



ATHI WATER WORKS DEVELOPMENT AGENCY

CONSTRUCTION OF KANDARA WATER SUPPLY PROJECT

CONTRACT NO AWWDA/KWSP/W-01/2023-24

BOOK OF DRAWINGS

KANDARA WATER SUPPLY PROJECT				
BOOK OF DRAWINGS				
LIST OF DRAWINGS				
1.0.	PROJECT LAYOUT DRAWING			
1.1.	SCHEMATIC LAYOUT			
No.	NAME	DRAWING NO.	Sheet No	Drawing index
1	Project Schematic drawing	MUSWAS-LO-001	01 of 01	MUSWAS-2020-001
2.0.	TRANSMISSION PIPELINE PROFILES			
2.1.	RAW WATER PIPELINE			
No.	NAME	DRAWING NO.	Sheet No	Drawing index
2	Raw Water Pipeline Profile Chainage 0+000 – 0+720	MUSWAS-RWP-001	01 of 07	MUSWAS-2020-002
3	Raw Water Pipeline Profile Chainage 0+720 – 1+440	MUSWAS-RWP-002	02 of 07	MUSWAS-2020-003
4	Raw Water Pipeline Profile Chainage 1+440 – 2+160	MUSWAS-RWP-003	03 of 07	MUSWAS-2020-004
5	Raw Water Pipeline Profile Chainage 2+160 – 2+880	MUSWAS-RWP-004	04 of 07	MUSWAS-2020-005
6	Raw Water Pipeline Profile Chainage 2+880 – 3+600	MUSWAS-RWP-005	05 of 07	MUSWAS-2020-006
7	Raw Water Pipeline Profile Chainage 3+600 – 4+320	MUSWAS-RWP-006	06 of 07	MUSWAS-2020-007
8	Raw Water Pipeline Profile Chainage 4+320 – 4+415	MUSWAS-RWP-006	07 of 07	MUSWAS-2020-008
2.2.	GRAVITY MAIN WATER PIPELINE			
No.	NAME	DRAWING NO.	Sheet No	Drawing index
9	Gravity Main Water Pipeline Profile Chainage 0+000 – 0+720	MUSWAS-GMP-001	01 of 26	MUSWAS-2020-009
10	Gravity Main Water Pipeline Profile Chainage 0+720 – 1+440	MUSWAS-GMP-002	02 of 26	MUSWAS-2020-010
11	Gravity Main Water Pipeline Profile Chainage 1+440 – 2+160	MUSWAS-GMP-003	03 of 26	MUSWAS-2020-011
12	Gravity Main Water Pipeline Profile Chainage 2+160 – 2+880	MUSWAS-GMP-004	04 of 26	MUSWAS-2020-012
13	Gravity Main Water Pipeline Profile Chainage 2+880 – 3+600	MUSWAS-GMP-005	05 of 26	MUSWAS-2020-013
14	Gravity Main Water Pipeline Profile Chainage 3+600 – 4+320	MUSWAS-GMP-006	06 of 26	MUSWAS-2020-014
15	Gravity Main Water Pipeline Profile Chainage 4+320 – 5+040	MUSWAS-GMP-007	07 of 26	MUSWAS-2020-015
16	Gravity Main Water Pipeline Profile Chainage 5+040 – 5+760	MUSWAS-GMP-008	08 of 26	MUSWAS-2020-016
17	Gravity Main Water Pipeline Profile Chainage 5+760 – 6+480	MUSWAS-GMP-009	09 of 26	MUSWAS-2020-017
18	Gravity Main Water Pipeline Profile Chainage 6+480 – 7+200	MUSWAS-GMP-010	10 of 26	MUSWAS-2020-018
19	Gravity Main Water Pipeline Profile Chainage 7+200 – 7+920	MUSWAS-GMP-011	11 of 26	MUSWAS-2020-019
20	Gravity Main Water Pipeline Profile Chainage 7+920 – 8+640	MUSWAS-GMP-012	12 of 26	MUSWAS-2020-020
21	Gravity Main Water Pipeline Profile Chainage 8+640 – 9+360	MUSWAS-GMP-013	13 of 26	MUSWAS-2020-021
22	Gravity Main Water Pipeline Profile Chainage 9+360 – 10+080	MUSWAS-GMP-014	14 of 26	MUSWAS-2020-022
23	Gravity Main Water Pipeline Profile Chainage 10+080 – 10+800	MUSWAS-GMP-015	15 of 26	MUSWAS-2020-023
24	Gravity Main Water Pipeline Profile Chainage 10+800 – 11+520	MUSWAS-GMP-016	16 of 26	MUSWAS-2020-024

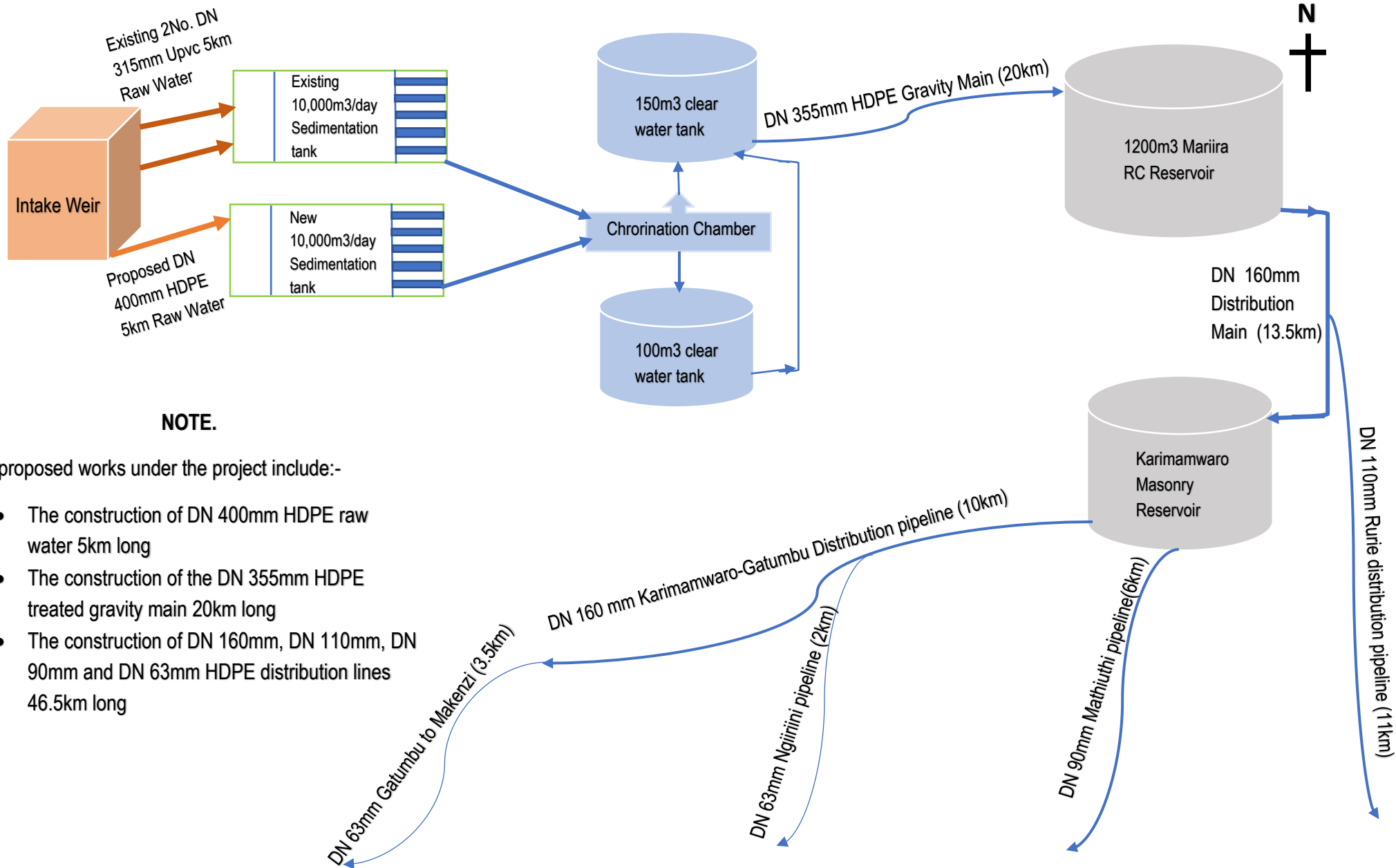
25	Gravity Main Water Pipeline Profile Chainage 11+520 – 12+240	MUSWAS-GMP-017	17 of 26	MUSWAS-2020-025
26	Gravity Main Water Pipeline Profile Chainage 12+240 – 12+960	MUSWAS-GMP-018	18 of 26	MUSWAS-2020-026
27	Gravity Main Water Pipeline Profile Chainage 12+960 – 13+680	MUSWAS-GMP-019	19 of 26	MUSWAS-2020-027
28	Gravity Main Water Pipeline Profile Chainage 13+680 – 14+400	MUSWAS-GMP-020	20 of 26	MUSWAS-2020-028
29	Gravity Main Water Pipeline Profile Chainage 14+400 – 15+120	MUSWAS-GMP-021	21 of 26	MUSWAS-2020-029
30	Gravity Main Water Pipeline Profile Chainage 15+120 – 15+840	MUSWAS-GMP-022	22 of 26	MUSWAS-2020-030
31	Gravity Main Water Pipeline Profile Chainage 15+840 – 16+560	MUSWAS-GMP-023	23 of 26	MUSWAS-2020-031
32	Gravity Main Water Pipeline Profile Chainage 16+560 – 17+280	MUSWAS-GMP-024	24 of 26	MUSWAS-2020-032
33	Gravity Main Water Pipeline Profile Chainage 17+280 – 18+000	MUSWAS-GMP-025	25 of 26	MUSWAS-2020-033
34	Gravity Main Water Pipeline Profile Chainage 18+000 – 18+438	MUSWAS-GMP-026	26 of 26	MUSWAS-2020-034
2.3.	DISTRIBUTION MAIN WATER PIPELINE			
No.	NAME	DRAWING NO.	Sheet No	Drawing index
35	Distribution Main Water Pipeline Profile Chainage 0+000 – 0+720	MUSWAS-DM-001	01 of 19	MUSWAS-2020-035
36	Distribution Main Water Pipeline Profile Chainage 0+720 – 1+440	MUSWAS-DM-002	02 of 19	MUSWAS-2020-036
37	Distribution Main Water Pipeline Profile Chainage 1+440 – 2+160	MUSWAS-DM-003	03 of 19	MUSWAS-2020-037
38	Distribution Main Water Pipeline Profile Chainage 2+160 – 2+880	MUSWAS-DM-004	04 of 19	MUSWAS-2020-038
39	Distribution Main Water Pipeline Profile Chainage 2+880 – 3+600	MUSWAS-DM-005	05 of 19	MUSWAS-2020-039
40	Distribution Main Water Pipeline Profile Chainage 3+600 – 4+320	MUSWAS-DM-006	06 of 19	MUSWAS-2020-040
41	Distribution Main Water Pipeline Profile Chainage 4+320 – 5+040	MUSWAS-DM-007	07 of 19	MUSWAS-2020-041
42	Distribution Main Water Pipeline Profile Chainage 5+040 – 5+760	MUSWAS-DM-008	08 of 19	MUSWAS-2020-042
43	Distribution Main Water Pipeline Profile Chainage 5+760 – 6+480	MUSWAS-DM-009	09 of 19	MUSWAS-2020-043
44	Distribution Main Water Pipeline Profile Chainage 6+480 – 7+200	MUSWAS-DM-010	10 of 19	MUSWAS-2020-044
45	Distribution Main Water Pipeline Profile Chainage 7+200 – 7+920	MUSWAS-DM-011	11 of 19	MUSWAS-2020-045
46	Distribution Main Water Pipeline Profile Chainage 7+920 – 8+640	MUSWAS-DM-012	12 of 19	MUSWAS-2020-046
47	Distribution Main Water Pipeline Profile Chainage 8+640 – 9+360	MUSWAS-DM-013	13 of 19	MUSWAS-2020-047
48	Distribution Main Water Pipeline Profile Chainage 9+360 – 10+080	MUSWAS-DM-014	14 of 19	MUSWAS-2020-048
49	Distribution Main Water Pipeline Profile Chainage 10+080 – 10+800	MUSWAS-DM-015	15 of 19	MUSWAS-2020-049
50	Distribution Main Water Pipeline Profile Chainage 10+800 – 11+520	MUSWAS-DM-016	16 of 19	MUSWAS-2020-050
51	Distribution Main Water Pipeline Profile Chainage 11+520 – 12+240	MUSWAS-DM-017	17 of 19	MUSWAS-2020-051
52	Distribution Main Water Pipeline Profile Chainage 12+240 – 12+960	MUSWAS-DM-018	18 of 19	MUSWAS-2020-052
53	Distribution Main Water Pipeline Profile Chainage 12+960 – 13+116	MUSWAS-DM-019	19 of 19	MUSWAS-2020-053
3.0.	CONNECTION DETAILS			
No.	NAME	DRAWING NO.	Sheet No	Drawing index
54	Intake Connection Plan	MUSWAS-CONN-001	01 of 04	MUSWAS-2020-054
55	Intake Connection Cross-Sectional Details	MUSWAS-CONN-002	02 of 04	MUSWAS-2020-055

56	Treatment works -Intake Connection Details	MUSWAS-CONN-003	03 of 04	MUSWAS-2020-056
57	Gravity Main Connection Details	MUSWAS-CONN-004	04 of 04	MUSWAS-2020-057
4.0.	STANDARD DRAWINGS			
No.	NAME	DRAWING NO.	Sheet No	Drawing index
58	Crossings Details	MUSWAS-STD-001	01 of 05	MUSWAS-2020-058
59	Air Valve Details	MUSWAS-STD-002	02 of 05	MUSWAS-2020-059
60	Wash Out Details	MUSWAS-STD-003	03 of 05	MUSWAS-2020-060
61	Trust Blocks on Vertical Bends Details	MUSWAS-STD-004	04 of 05	MUSWAS-2020-061
62	Trust Blocks on Horizontal Bends Details	MUSWAS-STD-005	05 of 05	MUSWAS-2020-062
5.0.	BREAK PRESSURE TANK			
No.	NAME	DRAWING NO.	Sheet No	Drawing index
63	50m3 Break Pressure Tank Ground Details	MUSWAS-BPT-001	01 of 03	MUSWAS-2020-063
64	50m3 Break Pressure Tank Roof Details	MUSWAS-BPT-002	02 of 03	MUSWAS-2020-064
65	50m3 Break Pressure Tank Drawing Notes	MUSWAS-BPT-003	02 of 03	MUSWAS-2020-065

1.0. PROJECT LAYOUT DRAWING

1.1. SCHEMATIC LAYOUT

KANDARA SOUTH WATER SUPPLY SCHEMATIC DIAGRAM



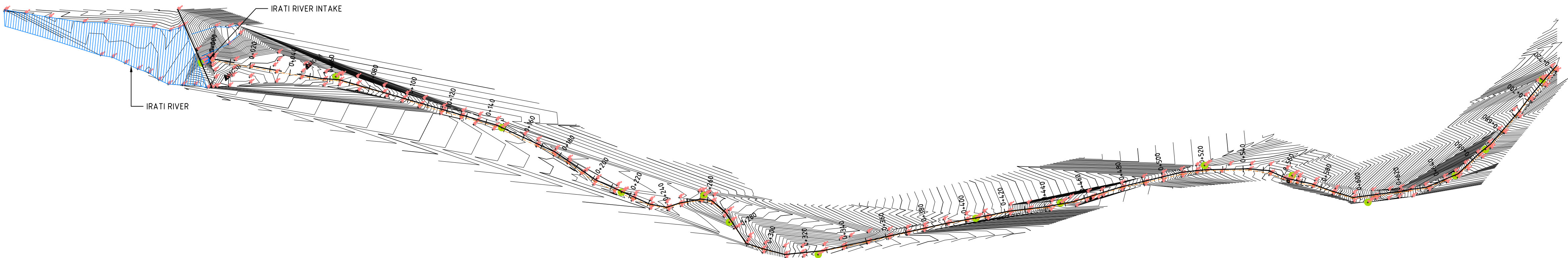
NOTE.

The proposed works under the project include:-

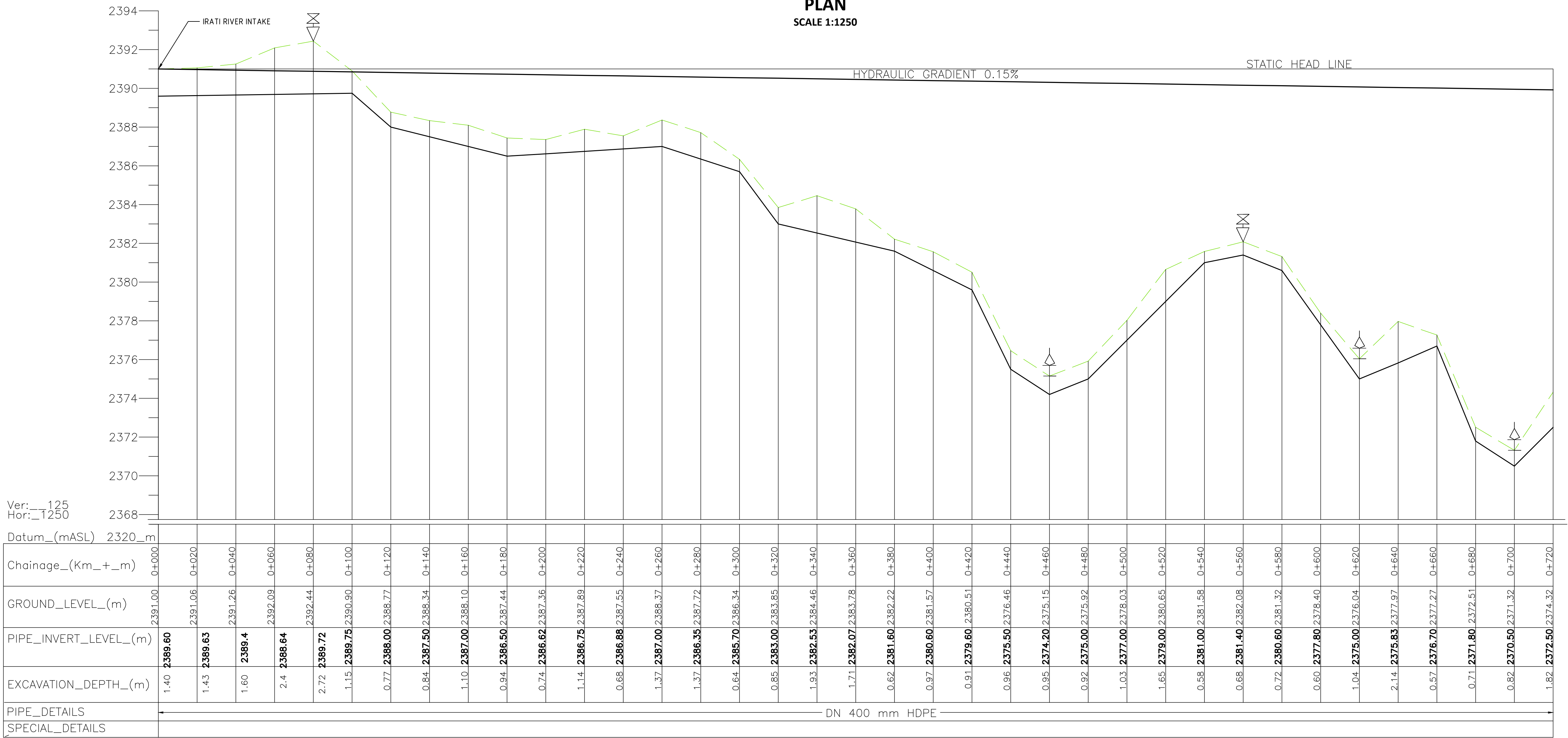
- The construction of DN 400mm HDPE raw water 5km long
- The construction of the DN 355mm HDPE treated gravity main 20km long
- The construction of DN 160mm, DN 110mm, DN 90mm and DN 63mm HDPE distribution lines 46.5km long

2.0. TRANSMISSION PIPELINE PROFILES

2.1. RAW WATER PIPELINE



PLAN
SCALE 1:1250




PROFILE
SCALE Horiz.1:1250
Vert: 1:125

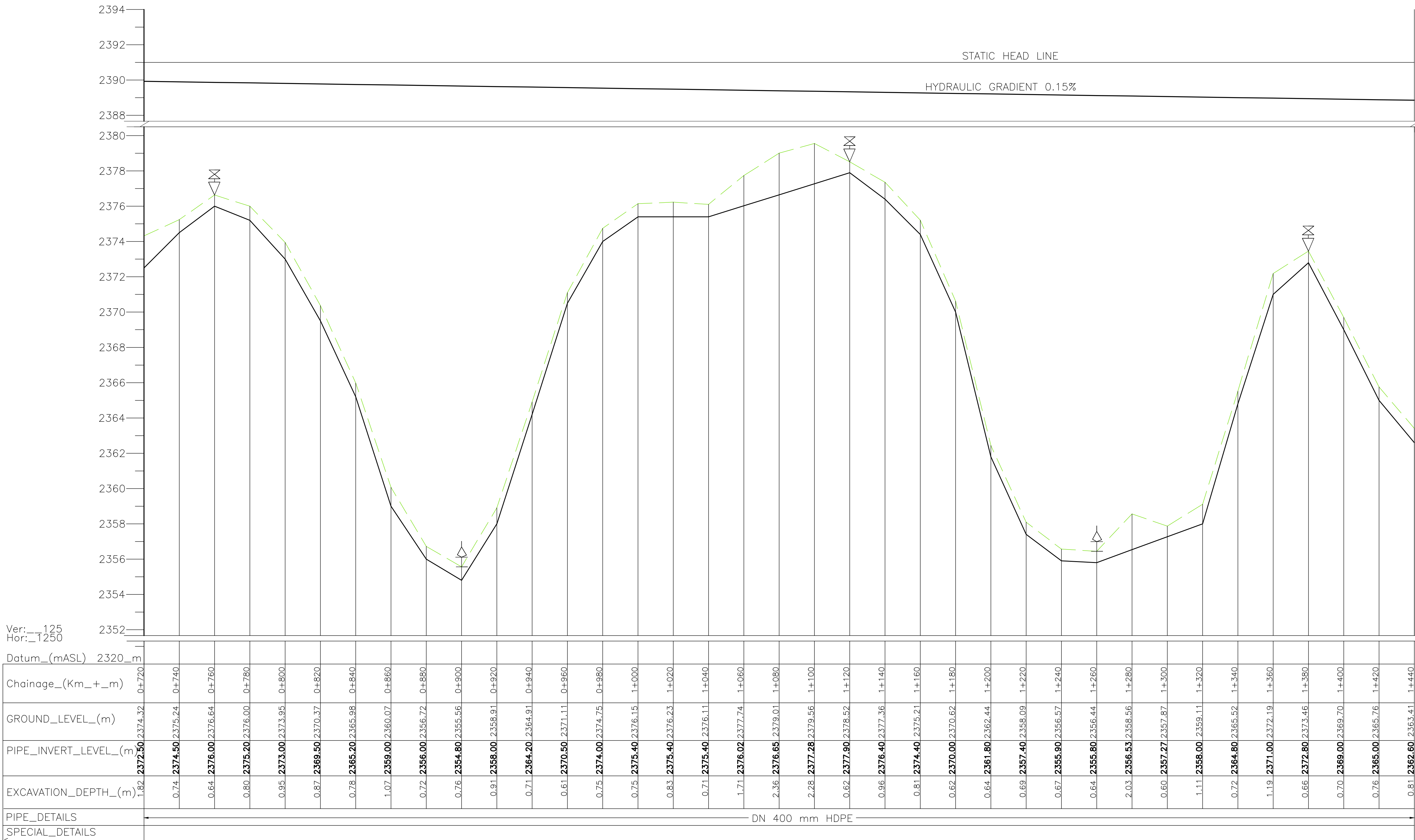
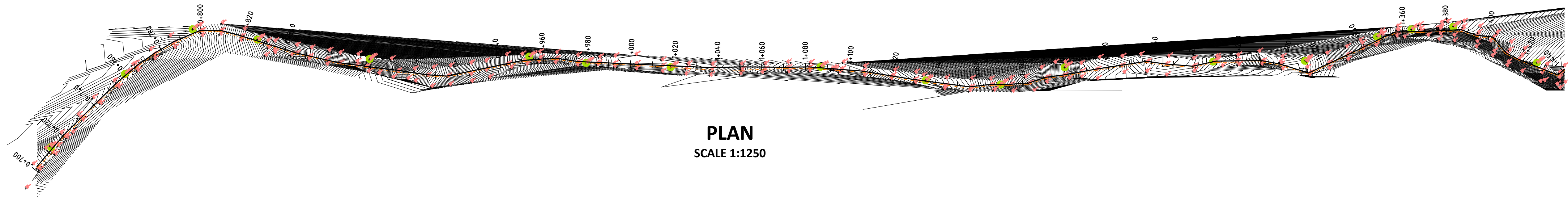
NOTES:

- Plan and profile are on the same sheet and to the same horizontal scale.
- Chainage of pipelines start at the inlet and run in the same direction as the flow.
- The profile show ground levels of all surveyed points and invert levels at points where the gradient changes.
- All levels are given to two decimals of metre and the chainage to the metre only.
- The profiles show static head, the hydraulic gradient in percent, pipe material size and class.
- The plans show enough features of the terrain to make it possible to find the surveyed line at the time of the construction.
- A general Layout Plan covering the whole supply system is provided in schematic format as drawing indexed MUSWAS-2020-002 Showing pipe dimensions and reservoir capacities.

LEGEND:

- All dimensions are in metres
 - the actual setting out to be confirmed on site by the engineer
- EXISTING WATER PIPELINE
 - EXISTING GROUND LEVEL
 - PROPOSED WATER PIPELINE
 - MURRAM ROAD
 - AIR VALVE
 - WASH OUT
 - FH FIRE HYDRANT

Revised		<div><div>ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 452/3/00100, Athiira Region, Homa Bay Road Nairobi Kenya Tel: 0254 20 272743 email: aww@ard.or.ke</div></div>	Project Manager	Designd	Drawn	Checked	Approved	KANDARA WATER SUPPLY PROJECT	FINAL DESIGN REVIEW	
Design	Date								JULY2023	
									Drawing No: MUSWAS:RWP:001	
									Scale: Plot: 1:250, Vertical: 1:25	Sheet Size: A1
									Scale: No: 1:7	
									Index No: MUSWAS:2020:002	



PROFILE
SCALE Horiz:1:1250
Vert: 1:125

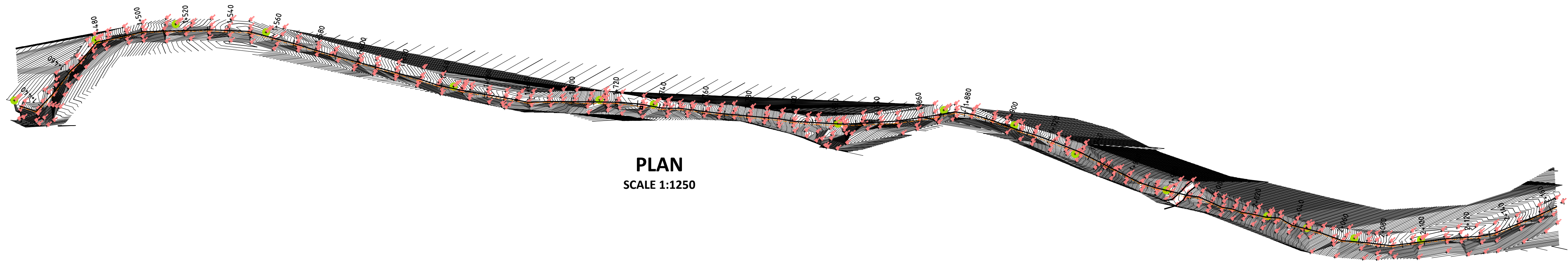
NOTES:

- 1..Chainage of pipelines start at the inlet and run in the same direction as the flow.
- 2.The profile show ground levels of all surveyed points and invert levels at points where the gradient changes.
- 3.All levels are given to two decimals of metre and the chainage to the metre only.
- 4.The profiles show static head, the hydraulic gradient in percent, pipe material size and class.
- 5.The plans show enough features of the terrain to make it possible to find the surveyed line at the time of the construction.
6. A general Layout Plan covering the whole supply system is be provided in schematic format as drawing indexed MUSWAS-2020-002 Showing pipe dimensions and reservoir capacities.

LEGEND:

- 1.All dimensions are in metres
 - 2.the actual setting out to be confirmed on site by the engineer
- EXISTING WATER PIPELINE
 - EXISTING GROUND LEVEL
 - PROPOSED WATER PIPELINE
 - MURRAM ROAD
 - AIR VALVE
 - WASH OUT
 - FH FIRE HYDRANT

Revised		Comments		Emitted	Project Manager	KANDARA WATER SUPPLY PROJECT		FINAL DESIGN REVIEW	
Drawn	Date			ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 452300100, Athi River Center, Highway Road Nairobi Kenya Tel: 254 20 272743 email: awd@ard.co.ke				Date: JULY 2023	
								Drawn: MUSWAS:RWP:002	
								Scale: Plan: 1:1250, Ver: 1:125	Sheet Size: A1
								Sheet No: 2 of 7	
								Index No: MUSWAS:2020:003	



PLAN
SCALE 1:1250





PROFILE
SCALE Horiz.1:1250
Vert: 1:125

NOTES:

- Plan and profile are on the same sheet and to the same horizontal scale.
- Chainage of pipelines start at the inlet and run in the same direction as the flow.
- The profile show ground levels of all surveyed points and invert levels at points where the gradient changes.
- All levels are given to two decimals of metre and the chainage to the metre only.
- The profiles show static head, the hydraulic gradient in percent, pipe material size and class.
- The plans show enough features of the terrain to make it possible to find the surveyed line at the time of the construction.
- A general Layout Plan covering the whole supply system is provided in schematic format as drawing indexed MUSWAS-2020-002 Showing pipe dimensions and reservoir capacities.

LEGEND:

- All dimensions are in metres
 - the actual setting out to be confirmed on site by the engineer
- EXISTING WATER PIPELINE
 - EXISTING GROUND LEVEL
 - PROPOSED WATER PIPELINE
 - MURRAM ROAD
 - AIR VALVE
 - WASH OUT
 - FIRE HYDRANT

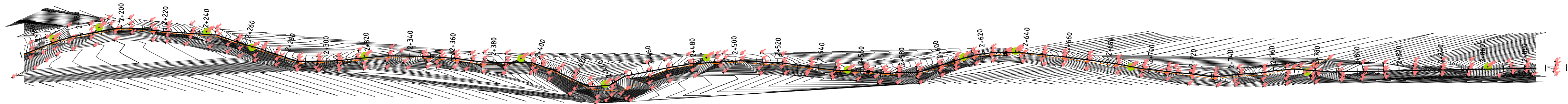
Revised		Comments		Employer		Project Manager		Project		KANDARA WATER SUPPLY PROJECT		Scale		FINAL DESIGN REVIEW			
Drawn	Date			 <div>ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 4523/00100, Athira Re Center, Harar Road Nairobi, Kenya Tel: 254 20 2727433 email: athi@ard.ac.ke</div>				Designed		MARIIRA DN 400 mm GRAVITY RAW WATER PIPELINE PLAN AND PROFILE		Date		JULY 2023			
						Drawn		Drawn No				MUSWAS:RWP:003					
						Checked		Drawn Title				Scale		Plan: H: 1:1250, Ver: 1:125		Sheet Size	
						Approved						Sheet No		3 of 7		A1	
												Index No		MUSWAS:2020:004			

NOTES:

- Plan and profile are on the same sheet and to the same horizontal scale.
- 1..Chainage of pipelines start at the inlet and run in the same direction as the flow.
- 2.The profile show ground levels of all surveyed points and invert levels at points where the gradient changes.
- 3.All levels are given to two decimals of metre and the chainage to the metre only.
- 4.The profiles show static head, the hydraulic gradient in percent, pipe material size and class.
- 5.The plans show enough features of the terrain to make it possible to find the surveyed line at the time of the construction.
6. A general Layout Plan covering the whole supply system is be provided in schematic format as drawing indexed MUSWAS-2020-002 Showing pipe dimensions and reservoir capacities.

LEGEND:

- 1.All dimensions are in metres
- 2.the actual setting out to be confirmed on site by the engineer
- EXISTING WATER PIPELINE
- EXISTING GROUND LEVEL
- PROPOSED WATER PIPELINE
- MURRAM ROAD
- AIR VALVE
- WASH OUT
- FIRE HYDRANT



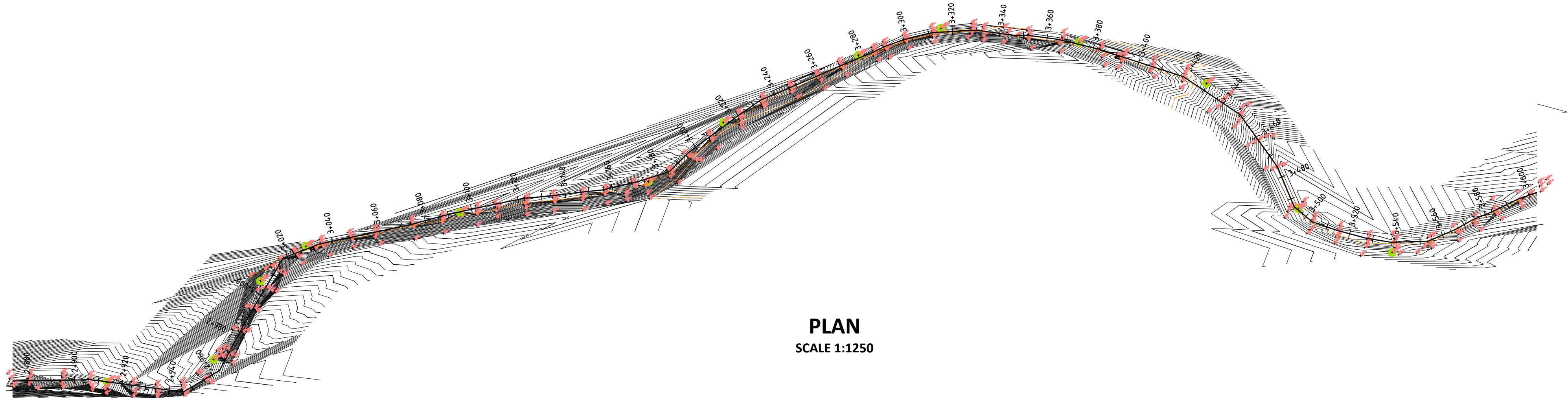
PLAN
SCALE 1:1250



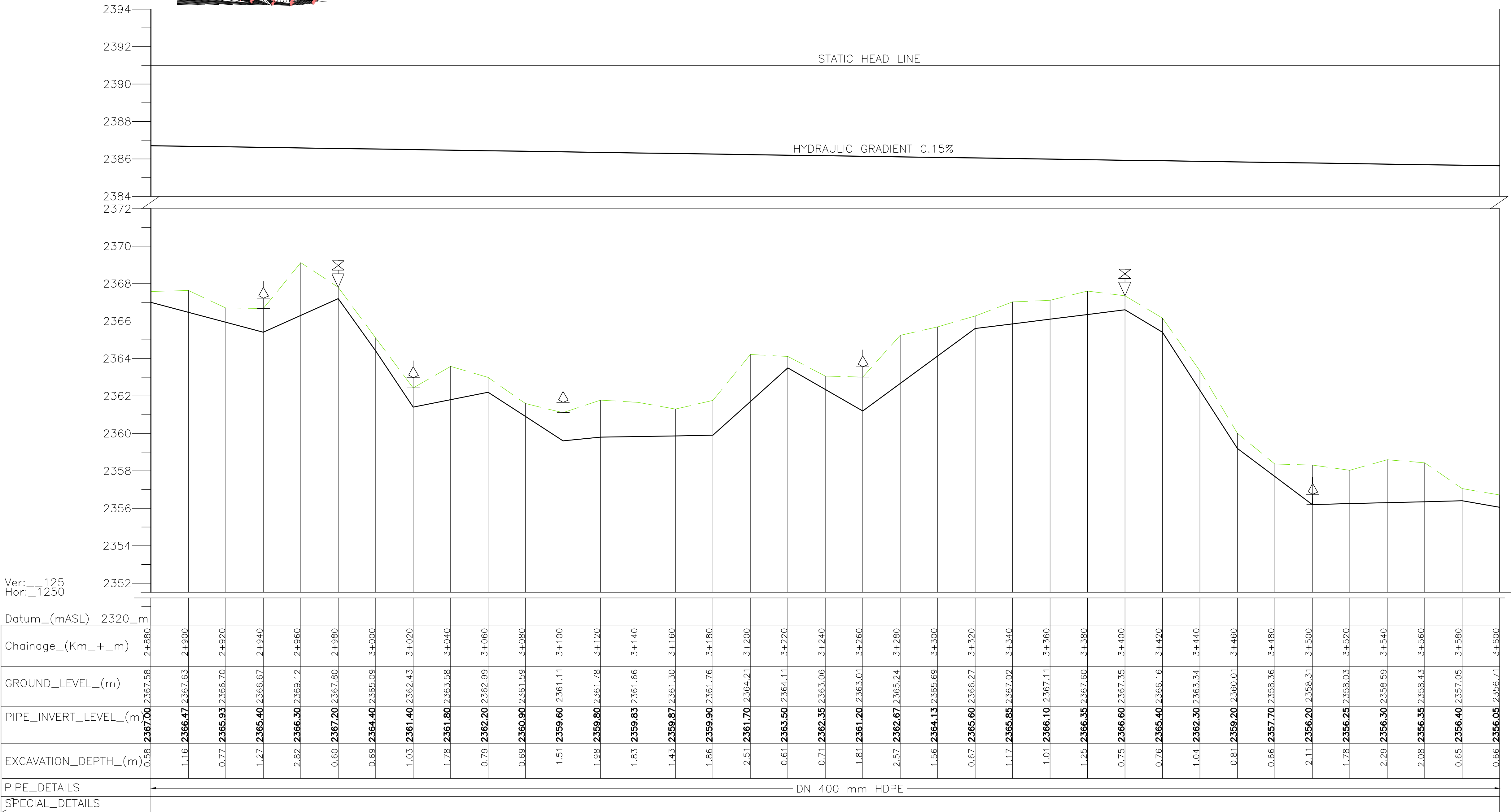
Ver: 125 Hor: 1250	Datum_(mASL) 2320	Chainage_(Km_+_m)	GROUND_LEVEL_(m)	PIPE_INVERT_LEVEL_(m)	EXCAVATION_DEPTH_(m)	PIPE_DETAILS	SPECIAL_DETAILS
	2320	2+160	2372.87	2370.13	2.74		
		2+180	2372.77	2371.50	1.27		
		2+200	2371.83	2370.95	0.88		
		2+220	2371.04	2370.40	0.64		
		2+240	2370.38	2369.10	1.28		
		2+260	2368.57	2367.80	0.77		
		2+280	2366.23	2365.40	0.83		
		2+300	2365.69	2365.00	0.69		
		2+320	2367.30	2365.35	1.95		
		2+340	2367.91	2365.70	2.21		
		2+360	2366.79	2366.05	0.74		
		2+380	2367.01	2366.40	0.61		
		2+400	2365.91	2365.20	0.71		
		2+420	2362.87	2362.20	0.67		
		2+440	2360.05	2359.20	0.85		
		2+460	2362.06	2360.23	1.83		
		2+480	2362.89	2361.27	1.62		
		2+500	2362.97	2362.30	0.67		
		2+520	2362.68	2361.93	0.75		
		2+540	2362.62	2361.57	1.05		
		2+560	2361.90	2361.20	0.70		
		2+580	2362.86	2361.84	1.02		
		2+600	2363.95	2362.48	1.47		
		2+620	2365.49	2363.12	2.37		
		2+640	2365.90	2363.76	2.14		
		2+660	2365.00	2364.40	0.60		
		2+680	2363.45	2362.87	0.58		
		2+700	2362.10	2361.33	0.77		
		2+720	2361.88	2359.80	2.08		
		2+740	2361.84	2360.40	1.44		
		2+760	2362.21	2361.00	1.21		
		2+780	2363.42	2361.60	1.82		
		2+800	2362.85	2362.20	0.65		
		2+820	2363.12	2362.50	0.62		
		2+840	2364.12	2362.80	1.32		
		2+860	2367.18	2364.90	2.28		
		2+880	2367.58	2367.00	0.58		

PROFILE
SCALE Horiz.1:1250
Vert: 1:125

Revised		Comments		Emmitter		Project Manager		KANDARA WATER SUPPLY PROJECT		Sate FINAL DESIGN REVIEW	
Design	Date			ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 452 300100, Athira Re Center, Hattia Road Nairobi Kenya Tel: 254 20 272743 email: athi@ard.co.ke						Date JULY 2023	
										Drawing No. MUSWAS:RWP:004	
										Scale Plan: H:V 1:1250, Ver 1:125	
										Sheet No. 4 of 7	
										Index No. MUSWAS:2020:005	
										A1	



PLAN
SCALE 1:1250



PROFILE
SCALE Horiz.1:1250
Vert: 1:125

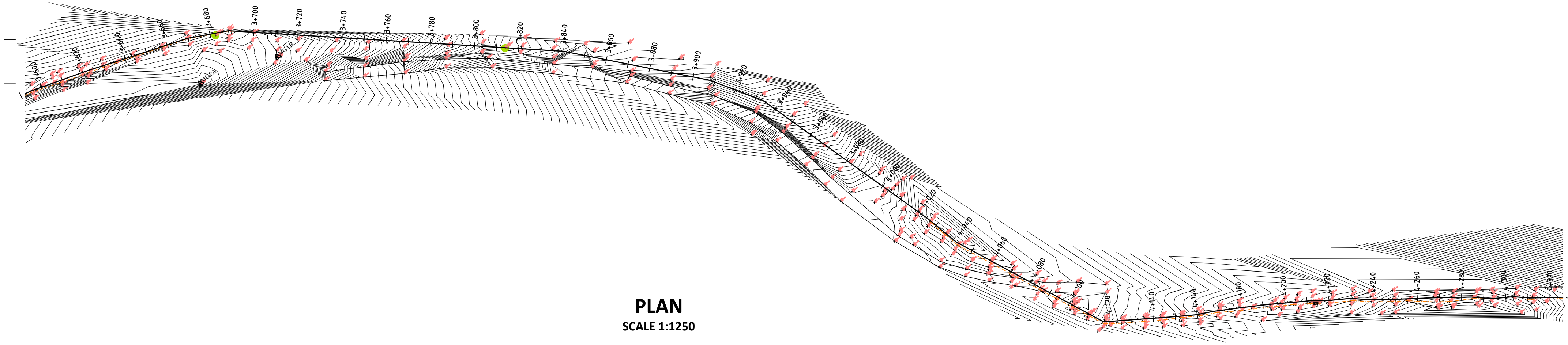
NOTES:

- 1..Chainage of pipelines start at the inlet and run in the same direction as the flow.
- 2.The profile show ground levels of all surveyed points and invert levels at points where the gradient changes.
- 3.All levels are given to two decimals of metre and the chainage to the metre only.
- 4.The profiles show static head, the hydraulic gradient in percent, pipe material size and class.
- 5.The plans show enough features of the terrain to make it possible to find the surveyed line at the time of the construction.
6. A general Layout Plan covering the whole supply system is be provided in schematic format as drawing indexed MUSWAS-2020-002 Showing pipe dimensions and reservoir capacities.

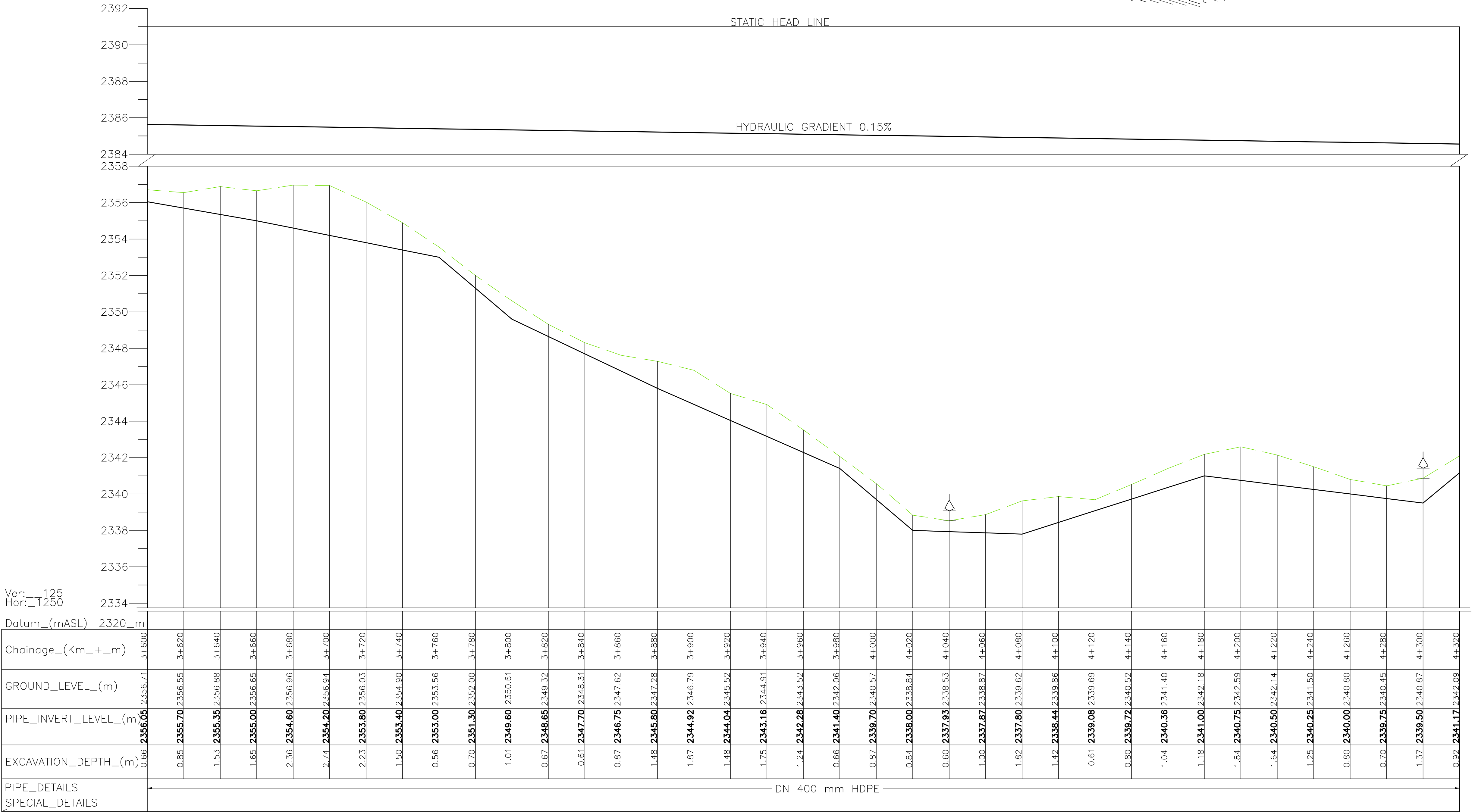
LEGEND:

- 1.All dimensions are in metres
 - 2.the actual setting out to be confirmed on site by the engineer
- EXISTING WATER PIPELINE
 - EXISTING GROUND LEVEL
 - PROPOSED WATER PIPELINE
 - MURRAM ROAD
 - AIR VALVE
 - WASH OUT
 - FH FIRE HYDRANT

Revised		Comments		Emitted	Project Manager	KANDARA WATER SUPPLY PROJECT		FINAL DESIGN REVIEW	
Drawn	Date			ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 452-300100, Africa Re Center, Harare Road Nairobi Kenya Tel: 254 20 2727433 email: a@ard.co.ke				Date: JULY 2023	
								Drawn: MUSWAS/RWP/005	
						Mariira DN 400 mm GRAVITY RAW WATER PIPELINE PLAN AND PROFILE		Scale: Plan, Horiz. 1:1250, Ver. 1:125	Sheet Size: A1
								Sheet No: 5 of 7	
								Index No: MUSWAS/2020/006	



PLAN
SCALE 1:1250



PROFILE
SCALE Horiz.1:1250
Vert: 1:125

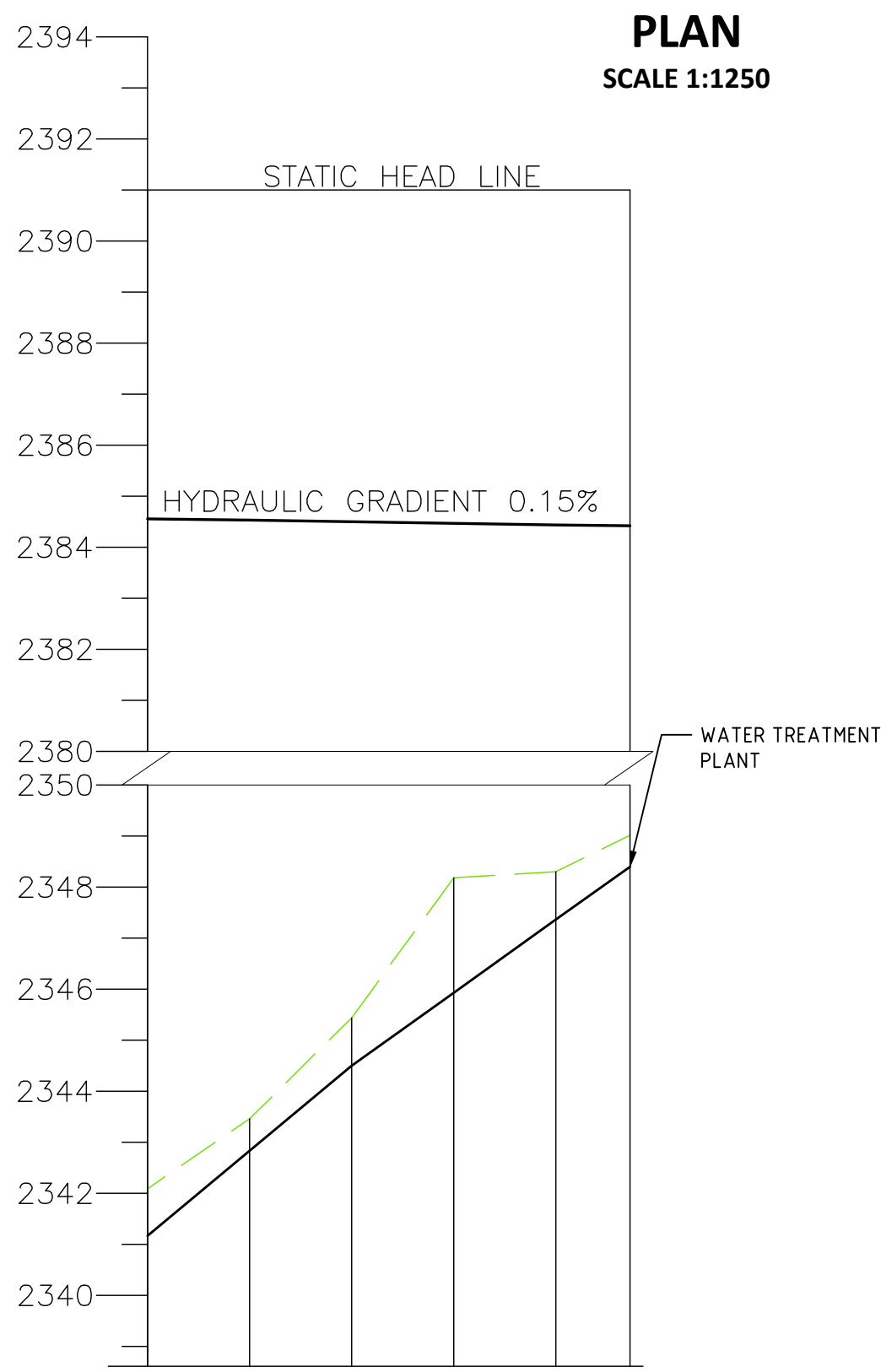
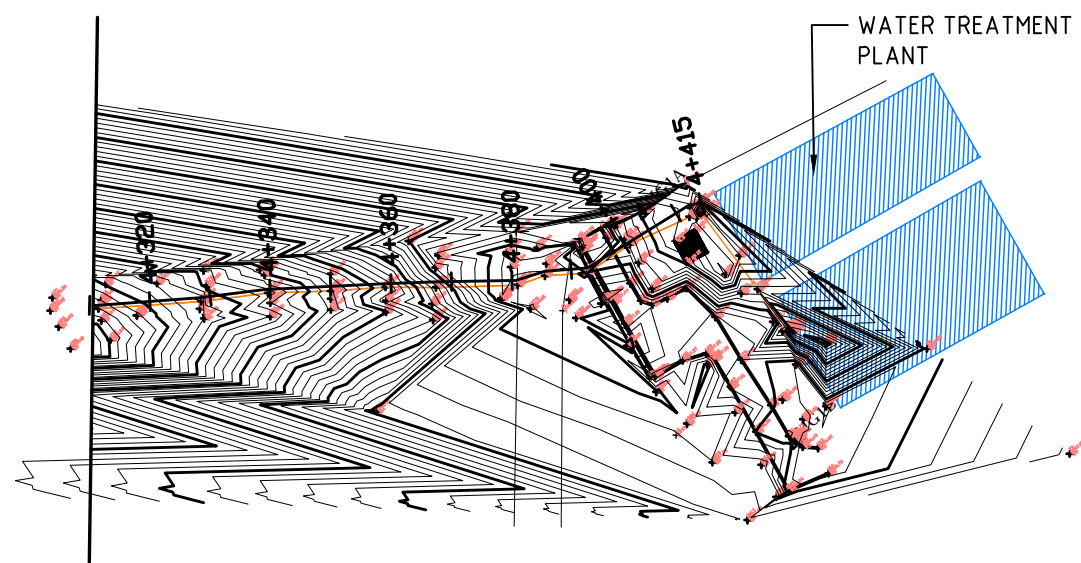
NOTES:

- Plan and profile are on the same sheet and to the same horizontal scale.
- Chainage of pipelines start at the inlet and run in the same direction as the flow.
 - The profile show ground levels of all surveyed points and invert levels at points where the gradient changes.
 - All levels are given to two decimals of metre and the chainage to the metre only.
 - The profiles show static head, the hydraulic gradient in percent, pipe material size and class.
 - The plans show enough features of the terrain to make it possible to find the surveyed line at the time of the construction.
 - A general Layout Plan covering the whole supply system is provided in schematic format as drawing indexed MUSWAS-2020-002 Showing pipe dimensions and reservoir capacities.

LEGEND:

- 1.All dimensions are in metres
- 2.the actual setting out to be confirmed on site by the engineer
- EXISTING WATER PIPELINE
 - EXISTING GROUND LEVEL
 - PROPOSED WATER PIPELINE
 - MURRAM ROAD
 - AIR VALVE
 - WASH OUT
 - FIRE HYDRANT

Revised		Comments		Emitted	Project Manager	Project		Status	
Drawn	Date			ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 452-300100, Athi River Center, Highway Road Nairobi Kenya Tel: 254 20 2727433 email: awd@athiriver.co.ke		KANDARA WATER SUPPLY PROJECT		FINAL DESIGN REVIEW	
								JULY 2023	
								MUSWAS:RWP:006	
						Mariira		Scale: Plan: 1:1250, Ver: 125	
						DN 400 mm GRAVITY RAW WATER PIPELINE		Sheet Size: A1	
						PLAN AND PROFILE		Scale: N: 6:1	
								Index N: MUSWAS:2020:007	



Ver: 125
Hor: 1250

Datum_(mASL)	2320_m					
Chainage_(Km+_m)	4+320	4+340	4+360	4+380	4+400	4+415
GROUND_LEVEL_(m)	2342.09	2343.46	2345.44	2348.18	2348.30	2349.02
PIPE_INVERT_LEVEL_(m)	2341.17	2342.83	2344.50	2345.93	2347.36	2348.40
EXCAVATION_DEPTH_(m)	0.92	0.63	0.94	2.25	0.94	0.62
PIPE_DETAILS	DN 400 mm HDPE					
SPECIAL_DETAILS						

PROFILE

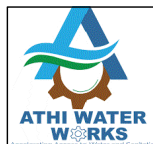
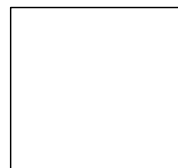
SCALE Horiz:1:1250
Vert: 1:125

NOTES:

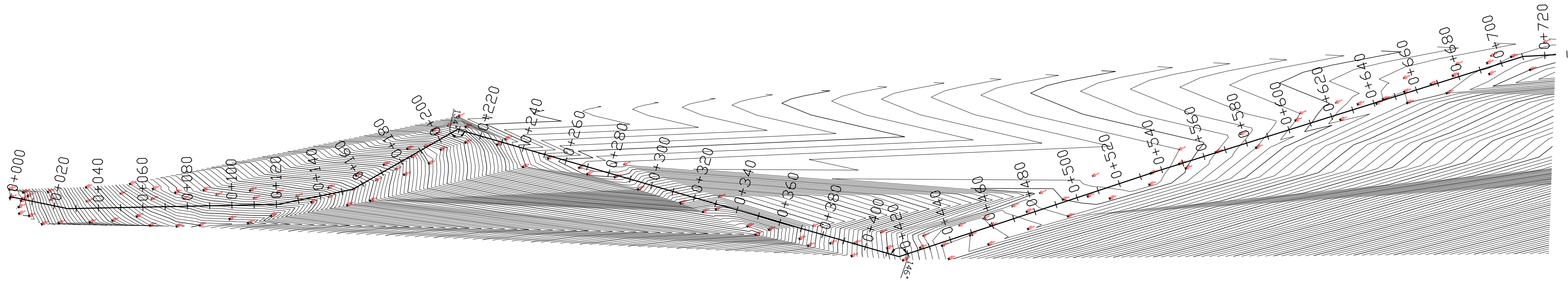
- Plan and profile are on the same sheet and to the same horizontal scale.
- Chainage of pipelines start at the inlet and run in the same direction as the flow.
 - The profile show ground levels of all surveyed points and invert levels at points where the gradient changes.
 - All levels are given to two decimals of metre and the chainage to the metre only.
 - The profiles show static head, the hydraulic gradient in percent, pipe material size and class.
 - The plans show enough features of the terrain to make it possible to find the surveyed line at the time of the construction.
 - A general Layout Plan covering the whole supply system is be provided in schematic format as drawing indexed MUSWAS-2020-002 Showing pipe dimensions and reservoir capacities.

LEGEND:

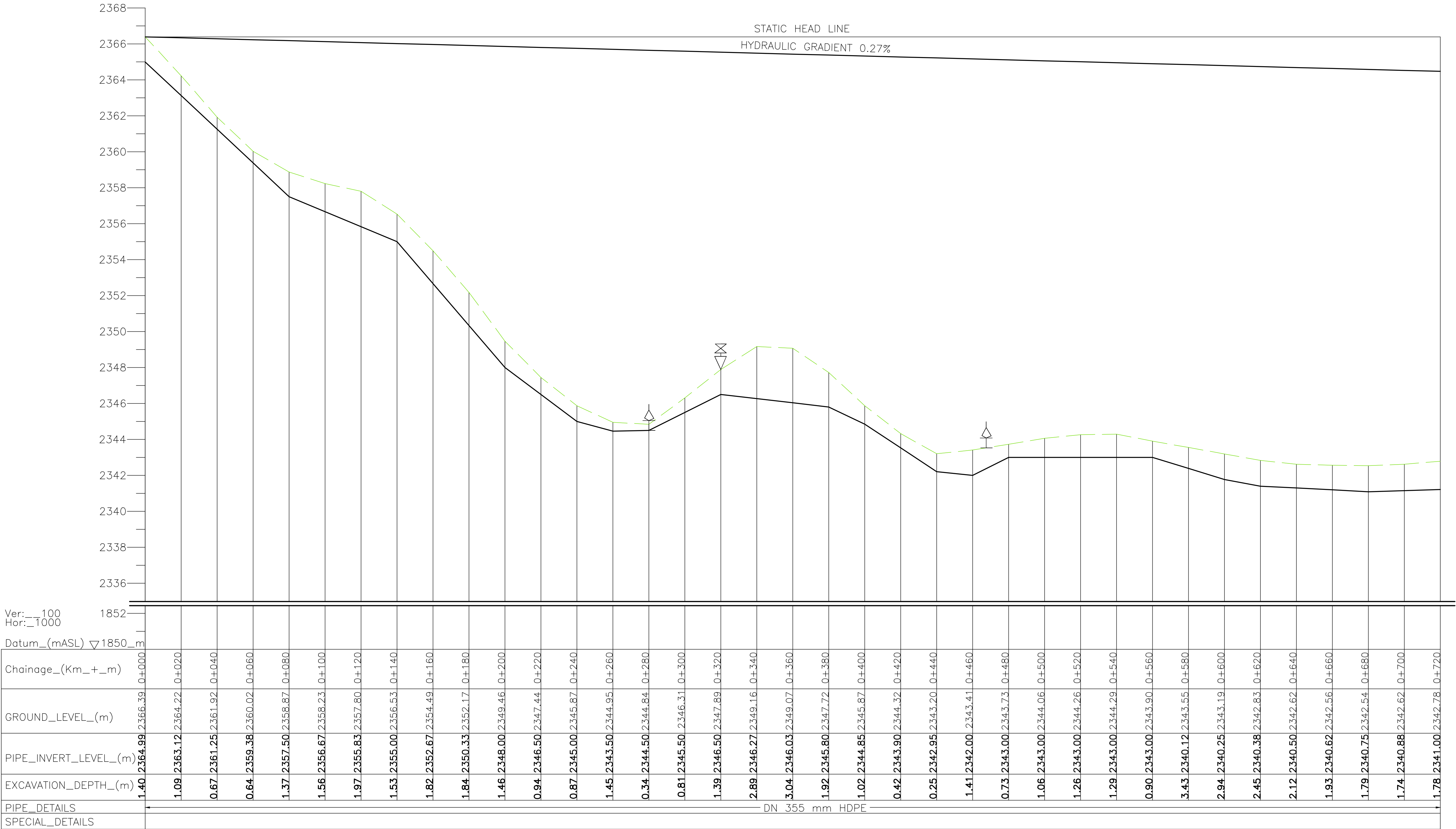
- All dimensions are in metres
 - the actual setting out to be confirmed on site by the engineer
- EXISTING WATER PIPELINE
- EXISTING GROUND LEVEL
- PROPOSED WATER PIPELINE
- MURRAM ROAD
- AIR VALVE
- WASH OUT
- FH FIRE HYDRANT

Revised		Comments		Engineer	Project Manager	Design	Project	KANDARA WATER SUPPLY PROJECT		Date	FINAL DESIGN REVIEW	
Design	Date			 ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 452 300100, Athi Re Center, Highway Road Nairobi Kenya Tel: 254 20 272743 email: athi@ard.co.ke				Drawing	KANDARA WATER SUPPLY PROJECT	Date	JULY 2023	
						Drawing				MUSWAS:RWP:007		
						Created	Scale			Pa: 1:1250, Ver1:125	Sheet Size	
						Approved	Sheet No			7	A1	
						MARIIRA DN 400 mm GRAVITY RAW WATER PIPELINE PLAN AND PROFILE						
								Index No	MUSWAS:2020:00			

2.2. GRAVITY MAIN WATER PIPELINE



PLAN
SCALE 1:1250




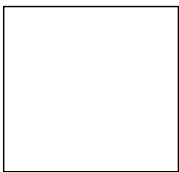
PROFILE
SCALE Horiz.1:1250
Vert: 1:125

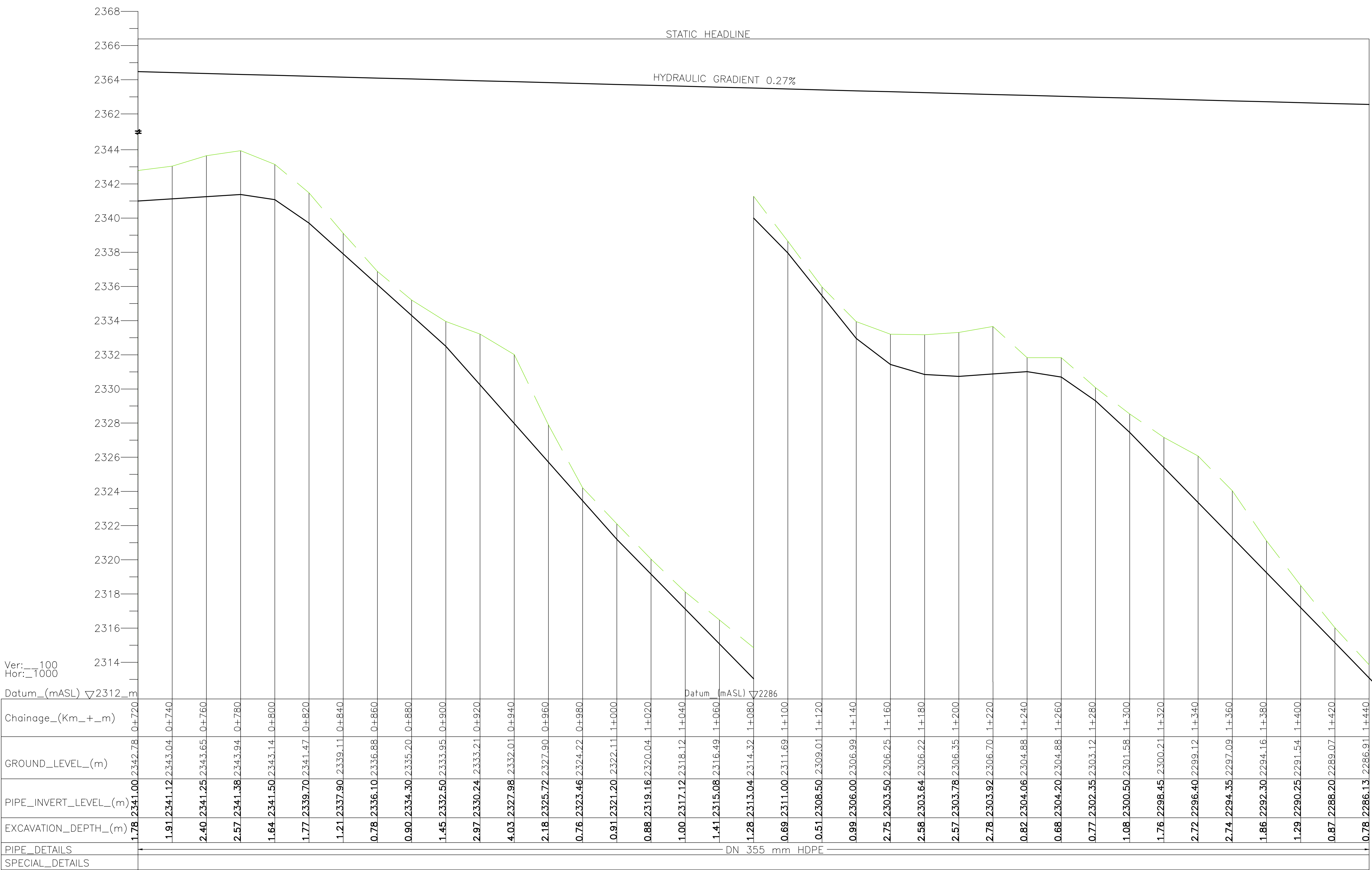
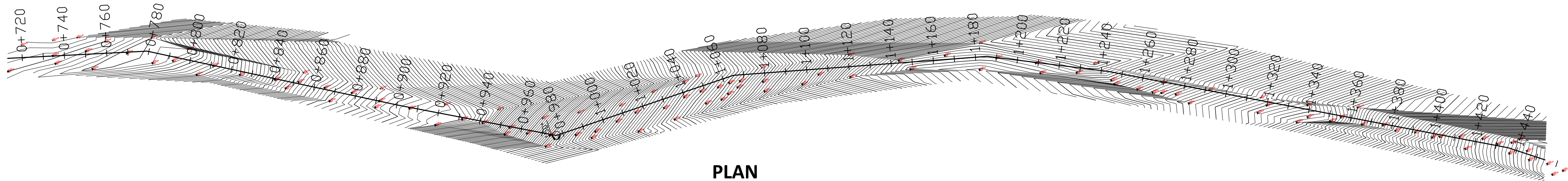
NOTES:

- 1..Chainage of pipelines start at the inlet and run in the same direction as the flow.
- 2.The profile show ground levels of all surveyed points and invert levels at points where the gradient changes.
- 3.All levels are given to two decimals of metre and the chainage to the metre only.
- 4.The profiles show static head, the hydraulic gradient in percent, pipe material size and class.
- 5.The plans show enough features of the terrain to make it possible to find the surveyed line at the time of the construction.
6. A general Layout Plan covering the whole supply system is be provided in schematic format as drawing indexed MUSWAS-2020-002 Showing pipe dimensions and reservoir capacities.

LEGEND:

- 1.All dimensions are in metres
 - 2.the actual setting out to be confirmed on site by the engineer
- EXISTING WATER PIPELINE
 - EXISTING GROUND LEVEL
 - PROPOSED WATER PIPELINE
 - MURRAM ROAD
 - AIR VALVE
 - WASH OUT
 - FH FIRE HYDRANT

Revised		Contract		Employer		Project Manager		Project		Stage	
Drawn	Date	And		 ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 452-300100, Africa Re Center, Harare Road Nairobi Kenya Tel: 254 20 272743 email: a@ard.co.ke				KANDARA WATER SUPPLY PROJECT		FINAL DESIGN REVIEW	
										Date: JULY 2023	
										Drawing No: MUSWAS/GMP/001	
										Scale: Plan, Horiz. 1:1250, Ver 1:125	Sheet Size
										Sheet No: 1 of 26	A1
								Mariira DN 355mm GRAVITY MAIN WATER PIPELINE PLAN AND PROFILE		Index No: MUSWAS/2020/009	





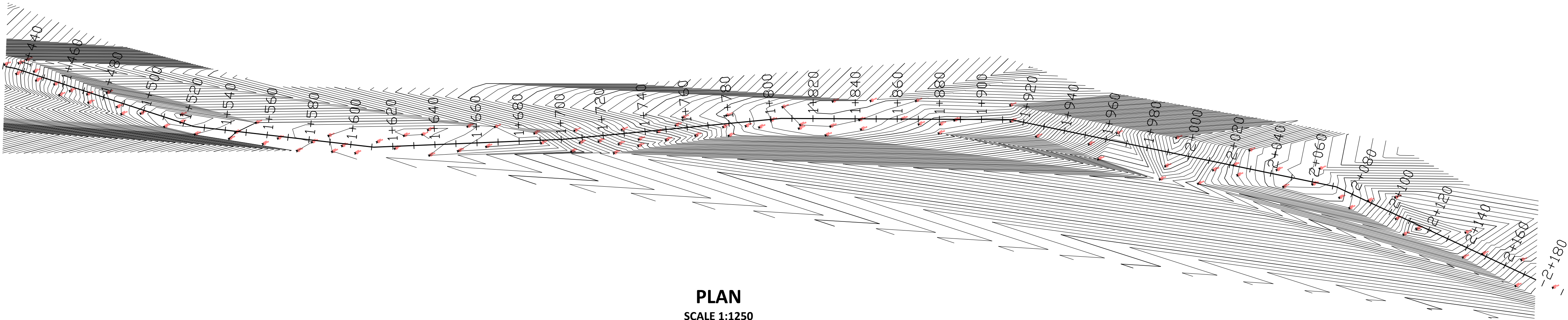
NOTES:

- Plan and profile are on the same sheet and to the same horizontal scale.
- Chainage of pipelines start at the inlet and run in the same direction as the flow.
 - The profile show ground levels of all surveyed points and invert levels at points where the gradient changes.
 - All levels are given to two decimals of metre and the chainage to the metre only.
 - The profiles show static head, the hydraulic gradient in percent, pipe material size and class.
 - The plans show enough features of the terrain to make it possible to find the surveyed line at the time of the construction.
 - A general Layout Plan covering the whole supply system is be provided in schematic format as drawing indexed MUSWAS-2020-002 Showing pipe dimensions and reservoir capacities.

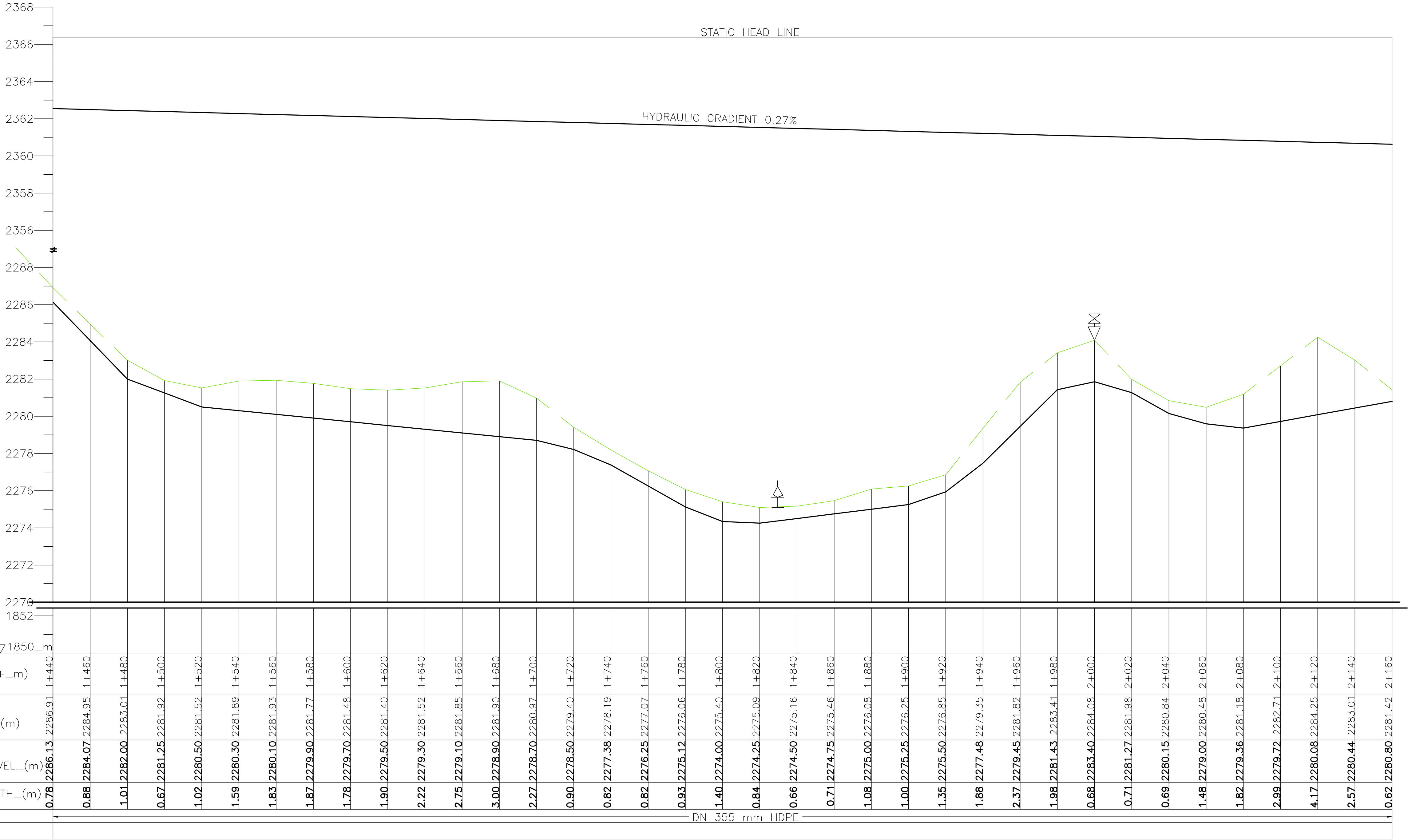
LEGEND:

- 1.All dimensions are in metres
- 2.the actual setting out to be confirmed on site by the engineer
- EXISTING WATER PIPELINE
 - EXISTING GROUND LEVEL
 - PROPOSED WATER PIPELINE
 - MURRAM ROAD
 - AIR VALVE
 - WASH OUT
 - FIRE HYDRANT

Revised		Comments		Engineer	Project Manager	KANDARA WATER SUPPLY PROJECT		State FINAL DESIGN REVIEW				
Drawn	Date			 ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 452300100, Africa Re Center, Harare Road Nairobi Kenya Tel: 254 20 272743 email: awk@ard.co.ke		Designed	MARIIRA DN 355mm GRAVITY MAIN WATER PIPELINE PLAN AND PROFILE		Date JULY 2023			
						Drawn			MUSWAS:GMP:002			
						Checked			Scale Plan: H: 1:1250, Ver: 1:125	Sheet Size A1		
						Approved			Sheet No 2 of 26			
									Index No MUSWAS:2020:010			



PLAN
SCALE 1:1250



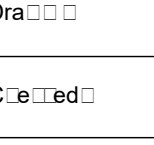

PROFILE
SCALE Horiz.1:1250
Vert: 1:125

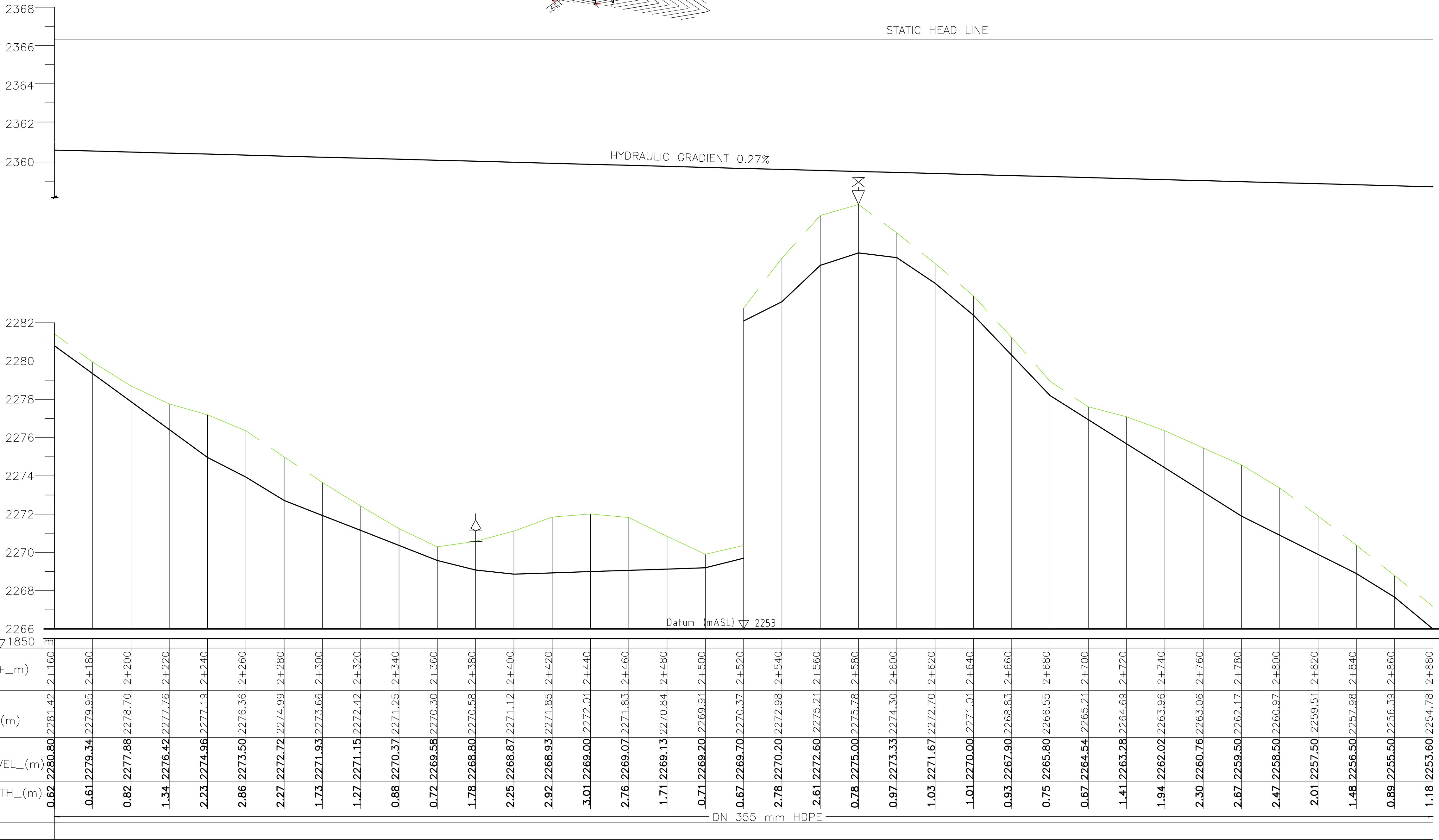
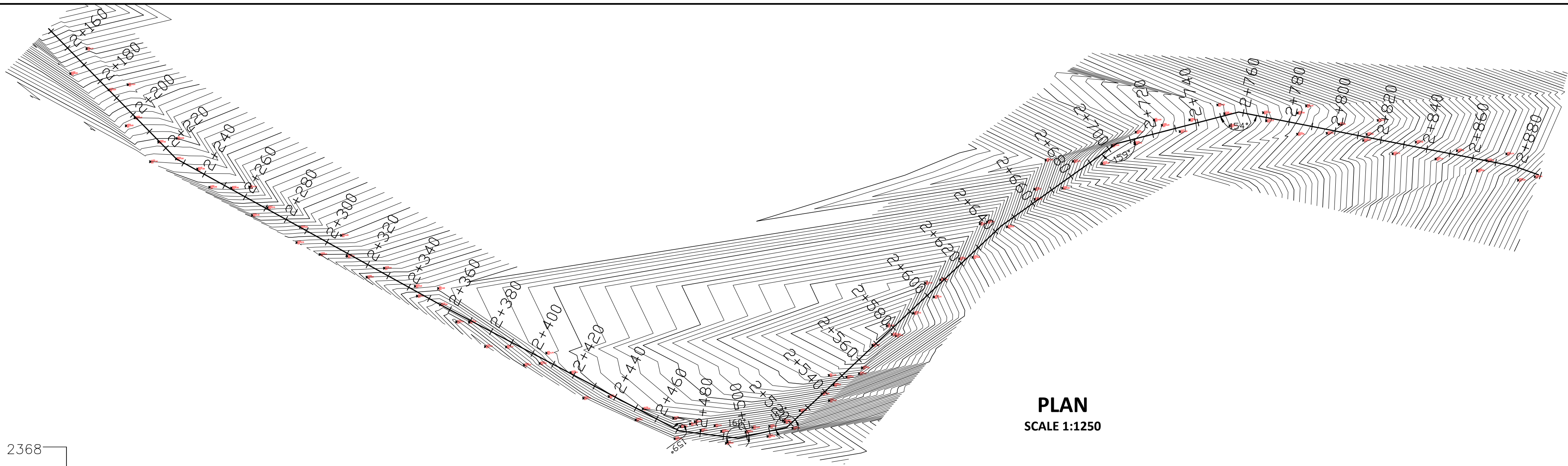
NOTES:

- 1..Chainage of pipelines start at the inlet and run in the same direction as the flow.
- 2.The profile show ground levels of all surveyed points and invert levels at points where the gradient changes.
- 3.All levels are given to two decimals of metre and the chainage to the metre only.
- 4.The profiles show static head, the hydraulic gradient in percent, pipe material size and class.
- 5.The plans show enough features of the terrain to make it possible to find the surveyed line at the time of the construction.
6. A general Layout Plan covering the whole supply system is be provided in schematic format as drawing indexed MUSWAS-2020-002 Showing pipe dimensions and reservoir capacities.

LEGEND:

- 1.All dimensions are in metres
 - 2.the actual setting out to be confirmed on site by the engineer
- EXISTING WATER PIPELINE
 - EXISTING GROUND LEVEL
 - PROPOSED WATER PIPELINE
 - MURRAM ROAD
 - AIR VALVE
 - WASH OUT
 - FIRE HYDRANT

Revised		Checked		Emitted		Project Manager		KANDARA WATER SUPPLY PROJECT		Scale		FINAL DESIGN REVIEW			
Design	Date									Date	JULY 2023				
.	.	.	.					Drawing Title		Drawing No.		MUSWAS:GMP:003			
.	.	.	.							Scale		Plan, Horiz. 1:1250, Vert 1:25		Sheet Size	
.	.	.	.							Sheet No.		3 of 26		A1	
.	.	.	.							Index No.		MUSWAS:2020:011			
.	.	.	.												
								MARIIRA DN 355mm GRAVITY MAIN WATER PIPELINE PLAN AND PROFILE							

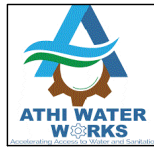



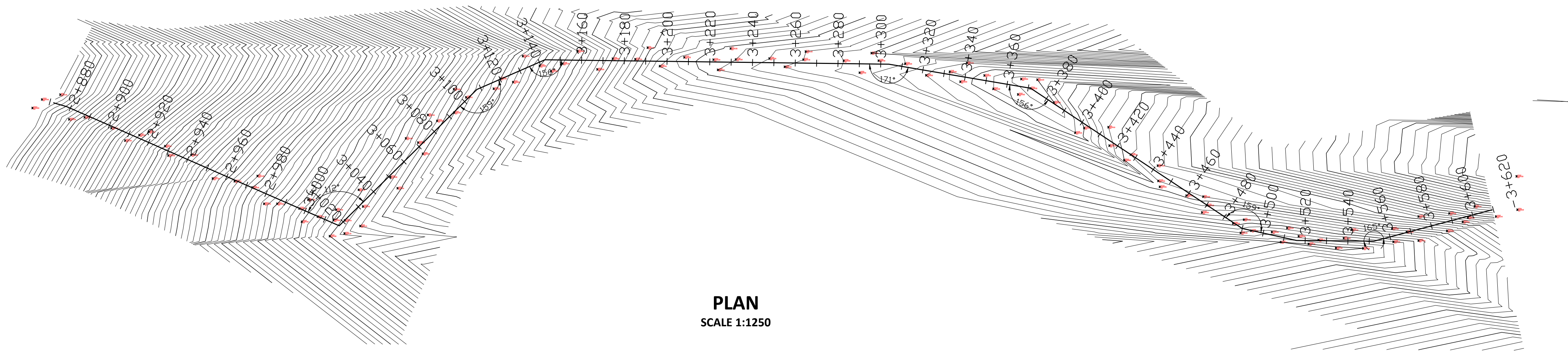
NOTES:

- Plan and profile are on the same sheet and to the same horizontal scale.
- Chainage of pipelines start at the inlet and run in the same direction as the flow.
 - The profile show ground levels of all surveyed points and invert levels at points where the gradient changes.
 - All levels are given to two decimals of metre and the chainage to the metre only.
 - The profiles show static head, the hydraulic gradient in percent, pipe material size and class.
 - The plans show enough features of the terrain to make it possible to find the surveyed line at the time of the construction.
 - A general Layout Plan covering the whole supply system is be provided in schematic format as drawing indexed MUSWAS-2020-002 Showing pipe dimensions and reservoir capacities.

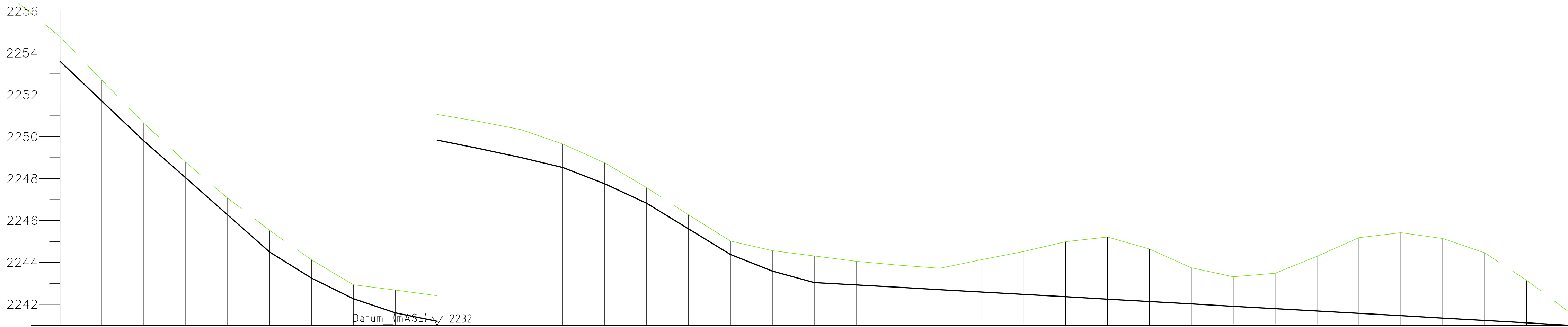
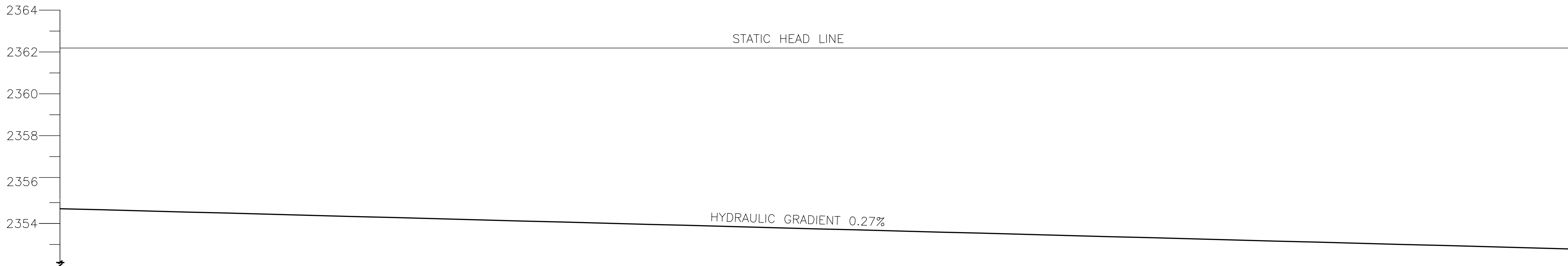
LEGEND:

- 1.All dimensions are in metres
- 2.the actual setting out to be confirmed on site by the engineer
- EXISTING WATER PIPELINE
 - EXISTING GROUND LEVEL
 - PROPOSED WATER PIPELINE
 - MURRAM ROAD
 - AIR VALVE
 - WASH OUT
 - FIRE HYDRANT

Revised		Contract		Employer	Project Manager	KANDARA WATER SUPPLY PROJECT		FINAL DESIGN REVIEW				
Design	Date			 <div>ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 452-300100, Athi River Center, Highway Road Nairobi Kenya Tel: 254 20 2727433 email: a@athiwat.co.ke</div>		Design	KANDARA WATER SUPPLY PROJECT		Date	JULY 2023		
						Drawing	MUSWAS-GMP-004	Drawing No	MUSWAS-GMP-004			
						Checked		Scale	Plan: 1:1250, Ver: 1:125			
						Approved		Sheet No	4 of 26			
							MARIIRA DN 355mm GRAVITY MAIN WATER PIPELINE PLAN AND PROFILE		Index No	MUSWAS:2020:012		



PLAN
SCALE 1:1250



Ver: 100
Hor: T000

Datum (mASL) 1850.0

Chainage_(Km+_m)	2+880																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						</
------------------	-------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	----

PROFILE

SCALE Horiz: 1:1250
Vert: 1:125

NOTES:

Plan and profile are on the same sheet and to the same horizontal scale.

1..Chainage of pipelines start at the inlet and run in the same direction as the flow.

2.The profile show ground levels of all surveyed points and invert levels at points where the gradient changes.

3.All levels are given to two decimals of metre and the chainage to the metre only.

4.The profiles show static head, the hydraulic gradient in percent, pipe material size and class.

5.The plans show enough features of the terrain to make it possible to find the surveyed line at the time of the construction.

6. A general Layout Plan covering the whole supply system is be provided in schematic format as drawing indexed MUSWAS-2020-002 Showing pipe dimensions and reservoir capacities.

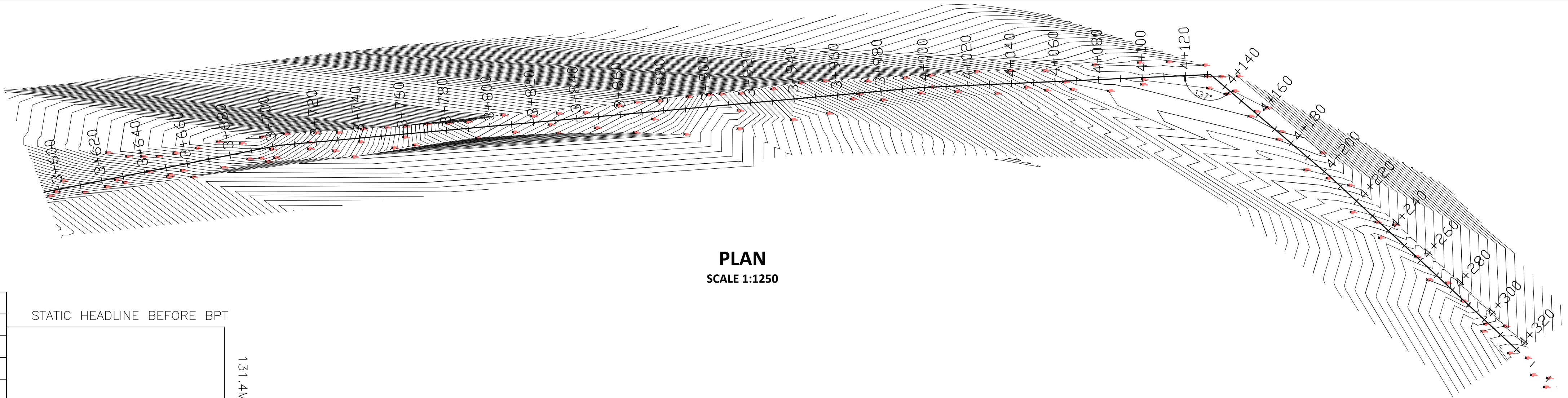
LEGEND:

1.All dimensions are in metres

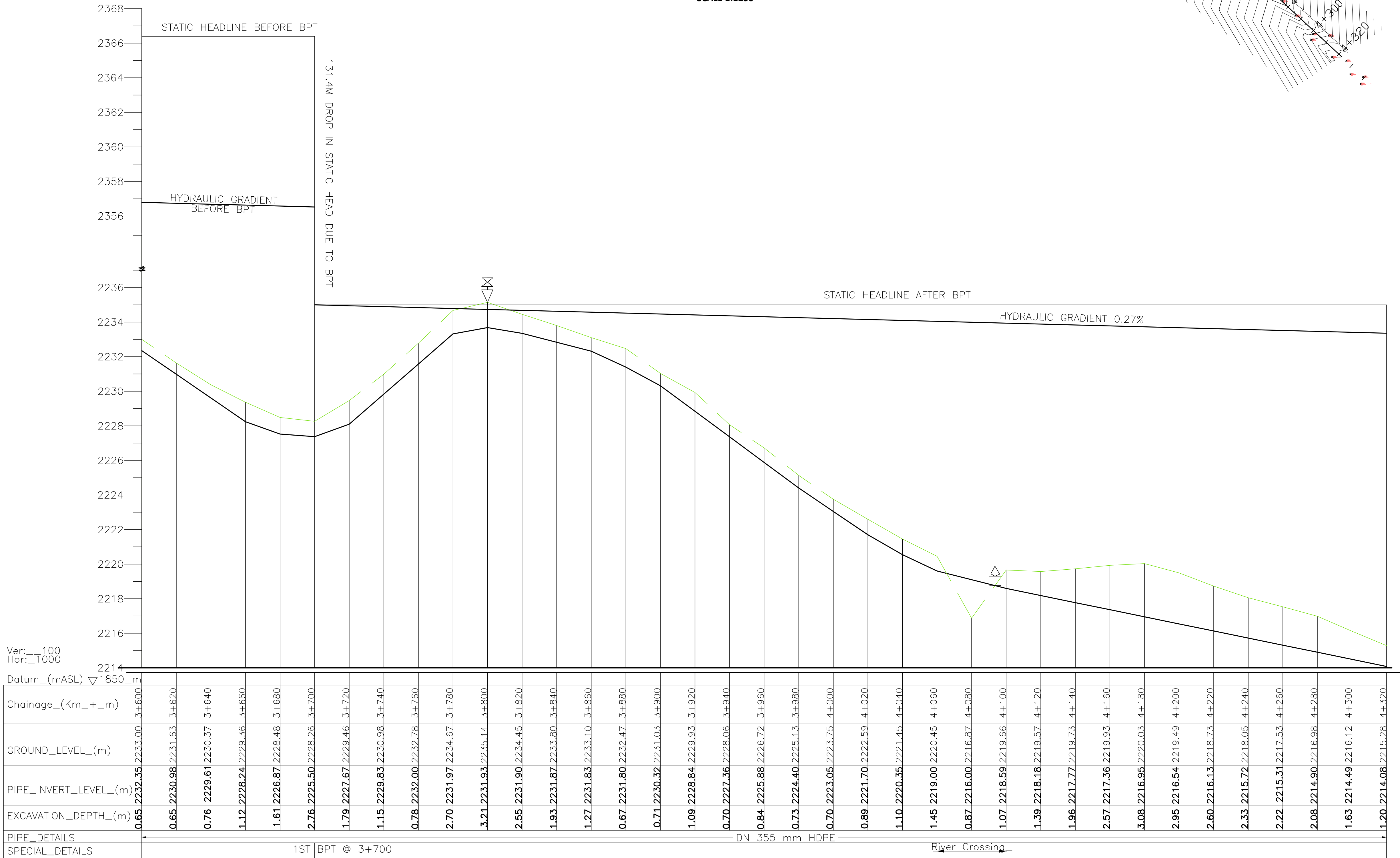
2.the actual setting out to be confirmed on site by the engineer

---	EXISTING WATER PIPELINE
---	EXISTING GROUND LEVEL
---	PROPOSED WATER PIPELINE
---	MURRAM ROAD
⋈	AIR VALVE
⋈	WASH OUT
FH	FIRE HYDRANT

Revisi		Comments		Emitted	Project Manager	Designed	KANDARA WATER SUPPLY PROJECT	Status		FINAL DESIGN REVIEW	
Drawn	Date					Drawn		Mariira DN 355mm GRAVITY MAIN WATER PIPELINE PLAN AND PROFILE	Date	JULY 2023	
									Drawn No	MUSWAS-GMP-005 <th rowspan="3">A1</th>	A1
									Scale	Plan: H: 1:1250, Ver: 1:125	
									Sheet No	5 of 26	
							Index No	MUSWAS-2020-013			



PLAN
SCALE 1:1250



PROFILE
SCALE Horiz.1:1250
Vert: 1:125

NOTES:

- 1..Chainage of pipelines start at the inlet and run in the same direction as the flow.
- 2.The profile show ground levels of all surveyed points and invert levels at points where the gradient changes.
- 3.All levels are given to two decimals of metre and the chainage to the metre only.
- 4.The profiles show static head, the hydraulic gradient in percent, pipe material size and class.
- 5.The plans show enough features of the terrain to make it possible to find the surveyed line at the time of the construction.
6. A general Layout Plan covering the whole supply system is provided in schematic format as drawing indexed MUSWAS-2020-002 Showing pipe dimensions and reservoir capacities.

LEGEND:

- 1.All dimensions are in metres
 - 2.the actual setting out to be confirmed on site by the engineer
- EXISTING WATER PIPELINE
 - EXISTING GROUND LEVEL
 - PROPOSED WATER PIPELINE
 - MURRAM ROAD
 - AIR VALVE
 - WASH OUT
 - FIRE HYDRANT

Revised		Comments		Emitted	Project Manager	Designed	Project KANDARA WATER SUPPLY PROJECT		Stage FINAL DESIGN REVIEW	
Design	Date					Drawing			Date	JULY 2023
.	.								Drawing No	MUSWAS-GMP-006
.	.					Created	Drawing Title		Scale	Plan, Horiz. 1:1250, Ver 1:125
.	.					Approved			Sheet No	6 of 26
.	.								Index No	MUSWAS:2020:014
.	.								A1	

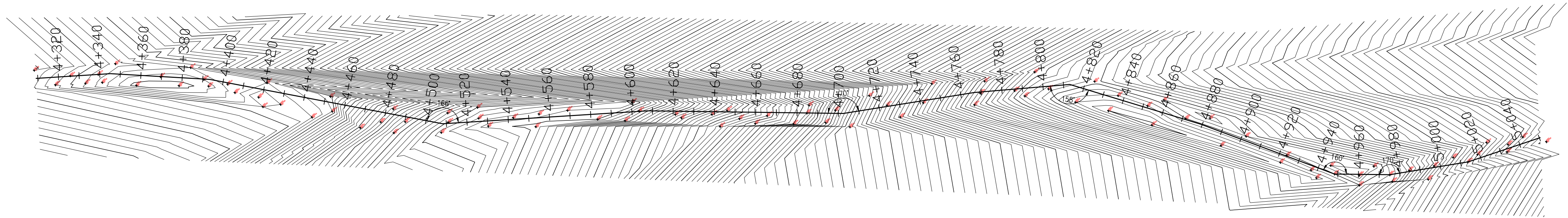
ATHI WATER WORKS

ATHI WATER WORKS

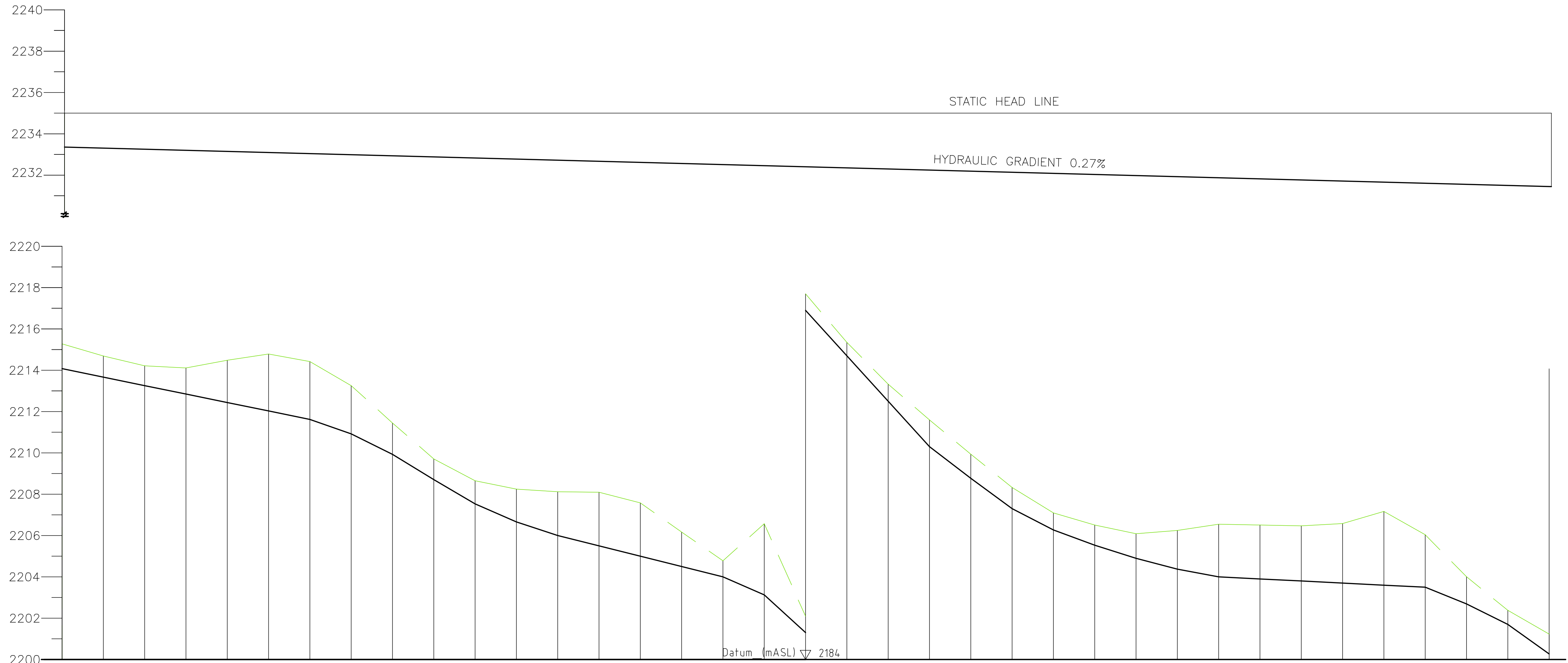
ATHI WATER WORKS
DEVELOPMENT AGENCY
P.O Box 452-300100,
Athi River Center, Homa Bay Road
Nairobi Kenya
Tel: 254 20 272743
email: a@athiwat.co.ke

Designed
Drawing
Created
Approved

MARIIRA
DN 355mm GRAVITY MAIN WATER PIPELINE
PLAN AND PROFILE



PLAN
SCALE 1:1250



Ver: 1:100
Hor: 1:1000

Datum (mASL) 2184

Chainage_ (Km_+_m)	4+320	4+340	4+360	4+380	4+400	4+420	4+440	4+460	4+480	4+500	4+520	4+540	4+560	4+580	4+600	4+620	4+640	4+660	4+680	4+700	4+720	4+740	4+760	4+780	4+800	4+820	4+840	4+860	4+880	4+900	4+920	4+940	4+960	4+980	5+000	5+020	5+040	
GROUND_LEVEL_(m)	2215.28	2214.69	2214.22	2214.11	2214.49	2214.79	2214.42	2213.26	2211.45	2209.71	2208.65	2208.25	2208.12	2208.10	2207.58	2206.17	2204.78	2206.57	2202.10	2199.75	2197.73	2196.00	2194.34	2191.50	2190.91	2190.49	2190.65	2190.95	2190.87	2190.98	2191.57	2190.44	2188.41	2186.78	2185.63	2184.40		
PIPE_INVERT_LEVEL_(m)	2214.08	2213.67	2213.26	2212.85	2212.44	2212.03	2211.62	2211.21	2210.80	2208.90	2207.00	2206.50	2206.00	2205.50	2205.00	2204.50	2204.00	2203.50	2201.30	2199.10	2196.90	2194.70	2192.50	2190.30	2188.10	2185.90	2183.70	2181.50	2179.30	2177.10	2174.90	2172.70	2170.50	2168.30	2166.10	2163.90		
EXCAVATION_DEPTH_(m)	1.20	1.02	0.96	1.26	2.05	2.76	2.80	2.05	0.65	0.81	1.65	1.75	2.12	2.60	2.58	1.67	0.78	3.07	0.80	0.65	0.83	1.30	1.84	1.03	0.60	0.81	1.19	2.15	2.55	2.61	2.67	2.88	3.57	2.54	0.61	0.68	1.23	
PIPE_DETAILS	DN 355 mm HDPE																																					
SPECIAL_DETAILS																																						



PROFILE
SCALE Horiz:1:1250
Vert: 1:125

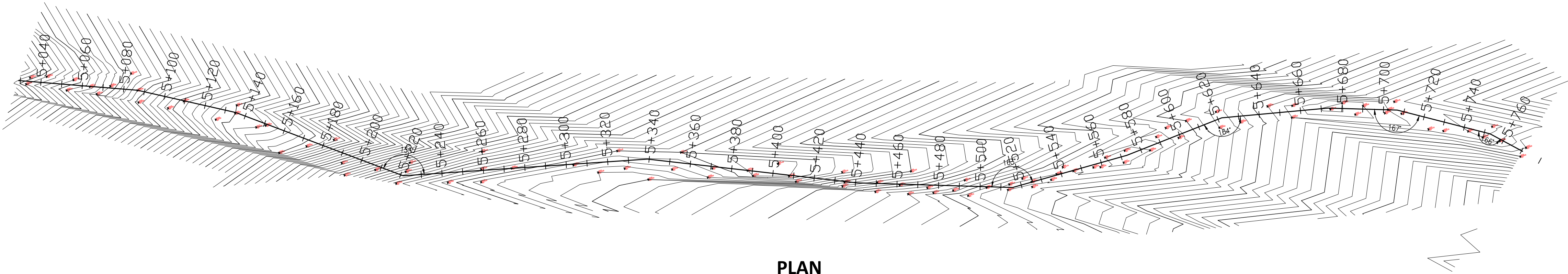
NOTES:

- Chainage of pipelines start at the inlet and run in the same direction as the flow.
- The profile show ground levels of all surveyed points and invert levels at points where the gradient changes.
- All levels are given to two decimals of metre and the chainage to the metre only.
- The profiles show static head, the hydraulic gradient in percent, pipe material size and class.
- The plans show enough features of the terrain to make it possible to find the surveyed line at the time of the construction.
- A general Layout Plan covering the whole supply system is provided in schematic format as drawing indexed MUSWAS-2020-002 Showing pipe dimensions and reservoir capacities.

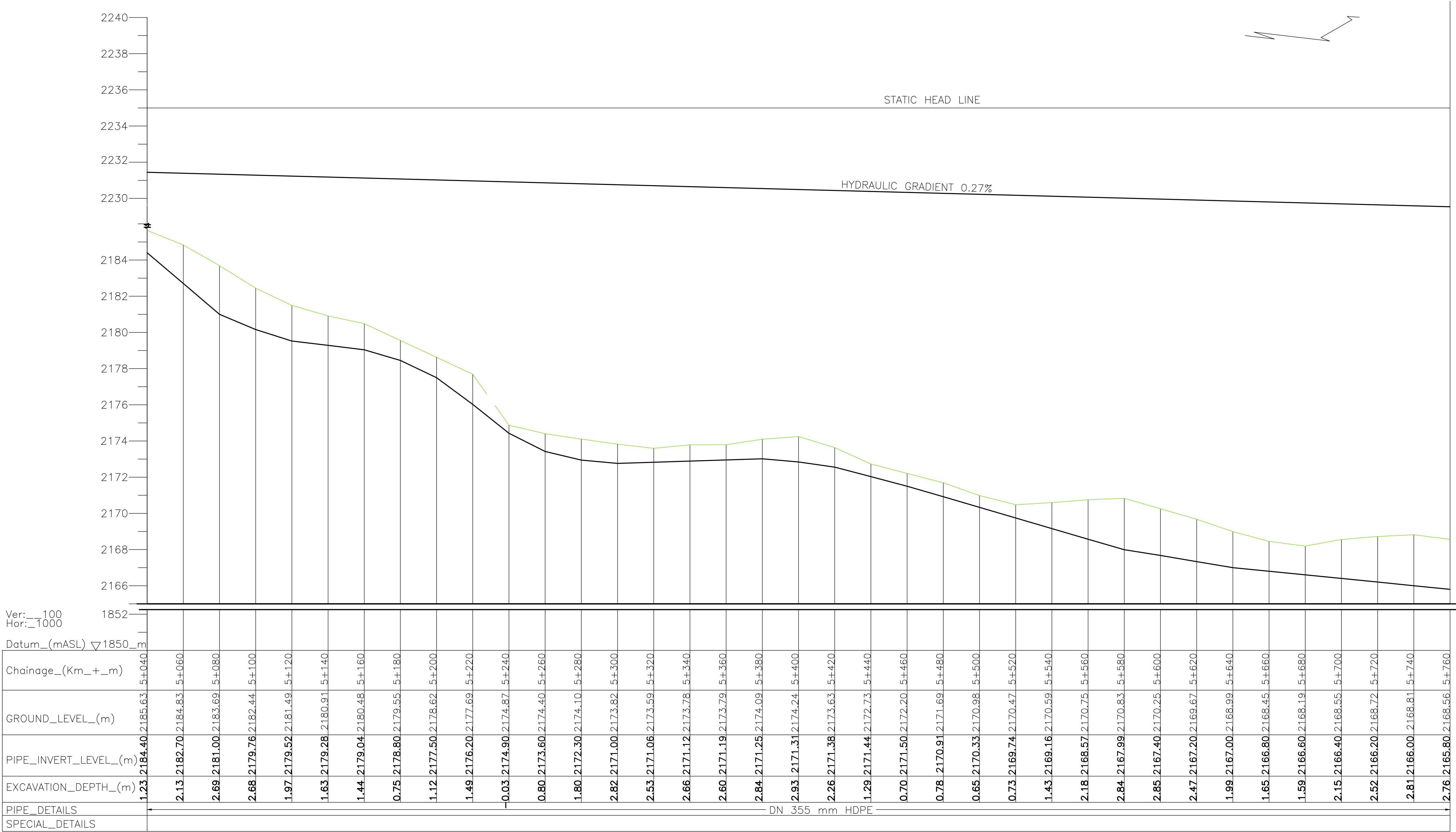
LEGEND:

- All dimensions are in metres
 - the actual setting out to be confirmed on site by the engineer
- EXISTING WATER PIPELINE
 - EXISTING GROUND LEVEL
 - PROPOSED WATER PIPELINE
 - MURRAM ROAD
 - AIR VALVE
 - WASH OUT
 - FIRE HYDRANT

Revised		Comments		Emitted	Project Manager	Project KANDARA WATER SUPPLY PROJECT	Sheet FINAL DESIGN REVIEW	
Drawn	Date						Date JULY 2023	
				 <div>ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 452/3/00100, Athira Re Center, Haritala Road Nairobi Kenya Tel: 254 20 272743 email: athiwa@ard.or.ke</div>			Drawn Name	
							Sheet Path: H:\1250, Ver1\125		Sheet Size
						Sheet No: 7 of 26		A1
				Index No: MUSWAS/2020/015				



PLAN
SCALE 1:1250



PROFILE
SCALE Horiz. 1:1250
Vert: 1:125

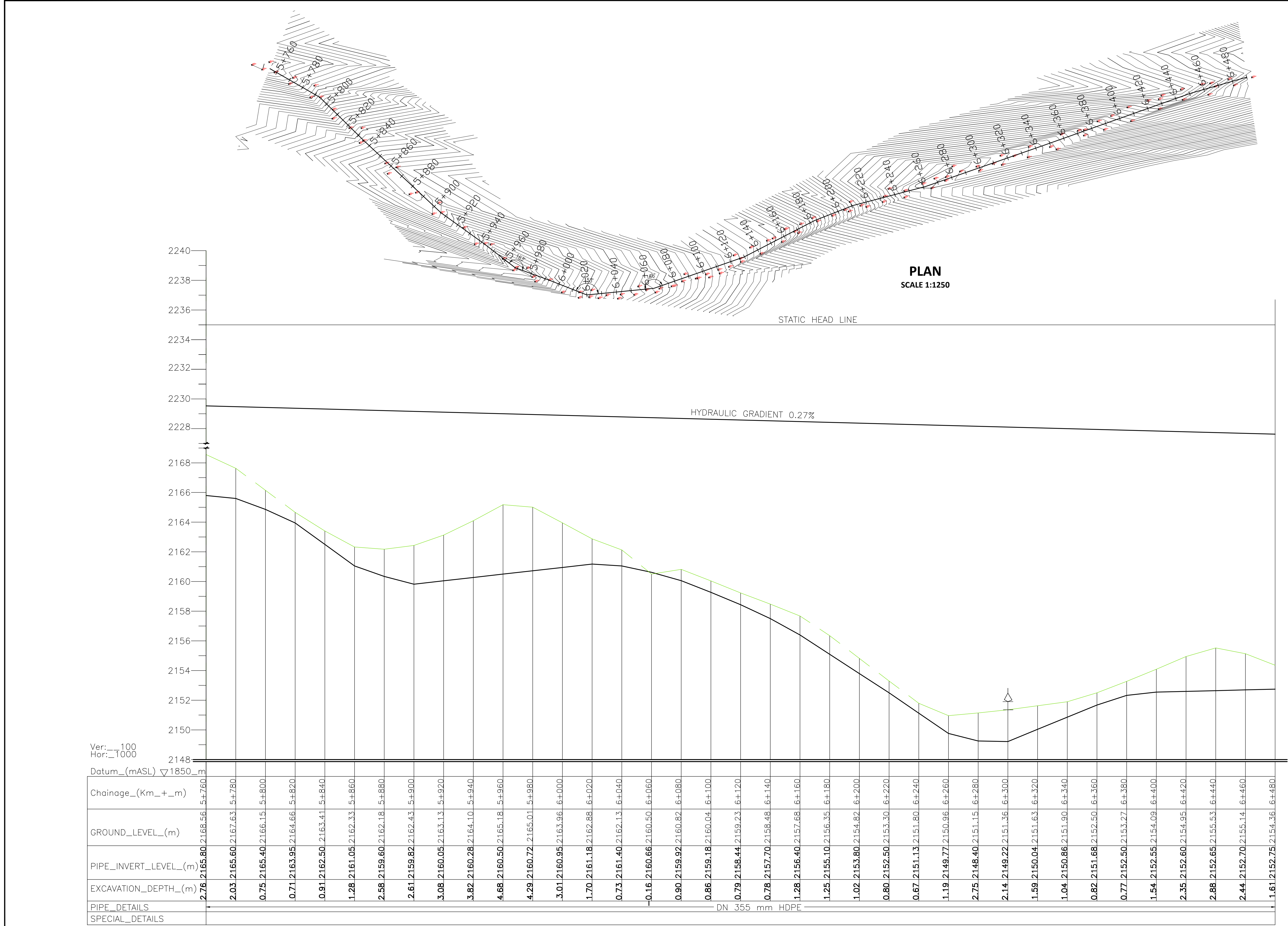
NOTES:

- 1..Chainage of pipelines start at the inlet and run in the same direction as the flow.
- 2.The profile show ground levels of all surveyed points and invert levels at points where the gradient changes.
- 3.All levels are given to two decimals of metre and the chainage to the metre only.
- 4.The profiles show static head, the hydraulic gradient in percent, pipe material size and class.
- 5.The plans show enough features of the terrain to make it possible to find the surveyed line at the time of the construction.
6. A general Layout Plan covering the whole supply system is provided in schematic format as drawing indexed MUSWAS-2020-002 Showing pipe dimensions and reservoir capacities.

LEGEND:

- 1.All dimensions are in metres
 - 2.the actual setting out to be confirmed on site by the engineer
- EXISTING WATER PIPELINE
 - EXISTING GROUND LEVEL
 - PROPOSED WATER PIPELINE
 - MURRAM ROAD
 - AIR VALVE
 - WASH OUT
 - FIRE HYDRANT

Revised		Comments		Engineer	Project Manager	KANDARA WATER SUPPLY PROJECT		Status: FINAL DESIGN REVIEW	
Drawn by	Date			ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 452 300100, Athi Re Center, Highway Road Nairobi Kenya Tel: 254 20 272743 Email: awd@athiwat.co.ke				Date: JULY 2023	
								Drawn by: MUSWAS:GMP:00	
								Scale: Plan: 1:1250, Ver: 1:125	Sheet Size: A1
								Scale: N: 1:26	
								Index No: MUSWAS:2020:016	





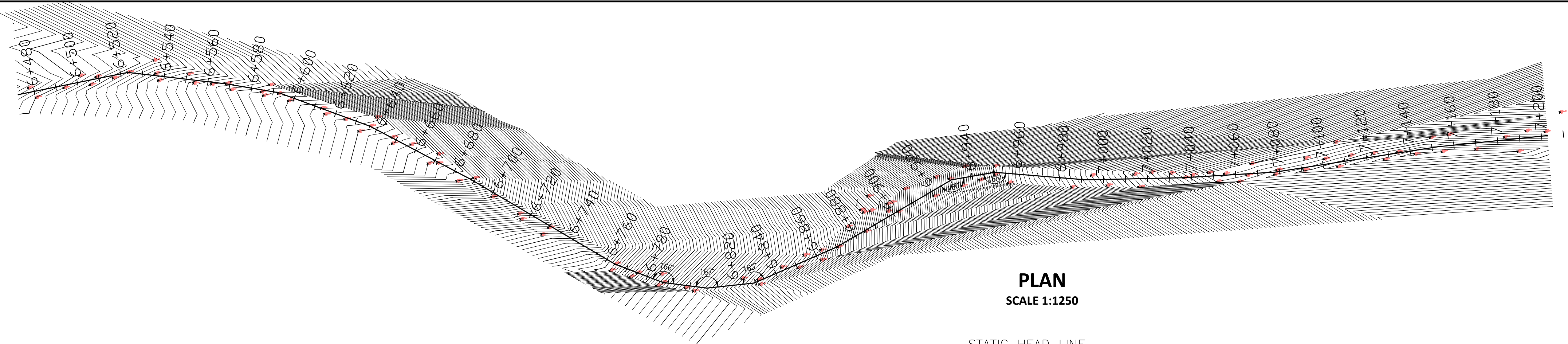
NOTES:

- Plan and profile are on the same sheet and to the same horizontal scale.
- 1..Chainage of pipelines start at the inlet and run in the same direction as the flow.
- 2.The profile show ground levels of all surveyed points and invert levels at points where the gradient changes.
- 3.All levels are given to two decimals of metre and the chainage to the metre only.
- 4.The profiles show static head, the hydraulic gradient in percent, pipe material size and class.
- 5.The plans show enough features of the terrain to make it possible to find the surveyed line at the time of the construction.
6. A general Layout Plan covering the whole supply system is be provided in schematic format as drawing indexed MUSWAS-2020-002 Showing pipe dimensions and reservoir capacities.

LEGEND:

- 1.All dimensions are in metres
- 2.the actual setting out to be confirmed on site by the engineer
- EXISTING WATER PIPELINE
- EXISTING GROUND LEVEL
- PROPOSED WATER PIPELINE
- MURRAM ROAD
- AIR VALVE
- WASH OUT
- FH FIRE HYDRANT

Revisions		Comments	Engineer  ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 452-300100, Africa Re Center, Harare Road Nairobi Kenya Tel: 254 20 272743 email: athi@ard.ac.ke	Project Manager 	Design Drawing Checked Approved	Project KANDARA WATER SUPPLY PROJECT Drawing Title MARIIRA DN 355mm GRAVITY MAIN WATER PIPELINE PLAN AND PROFILE	Sheet FINAL DESIGN REVIEW	
Design	Date						Date	JULY 2023
							Drawing No	MUSWAS:GMP:009
							Scale	Plan: 1:1250, Vertical: 1:25
							Sheet No	9 of 26
							Index No	MUSWAS:2020:017



PLAN
SCALE 1:1250





PROFILE
SCALE Horiz.1:1250
Vert: 1:125

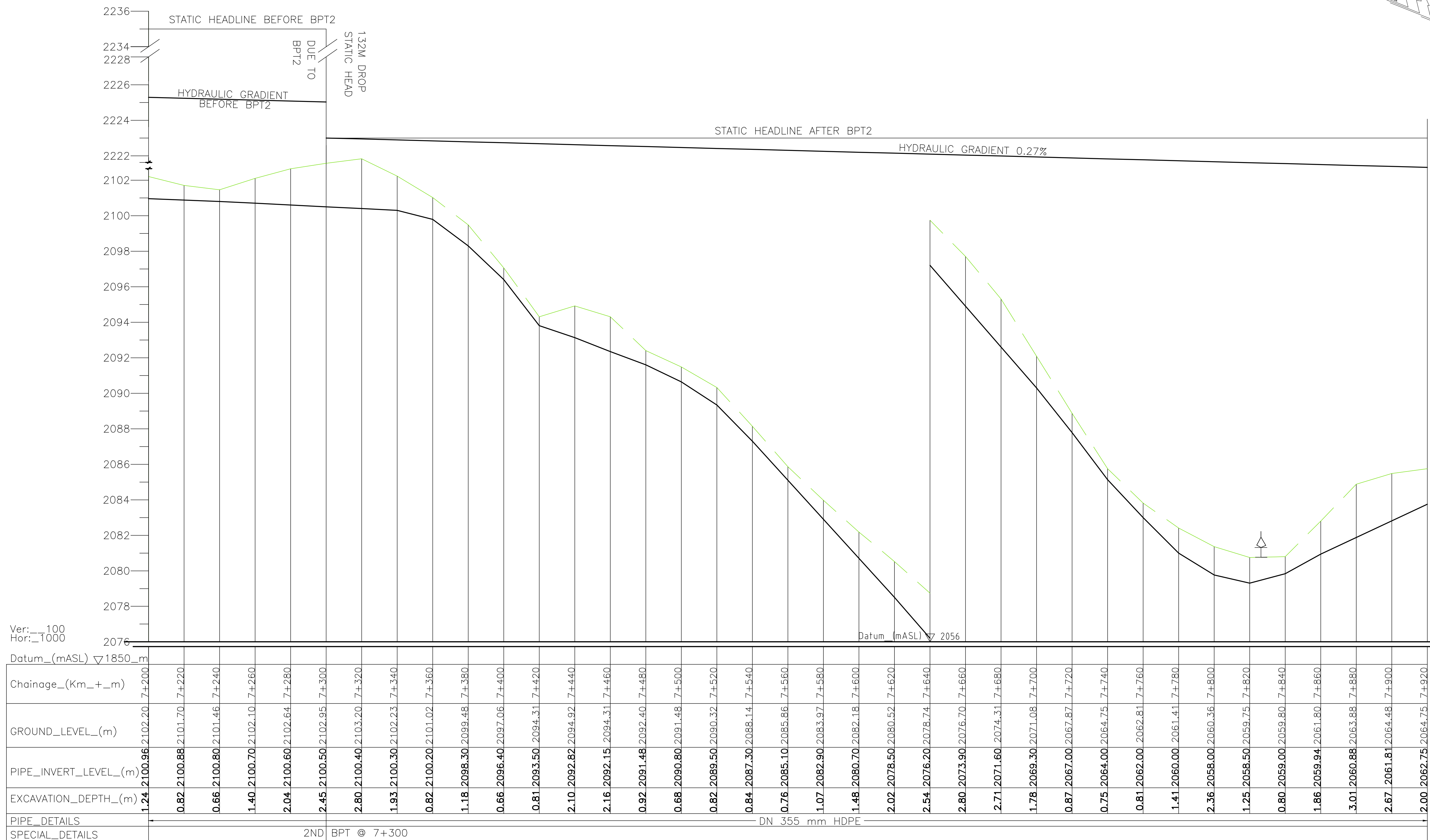
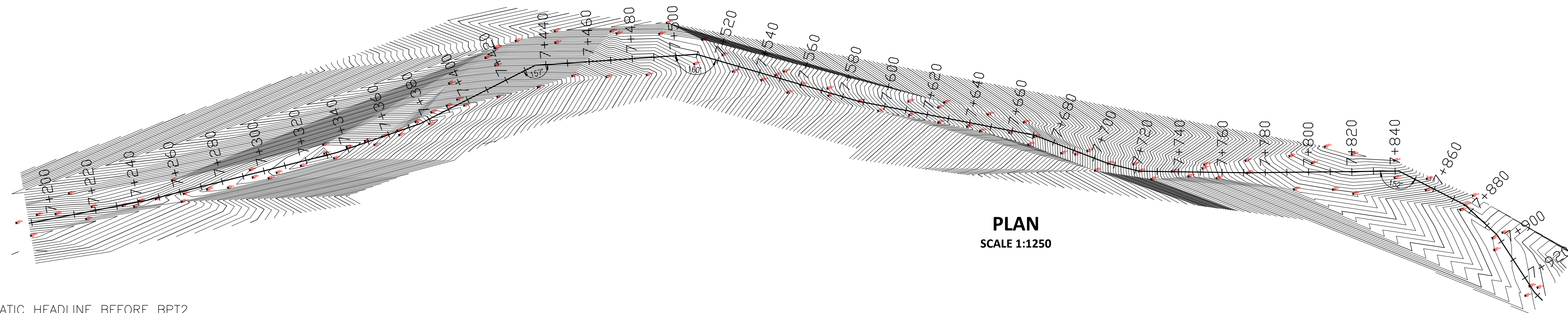
NOTES:

- 1..Chainage of pipelines start at the inlet and run in the same direction as the flow.
- 2.The profile show ground levels of all surveyed points and invert levels at points where the gradient changes.
- 3.All levels are given to two decimals of metre and the chainage to the metre only.
- 4.The profiles show static head, the hydraulic gradient in percent, pipe material size and class.
- 5.The plans show enough features of the terrain to make it possible to find the surveyed line at the time of the construction.
6. A general Layout Plan covering the whole supply system is be provided in schematic format as drawing indexed MUSWAS-2020-002 Showing pipe dimensions and reservoir capacities.

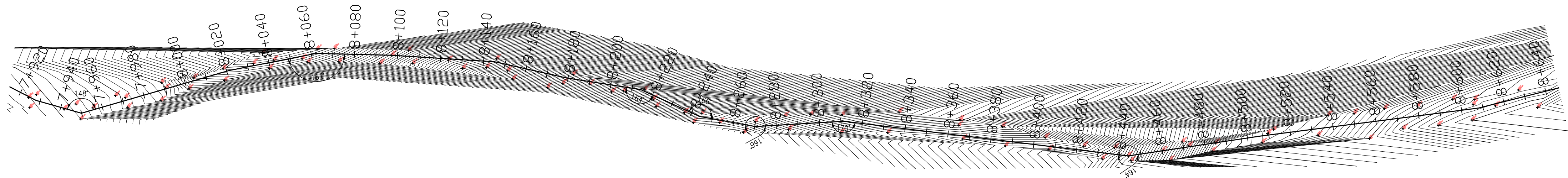
LEGEND:

- 1.All dimensions are in metres
 - 2.the actual setting out to be confirmed on site by the engineer
- EXISTING WATER PIPELINE
 - EXISTING GROUND LEVEL
 - PROPOSED WATER PIPELINE
 - MURRAM ROAD
 - AIR VALVE
 - WASH OUT
 - FIRE HYDRANT

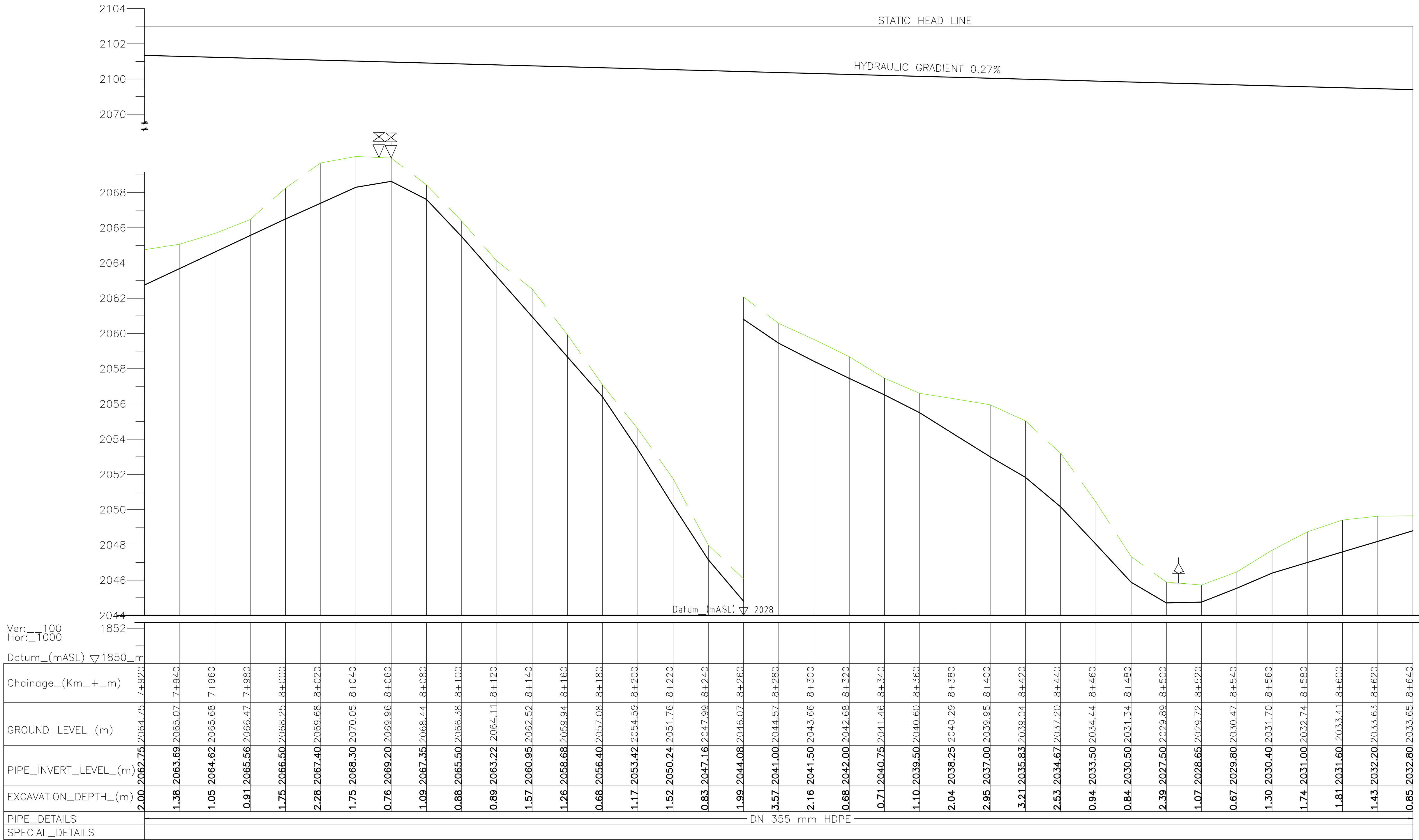
Revised		Comments		Emitted	Project Manager	KANDARA WATER SUPPLY PROJECT		FINAL DESIGN REVIEW	
Drawn	Date			 <div>ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 452300100, Africa Re Center, Harare Nairobi Kenya Tel: 254 20 272743 email: athi@ard.co.ke</div>		MARIIRA DN 355mm GRAVITY MAIN WATER PIPELINE PLAN AND PROFILE		Date	MUSWAS:GMP:010
Checked								Scale	MUSWAS:GMP:010
Reviewed								Sheet	MUSWAS:GMP:010
Approved								Index	MUSWAS:GMP:010
Drawn								Sheet	MUSWAS:GMP:010



Revisão		Código		Empresa		Projeto		KANDARA WATER SUPPLY PROJECT		Série FINAL DESIGN REVIEW	
Descrição	Data									Date JULY 2020	
.	.	.	.	.	.	.	.	.	.	Drawing No MUSWAS-GMP-011	
.	.	.	.	.	.	.	.	.	.	Scale Plot, H=11250, Ver=125	Sheet Size A1
.	.	.	.	.	.	.	.	.	.	Series No 11 026	
.	.	.	.	.	.	.	.	.	.	Index No MUSWAS-2020-019	



PLAN
SCALE 1:1250



PROFILE
SCALE Horiz.1:1250
Vert: 1:125

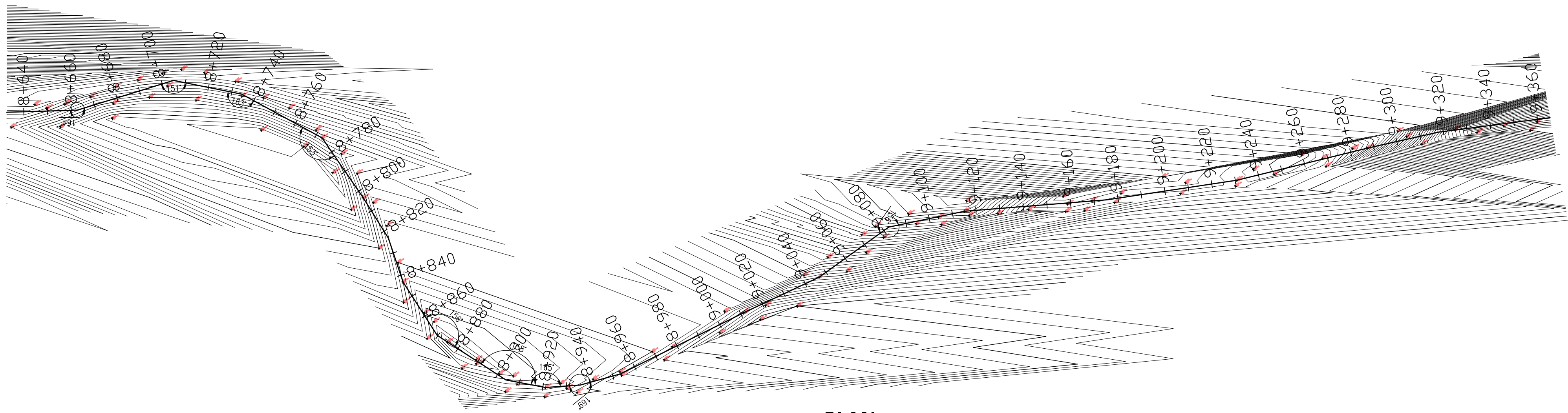
NOTES:

- 1..Chainage of pipelines start at the inlet and run in the same direction as the flow.
- 2.The profile show ground levels of all surveyed points and invert levels at points where the gradient changes.
- 3.All levels are given to two decimals of metre and the chainage to the metre only.
- 4.The profiles show static head, the hydraulic gradient in percent, pipe material size and class.
- 5.The plans show enough features of the terrain to make it possible to find the surveyed line at the time of the construction.
6. A general Layout Plan covering the whole supply system is be provided in schematic format as drawing indexed MUSWAS-2020-002 Showing pipe dimensions and reservoir capacities.

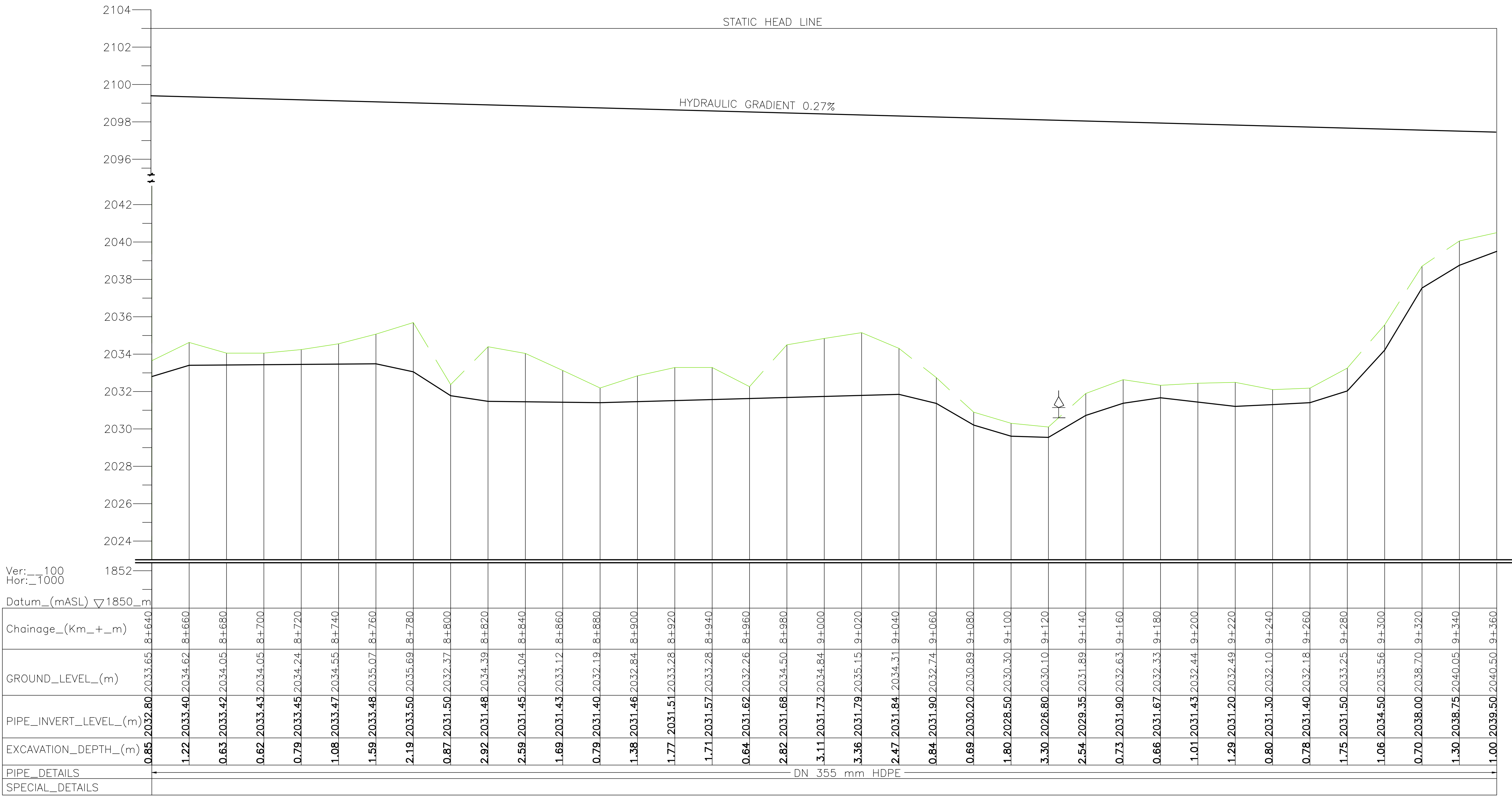
LEGEND:

- 1.All dimensions are in metres
 - 2.the actual setting out to be confirmed on site by the engineer
- EXISTING WATER PIPELINE
 - EXISTING GROUND LEVEL
 - PROPOSED WATER PIPELINE
 - MURRAM ROAD
 - AIR VALVE
 - WASH OUT
 - FIRE HYDRANT

Revised		Checked		Engineer		Project Manager		KANDARA WATER SUPPLY PROJECT		Stage FINAL DESIGN REVIEW	
Design	Date			<div>ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 452/3/00100, Athi River Center, Hombia Road Nairobi Kenya Tel: 254 20 272743 email: a@ard.co.ke</div>		<div></div>		Project Title <div>MARIIRA DN 355mm GRAVITY MAIN WATER PIPELINE PLAN AND PROFILE</div>		Date JULY 2020	
										Drawing No. MUSWAS/GMP/012	
										Scale Plot, Horiz. 1:1250, Ver 1:125	Sheet Size <div>A1</div>
										Sheet No. 12 of 26	
										Index No. MUSWAS/2020/020	



PLAN
SCALE 1:1250



PROFILE
SCALE Horiz.1:1250
Vert: 1:125


NOTES:

- 1..Chainage of pipelines start at the inlet and run in the same direction as the flow.
- 2.The profile show ground levels of all surveyed points and invert levels at points where the gradient changes.
- 3.All levels are given to two decimals of metre and the chainage to the metre only.
- 4.The profiles show static head, the hydraulic gradient in percent, pipe material size and class.
- 5.The plans show enough features of the terrain to make it possible to find the surveyed line at the time of the construction.
6. A general Layout Plan covering the whole supply system is be provided in schematic format as drawing indexed MUSWAS-2020-002 Showing pipe dimensions and reservoir capacities.

LEGEND:

- 1.All dimensions are in metres
 - 2.the actual setting out to be confirmed on site by the engineer
- EXISTING WATER PIPELINE
 - EXISTING GROUND LEVEL
 - PROPOSED WATER PIPELINE
 - MURRAM ROAD
 - AIR VALVE
 - WASH OUT
 - FIRE HYDRANT

Revised		Checked		Emitted		Project Manager		Project		KANDARA WATER SUPPLY PROJECT		State		FINAL DESIGN REVIEW	
Design	Date											Date			JULY 2023
												Drawn			MUSWAS/GMP/013
												Scale			Pa.Hr.1:1250, Ver1:125
												Sheet No			13 of 26
												Index No			MUSWAS:2020:021
															A1



ATHI WATER WORKS DEVELOPMENT AGENCY
P.O Box 452-300100,
Africa Re Center, Harare Road
Nairobi Kenya
Tel: 254 20 272743
email: a@ard.co.ke

Design

Drawn

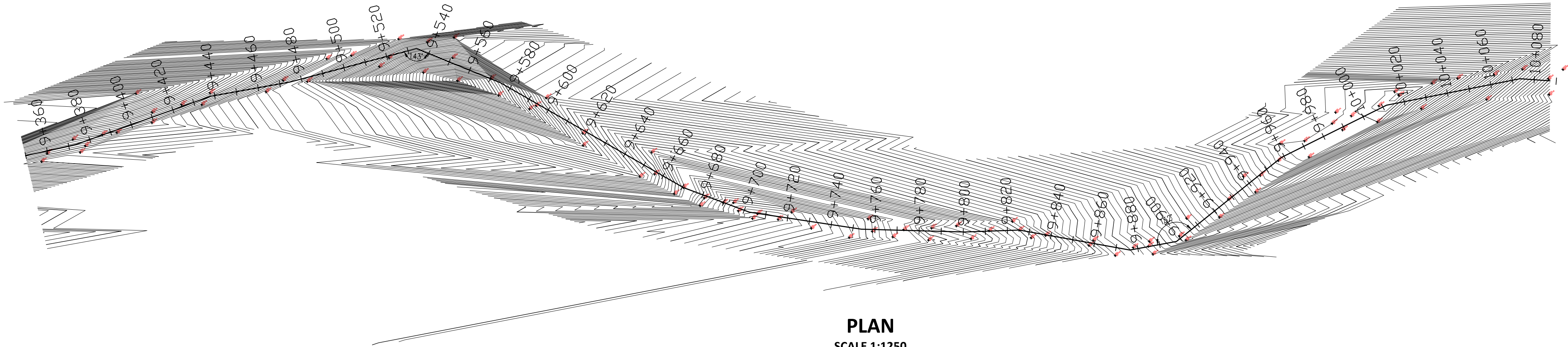
Created

Approved

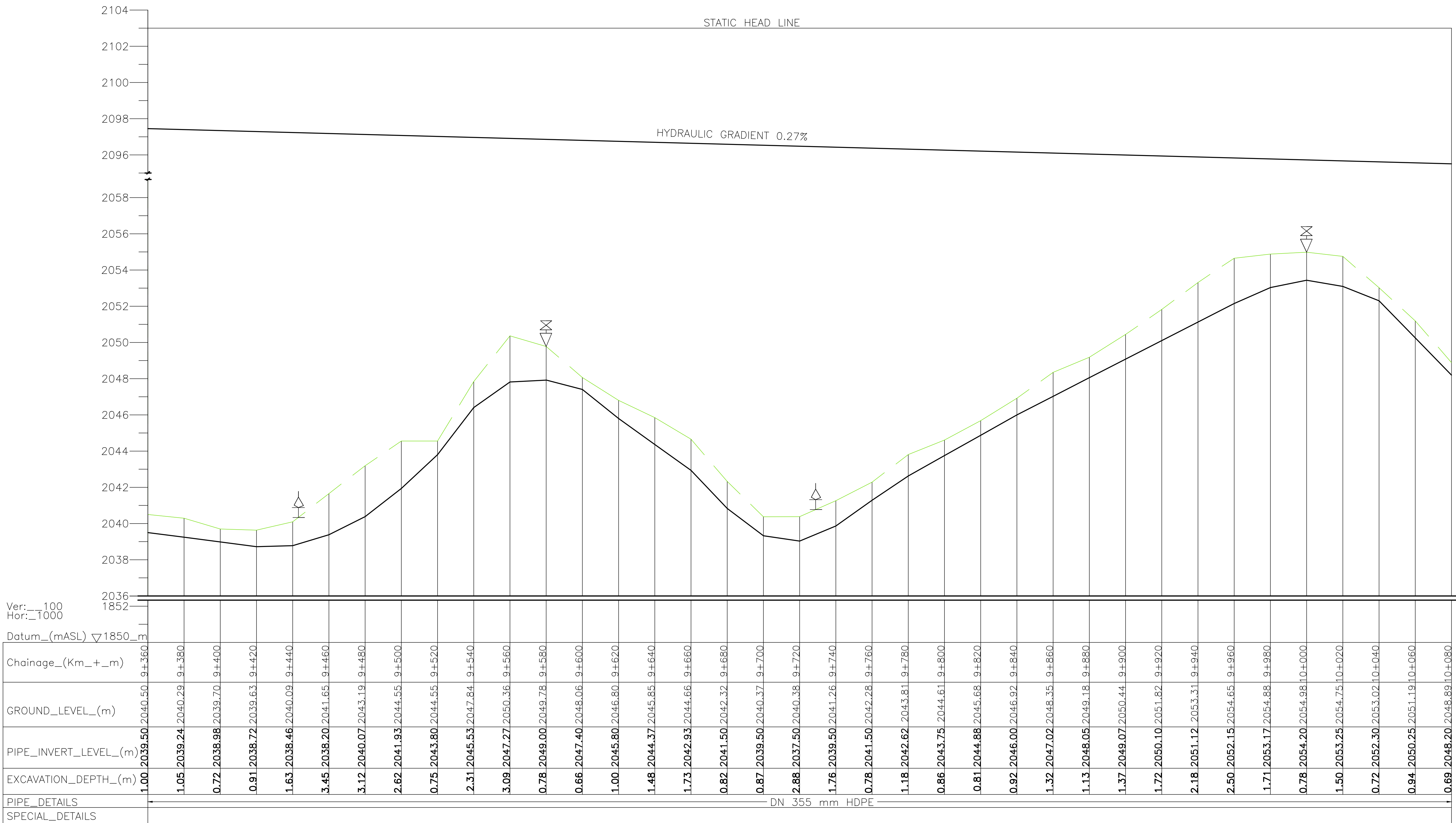
Project

Drawn Title

MARIIRA
DN 355mm GRAVITY MAIN WATER PIPELINE
PLAN AND PROFILE



PLAN
SCALE 1:1250



PROFILE
SCALE Horiz:1:1250
Vert: 1:125



NOTES:

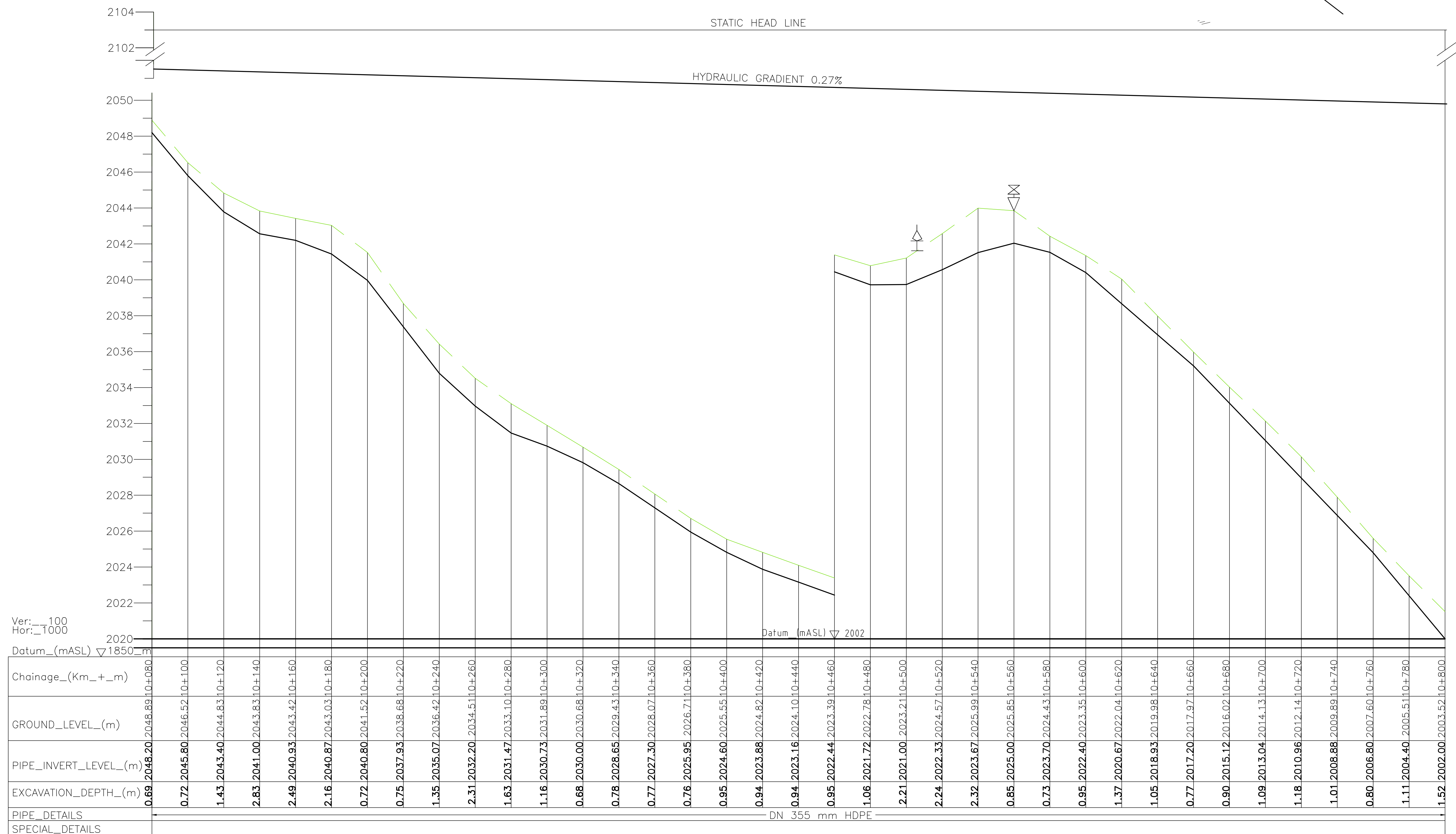
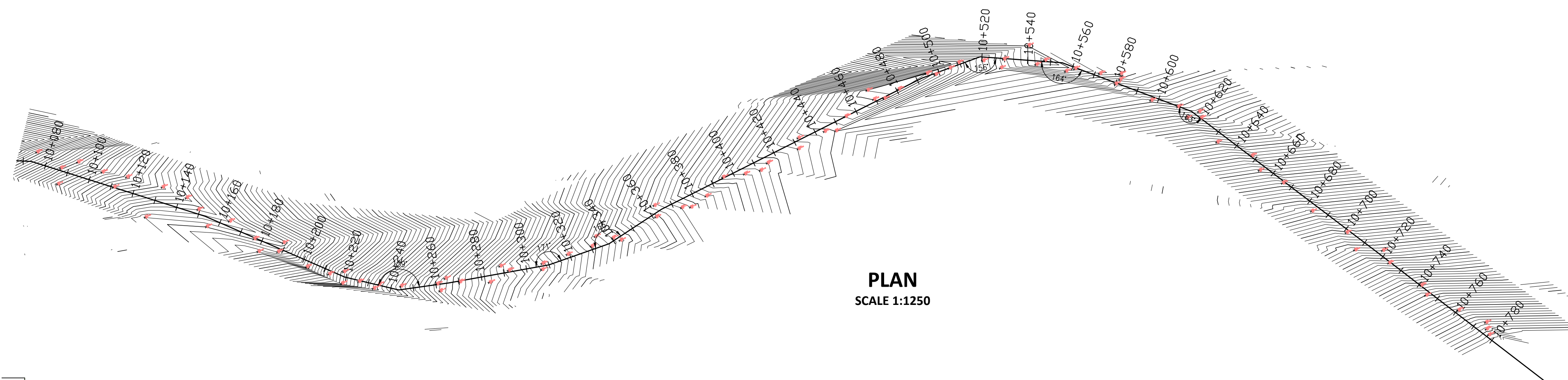
- 1..Chainage of pipelines start at the inlet and run in the same direction as the flow.
- 2.The profile show ground levels of all surveyed points and invert levels at points where the gradient changes.
- 3.All levels are given to two decimals of metre and the chainage to the metre only.
- 4.The profiles show static head, the hydraulic gradient in percent, pipe material size and class.
- 5.The plans show enough features of the terrain to make it possible to find the surveyed line at the time of the construction.
6. A general Layout Plan covering the whole supply system is provided in schematic format as drawing indexed MUSWAS-2020-002 Showing pipe dimensions and reservoir capacities.

LEGEND:


- 1.All dimensions are in metres
- 2.the actual setting out to be confirmed on site by the engineer

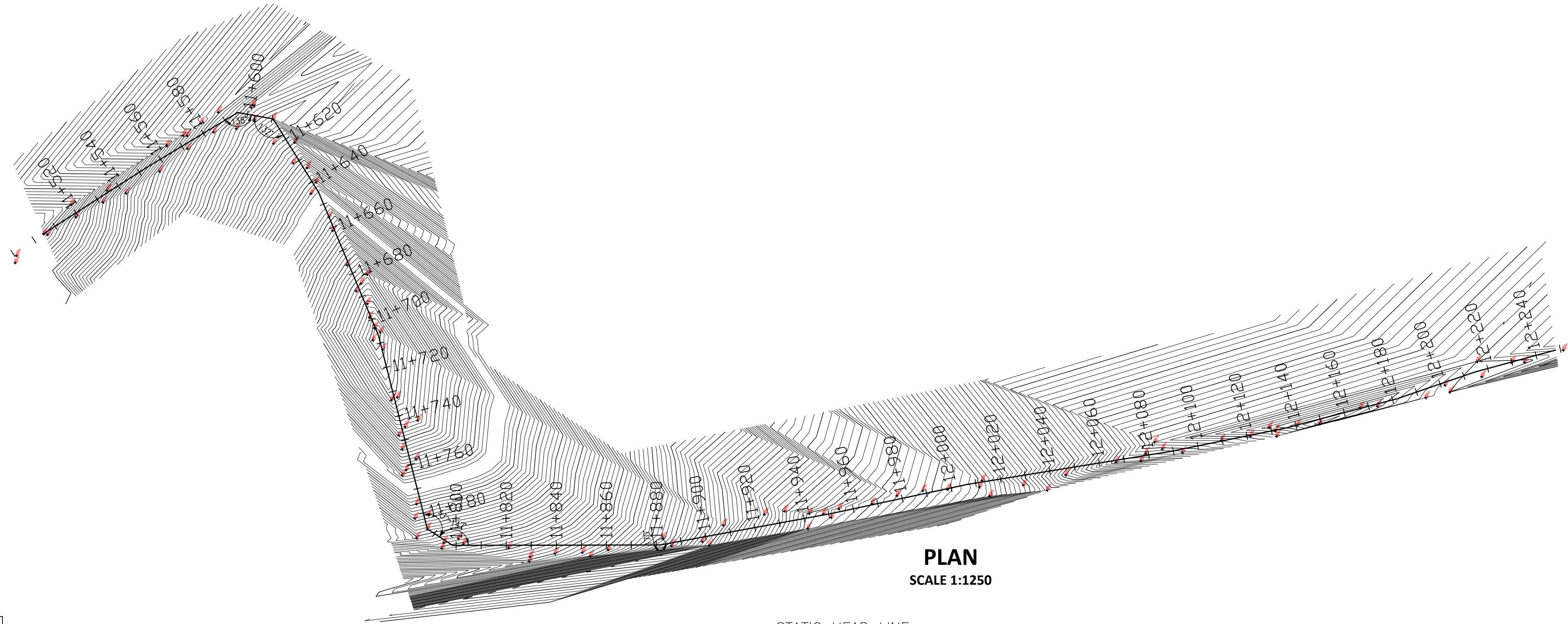
- EXISTING WATER PIPELINE
- EXISTING GROUND LEVEL
- PROPOSED WATER PIPELINE
- MURRAM ROAD
- AIR VALVE
- WASH OUT
- FH FIRE HYDRANT

Revised		Comments		Emitted	Project Manager	KANDARA WATER SUPPLY PROJECT	Scale		FINAL DESIGN REVIEW				
Drawn	Date			 <div>ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 452/3/00100, Athi River Center, Highway Road Nairobi Kenya Tel: 254 20 2727433 email: aw@ard.co.ke</div>			Draft Title	Date		JULY 2023			
								Drawn No		MUSWAS:GMP:014			
								Scale		Plan: H.R. 1:1250, Ver: 1:125		Sheet Size	A1
								Sheet No		14 of 26			
						Index No		MUSWAS:2020:022					

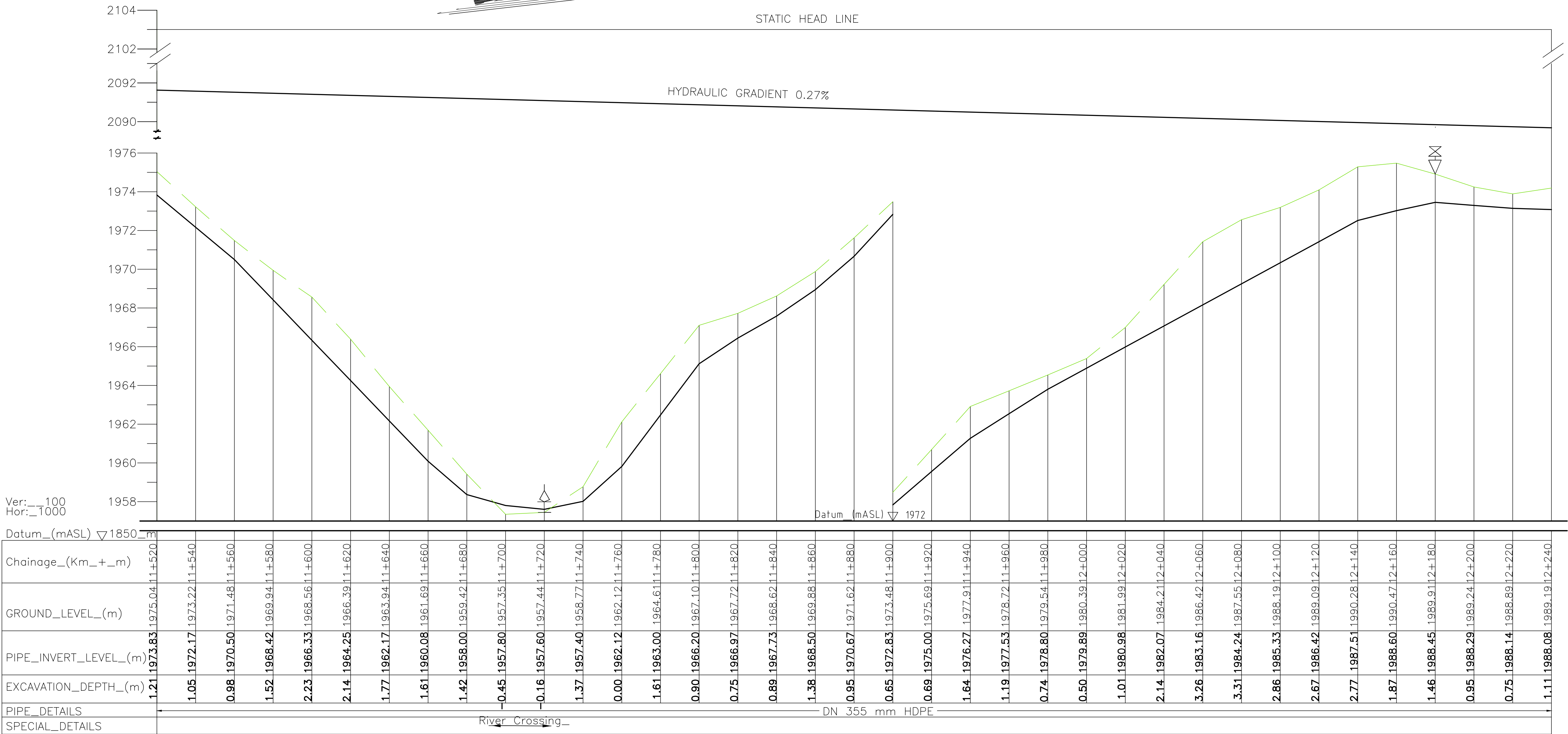


PROFILE
SCALE Horiz.1:1250
Vert: 1:125

Reddipatti		Civilian	Employer	Project Manager	KANDARA WATER SUPPLY PROJECT <div style="text-align: center;">MARIIRA DN 355mm GRAVITY MAIN WATER PIPELINE PLAN AND PROFILE</div>	Sale FINAL DESIGN REVIEW	
Description	Date		 ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 452/3/00100, Athira Re Center, Hottia Road Nairambi Ketta Tel: 254 20 272743 email: athi@ard.ac.ke			Decided	Date JULY 2023
.	.	.				Drawing No.	MUSWAS/GMP/015
.	.	.				Scale	Pan.Hor. 1:250, Ver 1:25
.	.	.				Sheet No.	15 of 26
.	.	.				Index No.	MUSWAS/2020/023



PLAN
SCALE 1:1250




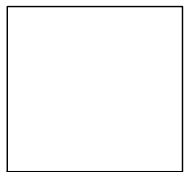
PROFILE
SCALE Horiz.1:1250
Vert: 1:125

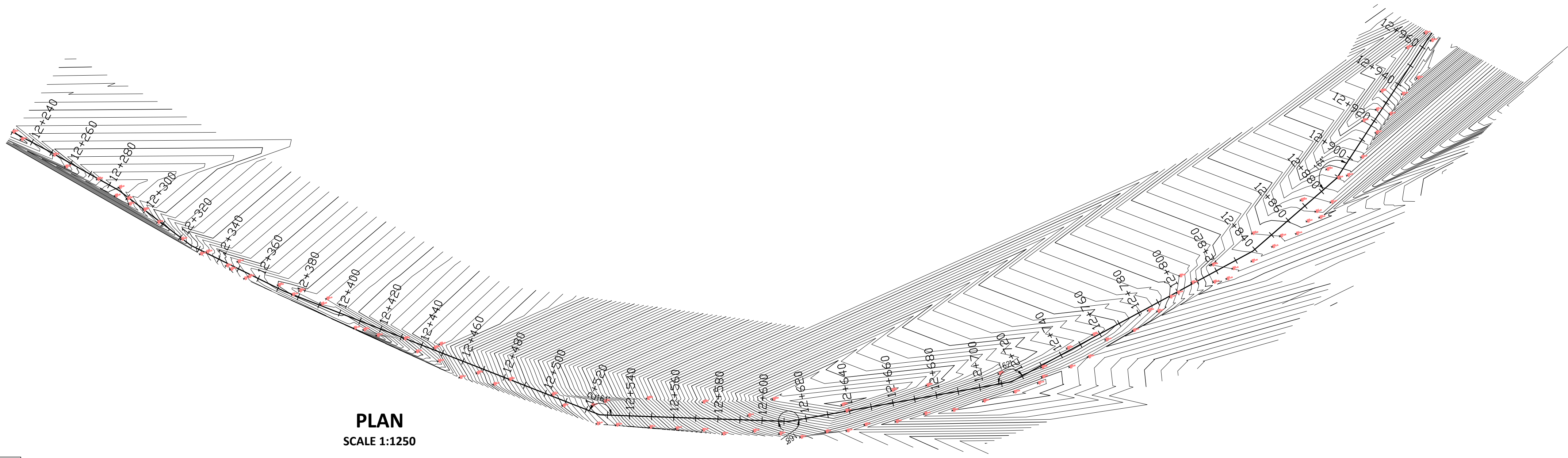
NOTES:

- 1..Chainage of pipelines start at the inlet and run in the same direction as the flow.
- 2.The profile show ground levels of all surveyed points and invert levels at points where the gradient changes.
- 3.All levels are given to two decimals of metre and the chainage to the metre only.
- 4.The profiles show static head, the hydraulic gradient in percent, pipe material size and class.
- 5.The plans show enough features of the terrain to make it possible to find the surveyed line at the time of the construction.
6. A general Layout Plan covering the whole supply system is provided in schematic format as drawing indexed MUSWAS-2020-002 Showing pipe dimensions and reservoir capacities.

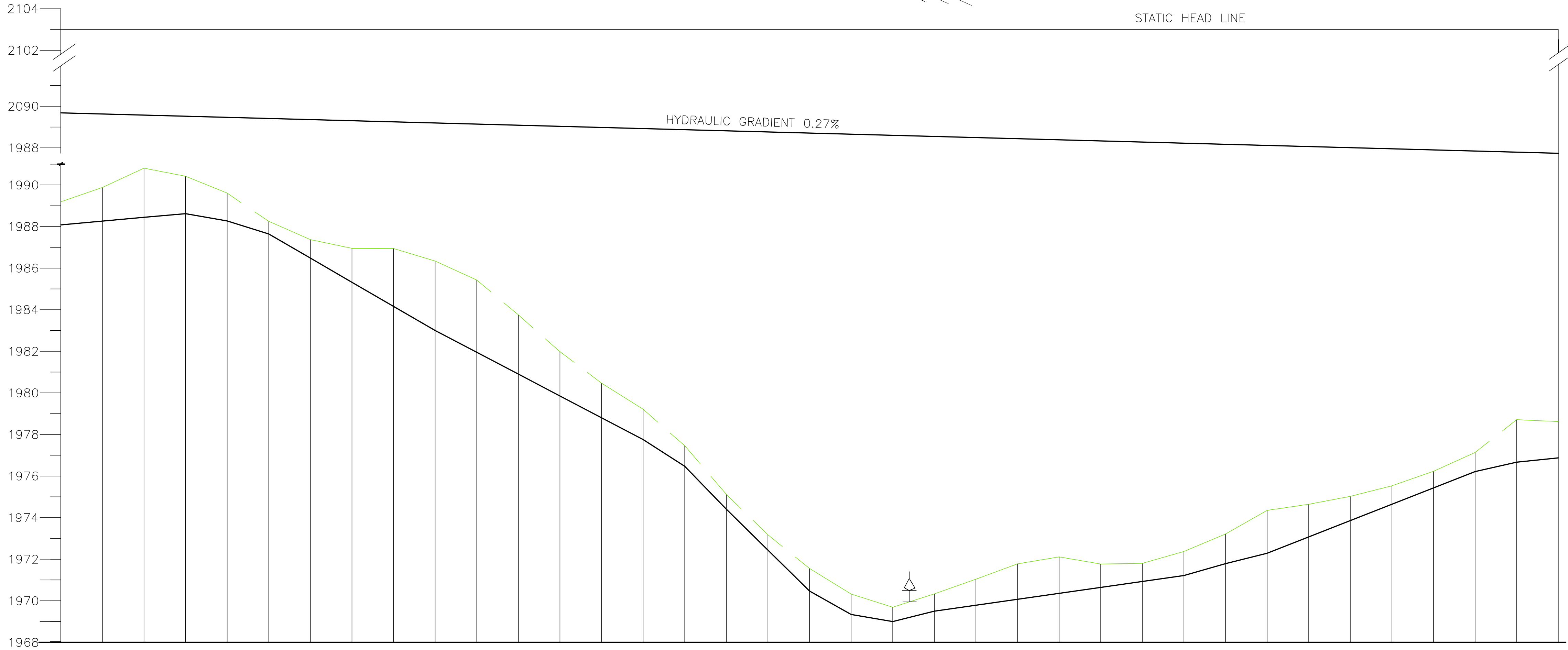
LEGEND:

- 1.All dimensions are in metres
 - 2.the actual setting out to be confirmed on site by the engineer
- EXISTING WATER PIPELINE
 - EXISTING GROUND LEVEL
 - PROPOSED WATER PIPELINE
 - MURRAM ROAD
 - AIR VALVE
 - WASH OUT
 - FIRE HYDRANT

Revised		Checked		Emitted		Project Manager		KANDARA WATER SUPPLY PROJECT		FINAL DESIGN REVIEW	
Drawn	Date							MARIIRA DN 355mm GRAVITY MAIN WATER PIPELINE PLAN AND PROFILE		Date: JULY 2023	
										Drawing No: MUSWAS/GMP/017	
										Scale: Plan, Horiz. 1:1250, Ver. 1:25	
										Sheet No: 17 of 26	
										Index No: MUSWAS/2020/025	
										A1	



PLAN
SCALE 1:1250



STATIC HEAD LINE

HYDRAULIC GRADIENT 0.27%

Ver: 100
Hor: 1000

Datum_(mASL) ▽1850_m	
Chainage_(Km+_m)	
GROUND_LEVEL_(m)	
PIPE_INVERT_LEVEL_(m)	
EXCAVATION_DEPTH_(m)	
PIPE_DETAILS	DN 355 mm HDPE
SPECIAL_DETAILS	

PROFILE
SCALE Horiz:1:1250
Vert: 1:125

NOTES:

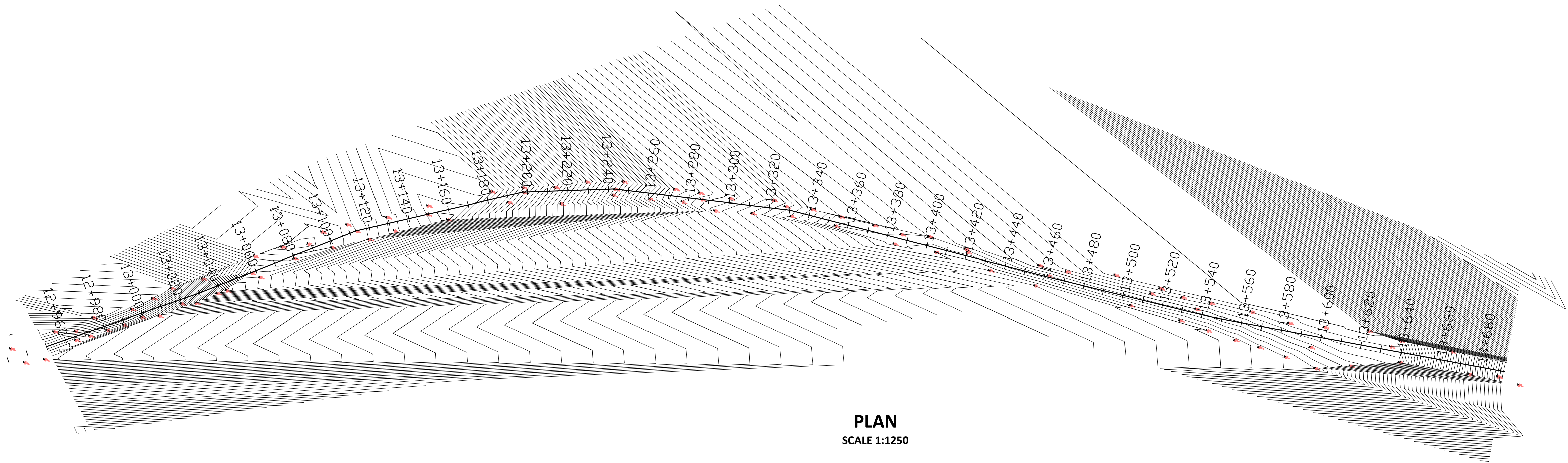
- Plan and profile are on the same sheet and to the same horizontal scale.
- Chainage of pipelines start at the inlet and run in the same direction as the flow.
- The profile show ground levels of all surveyed points and invert levels at points where the gradient changes.
- All levels are given to two decimals of metre and the chainage to the metre only.
- The profiles show static head, the hydraulic gradient in percent, pipe material size and class.
- The plans show enough features of the terrain to make it possible to find the surveyed line at the time of the construction.
- A general Layout Plan covering the whole supply system is be provided in schematic format as drawing indexed MUSWAS-2020-002 Showing pipe dimensions and reservoir capacities.

LEGEND:

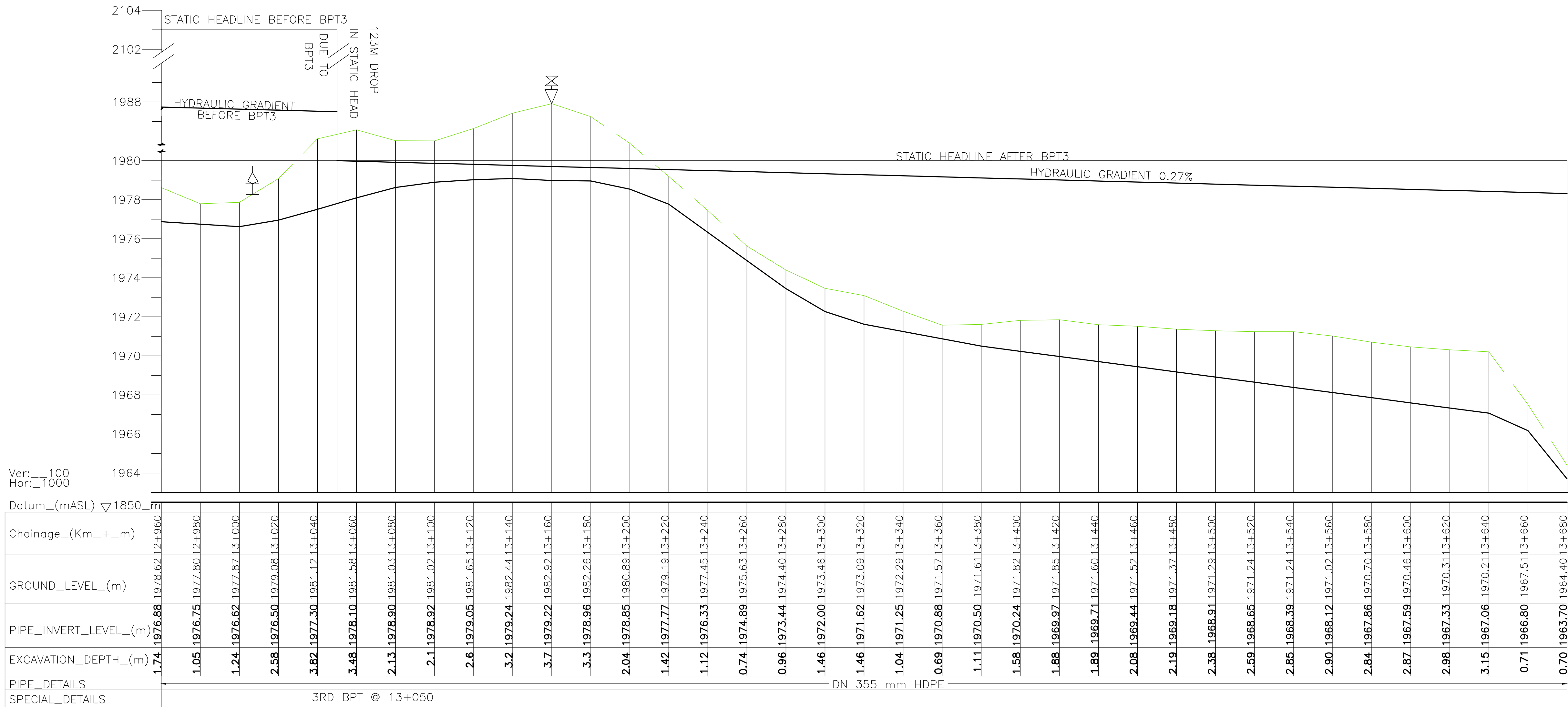
- All dimensions are in metres
- the actual setting out to be confirmed on site by the engineer

- EXISTING WATER PIPELINE
- EXISTING GROUND LEVEL
- PROPOSED WATER PIPELINE
- MURRAM ROAD
- AIR VALVE
- WASH OUT
- FIRE HYDRANT

Revised	Comments	Emitted	Project Manager	Designed	Project	State	FINAL DESIGN REVIEW
Design	Date	ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 452-300100, Athi River Center, Highway Road Nairobi Kenya Tel: 254 20 272743 email: athi@ard.ac.ke		Drawing	KANDARA WATER SUPPLY PROJECT	Date	JULY 2023
				Created		Drawing No	MUSWAS:GMP/01
				Approved		Scale	Plan: 1:1250, Ver: 1:125
						Sheet No	1 of 26
						Index No	MUSWAS:2020:026



PLAN
SCALE 1:1250



PROFILE
SCALE Horiz.1:1250
Vert: 1:125

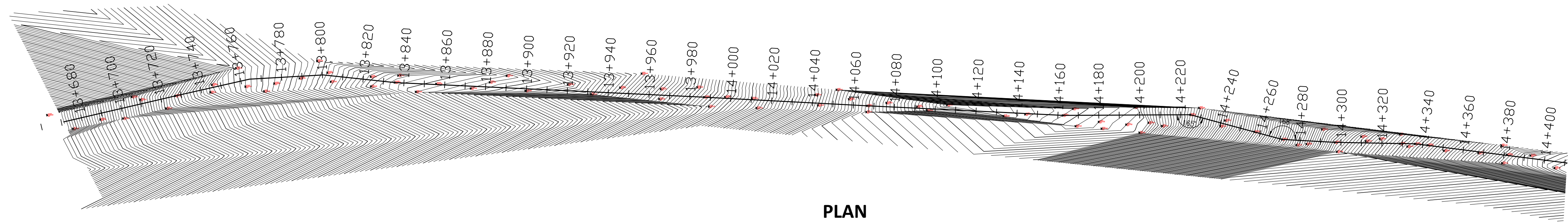
NOTES:

- 1.Chainage of pipelines start at the inlet and run in the same direction as the flow.
- 2.The profile show ground levels of all surveyed points and invert levels at points where the gradient changes.
- 3.All levels are given to two decimals of metre and the chainage to the metre only.
- 4.The profiles show static head, the hydraulic gradient in percent, pipe material size and class.
- 5.The plans show enough features of the terrain to make it possible to find the surveyed line at the time of the construction.
6. A general Layout Plan covering the whole supply system is be provided in schematic format as drawing indexed MUSWAS-2020-002 Showing pipe dimensions and reservoir capacities.

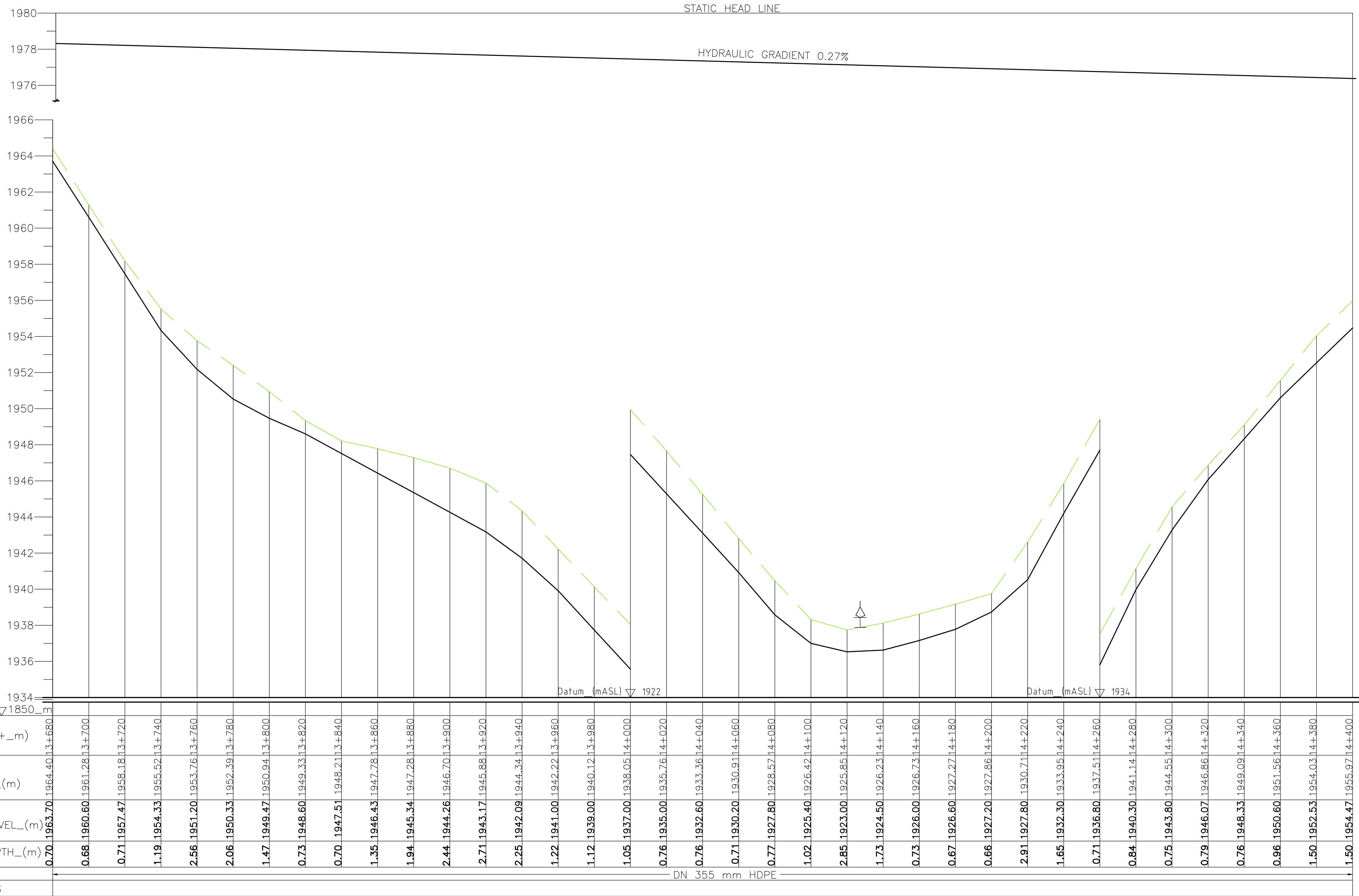
LEGEND:

- 1.All dimensions are in metres
 - 2.the actual setting out to be confirmed on site by the engineer
- EXISTING WATER PIPELINE
 - EXISTING GROUND LEVEL
 - PROPOSED WATER PIPELINE
 - MURRAM ROAD
 - AIR VALVE
 - WASH OUT
 - FIRE HYDRANT

Revised		Comments		Engineer	Project Manager	KANDARA WATER SUPPLY PROJECT		FINAL DESIGN REVIEW	
Drawn	Date			ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 452-300100, Athi River Center, Highway Road Nairobi Kenya Tel: 254 20 272743 email: awd@ard.ac.ke				Date	JULY 2023
								Drawing No	MUSWAS:GMP:019
								Scale	Plan: 1:1250, Ver: 1:125
								Sheet No	19 of 26
								Index No	MUSWAS:2020:027
								Sheet Size	A1
								MARIIRA DN 355mm GRAVITY MAIN WATER PIPELINE PLAN AND PROFILE	



PLAN
SCALE 1:1250



PROFILE
SCALE Horiz: 1:1250
Vert: 1:125

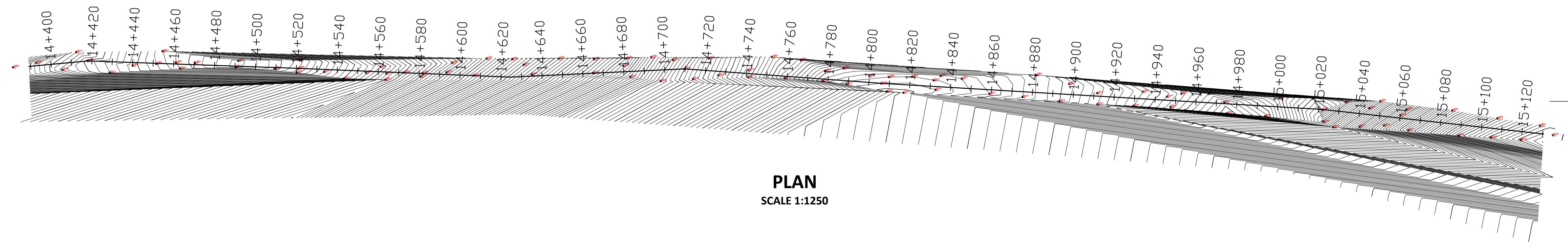
NOTES:

- 1..Chainage of pipelines start at the inlet and run in the same direction as the flow.
- 2.The profile show ground levels of all surveyed points and invert levels at points where the gradient changes.
- 3.All levels are given to two decimals of metre and the chainage to the metre only.
- 4.The profiles show static head, the hydraulic gradient in percent, pipe material size and class.
- 5.The plans show enough features of the terrain to make it possible to find the surveyed line at the time of the construction.
6. A general Layout Plan covering the whole supply system is be provided in schematic format as drawing indexed MUSWAS-2020-002 Showing pipe dimensions and reservoir capacities.

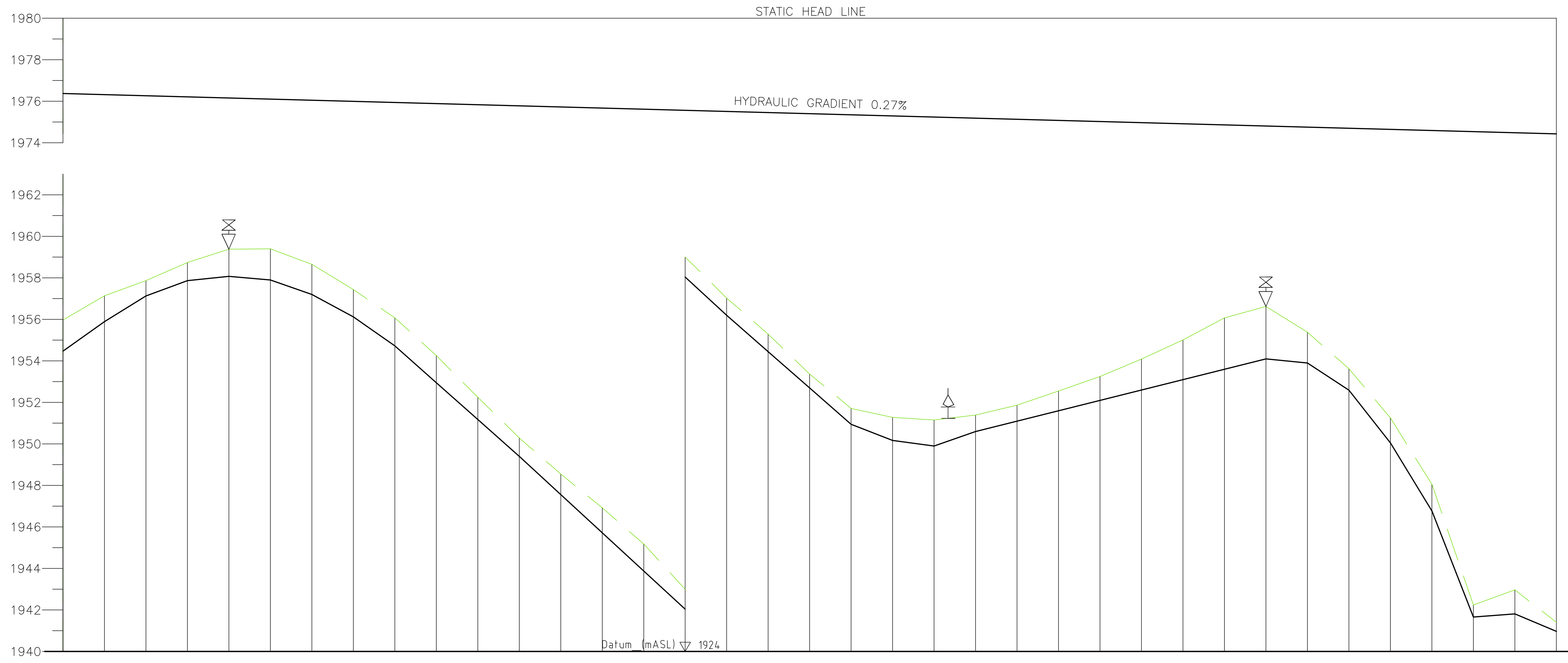
LEGEND:

- 1.All dimensions are in metres
 - 2.the actual setting out to be confirmed on site by the engineer
- EXISTING WATER PIPELINE
 - EXISTING GROUND LEVEL
 - PROPOSED WATER PIPELINE
 - MURRAM ROAD
 - AIR VALVE
 - WASH OUT
 - FH FIRE HYDRANT

Revised		Comments		Emitted	Project Manager	KANDARA WATER SUPPLY PROJECT		State: FINAL DESIGN REVIEW	
Drawn	Date			<div>ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 452-300100, Athi River Center, Homa Bay Road Nairobi Kenya Tel: 254 20 272743 email: awd@athiwat.co.ke</div>	<div></div>	MARIIRA DN 355mm GRAVITY MAIN WATER PIPELINE PLAN AND PROFILE		Date: JULY 2023	
								Drawing No: MUSWAS-GMP-020	
								Scale: Plan: 1:1250, Ver: 1:125	Sheet Size:
								Sheet No: 20 of 26	A1
								Index No: MUSWAS-2020-020	

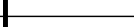
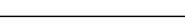


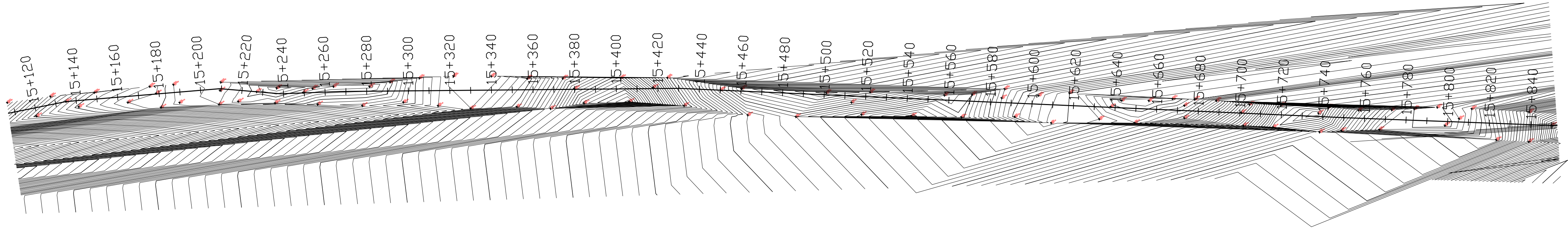
PLAN
SCALE 1:1250



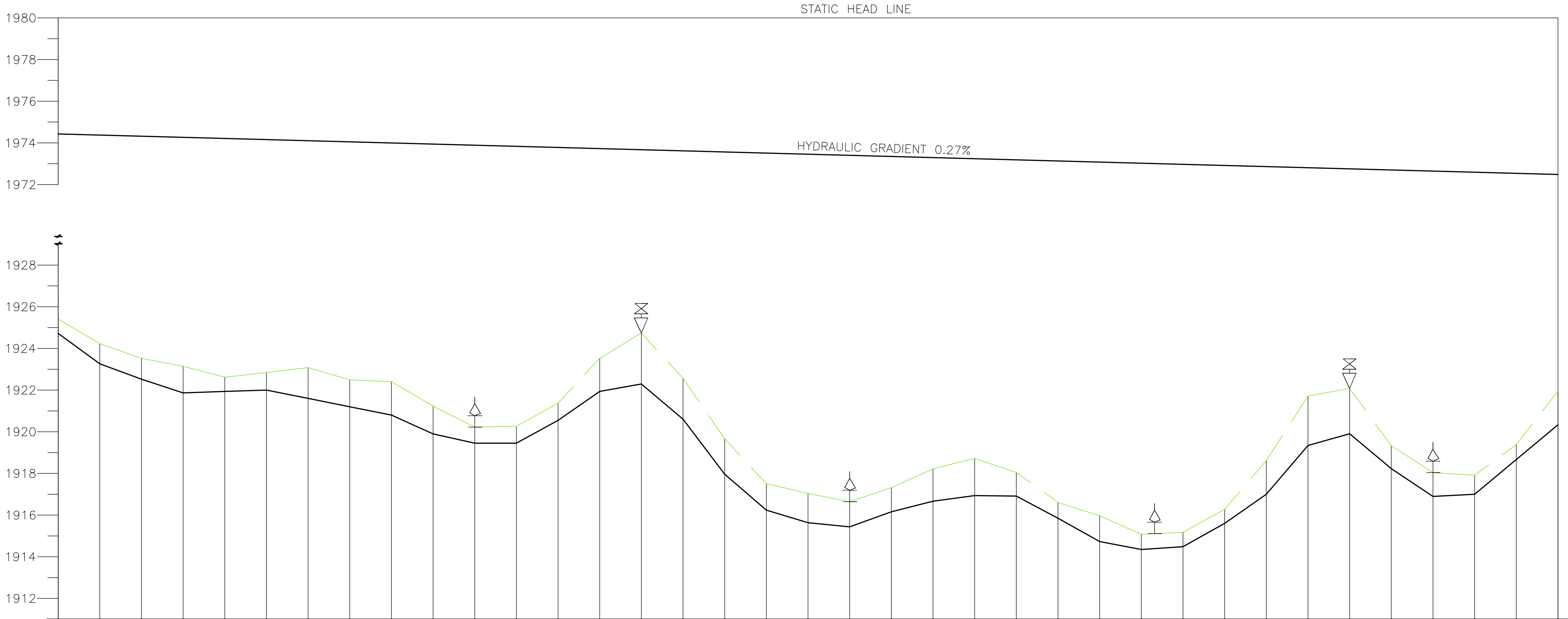
Ver: 100 Hor: 1000		1852	
Datum_(mASL) ▽1850		1850	
Chainage_(Km+_m)		1850	
GROUND_LEVEL_(m)		1850	
PIPE_INVERT_LEVEL_(m)		1850	
EXCAVATION_DEPTH_(m)		1850	
PIPE_DETAILS		1850	
SPECIAL_DETAILS		1850	
DN 355 mm HDPE		1850	

PROFILE
SCALE Horiz.1:1250
Vert: 1:125

Revised		Contract		Employer		Project Manager		Project		Revision	
Design	Date	 <div>ATHI WATER WORKS DEVELOPMENT AGENCY P.O. Box 452/300100, Ariara Re Center, Homa Bay Road Nairobi Kenya Tel: 254 20 2727433 email: info@athiwatworks.co.ke</div>		Design	KANDARA WATER SUPPLY PROJECT	Stage: FINAL DESIGN REVIEW					
.	.			Date: JULY 2023							
.	.			Drawing No: MUSWAS:GMP.021							
.	.			Stage: Plan, Hdr, 1:1250, Ver1:125		Sheet Size: A1					
.	.			Sheet No: 21 of 26							
.	.			Index No: MUSWAS:2020.029							
.	.			DN 355mm GRAVITY MAIN WATER PIPELINE PLAN AND PROFILE							



PLAN
SCALE 1:1250



Ver: 100 Hor: 1000	Datum (mASL) 1850.3
Chainage (Km + m)	15+120 15+140 15+160 15+180 15+200 15+220 15+240 15+260 15+280 15+300 15+320 15+340 15+360 15+380 15+400 15+420 15+440 15+460 15+480 15+500 15+520 15+540 15+560 15+580 15+600 15+620 15+640 15+660 15+680 15+700 15+720 15+740 15+760 15+780 15+800 15+820 15+840
GROUND LEVEL (m)	1925.41 1924.23 1923.52 1923.14 1922.62 1922.84 1923.08 1922.49 1922.40 1921.23 1920.22 1920.26 1921.37 1923.52 1924.74 1922.56 1919.66 1917.51 1913.80 1917.04 1916.64 1917.32 1918.22 1918.72 1918.05 1916.60 1915.97 1915.08 1915.17 1916.28 1918.62 1921.71 1922.08 1919.33 1918.04 1917.91 1919.39 1921.95
PIPE INVERT LEVEL (m)	1924.72 1923.26 1921.80 1921.87 1921.93 1922.00 1921.60 1920.80 1920.40 1921.40 1919.45 1918.50 1920.55 1922.60 1923.80 1921.60 1919.00 1916.40 1916.67 1916.93 1917.20 1915.85 1914.50 1914.35 1914.20 1915.60 1915.60 1917.00 1919.10 1921.20 1918.60 1916.00 1917.00 1917.00 1918.67 1920.33
EXCAVATION DEPTH (m)	0.69 0.97 1.72 1.27 0.69 0.84 1.48 1.29 1.60 0.83 0.77 1.76 0.82 0.92 0.94 0.96 0.66 1.11 0.24 1.54 0.92 1.55 1.79 0.85 0.75 1.47 0.73 0.97 0.68 1.62 2.61 0.88 0.73 2.04 0.91 0.72 1.62
PIPE DETAILS	DN 355 mm HDPE
SPECIAL DETAILS	



PROFILE
SCALE Horiz: 1:1250
Vert: 1:125

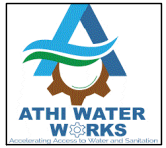
NOTES:

- Plan and profile are on the same sheet and to the same horizontal scale.
- Chainage of pipelines start at the inlet and run in the same direction as the flow.
- The profile show ground levels of all surveyed points and invert levels at points where the gradient changes.
- All levels are given to two decimals of metre and the chainage to the metre only.
- The profiles show static head, the hydraulic gradient in percent, pipe material size and class.
- The plans show enough features of the terrain to make it possible to find the surveyed line at the time of the construction.
- A general Layout Plan covering the whole supply system is be provided in schematic format as drawing indexed MUSWAS-2020-002 Showing pipe dimensions and reservoir capacities.

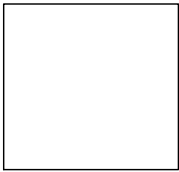
LEGEND:

- All dimensions are in metres
 - the actual setting out to be confirmed on site by the engineer
- EXISTING WATER PIPELINE
 - EXISTING GROUND LEVEL
 - PROPOSED WATER PIPELINE
 - MURRAM ROAD
 - AIR VALVE
 - WASH OUT
 - FIRE HYDRANT

Revised		Comments	Emitted	Project Manager	Decided	Project	KANDARA WATER SUPPLY PROJECT			Status		FINAL DESIGN REVIEW			
Design	Date								Drawn	Checked	Drawn Title	Scale	Plan, Horiz: 1:1250, Ver: 1:125	Sheet/Size	A1

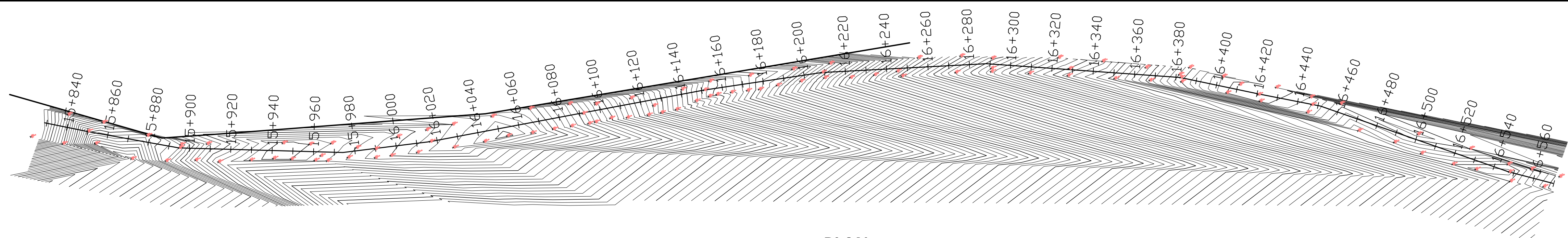


ATHI WATER WORKS
DEVELOPMENT AGENCY
P.O Box 452-300100,
Athi River Center, Hombia Road
Nairobi Kenya
Tel: 254 20 272743
email: aww@ard.co.ke



KANDARA WATER SUPPLY PROJECT

MARIIRA
DN 355mm GRAVITY MAIN WATER PIPELINE
PLAN AND PROFILE



PLAN

SCALE 1:1250



Ver:_100
Hor:_1000

Datum_(mASL) ∇ 1850_m

Chainage_(Km+_m)

GROUND_LEVEL_(m)

PIPE_INVERT_LEVEL_(m)

EXCAVATION_DEPTH_(m)

PIPE_DETAILS

SPECIAL_DETAILS

DN 355 mm HDPE

PROFILE

SCALE Horiz.1:1250

Vert: 1:125

NOTES:

Plan and profile are on the same sheet and to the same horizontal scale.

1..Chainage of pipelines start at the inlet and run in the same direction as the flow.

2.The profile show ground levels of all surveyed points and invert levels at points where the gradient changes.

3.All levels are given to two decimals of metre and the chainage to the metre only.

4.The profiles show static head, the hydraulic gradient in percent, pipe material size and class.

5.The plans show enough features of the terrain to make it possible to find the surveyed line at the time of the construction.



6. A general Layout Plan covering the whole supply system is be provided in schematic format as drawing indexed MUSWAS-2020-002 Showing pipe dimensions and reservoir capacities.

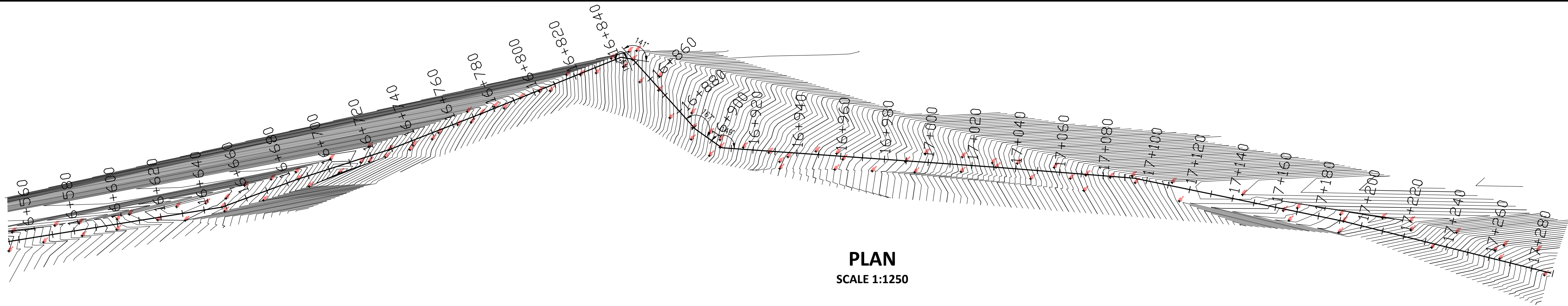
LEGEND:

1.All dimensions are in metres

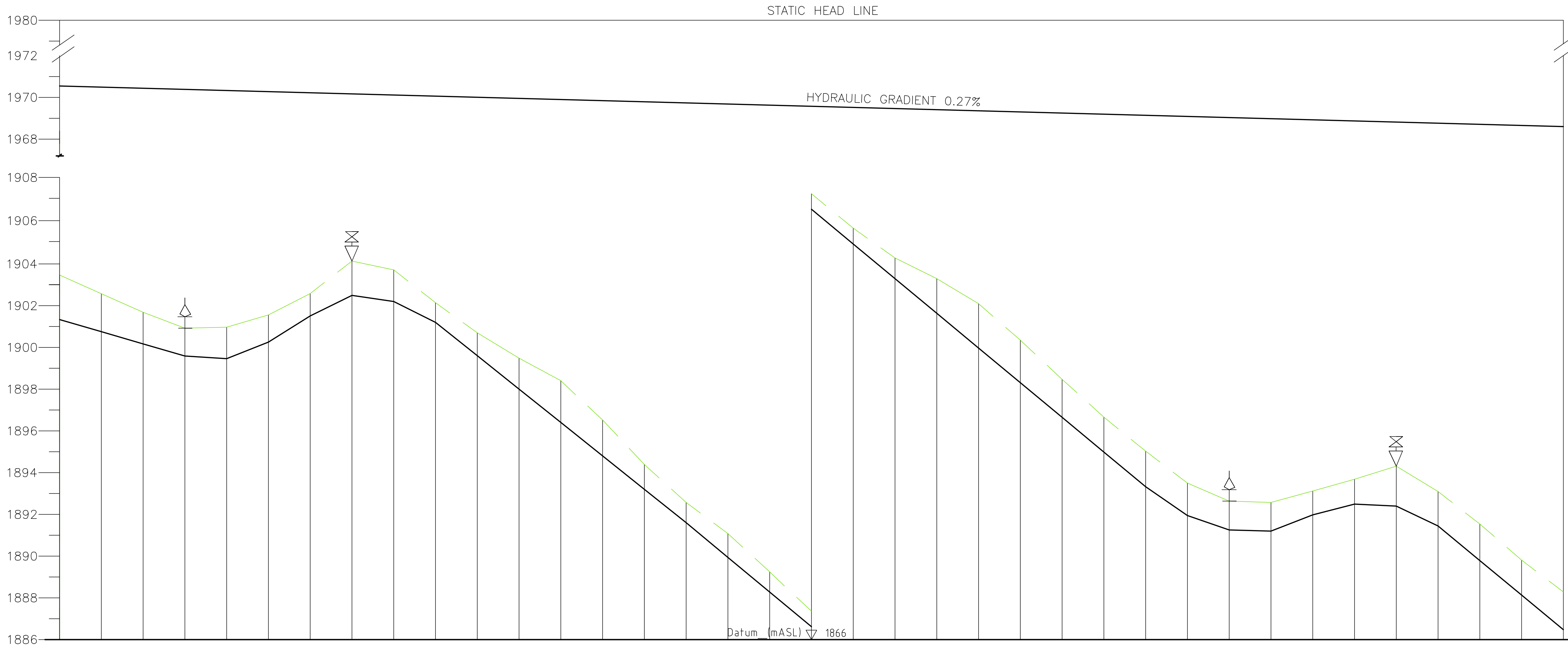
2.the actual setting out to be confirmed on site by the engineer

- EXISTING WATER PIPELINE
- EXISTING GROUND LEVEL
- PROPOSED WATER PIPELINE
- MURRAM ROAD
- AIR VALVE
- WASH OUT
- FIRE HYDRANT

Revisi		Comments		Engineer	Project Manager	KANDARA WATER SUPPLY PROJECT	FINAL DESIGN REVIEW				
Drawn	Date	 ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 452-300100, Africa Re Center, Harare Road Nairobi Kenya Tel: 254 20 272743 email: athi@ard.ac.ke		Date	JULY 2023						
				Drawn	Project No		MUSWAS/GMP/023	Scale	Sheet Size		
				Checked	Drawn Title		MARIIRA			23 of 26	
				Approved	DN 355mm GRAVITY MAIN WATER PIPELINE PLAN AND PROFILE		Index No			MUSWAS/2020/031	



PLAN
SCALE 1:1250



Ver: 100 Hor: 1000	Datum (mASL) 1850.3
Chainage_(Km+_m)	16+560 16+580 16+600 16+620 16+640 16+660 16+680 16+700 16+720 16+740 16+760 16+780 16+800 16+820 16+840 16+860 16+880 16+900 16+920 16+940 16+960 16+980 17+000 17+020 17+040 17+060 17+080 17+100 17+120 17+140 17+160 17+180 17+200 17+220 17+240 17+260 17+280
GROUND_LEVEL_(m)	1903.47 1902.57 1901.68 1900.92 1900.97 1901.55 1902.58 1904.13 1903.71 1902.14 1900.70 1899.48 1898.40 1896.52 1894.39 1892.57 1891.08 1889.24 1887.36 1885.71 1884.28 1883.29 1883.29 1882.09 1875.03 1873.50 1872.63 1872.57 1873.12 1873.68 1874.31 1873.09 1871.54 1869.81 1868.28
PIPE_INVERT_LEVEL_(m)	1901.33 1900.75 1900.17 1899.58 1899.00 1900.40 1901.80 1903.20 1902.20 1901.20 1899.60 1898.00 1896.40 1894.80 1893.20 1891.60 1889.94 1888.28 1886.62 1884.95 1883.29 1881.63 1879.97 1878.31 1876.65 1874.98 1873.32 1871.66 1870.00 1868.34 1866.68 1865.02
EXCAVATION_DEPTH_(m)	2.14 1.82 1.51 1.34 1.97 1.15 0.78 0.93 1.51 0.94 1.10 1.48 2.00 1.72 1.19 0.97 1.14 0.96 0.74 0.76 0.99 1.66 2.12 2.04 1.82 1.68 1.71 1.84 2.63 1.37 0.72 1.35 2.04 0.89 3.61 2.94 2.48
PIPE_DETAILS	DN 355 mm HDPE
SPECIAL_DETAILS	

PROFILE
SCALE Horiz.1:1250
Vert: 1:125

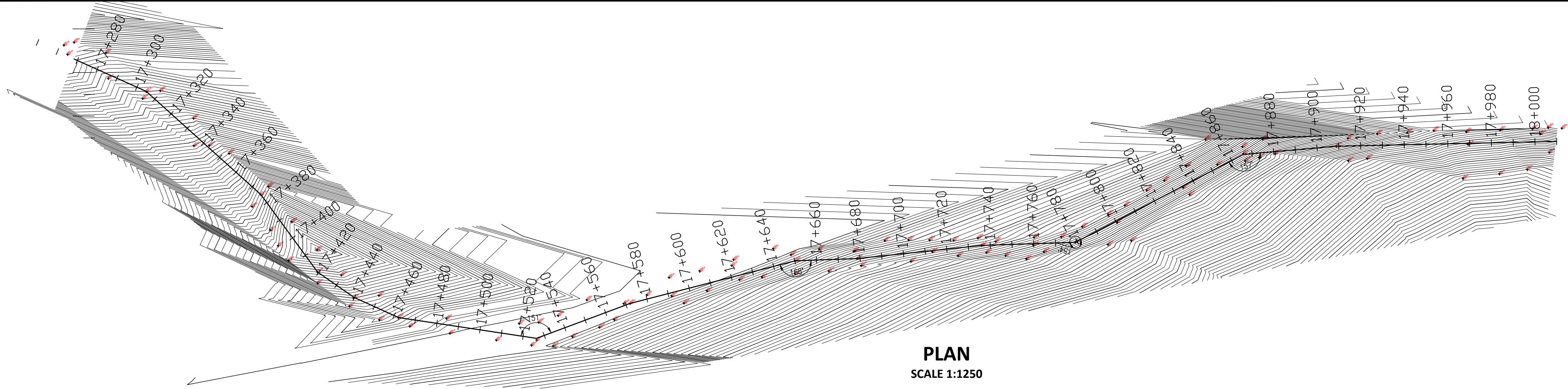
NOTES:

- Chainage of pipelines start at the inlet and run in the same direction as the flow.
- The profile show ground levels of all surveyed points and invert levels at points where the gradient changes.
- All levels are given to two decimals of metre and the chainage to the metre only.
- The profiles show static head, the hydraulic gradient in percent, pipe material size and class.
- The plans show enough features of the terrain to make it possible to find the surveyed line at the time of the construction.
- A general Layout Plan covering the whole supply system is provided in schematic format as drawing indexed MUSWAS-2020-002 Showing pipe dimensions and reservoir capacities.

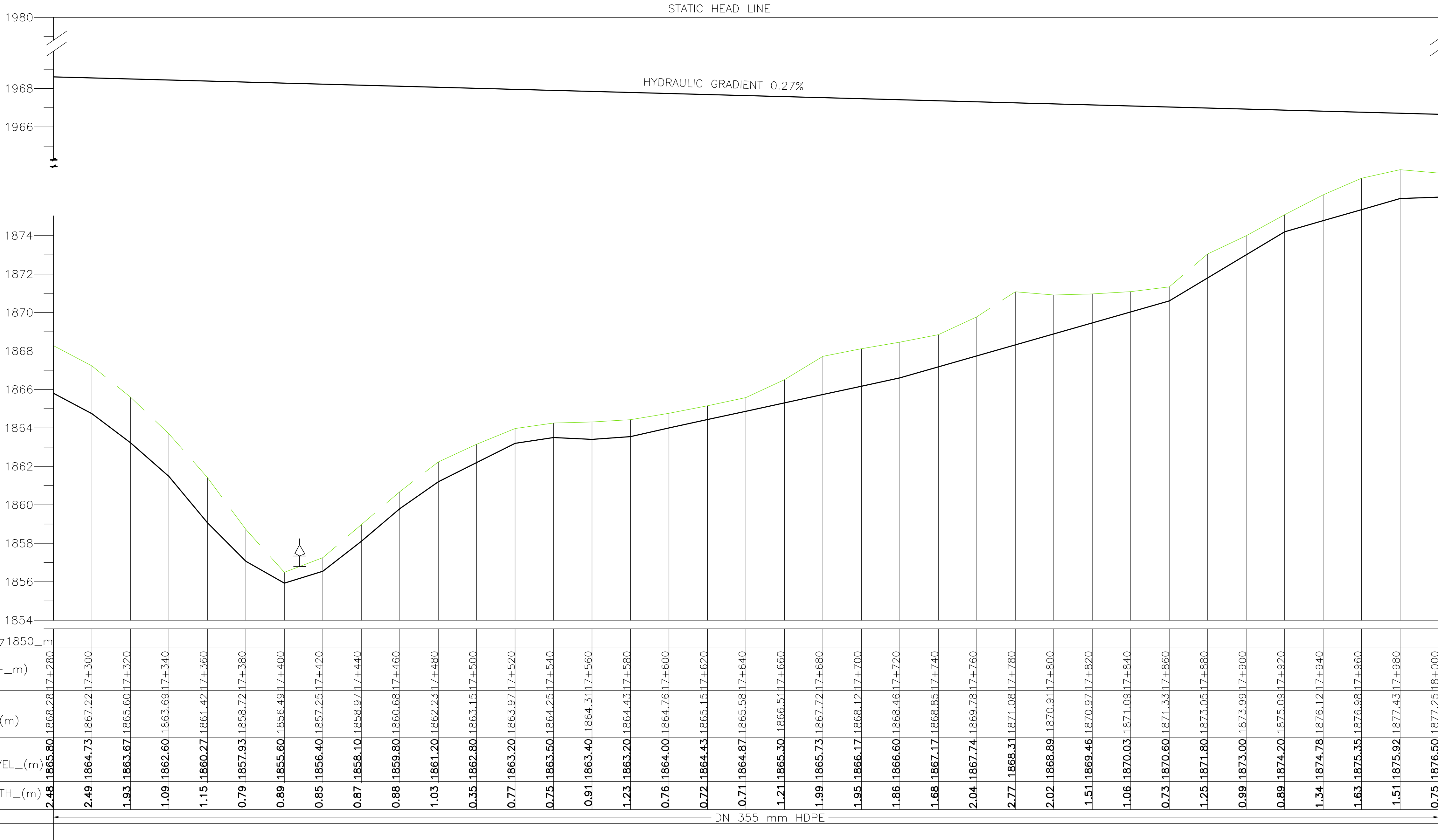
LEGEND:

- All dimensions are in metres
 - the actual setting out to be confirmed on site by the engineer
- EXISTING WATER PIPELINE
 - EXISTING GROUND LEVEL
 - PROPOSED WATER PIPELINE
 - MURRAM ROAD
 - AIR VALVE
 - WASH OUT
 - FH FIRE HYDRANT

Revised		Comments		Emitted		Project Manager		Project		State: FINAL DESIGN REVIEW	
Design	Date			ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 4523, 00100, Athi River Center, Nairobi Tel: 254 20 272743 email: athi@ard.ac.ke						Date: JULY 2023	A1
										Drawing: MUSWAS-GMP-024	
										Scale: Plan: 1:1250, Ver: 1:125	
										Sheet: 24 of 26	
										Index: MUSWAS-2020-032	



PLAN
SCALE 1:1250





PROFILE
SCALE Horiz.1:1250
Vert: 1:125

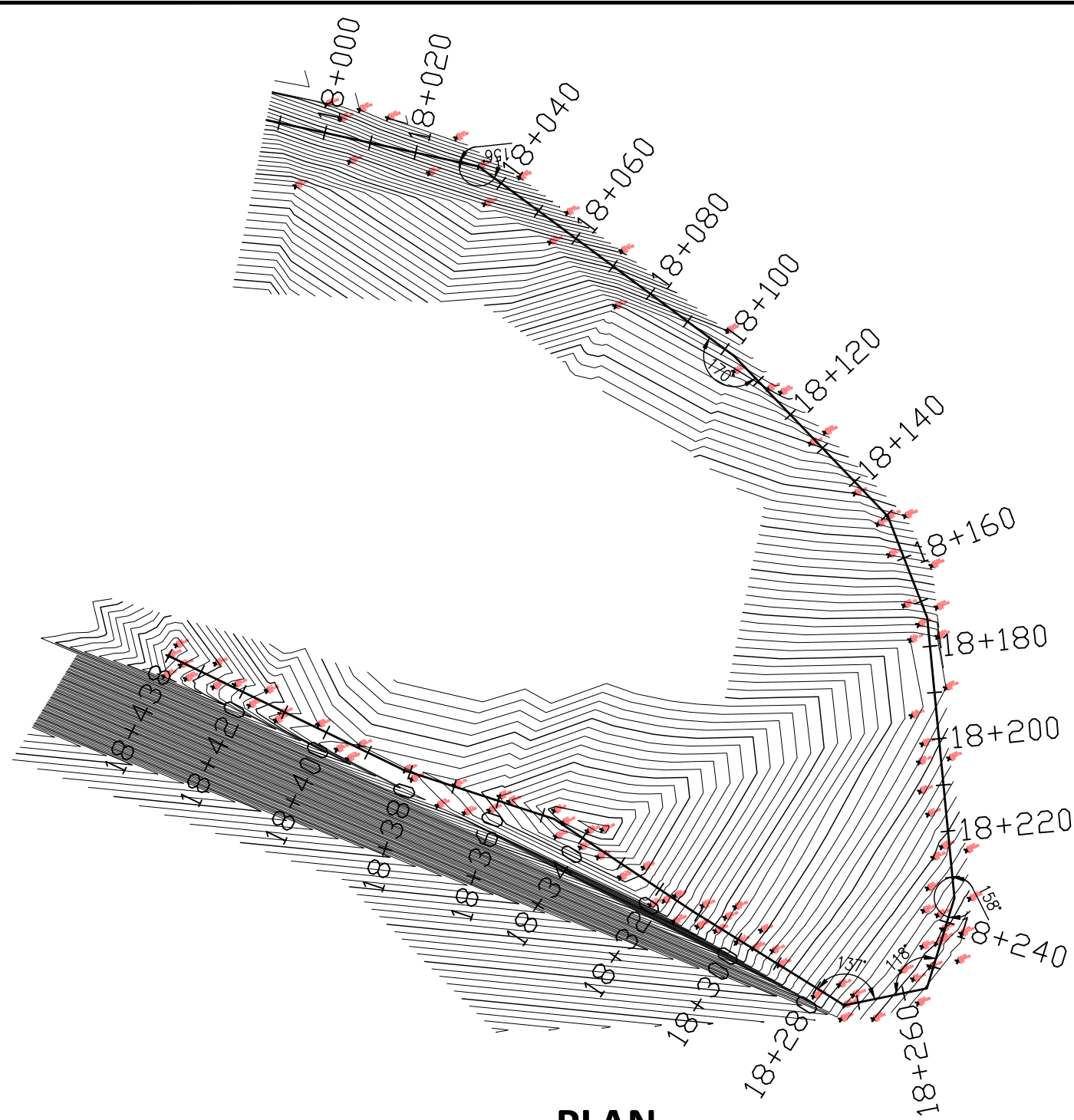
NOTES:

- 1..Chainage of pipelines start at the inlet and run in the same direction as the flow.
- 2.The profile show ground levels of all surveyed points and invert levels at points where the gradient changes.
- 3.All levels are given to two decimals of metre and the chainage to the metre only.
- 4.The profiles show static head, the hydraulic gradient in percent, pipe material size and class.
- 5.The plans show enough features of the terrain to make it possible to find the surveyed line at the time of the construction.
6. A general Layout Plan covering the whole supply system is be provided in schematic format as drawing indexed MUSWAS-2020-002 Showing pipe dimensions and reservoir capacities.

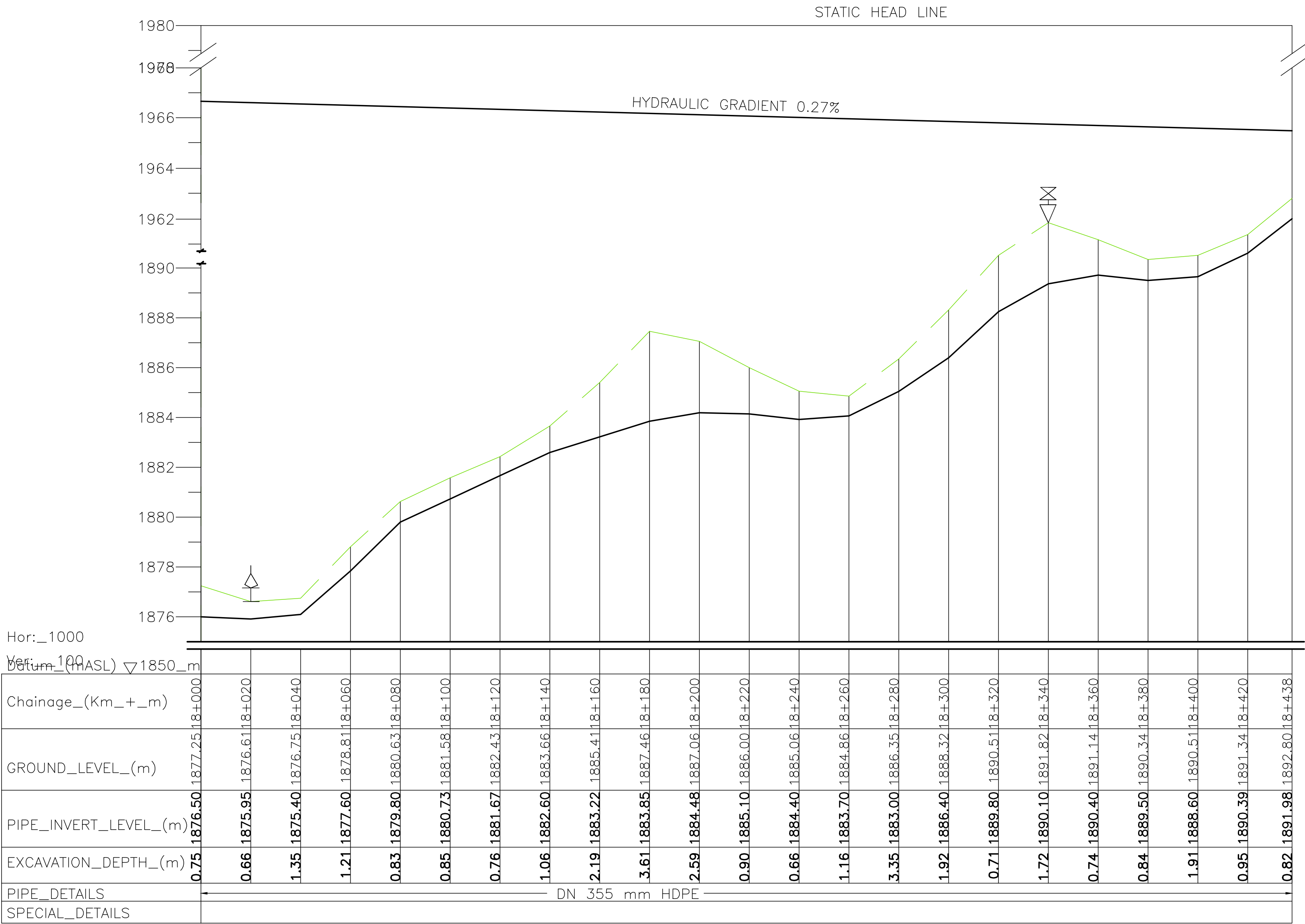
LEGEND:

- 1.All dimensions are in metres
 - 2.the actual setting out to be confirmed on site by the engineer
- EXISTING WATER PIPELINE
 - EXISTING GROUND LEVEL
 - PROPOSED WATER PIPELINE
 - MURRAM ROAD
 - AIR VALVE
 - WASH OUT
 - FIRE HYDRANT

Revised		Checked		Emitted		Project Manager		KANDARA WATER SUPPLY PROJECT		FINAL DESIGN REVIEW		
Design	Date			ATHI WATER WORKS DEVELOPMENT AGENCY P.O Bx 452-300100, Africa Re Center, Harare Road Nairobi Kenya Tel: 254 20 272743 email: a@ard.co.ke						Date	JULY 2023	
.	.	.	.					Draft Title MARIIRA DN 355mm GRAVITY MAIN WATER PIPELINE PLAN AND PROFILE		MUSWAS-GMP-025		
.	.	.	.							Scale	Plan, Horiz. 1:1250, Ver 1:125	Sheet Size A1
.	.	.	.							Sheet No.	25 of 26	
.	.	.	.							Index No.			MUSWAS/2020-033



PLAN
SCALE 1:1250




PROFILE
SCALE Horiz.1:1250
Vert: 1:125

NOTES:

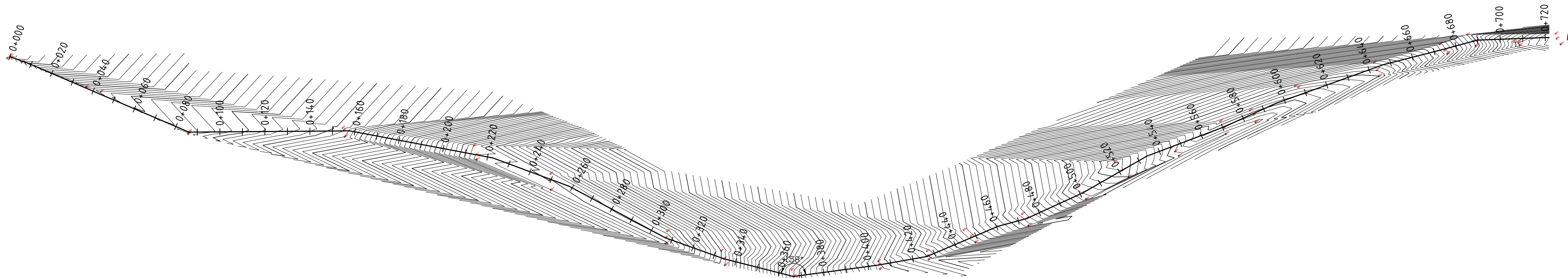
- 1..Chainage of pipelines start at the inlet and run in the same direction as the flow.
- 2.The profile show ground levels of all surveyed points and invert levels at points where the gradient changes.
- 3.All levels are given to two decimals of metre and the chainage to the metre only.
- 4.The profiles show static head, the hydraulic gradient in percent, pipe material size and class.
- 5.The plans show enough features of the terrain to make it possible to find the surveyed line at the time of the construction.
6. A general Layout Plan covering the whole supply system is be provided in schematic format as drawing indexed MUSWAS-2020-002 Showing pipe dimensions and reservoir capacities.

LEGEND:

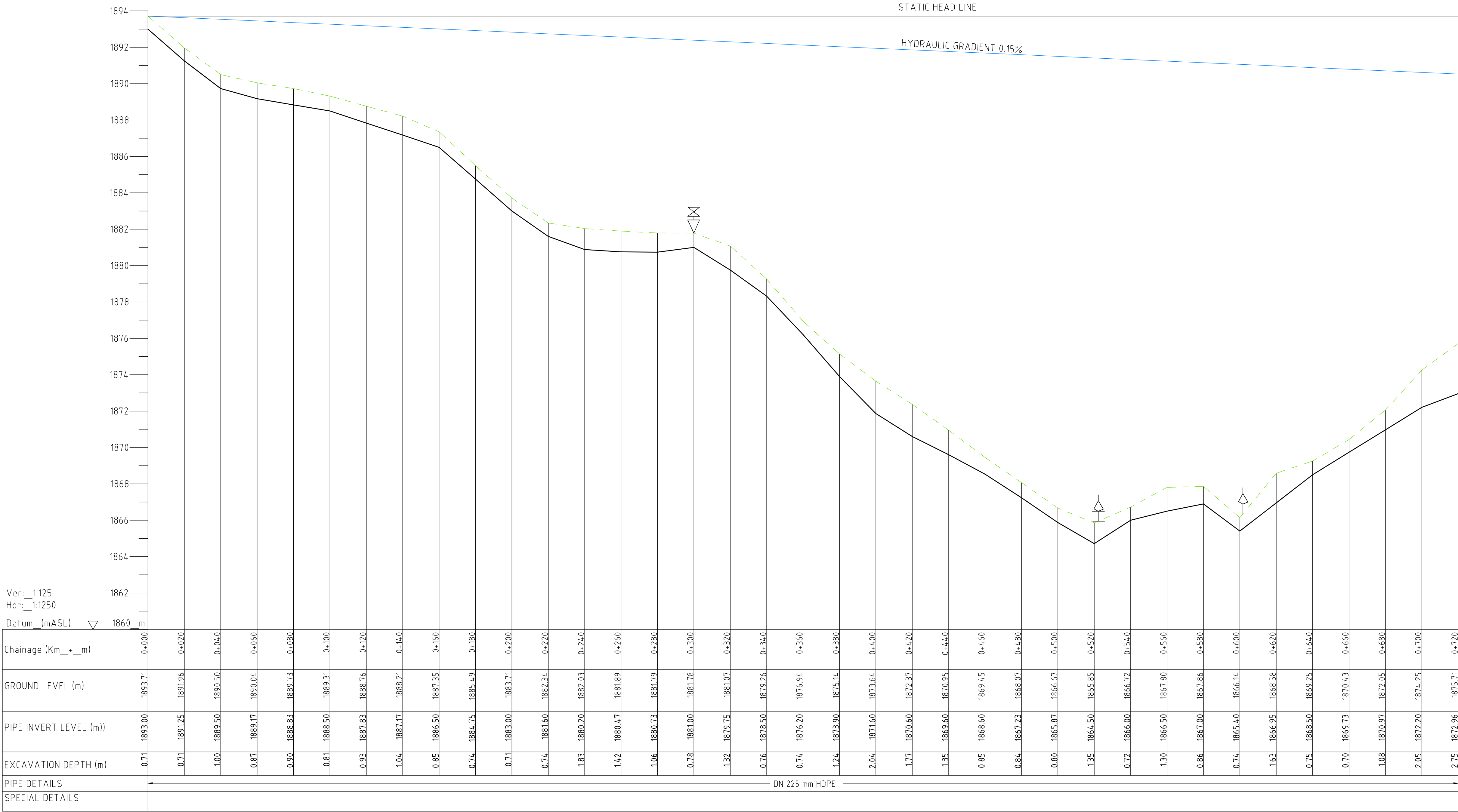
- 1.All dimensions are in metres
 - 2.the actual setting out to be confirmed on site by the engineer
- EXISTING WATER PIPELINE
 - EXISTING GROUND LEVEL
 - PROPOSED WATER PIPELINE
 - MURRAM ROAD
 - AIR VALVE
 - WASH OUT
 - FIRE HYDRANT

Revised		Comments		Emitter	Proposed	Project		KANDARA WATER SUPPLY PROJECT		State		FINAL DESIGN REVIEW	
Design	Date			 <div>ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 452-300100, Athi River Center, Homa Bay Road Nairobi Kenya Tel: 254 20 272743 email: athi@athiwat.co.ke</div>						Date	JULY 2030		
										Drawing No	MUSWAS:GMP:026		
										State	Plan: H: 1:1250, Ver: 1:125	Sheet Size	A1
										Sheet No	26 of 26		
										Index No	MUSWAS:2020:034		
									MARIIRA DN 355mm GRAVITY MAIN WATER PIPELINE PLAN AND PROFILE				

2.3. DISTRIBUTION MAIN WATER PIPELINE



PLAN
SCALE 1:1250



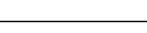
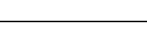
PROFILE
SCALE Horiz.1:1250
Vert: 1:125

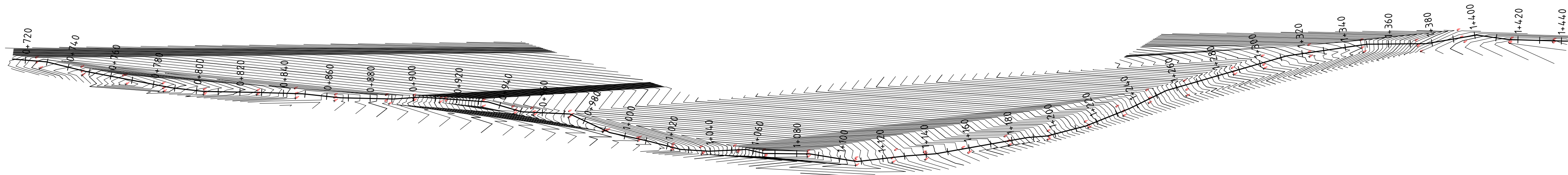
NOTES:

- 1..Chainage of pipelines start at the inlet and run in the same direction as the flow.
- 2.The profile show ground levels of all surveyed points and invert levels at points where the gradient changes.
- 3.All levels are given to two decimals of metre and the chainage to the metre only.
- 4.The profiles show static head, the hydraulic gradient in percent, pipe material size and class.
- 5.The plans show enough features of the terrain to make it possible to find the surveyed line at the time of the construction.
6. A general Layout Plan covering the whole supply system is be provided in schematic format as drawing indexed MUSWAS-2020-002 Showing pipe dimensions and reservoir capacities.

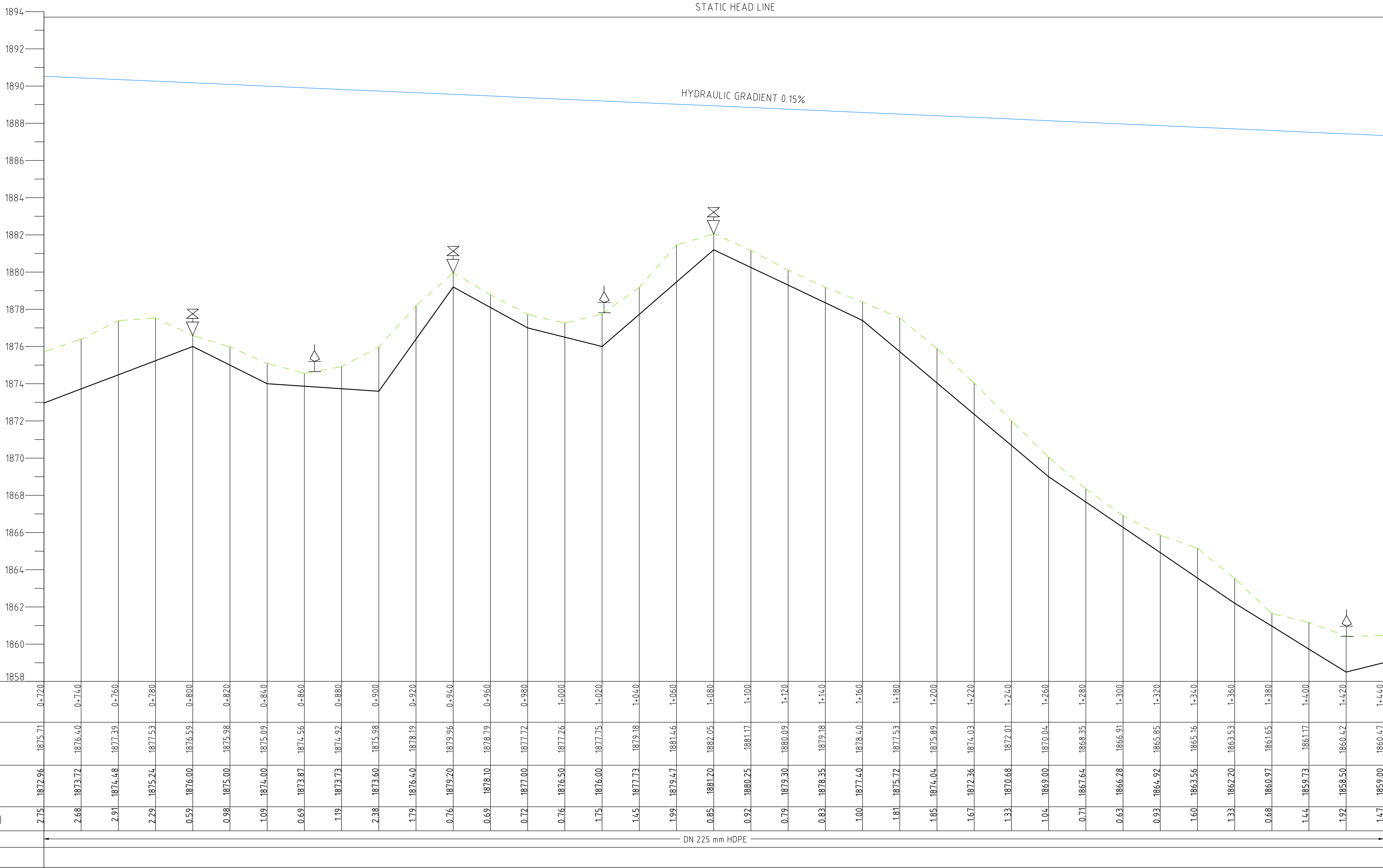
LEGEND:

- 1.All dimensions are in metres
 - 2.the actual setting out to be confirmed on site by the engineer
- EXISTING GROUND LEVEL
 - PROPOSED WATER PIPELINE
 - MURRAM ROAD
 - AIR VALVE
 - WASH OUT
 - FH FIRE HYDRANT

Revised		Comments		Emitted	Project Manager	Deleted	Project	KANDARA WATER SUPPLY PROJECT	Scale	FINAL DESIGN REVIEW												
Drawn	Date										Date	JULY 2023										
				 <div>ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 452/3/00100, Athira Center, Haritala Road Nairobi Kenya Tel: 254 20 272743 email: athiwa@ard.or.ke</div>		Drawing Title	MARIIRA DN 225 mm DISTRIBUTION MAIN PLAN AND PROFILE	Scale	Pa.Hor.1:1250, Ver1:125	Sheet Size	A1											
Drawing No	1	19																				
Index No	MUSWAS/2020/035																					



PLAN
SCALE 1:1250



PROFILE
SCALE Horiz.1:1250
Vert: 1:125

NOTES:

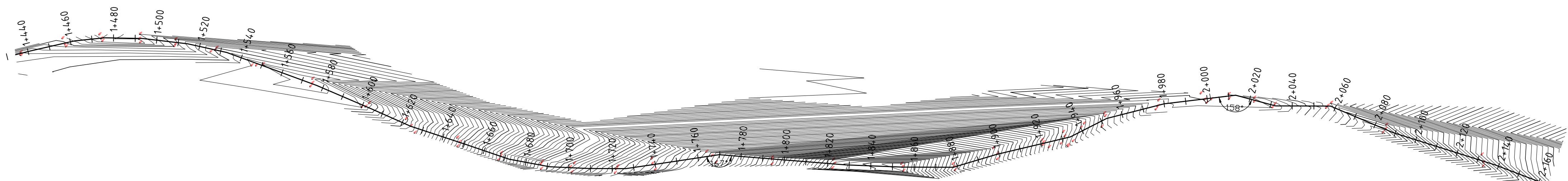
- 1.Chainage of pipelines start at the inlet and run in the same direction as the flow.
- 2.The profile show ground levels of all surveyed points and invert levels at points where the gradient changes.
- 3.All levels are given to two decimals of metre and the chainage to the metre only.
- 4.The profiles show static head, the hydraulic gradient in percent, pipe material size and class.
- 5.The plans show enough features of the terrain to make it possible to find the surveyed line at the time of the construction.
6. A general Layout Plan covering the whole supply system is be provided in schematic format as drawing indexed MUSWAS-2020-002 Showing pipe dimensions and reservoir capacities.

LEGEND:

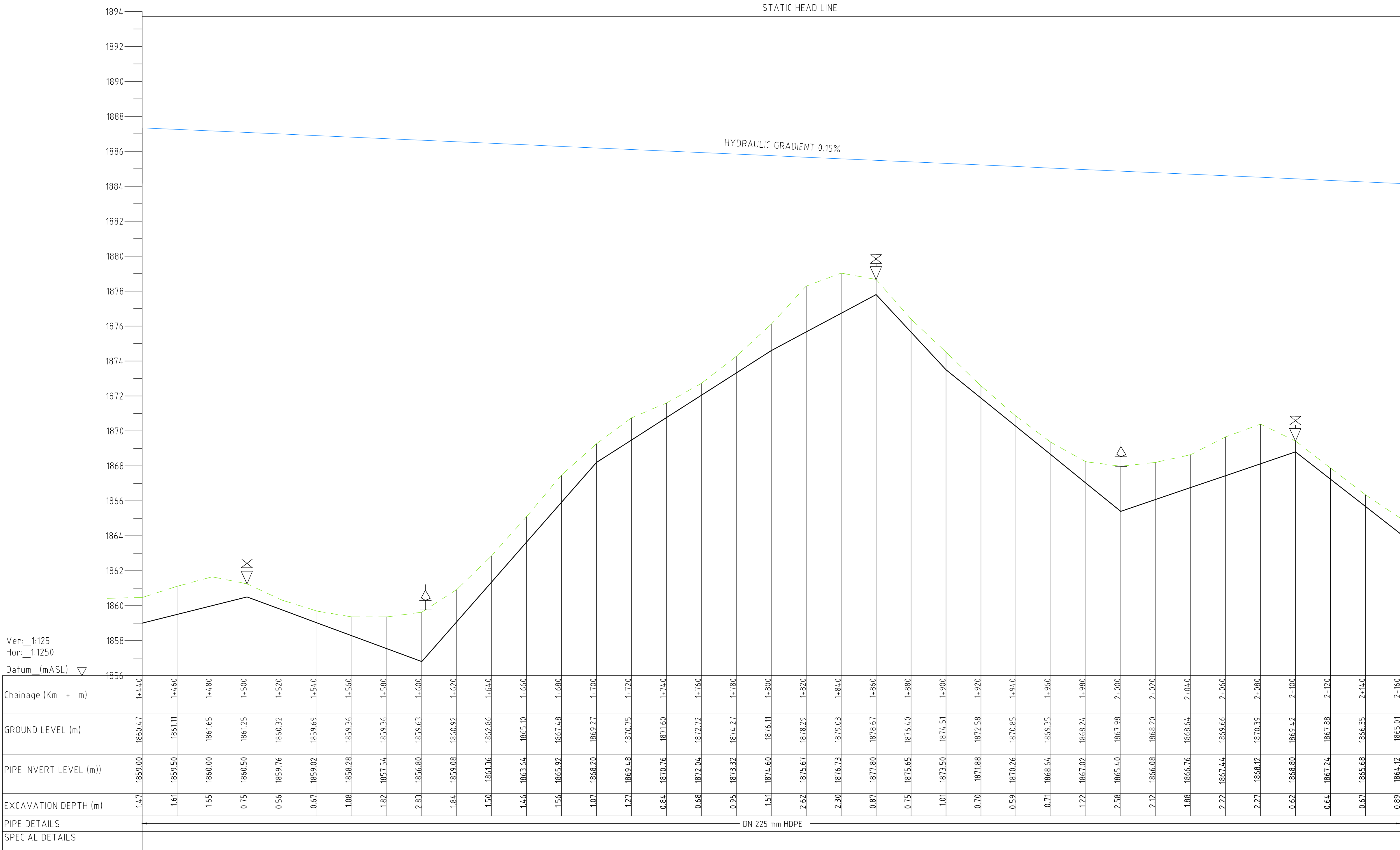
- 1.All dimensions are in metres
- 2.the actual setting out to be confirmed on site by the engineer

- EXISTING GROUND LEVEL
- PROPOSED WATER PIPELINE
- MURRAM ROAD
- AIR VALVE
- WASH OUT
- FIRE HYDRANT

Revised		Comments		Emmitter	Project Manager	KANDARA WATER SUPPLY PROJECT		Stage FINAL DESIGN REVIEW	
Design	Date			ATHI WATER WORKS DEVELOPMENT AGENCY P.O BOX 4523/00100, Athi River Center, Homa Bay Road Nairobi Kenya Tel: 254 20 272743 email: athi@ard.co.ke				Date JULY 2023	
								Drawing No. MUSWAS:DM:002	
								Scale Plan: 1:1250, Ver: 1:125	Sheet Size
								Revision 2 of 19	A1
								Index No. MUSWAS:2020:036	



PLAN
SCALE 1:1250




PROFILE
SCALE Horiz.1:1250
Vert: 1:125

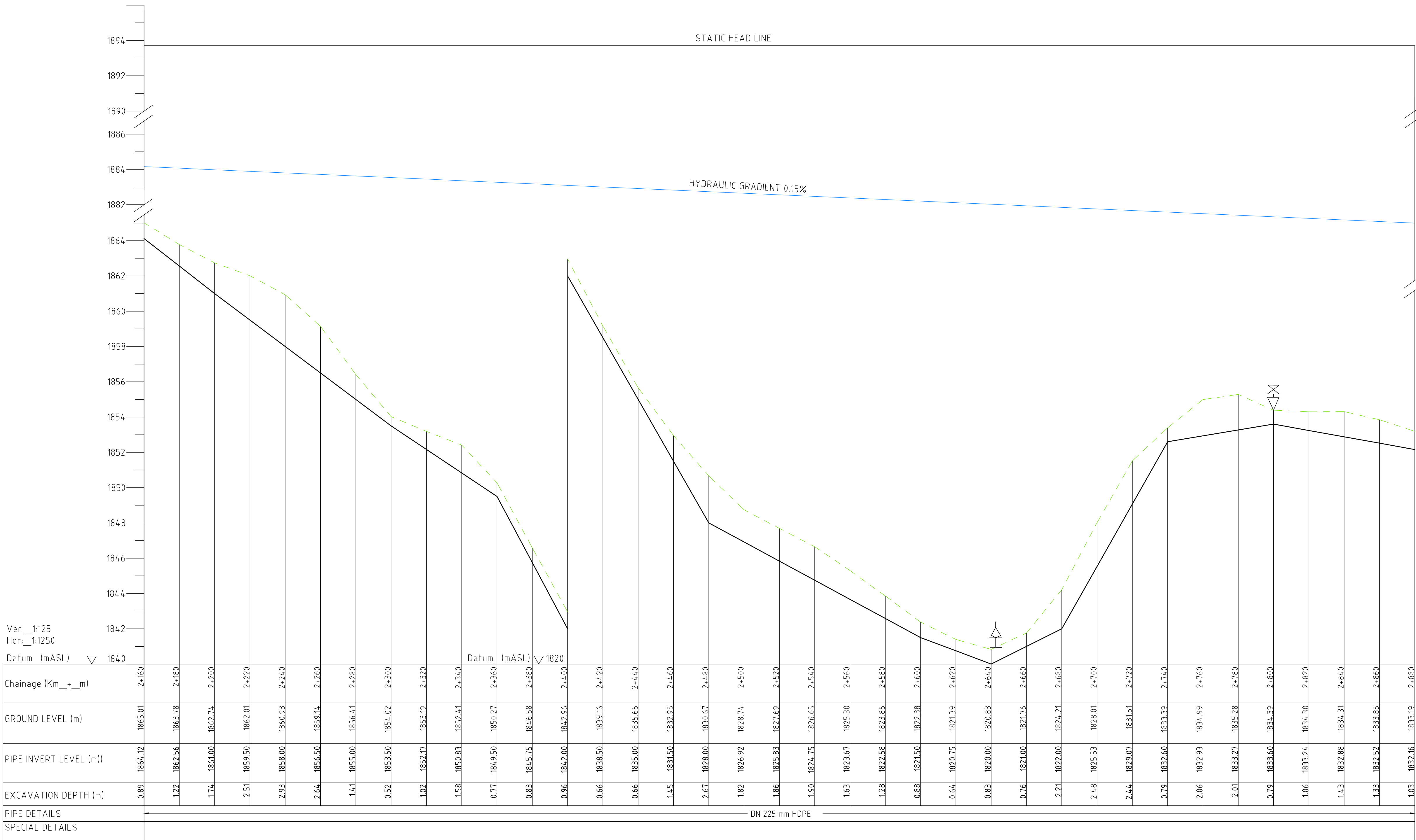
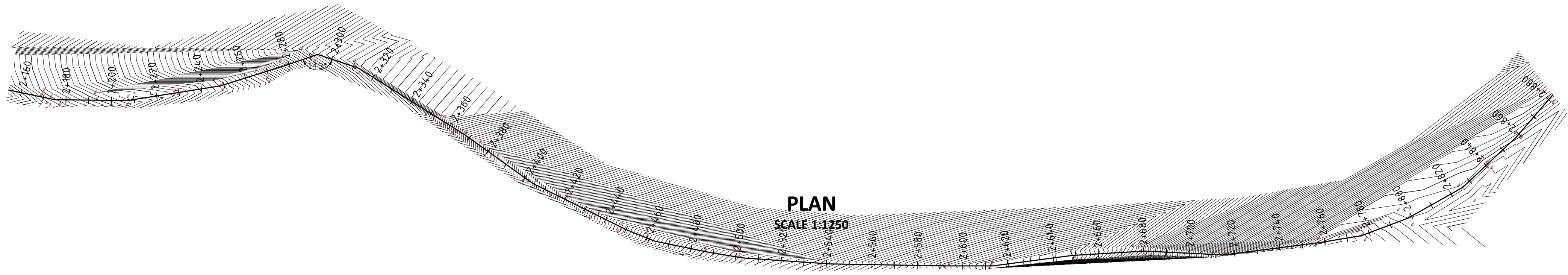
NOTES:

- 1.Chainage of pipelines start at the inlet and run in the same direction as the flow.
- 2.The profile show ground levels of all surveyed points and invert levels at points where the gradient changes.
- 3.All levels are given to two decimals of metre and the chainage to the metre only.
- 4.The profiles show static head, the hydraulic gradient in percent, pipe material size and class.
- 5.The plans show enough features of the terrain to make it possible to find the surveyed line at the time of the construction.
6. A general Layout Plan covering the whole supply system is be provided in indexed MUSWAS-2020-002 Showing pipe dimensions and reservoir capacities.

LEGEND:

- 1.All dimensions are in metres
 - 2.the actual setting out to be confirmed on site by the engineer
- EXISTING GROUND LEVEL
 - PROPOSED WATER PIPELINE
 - MURRAM ROAD
 - AIR VALVE
 - WASH OUT
 - FH FIRE HYDRANT

Revised		Contract		Employer		Project Manager		KANDARA WATER SUPPLY PROJECT		Scale		FINAL DESIGN REVIEW	
Drawn	Date	T		<div><div>ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 4523/00100, Athi River Center, Highway Road Nairobi Kenya Tel: 254 20 272743 email: athi@ard.co.ke</div></div>		<div></div>				Date		JULY 2023	
								Drawing No		MUSWAS/DM/003			
								Scale		Plan: 1:1250, Ver: 1:125		Sheet Size	
								Sheet No		3 of 19		A1	
								Index No		MUSWAS/2020/037			




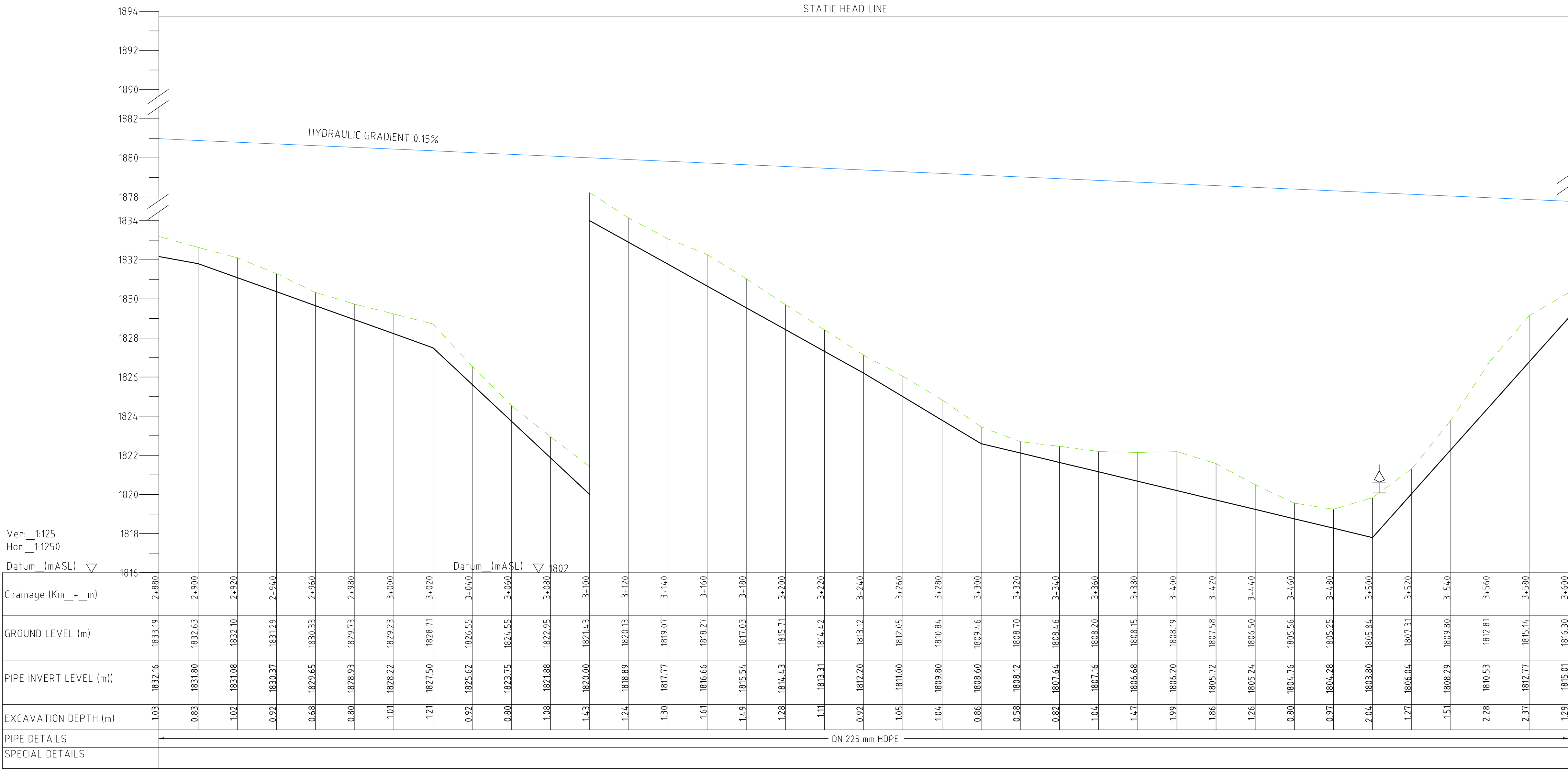
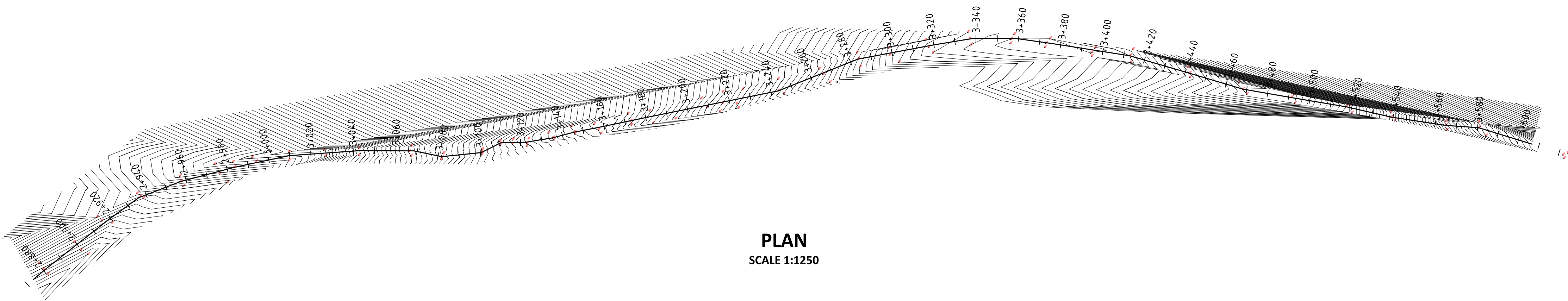
NOTES:

- 1..Chainage of pipelines start at the inlet and run in the same direction as the flow.
- 2.The profile show ground levels of all surveyed points and invert levels at points where the gradient changes.
- 3.All levels are given to two decimals of metre and the chainage to the metre only.
- 4.The profiles show static head, the hydraulic gradient in percent, pipe material size and class.
- 5.The plans show enough features of the terrain to make it possible to find the surveyed line at the time of the construction.
6. A general Layout Plan covering the whole supply system is be provided in schematic format as drawing indexed MUSWAS-2020-002 Showing pipe dimensions and reservoir capacities.

LEGEND:

- 1.All dimensions are in metres
 - 2.the actual setting out to be confirmed on site by the engineer
- EXISTING GROUND LEVEL
 - PROPOSED WATER PIPELINE
 - MURRAM ROAD
 - AIR VALVE
 - WASH OUT
 - FIRE HYDRANT

Revised		Comments		Engineer	Project Manager	KANDARA WATER SUPPLY PROJECT	Stage		FINAL DESIGN REVIEW
Drawn	Date	<div><div>ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 452-300100, Athi River Center, Homa Bay Road Nairobi Kenya Tel: 254 20 272743 email: awd@ard.co.ke</div></div>		<div></div>	Date		JULY 2023	Drawn No	MUSWAS:DM:004
				Drawn Title	MARIIRA DN 225 mm DISTRIBUTION MAIN PLAN AND PROFILE	Scale	Plan, Horiz. 1:1250, Ver 1:125	Sheet Size	A1
						Sheet No	4 of 19		
								Index No	MUSWAS:2020:03



PROFILE
SCALE Horiz.1:1250
Vert: 1:125

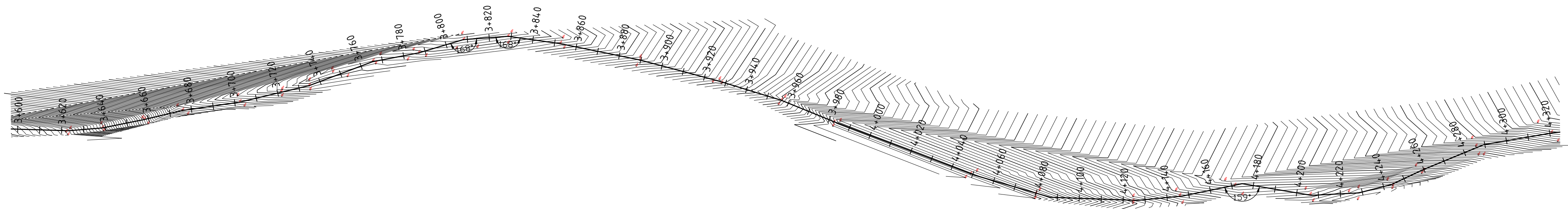
NOTES:

- Plan and profile are on the same sheet and to the same horizontal scale.
- Chainage of pipelines start at the inlet and run in the same direction as the flow.
- The profile show ground levels of all surveyed points and invert levels at points where the gradient changes.
- All levels are given to two decimals of metre and the chainage to the metre only.
- The profiles show static head, the hydraulic gradient in percent, pipe material size and class.
- The plans show enough features of the terrain to make it possible to find the surveyed line at the time of the construction.
- A general Layout Plan covering the whole supply system is be provided in schematic format as drawing indexed MUSWAS-2020-002 Showing pipe dimensions and reservoir capacities.

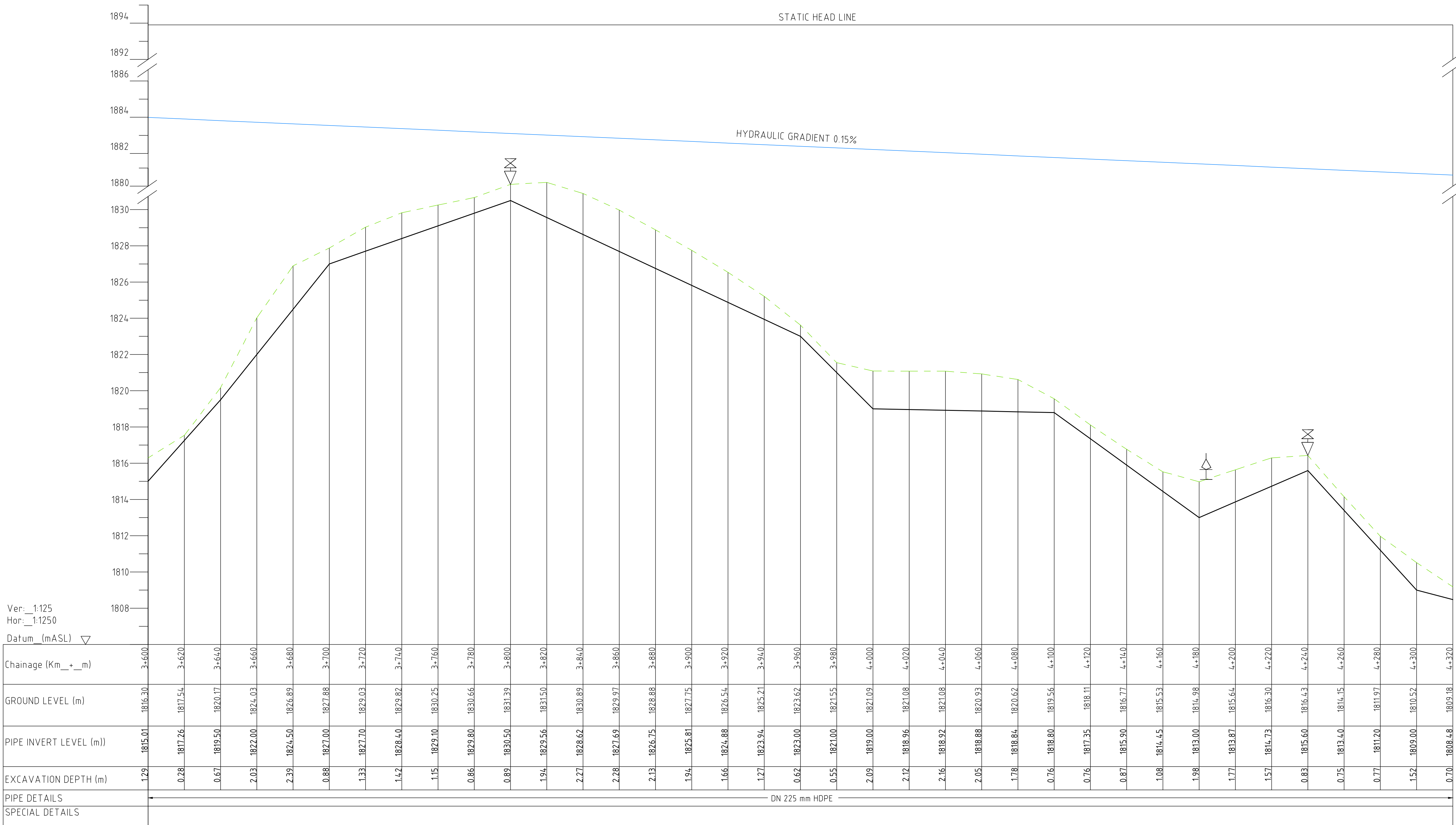
LEGEND:

- All dimensions are in metres
 - the actual setting out to be confirmed on site by the engineer
- EXISTING GROUND LEVEL
 - PROPOSED WATER PIPELINE
 - MURRUMBIDGEE ROAD
 - AIR VALVE
 - WASH OUT
 - FIRE HYDRANT

Revised		Contract		Employer	Project Manager	KANDARA WATER SUPPLY PROJECT		Stage FINAL DESIGN REVIEW	
Drawn	Date			ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 45200100, Africa Re Center, Harare Road Nairobi Kenya Tel: 254 20 272743 email: a@ard.co.ke				Date JULY 2020	
								Drawn: MUSWAS:DM:005	
						Mariira DN 225 mm Distribution		Scale: Plan: 1:1250, Ver: 1:125	Sheet Size
						MAIN PLAN AND PROFILE		Sheet No: 5 of 19	A1
								Index No: MUSWAS:2020:039	



PLAN
SCALE 1:1250



PROFILE
SCALE Horiz.1:1250
Vert: 1:125

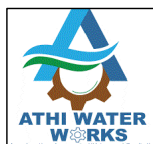
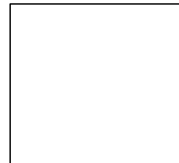
NOTES:

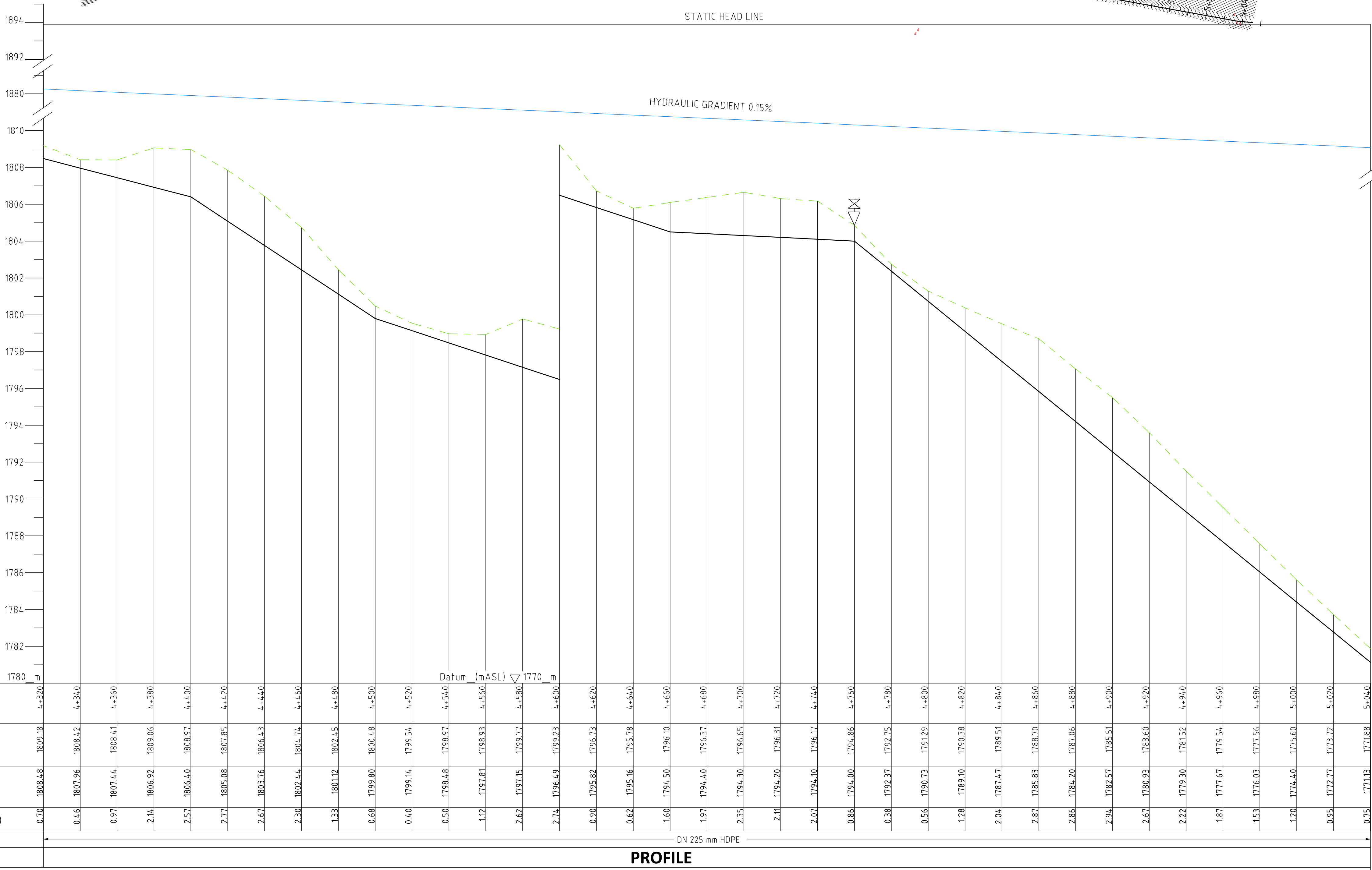
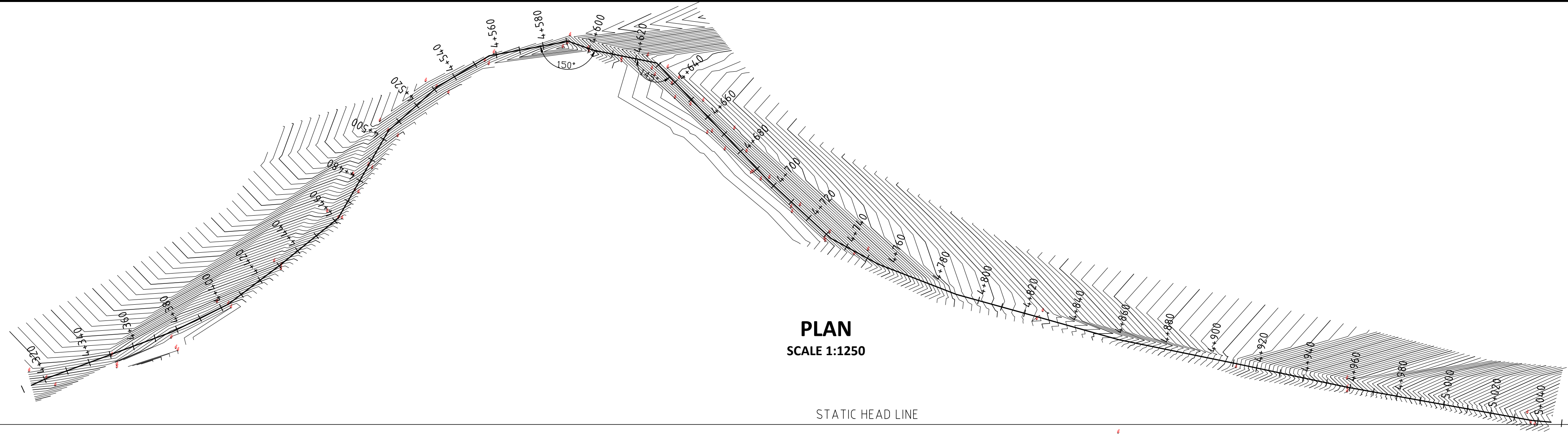
- 1..Chainage of pipelines start at the inlet and run in the same direction as the flow.
- 2.The profile show ground levels of all surveyed points and invert levels at points where the gradient changes.
- 3.All levels are given to two decimals of metre and the chainage to the metre only.
- 4.The profiles show static head, the hydraulic gradient in percent, pipe material size and class.
- 5.The plans show enough features of the terrain to make it possible to find the surveyed line at the time of the construction.
6. A general Layout Plan covering the whole supply system is be provided in schematic format as drawing indexed MUSWAS-2020-002 Showing pipe dimensions and reservoir capacities.

LEGEND:

- 1.All dimensions are in metres
- 2.the actual setting out to be confirmed on site by the engineer

- EXISTING GROUND LEVEL
- PROPOSED WATER PIPELINE
- MURRAM ROAD
- AIR VALVE
- WASH OUT
- FIRE HYDRANT

Revisi		Comments		Engineer	Project Manager	Project		Scale		
Drawn	Date			 ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 452-300100, Africa Re Center, Harare Nairobi Kenya Tel: 254 20 272743 email: a@ard.co.ke		KANDARA WATER SUPPLY PROJECT		FINAL DESIGN REVIEW		
						Date: JULY 2023				
						Drawing No: MUSWAS-DM-006				
						Scale: Plan: 1:1250, Ver: 1:125		Sheet Size: A1		
									Sheet No: 6 of 19	
								Drawing Title: MARIIRA DN 225 mm DISTRIBUTION MAIN PLAN AND PROFILE		Index No: MUSWAS-2020-040

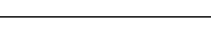



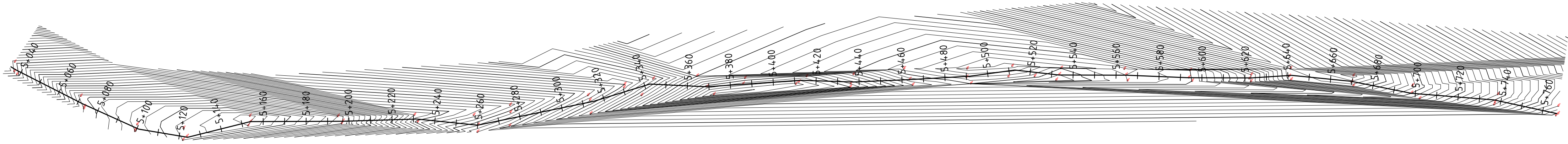
NOTES:

- Chainage of pipelines start at the inlet and run in the same direction as the flow.
- The profile show ground levels of all surveyed points and invert levels at points where the gradient changes.
- All levels are given to two decimals of metre and the chainage to the metre only.
- The profiles show static head, the hydraulic gradient in percent, pipe material size and class.
- The plans show enough features of the terrain to make it possible to find the surveyed line at the time of the construction.
- A general Layout Plan covering the whole supply system is be provided in schematic format as drawing indexed MUSWAS-2020-002 Showing pipe dimensions and reservoir capacities.

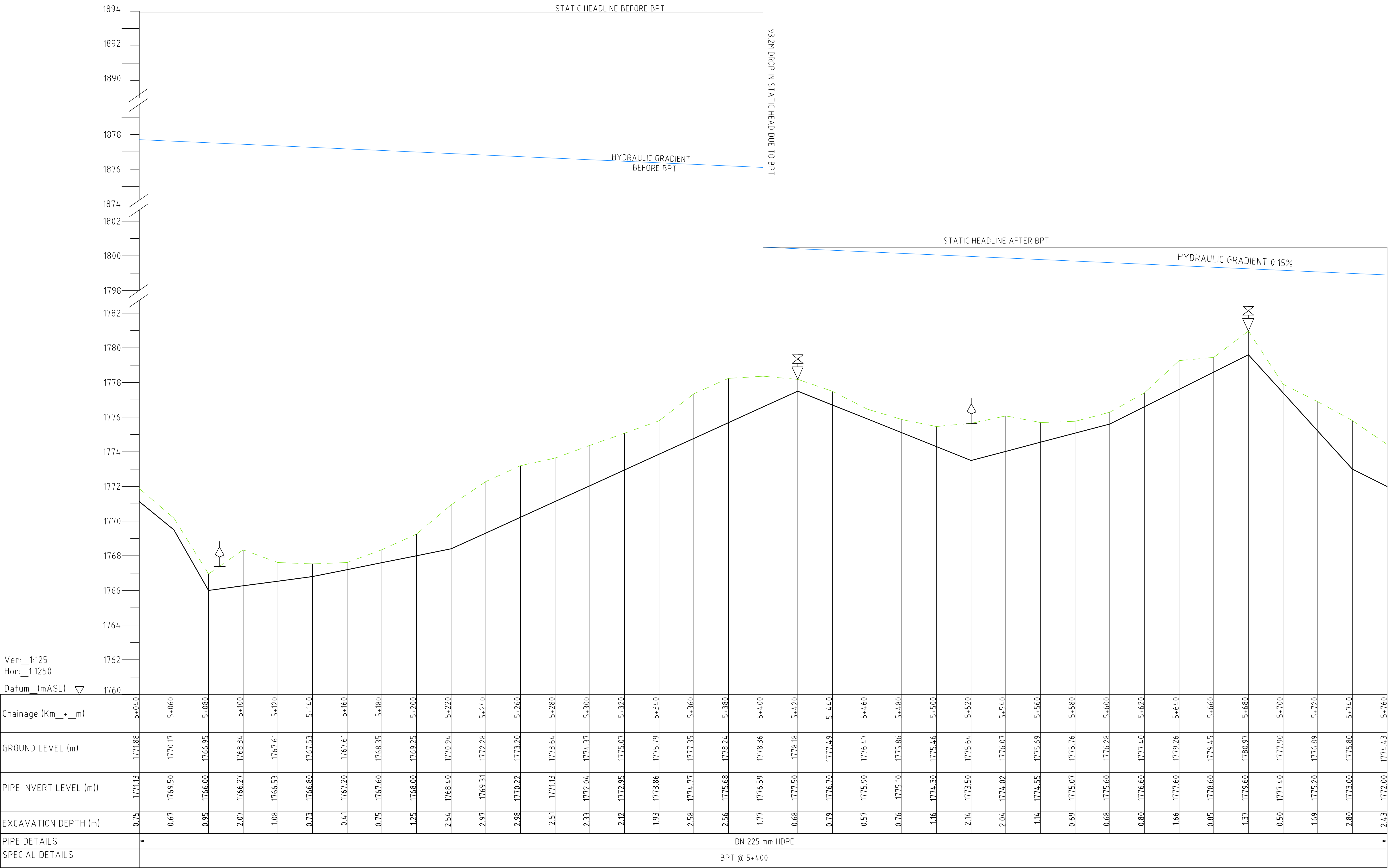
LEGEND:

- All dimensions are in metres
 - the actual setting out to be confirmed on site by the engineer
- EXISTING GROUND LEVEL
 - PROPOSED WATER PIPELINE
 - MURRAM ROAD
 - AIR VALVE
 - WASH OUT
 - FIRE HYDRANT

Revised		Comments		Engineer	Project Manager	Project		KANDARA WATER SUPPLY PROJECT		Sheet		FINAL DESIGN REVIEW	
Design	Date			 <div>ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 452-300100, Athi River Center, Homa Bay Road Nairobi Kenya Tel: 254 20 272743 email: athi@ard.ac.ke</div>		Design		KANDARA WATER SUPPLY PROJECT		Sheet		JULY 2023	
		Drawing				MUSWAS:DM:007							
						MARIIRA DN 225 mm DISTRIBUTION MAIN PLAN AND PROFILE		Drawing Title		Scale: Plan, Horiz. 1:1250, Ver. 1:25		Sheet Size	A1
								Drawing Title		7 of 19			
												Index No		MUSWAS:2020:041



PLAN
SCALE 1:1250



PROFILE
SCALE Horiz.1:1250
Vert: 1:125

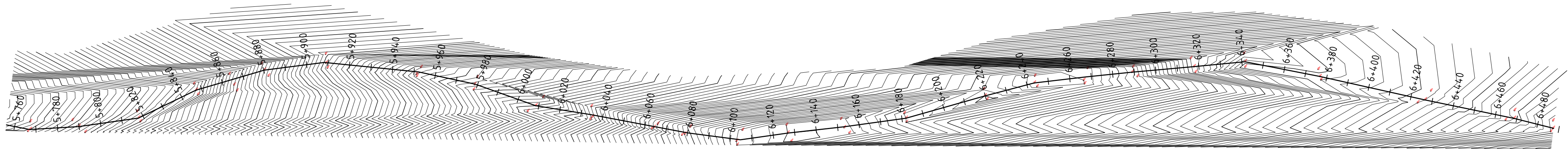
NOTES:

- 1..Chainage of pipelines start at the inlet and run in the same direction as the flow.
- 2.The profile show ground levels of all surveyed points and invert levels at points where the gradient changes.
- 3.All levels are given to two decimals of metre and the chainage to the metre only.
- 4.The profiles show static head, the hydraulic gradient in percent, pipe material size and class.
- 5.The plans show enough features of the terrain to make it possible to find the surveyed line at the time of the construction.
6. A general Layout Plan covering the whole supply system is be provided in schematic format as drawing indexed MUSWAS-2020-002 Showing pipe dimensions and reservoir capacities.

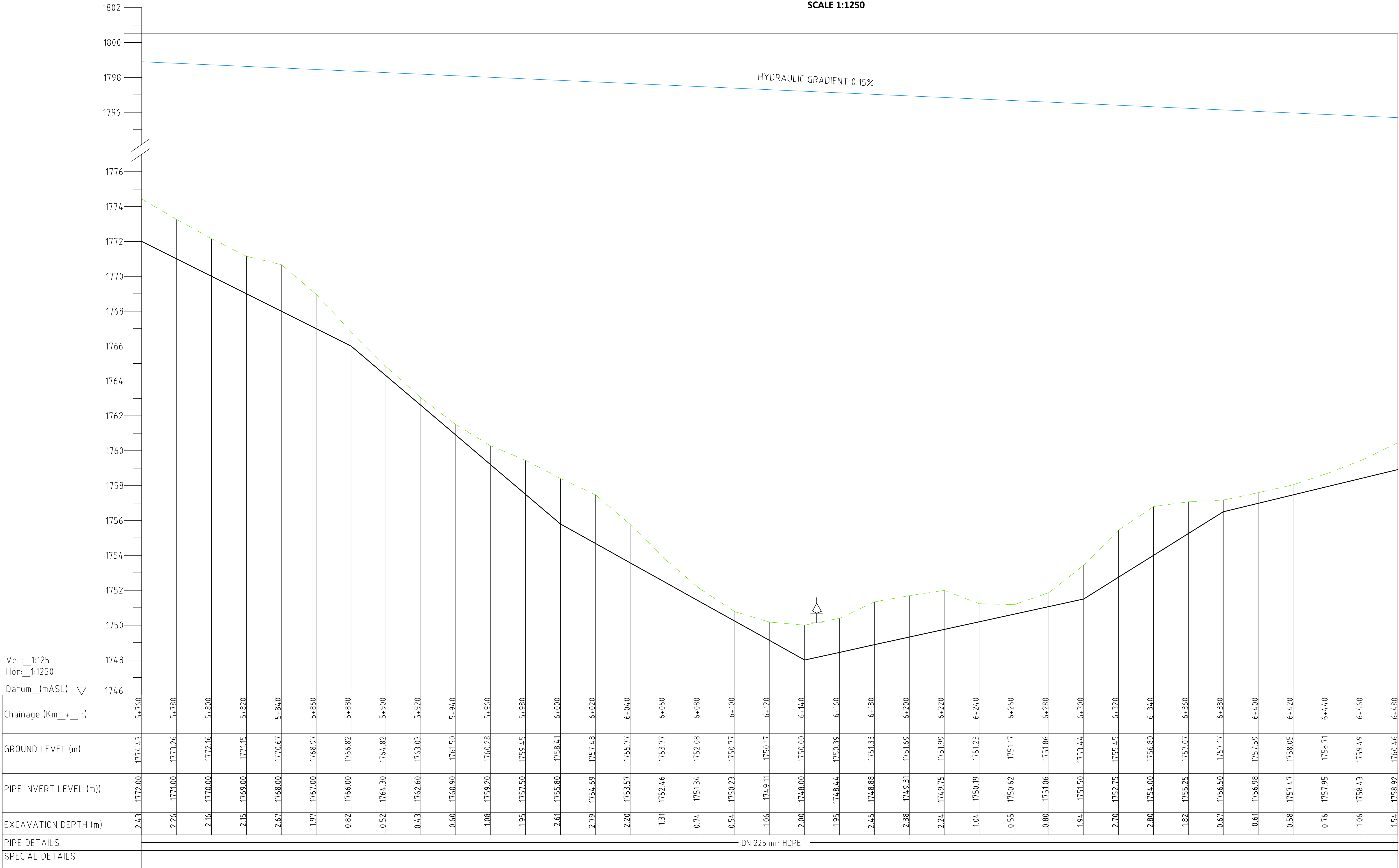
LEGEND:

- 1.All dimensions are in metres
 - 2.the actual setting out to be confirmed on site by the engineer
- EXISTING GROUND LEVEL
 - PROPOSED WATER PIPELINE
 - MURRAM ROAD
 - X AIR VALVE
 - △ WASH OUT
 - FH FIRE HYDRANT

Revised		Comments		Emitted	Project Manager	Designed	Project KANDARA WATER SUPPLY PROJECT		Stage FINAL DESIGN REVIEW	
Design	Date					Drawing			Date JULY 2023	
.	.								Drawing No. MUSWAS:DM:00	
.	.					Created	Drawing Title		Scale Pa. Horiz.1:1250, Ver1:125	Sheet Size
.	.								Sheet No. 19	A1
.	.					Approved			Index No. MUSWAS:2020:042	



PLAN
SCALE 1:1250



PROFILE
SCALE Horiz.1:1250
Vert: 1:125

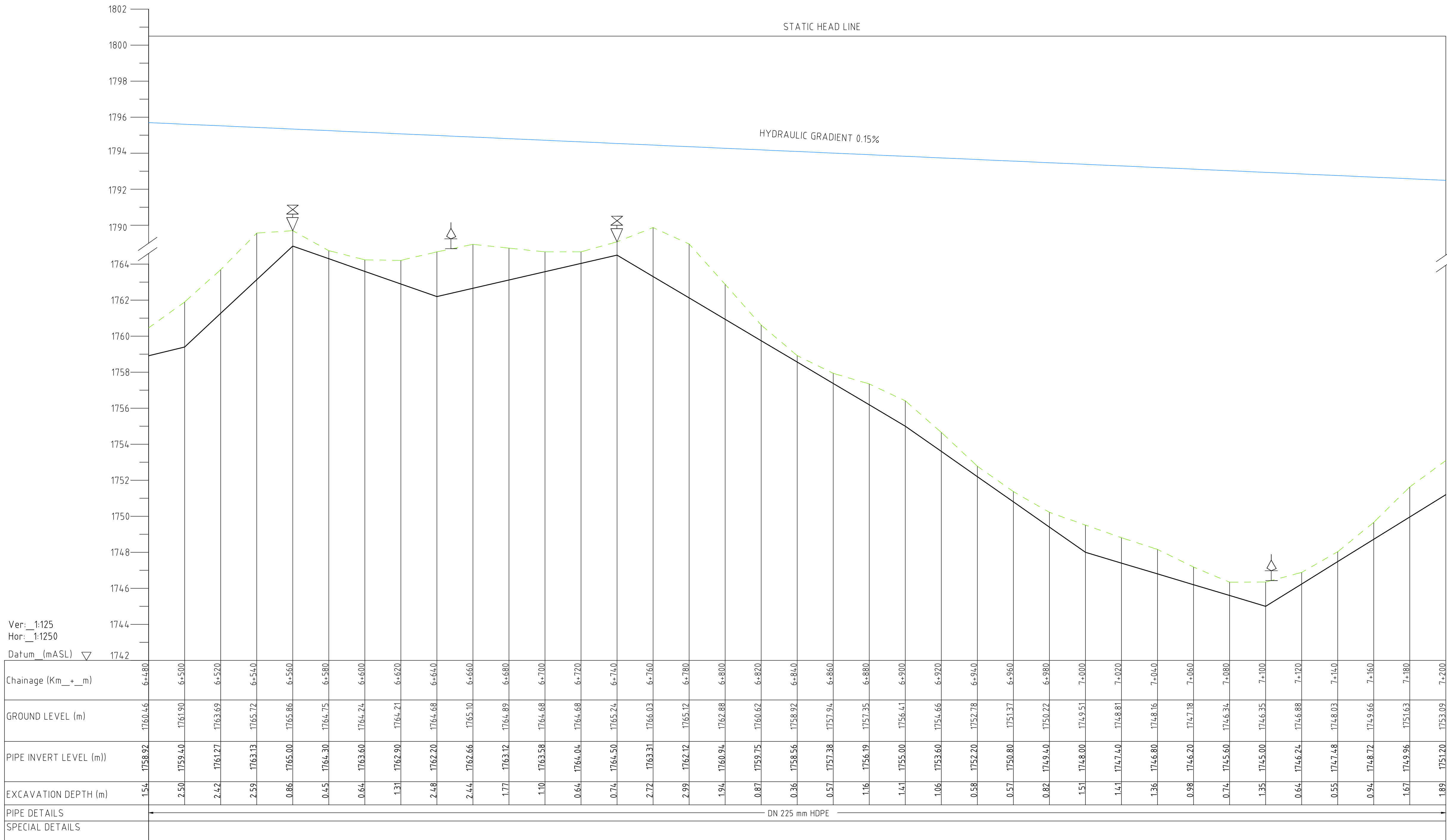
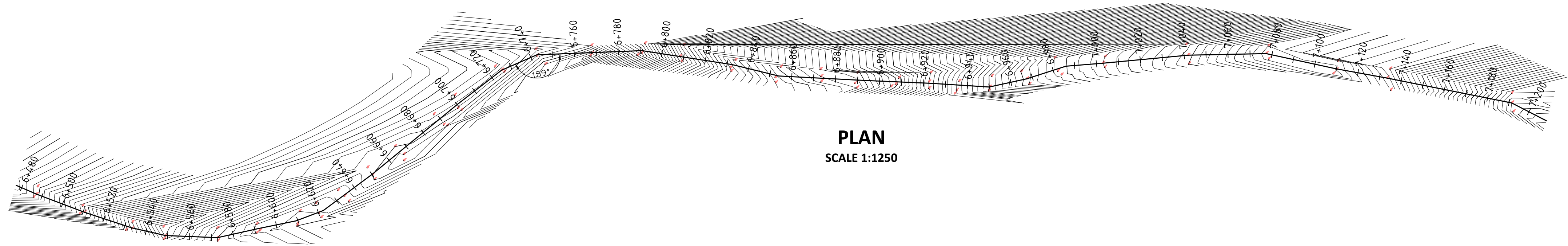
NOTES:

- 1..Chainage of pipelines start at the inlet and run in the same direction as the flow.
- 2.The profile show ground levels of all surveyed points and invert levels at points where the gradient changes.
- 3.All levels are given to two decimals of metre and the chainage to the metre only.
- 4.The profiles show static head, the hydraulic gradient in percent, pipe material size and class.
- 5.The plans show enough features of the terrain to make it possible to find the surveyed line at the time of the construction.
6. A general Layout Plan covering the whole supply system is be provided in schematic format as drawing indexed MUSWAS-2020-002 Showing pipe dimensions and reservoir capacities.

LEGEND:

- 1.All dimensions are in metres
 - 2.the actual setting out to be confirmed on site by the engineer
- EXISTING GROUND LEVEL
 - PROPOSED WATER PIPELINE
 - MURRUM ROAD
 - AIR VALVE
 - WASH OUT
 - FIRE HYDRANT

Revised		Comments		Emmitter		Project Manager		Design		Project		Status	
Design	Date			ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 452300100, Athi River Center, Highway 100 Nairobi Kenya Tel: 254 20 2727433 email: awd@athiwat.co.ke				Drawn		KANDARA WATER SUPPLY PROJECT		Final Design Review	
								Checked				Date: JULY 2020	
								Drawn				Drawing No: MUSWAS:DM.009	
								Created		Drawing Title		Scale: Plan: 1:1250, Ver: 1:125	
								Approved		MARIIRA DN 225 mm DISTRIBUTION MAIN PLAN AND PROFILE		Sheet Size: A1	
												Sheet No: 9 of 19	
												Index No: MUSWAS:2020:043	



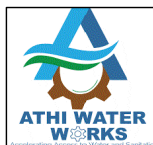
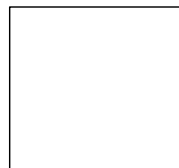
PROFILE
SCALE Horiz.1:1250
Vert: 1:125

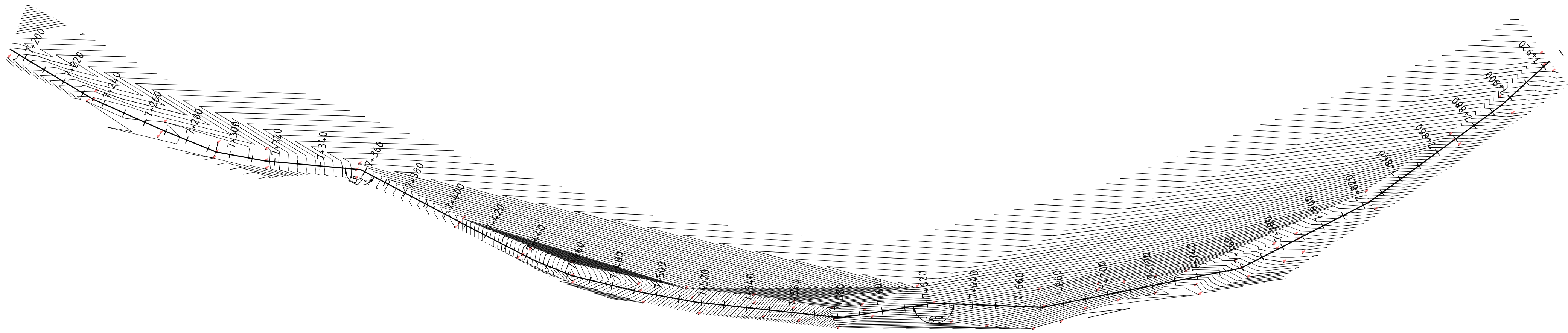
NOTES:

- 1.Chainage of pipelines start at the inlet and run in the same direction as the flow.
- 2.The profile show ground levels of all surveyed points and invert levels at points where the gradient changes.
- 3.All levels are given to two decimals of metre and the chainage to the metre only.
- 4.The profiles show static head, the hydraulic gradient in percent, pipe material size and class.
- 5.The plans show enough features of the terrain to make it possible to find the surveyed line at the time of the construction.
6. A general Layout Plan covering the whole supply system is be provided in schematic format as drawing indexed MUSWAS-2020-002 Showing pipe dimensions and reservoir capacities.

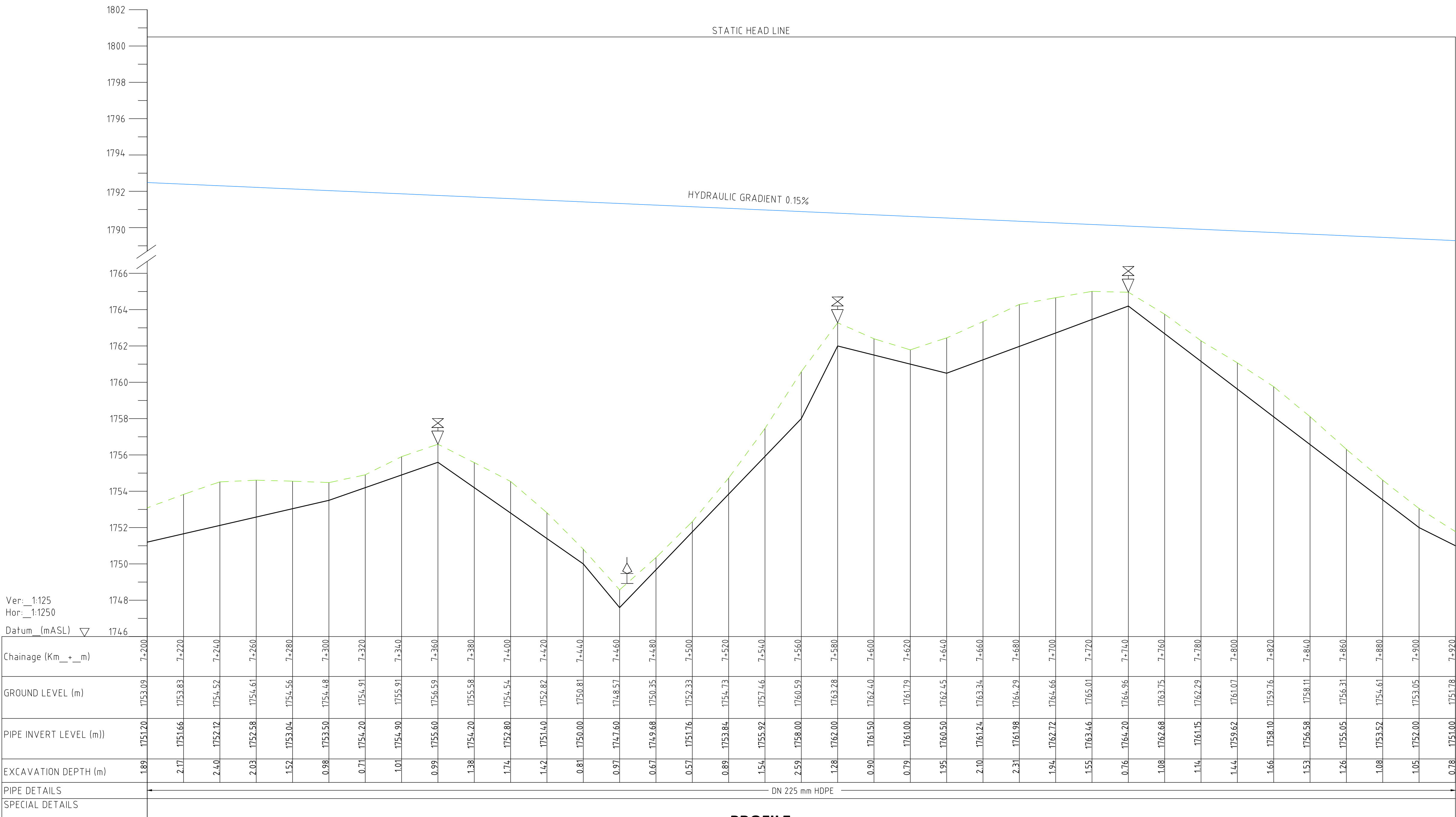
LEGEND:

- 1.All dimensions are in metres
 - 2.the actual setting out to be confirmed on site by the engineer
- EXISTING GROUND LEVEL
 - PROPOSED WATER PIPELINE
 - MURRAM ROAD
 - ▽ AIR VALVE
 - △ WASH OUT
 - FH FIRE HYDRANT

Revised		Comments		Emitter	Project Manager	Project	KANDARA WATER SUPPLY PROJECT		State		FINAL DESIGN REVIEW			
Drawn	Date			 ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 452-300100, Athi River Center, Homa Bay Road Nairobi Kenya Tel: 254 20 272743 email: a@athiwat.co.ke			Designed			Date	JULY 2023			
						Drawn			Drawn No		MUSWAS:DM:010			
						Checked	Drawn Title		MARIIRA DN 225 mm DISTRIBUTION MAIN PLAN AND PROFILE		Scale	Plan: H:V: 1:1250, Ver1:125	Sheet Size	A1
						Approved					Scale: No	10			19
										Index No	MUSWAS:2020:044			



PLAN
SCALE 1:1250



PROFILE
SCALE Horiz.1:1250
Vert: 1:125

NOTES:

- 1..Chainage of pipelines start at the inlet and run in the same direction as the flow.
- 2.The profile show ground levels of all surveyed points and invert levels at points where the gradient changes.
- 3.All levels are given to two decimals of metre and the chainage to the metre only.
- 4.The profiles show static head, the hydraulic gradient in percent, pipe material size and class.
- 5.The plans show enough features of the terrain to make it possible to find the surveyed line at the time of the construction.
6. A general Layout Plan covering the whole supply system is be provided in schematic format as drawing indexed MUSWAS-2020-002 Showing pipe dimensions and reservoir capacities.

LEGEND:

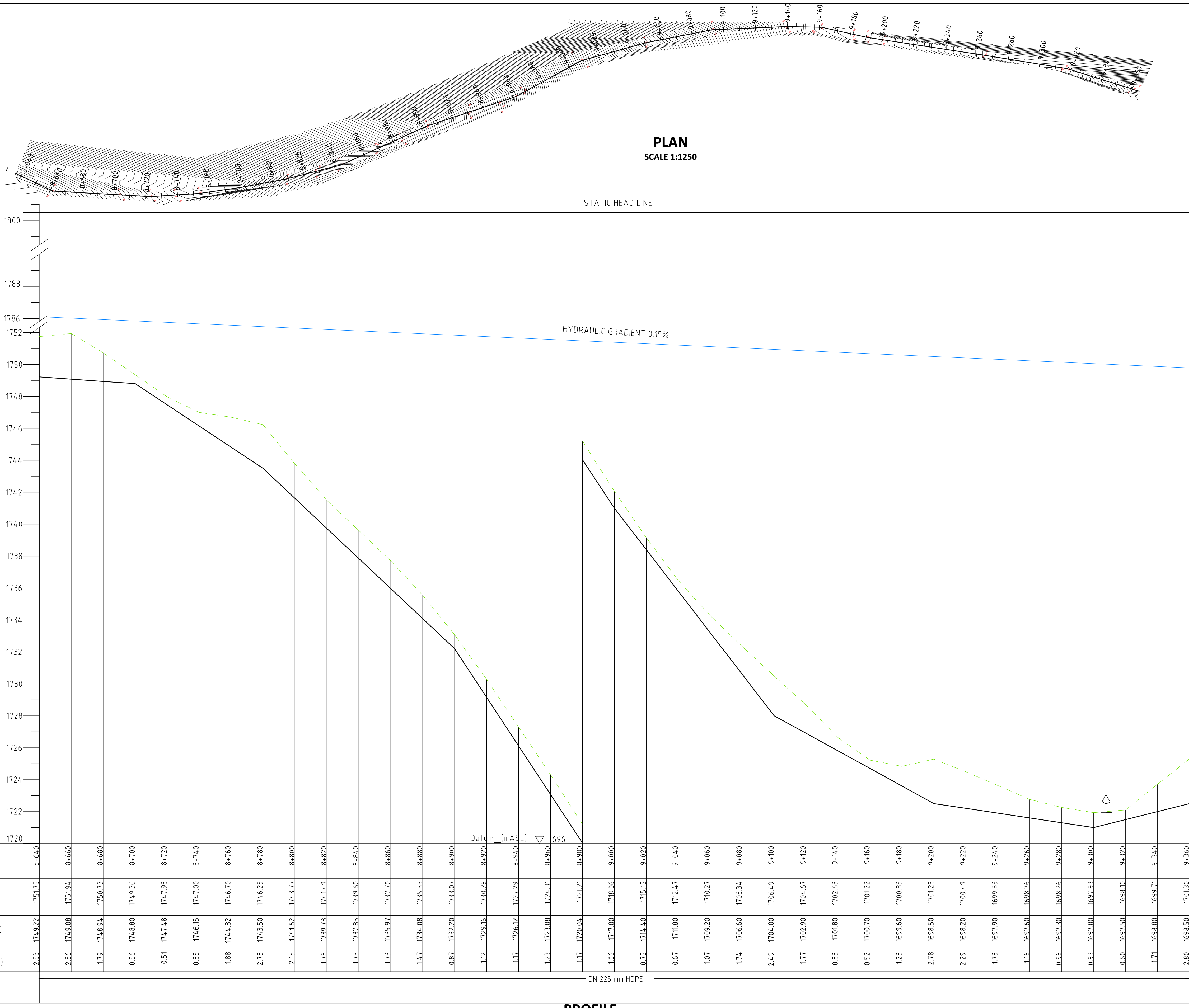
- 1.All dimensions are in metres
 - 2.the actual setting out to be confirmed on site by the engineer
- EXISTING GROUND LEVEL
 - PROPOSED WATER PIPELINE
 - MURRAM ROAD
 - AIR VALVE
 - WASH OUT
 - FIRE HYDRANT

Revised		Comments		Emitted	Project Manager	Designed	Project KANDARA WATER SUPPLY PROJECT		State FINAL DESIGN REVIEW	
Drawn	Date					Drawn			Date JULY 2023	
									Drawing No. MUSWAS:DM:011	
						Created	Drawing Title		Scale Pa, Horiz.1:1250, Ver1:125	Sheet Size
							MARIIRA DN 225 mm DISTRIBUTION MAIN PLAN AND PROFILE		Sheet No. 11 of 19	A1
						Approved			Index No. MUSWAS:2020:045	



ATHI WATER WORKS
DEVELOPMENT AGENCY
P.O Box 452-300100,
Athi River Center, Highway Road
Nairobi, Kenya
Tel: 254 20 272743
email: aww@ard.ac.ke





PROFILE
SCALE Horiz.1:1250
Vert: 1:125

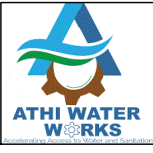

NOTES:

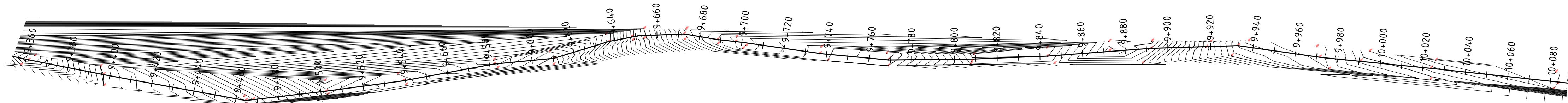
- 1..Chainage of pipelines start at the inlet and run in the same direction as the flow.
- 2.The profile show ground levels of all surveyed points and invert levels at points where the gradient changes.
- 3.All levels are given to two decimals of metre and the chainage to the metre only.
- 4.The profiles show static head, the hydraulic gradient in percent, pipe material size and class.
- 5.The plans show enough features of the terrain to make it possible to find the surveyed line at the time of the construction.
6. A general Layout Plan covering the whole supply system is be provided in schematic format as drawing indexed MUSWAS-2020-002 Showing pipe dimensions and reservoir capacities.

LEGEND:

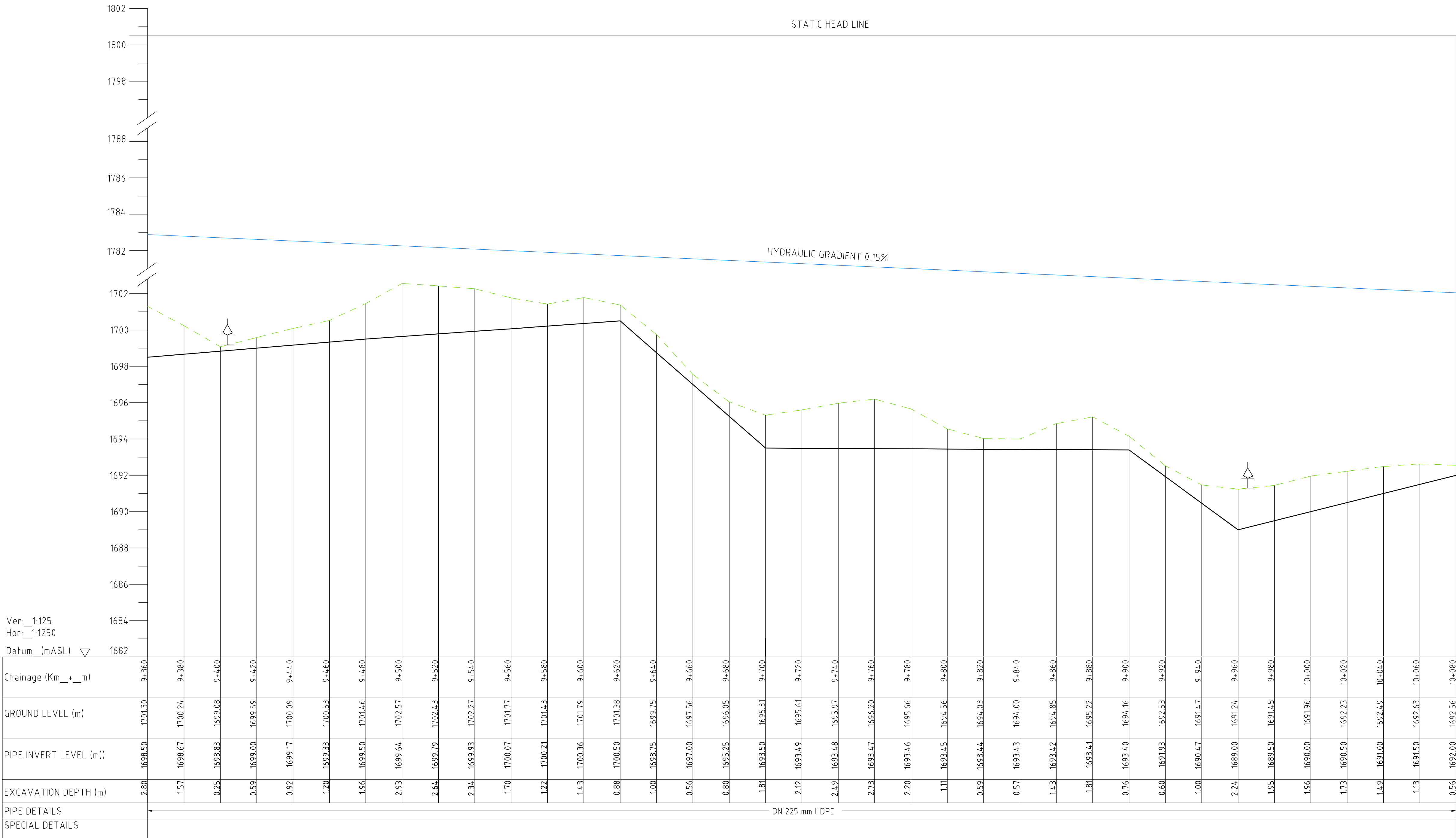
- 1.All dimensions are in metres
- 2.the actual setting out to be confirmed on site by the engineer

- EXISTING GROUND LEVEL
- PROPOSED WATER PIPELINE
- MURRAM ROAD
- AIR VALVE
- WASH OUT
- FIRE HYDRANT

Revised		Checked		Emitted		Project Manager		Project		KANDARA WATER SUPPLY PROJECT		State		FINAL DESIGN REVIEW	
Design	Date					<p>ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 452-300100, Africa Re Center, Harare Road Nairobi Kenya Tel: 254 20 272743 email: a@kard.co.ke</p>				Mariira DN 225 mm Distribution Main Plan and Profile		Date		JULY 2023	
.	.											Drawing No		MUSWAS:DM:013	
.	.											Scale		Plan, Horiz. 1:1250, Ver 1:125	
.	.											Sheet No		13 of 19	
.	.											Index No		MUSWAS:2020:047	
														A1	



PLAN
SCALE 1:1250



PROFILE
SCALE Horiz.1:1250
Vert: 1:125

NOTES:

- 1..Chainage of pipelines start at the inlet and run in the same direction as the flow.
- 2.The profile show ground levels of all surveyed points and invert levels at points where the gradient changes.
- 3.All levels are given to two decimals of metre and the chainage to the metre only.
- 4.The profiles show static head, the hydraulic gradient in percent, pipe material size and class.
- 5.The plans show enough features of the terrain to make it possible to find the surveyed line at the time of the construction.
6. A general Layout Plan covering the whole supply system is be provided in schematic format as drawing indexed MUSWAS-2020-002 Showing pipe dimensions and reservoir capacities.

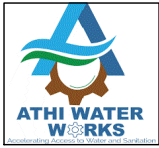
LEGEND:

- 1.All dimensions are in metres
- 2.the actual setting out to be confirmed on site by the engineer

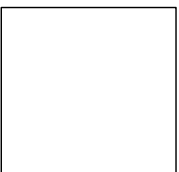
- EXISTING GROUND LEVEL
- PROPOSED WATER PIPELINE
- MURRAM ROAD

- △ AIR VALVE
- △ WASH OUT
- FH FIRE HYDRANT

Revised		Comments		Emitted	Project Manager	KANDARA WATER SUPPLY PROJECT		FINAL DESIGN REVIEW	
Drawn	Date							Date	JULY 2023
.	.							Drawn	MUSWAS:DM:014
.	.							Scale	Plan: Horiz. 1:1250, Ver. 1:125
.	.							Sheet No.	14 of 19
.	.							Index No.	MUSWAS:2020:04
.	.							A1	

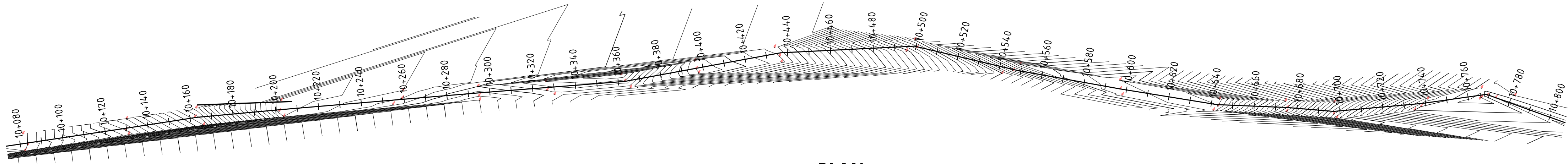


ATHI WATER WORKS
DEVELOPMENT AGENCY
P.O Box 452-300100,
Athi River Center, Highway Road
Nairobi Kenya
Tel: 254 20 272743
email: info@athiwaterworks.co.ke

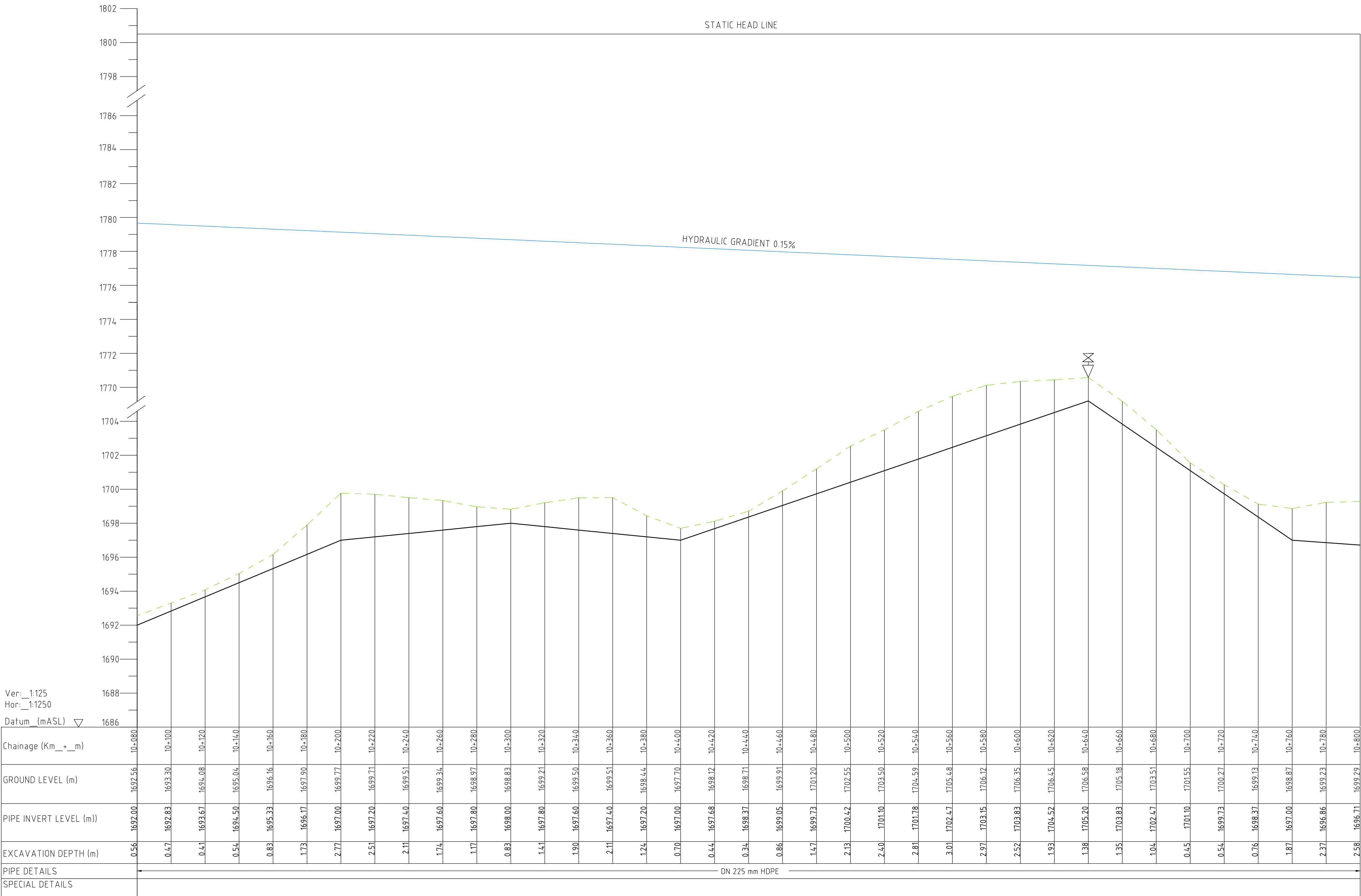


- Designed
- Drawn
- Checked
- Approved

MARIIRA DN 225 mm DISTRIBUTION
MAIN PLAN AND PROFILE



PLAN
SCALE 1:1250




PROFILE
SCALE Horiz.1:1250
Vert: 1:125

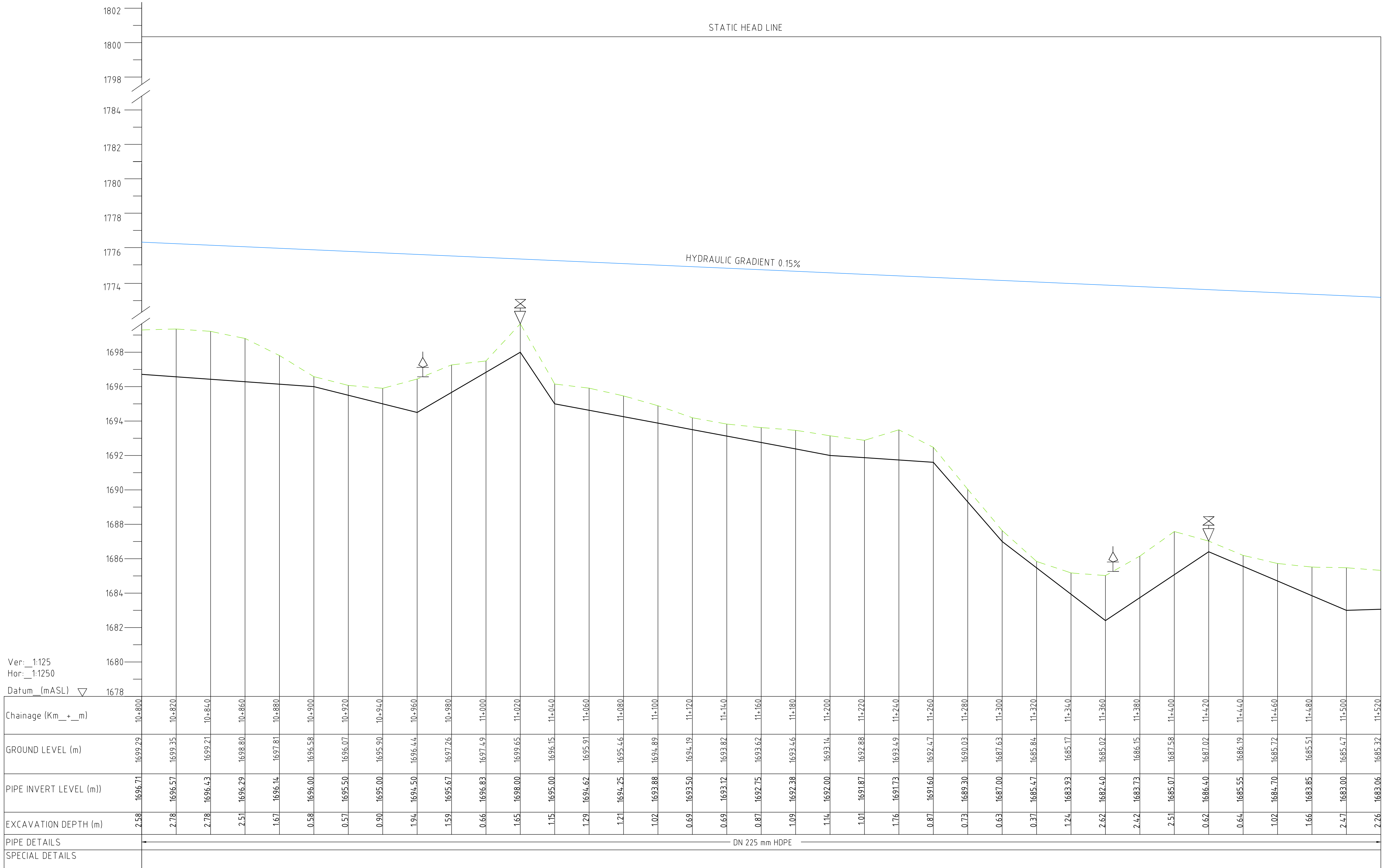
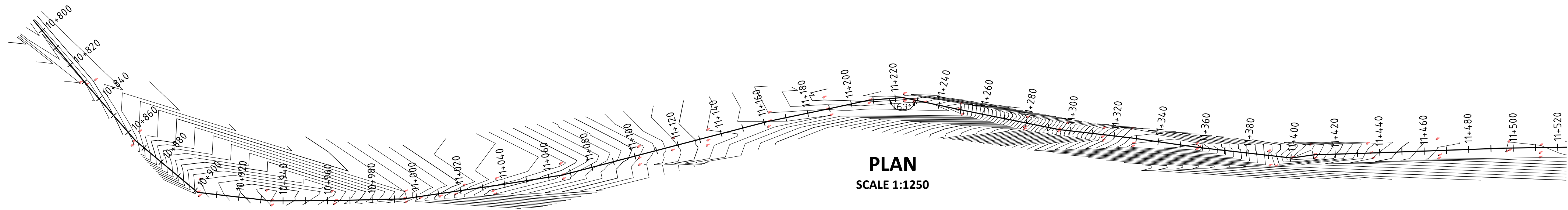
NOTES:

- 1..Chainage of pipelines start at the inlet and run in the same direction as the flow.
- 2.The profile show ground levels of all surveyed points and invert levels at points where the gradient changes.
- 3.All levels are given to two decimals of metre and the chainage to the metre only.
- 4.The profiles show static head, the hydraulic gradient in percent, pipe material size and class.
- 5.The plans show enough features of the terrain to make it possible to find the surveyed line at the time of the construction.
6. A general Layout Plan covering the whole supply system is be provided in schematic format as drawing indexed MUSWAS-2020-002 Showing pipe dimensions and reservoir capacities.

LEGEND:

- 1.All dimensions are in metres
 - 2.the actual setting out to be confirmed on site by the engineer
- EXISTING GROUND LEVEL
 - PROPOSED WATER PIPELINE
 - MURRAM ROAD
 - AIR VALVE
 - WASH OUT
 - FIRE HYDRANT

Revised		Comments	<div><div>ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 452-300100, Africa Re Center, Harambee Road Nairobi Kenya Tel: 254 20 272743 email: athi@ard.co.ke</div></div>	Project Manager	<div><div></div></div>	Designed	Drawn	Checked	Approved	Project Title	KANDARA WATER SUPPLY PROJECT	State		FINAL DESIGN REVIEW									
Drawn	Date											JULY 2020		Drawing No.		MUSWAS/DM/015							
Scale	Plan											1:1250	Ver	1:125	Sheet Size	A1							
Scale	No.											15		19									
Index No.												MUSWAS/2020/049											
MARIIRA DN 225 mm DISTRIBUTION MAIN PLAN AND PROFILE																							



PROFILE
SCALE Horiz.1:1250
Vert: 1:125

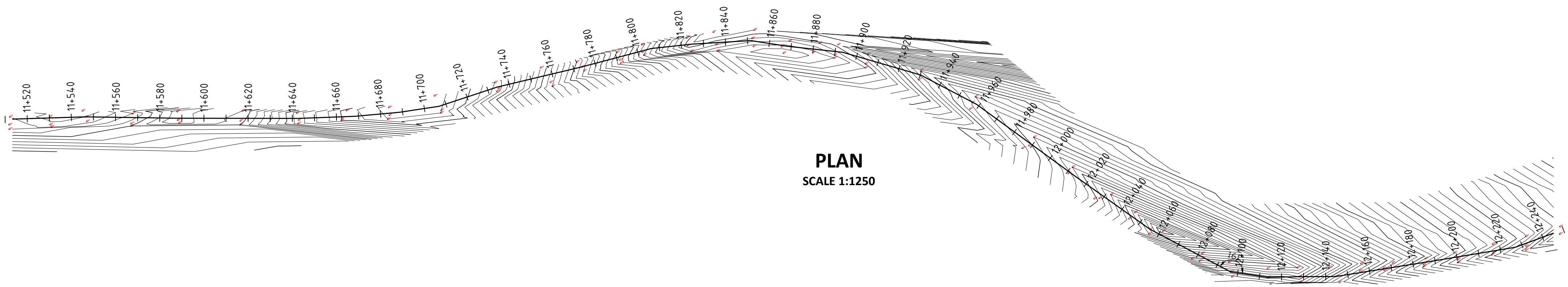
NOTES:

- 1.Chainage of pipelines start at the inlet and run in the same direction as the flow.
- 2.The profile show ground levels of all surveyed points and invert levels at points where the gradient changes.
- 3.All levels are given to two decimals of metre and the chainage to the metre only.
- 4.The profiles show static head, the hydraulic gradient in percent, pipe material size and class.
- 5.The plans show enough features of the terrain to make it possible to find the surveyed line at the time of the construction.
6. A general Layout Plan covering the whole supply system is be provided in schematic format as drawing indexed MUSWAS-2020-002 Showing pipe dimensions and reservoir capacities.

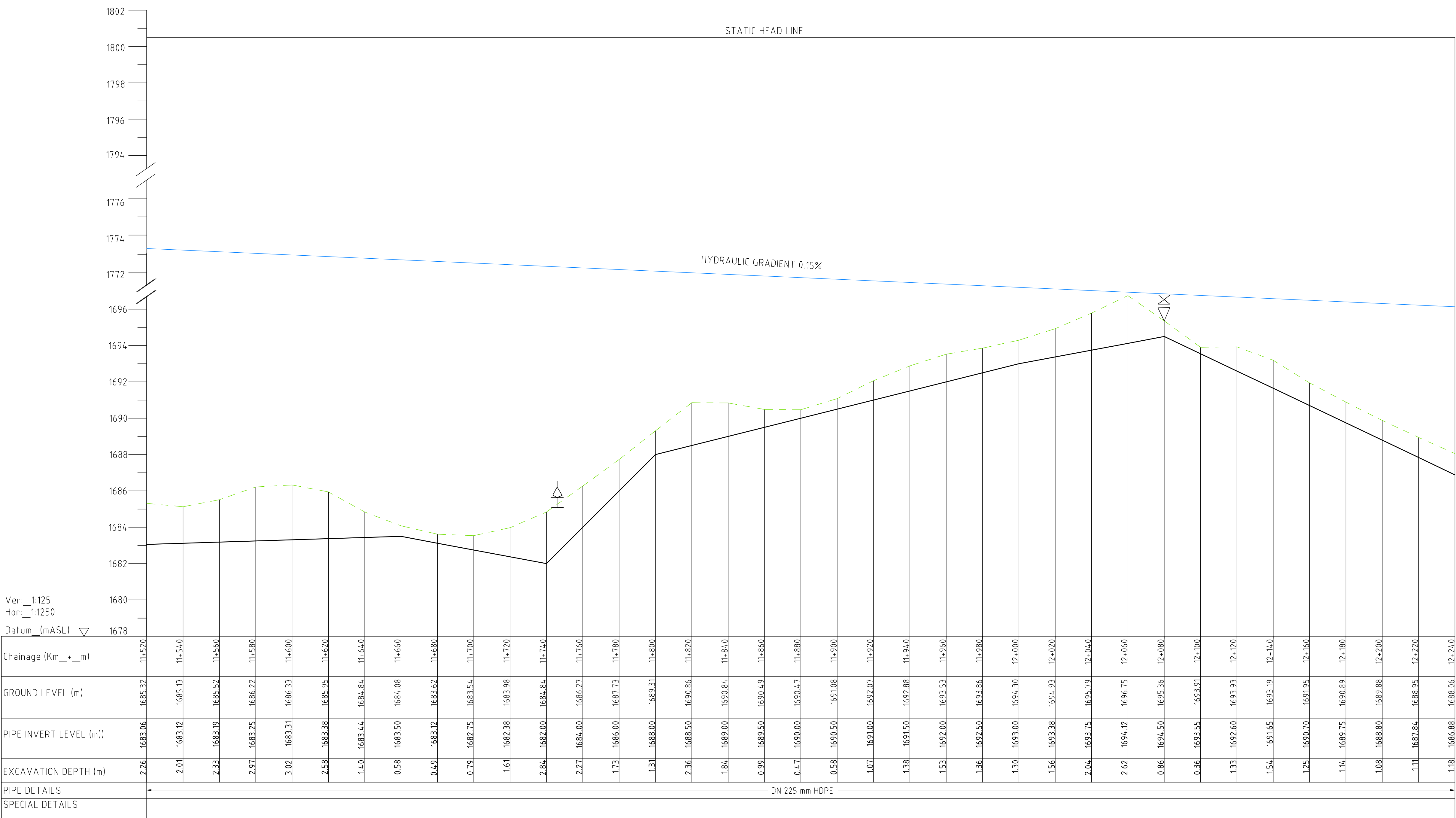
LEGEND:

- 1.All dimensions are in metres
 - 2.the actual setting out to be confirmed on site by the engineer
- EXISTING GROUND LEVEL
 - PROPOSED WATER PIPELINE
 - MURRAM ROAD
 - AIR VALVE
 - WASH OUT
 - FIRE HYDRANT

Revised		Checked		Engineer		Project Manager		Project		State	
Design	Date			<div>ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 452-300100, Africa Re Center, Homa Bay Road Nairobi Kenya Tel: 254 20 272743 email: athi@ard.co.ke</div>		<div></div>		KANDARA WATER SUPPLY PROJECT		FINAL DESIGN REVIEW	
										Date: JULY 2023	
										Drawing No: MUSWAS/DM/016	
										Scale: Plan: 1:1250, Ver: 1:125	Sheet Size:
										Scale: 16:19	A1
								Mariira DN 225 mm Distribution MAIN PLAN AND PROFILE		Index No: MUSWAS/2020/050	



PLAN
SCALE 1:1250



PROFILE
SCALE Horiz.1:1250
Vert: 1:125

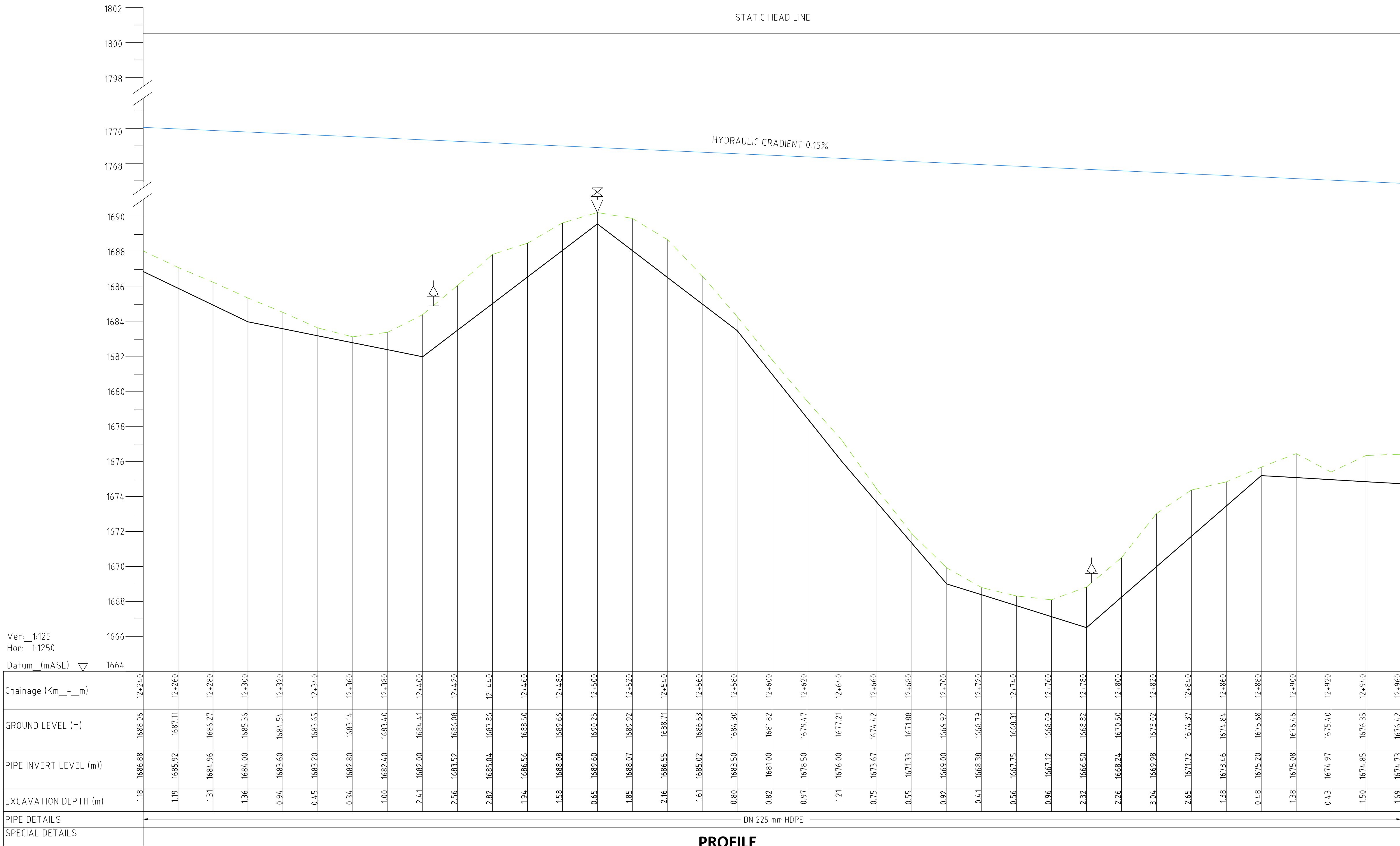
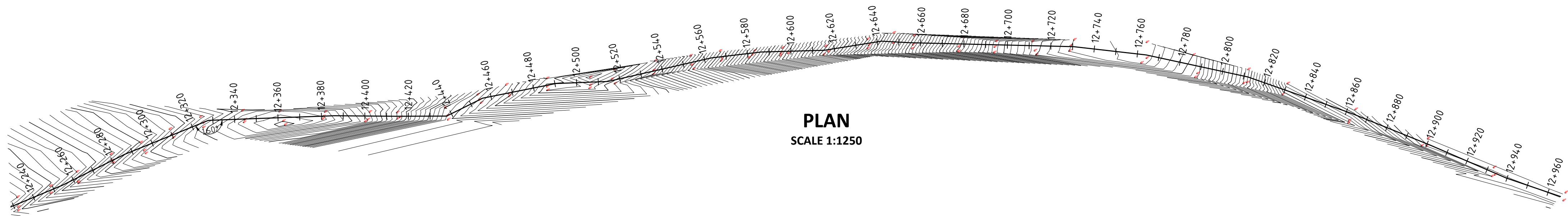
NOTES:

- 1.Chainage of pipelines start at the inlet and run in the same direction as the flow.
- 2.The profile show ground levels of all surveyed points and invert levels at points where the gradient changes.
- 3.All levels are given to two decimals of metre and the chainage to the metre only.
- 4.The profiles show static head, the hydraulic gradient in percent, pipe material size and class.
- 5.The plans show enough features of the terrain to make it possible to find the surveyed line at the time of the construction.
6. A general Layout Plan covering the whole supply system is provided in schematic format as drawing indexed MUSWAS-2020-002 Showing pipe dimensions and reservoir capacities.

LEGEND:

- 1.All dimensions are in metres
 - 2.the actual setting out to be confirmed on site by the engineer
- EXISTING GROUND LEVEL
 - PROPOSED WATER PIPELINE
 - MURRAM ROAD
 - AIR VALVE
 - WASH OUT
 - FIRE HYDRANT

Revised		Comments		Emmitter	Project Manager	KANDARA WATER SUPPLY PROJECT		Stage FINAL DESIGN REVIEW	
Drawn	Date			ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 452-300100, Athi River Center, Homa Bay Road Nairobi Kenya Tel: 254 20 2727433 email: awd@kard.ac.ke				Date JULY 2030	
								Drawn by MUSWAS:DM:017	
						Mariira DN 225 mm Distribution Main Plan and Profile	Scale: 1:1250, Ver1:125	Stage: 17	Size: A1
								Index: 19	
								MUSWAS:2020:051	



NOTES:

- 1.Chainage of pipelines start at the inlet and run in the same direction as the flow.
- 2.The profile show ground levels of all surveyed points and invert levels at points where the gradient changes.
- 3.All levels are given to two decimals of metre and the chainage to the metre only.
- 4.The profiles show static head, the hydraulic gradient in percent, pipe material size and class.
- 5.The plans show enough features of the terrain to make it possible to find the surveyed line at the time of the construction.
6. A general Layout Plan covering the whole supply system is be provided in schematic format as drawing indexed MUSWAS-2020-002 Showing pipe dimensions and reservoir capacities.

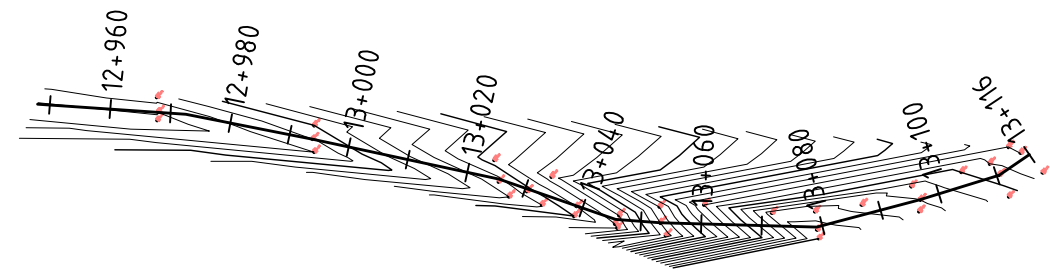
LEGEND:

- 1.All dimensions are in metres
- 2.the actual setting out to be confirmed on site by the engineer

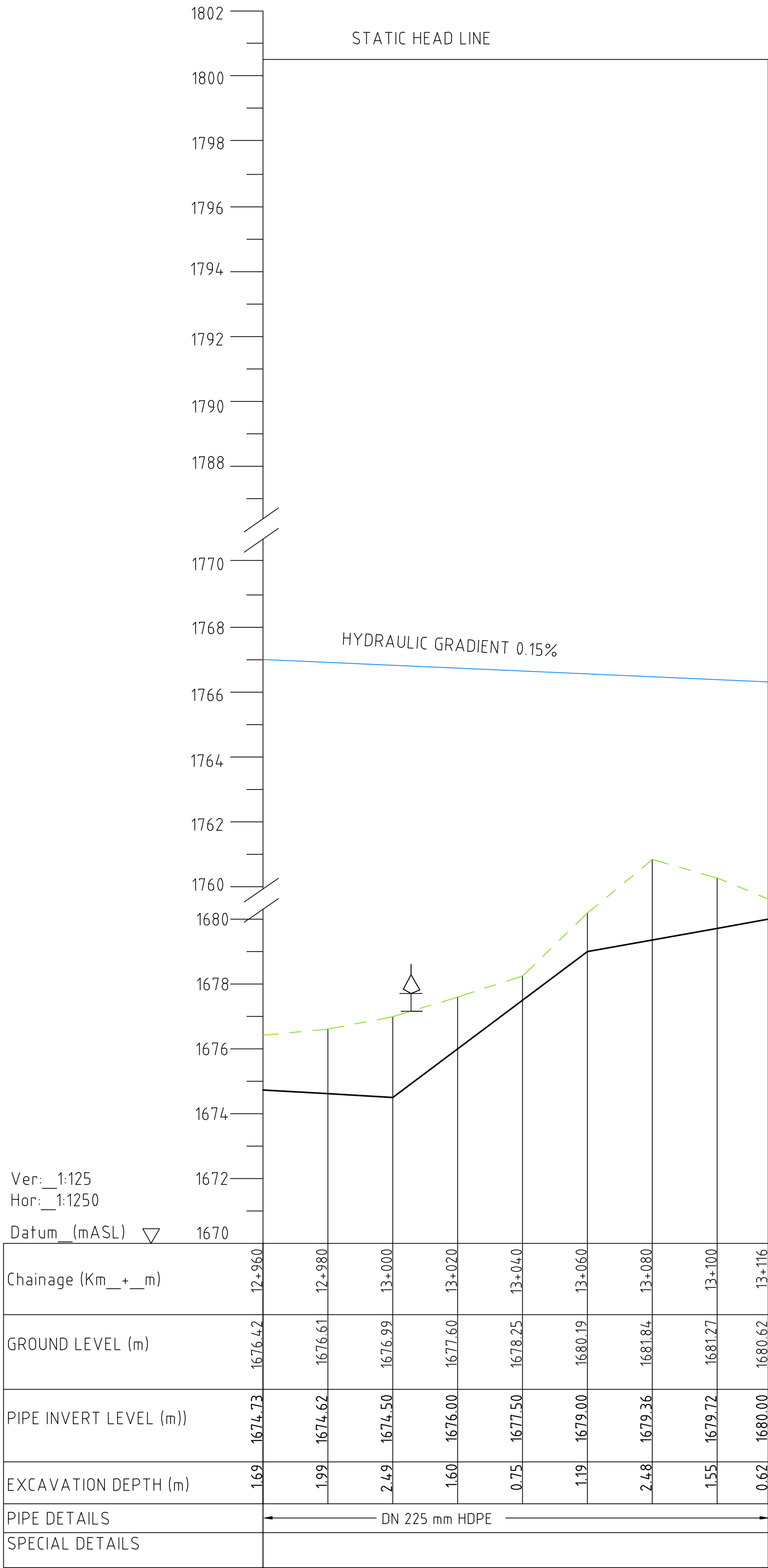
- EXISTING GROUND LEVEL
- PROPOSED WATER PIPELINE
- MURRAM ROAD

- AIR VALVE
- WASH OUT
- FH FIRE HYDRANT

Revised		Comments		Emmitter	Project Manager	KANDARA WATER SUPPLY PROJECT		FINAL DESIGN REVIEW	
Drawn by	Date			ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 452300100, Athira Re Center, Homa Bay Road Nairobi Kenya Tel: 254 20 272743 email: awd@ard.co.ke				Date: JULY 2023	
								Drawn by: MUSWAS/DM/01	
								Scale: Plan: 1:1250, Ver: 1:125	Sheet Size: A1
								Sheet No: 1 of 19	
								Index No: MUSWAS/2020/052	



PLAN
SCALE 1:1250




PROFILE
SCALE Horiz.1:1250
Vert: 1:125

NOTES:

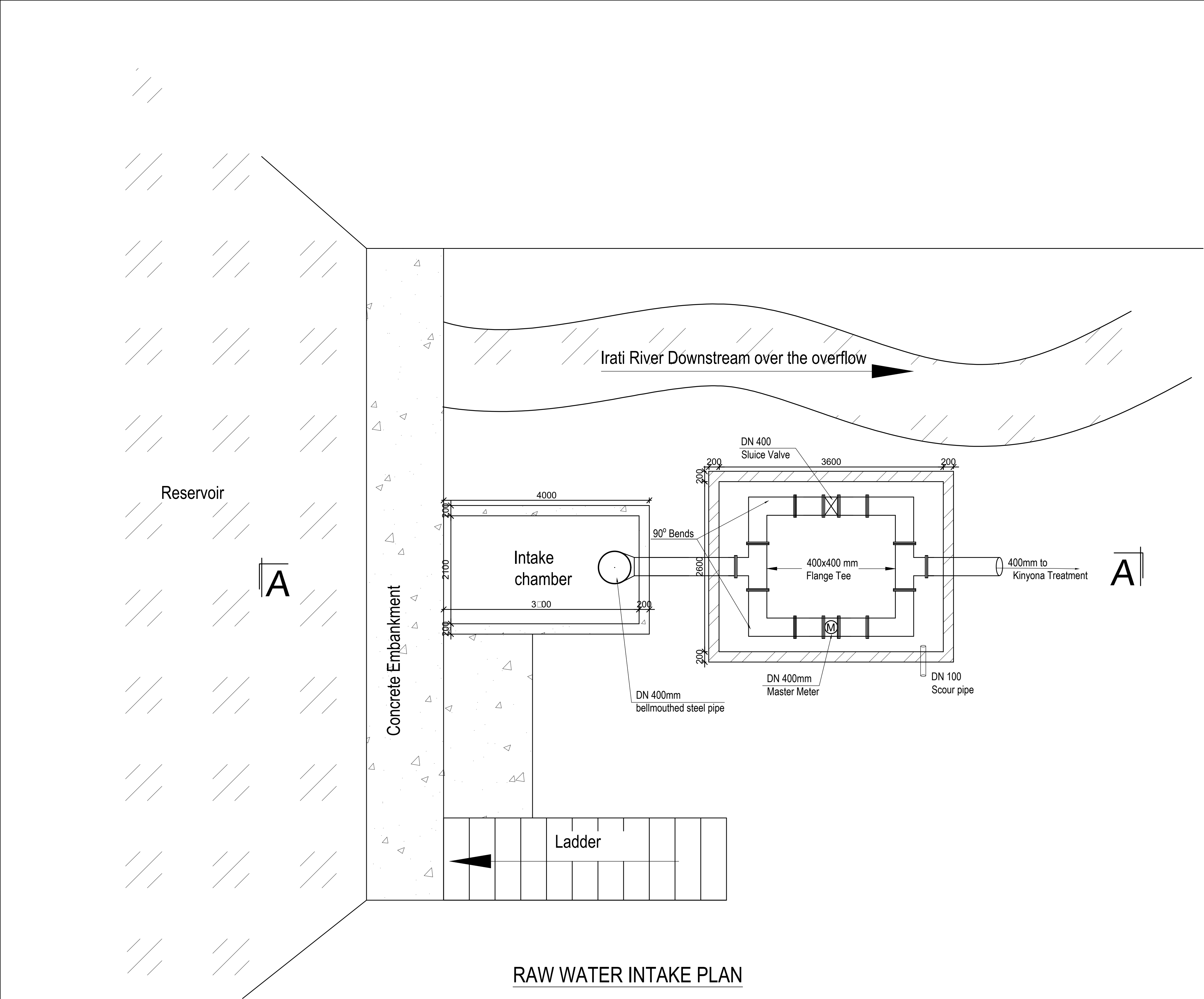
- Plan and profile are on the same sheet and to the same horizontal scale.
- Chainage of pipelines start at the inlet and run in the same direction as the flow.
 - The profile show ground levels of all surveyed points and invert levels at points where the gradient changes.
 - All levels are given to two decimals of metre and the chainage to the metre only.
 - The profiles show static head, the hydraulic gradient in percent, pipe material size and class.
 - The plans show enough features of the terrain to make it possible to find the surveyed line at the time of the construction.
 - A general Layout Plan covering the whole supply system is be provided in schematic format as drawing indexed MUSWAS-2020-002 Showing pipe dimensions and reservoir capacities.

LEGEND:

- 1.All dimensions are in metres
- 2.the actual setting out to be confirmed on site by the engineer
- EXISTING GROUND LEVEL
- PROPOSED WATER PIPELINE
- MURRAM ROAD
- ⊗ AIR VALVE
- ⊗ WASH OUT
- FH FIRE HYDRANT

Revisi		C		Em	Pr	Des	Proj	State
De	Date			<div><div>ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 452-300100, Athi River Center, Homa Bay Road Nairobi Kenya Tel: 254 20 272743 email: athi@athiwat.co.ke</div></div>	<div></div>	Drawn	Project	KANDARA WATER SUPPLY PROJECT
						Mariira	Main Plan and Profile	Final Design Review
						1:1250	Ver 1.125	A1
						19	19	MUSWAS/2020/053

3.0. CONNECTION DETAILS



RAW WATER INTAKE PLAN

NOTES:

GENERAL

- 1.This drawing to be read in conjunction with all relevant Engineer's and Architects drawings
2. The contractor shall check all dimensions on site, any error & or omissions shall be reported to the Engineer before work is commenced.
- 3.The latest amendment or revision shall superceed all other issues which shall be destroyed.
4. All dimensions in millimetres unless otherwise indicated

CONCRETE

1. Blinding under pad foundation to be 1:4:8 mix.
2. All reinforced concrete to be grade 25(1:11/2:3) mix giving a minimum crushing strength of 17N/mm2 and 25N/mm2 of 7 and 28 days respectively.
3. Cement shall be portland cement to comply with BS12.
4. Maximum aggregate size shall be 20mm unless otherwise stated.

REINFORCEMENT

1. R indicate hot rolled mild steel to BS4449.
2. D indicate cold rolled high tensile steel to BS4461
3. Fabric reinforcement shall be to BS4483.
4. All reinforcement shall be presented to the Engineer prior to concreting.

COVER

- Unless otherwise stated cover to main steel shall be as follows:
1. 50mm to all steel below ground level.
 2. 40mm to columns above ground level.
 3. 30mm to steel in beams.
 4. 20mm to steel in slabs & staircase.

WORKMANSHIP

1. All concrete work to be in accordance with BS8110.
2. All reinforced concrete to be mechanically vibrated.
3. All load bearing blockwork shall be in accordance with CP111

EXCAVATIONS


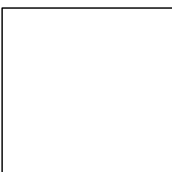
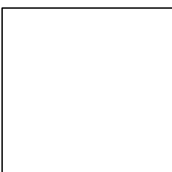
1. All excavations for foundation shall be presented to the Engineer for his approval prior to placing of blinding.
2. Depth of foundation on all drawing are provisional & the Engineer shall be consulted before final depth is arrived at during construction.
3. Foundations designed for safe soil bearing capacity of 150KN/M².

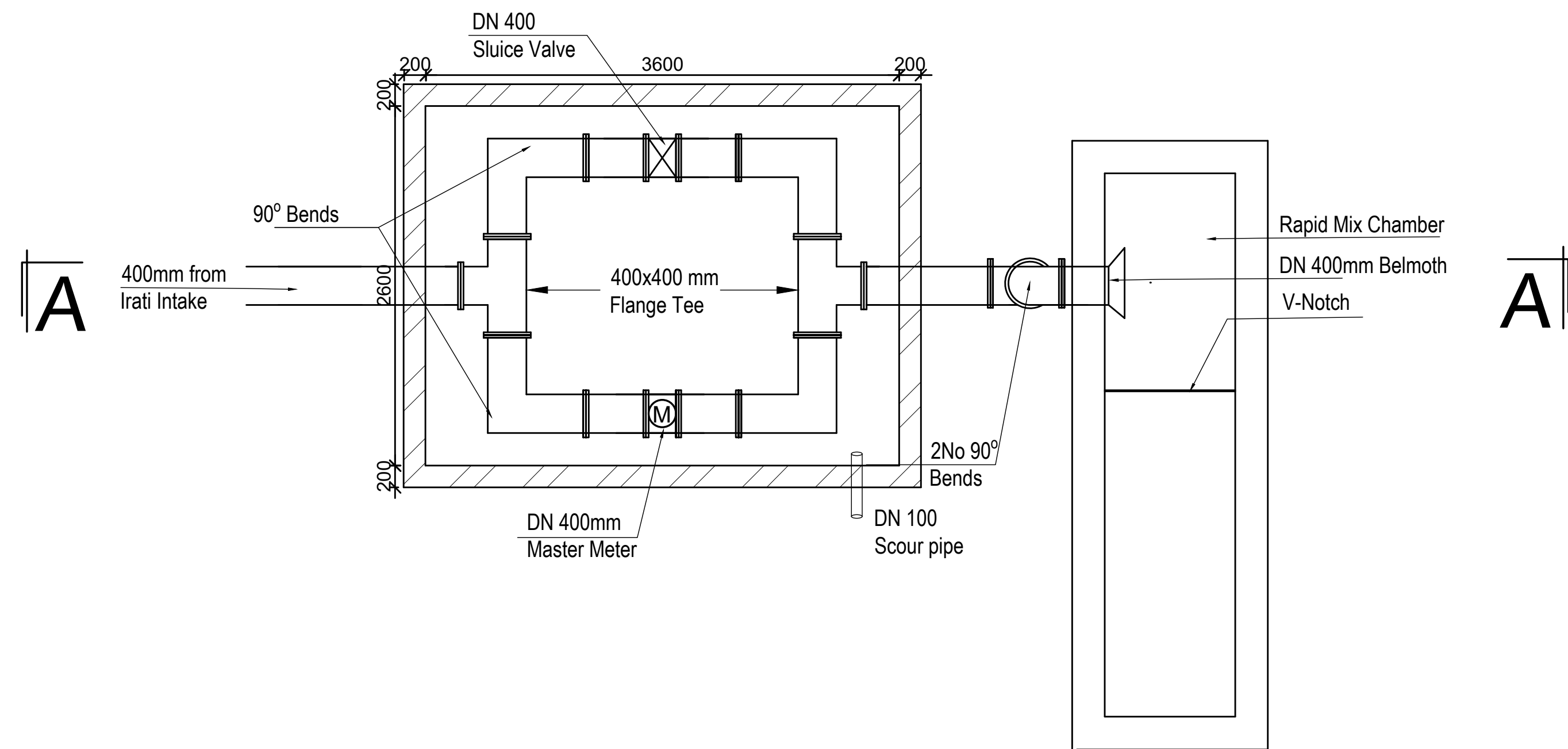
GROUND FLOOR SLAB

1. Ground floor slab to be cast on compacted & approved hardcore as per specifications & to be reinforced with mild steel of 10mm dia.at 200mm centres, placed 40mm from top.

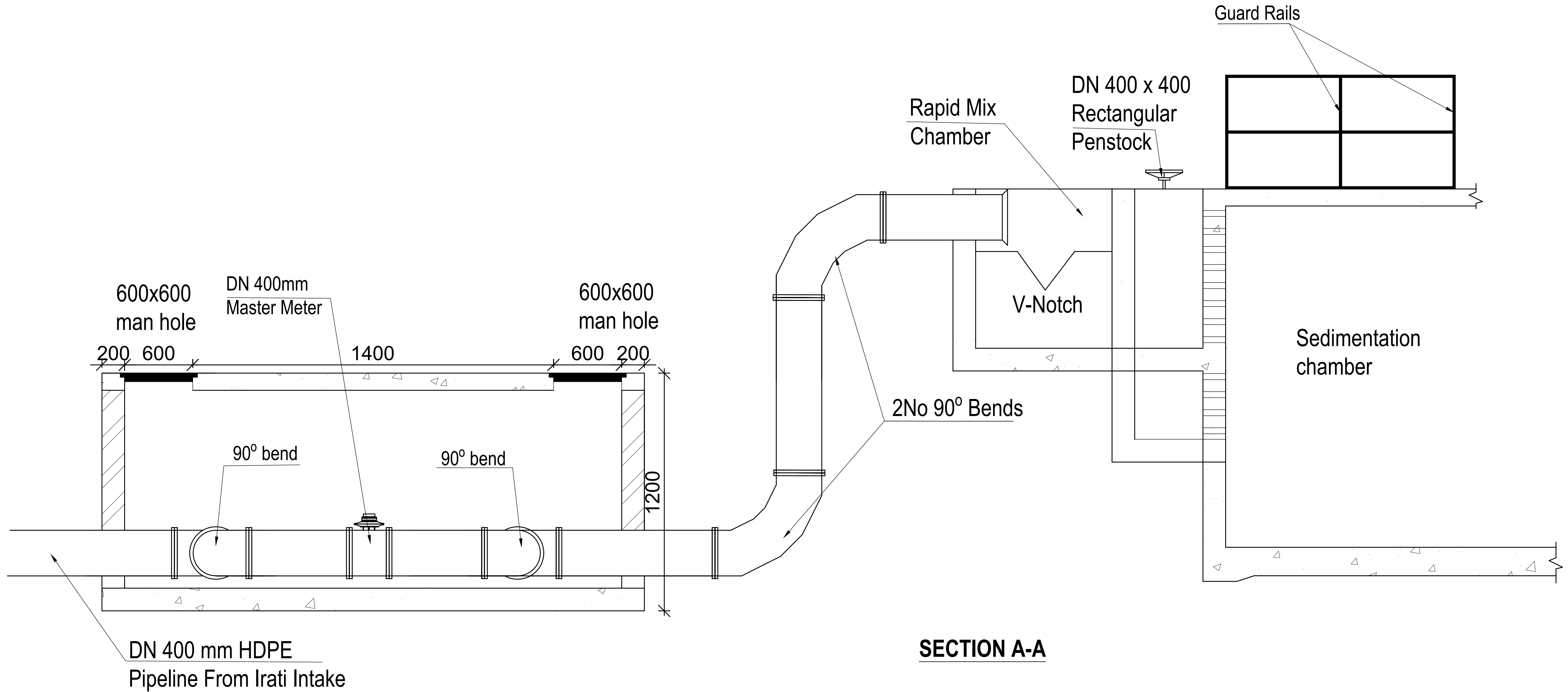
LEGEND

1. T1 Top first layer
2. T2 Top second layer
3. B1 Bottom first layer
4. B2 Bottom second layer

Revised		Comments		Engineer	Project Manager	Project		KANDARA WATER SUPPLY PROJECT		Scale	FINAL DESIGN REVIEW		
Drawn	Date	 ATHI WATER WORKS DEVELOPMENT AGENCY P.O. Box 452-300100, Africa Re-Center, Harare Road Nairobi, Kenya Tel: 254 20 272743 email: athi@ard.co.ke		Drawn		Drawn	IRATI INTAKE CONNECTION DRAWINGS INTAKE CONNECTION PLAN		Scale	AS INDICATED		Sheet Size	



RAW WATER TO TREATMENT CONNECTION PLAN



SECTION A-A

NOTES:

GENERAL

1. This drawing to be read in conjunction with all relevant Engineer's and Architects drawings
2. The contractor shall check all dimensions on site, any error & or omissions shall be reported to the Engineer before work is commenced.
3. The latest amendment or revision shall supersede all other issues which shall be destroyed.
4. All dimensions in millimetres unless otherwise indicated

CONCRETE

1. Blinding under pad foundation to be 1:4:8 mix.
2. All reinforced concrete to be grade 25(1:1 1/2:3) mix giving a minimum crushing strength of 17N/mm² and 25N/mm² of 7 and 28 days respectively.
3. Cement shall be portland cement to comply with BS12.
4. Maximum aggregate size shall be 20mm unless otherwise stated.

REINFORCEMENT

1. R indicate hot rolled mild steel to BS4449.
2. D indicate cold rolled high tensile steel to BS4461
3. Fabric reinforcement shall be to BS4483.
4. All reinforcement shall be presented to the Engineer prior to concreting.

COVER

- Unless otherwise stated cover to main steel shall be as follows:
1. 50mm to all steel below ground level.
 2. 40mm to columns above ground level.
 3. 30mm to steel in beams.
 4. 20mm to steel in slabs & staircase.

WORKMANSHIP

1. All concrete work to be in accordance with BS8110.
2. All reinforced concrete to be mechanically vibrated.
3. All load bearing blockwork shall be in accordance with CP111

EXCAVATIONS

1. All excavations for foundation shall be presented to the Engineer for his approval prior to placing of blinding.
2. Depth of foundation on all drawing are provisional & the Engineer shall be consulted before final depth is arrived at during construction.
3. Foundations designed for safe soil bearing capacity of 150KN/M².

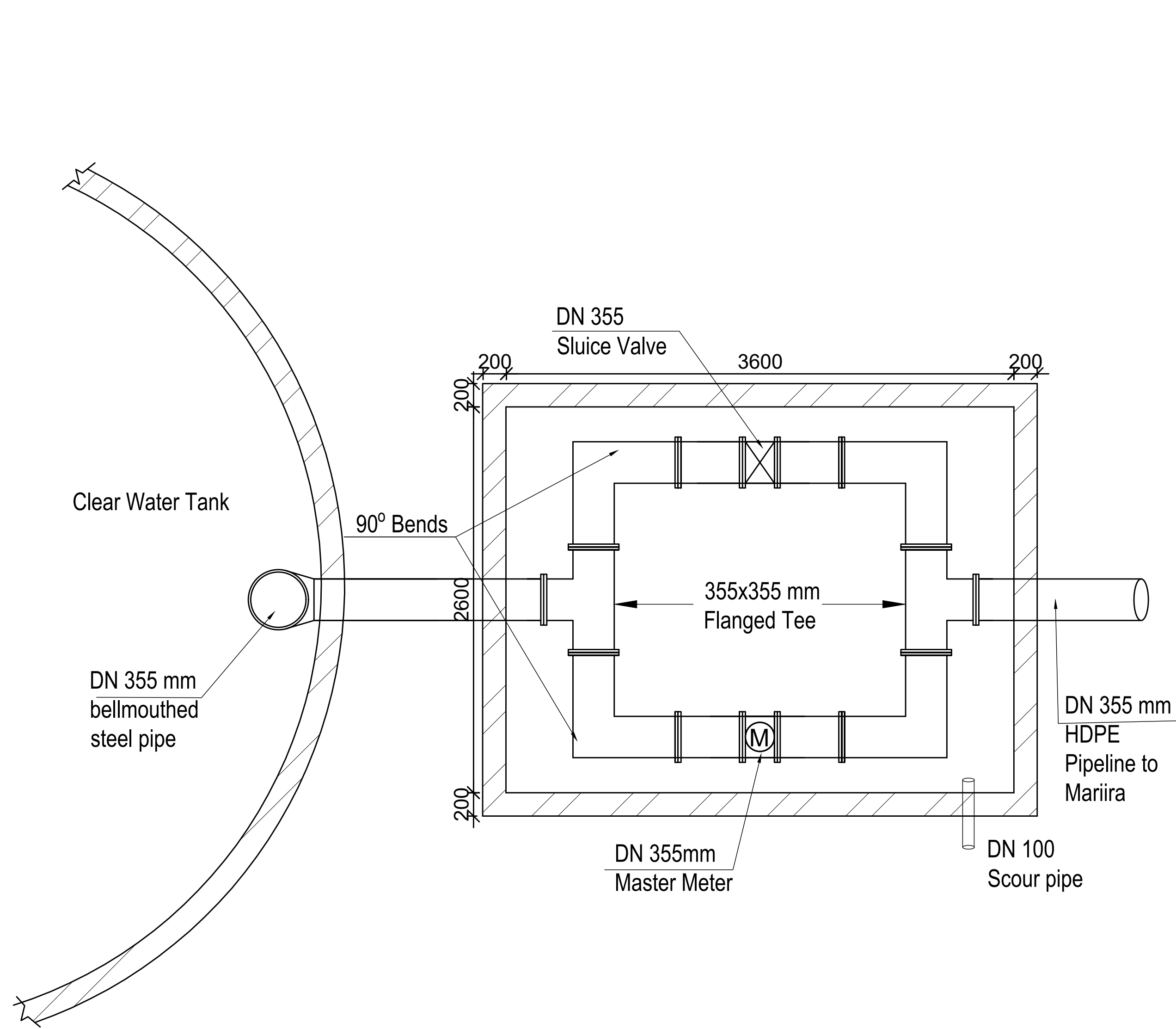
GROUND FLOOR SLAB

1. Ground floor slab to be cast on compacted & approved hardcore as per specifications & to be reinforced with mild steel of 10mm dia. at 200mm centres, placed 40mm from top.

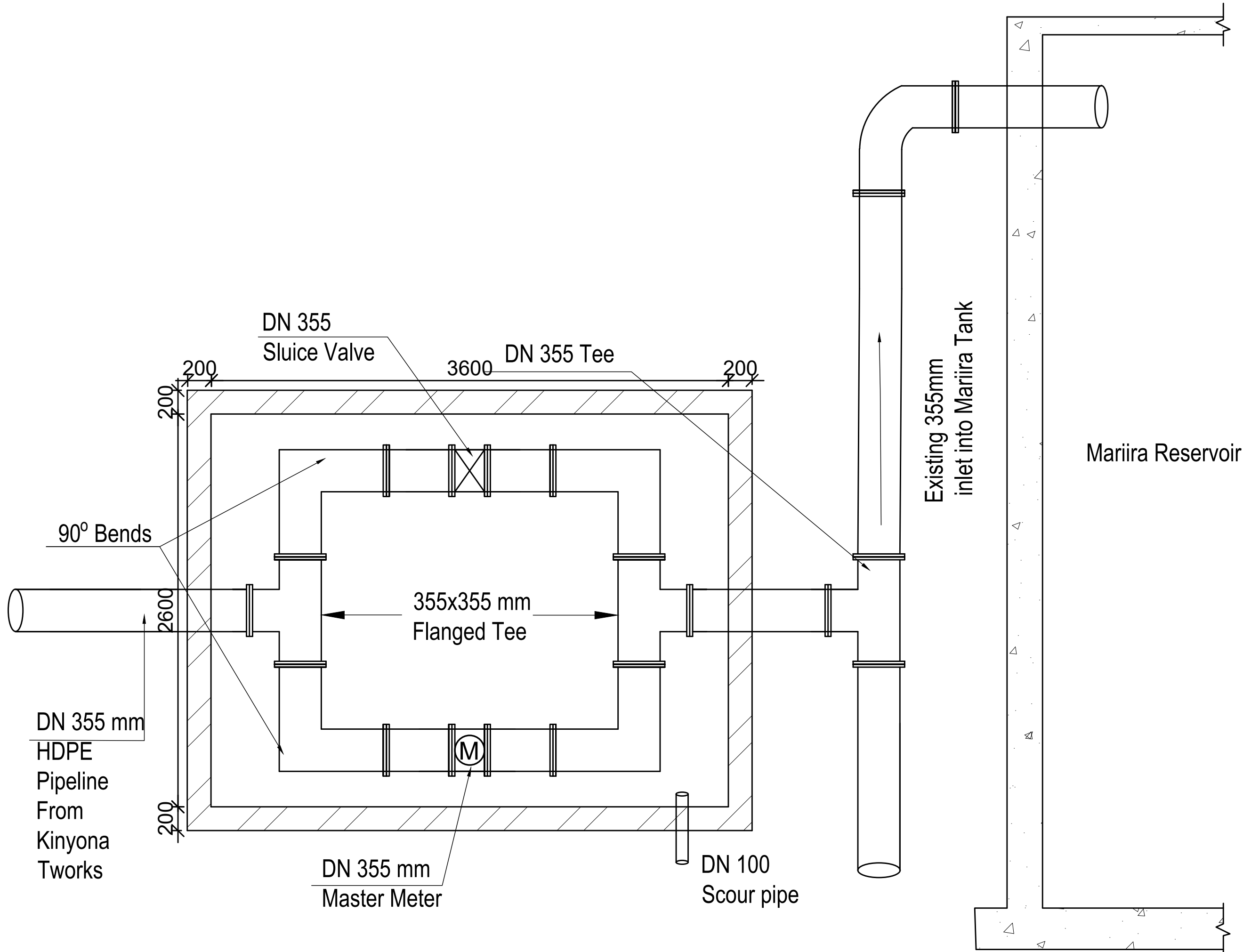
LEGEND

1. T1 Top first layer
2. T2 Top second layer
3. B1 Bottom first layer
4. B2 Bottom second layer

Revisions		Comments		Engineer	Project Manager	Project		State	Final Design Review	
Date				ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 452/3/00100, Ariia Re Center, Haria Road Nairobi Kenya Tel: 254 20 272743 email: a@ard.co.ke		Decided		KANDARA WATER SUPPLY PROJECT	Date	JULY 2023
						Drafted			Drafted No	MUSWAS/CONN/003
						Checked			Drafted Title	
						Approved				
						IRATI CONNECTION DRAWINGS		State	AS INDICATED	Sheet/Size
						RAW WATER TO TREATMENT CONNECTION PLAN AND SECTION		Sheet No	3 of 4	A1
								Index No		



CONNECTION AT THE CLEAR WATER TANK



CONNECTION AT MARIIRA TANK

NOTES:

GENERAL

- 1.This drawing to be read in conjunction with all relevant Engineer's and Architects drawings
2. The contractor shall check all dimensions on site, any error & or omissions shall be reported to the Engineer before work is commenced.
- 3.The latest amendment or revision shall supercede all other issues which shall be destroyed.
4. All dimensions in millimetres unless otherwise indicated

CONCRETE

1. Blinding under pad foundation to be 1:4:8 mix.
2. All reinforced concrete to be grade 25(1:1:2:3) mix giving a minimum crushing strength of 17N/mm² and 25N/mm² of 7 and 28 days respectively.
3. Cement shall be portland cement to comply with BS12.
4. Maximum aggregate size shall be 20mm unless otherwise stated.

REINFORCEMENT

1. R indicate hot rolled mild steel to BS4449.
2. D indicate cold rolled high tensile steel to BS4461
3. Fabric reinforcement shall be to BS4483.
4. All reinforcement shall be presented to the Engineer prior to concreting.

COVER

- Unless otherwise stated cover to main steel shall be as follows:
1. 50mm to all steel below ground level.
 2. 40mm to columns above ground level.
 3. 30mm to steel in beams.
 4. 20mm to steel in slabs & staircase.

WORKMANSHIP

1. All concrete work to be in accordance with BS8110.
2. All reinforced concrete to be mechanically vibrated.
3. All load bearing blockwork shall be in accordance with CP111

EXCAVATIONS

1. All excavations for foundation shall be presented to the Engineer for his approval prior to placing of blinding.
2. Depth of foundation on all drawing are provisional & the Engineer shall be consulted before final depth is arrived at during construction.
3. Foundations designed for safe soil bearing capacity of 150KN/M².

GROUND FLOOR SLAB

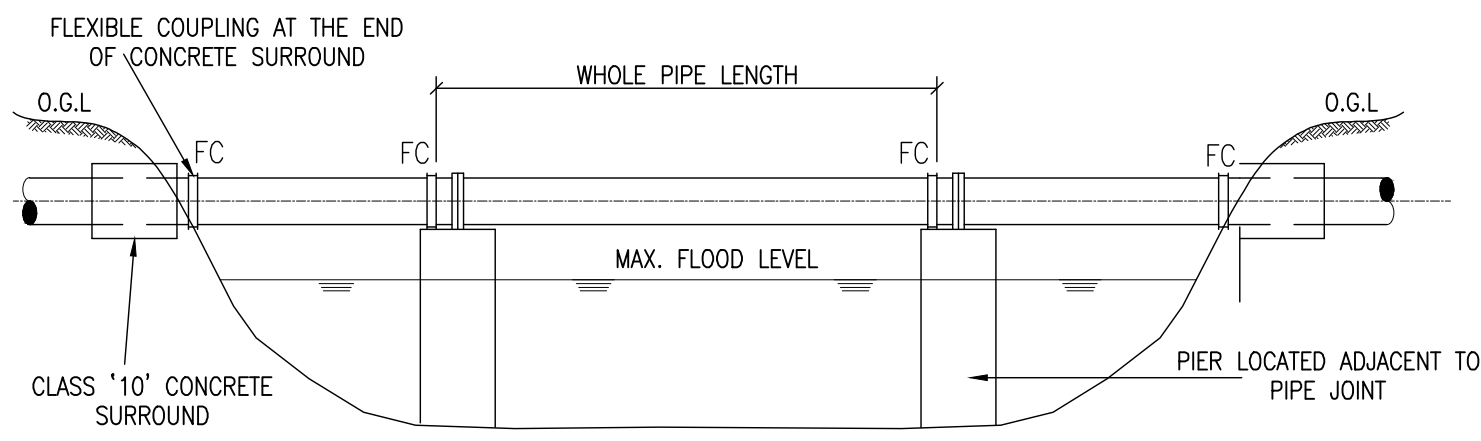
1. Ground floor slab to be cast on compacted & approved hardcore as per specifications & to be reinforced with mild steel of 10mm dia.at 200mm centres, placed 40mm from top.

LEGEND

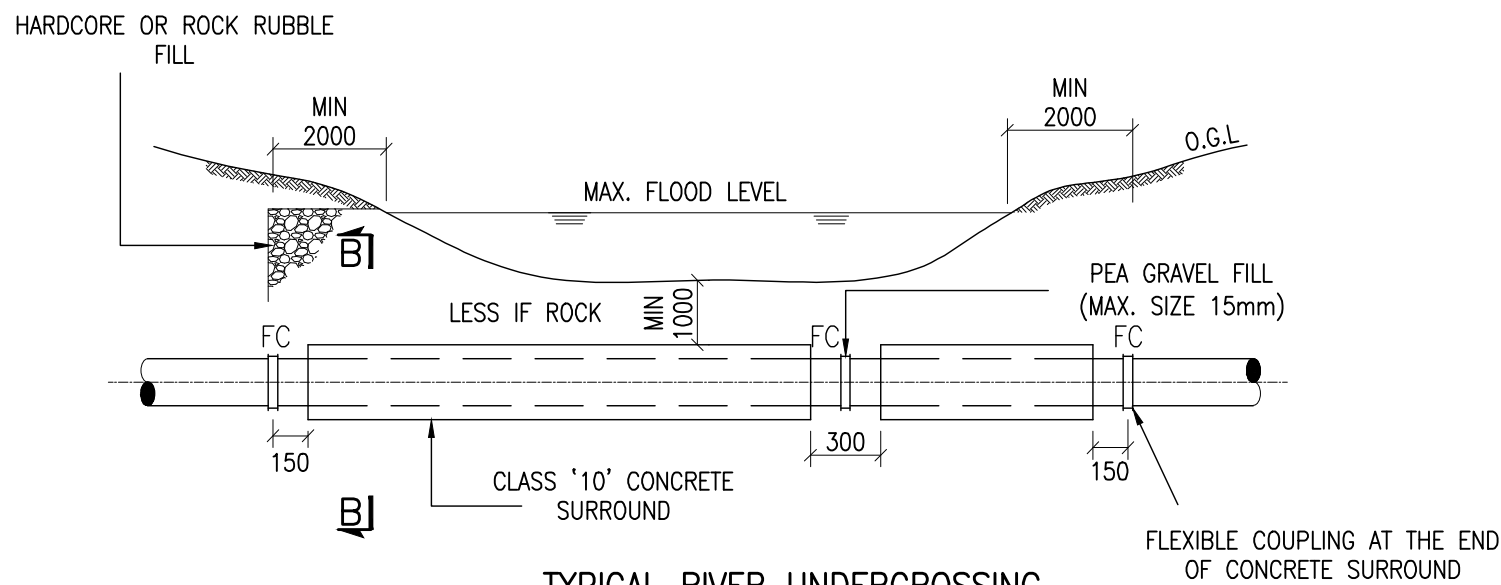
1. T1 Top first layer
2. T2 Top second layer
3. B1 Bottom first layer
4. B2 Bottom second layer

Revisions		Comments		Engineer	Project Manager	Project		Scale	FINAL DESIGN REVIEW	
Description	Date					KANDARA WATER SUPPLY PROJECT		Date	JULY 2023	
						Project Title		Drawn No.	MUSWAS:CONN:004	
						Drawn Title		Scale	AS INDICATED	
						Approved		Sheet No.	4 of 4	
								Index No.		
									A1	

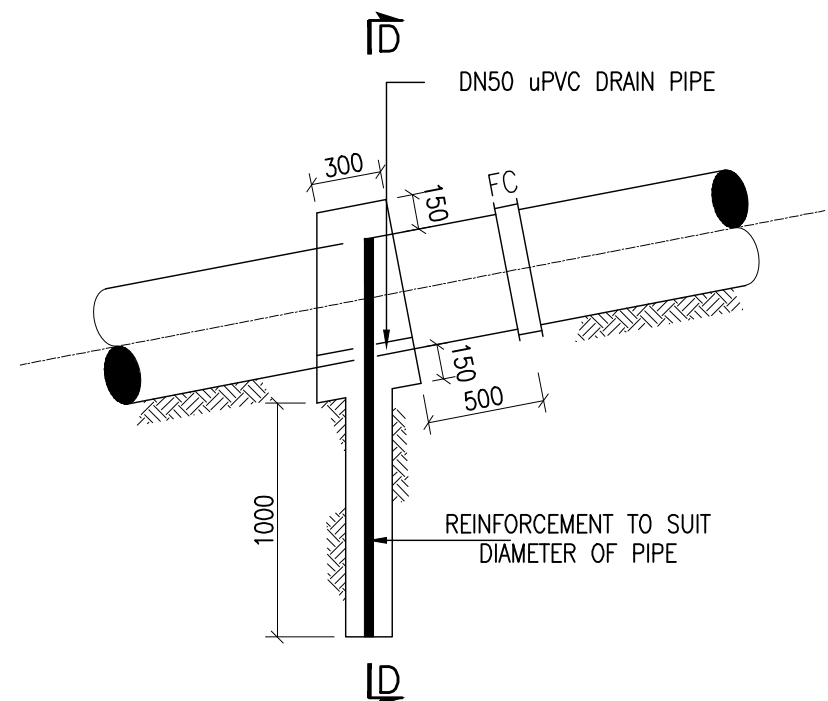
4.0. STANDARD DRAWINGS



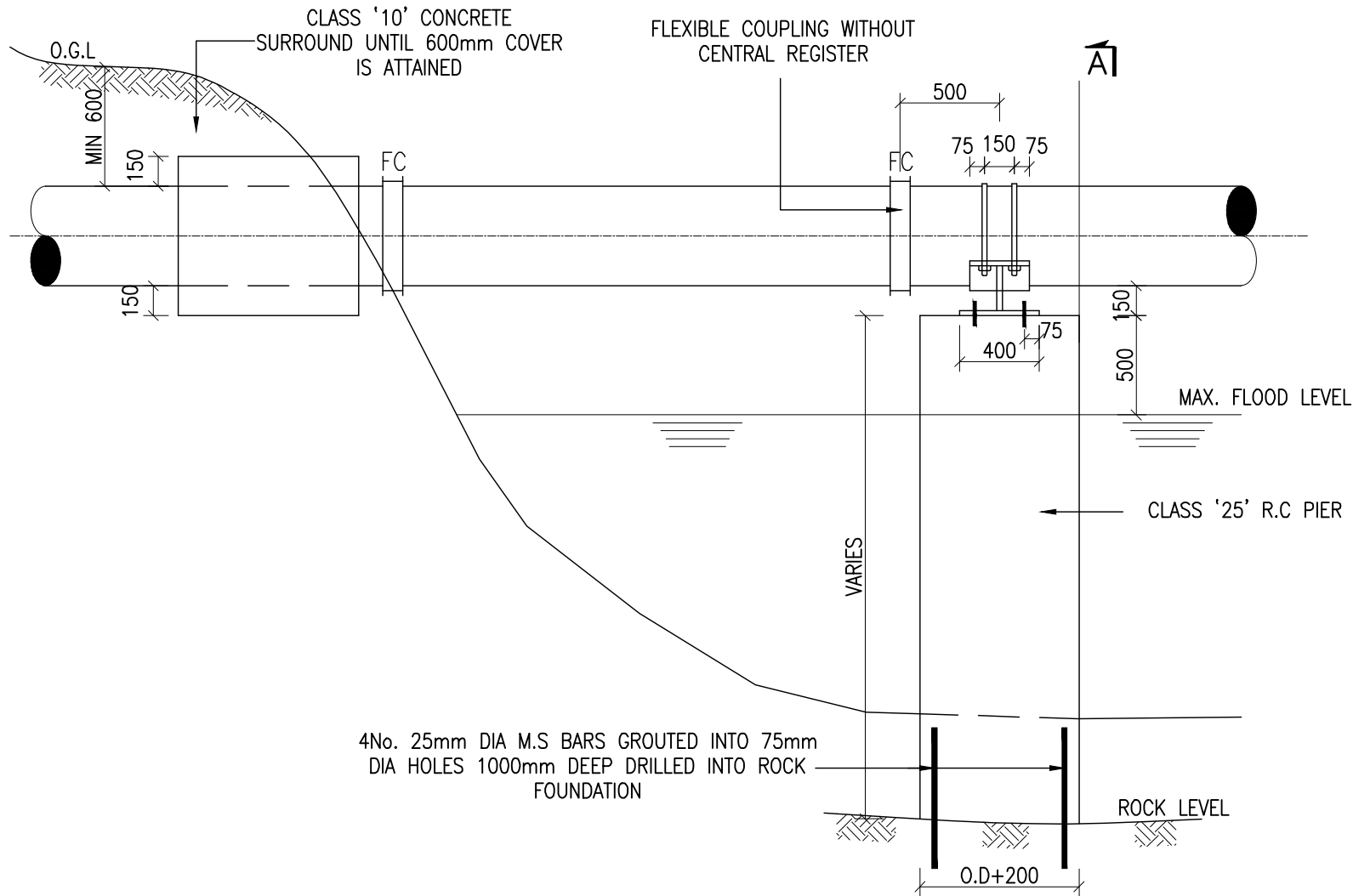
TYPICAL RIVER OVERCROSSING
N.T.S.



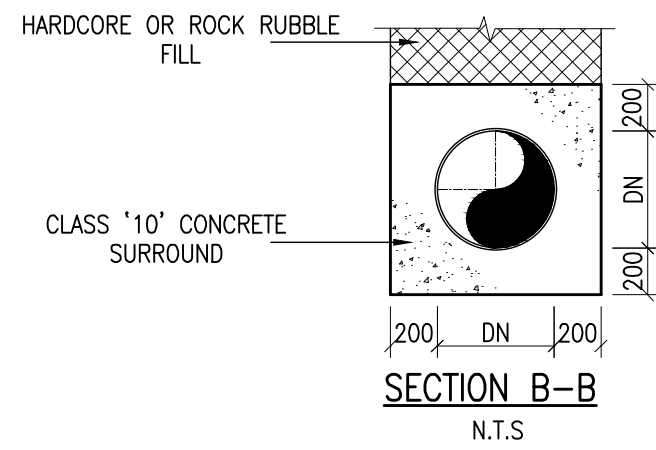
TYPICAL RIVER UNDERCROSSING
N.T.S.



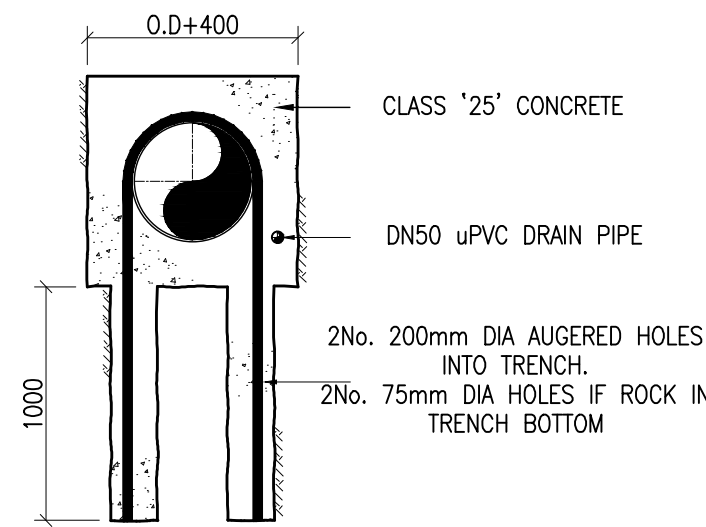
SLIP ANCHOR DETAIL
N.T.S.



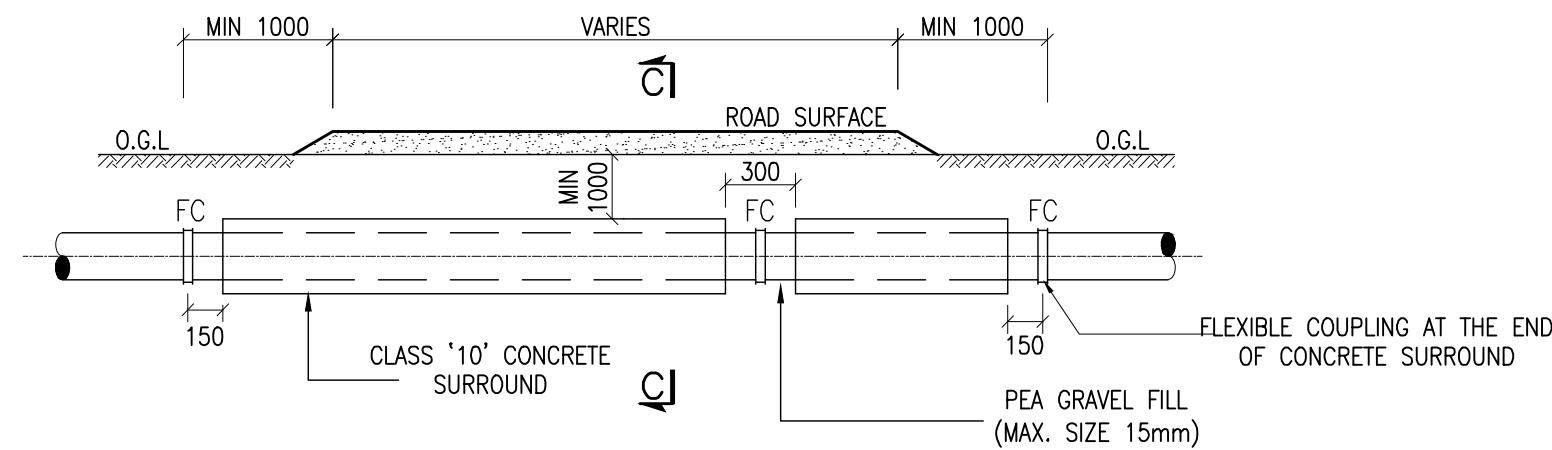
TYPICAL RIVER OVERCROSSING - DETAILS
N.T.S.



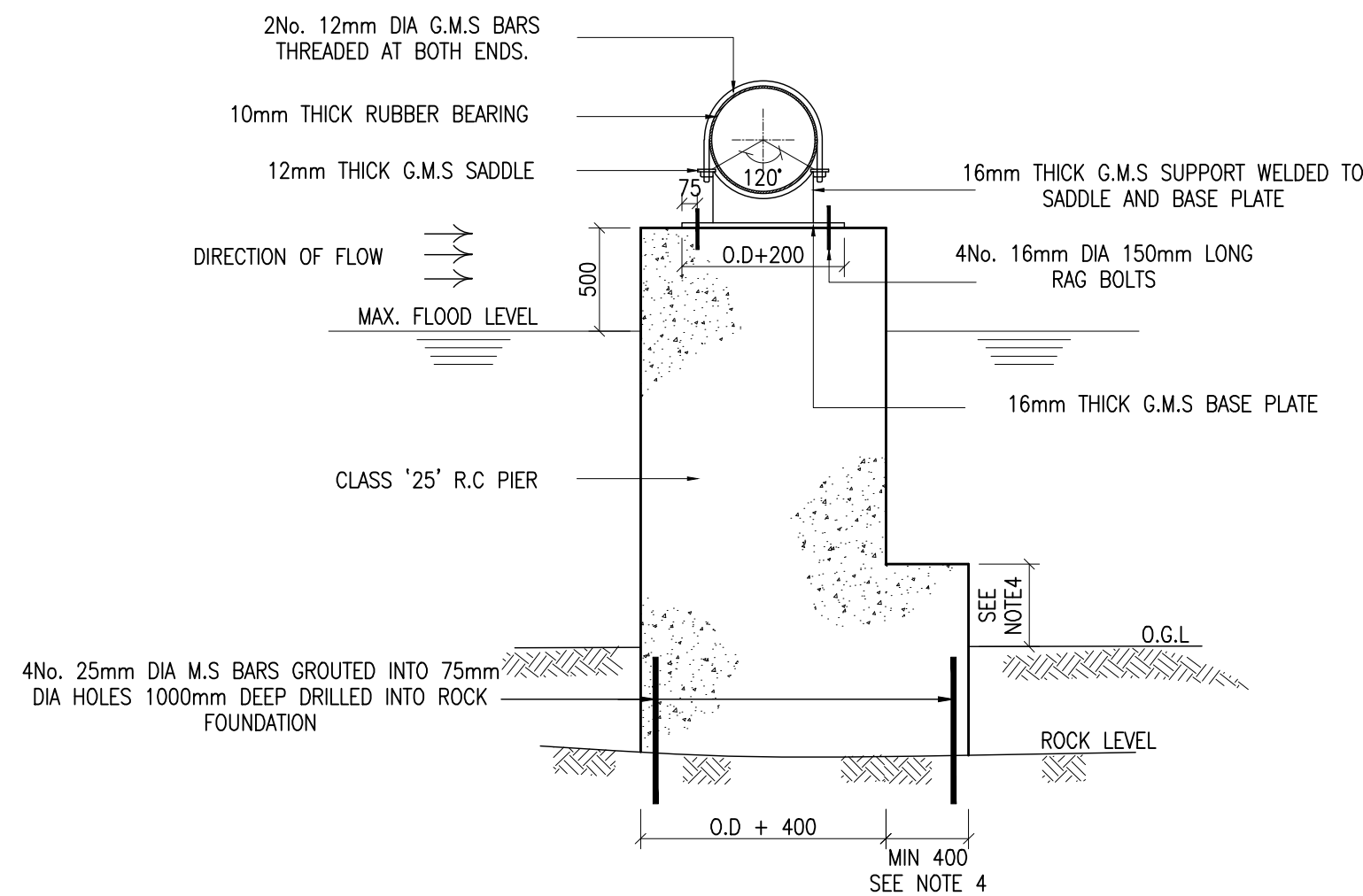
SECTION B-B
N.T.S.



SECTION D-D
N.T.S.

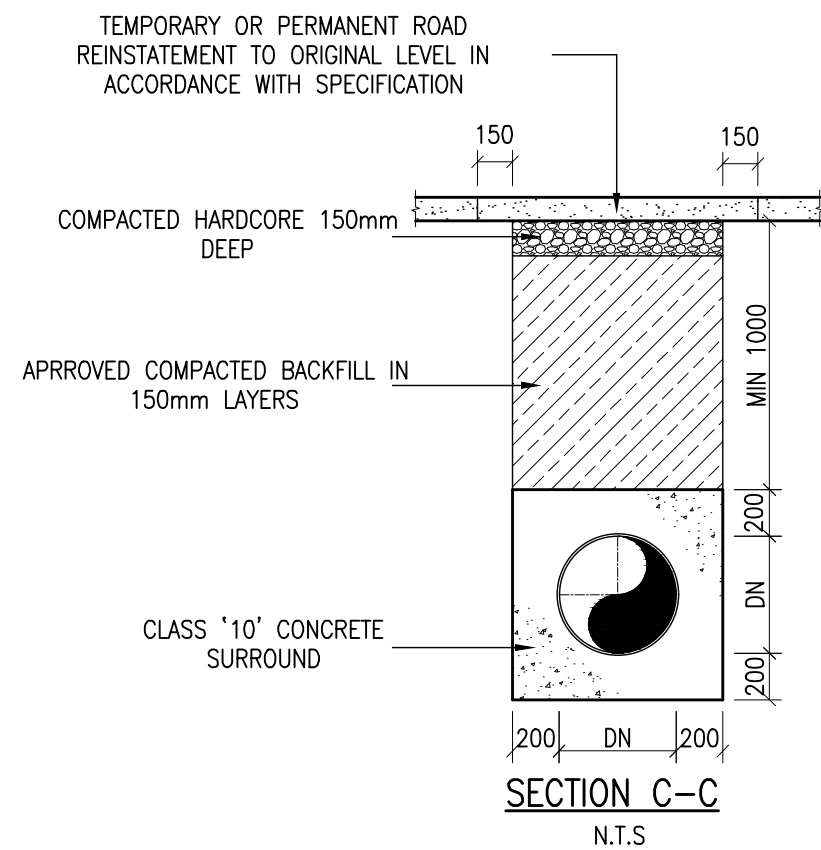


TYPICAL ROAD CROSSING
N.T.S.



SECTION N A-A

N.T.S.



SECTION C-C
N.T.S.

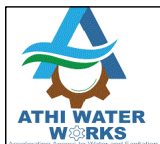
NOTES:

- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.
- ALL RAILWAY CROSSINGS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF KENYA RAILWAYS.
- RIVER OVERCROSSING DETAILS ARE APPLICABLE TO PIPES OF DN 300 AND ABOVE. DETAILS FOR SMALLER PIPES ARE SIMILAR AND WILL BE FINALISED BY THE ENGINEER'S REPRESENTATIVE.
- DIMENSIONS OF CONCRETE PIERS TO BE FINALISED BY THE ENGINEER'S REPRESENTATIVE AFTER A DETAILED SURVEY.
- SLIP ANCHORS TO BE PROVIDED WHERE:-
(A) THE LONGITUDINAL SLOPE EXCEEDS 1:6.
(B) THE CROSSFALL EXCEEDS 1:3. ONE SLIP ANCHOR TO BE PROVIDED PER LENGTH OF PIPE.
- PIPE WRAP SHALL BE REMOVED UNDER THE CONCRETE WHERE SLIP ANCHORS ARE PROVIDED.
- CLASS '10' CONCRETE PIPE SURROUND SHALL BE PROVIDED FOR UNDERCROSSING OF LARGE OPEN DRAINS IN ACCORDANCE WITH THE DETAILS FOR RIVER UNDERCROSSINGS.
- MAXIMUM FLOOD LEVEL IS TO BE DETERMINED BY THE ENGINEER'S REPRESENTATIVE.
- FOR RIVER OVERCROSSINGS, A 10mm GAP SHALL BE LEFT BETWEEN PIPES AT FLEXIBLE COUPLING TO PERMIT EXPANSION.

LEGEND:

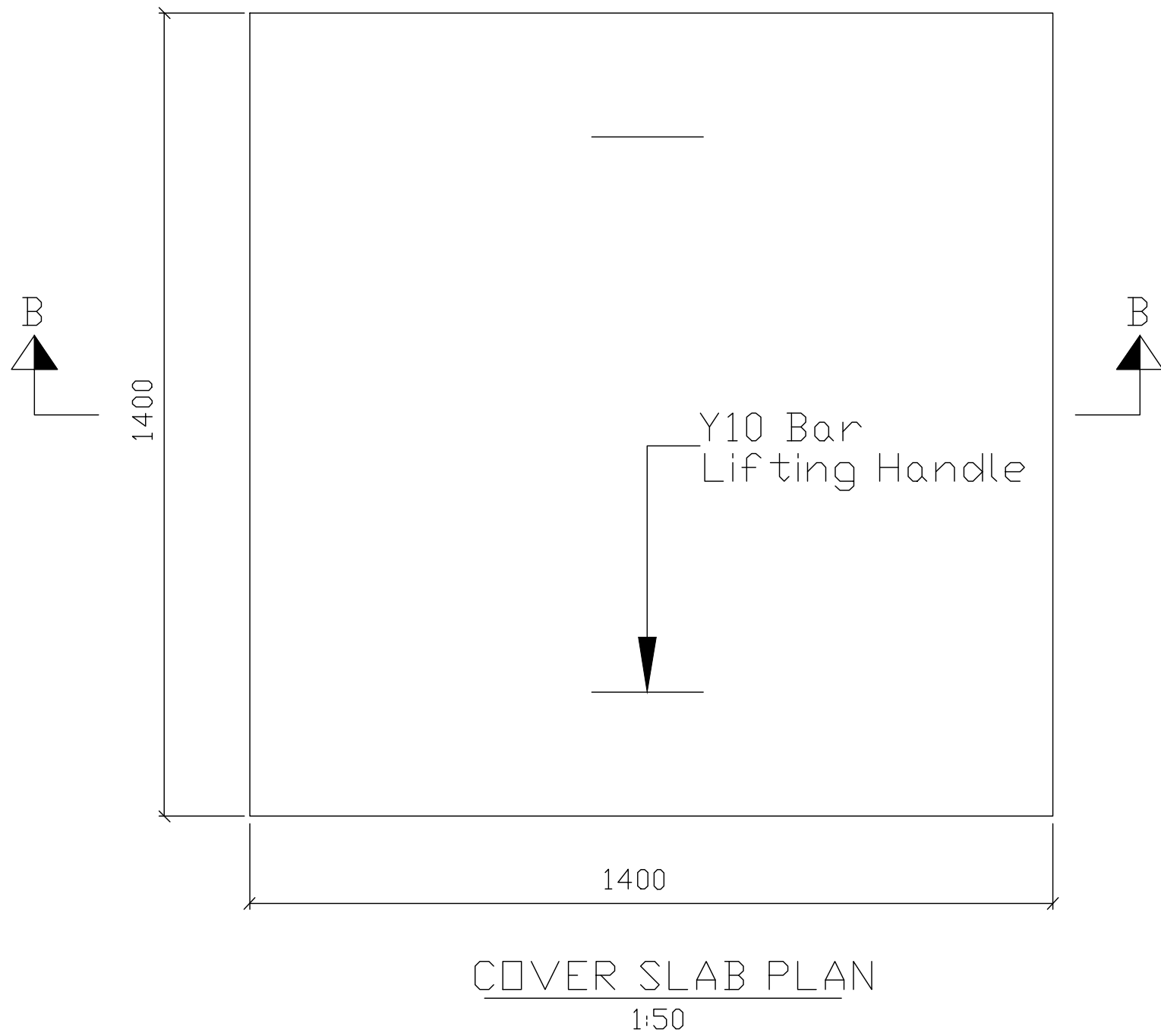
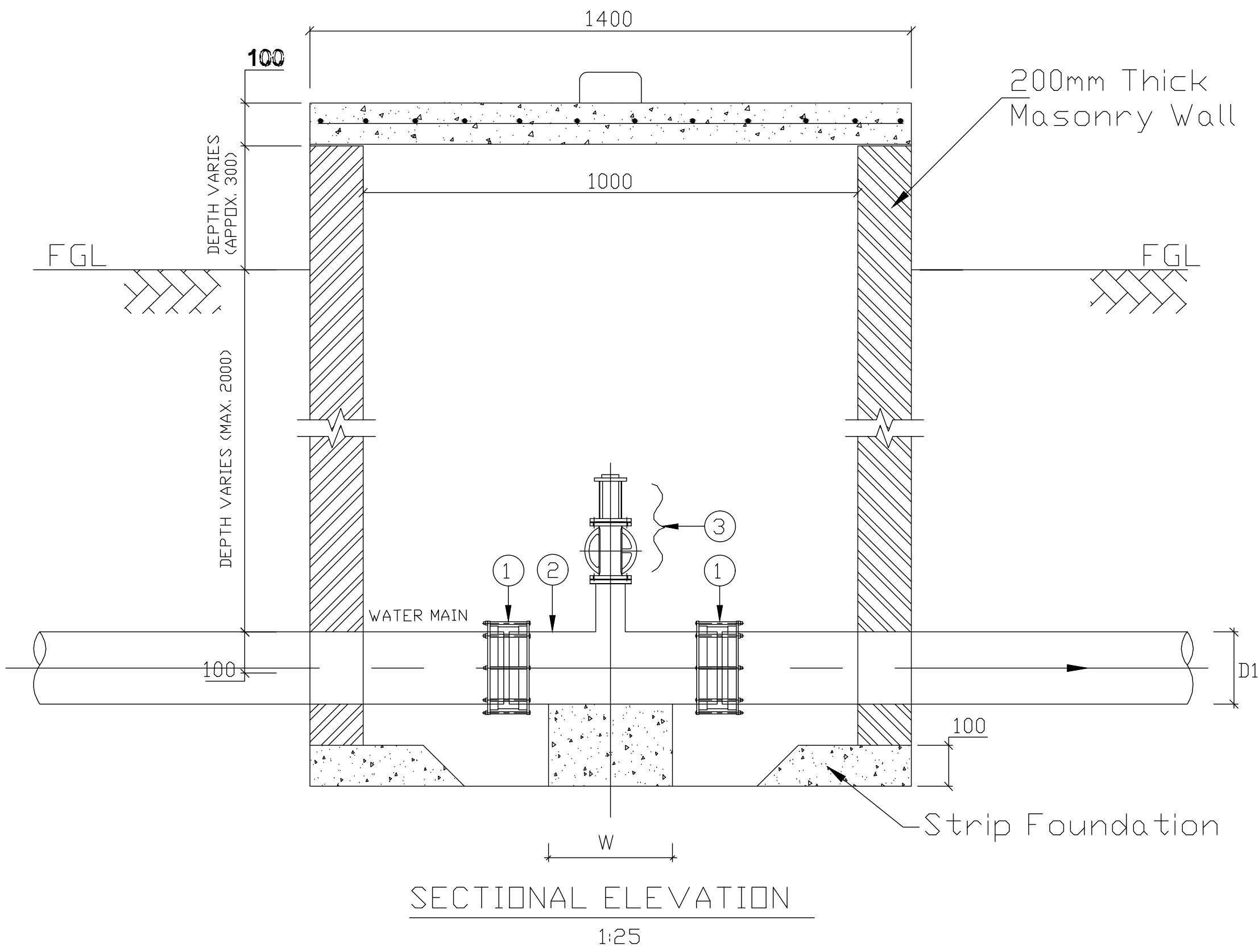
- O.G.L. -ORIGINAL GROUND LEVEL
F.C -FLEXIBLE COUPLING
O.D -OUTSIDE DIAMETER
DN -NOMINAL DIAMETER

Revised		Comments		Emitted	Prepared	KANDARA WATER SUPPLY PROJECT	Scale		FINAL DESIGN REVIEW	
Date							Date		JULY 2023	
							Drawn		MUSWAS/STD/001	
							Checked		Scale	AS INDICATED
						CROSSINGS DETAILS DETAILS	Drawn Title		Sheet No	1 of 5
							Approved		Index No	MUSWAS/2020/05



ATHI WATER WORKS
DEVELOPMENT AGENCY
P.O. Box 452/3/00100,
Athi River Center, Hombia Road
Nairobi, Kenya
Tel: 254 20 272743
email: athi@ard.ac.ke



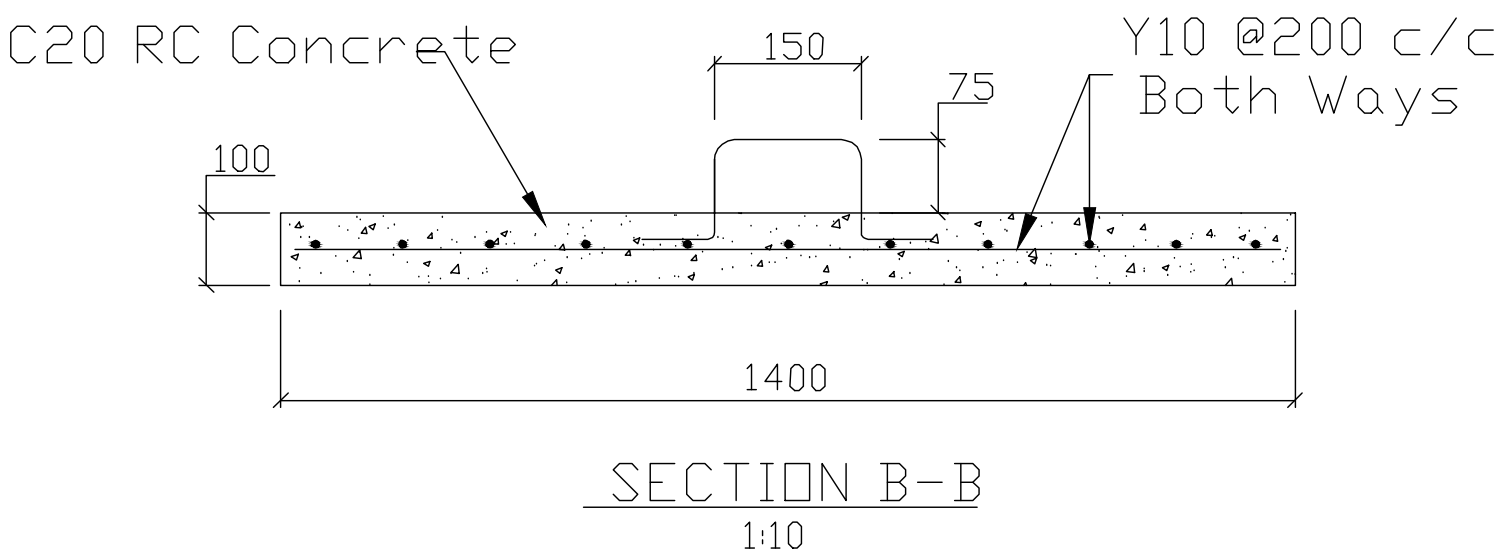


SCHEDULE OF PIPEWORK & FITTINGS

ITEM No.	DIAMETER (mm)	DESCRIPTION
1	D1	FLEXIBLE COUPLING
2	D1 x 50	PLAIN ENDED TEE WITH FLANGED BRANCH
3	50	ANTI SHOCK ANTI SURGE AIR VALVE c/w ISOLATING VALVE

SCHEDULE OF AIR VALVES

NAME OF PIPELINE	DIAMETER MAIN (mm)	DIAMETER BRANCH (mm)
GRAVITY RAW WATER	400	50
TREATED WATER GRAVITY MAIN	355	50
KARIMAMWARD DISTRIBUTION MAIN	225	50



NOTES:

- GENERAL**
- This drawing to be read in conjunction with all relevant Engineer's and Architects drawings
 - The contractor shall check all dimensions on site, any error & or omissions shall be reported to the Engineer before work is commenced.
 - The latest amendment or revision shall superceed all other issues which shall be destroyed.
 - All dimensions in millimetres unless otherwise indicated

- CONCRETE**
- Blinding under pad foundation to be 1:4:8 mix.
 - All reinforced concrete to be grade 25(1:11/2:3) mix giving a minimum crushing strength of 17N/mm² and 25N/mm² of 7 and 28 days respectively.
 - Cement shall be portland cement to comply with BS12.
 - Maximum aggregate size shall be 20mm unless otherwise stated.

- REINFORCEMENT**
- R indicate hot rolled mild steel to BS4449.
 - D indicate cold rolled high tensile steel to BS4461
 - Fabric reinforcement shall be to BS4483.
 - All reinforcement shall be presented to the Engineer prior to concreting.

- COVER**
- Unless otherwise stated cover to main steel shall be as follows:
- 50mm to all steel below ground level.
 - 40mm to columns above ground level.
 - 30mm to steel in beams.
 - 20mm to steel in slabs & staircase.

- WORKMANSHIP**
- All concrete work to be in accordance with BS8110.
 - All reinforced concrete to be mechanically vibrated.
 - All load bearing blockwork shall be in accordance with CP111

- EXCAVATIONS**
- All excavations for foundation shall be presented to the Engineer for his approval prior to placing of blinding.
 - Depth of foundation on all drawing are provisional & the Engineer shall be consulted before final depth is arrived at during construction.
 - Foundations designed for safe soil bearing capacity of 150KN/M².

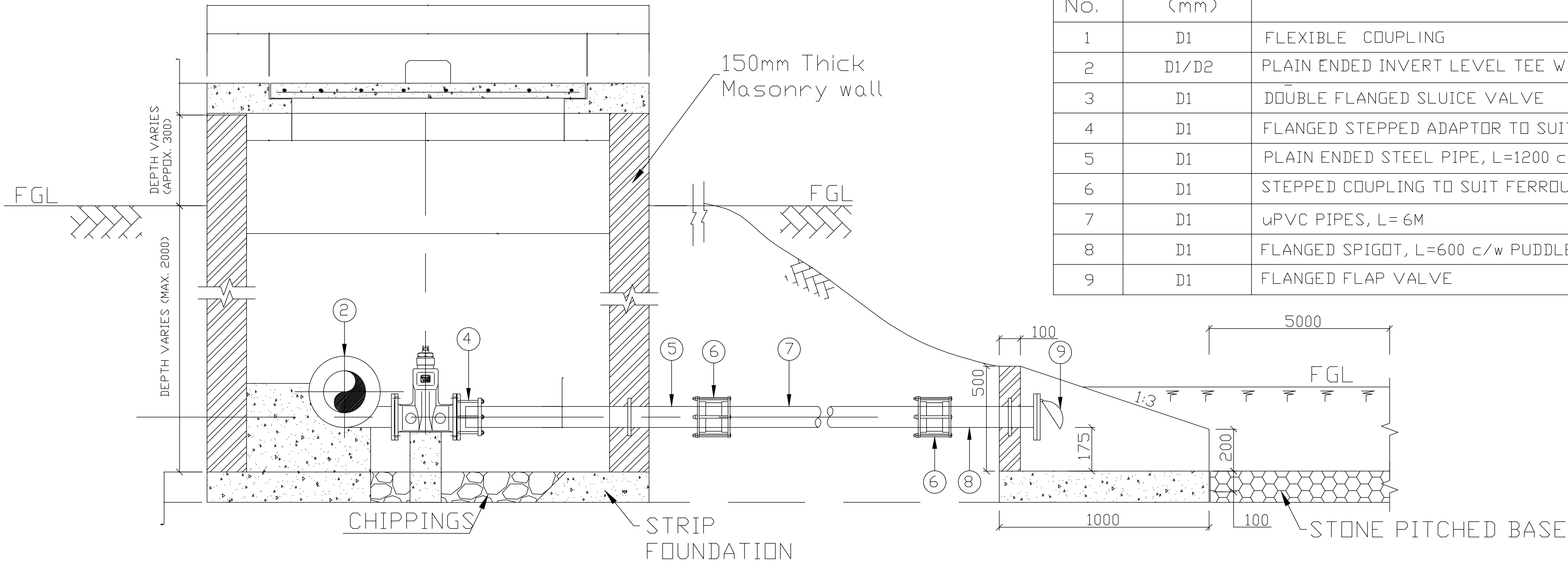
- GROUND FLOOR SLAB**
- Ground floor slab to be cast on compacted & approved hardcore as per specifications & to be reinforced with mild steel of 10mm dia at 200mm centres, placed 40mm from top.

- LEGEND**
- T1 Top first layer
 - T2 Top second layer
 - B1 Bottom first layer
 - B2 Bottom second layer

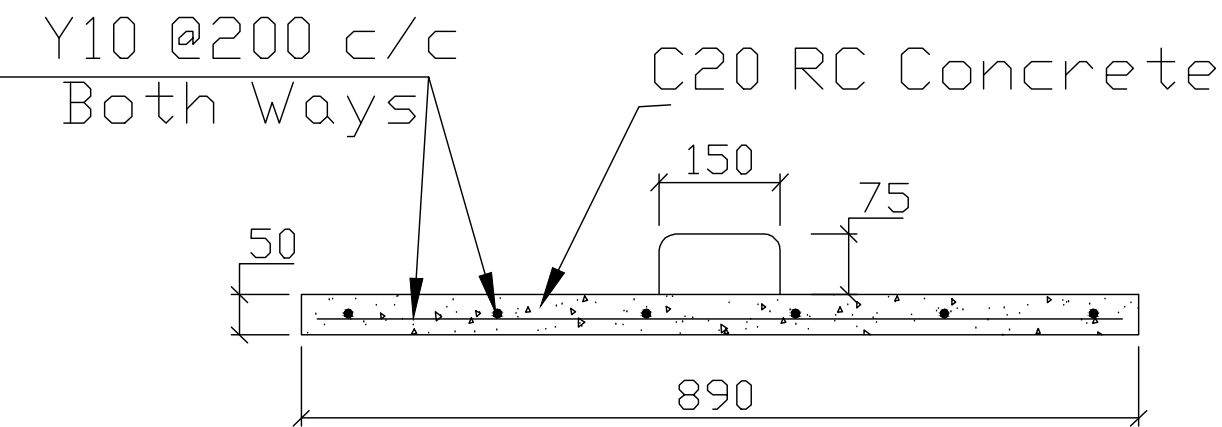
Revised		Comments		Engineer	Project Manager	Project		Scale	Status	
Drawn	Date					KANDARA WATER SUPPLY PROJECT			Scale	Final Design Review
									Date	JULY 2023
									Drawn	MUSWAS STD.002
									Scale	AS INDICATED
									Sheet No	2 of 5
									Index No	MUSWAS/2020.059
										A1

SCHEDULE OF PIPEWORK & FITTINGS

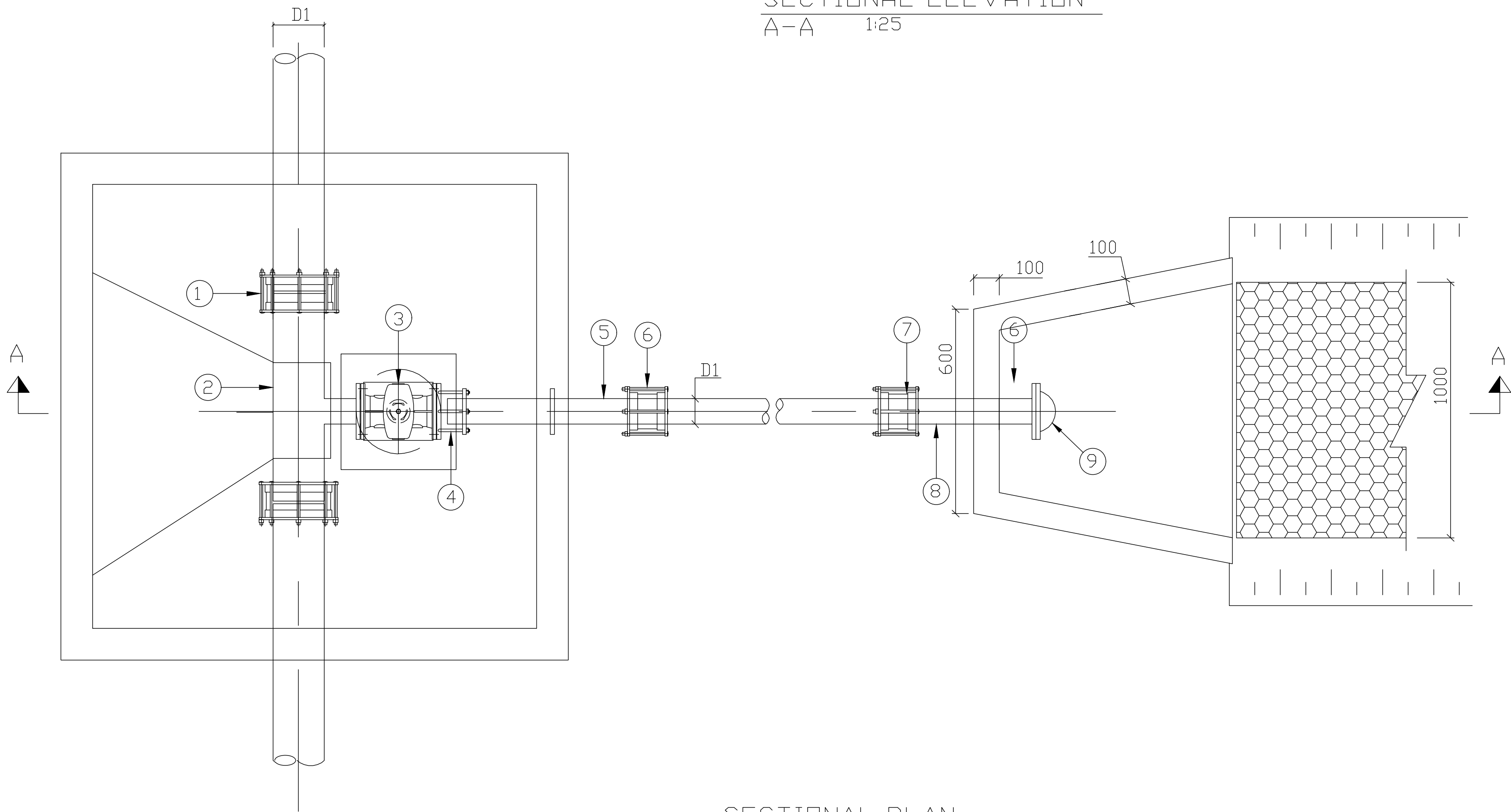
ITEM No.	DIAMETER (mm)	DESCRIPTION	No.
1	D1	FLEXIBLE COUPLING	2
2	D1/D2	PLAIN ENDED INVERT LEVEL TEE WITH FLANGED BRANCH	1
3	D1	DOUBLE FLANGED SLUICE VALVE	1
4	D1	FLANGED STEPPED ADAPTOR TO SUIT uPVC	1
5	D1	PLAIN ENDED STEEL PIPE, L=1200 c/w PUDDLE FLANGE	1
6	D1	STEPPED COUPLING TO SUIT FERROUS/uPVC	2
7	D1	uPVC PIPES, L= 6M	-
8	D1	FLANGED SPIGOT, L=600 c/w PUDDLE FLANGE	1
9	D1	FLANGED FLAP VALVE	1



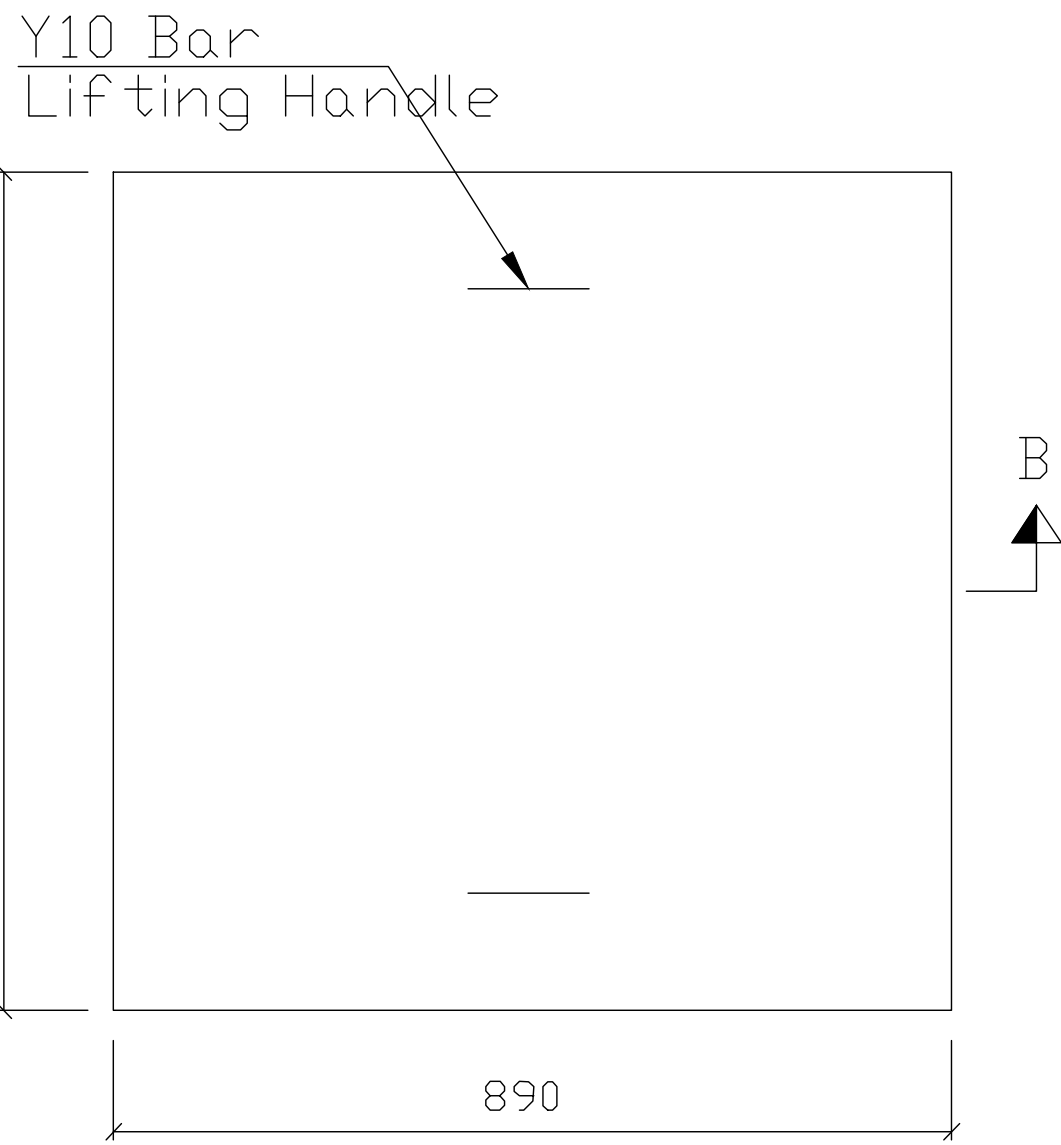
SECTIONAL ELEVATION
A-A 1:25



SECTION B-B
1:10



SECTIONAL PLAN
1:50



COVER SLAB PLAN
1:50

NOTES:

GENERAL

1. This drawing to be read in conjunction with all relevant Engineer's and Architects drawings
2. The contractor shall check all dimensions on site, any error & or omissions shall be reported to the Engineer before work is commenced.
3. The latest amendment or revision shall supersede all other issues which shall be destroyed.
4. All dimensions in millimetres unless otherwise indicated

CONCRETE

1. Blinding under pad foundation to be 1:4:8 mix.
2. All reinforced concrete to be grade 25(1:1/2:3) mix giving a minimum crushing strength of 17N/mm² and 25N/mm² of 7 and 28 days respectively.
3. Cement shall be portland cement to comply with BS12.
4. Maximum aggregate size shall be 20mm unless otherwise stated.

REINFORCEMENT

1. R indicate hot rolled mild steel to BS4449.
2. D indicate cold rolled high tensile steel to BS4461
3. Fabric reinforcement shall be to BS4483.
4. All reinforcement shall be presented to the Engineer prior to concreting.

COVER

- Unless otherwise stated cover to main steel shall be as follows:
1. 50mm to all steel below ground level.
 2. 40mm to columns above ground level.
 3. 30mm to steel in beams.
 4. 20mm to steel in slabs & staircase.

WORKMANSHIP

1. All concrete work to be in accordance with BS8110.
2. All reinforced concrete to be mechanically vibrated.
3. All load bearing blockwork shall be in accordance with CP111

EXCAVATIONS

1. All excavations for foundation shall be presented to the Engineer for his approval prior to placing of blinding.
2. Depth of foundation on all drawing are provisional & the Engineer shall be consulted before final depth is arrived at during construction.
3. Foundations designed for safe soil bearing capacity of 150KN/M².

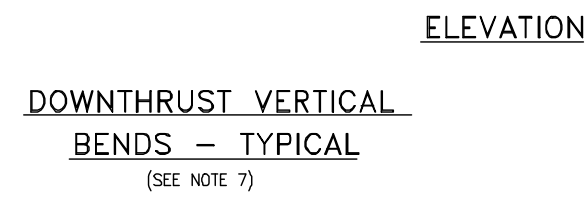
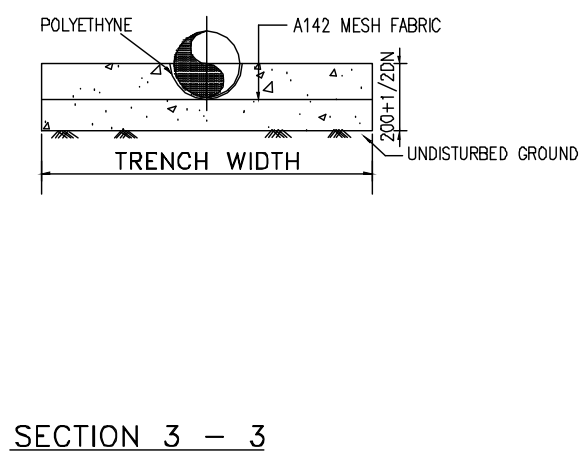
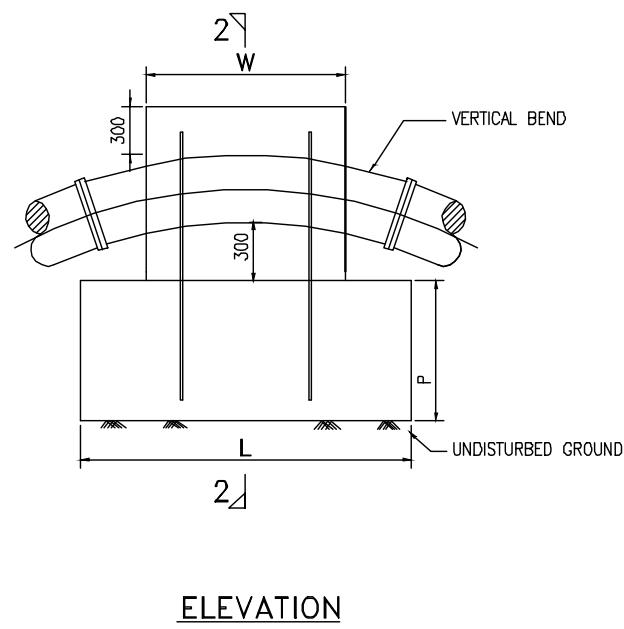
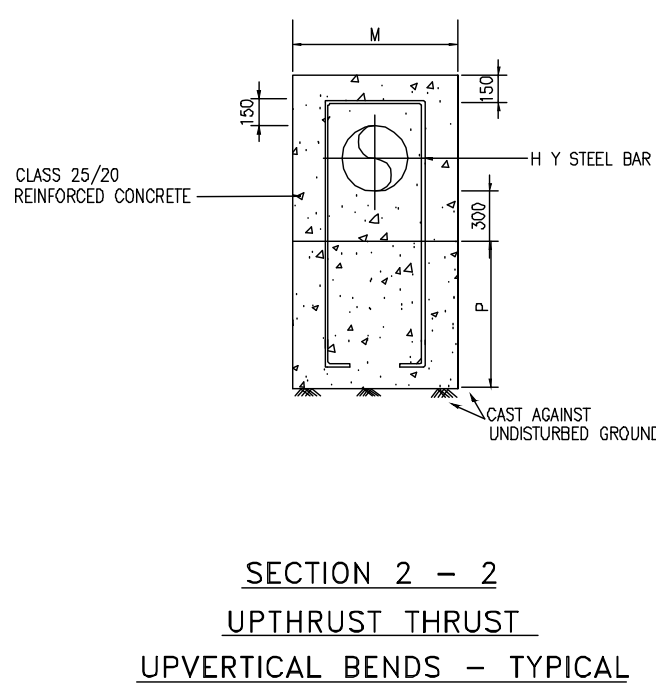
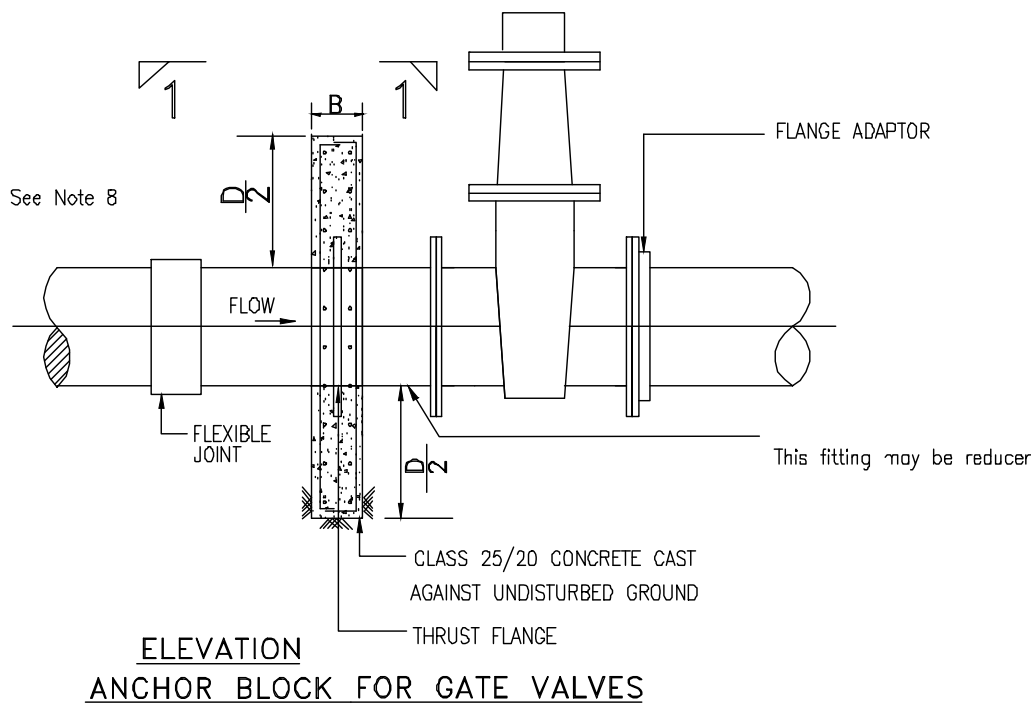
GROUND FLOOR SLAB

1. Ground floor slab to be cast on compacted & approved hardcore as per specifications & to be reinforced with mild steel of 10mm dia. at 200mm centres, placed 40mm from top.

LEGEND

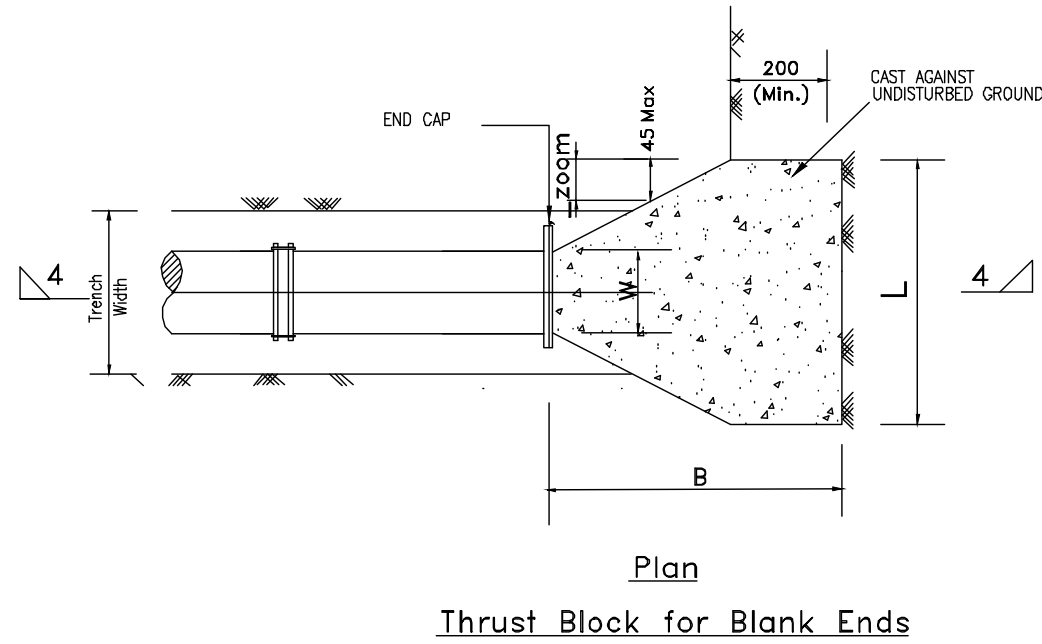
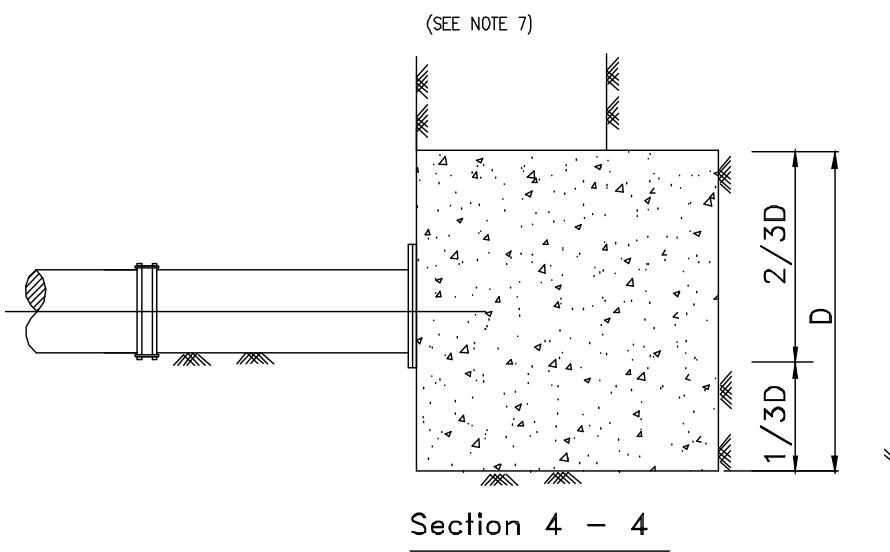
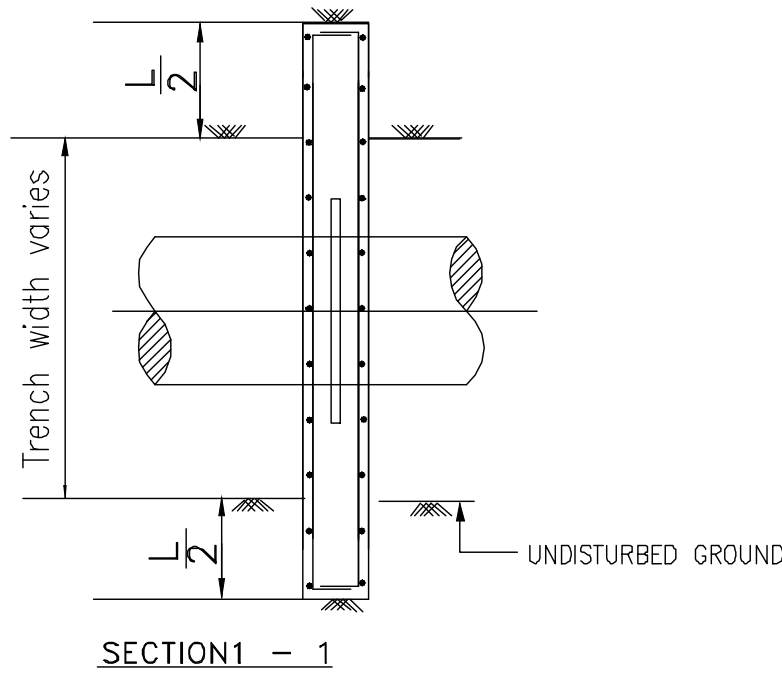
1. T1 Top first layer
2. T2 Top second layer
3. B1 Bottom first layer
4. B2 Bottom second layer

Revisions		Comments		Engineer	Project Manager	Design	Project	Scale	Final Design Review
Drawn	Date			ATHI WATER WORKS AGENCY P.O. Box 452-300100, Athi River Center, Highway Road Nairobi Kenya Tel: 254 20 272743 email: info@athiwat.co.ke		Drawn	KANDARA WATER SUPPLY PROJECT		DATE: JULY 2023 MUSWAS-STD-003
						Checked	Drawn Title	AS INDICATED	Scale Size
						Approved		3 of 5	A1
								Index No	MUSWAS:2020/060



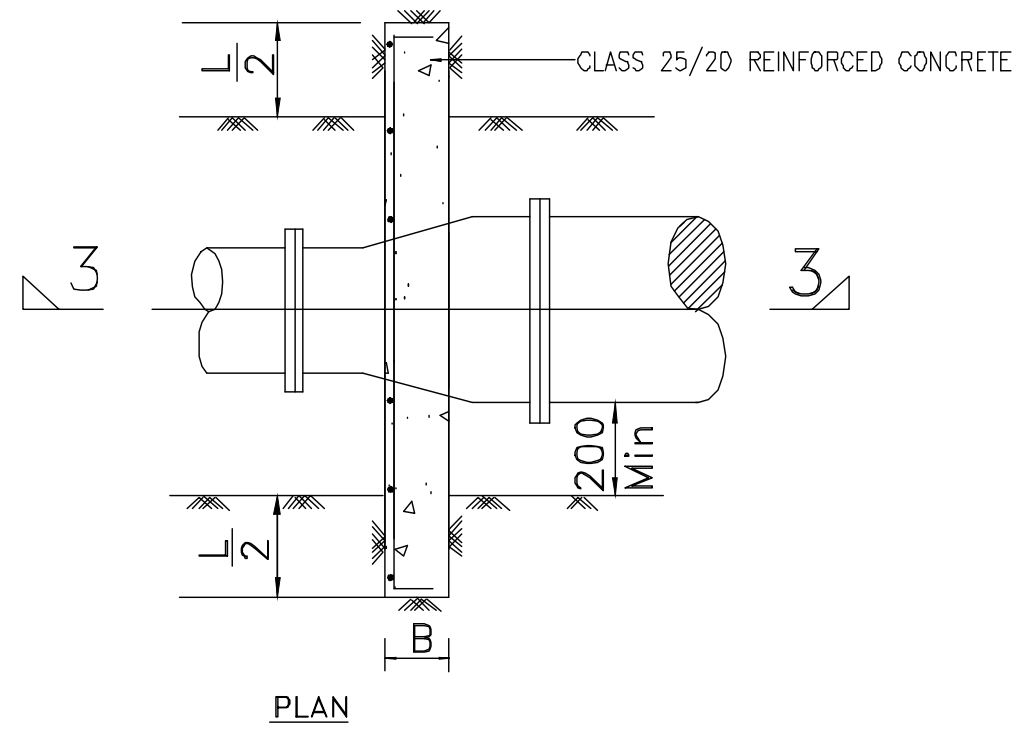
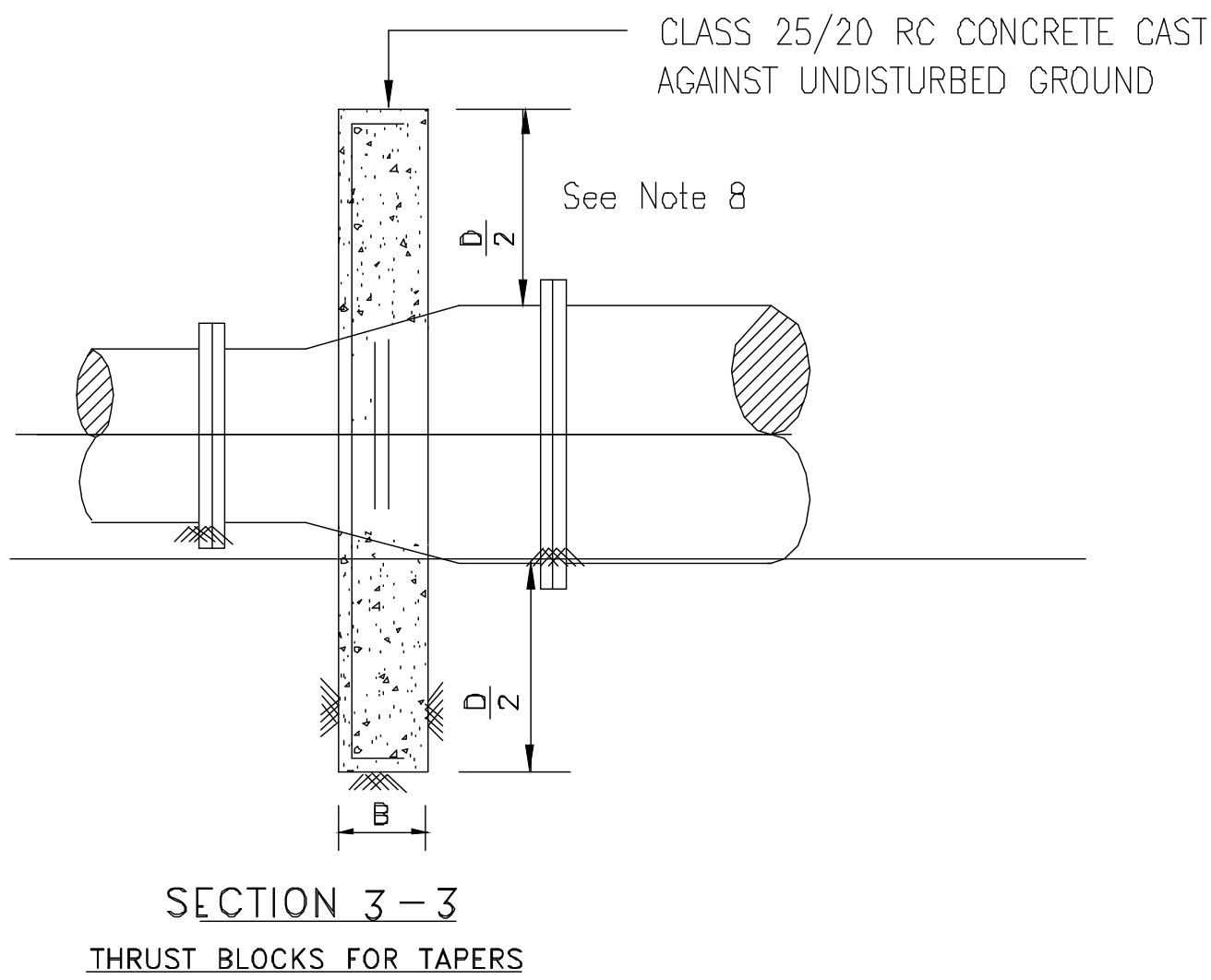
TEST HEAD (m)	PIPE DIA (mm)	D (m)	L (m)	B (m)	CONCRETE VOL (m3)
100	600	1.6	2.6	1.2	3.1
	500	1.4	2.2	1.1	2.1
	450	1.2	2.0	1.0	1.5
	400	1.2	1.6	0.8	1.0
	350	1.0	1.5	0.8	0.7
	300	1.0	1.2	0.7	0.5
	250	0.8	1.0	0.5	0.3
	200	0.6	0.8	0.5	0.2
	150	0.5	0.6	0.5	0.1
	100	0.5	0.6	0.5	0.1

TABLE OF ANCHOR BLOCKS FOR BLANK ENDS



BLOCK TYPE	D (m)	L (m)	B (mm)	MAIN STEEL	DISTRIBUTION STEEL
A	0.6	1.4	200	Y10 - 150	Y10 - 150
B	0.8	1.6	300	Y10 - 150	Y10 - 150
C	1.0	1.8	300	Y12 - 150	Y10 - 150
D	1.2	2.0	400	Y12 - 150	Y12 - 150
E	1.4	2.6	500	Y12 - 150	Y12 - 150
F	1.6	3.2	500	Y12 - 150	Y12 - 150

DETAILS OF ANCHOR BLOCKS FOR GATE VALVES AND TAPERS
(CLASS '25/20' CONCRETE)



MAIN SIZE (mm)	BLOCK TYPE	
	100m Head	150m Head
600	E	E
500	D	E
450	D	D
400	C	D
350	C	C
300	B	C
250	B	B
200	A	A
150	A	A
100	A	A

Table of Anchor Blocks For Gate Valves

MAIN SIZE (mm)	TABLE OF THRUST BLOCKS FOR TAPERS															
	TAPER (SMALLER SIZE) mm															
	100 m HEAD TEST PRESSURE															
	800	700	600	500	450	400	350	300	250	200	150	100				
800	—	D	E	F	—	F	—	E	—	—	—	—				
700	—	—	D	E	—	F	F	E	—	—	—	—				
600	—	—	D	C	D	D	E	E	—	—	—	—				
500	—	B	C	—	B	C	C	D	—	—	—	—				
450	—	—	B	—	—	B	C	C	D	—	—	—				
400	—	—	—	—	—	A	B	C	C	—	—	—				
350	—	—	—	—	—	—	A	B	B	C	—	—				
300	—	—	—	—	—	—	—	A	B	B	B	—				
250	—	—	—	—	—	—	—	—	A	A	B	—				
200	—	—	—	—	—	—	—	—	—	A	A	A				
150	—	—	—	—	—	—	—	—	—	—	—	A				

TABLE OF ANCHOR BLOCKS FOR GATE VALVES AND TAPERS
(CLASS '25' CONCRETE)
FOR DIMENSIONS (See table 4)

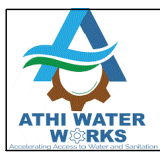
NOTES

- All concrete thrust blocks shall be constructed on and against firm ground directly. The thrust or anchor blocks shall not be cast against black cotton soil and reference shall be made to the Engineer's Representative for further instructions.
- The concrete thrust blocks are designed to bear on the original earth surface with bearing pressure of 100KN/m².
- Concrete to be Class '20/20' unless otherwise stated.
- Concrete in thrust and anchor blocks must be cast clear of joints.
- Dimensions 'W' for thrust blocks on vertical bends to suit the size of bend and clearance required for joints.
- The steel anchoring reinforcement and the dimensions L, P and M are to be decided by the Engineer's Representative to suit each individual bend.
- Where D/2 exceeds the cover, increase the depth below the pipe to make the total = D.
- All dimensions are in millimeters unless otherwise stated. This drawing shall be read in conjunction with all relevant drawings.
- All dimensions must be checked on site before commencing any work and if any discrepancy in dimensions to be reported to engineer immediately.
- Drawing to scale in A1 size.
- Only figured dimensions to be taken from drawing.

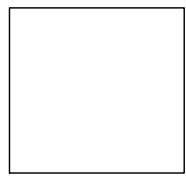
LEGEND

- DN - Nominal diameter
BF - Blank Flange
FA - Flange Adaptor

Revised	Checked	Emitted	Project Manager	Designed	Project	State	FINAL DESIGN REVIEW
Date				Drawing	KANDARA WATER SUPPLY PROJECT	Date	JULY 2023
				Created		Drawing No	MUSWAS/STD/004
				Approved		State	AS INDICATED
						Scale	4 : 5
						Index No	MUSWAS/2020/061
							A1



ATHI WATER WORKS
DEVELOPMENT AGENCY
P.O. Box 452/3/00100,
Africa Re Center, Harare
Tel: 254 20 272743
email: athi@ard.co.ke



VERTICLE BENDS DETAILS
DETAILS

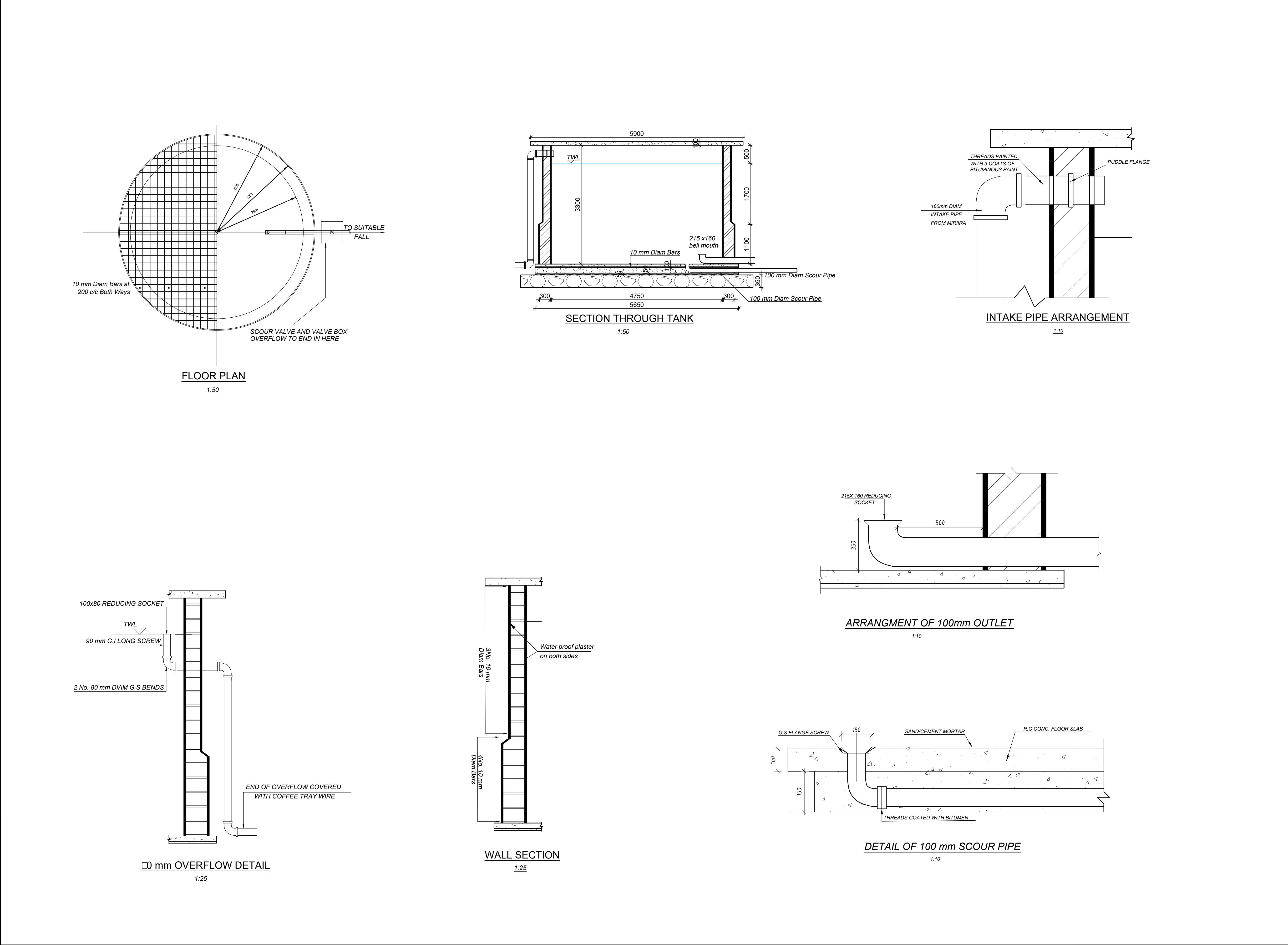


Table of Thrust Blocks for Horizontal Bends

Table of Thrust Blocks for Tees (CLASS '20/20' CONCRETE)

- [illegible]

5.0. BREAK PRESSURE TANK



NOTES:

GENERAL

- 1.This drawing to be read in conjunction with all relevant Engineer's and Architects drawings
2. The contractor shall check all dimensions on site, any error & or omissions shall be reported to the Engineer before work is commenced.
- 3.The latest amendment or revision shall superceed all other issues which shall be destroyed.
4. All dimensions in millimetres unless otherwise indicated

CONCRETE

1. Blinding under pad foundation to be 1:4:8 mix.
2. All reinforced concrete to be grade 25(1:11/2:3) mix giving a minimum crushing strength of 17N/mm2 and 25N/mm2 of 7 and 28 days respectively.
3. Cement shall be portland cement to comply with BS12.
4. Maximum aggregate size shall be 20mm unless otherwise stated.

REINFORCEMENT

1. R indicate hot rolled mild steel to BS4449.
2. D indicate cold rolled high tensile steel to BS4461
3. Fabric reinforcement shall be to BS4483.
4. All reinforcement shall be presented to the Engineer prior to concreting.

COVER

- Unless otherwise stated cover to main steel shall be as follows:
1. 50mm to all steel below ground level.
 2. 40mm to columns above ground level.
 3. 30mm to steel in beams.
 4. 20mm to steel in slabs & staircase.

WORKMANSHIP

1. All concrete work to be in accordance with BS8110.
2. All reinforced concrete to be mechanically vibrated.
3. All load bearing blockwork shall be in accordance with CP111

EXCAVATIONS

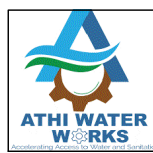

1. All excavations for foundation shall be presented to the Engineer for his approval prior to placing of blinding.
2. Depth of foundation on all drawing are provisional & the Engineer shall be consulted before final depth is arrived at during construction.
3. Foundations designed for safe soil bearing capacity of 150KN/M².

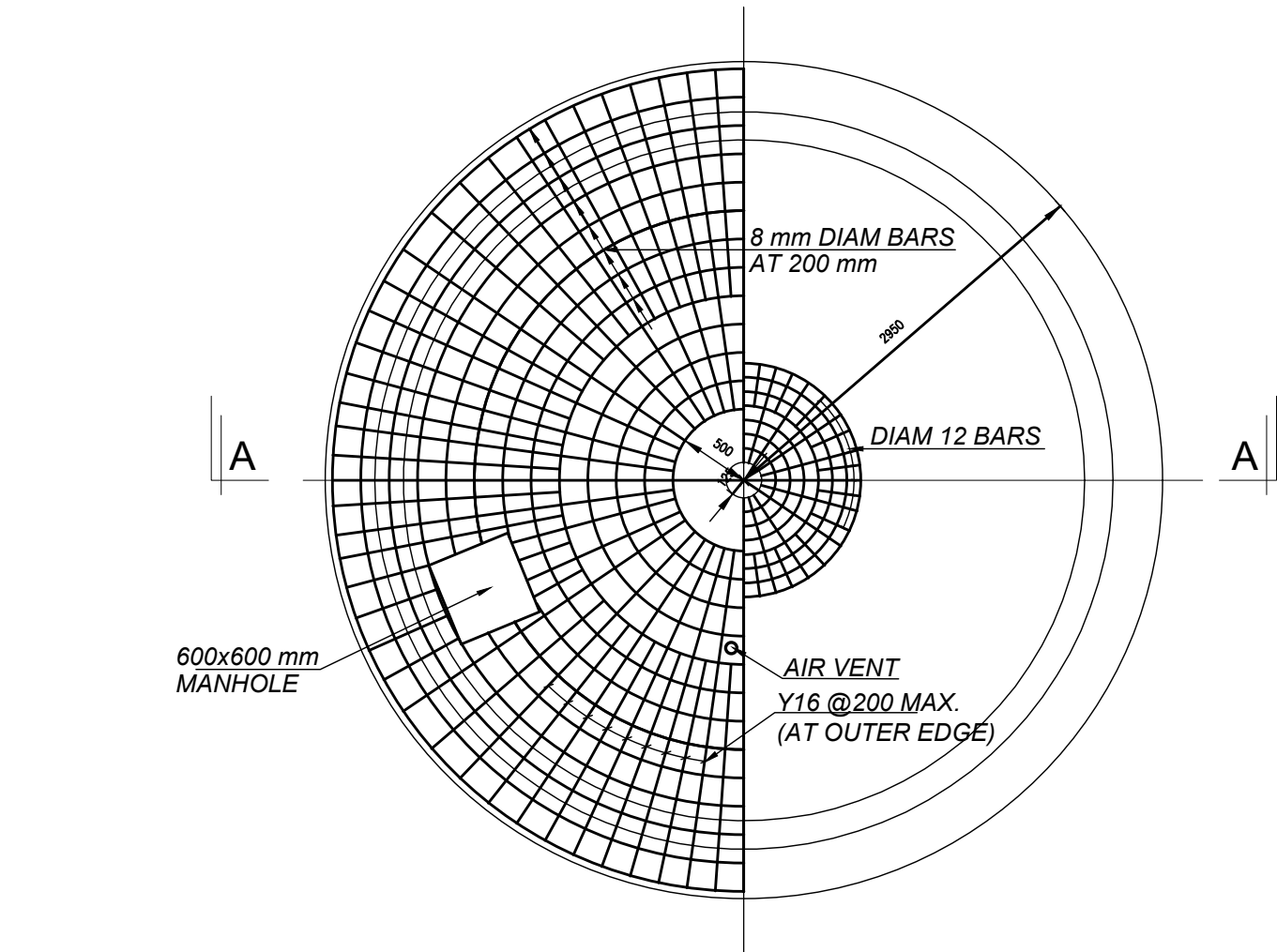
GROUND FLOOR SLAB

1. Ground floor slab to be cast on compacted & approved hardcore as per specifications & to be reinforced with mild steel of 10mm dia.at 200mm centres, placed 40mm from top.

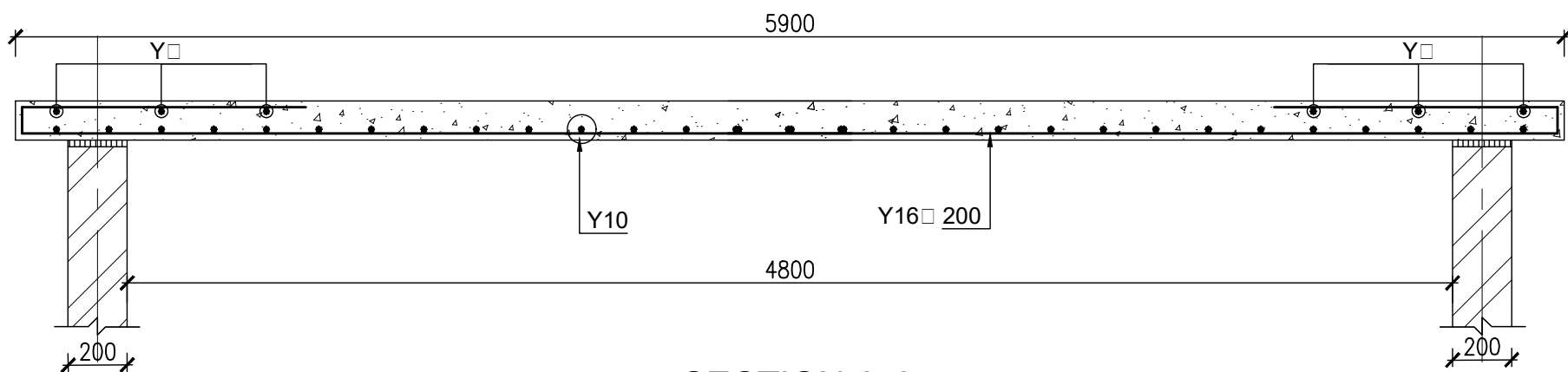
LEGEND

1. T1 Top first layer
2. T2 Top second layer
3. B1 Bottom first layer
4. B2 Bottom second layer

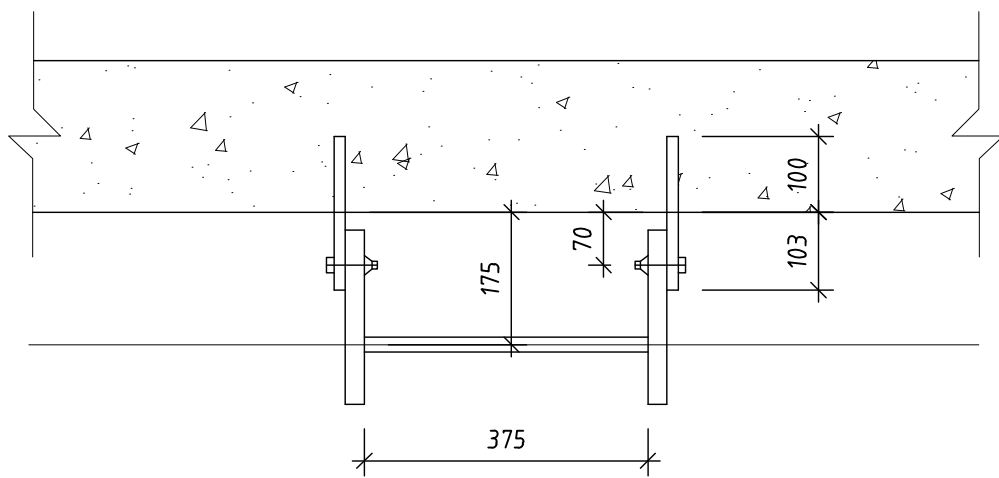
Revisions		Comments		Engineer	Project Manager	Project		Scale		FINAL DESIGN REVIEW	
Drawn	Date			 ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 4523/00100, Athira Re Center, Hottia Road Nairanketta Tel: 254 20 272743 email: a@ard.co.ke		Designed	KANDARA WATER SUPPLY PROJECT		Scale	JULY 2023	
						Drawn			Drawn No	MUSWAS.BPT.001	
						Checked	Scale	AS INDICATED			
						Approved	Scale: No	1:2			
							Index No	A1			
						KANDARA 50M3 BREAK PRESSURE TANK FLOOR PLAN, SECTIONS AND DETAILS					



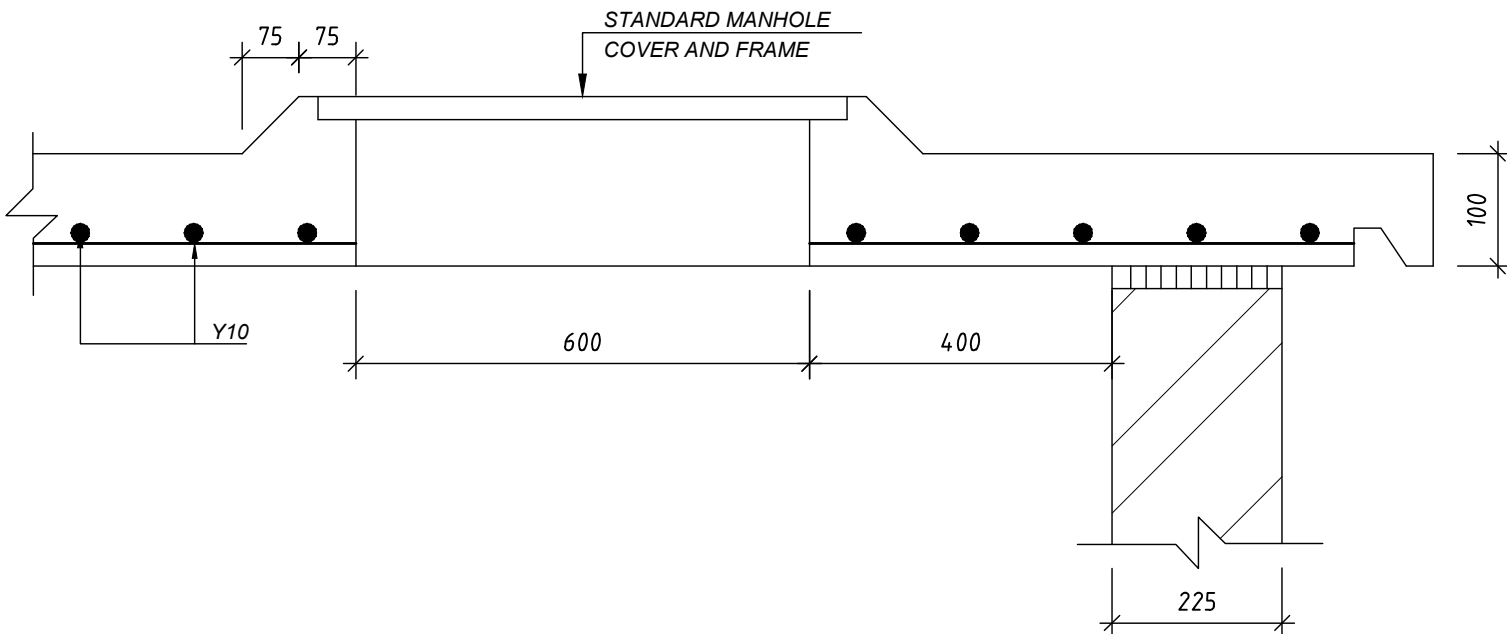
ROOF PLAN
1:50



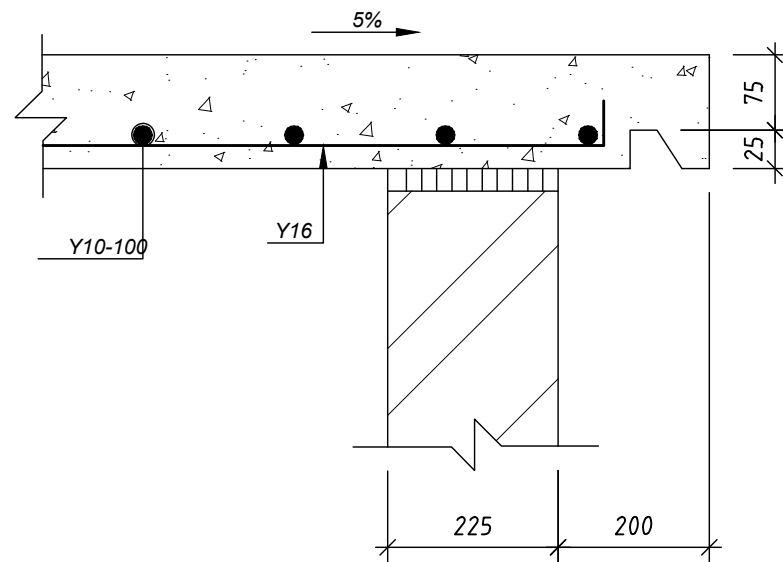
SECTION A/A
1:25



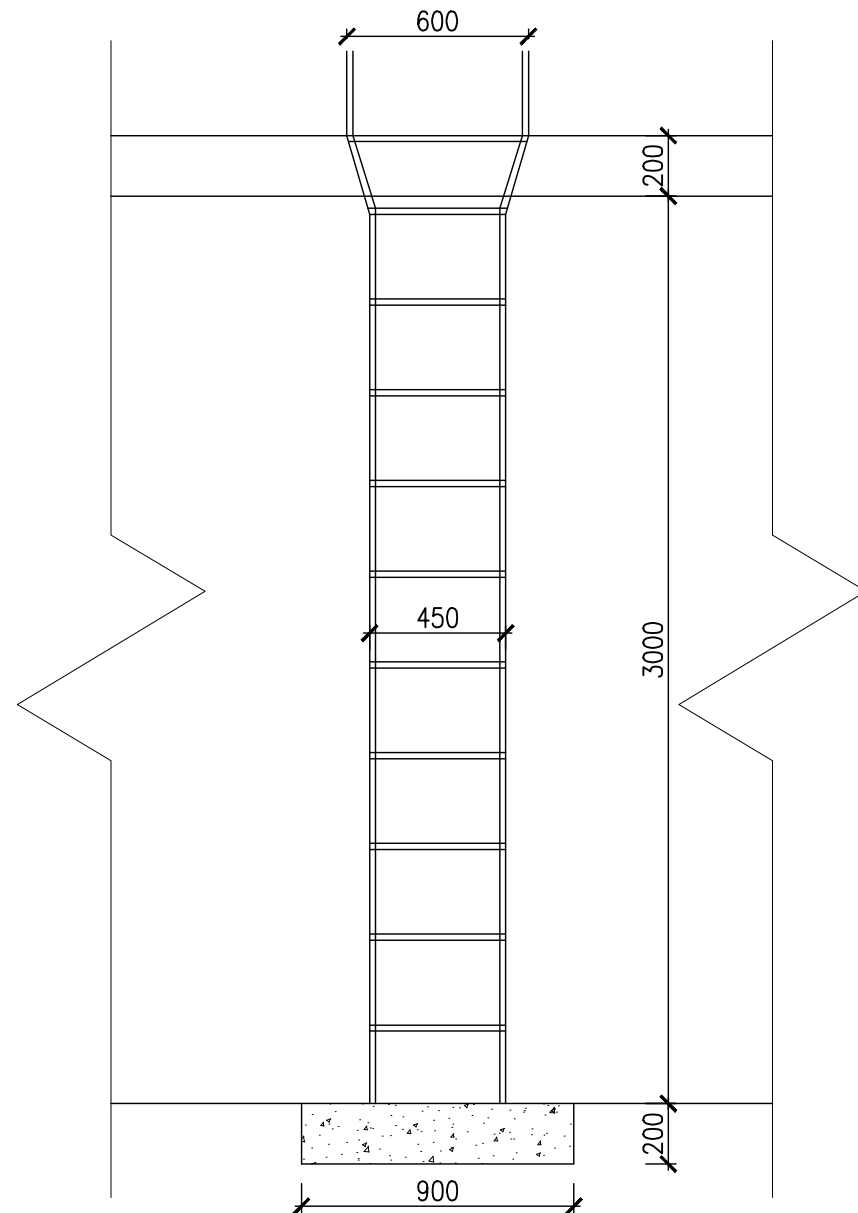
TOP ELEVATION LADDER
1:10



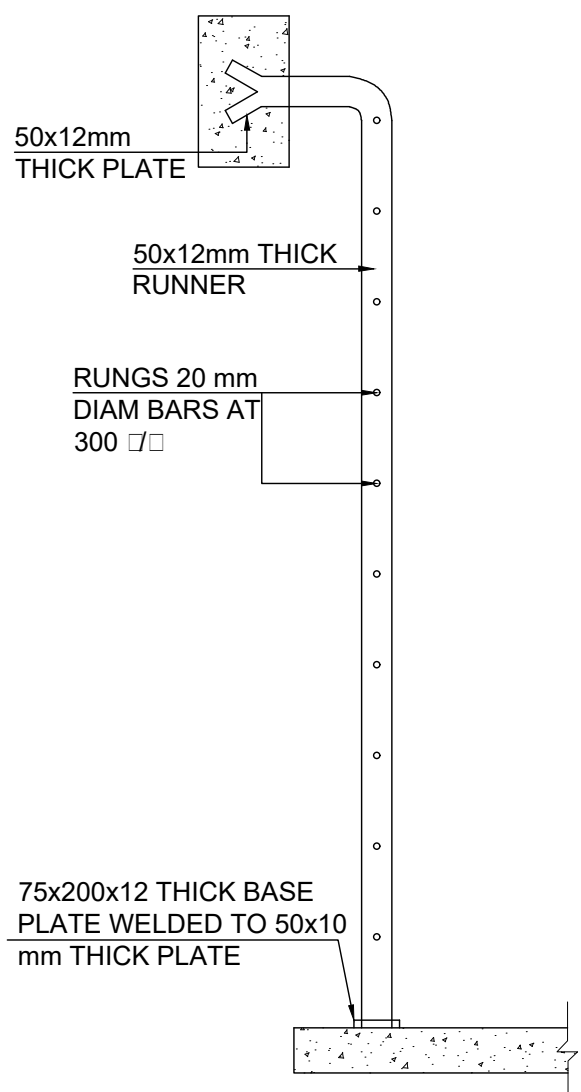
600x600mm MANHOLE DETAIL
1:10



END ROOF DETAIL
1:10



ELEVATION G.M.S LADDER
1:25



LADDER
1:25

NOTES:

GENERAL

- 1.This drawing to be read in conjunction with all relevant Engineer's and Architects drawings
2. The contractor shall check all dimensions on site, any error & or omissions shall be reported to the Engineer before work is commenced.
- 3.The latest amendment or revision shall supercede all other issues which shall be destroyed.
4. All dimensions in millimetres unless otherwise indicated

CONCRETE

1. Blinding under pad foundation to be 1:4:8 mix.
2. All reinforced concrete to be grade 25(1:11/2:3) mix giving a minimum crushing strength of 17N/mm² and 25N/mm² of 7 and 28 days respectively.
3. Cement shall be portland cement to comply with BS12.
4. Maximum aggregate size shall be 20mm unless otherwise stated.

REINFORCEMENT

1. R indicate hot rolled mild steel to BS4449.
2. D indicate cold rolled high tensile steel to BS4461
3. Fabric reinforcement shall be to BS4483
4. All reinforcement shall be presented to the Engineer prior to concreting.

COVER

- Unless otherwise stated cover to main steel shall be as follows:
1. 50mm to all steel below ground level.
 2. 40mm to columns above ground level.
 3. 30mm to steel in beams.
 4. 20mm to steel in slabs & staircase.

WORKMANSHIP

1. All concrete work to be in accordance with BS8110.
2. All reinforced concrete to be mechanically vibrated.
3. All load bearing blockwork shall be in accordance with CP111

EXCAVATIONS

1. All excavations for foundation shall be presented to the Engineer for his approval prior to placing of blinding.
2. Depth of foundation on all drawing are provisional & the Engineer shall be consulted before final depth is arrived at during construction.
3. Foundations designed for safe soil bearing capacity of 150KN/M².

GROUND FLOOR SLAB

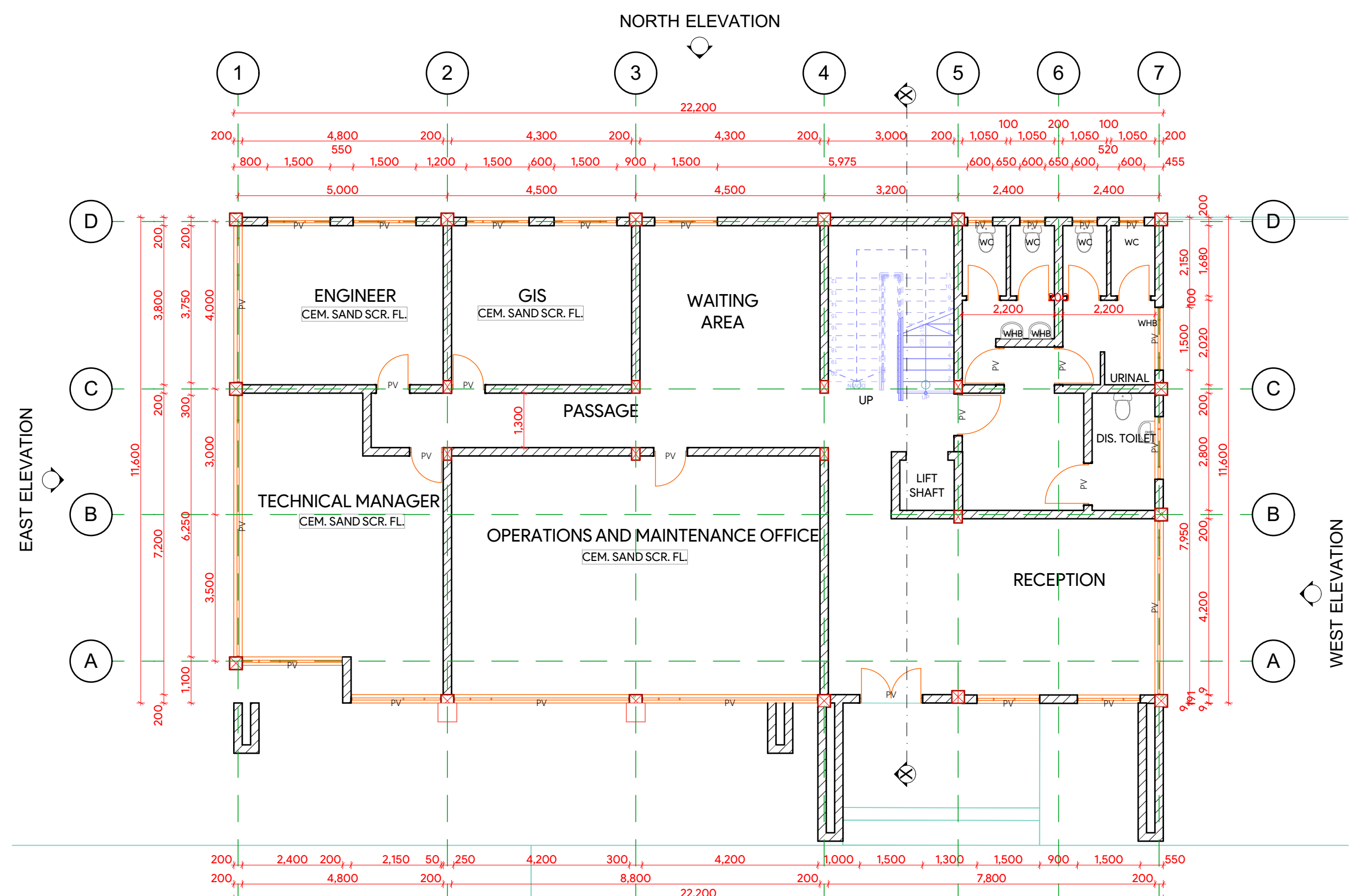
1. Ground floor slab to be cast on compacted & approved hardcore as per specifications & to be reinforced with mild steel of 10mm dia at 200mm centres, placed 40mm from top.

LEGEND

1. T1 Top first layer
2. T2 Top second layer
3. B1 Bottom first layer
4. B2 Bottom second layer

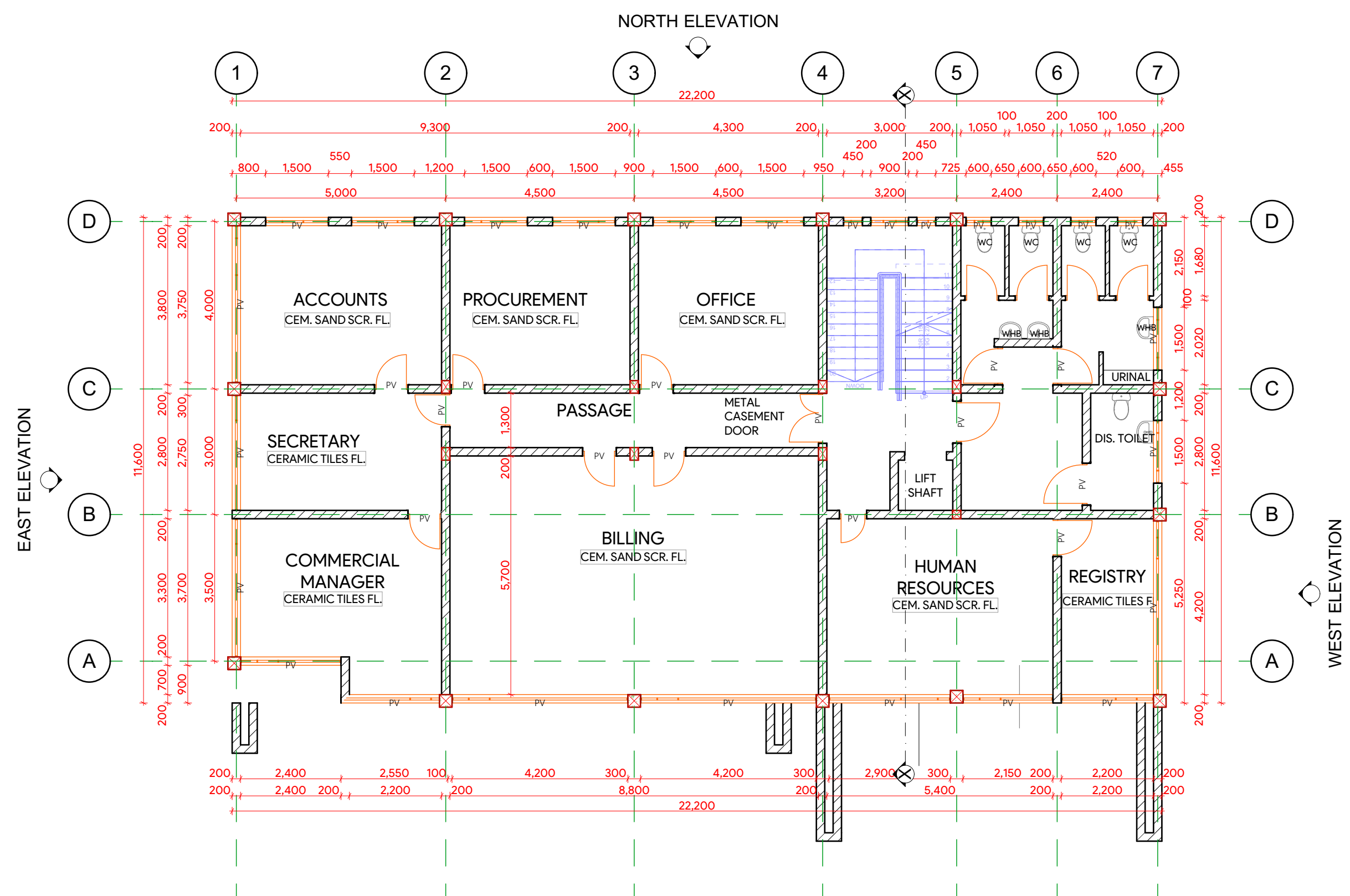
Revisions		Comments		Engineer	Project Manager	Design	KANDARA WATER SUPPLY PROJECT		Stage: FINAL DESIGN REVIEW	
Design	Date			ATHI WATER WORKS DEVELOPMENT AGENCY P.O Box 452, 300100, Athi River Center, Highway Road Nairobi Kenya Tel: 254 20 272743 email: athi@ard.co.ke		Design	KANDARAPLY 50M3 BREAK PRESSURE TANK ROOF PLAN, SECTIONS AND DETAILS		Date: JULY 2023	
						Drawn			Drawn: MUSWAS/BPT:002	
						Checked			Stage: AS INDICATED	Sheet Size: A1
						Approved			Scale: 2:1	
									Index No:	

6.0. OFFICE BLOCK



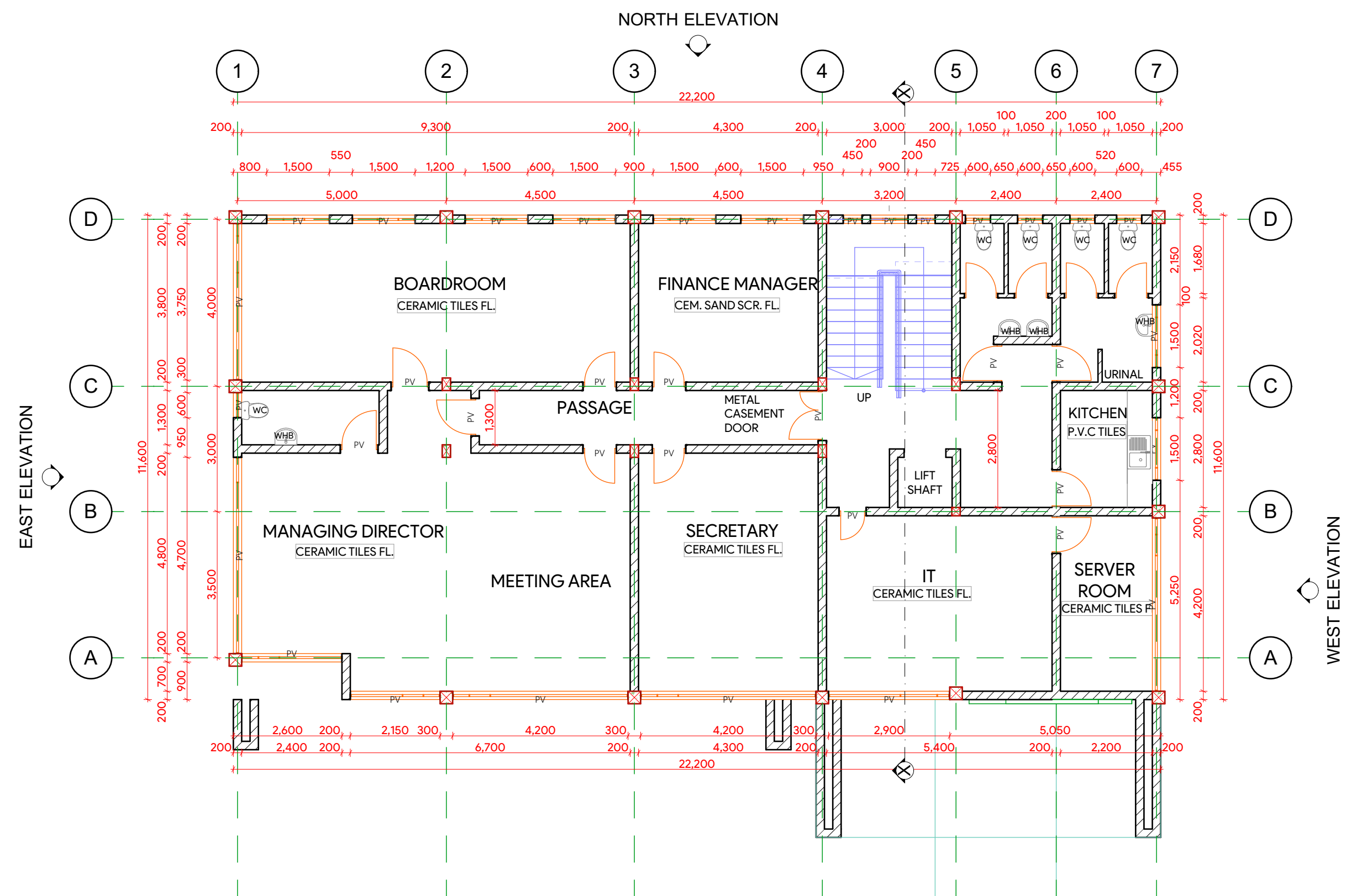
GROUND FLOOR PLAN

1:100



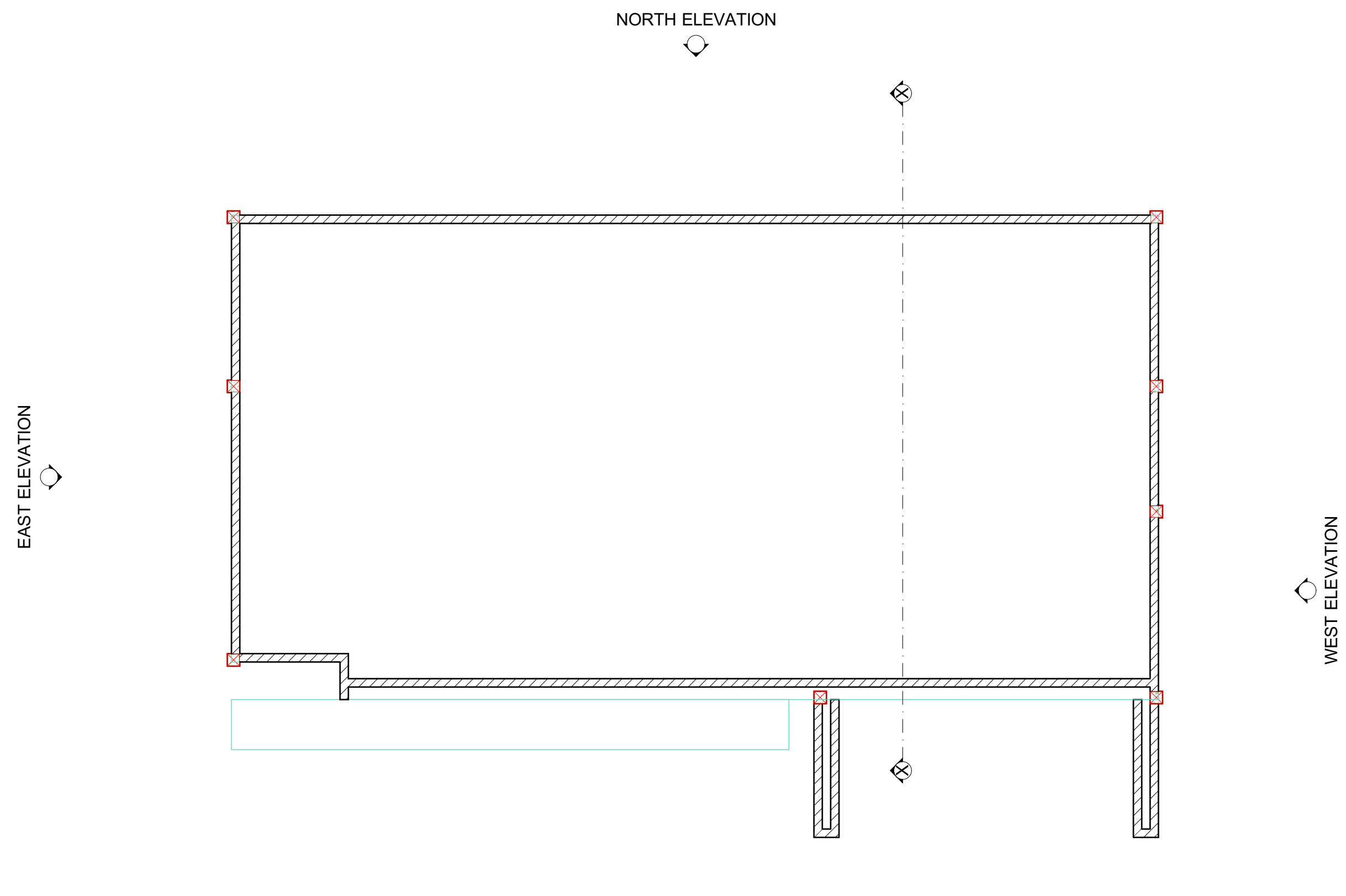
FIRST FLOOR PLAN

1:100



SECOND FLOOR PLAN

1:100



ROOF PLAN

1:100

NOTES

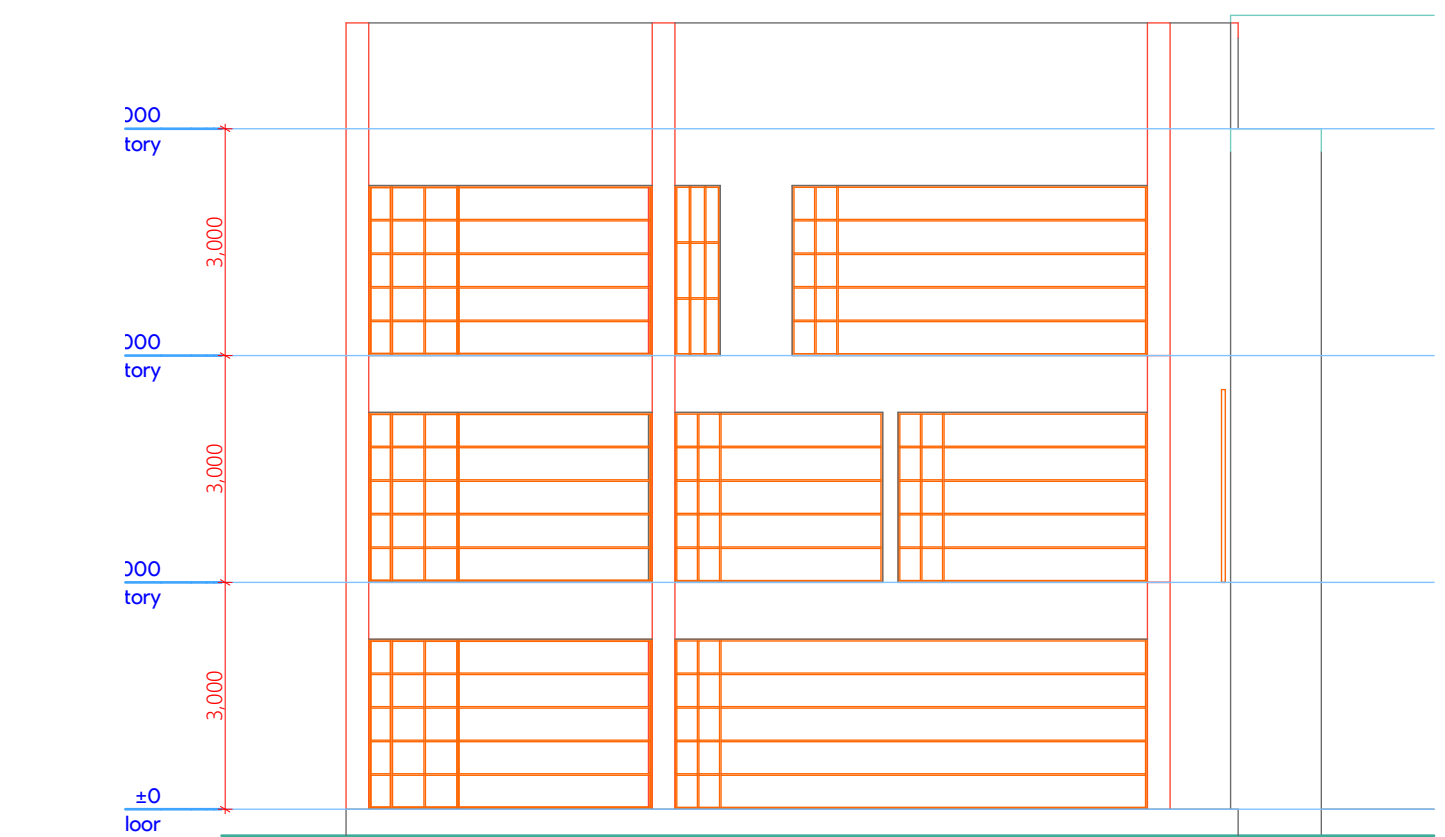
1. All dimensions are in millimetres unless otherwise stated.
2. Written dimensions to be considered over scaled dimensions.
3. RC works to conform to SE details and specifications
4. Foundation depth to be determined on site
5. DPC denotes one layer of bituminous felt and should be provided under all external walls
6. Heavy duty polythene sheeting to be provided under the ground slab.
7. All surface beds to be casted on well compacted and consolidated filling
8. All surface pipes to be at a minimum of 450mm below reduced ground level.
9. All inspection chambers within building driveway and parking areas to be heavy duty, double seal covers while drains in the same areas to be PVC pipes encased in 150mm concrete surround
10. All walls to be reinforced with hoop iron at every course.
11. PV denotes permanent ventilation
12. This drawing is protected under the Copyright Act and should not be reproduced without the author's consent.

PROJECT TITLE: OFFICE BLOCK PLANS

CLIENT:

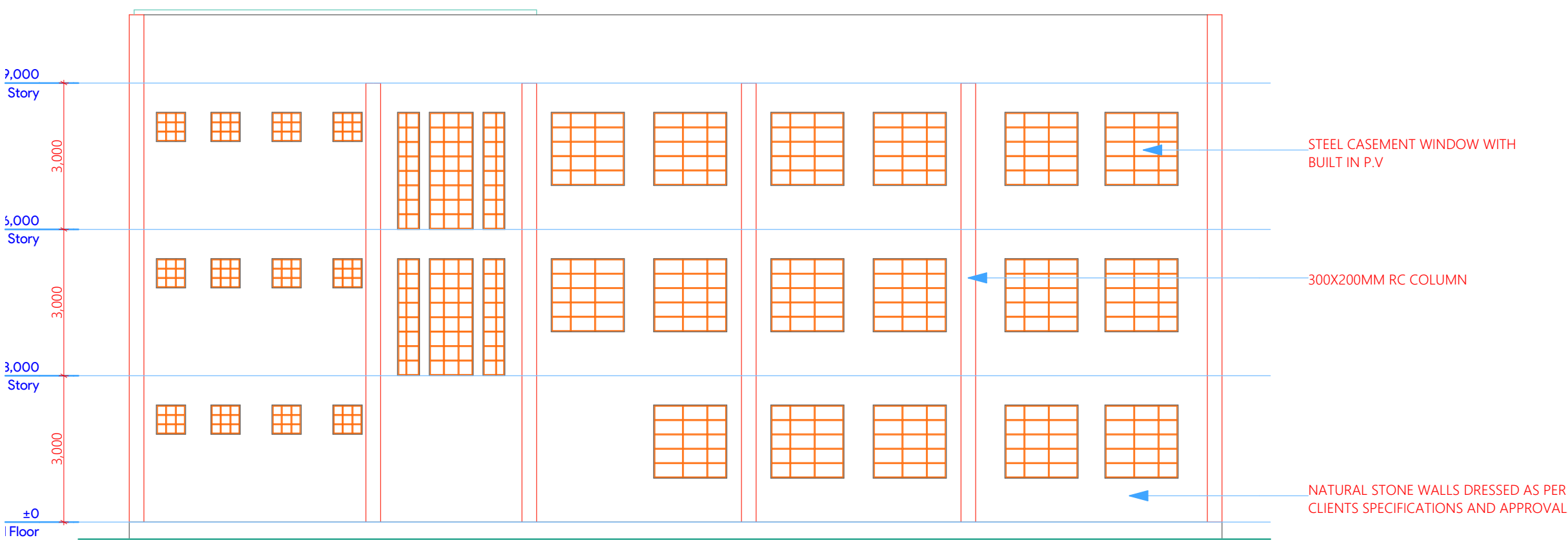
Drawn:

Checked:



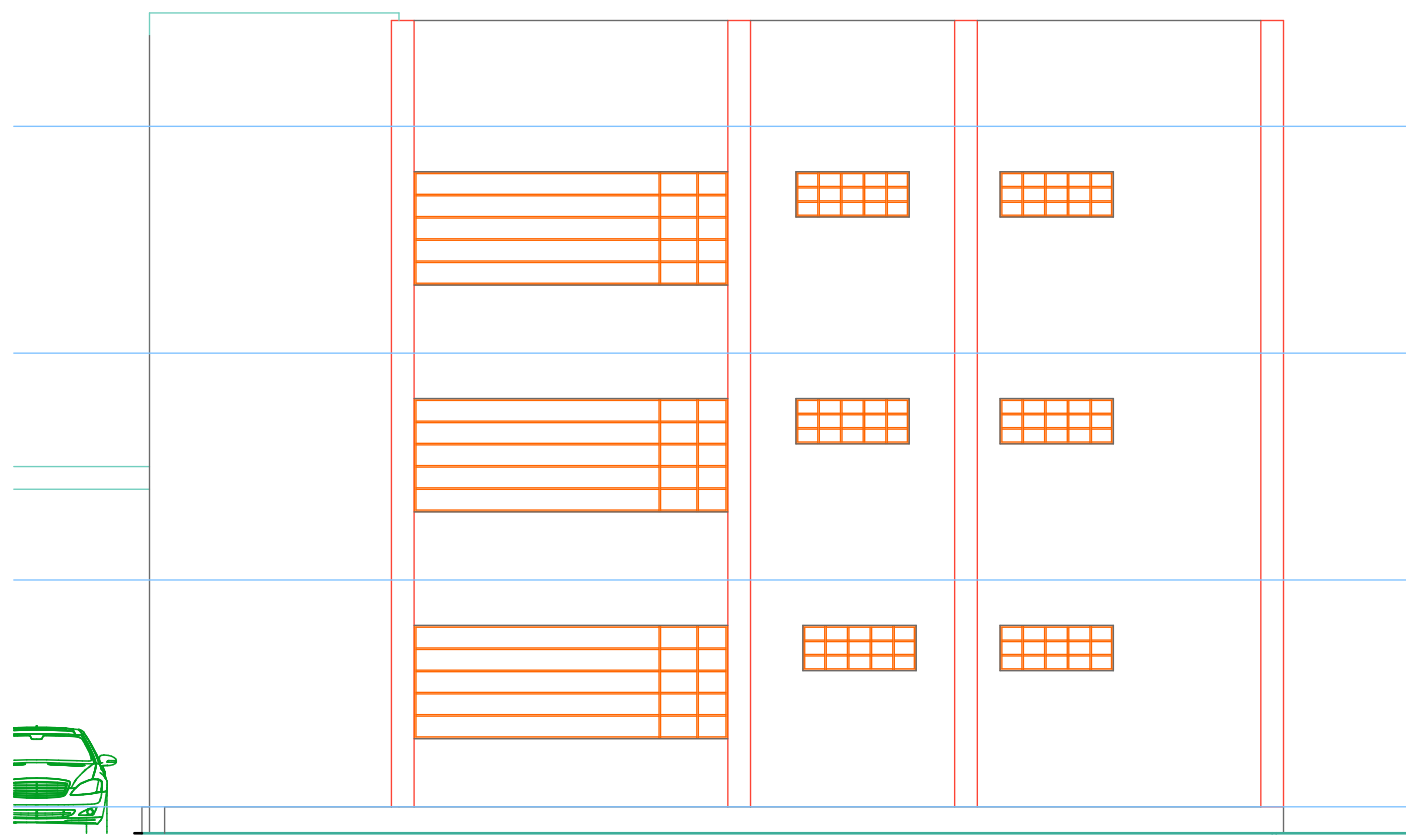
EAST ELEVATION

1:100



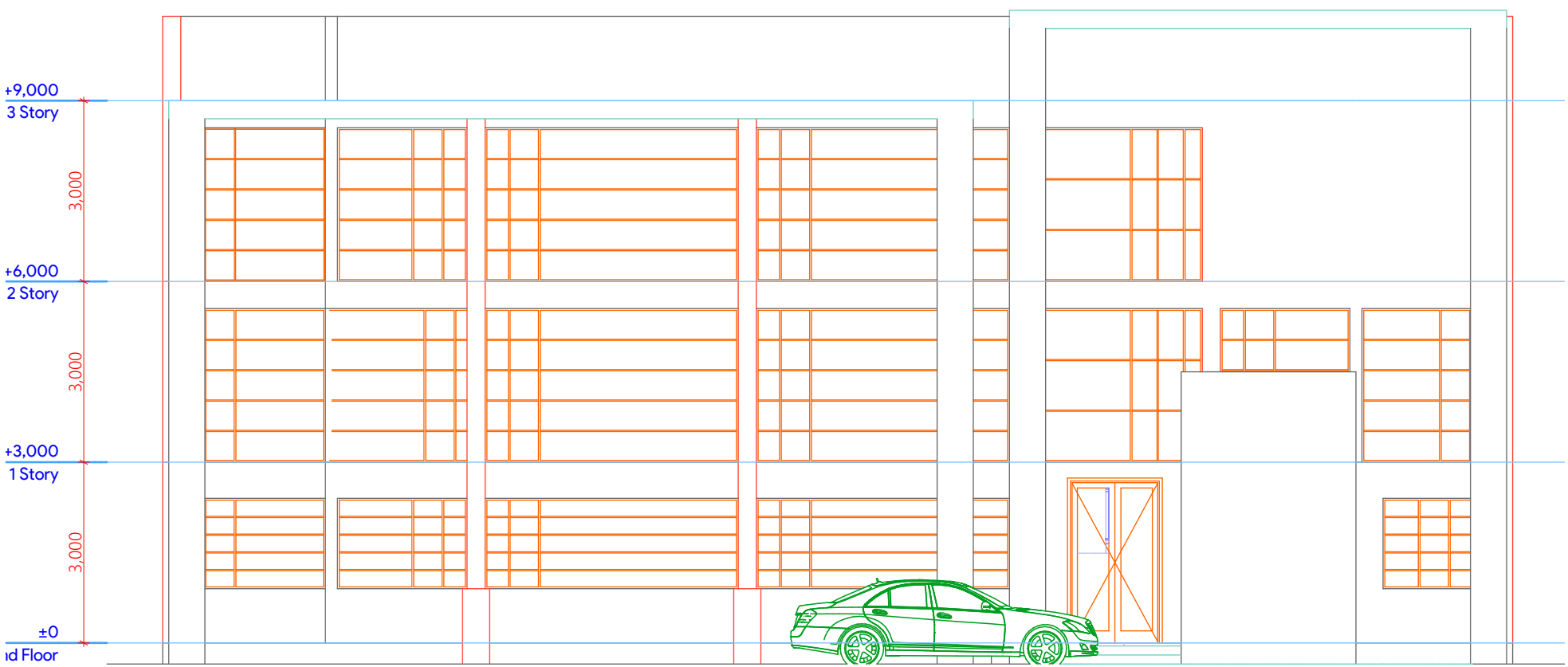
NORTH ELEVATION

1:100



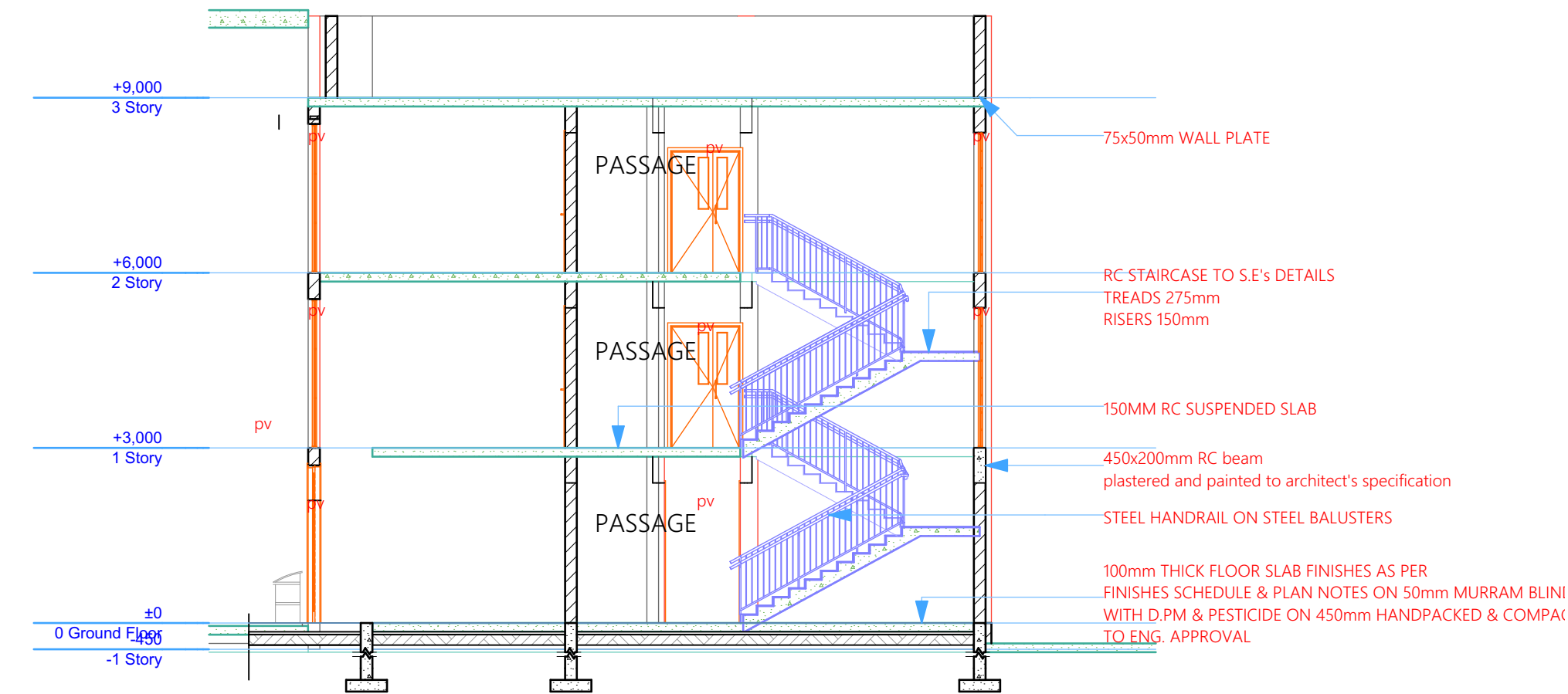
WEST ELEVATION

1:100



SOUTH ELEVATION

1:100



SECTION X-X

1:100

NOTES

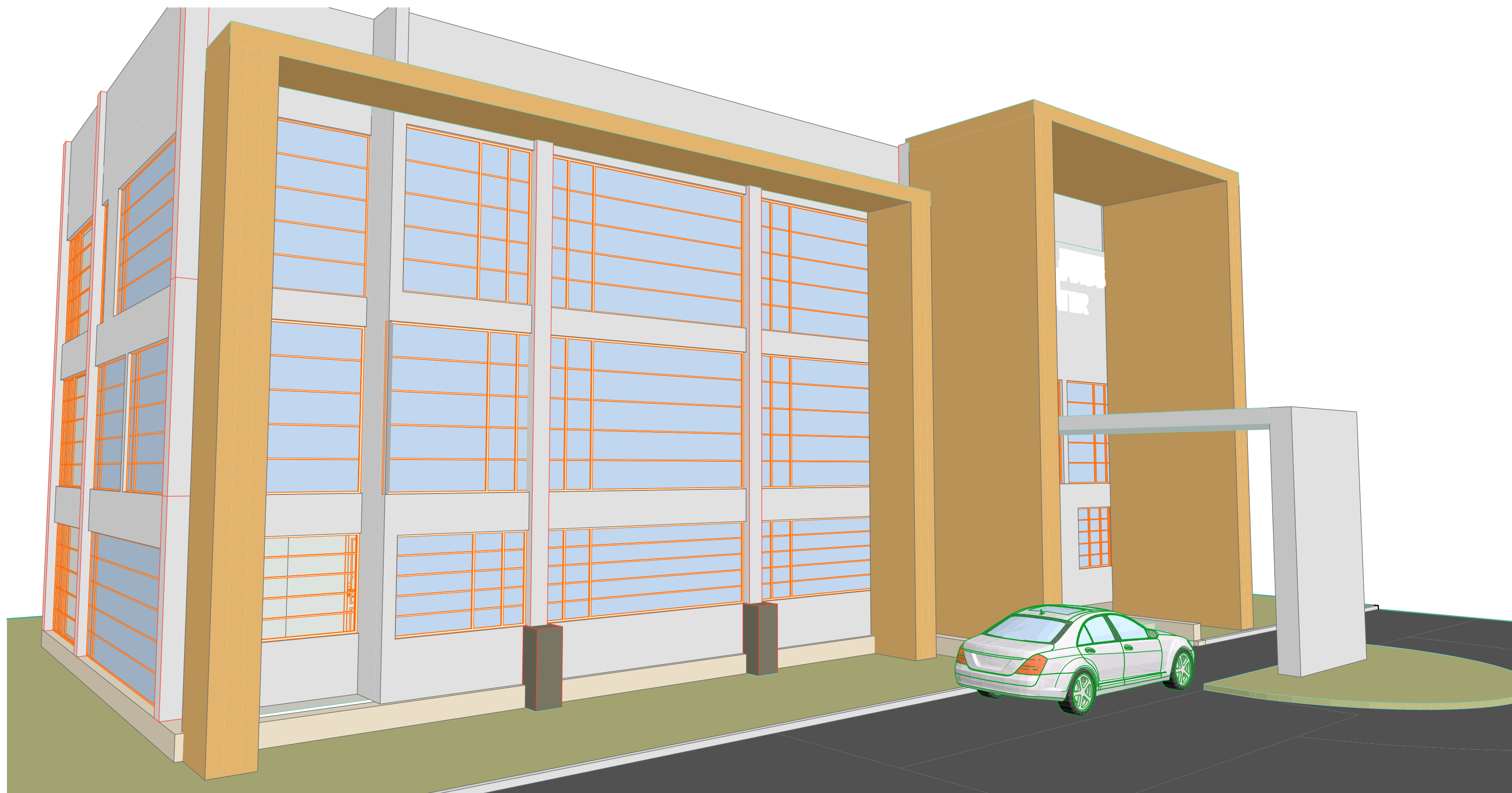
1. All dimensions are in millimetres unless otherwise stated.
2. Written dimensions to be considered over scaled dimensions.
3. RC works to conform to SE details and specifications
4. Foundation depth to be determined on site
5. DPC denotes one layer of bituminous felt and should be provided under all external walls
6. Heavy duty polythene sheeting to be provided under the ground slab.
7. All surface beds to be casted on well compacted and consolidated filling
8. All surface pipes to be at a minimum of 450mm below reduced ground level.
9. All inspection chambers within building driveway and parking areas to be heavy duty, double seal covers while drains in the same areas to be PVC pipes encased in 150mm concrete surround
10. All walls to be reinforced with hoop iron at every course.
11. PV denotes permanent ventilation
12. This drawing is protected under the Copyright Act and should not be reproduced without the author's consent.

PROJECT TITLE OFFICE BLOCK:

CLIENT:

Drawn:

Checked:



NOTES

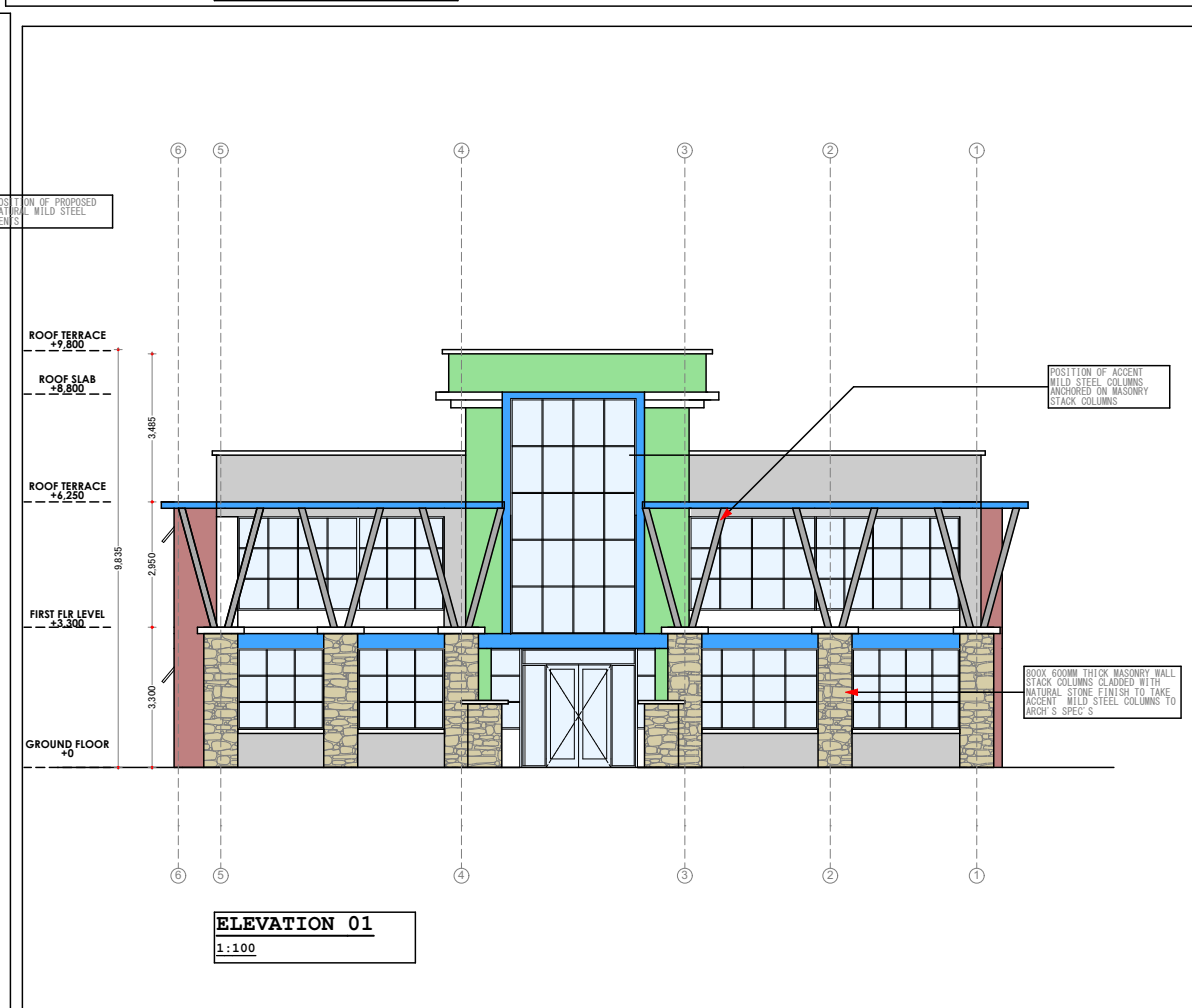
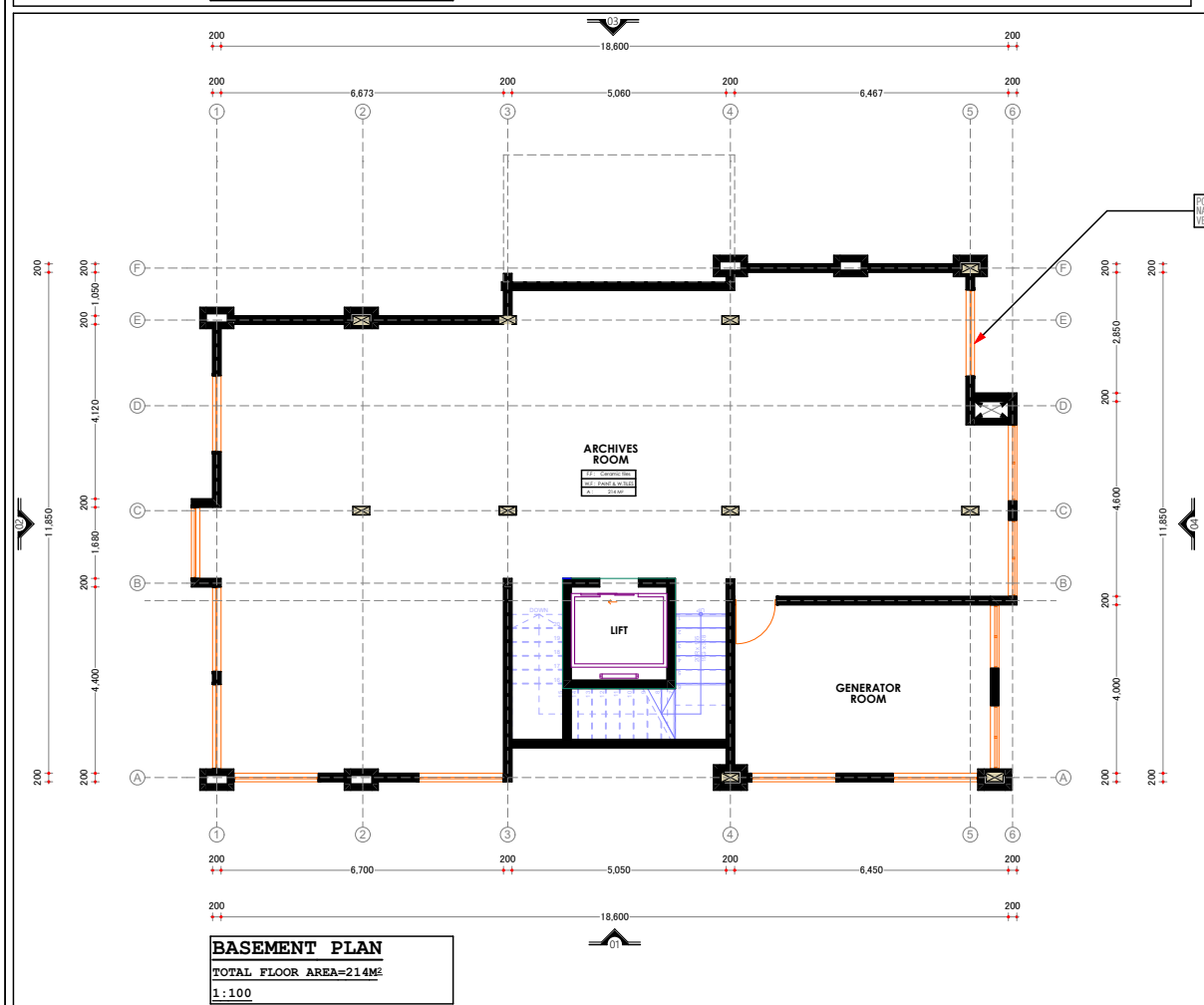
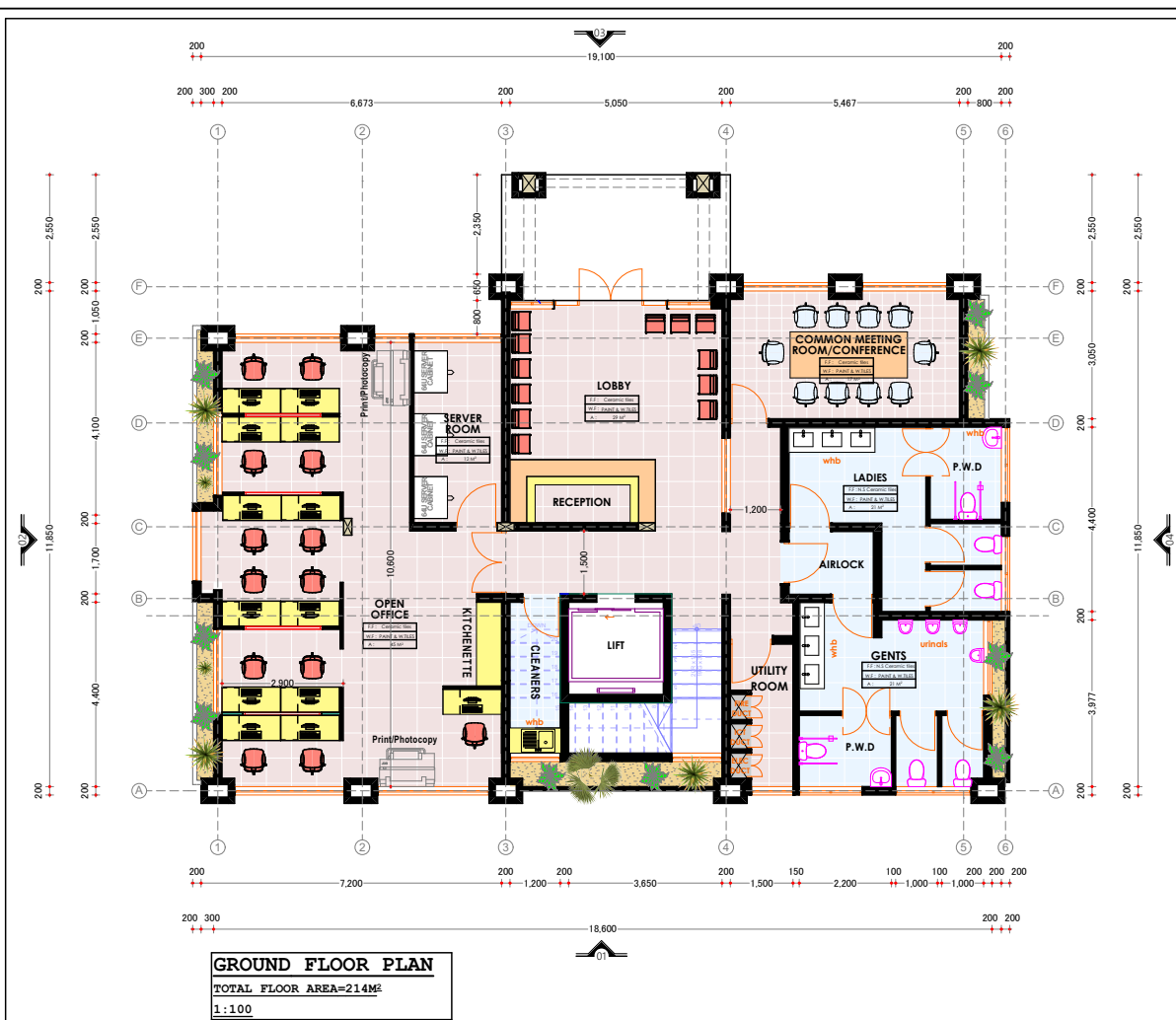
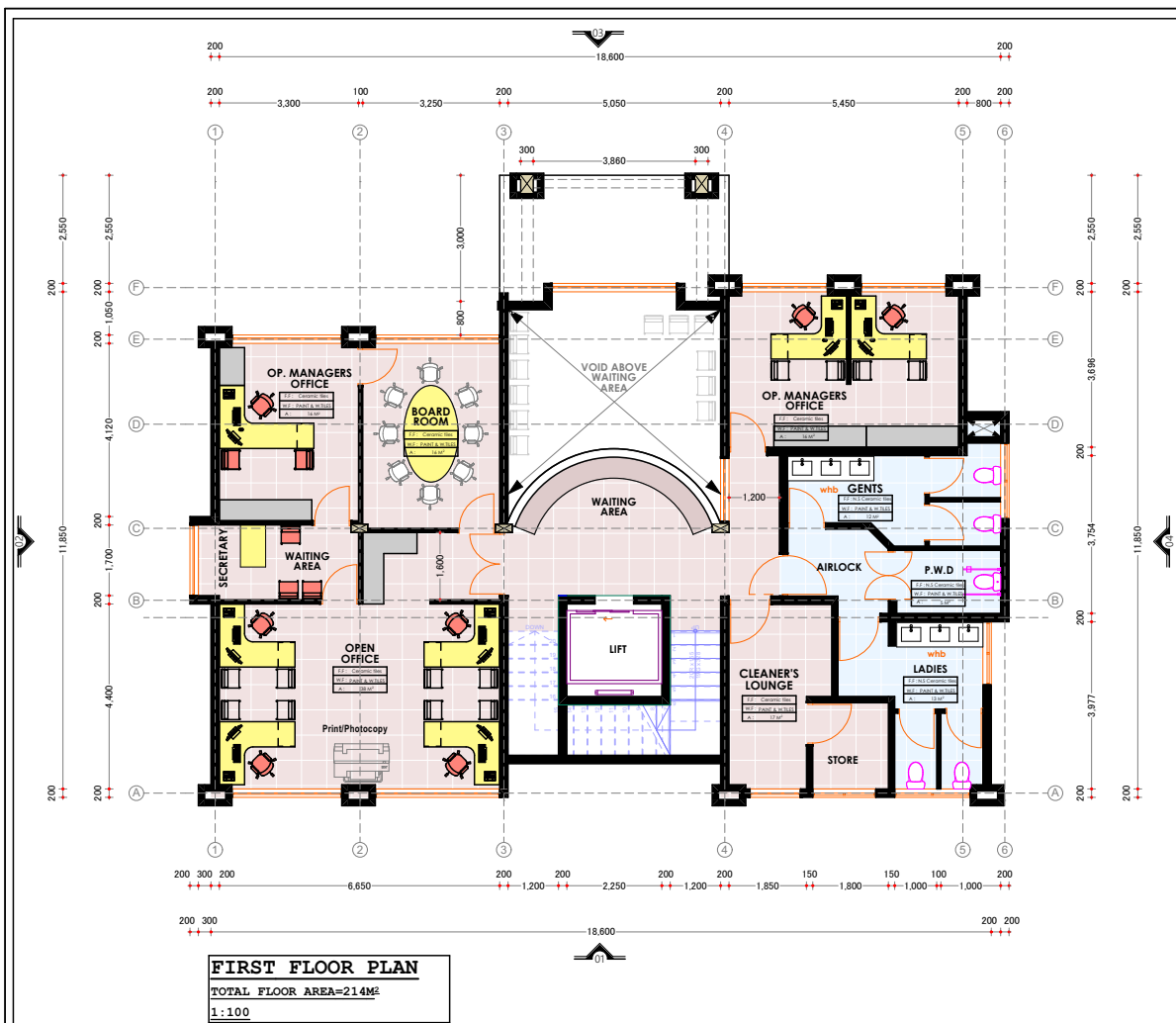
1. All dimensions are in millimetres unless otherwise stated.
2. Written dimensions to be considered over scaled dimensions.
3. RC works to conform to SE details and specifications
4. Foundation depth to be determined on site
5. DPC denotes one layer of bituminous feltand should be provided under all external walls
6. Heavy duty polythene sheeting to be provided under the ground slab.
7. All surface beds to be casted on well compacted and consolidated filling
8. All surface pipes to be at a minimum of 450mm below reduced ground level.
9. All inspection chambers within building driveway and parking areas to be heavy duty, double seal covers while drains in the same areas to be PVC pipes encased in 150mm concrete surround
10. All walls to be reinforced with hoop iron at every course.
11. PV denotes permanent ventilation
12. This drawing is protected under the Copyright Act and should not be reproduced without the author's consent.

PROJECT TITLEOFFICE BLOCK:

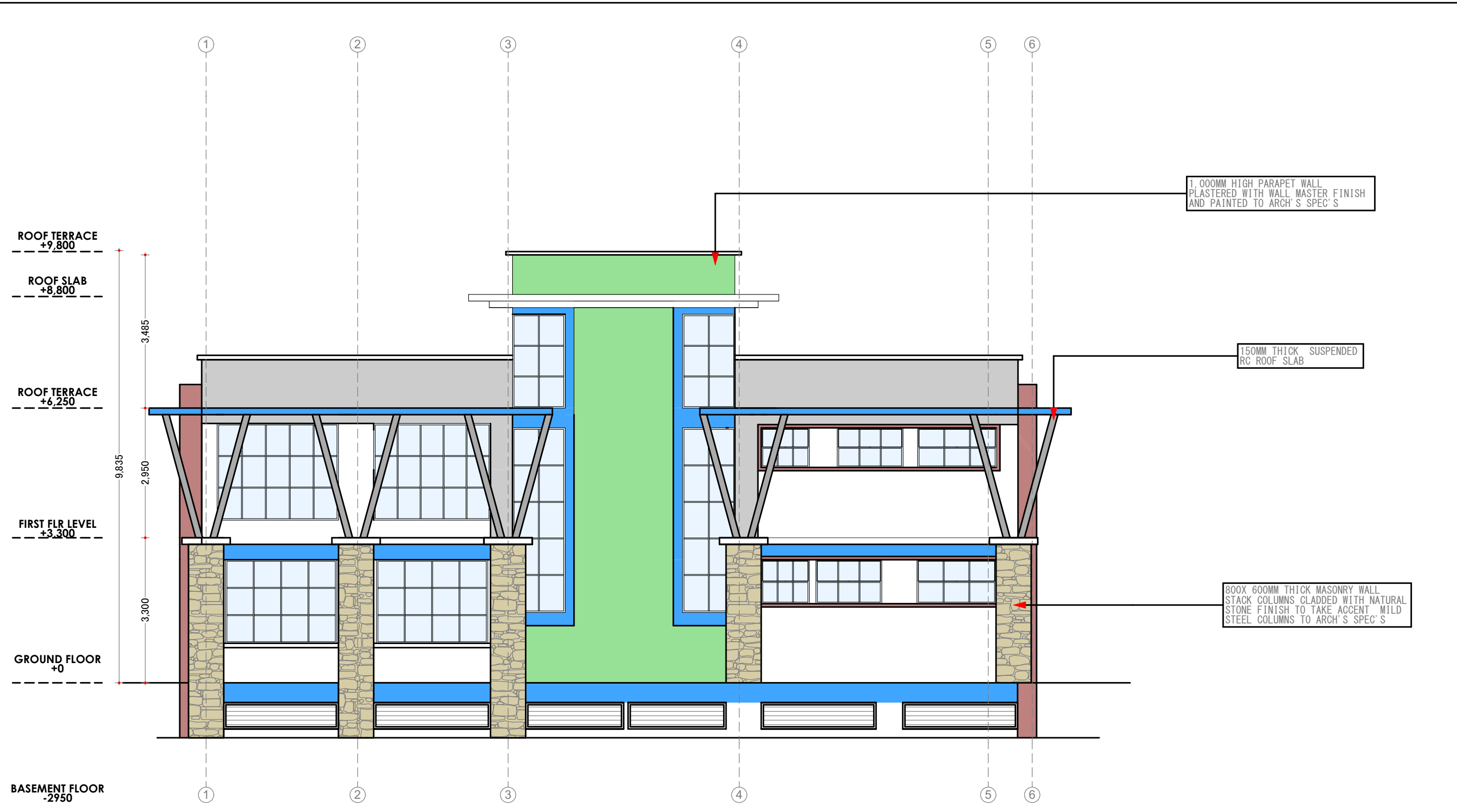
CLIENT:

[illegible]

7.0. ANNEX PLAZA




CONSULTANT	DESCRIPTION	DATE	REV.No.	DESCRIPTION	CLIENT  KARNATAKA POWER CORPORATION LIMITED P.O. BOX.....	PROJECT	DRG TITLE	Date:	SEPT 2023	Job No.
						PROPOSED OFFICE BLOCK ANNEX PLAZA ON PLOT LR NO	LAYOUT PROPOSAL	Designed:	V.O	
						P.O. BOX.....	PLANS,ELEVATIONS,SECTIONS	Drawn:	V.O	Cad Filename
								Checked:	ENG. W.J.K	
								Approved:		DRG. No.
								Scale:	1:100	REV O
							SHEET 01 OF 02			



ELEVATION 02

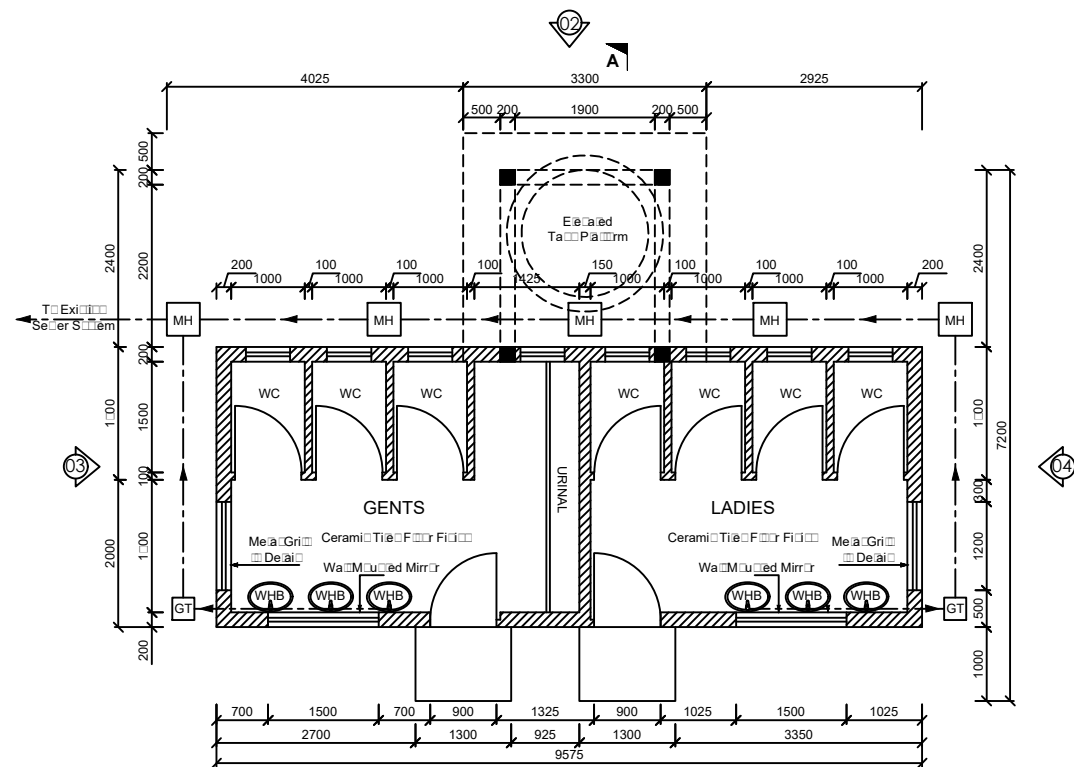
1:100

CONSULTANT	DESCRIPTION	DATE	REV.No.	DESCRIPTION	<div>CLIENT</div> <div><div>ATHI WATER WORKS ATHI WATER WORKS DEVELOPMENT AGENCY (AWWDA) P. O. BOX 45263 - 00100, NAIROBI, KENYA.</div></div>	PROJECT	DRG.TITLE	Date:	SEPT. 2023	Job No.	
						PROPOSED OFFICE BLOCK ANNEX PLAZA ON PLOT LR NO.....	WORKING DRAWINGS, PLANS,ELEVATIONS,SECTIONS	Designed:	V.O.		
						P.O. BOX.....,		Drawn:	V.O	Cad Filename	
								Checked:	ENG. W.J.K		
								Approved:	ENG. B.M.O	DRG.No.	REV
								Scale:	1:100		1
								SHEET 02 OF 02			

8.0. ABLUTION BLOCK

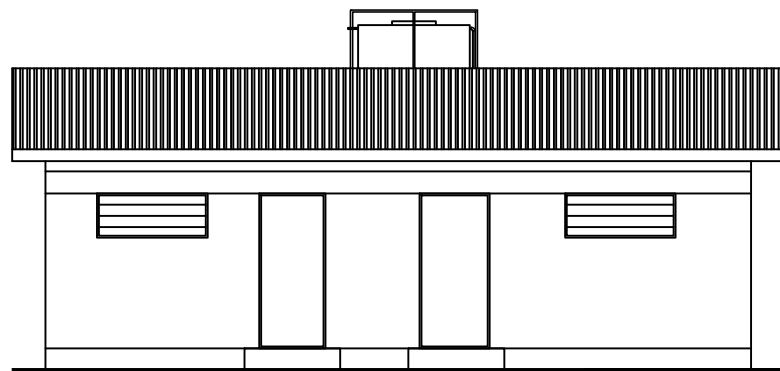
NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.



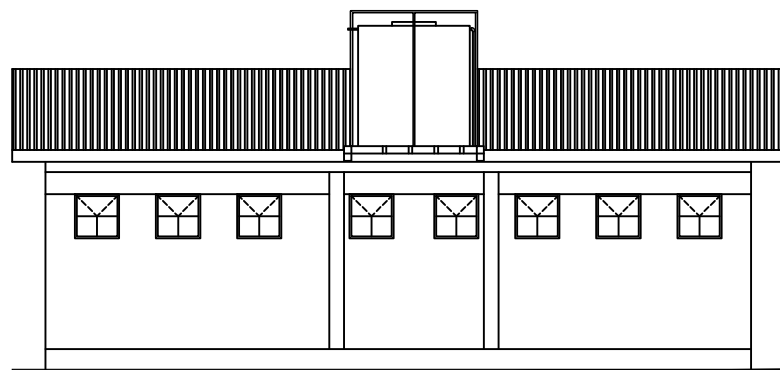
PLAN

Scale 1:50



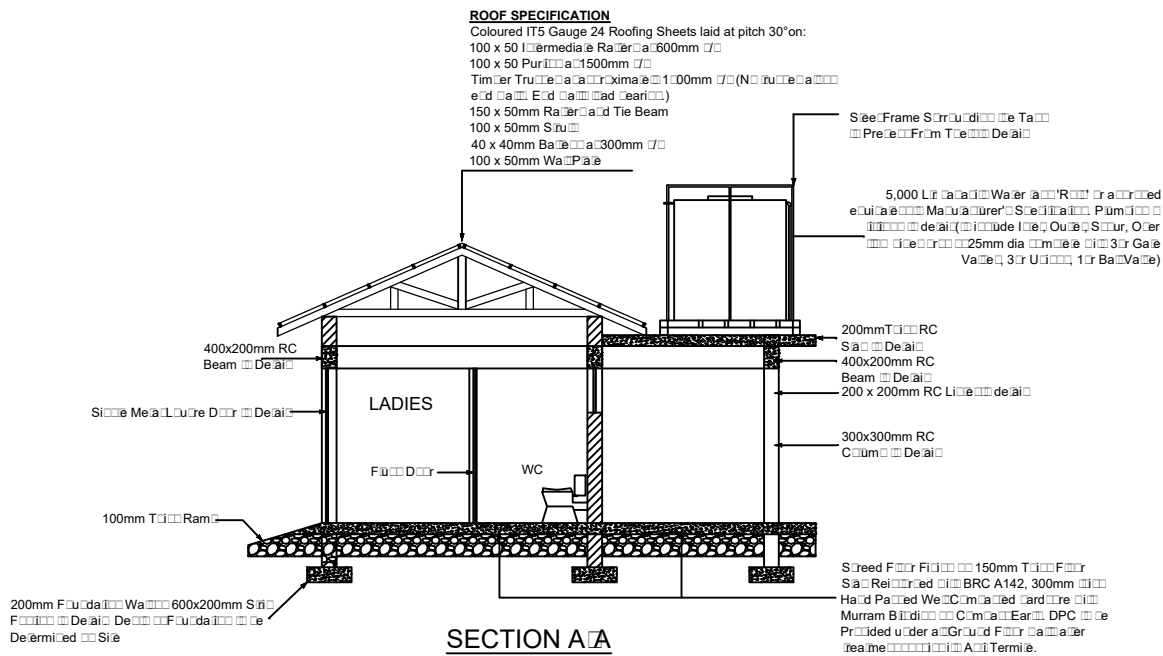
ELEVATION 01

Scale 1:50



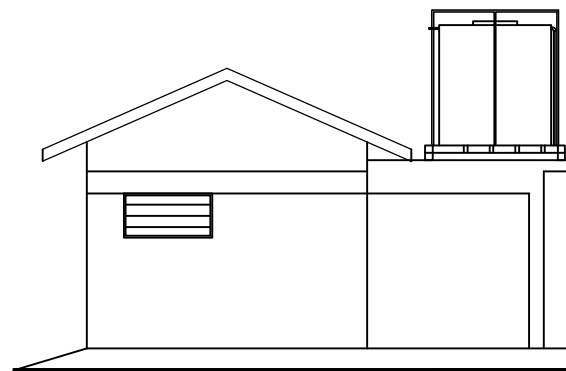
ELEVATION 02

Scale 1:50



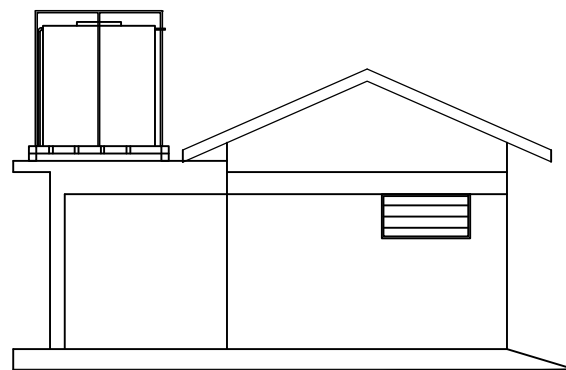
SECTION A-A

Scale 1:50



ELEVATION 03

Scale 1:50



ELEVATION 04

Scale 1:50

Client/Engineer

Funder

Contractor

Revision

Notes

DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:

SCALE: AS SHOWN (AT A1)

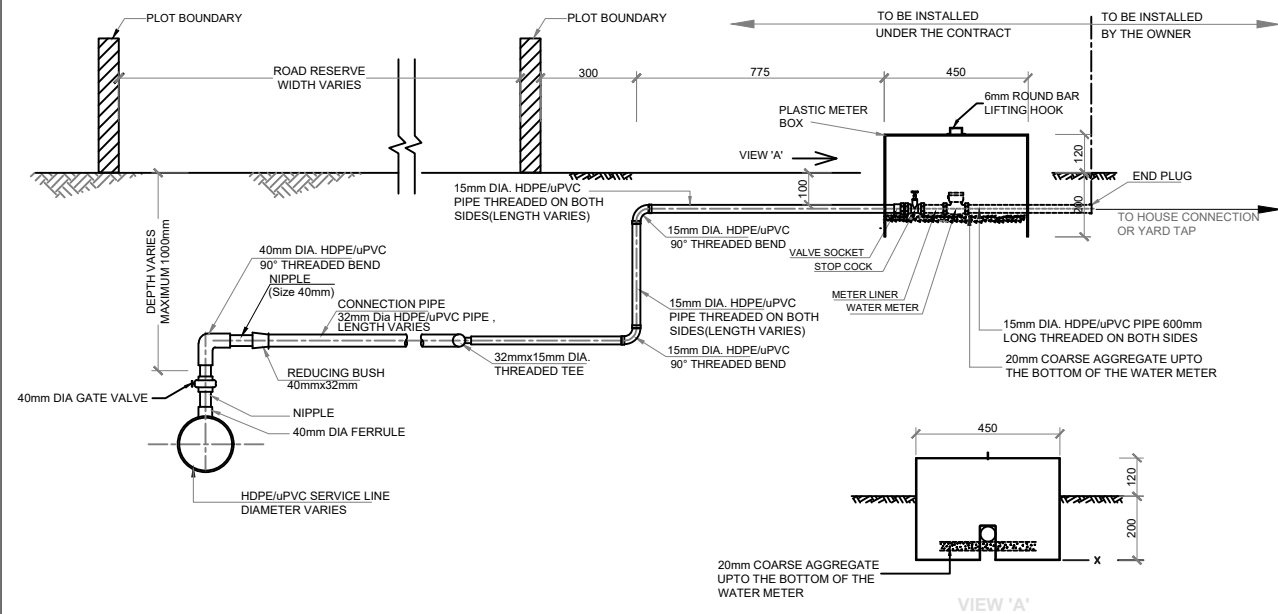
Project: KANDARA WATER SUPPLY PROJECT

Drawing Title:
STANDARD DRAWING
PROPOSED ABLUTION BLOCK - PLAN, ELEVATIONS AND SECTION

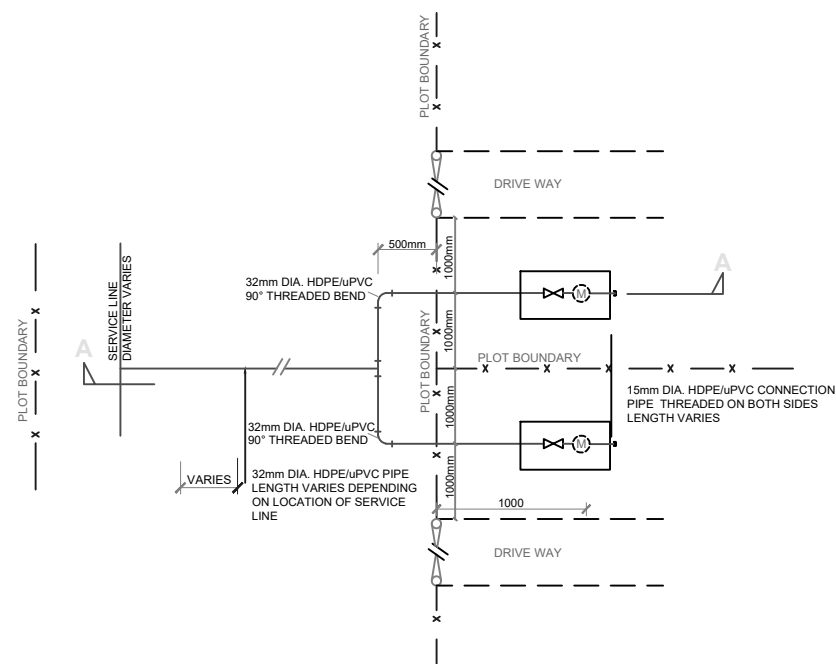
Date: MARCH 2022

Drawn By:
KTSWSP/MSP/STD/ABLUTION BLOCK/01

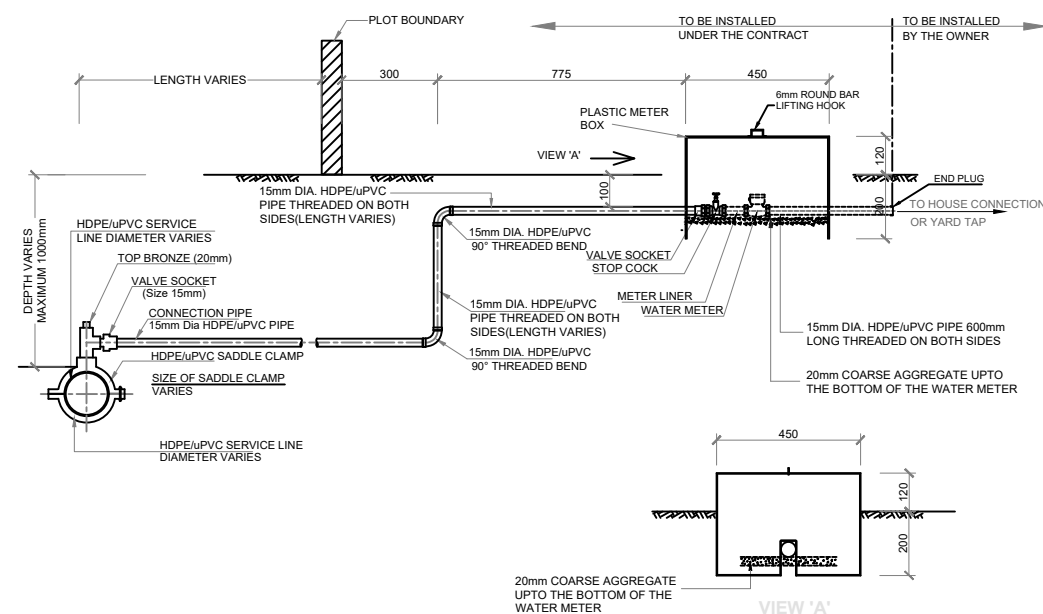
REV. DATE REMARKS



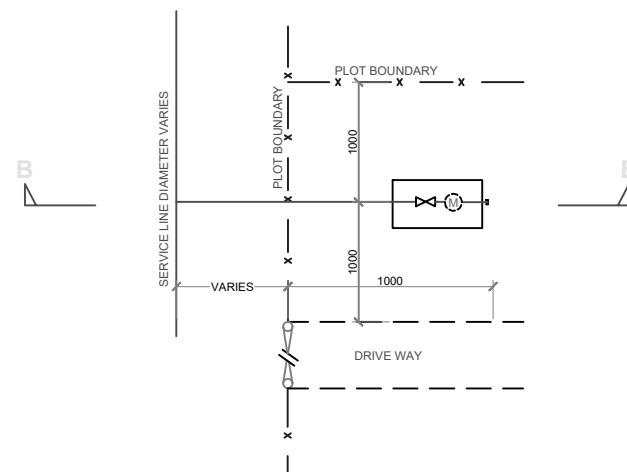
SECTION A-A
NTS



TYPICAL CONSUMER CONNECTION ACROSS CARRIAGE WAY
FOR TWO HOUSEHOLDS ON A HDPE/uPVC SERVICE LINE
NTS



SECTION B-B
NTS



TYPICAL CONSUMER CONNECTION FOR ONE
HOUSEHOLD ON A uPVC/HDPE SERVICE LINE
NTS

NOTE

ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED

ABBREVIATIONS

mm	- MILLIMETERS
G.L	- GROUND LEVEL
D.I.A	- DIAMETER
HDPE	- HIGH-DENSITY POLYETHYLENE
uPVC	- UNPLASTICISED POLYVINYL CHLORIDE

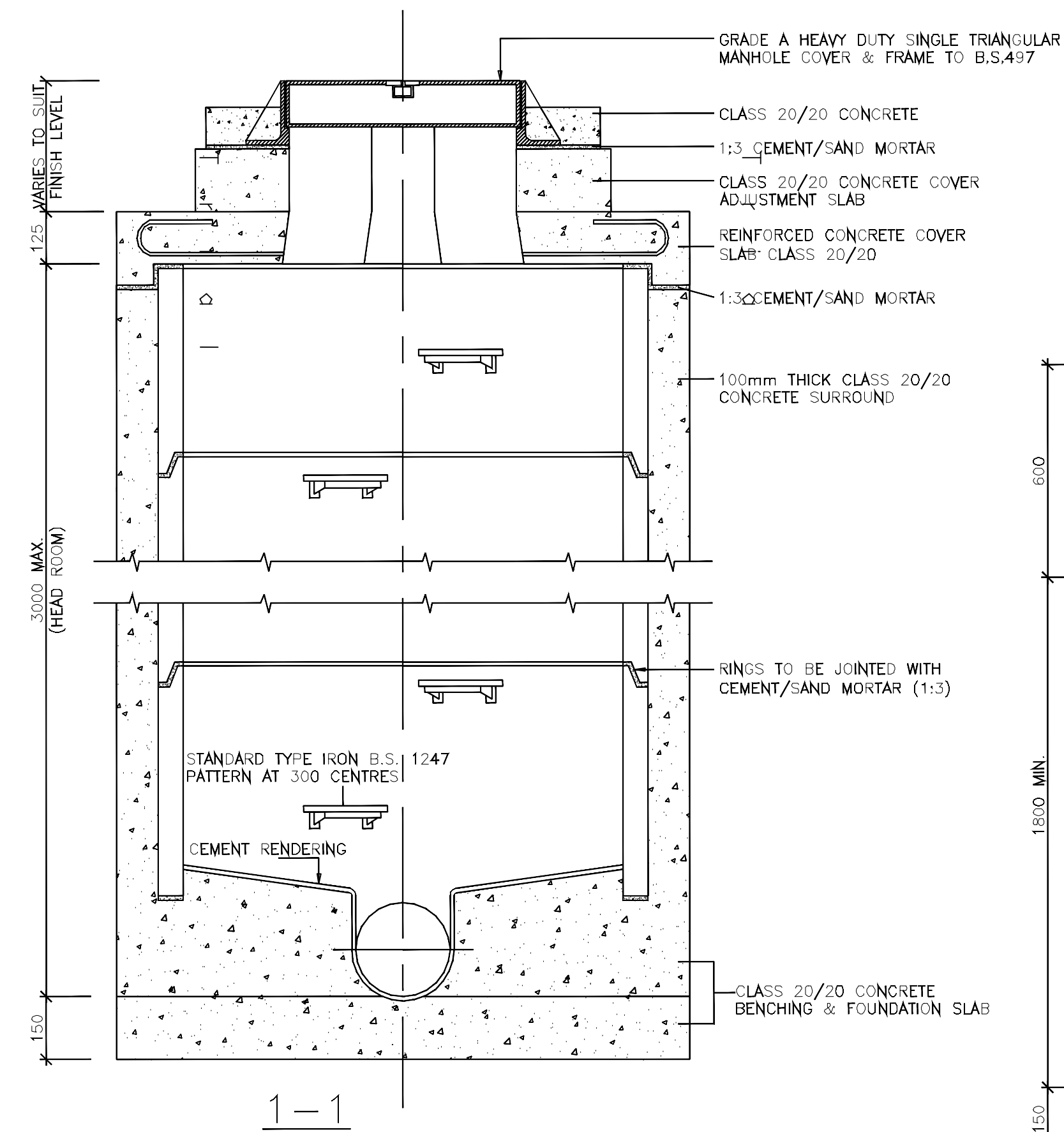
REV	REVISIONS	SIGN	DATE	APPROVED
	BY			
	CHECKED			
	BY			
	CHECKED			

ATHI WATER WORKS
DEVELOPMENT AGENCY
P.O BOX 45283 - 00100 NAIROBI
TEL: 020 - 2727438 FAX: 2724295

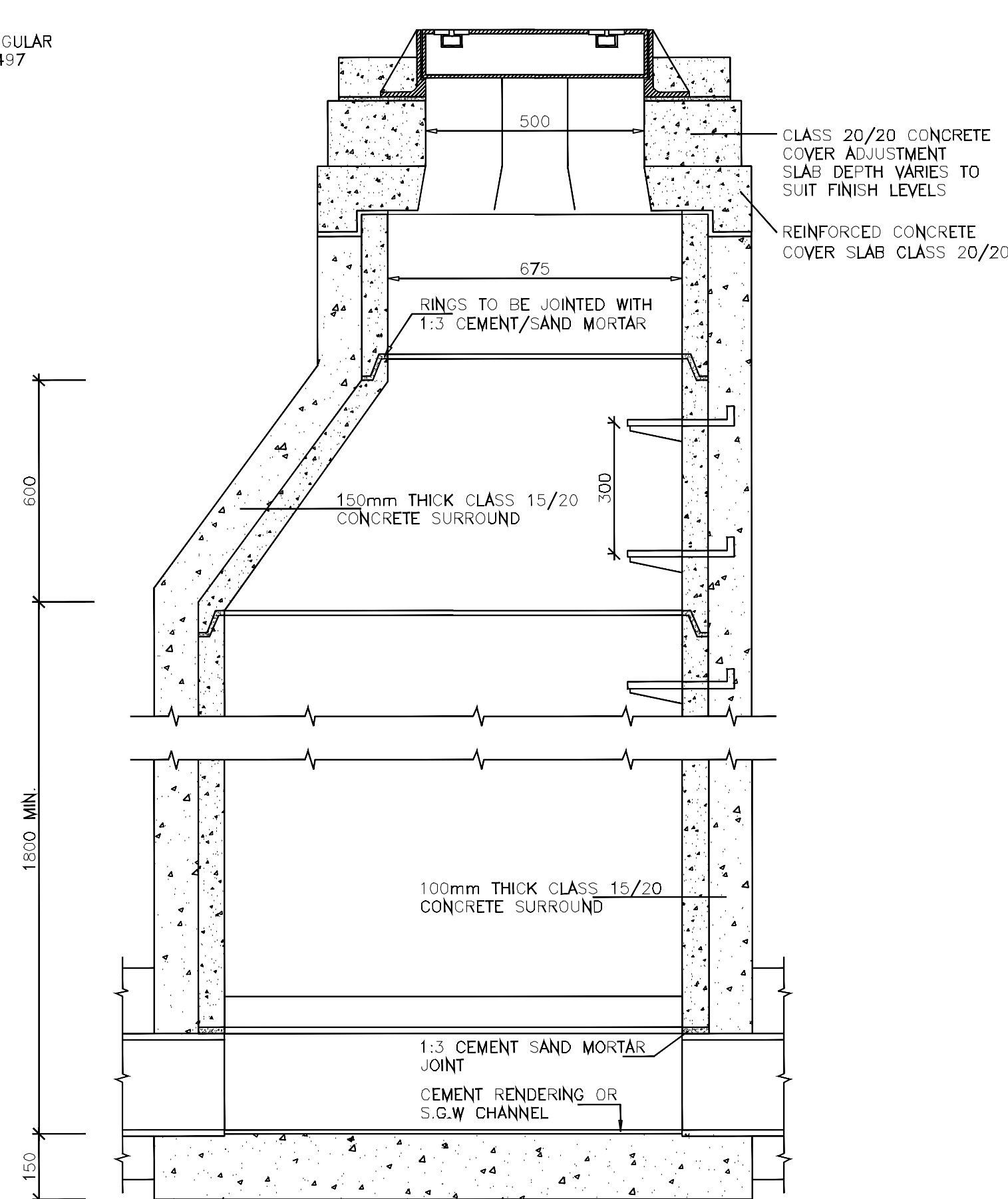


DRAWING TITLE:
STANDARD DRAWINGS
TYPICAL DETAILS OF CONSUMER
WATER SUPPLY CONNECTION

DESIGNED BY:	DRAWN BY:
CHECKED BY:	APPROVED BY:
SCALE:	DATE:
DRAWING No.	



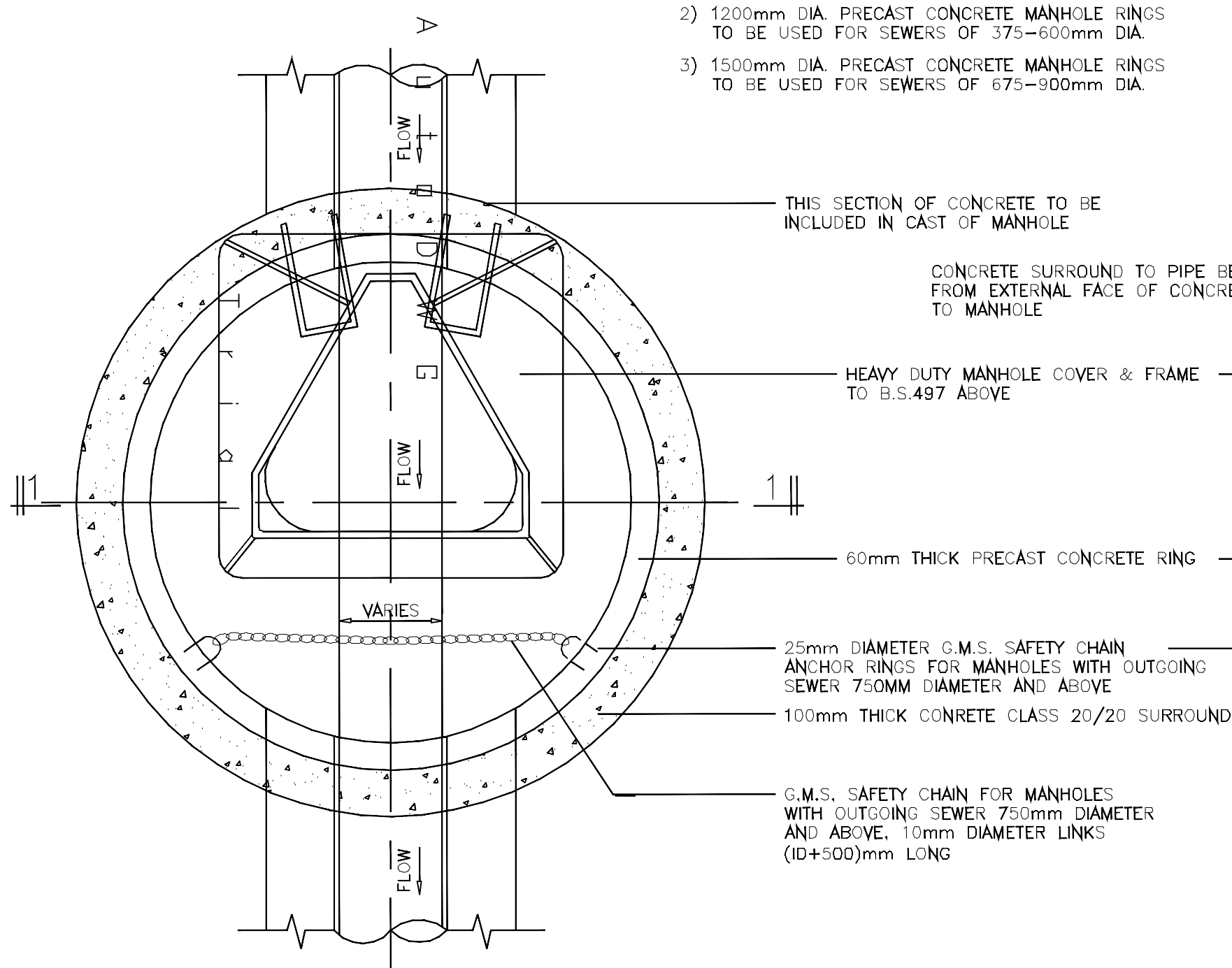
STANDARD MANHOLE DETAILS
TYPE A
(Where Manhole Depth <3.0m)



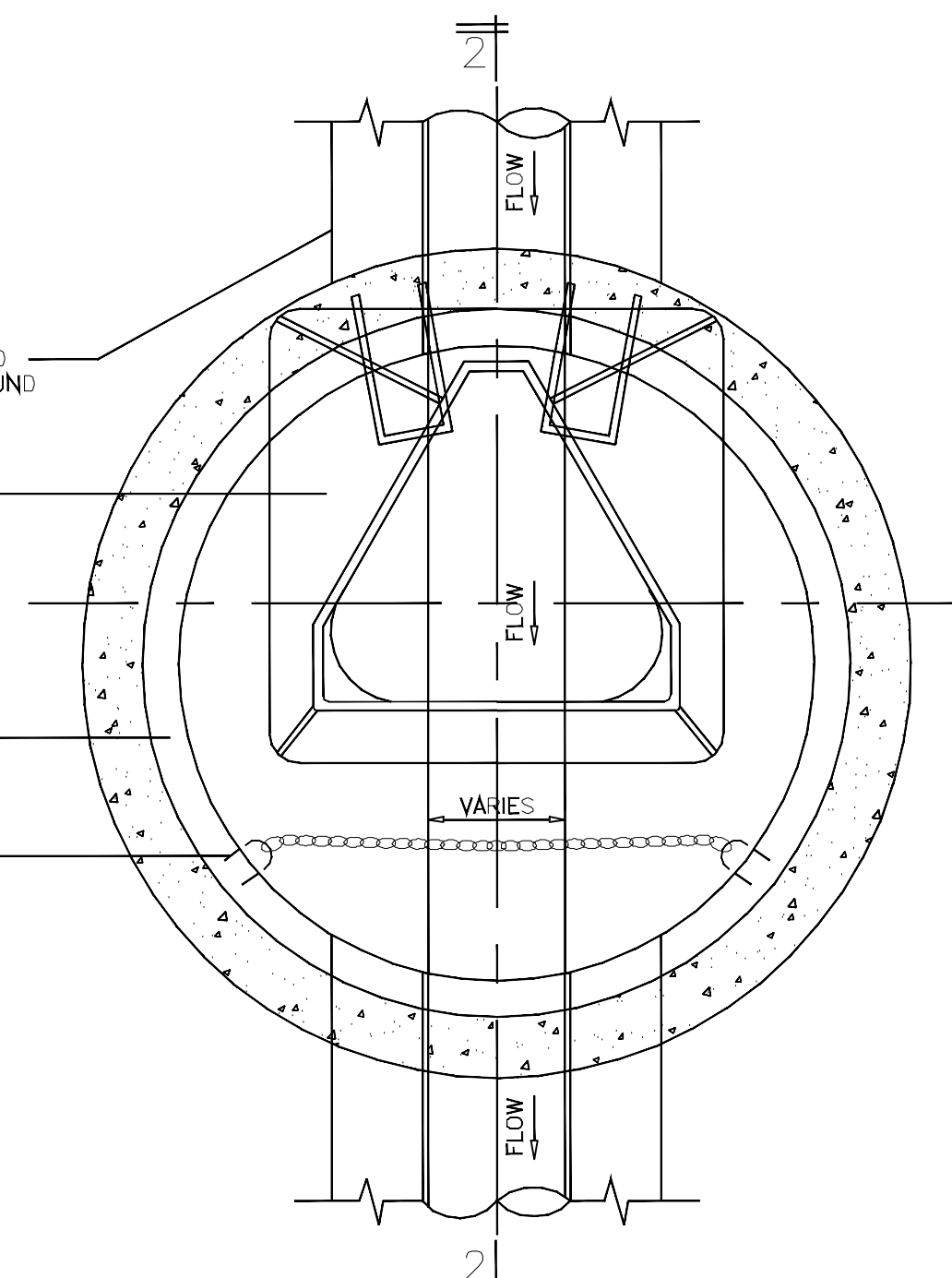
STANDARD TAPERED MANHOLE DETAILS
TYPE B
(Where Manhole Depth ≥3.0m)

NOTES

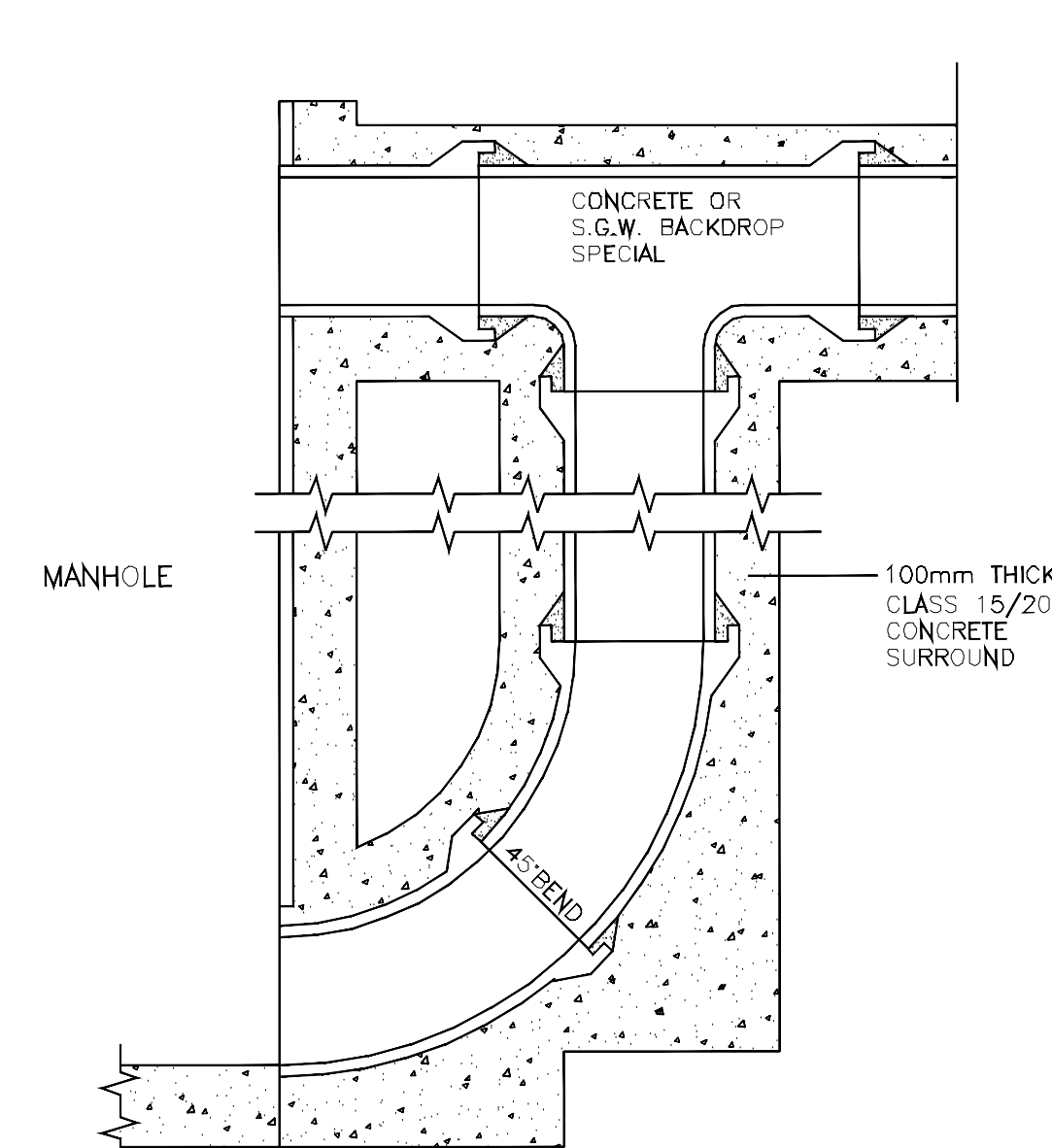
- 1) 1050mm DIA. PRECAST CONCRETE MANHOLE RINGS TO BE USED FOR SEWERS UP TO AND INCLUDING 300mm DIA.
- 2) 1200mm DIA. PRECAST CONCRETE MANHOLE RINGS TO BE USED FOR SEWERS OF 375-600mm DIA.
- 3) 1500mm DIA. PRECAST CONCRETE MANHOLE RINGS TO BE USED FOR SEWERS OF 675-900mm DIA.



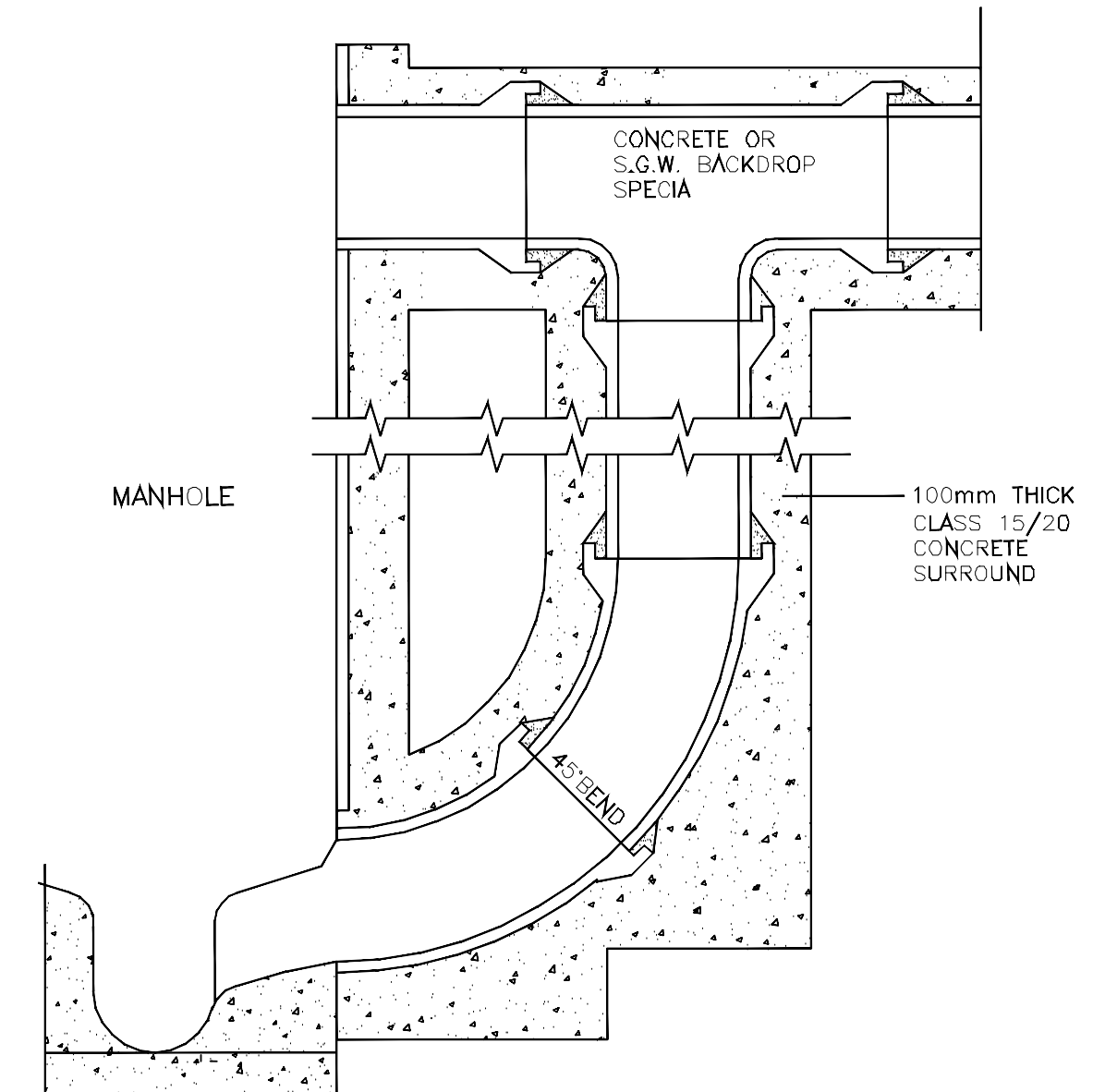
SECTIONAL PLAN



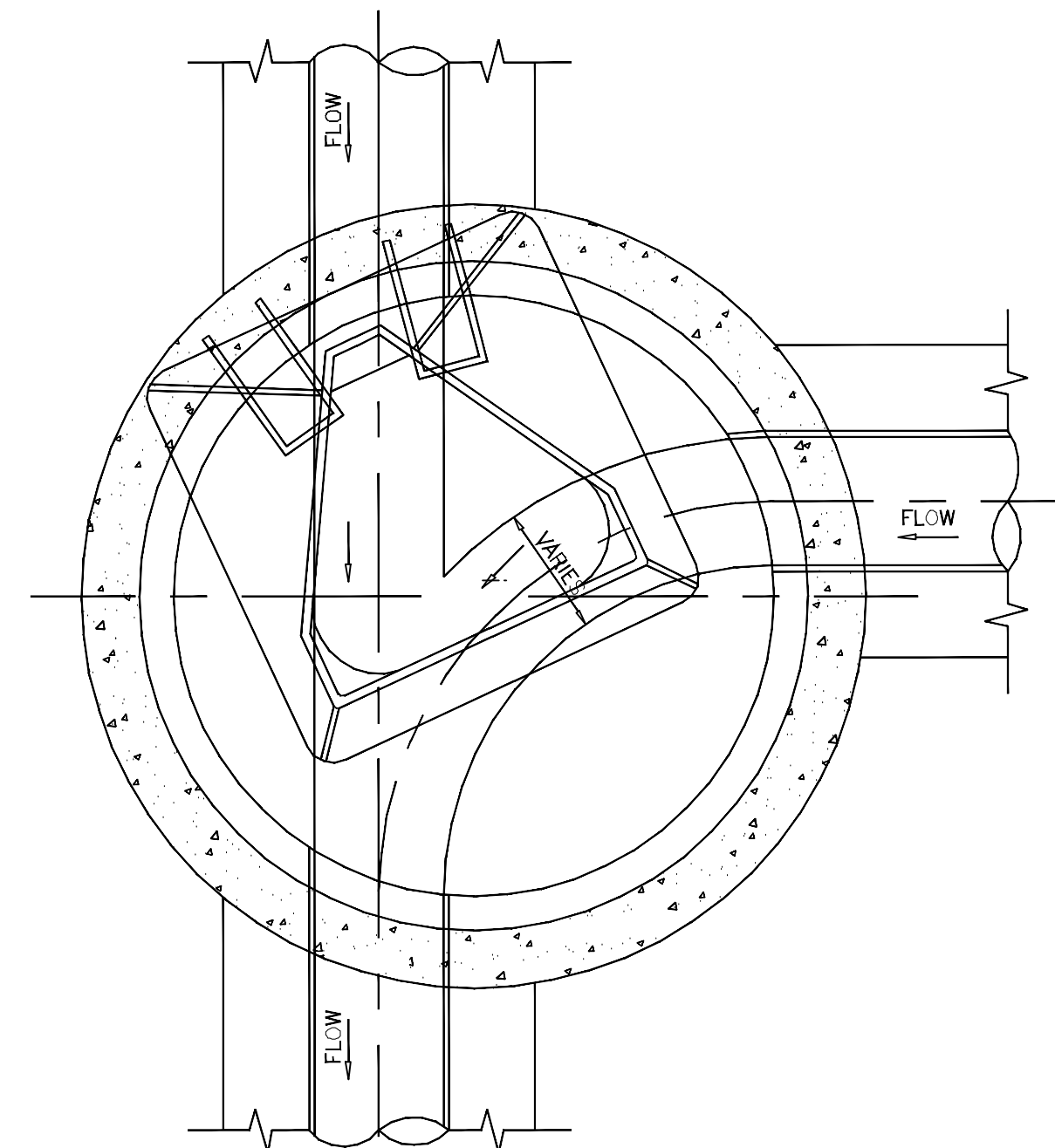
SECTIONAL PLAN



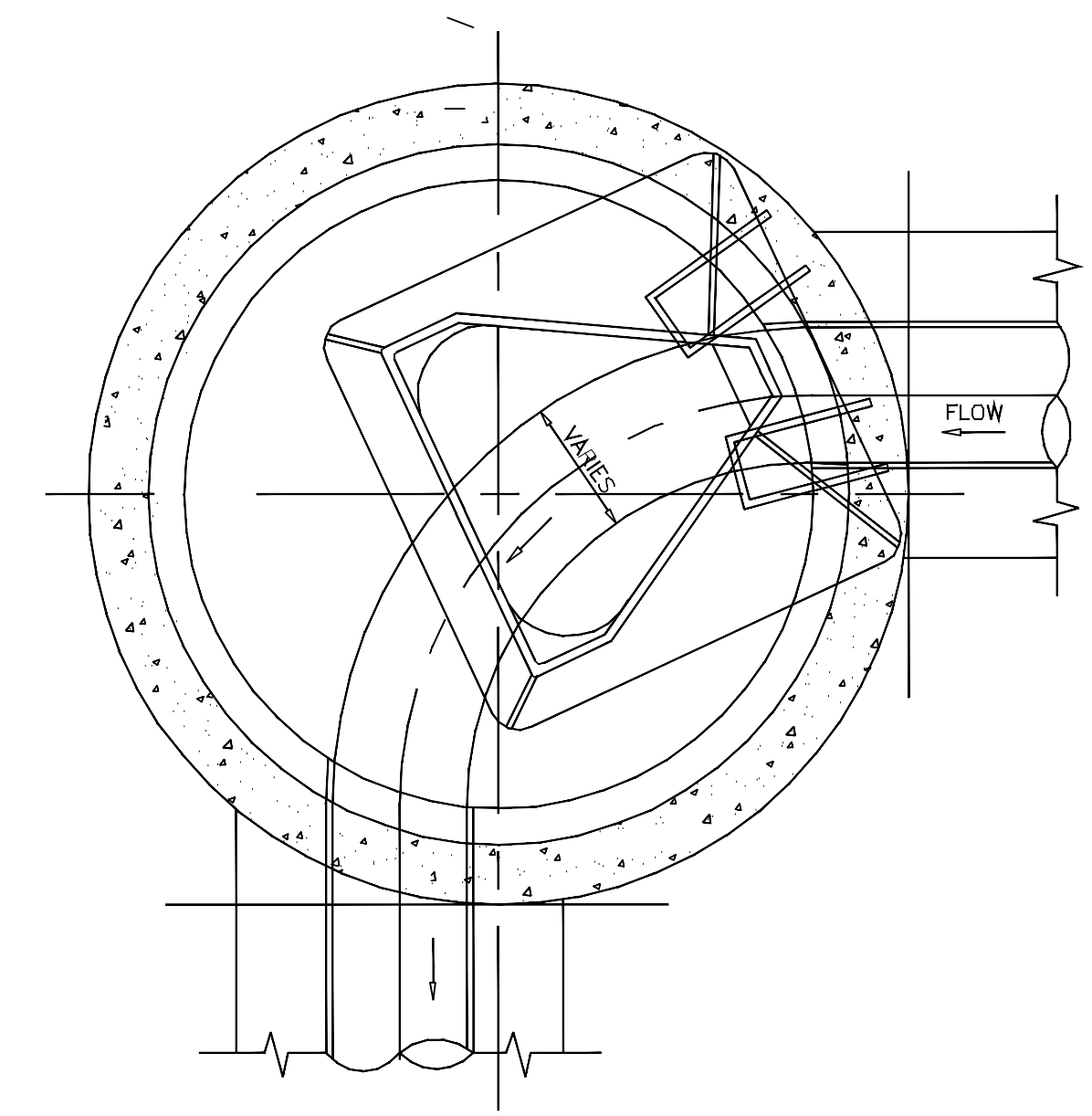
END ENTRANCE BACKDROP



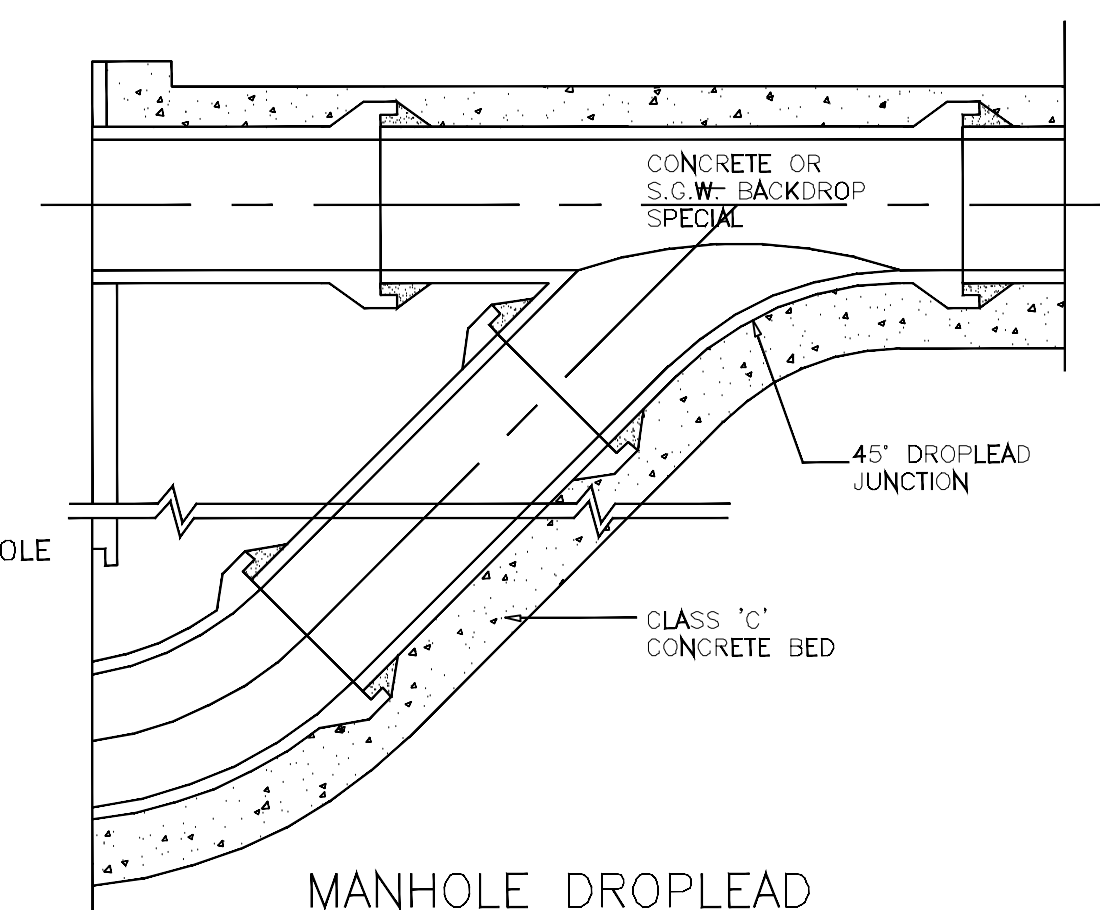
SIDE ENTRANCE BACKDROP



90° SIDE ENTRANCE



90° CHANGE OF DIRECTION

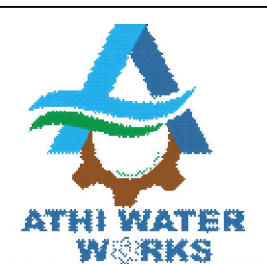


MANHOLE DROPLEAD

Civil Engineer:



Client:



Project:

NAIROBI RIVERS SEWERAGE
IMPROVEMENT PROJECT - PHASE II
(NaRSIP II)

Drawing Title

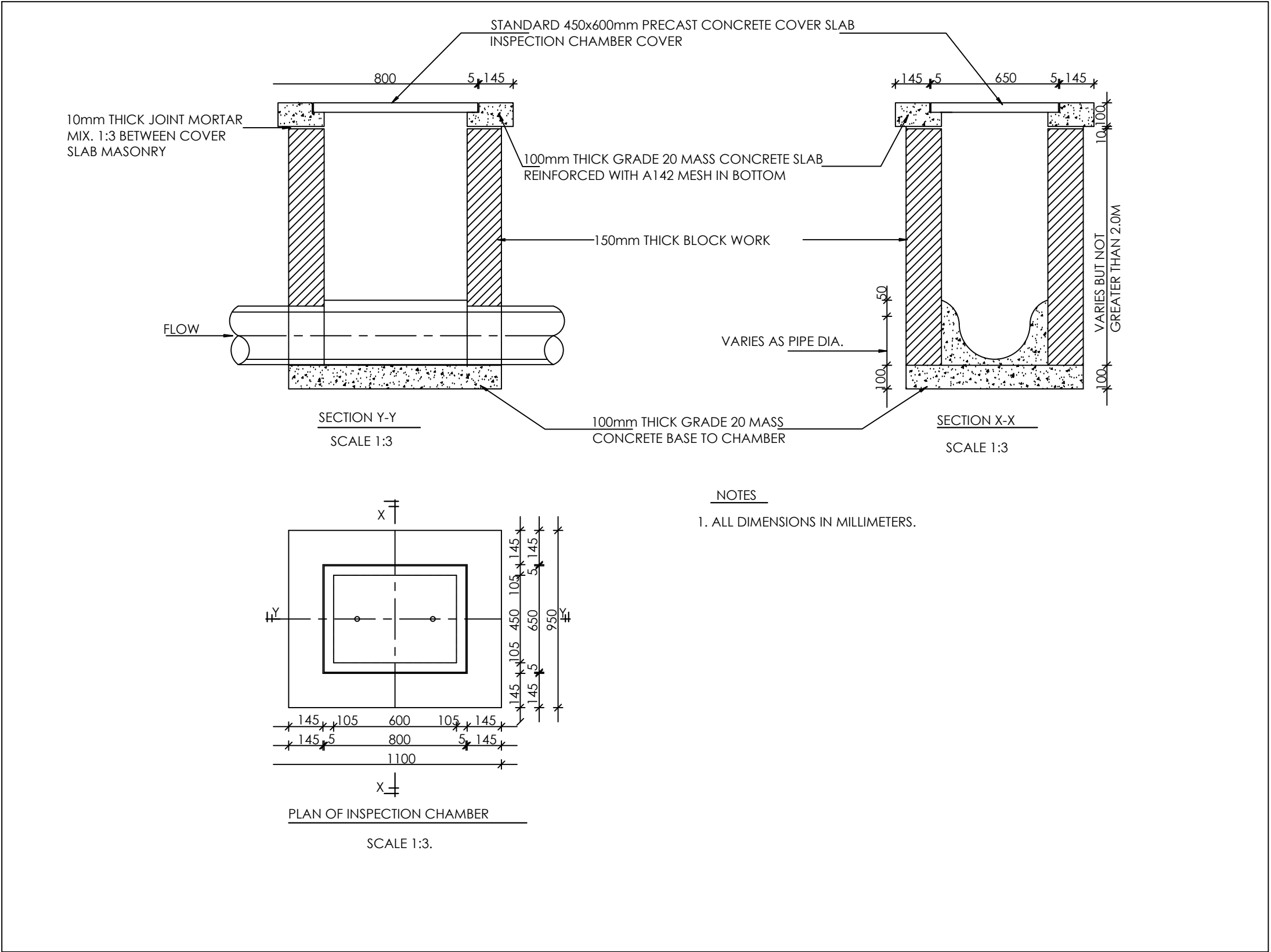
STANDARD DETAILS
MANHOLE TYPES A, B AND BACKDROP
DETAILS


NOTES

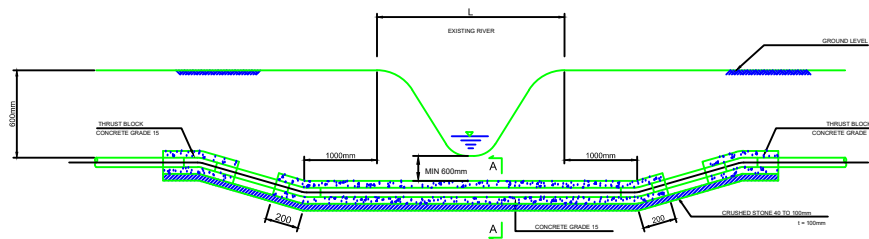
1. Sewer diameter, Orientation, Depth of Manhole and dimensions to be obtained from the relevant plan and profile drawings
2. Longitudinal slopes of channels in manholes shall be equal to the slope of the incoming and outgoing sewers
3. Manhole floors and walls shall be of Class "20" R.C; The ceiling of Class "25" R.C and Benching Class "10" mass concrete
4. All step Irons shall be protected from rusting by painting with bituminous paint or have plastic/rubber cover

REV	REVISIONS	SIGN	DATE	APPROVED	Designed by	Drawn by
D	CHECKED				ALBERT OCHARO	ALBERT OCHARO
C	CHECKED				Not to Scale	Date: DECEMBER 2021
B	CHECKED				Job No.	ACAD File:
A	CHECKED				P STATUS	DRG No. FC/CE90/SD/01

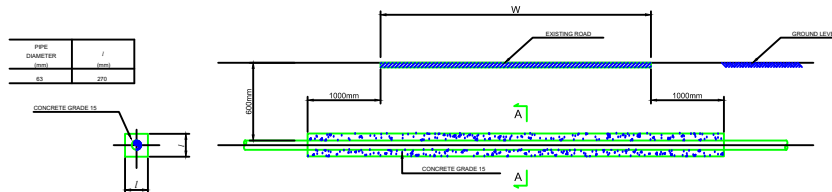
DETAILS OF CHAMBERS



Civil Engineer:	Client:	Project	Drawing Title	NOTES	
		NAIROBI RIVERS SEWERAGE IMPROVEMENT PROJECT - PHASE II (NaRSIP II)	STANDARD DETAILS MANHOLE COVER, BACKDROP AND CHAMBER DETAILS	1. Sewer diameter, Orientation, Depth of Manhole and dimensions to be obtained from the relevant plan and profile drawings 2. Longitudinal slopes of channels in manholes shall be equal to the slope of the incoming and outgoing sewers 3. Manhole floors and walls shall be of Class "20" R.C; The ceiling of Class "25" R.C and Benching Class "10" mass concrete 4. All step irons shall be protected from rusting by painting with bituminous paint or have plastic/rubber cover	



RIVER CROSSING




A-A

ROAD CROSSING

NOTES :

1. WALLS BUILT OF SOLID CONCRETE BLOCKS OR MASONRY, 150 mm (225 mm) THICK. ALL JOINTS ARE 10 mm THICK.
2. EXTERNAL FINISH ON CONCRETE BLOCK WALLS IS 10 mm CEMENT RENDERING WITH TWO COATS EXTERNAL QUALITY WATER PAINT FINISH.
3. PLINTH IS 15 mm CEMENT RENDERING WITH BITUMINOUS PAINT FINISH. MINIMUM HEIGHT OF PLINTH ABOVE FINISHED GROUND LEVEL IS 300 mm.
4. INTERNAL FINISH ON WALLS IS 10 mm INTERNAL GAUGED LIME PLASTER WITH GLOSS PAINT FINISH.
5. THE PIPES INSIDE THE KIOSK ARE DN 15mm G.I. PIPES.
6. WATER METERS ARE INSTALLED INSIDE WATER KIOSK NEAR FENCE.

Notes		Revisions			STANDARD DRAWINGS RIVER AND ROAD CROSSINGS DETAILS	AWWDA/NARSIP II/W-05/2022	Description		 ATHI WATER WORKS DEVELOPMENT AGENCY
No.	Date	Details	Chd.	Appr.			INDEX		
							Scale: 1 : 50 (A3)		
							Drawn: December 2021		
							Checked By: Eng. D. Ogesa		
							Approved By: Eng. B. Njoroge	Drawn By: Albert Ocharo	
							Drawing No: AWWDA/ACPEU/RRC/01		