



Athi Water Works Development Agency



Tanathi Water Works Development Agency



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

DRAFT FINAL DESIGN REVIEW REPORT-WOTE TOWN WATER SUPPLY BOOK OF DRAWINGS



MAY 2020

SUBMITTED BY

JOINT VENTURE BETWEEN






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AND

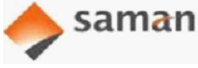





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REVISIONS		Consultant:	Employer:	Project Manager:	Designed:	A. MAKHETI	Project:	CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA		Stage:	FINAL DETAILED DESIGN
DESCRIPTION	DATE	 SAMAN CORPORATION 5 Byeonangsan-gu3(eam)-ro, Gwachon-si, Gyeonggi-do, Korea Tel: (+82) 2 6488 8255 Fax: (+82)2 6488 8080 And E-mail: kitumatusaman@gmail.com	 ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 45283-00100, Africa Re Center, Hospital Road Nairobi-Kenya Tel: +254 20 2727438 email: info@awwboard.go.ke	 TANATHI WATER WORKS DEVELOPMENT AGENCY Private Bag-90200, K.I.D.P Building, Along Kalawa Road, Kitui-Kenya Tel: +254 712351104 email: info@tanathi.go.ke	Drawn:	A. MAKHETI	Drawing Title:	DRAWING INDEX	Date:	MARCH 2020	
					Checked:	D. LIAMBILA			Drawing No.	WOTE-WS-DI-001	
					Approved:	B. KIM			Scale:	NOT TO SCALE	
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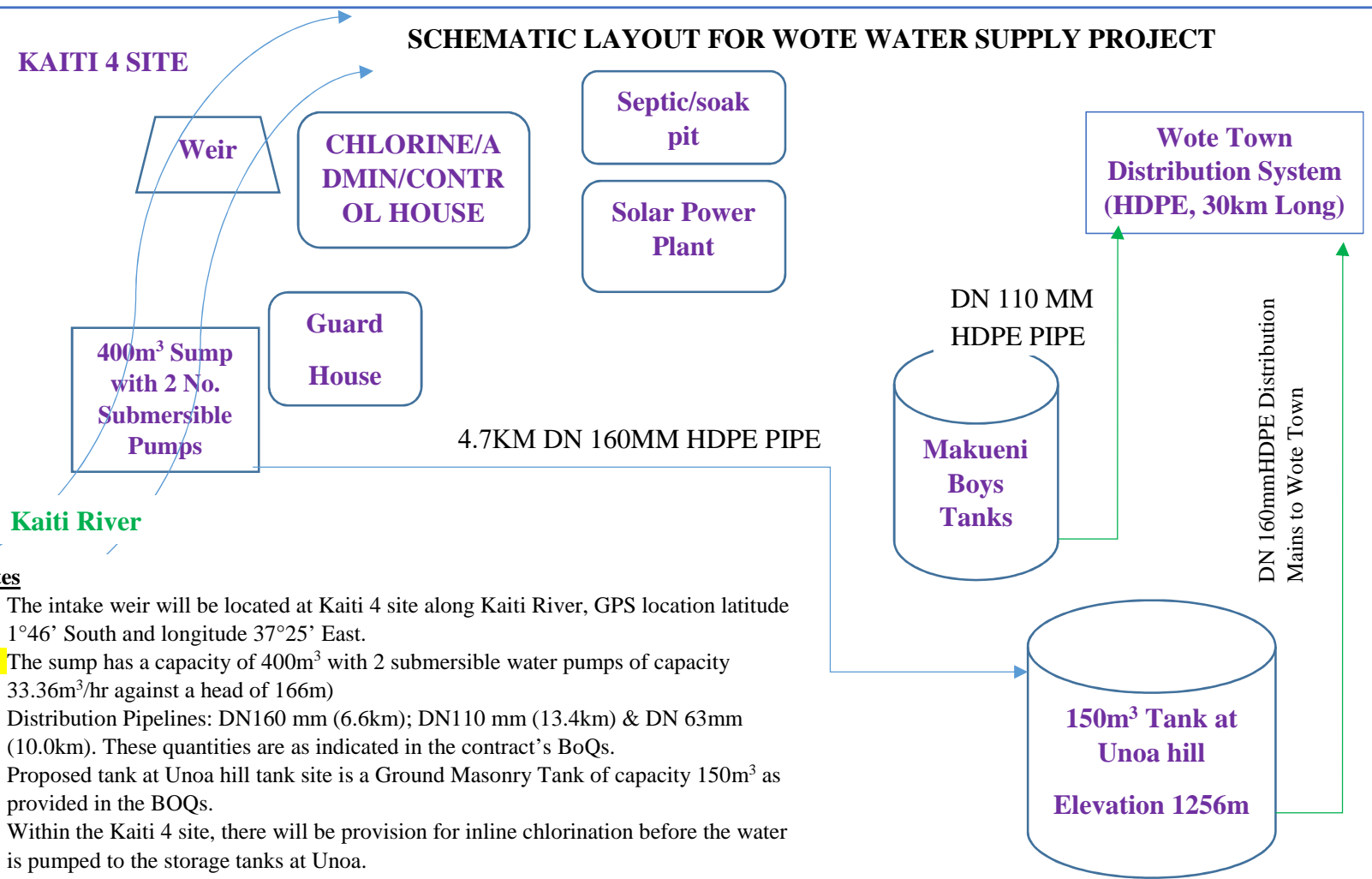
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DESCRIPTION	DATE								Drawn:	A. MAKHETI			Date:	MARCH 2020
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									Approved:	B. KIM			Scale:	NOT TO SCALE
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WATER SUPPLY AND DISTRIBUTION LAYOUT

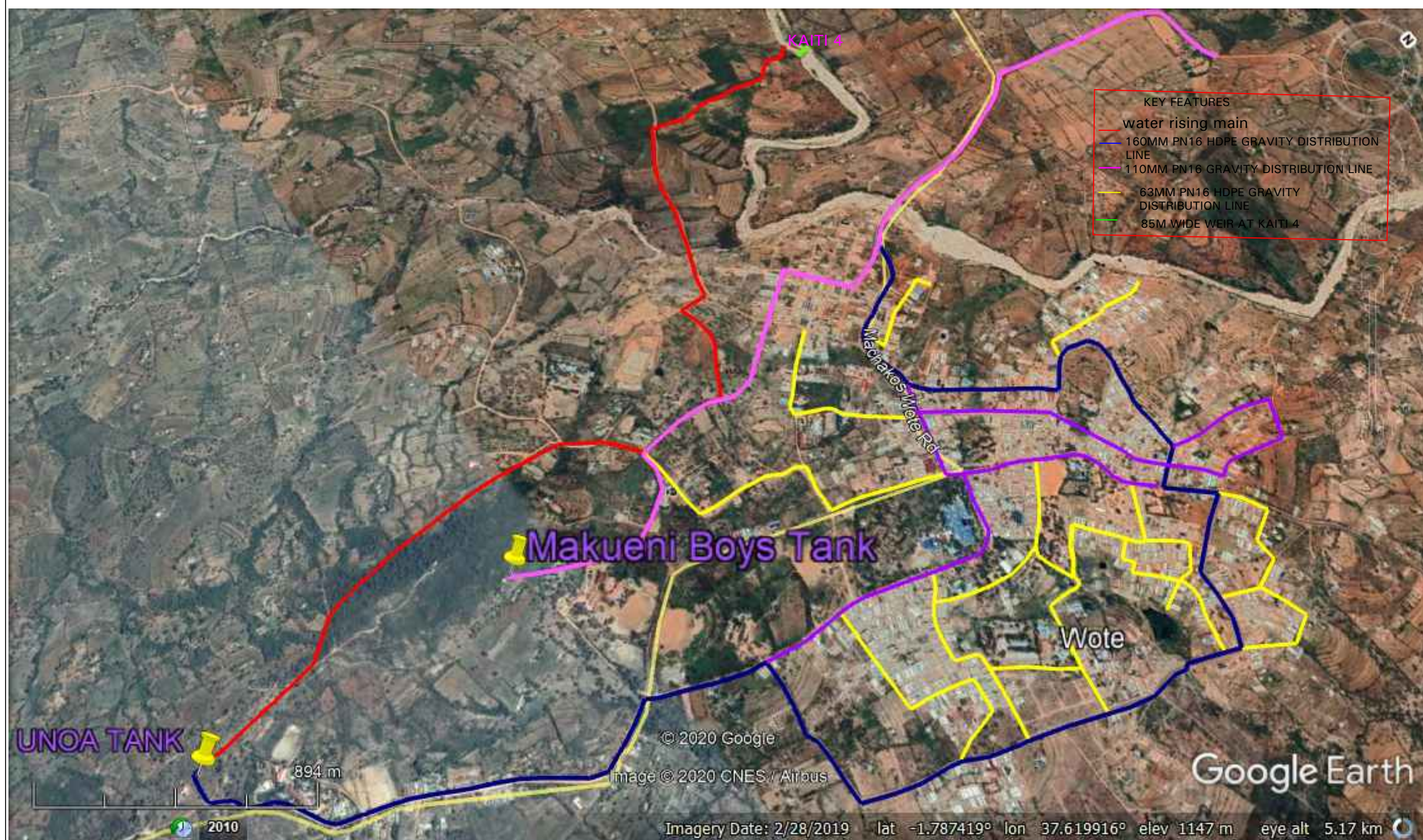
SCHEMATIC LAYOUT FOR WOTE WATER SUPPLY PROJECT

KAITI 4 SITE



Notes

1. The intake weir will be located at Kaiti 4 site along Kaiti River, GPS location latitude 1°46' South and longitude 37°25' East.
2. The sump has a capacity of 400m³ with 2 submersible water pumps of capacity 33.36m³/hr against a head of 166m)
3. Distribution Pipelines: DN160 mm (6.6km); DN110 mm (13.4km) & DN 63mm (10.0km). These quantities are as indicated in the contract's BoQs.
4. Proposed tank at Unoa hill tank site is a Ground Masonry Tank of capacity 150m³ as provided in the BOQs.
5. Within the Kaiti 4 site, there will be provision for inline chlorination before the water is pumped to the storage tanks at Unoa.

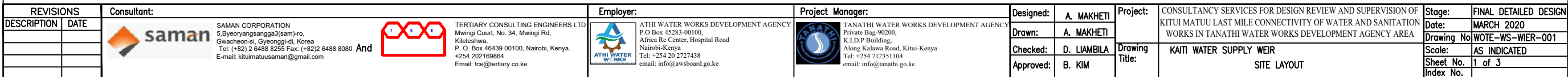


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KAITI WATER SUPPLY WEIR

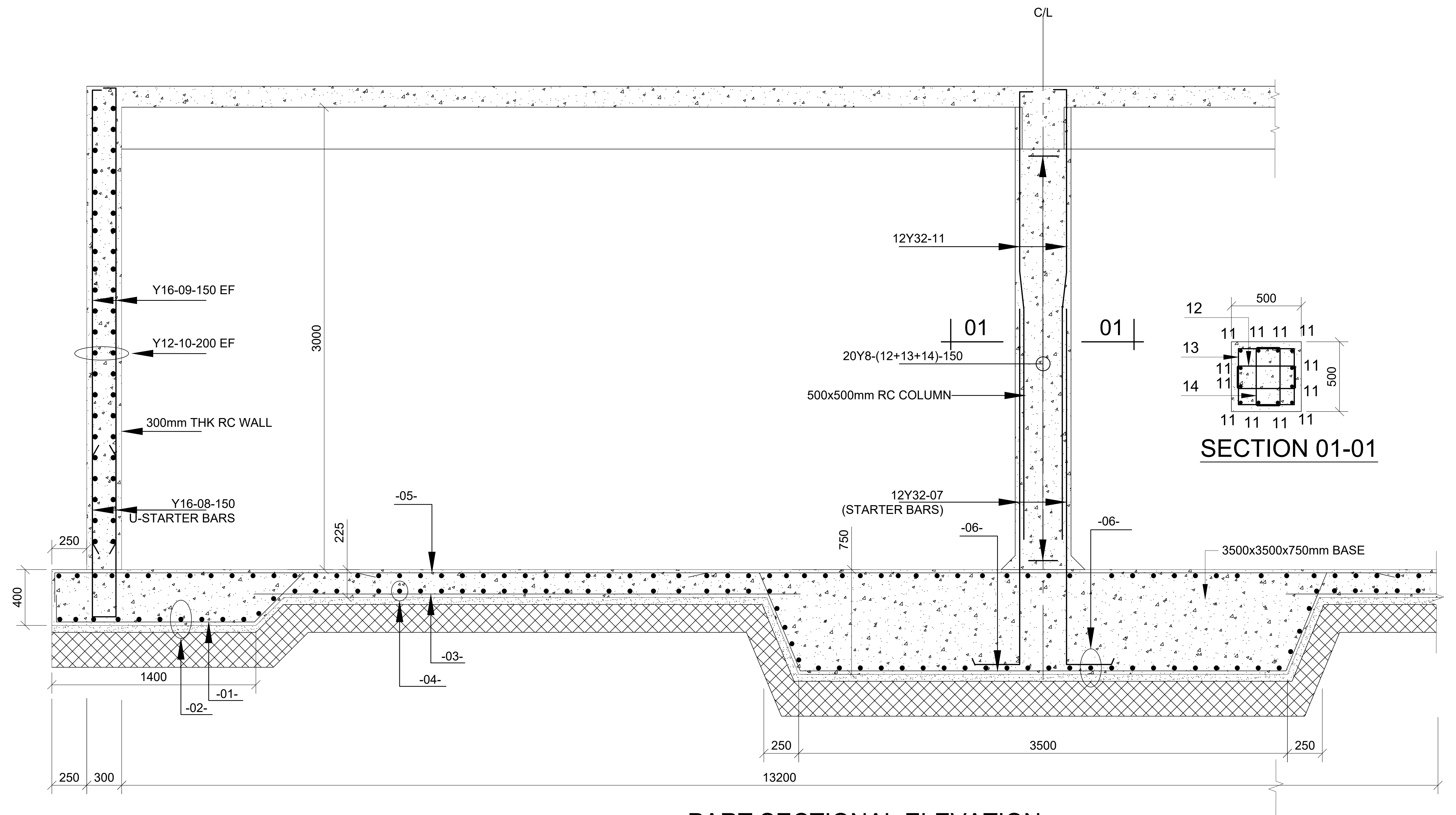


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KAITI WATER SUPPLY 400M3 SUMP



PART SECTIONAL ELEVATION
SCALE 1:25




REVISIONS		<div>Consultant:</div> <div> SAMAN CORPORATION 5,Byeonjyongsangga3(sam)-ro, Gwacheon-si, Gyeonggi-do, Korea Tel: (+82) 2 6488 8255 Fax: (+82)2 6488 8080 And E-mail: kitumatuusaman@gmail.com</div> <div> TERTIARY CONSULTING ENGINEERS LTD Mwingi Court, No. 34, Mwingi Rd, Kileleshwa, P. O. Box 46439 00100, Nairobi, Kenya. +254 202169864 Email: tce@tertiary.co.ke</div>	<div>Employer:</div> <div> ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 45283-00100, Africa Re Center, Hospital Road Nairobi-Kenya Tel: +254 20 2727438 email: info@awsboard.go.ke</div>	<div>Project Manager:</div> <div> TANATHI WATER WORKS DEVELOPMENT AGENCY Private Bag-90200, K.I.D.P Building, Along Kalawa Road, Kitui-Kenya Tel: +254 712351104 email: info@tanathi.go.ke</div>	Designed: A. MAKHETI	<div>Project:</div> <div>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</div> <div>Drawing Title: KITUI WATER SUPPLY: 400M³ SUMP WALL & COLUMN REINFORCEMENT DETAILS</div>	Stage: FINAL DETAILED DESIGN
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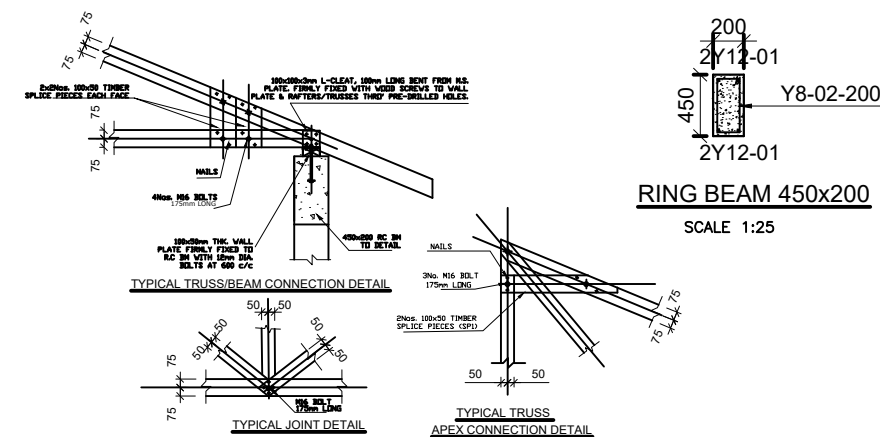
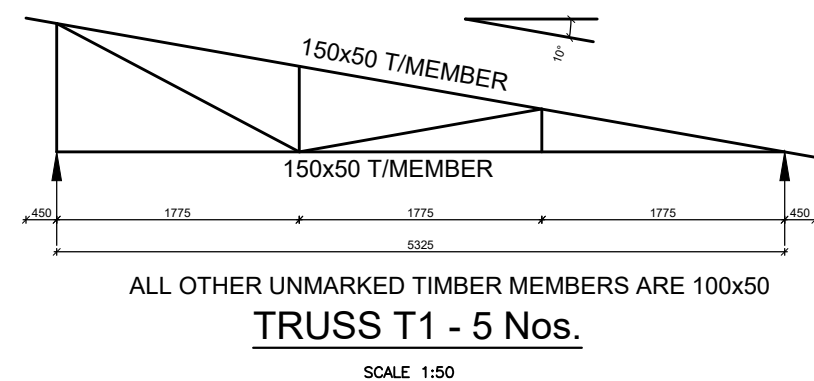
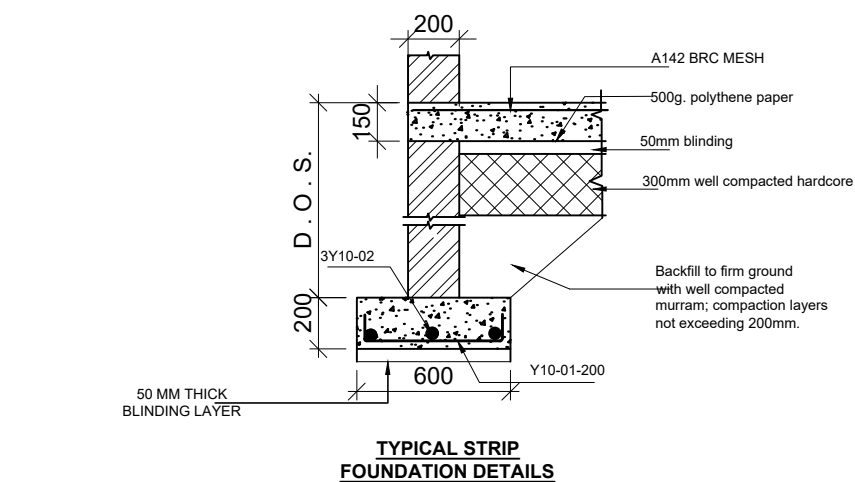
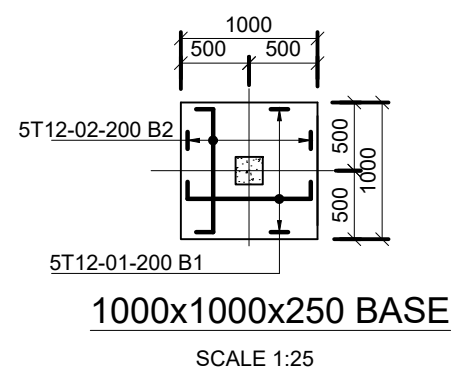
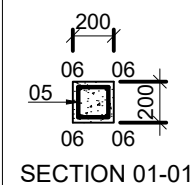
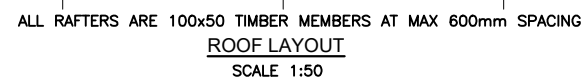
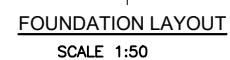
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CHLORINE /CONTROL ROOM HOUSE

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DESCRIPTION	DATE						Date:	MARCH 2020
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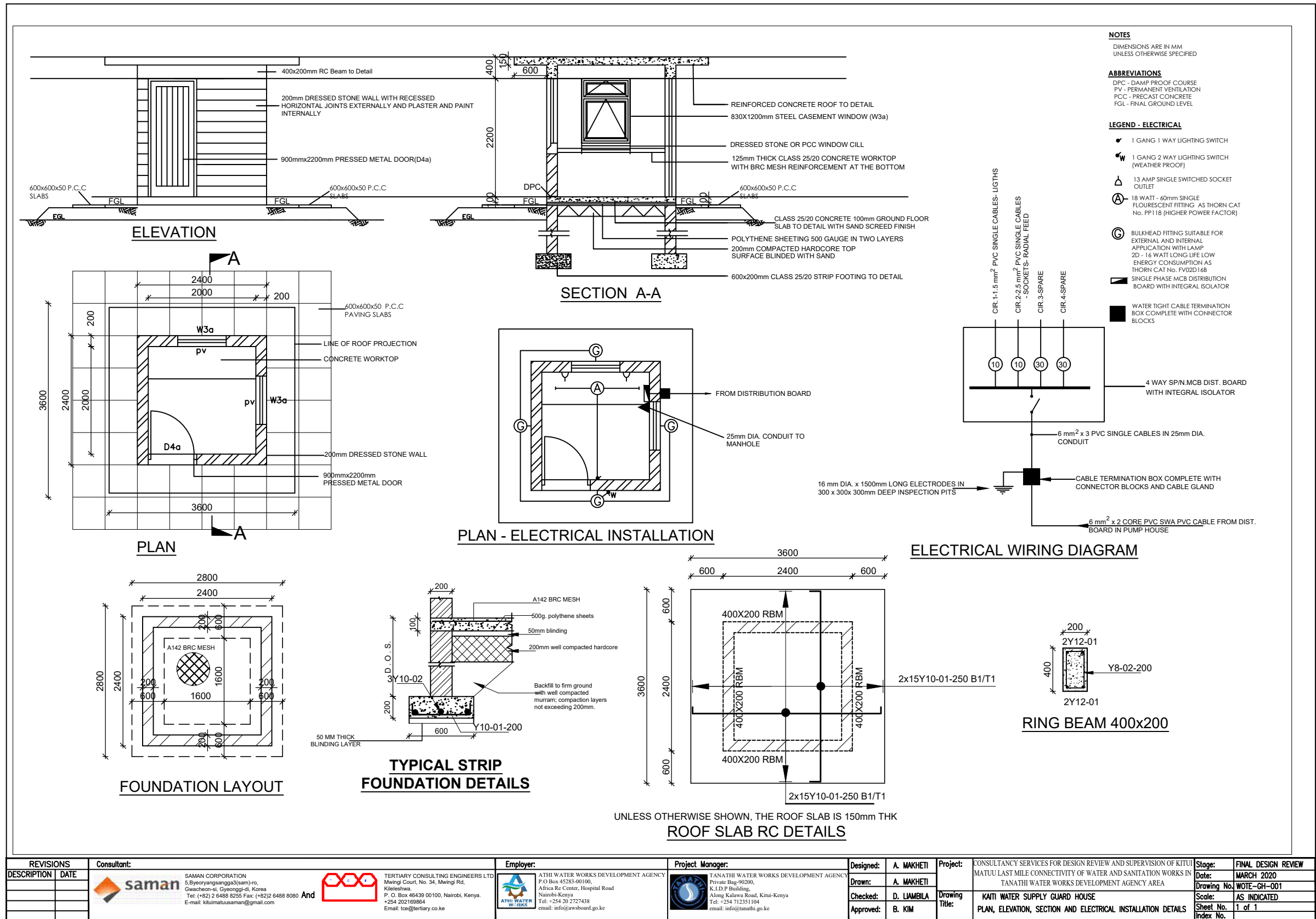
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DESCRIPTION	DATE				Drawn: A. MAKHETI		Date:	MARCH 2020
					Checked: D. LIAMBILA		Drawing No:	WOTE-CL-CNTRHS-002
					Approved: B. KIM		Drawing Title:	KAITI WATER SUPPLY CHLORINE HOUSE, STORE AND CONTROL ROOM HOUSE
							Scale:	AS INDICATED
							Sheet No.	2 of 2
			Index No.					

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GUARD HOUSE



REVISIONS	Consultant:	Employer:	Project Manager:	Designed:	Project:	Stage:
DESCRIPTION	DATE			A. MAKHETI	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	FINAL DESIGN REVIEW
				A. MAKHETI		Date: MARCH 2020
				D. LIAMBILA		Drawing No. WOTE-GH-001
				B. KIM		Scale: AS INDICATED
						Sheet No. 1 of 1
						Index No.

SEPTIC TANK & SOAK AWAY PIT



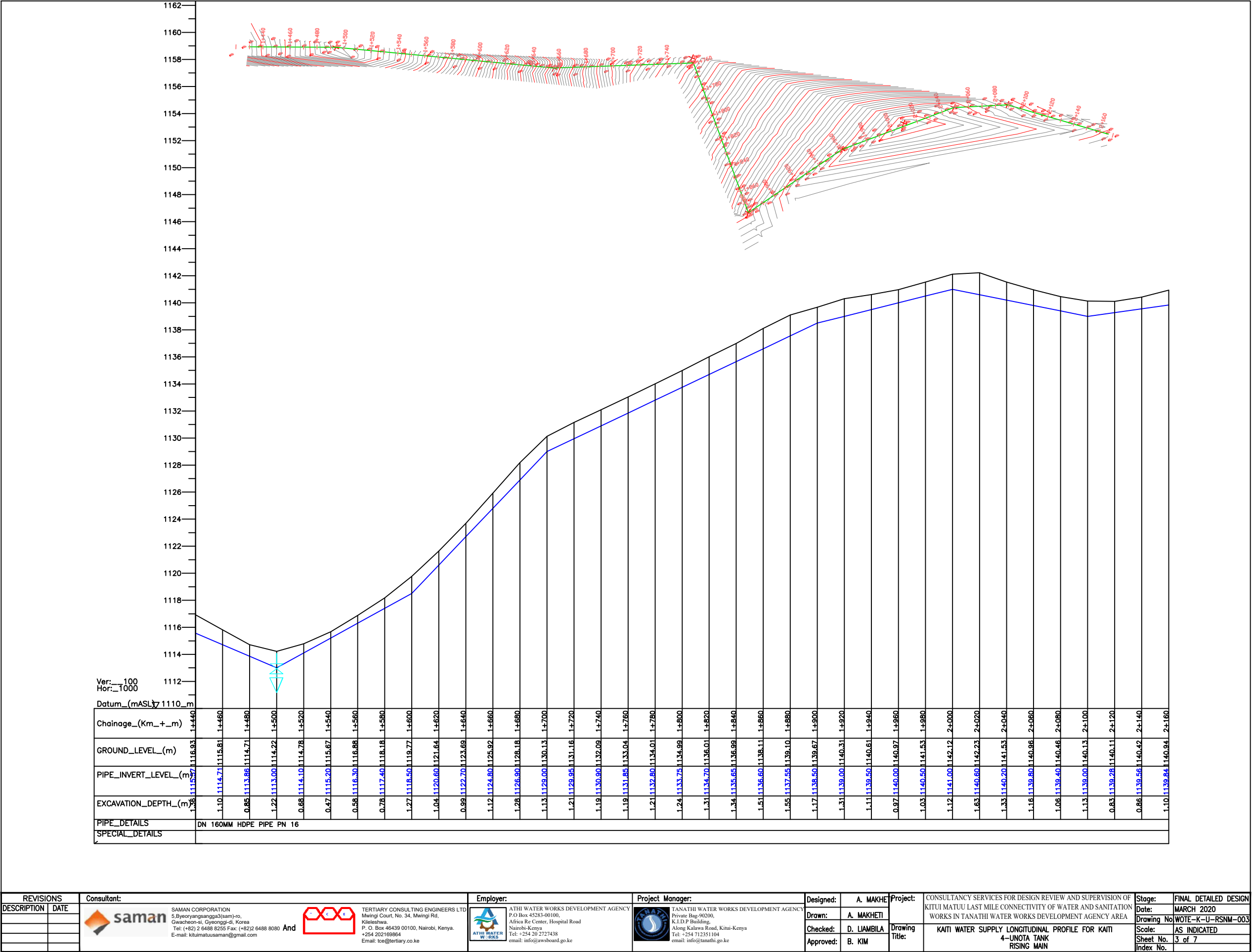
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DESCRIPTION	DATE	 SAMAN CORPORATION 5,Byecoronyanganga3(jam)ro, Gyecheon-si, Gyeonggi-do, Korea Tel: (+82) 2 6488 8255 Fax: (+82)2 6488 8080 E-mail: kitui@tutanusaan@gmail.com		And 	 TERTIARY CONSULTING ENGINEERS LTD Mwingi Court, No. 34, Mwingi Rd., Kileleshwa. P. O. Box 46439 00100, Nairobi, Kenya. +254 202169864 Email: tce@tertiary.co.ke		 TANATHI WATER WORKS DEVELOPMENT AGENCY Private Bag-90200, K.I.D.P Building, Along Kalawa Road, Kitui-Kenya Tel: +254 20 2727438 email: pdr@tanathi.co.ke		Drawn:		A. MAKHETI		Project Name		KAITI WATER SUPPLY PROJECT SEPTIC TANK AND SOAKAWAY PIT LAYOUT AND DETAILS		Date:		MARCH 2020	
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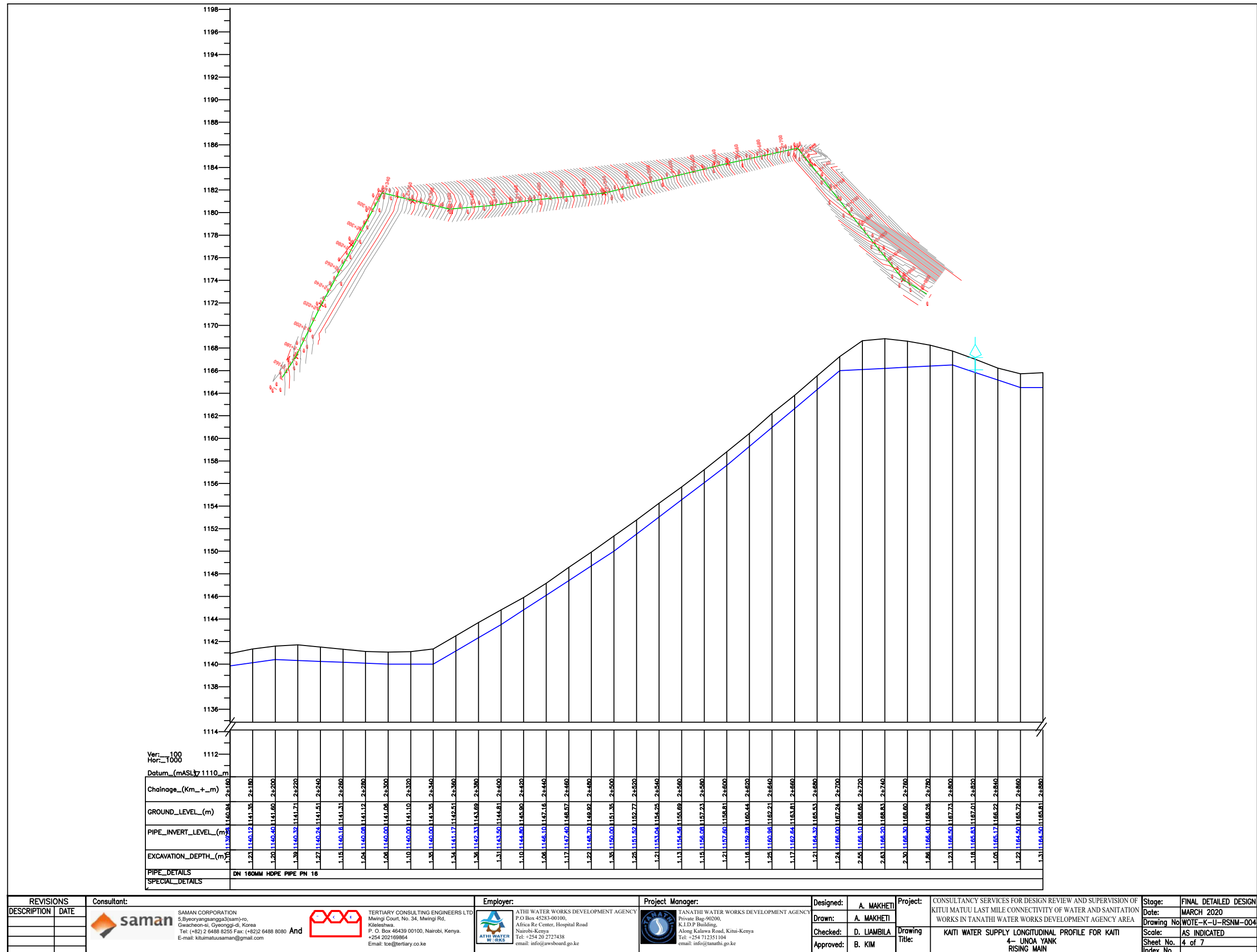
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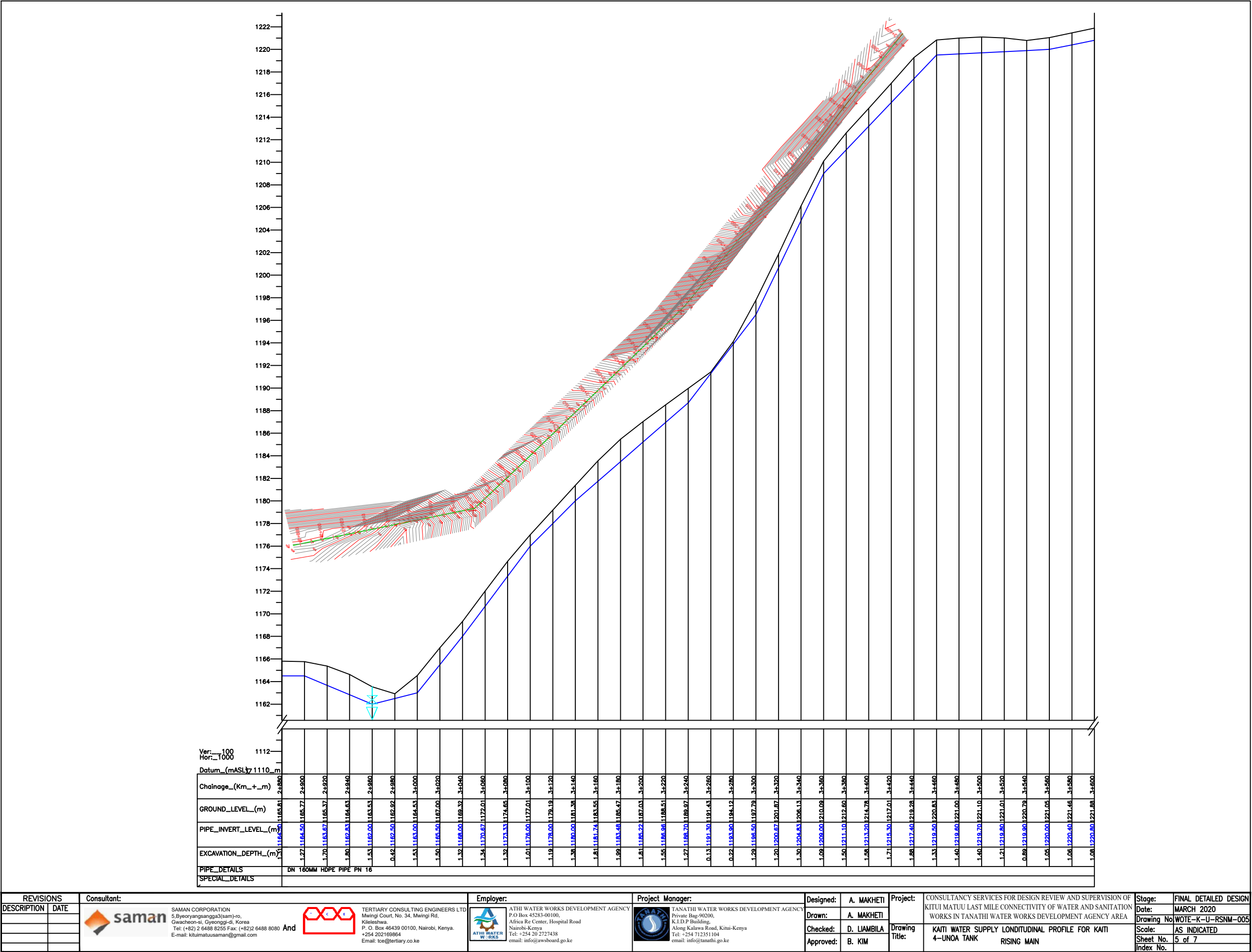
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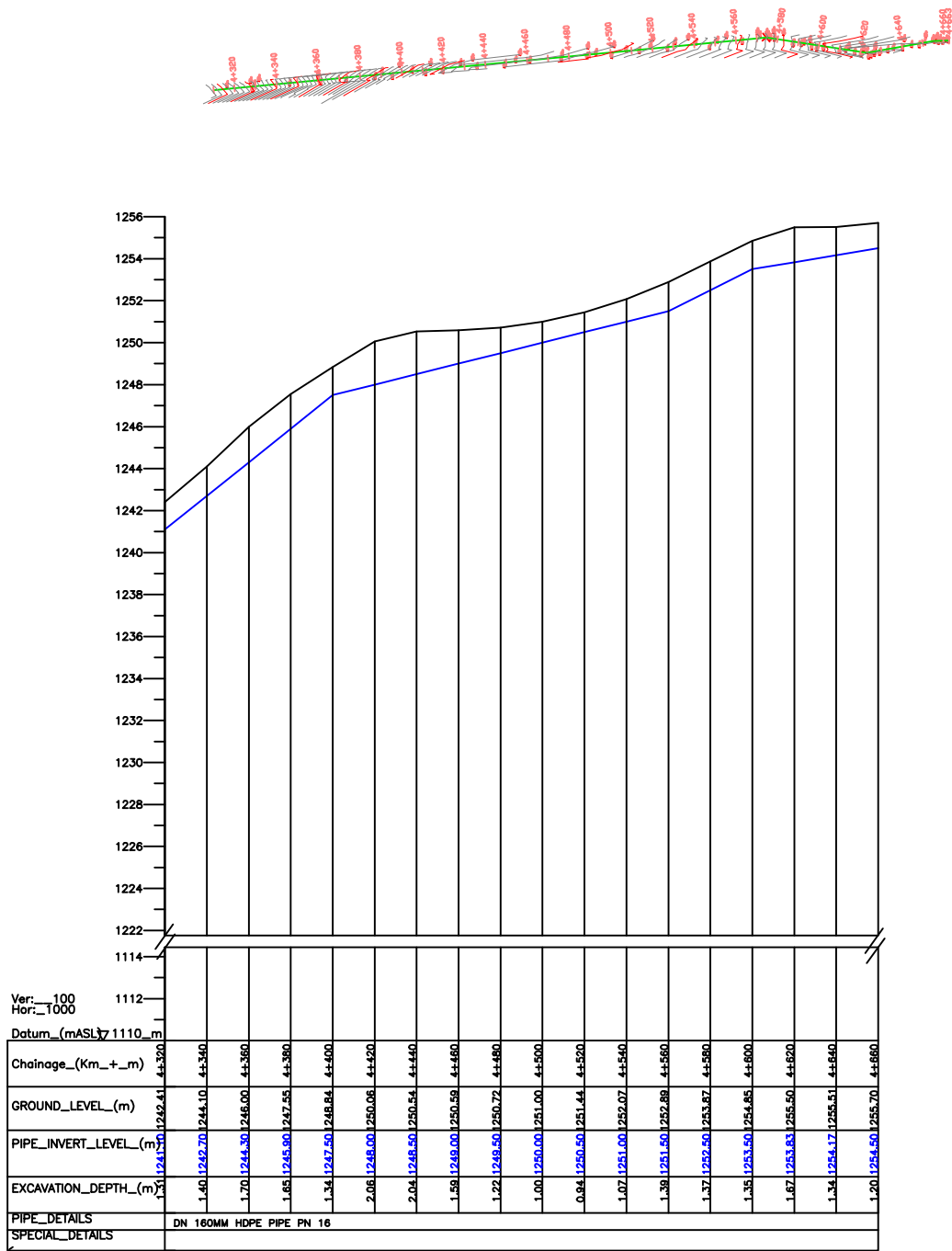
Kaiti Water Supply





KAITI 4-UNOA TANK WATER RISING MAIN









REVISIONS		Consultant:				Employer:		Project Manager:		Designed:	A. MAKHE	Project:	Stage:	FINAL DETAILED DESIGN	
DESCRIPTION	DATE		SAMAN CORPORATION 5,Byeoryangsanga3(sam)-ro, Gwacheon-si, Gyeonggi-do, Korea Tel: (+82) 2 6488 8255 Fax: (+82)2 6488 8080 E-mail: kitumatusaman@gmail.com		TERTIARY CONSULTING ENGINEERS LTD Mwingi Court, No. 34, Mwingi Rd, Kileleshwa, P. O. Box 46439 00100, Nairobi, Kenya. +254 202169864 Email: tce@tertiary.co.ke		ATHI WATER WORKS DEVELOPMENT AGENCY P.O. Box 45283-00100, Africa Rd Center, Hospital Road Nairobi-Kenya Tel: +254 20 2727438 email: info@awwsboard.go.ke		TANATHI WATER WORKS DEVELOPMENT AGENCY Private Bag-90200, K.I.D.P Building Along Kalawa Road, Kitui-Kenya Tel: +254 712351104 email: info@tanathi.go.ke	Drawn:	A. MAKHETI	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	Stage:	FINAL DETAILED DESIGN	
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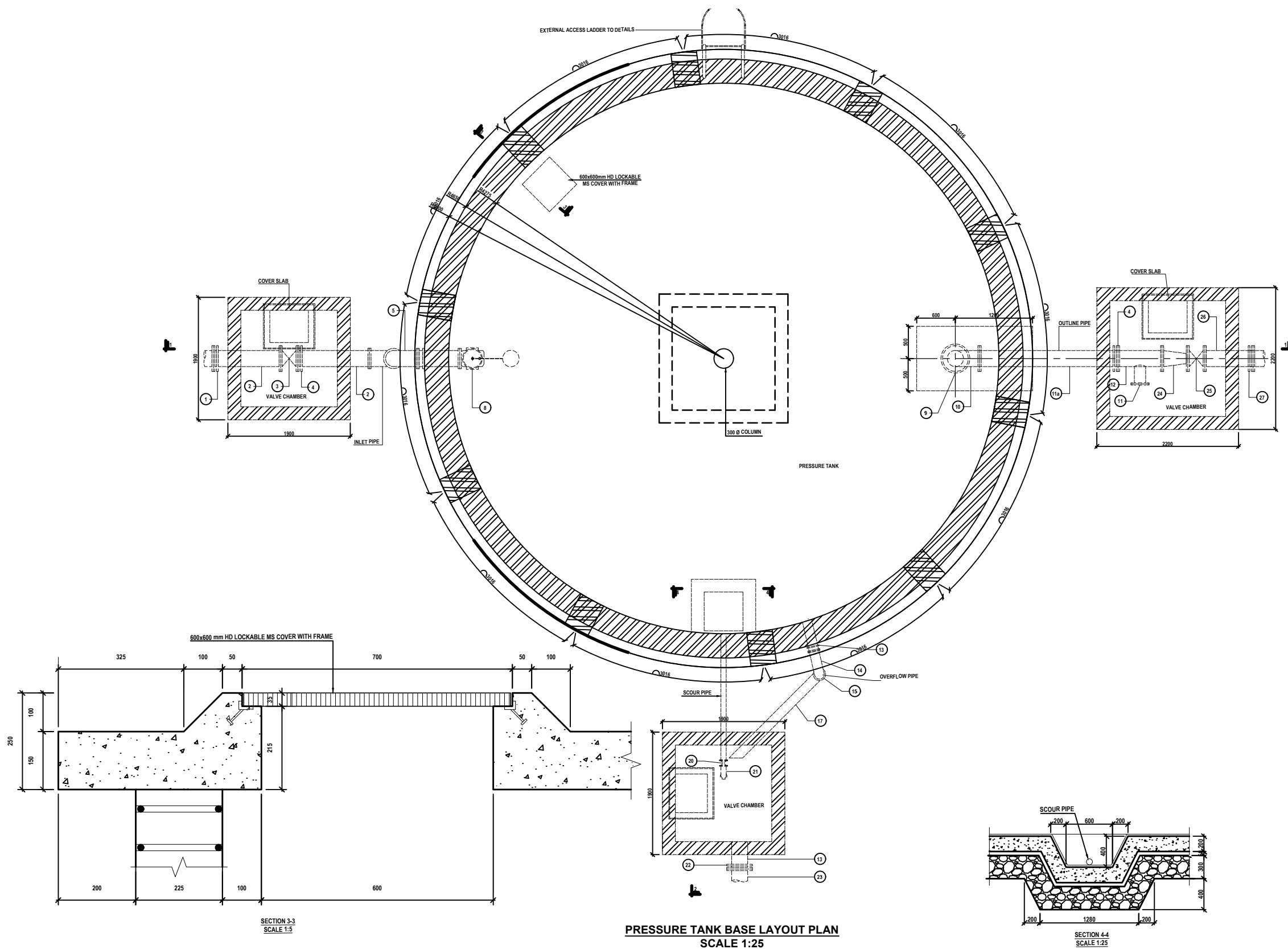
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UNOA 150M3 GROUND MASONRY TANK

NOTES

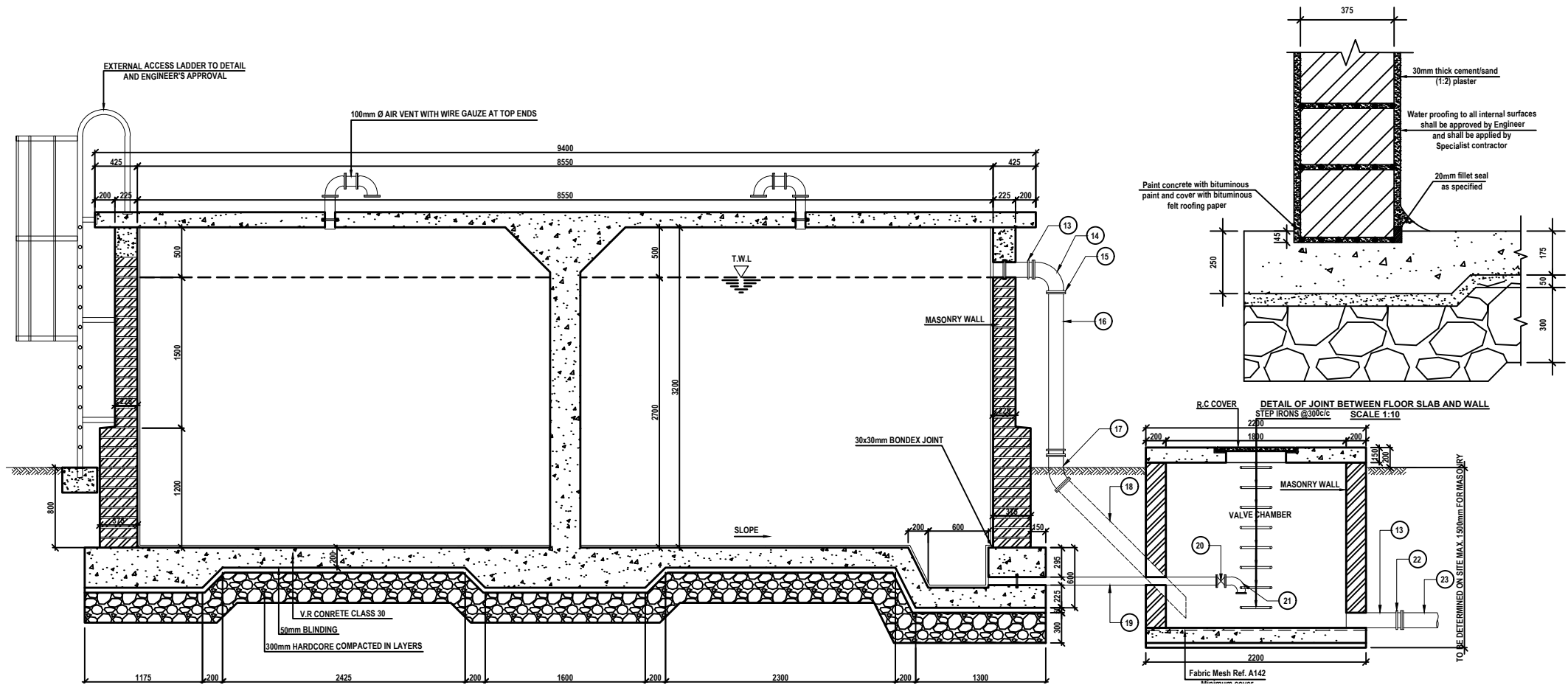
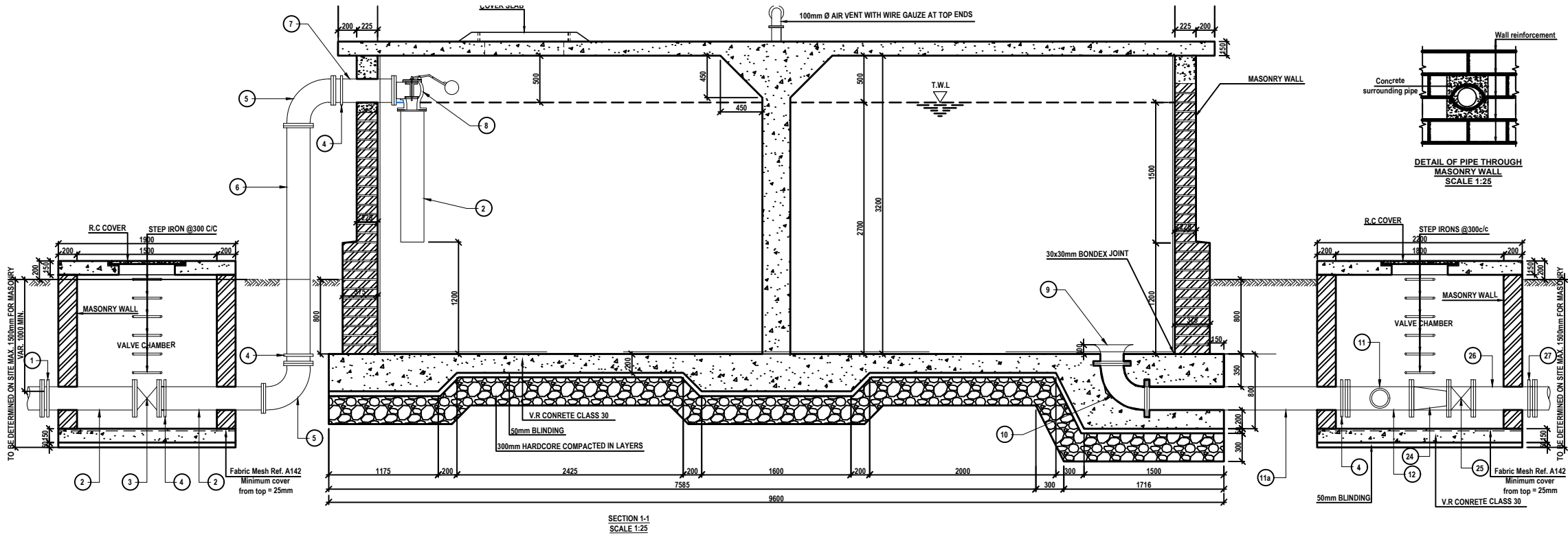
1. All dimensions are in millimeters, unless otherwise stated.
2. This drawing must not be scaled, only figured dimensions should be used.
3. This drawing must be read in conjunction with relevant Architectural drawings.
4. Reinforced concrete to be grade 30 to BS 8110.
5. Cover to main reinforcement to be as follows:
(a) Foundation = 50mm
(b) Columns = 40mm
(c) Beams = 30mm
(d) Slabs = 20mm
6. "T" Denotes High yield bars to BS 4449:005.
"R" Denotes round mild steel bars to BS 4449:005.
7. Reinforcement in walls and columns must be inspected by the Engineer before being enclosed in the formwork.
8. All masonry walls must be reinforced with 25mm hoop iron after every two alternate courses. The hoop iron must be extended through the column sections.
9. To ensure enhanced bonding between the masonry and the R.C. columns, the masonry walling must be raised first before the columns are casted.
10. All mortar used to be of cement sand mix 1:2, with all the stone walling being laid in 200mm courses with 12mm mortar joints.
11. A minimum of 5.0N/mm² average compressive strength of masonry in accordance with BS5390 should be used for all wall sections.
12. Mass concrete to be grade 15



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										PLAN AND SECTION DETAILS			

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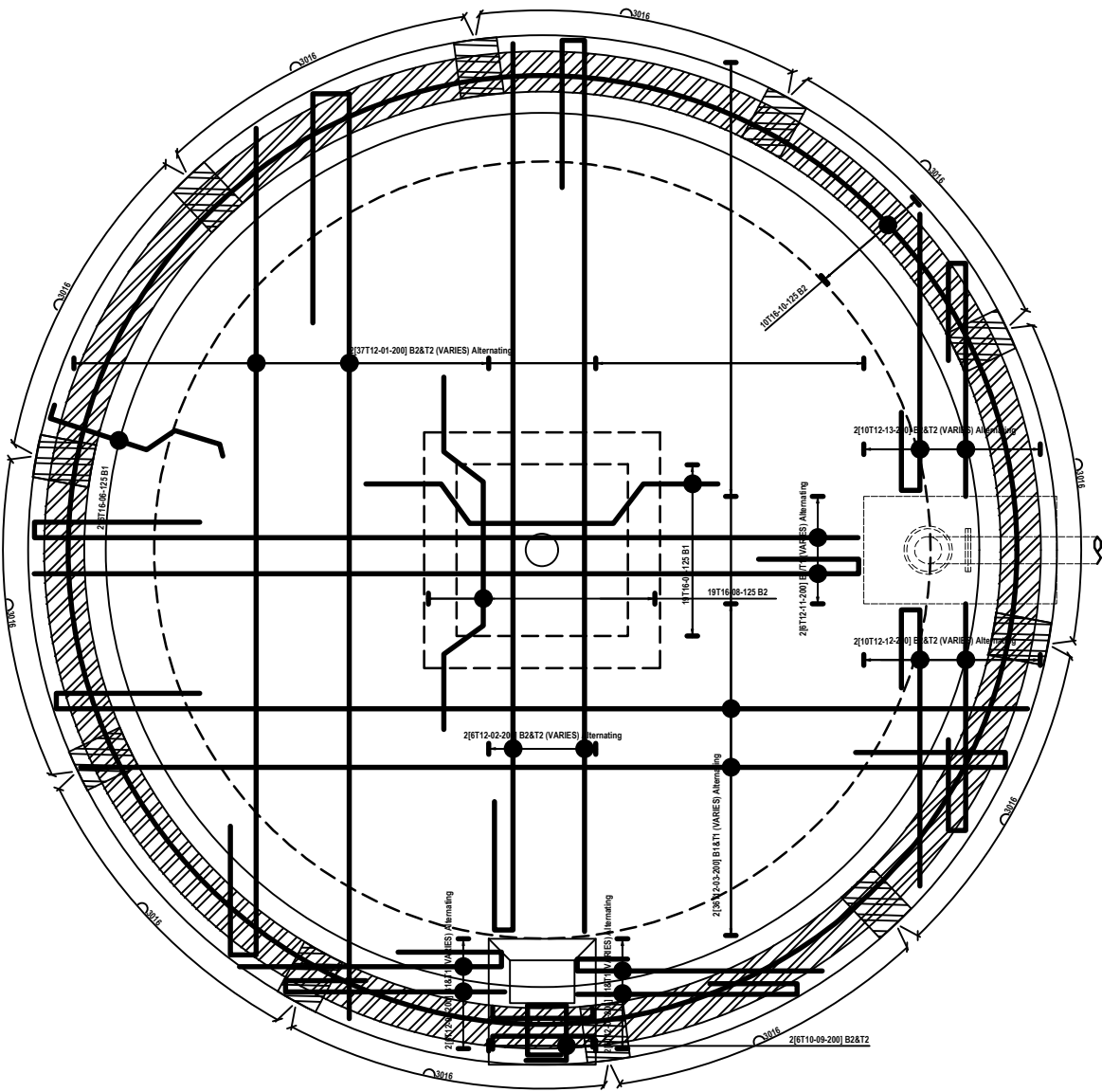
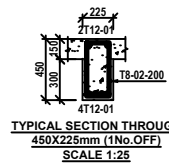
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4. Reinforced concrete to be grade 30 to BS 8110.
5. Cover to main reinforcement to be as follows:
(a) Foundation = 50mm
(b) Columns = 40mm
(c) Beams = 30mm
(d) Slabs = 20mm
6. "T" Denotes High yield bars to BS 4449:005.
"R" Denotes round mild steel bars to BS 4449:005.
7. Reinforcement in walls and columns must be inspected by the Engineer before being enclosed in the formwork.
8. All masonry walls must be reinforced with 25mm hoop iron after every two alternate courses. The hoop iron must be extended through the column sections.
9. To ensure enhanced bonding between the masonry and the R.C. columns, the masonry walling must be raised first before the columns are casted.
10. All mortar used to be of cement sand mix 1:2, with all the stone walling being laid in 200mm courses with 12mm mortar joints.
11. A minimum of 5.0N/mm² average compressive strength of masonry in accordance with BS5399 should be used for all wall sections.
13. Mass concrete to be grade 15



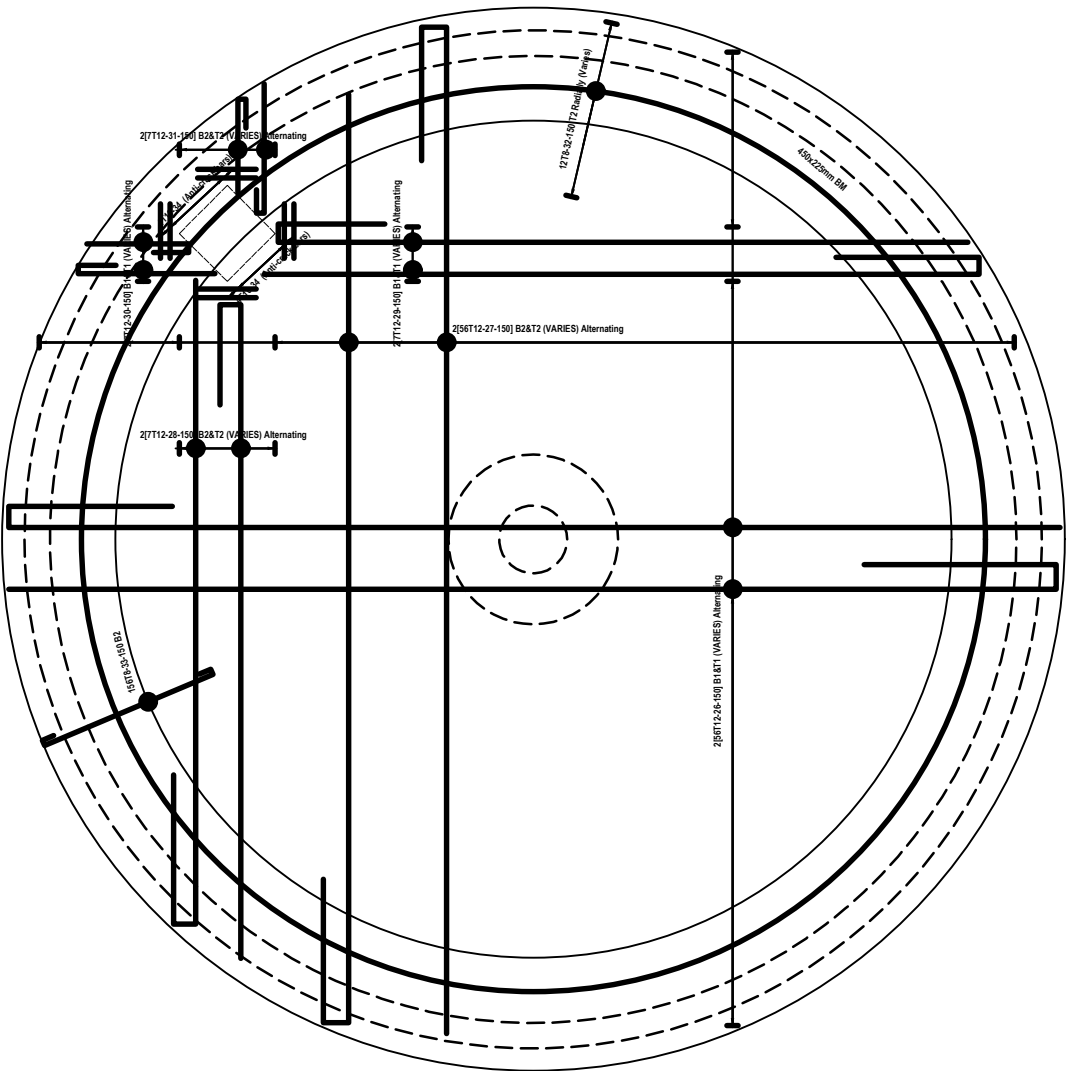
REVISIONS	DATE	Consultant:	Employer:	Project Manager:	Designed:	Project:	Stage:
DESCRIPTION		SAMAN CORPORATION 5 Byeoryangsanga3(sam)ro, Gwacheon-si, Gyeonggi-do, Korea Tel: (+82) 2 6488 8255 Fax: (+82) 2 6488 8080 E-mail: kitumatusaman@gmail.com	ATHI WATER WORKS DEVELOPMENT AGENCY Private Bag 90200, K.I.D.P. Building, Along Kalawa Road, Kitui-Kenya Tel: +254 20 2727438 email: info@awwboard.go.ke	TANATHI WATER WORKS DEVELOPMENT AGENCY Private Bag 90200, K.I.D.P. Building, Along Kalawa Road, Kitui-Kenya Tel: +254 20 2727438 email: info@tanathi.go.ke	A. MAKHETI	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	FINAL DETAILED DESIGN
					A. MAKHETI		Date: MARCH 2020
					D. LIAMBILA		Drawing No: WOT-INK-1502002
					B. KIM		Scale: AS INDICATED
							Sheet No: 2 of 5
							Index No:

NOTES



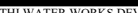


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10. To ensure enhanced bonding between the masonry and the R.C. columns, the masonry walling must be raised first before the columns are casted.
11. All mortar used to be of cement sand mix 1:2, with all the stone walling being laid in 200mm courses with 12mm mortar joints.
12. A minimum of 5.0N/mm² average compressive strength of masonry in accordance with BS5390 should be used for all wall sections.
13. Mass concrete to be grade 15



PRESSURE TANK BASE R.C DETAILS
SCALE 1:25

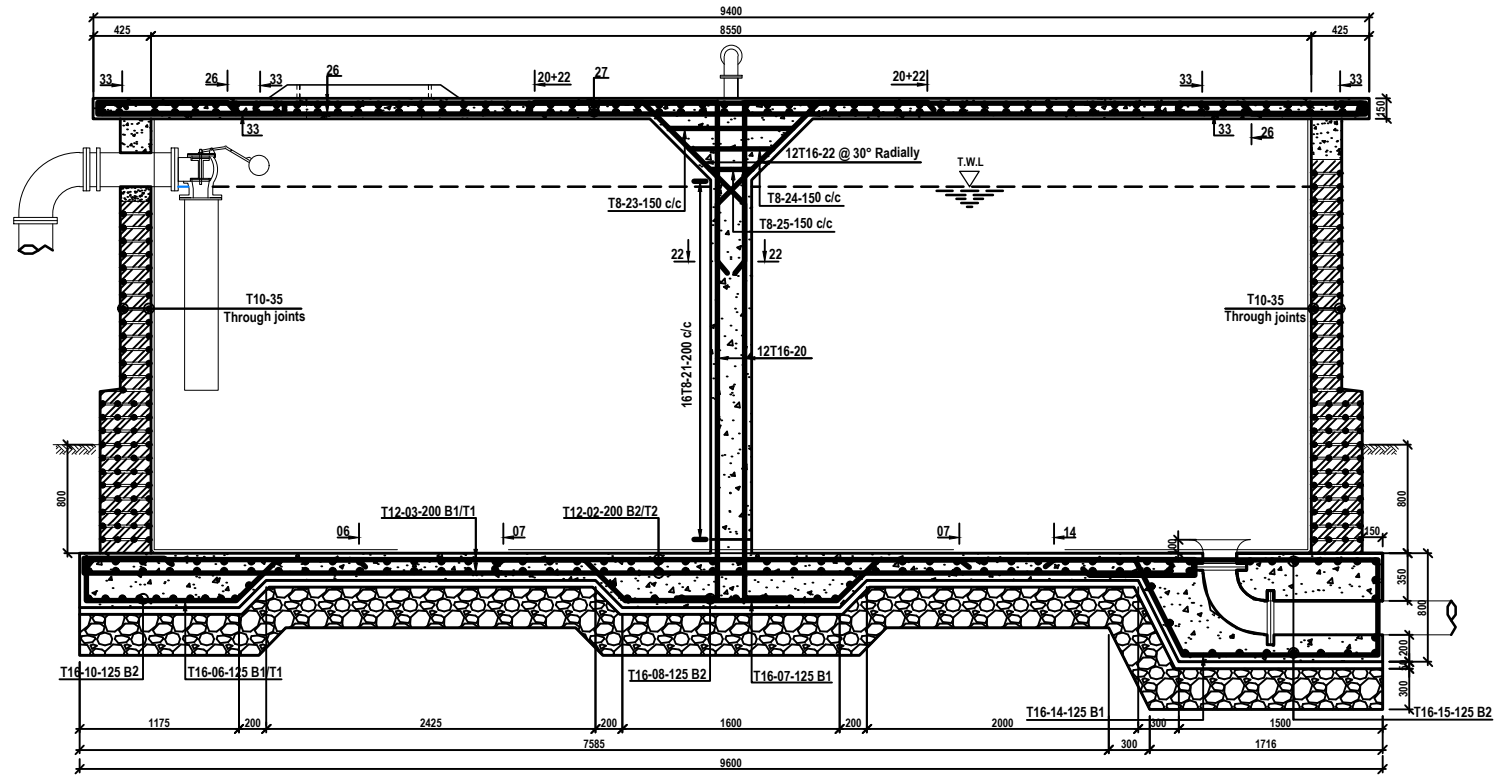


PRESSURE TANK COVER SLAB R.C DETAILS
SCALE 1:25

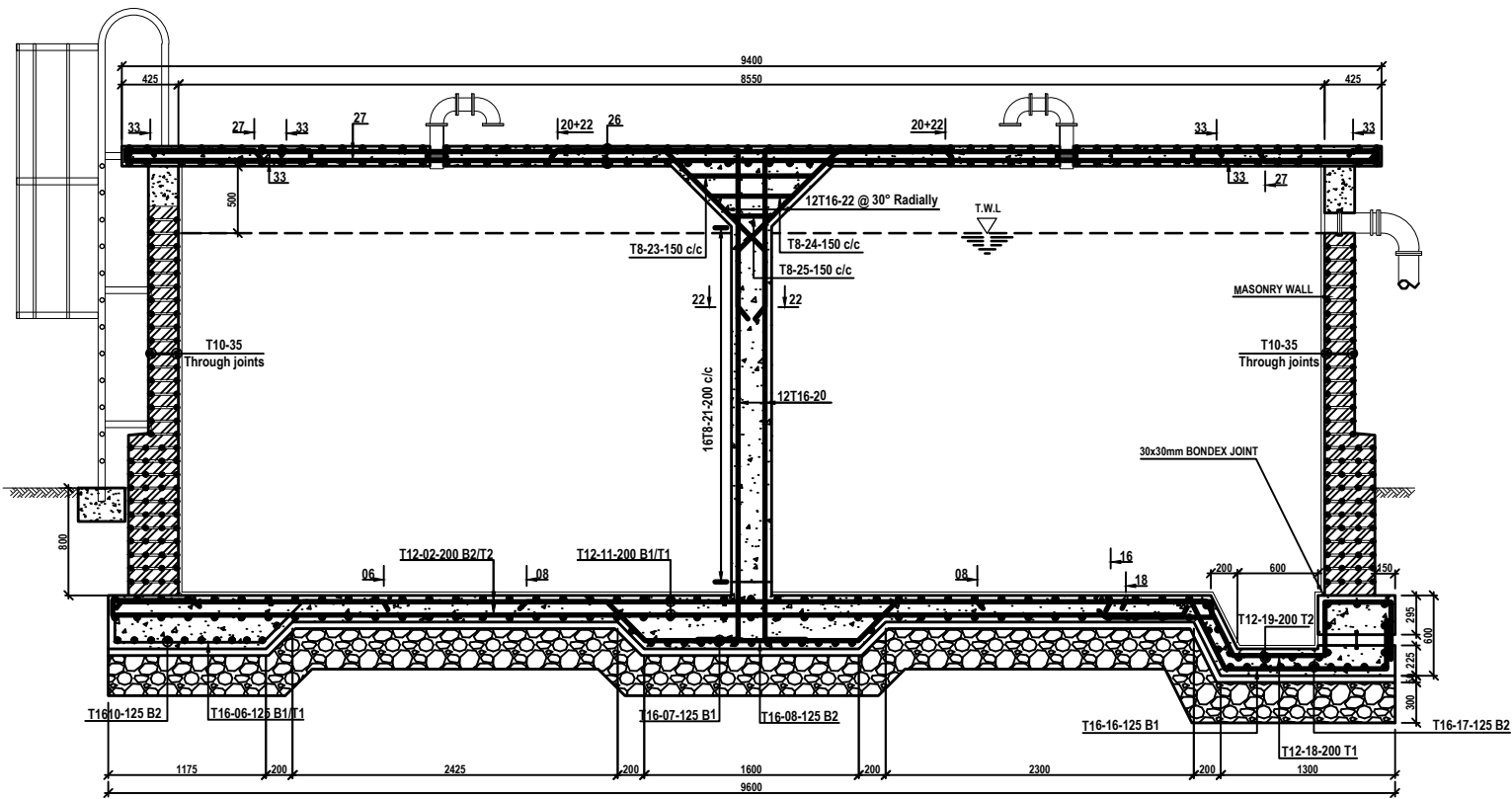
REVISIONS		Consultant:			Employer:		Project Manager:		Designed:	A. MAKHETI	Project:	Stage:	FINAL DETAILED DESIGN								
DESCRIPTION	DATE	 SAMAN CORPORATION 5,Byeoryangsanggi3(sam)-ro, Gwacheon-si, Gyeonggi-do, Korea Tel: (+82) 2 6488 8255 Fax: (+82)2 6488 8080 And E-mail: kitumatusaman@gmail.com		 TERTIARY CONSULTING ENGINEERS LTD Mwingi Court, No. 34, Mwingi Rd, Kileleshwa, P. O. Box 46439 00100, Nairobi, Kenya. +254 202169864 Email: tce@tertiary.co.ke	 ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 45283-00100, Africa Re Center, Hospital Road Nairobi-Kenya Tel: +254 20 2727438 email: info@awsboard.go.ke	 TANATHI WATER WORKS DEVELOPMENT AGENCY Private Bag-90200, K.I.D.P Building, Along Kalawa Road, Kitui-Kenya Tel: +254 712351104 email: info@tanathi.go.ke	Drawn:	A. MAKHETI	Checked:	D. LIAMBILA	Drawing Title:	KAITI WATER SUPPLY : 150M3 GROUND MASONRY TANK BOTTOM AND BASE SLAB R.C DETAILS	Date:	MARCH 2020	Drawing No:	W01E-TNK-150-003	Scale:	AS INDICATED	Sheet No:	8 of 5	Index No:

NOTES

1. All dimensions are in millimeters, unless otherwise stated.
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11. All mortar used to be of cement sand mix 1:2, with all the stone walling being laid in 200mm courses with 12mm mortar joints.
12. A minimum of 5.0N/mm² average compressive strength of masonry in accordance with BS5390 should be used for all wall sections.
13. Mass concrete to be grade 15



SECTION 1-1 R.C DETAILS
SCALE 1:25



SECTION 2-2 R.C DETAILS

REVISIONS		Consultant:		Employer:		Project Manager:		Designed:		Project:	
DESCRIPTION	DATE	SAMAN CORPORATION		ATHI WATER WORKS DEVELOPMENT AGENCY		TANATHI WATER WORKS DEVELOPMENT AGENCY		A. MAKHETI		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	
		5, Byeoryanggang3(sam)-ro, Gwacheon-si, Gyeonggi-do, Korea		P.O. Box 45283-00100, Kileleshwa, Nairobi-Kenya		Private Bag-90200, K.I.D.P Building, Along Kalawa Road, Kitui-Kenya		A. MAKHETI		Stage: FINAL DETAILED DESIGN	
		Tel: (+82) 2 6488 8255 Fax: (+82)2 6488 8080 And E-mail: kituimatusaman@gmail.com		Tel: +254 20 2727438 email: info@awsboard.go.ke		Tel: +254 712351104 email: info@tanathi.go.ke		D. LIAMBILA		Date: MARCH 2020	
								B. KIM		Drawing No: WOTF-TNK-150-004	
										Scale: AS INDICATED	
										Sheet No: 4 of 5	
										Index No:	

PIPE WORK SCHEDULE

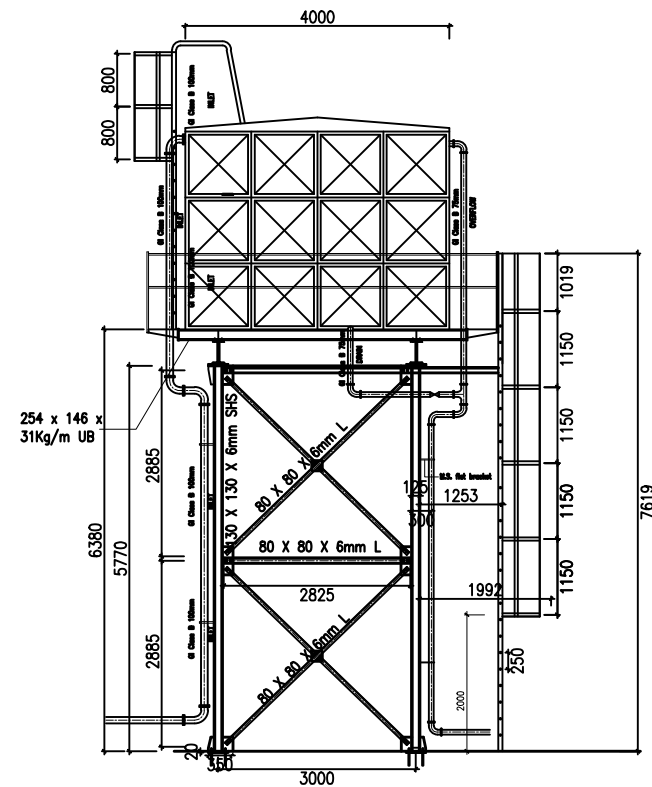
ITEM	DESCRIPTION	DIAMETER (mm)	LENGTH (mm)	QUANTITY (No.)
I	INLET AND OUTLET PIPEWORK			
1	uPVC/GI ADAPTOR	160/100		1
2	SINGLE FLANGED PIPE	160	1000	2
3	ALL FLANGED GATE VALVE	160		1
4	FLANGED ADOPTER	160		4
5	90° FLANGED BEND	160		2
6	SINGLE FLANGED PIPE	160	2500	1
7	SINGLE FLANGED PIPE WITH CENTRAL PADDLEFLANGE	160	600	1
8	FLANGED BEAT EQUILIBRIUM FLOAT VALVE	160		1
9	SINGLE FLANGED BELL MOUTH	160		1
10	DOUBLE FLANGED SHORT RADIUS BEND	160		1
11	BLIND FLANGE	160		1
11a	SINGLE FLANGED PIPE WITH PADDLE FLANGE 500mm FROM ONE END	160	2100	1
12	ALL FLANGED TEE	80x50		1
II	OVERFLOW AND WASHOUT FITTINGS			
13	SINGLE FLANGED PIPE WITH PADDLE FLANGE	80	400	2
14	90° DOUBLE FLANGED BEND	80		1
15	FLANGED ADAPTOR	80		1
16	SINGLE FLANGED PIPE	80	1500	1
17	45° DOUBLE FLANGED BEND	80		1
18	SINGLE FLANGED PIPE WITH BEVELED END	80	1500	1
19	SINGLE FLANGED PIPE WITH PADDLE FLANGE 450mm FROM PLAIN END	80	2100	1
20	ALL FLANGED GATE VALVE	80		1
21	90° DOUBLE FLANGED BEND	80		1
22	FLANGED ADAPTOR	80x90		1
23	uPVC PIPE	90	6000	4
24	DOUBLE FLANGED TAPER	80x50		1
25	DOUBLE FLANGED GATE VALVE	160		1
26	SINGLE FLANGED STEEL PIPE	160	1000	1
27	uPVC/GI ADAPTOR	160/160		1

NOTES

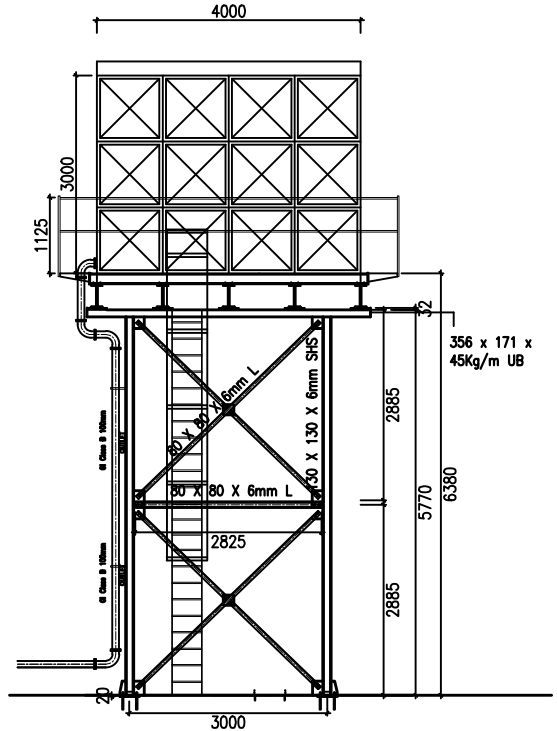
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- Mass concrete to be grade 15

REVISIONS		Consultant:		Employer:		Project Manager:		Designed: A. MAKHETI		Project:		Stage: FINAL DETAILED DESIGN	
DESCRIPTION	DATE	SAMAN CORPORATION		ATHI WATER WORKS DEVELOPMENT AGENCY		TANATHI WATER WORKS DEVELOPMENT AGENCY		Drawn: A. MAKHETI		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		Date: MARCH 2020	
		5, Byeoryangsan-gil (sam)-ro, Gwacheon-si, Gyeonggi-do, Korea		P.O. Box 45283-00100, Africa Re Center, Hospital Road, Nairobi-Kenya		Private Bag-90200, K.I.D.P Building, Along Kalawa Road, Kitui-Kenya		Checked: D. LIAMBILA		Drawing Title: KAITI WATER SUPPLY: 150M3 GROUND MASONRY TANK		Drawing No: WOTF-TNK-1502005	
		Tel: (+82) 2 6488 8255 Fax: (+82) 2 6488 8080 And E-mail: kitumatusaman@gmail.com		P. O. Box 46439 00100, Nairobi, Kenya. +254 202169964 Email: tce@tertiary.co.ke		Tel: +254 20 2727438 email: info@tanathi.go.ke		Approved: B. KIM		PIPEWORK SCHEDULE		Scale: AS INDICATED	
												Sheet No: 5 of 5	
												Index No:	

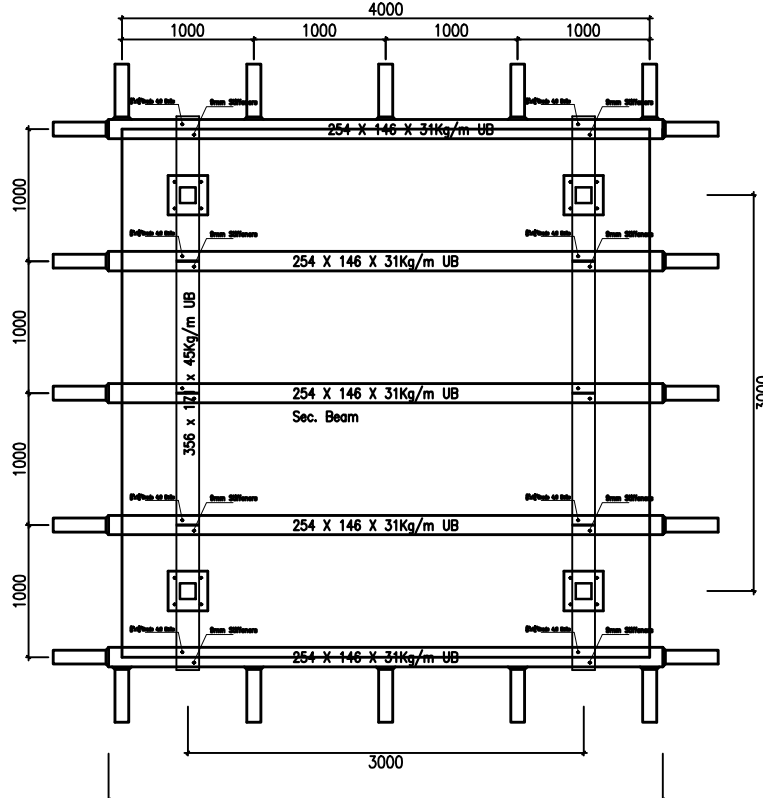
6M HIGH 48M3 ELEVATED STEEL TANKS



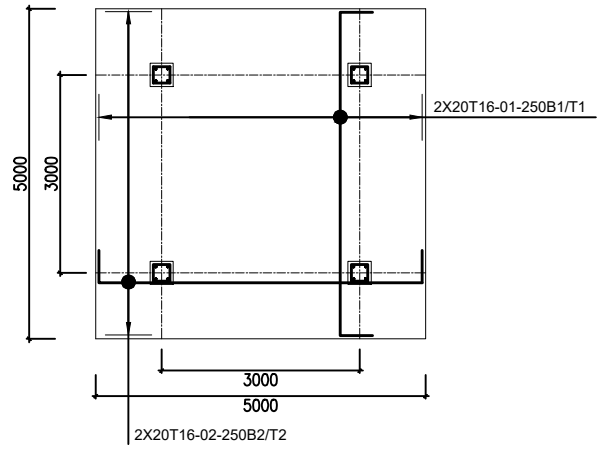
GENERAL ARRANGEMENT: FRONT VIEW
1:50



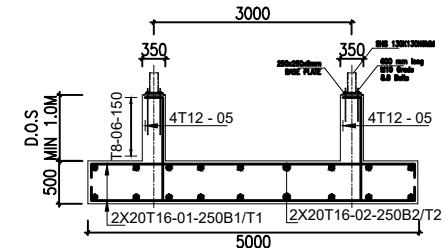
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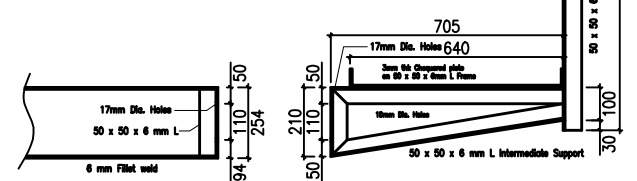
GRILLAGE: PLAN VIEW
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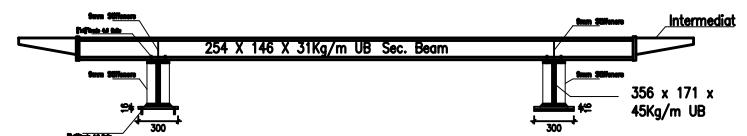
FOUNDATION DETAILS: PLAN VIEW
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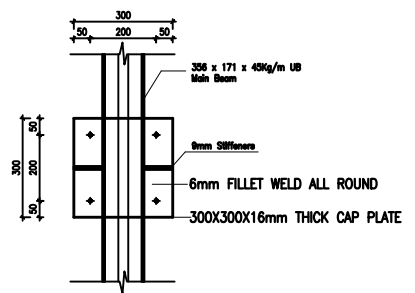
FOUNDATION DETAILS: SECTION
1:50



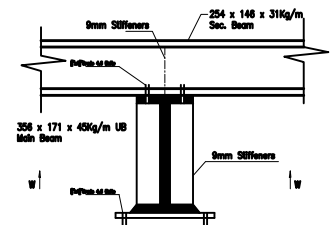
INTERMEDIATE SUPPORT:
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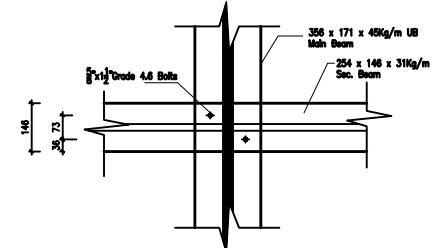
GRILLAGE: SECTION
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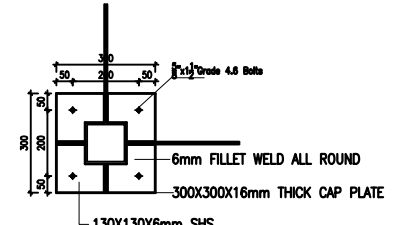
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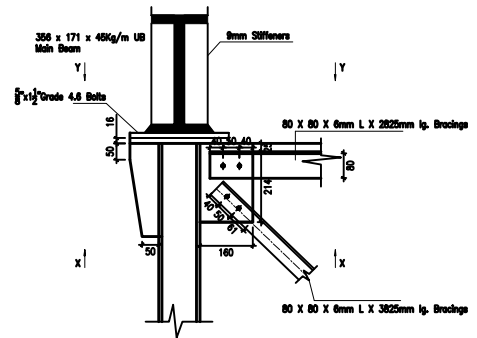
Sec.Beam to Main Beam connection
1:10







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



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



STANCHION TOP DETAILS
CAP GUSSET DETAILS: SECTION
1:10

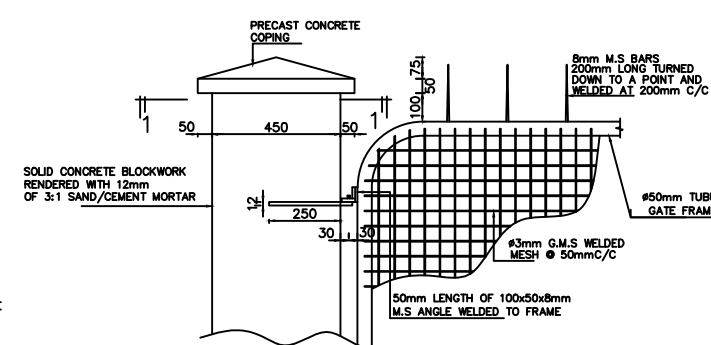
REVISIONS		Consultant:		Employer:		Project Manager:		Designed: A. MAKHETI		Project:		Stage: FINAL DETAILED DESIGN	
DESCRIPTION	DATE	 SAMAN CORPORATION 5,Byeranyanganga(sam)-ro, Gwacheon-si, Gyeonggi-do, Korea Tel: (+82) 2 6488 8255 Fax: (+82) 6488 8080 E-mail: kituimatusaman@gmail.com	 TERTIARY CONSULTING ENGINEERS LTD Mwingi Court, No. 34, Mwingi Rd, Kileleshwa, P. O. Box 46439 00100, Nairobi, Kenya. +254 202169864 Email: toe@tertiary.co.ke	 ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 45283-00100, Africa Re Center, Hospital Road Nairobi-Kenya Tel: +254 20 2727438 email: info@awsboard.go.ke	 TANATHI WATER WORKS DEVELOPMENT AGENCY Private Bag-90200, K.I.D.P Building, Along Kalawa Road, Kitui-Kenya Tel: +254 712351104 email: info@tanathi.go.ke	Drawn: A. MAKHETI		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		Date: MARCH 2020			
						Checked: D. LIAMBILA		Drawing Title: KITUI WATER SUPPLY 6M HIGH 48M3 ELEVATED STEEL TANK		Drawing No: WOTE-BWT-01			
						Approved: B. KIM				Scale: AS INDICATED			
										Sheet No. 1 of 1			
										Index No.		ELEVATIONS AND FOUNDATION DETAILS	

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.

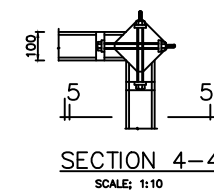
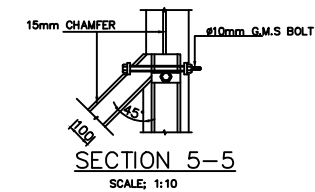
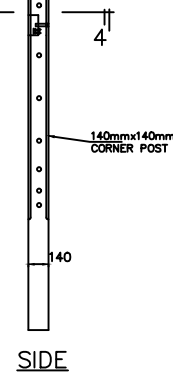
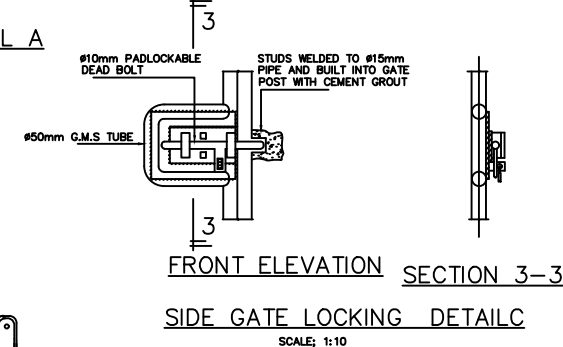
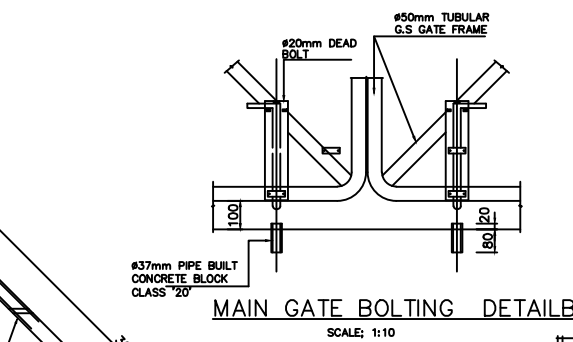
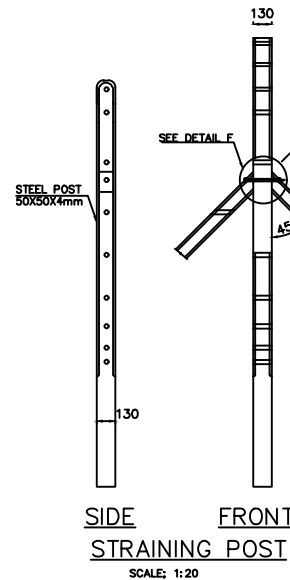
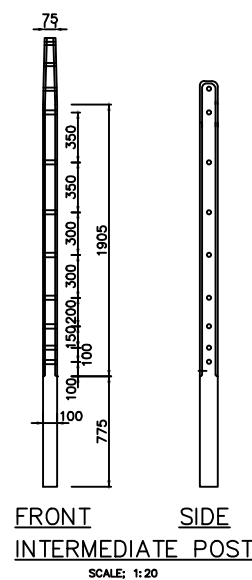
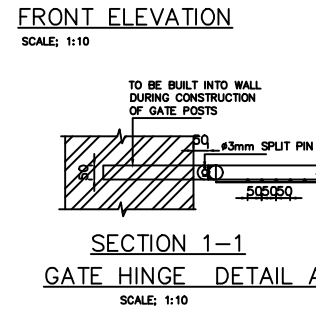
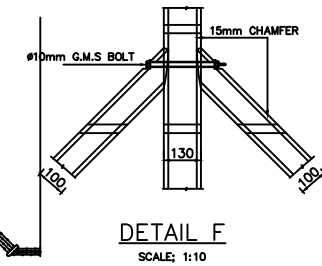
Draft Final Design Review Report

Kaiti Water Supply

KAITI WATER SUPPLY STANDARD DRAWINGS



1. ALL DIMENSIONS ARE IN MILLIMETRES
UNLESS OTHERWISE STATED
2. ALL STEELWORKS IS TO BE CLEANED IN
ACCORDANCE WITH THE SPECIFICATION
ON DIPPED GALVANISED
3. ALL PRECAST ITEMS TO BE CLASS'20'



REVISIONS		Consultant:		Employer:		Project Manager:		Designed: A. MAKHETI	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		Stage:	FINAL DETAILED DESIGN
DESCRIPTION	DATE	 SAMAN CORPORATION 5,Byeonyangsangga3(sam)-ro, Gwachon-si, Gyeonggi-do, Korea Tel: (+82) 2 6488 8255 Fax: (+82)2 6488 8080 And E-mail: kitumatusaman@gmail.com	 TERTIARY CONSULTING ENGINEERS LTD Mwingi Court, No. 34, Mwingi Rd, Killeshwa. P. O. Box 46439 00100, Nairobi, Kenya. Tel: +254 202169864 Email: toe@tertiary.co.ke	 ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 45283-00100, Africa Rc Center, Hospital Road Nairobi-Kenya Tel: +254 20 2727428 email: info@awwboard.go.ke	 TANATHI WATER WORKS DEVELOPMENT AGENCY Private Bag-90200, K.I.D.P Building, Along Kalawa Road, Kiini-Kenya Tel: +254 20 712351104 email: info@tanathi.go.ke	Drawn: A. MAKHETI	Date: MARCH 2020						
						Checked: D. LIAMBILA	Drawing Title: KATI WATER SUPPLY FANCING DETAILS						
						Approved: B. KIM	Scale: AS INDICATED						
							Sheet No. 1 of 1						
							Index No.						

Technical drawing of a roof plan for a building. The drawing shows a square layout with concentric lines representing walls and a central staircase area. Dimensions are provided for the overall size (14.00m by 14.00m) and various offsets. A section line B-B is indicated. A label "DRAIN PIPE" points to a feature on the right side.

PLAN OF CHAMBER
SCALE 1:40

Technical drawing of a valve structure, showing cross-section and elevation views with dimensions and material specifications.

Dimensions:

- Top horizontal dimensions: 25, 247.5, 3, 47.5, 1400, 47.5, 3, 247.5, 25, 200, 175.
- Left vertical dimensions: 150, 150, 200, 1200, 1000, 200, 150, 50.

Labels and Specifications:

- 150mm THICK R.C. CLASS 25/20 COVER SLAB.
- VENT (ONE BLOCK OMITTED) WITH WIRE GAUZE
- FINAL GROUND LEVEL
- 200mm BELOW SLAB LEVEL.
- BLOCKWORK WALLING REINFORCED WITH 6mm DIA. M.S. REINFORCEMENT BETWEEN COURSES, CEMENT MORTAR 1:3 RENDERING INSIDE AND OUTSIDE
- M.S. STEP IRONS @300 C/C
- BITUMEN BASED PAPER BETWEEN MORTAR AND PIPE SURFACES
- OPENING FOR PIPE O.D. OF FLANGE PLUS 200mm FILLED WITH MORTAR.
- 50mm DIA. 500mm LONG DRAIN PIPE
- 150mm THICK FOUNDATION CONCRETE CLASS 15/20
- CONCRETE CLASS 15/40 BLINDING
- VALVE SUPPORT
- A 142 MESH REINFORCEMENT

SPILLCHAMBER TYPE I

[illegible]

SECTION E-E

1. LEVEL INVERT SCOUR TEE WITH FLANGED BRANCH.





2. FLANGED GATE VALVE

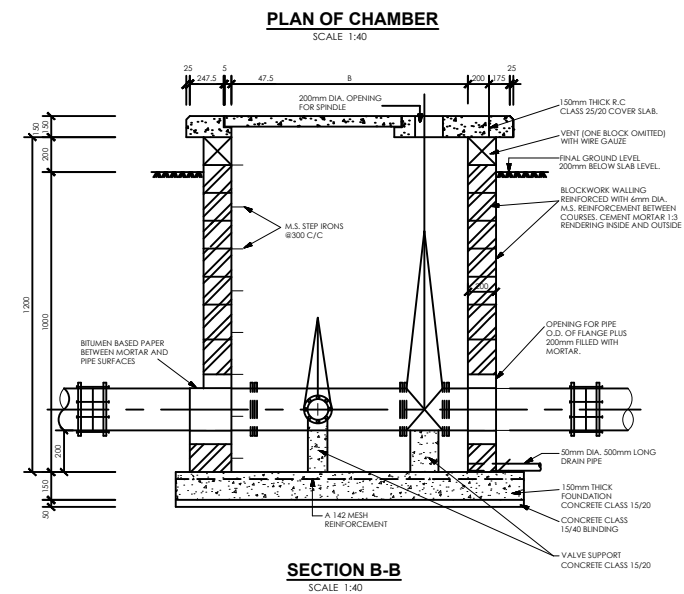
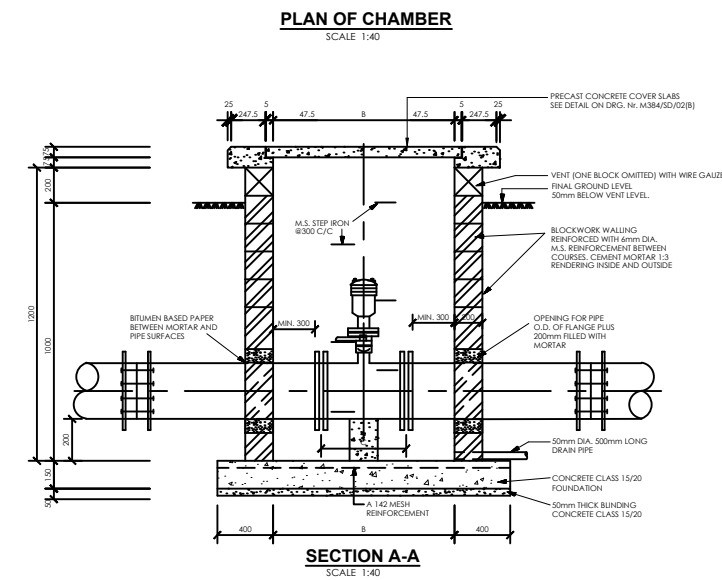
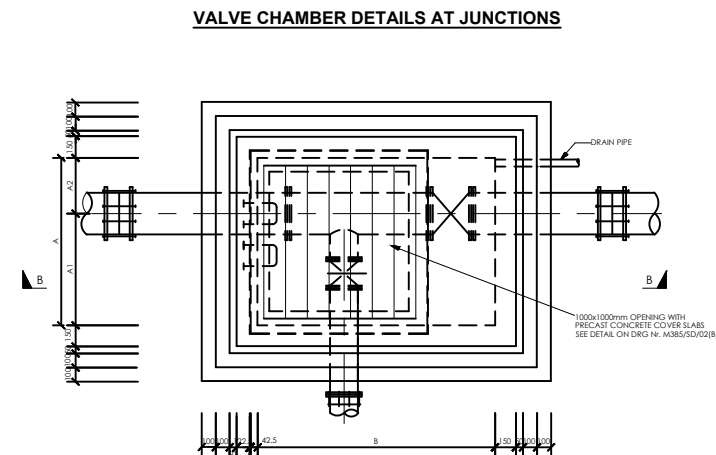
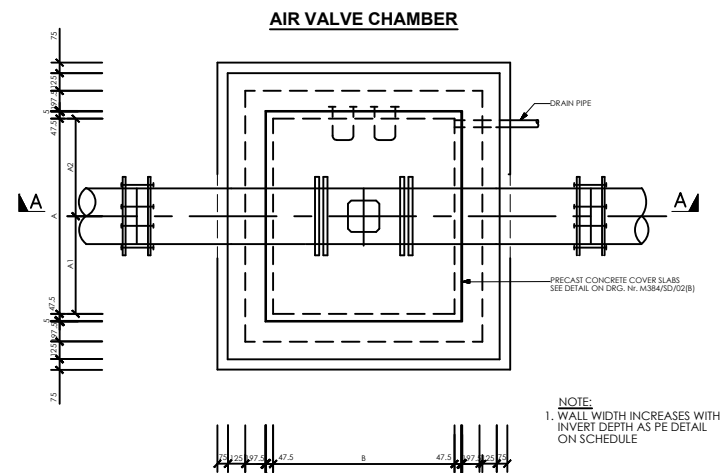
3. FLANGE ADAPTOR TO SUIT uPVC PIPE

4. DCI PUDDLE PIPE 600mm LONG

5. CI FLANGED FLAP VALVE

- 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

REVISIONS		Consultant:		Employer:		Project Manager:		Designed:		Project:		Stage:	
DESCRIPTION	DATE	 <div>SAMAN CORPORATION 5 Byoungsangsa-gil Sam-so, Gwangcheon-si, Gyeonggi-do, Korea Tel: (+82) 2 6486 8255 Fax: (+82) 2 6486 8080 E-mail: kltuamatusaman@gmail.com</div>		And	 <div>TERTIARY CONSULTING ENGINEERS LTD Mwangi Court, No. 34, Mwangi Rd, Killeshwa, P. O. Box 64340 00100, Nairobi, Kenya. +254 20169864 Email: toe@tertiary.co.ke</div>	 <div>ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 4528-00100, Athi River Center, Hospital Road Nairobi-Kenya Tel: +254 20 2727438 email: info@awwboard.go.ke</div>	 <div>TANATHI WATER WORKS DEVELOPMENT AGENCY Private Bag 90206, K. L.D P Building, Along Kalawa Road, Kitui-Kenya Tel: +254 712351104 email: info@tanathi.go.ke</div>	Drawn:	A. MAKHETI	Drawing Title:	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	Date:	FINAL DETAILED DESIGN
						Checked:	D. LIAMBILLA	Scale:	AS INDICATED		Drawing No:	WOTE-STD-002	
						Approved:	B. KIM	Sheet No.	1 of 1				
								Index No.					

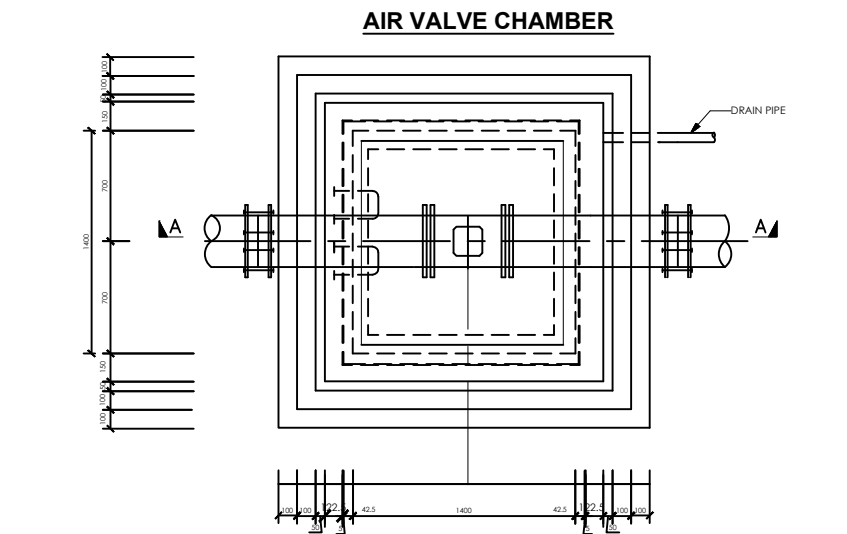


CONSTRUCTION DETAILS FOR VALVE CHAMBERS

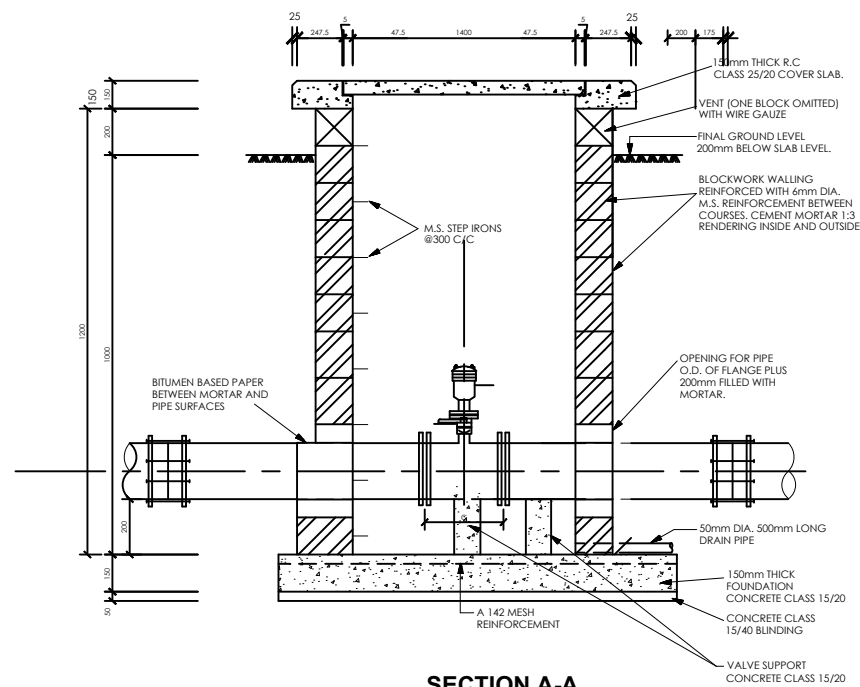
MAINS DIAMETER (mm)	PLAN SIZE OF CHAMBER [INTERNAL DIMENSIONS] A(mm) x B(mm)
160	1400 x 1400
110	1400 x 1400
90	1400 x 1400
63	1400 x 1400

CHAMBER SIZE SCHEDULE FOR VARIOUS PIPE SIZES

REVISIONS		Consultant:	Employer:	Project Manager:	Designed:	Project:	Stage:
DESCRIPTION	DATE				A. MAKHETI		FINAL DETAILED DESIGN
					Drawn:		Date:
					A. MAKHETI		MARCH 2020
					Checked:		Drawing No.
					D. LIAMBILA	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	WOTE-STD-003
					Approved:	Drawing Title:	Scale:
					B. KIM	KAITI WATER SUPPLY: WATER DISTRIBUTION SYSTEM STANDARD DETAIL FOR SERVICE CONNECTION AIR VALVE & JUNCTION CHAMBER	AS INDICATED
							Sheet No.
							1 of 1
							Index No.

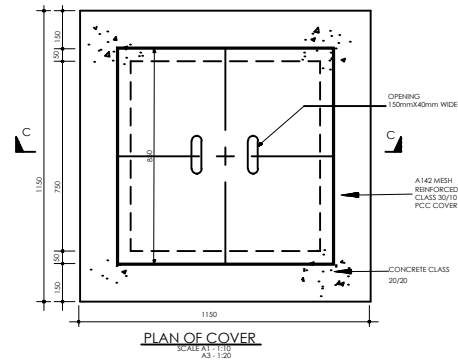


PLAN OF CHAMBER
SCALE 1:40

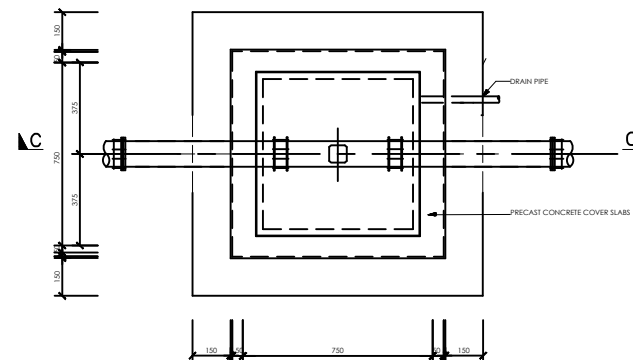


SECTION A-A
SCALE 1:40

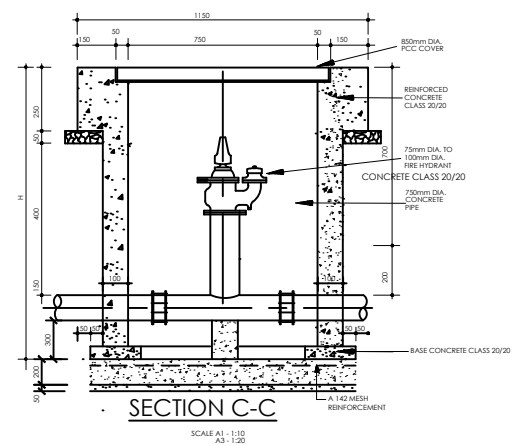
VALVE CHAMBER DETAIL FOR FIRE HYDRANT



PLAN OF COVER
SCALE A1-1:50
A3-1:30

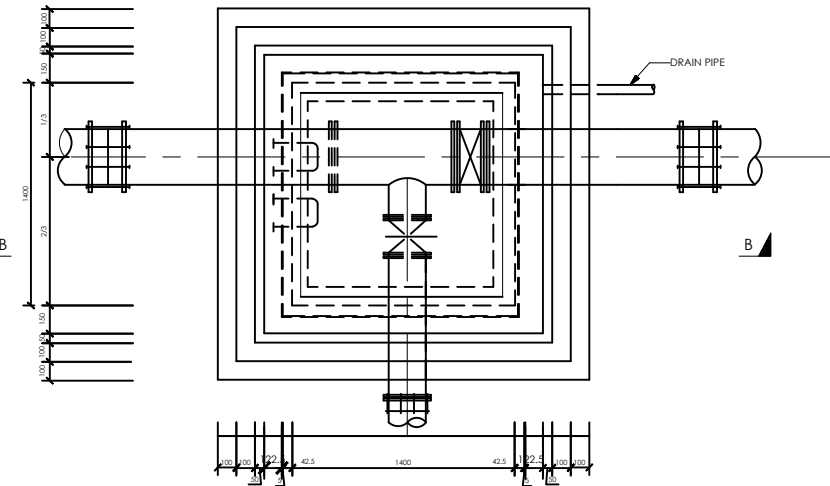


PLAN OF CHAMBER
SCALE 1:40

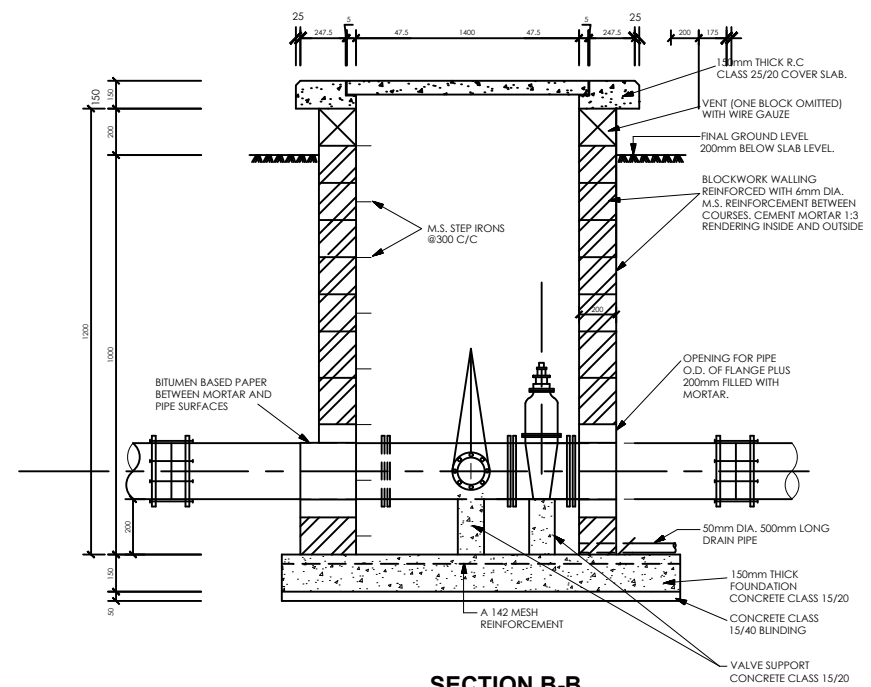


SECTION C-C
SCALE A1-1:50
A3-1:30

VALVE CHAMBER DETAIL FOR CONTROL VALVE

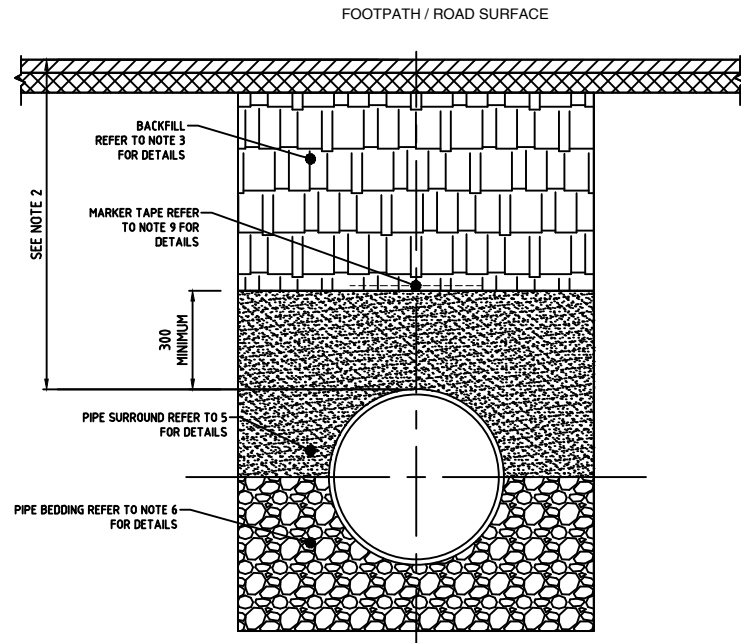


PLAN OF CHAMBER
SCALE 1:40

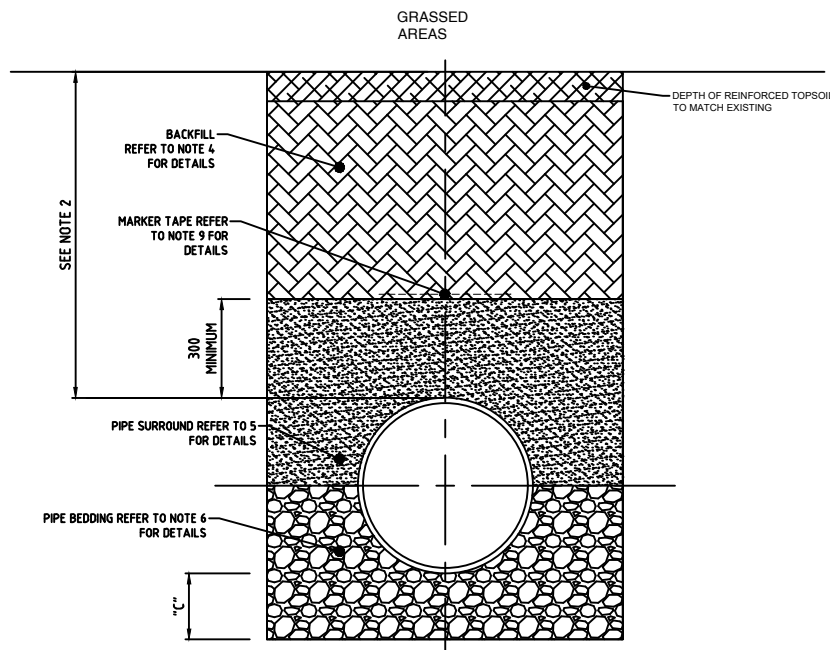


SECTION B-B
SCALE 1:40

REVISIONS		Consultant:	Employer:	Project Manager:	Designed:	Project:	Stage:
DESCRIPTION	DATE				A. MAKHETI		FINAL DETAILED DESIGN
					Drawn:		Date:
					A. MAKHETI		MARCH 2020
					Checked:		Drawing No:
					D. LIAMBILA	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	WOTE-STD-004
					Approved:	Drawing Title:	Scale:
					B. KIM	KAITI WATER SUPPLY: WATER DISTRIBUTION SYSTEM STANDARD DETAIL FOR SERVICE CONNECTION AV FH & VALVE CHAMBER	AS INDICATED
							Sheet No.
							1 of 1
							Index No.



TRENCH SECTION IN ROADWAYS



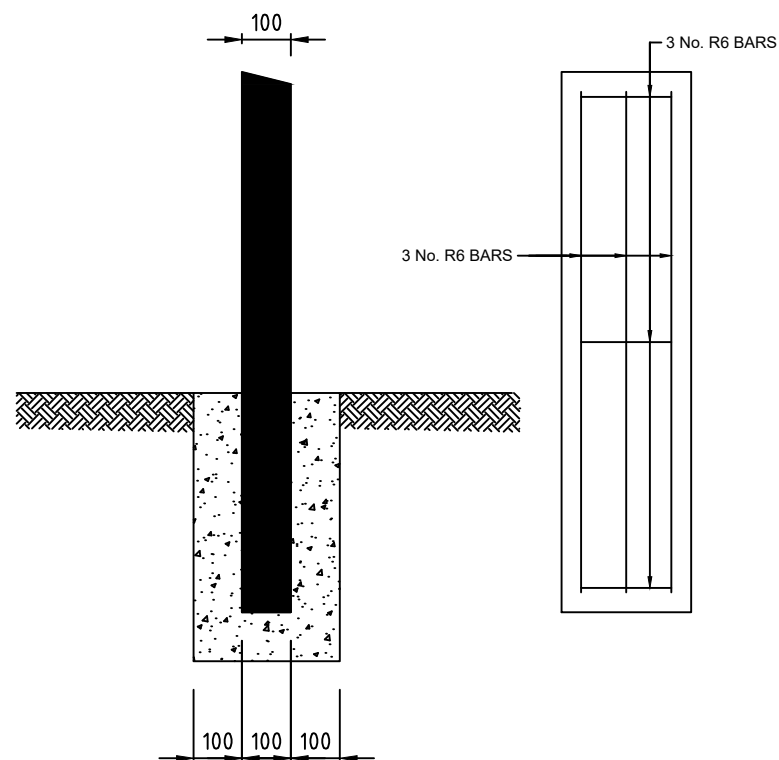
TRENCH SECTION IN GRASSED VERGE

- NOTES:**
- ALL DIMENSIONS ARE IN MILLIMETRES (mm) UNLESS NOTED OTHERWISE.
 - THE MINIMUM DEPTH OF COVER FROM THE FINISHED GROUND/ROAD LEVEL TO THE EXTERNAL CROWN OF THE PIPE SHALL BE 750mm FOR SERVICE CONNECTIONS AND 900mm FOR WATER MAINS. THE MAXIMUM COVER SHOULD NOT EXCEED 1,200mm.
 - THE BACKFILL MATERIAL SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS FOR ROAD WORKS WHERE THE WATER MAIN IS LOCATED IN ROADS, FOOTPATHS OR WHEN THE NEAREST PART OF THE TRENCH IS WITHIN 1m OF THE PAVED EDGE OF THE ROADWAY.
 - SELECTED EXCAVATED MATERIAL MAY BE USED IN GRASS VERGE ABOVE GRANULAR PIPE SURROUND MATERIAL SUBJECT TO THE APPROVAL OF THE ENGINEER.
 - PIPE SURROUND MATERIAL SHALL COMPLY WITH CLAUSE 2514 OF THE TECHNICAL SPECIFICATIONS.
 - PIPE BEDDING MATERIAL SHALL COMPLY WITH CLAUSE 2513 OF THE TECHNICAL SPECIFICATIONS.
 - PIPES SHALL NOT BE SUPPORTED ON STONES OR ROCKS, OR ANY HARD OBJECT AT ANY POINT ALONG THE TRENCH. ROCK SHALL BE EXCAVATED TO A DEPTH OF 150mm BELOW THE ACTUAL DEPTH OF THE TRENCH WITH THE VOID FILLED WITH APPROVED BACKFILL MATERIAL IN ACCORDANCE WITH CLAUSE 2516 OF THE TECHNICAL SPECIFICATIONS. THE GRANULAR MATERIAL SHALL BE LAID ABOVE THIS VOID BACKFILL MATERIAL.
 - SHOULD MINIMUM COVER NOT BE ACHIEVABLE, CONCRETE GRADE C15/20 SHALL BE USED AS BACKFILL MATERIAL.
 - MARKER TAPE TO BE 400mm WIDE BLUE POLYETHYLENE MATERIAL IN ACCORDANCE WITH EN 12163. MARKER TAPE TO BE LAID AT TOP OF PIPE BEDDING LAYER.

PIPE DIAMETER 'A' (mm)	TRENCH WIDTH 'B' (mm)
≤ 200	600
250	750
300	750
350	750
400	900
450	900

PIPE DIAMETER 'A' (mm)	DEPTH OF BEDDING 'C' (mm)
< 200	150
> 250	200

REVISIONS		Consultant:	Employer:	Project Manager:	Designed:	A. MAKHETI	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		Stage:	FINAL DETAILED DESIGN
DESCRIPTION	DATE				Drawn:	A. MAKHETI		KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA		Date:	MARCH 2020
					Checked:	D. LIAMBILA		KAITI WATER SUPPLY : STANDARD DRAWINGS		Drawing No.	WOTE-STD-005
					Approved:	B. KIM		TRENCH BACKFILLING DETAILS		Scale:	NOT TO SCALE
										Sheet No.	1 of 1
										Index No.	

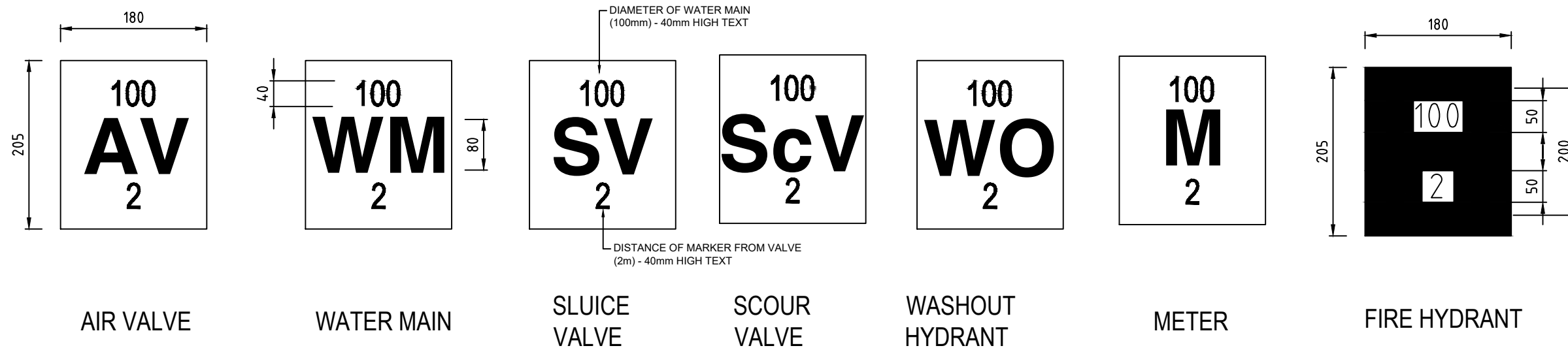
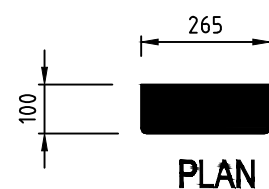






- NOTES:**
1. MARKER PLATES TO BE FIXED IN POSITION USING WALL PLUGS AND STAINLESS STEEL SCREWS.
 2. MARKER PLATES TO BE MANUFACTURED IN ACCORDANCE WITH BS 3251.
 3. FOR HYDRANT PLATE ALL CHARACTERS SHOULD BE BLACK AND THE REMAINDER OF THE FRONT FACE SHOULD CONFORM TO COLOUR REFERENCE No. 309 (CANARY 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.

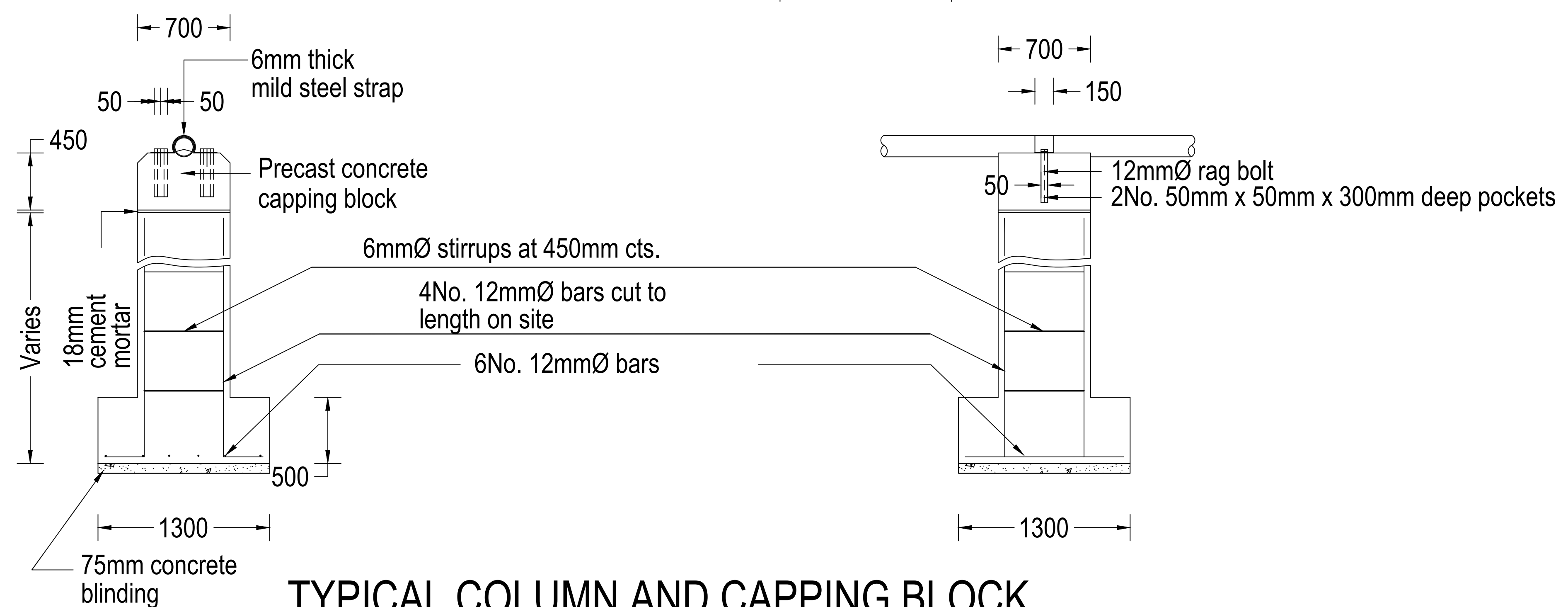
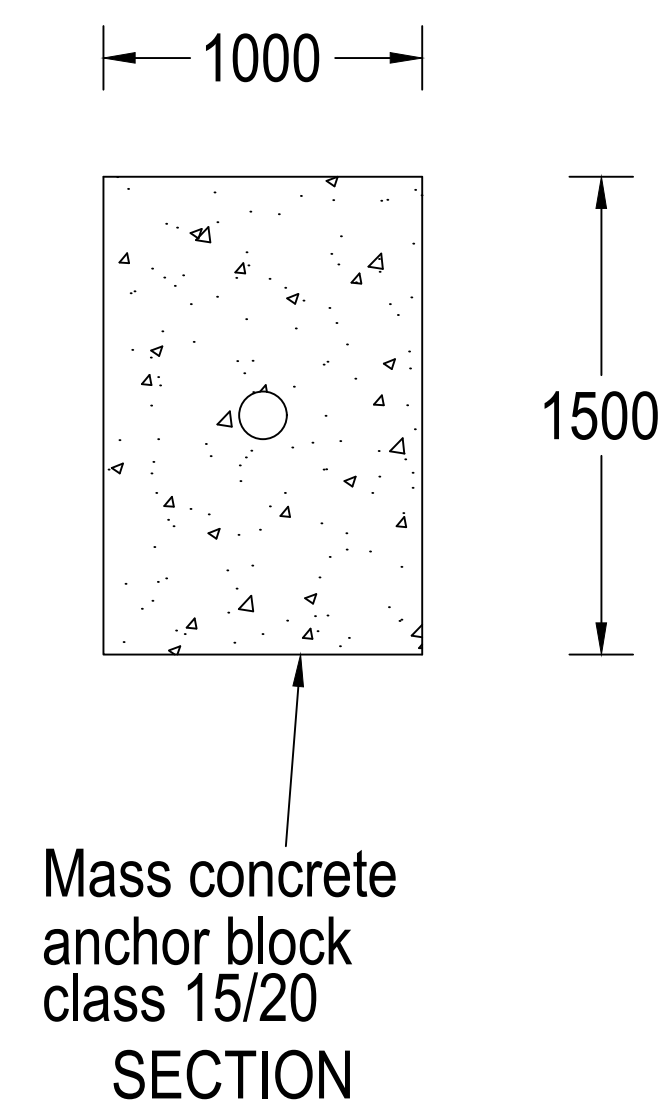
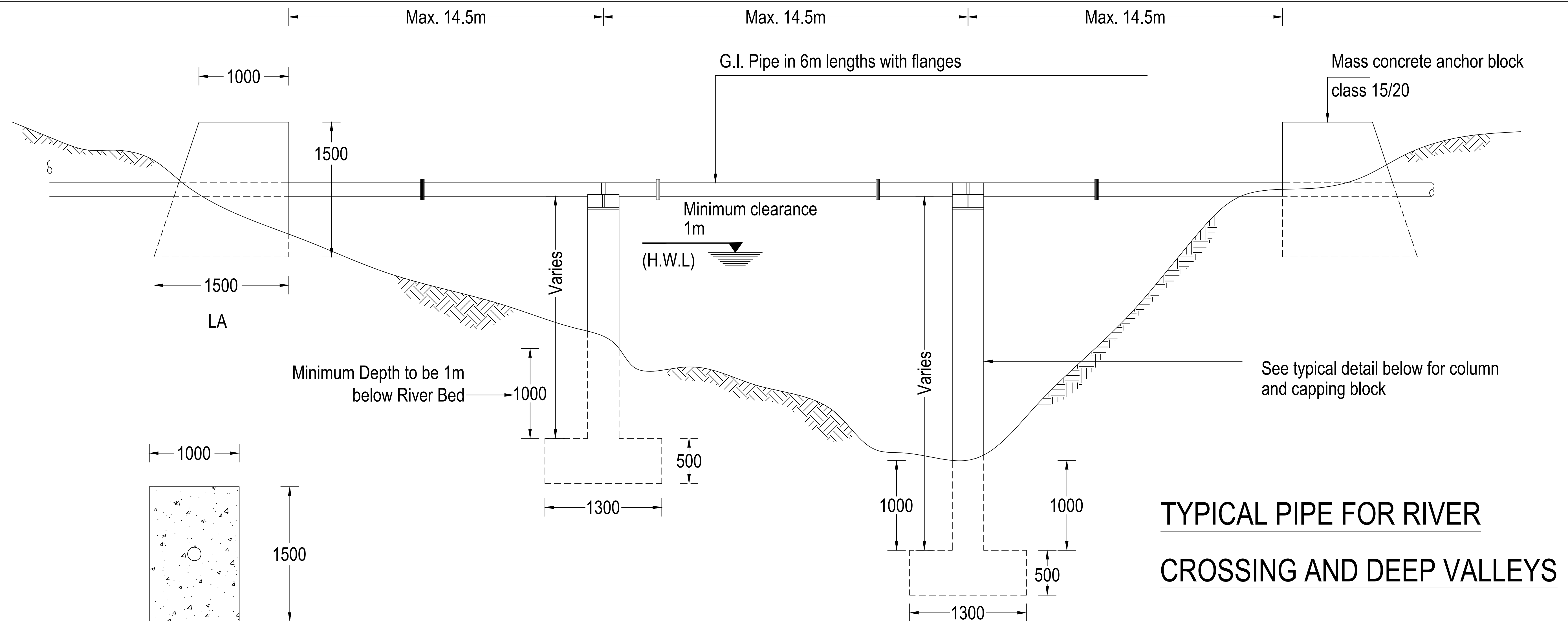
ELEVATION

SECTION

REINFORCEMENT DETAILS



REVISIONS		Consultant:	Employer:	Project Manager:	Designed:	A. MAKHETI	Project:	CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITIWI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA	Stage:	FINAL DETAILED DESIGN
DESCRIPTION	DATE					Drawn:				A. MAKHETI
		 <p>SAMAN CORPORATION 5,Byerooyanggangsa (sam)-ro, Gwancheon-eui, Gyeonggi-do, Korea Tel : (+82) 2 6488 8255 Fax: (+82) 6488 8080 E-mail: kitiimatuu@sam@gmail.com</p>	 <p>TERTIARY CONSULTING ENGINEERS LTD Mwangi Court, No. 34, Mwingi Rd., Kileleshwa. P.O. Box 45430 00100, Nairobi, Kenya +254 20 2727438 Email: tce@tertiary.co.ke</p>	 <p>ATHI WATER WORKS DEVELOPMENT AGENCY Private Bag-90200, Africa Re-Enter, Hospital Road Nairobi-Kenya Tel : +254 20 2727438 email: info@awsboard.go.ke</p>	 <p>TANATHI WATER WORKS DEVELOPMENT AGENCY Private Bag-90200, Along Kalawa Road, Kitui-Kenya Tel : +254 712351 104 email: info@tanathi.go.ke</p>		Drawing Title:	KAITI WATER SUPPLY WATER DISTRIBUTION SYSTEM STANDARD DETAIL FOR MARKER POSTS AND PLATES	Drawing No.	WOTE-STND-006
										Scale:
									Sheet No.	1 of 1
									Index No.	



NOTE

Minimum cover to reinforcement 25mm

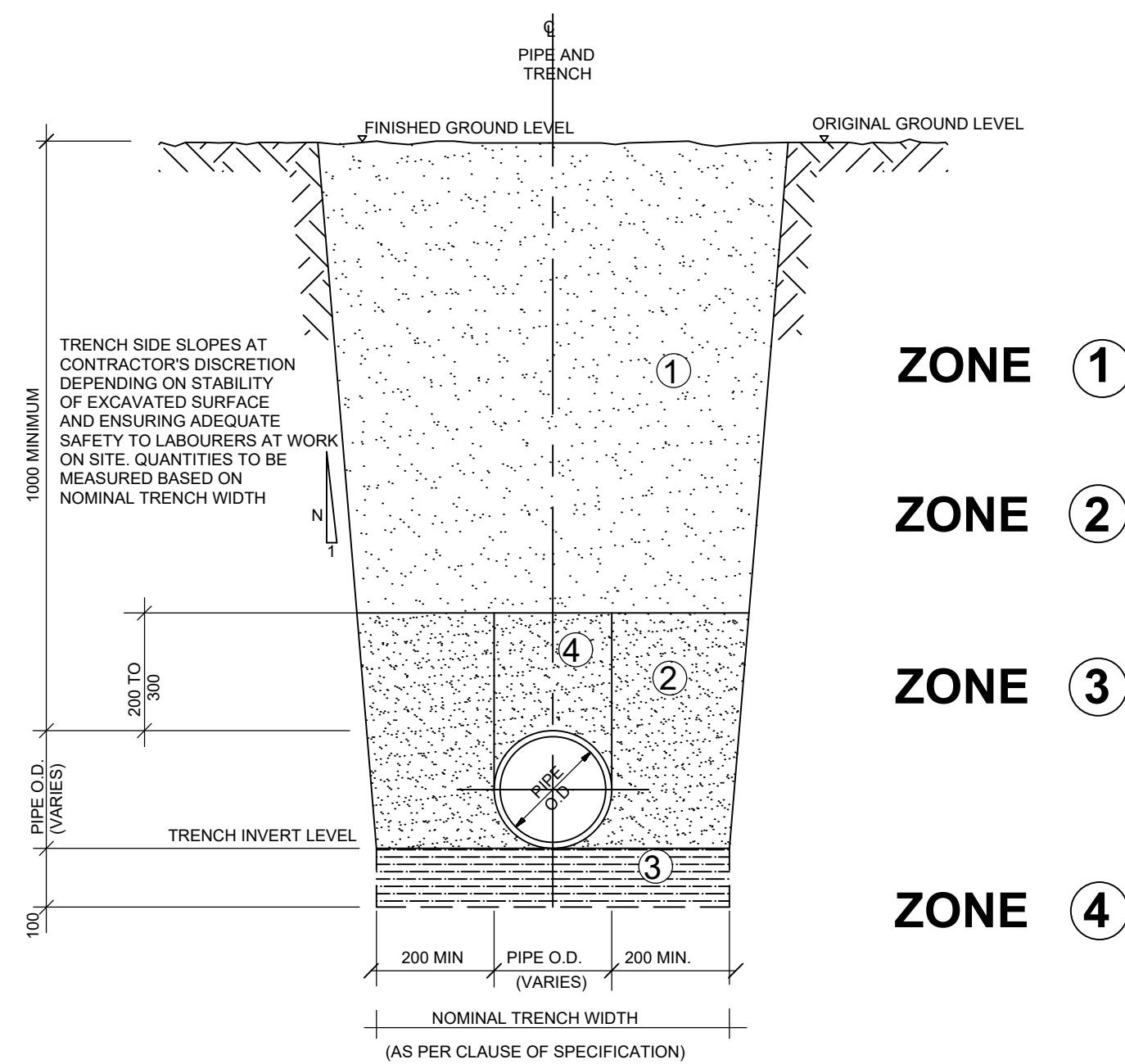
REVISIONS		Consultant:		Employer:		Project Manager:		Designed:		Project:		Stage:	
DESCRIPTION	DATE												
		saman		TERTIARY CONSULTING ENGINEERS LTD		TANATHI WATER WORKS DEVELOPMENT AGENCY		A. MAKHETI		CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUU LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANATHI WATER WORKS DEVELOPMENT AGENCY AREA		FINAL DETAILED DESIGN	
		5, Byeonyangsangga3(sam)-ro, Gwachon-si, Gyeonggi-do, Korea		P.O. Box 45283-00100, Nairobi, Kenya		Private Bag 90200, Kitui, Kenya		A. MAKHETI		KAITI WATER SUPPLY: STANDARD DRAWINGS FOR RIVER CROSSING		MARCH 2020	
		Tel: (+82) 2 6488 8255 Fax: (+82) 2 6488 8080		Tel: +254 20 2727438		Tel: +254 712351104		D. LIAMBILA				WOTE-STND-009	
		E-mail: kituimatusaman@gmail.com		Email: tce@tertiary.co.ke		email: info@tanathi.go.ke		B. KIM				AS INDICATED	
												1 of 1	
												Index No.	

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.



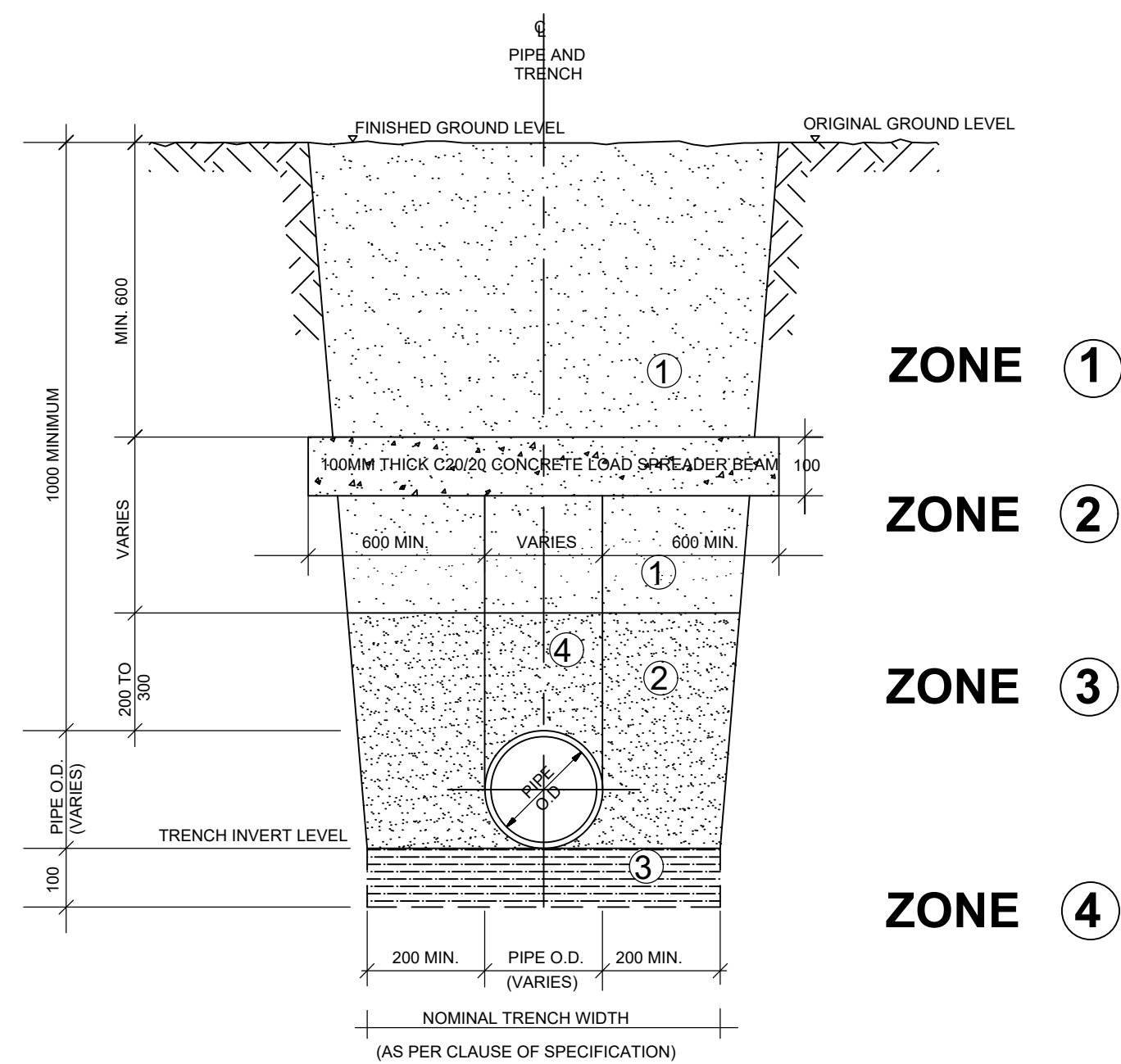
FRONT ELEVATION

REVISIONS		Consultant:		Employer:		Project Manager:		Designed:		Project:		CONSULTANCY SERVICES FOR DESIGN REVIEW AND SUPERVISION OF KITUI MATUO LAST MILE CONNECTIVITY OF WATER AND SANITATION WORKS IN TANANHAI WATER WORKS DEVELOPMENT AGENCY AREA		Stage:		FINAL DESIGN REVIEW	
DESCRIPTION	DATE		And 	 ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 4528-00100, Africa Rd Center, Hospital Road Nairobi-Kenya Tel: +254 20 2727348 0254 202 169864		 TANANHAI WATER WORKS DEVELOPMENT AGENCY Private Bag 9020, K.I.D P Building, Along Kalawa Road, Kitui-Kenya Tel: +254 20 712351 104 0254 202 169864		Drawn:		Drawing Title:		KATU WATER SUPPLY PROJECT PUBLICITY SIGNBOARD		Drawing No.		WOTE-STND-010	
								Checked:		Scale:				AS INDICATED			
								Approved:		Sheet No.				1 of 1			
										Index No.							
		SAMAN CORPORATION 5,Byonyonyanganga3,(sam)ro, Gwacheon-si, Gyeonggi-do, Korea Tel: (+82) 2 6488 8226 Fax: (+82) 2 6488 8380 E-mail: kitumatutasaman@gmail.com		TERTIARY CONSULTING ENGINEERS LTD Mwingi Court, No. 34, Mwingi Rd, Kileleshwa, P.O. Box 48439 00100, Nairobi, Kenya. Tel: +254 202 169864 Email: tce@tertiary.co.ke													



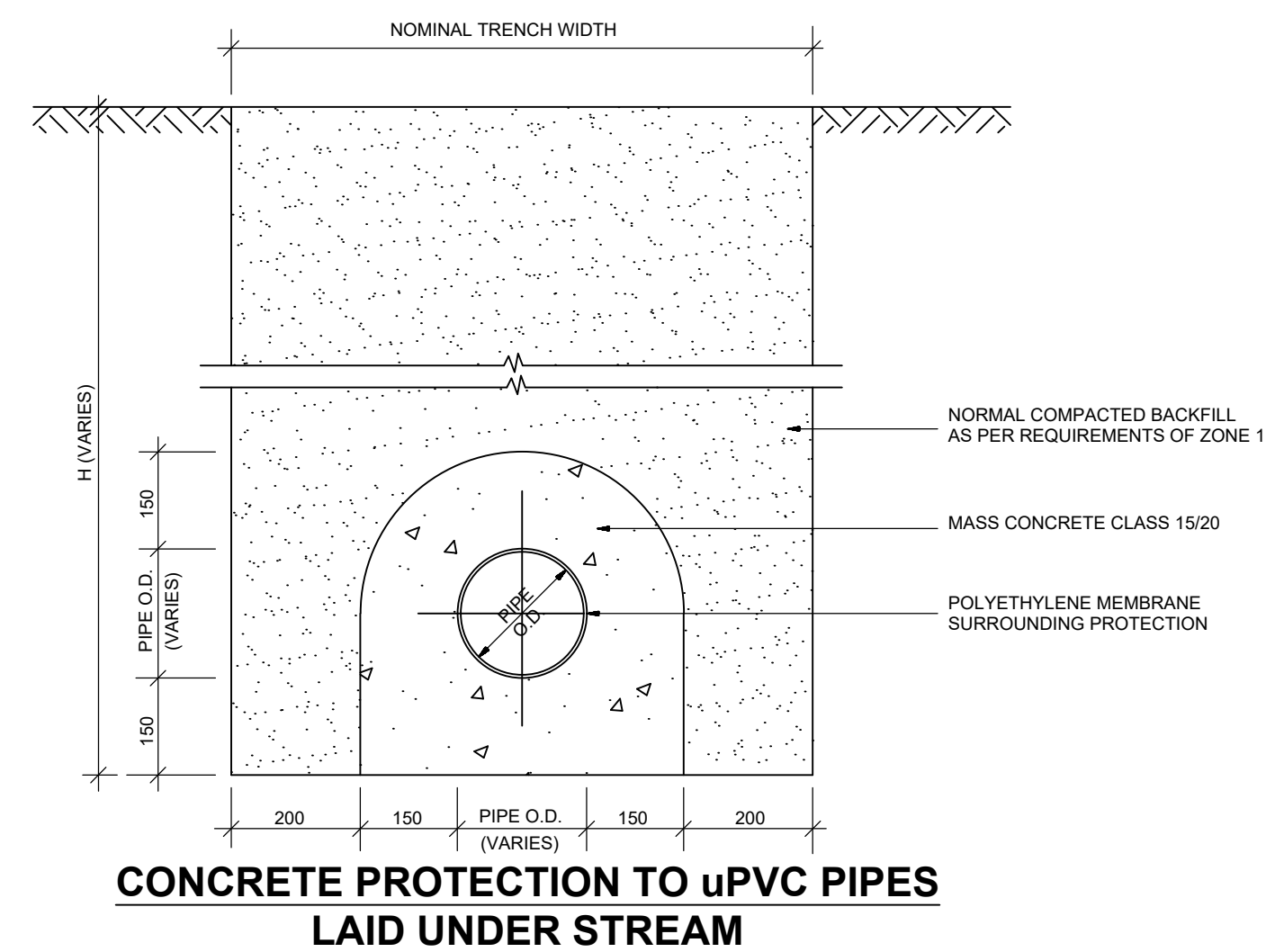
**TYPICAL TRENCH DETAIL FOR RETICULATION PIPES
(uPVC OR CEMENT LINED FERROUS PIPES)**

SCALE 1:100



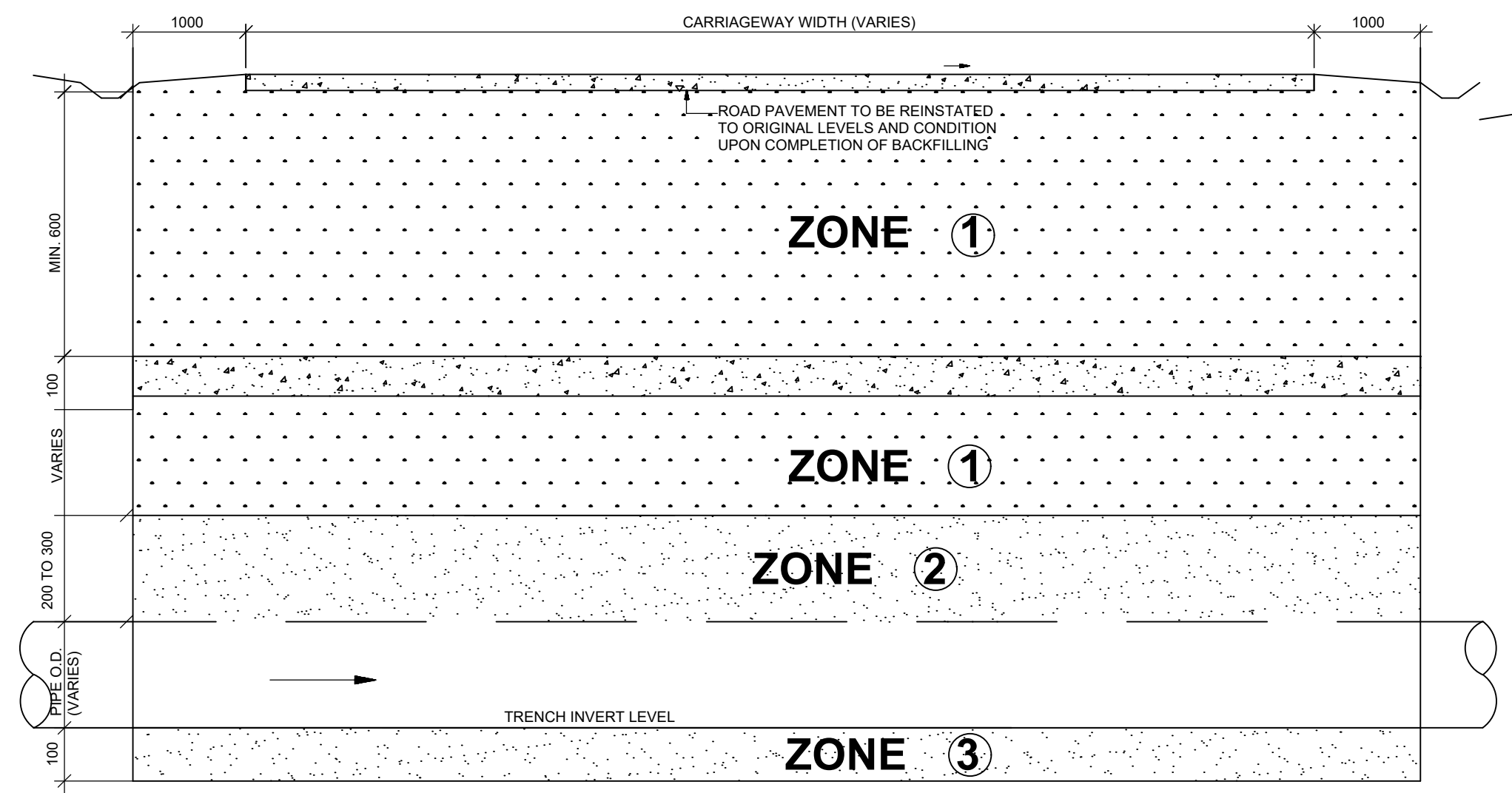
**TYPICAL TRENCH DETAIL SHOWING PIPE PROTECTION
(uPVC OR CEMENT LINED FERROUS PIPES)**

SCALE 1:100



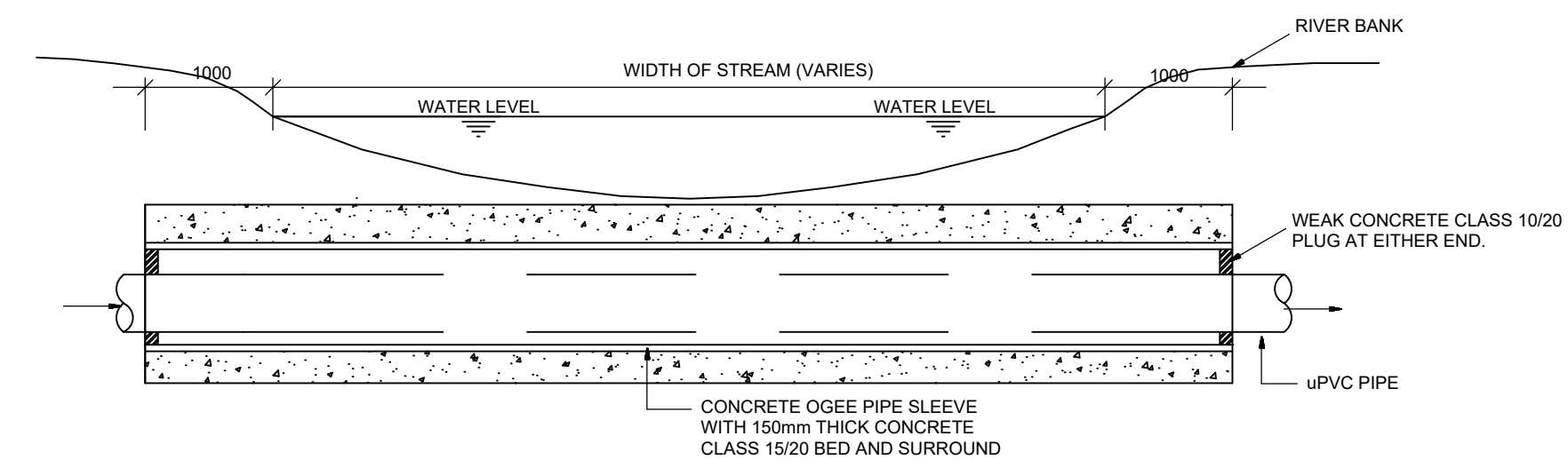
**CONCRETE PROTECTION TO uPVC PIPES
LAID UNDER STREAM**

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

SOIL TO BE USED MAY INCLUDE FREE-DRAINING COARSE SAND, GRAVEL, LOAM AND SOIL OF A FRIABLE NATURE. PARTICLE SIZE NOT TO EXCEED 20mm.

BACKFILL IN LAYERS NOT EXCEEDING 300mm UP TO FINISHED GROUND LEVEL, EACH LAYER BEING WELL COMPACTED TO LIMIT VOIDS.

MECHANICAL COMPACTION EQUIPMENT MAY BE USED IF APPROVED BY ENGINEER.

BACKFILL WITH SOIL APPROVED BY THE ENGINEER, IN LAYERS NOT EXCEEDING 200mm.

THOROUGHLY COMPACT SOIL, TAMPING EQUALLY ON EITHER SIDE AND ALONG LOWER EDGE OF PIPE. ONLY HAND TAMPING TO BE USED





IF ROCK SHARP PROJECTIONS, TREE ROOTS OR OTHER UNSUITABLE MATERIAL IS ENCOUNTERED AT TRENCH INVERT LEVEL, A FURTHER 100mm DEPTH OF MATERIAL IS TO BE EXCAVATED.

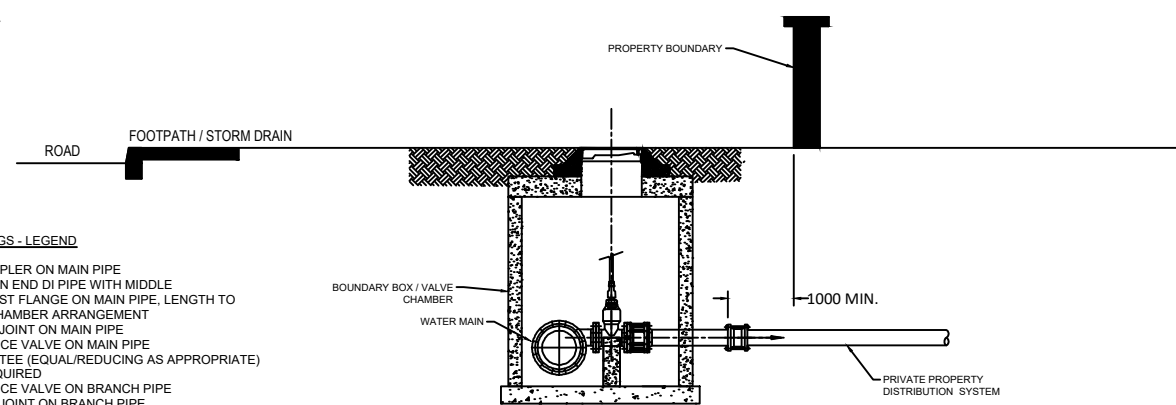
BACKFILL WITH SOIL APPROVED BY THE ENGINEER UP TO TRENCH INVERT LEVEL.

THOROUGHLY COMPACT SOIL BY HAND TO GIVE A UNIFORM GRADIENT ALONG PIPE TRENCH, LEAVING RECESSES FOR PIPE JOINTS.

SIMILAR REQUIREMENTS TO ZONE 2 EXCEPT NO EXCESS TAMPING IS PERMITTED OVER PIPE.





REVISIONS		Consultant:				Employer:		Project Manager:		Designed:	A. MAKHETI	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	Stage:	FINAL DETAILED DESIGN		
DESCRIPTION	DATE									Drawn:	A. MAKHETI			Date:	MARCH 2020		
										Checked:	D. LIAMBILA			Drawing No.:	WOTE-STND-011		
										Approved:	B. KIM			Scale:	AS INDICATED		
														Drawing Title:	Sheet No.:	1 of 1	
															Index No.:		

	<p>SAMAN CORPORATION 5 Byemba Road, Samanjiro, Gwachene-si, Gyeonggi-do, Korea Tel: (+82) 2 6488 8255 Fax: (+82)2 6488 8080 E-mail: kitumatusaman@gmail.com</p>	And		<p>TERTIARY CONSULTING ENGINEERS LTD Mwingi Court, No. 34, Mwingi, Kilileleshwa, P. O. Box 46439 00100, Nairobi, Kenya. +254 202169864 Email: tce@tertiary.co.ke</p>
	<p>ATHI WATER WORKS DEVELOPMENT AGENCY P.O. Box 85283-00100, Africa Re Center, Hospital Road Nairobi-Kenya Tel: +254 20 2727438 email: info@awwboard.go.ke</p>			
	<p>TANATHI WATER WORKS DEVELOPMENT AGENCY Private Bag-90200, K.I.D.F Building, Along Kalawa Road, Kitui-Kenya Tel: +254 712351104 email: info@tanathi.go.ke</p>			



- PIPE WORK FITTINGS - LEGEND
- A. PE MAIN PIPE
 - B. FLEXIBLE COUPLER ON MAIN PIPE
 - C. FLANGED PLAIN END DI PIPE WITH MIDDLE PUDDLE/THRUST FLANGE ON MAIN PIPE, LENGTH TO SUIT VALVE CHAMBER ARRANGEMENT
 - D. DISMANTLING JOINT ON MAIN PIPE
 - E. FLANGED SLUICE VALVE ON MAIN PIPE
 - F. ALL FLANGED TEE (EQUAL/REDUCING AS APPROPRIATE)
 - G. TAPER AS REQUIRED
 - H. FLANGED SLUICE VALVE ON BRANCH PIPE
 - I. DISMANTLING JOINT ON BRANCH PIPE
 - J. FLANGED PLAIN END DI PIPE WITH PUDDLE/THRUST FLANGE ON BRANCH PIPE, LENGTH TO SUIT VALVE CHAMBER ARRANGEMENT
 - K. FLEXIBLE COUPLER ON MAIN PIPE
 - L. PE BRANCH PIPE

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

REVISIONS		Consultant:				Employer:				Project Manager:				Designed: A. MAKHETI		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		Stage: FINAL DETAILED DESIGN					
DESCRIPTION	DATE	 <p>SAMAN CORPORATION S.Byeongyongsangso(sam)-ro, Gwacheon-si, Gyeonggi-do, Korea Tel : (+82) 2 6468 8255 Fax: (+82)2 6468 8080 E-mail: kummat@saman@gmail.com</p>				And  <p>TERTIARY CONSULTING ENGINEERS LTD Mwingi Court, No. 34, Mwingi Rd, Kileleshwa. P. O. Box 40439 00100, Nairobi, Kenya. Tel: +254 20169864 Email: toe@tertiary.co.ke</p>				 <p>ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 45283-00100, Africa Re Center, Hospital Road Nairobi-Kenya Tel: +254 20 727438 email: info@awwboard.go.ke</p>				 <p>TANATHI WATER WORKS DEVELOPMENT AGENCY Private Bag 90200, K.L.D.P Building, Along Kadawa Road, Kitui-Kenya Tel: +254 20 712351 04 email: info@tanathi.go.ke</p>				Drawn: A. MAKHETI		Drawing Title: KAITI WATER SUPPLY: WATER DISTRIBUTION SYSTEM STANDARD DETAIL FOR SERVICE CONNECTION		Date: MARCH 2020	
										Checked: D. LIAMBILA		Drawing No. WOTE-STND-012											
										Approved: B. KIM		Scale: AS INDICATED											
																Sheet No. 1 of 1							
																Index No.							