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: NZINIA–KAKEANI–KALAMBYA DISTRIBUTION PIPELINE PROFILE, DN 110mm, 90 AND 63mm

Stage:	FINAL DETAILED DESIGN
Date:	DECEMBER 2021
Drawing No.	TCE–KDP–KKK–016
Scale:	VERT–1:200 HOR–1:2000
Sheet No.	16 of 18
Index No.	



Nzinia–Kalmbya Alignment PROFILE



CHAINAGE		9+360	9+380	9+400	9+420	9+440	9+460	9+480	9+500	9+520	9+540	9+560	9+580	9+600	9+620	9+640	9+660	9+680	9+700	9+720	9+740	9+760	9+780	9+800	9+820	9+840	9+860	9+880	9+900		9+920	
ORIGINAL GROUND LEVEL (m.a.s.l)	1193.28	1193.84	1194.22	1194.54	1194.86	1195.18	1195.43	1195.63	1195.79	1196.06	1196.45	1196.53	1196.47	1196.31	1196.21	1196.02	1195.78	1195.64	1195.43	1195.30	1195.16	1195.05	1194.82	1194.65	1194.50	1194.26	1194.10	1194.28	1194.37		1194.49	1194.55
PIPELINE INVERT LEVEL (m.a.s.l)	1191.73	1191.94	1192.21	1192.48	1192.74	1193.01	1193.28	1193.55	1193.81	1194.08	1194.35	1194.32	1194.29	1194.26	1194.23	1194.20	1194.17	1194.11	1194.00	1193.90	1193.80	1193.69	1193.59	1193.48	1193.38	1193.28	1193.17	1193.07	1193.10		1193.33	1193.42
TRENCH DEPTH (m)	1.55	1.90	2.01	2.06	2.12	2.17	2.15	2.09	1.97	1.98	2.10	2.21	2.18	2.05	1.99	1.82	1.61	1.53	1.42	1.40	1.36	1.36	1.23	1.17	1.12	0.98	0.93	1.22	1.28		1.16	1.12
PIPE DATA	PIPE DIAMETER AND MATERIAL: HDPE DN 110mm, 90, AND 63mm													GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD																		

0 1000 2000

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH–OUT (W.O)

START CHAINAGE

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

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Project Manager:

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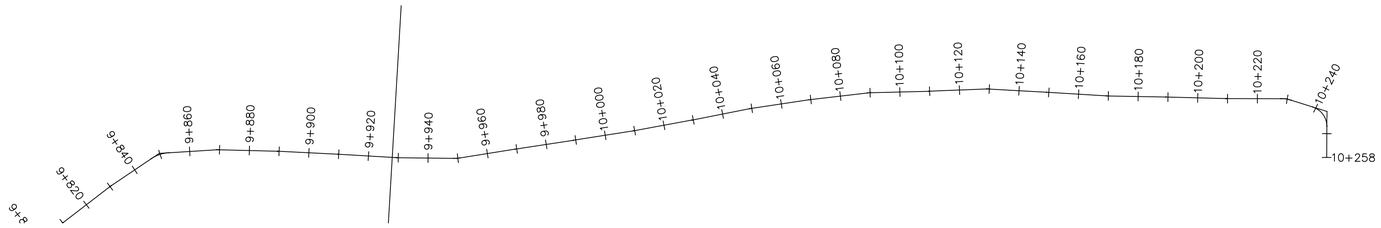
Designed:	D. Liambila
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

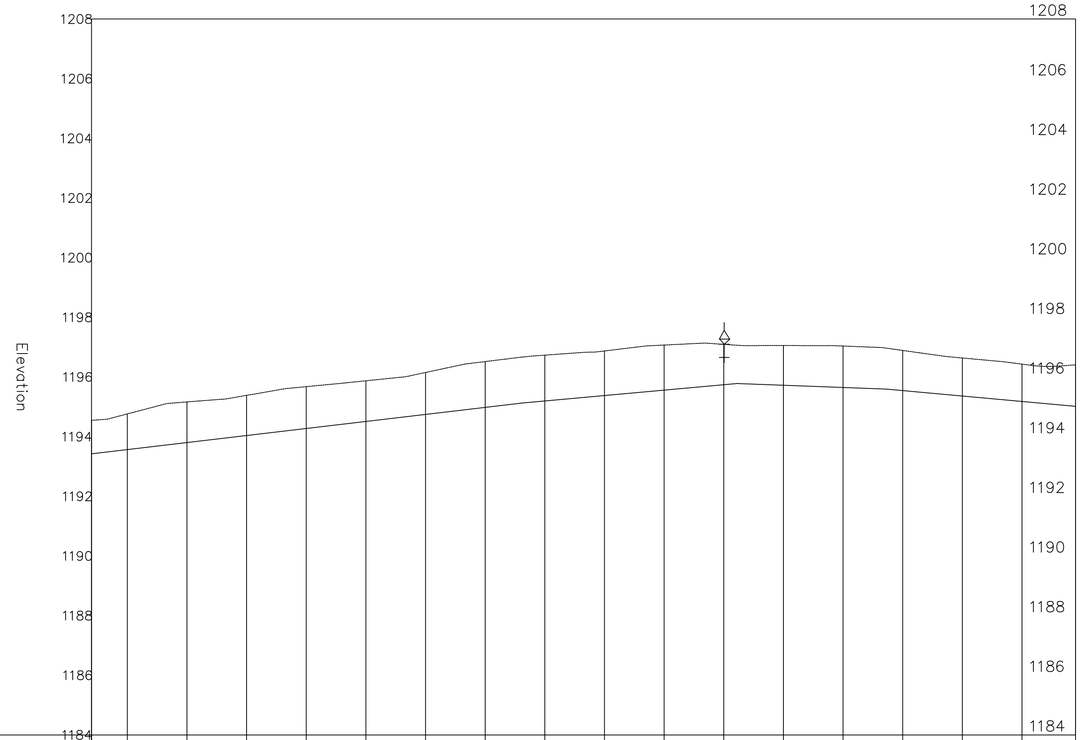
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: NZINIA–KAKEANI–KALAMBYA DISTRIBUTION PIPELINE PROFILE, DN 110mm, 90 AND 63mm

Stage:	FINAL DETAILED DESIGN
Date:	DECEMBER 2021
Drawing No.	TCE–KDP–KKK–017
Scale:	VERT–1:200 HOR–1:2000
Sheet No.	17 of 18
Index No.	



Nzinia–Kalmbya Alignment PROFILE



CHAINAGE		9+940	9+960	9+980	10+000	10+020	10+040	10+060	10+080	10+100	10+120	10+140	10+160	10+180	10+200	10+220	10+240	
ORIGINAL GROUND LEVEL (m.a.s.l)	1194.55	1194.76	1195.16	1195.38	1195.68	1195.87	1196.15	1196.52	1196.73	1196.87	1197.07	1197.09	1197.05	1197.04	1196.89	1196.64	1196.43	1196.40
PIPELINE INVERT LEVEL (m.a.s.l)	1193.42	1193.57	1193.80	1194.04	1194.27	1194.51	1194.74	1194.98	1195.20	1195.38	1195.56	1195.74	1195.72	1195.65	1195.54	1195.36	1195.18	1195.02
TRENCH DEPTH (m)	1.12	1.19	1.36	1.35	1.40	1.36	1.41	1.54	1.54	1.49	1.51	1.35	1.33	1.39	1.35	1.28	1.25	1.39
PIPE DATA	PIPE DIAMETER AND MATERIAL: HDPE DN 110mm, 90, AND 63mm									GRADED GRANULAR MATERIAL COMPACTED TO 85% MPD								

0 1000 2000

NOTES

Elevations in meters unless otherwise stated

LEGEND

PIPELINE WITH CHAINAGE

PROFILE

ORIGINAL GROUND LEVEL

PIPELINE INVERT LEVEL

AIR VALVE

WASH–OUT (W.O)

END CHAINAGE

REVISIONS	
DESCRIPTION	DATE

Consultant:

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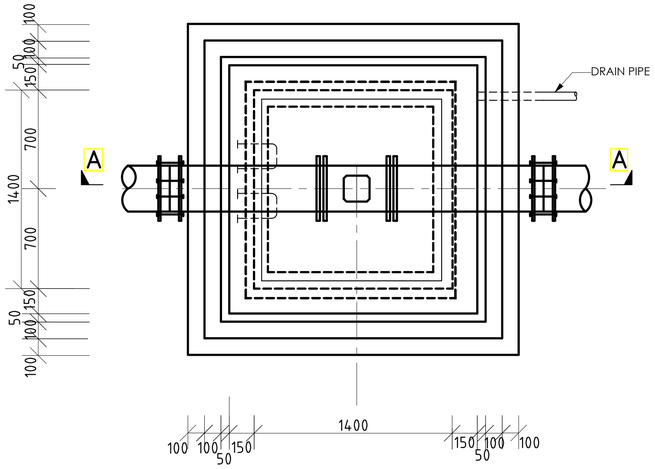
Designed:	D. Liambila
Drawn:	F. Kangogo
Checked:	D. Liambila
Approved:	B. Kim

Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: NZINIA–KAKEANI–KALAMBYA DISTRIBUTION PIPELINE PROFILE, DN 110mm, 90 AND 63mm

Stage:	FINAL DETAILED DESIGN
Date:	DECEMBER 2021
Drawing No.	TCE–KDP–KKK–018
Scale:	VERT–1:200 HOR–1:2000
Sheet No.	18 of 18
Index No.	

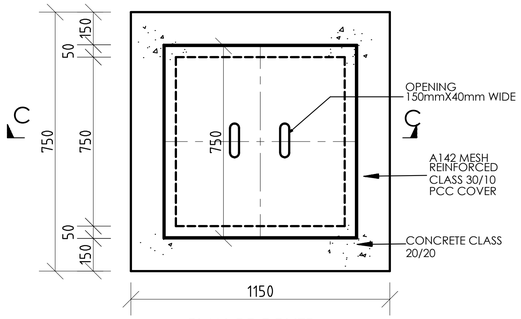
AIR VALVE CHAMBER



PLAN OF CHAMBER

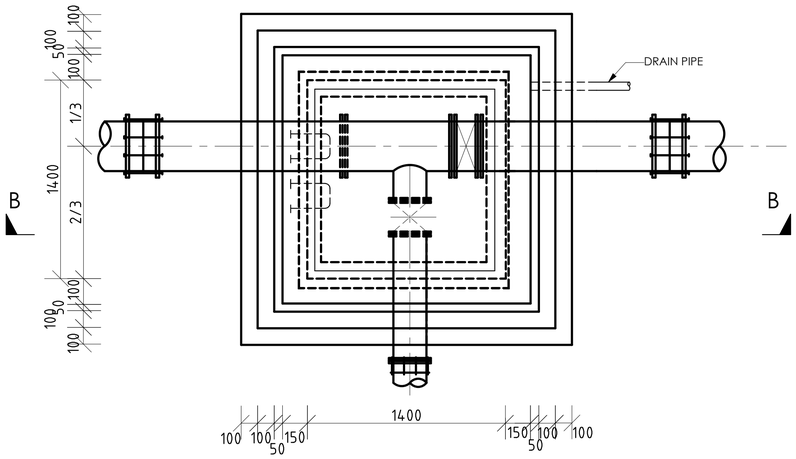
SCALE 1:40

VALVE CHAMBER DETAIL FOR FIRE HYDRANT



PLAN OF COVER

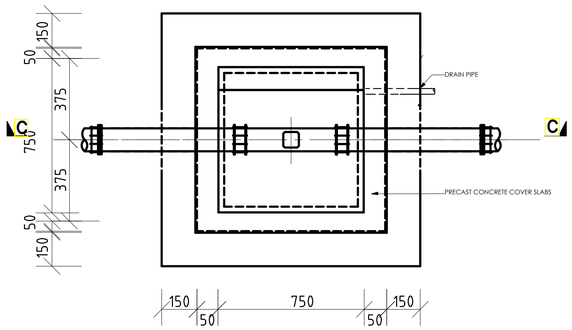
VALVE CHAMBER DETAIL FOR CONTROL VALVE



PLAN OF CHAMBER

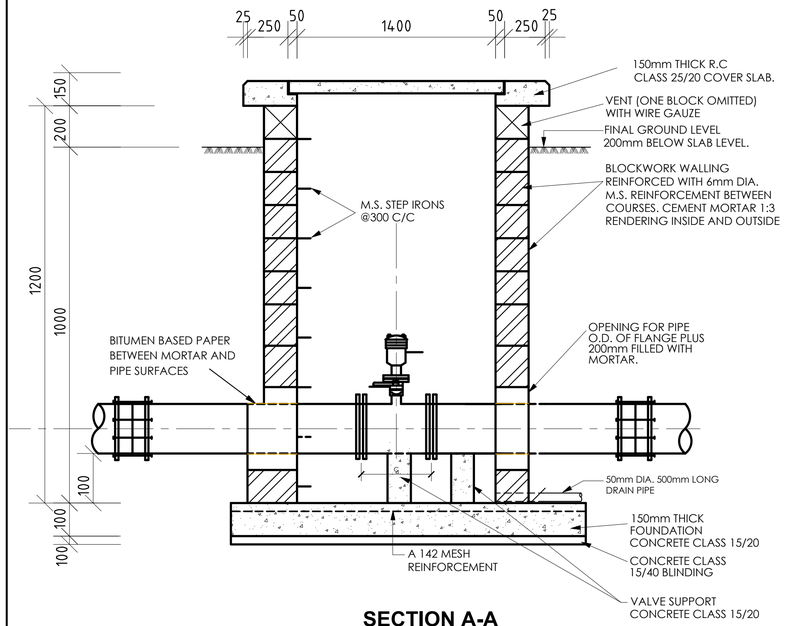
SCALE 1:40

AIR VALVE CHAMBER



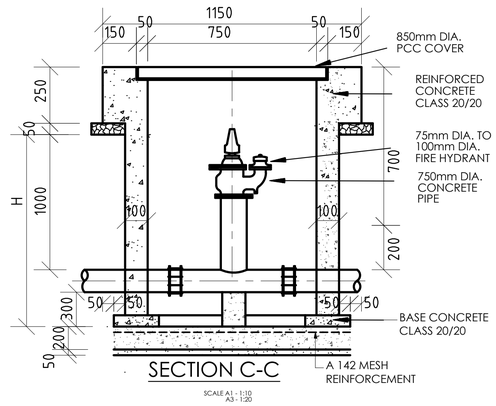
PLAN OF CHAMBER

SCALE 1:40



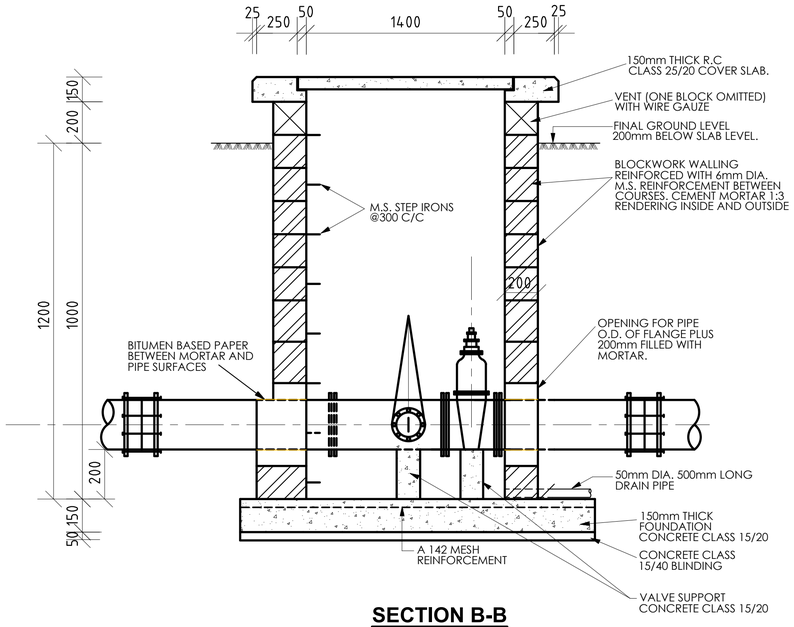
SECTION A-A

SCALE 1:40



SECTION C-C

SCALE A1 - 1:10
A3 - 1:20



SECTION B-B

SCALE 1:40

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES (mm) UNLESS NOTED OTHERWISE.
2. ALL BENDS, TEES, DEAD ENDS, ETC. OF PIPELINES TO BE ADEQUATELY RESTRAINED BY THRUST BLOCKS AS PER DRAWING No. TCE-TC-STD-W-007. THRUST BLOCKS NOT SHOWN FOR CLARITY.
3. BUTT FUSION WELDING AND ELECTRO FUSION JOINTING OF PIPES SHALL ONLY BE CARRIED OUT BY TRAINED OPERATIVES IN POSSESSION OF A CURRENT TRAINING CERTIFICATE, USING FULLY AUTOMATIC APPROVED JOINTING MACHINE/RIGS IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
4. VALVE CHAMBERS TO BE IN ACCORDANCE WITH STD-W-15. CHAMBERS NOT SHOWN FOR CLARITY.
5. ALL THRUST FLANGES TO BE ADEQUATELY RESTRAINED BY THRUST BLOCKS AS PER DRAWING No. TCE-TC-STD-W-007. THRUST BLOCKS NOT SHOWN FOR CLARITY.

PIPE WORK FITTINGS - LEGEND

1. PE MAIN PIPE
2. FLEXIBLE COUPLER ON MAIN PIPE
3. FLANGED PLAIN END DI PIPE WITH MIDDLE PUDDLE/THRUST FLANGE ON MAIN PIPE, LENGTH TO SUIT VALVE CHAMBER ARRANGEMENT
4. DISMANTLING JOINT ON MAIN PIPE
5. FLANGED SLUICE VALVE ON MAIN PIPE
6. ALL FLANGED TEE/CROSS (EQUAL/REDUCING AS APPROPRIATE)
7. TAPER AS REQUIRED
8. FLANGED SLUICE VALVE ON BRANCH PIPE
9. DISMANTLING JOINT ON BRANCH PIPE
10. FLANGED PLAIN END DI PIPE WITH PUDDLE/THRUST FLANGE ON BRANCH PIPE, LENGTH TO SUIT VALVE CHAMBER ARRANGEMENT
11. FLEXIBLE COUPLER ON MAIN PIPE
12. PE BRANCH PIPE

ABBREVIATIONS:

1. n.e.- NOT EXCEEDING
2. c/c- CENTRE TO CENTRE
3. MIN- MINIMUM
4. G.L.- GROUND LEVEL
5. mm- MILIMETER
6. m- METRE
7. EXT. DIA.- EXTERNAL DIAMETER
8. OD- OUTSIDE DIAMETER
9. ND- NOMINAL DIAMETER
10. RC- REINFORCED CONCRETE
11. T10- TWISTED BAR 10mm SIZE
12. NTS- NOT TO SCALE
13. CU.M PER LIN. METER- CUBIC METER PER LINER METER

Revisions	
Description	Date
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.	.

Consultant

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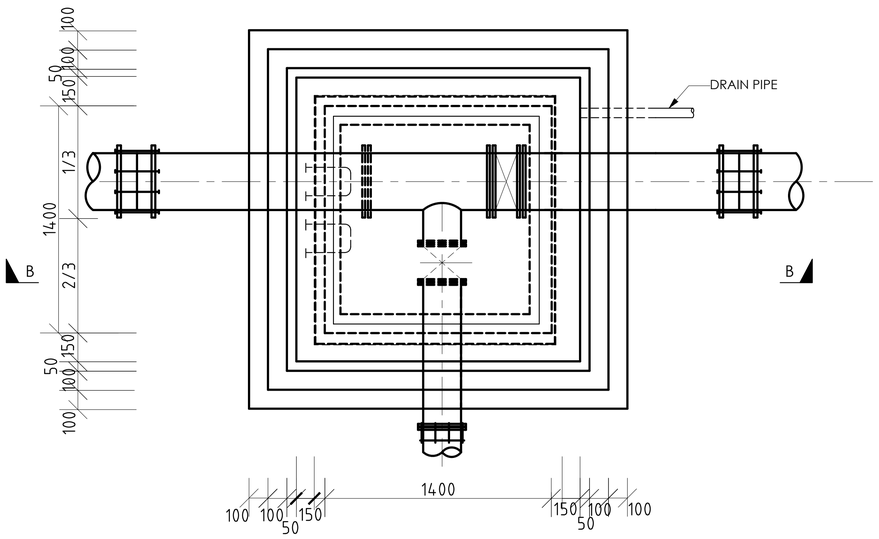
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KITUI WATER DISTRIBUTION SYSTEM
STANDARD DETAILS
AIR VALVE, FIRE HYDRANT AND VALVE CHAMBER

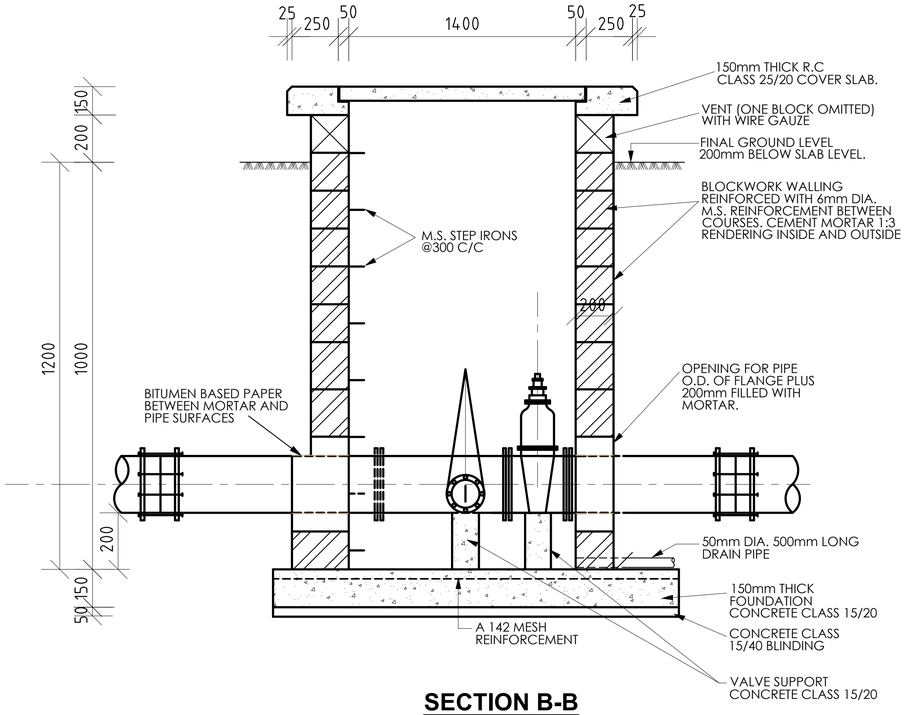
Stage :	FINAL DESIGN REVIEW	
Date :	JULY 2020	
Drawing No. :	KITUI-WS-STD-001	
Scale :	AS INDICATED	Sheet Size : A1
Sheet No. :	1 of 11	
Index No. :		

VALVE CHAMBER DETAIL FOR WASHOUT



PLAN OF CHAMBER

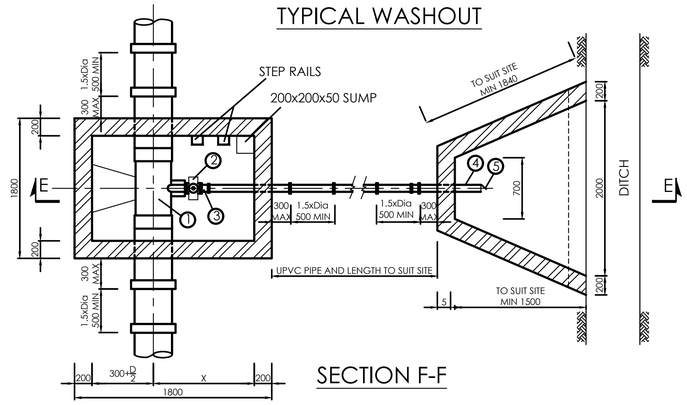
SCALE 1:40



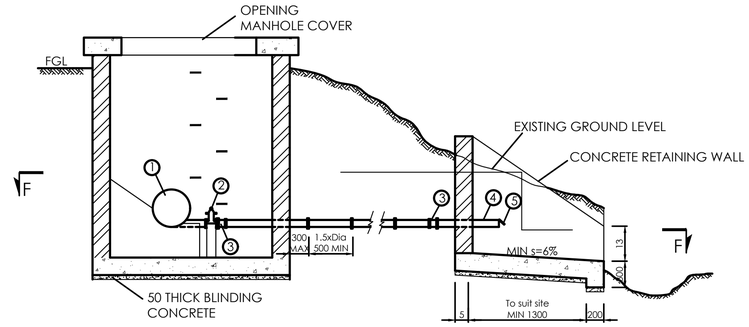
SECTION B-B

SCALE 1:40

TYPICAL WASHOUT

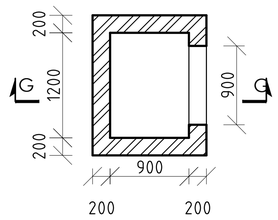


SECTION F-F

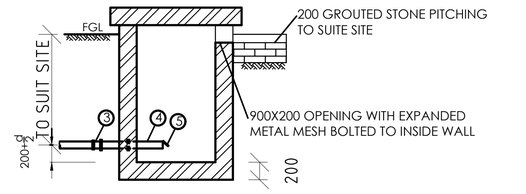


SECTION E-E

SPILLCHAMBER TYPE I

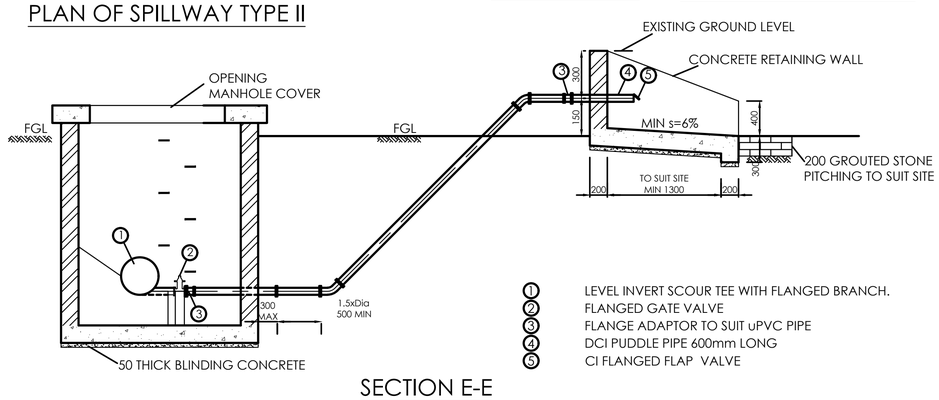


PLAN OF SPILLWAY TYPE II



SECTION G-G

SPILLCHAMBER TYPE II



SECTION E-E

1. LEVEL INVERT SCOUR TEE WITH FLANGED BRANCH.
2. FLANGED GATE VALVE
3. FLANGE ADAPTOR TO SUIT uPVC PIPE
4. DCI PUDDLE PIPE 600mm LONG
5. CI FLANGED FLAP VALVE

SPILLCHAMBER TYPE III

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES (mm) UNLESS NOTED OTHERWISE.
2. ALL BENDS, TEES, DEAD ENDS, ETC. OF PIPELINES TO BE ADEQUATELY RESTRAINED BY THRUST BLOCKS AS PER DRAWING No. TCE-TC-STD-W-007. THRUST BLOCKS NOT SHOWN FOR CLARITY.
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4. VALVE CHAMBERS TO BE IN ACCORDANCE WITH STD-W-15. CHAMBERS NOT SHOWN FOR CLARITY.
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PIPE WORK FITTINGS - LEGEND

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2. FLEXIBLE COUPLER ON MAIN PIPE
3. FLANGED PLAIN END DI PIPE WITH MIDDLE PUDDLE/THRUST FLANGE ON MAIN PIPE, LENGTH TO SUIT VALVE CHAMBER ARRANGEMENT
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5. FLANGED SLUICE VALVE ON MAIN PIPE
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7. TAPER AS REQUIRED
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11. FLEXIBLE COUPLER ON MAIN PIPE
12. PE BRANCH PIPE

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10. RC- REINFORCED CONCRETE
11. T10- TWISTED BAR 10mm SIZE
12. NTS- NOT TO SCALE
13. CU.M PER LIN. METER- CUBIC METER PER LINER METER

SCALE 1 : 20 — 200 0 200 400 600 800 1000mm

Revisions	
Description	Date
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Consultant

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Designed:	K. KAKA
Drawn :	K. KAKA
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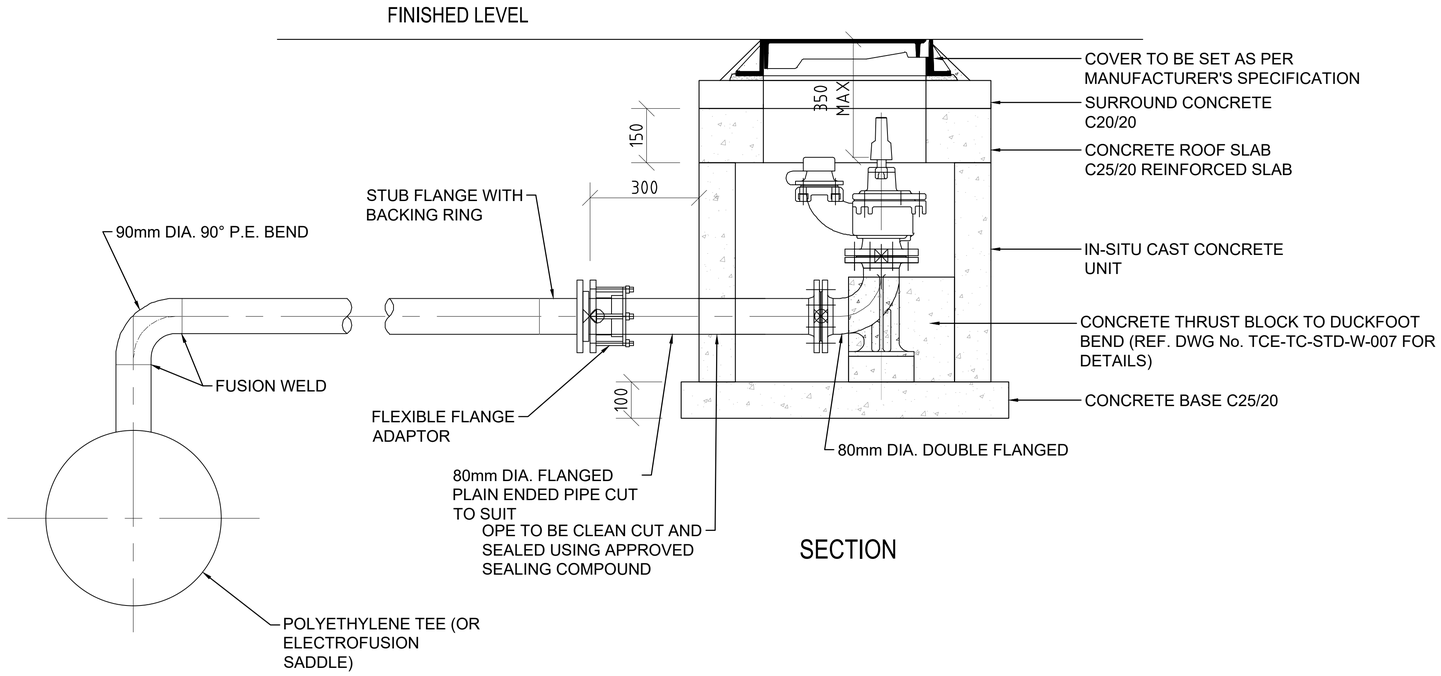
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KITUI WATER DISTRIBUTION SYSTEM
STANDARD DETAILS
WASHOUT

Stage :	FINAL DESIGN REVIEW
Date :	JULY 2020
Drawing No. :	KITUI-WS-STD-002
Scale :	AS INDICATED
Sheet Size :	A1
Sheet No. :	2 of 11
Index No. :	



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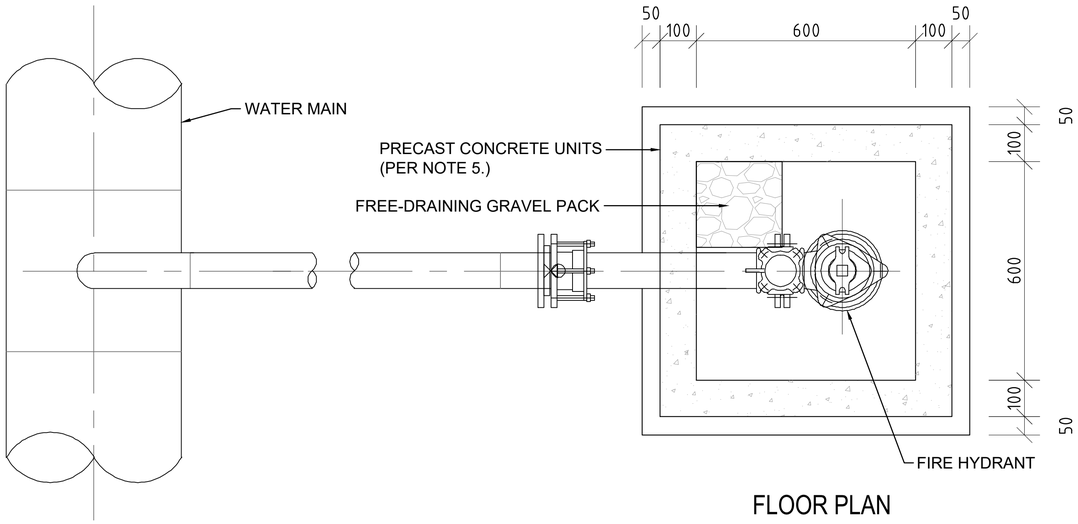
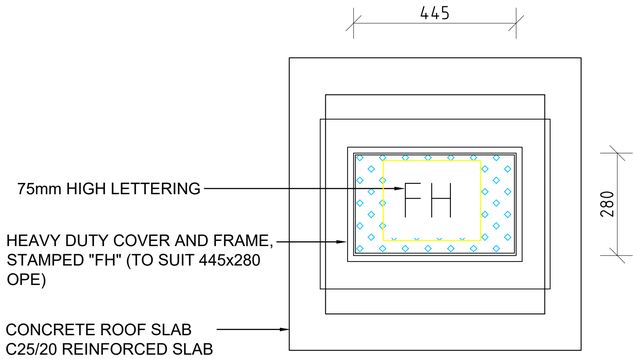


FLOOR PLAN



ROOF PLAN

FIRE HYDRANT CHAMBER
(PRECAST CONCRETE CONSTRUCTION)

NOTES:

1. ALL DIMENSIONS IN MILLIMETRES (mm) UNLESS NOTED OTHERWISE.
2. HYDRANT CHAMBERS SHALL BE COVERED WITH APPROVED HEAVY DUTY DUCTILE IRON COVERS TO BS EN 124 . COVER AND FRAME SHALL BE SUITABLE FOR ROAD AND TRAFFIC CONDITIONS AND SUBJECT TO APPROVAL OF THE ENGINEER.
3. ALL HYDRANTS SHALL BE CLOCKWISE CLOSING.
4. HYDRANT CHAMBERS SHALL BE CONSTRUCTED OF PRECAST UNITS APPROVED BY THE ENGINEER.
5. PE PIPES / FITTINGS TO BE IN ACCORDANCE WITH BS ISO 4427.
6. THRUST BLOCKS (NOT SHOWN ON DRAWING), TO BE PROVIDED AS PER STANDARD DRAWING TCE-TC-STD-W-007 AT ALL TEES, BENDS, TAPERS, DEAD ENDS AND PIPES AT STEEP SLOPES.
7. ANTI CORROSION TAPE TO BE PROVIDED AROUND BURIED FLANGES.
8. ALL CONCRETE TO BE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.

Revisions	
Description	Date
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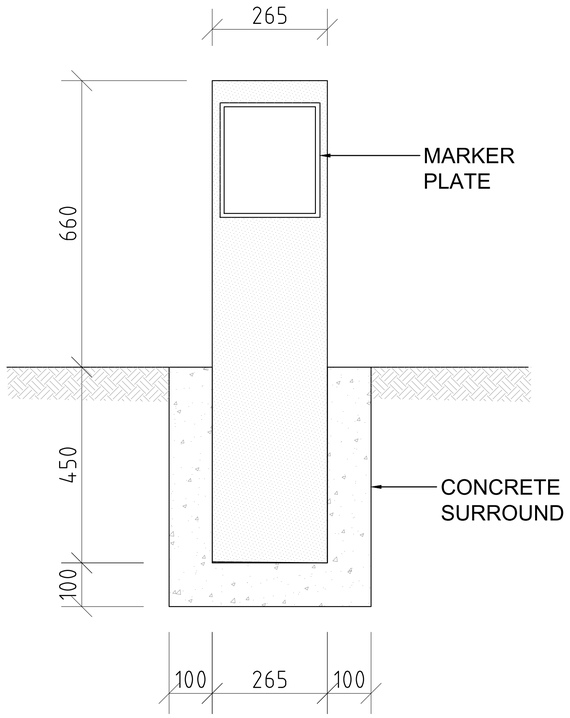
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KITUI WATER DISTRIBUTION SYSTEM
STANDARD DETAILS
OFF-LINE FIRE HYDRANT

Stage :	FINAL DESIGN REVIEW
Date :	JULY 2020
Drawing No. :	KITUI-WS-STD-003
Scale :	AS INDICATED
Sheet Size :	A1
Sheet No. :	3 of 11
Index No. :	



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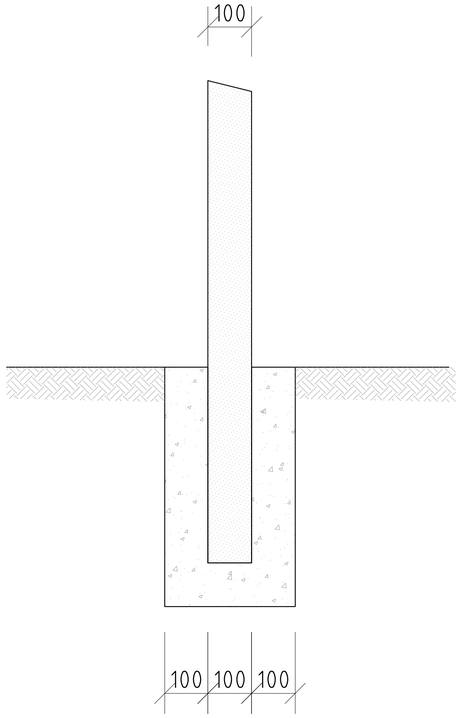

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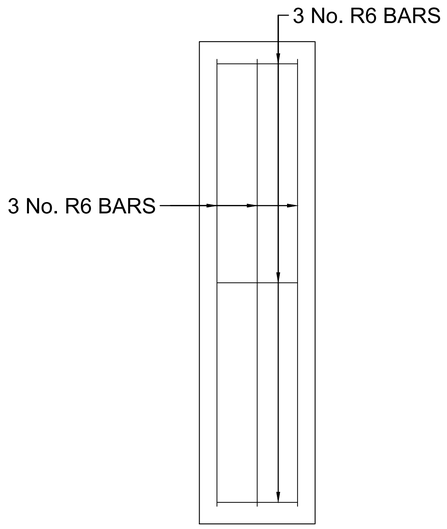

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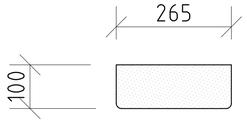
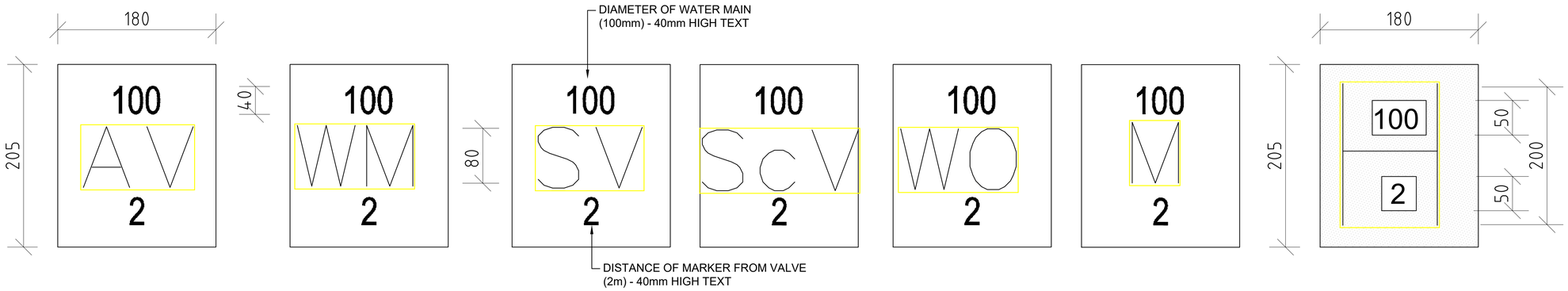


PLAN



AIR VALVE | WATER MAIN | SLUICE VALVE | SCOUR VALVE | WASHOUT HYDRANT | METER | FIRE HYDRANT

NOTES:

1. MARKER PLATES TO BE FIXED IN POSITION USING WALL PLUGS AND STAINLESS STEEL SCREWS.
2. MARKER PLATES TO BE MANUFACTURED IN ACCORDANCE WITH BS 3251.
3. FOR HYDRANT PLATE ALL CHARACTERS SHOULD BE BLACK AND THE REMAINDER OF THE FRONT FACE SHOULD CONFORM TO COLOUR REFERENCE No. 309 (CANARY YELLOW) OF BS 381C.
4. PIPE DIAMETER ON HYDRANT PLATE TO REFER TO WATERMAIN NOT BRANCH.
5. SLUICE VALVE, AIR VALVE, WASHOUT HYDRANT AND METER PLATES SHOULD BE CAST IRON. ALL CHARACTERS SHOULD BE BLACK ON WHITE PAINT BACKGROUND.
6. CONCRETE SURROUND TO MARKER POST TO BE GRADE C20/ 20 AND IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.

Revisions	
Description	Date
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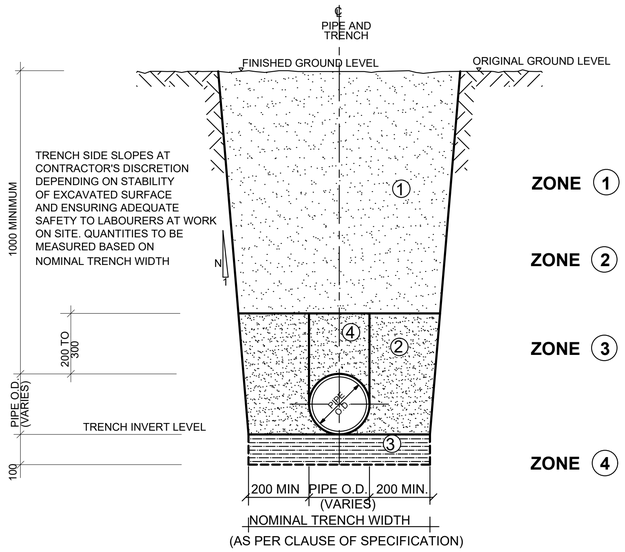
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

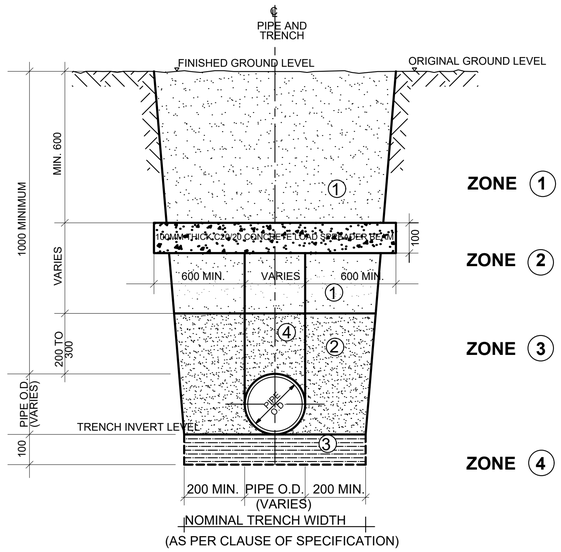
Drawing Title: KITUI WATER DISTRIBUTION SYSTEM
STANDARD DETAILS
MARKER POSTS AND PLATES

Stage :	FINAL DESIGN REVIEW
Date :	JULY 2020
Drawing No. :	KITUI-WS-STD-004
Scale :	AS INDICATED
Sheet No. :	4 of 11
Sheet Size :	A1
Index No. :	



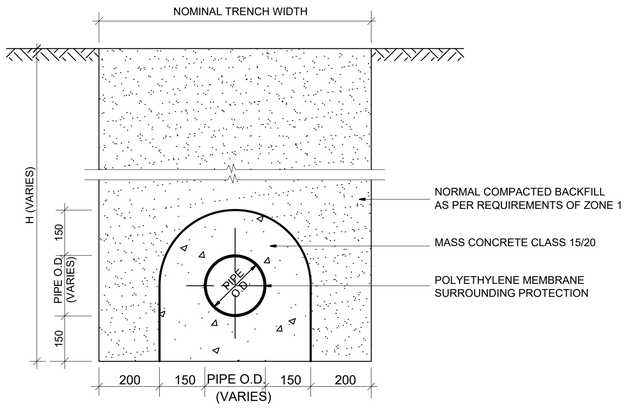
TYPICAL TRENCH DETAIL FOR RETICULATION PIPES (uPVC OR CEMENT LINED FERROUS PIPES)

SCALE 1:100



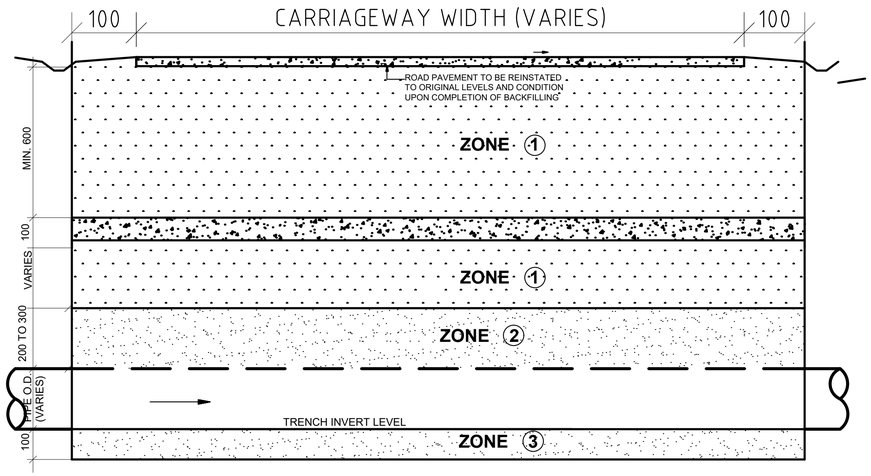
TYPICAL TRENCH DETAIL SHOWING PIPE PROTECTION (uPVC OR CEMENT LINED FERROUS PIPES)

SCALE 1:100



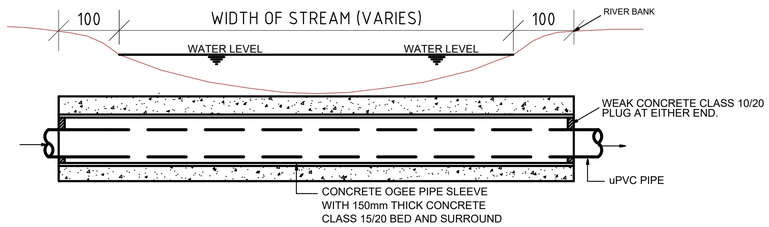
CONCRETE PROTECTION TO uPVC PIPES LAID UNDER STREAM

SCALE 1: 20



LONGITUDINAL SECTION SHOWING PIPE PROTECTION (uPVC OR CEMENT LINED FERROUS PIPES)

SCALE 1:100



TYPICAL STREAM CROSSING DETAIL FOR uPVC PIPES

SCALE A1- 1: 100

NOTES:

1. SOIL TO BE USED MAY INCLUDE FREE-DRAINING COARSE SAND,GRAVEL, LOAM AND SOIL OF A FRIABLE NATURE. PARTICLE SIZE NOT TO EXCEED 20mm.
2. BACKFILL IN LAYERS NOT EXCEEDING 300mm UP TO FINISHED GROUND LEVEL, EACH LAYER BEING WELL COMPACTED TO LIMIT VOIDS.
3. MECHANICAL COMPACTION EQUIPMENT MAY BE USED IF APPROVED BY ENGINEER.
4. BACKFILL WITH SOIL APPROVED BY THE ENGINEER, IN LAYERS NOT EXCEEDING 200mm.
5. THOROUGHLY COMPACT SOIL, TAMPING EQUALLY ON EITHER SIDE AND ALONG LOWER EDGE OF PIPE. ONLY HAND TAMPING TO BE USED
6. IF ROCK SHARP PROJECTIONS, TREE ROOTS OR OTHER UNSUITABLE MATERIAL IS ENCOUNTERED AT TRENCH INVERT LEVEL, A FURTHER100mm DEPTH OF MATERIAL IS TO BE EXCAVATED.
7. BACKFILL WITH SOIL APPROVED BY THE ENGINEER UP TO TRENCH INVERT LEVEL.
8. THOROUGHLY COMPACT SOIL BY HAND TO GIVE A UNIFORM GRADIENT ALONG PIPE TRENCH, LEAVING RECESSES FOR PIPE JOINTS.
9. SIMILAR REQUIREMENTS TO ZONE 2 EXCEPT NO EXCESS TAMPING IS PERMITTED OVER PIPE.

Revisions	
Description	Date
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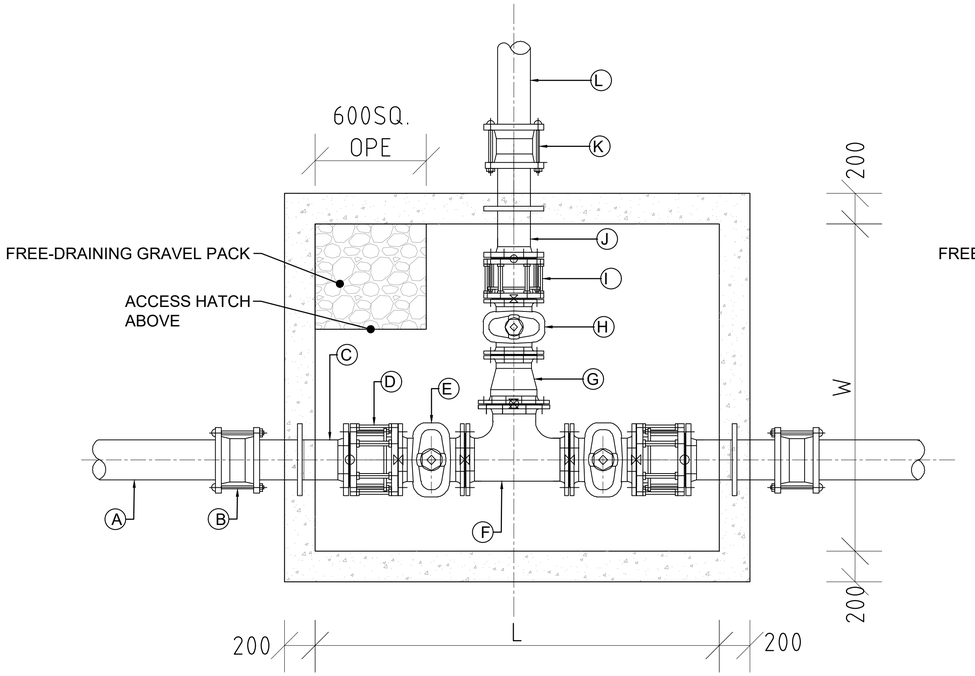
Approved:	B. KIM

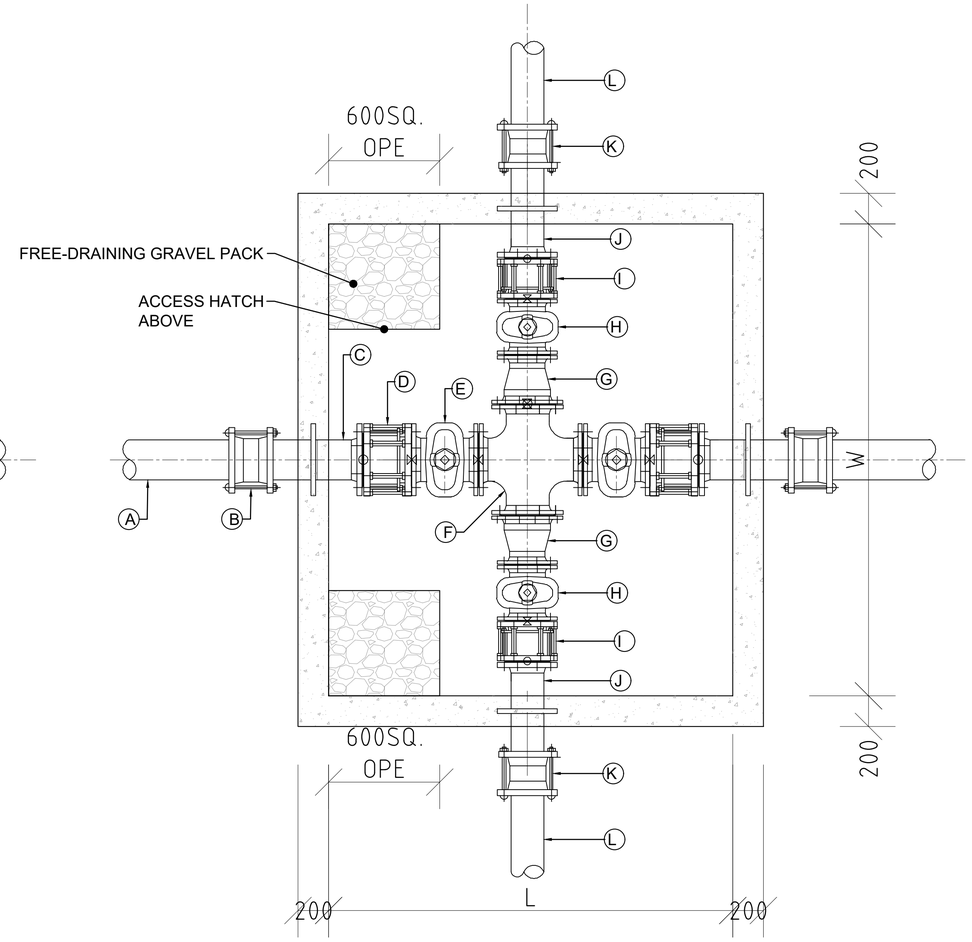
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KITUI WATER DISTRIBUTION SYSTEM
STANDARD DETAILS
PIPE PROTECTION DETAILS

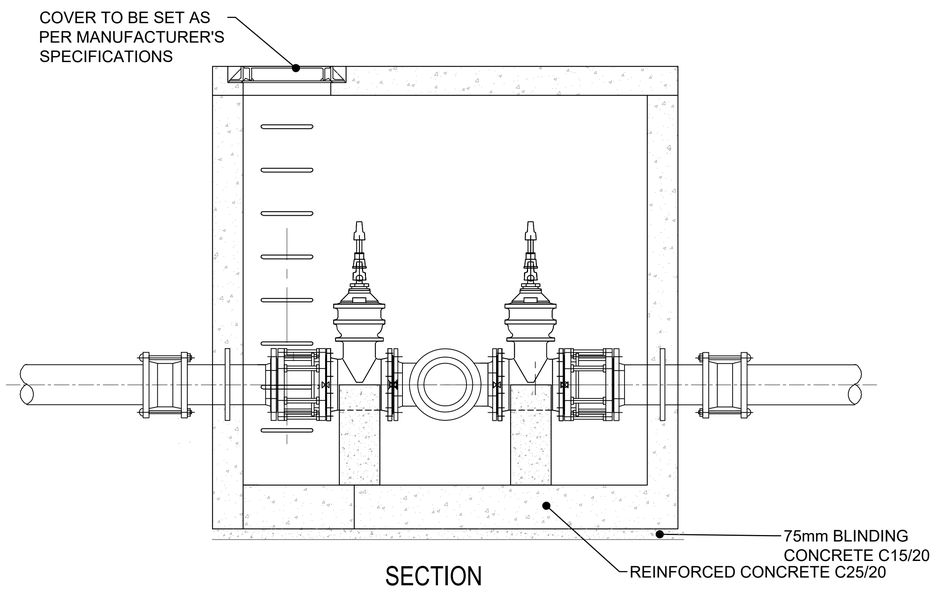
Stage :	FINAL DESIGN REVIEW
Date :	JULY 2020
Drawing No. :	KITUI-WS-STD-005
Scale :	AS INDICATED
Sheet Size :	A1
Sheet No. :	5 of 11
Index No. :	



FLOOR PLAN (TEE JUNCTION)



FLOOR PLAN (CROSS JUNCTION)



SECTION

NOM. DIA. OF WATERMAIN (mm)	CHAMBER DIMENSIONS (mm)			
	TEE JUNCTION		CROSS JUNCTION	
	L	W	L	W
≤160	900	900	900	1500
225 - 280	1200	1200	1200	1800

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES (mm) UNLESS NOTED OTHERWISE.
2. ALL BENDS, TEES, DEAD ENDS, ETC. OF PIPELINES TO BE ADEQUATELY RESTRAINED BY THRUST BLOCKS AS PER DRAWING No. TCE-TC-STD-W-007. THRUST BLOCKS NOT SHOWN FOR CLARITY.
3. BUTT FUSION WELDING AND ELECTRO FUSION JOINTING OF PIPES SHALL ONLY BE CARRIED OUT BY TRAINED OPERATIVES IN POSSESSION OF A CURRENT TRAINING CERTIFICATE, USING FULLY AUTOMATIC APPROVED JOINTING MACHINE/RIGS IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
4. VALVE CHAMBERS TO BE IN ACCORDANCE WITH STD-W-15. CHAMBERS NOT SHOWN FOR CLARITY.
5. ALL THRUST FLANGES TO BE ADEQUATELY RESTRAINED BY THRUST BLOCKS AS PER DRAWING No. TCE-TC-STD-W-007. THRUST BLOCKS NOT SHOWN FOR CLARITY.

PIPE WORK FITTINGS - LEGEND

1. PE MAIN PIPE
2. FLEXIBLE COUPLER ON MAIN PIPE
3. FLANGED PLAIN END DI PIPE WITH MIDDLE PUDDLE/THRUST FLANGE ON MAIN PIPE, LENGTH TO SUIT VALVE CHAMBER ARRANGEMENT
4. DISMANTLING JOINT ON MAIN PIPE
5. FLANGED SLUICE VALVE ON MAIN PIPE
6. ALL FLANGED TEE/CROSS (EQUAL/REDUCING AS APPROPRIATE)
7. TAPER AS REQUIRED
8. FLANGED SLUICE VALVE ON BRANCH PIPE
9. DISMANTLING JOINT ON BRANCH PIPE
10. FLANGED PLAIN END DI PIPE WITH PUDDLE/THRUST FLANGE ON BRANCH PIPE, LENGTH TO SUIT VALVE CHAMBER ARRANGEMENT
11. FLEXIBLE COUPLER ON MAIN PIPE
12. PE BRANCH PIPE

ABBREVIATIONS:

1. n.e.- NOT EXCEEDING
2. c/c- CENTRE TO CENTRE
3. MIN- MINIMUM
4. G.L.- GROUND LEVEL
5. mm- MILIMETER
6. m- METRE
7. EXT. DIA.- EXTERNAL DIAMETER
8. OD- OUTSIDE DIAMETER
9. ND- NOMINAL DIAMETER
10. RC- REINFORCED CONCRETE
11. T10- TWISTED BAR 10mm SIZE
12. NTS- NOT TO SCALE
13. CU.M PER LIN. METER- CUBIC METER PER LINER METER

SCALE 1 : 20 — 200 0 200 400 600 800 1000mm

Revisions	
Description	Date
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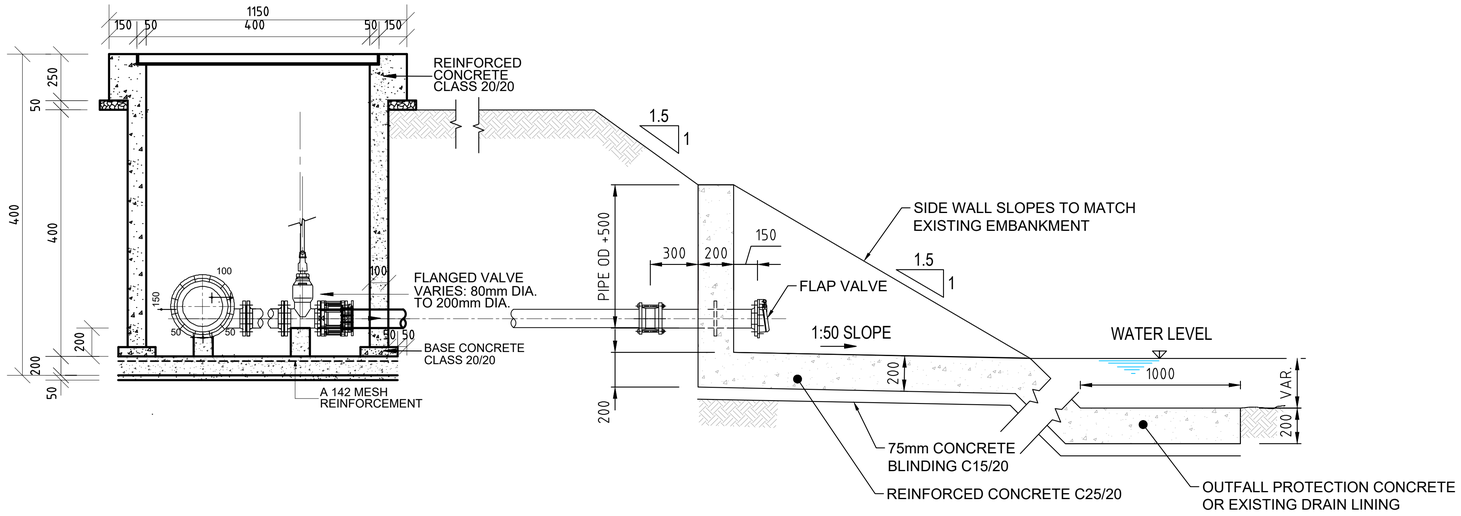
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KITUI WATER DISTRIBUTION SYSTEM
STANDARD DETAILS
JUNCTION ISOLATION VALVE CHAMBER

Stage :	FINAL DESIGN REVIEW	
Date :	JULY 2020	
Drawing No. :	KITUI-WS-STD-006	
Scale :	AS INDICATED	Sheet Size : A1
Sheet No. :	6 of 11	
Index No. :		



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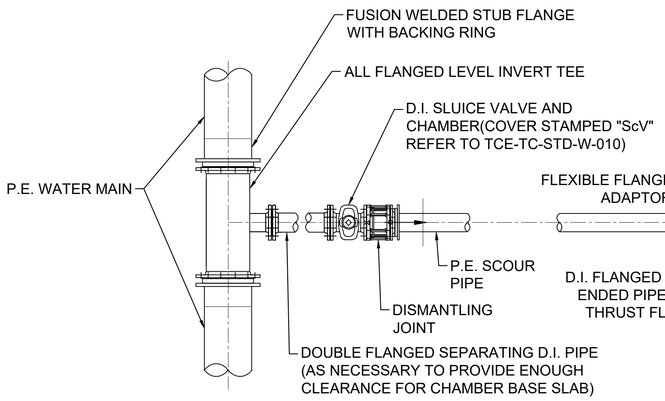
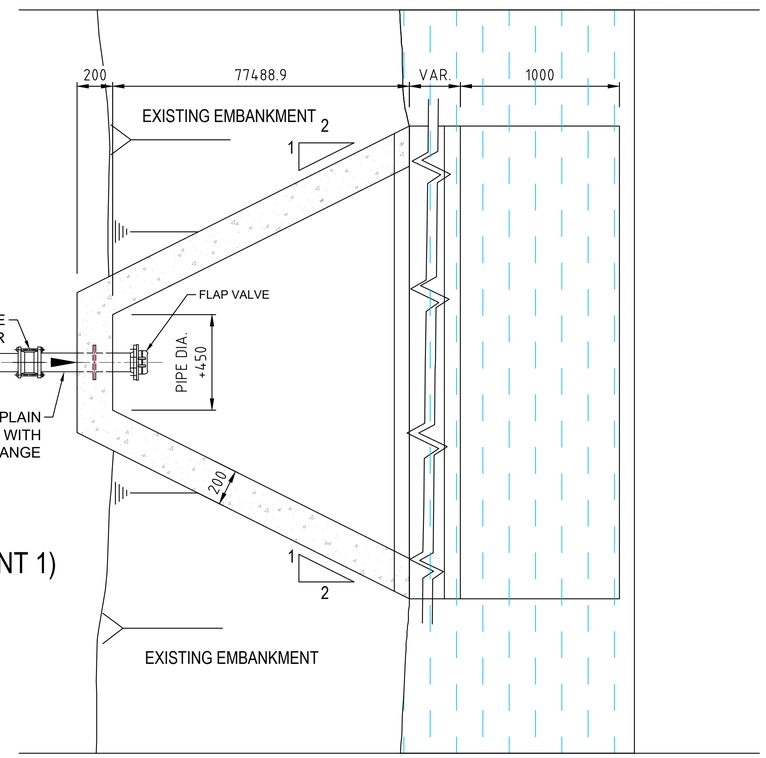
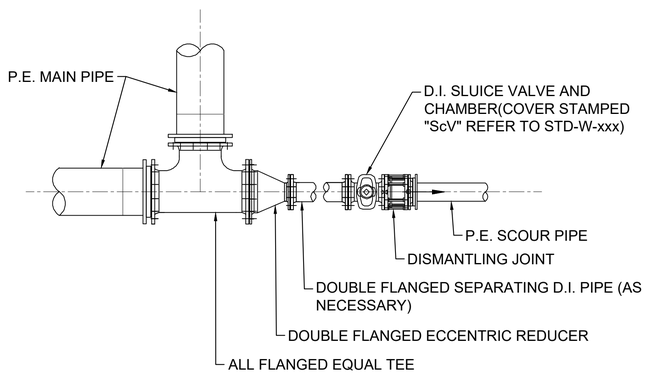


PLAN (TYPICAL ARRANGEMENT 1)





PLAN (TYPICAL ARRANGEMENT 2)

DIAMETER OF WATERMAIN (mm)	DIAMETER OF SCOUR (mm)
NOT EXCEEDING 75	50
100 TO 200	75
200 TO 600	100 - 200

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES (mm) UNLESS NOTED OTHERWISE.
2. CONCRETE FOR SCOUR CHAMBER AND HEADWALL TO BE C25 / 20 IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
3. THRUST BLOCKS (NOT SHOWN ON DRAWING), TO BE PROVIDED AS PER STANDARD DRAWING TCE-TC-STD-W-007 AT ALL TEES, BENDS, TAPERS, DEAD ENDS AND PIPES AT STEEP SLOPES.
4. ANTI-CORROSION TAPE TO BE PROVIDED AROUND BURIED FLANGES.

Revisions	
Description	Date
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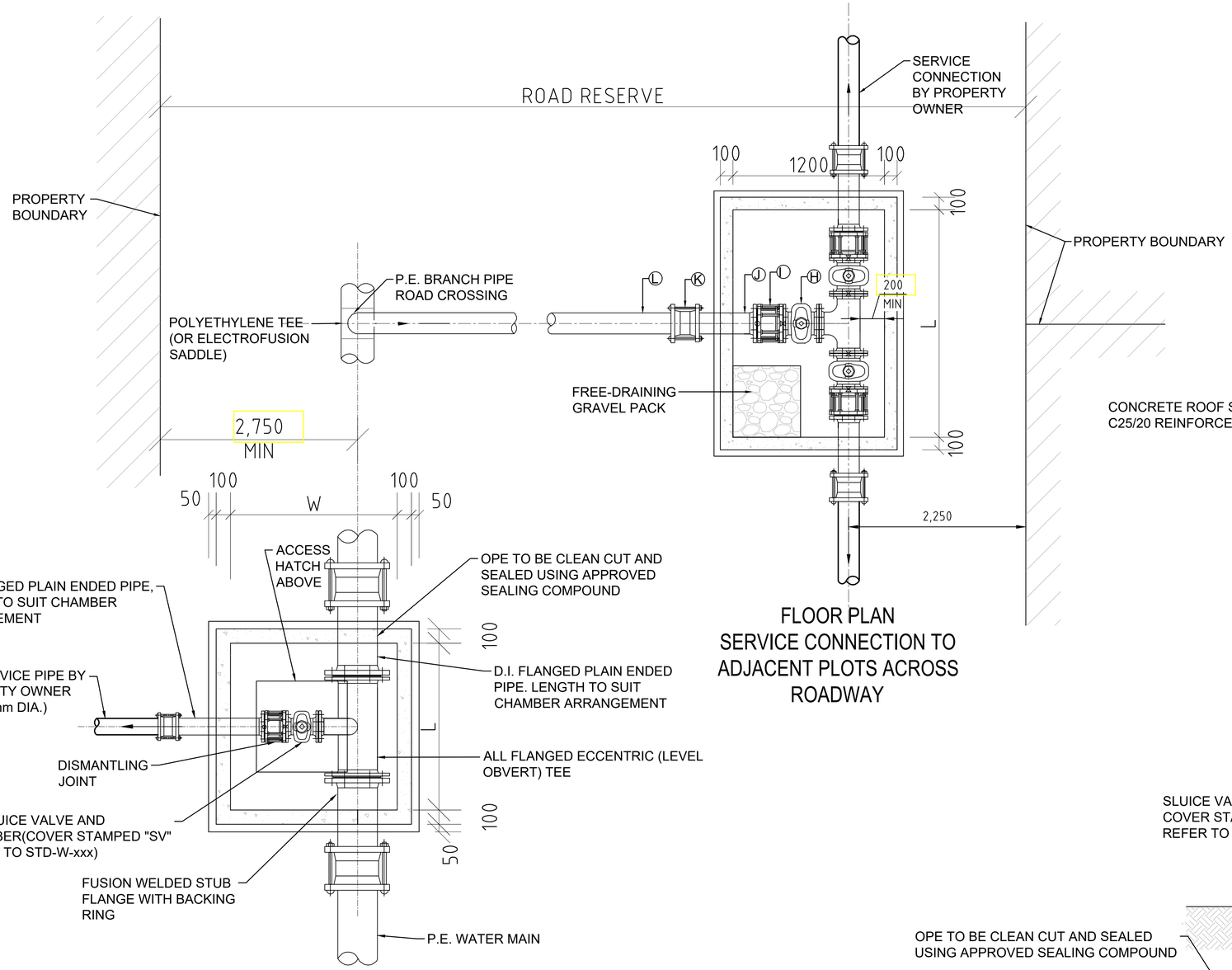
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

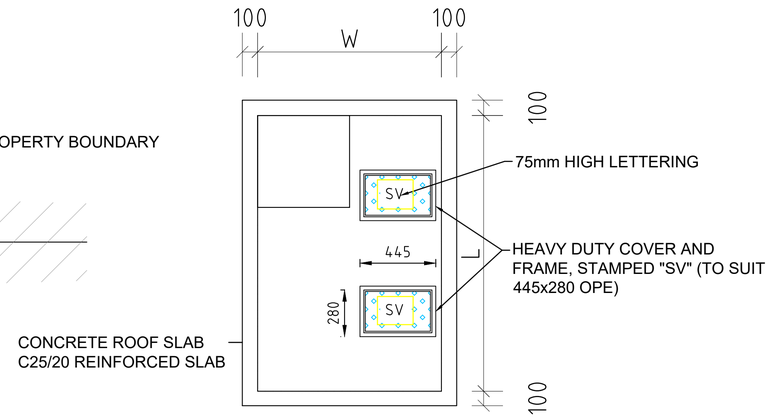
Drawing Title: KITUI WATER DISTRIBUTION SYSTEM
STANDARD DETAILS
WASHOUT

Stage :	FINAL DESIGN REVIEW
Date :	JULY 2020
Drawing No. :	KITUI-WS-STD-007
Scale :	AS INDICATED
Sheet No. :	7 of 11
Sheet Size :	A1
Index No. :	

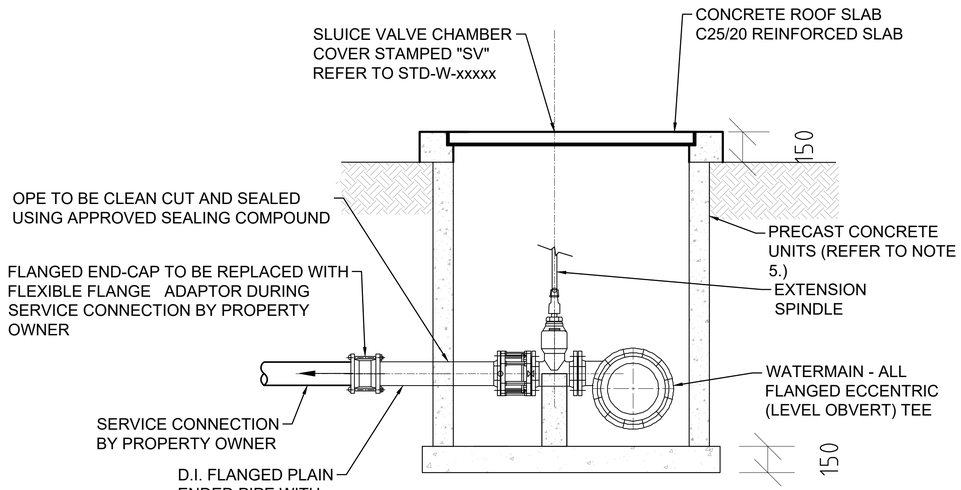


FLOOR PLAN
SERVICE CONNECTION TO ADJACENT PLOTS ACROSS ROADWAY

FLOOR PLAN
SERVICE CONNECTION OFF WATER MAIN



TYPICAL ROOF PLAN



TYPICAL SECTION

NOM. DIA. OF WATERMAIN (mm)	CHAMBER DIMENSIONS (mm)			
	ONE-WAY		TWO-WAY	
	L	W	L	W
≤160	900	900	1800	1200
225 - 280	1200	1200	2000	1500

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES (mm) UNLESS NOTED OTHERWISE.
2. REFER TO DRAWINGS NO.TCE-TC-W-001AND TCE-TC-RD-002 FOR LOCATION OF WATER DISTRIBUTION SYSTEM
3. PE PIPES / FITTINGS TO BE IN ACCORDANCE WITH BS ISO 4427.
4. THRUST BLOCKS (NOT SHOWN ON DRAWING), TO BE PROVIDED AS PER STANDARD DRAWING TCE-TC-STD-W-007 AT ALL TEES, BENDS, TAPERS, DEAD ENDS AND PIPES AT STEEP SLOPES.
5. ANTI CORROSION TAPE TO BE PROVIDED AROUND BURIED FLANGES.
6. ALL CONCRETE TO BE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.

PIPE WORK FITTINGS - LEGEND

1. PE MAIN PIPE
2. FLEXIBLE COUPLER ON MAIN PIPE
3. FLANGED PLAIN END DI PIPE WITH MIDDLE PUDDLE/THRUST FLANGE ON MAIN PIPE, LENGTH TO SUIT VALVE CHAMBER ARRANGEMENT
4. DISMANTLING JOINT ON MAIN PIPE
5. FLANGED SLUICE VALVE ON MAIN PIPE
6. ALL FLANGED TEE (EQUAL/REDUCING AS APPROPRIATE)
7. TAPER AS REQUIRED
8. FLANGED SLUICE VALVE ON BRANCH PIPE
9. DISMANTLING JOINT ON BRANCH PIPE
10. FLANGED PLAIN END DI PIPE WITH PUDDLE/THRUST FLANGE ON BRANCH PIPE, LENGTH TO SUIT VALVE CHAMBER ARRANGEMENT
11. FLEXIBLE COUPLER ON MAIN PIPE
12. PE BRANCH PIPE

ABBREVIATIONS:

1. n.e.- NOT EXCEEDING
2. c/c- CENTRE TO CENTRE
3. MIN- MINIMUM
4. G.L.- GROUND LEVEL
5. mm- MILIMETER
6. m- METRE
7. EXT. DIA.- EXTERNAL DIAMETER
8. OD- OUTSIDE DIAMETER
9. ND- NOMINAL DIAMETER
10. RC- REINFORCED CONCRETE
11. T10- TWISTED BAR 10mm SIZE
12. NTS- NOT TO SCALE
13. CU.M PER LIN. METER- CUBIC METER PER LINER METER

SCALE 1 : 20 — 200 0 200 400 600 800 1000mm

Revisions	
Description	Date
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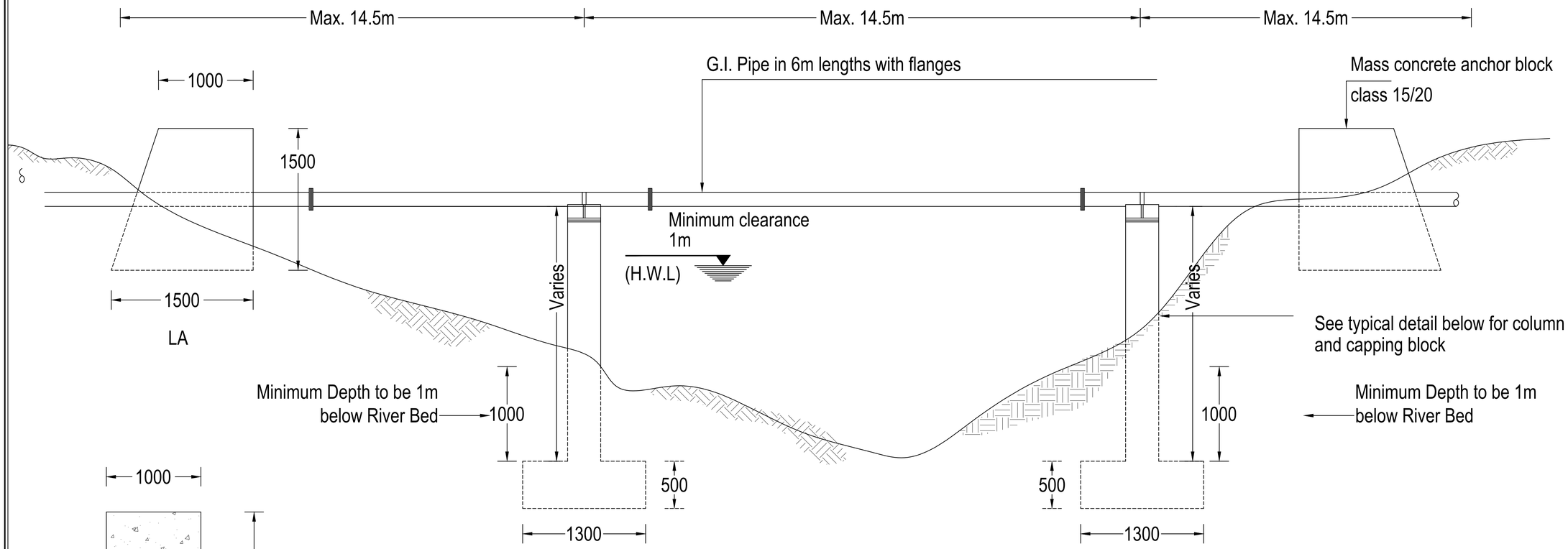
Approved:	B. KIM

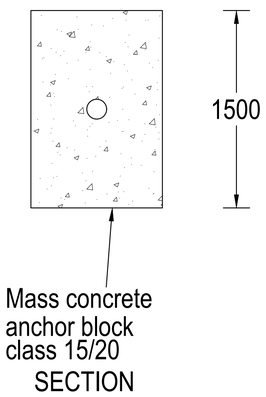
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

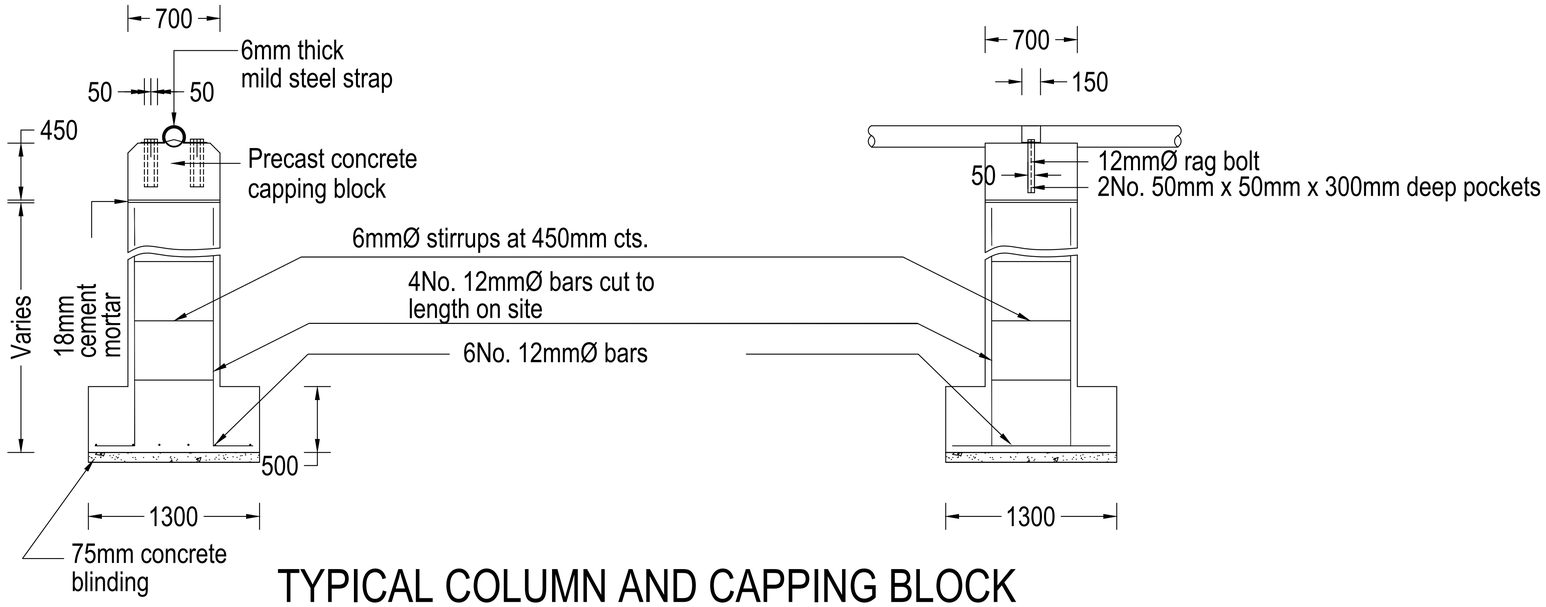
Drawing Title: KITUI WATER DISTRIBUTION SYSTEM
STANDARD DETAILS
SERVICE CONNECTION

Stage :	FINAL DESIGN REVIEW
Date :	JULY 2020
Drawing No. :	KITUI-WS-STD-008
Scale :	AS INDICATED
Sheet Size :	A1
Sheet No. :	8 of 11
Index No. :	



TYPICAL PIPE FOR RIVER CROSSING AND DEEP VALLEYS





TYPICAL COLUMN AND CAPPING BLOCK

NOTE

Minimum cover to reinforcement 25mm

Revisions	
Description	Date
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Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KITUI WATER DISTRIBUTION SYSTEM
STANDARD DETAILS
RIVER CROSSING DETAILS

Stage :	FINAL DESIGN REVIEW		
Date :	JULY 2020		
Drawing No. :	KITUI-WS-STD-009		
Scale :	1:100	Sheet Size :	A1
Sheet No. :	9 of 11		
Index No. :			

DIMENSIONS TABLE FOR THRUST BLOCKS - HORIZONTAL BENDS

TEST HEAD (M)	BEND ANGLE	SIZE OF BEND DN(MM)					
		250			200 OR LESS		
		L(MM)	P(MM)	W(MM)	L(MM)	P(MM)	W(MM)
200	11 1/4°	600	900	350	400	900	200
	22 1/2°	1000	1000	350	600	1000	200
	45°	1100	1300	400	1000	1100	200
	90°	1500	1500	400	1000	1500	300

DIMENSIONS TABLE FOR THRUST BLOCKS FOR TEES

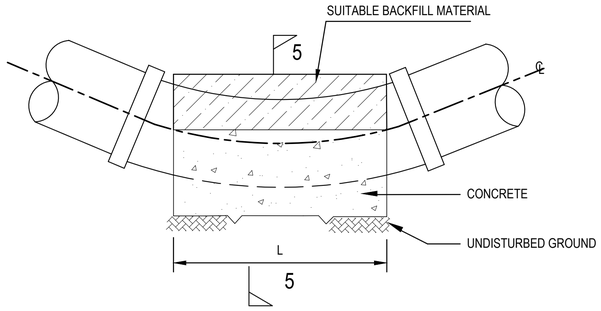
TEST HEAD (M)	MAIN SIZE (MM)	BRANCH SIZE IN (MM) DIMENSIONS (L)M X (P)M		
		250	200	150/100
200	250	1.3 X 1.35	1.0 X 1.25	0.85 X 1.0
	200	-	1.0 X 1.25	0.85 X 1.0
	150	-	-	0.85 X 1.0
	100	-	-	0.85 X 1.0

DIMENSIONS TABLE FOR THRUST BLOCKS - VERTICAL BENDS

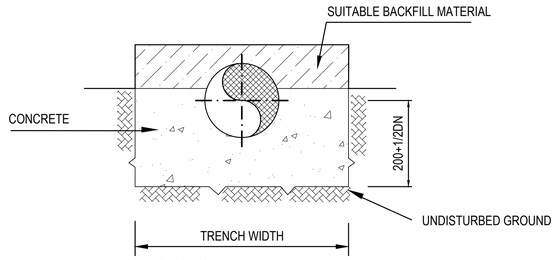
TEST HEAD (M)	BEND ANGLE	SIZE OF BEND DN(MM)					
		250			200 OR LESS		
		L(MM)	P(MM)	W(MM)	L(MM)	P(MM)	W(MM)
200	11 1/4°	600	900	350	400	900	200
	22 1/2°	1000	1000	350	600	1000	200
	45°	1100	1300	400	1000	1100	200
	90°	1500	1500	400	1000	1500	300

DIMENSIONS TABLE FOR ANCHOR BLOCKS - TAPERS

TEST HEAD (M)	MAIN SIZE (MM)	DIMENSIONS (S)M X (W)M X (D)M TAPER (SMALLER SIZE)MM		
		200	150	100
200	250	0.7X1.0X0.2	1.0X1.0X0.2	1.1X1.1X0.2
	200	-	0.7X1.0X0.2	0.7X1.0X0.2
	150	-	-	0.7X1.0X0.2



VERTICAL BENDS
N.T.S.



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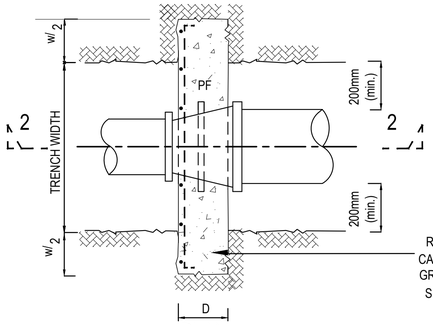
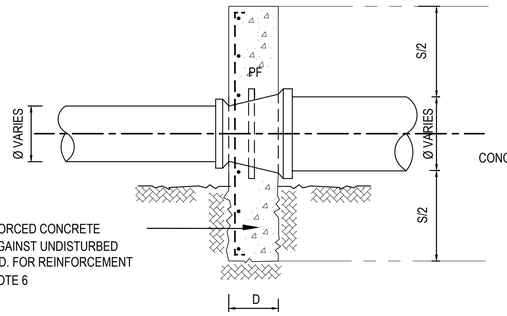


PLAN
ANCHOR BLOCKS FOR TAPERS



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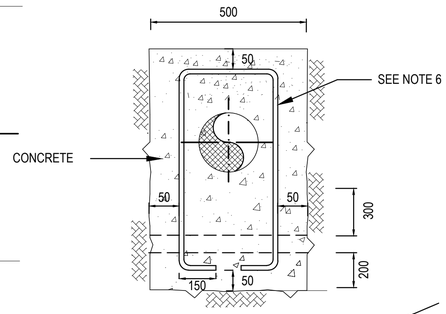

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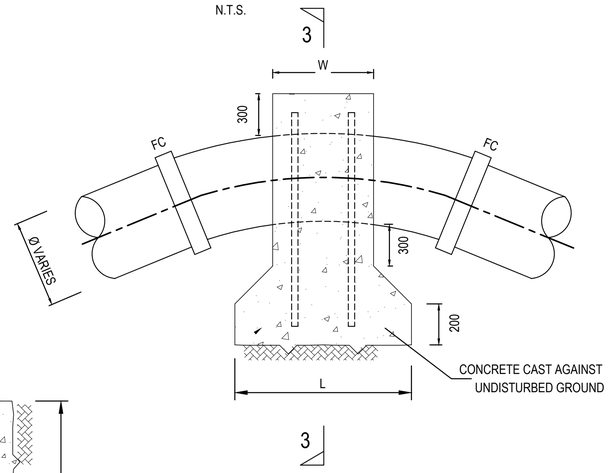
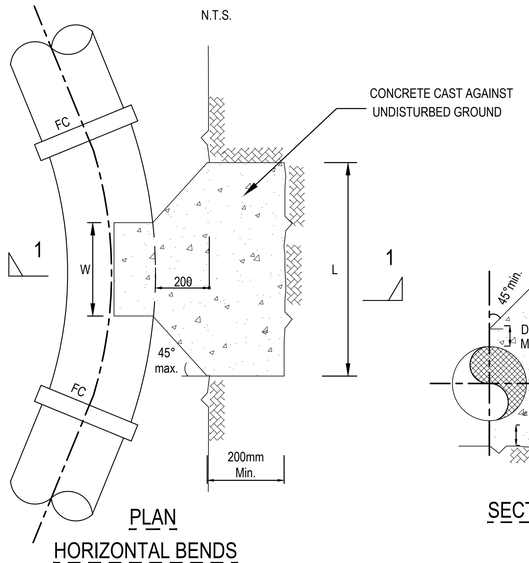
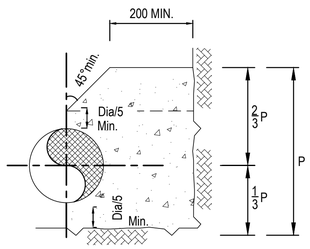


VERTICAL BENDS
(TYPICAL)
N.T.S.



PLAN
HORIZONTAL BENDS
N.T.S.



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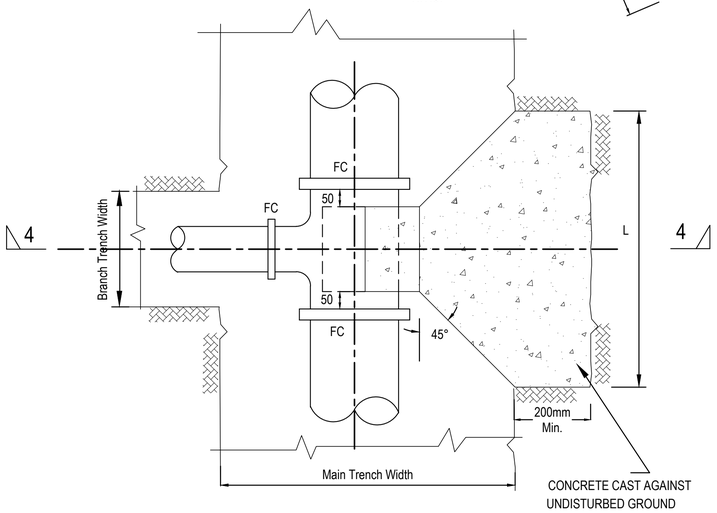
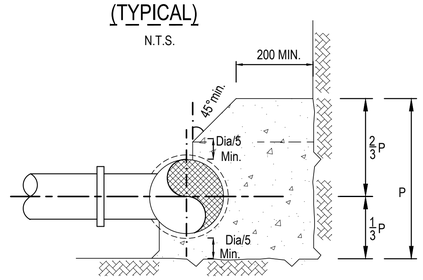


PLAN
THRUST BLOCKS FOR TEES
N.T.S.



SECTION 4-4
N.T.S.

Revisions	
Description	Date
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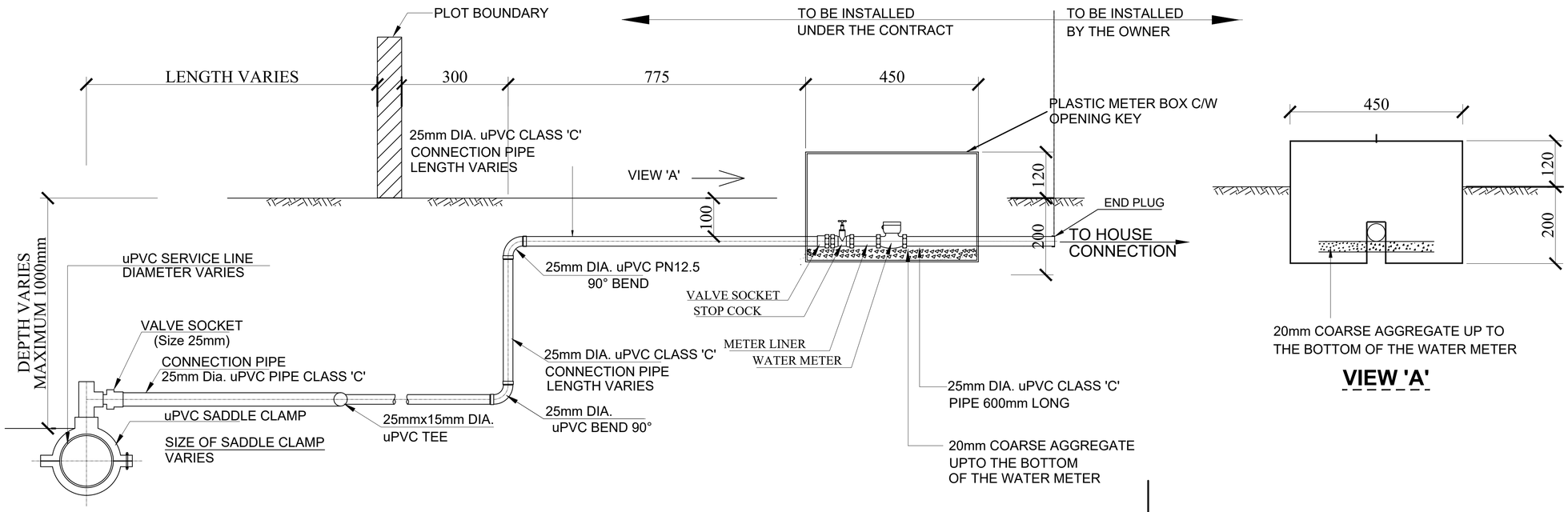
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KITUI WATER DISTRIBUTION SYSTEM
STANDARD DETAILS
SERVICE CONNECTION

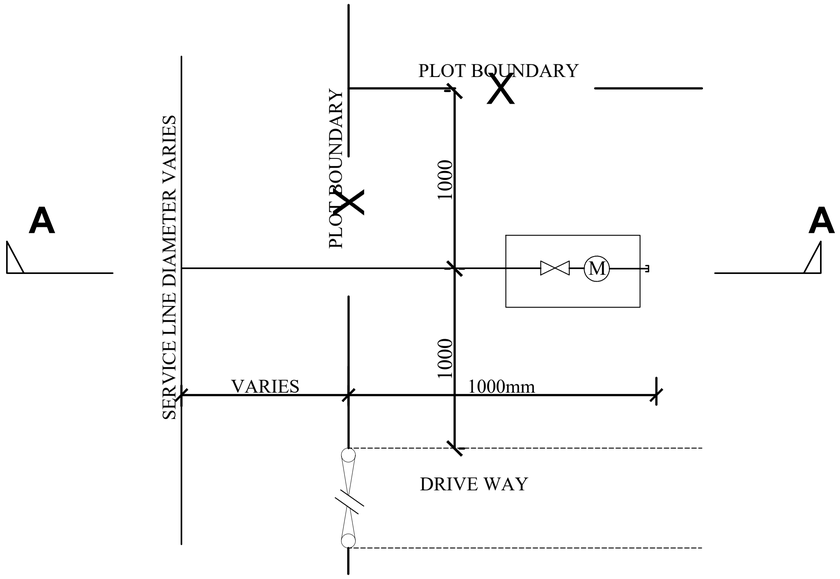
Stage :	FINAL DESIGN REVIEW
Date :	JULY 2020
Drawing No. :	KITUI-WS-STD-010
Scale :	AS INDICATED
Sheet Size :	A1
Sheet No. :	10 of 11
Index No. :	



VIEW 'A'

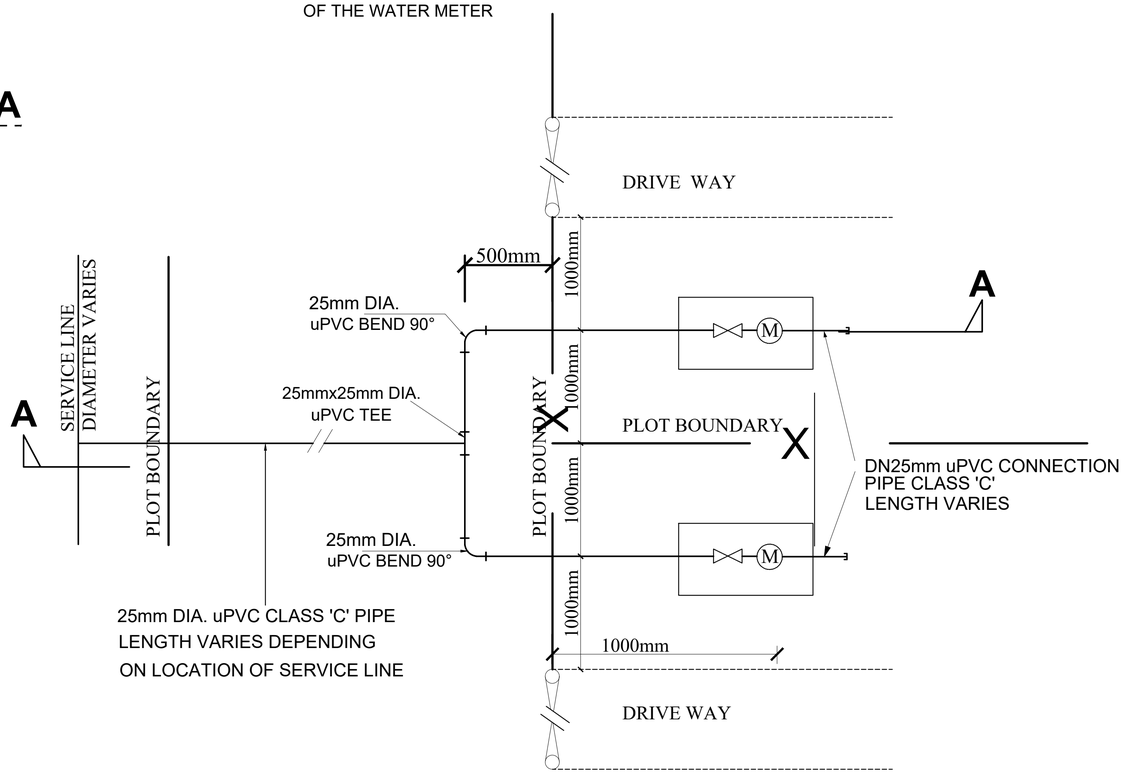
SECTION A-A

NTS



TYPICAL CONSUMER CONNECTION FOR ONE HOUSEHOLD ON A SERVICE LINE

NOT TO SCALE



TYPICAL CONSUMER CONNECTION ACROSS CARRIAGE WAY FOR TWO HOUSEHOLDS ON A SERVICE LINE

NOT TO SCALE

NOTES:

1. Manhole details found in the Standard Drawing no.

Revisions	
Description	Date
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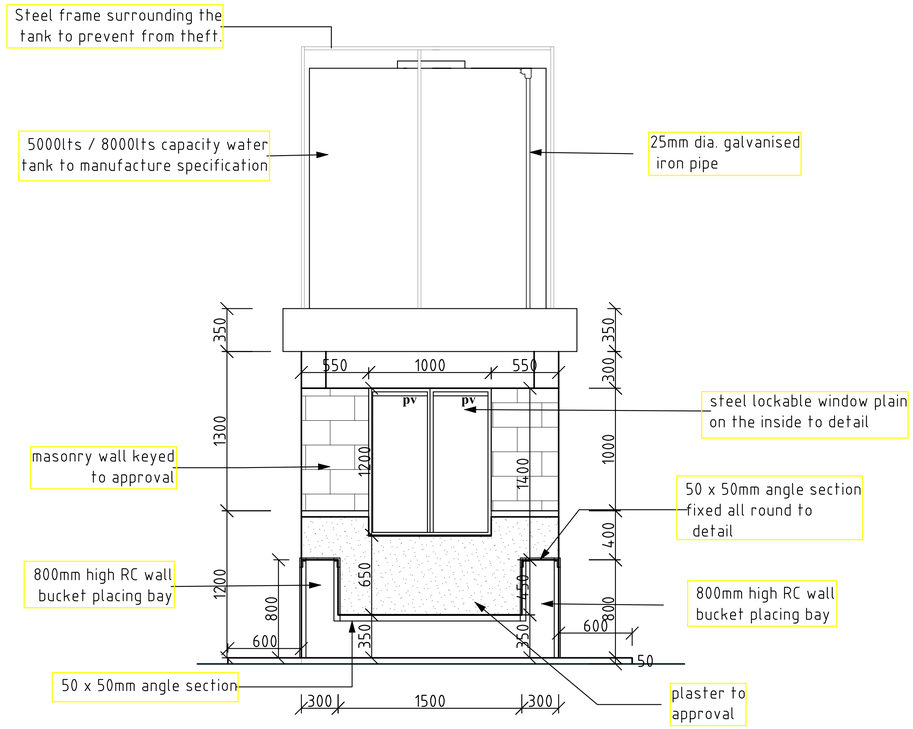
Drawn :	K. KAKA
Checked:	D. LIAMBILA
Approved:	B. KIM

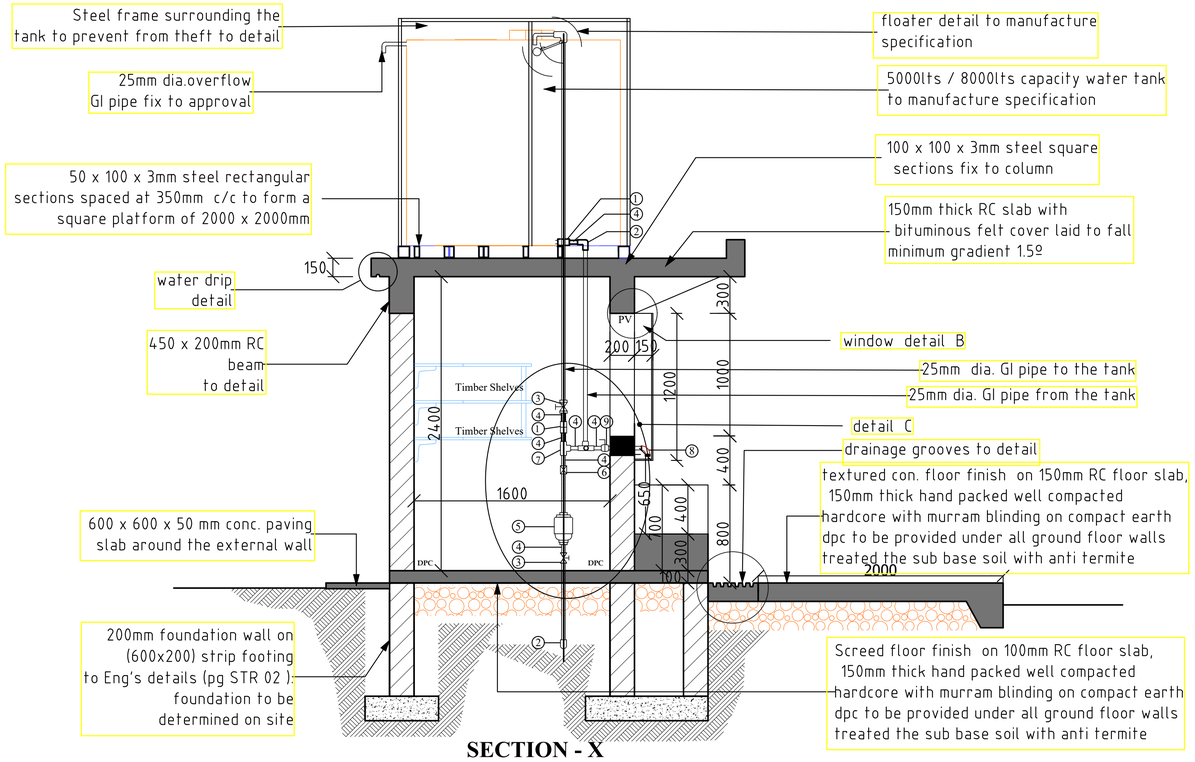
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KITUI WATER DISTRIBUTION SYSTEM
STANDARD DETAILS
WATER METER CONNECTION DETAILS

Stage :	FINAL DESIGN REVIEW		
Date :	JULY 2020		
Drawing No. :	KITUI-WS-STD-011		
Scale :	AS INDICATED	Sheet Size :	A1
Sheet No. :	11 of 11		
Index No. :			



FRONT ELEVATION



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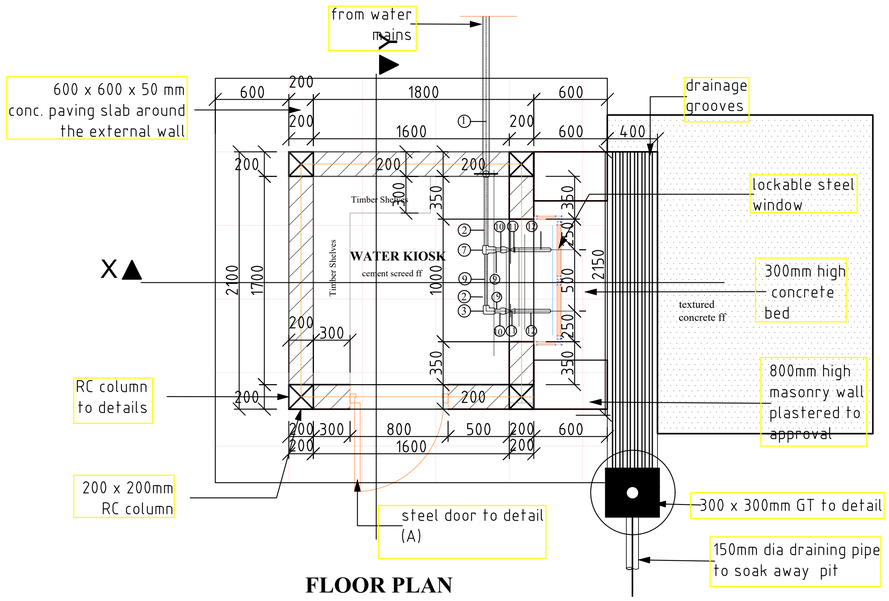
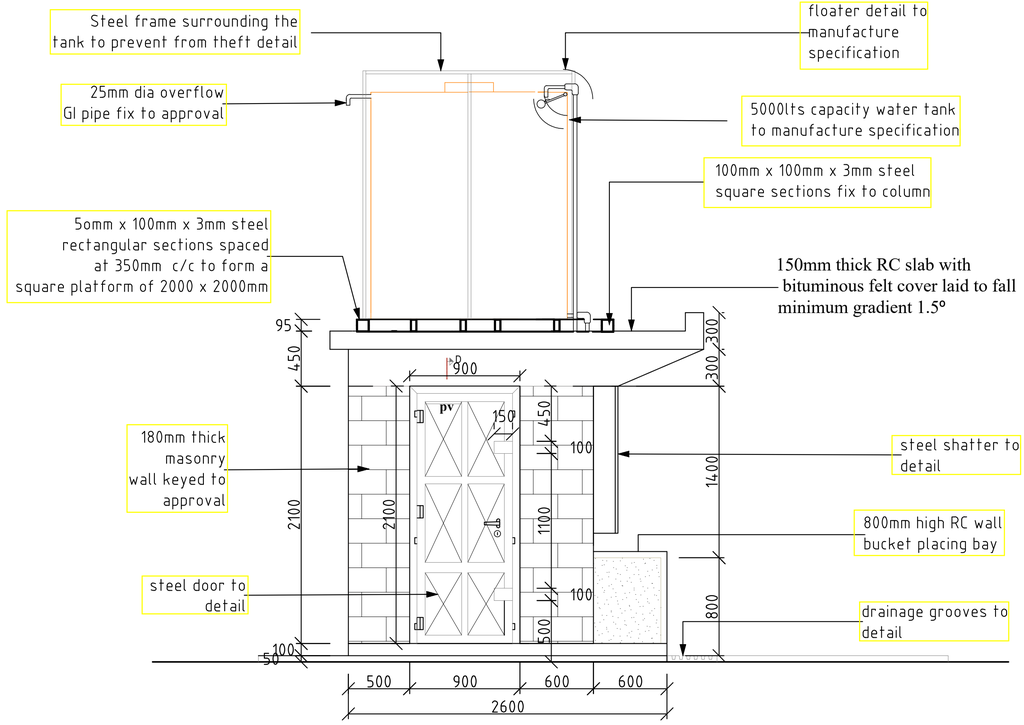


FLOOR PLAN



SIDE ELEVATION

NOTES:

1. Dimensions and conditions must be checked on site and any discrepancies refered to the Engineer. All dimensions in mm unless otherwise specified.
2. All levels to be checked on site before commencement of works.
3. Depth of foundation to be determined on site. Foundation to be carried down to hard base to the approval of the Engineer and all unsuitable soils to be excavated and the openings filled with hardcore.
4. Three ply tropical 'pluvex' bituminous felt D.P.C under all walls to be rendered in hot bitumen.
5. All walls to be reinforced with heavy duty gauge hoop iron at every alternative course and jointed in 1:3 cement sand mortar.
6. Reinforced concrete work as follows:
   - Blinding under foundation class 15/20
   - Foundation class 25/20 reinforced with T12 @ 200mm both ways
   - Floor slab class 25/20 reinforced with BRC mesh A142
   - Ring beam class 25/20 reinforced with 4 Nr. T12 and R 8 @150mm c/c

SCALE 1 : 25 — 250 0 250 500 750 1000 1250mm

Revisions	
Description	Date
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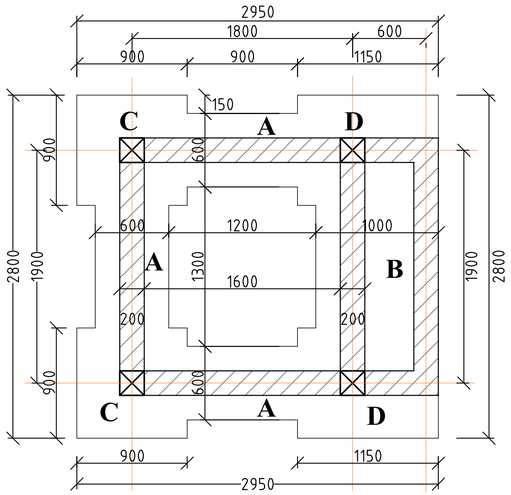
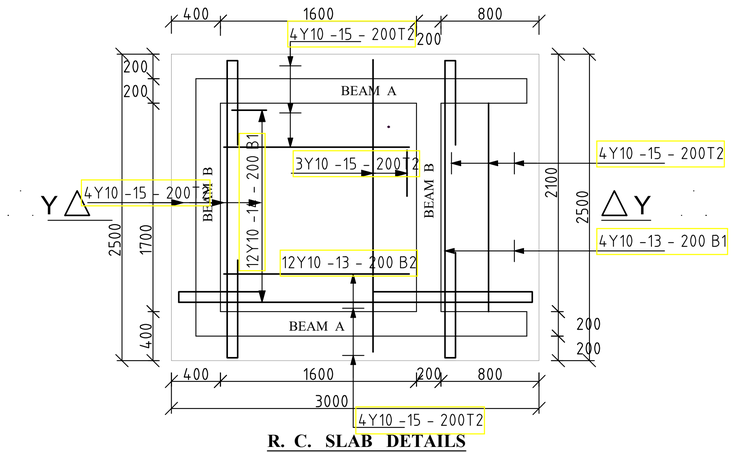
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KITUI WATER DISTRIBUTION SYSTEM
WATER KIOSK DRAWING
FLOOR PLAN, ELEVATION AND SECTION DRAWING

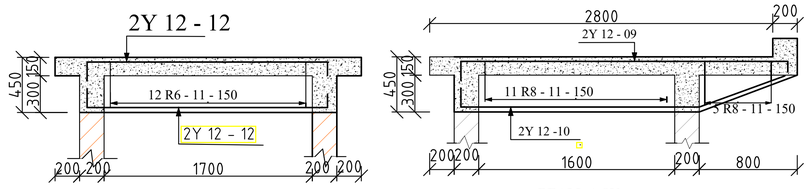
Stage :	FINAL DESIGN REVIEW
Date :	JULY 2020
Drawing No. :	KITUI-WS-WK-001
Scale :	1:25
Sheet Size :	A1
Sheet No. :	1 of 3
Index No. :	



FOUNDATION PLAN

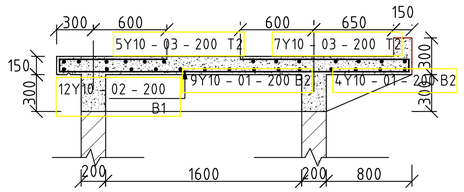


R. C. SLAB DETAILS

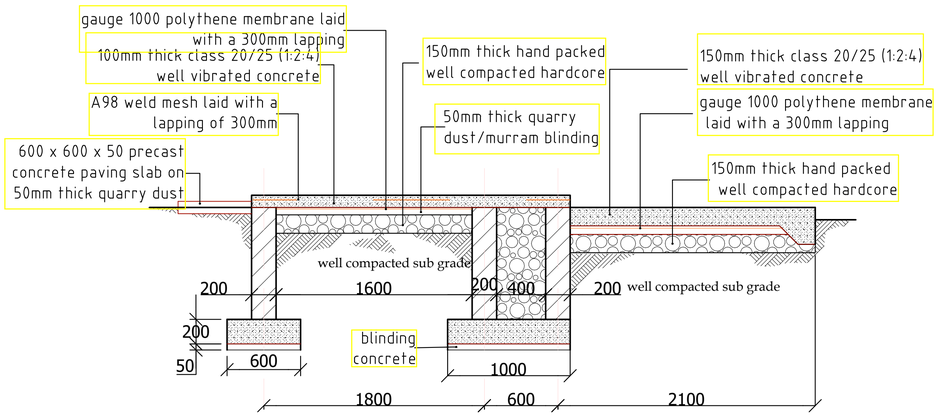


BEAM B 2No.

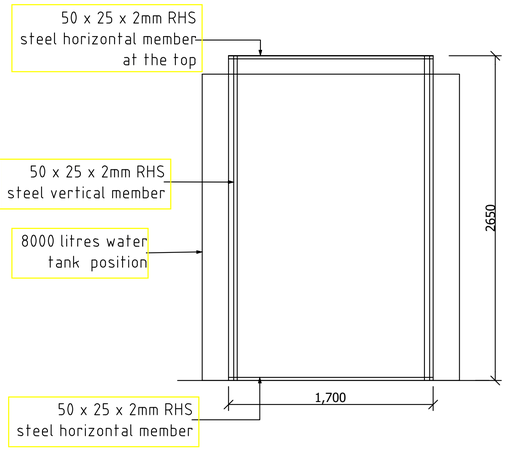
BEAM A 2No.



R. C. SLAB SECTION Y-Y



FOUNDATION SECTION

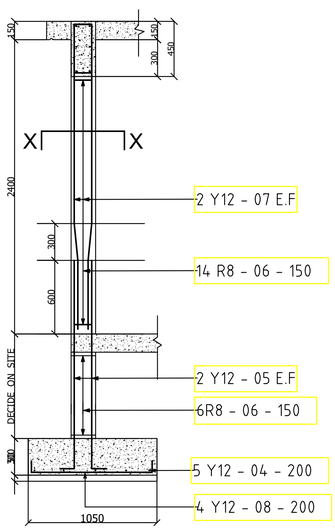


SIDE VIEW X -X

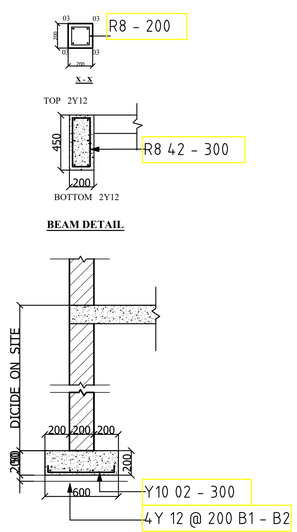
NOTES:

1. Dimensions and conditions must be checked on site and any discrepancies refered to the Engineer. All dimensions in mm unless otherwise specified.
2. All levels to be checked on site before commencement of works.
3. Depth of foundation to be determined on site. Foundation to be carried down to hard base to the approval of the Engineer and all unsuitable soils to be excavated and the openings filled with hardcore.
4. Three ply tropical 'pluvex' bituminous felt D.P.C under all walls to be rendered in hot bitumen.
5. All walls to be reinforced with heavy duty gauge hoop iron at every alternative course and jointed in 1:3 cement sand mortar.
6. Reinforced concrete work as follows:

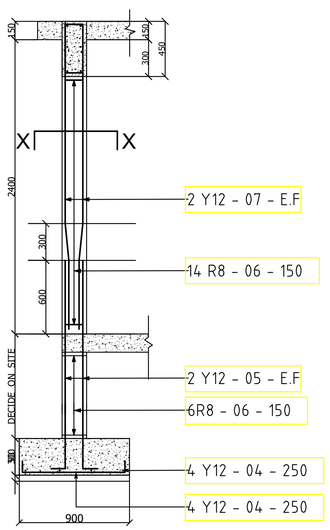
- Blinding under foundation class 15/20
- Foundation class 25/20 reinforced with T12 @ 200mm both ways
- Floor slab class 25/20 reinforced with BRC mesh A142
- Ring beam class 25/20 reinforced with 4 Nr. T12 and R 8 @150mm c/c



DETAIL FOR COLUMN & COL. BASE SHOWN THUS D 2no.



REINFORCEMENT DETAIL FOR TYPICAL STRIP FOOTING



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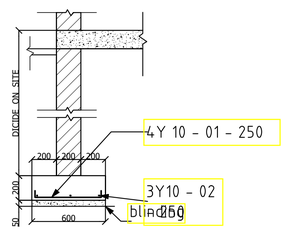
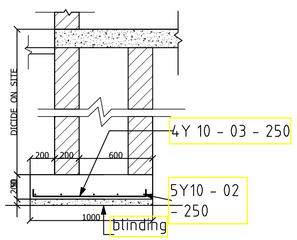
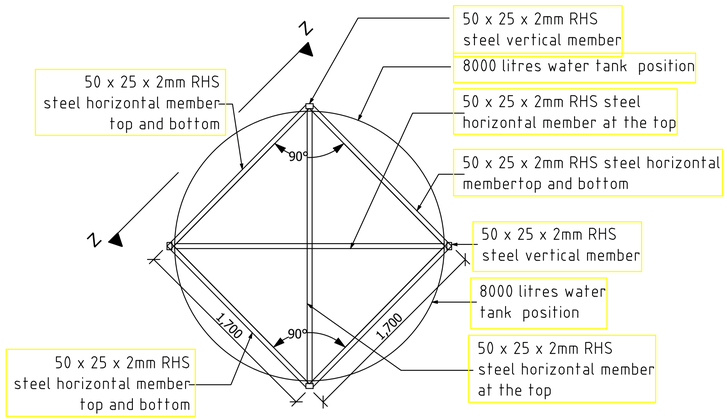


DETAIL FOR STRIP FOOTING SHOWN THUS A



DETAIL FOR STRIP FOOTING SHOWN THUS B



TOP VIEW

NB the cage to be used on both 8000ltrs and 5000ltrs tanks

STEEL CAGE DETAIL

SCALE 1 : 25 — 250 0 250 500 750 1000 1250mm

Revisions	
Description	Date

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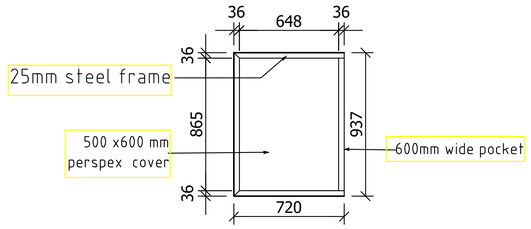
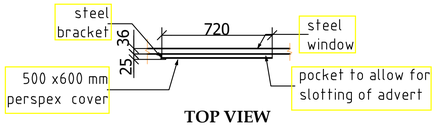
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KITUI WATER DISTRIBUTION SYSTEM
WATER KIOSK DRAWING
FOUNDATION EXCAVATION, SLAB, COLUMN AND STEEL CAGE PLANS AND SECTION

Stage :	FINAL DESIGN REVIEW
Date :	JULY 2020
Drawing No. :	KITUI-WS-WK-002
Scale :	1:25
Sheet Size :	A1
Sheet No. :	2 of 3
Index No. :	

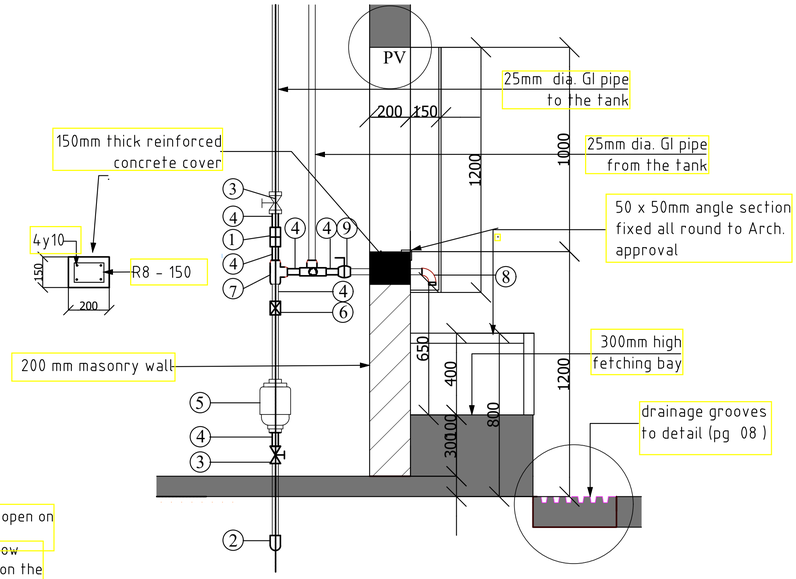


SIDE VIEW

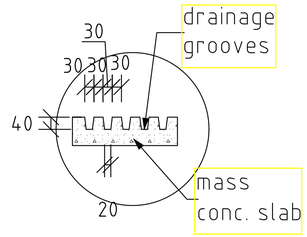


TOP VIEW

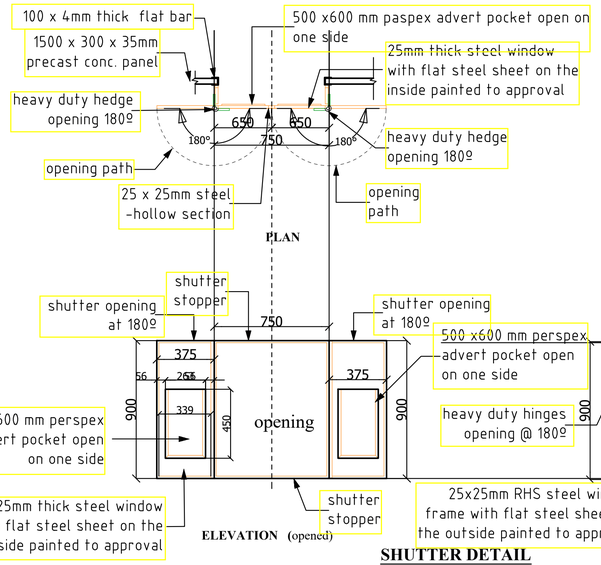
ADVERT POCKET DETAIL



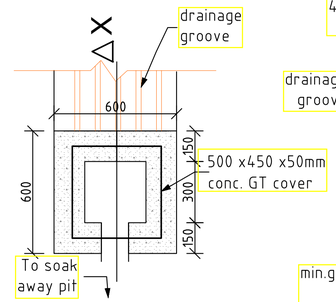
DETAIL C SCALE 1:15



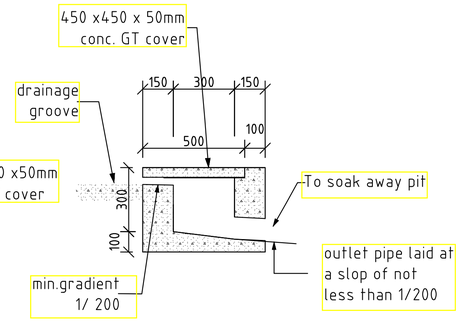
DRAINAGE GROOVES DETAILS
SCALE 1:10



SHUTTER DETAIL
SCALE 1:20

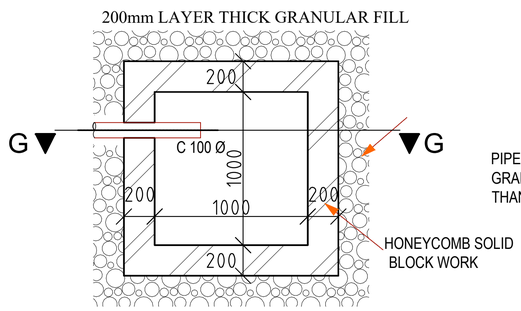


PLAN

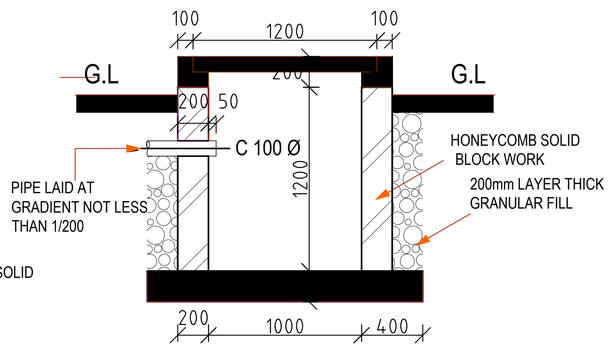


SECTION

GT DETAIL
SCALE 1:15

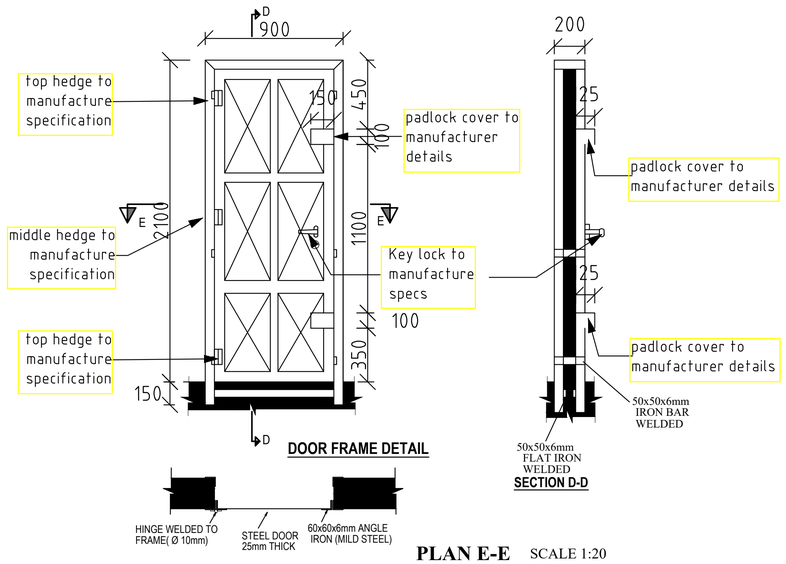


SOAK PIT PLAN



LONGITUDINAL SECTION THROUGH SECTION G-G

SCALE 1:20



DOOR FRAME DETAIL

PLAN E-E SCALE 1:20

NOTES:

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- Foundation class 25/20 reinforced with T12 @ 200mm both ways
- Floor slab class 25/20 reinforced with BRC mesh A142
- Ring beam class 25/20 reinforced with 4 Nr. T12 and R 8 @150mm c/c

ITEM NO.	DESCRIPTION (ALL 25NN DIA)	UNIT	QTY
1	Galvanised Iron Union	No.	3
2	Galvanised Iron Elbows	No.	3
3	Galvanised Iron Gate Valve (Pegler)	No.	2
4	Galvanised Iron Nipples	No.	11
5	Water Meter	No.	1
6	Non Return Valve	No.	1
7	Galvanised Iron Equal Tee	No.	5
8	Galvanised Iron Bend	No.	4
9	Ball Cock Water Taps	No.	3
10	Galvanised Iron Long Thread Nipples	No.	2
17	Galvanised Iron Black Nuts	No.	4
12	Galvanised Iron Class B Pipe (per metres)	No.	4
13	Boss white (400g)	No.	3
14	Temp Thread	LM.	2

SCALE 1 : 10 — 100 0 100 200 300 400 500mm

SCALE 1 : 20 — 200 0 200 400 600 800 1000mm

Revisions	
Description	Date
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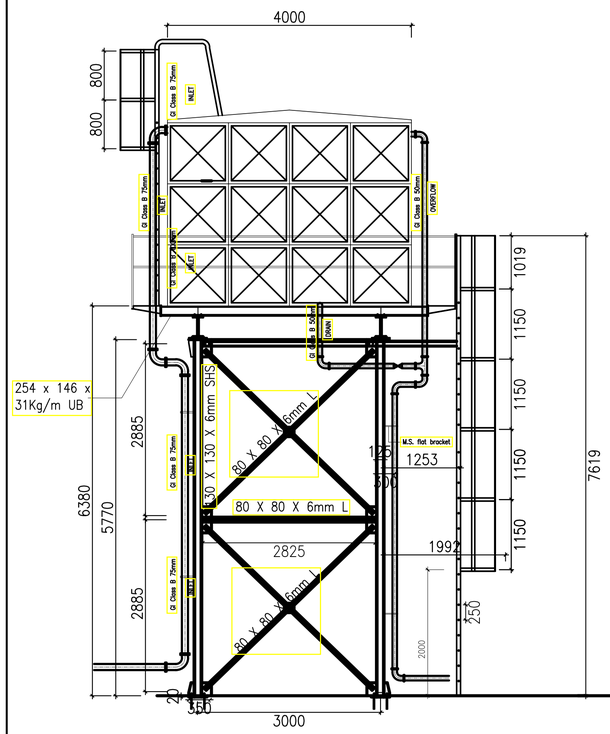
Approved:	B. KIM

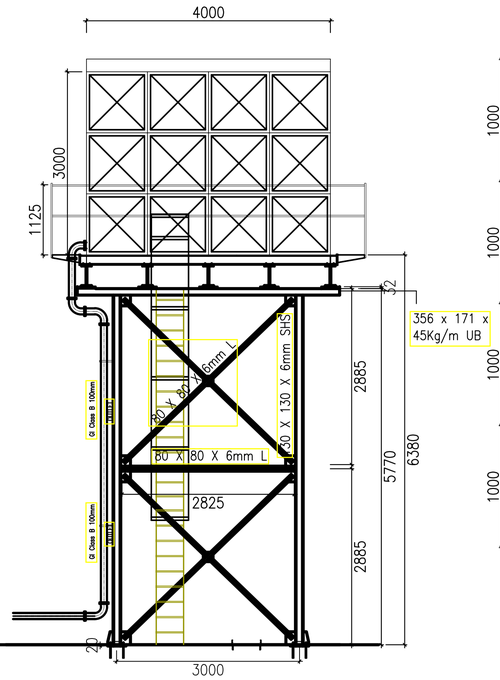
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KITUI WATER DISTRIBUTION SYSTEM
WATER KIOSK DRAWING
NOTICE BOARD, SOAK PIT, PLUMBING DETAILS, DOOR AND GREASE TRAP DETAILS

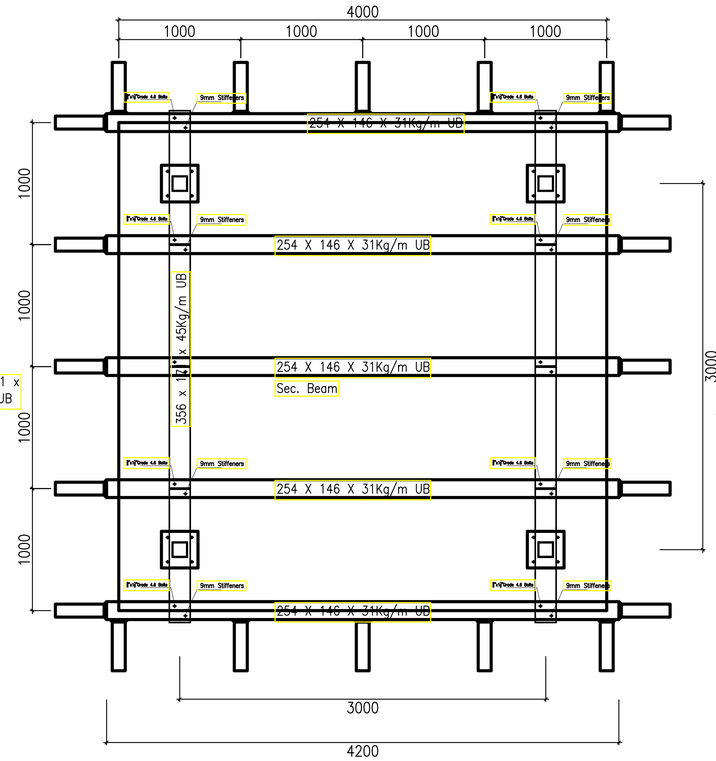
Stage :	FINAL DESIGN REVIEW
Date :	JULY 2020
Drawing No. :	KITUI-WS-WK-003
Scale :	1:10 ; 1:15; 1:20
Sheet No. :	3 of 3
Sheet Size :	A1
Index No. :	



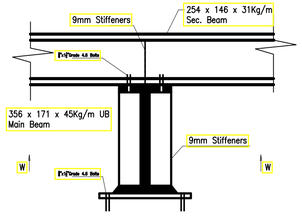
GENERAL ARRANGEMENT: FRONT VIEW
1:50



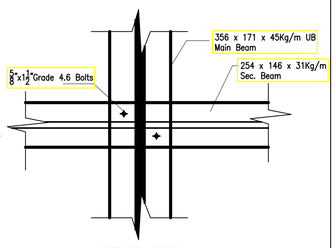
GENERAL ARRANGEMENT: SIDE VIEW
1:50



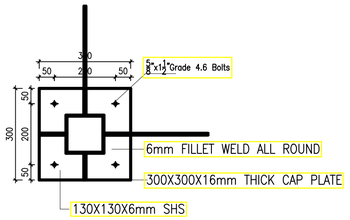
GRILLAGE: PLAN VIEW
1:25



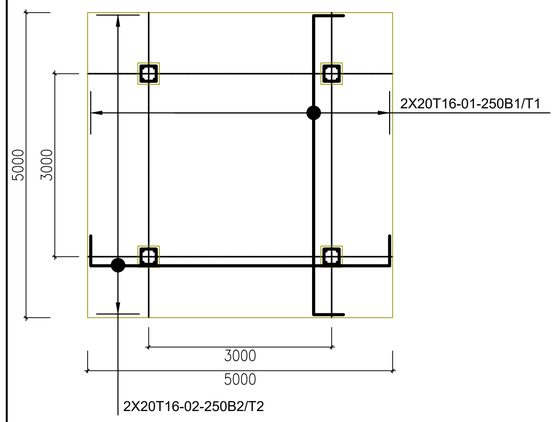
Sec.Beam to Main Beam connection
1:10



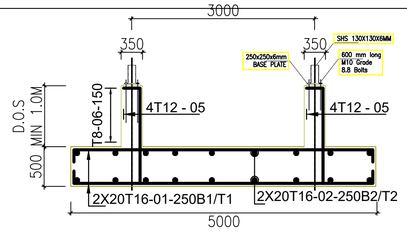
VIEW 'WW'
Sec.Beam to Main Beam connection
1:10



VIEW 'XX'
CAP GUSSET DETAILS: PLAN
1:10



FOUNDATION DETAILS: PLAN VIEW
1:50



FOUNDATION DETAILS: SECTION
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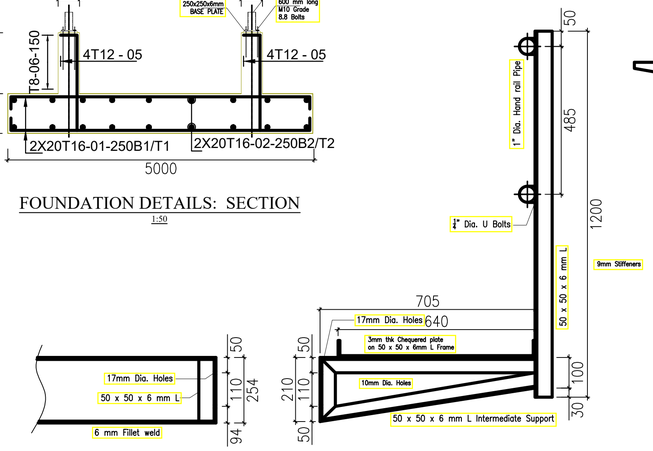

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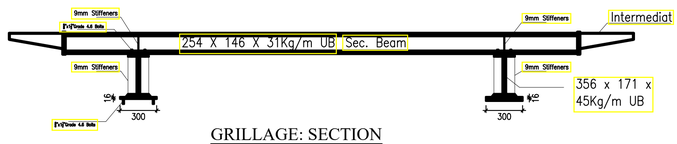

GRILLAGE: SECTION
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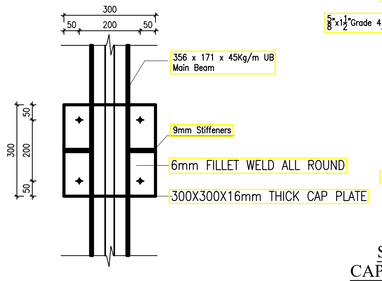

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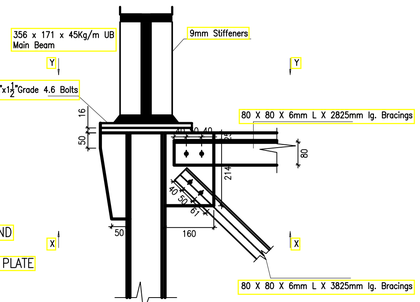

STANCHION TOP DETAILS
CAP GUSSET DETAILS: SECTION
1:10

Revisions	
Description	Date
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.	.

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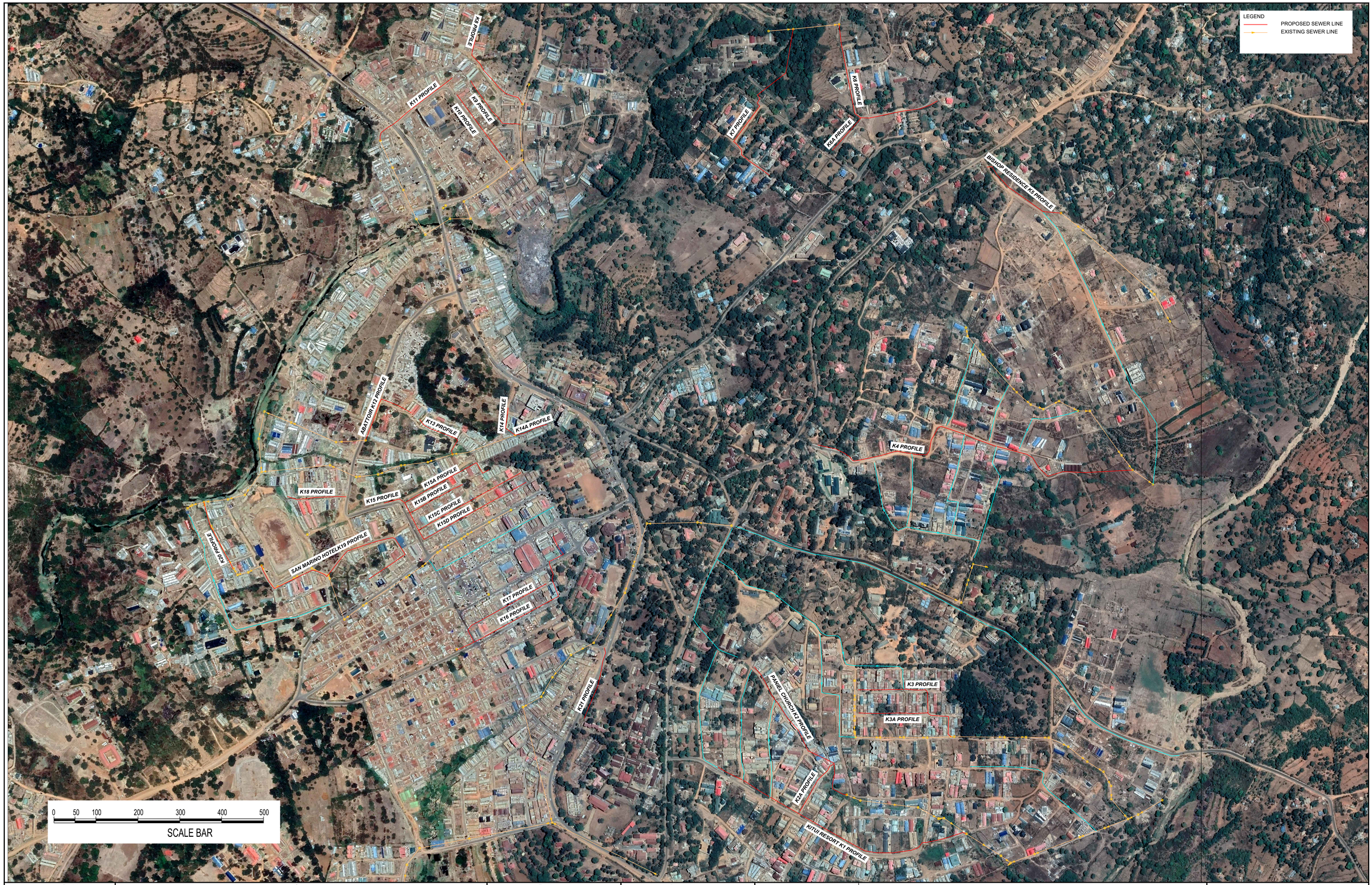
Approved:	B. KIM

Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KITUI WATER SUPPLY
6M HIGH 48M3 ELEVATED STEEL TANK
ELEVATIONS AND FOUNDATION DETAILS

Stage :	FINAL DESIGN REVIEW		
Date :	JULY 2020		
Drawing No. :	KITUI-WS-WT-001		
Scale :	AS INDICATED	Sheet Size :	A1
Sheet No. :	1 of 1		
Index No. :			



Revisions	
Description	Date
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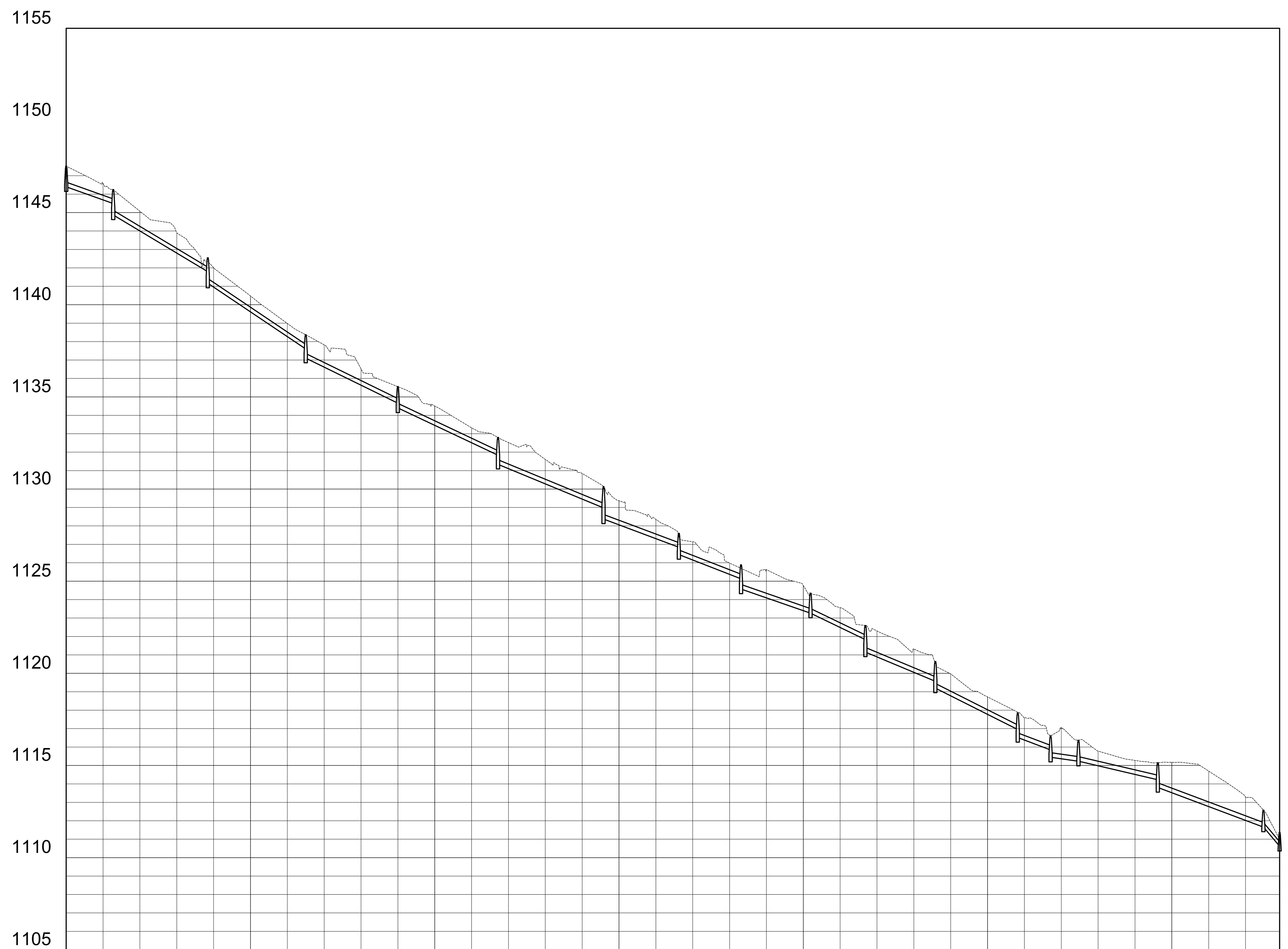
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KITUI SEWER LINE DISTRIBUTION SYSTEM

PROJECT LAYOUT MAP- SEWER TRUNKS

Stage :	FINAL DESIGN REVIEW
Date :	JULY 2020
Drawing No. :	KITUI-SL-LAY-001
Scale :	NTS
Sheet Size :	A1
Sheet No. :	1 of 1
Index No. :	

KITUI RESORT K1 PROFILE



STATION	0+000 · 0+100 · 0+200 · 0+300 · 0+400 · 0+500 · 0+600 · 0+659
EXISTING GROUND LEVELS	1147.518, 1146.579, 1145.072, 1143.902, 1142.013, 1140.476, 1138.983, 1137.825, 1136.519, 1135.554, 1134.506, 1133.321, 1132.522, 1131.608, 1130.840, 1129.367, 1128.353, 1127.139, 1125.983, 1125.625, 1124.766, 1123.564, 1122.300, 1121.319, 1119.971, 1118.719, 1117.582, 1117.052, 1115.779, 1115.276, 1115.171, 1114.696, 1113.299, 1111.003
SEWER INVERT LEVELS	1146.400, 1145.491, 1144.870, 1141.790, 1141.171, 1137.601, 1137.101, 1134.659, 1134.399, 1131.833, 1131.340, 1128.978, 1128.373, 1126.839, 1126.444, 1125.127, 1124.571, 1123.264, 1123.264, 1121.828, 1121.156, 1119.567, 1119.200, 1116.949, 1116.517, 1115.841, 1115.447, 1115.232, 1115.232, 1114.225, 1113.806, 1111.656, [illegible], [illegible]
PIPE SLOPE/LENGTH	3.57%, 6.00%, 6.72%, 4.88%, 4.72%, 4.13%, 3.75%, 3.90%, 3.47%, 4.82%, 4.19%, 5.03%, 3.79%, 1.42%, 2.34%, 3.75%, 11.92%
PIPE INVERT LEVEL	1146.400, 1145.491, 1144.870, 1141.790, 1141.171, 1137.601, 1137.101, 1134.659, 1134.399, 1131.833, 1131.340, 1128.978, 1128.373, 1126.839, 1126.444, 1125.127, 1124.571, 1123.264, 1123.264, 1121.828, 1121.156, 1119.567, 1119.200, 1116.949, 1116.517, 1115.841, 1115.447, 1115.232, 1115.232, 1114.225, 1113.806, 1111.656, [illegible], [illegible]
PIPE SIZE & MATERIAL	200mm DIA PVC PIPE
PIPE BED & SURROUND	CONCRETE; SELECTED FILL MATERIAL
MANHOLE DEPTH & CHAINAGE	1.218 0+000.00; 1.478 0+025.50; 1.475 0+076.84; 1.369 0+129.99; 1.257 0+179.98; 1.557 0+234.33; 1.853 0+291.60; 1.253 0+332.49; 1.413 0+366.22; 1.186 0+403.93; 1.536 0+433.70; 1.537 0+471.66; 1.435 0+516.39; 1.258 0+534.22; 1.234 0+549.32; 1.441 0+592.40; 1.018 [illegible]; 0+658.50

NOTES :

1. THE CONTRACTOR TO VERIFY BOTH HORIZONTAL AND VERTICAL LOCATIONS OF ALL EXISTING SEWERS TO BE CONNECTED PRIOR TO CONSTRUCTION
2. VERTICAL EXAGGERATION IN PROFILE IS 10 TIMES THE HORIZONTAL SCALE.
3. THIS DRAWING TO BE READ WITH ALL RELEVANT LAYOUTS PLAN AND STANDARD DRAWINGS.
4. SEWER ROUTE(S) TO BE ALIGNED UPON CONFIRMATION OF FINAL WAYLEAVES
5. INVERT LEVELS (PIPES & MANHOLES) TO BE CONFIRMED BEFORE INSTALLATIONS
6. MANHOLES TO BE MIN 1200mm DIAMETER TO STANDARDS AND SPECIFICATIONS
7. BEDDING AND SURROUND MATERIAL TO THE APPROVAL OF THE ENGINEER

LEGEND :

- SEWER PIPELINE
- Ⓢ MANHOLE (PLAN)
- MANHOLE (PROFILE)

Revisions	
Description	Date
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Approved:	B. KIM

Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KITUI SEWER LINE PROFILES ALIGNMENT K1
PLAN& PROFILE DRAWINGS
KM 0+000-0+659

Stage :	FINAL DESIGN REVIEW
Date :	JULY 2020
Drawing No. :	KITUI-SL-P&P-001
Scale :	VERT-1:200 HOR-1:2000
Sheet Size :	A1
Sheet No. :	1 of 1
Index No. :	

NOTES :

1. THE CONTRACTOR TO VERIFY BOTH HORIZONTAL AND VERTICAL LOCATIONS OF ALL EXISTING SEWERS TO BE CONNECTED PRIOR TO CONSTRUCTION
2. VERTICAL EXAGGERATION IN PROFILE IS 10 TIMES THE HORIZONTAL SCALE.
3. THIS DRAWING TO BE READ WITH ALL RELEVANT LAYOUTS PLAN AND STANDARD DRAWINGS.
4. SEWER ROUTE(S) TO BE ALIGNED UPON CONFIRMATION OF FINAL WAYLEAVES
5. INVERT LEVELS (PIPES & MANHOLES) TO BE CONFIRMED BEFORE INSTALLATIONS
6. MANHOLES TO BE MIN 1200mm DIAMETER TO STANDARDS AND SPECIFICATIONS
7. BEDDING AND SURROUND MATERIAL TO THE APPROVAL OF THE ENGINEER

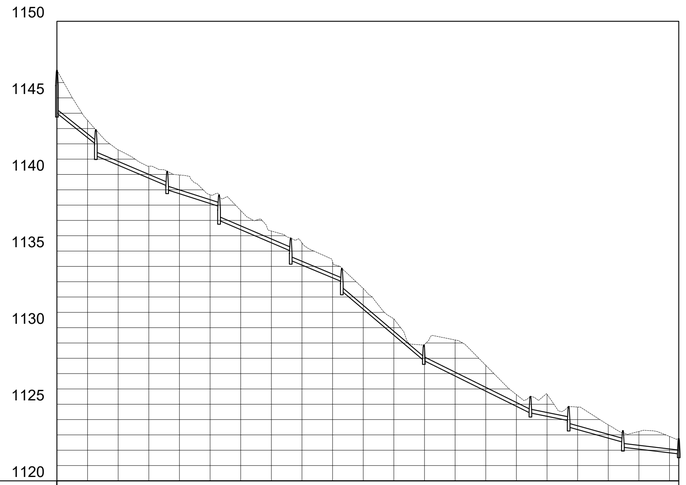
LEGEND :

SEWER PIPELINE

MANHOLE (PLAN)

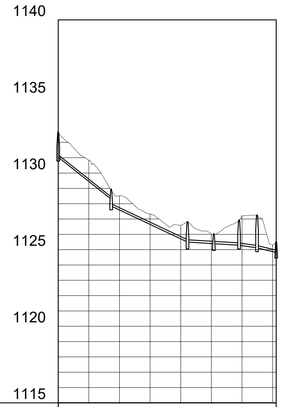
MANHOLE (PROFILE)

PANIEL CHURCH K2 PROFILE



STATION	0+000																									0+406
EXISTING GROUND LEVELS	1146.801	1143.535	1141.607	1140.541	1139.967	1138.679	1137.649	1136.310	1135.536	1134.294	1132.561	1130.576	1128.907	1129.197	1127.543	1125.632	1125.653	1124.818	1123.657	1123.224	1122.902	1122.760				
SEWER INVERT LEVELS	1144.000	1141.975	1141.224	1139.250	1139.000	1137.917	1137.000	1135.000	1134.393	1133.000	1132.395	1127.855	1127.855	1124.414	1124.432	1123.927	1123.507	1122.525	1122.192	1121.760						
PIPE SLOPE/LENGTH	7.98%	4.24%	3.20%	4.27%	4.18%	8.48%	4.94%	2.02%	2.77%	1.18%																
PIPE INVERT LEVEL	1144.000	1141.975	1141.224	1139.250	1139.000	1137.917	1137.000	1135.000	1134.393	1133.000	1132.395	1127.855	1127.855	1124.414	1124.432	1123.927	1123.507	1122.525	1122.192	1121.760						
PIPE SIZE & MATERIAL	200mm DIA PVC PIPE																300mm DIA PVC PIPE									
PIPE BED & SURROUND	SELECTED FILL MATERIAL																									
MANHOLE DEPTH & CHAINAGE	2.901 0+000.00	1.805 0+025.39		1.311 0+071.98		1.774 0+105.85		1.555 0+152.67		1.583 0+186.03		1.110 0+239.56		1.197 0+309.16		1.449 0+334.13		1.190 0+369.55		1.100 0+406.02						

K2A PROFILE



STATION	0+000							0+100	0+142
EXISTING GROUND LEVELS	1132.617	1130.847	1128.518	1127.328	1126.595	1126.018	1127.215	1126.399	
SEWER INVERT LEVELS	1131.036	1128.295	1127.846	1125.493	1125.493	1125.390	1125.391	1125.296	1124.819
PIPE SLOPE/LENGTH	7.92%	4.72%	0.60%	0.60%	0.48%	2.41%			
PIPE INVERT LEVEL	1131.036	1128.295	1127.846	1125.493	1125.493	1125.390	1125.391	1125.296	1124.819
PIPE SIZE & MATERIAL	200mm DIA PVC PIPE								
PIPE BED & SURROUND	SELECTED FILL MATERIAL								
MANHOLE DEPTH & CHAINAGE	1.755 0+000.00	1.204 0+034.58		1.635 0+084.43	0.755 0+101.61	1.755 0+118.10	2.233 0+134.83	0.794 0+142.34	

Revisions	
Description	Date
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Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KITUI SEWER LINE PROFILES ALIGNMENT K2 & K2A
PLAN& PROFILE DRAWINGS
K2:KM 0+000-0+406; K2A: KM 0+000-0+142

Stage :	FINAL DESIGN REVIEW
Date :	JULY 2020
Drawing No. :	KITUI-SL-P&P-002
Scale :	VERT-1:200 HOR-1:2000
Sheet No. :	1 of 1
Sheet Size :	A1
Index No. :	

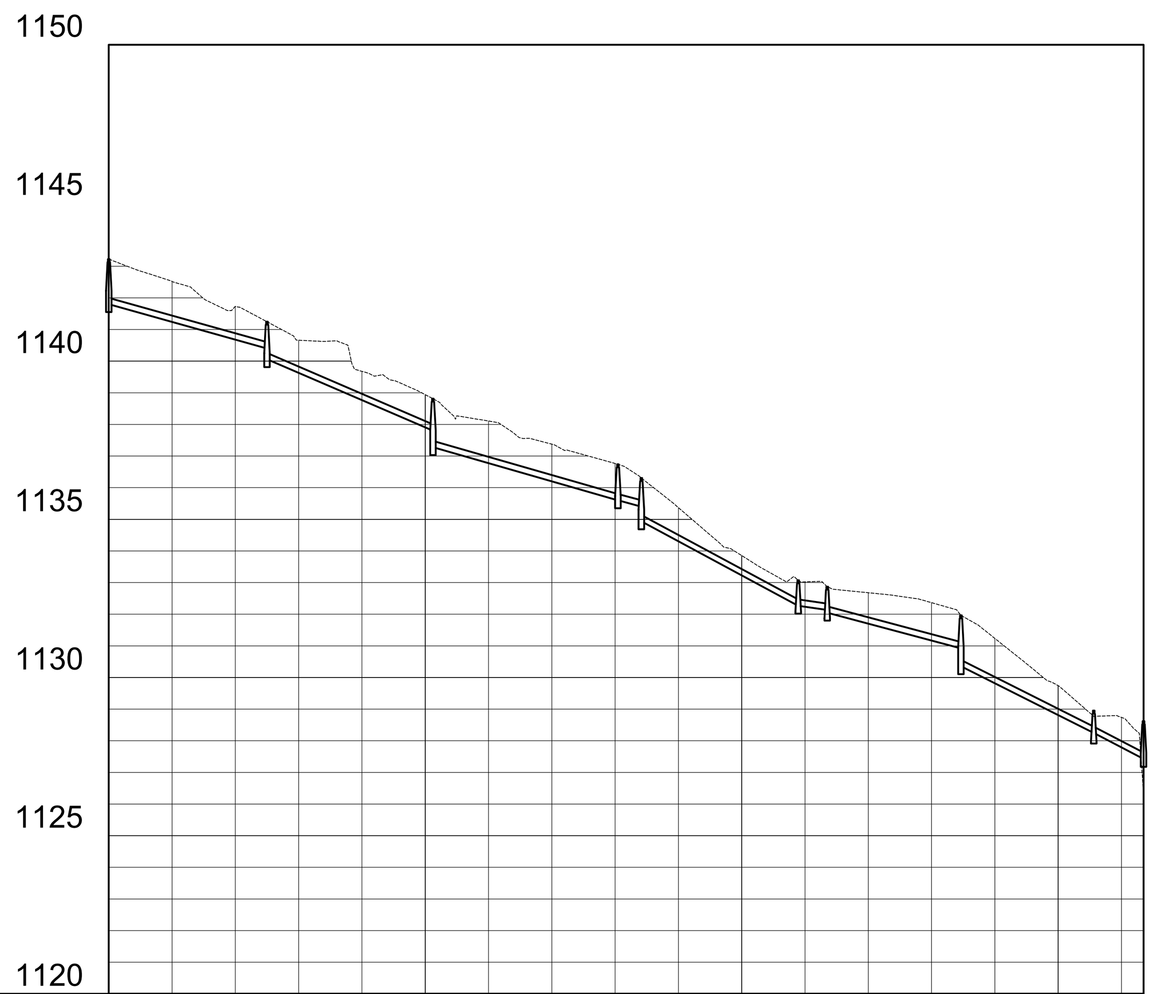
NOTES :

1. THE CONTRACTOR TO VERIFY BOTH HORIZONTAL AND VERTICAL LOCATIONS OF ALL EXISTING SEWERS TO BE CONNECTED PRIOR TO CONSTRUCTION
2. VERTICAL EXAGGERATION IN PROFILE IS 10 TIMES THE HORIZONTAL SCALE.
3. THIS DRAWING TO BE READ WITH ALL RELEVANT LAYOUTS PLAN AND STANDARD DRAWINGS.
4. SEWER ROUTE(S) TO BE ALIGNED UPON CONFIRMATION OF FINAL WAYLEAVES
5. INVERT LEVELS (PIPES & MANHOLES) TO BE CONFIRMED BEFORE INSTALLATIONS
6. MANHOLES TO BE MIN 1200mm DIAMETER TO STANDARDS AND SPECIFICATIONS
7. BEDDING AND SURROUND MATERIAL TO THE APPROVAL OF THE ENGINEER

LEGEND :

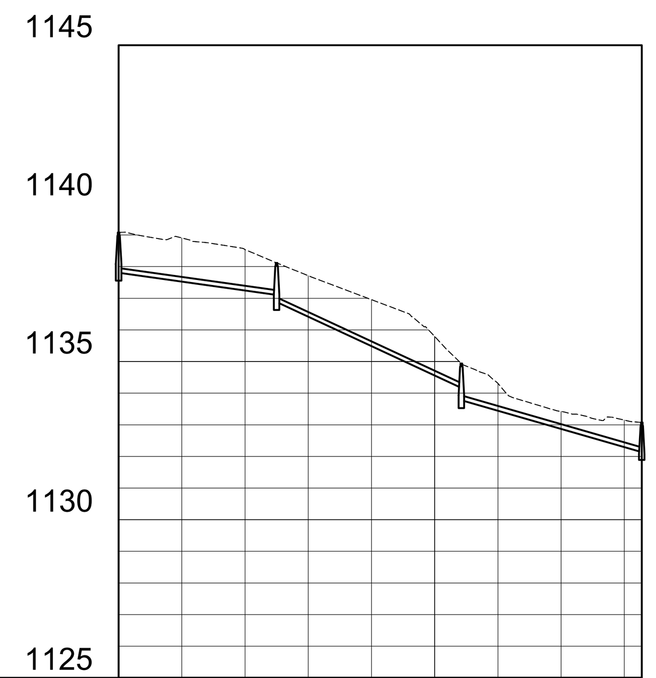
Symbol	Meaning
═	SEWER PIPELINE
Ⓢ	MANHOLE (PLAN)
▯	MANHOLE (PROFILE)

K3 PROFILE



STATION	0+000, 0+100, 0+200, 0+300, 0+327
EXISTING GROUND LEVELS	1143.225, 1142.517, 1141.730, 1140.661, 1139.678, 1138.941, 1138.107, 1137.376, 1136.765, 1135.370, 1133.853, 1133.023, 1132.680, 1132.365, 1131.235, 1129.743, 1128.739, 1128.619
SEWER INVERT LEVELS	1141.800, 1140.400, 1140.061, 1137.800, 1137.278, 1135.600, 1135.402, 1135.600, 1134.936, 1132.268, 1132.137, 1132.268, 1132.049, 1130.920, 1130.355, 1128.247, 1128.247, 1127.425
PIPE SLOPE/LENGTH	2.80%, 4.31%, 2.87%, 2.68%, 5.38%, 1.43%, 2.67%, 5.02%, 5.22%
PIPE INVERT LEVEL	1141.800, 1140.400, 1140.061, 1137.800, 1137.278, 1135.600, 1135.402, 1135.600, 1134.936, 1132.268, 1132.137, 1132.268, 1132.049, 1130.920, 1130.355, 1128.247, 1128.247, 1127.425
PIPE SIZE & MATERIAL	200mm DIA PVC PIPE
PIPE BED & SURROUND	SELECTED FILL MATERIAL; CONCRETE; SELECTED FILL MATERIAL
MANHOLE DEPTH & CHAINAGE	1.525 0+000.00; 1.285 0+050.00; 1.636 0+102.43; 1.240 0+160.39; 0+168.30; 0.905 0+217.86; 0+227.02; 1.709 0+269.28; 0.807 0+311.25; 1.293 0+326.97

K3A PROFILE



STATION	0+000, 0+100, 0+166
EXISTING GROUND LEVELS	1139.080, 1138.906, 1138.538, 1137.714, 1136.957, 1135.791, 1134.309, 1133.421, 1133.149, 1133.073
SEWER INVERT LEVELS	1137.805, 1137.106, 1136.881, 1134.167, 1133.777, 1132.138
PIPE SLOPE/LENGTH	1.40%, 4.64%, 2.87%
PIPE INVERT LEVEL	1137.805, 1137.106, 1136.881, 1134.167, 1133.777, 1132.138
PIPE SIZE & MATERIAL	200mm DIA PVC PIPE
PIPE BED & SURROUND	SELECTED FILL MATERIAL; CONCRETE
MANHOLE DEPTH & CHAINAGE	1.375 0+000.00; 1.336 0+049.99; 1.261 0+108.44; 1.035 0+165.52

Revisions	
Description	Date
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Drawn :	K. KAKA
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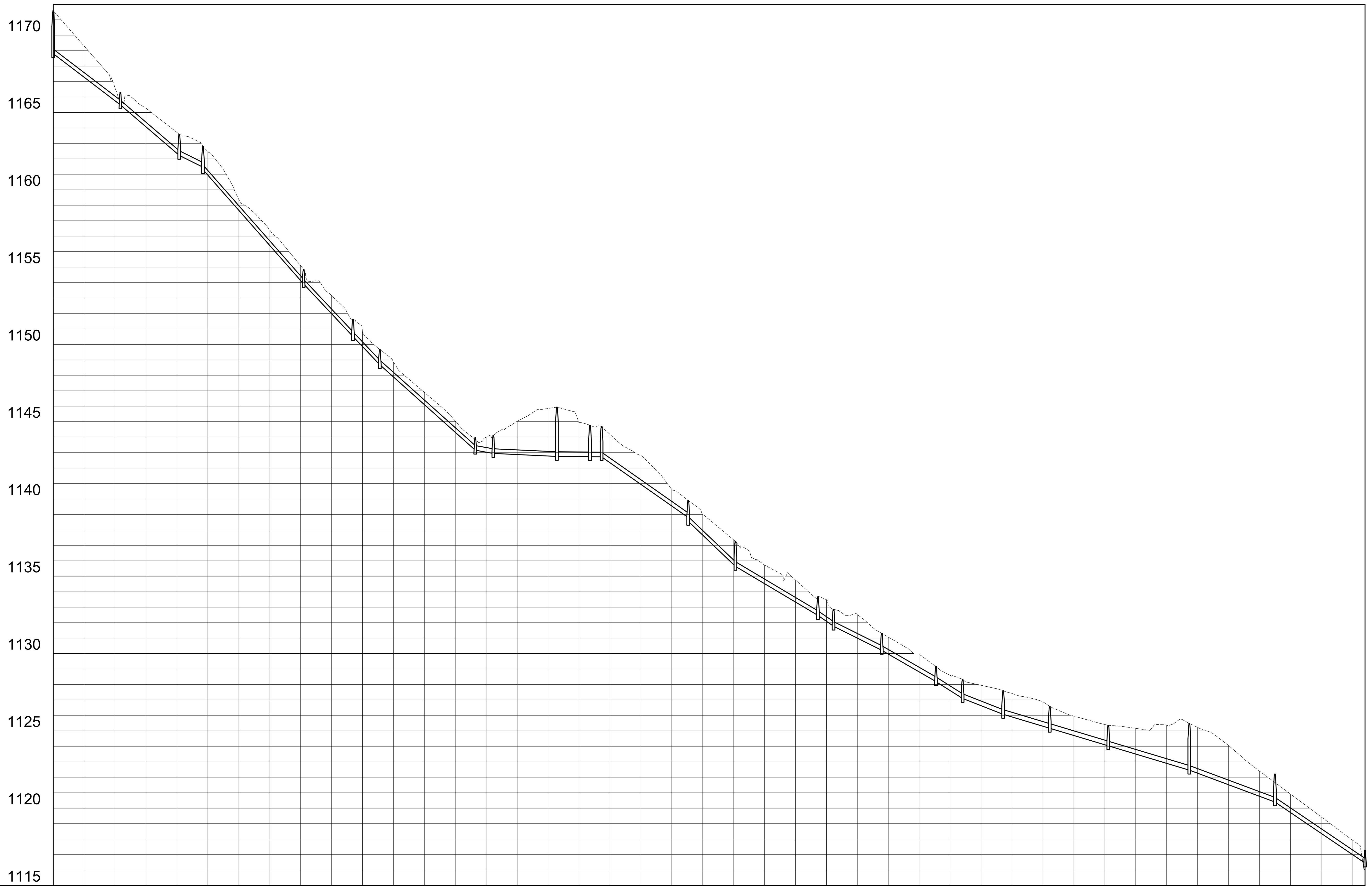
Approved:	B. KIM

Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KITUI SEWER LINE PROFILES ALIGNMENT K3 & K3A PLAN& PROFILE DRAWINGS K3:KM 0+000-0+327; K3A: KM 0+000-0+166

Stage :	FINAL DESIGN REVIEW
Date :	JULY 2020
Drawing No. :	KITUI-SL-P&P-003
Scale :	VERT-1:200 HOR-1:2000
Sheet Size :	A1
Sheet No. :	1 of 1
Index No. :	

K4 PROFILE



STATION	0+000, 0+100, 0+200, 0+300, 0+400, 0+500, 0+600, 0+700, 0+800, 0+848
EXISTING GROUND LEVELS	1171.581, 1169.296, 1166.587, 1165.271, 1163.710, 1162.473, 1159.369, 1157.398, 1155.087, 1153.158, 1150.778, 1148.866, 1146.896, 1145.038, 1143.996, 1145.024, 1145.854, 1144.945, 1144.180, 1142.806, 1140.614, 1139.019, 1137.352, 1135.721, 1134.759, 1133.483, 1132.528, 1131.063, 1129.951, 1128.587, 1127.949, 1127.418, 1126.883, 1125.954, 1125.412, 1125.163, 1125.379, 1125.224, 1124.059, 1122.402, 1120.920, 1119.431, 1117.948, 1116.021
SEWER INVERT LEVELS	1168.800, 1165.493, 1165.493, 1162.226, 1162.226, 1161.460, 1161.310, 1153.910, 1153.910, 1150.512, 1150.512, 1148.684, 1148.684, 1143.154, 1142.945, 1142.945, 1142.754, 1142.754, 1142.733, 1142.733, 1142.725, 1142.725, 1138.800, 1138.554, 1135.643, 1135.643, 1132.467, 1132.467, 1131.770, 1131.770, 1130.210, 1130.210, 1128.187, 1128.187, 1127.098, 1127.098, 1126.071, 1126.071, 1125.167, 1125.167, 1124.032, 1124.032, 1122.460, 1122.460, 1120.400, 1120.400, 1116.450
PIPE SLOPE/LENGTH	7.62%, 8.58%, 5.00%, 11.37%, 10.65%, 10.54%, 8.95%, 1.79%, 0.46%, 0.10%, 0.10%, 7.01%, 9.54%, 5.95%, 6.91%, 5.00%, 5.77%, 6.33%, 3.91%, 3.00%, 3.00%, 3.00%, 3.72%, 6.78%
PIPE SIZE & MATERIAL	200mm DIA PVC PIPE; 300mm DIA PVC PIPE
PIPE BED & SURROUND	SELECTED FILL MATERIAL; CONCRETE; SELECTED FILL MATERIAL
MANHOLE DEPTH & CHAINAGE	2.881 0+000.00; 0.907 0+043.41; 1.469 0+081.49; 1.596 0+096.80; 1.038 0+161.90; 1.220 0+193.81; 1.086 0+211.16; 0.907 0+272.92; 1.251 0+284.59; 3.290 0+325.71; 2.139 0+347.21; 0+354.60; 1.443 0+410.63; 1.714 0+441.15; 1.303 0+494.50; 1.198 0+504.60; 1.194 0+535.80; 1.069 0+570.84; 1.323 0+588.04; 1.625 0+614.30; 1.513 0+644.42; 1.424 0+682.25; 3.120 0+734.68; 1.907 0+790.00; 0.907 0+848.30

NOTES :

1. THE CONTRACTOR TO VERIFY BOTH HORIZONTAL AND VERTICAL LOCATIONS OF ALL EXISTING SEWERS TO BE CONNECTED PRIOR TO CONSTRUCTION
2. VERTICAL EXAGGERATION IN PROFILE IS 10 TIMES THE HORIZONTAL SCALE.
3. THIS DRAWING TO BE READ WITH ALL RELEVANT LAYOUTS PLAN AND STANDARD DRAWINGS.
4. SEWER ROUTE(S) TO BE ALIGNED UPON CONFIRMATION OF FINAL WAYLEAVES
5. INVERT LEVELS (PIPES & MANHOLES) TO BE CONFIRMED BEFORE INSTALLATIONS
6. MANHOLES TO BE MIN 1200mm DIAMETER TO STANDARDS AND SPECIFICATIONS
7. BEDDING AND SURROUND MATERIAL TO THE APPROVAL OF THE ENGINEER

LEGEND :

SEWER PIPELINE

Ⓢ MANHOLE (PLAN)

MANHOLE (PROFILE)

Revisions	
Description	Date
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. .	.
. .	.
. .	.

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Drawn :	K. KAKA
Checked:	D. LIAMBILA
Approved:	B. KIM

Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KITUI SEWER LINE PROFILES ALIGNMENT K4
PLAN& PROFILE DRAWINGS
KM 0+000-0+848

Stage :	FINAL DESIGN REVIEW
Date :	JULY 2020
Drawing No. :	KITUI-SL-P&P-004
Scale :	VERT-1:200 HOR-1:2000
Sheet Size :	A1
Sheet No. :	1 of 1
Index No. :	

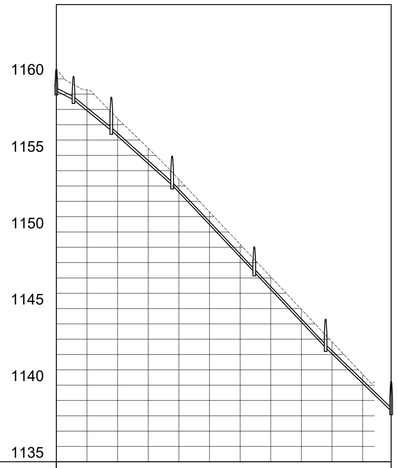
NOTES :

1. THE CONTRACTOR TO VERIFY BOTH HORIZONTAL AND VERTICAL LOCATIONS OF ALL EXISTING SEWERS TO BE CONNECTED PRIOR TO CONSTRUCTION
2. VERTICAL EXAGGERATION IN PROFILE IS 10 TIMES THE HORIZONTAL SCALE.
3. THIS DRAWING TO BE READ WITH ALL RELEVANT LAYOUTS PLAN AND STANDARD DRAWINGS.
4. SEWER ROUTE(S) TO BE ALIGNED UPON CONFIRMATION OF FINAL WAYLEAVES
5. INVERT LEVELS (PIPES & MANHOLES) TO BE CONFIRMED BEFORE INSTALLATIONS
6. MANHOLES TO BE MIN 1200mm DIAMETER TO STANDARDS AND SPECIFICATIONS
7. BEDDING AND SURROUND MATERIAL TO THE APPROVAL OF THE ENGINEER

LEGEND :

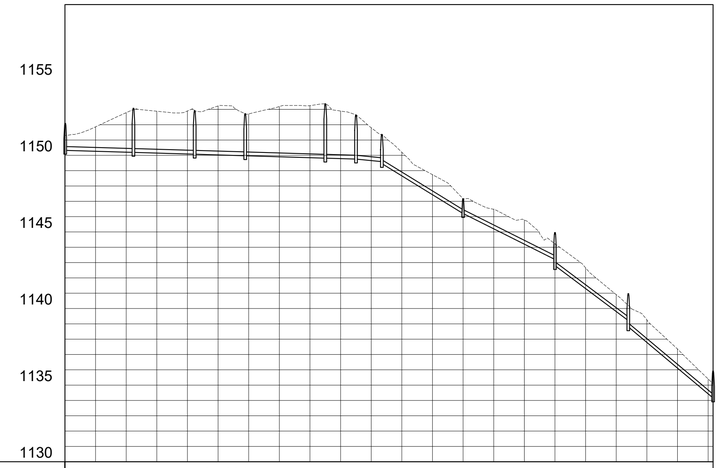
- SEWER PIPELINE
- (S) MANHOLE (PLAN)
- MANHOLE (PROFILE)

BISHOP RESIDENCE K5 PROFILE



STATION	0+000											0+200	0+219
EXISTING GROUND LEVELS	1160.607	1159.275	1157.400	1155.466	1153.436	1151.314	1149.192	1147.070	1144.948	1142.827	1140.705		
SEWER INVERT LEVELS	1159.809	1158.639	1156.622	1156.622	1153.059	1153.059	1147.382	1147.382	1142.445	1142.445	1138.318		
PIPE SLOPE/LENGTH	5.00%	8.17%	8.97%		10.59%			10.60%			9.64%		
PIPE INVERT LEVEL	1159.809	1158.639	1156.622	1156.622	1153.059	1153.059	1147.382	1147.382	1142.445	1142.445	1138.318		
PIPE SIZE & MATERIAL	200mm DIA PVC PIPE												
PIPE BED & SURROUND	SELECTED FILL MATERIAL						CONCRETE						
MANHOLE DEPTH & CHAINAGE	1.507 0+000.00	2.000 0+011.22	2.271 0+035.90		1.987 0+075.61		1.743 0+129.24		1.953 0+175.81		2.012 0+218.61		

K6 PROFILE



STATION	0+000																	0+300					0+400	0+423
EXISTING GROUND LEVELS	1151.319	1151.860	1152.786	1152.879	1152.896	1153.224	1152.707	1153.184	1153.246	1152.894	1151.802	1150.199	1148.739	1147.167	1146.481	1145.779	1144.229	1142.656	1140.910	1139.262	1137.361	1135.403	1138.564	
SEWER INVERT LEVELS	1150.325		1150.193	1150.193		1150.073	1150.073	1149.974	1149.974		1149.816	1149.816	1149.756	1149.756	1149.588	1149.463		1146.200	1146.206		1143.200	1142.802	1139.214	1138.804		1134.160
PIPE SLOPE/LENGTH		0.30%		0.30%		0.30%			0.30%		0.30%	1.00%		6.15%			5.01%			7.49%				8.39%
PIPE SIZE & MATERIAL	200mm DIA PVC PIPE																							
PIPE BED & SURROUND	SELECTED FILL MATERIAL																							
MANHOLE DEPTH & CHAINAGE	1.857 0+000.21		2.979 0+044.74		2.945 0+084.72		2.844 0+117.71			3.650 0+170.03		2.979 0+190.08	2.004 0+206.95		1.067 0+260.00			2.255 0+320.00		2.267 0+367.90			1.857 0+423.24	

Revisions	
Description	Date
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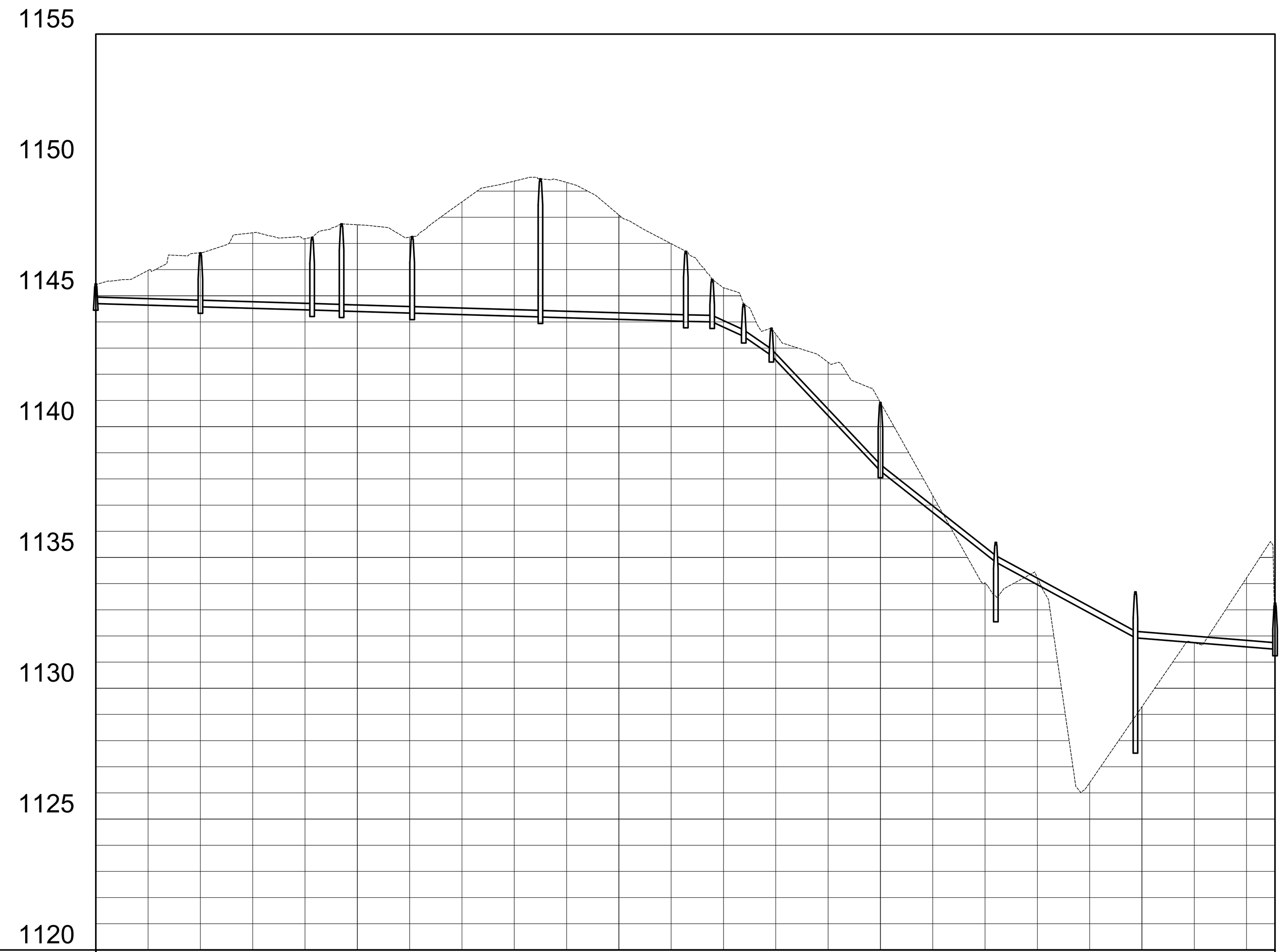
Drawn :	K. KAKA
Checked:	D. LIAMBILA
Approved:	B. KIM

Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KITUI SEWER LINE PROFILES ALIGNMENT K5 & K6
PLAN& PROFILE DRAWINGS
K5:KM 0+000-0+219; K6: KM 0+000-0+423

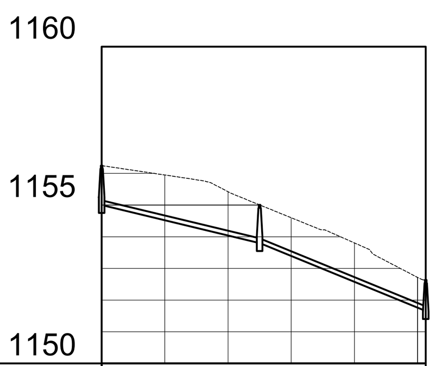
Stage :	FINAL DESIGN REVIEW
Date :	JULY 2020
Drawing No. :	KITUI-SL-P&P-005
Scale :	VERT-1:200 HOR-1:2000
Sheet Size :	A1
Sheet No. :	1 of 1
Index No. :	

K7 PROFILE



STATION	0+000; 0+100; 0+200; 0+300; 0+400; 0+451
EXISTING GROUND LEVELS	1145.426; 1145.968; 1146.641; 1147.406; 1147.182; 1147.713; 1147.245; 1148.588; 1149.383; 1149.332; 1148.087; 1146.992; 1145.308; 1143.531; 1142.460; 1140.921; 1137.366; 1134.035; 1134.224; 1126.390; 1129.294; 1131.735; 1134.220; 1131.871
SEWER INVERT LEVELS	1144.700; 1144.580; 1144.580; 1144.455; [illegible]; 1144.418; 1144.337; 1144.337; 1144.190; 1144.190; 1144.023; [illegible]; [illegible]; [illegible]; 1142.715; 1138.300; 1138.300; 1134.818; 1134.818; 1131.925; 1131.925; 1131.493
PIPE SLOPE/LENGTH	0.30%; 0.29%; 0.33%; 0.30%; 0.30%; 0.30%; [illegible]; 10.60%; 7.89%; 5.42%; 0.81%
PIPE INVERT LEVEL	1144.700; 1144.580; 1144.580; 1144.455; [illegible]; 1144.418; 1144.337; 1144.337; 1144.190; 1144.190; 1144.023; [illegible]; [illegible]; [illegible]; 1142.715; 1138.300; 1138.300; 1134.818; 1134.818; 1131.925; 1131.925; 1131.493
PIPE SIZE & MATERIAL	300mm DIA PVC PIPE
PIPE BED & SURROUND	SELECTED FILL MATERIAL; CONCRETE
MANHOLE DEPTH & CHAINAGE	0.857 0+000.00; 2.161 0+040.00; 2.880 [illegible]; 0+093.98; 3.028 0+120.97; 5.377 0+170.00; 2.778 [illegible]; [illegible]; [illegible]; 0+258.33; 2.721 0+300.00; 2.882 0+344.12; 6.010 0+397.51; 1.857 0+450.89

K6A PROFILE



STATION	0+000; 0+103
EXISTING GROUND LEVELS	1156.247; 1155.950; 1155.423; 1154.600; 1153.805; [illegible]
SEWER INVERT LEVELS	1155.000; 1153.800; 1153.800; 1151.655
PIPE SLOPE/LENGTH	2.40%; 4.08%
PIPE INVERT LEVEL	
PIPE SIZE & MATERIAL	200mm DIA PVC PIPE
PIPE BED & SURROUND	
MANHOLE DEPTH & CHAINAGE	1.347 0+000.00; 1.305 0+050.00; 1.080 0+102.56

NOTES :

1. THE CONTRACTOR TO VERIFY BOTH HORIZONTAL AND VERTICAL LOCATIONS OF ALL EXISTING SEWERS TO BE CONNECTED PRIOR TO CONSTRUCTION
2. VERTICAL EXAGGERATION IN PROFILE IS 10 TIMES THE HORIZONTAL SCALE.
3. THIS DRAWING TO BE READ WITH ALL RELEVANT LAYOUTS PLAN AND STANDARD DRAWINGS.
4. SEWER ROUTE(S) TO BE ALIGNED UPON CONFIRMATION OF FINAL WAYLEAVES
5. INVERT LEVELS (PIPES & MANHOLES) TO BE CONFIRMED BEFORE INSTALLATIONS
6. MANHOLES TO BE MIN 1200mm DIAMETER TO STANDARDS AND SPECIFICATIONS
7. BEDDING AND SURROUND MATERIAL TO THE APPROVAL OF THE ENGINEER

LEGEND :

SEWER PIPELINE

(S) MANHOLE (PLAN)

MANHOLE (PROFILE)

Revisions	
Description	Date
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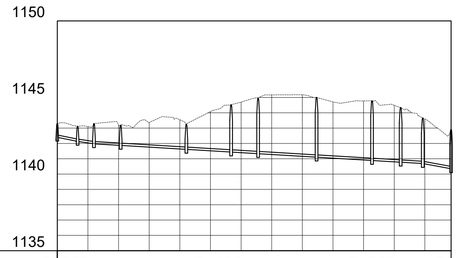
Checked: D. LIAMBILA
Approved: B. KIM

Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KITUI SEWER LINE PROFILES ALIGNMENT K6A & K7
PLAN& PROFILE DRAWINGS
K6A: KM 0+000-0+103; K7: KM 0+000-0+451

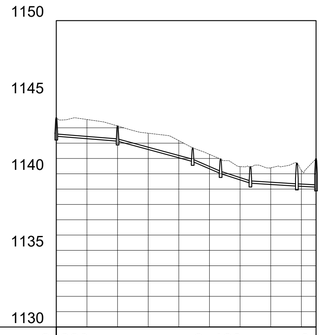
Stage :	FINAL DESIGN REVIEW
Date :	JULY 2020
Drawing No. :	KITUI-SL-P&P-006
Scale :	VERT-1:200 HOR-1:2000
Sheet Size :	A1
Sheet No. :	1 of 1
Index No. :	

K8 PROFILE



STATION	0+000																											0+257
EXISTING GROUND LEVELS	1143.287		1143.104		1143.215		1143.368		1143.550		1144.079		1144.697		1145.170		1145.178		1144.713		1144.774		1144.492		1143.594		1142.900	
SEWER INVERT LEVELS	1142.490	1142.974	1142.974	1141.879	1141.872		1141.872		1141.614		1141.614		1141.439	1141.439	1141.333		1141.104		1141.104		1140.887		1140.887	1140.775	1140.775	1140.688	1140.688	1140.350
PIPE SLOPE/LENGTH	2.00%	4.83%	0.60%		0.60%		0.60%		0.60%		0.60%		0.60%	0.60%	0.60%		0.60%		0.60%		0.60%		0.60%	0.60%		4.83%		
PIPE INVERT LEVEL	1142.490	1142.974	1142.974	1141.879	1141.872		1141.872		1141.614		1141.614		1141.439	1141.439	1141.333		1141.104		1141.104		1140.887		1140.887	1140.775	1140.775	1140.688	1140.688	1140.350
PIPE SIZE & MATERIAL	200mm DIA PVC PIPE																											
PIPE BED & SURROUND	SELECTED FILL MATERIAL																											
MANHOLE DEPTH & CHAINAGE	0.987 0+000.00	1.063 0+012.29		0+023.96	1.415 0+041.39				1.725 0+084.28				3.189 0+113.50	3.699 0+131.13			3.998 0+169.29				3.994 0+205.50		3.666 0+224.19	3.068 0+238.63			2.650 0+257.11	

K9 PROFILE



STATION	0+000															0+170
EXISTING GROUND LEVELS	1143.652	1143.545	1143.122	1142.649	1142.165	1141.270	1140.473	1140.389	1140.235	1140.982						
SEWER INVERT LEVELS	1142.450	1142.130	1142.130	1140.800	1140.800	1140.012	1140.012	1139.386	1139.386	1139.195	1139.195					
PIPE SLOPE/LENGTH	0.80%		2.71%			4.32%	3.22%		0.63%	0.50%						
PIPE INVERT LEVEL	1142.450	1142.130	1142.130	1140.800	1140.800	1140.012	1140.012	1139.386	1139.386	1139.195	1139.195					
PIPE SIZE & MATERIAL	200mm DIA PVC PIPE															
PIPE BED & SURROUND	SELECTED FILL MATERIAL															
MANHOLE DEPTH & CHAINAGE	1.302 0+000.00		1.092 0+040.00		0.992 0+069.05	1.057 0+107.30		1.171 0+126.75		1.598 0+157.08	1.949 0+169.59					

NOTES :

1. THE CONTRACTOR TO VERIFY BOTH HORIZONTAL AND VERTICAL LOCATIONS OF ALL EXISTING SEWERS TO BE CONNECTED PRIOR TO CONSTRUCTION
2. VERTICAL EXAGGERATION IN PROFILE IS 10 TIMES THE HORIZONTAL SCALE.
3. THIS DRAWING TO BE READ WITH ALL RELEVANT LAYOUTS PLAN AND STANDARD DRAWINGS.
4. SEWER ROUTE(S) TO BE ALIGNED UPON CONFIRMATION OF FINAL WAYLEAVES
5. INVERT LEVELS (PIPES & MANHOLES) TO BE CONFIRMED BEFORE INSTALLATIONS
6. MANHOLES TO BE MIN 1200mm DIAMETER TO STANDARDS AND SPECIFICATIONS
7. BEDDING AND SURROUND MATERIAL TO THE APPROVAL OF THE ENGINEER

LEGEND :

- SEWER PIPELINE
- MANHOLE (PLAN)
- MANHOLE (PROFILE)

Revisions	
Description	Date
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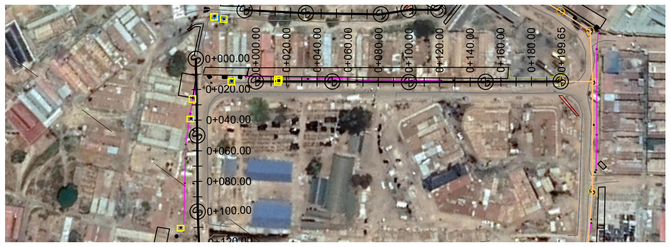
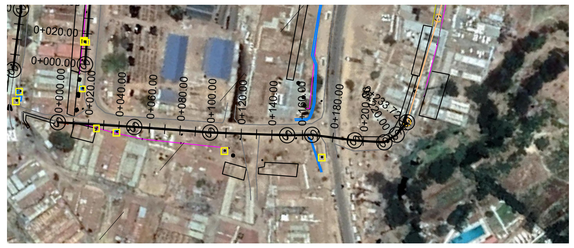
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

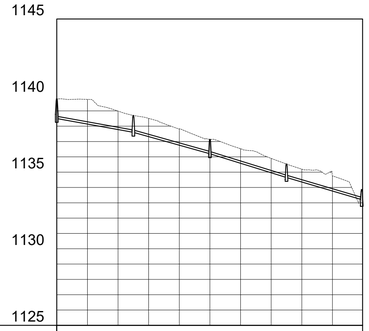
Drawing Title: KITUI SEWER LINE PROFILES ALIGNMENT K8 & K9
PLAN& PROFILE DRAWINGS
K8:KM 0+000-0+257; K9: KM 0+000-0+170

Stage :	FINAL DESIGN REVIEW
Date :	JULY 2020
Drawing No. :	KITUI-SL-P&P-007
Scale :	VERT-1:200 HOR-1:2000
Sheet Size :	A1
Sheet No. :	1 of 1
Index No. :	



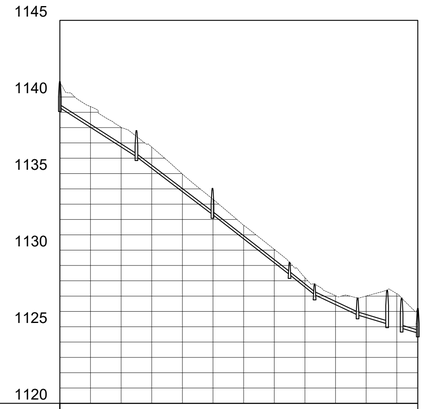


K10 PROFILE



STATION	0+000										0+100										0+200	
EXISTING GROUND LEVELS	1139.778	1139.751	1138.987	1138.510	1137.829	1137.137	1136.532	1135.896	1135.195	1134.761	1133.908											
SEWER INVERT LEVELS	1138.500		1137.600	1137.600		1136.200	1136.200		1134.650	1134.650	1133.207											
PIPE SLOPE/LENGTH	1.80%			2.80%			3.10%				2.94%											
PIPE INVERT LEVEL	1138.500		1137.600	1137.600		1136.200	1136.200		1134.650	1134.650	1133.207											
PIPE SIZE & MATERIAL	200mm DIA PVC PIPE																					
PIPE BED & SURROUND	SELECTED FILL MATERIAL																					
MANHOLE DEPTH & CHAINAGE	1.378 0+000.00			1.200 0+050.00			1.037 0+100.00			0.980 0+150.00				0.755 0+199.09								

K11 PROFILE



STATION	0+000										0+100										0+200	0+234
EXISTING GROUND LEVELS	1140.869	1139.371	1138.017	1136.731	1134.968	1133.319	1131.626	1130.055	1128.209	1127.027	1127.005	1127.159	1126.200									
SEWER INVERT LEVELS	1139.300		1136.100	1136.100		1132.326	1132.326		1128.402	1128.402 1127.088	1127.088	1125.769	1125.769 1125.189		1124.605							
PIPE SLOPE/LENGTH	6.40%			7.60%			7.80%			8.03%	4.71%	3.00%		3.00%								
PIPE INVERT LEVEL	1139.300		1136.100	1136.100		1132.326	1132.326		1128.402	1128.402 1127.088	1127.088	1125.769	1125.769 1125.189		1124.605							
PIPE SIZE & MATERIAL	200mm DIA PVC PIPE																					
PIPE BED & SURROUND	SELECTED FILL MATERIAL																					
MANHOLE DEPTH & CHAINAGE	1.807 0+000.00			1.807 0+050.00			1.807 0+099.65			0.904 0+149.98	0.807 0+166.33		1.205 0+194.37	2.296 0+206.69	0+221.15	0+233.72						

NOTES :

1. THE CONTRACTOR TO VERIFY BOTH HORIZONTAL AND VERTICAL LOCATIONS OF ALL EXISTING SEWERS TO BE CONNECTED PRIOR TO CONSTRUCTION
2. VERTICAL EXAGGERATION IN PROFILE IS 10 TIMES THE HORIZONTAL SCALE.
3. THIS DRAWING TO BE READ WITH ALL RELEVANT LAYOUTS PLAN AND STANDARD DRAWINGS.
4. SEWER ROUTE(S) TO BE ALIGNED UPON CONFIRMATION OF FINAL WAYLEAVES
5. INVERT LEVELS (PIPES & MANHOLES) TO BE CONFIRMED BEFORE INSTALLATIONS
6. MANHOLES TO BE MIN 1200mm DIAMETER TO STANDARDS AND SPECIFICATIONS
7. BEDDING AND SURROUND MATERIAL TO THE APPROVAL OF THE ENGINEER

LEGEND :

SEWER PIPELINE

MANHOLE (PLAN)

MANHOLE (PROFILE)

Revisions	
Description	Date
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Consultant

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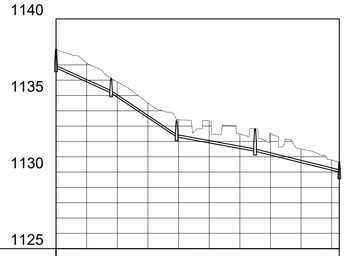
Drawn :	K. KAKA
Checked:	D. LIAMBILA
Approved:	B. KIM

Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KITUI SEWER LINE PROFILES ALIGNMENT K10 & K11
PLAN& PROFILE DRAWINGS
K10:KM 0+000-0+200; K11: KM 0+000-0+234

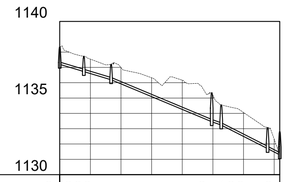
Stage :	FINAL DESIGN REVIEW
Date :	JULY 2020
Drawing No. :	KITUI-SL-P&P-008
Scale :	VERT-1:200 HOR-1:2000
Sheet Size :	A1
Sheet No. :	1 of 1
Index No. :	

ABATTOIR K12 PROFILE



STATION	0+000				0+100			0+185
EXISTING GROUND LEVELS	1138.033	1137.118	1135.892	1134.517	1133.410	1133.343	1132.486	1132.528	1131.510	1130.783 / 1130.487
SEWER INVERT LEVELS	1136.800	1135.162 / 1135.162		1132.296 / 1132.296		1131.360 / 1131.360		1130.000
PIPE SLOPE/LENGTH	4.55%	6.70%		1.83%		2.48%		
PIPE INVERT LEVEL	1136.800	1135.162 / 1135.162		1132.296 / 1132.296		1131.360 / 1131.360		1130.000
PIPE SIZE & MATERIAL	200mm DIA PVC PIPE							
PIPE BED & SURROUND	SELECTED FILL MATERIAL							
MANHOLE DEPTH & CHAINAGE	1.333 0+000.00	1.056 0+035.98		1.147 0+078.72		1.569 0+130.00		0.755 0+184.94

K13 PROFILE



STATION	0+000				0+100		0+144
EXISTING GROUND LEVELS	1138.322	1137.540	1136.992	1136.323	1136.168	1135.181	1134.057	1132.390 / 1132.398
SEWER INVERT LEVELS	1137.208 / 1137.208	1136.724 / 1136.724	1136.194		1133.453 / 1133.453 / 1133.453 / 1133.236		1131.700 / 1131.700
PIPE SLOPE/LENGTH	3.00%	3.00%	4.17%		3.49%	5.08%	5.14%
PIPE INVERT LEVEL	1137.208 / 1137.208	1136.724 / 1136.724	1136.194		1133.453 / 1133.453 / 1133.453 / 1133.236		1131.700 / 1131.700
PIPE SIZE & MATERIAL	200mm DIA PVC PIPE						
PIPE BED & SURROUND	SELECTED FILL MATERIAL						
MANHOLE DEPTH & CHAINAGE	1.222 0+000.00	1.096 0+015.73	1.104 0+033.55		1.909 0+063.41 / 0+105.45		1.467 0+140.67 / 0+143.67

NOTES :

1. THE CONTRACTOR TO VERIFY BOTH HORIZONTAL AND VERTICAL LOCATIONS OF ALL EXISTING SEWERS TO BE CONNECTED PRIOR TO CONSTRUCTION
2. VERTICAL EXAGGERATION IN PROFILE IS 10 TIMES THE HORIZONTAL SCALE.
3. THIS DRAWING TO BE READ WITH ALL RELEVANT LAYOUTS PLAN AND STANDARD DRAWINGS.
4. SEWER ROUTE(S) TO BE ALIGNED UPON CONFIRMATION OF FINAL WAYLEAVES
5. INVERT LEVELS (PIPES & MANHOLES) TO BE CONFIRMED BEFORE INSTALLATIONS
6. MANHOLES TO BE MIN 1200mm DIAMETER TO STANDARDS AND SPECIFICATIONS
7. BEDDING AND SURROUND MATERIAL TO THE APPROVAL OF THE ENGINEER

LEGEND :

SEWER PIPELINE

MANHOLE (PLAN)

MANHOLE (PROFILE)

Revisions	
Description	Date
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Consultant

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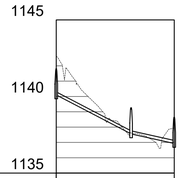
Drawn :	K. KAKA
Checked:	D. LIAMBILA
Approved:	B. KIM

Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KITUI SEWER LINE PROFILES ALIGNMENT K12 & K13
PLAN& PROFILE DRAWINGS
K12:KM 0+000-0+185; K13: KM 0+000-0+144

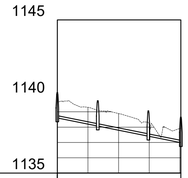
Stage :	FINAL DESIGN REVIEW
Date :	JULY 2020
Drawing No. :	KITUI-SL-P&P-00
Scale :	VERT-1:200 HOR-1:2000
Sheet Size :	A1
Sheet No. :	1 of 1
Index No. :	

K14 PROFILE



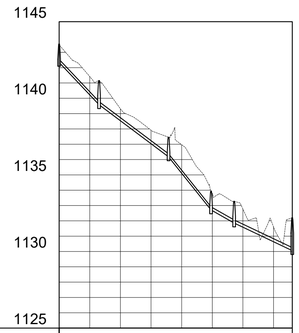
STATION	0+000			0+077
EXISTING GROUND LEVELS	1142.639	1140.077	1138.375	1137.318
SEWER INVERT LEVELS	1140.100		1137.557	1137.557	1136.930
PIPE SLOPE/LENGTH	5.20%		2.23%	
PIPE INVERT LEVEL	1140.100		1137.557	1137.557	1136.930
PIPE SIZE & MATERIAL	200mm DIA PVC PIPE			
PIPE BED & SURROUND		CONCRETE		
MANHOLE DEPTH & CHAINAGE	1.807 ???		1.807 ???	1.807 ???

K14A PROFILE



STATION	0+000			0+081
EXISTING GROUND LEVELS	1139.648	1139.295	1138.886	1138.208	1137.940
SEWER INVERT LEVELS	1138.600	1138.072	1138.072	1137.411	1137.411	1136.987
PIPE SLOPE/LENGTH	2.00%	2.00%	2.00%
PIPE INVERT LEVEL	1138.600	1138.072	1138.072	1137.411	1137.411	1136.987
PIPE SIZE & MATERIAL	200mm DIA PVC PIPE		
PIPE BED & SURROUND	SELECTED FILL MATERIAL		
MANHOLE DEPTH & CHAINAGE	1.755 0+000.00	1.755 0+026.41	1.755 0+069.45	1.768 0+080.65

K15 PROFILE



STATION	0+000				0+100			0+152
EXISTING GROUND LEVELS	1143.541	1141.418	1139.313	1137.920	1136.969	1133.783	1132.766	1131.606	1132.201
SEWER INVERT LEVELS	1142.341	1139.580	1139.580	1136.175	1136.175	1132.712	1132.712	1131.856	1130.054
PIPE SLOPE/LENGTH	10.59%	7.50%	12.49%	5.67%	4.75%
PIPE INVERT LEVEL	1142.341	1139.580	1139.580	1136.175	1136.175	1132.712	1132.712	1131.856	1130.054
PIPE SIZE & MATERIAL	200mm DIA PVC PIPE								
PIPE BED & SURROUND	SELECTED FILL MATERIAL						CONCRETE		
MANHOLE DEPTH & CHAINAGE	1.300 0+000.00	1.679 0+026.06	1.383 0+071.45	1.332 0+099.19	1.373 0+114.29	2.246 0+152.22

NOTES :

1. THE CONTRACTOR TO VERIFY BOTH HORIZONTAL AND VERTICAL LOCATIONS OF ALL EXISTING SEWERS TO BE CONNECTED PRIOR TO CONSTRUCTION
2. VERTICAL EXAGGERATION IN PROFILE IS 10 TIMES THE HORIZONTAL SCALE.
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7. BEDDING AND SURROUND MATERIAL TO THE APPROVAL OF THE ENGINEER

LEGEND :

SEWER PIPELINE

MANHOLE (PLAN)

MANHOLE (PROFILE)

Revisions	
Description	Date
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Consultant

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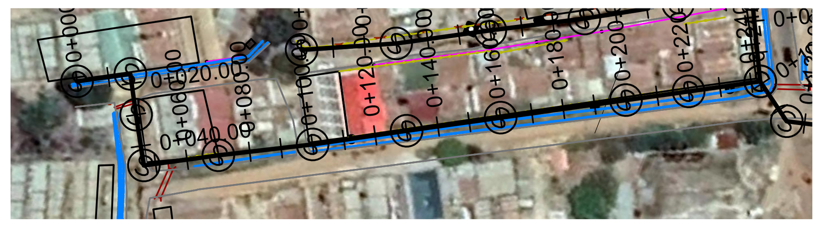
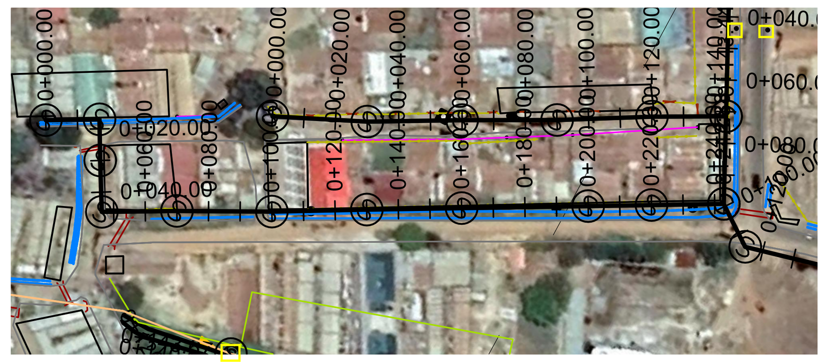
Drawn :	K. KAKA
Checked:	D. LIAMBILA
Approved:	B. KIM

Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

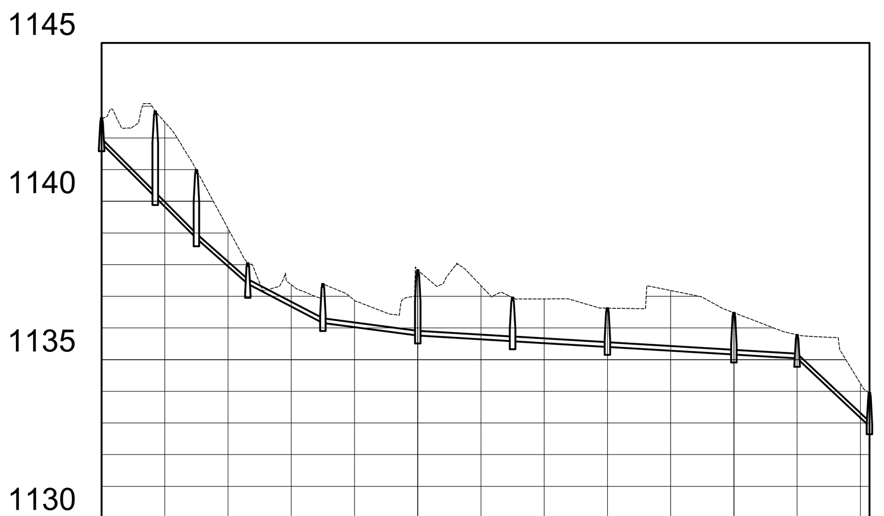
Drawing Title: KITUI SEWER LINE PROFILES ALIGNMENT K14, 14A & K15 PLAN& PROFILE DRAWINGS
K14:KM 0+000-0+077;K14A: 0+000-0+081; K15: KM 0+000-0+152

Stage :	FINAL DESIGN REVIEW
Date :	JULY 2020
Drawing No. :	KITUI-SL-P&P-001
Scale :	VERT-1:200 HOR-1:2000
Sheet Size :	A1
Sheet No. :	1 of 1
Index No. :	



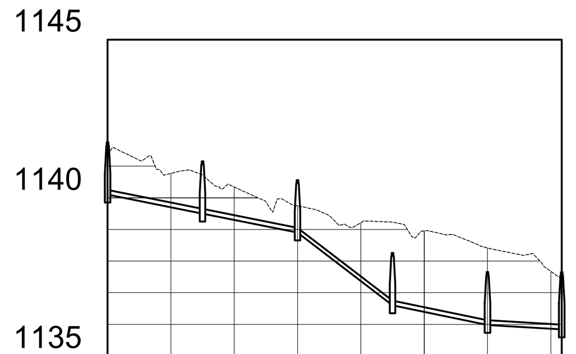


K15A PROFILE



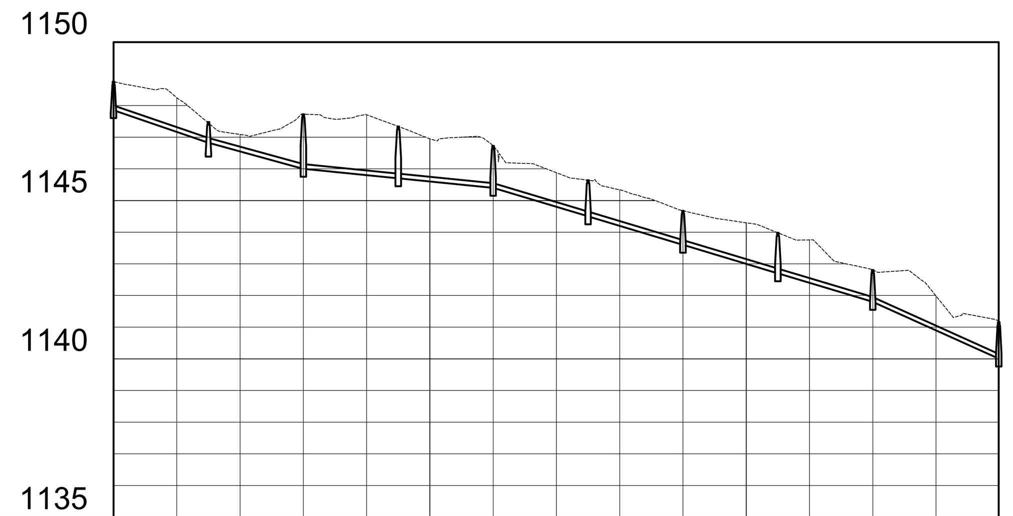
STATION	0+000 0+100 0+200 0+243
EXISTING GROUND LEVELS	1142.630 1142.502 1139.139 1137.366 1136.871 1137.825 1137.333 1136.917 1136.624 1137.182 1136.481 1135.781 1134.259 1133.954
SEWER INVERT LEVELS	1141.830 1140.132 1140.132 1138.830 1138.830 1137.392 1137.392 1136.155 1136.155 1135.760 1135.760 1135.580 1135.580 1135.400 1135.400 1135.160 1135.160 1135.040 1135.040 1132.896
PIPE SLOPE/LENGTH	10.00% 10.00% 8.85% 5.21% 1.32% 0.60% 0.60% 0.60% 0.60% 9.37%
PIPE INVERT LEVEL	1141.830 1140.132 1140.132 1138.830 1138.830 1137.392 1137.392 1136.155 1136.155 1135.760 1135.760 1135.580 1135.580 1135.400 1135.400 1135.160 1135.160 1135.040 1135.040 1132.896
PIPE SIZE & MATERIAL	200mm DIA PVC PIPE
PIPE BED & SURROUND	SELECTED FILL MATERIAL
MANHOLE DEPTH & CHAINAGE	0.900 0+000.00; 2.811 0+016.98; 2.258 0+030.00; 0.755 0+046.25; 1.333 0+070.00; 2.165 0+100.00; 1.480 0+130.00; 1.324 0+160.00; 1.421 0+200.00; 0.841 0+220.00; 1.158 0+242.88

K15B PROFILE



STATION	0+000 0+100 0+143
EXISTING GROUND LEVELS	1141.367 1140.771 1140.343 1139.748 1139.213 1138.954 1138.413 1137.674 1137.459
SEWER INVERT LEVELS	1140.100 1139.500 1139.500 1138.901 1138.901 1136.600 1136.600 1135.980 1135.980 1135.839
PIPE SLOPE/LENGTH	2.00% 2.00% 7.67% 2.07% 0.60%
PIPE INVERT LEVEL	1140.100 1139.500 1139.500 1138.901 1138.901 1136.600 1136.600 1135.980 1135.980 1135.839
PIPE SIZE & MATERIAL	200mm DIA PVC PIPE
PIPE BED & SURROUND	SELECTED FILL MATERIAL
MANHOLE DEPTH & CHAINAGE	1.755 ???; 1.755 ???; 1.755 ???; 1.755 ???; 1.775 ???; 1.916 ???

K15C PROFILE



STATION	0+000 0+100 0+200 0+280
EXISTING GROUND LEVELS	1148.753 1148.247 1147.086 1147.725 1147.706 1146.947 1146.726 1145.879 1145.337 1144.678 1144.297 1143.757 1142.804 1141.986 1141.159
SEWER INVERT LEVELS	1147.850 1146.825 1146.825 1146.000 1146.000 1145.700 1145.700 1145.400 1145.400 1144.500 1144.500 1143.600 1143.600 1142.700 1142.700 1141.800 1141.800 1140.005
PIPE SLOPE/LENGTH	3.42% 2.75% 1.00% 1.00% 3.00% 3.00% 3.00% 3.00% 4.51%
PIPE INVERT LEVEL	1147.850 1146.825 1146.825 1146.000 1146.000 1145.700 1145.700 1145.400 1145.400 1144.500 1144.500 1143.600 1143.600 1142.700 1142.700 1141.800 1141.800 1140.005
PIPE SIZE & MATERIAL	200mm DIA PVC PIPE
PIPE BED & SURROUND	SELECTED FILL MATERIAL
MANHOLE DEPTH & CHAINAGE	1.003 0+000.00; 0.755 0+030.00; 1.825 0+060.00; 1.740 0+090.00; 1.426 0+120.00; 1.241 0+150.00; 1.178 0+180.00; 1.381 0+210.00; 1.104 0+240.00; 1.254 0+279.82

NOTES :

1. THE CONTRACTOR TO VERIFY BOTH HORIZONTAL AND VERTICAL LOCATIONS OF ALL EXISTING SEWERS TO BE CONNECTED PRIOR TO CONSTRUCTION
2. VERTICAL EXAGGERATION IN PROFILE IS 10 TIMES THE HORIZONTAL SCALE.
3. THIS DRAWING TO BE READ WITH ALL RELEVANT LAYOUTS PLAN AND STANDARD DRAWINGS.
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5. INVERT LEVELS (PIPES & MANHOLES) TO BE CONFIRMED BEFORE INSTALLATIONS
6. MANHOLES TO BE MIN 1200mm DIAMETER TO STANDARDS AND SPECIFICATIONS
7. BEDDING AND SURROUND MATERIAL TO THE APPROVAL OF THE ENGINEER

LEGEND :

- SEWER PIPELINE
- Ⓢ MANHOLE (PLAN)
- MANHOLE (PROFILE)

Revisions	
Description	Date
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. .	.
. .	.

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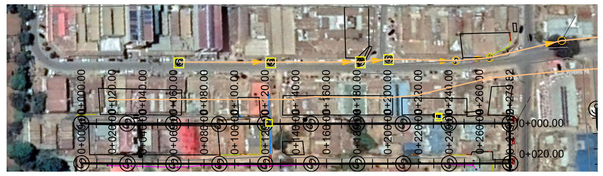
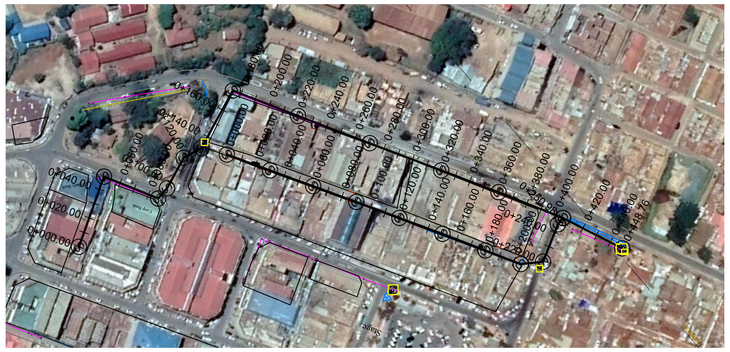
Drawn : K. KAKA
Checked: D. LIAMBILA
Approved: B. KIM

Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KITUI SEWER LINE PROFILES ALIGNMENT K15A, 15B & K15C
PLAN& PROFILE DRAWINGS
K15A:KM 0+000-0+243;K15B: 0+000-0+143; K15C: KM 0+000-0+280

Stage :	FINAL DESIGN REVIEW
Date :	JULY 2020
Drawing No. :	KITUI-SL-P&P-001
Scale :	VERT-1:200 HOR-1:2000
Sheet Size :	A1
Sheet No. :	1 of 1
Index No. :	





NOTES :

1. THE CONTRACTOR TO VERIFY BOTH HORIZONTAL AND VERTICAL LOCATIONS OF ALL EXISTING SEWERS TO BE CONNECTED PRIOR TO CONSTRUCTION
2. VERTICAL EXAGGERATION IN PROFILE IS 10 TIMES THE HORIZONTAL SCALE.
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4. SEWER ROUTE(S) TO BE ALIGNED UPON CONFIRMATION OF FINAL WAYLEAVES
5. INVERT LEVELS (PIPES & MANHOLES) TO BE CONFIRMED BEFORE INSTALLATIONS
6. MANHOLES TO BE MIN 1200mm DIAMETER TO STANDARDS AND SPECIFICATIONS
7. BEDDING AND SURROUND MATERIAL TO THE APPROVAL OF THE ENGINEER

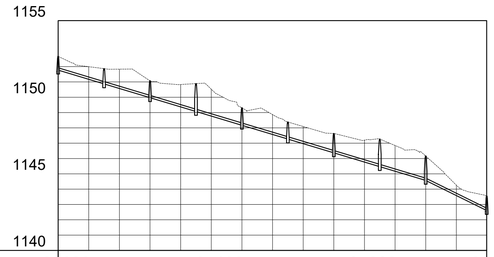
LEGEND :

SEWER PIPELINE

MANHOLE (PLAN)

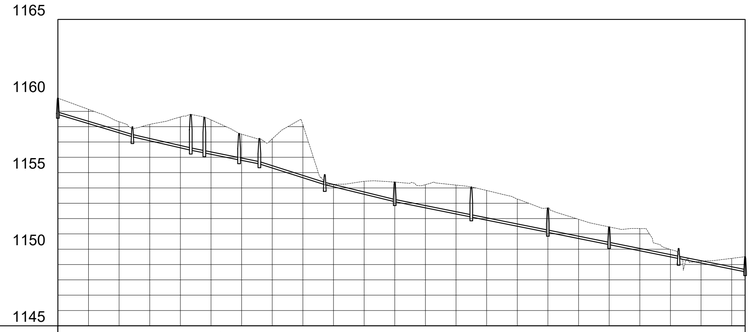
MANHOLE (PROFILE)

K15D PROFILE



STATION	0+000				0+100				0+200				0+280
EXISTING GROUND LEVELS	1152.666	1151.995	1151.833	1151.069	1150.834	1150.523	1149.309	1148.868	1148.089	1147.632	1147.199	1146.850	1146.161	1144.262	1143.541
SEWER INVERT LEVELS	1151.770	1150.870	1150.870	1149.970	1149.970	1149.070	1149.070	1148.170	1148.170	1147.270	1147.270	1146.370	1146.370	1145.470	1145.470	1144.570	1144.570	1142.605
PIPE SLOPE/LENGTH	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	4.93%
PIPE INVERT LEVEL	1151.770	1150.870	1150.870	1149.970	1149.970	1149.070	1149.070	1148.170	1148.170	1147.270	1147.270	1146.370	1146.370	1145.470	1145.470	1144.570	1144.570	1142.605
PIPE SIZE & MATERIAL	200mm DIA PVC PIPE																	
PIPE BED & SURROUND	SELECTED FILL MATERIAL																	
MANHOLE DEPTH & CHAINAGE	0.996 0+000.00	1.097 0+030.00	1.199 0+060.00	1.918 0+090.00	1.239 0+120.00	1.212 0+150.00	1.362 0+180.00	1.898 0+210.00	1.691 0+240.00	1.036 0+279.82

K16 PROFILE



STATION	0+000				0+100				0+200				0+300				0+400		0+449
EXISTING GROUND LEVELS	1159.861	1159.131	1158.324	1158.146	1158.633	1158.445	1157.510	1157.208	1158.121	1154.233	1154.433	1154.380	1154.213	1154.187	1153.834	1153.268	1152.689	1151.954	1151.454	1151.350	1149.982	1149.210	1149.402	1149.510
SEWER INVERT LEVELS	1158.800	1157.340	1157.340	1156.464	1156.464	1156.287	1155.833	1155.568	1155.568	1154.215	1154.215	1153.100	1153.100	1152.100	1152.100	1151.101	1151.101	1150.300	1150.300	1149.393	1149.393	1148.527
PIPE SLOPE/LENGTH	3.00%	2.30%	2.00%	2.00%	2.00%	3.17%	2.44%	2.00%	2.00%	2.00%	2.00%	1.99%
PIPE INVERT LEVEL	1158.800	1157.340	1157.340	1156.464	1156.464	1156.287	1155.833	1155.568	1155.568	1154.215	1154.215	1153.100	1153.100	1152.100	1152.100	1151.101	1151.101	1150.300	1150.300	1149.393	1149.393	1148.527
PIPE SIZE & MATERIAL	200mm DIA PVC PIPE																					
PIPE BED & SURROUND	SELECTED FILL MATERIAL								CONCRETE	SELECTED FILL MATERIAL										CONCRETE	
MANHOLE DEPTH & CHAINAGE	1.161 0+000.00	0.755 0+048.67	2.433 0+080.79	0+095.65	1.821 0+115.35	1.780 0+131.59	0.755 0+174.27	1.380 0+219.98	2.063 0+269.98	1.688 0+319.96	1.254 0+359.98	0.755 0+405.36	1.083 0+448.76

Revisions	
Description	Date
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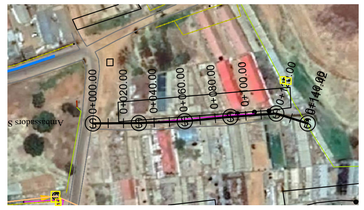
Designed:	K. KAKA
Drawn :	K. KAKA
Checked:	D. LIAMBILA
Approved:	B. KIM

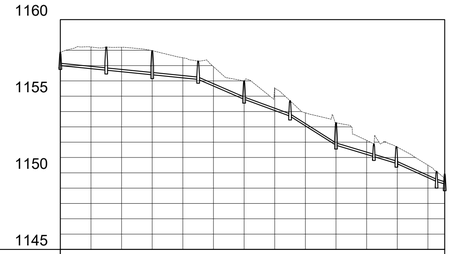
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KITUI SEWER LINE PROFILES ALIGNMENT K15D & K16
PLAN& PROFILE DRAWINGS
K15D:KM 0+000-0+280; K16: KM 0+000-0+449

Stage :	FINAL DESIGN REVIEW
Date :	JULY 2020
Drawing No. :	KITUI-SL-P&P-001
Scale :	VERT-1:200 HOR-1:2000
Sheet Size :	A1
Sheet No. :	1 of 1
Index No. :	

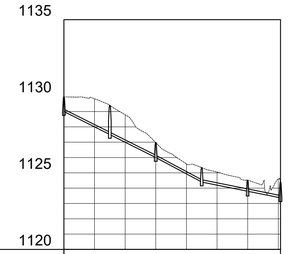


K17 PROFILE



STATION	0+000														0+100												0+200												0+251
EXISTING GROUND LEVELS	1157.867		1158.214		1158.195		1157.973		1157.511		1156.930		1156.000		1155.548		1153.917		1153.264		1152.118		1151.679		1150.500		1149.671											
SEWER INVERT LEVELS	1157.000		1156.700		1156.700		1156.400		1156.400		1156.100		1156.100		1154.800		1154.800		1153.700		1153.700		1151.800		1151.800		1151.058		1150.679		1150.679		1150.617		1149.430		1149.430		1149.369
PIPE SLOPE/LENGTH	1.00%		1.00%		1.00%		4.33%		3.67%		6.33%		3.00%		3.00%		4.52%		3.03%																				
PIPE INVERT LEVEL	1157.000		1156.700		1156.700		1156.400		1156.400		1156.100		1156.100		1154.800		1154.800		1153.700		1153.700		1151.800		1151.800		1151.058		1150.679		1150.679		1150.617		1149.430		1149.430		1149.369
PIPE SIZE & MATERIAL	200mm DIA PVC PIPE																																						
PIPE BED & SURROUND	SELECTED FILL MATERIAL																																						
MANHOLE DEPTH & CHAINAGE	0.967 0+000.00		1.609 0+030.00		1.673 0+060.00		1.295 0+090.00		1.300 0+120.00		1.107 0+150.00		1.564 0+180.00		0.906 0+209.73		1.192 0+219.42		0.762 0+249.67		0+250.98																			

K18 PROFILE



STATION	0+000														0+100												0+141
EXISTING GROUND LEVELS	1129.957		1129.835		1128.793		1128.971		1125.587		1125.054		1124.517		1124.592												
SEWER INVERT LEVELS	1129.000		1127.500		1127.500		1126.000		1126.000		1124.401		1124.401		1123.801		1123.369										
PIPE SLOPE/LENGTH	5.00%		5.00%		5.34%		2.00%		2.01%																		
PIPE INVERT LEVEL	1129.000		1127.500		1127.500		1126.000		1126.000		1124.401		1124.401		1123.801		1123.369										
PIPE SIZE & MATERIAL	200mm DIA PVC PIPE																										
PIPE BED & SURROUND	SELECTED FILL MATERIAL																										
MANHOLE DEPTH & CHAINAGE	1.057 0+000.00		2.001 0+029.99		1.072 0+059.99		1.042 0+089.97		0.818 0+119.93		1.123 0+141.42																

NOTES :

1. THE CONTRACTOR TO VERIFY BOTH HORIZONTAL AND VERTICAL LOCATIONS OF ALL EXISTING SEWERS TO BE CONNECTED PRIOR TO CONSTRUCTION
2. VERTICAL EXAGGERATION IN PROFILE IS 10 TIMES THE HORIZONTAL SCALE.
3. THIS DRAWING TO BE READ WITH ALL RELEVANT LAYOUTS PLAN AND STANDARD DRAWINGS.
4. SEWER ROUTE(S) TO BE ALIGNED UPON CONFIRMATION OF FINAL WAYLEAVES
5. INVERT LEVELS (PIPES & MANHOLES) TO BE CONFIRMED BEFORE INSTALLATIONS
6. MANHOLES TO BE MIN 1200mm DIAMETER TO STANDARDS AND SPECIFICATIONS
7. BEDDING AND SURROUND MATERIAL TO THE APPROVAL OF THE ENGINEER

LEGEND :

SEWER PIPELINE

MANHOLE (PLAN)

MANHOLE (PROFILE)

Revisions	
Description	Date
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Drawn :	K. KAKA
Checked:	D. LIAMBILA
Approved:	B. KIM

Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KITUI SEWER LINE PROFILES ALIGNMENT K17 & K18
PLAN& PROFILE DRAWINGS
K17:KM 0+000-0+251; K18: KM 0+000-0+141

Stage :	FINAL DESIGN REVIEW
Date :	JULY 2020
Drawing No. :	KITUI-SL-P&P-001
Scale :	VERT-1:200 HOR-1:2000
Sheet Size :	A1
Sheet No. :	1 of 1
Index No. :	

NOTES :

1. THE CONTRACTOR TO VERIFY BOTH HORIZONTAL AND VERTICAL LOCATIONS OF ALL EXISTING SEWERS TO BE CONNECTED PRIOR TO CONSTRUCTION
2. VERTICAL EXAGGERATION IN PROFILE IS 10 TIMES THE HORIZONTAL SCALE.
3. THIS DRAWING TO BE READ WITH ALL RELEVANT LAYOUTS PLAN AND STANDARD DRAWINGS.
4. SEWER ROUTE(S) TO BE ALIGNED UPON CONFIRMATION OF FINAL WAYLEAVES
5. INVERT LEVELS (PIPES & MANHOLES) TO BE CONFIRMED BEFORE INSTALLATIONS
6. MANHOLES TO BE MIN 1200mm DIAMETER TO STANDARDS AND SPECIFICATIONS
7. BEDDING AND SURROUND MATERIAL TO THE APPROVAL OF THE ENGINEER

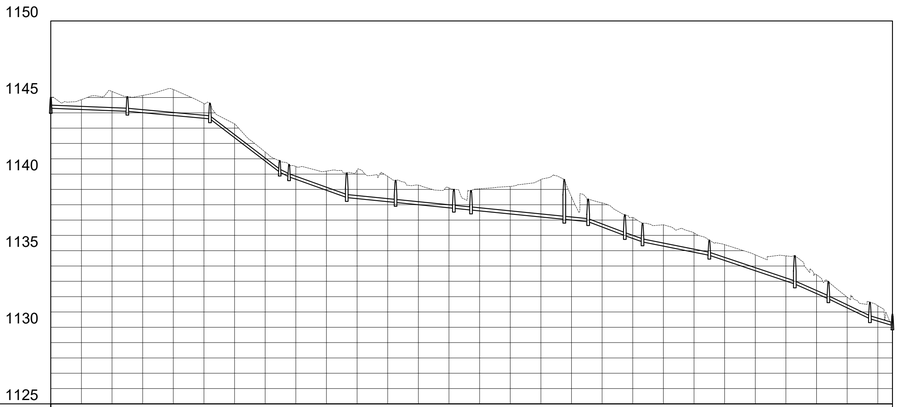
LEGEND :

SEWER PIPELINE

MANHOLE (PLAN)

MANHOLE (PROFILE)

SAN MARINO HOTELK19 PROFILE



STATION	0+000					0+100					0+200					0+300					0+400					0+500		0+550
EXISTING GROUND LEVELS	1144.991	1144.861	1145.393	1145.133	1145.520	1144.600	1143.279	1141.443	1140.495	1140.195	1140.250	1139.852	1139.278	1139.099	1139.042	1139.196	1139.640	1138.518	1138.124	1137.179	1136.691	1136.164	1135.395	1134.731	1134.662	1133.437	1131.969	1131.409	1130.849
SEWER INVERT LEVELS	1144.300		1144.100	1144.100		1143.605	1143.605		1140.126 1139.928 1139.728 1139.620	1138.467	1138.467	1138.149	1138.149	1137.768	1137.666 1137.656		1137.047	1137.047 1136.891 1136.691	1136.891	1135.985 1135.982	1135.572	1134.700	1134.700		1132.826	1132.826	1131.858	1130.554	1130.554 1130.113
PIPE SLOPE/LENGTH	0.40%			0.92%			7.64%		5.00%	3.59%		1.00%		1.00%	1.00%		1.00%	1.00%	3.78%	3.57%	2.00%			3.36%		4.41%	4.81%	3.00%
PIPE INVERT LEVEL	1144.300		1144.100	1144.100		1143.605	1143.605		1140.126 1139.928 1139.728 1139.620	1138.467	1138.467	1138.149	1138.149	1137.768	1137.666 1137.656		1137.047	1137.047 1136.891 1136.691	1136.891	1135.985 1135.982	1135.572	1134.700	1134.700		1132.826	1132.826	1131.858	1130.554	1130.554 1130.113
PIPE SIZE & MATERIAL	200mm DIA PVC PIPE																											
PIPE BED & SURROUND	SELECTED FILL MATERIAL																											
MANHOLE DEPTH & CHAINAGE	0.807 0+000.00		1.058 0+049.99			1.125 0+103.93			0.862 0.848 0.848 0+155.59		1.710 0+193.26		1.544 0+225.14		1.337 0.918 0+274.41			2.701 0+335.30	1.579 0+350.87	1.458 0.748 0.746 0+386.39		1.089 0+430.00			1.950 0+485.81	1.233 0+507.75	1.178 0+534.85 0.836 0+549.56	

Revisions	
Description	Date
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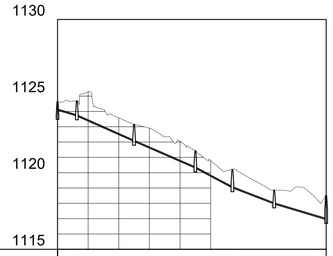
Drawn :	K. KAKA
Checked:	D. LIAMBILA
Approved:	B. KIM

Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KITUI SEWER LINE PROFILES ALIGNMENT K19
PLAN& PROFILE DRAWINGS
KM 0+000-0+550

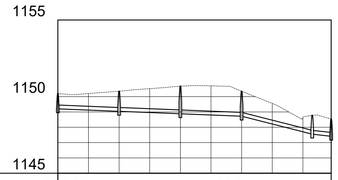
Stage :	FINAL DESIGN REVIEW
Date :	JULY 2020
Drawing No. :	KITUI-SL-P&P-001
Scale :	VERT-1:200 HOR-1:2000
Sheet Size :	A1
Sheet No. :	1 of 1
Index No. :	

K20 PROFILE



STATION	0+000									0+100							0+175
EXISTING GROUND LEVELS	1124.564		1125.285		1123.581		1122.914		1122.048		1120.793		1119.970		1118.866		1119.045
SEWER INVERT LEVELS	1124.701	1124.701	1123.701		1122.040	1122.040			1120.300	1120.300	1119.007	1119.007		1117.956	1117.956		1116.938
PIPE SLOPE/LENGTH	3.00%		4.44%			4.35%			5.35%		3.85%			3.00%			
PIPE INVERT LEVEL	1124.701	1124.701	1123.701		1122.040	1122.040			1120.300	1120.300	1119.007	1119.007		1117.956	1117.956		1116.938
PIPE SIZE & MATERIAL	200mm DIA PVC PIPE																
PIPE BED & SURROUND	SELECTED FILL MATERIAL																
MANHOLE DEPTH & CHAINAGE	0.678 0+000.00	1.091 0+012.63			1.216 0+050.00				1.232 0+090.00		1.308 0+114.18		1.010 0+141.47				1.692 0+175.38

K21 PROFILE



STATION	0+000									0+100							0+178
EXISTING GROUND LEVELS	1150.201		1150.202		1150.353		1150.522		1150.686		1150.704		1150.353		1149.558		1148.631	1148.543
SEWER INVERT LEVELS	1149.200		1149.040	1149.040			1148.880	1148.880			1148.720	1148.720			1147.551		1147.452
PIPE SLOPE/LENGTH		0.40%			0.40%			0.40%				2.54%				1.12%	
PIPE INVERT LEVEL	1149.200		1149.040	1149.040			1148.880	1148.880			1148.720	1148.720			1147.551		1147.452
PIPE SIZE & MATERIAL	300mm DIA PVC PIPE																
PIPE BED & SURROUND	SELECTED FILL MATERIAL																
MANHOLE DEPTH & CHAINAGE	1.101 0+000.00			1.413 0+040.00			1.906 0+080.00				1.733 0+120.00				1.332 0+166.11	1.231 0+178.47	

NOTES :

1. THE CONTRACTOR TO VERIFY BOTH HORIZONTAL AND VERTICAL LOCATIONS OF ALL EXISTING SEWERS TO BE CONNECTED PRIOR TO CONSTRUCTION
2. VERTICAL EXAGGERATION IN PROFILE IS 10 TIMES THE HORIZONTAL SCALE.
3. THIS DRAWING TO BE READ WITH ALL RELEVANT LAYOUTS PLAN AND STANDARD DRAWINGS.
4. SEWER ROUTE(S) TO BE ALIGNED UPON CONFIRMATION OF FINAL WAYLEAVES
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7. BEDDING AND SURROUND MATERIAL TO THE APPROVAL OF THE ENGINEER

LEGEND :

SEWER PIPELINE

Ⓢ MANHOLE (PLAN)

MANHOLE (PROFILE)

Revisions	
Description	Date
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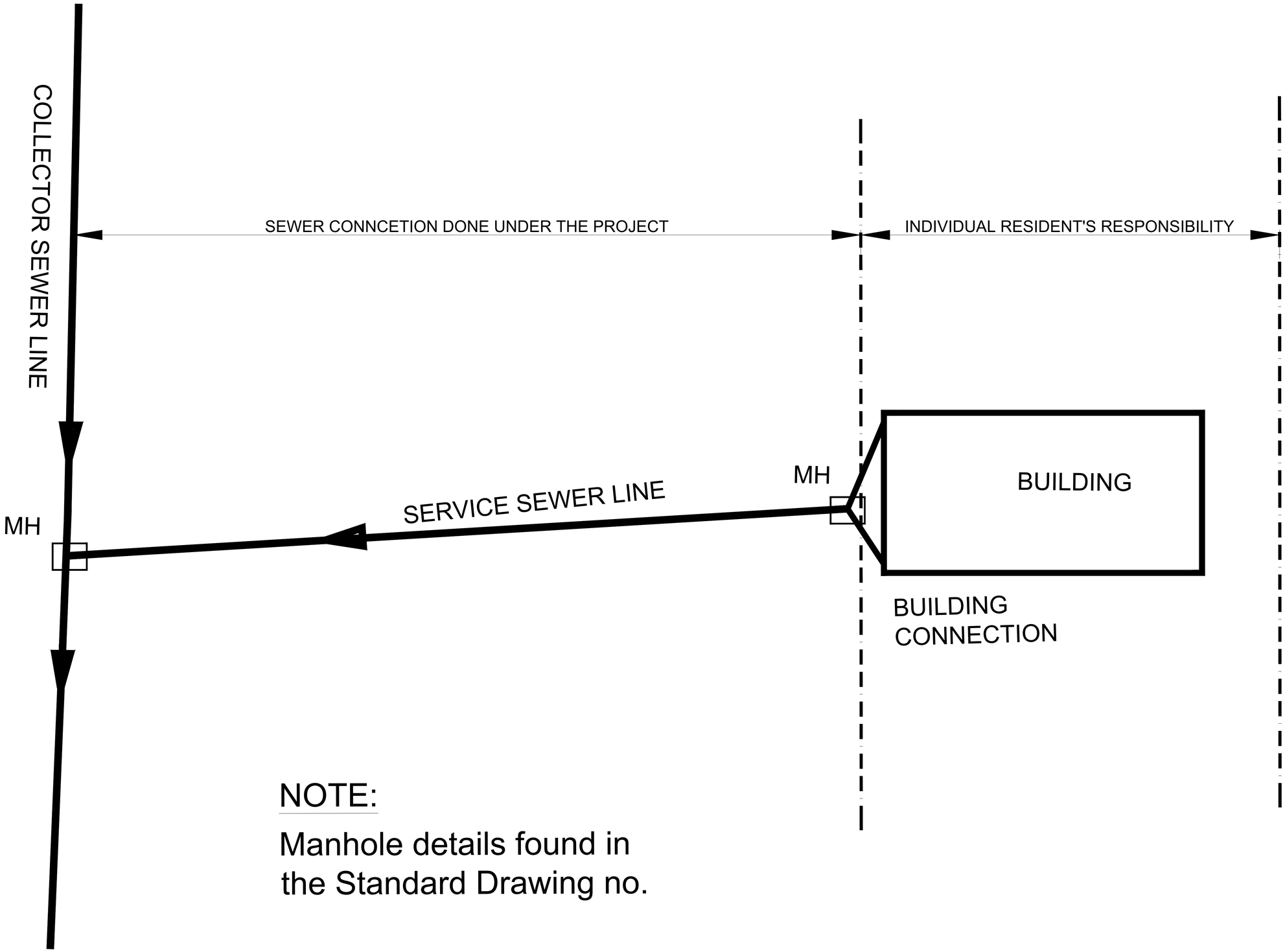
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KITUI SEWER LINE PROFILES ALIGNMENT K20 & K21
PLAN& PROFILE DRAWINGS
K20:KM 0+000-0+175; K21: KM 0+000-0+178

Stage :	FINAL DESIGN REVIEW
Date :	JULY 2020
Drawing No. :	KITUI-SL-P&P-001
Scale :	VERT-1:200 HOR-1:2000
Sheet Size :	A1
Sheet No. :	1 of 1
Index No. :	



NOTE:

Manhole details found in the Standard Drawing no.

NOTES:

1. Manhole details found in the Standard Drawing no.

Revisions	
Description	Date
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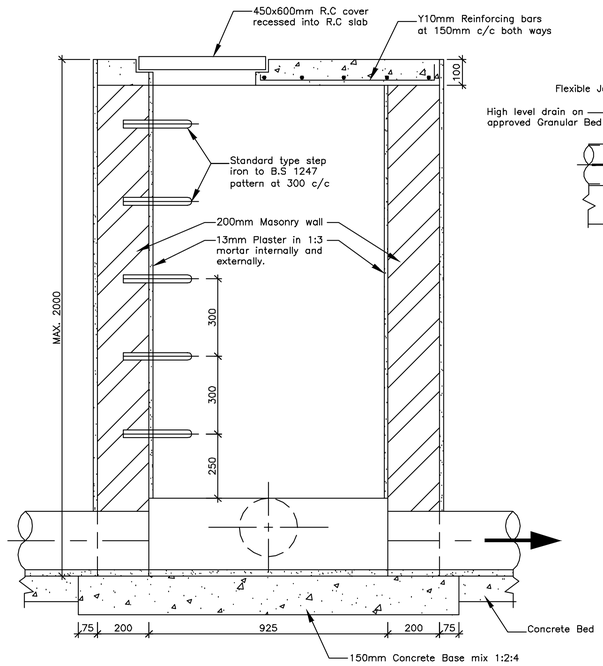
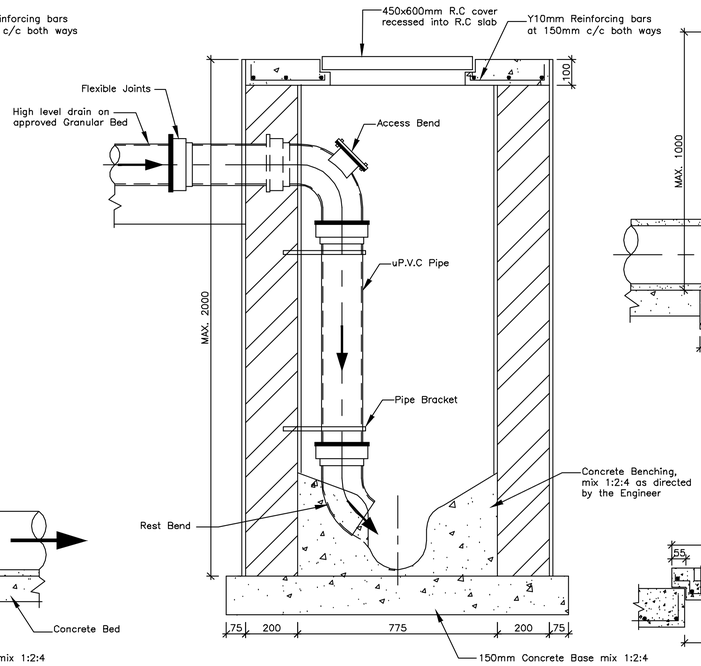
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KITUI SEWER LINE SYSTEM
STANDARD DETAILS
COLLECTOR SEWER DETAILS

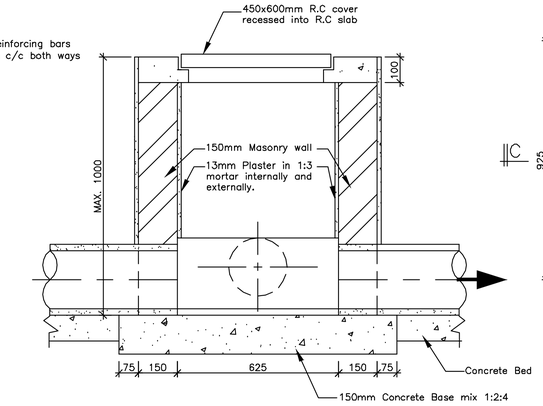
Stage :	FINAL DESIGN REVIEW
Date :	JULY 2020
Drawing No. :	KITUI-SL-STD-001
Scale :	AS INDICATED
Sheet Size :	A1
Sheet No. :	1 of 5
Index No. :	



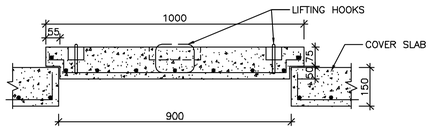
SECTION A–A



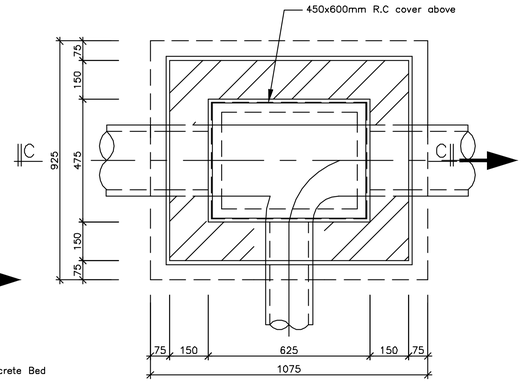
SECTION B–B



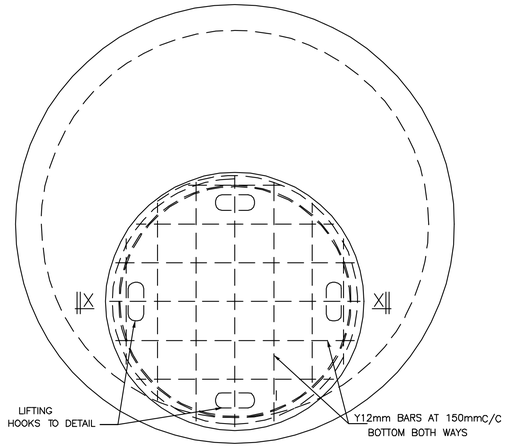
SECTION C–C



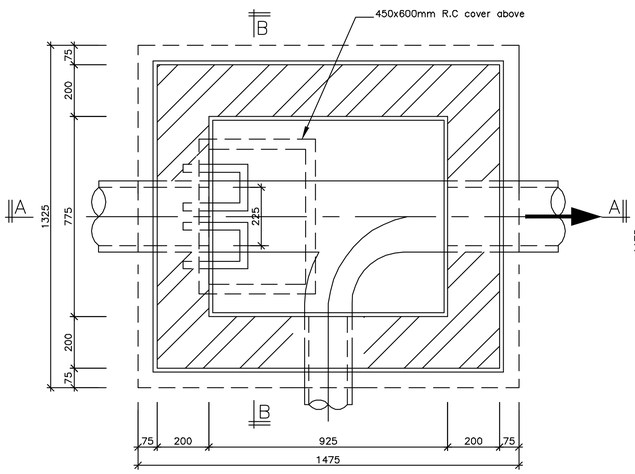
SECTION X–X



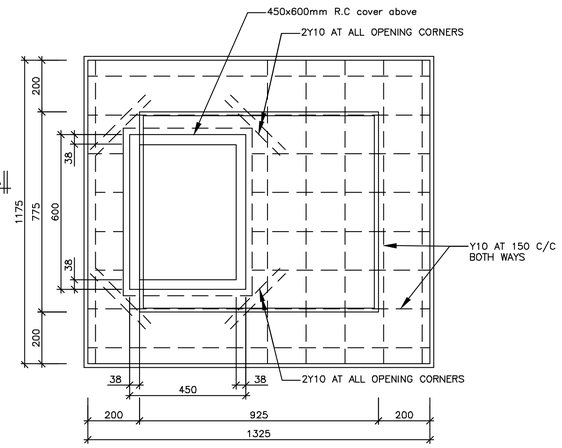
INSPECTION CHAMBER – TYPE A
PLAN



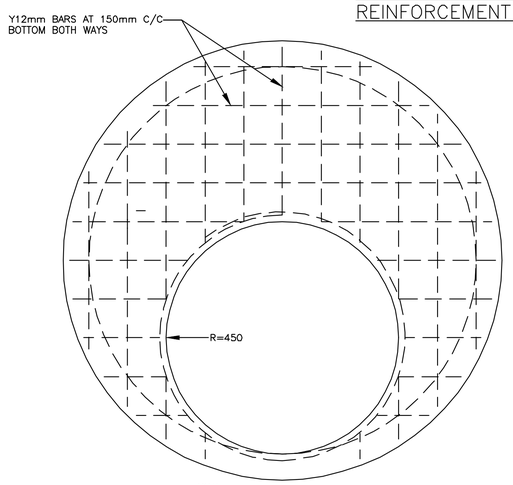
REMOVABLE COVER SLAB–TYPE–2
REINFORCEMENT DETAIL



INSPECTION CHAMBER – TYPE B
PLAN



R.C SLAB (Recess to recieve R.C cover)



NOTE
COVER SLAB TO BE PRECAST CONCRETE CLASS 'C'

FIXED COVER SLAB–TYPE–2
REINFORCEMENT DETAIL

NOTES:

1. SEWER DIAMETERS, ORIENTATION, DEPTH OF MANHOLE AND DIMENSIONS SHALL BE AS DIRECTED BY THE ENGINEER.
2. UNLESS OTHERWISE NOTED ON THE SEWER PROFILES, LONGITUDINAL SLOPES OF CHANNELS IN M.H SHALL EQUAL THE SLOPE OF INCOMING AND OUTGOING SEWERS
3. MANHOLE FLOOR AND WALLS SHALL BE OF CLASS'20' R.C; THE CEILING OF CLASS '25' R.C; AND THE BENCHING TO BE OF CLASS '10' MASS CONCRETE. SHUTTERING FOR ALL INTERIOR SURFACES OF M.H. SHALL BE WROUGHT
4. IN OPEN AREAS, SURFACE OF COVERS SHALL BE HORIZONTAL IN ROADS AND SIDEWALK, COVERS SHALL BE CONCRETED AT THE SLOPE OF ROAD OR SIDE WALK, FLUSH WITH THE SURFACE.
5. AFTER CONSTRUCTION, ALL C.I RINGS AND SEATS OF TRIANGULAR TYPE COVERS SHALL BE GREASED.
6. ALL STEP IRON SHALL BE PAINTED WITH TWO COATS OF BITUMINOUS PAINT.
7. DRAWING TO SCALE IN A1 SIZE.
8. ONLY FIGURED DIMENSIONS TO BE TAKEN FROM THIS DRAWING.
9. REINFORCEMENT 'Y' DENOTES HIGH TENSILE SQUARE TWISTED BARS TO RELEVANT B.S
10. REINFORCEMENT 'R' DENOTES ROUND MILD STEEL BARS TO RELEVANT B.S

Revisions	
Description	Date
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Consultant

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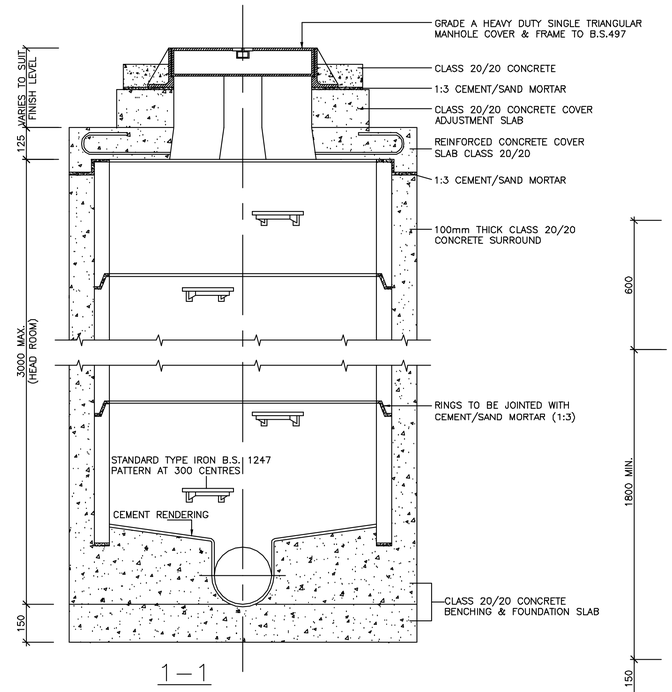
Checked:	D. LIAMBILA
Approved:	B. KIM

Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

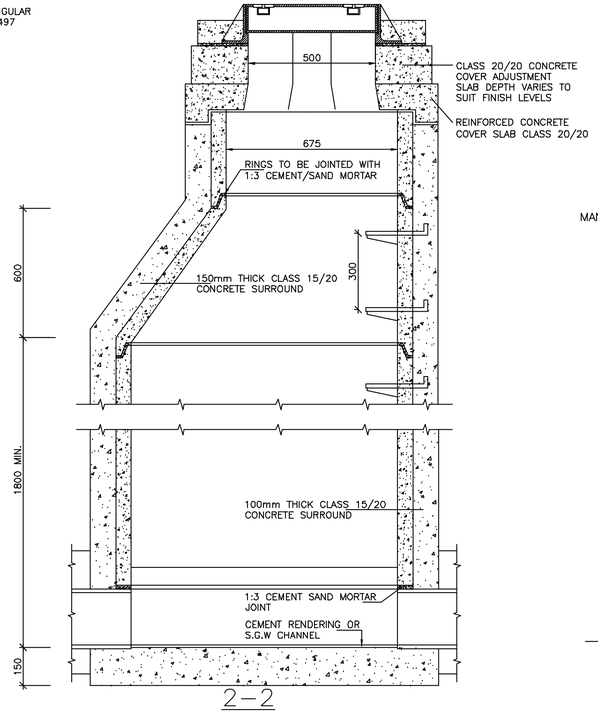
Drawing Title: KITUI SEWER LINE SYSTEM
STANDARD SEWER DETAILS
INSPECTION CHAMBER- SECTION DETAILS

Stage :	FINAL DESIGN REVIEW		
Date :	JULY 2020		
Drawing No. :	KITUI-SL-STD-002		
Scale :	AS INDICATED	Sheet Size :	A1
Sheet No. :	2 of 5		
Index No. :			



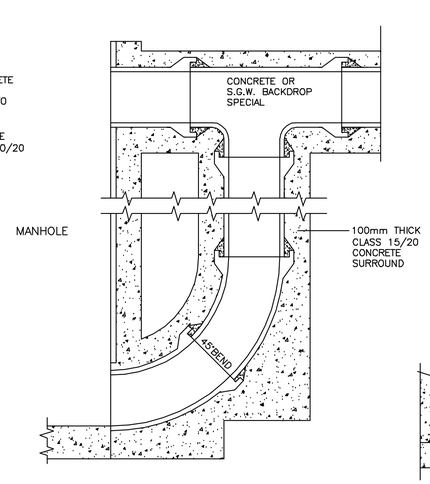
1—1

STANDARD MANHOLE DETAILS
TYPE A
(Where Manhole Depth <3.0m)

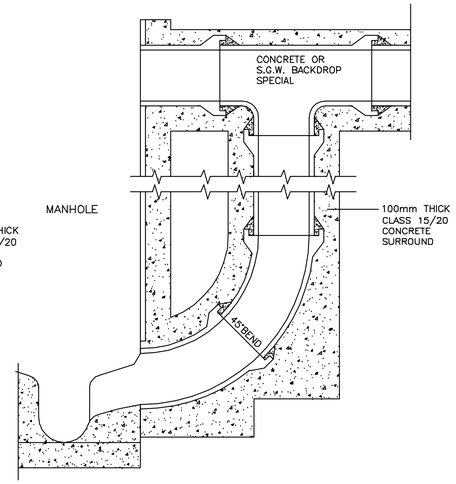


2—2

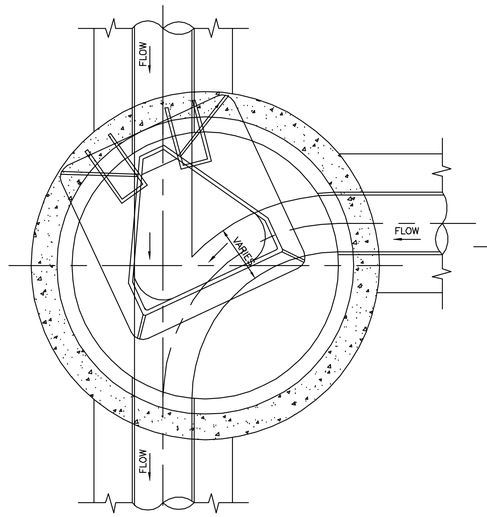
STANDARD TAPERED MANHOLE DETAILS
TYPE B (Where Manhole Depth ≥3.0m)



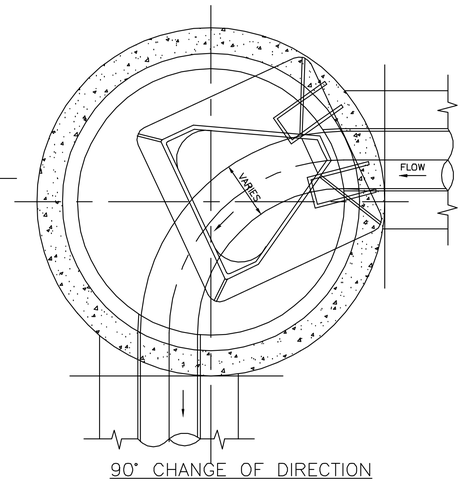
END ENTRANCE BACKDROP



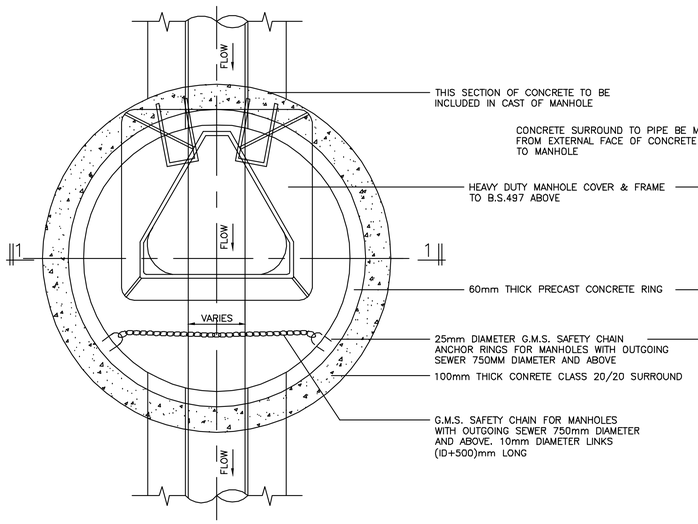
SIDE ENTRANCE BACKDROP



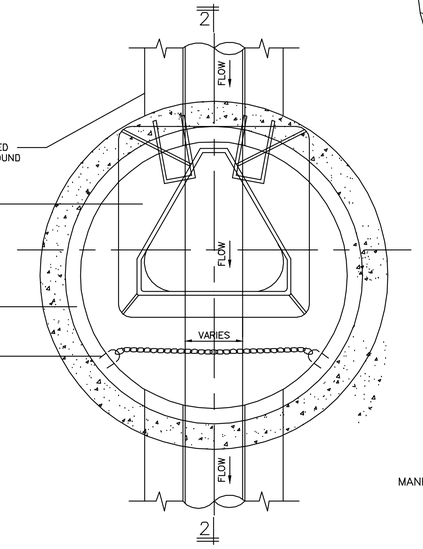
90° SIDE ENTRANCE



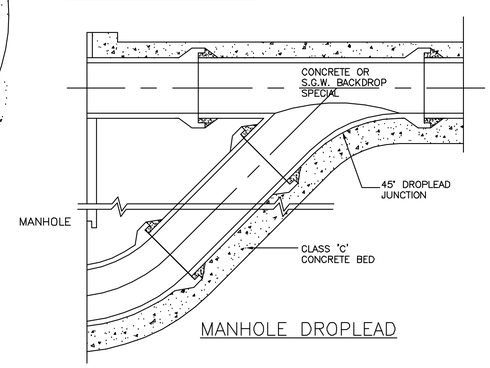
90° CHANGE OF DIRECTION



SECTIONAL PLAN



SECTIONAL PLAN



MANHOLE DROPLEAD

NOTES:

1. SEWER DIAMETERS, ORIENTATION, DEPTH OF MANHOLE AND DIMENSIONS SHALL BE AS DIRECTED BY THE ENGINEER.
2. UNLESS OTHERWISE NOTED ON THE SEWER PROFILES, LONGITUDINAL SLOPES OF CHANNELS IN M.H SHALL EQUAL THE SLOPE OF INCOMING AND OUTGOING SEWERS
3. MANHOLE FLOOR AND WALLS SHALL BE OF CLASS'20' R.C; THE CEILING OF CLASS '25' R.C; AND THE BENCHING TO BE OF CLASS '10' MASS CONCRETE. SHUTTERING FOR ALL INTERIOR SURFACES OF M.H. SHALL BE WROUGHT
4. IN OPEN AREAS, SURFACE OF COVERS SHALL BE HORIZONTAL IN ROADS AND SIDEWALK, COVERS SHALL BE CONCRETED AT THE SLOPE OF ROAD OR SIDE WALK, FLUSH WITH THE SURFACE.
5. AFTER CONSTRUCTION, ALL C.I RINGS AND SEATS OF TRIANGULAR TYPE COVERS SHALL BE GREASED.
6. ALL STEP IRON SHALL BE PAINTED WITH TWO COATS OF BITUMINOUS PAINT.
7. DRAWING TO SCALE IN A1 SIZE.
8. ONLY FIGURED DIMENSIONS TO BE TAKEN FROM THIS DRAWING.
9. REINFORCEMENT 'Y' DENOTES HIGH TENSILE SQUARE TWISTED BARS TO RELEVANT B.S
10. 1050mm DIA. PRECAST CONCRETE MANHOLE RINGS TO BE USED FOR SEWERS UP TO AND INCLUDING 300mm DIA.
11. 1200mm DIA. PRECAST CONCRETE MANHOLE RINGS TO BE USED FOR SEWERS OF 375 ~600mm DIA.
12. 1500mm DIA. PRECAST CONCRETE MANHOLE RINGS TO BE USED FOR SEWERS OF 675~900mm DIA.

Revisions	
Description	Date
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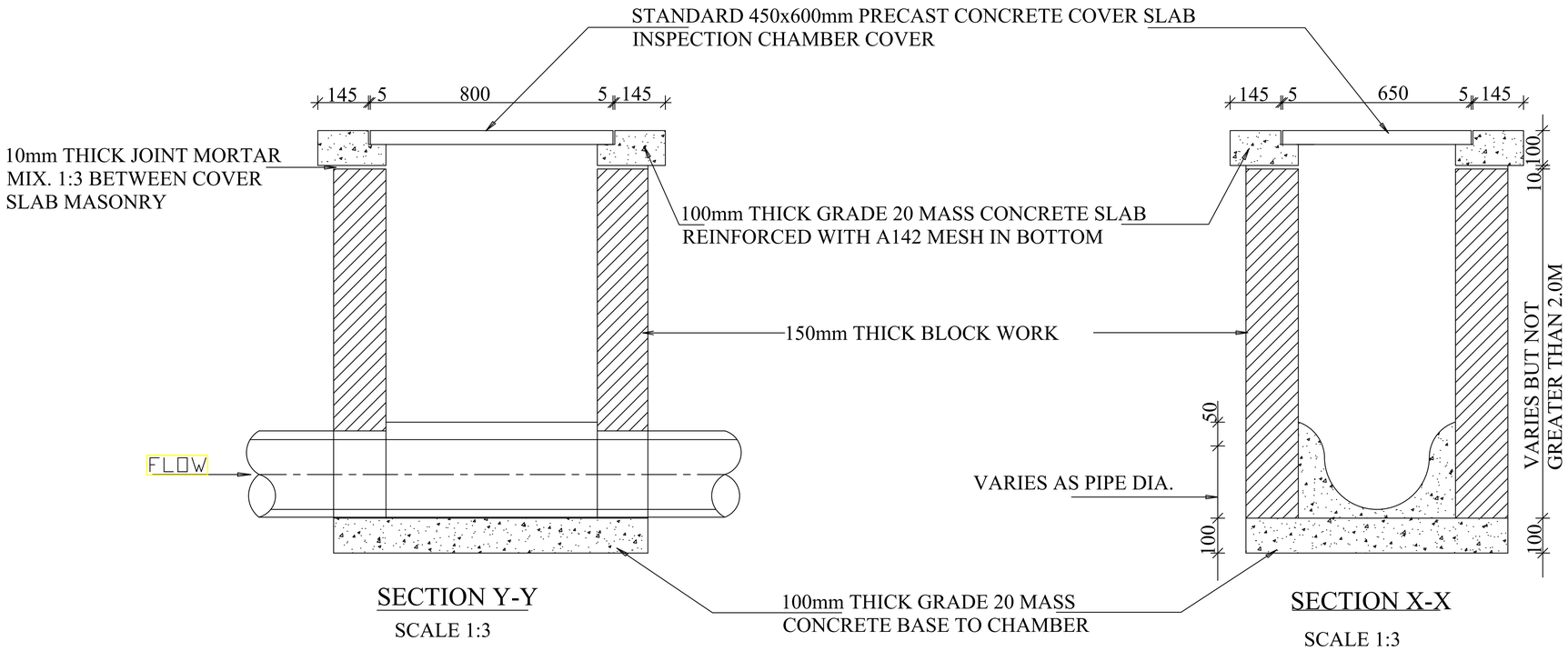
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KITUI SEWER LINE SYSTEM
STANDARD DETAILS
STANDARD MANHOLE-SECTION DETAIL

Stage :	FINAL DESIGN REVIEW	
Date :	JULY 2020	
Drawing No. :	KITUI-SL-STD-003	
Scale :	AS INDICATED	Sheet Size : A1
Sheet No. :	3 of 5	
Index No. :		

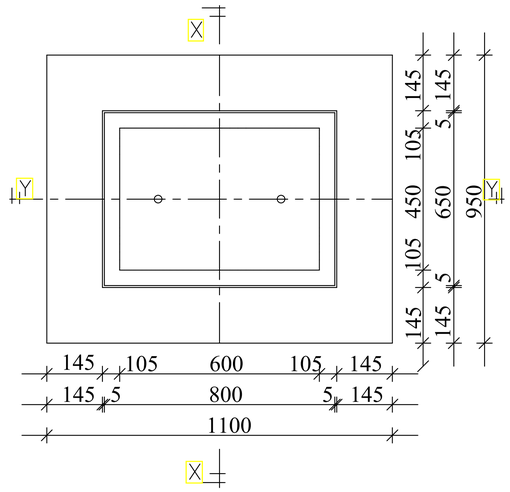


SECTION Y-Y

SCALE 1:3

SECTION X-X

SCALE 1:3



PLAN OF INSPECTION CHAMBER

SCALE 1:3.

NOTES

1. ALL DIMENSIONS IN MILLIMETERS.

NOTES:

1. SEWER DIAMETERS, ORIENTATION, DEPTH OF MANHOLE AND DIMENSIONS SHALL BE AS NOTED ON SEWER PLANS AND PROFILES OR AS DIRECTED BY THE ENGINEER
2. UNLESS OTHERWISE NOTED ON SEWER PROFILE, LONGITUDINAL SLOPES OF CHANNELS IN M.H. SHALL EQUAL THE SLOPES OF INCOMING AND OUTGOING SEWER.
3. MANHOLE FLOORS AND WALLS SHALL BE OF CLASS '20' R.C; THE CEILING OF CLASS '20' R.C; AND THE BENCHING TO BE OF CLASS '10' MASS CONCRETE. SHUTTERING FOR ALL INTERIOR SURFACES OF M.H . SHALL BE WROUGHT
4. IN OPEN AREAS, SURFACE OF COVERS SHALL BE HORIZONTAL. IN ROADS AND SIDE WALKS, COVERS SHALL BE CONCRETED AT THE SLOPE OF ROAD OR SIDEWALK, FLUSH WITH THE SURFACE.
5. ONLY FIGURED DIMENSION TO BE TAKEN FROM THIS DRAWING.
6. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED

ABBREVIATIONS:

1. n.e.- NOT EXCEEDING
2. c/c- CENTRE TO CENTRE
3. MIN- MINIMUM
4. G.L.- GROUND LEVEL
5. mm- MILIMETER
6. m- METRE
7. EXT. DIA.- EXTERNAL DIAMETER
8. OD- OUTSIDE DIAMETER
9. ND- NOMINAL DIAMETER
10. RC- REINFORCED CONCRETE
11. T10- TWISTED BAR 10mm SIZE
12. NTS- NOT TO SCALE
13. CU.M PER LIN. METER- CUBIC METER PER LINER METER

Revisions	
Description	Date
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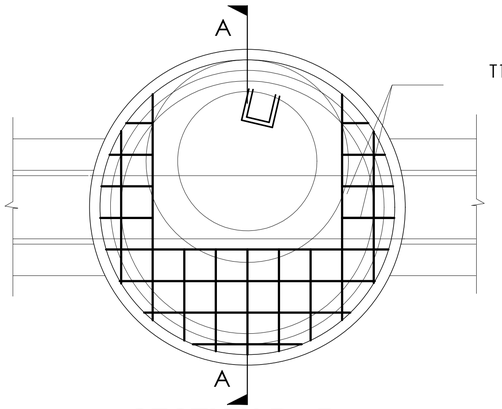
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KITUI SEWER LINE SYSTEM
STANDARD DETAILS
INSPECTION CHAMBER DETAILS

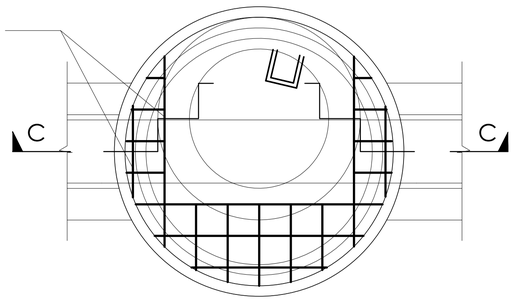
Stage :	FINAL DESIGN REVIEW		
Date :	JULY 2020		
Drawing No. :	KITUI-SL-STD-004		
Scale :	AS INDICATED	Sheet Size :	A1
Sheet No. :	4 of 5		
Index No. :			

REINFORCED CONCRETE CIRCULAR MANHOLE & COVER



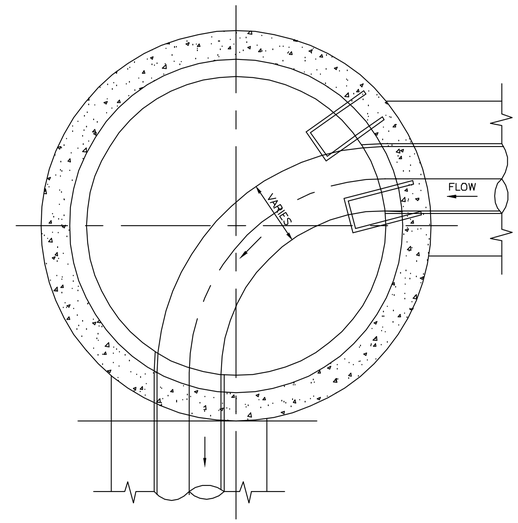
SECTION B - B

SCALE 1:50



SECTION D - D

SCALE 1:50



90^0 CHANGE OF DIRECTION

NOTES:

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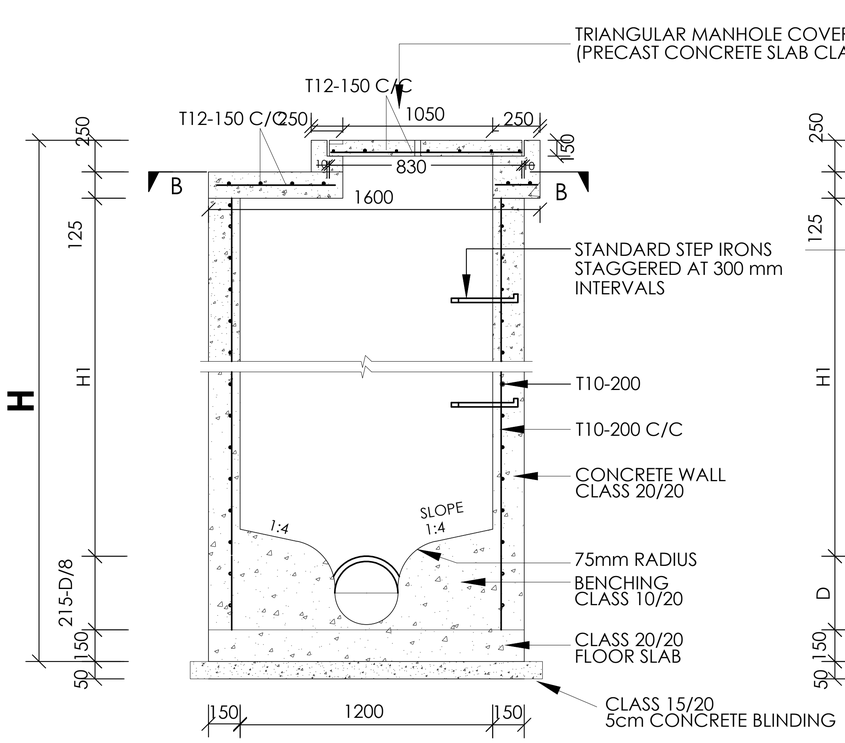
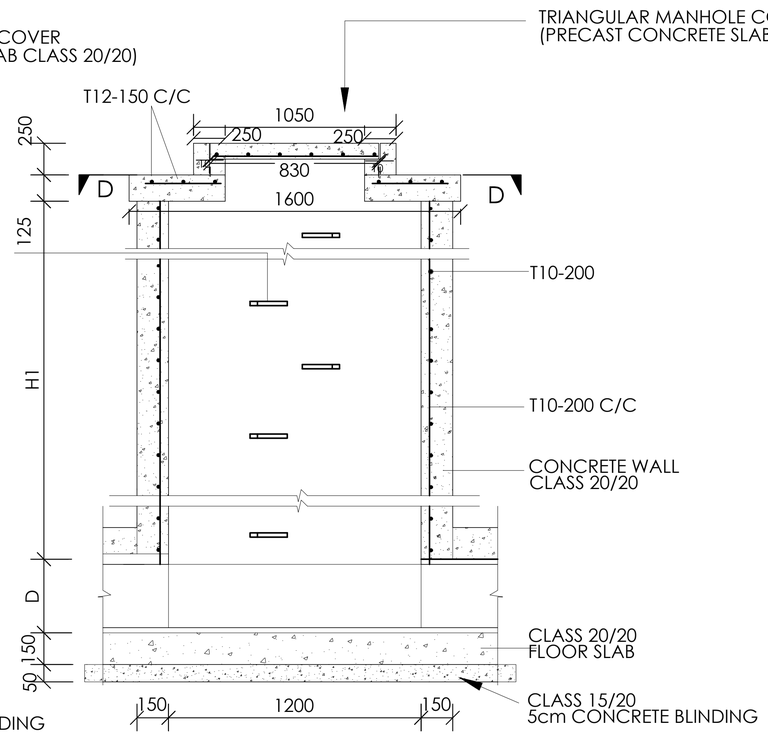
10. REINFORCEMENT 'R' DENOTES ROUND MILD STEEL BARS TO RELEVANT B.S



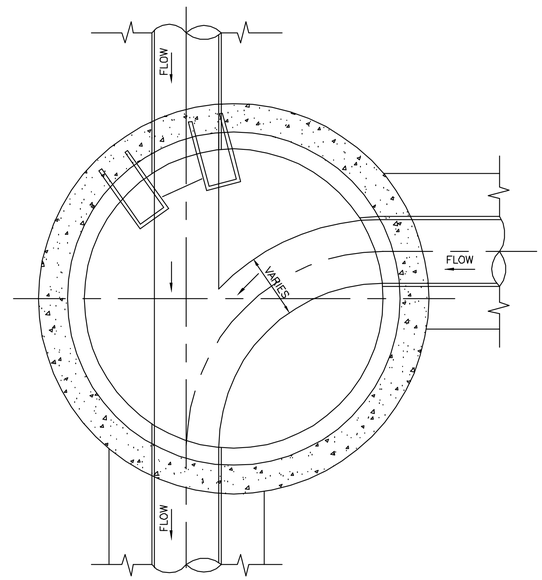
SECTION A - A

SCALE 1:50



SECTION C - C

SCALE 1:50



90^0 SIDE ENTRANCE

Revisions	
Description	Date

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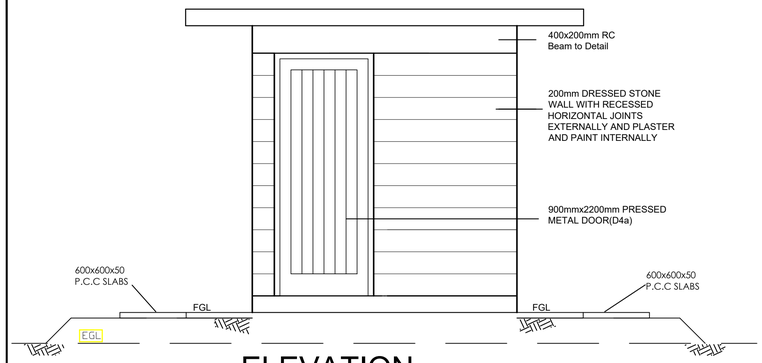
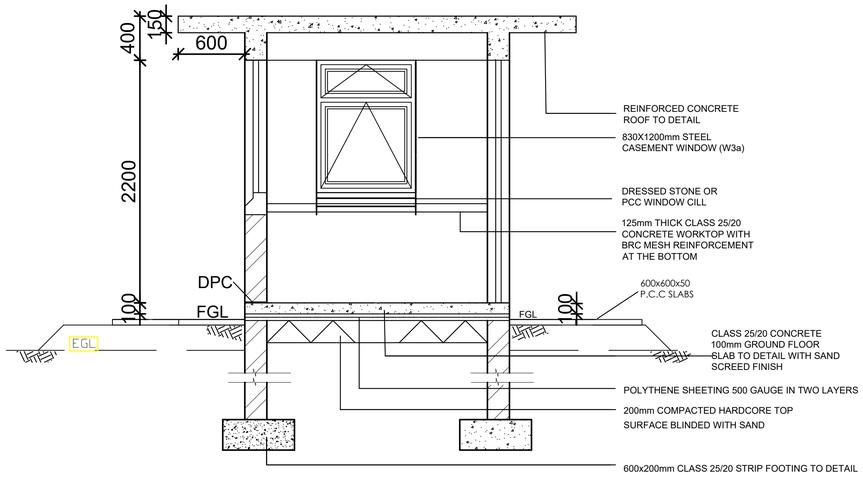
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KITUI SEWER LINE SYSTEM
STANDARD SEWER DETAILS
MANHOLE COVERS AND CHAMBER DETAILS

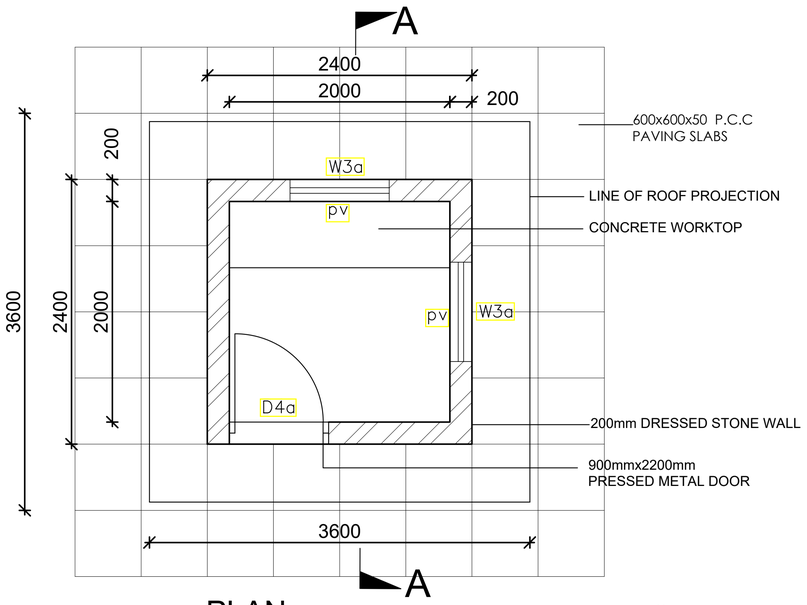
Stage :	FINAL DESIGN REVIEW
Date :	JULY 2020
Drawing No. :	KITUI-SL-STD-005
Scale :	AS INDICATED
Sheet No. :	5 of 5
Sheet Size :	A1
Index No. :	



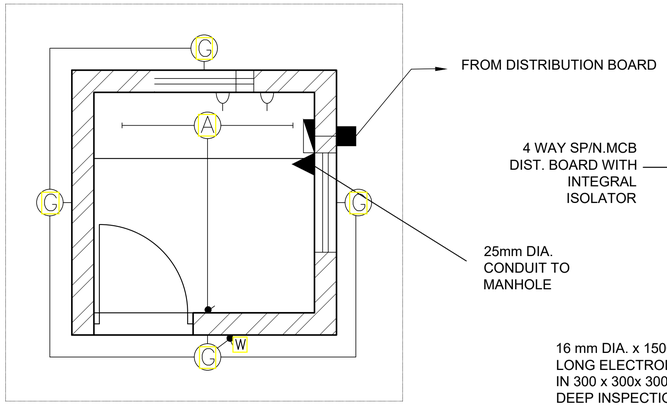
ELEVATION



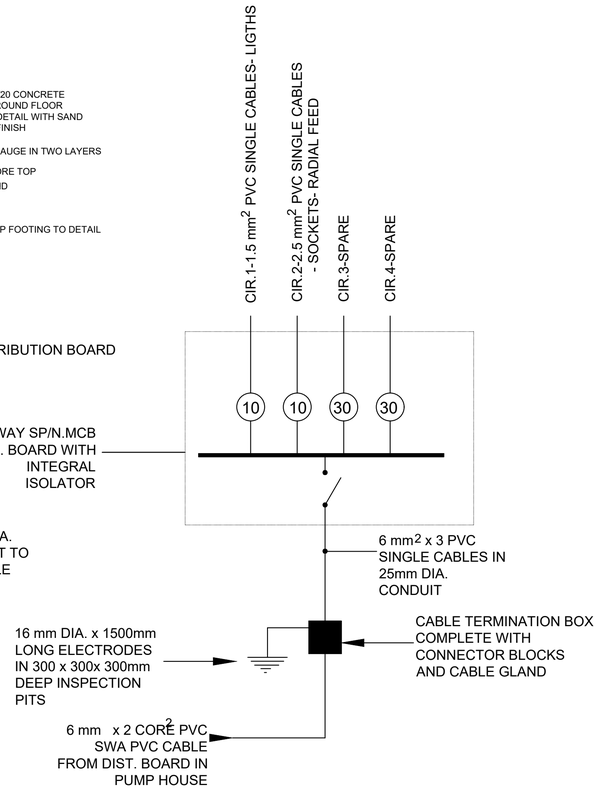
SECTION A-A



PLAN



PLAN - ELECTRICAL INSTALLATION



ELECTRICAL WIRING DIAGRAM

NOTES

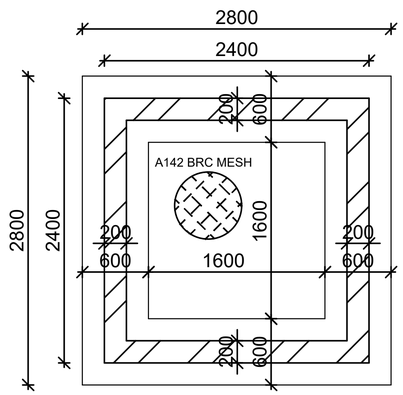
DIMENSIONS ARE IN MM
UNLESS OTHERWISE SPECIFIED

ABBREVIATIONS

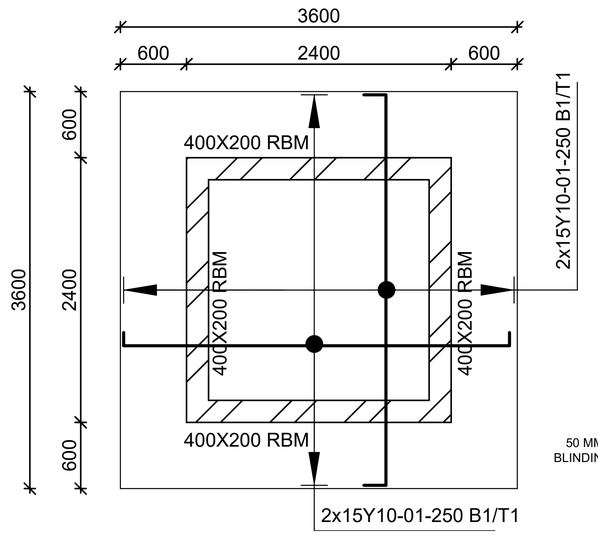
DPC - DAMP PROOF COURSE
PV - PERMANENT VENTILATION
PCC - PRECAST CONCRETE
FGL - FINAL GROUND LEVEL

LEGEND - ELECTRICAL

- 1 GANG 1 WAY LIGHTING SWITCH
- W 1 GANG 2 WAY LIGHTING SWITCH (WEATHER PROOF)
- 13 AMP SINGLE SWITCHED SOCKET OUTLET
- A 18 WATT - 60mm SINGLE FLOURESCENT FITTING AS THORN CAT No. PP118 (HIGHER POWER FACTOR)
- G BULKHEAD FITTING SUITABLE FOR EXTERNAL AND INTERNAL APPLICATION WITH LAMP 2D - 16 WATT LONG LIFE LOW ENERGY CONSUMPTION AS THORN CAT No. FV02D16B
- SINGLE PHASE MCB DISTRIBUTION BOARD WITH INTEGRAL ISOLATOR
- WATER TIGHT CABLE TERMINATION BOX COMPLETE WITH CONNECTOR BLOCKS

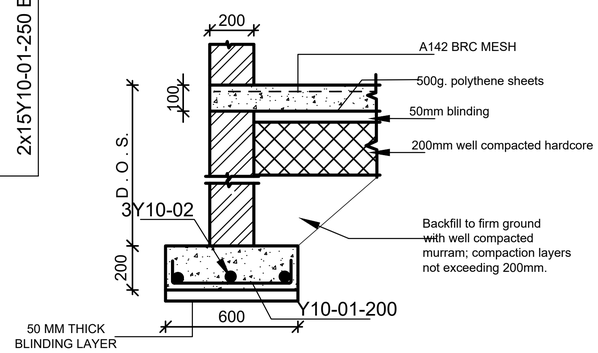


FOUNDATION LAYOUT

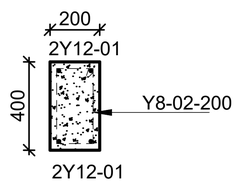


UNLESS OTHERWISE SHOWN, THE ROOF SLAB IS 150mm THK

ROOF SLAB RC DETAILS



TYPICAL STRIP FOUNDATION DETAILS



RING BEAM 400x200

Revisions	
Description	Date
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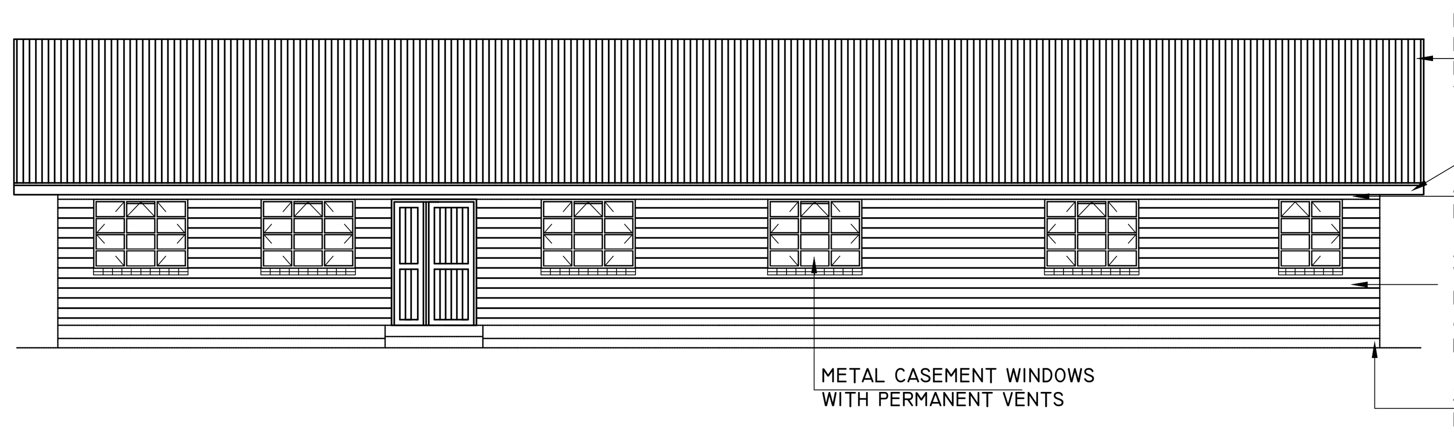
Approved:	B. KIM

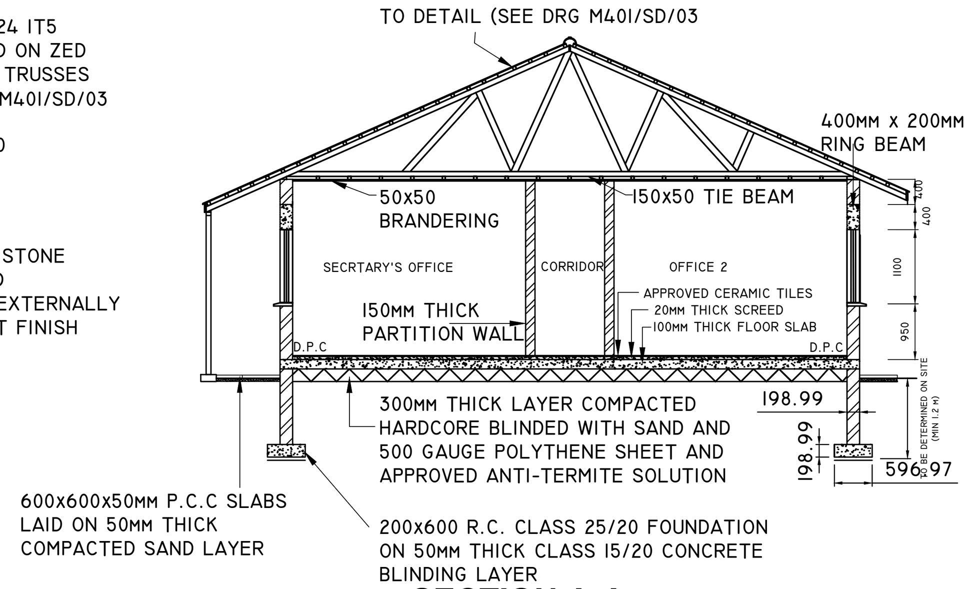
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: KITUI WATER SUPPLY
GUARD HOUSE
FLOOR PLANS, ELEVATION AND FOUNDATION DETAILS

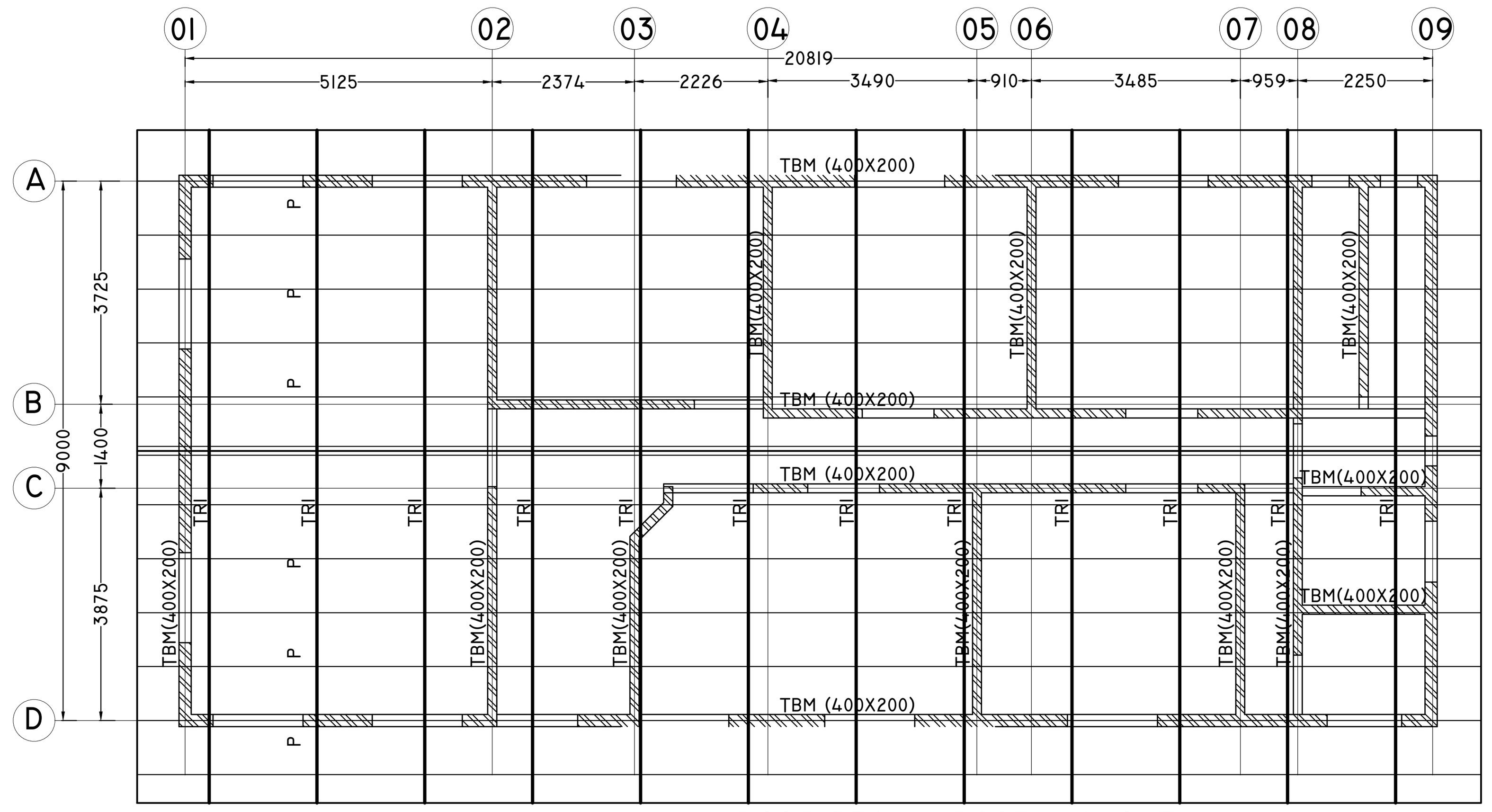
Stage :	FINAL DESIGN REVIEW
Date :	JULY 2020
Drawing No. :	KITUI-WS-GH-001
Scale :	1:40
Sheet Size :	A1
Sheet No. :	1 of 1
Index No. :	



FRONT ELEVATION

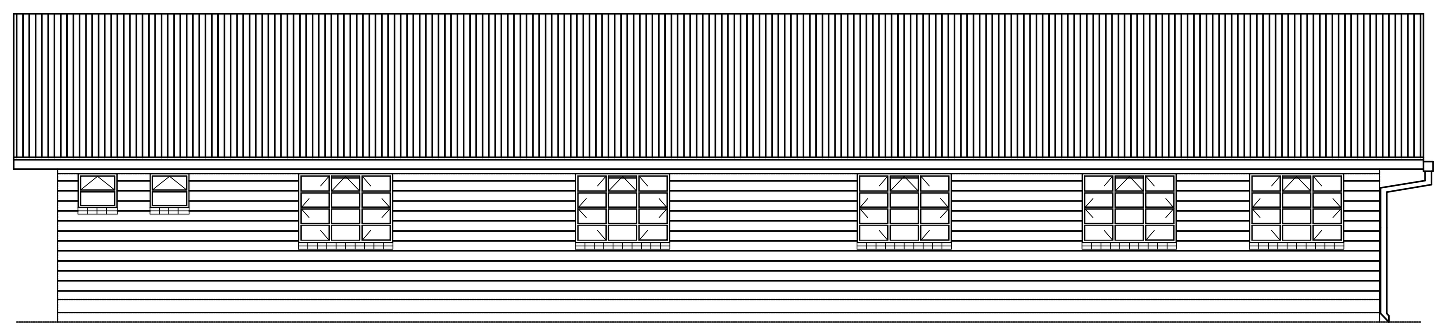


SECTION A-A

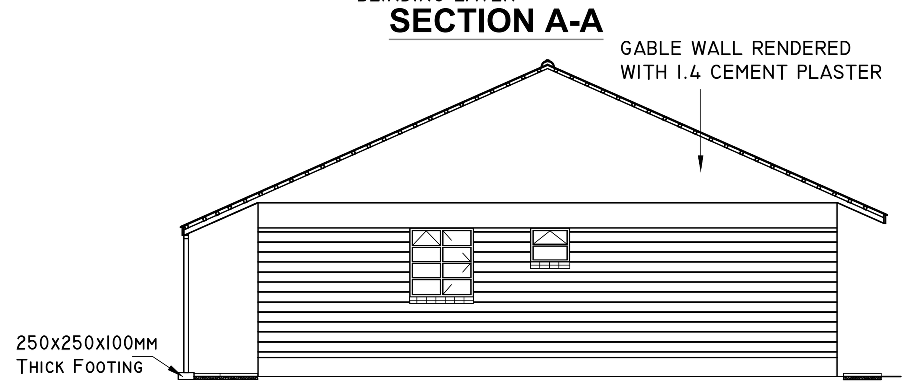


ROOF BEAM / ROOF LAYOUT

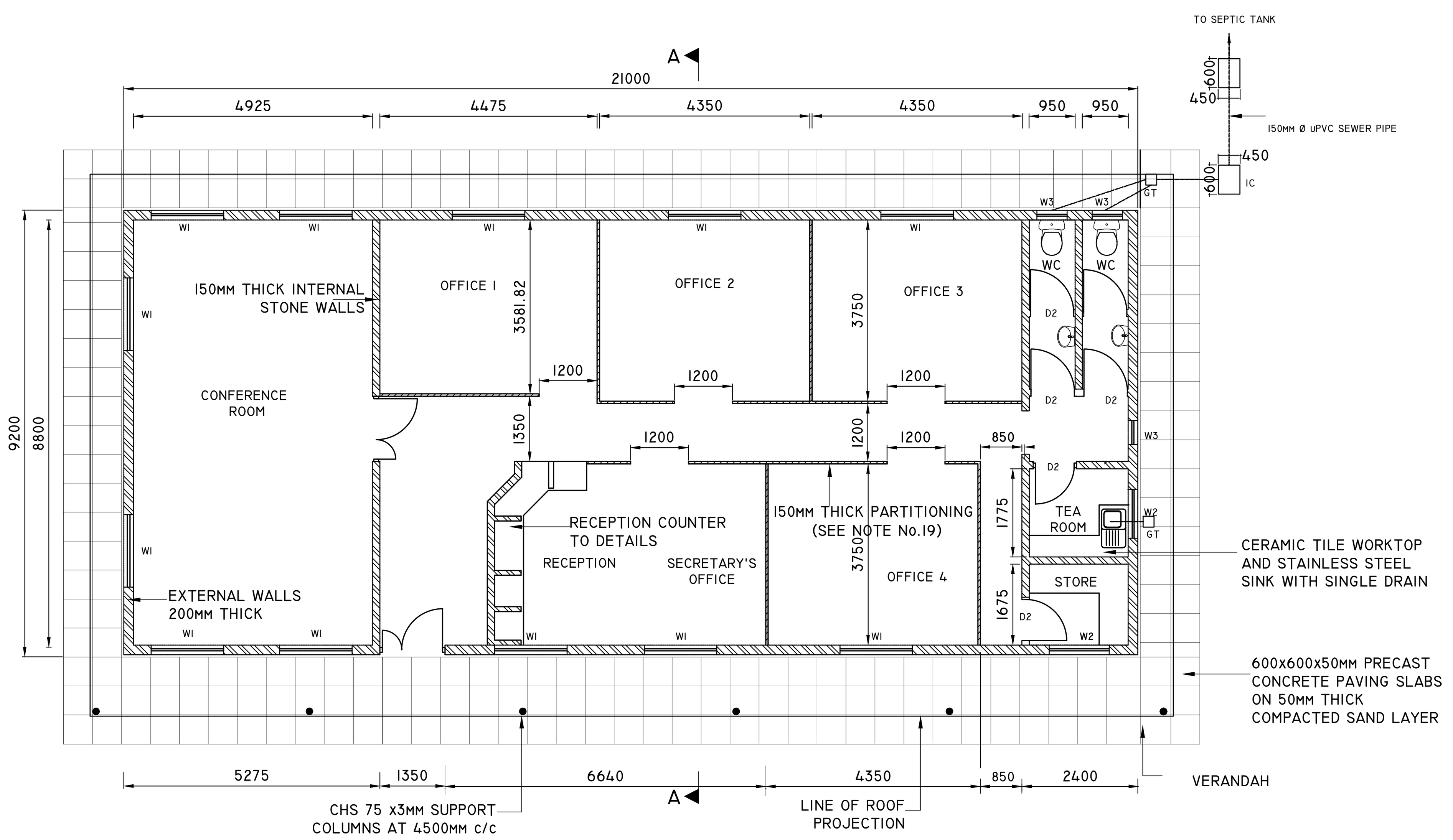
SCALE 1:100



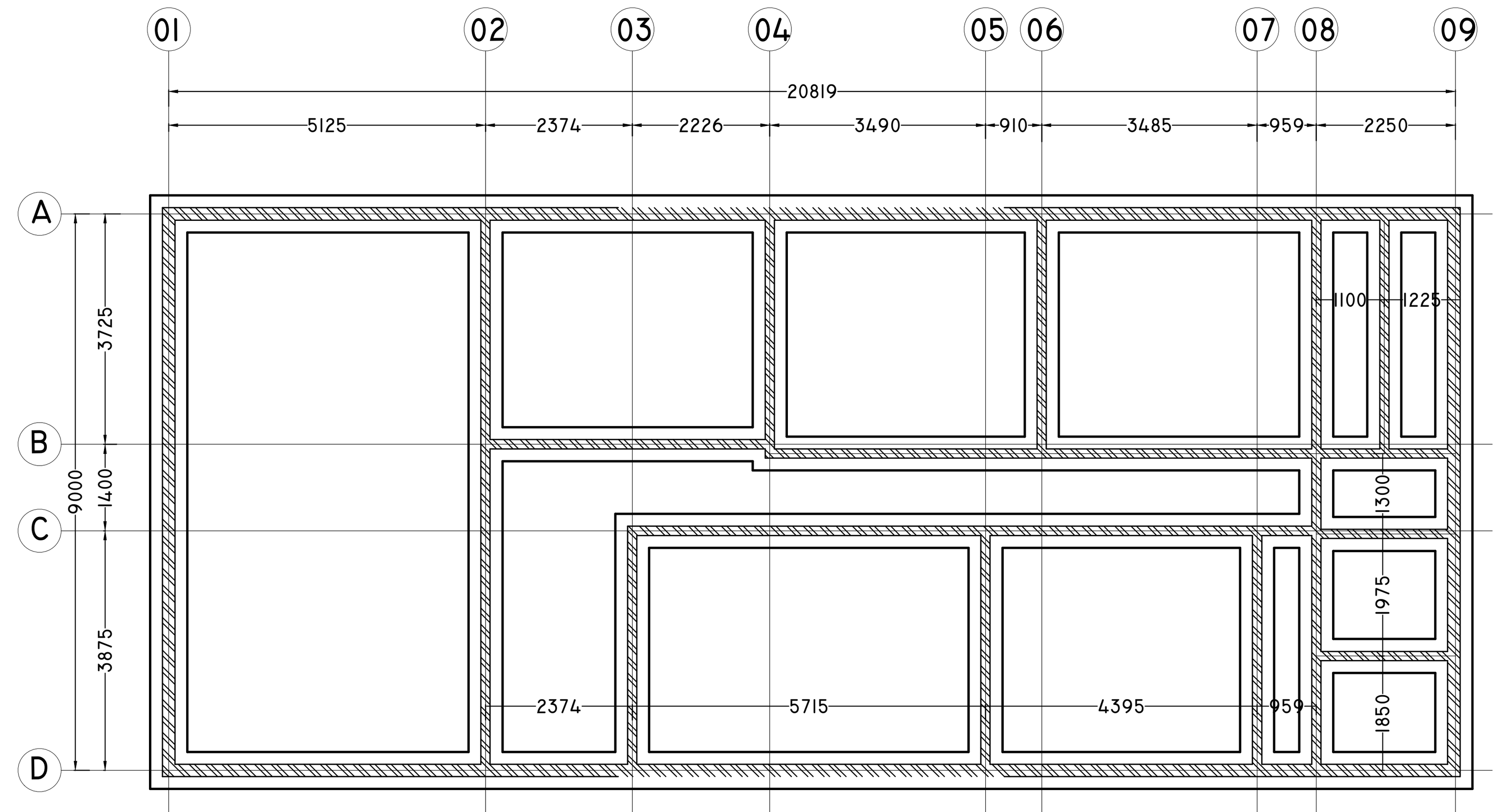
REAR ELEVATION



SIDE ELEVATION

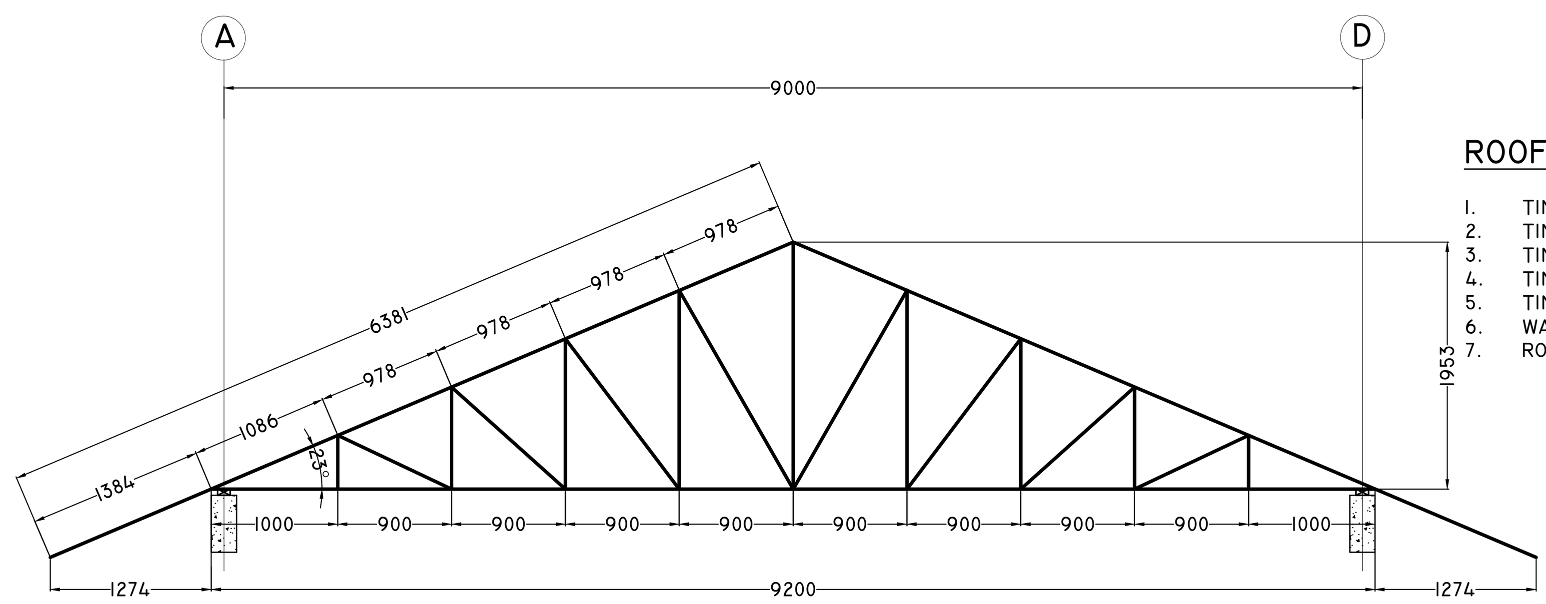


PLAN



FOUNDATION LAYOUT

SCALE 1:100



TYPICAL TRUSS

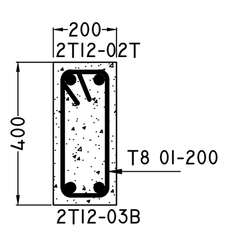
SCALE 1:50

ALL EXTERNAL MEMBERS-150X50

ALL INTERNAL MEMBERS-100X50

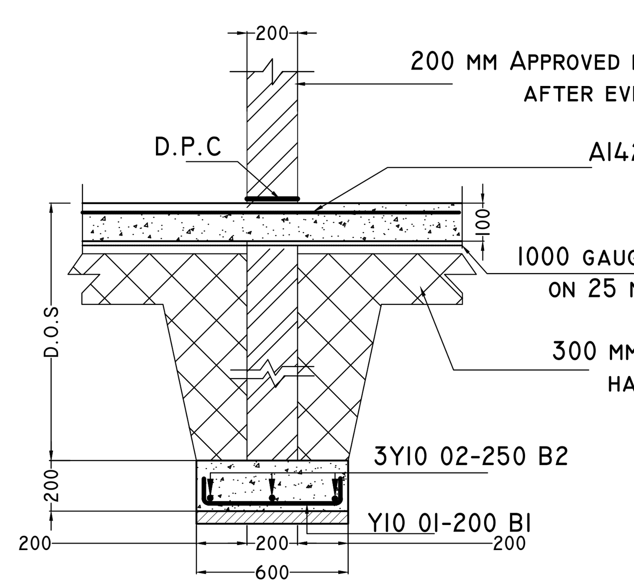
ROOF NOTES.

1. TIMBER PURLINS SPACED @MAX 900 MM C/C
2. TIMBER TRUSSES SPACED @ MAX 1800 MM C/C
3. TIMBER PURLINS SIZE-100X50 MM
4. TIMBER RAFTERS SIZE-150X50 MM
5. TIMBER STRUTS AND TIES SIZE-150X50 MM
6. WALL PLATE SIZE-100X50
7. ROOF PITCH 23°



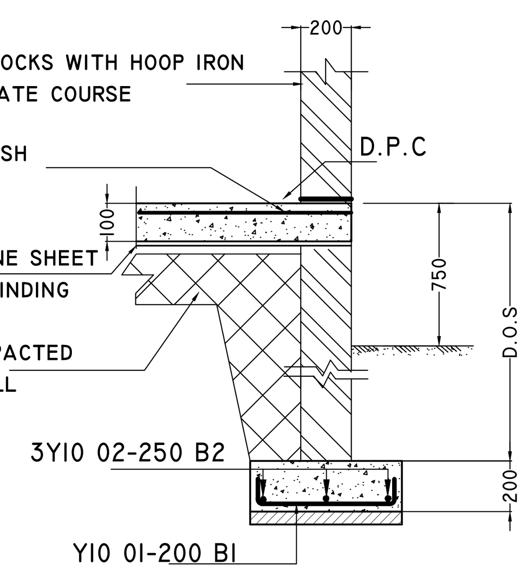
TYPICAL ROOF BEAM SECTION

SCALE 1:10



TYPICAL INTERNAL STRIP FOOTING SECTION

SCALE 1:25



TYPICAL EXTERNAL STRIP FOOTING SECTION

SCALE 1:25

NOTES:

1. Dimensions and conditions must be checked on site and any discrepancies refered to the Engineer. All dimensions in mm unless otherwise specified.
2. All levels to be checked on site before commencement of works.
3. Depth of foundation to be determined on site. Foundation to be carried down to hard base to the approval of the Engineer and all unsuitable soils to be excavated and the openings filled with hardcore.
4. Contractor to submit plumbing details for approval.
5. Three ply tropical 'pluvex' bituminous felt D.P.C under all walls to be rendered in hot bitumen.
6. All walls to be reinforced with heavy duty gauge hoop iron at every alternative course and jointed in 1:3 cement sand mortar.
7. Reinforced concrete work as follows:
- Blinding under foundation class 15/20
- Foundation class 25/20 reinforced with T12 @ 200mm both ways
- Floor slab class 25/20 reinforced with BRC mesh A142
- Ring beam class 25/20 reinforced with 4 Nr. T12 and R 8 @150mm c/c
8. Finishes schedule

Internal Finishes
- Floor - 300x300 Ceramic tiles
- Skirtings - Ceramic tiles (150mm high)
- Walls - Plastered with 12.5 mm thick cement plaste and painted with three coats of paint
- Ceiling - 12mm thick chipboard(480 - 640kg/m^2) painted
- Cornices - Timber and painted

LEGEND:

Doors

External Door (D1) to be solid core timber door in two panels with ex100x50mm stiles and top rails, ex 150x50mm middle and bottom rails, and infill panels in ex100x50mm t&g battens, all in prime grade cypress, painted

Internal door (D2) to be semi solid core flush door with hardwood lipping all round, painted

External Door to have Secondary Metal Security Grilled Door fabricated from square tubes

Windows

Metal casement windows with permanent vents

Burglar proofing made of 12mm square M.S Bars at 150mm c/c both ways, fixed to wall with fish tail lugs at 600mm c/c, Painted.

Window Schedule

W1 - 1500 X 1085
W2 - 1000 X 1085
W3 - 500 X 500
W4 - 1500 X 500

Roof Water Storage Tank

200 Litres uPVC Water Tank to be provided in Roof Space

Colour Scheme

Colour Scheme for all painted Walls, Doors, Ceilings, Roofing Sheets, etc. to be approved by the Engineer.

ABBREVIATION:

D.P.C. - Damp Proof Course
W.C. - Water Closet
W.H.B.s. - Wash Hand Basins
M.S. - Mild Steel
CHS - Circular Hollow Section
IC - Inspection Chamber
GT - Gulley Trap

Revisions	
Description	Date
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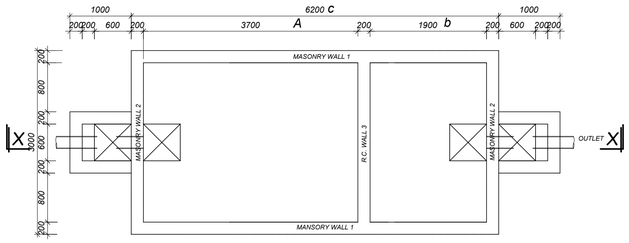
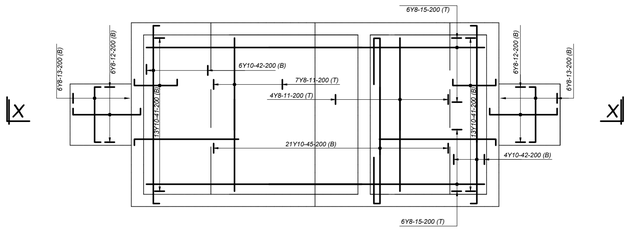
Project: CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA

Drawing Title: ADMINSTRATION OFFICE
RESIDENT ENGINEER'S OFFICE BUILDING
FLOOR PLAN, ELEVATIONS, STRUCTURAL DETAILS AND TRUSS SECTION

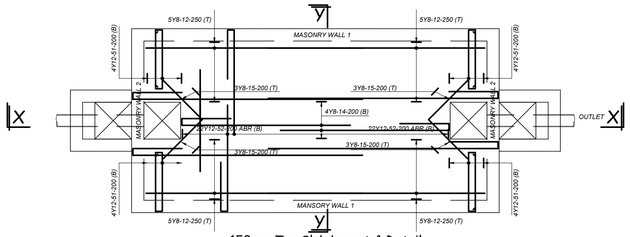
Stage :	FINAL DESIGN REVIEW
Date :	JULY 2020
Drawing No. :	KITUI-AO-RE-001
Scale :	AS INDICATED
Sheet No. :	1 of 2
Sheet Size :	A1
Index No. :	



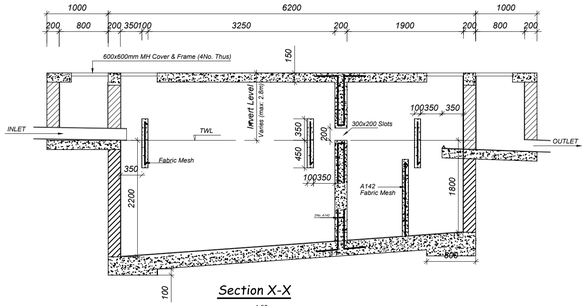
Standard Septic Tank
1:50



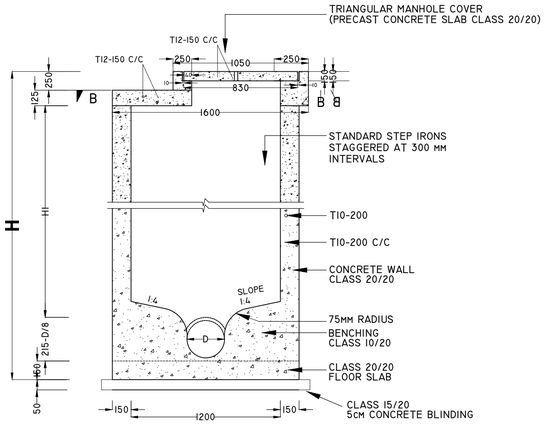
200mm Base Slab Layout & Details
1:50



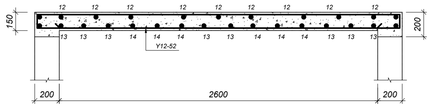
150mm Top Slab Layout & Details
1:50



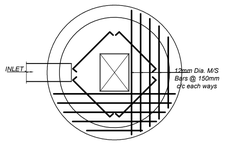
Section X-X
1:50



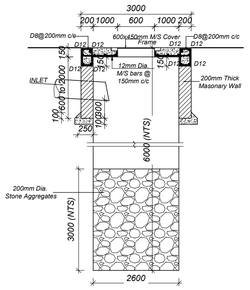
SECTION A - A
SCALE 1:25



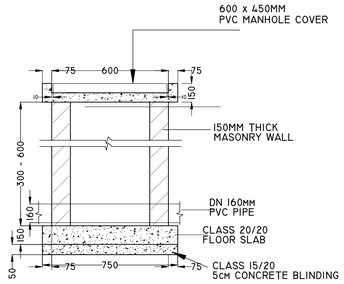
Section Y-Y
1:50



Soak Pit Details
1:50



Soak Pit Section
1:50



SECTION C - C
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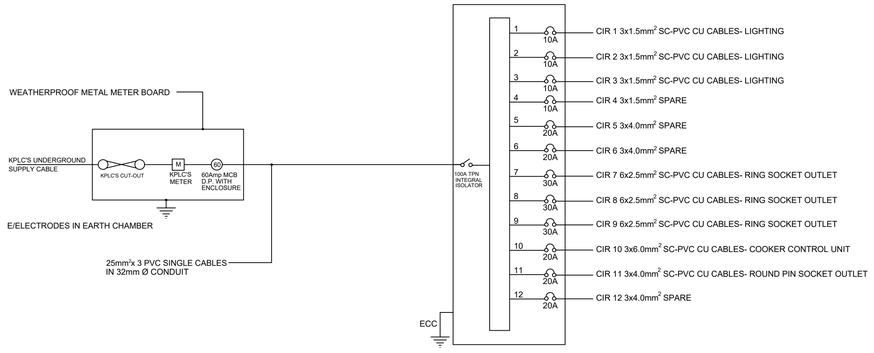

12 - WAY SP.N MCB CONSUMER UNIT

WIRING DIAGRAM

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Drawing Title: ADMINSTRATION OFFICE
RESIDENT ENGINEER'S OFFICE BUILDING
SEPTIC TANK DETAILS, MANHOLE AND ELECTRICAL DRAWINGS

Stage :	FINAL DESIGN REVIEW
Date :	JULY 2020
Drawing No. :	KITUI-AO-RE-002
Scale :	AS INDICATED
Sheet Size :	A1
Sheet No. :	2 of 2
Index No. :	