REPUBLIC OF KENYA

MINISTRY OF WATER AND SANITATION

ATHI WATER WORKS
Accelerating Access to Water and Sanitation

ATHI WATER WORKS DEVELOPMENT AGENCY

TANATHI WATER WORKS DEVELOPMENT AGENCY

AFRICAN DEVELOPMENT FUND





CONSULTANCY SERVICES FOR DESIGN REVIEW, PREPARATION OF TENDER DOCUMENTS AND SUPERVISION OF CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT NO: AWWDA/AFDB/KTSWSSP/W/08/ 2023

MWALA CLUSTER WATER SUPPLY PROJECT BOOK OF DRAWINGS

CAS CONSULTANTS LIMITED
Le' Mac Building, 1st Fl, Off Church Rd,
Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

DATE: MARCH 2023

DRAWING INDEX

DRAWING No.	DESCRIPTION
AWSB/MC/DI/001	DRAWING INDEX SHEET 1 OF 2
AWSB/MC/DI/002	DRAWING INDEX SHEET 2 OF 2
	GENERAL LAYOUT DRAWINGS
DRAWING No.	DESCRIPTION
AWSB/MC/PL/001	PROJECT LOCATION
AWSB/MC/PL/002	PROJECT LAYOUT PLAN
AWSB/MC/PL/003	MWALA CLUSTER WATER SUPPLY COVERAGE AREA
	INTAKE DRAWINGS
DRAWING No.	DESCRIPTION
AWSB/MC/ITW/001	INTAKE WEIR PLAN AND SECTIONS
AWSB/MC/ITW/002	PLAN SEDIMENTATION TANK PLAN AND SECTION
AWSB/MC/ITW/003	INTAKE FRONT VIEW AND SECTION
AWSB/MC/ITW/004	INTAKE HANDRAIL AND SECTION DETAILS
AWSB/MC/ITW/005	INTAKE STAFF GAUGE AND SECTION DETAILS
AWSB/MC/ITW/006	PLAN SEDIMENTATION REINFORCEMENT DEATILS
AWSB/MC/ITW/007	INTAKE REINFORCEMENT DETAILS 1
AWSB/MC/ITW/008	INTAKE REINFORCEMENT DETAILS 2
	RAW WATER MAIN
DRAWING No.	DESCRIPTION
AWSB/MC/RWM/001	RAW WATER MAIN PLAN AND PROFILE – 0+000 TO 2+000
AWSB/MC/RWM/002	RAW WATER MAIN PLAN AND PROFILE – 2+000 TO 4+000
AWSB/MC/RWM/003	4RAW WATER MAIN PLAN AND PROFILE – 4+000 TO 4+460
	TREATMENT WORKS DRAWINGS
DRAWING No.	DESCRIPTION
AWSB/MC/TW/001	TREATMENT WORKS GENERAL LAYOUT
AWSB/MC/MC/001	MIXING CHAMBER PLAN AND SECTION
AWSB/MC/MC/002	MIXING CHAMBER SECTION DETAILS
AWSB/MC/MC/003	MIXING CHAMBER RC DETAILS OF SLAB AND WALLS
AWSB/MC/MC/004	MIXING CHAMBER SECTION AND BAR BENDING SCHEDULE
AWSB/MC/TW/001	TREATMENT WORKS GENERAL LAYOUT PLAN
AWSB/MC/TW/002	TREATMENT WORKS SECTION D–D
AWSB/MC/TW/003	PLAN AND SECTION D–D
AWSB/MC/TW/004	FLOCCULATION SECTION DETAILS
AWSB/MC/TW/005	INLET PLAN AND SECTION DETAILS AND FLOCCULATION BOTTOM DETAILS
AWSB/MC/TW/006	FILTERS SECTION DETAILS
AWSB/MC/TW/007	PIPE WORK SCHEDULE
AWSB/MC/TW/008	SEDIMENTATION SECTION I–I
AWSB/MC/TW/009	FLOCCULATION SLABS REINFORCEMENT DETAILS
AWSB/MC/TW/010	FLOCCULATION WALL SECTIONS 2–2 AND 4–4 REINFORCEMENT DETAILS
AWSB/MC/TW/011	FLOCCULATION WALL SECTIONS 1–1 AND WALLS 1–8 REINFORCEMENT DETAILS
AWSB/MC/TW/012	SEDIMENTATION SLAB AND WALL SECTIONS REINFORCEMENT DETAILS
AWSB/MC/TW/013	FILTER CHANNEL SLAB AND WALL SECTIONS REINFORCEMENT DETAILS
AWSB/MC/TW/014	SLAB REINFORCEMENT DETAILS
AWSB/MC/TW/015	SECTION G–G REINFORCEMENT DETAILS
AWSB/MC/TW/016	SECTION F–F REINFORCEMENT DETAILS
AWSB/MC/TW/022	SECTION F–F REINFORCEMENT DETAILS
AWSB/MC/TW/018	SECTION E–E REINFORCEMENT DETAILS
AWSB/MC/TW/019	SECTIONS I–I REINFORCEMENT DETAILS
AWSB/MC/TW/020	BOTTOM FLOCCULATOR, INJECTION DEVICE, INLET CHAMBER AND SECTION H–H REINFORCEMENT DETAILS
AWSB/MC/TW/021	SECTION D–D AND REINFORCEMENT DETAILS
AWSB/MC/TW/021	SECTION D–D AND REINFORCEMENT DETAILS 2

SLUDGE DRYING BEDS

DRAWING No.	DESCRIPTION
AWSB/MC/DB/001	DRYING BEDS PLAN AND SECTION
AWSB/MC/DB/002	SLAB PLAN, SECTION A–A, SECTION B–B & SECTION C–C RC DETAILS
	CLEAR WATER TANK
DRAWING No.	DESCRIPTION
AWSB/MC/CWT/001	1000M3 CLEAR WATER TANK – ROOF PLAN
AWSB/MC/CWT/002	1000M3 CLEAR WATER TANK – SLAB PLAN
AWSB/MC/CWT/003	1000M3 CLEAR WATER TANK – SECTION A–A, B–B AND VENT PIPE DETAILS
AWSB/MC/CWT/004	1000M3 CLEAR WATER TANK – OVERFLOW AND WASHOUT DETAILS
AWSB/MC/CWT/005	1000M3 CLEAR WATER TANK – INLET, OUTLET CHAMBER PLAN AND DETAILS
	BUILDINGS
	ADMINISTRATION BLOCK
DRAWING No.	DESCRIPTION
AWSB/MC/AB/001	ADMINISTRATION BLOCK PLAN
AWSB/MC/AB/002	ADMINISTRATION BLOCK ELEVATIONS AND SECTION
AWSB/MC/AB/003	ADMINISTRATION BLOCK STRUCTURAL DETAILS
	CHEMICAL BUILDING
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AWSB/MC/CB/001	CHEMICAL BUILDING PLAN
AWSB/MC/CB/002	CHEMICAL BUILDING ELEVATIONS AND SECTIONS
AWSB/MC/CB/003	CHEMICAL BUILDING PLAN SECTION A–A, B–B, C–C & D–D
AWSB/MC/CB/004	SCHEMATIC DIAGRAM OF CHEMICAL MIXING TANKS
	GUARD HOUSE
DRAWING No.	DESCRIPTION
AWSB/MC/GDH/001	GUARD HOUSE – PLAN, SECTION AND ELEVATION
AWSB/MC/GDH/002	GUARD HOUSE – STRUCTURAL DETAILS
	PIPE SHED
DRAWING No.	DESCRIPTION
AWSB/MC/PS/001	PIPE SHED – PLAN, SECTIONS AND ELEVATION
AWSB/MC/PS/002	PIPE SHED – STRUCTURAL DETAILS
	METER ROOM
DRAWING No.	DESCRIPTION
AWSB/MC/MR/001	PIPE SHED FOUNDATION LAYOUT SECTIONS AND ELEVATION
	POWER AND GENERATOR HOUSE
DRAWING No.	DESCRIPTION
AWSB/MC/PH/001	PUMP HOUSE – ARCHITECTURAL DETAILS
AWSB/MC/PH/002	PUMP HOUSE – PIPE ARRANGEMENT
AWSB/MC/PH/003	POWER HOUSE – SUCTION PIPE, DELIVERY LINE AND SECTION PIPEWORKS
AWSB/MC/PH/004	POWER HOUSE – STRUCTURAL DETAILS
	STAFF HOUSES
	STAFF HOUSE TYPE 'C'
DRAWING No.	DESCRIPTION
AWSB/MC/SHD/001	STAFF HOUSE TYPE 'C' PLAN, ARCHITECTURAL ELEVATIONS
AWSB/MC/SHD/002	STAFF HOUSE TYPE 'C' ELECTRICAL INSTALLATION
AWSB/MC/SHD/002	STAFF HOUSE TYPE 'C' PLANS
	STAFF HOUSE TYPE 'D'
DRAWING No.	DESCRIPTION
AWSB/MC/SHD/001	STAFF HOUSE TYPE 'D' PLAN, ELEVATIONS AND SECTIONS
AWSB/MC/SHD/002	STAFF HOUSE TYPE 'D' ELECTRICAL INSTALLATION

STANDARD DRAWINGS

DRAWING No.	DESCRIPTION
AWSB/MC/SD/001	AEERIAL CROSSING
AWSB/MC/SD/002	CONSUMER CONNECTIONS
AWSB/MC/SD/003	COVER DETAILS
AWSB/MC/SD/004	DEEP VALVE CHAMBER
AWSB/MC/SD/005	CHECKERED PLATE DETAILS
AWSB/MC/SD/006	DETAILS OF FENCING POSTS
AWSB/MC/SD/007	FENCE AND GATE DETAILS
AWSB/MC/SD/008A	DETAILS OF METAL COVER
AWSB/MC/SD/008B	DETAILS OF METAL COVER CONTINUES
AWSB/MC/SD/009	PIPE TRENCH
AWSB/MC/SD/010	DETAILS OF VALVE CHAMBER
AWSB/MC/SD/011	DETAILS OF WATER KIOSK
AWSB/MC/SD/012	DOOR SCHEDULE 01
AWSB/MC/SD/013	DOOR SCHEDULE 02
AWSB/MC/SD/014	FLOOR MESH
AWSB/MC/SD/015	GMS LADDER DETAILS
AWSB/MC/SD/016	IBD AND HEADWALL
AWSB/MC/SD/017A	MANHOLE DETAILS
AWSB/MC/SD/017B	MANHOLE DETAILS
AWSB/MC/SD/017C	MANHOLE DETAILS
AWSB/MC/SD/018	SEPTIC TANK PLAN AND SECTIONS
AWSB/MC/SD/019	STANDARD WATER DETAILS
AWSB/MC/SD/020A	THRUST BLOCK 1
AWSB/MC/SD/020B	THRUST BLOCK 2
AWSB/MC/SD/020C	THRUST BLOCK 3
AWSB/MC/SD/021	THRUST BLOCK
AWSB/MC/SD/022	TYPICAL ROAD CROSSING DETAILS
AWSB/MC/SD/023	WINDOW SCHEDULE
AWSB/MC/SD/024	DOORS AND WINDOW DETAILS
	STORAGE TANKS
	MASONRY STORAGE TANK (225M3 CAPACITY)
DRAWING No.	DESCRIPTION
AWSB/MC/MST/001	225M3 MASONRY STORAGE TANK – HALF FLOOR PLAN AND SECTION
AWSB/MC/MST/002	225M3 MASONRY STORAGE TANK – SECTION AND DETAILS
AWSB/MC/MST/003	225M3 MASONRY STORAGE TANK – SECTION AND DETAILS
AWSB/MC/MST/004	225M3 MASONRY STORAGE TANK – ROOF PLAN AND COLUMN ROOF SUPPORT
AWSB/MC/MST/005	225M3 MASONRY STORAGE TANK – BAR BENDING SCHEDULE
	MUTHEI HILL STORAGE TANK (1000M3 CAPACITY)
DRAWING No.	DESCRIPTION
AWSB/MC/MHT/001	MUTHEI HILL 1000M3 WATER TANK – ROOF PLAN
AWSB/MC/MHT/002	MUTHEI HILL 1000M3 WATER TANK – SLAB PLAN
AWSB/MC/MHT/003	MUTHEI HILL 1000M3 WATER TANK – SECTIONS A–A, B–B, AND VENT PIPE DETAILS
AWSB/MC/MHT/004	MUTHEI HILL 1000M3 WATER TANK – OVERFLOW AND WASHOUT CHAMBER PLAN
AWSB/MC/MHT/005	MUTHEI HILL 1000M3 WATER TANK – INLET, OUTLET CHAMBER PLAN AND SECTION
AWSB/MC/MHT/006	MUTHEI HILL 1000M3 WATER TANK – STRUCTURAL DETAILS
AWSB/MC/MHT/007	MUTHEI HILL 1000M3 WATER TANK – STRUCTURAL

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	May 2018
2.				
3.				
4.				

Client:
ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:
AFRICAN DEVELOPMENT BANK

Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
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E-mail: casconsult@africaonline.co.ke

Drawing Title:
MWALA CLUSTER WATER WORKS
DRAWING INDEX
SHEET 1 OF 2

Designed By	: L.K
Drawn By	: E.O
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/DI/001

CONVEYANCE

TREATMENT WORKS TO PUMP TRANSMISSION MAIN

DRAWING No.	DESCRIPTION
AWSB/MC/TWP/001	TREATMENT WORKS TO PUMP PIPELINE – PLAN AND PROFILE FROM CH 0+000 TO CH 2+000
AWSB/MC/TWP/002	TREATMENT WORKS TO PUMP PIPELINE – PLAN AND PROFILE FROM CH 2+000 TO CH 4+000
AWSB/MC/TWP/003	TREATMENT WORKS TO PUMP PIPELINE – PLAN AND PROFILE FROM CH 4+000 TO CH 6+000
AWSB/MC/TWP/004	TREATMENT WORKS TO PUMP PIPELINE – PLAN AND PROFILE FROM CH 6+000 TO CH 8+000
AWSB/MC/TWP/005	TREATMENT WORKS TO PUMP PIPELINE – PLAN AND PROFILE FROM CH 8+000 TO CH 10+000
AWSB/MC/TWP/006	TREATMENT WORKS TO PUMP PIPELINE – PLAN AND PROFILE FROM CH 10+000 TO CH 12+000
AWSB/MC/TWP/007	TREATMENT WORKS TO PUMP PIPELINE – PLAN AND PROFILE FROM CH 12+000 TO CH 14+000
AWSB/MC/TWP/008	TREATMENT WORKS TO PUMP PIPELINE – PLAN AND PROFILE FROM CH 14+000 TO CH 16+000
AWSB/MC/TWP/009	TREATMENT WORKS TO PUMP PIPELINE – PLAN AND PROFILE FROM CH 16+000 TO CH 18+000
AWSB/MC/TWP/010	TREATMENT WORKS TO PUMP PIPELINE – PLAN AND PROFILE FROM CH 18+000 TO CH 20+000
AWSB/MC/TWP/011	TREATMENT WORKS TO PUMP PIPELINE – PLAN AND PROFILE FROM CH 20+000 TO CH 22+000
AWSB/MC/TWP/012	TREATMENT WORKS TO PUMP PIPELINE – PLAN AND PROFILE FROM CH 22+000 TO CH 24+000
AWSB/MC/TWP/013	TREATMENT WORKS TO PUMP PIPELINE – PLAN AND PROFILE FROM CH 24+000 TO CH 26+000
AWSB/MC/TWP/014	TREATMENT WORKS TO PUMP PIPELINE – PLAN AND PROFILE FROM CH 26+000 TO CH 28+000
AWSB/MC/TWP/015	TREATMENT WORKS TO PUMP PIPELINE – PLAN AND PROFILE FROM CH 28+000 TO CH 30+000
AWSB/MC/TWP/016	TREATMENT WORKS TO PUMP PIPELINE – PLAN AND PROFILE FROM CH 30+000 TO CH 32+000
AWSB/MC/TWP/017	TREATMENT WORKS TO PUMP PIPELINE – PLAN AND PROFILE FROM CH 32+000 TO CH 34+000
AWSB/MC/TWP/018	TREATMENT WORKS TO PUMP PIPELINE – PLAN AND PROFILE FROM CH 34+000 TO CH 36+000
AWSB/MC/TWP/019	TREATMENT WORKS TO PUMP PIPELINE – PLAN AND PROFILE FROM CH 36+000 TO CH 38+000
AWSB/MC/TWP/020	TREATMENT WORKS TO PUMP PIPELINE – PLAN AND PROFILE FROM CH 38+000 TO CH 40+000
AWSB/MC/TWP/021	TREATMENT WORKS TO PUMP PIPELINE – PLAN AND PROFILE FROM CH 40+000 TO CH 42+000
AWSB/MC/TWP/022	TREATMENT WORKS TO PUMP PIPELINE – PLAN AND PROFILE FROM CH 42+000 TO CH 44+000
AWSB/MC/TWP/023	TREATMENT WORKS TO PUMP PIPELINE – PLAN AND PROFILE FROM CH 44+000 TO CH 46+000
AWSB/MC/TWP/024	TREATMENT WORKS TO PUMP PIPELINE – PLAN AND PROFILE FROM CH 46+000 TO CH 48+000
AWSB/MC/TWP/025	TREATMENT WORKS TO PUMP PIPELINE – PLAN AND PROFILE FROM CH 48+000 TO CH 50+000
AWSB/MC/TWP/026	TREATMENT WORKS TO PUMP PIPELINE – PLAN AND PROFILE FROM CH 50+000 TO CH 52+000
AWSB/MC/TWP/027	TREATMENT WORKS TO PUMP PIPELINE – PLAN AND PROFILE FROM CH 52+000 TO CH 52+642

KABAA TO WAMUNYU PIPELINE

DRAWING No.	DESCRIPTION
AWSB/MC/KW/001	KABAA TO WAMUNYU PIPELINE – PLAN AND PROFILE FROM CH 0+000 TO CH 2+000
AWSB/MC/KW/002	KABAA TO WAMUNYU PIPELINE – PLAN AND PROFILE FROM CH 2+000 TO CH 4+000
AWSB/MC/KW/003	KABAA TO WAMUNYU PIPELINE – PLAN AND PROFILE FROM CH 4+000 TO CH 6+000
AWSB/MC/KW/004	KABAA TO WAMUNYU PIPELINE – PLAN AND PROFILE FROM CH 6+000 TO CH 8+000
AWSB/MC/KW/005	KABAA TO WAMUNYU PIPELINE – PLAN AND PROFILE FROM CH 8+000 TO CH 10+000
AWSB/MC/KW/006	KABAA TO WAMUNYU PIPELINE – PLAN AND PROFILE FROM CH 10+000 TO CH 12+000
AWSB/MC/KW/007	KABAA TO WAMUNYU PIPELINE – PLAN AND PROFILE FROM CH 12+000 TO CH 14+000
AWSB/MC/KW/008	KABAA TO WAMUNYU PIPELINE – PLAN AND PROFILE FROM CH 14+000 TO CH 16+000
AWSB/MC/KW/009	KABAA TO WAMUNYU PIPELINE – PLAN AND PROFILE FROM CH 16+000 TO CH 18+000
AWSB/MC/KW/010	KABAA TO WAMUNYU PIPELINE – PLAN AND PROFILE FROM CH 18+000 TO CH 20+000
AWSB/MC/KW/011	KABAA TO WAMUNYU PIPELINE – PLAN AND PROFILE FROM CH 20+000 TO CH 22+000
AWSB/MC/KW/012	KABAA TO WAMUNYU PIPELINE – PLAN AND PROFILE FROM CH 22+000 TO CH 24+000
AWSB/MC/KW/013	KABAA TO WAMUNYU PIPELINE – PLAN AND PROFILE FROM CH 24+000 TO CH 26+000
AWSB/MC/KW/014	KABAA TO WAMUNYU PIPELINE – PLAN AND PROFILE FROM CH 26+000 TO CH 28+000
AWSB/MC/KW/015	KABAA TO WAMUNYU PIPELINE – PLAN AND PROFILE FROM CH 28+000 TO CH 30+000
AWSB/MC/KW/016	KABAA TO WAMUNYU PIPELINE – PLAN AND PROFILE FROM CH 30+000 TO CH 32+000
AWSB/MC/KW/017	KABAA TO WAMUNYU PIPELINE – PLAN AND PROFILE FROM CH 32+000 TO CH 34+000
AWSB/MC/KW/018	KABAA TO WAMUNYU PIPELINE – PLAN AND PROFILE FROM CH 34+000 TO CH 34+492

PUMP TO MUTHEI HILL PIPELINE

DRAWING No.	DESCRIPTION
AWSB/MC/PMH/001	PUMP TO MUTHEI HILL PIPELINE – PLAN AND PROFILE FROM CH 0+000 TO CH 2+000
AWSB/MC/PMH/002	PUMP TO MUTHEI HILL PIPELINE – PLAN AND PROFILE FROM CH 2+000 TO CH 4+000
AWSB/MC/PMH/003	PUMP TO MUTHEI HILL PIPELINE – PLAN AND PROFILE FROM CH 4+000 TO CH 6+000
AWSB/MC/PMH/004	PUMP TO MUTHEI HILL PIPELINE – PLAN AND PROFILE FROM CH 6+000 TO CH 8+000
AWSB/MC/PMH/005	PUMP TO MUTHEI HILL PIPELINE – PLAN AND PROFILE FROM CH 8+000 TO CH 8+880

MUTHEI HILL TO MASII PIPELINE

DRAWING No.	DESCRIPTION
AWSB/MC/MHT/001	MUTHEI HILL TO MASII PIPELINE – PLAN AND PROFILE FROM CH 0+000 TO CH 2+000
AWSB/MC/MHT/002	MUTHEI HILL TO MASII PIPELINE – PLAN AND PROFILE FROM CH 2+000 TO CH 4+000
AWSB/MC/MHT/003	MUTHEI HILL TO MASII PIPELINE – PLAN AND PROFILE FROM CH 4+000 TO CH 6+000
AWSB/MC/MHT/004	MUTHEI HILL TO MASII PIPELINE – PLAN AND PROFILE FROM CH 6+000 TO CH 6+709

JUNCTION TO MAKUTANO PIPELINE

DRAWING No.	DESCRIPTION
AWSB/MC/JM/001	JUNCTION TO MAKUTANO PIPELINE – PLAN AND PROFILE FROM CH 0+000 TO CH 2+000
AWSB/MC/JM/002	JUNCTION TO MAKUTANO PIPELINE – PLAN AND PROFILE FROM CH 2+000 TO CH 4+000
AWSB/MC/JM/003	JUNCTION TO MAKUTANO PIPELINE – PLAN AND PROFILE FROM CH 4+000 TO CH 5+460

NZAMBANI RISING MAIN

DRAWING No.	DESCRIPTION
AWSB/MC/NZ/001	NZAMBANI RISING MAIN – PLAN AND PROFILE FROM CH 0+000 TO CH 2+000
AWSB/MC/NZ/002	NZAMBANI RISING MAIN – PLAN AND PROFILE FROM CH 2+000 TO CH 4+000
AWSB/MC/NZ/003	NZAMBANI RISING MAIN – PLAN AND PROFILE FROM CH 4+000 TO CH 6+000
AWSB/MC/NZ/004	NZAMBANI RISING MAIN – PLAN AND PROFILE FROM CH 6+000 TO CH 6+440

100M3 GROUND LEVEL MASONRY STORAGE TANK

DRAWING No.	DESCRIPTION
AWSB/MC/GMT/001	100M3 TANK SECTION AND BASE SLAB
AWSB/MC/GMT/002	100M3 TANK ROOF SLAB
AWSB/MC/GMT/003	100M3 TANK BASE SLAB AND PIPE DETAILS
AWSB/MC/GMT/004	100M3 TANK BASE AND ROOF SLAB REINFORCEMENT DETAILS

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	May 2018
2.				
3.				
4.				

Client:

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MUTHAIGA NORTH ROAD
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E-mail: casconsult@africaonline.co.ke

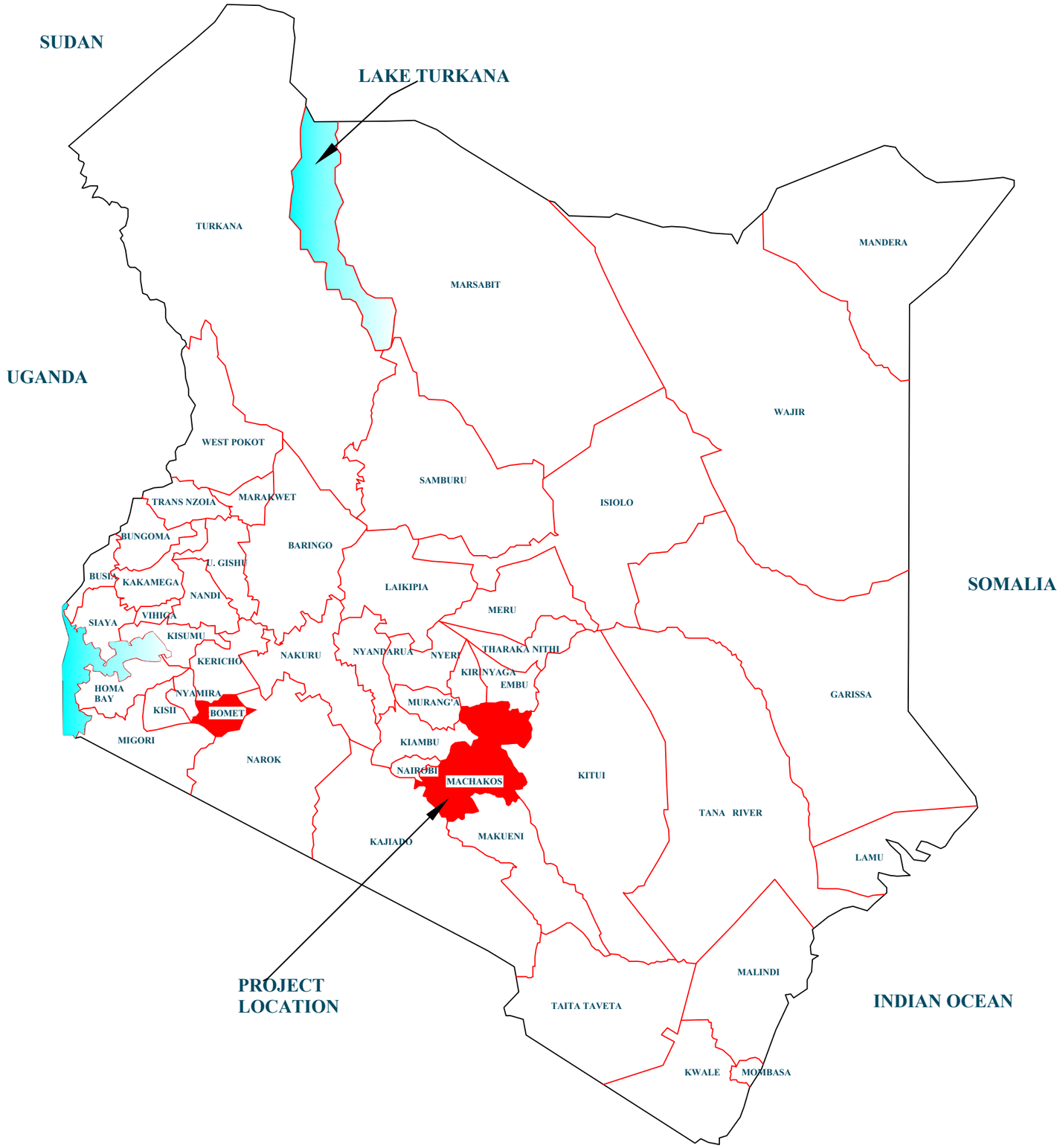
Drawing Title:

MWALA CLUSTER WATER WORKS

DRAWING INDEX

SHEET 2 OF 2

Designed By	:	L.K
Drawn By	:	E.O
Checked By	:	G.I
Approved By	:	S.M.M
Client approval	:	
Date	:	MARCH 2023
Drawing No	:	AWSB/MC/DI/002



No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	February; 2018
2.				
3.				
4.				

Client

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MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency

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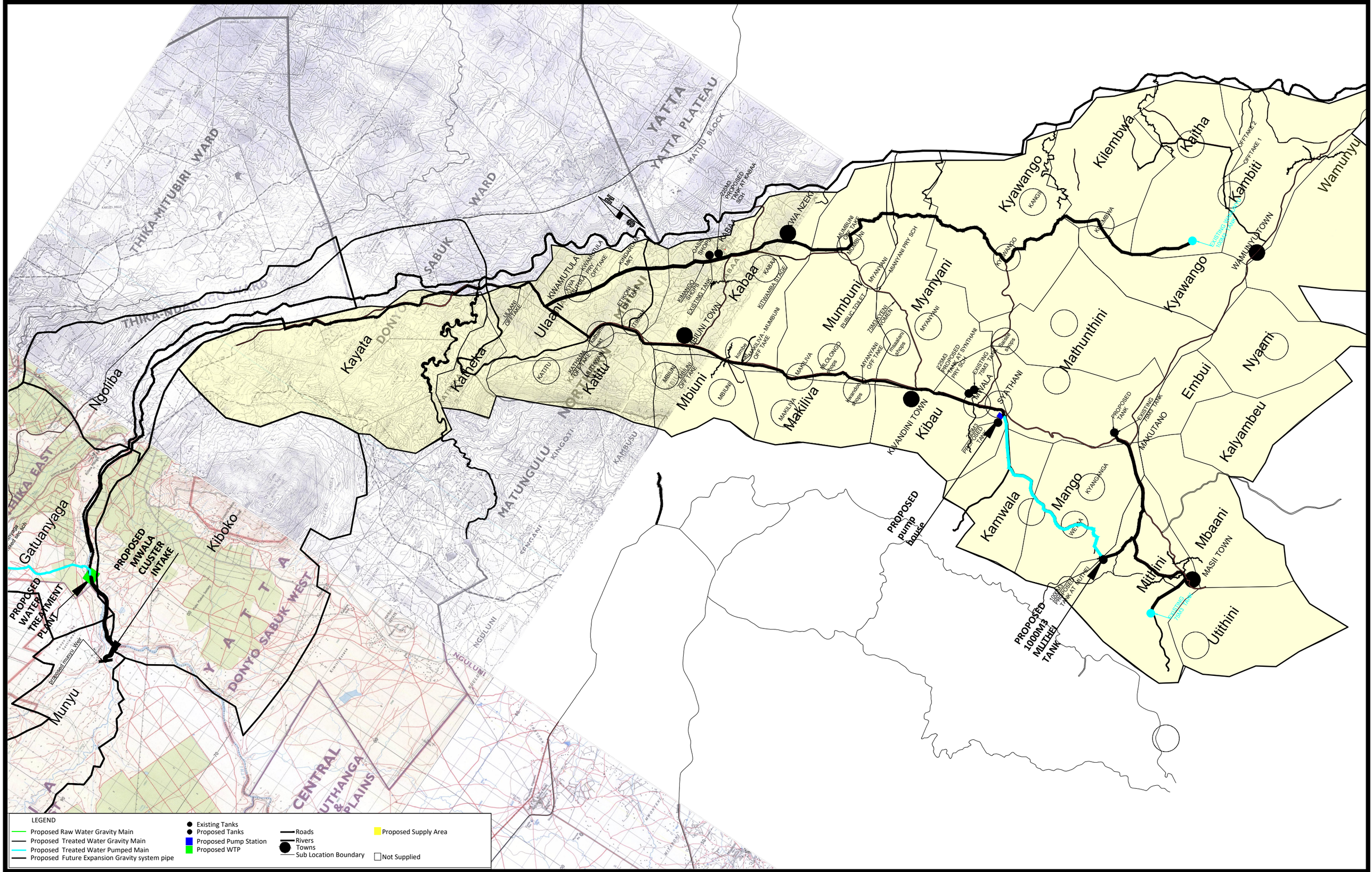
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title

PROJECT LOCATION

Designed By	:	LK
Drawn By	:	E.M
Checked By	:	W.K
Approved By	:	S.M.M
Client approval	:	
Date	:	MARCH 2023
Drawing No	:	AWSB/MC/PL/001



LEGEND

- Proposed Raw Water Gravity Main
- Proposed Treated Water Gravity Main
- Proposed Treated Water Pumped Main
- Proposed Future Expansion Gravity system pipe
- Existing Tanks
- Proposed Tanks
- Proposed Pump Station
- Proposed WTP
- Roads
- Rivers
- Towns
- Sub Location Boundary
- Proposed Supply Area
- Not Supplied

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1.		W.K	S.M.M	February; 2018
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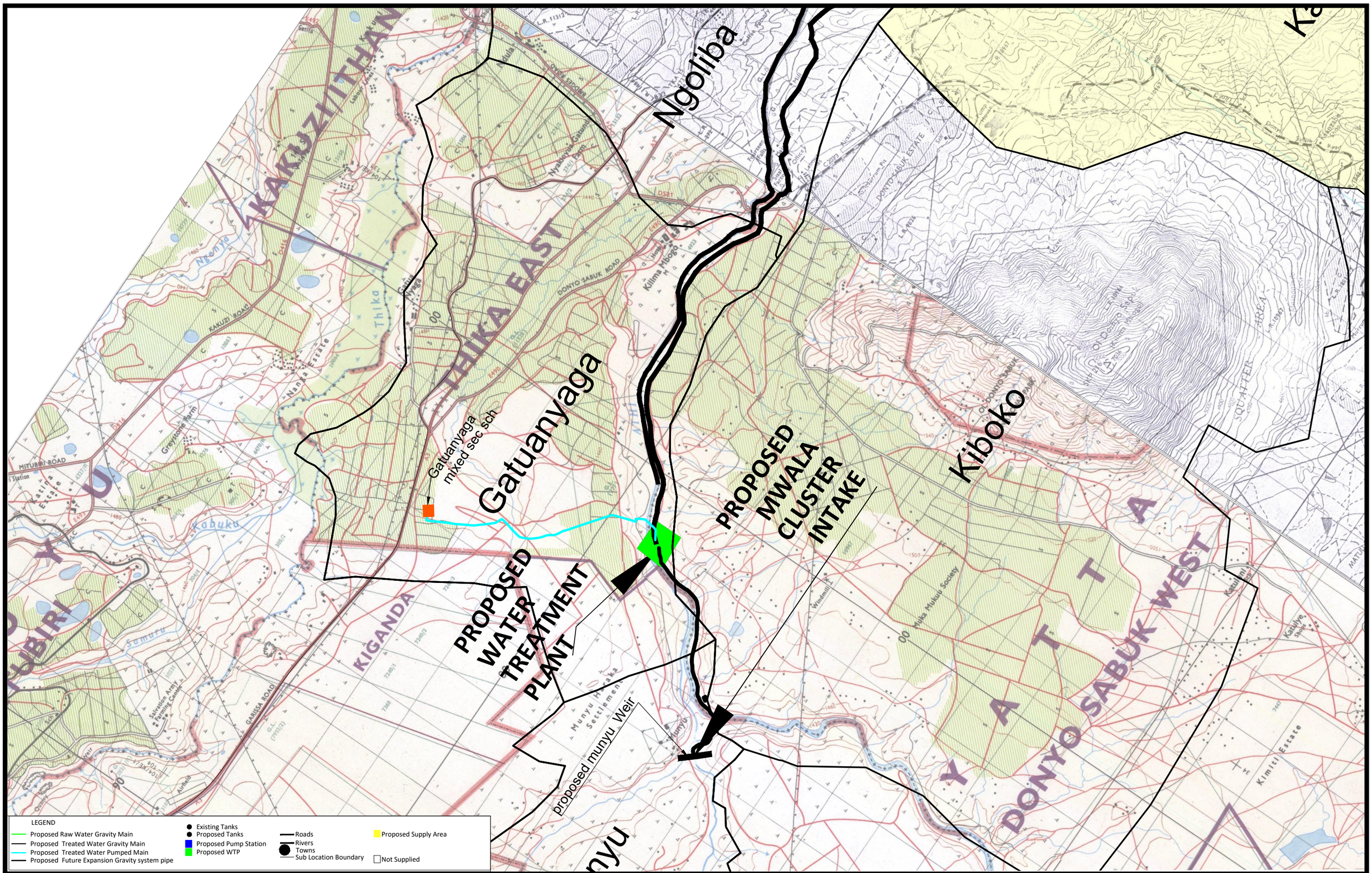
Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title

MWALA CLUSTER WATER SUPPLY
COVERAGE AREA

Designed By	:	LK
Drawn By	:	E.M
Checked By	:	W.K
Approved By	:	S.M.M
Client approval	:	
Date	:	MARCH 2023
Drawing No	:	AWSB/MC/PL/003



No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	February; 2018
2.				
3.				
4.				

Client

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD

Financed By

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AFDB/KTSWSSP/W/08/ 2023

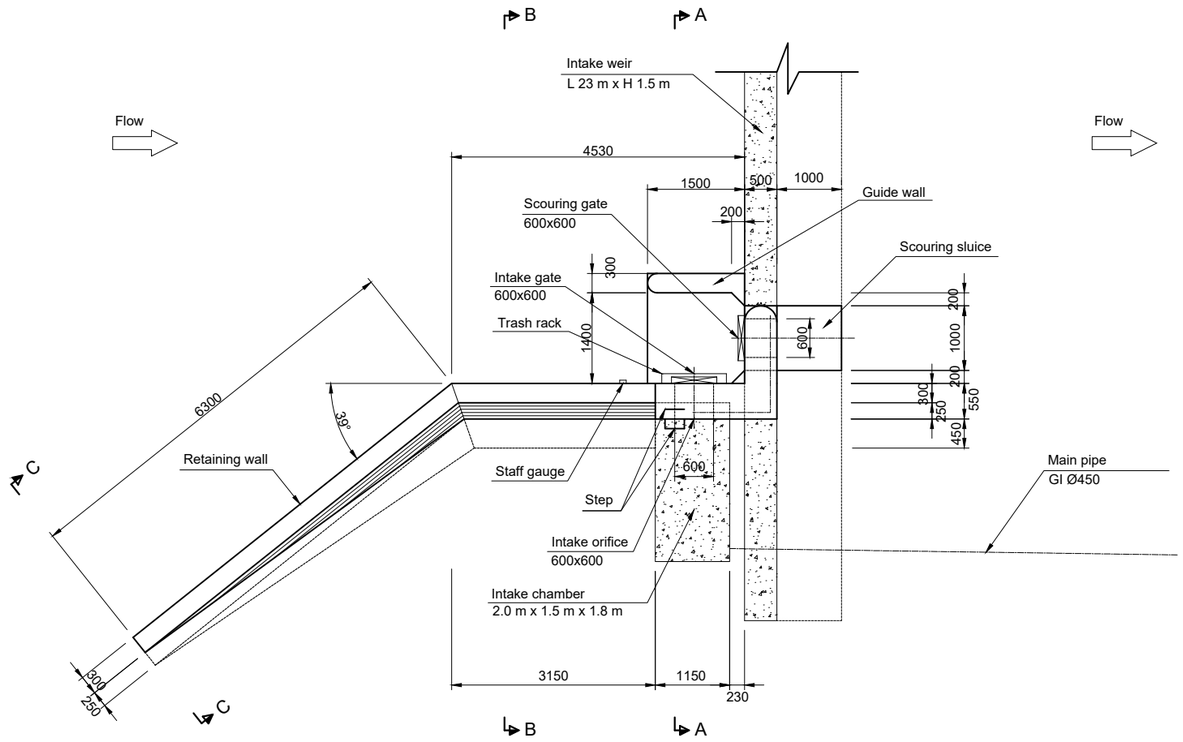
Reviewed By

CAS CONSULTANTS LIMITED
Le' Mac Building, 1st Fl, Off Church Rd,
Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

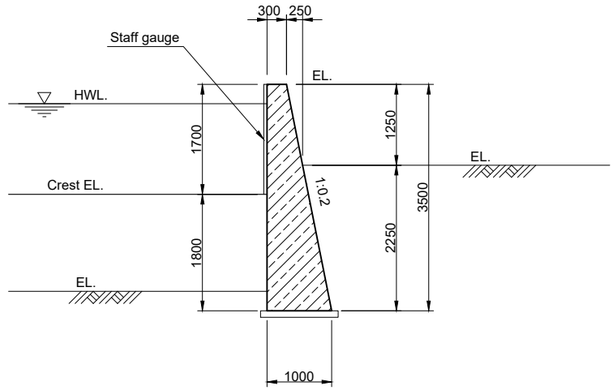
Drawing Title

MWALA CLUSTER WATER SUPPLY
COVERAGE AREA

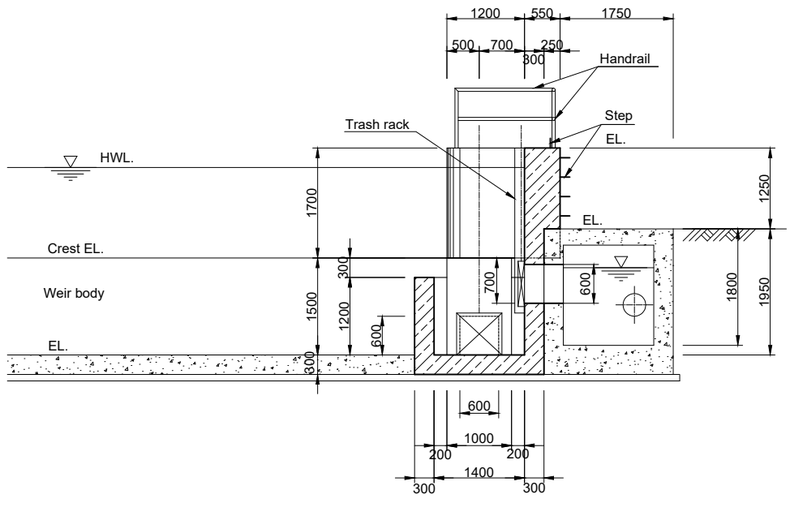
Designed By	: LK
Drawn By	: E.M
Checked By	: W.K
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/PL/003



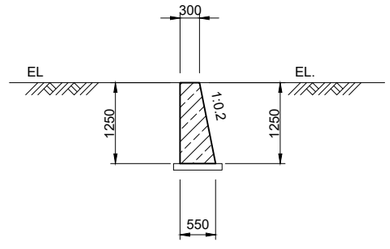
P L A N



SECTION B - B



SECTION A - A



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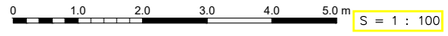


No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client:
ATHI WATER WORKS AGENCY,
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:
TANATHI WATER WORKS AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:
AFRICAN DEVELOPMENT BANK

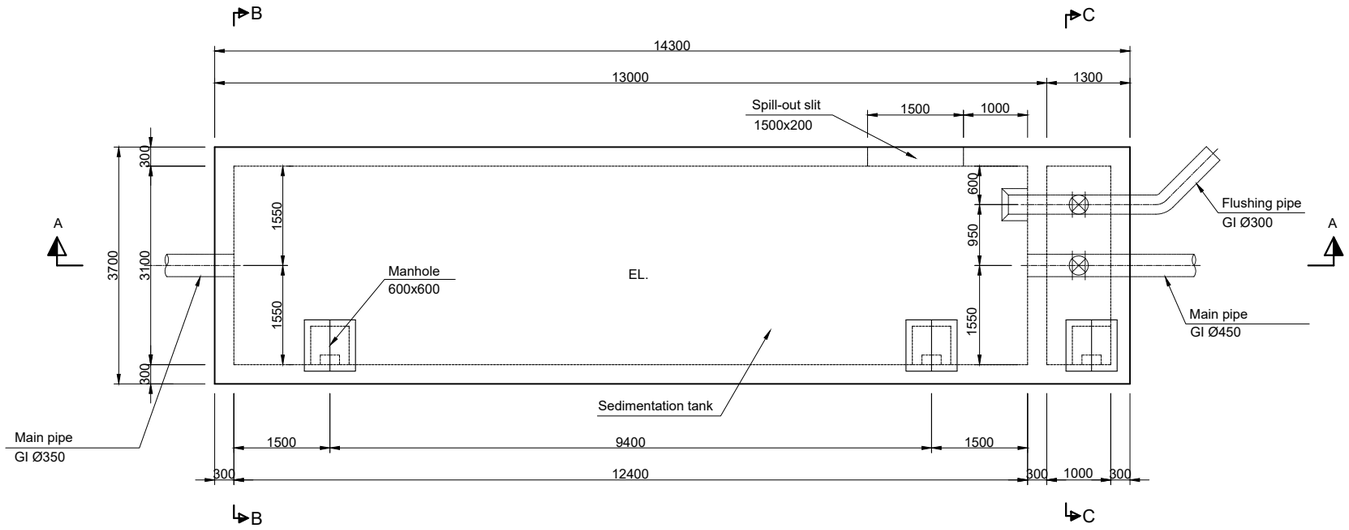
Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

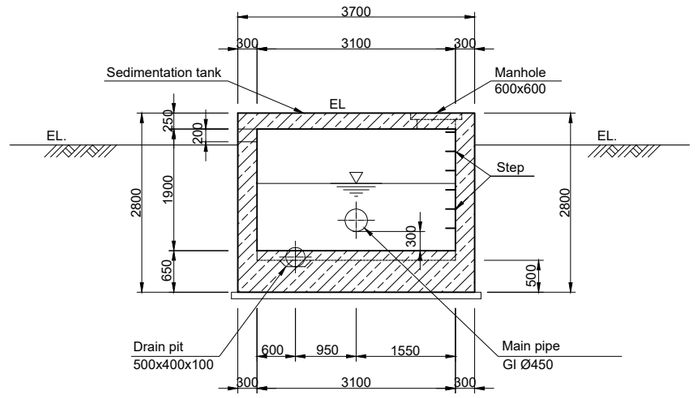
Reviewed By:
CAS CONSULTANTS LIMITED
Le'Mac Building,1st FL,Off Church Rd,, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title:
INTAKE WEIR PLAN AND SECTIONS

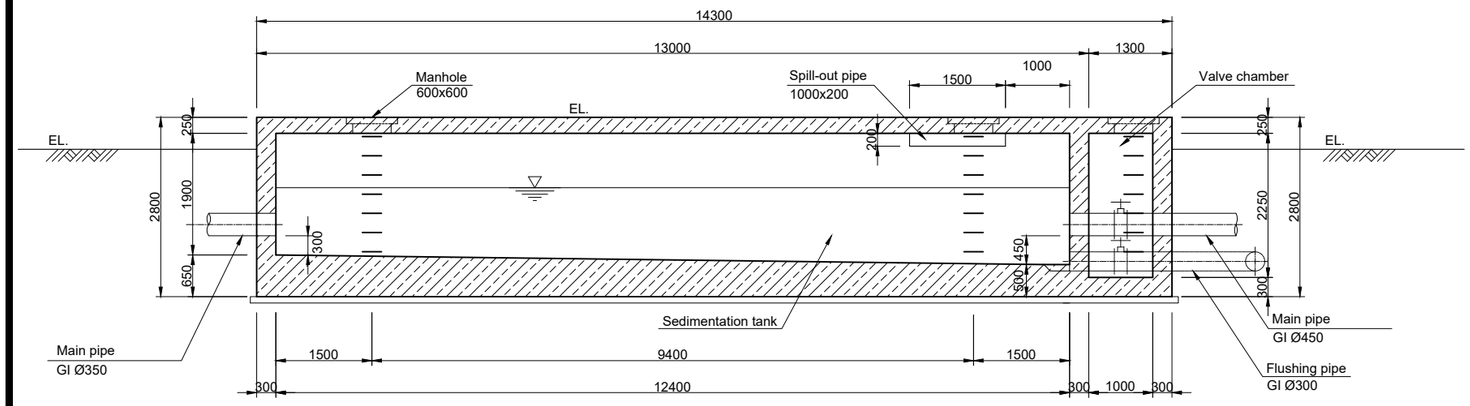
Designed By	: L.K
Drawn By	: E.O
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/ITW/001



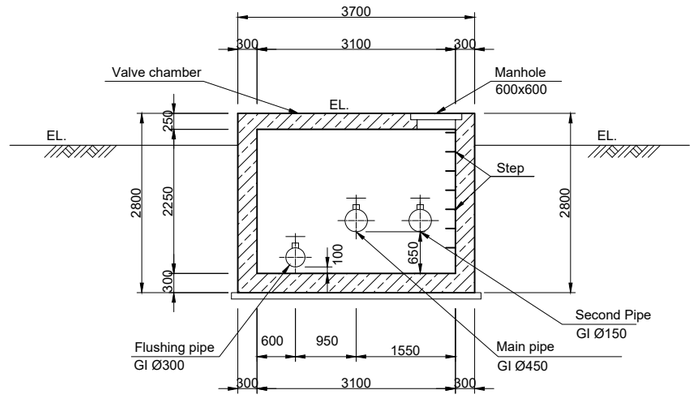
P L A N



SECTION B - B



SECTION A - A



SECTION C - C

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client:
ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:
AFRICAN DEVELOPMENT BANK

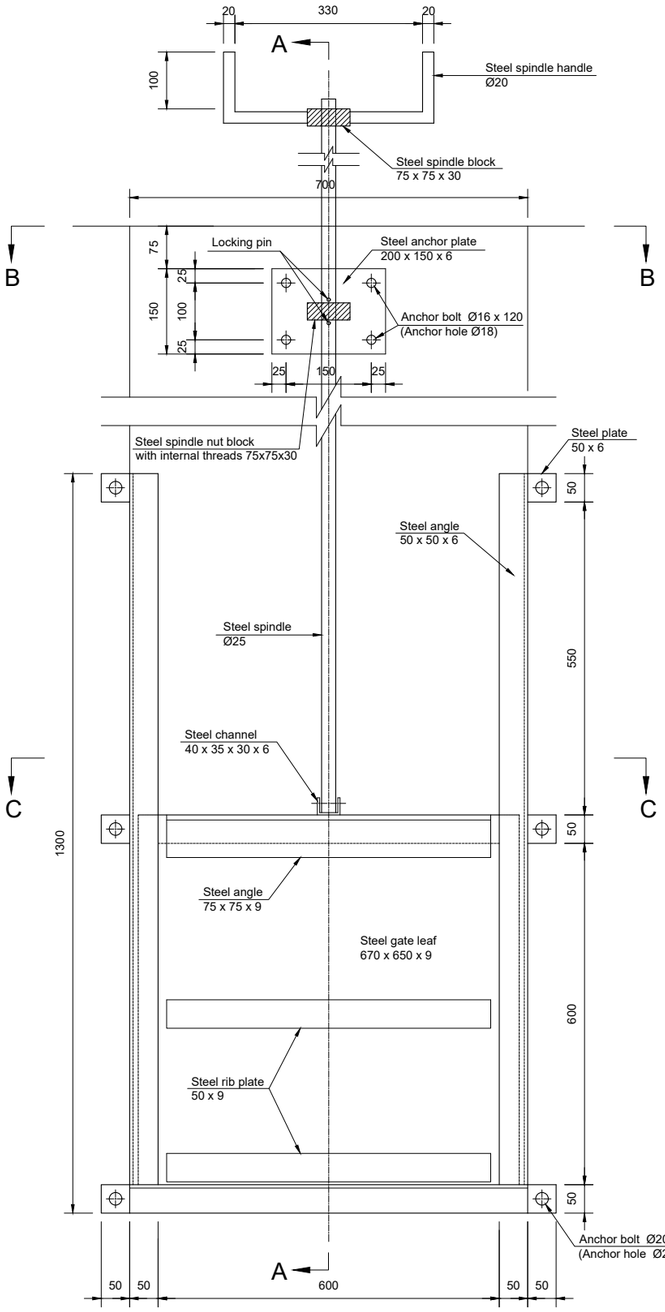
Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

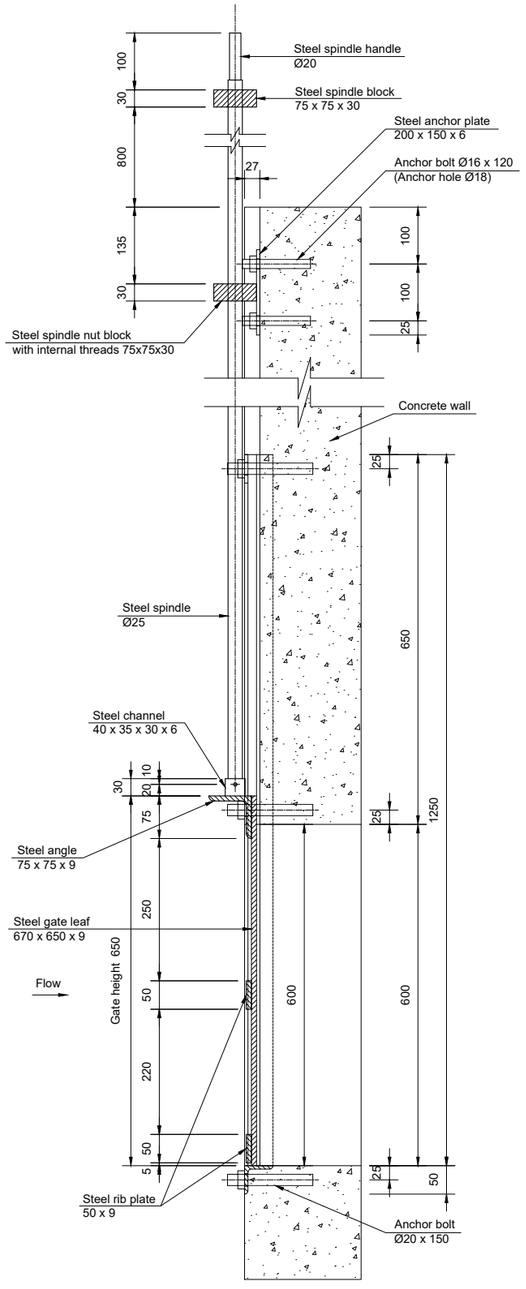
Reviewed By:
CAS CONSULTANTS LIMITED
Le' Mac Building, 1st Fl, Off Church Rd, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title:
PLAIN SEDIMENTATION TANK
PLAN AND SECTIONS

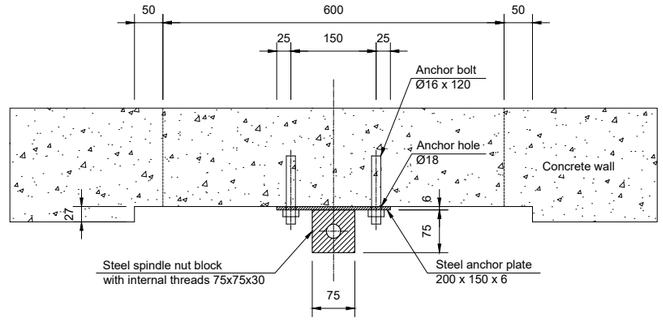
Designed By	: L.K
Drawn By	: E.O
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/ITW/003



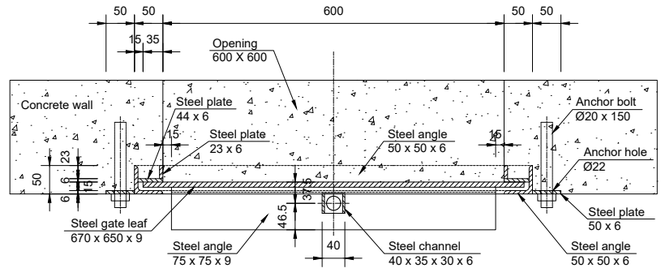
FRONT VIEW



SECTION A-A



SECTION B-B



SECTION C-C

Design Conditions	
Clear span x Clear height	0.60 m x 0.60 m
Design head	2.10 m
Operating head	0.60 m
Lifting height	0.60 m

0 10 20 30 40 50 cm

S = 1 : 10

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client:

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

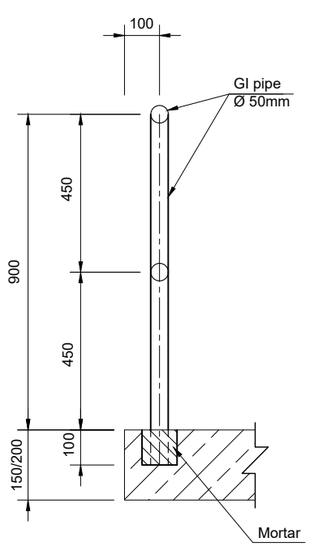
CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:

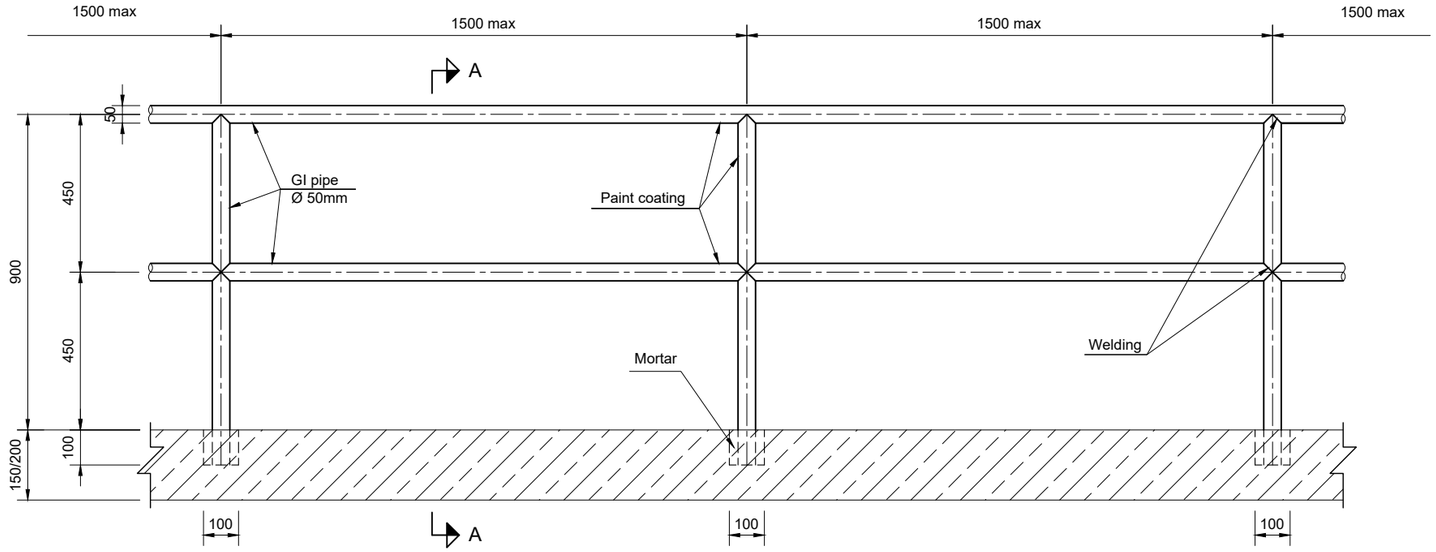
CAS CONSULTANTS LIMITED
Le´Mac Building,1st FL,Off Church Rd,, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title:
INTAKE FRONT VIEW AND SECTION DETAILS

Designed By	: L.K
Drawn By	: E.O
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MAY 2023
Drawing No	: AWSB/MC/ITW/003



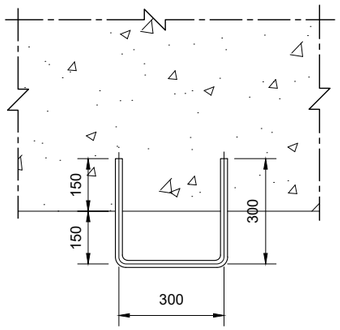
SECTION A-A



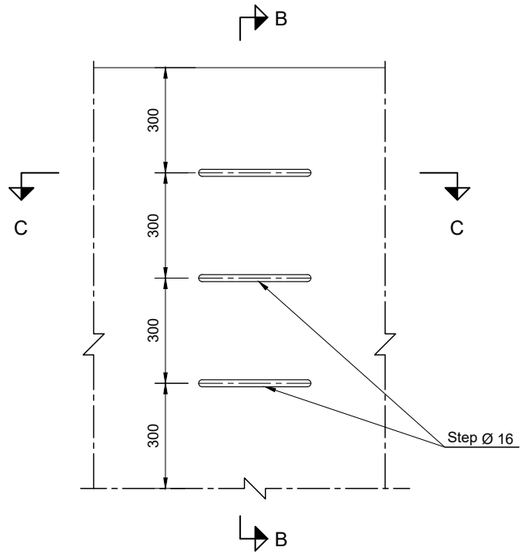
HANDRAIL

S = 1 : 20

SIDE VIEW



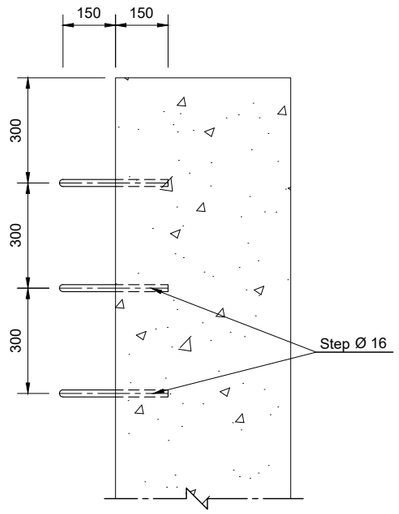
SECTION C-C



FRONT VIEW

STEPS

S = 1 : 20



SECTION B-B

0 20 40 60 80 100 cm

S = 1 : 20

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client:

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

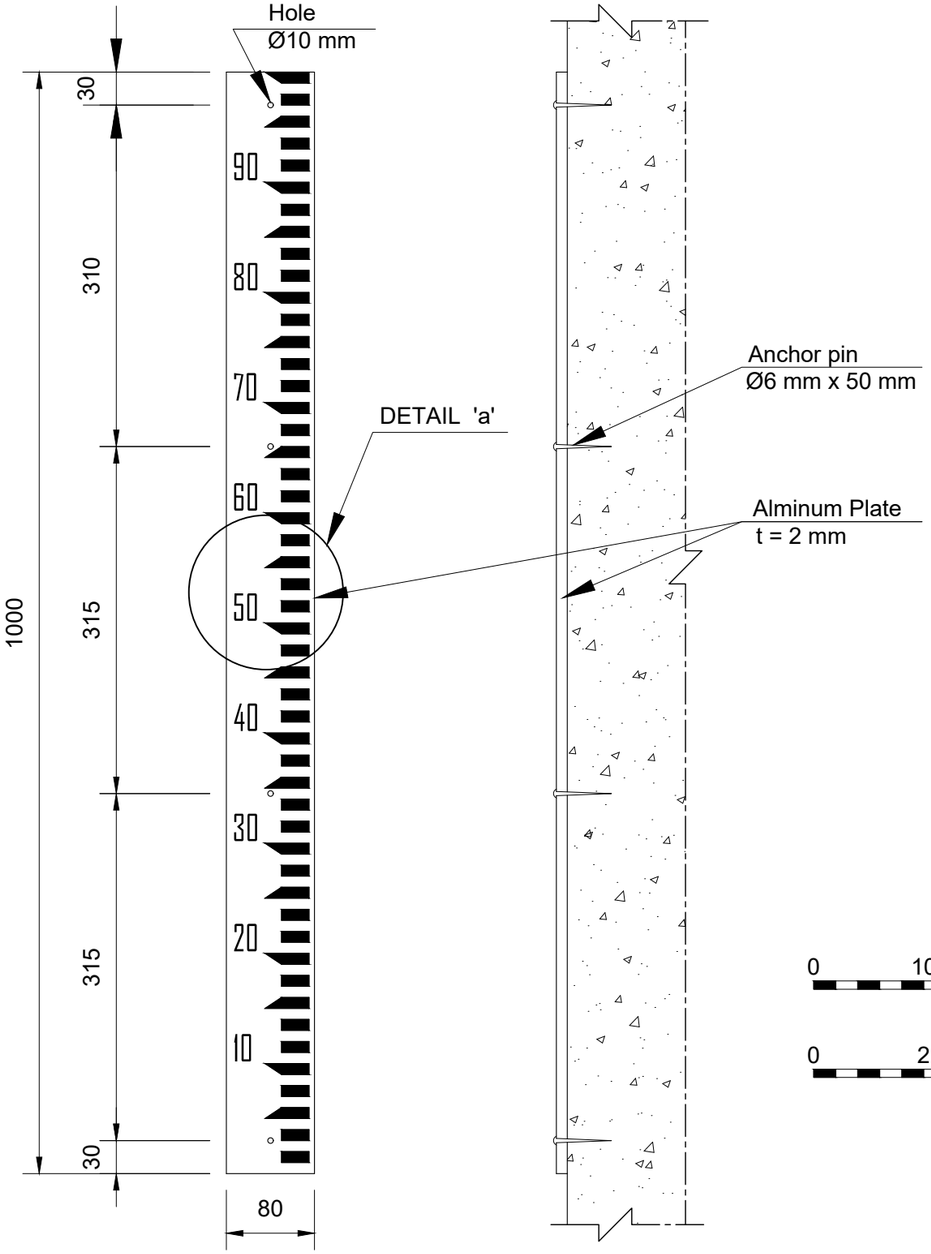
CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:

CAS CONSULTANTS LIMITED
Le´Mac Building,1st Fl,Off Church Rd,, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

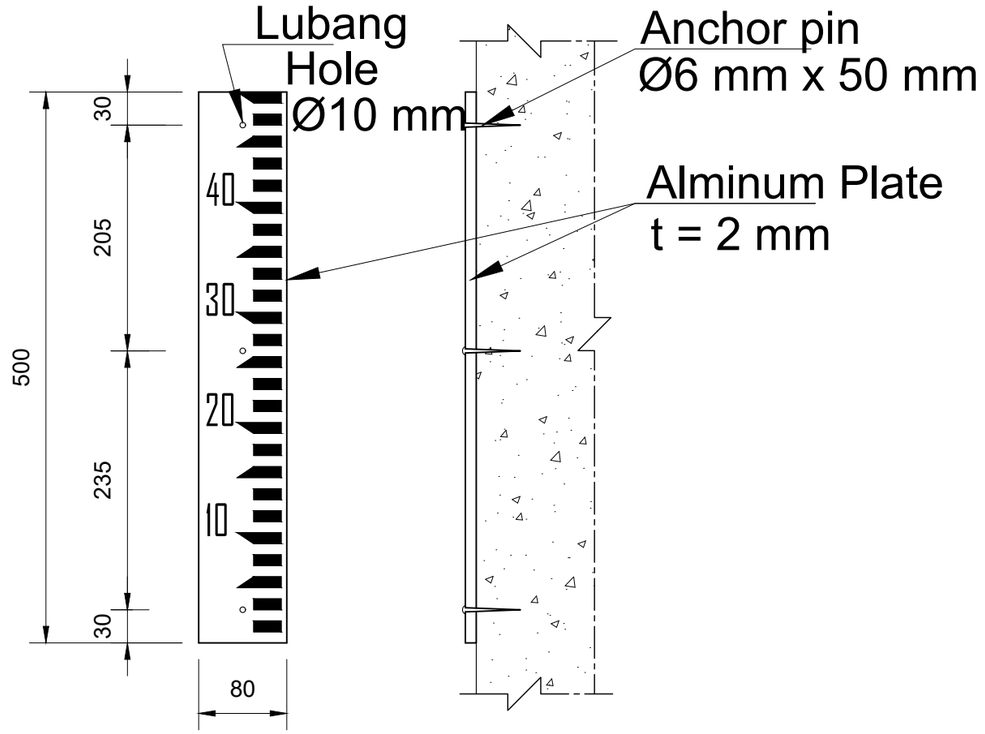
Drawing Title:
INTAKE HANDRAIL AND SECTION DETAILS

Designed By	: L.K
Drawn By	: E.O
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MAY 2023
Drawing No	: AWSB/MC/ITW/004



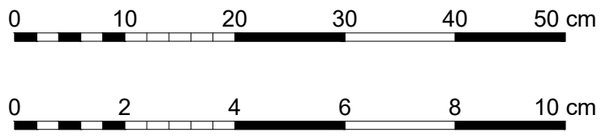
STAFF GAUGE

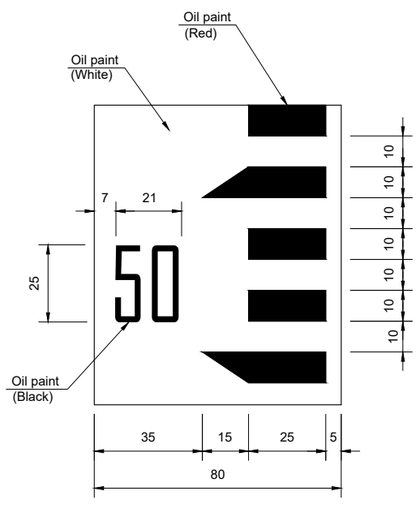
S = 1 : 10



TYPE 'B'

S = 1 : 10





DETAIL 'a'

S = 1 : 2

NOTE :

The zero point of staff gauge should be installed at crested level of sill.

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client:

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

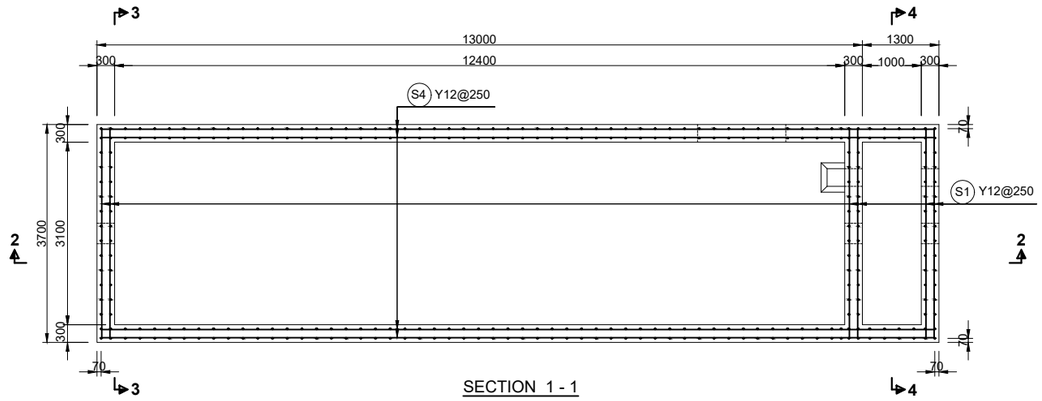
CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:

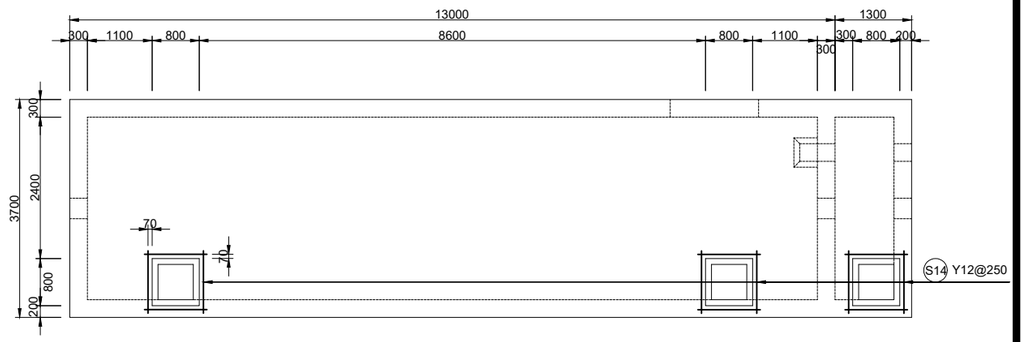
CAS CONSULTANTS LIMITED
Le'Mac Building,1st FL,Off Church Rd,,
Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title:
INTAKE STAFF GAUGE AND SECTION DETAILS

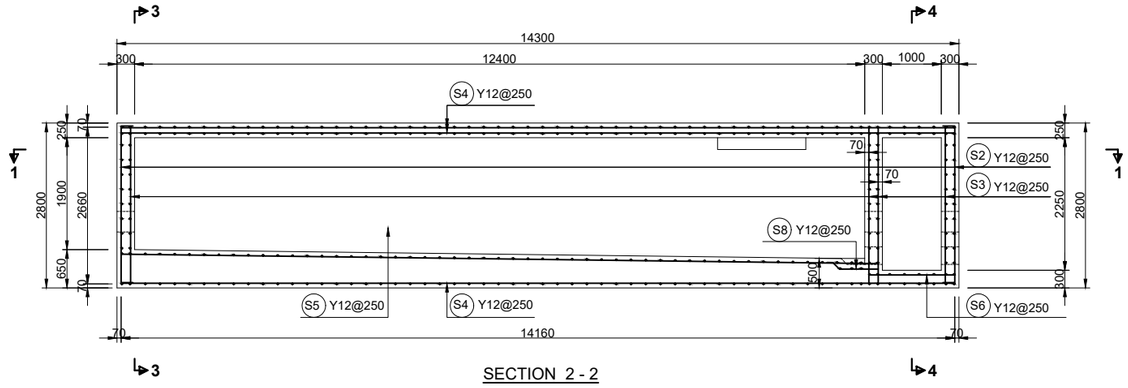
Designed By	: L.K
Drawn By	: E.O
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/ITW/005



SECTION 1 - 1



MANHOLE (UPPER)



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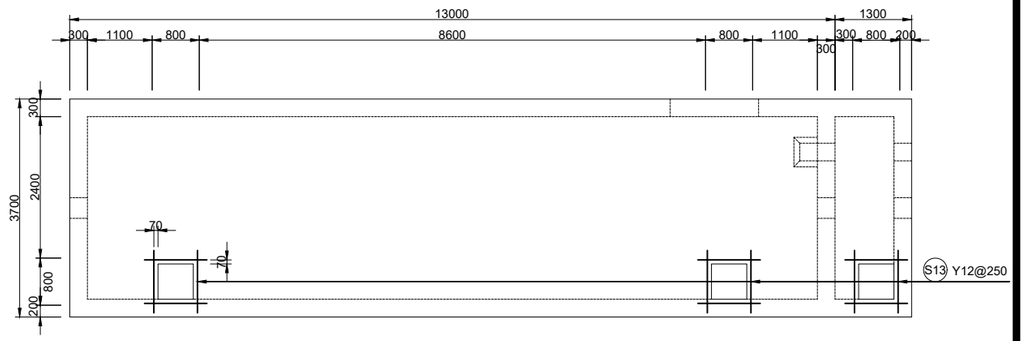
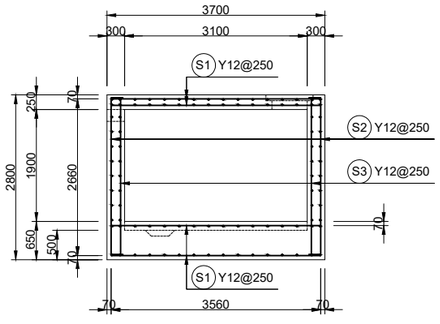
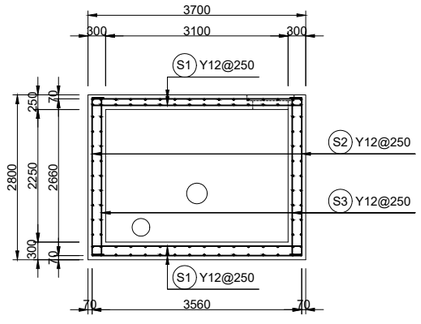


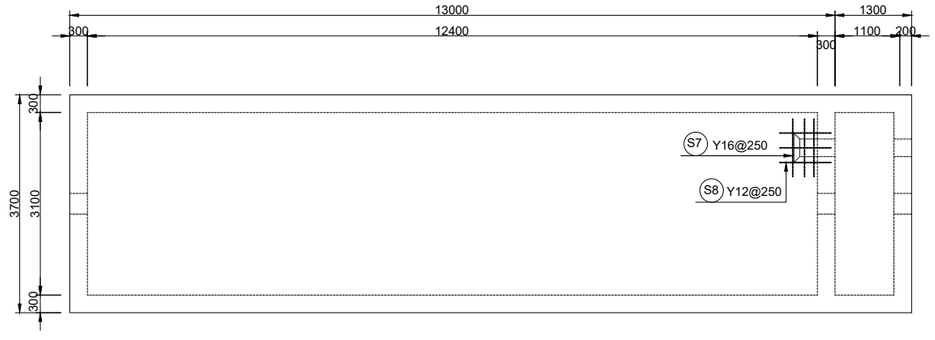
MANHOLE (LOWER)



SECTION 3 - 3



SECTION 4 - 4



DRAIN PIT

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client:

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

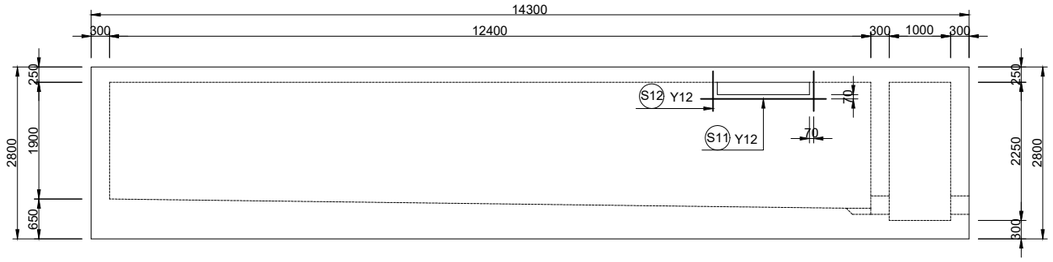
CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:

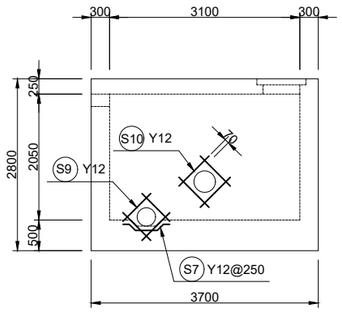
CAS CONSULTANTS LIMITED
Le´Mac Building,1st FL,Off Church Rd,, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title:
PLAIN SEDIMENTATION REINFORCEMENT DETAILS

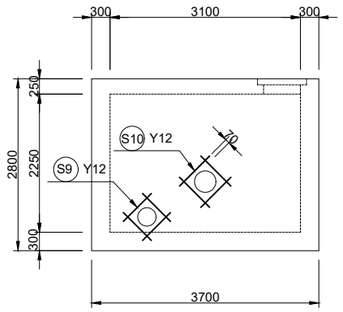
Designed By	: L.K
Drawn By	: E.O
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/ITW/006



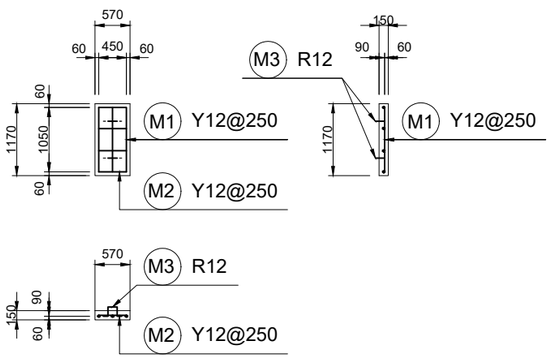
INTAKE ORIFICE AND SPILL-OUT SLIT



PIPE (INLET SIDE)

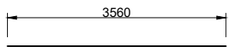


PIPE (OUTLET SIDE)



MANHOLE COVER

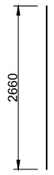
S1 290-Y12 L=3560



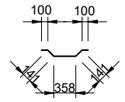
S2 148-Y12 L=3060



S3 164-Y12 L=2660



S7 3-Y12 L=840



S8 3-Y12 L=920



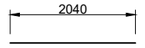
S9 16-Y12 L=640



S10 16-Y12 L=690



S11 2-Y12 L=2040



S12 4-Y12 L=650



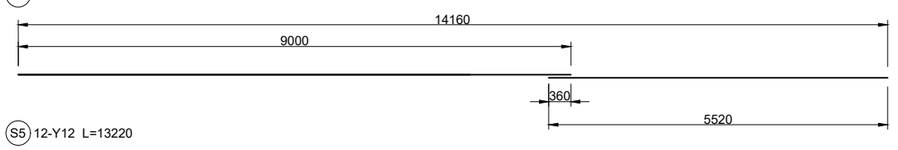
S13 12-Y12 L=1060



S14 12-Y12 L=1060



S4 84-Y12 L=14520



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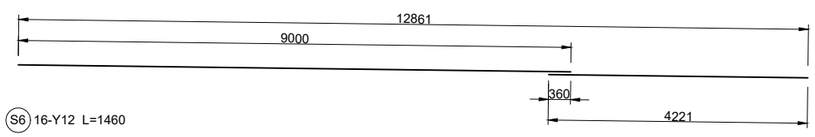
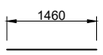


S6 16-Y12 L=1460



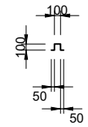
M1 18-Y12 L=700



M2 24-Y12 L=300



M3 12-R12 L=400



BAR BENDING SCHEDULE

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client:
ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:
AFRICAN DEVELOPMENT BANK

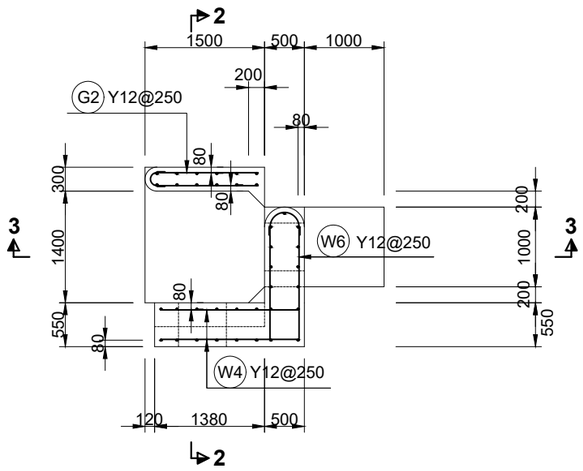
Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

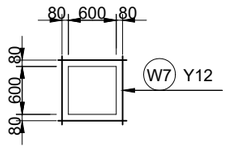
Reviewed By:
CAS CONSULTANTS LIMITED
Le'Mac Building,1st FL,Off Church Rd,, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title:
INTAKE REINFORCEMENT DETAILS 1

Designed By	: L.K
Drawn By	: E.O
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/ITW/007

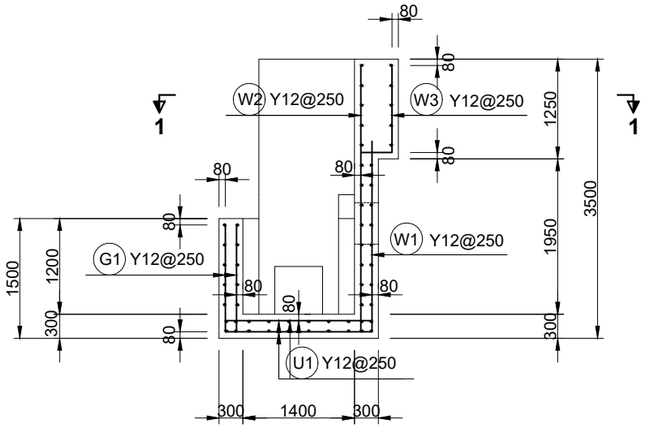


SECTION 1 - 1

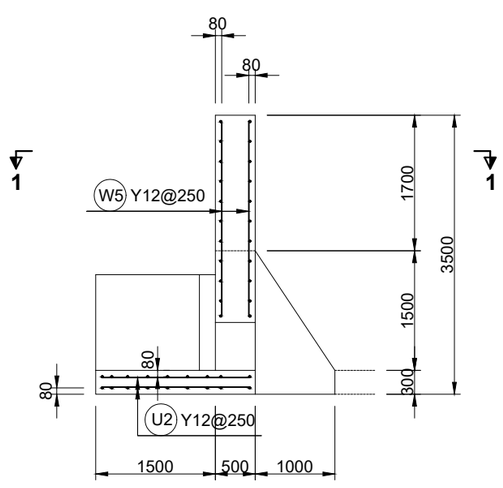


REINFORCEMENT AT OPENING

(SCOURING SLUICE AND INTAKE ORIFICE)



SECTION 2 - 2

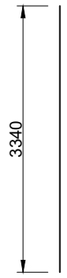


SECTION 3 - 3

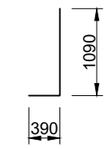
W1 8-Y12 L=2390



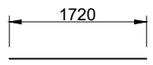
W2 8-Y12 L=3340



W3 8-Y12 L=1480



W4 30-Y12 L=1720



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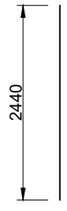
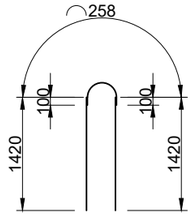


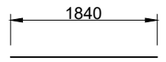
W6 11-Y12 L=3300



W7 16-Y12 L=860



U1 18-Y12 L=1840



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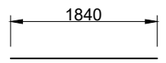

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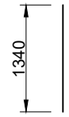
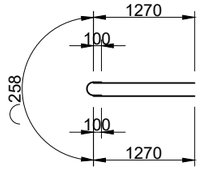


G2 5-Y12 L=3000



BAR BENDING SCHEDULE

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client:

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

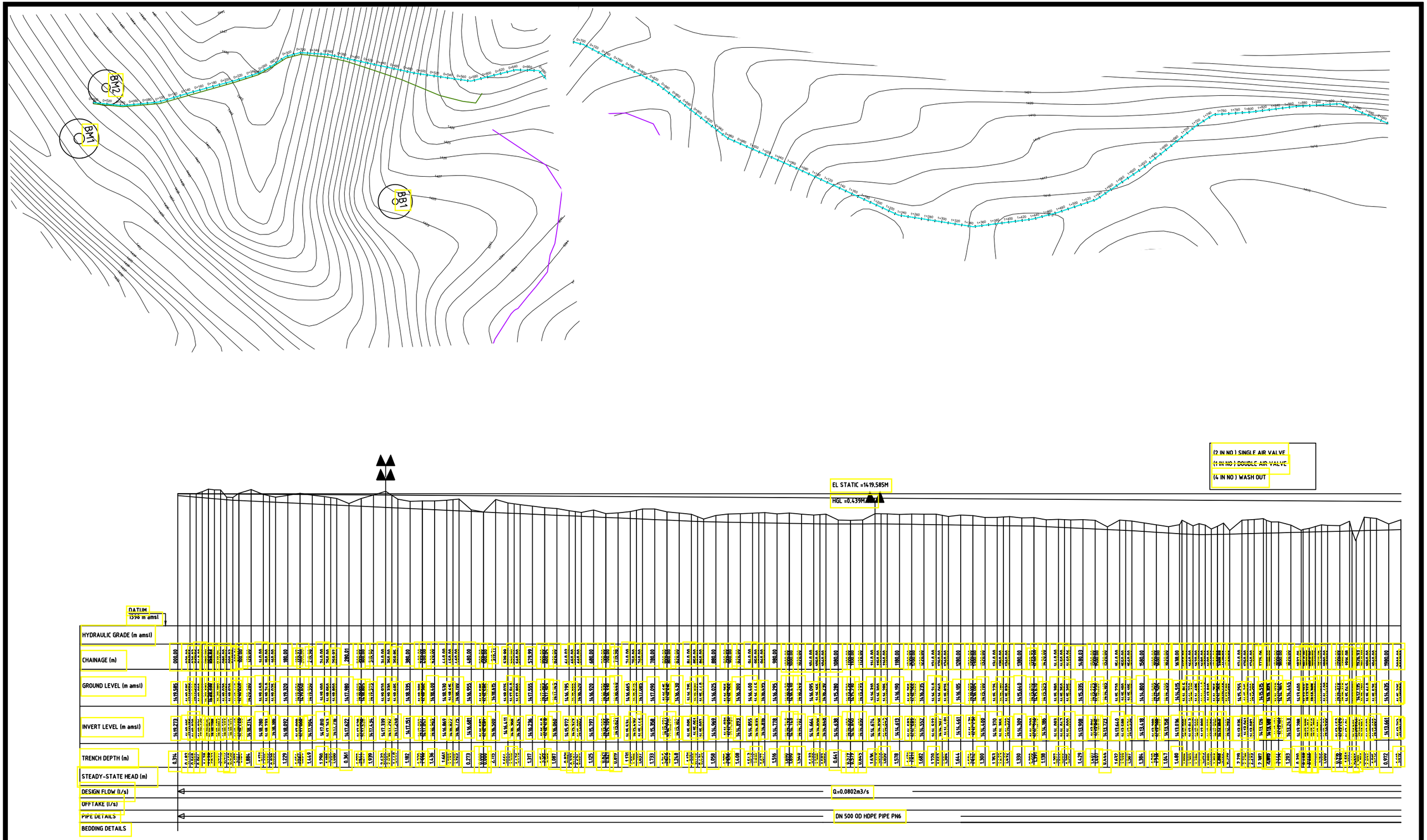
CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:

CAS CONSULTANTS LIMITED
Le'Mac Building,1st FL,Off Church Rd,, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title:
INTAKE REINFORCEMENT DETAILS 2

Designed By	: L.K
Drawn By	: E.O
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/ITW/008



No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.		G.I	S.M.M	Feb 2020
3.				
4.				

Client:

ATHI WATER WORKS

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER SERVICES AGENCY

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:

AFRICAN DEVELOPMENT BANK

Project

CONTSRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:

CAS CONSULTANTS LIMITED
Le' Mac Building, 1st/ Floor,
off Church Road, Westlands.
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

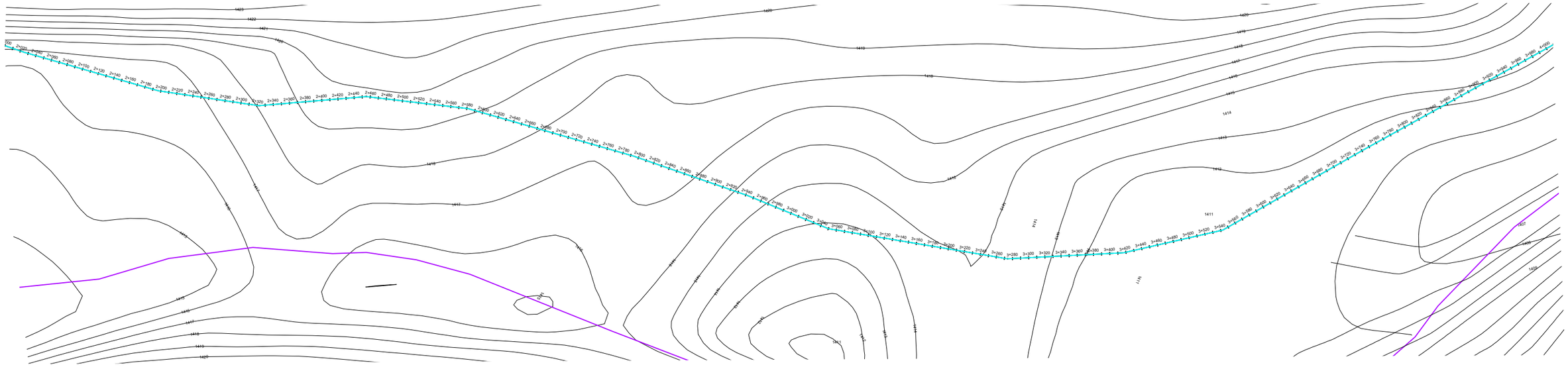
Drawing Title:

NDARUGU RAW WATER

PLAN AND PROFILE

FROM CH 0+ 000 TO CH 2 +000

Designed By	:	L.K
Drawn By	:	E.W.K
Checked By	:	G.I
Approved By	:	S.M.M
Client approval	:	
Date	:	MARCH 2023
Drawing No	:	AWSB/MC/ND/001



(2 IN NO.) SINGLE AIR VALVE
(1 IN NO.) DOUBLE AIR VALVE
(3 IN NO.) WASH OUT

EL STATIC =1419.585M
HGL =0.439M/KM

DATUM
1396 m amsl

HYDRAULIC GRADE (m amsl)
CHAINAGE (m)
GROUND LEVEL (m amsl)
INVERT LEVEL (m amsl)
TRENCH DEPTH (m)
STEADY-STATE HEAD (m)
DESIGN FLOW (l/s)
OFFTAKE (l/s)
PIPE DETAILS
BEDDING DETAILS

Q=0.0802m3/s

DN 500 OD HDPE PIPE PN6

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.		G.I	S.M.M	Feb 2020
3.				
4.				

Client:

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:

AFRICAN DEVELOPMENT BANK

Project

CONTSRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:

CAS CONSULTANTS LIMITED
Le' Mac Building, 1st/ Floor,
off Church Road, Westlands.
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

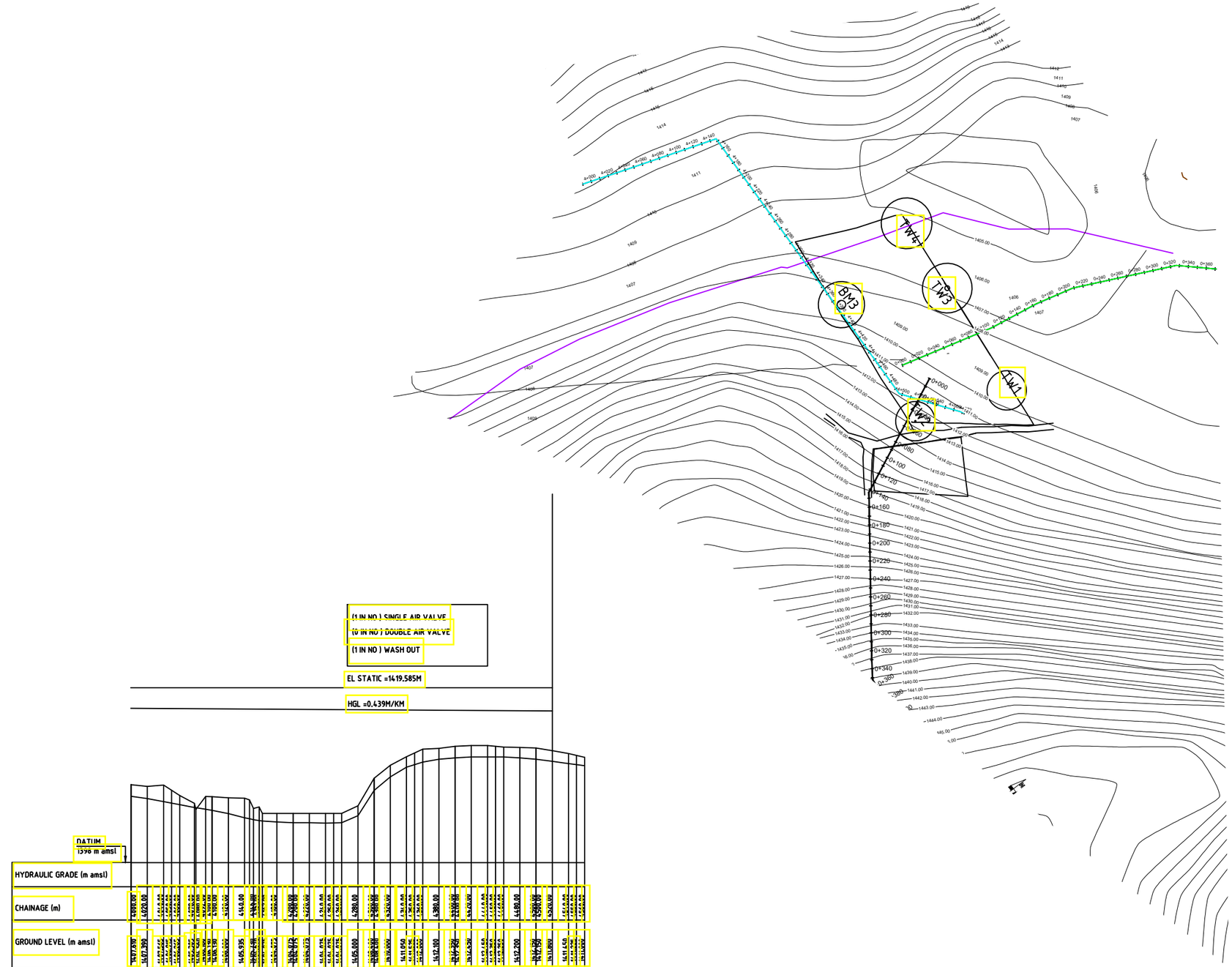
Drawing Title:

NDARUGU RAW WATER

PLAN AND PROFILE

FROM CH 2+ 000 TO CH 4 +000

Designed By	: L.K
Drawn By	: E.W.K
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/ND/002



No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.		G.I	S.M.M	Feb 2020
3.				
4.				

Client:

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:

AFRICAN DEVELOPMENT BANK

Project

CONTSRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:

CAS CONSULTANTS LIMITED
Le' Mac Building, 1st/ Floor,
off Church Road, Westlands.
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

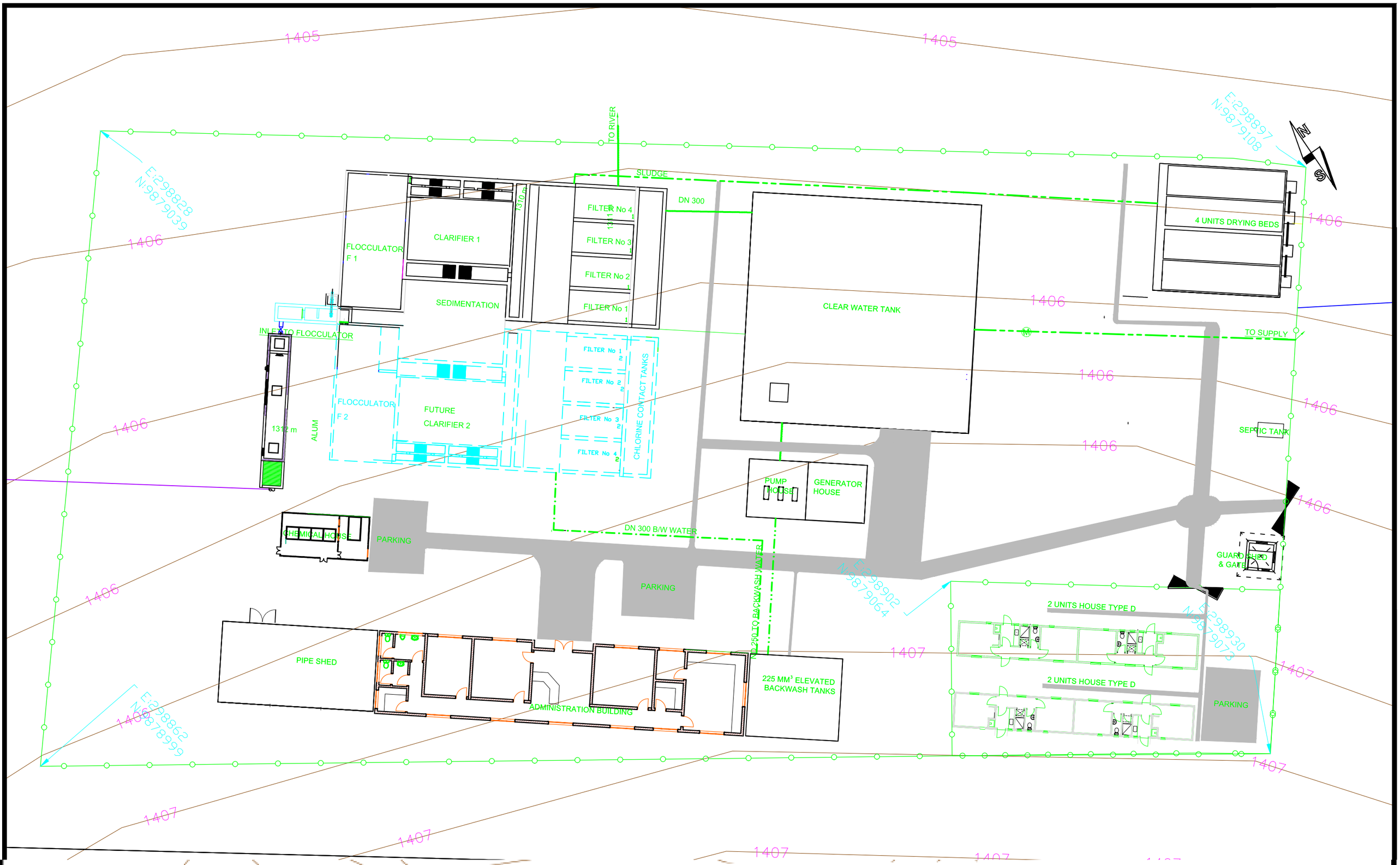
Drawing Title:

NDARUGO RAW WATER

PLAN AND PROFILE

FROM CH 4+ 000 TO CH 4 +580

Designed By	:	L.K
Drawn By	:	E.W.K
Checked By	:	G.I
Approved By	:	S.M.M
Client approval	:	
Date	:	MARCH 2023
Drawing No	:	AWSB/MC/ND/003



No.	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	May, 2018.
2.				
3.				
4.				

Client:
ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD

Financed By:
AFRICAN DEVELOPMENT BANK

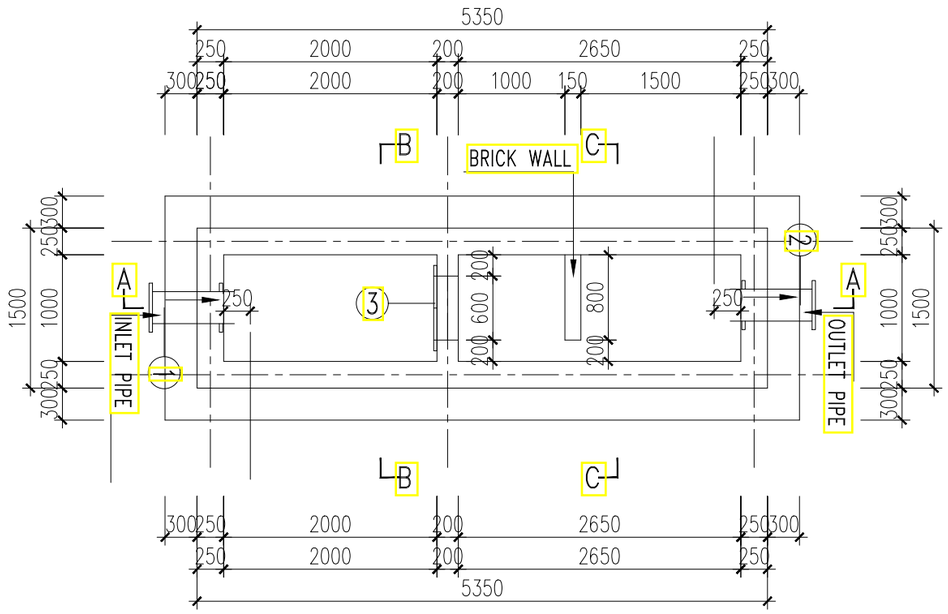
Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No:
AWWDA/AFDB/KTSWSSP/W/09/ 2023

Reviewed By:
CAS CONSULTANTS LIMITED
Le' Mac Building, 1st Fl, Off Church Rd,
Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

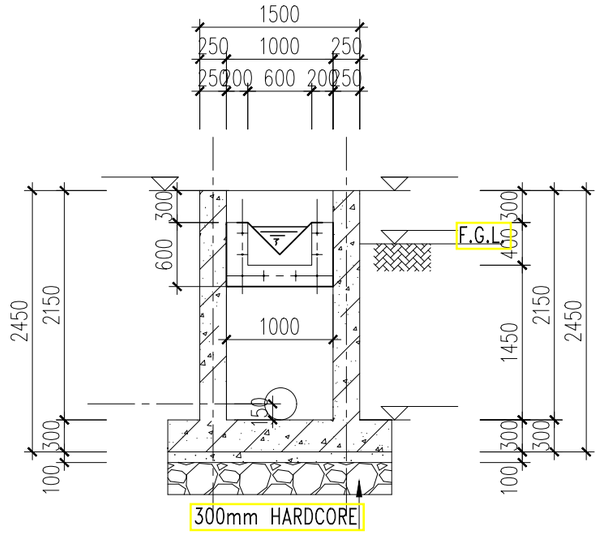
TREATMENT WORKS Layout

Designed By	: L.K
Drawn By	: A.O.O
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/TWL/001



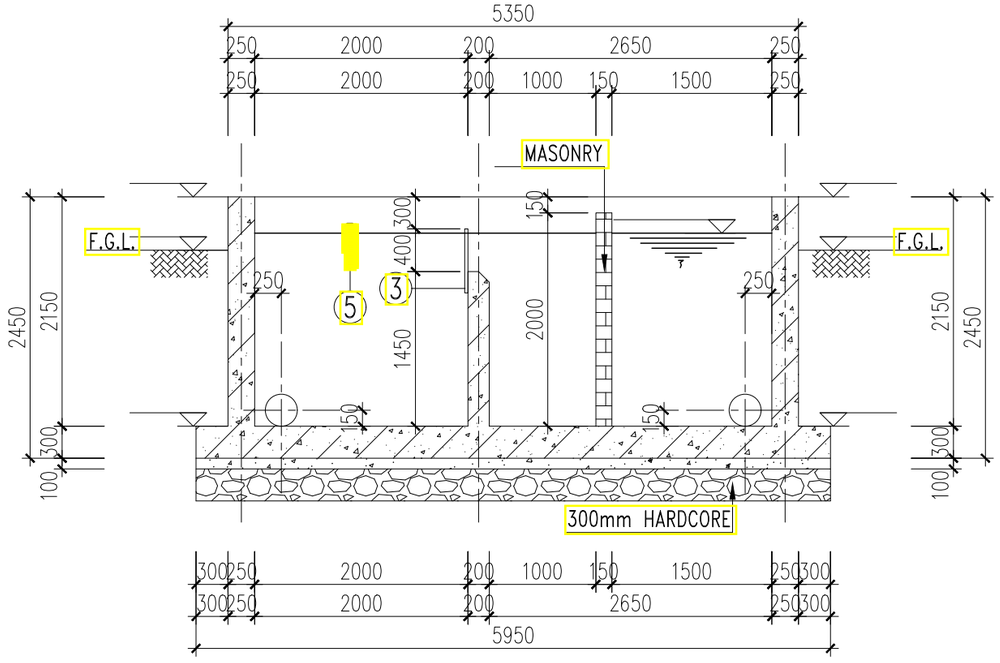
PLAN

Scale: 1:50



SECTION B–B

Scale: 1:50



SECTION A–A

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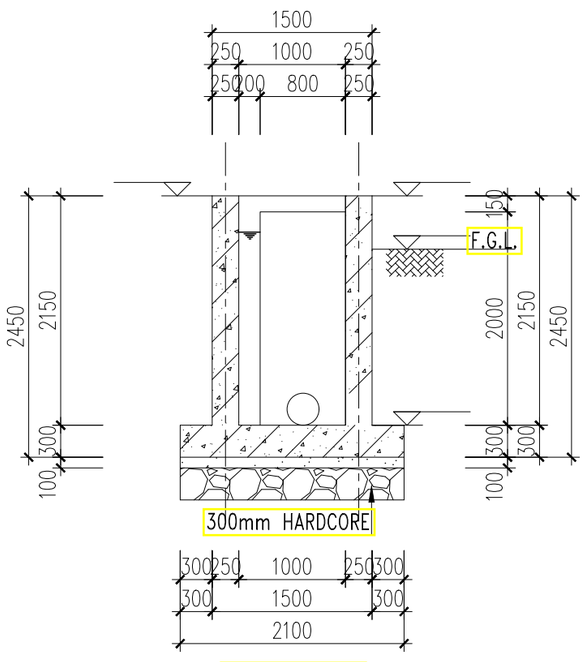


SECTION C–C

Scale: 1:50

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client:

ATHI WATER WORKS

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AFDB/KTSWSSP/W/08/ 2023

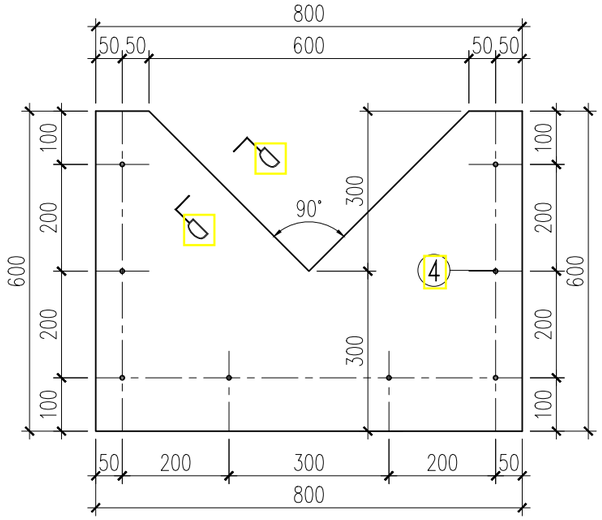
Reviewed By:

CAS CONSULTANTS LIMITED
Le' Mac Building, 1st Fl, Off Church Rd, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title:

MIXING CHAMBER PLAN AND SECTIONS

Designed By	:	L.K
Drawn By	:	P.N
Checked By	:	G.I
Approved By	:	S.M.M
Client approval	:	
Date	:	MARCH 2023
Drawing No	:	AWSB/MC/MC/001

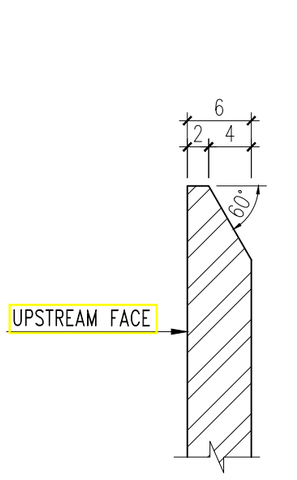


DETAILS OF V-NOTCH TYPE MEASURING WEIR PLATE

Scale: 1:10

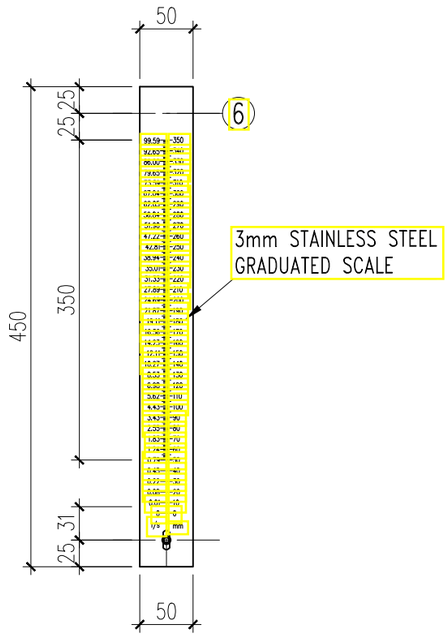
PIPEWORKS SCHEDULE

CODE	Q'TY	DIA. (mm)	DESCRIPTION	SIZE/SKETCH
1	1	300	Single Flanged Pipe with Puddle Flange	675 / 800
2	1	300	Single Flanged Pipe with Puddle Flange	675 / 800
3	1		G.S. V-NOTCH TYPE MEASURING WEIR PLATE	800x600x6mm
4	8	8	S.S. RAG BOLTS	M8x80mm
5	1		S.S. MEASURING SCALE	400x50x3mm
6	2	6	S.S. RAG BOLTS	M6x80mm



SECTION D-D

Scale: 5:1



MEASURING SCALE

Scale: 1:5

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client:
ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:
AFRICAN DEVELOPMENT BANK

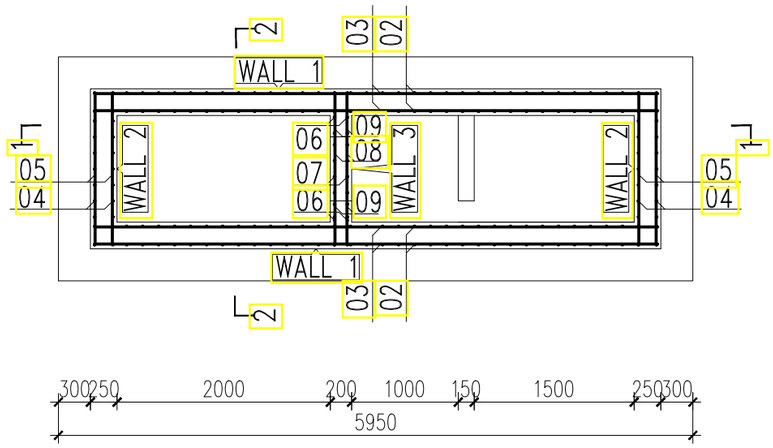
Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AFDB/KTSWSSP/W/08/ 2023

Reviewed By:
CAS CONSULTANTS LIMITED
Le' Mac Building, 1st Fl, Off Church Rd, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

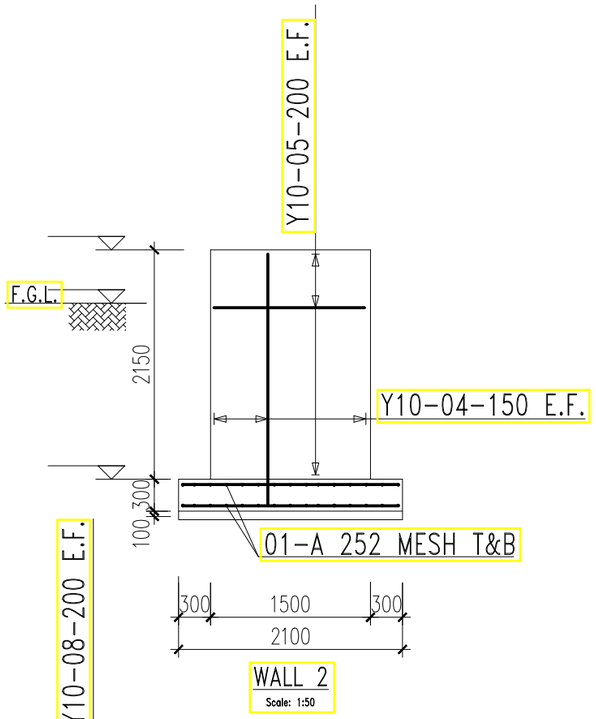
Drawing Title:
MIXING CHAMBER SECTION DETAILS

Designed By	: L.K
Drawn By	: P.N
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/MC/002



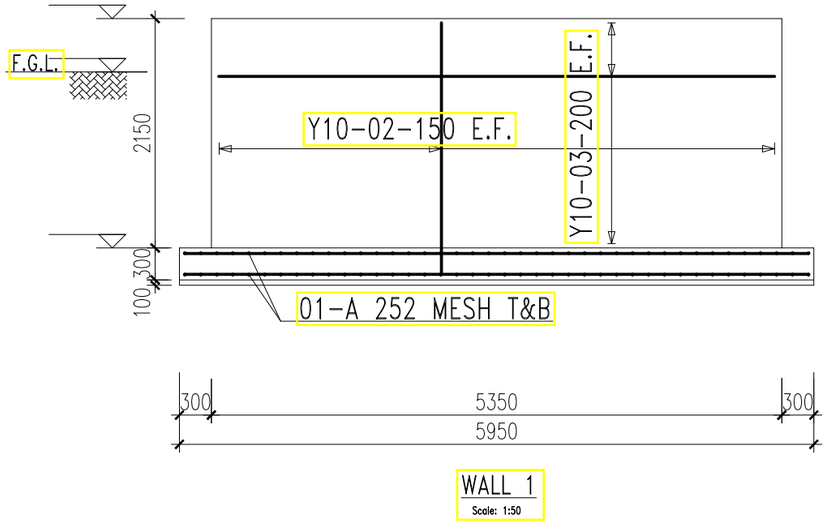
R.C. DETAIL OF WALLS

Scale: 1:50



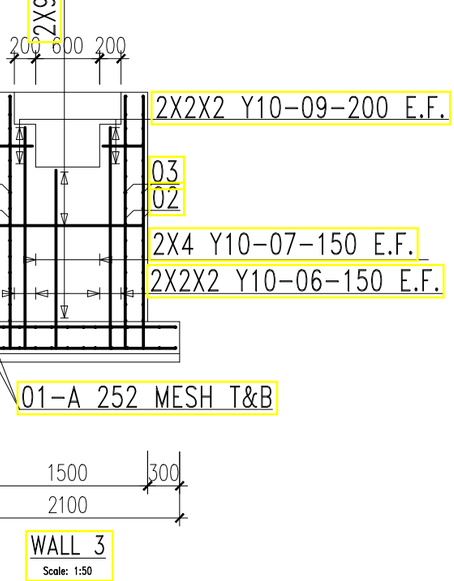
WALL 2

Scale: 1:50



WALL 1

Scale: 1:50



WALL 3

Scale: 1:50

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client:

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AFDB/KTSWSSP/W/08/ 2023

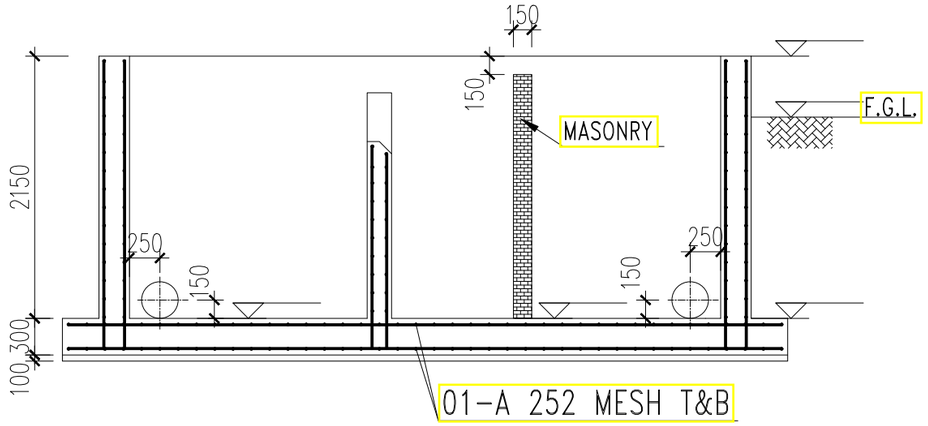
Reviewed By:

CAS CONSULTANTS LIMITED
Le' Mac Building, 1st Fl, Off Church Rd, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title:

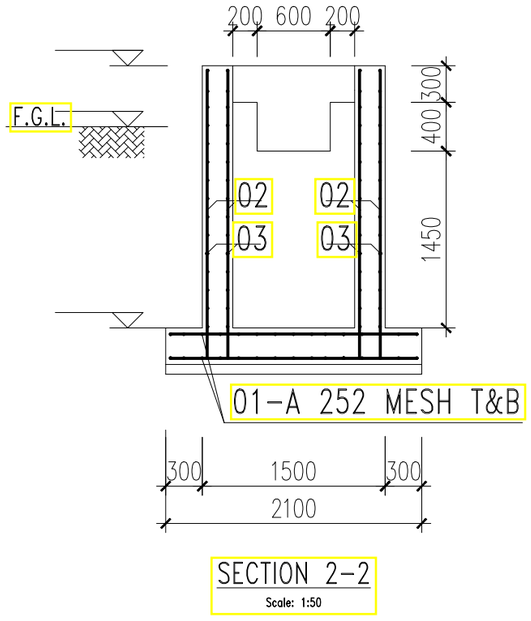
MIXING CHAMBER R.C DETAILS OF SLAB AND WALLS

Designed By	:	L.K
Drawn By	:	P.N
Checked By	:	G.I
Approved By	:	S.M.M
Client approval	:	
Date	:	MARCH 2023
Drawing No	:	AWSB/MC/MC/003



SECTION 1-1

Scale: 1:50



SECTION 2-2

Scale: 1:50

BAR BENDING SCHEDULE

CODE	SHAPE	DIA.	EACH LENGTH (mm)	NO.	TOTAL LENGTH (m)	WEIGHT (kg)
1	MESH A252	TOTAL OF NET AREA=25.74m² ALLOW FOR 10% OVERLOP=28.32m²				
2	2360, 170	10	2530	148	374.44	231.03
3	170, 5270, 170	10	5610	48	269.28	166.15
4	2360, 170	10	2530	44	111.32	68.68
5	170, 1420, 170	10	1760	48	84.48	52.12
6	2060, 120	10	2180	8	17.44	10.76
7	1660, 120	10	1780	8	14.24	8.79
8	120, 1420, 120	10	1660	18	29.88	18.44
9	120, 370, 120	10	610	8	4.88	3.01

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client:
ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:
AFRICAN DEVELOPMENT BANK

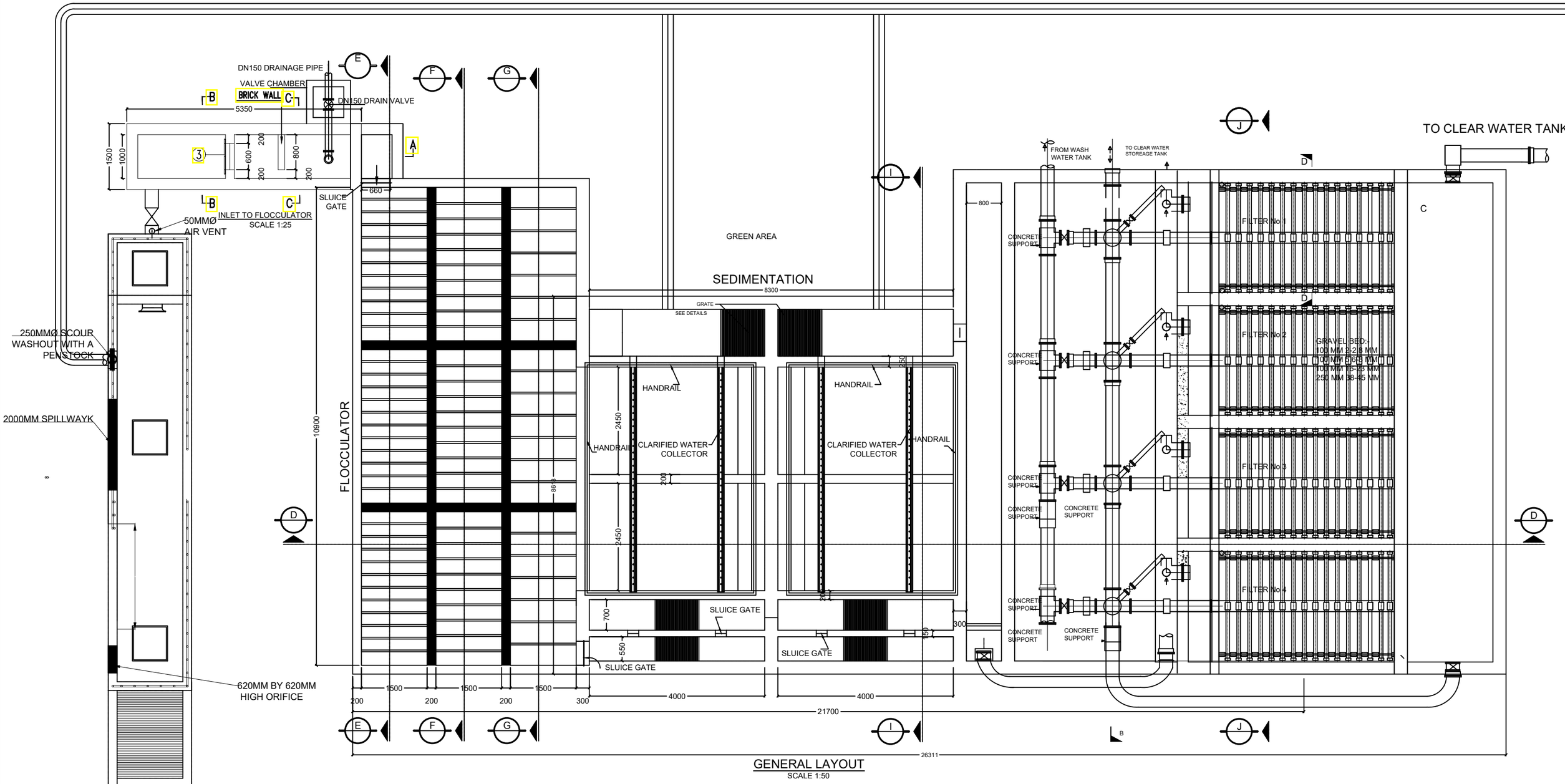
Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AFDB/KTSWSSP/W/08/ 2023

Reviewed By:
CAS CONSULTANTS LIMITED
Le' Mac Building, 1st Fl, Off Church Rd, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title:
MIXING CHAMBER SECTIONS AND BAR BENDING SCHEDULE

Designed By	: L.K
Drawn By	: P.N
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/MC/004



GENERAL LAYOUT
SCALE 1:50

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client:

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD

Financed By:

AFRICAN DEVELOPMENT BANK

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CONSTRUCTION OF MWALA CLUSTER WATER SUPLLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:

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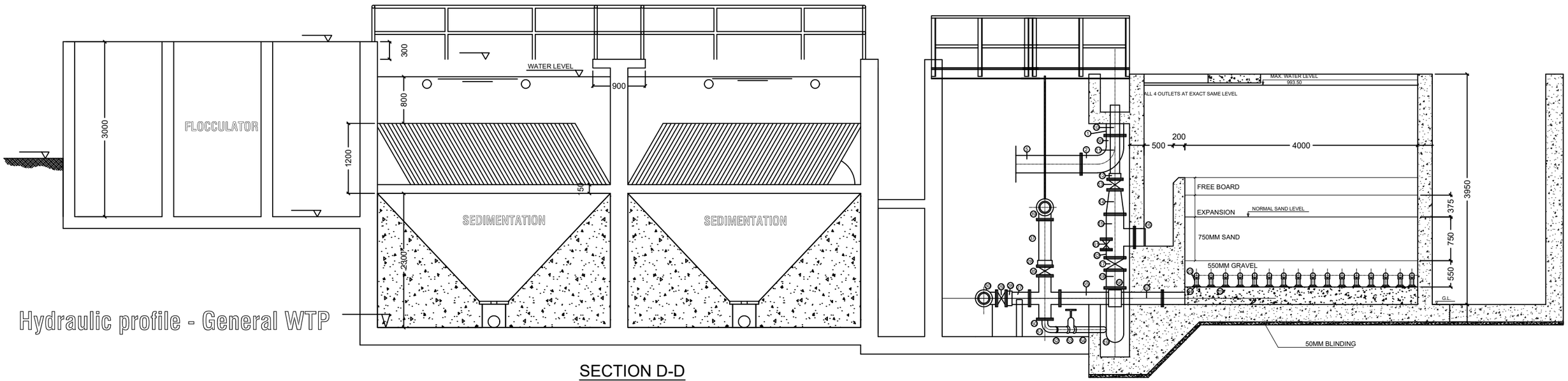
Le´Mac Building,1st FL,Off Church Rd,, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title:

TREATMENT WORKS GENERAL LAYOUT PLAN

Designed By	:	L.K
Drawn By	:	E.O
Checked By	:	G.I
Approved By	:	S.M.M
Client approval	:	
Date	:	MARCH 2023

NOTE: ALL LEVELS TO BE CONFIRMED ON SITE



Hydraulic profile - General WTP

SECTION D-D

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client:

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD

Financed By:

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPLLY PROJECT

CONTRACT No;
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Reviewed By:

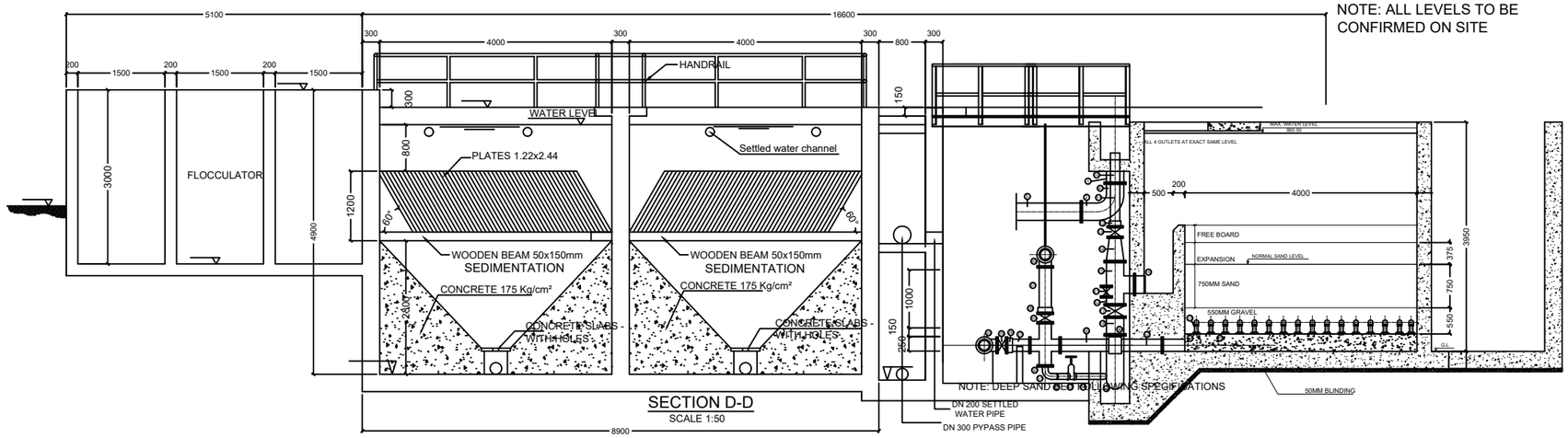
CAS CONSULTANTS LIMITED
Le´Mac Building,1st FL,Off Church Rd,, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title:

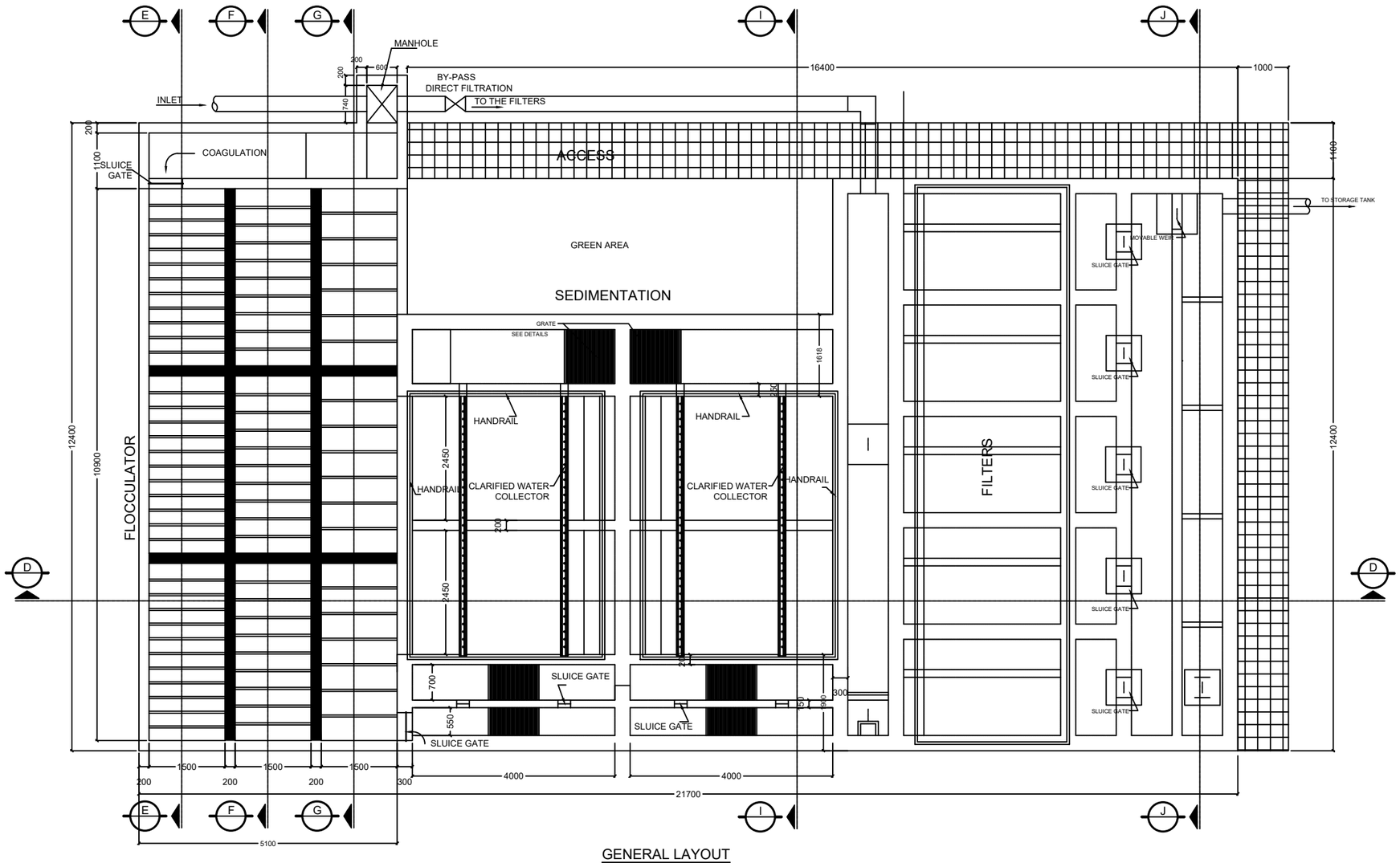
TRETMENT WORKS SECTION D-D

Designed By	: L.K
Drawn By	: E.O
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/TW/002

NOTE: ALL LEVELS TO BE CONFIRMED ON SITE



SECTION D-D
SCALE 1:50



GENERAL LAYOUT
SCALE 1:50

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client:
ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

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Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPLLY PROJECT

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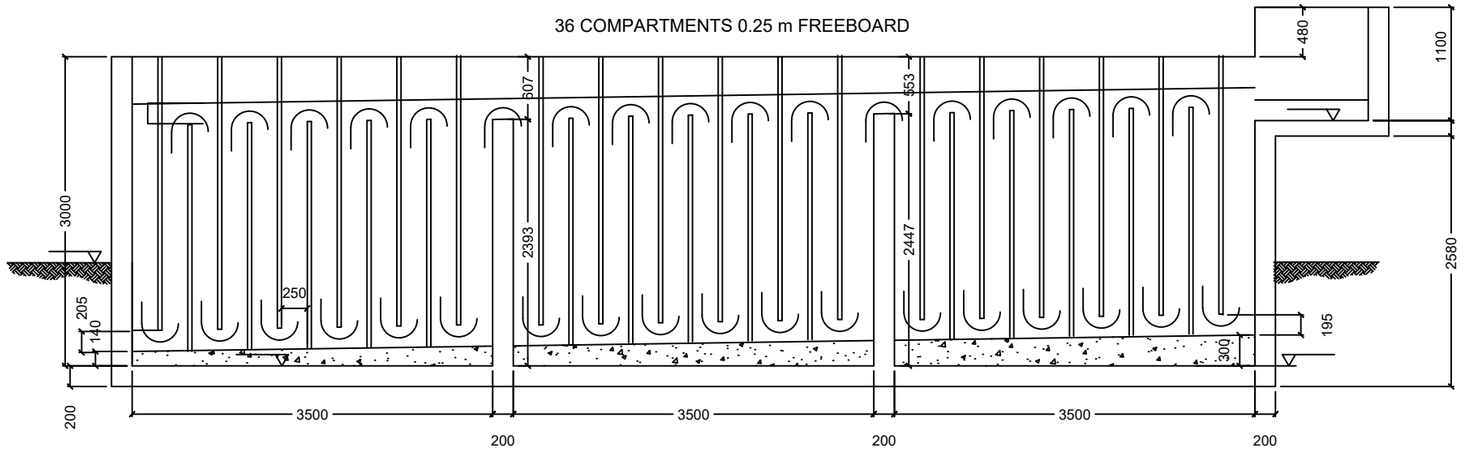
Le´Mac Building,1st FL,Off Church Rd,, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title:
PLAN AND SECTION D-D

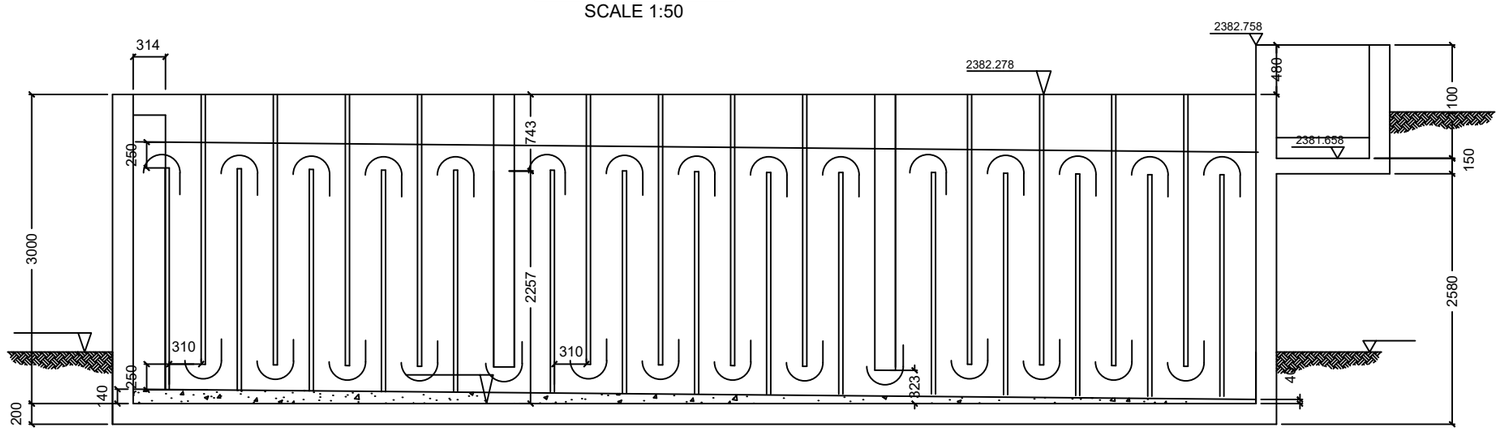
Designed By	: L.K
Drawn By	: E.O
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/TW/003

36 COMPARTMENTS 0.25 m FREEBOARD



SECTION E - E

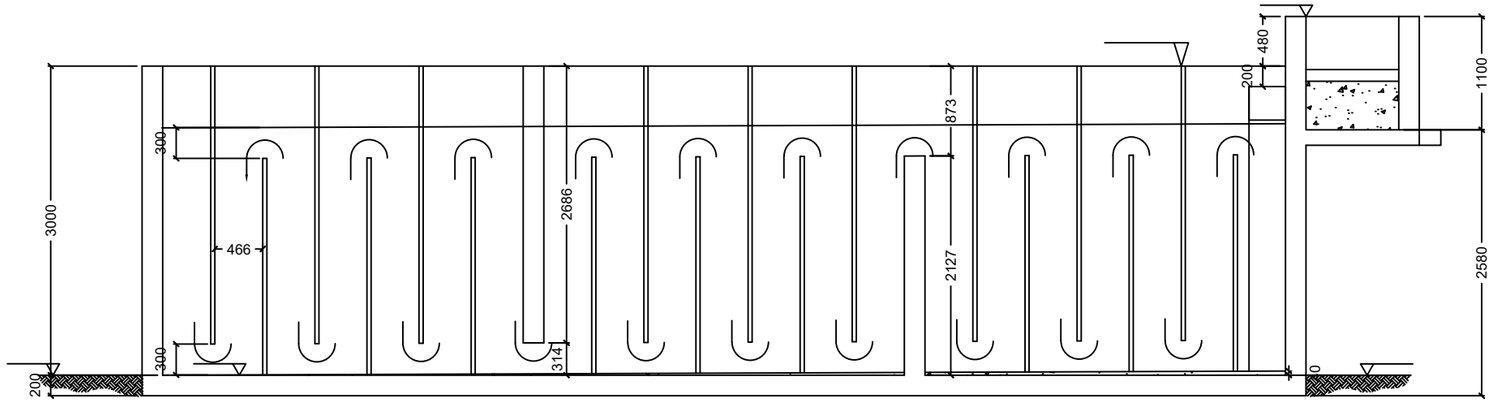
SCALE 1:50



30 COMPARTMENTS 0.31 m FREEBOARD

SECTION F-F

SCALE 1:50



21 COMPARTMENTS 0.46m FREEBOARD

SECTION G-G

SCALE 1:50

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client:

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPLLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

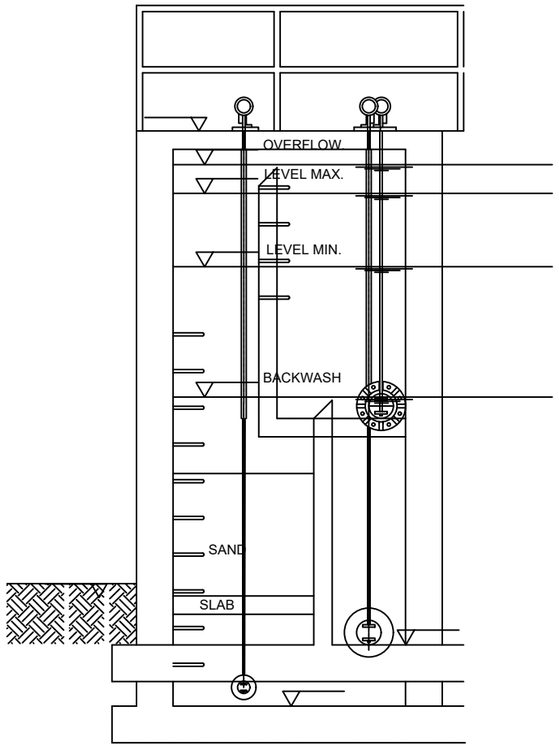
Reviewed By:

CAS CONSULTANTS LIMITED
Le'Mac Building,1st FL,Off Church Rd,, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

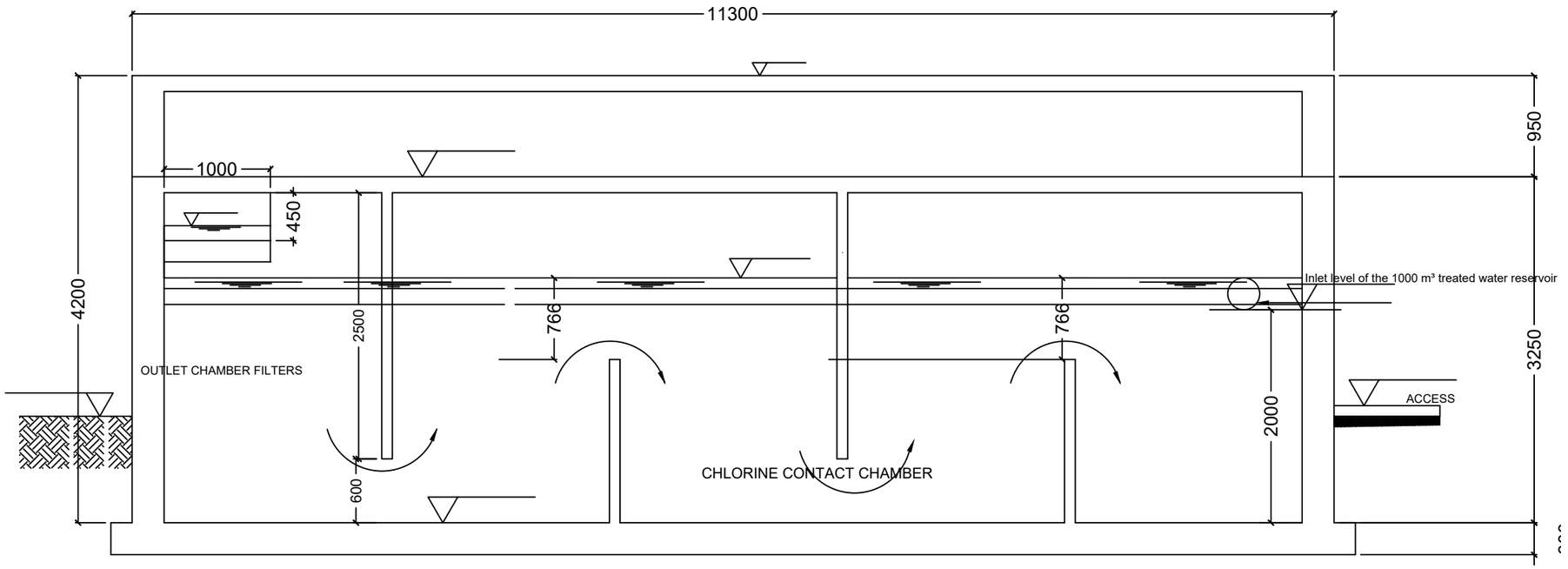
Drawing Title:

FLOCCULATION SECTION DETAILS

Designed By	: L.K
Drawn By	: E.O
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/TW/004

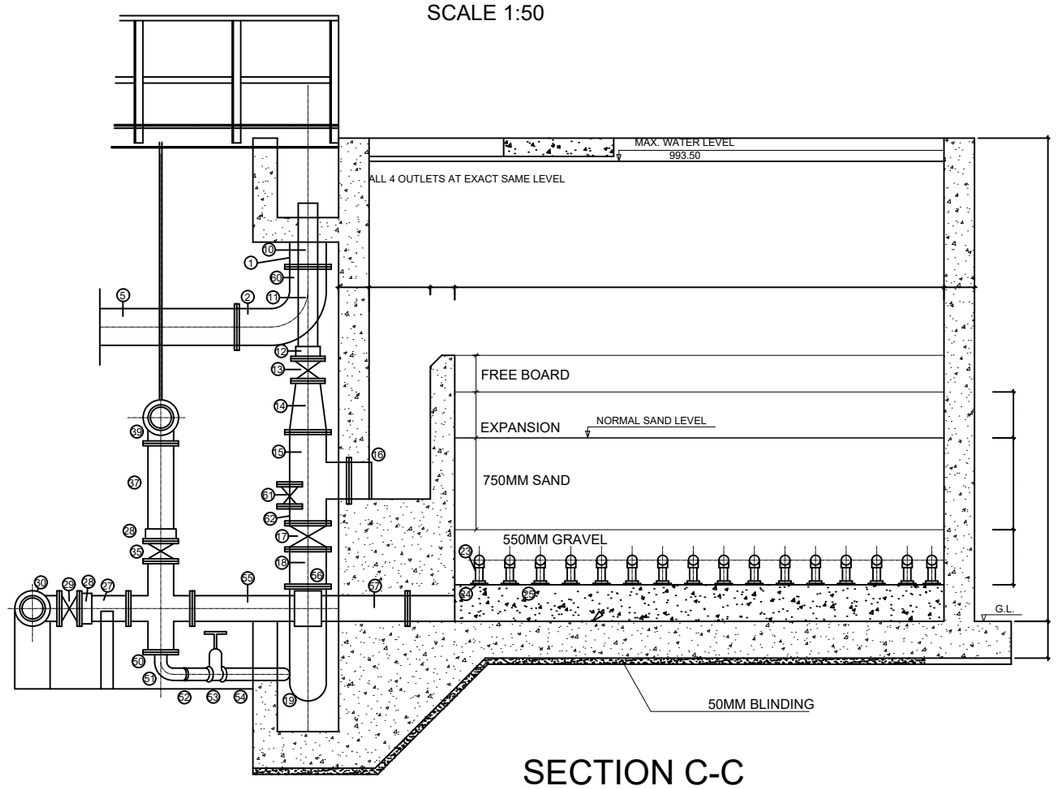


Hydraulic profile - Filters



SECTION J-J

SCALE 1:50



SECTION C-C

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client:

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPLLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:

CAS CONSULTANTS LIMITED
Le´Mac Building,1st FL,Off Church Rd,, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

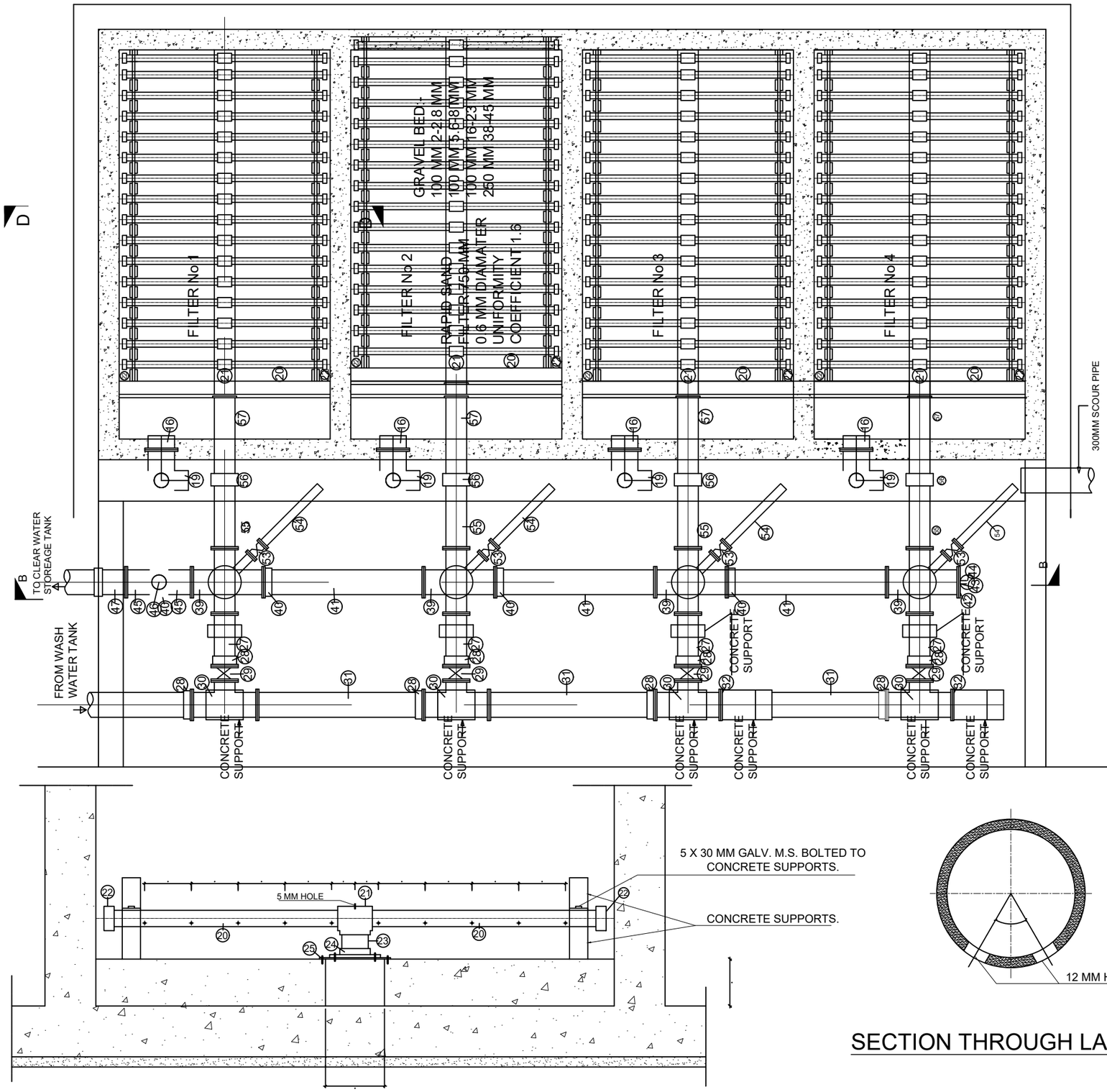
Drawing Title:

FILTERS SECTION DETAILS

Designed By	: L.K
Drawn By	: E.O
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/TW/005

PIPE WORK SCHEDULE

ITEM No.	No. OF	DIAM. MM	MATER	DESCRIPTION	LENGTH MM
01	2	250	G.S.	FLANGE/SPIGOT PIPE WITH PUDDLE FLANGE 300 100	400
02	2	250	G.S.	FLANGED BEND 90'	
03	1	250		BUTTER FLY VALVE, LEVEL OPERATED	
04	1	250		V.J. FLANGE ADAPTOR	
05	1	250	G.S.	FLANGE / SPIGOT PIPE	CUT TO FIT
10	4	150	G.S.	FLANGE/SPIGOT PIPE WITH PUDDLE FLANGE	CUT TO FIT
11	4	150	G.S.	FLANGE / SPIGOT PIPE	
12	4	150		V.J. FLANGE ADAPTOR	
13	4	150		BUTTER FLY VALVE, LEVEL OPERATED	
14	4	150/250	G.S.	FLANGED TAPER.	
15	4	250	G.S.	EQUAL TEE.	
16	4	250	G.S.	FLANGE / SPIGOT PIPE	200
17	4	250		BUTTER FLY VALVE, LEVEL OPERATED	
18	4	250	G.S.	FLANGE / FLANGE PIPE	300
19	4	250	G.S.	FLANGE / SPIGOT BEND 45'	
20	72	65	G.S.	SPIGOT / SPIGOT PIPE MALE THREADED	1180
21	36	65	G.S.	EQUAL TEE FEMALE THREADED	
22	72	65	G.S.	CAPS. FEMALE THREADED	150
23	36	65	G.S.	SPIGOT / SPIGOT PIPE MALE THREADED	
24	36	65	G.S.	FLANGE, FLANGE TREADED	
25	4		M.S.	GALVANIZED M.S. PLATE 6X2400X450	
26	4	250X200	G.S.	FLANGED REDUCING TEE	CUT TO FIT
27	4	250	G.S.	FLANGE / SPIGOT PIPE	
28	4	300		V.J. FLANGE ADAPTOR	
29	4	250		SLUICE VALVE	
30	4	300/250	G.S.	FLANGED REDUCING TEE	CUT TO FIT
31	3	300	G.S.	FLANGE / SPIGOT PIPE	
32	1	300	G.S.	BLIND FLANGE	
35	4	200		SLUICE VALVE	
36	4	250		V.J. FLANGE ADAPTOR	
37	4	200	G.S.	FLANGE / SPIGOT PIPE	CUT TO FIT
39	4	200/250	G.S.	FLANGED TEE	
40	4	250		V.J. FLANGE ADAPTOR	
41	3	250	G.S.	FLANGE / SPIGOT PIPE	CUT TO FIT
42	1	250	G.S.	BLIND FLANGE	
43	1	250	G.S.	ELBOW MALE AND FEMALE THREADED	
44	1	25	G.S.	SPIGOT / SPIGOT PIPE, ONE END MALE THREADED	1900
45	2	250	G.S.	FLANGED/ FLANGED BEND 90'	
46	1	250	G.S.	FLANGE / SPIGOT PIPE	CUT TO FIT
47	1	250		STANDARD P.V.C. G.S. ADAPTOR. TYPE A2	600
50	4	200	G.S.	BLIND FLANGE	
51	4	80	G.S.	ELBOW MALE AND FEMALE THREADED	
52	4	80	G.S.	FLANGE / SPIGOT MALE THREADED	CUT TO FIT
53	4	80		SLUICE VALVE	
54	4	80	G.S.	FLANGE / SPIGOT PIPE	CUT TO FIT
55	4	250	G.S.	FLANGE / SPIGOT PIPE	750
56	4	250		V.J. COUPLING	
57	4	250	G.S.	SPIGOT / SPIGOT PIPE WITH PUDDLE FLANGE 1000 200	1200
60	1	80	G.S.	FLANGE/SPIGOT PIPE WITH PUDDLE FLANGE 2100 100	2200
61	1	80		SLUICE VALVE	
62	1	80	G.S.	FLANGE / SPIGOT PIPE	CUT TO FIT



SECTION D-D

SECTION THROUGH LATERAL

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client:
ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:
AFRICAN DEVELOPMENT BANK

Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPLLY PROJECT
CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:
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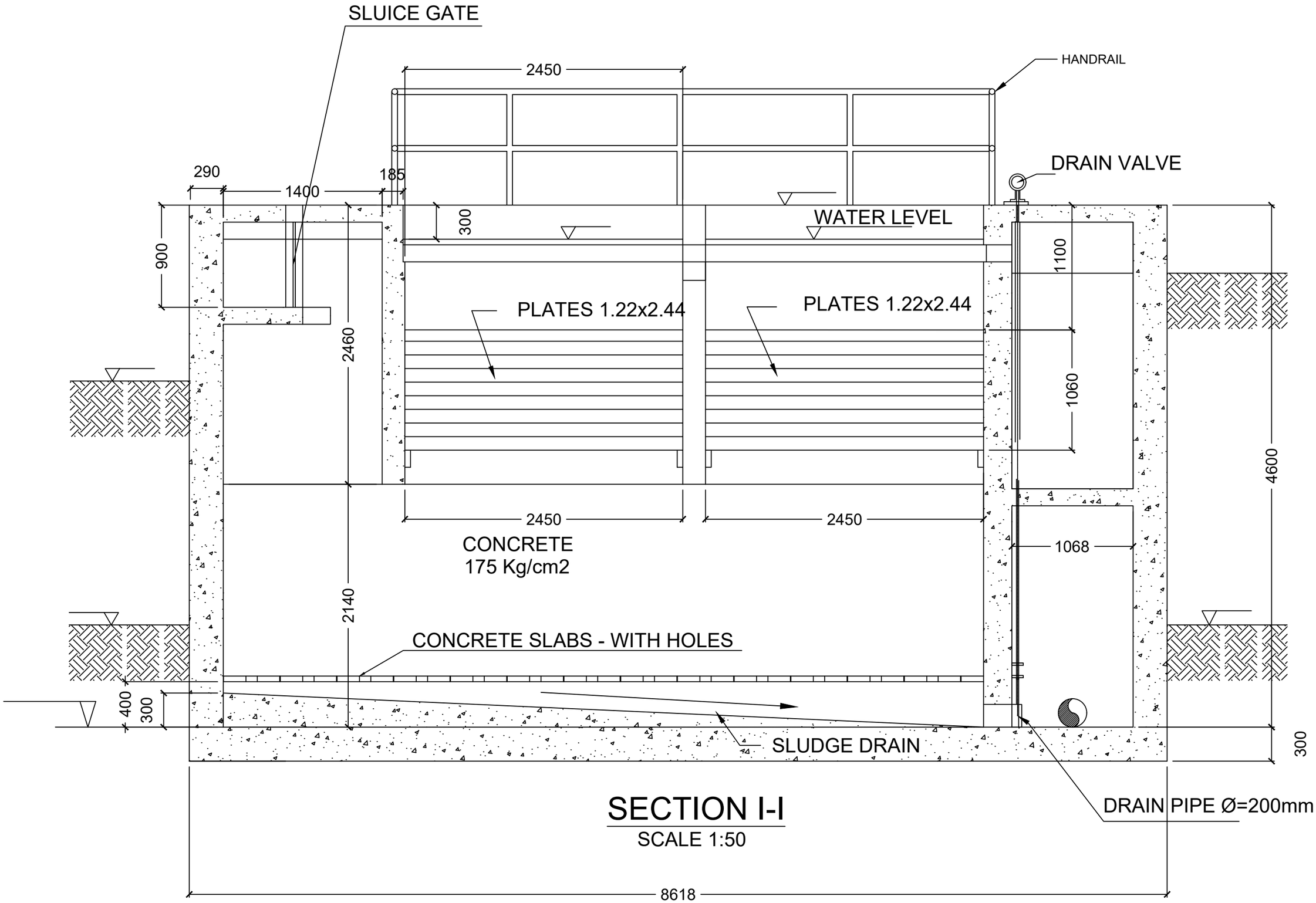
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title:
PIPE WORK SCHEDULE

Designed By	: L.K
Drawn By	: E.O
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/TW/006



SECTION I-I

SCALE 1:50

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client:

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPLLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:

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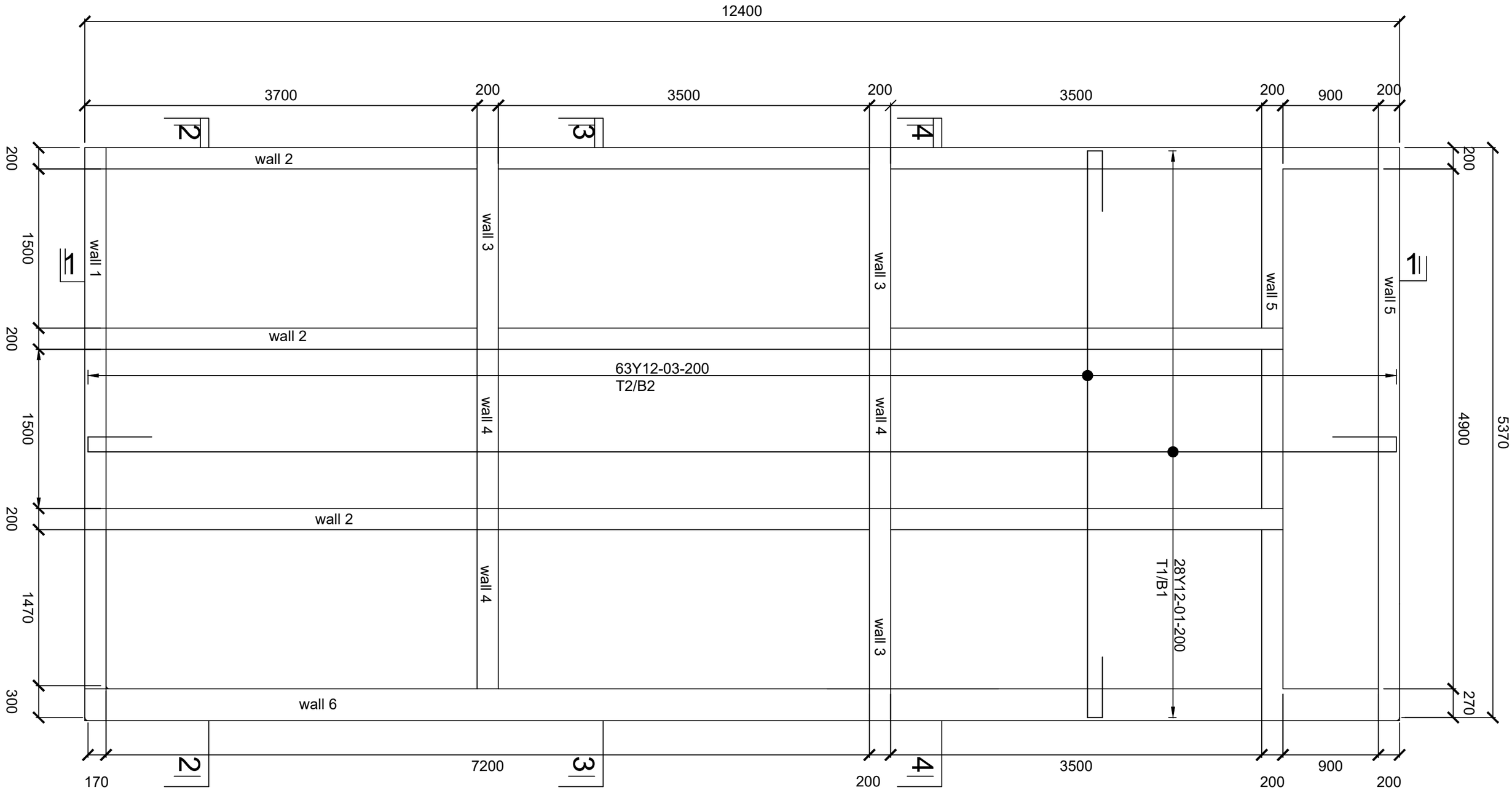
Le´Mac Building,1st FL,Off Church Rd,, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title:

SEDIMENTATION SECTION I-I

Designed By	: L.K
Drawn By	: E.O
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/TW/007



SLAB 1 1 NO
scale 1:50

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client:
ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:
AFRICAN DEVELOPMENT BANK

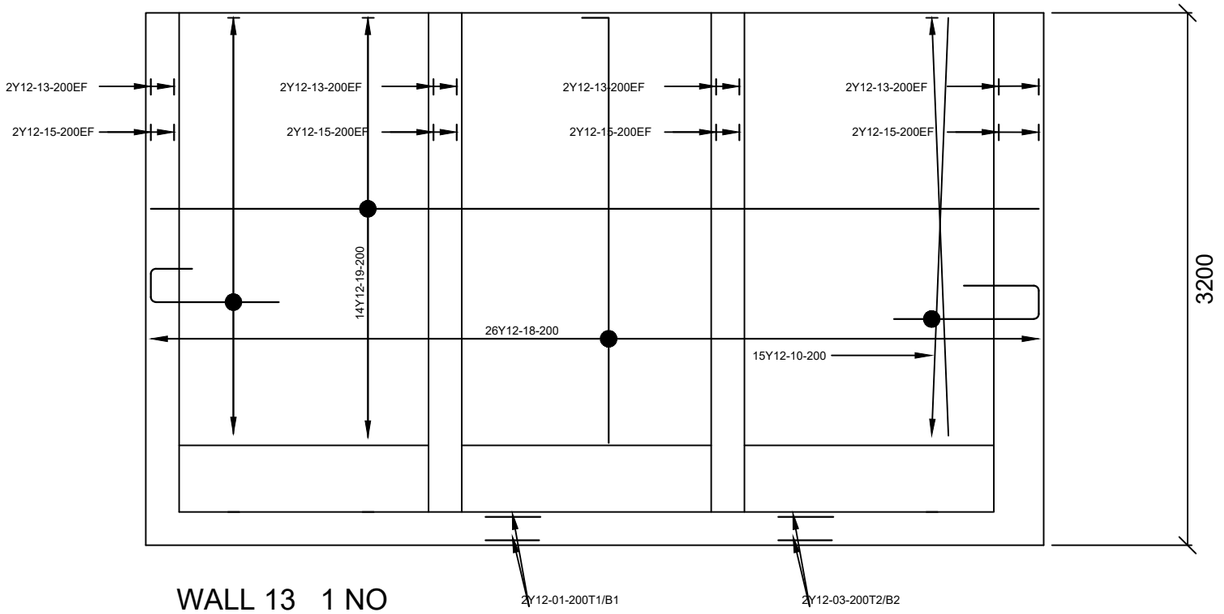
Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPLLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

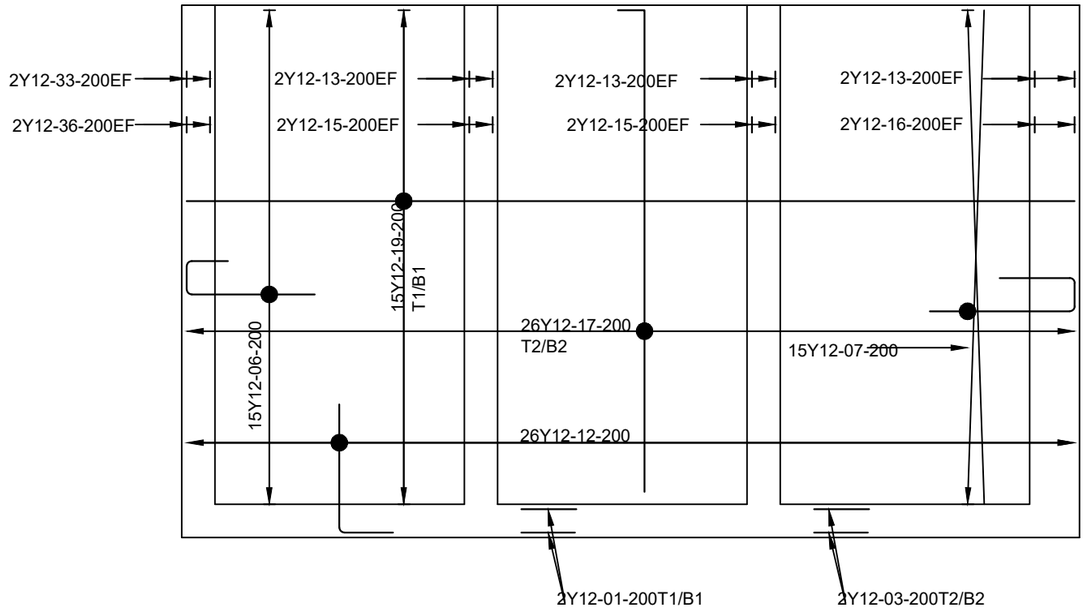
Reviewed By:
CAS CONSULTANTS LIMITED
Le´Mac Building,1st FL,Off Church Rd,, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title:
FLOCULATION SLAB REINFORCEMENT DETAILS

Designed By	: L.K
Drawn By	: E.O
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/TW/008



WALL 13 1 NO



SECTION 2-2
SCALE 1:50

SECTION 3-3
SCALE 1:50

SECTION 4-4
SCALE 1:50

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client:
ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:
AFRICAN DEVELOPMENT BANK

Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPLLY PROJECT
CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:
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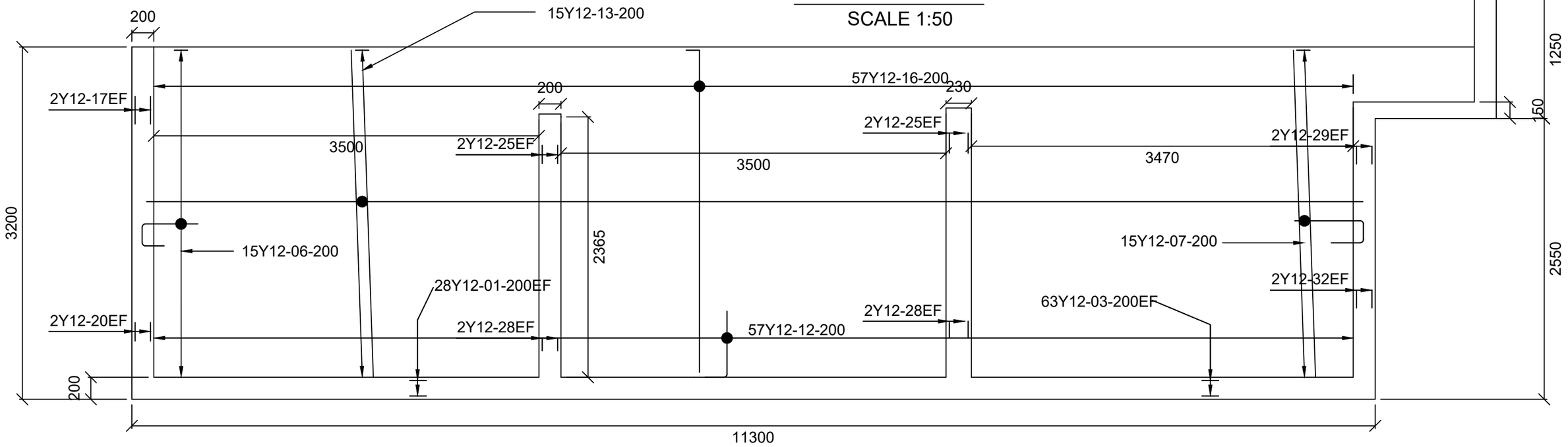
Le´Mac Building,1st FL,Off Church Rd,, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

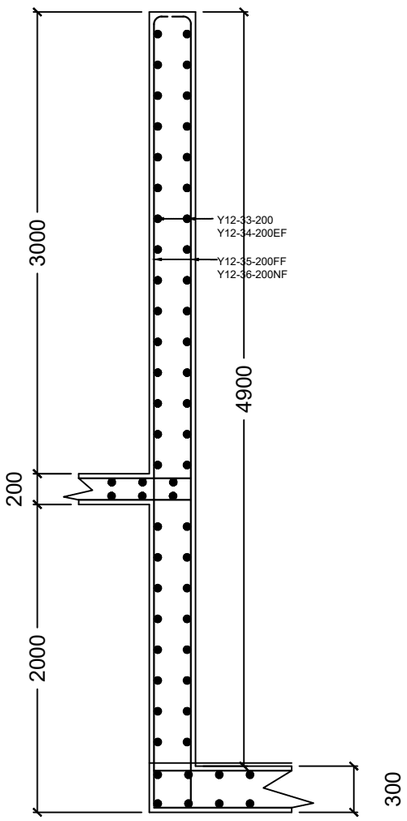
Drawing Title:
FLOCULATION WALL SECTIONS 2-2 TO 4-4 REINFORCEMENT DETAILS

Designed By	: L.K
Drawn By	: E.O
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/TW/009

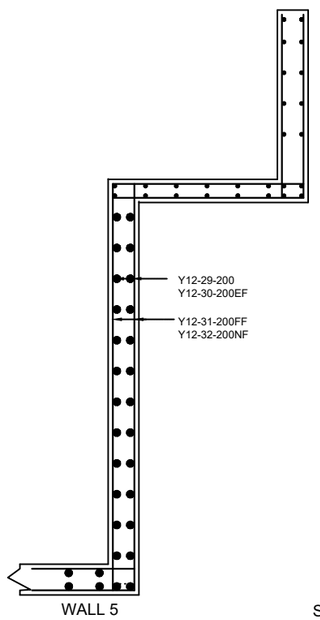
SECTION 1-1

SCALE 1:50

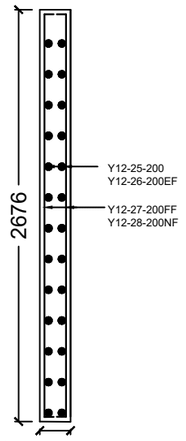




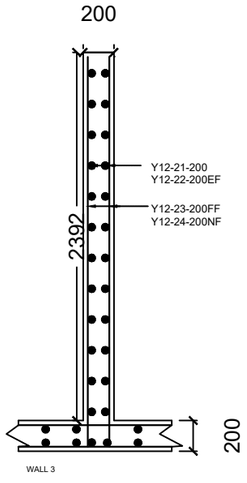
WALL 6
SCALE 1:25



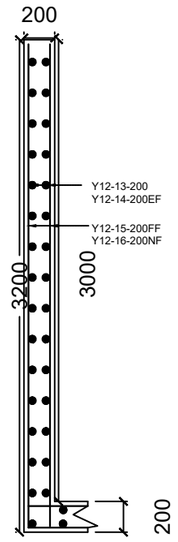
WALL 5
SCALE 1:25



WALL 4
SCALE 1:25



WALL 3
SCALE 1:20



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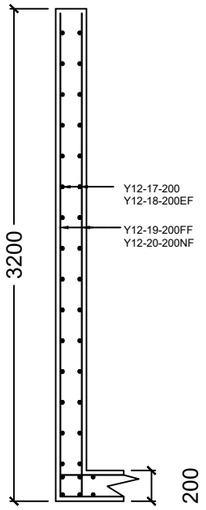
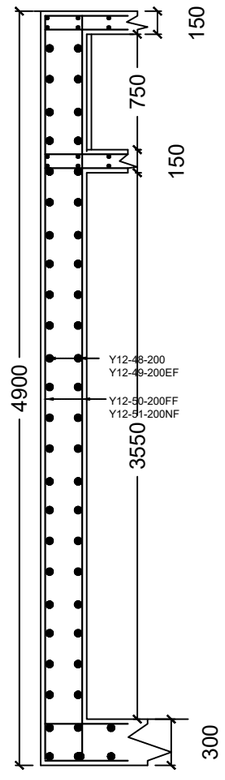
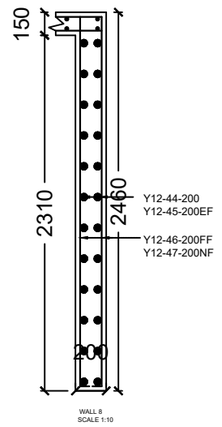
SCALE 1:25



WALL 1
SCALE 1:25



WALL 7
SCALE 1:25



WALL 8
SCALE 1:10

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client:

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPLLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

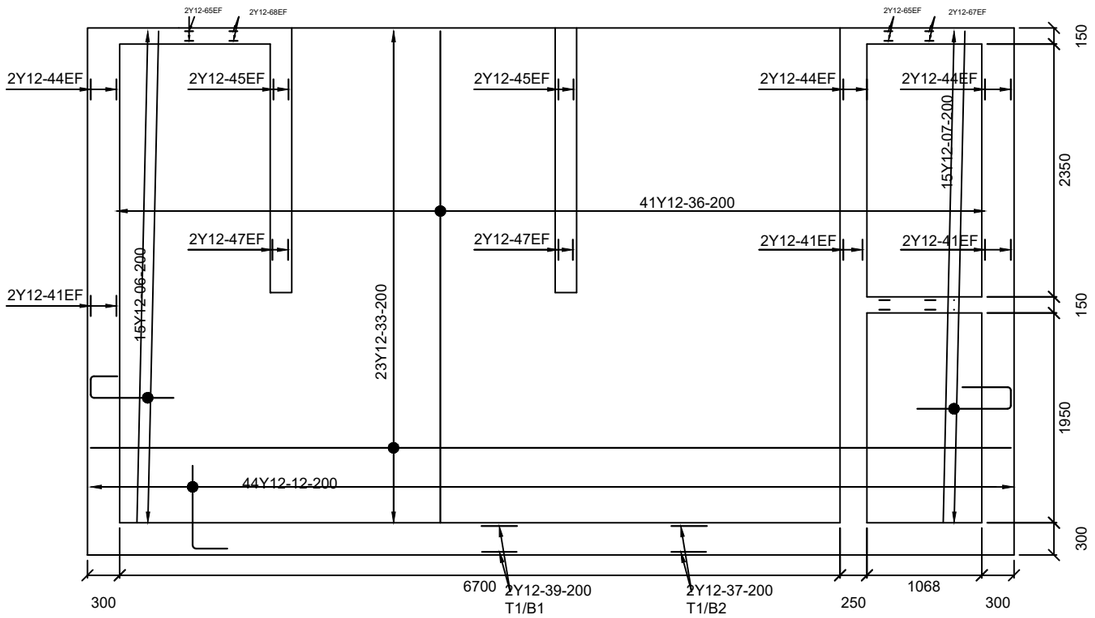
Reviewed By:

CAS CONSULTANTS LIMITED
Le´Mac Building,1st FL,Off Church Rd,, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

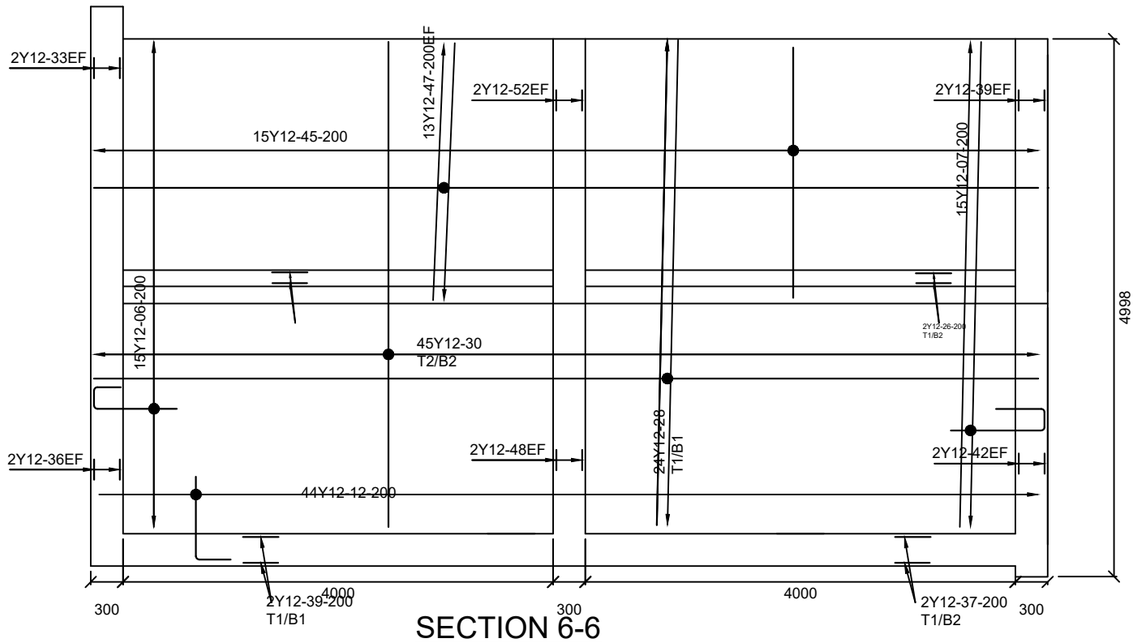
Drawing Title:

FLOCULATION WALL SECTIONS 1-1 AND WALLS 1-8 REINFORCEMENT DETAILS

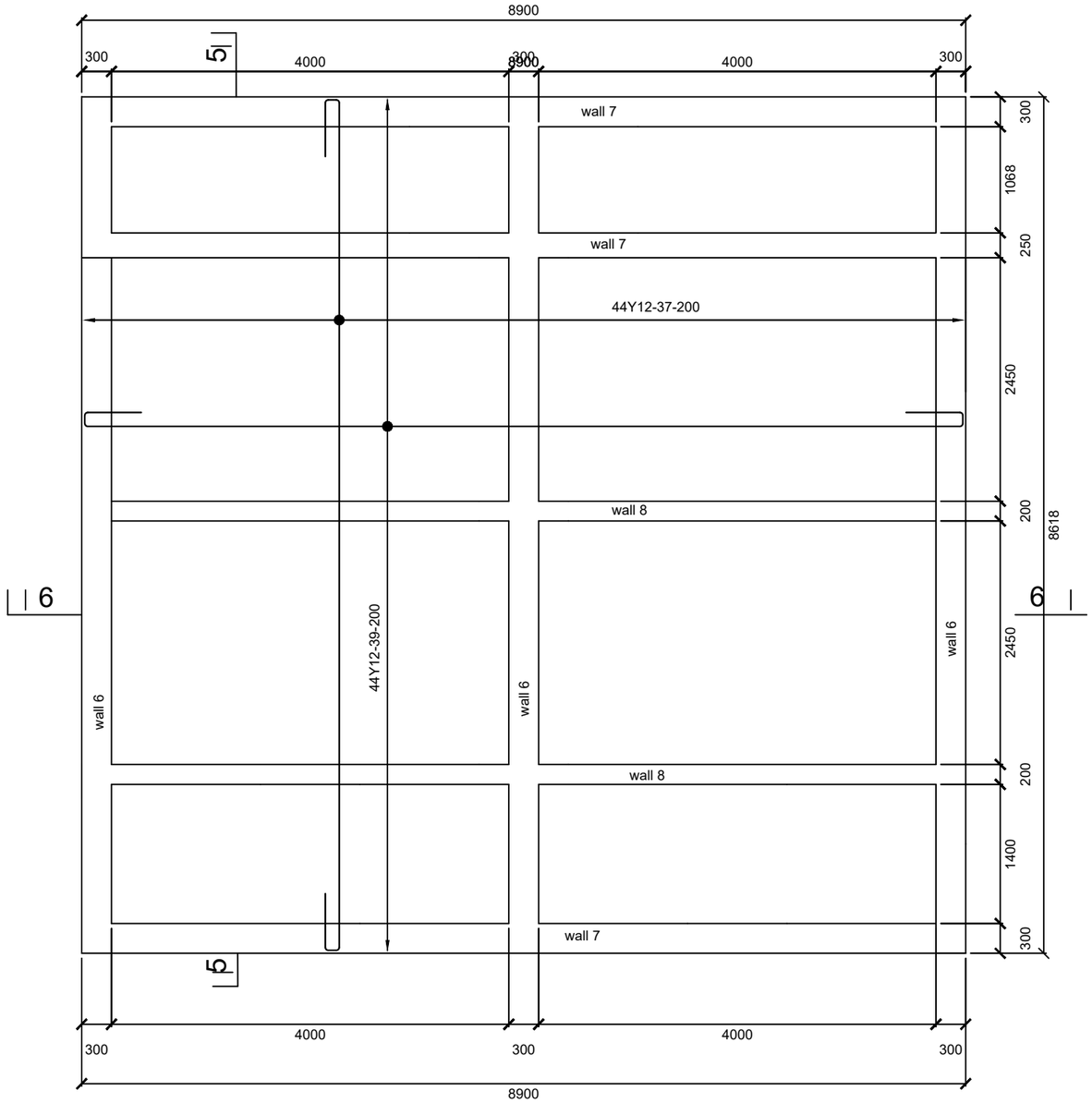
Designed By	: L.K
Drawn By	: E.O
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/TW/010



SECTION 5-5
SCALE 1:50



SECTION 6-6
SCALE 1:50



SLAB 2 1 NO
SCALE 1:50

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client:
ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:
AFRICAN DEVELOPMENT BANK

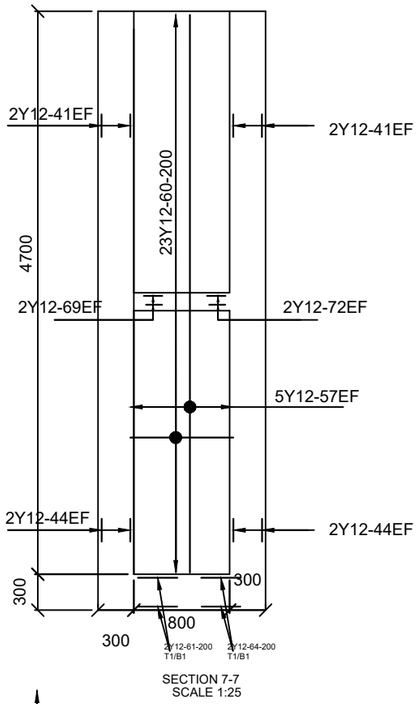
Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPLLY PROJECT

CONTRACT No; AWSB/KTSWSSP/CS-05/ 2016

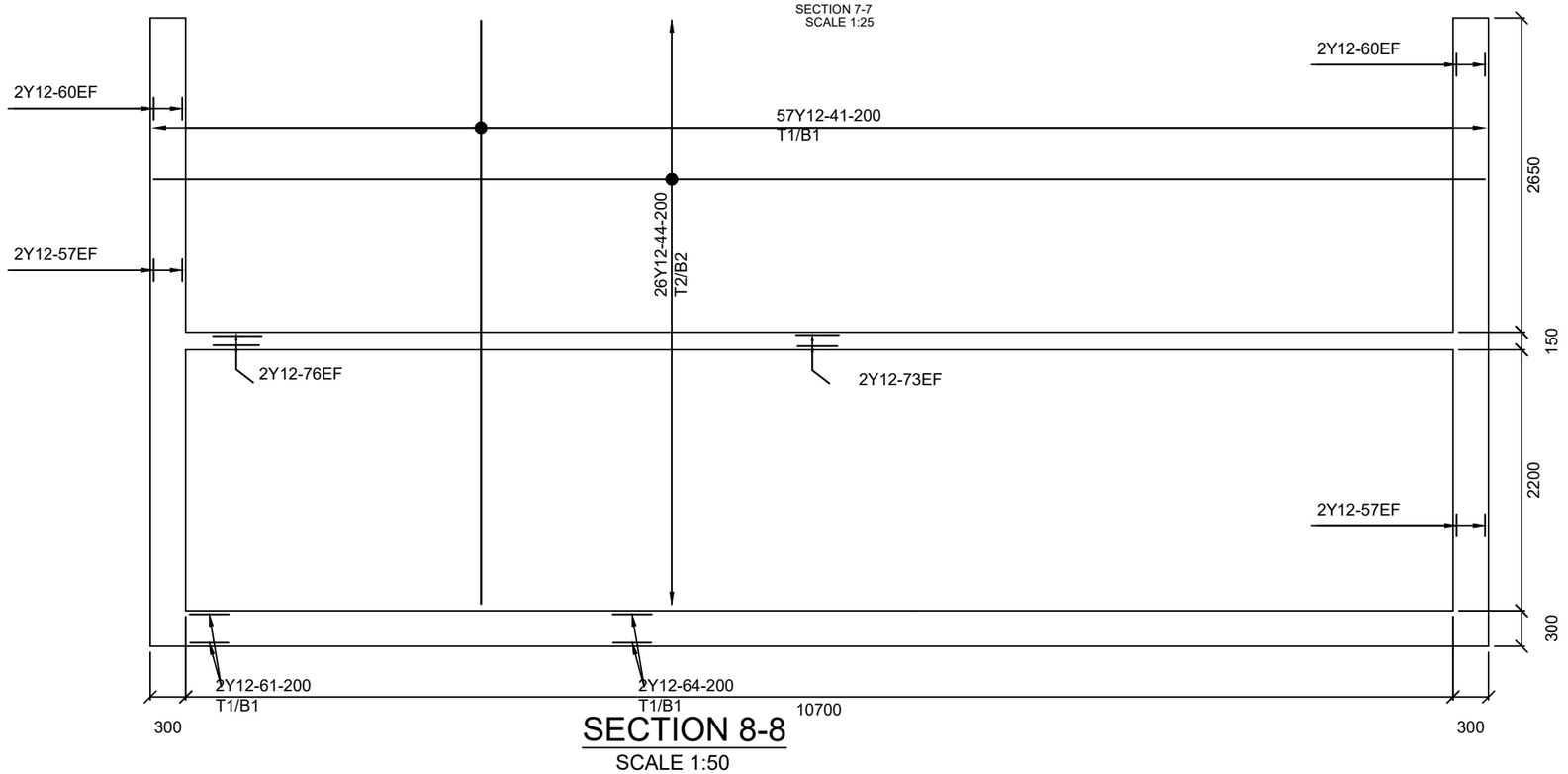
Reviewed By:
CAS CONSULTANTS LIMITED
Le´Mac Building,1st FL,Off Church Rd,, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title:
SEDIMENTATION SLAB AND WALL SECTIONS REINFORCEMENT DETAILS

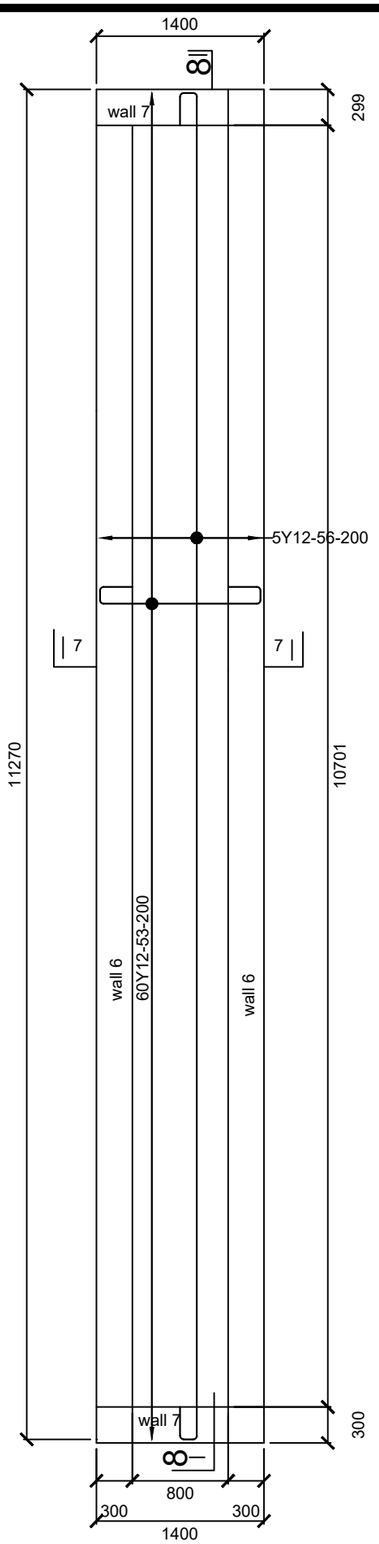
Designed By	:	L.K
Drawn By	:	E.O
Checked By	:	G.I
Approved By	:	S.M.M
Client approval	:	
Date	:	MARCH 2023
Drawing No	:	AWSB/MC/TW/011



SECTION 7-7
SCALE 1:25



SECTION 8-8
SCALE 1:50



SLAB 3 1 NO
SCALE 1:50

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client:
ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

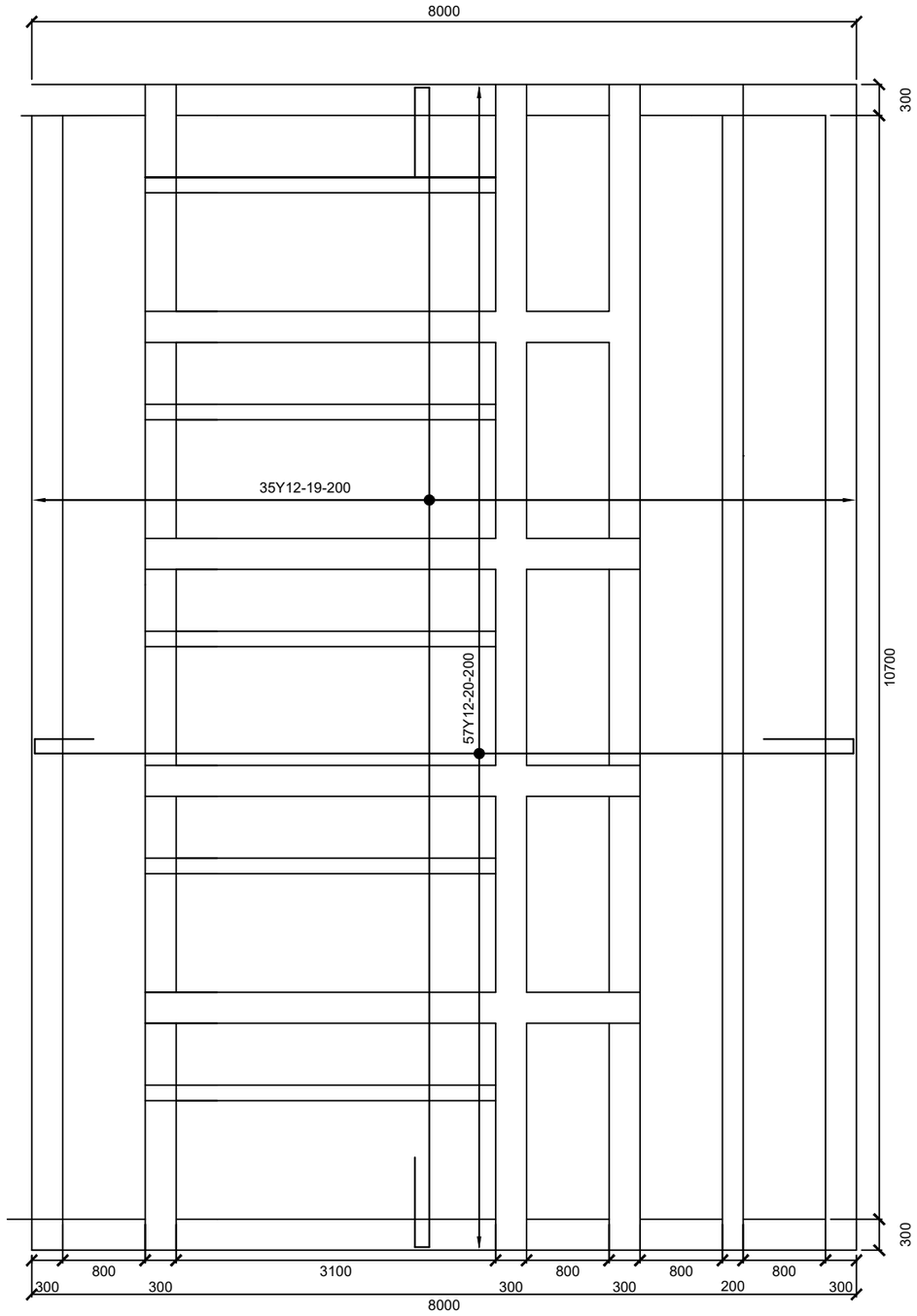
Financed By:
AFRICAN DEVELOPMENT BANK

Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPLLY PROJECT
CONTRACT No; AWSB/KTSWSSP/CS-05/ 2016

Reviewed By:
CAS CONSULTANTS LIMITED
Le´Mac Building,1st FL,Off Church Rd,, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

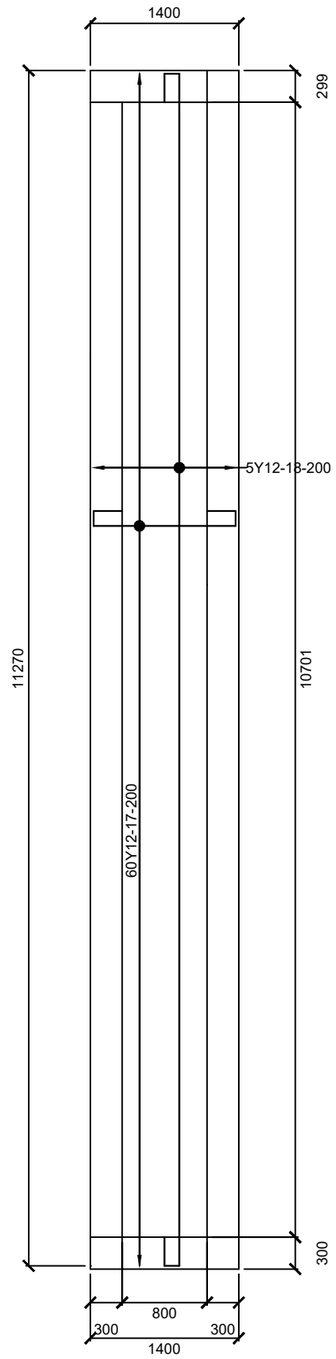
Drawing Title:
FILTER CHANNEL SLAB AND WALL SECTIONS REINFORCEMENT DETAILS

Designed By	: L.K
Drawn By	: E.O
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/TW/012



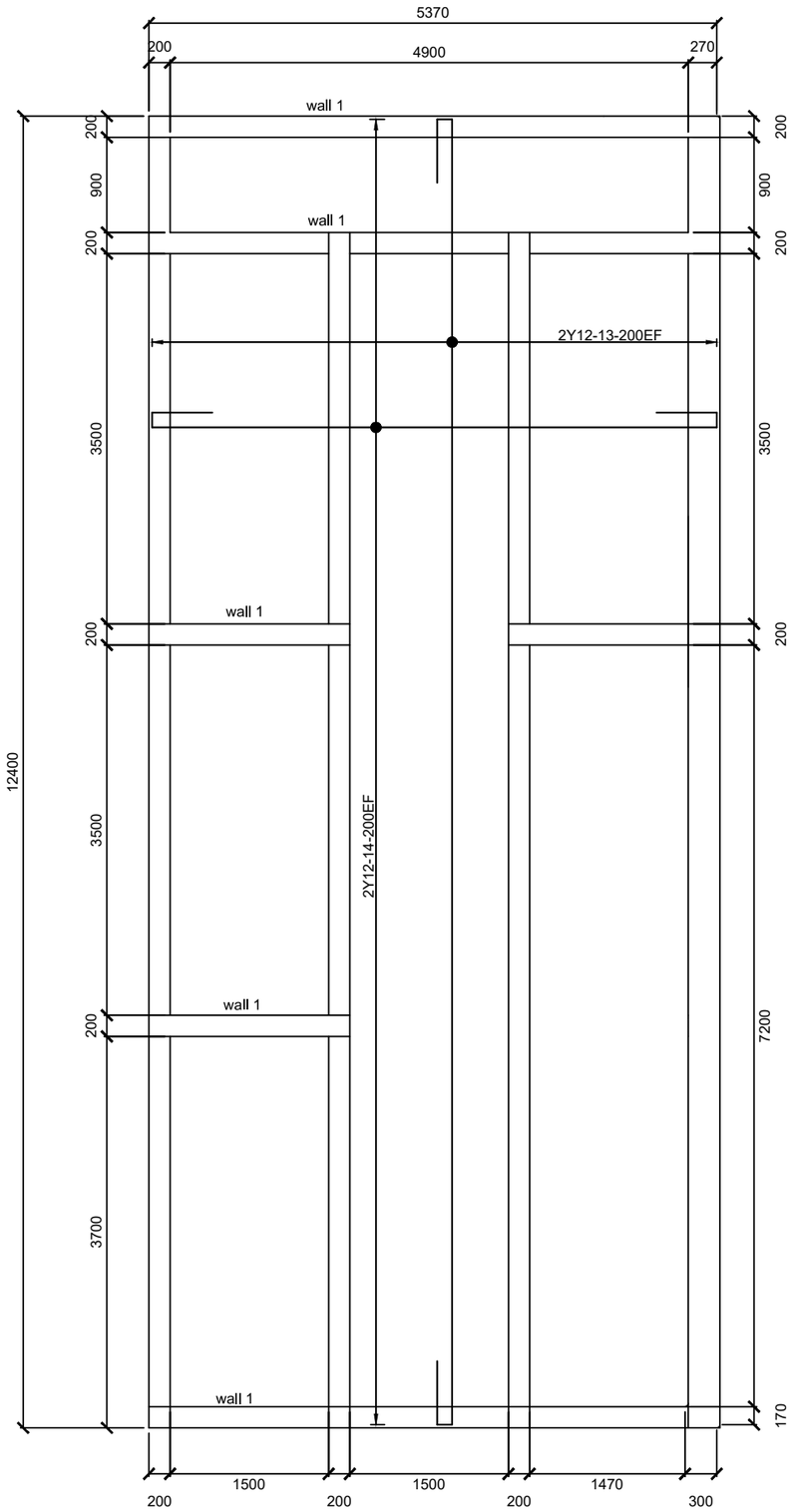
SLAB 7 1 NO

SCALE 1:50



SLAB 6 1 NO

SCALE 1:50



SLAB 1 1 NO

scale 1:50

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client:

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPLLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

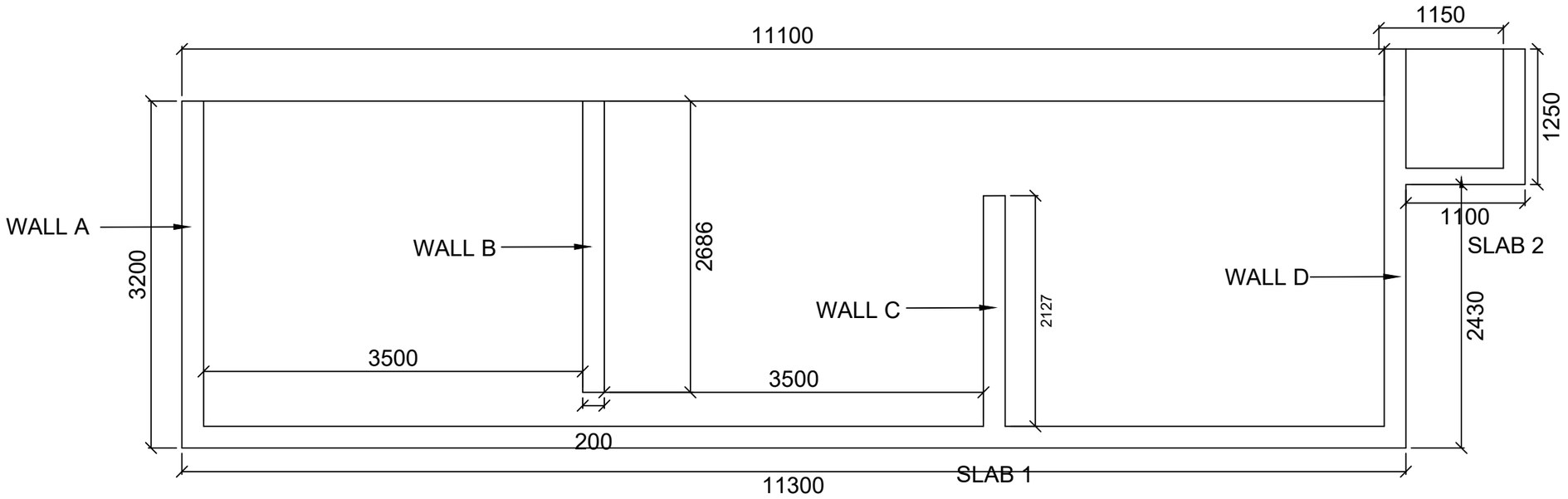
Reviewed By:

CAS CONSULTANTS LIMITED
Le´Mac Building1st FL,Off Church Rd, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title:

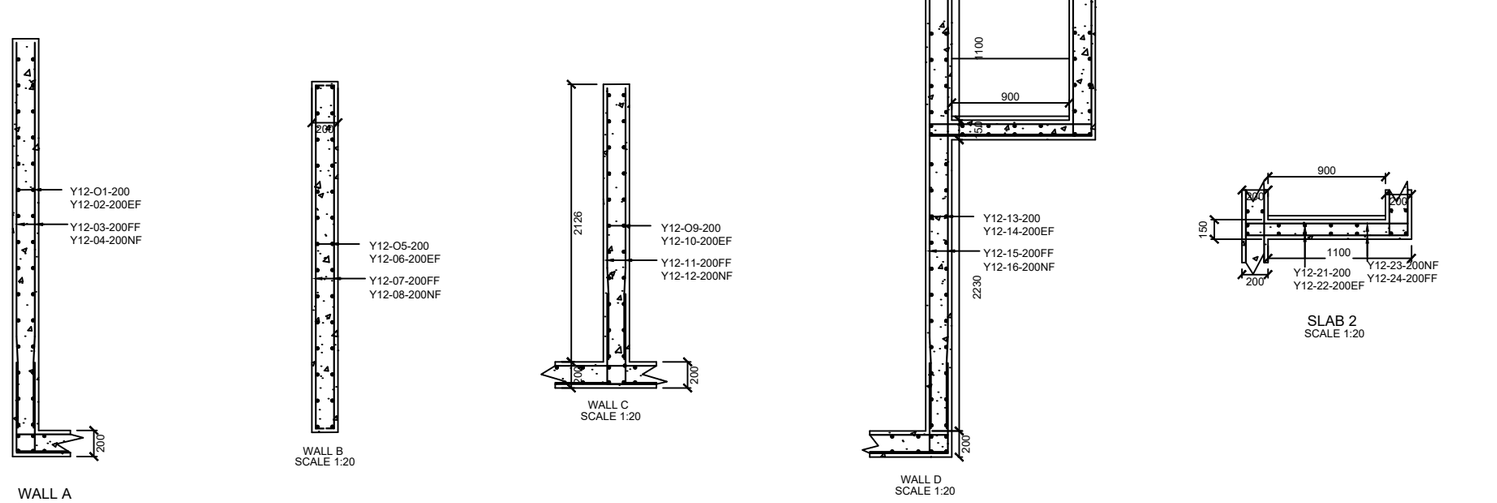
SLAB REINFORCEMENT DETAILS

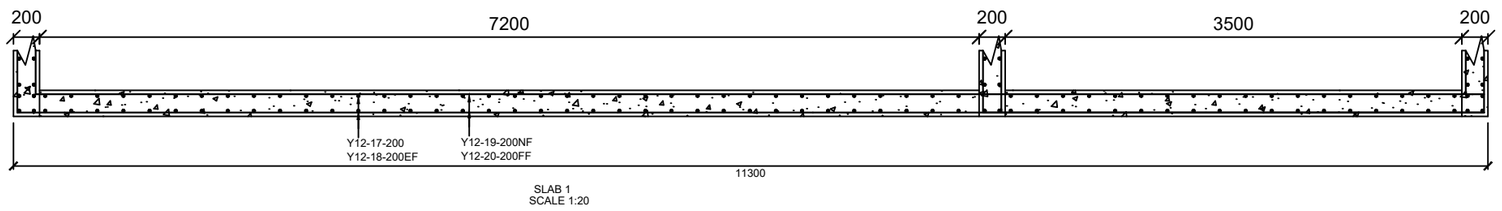
Designed By	: L.K
Drawn By	: E.O
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/TW/013



SECTION G-G

SCALE 1:50





No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client:
ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:
AFRICAN DEVELOPMENT BANK

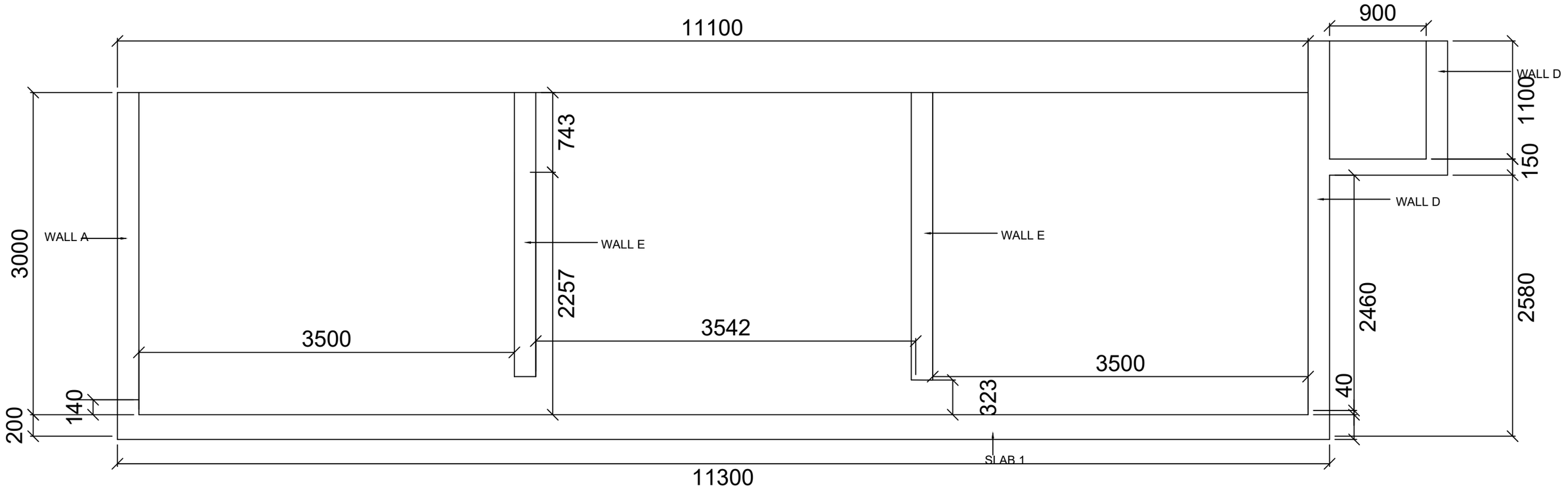
Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPLLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:
CAS CONSULTANTS LIMITED
Le´Mac Building,1st FL,Off Church Rd,, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title:
SECTION G-G REINFORCEMENT DETAILS

Designed By	:	L.K
Drawn By	:	E.O
Checked By	:	G.I
Approved By	:	S.M.M
Client approval	:	
Date	:	MARCH 2023
Drawing No	:	AWSB/MC/TW/014



SECTION F-F
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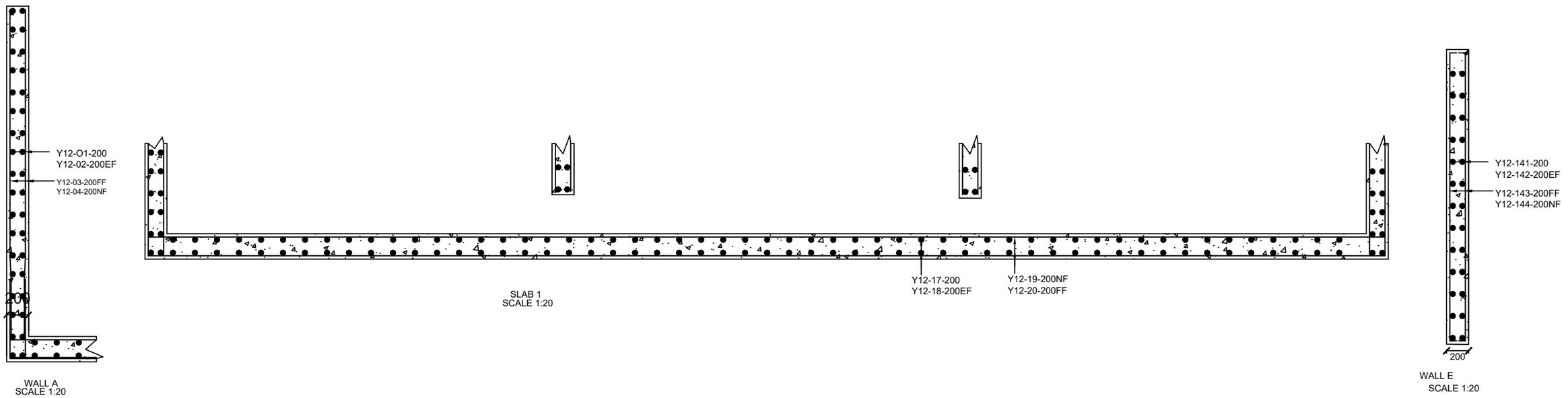


WALL A
SCALE 1:20

SLAB 1
SCALE 1:20

WALL E
SCALE 1:20

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client:
ATHI WATER SERVICES BOARD,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:
TANATHI WATER SERVICES BOARD
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:
AFRICAN DEVELOPMENT BANK

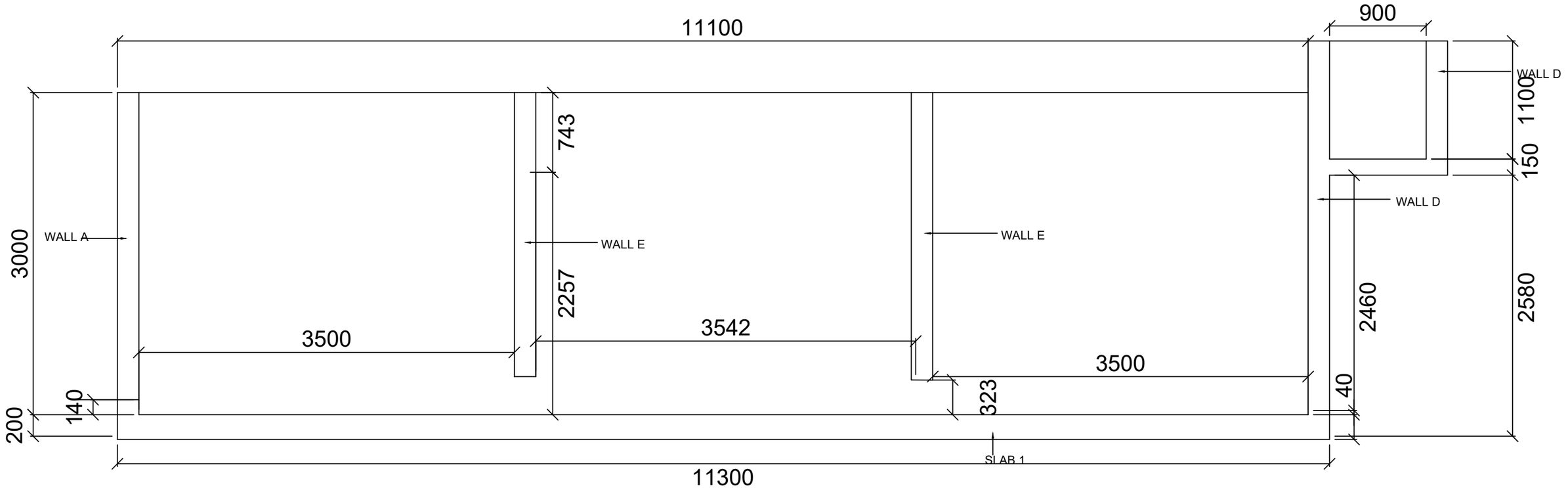
Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPLLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

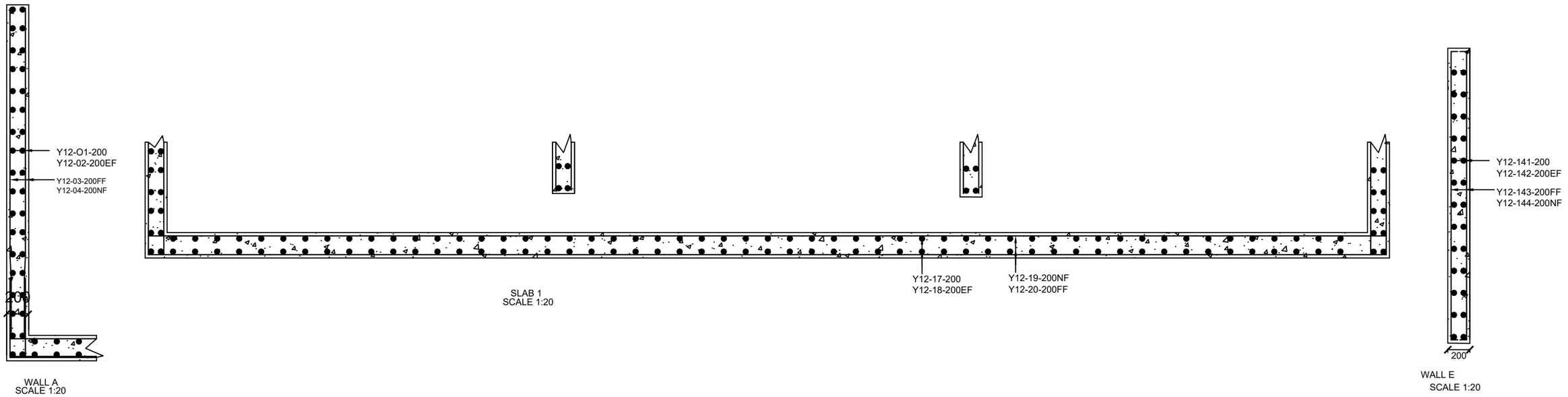
Reviewed By:
CAS CONSULTANTS LIMITED
Le´Mac Building,1st FL,Off Church Rd,, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title:
SECTION F-F REINFORCEMENT DETAILS

Designed By	: L.K
Drawn By	: E.O
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/TW/015



SECTION F-F
SCALE 1:50



WALL A
SCALE 1:20

SLAB 1
SCALE 1:20

WALL E
SCALE 1:20

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client:
ATHI WATER SERVICES BOARD,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:
TANATHI WATER SERVICES BOARD
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:
AFRICAN DEVELOPMENT BANK

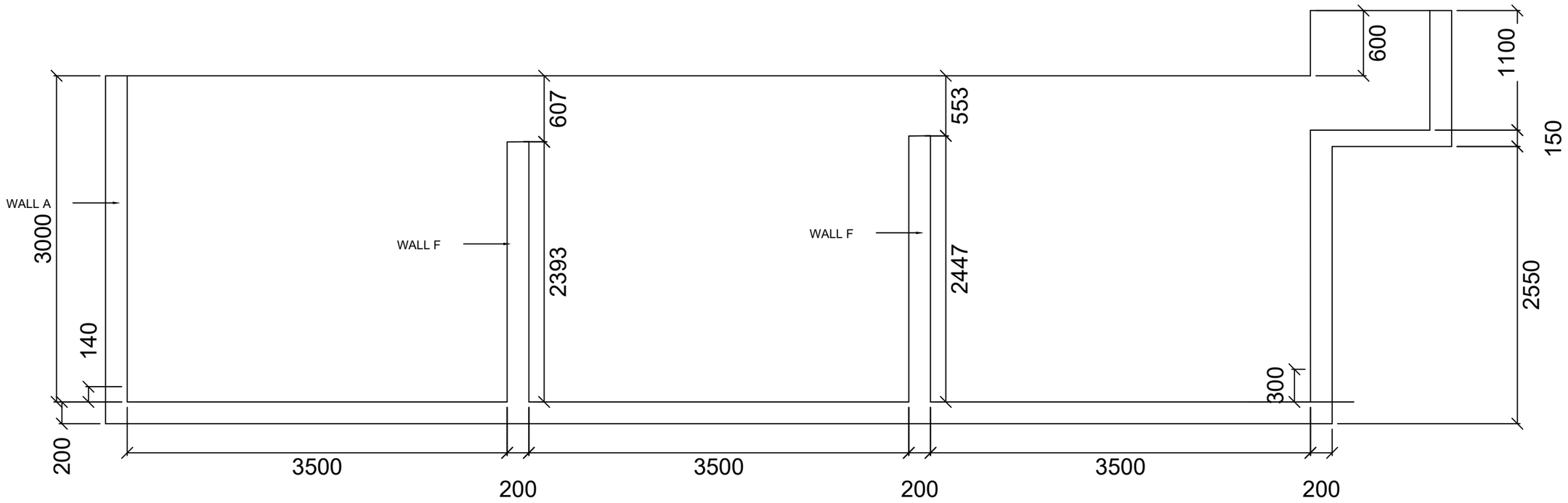
Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPLLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:
CAS CONSULTANTS LIMITED
Le´Mac Building,1st FL,Off Church Rd,, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

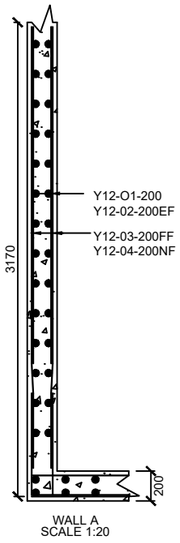
Drawing Title:
SECTION F-F REINFORCEMENT DETAILS

Designed By	: L.K
Drawn By	: E.O
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/TW/016

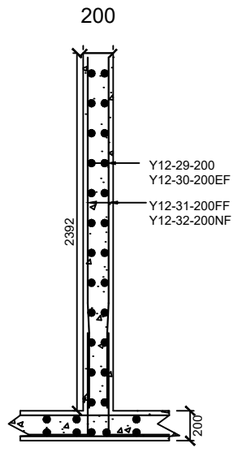


SECTION E - E

SCALE 1:50



WALL A
SCALE 1:20



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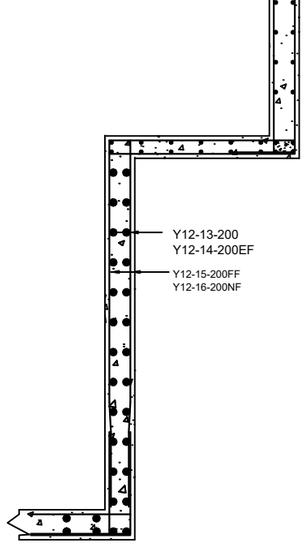
SCALE 1:20



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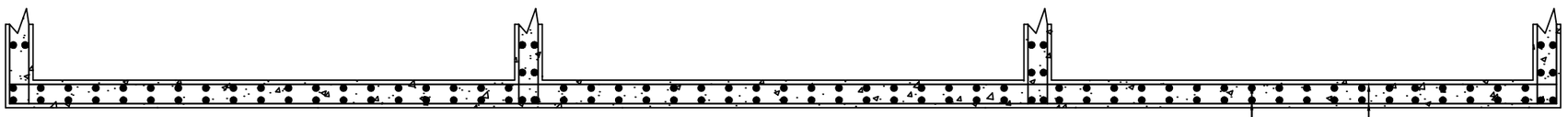


SLAB 1
SCALE 1:20

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client:

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPLLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

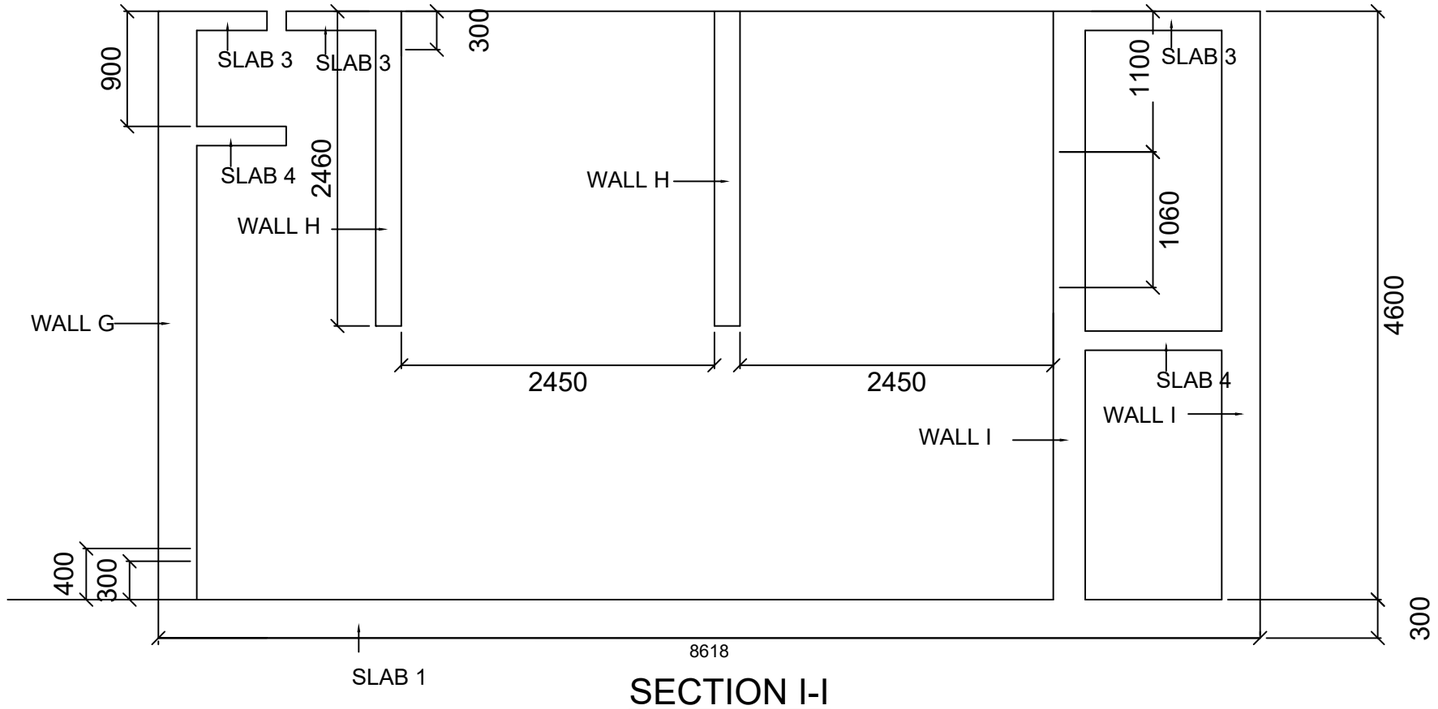
Reviewed By:

CAS CONSULTANTS LIMITED
Le´Mac Building,1st FL,Off Church Rd,, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title:

SECTION E-E REINFORCEMENT DETAILS

Designed By	: L.K
Drawn By	: E.O
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/TW/017



SECTION I-I
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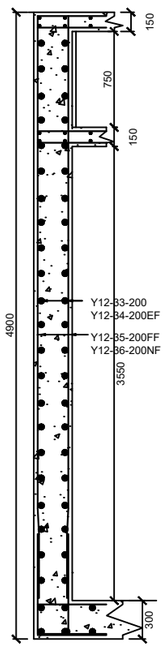

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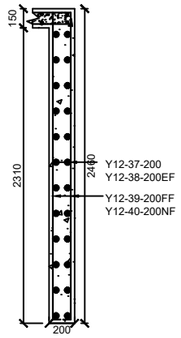
SCALE 1:20



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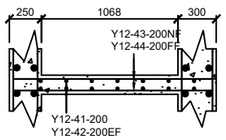
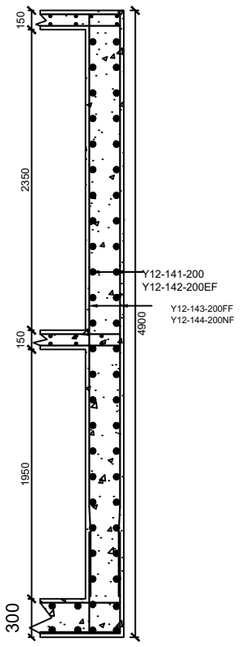
SCALE 1:20



SLAB 4
SCALE 1:20



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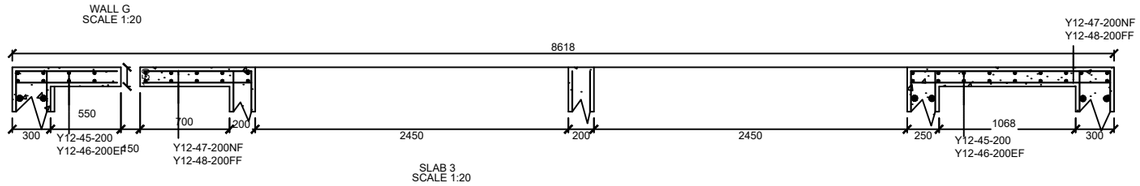


SLAB 3
SCALE 1:20

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client:
ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:
AFRICAN DEVELOPMENT BANK

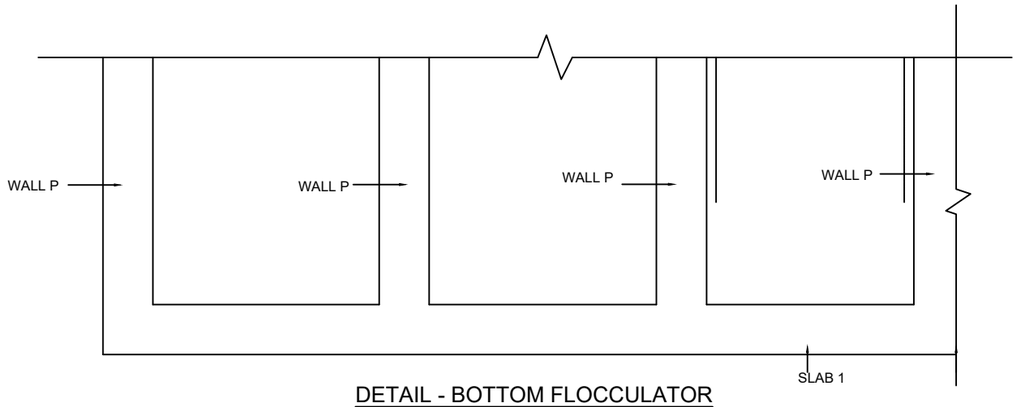
Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPLLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:
CAS CONSULTANTS LIMITED
Le´Mac Building,1st FL,Off Church Rd,, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

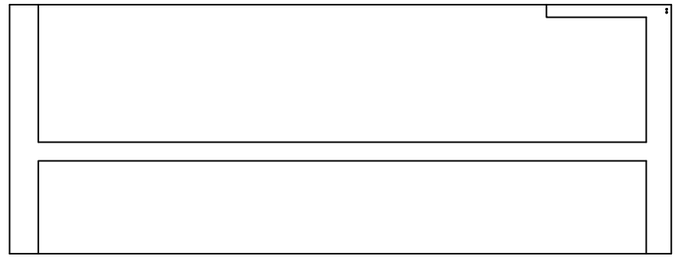
Drawing Title:
SECTION I-I REINFORCEMENT DETAILS

Designed By	: L.K
Drawn By	: E.O
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/TW/018



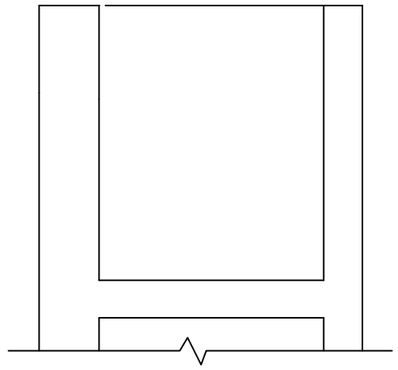
DETAIL - BOTTOM FLOCCULATOR

SCALE 1:25



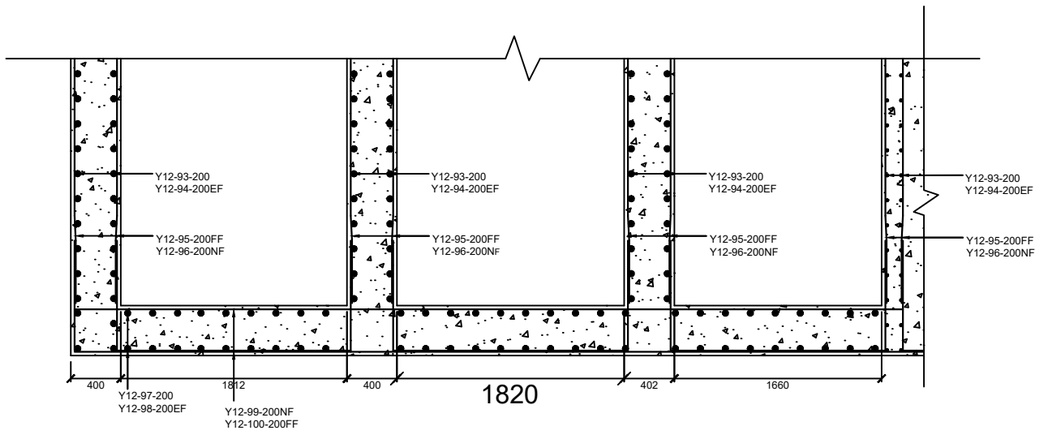
SECTION H-H

SCALE 1:25



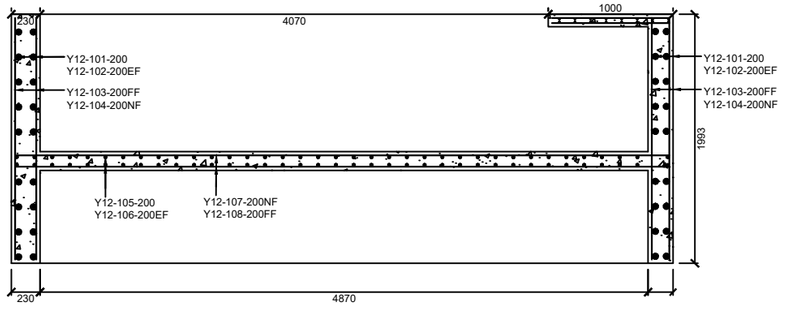
DETAIL - INJECTION DEVICE

SCALE 1:25



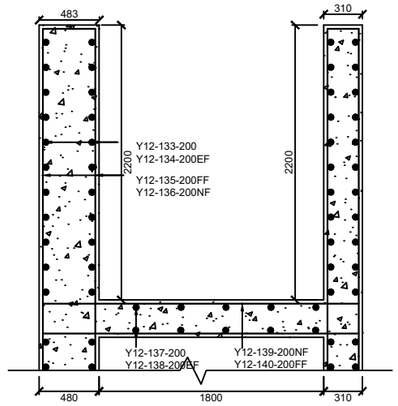
DETAIL - BOTTOM FLOCCULATOR

SCALE 1:20



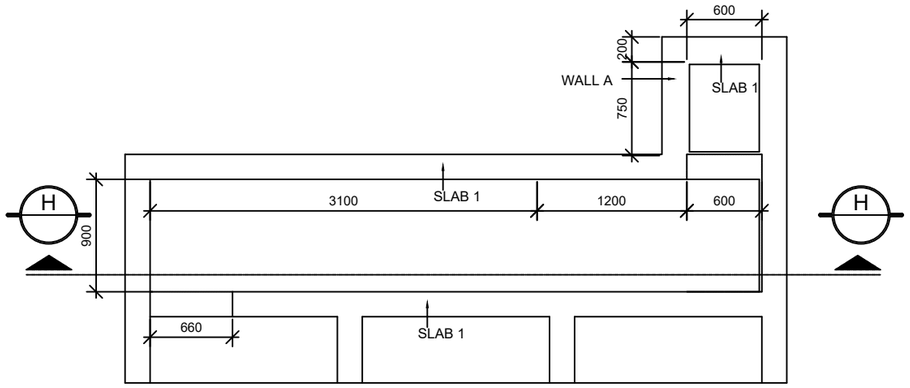
SECTION H-H

SCALE 1:20



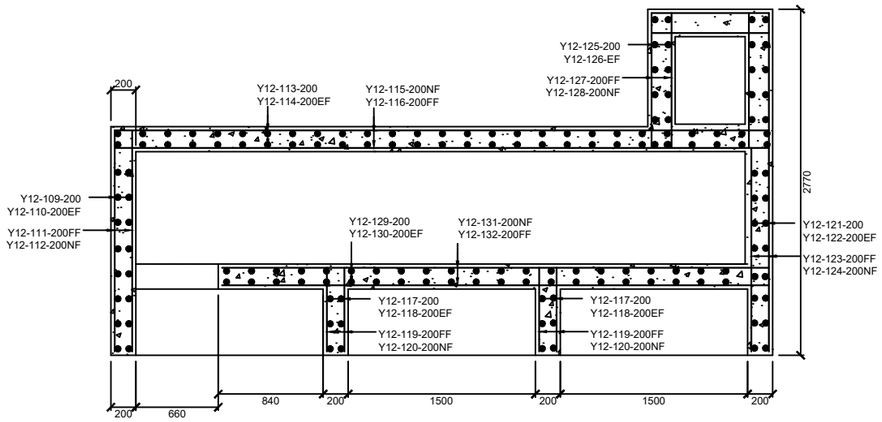
INJECTION DEVICE

SCALE 1:20



INLET TO FLOCCULATOR

SCALE 1:25



INLET TO FLOCCULATOR

SCALE 1:20

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client:

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPLLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

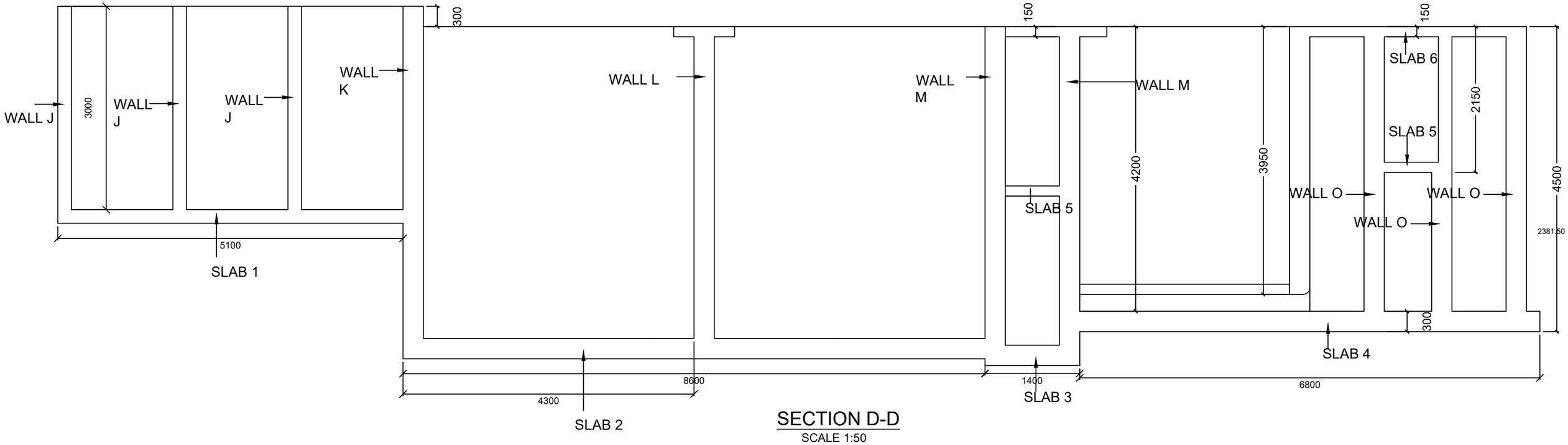
Reviewed By:

CAS CONSULTANTS LIMITED
Le´Mac Building,1st FL,Off Church Rd,, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title:

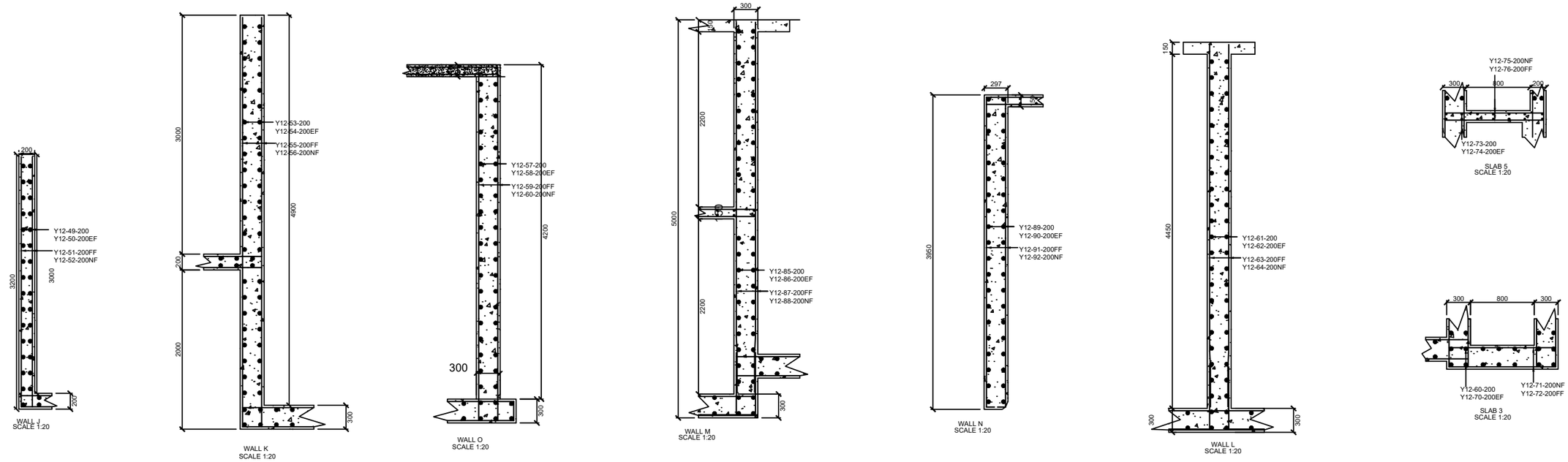
BOTTOM FLOCCULATOR, INJECTION DEVICE, INLET CHAMBER AND SECTION H-H REINFORCEMENT DETAILS

Designed By	: L.K
Drawn By	: E.O
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/TW/019



SECTION D-D

SCALE 1:50



No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client:

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPLLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

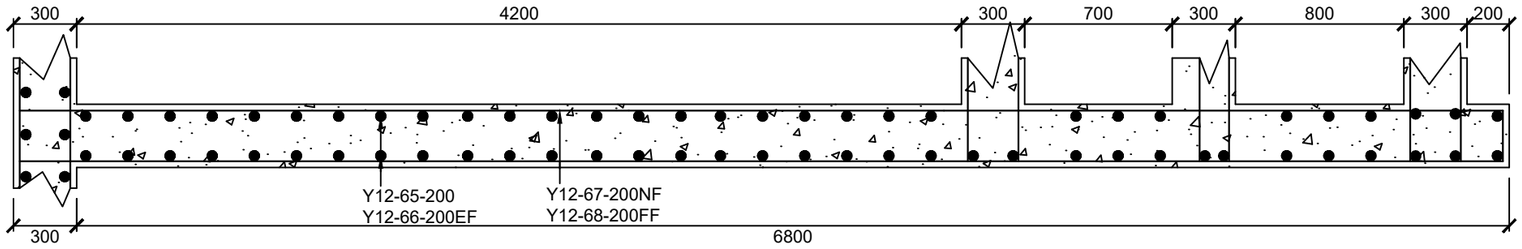
Reviewed By:

CAS CONSULTANTS LIMITED
Le´Mac Building,1st FL,Off Church Rd,,
Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

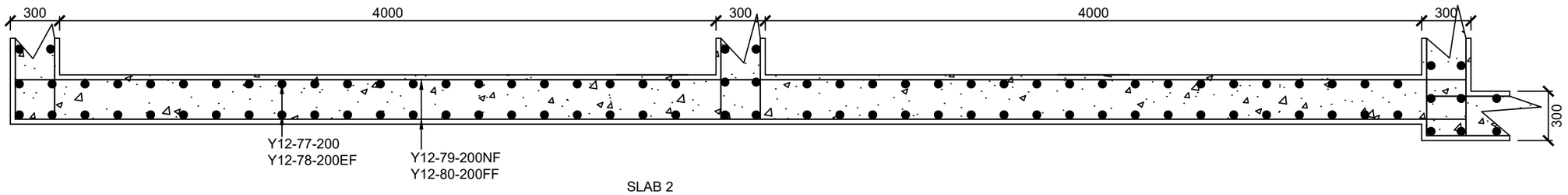
Drawing Title:

TREATMENT PLAN SECTION D-D
REINFORCEMENT DETAILS

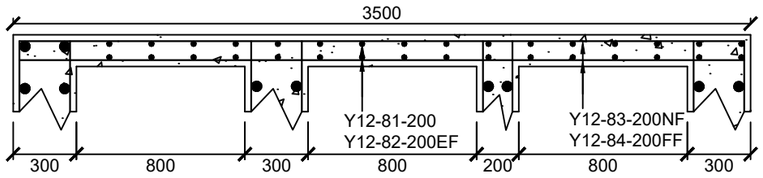
Designed By	: L.K
Drawn By	: E.O
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/TW/020



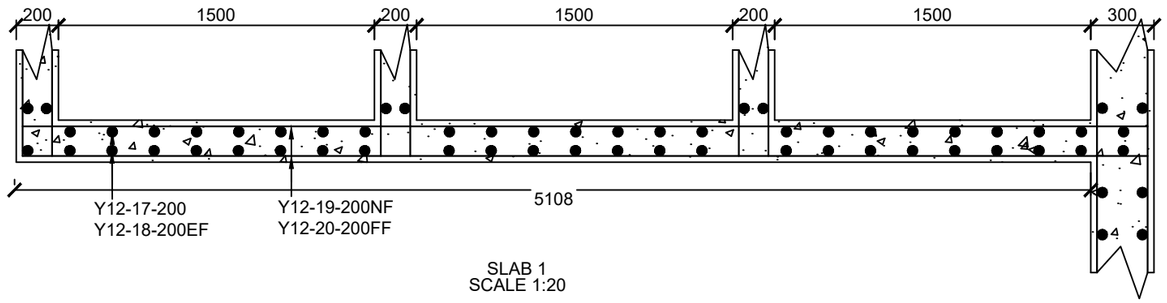
SLAB 4
SCALE 1:20



SLAB 2
SCALE 1:20



SLAB 6
SCALE 1:20



SLAB 1
SCALE 1:20

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client:

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPLLY PROJECT

CONTRACT No; AWSB/KTSWSSP/CS-05/ 2016

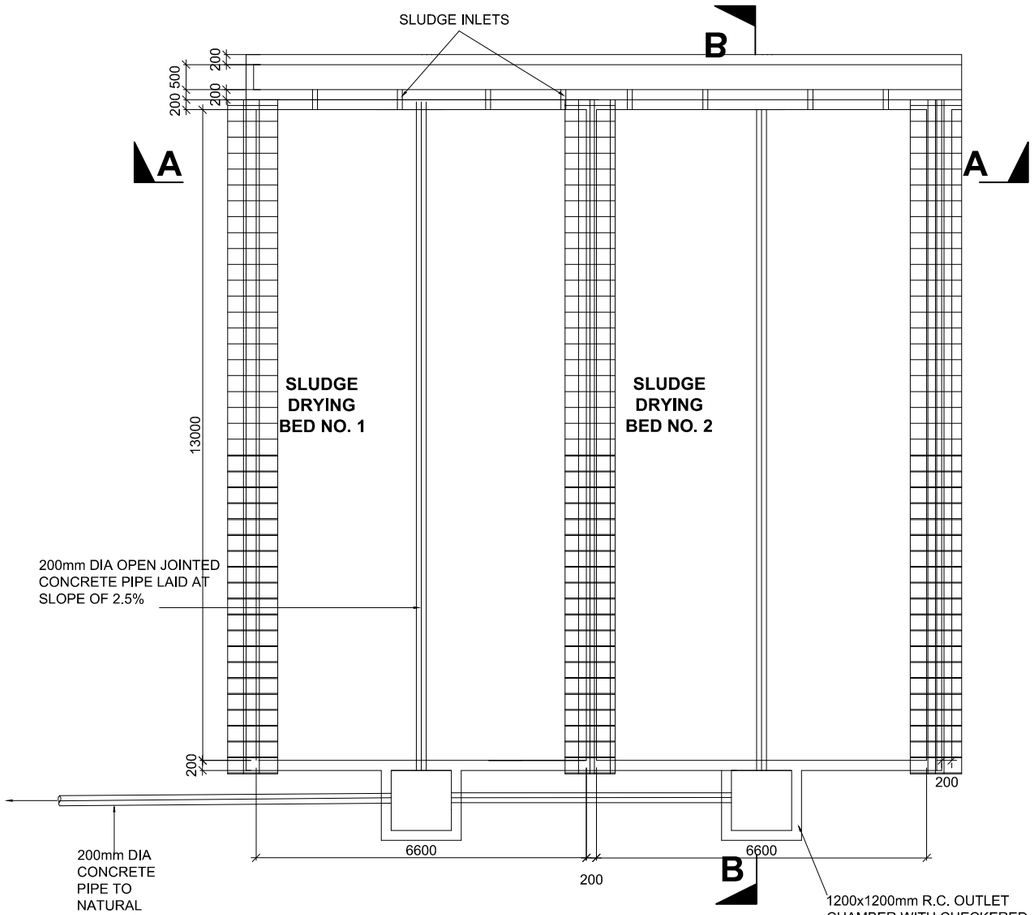
Reviewed By:

CAS CONSULTANTS LIMITED
Le´Mac Building,1st FL,Off Church Rd,, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title:

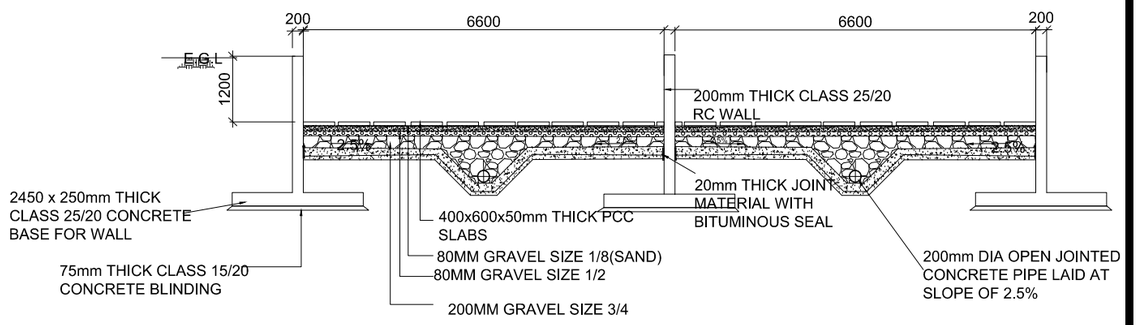
TREATMENT PLAN SECTION D-D
REINFORCEMENT DETAILS 2

Designed By	:	L.K
Drawn By	:	E.O
Checked By	:	G.I
Approved By	:	S.M.M
Client approval	:	
Date	:	MARCH 2023
Drawing No	:	AWSB/MC/TW/021



SLUDGE DRYING BEDS PLAN

SCALE 1:175



SECTION A-A

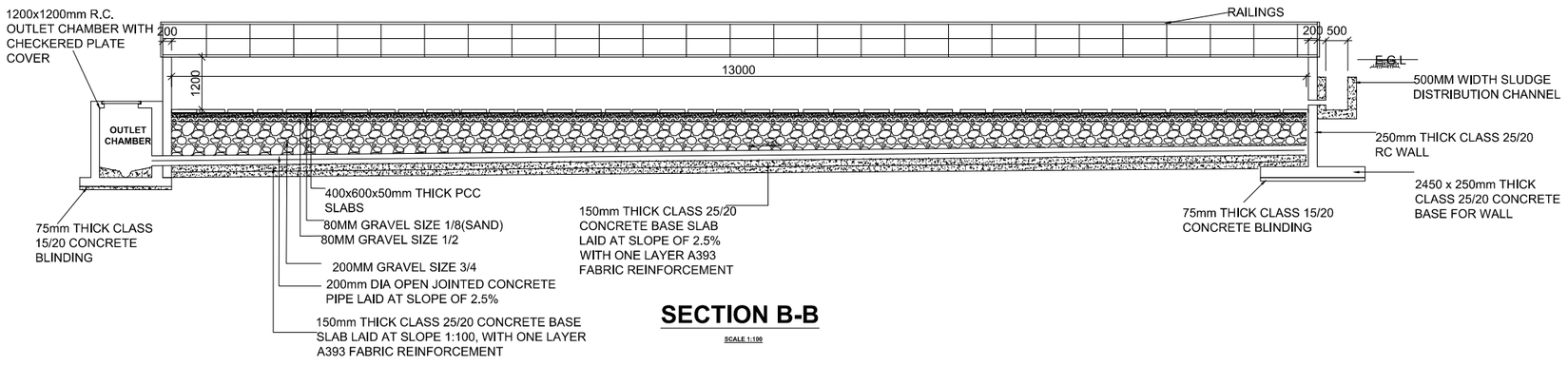
SCALE 1:100

NOTES:

1. DIMENSIONS IN mm UNLESS OTHERWISE SPECIFIED
2. ALL EXPOSED CONCRETE EDGES TO HAVE A 25mm X 25mm CHAMFER
3. ABBREVIATIONS

   R.C - REINFORCED CONCRETE
   P.C.C - PRECAST CONCRETE
   G.M.S. - GALVANISED MILD STEEL

4. GMS HANDSTOPS TO BE MADE OF 6mm THICK DOUBLE GALVANISED MILD STEEL PLATE WITH SUITABLE GMS FRAME BOLTED ONTO CONCRETE WALLS. THE PLATE AND FRAME TO BE APPLIEDWITH 2 COATS OF APPROVED METAL EPOXY COATING.



SECTION B-B

SCALE 1:100

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	April 2018
2.				
3.				
4.				

Client

ATHI WATER WORKS DEVELOPMENT AGENCY
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;AWWDA/AfDB/KTSWSSP/W/08/2023

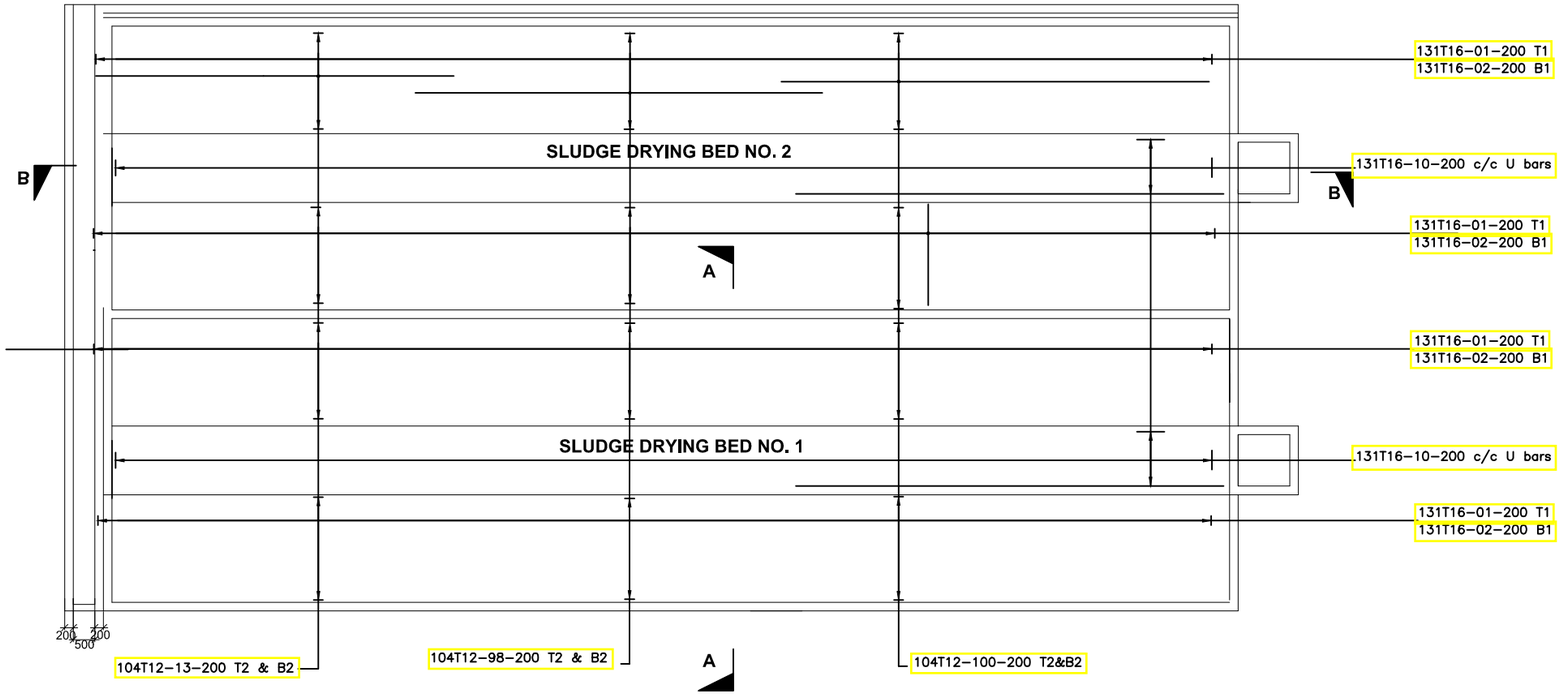
Reviewed By

CAS CONSULTANTS LIMITED
Le' Mac Building, 1st fl, Off Church Road
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

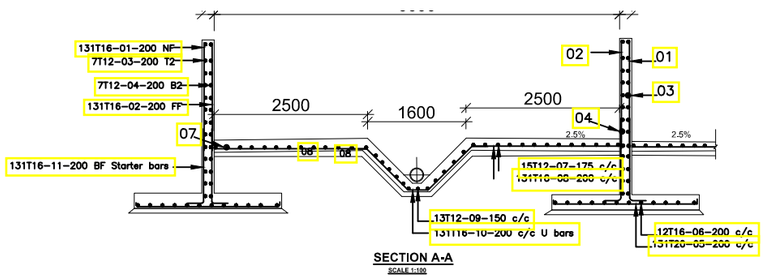
Drawing Title

DRYING BEDS PLAN AND SECTION

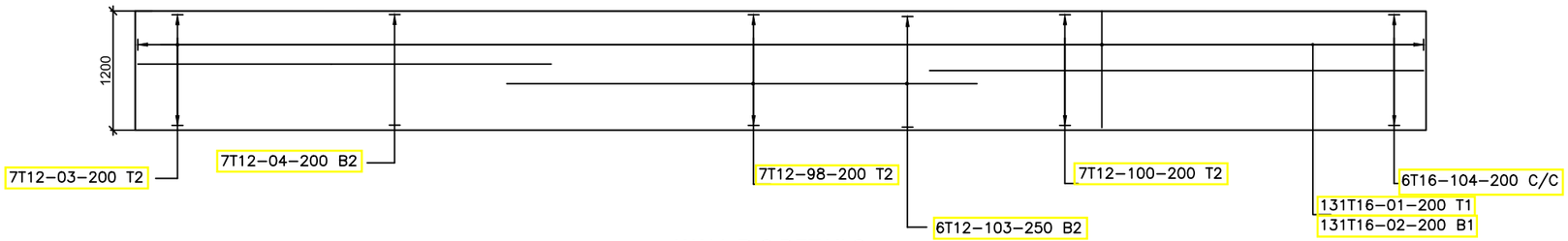
Designed By	: LK
Drawn By	: R.W
Checked By	: W.K
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/DB/001



SLAB PLAN
SCALE 1:50



SECTION A-A
SCALE 1:100



WALL R.C DETAILS
SCALE 1:50

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	April 2018
2.				
3.				
4.				

Client
ATHI WATER WORKS DEVELOPMENT AGENCY
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By
AFRICAN DEVELOPMENT BANK

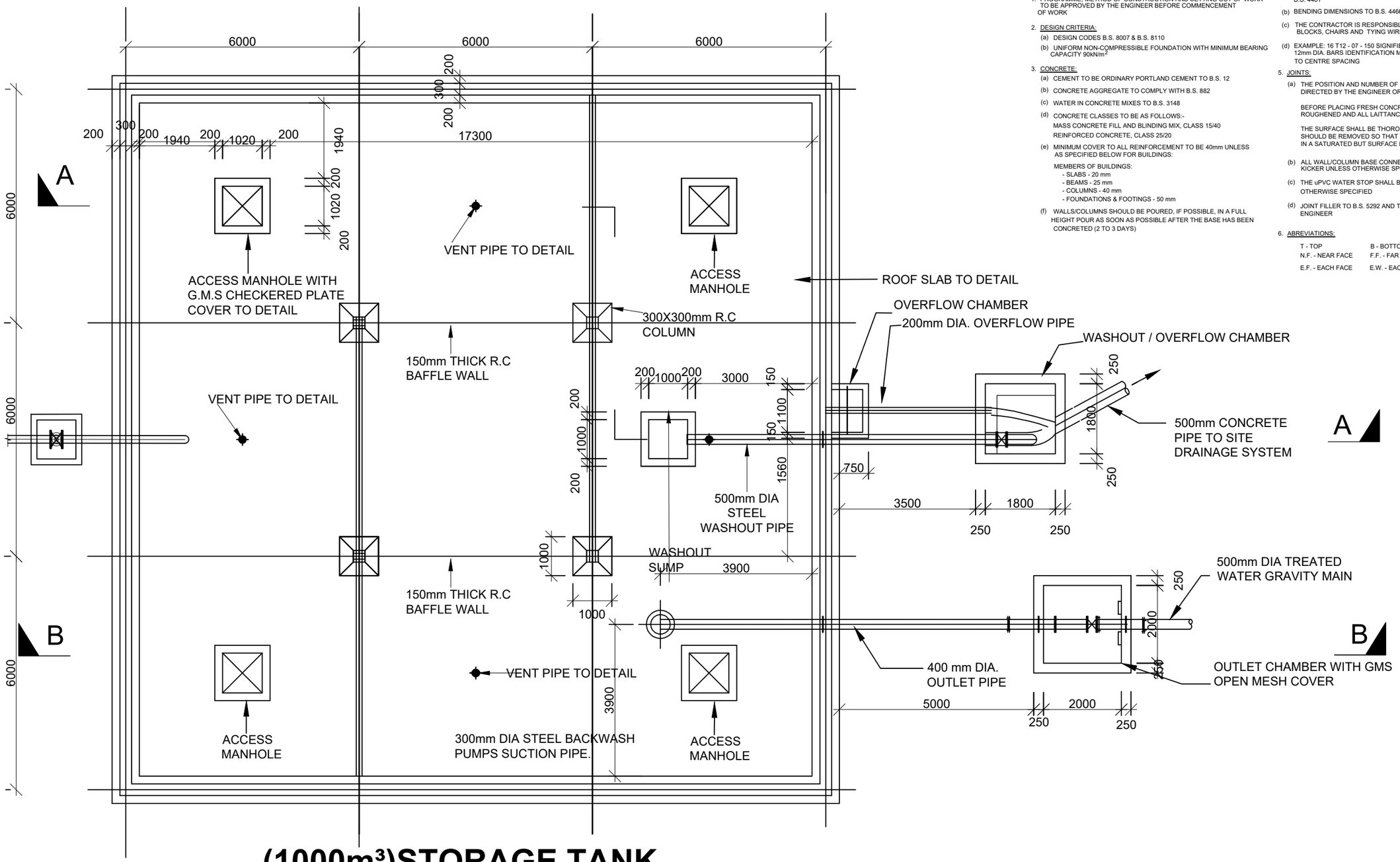
Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT
No;AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By
CAS CONSULTANTS LIMITED
Le' Mac Building, 1st fl, Off Church Road
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title
SLAB PLAN, SECTION A-A, SECTION B-B & SECTION C-C RC DETAILS

Designed By	: LK
Drawn By	: R.W
Checked By	: W.K
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/SDB/STR002



NOTES:

1. PROGRAMME, METHOD OF CONSTRUCTION AND SETTING OUT OF WORK TO BE APPROVED BY THE ENGINEER BEFORE COMMENCEMENT OF WORK
2. DESIGN CRITERIA:
   (a) DESIGN CODES B.S. 8007 & B.S. 8110
   (b) UNIFORM NON-COMPRESSIBLE FOUNDATION WITH MINIMUM BEARING CAPACITY 90kN/m^2
3. CONCRETE:
   (a) CEMENT TO BE ORDINARY PORTLAND CEMENT TO B.S. 12
   (b) CONCRETE AGGREGATE TO COMPLY WITH B.S. 882
   (c) WATER IN CONCRETE MIXES TO B.S. 3148
   (d) CONCRETE CLASSES TO BE AS FOLLOWS:-
   MASS CONCRETE FILL AND BLINDING MIX, CLASS 15/40
   REINFORCED CONCRETE, CLASS 25/20
   (e) MINIMUM COVER TO ALL REINFORCEMENT TO BE 40mm UNLESS AS SPECIFIED BELOW FOR BUILDINGS:
   MEMBERS OF BUILDINGS:
   - SLABS - 20 mm
   - BEAMS - 25 mm
   - COLUMNS - 40 mm
   - FOUNDATIONS & FOOTINGS - 50 mm
   (f) WALLS/COLUMNS SHOULD BE POURED, IF POSSIBLE, IN A FULL HEIGHT POUR AS SOON AS POSSIBLE AFTER THE BASE HAS BEEN CONCRETED (2 TO 3 DAYS)
4. REINFORCEMENT:
   (a) REINFORCEMENT TO BE HIGH YIELD SQUARE TWISTED BARS TO B.S. 4461
   (b) BENDING DIMENSIONS TO B.S. 4466
   (c) THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL SPACER BLOCKS, CHAIRS AND TYING WIRE
   (d) EXAMPLE: 16 T12 - 07 - 150 SIGNIFIES 16 No. HIGH TENSILE 12mm DIA. BARS IDENTIFICATION MARK 07 AT 150mm CENTRE TO CENTRE SPACING
5. JOINTS:
   (a) THE POSITION AND NUMBER OF INTERMEDIATE JOINTS TO BE AS DIRECTED BY THE ENGINEER OR AS SHOWN IN THE DRAWINGS.
   BEFORE PLACING FRESH CONCRETE THE OLD SURFACE SHALL BE ROUGHENED AND ALL LAITTANCE AND LOOSE MATERIAL REMOVED
   THE SURFACE SHALL BE THOROUGHLY WETTED BUT EXCESS WATER SHOULD BE REMOVED SO THAT THE CONSTRUCTION JOINTS ARE IN A SATURATED BUT SURFACE DRY CONDITION
   (b) ALL WALL/COLUMN BASE CONNECTIONS SHOULD HAVE 100mm KICKER UNLESS OTHERWISE SPECIFIED
   (c) THE uPVC WATER STOP SHALL BE 200mm WIDE UNLESS OTHERWISE SPECIFIED
   (d) JOINT FILLER TO B.S. 5292 AND TO BE APPROVED BY THE ENGINEER
6. ABREVIATIONS:

T - TOP	B - BOTTOM
N.F. - NEAR FACE	F.F. - FAR FACE
E.F. - EACH FACE	E.W. - EACH WAY

(1000m³)STORAGE TANK
ROOF PLAN

SCALE 1:100

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	May 2018
2.				
3.				
4.				

Client:
ATHI WATER WORKS DEVELOPMENT AGENCY
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

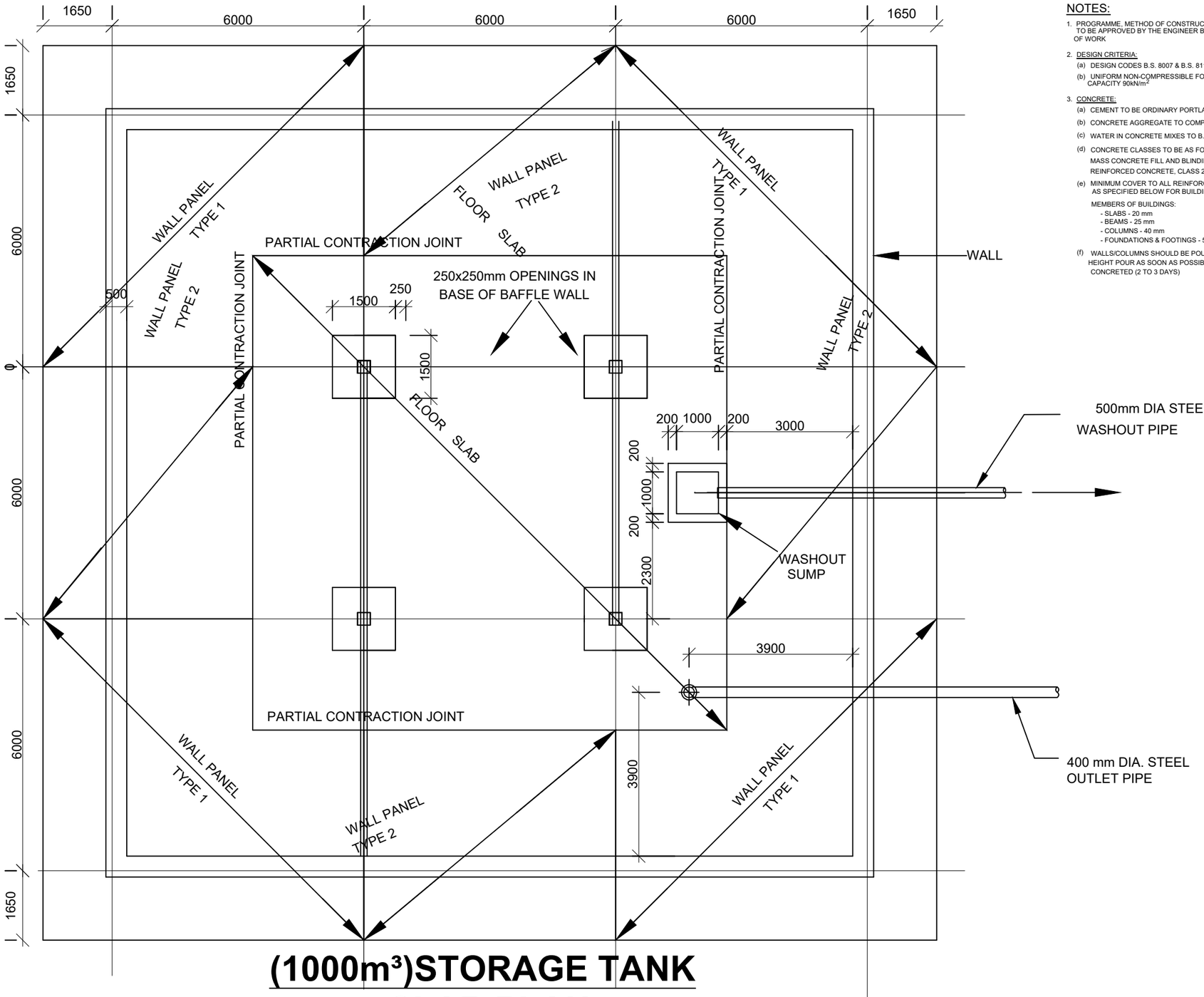
Financed By:
AFRICAN DEVELOPMENT BANK

Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT
CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:
CAS CONSULTANTS LIMITED
Le' Mac Building, 1st fl, Off Church Road
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title:
1000M³ CLEAR WATER TANK
ROOF PLAN

Designed By	:	L.K
Drawn By	:	R.W
Checked By	:	G.I
Approved By	:	S.M.M
Client approval	:	
Date	:	MARCH 2023
Drawing No	:	AWSB/MC/CWT/001



(1000m³)STORAGE TANK
SLAB PLAN

SCALE 1:100

NOTES:

1. PROGRAMME, METHOD OF CONSTRUCTION AND SETTING OUT OF WORK TO BE APPROVED BY THE ENGINEER BEFORE COMMENCEMENT OF WORK
2. DESIGN CRITERIA:
   (a) DESIGN CODES B.S. 8007 & B.S. 8110
   (b) UNIFORM NON-COMPRESSIBLE FOUNDATION WITH MINIMUM BEARING CAPACITY 90kN/m²
3. CONCRETE:
   (a) CEMENT TO BE ORDINARY PORTLAND CEMENT TO B.S. 12
   (b) CONCRETE AGGREGATE TO COMPLY WITH B.S. 882
   (c) WATER IN CONCRETE MIXES TO B.S. 3148
   (d) CONCRETE CLASSES TO BE AS FOLLOWS:-
   MASS CONCRETE FILL AND BLINDING MIX, CLASS 15/40
   REINFORCED CONCRETE, CLASS 25/20
   (e) MINIMUM COVER TO ALL REINFORCEMENT TO BE 40mm UNLESS AS SPECIFIED BELOW FOR BUILDINGS:
   MEMBERS OF BUILDINGS:
   - SLABS - 20 mm
   - BEAMS - 25 mm
   - COLUMNS - 40 mm
   - FOUNDATIONS & FOOTINGS - 50 mm
   (f) WALLS/COLUMNS SHOULD BE POURED, IF POSSIBLE, IN A FULL HEIGHT POUR AS SOON AS POSSIBLE AFTER THE BASE HAS BEEN CONCRETED (2 TO 3 DAYS)
4. REINFORCEMENT:
   (a) REINFORCEMENT TO BE HIGH YIELD SQUARE TWISTED BARS TO B.S. 4461
   (b) BENDING DIMENSIONS TO B.S. 4466
   (c) THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL SPACER BLOCKS, CHAIRS AND TYING WIRE
   (d) EXAMPLE: 16 T12 - 07 - 150 SIGNIFIES 16 No. HIGH TENSILE 12mm DIA. BARS IDENTIFICATION MARK 07 AT 150mm CENTRE TO CENTRE SPACING
5. JOINTS:
   (a) THE POSITION AND NUMBER OF INTERMEDIATE JOINTS TO BE AS DIRECTED BY THE ENGINEER OR AS SHOWN IN THE DRAWINGS.
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   THE SURFACE SHALL BE THOROUGHLY WETTED BUT EXCESS WATER SHOULD BE REMOVED SO THAT THE CONSTRUCTION JOINTS ARE IN A SATURATED BUT SURFACE DRY CONDITION
   (b) ALL WALL/COLUMN BASE CONNECTIONS SHOULD HAVE 100mm KICKER UNLESS OTHERWISE SPECIFIED
   (c) THE uPVC WATER STOP SHALL BE 200mm WIDE UNLESS OTHERWISE SPECIFIED
   (d) JOINT FILLER TO B.S. 5292 AND TO BE APPROVED BY THE ENGINEER
6. ABREVIATIONS:

T - TOP	B - BOTTOM
N.F. - NEAR FACE	F.F. - FAR FACE
E.F. - EACH FACE	E.W. - EACH WAY

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	May 2018
2.				
3.				
4.				

Client:
ATHI WATER WORKS DEVELOPMENT AGENCY
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

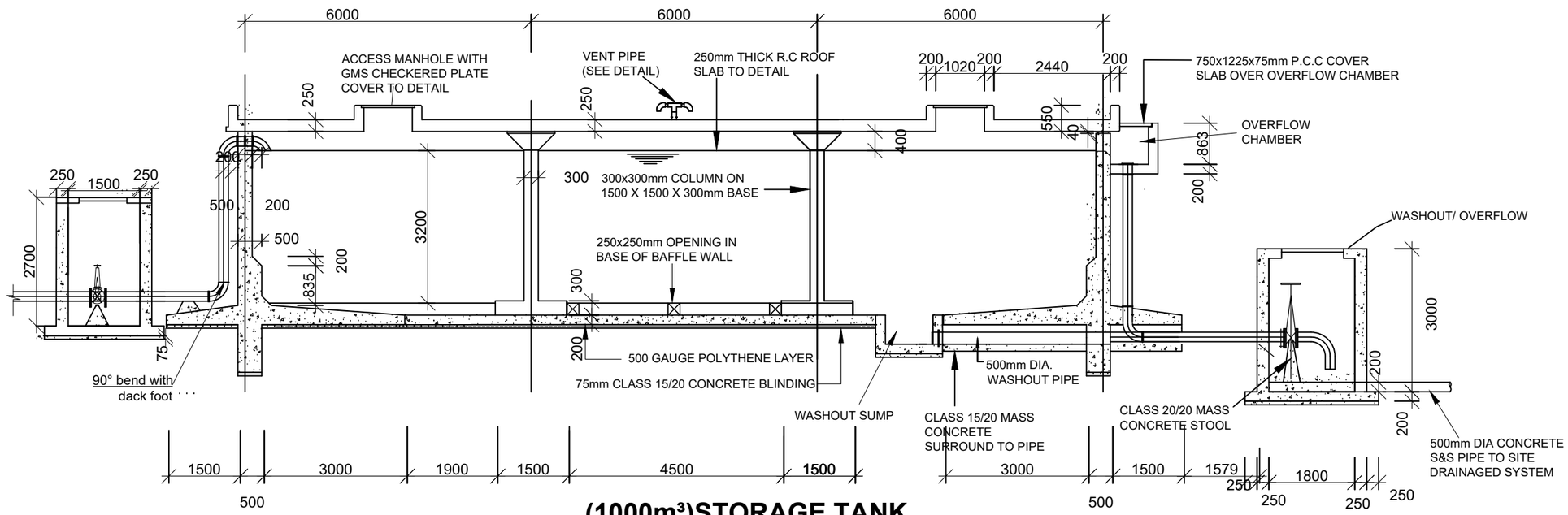
Financed By:
AFRICAN DEVELOPMENT BANK

Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT
CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:
CAS CONSULTANTS LIMITED
Le' Mac Building, 1st fl, Off Church Road
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

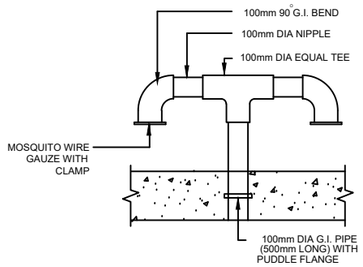
Drawing Title:
1000M³ CLEAR WATER TANK
SLAB PLAN

Designed By	: L.K
Drawn By	: R.W
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/CWT/002



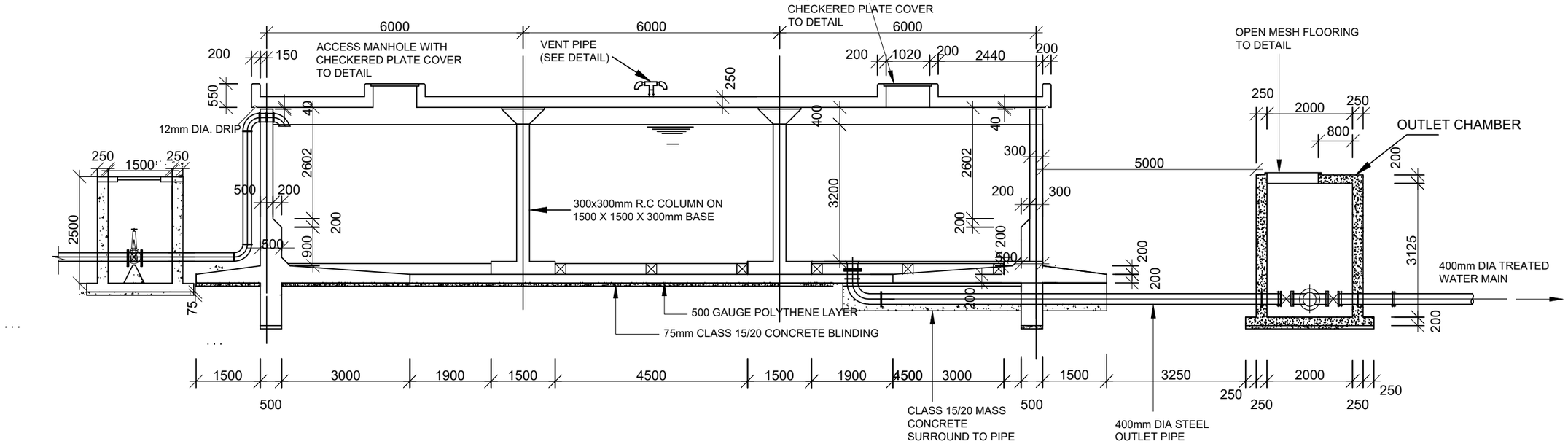
(1000m³)STORAGE TANK SECTION A-A

SCALE 1:100



VENT PIPE DETAIL

SCALE 1:30



(1000m³)STORAGE TANK SECTION B-B

SCALE 1:100

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	May 2018
2.				
3.				
4.				

Client:
ATHI WATER WORKS DEVELOPMENT AGENCY
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:
AFRICAN DEVELOPMENT BANK

Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT
CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:
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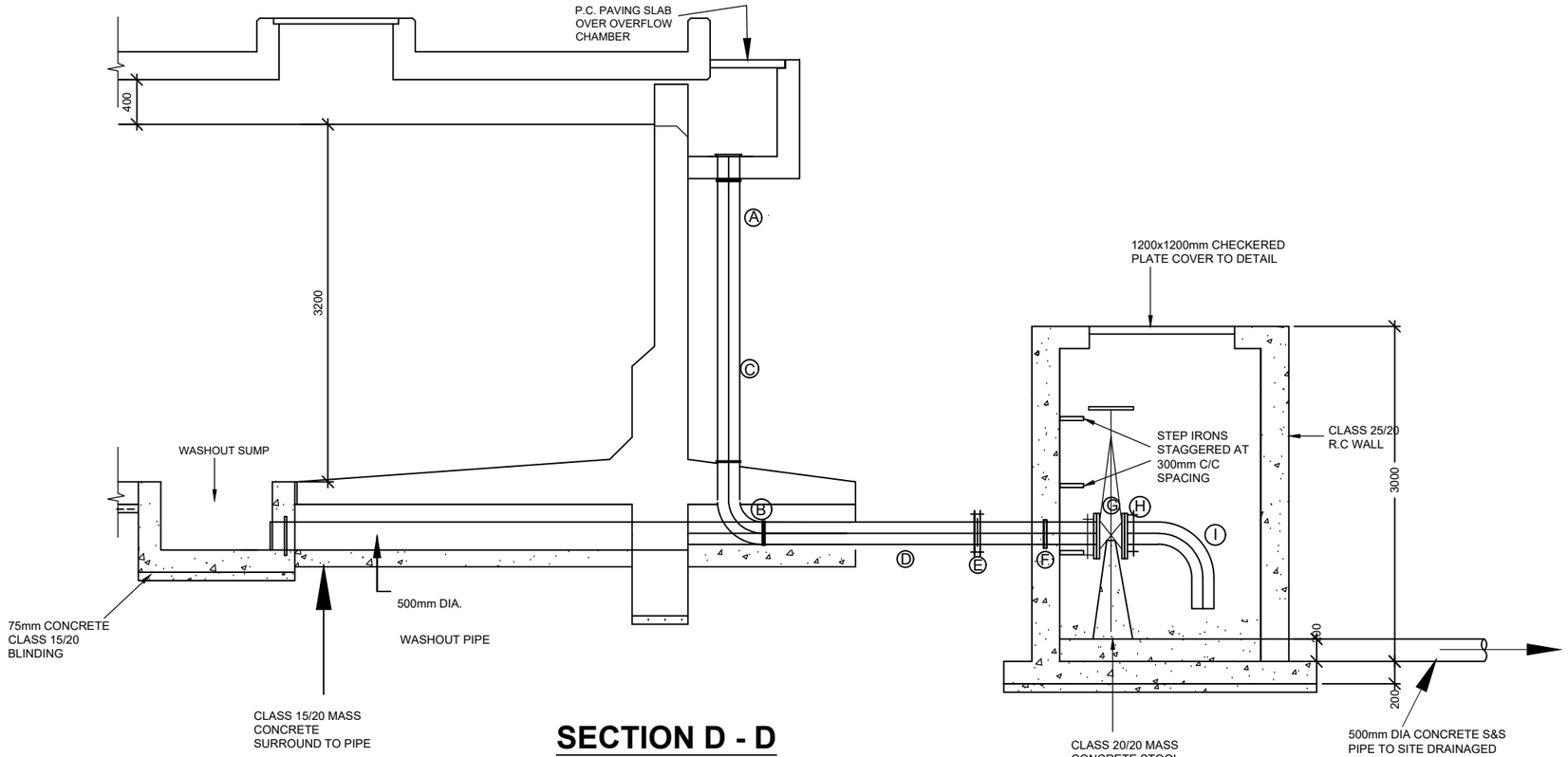
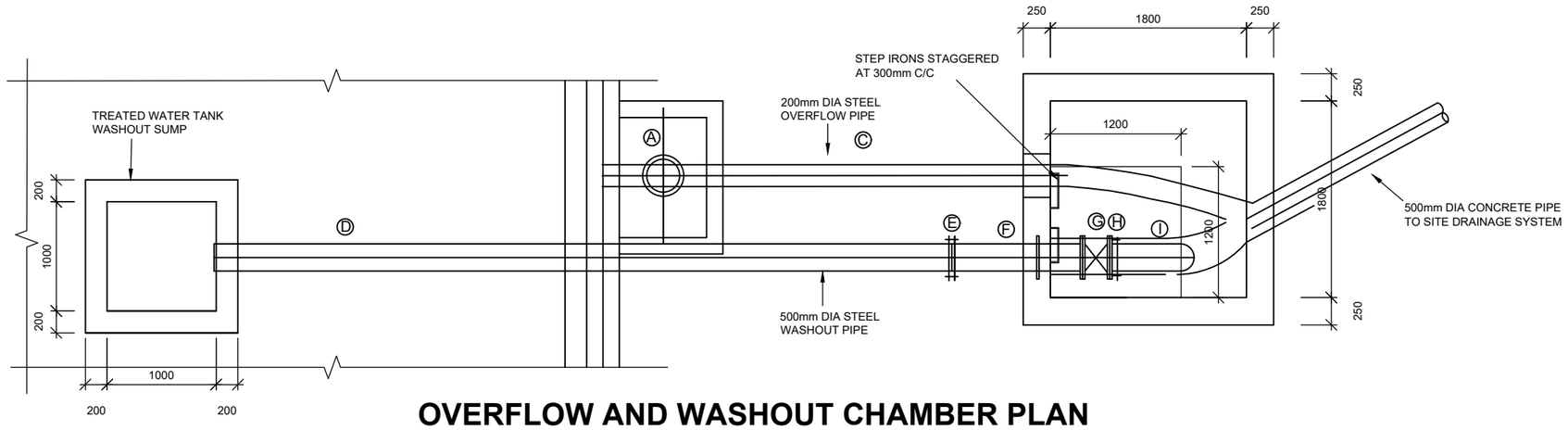
Le' Mac Building, 1st fl, Off Church Road
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title:
1000M³ CLEAR WATER TANK
SECTIONS A-A,B-B
&
VENT PIPE DETAIL

Designed By	: L.K
Drawn By	: R.W
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/CWT/003



SECTION D - D
OVERFLOW AND WASHOUT DETAILS
SCALE 1:50



OVERFLOW AND WASHOUT CHAMBER PLAN
SCALE 1:50

NOTES:

1. PROGRAMME, METHOD OF CONSTRUCTION AND SETTING OUT OF WORK TO BE APPROVED BY THE ENGINEER BEFORE COMMENCEMENT OF WORK
2. DESIGN CRITERIA:
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   (c) WATER IN CONCRETE MIXES TO B.S. 3148
   (d) CONCRETE CLASSES TO BE AS FOLLOWS:-
   MASS CONCRETE FILL AND BLINDING MIX, CLASS 15/40
   REINFORCED CONCRETE, CLASS 25/20
   (e) MINIMUM COVER TO ALL REINFORCEMENT TO BE 40mm UNLESS AS SPECIFIED BELOW FOR BUILDINGS:
   MEMBERS OF BUILDINGS:
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   - BEAMS - 25 mm
   - COLUMNS - 40 mm
   - FOUNDATIONS & FOOTINGS - 50 mm
   (f) WALLS/COLUMNS SHOULD BE POURED, IF POSSIBLE, IN A FULL HEIGHT POUR AS SOON AS POSSIBLE AFTER THE BASE HAS BEEN CONCRETED (2 TO 3 DAYS)
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   (c) THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL SPACER BLOCKS, CHAIRS AND TYING WIRE
   (d) EXAMPLE: 16 T12 - 07 - 150 SIGNIFIES 16 No. HIGH TENSILE 12mm DIA. BARS IDENTIFICATION MARK 07 AT 150mm CENTRE TO CENTRE SPACING
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   (d) JOINT FILLER TO B.S. 5292 AND TO BE APPROVED BY THE ENGINEER
6. ABREVIATIONS:

T - TOP	B - BOTTOM
N.F. - NEAR FACE	F.F. - FAR FACE
E.F. - EACH FACE	E.W. - EACH WAY

OVERFLOW PIPEWORK SCHEDULE
APPROVED LINED STEEL PIPES AND FITTINGS

ITEM No.	DESCRIPTION	DIA. (mm)	LENGTH (mm)	QUANTITY (No.)
Ⓐ	FLANGED SPIGOT PIPE WITH PUDDLE FLANGE 100mm FROM SPIGOT END	200	1600	1
Ⓑ	ALL FLANGED 90° BEND	200Ø 600 600 200Ø		1
Ⓒ	FLANGED SPIGOT PIPE WITH SPIGOT END BEVELLED	200	3000	1

SCOUR PIPEWORK SCHEDULE
APPROVED LINED STEEL PIPES AND FITTINGS

ITEM No.	DESCRIPTION	DIA. (mm)	LENGTH (mm)	QUANTITY (No.)
Ⓓ	PLAIN ENDED PIPE WITH PUDDLE FLANGE AT 120mm FROM ONE END (CUT TO SUIT ON SITE)	500	7000	1
Ⓔ	COUPLING	500	-	1
Ⓕ	FLANGED SPIGOT PIPE WITH PUDDLE FLANGE AT 430mm FROM FLANGED END	500	1200	1
Ⓖ	ALL FLANGED GATE VALVE	500	-	1
Ⓗ	FLANGE ADAPTOR	500	-	1
Ⓘ	PLAIN ENDED 90° BEND	500	500Ø 500 500 500Ø	1

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	May 2018
2.				
3.				
4.				

Client:
ATHI WATER WORKS DEVELOPMENT AGENCY
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

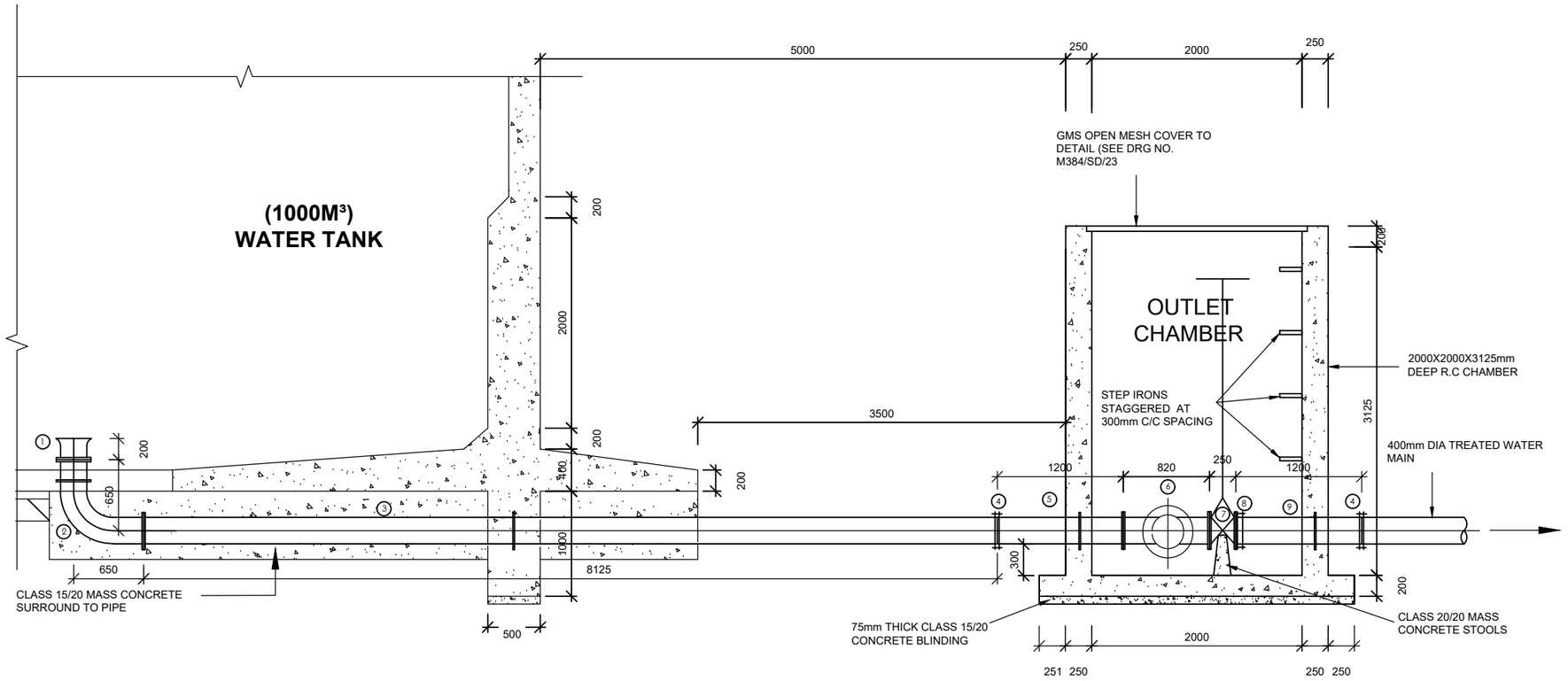
Financed By:
AFRICAN DEVELOPMENT BANK

Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT
CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:
CAS CONSULTANTS LIMITED
Le' Mac Building, 1st fl, Off Church Road
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

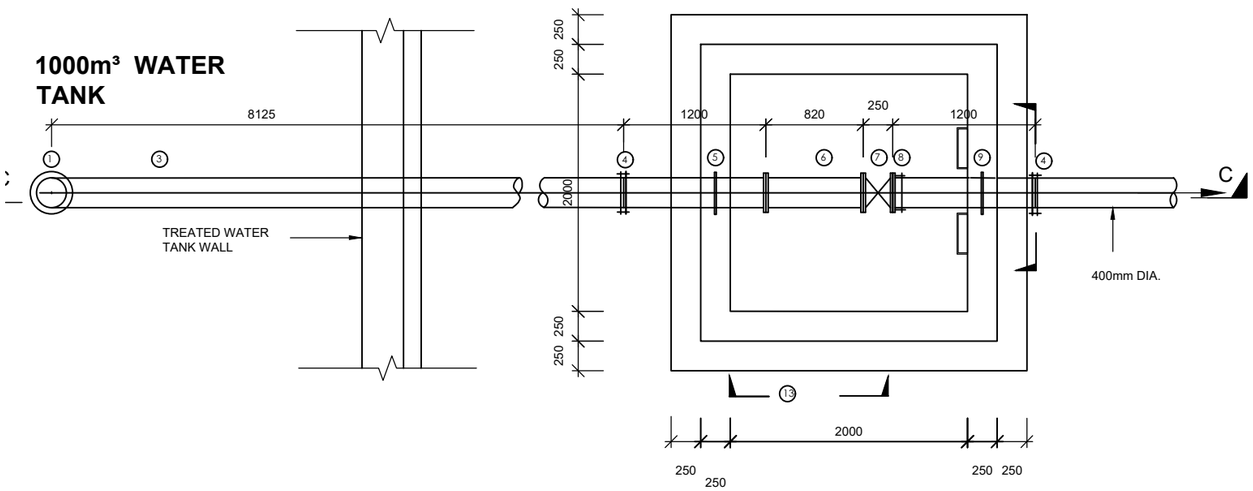
Drawing Title:
1000M³ CLEAR WATER TANK
OVERFLOW AND WASHOUT CHAMBER PLAN

Designed By	: L.K
Drawn By	: R.W
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/CWT/004



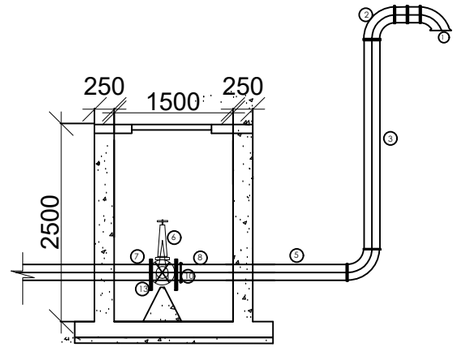
SECTION C-C

SCALE 1:75



OUTLET CHAMBER PLAN

SCALE 1:75



INLET CHAMBER PLAN

SCALE 1:75

INLET PIPEWORK SCHEDULE APPROVED LINED STEEL PIPES AND FITTINGS

ITEM No.	DESCRIPTION	DIA. (mm)	LENGTH (mm)	QUANTITY (No.)
1	FLANGED SPECIAL BELLMOUTH	500	500	1
2	ALL FLANGED 90° BEND WITH PUDDLE FLANGE 500mm FROM ONE END			1
3	STEEL FLANGED SPIGOT PIPE WITH PUDDLE FLANGE AT 2630mm FROM FLANGED END	500	8500	1
4	COUPLINGS	500	-	2
5	STEEL FLANGED SPIGOT PIPE WITH PUDDLE FLANGE 1450mm FROM SPIGOT END	500	1200	1
6	ALL FLANGED SLUICE VALVE (EURO 20 SERIES TYPE 23 OR APPROVED EQUIVALENT)	500	250	1
7	FLANGE ADAPTOR	500	-	1
8	PLAIN ENDED PIPE WITH PUDDLE FLANGE AT 720mm FROM ONE END	500	1200	1
9	PLAIN ENDED PIPE WITH PUDDLE FLANGE AT 450mm FROM ONE END	500	1200	1
10	COUPLING	500	-	1

OUTLET PIPEWORK SCHEDULE APPROVED LINED STEEL PIPES AND FITTINGS

ITEM No.	DESCRIPTION	DIA. (mm)	LENGTH (mm)	QUANTITY (No.)
1	FLANGED SPECIAL BELLMOUTH	400	400	1
2	ALL FLANGED 90° BEND WITH PUDDLE FLANGE 400mm FROM ONE END			1
3	STEEL FLANGED SPIGOT PIPE WITH PUDDLE FLANGE AT 3530mm FROM FLANGED END	400	3300	1
4	COUPLINGS	400	-	2
5	STEEL FLANGED SPIGOT PIPE WITH PUDDLE FLANGE 775mm FROM SPIGOT END	400	1200	1
6	ALL FLANGED 250mm X 250mm X 400mm TEE			0
7	ALL FLANGED GATE VALVE (EURO 20 SERIES TYPE 23 OR APPROVED EQUIVALENT)	400	250	1
8	FLANGE ADAPTOR	400	-	1
9	PLAIN ENDED PIPE WITH PUDDLE FLANGE AT 445mm FROM ONE END	400	445	1
10	ALL FLANGED GATE VALVE (EURO 20 SERIES TYPE 23 OR APPROVED EQUIVALENT)	400	-	1
11	FLANGE ADAPTOR	400	-	1
12	PLAIN ENDED PIPE WITH PUDDLE FLANGE AT 605mm FROM ONE END	400	605	1
13	COUPLING	400	-	1

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	May 2018
2.				
3.				
4.				

Client:
ATHI WATER WORKS DEVELOPMENT AGENCY
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

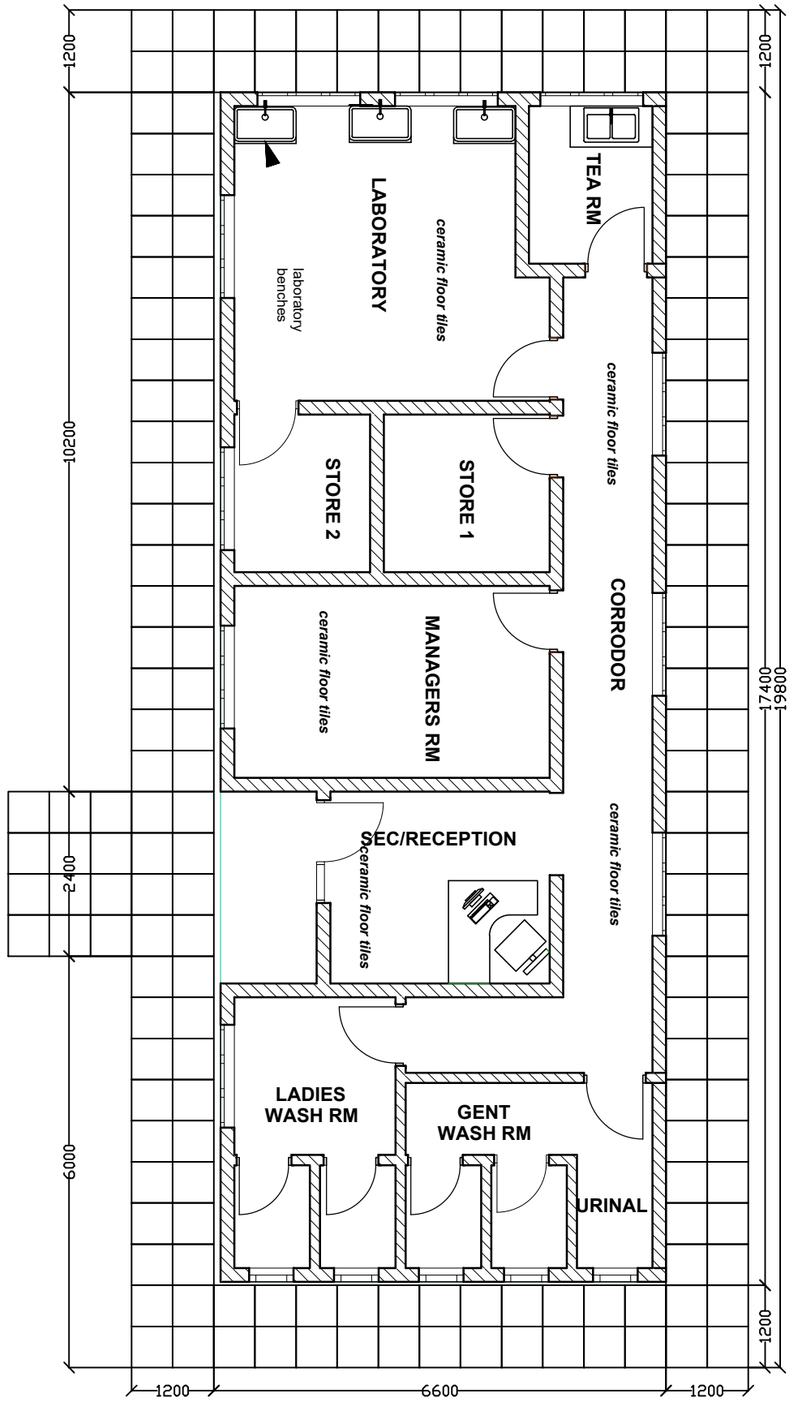
Financed By:
AFRICAN DEVELOPMENT BANK

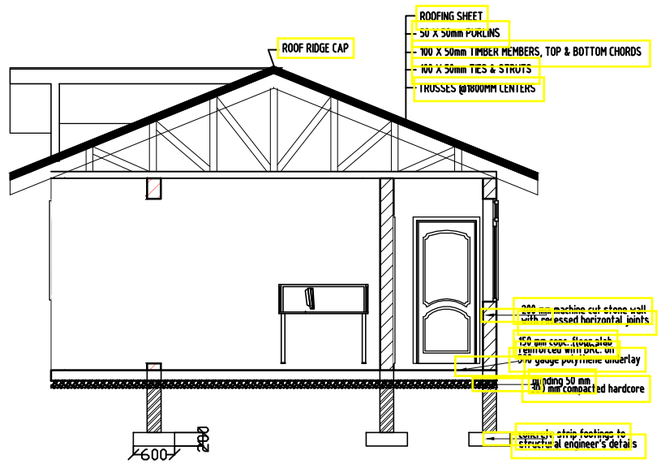
Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT
CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:
CAS CONSULTANTS LIMITED
Le' Mac Building, 1st fl, Off Church Road
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing title:
1000M³ CLEAR WATER TANK
INLET, OUTLET CHAMBER PLAN AND SECTION

Designed By	: L.K
Drawn By	: R.W
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/CWT/005





SECTION
SCALE 1:75

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client

ATHI WATER WORKS DEVELOPMENT AGENCY
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By

CAS CONSULTANTS LIMITED
Le' Mac Building, 1st Fl, Off Church Road
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title

ADMINISTRATION BLOCK PLAN AND SECTION

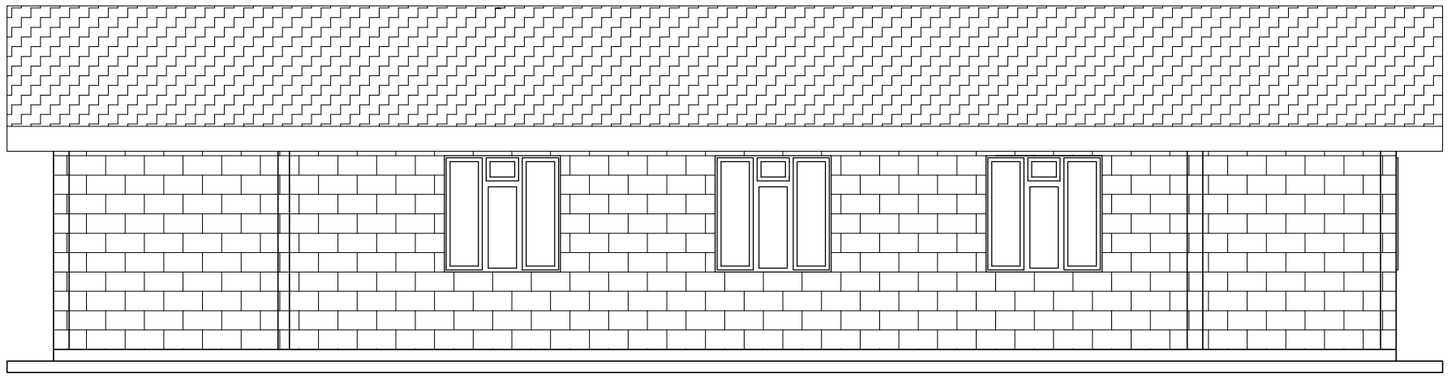
Designed By	:	LK
Drawn By	:	D.G.M
Checked By	:	W.K
Approved By	:	S.M.M
Client approval	:	
Date	:	MARCH 2023
Drawing No	:	AWSB/MC/AB/002



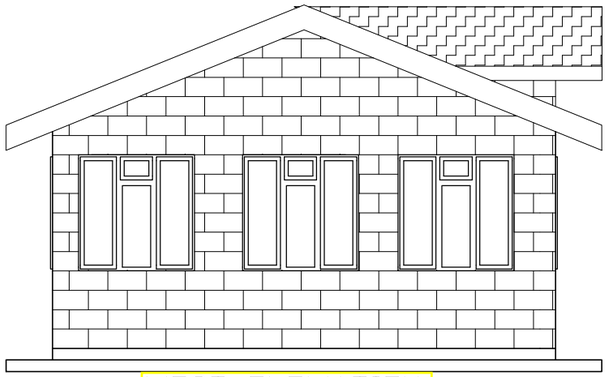
NORTH ELEVATION
SCALE 1:75



EAST ELEVATION
SCALE 1:75



SOUTH ELEVATION
SCALE 1:75



WEST ELEVATION
SCALE 1:75

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client

ATHI WATER WORKS DEVELOPMENT AGENCY
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By

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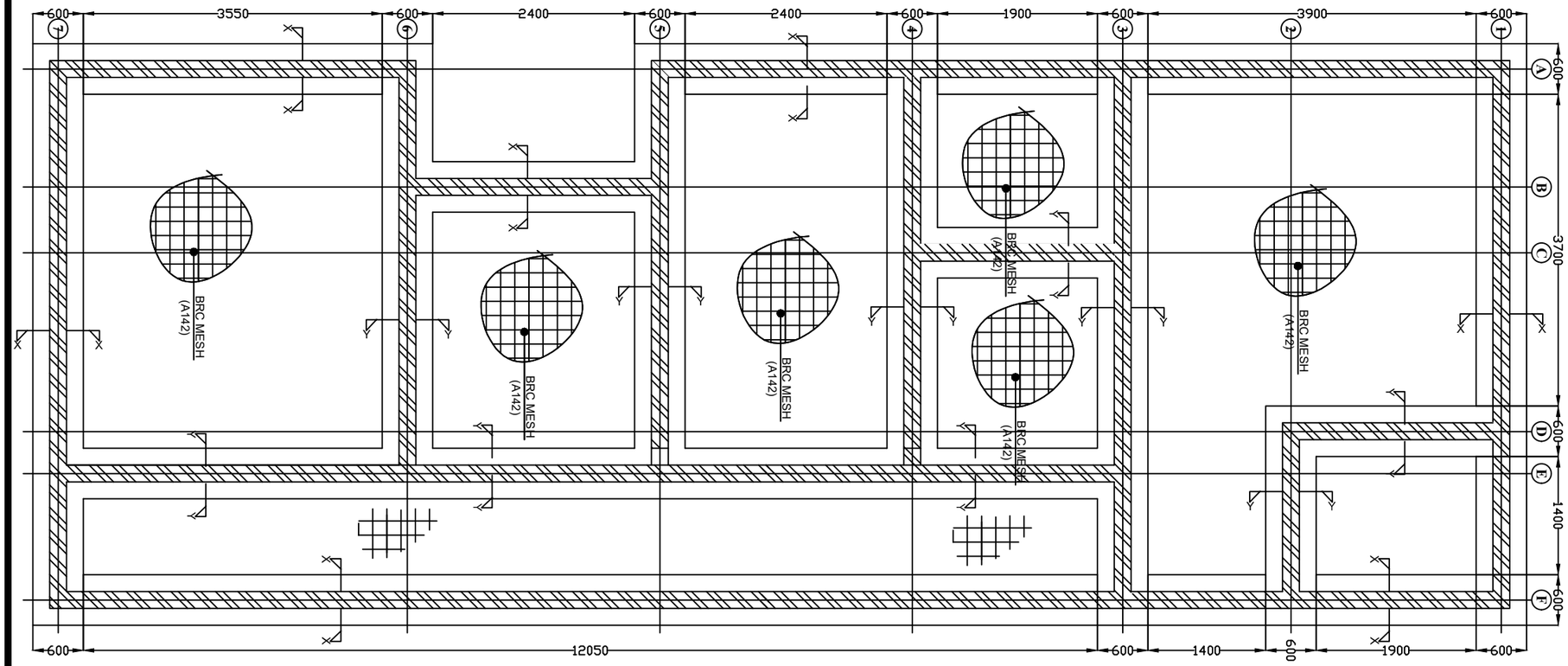
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

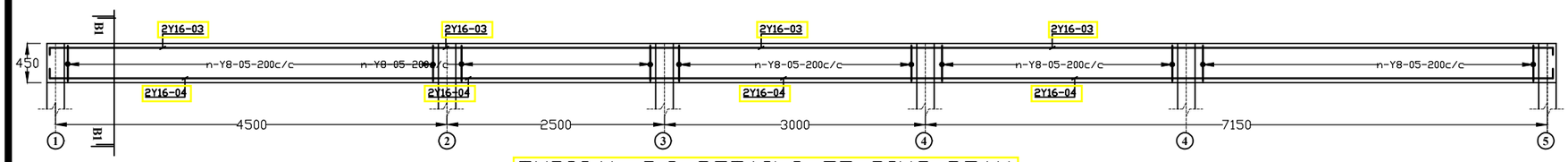
Drawing title:

ADMINISTRATION BLOCK
ELEVATIONS AND SECTIONS

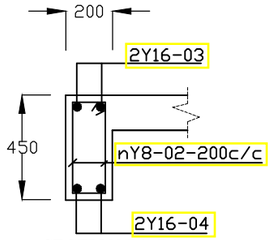
Designed By	:	LK
Drawn By	:	D.G.M
Checked By	:	W.K
Approved By	:	S.M.M
Client approval	:	
Date	:	MARCH 2023
Drawing No	:	AWSB/MC/AB/001



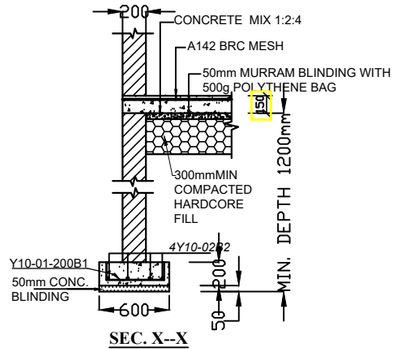
ADMINISTRATION BLOCK FOUNDATION PLAN
SCALE 1:60



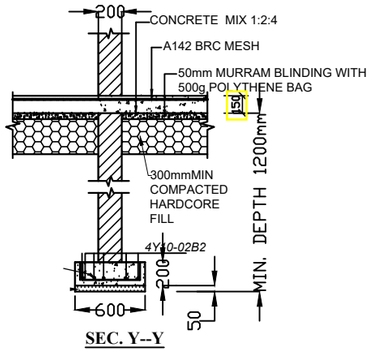
TYPICAL R.C DETAILS OF RING BEAM (450 X 200)
SCALE 1:50



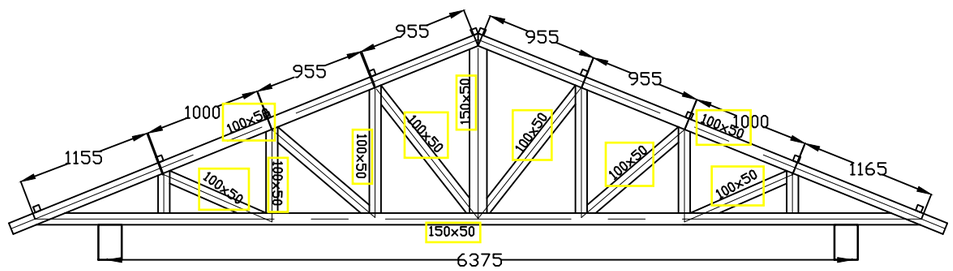
SECTION(B1--B1) (450X200)
SCALE : 1:25



SEC. X--X
SCALE : 1:50



SEC. Y--Y
SCALE : 1:50



TRUSS TYPE 1
SCALE 1:50

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client
ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By
AFRICAN DEVELOPMENT BANK

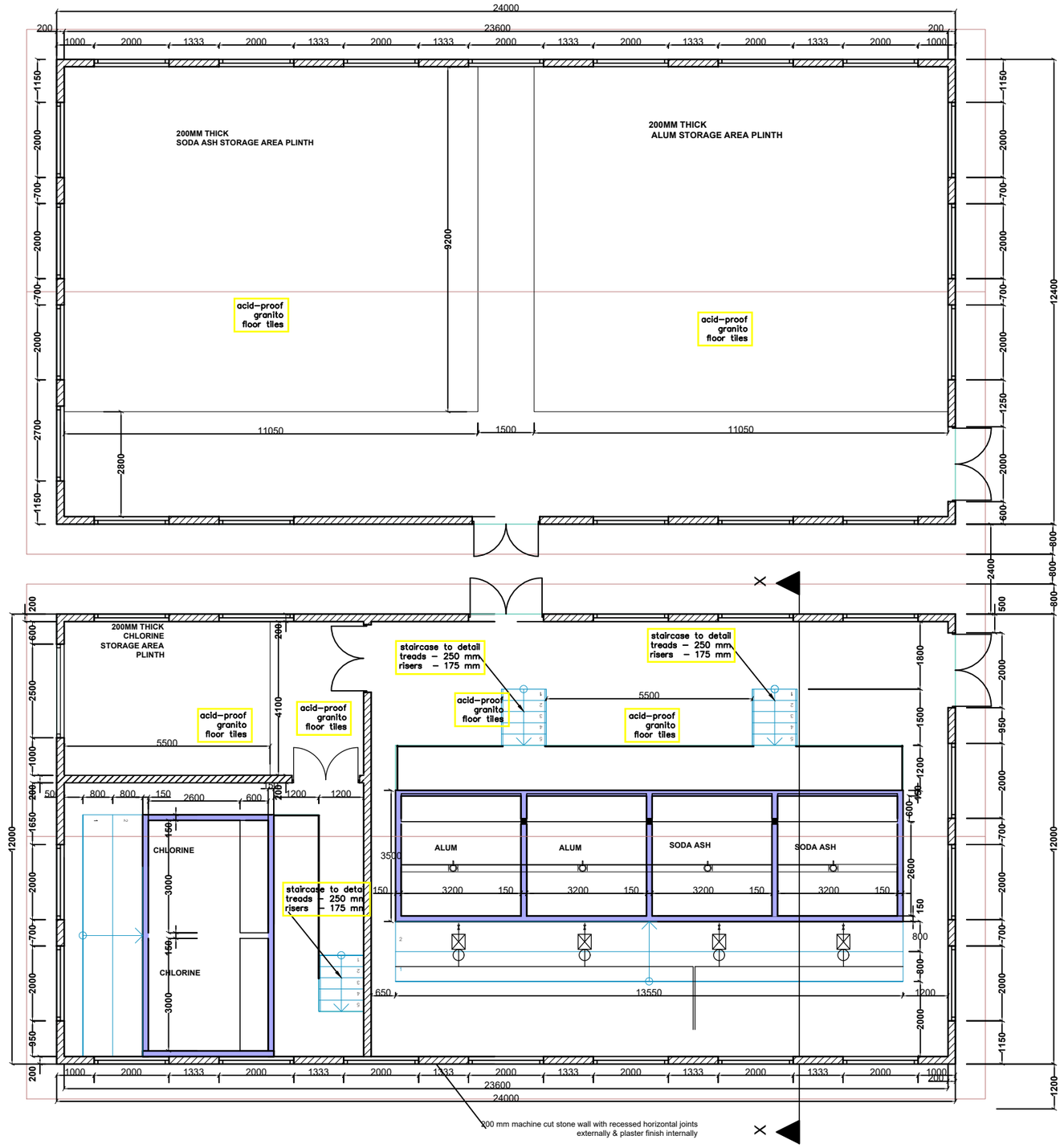
Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

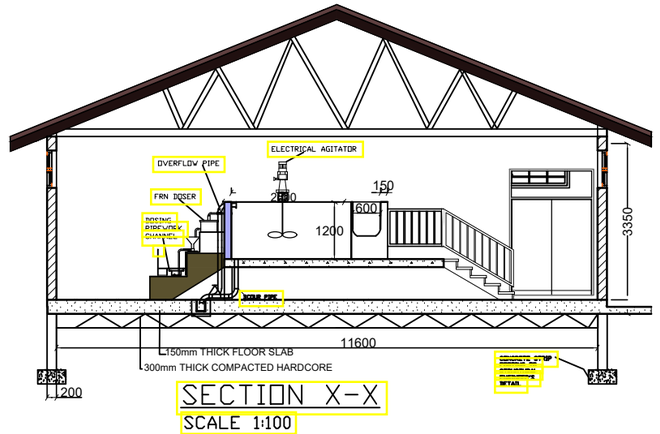
CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By
CAS CONSULTANTS LIMITED
Le' Mac Building, 1st Fl, Off Church Road
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing title:
ADMINISTRATION BLOCK STRUCTURAL DETAILS

Designed By	: LK
Drawn By	: D.G.M
Checked By	: W.K
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/AB/003





SECTION X-X
SCALE 1:100

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	April 2018
2.				
3.				
4.				

Client
ATHI WATER WORKS DEVELOPMENT AGENCY
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
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AFRICAN DEVELOPMENT BANK

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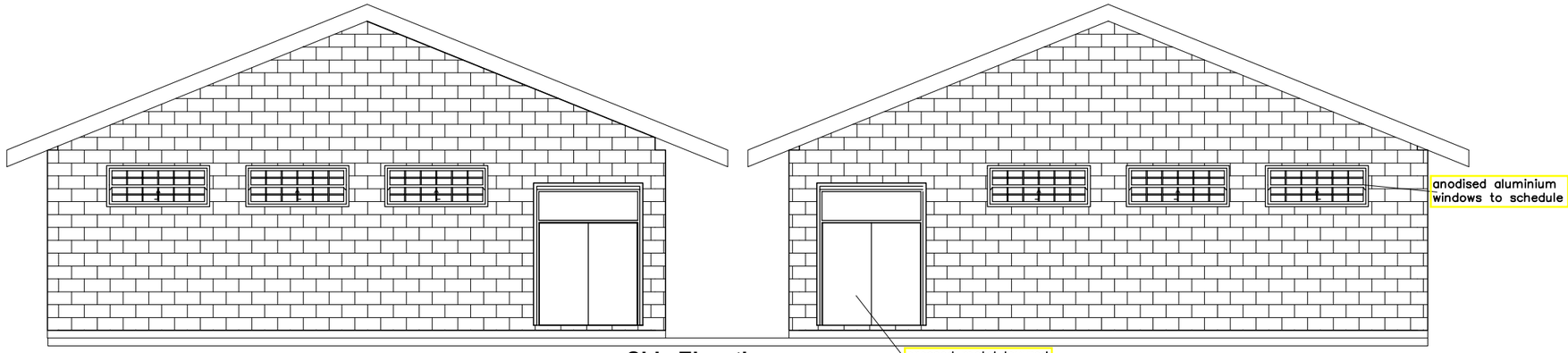
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title
CHEMICAL BUILDING PLAN ELEVATIONS

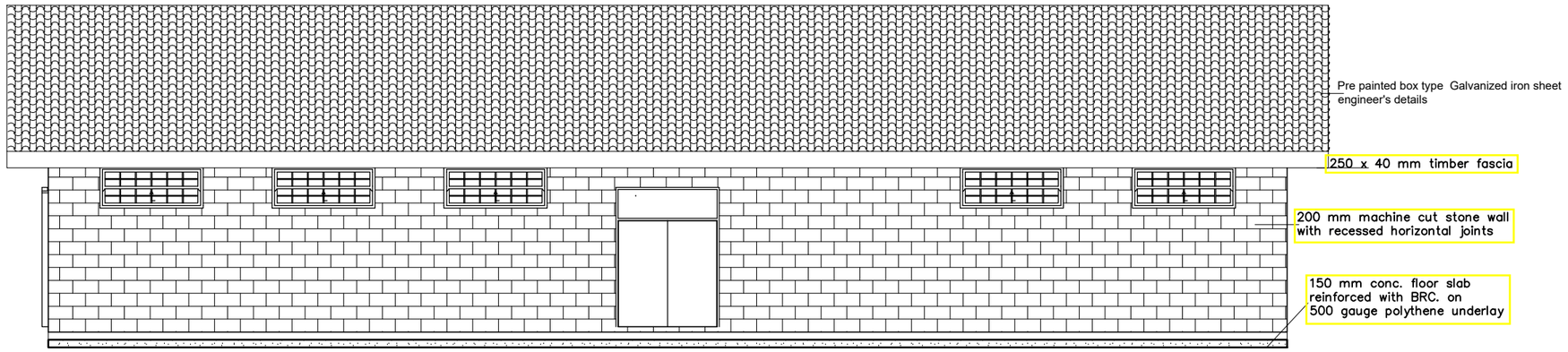
Designed By	:	LK
Drawn By	:	R.W
Checked By	:	W.K
Approved By	:	S.M.M
Client approval	:	
Date	:	MARCH 2023
Drawing No	:	AWSB/MC/CB/001



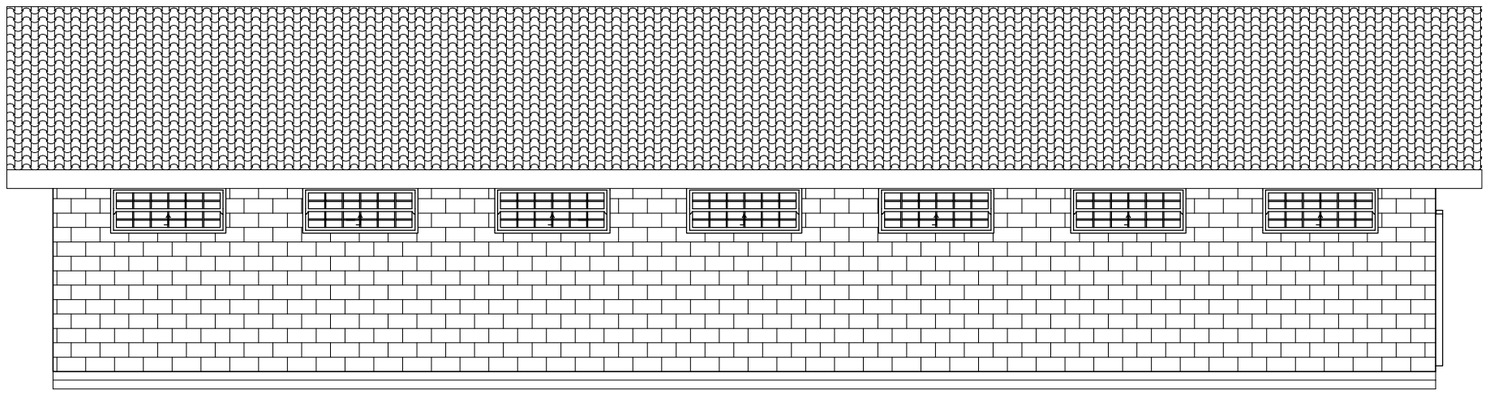
Side Elevation
SCALE 1:100

NOTES:

1. CHEMICAL DOSING PIPES SHALL BE REINFORCED NYLON PIPES OR uPVC AS INDICATED ON DETAILS
2. SHOP DRAWINGS FOR PIPEWORK TO BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE FABRICATION



Front Elevation
SCALE 1:100



Rear Elevation
SCALE 1:100

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	April 2018
2.				
3.				
4.				

Client

ATHI WATER WORKS DEVELOPMENT AGENCY
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

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Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

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AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By

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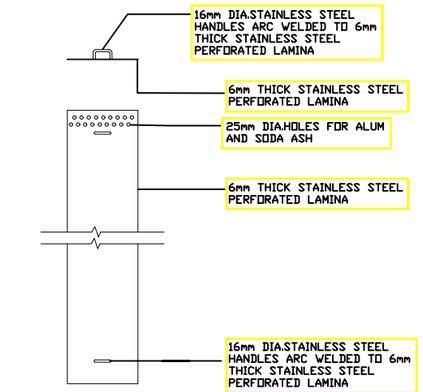
Le' Mac Building, 1st fl, Off Church Road
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title

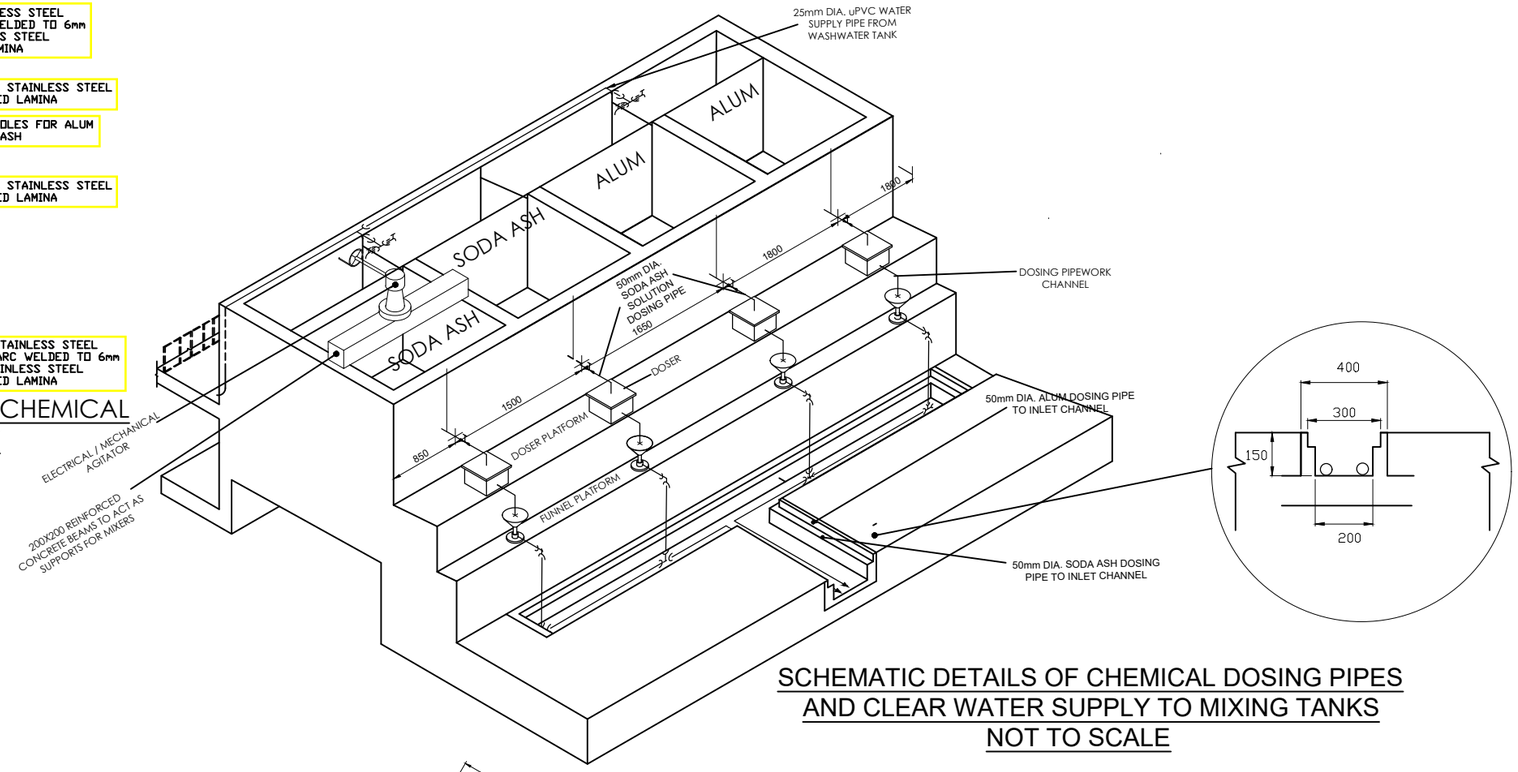
CHEMICAL BUILDING PLAN ELEVATIONS

Designed By	: LK
Drawn By	: R.W
Checked By	: W.K
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/CB/002

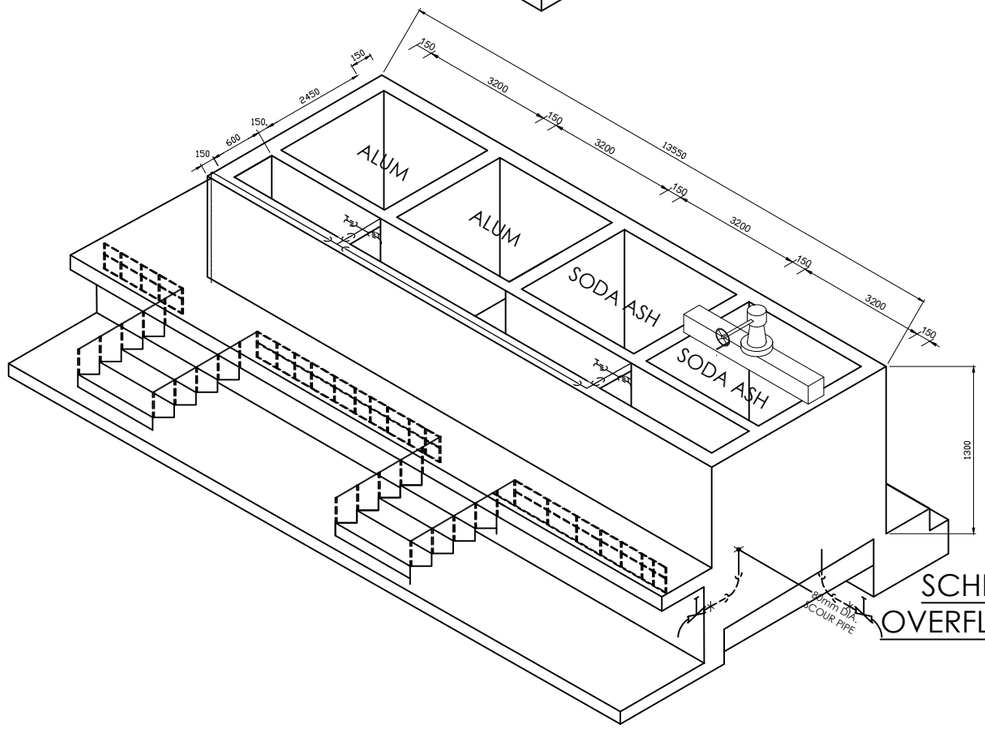


SECTION AND PLAN OF CHEMICAL MIXING TRAY

SCALE 1 : 50



SCHEMATIC DETAILS OF CHEMICAL DOSING PIPES AND CLEAR WATER SUPPLY TO MIXING TANKS NOT TO SCALE



SCHEMATIC DIAGRAM OF MIXING TANKS OVERFLOW PIPEWORK AND SCOUR PIPEWORK

NTS

LEGEND FOR ISOMETRIC DETAILS OF CLEAR WATER SUPPLY TO CHEMICAL MIXING TANKS

- uPVC PIPE
- uPVC SOCKETED TEE
- uPVC SOCKETED BEND
- SOCKET OR COUPLER
- uPVC TAP

LEGEND FOR ISOMETRIC DETAILS OF CHEMICAL DOSING PIPEWORK

- uPVC PIPE
- uPVC FEMALE THREADED STOP VALVE (SAUNDERS VALVES)
- uPVC SOCKETED TEE
- uPVC SOCKETED BEND WITH RODING EYE

LEGEND FOR ISOMETRIC DETAILS OF OVERFLOW PIPEWORK

- uPVC PIPE
- uPVC SOCKETED BEND (90°)

LEGEND FOR ISOMETRIC DETAILS OF SCOUR PIPEWORK

- uPVC PIPE
- uPVC FEMALE THREADED STOP VALVE (SAUNDERS VALVES)
- uPVC SOCKETED BEND
- uPVC SIGOT BEND WITH ONE END THREADED

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	April 2018
2.				
3.				
4.				

Client

ATHI WATER WORKS DEVELOPMENT AGENCY
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

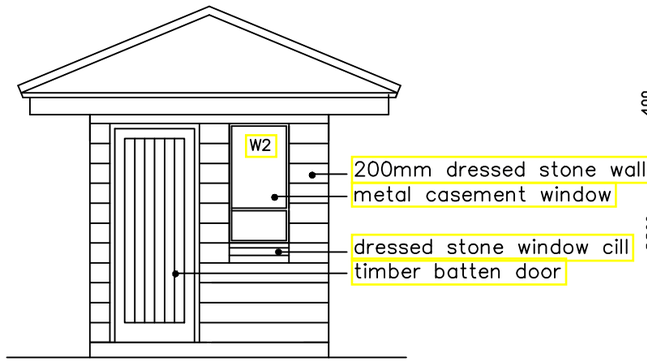
Reviewed By

CAS CONSULTANTS LIMITED
Le' Mac Building, 1st fl, Off Church Road
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title

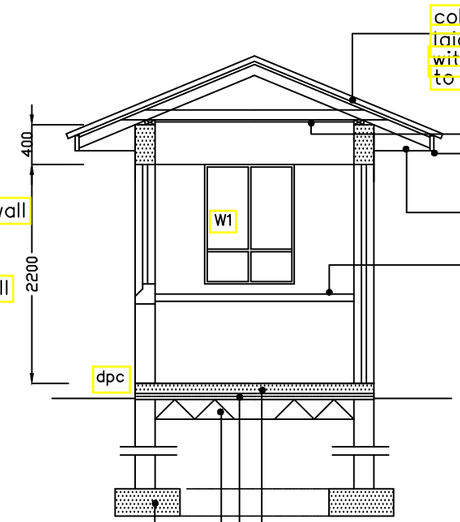
SCHEMATIC DIAGRAMS OF THE TANKS

Designed By	:	LK
Drawn By	:	R.W
Checked By	:	W.K
Approved By	:	S.M.M
Client approval	:	
Date	:	MARCH 2023
Drawing No	:	AWSB/MC/CB/003



200mm dressed stone wall
metal casement window
dressed stone window cill
timber batten door

elevation

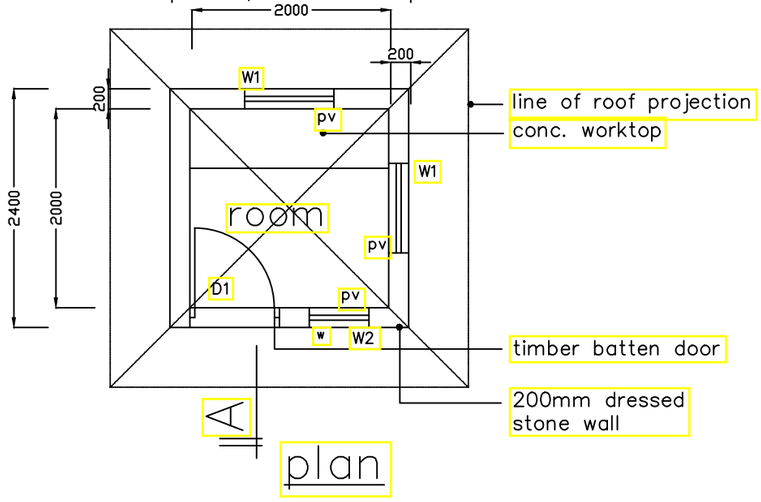


colured conc. interlocking roofing tiles laid on 25x50mm timber battens at 340mm c/c with polythene sheet underlay on timber rafters to S.E.s details
chip board ceiling
ex 200x40mm timber fascia board
600mm roof projection
conc. worktop
100mm floor slab + BRC
polythene sheeting 500 gauge
200mm compacted hardcore
600x200mm conc. footing

section A–A

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.
2. THIS DRAWING MUST NOT BE SCALED, ONLY FIGURED DIMENSIONS SHOULD BE USED.
3. MASS CONCRETE TO BE GRADE 15.
4. REINFORCED CONCRETE TO BE GRADE 35



line of roof projection
conc. worktop
timber batten door
200mm dressed stone wall

plan

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March; 2018
2.				
3.				
4.				

Client
ATHI WATER WORKS DEVELOPMENT AGENCY
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By
AFRICAN DEVELOPMENT BANK

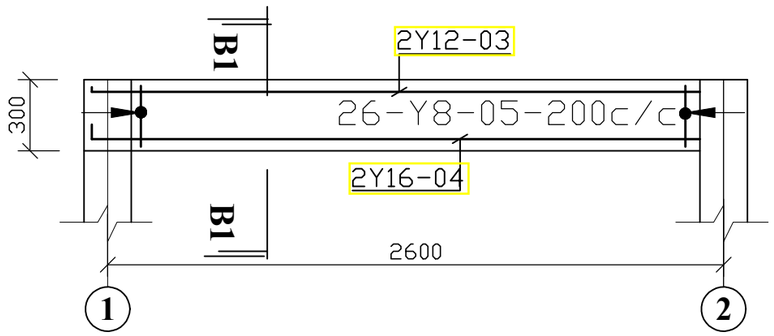
Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By
CAS CONSULTANTS LIMITED
Le' Mac Building, 1st fl, Off Church Road
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

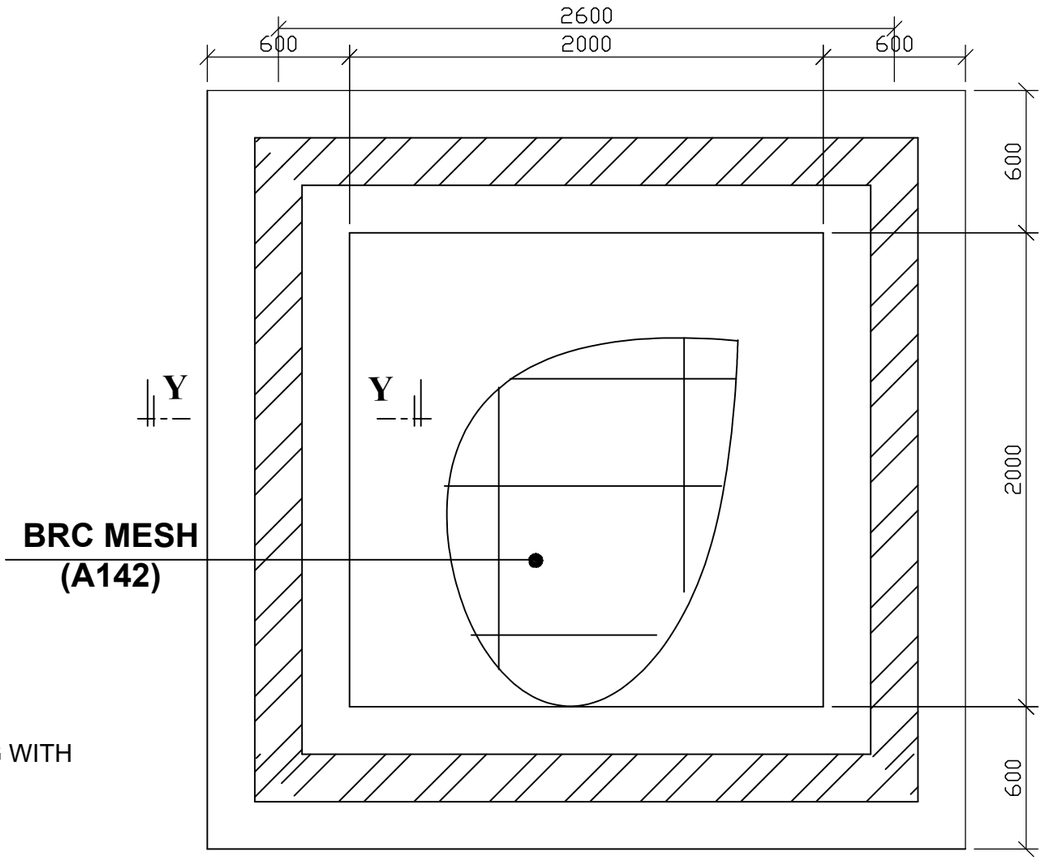
Drawing title:
GUARD HOUSE PLAN,SECTION AND ELEVATION

Designed By	: LK
Drawn By	: D.G.M
Checked By	: W.K
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/GUH/001



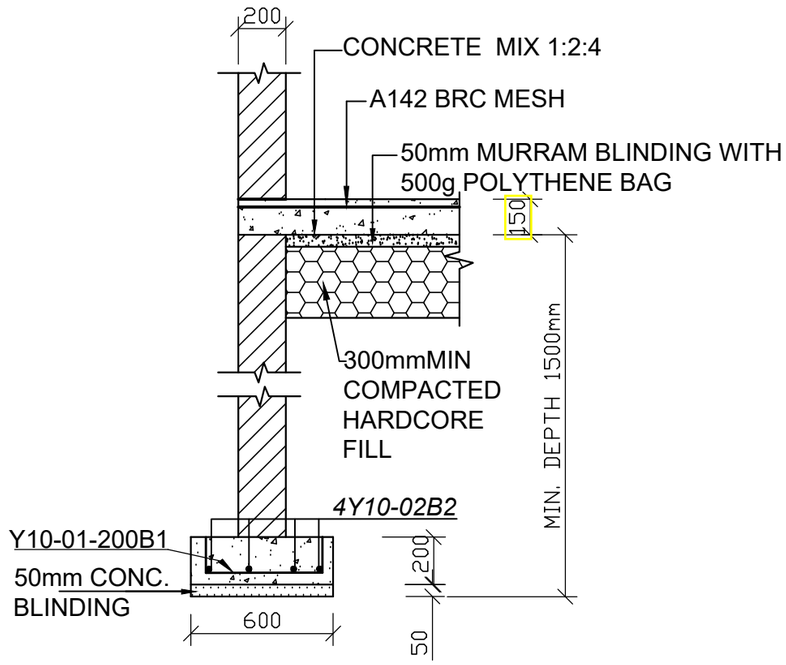
TYPICAL R.C DETAILS OF RING BEAM (450X200)

SCALE : 1:25



FOUNDATION FLOOR PLAN

SCALE 1 :25



SEC. Y-Y

SCALE : 1:25

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March; 2018
2.				
3.				
4.				

Client

ATHI WATER WORKS DEVELOPMENT AGENCY
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

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AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By

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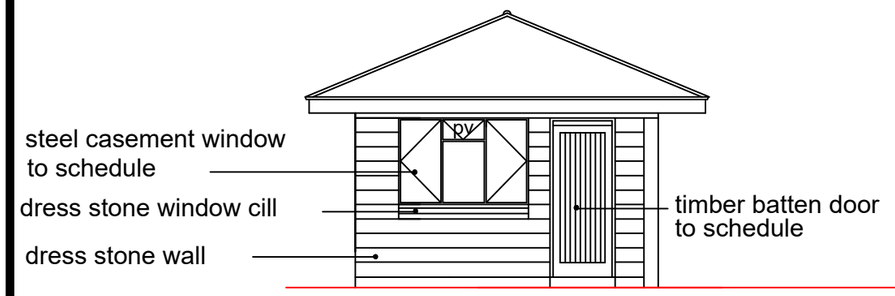
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

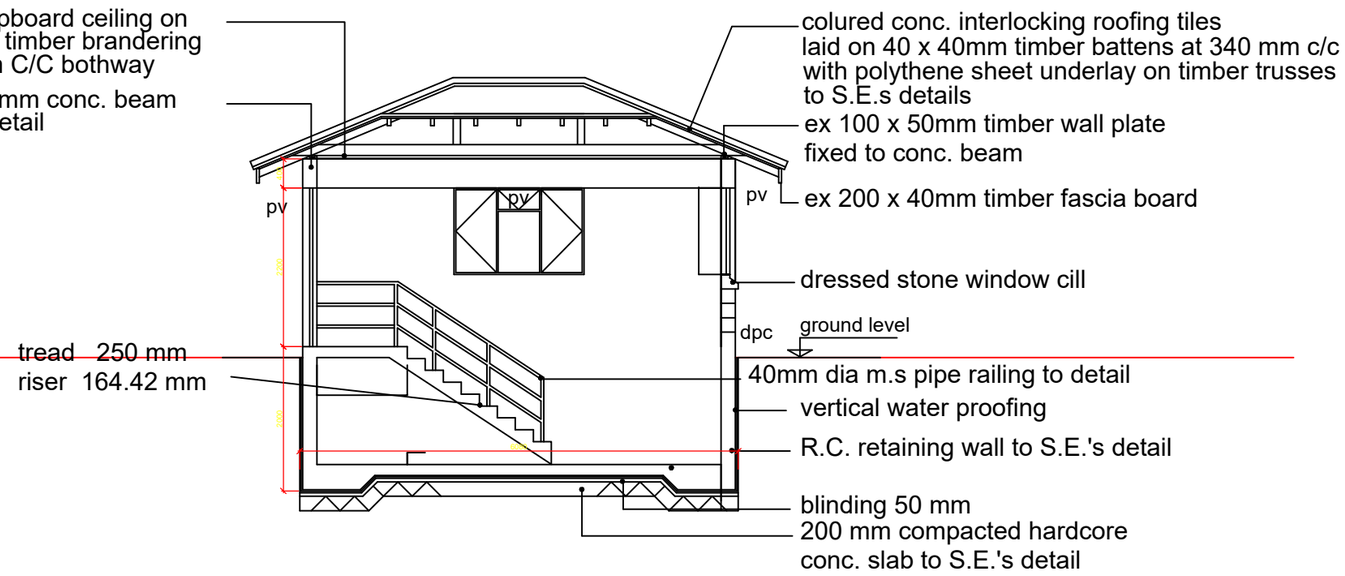
Drawing title:

GUARD HOUSE
STRUCTURAL DETAILS

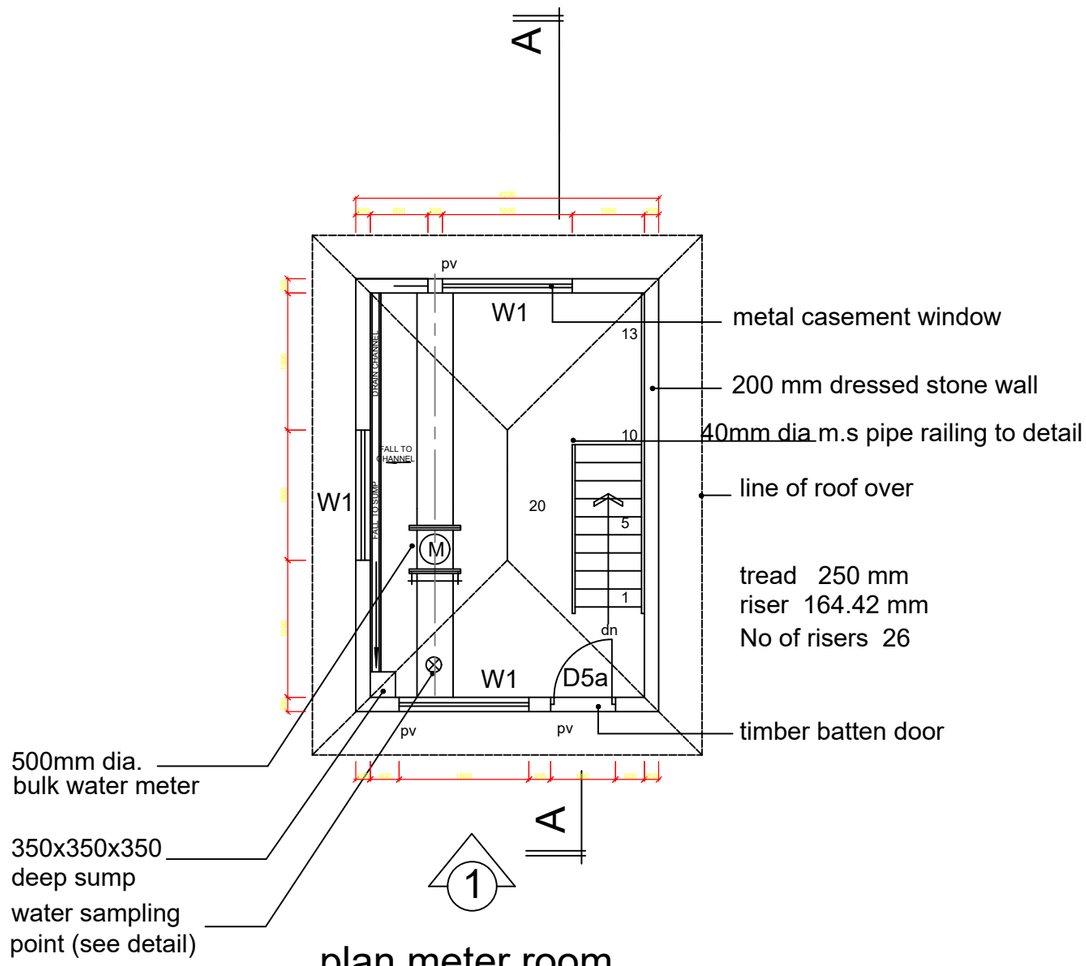
Designed By	: LK
Drawn By	: D.G.M
Checked By	: W.K
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/GUH/002



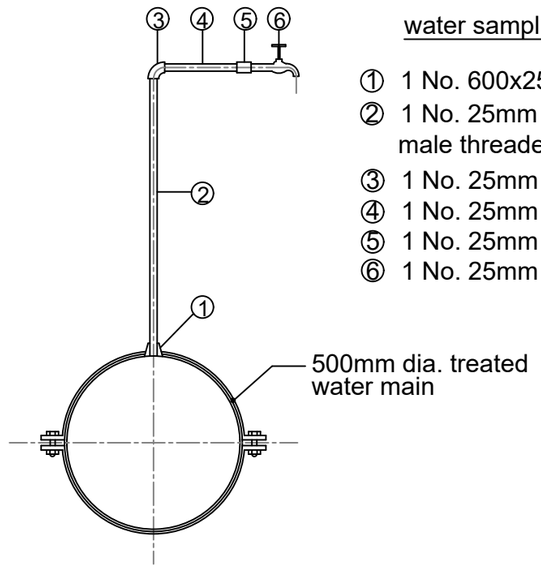
elevation 01



section A - A



plan meter room



water sampling pipe details

① 1 No. 600x25mm dia. steel saddle clamp
② 1 No. 25mm dia. G.I. 1000mm long pipe with male threaded ends
③ 1 No. 25mm dia. G.I. elbow
④ 1 No. 25mm dia. G.I. 250mm long pipe (male threaded)
⑤ 1 No. 25mm dia. G.I. coupler
⑥ 1 No. 25mm dia. brass tap

water sampling pipe detail

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client
ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency
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K.I.D.P BUILDING, ALONG KALAWA ROAD
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Reviewed By
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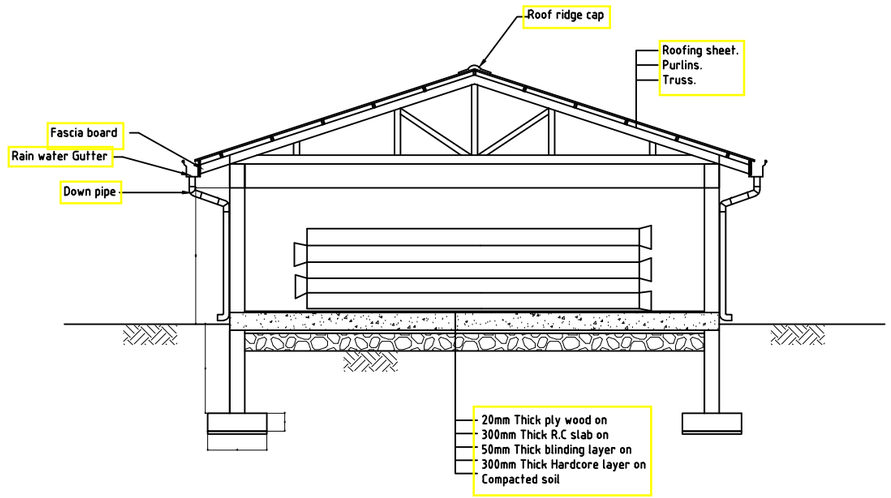
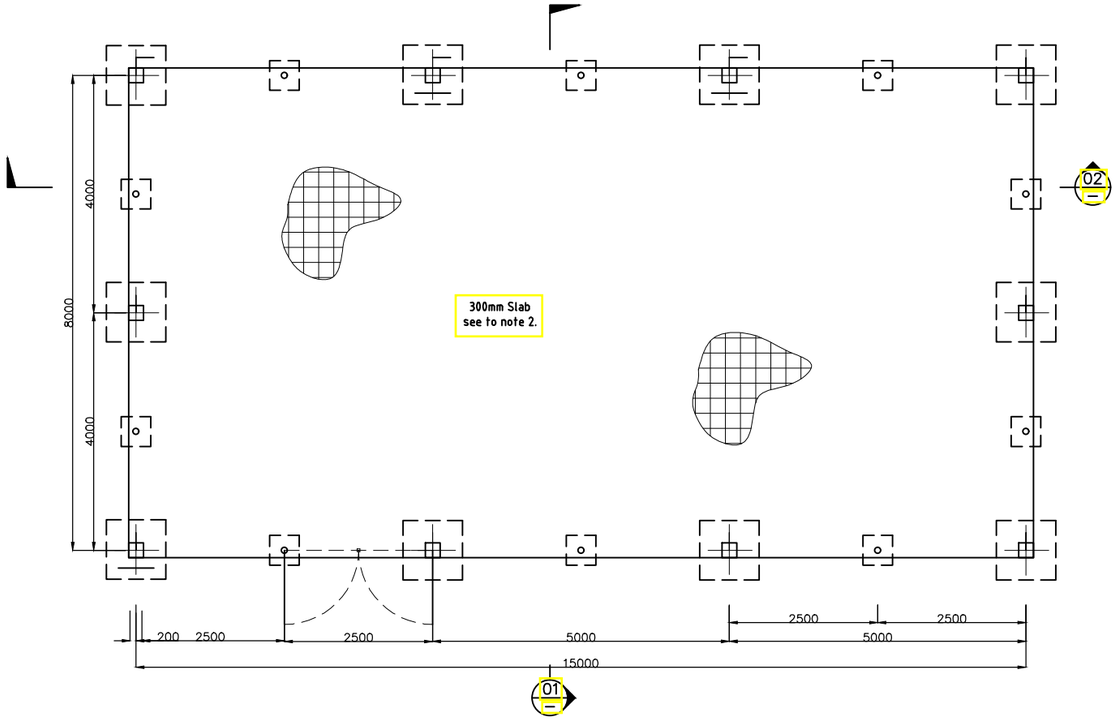
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing title:
METER ROOM PLAN, ELEVATIONS AND SECTION

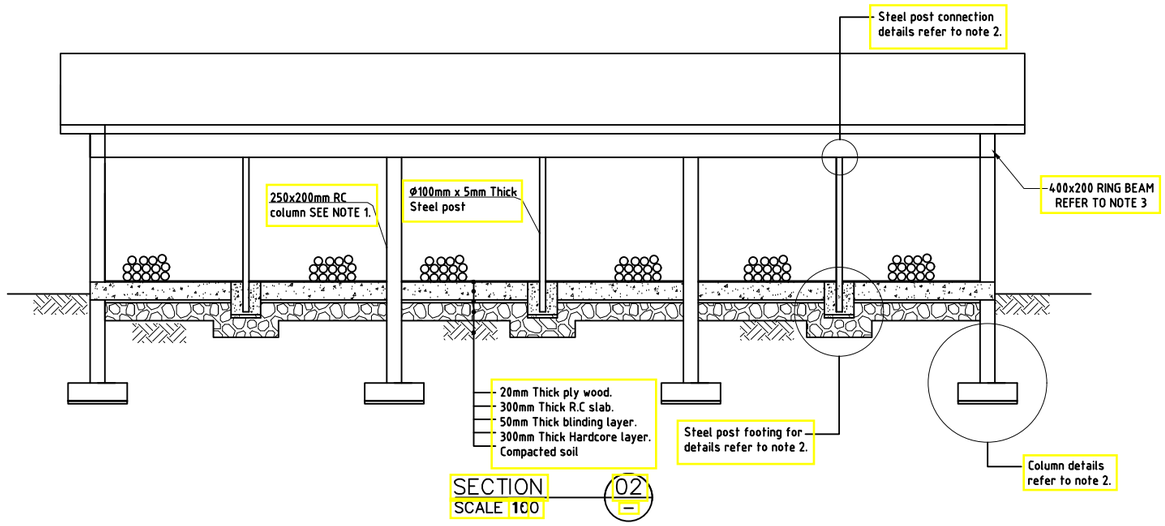
Designed By	: LK
Drawn By	: D.G.M
Checked By	: W.K
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/MR/001



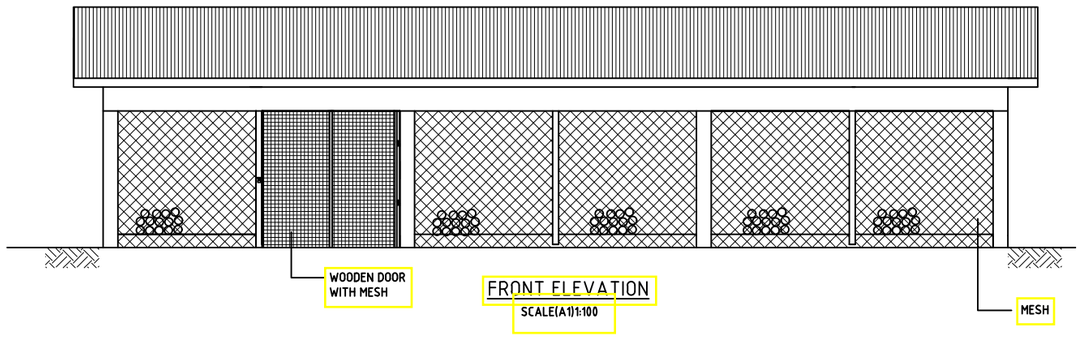
SECTION 01
SCALE 1:00



FLOOR AND FOUNDATION PLAN
SCALE(A1) 1:100



SECTION 02
SCALE 1:00



FRONT ELEVATION
SCALE(A1)1:100

NOTES

FLOOR AND FOUNDATION PLAN

1. Ø100 x 5mm STEEL POST IN 500x500x600mm DEEP MASS CONCRETE FOUNDATION.
2. THIS DRAWING IS TO BE READ IN-CONJUNCTION WITH DRAWING NO. 5096004-BOR-07901, FOR DETAILS.

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March; 2018
2.				
3.				
4.				

Client
ATHI WATER WORKS DEVELOPMENT AGENCY
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
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AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By
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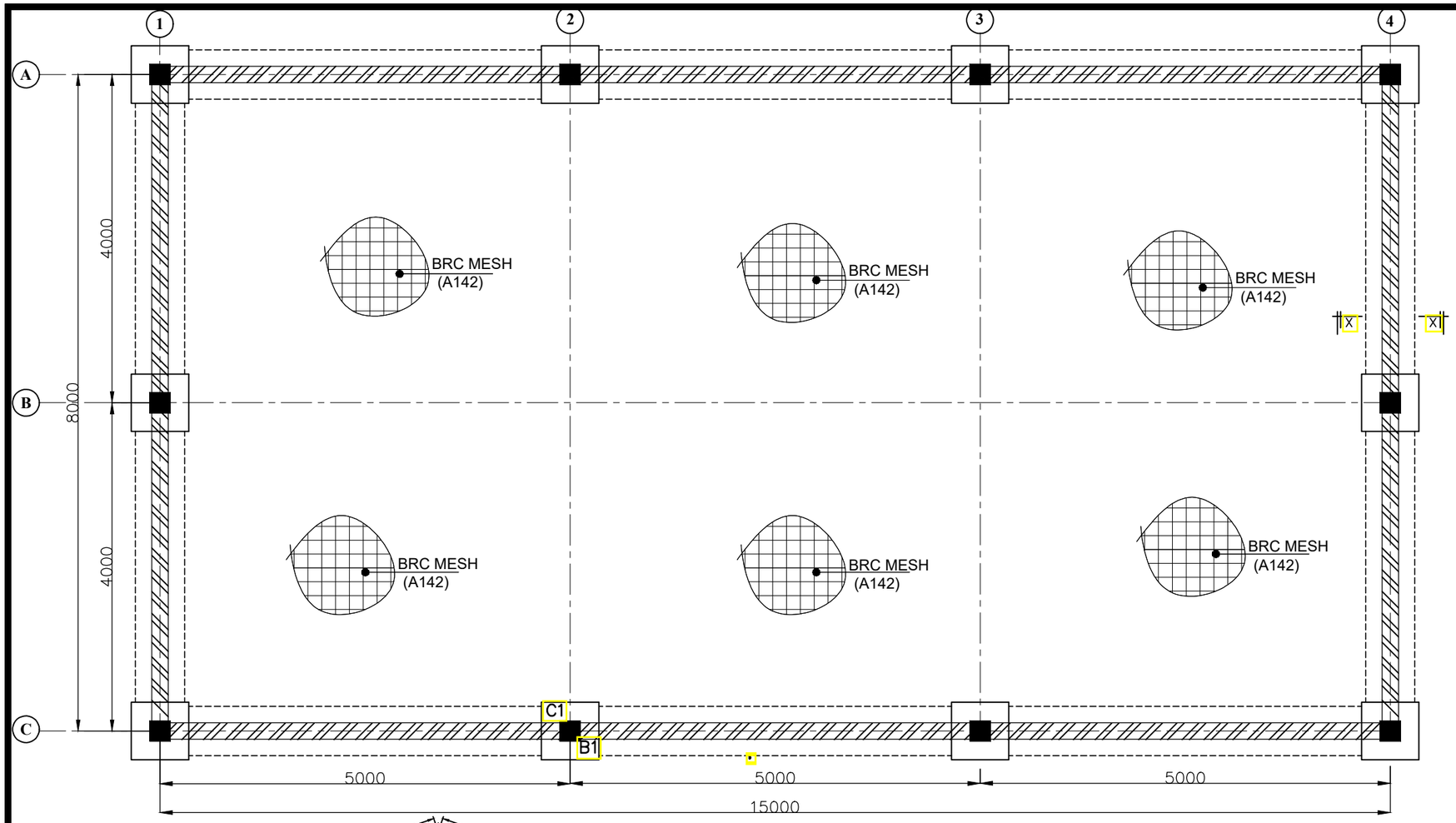
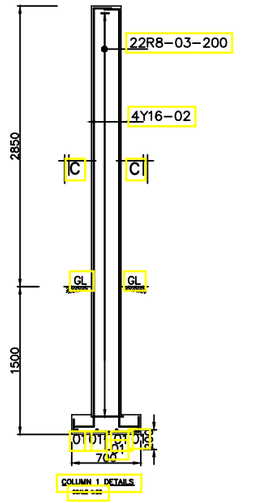
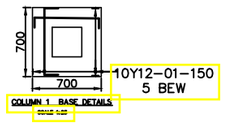
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

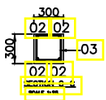
Drawing title:
PIPE SHED FOUNDATION LAYOUT,SECTIONS AND ELEVATION

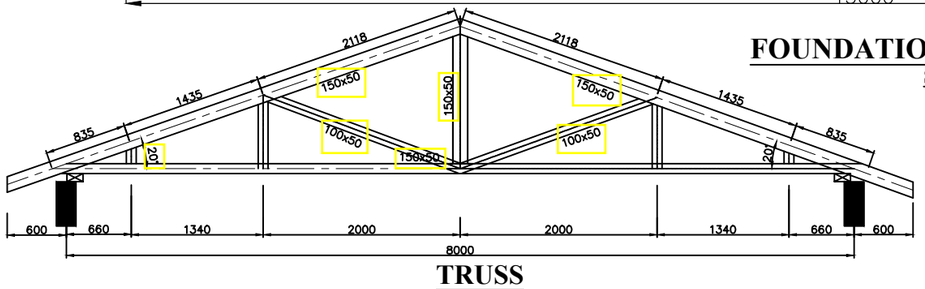
Designed By	: LK
Drawn By	: D.G.M
Checked By	: W.K
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/PS/001





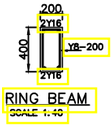




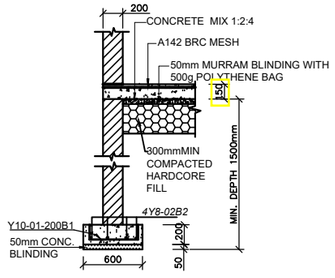


TRUSS
SCALE 1:50

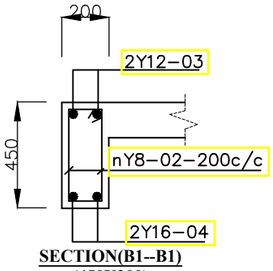
FOUNDATION AND FLOOR PLAN
SCALE : 1:100



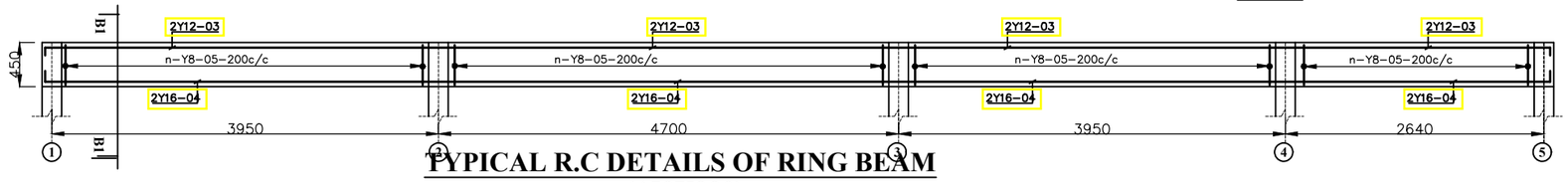
RING BEAM
SCALE 1:10



SEC. X--X
SCALE : 1:50



SECTION(B1--B1)
(450X200)
SCALE : 1:25



TYPICAL R.C DETAILS OF RING BEAM (450X200)

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client

ATHI WATER WORKS DEVELOPMENT AGENCY
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

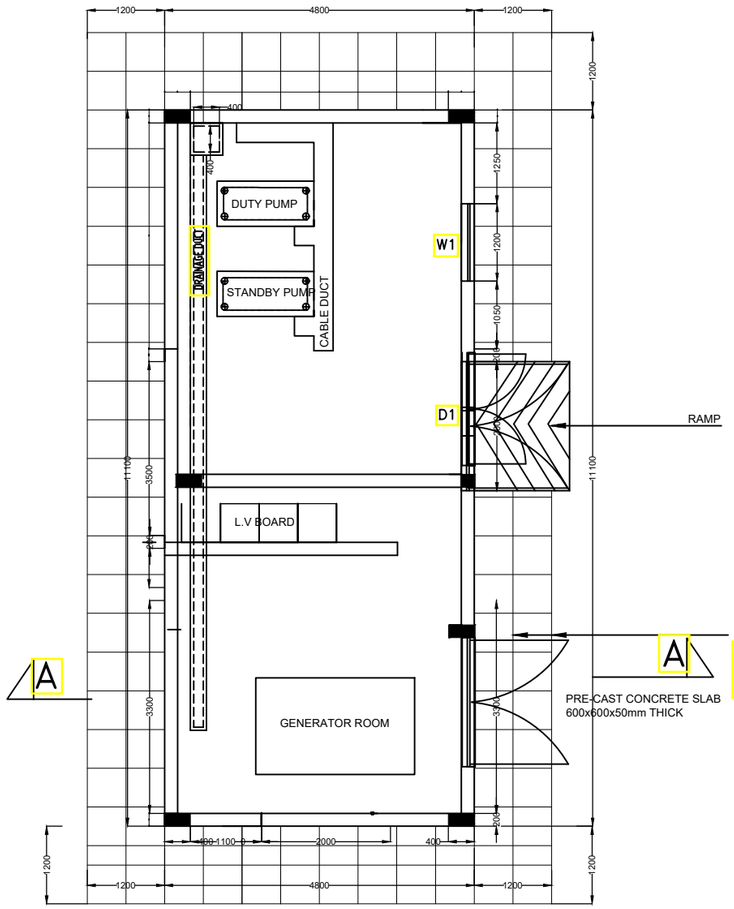
Reviewed By

CAS CONSULTANTS LIMITED
Le' Mac Building, 1st fl, Off Church Road
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

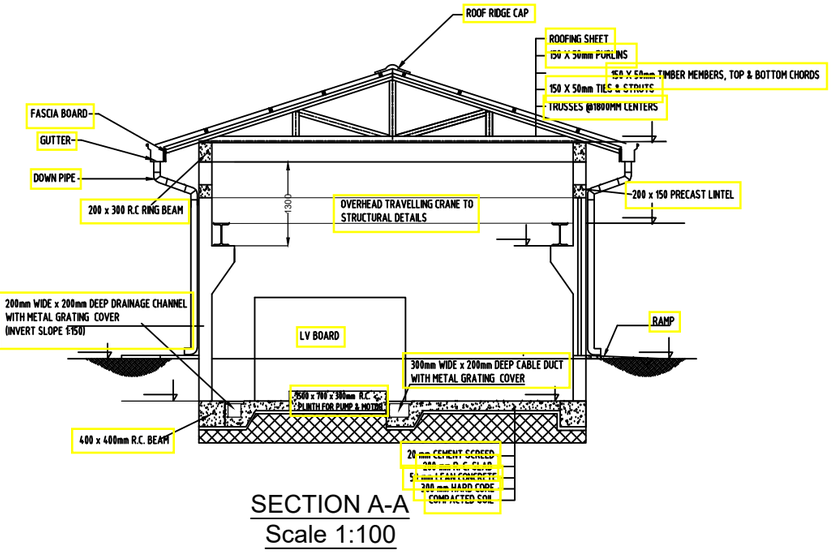
Drawing title:

PIPE SHED STRUCTURAL DETAILS

Designed By	: LK
Drawn By	: D.G.M
Checked By	: W.K
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/PS/002



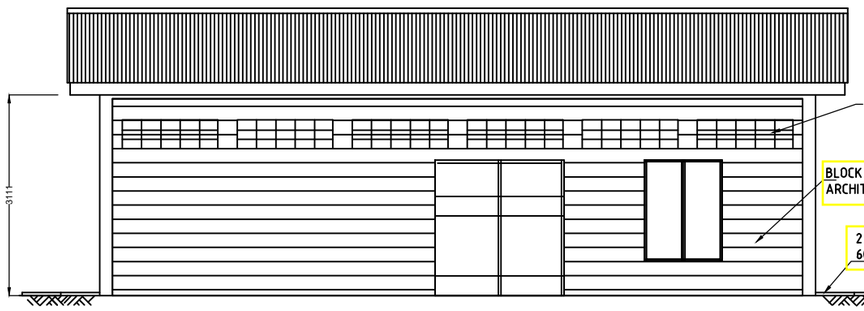
PUMP HOUSE GENERAL ARRANGEMENT
Scale 1:100



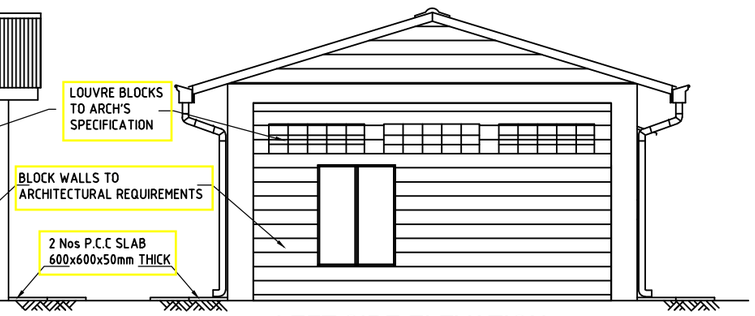
SECTION A-A
Scale 1:100

NOTES

1. All dimensions are in millimeters unless otherwise stated
2. This drawing must not be scaled ,only figured dimensions should be used
3. All masonry walls must be reinforced with 25mm hoop iron after every two alternate courses
4. All mortar used to be of cement sand mix 1:3, with all the stone walling being laid in 200mm courses with 12mm mortar joints
5. A minimum of 7.0N/mm2 average compressive strength of masonry in accordance with BS5390 should be used for all wall sections
6. Mass concrete to be grade 15

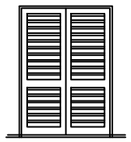


FRONT SIDE ELEVATION
Scale 1:100



LEFT SIDE ELEVATION
Scale 1:100

DOOR DETAIL - 1 Nr



1600X2100MM PRESSED METAL LOUVRE DOOR IN TWO EQUAL PANELS WITH 100X50MM STILES AND TOP RAILS, 150X50MM MIDDLE AND BOTTOM RAILS WITH PRESSED METAL INFILL LOUVRES AND 100X50MM PRESSED METAL FRAMES, ALL TO MANUFACTURE'S DETAILS. HINGES, PAD BOLTS, AND TOWER BOLTS TO MANUFACTURER'S SPECIFICATION.

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client
ATHI WATER WORKS DEVELOPMENT AGENCY
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By
AFRICAN DEVELOPMENT BANK

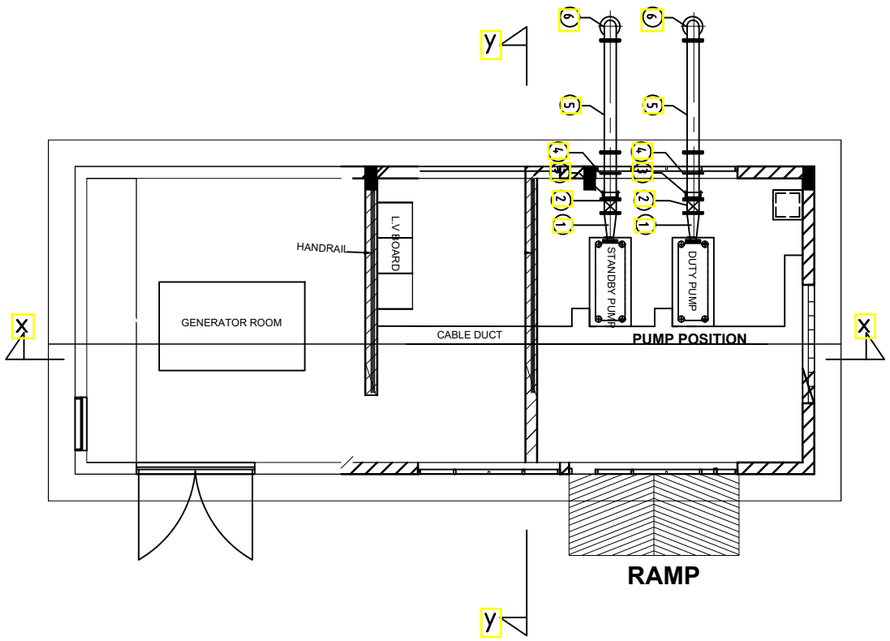
Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

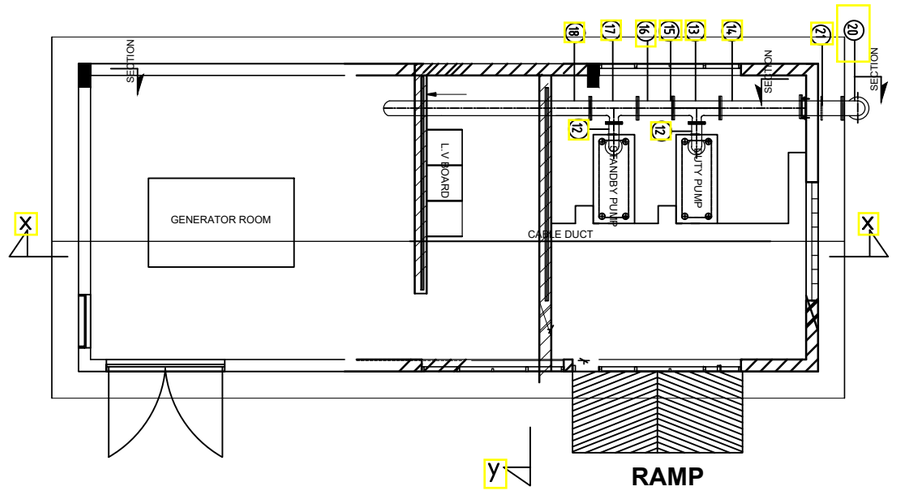
Reviewed By
CAS CONSULTANTS LIMITED
Le' Mac Building, 1st fl, Off Church Road
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing title:
PUMP HOUSE
ARCHITECTURAL DETAILS

Designed By	: LK
Drawn By	: R.W
Checked By	: W.K
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/PH/001

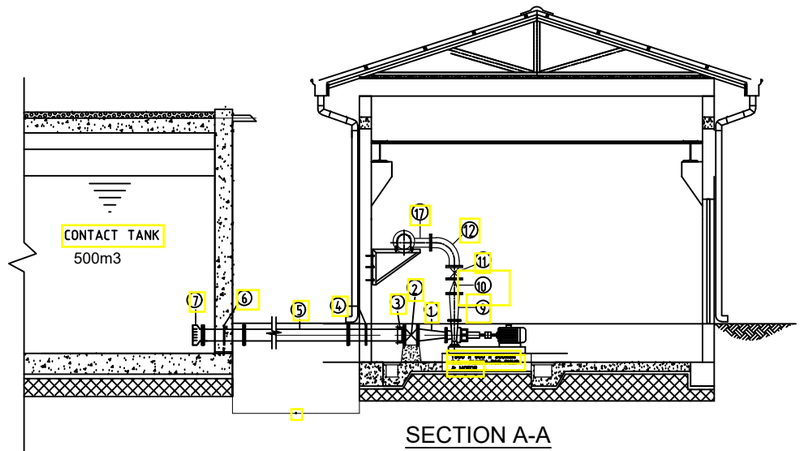


SUCTION LINE PIPEWORKS
Scale 1:100

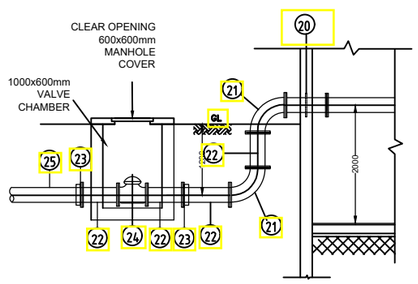


CLEAR WATER TANK PIPEWORK SCHEDULE

ITEM No	DESCRIPTION	DIA. (mm)	PN	LENGTH (mm)	QUANTITY (No.)
I	SUCTION LINE PIPEWORK				
1	DOUBLE FLANGED TAPER WITH BLANK FLANGE	100/150		450	4
2	FLANGED GATE VALVE	150			4
3	FLANGED ADAPTOR	150			4
4	SIGLE FLANGED PIPE WITH PUDDLE FLANGE	150		950	4
5	DOUBLE FLANGED PIPE	150		1400	4
6	DOUBLE FLANGED PIPE WITH CENTRAL PUDDLE FLANGE	150		700	4
7	FLANGED STRAINER	150			4
II	DELIVERY LINE PIPEWORK				
9	DOUBLE FLANGED TAPER	100/150			3
10	FLANGED NON RETURNED VALVE	150			3
11	FLANGED GATE VALVE	150			3
12	90° FLANGED BEND	150			3
13	ALL FLANGED REDUCING TEE	150			1
14	DOUBLE FLANGED PIPE	150		5400	1
15	DOUBLE FLANGED TAPER	150			1
16	DOUBLE FLANGED SHORT PIPE	150			1
17	ALL FLANGED REDUCING TEE	150			2
18	BLANK FLANGE	150			2
19	DOUBLE FLANGED PIPE	150		5400	1
20	DOUBLE FLANGED PIPE WITH PUDDLE FLANGE	150		700	1
21	90° FLANGED BEND	150			2
27	DOUBLE FLANGED PIPE	150		600	4
23	FLANGED ADAPTOR	150			2
24	BULK WATER METER	150		600	1
25	PLAIN PIPE	150		135000	1



SECTION A-A
Scale 1:100



SECTION B-B
Scale 1:100

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client
ATHI WATER WORKS DEVELOPMENT AGENCY
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By
AFRICAN DEVELOPMENT BANK

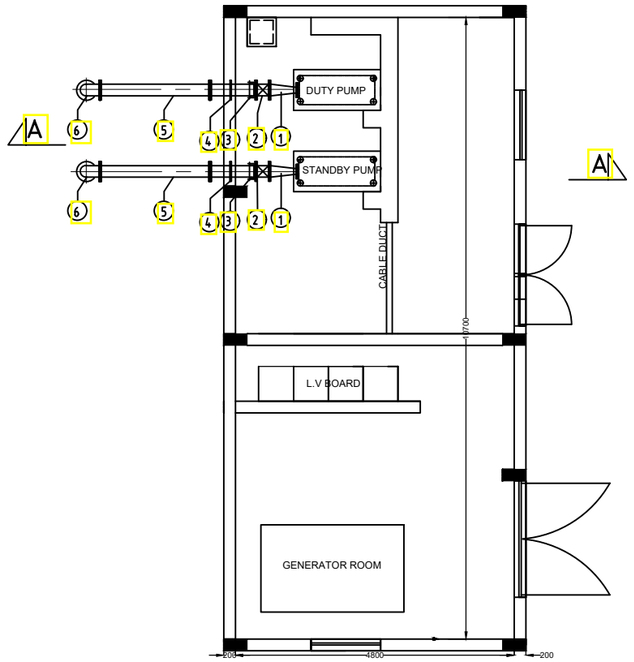
Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

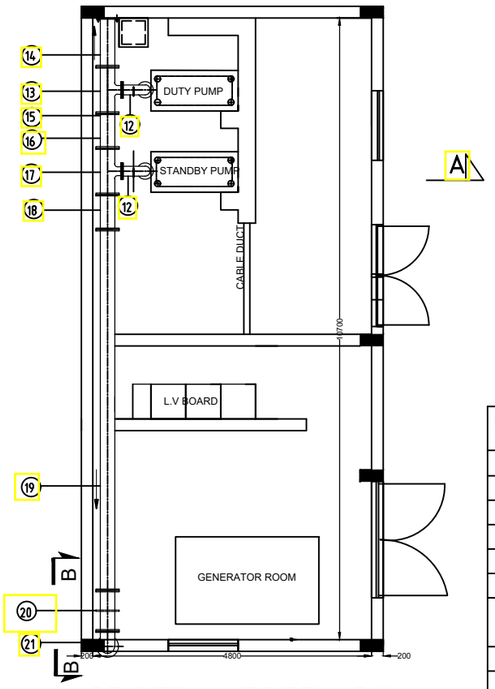
Reviewed By
CAS CONSULTANTS LIMITED
Le' Mac Building, 1st fl, Off Church Road
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing title:
PUMP HOUSE
PIPE ARRANGEMENT

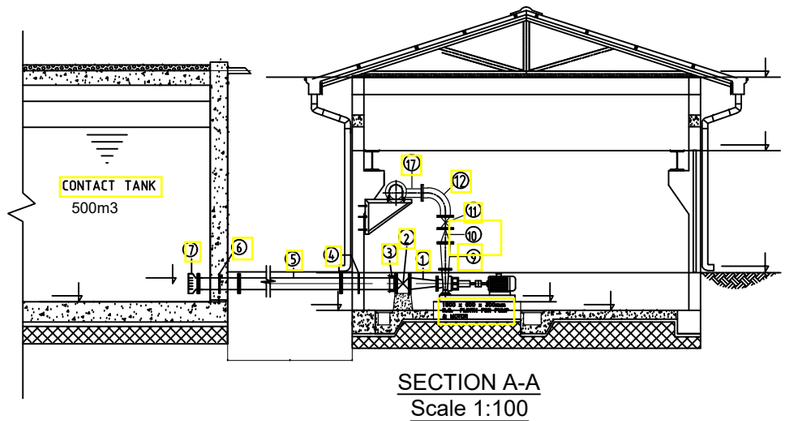
Designed By	: LK
Drawn By	: R.W
Checked By	: W.K
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/PH/002



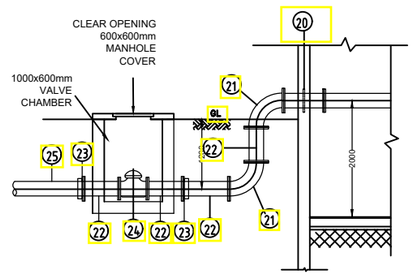
SUCTION LINE PIPEWORKS
Scale 1:100



DELIVERY LINE PIPEWORKS
Scale 1:100



SECTION A-A
Scale 1:100



SECTION B-B
Scale 1:100

CLEAR WATER TANK PIPEWORK SCHEDULE

ITEM No	DESCRIPTION	DIA. (mm)	PN	LENGTH (mm)	QUANTITY (No.)
	SUCTION LINE PIPEWORK				
1	DOUBLE FLANGED TAPER WITH BLANK FLANGE	100/150		450	4
2	FLANGED GATE VALVE	150			4
3	FLANGED ADAPTOR	150			4
4	SIGLE FLANGED PIPE WITH PUDDLE FLANGE	150		950	4
5	DOUBLE FLANGED PIPE	150		1400	4
6	DOUBLE FLANGED PIPE WITH CENTRAL PUDDLE FLANGE	150		700	4
7	FLANGED STRAINER	150			4
8	DELIVERY LINE PIPEWORK				
9	DOUBLE FLANGED TAPER	100/150			3
10	FLANGED NON RETURNED VALVE	150			3
11	FLANGED GATE VALVE	150			3
12	90° FLANGED BEND	150			3
13	ALL FLANGED REDUCING TEE	150			1
14	DOUBLE FLANGED PIPE	150		5400	1
15	DOUBLE FLANGED TAPER	150			1
16	DOUBLE FLANGED SHORT PIPE	150			1
17	ALL FLANGED REDUCING TEE	150			2
18	BLANK FLANGE	150			2
19	DOUBLE FLANGED PIPE	150		5400	1
20	DOUBLE FLANGED PIPE WITH PUDDLE FLANGE	150		700	1
21	90° FLANGED BEND	150			2
22	DOUBLE FLANGED PIPE	150		600	4
23	FLANGED ADAPTOR	150			2
24	BULK WATER METER	150		600	1
25	PLAIN PIPE	150		13500	1

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client
ATHI WATER WORKS DEVELOPMENT AGENCY
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

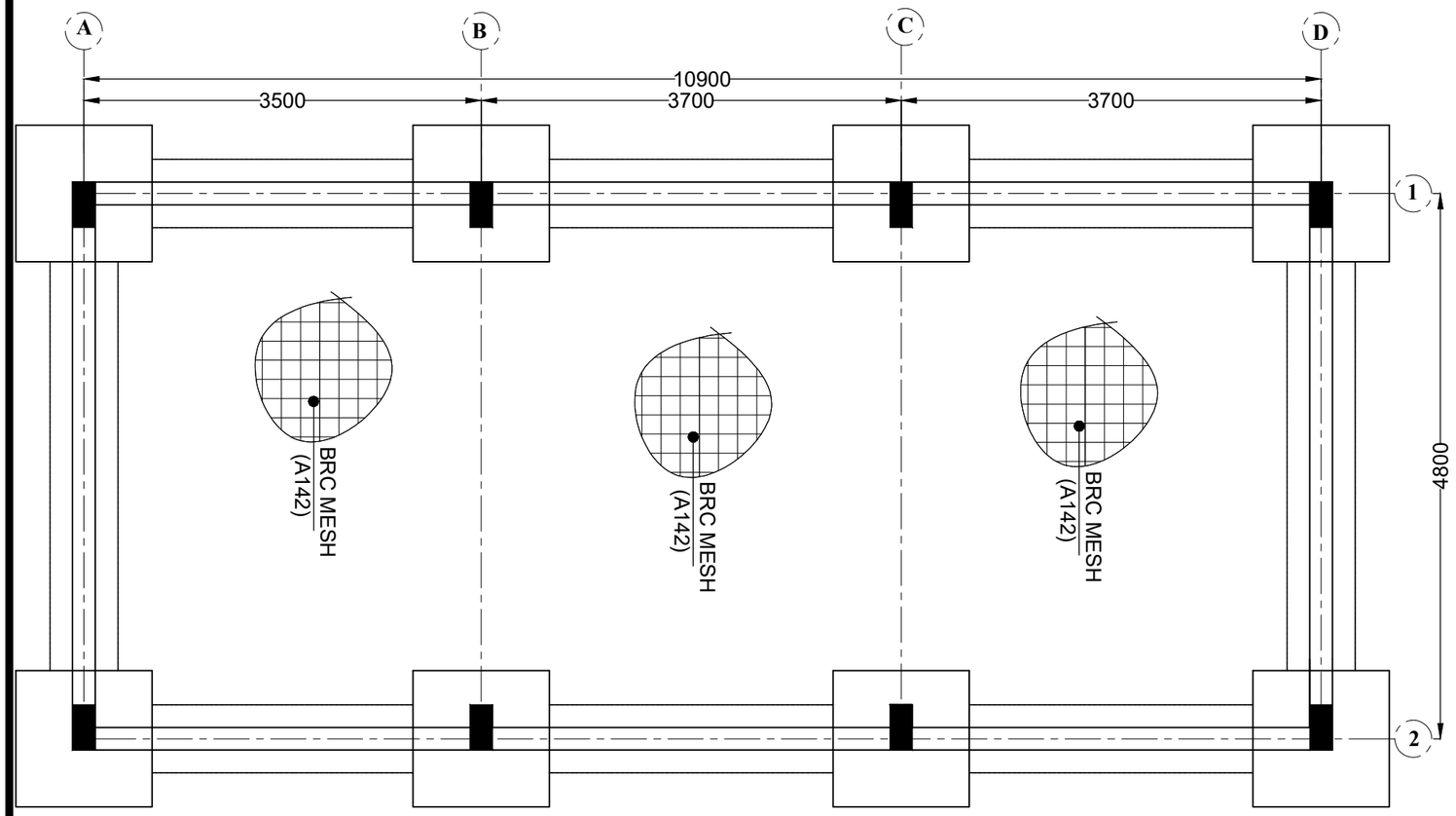
Financed By
AFRICAN DEVELOPMENT BANK

Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT
CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By
CAS CONSULTANTS LIMITED
Le' Mac Building, 1st fl, Off Church Road
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

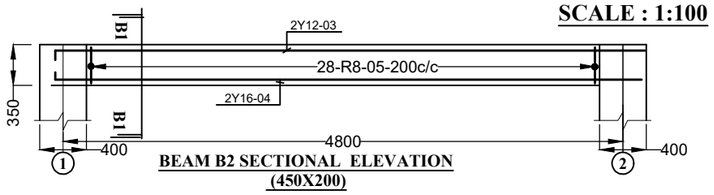
Drawing title:
SUCTION PIPE, DELIVERY LINE AND SECTIONS PIPEWORKS

Designed By	: LK
Drawn By	: R.W
Checked By	: W.K
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/PH/003

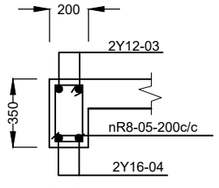


FOUNDATION AND FLOOR PLAN

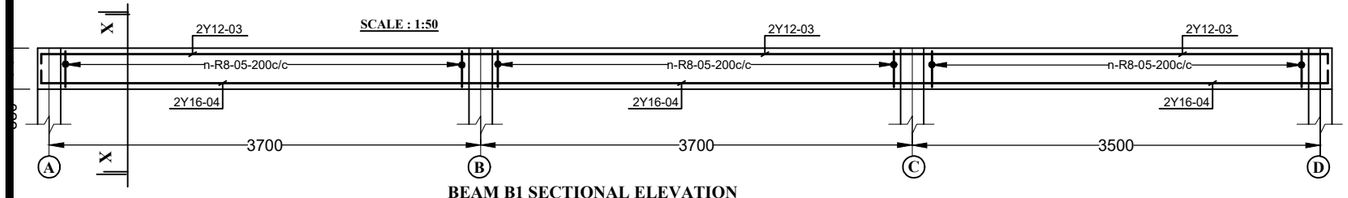
SCALE : 1:100



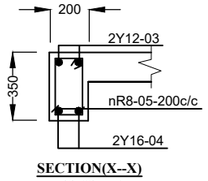
BEAM B2 SECTIONAL ELEVATION (450X200)



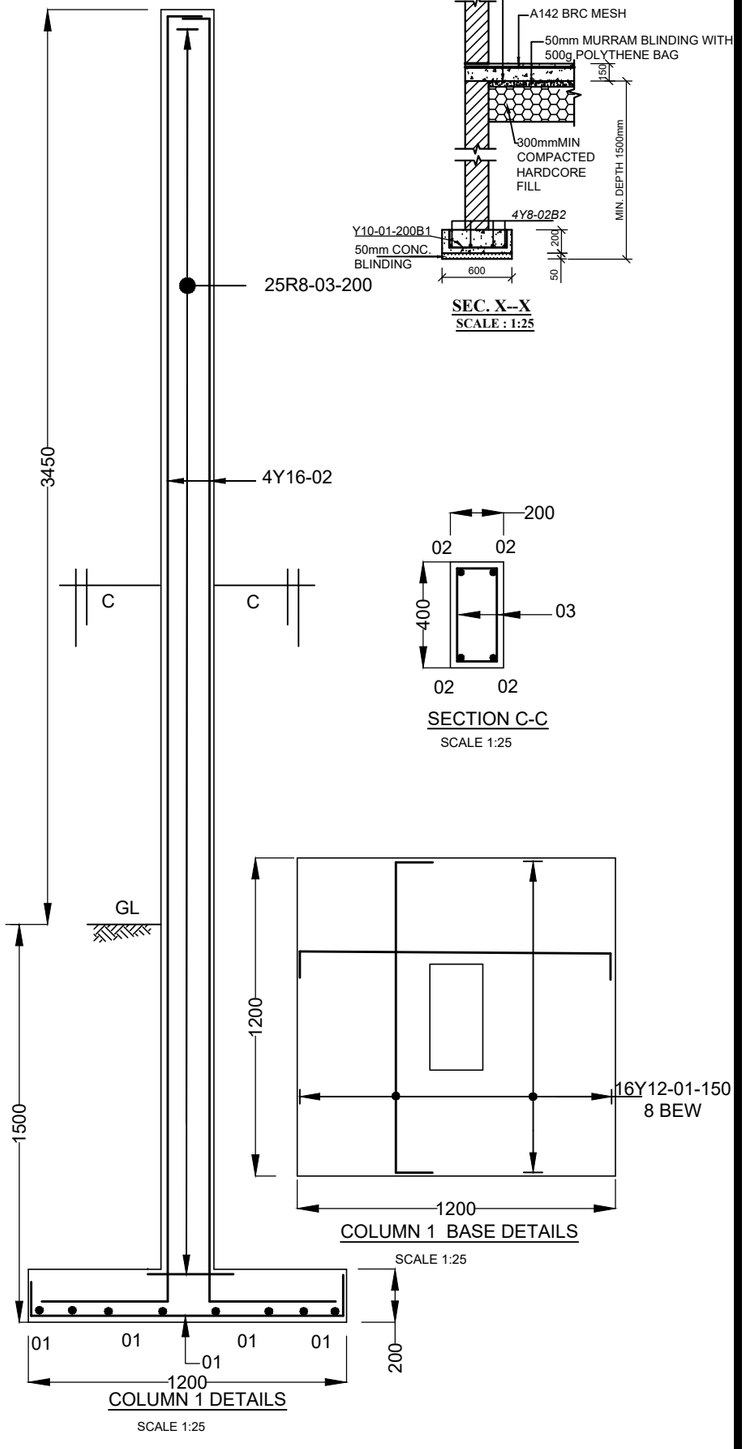
SECTION(B1--B1)
SCALE : 1:30



BEAM B1 SECTIONAL ELEVATION
SCALE : 1:50



SECTION(X--X)
SCALE : 1:30



No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client

ATHI WATER WORKS DEVELOPMENT AGENCY
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By

AFRICAN DEVELOPMENT BANK

Project

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CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By

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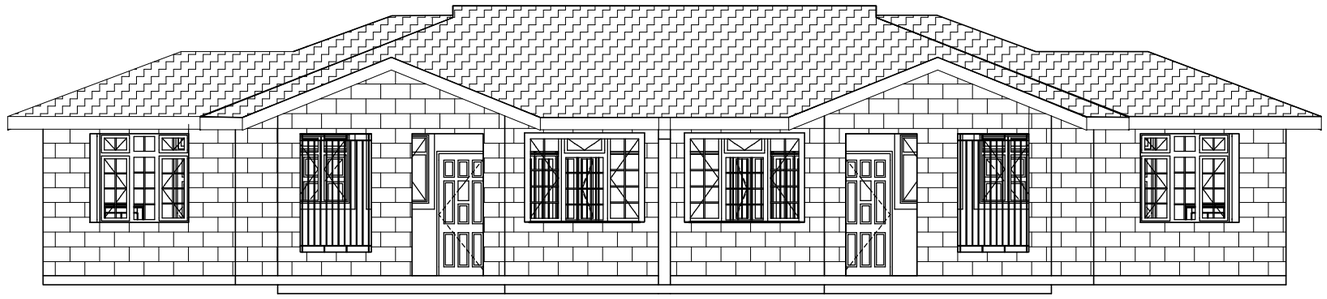
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

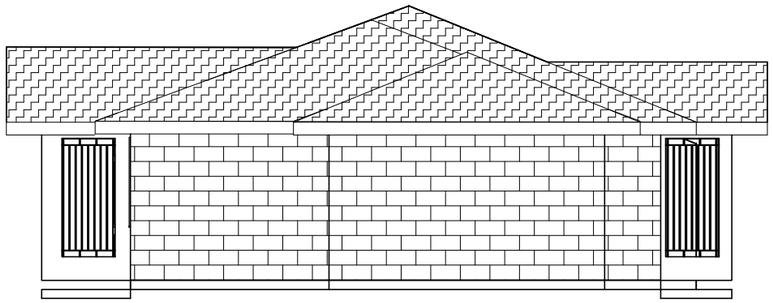
Drawing title:

PUMP HOUSE STRUCTURAL DETAILS

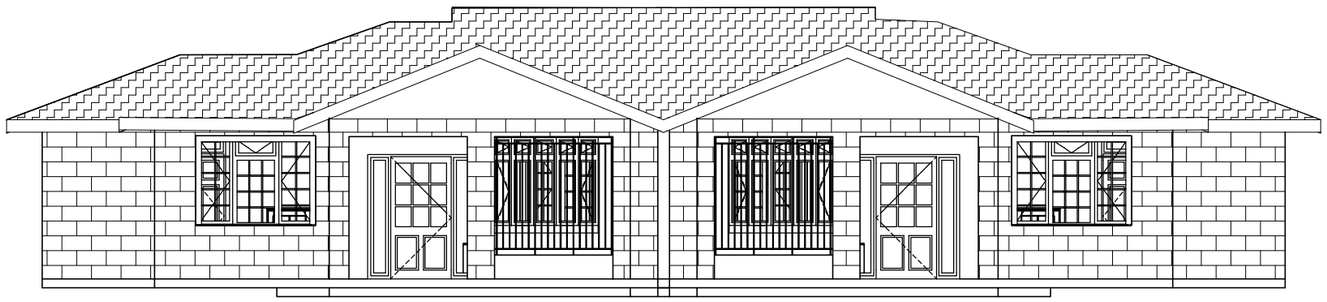
Designed By	: LK
Drawn By	: R.W
Checked By	: W.K
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/PH/004



BACK ELEVATION
SCALE 1:100



SIDE ELEVATION
SCALE 1:100



FRONT ELEVATION
SCALE 1:100

NOTES

1. ALL DIMENSIONS AND CONDITIONS MUST BE CHECKED ON SITE AND ANY DISCREPANCIES REFRED TO THE ENGINEER
2. ALL LEVELS TO BE CHECKED ON SITE BEFORE COMMENCEMENT OF WORK.
3. DEPTH OF FOUNDATION TO BE DETERMINED ON SITE FOUNDATION TO BE CARRIED DOWN TO HARD BASE TO THE APPROVAL OF THE ENGINEER AND ALL SOILS TO BE EXCAVATED AND THE OPENING FILLED WITH HARDCORE.
4. FIGURED DIMENSIONS TO BE TO BE TAKEN IN PREFERENCE TO SCALE.
5. THREE PLY TROPICAL'PLUVEX' BITUMINOS FELT D.P.C. UNDER ALL WALLS TO BE RENDERED IN HOT BITUMEN.
6. ALL WALLS LESS THAN 200mm THICK TO BE REINFORCED WITH HEAVY GAUGE HOOP IRON AT EVERY ALTERNATIVE COURSE.
7. P.V. DENOTES PERMANENT VENT TO BE PROVIDED TO ALL HABITABLE ROOMS AND AS SHOWN ON PLAN.
8. ALL DRAIN PIPES TO ENGINEER'S SATISFACTION.
9. WHERE DRAIN PASSES UNDER THE BUILDING OR DRIVEWAY IT SHALL BE OF CAST IRON AND ENCASED IN 150mm WEAK CONCRETE ALL ROUND.
10. ALL SANITARY WORK TO BE CARRIED OUT IN ACCORDANCE TO THE MUNICIPAL COUNCIL'S RULES AND REGULATION.
11. MANHOLES IN DRIVEWAY TO HAVE HEAVY DUTY COVERS SET IN CART GREASE.
12. ALL REINFORCED CONCRETE WORK TO STRUCTURAL ENGINEER'S DETAIL DRGS.
13. ALL STEEL GLAZED WINDOWS TO HAVE BUGLAR PROOFING TO DETAIL.
14. EXTERNAL DOORS (D,1) TO HAVE DRIPS.
15. 600X450mm MIRRORS OVER ALL W.H.B.s.
16. CONC. WINDOW CILLS TO HAVE DRIPS.
17. FOR ALL WINDOWS PROVIDE 150X150mm CYPRESS PELMET BOXES PAINTED AND WITH CURTAIN RAILS.
18. ALL STEEL GLAZED WINDOWS TO HAVE BUILT-IN MOSQUITO PROOF 'GREENVAC' PERMANENT VENTS.
19. ROOF EAVES SOFIT 50X25mm TIMBER BATTENS AND WIRE GAUZE WITH COFFEE TRAY WIRE.
20. 1000 GAUGE POLYTHENE SHEET BELOW FLOOR SLAB.
21. B.R.C. IN FLOOR SLAB.
22. FINISHES SCHEDULE

INTERNAL FINISHES
- *FLOOR— COLOURED GRANO
- *SKIRTINGS— COLOURED GRANO
- *WALLS— PLASTERED AND PAINTED
- *CEILING— CHIPBOARD PAINTED
- *CORNICES— TIMBER AND PAINTED

EXTERNAL FINISHES
- *NATURAL STONE WITH HORIZONTAL JOINTS RAKED
- *WALLS BELOW WINDOWS,RING BEAMS AND GABLE WALLS TO BE RENDERED

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client
ATHI WATER WORKS DEVELOPMENT AGENCY
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By
AFRICAN DEVELOPMENT BANK

Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

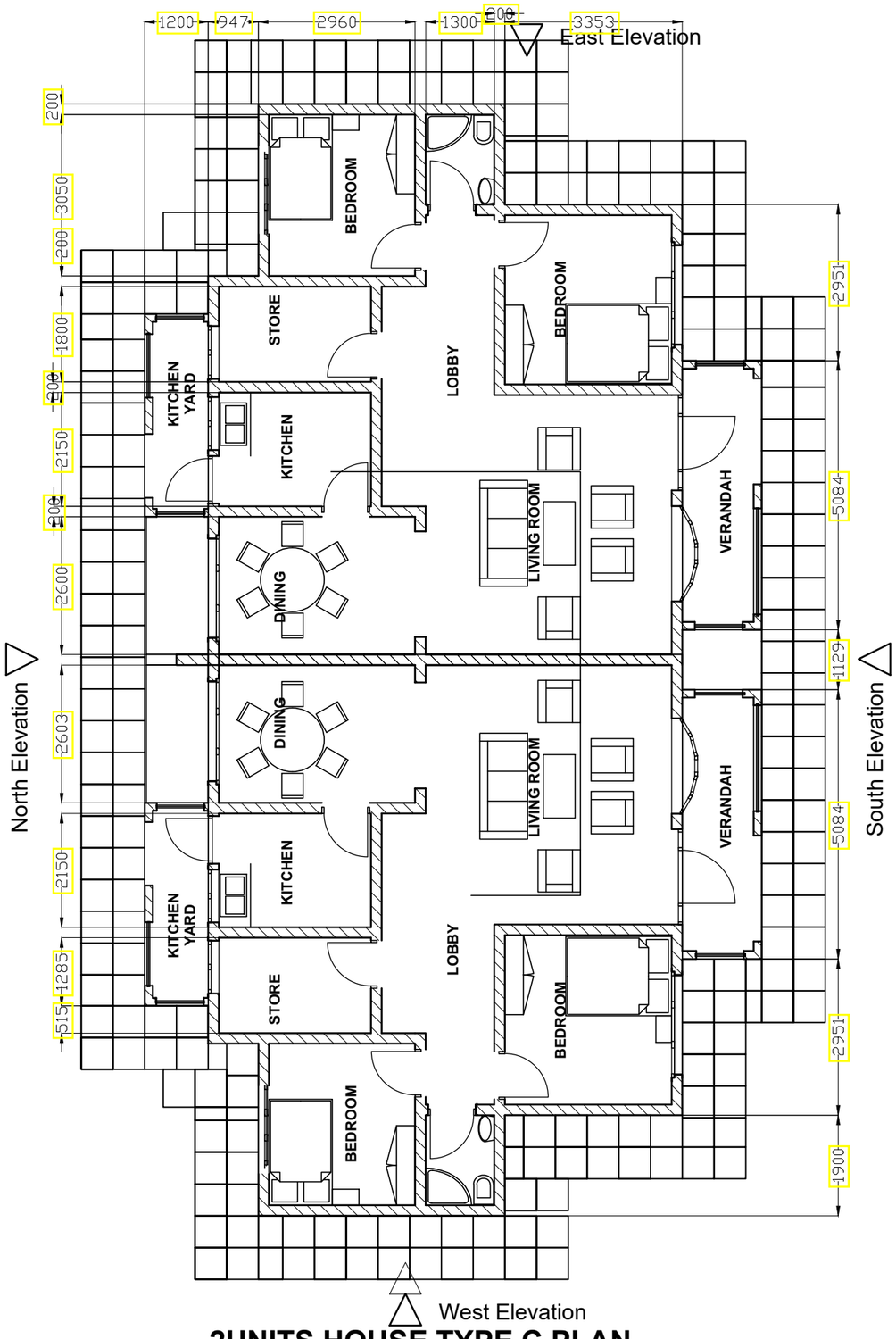
CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By
CAS CONSULTANTS LIMITED
Le' Mac Building, 1st fl, Off Church Road
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

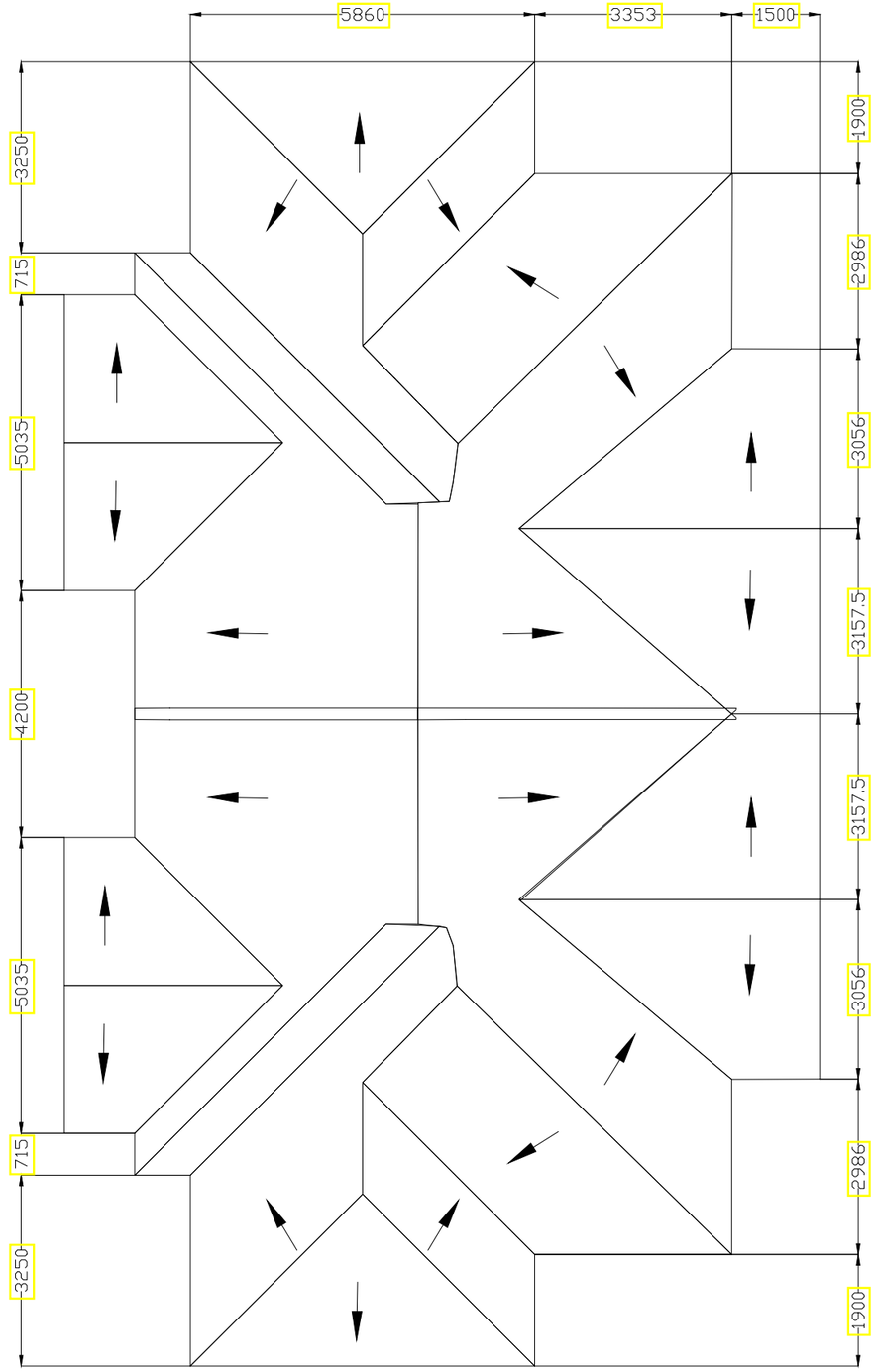
Drawing title:

STAFF HOUSE TYPE C
ARCHITECTURAL
ELEVATIONS

Designed By	: LK
Drawn By	: D.G.M
Checked By	: W.K
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/SHC/001



2UNITS HOUSE TYPE C PLAN



2UNITS HOUSE TYPE C ROOF PLAN

SCALE 1:100

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client

ATHI WATER WORKS DEVELOPMENT AGENCY
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
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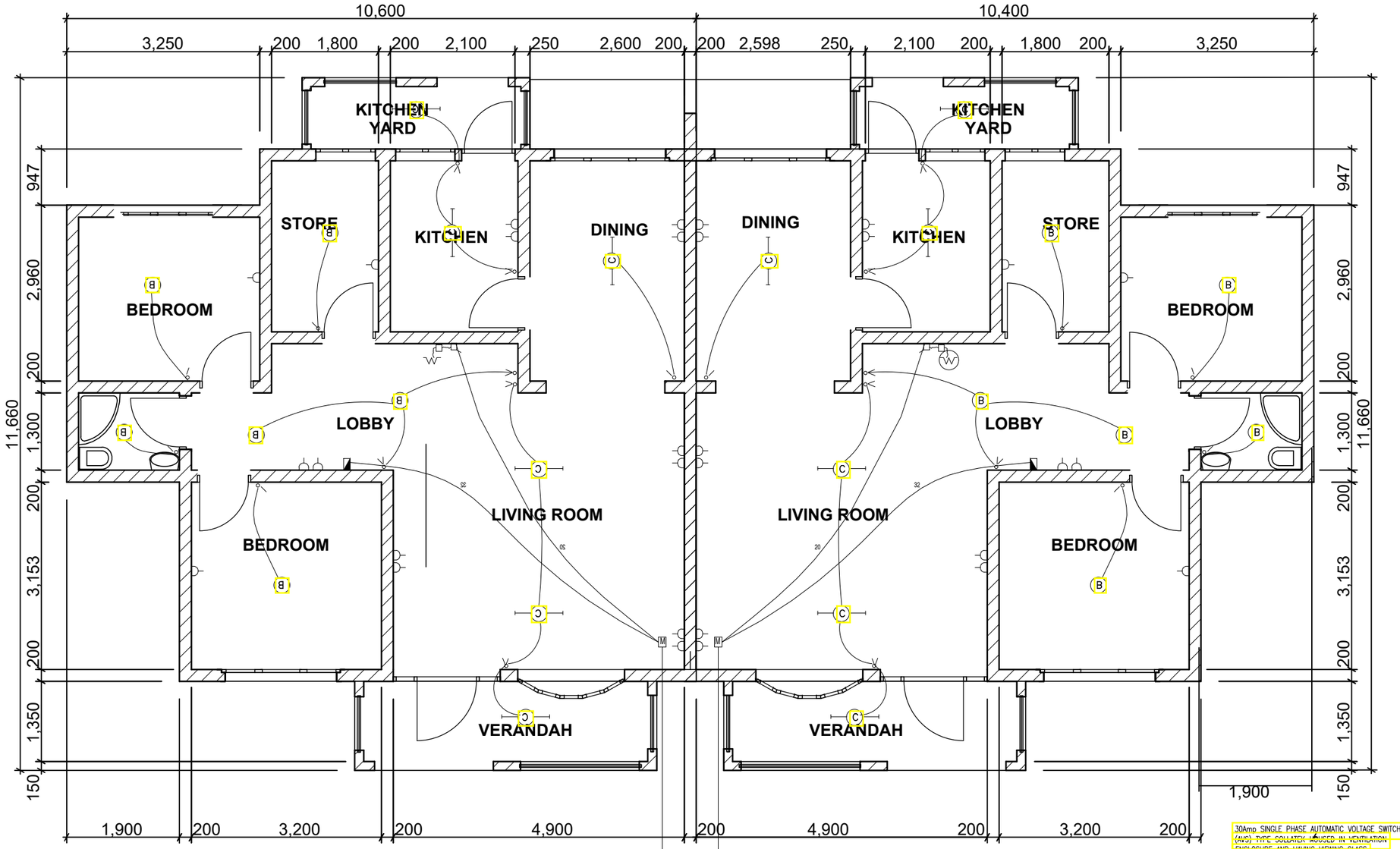
Le' Mac Building, 1st fl, Off Church Road
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing title:

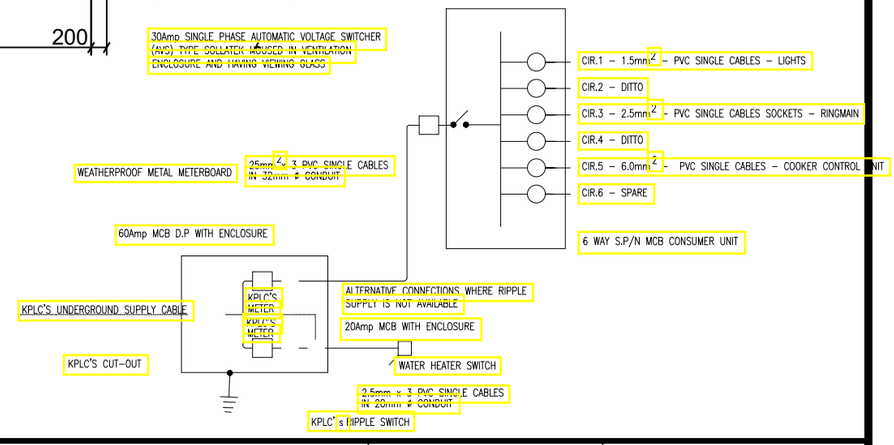
STAFF HOUSE TYPE C PLANS

Designed By	: LK
Drawn By	: D.G.M
Checked By	: W.K
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/SHC/002



2UNITS HOUSE TYPE C ELECTRICAL PLAN

SCALE 1:100



No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
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3.				
4.				

Client

ATHI WATER WORKS DEVELOPMENT AGENCY
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
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Financed By

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CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By

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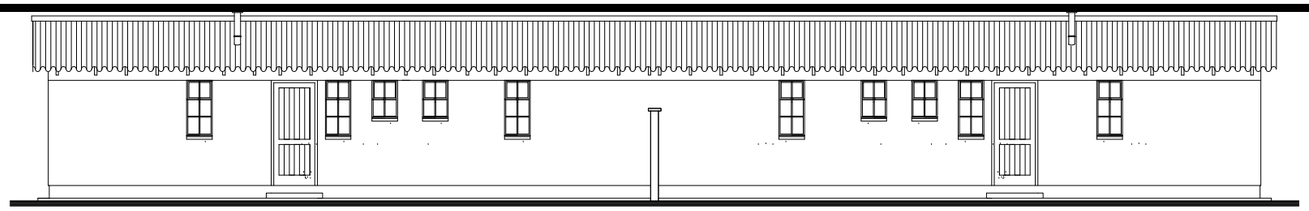
Le' Mac Building, 1st fl, Off Church Road
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

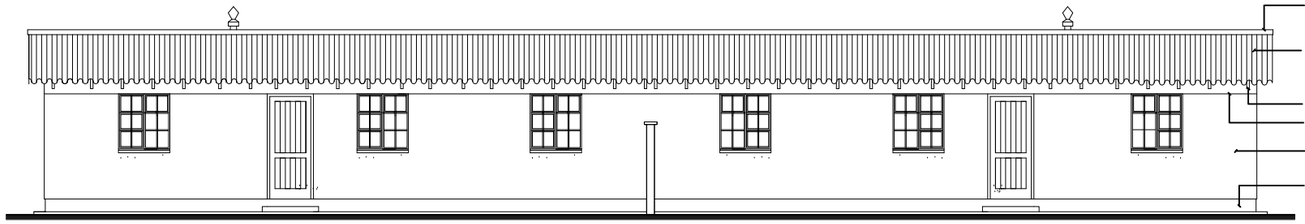
Drawing title:

STAFF HOUSE TYPE C
ELECTRICAL PLAN
ARRANGEMENT

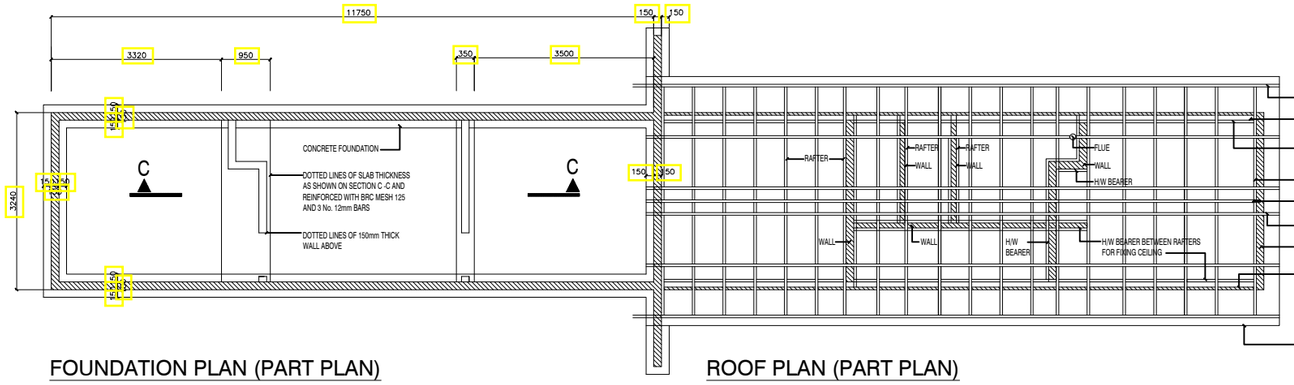
Designed By	: LK
Drawn By	: D.G.M
Checked By	: W.K
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/SHC/003



REAR ELEVATION

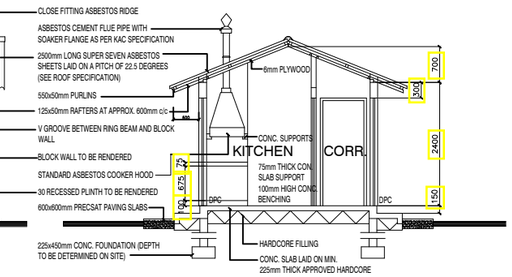


FRONT ELEVATION

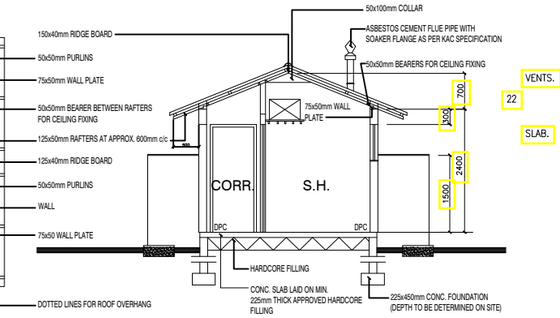


FOUNDATION PLAN (PART PLAN)

ROOF PLAN (PART PLAN)



SECTION A-A



SECTION B-B

NOTES

1. ALL DIMENSIONS AND CONDITIONS MUST BE CHECKED ON SITE AND ANY DISCREPANCIES REFERED TO THE ENGINEER.
2. ALL LEVELS TO BE CHECKED ON SITE BEFORE COMMENCEMENT OF WORK.
3. DEPTH OF FOUNDATION TO BE DETERMINED ON SITE. FOUNDATION TO BE CARRIED DOWN TO HARD BASE TO THE APPROVAL OF THE ENGINEER AND ALL SOILS TO BE EXCAVATED AND THE OPENING FILLED WITH HARDCORE.
4. FIGURED DIMENSIONS TO BE TO BE TAKEN IN PREFERENCE TO SCALE.
5. THREE PLY TROPICAL 'RUBEX' BITUMINOUS FELT D.P.C. UNDER ALL WALLS TO BE RENDERED IN MIX BITUMEN.
6. ALL WALLS LESS THAN 200mm THICK TO BE REINFORCED WITH HEAVY GAUGE HOOP IRON AT EVERY ALTERNATIVE COURSE.
7. P.V. DENOTES PERMANENT VENT TO BE PROVIDED TO ALL HABITABLE ROOMS AND AS SHOWN ON PLAN.
8. ALL DRAIN PIPES TO ENGINEER'S SATISFACTION.
9. WHERE DRAIN PASSES UNDER THE BUILDING OR DRIVEWAY IT SHALL BE OF CAST IRON AND ENCASED IN 150mm. MEAN CONCRETE ALL ROUND.
10. ALL SANITARY WORK TO BE CARRIED OUT IN ACCORDANCE TO THE MUNICIPAL COUNCIL'S RULES AND REGULATION.
11. MANHOLES IN DRIVEWAY TO HAVE HEAVY DUTY COVERS SET IN CAST ORDER.
12. ALL REINFORCED CONCRETE WORK TO STRUCTURAL ENGINEER'S DETAIL DRGS.
13. ALL STEEL GLAZED WINDOWS TO HAVE BUGLAR PROOFING TO DETAIL.
14. EXTERNAL DOORS (D,1) TO HAVE DRIPS.
15. 600X450mm MIRRORS OVER ALL W.H.B.s.
16. CONCRETE WINDOW CILLS TO HAVE DRIPS.
17. FOR ALL WINDOWS PROVIDE 150X150mm OPENED ALIFT BOARDS PAINTED AND WITHSTAND WALL.
18. ALL STEEL GLAZED WINDOWS TO HAVE BUILT IN MOSQUITO PROOF GREENVAC PERMANENT VENTS.
19. ROOF EAVES SOFIT 50X25mm TIMBER BATTENS AND WIRE GAUZE WITH COFFEE TRAY WIRE.
20. 1000 GAUGE POLYTHENE SHEET BELOW FLOOR SLAB.
21. B.R.C. IN FLOOR SLAB.

FINISHES SCHEDULE

INTERNAL FINISHES

*FLOOR— COLOURED GRANO

*SKIRTINGS— COLOURED GRANO

*WALLS— PLASTERED AND PAINTED

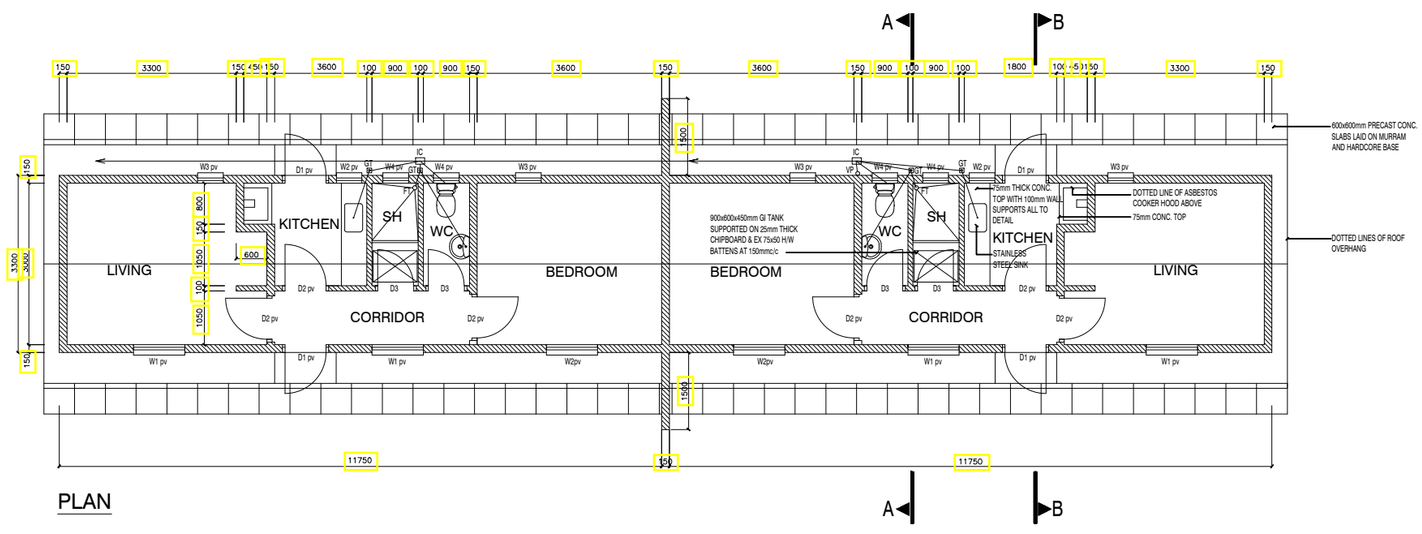
*CEILING— CHIPBOARD PAINTED

*CORNICES— TIMBER AND PAINTED

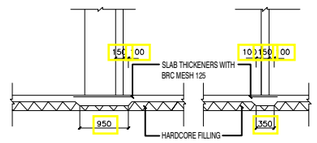
EXTERNAL FINISHES

*NATURAL STONE WITH HORIZONTAL JOINTS RAISED

*WALLS BELOW WINDOWS, RING BEAMS AND GABLE WALLS TO BE RENDERED



PLAN



SECTION C-C

ROOF SPECIFICATIONS

250mm LONG SUPER SEVEN ASBESTOS SHEETS LAID AT A PITCH OF 22.5 DEG. ON

* 50*50 PURLINS (MAX. PURLIN SPACE 1175mm)
* 125*50 RAFTERS AT APPROX. 600 c/c
* 75*50 WALL PLATE
* 50*50 BEARERS FOR CEILING FIXING (AS SHOWN ON ROOF PLAN)
* 6mm PLYWOOD CEILING
* EX. 50*25 CORNICE

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
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4.				

Client

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MUTHAIGA NORTH ROAD
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Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By

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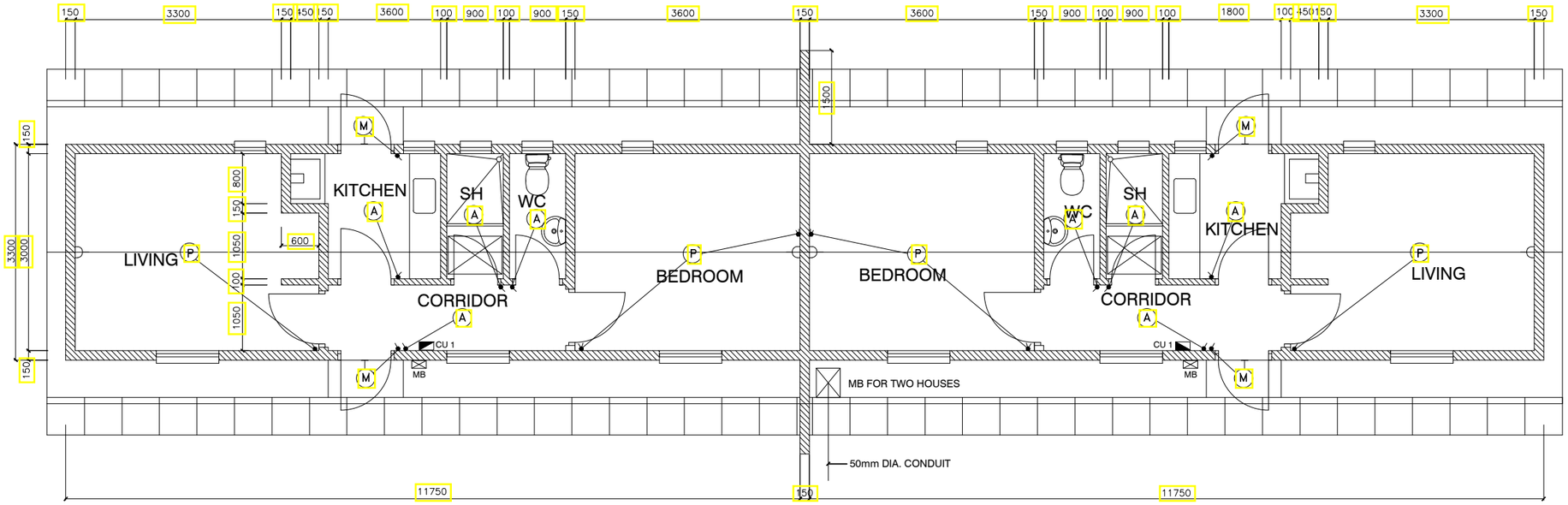
Le' Mac Building, 1st fl, Off Church Road
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing title:

STAFF HOUSE TYPE 'D'
PLAN, ELEVATIONS AND SECTIONS

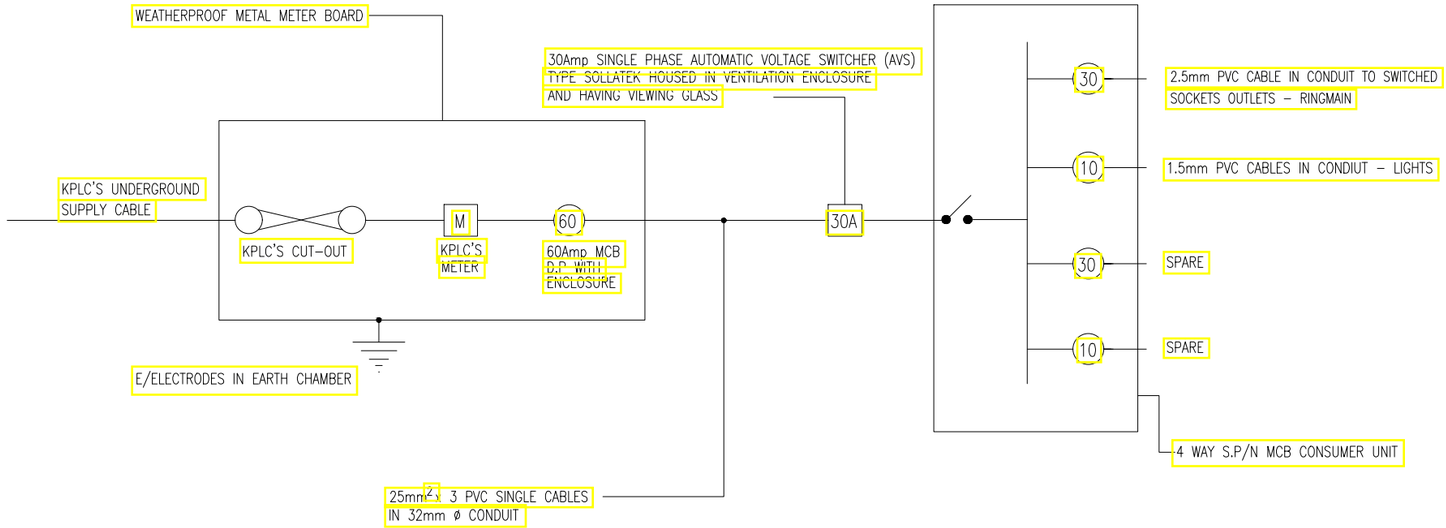
Designed By	:	LK
Drawn By	:	D.G.M
Checked By	:	W.K
Approved By	:	S.M.M
Client approval	:	
Date	:	MARCH 2023
Drawing No	:	AWSB/MC/SHD/001



LEGEND

SYMBOL	DESCRIPTION
	5A SWITCH 1 WAY MK
	5A SWITCH 2 WAY MK
	13A SWITCHED SOCKET OUTLET MK 2535
	CONSUMER UNIT CRABTREE
	METAL METER BOX TO ACCOMMODATE 2 S/P METERS
A	150mm DIA. BALL FITTING OPALL GLASS WITH LAMP THORN MTC 1060
P	PENDANT LIGHT WITH CEILING ROSE LAMP HOLDER TWIN FLEX AND LAMP
M	18W S O x KOMBI GC 001 PHILIPS

PLAN



WIRING DIAGRAM

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client

ATHI WATER WORKS DEVELOPMENT AGENCY
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency

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K.I.D.P BUILDING, ALONG KALAWA ROAD
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Project

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CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

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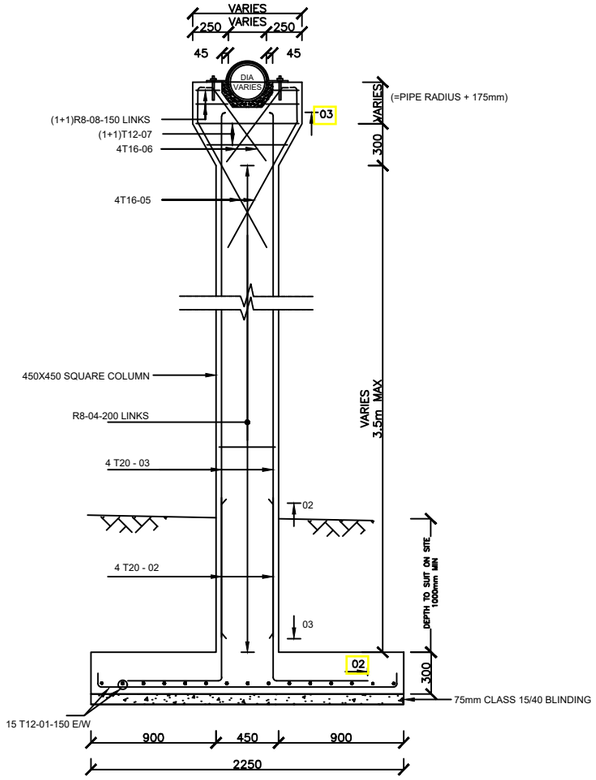
Le' Mac Building, 1st fl, Off Church Road
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing title:

STAFF HOUSE TYPE 'D'
ELECTRICAL INSTALLATION

Designed By	: LK
Drawn By	: D.G.M
Checked By	: W.K
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/SHD/002



PIER TYPE 'A'
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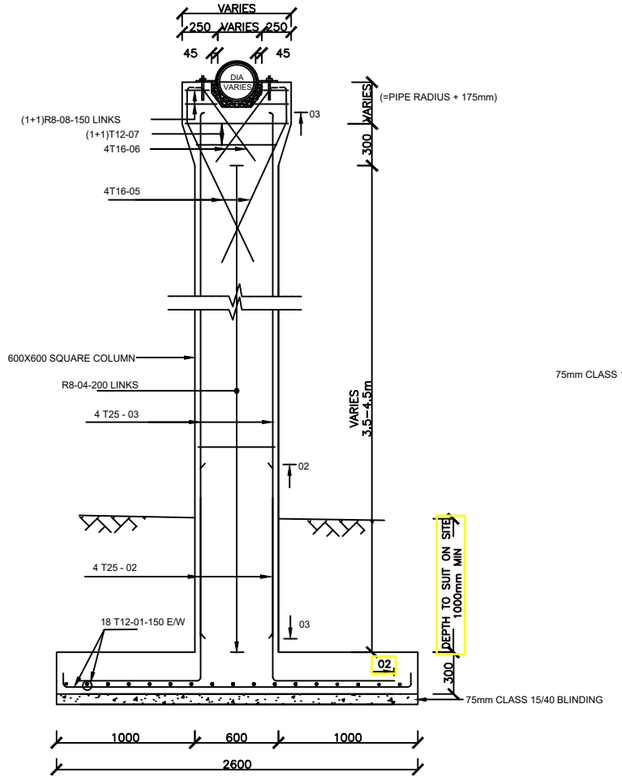
SCALE 1:40



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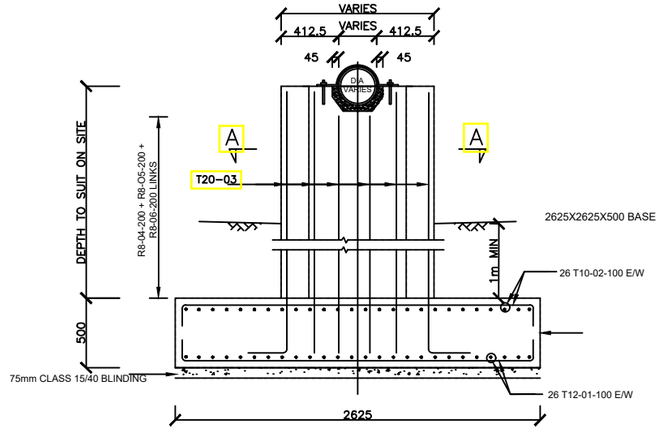
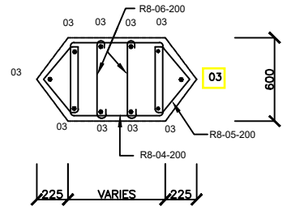
(HEIGHT 3.5-4.5m)
SCALE 1:40



PIER TYPE 'C' (4m HIGH MAX)
(TO BE USED AT RIVER CROSSINGS)
SCALE 1:40

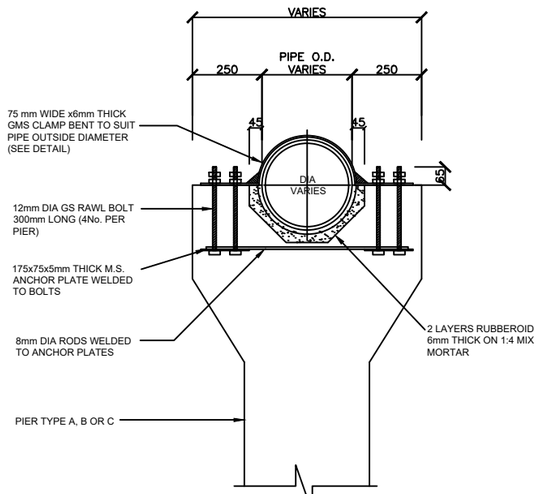


SECTION A-A

PIER TYPE 'C' (4m HIGH MAX)
(TO BE USED AT RIVER CROSSINGS)
SCALE 1:40

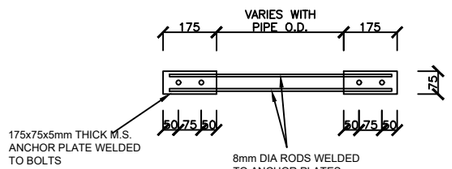
(NOTES)

1. PROGRAMME, METHOD OF CONSTRUCTION AND SETTING OUT OF WORK TO BE APPROVED BY THE ENGINEER BEFORE COMMENCEMENT OF WORK
2. DESIGN CRITERIA:
   (a) DESIGN CODES B.S. 8007 & B.S. 8110
   (b) UNIFORM NON-COMPRESSIBLE FOUNDATION WITH BEARING CAPACITY 80kN/m^2
3. CONCRETE:
   (a) CEMENT TO BE ORDINARY PORTLAND CEMENT TO B.S. 12
   (b) CONCRETE AGGREGATE TO COMPLY WITH B.S. 882
   (c) WATER IN CONCRETE MIXES TO B.S. 3148
   (d) CONCRETE CLASSES TO BE AS FOLLOWS:-
   MASS CONCRETE FILL AND BLINDING MIX, CLASS 15/40
   REINFORCED CONCRETE, CLASS 25/20
   (e) MINIMUM COVER TO ALL REINFORCEMENT TO BE 40mm UNLESS AS SPECIFIED BELOW FOR BUILDINGS:
   MEMBERS OF BUILDINGS:
   - SLABS - 20 mm
   - BEAMS - 25 mm
   - COLUMNS - 40 mm
   - FOUNDATIONS & FOOTINGS - 50 mm
   (f) WALLS/COLUMNS SHOULD BE POURED, IF POSSIBLE, IN A FULL HEIGHT POUR AS SOON AS POSSIBLE AFTER THE BASE HAS BEEN CONCRETED (2 TO 3 DAYS)
4. REINFORCEMENT:
   (a) REINFORCEMENT TO BE HIGH YIELD SQUARE TWISTED BARS TO B.S. 4461
   (b) BENDING DIMENSIONS TO B.S. 4466
   (c) THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL SPACER BLOCKS, CHAIRS AND TYING WIRE
   (d) EXAMPLE: 16 T12 - 07 - 150
   SIGNIFIES 16 No. HIGH TENSILE 12mm DIA. BARS IDENTIFICATION MARK 07 AT 150mm CENTRE TO CENTRE SPACING
5. JOINTS:
   (a) THE POSITION AND NUMBER OF INTERMEDIATE JOINTS TO BE AS DIRECTED BY THE ENGINEER OR AS SHOWN IN THE DRAWINGS.
   BEFORE PLACING FRESH CONCRETE THE OLD SURFACE SHALL BE ROUGHENED AND ALL LAITTANCE AND LOOSE MATERIAL REMOVED.
   THE SURFACE SHALL BE THOROUGHLY WETTED BUT EXCESS WATER SHOULD BE REMOVED SO THAT THE CONSTRUCTION JOINTS ARE IN A SATURATED BUT SURFACE DRY CONDITION
   (b) ALL WALL/COLUMN BASE CONNECTIONS SHOULD HAVE 100mm KICKER UNLESS OTHERWISE SPECIFIED
   (c) THE uPVC WATER STOP SHALL BE 200mm WIDE UNLESS OTHERWISE SPECIFIED
   (d) JOINT FILLER TO B.S. 5292 AND TO BE APPROVED BY THE ENGINEER

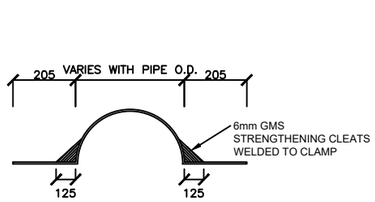


TYPICAL PIPE FIXING DETAIL ON COLUMN HEAD
SCALE 1:20

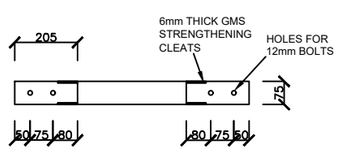
ANCHOR PLATES & GMS CLAMP DETAILS



ANCHOR PLATE DETAIL
(N.T.S.)



GMS CLAMP - ELEVATION
(N.T.S.)



GMS CLAMP - PLAN
(N.T.S.)

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
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Client
ATHI WATER WORKS DEVELOPMENT AGENCY ,
MUTHAIGA, NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

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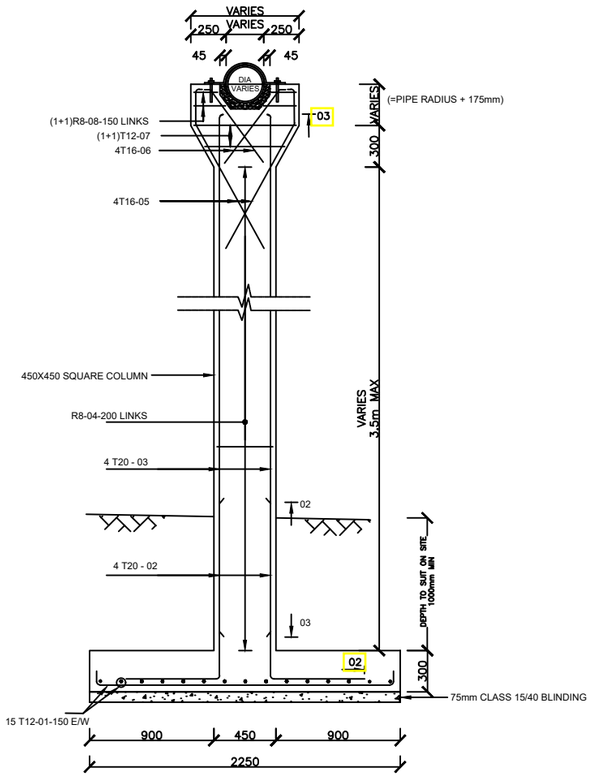
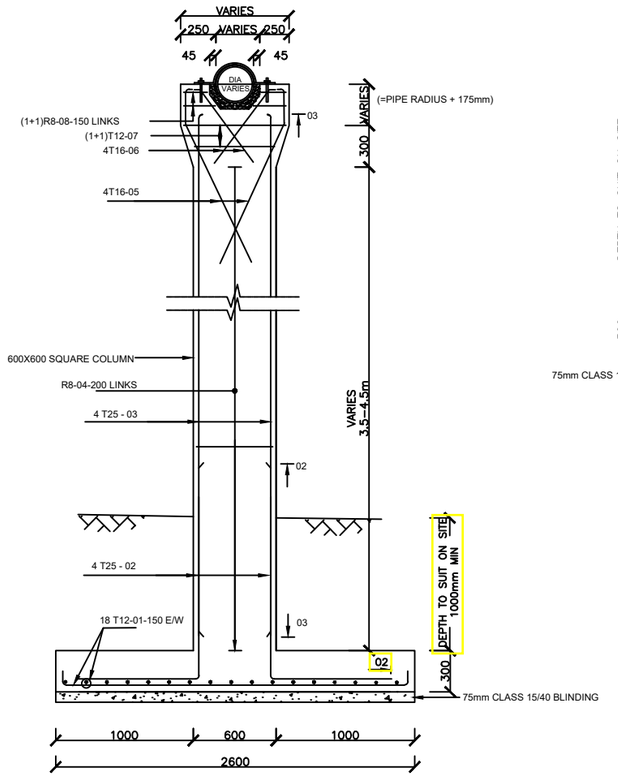
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title
AERIAL CROSSING

Designed By	: LK
Drawn By	: D.G.M
Checked By	: W.K
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/SD/001



PIER TYPE 'A'
(HEIGHT UPTO 3.5m)
SCALE 1:40



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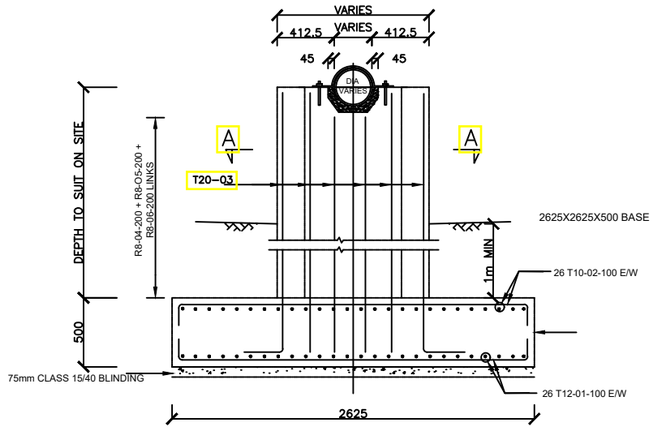
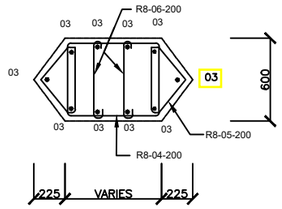
(HEIGHT 3.5-4.5m)
SCALE 1:40



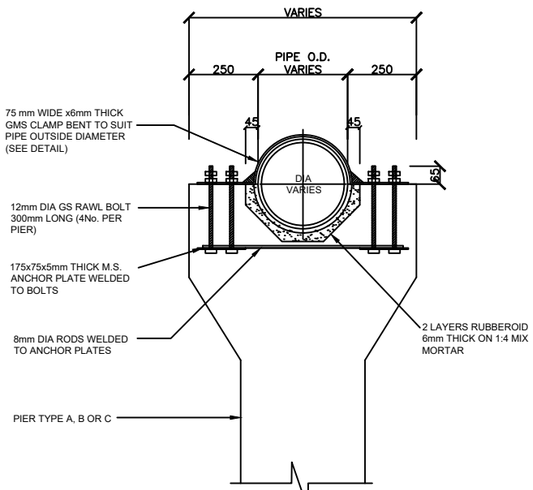
PIER TYPE 'C' (4m HIGH MAX)
(TO BE USED AT RIVER CROSSINGS)
SCALE 1:40



SECTION A-A
PIER TYPE 'C' (4m HIGH MAX)
(TO BE USED AT RIVER CROSSINGS)
SCALE 1:40

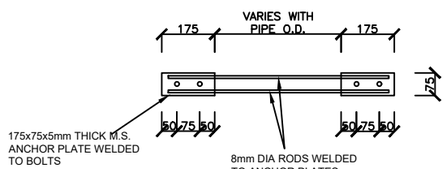
(NOTES)

1. PROGRAMME, METHOD OF CONSTRUCTION AND SETTING OUT OF WORK TO BE APPROVED BY THE ENGINEER BEFORE COMMENCEMENT OF WORK
2. DESIGN CRITERIA:
   (a) DESIGN CODES B.S. 8007 & B.S. 8110
   (b) UNIFORM NON-COMPRESSIBLE FOUNDATION WITH BEARING CAPACITY 80kN/m^2
3. CONCRETE:
   (a) CEMENT TO BE ORDINARY PORTLAND CEMENT TO B.S. 12
   (b) CONCRETE AGGREGATE TO COMPLY WITH B.S. 882
   (c) WATER IN CONCRETE MIXES TO B.S. 3148
   (d) CONCRETE CLASSES TO BE AS FOLLOWS:-
   MASS CONCRETE FILL AND BLINDING MIX, CLASS 15/40
   REINFORCED CONCRETE, CLASS 25/20
   (e) MINIMUM COVER TO ALL REINFORCEMENT TO BE 40mm UNLESS AS SPECIFIED BELOW FOR BUILDINGS:
   MEMBERS OF BUILDINGS:
   - SLABS - 20 mm
   - BEAMS - 25 mm
   - COLUMNS - 40 mm
   - FOUNDATIONS & FOOTINGS - 50 mm
   (f) WALLS/COLUMNS SHOULD BE POURED, IF POSSIBLE, IN A FULL HEIGHT POUR AS SOON AS POSSIBLE AFTER THE BASE HAS BEEN CONCRETED (2 TO 3 DAYS)
4. REINFORCEMENT:
   (a) REINFORCEMENT TO BE HIGH YIELD SQUARE TWISTED BARS TO B.S. 4461
   (b) BENDING DIMENSIONS TO B.S. 4466
   (c) THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL SPACER BLOCKS, CHAIRS AND TYING WIRE
   (d) EXAMPLE: 16 T12 - 07 - 150
   SIGNIFIES 16 No. HIGH TENSILE 12mm DIA. BARS IDENTIFICATION MARK 07 AT 150mm CENTRE TO CENTRE SPACING
5. JOINTS:
   (a) THE POSITION AND NUMBER OF INTERMEDIATE JOINTS TO BE AS DIRECTED BY THE ENGINEER OR AS SHOWN IN THE DRAWINGS.
   BEFORE PLACING FRESH CONCRETE THE OLD SURFACE SHALL BE ROUGHENED AND ALL LAITTANCE AND LOOSE MATERIAL REMOVED. THE SURFACE SHALL BE THOROUGHLY WETTED BUT EXCESS WATER SHOULD BE REMOVED SO THAT THE CONSTRUCTION JOINTS ARE IN A SATURATED BUT SURFACE DRY CONDITION
   (b) ALL WALL/COLUMN BASE CONNECTIONS SHOULD HAVE 100mm KICKER UNLESS OTHERWISE SPECIFIED
   (c) THE uPVC WATER STOP SHALL BE 200mm WIDE UNLESS OTHERWISE SPECIFIED
   (d) JOINT FILLER TO B.S. 5292 AND TO BE APPROVED BY THE ENGINEER

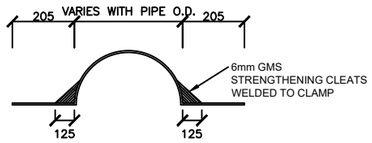


TYPICAL PIPE FIXING DETAIL ON COLUMN HEAD
SCALE 1:20

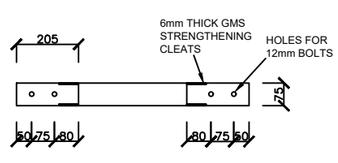
ANCHOR PLATES & GMS CLAMP DETAILS



ANCHOR PLATE DETAIL
(N.T.S.)



GMS CLAMP - ELEVATION
(N.T.S.)



GMS CLAMP - PLAN
(N.T.S.)

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client
ATHI WATER WORKS DEVELOPMENT AGENCY ,
MUTHAIGA, NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

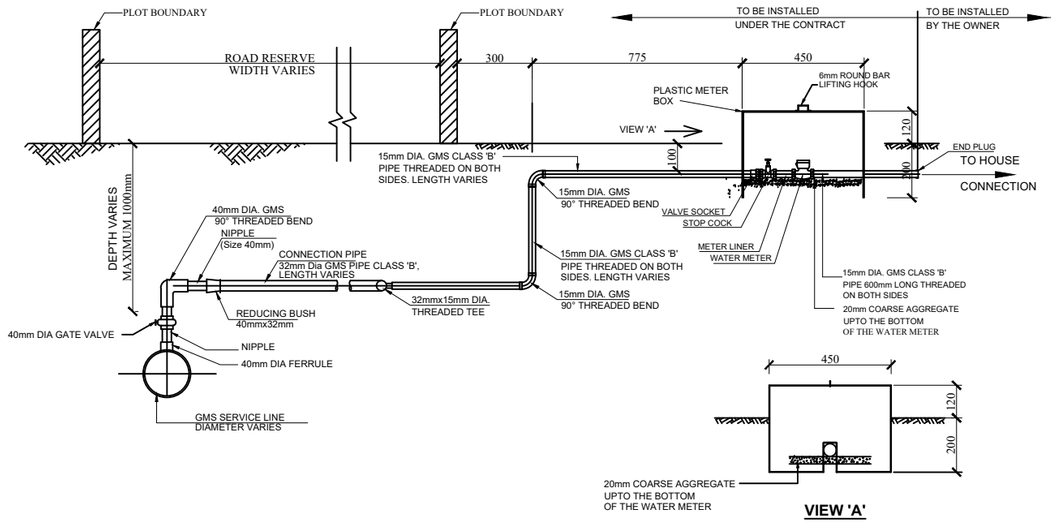
Financed By
AFRICAN DEVELOPMENT BANK

Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT
CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By
CAS CONSULTANTS LIMITED
Le' Mac Building, 1st Fl, Off Church Rd, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

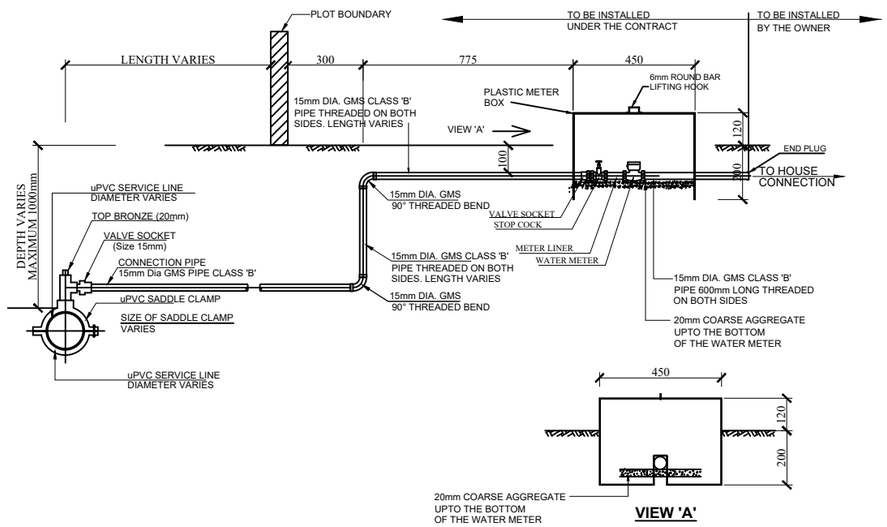
Drawing Title
AERIAL CROSSING

Designed By	: LK
Drawn By	: D.G.M
Checked By	: W.K
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/SD/001



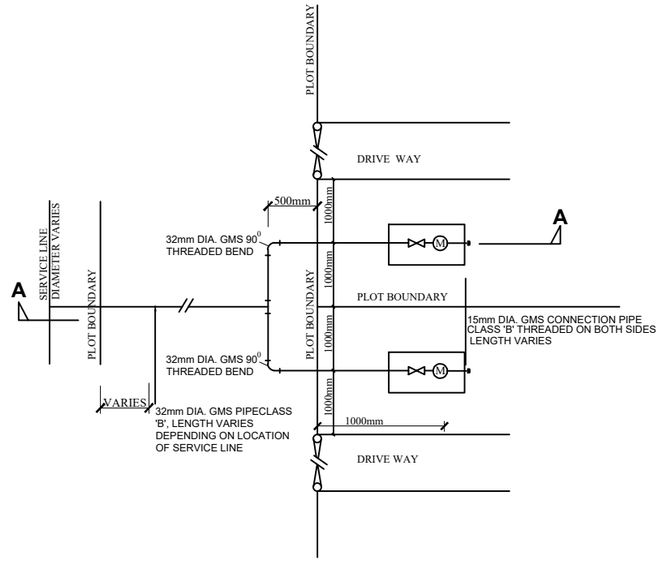
SECTION A-A

NTS



SECTION B-B

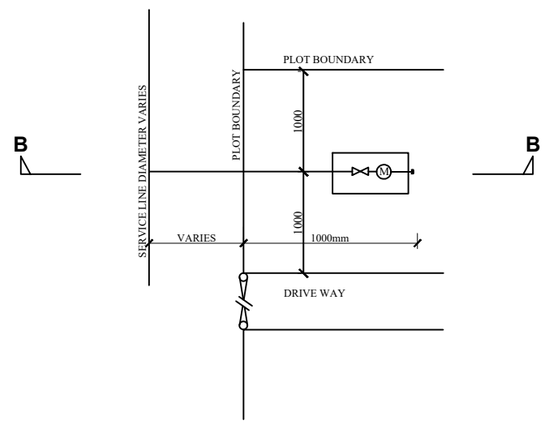
NTS



PLAN

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

NTS



PLAN

TYPICAL CONSUMER CONNECTION FOR ONE HOUSEHOLD ON A uPVC SERVICE LINE

NTS

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client

ATHI WATER WORKS DEVELOPMENT AGENCY ,
MUTHAIGA, NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By

AFRICAN DEVELOPMENT BANK

Project

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CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By

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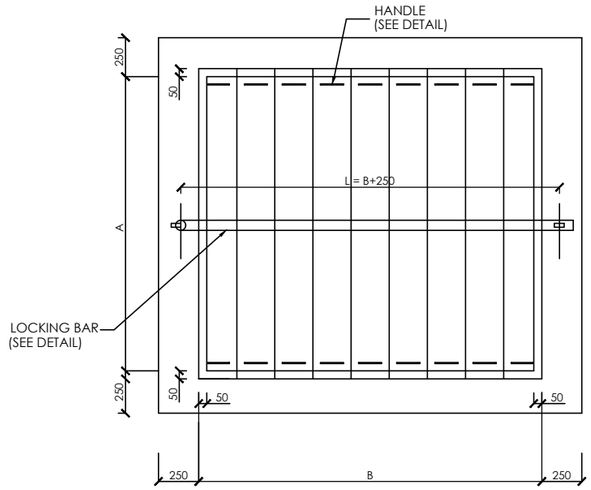
Le' Mac Building, 1st Fl, Off Church Rd, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title

CONSUMER CONNECTIONS

Designed By	: LK
Drawn By	: D.G.M
Checked By	: W.K
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/SD/002



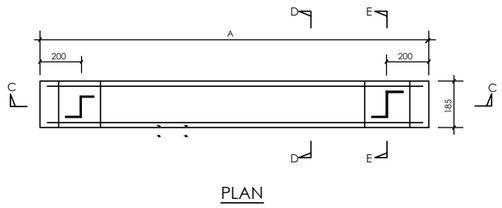
COVER FOR AIR VALVE CHAMBERS

SCALE A1 - 1:10
A3 - 1:20

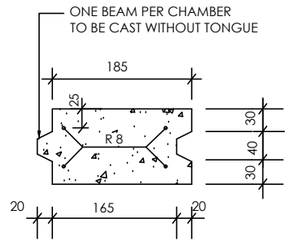


SECTION G-G

SCALE A1 - 1:10
A3 - 1:20

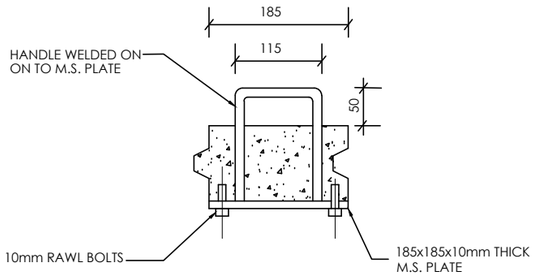


PLAN



SECTION D-D

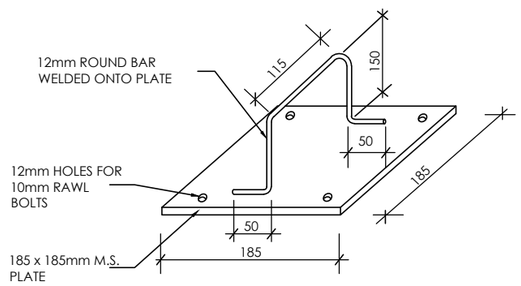
NTS



SECTION E-E

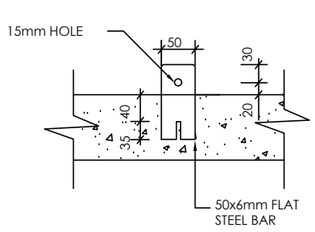
NTS

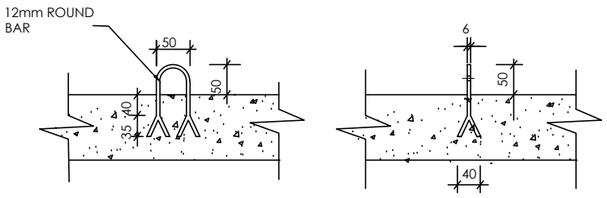
DETAIL OF PRECAST CONCRETE COVER SLAB



DETAIL OF HANDLE

NTS

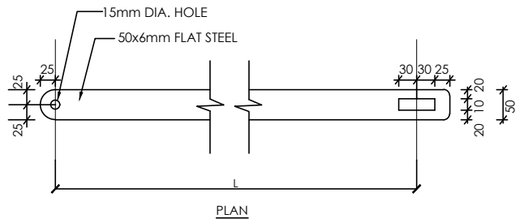




SECTIONS

COVER SIZE SCHDULE

CHAMBER INTERNAL DIMENSIONS (mm)	SIZE OF COVER A (mm) x B(mm)
1200 X 1200	1300 X 1300
1200 X 1200	1300 X 1300
1400 X 1200	1500 X 1500
1500 X 1200	1600 X 1300
1500 X 1200	1600 X 1300
1800 X 1200	1900 X 1300
1800 X 1200	1900 X 1300
1400 X 1400	1500 X 1500
1400 X 1200	1500 X 1300



PLAN

DETAILS OF LOCKING BAR

NTS

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March; 2018
2.				
3.				
4.				

Client

ATHI WATER WORKS DEVELOPMENT AGENCY ,
MUTHAIGA, NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By

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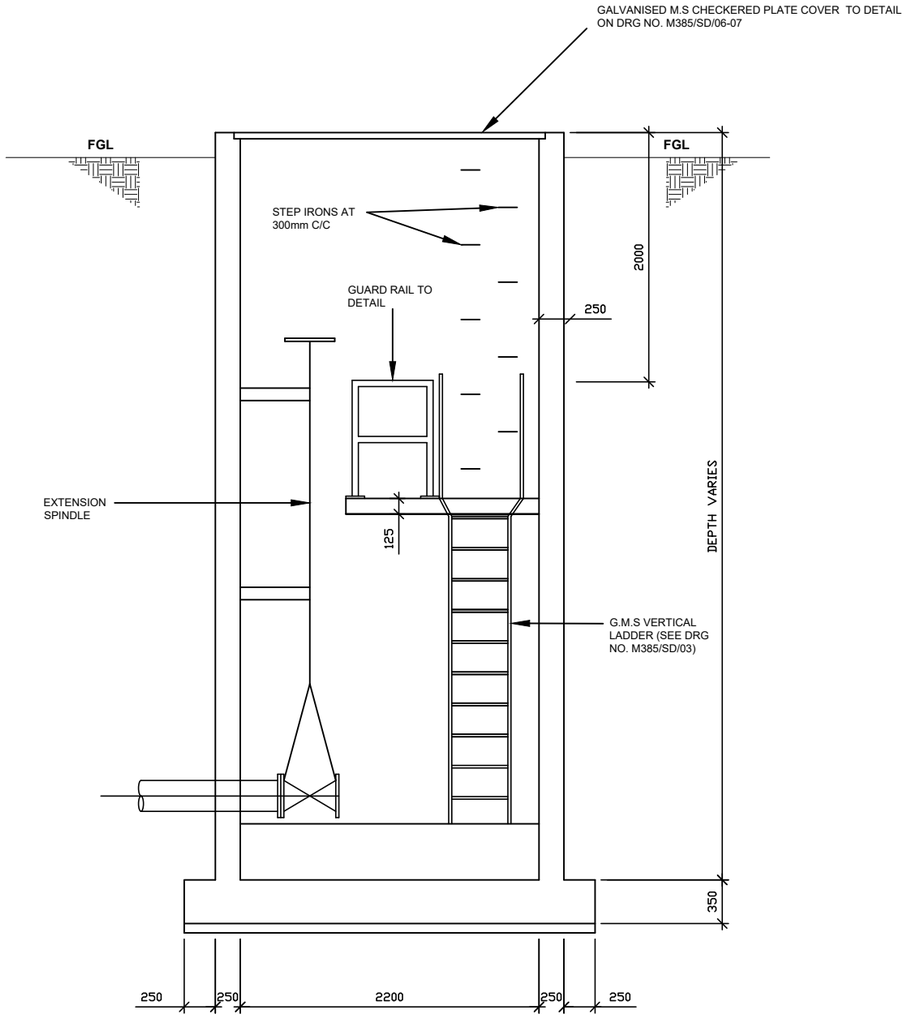
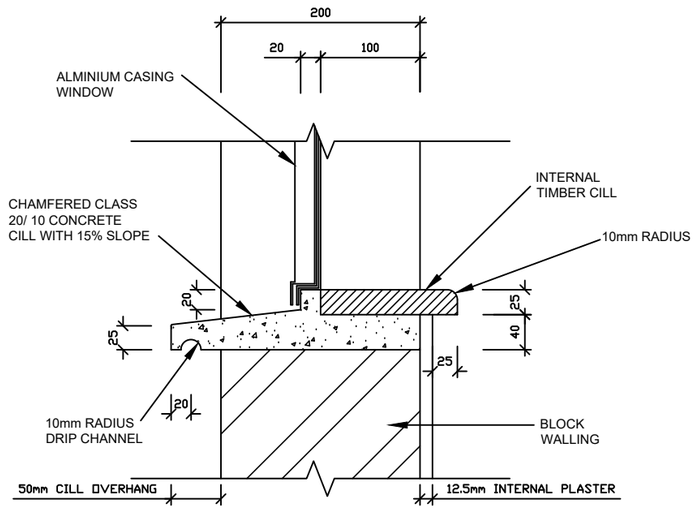
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title

COVER DETAILS

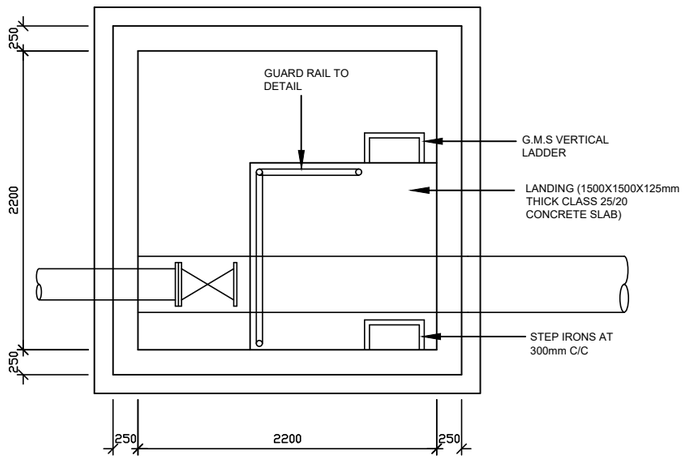
Designed By	: LK
Drawn By	: D.G.M
Checked By	: W.K
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/SD/003





WINDOW CILL DETAIL

(ALL DIMENSIONS IN MILLIMETERS)



CHAMBER TYPE 1A

PLAN

NOTES

1. ALL DIMENSIONS ARE IN MILIMETRES UNLESS OTHERWISE STATED

ABBREVIATIONS

mm - MILIMETER
G.M.S. - GALVANISED MILD STEEL
E.G.L. - EXISTING GROUND LEVEL

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March; 2018
2.				
3.				
4.				

Client

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MUTHAIGA, NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency

TANATHI WATER WORKS DEVELOPMENT AGENCY
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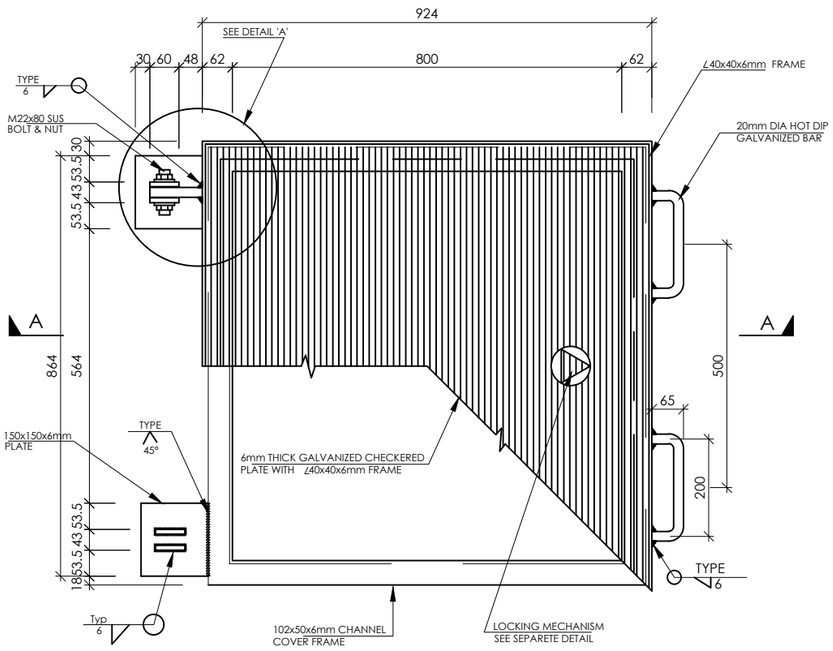
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title

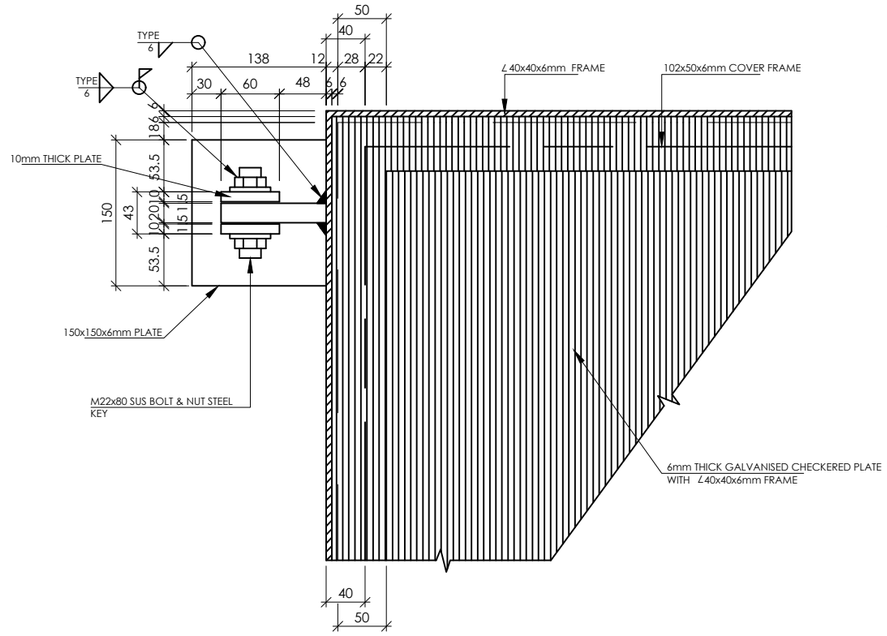
DEEP VALVE CHAMBER

Designed By	: LK
Drawn By	: D.G.M
Checked By	: W.K
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/SD/004



PLAN OF CHECKERED PLATE COVER FOR CHAMBERS

SCALE 1:10

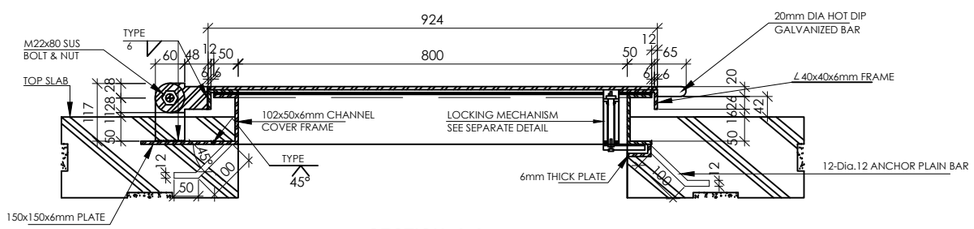


NOTES

ALL DIMENSIONS ARE IN MILIMETRES (mm) UNLESS OTHERWISE STATED

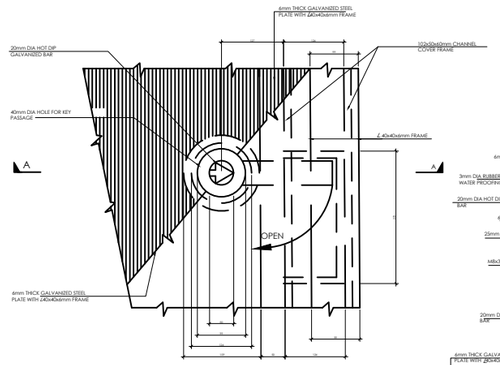
ABBREVIATIONS

SUS	-	Stainless Steel
thk	-	thick
Typ	-	Type
Dia.	-	Diameter
∠	-	Angle Iron



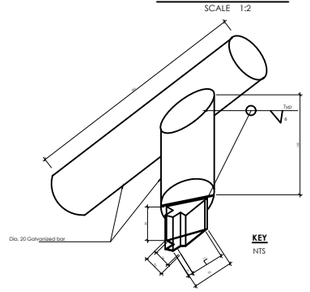
SECTION A-A

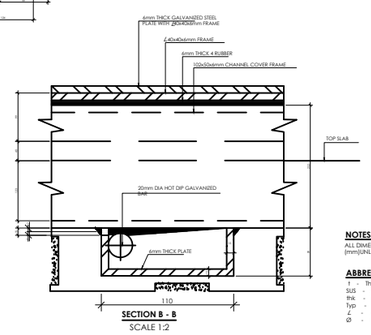
SCALE 1:10



PLAN OF LOCKING MECHANISM

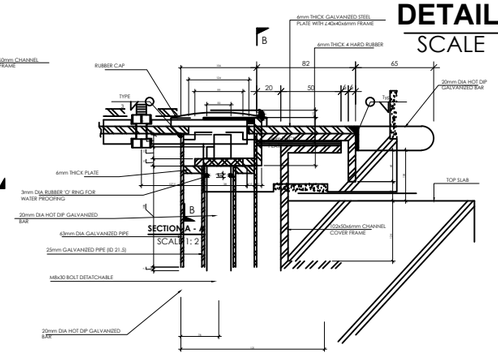
SCALE 1:2





SECTION B - B

SCALE 1:2



SECTION A - A

SCALE 1:2

DETAIL 'A'

SCALE 1:5

NOTES

ALL DIMENSIONS ARE IN MILLIMETERS (mm) UNLESS OTHERWISE STATED

ABBREVIATIONS

t	-	Thick
SUS	-	STAINLESS STEEL
thk	-	Thick
Typ	-	Type
∠	-	Angle Iron
Ø	-	Diameter

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March; 2018
2.				
3.				
4.				

Client

ATHI WATER WORKS DEVELOPMENT AGENCY ,
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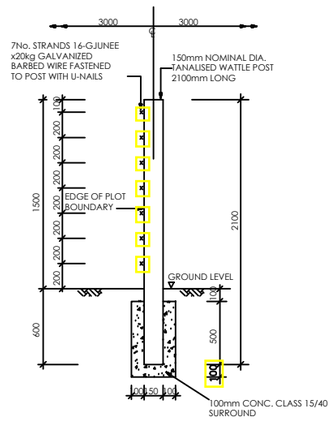
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title

CHECKERED PLATE DETAILS

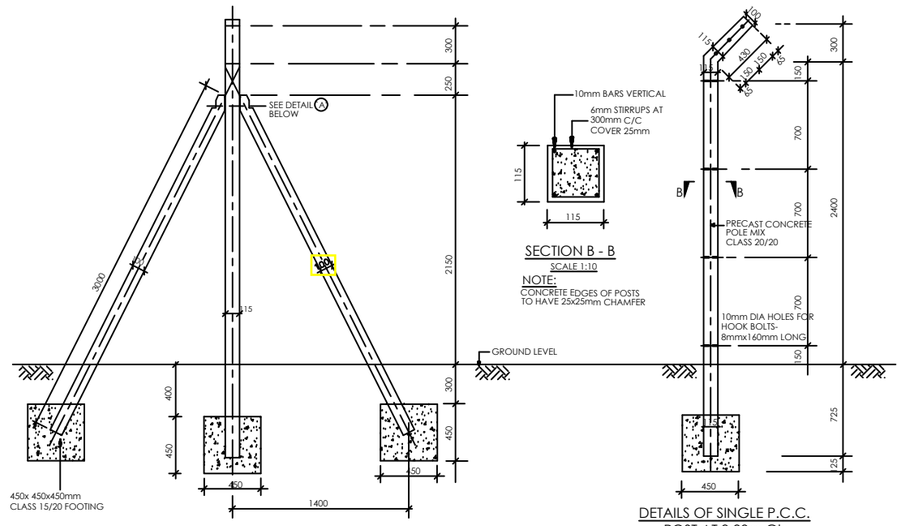
Designed By	:	LK
Drawn By	:	D.G.M
Checked By	:	W.K
Approved By	:	S.M.M
Client approval	:	
Date	:	MARCH 2023
Drawing No	:	AWSB/MC/SD/005

DETAILS OF WATTLE POSTS FOR BARBED WIRE FENCE



TYPICAL END ELEVATION - SINGLE POST
(TO BE AT 3.0m CENTRES)
(NTS)

DETAILS OF PRECAST CONCRETE POSTS FOR CHAIN LINK FENCE

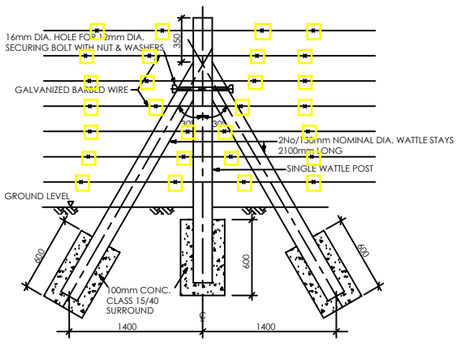


DETAILS OF STRAINING POST FOR
CHAIN LINK FENCE AT 33.3m Cts.
SCALE 1:40

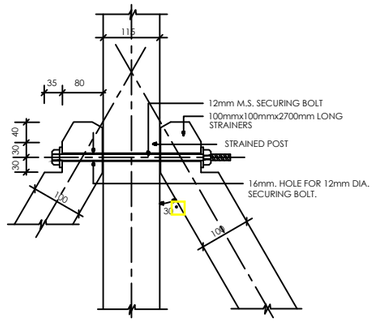
DETAILS OF SINGLE P.C.C.
POST AT 3.30m Cts.
SCALE 1:40

(NOTES)

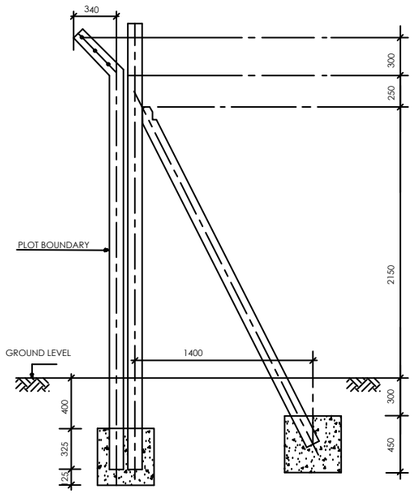
1. PROGRAMME, METHOD OF CONSTRUCTION AND SETTING OUT OF WORK TO BE APPROVED BY THE ENGINEER BEFORE COMMENCEMENT OF WORK
2. DESIGN CRITERIA:
   (a) DESIGN CODES B.S. 8007 & B.S. 8110
   (b) UNIFORM NON-COMPRESSIBLE FOUNDATION WITH BEARING CAPACITY 80kN/m^2
3. CONCRETE:
   (a) CEMENT TO BE ORDINARY PORTLAND CEMENT TO B.S. 12
   (b) CONCRETE AGGREGATE TO COMPLY WITH B.S. 882
   (c) WATER IN CONCRETE MIXES TO B.S. 3148
   (d) CONCRETE CLASSES TO BE AS FOLLOWS:-
   MASS CONCRETE FILL AND BLINDING MIX, CLASS 15/40
   REINFORCED CONCRETE, CLASS 25/20
   (e) MINIMUM COVER TO ALL REINFORCEMENT TO BE 40mm UNLESS AS SPECIFIED BELOW FOR BUILDINGS:
   MEMBERS OF BUILDINGS:
   - SLABS - 20 mm
   - BEAMS - 25 mm
   - COLUMNS - 40 mm
   - FOUNDATIONS & FOOTINGS - 50 mm
   (f) WALLS/COLUMNS SHOULD BE POURED, IF POSSIBLE, IN A FULL HEIGHT POUR AS SOON AS POSSIBLE AFTER THE BASE HAS BEEN CONCRETED (2 TO 3 DAYS)
4. REINFORCEMENT:
   (a) REINFORCEMENT TO BE HIGH YIELD SQUARE TWISTED BARS TO B.S. 4461
   (b) BENDING DIMENSIONS TO B.S. 4466
   (c) THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL SPACER BLOCKS, CHAIRS AND TYING WIRE
   (d) EXAMPLE: 16 T12 - 07 - 150
   SIGNIFIES 16 No. HIGH TENSILE 12mm DIA. BARS IDENTIFICATION MARK 07 AT 150mm CENTRE TO CENTRE SPACING
5. JOINTS:
   (a) THE POSITION AND NUMBER OF INTERMEDIATE JOINTS TO BE AS DIRECTED BY THE ENGINEER OR AS SHOWN IN THE DRAWINGS.
   BEFORE PLACING FRESH CONCRETE THE OLD SURFACE SHALL BE ROUGHENED AND ALL LAITTANCE AND LOOSE MATERIAL REMOVED.
   THE SURFACE SHALL BE THOROUGHLY WETTED BUT EXCESS WATER SHOULD BE REMOVED SO THAT THE CONSTRUCTION JOINTS ARE IN A SATURATED BUT SURFACE DRY CONDITION
   (b) ALL WALL/COLUMN BASE CONNECTIONS SHOULD HAVE 100mm KICKER UNLESS OTHERWISE SPECIFIED
   (c) THE uPVC WATER STOP SHALL BE 200mm WIDE UNLESS OTHERWISE SPECIFIED
   (d) JOINT FILLER TO B.S. 5292 AND TO BE APPROVED BY THE ENGINEER



TYPICAL FRONT ELEVATION - STAYED POST
(STAYS TO BE PROVIDED AT 30.0m c/c AND AT CORNERS
(NTS)



DETAIL 'A'
SCALE 1:10



DETAILS OF CORNER POSTS
SCALE 1:40

NOTES

a) ALL CORNER POSTS AND EVERY 10th SINGLE POST TO HAVE 2No. STAYS
b) POSTS TO BE AT 3000mm CENTRES
c) TOP OF ALL POSTS TO BE KEPT IN UNIFORM LINE
d) EXTENT OF FENCING IS SHOWN ON THE LAYOUT PLAN
e) N.T.S = NOT TO SCALE

NOTES

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

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	February; 2018
2.				
3.				
4.				

Client
ATHI WATER WORKS DEVELOPMENT AGENCY ,
MUTHAIGA, NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By
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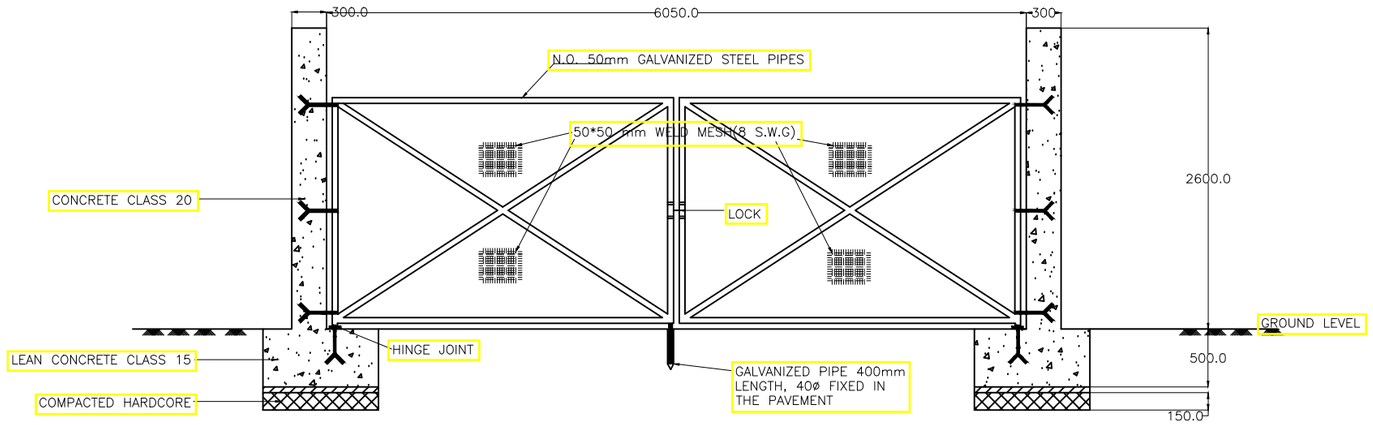
Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT
CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

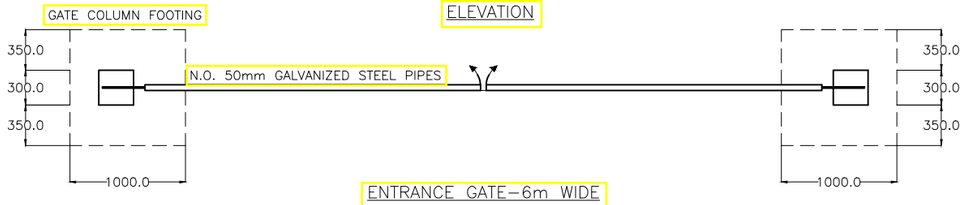
Reviewed By
CAS CONSULTANTS LIMITED
Le' Mac Building, 1st Fl, Off Church Rd, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title
DETAILS OF FENCING POSTS

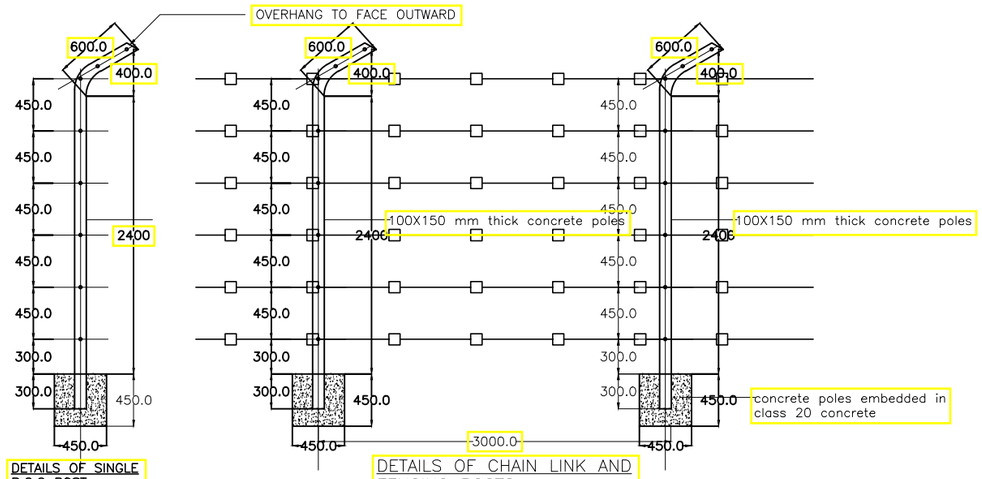
Designed By	:	LK
Drawn By	:	D.G.M
Checked By	:	W.K
Approved By	:	S.M.M
Client approval	:	
Date	:	MARCH 2023
Drawing No	:	AWSB/MC/SD/006



ELEVATION

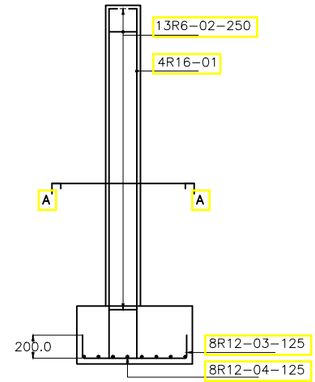


ENTRANCE GATE–6m WIDE

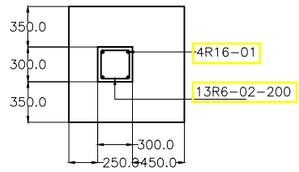


DETAILS OF SINGLE P.C.C POST

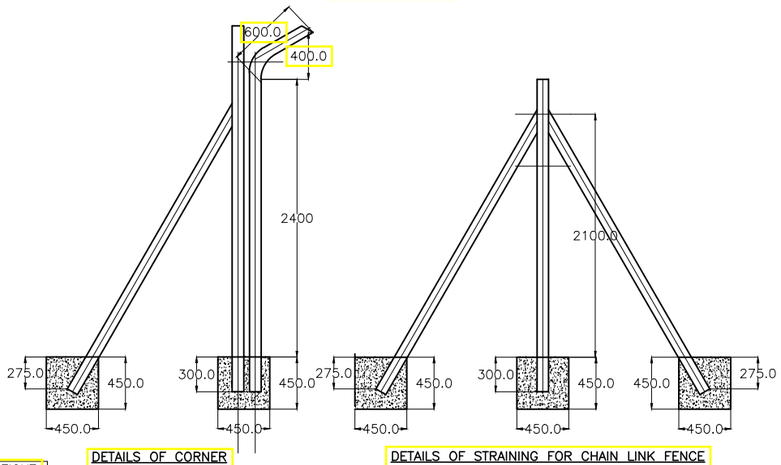
DETAILS OF CHAIN LINK AND FENCING POSTS



GATE POST



SECTION A–A



DETAILS OF CORNER P.C.C POST

DETAILS OF STRAINING FOR CHAIN LINK FENCE

LOCATION	BAR MARK	TYPE AND SIZE	No IN EACH	TOTAL No	CUT LENGTHS METRES	TOTAL LENGTH METRES	SHAPE CODE	A	B	C	WEIGHT KG
ENTRANCE GATE 6m WIDE	01	R16	4	8	3.050	24.400	37	0.050	3.000		38.527
	02	R6	13	26	1.050	27.300	60	0.200	0.200		6.060
	03	R12	8	8	1.400	11.200	38	0.250	0.900		9.945
	04	R12	8	8	1.400	11.200	38	0.250	0.900		9.945
CHAIN LINK FENCING POST	05	R6	32	32	0.450	14.400	60	0.600	0.600	2.580	3.197
	06	R8	4	4	3.160	12.640	62	0.580	0.580		4.993

BAR BENDING SCHEDULE

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	February; 2018
2.				
3.				
4.				

Client

ATHI WATER WORKS DEVELOPMENT AGENCY ,
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P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency

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CONTRACT No;
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Reviewed By

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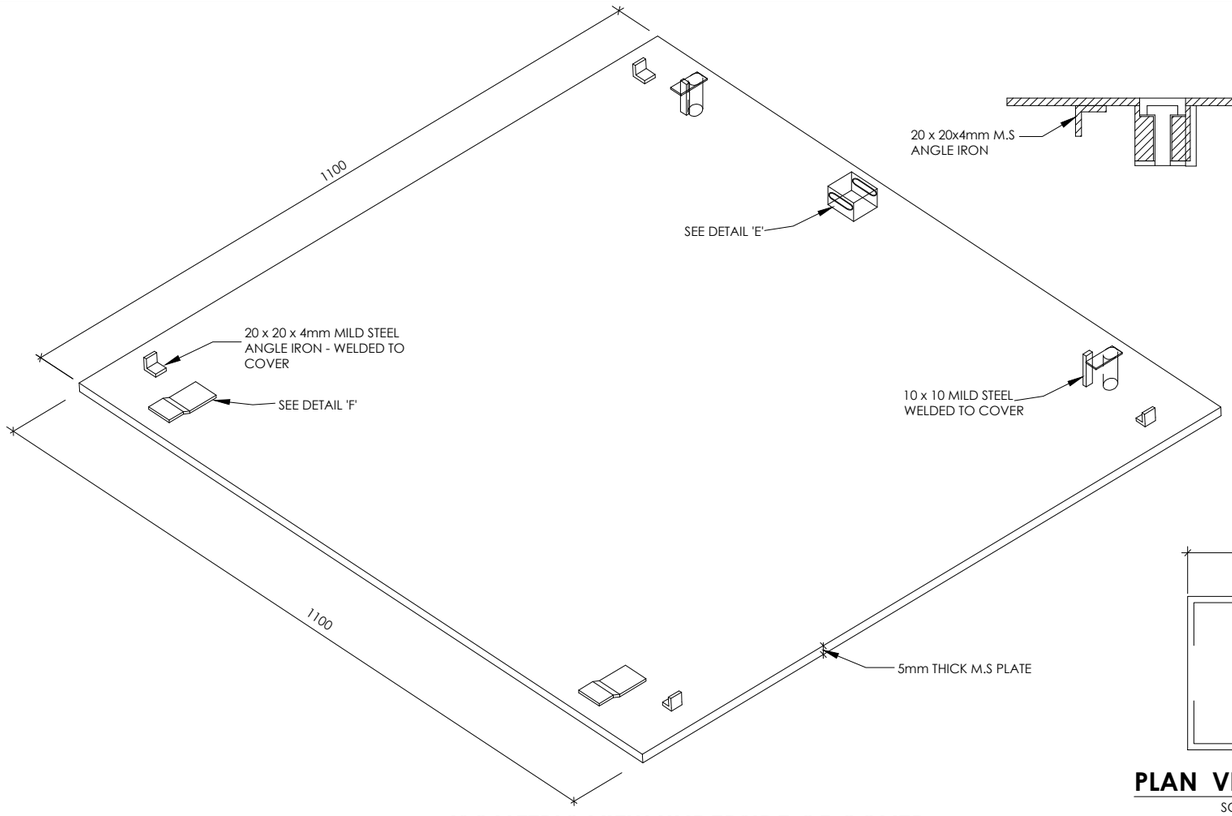
Le' Mac Building, 1st Fl, Off Church Rd, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

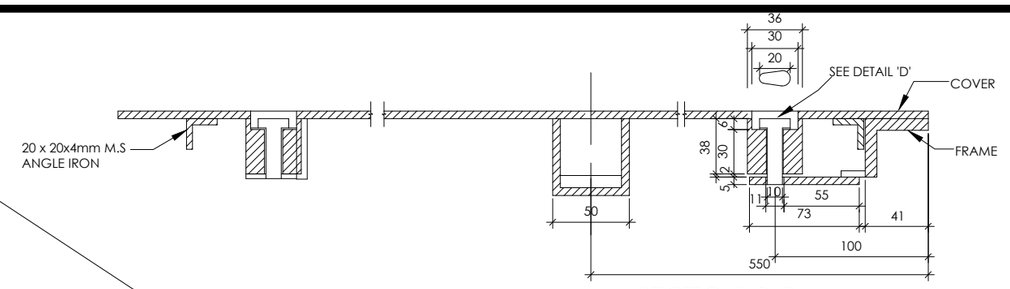
Drawing Title

FENCING AND GATE DETAILS

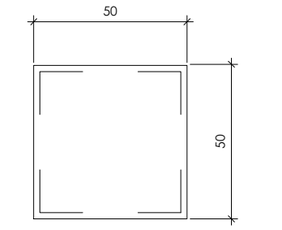
Designed By	: LK
Drawn By	: D.G.M
Checked By	: W.K
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/SD/007



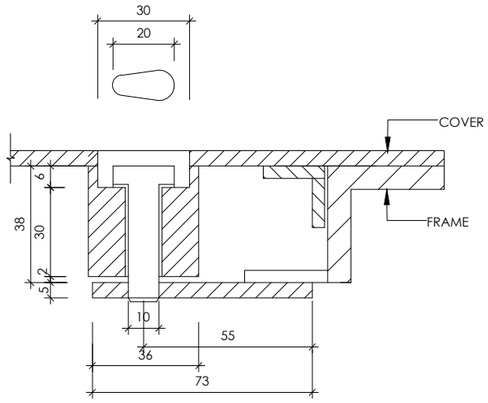
ISOMETRIC VIEW UNDERSIDE OF COVER
SCALE 1:10



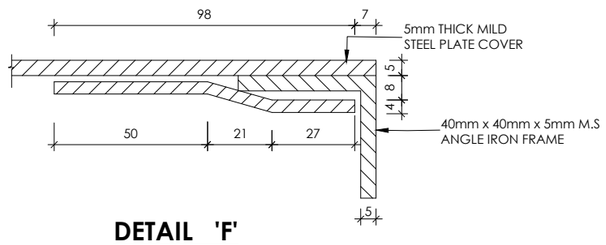
SECTION B-B
SCALE 1: 40



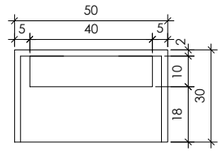
PLAN VIEW OF DETAIL E
SCALE 1: 20



DETAIL 'D'
SCALE 1: 20



DETAIL 'F'
SCALE 1:20



DETAIL 'E'
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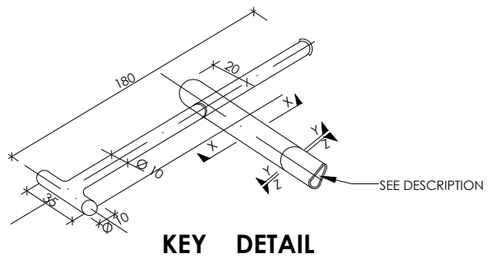
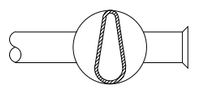
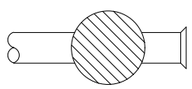


KEY DETAIL
SCALE 1: 20



SECTION Y-Y



SECTION X-X



SECTION Z-Z

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	February; 2018
2.				
3.				
4.				

Client

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Executing Agency

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By

AFRICAN DEVELOPMENT BANK

Project

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CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By

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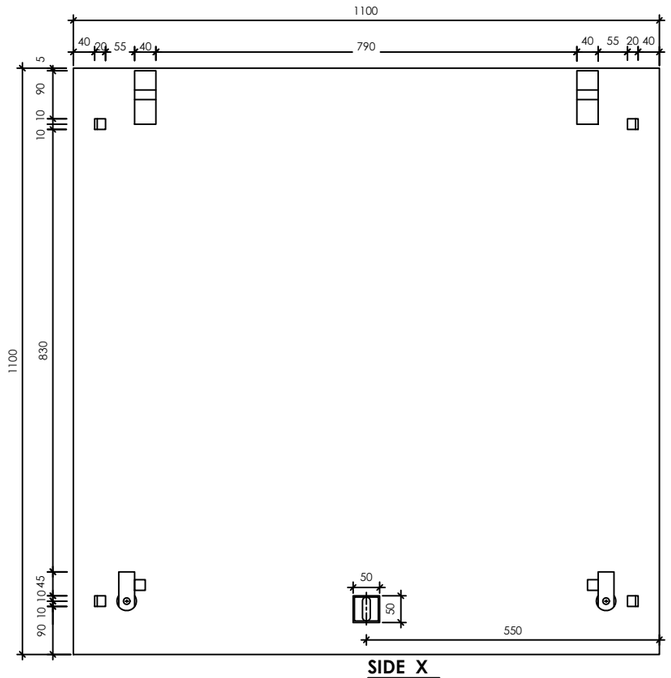
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

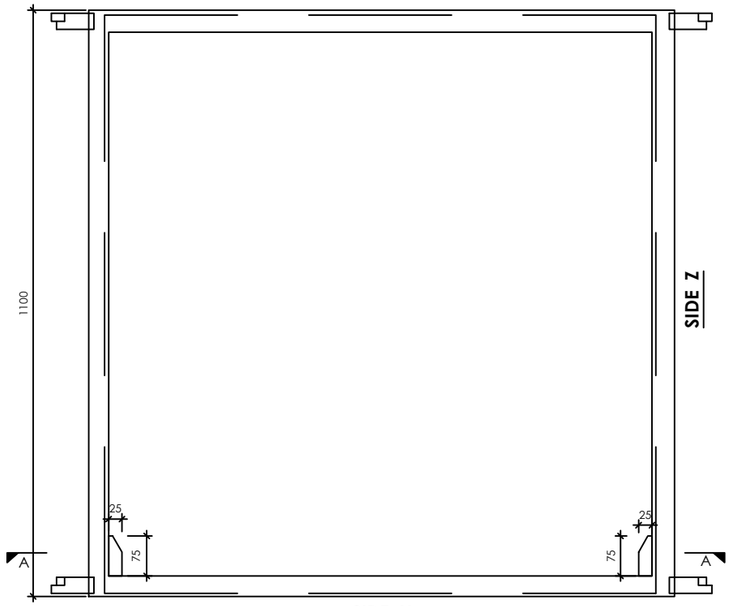
Drawing Title

DETAILS OF METAL COVER

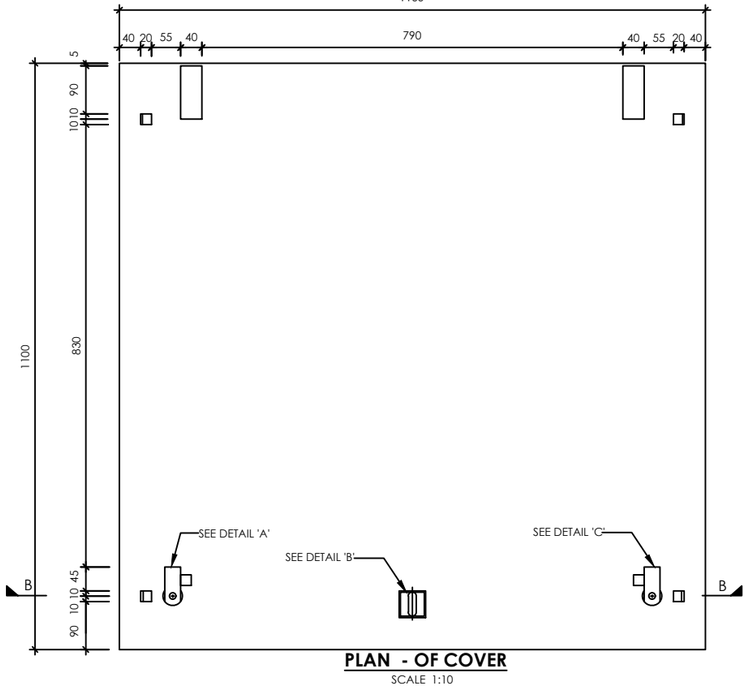
Designed By	: LK
Drawn By	: D.G.M
Checked By	: W.K
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/SD/008A



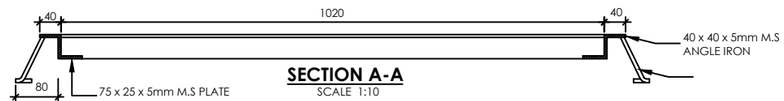
SIDE X
PLAN - UNDERSIDE OF COVER
SCALE 1:10



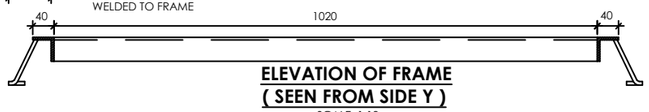
SIDE Y
PLAN OF FRAME
SCALE 1:10



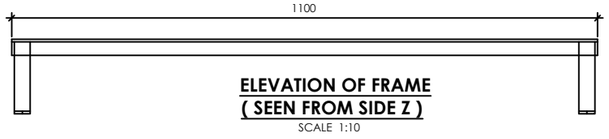
PLAN - OF COVER
SCALE 1:10



SECTION A-A
SCALE 1:10



ELEVATION OF FRAME
(SEEN FROM SIDE Y)
SCALE 1:10



ELEVATION OF FRAME
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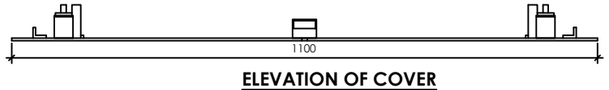

ELEVATION OF COVER
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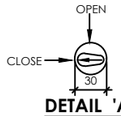
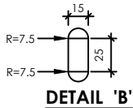
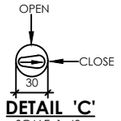
SCALE 1:10



DETAIL 'A'
SCALE 1: 40



DETAIL 'B'
SCALE 1: 40



DETAIL 'C'
SCALE 1: 40

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	February; 2018
2.				
3.				
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Drawing Title

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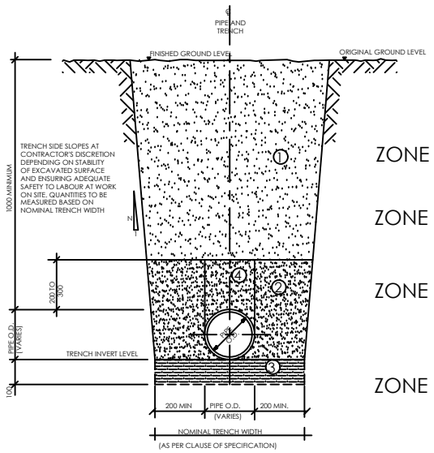


NOTES

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

ZONE 1 — BACKFILL IN LAYERS NOT EXCEEDING 300mm UPTO FINISHED GROUND LEVEL, EACH LAYER BEING WELL COMPACTED TO LIMIT VOIDS. MECHANICAL COMPACTION EQUIPMENT MAY BE USED IF APPROVED BY ENGINEER.

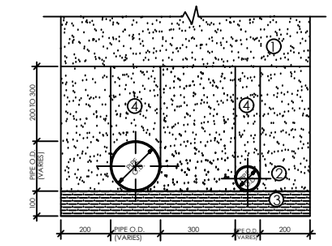
ZONE 2 — BACKFILL WITH SOIL APPROVED BY THE ENGINEER, IN LAYERS NOT EXCEEDING 200mm. THOROUGHLY COMPACT SOIL, TAMPING EQUALLY ON EITHER SIDE AND ALONG LOWER EDGE OF PIPE. ONLY HAND TAMPING TO BE USED

ZONE 3 — IF ROCK SHARP PROJECTIONS, TREE ROOTS OR OTHER UNSUITABLE MATERIAL IS ENCOUNTERED AT TRENCH INVERT LEVEL, A FURTHER 100mm DEPTH OF MATERIAL IS TO BE EXCAVATED. BACKFILL WITH SOIL APPROVED BY THE ENGINEER UPTO TRENCH INVERT LEVEL. THOROUGHLY COMPACT SOIL BY HAND TO GIVE A UNIFORM GRADIENT ALONG PIPE TRENCH, LEAVING RECESSES FOR PIPE JOINTS.

ZONE 4 — SIMILAR REQUIREMENTS TO ZONE 2 EXCEPT NO EXCESS TAMPING IS PERMITTED OVER PIPE.

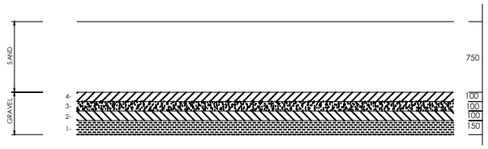
TYPICAL TRENCH DETAIL FOR RETICULATION PIPES (uPVC OR C/L FERROUS PIPES)

SCALE 1:100



TWIN PIPES IN SINGLE TRENCH

SCALE 1:20

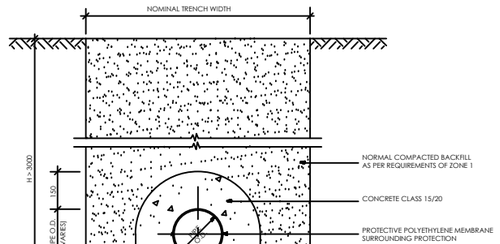


LAYER	1	2	3	4
DEPTH (mm)	150	100	100	100
PASSING SQUARE MESH	38mm (11/2")	20mm (3/4")	12mm (1/2")	5mm (3/16")
RETAINED	20mm (3/4")	12mm (1/2")	5mm (3/16")	2mm (3/32")

TOP SAND LAYER 750mm EFFECTIVE SIZE 0.7mm
UNIFORMITY COEFFICIENT 1.5

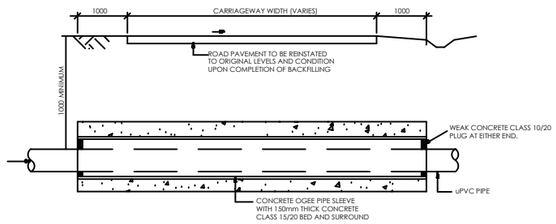
DETAILS OF FILTER MEDIA IN RAPID SAND FILTERS

NTS



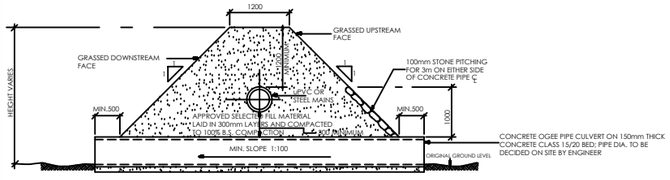
CONCRETE PROTECTION TO uPVC PIPES LAID AT DEPTHS GREATER THAN 3.0m

SCALE 1:20



TYPICAL ROAD PIPE CROSSING DETAIL FOR uPVC PIPES

SCALE A1- 1: 100



TYPICAL DETAIL OF PIPE CROSSING SEASONAL STREAM / DRAINAGE DITCH

SCALE 1 : 100

PIPE DIAMETER SCHEDULES

uPVC WATER PRESSURE PIPES TO KS. 06-149: PART 2, 2000			WALL THICKNESS (mm)							
NOMINAL OUTSIDE DIAMETER (mm)	CORRESPONDING OUTSIDE DIAMETER AS PER KS. 06-149: PART 2, 2000 (mm)		PN = 6 BAR		PN = 10 BAR		PN = 12.5 BAR		PN = 16 BAR	
			CLASS 'B'		CLASS 'C'		CLASS 'D'		CLASS 'E'	
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
63	63	63.3	1.70	2.1	2.70	3.2	3.40	3.9	4.30	4.9
75	75	75.3	2.00	2.4	3.30	3.8	4.00	4.6	5.10	5.8
90	90	90.3	2.40	2.8	3.90	4.5	4.80	5.5	6.10	6.9
110	110	110.4	2.90	3.4	4.80	5.5	5.90	6.7	7.50	8.5
125	125	125.4	3.30	3.8	5.40	6.1	6.70	7.6	8.50	9.6
140	140	140.4	3.70	4.3	6.00	6.8	7.50	8.5	9.50	10.7
160	160	160.5	4.20	4.8	7.00	7.9	8.60	9.7	10.80	12.1
200	200	200.6	4.80	5.5	7.80	8.8	9.70	10.9	12.20	13.6
225	225	225.7	5.40	6.1	8.80	9.9	10.90	12.2	13.70	15.3
250	250	250.8	6.00	6.8	9.80	11.0	12.10	13.5	15.30	17.0
280	280	280.9	6.70	7.6	10.90	12.2	13.50	15.1	17.10	19.0
315	315	316.0	7.50	8.5	12.30	13.7	15.20	16.9	19.20	21.3

uPVC PIPE PRESSURE CLASSES			
CLASS 'B'	CLASS 'C'	CLASS 'D'	CLASS 'E'
6 BAR	10 BAR	12.5 BAR	16 BAR
60m HEAD OF WATER	90m HEAD OF WATER	120m HEAD OF WATER	150m HEAD OF WATER

PN = NOMINAL PRESSURE

BITUMEN LINED STEEL PIPES TO TO B.S. 534:1981	
NOMINAL INTERNAL DIAMETER (mm)	CORRESPONDING OUTSIDE PIPE DIAMETER AS PER B.S. 534: 1981 (mm)
50	60.3
65	76.1
80	88.9
100	114.3
125	139.7
150	168.3
175	193.7
200	219.1
225	244.5
250	273.0
300	323.9
350	355.6
400	406.4
450	457.0
500	508.0
550	559.0
600	610.0

DUCTILE IRON PIPES TO B.S. 4772:1980	
NOMINAL INTERNAL DIAMETER (mm)	CORRESPONDING OUTSIDE DIAMETER AS PER B.S. 4772 1980 (mm)
50 *	66 *
65 *	82 *
80	98
100	118
125 *	144 *
150	170
200	222
250	274
300	326
350	378
400	429
450	480
500	532
600	635

* NOT IN B.S. 4772: DATA FROM HALBERGER HUTE TABLES

NOTE

ALL DIMENSIONS SHOWN ABOVE ARE BASED ON THE CURRENT RELEVANT KENYAN OR BRITISH STANDARDS AND ARE FOR THE TENDERER'S INFORMATION. TENDERER'S ARE FREE TO QUOTE FOR PIPES TO ANY OTHER APPROVED EQUIVALENT SRN NUMBER. THE TENDERER'S ATTENTION IS ALSO DRAWN TO CLAUSE 36 OF PREAMBLE TO THE BILL OF QUANTITIES, REGARDING ALTERNATIVE PIPE AND JOINTING TYPES.

NOTES

ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE STATED

ABBREVIATIONS

O.D. - Outside Diameter
uPVC - Unplasticised Polyvynl Chloride
℄ or C/L - Centre line
mm - Milimeter
m - Meter
> - Greater Than
KS - Kenya Standard
B.S. - British Standard
SRN - Standard Reference Number
MIN - Minimum

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	February; 2018
2.				
3.				
4.				

Client
ATHI WATER WORKS DEVELOPMENT AGENCY ,
MUTHAIGA, NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By
AFRICAN DEVELOPMENT BANK

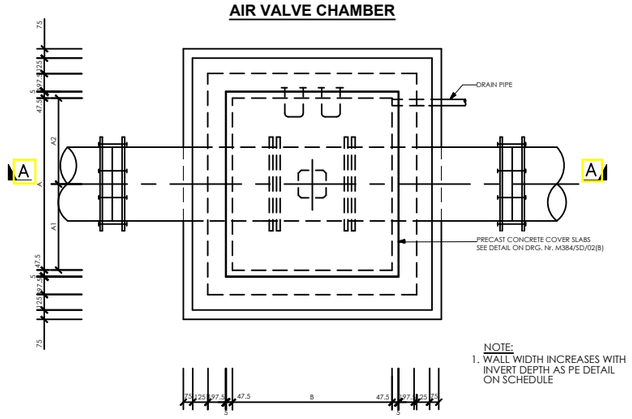
Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT
CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By
CAS CONSULTANTS LIMITED
Le' Mac Building, 1st Fl, Off Church Rd, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title
PIPE TRENCH DETAILS

Designed By	: LK
Drawn By	: D.G.M
Checked By	: W.K
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/SD/009

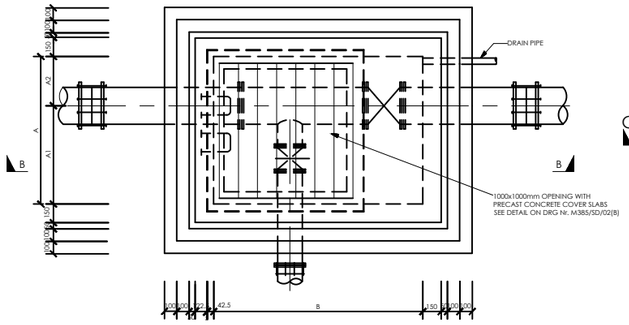
AIR VALVE CHAMBER



NOTE:
1. WALL WIDTH INCREASES WITH INVERT DEPTH AS PE DETAIL ON SCHEDULE

PLAN OF CHAMBER
SCALE 1:40

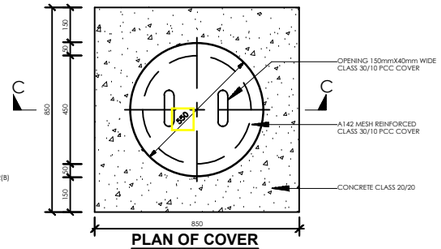
VALVE CHAMBER DETAILS AT JUNCTIONS



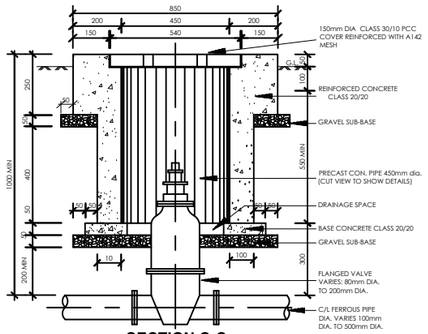
NOTE:
1. WALL WIDTH INCREASES WITH INVERT DEPTH AS PE DETAIL ON SCHEDULE

PLAN OF CHAMBER
SCALE 1:40

VALVE BOX DETAIL FOR WASHOUT/VALVE



PLAN OF COVER
SCALE 1:20



SECTION C-C
SCALE 1:20
A3 - 1:20

NOTES

1. DIMENSIONS ARE SHOWN IN MILIMETRES UNLESS OTHERWISE STATED

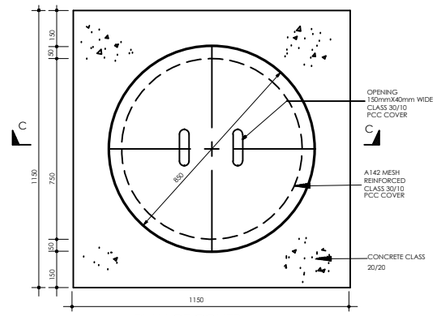
ABBREVIATIONS

P.C.C. - PRECAST CONCRETE
mm - MILLIMETRES
O.D. - OUTSIDE DIAMETER
M.S. - MILD STEEL
DIA. - DIAMETER
NO. - NUMBER
R.C. - REINFORCED CONCRETE
c/c - CENTRE TO CENTRE

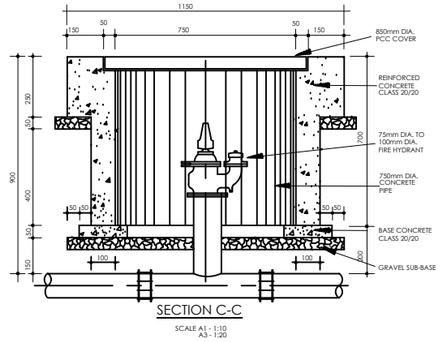
SECTION A-A
SCALE 1:40

SECTION B-B
SCALE 1:40

VALVE BOX DETAIL FOR FIRE HYDRANT



PLAN OF COVER
SCALE A1 - 1:10
A3 - 1:20



SECTION C-C
SCALE A1 - 1:10
A3 - 1:20

CONSTRUCTION DETAILS FOR VALVE CHAMBERS

MAINS DIAMETER (mm)	PLAN SIZE OF CHAMBER (INTERNAL DIMENSIONS) A(mm) x B(mm)
100	1200 x 1200
150	1200 x 1200
200	1400 x 1200
250	1500 x 1200
300	1500 x 1200
350	1800 x 1200
400	1800 x 1200
450	1400 x 1400
500	1400 x 1200

CHAMBER SIZE SCHEDULE FOR VARIOUS PIPE SIZES

INVERT DEPTHS (mm)	HEIGHT OF WALL (mm)	WALL WIDTH (mm)
0 - 800	800	150 - MASONRY WALL
800 - 1200	400	200 - MASONRY WALL
1200 - 2400	1200	300 - MASONRY WALL
2400 - 3000	600	350 - MASONRY WALL
DEPTH MORE THAN 3000	-	300mm REINFORCED CONCRETE (CLASS 25/20) WALL

CHAMBER DEPTHS & WALL THICKNESS SCHDULE

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	February; 2018
2.				
3.				
4.				

Client
ATHI WATER WORKS DEVELOPMENT AGENCY , MUTHAIGA, NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

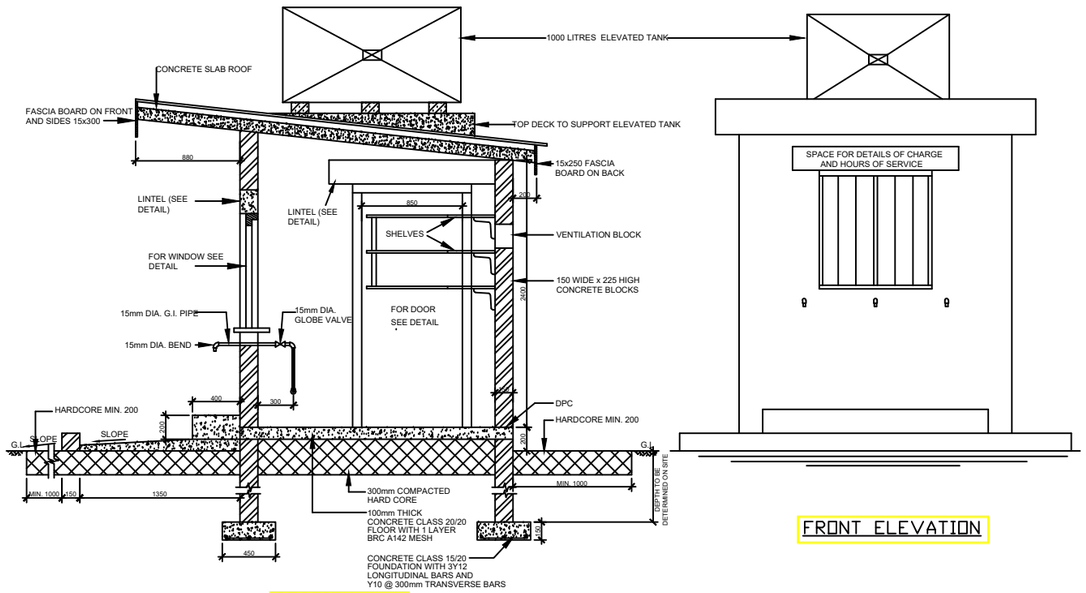
Financed By
AFRICAN DEVELOPMENT BANK

Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT
CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By
CAS CONSULTANTS LIMITED
Le' Mac Building, 1st Fl, Off Church Rd, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

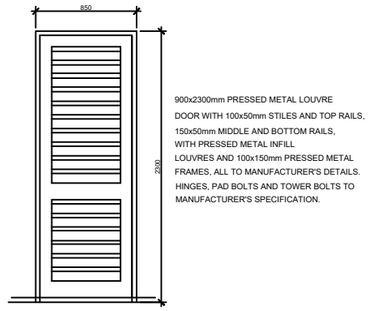
Drawing Title
Details of Valve Chamber

Designed By	: LK
Drawn By	: D.G.M
Checked By	: W.K
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/SD/010



SECTION A-A
SCALE 1:40

FRONT ELEVATION



900x2300mm PRESSED METAL LOUVRE DOOR WITH 100x50mm STILES AND TOP RAILS, 150x50mm MIDDLE AND BOTTOM RAILS, WITH PRESSED METAL INFILL LOUVRES AND 100x150mm PRESSED METAL FRAMES, ALL TO MANUFACTURER'S DETAILS. HINGES, PAD BOLTS AND TOWER BOLTS TO MANUFACTURER'S SPECIFICATION.

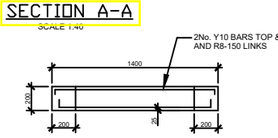
DOOR DETAILS
SCALE 1:40

NOTES

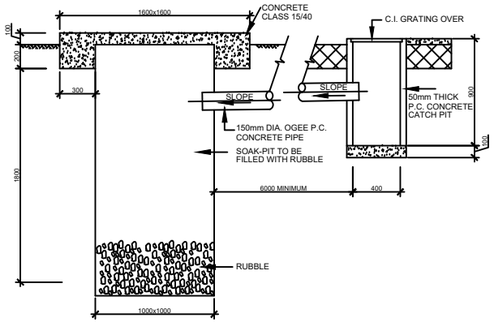
1. ALL DIMENSIONS ARE IN MILIMETRES UNLESS OTHERWISE STATED

ABBREVIATIONS

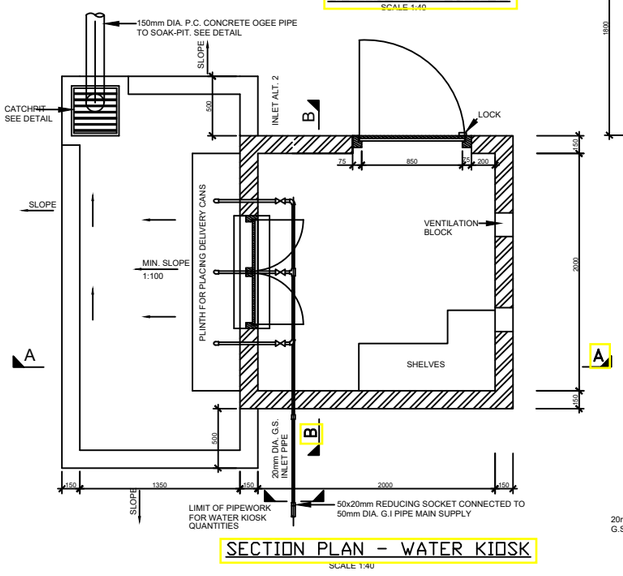
G.C.I. = GALVANISED CORRUGATED IRON
mm = MILIMETRES
Dia. = DIAMETER
MIN. = MINIMUM
No. = NUMBER
G.L. = GROUND LEVEL
G.I. = GALVANISED IRON
Y10 = REINFORCEMENT BAR 10mm DIAMETER
P.C.C. = PRECAST CEMENT CONCRETE
T&G = TONGUE AND GROOVE
G.S. = GALVANISED STEEL
C.I. = CAST IRON
ALT. = ALTERNATIVE
GV = GATE VALVE



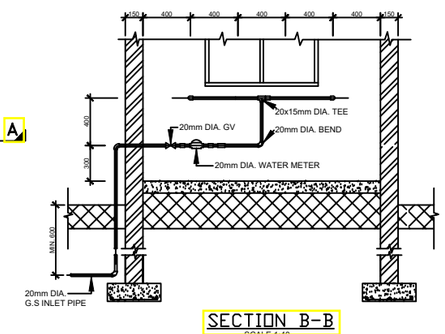
DETAIL OF LINTEL
SCALE 1:40



DETAIL OF SOAK-PIT AND CATCH PIT
SCALE 1:40

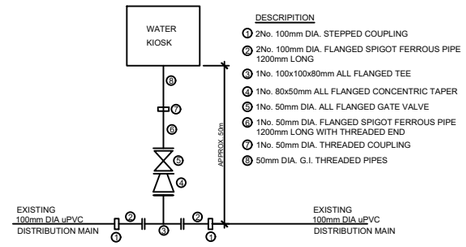


SECTION PLAN - WATER KIOSK
SCALE 1:40



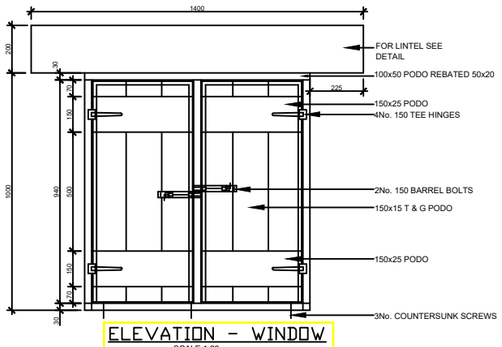
SECTION B-B
SCALE 1:40

TYPICAL CONNECTION TO WATER KIOSK FROM EXISTING DISTRIBUTION MAIN

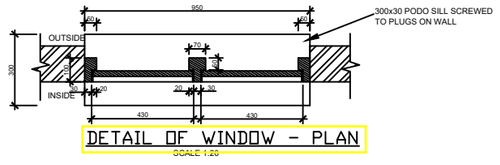


DESCRIPITION

1. 2No. 100mm DIA. STEPPED COUPLING
2. 2No. 100mm DIA. FLANGED SPIGOT FERROUS PIPE 1200mm LONG
3. 1No. 100x100x80mm ALL FLANGED TEE
4. 1No. 80x50mm ALL FLANGED CONCENTRIC TAPER
5. 1No. 50mm DIA. ALL FLANGED GATE VALVE
6. 1No. 50mm DIA. FLANGED SPIGOT FERROUS PIPE 1200mm LONG WITH THREADED END
7. 1No. 50mm DIA. THREADED COUPLING
8. 50mm DIA. G.I. THREADED PIPES



ELEVATION - WINDOW
SCALE 1:20



DETAIL OF WINDOW - PLAN
SCALE 1:20

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	February; 2018
2.				
3.				
4.				

Client
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K.I.D.P BUILDING, ALONG KALAWA ROAD
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Project
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CONTRACT No;
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Reviewed By
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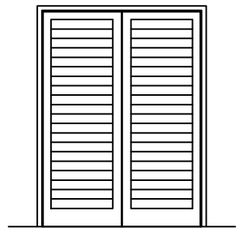
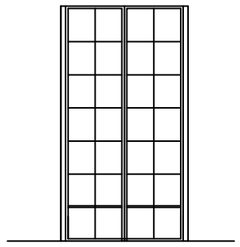
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title
DETAILS OF WATER KIOSK

Designed By	: LK
Drawn By	: D.G.M
Checked By	: W.K
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/SD/011

DOOR TYPES	DESCRIPTION	STRUCTURAL OPENING
 D 1	1800 x 2400 mm press metal louvre double door	1800 x 2400 mm
	Door Type D 1a similar, but door size to be 900 x 2400 mm.(Single door)	900 x 2400 mm
	Door Type D 1b similar, but door to be single door size 1200 x 2400 mm .	1200 x 2400 mm
 D 2	1200 x 2397mm side-hung standard section steel casement door in two equal panels	

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	February; 2018
2.				
3.				
4.				

Client

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MUTHAIGA, NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

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Project

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CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

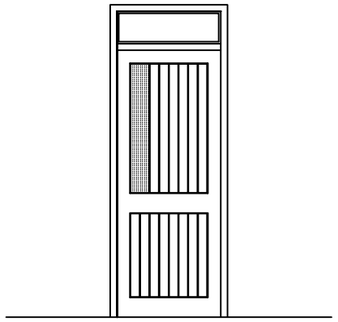
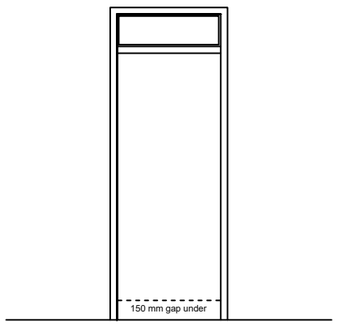
Reviewed By

CAS CONSULTANTS LIMITED
Le' Mac Building, 1st Fl, Off Church Rd, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title

DOOR SCHEDULE 01

Designed By	:	LK
Drawn By	:	D.G.M
Checked By	:	W.K
Approved By	:	S.M.M
Client approval	:	
Date	:	MARCH 2023
Drawing No	:	AWSB/MC/SD/012

DOOR TYPES	DESCRIPTION	STRUCTURAL OPENING
 D 4 / D4a	800 x 2030 mm timber door with ex 100 x 50 mm stiles and top rails, ex 150 x 50 mm middle and bottom rails, and infill panels in ex 100 x 50 mm t & g battens, all in prime grade cypress. 990 x 140 mm georgian wired clear glass panel in upper half, and glazed fanlight over. D 4a similar, but without georgian wired glass panel & fanlight over.	900 x 2400 mm 900 x 2200 mm
 D 5 / D 5a	800 x 2030 mm semi - solid core flush door with hardwood lipping all round, painted.Glazed fanlight over ex 125 x 50 mm prime grade cypress door frame. Door Type D 5a similar, but door size to be 800 x 1880 mm .	900 x 2400 mm 800 x 2400 mm

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	February; 2018
2.				
3.				
4.				

Client

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MUTHAIGA, NORTH ROAD
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Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

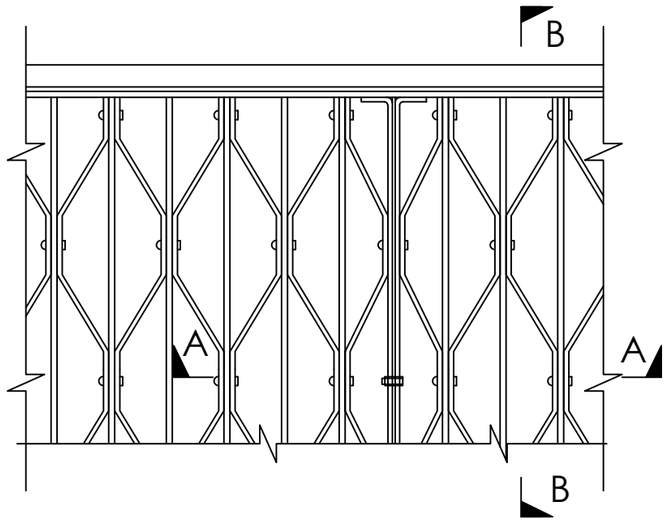
Reviewed By

CAS CONSULTANTS LIMITED
Le' Mac Building, 1st Fl, Off Church Rd, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title

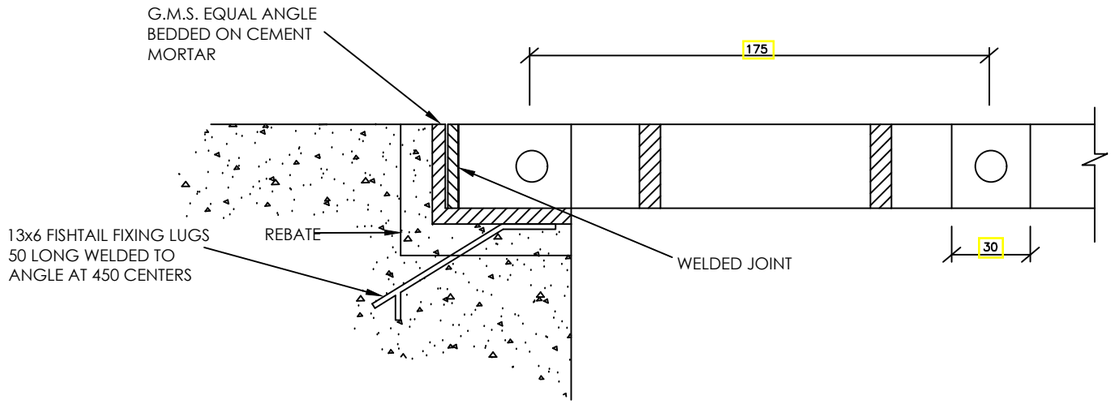
DOOR SCHEDULE 02

Designed By	:	LK
Drawn By	:	D.G.M
Checked By	:	W.K
Approved By	:	S.M.M
Client approval	:	
Date	:	MARCH 2023
Drawing No	:	AWSB/MC/SD/013



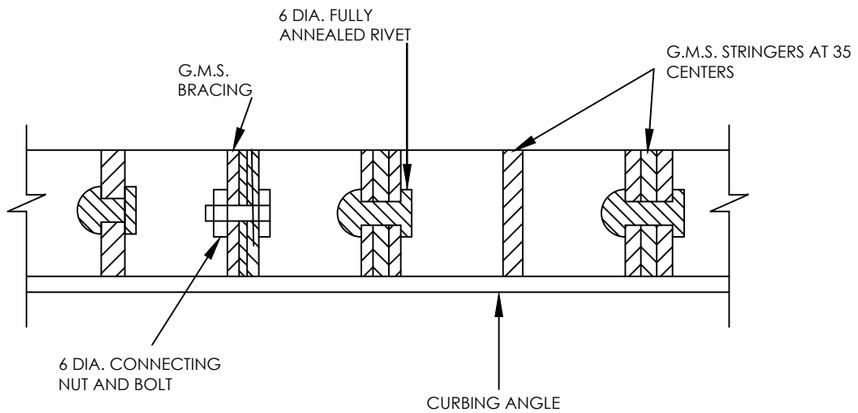
GALVANISED MILD STEEL OPEN MESH FLOORING

SCALE 1:2



SECTION B-B

SCALE 1:2



SECTION A-A

SCALE 1:1

TYPE	MAXIMUM SPAN	STRINGERS	BRACING	EDGING	CURBING	MAXIMUM PANEL WIDTH	REBATE DIMENSIONS
A	1100	25x3	25x3	25x5	31x31x6	1800	50x50
B	1600	35x3	35x3	35x5	51x51x6	1000	50x50
C	2000	40x5	40x3	40x5	46x46x6	750	65x65

NOTES

1. All mild steel components shall be hot dipped galvanised after fabrication
2. All flooring, curbing,framing etc is to be fabricated from mild steel to B.S 4592 : 1970
3. All flooring panel dimensions are to checked against as constructed site dimensions before fabrication
4. For all spans in excess of those shown on standard details flooring shall be designed to take distributed load at 50KN/m2
5. Maximum weight of panel 40kg.
6. Dimensions in mm unless otherwise specified
7. G.M.S. = Galvanized Mild Steel

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	February; 2018
2.				
3.				
4.				

Client

ATHI WATER WORKS DEVELOPMENT AGENCY ,
MUTHAIGA, NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

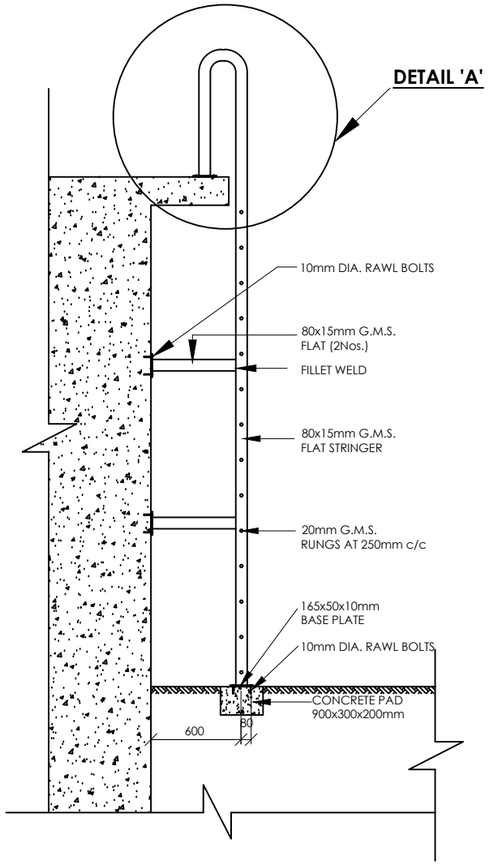
Reviewed By

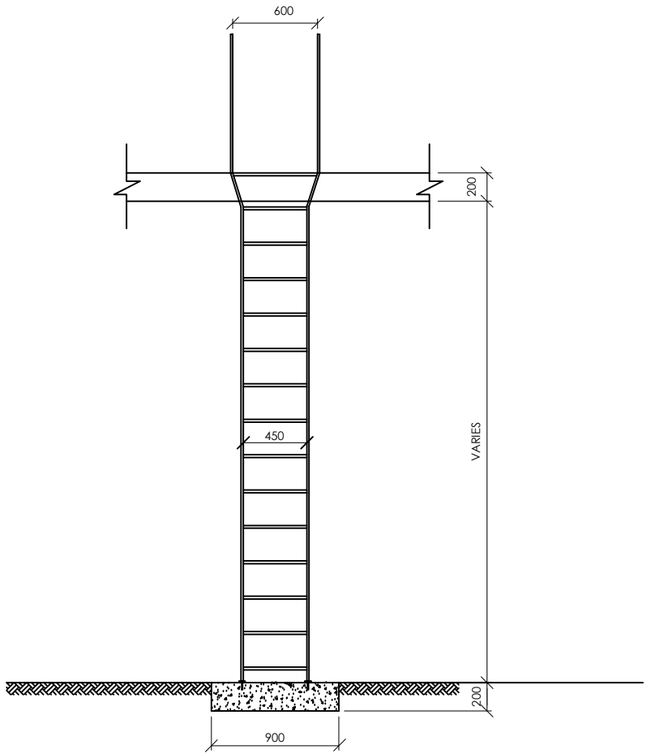
CAS CONSULTANTS LIMITED
Le' Mac Building, 1st Fl, Off Church Rd, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title

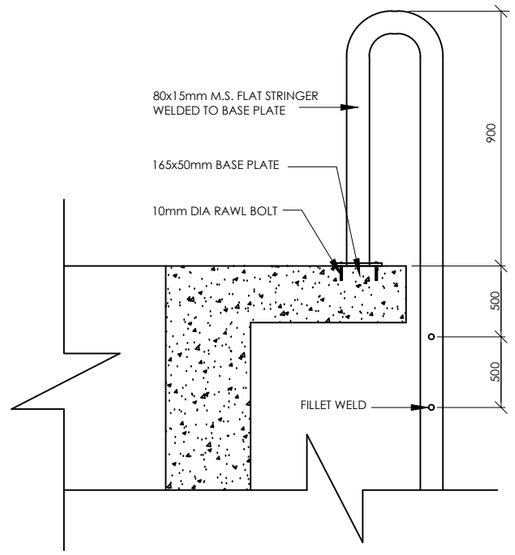
FLOOR MESH

Designed By	: LK
Drawn By	: D.G.M
Checked By	: W.K
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/SD/014

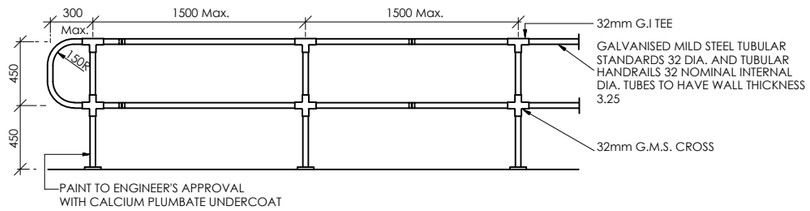




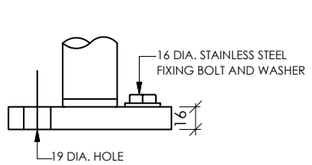
DETAILS OF G.M.S. LADDER
SCALE: 1: 50

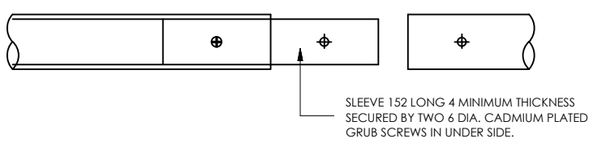


DETAIL 'A'
SCALE: 1:25

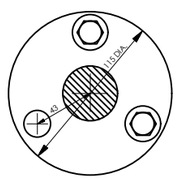


GUARDRAILING
SCALE: 1: 40

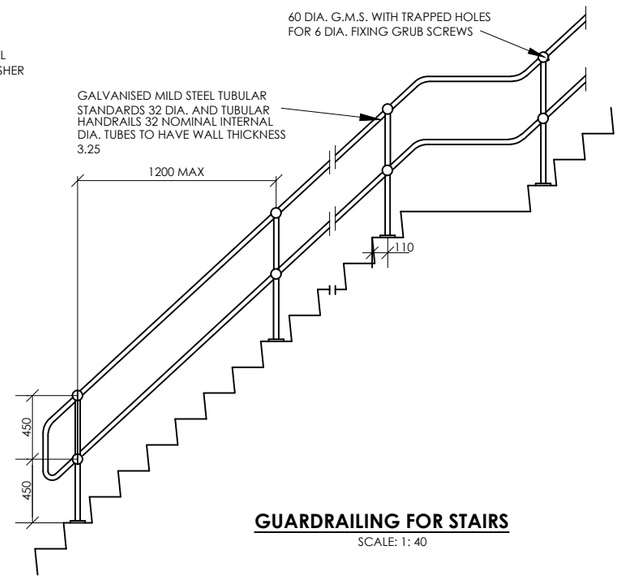




TUBULAR GUARDRAILING JOINT
SCALE: 1: 4



ROUND BASE
SCALE: 1: 4



GUARDRAILING FOR STAIRS
SCALE: 1: 40

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	February; 2018
2.				
3.				
4.				

Client
ATHI WATER WORKS DEVELOPMENT AGENCY
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

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TANATHI WATER WATER WORKS
DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By
AFRICAN DEVELOPMENT BANK

Project
CONSTRUCTION OF MWALA CLUSTER
WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By
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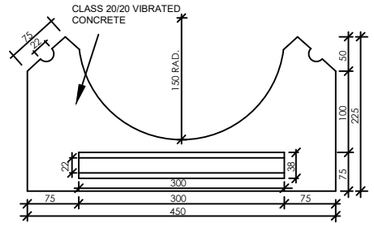
Le´Mac Building,1st FL,Off Church Road,
Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

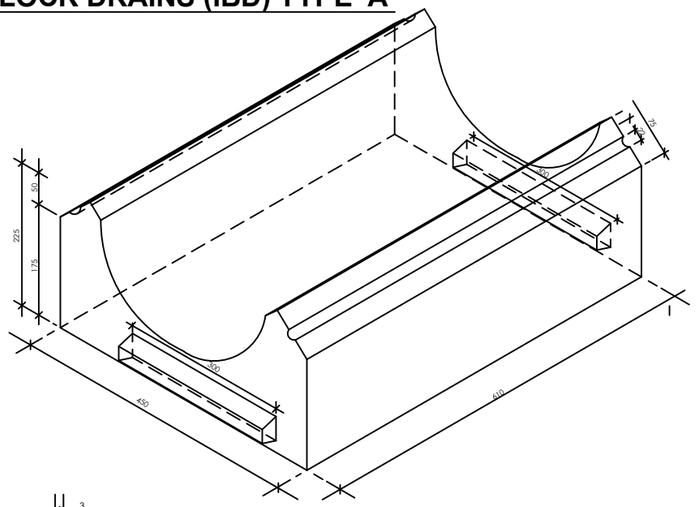
Drawing Title
GMS LADDER DETAILS

Designed By	: LK
Drawn By	: D.G.M
Checked By	: W.K
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/SD/015

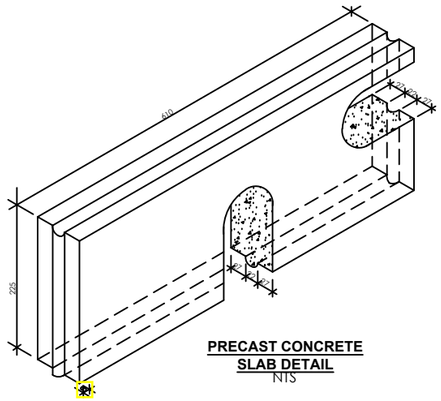
DETAILS OF INVERT BLOCK DRAINS (IBD) TYPE 'A'



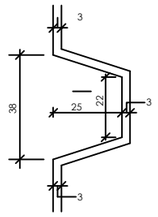
PRECAST CONCRETE INVERT BLOCK DRAIN (IBD) TYPE 'A'
SCALE 1:4



ISOMETRIC VIEW OF INVERT BLOCK TYPE 'A'
NTS

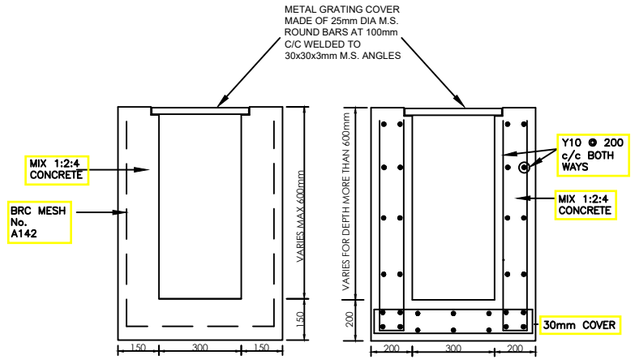


PRECAST CONCRETE SLAB DETAIL
NTS



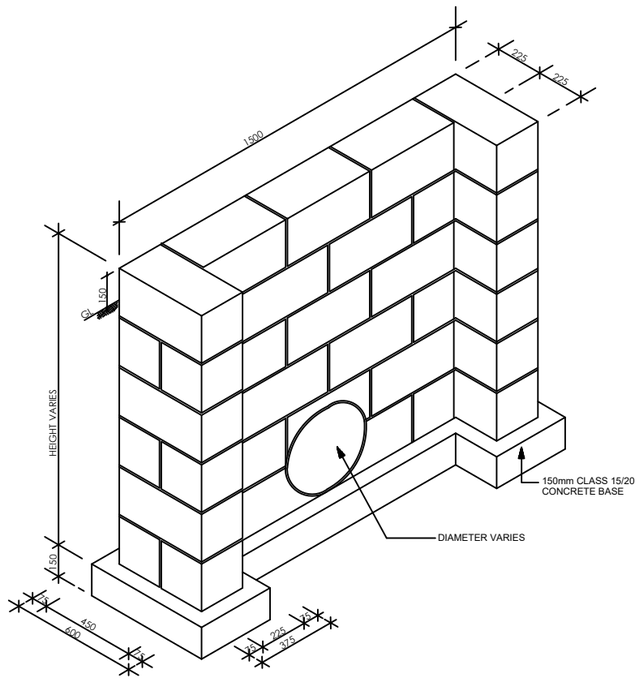
DETAIL OF JOINT
SCALE: 1:1

DRAIN TYPE 'C'

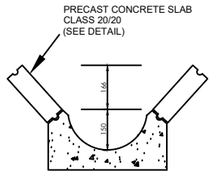


NOTE: BASE OF DRAIN LAID TO SLOPE 1:100 (STARTING DEPTH OF DRAIN IS 300mm)

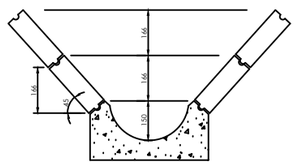
DETAILS OF HEAD WALLS



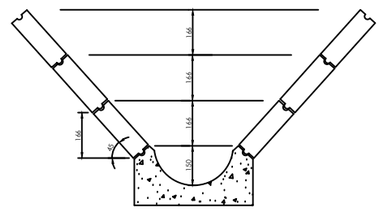
DETAIL OF HEAD WALL
SCALE 1:30



IBD TYPE 'A' + TWO COURSES (IBD TYPE 'A' + 2C)
SCALE 1:8

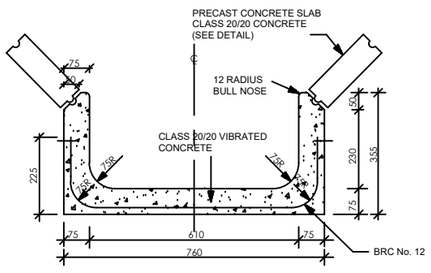


IBD TYPE 'A' + FOUR COURSES (IBD TYPE 'A' + 4C)
SCALE 1:8

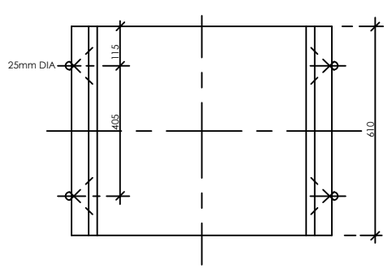


IBD TYPE 'A' + SIX COURSES (IBD TYPE 'A' + 6C)
SCALE 1:8

DETAILS OF INVERT BLOCK DRAINS (IBD) TYPE 'B'



SECTION - I.B.D. TYPE 'B'
SCALE 1:8



PLAN
INVERT BLOCK DRAIN (IBD) TYPE 'B'
SCALE 1: 8

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	February; 2018
2.				
3.				
4.				

Client
ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By
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Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

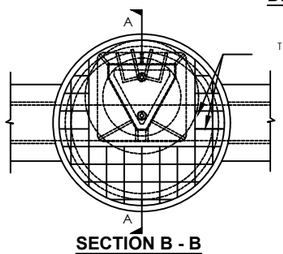
CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By
CAS CONSULTANTS LIMITED
Le´Mac Building,1st FL,Off Church Road, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

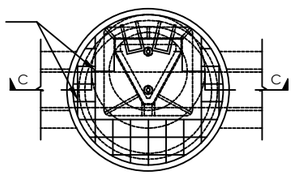
Drawing Title
IBD AND HEADWALL

Designed By	: LK
Drawn By	: D.G.M
Checked By	: W.K
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/SD/016

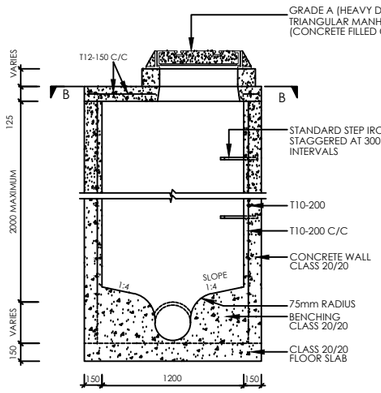
REINFORCED CONCRETE CIRCULAR MANHOLE & COVER DEPTH n.e. 2.0m



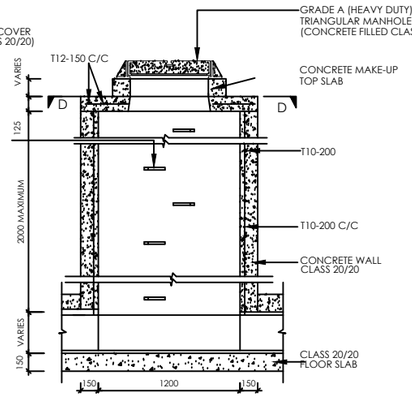
SECTION B - B
SCALE 1:50



SECTION D - D
SCALE 1:50

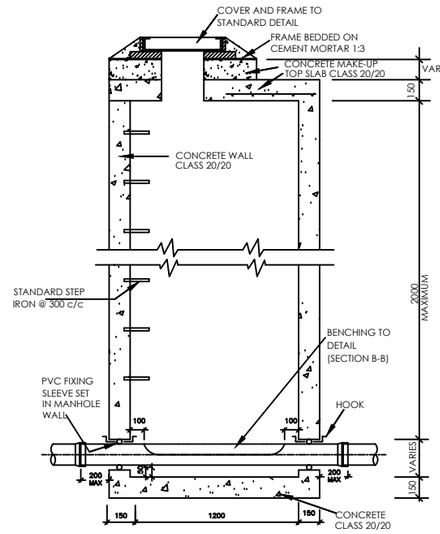


SECTION A - A
SCALE 1:50

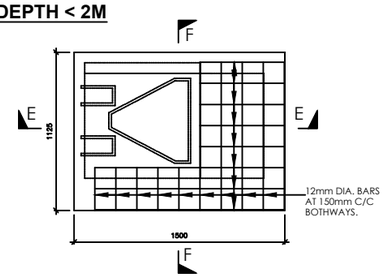


SECTION C - C
SCALE 1:50

RECTANGULAR MANHOLE FOR DEPTH < 2M



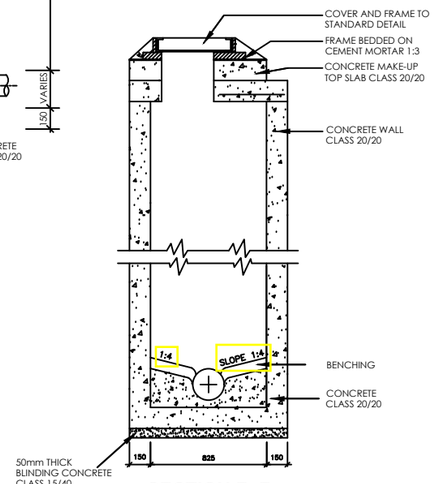
SECTION E - E
SCALE 1:40



PLAN
SCALE 1:40

NOTES:

1. ALL CONCRETE TO BE CLASS 20/20 IN ACCORDANCE WITH THE SPECIFICATION
2. uPVC PIPE CUT TO MID DIAMETER INSIDE MANHOLE AS DETAILED.



SECTION F -F
SCALE 1:40

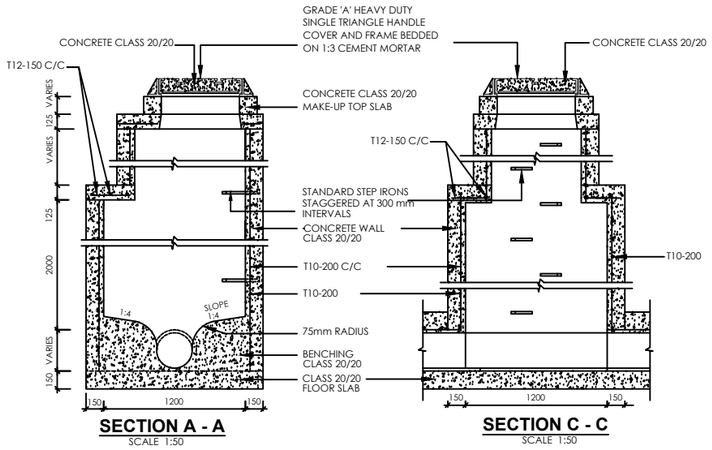
NOTES

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

ABBREVIATIONS

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

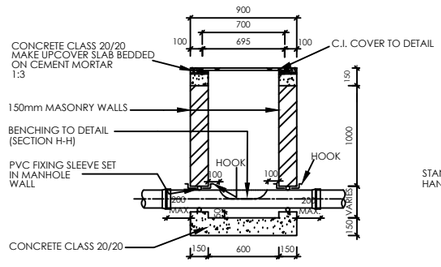
REINFORCED CONCRETE MANHOLE & COVER DEPTH > 2.0m



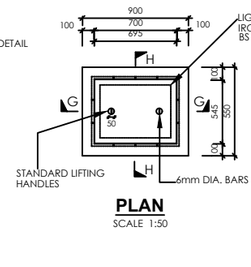
SECTION A - A
SCALE 1:50

SECTION C - C
SCALE 1:50

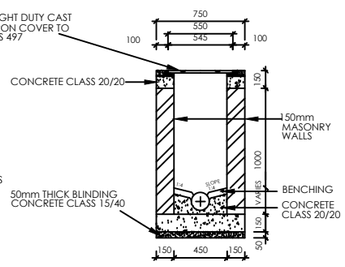
INSPECTION CHAMBER DETAILS



SECTION G - G
SCALE 1:50



PLAN
SCALE 1:50



SECTION H - H
SCALE 1:50

NOTES:

1. INSPECTION CHAMBER SHOULD BE SIZE 600x450mm UPTO DEPTH OF 1000mm
2. FOR INSPECTION CHAMBER EXCEEDING DEPTH 1000mm SIZE SHOULD BE 850x1200mm
3. WALLS OF INSPECTION CHAMBER TO BE OF MASONRY

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	February; 2018
2.				
3.				
4.				

Client
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MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By
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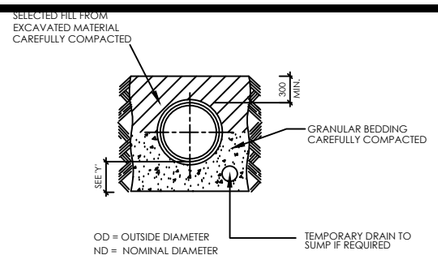
Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT
CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By
CAS CONSULTANTS LIMITED
Le´Mac Building,1st FL,Off Church Rd,, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title
MANHOLE DETAILS

Designed By	: LK
Drawn By	: D.G.M
Checked By	: W.K
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/SD/017A



SCALE (N.T.S)

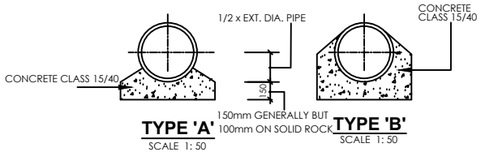
NOTES:

1.DIMENSION 'Y'
IN ROCK OR MIXED SOILS CONTAINING ROCK BANDS
BOULDERS OR STONES OR OTHER IRREGULAR HARD SPOTS.
Y= 1/4 OD UNDER BARRELS WITH MIN. 150mm
(PLUS 12mm PER 300mm OF COVER IN EXCESS OF 4.85m)
UNDER BOTH BARRELS AND SOCKETS
IN MACHINE DUG UNIFORM SOILS
Y= OD UNDER BARRELS WITH MIN. 100mm UNDER BOTH BARRELS AND SOCKETS

2.FOR GRANULAR BED AND SURROUND TO PIPES
UNIFORMLY GRADED GRANULAR MATERIAL SUCH AS GRAVEL OR BROKEN STONE TO BE USED. IT SHOULD PASS 12mm SIEVE OR SHALL BE RETAINED ON 5mm SIEVE.

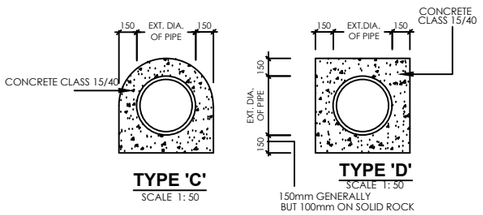
3.TRENCHES MUST BE KEPT TO DESIGN WIDTH

CONCRETE PIPE BEDS AND HAUNCHES



TYPE 'A' SCALE 1: 50

TYPE 'B' SCALE 1: 50



TYPE 'C' SCALE 1: 50

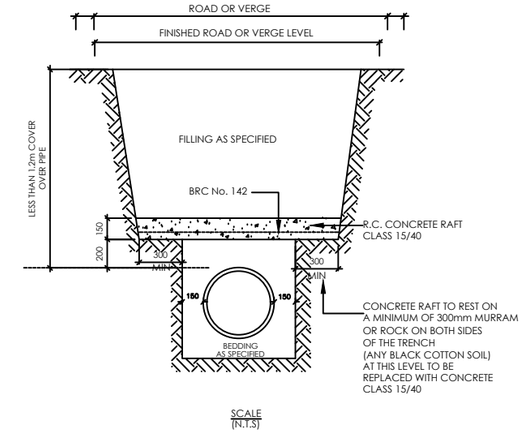
TYPE 'D' SCALE 1: 50

PIPE DIAMETER mm	PIPE WALL THICKNESS mm	HAUNCH TYPE							
		'A'		'B'		'C'		'D'	
		100mmBED	150mmBED	100mmBED	150mmBED	100mmBED	150mmBED	100mmBED	150mmBED
100	25.4	0.0556	0.0791	0.0799	0.1034	0.1431	0.1666	0.1653	0.1888
150	25.4	0.0642	0.0904	0.0845	0.1107	0.1706	0.1968	0.1981	0.2242
225	28.57	0.0783	0.1053	0.1262	0.1557	0.2155	0.2450	0.2525	0.2821
300	31.75	0.0929	0.1277	0.1557	0.1905	0.2617	0.2965	0.3100	0.3448
375	34.92	0.1080	0.1470	0.1864	0.2255	0.3094	0.3485	0.3702	0.4093
450	38.10	0.1253	0.1689	0.2208	0.2644	0.3623	0.4059	0.4382	0.4818
525	44.45	0.1433	0.1916	0.2564	0.3046	0.4169	0.4652	0.5052	0.5536
600	50.80	0.1619	0.2147	0.2943	0.3471	0.4731	0.5259	0.5844	0.6372
675	53.98	0.1804	0.2375	0.3310	0.3880	0.5270	0.5841	0.6570	0.7141
750	57.15	0.1986	0.2600	0.3582	0.4295	0.5823	0.6436	0.7325	0.7938
900	63.50	0.2378	0.3077	0.4479	0.5161	0.6973	0.7672	0.8922	0.9620
1050	69.85	0.2810	0.3605	0.4945	0.5741	0.8181	0.8977	1.0635	1.1431
1200	76.20	0.3291	0.4161	0.6230	0.7101	0.9448	1.0318	1.2466	1.3336

CONCRETE QUANTITIES IN BED AND SURROUNDS FOR O. G. CONCRETE PIPES (CU.M.PER LIN. METER)

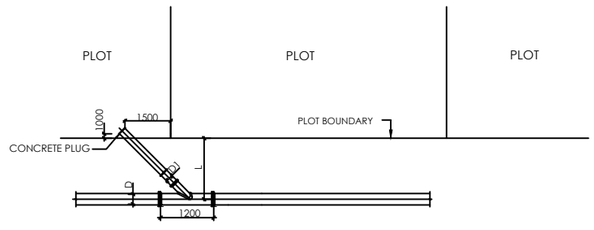
DEPTH TO THE TOP OF PIPE	PIPE DIAMETER IN mm									
	150	225	300	375	450	525	600	675	750	(>750)
<1.25M IN ROADS <1.00M ELSEWHERE	TYPE 'C'									AS SPECIFIED BY ENGINEER
<4.00M	TYPE 'A' (CONCRETE BED) MAY BE DELETED AT THE DISCRETION OF THE ENGINEER				TYPE 'B'					
>4.00M	TYPE 'B'									
>6.00M OR IN HEADING	TYPE 'C' OR 'D' AS DIRECTED									

TYPE OF BED AND HAUNCH TO BE USED

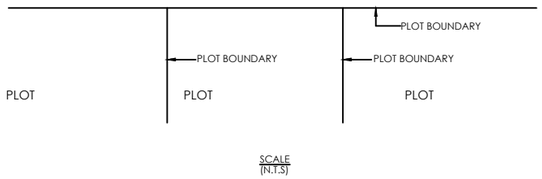


SCALE (N.T.S)

Y - JUNCTION DETAILS



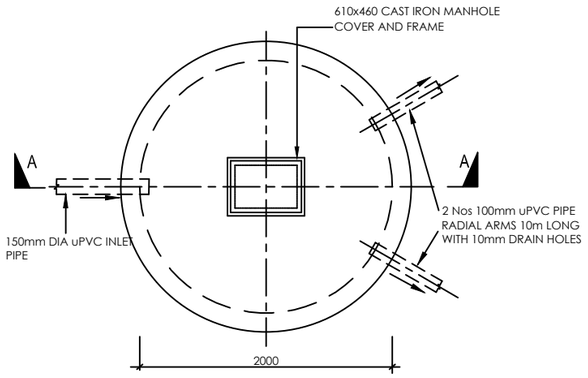
ROAD RESERVE / WAYLEAVE



SCALE (N.T.S)

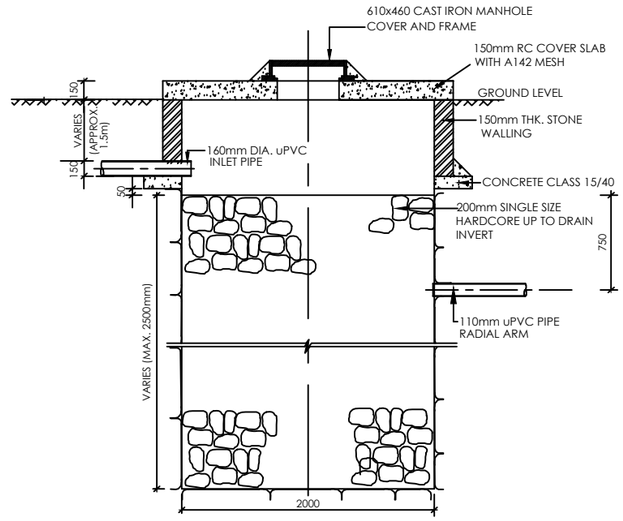
NOTES:

L - TO BE DETERMINED ON SITE
D - VARIES BETWEEN 160 - 250mm
D1 - 160mm DIA uPVC SEWER PIPE



PLAN OF SOAK AWAY PIT

SCALE 1: 50



SECTION A-A

SCALE 1:50

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	February; 2018
2.				
3.				
4.				

Client

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By

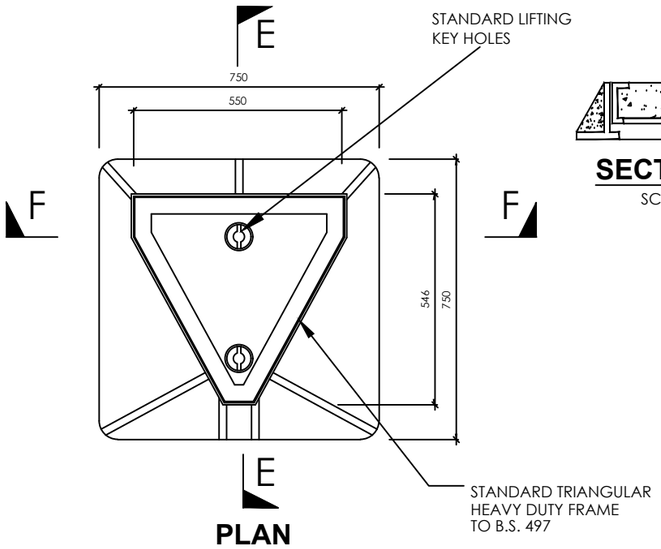
CAS CONSULTANTS LIMITED
Le'Mac Building,1st FL,Off Church Rd, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title

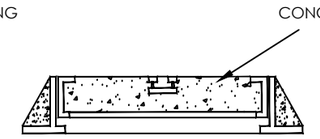
MANHOLE DETAILS

Designed By	: LK
Drawn By	: D.G.M
Checked By	: W.K
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/SD/017B

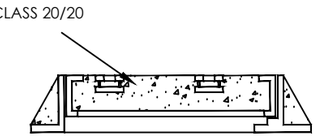
DETAILS OF TRIANGULAR CONCRETE FILLED MANHOLE COVER FOR FOUL SEWER



PLAN
SCALE 1:20



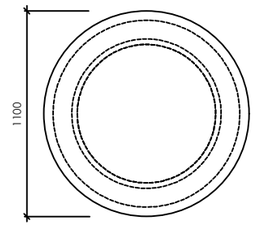
SECTION F - F
SCALE 1:20



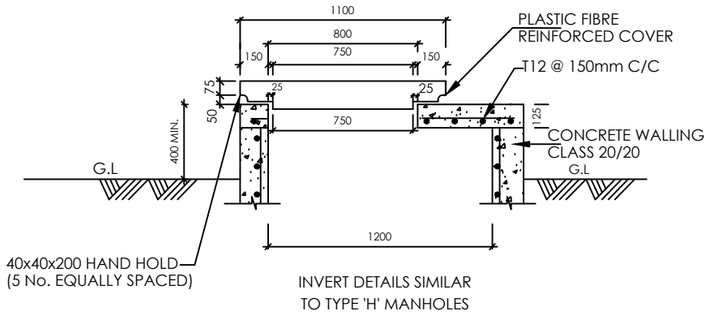
SECTION E - E
SCALE 1:20

NOTE
COVER FABRICATED FROM 6mm M.S. PLATE.

PLASTIC FIBRE REINFORCED COVER FOR MANHOLES



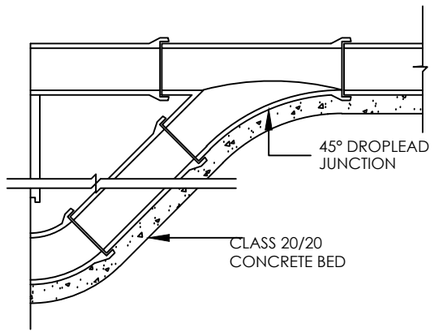
SECTIONAL ELEVATION
SCALE 1:40



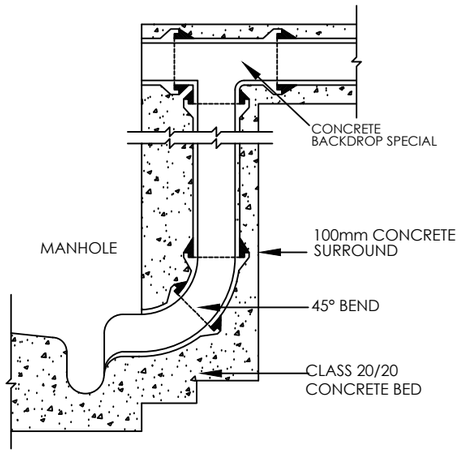
INVERT DETAILS SIMILAR TO TYPE 'H' MANHOLES

PLASTIC FIBRE REINFORCED COVER - PLAN
SCALE 1:40

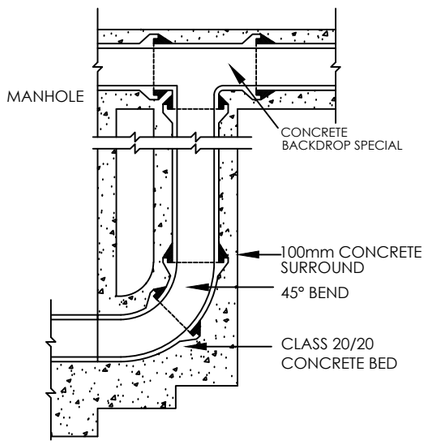
DETAILS OF BACKDROPS FOR MANHOLES



MANHOLE DROPLEAD
SCALE 1:20



SIDE ENTRANCE BACKDROP
SCALE 1:20



END ENTRANCE BACKDROP
SCALE 1:20

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	February; 2018
2.				
3.				
4.				

Client
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CONTRACT No;
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Reviewed By
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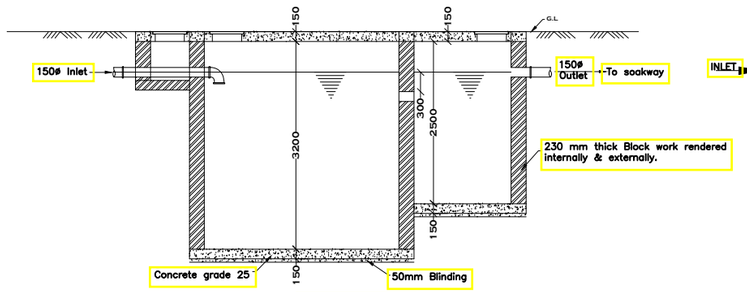
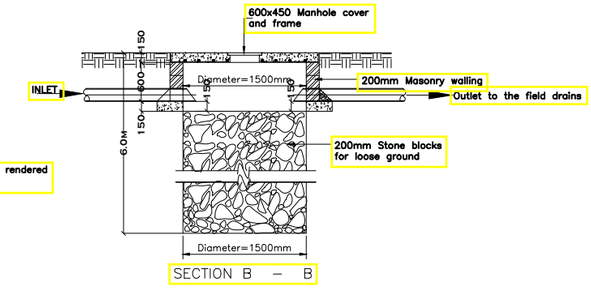
Le'Mac Building,1st FL,Off Church Rd,, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title
MANHOLE DETAILS

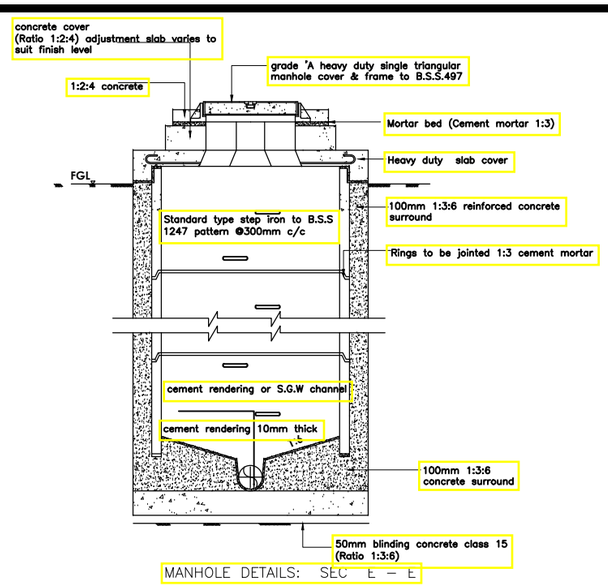
Designed By	:	LK
Drawn By	:	D.G.M
Checked By	:	W.K
Approved By	:	S.M.M
Client approval	:	
Date	:	MARCH 2023
Drawing No	:	AWSB/MC/SD/017C



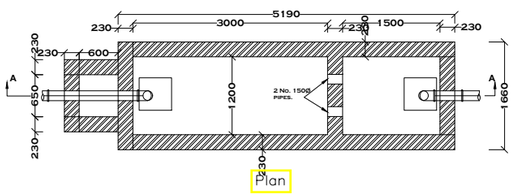
Section A – A



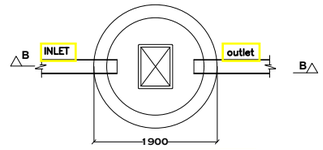
SECTION B – B



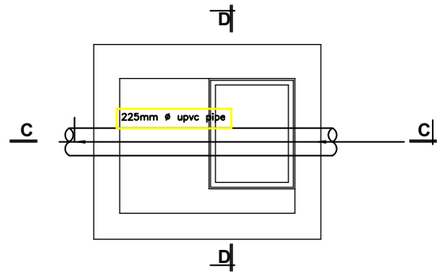
MANHOLE DETAILS: SEC E – E



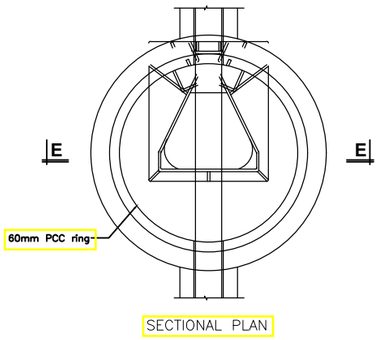
Plan



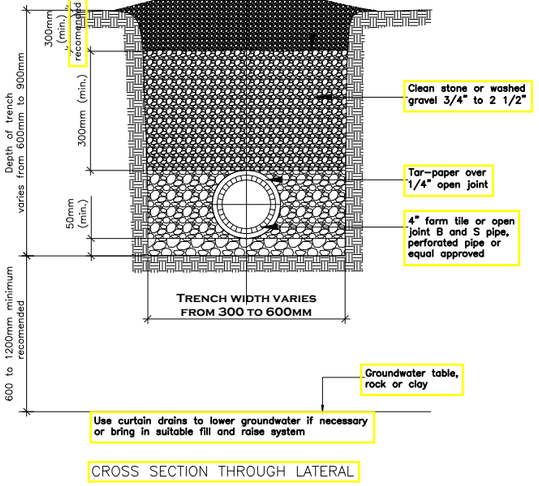
SOAK PIT – PLAN



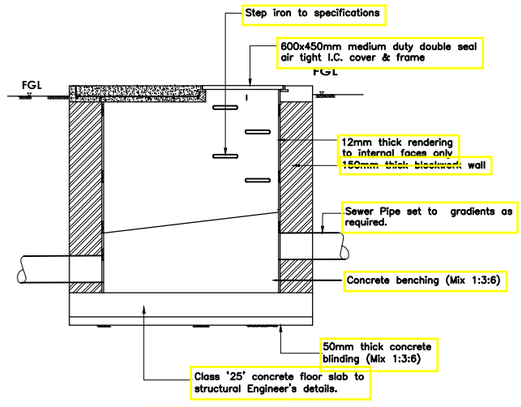
PLAN: FOUL WATER INSPECTION CHAMBER



SECTIONAL PLAN



CROSS SECTION THROUGH LATERAL



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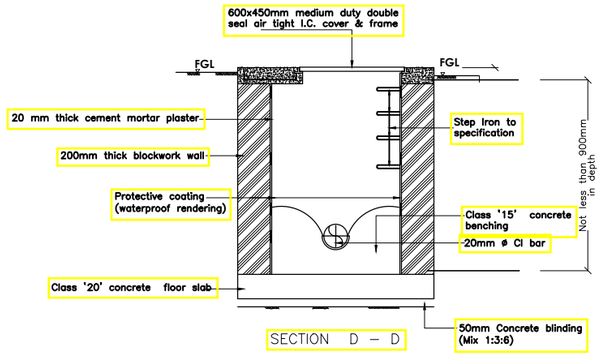
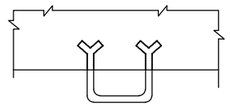


SECTION D – D



STEP IRON DETAIL

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	February; 2018
2.				
3.				
4.				

Client

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MUTHAIGA NORTH ROAD,
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Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

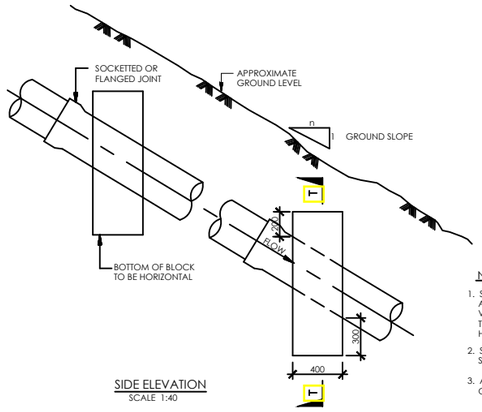
Reviewed By

CAS CONSULTANTS LIMITED
Le´Mac Building,1st FL,Off Church Rd, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title

SEPTIC TANK PLAN AND SECTIONS

Designed By	: LK
Drawn By	: D.G.M
Checked By	: W.K
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/SD/018

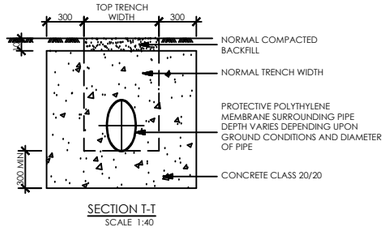


SIDE ELEVATION
SCALE 1:40

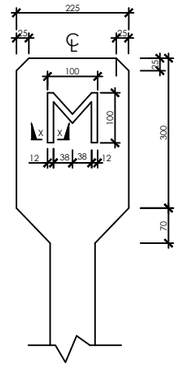
NOTES

1. SAME ARRANGEMENT CAN BE USED AS SUPPORTS FOR PIPES LAID IN VERY SOFT GROUND BUT BLOCKS TO BE CAST ON SOUND ROCK OR HARD STRATUM
2. SOCKETTED JOINT TO BE LAID WITH SOCKET FACING UPSTREAM OF GRADE
3. ANCHOR BLOCK TO BE CONSTRUCTED ON LOWER SIDE OF JOINT

RANGE OF GROUND SLOPE (1:n)	MAXIMUM DISTANCE BETWEEN ANCHOR BLOCKS (m)
1:6 - 1:5	24
1:5 - 1:4	18
1:4 - 1:2	12
>1:2	EVERY PIPE LENGTH TO BE ANCHORED (BASED ON PIPE LENGTH OF 6m)



SECTION T-T
SCALE 1:40



BULK METER POST
SCALE 1:10



SECTION X-X
N.T.S.

NOTE:-
ALL DETAILS TO BE SAME AS GATE VALVE BUT THE SIGN TO BE CHANGED AS INDICATED

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE STATED
2. ANCHOR BLOCKS TO BE INSTALLED FOR PIPES LAID AT SLOPES EXCEEDING 1:6 SLOPE
3. THRUST BLOCKS TO BE INSTALLED AT ALL HORIZONTAL AND VERTICAL BENDS, CAPPED ENDS, TEES, TAPERS AND GATE VALVES
4. DETAILS FOR ALL INDICATOR POSTS TO BE AS FOR GATE VALVE BUT LETTERING TO BE AS FOLLOWS:

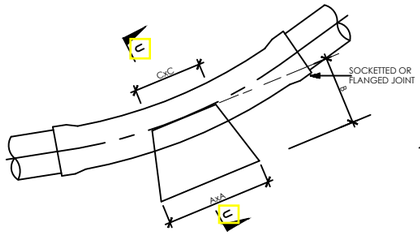
FOR	USE
GATE VALVE	GV
AIR VALVE	AV
WASHOUT	WO
WATER MAIN	WM
BULK METER	M
'Y'- JUNCTION	Y

5. ALL INDICATOR POSTS TO BE PAINTED WITH 2 COATS BLUE OIL BASED PAINT AND WHITE LETTERING TO ENGINEER'S APPROVAL

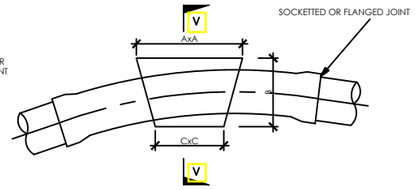
ABBREVIATIONS

mm - MILLIMETRES
OD - OUTSIDE DIAMETER
ND - NOMINAL DIAMETR
Dia - DIAMETER
c/c - CENTRE TO CENTRE
No. - NUMBER
uPVC - UNPLASTICISED POLYVINYL CHLORIDE
m - METRE
℄ - CENTRE LINE
GV - GATE VALVE
AV - AIR VALVE
WO - WASH OUT
WM - WATER MAIN
M - BULK METER
m^3 - CUBIC METER

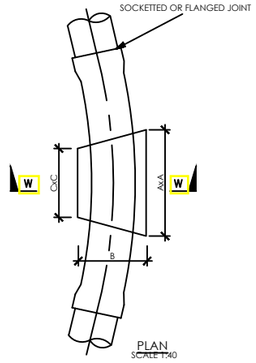
ANCHOR BLOCK FOR STEEP GRADIENTS (SLOPES>1:6)



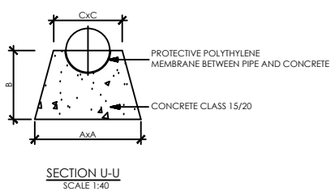
ELEVATION
SCALE 1:40



ELEVATION
SCALE 1:40

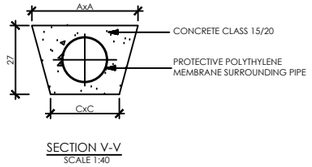


PLAN
SCALE 1:40



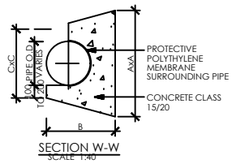
SECTION U-U
SCALE 1:40

THRUST BLOCKS ON VERTICAL BENDS (DOWN-THRUST)



SECTION V-V
SCALE 1:40

THRUST BLOCKS ON VERTICAL BENDS (UP-THRUST)

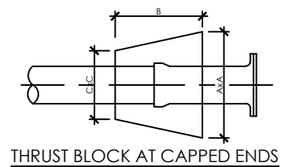


SECTION W-W
SCALE 1:40

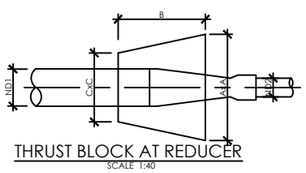
THRUST BLOCK ON HORIZONTAL BENDS AND TEES

(ND) NOMINAL DIAMETER (mm)	THRUST BLOCK DIMENSIONS AxBxC(m), CONCRETE VOLUME (m^3)						
	$11\frac{1}{4}$° BENDS	$22\frac{1}{2}$° BENDS	30°BENDS	45°BENDS	CAPPED ENDS & 90°TEES	90°BENDS	REDUCERS ND=NDT-ND2
80	0.2x0.2x0.2 (0.01m^3)	0.25x0.2x0.2 (0.01m^3)	0.25x0.2x0.2 **(0.01m^3)**	0.3x0.2x0.2 **(0.02m^3)**	0.35x0.2x0.2 (0.02m^3)	0.4x0.2x0.2 (0.02m^3)	0.35x0.2x0.2 (0.02m^3)
100	0.2x0.2x0.2 (0.01m^3)	0.3x0.2x0.2 (0.02m^3)	0.35x0.2x0.2 (0.02m^3)	0.4x0.2x0.2 (0.02m^3)	0.45x0.25x0.25 (0.04m^3)	0.55x0.3x0.3 (0.06m^3)	0.45x0.25x0.25 (0.04m^3)
150	0.3x0.25x0.25 (0.02m^3)	0.4x0.25x0.25 (0.03m^3)	0.5x0.3x0.3 (0.05m^3)	0.55x0.3x0.3 (0.06m^3)	0.65x0.35x0.35 (0.10m^3)	0.8x0.4x0.35 (0.16m^3)	0.65x0.35x0.35 (0.10m^3)
200	0.4x0.3x0.3 (0.04m^3)	0.55x0.35x0.35 (0.08m^3)	0.6x0.4x0.4 (0.11m^3)	0.75x0.4x0.4 (0.15m^3)	0.85x0.45x0.4 (0.20m^3)	1.0x0.5x0.4 (0.29m^3)	0.85x0.45x0.4 (0.20m^3)
250	0.5x0.35x0.35 (0.07m^3)	0.65x0.4x0.4 (0.12m^3)	0.75x0.45x0.45 (0.18m^3)	0.9x0.45x0.45 (0.23m^3)	1.1x0.55x0.45 (0.39m^3)	1.2x0.6x0.45 (0.50m^3)	1.1x0.55x0.45 (0.39m^3)
300	0.55x0.45x0.45 (0.12m^3)	0.8x0.5x0.5 (0.23m^3)	0.9x0.5x0.5 (0.27m^3)	1.1x0.6x0.5 (0.44m^3)	1.25x0.65x0.5 (0.59m^3)	1.5x0.75x0.5 (0.94m^3)	1.25x0.65x0.5 (0.59m^3)
350	0.6x0.5x0.5 (0.16m^3)	0.85x0.55x0.55 (0.29m^3)	1.0x0.55x0.55 (0.36m^3)	1.2x0.6x0.55 (0.53m^3)	1.4x0.7x0.55 (0.80m^3)	1.6x0.8x0.55 (1.20m^3)	1.4x0.7x0.55 (0.80m^3)
400	0.7x0.6x0.6 (0.26m^3)	0.95x0.6x0.6 (0.38m^3)	1.1x0.6x0.6 (0.47m^3)	1.3x0.65x0.6 (0.67m^3)	1.6x0.8x0.6 (1.20m^3)	1.8x0.9x0.6 (1.60m^3)	1.6x0.8x0.6 (1.20m^3)
450	0.8x0.65x0.65 (0.35m^3)	1.1x0.65x0.65 (0.53m^3)	1.3x0.65x0.65 (0.69m^3)	1.5x0.75x0.65 (1.0m^3)	1.8x0.9x0.65 (1.7m^3)	2.0x1.0x0.65 (2.2m^3)	1.8x0.9x0.65 (1.7m^3)
500	0.9x0.7x0.7 (0.46m^3)	1.2x0.7x0.7 (0.68m^3)	1.4x0.7x0.7 (0.86m^3)	1.7x0.85x0.7 (1.5m^3)	2.0x1.0x0.8 (2.3m^3)	2.3x1.2x0.7 (3.5m^3)	2.0x1.0x0.7 (2.3m^3)
600	1.1x0.8x0.8 (0.74m^3)	1.5x0.8x0.8 (1.2m^3)	1.7x0.9x0.8 (1.6m^3)	2.0x1.0x0.8 (2.3m^3)	2.3x1.2x0.8 (3.6m^3)	2.7x1.4x0.8 (5.6m^3)	2.3x1.2x0.8 (3.6m^3)

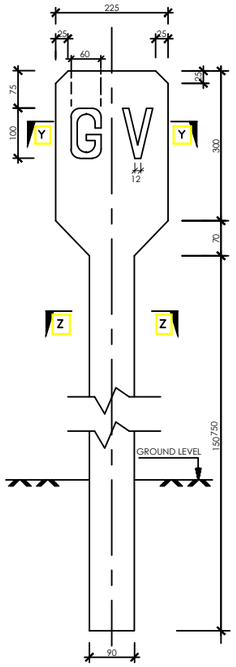
NOTE:- THE ABOVE VALUES APPLY FOR SOCKETTED uPVC AND FLANGED OR COUPLED LINED STEEL PIPES SUBJECT TO A WORKING PRESSURE HEAD OF 12 BAR



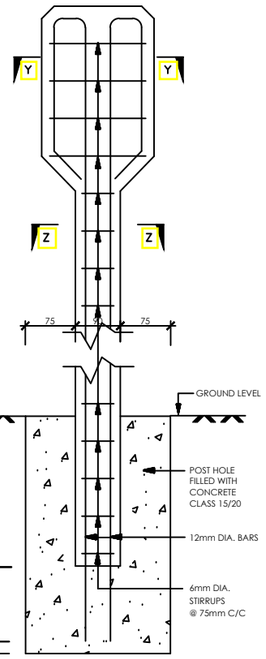
THRUST BLOCK AT CAPPED ENDS
SCALE 1:40



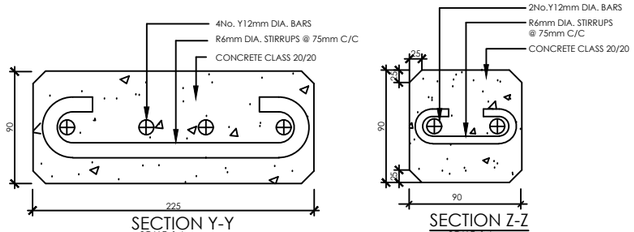
THRUST BLOCK AT REDUCER
SCALE 1:40



GATE VALVE INDICATOR POST
SCALE 1:10



INDICATOR POST REINFORCEMENT DETAILS
SCALE 1:10



SECTION Y-Y
SCALE 1:4

SECTION Z-Z
SCALE 1:4

INDICATOR POST DETAILS

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	February; 2018
2.				
3.				
4.				

Client
ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By
AFRICAN DEVELOPMENT BANK

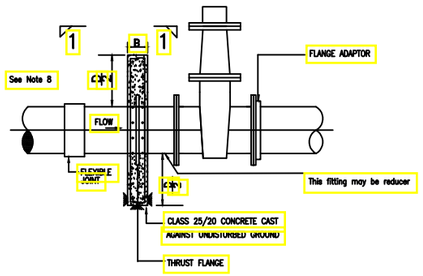
Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

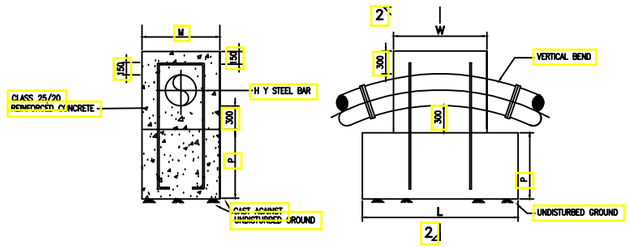
Reviewed By
CAS CONSULTANTS LIMITED
Le´Mac Building,1st FL,Off Church Road, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title
STANDARD WATER DETAILS

Designed By	: LK
Drawn By	: D.G.M
Checked By	: W.K
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/SD/019

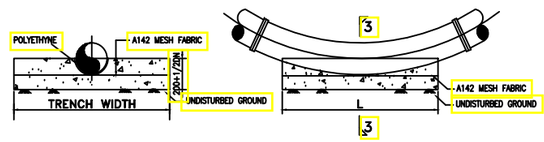


ELEVATION
ANCHOR BLOCK
FOR GATE VALVES



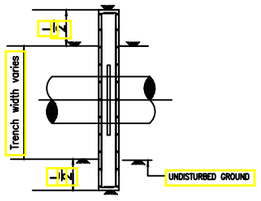
SECTION 2 – 2
UPTHRUST THRUST
UPVERTICAL BENDS – TYPICAL

ELEVATION

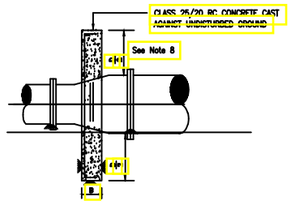


SECTION 3 – 3

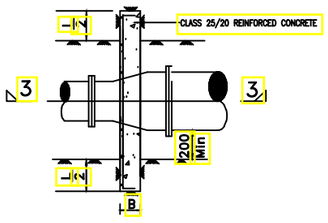
ELEVATION



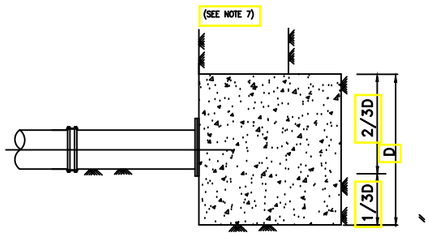
SECTION1 – 1



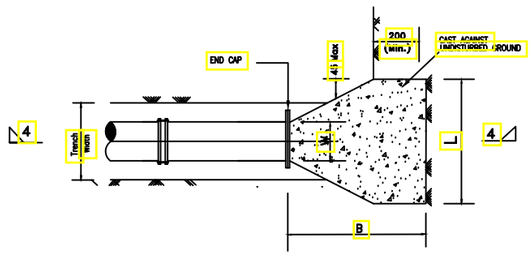
SECTION 3 – 3
THRUST BLOCKS FOR TAPERS



PLAN



Section 4 – 4



Plan
Thrust Block for Blank Ends

TABLE 1

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

DOWNTHRUST VERTICAL
BENDS – TYPICAL
(SEE NOTE 7)

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

TABLE 4

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)

TABLE OF THRUST BLOCKS FOR TAPERS

MAIN SIZE (mm)	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	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	—
250	—	—	—	—	—	—	—	—	—	A	A	B
200	—	—	—	—	—	—	—	—	—	—	A	A
150	—	—	—	—	—	—	—	—	—	—	—	A

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

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	February; 2018
2.				
3.				
4.				

Client
ATHI WATER WORKS DEVELOPMENT AGENCY
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By
AFRICAN DEVELOPMENT BANK

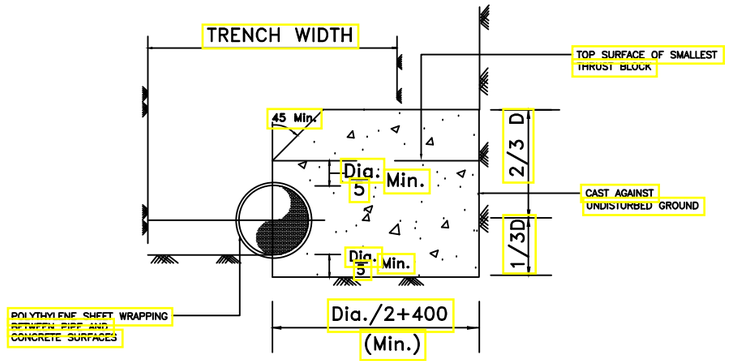
Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

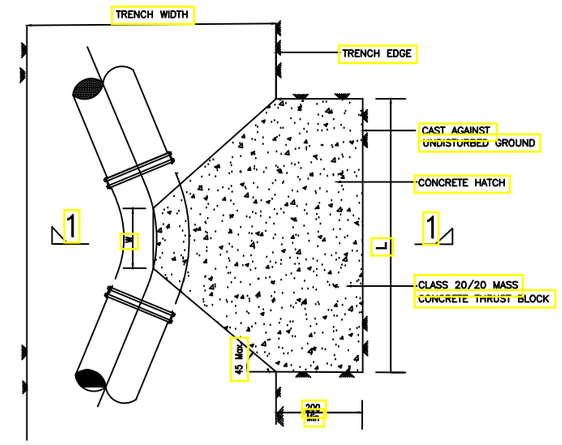
Reviewed By
CAS CONSULTANTS LIMITED
Le´Mac Building,1st FL,Off Church Road, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title
THRUST BLOCK 1

Designed By	: LK
Drawn By	: D.G.M
Checked By	: W.K
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/SD/020A



Section 1 – 1

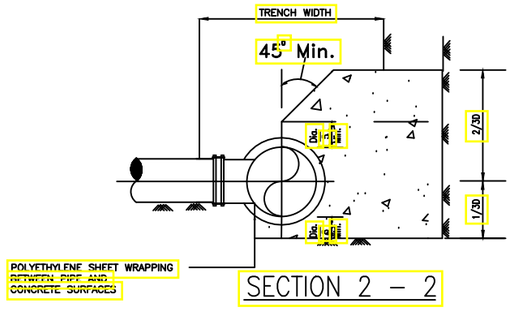


SECTIONAL PLAN

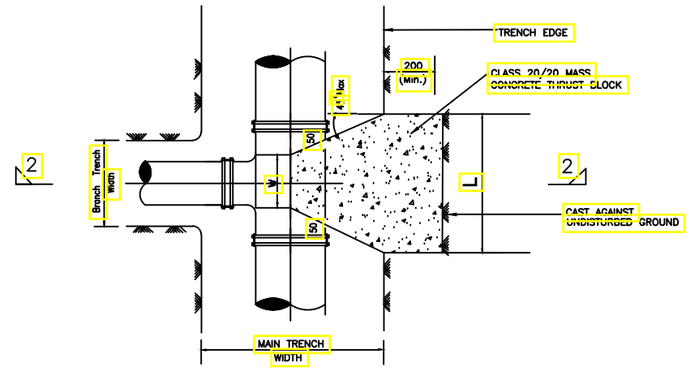
THRUST BLOCK FOR HORIZONTAL BENDS

TEST HEAD (m)	BEND	TABLE OF THRUST BLOCKS FOR HORIZONTAL BENDS — DIMENSIONS (D)m x (L)m x V(m³) — SIZE OF BEND DN (mm)										
		800	700	600	500	450	400	350	300	250	200	150/100
100 SEE NOTE 8	11¼°	1.8X0.8X0.7	1.6X0.8X0.6	1.4X0.7X0.4	1.2X0.6X0.3	1.1X0.5X0.2	1.0X0.5X0.2	0.9X0.4X0.1	0.8X0.4X0.1	0.7X0.3X0.1	0.5X0.3X0.1	0.5X0.3X0.1
	22½°	1.8X1.6X1.4	1.6X1.6X1.2	1.4X1.3X0.8	1.2X1.2X0.6	1.1X1.0X0.5	1.1X0.8X0.4	1.0X0.7X0.3	0.8X0.7X0.2	0.8X0.5X0.1	0.8X0.3X0.1	0.5X0.3X0.1
	30°	1.8X2.1X1.9	1.6X2.0X1.5	1.4X1.8X1.1	1.2X1.5X0.8	1.1X1.3X0.6	1.1X1.1X0.5	1.0X0.9X0.3	0.9X0.8X0.3	0.8X0.7X0.2	0.8X0.4X0.1	0.5X0.4X0.1
	45°	1.8X3.2X2.9	1.6X3.2X2.4	1.6X2.2X1.6	1.4X1.8X1.1	1.1X2.0X0.9	1.2X1.5X0.7	1.0X1.4X0.5	1.0X1.0X0.4	0.8X1.0X0.3	0.8X0.6X0.2	0.6X0.5X0.1
	90°	2.4X4.0X4.8	2.0X3.8X3.6	1.8X3.5X2.8	1.6X2.7X1.8	1.4X2.6X1.5	1.2X2.5X1.2	1.2X2.0X0.9	1.2X1.5X0.7	1.0X1.4X0.5	1.0X0.8X0.3	0.6X0.9X0.2

Table of Thrust Blocks for Horizontal Bends



SECTION 2 – 2



SECTIONAL PLAN

THRUST BLOCK FOR TEES

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE STATED
2. ANCHOR BLOCKS TO BE INSTALLED FOR PIPES LAID AT SLOPES EXCEEDING 1:6 SLOPE
3. THRUST BLOCKS TO BE INSTALLED AT ALL HORIZONTAL AND VERTICAL BENDS, CAPPED ENDS, TEES, TAPERS AND GATE VALVES
4. DETAILS FOR ALL INDICATOR POSTS TO BE AS FOR GATE VALVE BUT LETTERING TO BE AS FOLLOWS:

FOR	USE
GATE VALVE	GV
AIR VALVE	AV
WASHOUT	WO
WATER MAIN	WM
BULK METER	M
"Y" JUNCTION	Y

5. ALL INDICATOR POSTS TO BE PAINTED WITH 2 COATS BLUE OIL BASED PAINT AND WHITE LETTERING TO ENGINEER'S APPROVAL

TEST HEAD (m)	MAIN SIZE (mm)	TABLE OF THRUST BLOCKS FOR TEES — DIMENSIONS (D)m x (L)m x V (m3) — BRANCH SIZE (mm)										
		800	700	600	500	450	400	350	300	250	200	150/100
100 SEE NOTE No. 8	800	2.0x3.5x3.5	1.8x3.2x2.7	1.6x2.7x1.9	1.6x2.0x1.4	1.6x1.6x1.1	1.6x1.2x0.8	1.6x1.0x0.6	1.6x0.7x0.4	1.6x0.5x0.3	1.6x0.3x0.2	1.6x0.3x0.2
	700		1.6x3.6x2.7	1.6x2.7x1.9	1.5x2.1x1.4	1.5x1.7x1.1	1.5x1.3x0.8	1.5x1.0x0.6	1.5x0.8x0.5	1.4x0.6x0.3	1.4x0.4x0.2	1.4x0.3x0.2
	600			1.5x3.0x2.0	1.5x2.1x1.4	1.5x1.7x1.1	1.2x1.8x0.9	1.2x1.4x0.7	1.2x1.0x0.5	1.2x0.7x0.3	1.2x0.5x0.2	1.2x0.3x0.1
	500			—	1.4x2.3x1.4	1.3x2.0x1.1	1.2x1.8x0.9	1.2x1.4x0.7	1.2x1.0x0.5	1.1x0.8x0.3	1.1x0.5x0.2	1.1x0.3x0.1
	450			—	—	1.2x2.3x1.1	1.2x1.8x0.9	1.1x1.6x0.7	1.1x1.2x0.5	1.1x0.8x0.3	1.0x0.6x0.2	1.0x0.4x0.1
	400			—	—	—	1.0x1.3x0.9	1.0x1.8x0.7	1.0x1.3x0.5	1.0x0.9x0.3	1.0x0.6x0.2	1.0x0.4x0.1
	350			—	—	—	—	1.0x1.8x0.7	1.0x1.3x0.5	1.0x0.9x0.3	1.0x0.5x0.2	1.0x0.4x0.1
	300			—	—	—	—	—	0.8x1.7x0.5	0.8x1.2x0.3	0.8x0.8x0.2	0.8x0.5x0.1
	250			—	—	—	—	—	—	0.8x1.2x0.3	0.8x0.8x0.2	0.8x0.5x0.1
	200			—	—	—	—	—	—	—	0.6x1.1x0.2	0.6x0.7x0.1
	150			—	—	—	—	—	—	—	—	0.5x0.8x0.1

Table of Thrust Blocks for Tees

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	February; 2018
2.				
3.				
4.				

Client

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

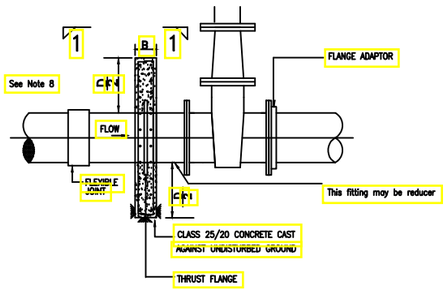
Reviewed By

CAS CONSULTANTS LIMITED
Le´Mac Building,1st FL,Off Church Road, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

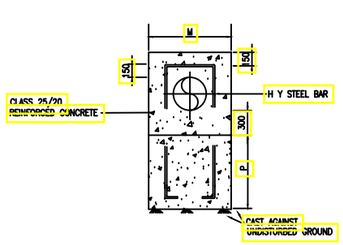
Drawing Title

THRUST BLOCK 2

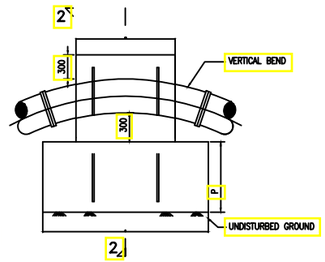
Designed By	: LK
Drawn By	: D.G.M
Checked By	: W.K
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/SD/020B



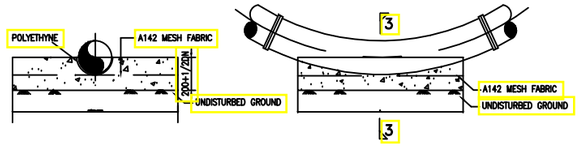
ELEVATION
ANCHOR BLOCK
FOR GATE VALVES



SECTION 2 – 2
UPTHRUST THRUST
UPVERTICAL BENDS – TYPICAL



ELEVATION



SECTION 3 – 3

ELEVATION

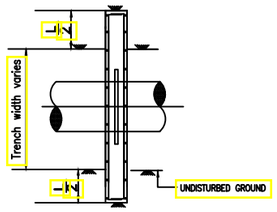
DOWNTHRUST VERTICAL
BENDS – TYPICAL
(SEE NOTE 7)

NOTES

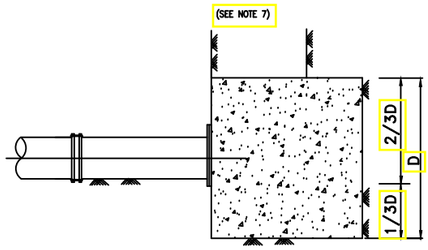
1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE STATED
2. ANCHOR BLOCKS TO BE INSTALLED FOR PIPES LAID AT SLOPES EXCEEDING 16 SLOPE
3. THRUST BLOCKS TO BE INSTALLED AT ALL HORIZONTAL AND VERTICAL BENDS, CAPPED ENDS, TEES, TAPERS AND GATE VALVES
4. DETAILS FOR ALL INDICATOR POSTS TO BE AS FOR GATE VALVE BUT LETTERING TO BE AS FOLLOWS:

FOR	USE
GATE VALVE	GV
AIR VALVE	AV
WASHOUT	WO
WATER MAIN	WM
BULK METER	M
'Y'- JUNCTION	Y

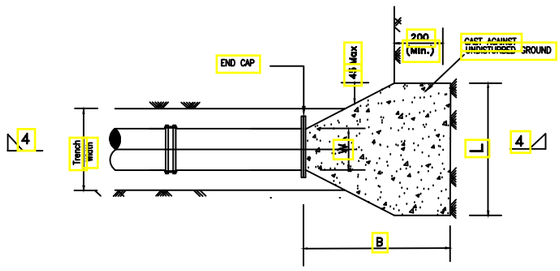
5. ALL INDICATOR POSTS TO BE PAINTED WITH 2 COATS BLUE OIL BASED PAINT AND WHITE LETTERING TO ENGINEER'S APPROVAL



SECTION1 – 1



Section 4 – 4

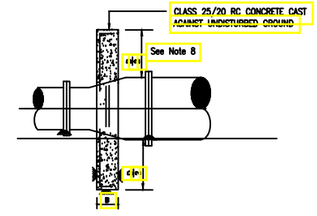


Plan

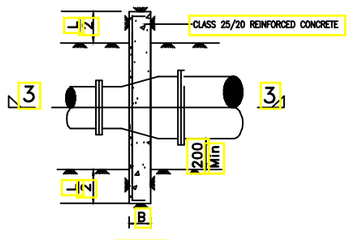
Thrust Block for Blank Ends

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



SECTION 3 – 3
THRUST BLOCKS FOR TAPERS



PLAN

MAIN SIZE (mm)	BLOCK TYPE 100m head	160m 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

TABLE 4

BLOCK TYPE	D (m)	L (m)	B (mm)	MAIN STEEL	DISTRIBUTION STEEL
A	0.8	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)

TABLE OF THRUST BLOCKS FOR TAPERS

MAIN SIZE (mm)	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	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	—
250	—	—	—	—	—	—	—	—	—	A	A	B
200	—	—	—	—	—	—	—	—	—	—	A	A
150	—	—	—	—	—	—	—	—	—	—	—	A

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

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	February; 2018
2.				
3.				
4.				

Client
ATHI WATER WORKS DEVELOPMENT AGENCY,
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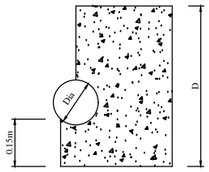
Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT
CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

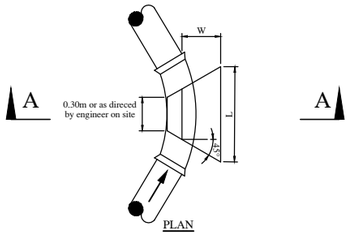
Reviewed By
CAS CONSULTANTS LIMITED
Le'Mac Building,1st FL,Off Church Road, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title
THRUST BLOCK 3

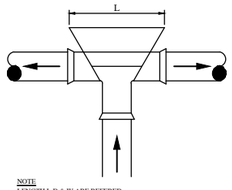
Designed By	: LK
Drawn By	: D.G.M
Checked By	: W.K
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/SD/020C



SECTION A - A



PLAN



NOTE
LENGTH L,D & W ARE REFERED TO IN THE TABLE

CLASS 'B' 60m. HEAD	90° BEND							45° BEND							22.5° BEND							11.25° BEND							JUNCTIONS & BLANK ENDS						
DIA.	80	100	125	150	200	250	300	80	100	125	150	200	250	300	80	100	125	150	200	250	300	80	100	125	150	200	250	300	80	100	125	150	200	250	300
D (m.)	0.45	0.45	0.60	0.60	0.60	0.60	0.60	0.45	0.45	0.45	0.60	0.60	0.60	0.60	0.45	0.45	0.45	0.45	0.60	0.60	0.60	0.45	0.45	0.45	0.45	0.60	0.60	0.60	0.45	0.45	0.60	0.60	0.60	0.60	0.60
L (m.)	0.60	0.60	0.75	0.75	0.75	1.00	1.40	0.60	0.60	0.60	0.75	0.75	0.75	0.75	0.60	0.60	0.60	0.60	0.60	0.75	0.75	0.60	0.60	0.60	0.60	0.60	0.60	0.75	0.60	0.60	0.60	0.75	0.75	0.75	1.00
W (m.)	0.35	0.35	0.40	0.40	0.40	0.45	0.45	0.35	0.35	0.40	0.40	0.40	0.45	0.45	0.35	0.35	0.40	0.40	0.40	0.45	0.45	0.35	0.35	0.40	0.40	0.40	0.45	0.45	0.35	0.35	0.40	0.40	0.40	0.45	0.45
VL. c.m.	0.13	0.13	0.21	0.21	0.21	0.27	0.32	0.13	0.13	0.14	0.21	0.21	0.24	0.24	0.13	0.13	0.14	0.14	0.24	0.24	0.24	0.13	0.13	0.14	0.14	0.16	0.24	0.13	0.13	0.13	0.14	0.21	0.21	0.24	0.24

CLASS 'C' 90m. HEAD	90° BEND							45° BEND							22.5° BEND							11.25° BEND							JUNCTIONS & BLANK ENDS						
DIA.	80	100	125	150	200	250	300	80	100	125	150	200	250	300	80	100	125	150	200	250	300	80	100	125	150	200	250	300	80	100	125	150	200	250	300
D (m.)	0.45	0.60	0.60	0.60	0.60	0.60	0.90	0.45	0.45	0.45	0.45	0.60	0.60	0.60	0.45	0.45	0.45	0.45	0.60	0.60	0.60	0.45	0.45	0.45	0.45	0.45	0.60	0.60	0.45	0.45	0.60	0.60	0.60	0.60	0.60
L (m.)	0.60	0.75	0.75	0.75	1.00	1.40	1.40	0.60	0.60	0.60	0.60	0.75	0.75	1.00	0.60	0.60	0.60	0.60	0.75	0.75	0.75	0.60	0.60	0.60	0.60	0.60	0.75	0.75	0.60	0.60	0.75	0.75	0.75	1.00	1.40
W (m.)	0.35	0.35	0.40	0.40	0.40	0.45	0.45	0.35	0.35	0.40	0.40	0.40	0.45	0.45	0.35	0.35	0.40	0.40	0.40	0.45	0.45	0.35	0.35	0.40	0.40	0.40	0.45	0.45	0.35	0.35	0.40	0.40	0.40	0.45	0.45
VL. c.m.	0.13	0.18	0.21	0.21	0.24	0.32	0.49	0.13	0.13	0.14	0.14	0.21	0.24	0.27	0.13	0.13	0.14	0.14	0.21	0.24	0.24	0.13	0.13	0.14	0.14	0.14	0.24	0.24	0.13	0.13	0.21	0.21	0.21	0.27	0.32

CLASS 'D' 120m. HEAD	90° BEND							45° BEND							22.5° BEND							11.25° BEND							JUNCTIONS & BLANK ENDS						
DIA.	80	100	125	150	200	250	300	80	100	125	150	200	250	300	80	100	125	150	200	250	300	80	100	125	150	200	250	300	80	100	125	150	200	250	300
D (m.)	0.45	0.60	0.60	0.60	0.90	0.90	0.90	0.45	0.45	0.60	0.60	0.60	0.60	0.60	0.45	0.45	0.45	0.60	0.60	0.60	0.60	0.45	0.45	0.45	0.45	0.60	0.60	0.60	0.45	0.45	0.60	0.60	0.60	0.60	0.90
L (m.)	0.60	0.75	0.75	0.75	1.20	1.40	1.80	0.60	0.60	0.75	0.75	0.75	1.00	1.40	0.60	0.60	0.60	0.60	0.75	0.75	0.75	0.60	0.60	0.60	0.60	0.60	0.75	0.75	0.60	0.60	0.75	0.75	1.00	1.40	1.40
W (m.)	0.35	0.35	0.40	0.40	0.40	0.45	0.45	0.35	0.35	0.40	0.40	0.40	0.45	0.45	0.35	0.35	0.40	0.40	0.40	0.45	0.45	0.35	0.35	0.40	0.40	0.40	0.45	0.45	0.35	0.35	0.40	0.40	0.40	0.45	0.45
VL. c.m.	0.13	0.18	0.21	0.21	0.26	0.49	0.57	0.13	0.13	0.21	0.21	0.21	0.27	0.32	0.13	0.13	0.14	0.14	0.21	0.24	0.24	0.13	0.13	0.14	0.14	0.14	0.24	0.24	0.13	0.13	0.21	0.21	0.24	0.32	0.49

CLASS 'E' 150m. HEAD	90° BEND							45° BEND							22.5° BEND							11.25° BEND							JUNCTIONS & BLANK ENDS						
DIA.	80	100	125	150	200	250	300	80	100	125	150	200	250	300	80	100	125	150	200	250	300	80	100	125	150	200	250	300	80	100	125	150	200	250	300
D (m.)	0.60	0.60	0.60	0.60	0.90	0.90	0.90	0.45	0.45	0.60	0.60	0.60	0.60	0.90	0.45	0.45	0.45	0.60	0.60	0.60	0.60	0.45	0.45	0.45	0.45	0.60	0.60	0.60	0.45	0.45	0.60	0.60	0.60	0.60	0.90
L (m.)	0.75	0.75	0.75	1.00	1.40	1.60	2.30	0.60	0.75	0.75	0.75	1.00	1.40	1.40	0.60	0.60	0.60	0.75	0.75	0.75	1.00	0.60	0.60	0.60	0.60	0.60	0.75	0.75	0.60	0.75	0.75	0.75	1.00	1.40	1.60
W (m.)	0.35	0.35	0.40	0.40	0.40	0.45	0.45	0.35	0.35	0.40	0.40	0.40	0.45	0.45	0.35	0.35	0.40	0.40	0.40	0.45	0.45	0.35	0.35	0.40	0.40	0.40	0.45	0.45	0.35	0.35	0.40	0.40	0.40	0.45	0.45
VL. c.m.	0.18	0.18	0.21	0.24	0.29	0.53	0.67	0.13	0.18	0.21	0.21	0.24	0.32	0.49	0.13	0.13	0.14	0.21	0.21	0.24	0.27	0.13	0.13	0.14	0.14	0.14	0.24	0.24	0.13	0.18	0.21	0.21	0.24	0.32	0.53

ANCHOR BLOCKS ON HORIZONTAL BENDS OR JUNCTIONS

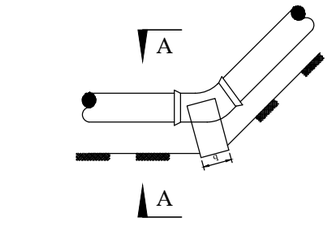
CLASS 'B' 60m. HEAD	45° BEND							22.5° BEND							11.25° BEND						
DIA.	80	100	125	150	200	250	300	80	100	125	150	200	250	300	80	100	125	150	200	250	300
a (m.)	0.45	0.45	0.65	0.95	1.70	2.20	3.15	0.45	0.45	0.50	0.60	0.85	1.15	1.60	0.30	0.30	0.35	0.45	0.60	0.60	0.85
b (m.)	0.60	0.60	0.90	0.90	0.90	0.90	0.90	0.60	0.60	0.60	0.90	0.90	0.90	0.90	0.45	0.45	0.45	0.60	0.60	0.90	0.90
c(m.)	0.60	0.60	0.60	0.60	0.60	0.70	0.70	0.60	0.60	0.60	0.60	0.60	0.70	0.70	0.60	0.60	0.60	0.60	0.60	0.70	0.70
VL. c.m.	0.13	0.23	0.35	0.51	0.90	1.40	2.00	0.06	0.12	0.18	0.26	0.46	0.72	1.00	0.03	0.13	0.09	0.13	0.23	0.36	0.52

CLASS 'C' 90m. HEAD	45° BEND							22.5° BEND							11.25° BEND						
DIA.	80	100	125	150	200	250	300	80	100	125	150	200	250	300	80	100	125	150	200	250	300
a (m.)	0.60	1.00	1.00	1.40	2.60	3.35	4.80	0.40	0.50	0.75	0.90	1.30	1.75	0.60	0.30	0.30	0.45	0.60	0.65	0.85	1.25
b (m.)	0.60	0.60	0.90	0.90	0.90	0.90	0.90	0.45	0.60	0.60	0.60	0.90	0.90	0.90	0.45	0.45	0.60	0.60	0.90	0.90	0.90
c(m.)	0.60	0.60	0.60	0.60	0.60	0.70	0.70	0.60	0.60	0.60	0.60	0.60	0.70	0.70	0.60	0.60	0.60	0.60	0.60	0.70	0.70
VL. c.m.	0.19	0.34	0.51	0.76	1.40	2.10	3.00	0.10	0.17	0.27	0.39	0.69	1.10	1.60	0.05	0.09	0.14	0.20	0.35	0.54	0.78

CLASS 'D' 120m. HEAD	45° BEND							22.5° BEND							11.25° BEND						
DIA.	80	100	125	150	200	250	300	80	100	125	150	200	250	300	80	100	125	150	200	250	300
a (m.)	0.70	1.25	1.30	1.85	3.35	4.50	6.50	0.50	0.65	1.00	1.45	1.70	2.30	2.35	0.30	0.45	0.50	0.75	0.85	1.15	1.60
b (m.)	0.60	0.60	0.90	0.90	0.90	0.90	0.90	0.45	0.60	0.60	0.60	0.90	0.90	0.90	0.45	0.45	0.60	0.60	0.90	0.90	0.90
c(m.)	0.60	0.60	0.60	0.60	0.60	0.70	0.70	0.60	0.60	0.60	0.60	0.60	0.70	0.70	0.60	0.60	0.60	0.60	0.60	0.70	0.70
VL. c.m.	0.25	0.45	0.70	1.00	1.80	2.80	4.10	0.13	0.23	0.36	0.52	0.92	1.44	2.10	0.07	0.12	0.18	0.26	0.46	0.72	1.00

CLASS 'E' 150m. HEAD	45° BEND							22.5° BEND							11.25° BEND						
DIA.	80	100	125	150	200	250	300	80	100	125	150	200	250	300	80	100	125	150	200	250	300
a (m.)	0.90	1.60	1.70	2.40	4.25	5.55	8.00	0.45	0.80	0.85	1.20	2.15	2.85	4.15	0.30	0.55	0.65	0.65	1.10	1.45	2.10
b (m.)	0.60	0.60	0.90	0.90	0.90	0.90	0.90	0.60	0.60	0.90	0.90	0.90	0.90	0.90	0.45	0.45	0.90	0.90	0.90	0.90	0.90
c(m.)	0.60	0.60	0.60	0.60	0.90	0.90	0.90	0.60	0.60	0.60	0.60	0.60	0.70	0.70	0.60	0.60	0.60	0.60	0.60	0.70	0.70
VL. c.m.	0.32	0.57	0.90	1.30	2.30	3.50	5.10	0.16	0.29	0.45	0.65	1.15	1.80	2.60	0.08	0.15	0.23	0.33	0.60	0.90	1.30

ANCHOR BLOCKS ON VERTICAL BENDS - UPTHRUST



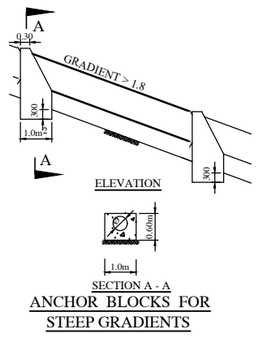
NOTE
LENGTH a,b & c ARE REFERED TO IN THE TABLE

NOTE
LENGTH P,q & r ARE REFERED TO IN THE TABLE

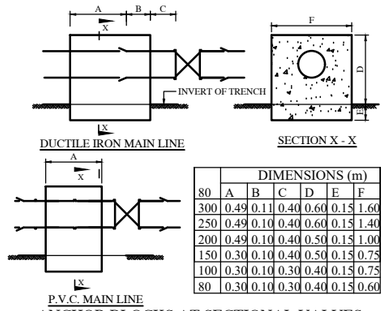
	CLASS 'B' 60m. HEAD			CLASS 'C' 90m. HEAD			CLASS 'D' 120m. HEAD			CLASS 'E' 150m. HEAD		
	45° BEND			45° BEND			45° BEND			45° BEND		
DIA.	200	250	300	200	250	300	200	250	300	200	250	300
p (m.)	0.25	0.35	0.45	0.35	0.45	0.60	0.35	0.60	0.70	0.45	0.60	0.70
q (m.)	0.40	0.45	0.50	0.45	0.50	0.60	0.45	0.60	0.70	0.60	0.60	0.70
r (m.)	0.25	0.25	0.30	0.25	0.25	0.30	0.25	0.25	0.30	0.25	0.25	0.30
VL. c.m.	0.03	0.04	0.07	0.04	0.06	0.11	0.04	0.09	0.15	0.07	0.09	0.15

	CLASS 'D' 120m. HEAD			CLASS 'E' 150m. HEAD		
	22.5° BEND			22.5° BEND		
DIA.	200	250	300	200	250	300
p (m.)	0.25	0.35	0.45	0.35	0.35	0.60
q (m.)	0.40	0.45	0.50	0.45	0.45	0.60
r (m.)	0.25	0.25	0.30	0.25	0.25	0.30
VL. c.m.	0.03	0.04	0.07	0.04	0.04	0.11

ANCHOR BLOCKS ON VERTICAL BENDS - DOWNTHRUST



ANCHOR BLOCKS FOR STEEP GRADIENTS



	DIMENSIONS (m)					
80	A	B	C	D	E	F
300	0.45	0.11	0.40	0.60	0.15	1.60
250	0.45	0.10	0.40	0.60	0.15	1.40
200	0.45	0.10	0.40	0.50	0.15	1.00
150	0.30	0.10	0.40	0.50	0.15	0.75
100	0.30	0.10	0.30	0.40	0.15	0.75
80	0.30	0.10	0.30	0.40	0.15	0.60

ANCHOR BLOCKS AT SECTIONAL VALVES

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE STATED
2. ANCHOR BLOCKS TO BE INSTALLED FOR PIPES LAID AT SLOPES EXCEEDING 16 SLOPE
3. THRUST BLOCKS TO BE INSTALLED AT ALL HORIZONTAL AND VERTICAL BENDS, CAPPED ENDS, TEES, TAPERS AND GATE VALVES
4. DETAILS FOR ALL INDICATOR POSTS TO BE AS FOR GATE VALVE BUT LETTERING TO BE AS FOLLOWS:

FOR	USE
GATE VALVE	GV
AIR VALVE	AV
WASHOUT	WO
WATER MAIN	WM
BULK METER	M
'Y'- JUNCTION	Y

5. ALL INDICATOR POSTS TO BE PAINTED WITH 2 COATS BLUE OIL BASED PAINT AND WHITE LETTERING TO ENGINEER'S APPROVAL

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	February; 2018
2.				
3.				
4.				

Client
ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By
AFRICAN DEVELOPMENT BANK

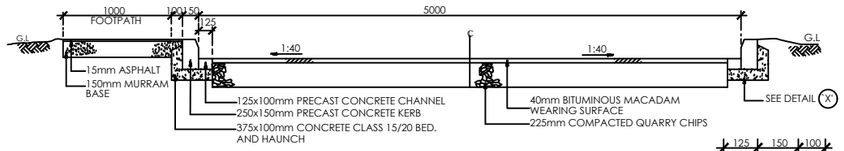
Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT
CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By
CAS CONSULTANTS LIMITED
Le'Mac Building,1st FL,Off Church Road, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

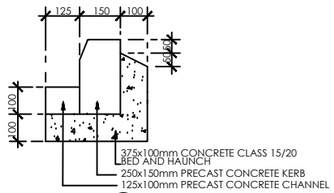
Drawing Title
THRUST BLOCK DETAILS

Designed By	: LK
Drawn By	: D.G.M
Checked By	: W.K
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/SD/021

TYPICAL BITUMINOUS ROAD DETAILS

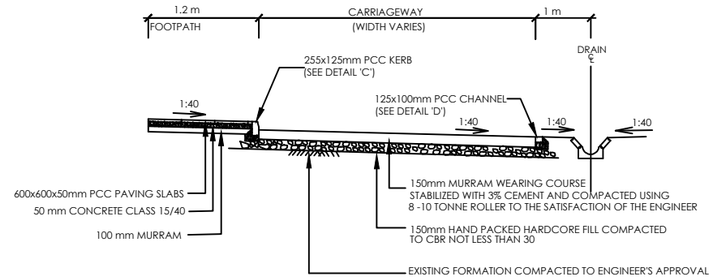


TYPICAL SECTION OF BITUMINOUS ROAD
SCALE 1:50



DETAIL 'X'
SCALE 1:20

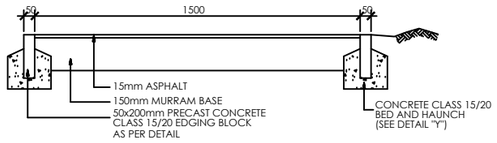
TYPICAL MURRAM ROAD DETAILS



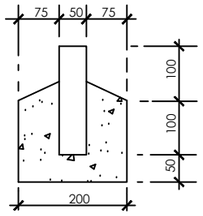
TYPICAL SECTION OF MURRAM ROAD
SCALE 1: 50

NOTE
ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE STATED

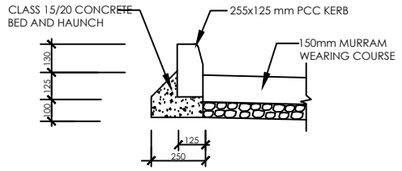
ABBREVIATIONS
℄ - CENTRE LINE
mm - MILIMETER
G.L. - GROUND LEVEL
m - METER
PCC - PRECAST CEMENT CONCRETE



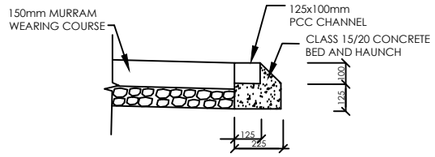
TYPICAL SECTION OF FOOTPATH
SCALE 1:25



DETAIL 'Y'
SCALE 1:10

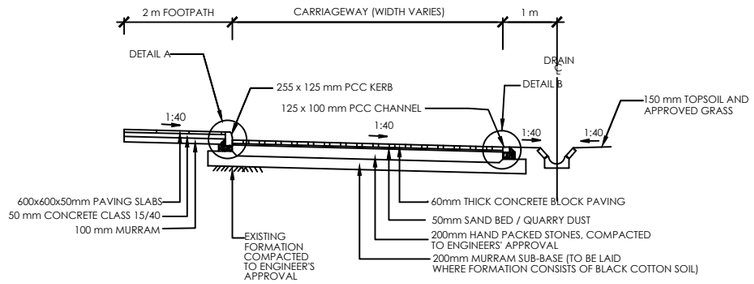


DETAIL 'C'
TYPICAL DETAIL OF KERB
SCALE 1:25

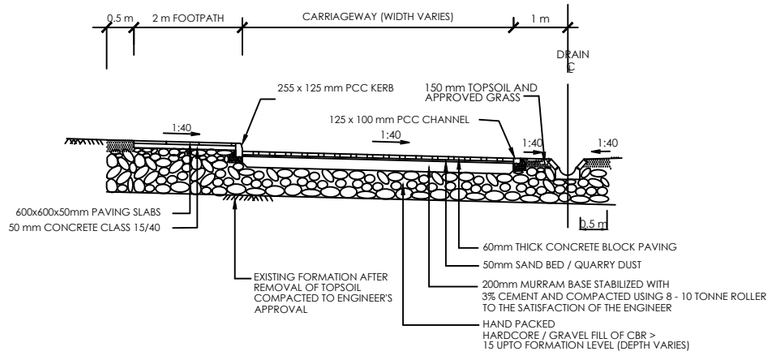


DETAIL 'D'
TYPICAL DETAIL OF CHANNEL
SCALE 1:25

TYPICAL CONCRETE BLOCK SURFACE ROAD DETAILS

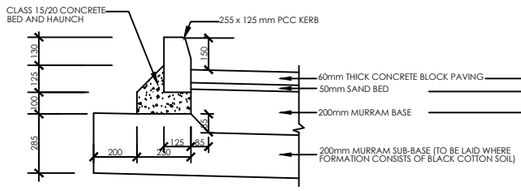


TYPICAL CROSS SECTION FOR CARRIAGEWAY IN CUT
SCALE 1:100



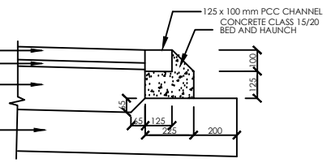
TYPICAL CROSS SECTION FOR CARRIAGEWAY IN FILL
SCALE 1:100

DETAIL A



DETAIL OF KERB
SCALE 1:25

DETAIL B



DETAIL OF CHANNEL
SCALE 1:25

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	February; 2018
2.				
3.				
4.				

Client
ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By
AFRICAN DEVELOPMENT BANK

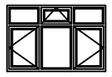
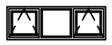
Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By
CAS CONSULTANTS LIMITED
Le´Mac Building,1st FL,Off Church Road, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title
TYPICAL ROAD CROSSING DETAILS

Designed By	: LK
Drawn By	: D.G.M
Checked By	: W.K
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/SD/022

WINDOW TYPES	DESCRIPTION	STRUCTURAL OPENING
 **W 1 / W 1a**	1797 X 1197 mm steel casement window in 3 equal panels, with upper part having 2 no. fixed and 1 no. top - hung ventilator, and lower half having 2 no.side-hung panels opening outwards, and 1 no. fixed panel. W1a similar but window size to be 1497 x 1197	1800 x 1200 mm 1500 x 1200 mm
 **W 2 / W 2a**	1797 X 1197 mm PVC window in 3 equal panels, with upper part having 2 no. fixed and 1 no. top - hung ventilator, and lower half having 2 no.side-hung panels opening outwards, and 1 no. fixed panel. W2a similar but window size to be 1497 x 1197	1800 x 1200 mm 1500 x 1200 mm
 **W 3 / W 3a**	1197 X 1397 mm steel casement window in 2 equal panels, with upper part having 1 no. fixed and 1 no. top - hung ventilator, and lower half having 1 no.side-hung casement opening outwards, and 1 no. fixed panel with coupling mullions. Window W3a similar but size 1197x1197mm	1200 x 1400 mm 1200 x 1200 mm
 **W 4/ W 4a**	597 X 1197 mm steel casement window, with upper part having 1 no. top - hung ventilator, and lower half having 1 no.side-hung panel opening outwards. W 4a similar but uPVC window	600 x 1200 mm 600 x 1200 mm
 **W 5 / W 5a / W5b**	1797 x 597 mm PVC window in 3 equal panels with 1 no. fixed and 2 no. top-hung panels opening outwards. Window W5a similar but steel casement window Window W5b similar but pvc window size 1497 x 597mm	1800 x 600 mm 1800 x 600 mm 1500 x 600 mm
 **W 6**	597 X 597 mm steel casement window, with top - hung ventilator.	600 x 600 mm
 **W 7 / W7a**	1197 X 597 mm steel casement window in 2 equal panels, with 1 no. fixed and 1 no. top - hung ventilator. Window W7a similar but pvc window size 997 x 597mm	1200 x 600 mm 1000 x 600 mm
 **W 8**	1197 X 597 mm PVC window in 2 equal panels, with 2 no. top - hung ventilators.	1200 x 600 mm

NOTES:

1. All windows to be fitted with burglar proofing grille fabricated from 12x12mm m.s. square bars at 150mm c/c vertically and 200mm c/c horizontally , and fixed internally to surrounding wall with 12mm m.s. fish tail lugs at centres not exceeding 600mm.

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	February; 2018
2.				
3.				
4.				

Client
ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

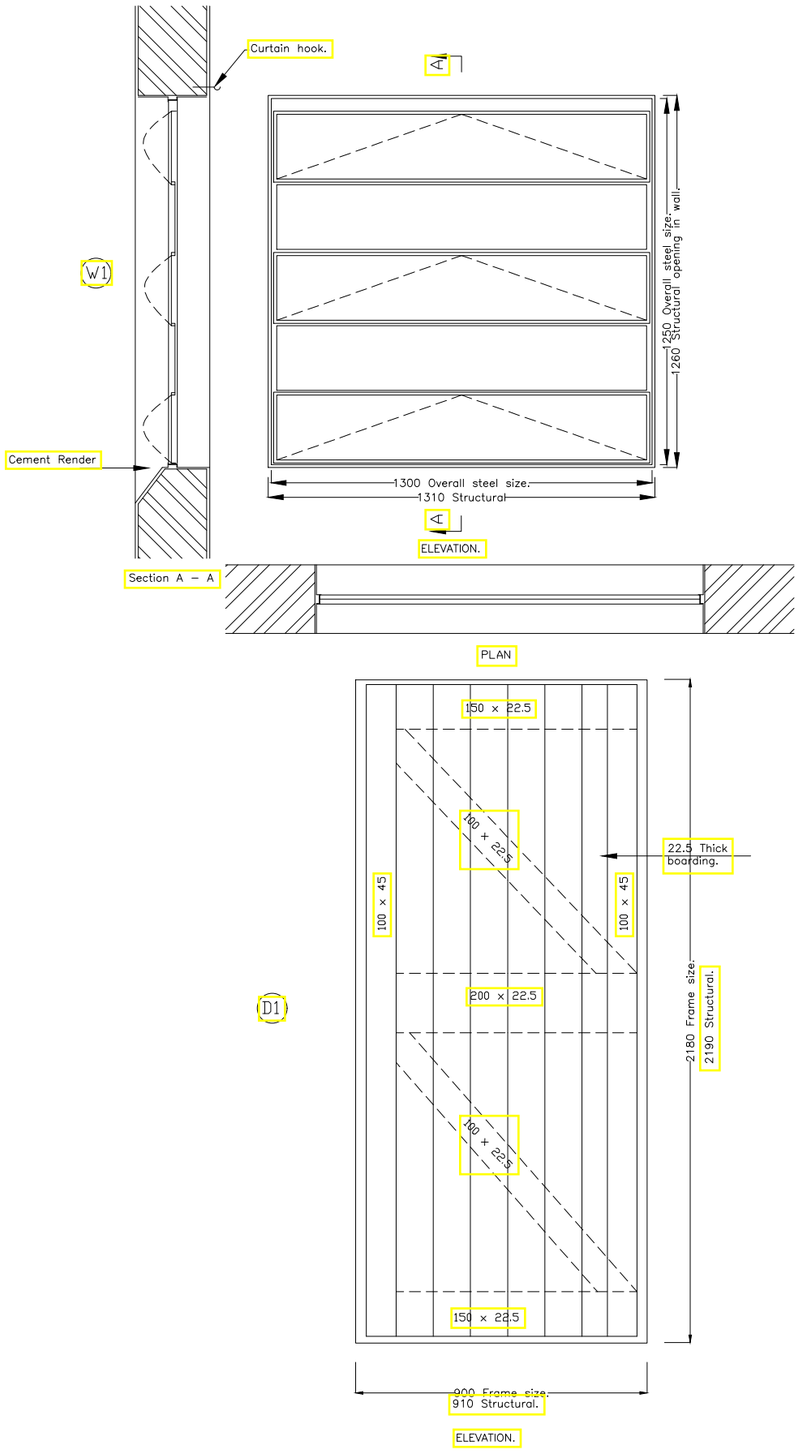
Financed By
AFRICAN DEVELOPMENT BANK

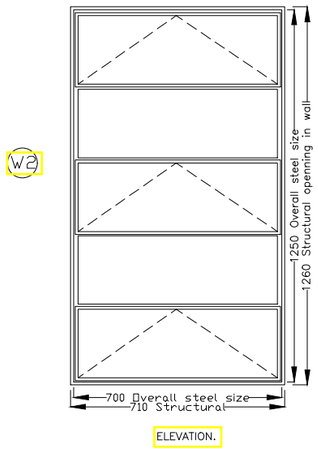
Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT
CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

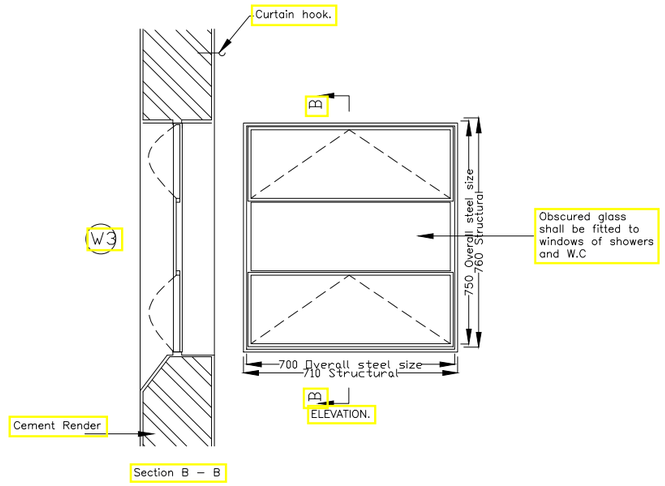
Reviewed By
CAS CONSULTANTS LIMITED
Le´Mac Building,1st FL,Off Church Road, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

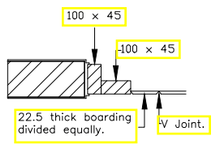
Drawing Title
WINDOW SCHEDULE

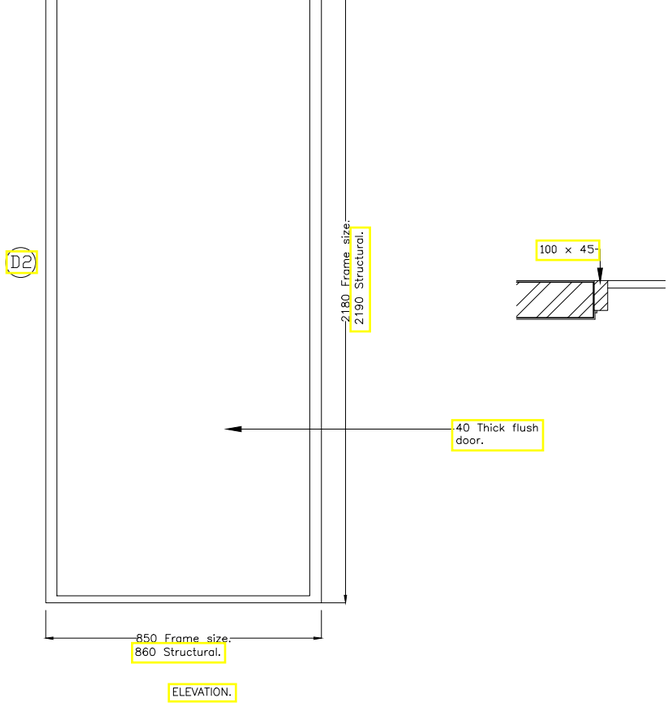
Designed By	:	LK
Drawn By	:	D.G.M
Checked By	:	W.K
Approved By	:	S.M.M
Client approval	:	
Date	:	MARCH 2023
Drawing No	:	AWSB/MC/SD/023











No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	February; 2018
2.				
3.				
4.				

Client

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

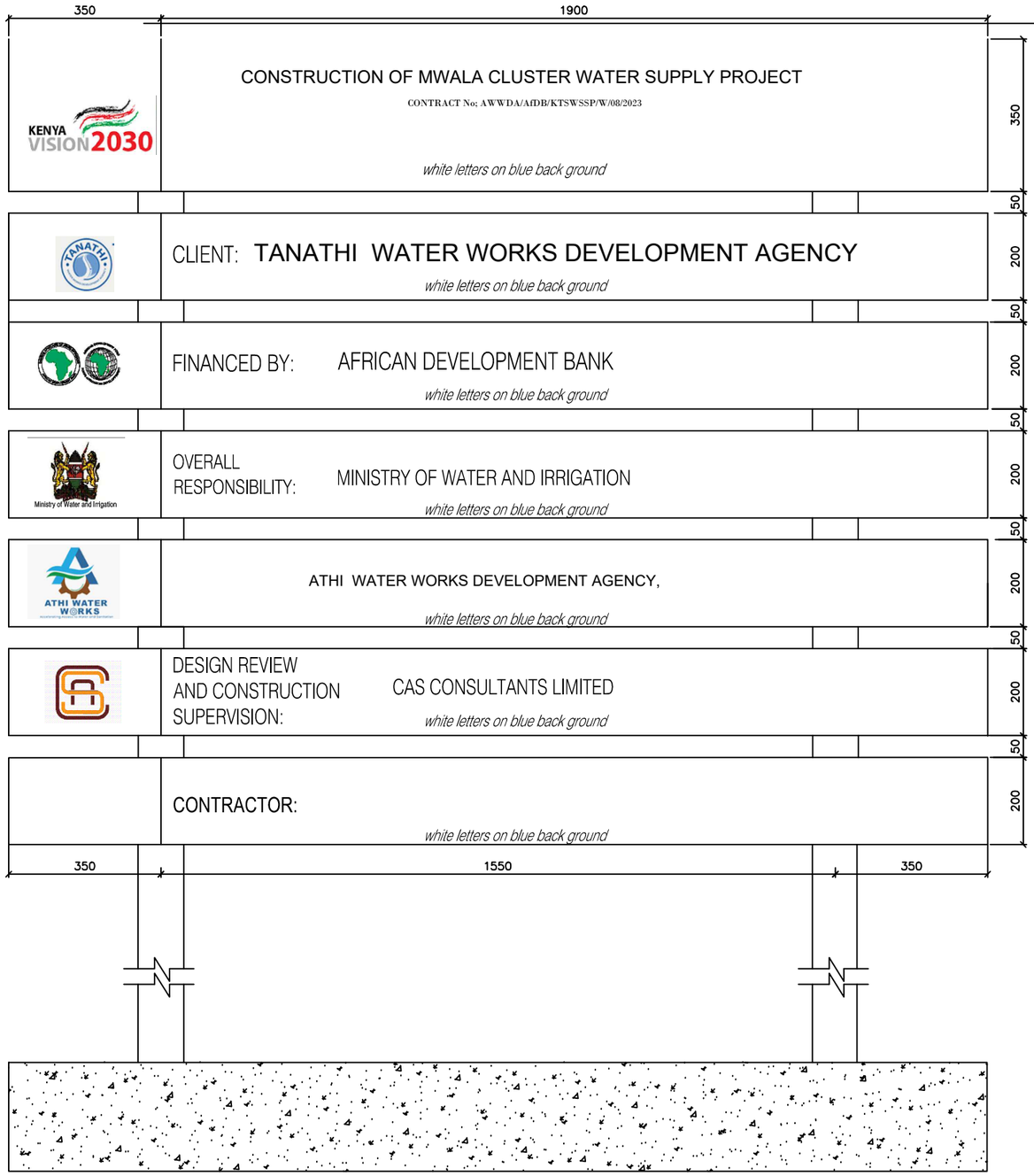
Reviewed By

CAS CONSULTANTS LIMITED
Le´Mac Building,1st FL,Off Church Road, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

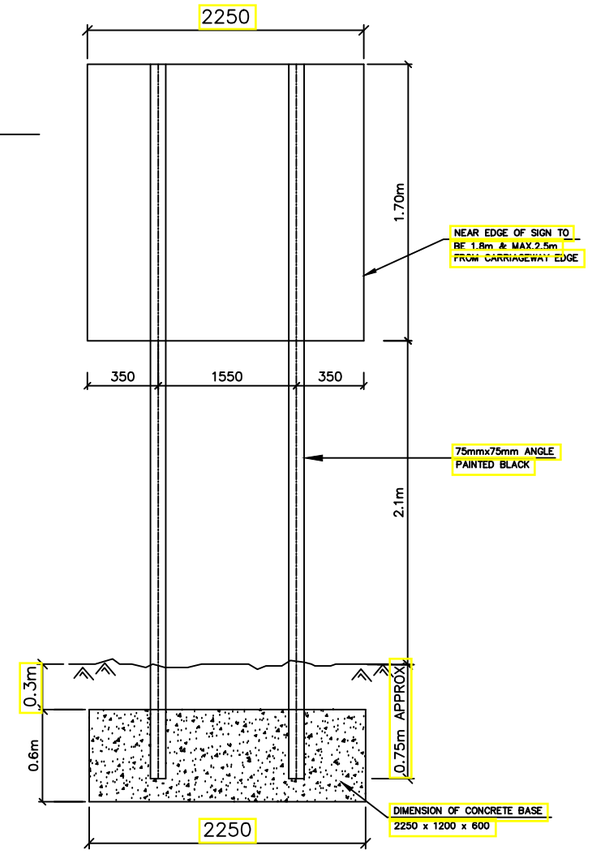
Drawing Title

DOORS AND WINDOW DETAILS

Designed By	: LK
Drawn By	: D.G.M
Checked By	: W.K
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/SD/024



PROJECT SIGN BOARD



SIGN BOARD INSTALLATION DETAILS

NOT TO SCALE

NOTES:

1. ALL DIMENSIONS IN MILLIMETER
2. HEIGHTS OF LETTERS 70mm, 50mm AND 35mm
3. SIGNBOARD PANELS ARE TIMBER HARDWOOD PANELS
4. BACKGROUND COLOUR TO BE BLUE UNLESS INSTRUCTED OTHER WISE BY THE ENGINEER

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client
ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

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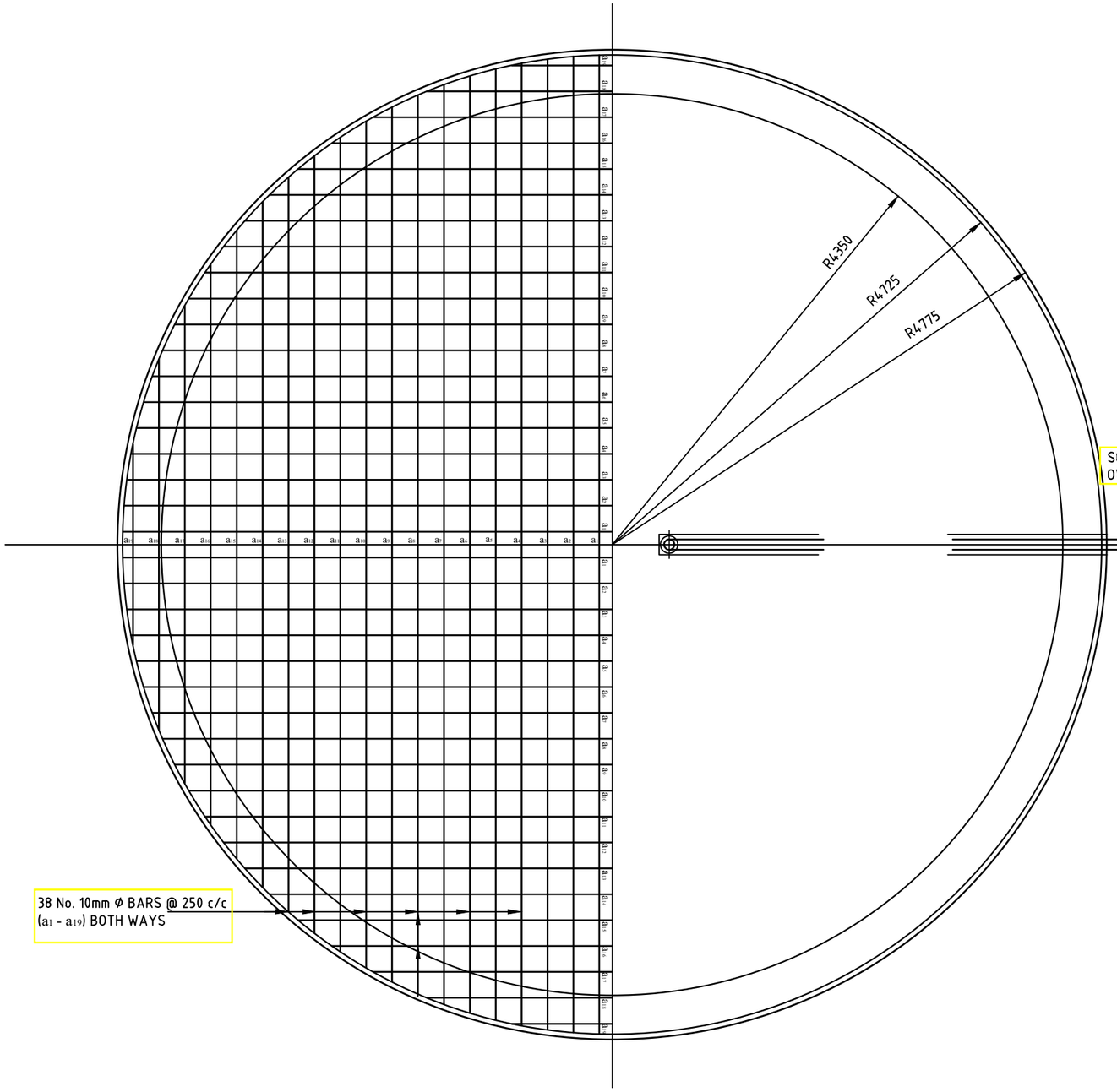
AFRICAN DEVELOPMENT BANK

Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT
CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By
CAS CONSULTANTS LIMITED
Le´Mac Building,1st FL,Off Church Road, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

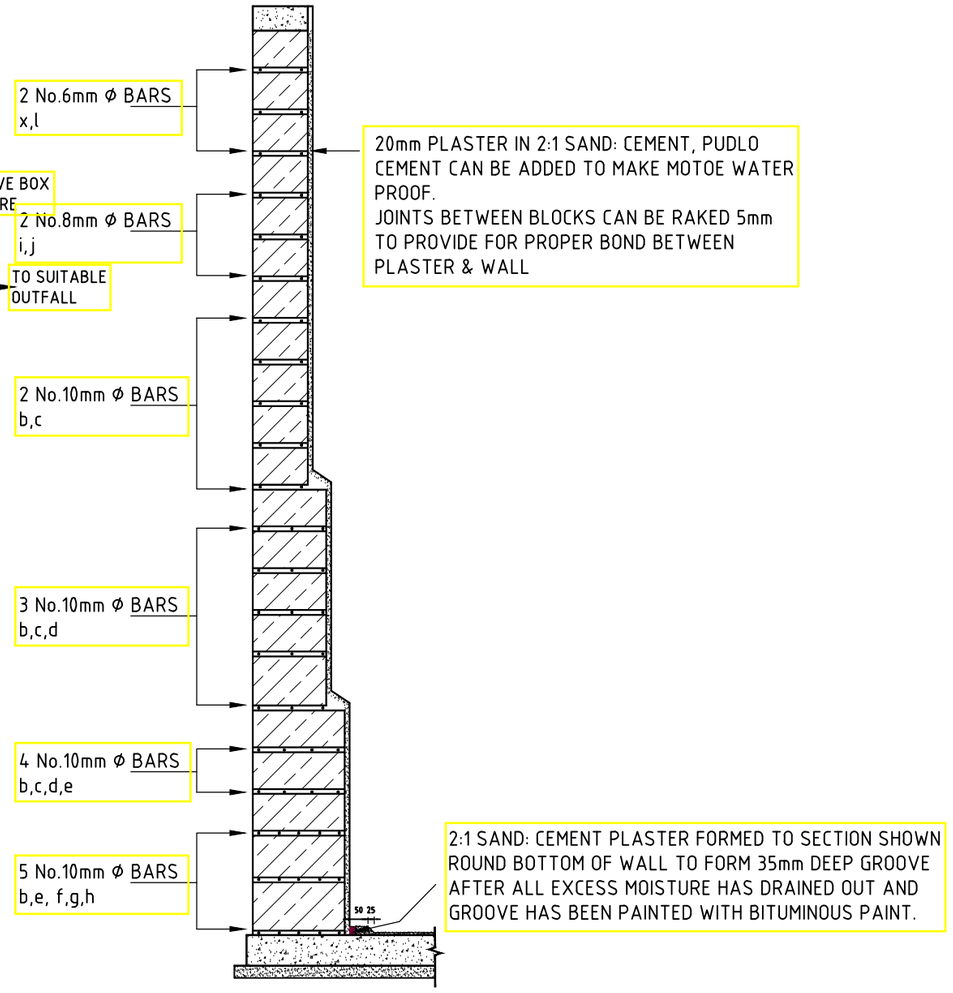
Drawing Title
PROJECT SIGN BOARD

Designed By	: LK
Drawn By	: D.G.M
Checked By	: W.K
Approved By	: S.M.M
Client approval	:
Date	: March 2023
Drawing No	: AWSB/MC/SD/025



HALF FLOOR PLAN

SCALE 1:50



SECTION THRO' WALL

SCALE 1:25

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	May 2018
2.				
3.				
4.				

Client:

ATHI WATER WORKS DEVELOPMENT AGENCY ,
MUTHAIGA, NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:

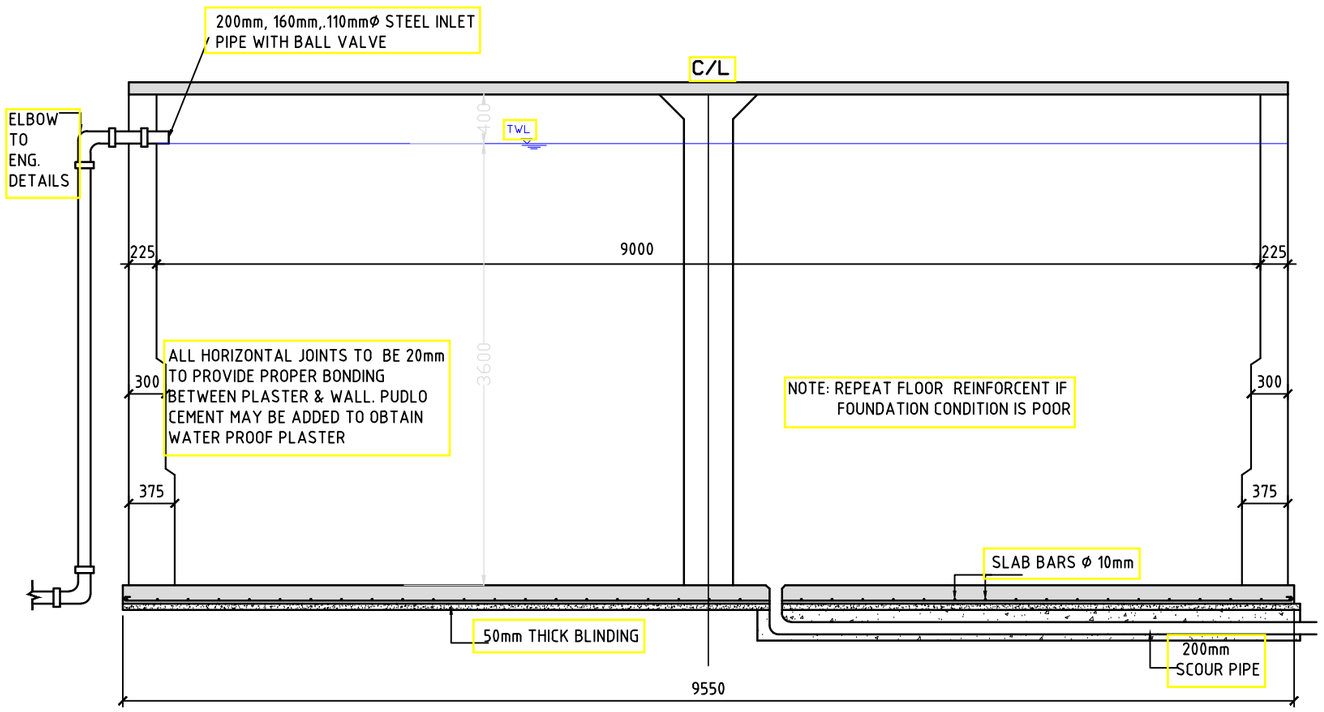
CAS CONSULTANTS LIMITED
Le' Mac Building, 1st Fl, Off Church Rd, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title:

225M³ MASONRY STORAGE TANK

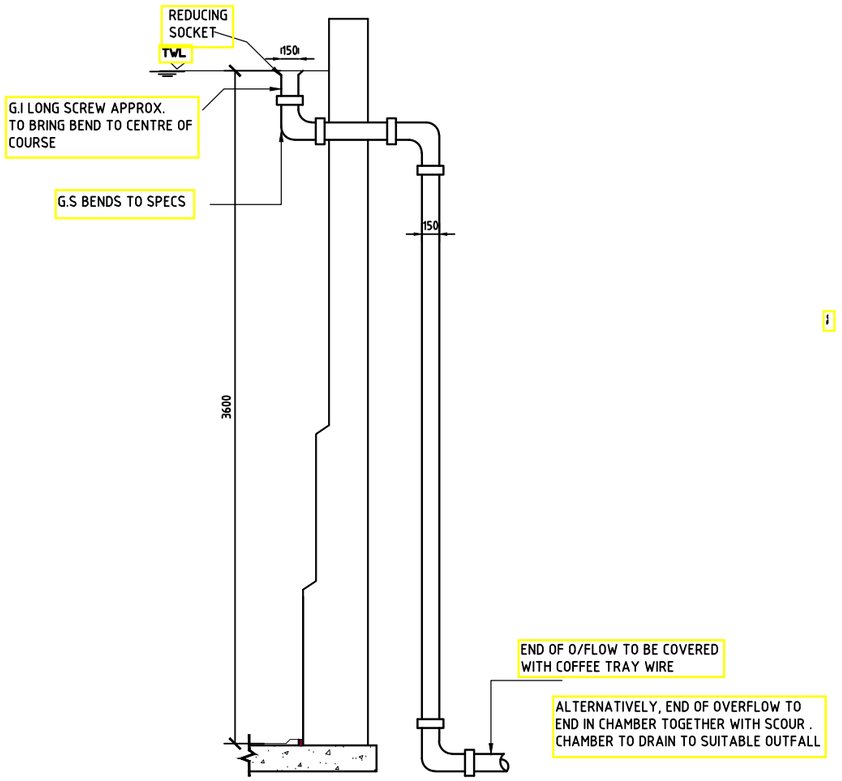
HALF FLOOR PLAN AND SECTION

Designed By	:	L.K
Drawn By	:	R.W
Checked By	:	G.I
Approved By	:	S.M.M
Client approval	:	
Date	:	MARCH 2023
Drawing No	:	AWSB/MC/MST/001



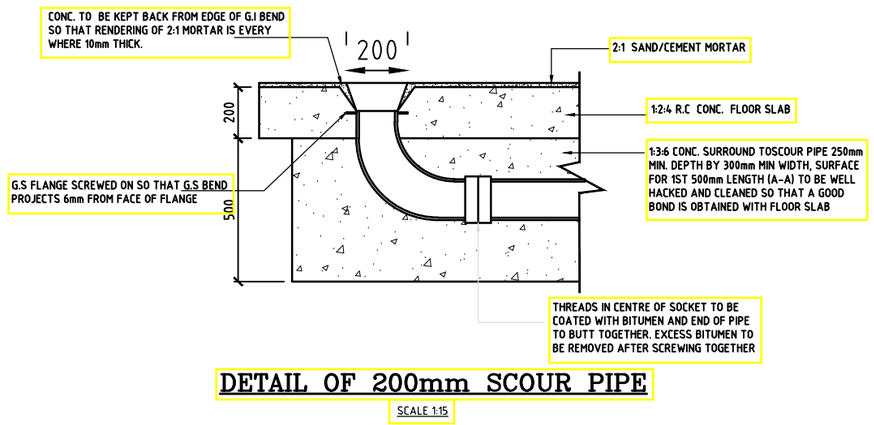
SECTION THRO' TANK ON CENTRE LINE

SCALE 1:50



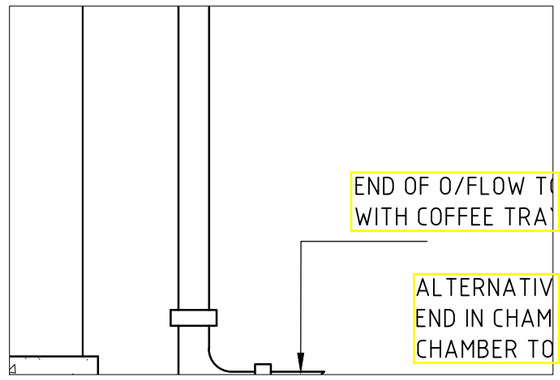
OVERFLOW DETAIL

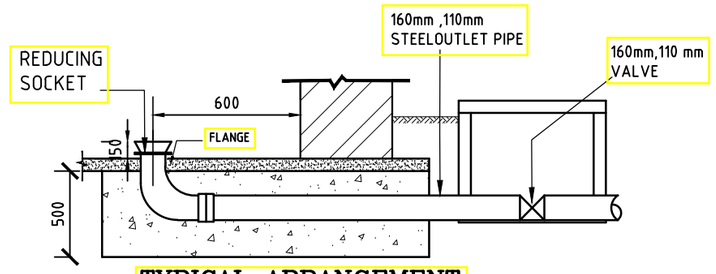
SCALE 1:30



DETAIL OF 200mm SCOUR PIPE

SCALE 1:15





TYPICAL ARRANGEMENT OF AN OUTLET

SCALE 1:25

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	MAY 2018
2.				
3.				
4.				

Client:

ATHI WATER WORKS DEVELOPMENT AGENCY
MUTHAIGA, NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD

Financed By:

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:

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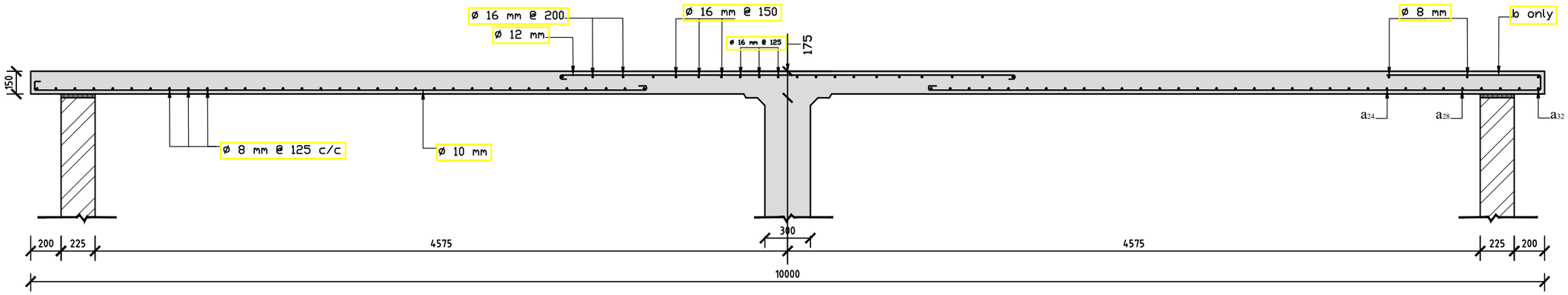
Drawing Title:

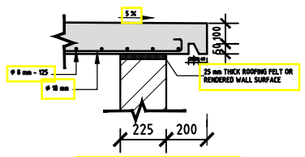
225M³ MASONRY STORAGE TANK

SECTIONS AND DETAILS

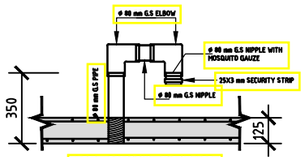
Designed By	: L.K
Drawn By	: R.W
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/MST/002



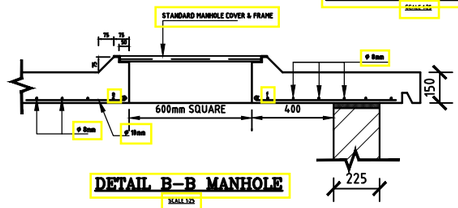
SECTION A–A



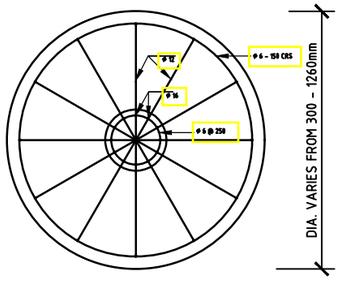
END ROOF DETAIL



AIR VENT DETAIL

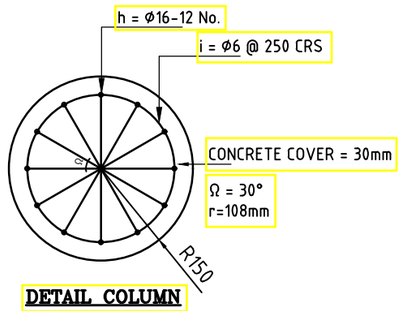


DETAIL B–B MANHOLE



SECTION C–C

NOTES:-
BOTTOM STEEL
LOOP STEEL a1 - am ø 8-125
RADIAL STEEL at R= 3000 ø 10-125
BARS b-EVERY 10"
c-b-, c-d EVERY 2"30" c-c :5"
d-c EVERY 2"30"
d-b EVERY 5", d-d 10"
TOP STEEL
LOOP STEEL t1- ta ø 16-125
t2- ta ø 16-150
t3- ta ø 16-200
RADIAL STEEL ø 12- u EVERY 20"
v EVERY 10"
w EVERY 20"
u-v EVERY 5"
u-w EVERY 10"
MIDDLE RING ø16 WITH 18 BARS ø12 AS INDICATED ON IT (SEE DETAIL)



DETAIL COLUMN

SCALE 1:10

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	May2018
2.				
3.				
4.				

Client:

ATHI WATER WORKS DEVELOPMENT AGENCY ,
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Executing Agency:

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K.I.D.P BUILDING, ALONG KALAWA ROAD

Financed By:

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

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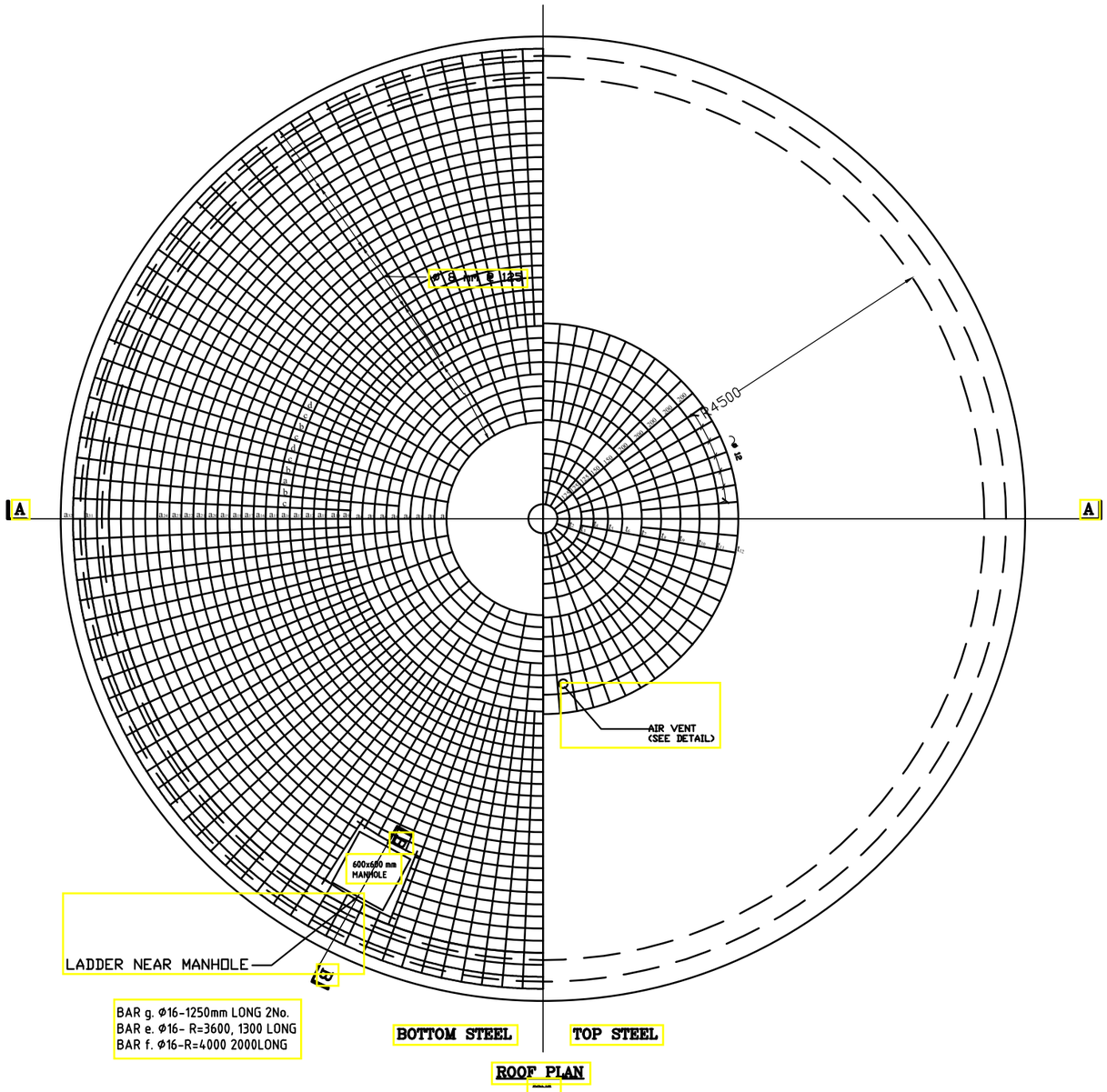
Drawing Title:

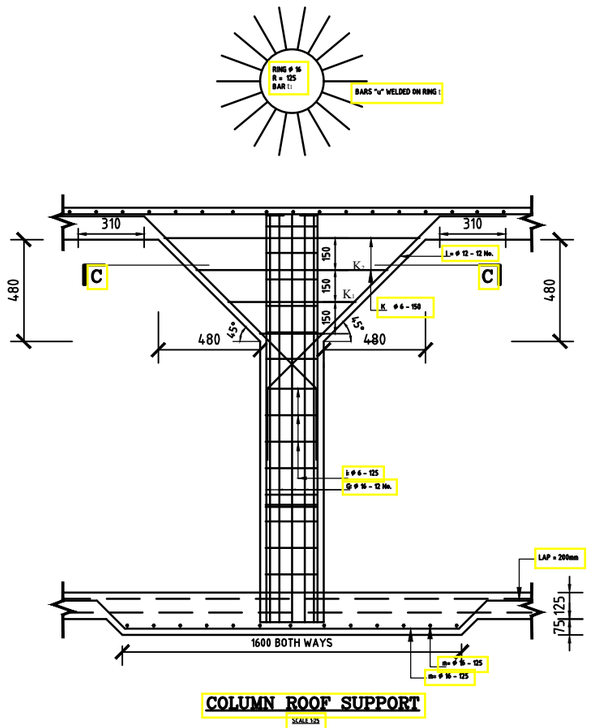
225M³ MASONRY STORAGE TANK

SECTIONS AND DETAILS

Designed By	: L.K
Drawn By	: R.W
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/MST/003



ROOF PLAN



COLUMN ROOF SUPPORT

SCALE 1:25

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1.		W.K	S.M.M	MAY 2018
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P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title:

225M³ MASONRY STORAGE TANK

ROOF PLAN AND COLUMN ROOF SUPPORT

Designed By	:	L.K
Drawn By	:	E.O
Checked By	:	G.I
Approved By	:	S.M.M
Client approval	:	
Date	:	MARCH 2023
Drawing No	:	AWSB/MC/MST/004

BAR BENDING SCHEDULE

DESTINATION	BAR MARK	TOTAL No.	BAR DIA. mm	LENGTH PER BAR (mm)	TOTAL LENGTH PER BAR MARK (mm) Φ 6	Φ 8	Φ 10	Φ 12	Φ 16	BENDING
BOTTOM RADIAL	b	37	10	5100			183.60			1000 / 4000 STRAIGHT
	c	60	10	3400			122.40			"
	d	72	10	2800			201.60			"
TOP RADIAL	u	18	16	1900				34.20		
	v	36	16	1000				36.00		
	w	18	16	1700				30.60		
BOTTOM LOOP	a1	32	8	6,283						a: R1= 1000, R2= 1125, R32=4875 per lap 200mm
	a32			7,069						
				30,630		681.90				
NOTE: a24,a28,a32 2No. each										
TOP LOOP	t1	12	16	785					73,95	R1= 125, R2= 250, R4= 500, R5= 650, R6= 800, R7= 1000, R12= 2000 per lap 400mm
	.			.						
	.			.						
	t12			12,567						
at MANHOLE	e	1	8	1700		1,70				e- R= 3600, f- R= 4500, g: STRAIGHT
	f	1	8	2000		2,00	4,00			
	g	2	10	2000						
COLUMN	b	12	16	4,450					53,40	250, 4175, 25
	i	16	6	800	12,80					
COLUMN TOP	k	3	6	2060						l: R = 120, R=280, R=450, R=590, laps = 300mm, 120, 300, 1150, 300
				3130						
				4010	9,20					
	l	12	12	1750			21.00			
COLUMN BOTTOM	m	26	16	2350					61,10	200, 200, 1550, 200, 200
TOTAL LENGTH					2200	683,60	511,60	121,80	186,45	(IN METERS)
TOTAL WEIGHT					5kg	271kg	316kg	109kg	298kg	TOTAL 999 kg - 1.0 TON

COMPONENT	No.	BAR MARK	No.	BAR DIA.	UNBENT LENGTH	BENDING	REMARKS
FLOOR SLAB	1	a1	4	10	2250	STRAIGHT	
		a2	4		3750		
		a3	4		4725		
		a4	4		5475		
		a5	4		6150		
		a6	4		6750		
		a7	4		7125		
		a8	4		7500		
		a9	4		7875		
		a10	4		8175		
		a11	4		8475		
		a12	4		8750		
		a13	4		8900		
		a14	4		9075		
		a15	4		9225		
		a16	4		9300		
		a17	4		9400		
		a18	4		9500		
		a19	4		9525		
WALL		b	15	10	3100	BENT TO INT. RADIUS OF 4690 2 LENGTHS 1150 1 LENGTH 8200 WITH 3 LAPS OF 600 EACH (NET LENGTH OF BAR 29200)	CIRCUMFERENCIAL BARS
		c	14	10	30550	BENT TO INT. RADIUS OF 4775 2 LENGTHS 10500 1 LENGTH 7750 WITH 3 LAPS OF 600 EACH (NET LENGTH OF BAR 28750)	
		d	9	10	29976	BENT TO INT. RADIUS OF 4500 2 LENGTHS 1 LENGTH 7175 WITH 3 LAPS OF 600 EACH (NET LENGTH OF 1 BAR 28175)	
		e	4	10	30675	BENT TO INT. RADIUS OF 4425 2 LENGTHS 11500 1 LENGTH 6675 WITH 3 LAPS OF 600 EACH (NET LENGTH OF 1 BAR 27675)	
		f	2	10	30275	BENT TO INT. RADIUS OF 4610 2 LENGTHS 11500 1 LENGTH 7875 WITH 3 LAPS OF 600 EACH (NET LENGTH OF 1 BAR 29075)	
		g	2	10	29800	BENT TO INT. RADIUS OF 4537 2 LENGTHS 11500 1 LENGTH 7475 WITH 3 LAPS OF 600 EACH (NET LENGTH OF 1 BAR 28475)	
		h	2	10	30250	BENT TO INT. RADIUS OF 4460 2 LENGTHS 11500 1 LENGTH 7000 WITH 3 LAPS OF 600 EACH (NET LENGTH OF 1 BAR 28300)	
		i	3	8	30250	BENT TO INT. RADIUS OF 4665 2 LENGTHS 11500 1 LENGTH 8200 WITH 3 LAPS OF 450 EACH (NET LENGTH OF 1 BAR 29200)	
		j	3	8	30250	BENT TO INT. RADIUS OF 4575 2 LENGTHS 11500 1 LENGTH 7750 WITH 3 LAPS OF 450 EACH (NET LENGTH OF 1 BAR 28750)	
		x	3	8	30400	BENT TO INT. RADIUS OF 4665 2 LENGTHS 11500 1 LENGTH 6400 WITH 3 LAPS OF 400 EACH (NET LENGTH OF 1 BAR 28200)	
		l	3	8	29950	BENT TO INT. RADIUS OF 4575 2 LENGTHS 11500 1 LENGTH 7750 WITH 3 LAPS OF 400 EACH (NET LENGTH OF 1 BAR 28750)	

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	MAY 2018
2.				
3.				
4.				

Client:
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Executing Agency:
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K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:
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Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT
CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

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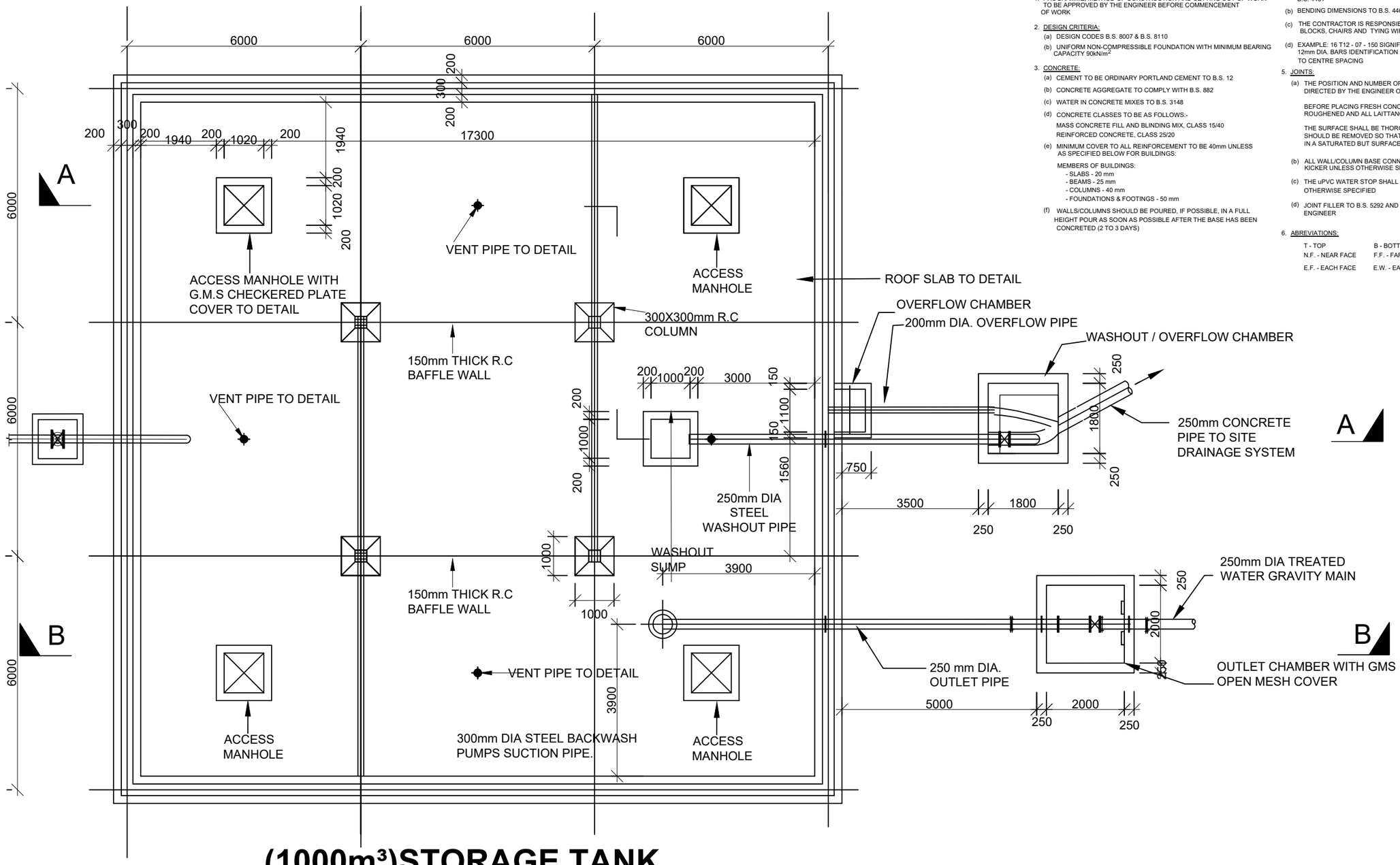
Drawing Title:
225M³ MASONRY STORAGE TANK
BAR BENDING SCHEDULE

Designed By	: L.K
Drawn By	: E.O
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/MST/005



NOTES:

1. PROGRAMME, METHOD OF CONSTRUCTION AND SETTING OUT OF WORK TO BE APPROVED BY THE ENGINEER BEFORE COMMENCEMENT OF WORK
2. DESIGN CRITERIA:
   (a) DESIGN CODES B.S. 8007 & B.S. 8110
   (b) UNIFORM NON-COMPRESSIBLE FOUNDATION WITH MINIMUM BEARING CAPACITY 90kN/m^2
3. CONCRETE:
   (a) CEMENT TO BE ORDINARY PORTLAND CEMENT TO B.S. 12
   (b) CONCRETE AGGREGATE TO COMPLY WITH B.S. 882
   (c) WATER IN CONCRETE MIXES TO B.S. 3148
   (d) CONCRETE CLASSES TO BE AS FOLLOWS:-
   MASS CONCRETE FILL AND BLINDING MIX, CLASS 15/40
   REINFORCED CONCRETE, CLASS 25/20
   (e) MINIMUM COVER TO ALL REINFORCEMENT TO BE 40mm UNLESS AS SPECIFIED BELOW FOR BUILDINGS:
   MEMBERS OF BUILDINGS:
   - SLABS - 20 mm
   - BEAMS - 25 mm
   - COLUMNS - 40 mm
   - FOUNDATIONS & FOOTINGS - 50 mm
   (f) WALLS/COLUMNS SHOULD BE POURED, IF POSSIBLE, IN A FULL HEIGHT POUR AS SOON AS POSSIBLE AFTER THE BASE HAS BEEN CONCRETED (2 TO 3 DAYS)
4. REINFORCEMENT:
   (a) REINFORCEMENT TO BE HIGH YIELD SQUARE TWISTED BARS TO B.S. 4461
   (b) BENDING DIMENSIONS TO B.S. 4466
   (c) THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL SPACER BLOCKS, CHAIRS AND TYING WIRE
   (d) EXAMPLE: 16 T12 - 07 - 150 SIGNIFIES 16 No. HIGH TENSILE 12mm DIA. BARS IDENTIFICATION MARK 07 AT 150mm CENTRE TO CENTRE SPACING
5. JOINTS:
   (a) THE POSITION AND NUMBER OF INTERMEDIATE JOINTS TO BE AS DIRECTED BY THE ENGINEER OR AS SHOWN IN THE DRAWINGS.
   BEFORE PLACING FRESH CONCRETE THE OLD SURFACE SHALL BE ROUGHENED AND ALL LAITTANCE AND LOOSE MATERIAL REMOVED
   THE SURFACE SHALL BE THOROUGHLY WETTED BUT EXCESS WATER SHOULD BE REMOVED SO THAT THE CONSTRUCTION JOINTS ARE IN A SATURATED BUT SURFACE DRY CONDITION
   (b) ALL WALL/COLUMN BASE CONNECTIONS SHOULD HAVE 100mm KICKER UNLESS OTHERWISE SPECIFIED
   (c) THE uPVC WATER STOP SHALL BE 200mm WIDE UNLESS OTHERWISE SPECIFIED
   (d) JOINT FILLER TO B.S. 5292 AND TO BE APPROVED BY THE ENGINEER
6. ABREVIATIONS:

T - TOP	B - BOTTOM
N.F. - NEAR FACE	F.F. - FAR FACE
E.F. - EACH FACE	E.W. - EACH WAY

(1000m³)STORAGE TANK
ROOF PLAN

SCALE 1:100

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	May 2018
2.				
3.				
4.				

Client:
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K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:
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CONTRACT No;
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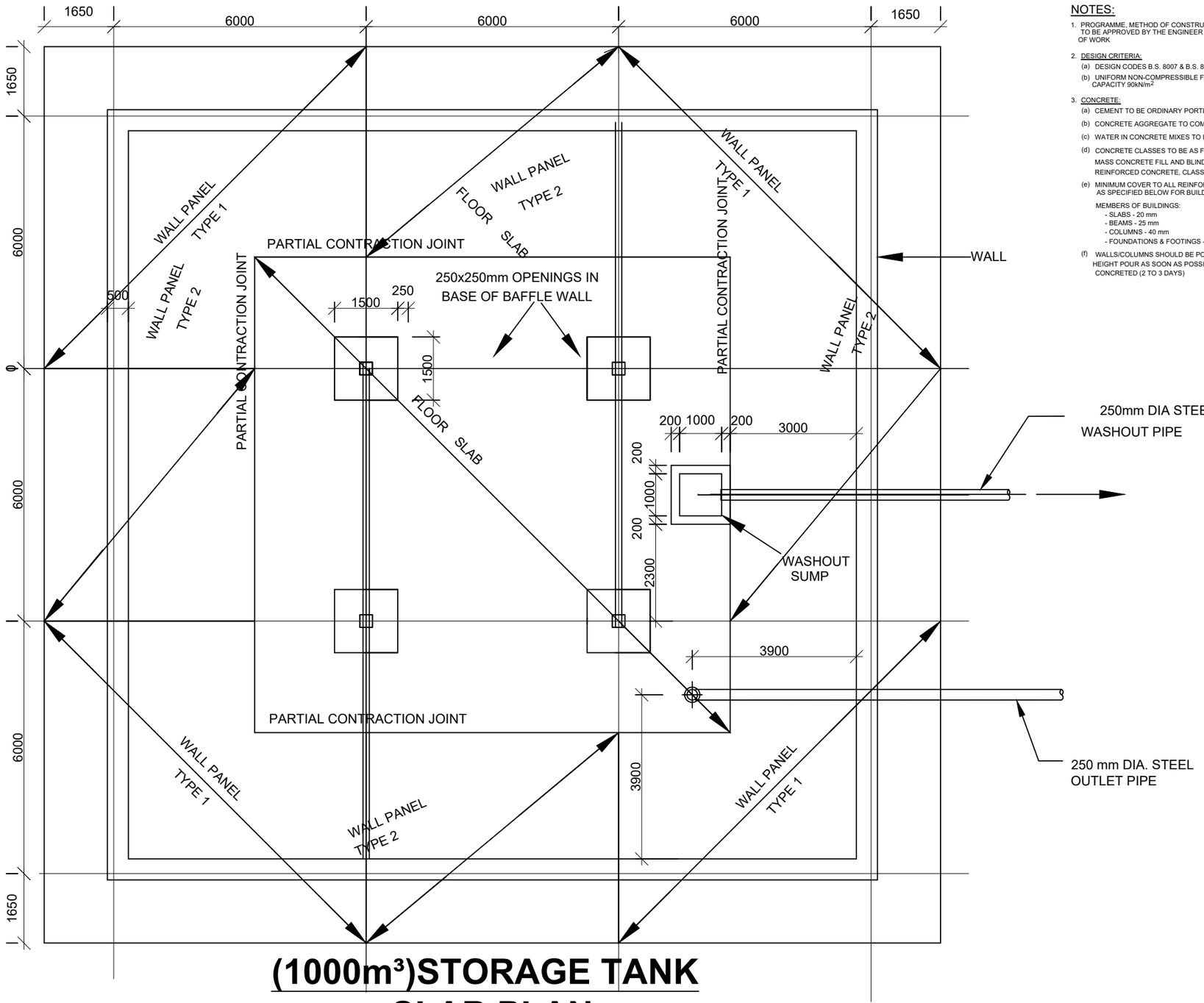
Drawing Title:
MUTHEI HILL
1000M³ WATER TANK
ROOF PLAN

Designed By	: L.K
Drawn By	: R.W
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/MHT/001



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   (c) WATER IN CONCRETE MIXES TO B.S. 3148
   (d) CONCRETE CLASSES TO BE AS FOLLOWS:-
   MASS CONCRETE FILL AND BLINDING MIX, CLASS 15/40
   REINFORCED CONCRETE, CLASS 25/20
   (e) MINIMUM COVER TO ALL REINFORCEMENT TO BE 40mm UNLESS AS SPECIFIED BELOW FOR BUILDINGS:
   MEMBERS OF BUILDINGS:
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   (b) ALL WALL/COLUMN BASE CONNECTIONS SHOULD HAVE 100mm KICKER UNLESS OTHERWISE SPECIFIED
   (c) THE uPVC WATER STOP SHALL BE 200mm WIDE UNLESS OTHERWISE SPECIFIED
   (d) JOINT FILLER TO B.S. 5292 AND TO BE APPROVED BY THE ENGINEER
6. ABREVIATIONS:

T - TOP	B - BOTTOM
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E.F. - EACH FACE	E.W. - EACH WAY

(1000m³)STORAGE TANK
SLAB PLAN

SCALE 1:100

No	Revisions	Checked By	Approved By	Date
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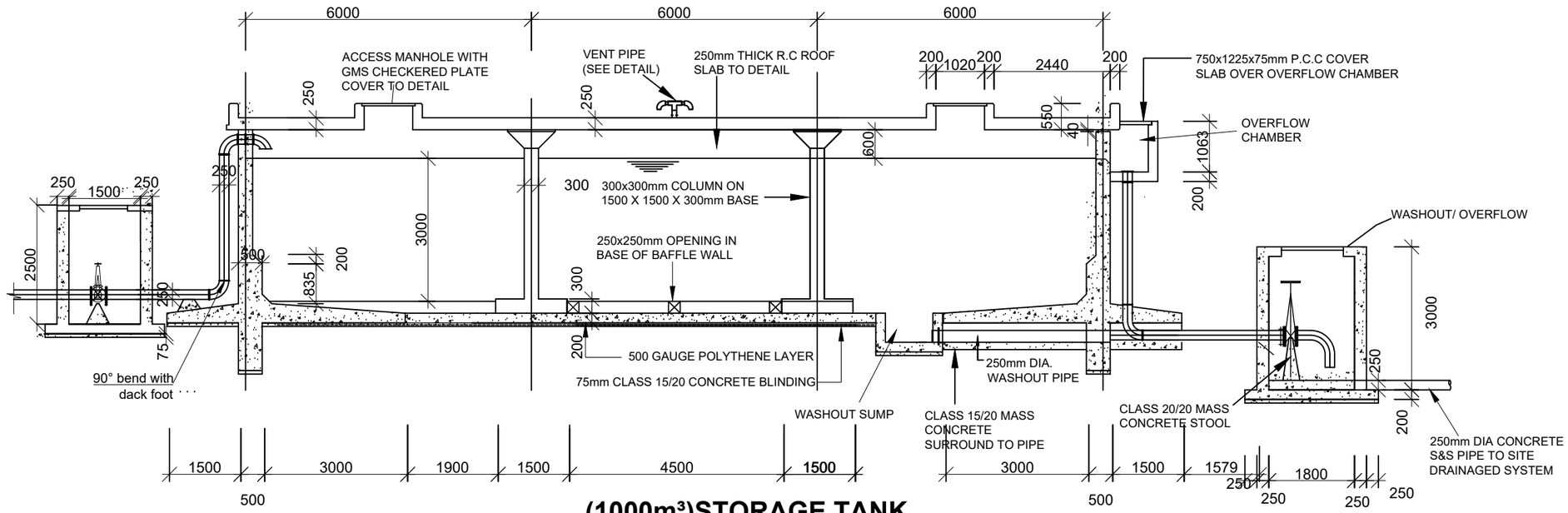
CAS CONSULTANTS LIMITED
Le' Mac Building, 1st Fl, Off Church Rd, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

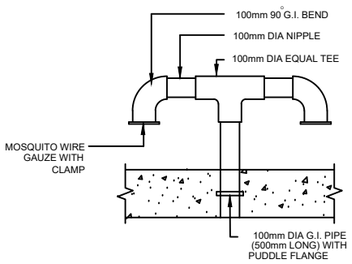
Drawing Title:
MUTHEI HILL
1000M³ WATER TANK
SLAB PLAN

Designed By	: L.K
Drawn By	: R.W
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/MHT/002



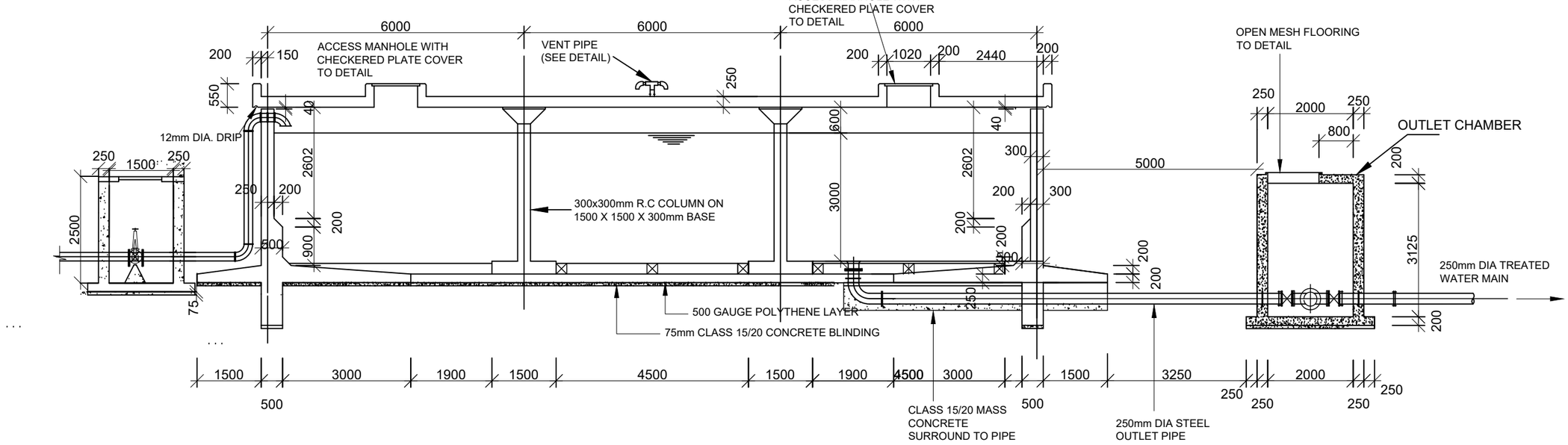
(1000m³)STORAGE TANK SECTION A-A

SCALE 1:100



VENT PIPE DETAIL

SCALE 1:30



(1000m³)STORAGE TANK SECTION B-B

SCALE 1:100

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	May 2018
2.				
3.				
4.				

Client:
ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

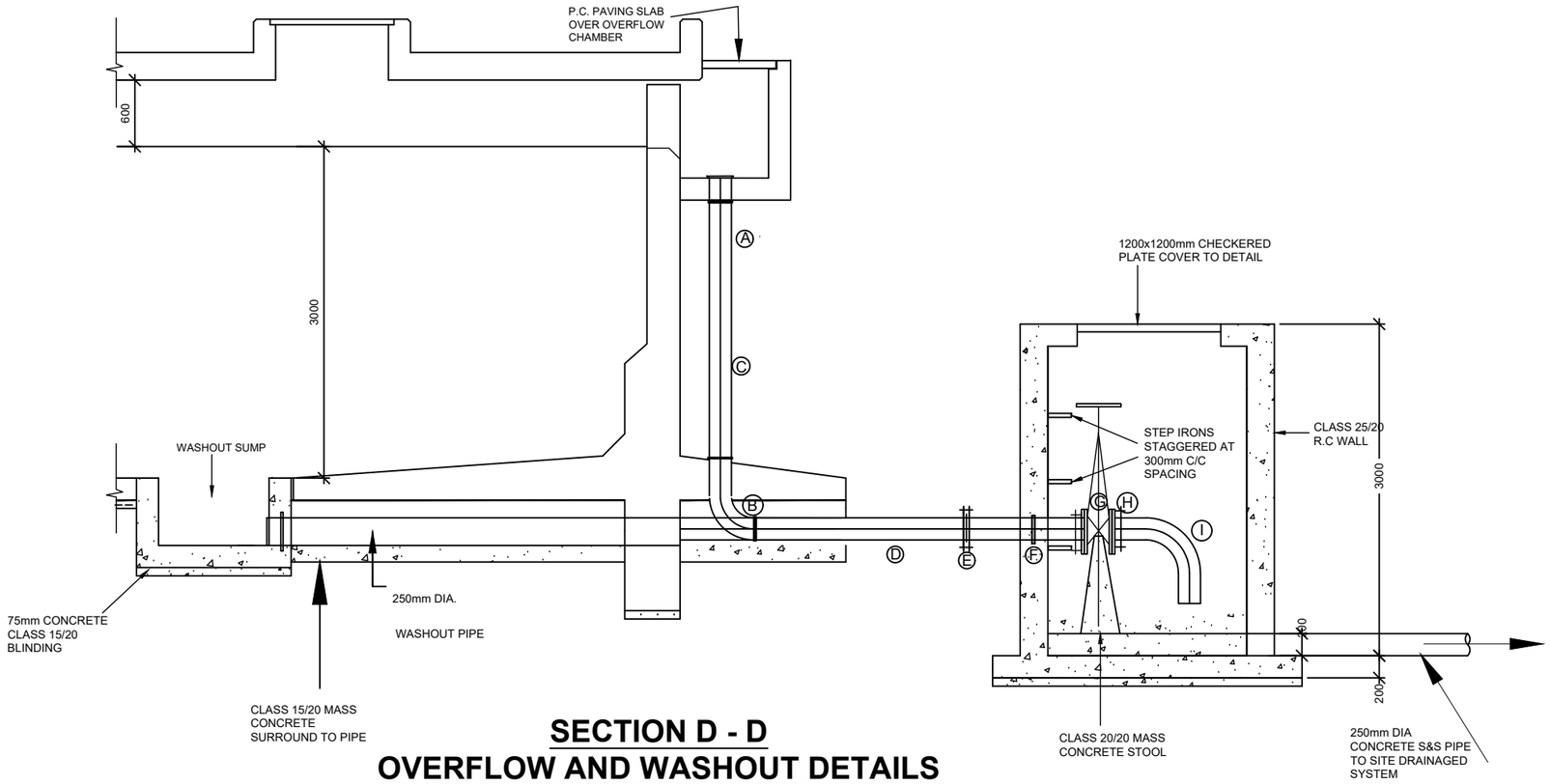
Financed By:
AFRICAN DEVELOPMENT BANK

Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT
CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:
CAS CONSULTANTS LIMITED
Le' Mac Building, 1st Fl, Off Church Rd, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

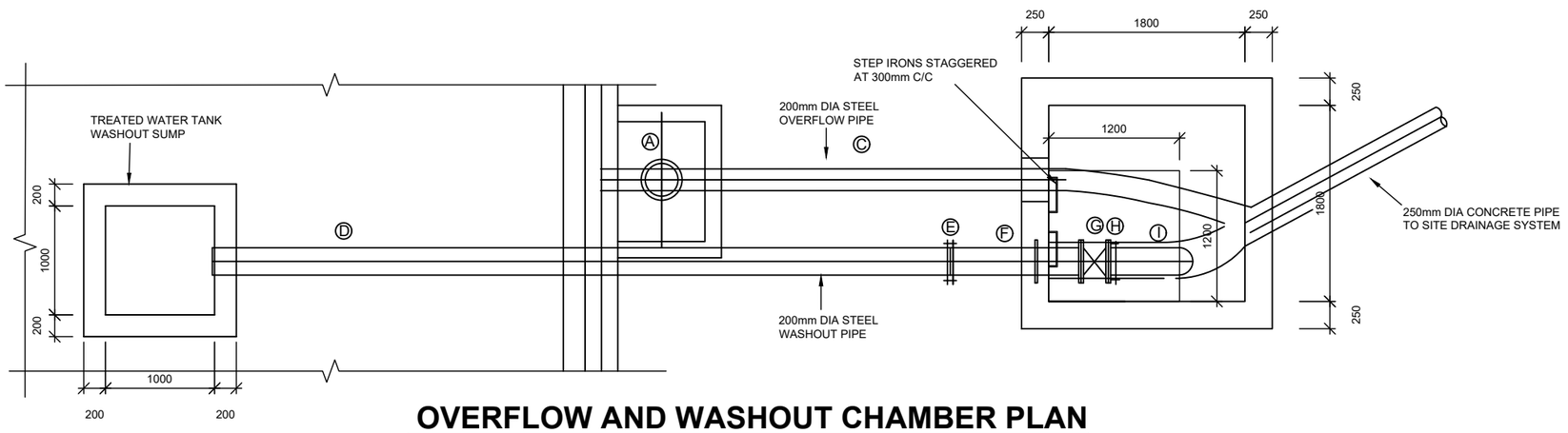
Drawing Title:
MUTHEI HILL
1000M³ WATER TANK
SECTIONS A-A,B-B
&
VENT PIPE DETAIL

Designed By	: L.K
Drawn By	: R.W
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/MHT/003



SECTION D - D
OVERFLOW AND WASHOUT DETAILS

SCALE 1:50



OVERFLOW AND WASHOUT CHAMBER PLAN

SCALE 1:50

NOTES:

1. PROGRAMME, METHOD OF CONSTRUCTION AND SETTING OUT OF WORK TO BE APPROVED BY THE ENGINEER BEFORE COMMENCEMENT OF WORK
2. DESIGN CRITERIA:
   (a) DESIGN CODES B.S. 8007 & B.S. 8110
   (b) UNIFORM NON-COMPRESSIBLE FOUNDATION WITH MINIMUM BEARING CAPACITY 90kN/m^2
3. CONCRETE:
   (a) CEMENT TO BE ORDINARY PORTLAND CEMENT TO B.S. 12
   (b) CONCRETE AGGREGATE TO COMPLY WITH B.S. 882
   (c) WATER IN CONCRETE MIXES TO B.S. 3148
   (d) CONCRETE CLASSES TO BE AS FOLLOWS:-
   MASS CONCRETE FILL AND BLINDING MIX, CLASS 15/40
   REINFORCED CONCRETE, CLASS 25/20
   (e) MINIMUM COVER TO ALL REINFORCEMENT TO BE 40mm UNLESS AS SPECIFIED BELOW FOR BUILDINGS:
   MEMBERS OF BUILDINGS:
   - SLABS - 20 mm
   - BEAMS - 25 mm
   - COLUMNS - 40 mm
   - FOUNDATIONS & FOOTINGS - 50 mm
   (f) WALLS/COLUMNS SHOULD BE POURED, IF POSSIBLE, IN A FULL HEIGHT POUR AS SOON AS POSSIBLE AFTER THE BASE HAS BEEN CONCRETED (2 TO 3 DAYS)
4. REINFORCEMENT:
   (a) REINFORCEMENT TO BE HIGH YIELD SQUARE TWISTED BARS TO B.S. 4461
   (b) BENDING DIMENSIONS TO B.S. 4466
   (c) THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL SPACER BLOCKS, CHAIRS AND TYING WIRE
   (d) EXAMPLE: 16 T12 - 07 - 150 SIGNIFIES 16 No. HIGH TENSILE 12mm DIA. BARS IDENTIFICATION MARK 07 AT 150mm CENTRE TO CENTRE SPACING
5. JOINTS:
   (a) THE POSITION AND NUMBER OF INTERMEDIATE JOINTS TO BE A DIRECTED BY THE ENGINEER OR AS SHOWN IN THE DRAWINGS
   BEFORE PLACING FRESH CONCRETE THE OLD SURFACE SHALL ROUGHENED AND ALL LAITTANCE AND LOOSE MATERIAL REMO
   THE SURFACE SHALL BE THOROUGHLY WETTED BUT EXCESS W SHOULD BE REMOVED SO THAT THE CONSTRUCTION JOINTS A IN A SATURATED BUT SURFACE DRY CONDITION
   (b) ALL WALL/COLUMN BASE CONNECTIONS SHOULD HAVE 100mm KICKER UNLESS OTHERWISE SPECIFIED
   (c) THE uPVC WATER STOP SHALL BE 200mm WIDE UNLESS OTHERWISE SPECIFIED
   (d) JOINT FILLER TO B.S. 5292 AND TO BE APPROVED BY THE ENGINEER
6. ABREVIATIONS:

T - TOP	B - BOTTOM
N.F. - NEAR FACE	F.F. - FAR FACE
E.F. - EACH FACE	E.W. - EACH WAY

OVERFLOW PIPEWORK SCHEDULE
APPROVED LINED STEEL PIPES AND FITTINGS

ITEM No.	DESCRIPTION	DIA. (mm)	LENGTH (mm)	QUANTITY (No.)
Ⓐ	FLANGED SPIGOT PIPE WITH PUDDLE FLANGE 100mm FROM SPIGOT END	250	1600	1
Ⓑ	ALL FLANGED 90° BEND	250Ø 600 600 250Ø		1
Ⓒ	FLANGED SPIGOT PIPE WITH SPIGOT END BEVELLED	250	3000	1

SCOUR PIPEWORK SCHEDULE
APPROVED LINED STEEL PIPES AND FITTINGS

ITEM No.	DESCRIPTION	DIA. (mm)	LENGTH (mm)	QUANTITY (No.)
Ⓓ	PLAIN ENDED PIPE WITH PUDDLE FLANGE AT 120mm FROM ONE END (CUT TO SUIT ON SITE)	250	7000	1
Ⓔ	COUPLING	250	-	1
Ⓕ	FLANGED SPIGOT PIPE WITH PUDDLE FLANGE AT 430mm FROM FLANGED END	250	1200	1
Ⓖ	ALL FLANGED GATE VALVE	250	-	1
Ⓗ	FLANGE ADAPTOR	250	-	1
Ⓘ	PLAIN ENDED 90° BEND	250	250Ø 350 350 250Ø	1

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	May 2018
2.				
3.				
4.				

Client:
ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:
AFRICAN DEVELOPMENT BANK

Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT
CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:
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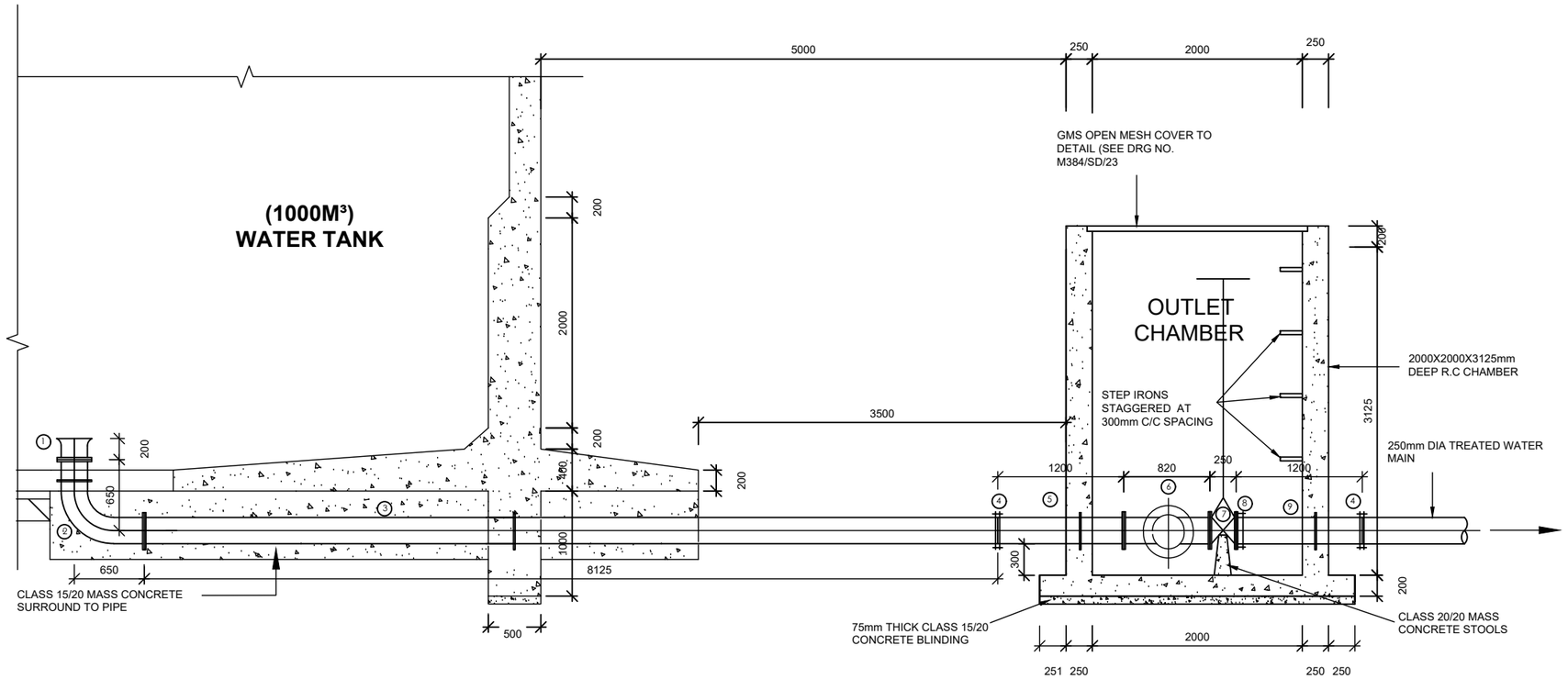
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

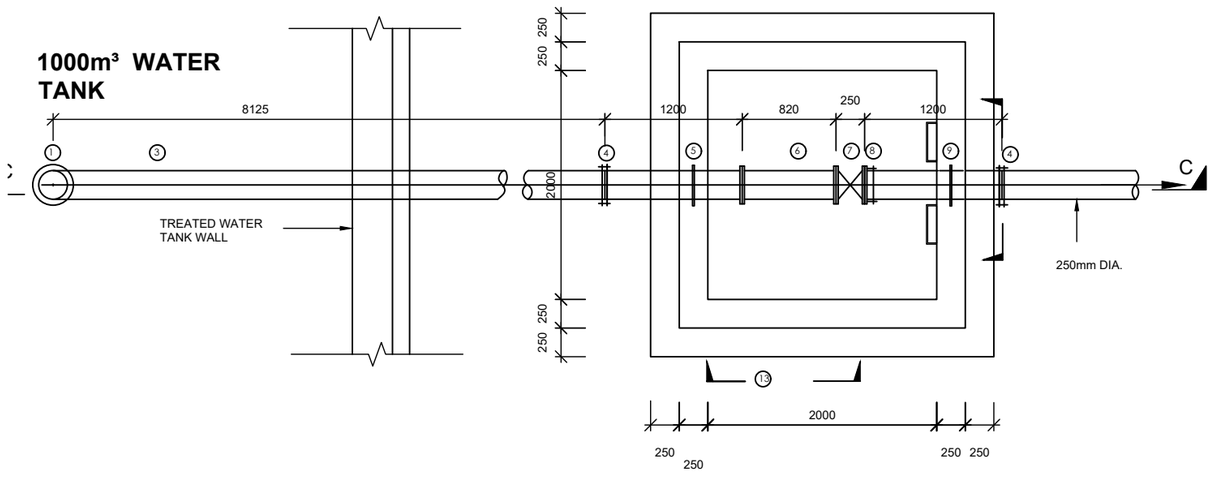
Drawing Title:
MUTHEI HILL
1000M³ WATER TANK
OVERFLOW AND WASHOUT CHAMBER PLAN

Designed By	: L.K
Drawn By	: R.W
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/MHT/004



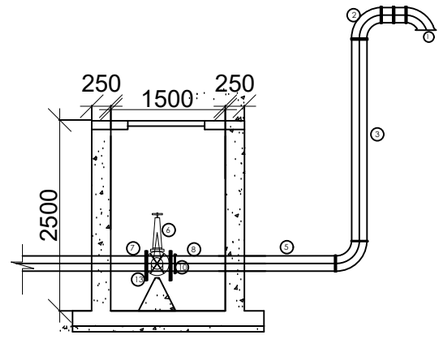
SECTION C-C

SCALE 1:75



OUTLET CHAMBER PLAN

SCALE 1:75



INLET CHAMBER PLAN

SCALE 1:75

INLET PIPEWORK SCHEDULE APPROVED LINED STEEL PIPES AND FITTINGS

ITEM No.	DESCRIPTION	DIA. (mm)	LENGTH (mm)	QUANTITY (No.)
①	FLANGED SPECIAL BELLMOUTH	250	350	1
②	ALL FLANGED 90° BEND WITH PUDDLE FLANGE 250mm FROM ONE END			1
③	STEEL FLANGED SPIGOT PIPE WITH PUDDLE FLANGE AT 2630mm FROM FLANGED END	250	8250	1
④	COUPLINGS	250	-	2
⑤	STEEL FLANGED SPIGOT PIPE WITH PUDDLE FLANGE 1450mm FROM SPIGOT END	250	1200	1
⑥	ALL FLANGED SLUICE VALVE (EURO 20 SERIES TYPE 23 OR APPROVED EQUIVALENT)	250	250	1
⑦	FLANGE ADAPTOR	250	-	1
⑧	PLAIN ENDED PIPE WITH PUDDLE FLANGE AT 720mm FROM ONE END	250	1200	1
⑨	PLAIN ENDED PIPE WITH PUDDLE FLANGE AT 450mm FROM ONE END	250	1200	1
⑩	COUPLING	250	-	1

OUTLET PIPEWORK SCHEDULE APPROVED LINED STEEL PIPES AND FITTINGS

ITEM No.	DESCRIPTION	DIA. (mm)	LENGTH (mm)	QUANTITY (No.)
①	FLANGED SPECIAL BELLMOUTH	250	250	1
②	ALL FLANGED 90° BEND WITH PUDDLE FLANGE 250mm FROM ONE END			1
③	STEEL FLANGED SPIGOT PIPE WITH PUDDLE FLANGE AT 3530mm FROM FLANGED END	250	3300	1
④	COUPLINGS	250	-	2
⑤	STEEL FLANGED SPIGOT PIPE WITH PUDDLE FLANGE 775mm FROM SPIGOT END	250	1200	1
⑥	ALL FLANGED 250mm X 250mm X 250mm TEE			0
⑦	ALL FLANGED GATE VALVE (EURO 20 SERIES TYPE 23 OR APPROVED EQUIVALENT)	250	250	1
⑧	FLANGE ADAPTOR	250	-	1
⑨	PLAIN ENDED PIPE WITH PUDDLE FLANGE AT 445mm FROM ONE END	250	445	1
⑩	ALL FLANGED GATE VALVE (EURO 20 SERIES TYPE 23 OR APPROVED EQUIVALENT)	250	-	1
⑪	FLANGE ADAPTOR	250	-	1
⑫	PLAIN ENDED PIPE WITH PUDDLE FLANGE AT 605mm FROM ONE END	250	605	1
⑬	COUPLING	250	-	1

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	May 2018
2.				
3.				
4.				

Client:
ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:
AFRICAN DEVELOPMENT BANK

Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

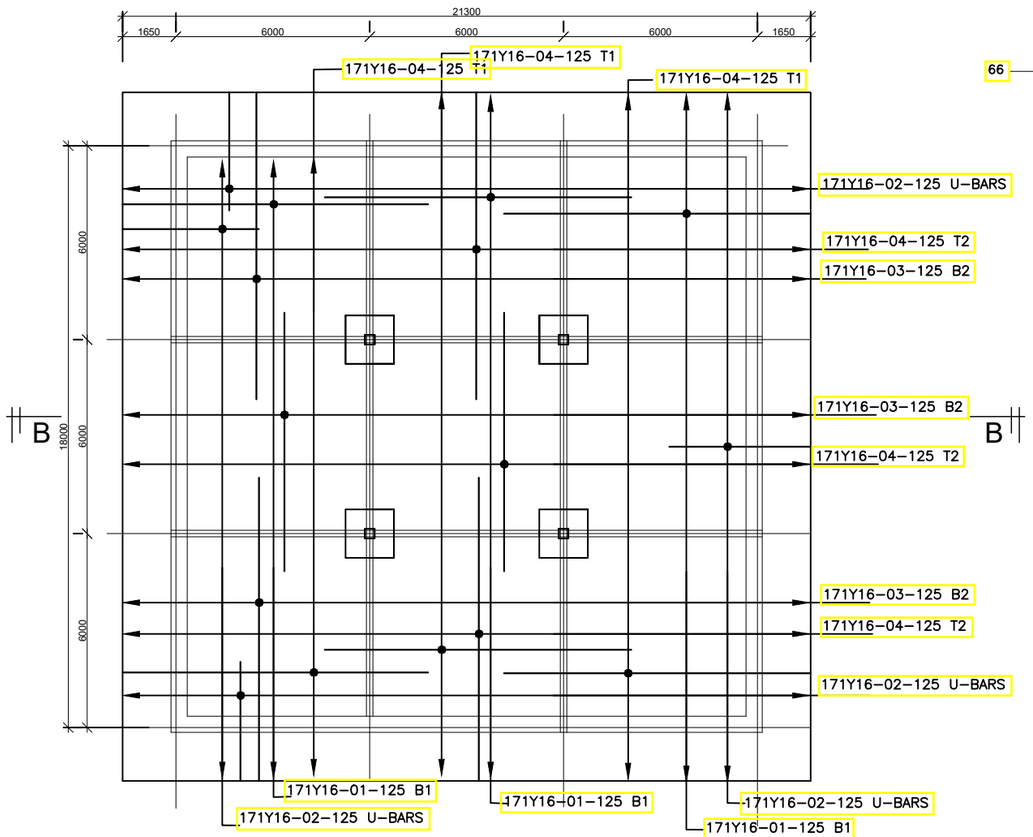
CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:
CAS CONSULTANTS LIMITED
Le' Mac Building, 1st Fl, Off Church Rd, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing title:
MUTHEI HILL
1000M³ WATER TANK

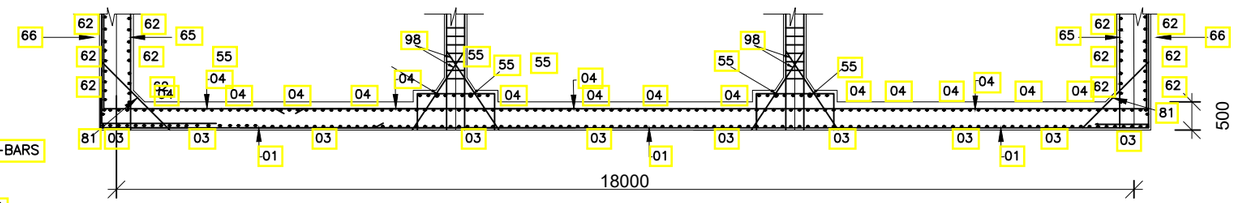
INLET, OUTLET CHAMBER PLAN AND SECTION

Designed By	: L.K
Drawn By	: R.W
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/MHT/005



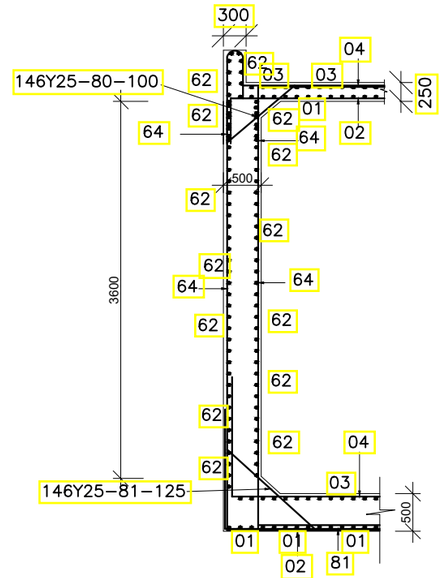
(1000m³)STORAGE TANK BOTTOM SLAB PLAN

SCALE 1:125



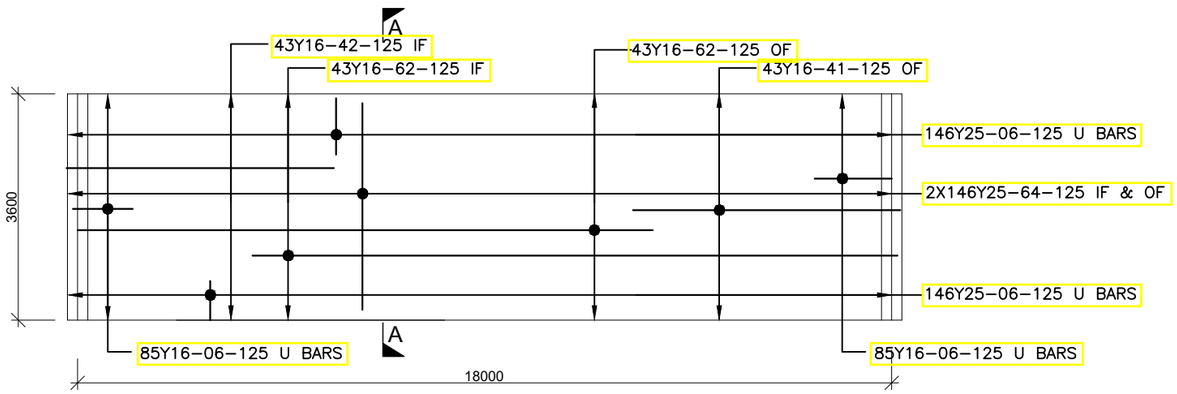
SECTION B - B

SCALE 1 :125



SECTION A-A

SCALE 1 :75



TYPICAL OUTER WALL ELEVATION

SCALE 1:100

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	May 2018
2.				
3.				
4.				

Client:

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT NO;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:

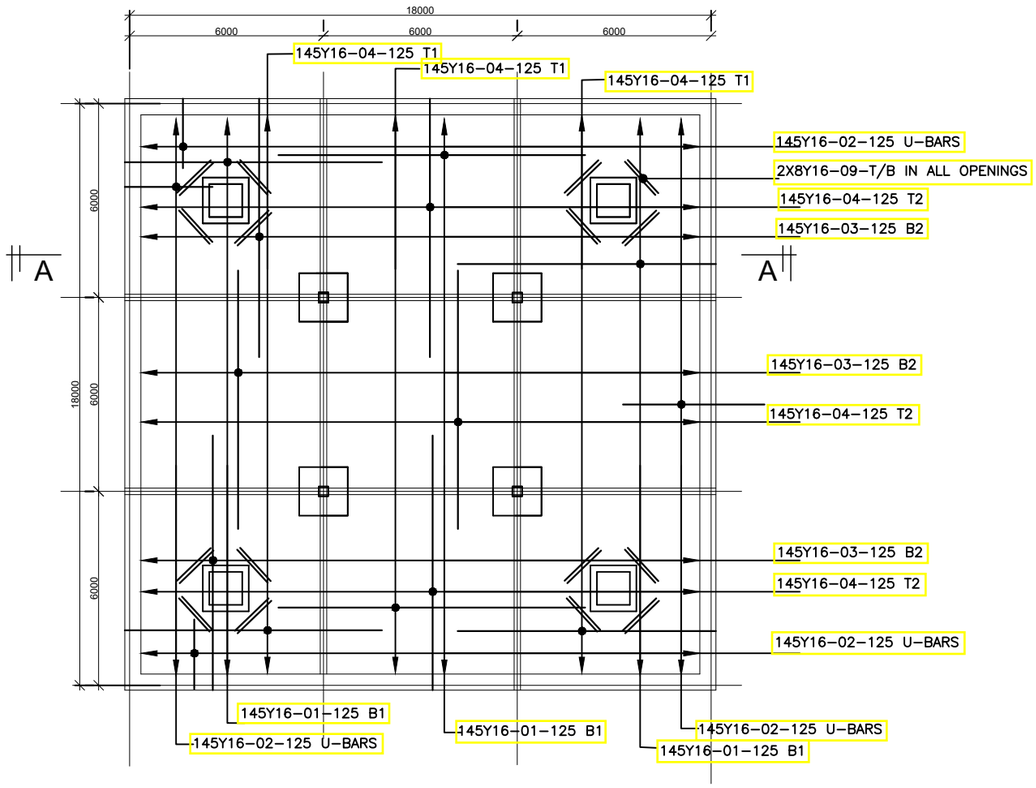
CAS CONSULTANTS LIMITED
Le' Mac Building, 1st Fl, Off Church Rd, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing title:

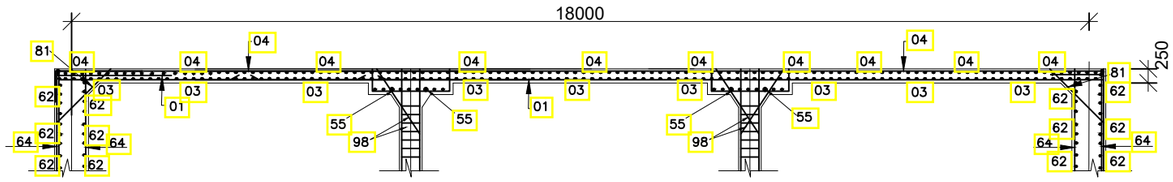
1000M3 TANK STRUCTURAL DETAILS

BOTTOM SLAB,WALL ELEVATION & SECTION

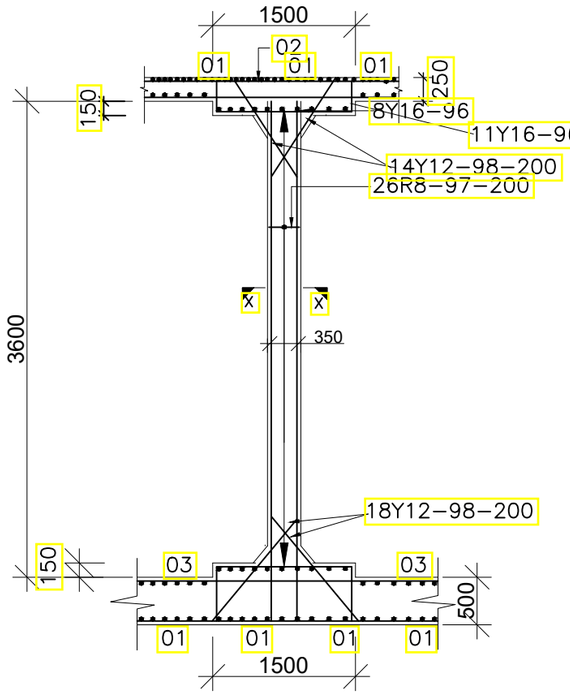
Designed By	: L.K
Drawn By	: R.W
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/CWT/006



(1000m³)STORAGE TANK
TOP SLAB PLAN
SCALE 1:125



SECTION A - A
SCALE 1 :125



TYPICAL COLUMN SECTION
SCALE 1 :75

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	May 2018
2.				
3.				
4.				

Client:
ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:
AFRICAN DEVELOPMENT BANK

Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

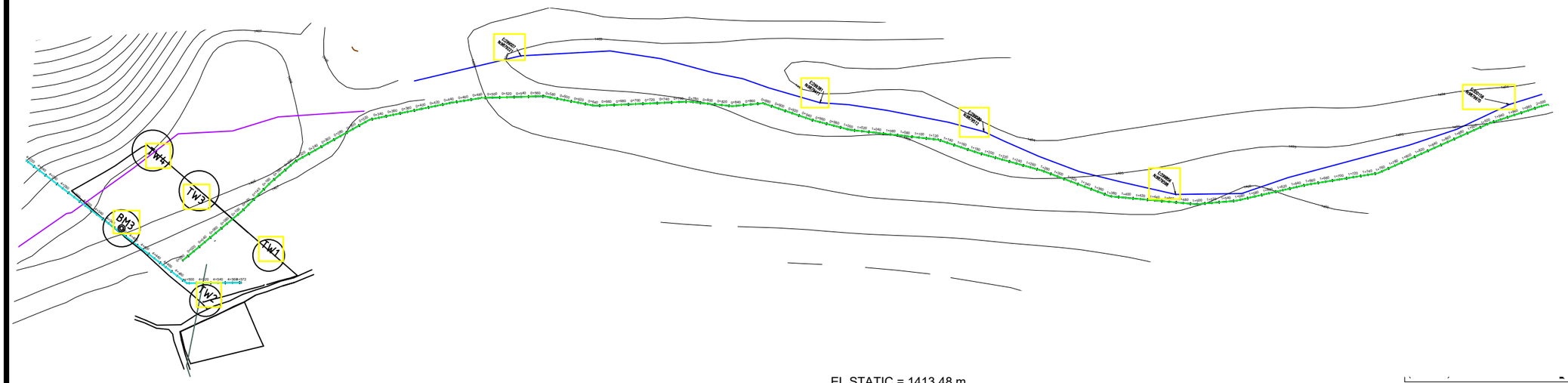
CONTRACT NO;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:
CAS CONSULTANTS LIMITED
Le' Mac Building, 1st Fl, Off Church Rd, Westlands
O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing title:
1000M3 TANK
STRUCTURAL DETAILS

TOP SLAB
&
COLUMN

Designed By	: L.K
Drawn By	: R.W
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/CWT/007



No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
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Client:

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:

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CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

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Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

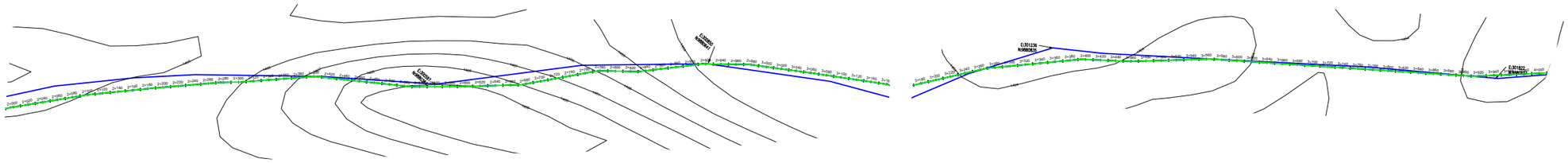
Drawing Title:

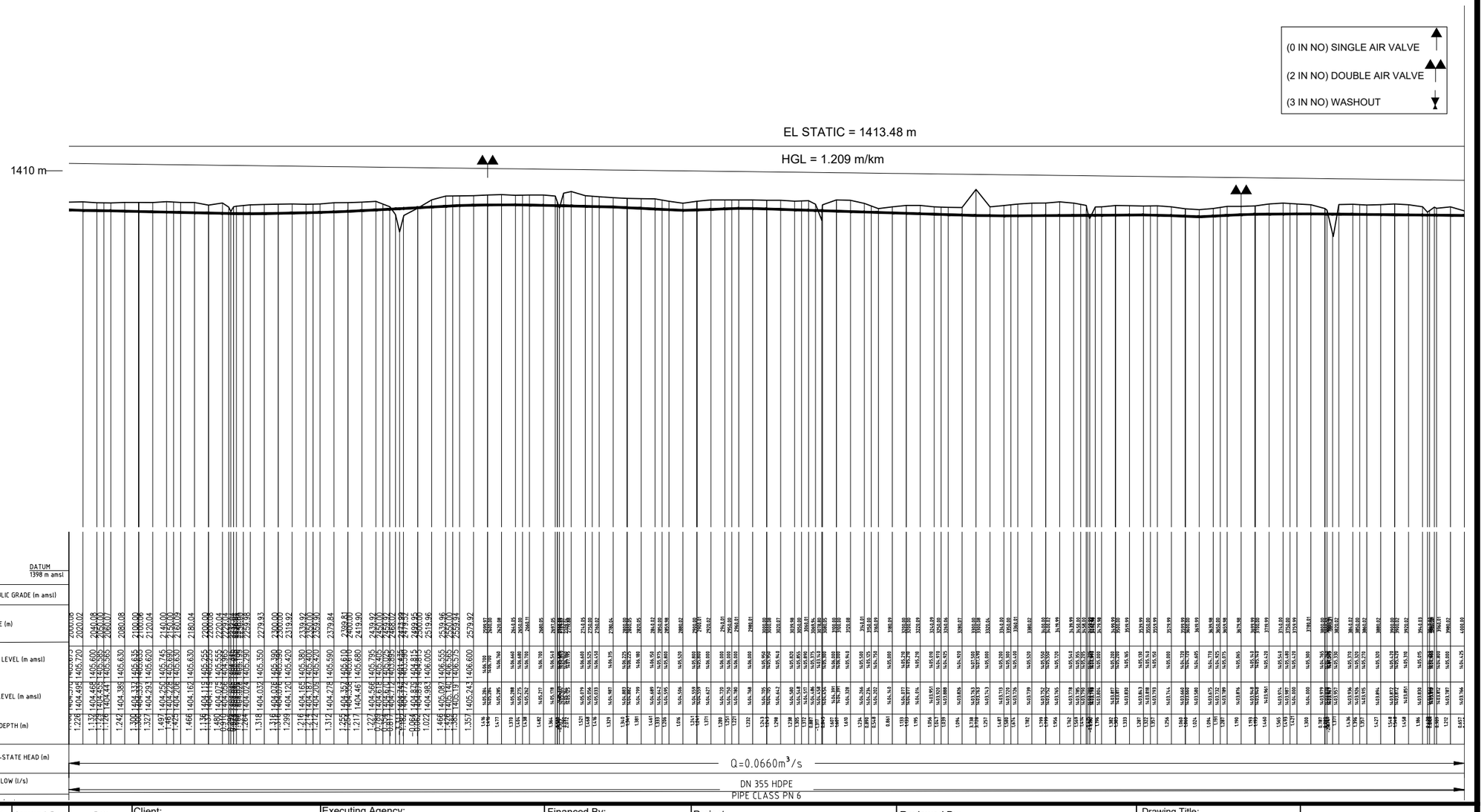
TREATMENT WORKS TO KYULUNI PRIMARY PUMP PIPELINE

PLAN AND PROFILE

FROM CH 0+ 000 TO CH 2 +000

Designed By	: L.K
Drawn By	: E.W.K
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/KY/001





No	Revisions	Checked By	Approved By	Date
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Client:
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MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:
AFRICAN DEVELOPMENT BANK

Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:
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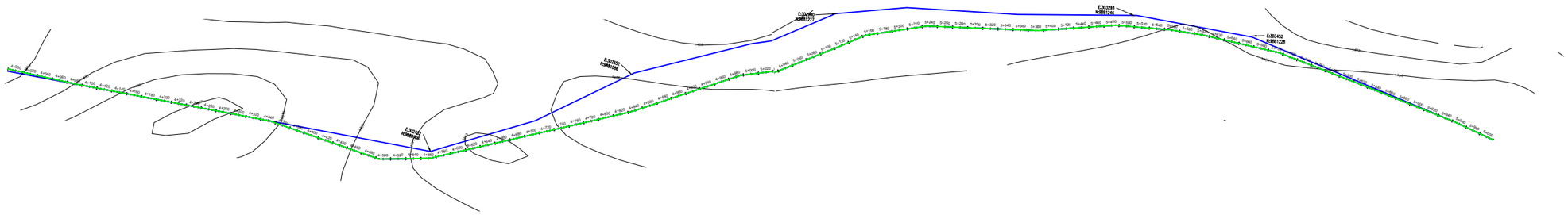
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

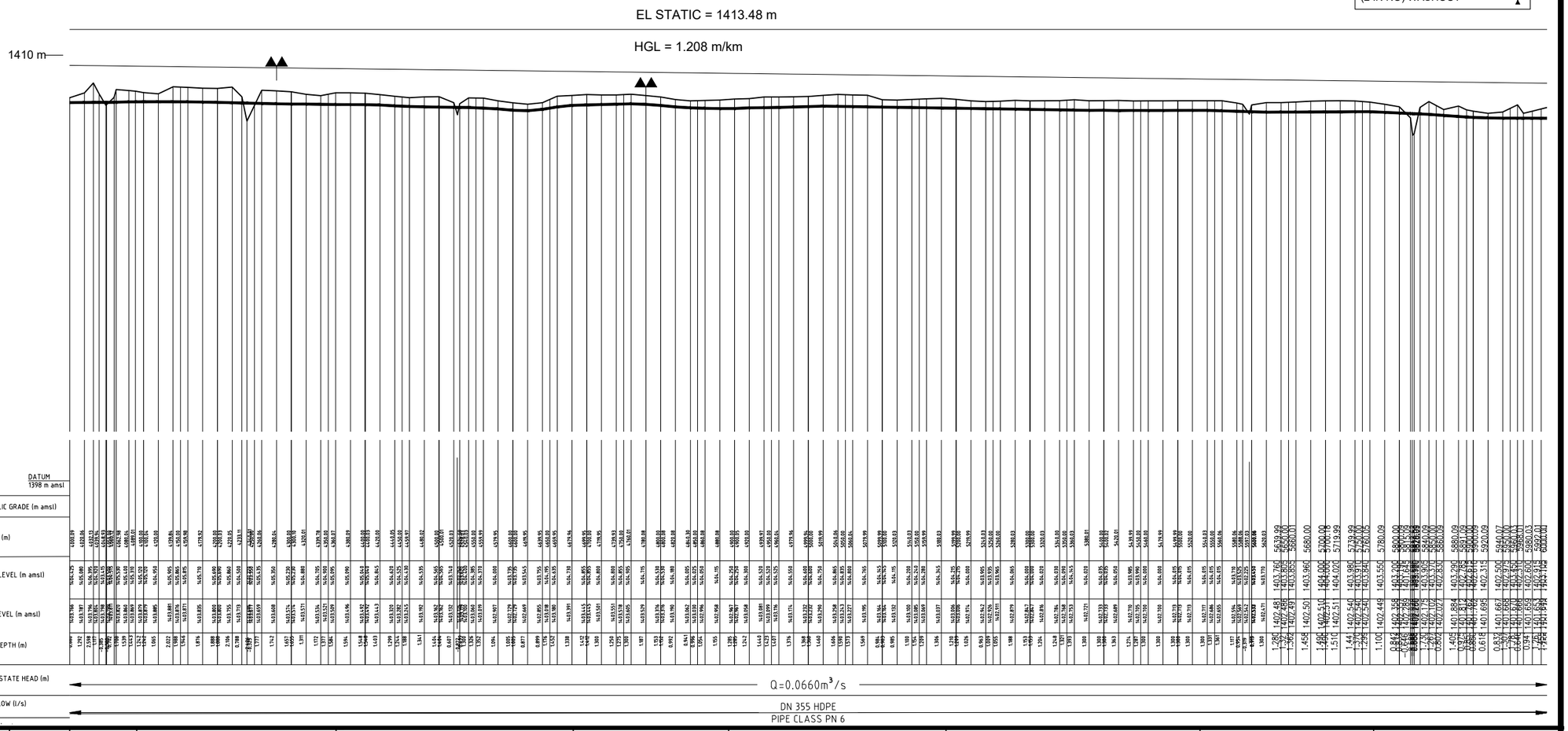
Drawing Title:
TREATMENT WORKS TO KYULUNI PRIMARY PUMP PIPELINE

PLAN AND PROFILE

FROM CH 2+ 000 TO CH 4 +000

Designed By	: L.K
Drawn By	: E.W.K
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/KY/002





(0 IN NO) SINGLE AIR VALVE

(2 IN NO) DOUBLE AIR VALVE

(2 IN NO) WASHOUT

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
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4.				

Client:

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MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:

CAS CONSULTANTS LIMITED
Le' Mac Building, 1st Fl, Off Church Rd, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

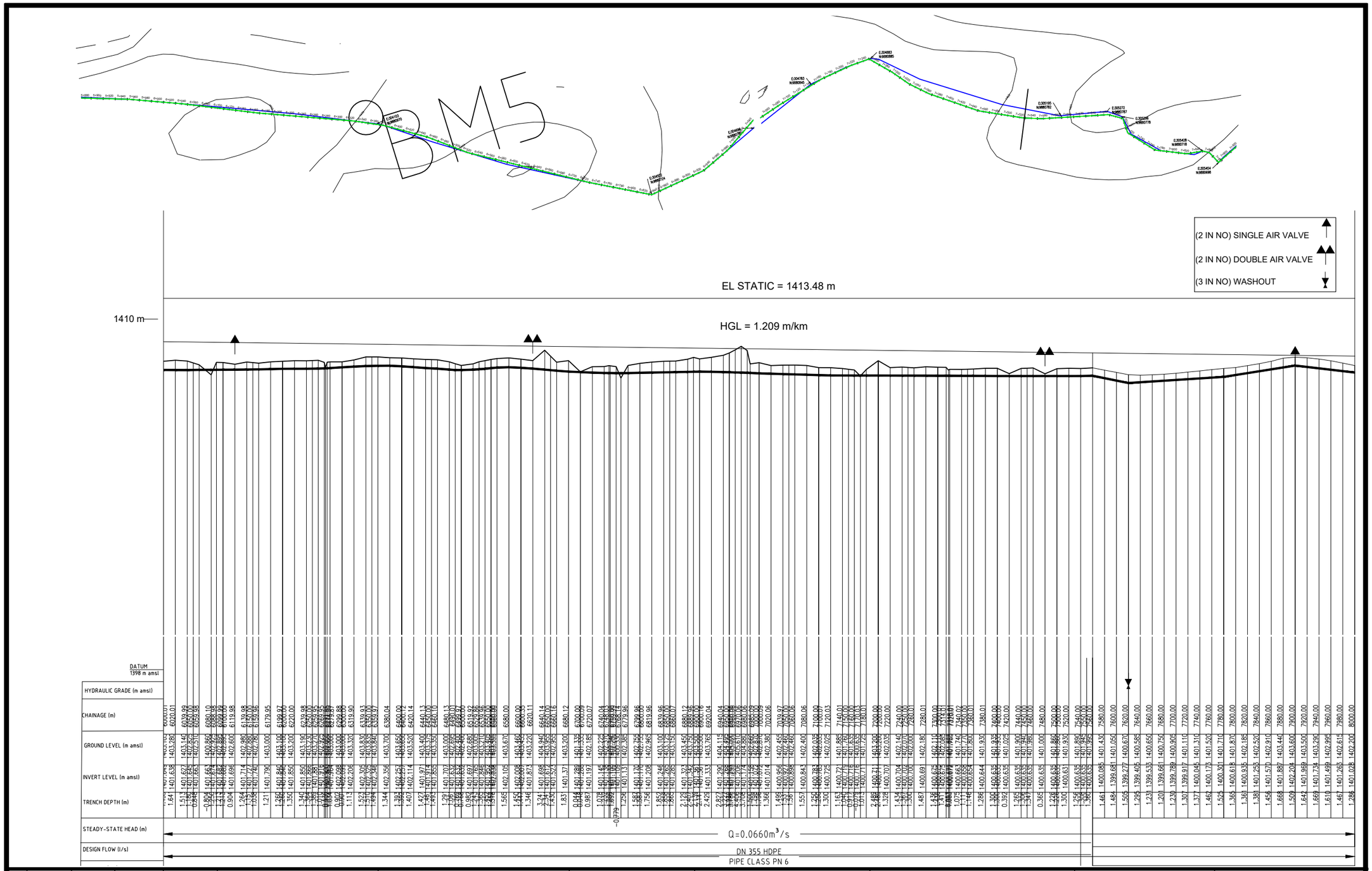
Drawing Title:

TREATMENT WORKS TO KYULUNI PRIMARY PUMP PIPELINE

PLAN AND PROFILE

FROM CH 4+ 000 TO CH 6 +000

Designed By	: L.K
Drawn By	: E.W.K
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/KY/003



No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client:

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:

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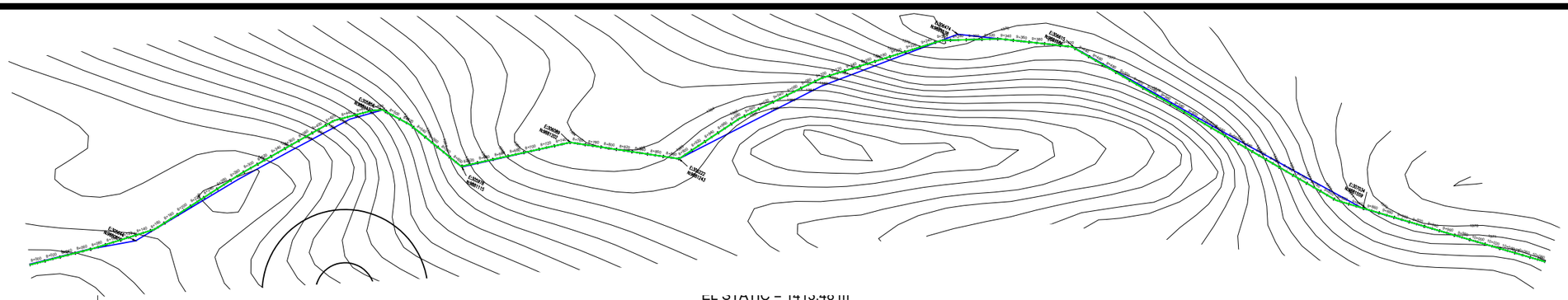
Drawing Title:

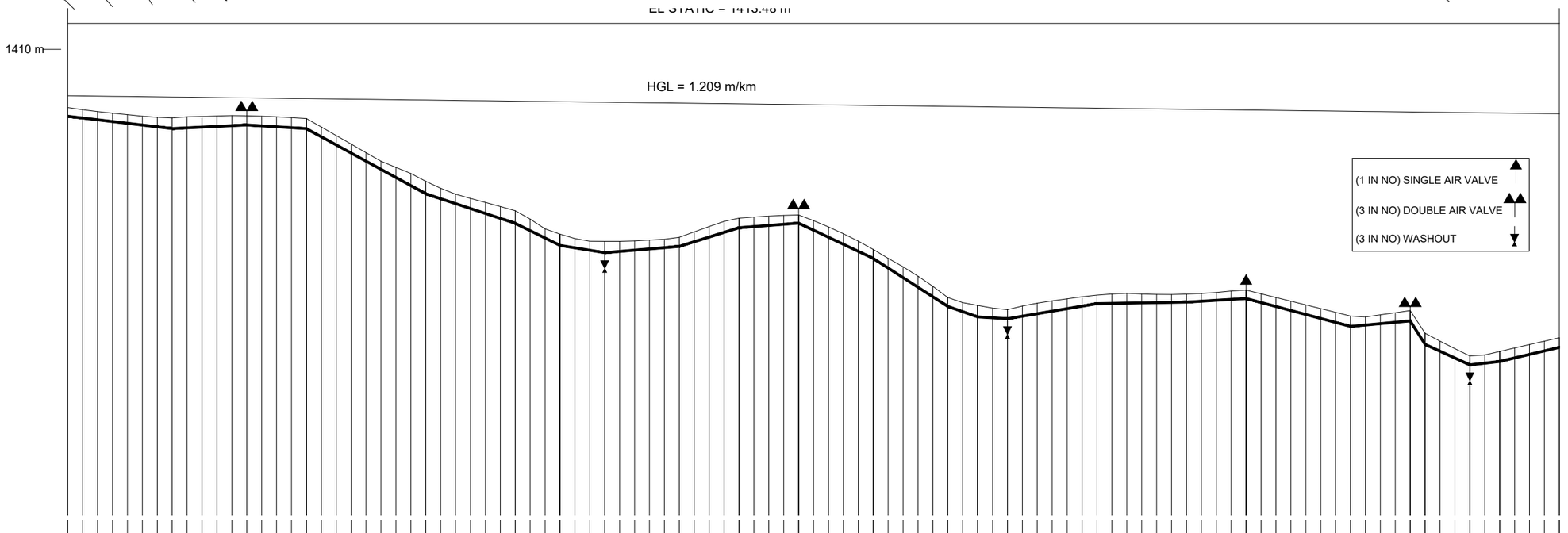
TREATMENT WORKS TO KYULUNI PRIMARY PUMP PIPELINE

PLAN AND PROFILE

FROM CH 6+ 000 TO CH 8 +000

Designed By	: L.K
Drawn By	: E.W.K
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/KY/004





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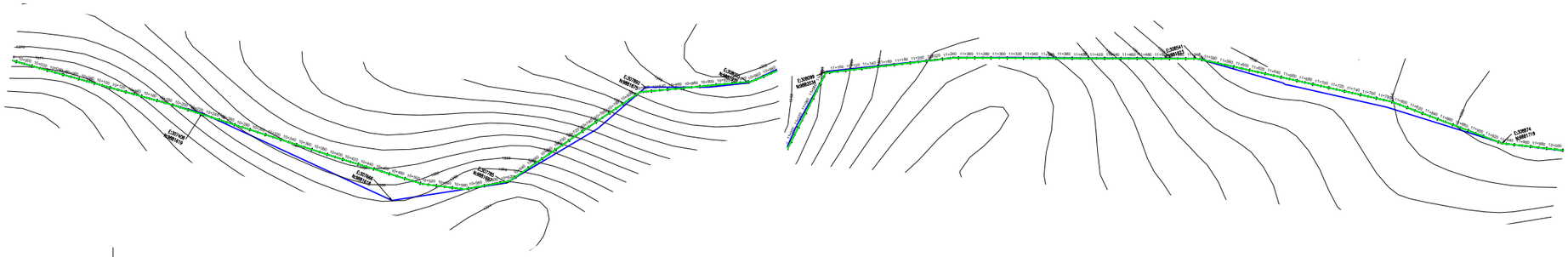


EL STATIC = 1413.48 m

1410 m

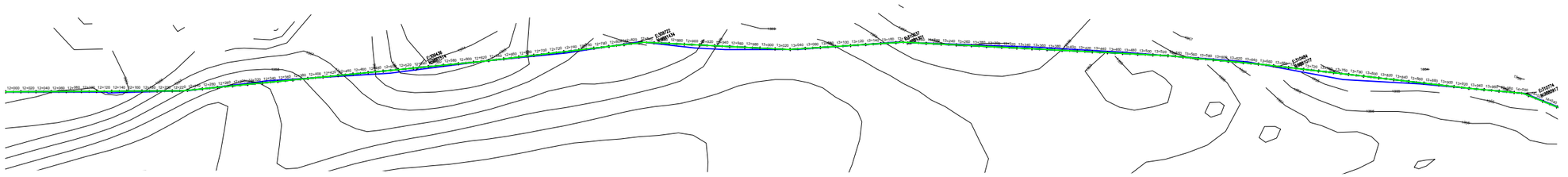
HGL = 1.209 m/km

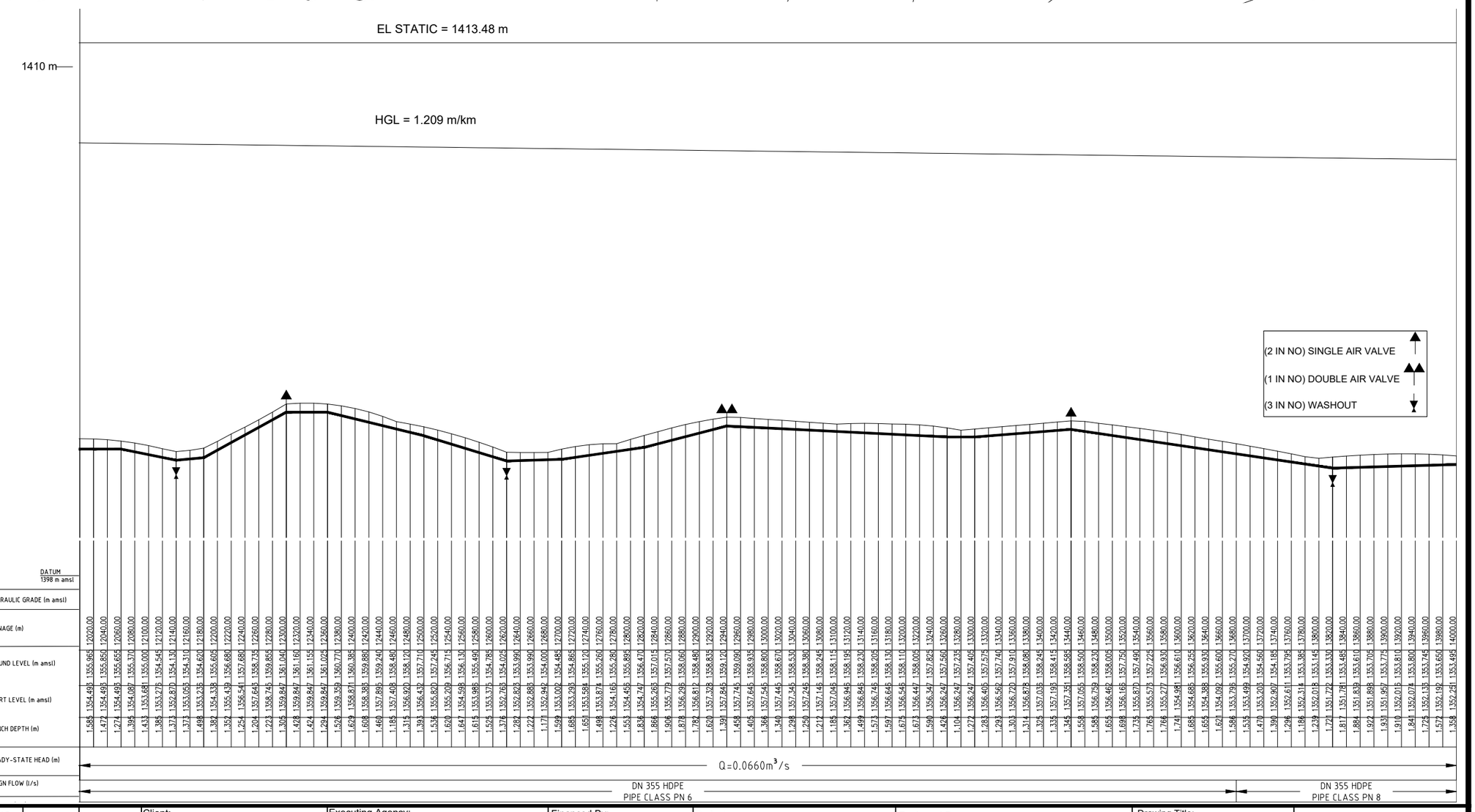
(1 IN NO) SINGLE AIR VALVE

(3 IN NO) DOUBLE AIR VALVE

(3 IN NO) WASHOUT

| DATUM 1398 m amsl | | |





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1.		W.K	S.M.M	March 2018
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Client:

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MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

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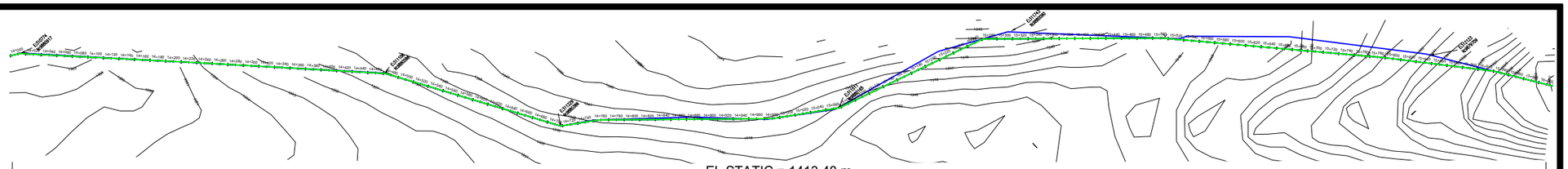
Drawing Title:

TREATMENT WORKS TO KYULUNI PRIMARY PUMP PIPELINE

PLAN AND PROFILE

FROM CH 12+ 000 TO CH 14 +000

Designed By	: L.K
Drawn By	: E.W.K
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/KY/007



EL STATIC = 1413.48 m

1410 m

HGL = 1.210 m/km

(1 IN NO) SINGLE AIR VALVE

(2 IN NO) DOUBLE AIR VALVE

(2 IN NO) WASHOUT

DATUM	1398 m amsl
HYDRAULIC GRADE (m amsl)	
CHAINAGE (m)	14020.00 14040.00 14060.00 14080.00 14100.00 14120.00 14140.00 14160.00 14180.00 14200.00 14220.00 14240.00 14260.00 14280.00 14300.00 14320.00 14340.00 14360.00 14380.00 14400.00 14420.00 14440.00 14460.00 14480.00 14500.00 14520.00 14540.00 14560.00 14580.00 14600.00 14620.00 14640.00 14660.00 14680.00 14700.00 14720.00 14740.00 14760.00 14780.00 14800.00 14820.00 14840.00 14860.00 14880.00 14900.00 14920.00 14940.00 14960.00 14980.00 15000.00 15020.00 15040.00 15060.00 15080.00 15100.00 15120.00 15140.00 15160.00 15180.00 15200.00 15220.00 15240.00 15260.00 15280.00 15300.00 15320.00 15340.00 15360.00 15380.00 15400.00 15420.00 15440.00 15460.00 15480.00 15500.00 15520.00 15540.00 15560.00 15580.00 15600.00 15620.00 15640.00 15660.00 15680.00 15700.00 15720.00 15740.00 15760.00 15780.00 15800.00 15820.00 15840.00 15860.00 15880.00 15900.00 15920.00 15940.00 15960.00 15980.00 16000.00
GROUND LEVEL (m amsl)	1352.700 1353.845 1354.925 1353.965 1354.075 1354.055 1354.010 1353.935 1353.810 1353.620 1353.360 1353.040 1352.655 1352.270 1351.940 1351.590 1351.220 1350.835 1350.450 1350.180 1349.910 1349.640 1349.520 1349.620 1349.605 1349.525 1349.390 1349.190 1348.925 1348.605 1348.220 1347.775 1347.625 1347.215 1348.225 1347.830 1347.560 1347.440 1347.280 1347.090 1346.885 1346.705 1346.805 1346.885 1347.025 1347.235 1347.500 1347.610 1347.785 1348.020 1348.315 1348.115 1347.640 1347.175 1346.720 1346.270 1345.835 1345.405 1344.985 1344.355 1343.680 1343.265 1343.509 1343.754 1344.955 1345.280 1345.550 1345.770 1345.940 1346.195 1346.455 1346.710 1346.970 1347.225 1347.485 1347.735 1347.970 1348.225 1348.500 1348.280 1347.380 1346.390 1345.280 1344.100 1342.830 1341.455 1339.985 1338.550 1337.225 1335.980 1334.750 1333.550 1332.265 1330.969 1329.672 1331.055
INVERT LEVEL (m amsl)	1350.310 1352.368 1352.427 1352.486 1352.546 1352.603 1352.662 1352.721 1352.780 1352.471 1352.162 1351.853 1351.544 1351.235 1350.926 1350.617 1350.308 1349.999 1349.690 1349.381 1349.072 1348.763 1348.454 1348.145 1347.988 1347.830 1347.672 1347.514 1347.356 1347.198 1347.040 1346.882 1346.725 1346.567 1346.409 1346.093 1345.935 1345.777 1345.619 1345.462 1345.304 1345.146 1344.988 1344.830 1344.672 1345.121 1345.412 1345.703 1345.994 1346.285 1346.576 1346.867 1347.158 1347.315 1347.640 1347.762 1347.884 1347.884 1347.762 1347.640 1347.518 1347.396 1347.275 1347.153 1347.031 1346.909 1346.787 1346.665 1346.543 1346.422 1346.300 1346.178 1346.056 1345.935 1345.813 1345.691 1345.569 1345.447 1345.326 1345.204 1345.082 1344.960 1344.838 1344.716 1344.595 1344.473 1344.351 1344.229 1344.107 1343.985 1343.864 1343.742 1343.620 1343.498 1343.376 1343.254 1343.133 1343.011 1342.889 1342.767 1342.645 1342.524 1342.402 1342.280 1342.158 1342.036 1341.915 1341.793 1341.671 1341.549 1341.427 1341.306 1341.184 1341.062 1340.940 1340.819 1340.697 1340.575 1340.453 1340.331 1340.210 1340.088 1339.966 1339.844 1339.723 1339.601 1339.479 1339.357 1339.236 1339.114 1338.992 1338.870 1338.749 1338.627 1338.505 1338.383 1338.261 1338.140 1338.018 1337.896 1337.774 1337.653 1337.531 1337.409 1337.287 1337.166 1337.044 1336.922 1336.800 1336.679 1336.557 1336.435 1336.313 1336.192 1336.070 1335.948 1335.826 1335.705 1335.583 1335.461 1335.339 1335.218 1335.096 1334.974 1334.852 1334.731 1334.609 1334.487 1334.365 1334.244 1334.122 1334.000 1333.878 1333.757 1333.635 1333.513 1333.391 1333.270 1333.148 1333.026 1332.904 1332.783 1332.661 1332.539 1332.417 1332.296 1332.174 1332.052 1331.930 1331.809 1331.687 1331.565 1331.443 1331.322 1331.200 1331.078 1330.956 1330.835 1330.713 1330.591 1330.469 1330.348 1330.226 1330.104 1329.982 1329.861 1329.739 1329.617 1329.495 1329.374 1329.252 1329.130 1329.008 1328.887 1328.765 1328.643 1328.521 1328.400 1328.278 1328.156 1328.034 1327.913 1327.791 1327.669 1327.547 1327.426 1327.304 1327.182 1327.060 1326.939 1326.817 1326.695 1326.573 1326.452 1326.330 1326.208 1326.086 1325.965 1325.843 1325.721 1325.599 1325.478 1325.356 1325.234 1325.113 1324.991 1324.869 1324.747 1324.626 1324.504 1324.382 1324.260 1324.139 1324.017 1323.895 1323.773 1323.652 1323.530 1323.408 1323.286 1323.165 1323.043 1322.921 1322.799 1322.678 1322.556 1322.434 1322.312 1322.191 1322.069 1321.947 1321.825 1321.704 1321.582 1321.460 1321.338 1321.217 1321.095 1320.973 1320.851 1320.730 1320.608 1320.486 1320.364 1320.243 1320.121 1319.999 1319.877 1319.756 1319.634 1319.512 1319.390 1319.269 1319.147 1319.025 1318.903 1318.782 1318.660 1318.538 1318.416 1318.295 1318.173 1318.051 1317.929 1317.808 1317.686 1317.564 1317.442 1317.321 1317.199 1317.077 1316.955 1316.834 1316.712 1316.590 1316.468 1316.347 1316.225 1316.103 1315.981 1315.860 1315.738 1315.616 1315.494 1315.373 1315.251 1315.129 1315.007 1314.886 1314.764 1314.642 1314.520 1314.399 1314.277 1314.155 1314.033 1313.912 1313.790 1313.668 1313.546 1313.425 1313.303 1313.181 1313.059 1312.938 1312.816 1312.694 1312.572 1312.451 1312.329 1312.207 1312.085 1311.964 1311.842 1311.720 1311.598 1311.477 1311.355 1311.233 1311.111 1310.990 1310.868 1310.746 1310.624 1310.503 1310.381 1310.259 1310.137 1310.016 1309.894 1309.772 1309.650 1309.529 1309.407 1309.285 1309.163 1309.042 1308.920 1308.798 1308.676 1308.555 1308.433 1308.311 1308.189 1308.068 1307.946 1307.824 1307.702 1307.581 1307.459 1307.337 1307.215 1307.094 1306.972 1306.850 1306.728 1306.607 1306.485 1306.363 1306.241 1306.120 1305.998 1305.876 1305.754 1305.633 1305.511 1305.389 1305.267 1305.146 1305.024 1304.902 1304.780 1304.659 1304.537 1304.415 1304.293 1304.172 1304.050 1303.928 1303.806 1303.685 1303.563 1303.441 1303.319 1303.198 1303.076 1302.954 1302.832 1302.711 1302.589 1302.467 1302.345 1302.224 1302.102 1301.980 1301.858 1301.737 1301.615 1301.493 1301.371 1301.250 1301.128 1301.006 1300.884 1300.763 1300.641 1300.519 1300.397 1300.276 1300.154 1300.032 1299.910 1299.789 1299.667 1299.545 1299.423 1299.302 1299.180 1299.058 1298.936 1298.815 1298.693 1298.571 1298.449 1298.328 1298.206 1298.084 1297.962 1297.841 1297.719 1297.597 1297.475 1297.354 1297.232 1297.110 1296.988 1296.867 1296.745 1296.623 1296.501 1296.380 1296.258 1296.136 1296.014 1295.893 1295.771 1295.649 1295.527 1295.406 1295.284 1295.162 1295.040 1294.919 1294.797 1294.675 1294.553 1294.432 1294.310 1294.188 1294.066 1293.945 1293.823 1293.701 1293.579 1293.458 1293.336 1293.214 1293.092 1292.971 1292.849 1292.727 1292.605 1292.484 1292.362 1292.240 1292.118 1291.997 1291.875 1291.753 1291.631 1291.510 1291.388 1291.266 1291.144 1291.023 1290.901 1290.779 1290.657 1290.536 1290.414 1290.292 1290.170 1290.049 1289.927 1289.805 1289.683 1289.562 1289.440 1289.318 1289.196 1289.075 1288.953 1288.831 1288.709 1288.588 1288.466 1288.344 1288.222 1288.101 1287.979 1287.857 1287.735 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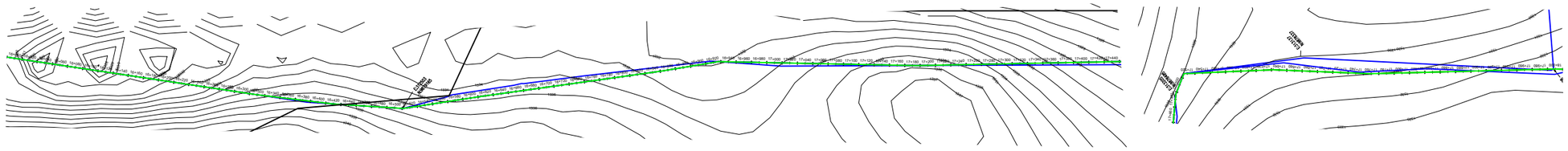
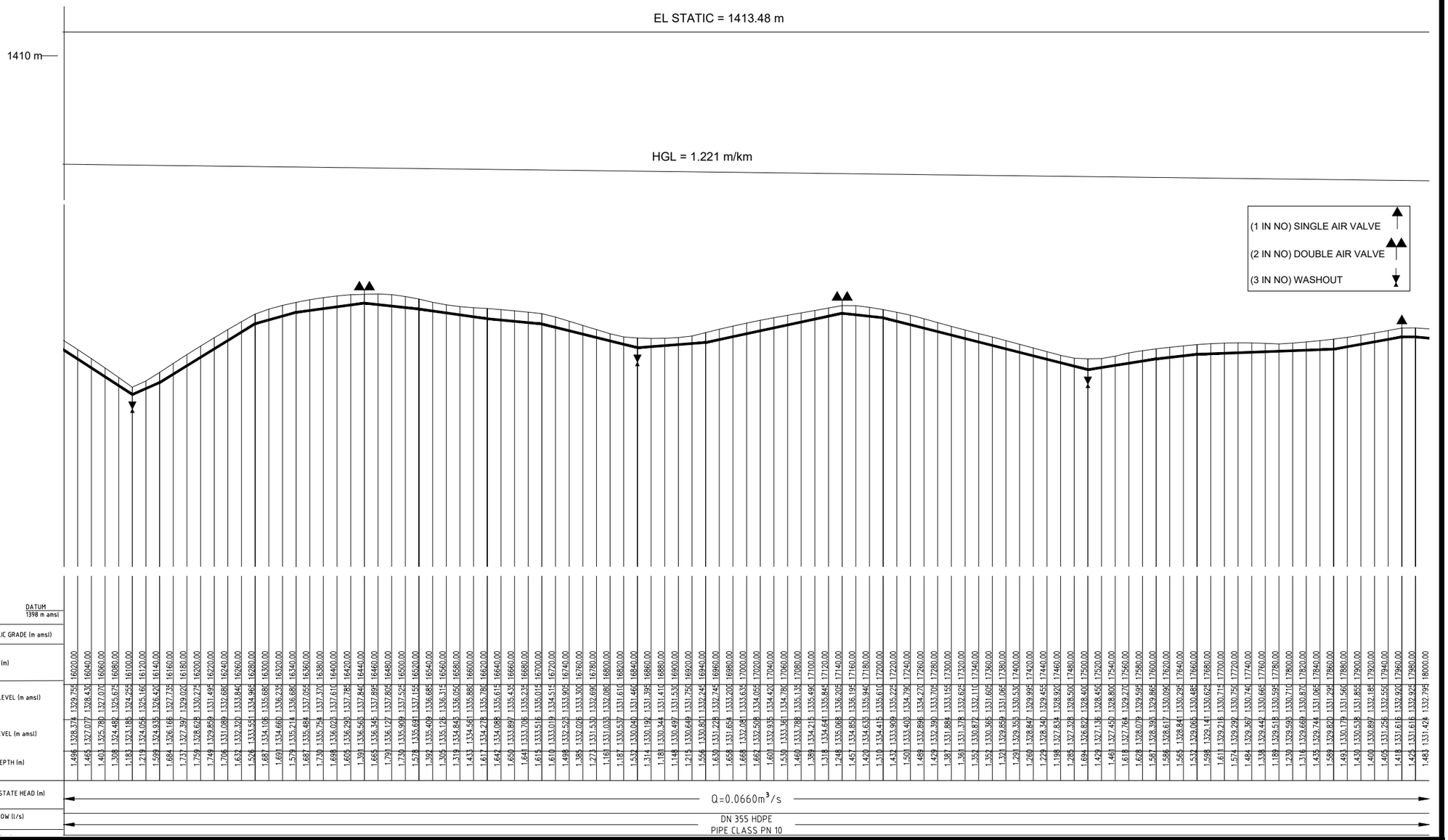
1260.585 1260.463 1260.342 1260.220 1260.098 1259.976 1259.855 1259.733 1259.611 1259.489 1259.368 1259.246 1259.124 1259.002 1258.881 1258.759 1258.637 1258.515 1258.394 1258.272 1258.150 1258.028 1257.907 1257.785 1257.663 1257.541 1257.420 1257.298 1257.176 1257.054 1256.933 1256.811 1256.689 1256.567 1256.446 1256.324 1256.202 1256.080 1255.959 1255.837 1255.715 1255.593 1255.472 1255.350 1255.228 1255.106 1254.985 1254.863 1254.741 1254.619 1254.498 1254.376 1254.254 1254.132 1254.011 1253.889 1253.767 1253.645 1253.524 1253.402 1253.280 1253.158 1253.037 1252.915 1252.793 1252.671 1252.550 1252.428 1252.306 1252.184 1252.063 1251.941 1251.819 1251.697 1251.576 1251.454 1251.332 1251.210 1251.089 1250.967 1250.845 1250.723 1250.602 1250.480 1250.358 1250.236 1250.115 1249.993 1249.871 1249.749 1249.628 1249.506 1249.384 1249.262 1249.141 1249.019 1248.897 1248.775 1248.654 1248.532 1248.410 1248.288 1248.167 1248.045 1247.923 1247.801 1247.680 1247.558 1247.436 1247.314 1247.193 1247.071 1246.949 1246.827 1246.706 1246.584 1246.462 1246.340 1246.219 1246.097 1245.975 1245.853 1245.732 1245.610 1245.488 1245.366 1245.245 1245.123 1245.001 1244.879 1244.758 1244.636 1244.514 1244.392 1244.271 1244.149 1244.027 1243.905 1243.784 1243.662 1243.540 1243.418 1243.297 1243.175 1243.053 1242.931 1242.810 1242.688 1242.566 1242.444 1242.323 1242.201 1242.079 1241.957 1241.836 1241.714 1241.592 1241.470 1241.349 1241.227 1241.105 1240.983 1240.862 1240.740 1240.618 1240.496 1240.375 1240.253 1240.131 1240.009 1239.888 1239.766 1239.644 1239.522 1239.401 1239.279 1239.157 1239.035 1238.914 1238.792 1238.670 1238.548 1238.427 1238.305 1238.183 1238.061 1237.940 1237.818 1237.696 1237.574 1237.453 1237.331 1237.209 1237.087 1236.966 1236.844 1236.722 1236.600 1236.479 1236.357 1236.235 1236.113 1235.992 1235.870 1235.748 1235.626 1235.505 1235.383 1235.261 1235.139 1235.018 1234.896 1234.774 1234.652 1234.531 1234.409 1234.287 1234.165 1234.044 1233.922 1233.800 1233.678 1233.557 1233.435 1233.313 1233.191 1233.070 1232.948 1232.826 1232.704 1232.583 1232.461 1232.339 1232.217 1232.096 1231.974 1231.852 1231.730 1231.609 1231.487 1231.365 1231.243 1231.122 1231.000 1230.878 1230.756 1230.635 1230.513 1230.391 1230.269 1230.148 1230.026 1229.904 1229.782 1229.661 1229.539 1229.417 1229.295 1229.174 1229.052 1228.930 1228.808 1228.687 1228.565 1228.443 1228.321 1228.200 1228.078 1227.956 1227.834 1227.713 1227.591 1227.469 1227.347 1227.226 1227.104 1226.982 1226.860 1226.739 1226.617 1226.495 1226.373 1226.252 1226.130 1226.008 1225.886 1225.765 1225.643 1225.521 1225.399 1225.278 1225.156 1225.034 1224.912 1224.791 1224.669 1224.547 1224.425 1224.304 1224.182 1224.060 1223.938 1223.817 1223.695 1223.573 1223.451 1223.330 1223.208 1223.086 1222.964 1222.843 1222.721 1222.599 1222.477 1222.356 1222.234 1222.112 1221.990 1221.869 1221.747 1221.625 1221.503 1221.382 1221.260 1221.138 1221.016 1220.895 1220.773 1220.651 1220.529 1220.408 1220.286 1220.164 1220.042 1219.921 1219.799 1219.677 1219.555 1219.434 1219.312 1219.190 1219.068 1218.947 1218.825 1218.703 1218.581 1218.460 1218.338 1218.216 1218.094 1217.973 1217.851 1217.729 1217.607 1217.486 1217.364 1217.242 1217.120 1216.999 1216.877 1216.755 1216.633 1216.512 1216.390 1216.268 1216.146 1216.025 1215.903 1215.781 1215.659 1215.538 1215.416 1215.294 1215.172 1215.051 1214.929 1214.807 1214.685 1214.564 1214.442 1214.320 1214.198 1214.077 1213.955 1213.833 1213.711 1213.590 1213.468 1213.346 1213.224 1213.103 1212.981 1212.859 1212.737 1212.616 1212.494 1212.372 1212.250 1212.129 1212.007 1211.885 1211.763 1211.642 1211.520 1211.398 1211.276 1211.155 1211.033 1210.911 1210.789 1210.668 1210.546 1210.424 1210.302 1210.181 1210.059 1209.937 1209.815 1209.694 1209.572 1209.450 1209.328 1209.207 1209.085 1208.963 1208.841 1208.720 1208.598 1208.476 1208.354 1208.233 1208.111 1207.989 1207.867 1207.746 1207.624 1207.502 1207.380 1207.259 1207.137 1207.015 1206.893 1206.772 1206.650 1206.528 1206.406 1206.285 1206.163 1206.041 1205.919 1205.798 1205.676 1205.554 1205.432 1205.311 1205.189 1205.067 1204.945 1204.824 1204.702 1204.580 1204.458 1204.337 1204.215 1204.093 1203.971 1203.850 1203.728 1203.606 1203.484 1203.363 1203.241 1203.119 1202.997 1202.876 1202.754 1202.632 1202.510 1202.389 1202.267 1202.145 1202.023 1201.902 1201.780 1201.658 1201.536 1201.415 1201.293 1201.171 1201.049 1200.928 1200.806 1200.684 1200.562 1200.441 1200.319 1200.197 1200.075 1199.954 1199.832 1199.710 1199.588 1199.467 1199.345 1199.223 1199.101 1198.980 1198.858 1198.736 1198.614 1198.493 1198.371 1198.249 1198.127 1198.006 1197.884 1197.762 1197.640 1197.519 1197.397 1197.275 1197.153 1197.032 1196.910 1196.788 1196.666 1196.545 1196.423 1196.301 1196.179 1196.058 1195.936 1195.814 1195.692 1195.571 1195.449 1195.327 1195.205 1195.084 1194.962 1194.840 1194.718 1194.597 1194.475 1194.353 1194.231 1194.110 1193.988 1193.866 1193.744 1193.623 1193.501 1193.379 1193.257 1193.136 1193.014 1192.892 1192.770 1192.649 1192.527 1192.405 1192.283 1192.162 1192.040 1191.918 1191.796 1191.675 1191.553 1191.431 1191.309 1191.188 1191.066 1190.944 1190.822 1190.701 1190.579 1190.457 1190.335 1190.214 1190.092 1189.970 1189.848 1189.727 1189.605 1189.483 1189.361 1189.240 1189.118 1188.996 1188.874 1188.753 1188.631 1188.509 1188.387 1188.266 1188.144 1188.022 1187.900 1187.779 1187.657 1187.535 1187.413 1187.292 1187.170 1187.048 1186.926 1186.805 1186.683 1186.561 1186.439 1186.318 1186.196 1186.074 1185.952 1185.831 1185.709 1185.587 1185.465 1185.344 1185.222 1185.100 1184.978 1184.857 1184.735 1184.613 1184.491 1184.370 1184.248 1184.126 1184.004 1183.883 1183.761 1183.639 1183.517 1183.396 1183.274 1183.152 1183.030 1182.909 1182.787 1182.665 1182.543 1182.422 1182.300 1182.178 1182.056 1181.935 1181.813 1181.691 1181.569 1181.448 1181.326 1181.204 1181.082 1180.961 1180.839 1180.717 1180.595 1180.474 1180.352 1180.230 1180.108 1179.987 1179.865 1179.743 1179.621 1179.500 1179.378 1179.256 1179.134 1179.013 1178.891 1178.769 1178.647 1178.526 1178.404 1178.282 1178.160 1178.039 1177.917 1177.795 1177.673 1177.552 1177.430 1177.308 1177.186 1177.065 1176.943 1176.821 1176.699 1176.578 1176.456 1176.334 1176.212 1176.091 1175.969 1175.847 1175.725 1175.604 1175.482 1175.360 1175.238 1175.117 1174.995 1174.873 1174.751 1174.630 1174.508 1174.386 1174.264 1174.143 1174.021 1173.899 1173.777 1173.656 1173.534 1173.412 1173.290 1173.169 1173.047 1172.925 1172.803 1172.682 1172.560 1172.438 1172.316 1172.195 1172.073 1171.951 1171.829 1171.708 1171.586 1171.464 1171.342 1171.221 1171.099 1170.977 1170.855 1170.734 1170.612 1170.490 1170.368 1170.247 1170.125 1170.003 1169.881 1169.760 1169.638 1169.516 1169.394 1169.273 1169.151 1169.029 1168.907 1168.786 1168.664 1168.542 1168.420 1168.299 1168.177 1168.055 1167.933 1167.812 1167.690 1167.568 1167.446 1167.325 1167.203 1167.081 1166.959 1166.838 1166.716 1166.594 1166.472 1166.351 1166.229 1166.107 1165.985 1165.864 1165.742 1165.620 1165.498 1165.377 1165.255 1165.133 1165.011 1164.890 1164.768 1164.646 1164.524 1164.403 1164.281 1164.159 1164.037 1163.916 1163.794 1163.672 1163.550 1163.429 1163.307 1163.185 1163.063 1162.942 1162.820 1162.698 1162.576 1162.455 1162.333 1162.211 1162.089 1161.968 1161.846 1161.724 1161.602 1161.481 1161.359 1161.237 1161.115 1160.994 1160.872 1160.750 1160.628 1160.507 1160.385 1160.263 1160.141 1160.020 1159.898 1159.776 1159.654 1159.533 1159.411 1159.289 1159.167 1159.046 1158.924 1158.802 1158.680 1158.559 1158.437 1158.315 1158.193 1158.072 1157.950 1157.828 1157.706 1157.585 1157.463 1157.341 1157.219 1157.098 1156.976 1156.854 1156.732 1156.611 1156.489 1156.367 1156.245 1156.124 1156.002 1155.880 1155.758 1155.637 1155.515 1155.393 1155.271 1155.150 1155.028 1154.906 1154.784 1154.663 1154.541 1154.419 1154.297 1154.176 1154.054 1153.932 1153.810 1153.689 1153.567 1153.445 1153.323 1153.202 1153.080 1152.958 1152.836 1152.715 1152.593 1152.471 1152.349 1152.228 1152.106 1151.984 1151.862 1151.741 1151.619 1151.497 1151.375 1151.254 1151.132 1151.010 1150.888 1150.767 1150.645 1150.523 1150.401 1150.280 1150.158 1150.036 1149.914 1149.793 1149.671 1149.549 1149.427 1149.306 1149.184 1149.062 1148.940 1148.819 1148.697 1148.575 1148.453 1148.332 1148.210 1148.088 1147.966 1147.845 1147.723 1147.601 1147.479 1147.358 1147.236 1147.114 1146.992 1146.871 1146.749 1146.627 1146.505 1146.384 1146.262 1146.140 1146.018 1145.897 1145.775 1145.653 1145.531 1145.410 1145.288 1145.166 1145.044 1144.923 1144.801 1144.679 1144.557 1144.436 1144.314 1144.192 1144.070 1143.949 1143.827 1143.705 1143.583 1143.462 1143.340 1143.218 1143.096 1142.975 1142.853 1142.731 1142.609 1142.488 1142.366 1142.244 1142.122 1142.001 1141.879 1141.757 1141.635 1141.514 1141.392 1141.270 1141.148 1141.027 1140.905 1140.783 1140.661 1140.540 1140.418 1140.296 1140.174 1140.053 1139.931 1139.809 1139.687 1139.566 1139.444 1139.322 1139.200 1139.079 1138.957 1138.835 1138.713 1138.592 1138.470 1138.348 1138.226 1138.105 1137.983 1137.861 1137.739 1137.618 1137.496 1137.374 1137.252 1137.131 1137.009 1136.887 1136.765 1136.644 1136.522 1136.400 1136.278 1136.157 1136.035 1135.913 1135.791 1135.670 1135.548 1135.426 1135.304 1135.183 1135.061 1134.939 1134.817 1134.696 1134.574 1134.452 1134.330 1134.209 1134.087 1133.965 1133.843 1133.722 1133.600 1133.478 1133.356 1133.235 1133.113 1132.991 1132.869 1132.748 1132.626 1132.504 1132.382 1132.261 1132.139 1132.017 1131.895 1131.774 1131.652 1131.530 1131.408 1131.287 1131.165 1131.043 1130.921 1130.800 1130.678 1130.556 1130.434 1130.313 1130.191 1130.069 1129.947 1129.826 1129.704 1129.582 1129.460 1129.339 1129.217 1129.095 1128.973 1128.852 1128.730 1128.608 1128.486 1128.365 1128.243 1128.121 1127.999 1127.878 1127.756 1127.634 1127.512 1127.391 1127.269 1127.147 1127.025 1126.904 1126.782 1126.660 1126.538 1126.417 1126.295 1126.173 1126.051 1125.930 1125.808 1125.686 1125.564 1125.443 1125.321 1125.199 1125.077 1124.956 1124.834 1124.712 1124.590 1124.469 1124.347 1124.225 1124.103 1123.982 1123.860 1123.738 1123.616 1123.495 1123.373 1123.251 1123.129 1123.008 1122.886 1122.764 1122.642 1122.521 1122.399 1122.277 1122.155 1122.034 1121.912 1121.790 1121.668 1121.547 1121.425 1121.303 1121.181 1121.060 1120.938 1120.816 1120.694 1120.573 1120.451 1120.329 1120.207 1120.086 1119.964 1119.842 1119.720 1119.599 1119.477 1119.355 1119.233 1119.112 1118.990 1118.868 1118.746 1118.625 1118.503 1118.381 1118.259 1118.138 1118.016 1117.894 1117.772 1117.651 1117.529 1117.407 1117.285 1117.164 1117.042 1116.920 1116.798 1116.677 1116.555 1116.433 1116.311 1116.190 1116.068 1115.946 1115.824 1115.703 1115.581 1115.459 1115.337 1115.216 1115.094 1114.972 1114.850 1114.729 1114.607 1114.485 1114.363 1114.242 1114.120 1113.998 1113.876 1113.755 1113.633 1113.511 1113.389 1113.268 1113.146 1113.024 1112.902 1112.781 1112.659 1112.537 1112.415 1112.294 1112.172 1112.050 1111.928 1111.807 1111.685 1111.563 1111.441 1111.320 1111.198 1111.076 1110.954 1110.833 1110.711 1110.589 1110.467 1110.346 1110.224 1110.102 1109.980 1109.859 1109.737 1109.615 1109.493 1109.372 1109.250 1109.128 1109.006 1108.885 1108.763 1108.641 1108.519 1108.398 1108.276 1108.154 1108.032 1107.911 1107.789 1107.667 1107.545 1107.424 1107.302 1107.180 1107.058 1106.937 1106.815 1106.693 1106.571 1106.450 1106.328 1106.206 1106.084 1105.963 1105.841 1105.719 1105.597 1105.476 1105.354 1105.232 1105.110 1104.989 1104.867 1104.745 1104.623 1104.502 1104.380 1104.258 1104.136 1104.015 1103.893 1103.771 1103.649 1103.528 1103.406 1103.284 1103.162 1103.041 1102.919 1102.797 1102.675 1102.554 1102.432 1102.310 1102.188 1102.067 1101.945 1101.823 1101.701 1101.580 1101.458 1101.336 1101.214 1101.093 1100.971 1100.849 1100.727 1100.606 1100.484 1100.362 1100.240 1100.119 1099.997 1099.875 1099.753 1099.632 1099.510 1099.388 1099.266 1099.145 1099.023 1098.901 1098.779 1098.658 1098.536 1098.414 1098.292 1098.171 1098.049 1097.927 1097.805 1097.684 1097.562 1097.440 1097.318 1097.197 1097.075 1096.953 1096.831 1096.710 1096.588 1096.466 1096.344 1096.223 1096.101 1095.979 1095.857 1095.736 1095.614 1095.492 1095.370 1095.249 1095.127 1095.005 1094.883 1094.762 1094.640 1094.518 1094.396 1094.275 1094.153 1094.031 1093.909 1093.788 1093.666 1093.544 1093.422 1093.301 1093.179 1093.057 1092.935 1092.814 1092.692 1092.570 1092.448 1092.327 1092.205 1092.083 1091.961 1091.840 1091.718 1091.596 1091.474 1091.353 1091.231 1091.109 1090.987 1090.866 1090.744 1090.622 1090.500 1090.379 1090.257 1090.135 1090.013 1089.892 1089.770 1089.648 1089.526 1089.405 1089.283 1089.161 1089.039 1088.918 1088.796 1088.674 1088.552 1088.431 1088.309 1088.187 1088.065 1087.944 1087.822 1087.700 1087.578 1087.457 1087.335 1087.213 1087.091 1086.970 1086.848 1086.726 1086.604 1086.483 1086.361 1086.239 1086.117 1085.996 1085.874 1085.752 1085.630 1085.509 1085.387 1085.265 1085.143 1085.022 1084.900 1084.778 1084.656 1084.535 1084.413 1084.291 1084.169 1084.048 1083.926 1083.804 1083.682 1083.561 1083.439 1083.317 1083.195 1083.074 1082.952 1082.830 1082.708 1082.587 1082.465 1082.343 1082.221 1082.100 1081.978 1081.856 1081.734 1081.613 1081.491 1081.369 1081.247 1081.126 1081.004 1080.882 1080.760 1080.639 1080.517 1080.395 1080.273 1080.152 1080.030 1079.908 1079.786 1079.665 1079.543 1079.421 1079.299 1079.178 1079.056 1078.934 1078.812 1078.691 1078.569 1078.447 1078.325 1078.204 1078.082 1077.960 1077.838 1077.717 1077.595 1077.473 1077.351 1077.230 1077.108 1076.986 1076.864 1076.743 1076.621 1076.499 1076.377 1076.256 1076.134 1076.012 1075.890 1075.769 1075.647 1075.525 1075.403 1075.282 1075.160 1075.038 1074.916 1074.795 1074.673 1074.551 1074.429 1074.308 1074.186 1074.064 1073.942 1073.821 1073.699 1073.577 1073.455 1073.334 1073.212 1073.090 1072.968 1072.847 1072.725 1072.603 1072.481 1072.360 1072.238 1072.116 1071.994 1071.873 1071.751 1071.629 1071.507 1071.386 1071.264 1071.142 1071.020 1070.899 1070.777 1070.655 1070.533 1070.412 1070.290 1070.168 1070.046 1069.925 1069.803 1069.681 1069.559 1069.438 1069.316 1069.194 1069.072 1068.951 1068.829 1068.707 1068.585 1068.464 1068.342 1068.220 1068.098 1067.977 1067.855 1067.733 1067.611 1067.490 1067.368 1067.246 1067.124 1067.003 1066.881 1066.759 1066.637 1066.516 1066.394 1066.272 1066.150 1066.029 1065.907 1065.785 1065.663 1065.542 1065.420 1065.298 1065.176 1065.055 1064.933 1064.811 1064.689 1064.568 1064.446 1064.324 1064.202 1064.081 1063.959 1063.837 1063.715 1063.594 1063.472 1063.350 1063.228 1063.107 1062.985 1062.863 1062.741 1062.620 1062.498 1062.376 1062.254 1062.133 1062.011 1061.889 1061.767 1061.646 1061.524 1061.402 1061.280 1061.159 1061.037 1060.915 1060.793 1060.672 1060.550 1060.428 1060.306 1060.185 1060.063 1059.941 1059.819 1059.698 1059.576 1059.454 1059.332 1059.211 1059.089 1058.967 1058.845 1058.724 1058.602 1058.480 1058.358 1058.237 1058.115 1057.993 1057.871 1057.750 1057.628 1057.506 1057.384 1057.263 1057.141 1057.019 1056.897 1056.776 1056.654 1056.532 1056.410 1056.289 1056.167 1056.045 1055.923 1055.802 1055.680 1055.558 1055.436 1055.315 1055.193 1055.071 1054.949 1054.828 1054.706 1054.584 1054.462 1054.341 1054.219 1054.097 1053.975 1053.854 1053.732 1053.610 1053.488 1053.367 1053.245 1053.123 1053.001 1052.880 1052.758 1052.636 1052.514 1052.393 1052.271 1052.149 1052.027 1051.906 1051.784 1051.662 1051.540 1051.419 1051.297 1051.175 1051.053 1050.932 1050.810 1050.688 1050.566 1050.445 1050.323 1050.201 1050.079 1049.958 1049.836 1049.714 1049.592 1049.471 1049.349 1049.227 1049.105 1048.984 1048.862 1048.740 1048.618 1048.497 1048.375 1048.253 1048.131 1048.010 1047.888 1047.766 1047.644 1047.523 1047.401 1047.279 1047.157 1047.036 1046.914 1046.792 1046.670 1046.549 1046.427 1046.305 1046.183 1046.062 1045.940 1045.818 1045.696 1045.575 1045.453 1045.331 1045.209 1045.088 1044.966 1044.844 1044.722 1044.601 1044.479 1044.357 1044.235 1044.114 1043.992 1043.870 1043.748 1043.627 1043.505 1043.383 1043.261 1043.140 1043.018 1042.896 1042.774 1042.653 1042.531 1042.409 1042.287 1042.166 1042.044 1041.922 1041.800 1041.679 1041.557 1041.435 1041.313 1041.192 1041.070 1040.948 1040.826 1040.705 1040.583 1040.461 1040.339 1040.218 1040.096 1039.974 1039.852 1039.731 1039.609 1039.487 1039.365 1039.244 1039.122 1039.000 1038.878 1038.757 1038.635 1038.513 1038.391 1038.270 1038.148 1038.026 1037.904 1037.783 1037.661 1037.539 1037.417 1037.296 1037.174 1037.052 1036.930 1036.809 1036.687 1036.565 1036.443 1036.322 1036.200 1036.078 1035.956 1035.835 1035.713 1035.591 1035.469 1035.348 1035.226 1035.104 1034.982 1034.861 1034.739 1034.617 1034.495 1034.374 1034.252 1034.130 1034.008 1033.887 1033.765 1033.643 1033.521 1033.400 1033.278 1033.156 1033.034 1032.913 1032.791 1032.669 1032.547 1032.426 1032.304 1032.182 1032.060 1031.939 1031.817 1031.695 1031.573 1031.452 1031.330 1031.208 1031.086 1030.965 1030.843 1030.721 1030.599 1030.478 1030.356 1030.234 1030.112 1029.991 1029.869 1029.747 1029.625 1029.504 1029.382 1029.260 1029.138 1029.017 1028.895 1028.773 1028.651 1028.530 1028.408 1028.286 1028.164 1028.043 1027.921 1027.799 1027.677 1027.556 1027.434 1027.312 1027.190 1027.069 1026.947 1026.825 1026.703 1026.582 1026.460 1026.338 1026.216 1026.095 1025.973 1025.851 1025.729 1025.608 1025.486 1025.364 1025.242 1025.121 1024.999 1024.877 1024.755 1024.634 1024.512 1024.390 1024.268 1024.147 1024.025 1023.903 1023.781 1023.660 1023.538 1023.416 1023.294 1023.173 1023.051 1022.929 1022.807 1022.686 1022.564 1022.442 1022.320 1022.199 1022.077 1021.955 1021.833 1021.712 1021.590 1021.468 1021.346 1021.225 1021.103 1020.981 1020.859 1020.738 1020.616 1020.494 1020.372 1020.251 1020.129 1020.007 1019.885 1019.764 1019.642 1019.520 1019.398 1019.277 1019.155 1019.033 1018.911 1018.790 1018.668 1018.546 1018.424 1018.303 1018.181 1018.059 1017.937 1017.816 1017.694 1017.572 1017.450 1017.329 1017.207 1017.085 1016.963 1016.842 1016.720 1016.598 1016.476 1016.355 1016.233 1016.111 1015.989 1015.868 1015.746 1015.624 1015.502 1015.381 1015.259 1015.137 1015.015 1014.894 1014.772 1014.650 1014.528 1014.407 1014.285 1014.163 1014.041 1013.920 1013.798 1013.676 1013.554 1013.433 1013.311 1013.189 1013.067 1012.946 1012.824 1012.702 1012.580 1012.459 1012.337 1012.215 1012.093 1011.972 1011.850 1011.728 1011.606 1011.485 1011.363 1011.241 1011.119 1010.998 1010.876 1010.754 1010.632 1010.511 1010.389 1010.267 1010.145 1010.024 1009.902 1009.780 1009.658 1009.537 1009.415 1009.293 1009.171 1009.050 1008.928 1008.806 1008.684 1008.563 1008.441 1008.319 1008.197 1008.076 1007.954 1007.832 1007.710 1007.589 1007.467 1007.345 1007.223 1007.102 1006.980 1006.858 1006.736 1006.615 1006.493 1006.371 1006.249 1006.128 1006.006 1005.884 1005.762 1005.641 1005.519 1005.397 1005.275 1005.154 1005.032 1004.910 1004.788 1004.667 1004.545 1004.423 1004.301 1004.180 1004.058 1003.936 1003.814 1003.693 1003.571 1003.449 1003.327 1003.206 1003.084 1002.962 1002.840 1002.719 1002.597 1002.475 1002.353 1002.232 1002.110 1001.988 1001.866 1001.745 1001.623 1001.501 1001.379 1001.258 1001.136 1001.014 1000.892 1000.771 1000.649 1000.527 1000.405 1000.284 1000.162 1000.040
STEADY-STATE HEAD (m)	Q=0.0660m³/s
DESIGN FLOW (l/s)	DN 355 HDPE PIPE CLASS PN 8

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client:

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, N





No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client:

ATHI WATER WORKS DEVELOPMENT AGENCY
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/afDB/KTSWSSP/W/08/2023

Reviewed By:

CAS CONSULTANTS LIMITED
Le' Mac Building, 1st Fl, Off Church Rd, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

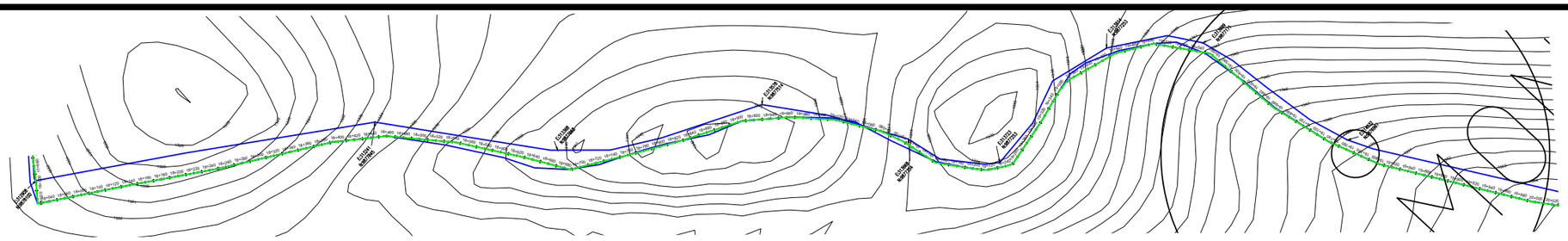
Drawing Title:

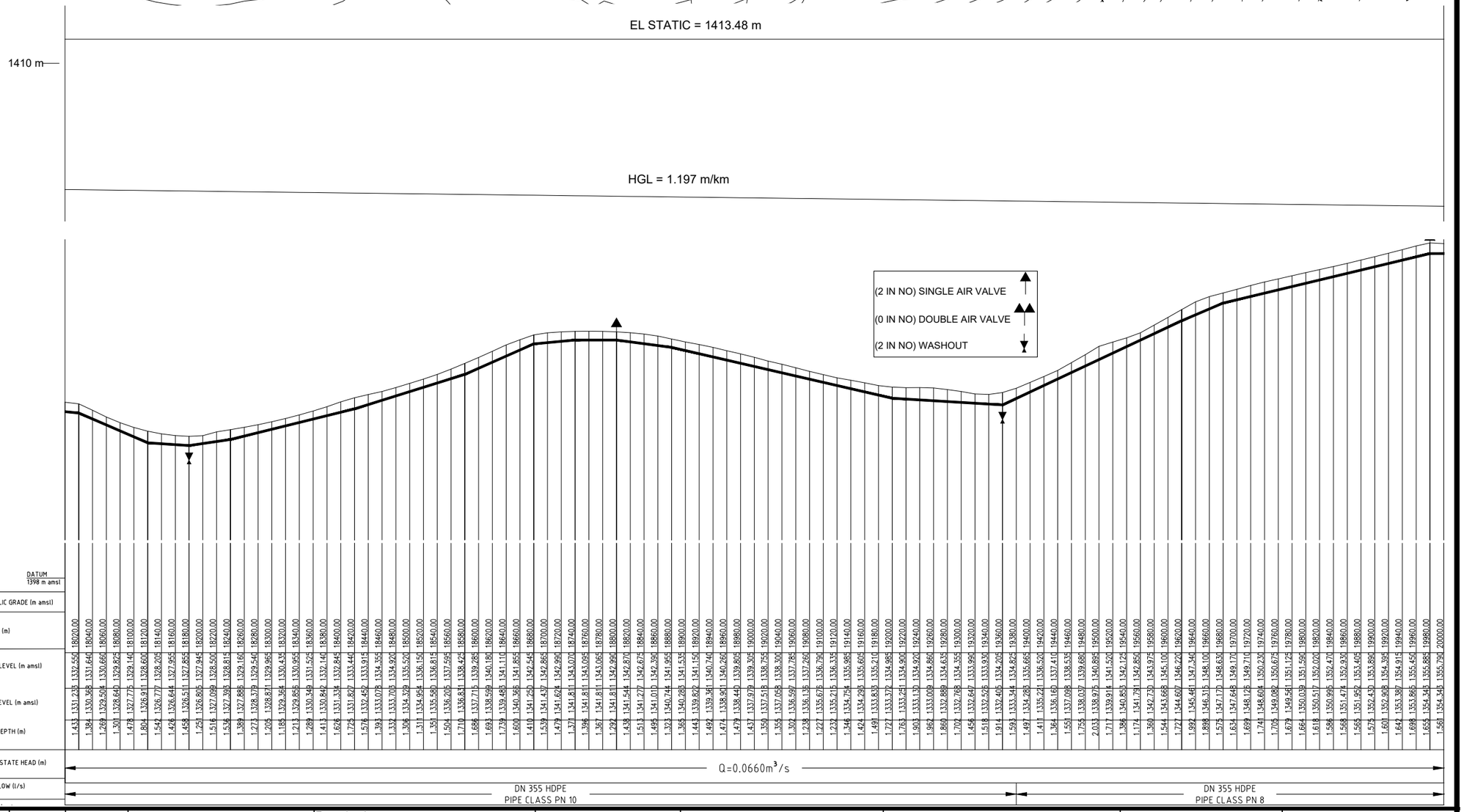
TREATMENT WORKS TO KYULUNI PRIMARY PUMP PIPELINE

PLAN AND PROFILE

FROM CH 16+ 000 TO CH 18 +000

Designed By	:	L.K
Drawn By	:	E.W.K
Checked By	:	G.I
Approved By	:	S.M.M
Client approval	:	
Date	:	MARCH 2023
Drawing No	:	AWSB/MC/KY/009





No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
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Client:
ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
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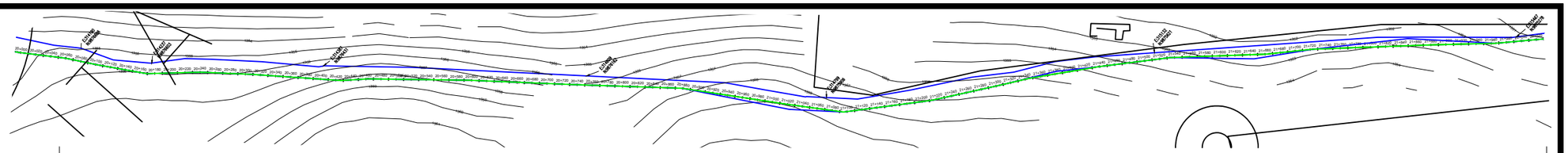
Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT
CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:
CAS CONSULTANTS LIMITED
Le' Mac Building, 1st Fl, Off Church Rd, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title:
TREATMENT WORKS TO KYULUNI PRIMARY PUMP PIPELINE
PLAN AND PROFILE
FROM CH 18+ 000 TO CH 20 +000

Designed By	:	L.K
Drawn By	:	E.W.K
Checked By	:	G.I
Approved By	:	S.M.M
Client approval	:	
Date	:	MARCH 2023
Drawing No	:	AWSB/MC/KY/010



EL STATIC = 1413.48 m

1410 m

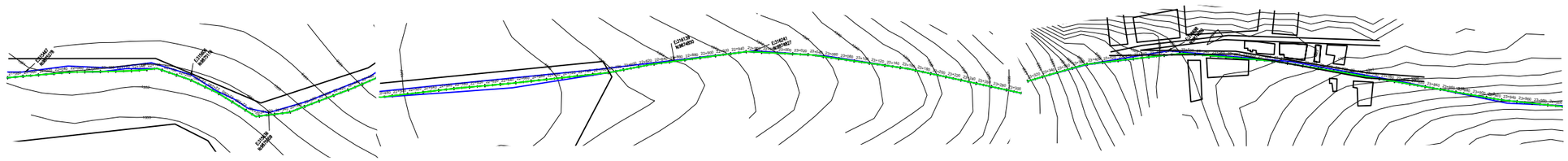
HGL = 1.209 m/km

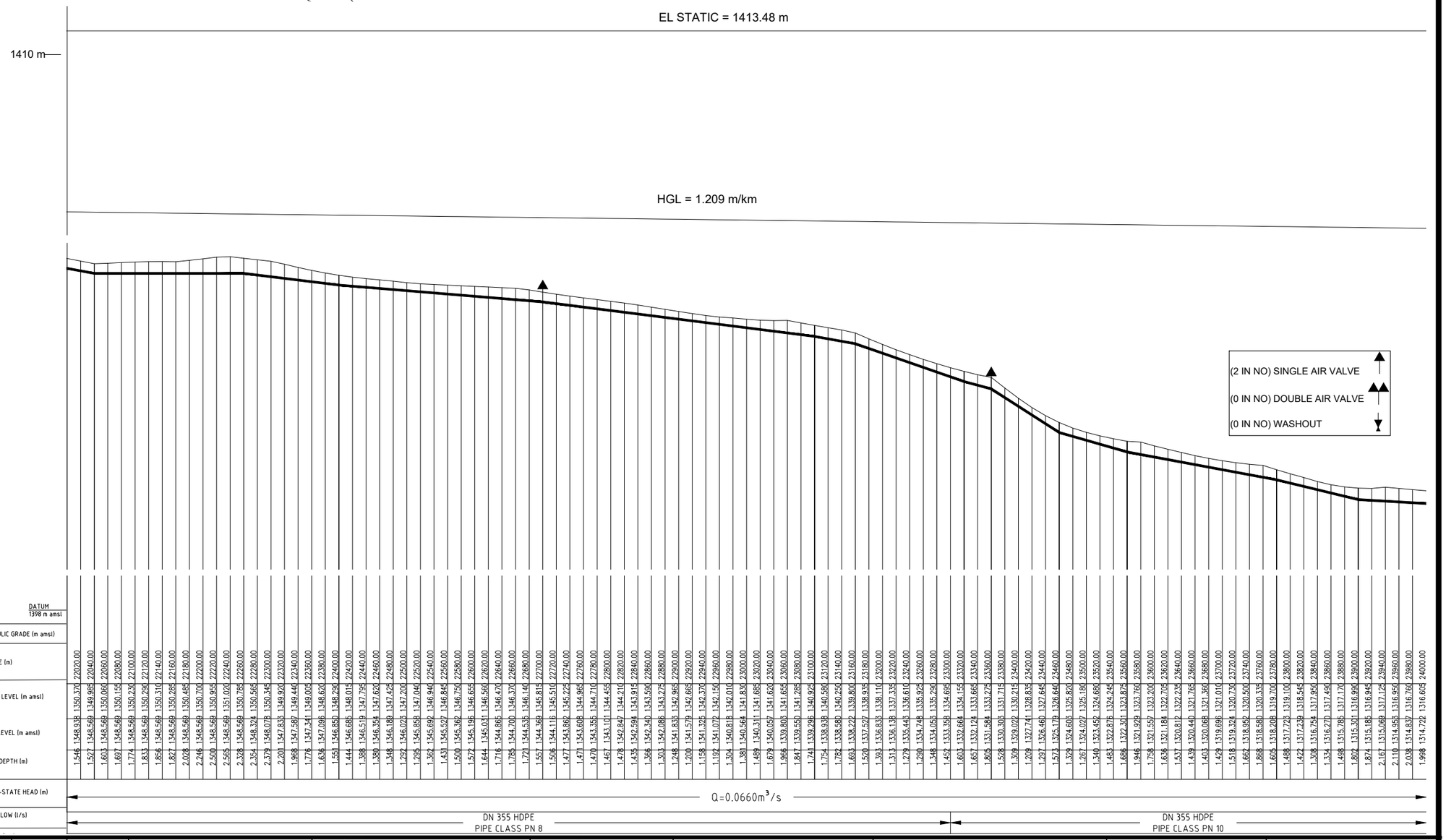
(3 IN NO) SINGLE AIR VALVE

(0 IN NO) DOUBLE AIR VALVE

(0 IN NO) WASHOUT

| DATUM 1398 m amsl | | |





DATUM	1398 m amsl
HYDRAULIC GRADE (m amsl)	1,546 1,527 1,603 1,697 1,774 1,833 1,856 1,827 2,028 2,246 2,500 2,565 2,328 2,354 2,379 2,201 1,968 1,776 1,635 1,551 1,444 1,388 1,380 1,348 1,297 1,295 1,362 1,431 1,500 1,572 1,644 1,716 1,785 1,721 1,557 1,506 1,477 1,471 1,470 1,467 1,478 1,435 1,368 1,301 1,248 1,200 1,158 1,192 1,304 1,381 1,489 1,679 1,966 1,847 1,741 1,754 1,782 1,693 1,520 1,393 1,311 1,279 1,290 1,348 1,452 1,601 1,657 1,805 1,528 1,309 1,209 1,291 1,571 1,329 1,267 1,340 1,483 1,688 1,946 1,758 1,636 1,537 1,439 1,403 1,429 1,518 1,662 1,868 1,605 1,488 1,422 1,308 1,334 1,498 1,807 1,874 2,161 2,110 2,038 1,998
CHAINAGE (m)	22020.00 22040.00 22060.00 22080.00 22100.00 22120.00 22140.00 22160.00 22180.00 22200.00 22220.00 22240.00 22260.00 22280.00 22300.00 22320.00 22340.00 22360.00 22380.00 22400.00 22420.00 22440.00 22460.00 22480.00 22500.00 22520.00 22540.00 22560.00 22580.00 22600.00 22620.00 22640.00 22660.00 22680.00 22700.00 22720.00 22740.00 22760.00 22780.00 22800.00 22820.00 22840.00 22860.00 22880.00 22900.00 22920.00 22940.00 22960.00 22980.00 23000.00 23020.00 23040.00 23060.00 23080.00 23100.00 23120.00 23140.00 23160.00 23180.00 23200.00 23220.00 23240.00 23260.00 23280.00 23300.00 23320.00 23340.00 23360.00 23380.00 23400.00 23420.00 23440.00 23460.00 23480.00 23500.00 23520.00 23540.00 23560.00 23580.00 23600.00 23620.00 23640.00 23660.00 23680.00 23700.00 23720.00 23740.00 23760.00 23780.00 23800.00 23820.00 23840.00 23860.00 23880.00 23900.00 23920.00 23940.00 23960.00 23980.00 24000.00
GROUND LEVEL (m amsl)	1350.570 1349.985 1350.069 1350.155 1350.230 1350.299 1350.310 1350.285 1350.488 1350.700 1350.955 1351.020 1350.785 1350.565 1350.345 1350.073 1349.920 1349.440 1349.065 1348.620 1348.290 1348.015 1347.795 1347.620 1347.425 1347.200 1347.040 1346.940 1346.750 1346.655 1346.470 1346.370 1346.140 1345.815 1345.510 1345.225 1344.965 1344.710 1344.455 1344.210 1343.915 1343.590 1343.272 1342.965 1342.665 1342.370 1342.150 1342.010 1341.830 1341.685 1341.620 1341.655 1341.285 1340.925 1340.598 1340.256 1339.800 1339.138 1338.110 1337.335 1336.610 1335.925 1335.290 1334.695 1334.155 1333.665 1333.225 1332.835 1332.445 1332.095 1331.795 1331.550 1331.360 1331.225 1331.145 1331.120 1331.150 1331.235 1331.375 1331.570 1331.820 1332.125 1332.485 1332.900 1333.370 1333.895 1334.475 1335.110 1335.800 1336.545 1337.345 1338.200 1339.110 1340.075 1341.095 1342.170 1343.300 1344.485 1345.725 1347.020 1348.370 1349.775 1351.235 1352.750 1354.320 1355.945 1357.625 1359.360 1361.150 1362.995 1364.895 1366.850 1368.860 1370.925 1373.045 1375.220 1377.450 1379.735 1382.075 1384.470 1386.920 1389.425 1391.985 1394.600 1397.270 1399.995 1402.775 1405.610 1408.500 1411.445 1414.445 1417.500 1420.610 1423.775 1426.995 1430.270 1433.600 1436.985 1440.425 1443.920 1447.470 1451.075 1454.735 1458.450 1462.220 1466.045 1469.925 1473.860 1477.850 1481.895 1485.995 1490.150 1494.360 1498.625 1502.945 1507.320 1511.750 1516.235 1520.775 1525.370 1530.020 1534.725 1539.485 1544.300 1549.170 1554.095 1559.075 1564.110 1569.200 1574.345 1579.545 1584.800 1590.110 1595.475 1600.895 1606.370 1611.900 1617.485 1623.125 1628.820 1634.570 1640.375 1646.235 1652.150 1658.120 1664.145 1670.225 1676.360 1682.550 1688.795 1695.095 1701.450 1707.860 1714.325 1720.845 1727.420 1734.050 1740.735 1747.475 1754.270 1761.120 1768.025 1774.985 1782.000 1789.070 1796.195 1803.375 1810.610 1817.900 1825.245 1832.645 1840.100 1847.610 1855.175 1862.795 1870.470 1878.200 1885.985 1893.825 1901.720 1909.670 1917.675 1925.735 1933.850 1942.020 1950.245 1958.525 1966.860 1975.250 1983.695 1992.195 2000.750 2009.360 2018.025 2026.745 2035.520 2044.350 2053.235 2062.175 2071.170 2080.220 2089.325 2098.485 2107.700 2116.970 2126.295 2135.675 2145.110 2154.600 2164.145 2173.745 2183.400 2193.110 2202.875 2212.695 2222.570 2232.500 2242.485 2252.525 2262.620 2272.770 2282.975 2293.235 2303.550 2313.920 2324.345 2334.825 2345.360 2355.950 2366.595 2377.295 2388.050 2398.860 2409.725 2420.645 2431.620 2442.650 2453.735 2464.875 2476.070 2487.320 2498.625 2509.985 2521.400 2532.870 2544.395 2555.975 2567.610 2579.300 2591.045 2602.845 2614.700 2626.610 2638.575 2650.595 2662.670 2674.800 2686.985 2699.225 2711.520 2723.870 2736.275 2748.735 2761.250 2773.820 2786.445 2799.125 2811.860 2824.650 2837.495 2850.395 2863.350 2876.360 2889.425 2902.545 2915.720 2928.950 2942.235 2955.575 2968.970 2982.420 2995.925 3009.485 3023.100 3036.770 3050.495 3064.275 3078.110 3092.000 3105.945 3119.945 3134.000 3148.110 3162.275 3176.495 3190.770 3205.100 3219.485 3233.925 3248.420 3262.970 3277.575 3292.235 3306.950 3321.720 3336.545 3351.425 3366.360 3381.350 3396.395 3411.495 3426.650 3441.860 3457.125 3472.445 3487.820 3503.250 3518.735 3534.275 3549.870 3565.520 3581.225 3596.985 3612.800 3628.670 3644.595 3660.575 3676.610 3692.700 3708.845 3725.045 3741.300 3757.610 3773.975 3790.395 3806.870 3823.400 3839.985 3856.625 3873.320 3890.070 3906.875 3923.735 3940.650 3957.620 3974.645 3991.725 4008.860 4026.050 4043.295 4060.595 4077.950 4095.360 4112.825 4130.345 4147.920 4165.550 4183.235 4200.975 4218.770 4236.620 4254.525 4272.485 4290.500 4308.570 4326.695 4344.875 4363.110 4381.400 4399.745 4418.145 4436.600 4455.110 4473.675 4492.295 4510.970 4529.700 4548.485 4567.325 4586.220 4605.170 4624.175 4643.235 4662.350 4681.520 4700.745 4720.025 4739.360 4758.750 4778.195 4797.695 4817.250 4836.860 4856.525 4876.245 4896.020 4915.850 4935.735 4955.675 4975.670 4995.720 5015.825 5035.985 5056.200 5076.470 5096.795 5117.175 5137.610 5158.100 5178.645 5199.245 5219.900 5240.610 5261.375 5282.195 5303.070 5324.000 5344.985 5366.025 5387.120 5408.270 5429.475 5450.735 5472.050 5493.420 5514.845 5536.325 5557.860 5579.450 5601.095 5622.795 5644.550 5666.360 5688.225 5710.145 5732.120 5754.150 5776.235 5798.375 5820.570 5842.820 5865.125 5887.485 5909.900 5932.370 5954.895 5977.475 6000.110 6022.800 6045.545 6068.345 6091.200 6114.110 6137.075 6160.095 6183.170 6206.300 6229.485 6252.725 6276.020 6299.370 6322.775 6346.235 6369.750 6393.320 6416.945 6440.625 6464.360 6488.150 6511.995 6535.895 6559.850 6583.860 6607.925 6632.045 6656.220 6680.450 6704.735 6729.075 6753.470 6777.920 6802.425 6826.985 6851.600 6876.270 6900.995 6925.775 6950.610 6975.500 7000.445 7025.445 7050.500 7075.610 7100.775 7125.995 7151.270 7176.600 7201.985 7227.425 7252.920 7278.470 7304.075 7329.735 7355.450 7381.220 7407.045 7432.925 7458.860 7484.850 7510.895 7536.995 7563.150 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18279.270 18322.475 18365.735 18409.050 18452.420 18495.845 18539.325 18582.860 18626.450 18670.095 18713.795 18757.550 18801.360 18845.225 18889.145 18933.120 18977.150 19021.235 19065.375 19109.570 19153.820 19198.125 19242.485 19286.900 19331.370 19375.895 19420.475 19465.110 19509.800 19554.545 19599.345 19644.200 19689.110 19734.075 19779.095 19824.170 19869.300 19914.485 19959.725 20005.020 20050.370 20095.775 20141.235 20186.750 20232.320 20277.945 20323.625 20369.360 20415.150 20460.995 20506.895 20552.850 20598.860 20644.925 20691.045 20737.220 20783.450 20829.735 20876.075 20922.470 20968.920 21015.425 21061.985 21108.600 21155.270 21201.995 21248.775 21295.610 21342.500 21389.445 21436.445 21483.500 21530.610 21577.775 21624.995 21672.270 21719.600 21766.985 21814.425 21861.920 21909.470 21957.075 22004.735 22052.450 22100.220 22148.045 22195.925 22243.860 22291.850 22339.895 22387.995 22436.150 22484.360 22532.625 22580.945 22629.320 22677.750 22726.235 22774.775 22823.370 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189101.300 189245.045 189388.845 189532.700 189676.610 189820.575 189964.595 190108.670 190252.800 190396.985 190541.225 190685.520 190829.870 190974.275 191118.735 191263.250 191407.820 191552.445 191697.125 191841.860 191986.650 192131.495 192276.395 192421.350 192566.360 192711.425 192856.545 193001.720 193146.950 193292.235 193437.575 193582.970 193728.420 193873.925 194019.485 194165.100 194310.770 194456.495 194602.275 194748.110 194894.000 195039.945 195185.945 195332.000 195478.110 195624.275 195770.495 195916.770 196063.100 196209.485 196355.925 196502.420 196648.970 196795.575 196942.235 197088.950 197235.720 197382.545 197529.425 197676.360 197823.350 197970.395 198117.495 198264.650 198411.860 198559.125 198706.445 198853.820 199001.250 199148.735 199296.275 199443.870 199591.520 199739.225 199886.985 200034.800 200182.670 200330.595 200478.575 200626.610 200774.700 200922.845 201071.045 201219.300 201367.610 201515.975 201664.395 201812.870 201961.400 202109.985 202258.625 202407.320 202556.070 202704.875 202853.735 203002.650 203151.620 203300.645 203449.725 203598.860 203748.050 203897.295 204046.595 204195.950 204345.360 204494.825 204644.345 204793.920 204943.550 205093.235 205242.975 205392.770 205542.620 205692.525 205842.485 205992.500 206142.570 206292.695 206442.875 206593.110 206743.400 206893.745 207044.145 207194.600 207345.110 207495.675 207646.295 207796.970 207947.700 208098.485 208249.325 208400.220 208551.170 208702.175 208853.235 209004.350 209155.520 209306.745 209458.025 209609.360 209760.750 209912.195 210063.695 210215.250 210366.860 210518.525 210670.245 210822.020 210973.850 211125.735 211277.675 211429.670 211581.720 211733.825 211885.985 212038.200 212190.470 212342.795 212495.175 212647.610 212800.100 212952.645 213105.245 213257.900 213410.610 213563.375 213716.195 213869.070 214022.000 214174.985 214328.025 214481.120 214634.270 214787.475 214940.735 215094.050 215247.420 215400.845 215554.325 215707.860 215861.450 216015.095 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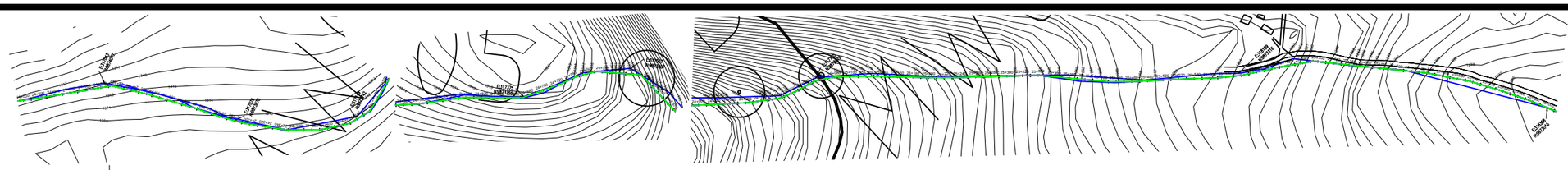
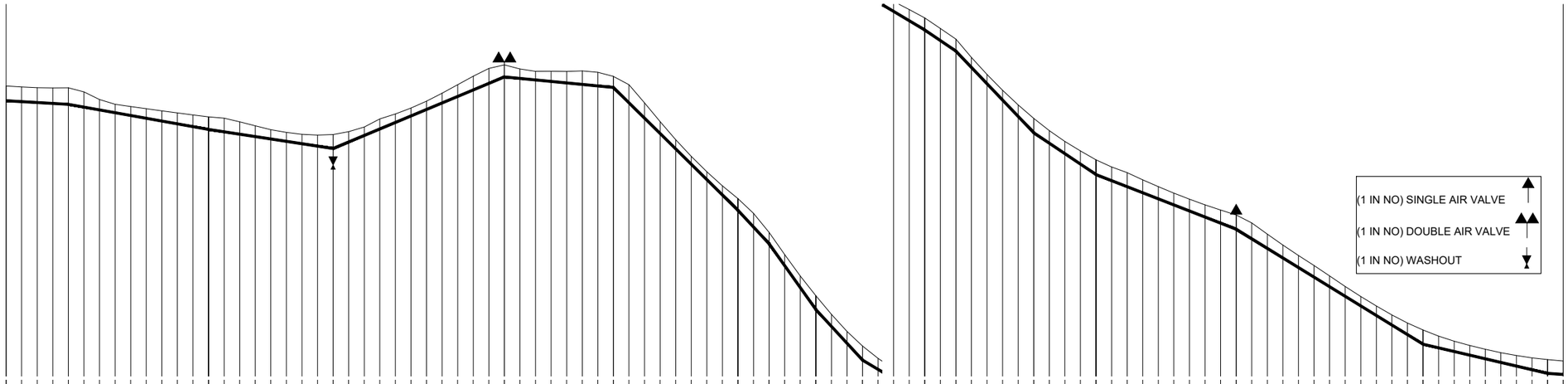


EL STATIC = 1413.48 m

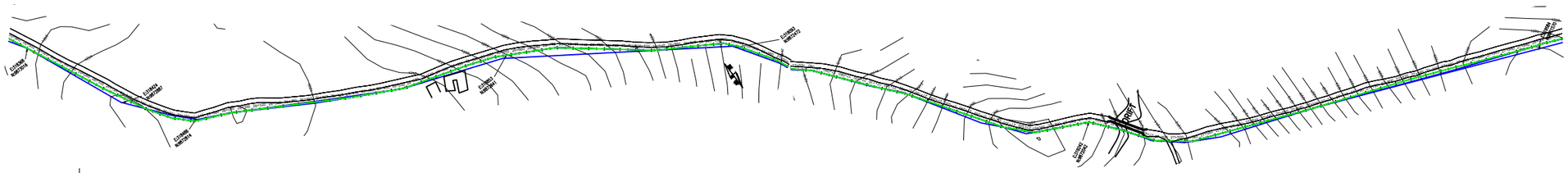
1410 m

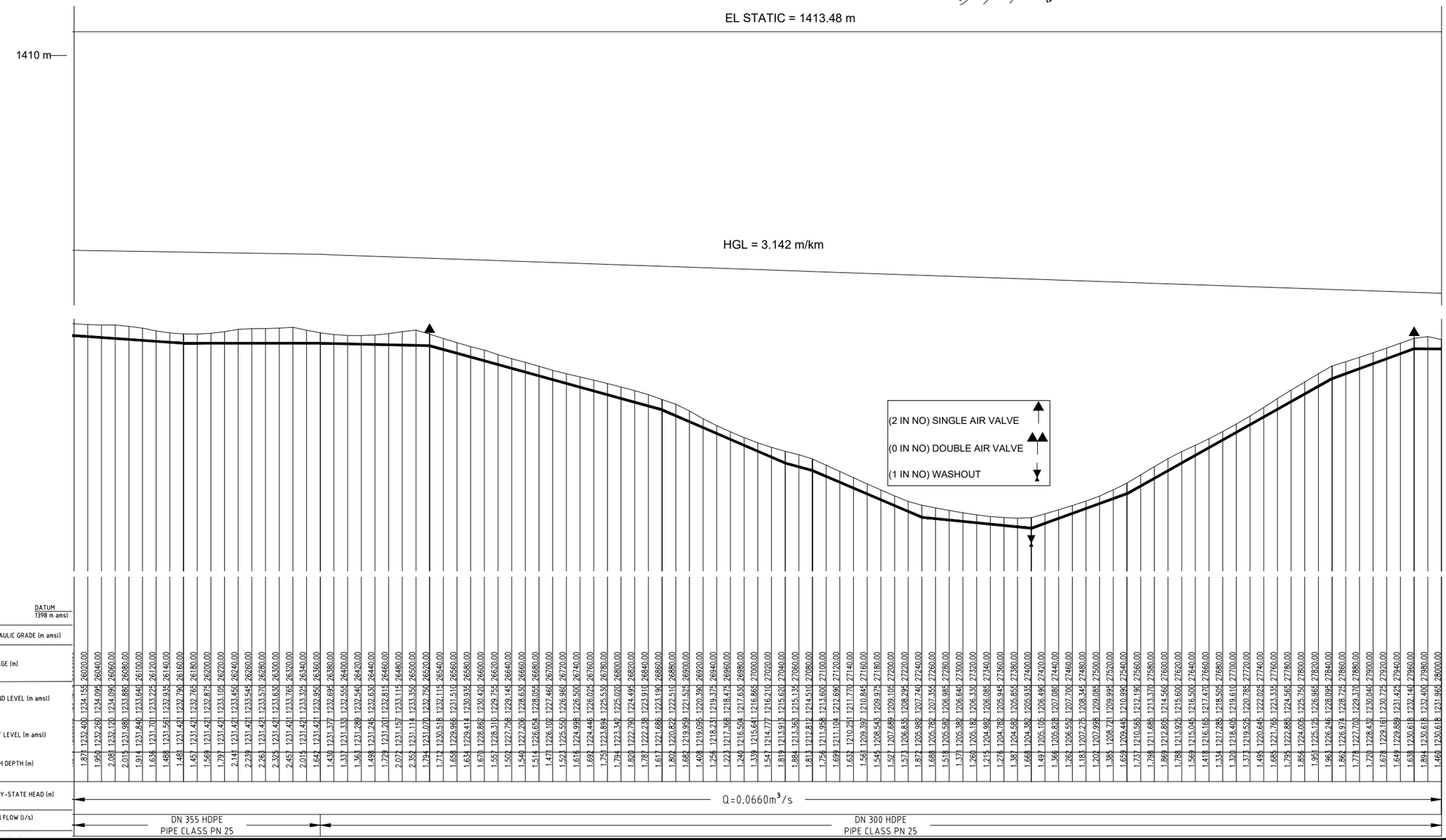
1410 m

HGL = 1.463 m/km



DATUM	1398 m amsl
HYDRAULIC GRADE (m amsl)	
CHAINAGE (m)	24020.00 24040.00 24060.00 24080.00 24100.00 24120.00 24140.00 24160.00 24180.00 24200.00 24220.00 24240.00 24260.00 24280.00 24300.00 24320.00 24340.00 24360.00 24380.00 24400.00 24420.00 24440.00 24460.00 24480.00 24500.00 24520.00 24540.00 24560.00 24580.00 24600.00 24620.00 24640.00 24660.00 24680.00 24700.00 24720.00 24760.00 24780.00 24800.00 24820.00 24840.00 24860.00 24880.00 24900.00 24920.00 24940.00 24960.00 25000.00 25020.00 25040.00 25060.00 25080.00 25100.00 25120.00 25140.00 25160.00 25180.00 25200.00 25220.00 25240.00 25260.00 25280.00 25300.00 25320.00 25340.00 25360.00 25380.00 25400.00 25420.00 25440.00 25460.00 25480.00 25500.00 25520.00 25540.00 25560.00 25580.00 25600.00 25620.00 25640.00 25660.00 25680.00 25700.00 25720.00 25740.00 25760.00 25780.00 25800.00 25820.00 25840.00 25860.00 25880.00 25900.00 25920.00 25940.00 25960.00 25980.00 26000.00
GROUND LEVEL (m amsl)	1316.485 1316.390 1316.360 1316.380 1315.850 1314.865 1314.255 1313.186 1313.970 1313.700 1313.160 1312.895 1312.480 1312.005 1311.500 1311.000 1310.665 1310.415 1310.315 1310.385 1310.755 1311.345 1312.385 1313.015 1313.780 1314.665 1316.775 1317.870 1318.865 1319.315 1318.785 1318.499 1318.505 1318.475 1318.545 1318.369 1317.850 1316.770 1314.440 1312.040 1310.513 1309.725 1307.585 1305.610 1302.165 1300.275 1298.519 1296.371 1294.995 1292.250 1289.720 1287.330 1285.135 1283.635 1281.470 1280.276 1278.240 1276.694 1275.341 1273.988 1273.180 1270.995 1269.802 1267.710 1267.085 1265.617 1263.525 1262.185 1260.845 1259.505 1258.165 1257.387 1256.608 1257.485 1256.052 1255.273 1254.286 1252.717 1251.939 1251.161 1252.985 1250.520 1249.125 1247.476 1246.247 1245.019 1243.791 1242.562 1241.334 1240.105 1238.878 1239.145 1238.410 1237.485 1236.610 1235.496 1236.800 1236.250 1235.335 1234.965 1234.082 1233.615 1233.147 1232.679 1232.539
INVERT LEVEL (m amsl)	1314.606 1314.490 1314.374 1314.258 1313.990 1313.543 1313.186 1312.827 1312.470 1312.112 1311.754 1311.397 1311.039 1310.734 1310.429 1310.123 1309.818 1309.513 1309.207 1308.902 1308.597 1309.430 1309.264 1309.098 1308.388 1308.544 1308.574 1308.604 1308.634 1308.664 1308.694 1308.724 1308.754 1308.784 1308.814 1308.844 1308.874 1308.904 1308.934 1308.964 1308.994 1309.024 1309.054 1309.084 1309.114 1309.144 1309.174 1309.204 1309.234 1309.264 1309.294 1309.324 1309.354 1309.384 1309.414 1309.444 1309.474 1309.504 1309.534 1309.564 1309.594 1309.624 1309.654 1309.684 1309.714





No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client:

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:

CAS CONSULTANTS LIMITED
Le' Mac Building, 1st Fl, Off Church Rd, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

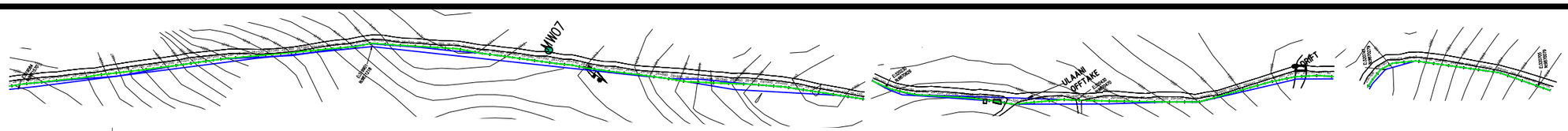
Drawing Title:

TREATMENT WORKS TO KYULUNI PRIMARY PUMP PIPELINE

PLAN AND PROFILE

FROM CH 26+ 000 TO CH 28 +000

Designed By	: L.K
Drawn By	: E.W.K
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/KY/014



EL STATIC = 1413.48 m

1410 m

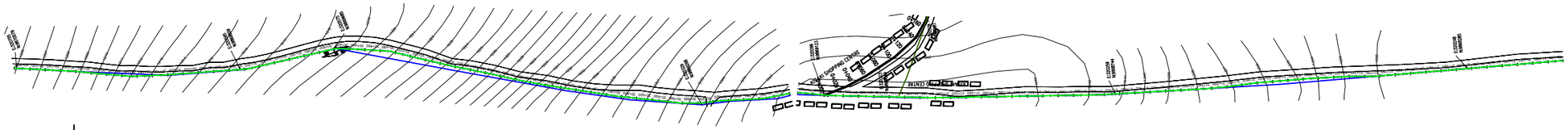
HGL = 3.378 m/km

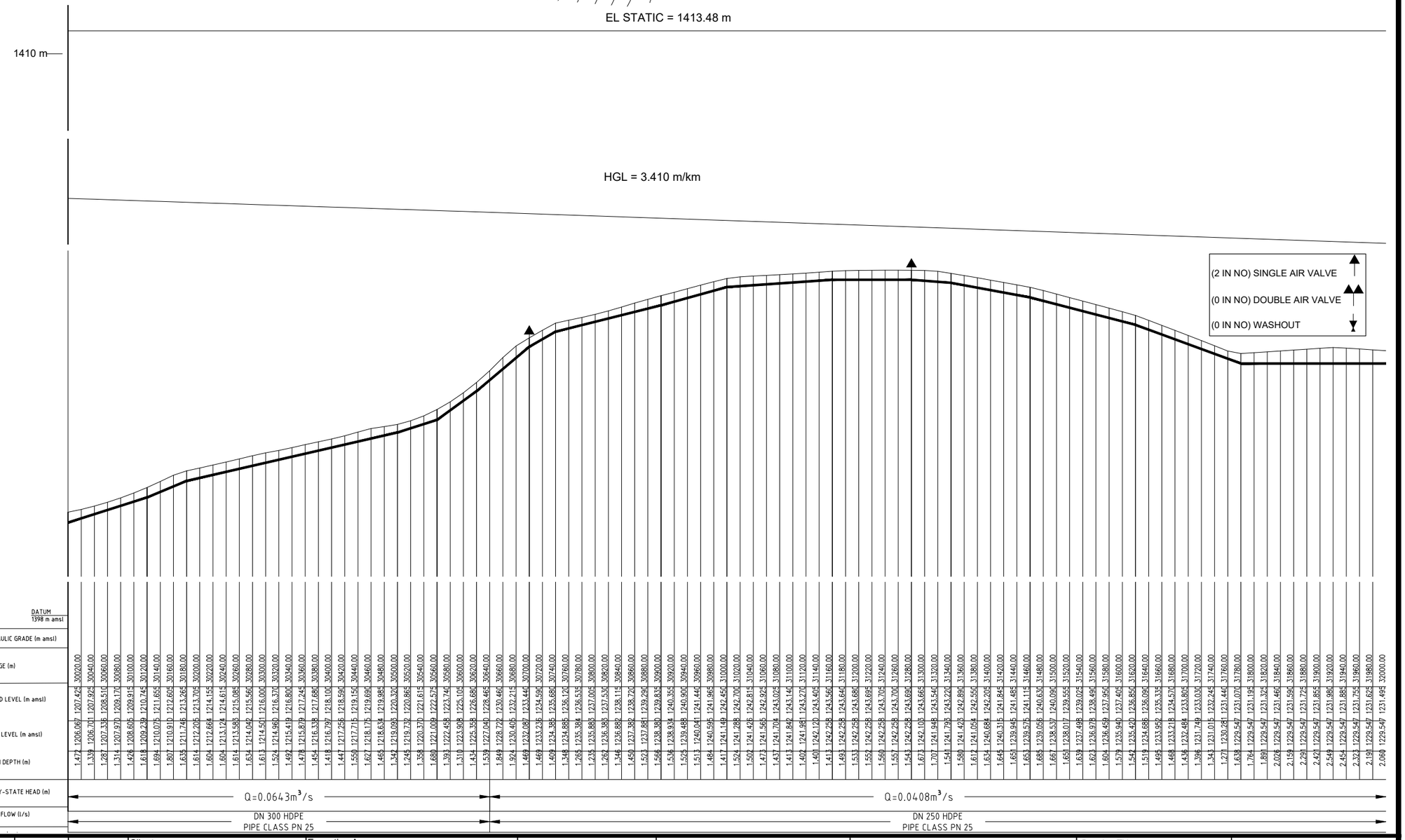
(0 IN NO) SINGLE AIR VALVE

(2 IN NO) DOUBLE AIR VALVE

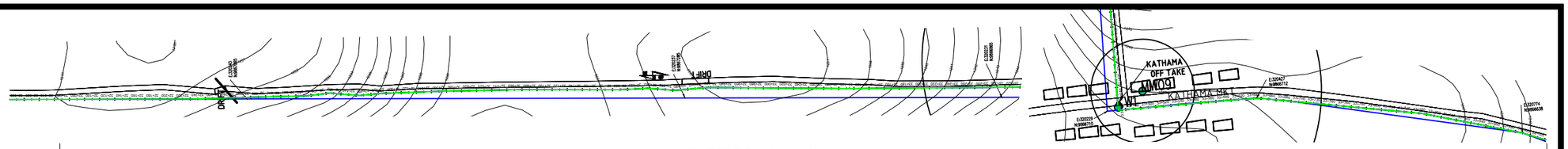
(3 IN NO) WASHOUT

| DATUM 1398 m amsl | | |





| DATUM 1398 m amsl | | |



EL STATIC = 1413.48 m

1410 m

HGL = 3.280 m/km

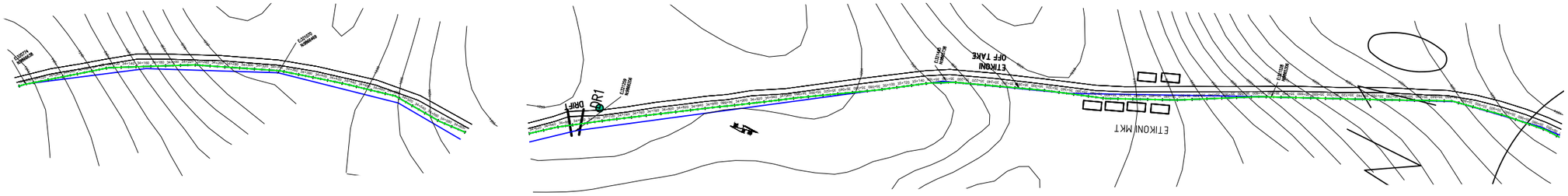
(2 IN NO) SINGLE AIR VALVE

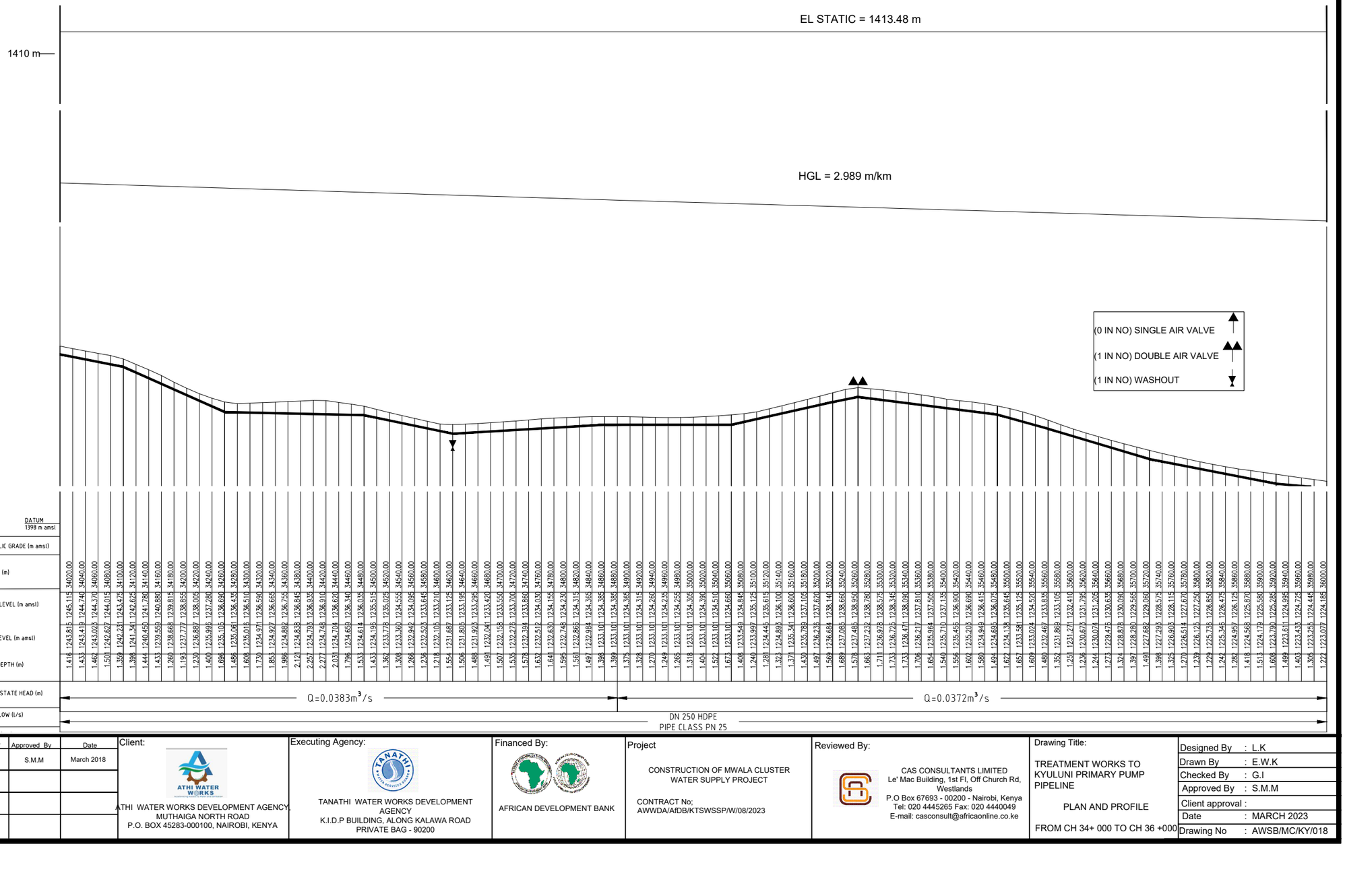
(1 IN NO) DOUBLE AIR VALVE

(2 IN NO) WASHOUT

DATUM
1398 m amsl

| | | |





No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client:

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K.I.D.P BUILDING, ALONG KALAWA ROAD
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AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:

CAS CONSULTANTS LIMITED
Le' Mac Building, 1st Fl, Off Church Rd, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

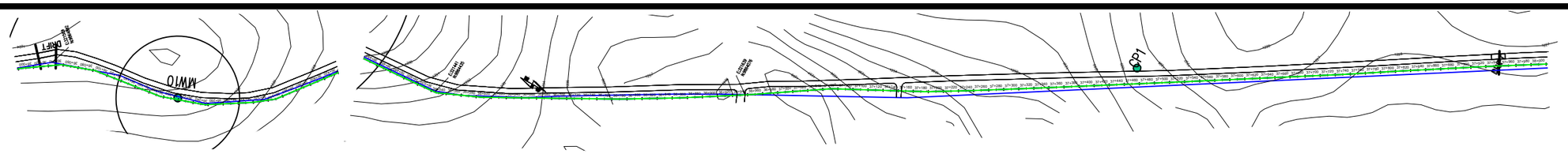
Drawing Title:

TREATMENT WORKS TO KYULUNI PRIMARY PUMP PIPELINE

PLAN AND PROFILE

FROM CH 34+ 000 TO CH 36 +000

Designed By	: L.K
Drawn By	: E.W.K
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/KY/018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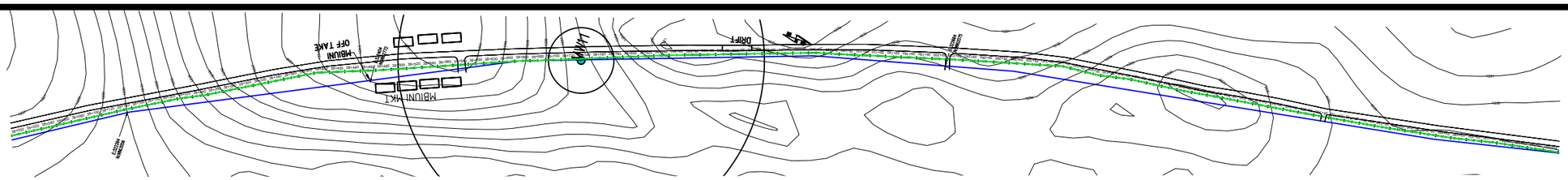

EL STATIC = 1413.48 m

1410 m

HGL = 2.543 m/km

(1 IN NO) SINGLE AIR VALVE
(2 IN NO) DOUBLE AIR VALVE
(2 IN NO) WASHOUT

DATUM	1398 m amsl
HYDRAULIC GRADE (m amsl)	
CHAINAGE (m)	0.000 20.000 40.000 60.000 80.000 100.000 120.000 140.000 160.000 180.000 200.000 220.000 240.000 260.000 280.000 300.000 320.000 340.000 360.000 380.000 400.000 420.000 440.000 460.000 480.000 500.000 520.000 540.000 560.000 580.000 600.000 620.000 640.000 660.000 680.000 700.000 720.000 740.000 760.000 780.000 800.000 820.000 840.000 860.000 880.000 900.000 920.000 940.000 960.000 980.000 1000.000 1020.000 1040.000 1060.000 1080.000 1100.000 1120.000 1140.000 1160.000 1180.000 1200.000 1220.000 1240.000 1260.000 1280.000 1300.000 1320.000 1340.000 1360.000 1380.000 1400.000 1420.000 1440.000 1460.000 1480.000 1500.000 1520.000 1540.000 1560.000 1580.000 1600.000 1620.000 1640.000 1660.000 1680.000 1700.000 1720.000 1740.000 1760.000 1780.000 1800.000 1820.000 1840.000 1860.000 1880.000 1900.000 1920.000 1940.000 1960.000 1980.000 2000.000 2020.000 2040.000 2060.000 2080.000 2100.000 2120.000 2140.000 2160.000 2180.000 2200.000 2220.000 2240.000 2260.000 2280.000 2300.000 2320.000 2340.000 2360.000 2380.000 2400.000 2420.000 2440.000 2460.000 2480.000 2500.000 2520.000 2540.000 2560.000 2580.000 2600.000 2620.000 2640.000 2660.000 2680.000 2700.000 2720.000 2740.000 2760.000 2780.000 2800.000 2820.000 2840.000 2860.000 2880.000 2900.000 2920.000 2940.000 2960.000 2980.000 3000.000 3020.000 3040.000 3060.000 3080.000 3100.000 3120.000 3140.000 3160.000 3180.000 3200.000 3220.000 3240.000 3260.000 3280.000 3300.000 3320.000 3340.000 3360.000 3380.000 3400.000 3420.000 3440.000 3460.000 3480.000 3500.000 3520.000 3540.000 3560.000 3580.000 3600.000 3620.000 3640.000 3660.000 3680.000 3700.000 3720.000 3740.000 3760.000 3780.000 3800.000 3820.000 3840.000 3860.000 3880.000 3900.000 3920.000 3940.000 3960.000 3980.000 4000.000
GROUND LEVEL (m amsl)	1227.640 1226.800 1227.915 1228.295 1228.790 1229.400 1230.100 1230.800 1231.500 1232.200 1232.900 1233.600 1234.300 1235.000 1235.700 1236.395 1236.984 1237.510 1237.980 1238.383 1238.750 1239.200 1239.663 1240.125 1240.465 1240.673 1240.840 1240.960 1241.024 1241.045 1241.015 1240.935 1240.745 1240.435 1240.026 1239.516 1238.906 1238.196 1237.386 1236.576 1235.765 1234.955 1234.145 1233.335 1232.525 1231.715 1230.905 1230.095 1229.285 1228.475 1227.665 1226.855 1226.045 1225.235 1224.425 1223.615 1222.805 1221.995 1221.185 1220.375 1219.565 1218.755 1217.945 1217.135 1216.325 1215.515 1214.705 1213.895 1213.085 1212.275 1211.465 1210.655 1209.845 1209.035 1208.225 1207.415 1206.605 1205.795 1204.985 1204.175 1203.365 1202.555 1201.745 1200.935 1200.125 1199.315 1198.505 1197.695 1196.885 1196.075 1195.265 1194.455 1193.645 1192.835 1192.025 1191.215 1190.405 1189.595 1188.785 1187.975 1187.165 1186.355 1185.545 1184.735 1183.925 1183.115 1182.305 1181.495 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1090.775 1089.965 1089.155 1088.345 1087.535 1086.725 1085.915 1085.105 1084.295 1083.485 1082.675 1081.865 1081.055 1080.245 1079.435 1078.625 1077.815 1077.005 1076.195 1075.385 1074.575 1073.765 1072.955 1072.145 1071.335 1070.525 1069.715 1068.905 1068.095 1067.285 1066.475 1065.665 1064.855 1064.045 1063.235 1062.425 1061.615 1060.805 1059.995 1059.185 1058.375 1057.565 1056.755 1055.945 1055.135 1054.325 1053.515 1052.705 1051.895 1051.085 1050.275 1049.465 1048.655 1047.845 1047.035 1046.225 1045.415 1044.605 1043.795 1042.985 1042.175 1041.365 1040.555 1039.745 1038.935 1038.125 1037.315 1036.505 1035.695 1034.885 1034.075 1033.265 1032.455 1031.645 1030.835 1030.025 1029.215 1028.405 1027.595 1026.785 1025.975 1025.165 1024.355 1023.545 1022.735 1021.925 1021.115 1020.305 1019.495 1018.685 1017.875 1017.065 1016.255 1015.445 1014.635 1013.825 1013.015 1012.205 1011.395 1010.585 1009.775 1008.965 1008.155 1007.345 1006.535 1005.725 1004.915 1004.105 1003.295 1002.485 1001.675 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292.925 292.115 291.305 290.495 289.685 288.875 288.065 287.255 286.445 285.635 284.825 284.015 283.205 282.395 281.585 280.775 279.965 279.155 278.345 277.535 276.725 275.915 275.105 274.295 273.485 272.675 271.865 271.055 270.245 269.435 268.625 267.815 267.005 266.195 265.385 264.575 263.765 262.955 262.145 261.335 260.525 259.715 258.905 258.095 257.285 256.475 255.665 254.855 254.045 253.235 252.425 251.615 250.805 249.995 249.185 248.375 247.565 246.755 245.945 245.135 244.325 243.515 242.705 241.895 241.085 240.275 239.465 238.655 237.845 237.035 236.225 235.415 234.605 233.795 232.985 232.175 231.365 230.555 229.745 228.935 228.125 227.315 226.505 225.695 224.885 224.075 223.265 222.455 221.645 220.835 220.025 219.215 218.405 217.595 216.785 215.975 215.165 214.355 213.545 212.735 211.925 211.115 210.305 209.495 208.685 207.875 207.065 206.255 205.445 204.635 203.825 203.015 202.205 201.395 200.585 199.775 198.965 198.155 197.345 196.535 195.725 194.915 194.105 193.295 192.485 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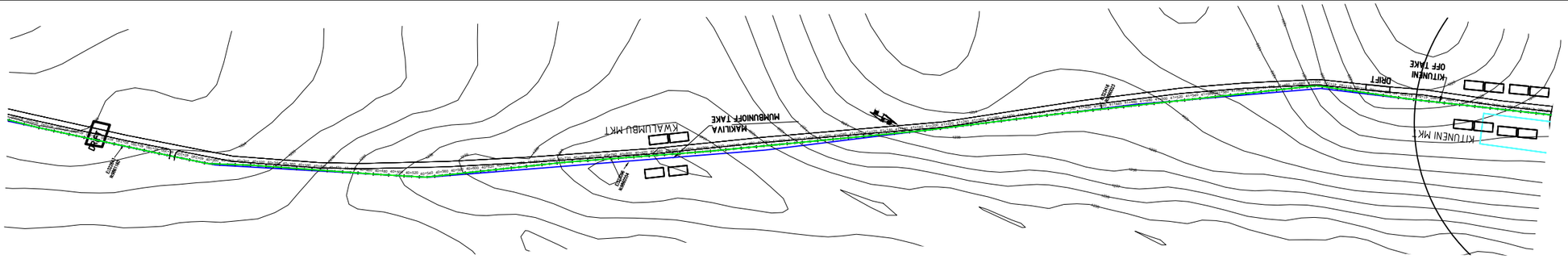
INVERT LEVEL (m amsl)	1226.388 1226.800 1227.211 1227.623 1228.035 1228.711 1228.386 1230.062 1230.738 1231.414 1232.090 1232.766 1233.442 1234.117 1234.793 1235.469 1236.145 1236.564 1236.982 1237.401 1237.819 1238.238 1238.657 1239.075 1239.494 1239.494 1239.494



EL STATIC = 1413.48 m

1410 m

HGL = 2.158 m/km

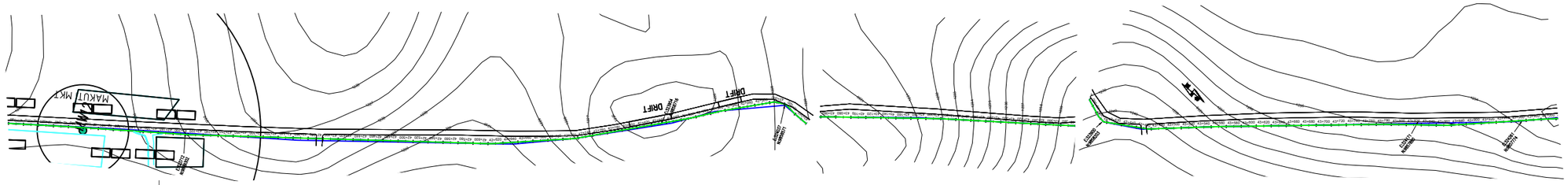
(0 IN NO) SINGLE AIR VALVE

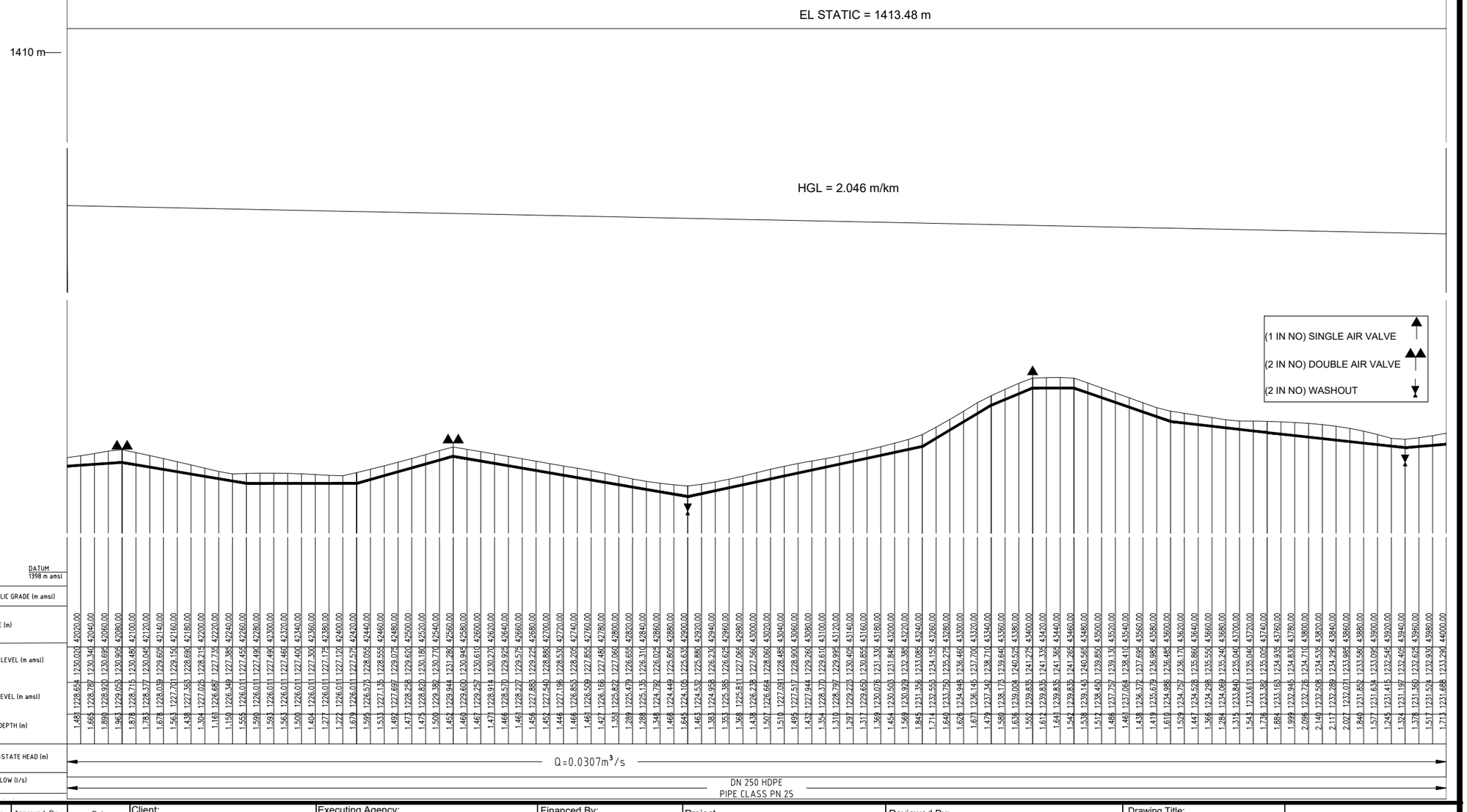
(1 IN NO) DOUBLE AIR VALVE

(1 IN NO) WASHOUT

DATUM
1398 m amsl

| | | |





No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client:

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:

CAS CONSULTANTS LIMITED
Le' Mac Building, 1st Fl, Off Church Rd, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

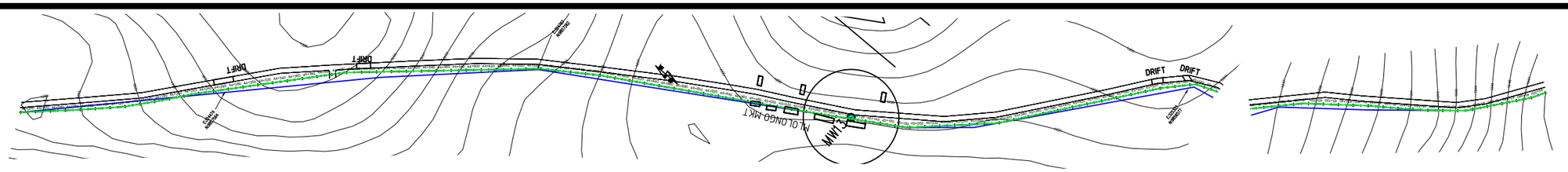
Drawing Title:

TREATMENT WORKS TO KYULUNI PRIMARY PUMP PIPELINE

PLAN AND PROFILE

FROM CH 42+ 000 TO CH 44 +000

Designed By	: L.K
Drawn By	: E.W.K
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/KY/022



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PLAN AND PROFILE

FROM CH 44+ 000 TO CH 46 +000

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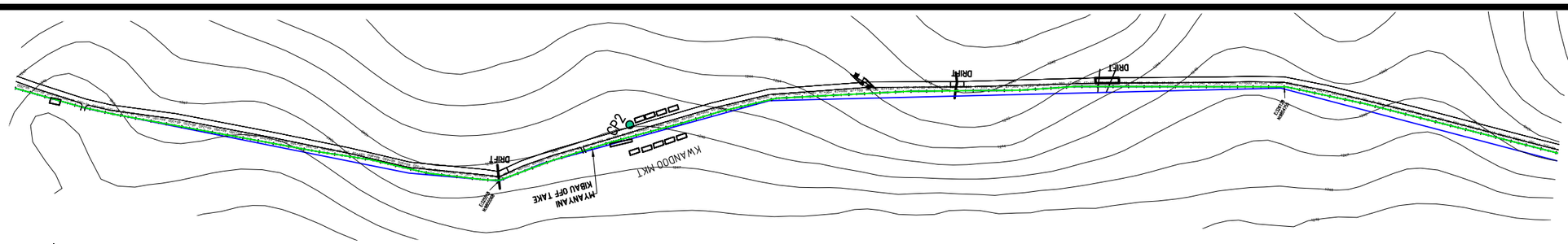
Drawn By	: E.W.K
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/KY/023



EL STATIC = 1413.48 m

1410 m

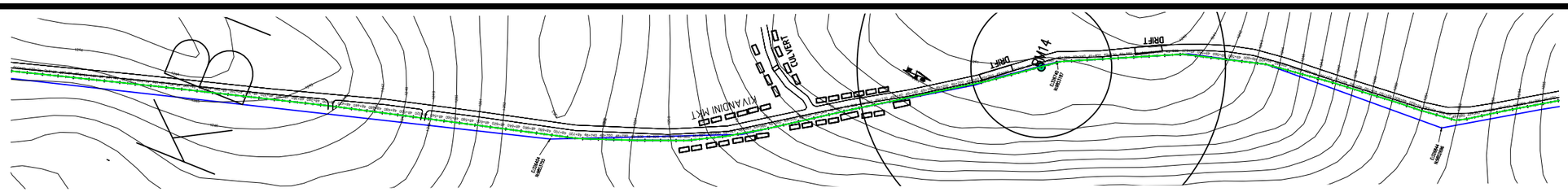
HGL = 4.653 m/km

(0 IN NO) SINGLE AIR VALVE

(2 IN NO) DOUBLE AIR VALVE

(0 IN NO) WASHOUT

| | DATUM 1398 m amsl | | |



EL STATIC = 1413.48 m

1410 m

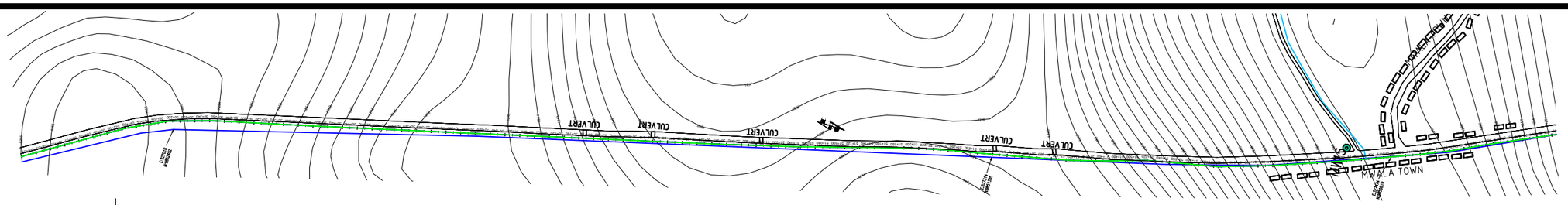
HGL = 4.653 m/km

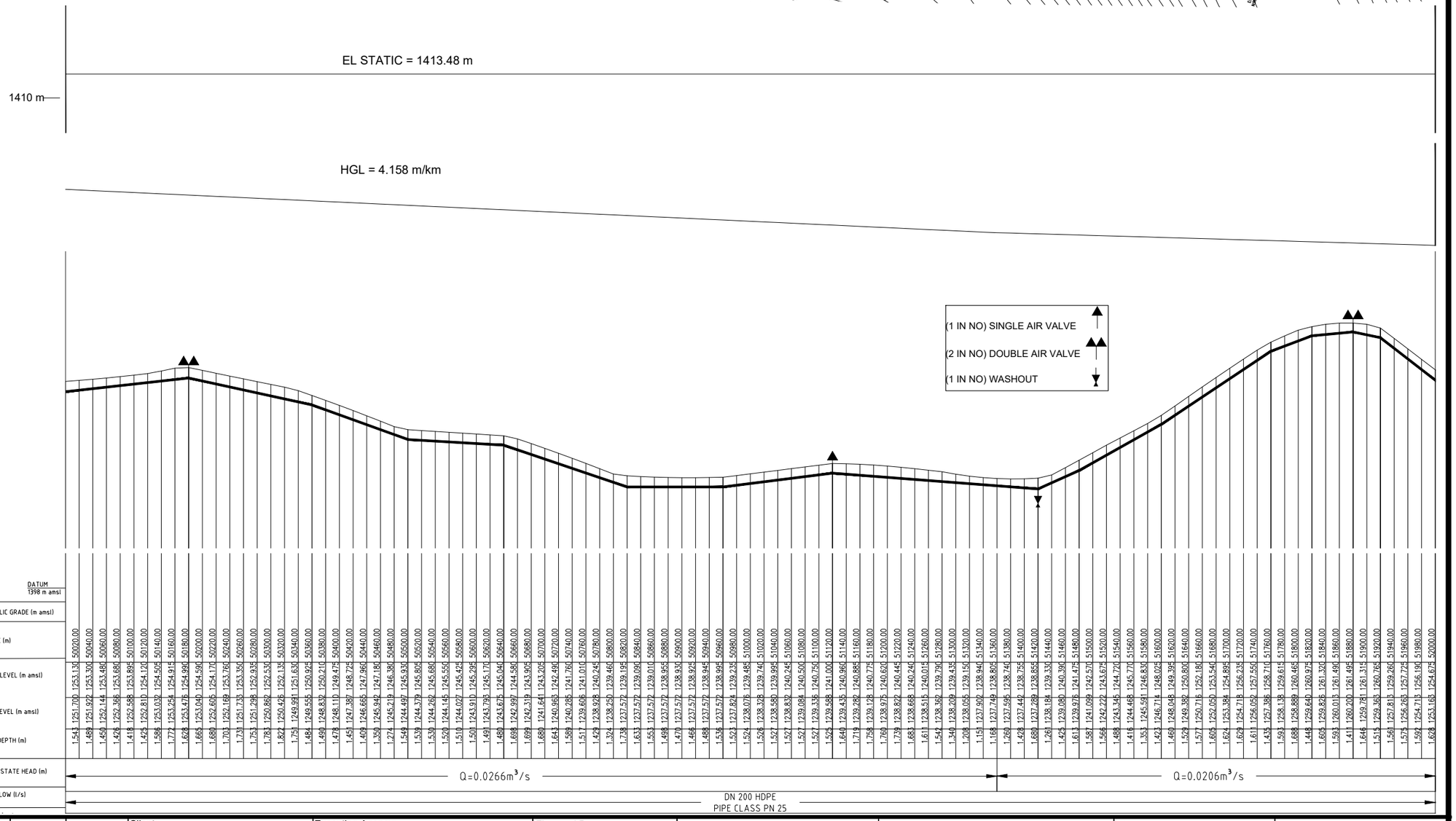
(0 IN NO) SINGLE AIR VALVE

(1 IN NO) DOUBLE AIR VALVE

(1 IN NO) WASHOUT

| | | |





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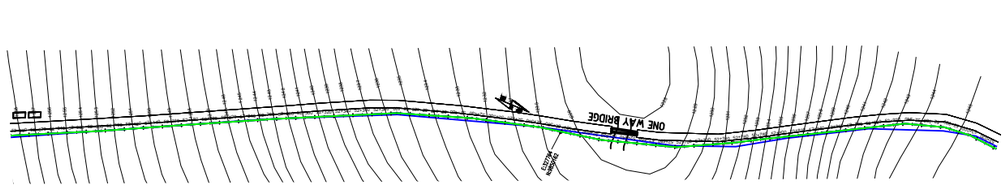
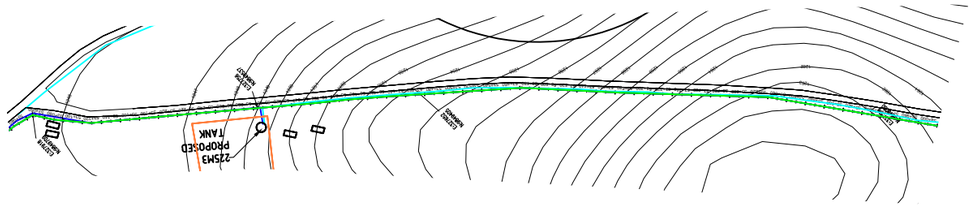
Drawing No	: AWSB/MC/KY/026





EL STATIC = 1413.48 m

1410 m

HGL = 2.893 m/km

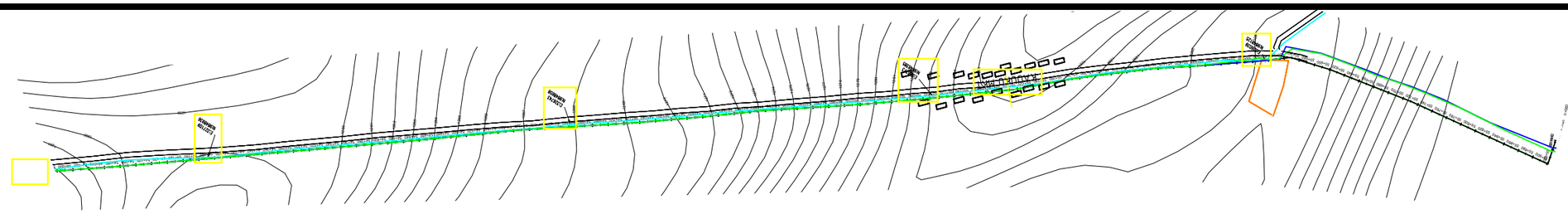
(1 IN NO) SINGLE AIR VALVE

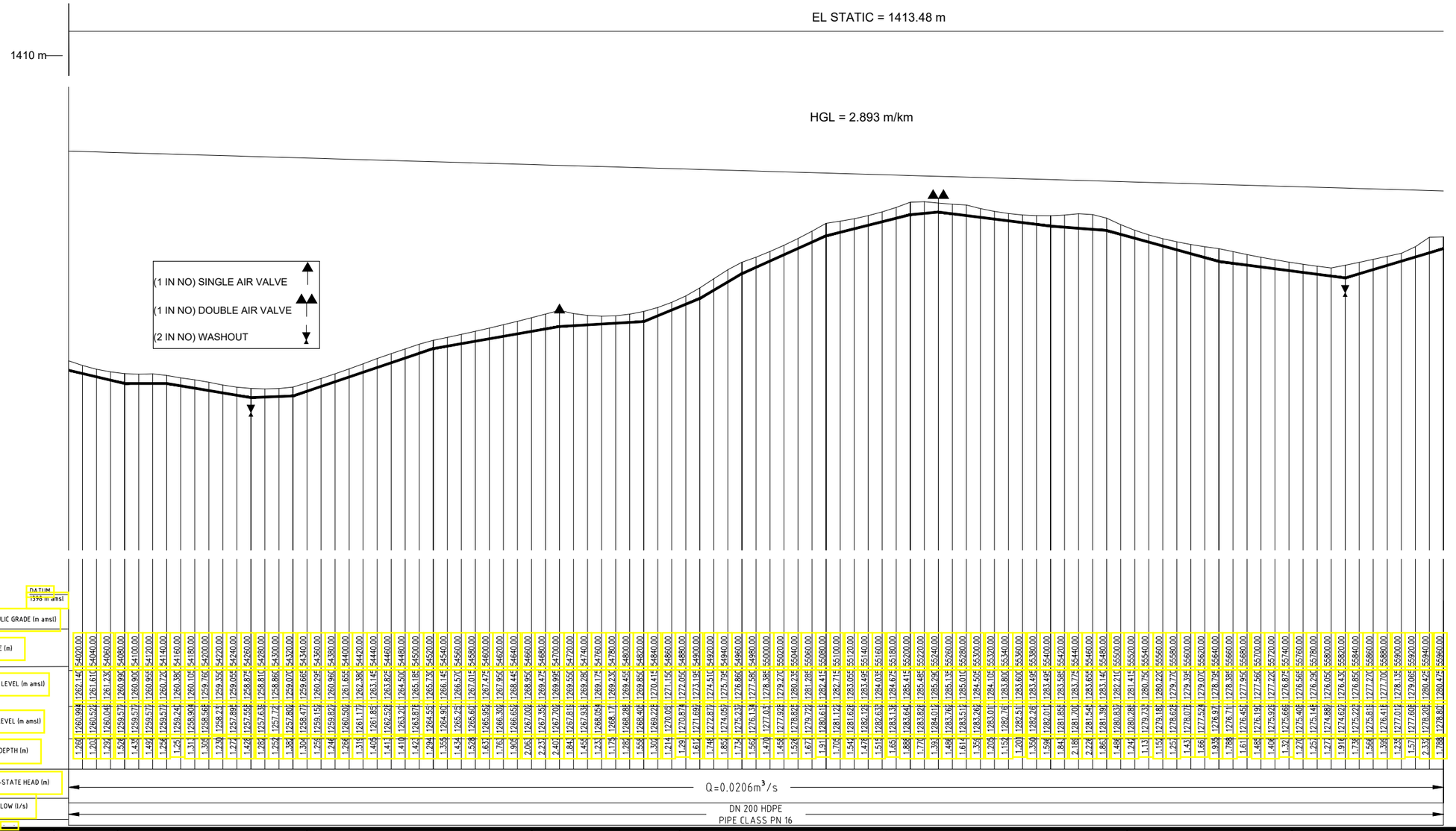
(1 IN NO) DOUBLE AIR VALVE

(1 IN NO) WASHOUT

DATUM 1398 m amsl

| | | |





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Client:

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:

CAS CONSULTANTS LIMITED
Le' Mac Building, 1st Fl, Off Church Rd, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

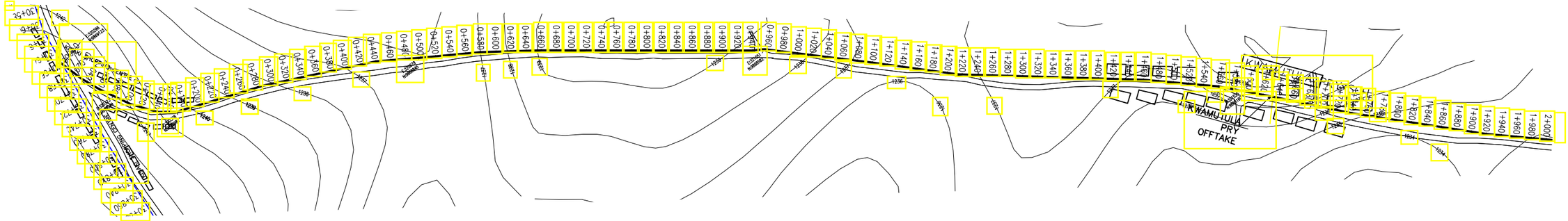
Drawing Title:

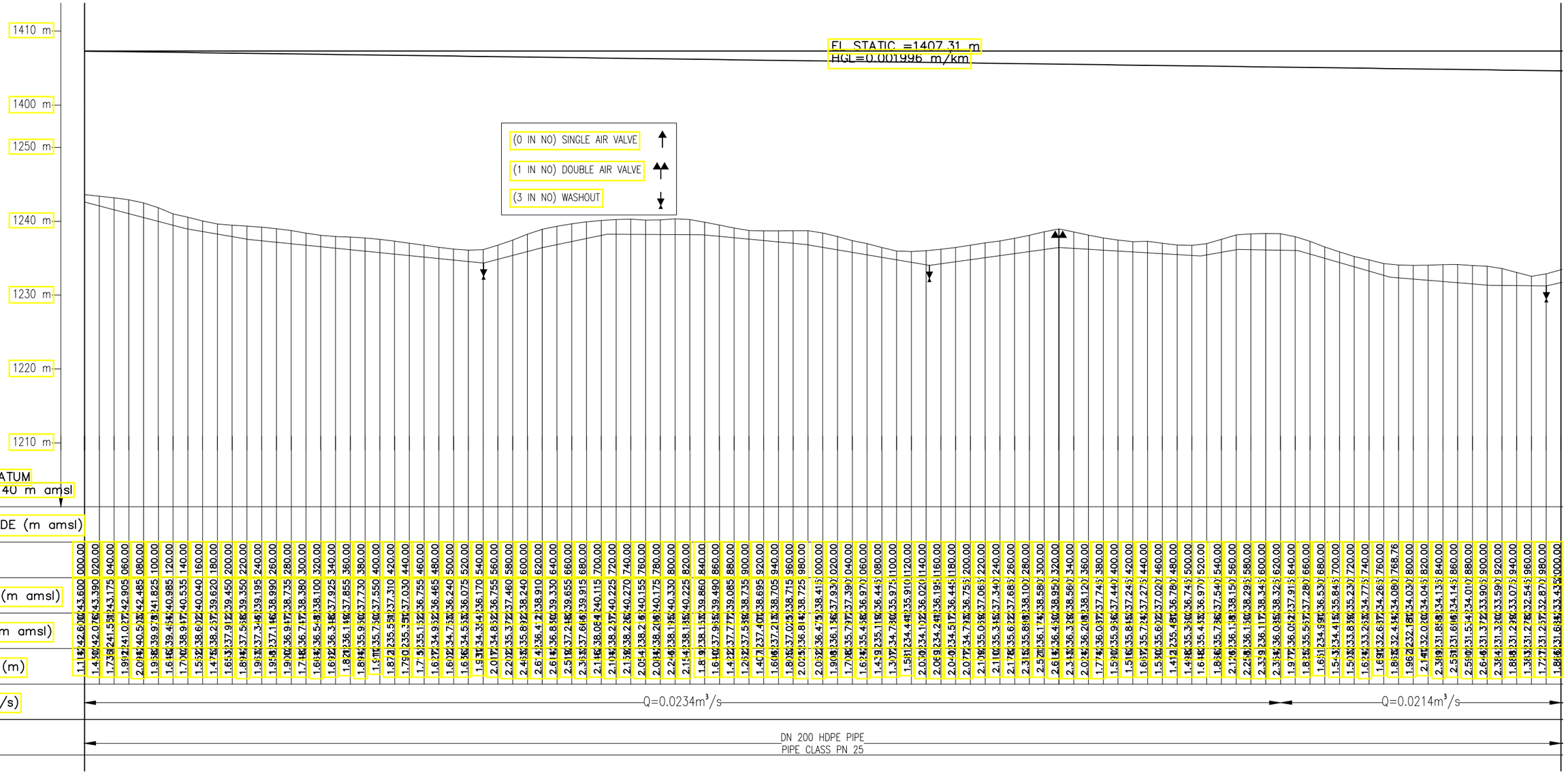
TREATMENT WORKS TO KYULUNI PRIMARY PUMP PIPELINE

PLAN AND PROFILE

FROM CH 54+ 000 TO CH 55 +940

Designed By	:	L.K
Drawn By	:	E.W.K
Checked By	:	G.I
Approved By	:	S.M.M
Client approval	:	
Date	:	MARCH 2023
Drawing No	:	AWSB/MC/KY/028





No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	MARCH 2023
2.				
3.				
4.				

Client:

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPLLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:

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P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

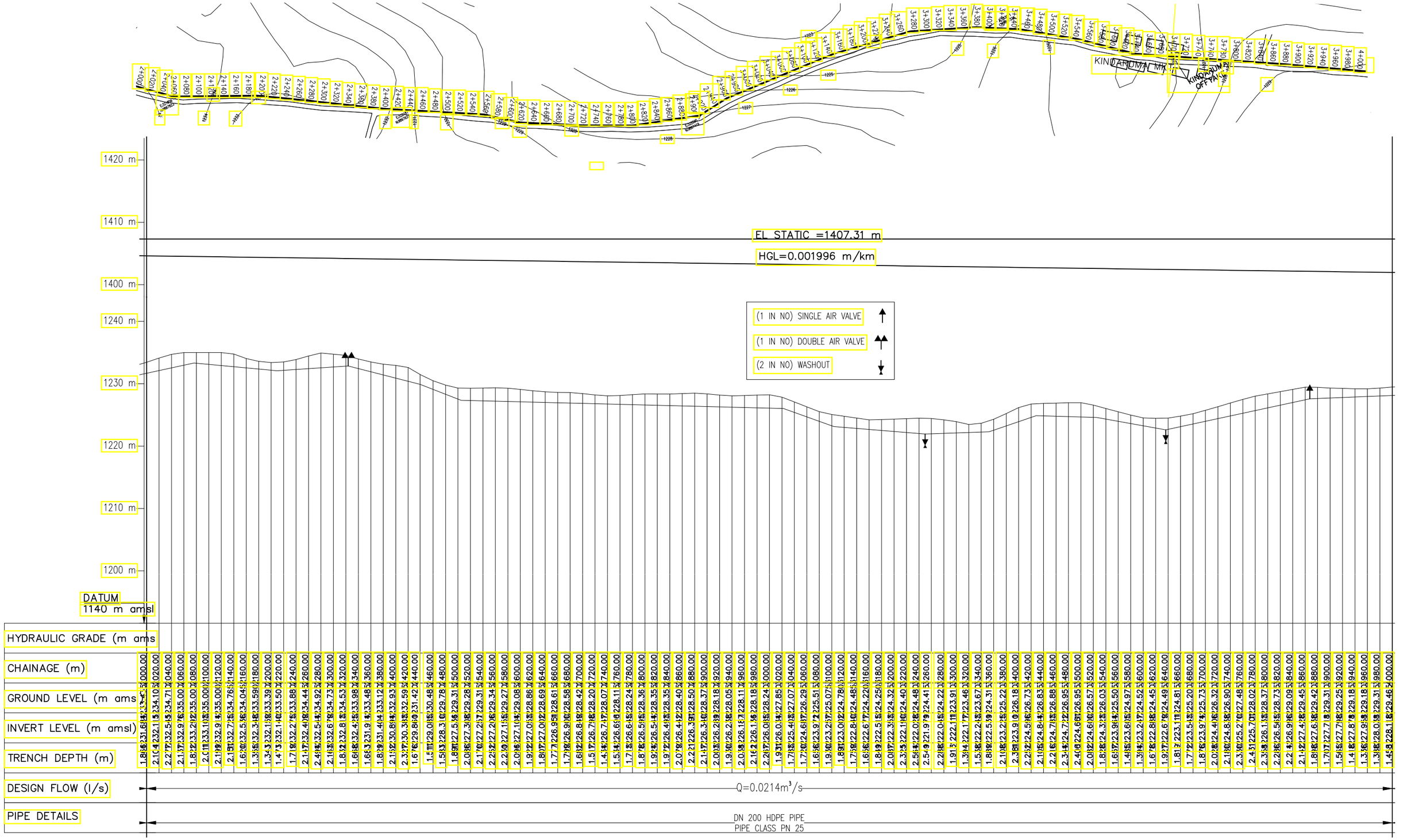
Drawing Title:

KABAA TO WAMUNYU PIPELINE

PLAN AND PROFILE

FROM CH 0 + 000 TO CH 2 +000

Designed By	: L.K
Drawn By	: E.O
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/KW/001



No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	May 2018
2.				
3.				
4.				

Client:

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPLLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:

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P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

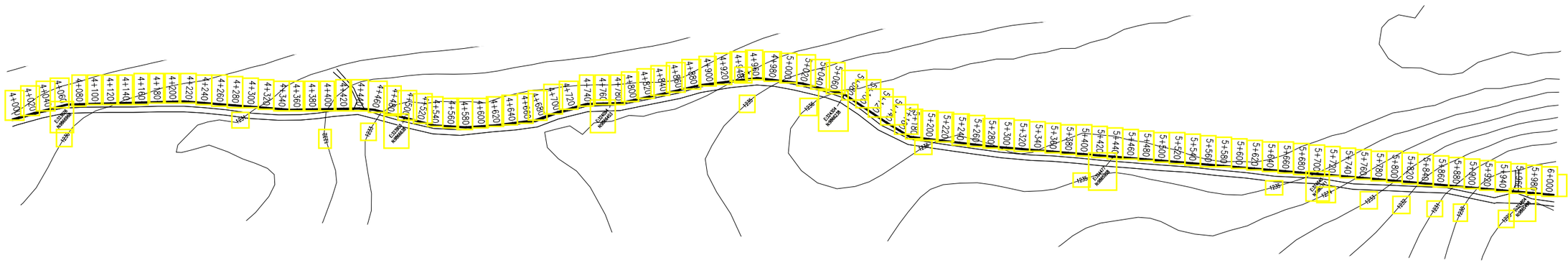
Drawing Title:

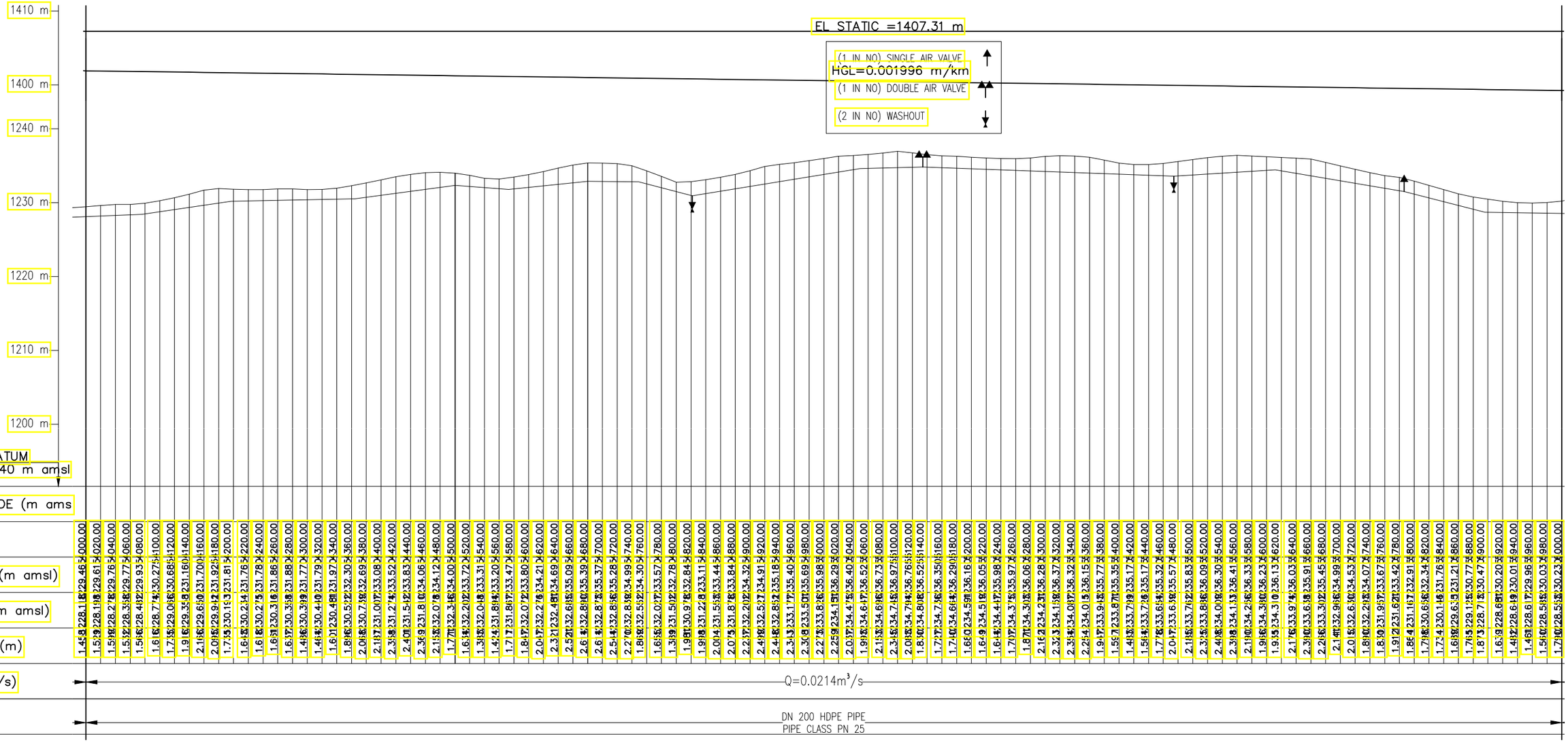
KABAA TO WAMUNYU PIPELINE

PLAN AND PROFILE

FROM CH 2 + 000 TO CH 4 +000

Designed By	: L.K
Drawn By	: E.O
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/KW/002





No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	May 2018
2.				
3.				
4.				

Client:

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPLLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:

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P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

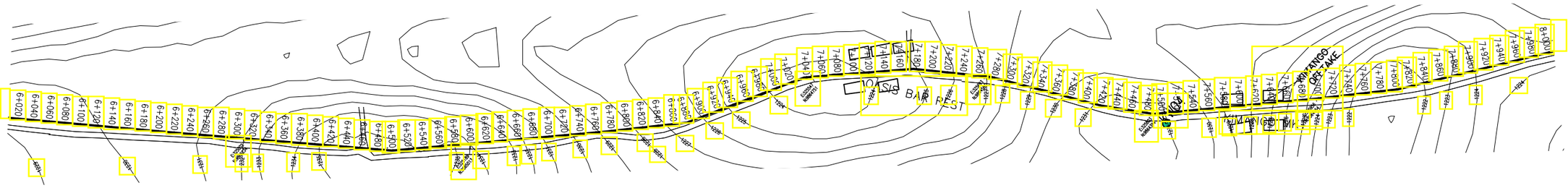
Drawing Title:

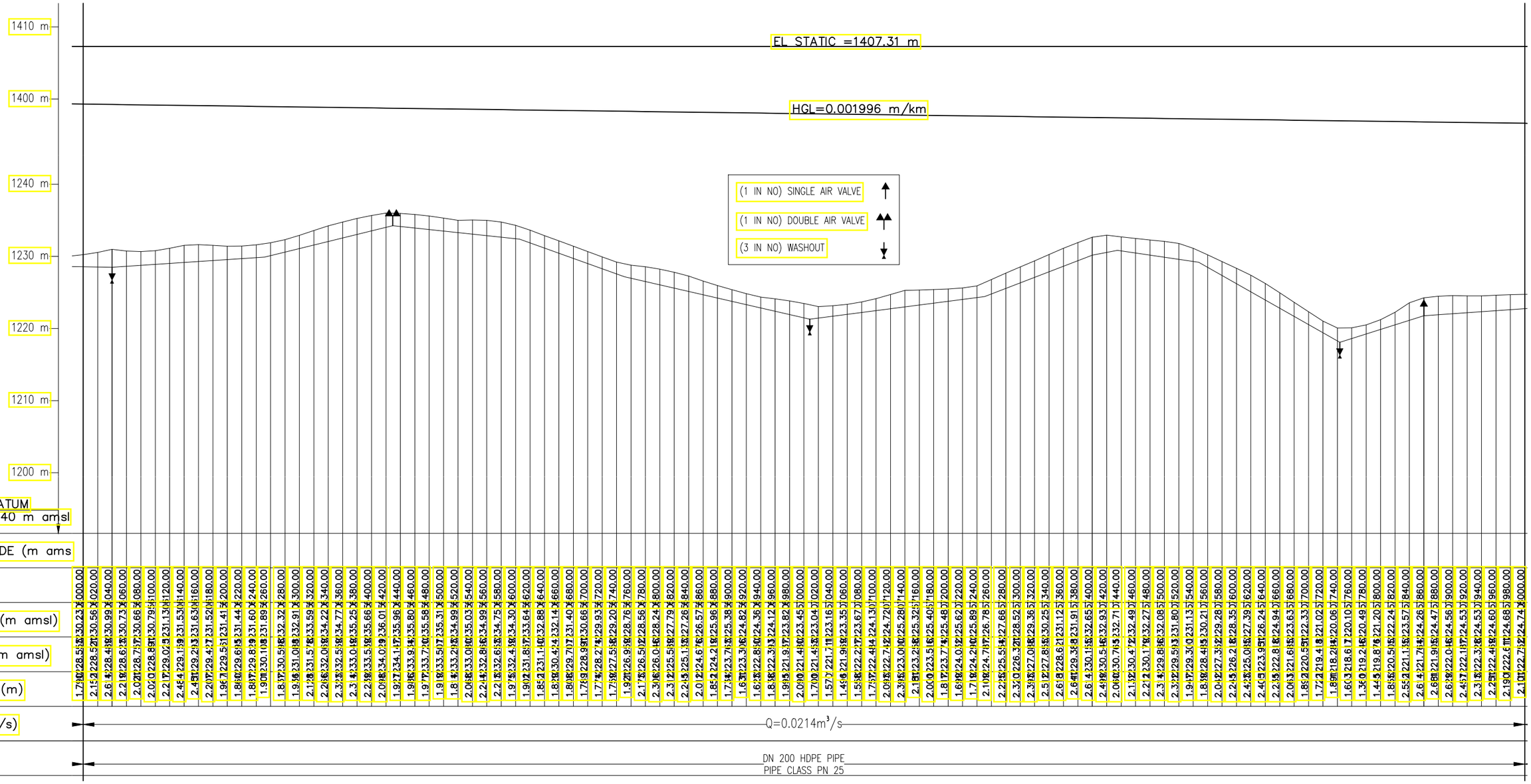
KABAA TO WAMUNYU PIPELINE

PLAN AND PROFILE

FROM CH 4 + 000 TO CH 6 +000

Designed By	: L.K
Drawn By	: E.O
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/KW/JM/003





No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	May 2018
2.				
3.				
4.				

Client:

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:

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P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

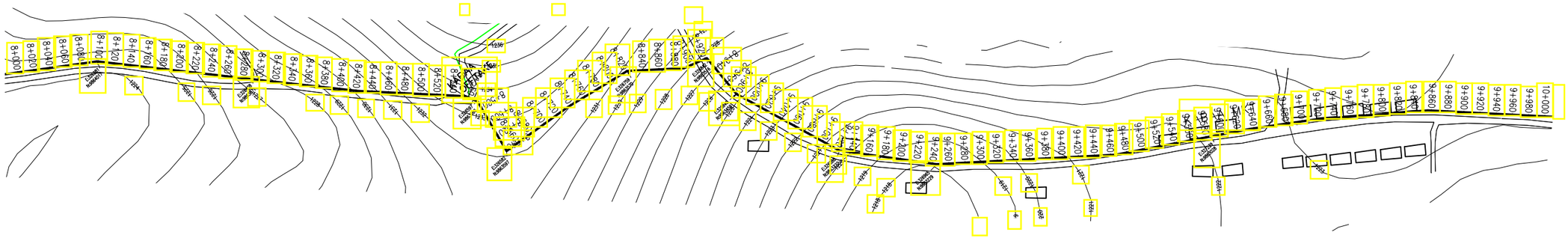
Drawing Title:

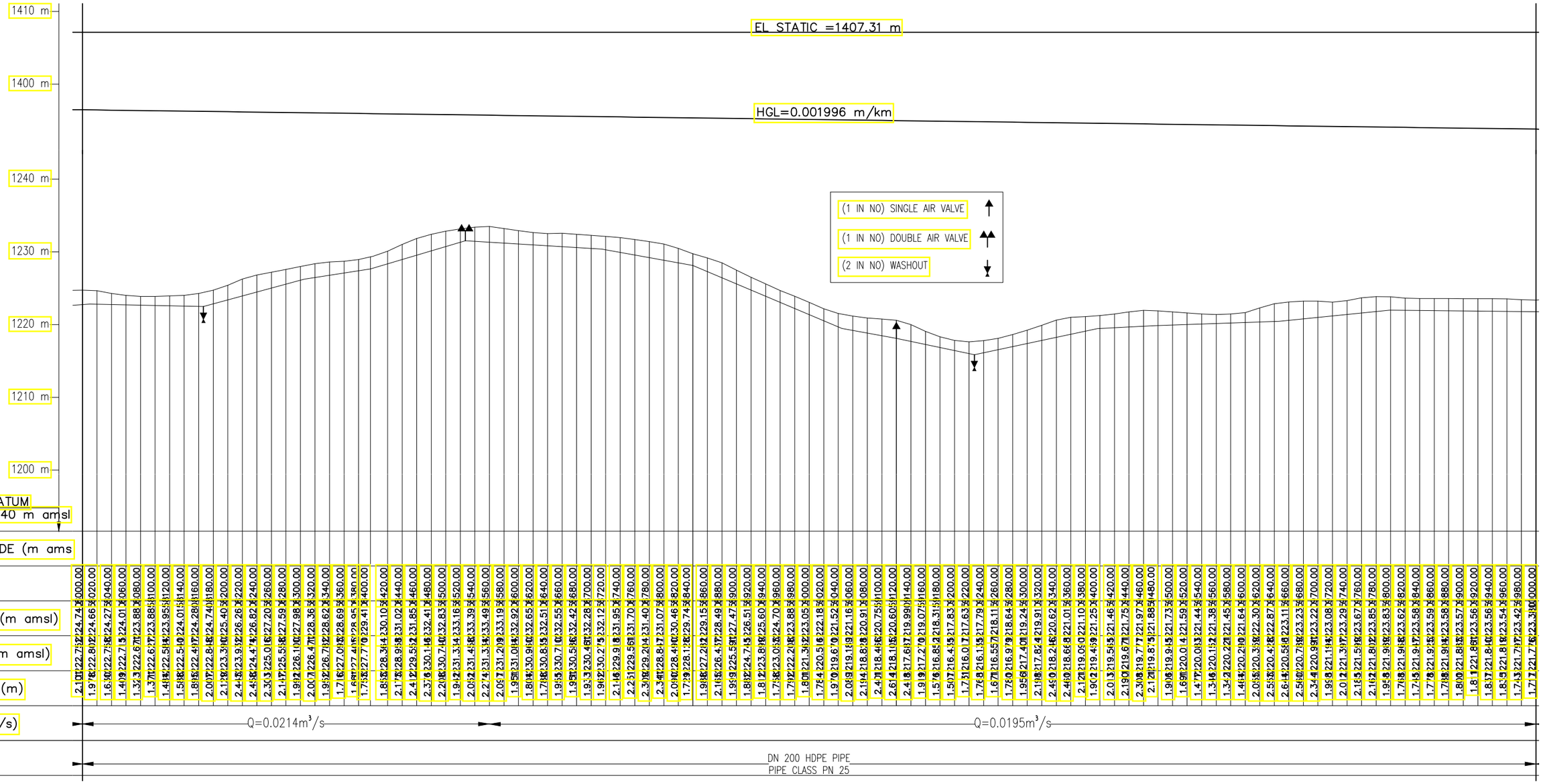
KABAA TO WAMUNYU PIPELINE

PLAN AND PROFILE

FROM CH 6 + 000 TO CH 8 +000

Designed By	: L.K
Drawn By	: E.O
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/KW/004





No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	May 2018
2.				
3.				
4.				

Client:

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPLLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:

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P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

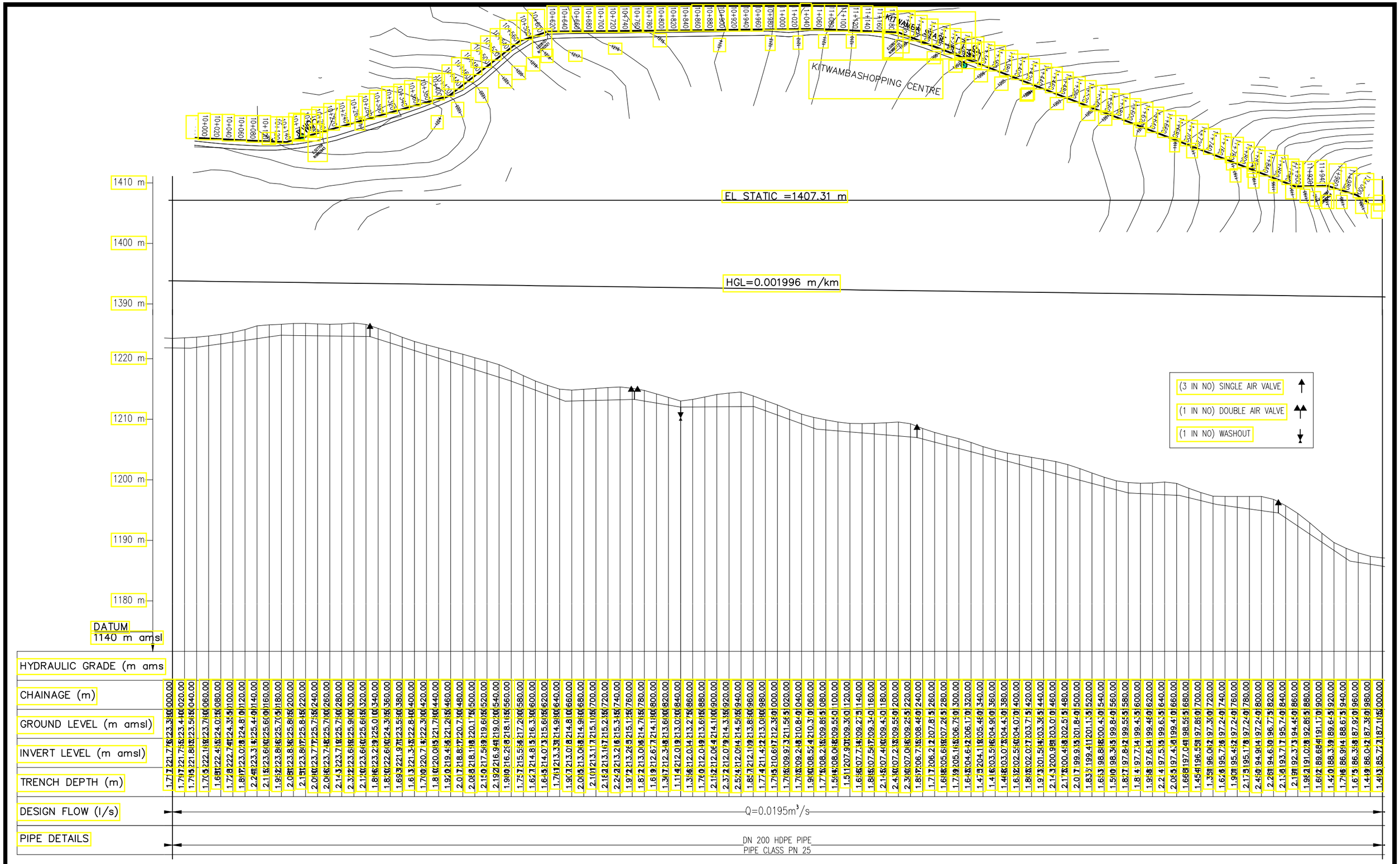
Drawing Title:

KABAA TO WAMUNYU PIPELINE

PLAN AND PROFILE

FROM CH 8 + 000 TO CH 10 +000

Designed By	: L.K
Drawn By	: E.O
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/KW/005



No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	May 2018
2.				
3.				
4.				

Client:

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPLLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:

CAS CONSULTANTS LIMITED
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P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

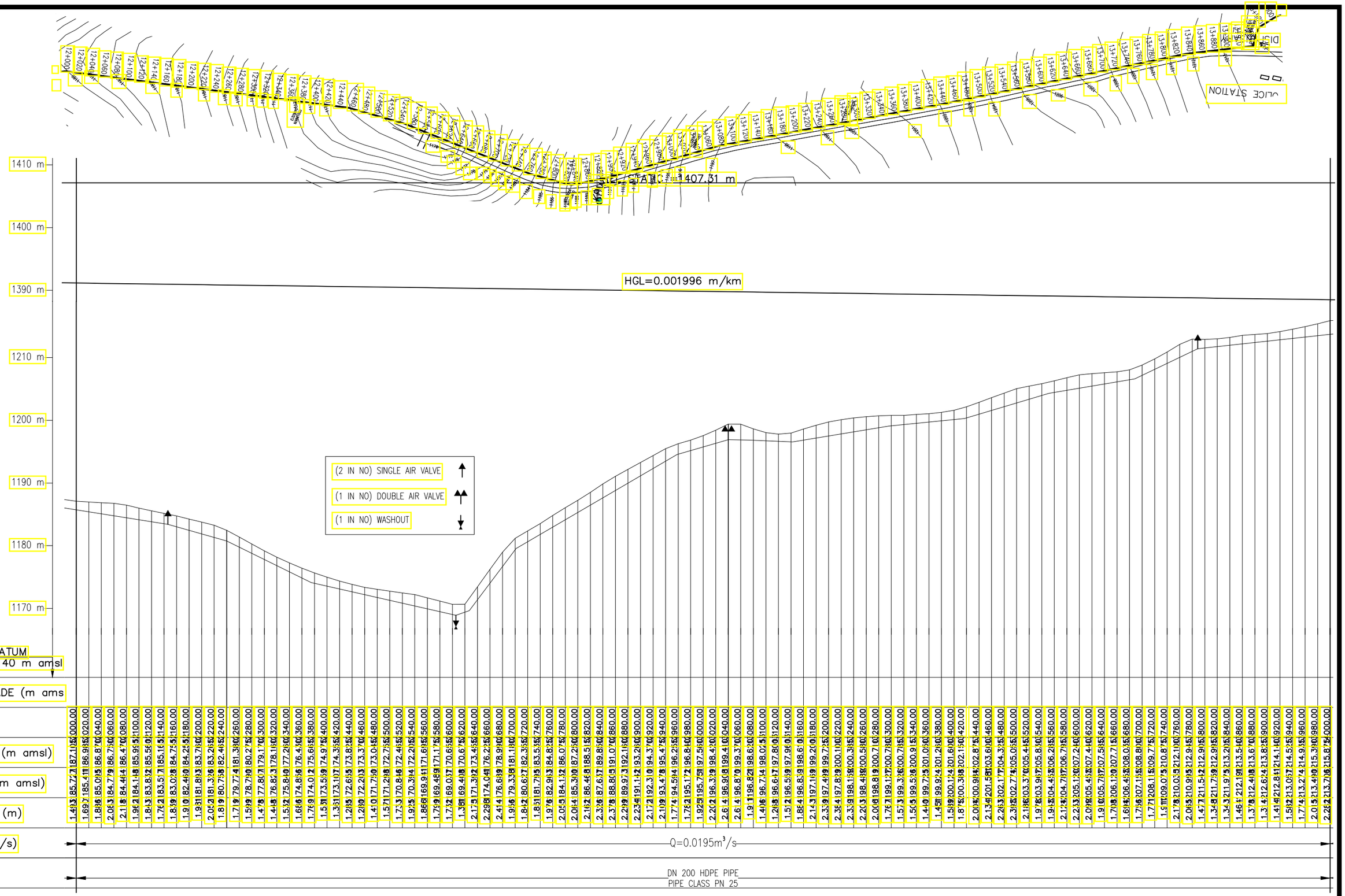
Drawing Title:

KABAA TO WAMUNYU PIPELINE

PLAN AND PROFILE

FROM CH 10 + 000 TO CH 12 +000

Designed By	: L.K
Drawn By	: E.O
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/KW/006



No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	May 2018
2.				
3.				
4.				

Client:

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPLLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:

CAS CONSULTANTS LIMITED
Le' Mac Building, 1st Fl, Off Church Rd, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

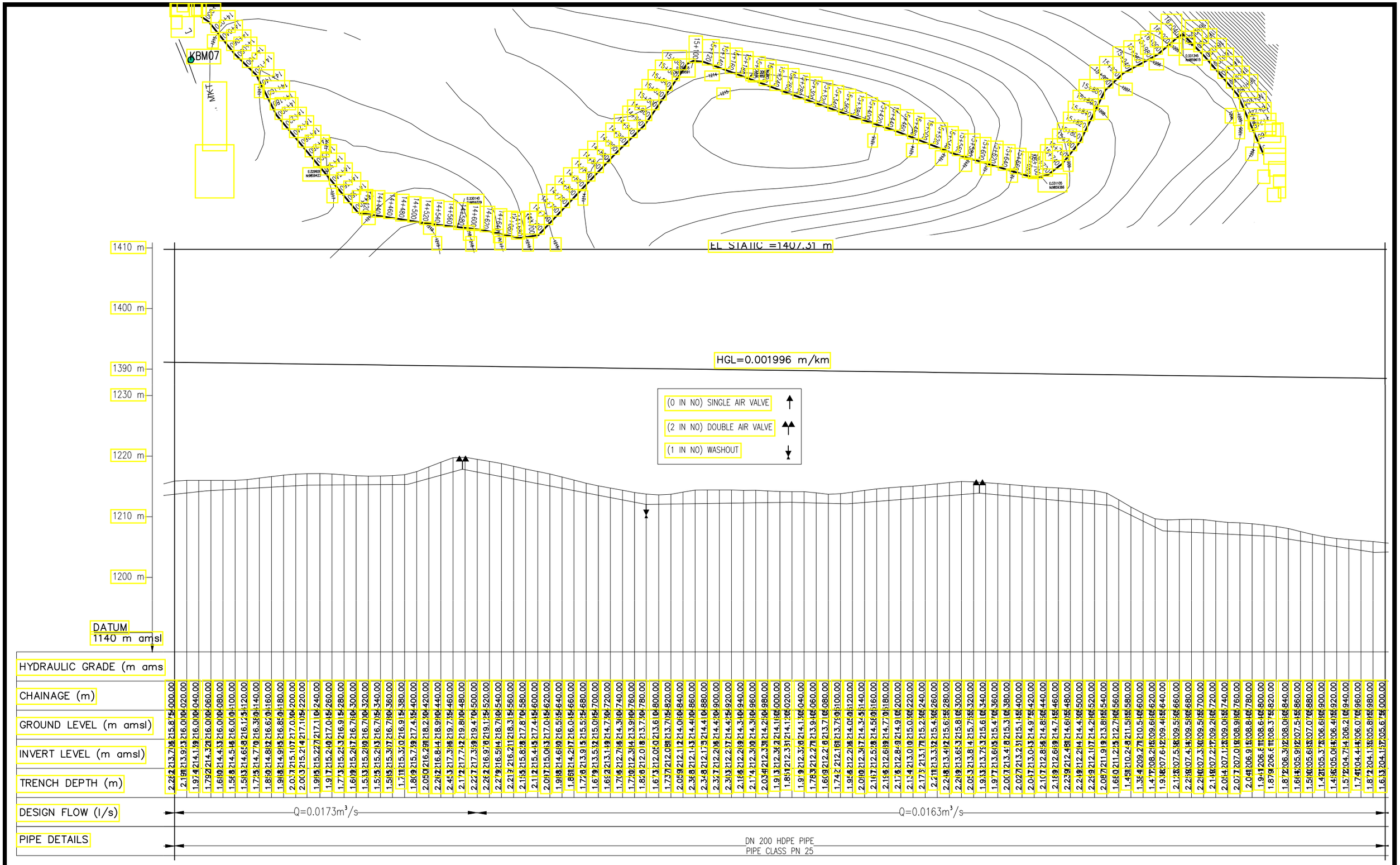
Drawing Title:

KABAA TO WAMUNYU PIPELINE

PLAN AND PROFILE

FROM CH 12 + 000 TO CH 14 +000

Designed By	: L.K
Drawn By	: E.O
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/KW/007



No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	May 2018
2.				
3.				
4.				

Client:

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPLLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:

CAS CONSULTANTS LIMITED
Le' Mac Building, 1st Fl, Off Church Rd, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

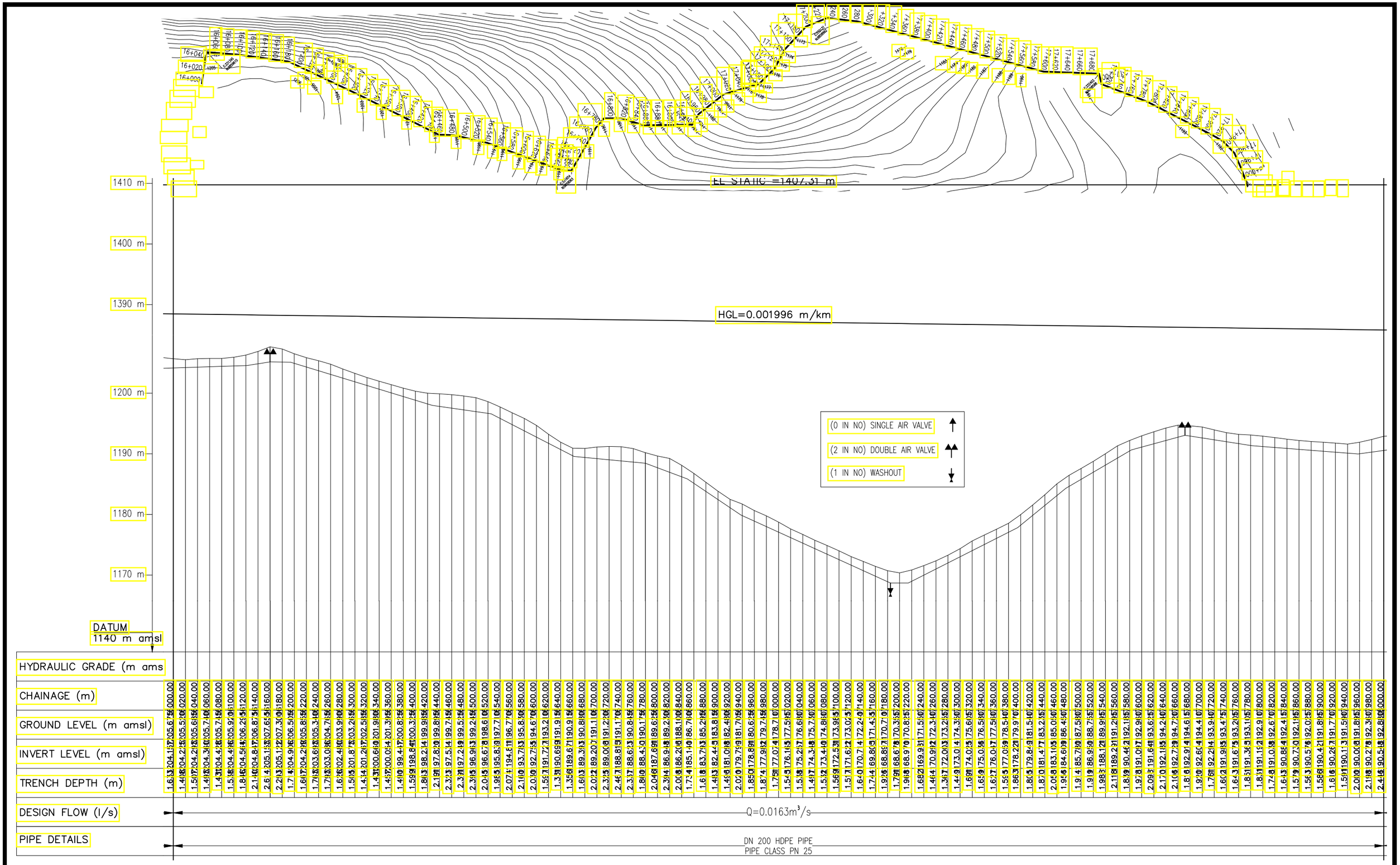
Drawing Title:

KABAA TO WAMUNYU PIPELINE

PLAN AND PROFILE

FROM CH 14 + 000 TO CH 18 +000

Designed By	: L.K
Drawn By	: E.O
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/KW/008



No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	May 2018
2.				
3.				
4.				

Client:

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPLLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:

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P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

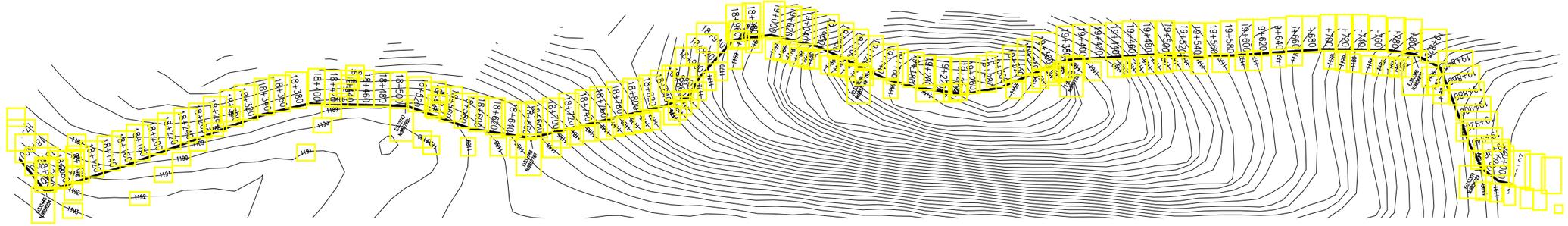
Drawing Title:

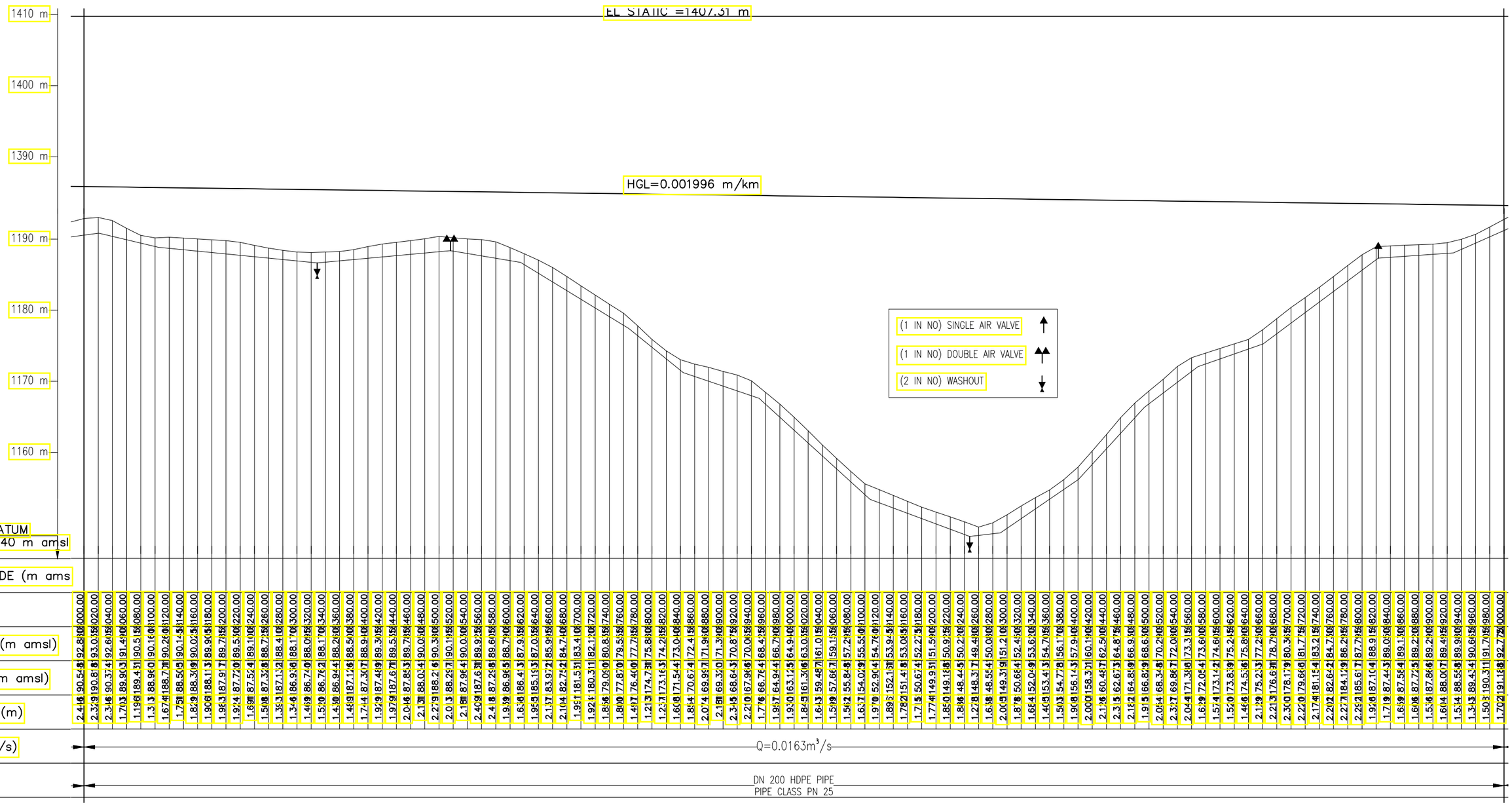
KABAA TO WAMUNYU PIPELINE

PLAN AND PROFILE

FROM CH 16+ 000 TO CH 18+000

Designed By	: L.K
Drawn By	: E.O
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/KW/009





No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	May 2018
2.				
3.				
4.				

Client:

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPLLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:

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P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

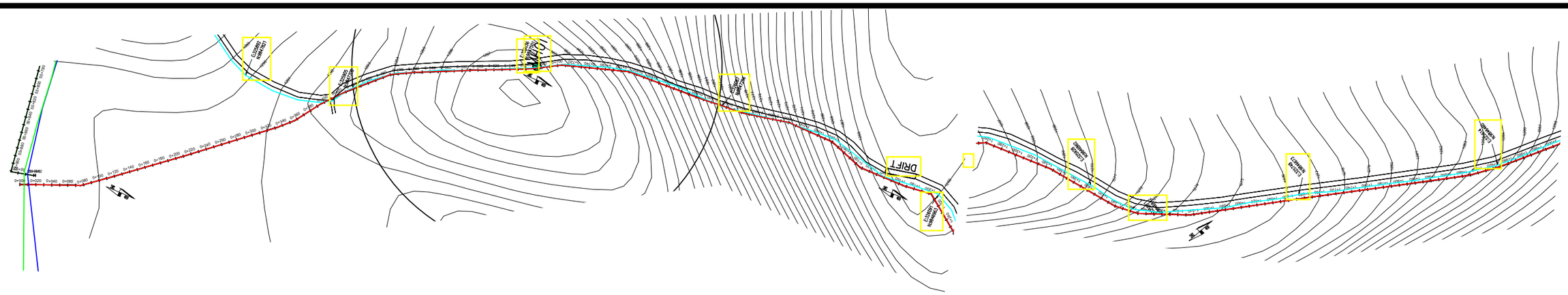
Drawing Title:

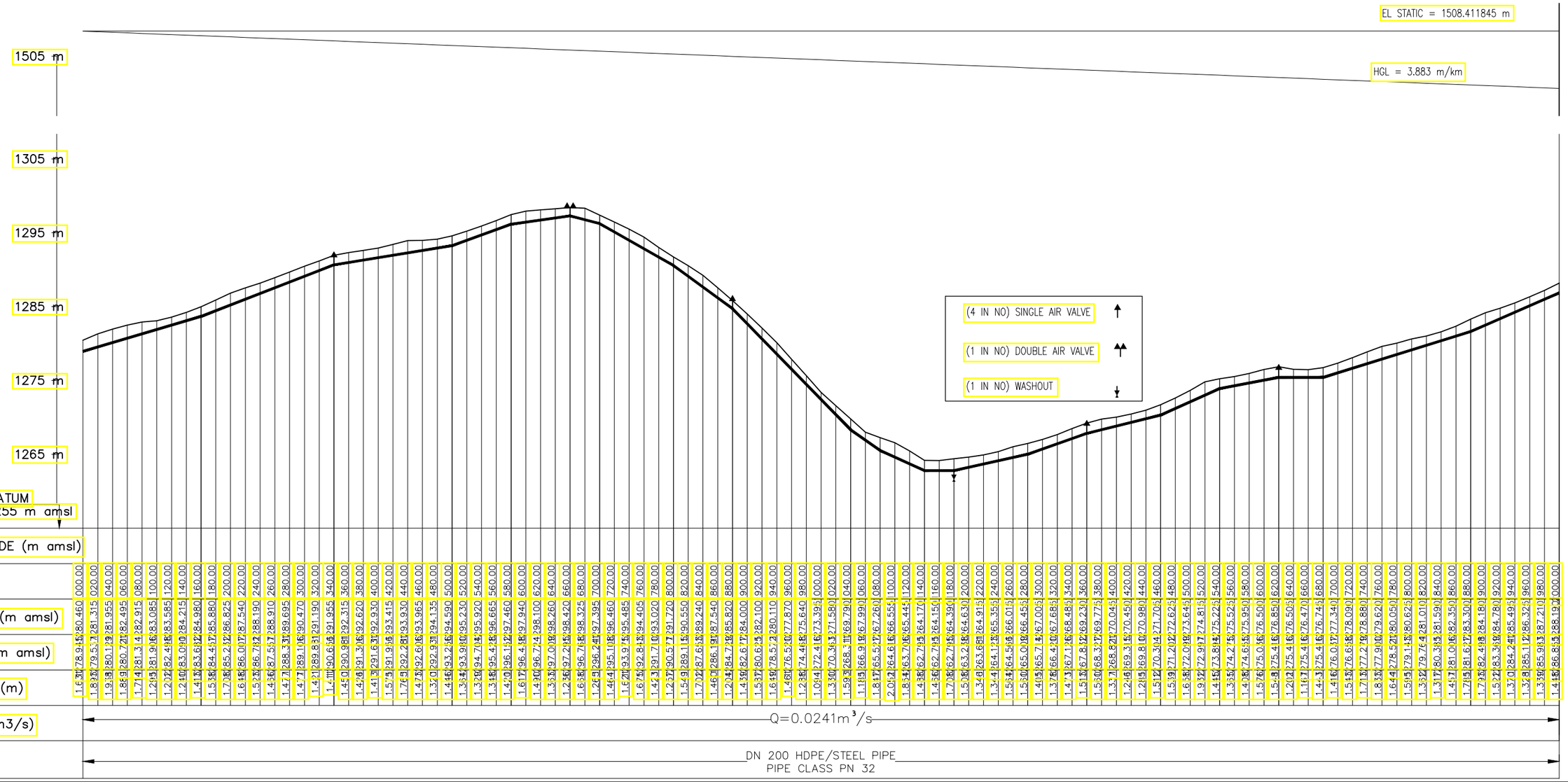
KABAA TO WAMUNYU PIPELINE

PLAN AND PROFILE

FROM CH 18+ 000 TO CH 20 +000

Designed By	: L.K
Drawn By	: E.O
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/KW/010





No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client:

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:

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P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

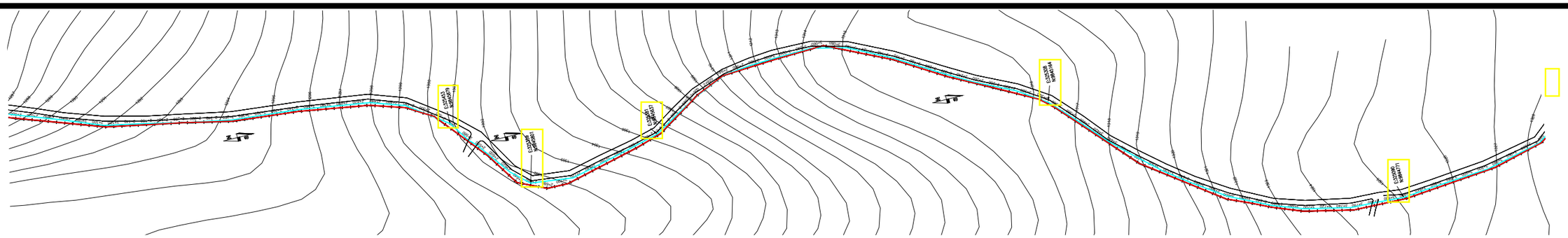
Drawing Title:

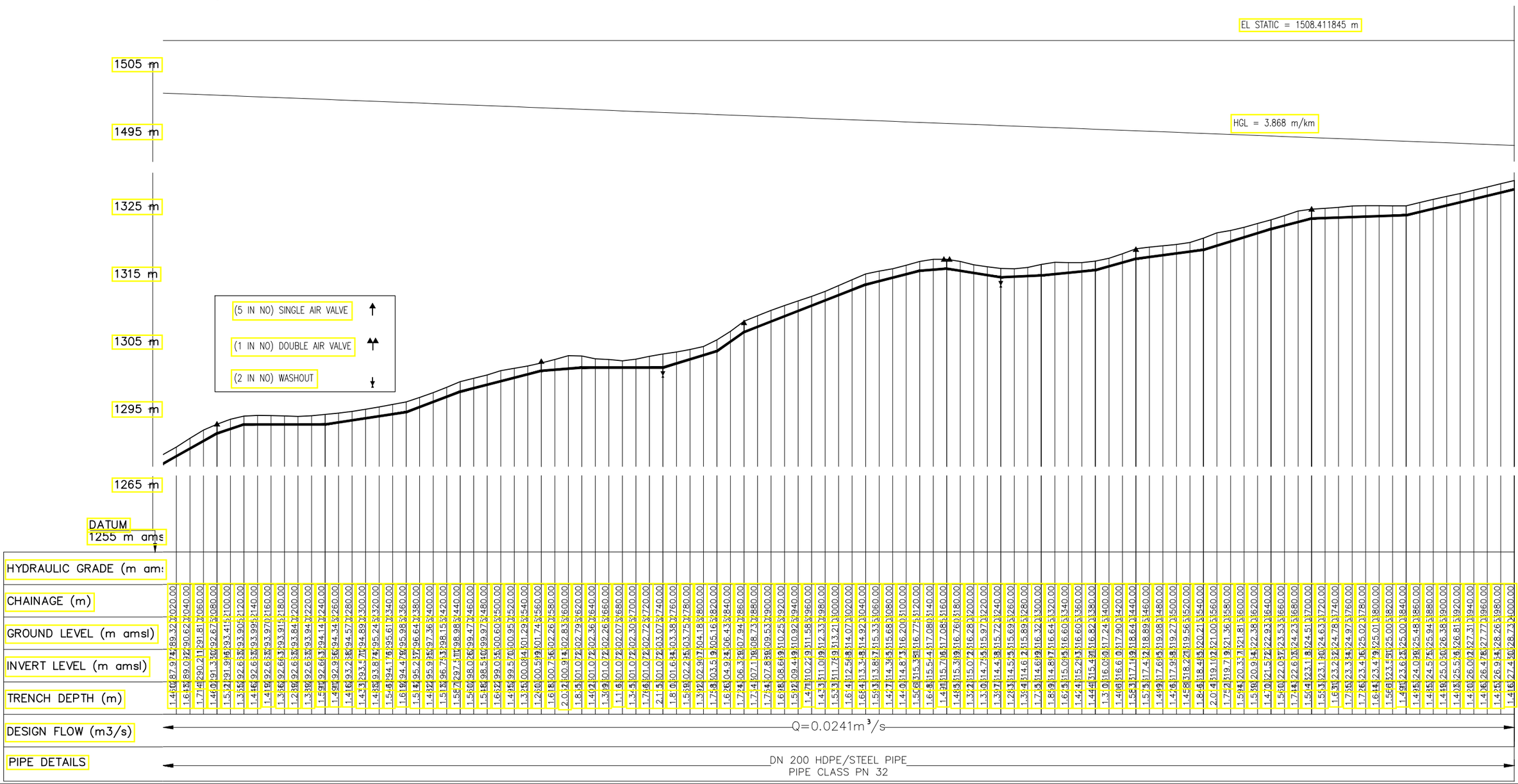
MUTHEI HILL RISING MAIN

PLAN AND PROFILE

FROM CH 0+ 000 TO CH 2 +000

Designed By	: L.K
Drawn By	: E.W.K
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	:MARCH 2023
Drawing No	: AWSB/MC/MH/001





No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client:

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:

CAS CONSULTANTS LIMITED
Le' Mac Building, 1st Fl, Off Church Rd, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

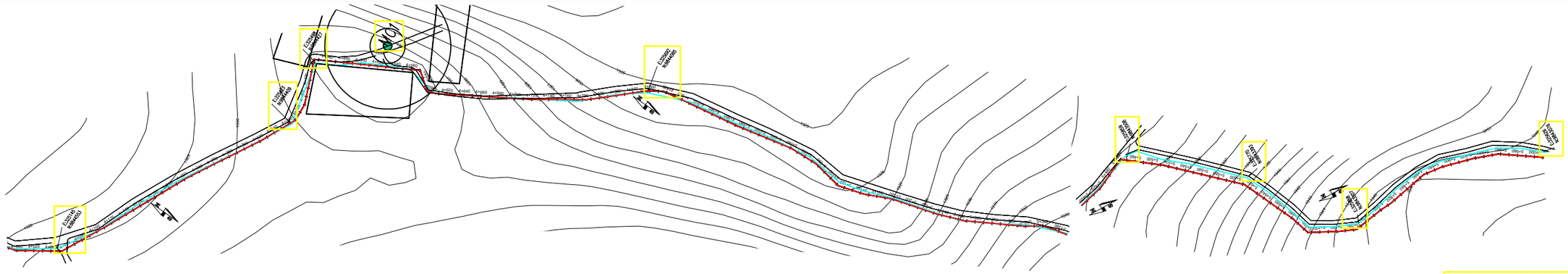
Drawing Title:

MUTHEI HILL RISING MAIN

PLAN AND PROFILE

FROM CH 2+ 000 TO CH 4 +000

Designed By	: L.K
Drawn By	: E.W.K
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	:MARCH 2023
Drawing No	: AWSB/MC/MH/002



EL STATIC = 1508.411845 m

1505 m

1495 m

1485 m

1345 m

1335 m

1325 m

1265 m

HGL = 3.869 m/km

(4 IN NO) SINGLE AIR VALVE

(1 IN NO) DOUBLE AIR VALVE

(2 IN NO) WASHOUT

DATUM
1255 m amsl

HYDRAULIC GRADE (m amsl)	
CHAINAGE (m)	0.00 20.00 40.00 60.00 80.00 100.00 120.00 140.00 160.00 180.00 200.00 220.00 240.00 260.00 280.00 300.00 320.00 340.00 360.00 380.00 400.00 420.00 440.00 460.00 480.00 500.00 520.00 540.00 560.00 580.00 600.00 620.00 640.00 660.00 680.00 700.00 720.00 740.00 760.00 780.00 800.00 820.00 840.00 860.00 880.00 900.00 920.00 940.00 960.00 980.00 1000.00 1020.00 1040.00 1060.00 1080.00 1100.00 1120.00 1140.00 1160.00 1180.00 1200.00 1220.00 1240.00 1260.00 1280.00 1300.00 1320.00 1340.00 1360.00 1380.00 1400.00 1420.00 1440.00 1460.00 1480.00 1500.00 1520.00 1540.00 1560.00 1580.00 1600.00 1620.00 1640.00 1660.00 1680.00 1700.00 1720.00 1740.00 1760.00 1780.00 1800.00 1820.00 1840.00 1860.00 1880.00 1900.00 1920.00 1940.00 1960.00 1980.00 2000.00 2020.00 2040.00 2060.00 2080.00 2100.00 2120.00 2140.00 2160.00 2180.00 2200.00 2220.00 2240.00 2260.00 2280.00 2300.00 2320.00 2340.00 2360.00 2380.00 2400.00 2420.00 2440.00 2460.00 2480.00 2500.00 2520.00 2540.00 2560.00 2580.00 2600.00 2620.00 2640.00 2660.00 2680.00 2700.00 2720.00 2740.00 2760.00 2780.00 2800.00 2820.00 2840.00 2860.00 2880.00 2900.00 2920.00 2940.00 2960.00 2980.00 3000.00
GROUND LEVEL (m amsl)	1527.4 1529.0 1528.9 1528.7 1528.5 1529.1 1529.3 1529.6 1529.8 1529.8 1529.8 1529.8 1529.6 1529.3 1529.1 1528.9 1528.7 1528.6 1528.4 1528.1 1527.9 1527.6 1527.4 1527.2 1527.0 1526.8 1526.6 1526.4 1526.2 1526.0 1525.9 1525.7 1525.5 1525.3 1525.1 1524.9 1524.8 1524.6 1524.4 1524.2 1524.0 1523.8 1523.7 1523.5 1523.3 1523.2 1523.0 1522.8 1522.7 1522.5 1522.3 1522.1 1521.9 1521.8 1521.6 1521.4 1521.2 1521.0 1520.9 1520.7 1520.5 1520.3 1520.1 1519.9 1519.8 1519.6 1519.4 1519.2 1519.0 1518.8 1518.7 1518.5 1518.3 1518.1 1517.9 1517.8 1517.6 1517.4 1517.2 1517.0 1516.8 1516.7 1516.5 1516.3 1516.1 1515.9 1515.8 1515.6 1515.4 1515.2 1515.0 1514.8 1514.7 1514.5 1514.3 1514.1 1513.9 1513.8 1513.6 1513.4 1513.2 1513.0 1512.8 1512.7 1512.5 1512.3 1512.1 1511.9 1511.8 1511.6 1511.4 1511.2 1511.0 1510.8 1510.7 1510.5 1510.3 1510.1 1509.9 1509.8 1509.6 1509.4 1509.2 1509.0 1508.8 1508.7 1508.5 1508.3 1508.1 1507.9 1507.8 1507.6 1507.4 1507.2 1507.0 1506.8 1506.7 1506.5 1506.3 1506.1 1505.9 1505.8 1505.6 1505.4 1505.2 1505.0 1504.8 1504.7 1504.5 1504.3 1504.1 1503.9 1503.8 1503.6 1503.4 1503.2 1503.0 1502.8 1502.7 1502.5 1502.3 1502.1 1501.9 1501.8 1501.6 1501.4 1501.2 1501.0 1500.8 1500.7 1500.5 1500.3 1500.1 1499.9 1499.8 1499.6 1499.4 1499.2 1499.0 1498.8 1498.7 1498.5 1498.3 1498.1 1497.9 1497.8 1497.6 1497.4 1497.2 1497.0 1496.8 1496.7 1496.5 1496.3 1496.1 1495.9 1495.8 1495.6 1495.4 1495.2 1495.0 1494.8 1494.7 1494.5 1494.3 1494.1 1493.9 1493.8 1493.6 1493.4 1493.2 1493.0 1492.8 1492.7 1492.5 1492.3 1492.1 1491.9 1491.8 1491.6 1491.4 1491.2 1491.0 1490.8 1490.7 1490.5 1490.3 1490.1 1489.9 1489.8 1489.6 1489.4 1489.2 1489.0 1488.8 1488.7 1488.5 1488.3 1488.1 1487.9 1487.8 1487.6 1487.4 1487.2 1487.0 1486.8 1486.7 1486.5 1486.3 1486.1 1485.9 1485.8 1485.6 1485.4 1485.2 1485.0 1484.8 1484.7 1484.5 1484.3 1484.1 1483.9 1483.8 1483.6 1483.4 1483.2 1483.0 1482.8 1482.7 1482.5 1482.3 1482.1 1481.9 1481.8 1481.6 1481.4 1481.2 1481.0 1480.8 1480.7 1480.5 1480.3 1480.1 1479.9 1479.8 1479.6 1479.4 1479.2 1479.0 1478.8 1478.7 1478.5 1478.3 1478.1 1477.9 1477.8 1477.6 1477.4 1477.2 1477.0 1476.8 1476.7 1476.5 1476.3 1476.1 1475.9 1475.8 1475.6 1475.4 1475.2 1475.0 1474.8 1474.7 1474.5 1474.3 1474.1 1473.9 1473.8 1473.6 1473.4 1473.2 1473.0 1472.8 1472.7 1472.5 1472.3 1472.1 1471.9 1471.8 1471.6 1471.4 1471.2 1471.0 1470.8 1470.7 1470.5 1470.3 1470.1 1469.9 1469.8 1469.6 1469.4 1469.2 1469.0 1468.8 1468.7 1468.5 1468.3 1468.1 1467.9 1467.8 1467.6 1467.4 1467.2 1467.0 1466.8 1466.7 1466.5 1466.3 1466.1 1465.9 1465.8 1465.6 1465.4 1465.2 1465.0 1464.8 1464.7 1464.5 1464.3 1464.1 1463.9 1463.8 1463.6 1463.4 1463.2 1463.0 1462.8 1462.7 1462.5 1462.3 1462.1 1461.9 1461.8 1461.6 1461.4 1461.2 1461.0 1460.8 1460.7 1460.5 1460.3 1460.1 1459.9 1459.8 1459.6 1459.4 1459.2 1459.0 1458.8 1458.7 1458.5 1458.3 1458.1 1457.9 1457.8 1457.6 1457.4 1457.2 1457.0 1456.8 1456.7 1456.5 1456.3 1456.1 1455.9 1455.8 1455.6 1455.4 1455.2 1455.0 1454.8 1454.7 1454.5 1454.3 1454.1 1453.9 1453.8 1453.6 1453.4 1453.2 1453.0 1452.8 1452.7 1452.5 1452.3 1452.1 1451.9 1451.8 1451.6 1451.4 1451.2 1451.0 1450.8 1450.7 1450.5 1450.3 1450.1 1449.9 1449.8 1449.6 1449.4 1449.2 1449.0 1448.8 1448.7 1448.5 1448.3 1448.1 1447.9 1447.8 1447.6 1447.4 1447.2 1447.0 1446.8 1446.7 1446.5 1446.3 1446.1 1445.9 1445.8 1445.6 1445.4 1445.2 1445.0 1444.8 1444.7 1444.5 1444.3 1444.1 1443.9 1443.8 1443.6 1443.4 1443.2 1443.0 1442.8 1442.7 1442.5 1442.3 1442.1 1441.9 1441.8 1441.6 1441.4 1441.2 1441.0 1440.8 1440.7 1440.5 1440.3 1440.1 1439.9 1439.8 1439.6 1439.4 1439.2 1439.0 1438.8 1438.7 1438.5 1438.3 1438.1 1437.9 1437.8 1437.6 1437.4 1437.2 1437.0 1436.8 1436.7 1436.5 1436.3 1436.1 1435.9 1435.8 1435.6 1435.4 1435.2 1435.0 1434.8 1434.7 1434.5 1434.3 1434.1 1433.9 1433.8 1433.6 1433.4 1433.2 1433.0 1432.8 1432.7 1432.5 1432.3 1432.1 1431.9 1431.8 1431.6 1431.4 1431.2 1431.0 1430.8 1430.7 1430.5 1430.3 1430.1 1429.9 1429.8 1429.6 1429.4 1429.2 1429.0 1428.8 1428.7 1428.5 1428.3 1428.1 1427.9 1427.8 1427.6 1427.4 1427.2 1427.0 1426.8 1426.7 1426.5 1426.3 1426.1 1425.9 1425.8 1425.6 1425.4 1425.2 1425.0 1424.8 1424.7 1424.5 1424.3 1424.1 1423.9 1423.8 1423.6 1423.4 1423.2 1423.0 1422.8 1422.7 1422.5 1422.3 1422.1 1421.9 1421.8 1421.6 1421.4 1421.2 1421.0 1420.8 1420.7 1420.5 1420.3 1420.1 1419.9 1419.8 1419.6 1419.4 1419.2 1419.0 1418.8 1418.7 1418.5 1418.3 1418.1 1417.9 1417.8 1417.6 1417.4 1417.2 1417.0 1416.8 1416.7 1416.5 1416.3 1416.1 1415.9 1415.8 1415.6 1415.4 1415.2 1415.0 1414.8 1414.7 1414.5 1414.3 1414.1 1413.9 1413.8 1413.6 1413.4 1413.2 1413.0 1412.8 1412.7 1412.5 1412.3 1412.1 1411.9 1411.8 1411.6 1411.4 1411.2 1411.0 1410.8 1410.7 1410.5 1410.3 1410.1 1409.9 1409.8 1409.6 1409.4 1409.2 1409.0 1408.8 1408.7 1408.5 1408.3 1408.1 1407.9 1407.8 1407.6 1407.4 1407.2 1407.0 1406.8 1406.7 1406.5 1406.3 1406.1 1405.9 1405.8 1405.6 1405.4 1405.2 1405.0 1404.8 1404.7 1404.5 1404.3 1404.1 1403.9 1403.8 1403.6 1403.4 1403.2 1403.0 1402.8 1402.7 1402.5 1402.3 1402.1 1401.9 1401.8 1401.6 1401.4 1401.2 1401.0 1400.8 1400.7 1400.5 1400.3 1400.1 1399.9 1399.8 1399.6 1399.4 1399.2 1399.0 1398.8 1398.7 1398.5 1398.3 1398.1 1397.9 1397.8 1397.6 1397.4 1397.2 1397.0 1396.8 1396.7 1396.5 1396.3 1396.1 1395.9 1395.8 1395.6 1395.4 1395.2 1395.0 1394.8 1394.7 1394.5 1394.3 1394.1 1393.9 1393.8 1393.6 1393.4 1393.2 1393.0 1392.8 1392.7 1392.5 1392.3 1392.1 1391.9 1391.8 1391.6 1391.4 1391.2 1391.0 1390.8 1390.7 1390.5 1390.3 1390.1 1389.9 1389.8 1389.6 1389.4 1389.2 1389.0 1388.8 1388.7 1388.5 1388.3 1388.1 1387.9 1387.8 1387.6 1387.4 1387.2 1387.0 1386.8 1386.7 1386.5 1386.3 1386.1 1385.9 1385.8 1385.6 1385.4 1385.2 1385.0 1384.8 1384.7 1384.5 1384.3 1384.1 1383.9 1383.8 1383.6 1383.4 1383.2 1383.0 1382.8 1382.7 1382.5 1382.3 1382.1 1381.9 1381.8 1381.6 1381.4 1381.2 1381.0 1380.8 1380.7 1380.5 1380.3 1380.1 1379.9 1379.8 1379.6 1379.4 1379.2 1379.0 1378.8 1378.7 1378.5 1378.3 1378.1 1377.9 1377.8 1377.6 1377.4 1377.2 1377.0 1376.8 1376.7 1376.5 1376.3 1376.1 1375.9 1375.8 1375.6 1375.4 1375.2 1375.0 1374.8 1374.7 1374.5 1374.3 1374.1 1373.9 1373.8 1373.6 1373.4 1373.2 1373.0 1372.8 1372.7 1372.5 1372.3 1372.1 1371.9 1371.8 1371.6 1371.4 1371.2 1371.0 1370.8 1370.7 1370.5 1370.3 1370.1 1369.9 1369.8 1369.6 1369.4 1369.2 1369.0 1368.8 1368.7 1368.5 1368.3 1368.1 1367.9 1367.8 1367.6 1367.4 1367.2 1367.0 1366.8 1366.7 1366.5 1366.3 1366.1 1365.9 1365.8 1365.6 1365.4 1365.2 1365.0 1364.8 1364.7 1364.5 1364.3 1364.1 1363.9 1363.8 1363.6 1363.4 1363.2 1363.0 1362.8 1362.7 1362.5 1362.3 1362.1 1361.9 1361.8 1361.6 1361.4 1361.2 1361.0 1360.8 1360.7 1360.5 1360.3 1360.1 1359.9 1359.8 1359.6 1359.4 1359.2 1359.0 1358.8 1358.7 1358.5 1358.3 1358.1 1357.9 1357.8 1357.6 1357.4 1357.2 1357.0 1356.8 1356.7 1356.5 1356.3 1356.1 1355.9 1355.8 1355.6 1355.4 1355.2 1355.0 1354.8 1354.7 1354.5 1354.3 1354.1 1353.9 1353.8 1353.6 1353.4 1353.2 1353.0 1352.8 1352.7 1352.5 1352.3 1352.1 1351.9 1351.8 1351.6 1351.4 1351.2 1351.0 1350.8 1350.7 1350.5 1350.3 1350.1 1349.9 1349.8 1349.6 1349.4 1349.2 1349.0 1348.8 1348.7 1348.5 1348.3 1348.1 1347.9 1347.8 1347.6 1347.4 1347.2 1347.0 1346.8 1346.7 1346.5 1346.3 1346.1 1345.9 1345.8 1345.6 1345.4 1345.2 1345.0 1344.8 1344.7 1344.5 1344.3 1344.1 1343.9 1343.8 1343.6 1343.4 1343.2 1343.0 1342.8 1342.7 1342.5 1342.3 1342.1 1341.9 1341.8 1341.6 1341.4 1341.2 1341.0 1340.8 1340.7 1340.5 1340.3 1340.1 1339.9 1339.8 1339.6 1339.4 1339.2 1339.0 1338.8 1338.7 1338.5 1338.3 1338.1 1337.9 1337.8 1337.6 1337.4 1337.2 1337.0 1336.8 1336.7 1336.5 1336.3 1336.1 1335.9 1335.8 1335.6 1335.4 1335.2 1335.0 1334.8 1334.7 1334.5 1334.3 1334.1 1333.9 1333.8 1333.6 1333.4 1333.2 1333.0 1332.8 1332.7 1332.5 1332.3 1332.1 1331.9 1331.8 1331.6 1331.4 1331.2 1331.0 1330.8 1330.7 1330.5 1330.3 1330.1 1329.9 1329.8 1329.6 1329.4 1329.2 1329.0 1328.8 1328.7 1328.5 1328.3 1328.1 1327.9 1327.8 1327.6 1327.4 1327.2 1327.0 1326.8 1326.7 1326.5 1326.3 1326.1 1325.9 1325.8 1325.6 1325.4 1325.2 1325.0 1324.8 1324.7 1324.5 1324.3 1324.1 1323.9 1323.8 1323.6 1323.4 1323.2 1323.0 1322.8 1322.7 1322.5 1322.3 1322.1 1321.9 1321.8 1321.6 1321.4 1321.2 1321.0 1320.8 1320.7 1320.5 1320.3 1320.1 1319.9 1319.8 1319.6 1319.4 1319.2 1319.0 1318.8 1318.7 1318.5 1318.3 1318.1 1317.9 1317.8 1317.6 1317.4 1317.2 1317.0 1316.8 1316.7 1316.5 1316.3 1316.1 1315.9 1315.8 1315.6 1315.4 1315.2 1315.0 1314.8 1314.7 1314.5 1314.3 1314.1 1313.9 1313.8 1313.6 1313.4 1313.2 1313.0 1312.8 1312.7 1312.5 1312.3 1312.1 1311.9 1311.8 1311.6 1311.4 1311.2 1311.0 1310.8 1310.7 1310.5 1310.3 1310.1 1309.9 1309.8 1309.6 1309.4 1309.2 1309.0 1308.8 1308.7 1308.5 1308.3 1308.1 1307.9 1307.8 1307.6 1307.4 1307.2 1307.0 1306.8 1306.7 1306.5 1306.3 1306.1 1305.9 1305.8 1305.6 1305.4 1305.2 1305.0 1304.8 1304.7 1304.5 1304.3 1304.1 1303.9 1303.8 1303.6 1303.4 1303.2 1303.0 1302.8 1302.7 1302.5 1302.3 1302.1 1301.9 1301.8 1301.6 1301.4 1301.2 1301.0 1300.8 1300.7 1300.5 1300.3 1300.1 1299.9 1299.8 1299.6 1299.4 1299.2 1299.0 1298.8 1298.7 1298.5 1298.3 1298.1 1297.9 1297.8 1297.6 1297.4 1297.2 1297.0 1296.8 1296.7 1296.5 1296.3 1296.1 1295.9 1295.8 1295.6 1295.4 1295.2 1295.0 1294.8 1294.7 1294.5 1294.3 1294.1 1293.9 1293.8 1293.6 1293.4 1293.2 1293.0 1292.8 1292.7 1292.5 1292.3 1292.1 1291.9 1291.8 1291.6 1291.4 1291.2 1291.0 1290.8 1290.7 1290.5 1290.3 1290.1 1289.9 1289.8 1289.6 1289.4 1289.2 1289.0 1288.8 1288.7 1288.5 1288.3 1288.1 1287.9 1287.8 1287.6 1287.4 1287.2 1287.0 1286.8 1286.7 1286.5 1286.3 1286.1 1285.9 1285.8 1285.6 1285.4 1285.2 1285.0 1284.8 1284.7 1284.5 1284.3 1284.1 1283.9 1283.8 1283.6 1283.4 1283.2 1283.0 1282.8 1282.7 1282.5 1282.3 1282.1 1281.9 1281.8 1281.6 1281.4 1281.2 1281.0 1280.8 1280.7 1280.5 1280.3 1280.1 1279.9 1279.8 1279.6 1279.4 1279.2 1279.0 1278.8 1278.7 1278.5 1278.3 1278.1 1277.9 1277.8 1277.6 1277.4 1277.2 1277.0 1276.8 1276.7 1276.5 1276.3 1276.1 1275.9 1275.8 1275.6 1275.4 1275.2 1275.0 1274.8 1274.7 1274.5 1274.3 1274.1 1273.9 1273.8 1273.6 1273.4 1273.2 1273.0 1272.8 1272.7 1272.5 1272.3 1272.1 1271.9 1271.8 1271.6 1271.4 1271.2 1271.0 1270.8 1270.7 1270.5 1270.3 1270.1 1269.9 1269.8 1269.6 1269.4 1269.2 1269.0 1268.8 1268.7 1268.5 1268.3 1268.1 1267.9 1267.8 1267.6 1267.4 1267.2 1267.0 1266.8 1266.7 1266.5 1266.3 1266.1 1265.9 1265.8 1265.6 1265.4 1265.2 1265.0
INVERT LEVEL (m amsl)	1527.4 1529.0 1528.9 1528.7 1528.5 1529.1 1529.3 1529.6 1529.8 1529.8 1529.8 1529.8 1529.6 1529.3 1529.1 1528.9 1528.7 1528.6 1528.4 1528.1 1527.9 1527.6 1527.4 1527.2 1527.0 1526.8 1526.6 1526.4 1526.2 1526.0 1525.9 1525.7 1525.5 1525.3 1525.1 1524.9 1524.8 1524.6 1524.4 1524.2 1524.0 1523.8 1523.7 1523.5 1523.3 1523.2 1523.0 1522.8 1522.7 1522.5 1522.3 1522.1 1521.9 1521.8 1521.6 1521.4 1521.2 1521.0 1520.9 1520.7 1520.5 1520.3 1520.1 1519.9 1519.8 1519.6 1519.4 1519.2 1519.0 1518.8 1518.7 1518.5 1518.3 1518.1 1517.9 1517.8 1517.6 1517.4 1517.2 1517.0 1516.8 1516.7 1516.5 1516.3 1516.1 1515.9 1515.8 1515.6 1515.4 1515.2 1515.0 1514.8 1514.7 1514.5 1514.3 1514.1 1513.9 1513.8 1513.6 1513.4 1513.2 1513.0 1512.8 1512.7 1512.5 1512.3 1512.1 1511.9 1511.8 1511.6 1511.4 1511.2 1511.0 1510.8 1510.7 1510.5 1510.3 1510.1 1509.9 1509.8 1509.6 1509.4 1509.2 1509.0 1508.8 1508.7 1508.5 1508.3 1508.1 1507.9 1507.8 1507.6 1507.4 1507.2 1507.0 1506.8 1506.7 1506.5 1506.3 1506.1 1505.9 1505.8 1505.6 1505.4 1505.2 1505.0 1504.8 1504.7 1504.5 1504.3 1504.1 1503.9 1503.8 1503.6 1503.4 1503.2 1503.0 1502.8 1502.7 1502.5 1502.3 1502.1 1501.9 1501.8 1501.6 1501.4 1501.2 1501.0 1500.8 1500.7 1500.5 1500.3 1500.1 1499.9 1499.8 1499.6 1499.4 1499.2 1499.0 1498.8 1498.7 1498.5 1498.3 1498.1 1497.9 1497.8 1497.6 1497.4 1497.2 1497.0 1496.8 1496.7 1496.5 1496.3 1496.1 1495.9 1495.8 1495.6 1495.4 1495.2 1495.0 1494.8 1494.7 1494.5 1494.3 1494.1 1493.9 1493.8 1493.6 1493.4 1493.2 1493.0 1492.8 1492.7 1492.5 1492.3 1492.1 1491.9 1491.8 1491.6 1491.4 1491.2 1491.0 1490.8 1490.7 1490.5 1490.3 1490.1 1489.9 1489.8 1489.6 1489.4 1489.2 1489.0 1488.8 1488.7 1488.5 1488.3 1488.1 1487.9 1487.8 1487.6 1487.4 1487.2 1487.0 1486.8 1486.7 1486.5 1486.3 1486.1 1485.9 1485.8 1485.6 1485.4 1485.2 1485.0 1484.8 1484.7 1484.5 1484.3 1484.1 1483.9 1483.8 1483.6 1483.4 1483.2 1483.0 1482.8 1482.7 1482.5 1482.3 1482.1 1481.9 1481.8 1481.6 1481.4 1481.2 1481.0 1480.8 1480.7 1480.5 1480.3 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1428.1 1427.9 1427.8 1427.6 1427.4 1427.2 1427.0 1426.8 1426.7 1426.5 1426.3 1426.1 1425.9 1425.8 1425.6 1425.4 1425.2 1425.0 1424.8 1424.7 1424.5 1424.3 1424.1 1423.9 1423.8 1423.6 1423.4 1423.2 1423.0 1422.8 1422.7 1422.5 1422.3 1422.1 1421.9 1421.8 1421.6 1421.4 1421.2 1421.0 1420.8 1420.7 1420.5 1420.3 1420.1 1419.9 1419.8 1419.6 1419.4 1419.2 1419.0 1418.8 1418.7 1418.5 1418.3 1418.1 1417.9 1417.8 1417.6 1417.4 1417.2 1417.0 1416.8 1416.7 1416.5 1416.3 1416.1 1415.9 1415.8 1415.6 1415.4 1415.2 1415.0 1414.8 1414.7 1414.5 1414.3 1414.1 1413.9 1413.8 1413.6 1413.4 1413.2 1413.0 1412.8 1412.7 1412.5 1412.3 1412.1 1411.9 1411.8 1411.6 1411.4 1411.2 1411.0 1410.8 1410.7 1410.5 1410.3 1410.1 1409.9 1409.8 1409.6 1409.4 1409.2 1409.0 1408.8 1408.7 1408.5 1408.3 1408.1 1407.9 1407.8 1407.6 1407.4 1407.2 1407.0 1406.8 1406.7 1406.5 1406.3 1406.1 1405.9 1405.8 1405.6 1405.4 1405.2 1405.0 1404.8 1404.7 1404.5 1404.3 1404.1 1403.9 1403.8 1403.6 1403.4 1403.2 1403.0 1402.8 1402.7 1402.5 1402.3 1402.1 1401.9 1401.8 1401.6 1401.4 1401.2 1401.0 1400.8 1400.7 1400.5 1400.3 1400.1 1399.9 1399.8 1399.6 1399.4 1399.2 1399.0 1398.8 1398.7 1398.5 1398.3 1398.1 1397.9 1397.8 1397.6 1397.4 1397.2 1397.0 1396.8 1396.7 1396.5 1396.3 1396.1 1395.9 1395.8 1395.6 1395.4 1395.2 1395.0 1394.8 1394.7 1394.5 1394.3 1394.1 1393.9 1393.8 1393.6 1393.4 1393.2 1393.0 1392.8 1392.7 1392.5 1392.3 1392.1 1391.9 1391.8 1391.6 1391.4 1391.2 1391.0 1390.8 1390.7 1390.5 1390.3 1390.1 1389.9 1389.8 1389.6 1389.4 1389.2 1389.0 1388.8 1388.7 1388.5 1388.3 1388.1 1387.9 1387.8 1387.6 1387.4 1387.2 1387.0 1386.8 1386.7 1386.5 1386.3 1386.1 1385.9 1385.8 1385.6 1385.4 1385.2 1385.0 1384.8 1384.7 1384.5 1384.3 1384.1 1383.9 1383.8 1383.6 1383.4 1383.2 1383.0 1382.8 1382.7 1382.5 1382.3 1382.1 1381.9 1381.8 1381.6 1381.4 1381.2 1381.0 1380.8 1380.7 1380.5 1380.3 1380.1 1379.9 1379.8 1379.6 1379.4 1379.2 1379.0 1378.8 1378.7 1378.5 1378.3 1378.1 1377.9 1377.8 1377.6 1377.4 1377.2 1377.0 1376.8 1376.7 1376.5 1376.3 1376.1 1375.9 1375.8 1375.6 1375.4 1375.2 1375.0 1374.8 1374.7 1374.5 1374.3 1374.1 1373.9 1373.8 1373.6 1373.4 1373.2 1373.0 1372.8 1372.7 1372.5 1372.3 1372.1 1371.9 1371.8 1371.6 1371.4 1371.2 1371.0 1370.8 1370.7 1370.5 1370.3 1370.1 1369.9 1369.8 1369.6 1369.4 1369.2 1369.0 1368.8 1368.7 1368.5 1368.3 1368.1 1367.9 1367.8 1367.6 1367.4 1367.2 1367.0 1366.8 1366.7 1366.5 1366.3 1366.1 1365.9 1365.8 1365.6 1365.4 1365.2 1365.0 1364.8 1364.7 1364.5 1364.3 1364.1 1363.9 1363.8 1363.6 1363.4 1363.2 1363.0 1362.8 1362.7 1362.5 1362.3 1362.1 1361.9 1361.8 1361.6 1361.4 1361.2 1361.0 1360.8 1360.7 1360.5 1360.3 1360.1 1359.9 1359.8 1359.6 1359.4 1359.2 1359.0 1358.8 1358.7 1358.5 1358.3 1358.1 1357.9 1357.8 1357.6 1357.4 1357.2 1357.0 1356.8 1356.7 1356.5 1356.3 1356.1 1355.9 1355.8 1355.6 1355.4 1355.2 1355.0 1354.8 1354.7 1354.5 1354.3 1354.1 1353.9 1353.8 1353.6 1353.4 1353.2 1353.0 1352.8 1352.7 1352.5 1352.3 1352.1 1351.9 1351.8 1351.6 1351.4 1351.2 1351.0 1350.8 1350.7 1350.5 1350.3 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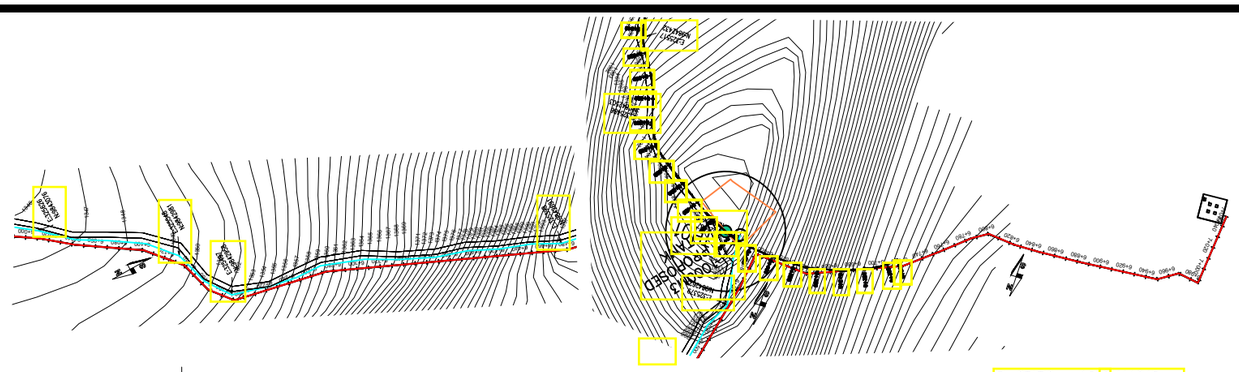
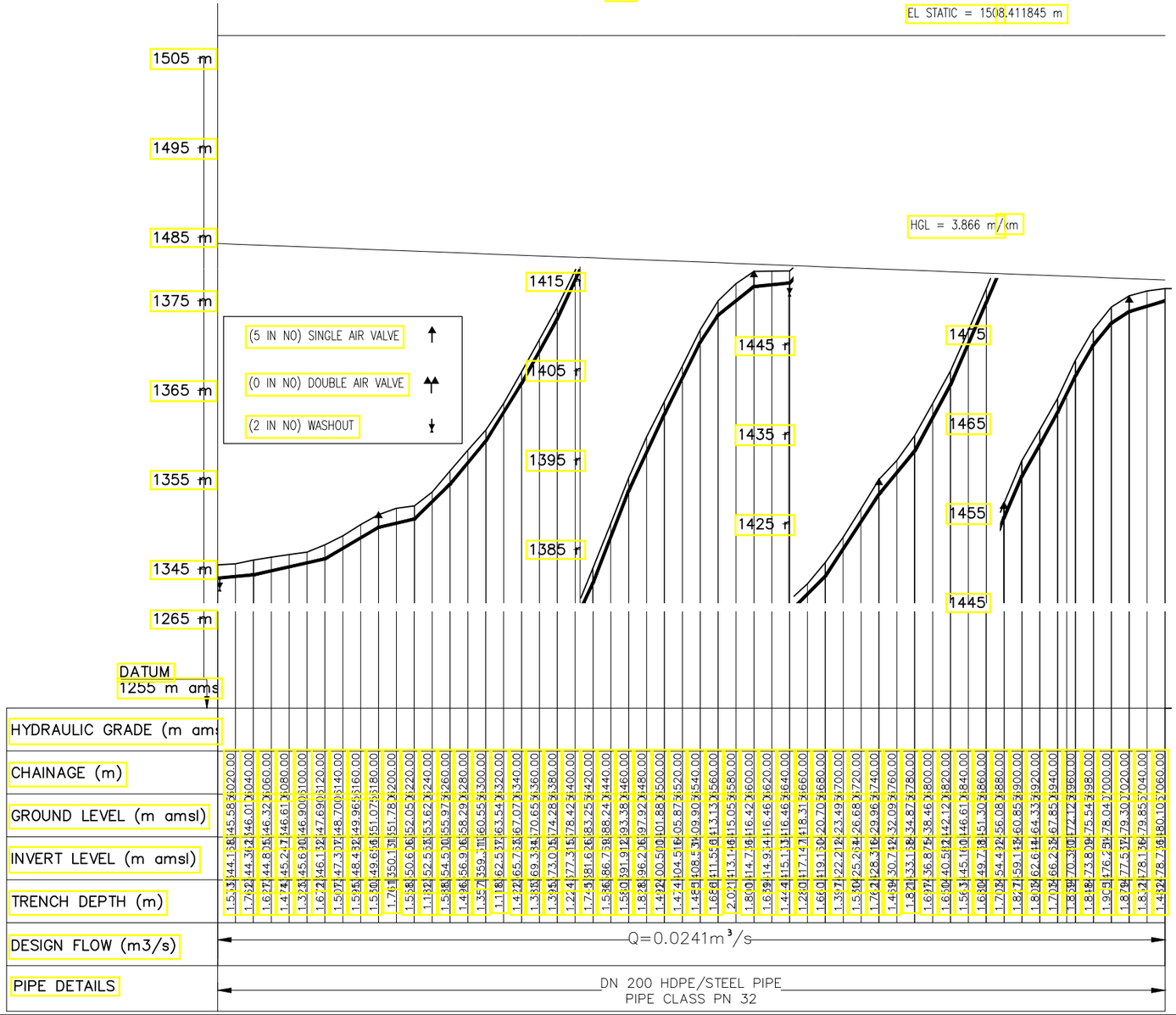
TRENCH DEPTH (m)	1.537 1.616 1.617 1.388 1.217 1.220 1.294 1.415 1.505 1.592 1.630 1.564 1.494 1.387 1.300 1.216 1.310 1.773 1.832 1.796 1.490 1.317 1.410 1.524 1.588 1.514 1.617 1.503 1.437 1.673 1.619 1.496 1.437 1.528 1.664 1.591 1.576 1.437 1.390 1.730 1.568 1.439 1.313 1.705 1.817 1.973 2.069 1.937 1.732 1.615 1.464 1.447 1.450 1.612 1.639 1.557 1.415 1.294 1.512 1.515 1.541 1.616 1.681 1.642 1.363 1.557 1.611 2.046 2.206 2.240 2.193 1.499 1.451 1.692 1.490 1.552 1.730 1.769 1.359 1.380 1.829 1.728 1.761 1.579 1.447 1.359 1.310 1.368 1.631 1.637 1.731 1.





No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.				
3.				
4.				

Client:

ATHI WATER WORKS DEVELOPMENT AGENCY
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:

CAS CONSULTANTS LIMITED
Le' Mac Building, 1st FL, Off Church Rd, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

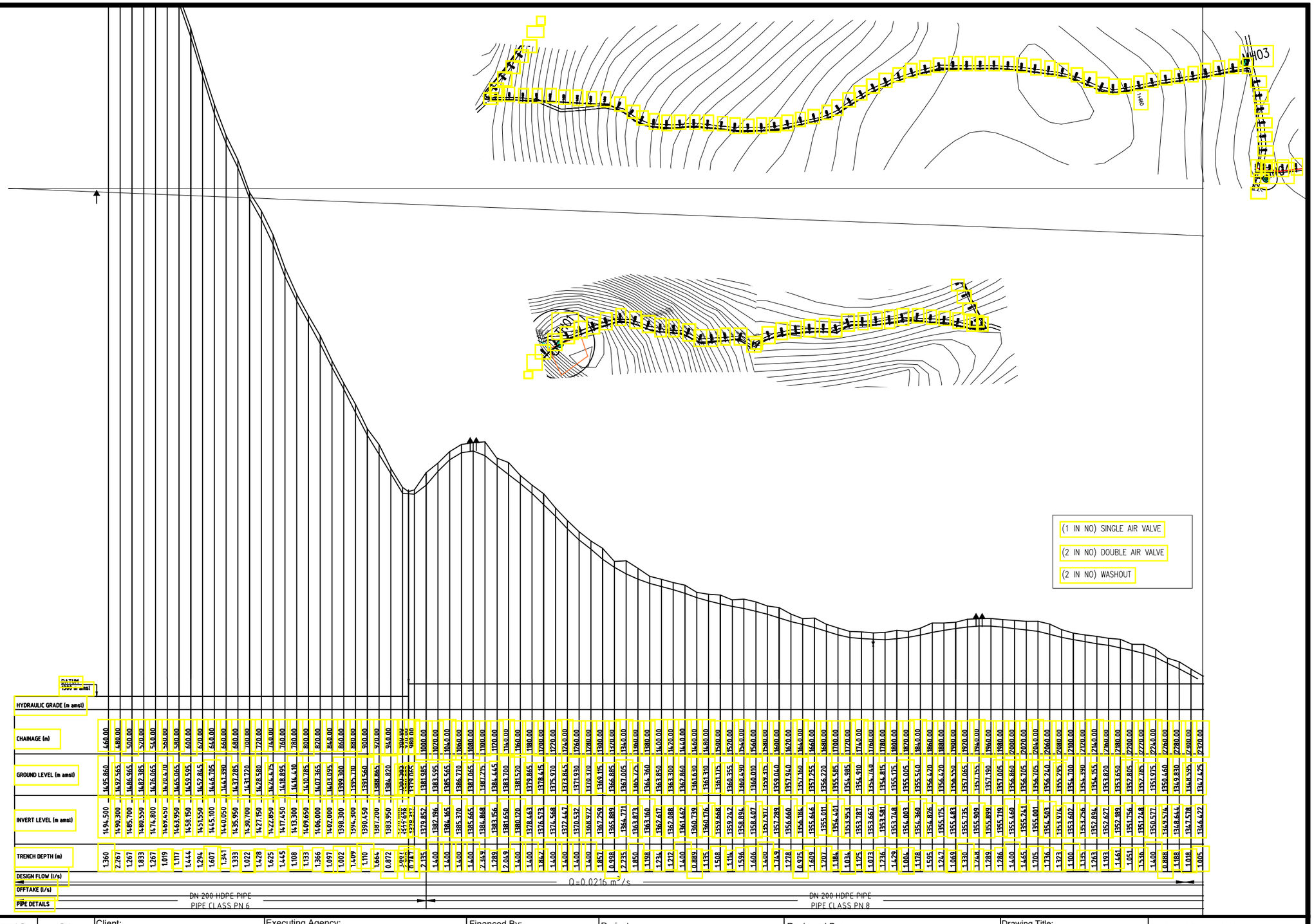
Drawing Title:

MUTHEI HILL RISING MAIN

PLAN AND PROFILE

FROM CH 6+ 000 TO CH 7 +060

Designed By	: L.K
Drawn By	: E.W.K
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	:MARCH 2023
Drawing No	: AWSB/MC/MH/004



No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	May 2018
2.				
3.				
4.				

Client:

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD ,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

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K.I.D.P BUILDING, ALONG KALAWA ROAD
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Reviewed By:

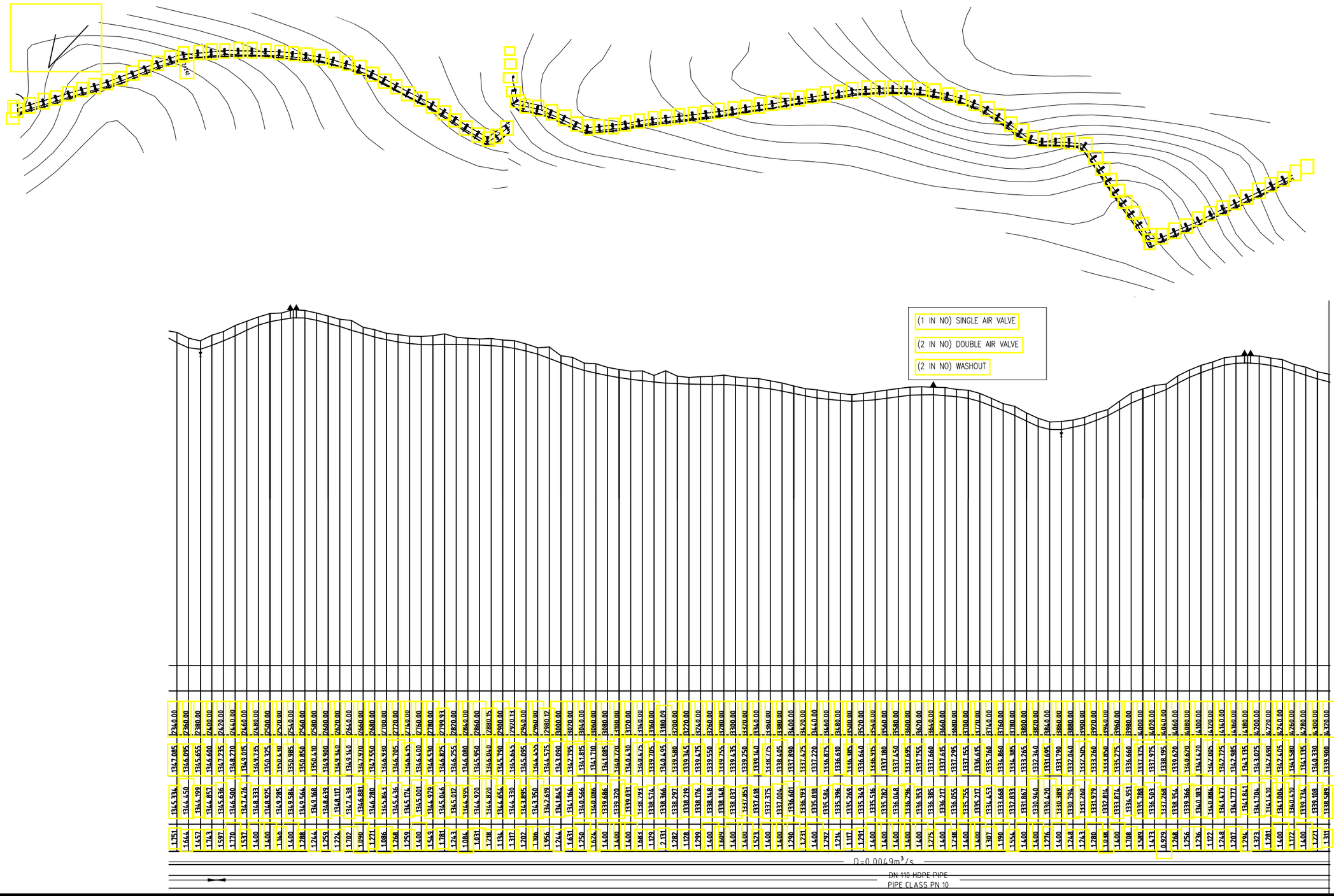
CAS CONSULTANTS LIMITED
Le' Mac Building, 1st Fl, Off Church Rd, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title:

MUTHEI HILL TO MASII TANK

FROM CH 0 + 000 TO CH 2 +000

Designed By	: L.K
Drawn By	: R.W
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/MMT/001



No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	May 2018
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3.				
4.				

Client:

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD ,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
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Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AFDB/KTSWSSP/W/08/ 2023

Reviewed By:

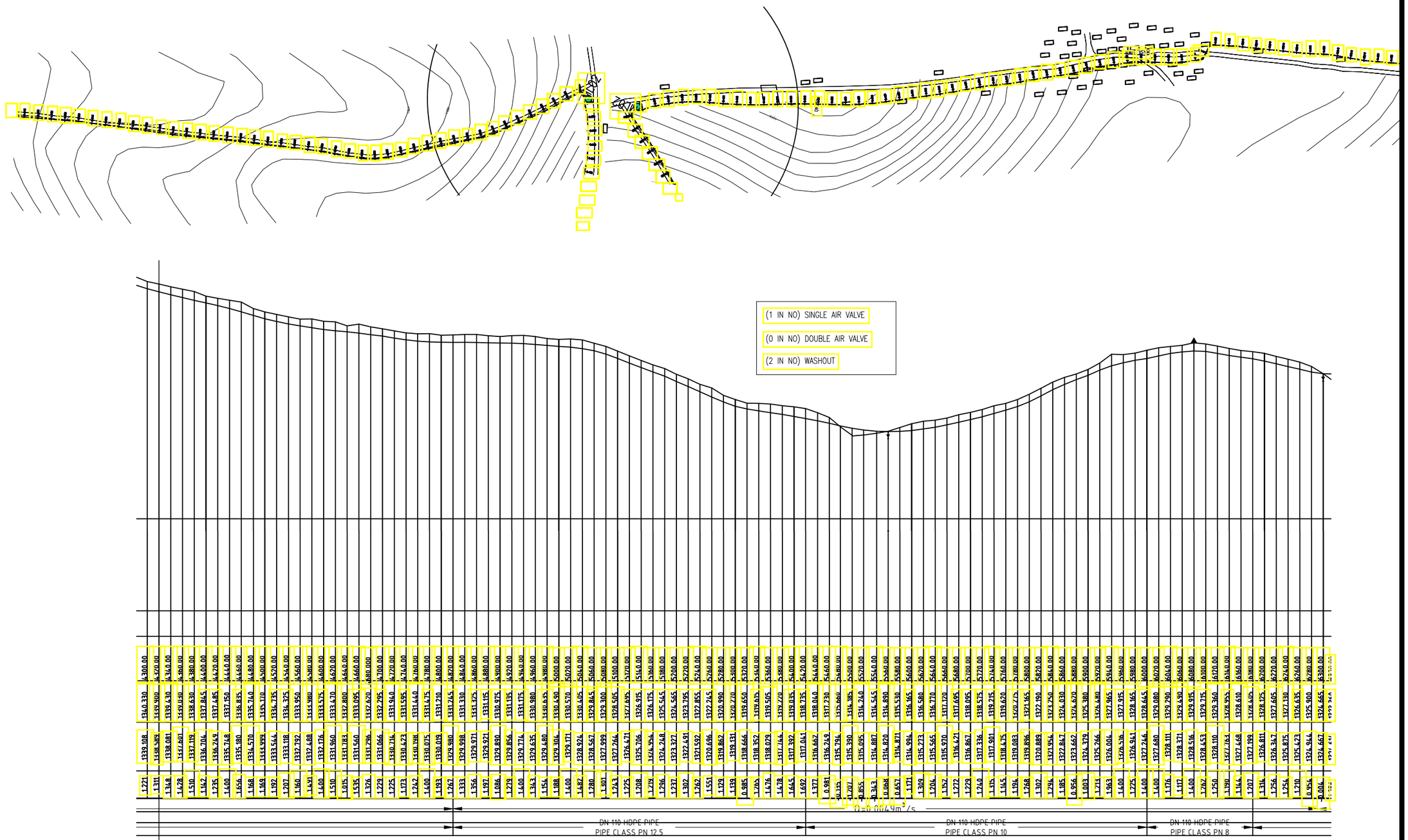
CAS CONSULTANTS LIMITED
Le' Mac Building, 1st Fl, Off Church Rd, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title:

MUTHEI HILL TO MASII TANK

FROM CH 2 + 000 TO CH 4 +000

Designed By	: L.K
Drawn By	: R.W
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/MMT/002



No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	May 2018
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3.				
4.				

Client:

ATHI WATER WORKS DEVELOPMENT AGENCY
MUTHAIGA NORTH ROAD ,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AFDB/KTSWSSP/W/08/ 2023

Reviewed By:

CAS CONSULTANTS LIMITED
Le' Mac Building, 1st Fl, Off Church Rd, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title:

MUTHEI HILL TO MASII TANK

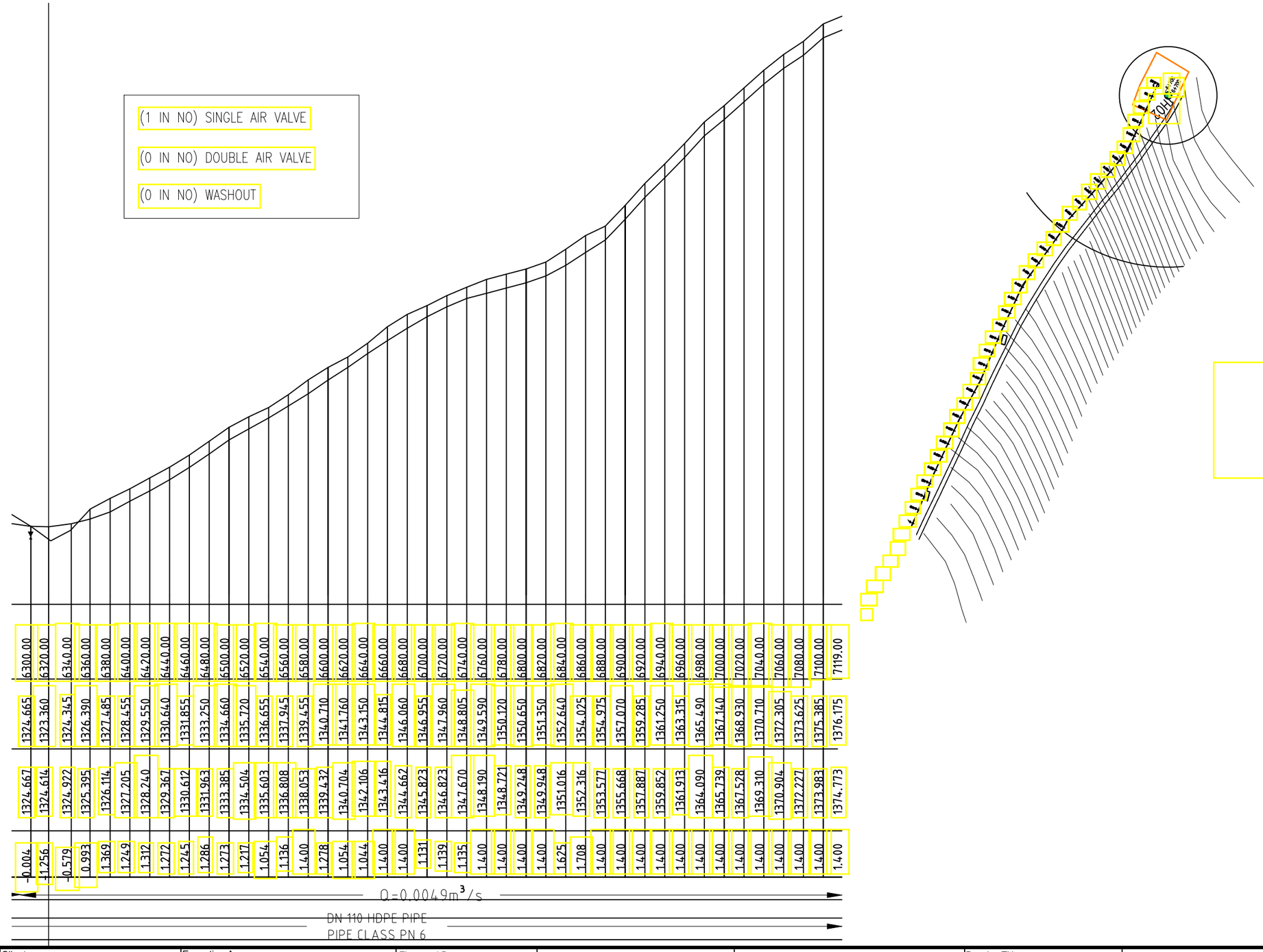
FROM CH 4 + 000 TO CH 6 +000

Designed By	: L.K
Drawn By	: R.W
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/MMT/003

(1 IN NO) SINGLE AIR VALVE

(0 IN NO) DOUBLE AIR VALVE

(0 IN NO) WASHOUT



No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	May 2018
2.				
3.				
4.				

Client:

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

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Drawing Title:

MUTHEI HILL TO MASII TANK

FROM CH 6 + 000 TO CH 6 +709

Designed By	: L.K
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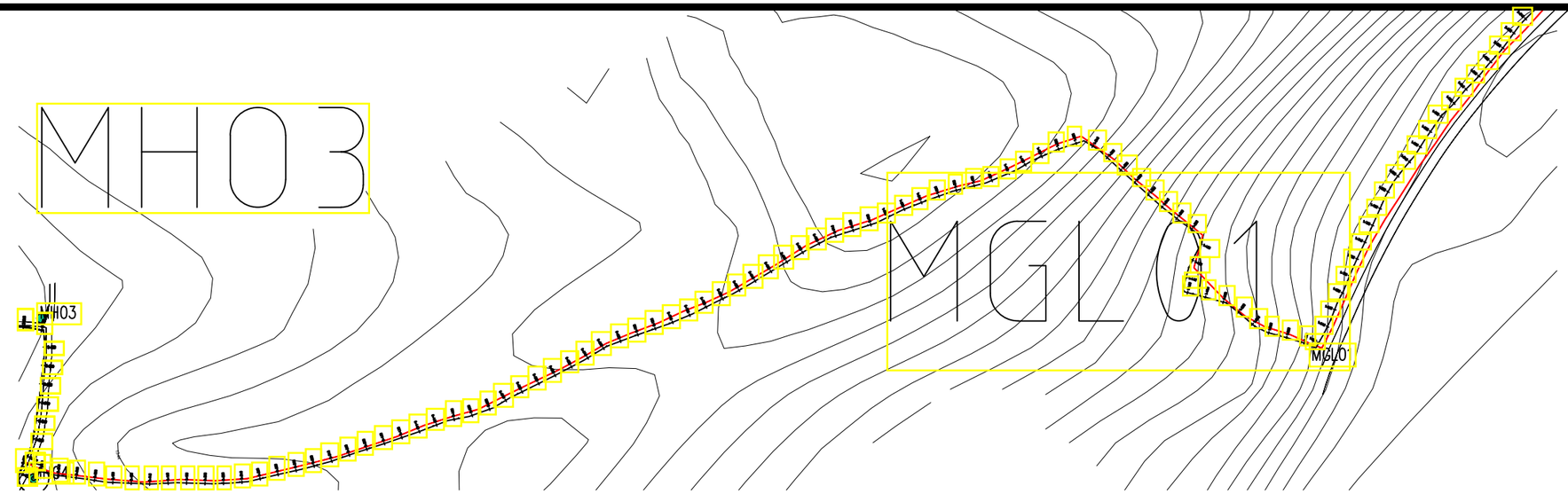
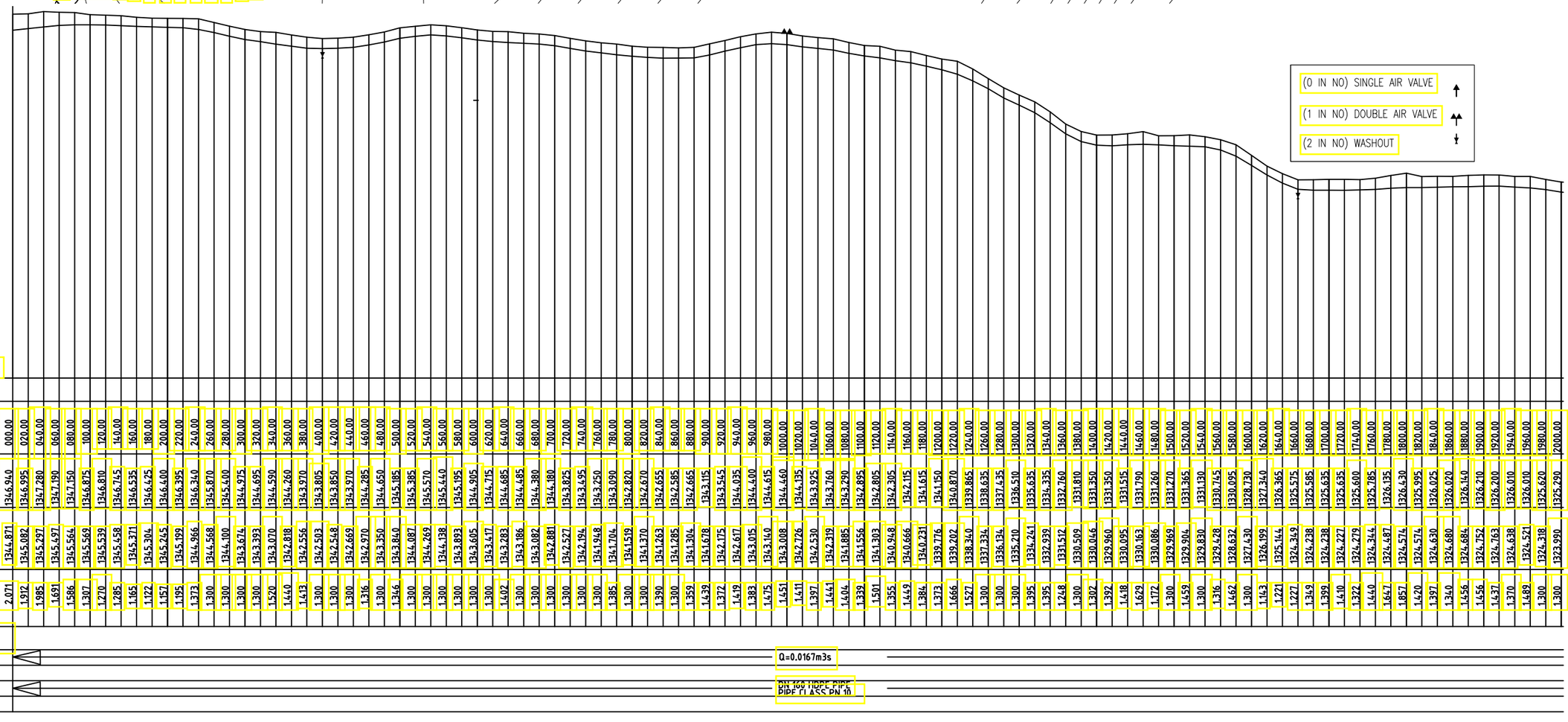
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/MMT/004





No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	May 2018
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3.				
4.				

Client:
ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:
AFRICAN DEVELOPMENT BANK

Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

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AWWDA/AFDB/KTSWSSP/W/08/ 2023

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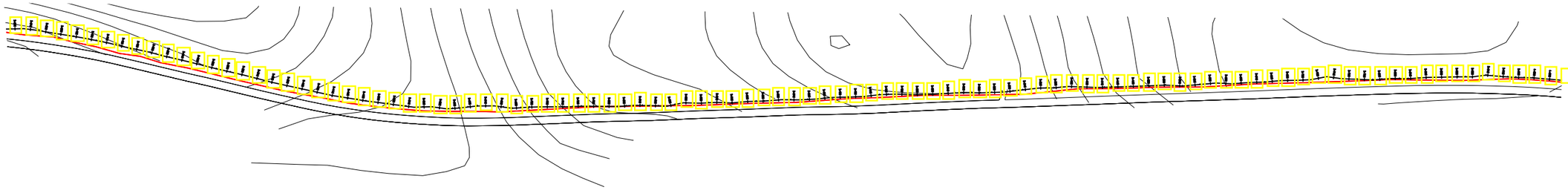
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

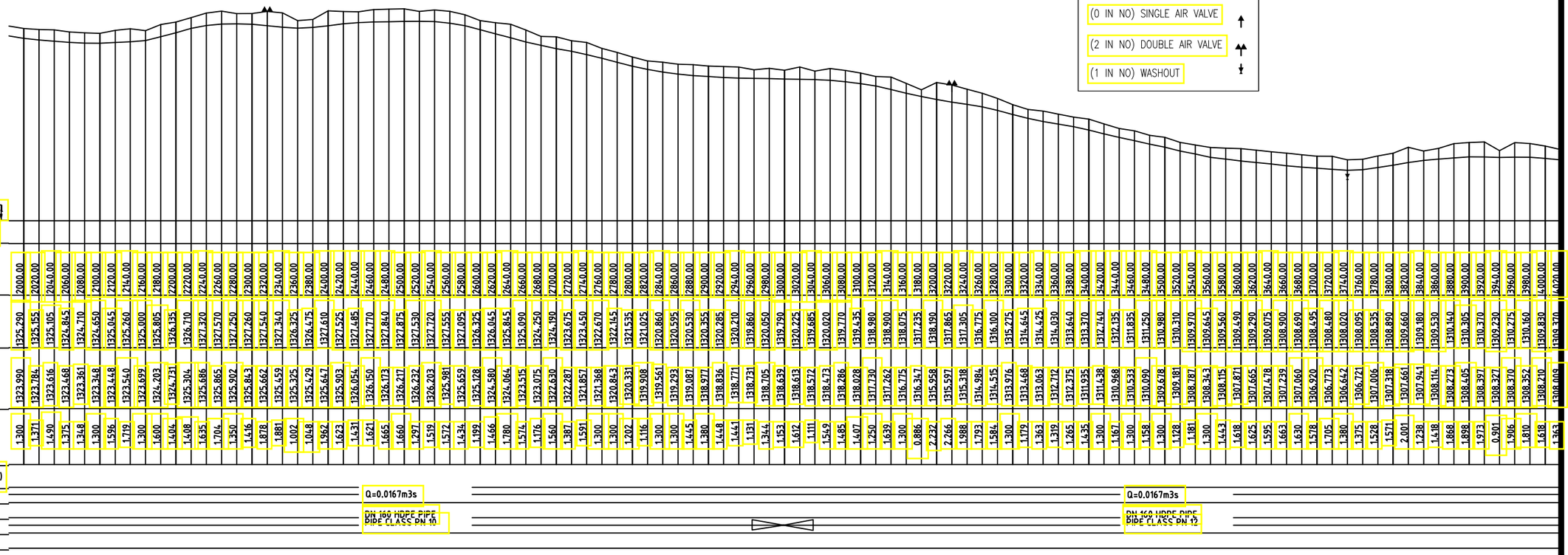
Drawing Title:
JUNCTION TO MAKUTANO PIPELINE

PLAN AND PROFILE

FROM CH 0 + 000 TO CH 2 +000

Designed By	: L.K
Drawn By	: E.O
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/JM/001





No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	May 2018
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Client:

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA, NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:

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Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AFDB/KTSWSSP/W/08/ 2023

Reviewed By:

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E-mail: casconsult@africaonline.co.ke

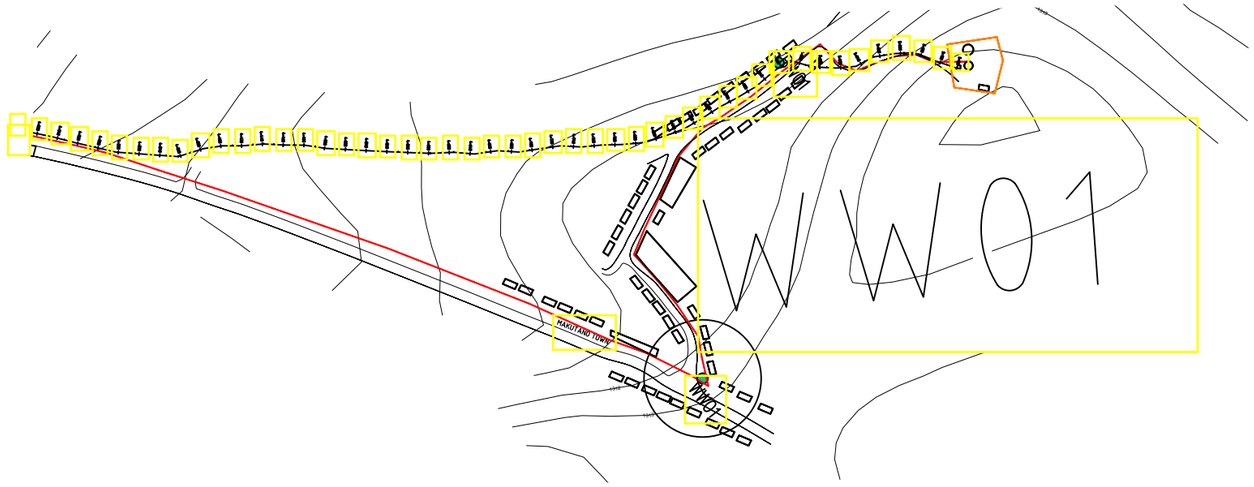
Drawing Title:

JUNCTION TO MAKUTANO PIPELINE

PLAN AND PROFILE

FROM CH 2 + 000 TO CH 4 +000

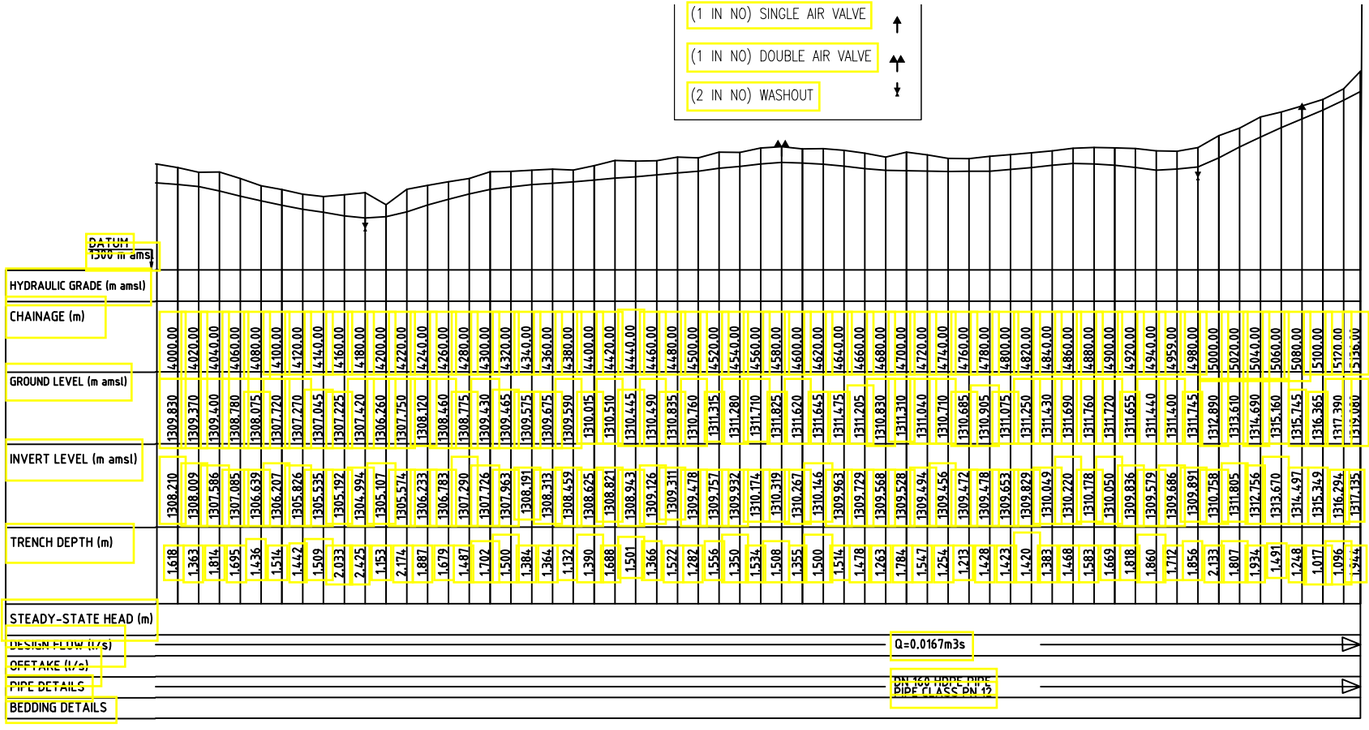
Designed By	: L.K
Drawn By	: E.O
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/JM/002



(1 IN NO) SINGLE AIR VALVE

(1 IN NO) DOUBLE AIR VALVE

(2 IN NO) WASHOUT



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1.		W.K	S.M.M	May 2018
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Client:

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA, NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:

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Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AFDB/KTSWSSP/W/08/ 2023

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E-mail: casconsult@africaonline.co.ke

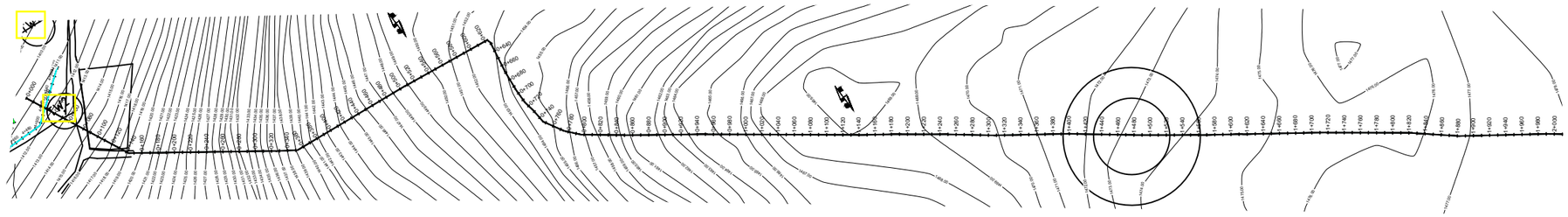
Drawing Title:

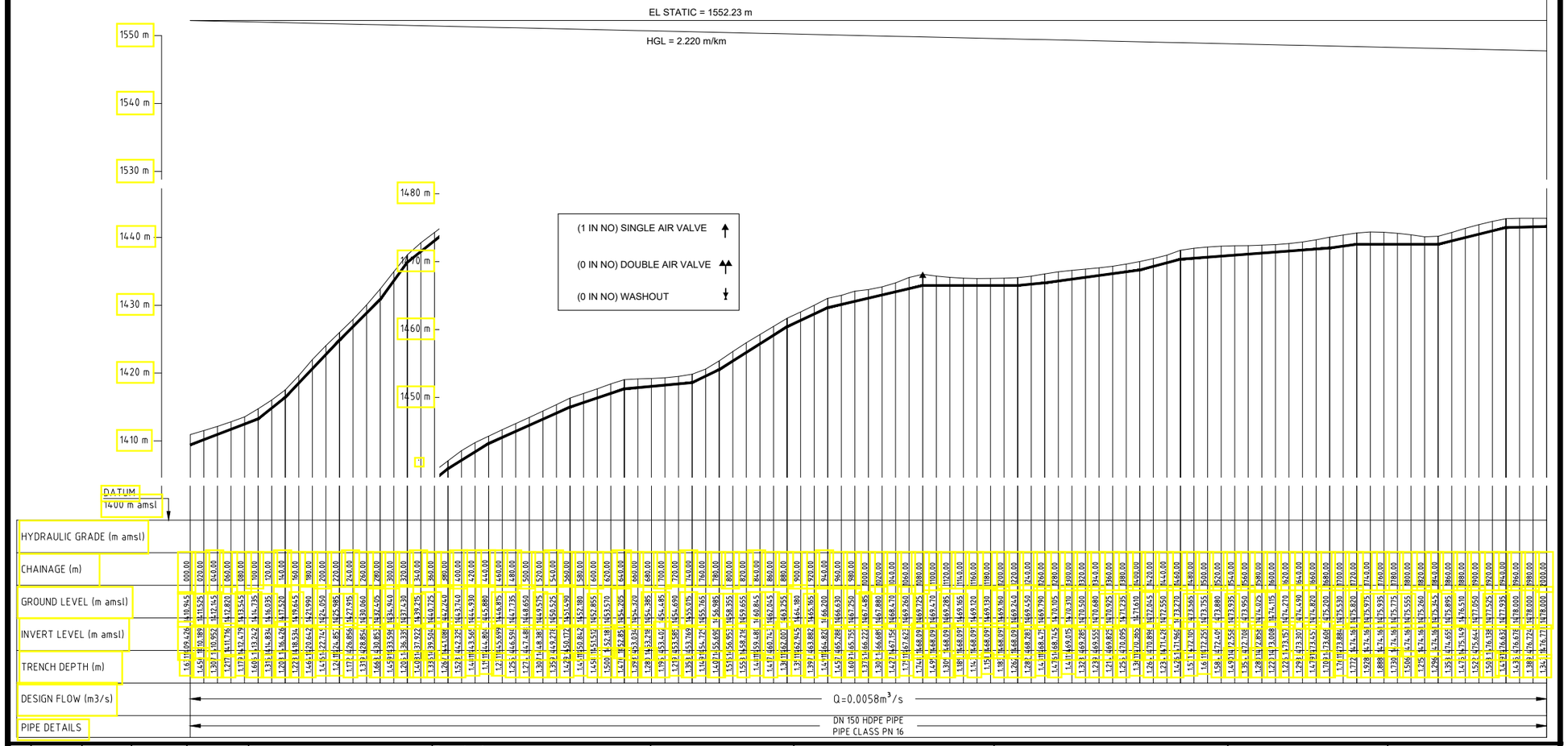
JUNCTION TO MAKUTANO PIPELINE

PLAN AND PROFILE

FROM CH 4+ 000 TO CH 5+460

Designed By	:	L.K
Drawn By	:	E.O
Checked By	:	G.I
Approved By	:	S.M.M
Client approval	:	
Date	:	MARCH 2023
Drawing No	:	AWSB/MC/JM/003





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1.		W.K	S.M.M	March 2018
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Client:

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MUTHAIGA, NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:

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Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

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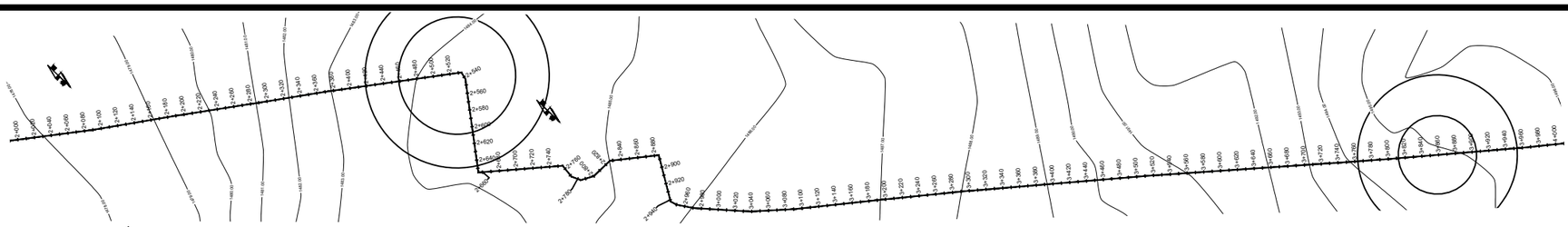
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

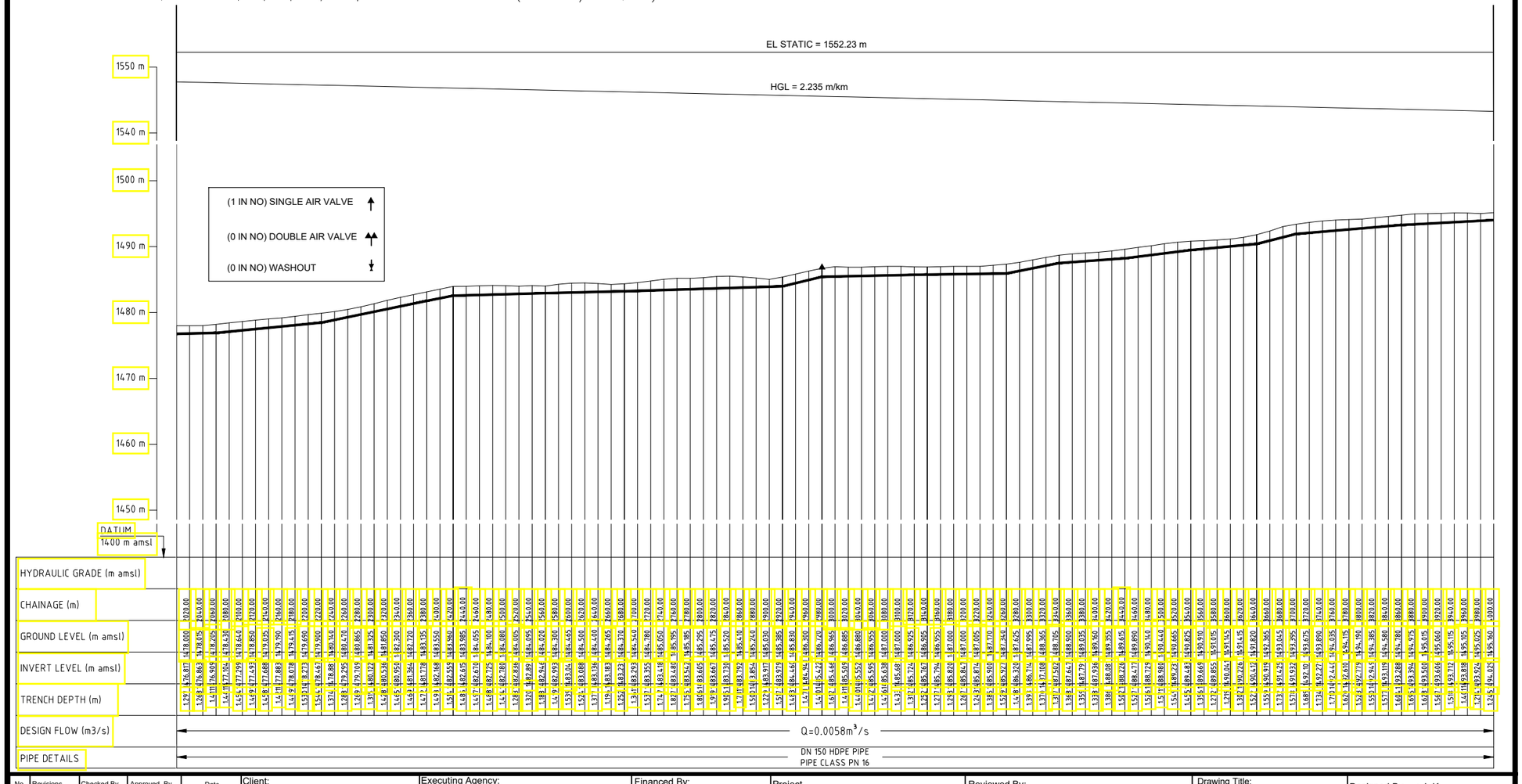
Drawing Title:

NZAMBANI RISING MAIN
PLAN AND PROFILE

FROM CH 0 + 000 TO CH 2 +000

Designed By	: L.K
Drawn By	: E.W.K
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/NZ/001





No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
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Client:
ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA, NORTH ROAD
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:
AFRICAN DEVELOPMENT BANK

Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT
CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:
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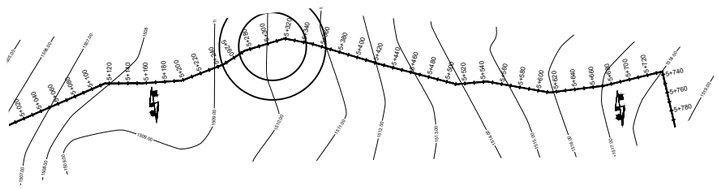
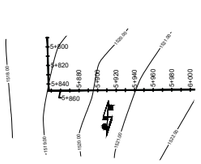
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title:
NZAMBANI RISING MAIN
PLAN AND PROFILE
FROM CH 2 + 000 TO CH 4 +000

Designed By	: L.K
Drawn By	: E.W.K
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/NZ/002







EL STATIC = 1552.23 m

HGL = 2.235 m/km

550 m

540 m

530 m

520 m

510 m

500 m

490 m

(1 IN NO) SINGLE AIR VALVE

(0 IN NO) DOUBLE AIR VALVE

(1 IN NO) WASHOUT

UM

m amsl

amsl)

l)

)

Q=0.0058m³/s

DN 150 HDPE PIPE
PIPE CLASS PN 16

Approved By	Date
S.M.M	March 2018

Client:

ATHI WATER WORKS DEVELOPMENT AGENCY,

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY

Financed By:

AFRICAN DEVELOPMENT BANK

Project

CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;

Reviewed By:

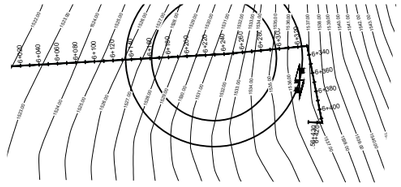
CAS CONSULTANTS LIMITED
Le' Mac Building, 1st Fl, Off Church Rd, Westlands
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049

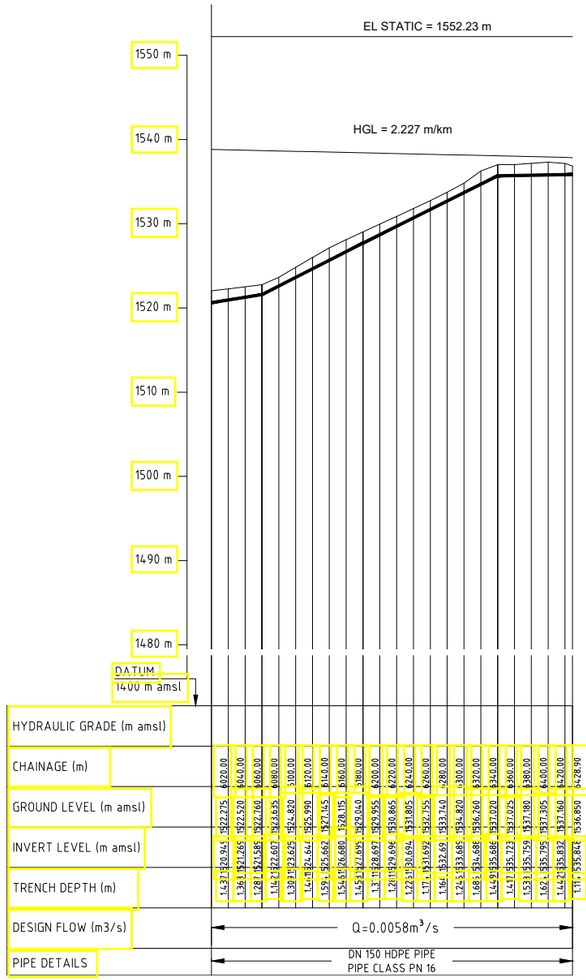
Drawing Title:

NZAMBANI RISING MAIN
PLAN AND PROFILE

FROM CH 4 + 000 TO CH 6 +000

Designed By	: L.K
Drawn By	: E.W.K
Checked By	: G.I
Approved By	: S.M.M
Client approval	:





No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
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Executing Agency:
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K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:
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Project
CONSTRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT
CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

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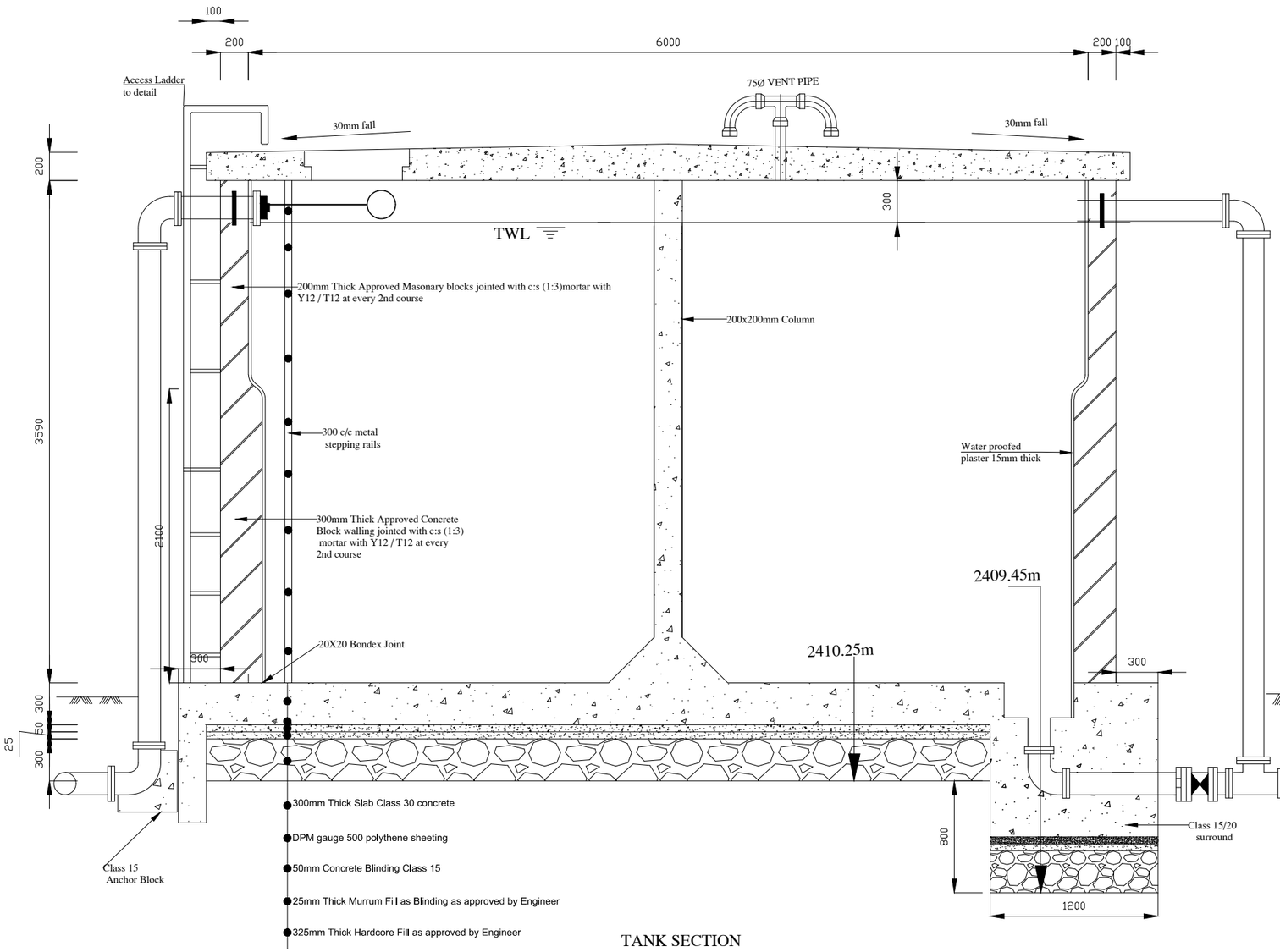
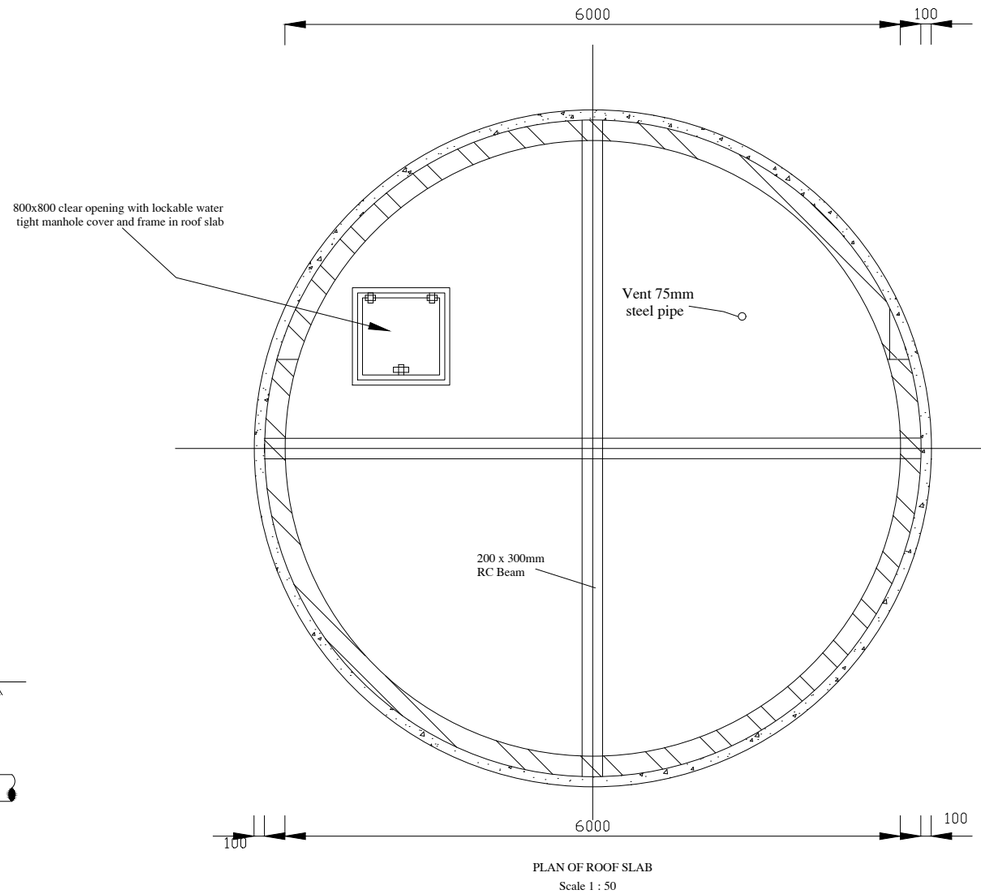
E-mail: casconsult@africaonline.co.ke

Drawing Title:
NZAMBANI RISING MAIN
PLAN AND PROFILE
FROM CH 6 + 000 TO CH 6 +440

Designed By	:	L.K
Drawn By	:	E.W.K
Checked By	:	G.I
Approved By	:	S.M.M
Client approval	:	
Date	:	MARCH 2023
Drawing No	:	AWSB/MC/NZ/004



TANK SECTION
Scale 1 : 30



PLAN OF ROOF SLAB
Scale 1 : 50

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.		G.I	S.M.M	Feb 2020
3.				
4.				

Client:
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MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:
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K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:
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Project
CONTSRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

Reviewed By:
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P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title:
100M³ TANK SECTION AND BASE SLAB

Designed By	: L.K
Drawn By	: E.W.K
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/GMT/001

NOTES

1.HARD-CORE

LAYER THICKNESS SHALL BE DETERMINED BY THE ENGINEER, BUT NOT LESS THAN 300mm

2. MASONARY WALL

SHALL NOT BE CONNECTED TO EITHER THE FLOOR SLAB NOR THE ROOF SLAB.THE WALL SUPPORTING AREA OF THE FLOOR SLAB AS WELL AS

THE TOP OF THE WALL SHALL BE TROWEL FINISHED AND BE PAINTED WITH THREE COATS OF BITUMINOUS PAINT.

3.THE MASONARY WALL SHALL BE BUILT OF GOOD QUALITY LOCAL BUILDING STONES OR CONCRETE BLOCKS. THE SIZE OF THE STONES SHALL BE:

- WIDTH: NOT LESS THAN 200MM RESP. 300mm
- LENGTH: BETWEEN 200 AND 300 mm
- HEIGHT: NOT MORE THAN 150 mm

THE STONES SHALL BE SOAKED IN WATER FOR 24HRS BEFORE BEING BUILT INTO THE WALL . PARTICULAR CARE MUST BE TAKEN TO FILL ALL THE JOINTS COMPLETELY WITH MOTAR.(MOTAR MIXTURE 3:1, SAND: CEMENT)

4. CONSTRUCTION JOINTS.

ARE NOT PERMITTED ,THE SLABS MUST BE CASTED IN ONE TIME.

5. FORMWORK

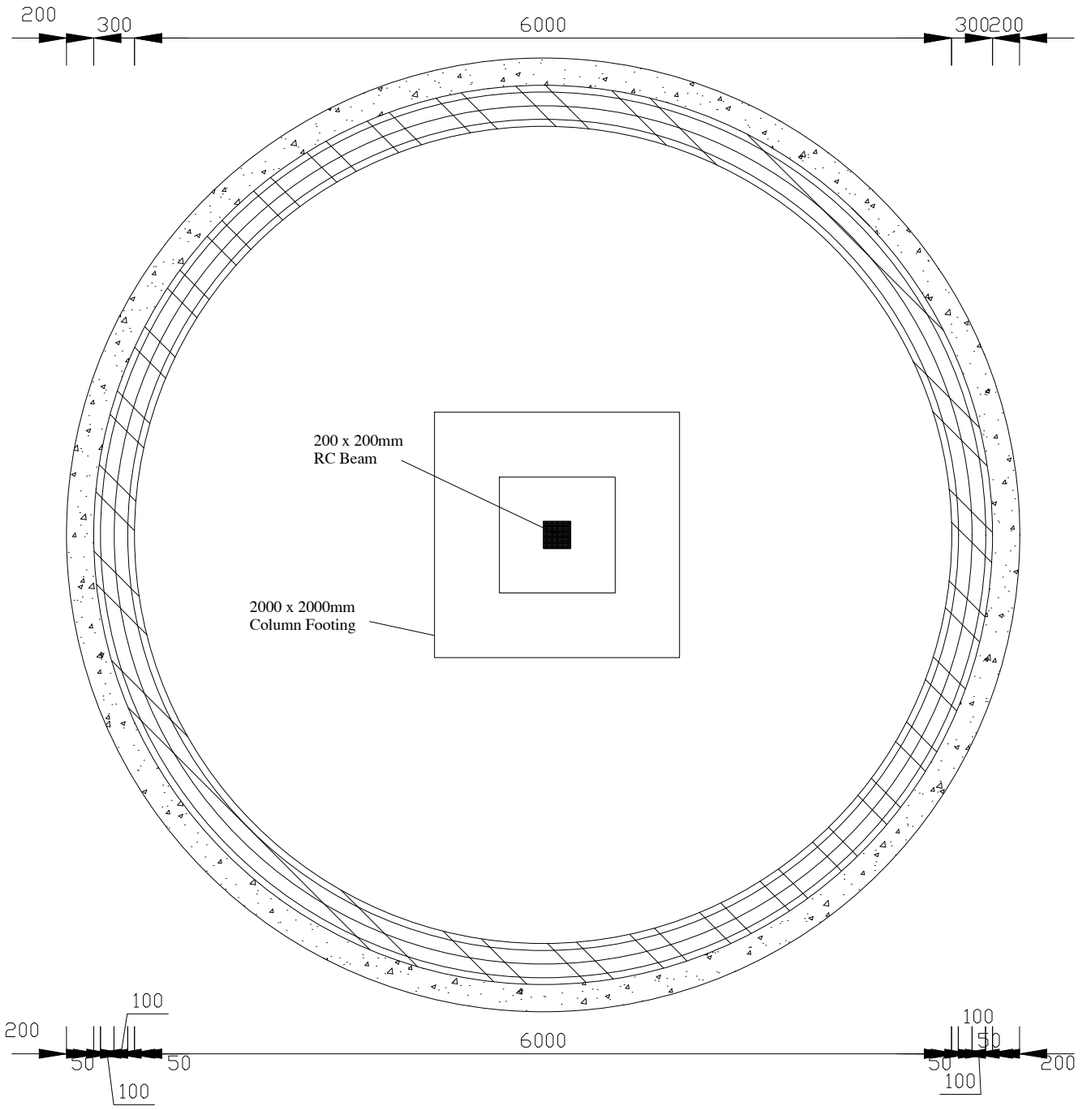
FOR THE ROOF SLAB MUST HAVE A CAMBER OF 30mm AT THE CENTRE

6. EXTERIOR SURFACE

OF THE TANK SHALL RECEIVE ONE COAT OF CEMENT WASH.

7. INTERIOR SURFACE

OF THE TANK SHALL BE PLASTERED THICKNESS 15MM WITH 2 MOTAR MIXTURE 2:1(SAND:CEMENT) TO OBTAIN A WATER PROOF PLASTERING; PUDLO CEMENT SHOULD BE ADDED.



PLAN OF BASE SLAB

Scale 1 : 50

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.		G.I	S.M.M	Feb 2020
3.				
4.				

Client:

ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:

TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:

AFRICAN DEVELOPMENT BANK

Project

CONTSRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
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Reviewed By:

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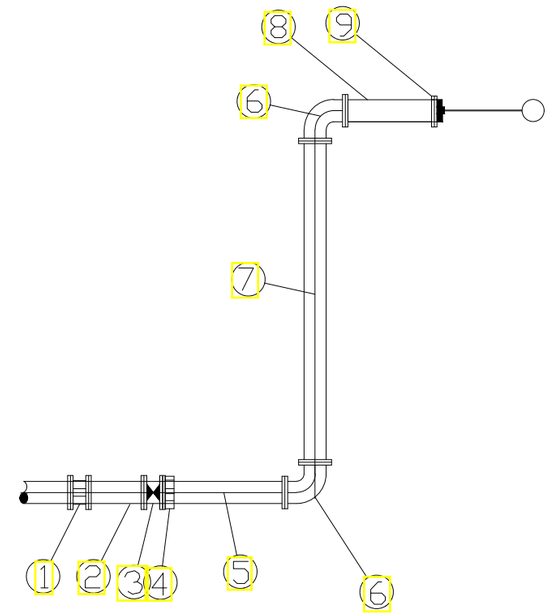
off Church Road, Westlands.
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title:

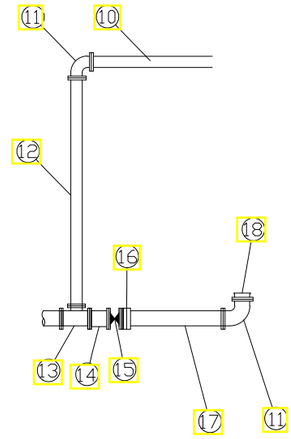
100M³ TANK
ROOF SLAB

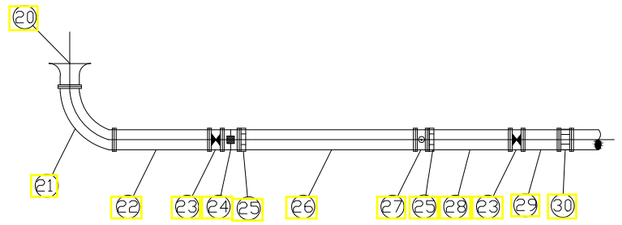
Designed By	:	L.K
Drawn By	:	E.W.K
Checked By	:	G.I
Approved By	:	S.M.M
Client approval	:	
Date	:	MARCH 2023
Drawing No	:	AWSB/MC/GMT/002

PIPEWORK SCHEDULE					
ITEM	DESCRIPTION	DIA (mm)	LENGTH (m)	CLASS / FLANGE	QTY (No.)
	INLET				
1	Straight Flexible Coupling	150		NP16	1
2	Flanged Spigot pipe piece	150	0.5	NP16	1
3	Double Flanged sluice valve	150		NP16	1
4	Flanged Adaptor	150		NP16	1
5	Flanged Spigot pipe piece	150	1.0	NP16	1
6	Double flanged 90° bend	150		NP16	2
7	Double Flanged pipe piece	150	3.7	NP16	1
8	Double Flanged pipe piece with central puddle flange	150	1.0	NP16	1
9	Ball valve	150		NP16	1

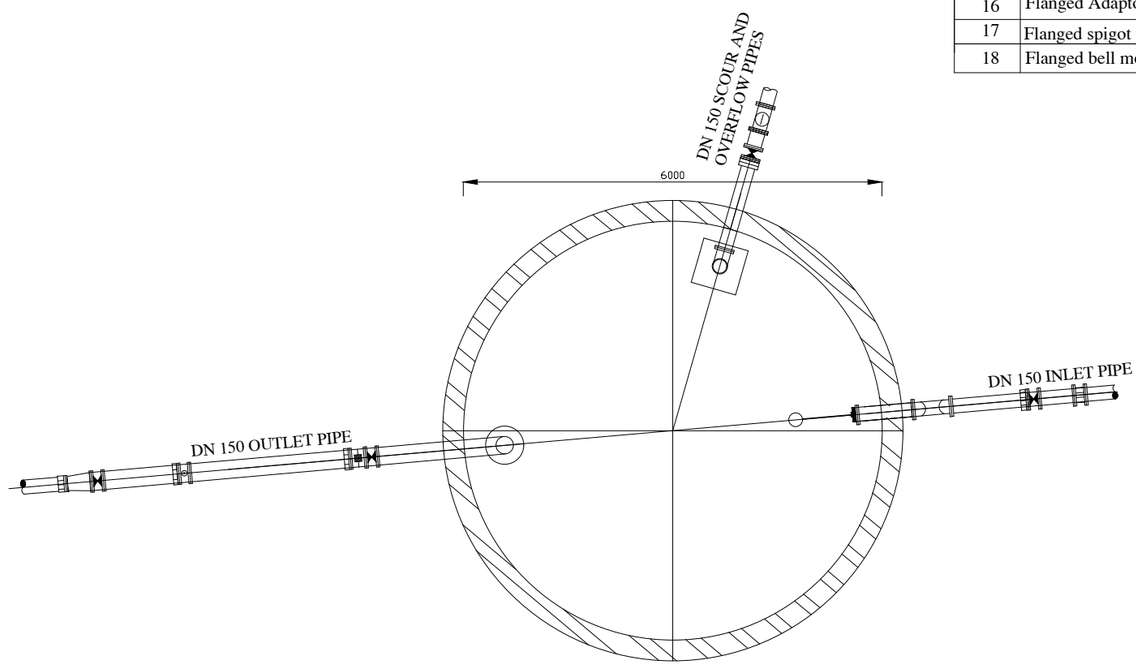


PIPEWORK SCHEDULE					
ITEM	DESCRIPTION	DIA (mm)	LENGTH (m)	CLASS / FLANGE	QTY (No.)
	OUTLET				
20	Flanged bell mouth	150		NP16	1
21	Double flanged 90° long radius bend	150		NP16	1
22	Double Flanged pipe piece	150	1.2	NP16	1
23	Double flanged sluice valve	150		NP16	2
24	Double flanged strainer	150		NP16	1
25	Flanged Adaptor	150		NP16	2
26	Flanged spigot pipe piece	150	2.0	NP16	1
27	Double flanged master meter	150		NP16	1
28	Flanged spigot pipe piece	150	1.0	NP16	1
29	Flanged Spigot pipe piece	150	0.5	NP16	1
30	Straight Flexible Coupling	150		NP16	1





PIPEWORK SCHEDULE					
ITEM	DESCRIPTION	DIA (mm)	LENGTH (m)	CLASS / FLANGE	QTY (No.)
	SCOUR AND OVERFLOW				
10	Flanged pipe piece with puddle flange 250mm from spigot end	150	1.5	NP16	1
11	Double flanged 90° bend	150		NP16	2
12	Double Flanged pipe piece	150	4.0	NP16	1
13	All flanged equal tee	150		NP16	1
14	Double Flanged pipe piece	150	0.2	NP16	1
15	Double flanged sluice valve	150		NP16	1
16	Flanged Adaptor	150		NP16	1
17	Flanged spigot pipe piece	150	1.2	NP16	1
18	Flanged bell mouth	150		NP16	1



PLAN OF BASE SLAB

Scale 1 : 100

No	Revisions	Checked By	Approved By	Date
1.		W.K	S.M.M	March 2018
2.		G.I	S.M.M	Feb 2020
3.				
4.				

Client:
ATHI WATER WORKS DEVELOPMENT AGENCY,
MUTHAIGA NORTH ROAD,
P.O. BOX 45283-000100, NAIROBI, KENYA

Executing Agency:
TANATHI WATER WORKS DEVELOPMENT AGENCY
K.I.D.P BUILDING, ALONG KALAWA ROAD
PRIVATE BAG - 90200

Financed By:
AFRICAN DEVELOPMENT BANK

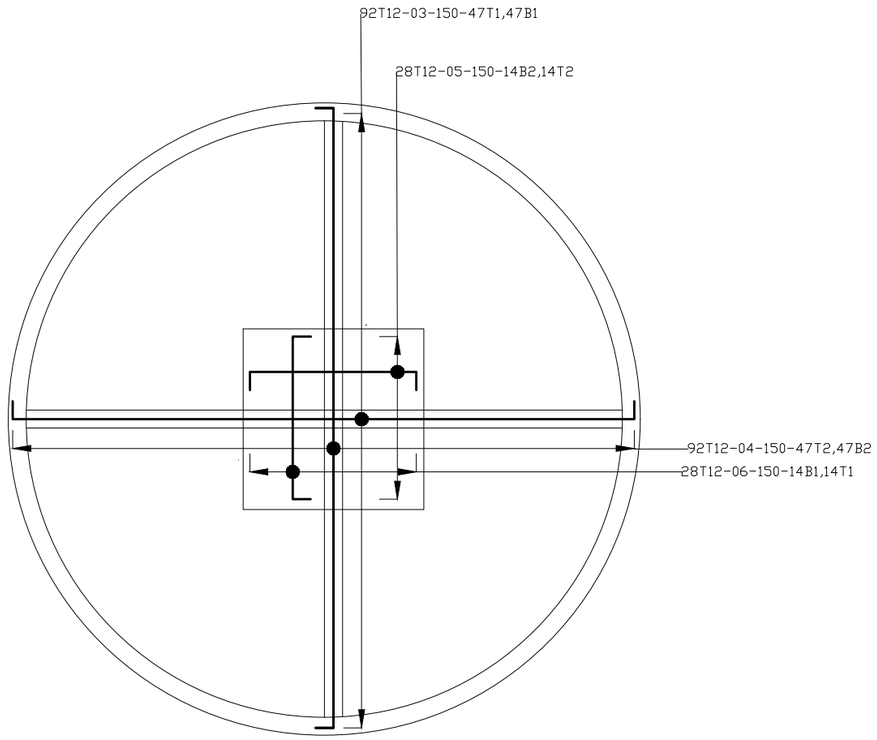
Project
CONTSRUCTION OF MWALA CLUSTER WATER SUPPLY PROJECT

CONTRACT No;
AWWDA/AfDB/KTSWSSP/W/08/2023

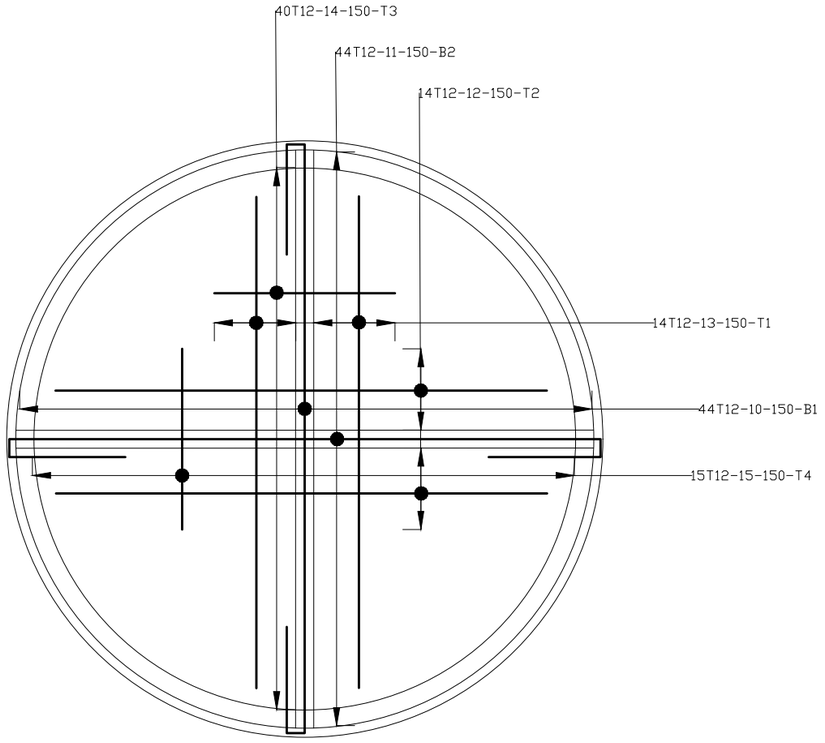
Reviewed By:
CAS CONSULTANTS LIMITED
Le' Mac Building, 1st/ Floor,
off Church Road, Westlands.
P.O Box 67693 - 00200 - Nairobi, Kenya
Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title:
100m³ TANK BASE & PIPE DETAILS

Designed By	: L.K
Drawn By	: E.W.K
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/GMT/003



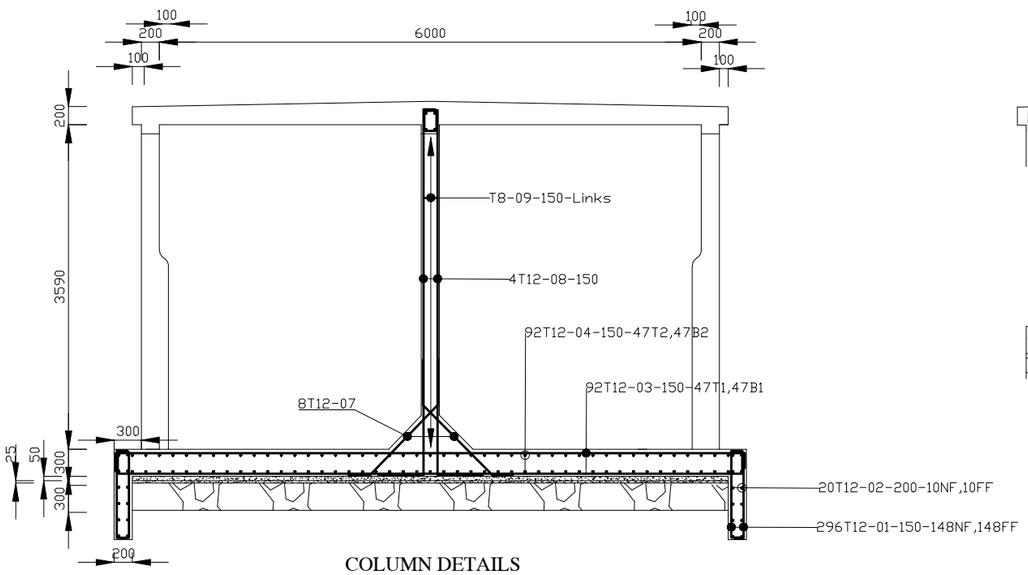
BASE SLAB LAYOUT PLAN
Scale 1 : 50



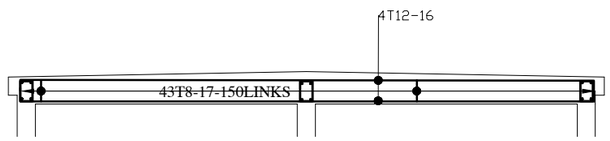
ROOF SLAB LAYOUT PLAN
Scale 1 : 50

GENERAL NOTES

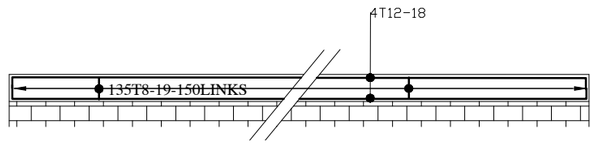
1. All dimensions in millimeteres
2. This drawing must not be scaled ,only figured dimensions should be used
3. Concrete to be:Rreinforced concrete grad 35,20mm max aggeregate,vibrated mass concrete and blinding grade 10
4. Reinforcement to be cold worked ribbed high tensile bars and round mild steel bars
5. Cover to all 300mm members to be and 200mmwalls to be 25mm
6. All circumferential reinforcement laps to be staggered



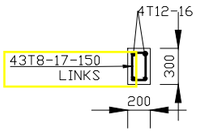
COLUMN DETAILS
Scale 1 : 50



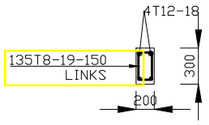
INTERNAL BEAM DETAILS
Scale 1 : 50



RING BEAM DETAILS
Scale 1 : 50



INTERNAL BEAM STRUCTURAL DETAILS
Scale 1 : 50



RING BEAM STRUCTURAL DETAILS
Scale 1 : 50

No	Revisions	Checked By	Approved By	Date
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CONTRACT No;
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Reviewed By:
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off Church Road, Westlands.
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Tel: 020 4445265 Fax: 020 4440049
E-mail: casconsult@africaonline.co.ke

Drawing Title:
100m³ TANK BASE & ROOF SLAB REINFORCEMENT

Designed By	: L.K
Drawn By	: E.W.K
Checked By	: G.I
Approved By	: S.M.M
Client approval	:
Date	: MARCH 2023
Drawing No	: AWSB/MC/GMT/004