

ATHI KILEMA TUNGUNI WATER PROJECT PHASE II MAKUENI COUNTY

PROPOSED WATER SUPPLY TO ATHI KILEMA TUNGUNI

DETAILED DESIGN :BOOK OF DRAWINGS

JANUARY 2024



Client

Chief Executive Officer
Makueni County Government
Water and sanitation Department
P.O. BOX 78-90300
Wote-Makueni, Kenya
email: info@makueni.go.ke.



CONSULTANT

Horicon Engineering Services Ltd
P.O. Box -00200
Nairobi.

LIST OF DRAWINGS			
S/NO	DESCRIPTION	DRAWING NUMBER	NUMBER OF PAGES
A			
GENERAL			
1.000	TITLE PAGE		1.000
2.000	LIST OF DRAWING	HES-2019-2023 S.01	1.000
3.000	LOCATION MAP	HES-2019-2023 S.02	1.000
B			
PIPELINE DETAILS			
RISING MAIN PIPELINE DETAILS			
4.000	GENERAL LAYOUT	HES-2019-2023 S.03	1.000
5.000	PLAN PROFILES	HES-2019-2023 S.04	10.000
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6.000	Mukononi Musingini Kamboo Layout	HES-2019-2023 S.06	1.000
7.000	Mukononi Kathyaka Nyayo shopping center Layout	HES-2019-2023 S.07	1.000
8.000	Mukononi Symule Layout	HES-2019-2023 S.08	1.000
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10.000	Washout manhole details	HES-2019-2023 S.10	1.000
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D			
TREATMENT PLANT			
11.000	FLOCCULATION PLAN LAYOUT	HES-2019-2023 S.15	1.000
12.000	FLOCCULATION TANK BEAM LAYOUT	HES-2019-2023 S.16	1.000
13.000	FLOCCULATION BEAM STRUCTURAL	HES-2019-2023 S.17	1.000
14.000	FLOCCULATION BAFFLE WALLS LAYOUT	HES-2019-2023 S.18	1.000
15.000	FLOCCULATION TANK SLAB RC DETAILS	HES-2019-2023 S.19	1.000
16.000	FLOCCULATION STAIRCASE RC DETAILS	HES-2019-2023 S.20	1.000
17.000	FLOCCULATION GRP LAYOUT	HES-2019-2023 S.21	1.000
18.000	FLOCCULATION WALKWAY SLAB SETALS	HES-2019-2023 S.22	1.000
E			
MUKONONI HILL TANK			
19.000	TANK LAYOUT	HES-2019-2023 S.23	1.000
20.000	TOP SLAB LAYOUT	HES-2019-2023 S.24	1.000
21.000	BOTTOM SLAB DETAILS	HES-2019-2023 S.25	1.000
22.000	SECTION AND PIPE WORK	HES-2019-2023 S.26	1.000
23.000	EXTERNAL RETAINING WALL RC DETAILS	HES-2019-2023 S.27	1.000
24.000	TOP SLAB RC DETAILS	HES-2019-2023 S.28	1.000
25.000	TOP SLAB BEAM LAYOUT	HES-2019-2023 S.29	1.000
26.000	TOP SLAB BEAM RC DETAILS	HES-2019-2023 S.30	1.000
F			
WATER KIOSK			
13.000	DETAILS	HES-2019-2023 S.31	1.000

NOTES:
1. Concrete Class: Foundation 25/20, Column 25/20, Ground Beam 25/20, Strip Footing 25/20 (i.e. Class 25N/mm² and Maximum Agg. Size 20mm)
2. Excavations to be inspected before blinding
3. All reinforcement to be inspected before concreting
4. Cover to Main Reinforcement: Foundations 50; Columns 25; Ground Beams 40; Strip Footing 50;
5. Dimensions to be read and not scaled
6. This drawing to be read in conjunction with Architectural Drawings

Revisions		
Date	Description	Remarks

Project:
ATHI KILEMA TUNGUNI
WATER PROJECT PHASE II

Client :



Chief Executive Officer
Makueni County Government
Water and sanitation
Department
P.O. BOX 76 50100
Wote, Makueni, Kenya
email: info@makueni.go.ke

Engineers:



Mima Centre, Othman Rd, Donholm,
2nd Floor, Suite 13
P.O. Box 961-00200, Nairobi
Tel: +254-20-5295085
Email: info@horzonengineering.com

Client:

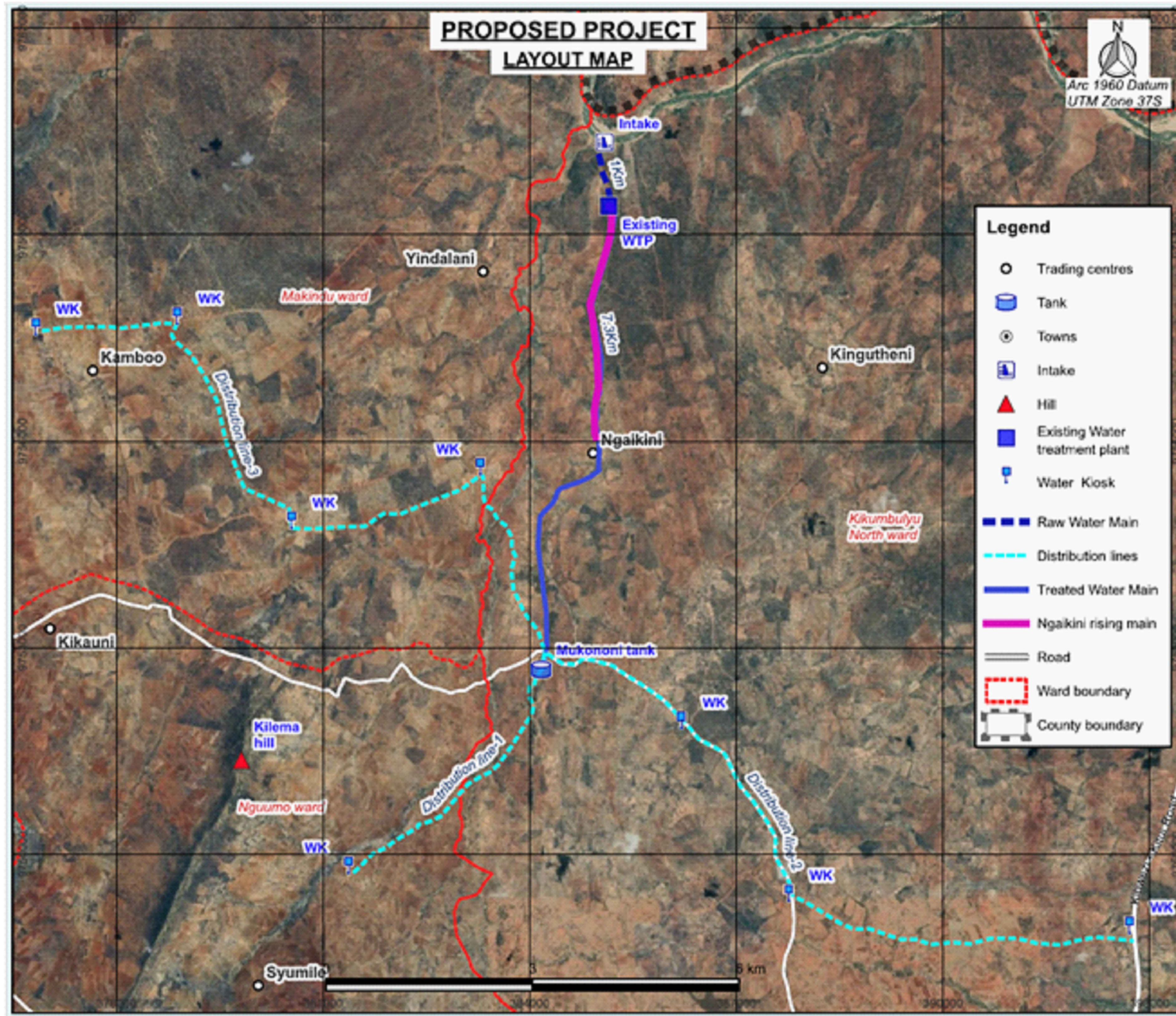
Owner

Drawing Title:
List of drawing

Designed by: A.G.N
Drawn by: A.G.N
Checked by: Eng. S. Muiruri
Approved by: Eng. S. Muiruri
Date: 9th October 2023

HES-009-2023
S.1

Scale:
as shown



- NOTES:**
1. Concrete Class: Foundation 25/20, Column 25/20, Ground Beam 25/20; Strip Footing 25/20 (i.e. Class 25N/mm² and Maximum Agg. Size 20mm)
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Revisions		
Date	Description	Remarks

Project:
ATHI KILEMA TUNGUNI
WATER PROJECT PHASE II

Client:

Chief Executive Officer
Makindu County Government
Water and Irrigation
Department
P.O. Box 178-00200
Wote-Makindu, Kenya
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Engineers:

Mine Centre, Quaking Rd, Donholm,
2nd Floor, Suite 13
P.O. Box 161 - 00200, Nairobi
Tel: +254 20 202020
Email: info@heseengineering.com

Client:
Owner

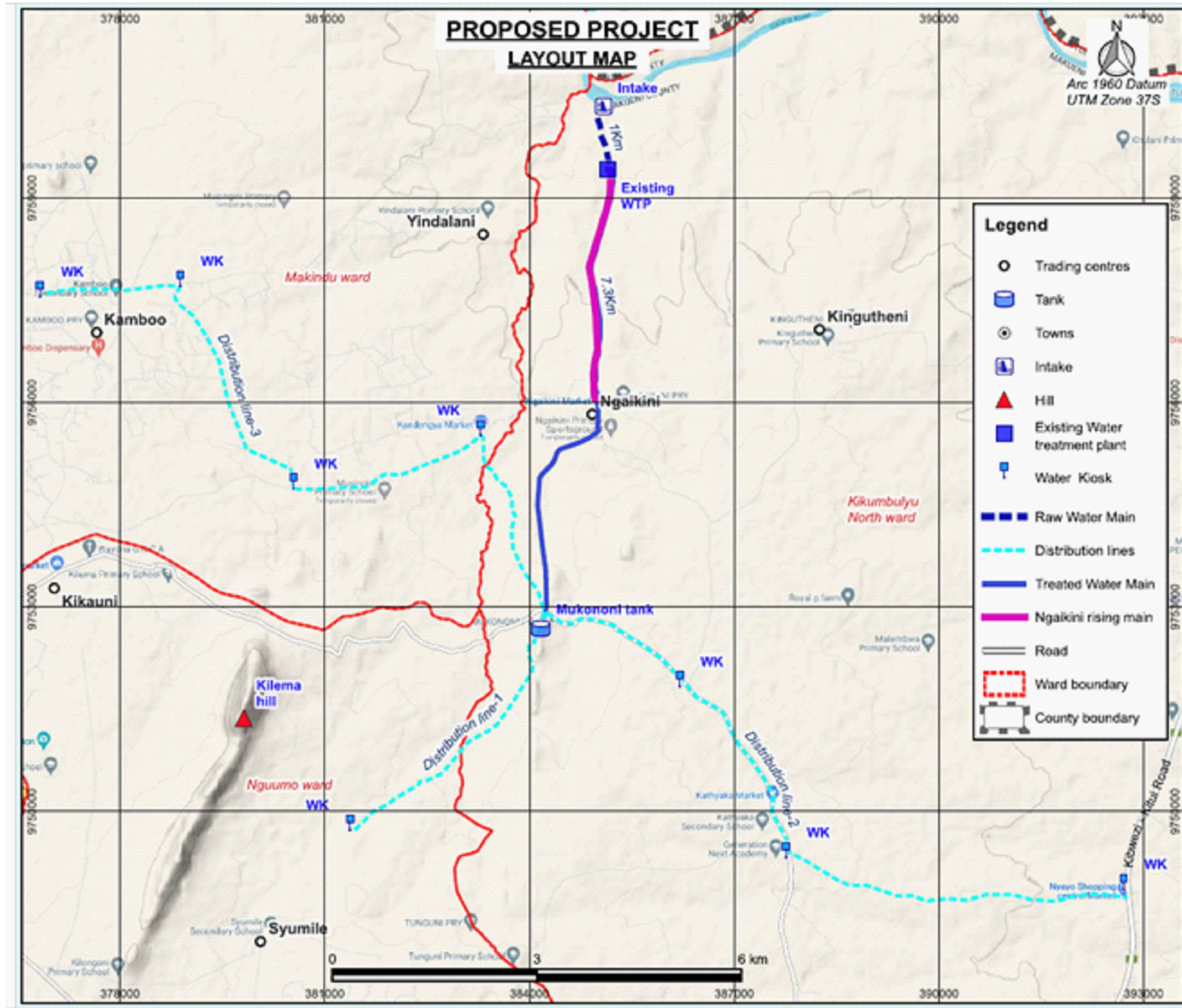
Drawing Title:
Location map

Designed by: A.G.N
 Drawn by: A.G.N
 Checked by: Eng. S. Muiruri
 Approved by: Eng. S. Muiruri
 Date: 9th October 2023

Drawing Title:
Location map

HES-009-2023
S.02

Scale:
as shown



- NOTES:**
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WATER PROJECT PHASE II

Client:



Chief Executive Officer
Makindu County Government
Water and Irrigation
Department
P.O. Box 79-10300
Wak-Makindu, Kenya
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Engineers:



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2nd Floor, Suite 13
P.O. Box 161-10300, Nairobi
Tel: +254 020 6290368
Email: info@hesonengineering.com

Client:

Owner

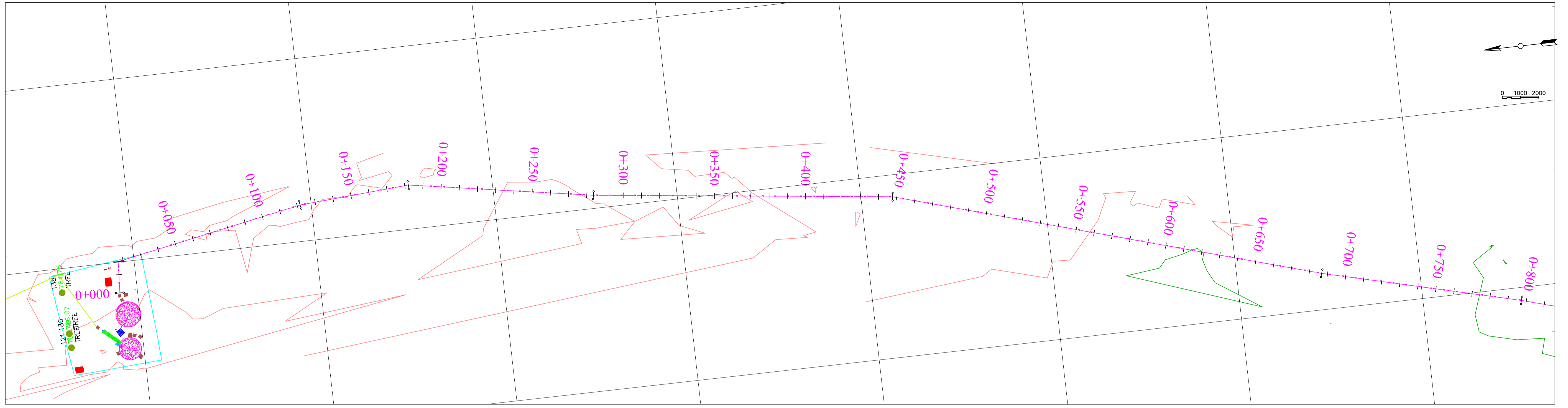
Drawing Title:
General layout

Designed by: A.G.N
Drawn by: A.G.N
Checked by: Eng. S. Muiruri
Approved by: Eng. S. Muiruri
Date: 9th October 2023

HES-009-2023
S.03

Scale:
as shown

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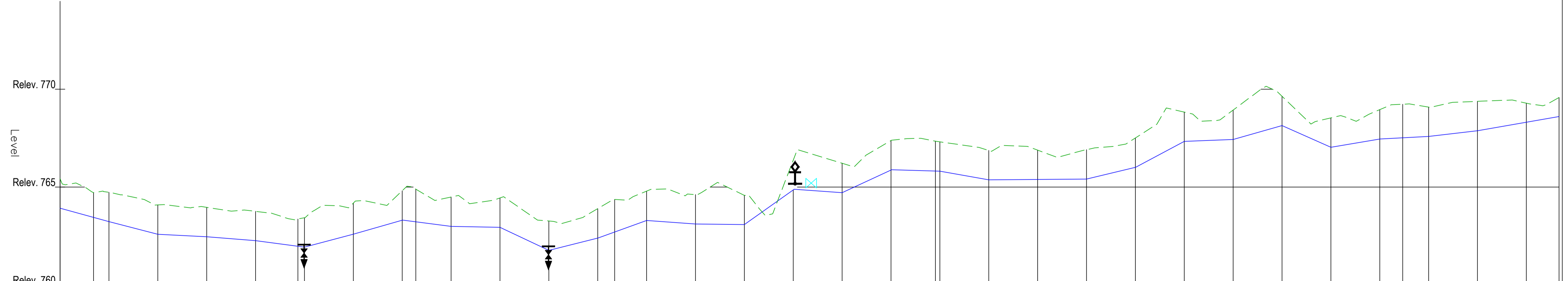


385100.000

TREATED MAIN PV - (237), DATUM: 760.000

- NOTES:**
1. VERTICAL EXAGGERATION IN PROFILE IS 10 TIMES THE HORIZONTAL SCALE.
 2. THIS DRAWING TO BE READ WITH ALL RELEVANT LAYOUTS PLAN AND STANDARD DRAWINGS.
 3. PIPE ROUTE TO BE ALIGNED TO MATCH THE FINAL WAYLEAVE.

- LEGEND:**
- ROAD NETWORK
 - PROPOSED WATER PIPE
 - NON RETURN VALVE (NRV)
 - PRV
 - PRESSURE REDUCING VALVE (PRV)
 - ISOLATING VALVE
 - AIR VALVE (AV)
 - WASHOUT (WO)
 - ZONAL METER
 - FIRE HYDRANT (FH)
 - BENCH MARK
 - HGL
 - HYDRAULIC GRADE LINE



CHAINAGES (M)	0+000	0+025	0+050	0+075	0+100	0+125	0+150	0+175	0+200	0+225	0+250	0+275	0+300	0+325	0+350	0+375	0+400	0+425	0+450	0+475	0+500	0+525	0+550	0+575	0+600	0+625	0+650	0+675	0+700	0+725	0+750	0+767	
GROUND LEVELS (Masl)	765.424	764.735	764.089	763.965	763.761	763.434	764.182	764.813	764.495	764.444	763.267	763.899	764.794	764.616	764.581	766.373	766.217	767.381	767.314	766.873	766.890	766.912	767.510	768.835	768.936	769.642	768.337	768.957	769.089	769.382	769.288	769.579	
INVERT LEVELS (Masl)	763.924	763.235	762.589	762.465	762.261	761.934	762.596	763.310	762.995	762.944	761.767	762.397	763.294	763.116	763.084	764.855	764.717	765.873	765.814	765.373	765.390	765.412	766.008	767.335	767.436	768.142	767.037	767.456	767.588	767.881	768.315	768.605	
TRENCH DEPTH (M)	1.50	1.50	1.50	1.50	1.50	1.50	1.59	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.52	1.50	1.51	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	0.97	0.97		
SIZE/TYPE OF PIPE & HGL	OD110 mm PN16 SDR 11																																
PIPE FITTINGS																																	
SLOPE (%)	-2.75%	-2.58%	-0.50%	-0.82%	-1.31%	2.65%	2.85%	-1.30%	-0.20%	-4.71%	2.52%	3.60%	-0.71%	-0.13%	7.08%	-0.71%	4.62%	-0.30%	-1.76%	0.07%	0.09%	2.38%	5.33%	0.40%	2.83%	-4.42%	1.68%	0.52%	1.17%	1.74%			

CLIENT
Makueni County Government Water and sanitation Department
P.O. Box 78 - 90300



REVISIONS	
DESCRIPTION	DATE

CONSULTANT:
Horicon Engineering Solutions Limited
Po Box 161-00300
Nairobi, Kenya

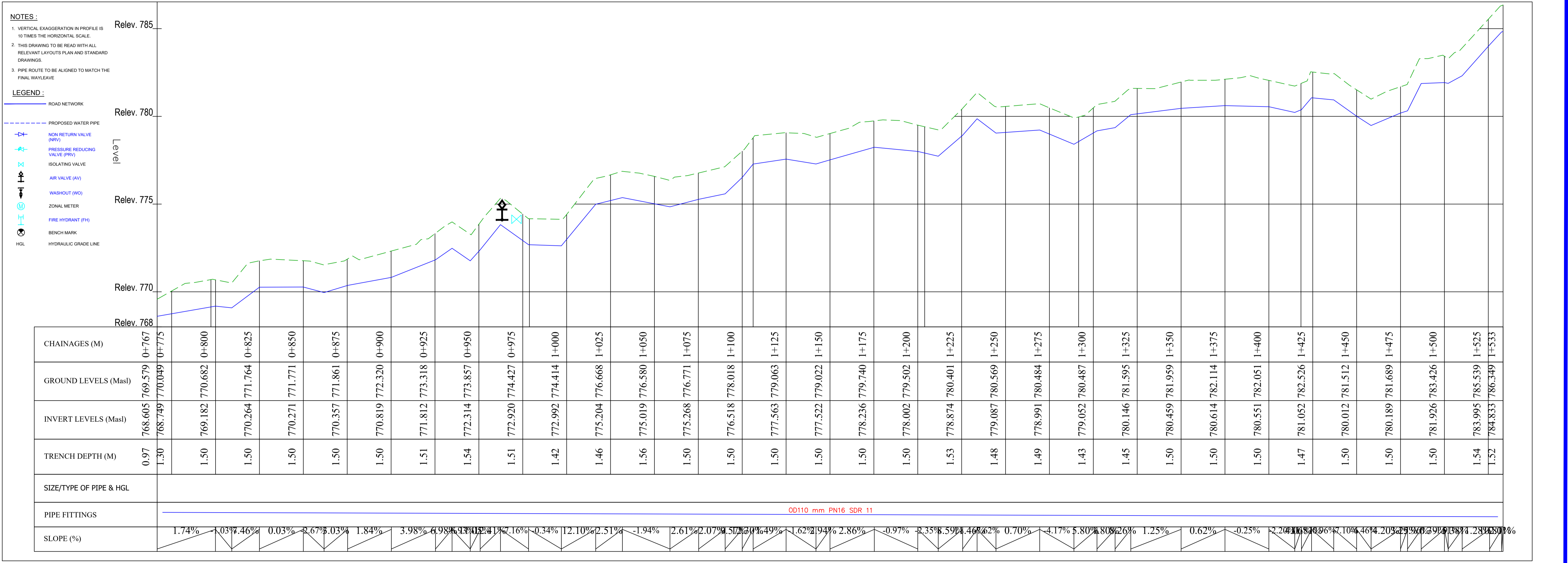
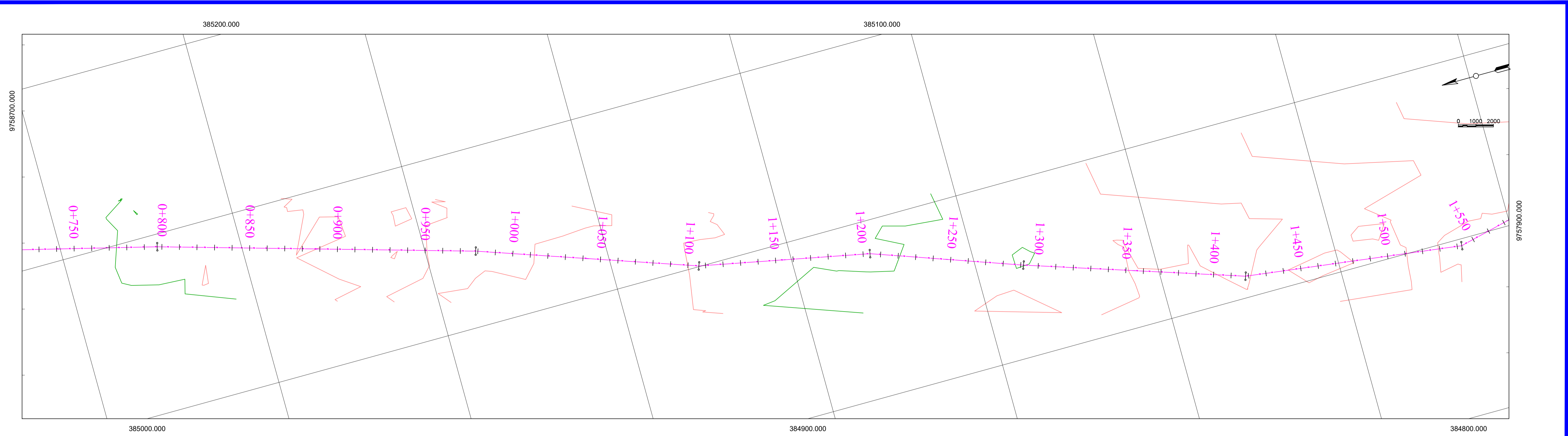


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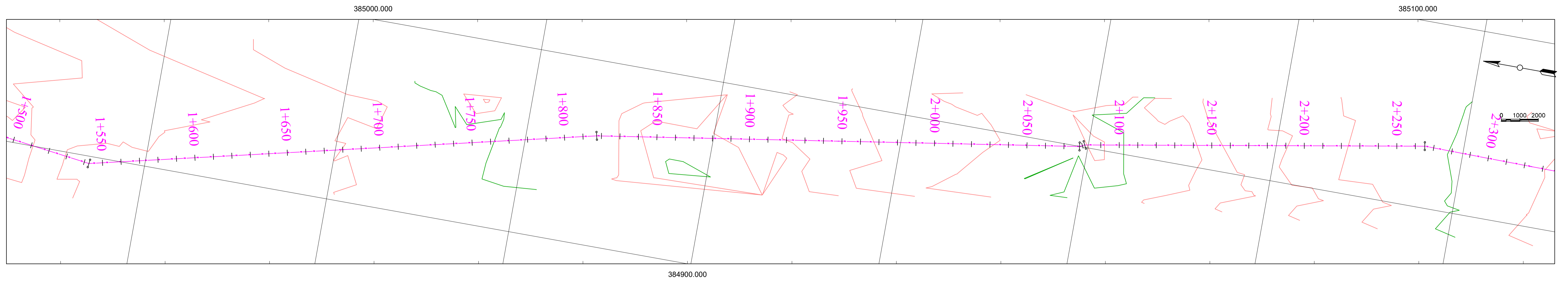
PROJECT
Athi Tunguni Water Project

TITLE:
PLAN PROFILE : RISING MAIN

DATE: NOV 2023
DRAWING NO: HES 2019-2025
SHEET NO: 1 OF 10



CLIENT Makueni County Government Water and sanitation Department P.O. Box 78 - 90300	REVISIONS		CONSULTANT : Horicon Engineering Solutions Limited Po Box 161-00300 Nairobi, Kenya	SCALES V:1:1000 H:1:100	PROJECT Athi Tunguni Water Project	TITLE: PLAN PROFILE : RISING MAIN	DATE: NOV 2023
	DESCRIPTION	DATE					DRAWING NO: HES 2019-2023 -04
							SHEET NO: 2 OF 10



NOTES:

1. VERTICAL EXAGGERATION IN PROFILE IS 10 TIMES THE HORIZONTAL SCALE.
2. THIS DRAWING TO BE READ WITH ALL RELEVANT LAYOUTS PLAN AND STANDARD DRAWINGS.
3. PIPE ROUTE TO BE ALIGNED TO MATCH THE FINAL WAYLEAVE.

LEGEND:

- ROAD NETWORK
- PROPOSED WATER PIPE
- NON RETURN VALVE (NRV)
- PRESSURE REDUCING VALVE (PRV)
- ISOLATING VALVE
- AIR VALVE (AV)
- WASHOUT (WO)
- ZONAL METER
- FIRE HYDRANT (FH)
- BENCH MARK
- HYDRAULIC GRADE LINE

Relev. 810
Relev. 805
Relev. 800
Relev. 795
Relev. 790
Relev. 785
Relev. 784

CHAINAGES (M)	1+533	1+550	1+575	1+600	1+625	1+650	1+675	1+700	1+725	1+750	1+775	1+800	1+825	1+850	1+875	1+900	1+925	1+950	1+975	2+000	2+025	2+050	2+075	2+100	2+125	2+150	2+175	2+200	2+225	2+250	2+275	2+300											
GROUND LEVELS (Masl)	784.833	786.534	786.299	786.460	787.040	787.306	787.805	788.383	788.927	789.334	790.474	791.258	791.731	791.275	791.536	792.700	794.512	795.472	796.207	796.353	797.657	798.775	799.788	799.538	800.849	803.605	805.275	806.647	808.047	809.282	809.789	810.773											
INVERT LEVELS (Masl)	784.833	785.034	784.799	784.960	785.540	785.806	786.305	786.883	787.424	787.834	788.974	789.758	790.231	789.734	790.037	791.199	792.944	793.962	794.704	794.853	796.049	797.275	798.363	798.935	799.346	802.023	803.759	805.122	806.527	807.782	808.236	809.269											
TRENCH DEPTH (M)	1.52	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.54	1.50	1.50	1.57	1.51	1.50	0.51	1.61	1.50	1.43	0.60	1.50	1.58	1.52	1.52	1.52	1.50	1.55	1.50											
SIZE/TYPE OF PIPE & HGL	OD110 mm PN16 SDR 11																																										
PIPE FITTINGS																																											
SLOPE (%)	2.01%	0.94%	0.64%	0.19%	0.07%	1.06%	2.00%	2.31%	3.32%	4.50%	1.64%	2.85%	2.00%	3.32%	1.3%	2.24%	4.86%	4.36%	4.14%	1.21%	4.69%	2.66%	1.22%	1.73%	3.38%	2.93%	0.58%	4.79%	4.90%	4.40%	2.29%	0.93%	4.79%	4.61%	6.68%	2.09%	8.24%	5.56%	0.31%	6.65%	1.35%	5.61%	2.46%

CLIENT
Makueni County
Government Water
and sanitation Department
P.O. Box 78 - 90300



REVISIONS	
DESCRIPTION	DATE

CONSULTANT:
Horicon Engineering Solutions
Limited
Po Box 161-00300
Nairobi, Kenya



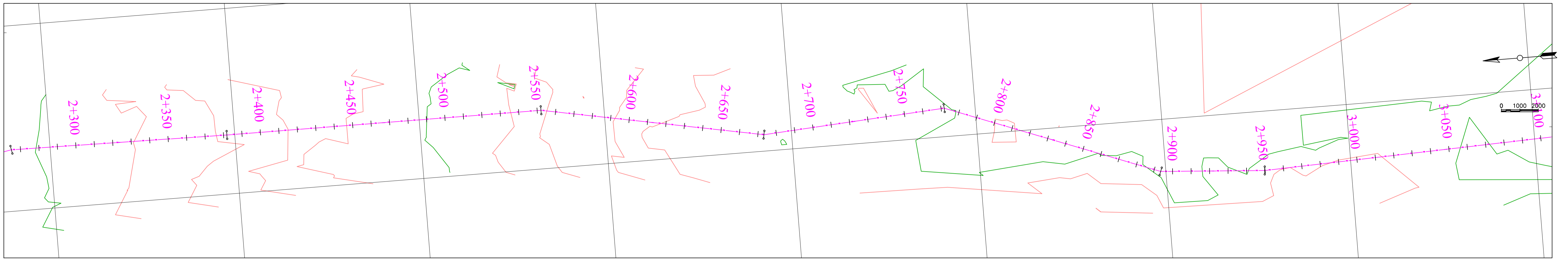
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PROJECT
Athi Tunguni Water Project

TITLE:
PLAN PROFILE : RISING MAIN

DATE: NOV 2023
DRAWING NO: HES 2019-2023
SHEET NO: 3 OF 10

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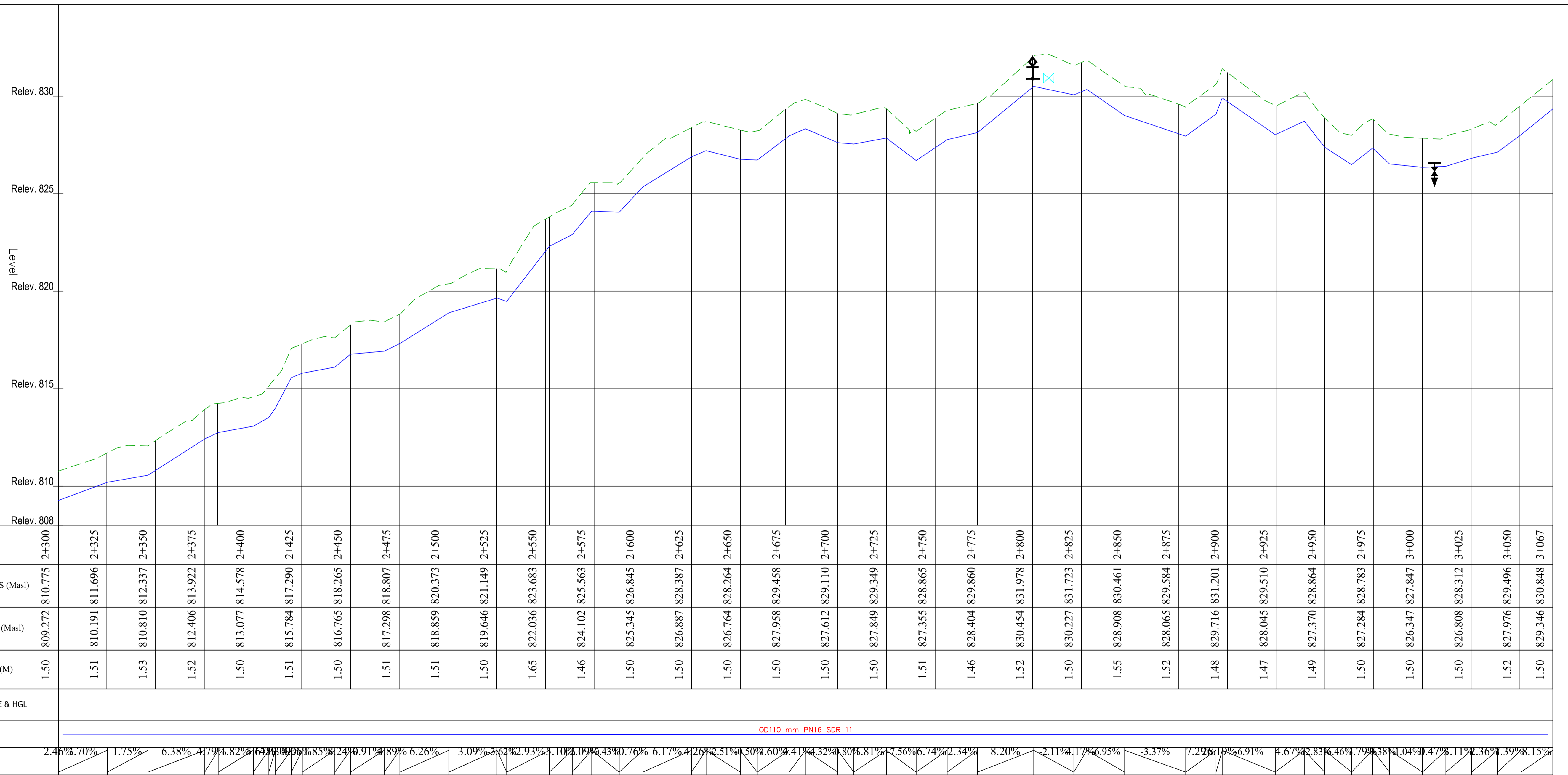


NOTES:

1. VERTICAL EXAGGERATION IN PROFILE IS 10 TIMES THE HORIZONTAL SCALE.
2. THIS DRAWING TO BE READ WITH ALL RELEVANT LAYOUTS PLAN AND STANDARD DRAWINGS.
3. PIPE ROUTE TO BE ALIGNED TO MATCH THE FINAL WAYLEAVE.

LEGEND:

- ROAD NETWORK
- PROPOSED WATER PIPE
- NON RETURN VALVE (NRV)
- PRESSURE REDUCING VALVE (PRV)
- ISOLATING VALVE
- AIR VALVE (AV)
- WASHOUT (WO)
- ZONAL METER
- FIRE HYDRANT (FH)
- BENCH MARK
- HYDRAULIC GRADE LINE



CLIENT
Makueni County Government Water and sanitation Department
P.O. Box 78 - 90300

REVISIONS	
DESCRIPTION	DATE

CONSULTANT:
Horicon Engineering Solutions Limited
Po Box 161-00300
Nairobi, Kenya

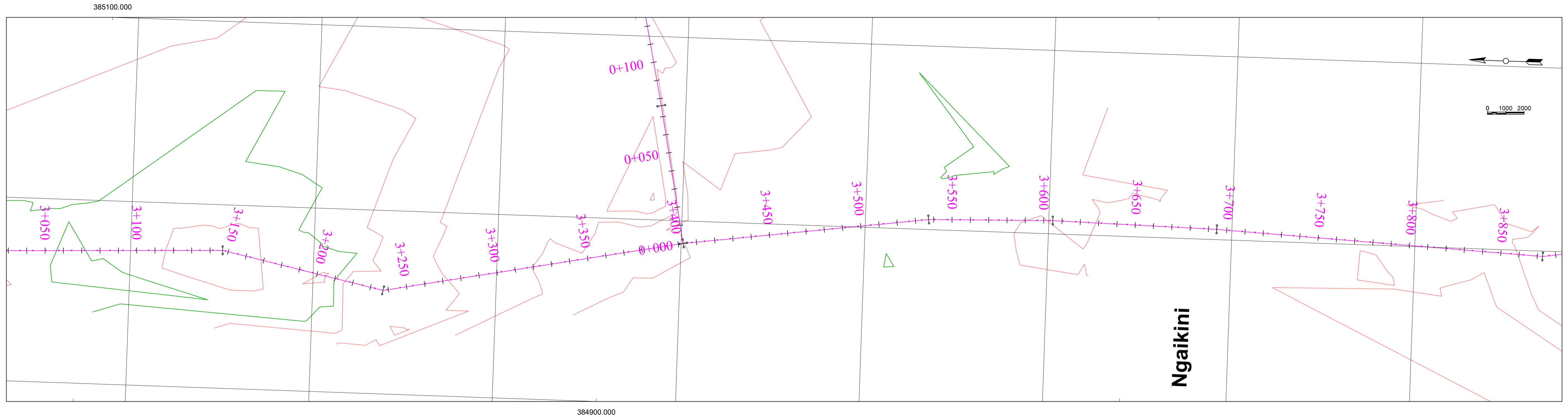
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PROJECT
Athi Tunguni Water Project

TITLE:
PLAN PROFILE : RISING MAIN

DATE: NOV 2023
DRAWING NO: HES 2019-2023 -04
SHEET NO: 4 OF 10





- NOTES:**
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- LEGEND:**
- ROAD NETWORK
 - PROPOSED WATER PIPE
 - NON RETURN VALVE (NRV)
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 - AIR VALVE (AV)
 - WASHOUT (WO)
 - ZONAL METER
 - FIRE HYDRANT (FH)
 - BENCH MARK
 - HGL

Relev. 840
Relev. 835
Relev. 830
Relev. 825
Relev. 824

CHAINAGES (M)	3+067	3+075	3+100	3+125	3+150	3+175	3+200	3+225	3+250	3+275	3+300	3+325	3+350	3+375	3+400	3+425	3+450	3+475	3+500	3+525	3+550	3+575	3+600	3+625	3+650	3+675	3+700	3+725	3+750	3+775	3+800	3+825	3+834	
GROUND LEVELS (Masl)	830.848	829.180	828.330	827.813	827.283	828.526	828.126	833.182	832.983	834.137	835.214	836.213	836.370	837.493	837.873	838.516	839.153	839.069	839.419	838.893	839.120	839.031	837.937	836.440	836.586	837.557	836.807	836.553	837.070	837.117	837.676	836.536	837.155	836.914
INVERT LEVELS (Masl)	829.346	827.476	826.829	826.313	825.783	827.026	826.611	831.677	831.483	832.629	833.707	834.707	834.774	835.993	836.394	837.014	837.651	837.569	837.919	837.393	837.620	837.529	836.440	836.586	836.057	835.316	835.069	835.570	835.619	836.176	835.139	835.627	835.362	
TRENCH DEPTH (M)	1.50	1.70	1.50	1.50	1.50	1.50	1.51	1.50	1.50	1.51	1.51	1.51	1.60	1.50	1.48	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.49	1.48	1.50	1.50	1.50	1.40	1.53	1.55	
SIZE/TYPE OF PIPE & HGL	00110 mm PN16 SDR 11																																	
PIPE FITTINGS																																		
SLOPE (%)	8.33%	4.02%	3.02%	-2.06%	-2.12%	1.26%	0.70%	0.83%	8.82%	8.82%	8.82%	8.82%	8.82%	8.82%	8.82%	8.82%	8.82%	8.82%	8.82%	8.82%	8.82%	8.82%	8.82%	8.82%	8.82%	8.82%	8.82%	8.82%	8.82%	8.82%	8.82%	8.82%	8.82%	8.82%

CLIENT
Makueni County
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and sanitation Department
P.O. Box 78 - 90300



REVISIONS	
DESCRIPTION	DATE

CONSULTANT:
Horicon Engineering Solutions
Limited
Po Box 161-00300
Nairobi, Kenya

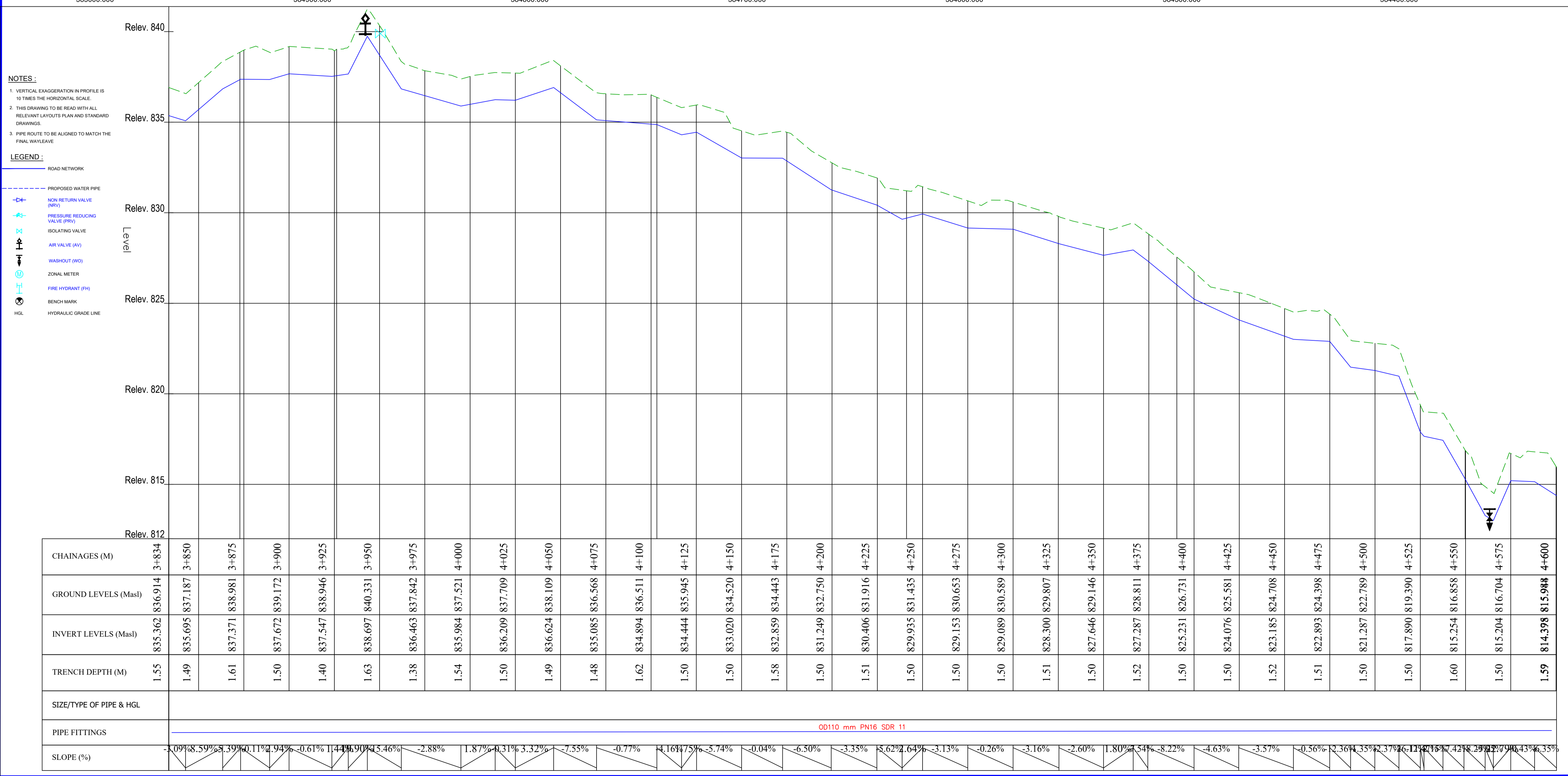
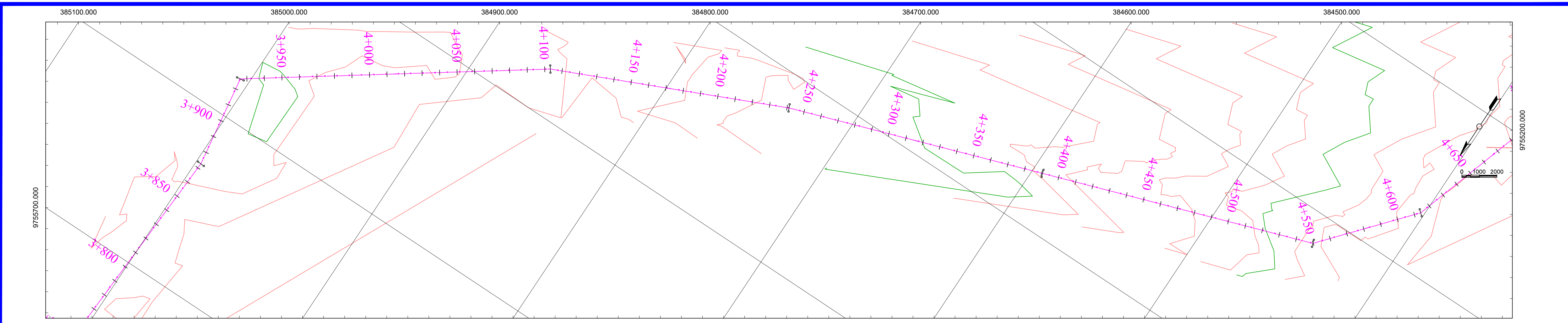


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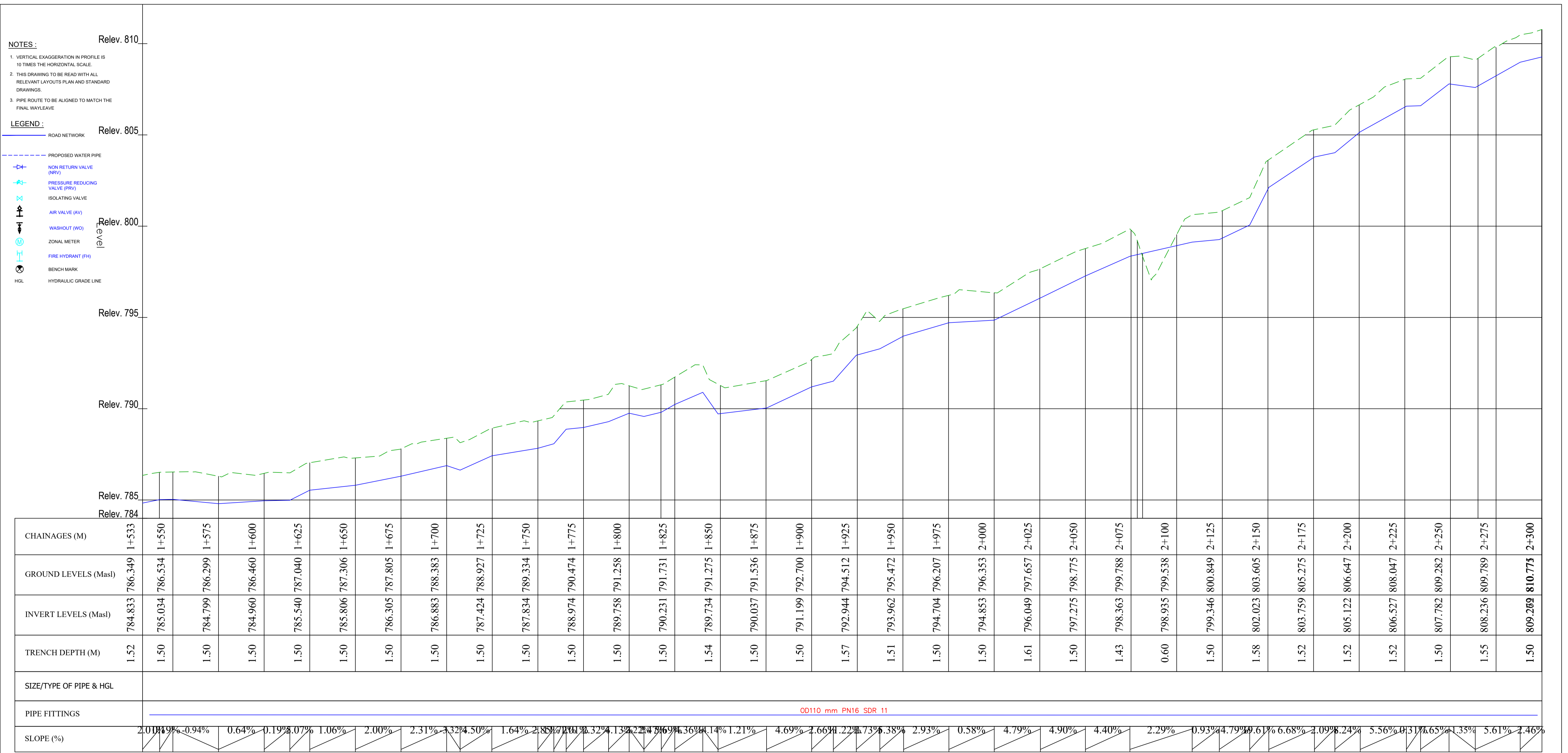
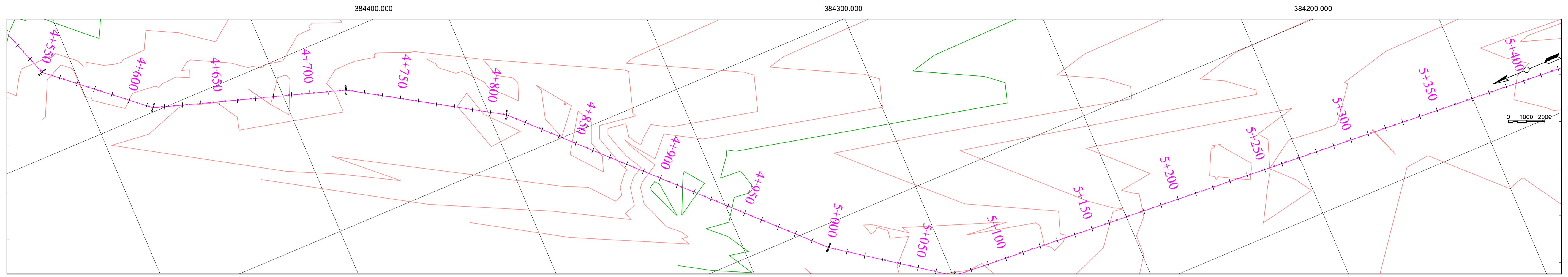
PROJECT
Athi Tunguni Water Project

TITLE:
PLAN PROFILE : RISING MAIN

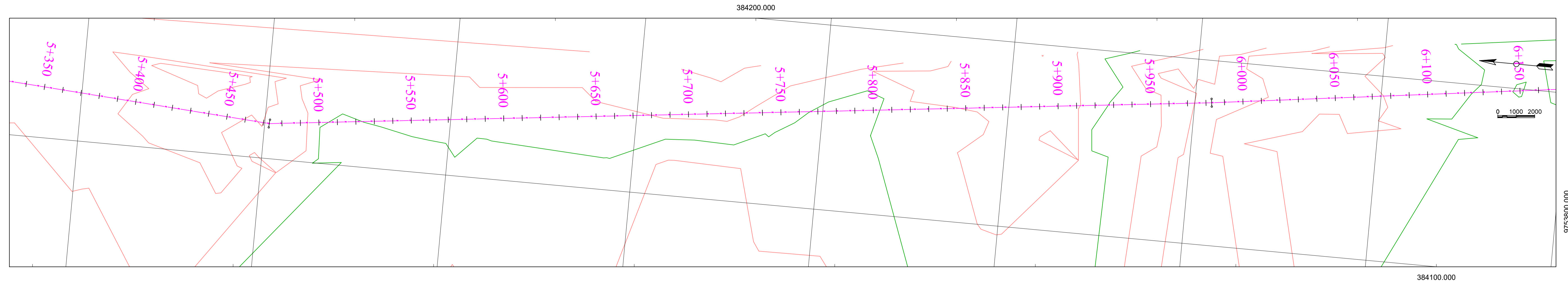
DATE: NOV 2023
DRAWING NO: HES 2019-2023
SHEET NO: 5 OF 10



CLIENT Makeni County Government Water and sanitation Department P.O. Box 78 - 90300	REVISIONS		CONSULTANT : Horicon Engineering Solutions Limited Po Box 161-00300 Nairobi, Kenya	SCALES V:1:1000 H:1:100	PROJECT Athi Tunguni Water Project	TITLE: PLAN PROFILE : RISING MAIN	DATE: NOV 2023
	DESCRIPTION	DATE					DRAWING NO: HES 2019-2023
							SHEET NO: 6 OF 10



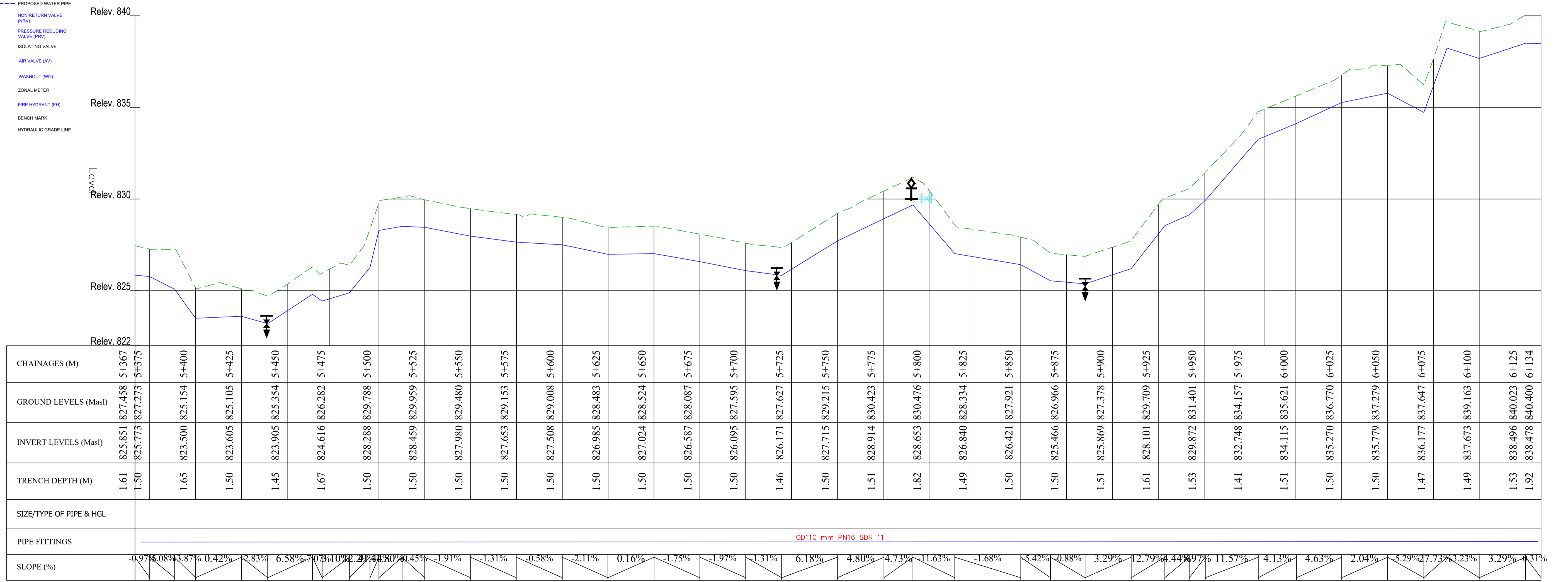
CLIENT Makueni County Government Water and sanitation Department P.O. Box 78 - 90300	REVISIONS		CONSULTANT : Horicon Engineering Solutions Limited Po Box 161-00300 Nairobi, Kenya	SCALES V:1:1000 H:1:100	PROJECT Athi Tunguni Water Project	TITLE: PLAN PROFILE : RISING MAIN	DATE: NOV 2023
	DESCRIPTION	DATE					DRAWING NO: HES 2019-2023
							SHEET NO: 7 OF 10



- NOTES:**
- VERTICAL EXAGGERATION IN PROFILE IS 10 TIMES THE HORIZONTAL SCALE.
 - THIS DRAWING TO BE READ WITH ALL RELEVANT LAYOUTS PLAN AND STANDARD DRAWINGS.
 - PIPE ROUTE TO BE ALIGNED TO MATCH THE FINAL WAYLEAVE

- LEGEND:**
- ROAD NETWORK
 - PROPOSED WATER PIPE
 - NON RETURN VALVE (NRV)
 - PRESSURE REDUCING VALVE (PRV)
 - ISOLATING VALVE
 - AIR VALVE (AV)
 - WASHOUT (WO)
 - ZONAL METER
 - FIRE HYDRANT (FH)
 - BENCH MARK
 - HGL
 - HYDRAULIC GRADE LINE

TREATED MAIN PV - (244),. DATUM: 822.000



CLIENT
Makueni County
Government Water
and sanitation Department
P.O. Box 78 - 90300



REVISIONS	
DESCRIPTION	DATE

CONSULTANT :
Horicon Engineering Solutions
Limited
Po Box 161-00300
Nairobi, Kenya

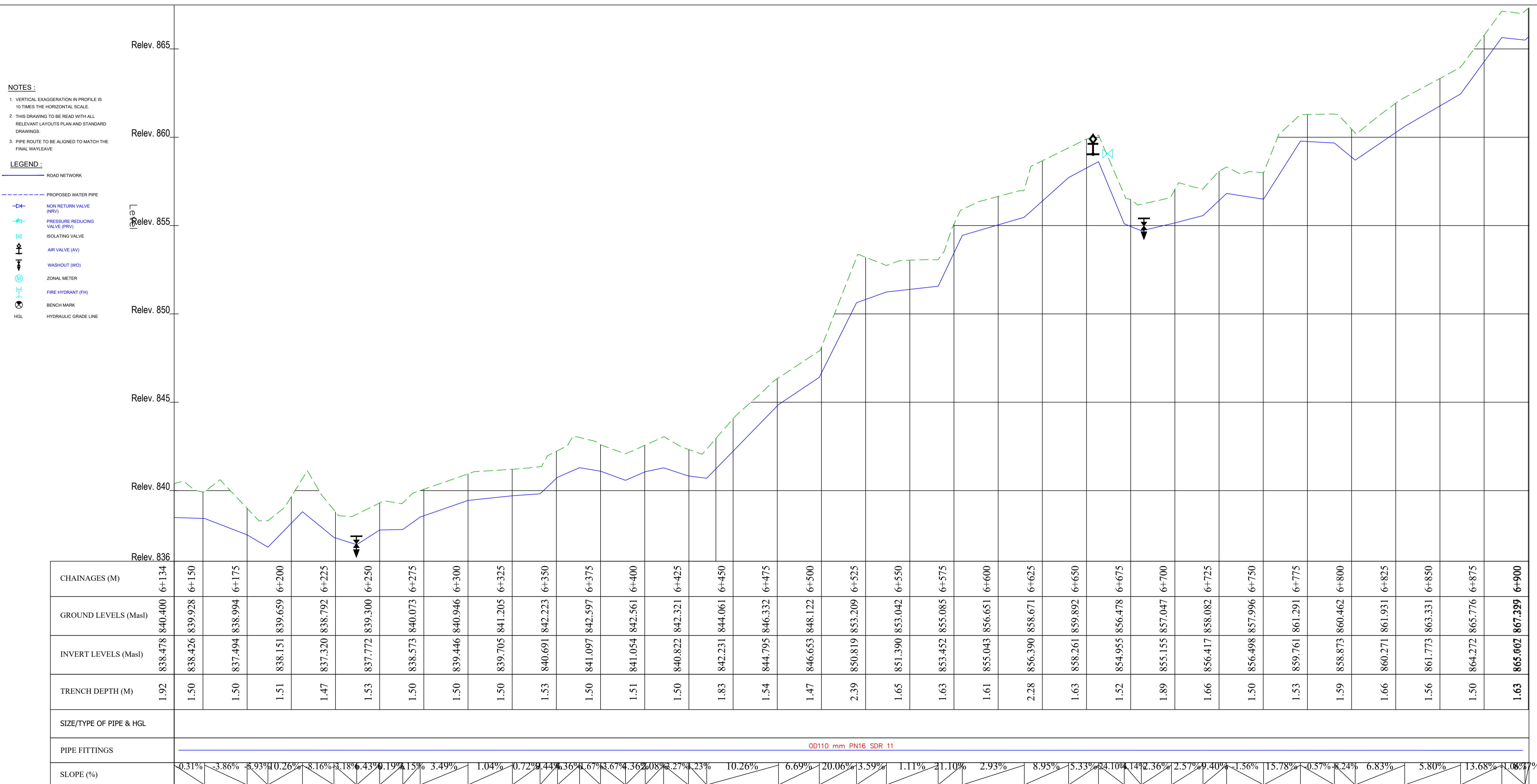
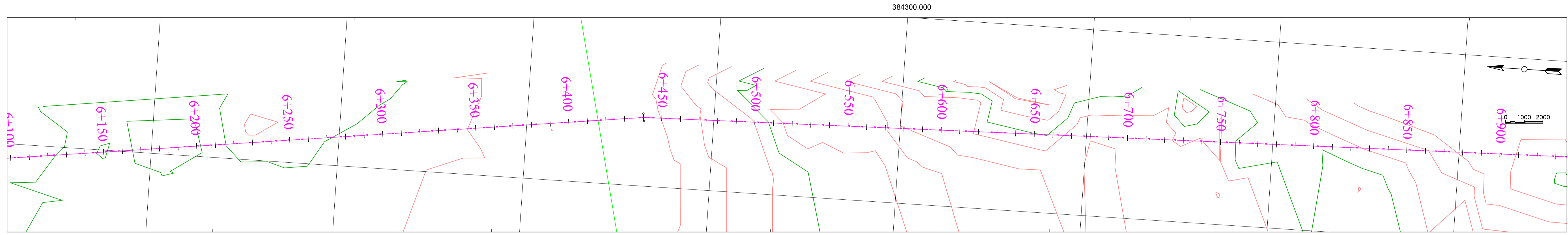


SCALES
V:1:1000
H:1:100

PROJECT
Athi Tunguni Water Project

TITLE:
PLAN PROFILE : RISING MAIN

DATE: NOV 2023
DRAWING NO: HES 2019-2023
SHEET NO: 8 OF 10



CLIENT
Makueni County
Government Water
and sanitation Department
P.O. Box 78 - 90300



REVISIONS	
DESCRIPTION	DATE

CONSULTANT :
Horicon Engineering Solutions
Limited
Po Box 161-00300
Nairobi, Kenya



SCALES
V:1:1000
H:1:100

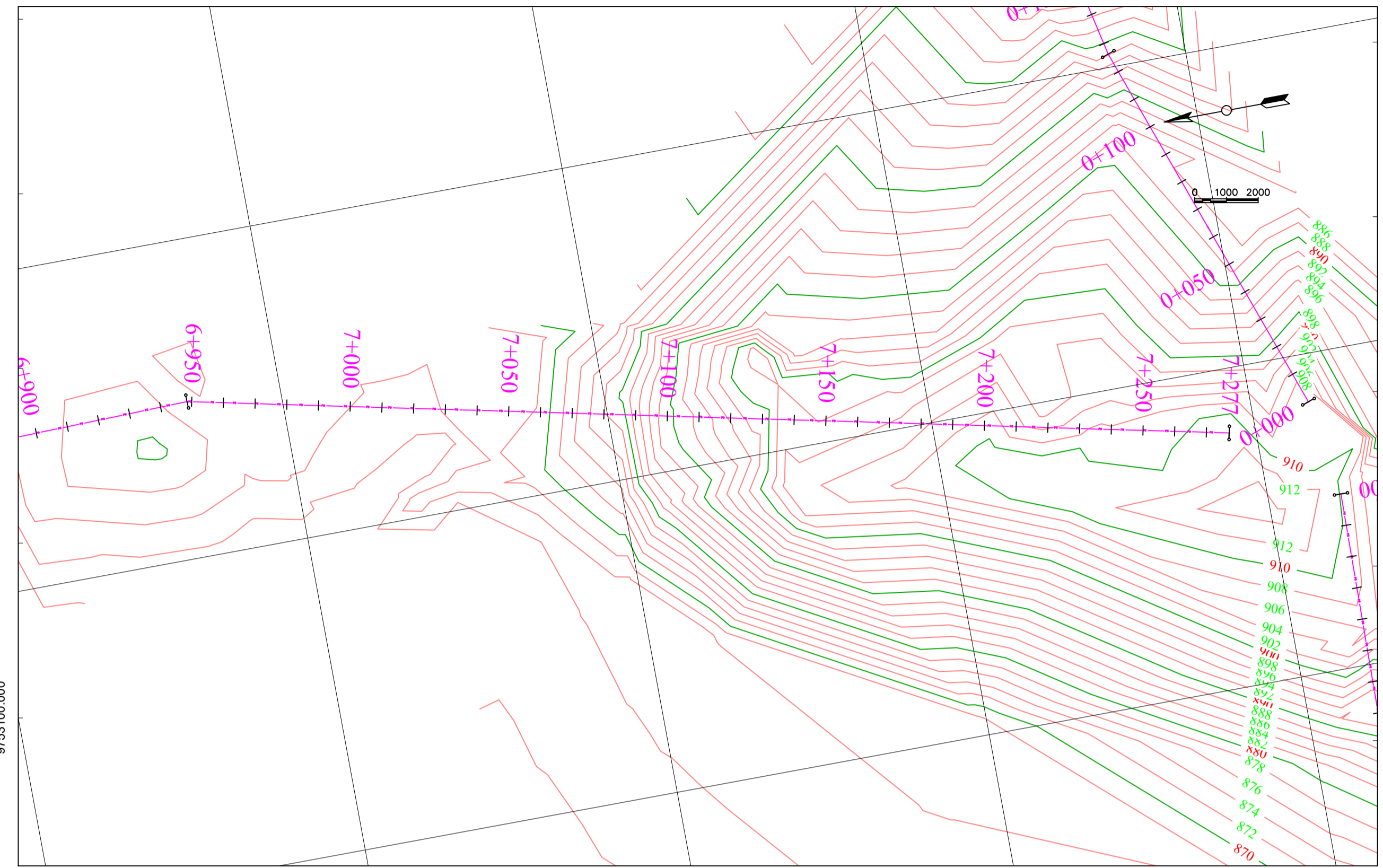
PROJECT
Athi Tunguni Water Project

TITLE:
PLAN PROFILE : RISING MAIN

DATE: NOV 2023
DRAWING NO: HES 2019-2023
SHEET NO: 9 OF 10

Relev. 905
Relev. 900
Relev. 895
Relev. 890
Relev. 885
Relev. 880
Relev. 875
Relev. 870
Relev. 865
Relev. 862

CHAINAGES (M)	6+900	6+925	6+950	6+975	7+000	7+025	7+050	7+075	7+100	7+125	7+150	7+175	7+200	7+225	7+250	7+275		
GROUND LEVELS (Masl)	867.329	868.992	866.585	867.277	866.024	864.861	867.770	875.649	889.376	898.161	902.129	904.588	908.777	906.408	909.815	910.468		
INVERT LEVELS (Masl)	865.702	867.492	865.097	865.467	864.295	863.423	866.244	873.364	887.635	896.427	900.637	903.055	907.243	907.940	908.312	909.268		
TRENCH DEPTH (M)	1.63	1.50	1.49	1.81	1.73	1.44	1.53	2.28	1.74	1.73	1.49	1.53	1.53	-1.53	1.50	1.40		
SIZE/TYPE OF PIPE & HGL	OD110 mm PN16 SDR 11																	
PIPE FITTINGS																		
SLOPE (%)	8.77%	0.53%	3.44%	3.81%	7.50%	-5.77%	22.12%	3.23%	42.66%	64.55%	35.17%	14.32%	6.2%	9.67%	16.94%	1.50%	1.12%	1.63%



CLIENT
Makueni County
Government Water
and sanitation Department
P.O. Box 78 - 90300



REVISIONS	
DESCRIPTION	DATE

CONSULTANT :
Horicon Engineering Solutions
Limited
Po Box 161-00300
Nairobi, Kenya



SCALES
V:1:1000
H:1:100

PROJECT
Athi Tunguni Water Project

TITLE:
PLAN PROFILE : RISING MAIN

DATE: NOV 2023
DRAWING NO: HES 2019-2023
SHEET NO: 10 OF 10



- NOTES:
- Concrete Class: Foundation 25/20, Column 25/20, Ground Beam 25/20; Strip Footing 25/20 (i.e. Class 25N/mm² and Maximum Agg. Size 20mm)
 - Excavations to be inspected before blinding
 - All reinforcement to be inspected before concreting
 - Cover to Main Reinforcement: Foundations 50; Columns 25; Ground Beams 40, Strip Footing 50;
 - Dimensions to be read and not scaled
 - This drawing to be read in conjunction with Architectural Drawings

Revisions		
Date	Description	Remarks

Project:
**ATHI KILEMA TUNGUNI
 WATER PROJECT PHASE II**

Client:

Chief Executive Officer
 Mukononi County Government
 Water and sanitation
 Department
 P.O. BOX 76-0000
 Wote, Mukononi, Kenya
 email: info@mukononi.go.ke

Engineers:

Mina Centre, Outer Ring Rd, Donholm,
 2nd Floor, Suite 13
 P.O. Box 161 - 00200, Nairobi
 Tel: +254-020-620369
 Email: info@horeconengineering.com

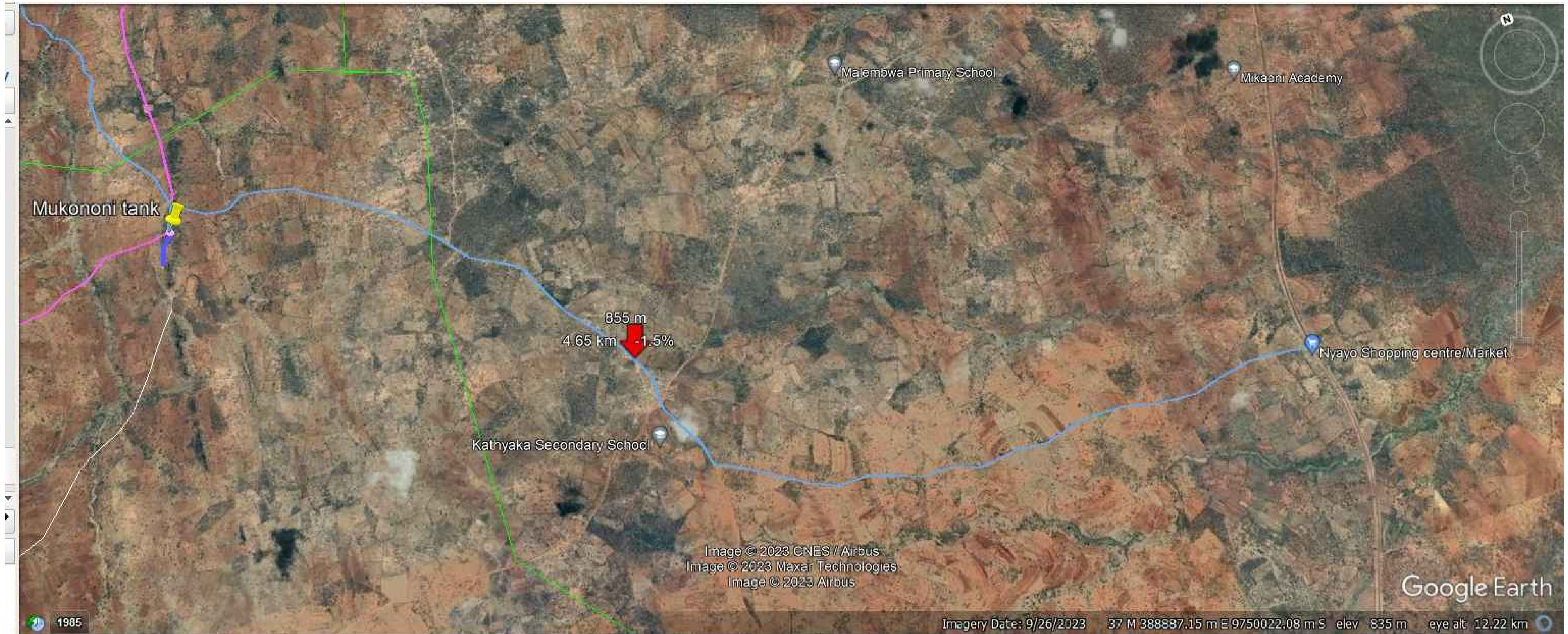
Client:
 Owner

Drawing Title:
 Mukononi Musingini Kamboo line
 layout

Designed by: A.G.N
 Drawn by: A.G.N
 Checked by: Eng. S. Muiruri
 Approved by: Eng. S. Muiruri
 Date: 9th October 2023

HES-009-2023
 S.06

Scale:
 as shown



1985 Imagery Date: 9/26/2023 37 M 388887.15 m E 9750022.08 m S elev 835 m eye alt: 12.22 km



- NOTES:
- Concrete Class: Foundation 25/20, Column 25/20, Ground Beam 25/20; Strip Footing 25/20 (i.e. Class 25N/mm² and Maximum Agg. Size 20mm)
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Revisions		
Date	Description	Remarks

Project:
**ATHI KILEMA TUNGUNI
 WATER PROJECT PHASE II**

Client:



Chief Executive Officer
 Mukoni County Commission
 Water and sanitation
 Department
 P.O. BOX 76-0000
 Wote-Makindu, Kenya
 email: info@athikwa.org.ke

Engineers:



Mina Centre, Outer Ring Rd, Donholm,
 2nd Floor, Suite 13
 P. O. Box 161 - 00200, Nairobi
 Tel: +254-020-620368
 Email: info@honorconengineering.com

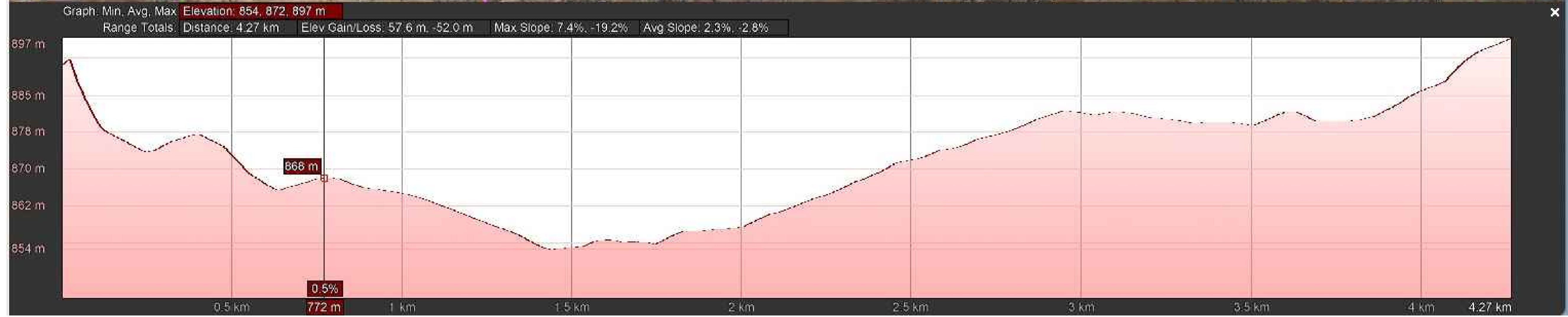
Client:
 Owner

Drawing Title:
**Mukononi Kathyaka Nyayo
 shopping center layout**

Designed by: AGN
 Drawn by: AGN
 Checked by: Eng. S. Muiruri
 Approved by: Eng. S. Muiruri
 Date: 9th October 2023

HES-009-2023
 S.07

Scale:
 as shown



- NOTES:
1. Concrete Class: Foundation 25/20, Column 25/20, Ground Beam 25/20; Strip Footing 25/20 (i.e. Class 25N/mm² and Maximum Agg. Size 20mm)
 2. Excavations to be inspected before blinding
 3. All reinforcement to be inspected before concreting
 4. Cover to Main Reinforcement: Foundations 50; Columns 25; Ground Beams 40, Strip Footing 50;
 5. Dimensions to be read and not scaled
 6. This drawing to be read in conjunction with Architectural Drawings

Revisions		
Date	Description	Remarks

Project:
**ATHI KILEMA TUNGUNI
 WATER PROJECT PHASE II**

Client:



Chief Executive Officer
 Mukononi County Commission
 Water and sanitation
 Department
 P.O. BOX 76-0000
 Wote Mukononi, Kenya
 email: info@mukononi.go.ke

Engineers:



Mina Centre, Outer Ring Rd, Donholm,
 2nd Floor, Suite 13
 P.O. Box 161 - 00200, Nairobi
 Tel: +254-020-620368
 Email: info@horconengineering.com

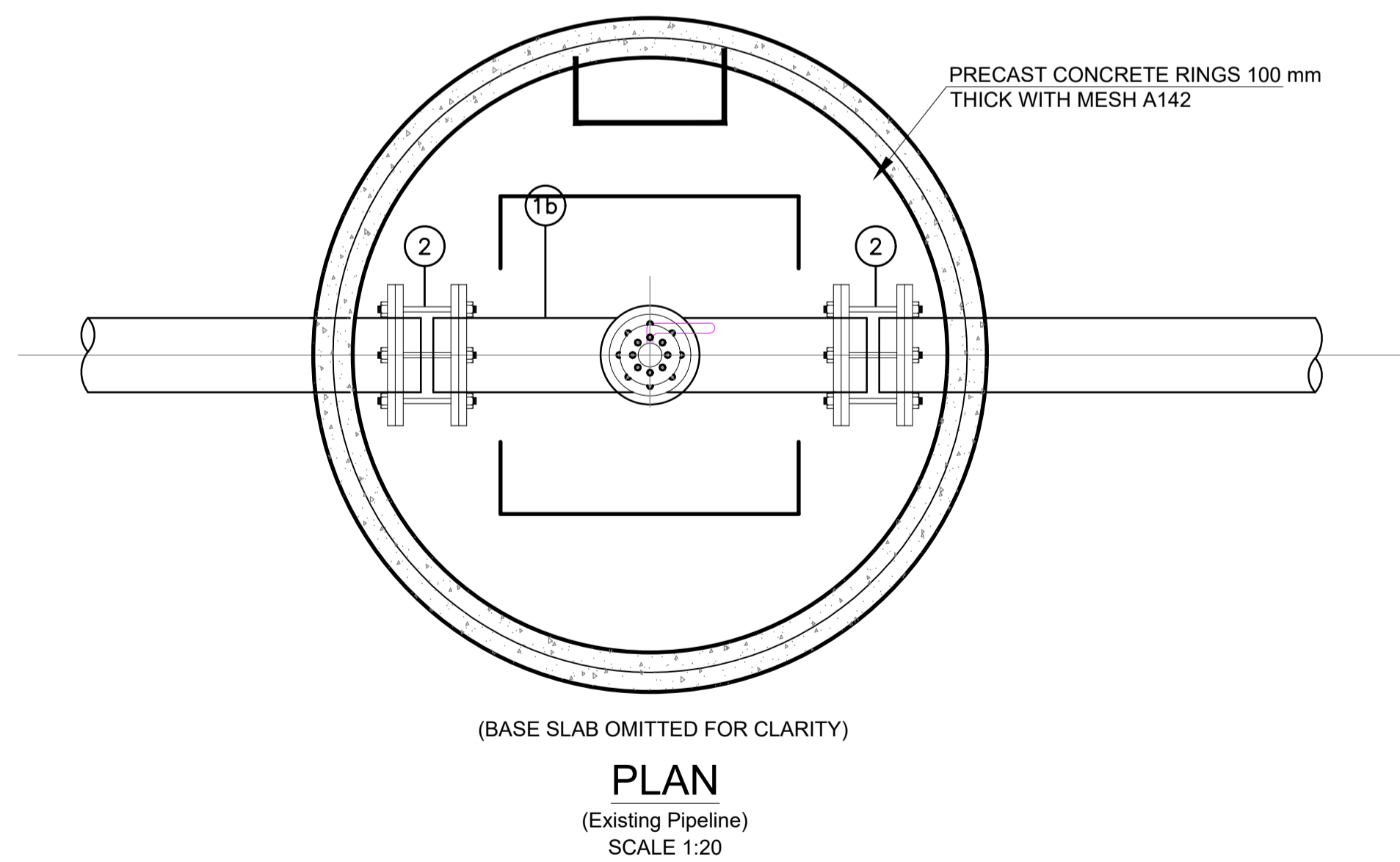
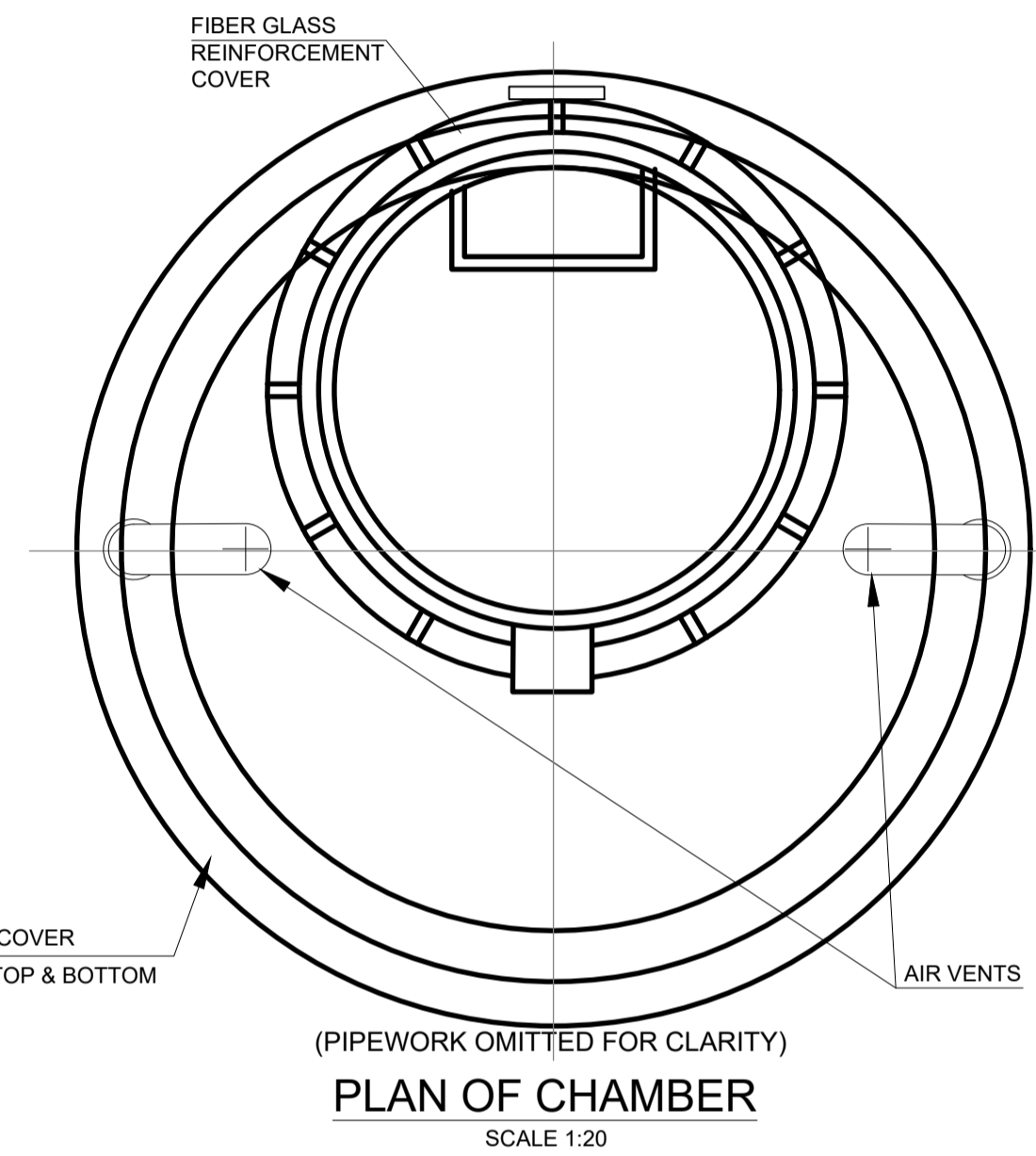
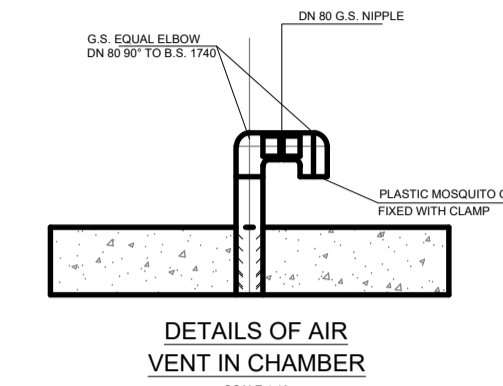
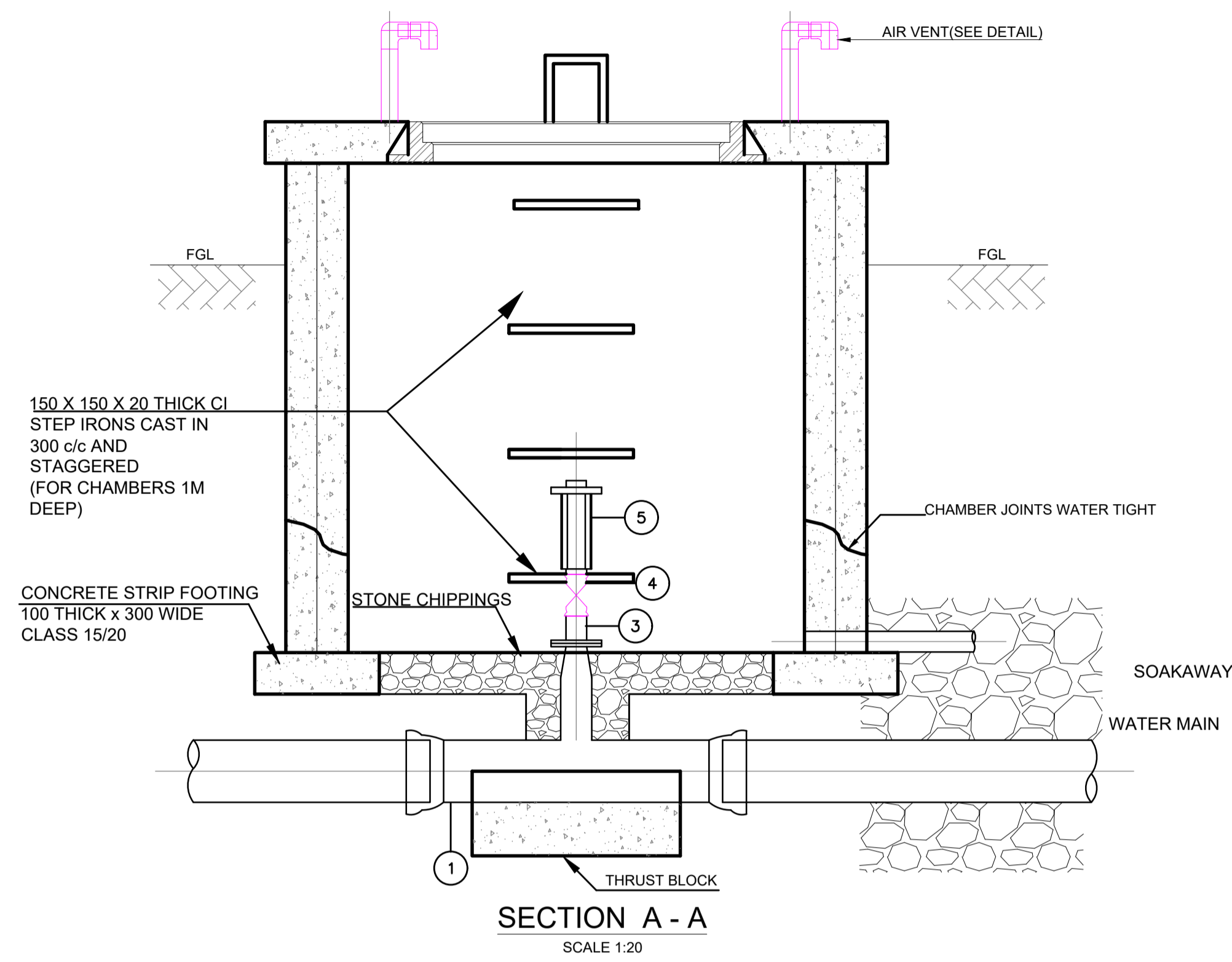
Client:
 Owner

Drawing Title:
 Mukononi Symule layout

Designed by: A.G.N.
 Drawn by: A.G.N.
 Checked by: Eng. S. Muiruri
 Approved by: Eng. S. Muiruri
 Date: 9th October 2023

HES-009-2023
 S.08

Scale:
 as shown



SCHEDULE OF PIPEWORK & FITTINGS (DN 25 & 50)

ITEM	DESCRIPTION	DIAMETER	No.
1a	SOCKETED TEE WITH FLANGED BRANCH (NEW PIPELINES) *	D/0.6D (min.)	1
1b	PLAIN ENDED TEE WITH FLANGED BRANCH (EXISTING PIPELINE) **	D/0.6D (min.)	1
2	STEPPED COUPLING TO SUIT EXISTING PIPELINES **	D	2
3	THREADED AIR VALVE FLANGE ADAPTOR PIECE	0.6D/50(or 25)	1
4	FEMALE THREADED STOP COCK/ISOLATOR	50(or 25)	1
5	THREADED ANTI-SHOCK ANTI-SURGE AIR VALVE	50(or 25)	1

- NOTES:
- Concrete Class: Foundation 25/20, Column 25/20, Ground Beam 25/20; Strip Footing 25/20 (i.e. Class 25N/mm² and Maximum Agg. Size 20mm)
 - Excavations to be inspected before blinding
 - All reinforcement to be inspected before concreting
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Revisions		
Date	Description	Remarks

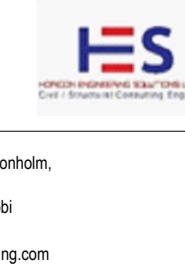
Project:
ATHI KILEMA TUNGUNI
WATER PROJECT PHASE II

Client :



Chief Executive Officer
Makurri County Government
Water and sanitation
Department
P.O. BOX 78-90300
Wote-Makurri, Kenya
email: info@makurri.go.ke

Engineers:



Mima Centre, Outer Ring Rd. Donholm,
2nd Floor, Suite 13
P.O. Box 161 - 00300, Nairobi
Tel: +254-020-5292358
Email: info@horconengineering.com

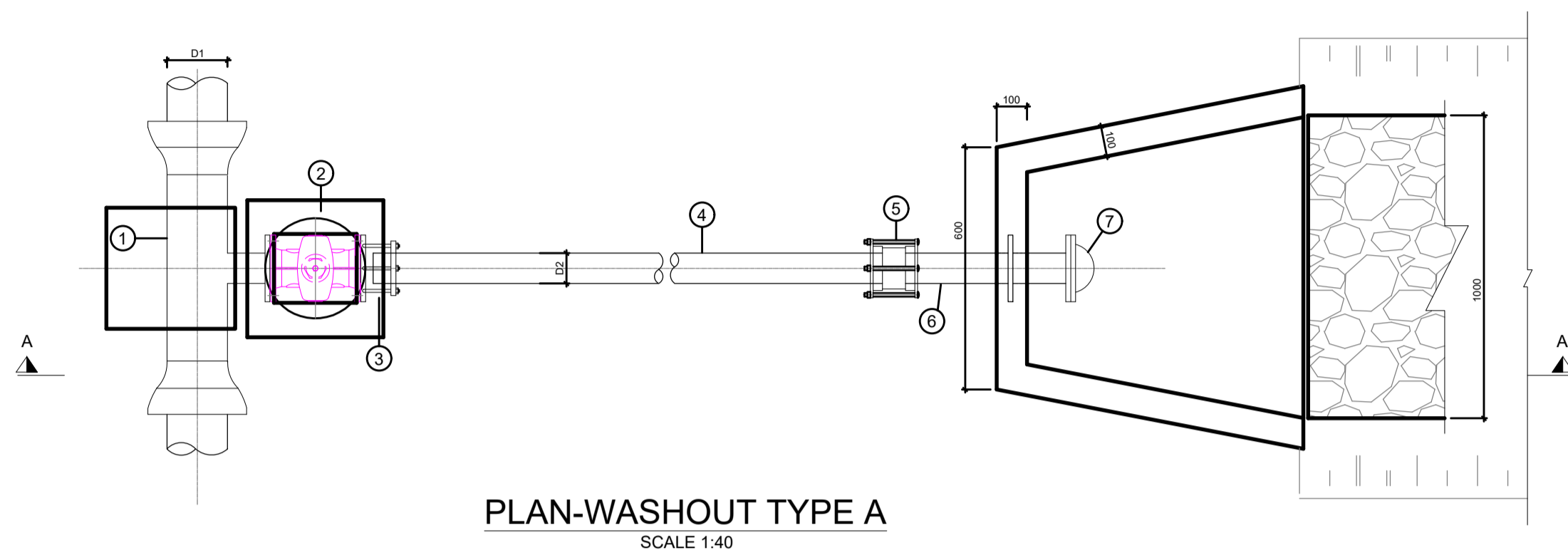
Client:
Owner

Drawing Title:
Air valve details

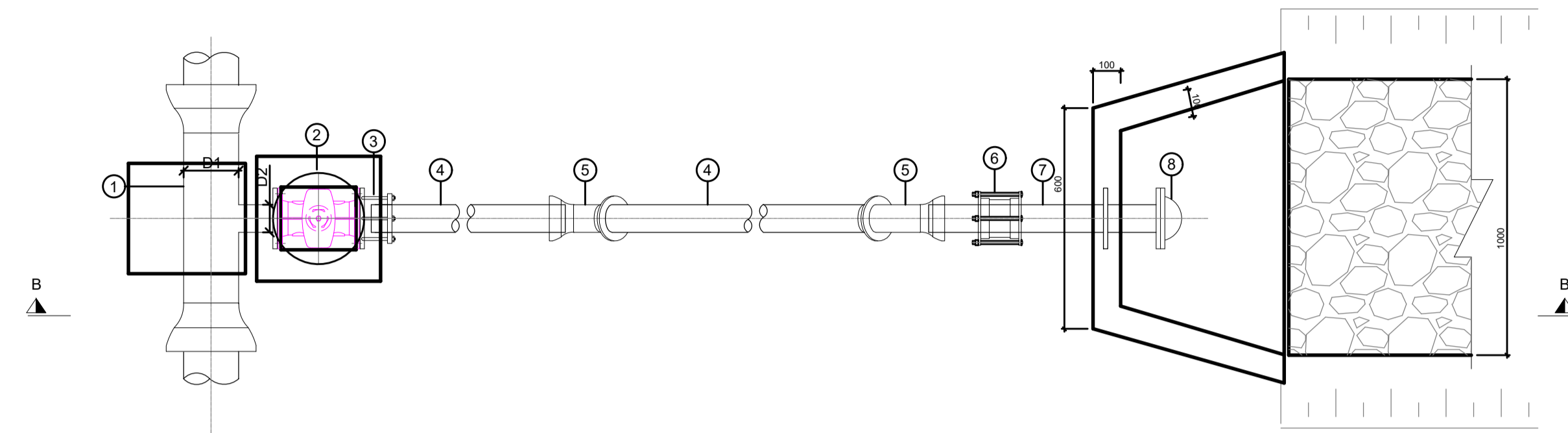
Designed by: A.G.N
Drawn by: A.G.N
Checked by: Eng. S. Muiruri
Approved by: Eng. S. Muiruri
Date: 9th October 2023

HES-009-2023
S.09

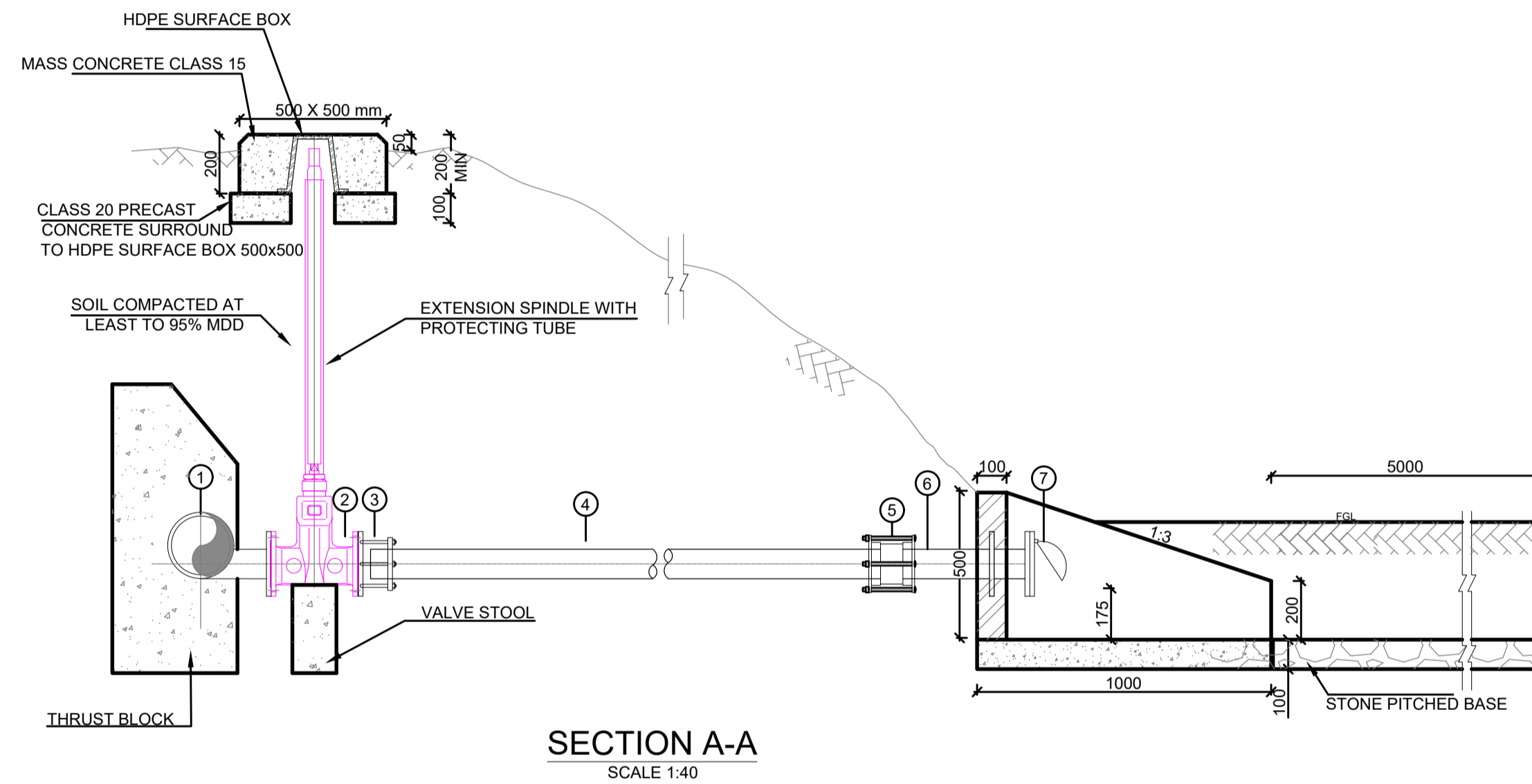
Scale:
as shown



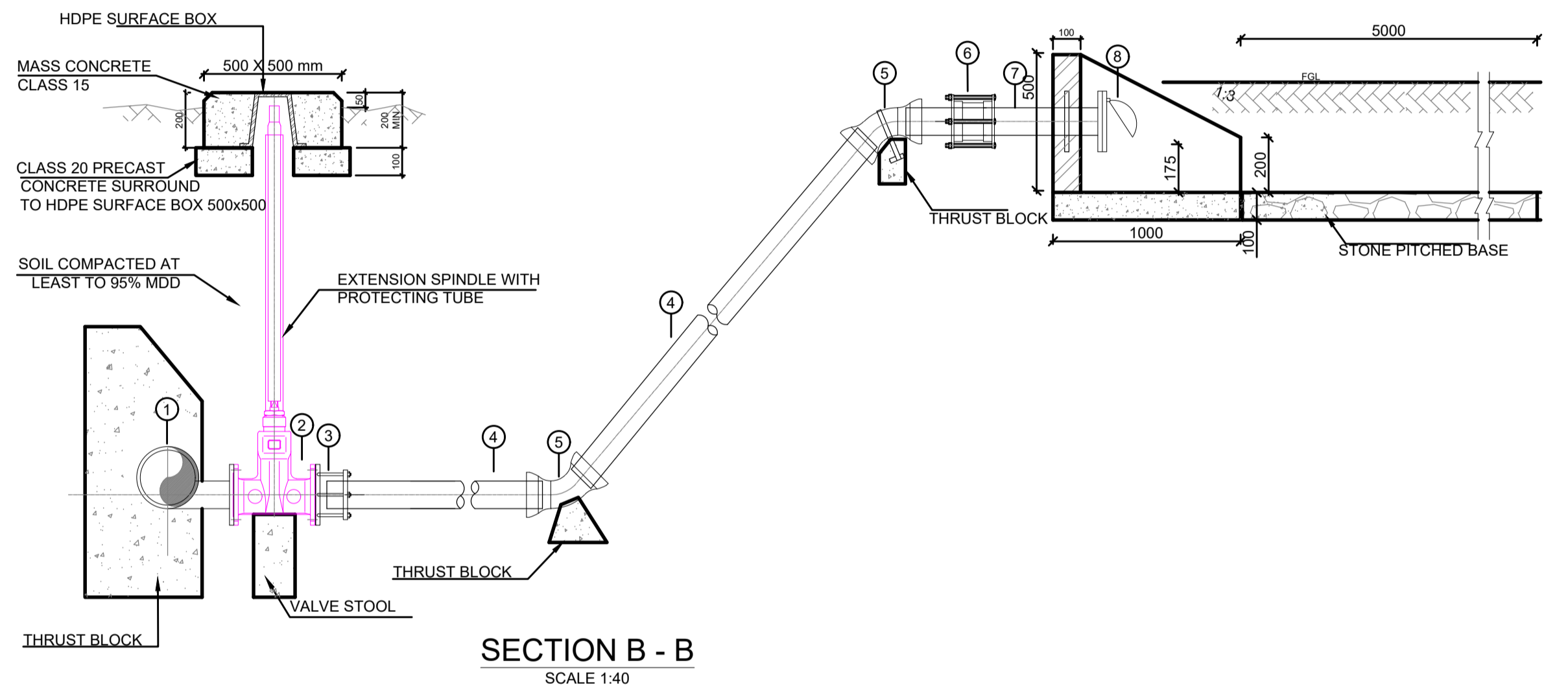
PLAN-WASHOUT TYPE A
SCALE 1:40



PLAN-WASHOUT TYPE B
SCALE 1:40



SECTION A-A
SCALE 1:40



SECTION B - B
SCALE 1:40

SCHEDULE OF PIPEWORK & FITTINGS

ITEM No.	DESCRIPTION	DIAMETER	No.
1	SOCKETED INVERT TEE WITH FLANGED BRANCH	D1/D2	1
2	DOUBLE FLANGED SLURGE VALVE	D2	1
3	FLANGED STEPPED ADAPTOR TO SUIT uPVC	D2	1
4	uPVC PIPES, LENGTH ± 18 m	D2	-
5	STEPPED COUPLING TO SUIT FERROUS/uPVC	D2	1
6	SINGLE FLANGED SPIGOT, L = 600 c/w PUDDLE FLANGE	D2	1
7	FLANGED FLAP VALVE	D2	1

SCHEDULE OF WASHOUTS

DIAMETER MAIN (mm)	DIAMETER BRANCH (mm)
D1	D2
500	150
400	100
350	80
300	
250	
200	
150	
100	
80	

SCHEDULE OF WASHOUTS

DIAMETER MAIN (mm)	DIAMETER BRANCH (mm)
D1	D2
500	150
450	100
400	80
350	
300	
250	
200	
150	
100	
80	

SCHEDULE OF PIPEWORK & FITTINGS

ITEM	DESCRIPTION	DIAMETER	No.
1	SOCKETED INVERT TEE WITH FLANGED BRANCH	D1/D2	1
2	DOUBLE FLANGED SLURGE VALVE	D2	1
3	FLANGED STEPPED ADAPTOR TO SUIT uPVC	D2	1
4	uPVC PIPES, LENGTH ± 18 m	D2	-
5	DOUBLE SOCKETED 45° BEND uPVC	D2	2
6	STEPPED COUPLING TO SUIT FERROUS/uPVC	D2	1
7	SINGLE FLANGED SPIGOT, L = 600 c/w PUDDLE FLANGE	D2	1
8	FLANGED FLAP VALVE	D2	1

- NOTES:
- Concrete Class: Foundation 25/20, Column 25/20, Ground Beam 25/20; Strip Footing 25/20 (i.e. Class 25N/mm² and Maximum Agg. Size 20mm)
 - Excavations to be inspected before blinding
 - All reinforcement to be inspected before concreting
 - Cover to Main Reinforcement: Foundations 50; Columns 25; Ground Beams 40; Strip Footing 50;
 - Dimensions to be read and not scaled
 - This drawing to be read in conjunction with Architectural Drawings

Date	Revisions Description	Remarks

Project:
ATHI KILEMA TUNGUNI
WATER PROJECT PHASE II

Client:



Chief Executive Officer
Makurui County Government
Water and sanitation
Department
P.O. BOX 78-90300
Wari-Makurui, Kenya
email: info@makurui.go.ke

Engineers:



Mima Centre, Outer Ring Rd, Donholm,
2nd Floor, Suite 13
P.O. Box 161 - 00300, Nairobi
Tel: +254-020-5292358
Email: info@horconengineering.com

Client:

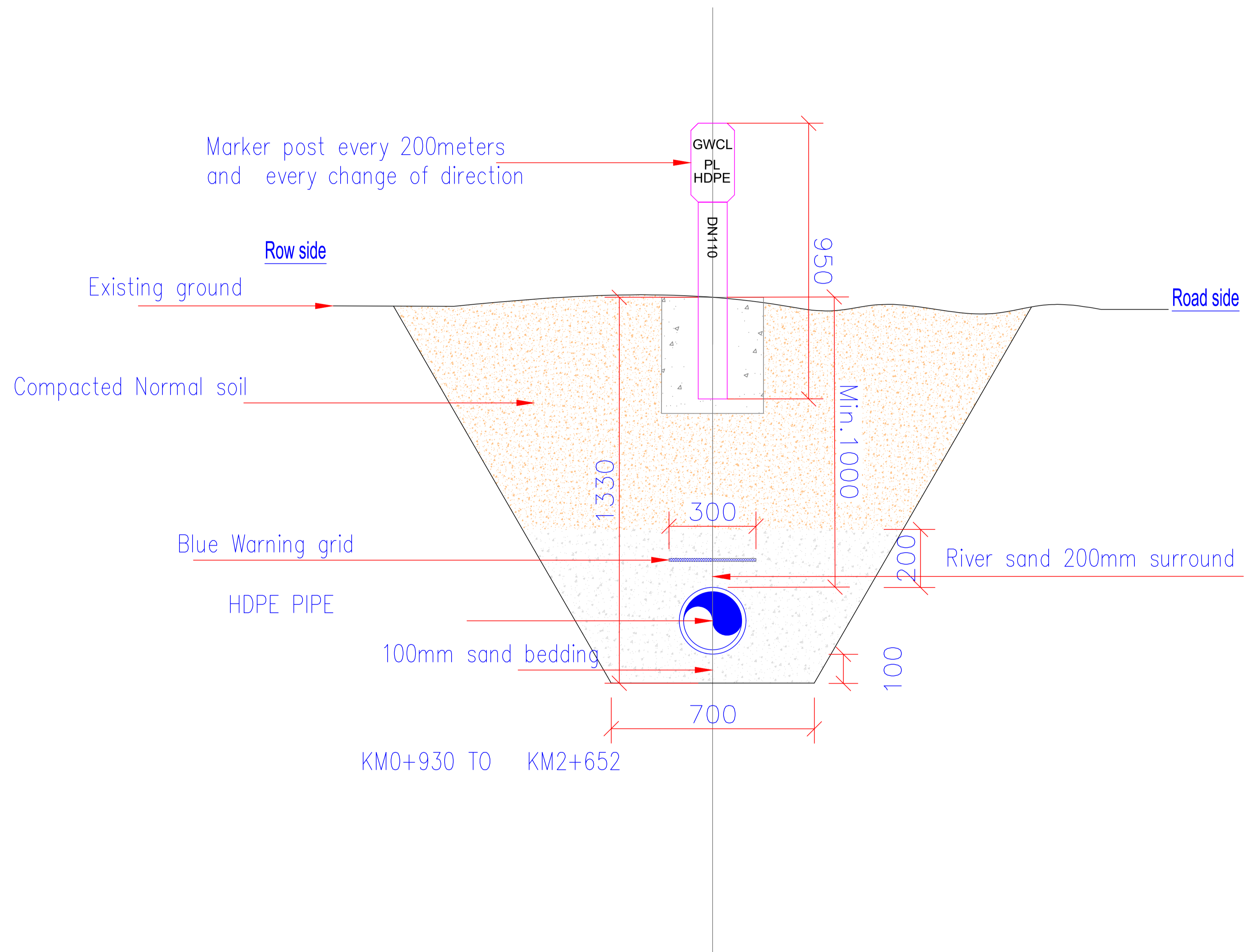
Owner

Drawing Title:
Washout details

Designed by: A.G.N
Drawn by: A.G.N
Checked by: Eng. S. Muiruri
Approved by: Eng. S. Muiruri
Date: 9th October 2023

HES-009-2023
S.10

Scale:
as shown



- NOTES:
1. Concrete Class: Foundation 25/20, Column 25/20, Ground Beam 25/20; Strip Footing 25/20 (i.e. Class 25N/mm² and Maximum Agg. Size 20mm)
 2. Excavations to be inspected before blinding
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Revisions		
Date	Description	Remarks

Project:
**ATHI KILEMA TUNGUNI
 WATER PROJECT PHASE II**

Client :



Chief Executive Officer
 Ministry of Water and Sanitation
 Department
 P.O. Box 79-00300
 Nairobi, Kenya
 Email: info@water.go.ke

Engineers:



Mesa Centre, Outring Rd, Donholm,
 2nd Floor, Suite 13
 P.O. Box 161-00300, Nairobi
 Tel: +254-020-5290388
 Email: info@horiconengineering.com

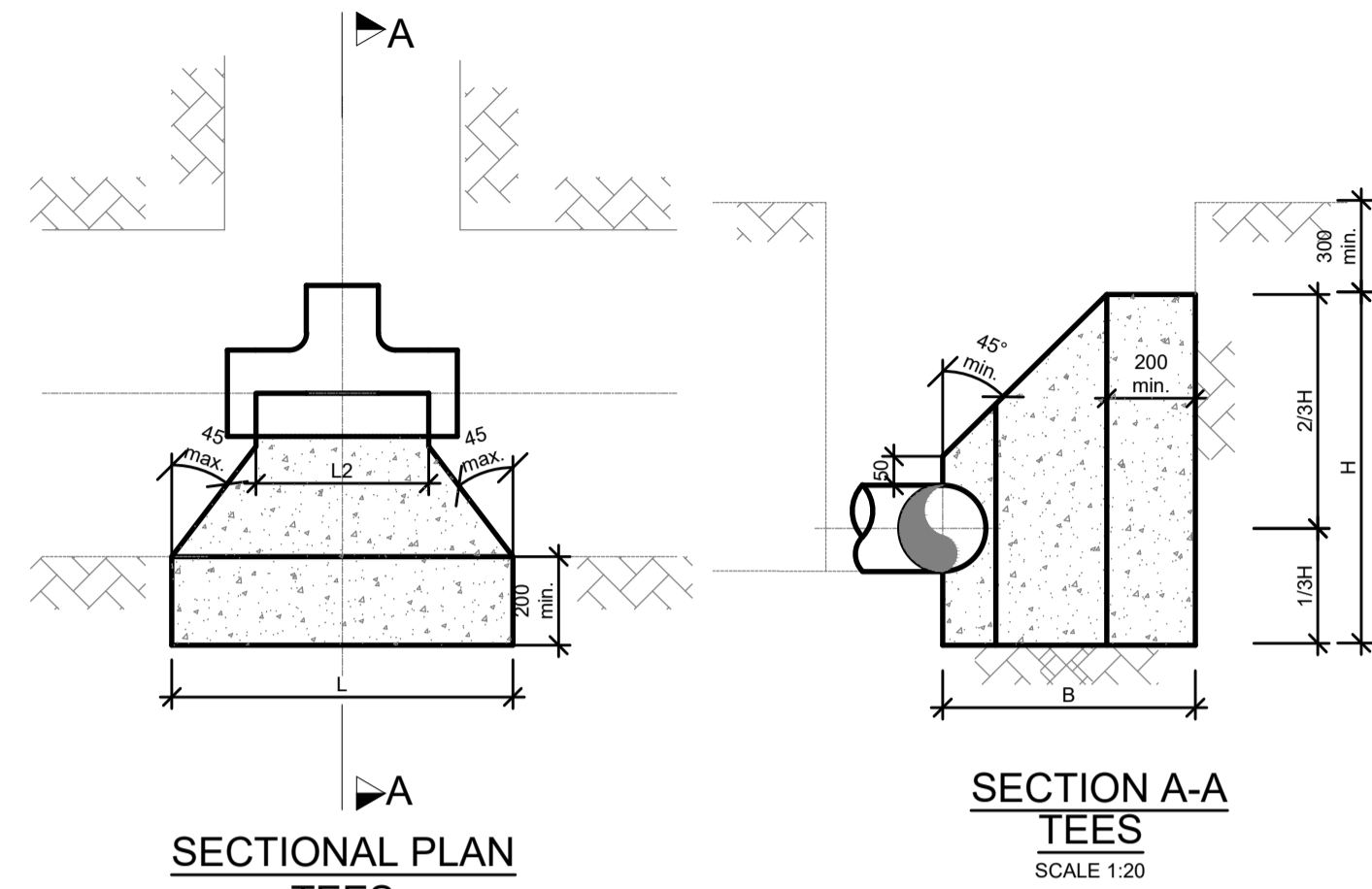
Client:
 Owner

Drawing Title:
 Pipe bedding details

Designed by: A.G.N
 Drawn by: A.G.N
 Checked by: Eng. S. Muiruri
 Approved by: Eng. S. Muiruri
 Date: 9th October 2023

HES-009-2023
 S.11

Scale:
 as shown

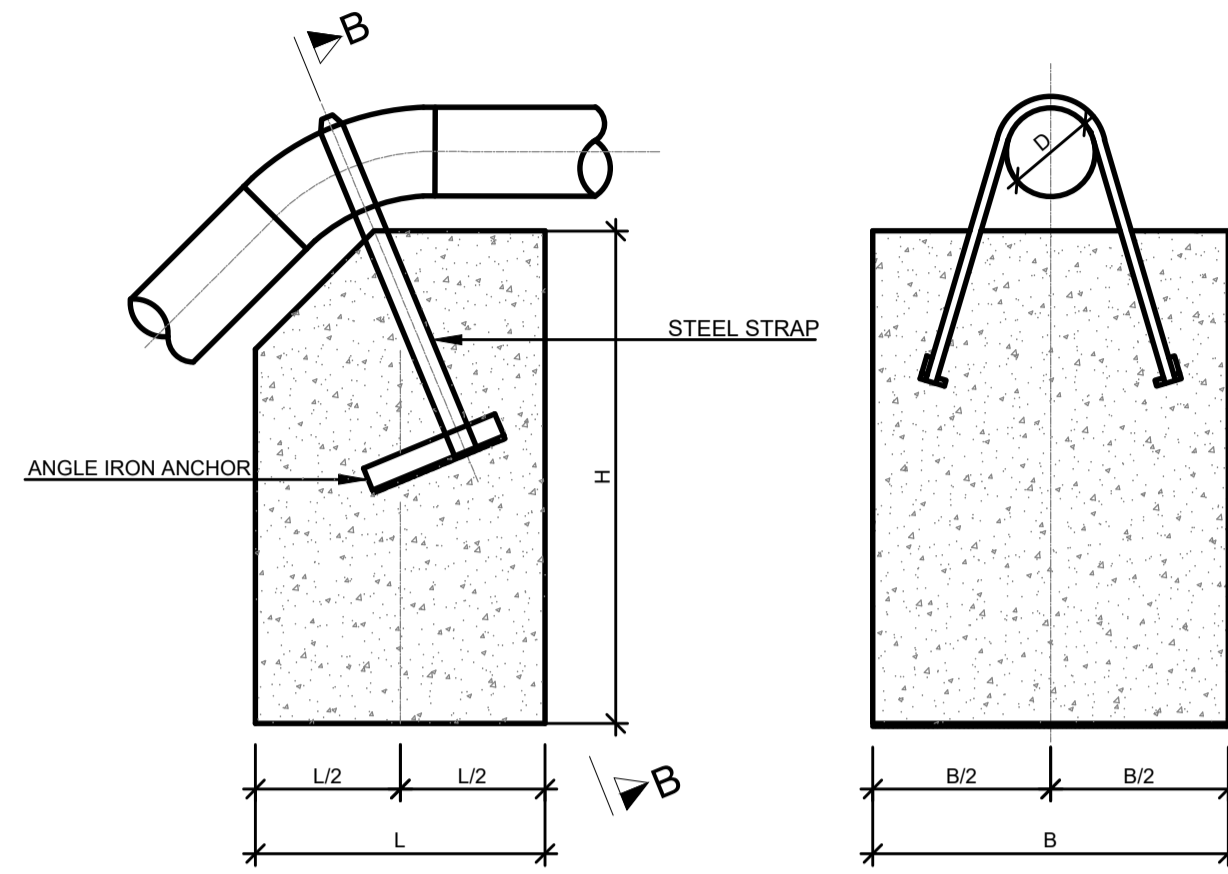


SECTIONAL PLAN
TEES
SCALE 1:20

SECTION A-A
TEES
SCALE 1:20

ANCHOR BLOCKS AT TEES AND ENDS

Branch Diameter (mm)	Test Pressure (m)	Tee					
		H (m)	L (m)	B (m)	L2 (m)	Vol (m ³)	
100	240	0.43	0.44	0.70	0.10	0.08	
200	240	0.87	0.87	0.75	0.20	0.34	
300	240	1.30	1.31	0.80	0.30	0.76	
400	240	1.70	1.78	0.85	0.40	1.36	
450	240	1.80	2.13	0.85	0.40	1.65	
700	240	2.00	4.63	1.92	0.70	6.53	
900	240	3.00	5.10	2.35	0.80	13.79	

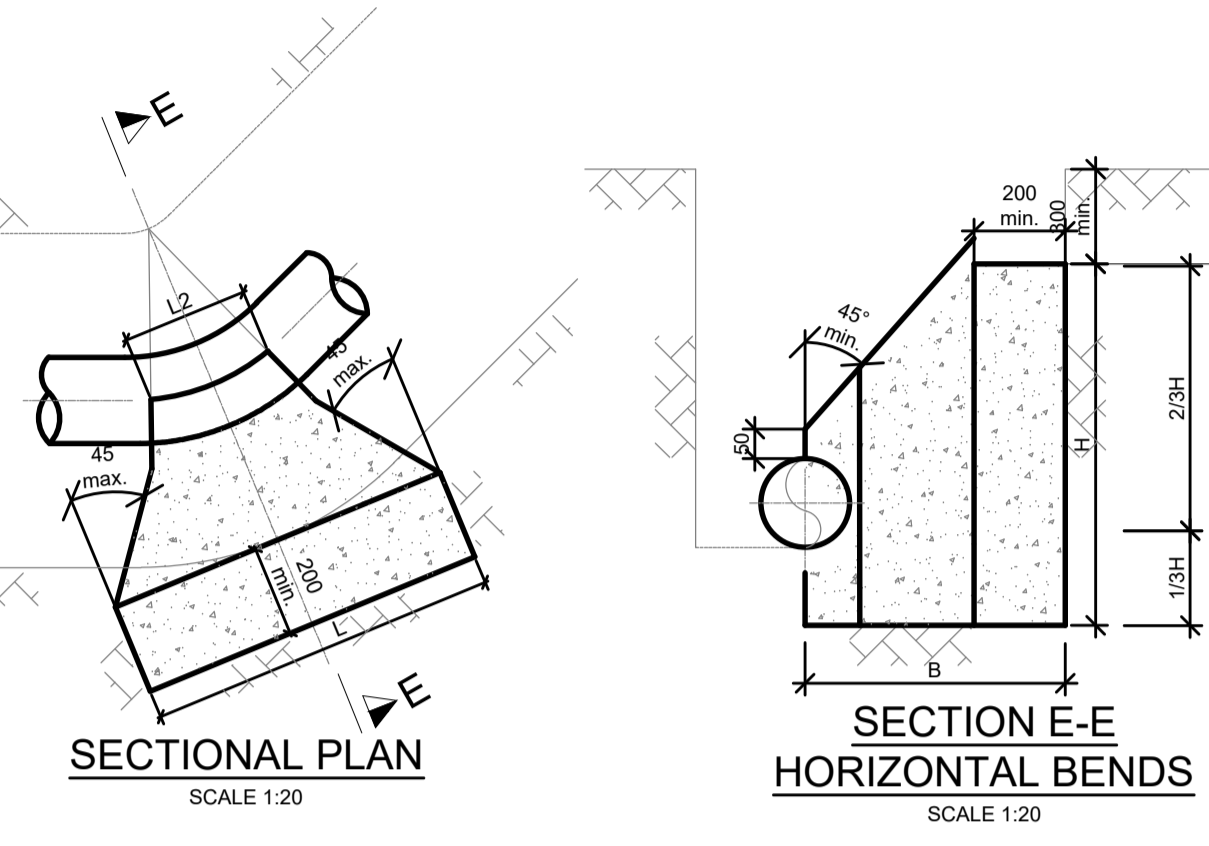


ELEVATION

SECTION B-B

ANCHOR BLOCKS AT VERTICAL CRESTS

Pipe Diameter (mm)	Test Pressure (m)	45 deg						22.5 deg						11.25 deg					
		H	L	B	L2	Vol	H	L	B	L2	Vol	H	L	B	L2	Vol			
100	240	0.9	1.4	0.8	30x4	0.6	0.8	1.2	0.7	30x4	0.6	0.7	0.7	30x4	0.3				
200	240	1.0	2.0	2.0	40x6	3.0	1.0	1.6	1.6	30x4	2.4	0.8	1.4	1.2	30x4	1.3			
300	240	1.8	2.5	2.2	100x6	7.1	1.2	2.0	1.8	80x4	4.0	1.0	1.7	1.2	60x4	2.0			
700	240	3.0	5.0	5.0	150x11	17.5	3.0	4.0	4.0	150x11	48	2.5	3.5	3.0	100x6	28.3			
900	240	3.3	6.0	6.0	150x11	11.9	3.2	5.0	5.0	125x11	80	3.0	4.0	3.5	125x11	42.9			

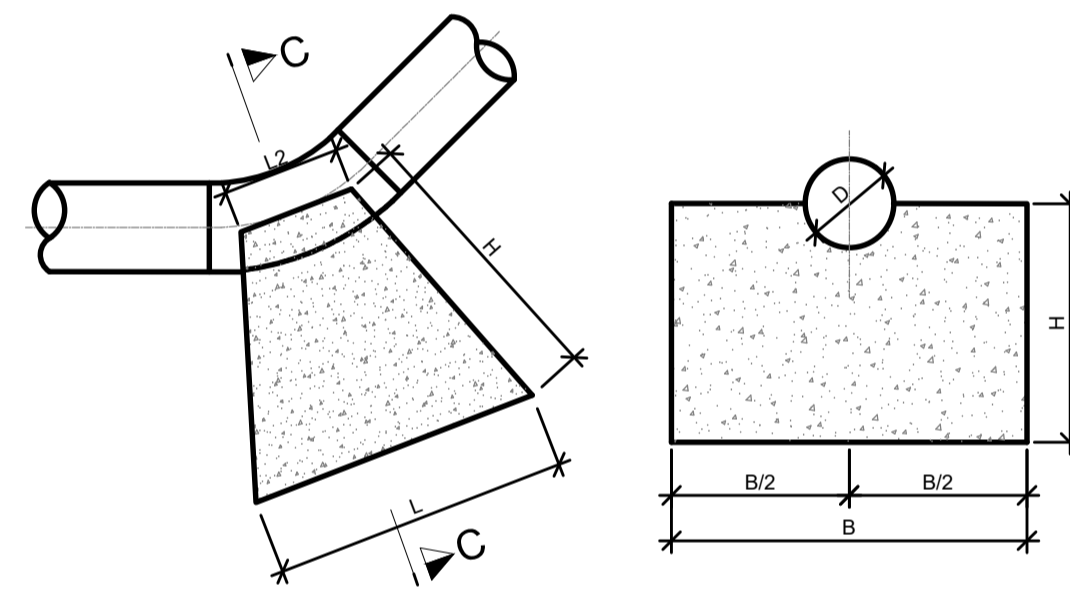


SECTIONAL PLAN
SCALE 1:20

SECTION E-E
HORIZONTAL BENDS
SCALE 1:20

ANCHOR BLOCKS AT HORIZONTAL BENDS

Pipe Diameter (mm)	Test Pressure (m)	90 deg						45 deg						22.5 deg						11.25 deg					
		H	L	B	L2	Vol	H	L	B	L2	Vol	H	L	B	L2	Vol	H	L	B	L2	Vol				
200	240	1.03	1.04	0.75	0.35	0.5	0.76	0.77	0.75	0.20	0.3	0.54	0.55	0.75	0.14	0.1	0.38	0.39	0.75	0.13	0.1				
400	240	1.80	2.38	0.85	0.50	1.8	1.50	1.55	0.85	0.30	1.0	1.09	1.09	0.85	0.20	0.5	0.77	0.77	0.85	0.18	0.3				
450	240	1.80	3.01	0.85	0.50	2.2	1.50	1.95	0.85	0.35	1.2	1.22	1.23	0.85	0.21	0.6	0.87	0.87	0.85	0.19	0.3				
700	240	2.80	4.67	2.18	0.80	8.6	2.30	3.08	2.02	0.60	4.8	1.50	2.41	1.75	0.30	2.5	1.35	1.35	1.70	0.25	1.3				
900	240	3.50	6.18	2.52	0.80	18.1	2.50	4.68	2.18	0.60	10.1	2.00	2.99	2.02	0.30	5.2	1.58	1.90	1.88	0.25	2.8				

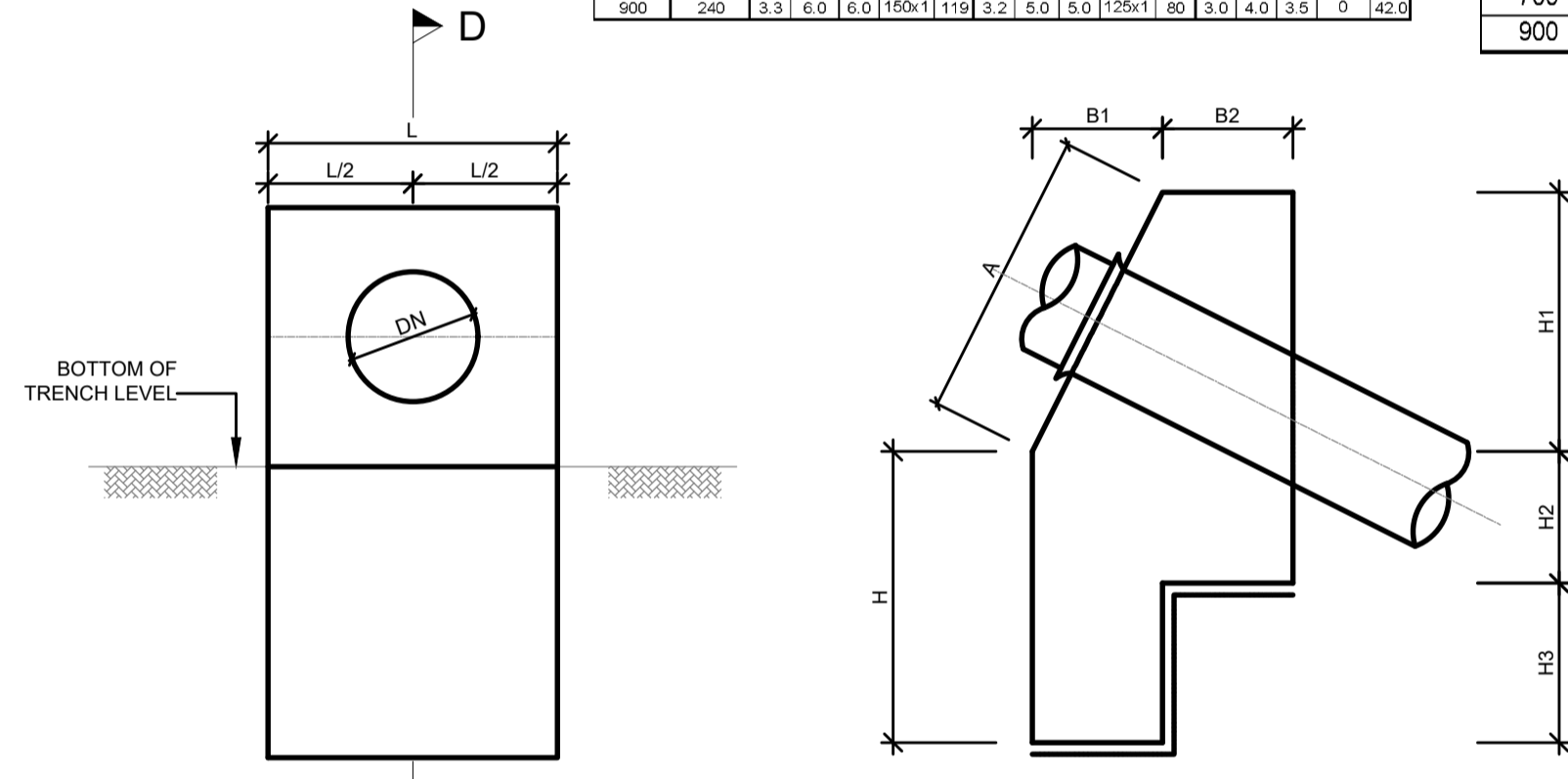


ELEVATION

SECTION C-C

VERTICAL ANCHOR BLOCKS AT DEPRESSIONS

SCALE 1:20



FRONT VIEW
SCALE 1:20

SECTION D-D

DETAIL OF PIPE SUPPORT BLOCK ANCHOR BLOCKS ON GRADIENTS

SCALE 1:20

ANCHOR BLOCKS AT VERTICAL DEPRESSIONS

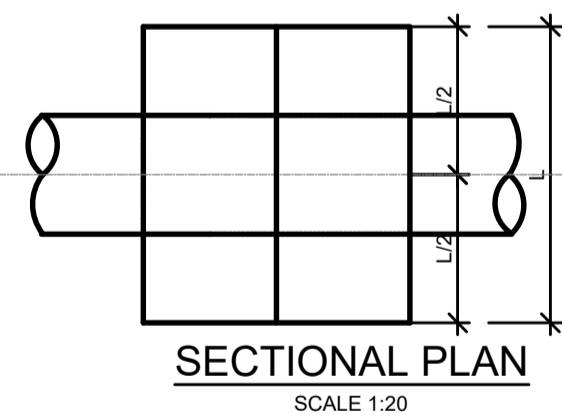
Pipe Diameter (mm)	Test Pressure (m)	45 deg						22.5 deg						11.25 deg					
		H	L	B	L2	Vol	H	L	B	L2	Vol	H	L	B	L2	Vol			
100	240	0.3	0.5	0.3	0.2	0.03	0.3	0.3	0.3	0.1	0.02	0.3	0.2	0.3	0.1	0.02			
200	240	0.5	1.2	0.5	0.2	0.11	0.3	0.8	0.5	0.1	0.08	0.3	0.4	0.5	0.1	0.05			
300	240	0.5	2.0	0.8	0.3	0.4	0.5	1.3	0.8	0.2	0.3	0.5	0.7	0.8	0.2	0.2			
700	240	0.9	4.2	2.0	0.6	4.1	0.9	2.8	2.0	0.3	2.6	0.9	1.5	2.0	0.3	1.6			
900	240	1.0	5.5	2.5	0.6	7.2	1.0	3.6	2.5	0.3	4.7	1.0	1.9	2.5	0.3	2.6			

ANCHOR BLOCKS SPACING ON GRADIENTS

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

NOTE

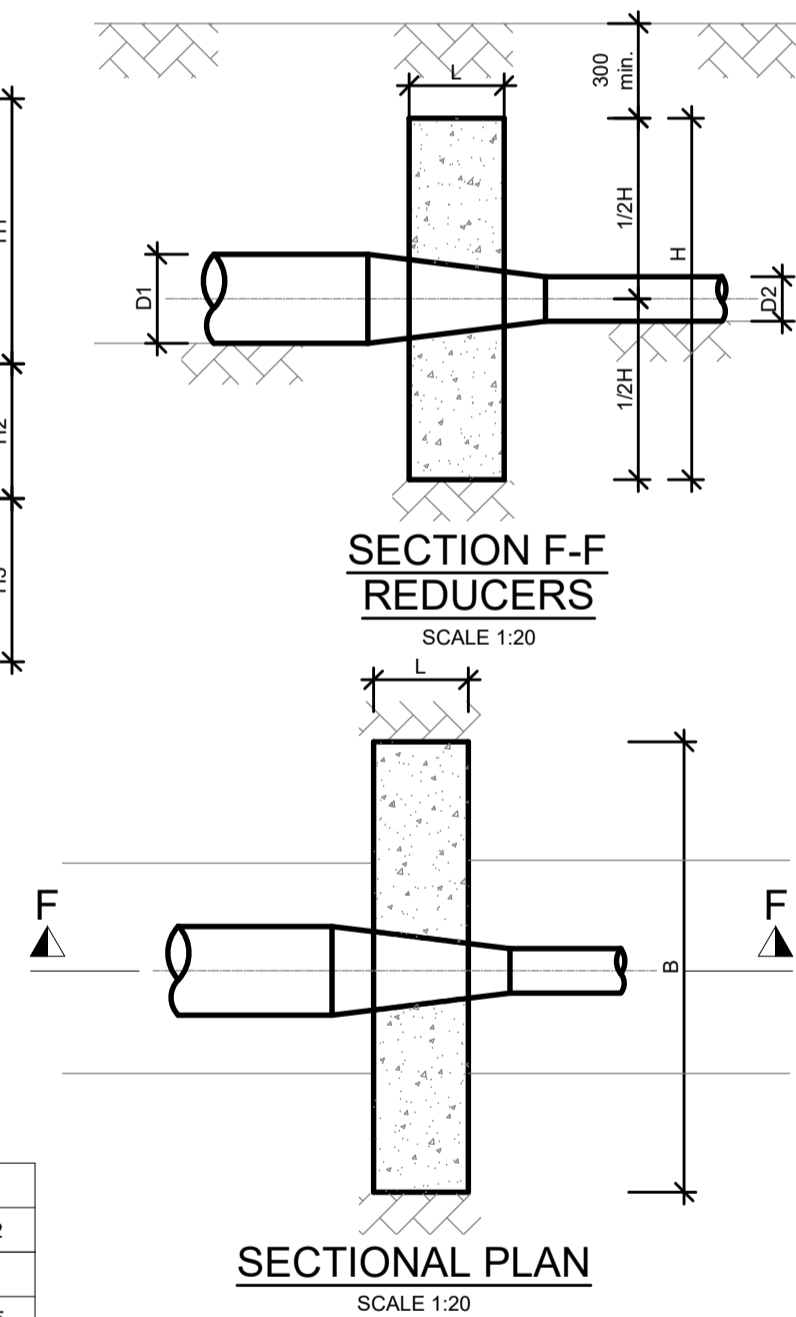
ANCHOR BLOCK TO BE POSITIONED BEHIND COLLAR AS SHOWN



SECTIONAL PLAN
SCALE 1:20

ANCHOR BLOCKS ON GRADIENTS

PIPE DIAMETER DN (mm)	DIMENSIONS (m)							
	A	L	H	H1	H2	H3	B1	B2
500	1.1	1.2	1.2	1.0	0.5	0.7	0.5	0.5
700	1.2	1.2	1.2	1.1	0.55	0.65	0.55	0.55
900	1.5	1.5	1.4	1.4	0.65	0.75	0.65	0.65



SECTION F-F
REDUCERS
SCALE 1:20

SECTIONAL PLAN
SCALE 1:20

ANCHOR BLOCKS AT REDUCERS

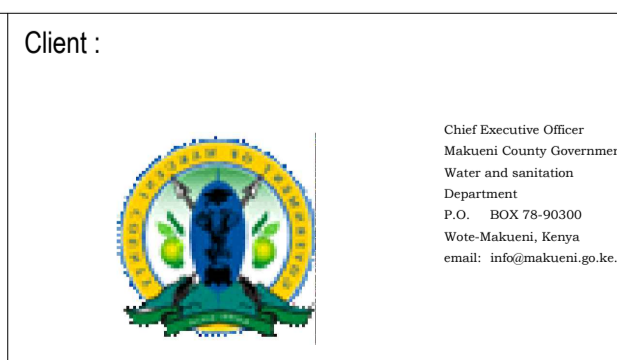
Pipe Diameter (D1/D2) (mm)	Test Pressure (m)	DIMENSIONS			
		L (m)	B (m)	H (m)	Vol (m ³)
800/400	240	0.4	2.0	2.4	1.9
900/600	240	0.7	3.9	2.7	7.4
1050/900	240	0.3	2.4	2.9	2.1

NOTE:
ANCHOR BLOCK AT REDUCERS TO BE REINFORCED WITH Y12 BARS AT 200mm SPACING BOTH WAYS ON BOTH FACES

- NOTES:
- Concrete Class: Foundation 25/20, Column 25/20, Ground Beam 25/20; Strip Footing 25/20 (i.e. Class 25N/mm² and Maximum Agg. Size 20mm)
 - Excavations to be inspected before blinding
 - All reinforcement to be inspected before concreting
 - Cover to Main Reinforcement: Foundations 50; Columns 25; Ground Beams 40; Strip Footing 50;
 - Dimensions to be read and not scaled
 - This drawing to be read in conjunction with Architectural Drawings

Revisions		
Date	Description	Remarks

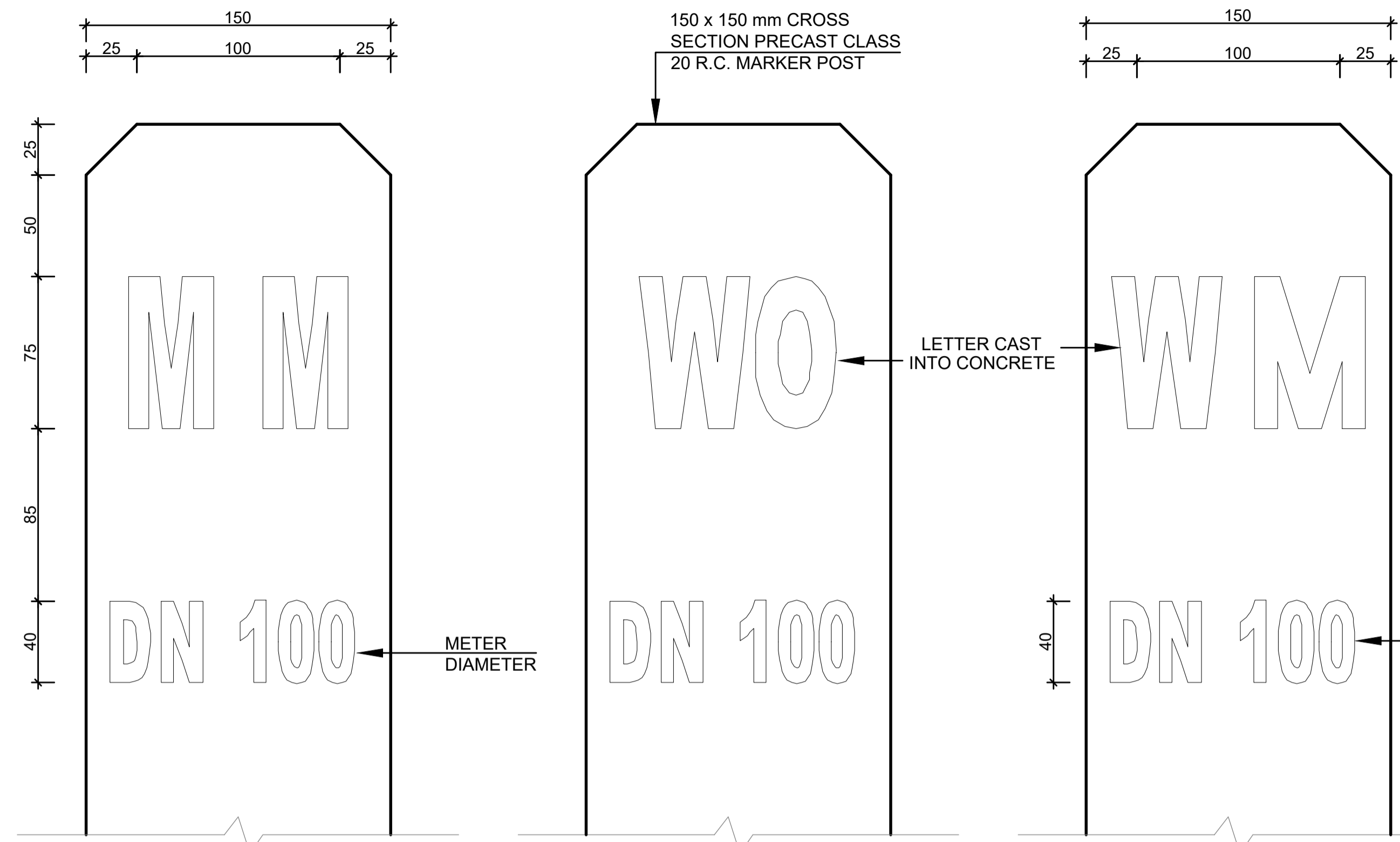
Project:
ATHI KILEMA TUNGUNI
WATER PROJECT PHASE II



Engineers:
Mima Centre, Outer Ring Rd, Donholm,
2nd Floor, Suite 13
P.O. Box 161-00300, Nairobi
Tel: +254-200-5290358
Email: info@horconengineering.com

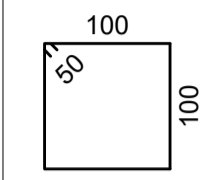
Client:
Owner
Drawing Title:
thrust block details

Designed by: A.G.N
Drawn by: A.G.N
Checked by: Eng. S. Muiruri
Approved by: Eng. S. Muiruri
Date: 9th October 2023
HES-009-2023
Scale:
as shown
S.12



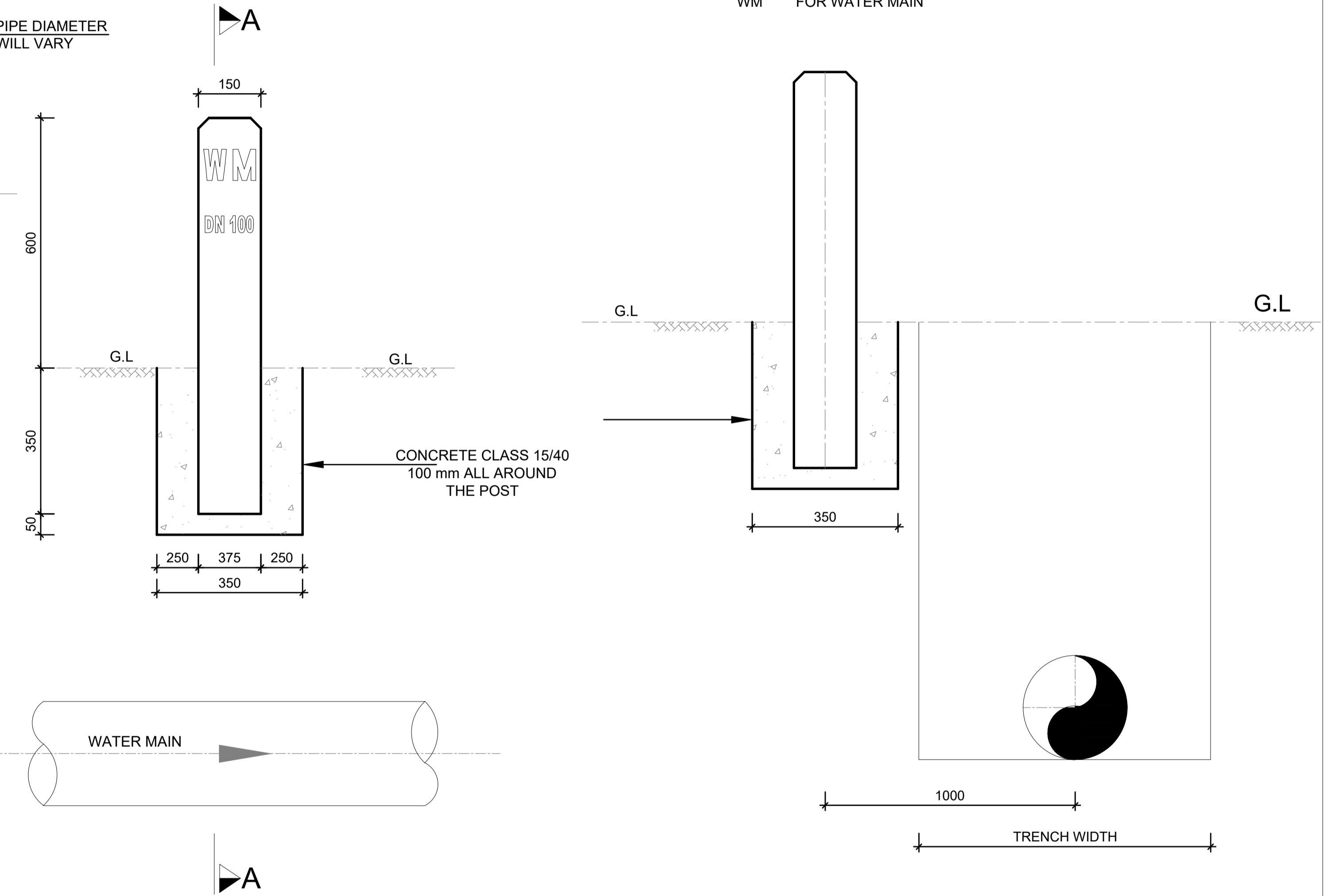
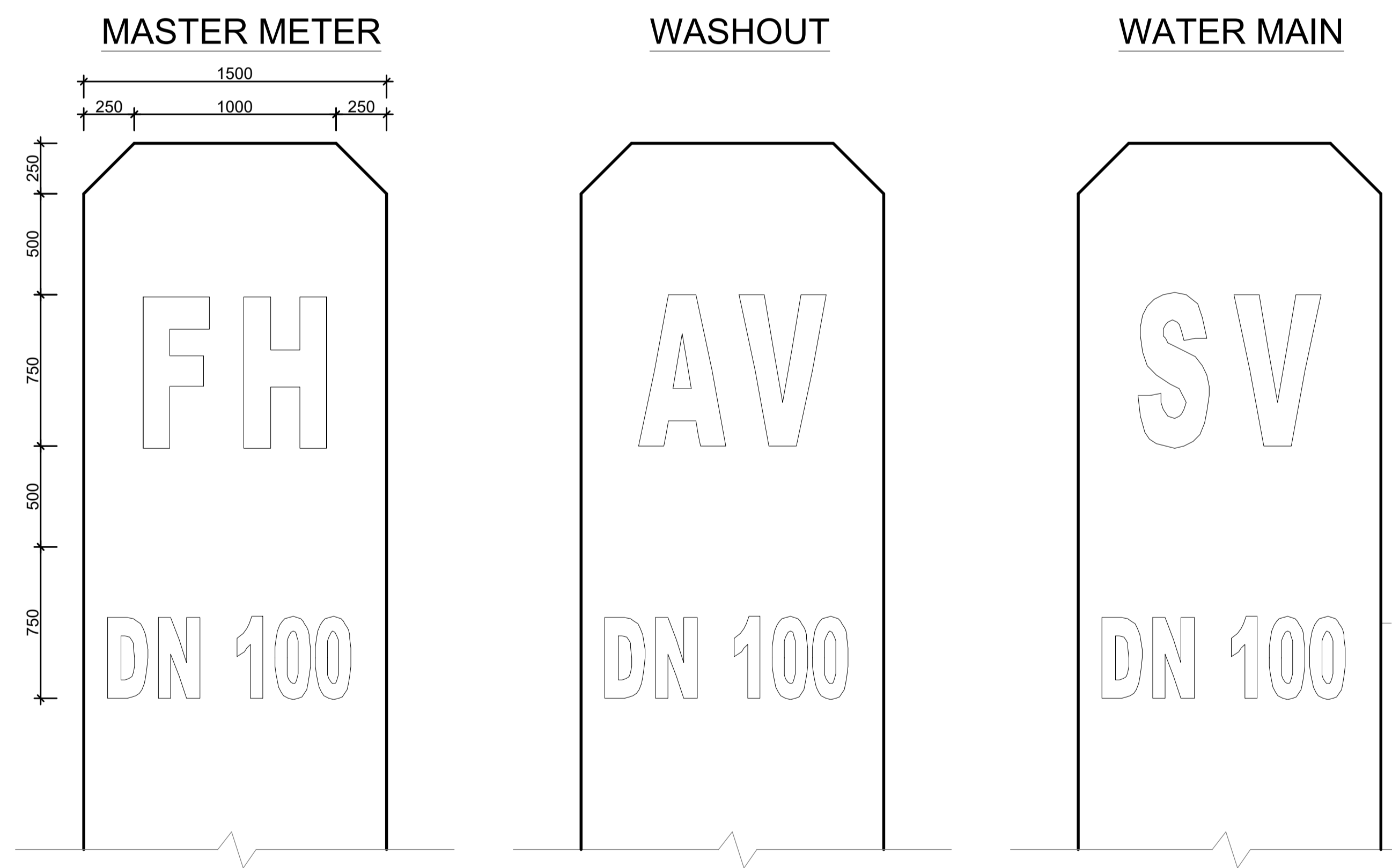
BAR BENDING SCHEDULE

BAR	No. OFF	TYPE	LENGTH
Y10	4	STRAIGHT	1000
R6	6		500



1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS STATED OTHERWISE
2. THE RESPECTIVE INSCRIPTION TO BE MADE ONLY ON ONE FACE OF INDICATOR POST FACING THE ACCESS ROAD.
3. ALL STRUCTURAL CONCRETE TO BE CLASS 20 ALL OTHER CONCRETE TO BE CLASS 15.
4. INDICATOR POST TO BE PLACED AT ALL APPURTENANCE LOCATIONS, AND AT INTERVALS OF 250 m ALONG WATER MAINS.
5. LETTERS TO BE INSCRIBED ON INDICATOR POLES SHOULD FACE ACCESS ROAD AND READ AS FOLLOWS:

- AV FOR AIR VALVE
- SV FOR SECTION VALVE
- WO FOR WASHOUT
- FH FOR FIRE HYDRANT
- MM FOR MASTER METER
- WM FOR WATER MAIN



PIPELINE MARKER POST POSITION

SECTION A-A
SCALE 1:5

FIRE HYDRANT


**AIR VALVE
MARKER POST DETAILS**

SLUICE VALVE

- NOTES:
1. Concrete Class: Foundation 25/20, Column 25/20, Ground Beam 25/20; Strip Footing 25/20 (i.e. Class 25N/mm² and Maximum Agg. Size 20mm)
 2. Excavations to be inspected before blinding
 3. All reinforcement to be inspected before concreting
 4. Cover to Main Reinforcement: Foundations 50; Columns 25; Ground Beams 40; Strip Footing 50;
 5. Dimensions to be read and not scaled
 6. This drawing to be read in conjunction with Architectural Drawings

Revisions		
Date	Description	Remarks

Project:
ATHI KILEMA TUNGUNI
WATER PROJECT PHASE II

Client:

Chief Executive Officer
Makurri County Government
Water and sanitation
Department
P.O. BOX 78-90300
Wari-Makurri, Kenya
email: info@makurri.go.ke

Engineers:

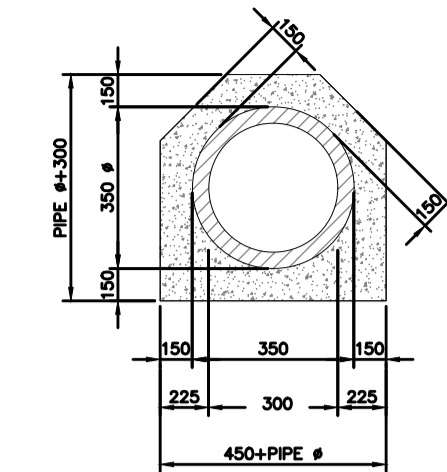
Mima Centre, Outer Ring Rd, Donholm,
2nd Floor, Suite 13
P.O. Box 161-00300, Nairobi
Tel: +254-020-5292358
Email: info@horconengineering.com

Client:
Owner

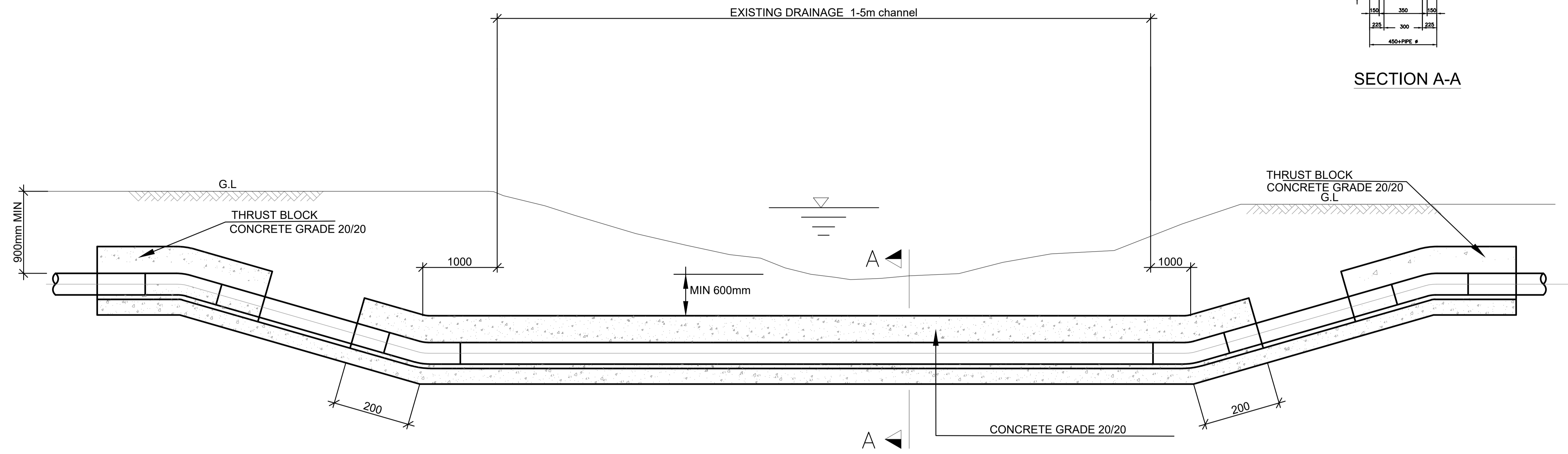
Drawing Title:
thrust block details

Designed by: A.G.N
Drawn by: A.G.N
Checked by: Eng. S. Muiruri
Approved by: Eng. S. Muiruri
Date: 9th October 2023
HES-009-2023
S.13

Scale:
as shown

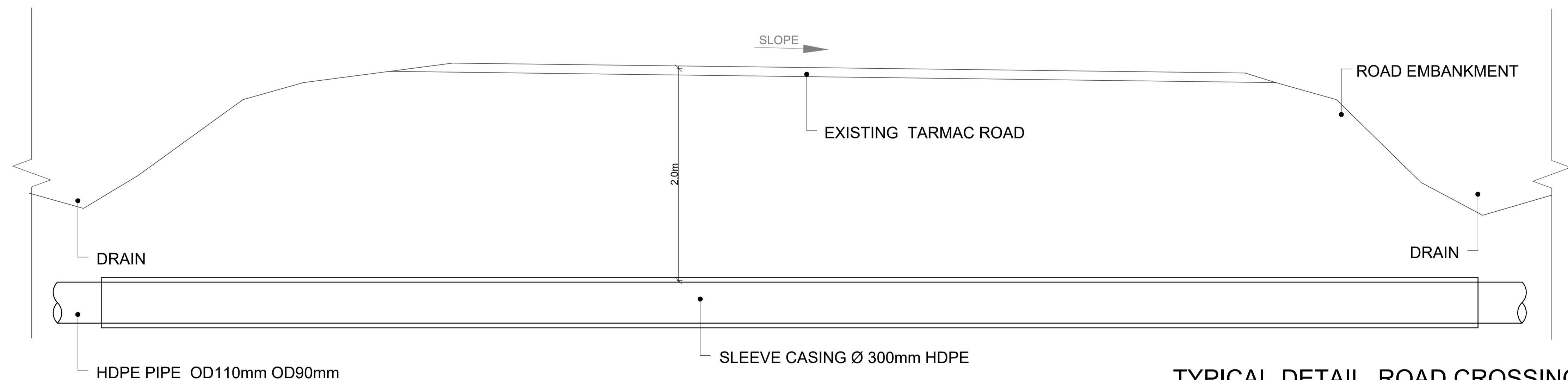


SECTION A-A



TYPICAL DETAIL RIVER /DRAINAGE CROSSING SCALE NS*

Right carriageway




TYPICAL DETAIL ROAD CROSSING SCALE NS* ROAD CROSSING DONE BY HORIZONTAL DRILLING/BORING

- NOTES:
- Concrete Class: Foundation 25/20, Column 25/20, Ground Beam 25/20; Strip Footing 25/20 (i.e. Class 25N/mm² and Maximum Agg. Size 20mm)
 - Excavations to be inspected before blinding
 - All reinforcement to be inspected before concreting
 - Cover to Main Reinforcement: Foundations 50; Columns 25; Ground Beams 40; Strip Footing 50;
 - Dimensions to be read and not scaled
 - This drawing to be read in conjunction with Architectural Drawings

Revisions		
Date	Description	Remarks

Project:
ATHI KILEMA TUNGUNI
WATER PROJECT PHASE II

Client:



Chief Executive Officer
Makurri County Government
Water and sanitation
Department
P.O. BOX 78-90300
Wote-Makurri, Kenya
email: info@makurri.go.ke

Engineers:



Mima Centre, Outer Ring Rd, Donholm,
2nd Floor, Suite 13
P.O. Box 161-00300, Nairobi
Tel: +254-020-5290358
Email: info@horconengineering.com

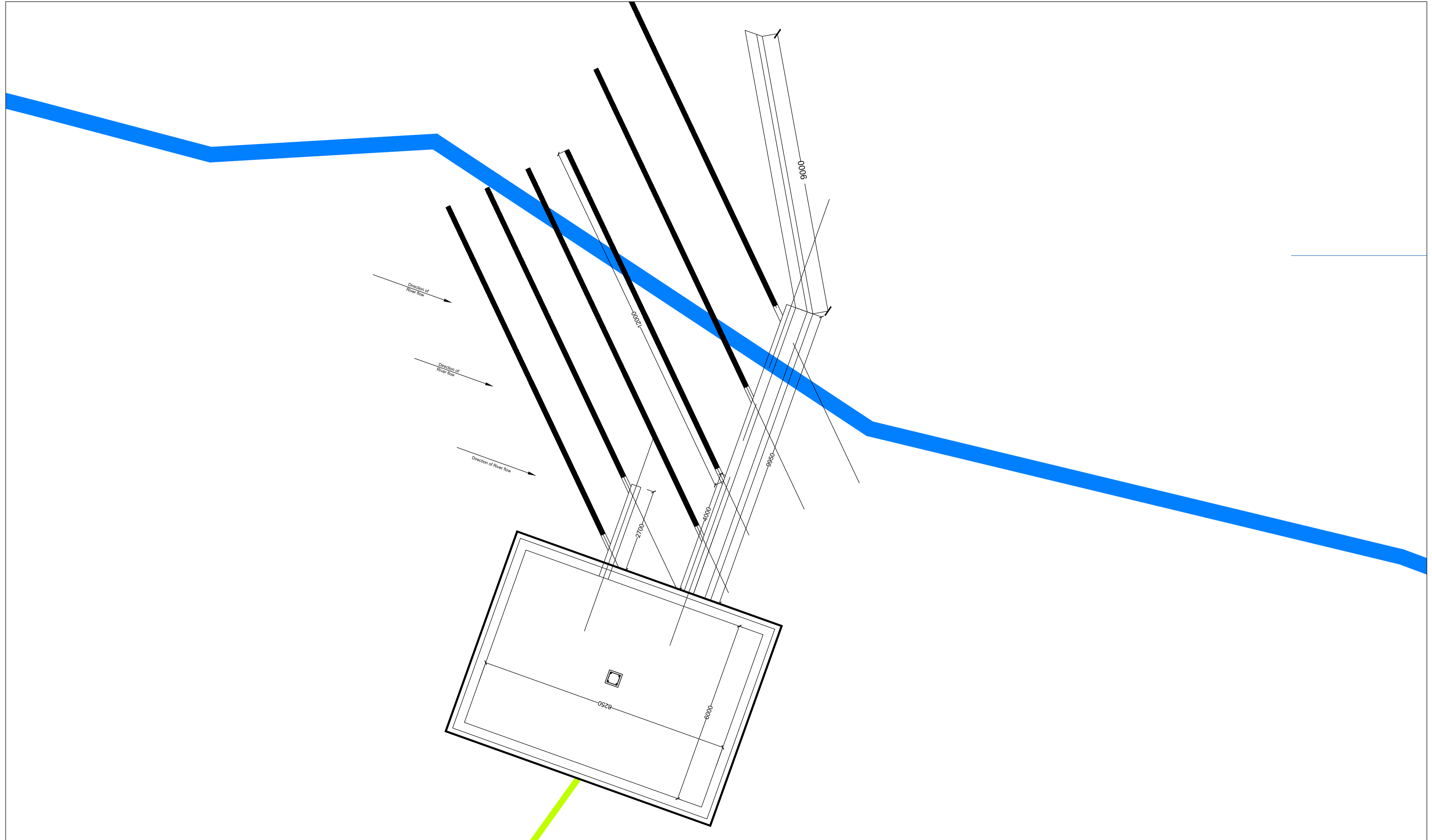
Client:
Owner

Drawing Title:
Pipe bedding details

Designed by: A.G.N
Drawn by: A.G.N
Checked by: Eng. S. Muiruri
Approved by: Eng. S. Muiruri
Date: 9th October 2023

HES-009-2023
S.13

Scale:
as shown




- NOTES:
1. Concrete Class: Foundation 25/20, Column 25/20, Ground Beam 25/20; Strip Footing 25/20 (i.e. Class 25N/mm² and Maximum Agg. Size 20mm)
 2. Excavations to be inspected before blinding
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 4. Cover to Main Reinforcement: Foundations 50; Columns 25; Ground Beams 40; Strip Footing 50;
 5. Dimensions to be read and not scaled
 6. This drawing to be read in conjunction with Architectural Drawings

Revisions		
Date	Description	Remarks

Project:
**ATHI KILEMA TUNGUNI
 WATER PROJECT PHASE II**

Client :



Chief Executive Officer
 Makueni County Government
 Water and sanitation
 Department
 P.O. BOX 78-90300
 Wote-Makueni, Kenya
 email: info@makueni.go.ke

Engineers:



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 2nd Floor, Suite 13
 P.O. Box 161 - 00300, Nairobi
 Tel: +254-020-5290358
 Email: info@horconengineering.com

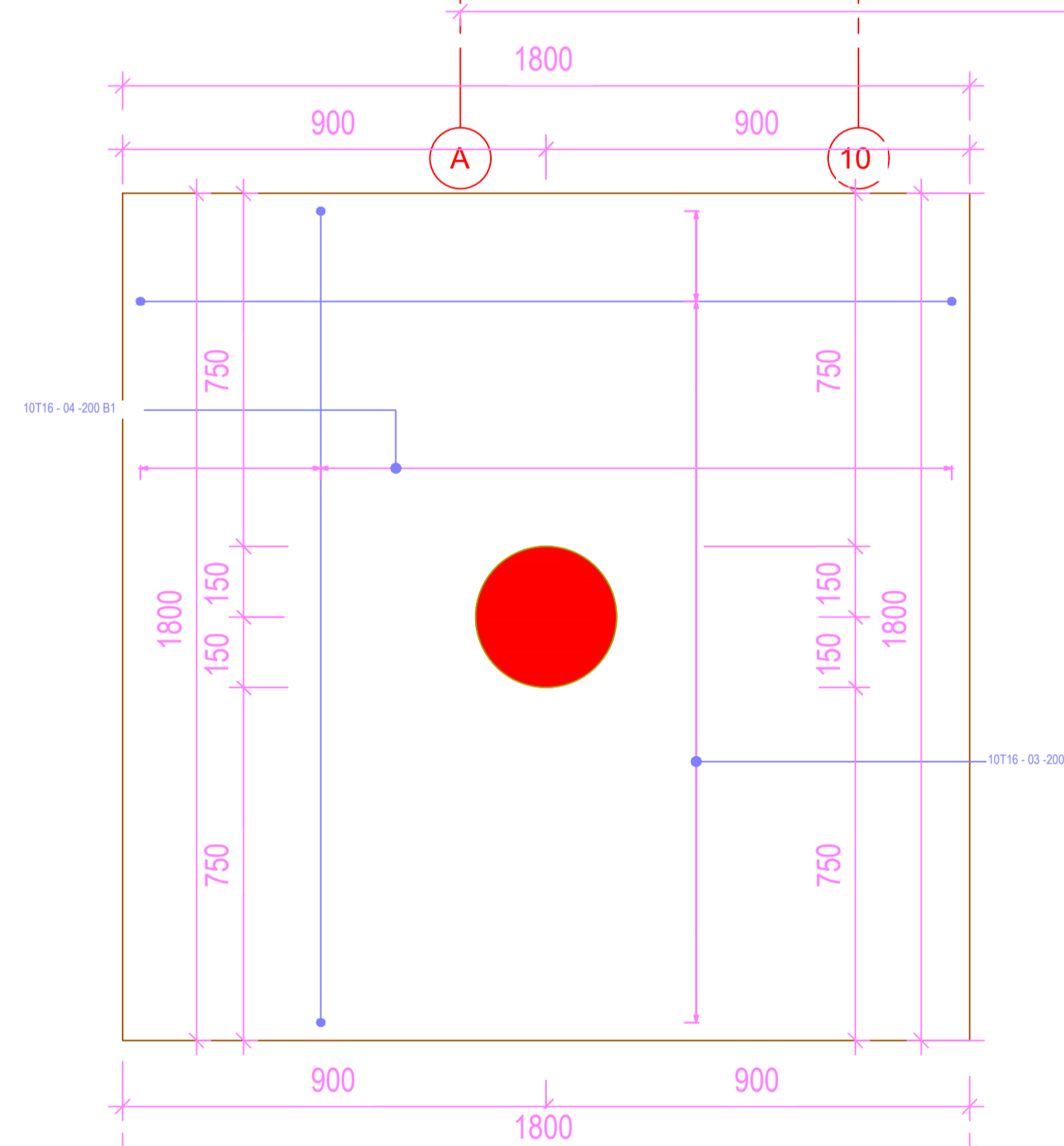
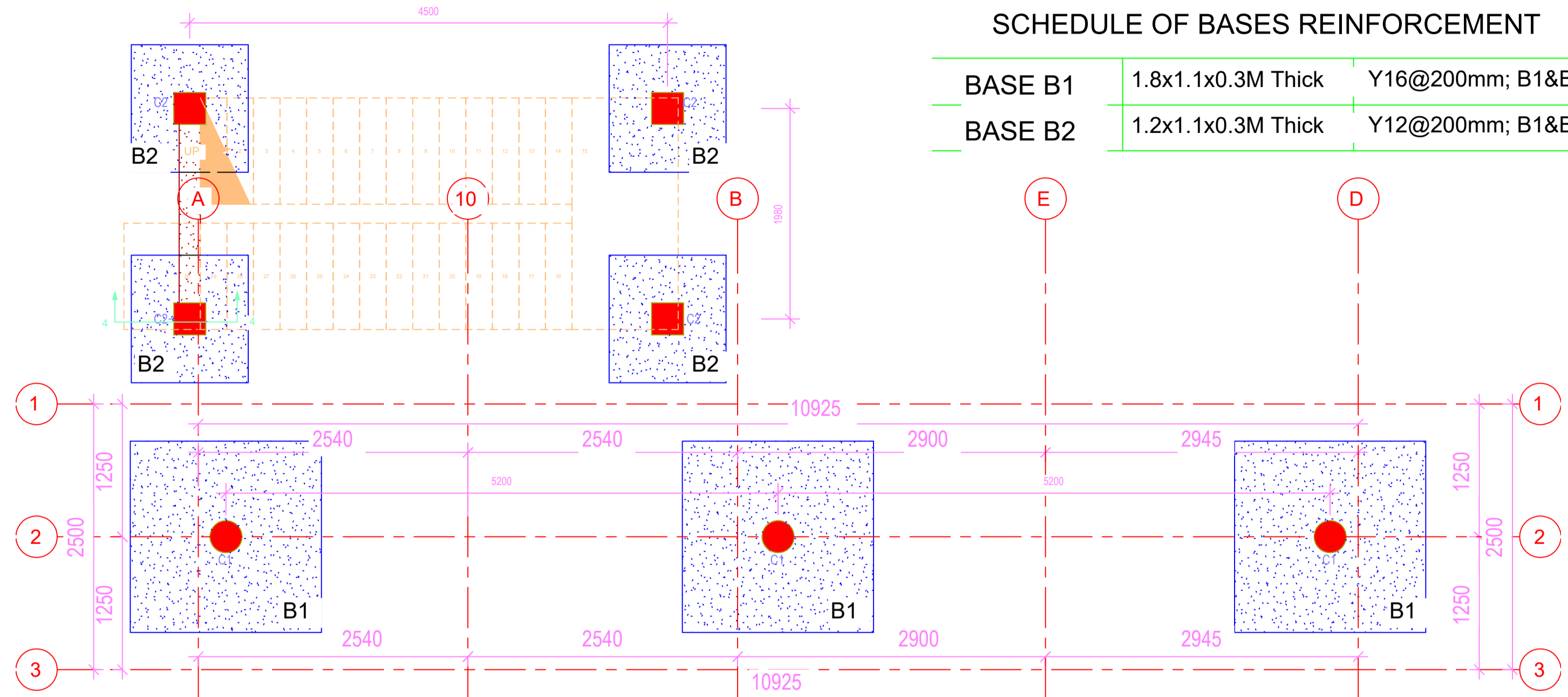
Client:
 Owner

Drawing Title:
 Intake layout details

Designed by: A.G.N
 Drawn by: A.G.N
 Checked by: Eng. S. Muiruri
 Approved by: Eng. S. Muiruri
 Date: 9th October 2023

HES-009-2023
 S.14

Scale:
 as shown

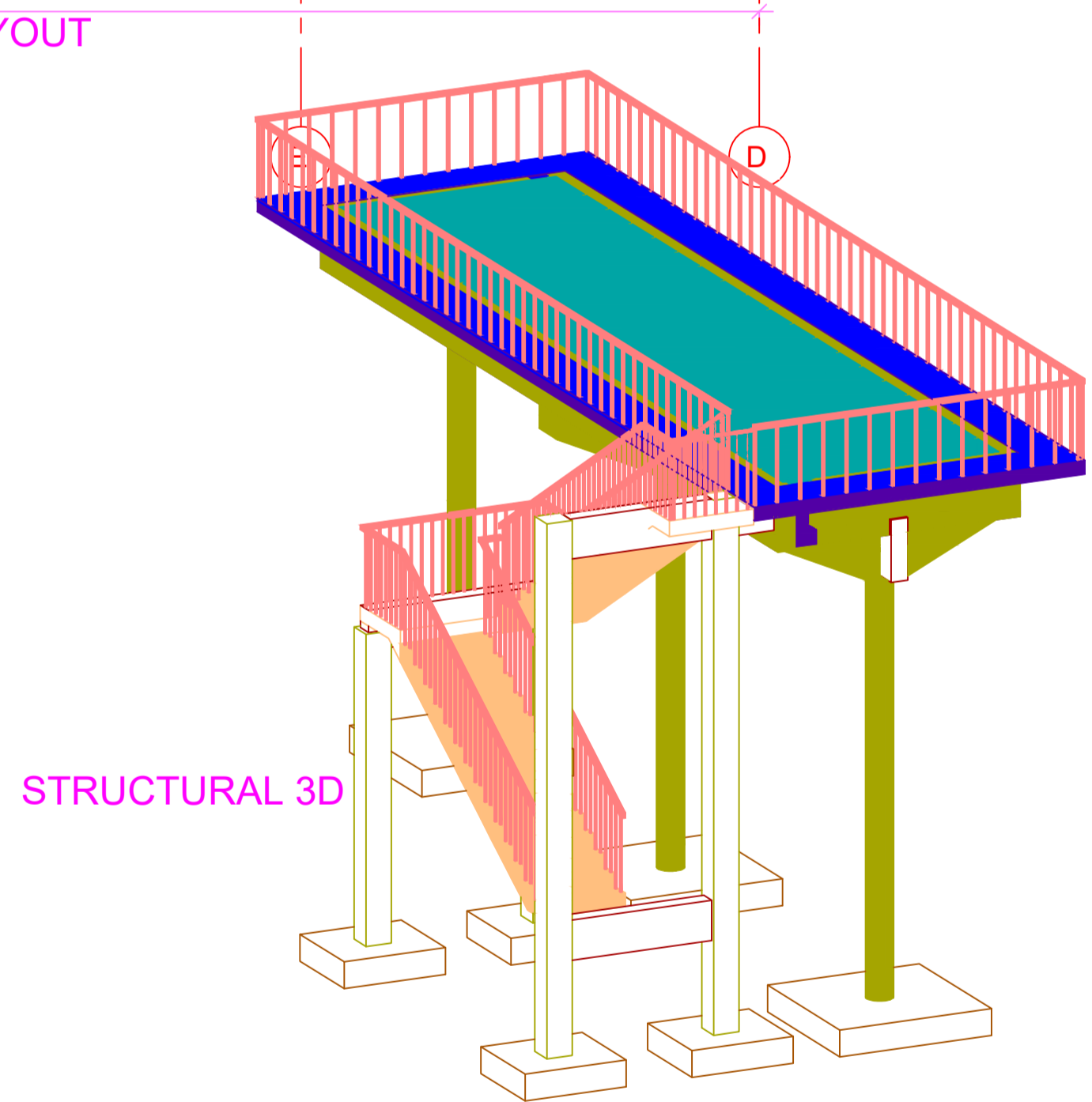
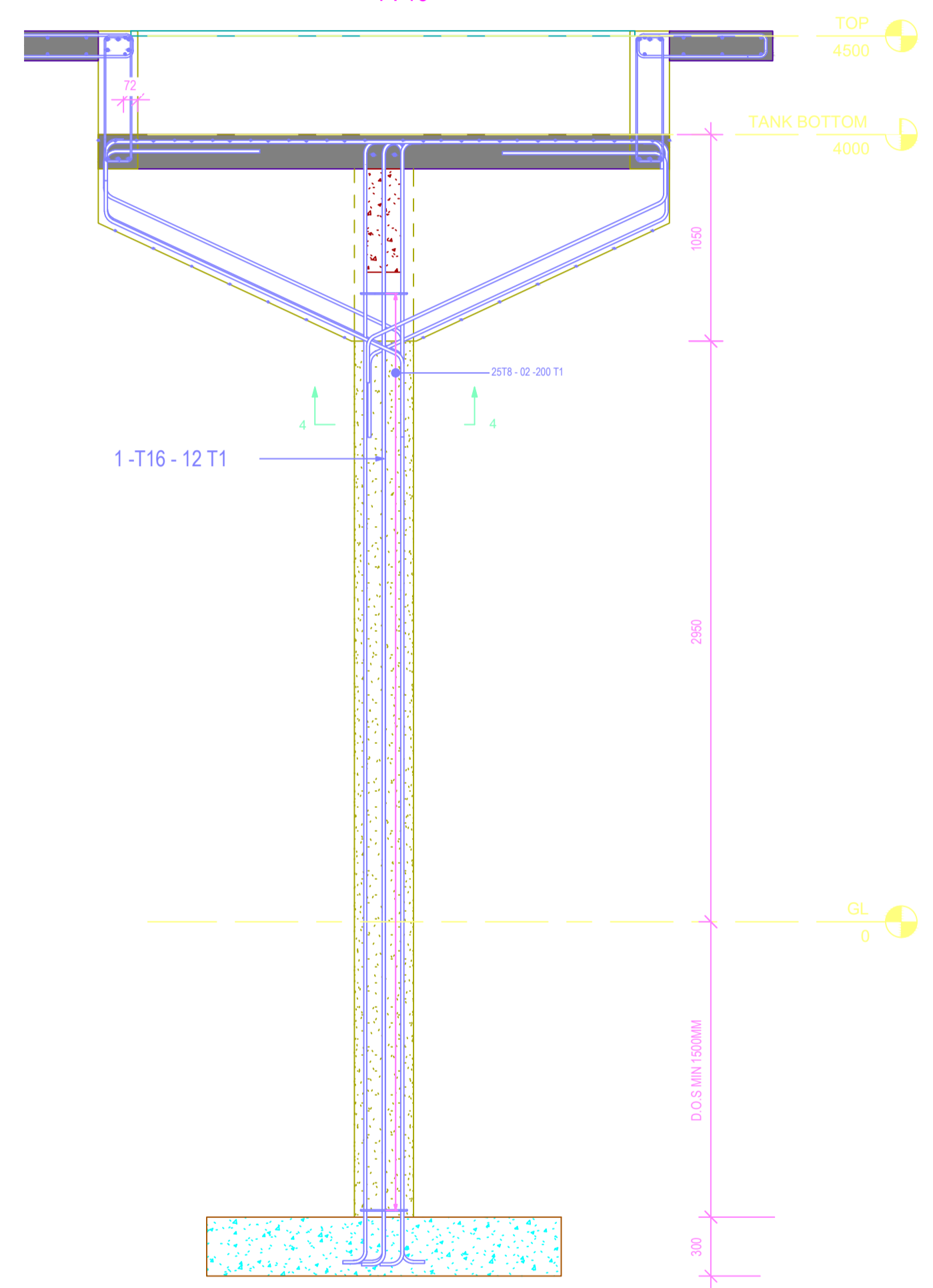
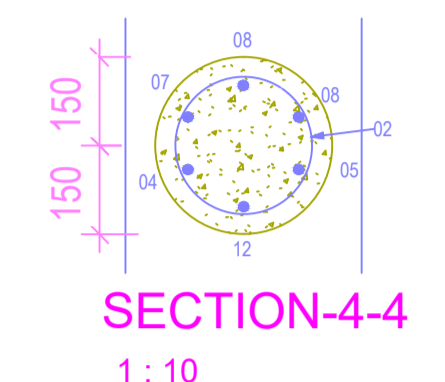


SCHEDULE OF BASES REINFORCEMENT

BASE B1	1.8x1.1x0.3M Thick	Y16@200mm; B1&B2
BASE B2	1.2x1.1x0.3M Thick	Y12@200mm; B1&B2

SCHEDULE OF STAIRCASE COLUMNS REINFORCEMENT

COLUMN C2	300X300	4Y16	Y8 Links @ 200
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SCHEDULE OF COLUMNS REINFORCEMENT

COLUMN C1	300DIA	6Y16	Y8 Links @ 200
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- NOTES:
- Concrete Class: Foundation 25/20, Column 25/20, Ground Beam 25/20; Strip Footing 25/20 (i.e. Class 25N/mm² and Maximum Agg. Size 20mm)
 - Excavations to be inspected before blinding
 - All reinforcement to be inspected before concreting
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 - Dimensions to be read and not scaled
 - This drawing to be read in conjunction with Architectural Drawings

Revisions		
Date	Description	Remarks

Project: ATHI KILEMA TUNGUNI WATER PROJECT PHASE II

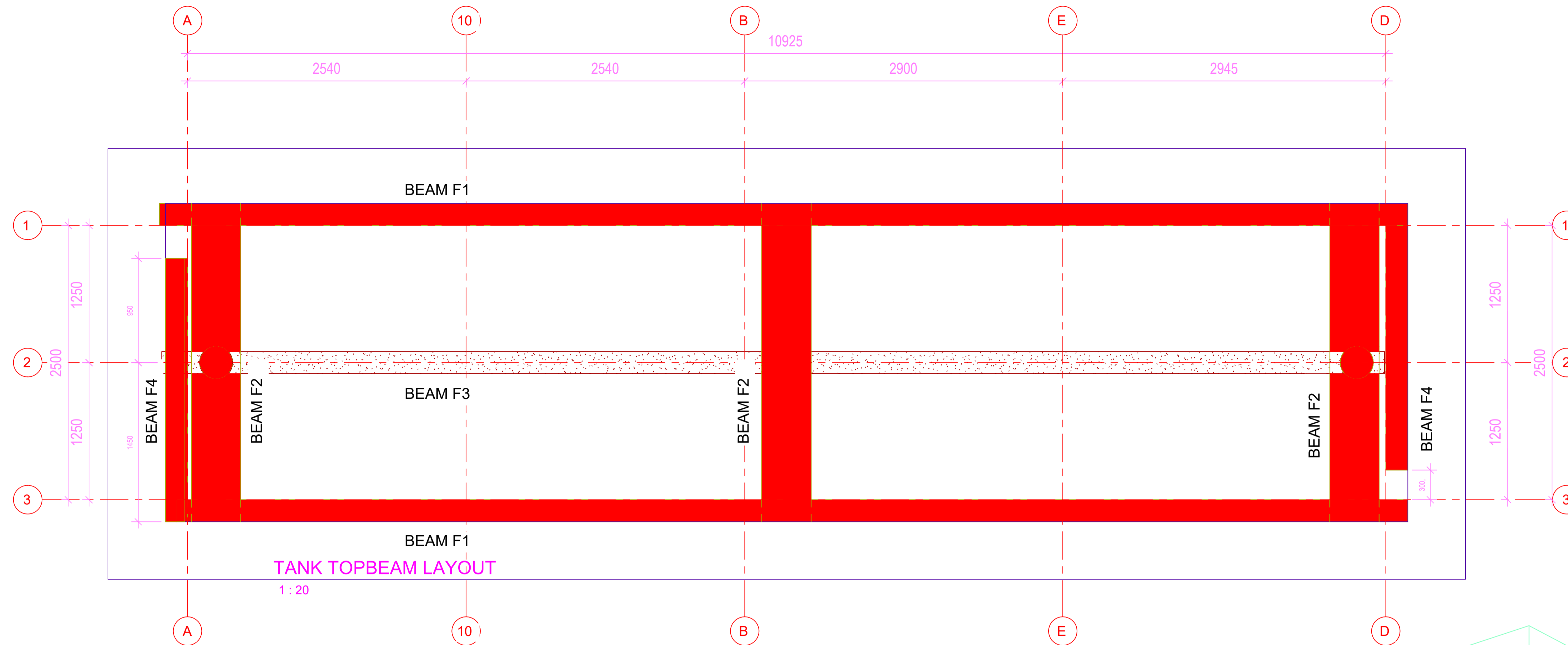
Client:

Engineers:

Client: Owner
Drawing Title: Layout

Designed by: A.G.N
Drawn by: Eng. S. Muiruri
Checked by: Eng. S. Muiruri
Approved by: 9th October 2023
Date: HES-009-2023
S.15

Scale: as shown

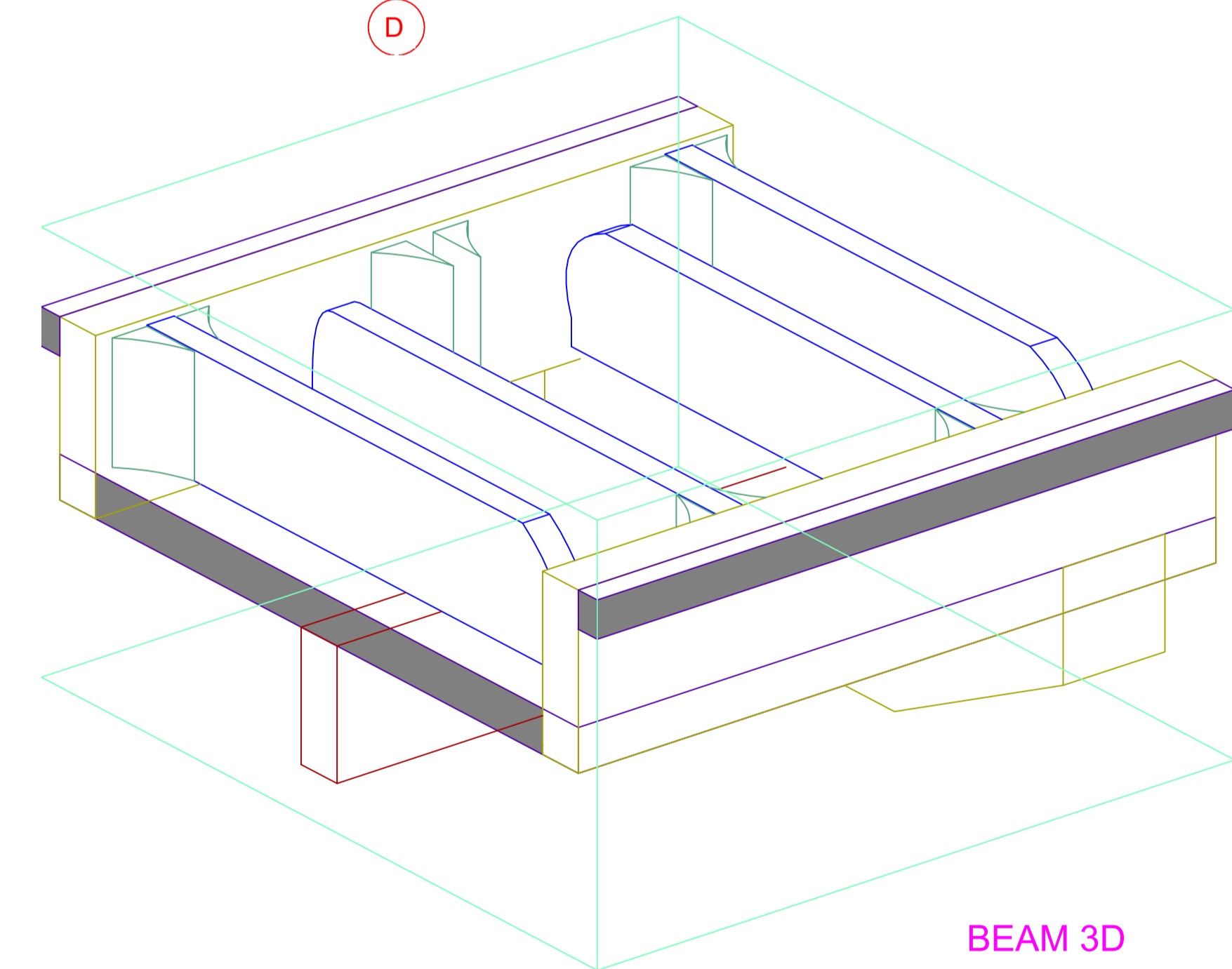


TANK DETAILS	
Number of baffles	18
Length of Basin	10.925 Metres
Length of Channels	2.50 Metres
Chamber Height	0.5 Meters
Baffle walls Thickness	0.12 Meters
Width of Channels	0.453 Meters

BEAM SCHEDULE				
BEAM	No	SIZE	STEEL	LINKS
BEAM F1	2	700X200	BOT 3T16, TOP 3T16 Add 2T16	8@200
BEAM F2	2	As In Section	BOT 3T16, TOP 3T16	3@200
BEAM F3	3	700X200	BOT 3T16, TOP 3T16 Add 2T16	8@200
BEAM F4	4	450X200	BOT 3T16, TOP 3T16 Add 2T16	8@200

UNDERGROUND WATER TANK BOTTOM SOLID SLAB DETAILS

SLAB THICKNESS	175MM THICK SLAB
REINFORCEMENT	Y10@200 T1&T2 Y10@200 B1&B2



- NOTES:
- Concrete Class: Foundation 25/20, Column 25/20, Ground Beam 25/20; Strip Footing 25/20 (i.e. Class 25N/mm² and Maximum Agg. Size 20mm)
 - Excavations to be inspected before blinding
 - All reinforcement to be inspected before concreting
 - Cover to Main Reinforcement: Foundations 50; Columns 25; Ground Beams 40; Strip Footing 50;
 - Dimensions to be read and not scaled
 - This drawing to be read in conjunction with Architectural Drawings

Revisions		
Date	Description	Remarks

Project:
ATHI KILEMA TUNGUNI
WATER PROJECT PHASE II

Client:



Chief Executive Officer
Makindu County Commission
Water and sanitation
Department
P.O. BOX 78-90300
Wote-Makindu, Kenya
email: info@makindu.go.ke

Engineers:



Mina Centre, Oudering Rd, Donholm,
2nd Floor, Suite 13
P.O. Box 161 - 00300, Nairobi
Tel: +254-020-6290368
Email: info@horcoengineering.com

Client:

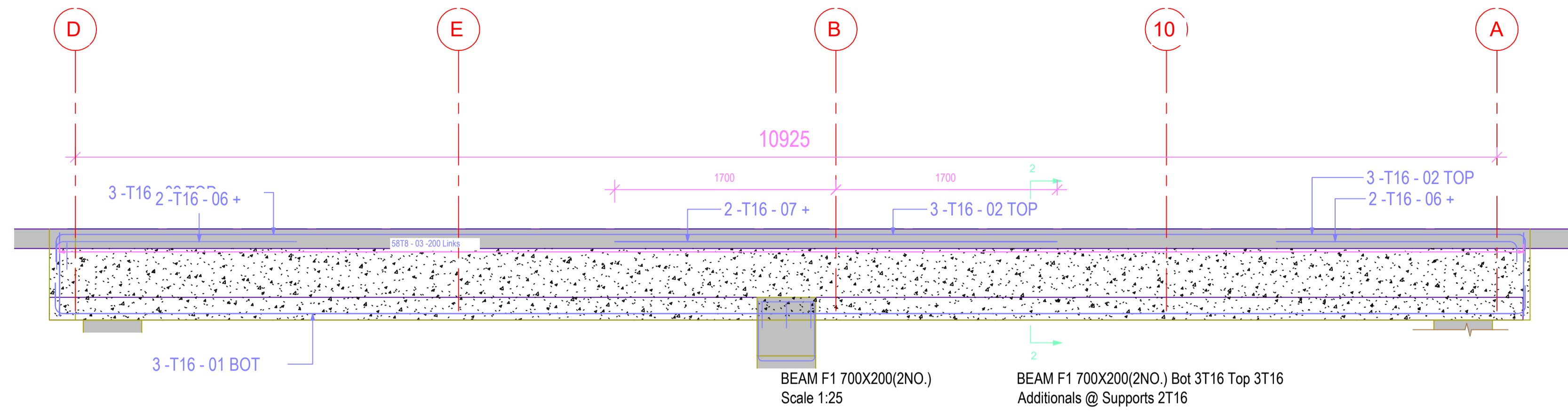
Owner

Drawing Title:
Beam layout

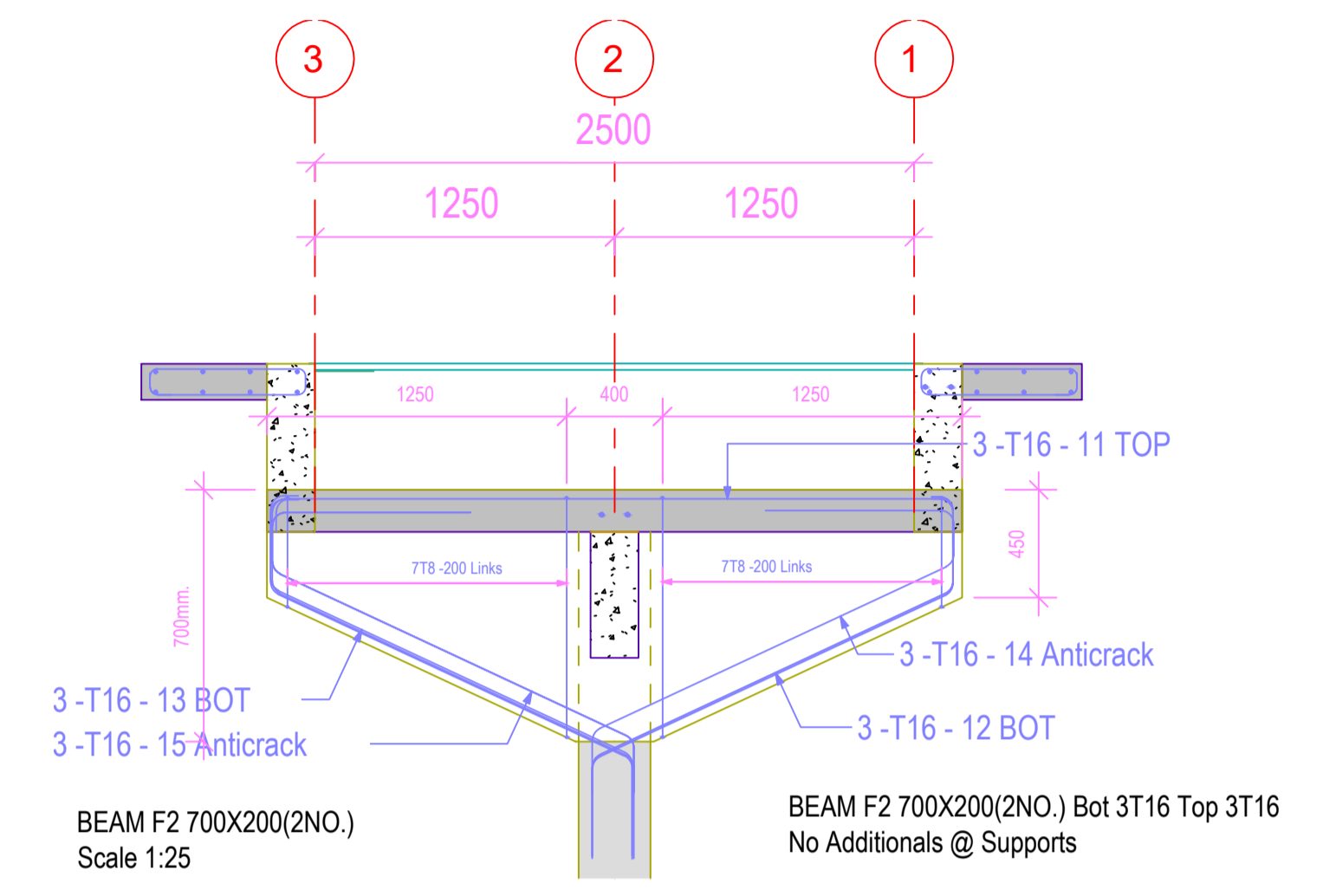
Designed by: A.G.N
Drawn by: A.G.N
Checked by: Eng. S. Muiruri
Approved by: Eng. S. Muiruri
Date: 9th October 2023

HES-009-2023
S.16

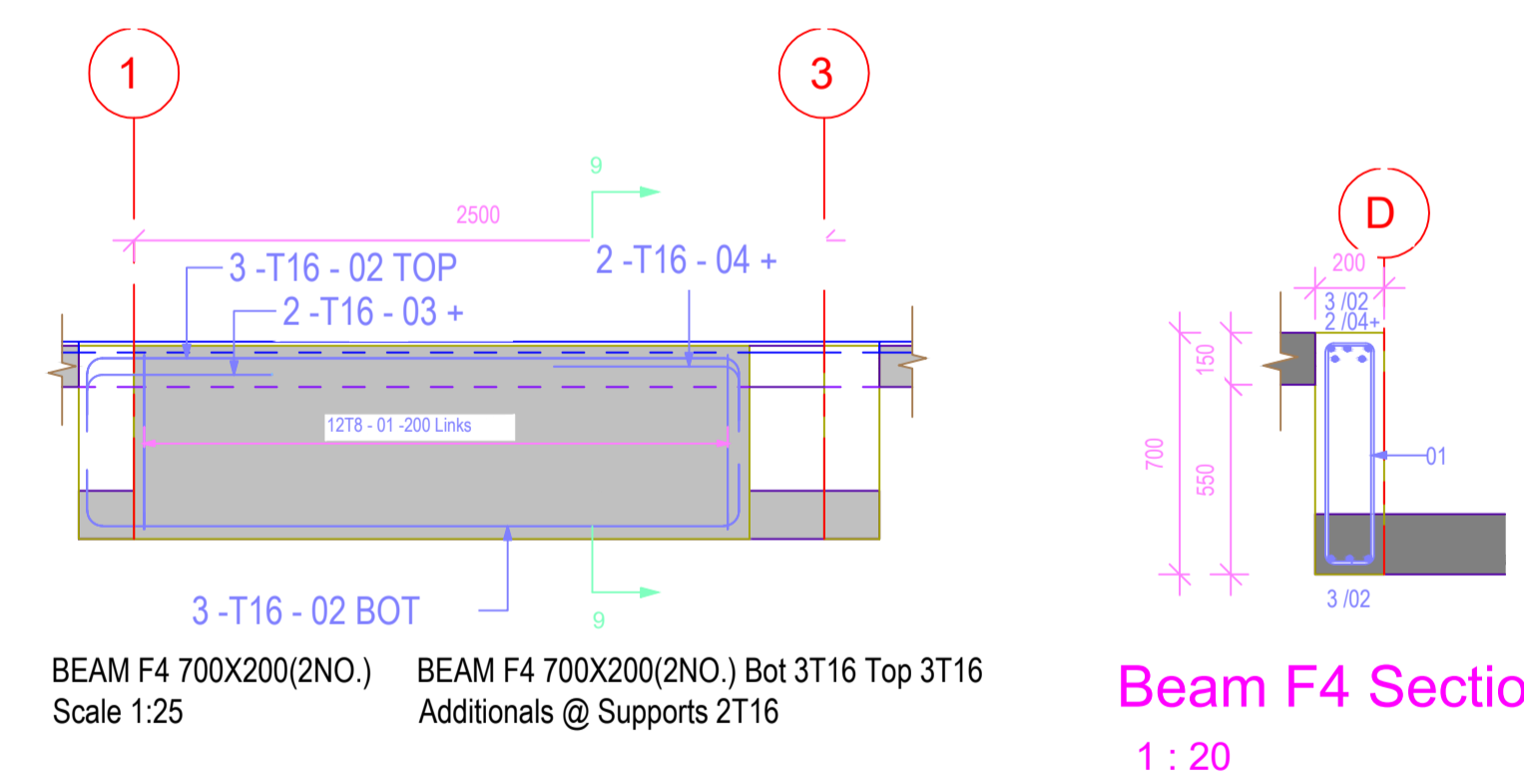
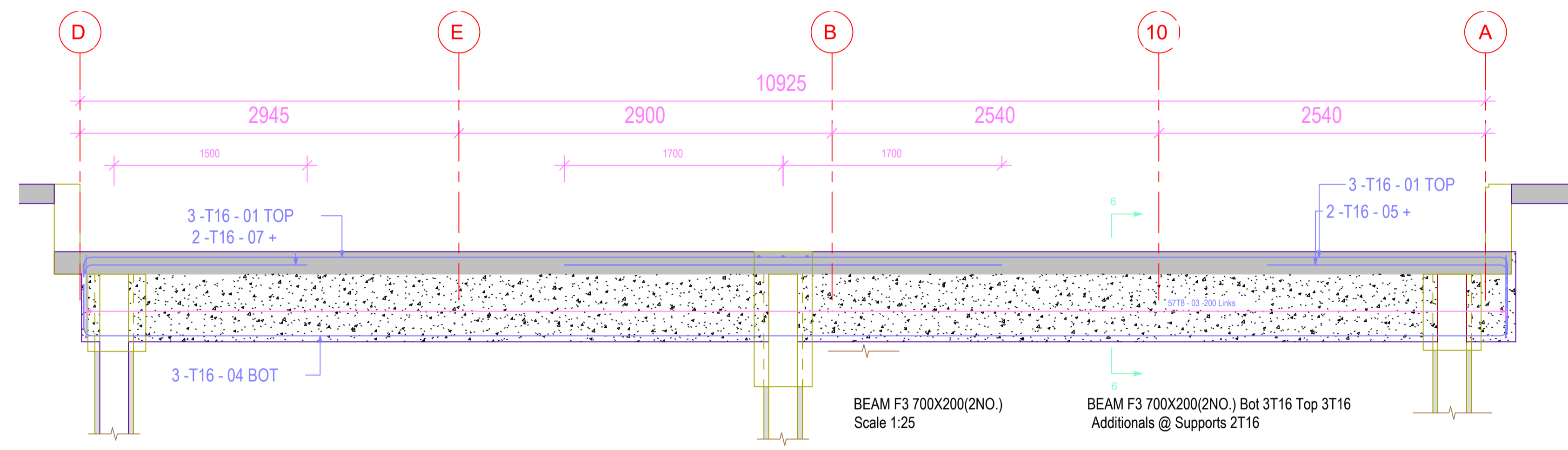
Scale:
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Section 2-2
1 : 20



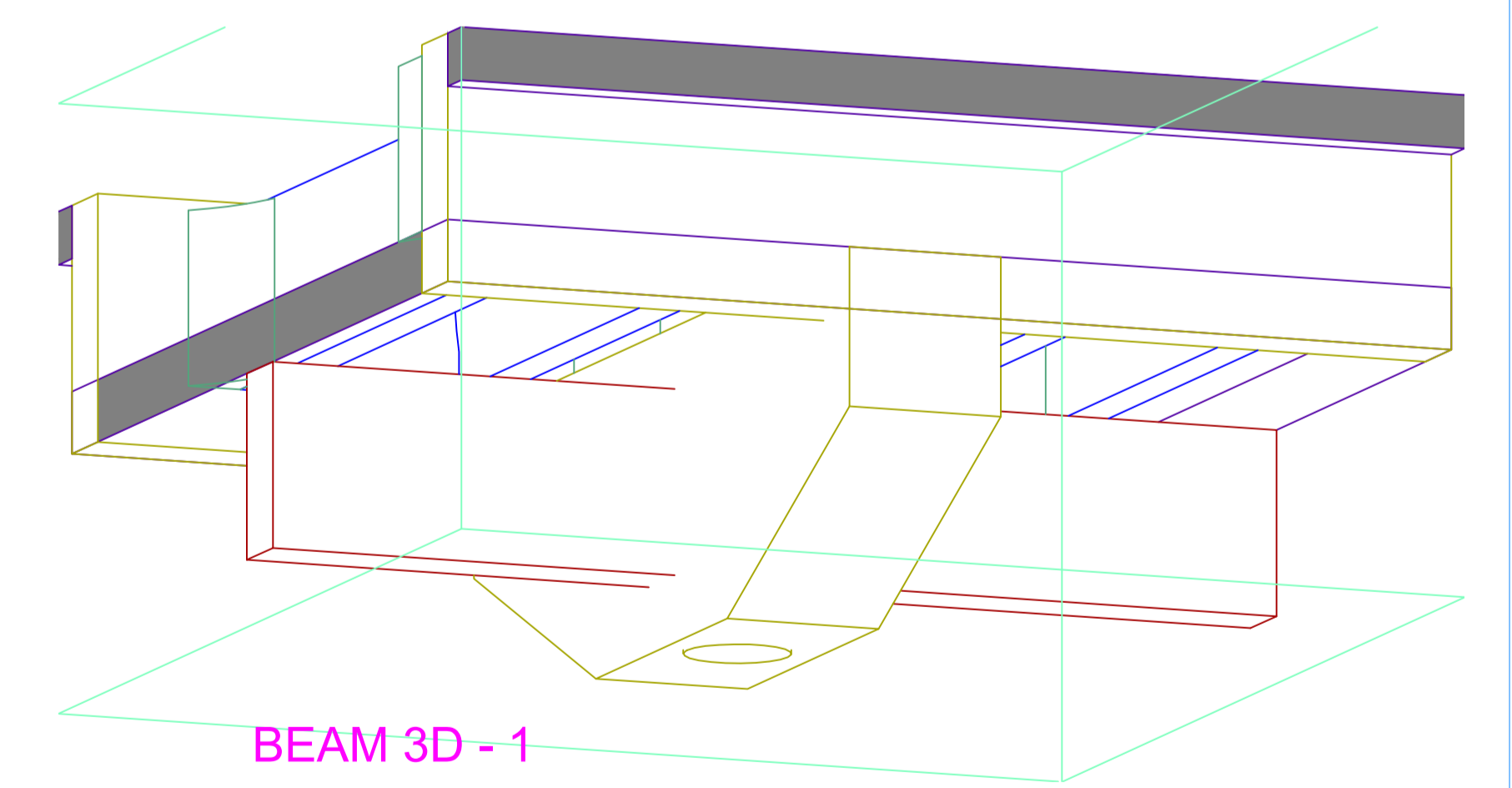
Section 6-6
1 : 20



Beam F4 Section 9-9
1 : 20

BEAM SCHEDULE

BEAM	No	SIZE	STEEL	LINKS
BEAM F1	2	700X200	BOT 3T16, TOP 3T16 Add 2T16	8@200
BEAM F2	2	As In Section	BOT 3T16, TOP 3T16	3@200
BEAM F3	3	700X200	BOT 3T16, TOP 3T16 Add 2T16	8@200
BEAM F4	4	450X200	BOT 3T16, TOP 3T16 Add 2T16	8@200



- NOTES:
- Concrete Class: Foundation 25/20, Column 25/20, Ground Beam 25/20; Strip Footing 25/20 (i.e. Class 25N/mm² and Maximum Agg. Size 20mm)
 - Excavations to be inspected before blinding
 - All reinforcement to be inspected before concreting
 - Cover to Main Reinforcement: Foundations 50; Columns 25; Ground Beams 40; Strip Footing 50;
 - Dimensions to be read and not scaled
 - This drawing to be read in conjunction with Architectural Drawings

Revisions		
Date	Description	Remarks

Project:
ATHI KILEMA TUNGUNI
WATER PROJECT PHASE II

Client:

Engineers:

Client:
Owner

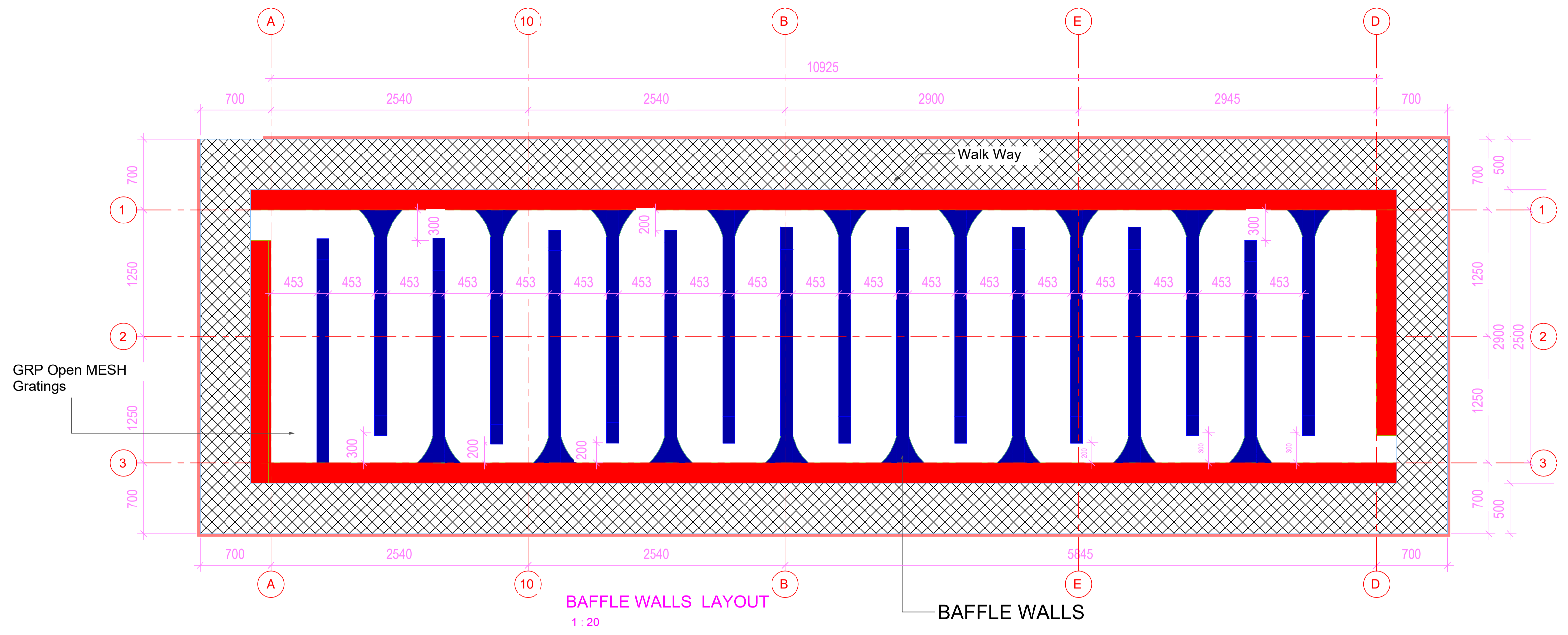
Drawing Title:
Beam structural

Designed by: A.G.N
Drawn by: A.G.N
Checked by: Eng. S. Muiruri
Approved by: Eng. S. Muiruri
Date: 9th October 2023

HES-009-2023

S.17

Scale:
as shown

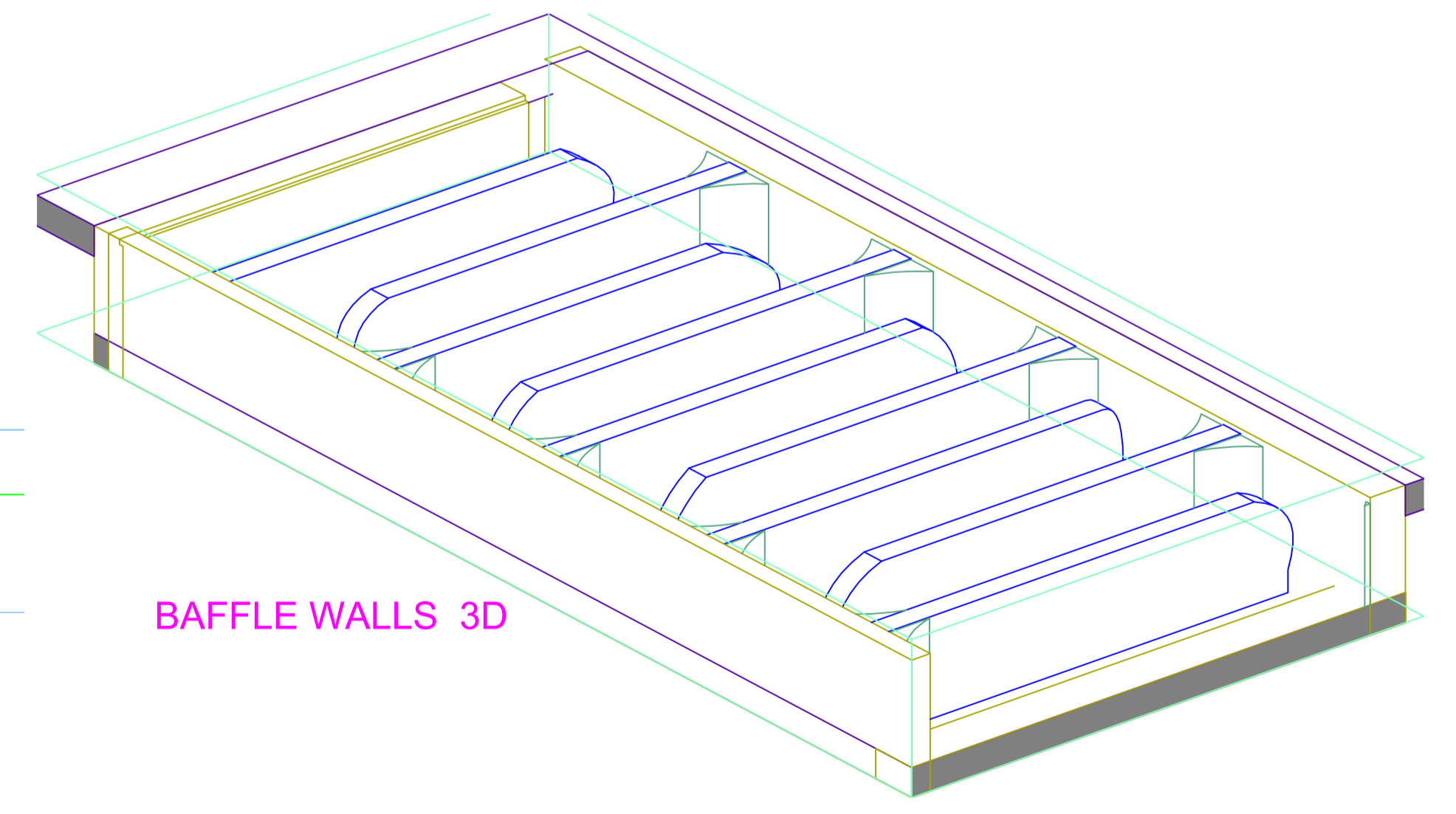


TANK DETAILS

Number of baffles	18
Length of Basin	10.925 Metres
Length of Channels	2.50 Metres
Chamber Height	0.5 Meters
Baffle walls Thickness	0.12 Meters
Width of Channels	0.453 Meters

UNDERGROUND WATER TANK BOTTOM SOLID SLAB DETAILS

SLAB THICKNESS	175MM THICK SLAB
REINFORCEMENT	Y10@200 T1&T2 Y10@200 B1&B2



- NOTES:**
- Concrete Class: Foundation 25/20, Column 25/20, Ground Beam 25/20; Strip Footing 25/20 (i.e. Class 25N/mm² and Maximum Agg. Size 20mm)
 - Excavations to be inspected before blinding
 - All reinforcement to be inspected before concreting
 - Cover to Main Reinforcement: Foundations 50; Columns 25; Ground Beams 40; Strip Footing 50;
 - Dimensions to be read and not scaled
 - This drawing to be read in conjunction with Architectural Drawings

Revisions		
Date	Description	Remarks

Project: **ATHI KILEMA TUNGUNI WATER PROJECT PHASE II**

Client:

Chief Executive Officer
Makindu County Commission
Water and sanitation
Department
P.O. BOX 78-90300
Wote, Makindu, Kenya
email: info@makindu.go.ke

Engineers:

Mina Centre, Outer Ring Rd, Donholm,
2nd Floor, Suite 13
P.O. Box 161 - 00300, Nairobi
Tel: +254-020-6290368
Email: info@horconengineering.com

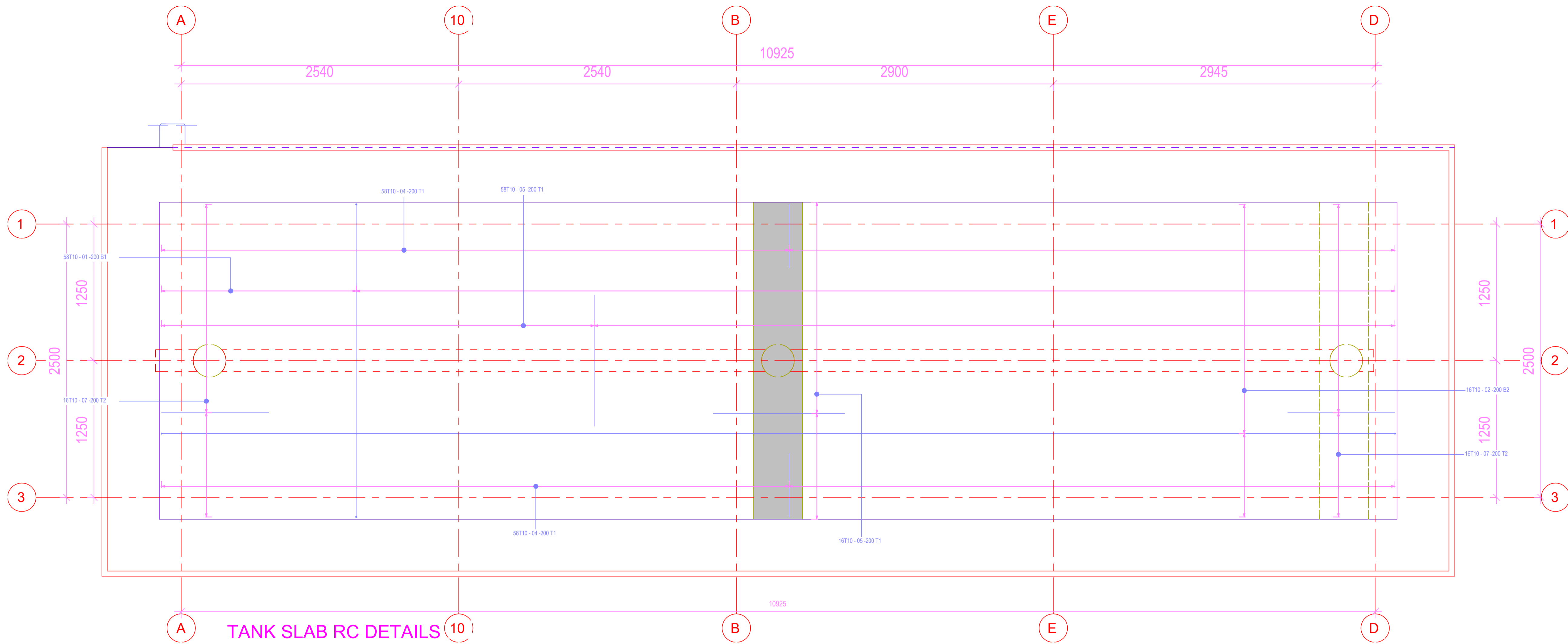
Client: **Owner**

Drawing Title: **BAFFLE WALL LAYOUT**

Designed by: **A.G.N**
Drawn by: **A.G.N**
Checked by: **Eng. S. Muiruri**
Approved by: **Eng. S. Muiruri**
Date: **9th October 2023**

HES-009-2023
S.18

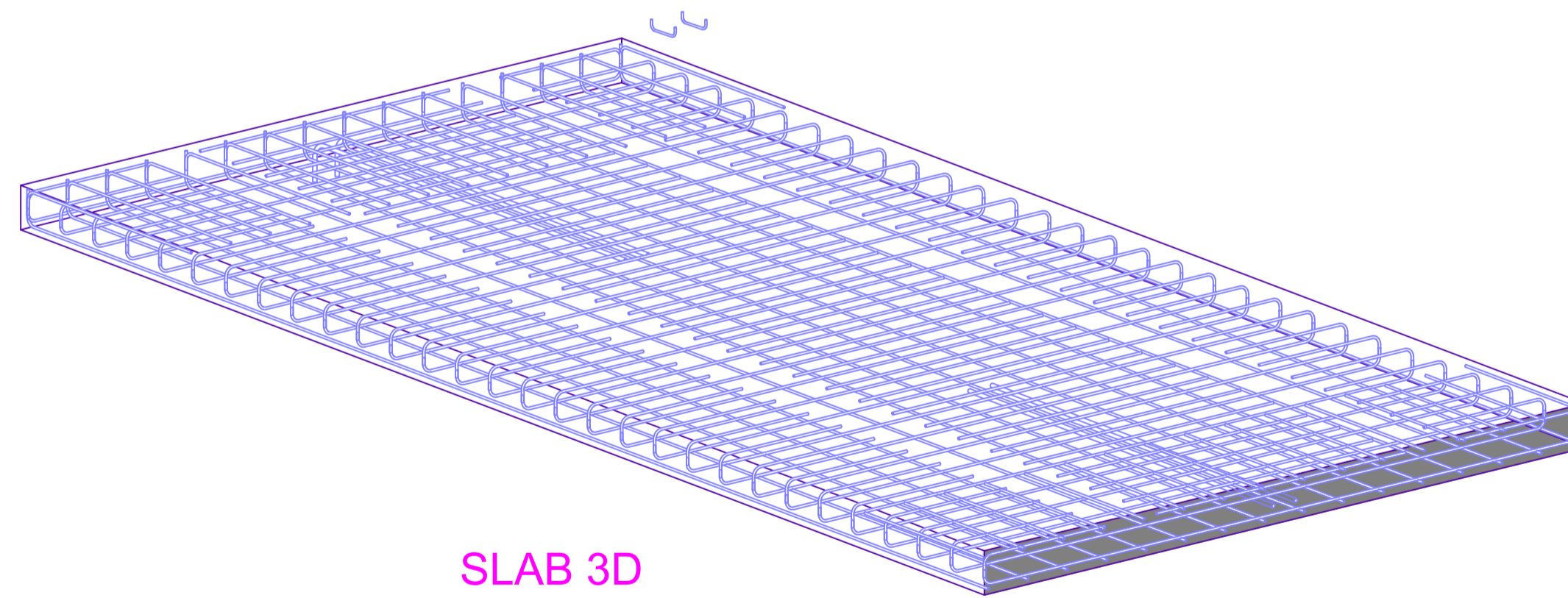
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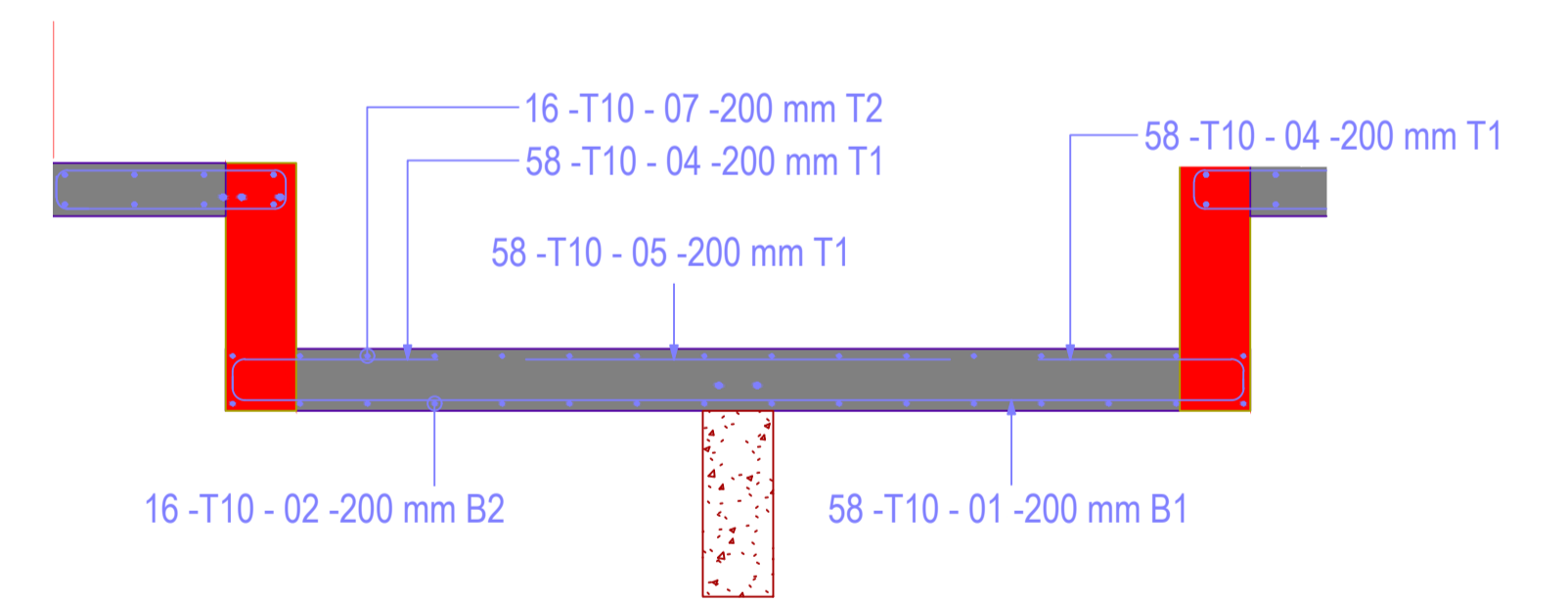
TANK SLAB RC DETAILS
1 : 20

UNDERGROUND WATER TANK BOTTOM SOLID SLAB DETAILS

SLAB THICKNESS	175MM THICK SLAB
REINFORCEMENT	Y10@200 T1&T2 Y10@200 B1&B2



SLAB 3D




section 2-2
1 : 20

- NOTES:**
- Concrete Class: Foundation 25/20, Column 25/20, Ground Beam 25/20; Strip Footing 25/20 (i.e. Class 25N/mm² and Maximum Agg. Size 20mm)
 - Excavations to be inspected before blinding
 - All reinforcement to be inspected before concreting
 - Cover to Main Reinforcement: Foundations 50; Columns 25; Ground Beams 40; Strip Footing 50;
 - Dimensions to be read and not scaled
 - This drawing to be read in conjunction with Architectural Drawings

Revisions		
Date	Description	Remarks

Project:
**ATHI KILEMA TUNGUNI
WATER PROJECT PHASE II**

Client:



Chief Executive Officer
National Water Commission
Water and sanitation
Department
P.O. BOX 78-00300
Westlands, Nairobi
email: info@nwc.or.ke

Engineers:



Mina Centre, Outer Ring Rd, Donholm,
2nd Floor, Suite 13
P.O. Box 161 - 00300, Nairobi
Tel: +254-020-6290368
Email: info@horconengineering.com

Client:
Owner

Drawing Title:
TANK SLAB RC DETAILS

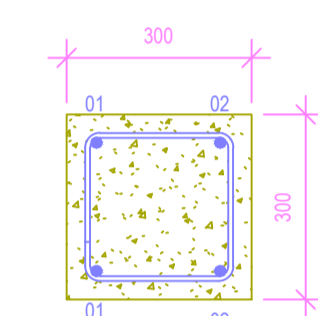
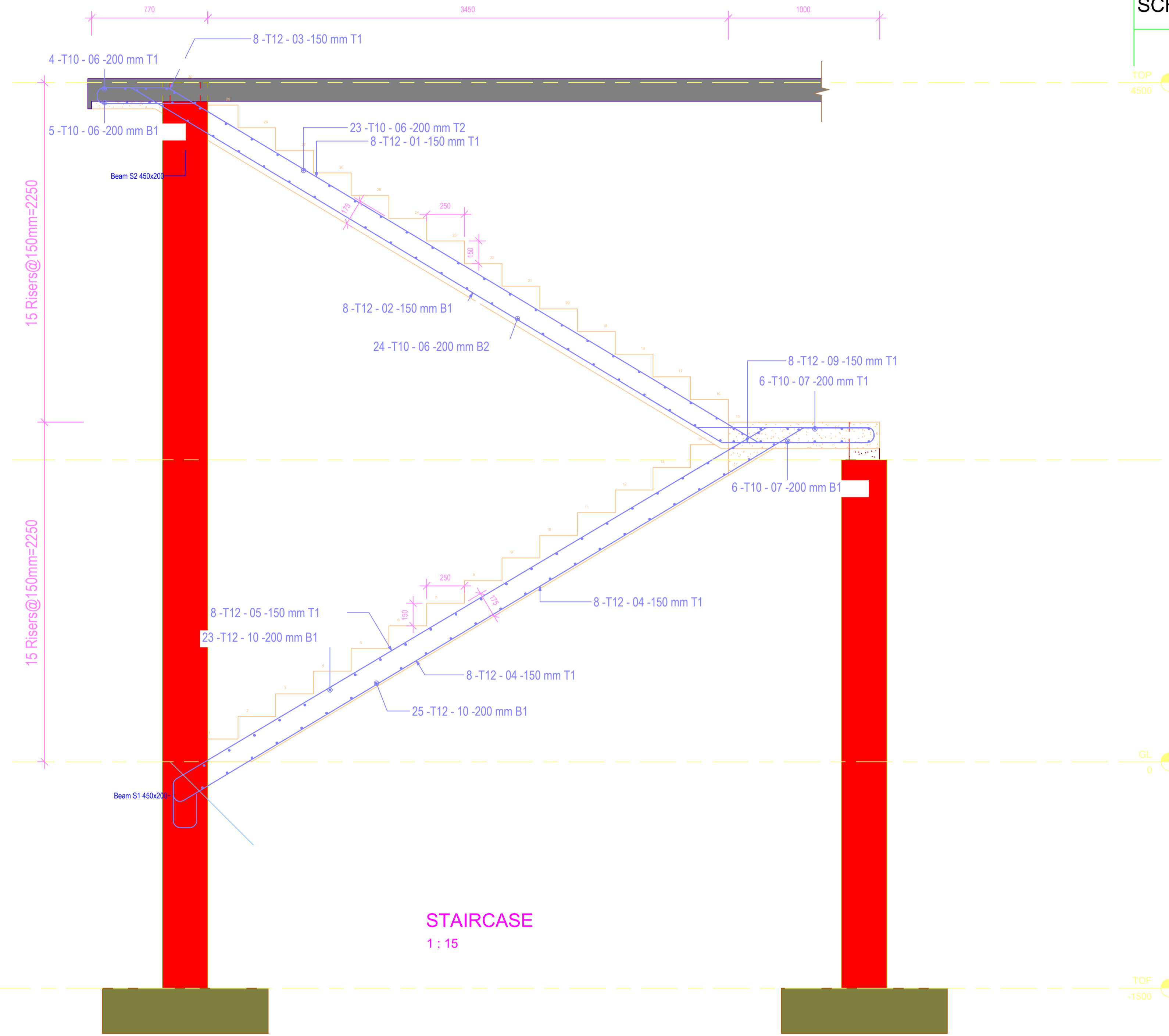
Designed by: A.G.N
Drawn by: A.G.N
Checked by: Eng. S. Muiruri
Approved by: Eng. S. Muiruri
Date: 9th October 2023

HES-009-2023
S.19

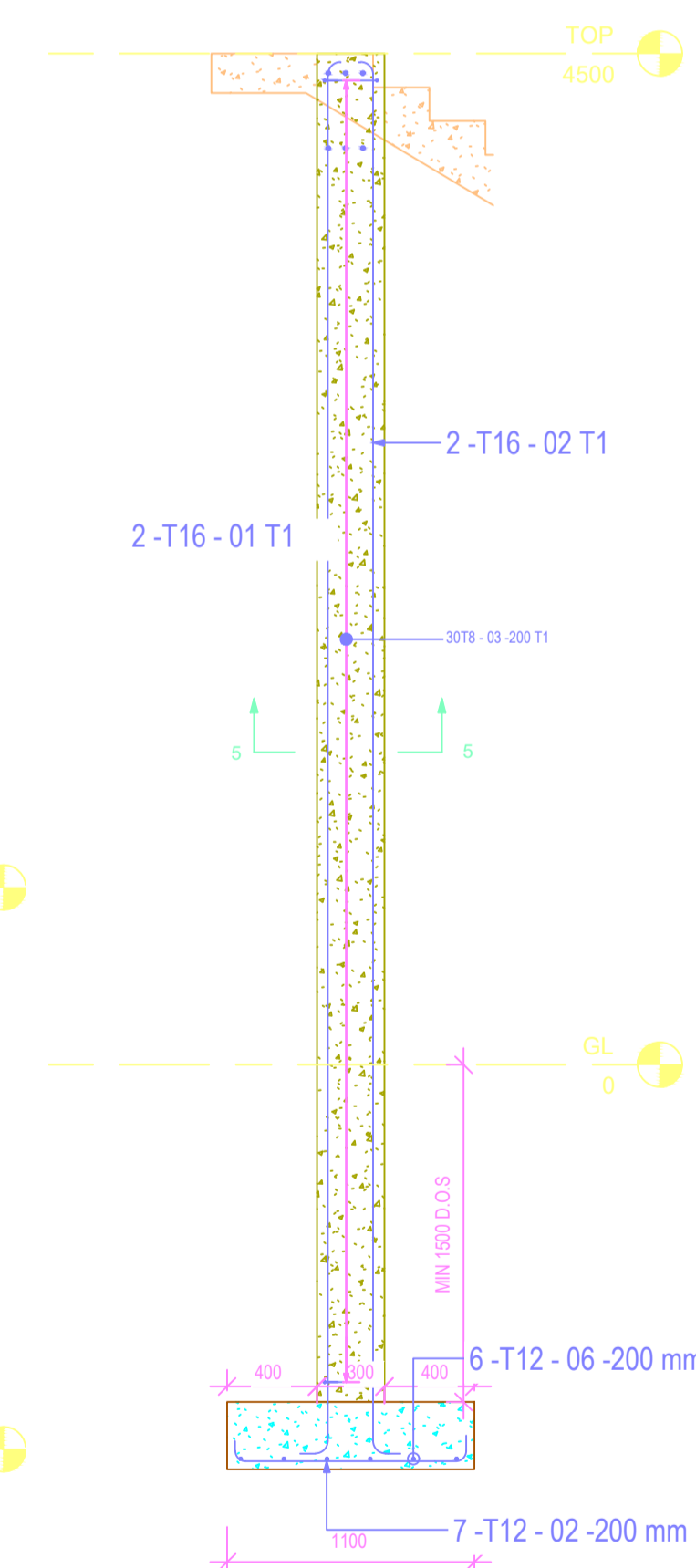
Scale:
as shown

SCHEDULE OF STAIRCASE COLUMNS REINFORCEMENT

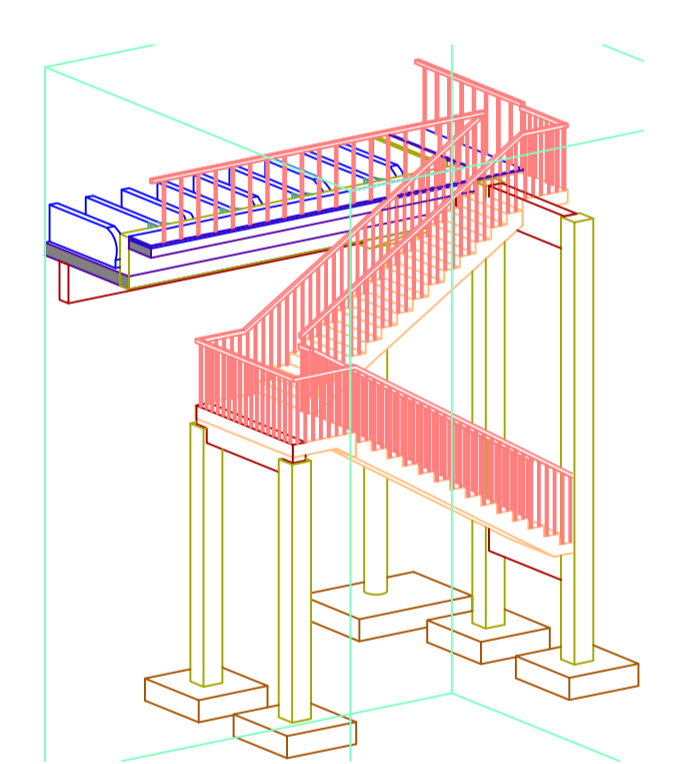
COLUMN C2	300X300	4Y16	Y8 Links @ 200
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COL C2 SECTION 5-5
1 : 10



COL C2
1 : 25



STAIRCASE 3D

- NOTES:
- Concrete Class: Foundation 25/20, Column 25/20, Ground Beam 25/20; Strip Footing 25/20 (i.e. Class 25N/mm² and Maximum Agg. Size 20mm)
 - Excavations to be inspected before blinding
 - All reinforcement to be inspected before concreting
 - Cover to Main Reinforcement: Foundations 50; Columns 25; Ground Beams 40, Strip Footing 50;
 - Dimensions to be read and not scaled
 - This drawing to be read in conjunction with Architectural Drawings

Date	Revisions	Remarks

Project:
ATHI KILEMA TUNGUNI
WATER PROJECT PHASE II

Client:

Engineers:

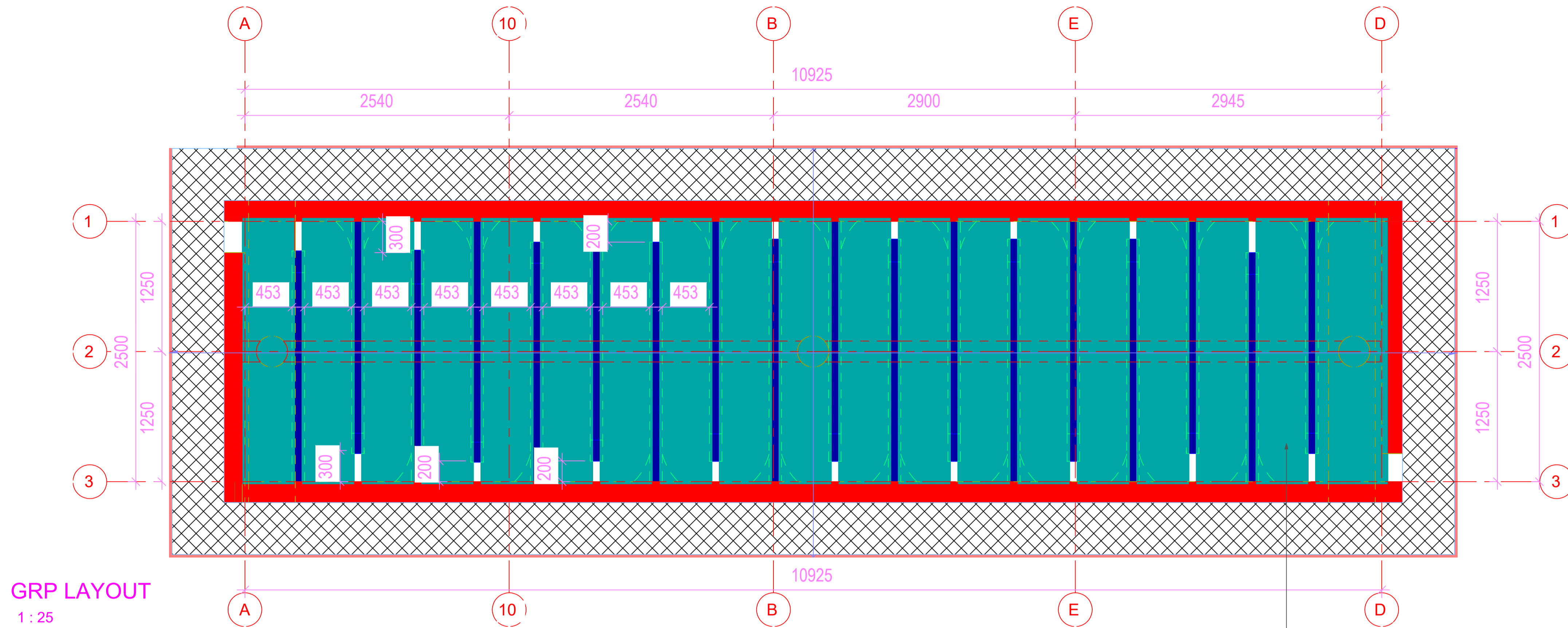
Client:
Owner

Designed by: A.G.N
Drawn by: A.G.N
Checked by: Eng. S. Muiruri
Approved by: Eng. S. Muiruri
Date: 9th October 2023

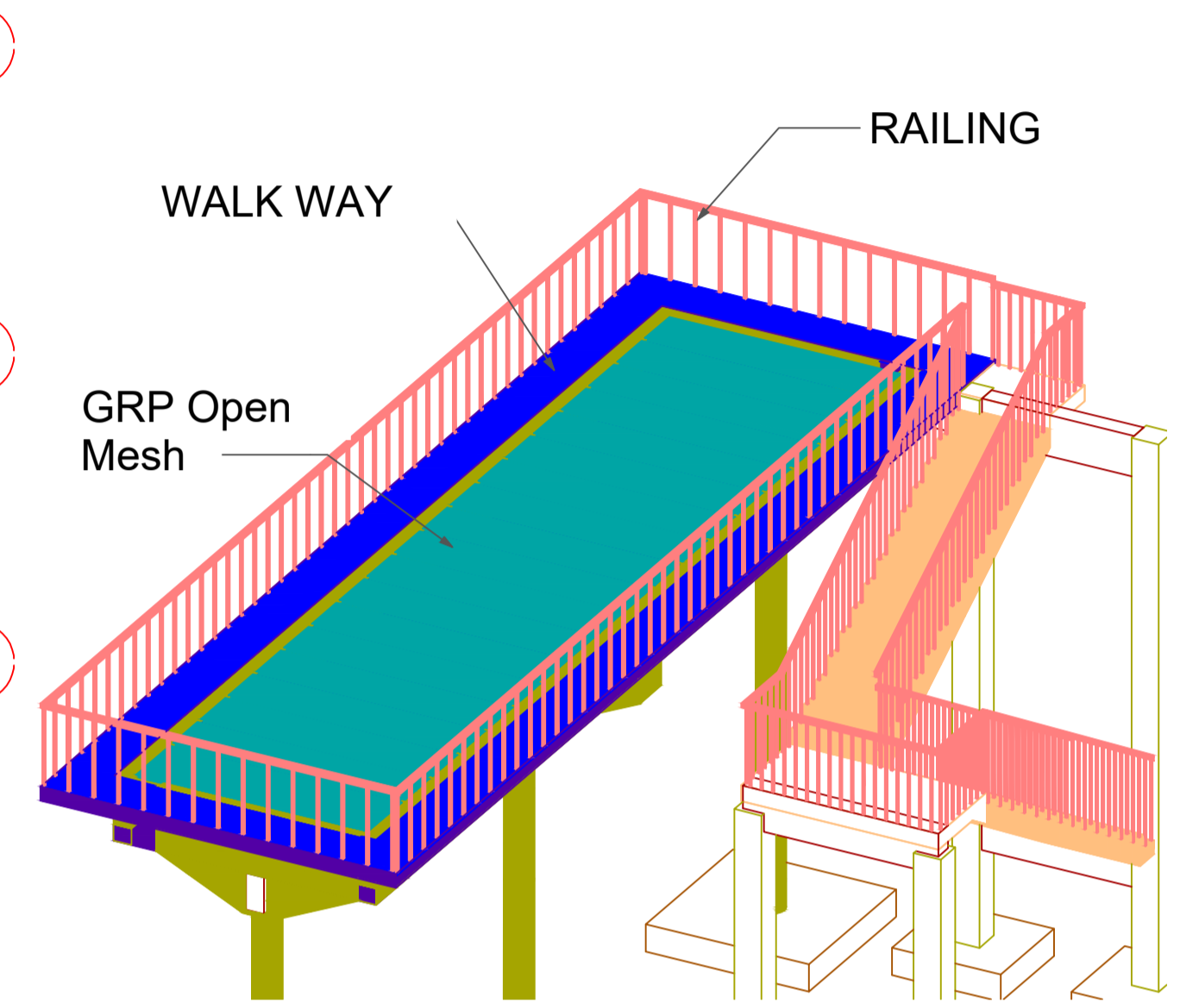
Scale:
as shown

Drawing Title:
STAIR CASE RC DETAILS

HES-009-2023
S.20



GRP LAYOUT
1:25

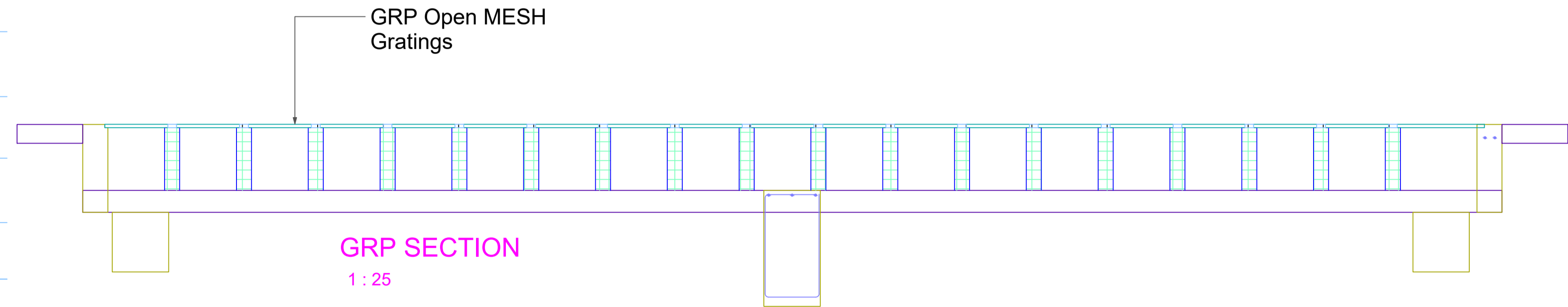


GRP AND RAILING 3D

GRP Open MESH
Gratings

TANK DETAILS

Number of baffles	18
Length of Basin	10.925 Metres
Length of Channels	2.50 Metres
Chamber Height	0.5 Metres
Baffle walls Thickness	0.12 Metres
Width of Channels	0.453 Metres




GRP SECTION
1:25

- NOTES:
- Concrete Class: Foundation 25/20, Column 25/20, Ground Beam 25/20; Strip Footing 25/20 (i.e. Class 25N/mm² and Maximum Agg. Size 20mm)
 - Excavations to be inspected before blinding
 - All reinforcement to be inspected before concreting
 - Cover to Main Reinforcement: Foundations 50; Columns 25; Ground Beams 40; Strip Footing 50;
 - Dimensions to be read and not scaled
 - This drawing to be read in conjunction with Architectural Drawings

Revisions		
Date	Description	Remarks

Project:
ATHI KILEMA TUNGUNI
WATER PROJECT PHASE II

Client:

Chief Executive Officer
Makindu County Commission
Water and sanitation
Department
P.O. BOX 78-90300
Wote-Makindu, Kenya
email: info@makindu.go.ke

Engineers:

Mina Centre, Outer Ring Rd, Donholm,
2nd Floor, Suite 13
P.O. Box 161 - 00300, Nairobi
Tel: +254-020-6290368
Email: info@horconengineering.com

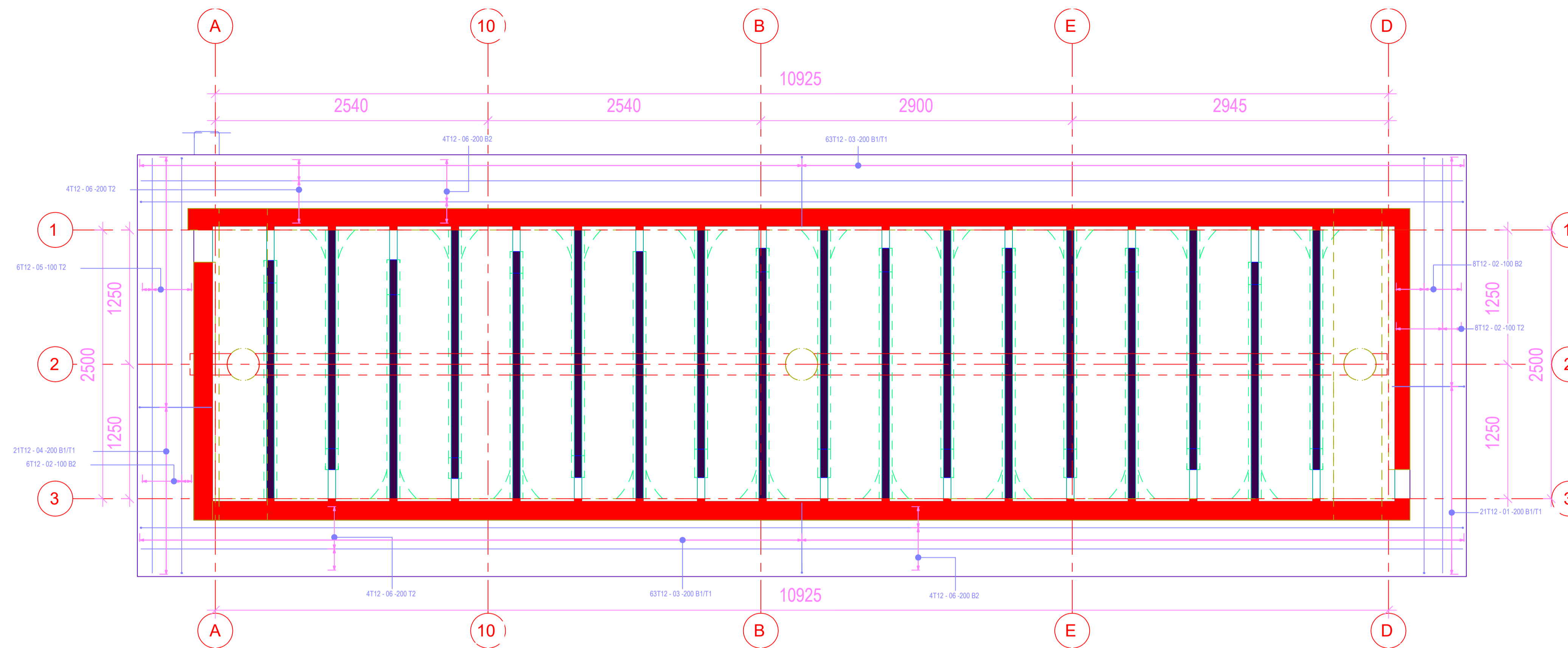
Client:
Owner

Drawing Title:
GRP LAYOUT

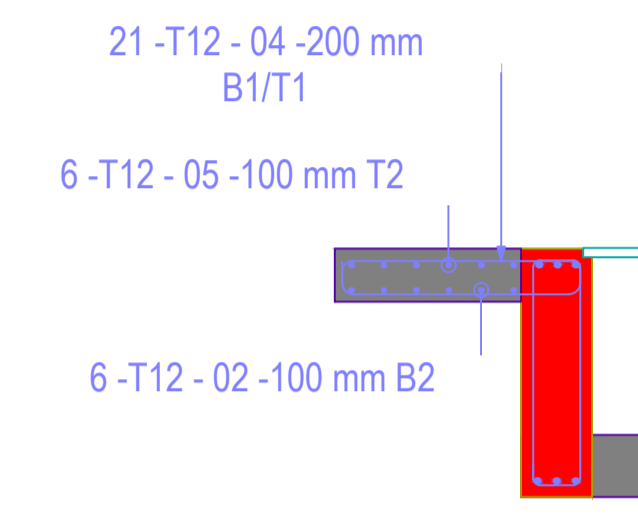
Designed by: A.G.N
Drawn by: A.G.N
Checked by: Eng. S. Muiruri
Approved by: Eng. S. Muiruri
Date: 9th October 2023

HES-009-2023
S.21

Scale:
as shown



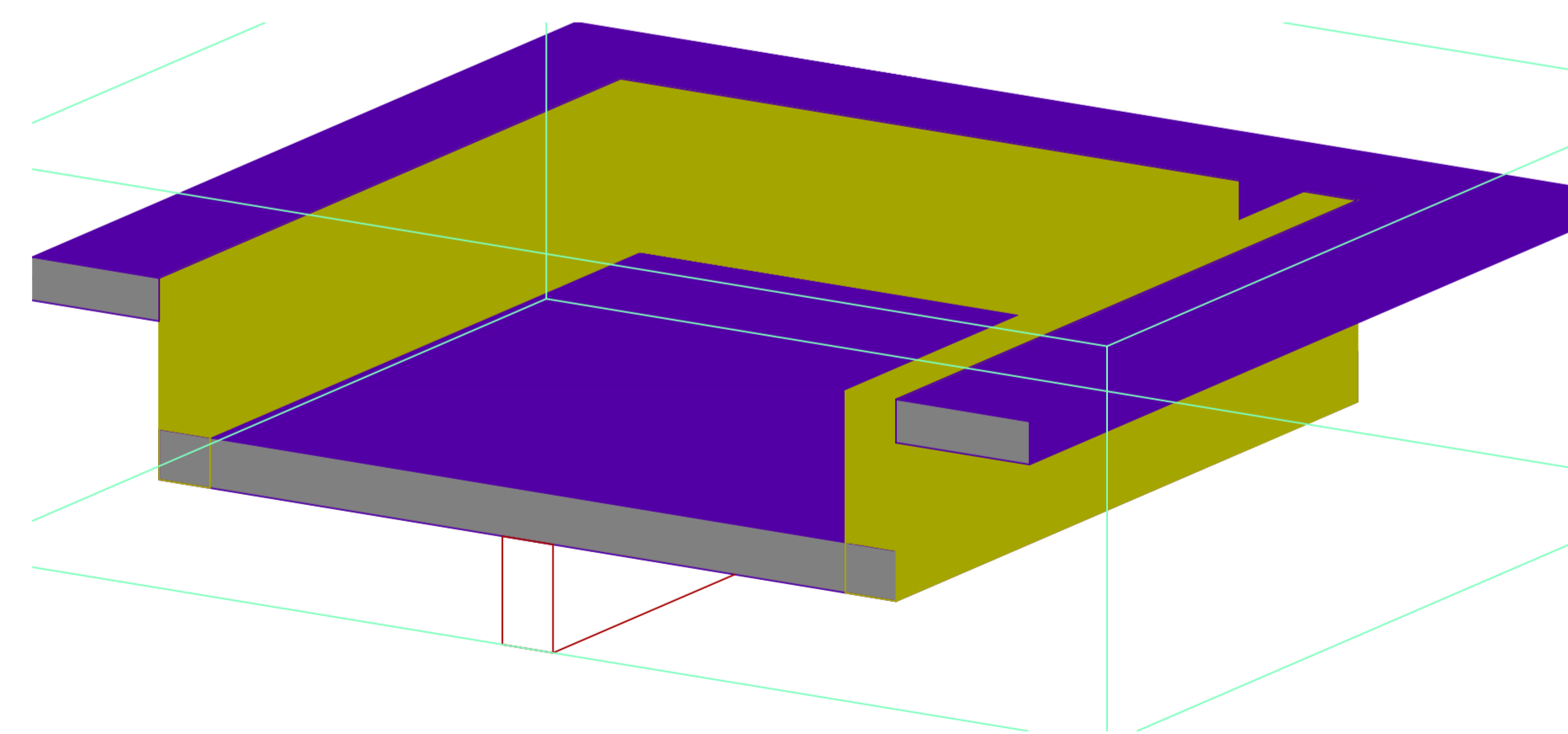
WALKWAY SLAB RC DETAILS
1 : 25



SECTION 2-2
1 : 20

FLOCCULATION TANK WALKWAY SLAB DETAILS

SLAB THICKNESS	150MM THICK SLAB
REINFORCEMENT	Y10@200 T1&T2 Y10@200 B1&B2



WALKWAY SLAB 3D

TANK DETAILS

Number of baffles	18
Length of Basin	10.925 Metres
Length of Channels	2.50 Metres
Chamber Height	0.5 Meters
Baffle walls Thickness	0.12 Meters
Width of Channels	0.453 Meters

- NOTES:**
- Concrete Class: Foundation 25/20, Column 25/20, Ground Beam 25/20; Strip Footing 25/20 (i.e. Class 25N/mm² and Maximum Agg. Size 20mm)
 - Excavations to be inspected before blinding
 - All reinforcement to be inspected before concreting
 - Cover to Main Reinforcement: Foundations 50; Columns 25; Ground Beams 40; Strip Footing 50;
 - Dimensions to be read and not scaled
 - This drawing to be read in conjunction with Architectural Drawings

Revisions		
Date	Description	Remarks

Project:
**ATHI KILEMA TUNGUNI
WATER PROJECT PHASE II**

Client :



Chief Executive Officer
National Water Commission
Water and sanitation
Department
P.O. BOX 78-00300
Wete-Makindu, Kenya
email: info@nwcwac.go.ke

Engineers:



Mina Centre, Outer Ring Rd, Donholm,
2nd Floor, Suite 13
P.O. Box 161 - 00300, Nairobi
Tel: +254-020-6290368
Email: info@horconengineering.com

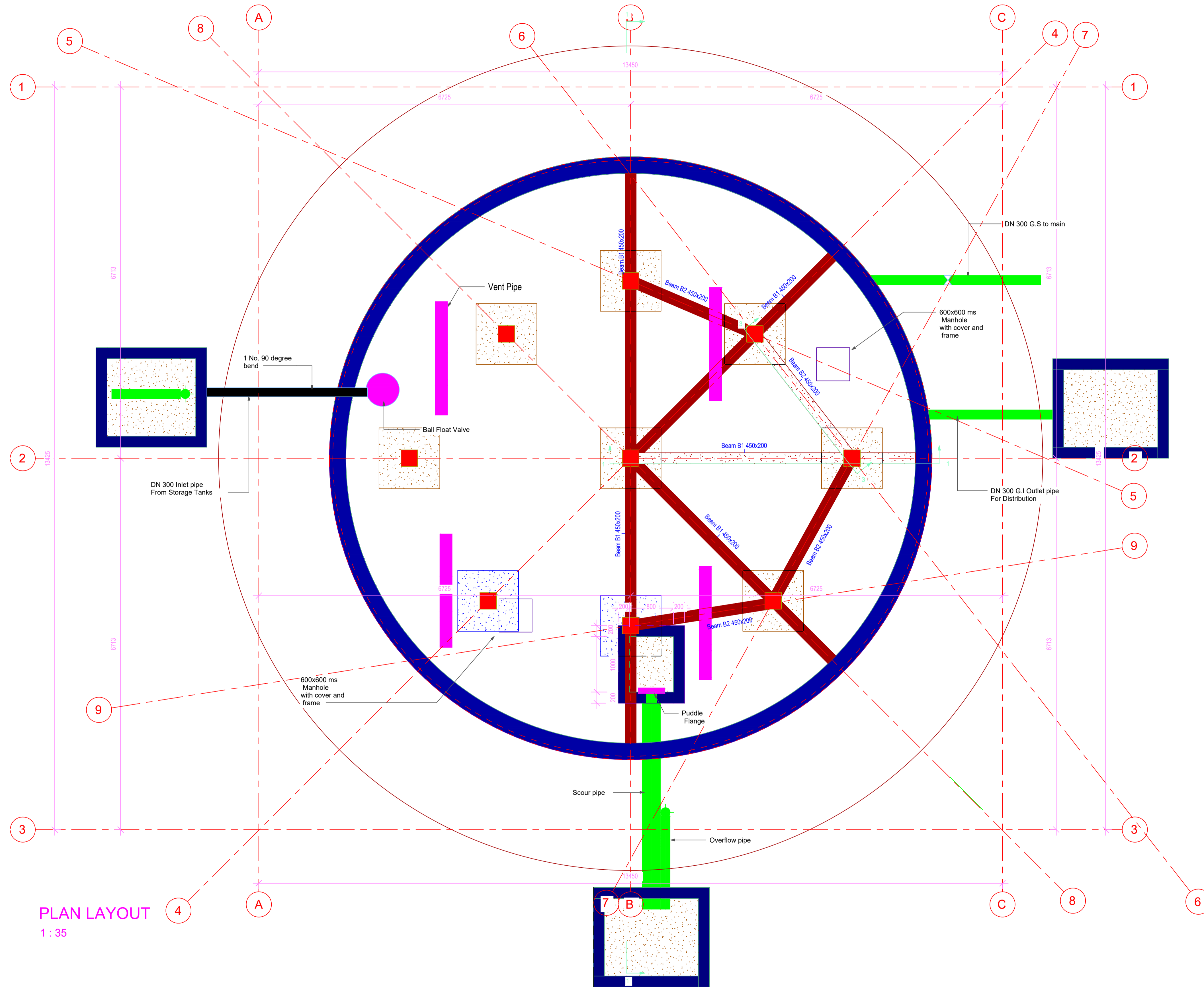
Client:
Owner

Drawing Title:
WALKWAY DETAILS

Designed by: A.G.N
Drawn by: A.G.N
Checked by: Eng. S. Muiruri
Approved by: Eng. S. Muiruri
Date: 9th October 2023

HES-009-2023
S.22

Scale:
as shown



PLAN LAYOUT
1 : 35

- NOTES:**
1. Concrete Class: Foundation 25/20, Column 25/20, Ground Beam 25/20; Strip Footing 25/20 (i.e. Class 25N/mm² and Maximum Agg. Size 20mm)
 2. Excavations to be inspected before blinding
 3. All reinforcement to be inspected before concreting
 4. Cover to Main Reinforcement: Foundations 50; Columns 25; Ground Beams 40; Strip Footing 50;
 5. Dimensions to be read and not scaled
 6. This drawing to be read in conjunction with Architectural Drawings

Revisions		
Date	Description	Remarks

Project:
**ATHI KILEMA TUNGUNI
WATER PROJECT PHASE II**

Client :



Chief Executive Officer
National Water and Sewerage Corporation
Water and sewerage
Department
P.O. Box 161-00300, Nairobi
Kenya
Email: info@nwsc.or.ke

Engineers:



Mwalimu, Quaking Rd. Dornheim,
2nd Floor, Suite 13
P.O. Box 161 - 00300, Nairobi
Tel: +254 20 2020200
Email: info@hazardousengineering.com

Client:

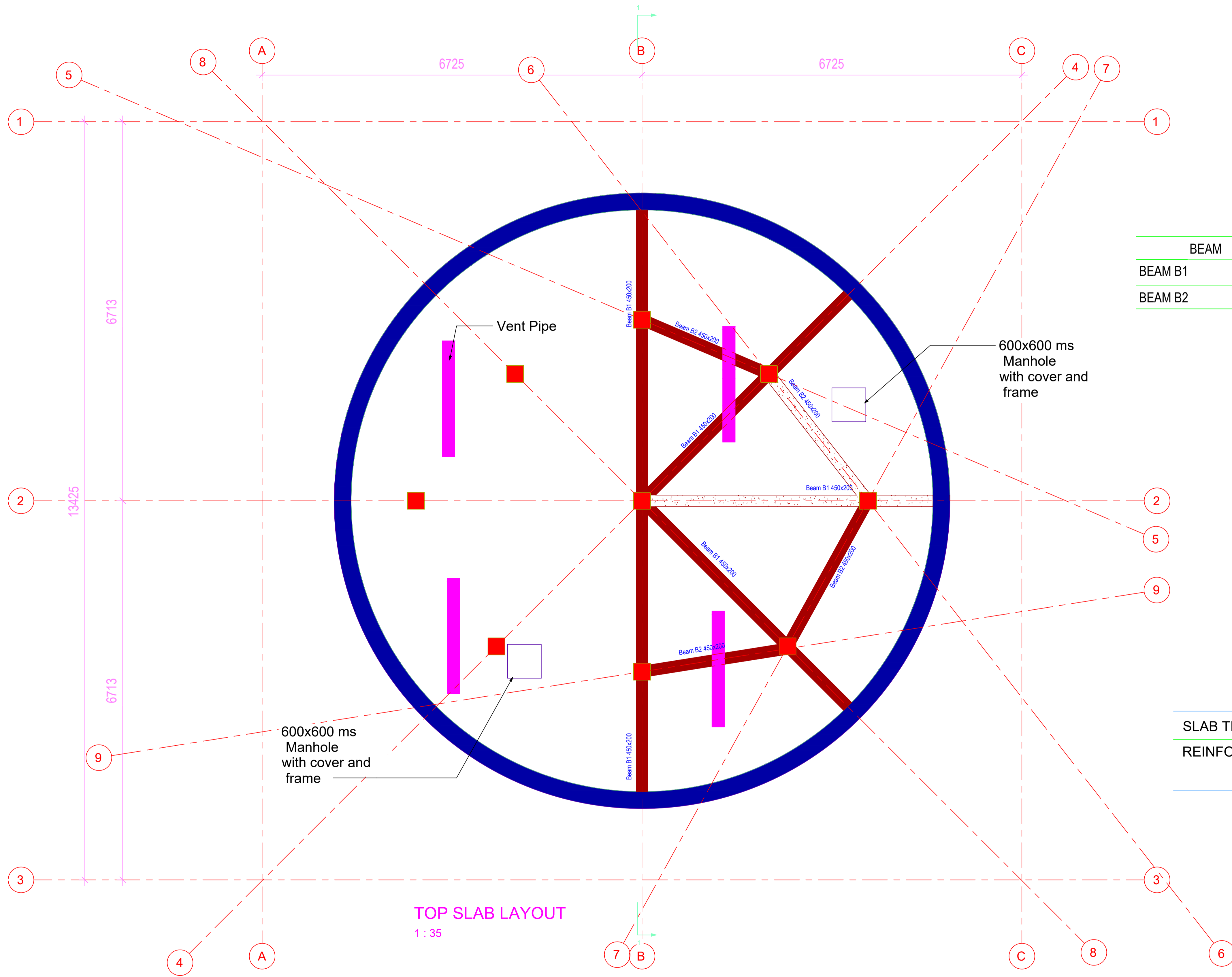
Owner

Drawing Title:
Tank Layout

Designed by: A.G.N.
Drawn by: A.G.N.
Checked by: Eng. S. Muiruri
Approved by: Eng. S. Muiruri
Date: 9th October 2023

HES-009-2023
S.23

Scale:
as shown



TOP SLAB LEVEL BEAM SCHEDULE

BEAM	SIZE	STEEL	LINKS
BEAM B1	450X450	BOT 2Y12, TOP 2Y12	∅@200
BEAM B2	450X450	BOT 2Y12, TOP 2Y12	∅@200

WATER TANK TOP SOLID SLAB DETAILS

SLAB THICKNESS	175MM THICK SLAB
REINFORCEMENT	Y10@200 T1&T2 Y10@200 B1&B2


- NOTES:**
- Concrete Class: Foundation 25/20, Column 25/20, Ground Beam 25/20; Strip Footing 25/20 (i.e. Class 25N/mm² and Maximum Agg. Size 20mm)
 - Excavations to be inspected before blinding
 - All reinforcement to be inspected before concreting
 - Cover to Main Reinforcement: Foundations 50; Columns 25; Ground Beams 40; Strip Footing 50;
 - Dimensions to be read and not scaled
 - This drawing to be read in conjunction with Architectural Drawings

Revisions		
Date	Description	Remarks

Project:
ATHI KILEMA TUNGUNI
WATER PROJECT PHASE II

Client:

Chief Executive Officer
Mombasa County Government
Water and sanitation
Department
P.O. Box 181-00300, Nairobi
Wiro-Mombasa, Kenya
email: info@kilematunguni.go.ke

Engineers:

Mama Centre, Quering Rd, Dar es Salaam,
2nd Floor, Suite 13
P.O. Box 181-00300, Nairobi
Tel: +254 020 3262568
Email: info@horconengineering.com

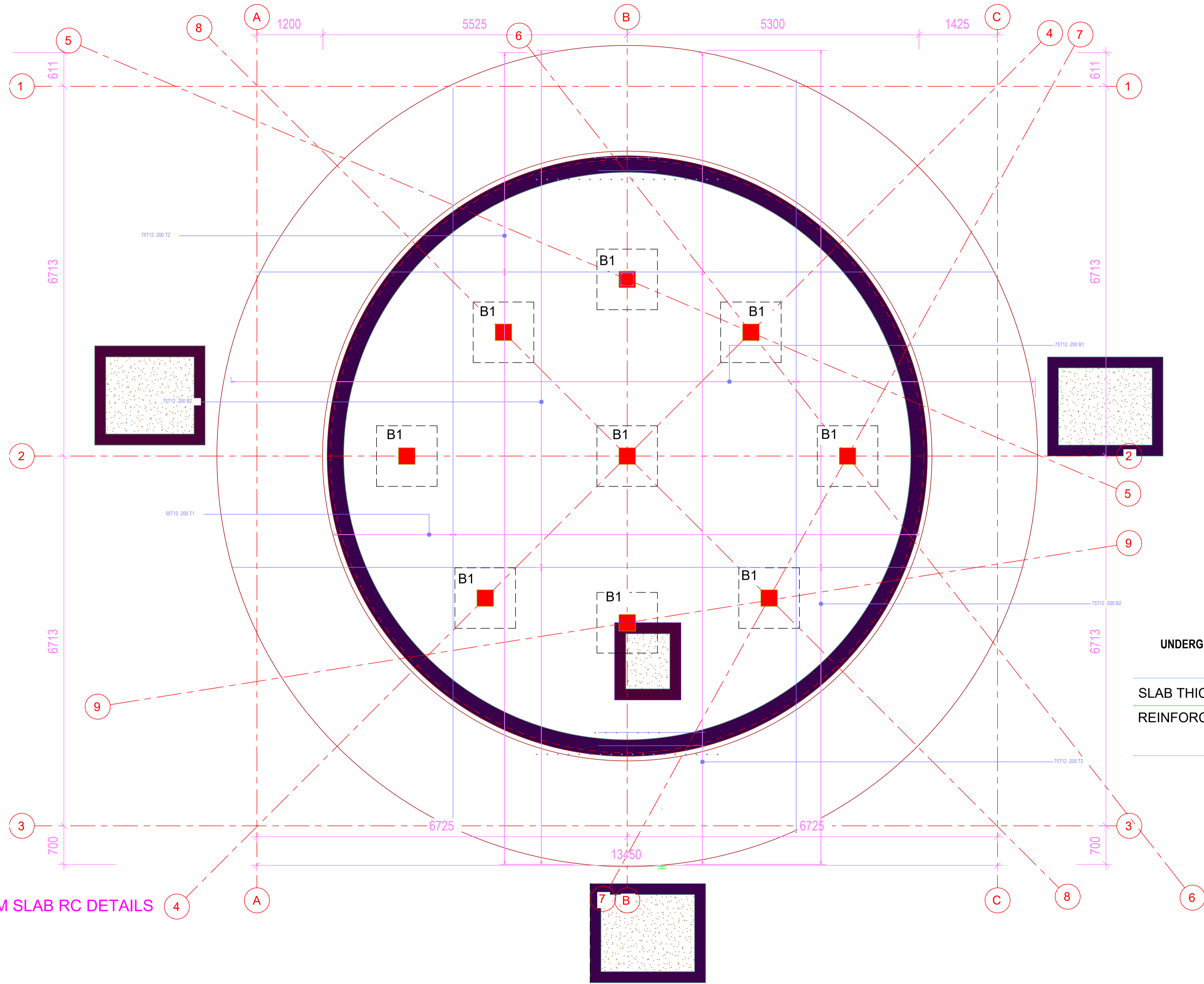
Client:
Owner

Drawing Title:
top slab layout

Designed by: A.G.N
Drawn by: A.G.N
Checked by: Eng. S. Muiruri
Approved by: Eng. S. Muiruri
Date: 9th October 2023

HES-009-2023
S.24

Scale:
as shown



BOTTOM SLAB RC DETAILS
1 : 35

UNDERGROUND WATER TANK BOTTOM SOLID SLAB DETAILS

SLAB THICKNESS	300MM THICK SLAB
REINFORCEMENT	Y12@200 T1&T2 Y12@200 B1&B2

- NOTES:**
- Concrete Class: Foundation 25/20, Column 25/20, Ground Beam 25/20; Strip Footing 25/20 (i.e. Class 25N/mm² and Maximum Agg. Size 20mm)
 - Excavations to be inspected before blinding
 - All reinforcement to be inspected before concreting
 - Cover to Main Reinforcement: Foundations 50; Columns 25; Ground Beams 40; Strip Footing 50;
 - Dimensions to be read and not scaled
 - This drawing to be read in conjunction with Architectural Drawings

Revisions		
Date	Description	Remarks

Project:
ATHI KILEMA TUNGUNI
WATER PROJECT PHASE II

Client :



Chief Executive Officer
Ministry of Water and Irrigation
Water and Irrigation
Department
P.O. Box 181 - 00300, Nairobi
Kenya
Email: info@water.go.ke

Engineers:



Mama Centre, Quibering Rd, Darheim,
2nd Floor, Suite 13
P.O. Box 181 - 00300, Nairobi
Tel: +254 020 206268
Email: info@horseengineering.com

Client:

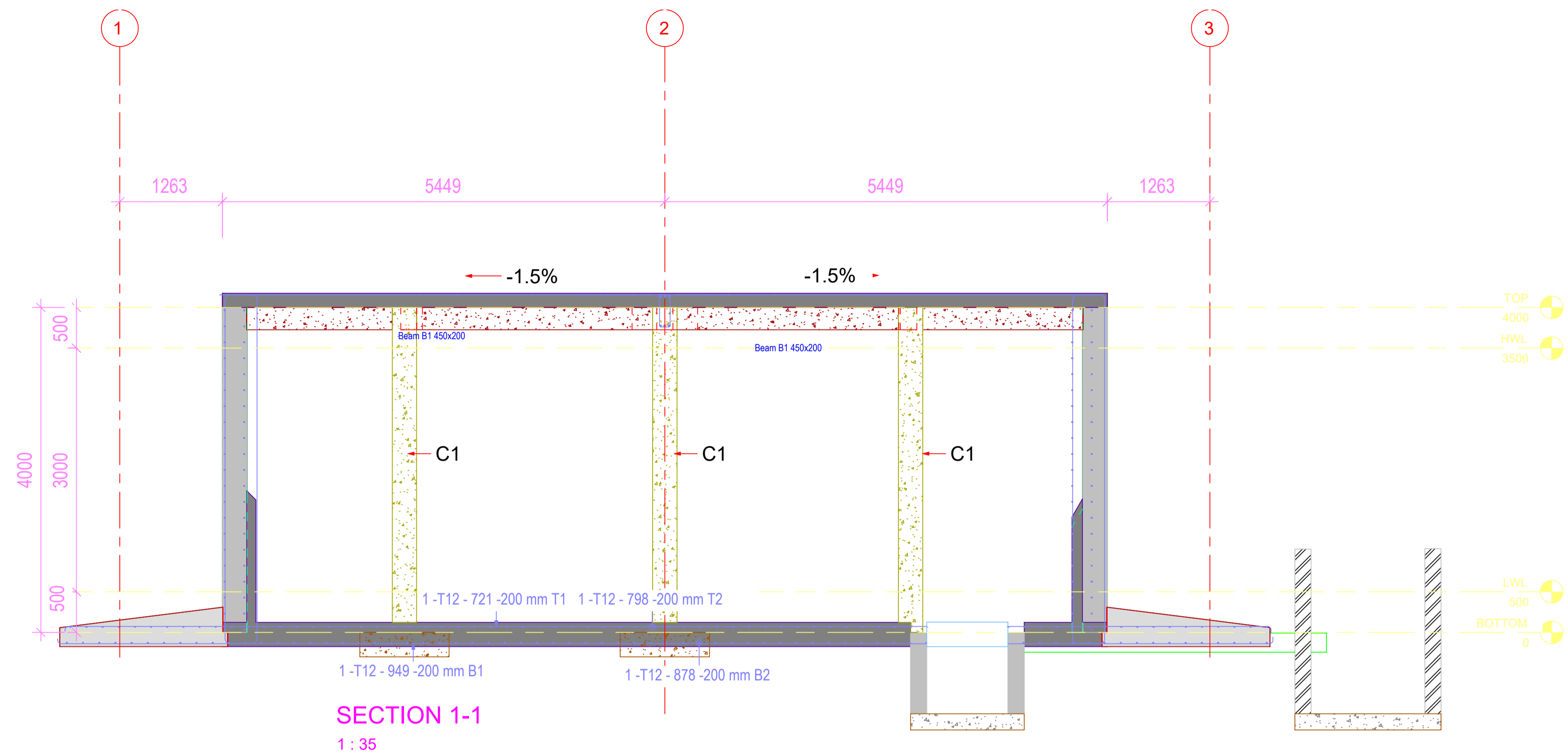
Owner

Drawing Title:
bottom slab layout

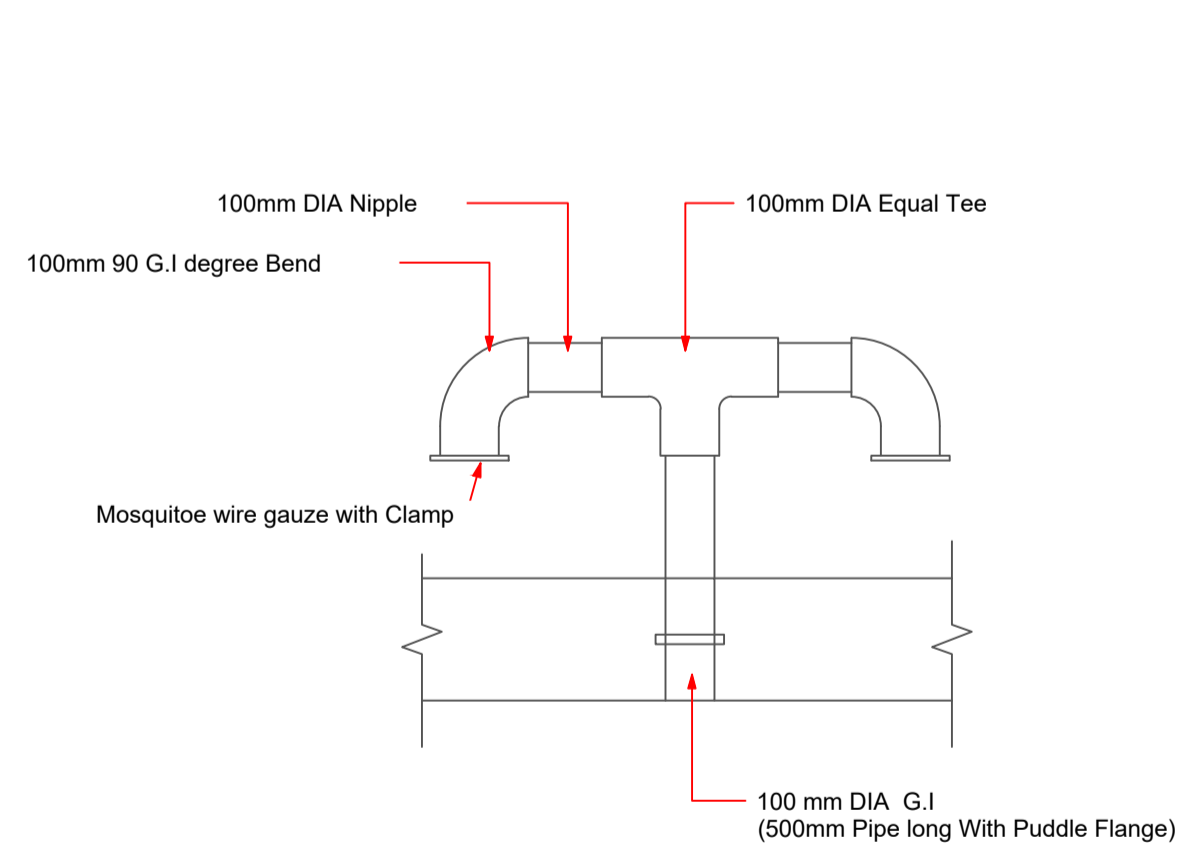
Designed by: A.G.N
Drawn by: A.G.N
Checked by: Eng. S. Muiruri
Approved by: Eng. S. Muiruri
Date: 9th October 2023

HES-009-2023
S.25

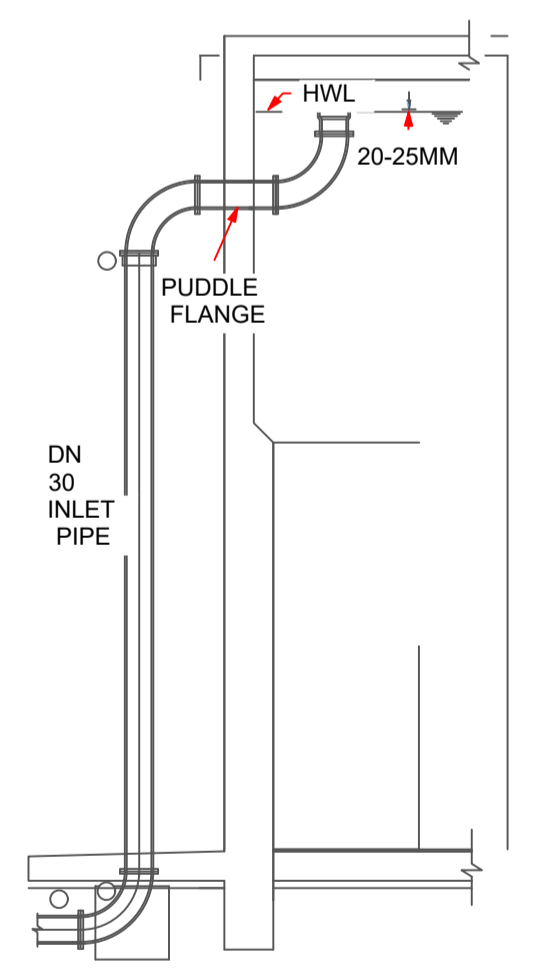
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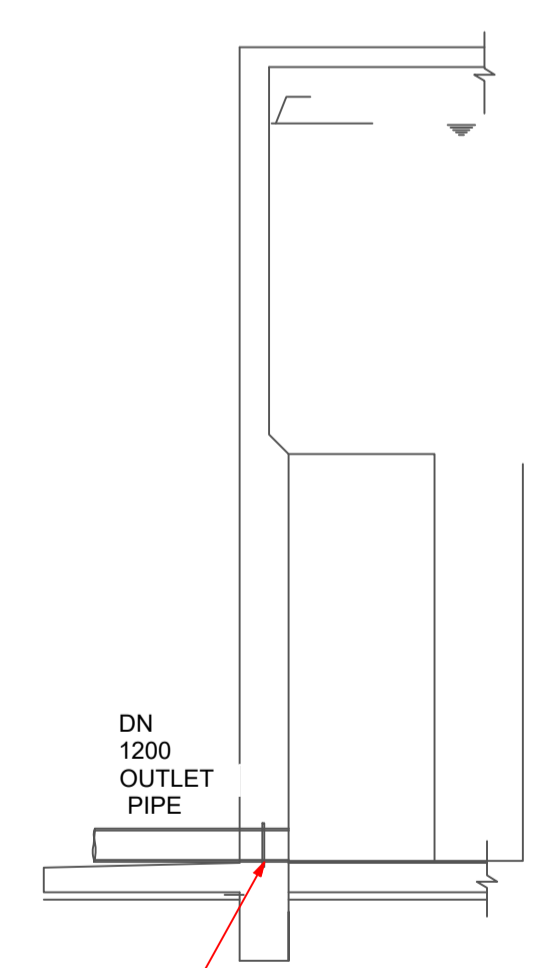
SECTION THROUGH THE WASHOUT SUMP AND CIRCULAR TANK



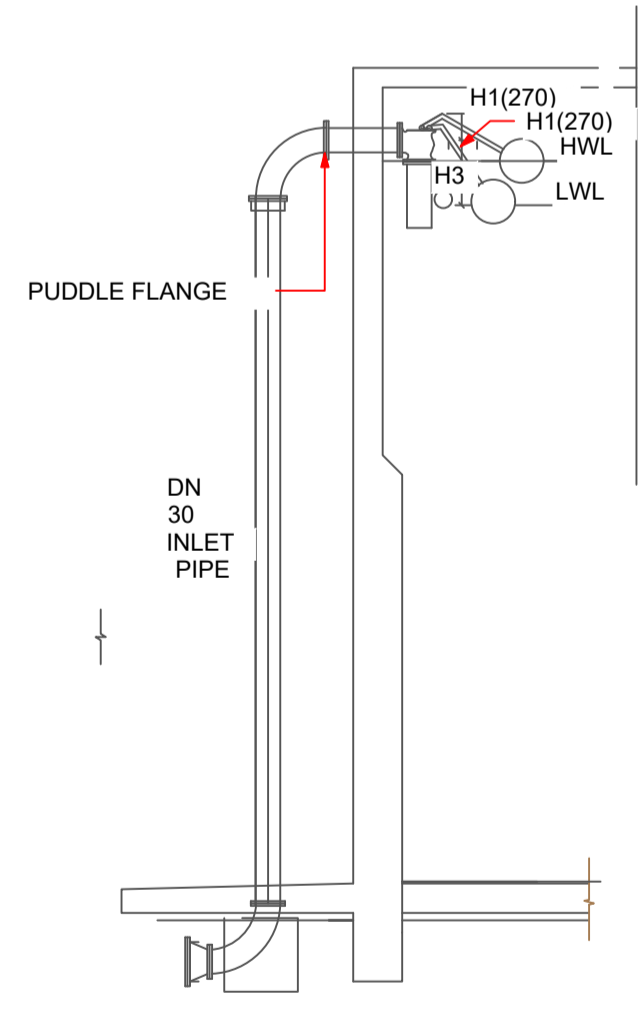
DETAIL OF PIPE VENT



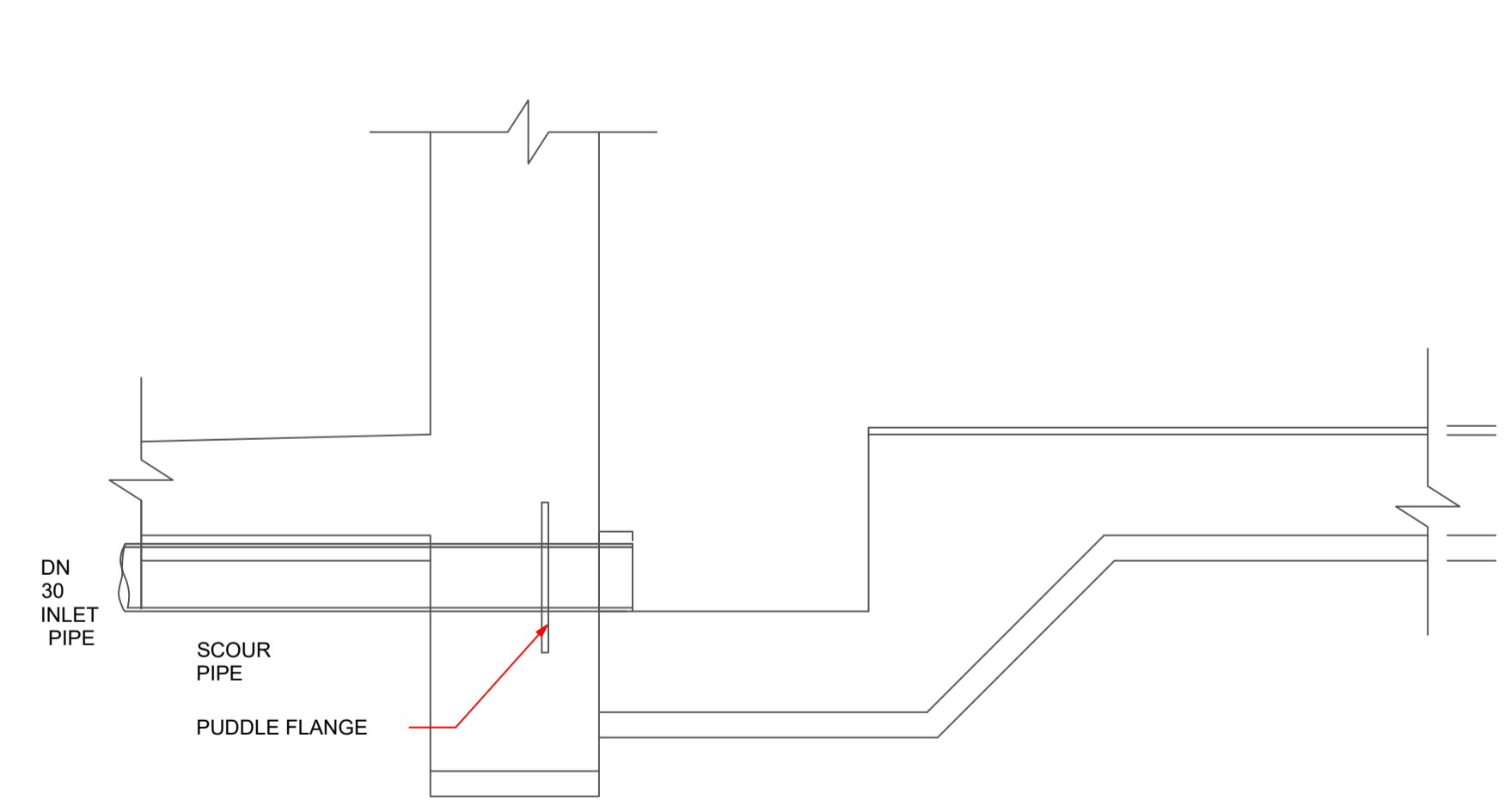
OVERFLOW DETAIL SCALE 1:1



OUTLET DETAIL SCALE 1:1



INLET DETAIL SCALE 1:1



DETAIL OF SUMP

- NOTES:**
- Concrete Class: Foundation 25/20, Column 25/20, Ground Beam 25/20; Strip Footing 25/20 (i.e. Class 25N/mm² and Maximum Agg. Size 20mm)
 - Excavations to be inspected before blinding
 - All reinforcement to be inspected before concreting
 - Cover to Main Reinforcement: Foundations 50; Columns 25; Ground Beams 40; Strip Footing 50;
 - Dimensions to be read and not scaled
 - This drawing to be read in conjunction with Architectural Drawings

Revisions		
Date	Description	Remarks

Project: ATHI KILEMA TUNGUNI WATER PROJECT PHASE II

Client: 

Chief Executive Officer
Ministry of Water and Irrigation
Water and Irrigation
Department
P.O. Box 191-00300
Nairobi, Kenya
email: info@water.go.ke

Engineers: 

Mama Centre, Quering Rd, Darheim,
2nd Floor, Suite 13
P.O. Box 191 - 00300, Nairobi
Tel: +254 (0) 20 200368
Email: info@horconengineering.com

Client: Owner

Drawing Title: pipe work details

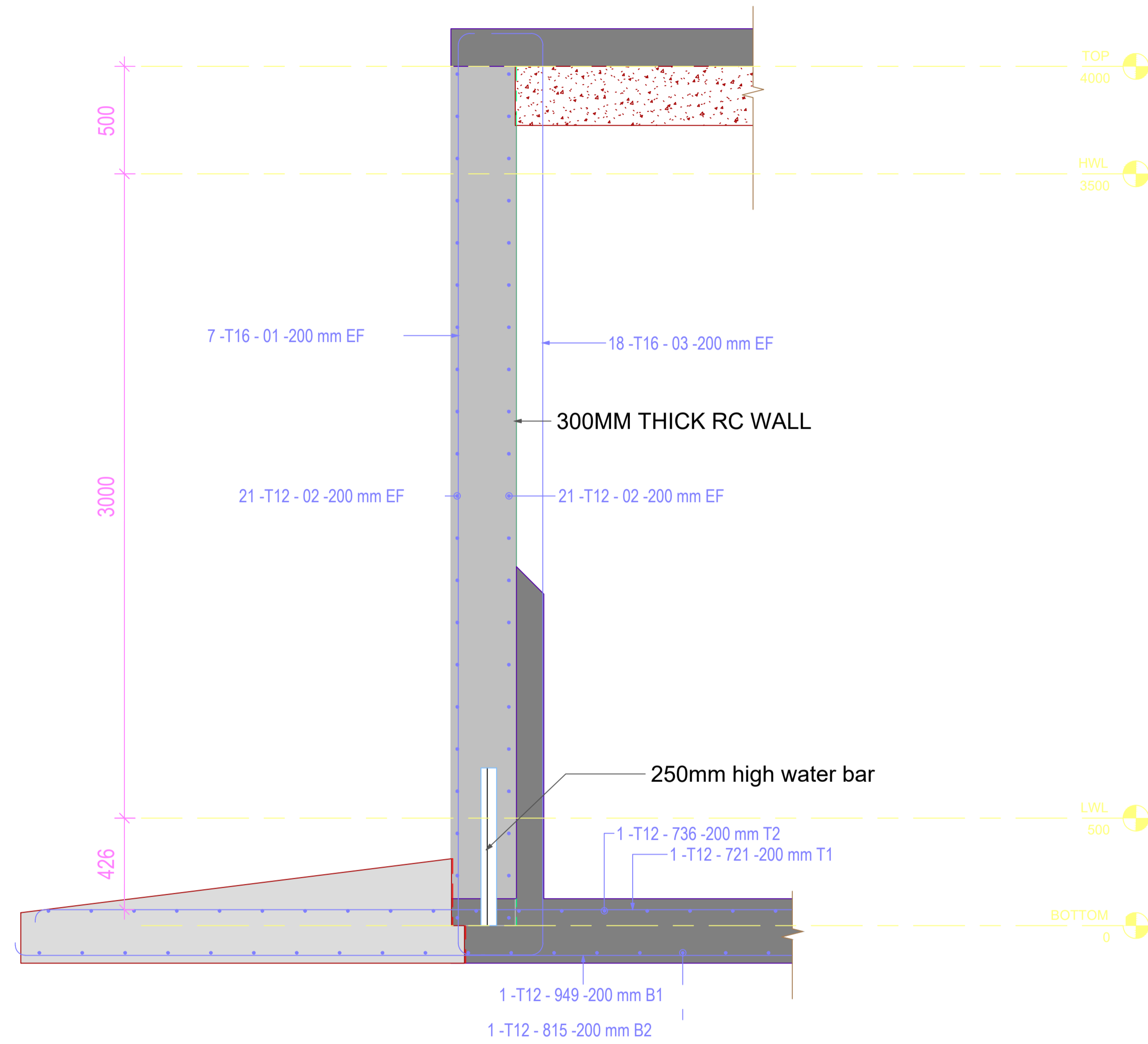
Designed by: A.G.N
Drawn by: A.G.N
Checked by: Eng. S. Muiruri
Approved by: Eng. S. Muiruri
Date: 9th October 2023

HES-009-2023
S.26

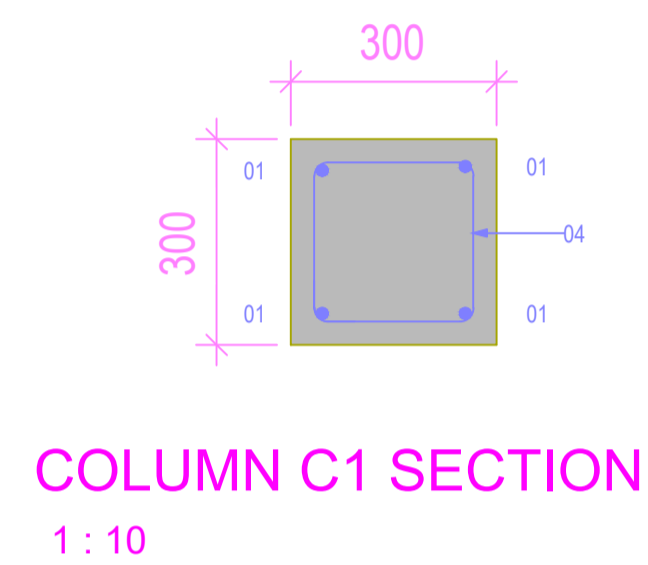
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WATER TANK DETAILS

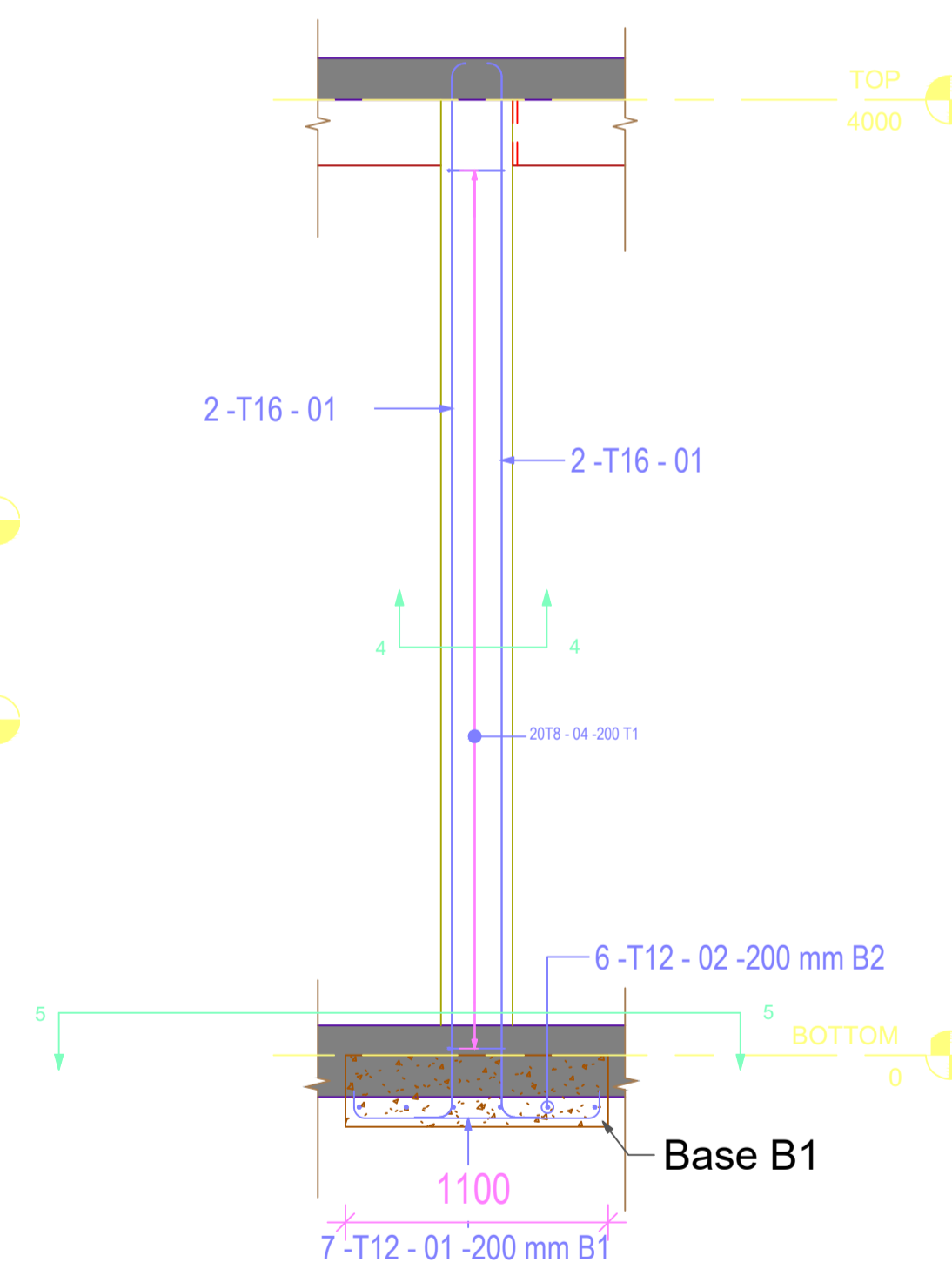
Capacity	250m ³
Diameter	10.3 Metres
Radius	5.15 Metres
Depth	3.0 Metres



EXTERNAL RETAINING WALL RC DETAILS
1 : 15



COLUMN C1 SECTION
1 : 10



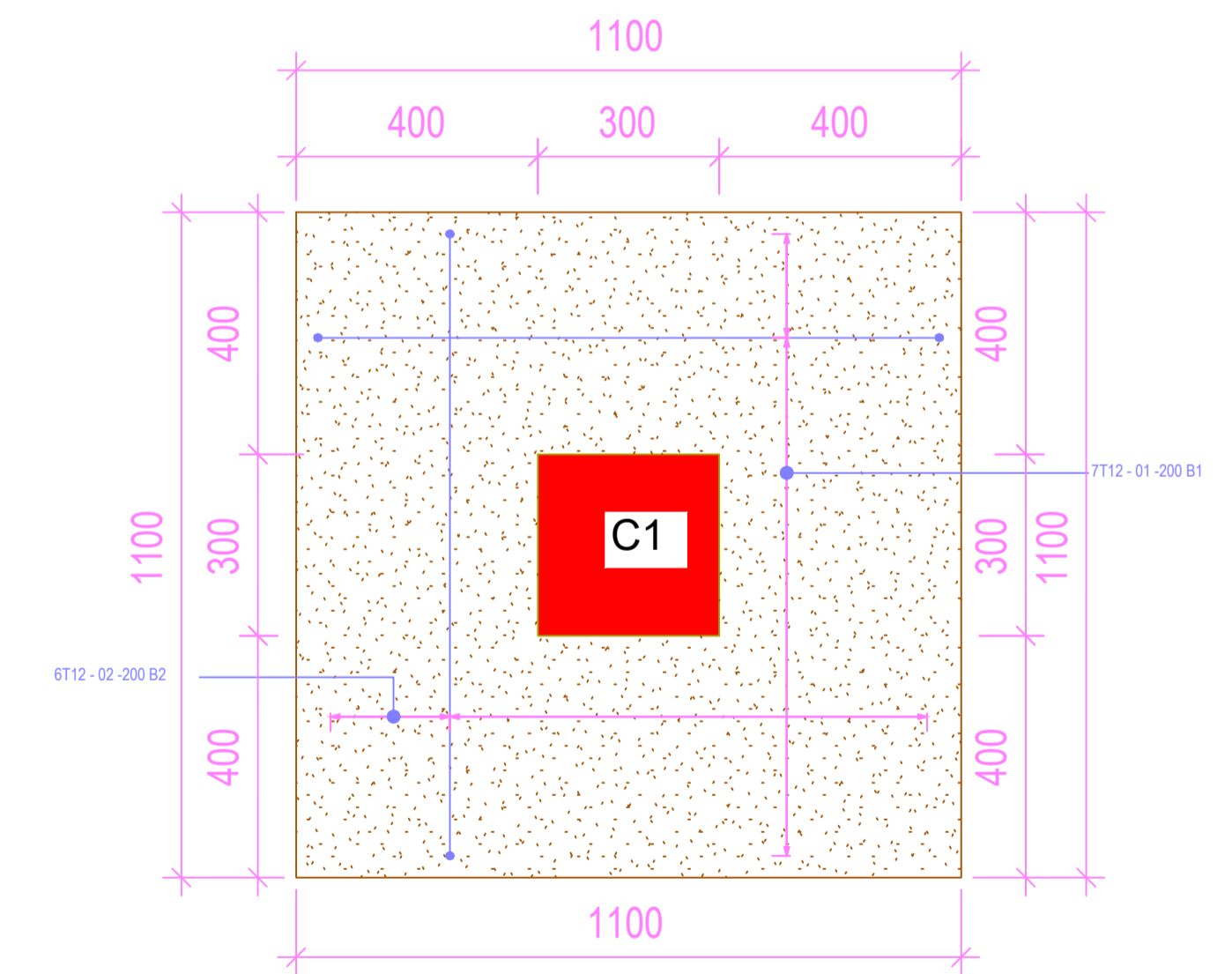
COLUMN C1
1 : 25

SCHEDULE OF BASES REINFORCEMENT

BASE B1	1.1x1.1x0.3M Thick	Y12@200mm; B1&B2
---------	--------------------	------------------

SCHEDULE OF COLUMNS REINFORCEMENT

COLUMN C1	300X300	4Y16	Y8 Links @ 200
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BASE B1 PLAN VIEW
1 : 10

- NOTES:**
1. Concrete Class: Foundation 25/20, Column 25/20, Ground Beam 25/20; Strip Footing 25/20 (i.e. Class 25N/mm² and Maximum Agg. Size 20mm)
 2. Excavations to be inspected before blinding
 3. All reinforcement to be inspected before concreting
 4. Cover to Main Reinforcement: Foundations 50; Columns 25; Ground Beams 40; Strip Footing 50;
 5. Dimensions to be read and not scaled
 6. This drawing to be read in conjunction with Architectural Drawings

Revisions		
Date	Description	Remarks

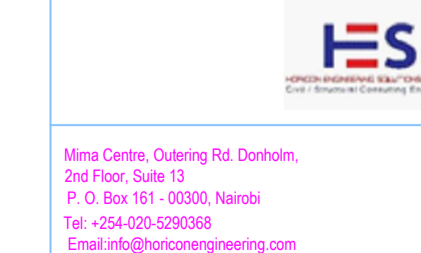
Project:
ATHI KILEMA TUNGUNI
WATER PROJECT PHASE II

Client :



Chief Executive Officer
Ministry of Water and Irrigation
Water and Irrigation
Department
P.O. Box 19-00300
Nairobi, Kenya
email: info@water.go.ke

Engineers:



Client:

Owner

Drawing Title:

EXTERNAL RETAINING
WALL RC DETAILS

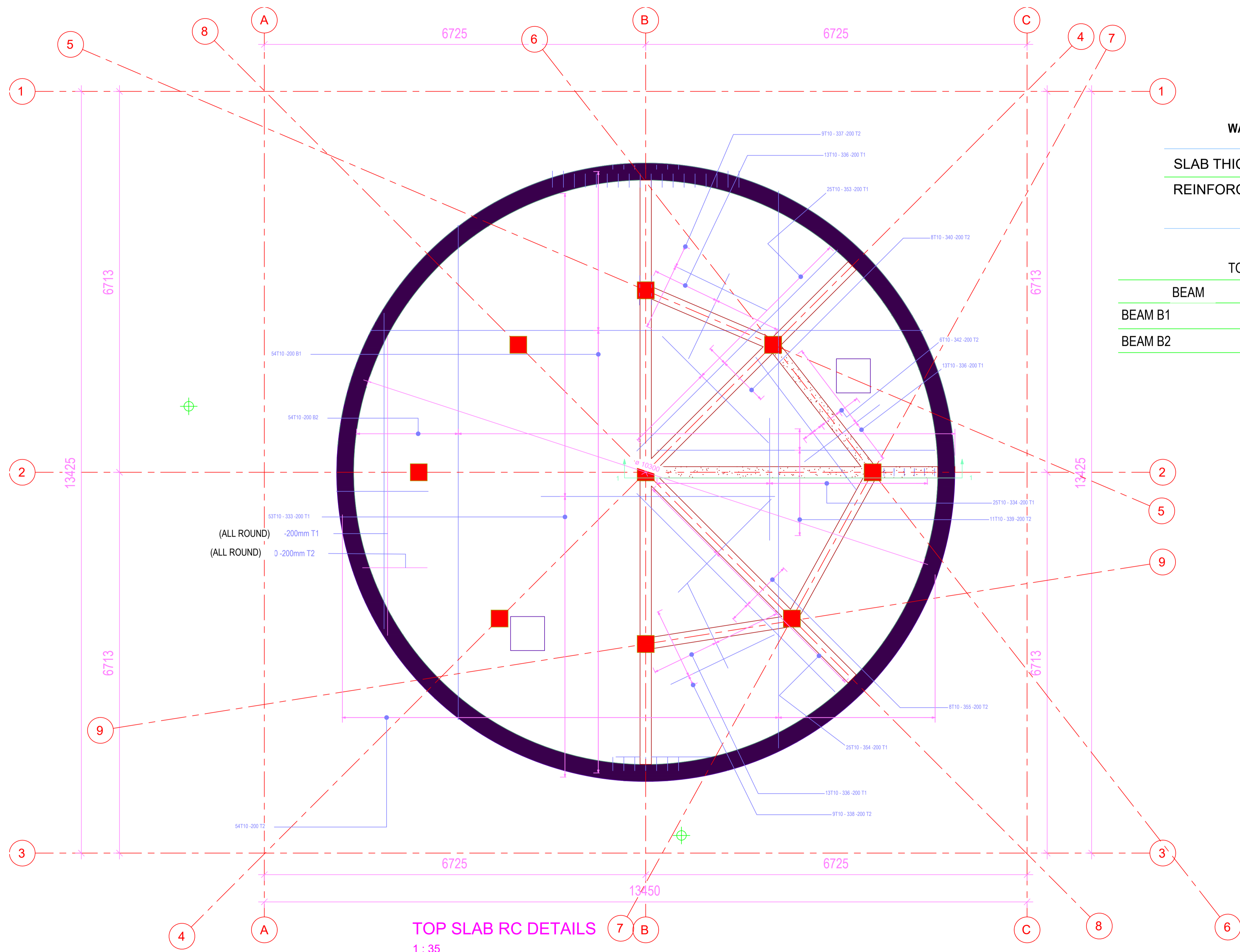
Designed by: A.G.N
Drawn by: A.G.N
Checked by: Eng. S. Muiruri
Approved by: Eng. S. Muiruri
Date: 9th October 2023

HES-009-2023

S.27

Scale:

as shown



WATER TANK TOP SOLID SLAB DETAILS

SLAB THICKNESS	175MM THICK SLAB
REINFORCEMENT	Y10@200 T1&T2 Y10@200 B1&B2

TOP SLAB LEVEL BEAM SCHEDULE

BEAM	SIZE	STEEL	LINKS
BEAM B1	450X450	BOT 2Y12, TOP 2Y12	∅@200
BEAM B2	450X450	BOT 2Y12, TOP 2Y12	∅@200

TOP SLAB RC DETAILS
1 : 35

- NOTES:**
- Concrete Class: Foundation 25/20, Column 25/20, Ground Beam 25/20; Strip Footing 25/20 (i.e. Class 25N/mm² and Maximum Agg. Size 20mm)
 - Excavations to be inspected before blinding
 - All reinforcement to be inspected before concreting
 - Cover to Main Reinforcement: Foundations 50; Columns 25; Ground Beams 40; Strip Footing 50;
 - Dimensions to be read and not scaled
 - This drawing to be read in conjunction with Architectural Drawings

Revisions		
Date	Description	Remarks

Project:
**ATHI KILEMA TUNGUNI
WATER PROJECT PHASE II**

Client:

Client Executive Officer
Ministry of Water and Irrigation
Water and Irrigation
Department
P.O. Box 181-00300, Nairobi
Kenya
Email: info@water.go.ke

Engineers:

HES
Engineering
Mama Centre, Quering Rd, Darheim,
2nd Floor, Suite 13
P.O. Box 181-00300, Nairobi
Tel: +254 020 526268
Email: info@hescorconengineering.com

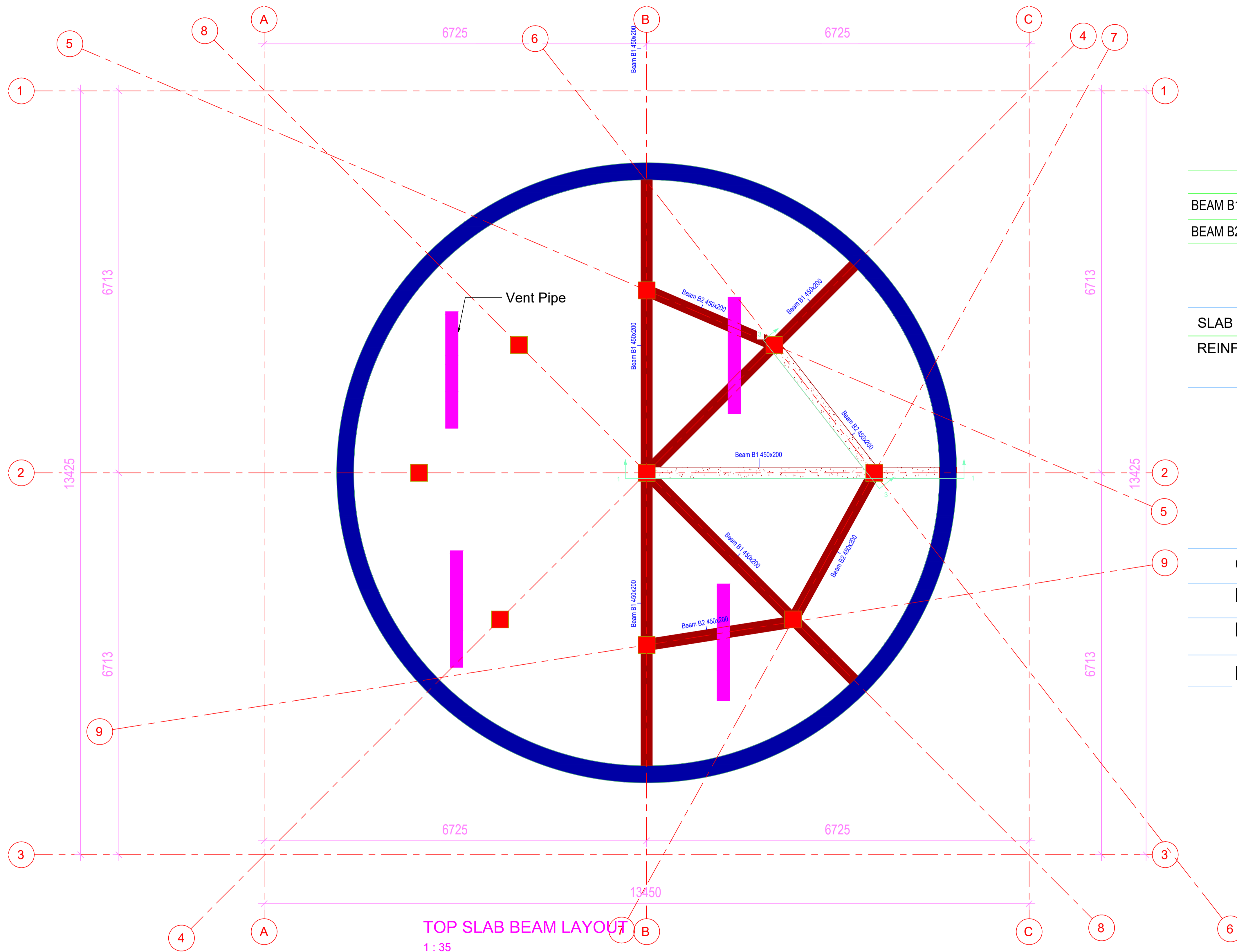
Client:
Owner

Drawing Title:
Top Slab Rc Details

Designed by: A.G.N
Drawn by: A.G.N
Checked by: Eng. S. Muiruri
Approved by: Eng. S. Muiruri
Date: 9th October 2023

HES-009-2023
S.28

Scale:
as shown



TOP SLAB LEVEL BEAM SCHEDULE

BEAM	SIZE	STEEL	LINKS
BEAM B1	450X450	BOT 2Y12, TOP 2Y12	∅@200
BEAM B2	450X450	BOT 2Y12, TOP 2Y12	∅@200

WATER TANK TOP SOLID SLAB DETAILS

SLAB THICKNESS	175MM THICK SLAB
REINFORCEMENT	Y10@200 T1&T2 Y10@200 B1&B2

WATER TANK DETAILS

Capacity	250m ³
Diameter	10.3 Metres
Radius	5.15 Metres
Depth	3.0 Metres

- NOTES:**
- Concrete Class: Foundation 25/20, Column 25/20, Ground Beam 25/20; Strip Footing 25/20 (i.e. Class 25N/mm² and Maximum Agg. Size 20mm)
 - Excavations to be inspected before blinding
 - All reinforcement to be inspected before concreting
 - Cover to Main Reinforcement: Foundations 50; Columns 25; Ground Beams 40; Strip Footing 50;
 - Dimensions to be read and not scaled
 - This drawing to be read in conjunction with Architectural Drawings

Revisions		
Date	Description	Remarks

Project:
ATHI KILEMA TUNGUNI
WATER PROJECT PHASE II

Client:



Chief Executive Officer
Ministry of Water and Irrigation
Water and Irrigation
Department
P.O. Box 161 - 00300, Nairobi
Kenya
Email: info@water.go.ke

Engineers:



Memo Centre, Quering Rd, Darheim,
2nd Floor, Suite 13
P.O. Box 161 - 00300, Nairobi
Tel: +254 (0) 20 526368
Email: info@hescorconengineering.com

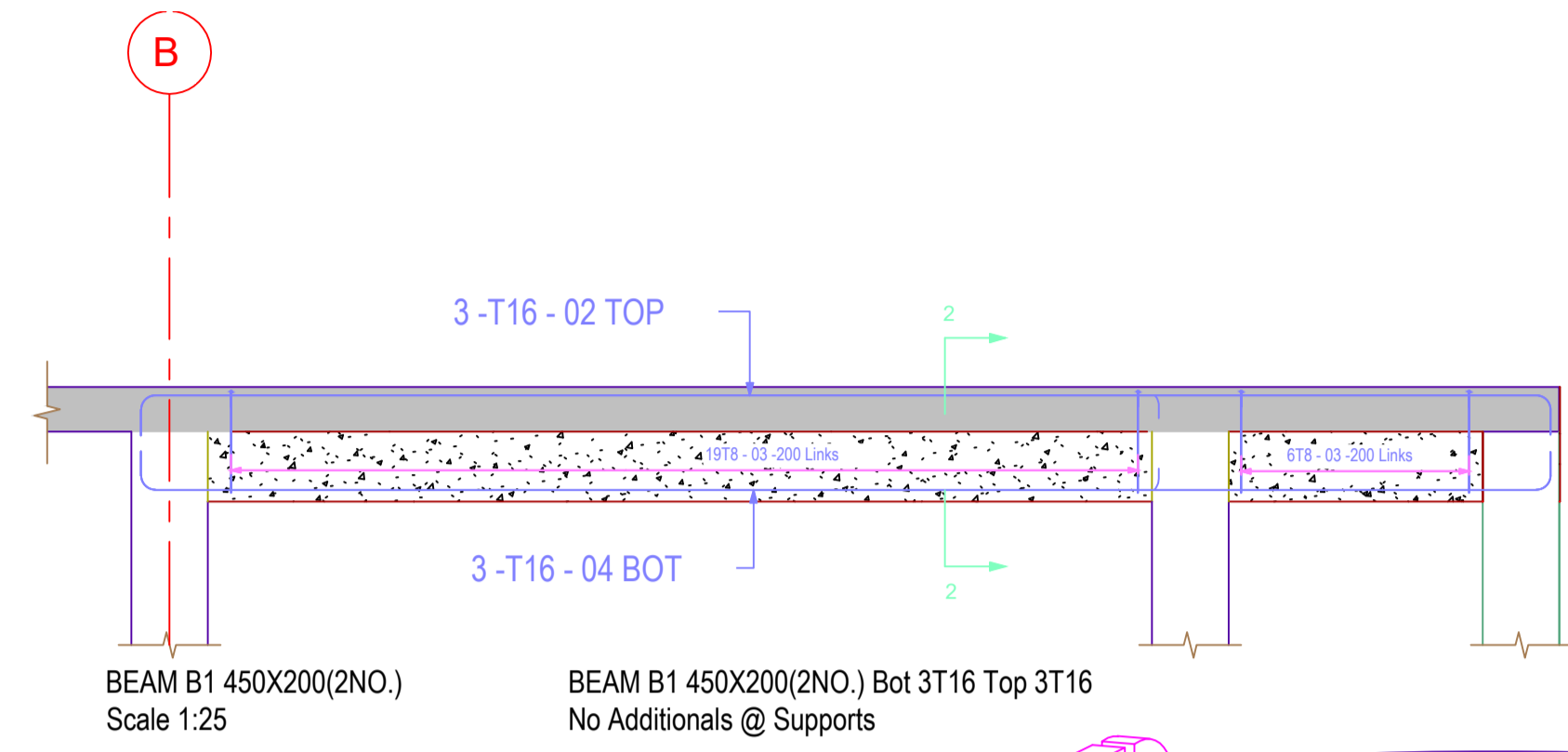
Client:
Owner

Drawing Title:
TOP SLAB BEAM LAYOUT

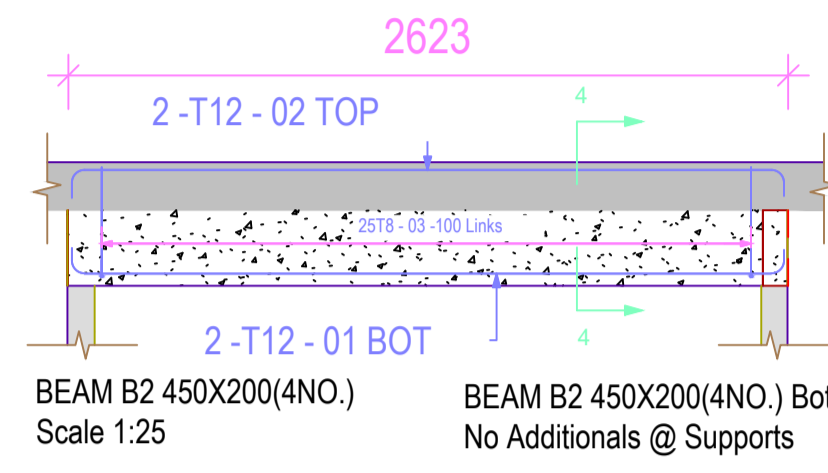
Designed by: A.G.N
Drawn by: A.G.N
Checked by: Eng. S. Muiruri
Approved by: Eng. S. Muiruri
Date: 9th October 2023

HES-009-2023
S.29

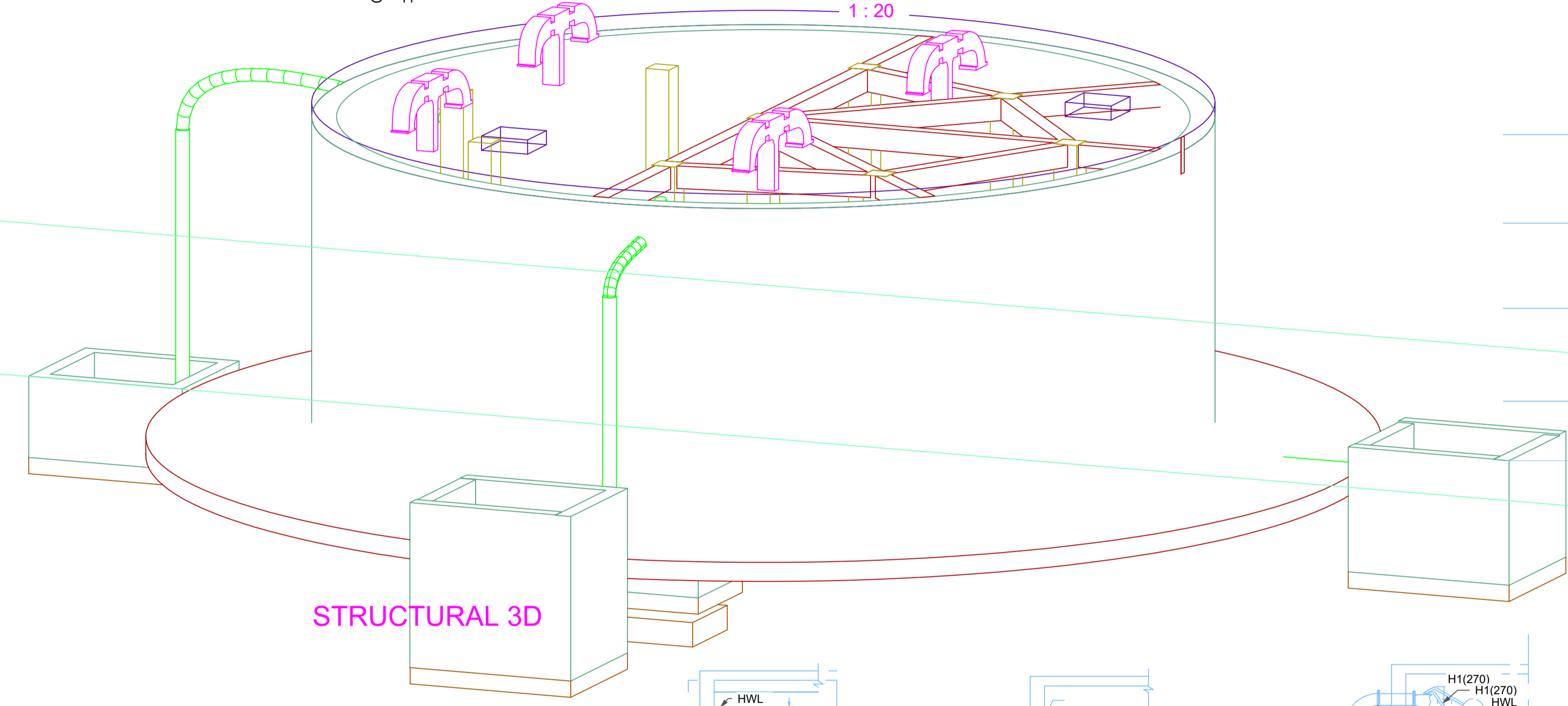
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Beam B1 Section 2-2
1 : 20

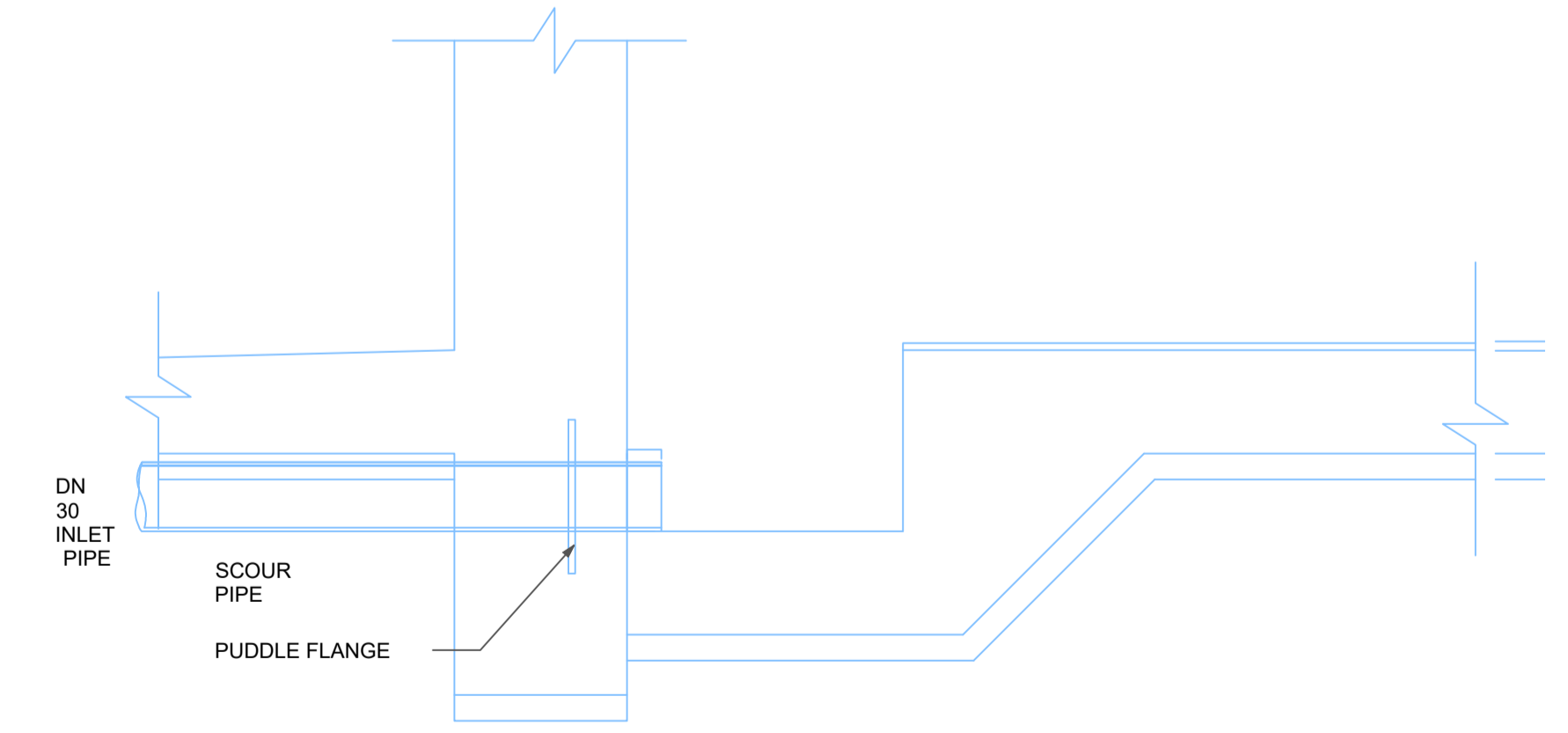
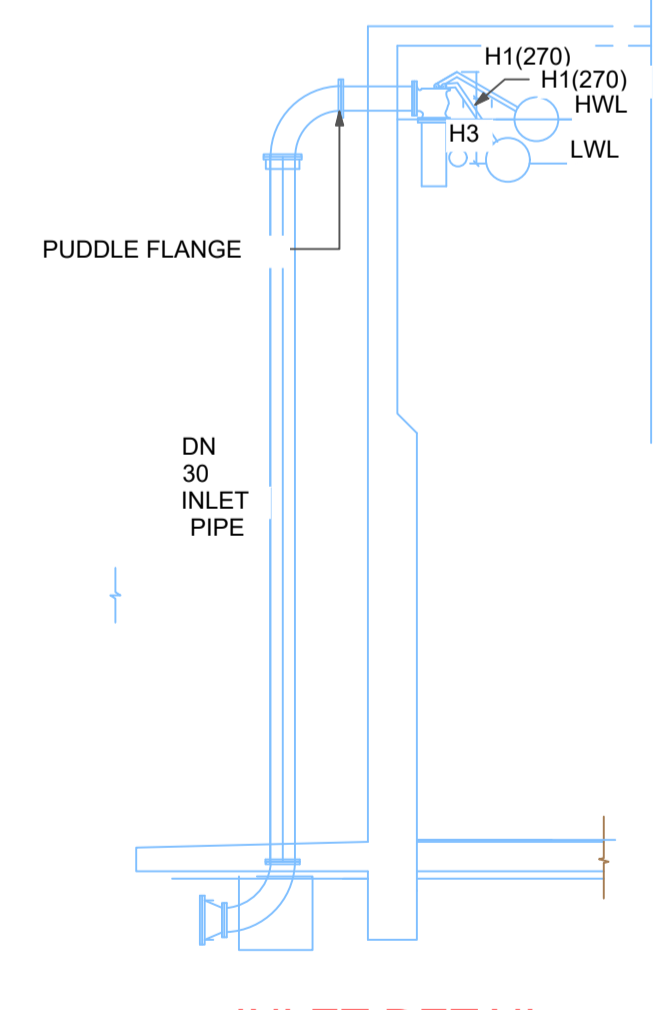
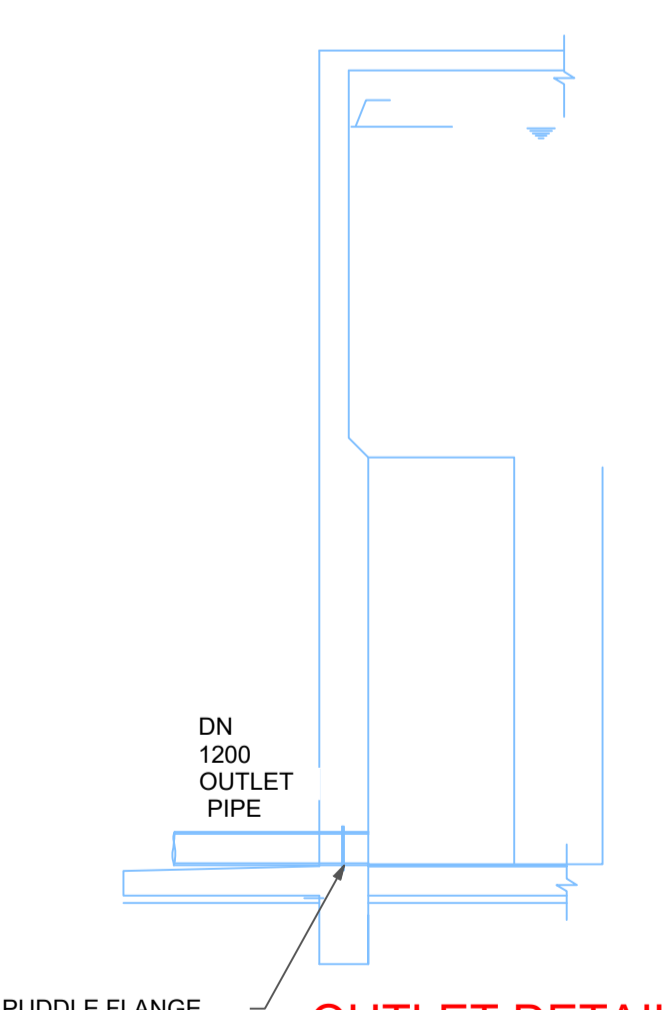
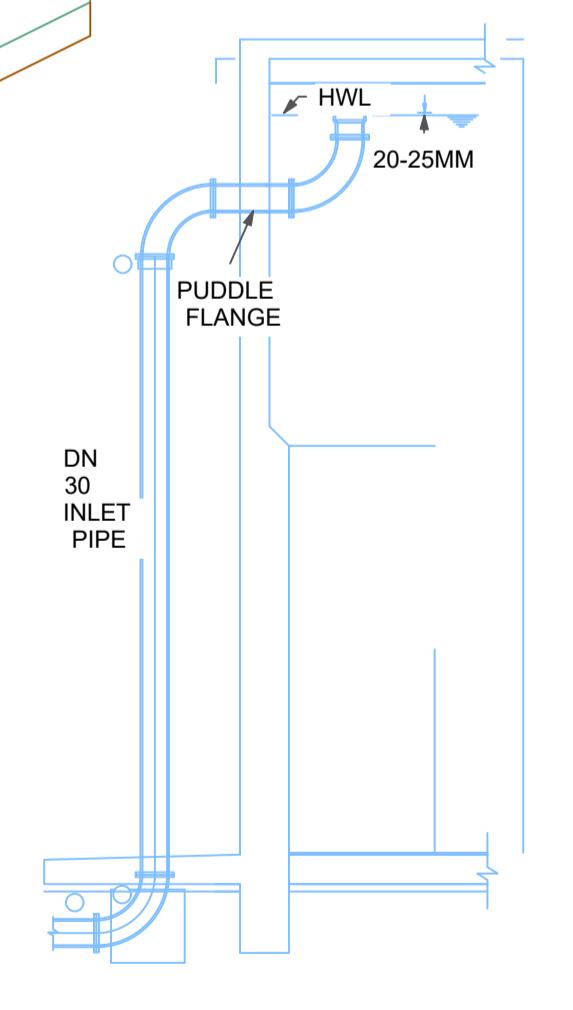
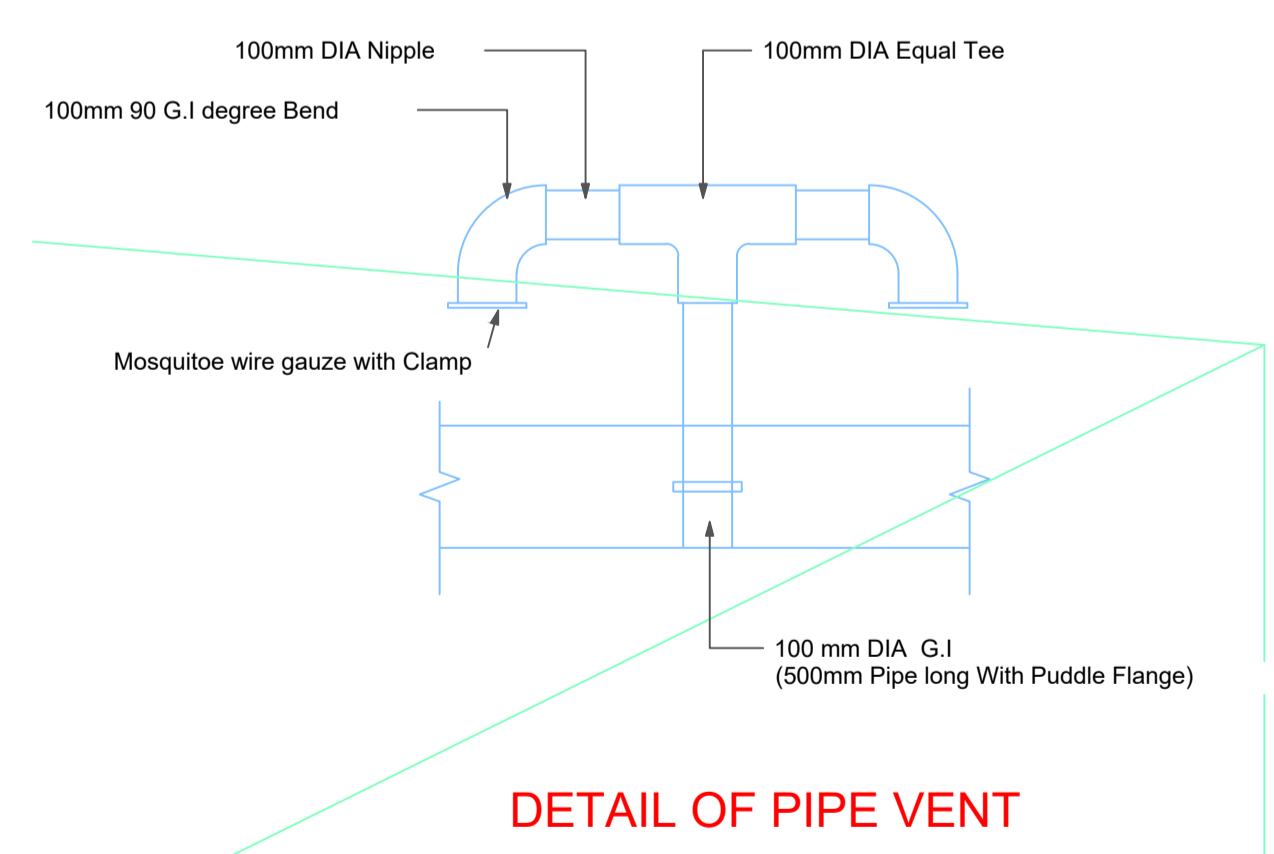


Beam B2 Section 4-4
1 : 20



WATER TANK DETAILS

Capacity	250m ³
Diameter	10.3 Metres
Radius	5.15 Metres
Depth	3.0 Metres



- NOTES:**
- Concrete Class: Foundation 25/20, Column 25/20, Ground Beam 25/20; Strip Footing 25/20 (i.e. Class 25N/mm² and Maximum Agg. Size 20mm)
 - Excavations to be inspected before blinding
 - All reinforcement to be inspected before concreting
 - Cover to Main Reinforcement: Foundations 50; Columns 25; Ground Beams 40; Strip Footing 50;
 - Dimensions to be read and not scaled
 - This drawing to be read in conjunction with Architectural Drawings

Revisions		
Date	Description	Remarks

Project:
ATHI KILEMA TUNGUNI WATER PROJECT PHASE II

Client:

Client Executive Officer
Ministry of Water and Irrigation
Water and Irrigation
Department
P.O. Box 19-00000
Nairobi, Kenya
email: info@water.go.ke

Engineers:

Mama Centre, Quering Rd, Darheim,
2nd Floor, Suite 13
P.O. Box 181 - 00300, Nairobi
Tel: +254 (0) 20 206368
Email: info@horizonengineering.com

Client:
Owner

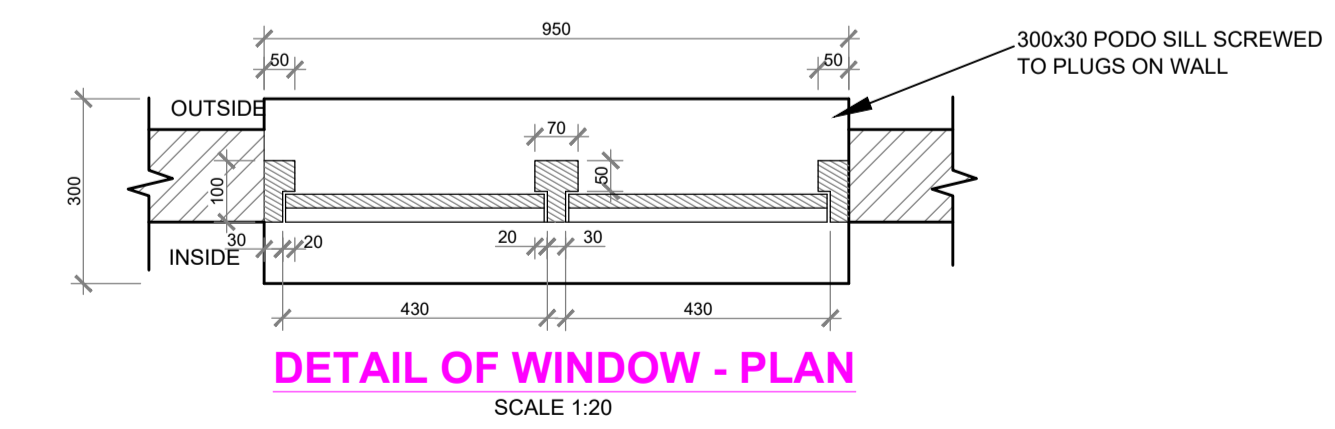
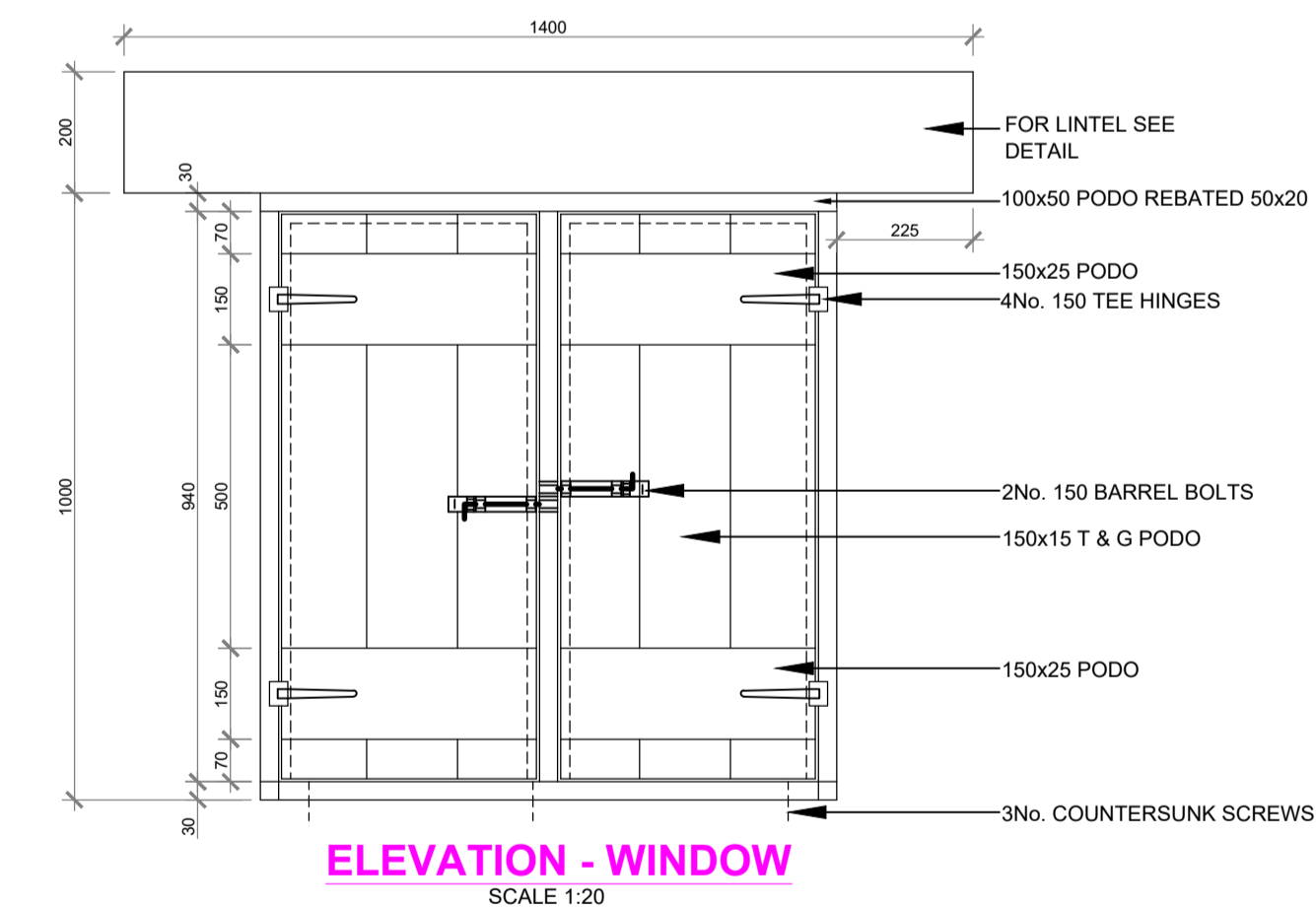
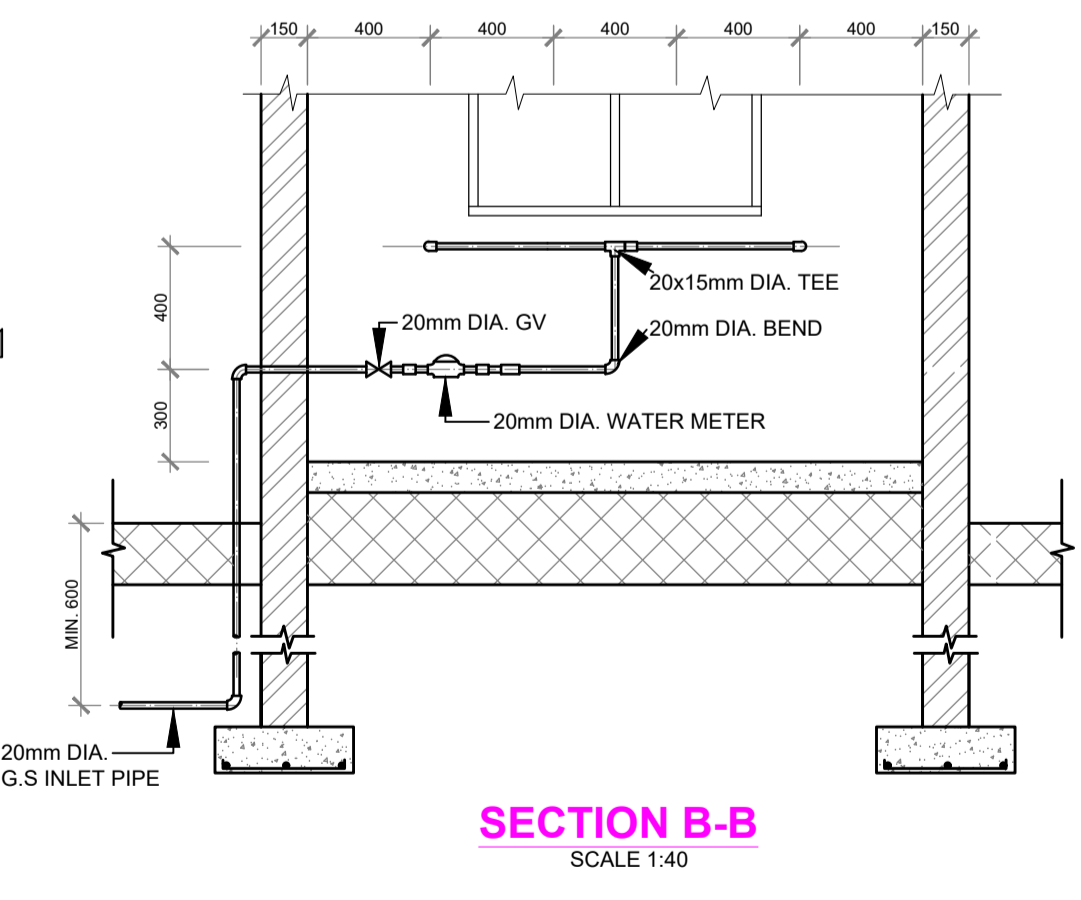
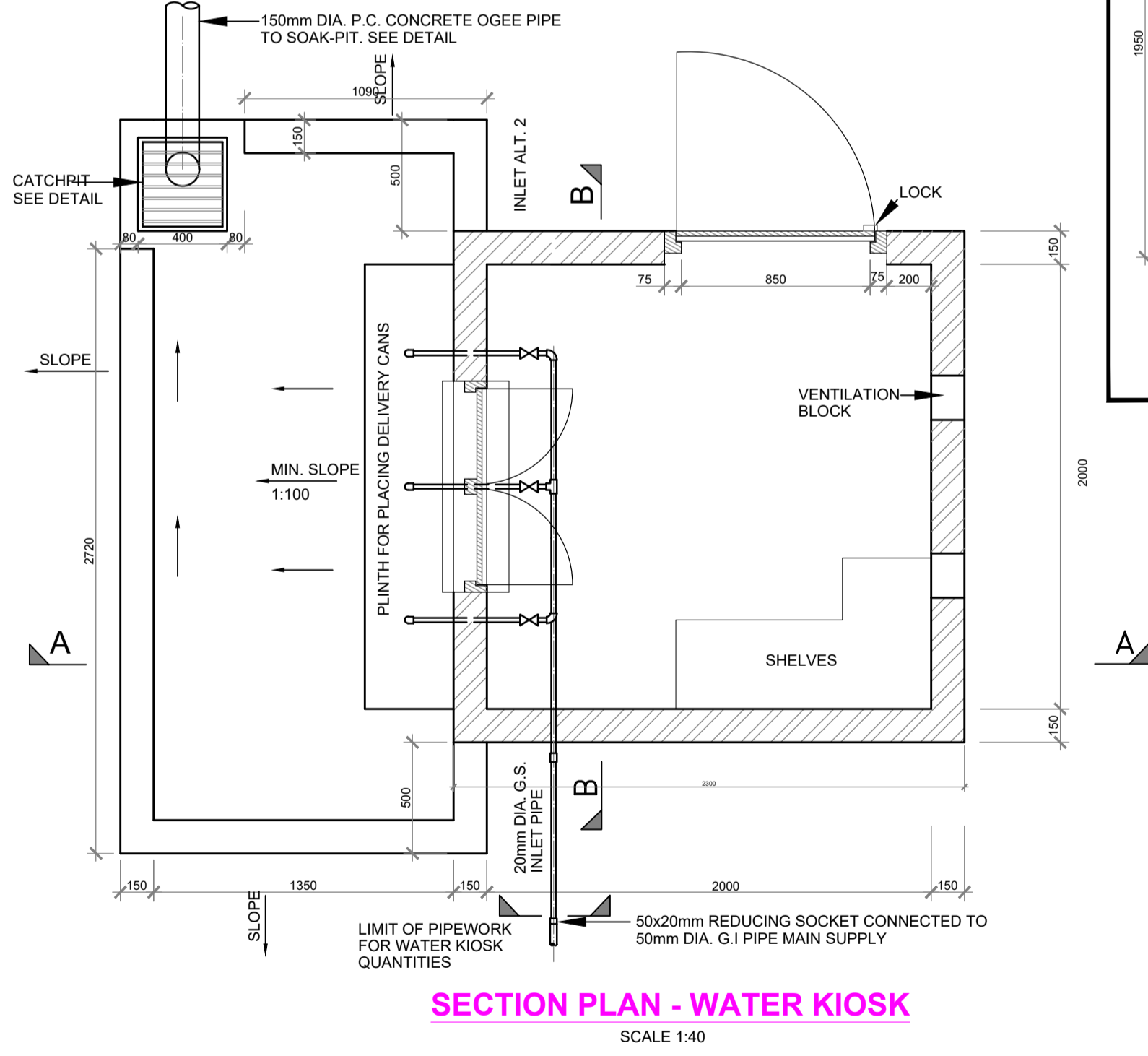
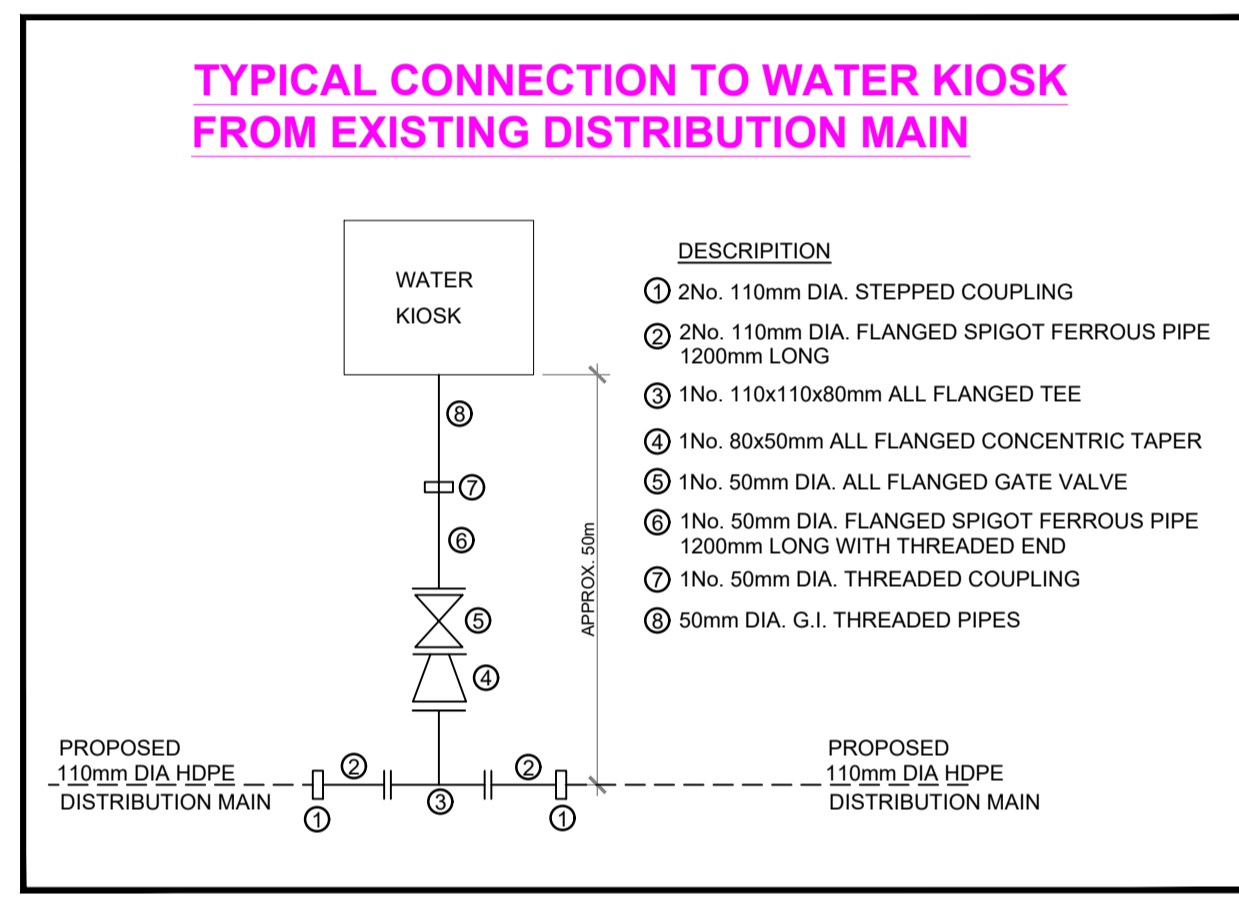
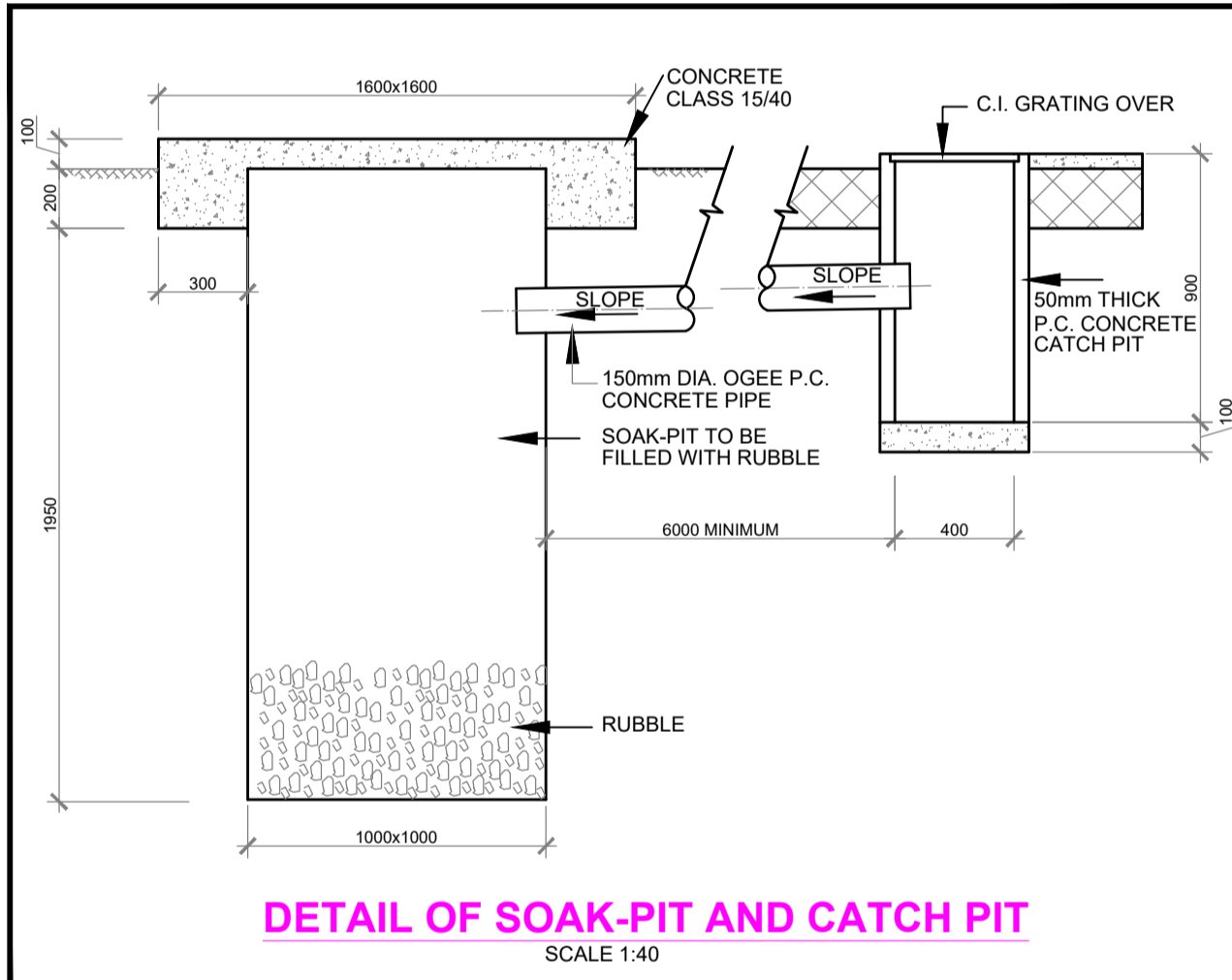
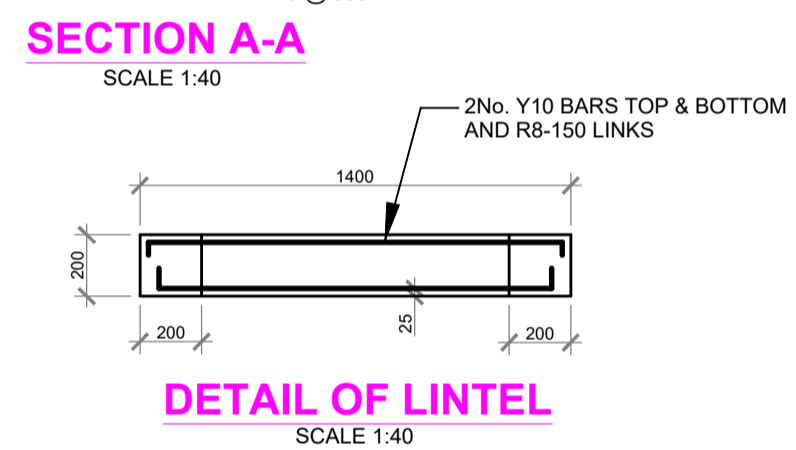
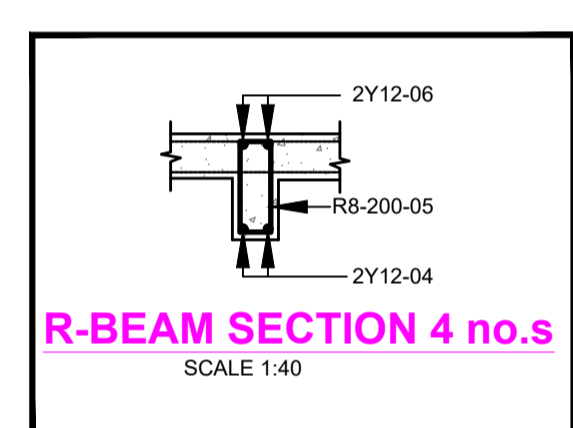
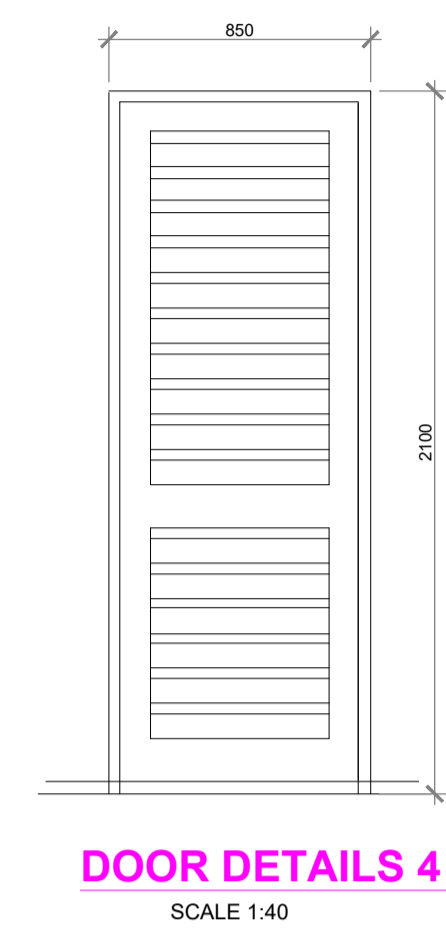
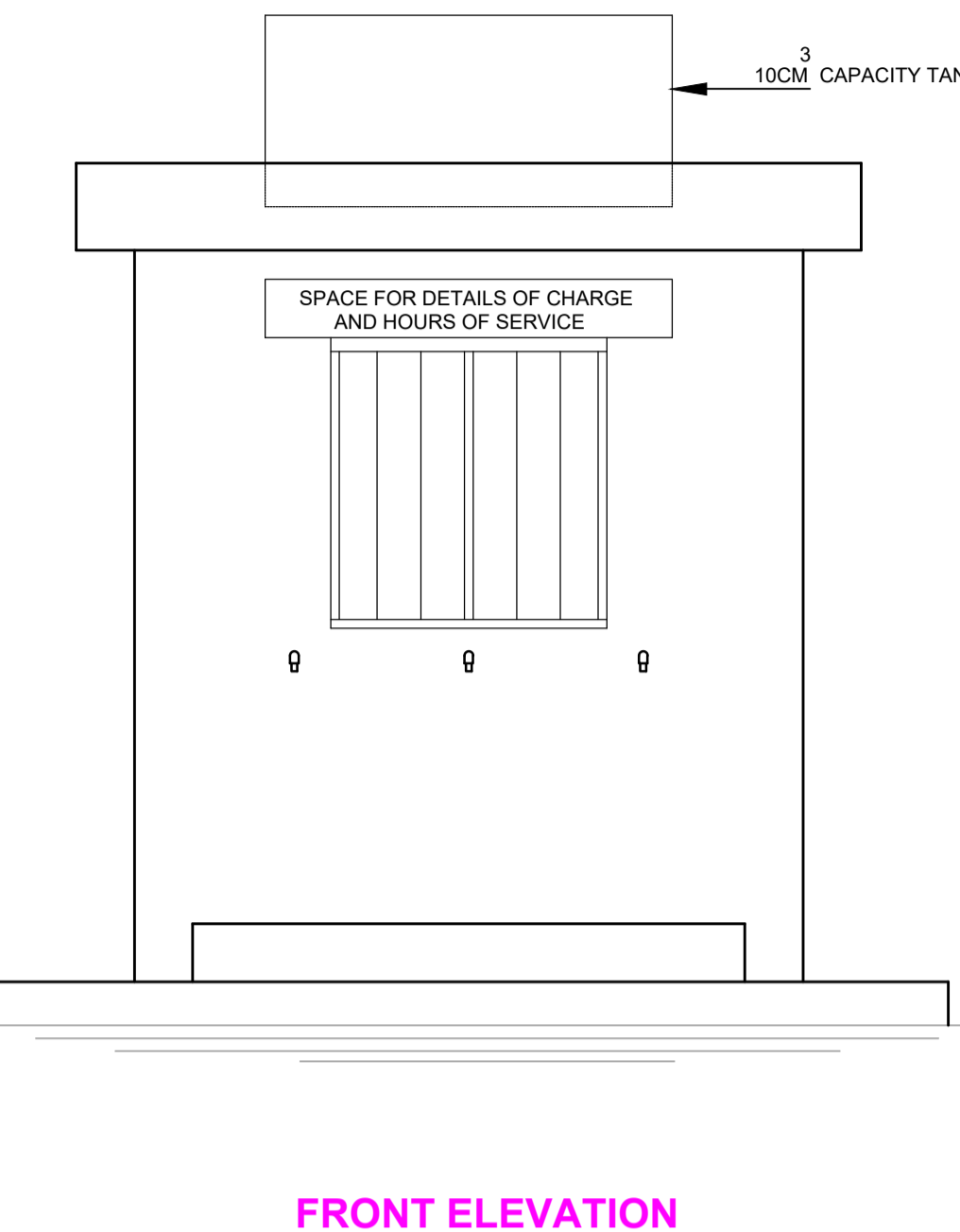
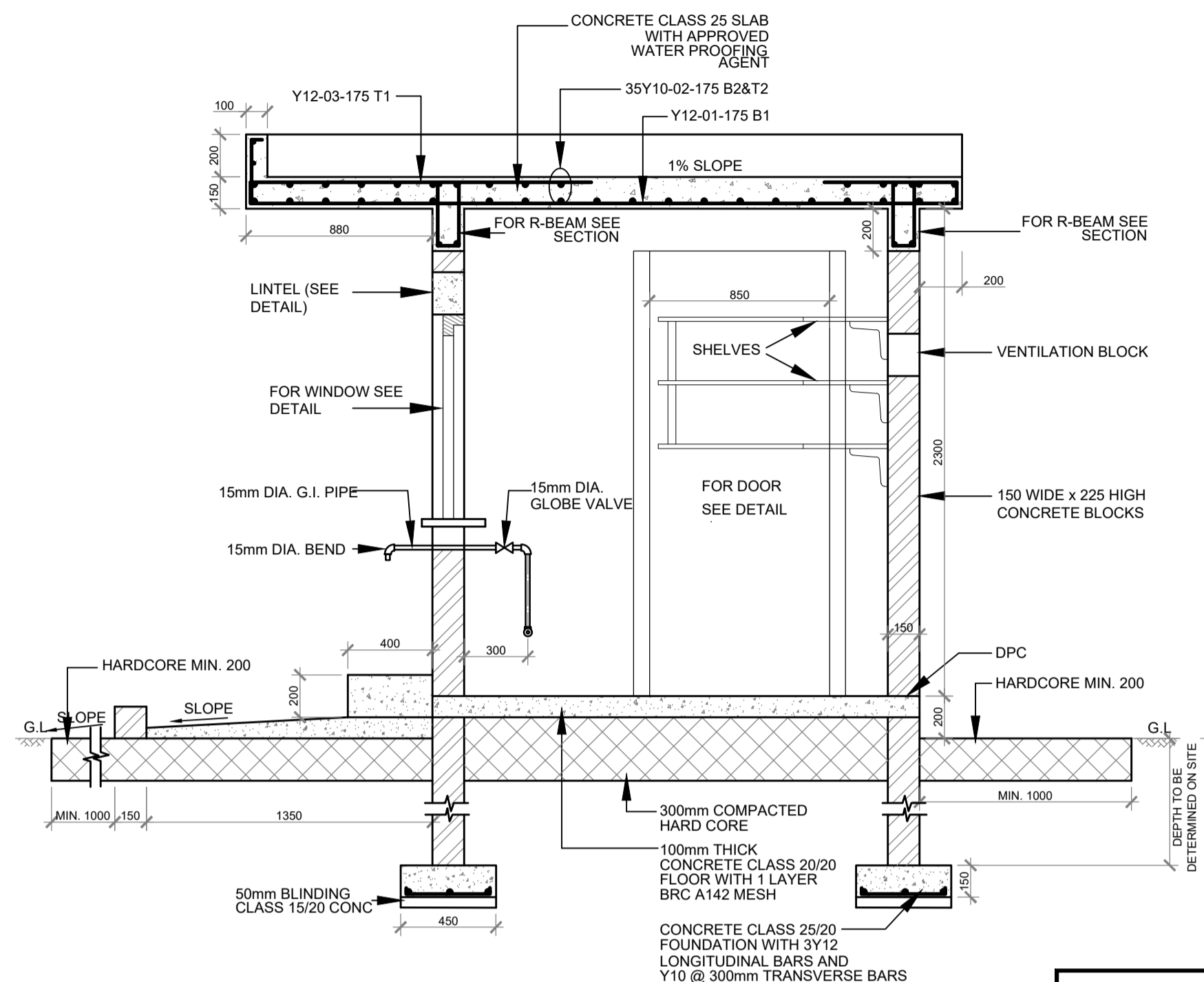
Drawing Title:
TOP SLAB BEAM RC DETAILS

Designed by: A.G.N
Drawn by: A.G.N
Checked by: Eng. S. Muiruri
Approved by: Eng. S. Muiruri
Date: 9th October 2023

HES-009-2023

S.30

Scale:
as shown



- NOTES:
- Concrete Class: Foundation 25/20, Column 25/20, Ground Beam 25/20; Strip Footing 25/20 (i.e. Class 25N/mm² and Maximum Agg. Size 20mm)
 - Excavations to be inspected before blinding
 - All reinforcement to be inspected before concreting
 - Cover to Main Reinforcement: Foundations 50; Columns 25; Ground Beams 40; Strip Footing 50;
 - Dimensions to be read and not scaled
 - This drawing to be read in conjunction with Architectural Drawings

Revisions		
Date	Description	Remarks

Project:
ATHI KILEMA TUNGUNI
WATER PROJECT PHASE II

Client:
Makindu County Government
Water and sanitation
Department
P.O. Box 79-90300
Wote-Makindu, Kenya
email: info@makmur.gov.ke



Engineers:
HES
Mama Centre, Othmanya Rd, Darhahin,
2nd Floor, Suite 13
P.O. Box 181 - 00300, Nairobi
Tel: +254-020-5292368
Email: info@horconengineering.com

Client:
Owner
Drawing Title:
Water Kiosk details

Designed by: A.G.N.
Drawn by: A.G.N.
Checked by: Eng. S. Muiruri
Approved by: Eng. S. Muiruri
Date: 9th October 2023
HES-009-2023
S.31

Scale:
as shown