



**THE REPUBLIC OF UGANDA
MINISTRY OF WATER AND ENVIRONMENT**

INTEGRATED WATER MANAGEMENT AND DEVELOPMENT PROJECT (PROJECT ID NO: P163782)

FINANCED BY THE WORLD BANK & GOVERNMENT OF UGANDA

CO-FINANCED BY



THE WORLD BANK

AND



GOVERNMENT OF UGANDA

**CONSTRUCTION OF GASPA RGC SOLAR POWERED PIPED WATER SUPPLY AND
SANITATION SYSTEM**

REFERENCE NO.: MWE/WRKS/22-23/00005

BIDDING DOCUMENT

VOLUME IV

DRAWINGS

October 2022

TABLE OF CONTENT

DRAWING No	DRAWING TITLE	DRAWING No	DRAWING TITLE
GPA/WS/0.0.0	GENERAL LAYOUT (TRANSMISSION AND DISTIRBUTION)	GPA/WS/2.2.10	TRANSMISSION LINE 02 (5+400.00 – 6+202.06)
GPA/WS/1.1.0	TYPICAL BOREHOLE PUMP HOUSE AND SOLAR ARRAY (SITE PLAN LAYOUT)	GPA/WS/3.1.1	200M3 GASPA RESERVOIR – PLAN LAYOUT
GPA/WS/1.1.1	TYPICAL BOREHOLE PUMP HOUSE (PLAN AND SECTION)	GPA/WS/3.1.2	200M3 GASPA RESERVOIR – SECTION A-A & SECTION B-B
GPA/WS/1.1.2	TYPICAL BOREHOLE PUMP HOUSE (DETAILS)	GPA/WS/3.1.3	200M3 GASPA RESERVOIR – FOUNDATION LAYOUT AND DETAILS
GPA/WS/1.1.3	TYPICAL BOREHOLE PUMP HOUSE (DETAILS)	GPA/WS/3.1.4	200M3 GASPA RESERVOIR – STRUCTURAL DETAILS
GPA/WS/1.1.4	TYPICAL BOREHOLE PUMP HOUSE (ELECTRICAL INSTALLATION)	GPA/WS/4.1.1	CHLORINE HOUSE – PLAN AND ELEVATIONS
GPA/WS/1.1.5	SOLAR ARRAY (ELECTRICAL LAYOUT)	GPA/WS/4.1.2	CHLORINE HOUSE – SECTIONS
GPA/WS/1.1.6	SOLAR ARRAY (PANEL LAYOUT, ELEVATION AND DETAILS)	GPA/WS/5.0.0	GENERAL LAYOUT DISTRIBUTION NETWORK
GPA/WS/1.2.1	BOREHOLE PUMP ATTENDANT, GUARD HOUSE & ECOSAN (PLAN & SECTION)	GPA/WS/5.1.1	DISTRIBUTION LINE 01 (0+000.00 – 0+600.00)
GPA/WS/1.2.2	BOREHOLE PUMP ATTENDANT, GUARD HOUSE & ECOSAN (ELEVATION)	GPA/WS/5.1.2	DISTRIBUTION LINE 01 (0+600.00 – 1+200.00)
GPA/WS/2.0.0	GENERAL LAYOUT TRANSMISSION NETWORK	GPA/WS/5.1.3	DISTRIBUTION LINE 01 (1+200.00 – 1+800.00)
GPA/WS/2.1.1	TRANSMISSION LINE 01 (0+000.00 – 0+600.00)	GPA/WS/5.1.4	DISTRIBUTION LINE 01 (1+800.00 – 2+400.00)
GPA/WS/2.1.2	TRANSMISSION LINE 01 (0+600.00 – 1+200.00)	GPA/WS/5.1.5	DISTRIBUTION LINE 01 (2+400.00 – 3+000.00)
GPA/WS/2.1.3	TRANSMISSION LINE 01 (1+200.00 – 1+800.00)	GPA/WS/5.1.6	DISTRIBUTION LINE 01 (3+000.00 – 3+600.00)
GPA/WS/2.1.4	TRANSMISSION LINE 01 (1+800.00 – 2+400.00)	GPA/WS/5.1.7	DISTRIBUTION LINE 01 (3+600.00 – 4+200.00)
GPA/WS/2.1.5	TRANSMISSION LINE 01 (2+400.00 – 3+000.00)	GPA/WS/5.1.8	DISTRIBUTION LINE 01 (4+200.00 – 4+800.00)
GPA/WS/2.1.6	TRANSMISSION LINE 01 (3+000.00 – 3+600.00)	GPA/WS/5.1.9	DISTRIBUTION LINE 01 (4+800.00 – 5+400.00)
GPA/WS/2.1.7	TRANSMISSION LINE 01 (3+600.00 – 4+200.00)	GPA/WS/5.1.10	DISTRIBUTION LINE 01 (5+400.00 – 6+000.00)
GPA/WS/2.1.8	TRANSMISSION LINE 01 (4+200.00 – 4+800.00)	GPA/WS/5.1.11	DISTRIBUTION LINE 01 (6+000.00 – 6+600.00)
GPA/WS/2.1.9	TRANSMISSION LINE 01 (4+800.00 – 5+400.00)	GPA/WS/5.1.12	DISTRIBUTION LINE 01 (6+600.00 – 7+200.00)
GPA/WS/2.1.10	TRANSMISSION LINE 01 (5+400.00 – 6+000.00)	GPA/WS/5.1.13	DISTRIBUTION LINE 01 (7+200.00 – 7+800.00)
GPA/WS/2.1.11	TRANSMISSION LINE 01 (6+000.00 – 6+616.73)	GPA/WS/5.1.14	DISTRIBUTION LINE 01 (7+800.00 – 8+400.00)
GPA/WS/2.2.1	TRANSMISSION LINE 02 (0+000.00 – 0+600.00)	GPA/WS/5.1.15	DISTRIBUTION LINE 01 (8+400.00 – 9+107.47)
GPA/WS/2.2.2	TRANSMISSION LINE 02 (0+600.00 – 1+200.00)	GPA/WS/5.2.1	DISTRIBUTION LINE 02 (0+000.00 – 0+600.00)
GPA/WS/2.2.3	TRANSMISSION LINE 02 (1+200.00 – 1+800.00)	GPA/WS/5.2.2	DISTRIBUTION LINE 02 (0+600.00 – 1+200.00)
GPA/WS/2.2.4	TRANSMISSION LINE 02 (1+800.00 – 2+400.00)	GPA/WS/5.2.3	DISTRIBUTION LINE 02 (1+200.00 – 1+707.61)
GPA/WS/2.2.5	TRANSMISSION LINE 02 (2+400.00 – 3+000.00)	GPA/WS/5.3.1	DISTRIBUTION LINE 03 (0+000.00 – 0+600.00)
GPA/WS/2.2.6	TRANSMISSION LINE 02 (3+000.00 – 3+600.00)	GPA/WS/5.3.2	DISTRIBUTION LINE 03 (0+600.00 – 1+200.00)
GPA/WS/2.2.7	TRANSMISSION LINE 02 (3+600.00 – 4+200.00)	GPA/WS/5.3.3	DISTRIBUTION LINE 03 (1+200.00 – 1+800.00)
GPA/WS/2.2.8	TRANSMISSION LINE 02 (4+200.00 – 4+800.00)	GPA/WS/5.3.4	DISTRIBUTION LINE 03 (1+800.00 – 2+515.20)
GPA/WS/2.2.9	TRANSMISSION LINE 02 (4+800.00 – 5+400.00)		

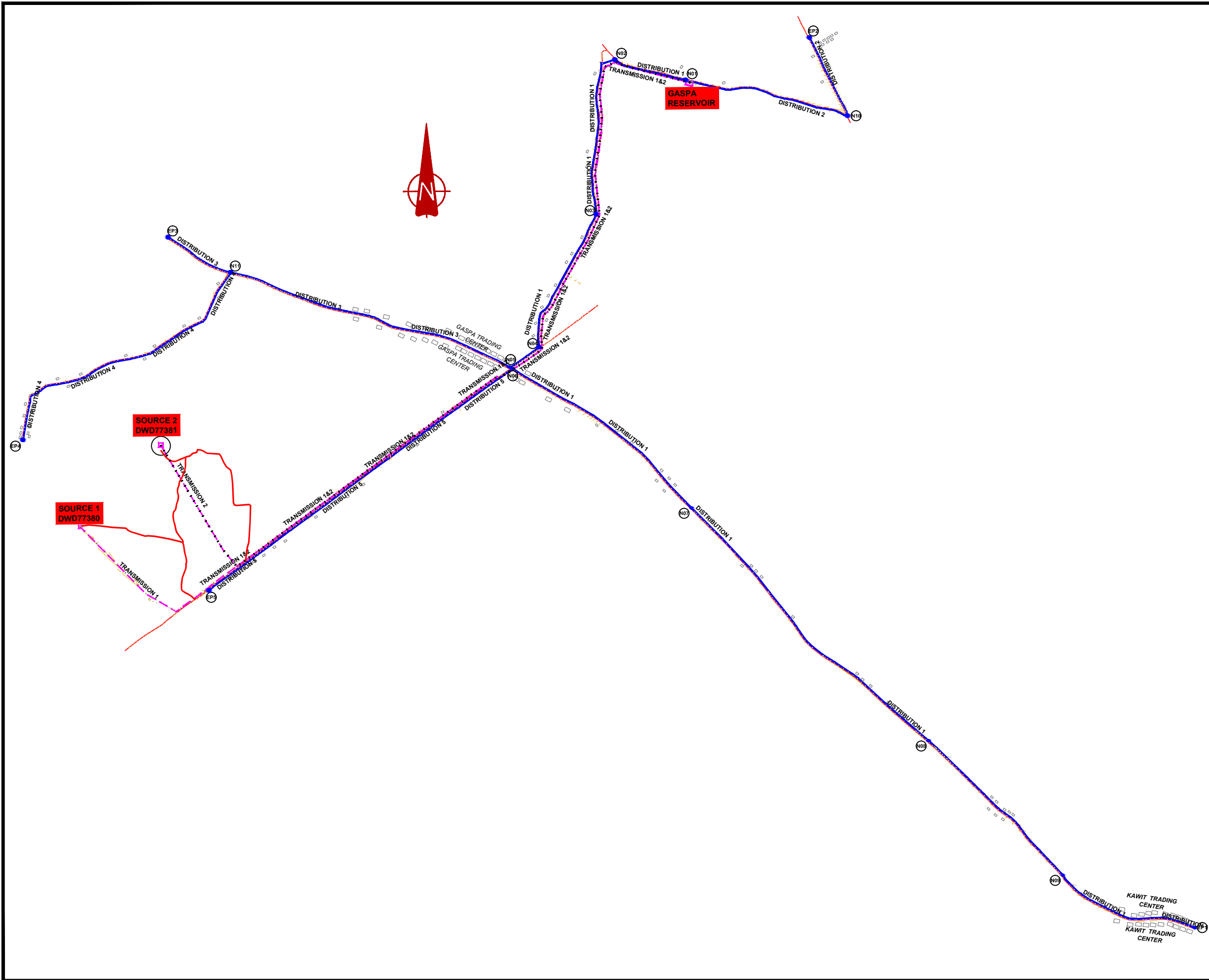
DRAWING No	DRAWING TITLE
GPA/WS/5.4.1	DISTRIBUTION LINE 04 (0+000.00 – 0+600.00)
GPA/WS/5.4.2	DISTRIBUTION LINE 04 (0+600.00 – 1+200.00)
GPA/WS/5.4.3	DISTRIBUTION LINE 04 (1+200.00 – 1+991.41)
GPA/WS/5.5.1	DISTRIBUTION LINE 05 (0+000.00 – 0+600.00)
GPA/WS/5.5.2	DISTRIBUTION LINE 05 (0+600.00 – 1+200.00)
GPA/WS/5.5.3	DISTRIBUTION LINE 05 (1+200.00 – 1+800.00)
GPA/WS/5.5.4	DISTRIBUTION LINE 05 (1+800.00 – 2+567.20)
GPA/WS/7.1.1	WATER OFFICE – PLAN AND SECTION
GPA/WS/7.1.2	WATER OFFICE – ELEVATIONS
GPA/WS/8.1.1	PUBLIC STAND POST- CONNECTION AND SOAK PIT DETAILS
GPA/WS/8.1.2	TYPICAL YARD CONNECTION- CONNECTION AND SOAK PIT DETAILS
GPA/S/1.1.1	INSTITUTIONAL TOILET - INCENERATOR
GPA/S/1.1.2	INSTITUTIONAL TOILET - BOYS
GPA/S/1.1.3	INSTITUTIONAL TOILET - GIRLS
GPA/S/1.2.1	WATER BORNE TOILET – FLOOR PLAN
GPA/S/1.2.2	WATER BORNE TOILET – SECTIONS
GPA/S/1.2.3	WATER BORNE TOILET – ELEVATIONS, DOOR & WINDOW SCHEDULE
GPA/S/1.2.4	WATER BORNE TOILET – ELEVATIONS

STANDARD DRAWINGS

SD 100	GENERAL NOTES FOR STANDARD DRAWINGS
SD 101	SIGN BOARD
SD104	CHAIN LINK FENCE DETAILS
SD106A	FORGED STEEL STANCHIONS FOR STAIRWAYS
SD106B	FORCED STEEL STANCHIONS FOR PLATFORMS AND WALKWAYS-1
SD106C	FORCED STEEL STANCHIONS FOR PLATFORMS AND WALKWAYS-2
SD106D	ARRANGEMENT OF HANDRAILING ON WALKWAYS AND TOP OF LADDERS
SD107A	ARRANGEMENT OF HANDRAILING ON WALKWAYS AND TOP OF LADDERS
SD107B	MILD STEEL SHIP TYPE LADDER - DETAIL
SD107C	MILD STEEL STAIRWAY SIDE ELEVATION
SD107D	MILD STEEL STAIRWAY FRONT ELEVATION
SD107E	MILD STEEL ACCESS LADDER – TYPE A (NOT EXCEEDING 2.3m RISE)

DRAWING No	DRAWING TITLE
SD107G	MILD STEEL ACCESS LADDERS - TYPE C
SD107H	MILD STEEL ACCESS LADDER DETAILS
SD109	PRESSURE REDUCING VALVE - PIPEWORK
SD110	FLOW METER - PIPEWORK
SD111A	GATE VALVE – TYPE 1
SD111B	GATE VALVE - TYPE 2
SD112A	AIR VALVE PIPE WORK
SD112B	AIR VALVE CHAMBER
SD113A	FIRE HYDRANT PIPE WORK
SD113B	FIRE HYDRANT CHAMBER
SD114A	WASHOUT – PIPE DETAILS
SD114B	WASHOUT – PIPEWORK WITH CHAMBER
SD116	OUTFALL
SD117	MARKER POST
SD118A	ANCHOR BLOCKS FOR TAPERS
SD118B	ANCHOR BLOCKS FOR BENDS-1
SD118C	ANCHOR BLOCKS FOR BENDS-2
SD118D	ANCHOR BLOCKS FOR BENDS-3
SD118E	ANCHOR BLOCKS FOR BENDS -4
SD118F	ANCHOR BLOCKS FOR BENDS -5
SD118G	ANCHOR BLOCKS FOR BENDS -6
SD118H	ANCHOR BLOCKS FOR BENDS -7
SD118I	ANCHOR BLOCKS FOR BENDS -8
SD118J	ANCHOR BLOCKS FOR TEES AND DEAD ENDS – 1
SD118K	ANCHOR BLOCKS FOR TEES AND DEAD ENDS - 2
SD118L	ANCHOR BLOCKS FOR TEES AND DEAD ENDS - 3
SD121	PIPE BEDDING
SD122	SURFACE BOX AND FIELD DRAIN
SD124	FIELD DRAIN
SD126	DUCT COVERS
SD130	DRAW PITS
SD132	TRENCH CUTOFF
SD135A	WASHOUT/GATE VALVE CHAMBER – R.C DETAILS
SD135C	WASHOUT/GATE VALVE CHAMBER ROOF SLAB – R.C DETAILS
SD137	FLEXIBLE PIPE JOINT DETAILES FOR PIPES IN CONCRETE STRUCTURES
SD202	BEDDING DETAILS FOR GRAVITY LINE AND LATERALS
SD206	INSPECTION CHAMBERS- TYPES 1 AND 2
SD211	PRECAST CONCRETE COVER SLAB OPEN AREAS
SD212	PRECAST CONCRETE COVER SLAB UNDER ROADS AND PAVINGS

DRAWING No	DRAWING TITLE
SD213	PRECAST CHAMBER COVER SLAB INSTALLATIONS
SD214	PRECAST CONCRETE CHAMBER SECTIONS
SD215	ALTERATIONS TO CHAMBERS IN OPEN AREAS
SD216	THRUST BLOCK
SD218	OPEN DRAINAGE CHANNEL AND KERB
SD220	PIPE SUPPORTS – R.C DETAILS
SD221	SEPTIC TANK DETAILS



NOTES

LEGEND

Transmission Pipeline

Distribution Pipeline

Ground Level

Building/House

Contours

Road

DAV Double Orifice Air Valve

End pipe

Node N01

Washout Type1

05.010.0

Vertical Scale: 1:250 50 100 Metres

050100

Horizontal Scale: 1:2500 Metres

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MINISTRY OF WATER AND ENVIRONMENT

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PROJECT

CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

GASPA WATER SUPPLY SYSTEM

CONSULTANT

SARI

Corporate Headquarter 10 Philip Lane, 1st Floor, London EC3M 8AA, United Kingdom

In Joint Venture with

SGAPI

CONTRACTOR

DETAILED ENGINEERING DESIGN

DRAWING TITLE

GENERAL LAYOUT TRANSMISSION AND DISTRIBUTION

SCALE

DRAWING No. GPA/WS/0.0.0

SURVEYED

Evans Mpanga

DESIGNED

Otwane Dan.

DRAWN

Joshua Nyarwanda

CHECKED

Rodney Barugahare

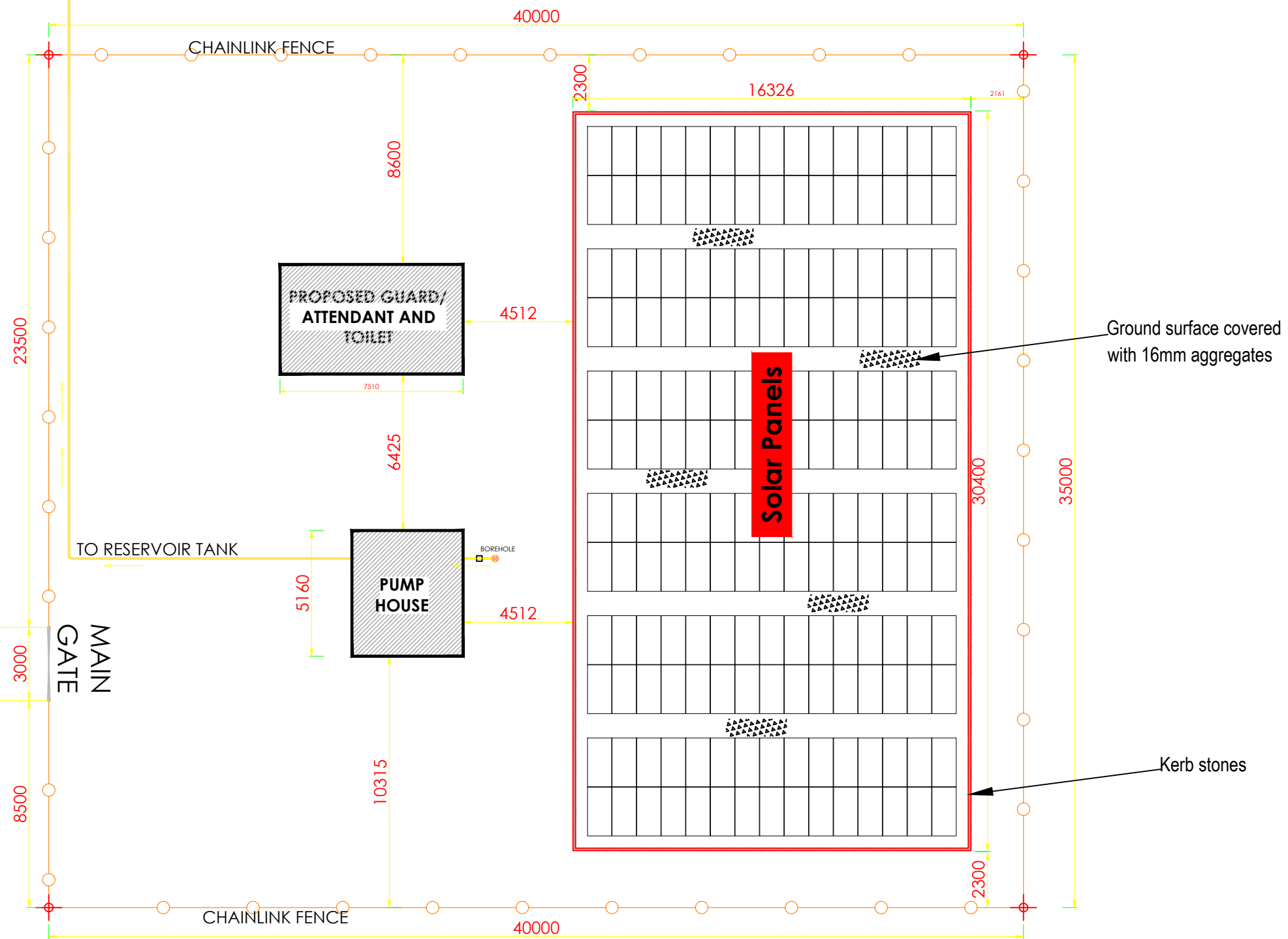
DATE

Oct 2021

APPROVED

Rodney Barugahare.

ACCESS



SITE LAYOUT

Scale 1:200

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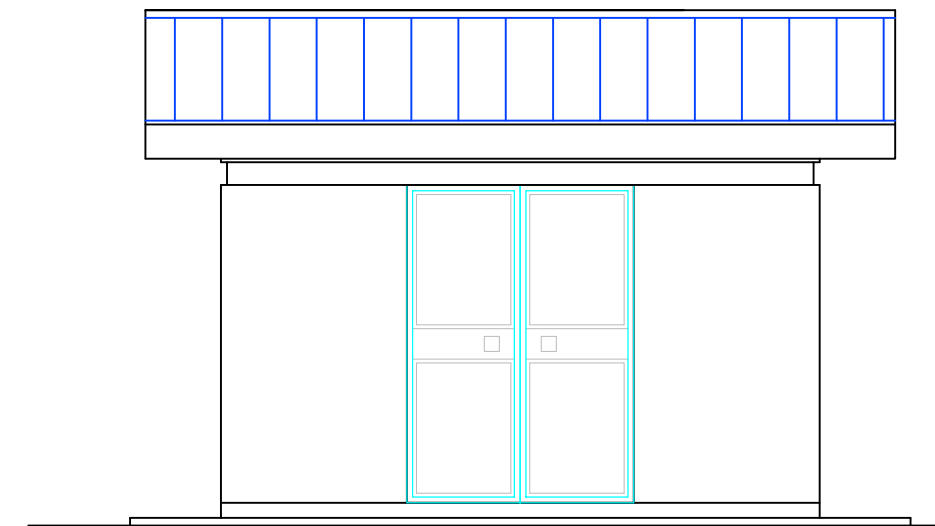
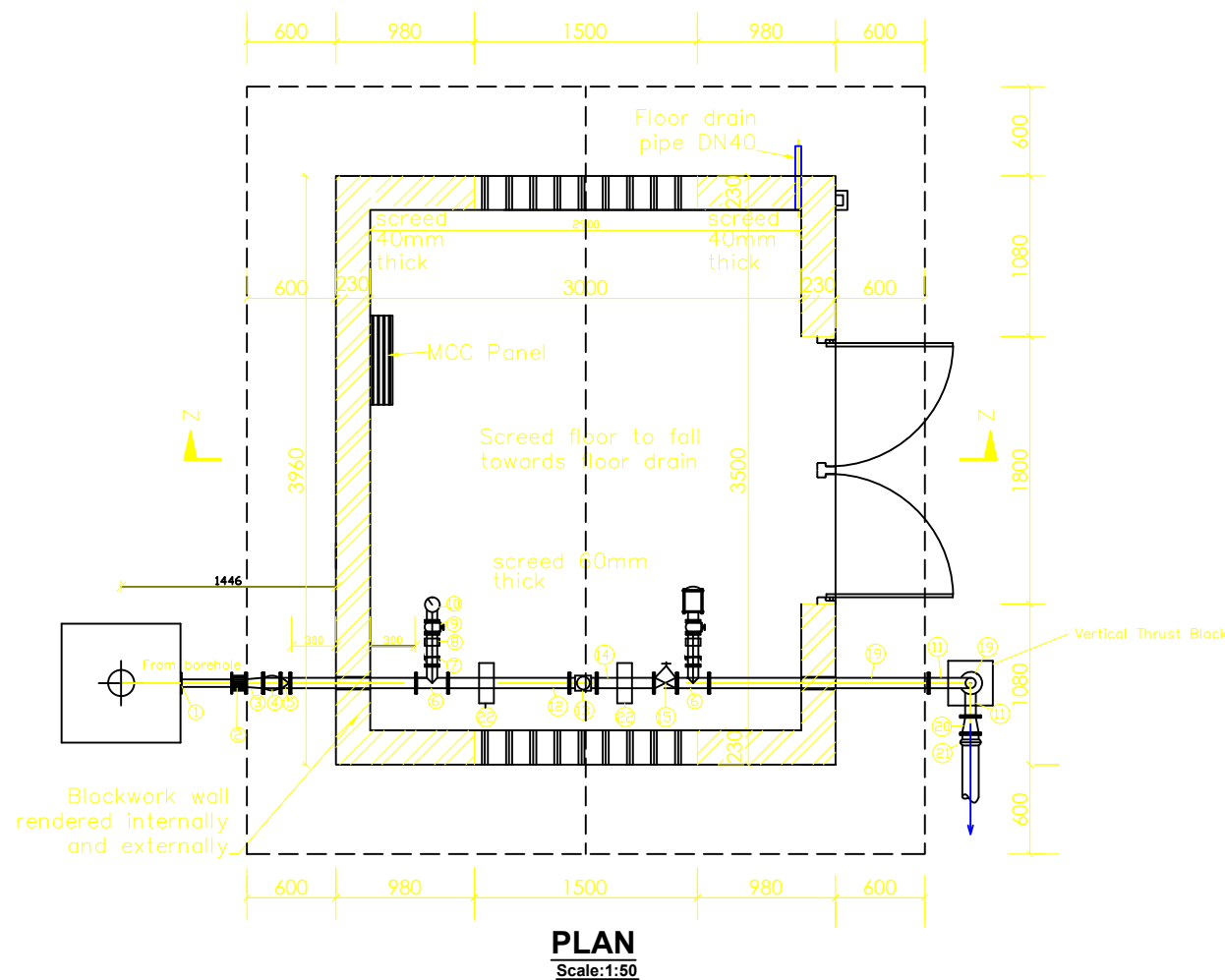
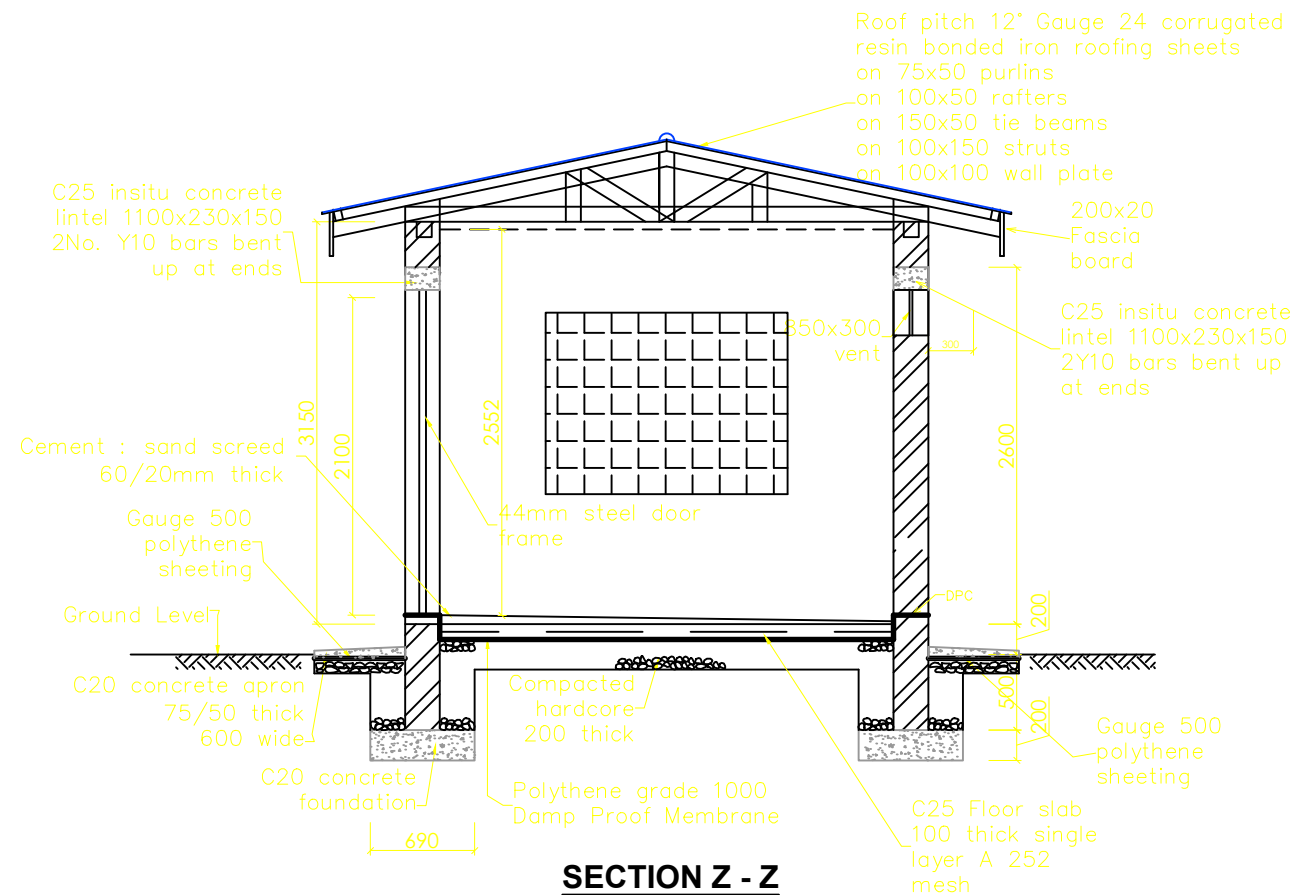
CONTRACTOR

DETAILED ENGINEERING DESIGN

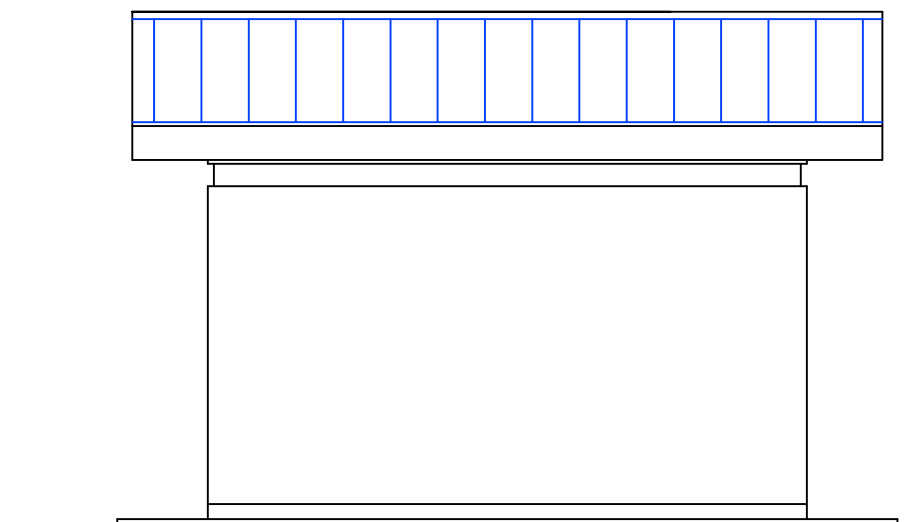
DRAWING TITLE

TYPICAL BOREHOLE PUMP HOUSE AND SOLAR ARRAY
SITE PLAN LAYOUT

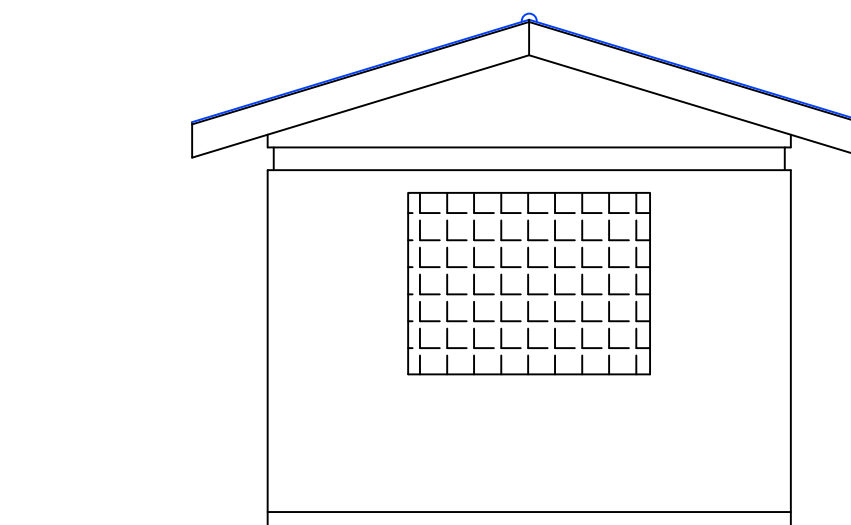
SCALE	AS SHOWN	DRAWING No.	GPA/WS/1.1.0
SURVEYED		DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	JUNE 2022	APPROVED	Rodney Barugahare.



FRONT ELEVATION



REAR ELEVATION



TYPICAL SIDE VIEW

NOTES

1. Unless otherwise stated, all dimensions are in mm
2. Concrete grade to be C30/20.

PIPEWORK FITTINGS SCHEDULE

- BH1. Steel Pipe Both Ends Plate Threaded.
BH2. Cast Iron Flanged Adaptor.
BH3. Double Flanged Steel Pipe Reducer To Match Pump Outlet Size & Pump House Pipework.
BH4. Double Flexible Rubber Pipe Flanged Coupling.
BH5. Duo-chek II (SPLUTOISK) Non-Return Valve, Wafer Type.
BH6. Double Flanged Tee with 25mm Female Threaded Branch on 150 x150mm Grade 25/19 Concrete Support.
BH7. 25 To 15mm Steel Reducing Bush.
BH8. 15mm Hexagon Nipple.
BH9. 15mm Brass Stopcock.
BH10. Wika Pressure Gauge, 100mm Ø Case Glycerine Filled With 15mm Male Thread.
BH11. 90°x50mmØ Double Flanged Steel Bend Small Radius.
BH12. Double Flanged Steel Pipe.
BH13. Double Flanged Meincke Cosmos NP Water Meter For 50 and 80mmØ and Double Flanged Meinecke Cosmos NS Water Meter (Verticle Spindle) For 100mmØ Pipework.
BH14. Double Flanged Steel Pipe.
BH15. Flanged RSV Rising Spindle, Clockwise Closing Complete with Handwheel To SABS 555.
BH16. 25mmØ Hexagon Nipple.
BH17. 25mmØ Brass Stopcock.
BH18. Vent-O-MAT 25mm No Anti-Shock Air Valve

CLIENT RSX 2511.
BH1. le 200mm Ø Red Steel Reducer
BH2. le 200mm Ø Red Steel Reducer
BH2. le 200mm Ø Red Steel Reducer
BH2. le 200mm Ø Red Steel Reducer

GOVERNMENT OF UGANDA
MINISTRY OF WATER AND ENVIRONMENT

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PROJECT CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

GASPA WATER SUPPLY SYSTEM

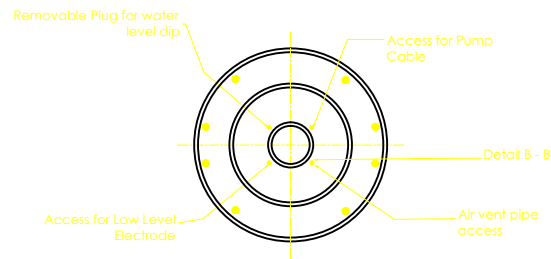
CONSULTANT SARI In Joint Venture with SGAPI
Corporate Headquarter
10 Philpot Lane, 1st Floor,
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CONTRACTOR

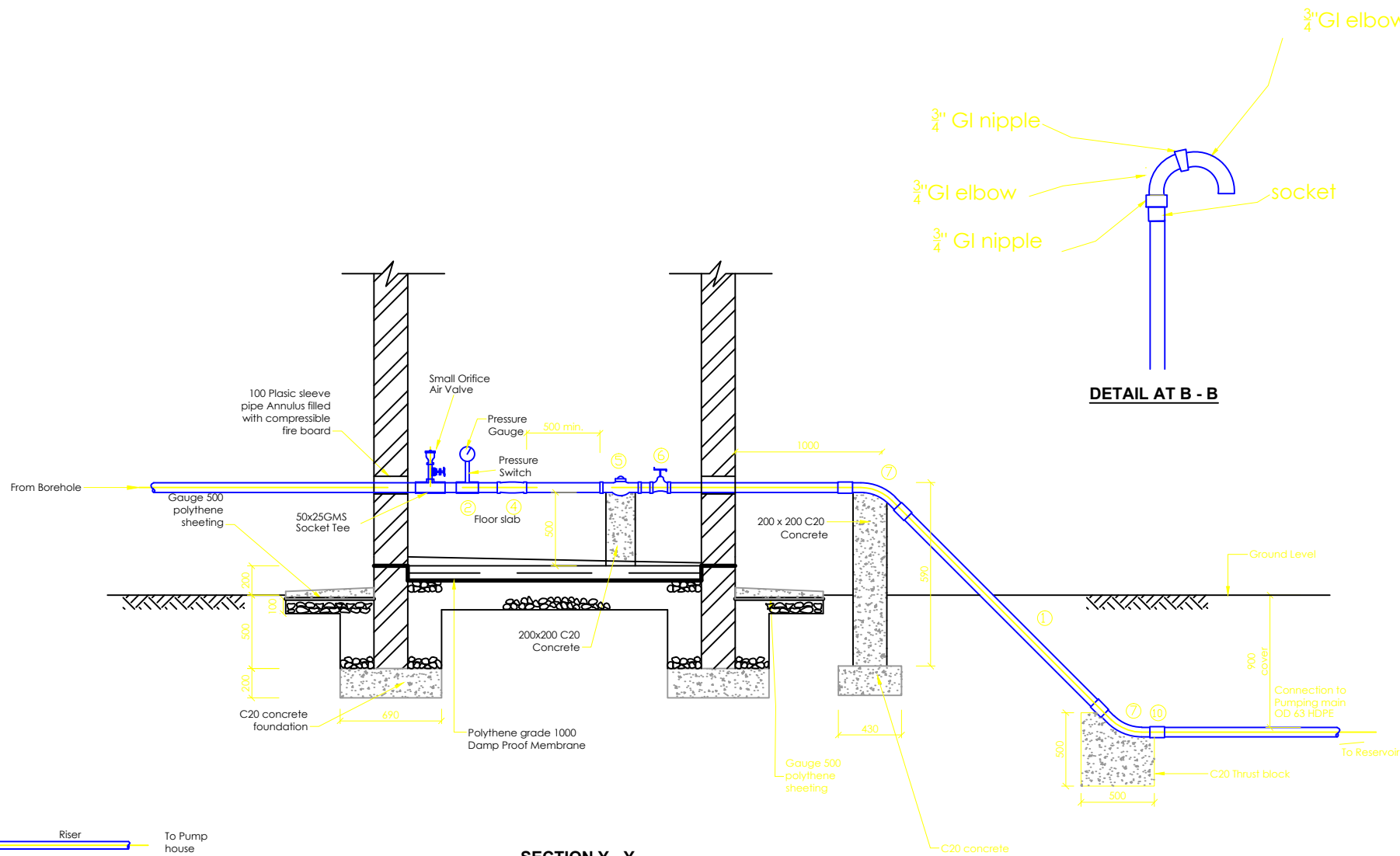
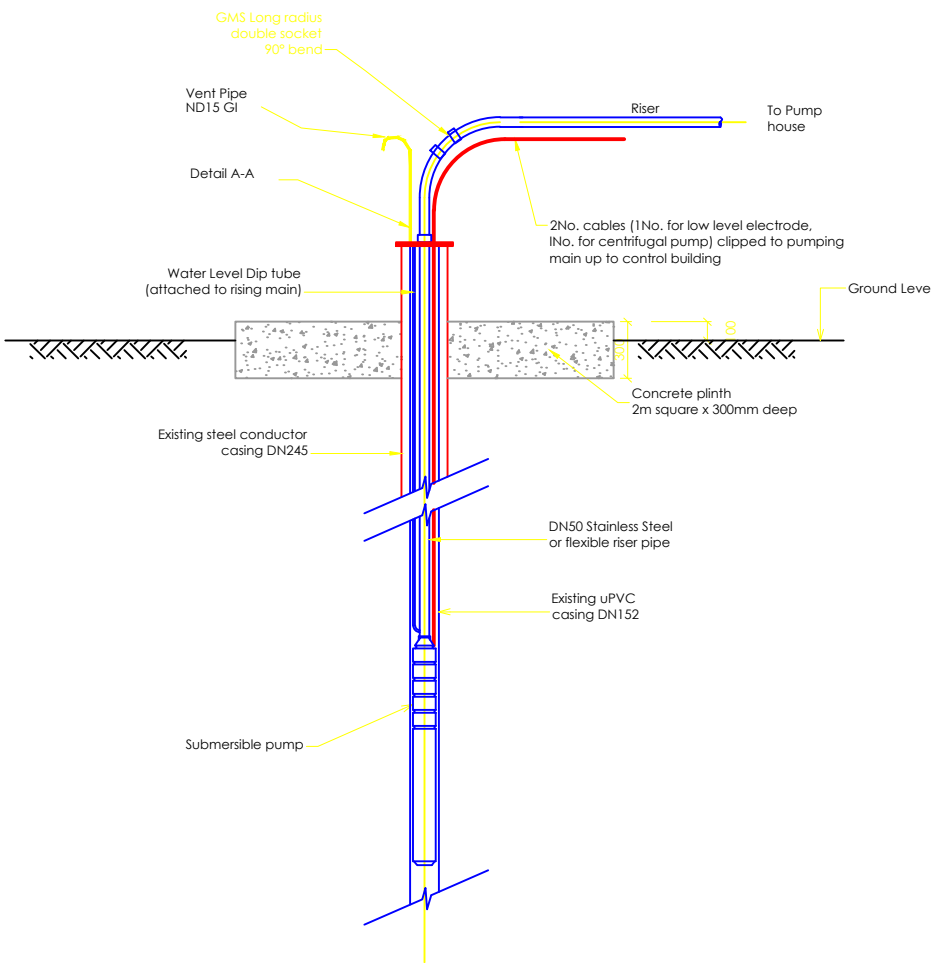
DETAILED ENGINEERING DESIGN
DRAWING TITLE
TYPICAL BOREHOLE PUMP HOUSE
PLAN,SECTION Z-Z & ELEVATIONS

SCALE	AS SHOWN	DRAWING No.	GPA/WS/1.1.1
SURVEYED		DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.

SCALE	AS SHOWN	DRAWING No.	GPA/WS/1.1.2
SURVEYED		DESIGNED	Otwane Dan.
DRAWN	Joshua Nyanwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



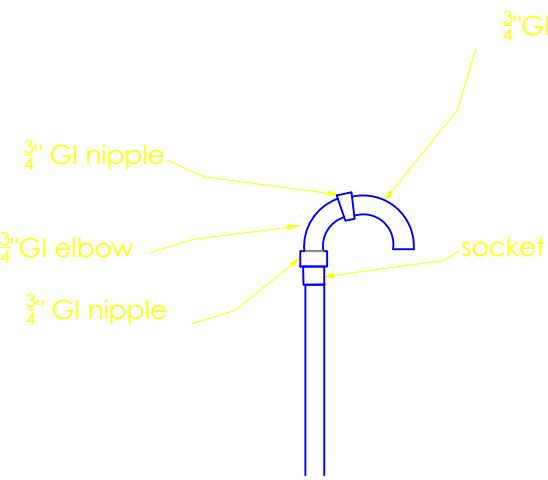
DETAIL AT A-A
Scale: 1:20



SECTION Y - Y
Scale: 1:40

FITTINGS SCHEDULE

- 2) 1No. DN50/25/50 gms tee for pressure pauge
- 3) 1No. DN50/50/50 gms Socket tee
- 4) 1No. 50mm non return valve (socketed flap valve)
- 5) 1DN 50mm flanged bulk meter
- 6) 2No. DN50 double socket gatevalve
- 7) 1No. DN50 45 gms double socket long radius bend
- 8) 1No. DN50 90 gms double socket long radius bend
- 9) 2No. DN50 Screw on flanges
- 10) Male Adaptor DN 50 x 2" to PN 16



DETAIL AT B - B

NOTES

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GASPA WATER SUPPLY SYSTEM

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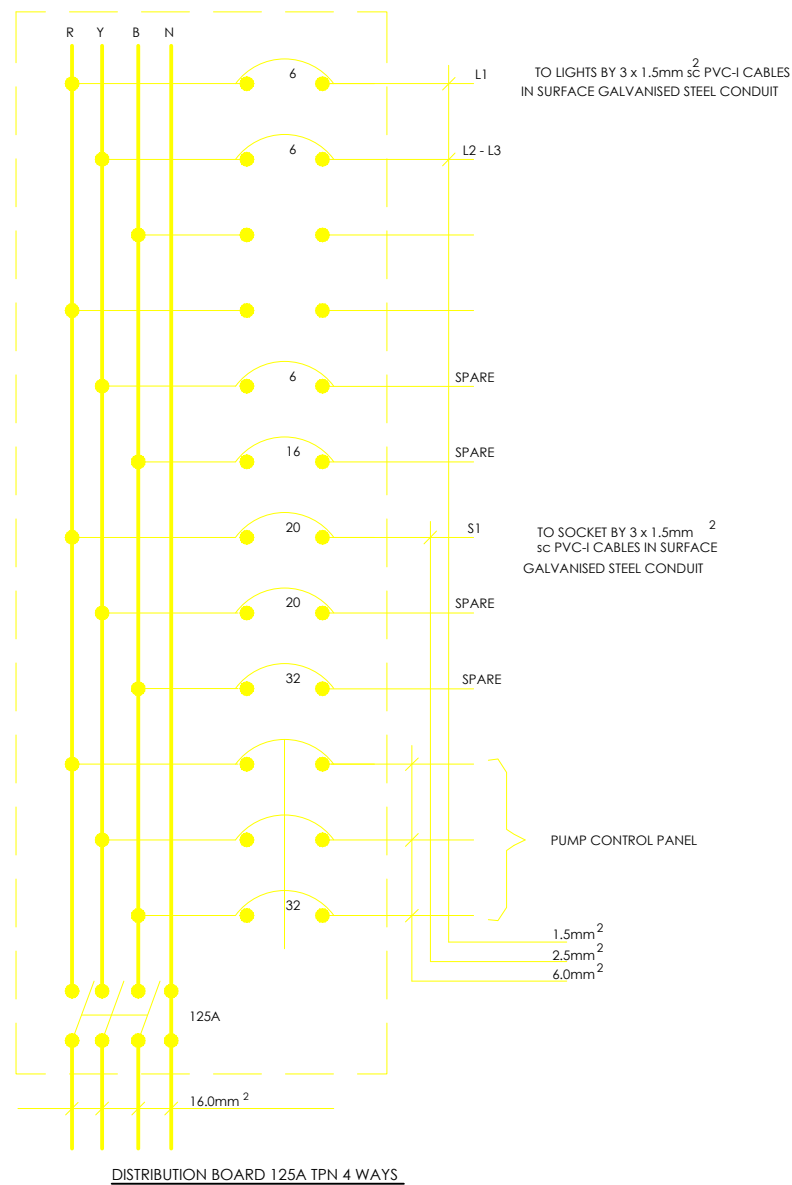
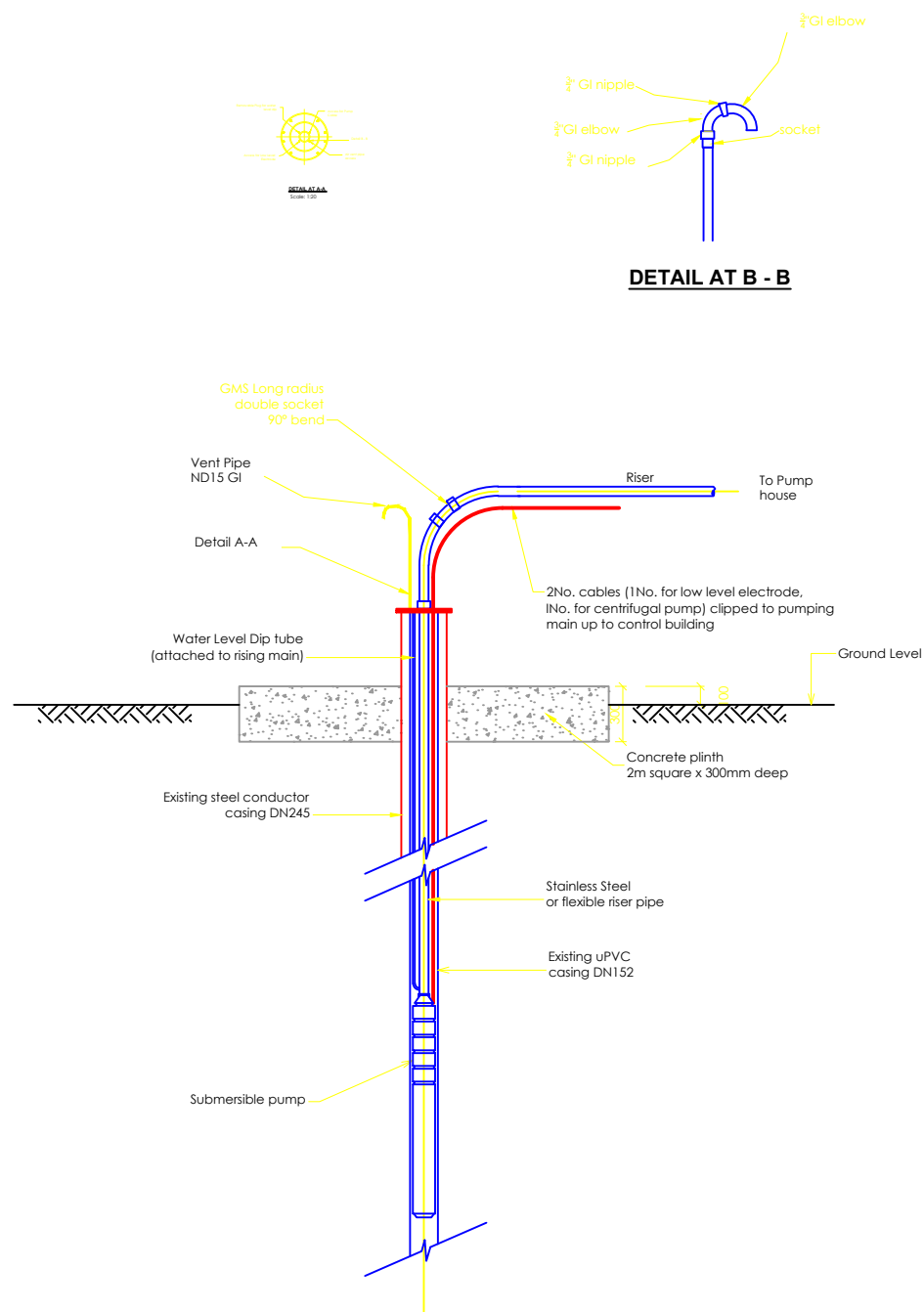
CONTRACTOR

DETAILED ENGINEERING DESIGN

DRAWING TITLE

TYPICAL BOREHOLE PUMP HOUSE
(DWD 77381) PIPE DETAILS

SCALE	AS SHOWN	DRAWING No.	GPA/WS/1.1.3
SURVEYED		DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



LEGEND

- Luminaire type A, 1X18W f600mm waterproof flourecent bulk head
 - Luminaire type B, 100W GLS with corner bracket
 - Distribution Board 125A TPN 4-Way
 - Socket outlet 13A switched 1-gang metal clad
 - Switch 6A sp 2Gang 1way metal clad flush
 - UMEME Meter box, 3-phase
- Dimensions in mm

NOTES

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GASPA WATER SUPPLY SYSTEM

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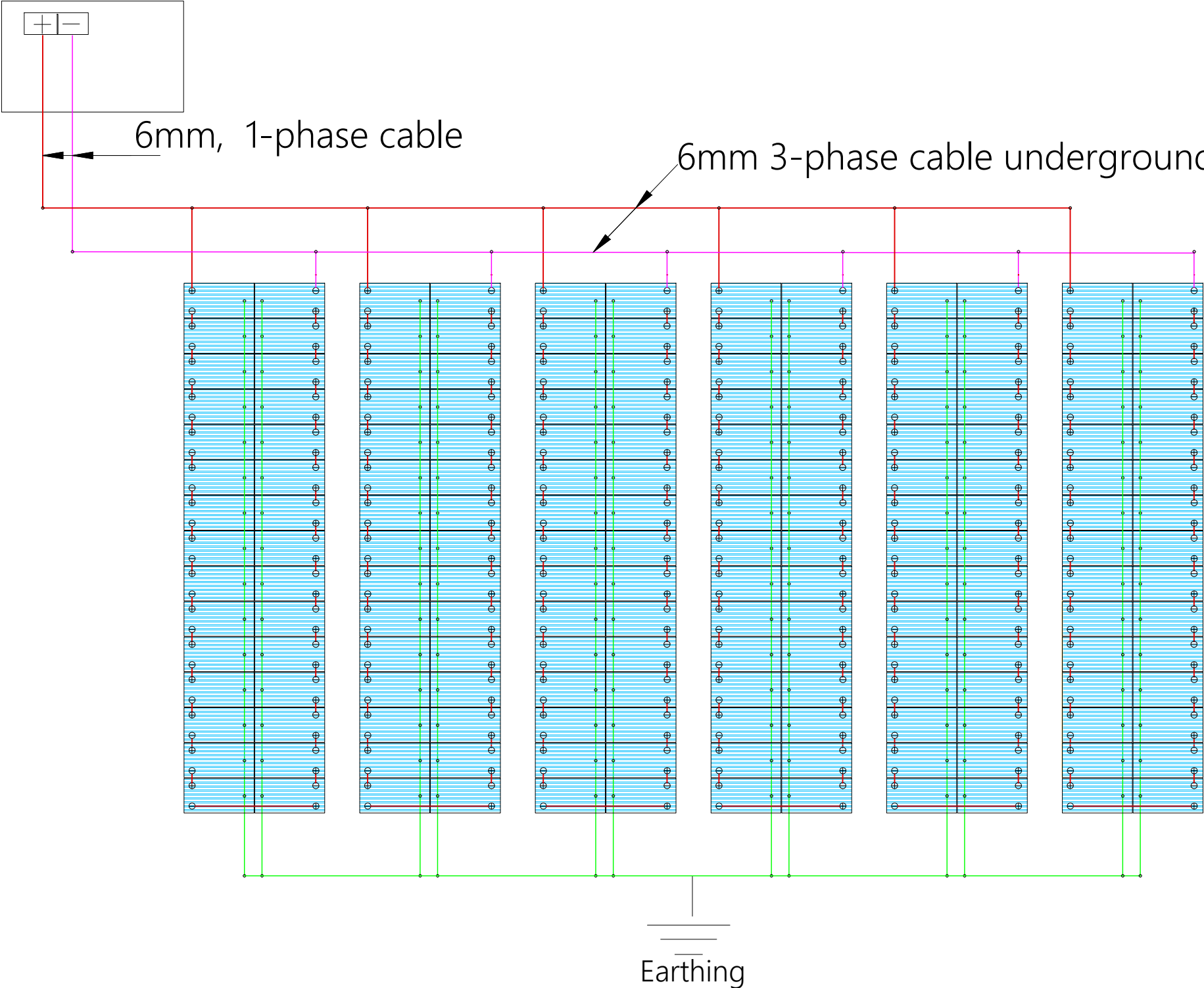
DETAILED ENGINEERING DESIGN

DRAWING TITLE

TYPICAL BOREHOLE PUMP HOUSE
ELECTRICAL INSTALLATION

SCALE	AS SHOWN	DRAWING No.	GPA/WS/1.1.4
SURVEYED		DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.

Controller
1 set 1-phase cable Well Probe V2, 2x PV
Disconnect 1000-40-5, PV Combiner
1000-125-4,PV Protect 1000-125,
SmartPSuk2-40,SmartStart, Surge Protector2



SOLAR ARRAY ELECTRICAL LAYOUT

NOTES

- 1. Unless otherwise stated, all dimensions are in mm
- 2. Concrete grade to be C30/20.

PIPEWORK FITTINGS SCHEDULE

- BH1. Steel Pipe Both Ends Plate Threaded.
- BH2. Cast Iron Flanged Adaptor.
- BH3. Double Flanged Steel Pipe Reducer To Match Pump Outlet Size & Pump House Pipework.
- BH4. Double Flexible Rubber Pipe Flanged Coupling.
- BH5. Duo-chek II (SPLITDISK) Non-Return Valve, Wafer Type.
- BH6. Double Flanged Tee with 25mm Female Threaded Branch on 150 x150mm Grade 25/19 Concrete Support.
- BH7. 25 To 15mm Steel Reducing Bush.
- BH8. 15mm Hexagon Nipple.
- BH9. 15mm Brass Stopcock.
- BH10. Wika Pressure Gauge, 100mm Ø Case Glycerine Filled With 15mm Male Thread.
- BH11. 90°x50mmØ Double Flanged Steel Bend Small Radius.
- BH12. Double Flanged Steel Pipe.
- BH13. Double Flanged Meincke Cosmos NP Water Meter For 50 and 80mmØ and Double Flanged Meincke Cosmos NS Water Meter (Verticle Spindle) For 100mmØ Pipework.
- BH14. Double Flanged Steel Pipe.
- BH15. Flanged RSV Rising Spindle, Clockwise Closing Complete with Handwheel To SABS 555.
- BH16. 25mmØ Hexagon Nipple.
- BH17. 25mmØ Brass Stopcock.
- BH18. Vent-O-MAT 25mm No Anti-Shock Air Valve

CLIENT

RSX 2511.

BH1

je

BH2

ged Steel Reduc

BH2

nge Adaptor

BH2

concrete Support Block 300mm Wide.



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GOVERNMENT OF UGANDA

PROJECT

CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

GASPA WATER SUPPLY SYSTEM

CONSULTANT



SARI

Corporate Headquarter
10 Philpot Lane, 1st Floor,
London EC3M 8AA,
United Kingdom

In Joint Venture with



SGAPI

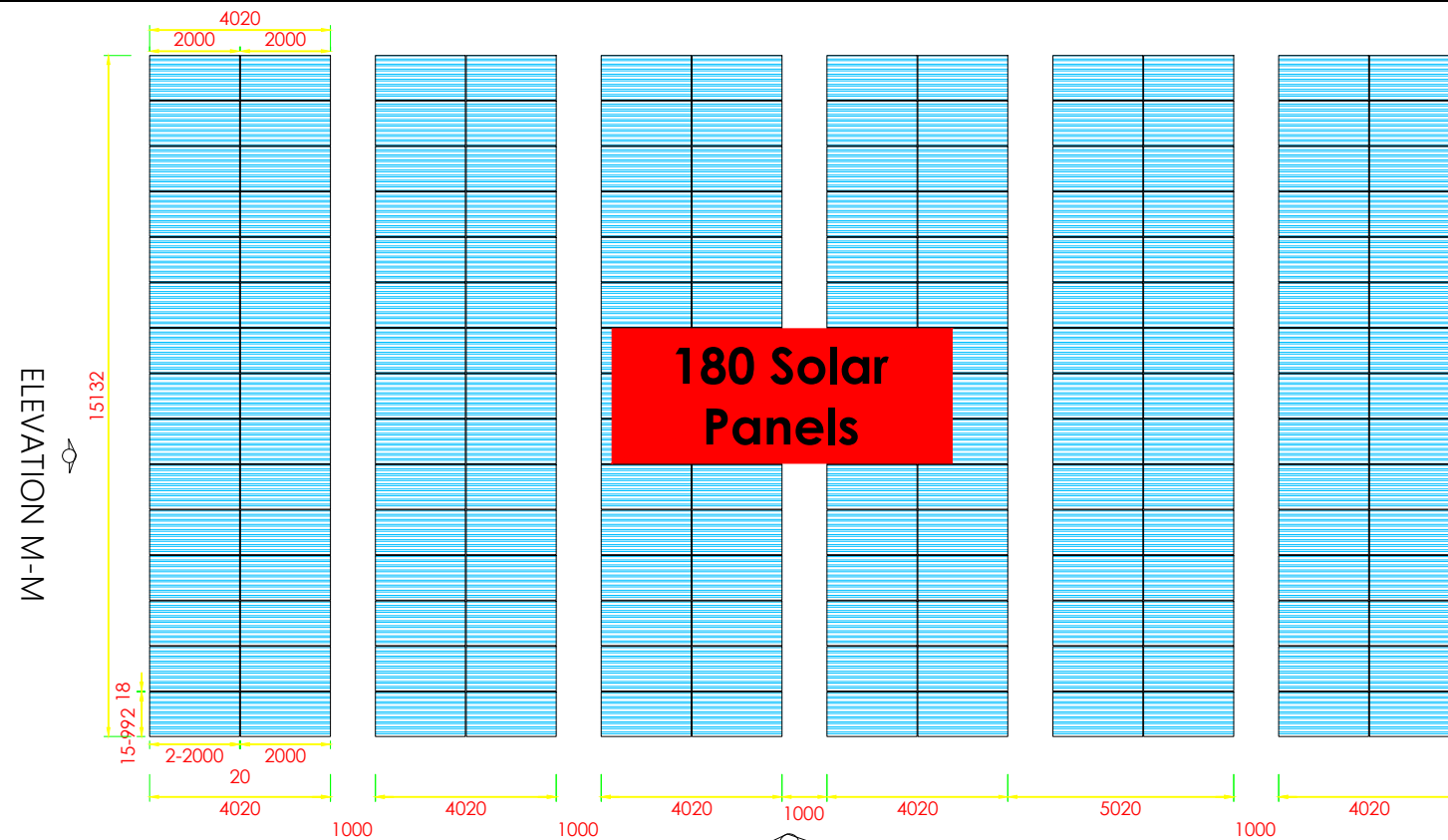
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DETAILED ENGINEERING DESIGN

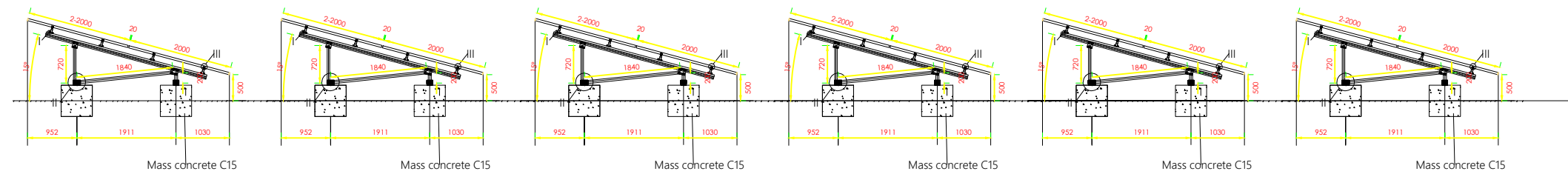
DRAWING TITLE

SOLAR ARRAY ELECTRICAL LAYOUT

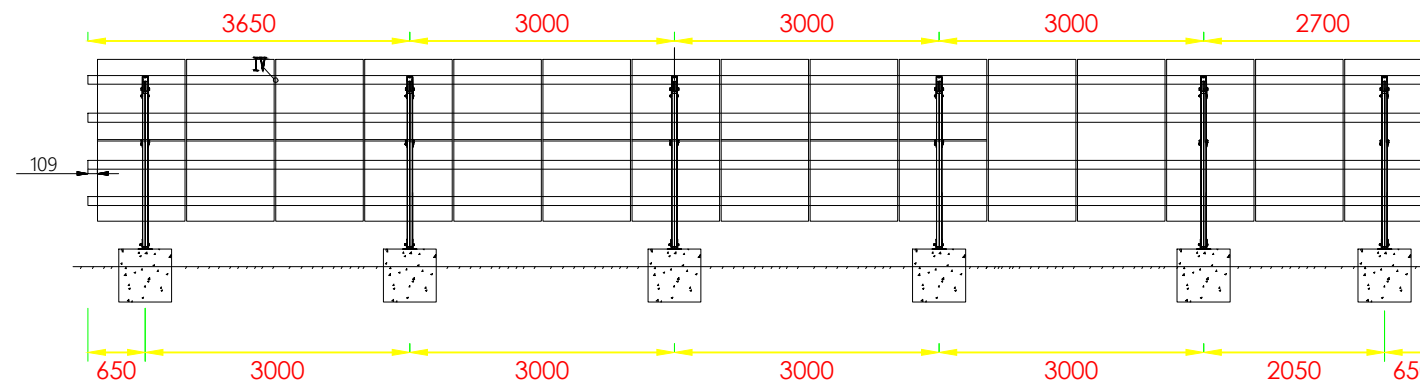
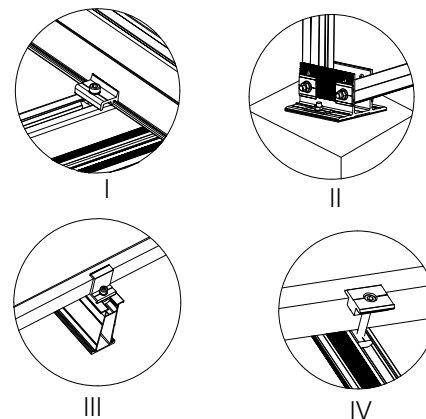
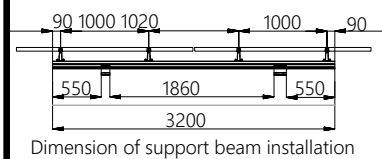
SCALE	AS SHOWN	DRAWING No.	GPA/WS/1.1.5
SURVEYED		DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	JUNE 2022	APPROVED	Rodney Barugahare.



ELEVATION Y-Y
SOLAR PANELS LAYOUT





ELEVATION Y-Y



ELEVATION M-M



NOTES

CLIENT
 **GOVERNMENT OF UGANDA**
MINISTRY OF WATER AND ENVIRONMENT

CO-FINANCED BY:
 **THE WORLD BANK** AND  **GOVERNMENT OF UGANDA**

PROJECT
CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

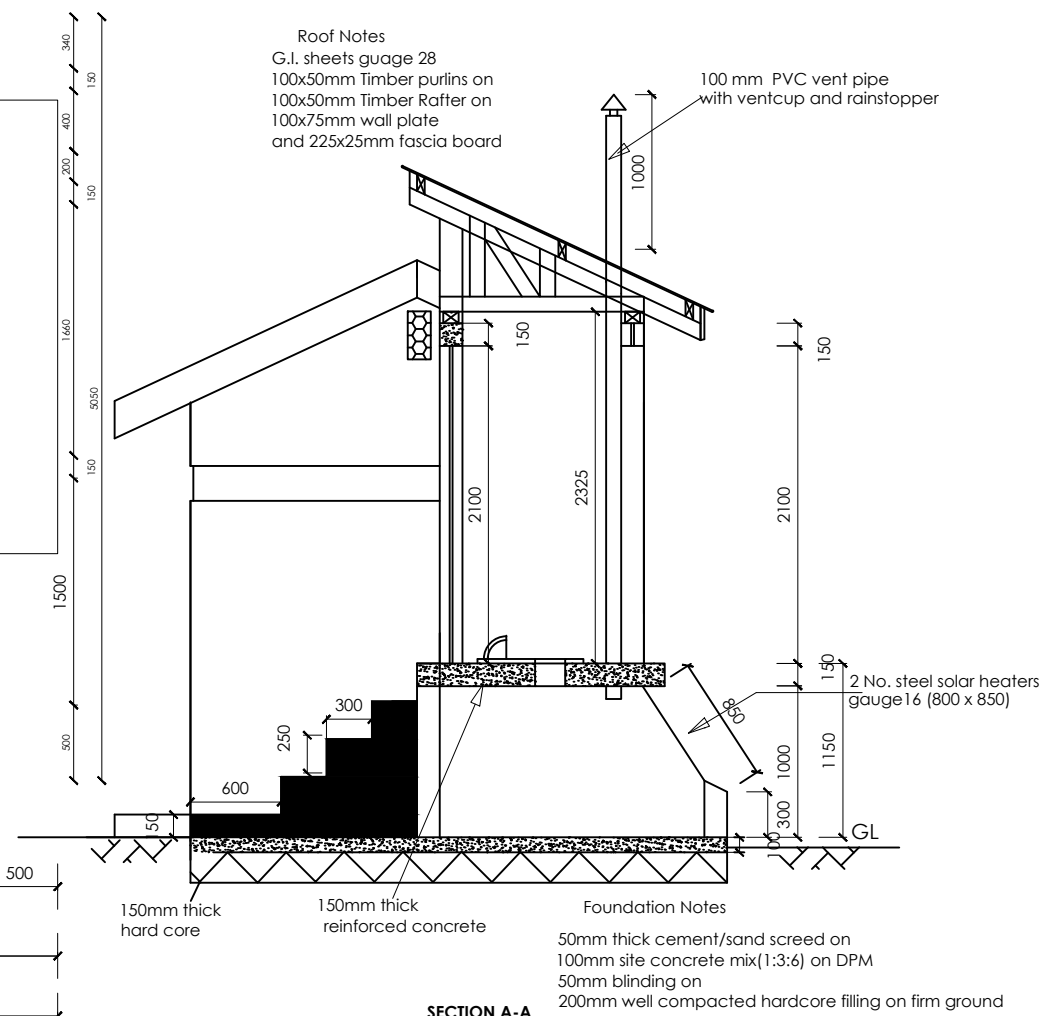
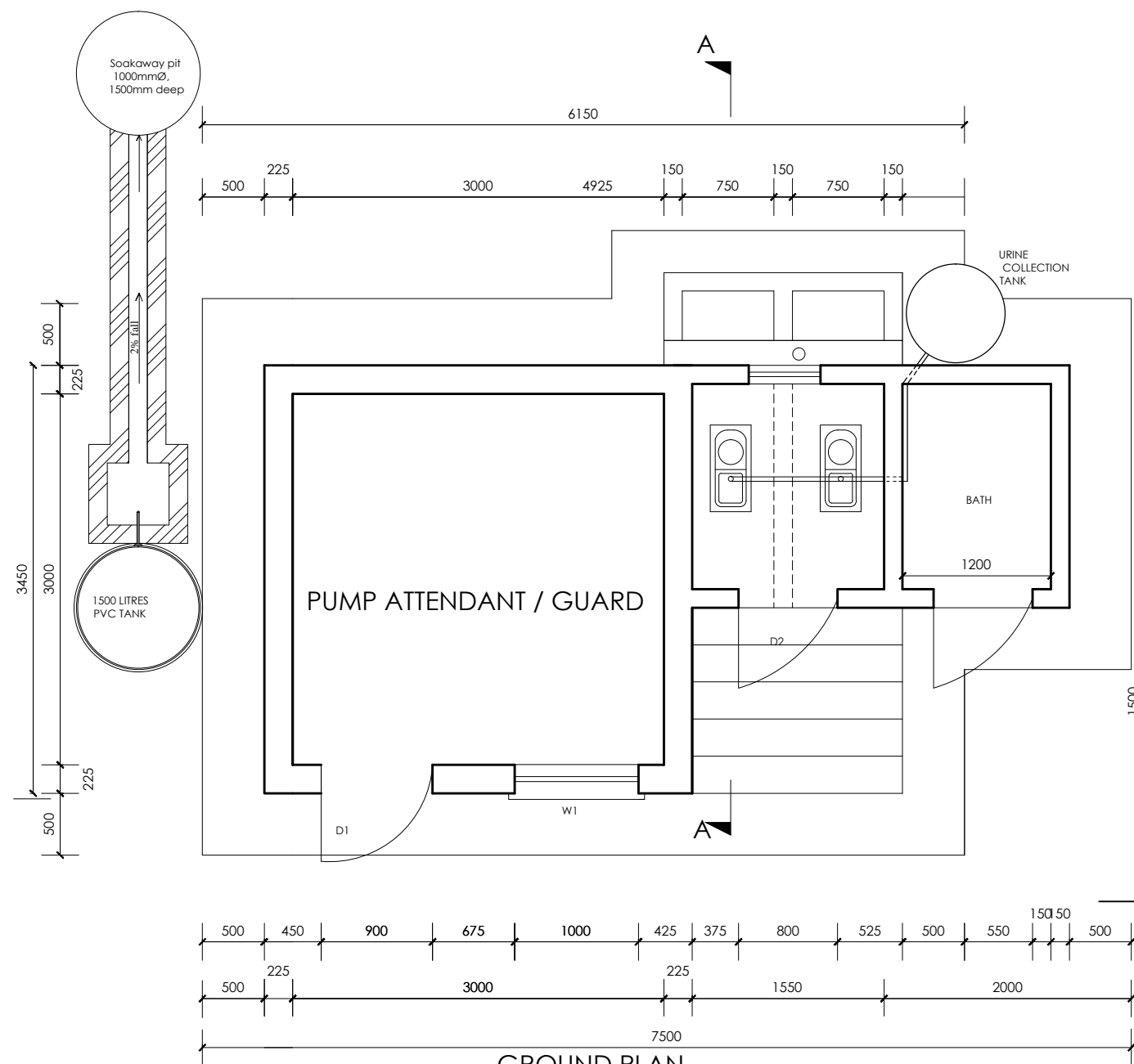
GASPA WATER SUPPLY SYSTEM

CONSULTANT
 **SARI** In Joint Venture with 
Corporate Headquarter
10 Philpot Lane, 1st Floor,
London EC3M 8AA,
United Kingdom

CONTRACTOR






DETAILED ENGINEERING DESIGN
DRAWING TITLE
SOLAR ARRAY
SOLAR PANEL PLAN LAYOUT, ELEVATIONS AND DETAILS

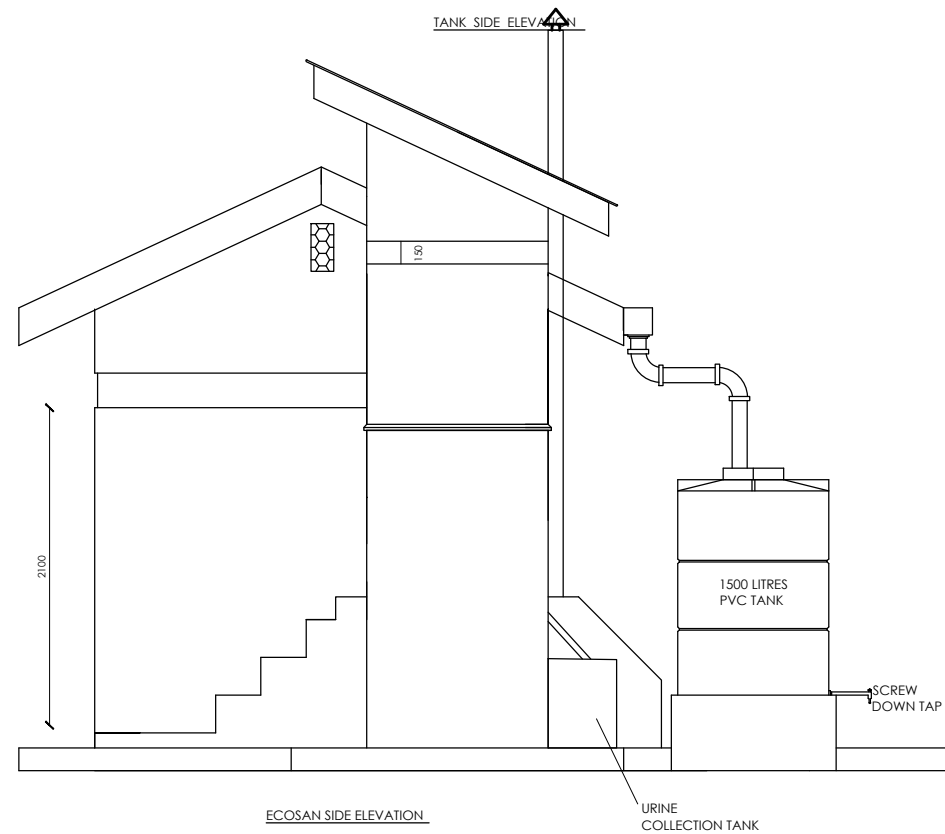
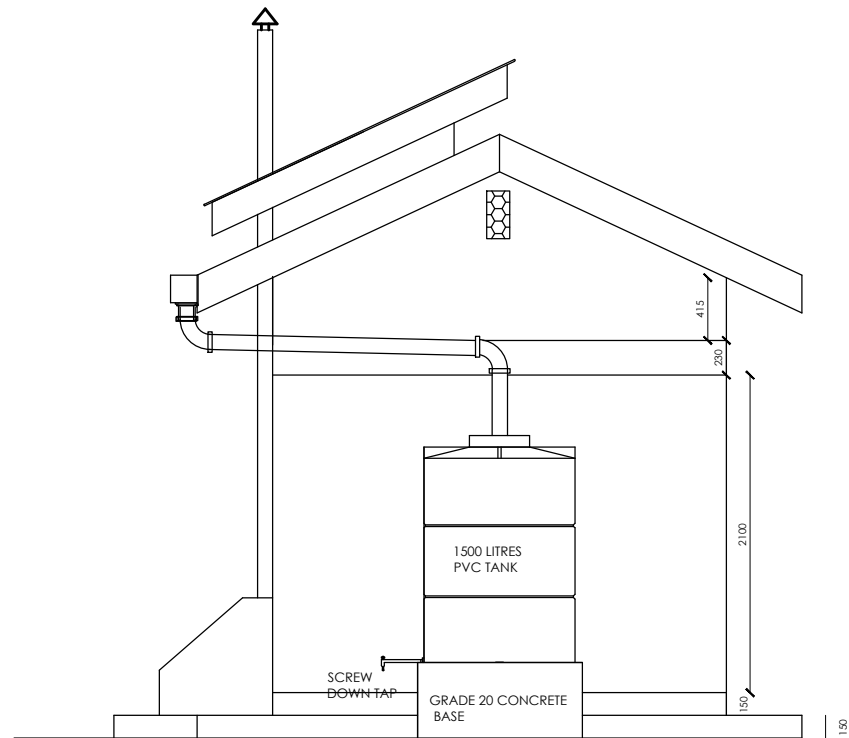
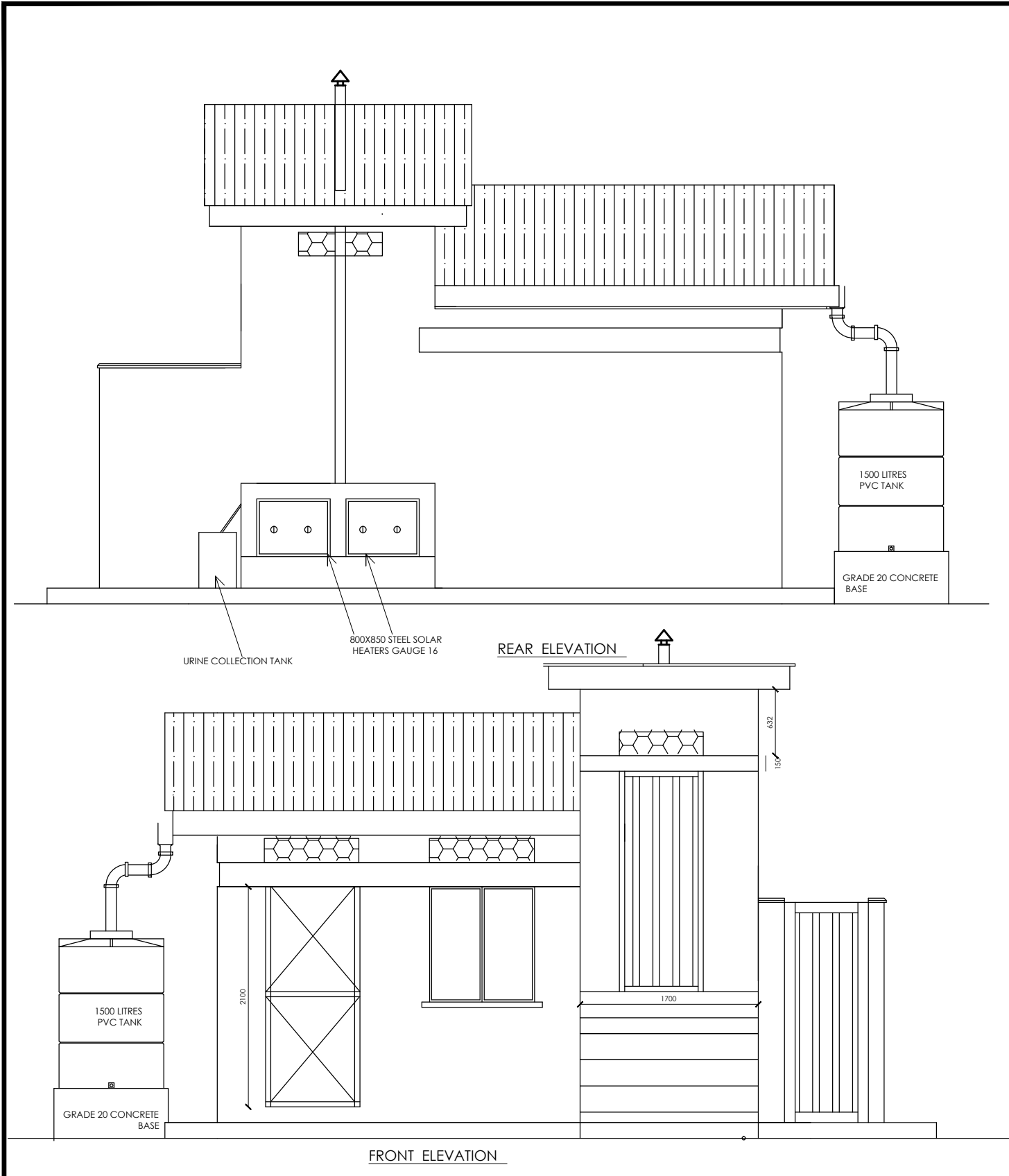
SCALE	AS SHOWN	DRAWING No.	GPA/WS/1.1.6
SURVEYED		DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	JUNE 2022	APPROVED	Rodney Barugahare.



PIPE FITTING SCHEDULE

1. All dimensions are in mm unless stated otherwise.
2. All levels are in metres above sea level.
3. Structural details are not included.
4. All structural concrete is Class 25/10.
5. All mass concrete is Class 15/10.

CLIENT		GOVERNMENT OF UGANDA MINISTRY OF WATER AND ENVIRONMENT	
			
CO-FINANCED BY:			AND 
THE WORLD BANK		GOVERNMENT OF UGANDA	
PROJECT			
CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRIYANDONGO DISTRICT			
GASPA WATER SUPPLY SYSTEM			
CONSULTANT			
 Corporate Headquarters 10 Prager Lane, 1st Floor, London EC4M 0BA, United Kingdom		In Joint Venture with 	
CONTRACTOR			
DETAILED ENGINEERING DESIGN			
DRAWING TITLE			
PUMP ATTENDANT / GUARD + ECOSAN PLAN AND SECTION A-A			
SCALE	AS SHOWN	DRAWING No.	GPA/WS/4.1.1
SURVEYED		DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



PIPE FITTING SCHEDULE

1. All dimensions are in mm unless stated otherwise.
2. All levels are in metres above sea level.
3. Structural details are not included.
4. All structural concrete is Class 25/10.
5. All mass concrete is Class 15/10.

CLIENT

 **GOVERNMENT OF UGANDA**
MINISTRY OF WATER AND ENVIRONMENT

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PROJECT

CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

GASPA WATER SUPPLY SYSTEM

CONSULTANT

 **SARI**
Sustainable Agriculture Research and Innovation
Corporate Headquarter
10 Pigott Lane, 1st Floor,
London EC2M 8AA,
United Kingdom

In Joint Venture with  **SGAPI**

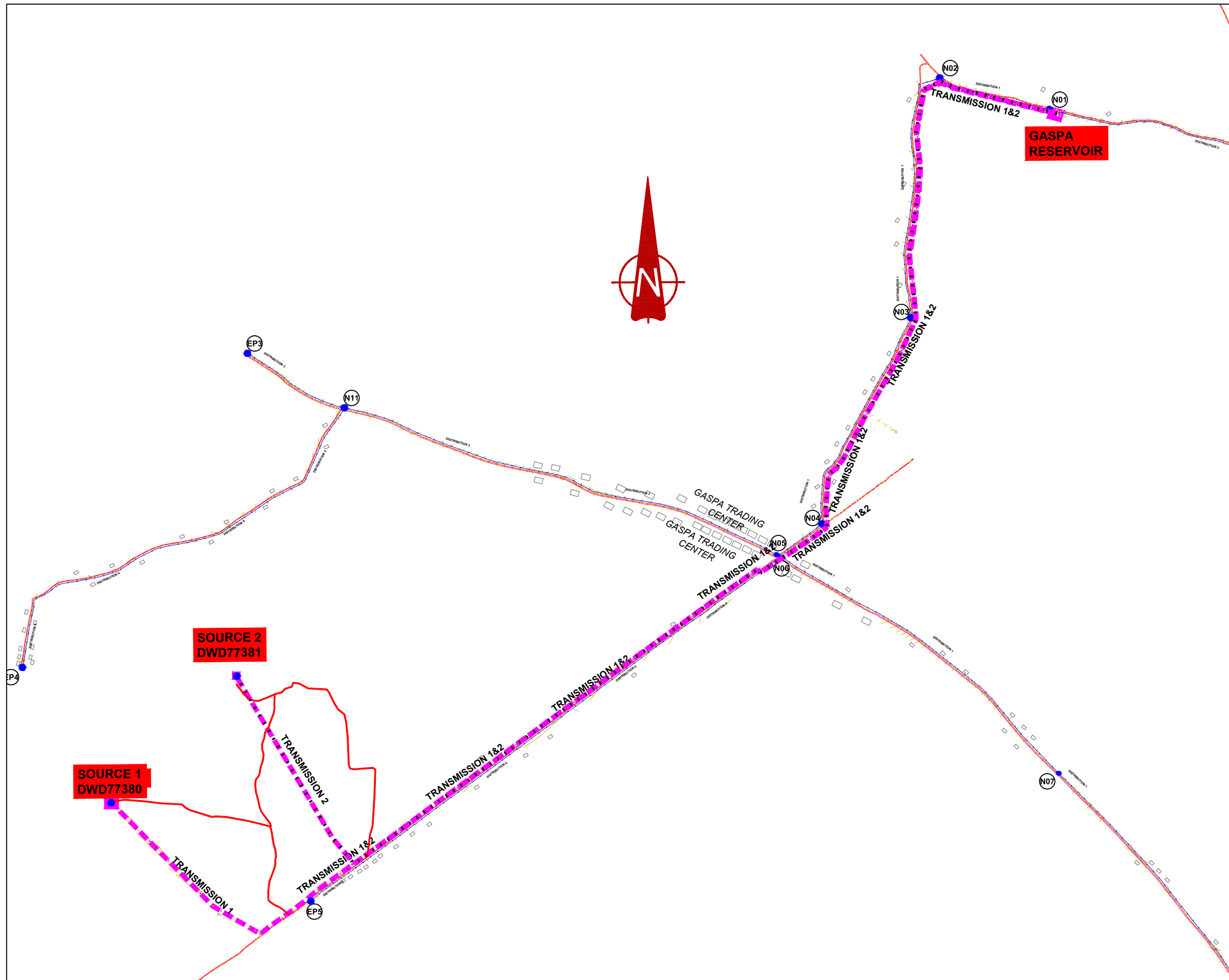
CONTRACTOR

DETAILED ENGINEERING DESIGN

DRAWING TITLE

**PUMP ATTENDANT / GUARD + ECOSAN
ELEVATIONS**

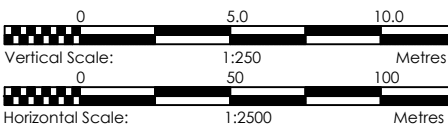
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SURVEYED		DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



NOTES

LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- EP End pipe
- N01 Node N01
- WO-1 Washout Type1



CLIENT

GOVERNMENT OF UGANDA
MINISTRY OF WATER AND ENVIRONMENT

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GASPA WATER SUPPLY SYSTEM

CONSULTANT

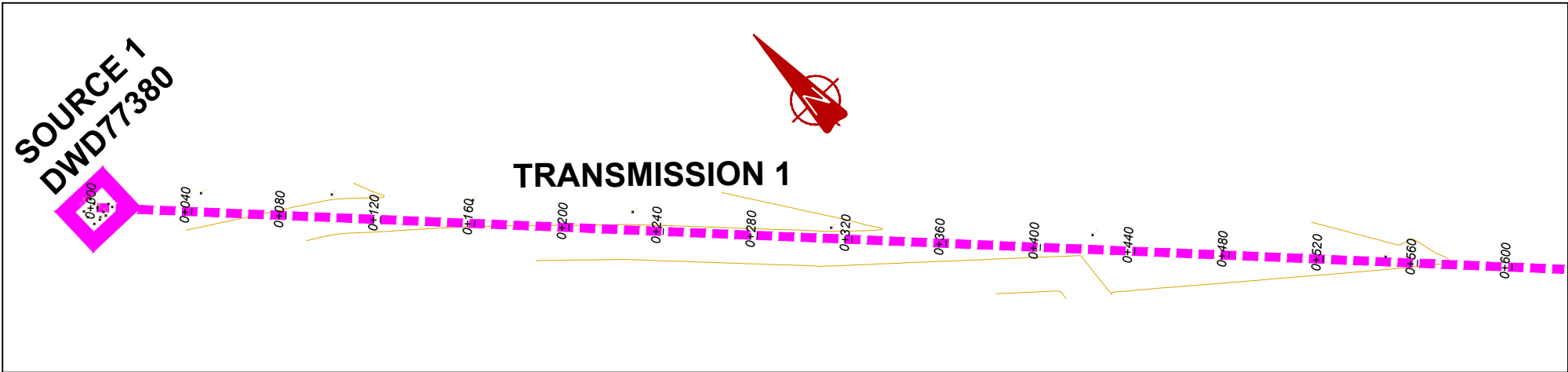
SARI In Joint Venture with **SGAPI**
Corporate Headquarter
10 Philip Lane, 1st Floor,
London EC3M 8AA,
United Kingdom

CONTRACTOR

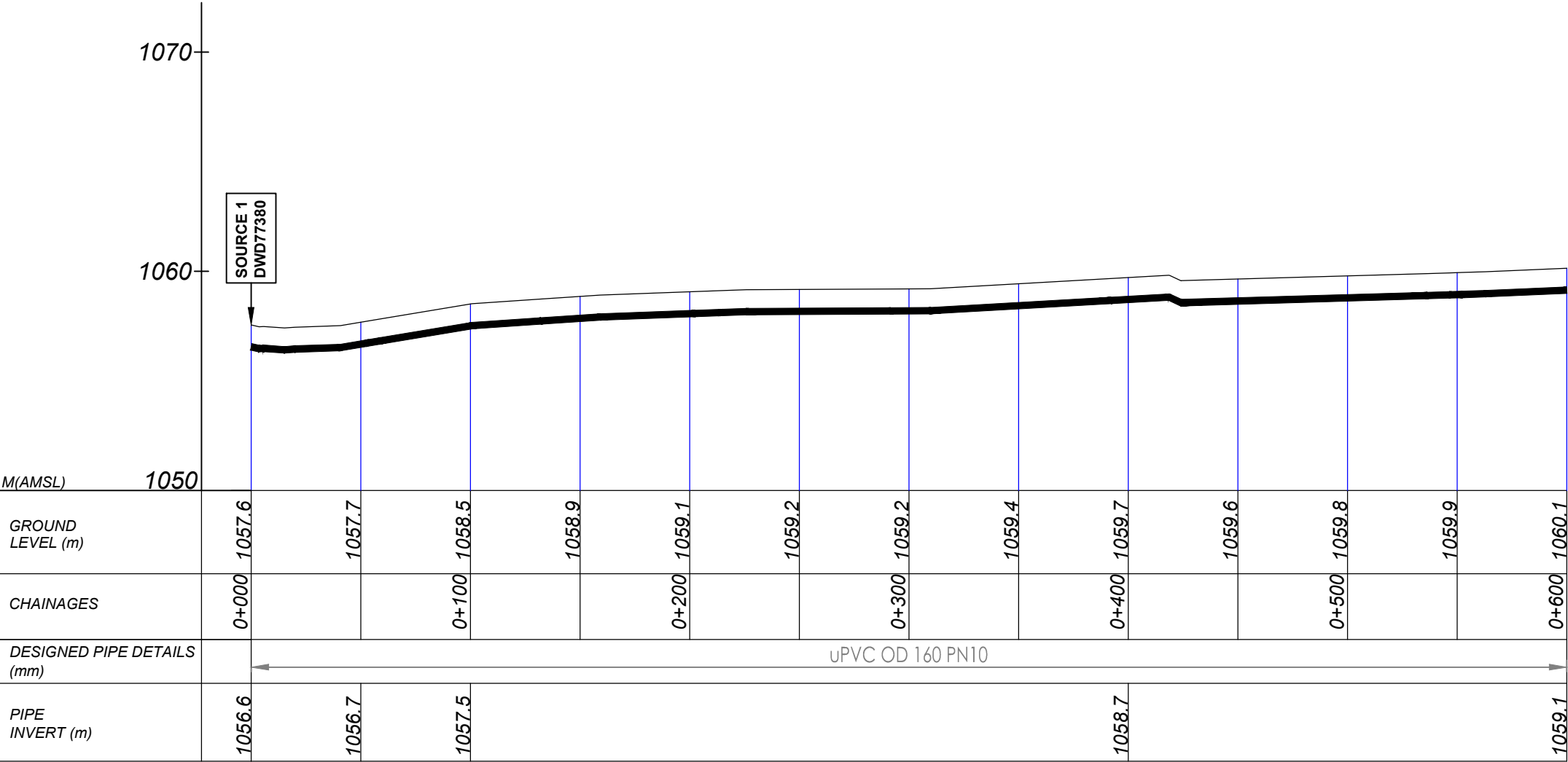
DETAILED ENGINEERING DESIGN

DRAWING TITLE **GENERAL LAYOUT TRANSMISSION NETWORK**

SCALE	DRAWING No.	GPA/WS/2.0.0	
SURVEYED	Evans Mpanga	DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	Oct 2021	APPROVED	Rodney Barugahare.



PLAN LAYOUT

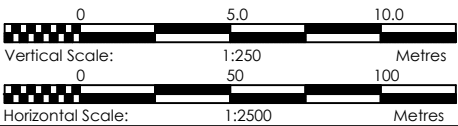


TRANSMISSION 1 (0+000.00 - 0+600.00)

NOTES

LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- EP End pipe
- N01 Node N01
- WO-1 Washout Type1



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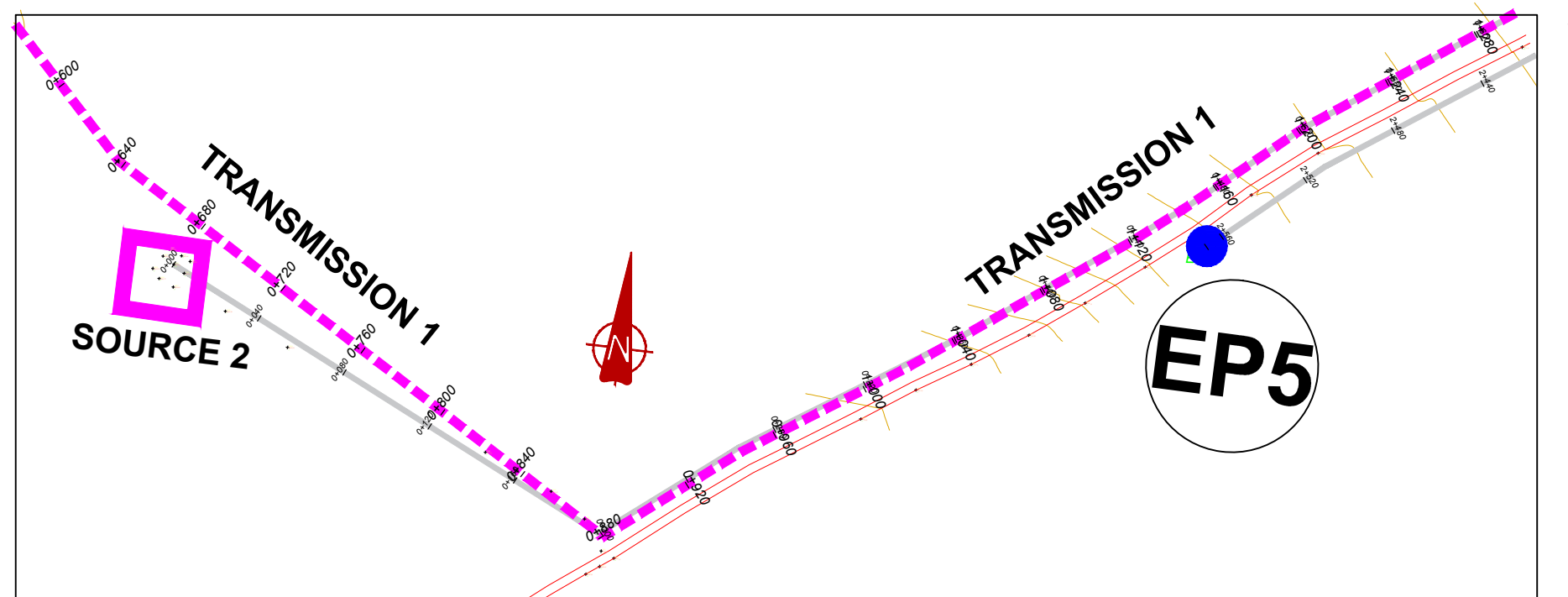
GASPA WATER SUPPLY SYSTEM

CONSULTANT
SARI
Corporate Headquarter
10 Philip Lane, 1st Floor,
London EC3M 8AA,
United Kingdom
In Joint Venture with
SGAPI

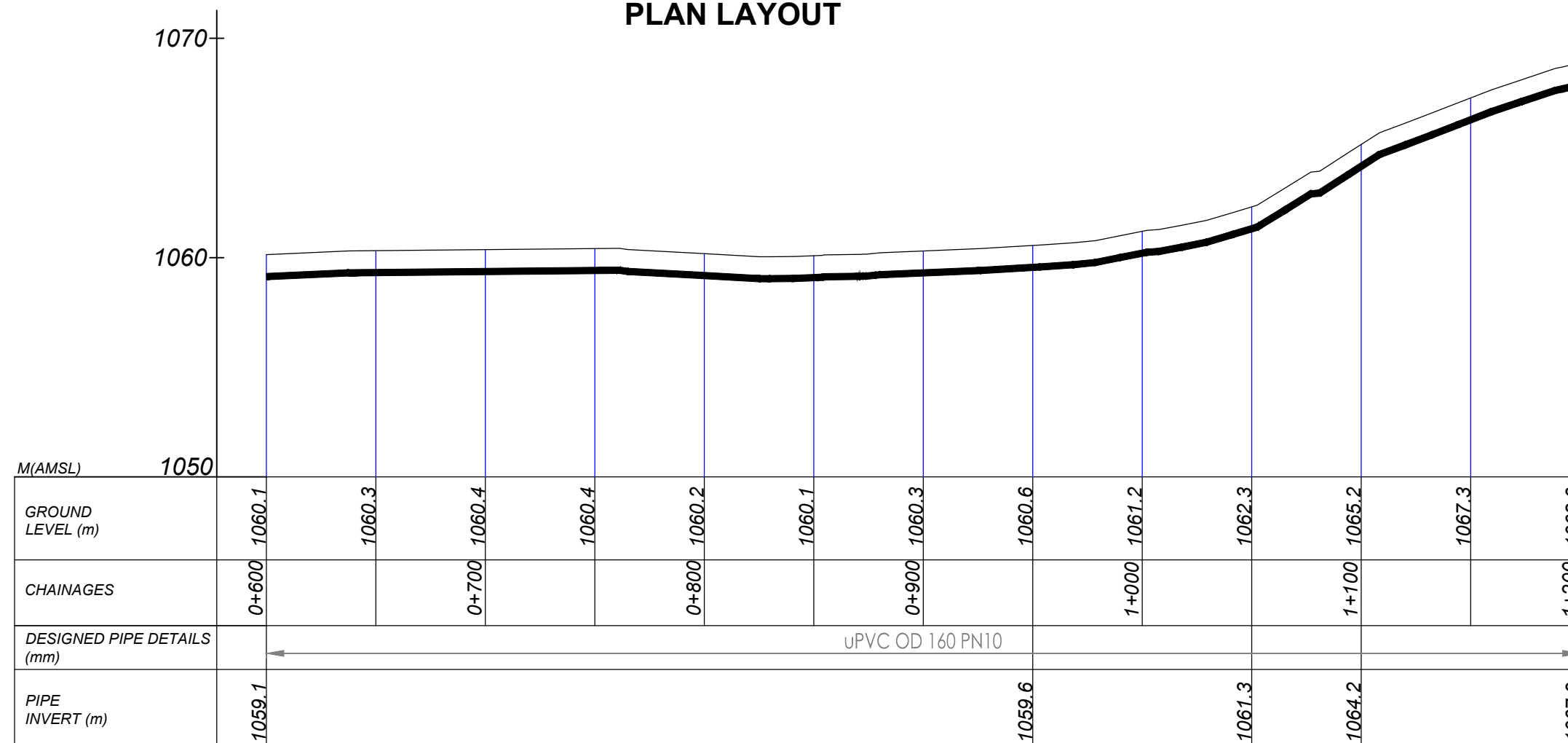
CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE
TRANSMISSION 01
(0+000.00 - 0+600.00)

SCALE	Vert. 1:250 Hori. 1:2500	DRAWING No.	GPA/WS/2.1.1
SURVEYED	Evans Mpanga	DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	Oct 2021	APPROVED	Rodney Barugahare.



PLAN LAYOUT

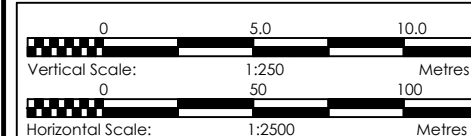


TRANSMISSION 1 (0+600.00 - 1+200.00)

NOTES

LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- EP End pipe
- N01 Node N01
- WO-1 Washout Type1



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GOVERNMENT OF UGANDA
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CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

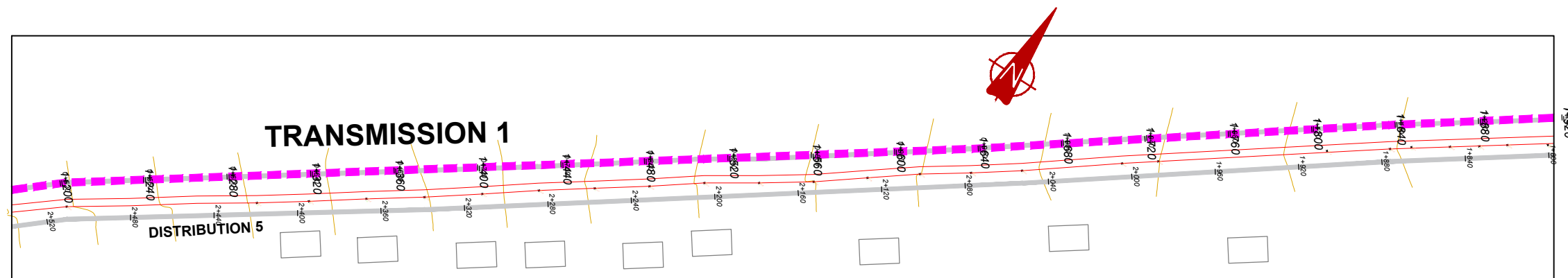
GASPA WATER SUPPLY SYSTEM

CONSULTANT
SARI In Joint Venture with **SGAPI**
Corporate Headquarter
10 Philip Lane, 1st Floor,
London EC3M 8AA,
United Kingdom

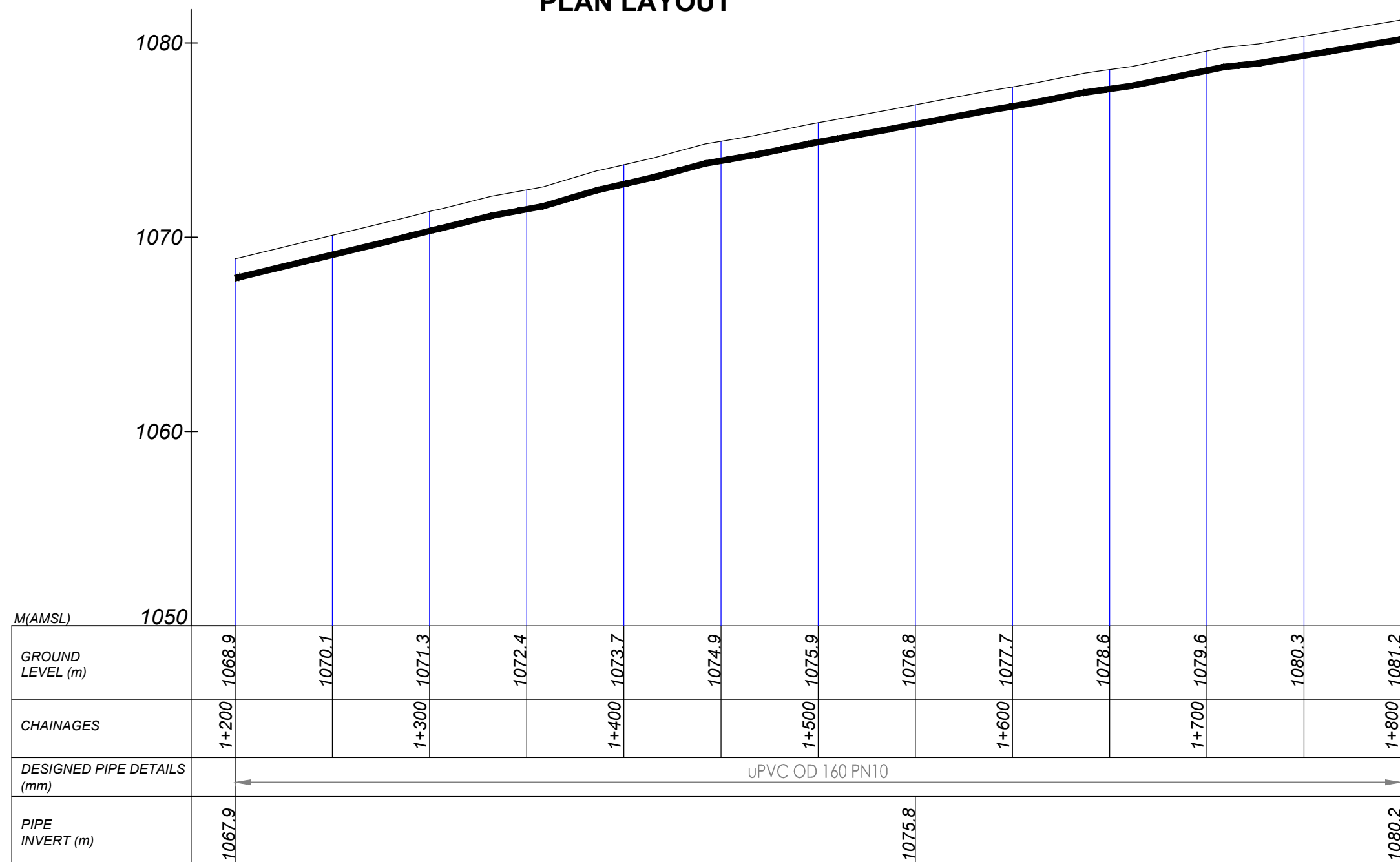
CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE **TRANSMISSION 01**
(0+600.00 - 1+200.00)

SCALE Vert, 1:250
Hor, 1:2500
DRAWING No. GPA/WS/2.1.2
SURVEYED Evans Mpanga
DESIGNED Otwane Dan.
DRAWN Joshua Nyarwanda
CHECKED Rodney Barugahare
DATE Oct 2021
APPROVED Rodney Barugahare.











PLAN LAYOUT

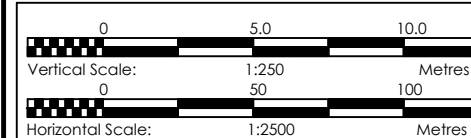


TRANSMISSION 1 (1+200.00 - 1+800.00)

NOTES

LEGEND

- | | |
|---|--------------------------|
|  | Transmission Pipeline |
|  | Distribution Pipeline |
|  | Ground Level |
|  | Building/House |
|  | Contours |
|  | Road |
| DAV | Double Orifice Air Valve |
|  | End pipe |
|  | Node N01 |
| WO-1 | Washout Type I |



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GOVERNMENT OF UGANDA
MINISTRY OF WATER AND ENVIRONMENT

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AN



PROJECT

**CONSULTANCY SERVICES FOR FEASIBILITY STUDY,
DETAILED ENGINEERING DESIGN AND CONSTRUCTION
SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY
SYSTEMS AND SANITATION FACILITIES IN REFUGEE
SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND
NORTHERN UGANDA IN KIRYANDONGO DISTRICT**

GASPA WATER SUPPLY SYSTEM

CONSULTANT



1. *Journal of the American Medical Association*, 1997; 277: 1033-1036.

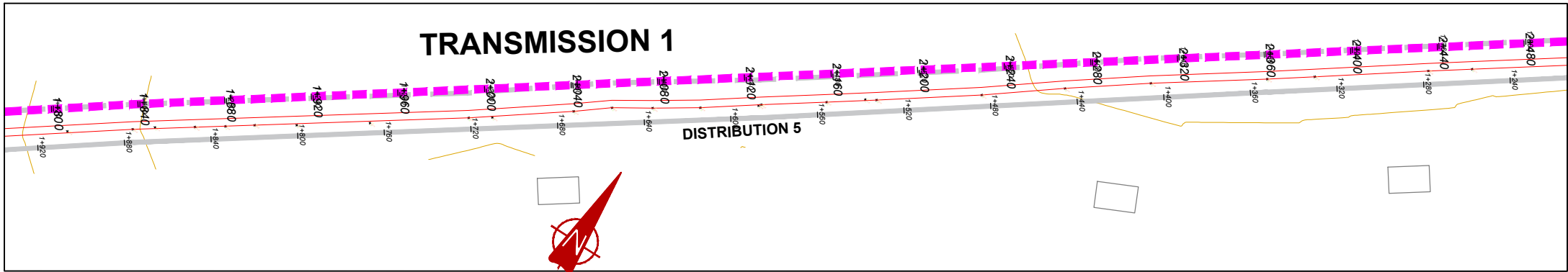


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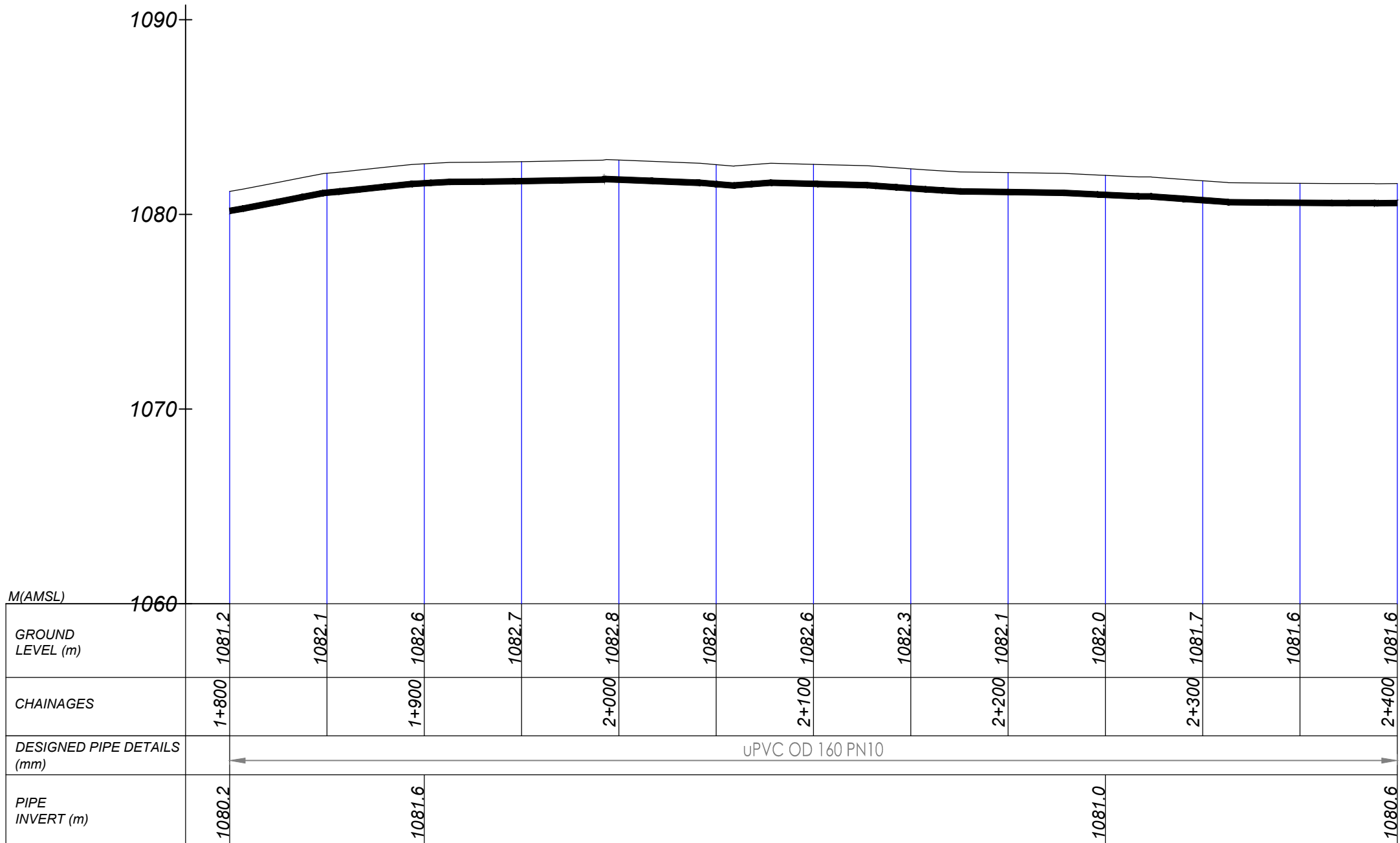
DETAILED ENGINEERING DESIGN

DRAWING TITLE	TRANSMISSION 01 (1+200.00 - 1+800.00)
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SCALE	<i>Vert, 1:250</i> <i>Hori, 1:2500</i>	DRAWING No.	GPA/WS/2.1.3
SURVEYED	Evans Mpanga	DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	Oct 2021	APPROVED	Rodney Barugahare.



PLAN LAYOUT

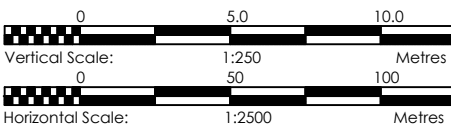


TRANSMISSION 1 (1+800.00 - 2+400.00)

NOTES

LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- EP End pipe
- N01 Node N01
- WO-1 Washout Type1



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GOVERNMENT OF UGANDA
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CO-FINANCED BY:
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PROJECT
CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

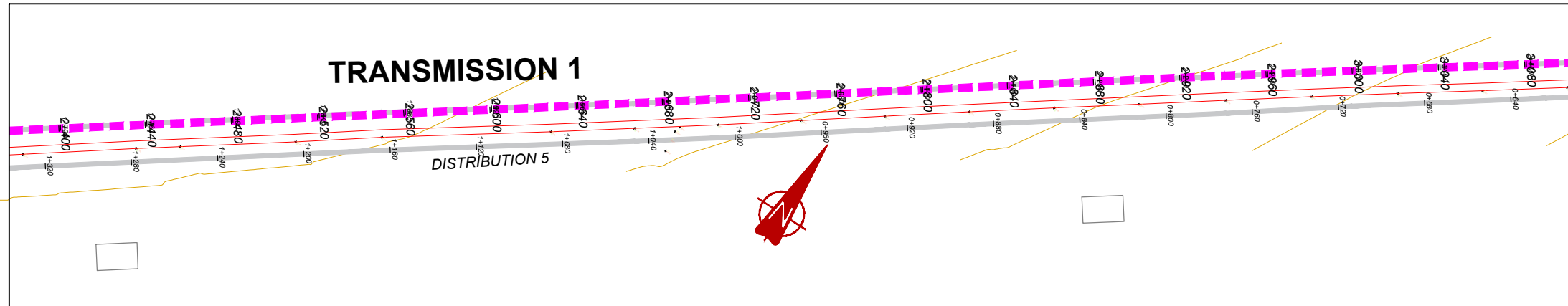
GASPA WATER SUPPLY SYSTEM

CONSULTANT
SARI In Joint Venture with **SGAPI**
Corporate Headquarter
10 Philip Lane, 1st Floor,
London EC3M 8AA,
United Kingdom

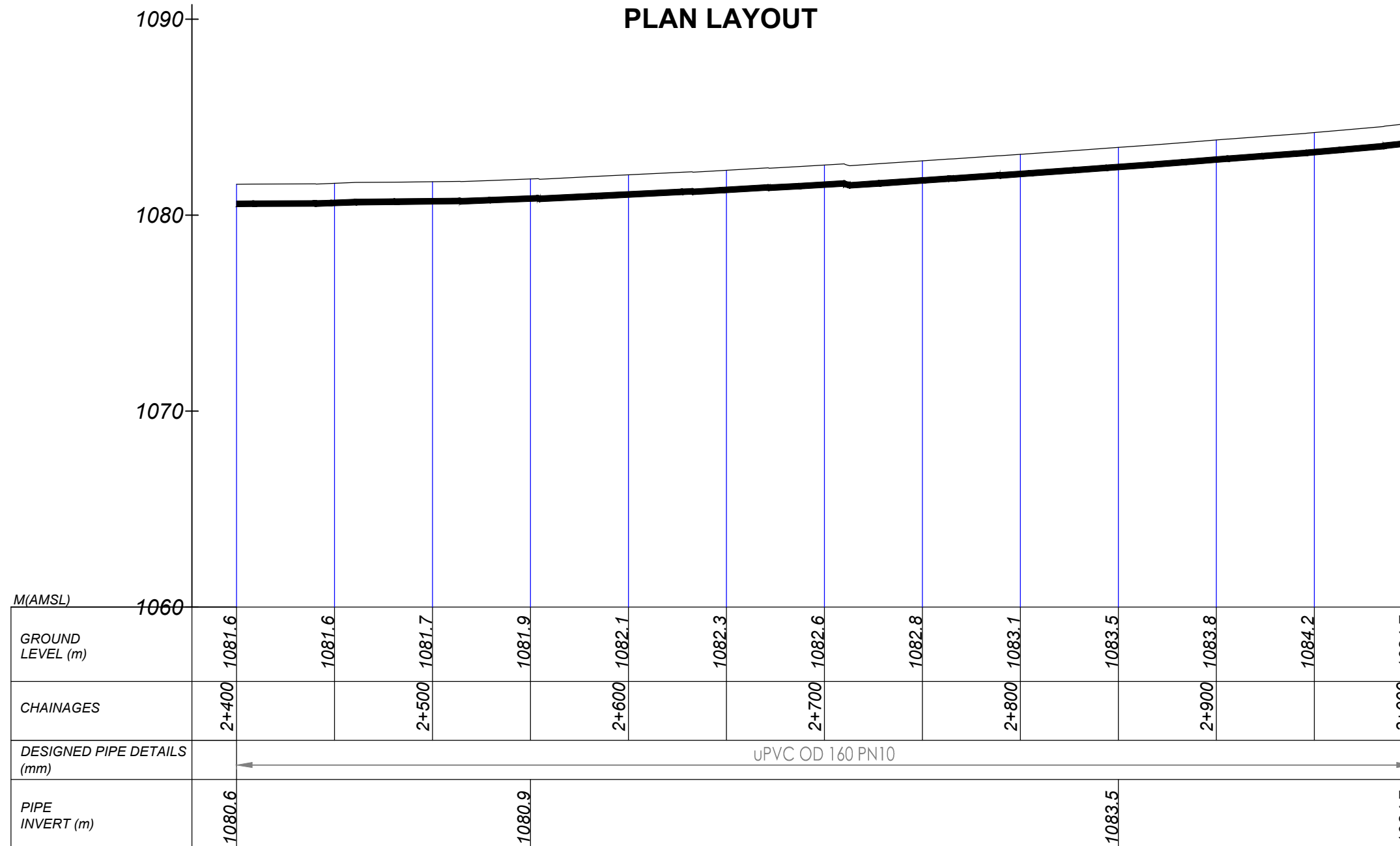
CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE **TRANSMISSION 01**
(1+800.00 - 2+400.00)

SCALE	Vert, 1:250 Hori, 1:2500	DRAWING No.	GPA/WS/2.1.4
SURVEYED	Evans Mpanga	DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	Oct 2021	APPROVED	Rodney Barugahare.



PLAN LAYOUT

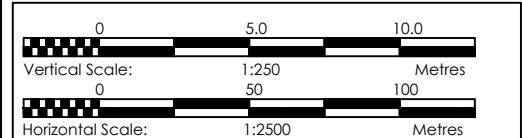


TRANSMISSION 1 (2+400.00 - 3+000.00)

NOTES

LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- EP End pipe
- N01 Node N01
- WO-1 Washout Type1



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GOVERNMENT OF UGANDA
MINISTRY OF WATER AND ENVIRONMENT

CO-FINANCED BY:
THE WORLD BANK AND GOVERNMENT OF UGANDA

PROJECT
CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

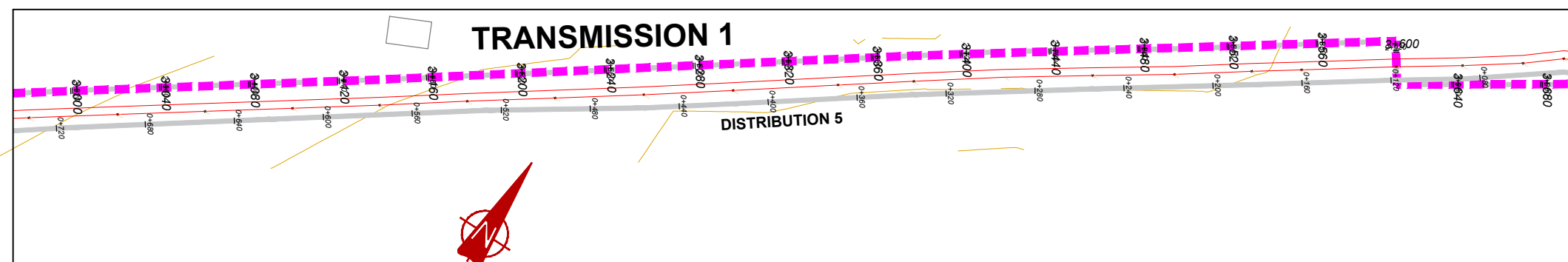
GASPA WATER SUPPLY SYSTEM

CONSULTANT
SARI In Joint Venture with **SGAPI**
Corporate Headquarter
10 Philip Lane, 1st Floor,
London EC3M 8AA,
United Kingdom

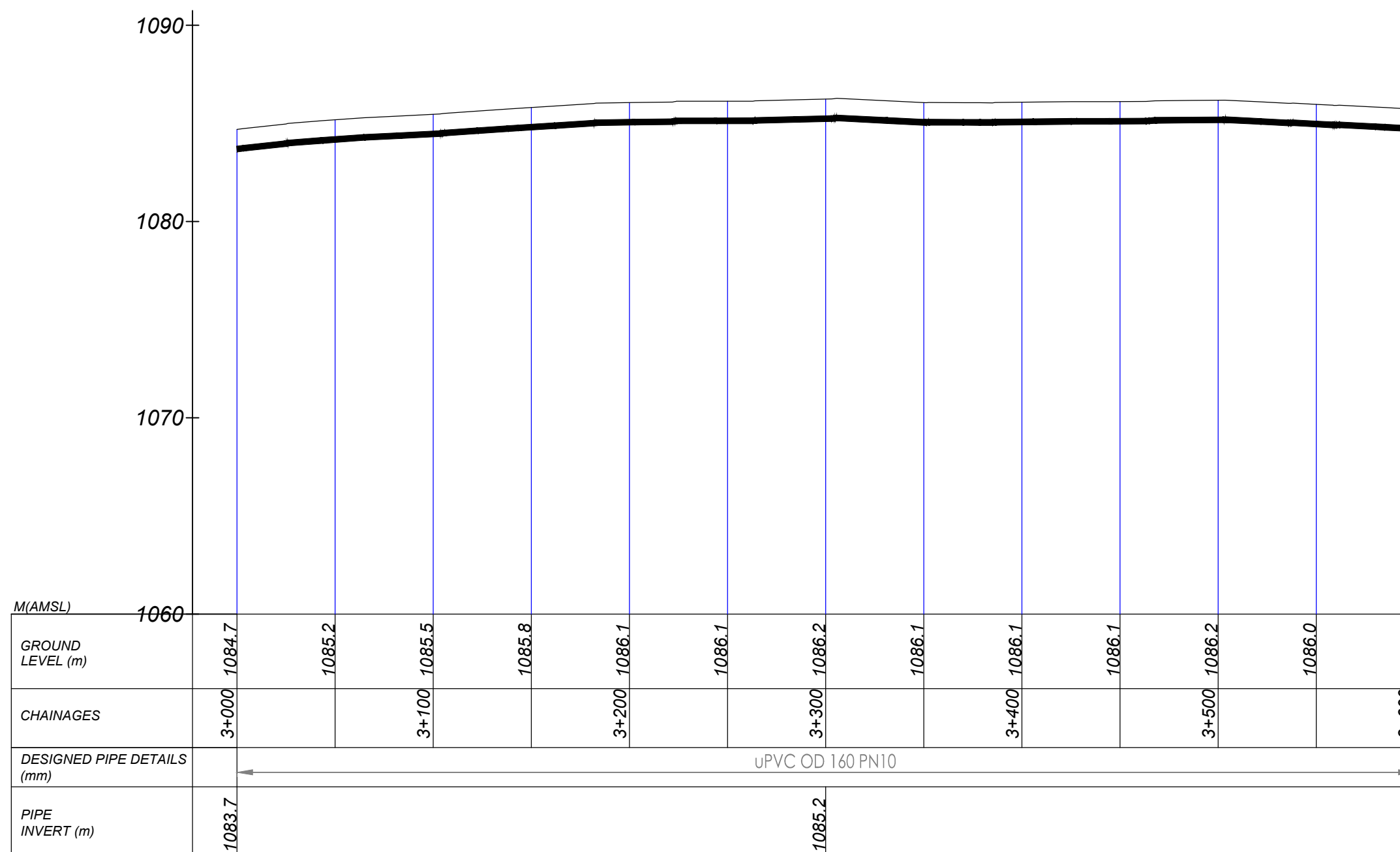
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DETAILED ENGINEERING DESIGN
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(2+400.00 - 3+000.00)

SCALE Vert, 1:250
Hor, 1:2500
DRAWING No. GPA/WS/2.1.5
SURVEYED Evans Mpanga DESIGNED Otwane Dan.
DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare
DATE Oct 2021 APPROVED Rodney Barugahare.











PLAN LAYOUT

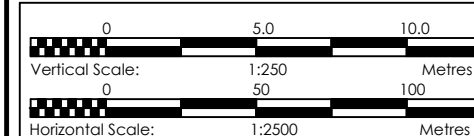


TRANSMISSION 1 (3+000.00 - 3+600.00)

NOTES

LEGEND

- | | |
|---|--------------------------|
|  | Transmission Pipeline |
|  | Distribution Pipeline |
|  | Ground Level |
|  | Building/House |
|  | Contours |
|  | Road |
| DAV | Double Orifice Air Valve |
|  | End pipe |
|  | Node N01 |
| WO-1 | Washout Type I |



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GOVERNMENT OF UGANDA
MINISTRY OF WATER AND ENVIRONMENT

CO-FINANCED BY:



AN



PROJECT

**CONSULTANCY SERVICES FOR FEASIBILITY STUDY,
DETAILED ENGINEERING DESIGN AND CONSTRUCTION
SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY
SYSTEMS AND SANITATION FACILITIES IN REFUGEE
SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND
NORTHERN UGANDA IN KIRYANDONGO DISTRICT**

GASPA WATER SUPPLY SYSTEM

CONSULTANT



In Joint Venture with



CONTRACTOR

DETAILED ENGINEERING DESIGN

DRAWING TITLE	TRANSMISSION 01 (3+000.00 - 3+600.00)
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SCALE	Vert, 1:250 Hori. 1:2500
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DRAWING No. GPA/WS/2.1.6

SURVEYED	Evans Mpanga
-----------------	--------------

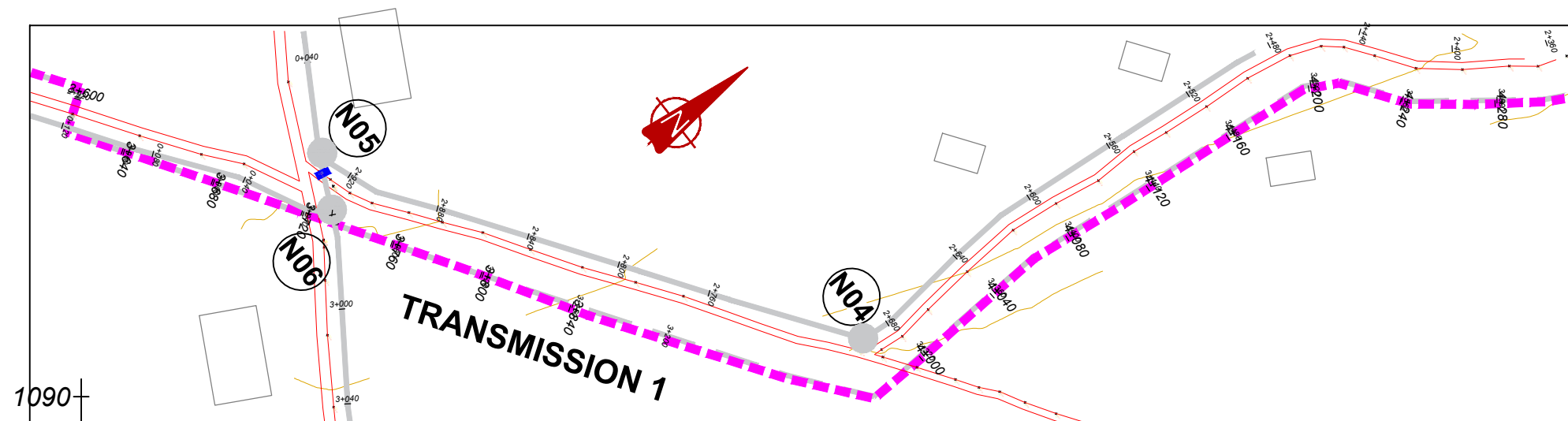
DESIGNED Otwane Dan.

DRAWN	Joshua Nyarwanda
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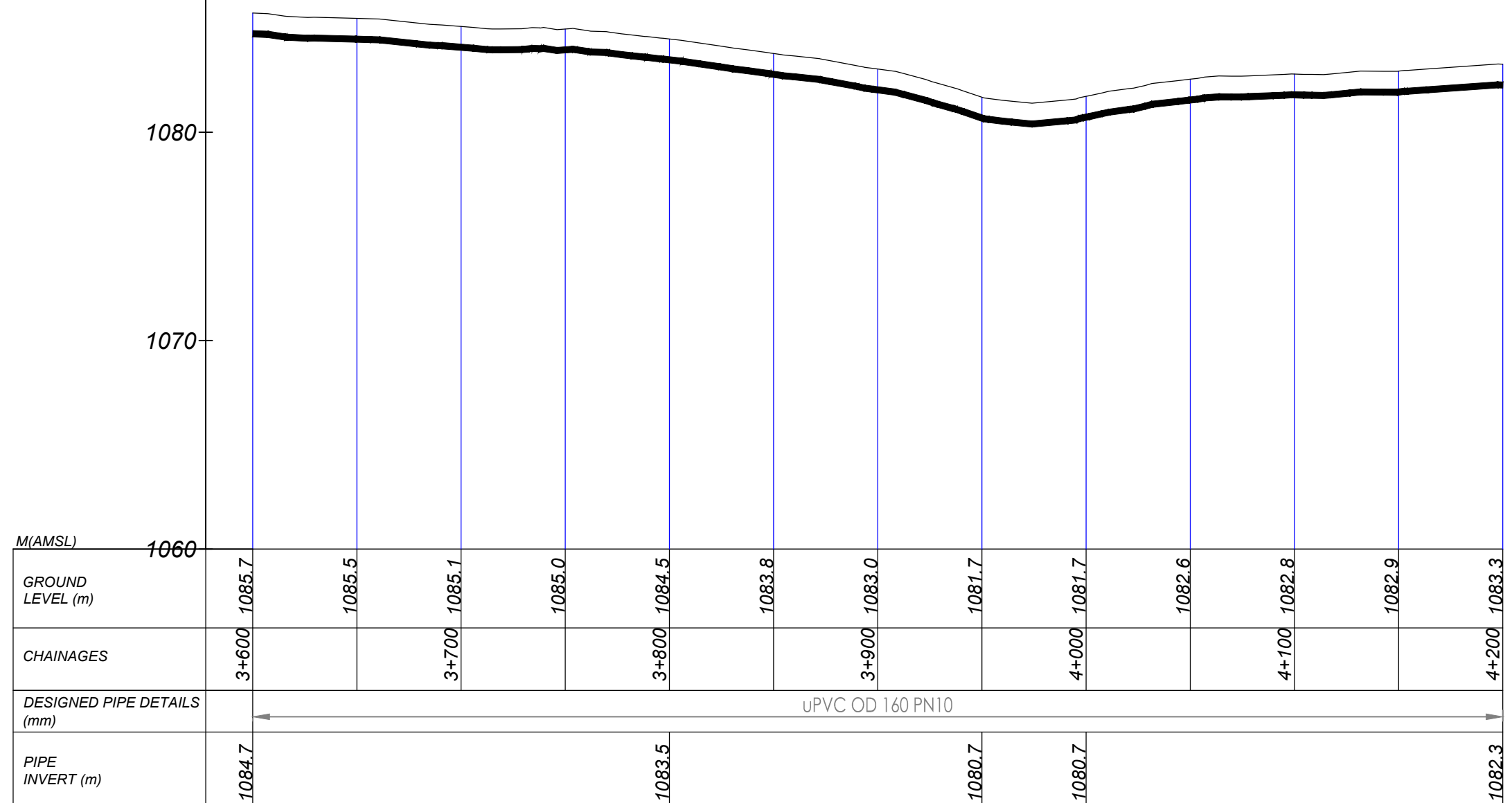
CHECKED	Rodney Baruaahare
---------	-------------------

DATE	Oct 2021
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APPROVED Rodney Barughare



PLAN LAYOUT

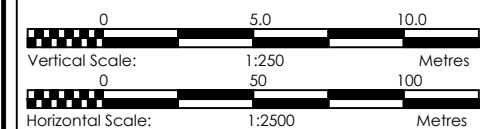


TRANSMISSION 1 (3+600.00 - 4+200.00)

NOTES

LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- EP End pipe
- N01 Node N01
- WO-1 Washout Type1





CLIENT
 **GOVERNMENT OF UGANDA**
MINISTRY OF WATER AND ENVIRONMENT

CO-FINANCED BY:
 AND  THE WORLD BANK GOVERNMENT OF UGANDA

PROJECT
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,
DETAILED ENGINEERING DESIGN AND CONSTRUCTION
SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY
SYSTEMS AND SANITATION FACILITIES IN REFUGEE
SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND
NORTHERN UGANDA IN KIRYANDONGO DISTRICT

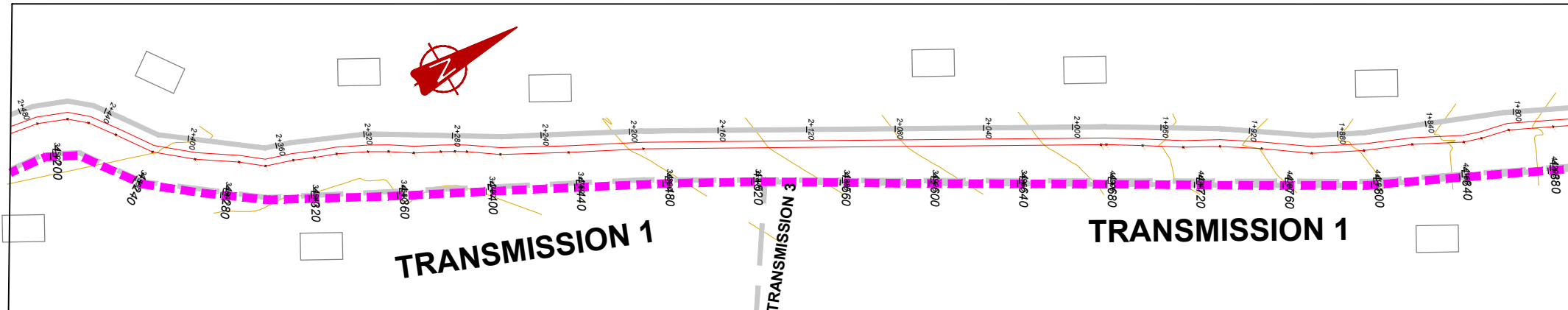
GASPA WATER SUPPLY SYSTEM

CONSULTANT
 In Joint Venture with 
Corporate Headquarter
10 Philip Lane, 1st Floor,
London EC3M 8AA,
United Kingdom

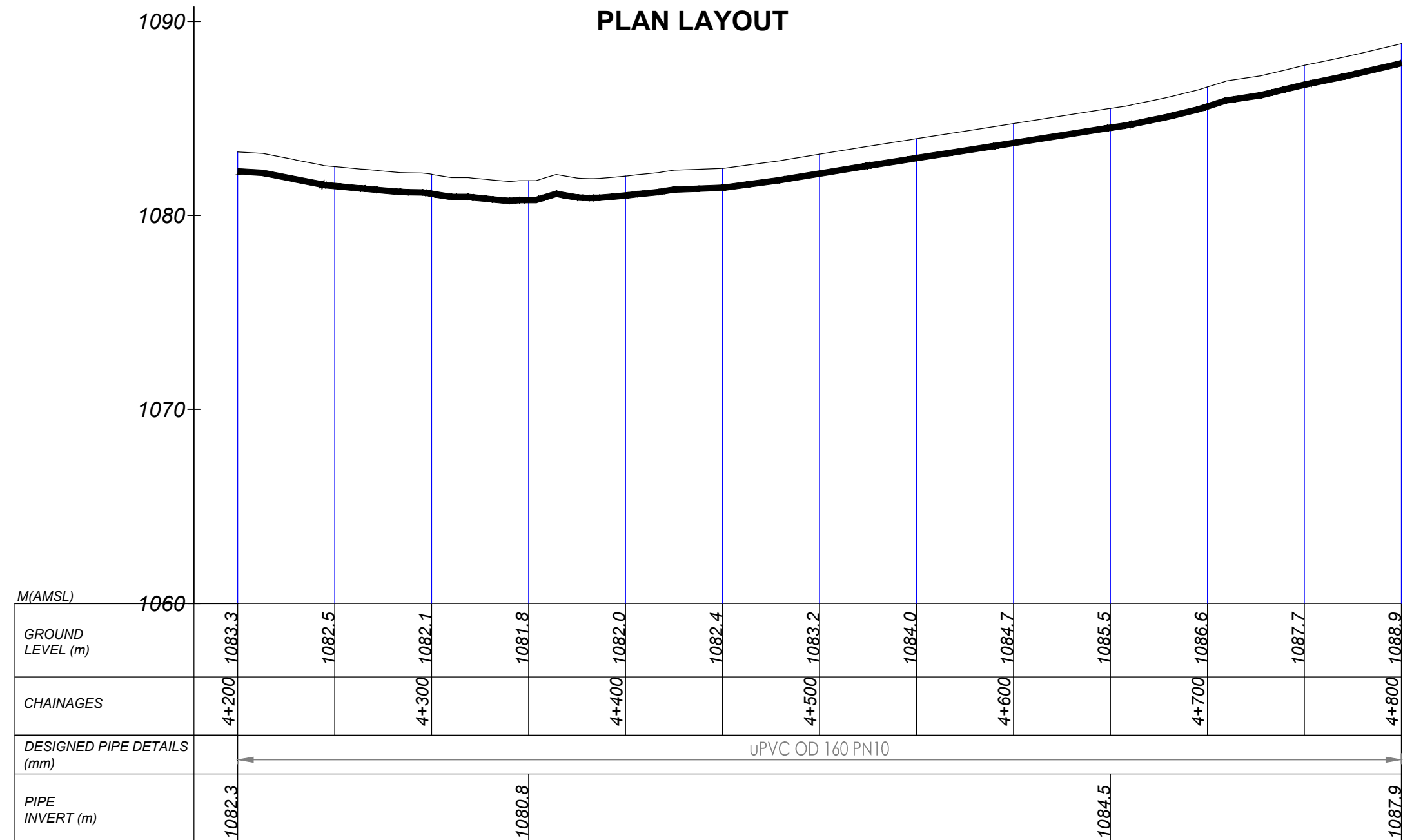
CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE **TRANSMISSION 01**
(3+600.00 - 4+200.00)

SCALE Vert, 1:250
Hor, 1:2500
DRAWING No. GPA/WS/2.1.7
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DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare
DATE Oct 2021 APPROVED Rodney Barugahare.



PLAN LAYOUT

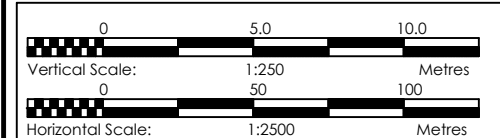


TRANSMISSION 1 (4+200.00 - 4+800.00)

NOTES

LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- EP End pipe
- N01 Node N01
- WO-1 Washout Type1



CLIENT
GOVERNMENT OF UGANDA
MINISTRY OF WATER AND ENVIRONMENT

CO-FINANCED BY:
THE WORLD BANK AND GOVERNMENT OF UGANDA

PROJECT
CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

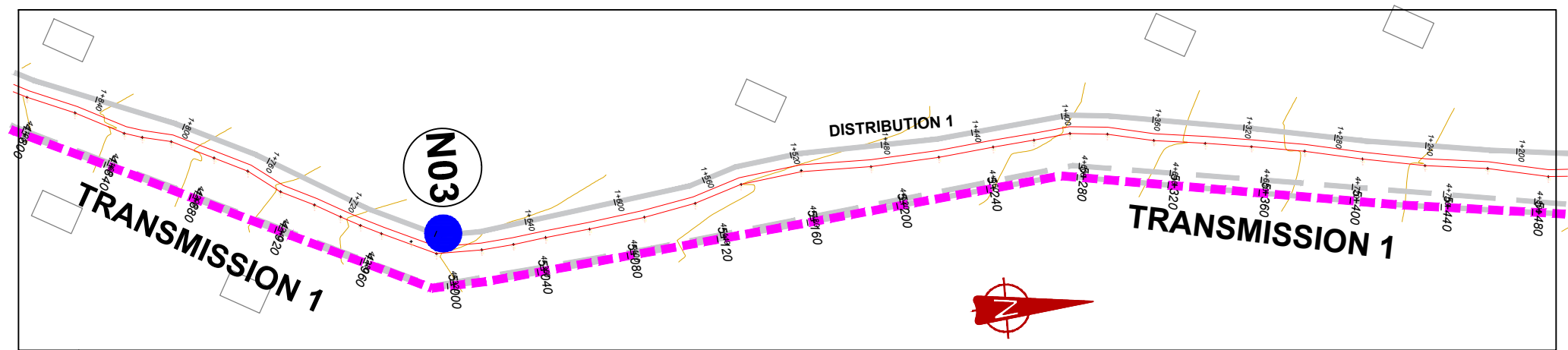
GASPA WATER SUPPLY SYSTEM

CONSULTANT
SARI In Joint Venture with **SGAPI**
Corporate Headquarter
10 Philip Lane, 1st Floor,
London EC3M 8AA,
United Kingdom

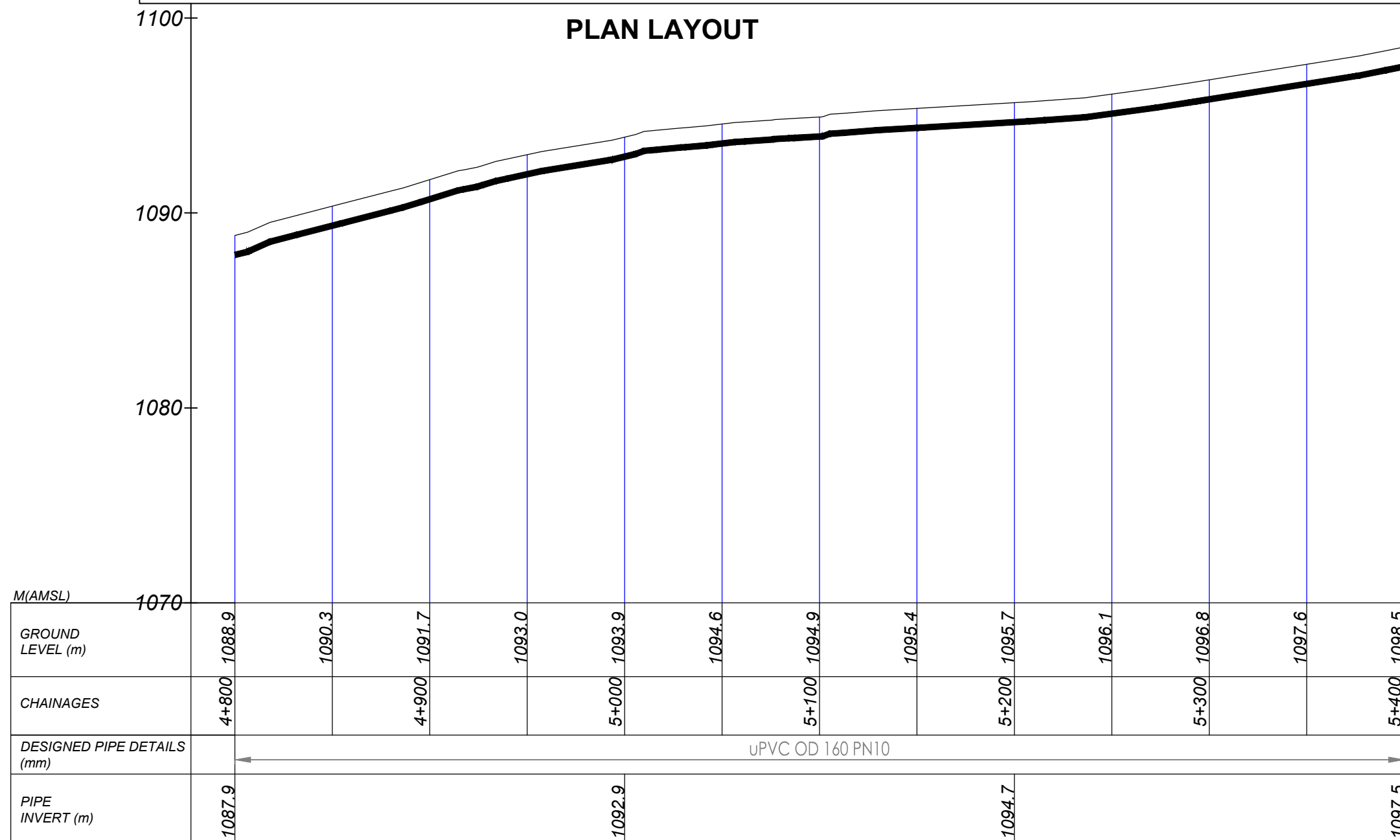
CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE **TRANSMISSION 01**
(4+200.00 - 4+800.00)

SCALE Vert, 1:250
Hor, 1:2500
DRAWING No. GPA/WS/2.1.8
SURVEYED Evans Mpanga DESIGNED Otwane Dan.
DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare
DATE Oct 2021 APPROVED Rodney Barugahare.



PLAN LAYOUT

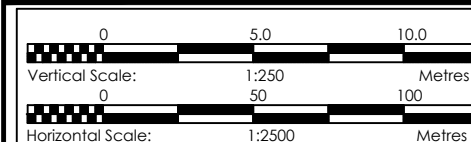


TRANSMISSION 1 (4+800.00 - 5+400.00)

NOTES

LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- EP End pipe
- N01 Node N01
- WO-1 Washout Type1



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GOVERNMENT OF UGANDA
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PROJECT
CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

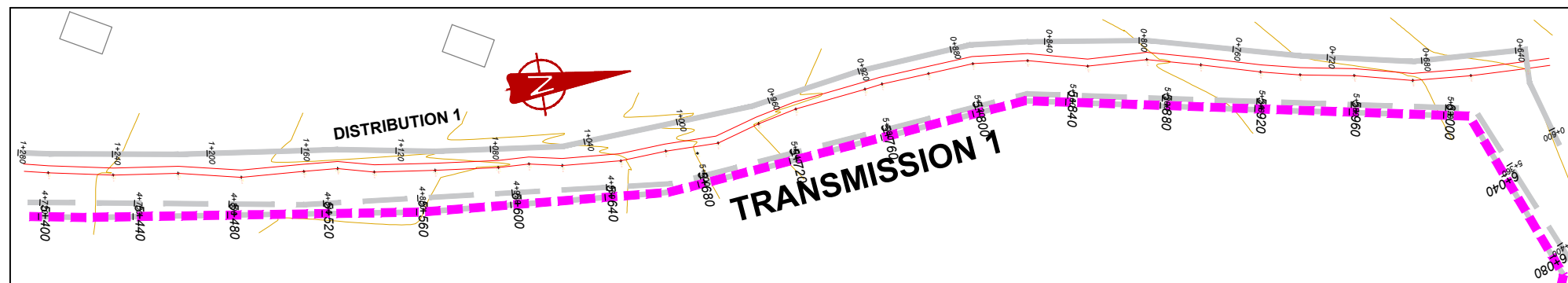
GASPA WATER SUPPLY SYSTEM

CONSULTANT
SARI In Joint Venture with **SGAPI**
Corporate Headquarter
10 Philip Lane, 1st Floor,
London EC3M 8AA,
United Kingdom

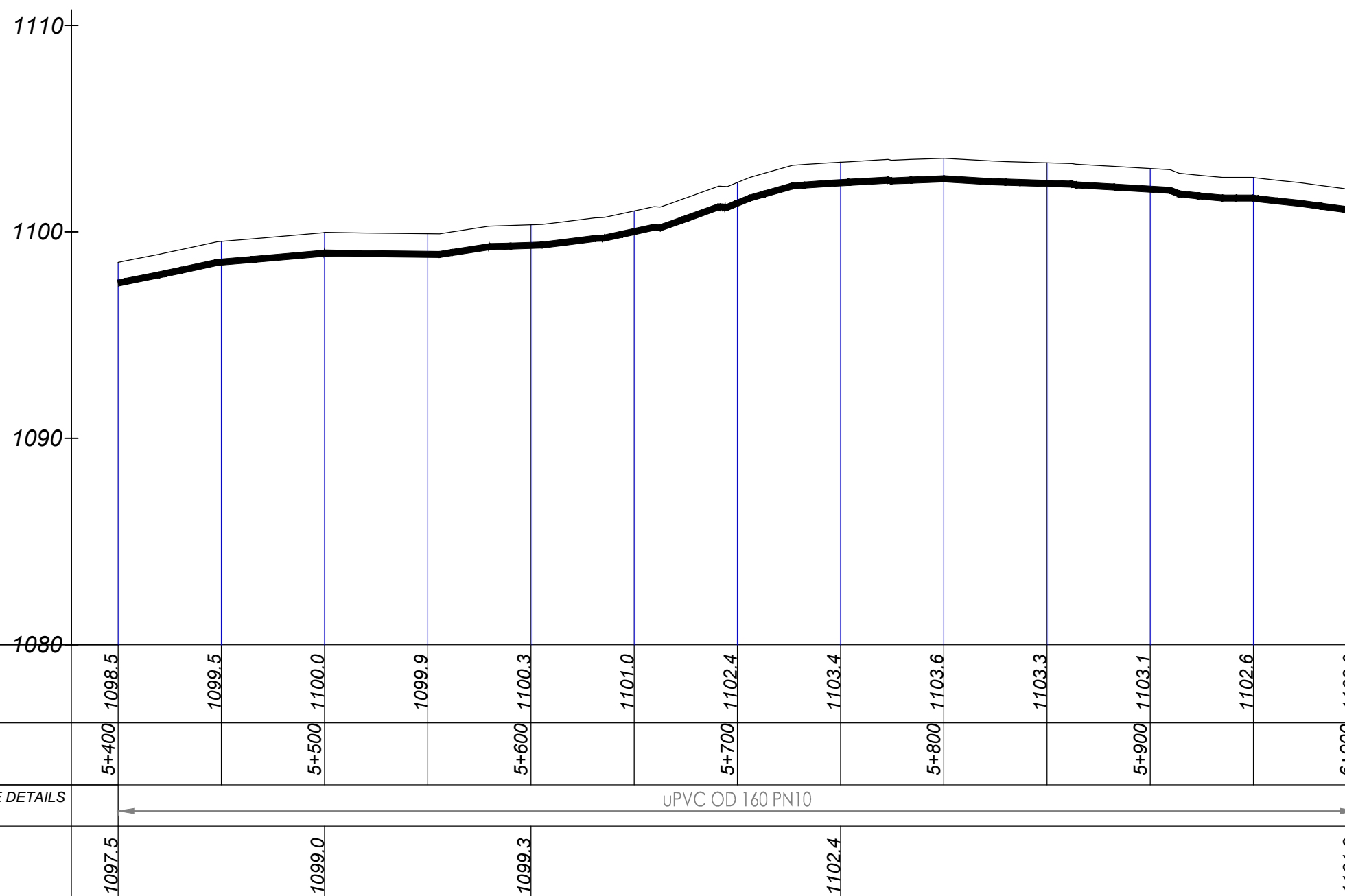
CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE **TRANSMISSION 01**
(4+800.00 - 5+400.00)

SCALE Vert. 1:250
Hor. 1:2500
DRAWING No. GPA/WS/2.1.9
SURVEYED Evans Mpanga DESIGNED Otwane Dan.
DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare
DATE Oct 2021 APPROVED Rodney Barugahare.



PLAN LAYOUT

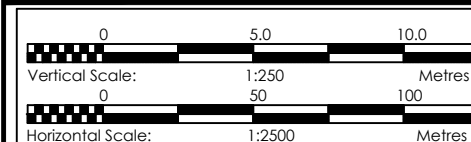


TRANSMISSION 1 (5+400.00 - 6+000.00)

NOTES

LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- EP End pipe
- N01 Node N01
- WO-1 Washout Type1



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CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

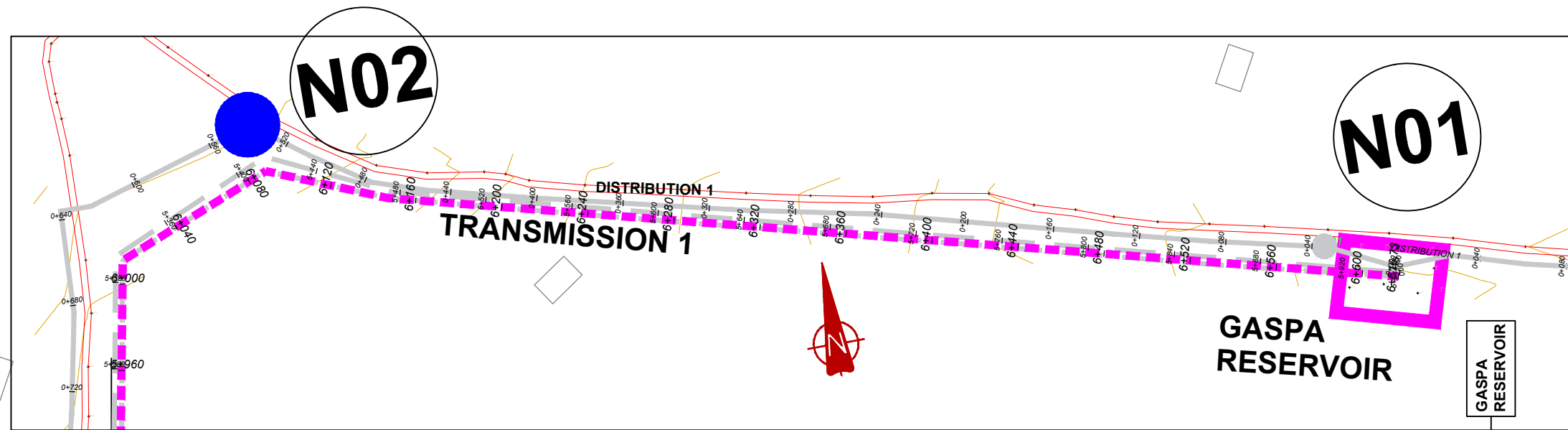
GASPA WATER SUPPLY SYSTEM

CONSULTANT
SARI In Joint Venture with **SGAPI**
Corporate Headquarter
10 Philip Lane, 1st Floor,
London EC3M 8AA,
United Kingdom

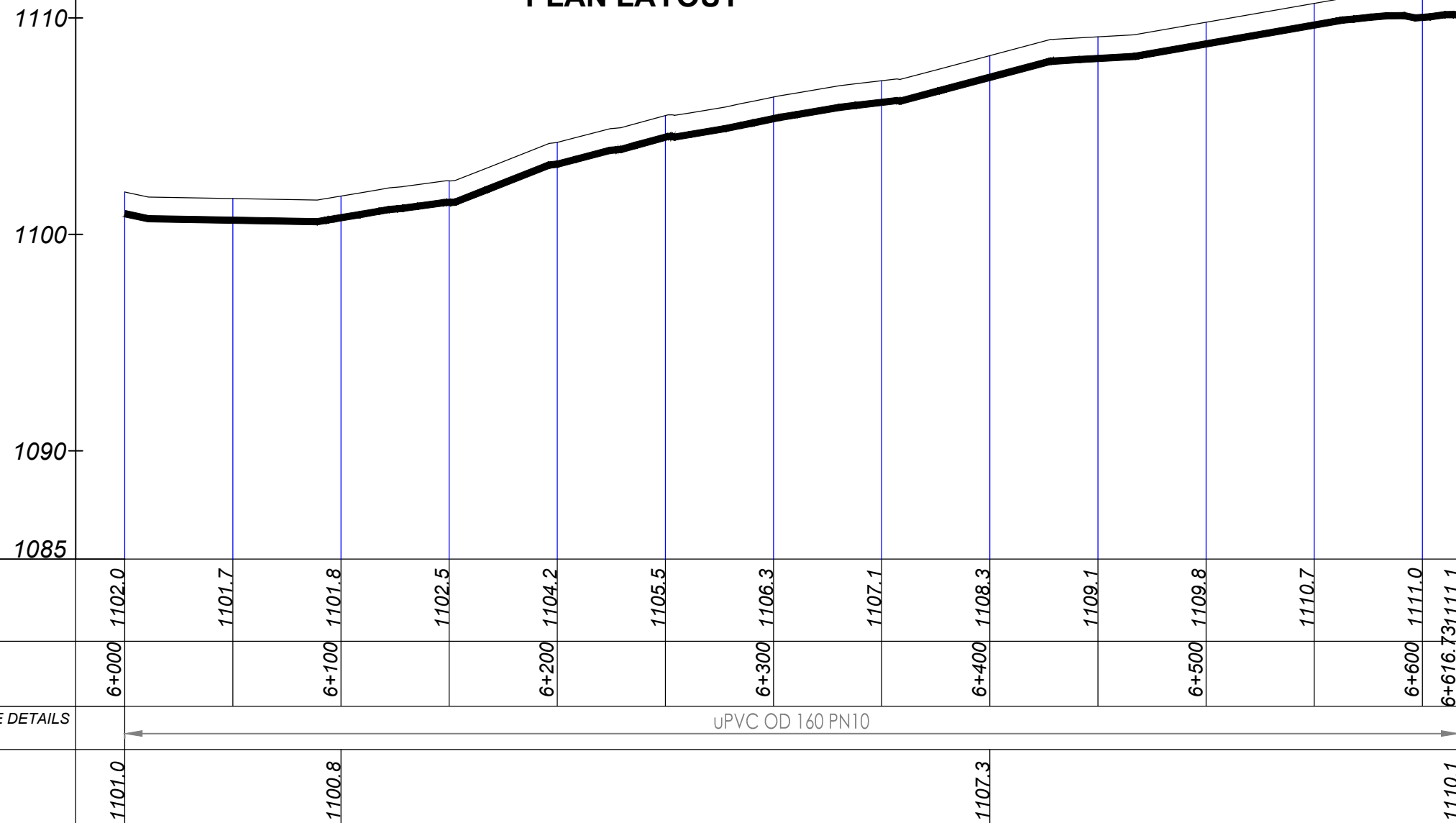
CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE **TRANSMISSION 01**
(5+400.00 - 6+000.00)

SCALE Vert, 1:250
Hor, 1:2500
DRAWING No. GPA/WS/2.1.10
SURVEYED Evans Mpanga DESIGNED Otwane Dan.
DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare
DATE Oct 2021 APPROVED Rodney Barugahare.



PLAN LAYOUT



TRANSMISSION 1 (6+000.00 - 6+616.73)

NOTES

LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- EP End pipe
- Node N01
- WO-1 Washout Type1



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GOVERNMENT OF UGANDA
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CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

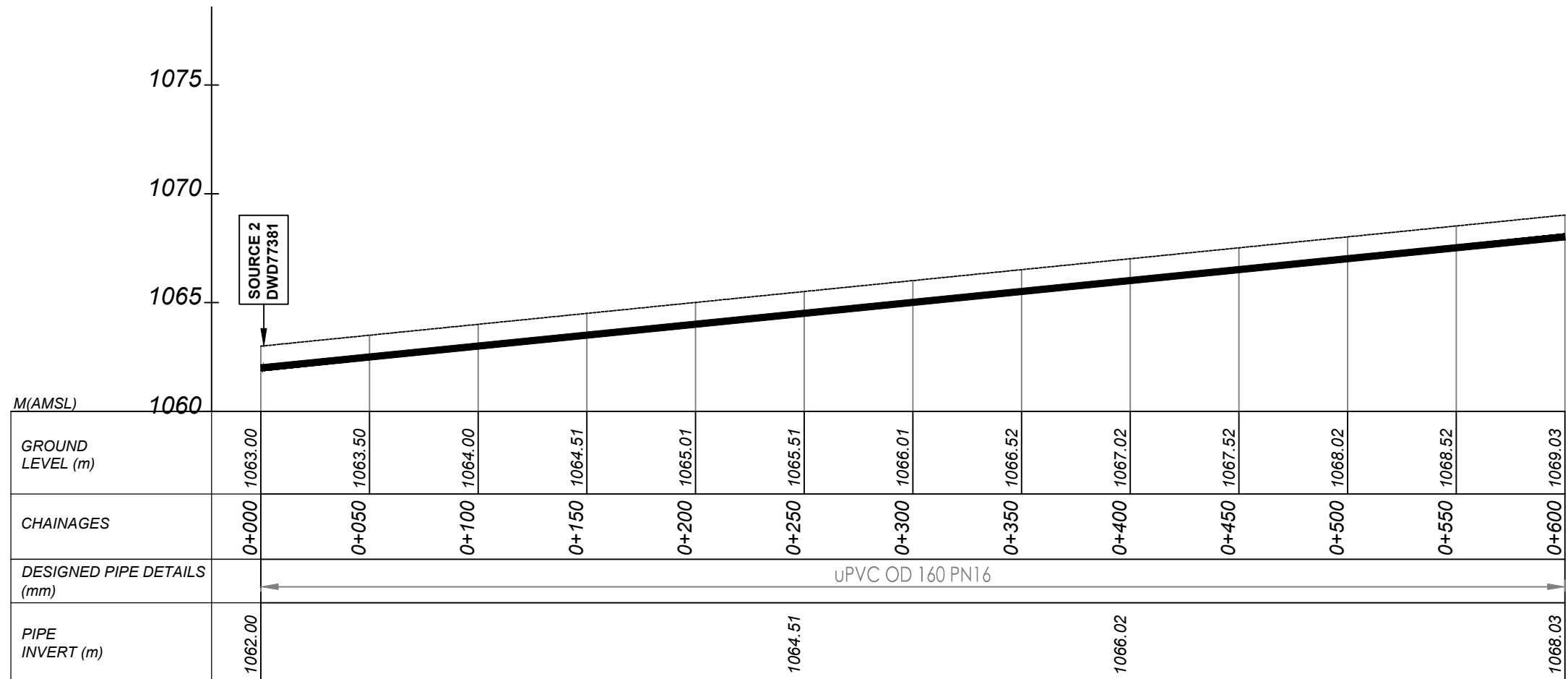
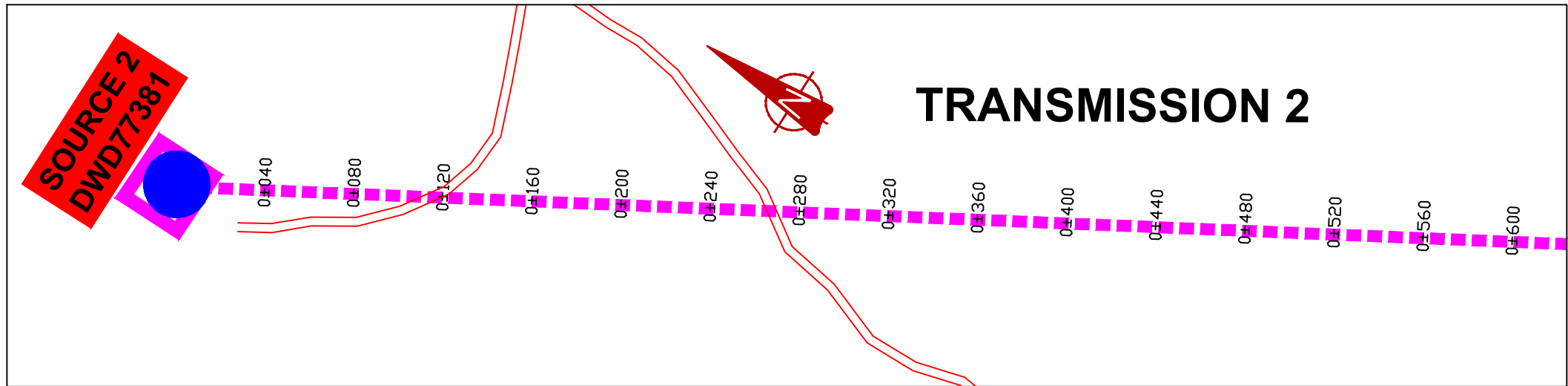
GASPA WATER SUPPLY SYSTEM

CONSULTANT
SARI In Joint Venture with **SGAPI**
Corporate Headquarter
10 Philip Lane, 1st Floor,
London EC3M 8AA,
United Kingdom

CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE **TRANSMISSION 01**
(6+000.00 - 6+616.73)

SCALE Vert, 1:250
Hor, 1:2500
DRAWING No. GPA/WS/2.1.11
SURVEYED Evans Mpanga DESIGNED Otwane Dan.
DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare
DATE Oct 2021 APPROVED Rodney Barugahare.



TRANSMISSION 2 (0+000.00 - 0+600.00)

NOTES

LEGEND

Transmission Pipeline

Distribution Pipeline

Ground Level

Building/House

Contours

Road

DAV Double Orifice Air Valve

EP End pipe

N01 Node N01

WO-1 Washout Type1

05.010.0

Vertical Scale: 1:250 Metres

050100

Horizontal Scale: 1:2500 Metres

CLIENT

GOVERNMENT OF UGANDA
MINISTRY OF WATER AND ENVIRONMENT

CO-FINANCED BY:

AND

PROJECT

CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

GASPA WATER SUPPLY SYSTEM

CONSULTANT

In Joint Venture with

CONTRACTOR

DETAILED ENGINEERING DESIGN

DRAWING TITLE

TRANSMISSION 02
(0+000.00 - 0+600.00)

SCALE

Vert, 1:250
Hori, 1:2500

DRAWING No.

GPA/WS/2.2.1

SURVEYED

Evans Mpanga

DESIGNED

Otwane Dan.

DRAWN

Joshua Nyarwanda

CHECKED

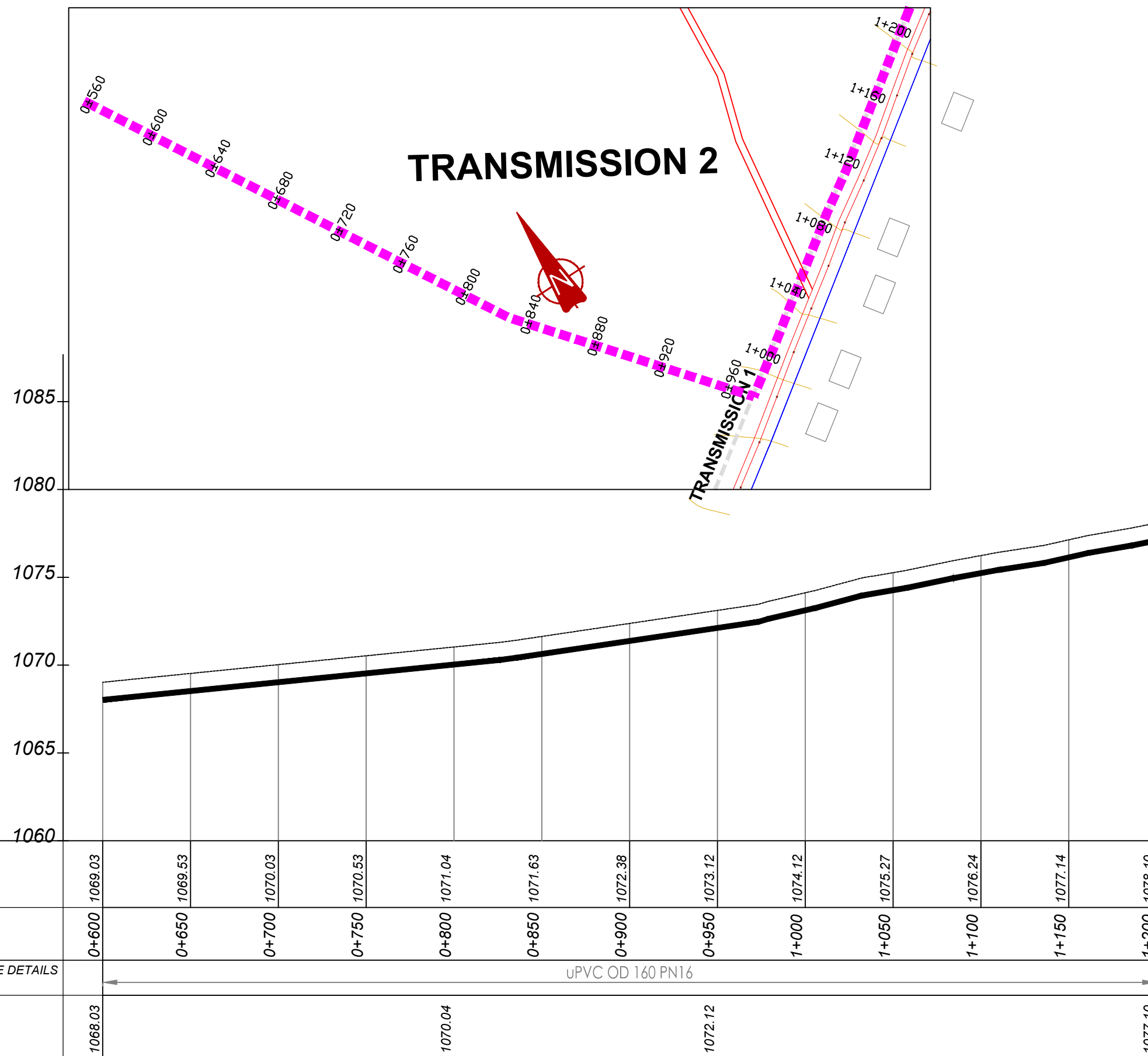
Rodney Barugahare

DATE

Oct 2021

APPROVED

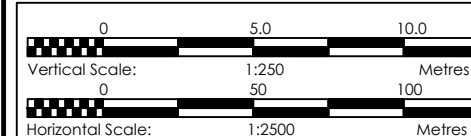
Rodney Barugahare.



NOTES

LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- EP End pipe
- N01 Node N01
- WO-1 Washout Type1



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GOVERNMENT OF UGANDA

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GASPA WATER SUPPLY SYSTEM

CONSULTANT

SARI In Joint Venture with **SGAPI**

Corporate Headquarter
10 Philip Lane, 1st Floor,
London EC3M 8AA,
United Kingdom

CONTRACTOR

DETAILED ENGINEERING DESIGN

DRAWING TITLE **TRANSMISSION 02**
(0+600.00 - 1+200.00)

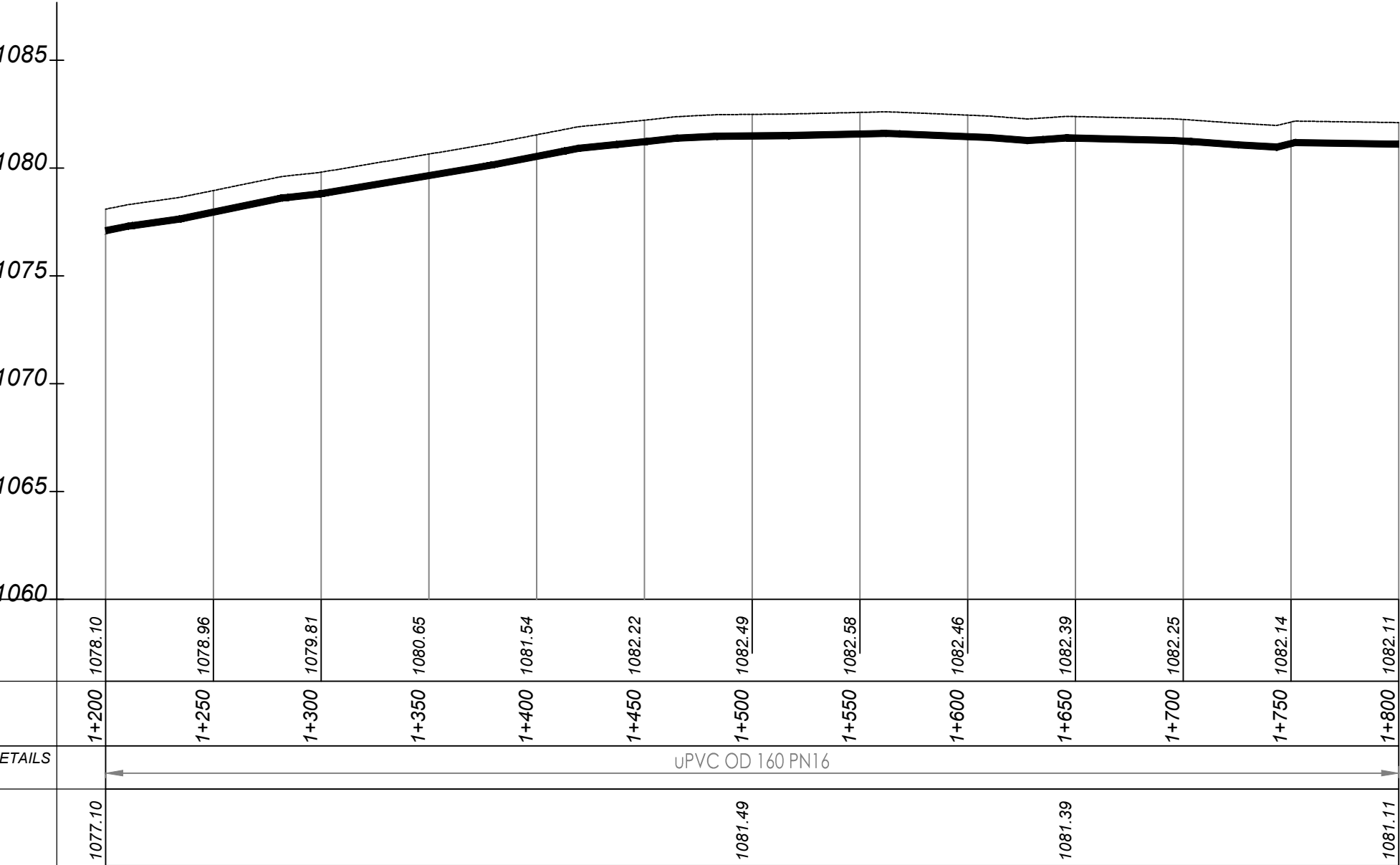
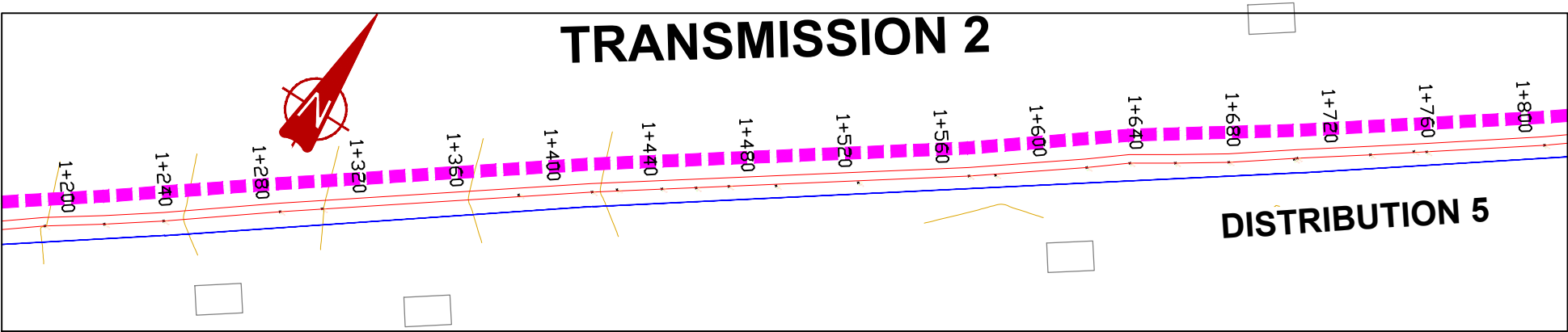
SCALE Vert. 1:250
Hori. 1:2500

DRAWING No. GPA/WS/2.2.2

SURVEYED Evans Mpanga DESIGNED Otwane Dan.

DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare

DATE Oct 2021 APPROVED Rodney Barugahare.

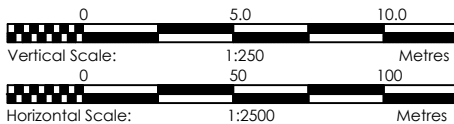


TRANSMISSION 1 (1+200.00 - 1+800.00)

NOTES

LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- EP End pipe
- N01 Node N01
- WO-1 Washout Type1



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CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

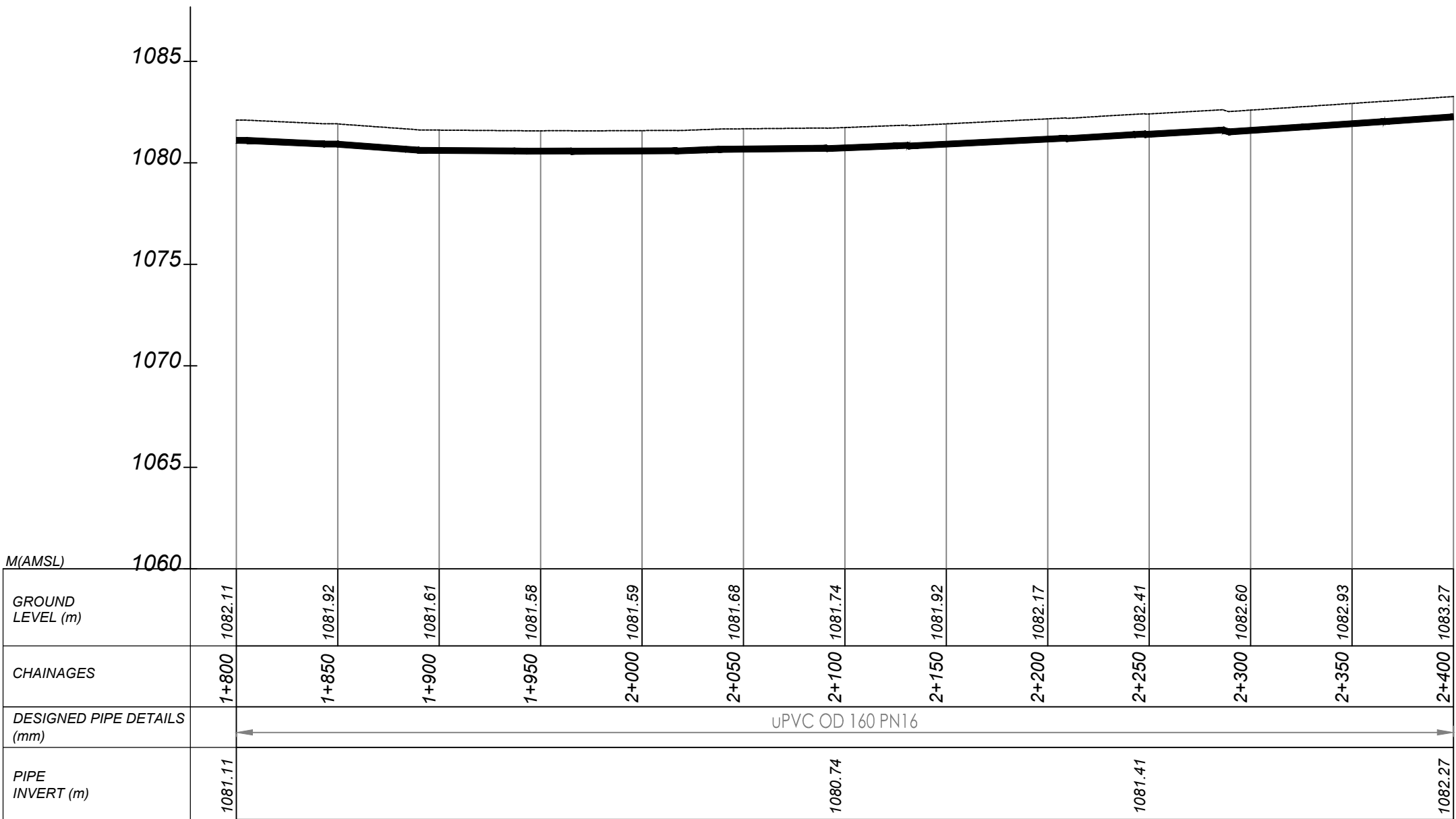
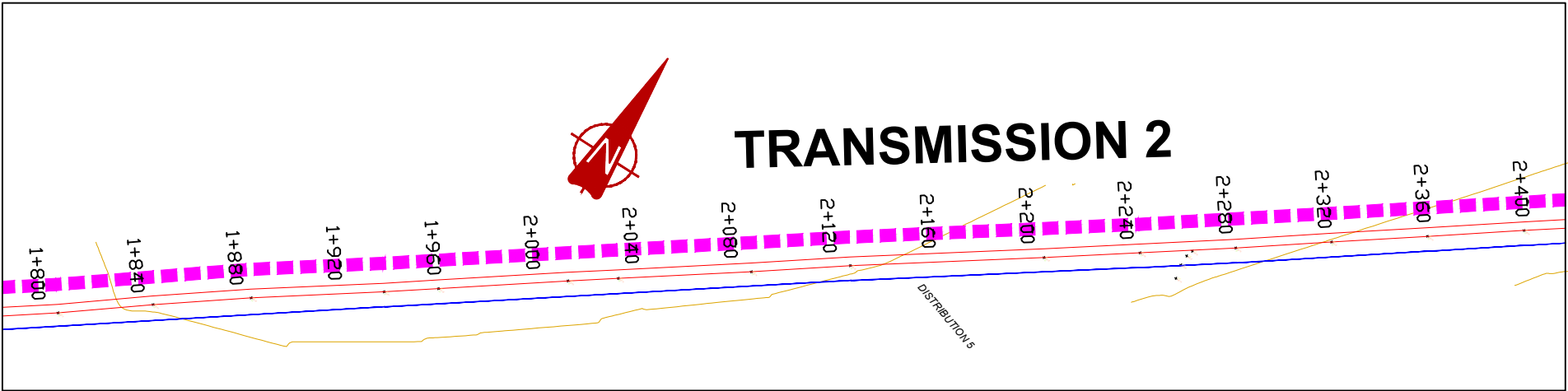
GASPA WATER SUPPLY SYSTEM

CONSULTANT
SARI
Corporate Headquarter
10 Philip Lane, 1st Floor,
London EC3M 8AA,
United Kingdom
In Joint Venture with
SGAPI

CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE
TRANSMISSION 02
(1+200.00 - 1+800.00)

SCALE	Vert, 1:250 Hor, 1:2500	DRAWING No.	GPA/WS/2.2.3
SURVEYED	Evans Mpanga	DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	Oct 2021	APPROVED	Rodney Barugahare.

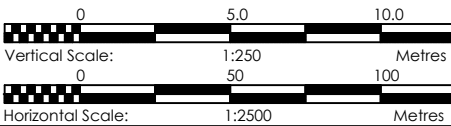


TRANSMISSION 1 (1+800.00 - 2+400.00)

NOTES

LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- EP End pipe
- N01 Node N01
- WO-1 Washout Type1



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GOVERNMENT OF UGANDA
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PROJECT
CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

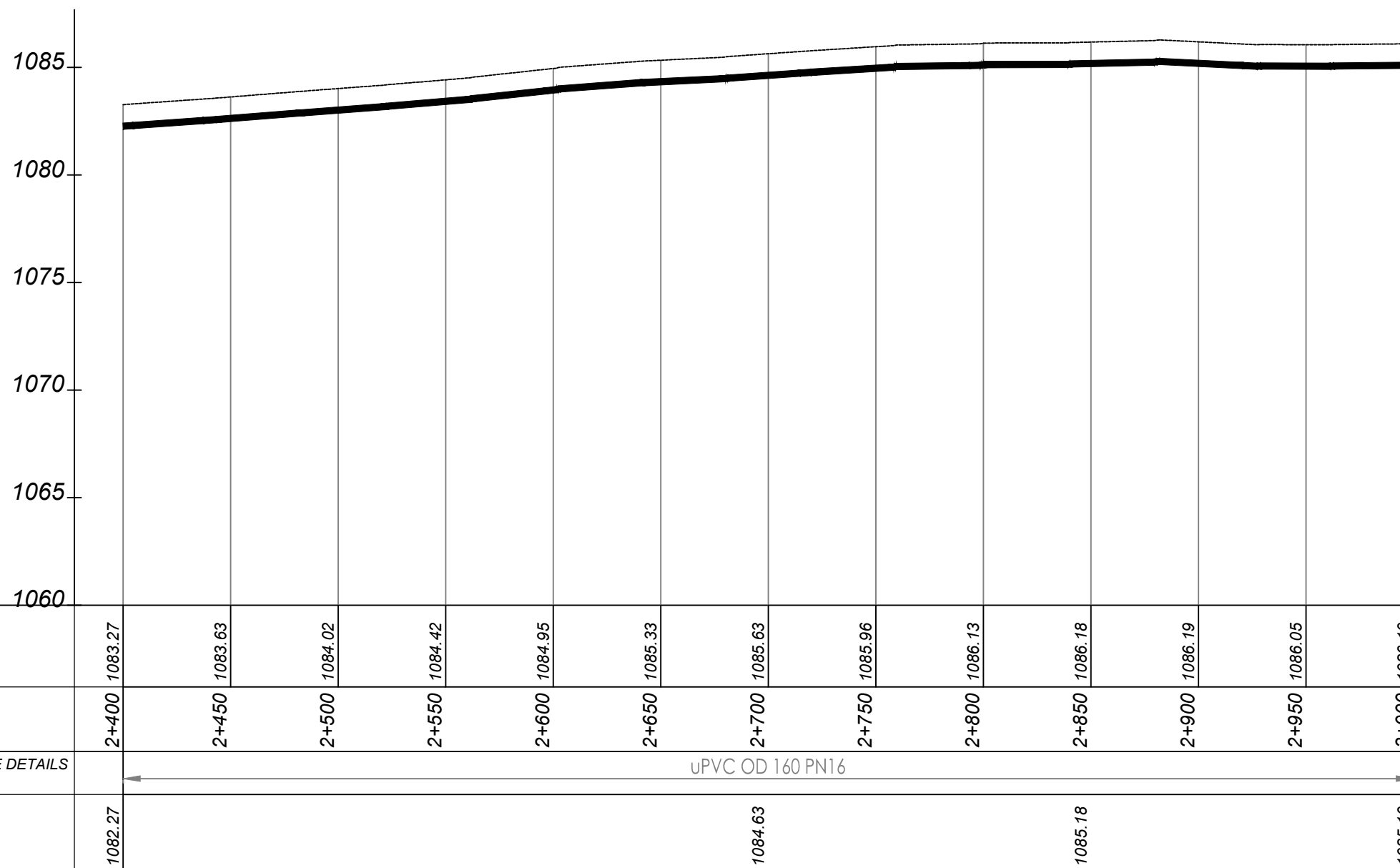
GASPA WATER SUPPLY SYSTEM

CONSULTANT
SARI In Joint Venture with **SGAPI**
Corporate Headquarter
10 Philip Lane, 1st Floor,
London EC3M 8AA,
United Kingdom

CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE **TRANSMISSION 02**
(1+800.00 - 2+400.00)

SCALE	Vert, 1:250 Hor, 1:2500	DRAWING No.	GPA/WS/2.2.4
SURVEYED	Evans Mpanga	DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	Oct 2021	APPROVED	Rodney Barugahare.



NOTES

LEGEND

Transmission Pipeline

Distribution Pipeline

Ground Level

Building/House

Contours

Road

DAV

End pipe

Node N01

WO-1

Washout Type 1

0
5.0
10.0

Vertical Scale:

1:250
Metres

Horizontal Scale:

1:2500
Metres

CLIENT

GOVERNMENT OF UGANDA

MINISTRY OF WATER AND ENVIRONMENT

CO-FINANCED BY:

THE WORLD BANK

AND

GOVERNMENT OF UGANDA

PROJECT

CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

GASPA WATER SUPPLY SYSTEM

CONSULTANT

In Joint Venture with

Corporate Headquarter
10 Philipot Lane, 1st Floor,
London EC3M 8AA,
United Kingdom

CONTRACTOR

DETAILED ENGINEERING DESIGN

DRAWING TITLE

TRANSMISSION 02
(2+400.00 - 3+000.00)

SCALE *Vert, 1:250*
Hori, 1:2500

SURVEYED Evans Mpinga

DRAWN Joshua Nyarwanda

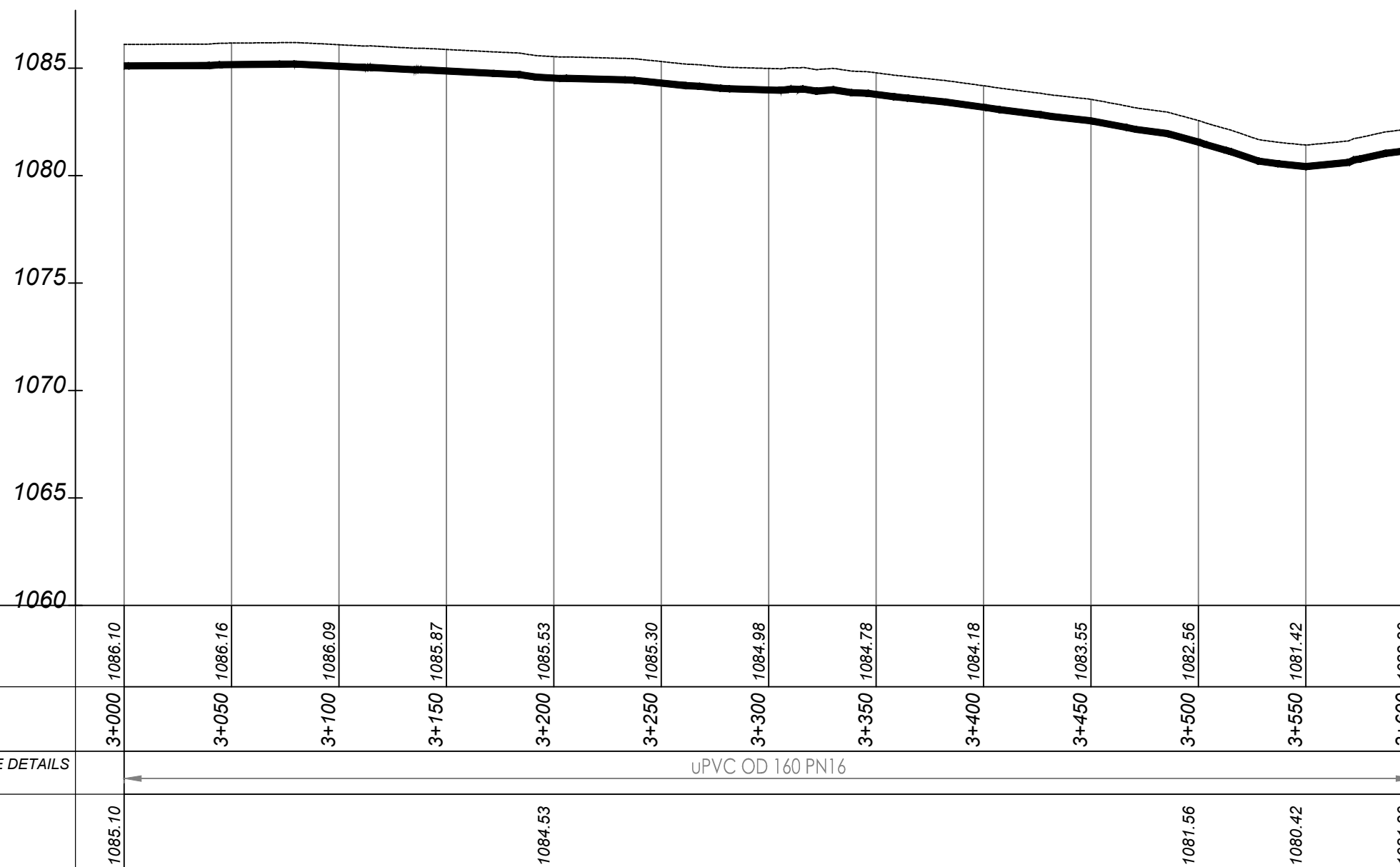
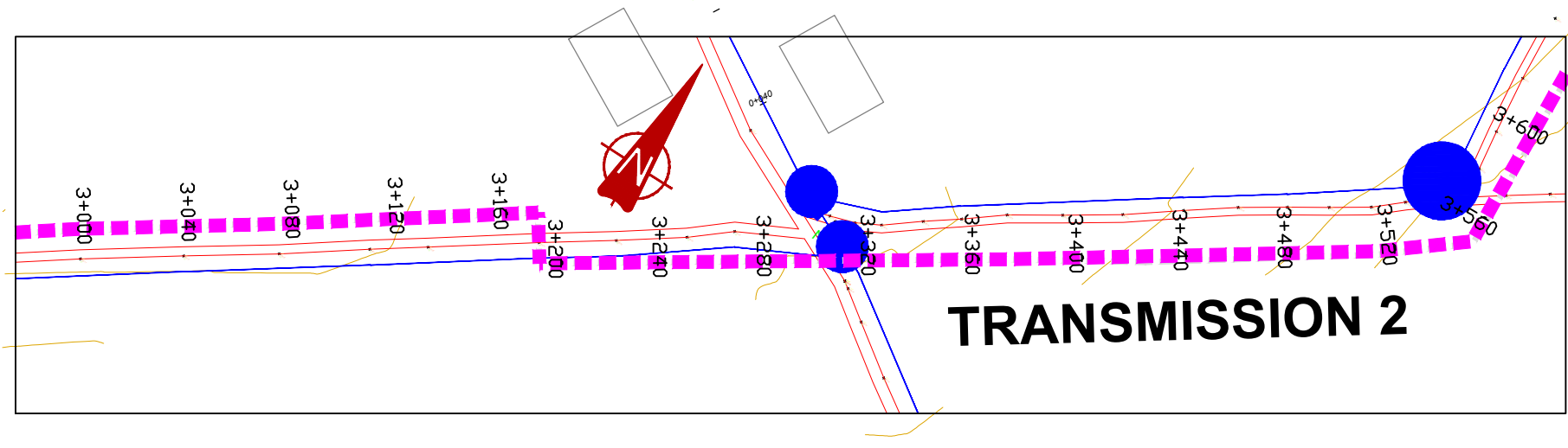
DATE Oct 2021

DRAWING No. GPA/WS/2.2.5

DESIGNED Otwane Dan.

CHECKED Rodney Barugahare

APPROVED Rodney Barugahare.

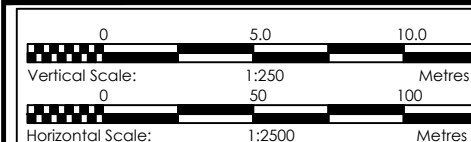


TRANSMISSION 1 (3+000.00 - 3+600.00)

NOTES

LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- EP End pipe
- N01 Node N01
- WO-1 Washout Type1



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GOVERNMENT OF UGANDA
MINISTRY OF WATER AND ENVIRONMENT

CO-FINANCED BY:
THE WORLD BANK AND GOVERNMENT OF UGANDA

PROJECT
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,
DETAILED ENGINEERING DESIGN AND CONSTRUCTION
SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY
SYSTEMS AND SANITATION FACILITIES IN REFUGEE
SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND
NORTHERN UGANDA IN KIRYANDONGO DISTRICT

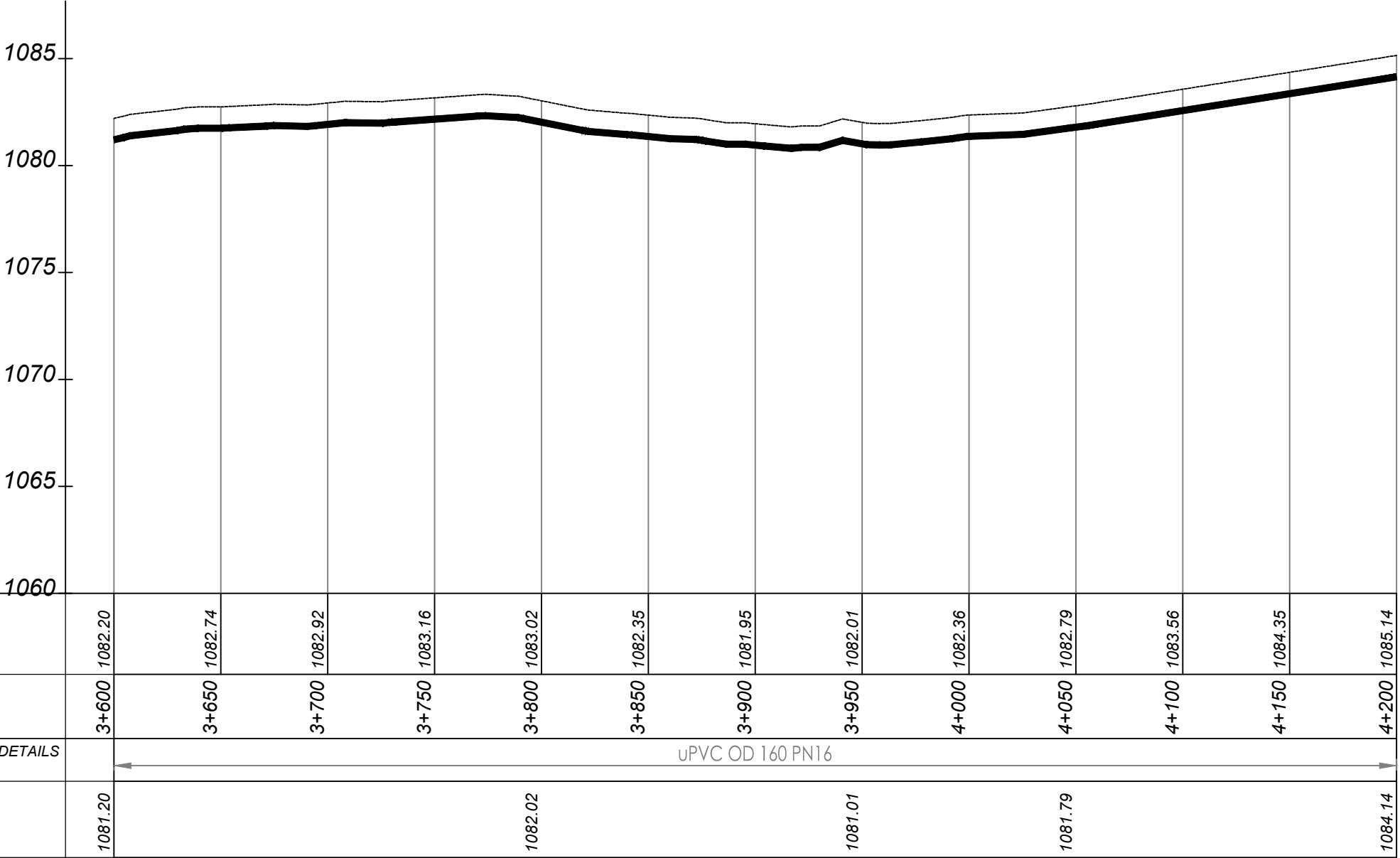
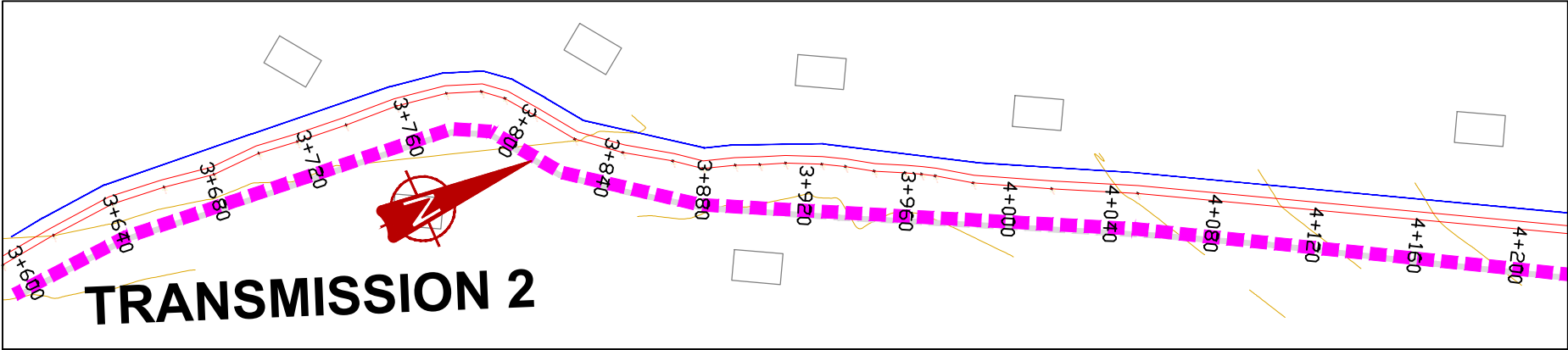
GASPA WATER SUPPLY SYSTEM

CONSULTANT
SARI
Corporate Headquarter
10 Philip Lane, 1st Floor,
London EC3M 8AA,
United Kingdom
In Joint Venture with
SGAPI

CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE
TRANSMISSION 02
(3+000.00 - 3+600.00)

SCALE
Vert. 1:250
Hor. 1:2500
DRAWING No. GPA/WS/2.2.6
SURVEYED
Evans Mpanga
DESIGNED
Otwane Dan.
DRAWN
Joshua Nyarwanda
CHECKED
Rodney Barugahare
DATE
Oct 2021
APPROVED
Rodney Barugahare.



TRANSMISSION 1 (3+600.00 - 4+200.00)

NOTES
LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- EP End pipe
- N01 Node N01
- WO-1 Washout Type1

Vertical Scale: 1:250 Metres

Horizontal Scale: 1:2500 Metres

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GOVERNMENT OF UGANDA
MINISTRY OF WATER AND ENVIRONMENT

CO-FINANCED BY:
 AND

THE WORLD BANK GOVERNMENT OF UGANDA

PROJECT
CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

GASPA WATER SUPPLY SYSTEM

CONSULTANT

In Joint Venture with

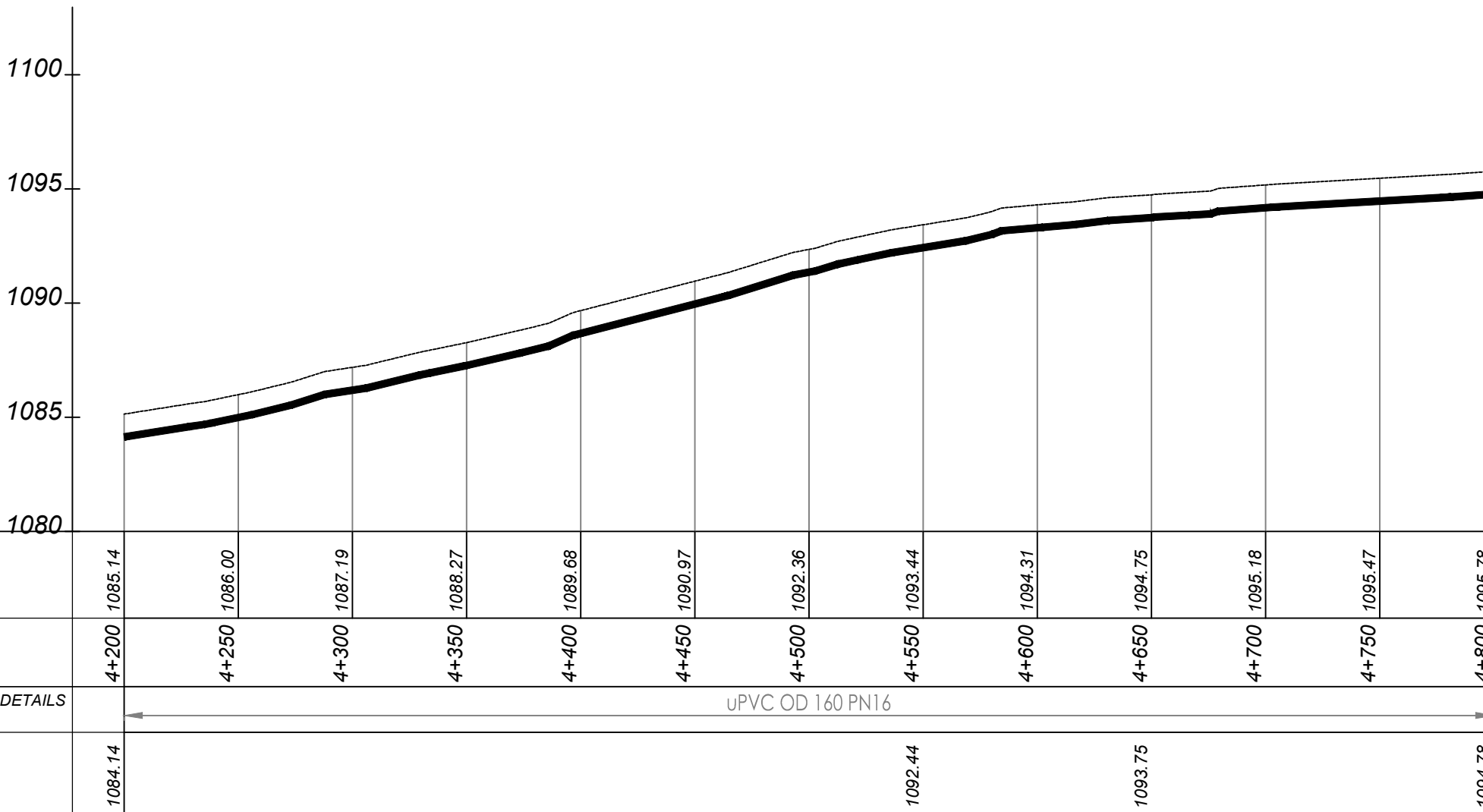
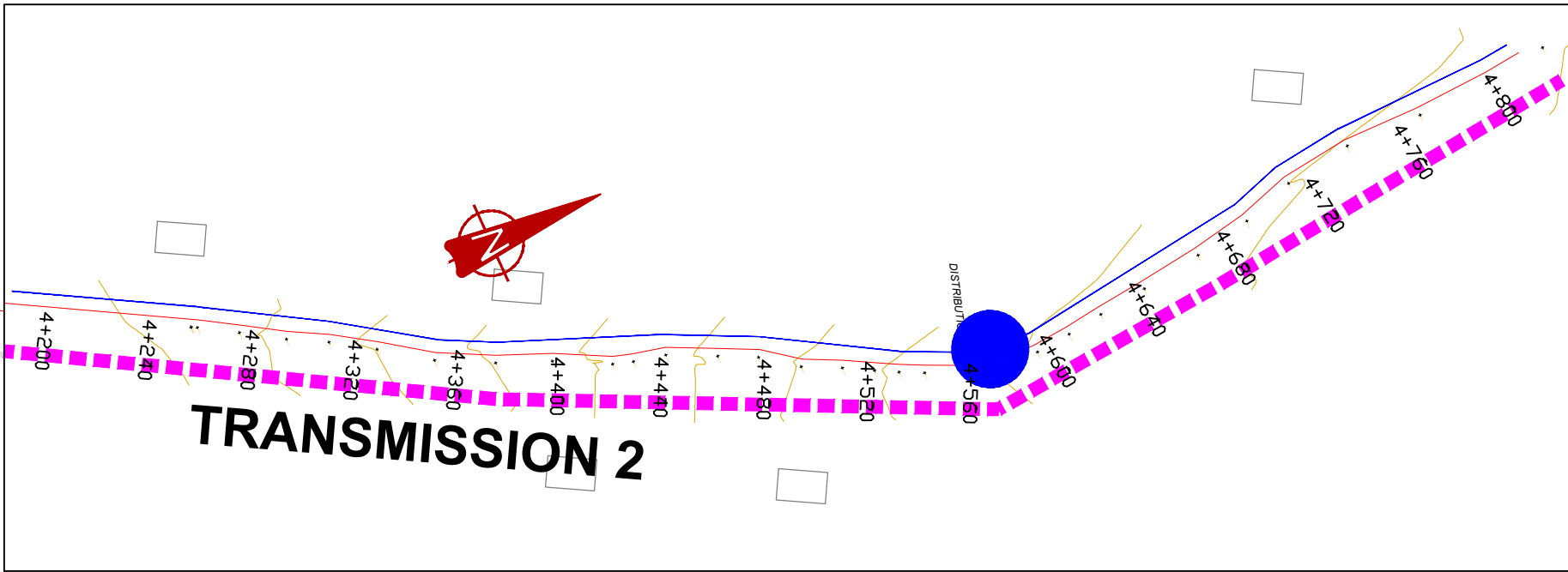
Corporate Headquarter
10 Philip Lane, 1st Floor,
London EC3M 8AA,
United Kingdom

CONTRACTOR

DETAILED ENGINEERING DESIGN

DRAWING TITLE
TRANSMISSION 02
(3+600.00 - 4+200.00)

SCALE	Vert, 1:250 Hori, 1:2500	DRAWING No.	GPA/WS/2.2.7
SURVEYED	Evans Mpanga	DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	Oct 2021	APPROVED	Rodney Barugahare.

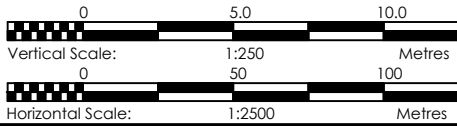


TRANSMISSION 1 (4+200.00 - 4+800.00)

NOTES

LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- EP End pipe
- N01 Node N01
- WO-1 Washout Type1



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GOVERNMENT OF UGANDA
MINISTRY OF WATER AND ENVIRONMENT

CO-FINANCED BY:
THE WORLD BANK AND GOVERNMENT OF UGANDA

PROJECT
CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

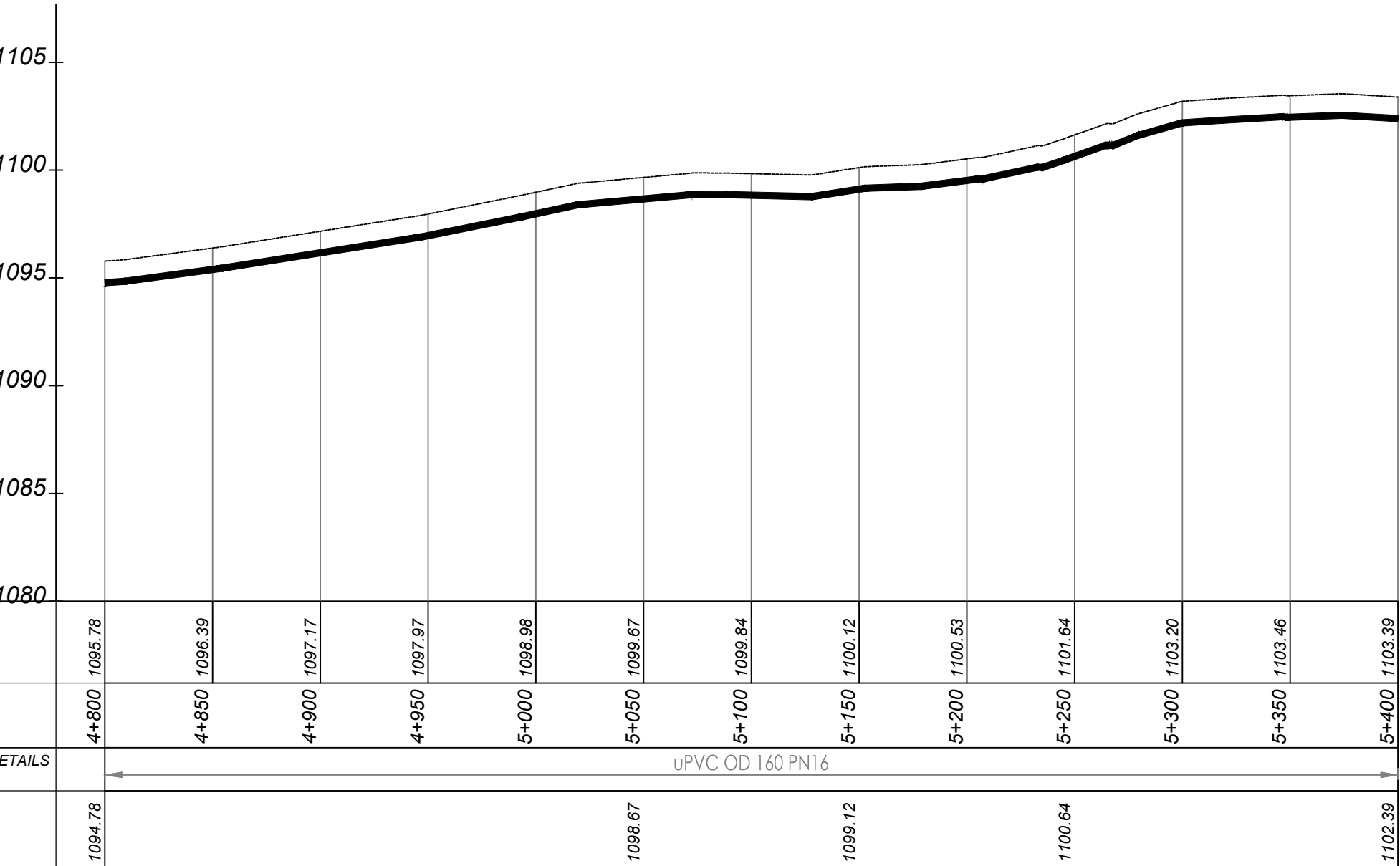
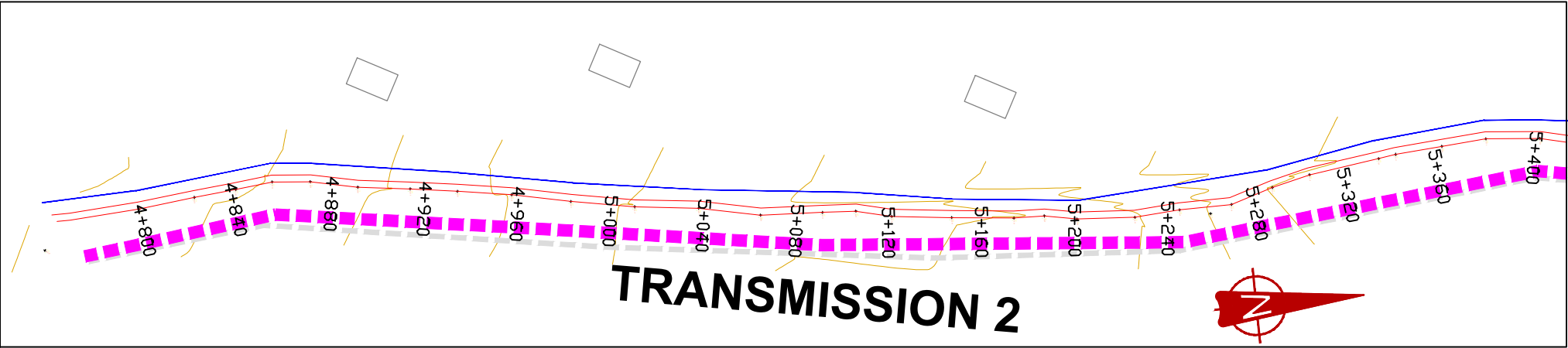
GASPA WATER SUPPLY SYSTEM

CONSULTANT
SARI In Joint Venture with **SGAPI**
Corporate Headquarter
10 Philip Lane, 1st Floor,
London EC3M 8AA,
United Kingdom

CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE **TRANSMISSION 02**
(4+200.00 - 4+800.00)

SCALE	Vert, 1:250 Hori, 1:2500	DRAWING No.	GPA/WS/2.2.8
SURVEYED	Evans Mpanga	DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	Oct 2021	APPROVED	Rodney Barugahare.



TRANSMISSION 1 (4+800.00 - 5+400.00)

NOTES

LEGEND

Transmission Pipeline

Distribution Pipeline

Ground Level

Building/House

Contours

Road

DAV

End pipe

Node N01

Washout Type1

Double Orifice Air Valve

End pipe

Node N01

Washout Type1

05.010.0

Vertical Scale: 1:250


050100

Horizontal Scale: 1:2500

Vertical Scale: 1:250


Horizontal Scale: 1:2500

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GOVERNMENT OF UGANDA
MINISTRY OF WATER AND ENVIRONMENT

CO-FINANCED BY:



AND




PROJECT


CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

GASPA WATER SUPPLY SYSTEM

CONSULTANT



In Joint Venture with



CONTRACTOR

DETAILED ENGINEERING DESIGN

DRAWING TITLE

TRANSMISSION 02
(4+800.00 - 5+400.00)

SCALE

Vert, 1:250
Hor, 1:2500

DRAWING No.

GPA/WS/2.2.9

SURVEYED

Evans Mpanga

DESIGNED

Otwane Dan.

DRAWN

Joshua Nyarwanda

CHECKED

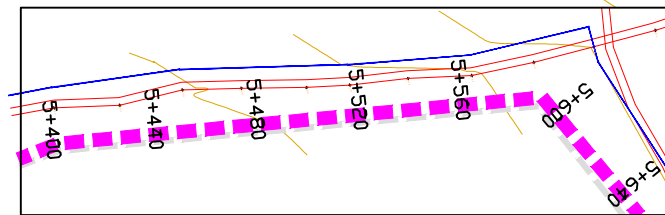
Rodney Barugahare

DATE

Oct 2021

APPROVED

Rodney Barugahare.



NOTES

LEGEND

Transmission Pipeline

Distribution Pipeline

Ground Level

Building/House

Contours

Road

DAV Double Orifice Air Valve

EP End pipe

N01 Node N01

WO-1 Washout Type1

0
5.0
10.0

Vertical Scale:
1:250
Metres

0
50
100

Horizontal Scale:
1:2500
Metres

CLIENT

GOVERNMENT OF UGANDA

MINISTRY OF WATER AND ENVIRONMENT

CO-FINANCED BY:

THE WORLD BANK

AND

GOVERNMENT OF UGANDA

PROJECT

CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

GASPA WATER SUPPLY SYSTEM

CONSULTANT

Corporate Headquarter
10 Philipot Lane, 1st Floor,
London EC3M 8AA,
United Kingdom

In Joint Venture with

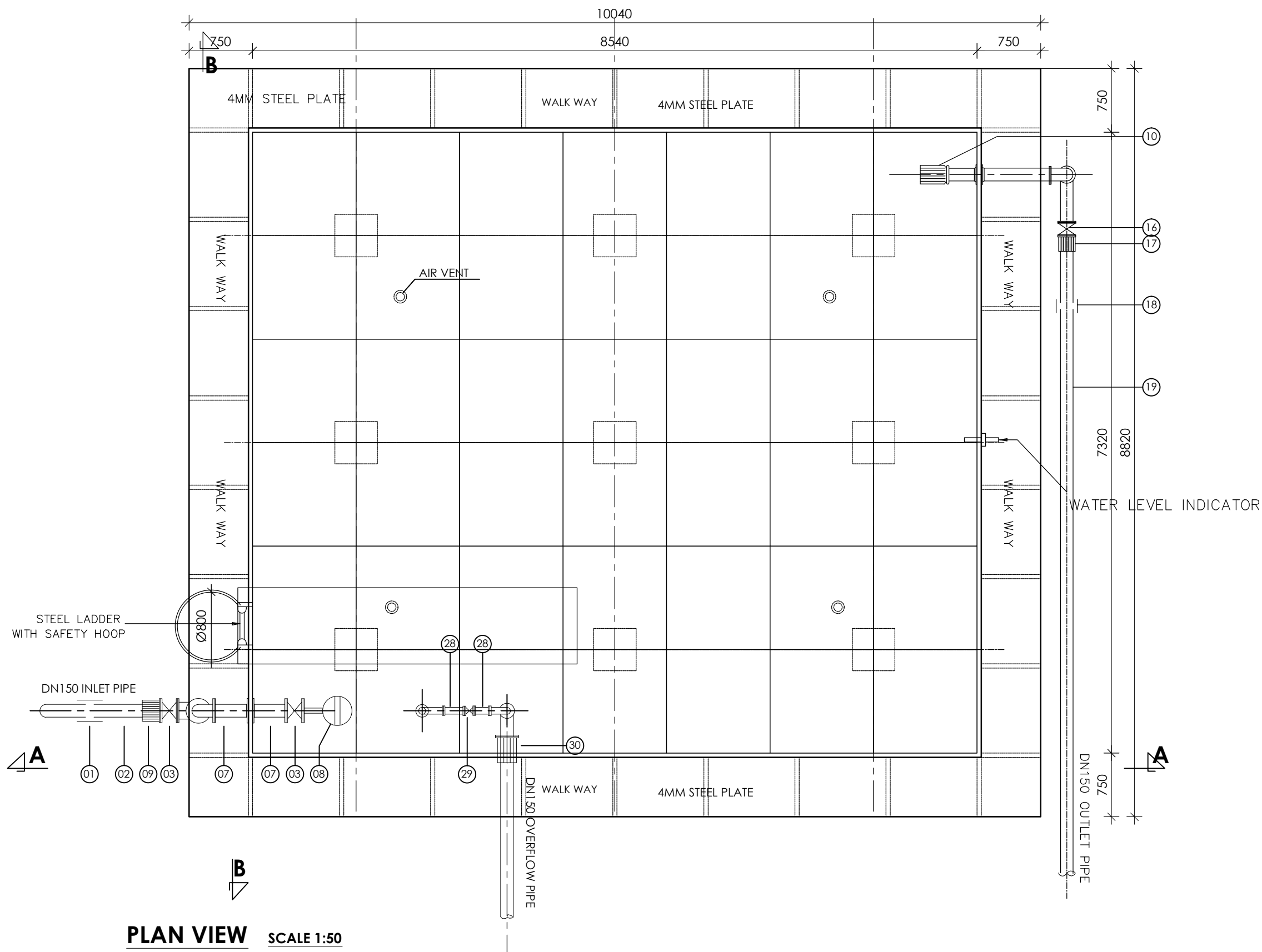
CONTRACTOR

DETAILED ENGINEERING DESIGN

DRAWING TITLE

TRANSMISSION 02
(5+400.00 - 6+202.06)

SCALE	Vert, 1:250 Hori, 1:2500	DRAWING No.	GPA/WS/2.2.10
SURVEYED	Evans Mpinga	DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	Oct 2021	APPROVED	Rodney Barugahare.



PIPE FITTING SCHEDULE

- 1No.DN150 Vicking Johnson or Similar Coupling.
- 1No.DN150 Pipe not exceeding 2.0m.
- 1No.DN150 All Flanged Gate Valve.
- 1No.DN150 All Flanged Duck foot 90° bend.
- 3No.DN150 Double Flanged Pipe not exceeding 6.0m.
- 1No.DN150 All Flanged 90° bend.
- 2No.DN150 Double Flanged Pipe not exceeding 0.6m.
- 1No.DN150 Flanged Ball Float Valve.
- 1No.DN150 Flanged Adaptor, Maxi type or similar.
- 1No.DN150 Flanged Outlet Pipe Strainer.
- 2No.DN150 Double Flanged Pipe not exceeding 0.6m.
- 1No.DN150 All Flanged 90° bend.
- 2No.DN150 Double Flanged Pipe not exceeding 6.0m.
- 1No.DN150 Double Flanged Pipe not exceeding 2.0m.
- 1No.DN150 All Flanged Duck foot 90° bend.
- 1No.DN150 Flanged Gate Valve.
- 1No.DN150 Flanged Adaptor, Maxi type or similar.
- 1No.DN150 Double Flanged Pipe not exceeding 2.0m.
- 1No.DN150 Vicking Johnson or Similar Coupling.
- 1No.DN150 Flanged Bell Mouth.
- 1No.DN150 Double Flanged Pipe not exceeding 3.0m.
- 1No.DN150 Double Flanged Pipe not exceeding 2.0m.
- 1No.DN150/100 All Flanged Tee.
- 2No.DN150 Double Flanged Pipe not exceeding 6.0m.
- 1No.DN150 All Flanged Duck foot 90° bend.
- 1No.DN100 All Flanged Pipe with puddle flange n.e 6.0m.
- 1No.DN100 All Flanged 90° bend.
- 1No.DN100 Double Flanged Pipe not exceeding 0.4m.
- 1No.DN100 Flanged Gate Valve.
- 1No.DN100 Flanged Adaptor, Maxi type or similar.

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PROJECT

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DETAILED ENGINEERING DESIGN AND CONSTRUCTION
SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY
SYSTEMS AND SANITATION FACILITIES IN REFUGEE
SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND
NORTHERN UGANDA IN KIRYANDONGO DISTRICT

GASPA WATER SUPPLY SYSTEM

CONSULTANT



In Joint Venture with



Corporate Headquarter
10 Philpot Lane, 1st Floor,
London EC3M 8AA,
United Kingdom

CONTRACTOR

DETAILED ENGINEERING DESIGN

DRAWING TITLE

GASPA RESERVOIR
200M³ RESERVOIR TANK
PLAN LAYOUT

SCALE

As Shown

DRAWING No.

GPA/WS/3.1.1

SURVEYED

DESIGNED

Otwane Dan.

DRAWN

Joshua Nyarwanda

CHECKED

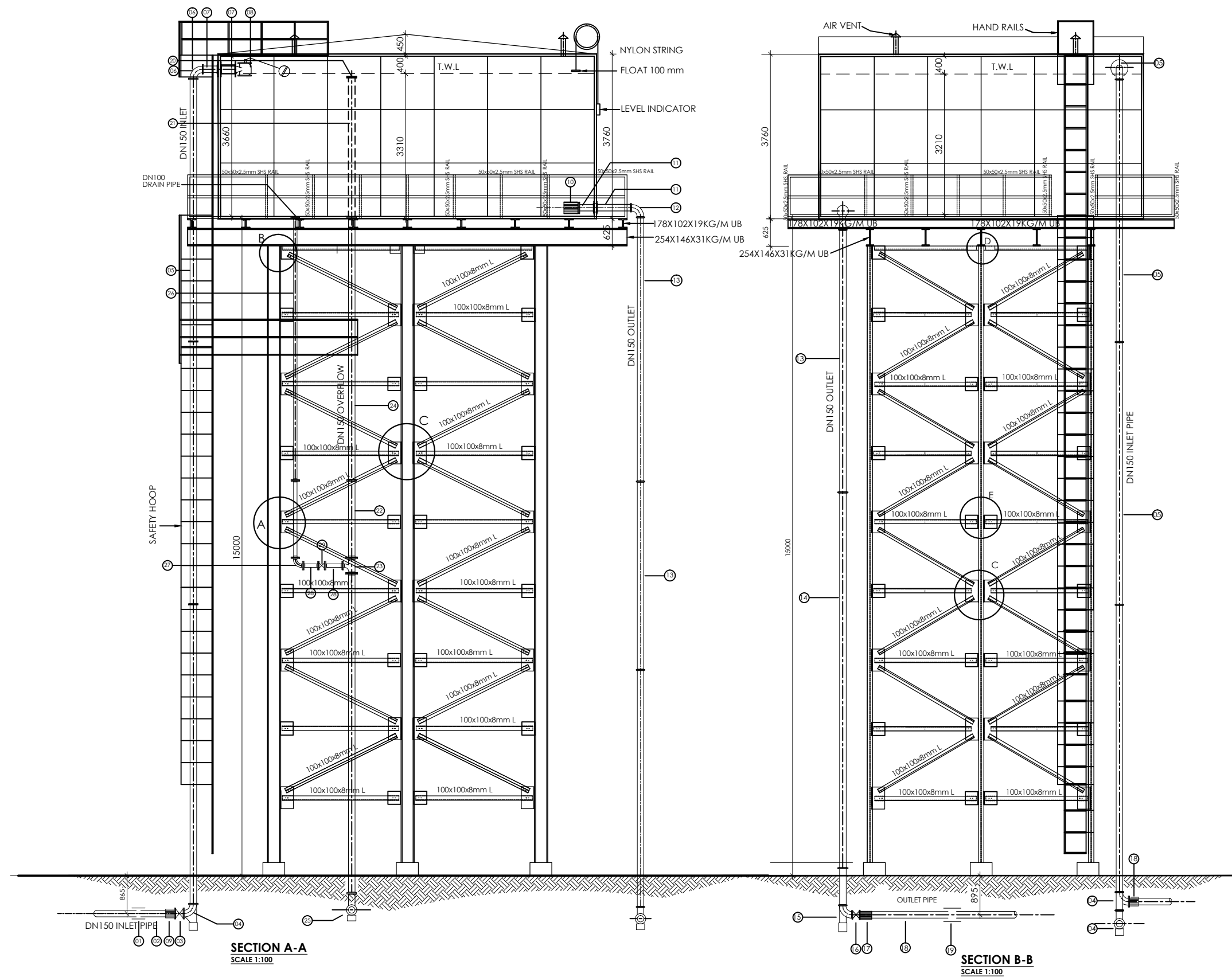
Rodney Barugahare

DATE

OCT 2021

APPROVED

Rodney Barugahare.



PIPE FITTING SCHEDULE

- 1No.DN150 Vicking Johnson or Similar Coupling.
- 1No.DN150 Pipe not exceeding 2.0m.
- 1No.DN150 All Flanged Gate Valve.
- 1No.DN150 All Flanged Duck foot 90° bend.
- 3No.DN150 Double Flanged Pipe not exceeding 6.0m.
- 1No.DN150 All Flanged 90° bend.
- 2No.DN150 Double Flanged Pipe not exceeding 0.6m.
- 1No.DN150 Flanged Ball Float Valve.
- 1No.DN150 Flanged Adaptor, Maxi type or similar.
- 1No.DN150 Flanged Outlet Pipe Strainer.
- 2No.DN150 Double Flanged Pipe not exceeding 0.6m.
- 1No.DN150 All Flanged 90° bend.
- 2No.DN150 Double Flanged Pipe not exceeding 6.0m.
- 1No.DN150 Double Flanged Pipe not exceeding 2.0m.
- 1No.DN150 All Flanged Duck foot 90° bend.
- 1No.DN150 Flanged Gate Valve.
- 1No.DN150 Flanged Adaptor, Maxi type or similar.
- 1No.DN150 Double Flanged Pipe not exceeding 2.0m.
- 1No.DN150 Vicking Johnson or Similar Coupling.
- 1No.DN150 Flanged Bell Mouth.
- 1No.DN150 Double Flanged Pipe not exceeding 3.0m.
- 1No.DN150 Double Flanged Pipe not exceeding 2.0m.
- 1No.DN150/100 All Flanged Tee.
- 2No.DN150 Double Flanged Pipe not exceeding 6.0m.
- 1No.DN150 All Flanged Duck foot 90° bend.
- 1No.DN100 All Flanged Pipe with puddle flange n.e 6.0m.
- 1No.DN100 All Flanged 90° bend.
- 1No.DN100 Double Flanged Pipe not exceeding 0.4m.
- 1No.DN100 Flanged Gate Valve.
- 1No.DN100 Flanged Adaptor, Maxi type or similar.

CLIENT



GOVERNMENT OF UGANDA
MINISTRY OF WATER AND
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PROJECT

CONSULTANCY SERVICES FOR FEASIBILITY STUDY,
DETAILED ENGINEERING DESIGN AND CONSTRUCTION
SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY
SYSTEMS AND SANITATION FACILITIES IN REFUGEE
SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND
NORTHERN UGANDA IN KIRYANDONGO DISTRICT

GASPA WATER SUPPLY SYSTEM

CONSULTANT

SARI
CONSULTING LTD
Corporate Headquarter
10 Philpot Lane, 1st Floor,
London EC3M 8AA,
United Kingdom

In Joint Venture with



CONTRACTOR

DETAILED ENGINEERING DESIGN

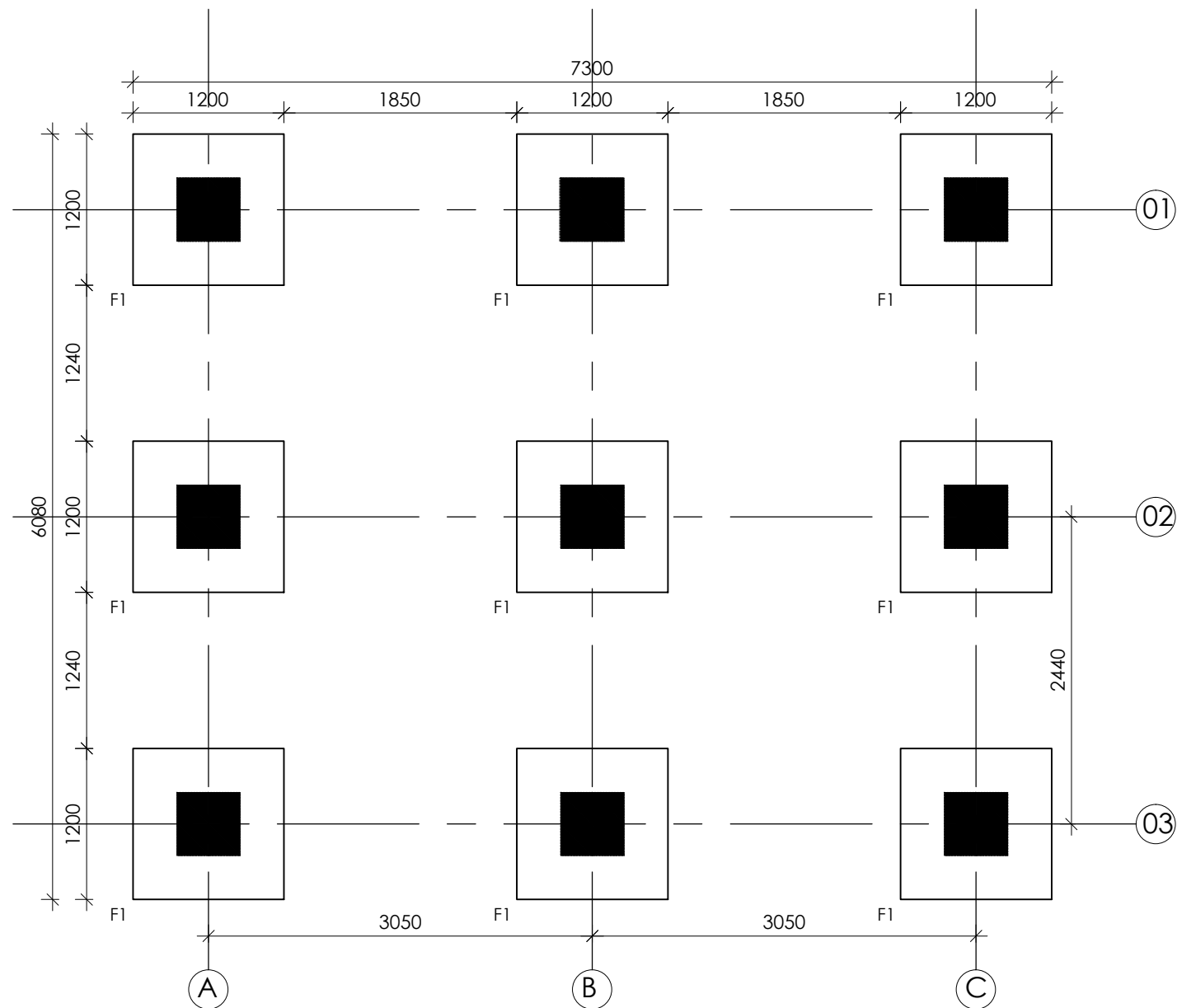
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**GASPA RESERVOIR
200M³ RESERVOIR TANK**
SECTION 'A-A' AND SECTION 'B-B'

SCALE As Shown DRAWING No. GPA/WS/3.1.2

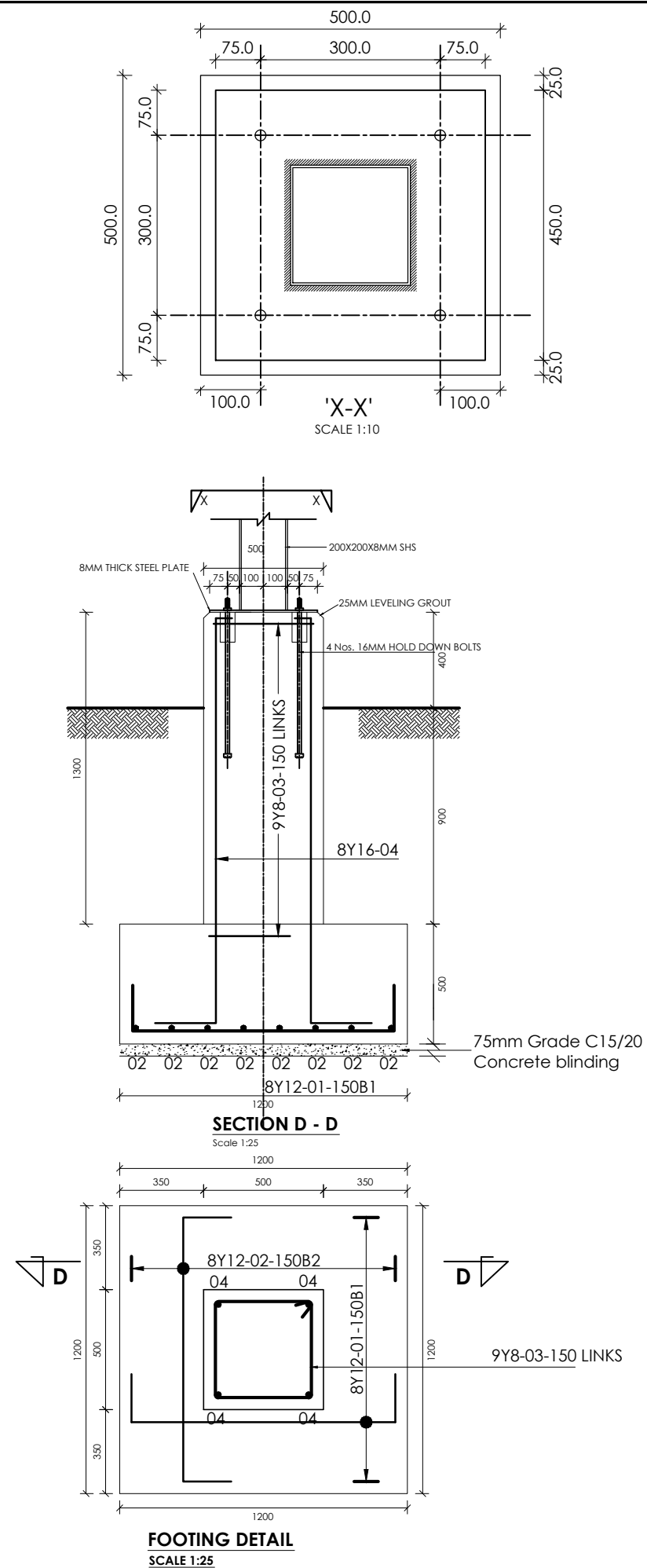
SURVEYED DESIGNED Otwane Dan.






DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare

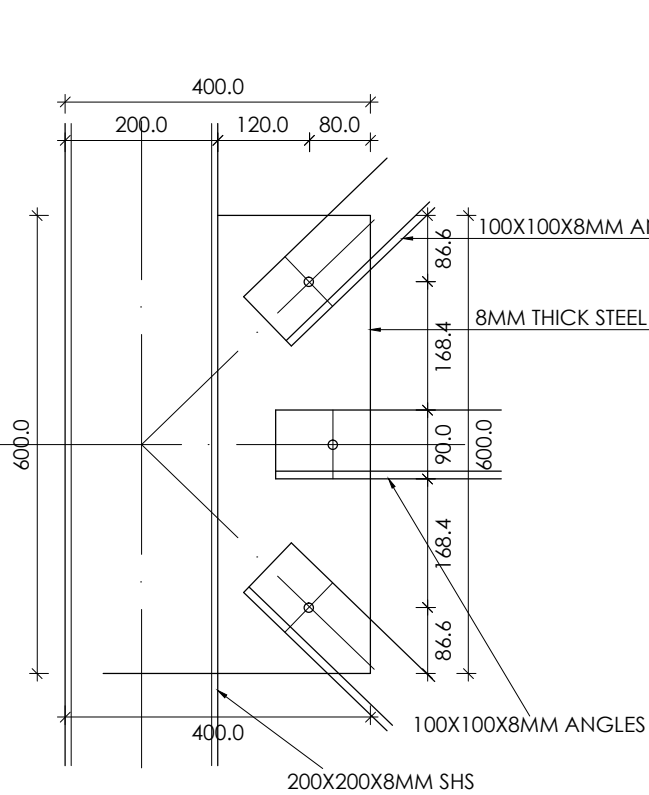
DATE OCT 2021 APPROVED Rodney Barugahare.



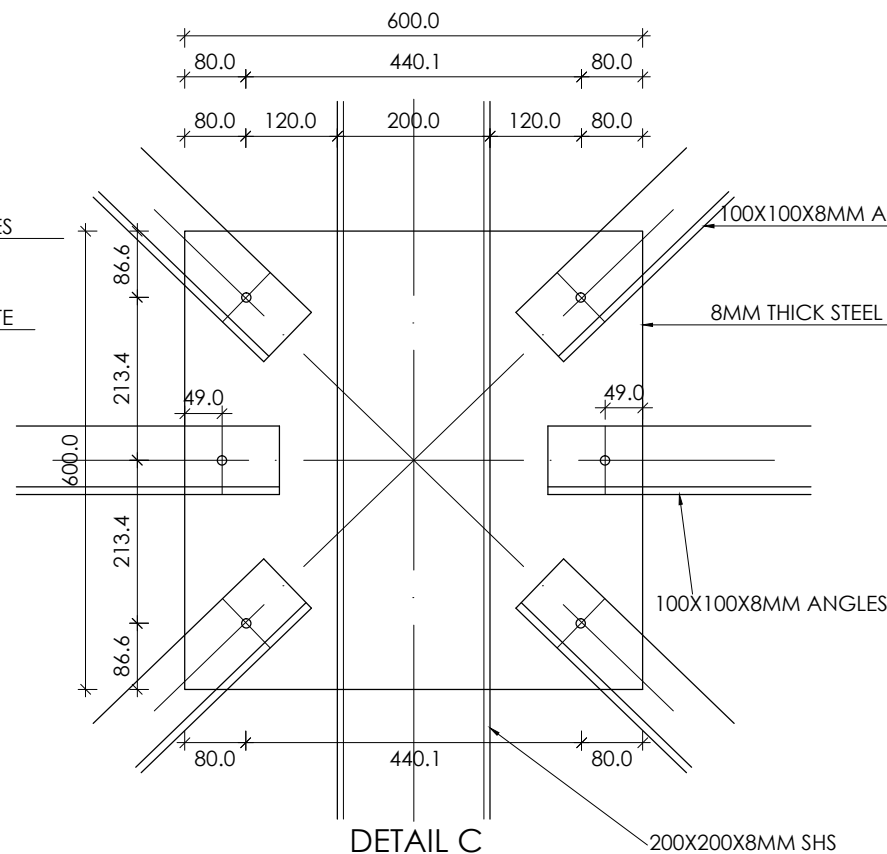
LAYOUT OF FOUNDATIONS
SCALE 1:50



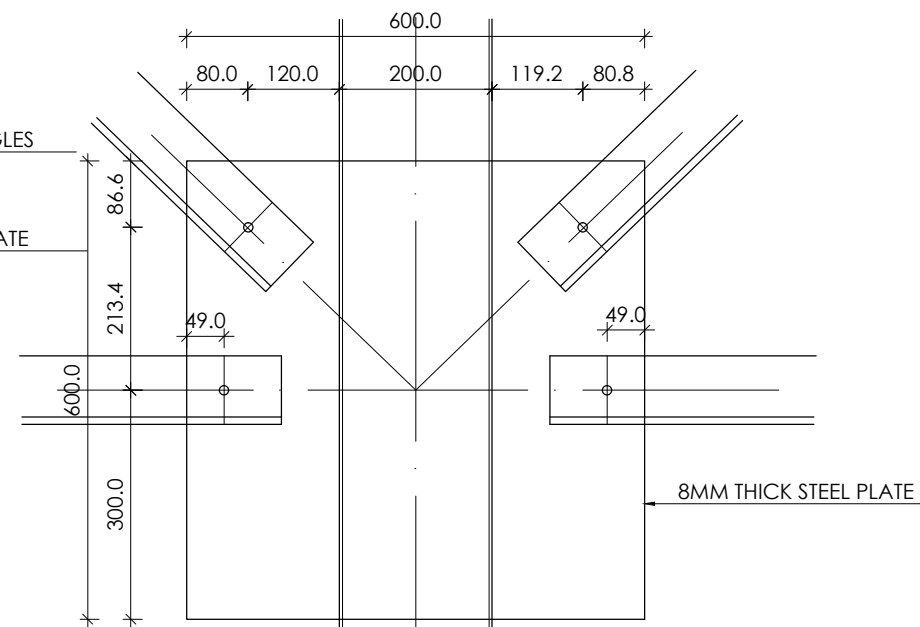
CLIENT		 GOVERNMENT OF UGANDA MINISTRY OF WATER AND ENVIRONMENT	
CO-FINANCED BY:		 THE WORLD BANK	AND  GOVERNMENT OF UGANDA
PROJECT		CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT	
GASPA WATER SUPPLY SYSTEM			
CONSULTANT		 SARI Corporate Headquarter 10 Philpote Lane, 1st Floor, London EC3M 8AA, United Kingdom	
		In Joint Venture with	 SGAPI
CONTRACTOR			
DETAILED ENGINEERING DESIGN			
DRAWING TITLE		GASPA RESERVOIR 200M³ RESERVOIR TANK FOUNDATION LAYOUT AND DETAILS	
SCALE	As Shown	DRAWING No.	GPA/WS/3.1.3
SURVEYED		DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



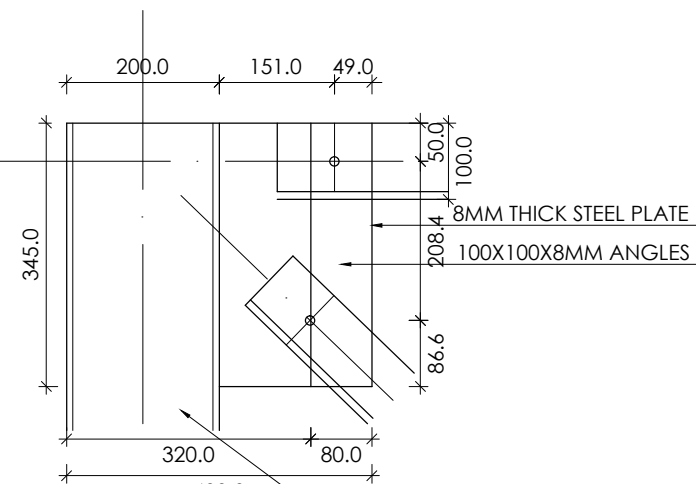
DETAIL A
SCALE 1:10



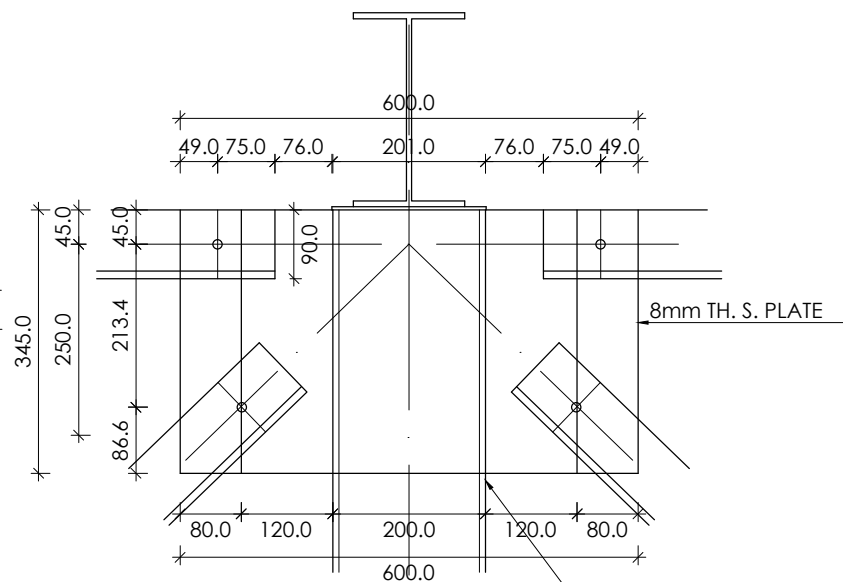
DETAIL C
SCALE 1:10



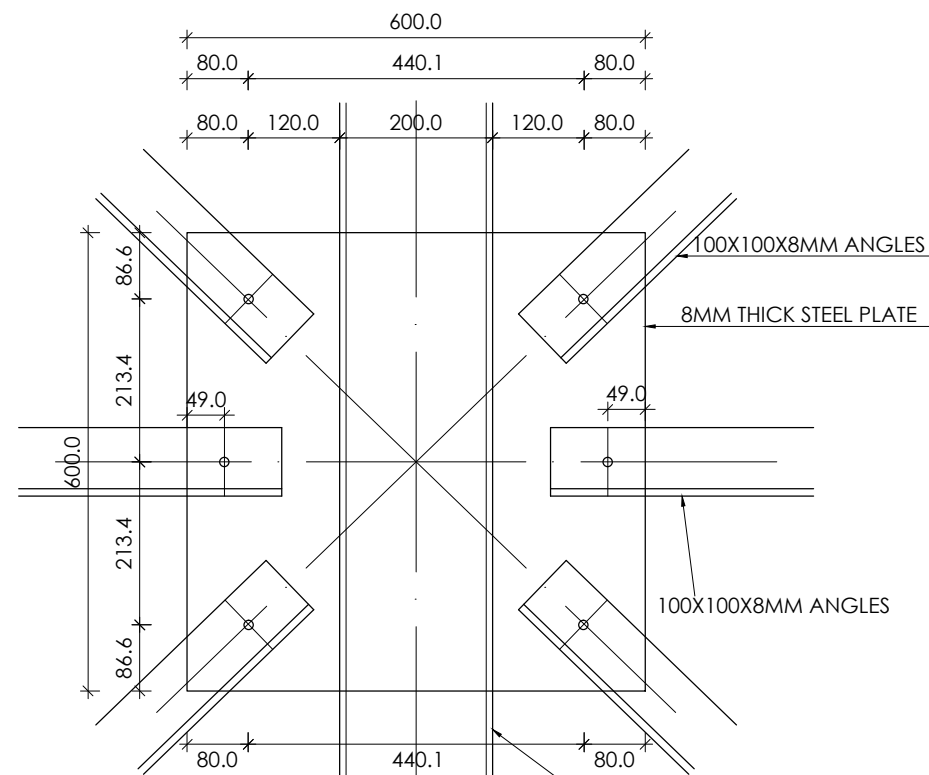
DETAIL E
SCALE 1:10



DETAIL B
SCALE 1:10



DETAIL D
SCALE 1:10



DETAIL F
SCALE 1:10

CLIENT

 **GOVERNMENT OF UGANDA**
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PROJECT

CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

GASPA WATER SUPPLY SYSTEM

CONSULTANT

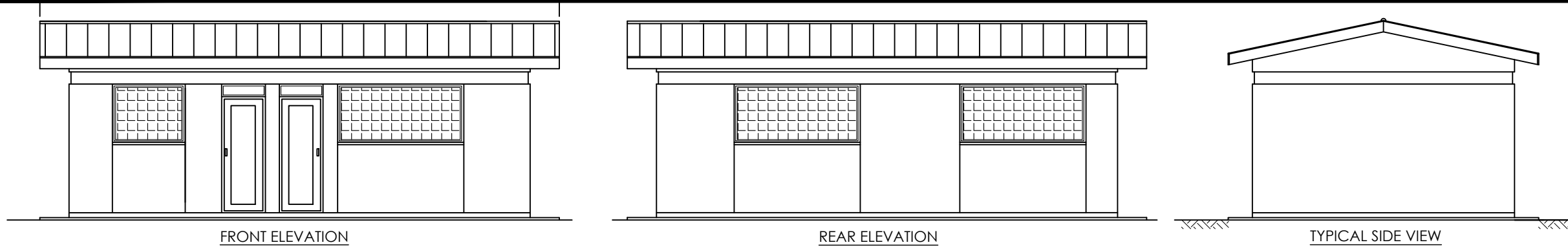
 **SARI** In Joint Venture with 
Corporate Headquarter
10 Philpot Lane, 1st Floor,
London EC3M 8AA,
United Kingdom

CONTRACTOR

DETAILED ENGINEERING DESIGN

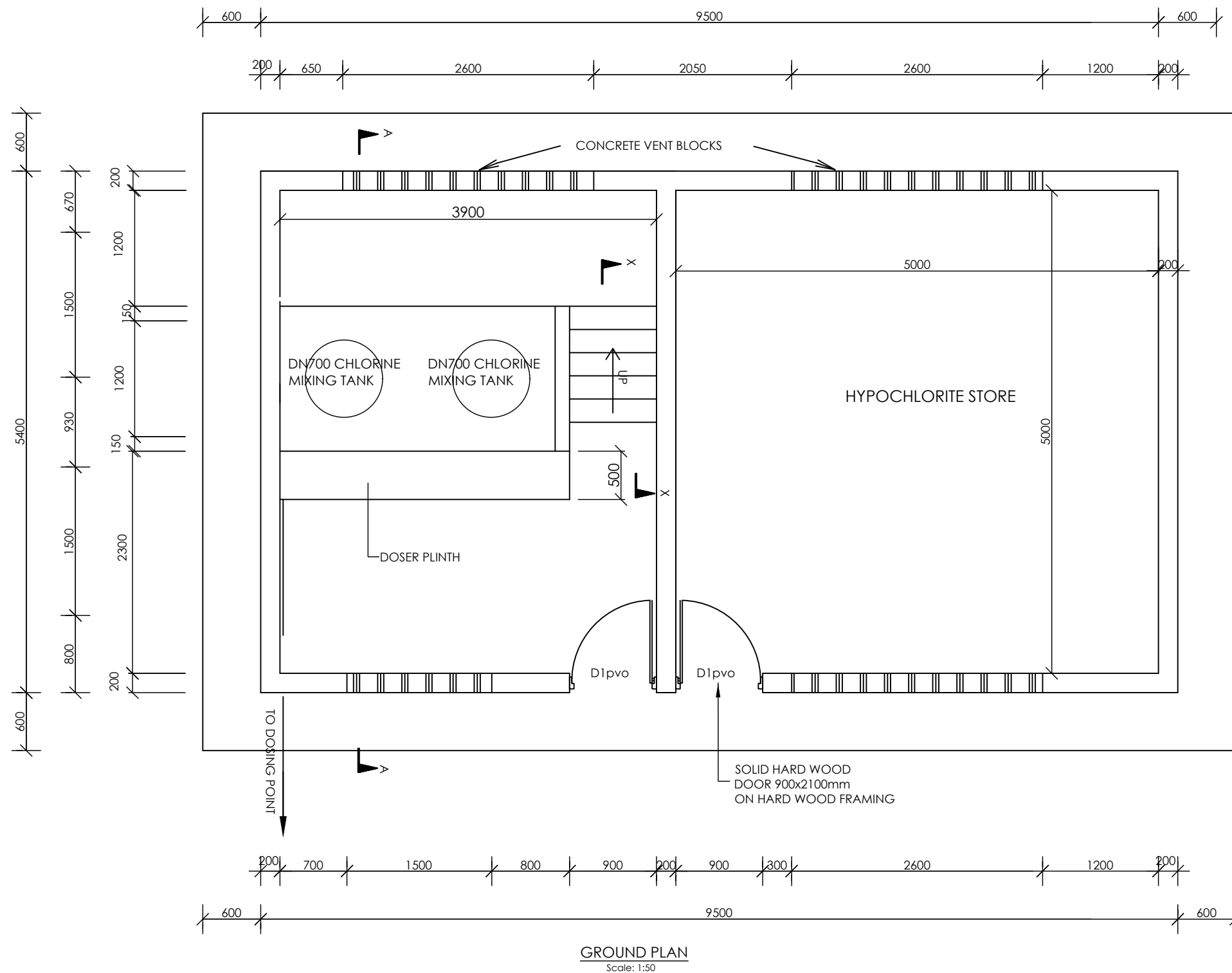
DRAWING TITLE **GASPA RESERVOIR
200M³ RESERVOIR TANK
STRUCTURAL DETAILS**

SCALE	As Shown	DRAWING No.	GPA/WS/3.1.4
SURVEYED		DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



NOTES

1. Unless otherwise stated, all dimensions are in mm
2. Concrete grade to be C30/20.





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SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY
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SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND
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GASPA WATER SUPPLY SYSTEM

CONSULTANT
 **SARI**
Corporate Headquarter
10 Philpot Lane, 1st Floor,
London EC3M 8AA,
United Kingdom
In Joint Venture with  **SGAPI**

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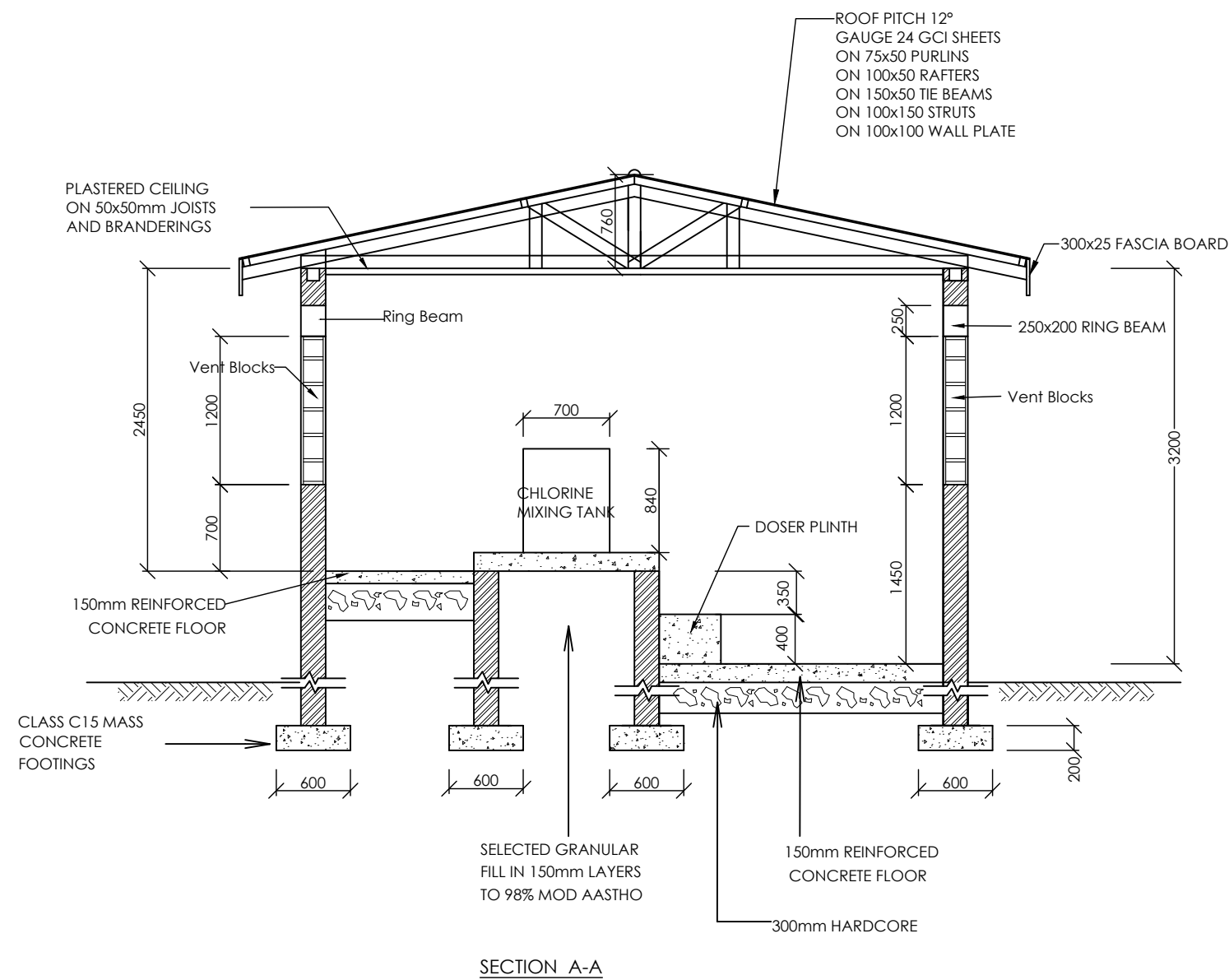
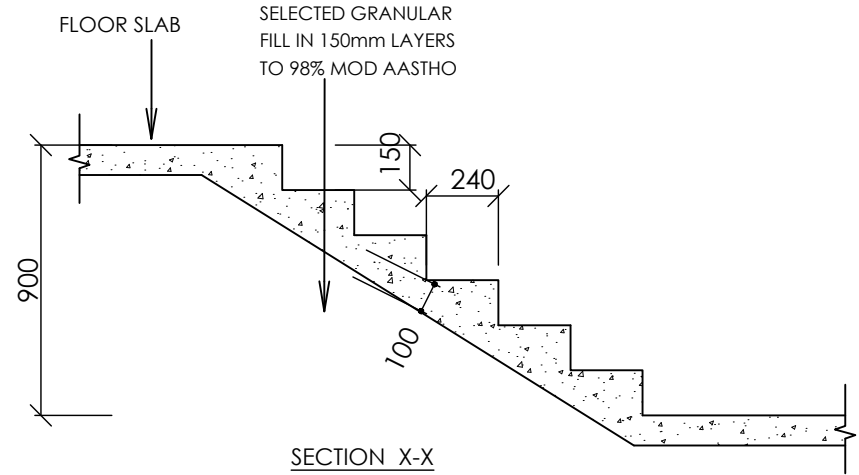
DETAILED ENGINEERING DESIGN

DRAWING TITLE
CHEMICAL DOSING HOUSE
PLAN AND ELEVATIONS

SCALE	AS SHOWN	DRAWING No.	GPA/WS/4.1.1
SURVEYED		DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.

DOOR SCHEDULE				
MARK	WIDTH	HEIGHT	No.	DESCRIPTION
D1	900	2100	02	SINGLE LEAF HARDWOOD TIMBER DOORS

DOOR SCHEDULE



- NOTES**
1. Unless otherwise stated, all dimensions are in mm
 2. Concrete grade to be C30/20.
 3. All levels in metres above mean sea level.

CUENT



GOVERNMENT OF UGANDA

MINISTRY OF WATER AND ENVIRONMENT

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PROJECT

CONSULTANCY SERVICES FOR FEASIBILITY STUDY,
DETAILED ENGINEERING DESIGN AND CONSTRUCTION
SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY
SYSTEMS AND SANITATION FACILITIES IN REFUGEE
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GASPA WATER SUPPLY SYSTEM


CONSULTANT



SARI

Corporate Headquarter
10 Philipot Lane, 1st Floor,
London EC3M 8AA,
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SGAPI

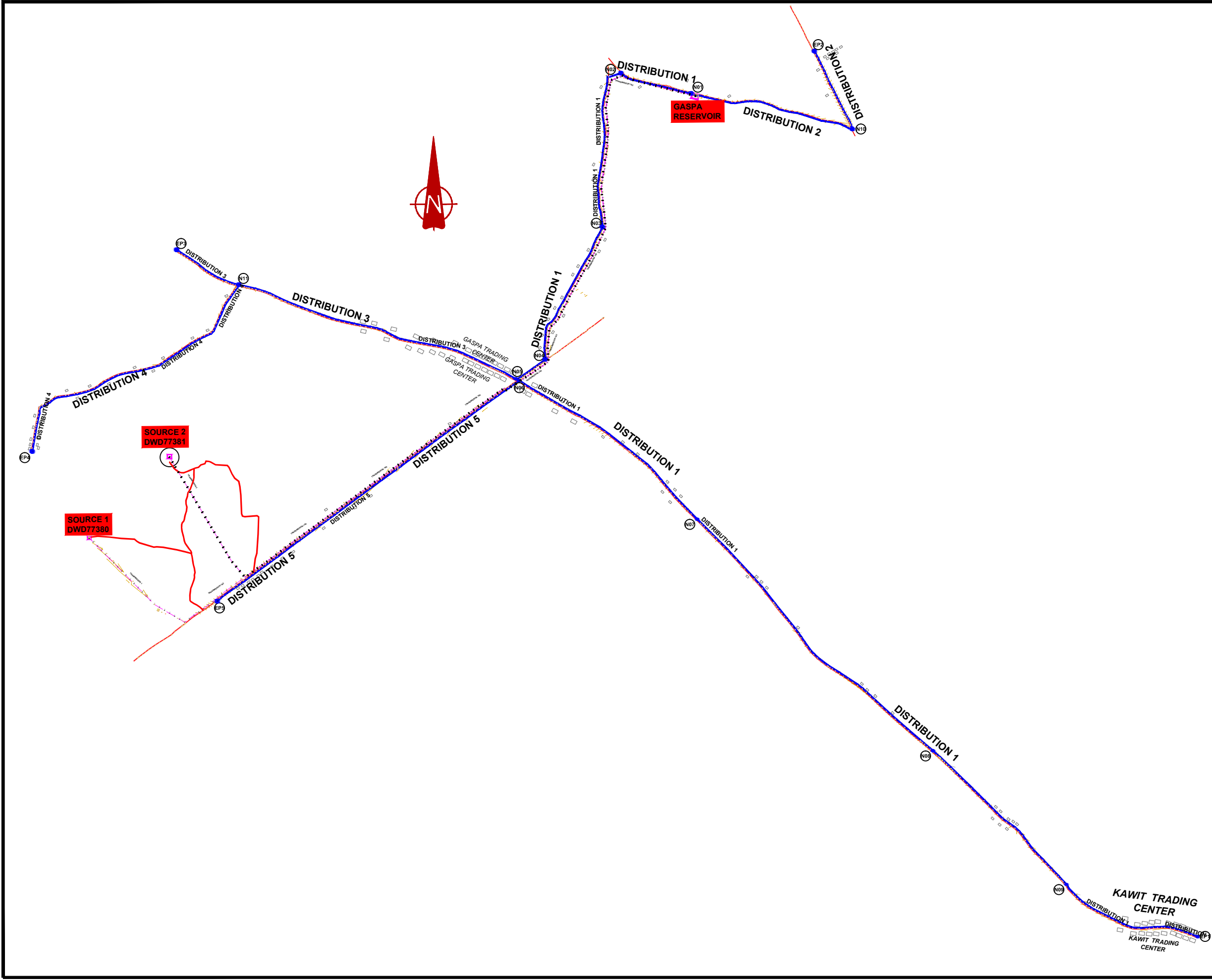
CONTRACTOR

DETAILED ENGINEERING DESIGN

DRAWING TITLE

CHEMICAL DOSING HOUSE
SECTIONS

SCALE	AS SHOWN	DRAWING No.	GPA/WS/4.1.2
SURVEYED		DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



NOTES

LEGEND

Transmission Pipeline

Distribution Pipeline

Ground Level

Building/House

Contours

Road

DAV

End pipe

Node N01

Washout Type1

Double Orifice Air Valve

End pipe

Node N01

Washout Type1

05.010.0

Vertical Scale: 1:250

Horizontal Scale: 1:2500

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GOVERNMENT OF UGANDA

MINISTRY OF WATER AND ENVIRONMENT

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PROJECT

CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

GASPA WATER SUPPLY SYSTEM

CONSULTANT

SARI

Corporate Headquarter
10 Philip Lane, 1st Floor,
London EC3M 8AA,
United Kingdom

In Joint Venture with

SGAPI

CONTRACTOR

DETAILED ENGINEERING DESIGN

DRAWING TITLE

GENERAL LAYOUT DISTRIBUTION NETWORK

SCALE

DRAWING No. GPA/WS/5.0.0

SURVEYED

Evans Mpanga

DESIGNED

Otwane Dan.

DRAWN

Joshua Nyarwanda

CHECKED

Rodney Barugahare

DATE

Oct 2021

APPROVED

Rodney Barugahare.

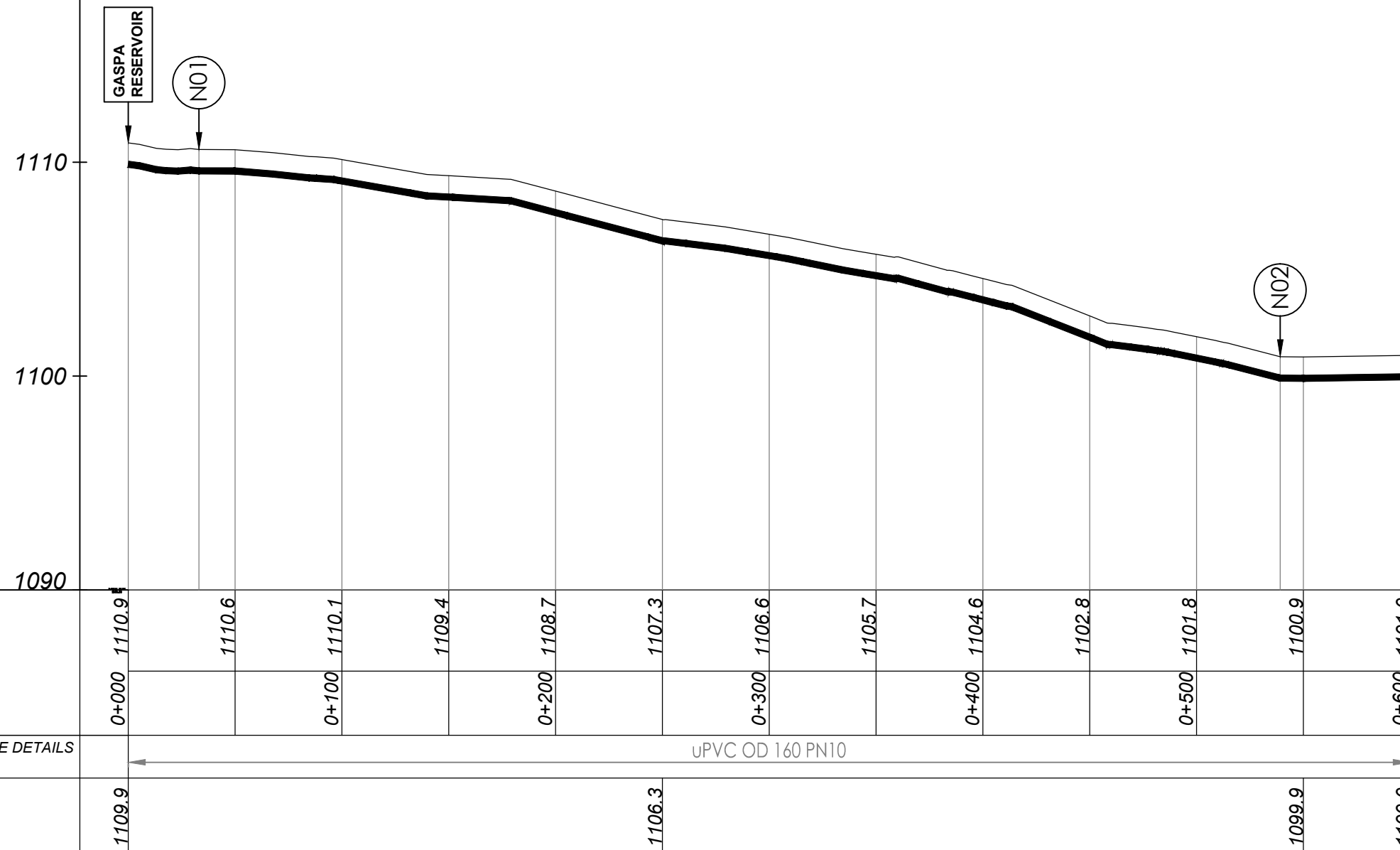
GASPA
RESERVOIR

N01

DISTRIBUTION 1
uPVC OD 160 PN10

N02

PLAN LAYOUT

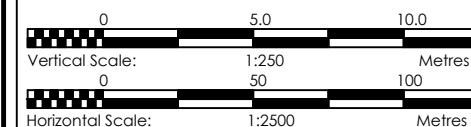


DISTRIBUTION 1 (0+000.00 - 0+600.00)

NOTES

LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- EP End pipe
- N01 Node N01
- WO-1 Washout Type1



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GOVERNMENT OF UGANDA
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GASPA WATER SUPPLY SYSTEM

CONSULTANT

SARI In Joint Venture with **SGAPI**

Corporate Headquarter
10 Philip Lane, 1st Floor,
London EC3M 8AA,
United Kingdom

CONTRACTOR

DETAILED ENGINEERING DESIGN

DRAWING TITLE **DISTRIBUTION 01**
(0+000.00 - 0+600.00)

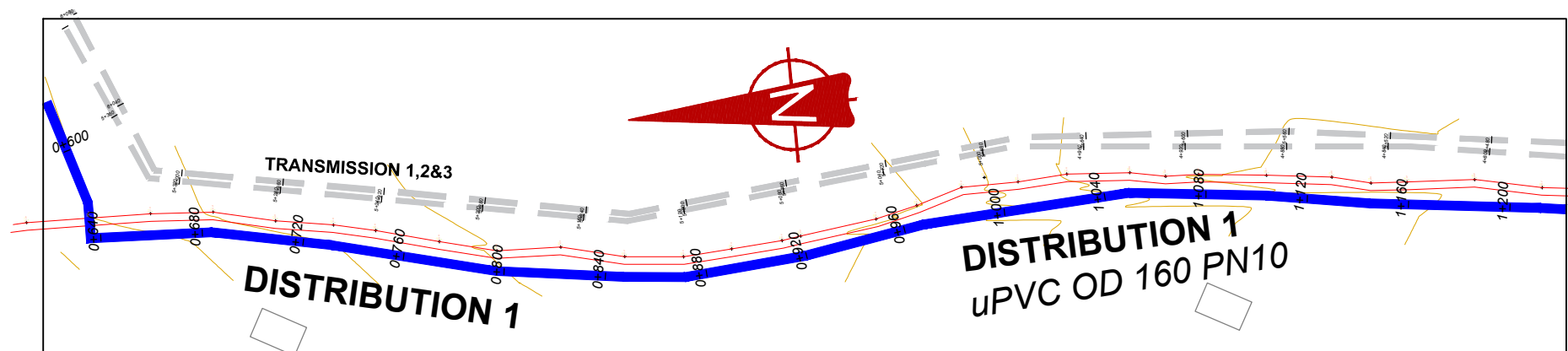
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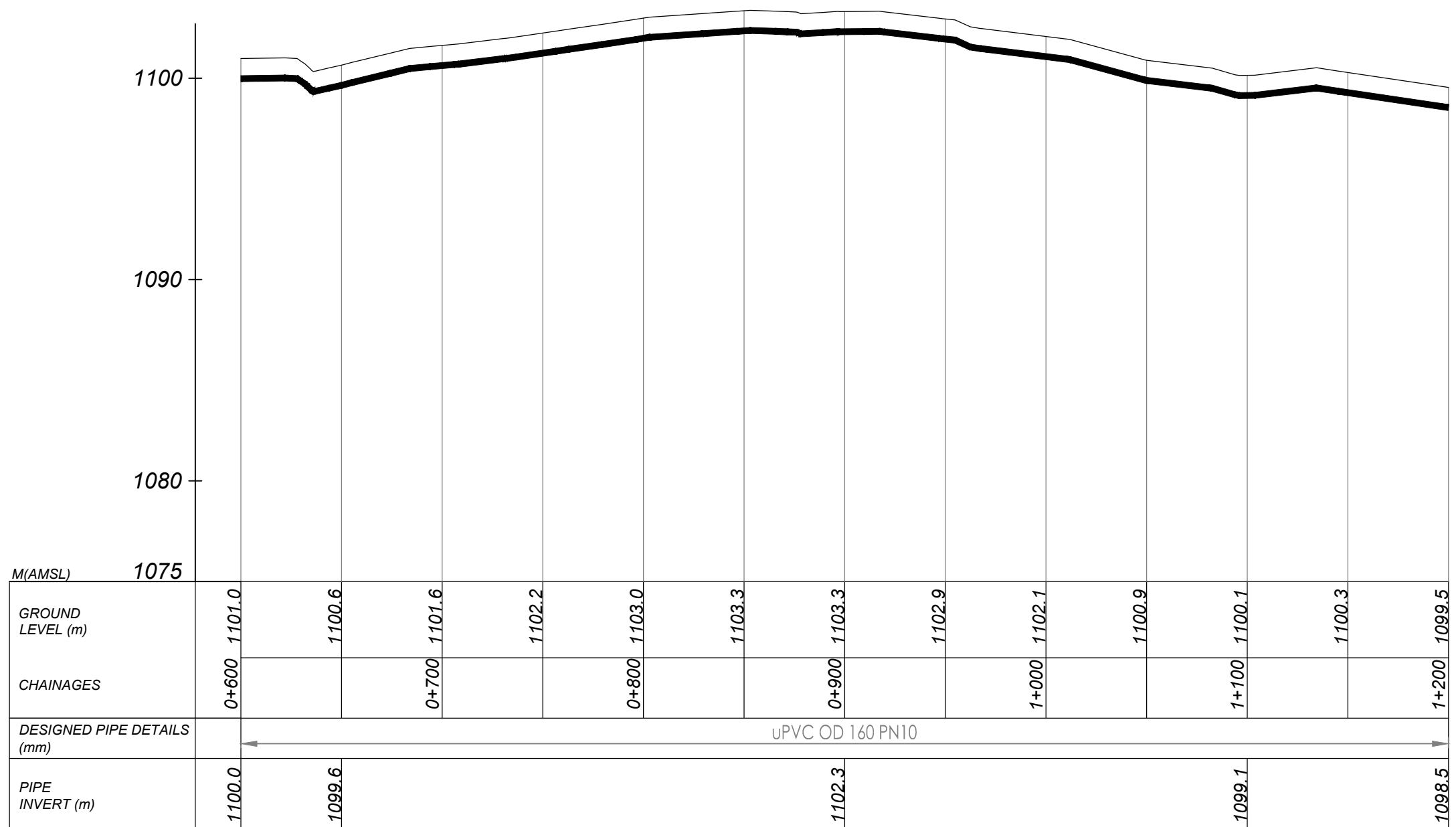
SURVEYED Evans Mpanga DESIGNED Otwane Dan.

DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare

DATE Oct 2021 APPROVED Rodney Barugahare.



PLAN LAYOUT

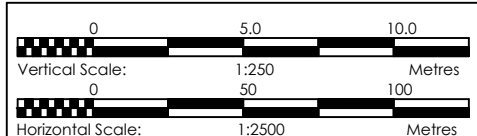


DISTRIBUTION 1 (0+600.00 - 1+200.00)

NOTES

LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- EP End pipe
- N01 Node N01
- WO-1 Washout Type1



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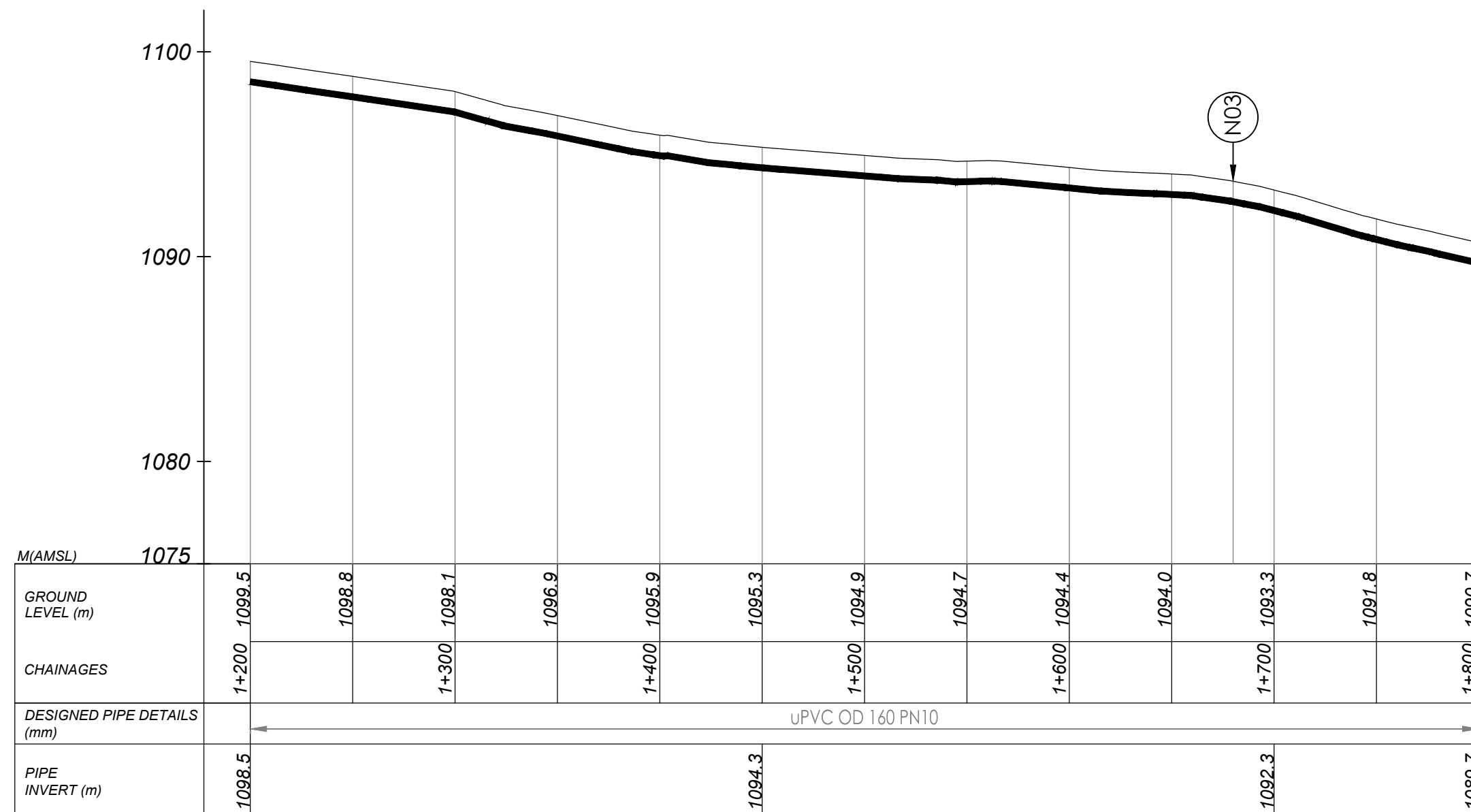
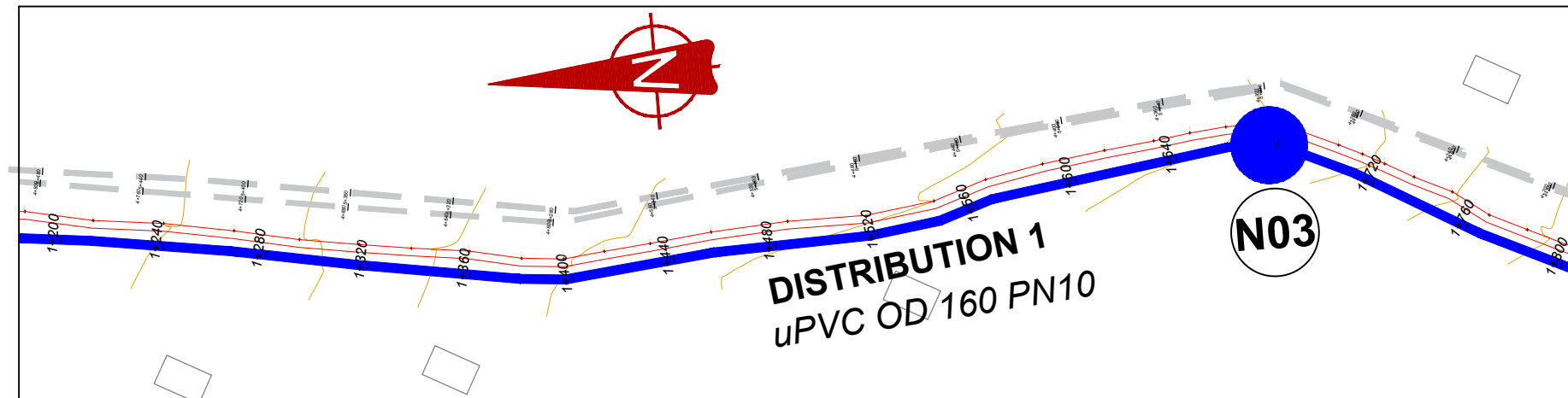
GASPA WATER SUPPLY SYSTEM

CONSULTANT
SARI
Corporate Headquarter
10 Philip Lane, 1st Floor,
London EC3M 8AA,
United Kingdom
In Joint Venture with
SGAPI

CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE
DISTRIBUTION 01
(0+600.00 - 1+200.00)

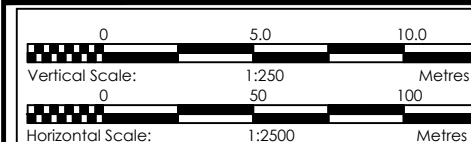
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SURVEYED	Evans Mpanga	DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	Oct 2021	APPROVED	Rodney Barugahare.



NOTES

LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- EP End pipe
- N01 Node N01
- WO-1 Washout Type1



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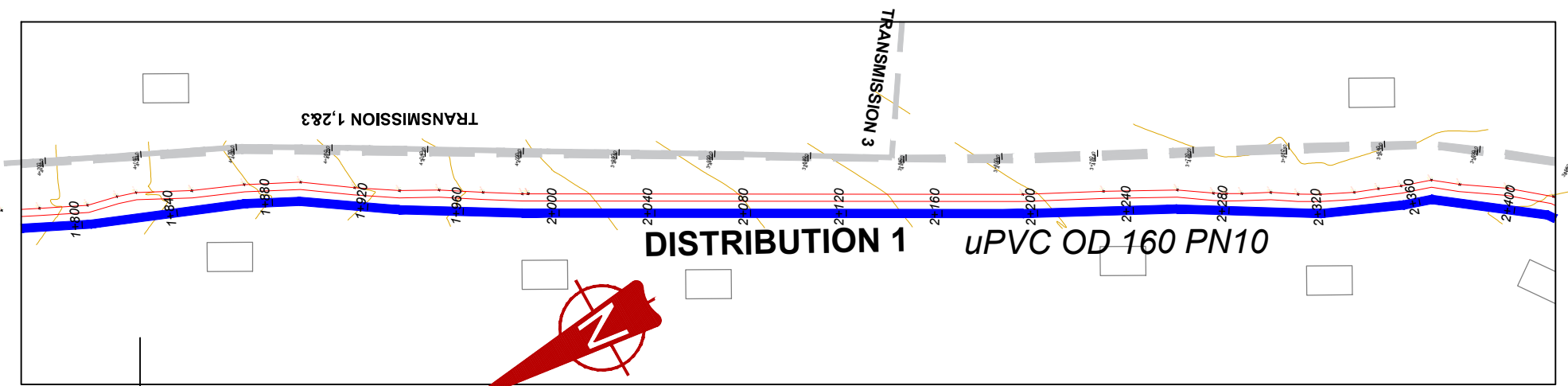
GASPA WATER SUPPLY SYSTEM

CONSULTANT
SARI
 Corporate Headquarter
 10 Philip Lane, 1st Floor,
 London EC3M 8AA,
 United Kingdom

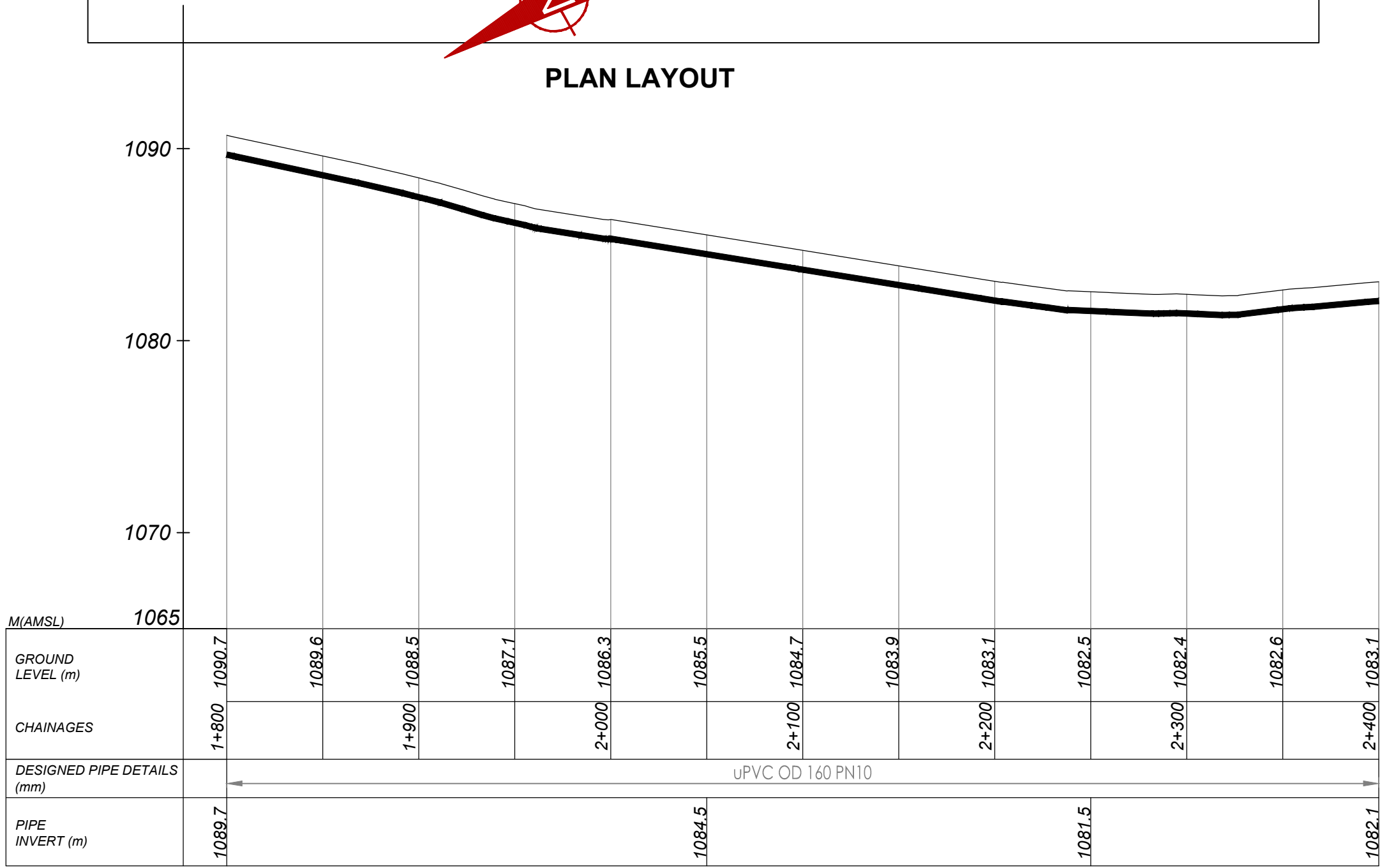
CONTRACTOR

DETAILED ENGINEERING DESIGN
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(1+200.00 - 1+800.00)

SCALE Vert, 1:250
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 DRAWING No. GPA/WS/5.1.3
 SURVEYED Evans Mpanga
 DESIGNED Otwane Dan.
 DRAWN Joshua Nyarwanda
 CHECKED Rodney Barugahare
 DATE Oct 2021
 APPROVED Rodney Barugahare.



PLAN LAYOUT

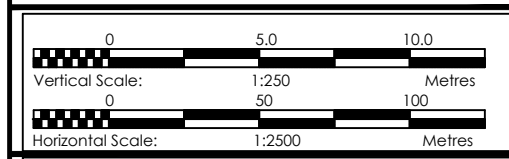


DISTRIBUTION 1 (1+800.00 - 2+400.00)

NOTES

LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- EP End pipe
- N01 Node N01
- WO-1 Washout Type1



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PROJECT
CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

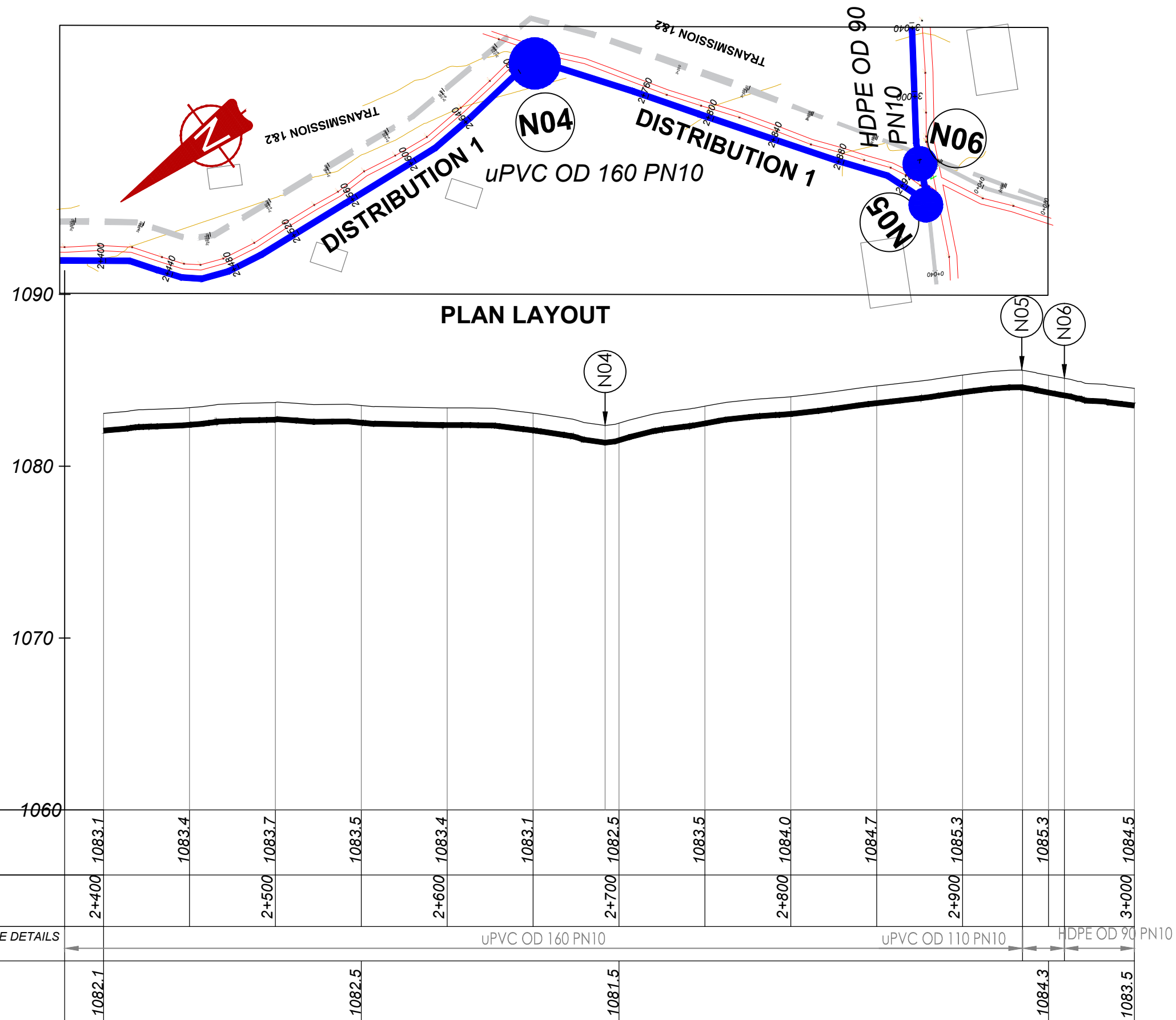
GASPA WATER SUPPLY SYSTEM

CONSULTANT
SARI In Joint Venture with **SGAPI**
Corporate Headquarter
10 Philip Lane, 1st Floor,
London EC3M 8AA,
United Kingdom

CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE **DISTRIBUTION 01**
(1+800.00 - 2+400.00)

SCALE	Vert, 1:250 Hor, 1:2500	DRAWING No.	GPA/WS/5.1.4
SURVEYED	Evans Mpanga	DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	Oct 2021	APPROVED	Rodney Barugahare.

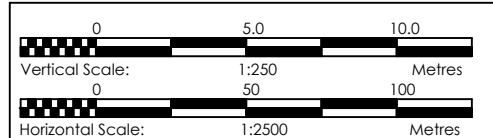


DISTRIBUTION 1 (2+400.00 - 3+000.00)

NOTES

LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- EP End pipe
- N01 Node N01
- WO-1 Washout Type1



CLIENT

GOVERNMENT OF UGANDA

MINISTRY OF WATER AND ENVIRONMENT

CO-FINANCED BY:

THE WORLD BANK AND GOVERNMENT OF UGANDA

PROJECT

CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

GASPA WATER SUPPLY SYSTEM

CONSULTANT

SARI In Joint Venture with **SGAPI**

Corporate Headquarter
10 Philip Lane, 1st Floor,
London EC3M 8AA,
United Kingdom

CONTRACTOR

DETAILED ENGINEERING DESIGN

DRAWING TITLE **DISTRIBUTION 01**
(2+400.00 - 3+000.00)

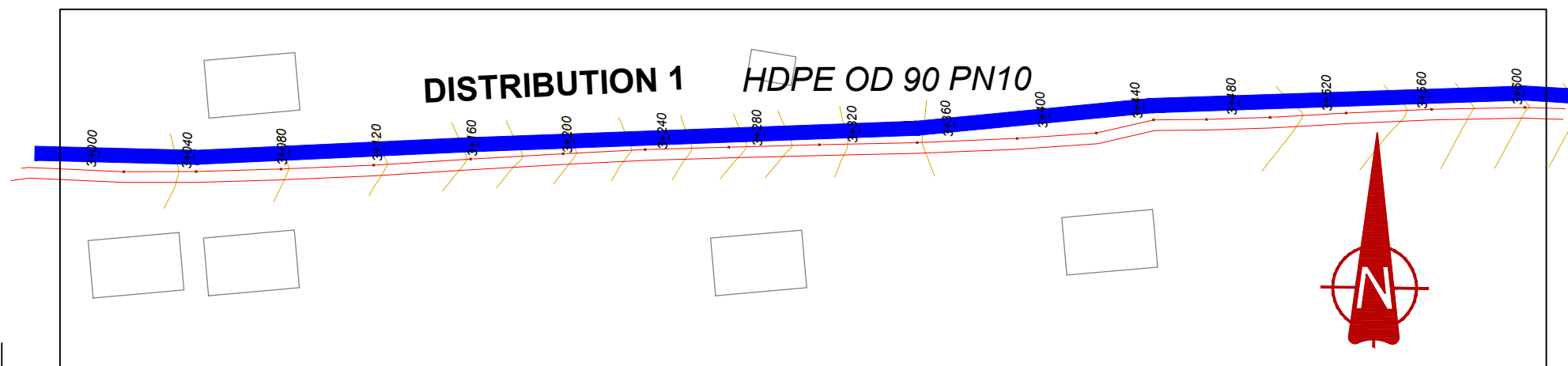
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Hor. 1:2500

DRAWING No. GPA/WS/5.1.5

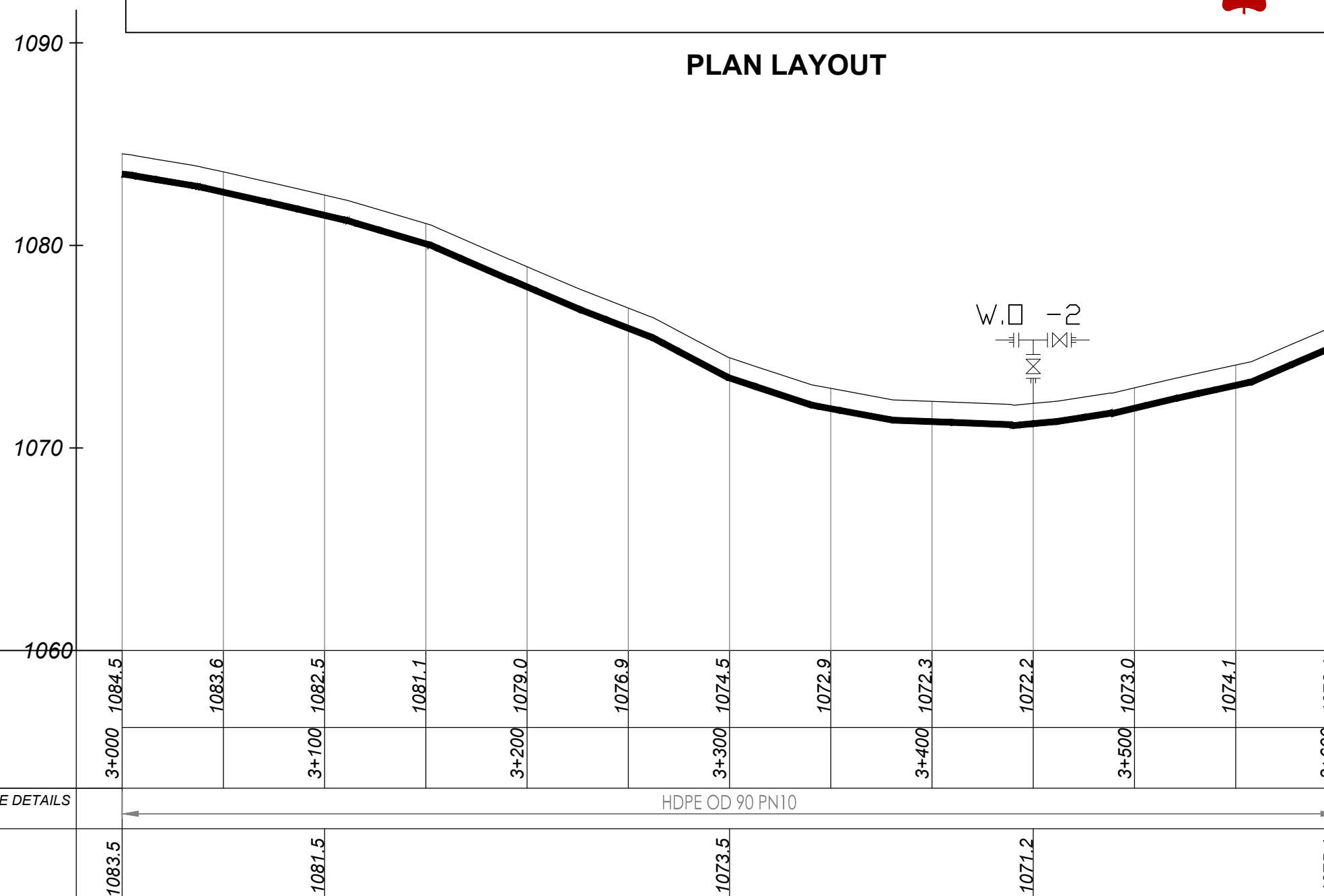
SURVEYED Evans Mpanga DESIGNED Otwane Dan.

DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare

DATE Oct 2021 APPROVED Rodney Barugahare.



PLAN LAYOUT



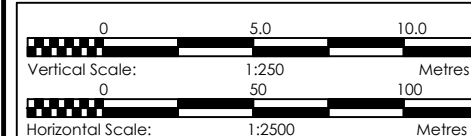
DISTRIBUTION 1 (3+000.00 - 3+600.00)

M(AMSL)	1060	1070	1080	1090
GROUND LEVEL (m)	1084.5	1083.6	1082.5	1081.1
CHAINAGES	3+000	3+100	3+200	3+300
DESIGNED PIPE DETAILS (mm)	HDPE OD 90 PN10			
PIPE INVERT (m)	1083.5	1081.5	1073.5	1071.2

NOTES

LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- EP End pipe
- N01 Node N01
- WO-1 Washout Type1



CLIENT
GOVERNMENT OF UGANDA
MINISTRY OF WATER AND ENVIRONMENT

CO-FINANCED BY:
THE WORLD BANK AND GOVERNMENT OF UGANDA

PROJECT
CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

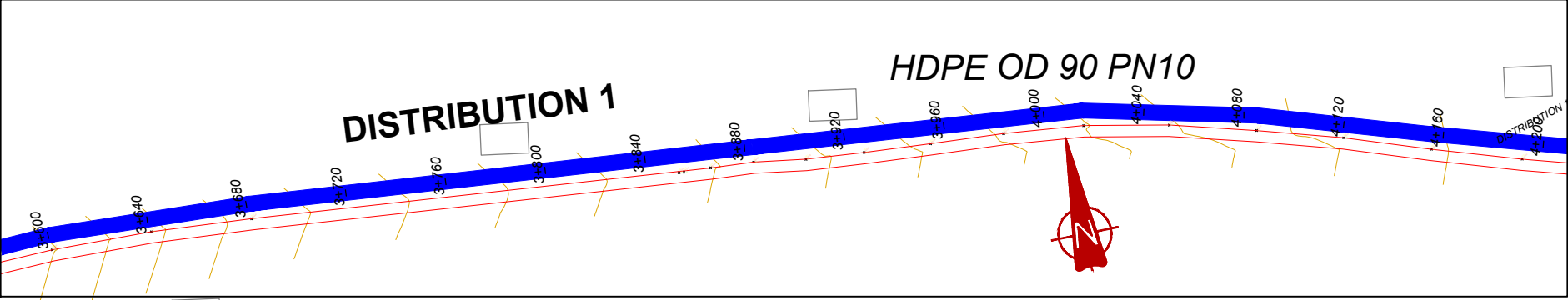
GASPA WATER SUPPLY SYSTEM

CONSULTANT
SARI
Corporate Headquarter
10 Philip Lane, 1st Floor,
London EC3M 8AA,
United Kingdom
In Joint Venture with
SGAPI

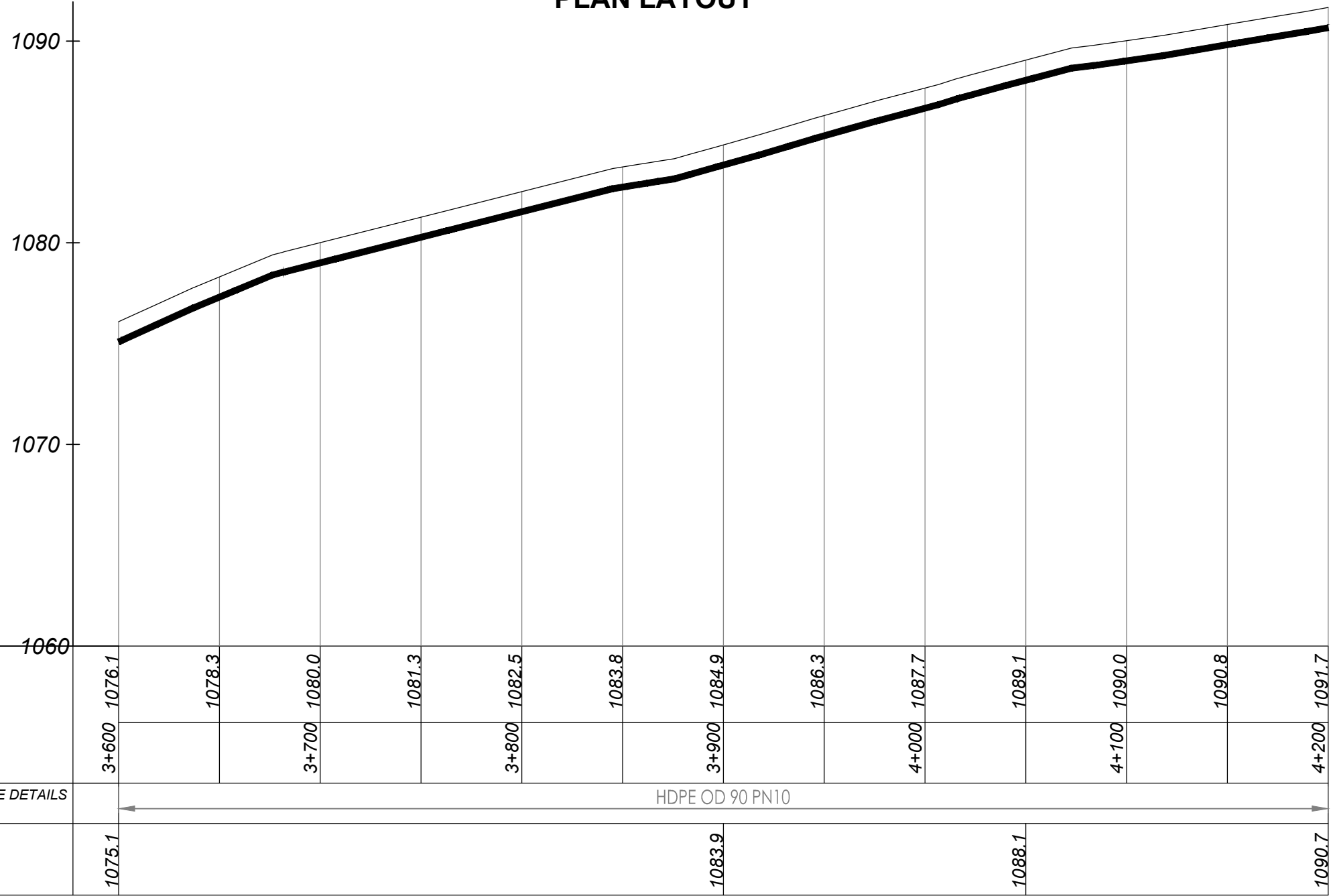
CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE
DISTRIBUTION 01
(3+000.00 - 3+600.00)

SCALE
Vert. 1:250
Hor. 1:2500
DRAWING No. GPA/WS/5.1.6
SURVEYED
Evans Mpanga
DESIGNED
Otwane Dan.
DRAWN
Joshua Nyarwanda
CHECKED
Rodney Barugahare
DATE
Oct 2021
APPROVED
Otwane Dan.



PLAN LAYOUT

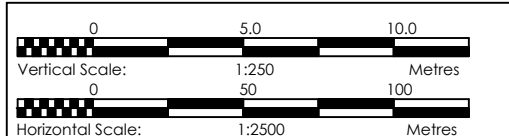


DISTRIBUTION 1 (3+600.00 - 4+200.00)

NOTES

LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- EP End pipe
- N01 Node N01
- WO-1 Washout Type1



CLIENT
GOVERNMENT OF UGANDA
MINISTRY OF WATER AND ENVIRONMENT

CO-FINANCED BY:
THE WORLD BANK AND GOVERNMENT OF UGANDA

PROJECT
CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

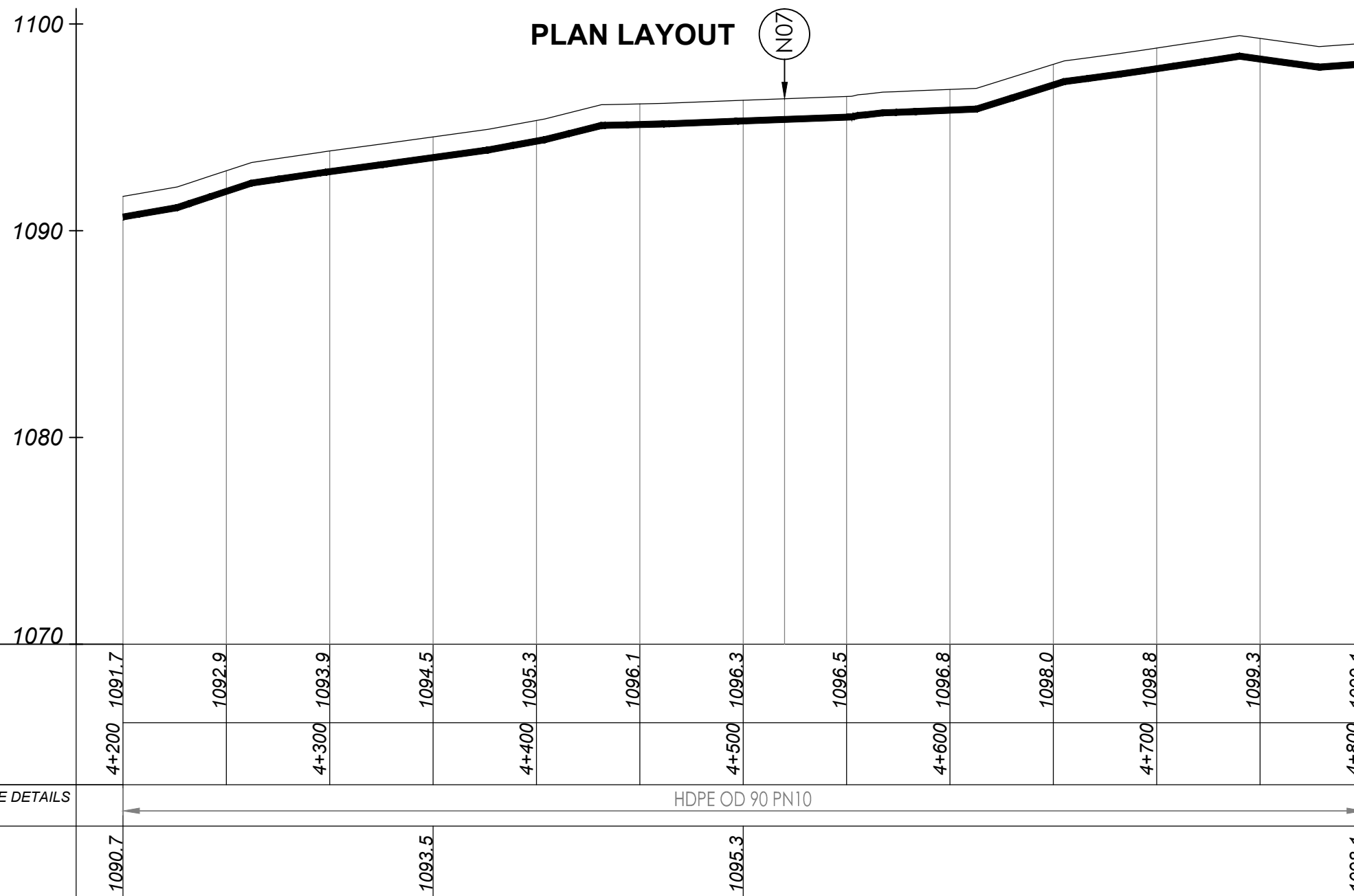
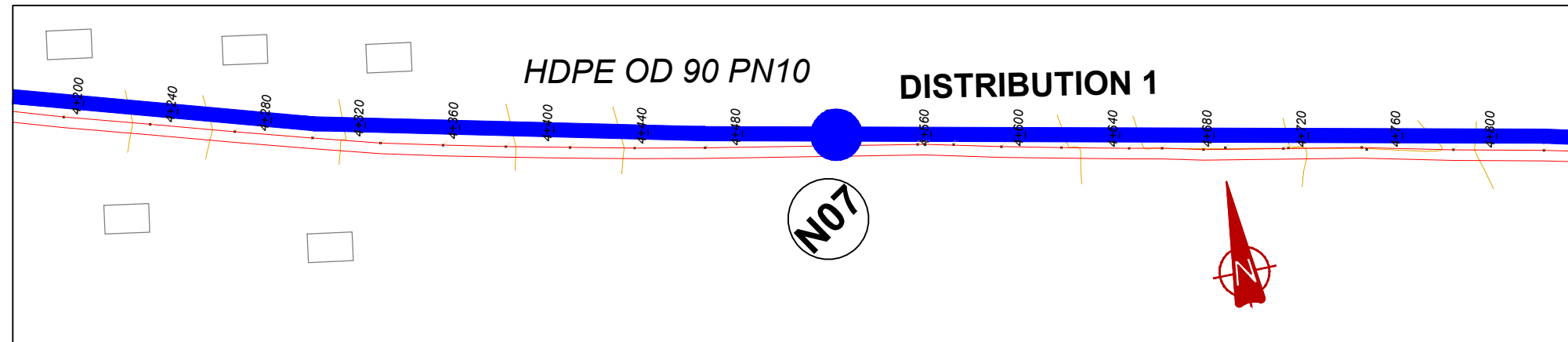
GASPA WATER SUPPLY SYSTEM

CONSULTANT
SARI In Joint Venture with **SGAPI**
Corporate Headquarter
10 Philip Lane, 1st Floor,
London EC3M 8AA,
United Kingdom

CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE **DISTRIBUTION 01**
(3+600.00 - 4+200.00)

SCALE	Vert, 1:250 Hor, 1:2500	DRAWING No.	GPA/WS/5.1.7
SURVEYED	Evans Mpanga	DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	Oct 2021	APPROVED	Otwane Dan.

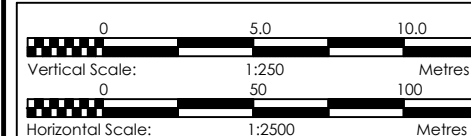


DISTRIBUTION 1 (4+200.00 - 4+800.00)

NOTES

LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- EP End pipe
- N01 Node N01
- WO-1 Washout Type1



CLIENT
GOVERNMENT OF UGANDA
MINISTRY OF WATER AND ENVIRONMENT

CO-FINANCED BY:
THE WORLD BANK AND GOVERNMENT OF UGANDA

PROJECT
CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

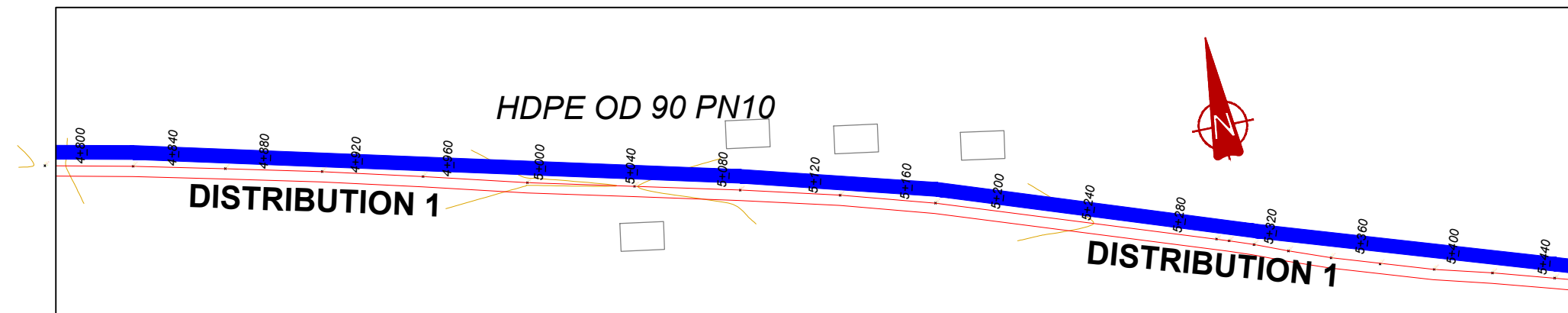
GASPA WATER SUPPLY SYSTEM

CONSULTANT
SARI In Joint Venture with **SGAPI**
Corporate Headquarter
10 Philip Lane, 1st Floor,
London EC3M 8AA,
United Kingdom

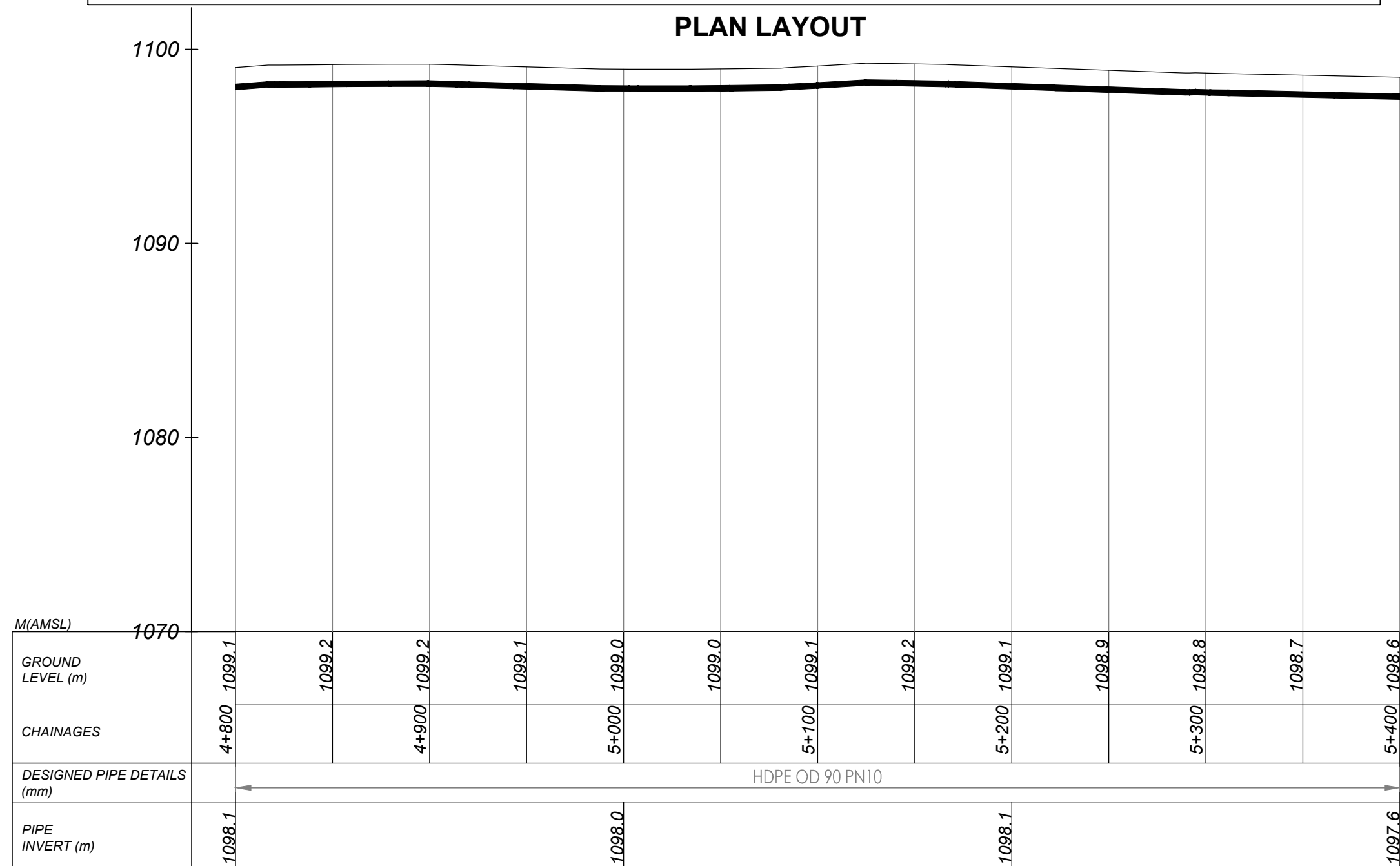
CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE **DISTRIBUTION 01**
(4+200.00 - 4+800.00)

SCALE Vert. 1:250
Hor. 1:2500
DRAWING No. GPA/WS/5.1.8
SURVEYED Evans Mpanga DESIGNED Otwane Dan.
DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare
DATE Oct 2021 APPROVED Otwane Dan.



PLAN LAYOUT

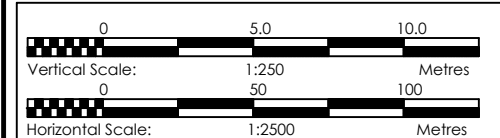


DISTRIBUTION 1 (4+800.00 - 5+400.00)

NOTES

LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- EP End pipe
- N01 Node N01
- WO-1 Washout Type1



CLIENT
GOVERNMENT OF UGANDA
MINISTRY OF WATER AND ENVIRONMENT

CO-FINANCED BY:
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PROJECT
CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

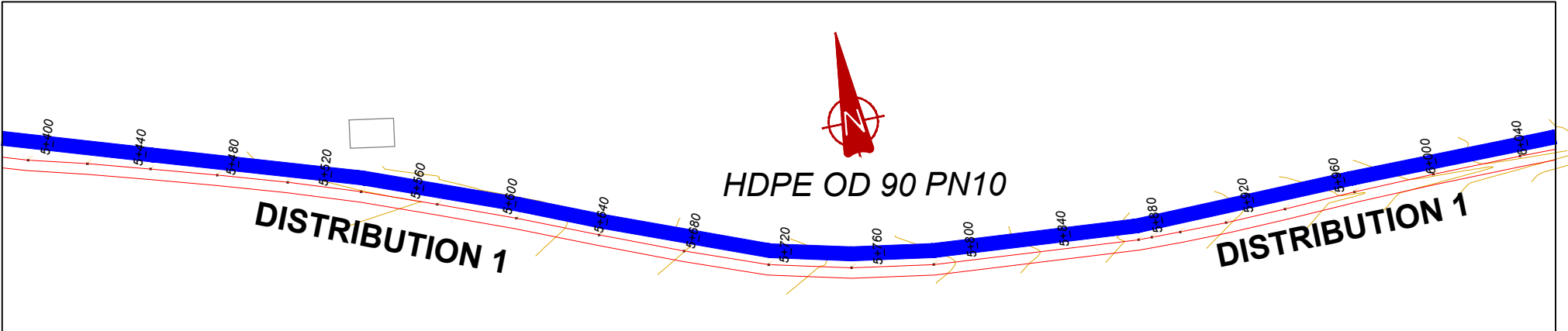
GASPA WATER SUPPLY SYSTEM

CONSULTANT
SARI
Corporate Headquarter
10 Philip Lane, 1st Floor,
London EC3M 8AA,
United Kingdom
In Joint Venture with
SGAPI

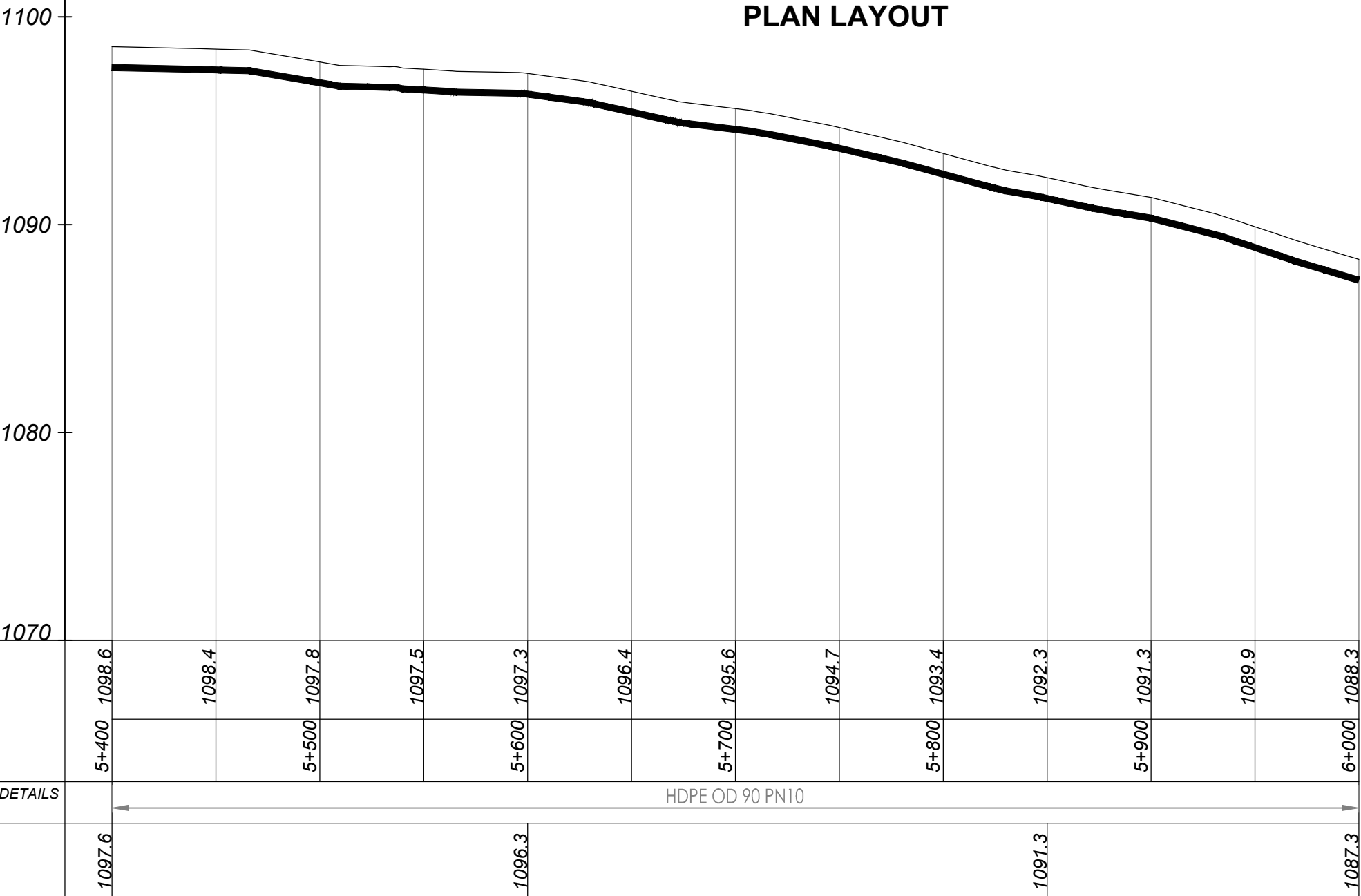
CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE
DISTRIBUTION 01
(4+800.00 - 5+400.00)

SCALE
Vert, 1:250
Hor, 1:2500
DRAWING No. GPA/WS/5.1.9
SURVEYED
Evans Mpanga
DESIGNED
Otwane Dan.
DRAWN
Joshua Nyarwanda
CHECKED
Rodney Barugahare
DATE
Oct 2021
APPROVED
Otwane Dan.



PLAN LAYOUT

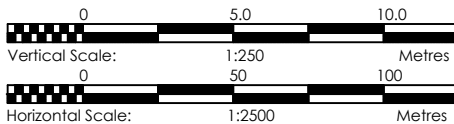


DISTRIBUTION 1 (5+400.00 - 6+000.00)

NOTES

LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- EP End pipe
- N01 Node N01
- WO-1 Washout Type1



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GOVERNMENT OF UGANDA
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CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

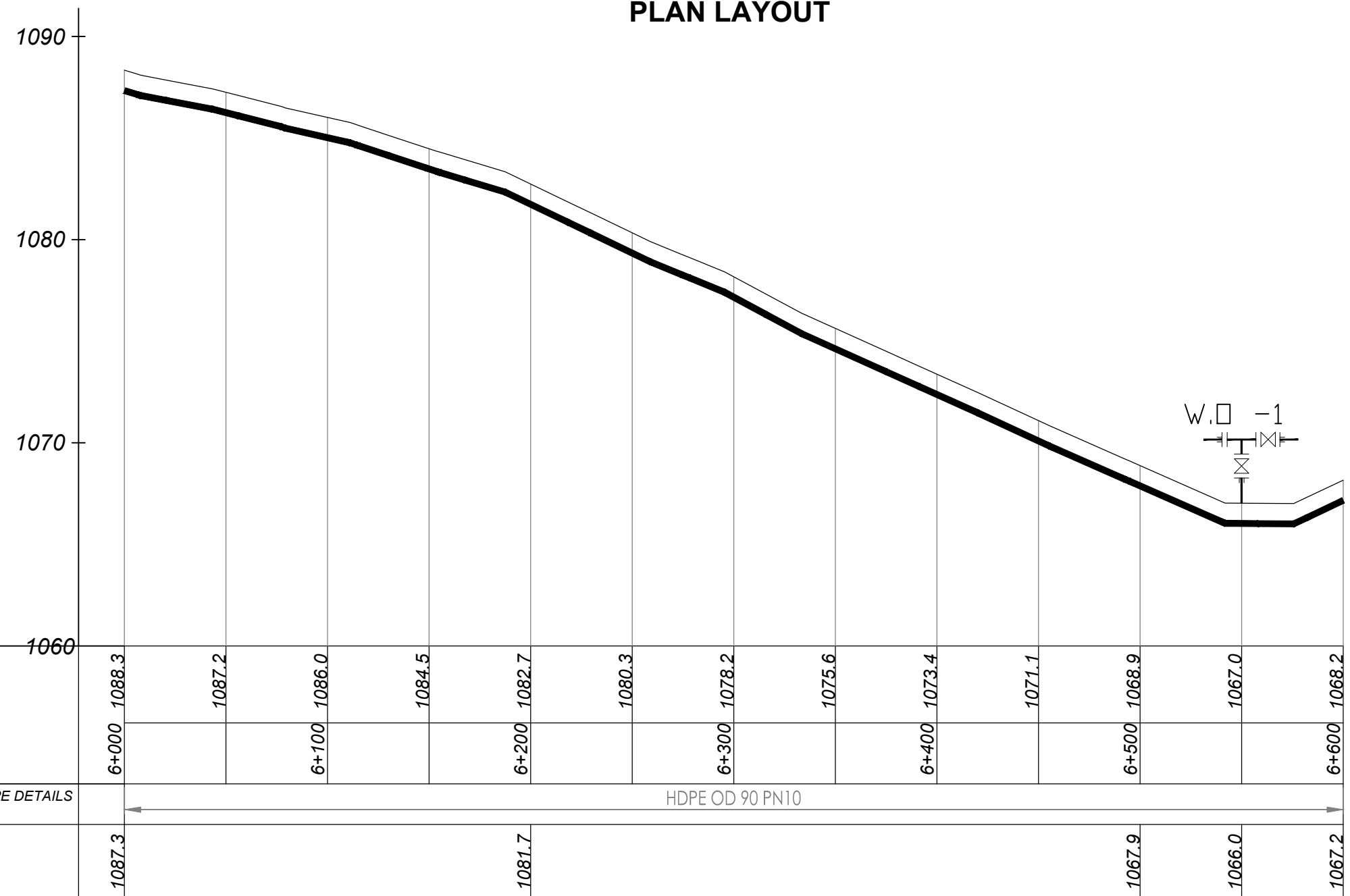
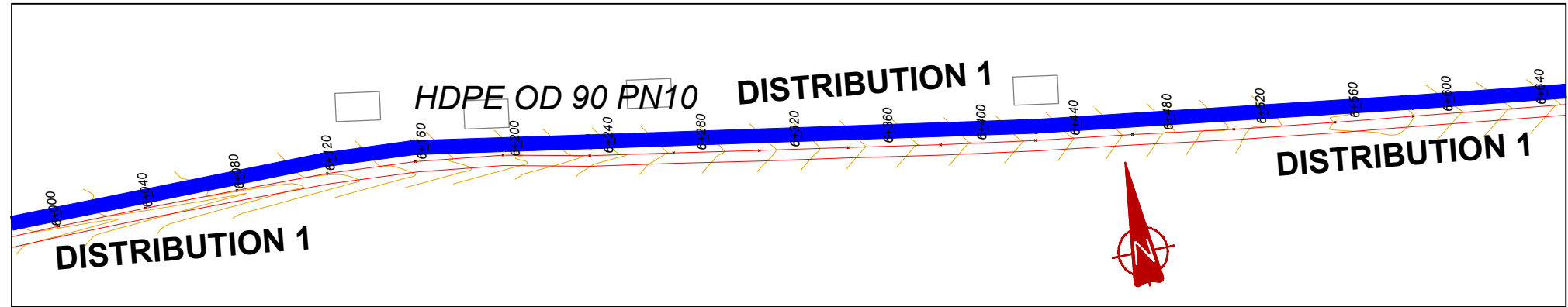
GASPA WATER SUPPLY SYSTEM

CONSULTANT
SARI In Joint Venture with **SGAPI**
Corporate Headquarter
10 Philip Lane, 1st Floor,
London EC3M 8AA,
United Kingdom

CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE **DISTRIBUTION 01**
(5+400.00 - 6+000.00)

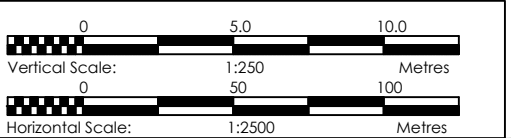
SCALE	Vert, 1:250 Hori, 1:2500	DRAWING No.	GPA/WS/5.1.10
SURVEYED	Evans Mpanga	DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	Oct 2021	APPROVED	Otwane Dan.



NOTES

LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- EP End pipe
- N01 Node N01
- WO-1 Washout Type1



CLIENT
GOVERNMENT OF UGANDA
MINISTRY OF WATER AND ENVIRONMENT

CO-FINANCED BY:
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PROJECT
CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

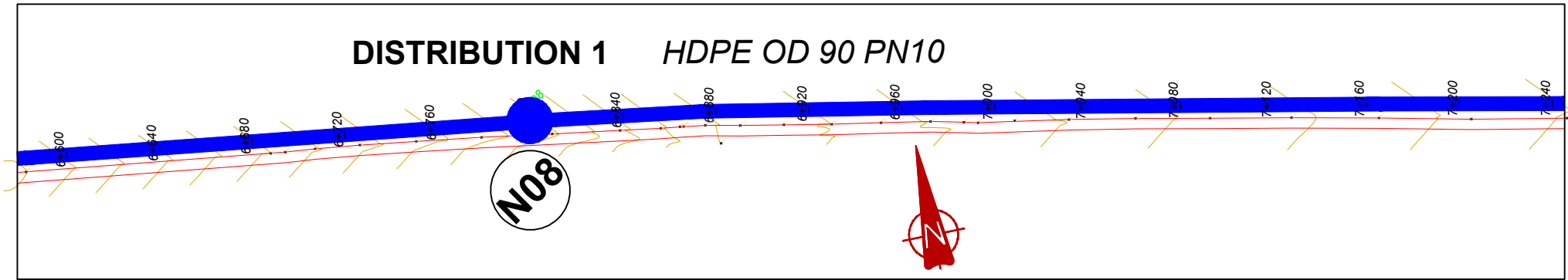
GASPA WATER SUPPLY SYSTEM

CONSULTANT
SARI In Joint Venture with **SGAPI**
Corporate Headquarter
10 Philip Lane, 1st Floor,
London EC3M 8AA,
United Kingdom

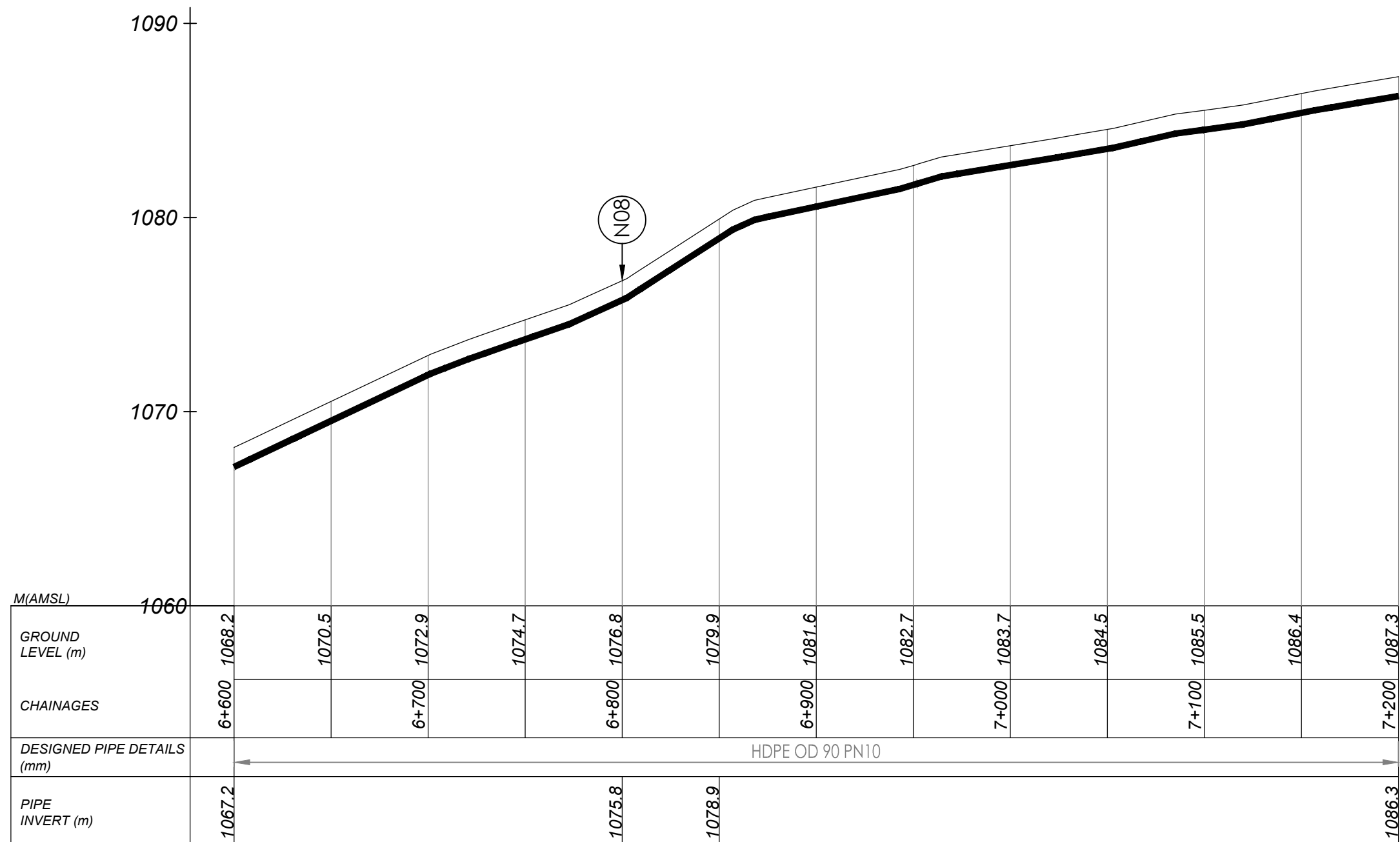
CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE **DISTRIBUTION 01**
(6+000.00 - 6+600.00)

SCALE Vert, 1:250
Hor, 1:2500
DRAWING No. GPA/WS/5.1.11
SURVEYED Evans Mpanga DESIGNED Otwane Dan.
DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare
DATE Oct 2021 APPROVED Otwane Dan.



PLAN LAYOUT

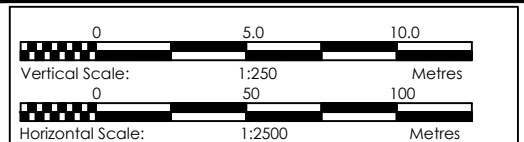


DISTRIBUTION 1 (6+600.00 - 7+200.00)

NOTES

LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- EP End pipe
- N01 Node N01
- WO-1 Washout Type1



CLIENT
GOVERNMENT OF UGANDA
MINISTRY OF WATER AND ENVIRONMENT

CO-FINANCED BY:
THE WORLD BANK AND GOVERNMENT OF UGANDA

PROJECT
CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

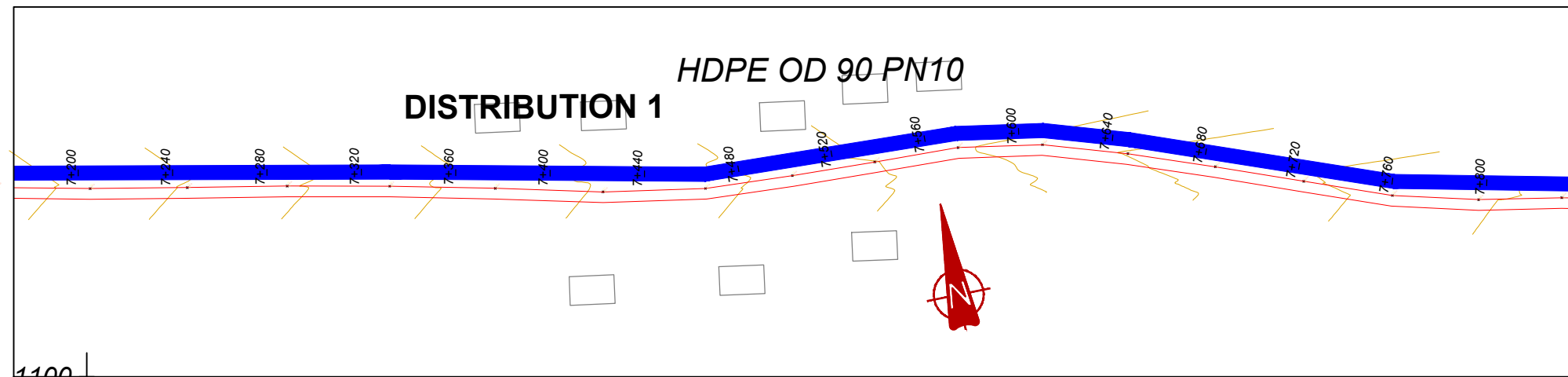
GASPA WATER SUPPLY SYSTEM

CONSULTANT
SARI In Joint Venture with **SGAPI**
Corporate Headquarter
10 Philip Lane, 1st Floor,
London EC3M 8AA,
United Kingdom

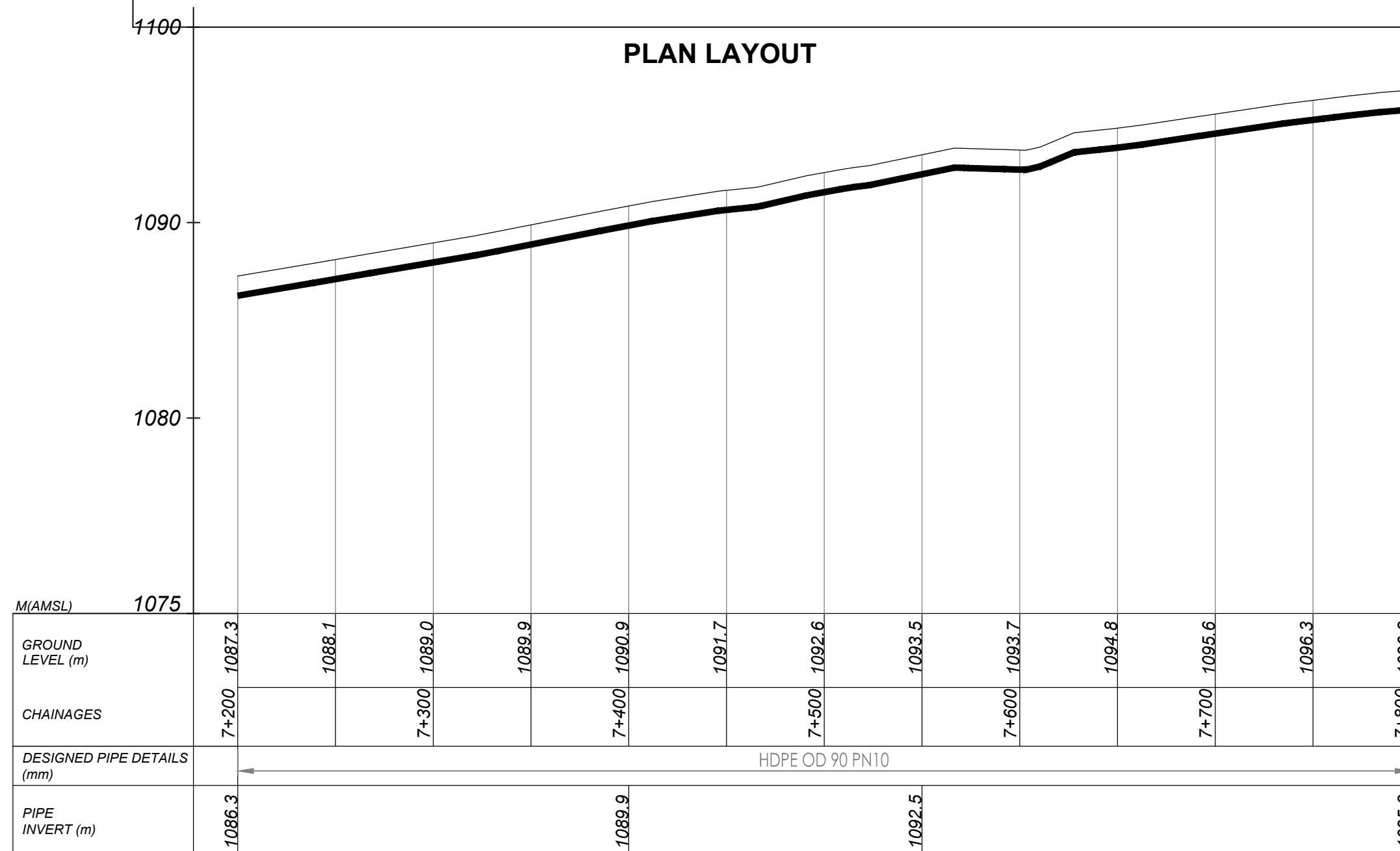
CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE **DISTRIBUTION 01**
(6+600.00 - 7+200.00)

SCALE	Vert, 1:250 Hor, 1:2500	DRAWING No.	GPA/WS/5.1.12
SURVEYED	Evans Mpanga	DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	Oct 2021	APPROVED	Otwane Dan.



PLAN LAYOUT

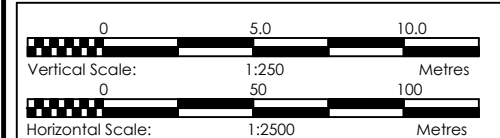


DISTRIBUTION 1 (7+200.00 - 7+800.00)

NOTES

LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- EP End pipe
- N01 Node N01
- WO-1 Washout Type1



CLIENT

GOVERNMENT OF UGANDA
MINISTRY OF WATER AND ENVIRONMENT

CO-FINANCED BY:

THE WORLD BANK AND GOVERNMENT OF UGANDA

PROJECT

CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

GASPA WATER SUPPLY SYSTEM

CONSULTANT

SARI In Joint Venture with **SGAPI**
Corporate Headquarter
10 Philip Lane, 1st Floor,
London EC3M 8AA,
United Kingdom

CONTRACTOR

DETAILED ENGINEERING DESIGN

DRAWING TITLE **DISTRIBUTION 01**
(7+200.00 - 7+800.00)

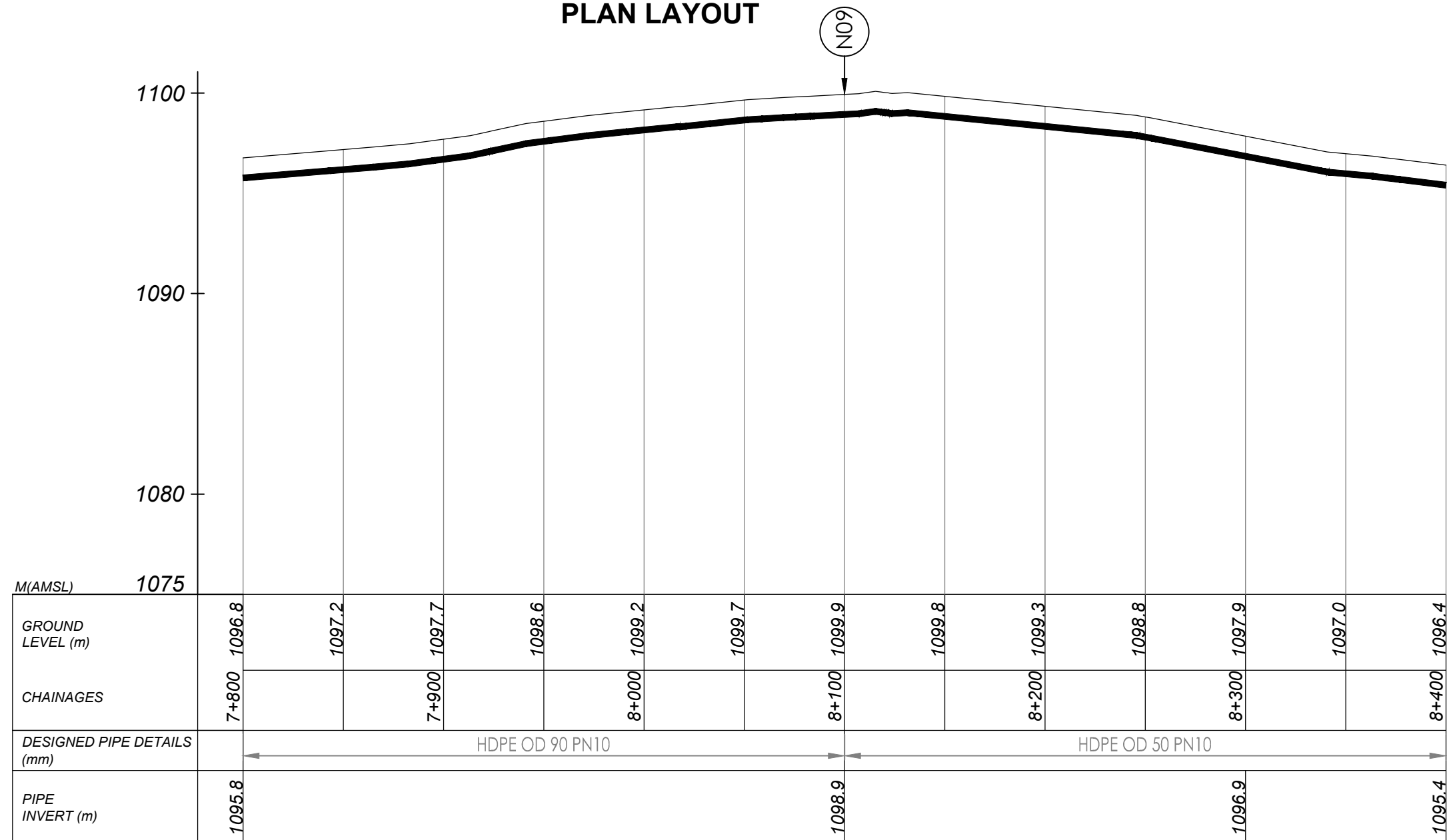
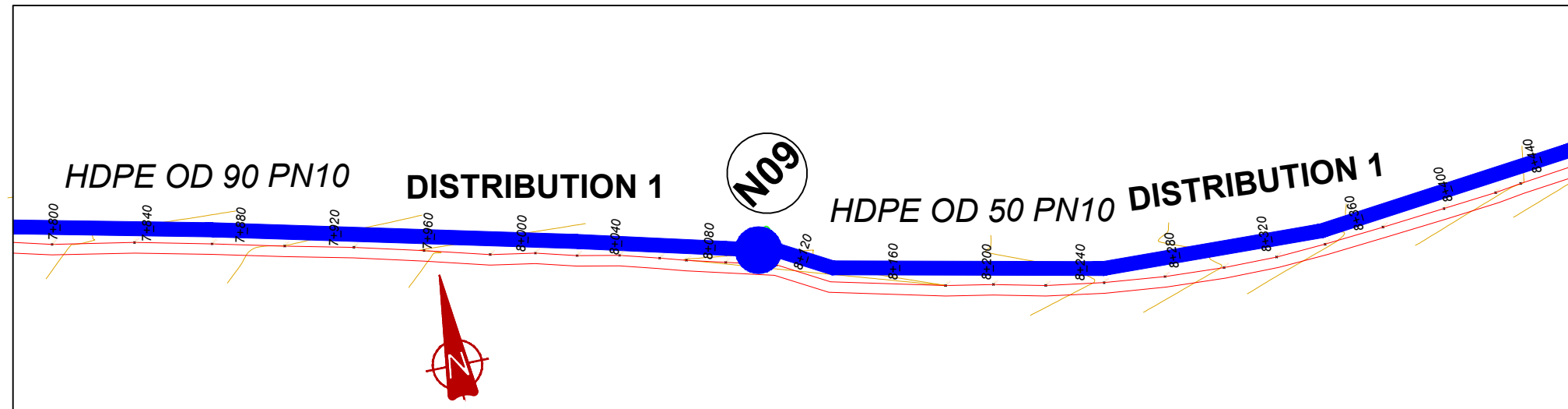
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Hor, 1:2500

DRAWING No. GPA/WS/5.1.13

SURVEYED Evans Mpanga DESIGNED Otwane Dan.

DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare

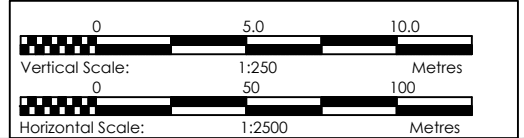
DATE Oct 2021 APPROVED Otwane Dan.



NOTES

LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- EP End pipe
- N01 Node N01
- WO-1 Washout Type1



CLIENT
GOVERNMENT OF UGANDA
MINISTRY OF WATER AND ENVIRONMENT

CO-FINANCED BY:
THE WORLD BANK AND GOVERNMENT OF UGANDA

PROJECT
CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

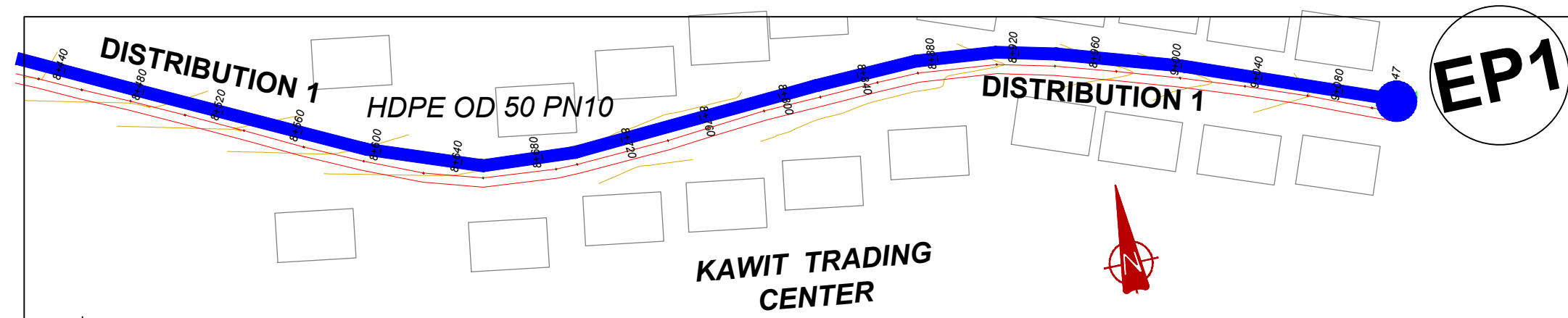
GASPA WATER SUPPLY SYSTEM

CONSULTANT
SARI
Corporate Headquarter
10 Philip Lane, 1st Floor,
London EC3M 8AA,
United Kingdom
In Joint Venture with
SGAPI

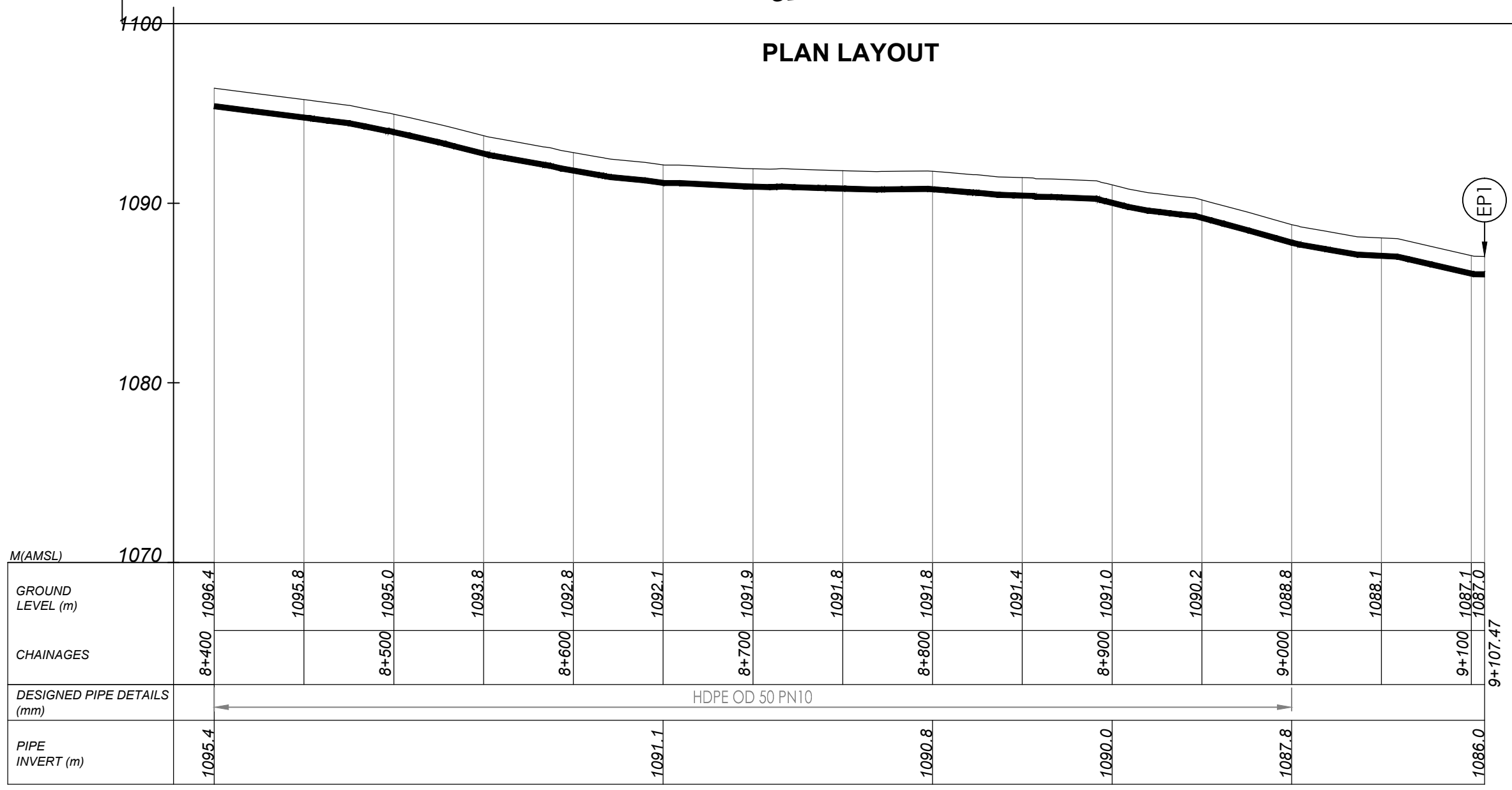
CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE
DISTRIBUTION 01
(7+800.00 - 8+400.00)

SCALE
Vert, 1:250
Hor, 1:2500
DRAWING No. GPA/WS/5.1.14
SURVEYED Evans Mpanga DESIGNED Otwane Dan.
DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare
DATE Oct 2021 APPROVED Otwane Dan.



PLAN LAYOUT

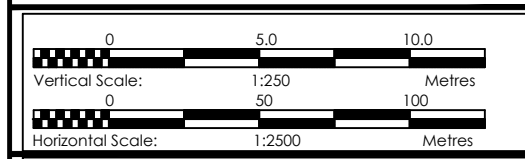


DISTRIBUTION 1 (8+400.00 - 9+107.47)

NOTES

LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- EP End pipe
- N01 Node N01
- WO-1 Washout Type1



CLIENT
GOVERNMENT OF UGANDA
MINISTRY OF WATER AND ENVIRONMENT

CO-FINANCED BY:
THE WORLD BANK AND GOVERNMENT OF UGANDA

PROJECT
CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

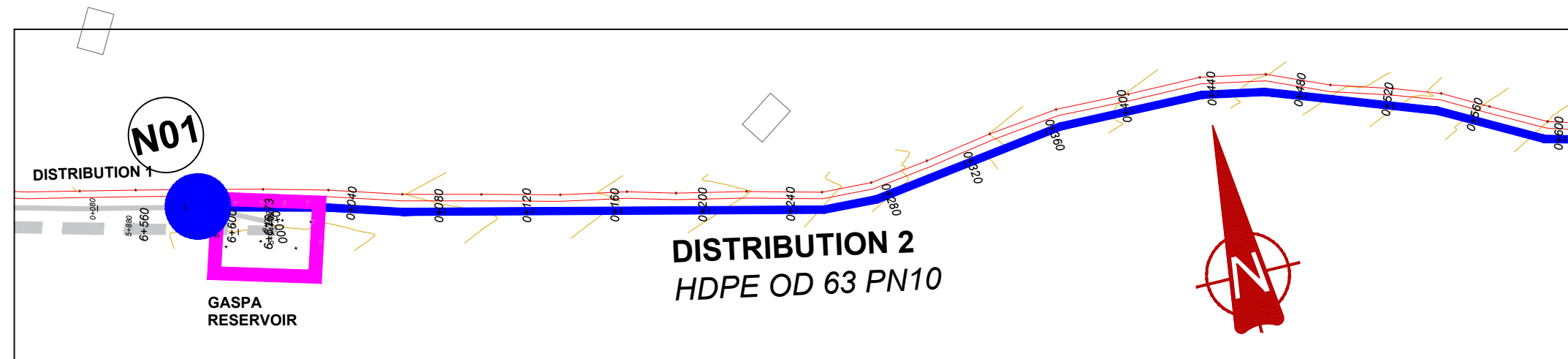
GASPA WATER SUPPLY SYSTEM

CONSULTANT
SARI
Corporate Headquarter
10 Philip Lane, 1st Floor,
London EC3M 8AA,
United Kingdom

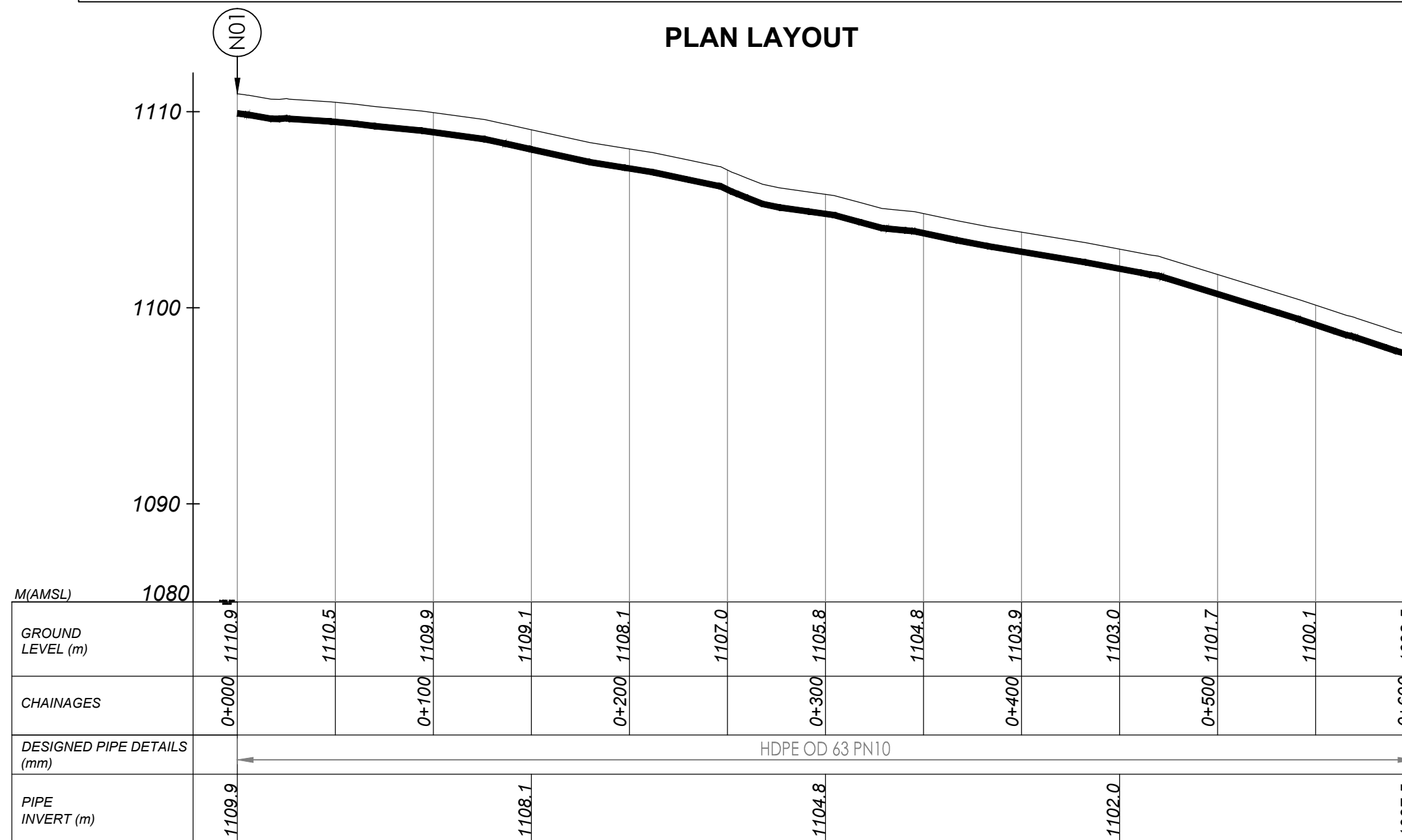
CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE
DISTRIBUTION 01
(8+400.00 - 9+107.47)

SCALE	Vert, 1:250 Hor, 1:2500	DRAWING No.	GPA/WS/5.1.15
SURVEYED	Evans Mpanga	DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	Oct 2021	APPROVED	Otwane Dan.



PLAN LAYOUT

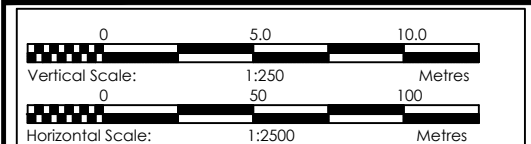


DISTRIBUTION 2 (0+000.00 - 0+600.00)

NOTES

LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- EP End pipe
- N01 Node N01
- WO-1 Washout Type1



CLIENT
GOVERNMENT OF UGANDA
MINISTRY OF WATER AND ENVIRONMENT

CO-FINANCED BY:
THE WORLD BANK AND GOVERNMENT OF UGANDA

PROJECT
CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

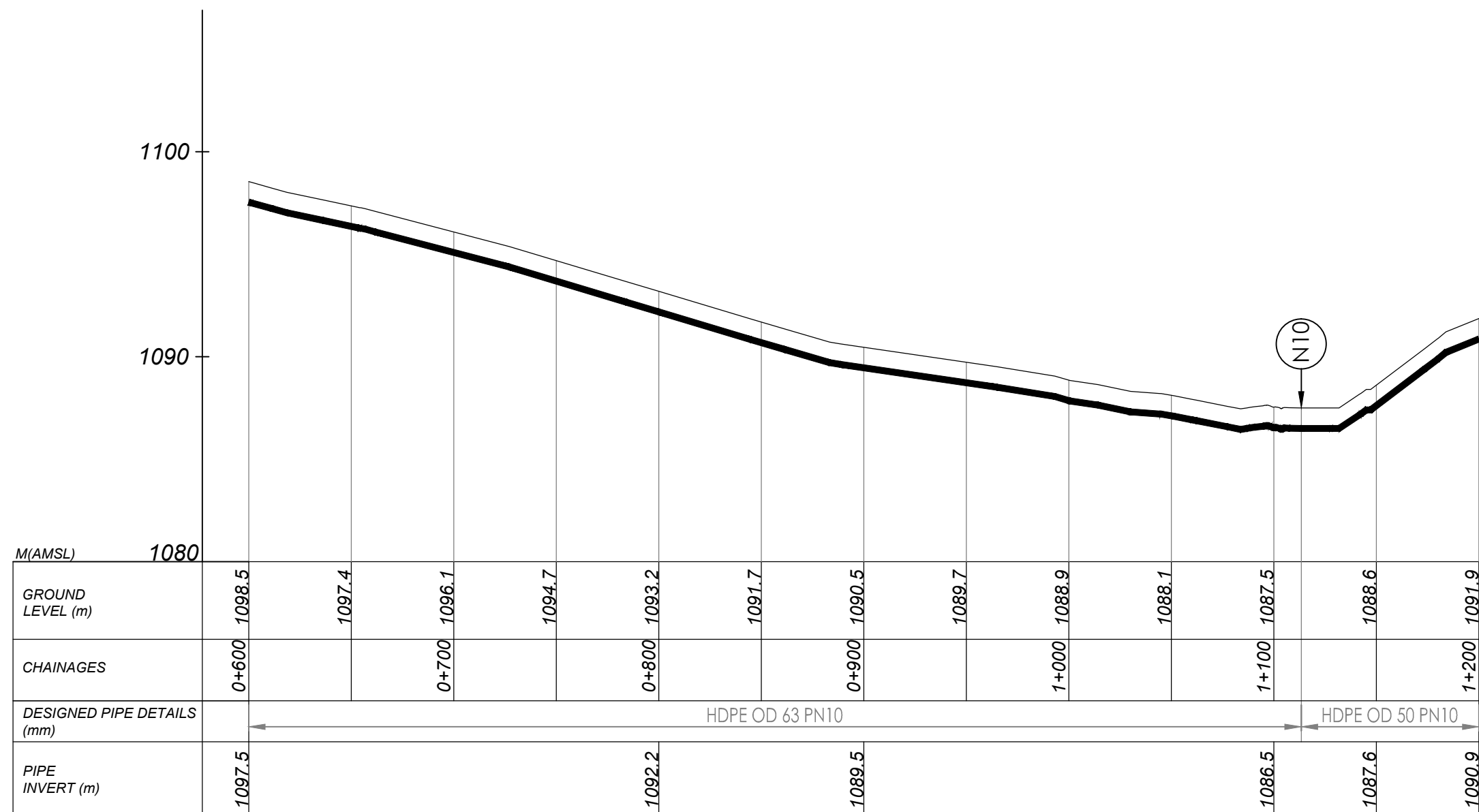
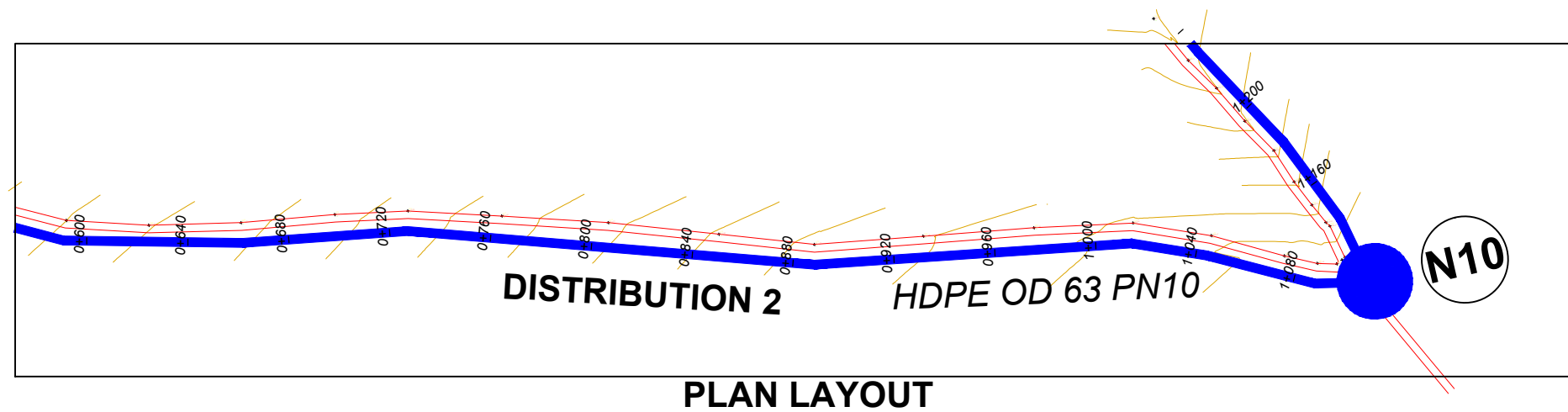
GASPA WATER SUPPLY SYSTEM

CONSULTANT
SARI
Corporate Headquarter
10 Philip Lane, 1st Floor,
London EC3M 8AA,
United Kingdom
In Joint Venture with
SGAPI

CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE
DISTRIBUTION 02
(0+000.00 - 0+600.00)

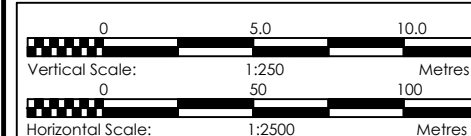
SCALE
Vert, 1:250
Hor, 1:2500
DRAWING No. GPA/WS/5.2.1
SURVEYED
Evans Mpanga
DESIGNED
Otwane Dan.
DRAWN
Joshua Nyarwanda
CHECKED
Rodney Barugahare
DATE
Oct 2021
APPROVED
Otwane Dan.



NOTES

LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- EP End pipe
- N01 Node N01
- WO-1 Washout Type1



CLIENT

GOVERNMENT OF UGANDA
MINISTRY OF WATER AND ENVIRONMENT

CO-FINANCED BY:

THE WORLD BANK AND GOVERNMENT OF UGANDA

PROJECT

CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

GASPA WATER SUPPLY SYSTEM

CONSULTANT

SARI In Joint Venture with **SGAPI**

Corporate Headquarter
10 Philip Lane, 1st Floor,
London EC3M 8AA,
United Kingdom

CONTRACTOR

DETAILED ENGINEERING DESIGN

DRAWING TITLE **DISTRIBUTION 02**
(0+600.00 - 1+200.00)

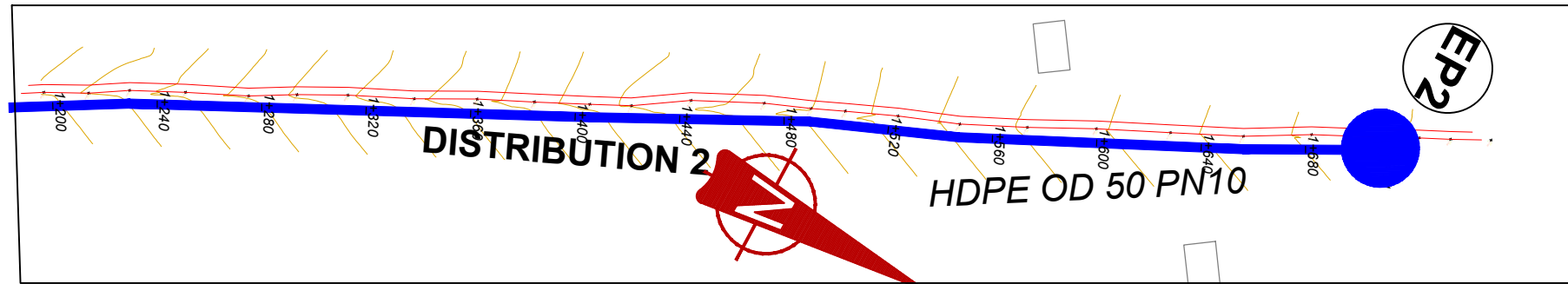
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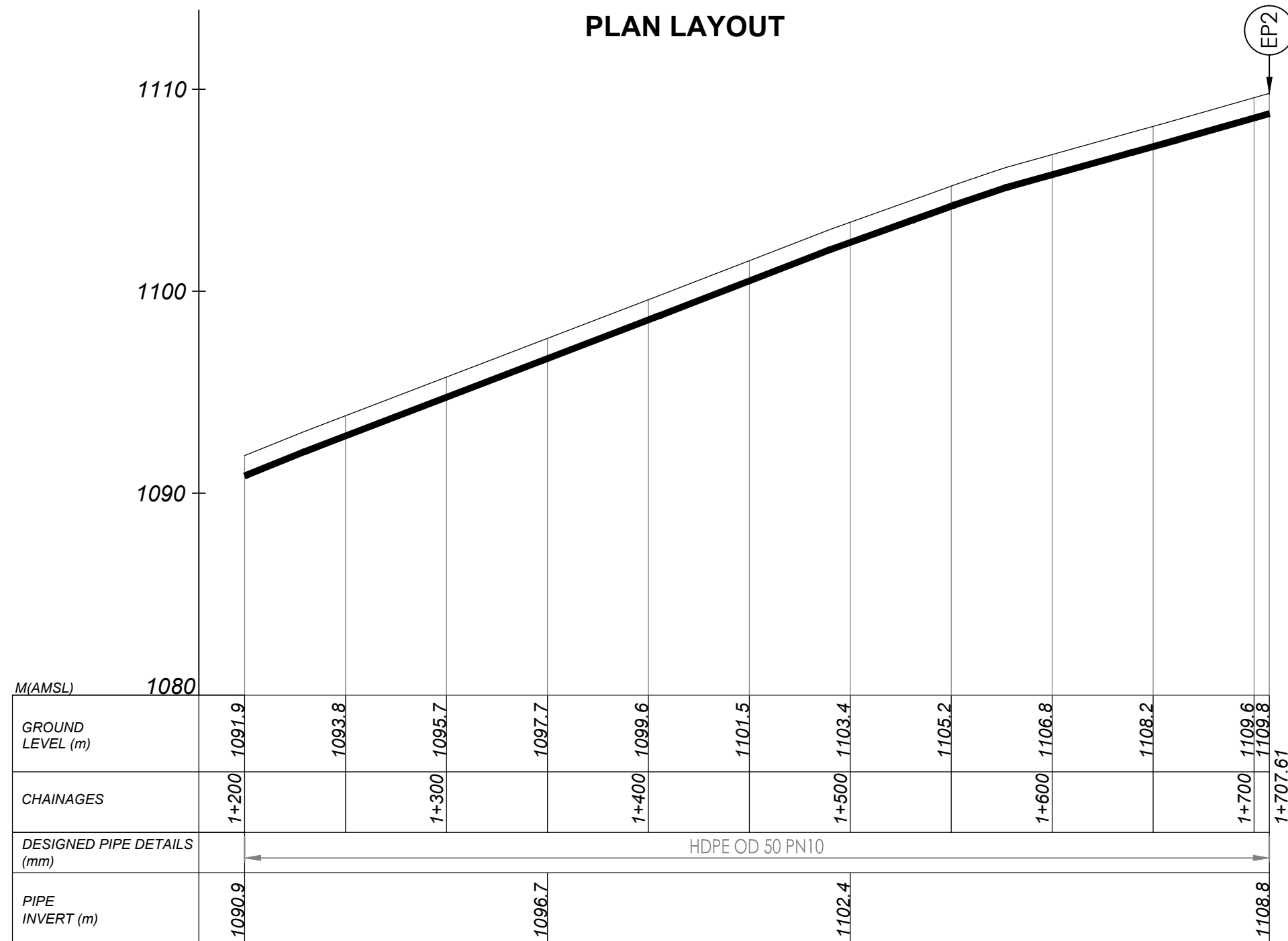
SURVEYED Evans Mpanga DESIGNED Otwane Dan.

DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare

DATE Oct 2021 APPROVED Rodney Barugahare.



PLAN LAYOUT

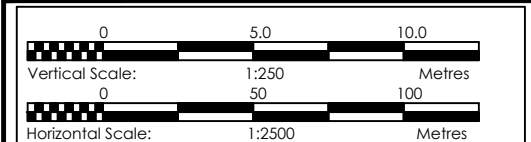


DISTRIBUTION 2 (1+200.00 - 1+707.61)

NOTES

LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- EP End pipe
- N01 Node N01
- WO-1 Washout Type1



CLIENT
GOVERNMENT OF UGANDA
MINISTRY OF WATER AND ENVIRONMENT

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PROJECT
CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

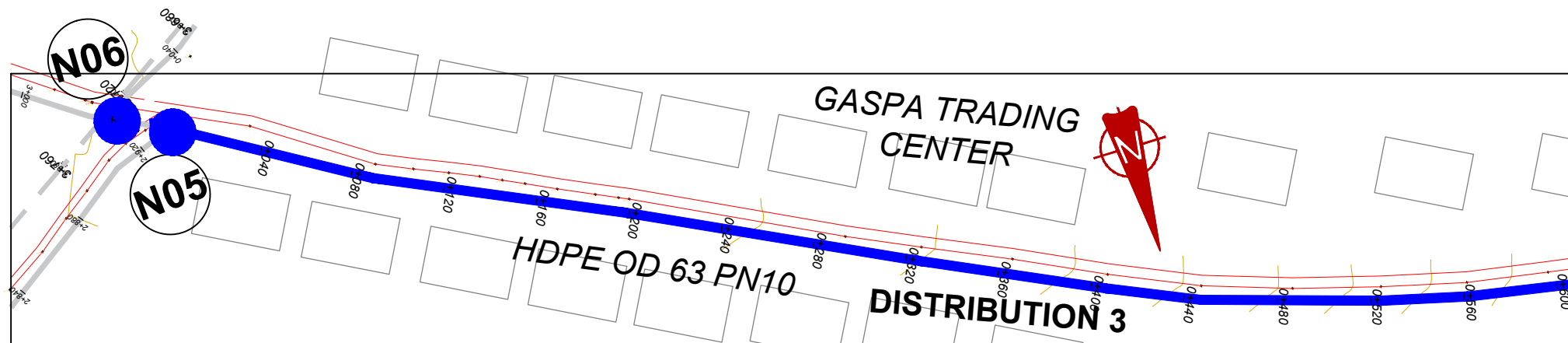
GASPA WATER SUPPLY SYSTEM

CONSULTANT
SARI
Corporate Headquarter
10 Philip Lane, 1st Floor,
London EC3M 8AA,
United Kingdom
In Joint Venture with
SGAPI

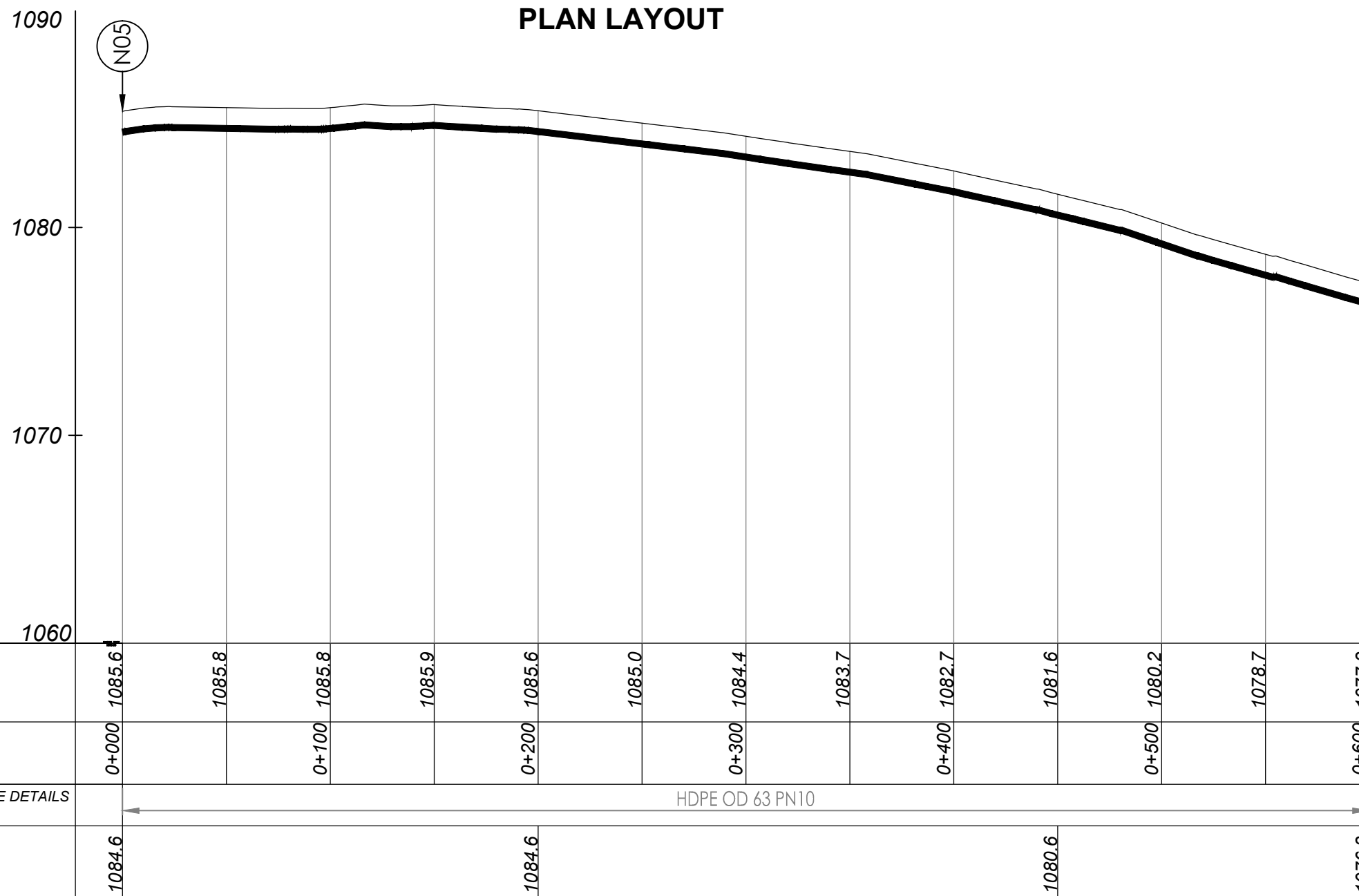
CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE
DISTRIBUTION 02
(1+200.00 - 1+707.61)

SCALE
Vert, 1:250
Hori, 1:2500
DRAWING No. GPA/WS/5.2.3
SURVEYED Evans Mpanga DESIGNED Otwane Dan.
DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare
DATE Oct 2021 APPROVED Rodney Barugahare.



PLAN LAYOUT

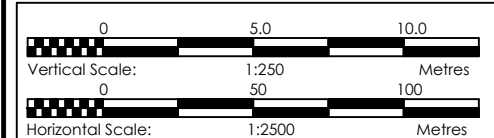


DISTRIBUTION 3 (0+000.00 - 0+600.00)

NOTES

LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- EP End pipe
- N01 Node N01
- WO-1 Washout Type1



CLIENT
GOVERNMENT OF UGANDA
MINISTRY OF WATER AND ENVIRONMENT

CO-FINANCED BY:
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PROJECT
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,
DETAILED ENGINEERING DESIGN AND CONSTRUCTION
SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY
SYSTEMS AND SANITATION FACILITIES IN REFUGEE
SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND
NORTHERN UGANDA IN KIRYANDONGO DISTRICT

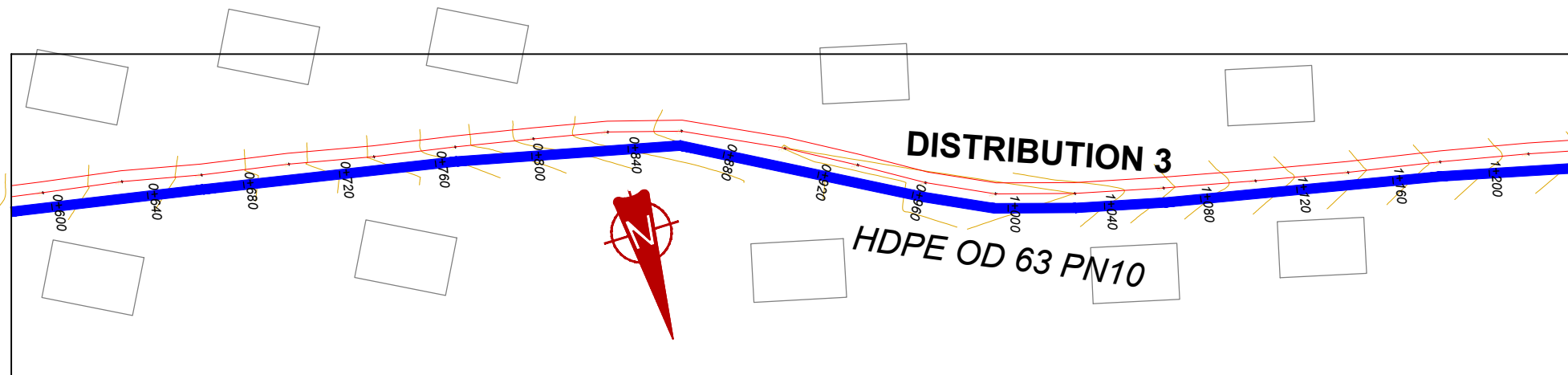
GASPA WATER SUPPLY SYSTEM

CONSULTANT
SARI
Corporate Headquarter
10 Philip Lane, 1st Floor,
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United Kingdom
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SGAPI

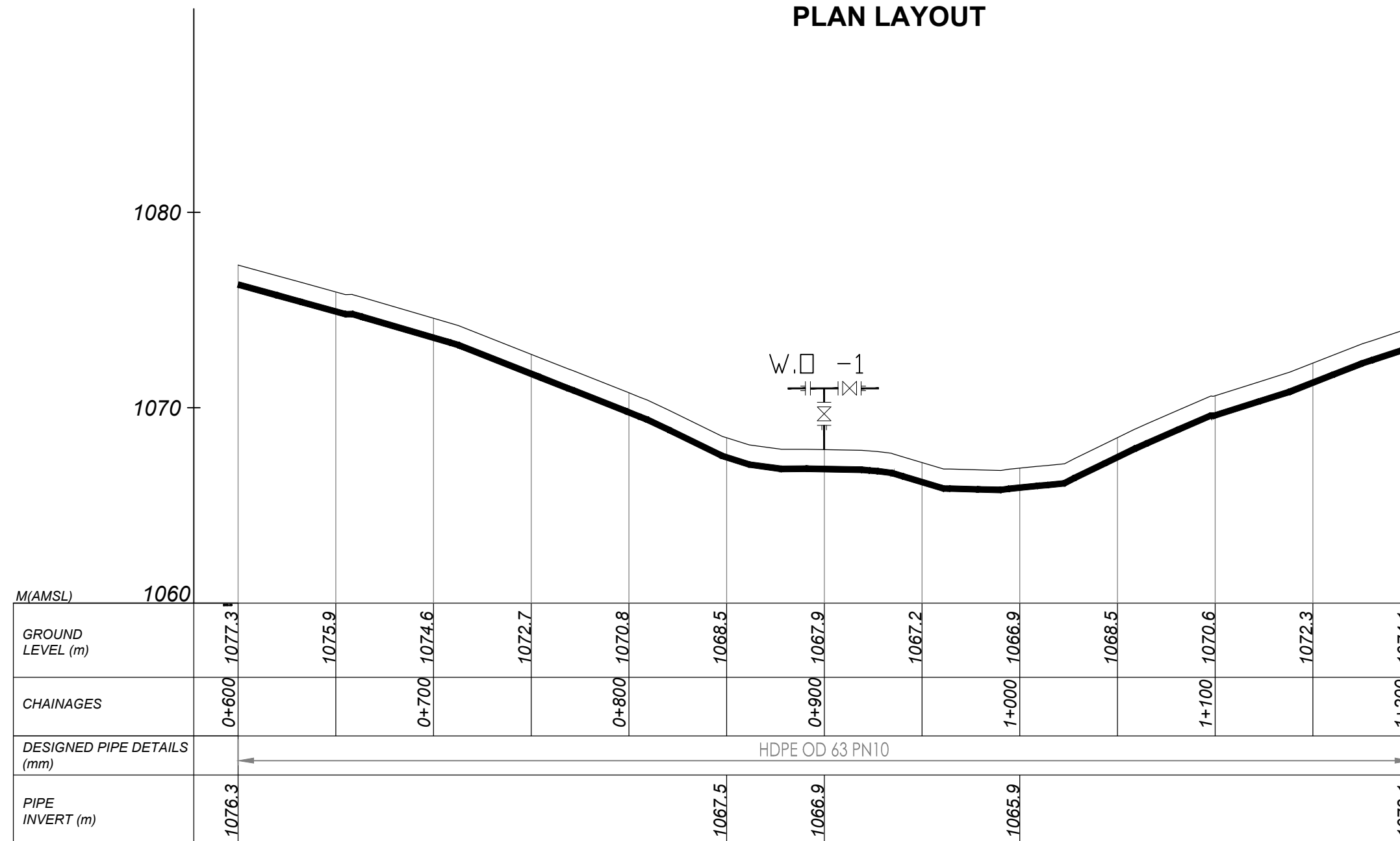
CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE
DISTRIBUTION 03
(0+000.00 - 0+600.00)

SCALE
Vert, 1:250
Hor, 1:2500
DRAWING No. GPA/WS/5.3.1
SURVEYED
Evans Mpanga
DESIGNED
Otwane Dan.
DRAWN
Joshua Nyarwanda
CHECKED
Rodney Barugahare
DATE
Oct 2021
APPROVED
Rodney Barugahare.



PLAN LAYOUT

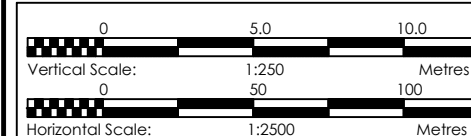


DISTRIBUTION 3 (0+600.00 - 1+200.00)

NOTES

LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- EP End pipe
- N01 Node N01
- WO-1 Washout Type1



CLIENT
GOVERNMENT OF UGANDA
MINISTRY OF WATER AND ENVIRONMENT

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PROJECT
CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

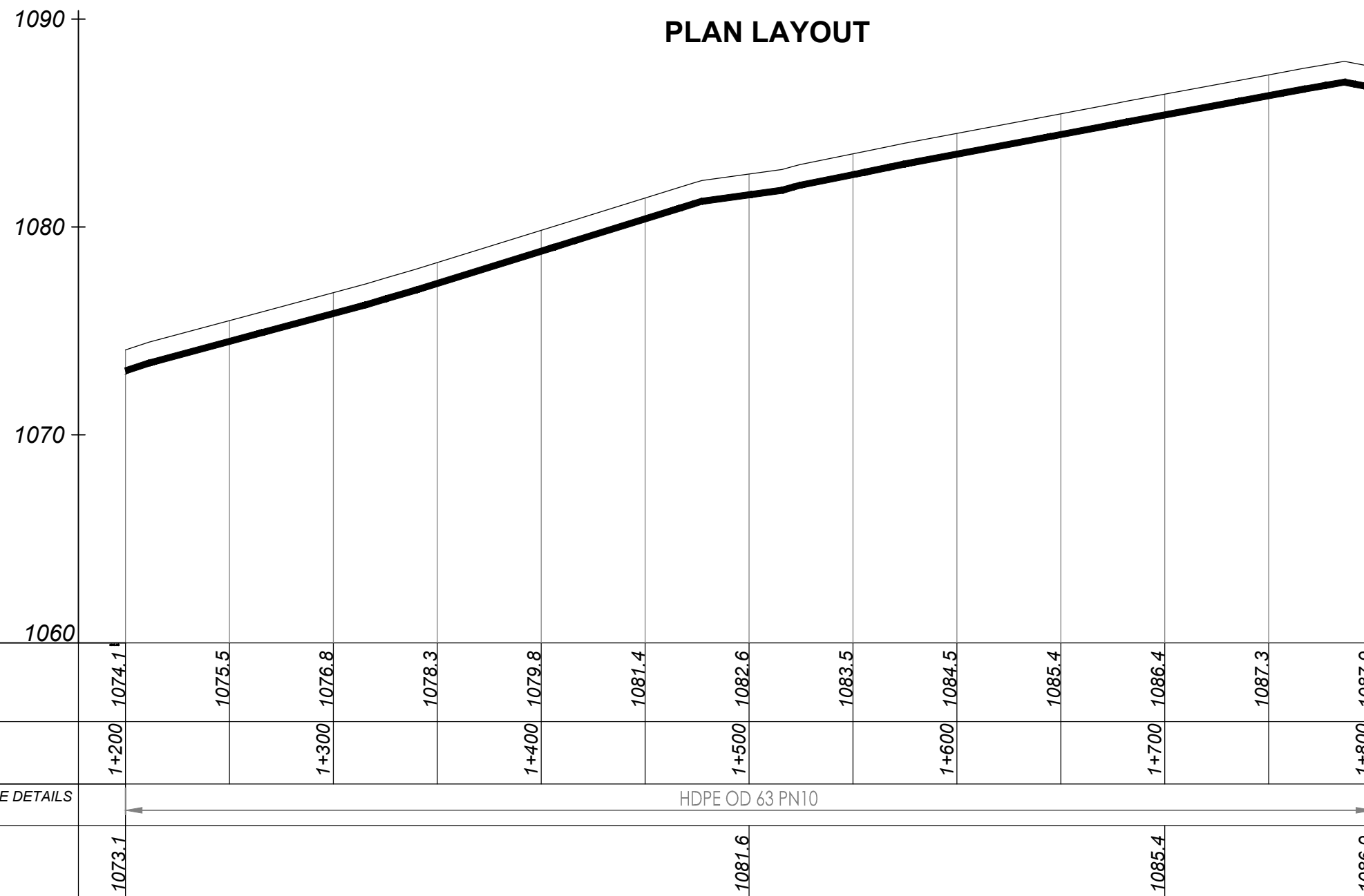
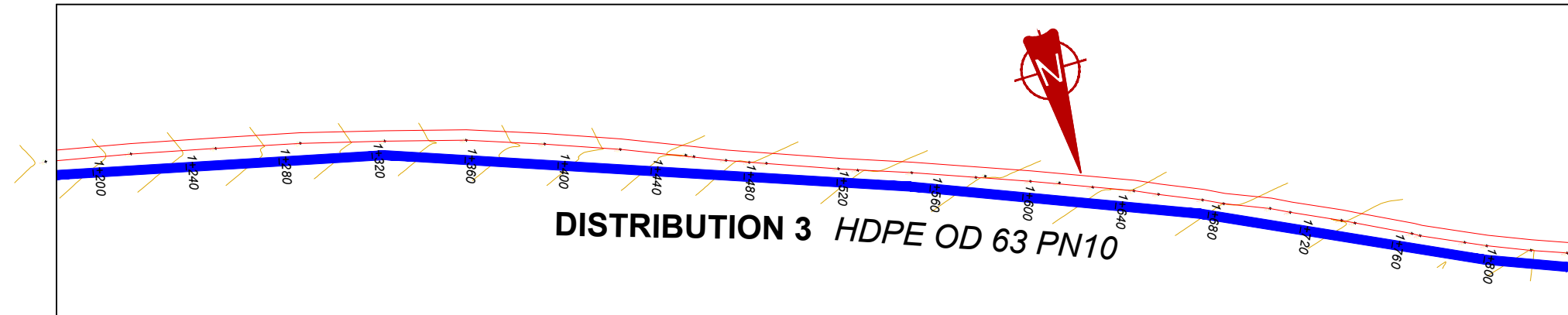
GASPA WATER SUPPLY SYSTEM

CONSULTANT
SARI
Corporate Headquarter
10 Philip Lane, 1st Floor,
London EC3M 8AA,
United Kingdom
In Joint Venture with
SGAPI

CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE
DISTRIBUTION 03
(0+600.00 - 1+200.00)

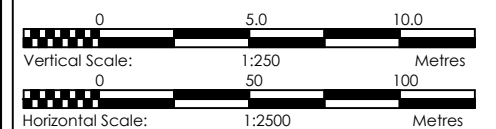
SCALE	Vert, 1:250 Hor, 1:2500	DRAWING No.	GPA/WS/5.3.2
SURVEYED	Evans Mpanga	DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	Oct 2021	APPROVED	Rodney Barugahare.



NOTES

LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- EP End pipe
- N01 Node N01
- WO-1 Washout Type1



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GOVERNMENT OF UGANDA
MINISTRY OF WATER AND ENVIRONMENT

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CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

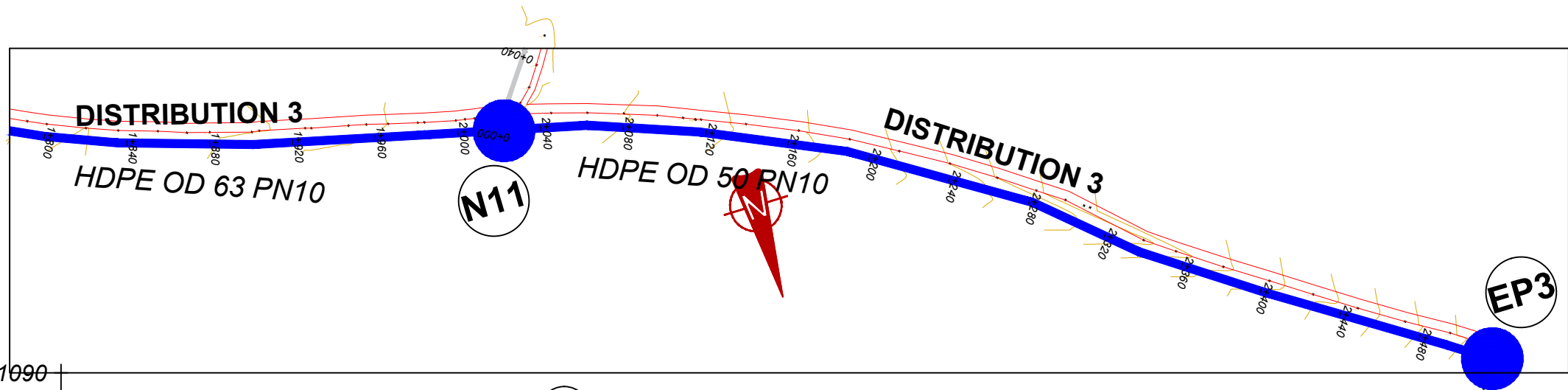
GASPA WATER SUPPLY SYSTEM

CONSULTANT
SARI
Corporate Headquarter
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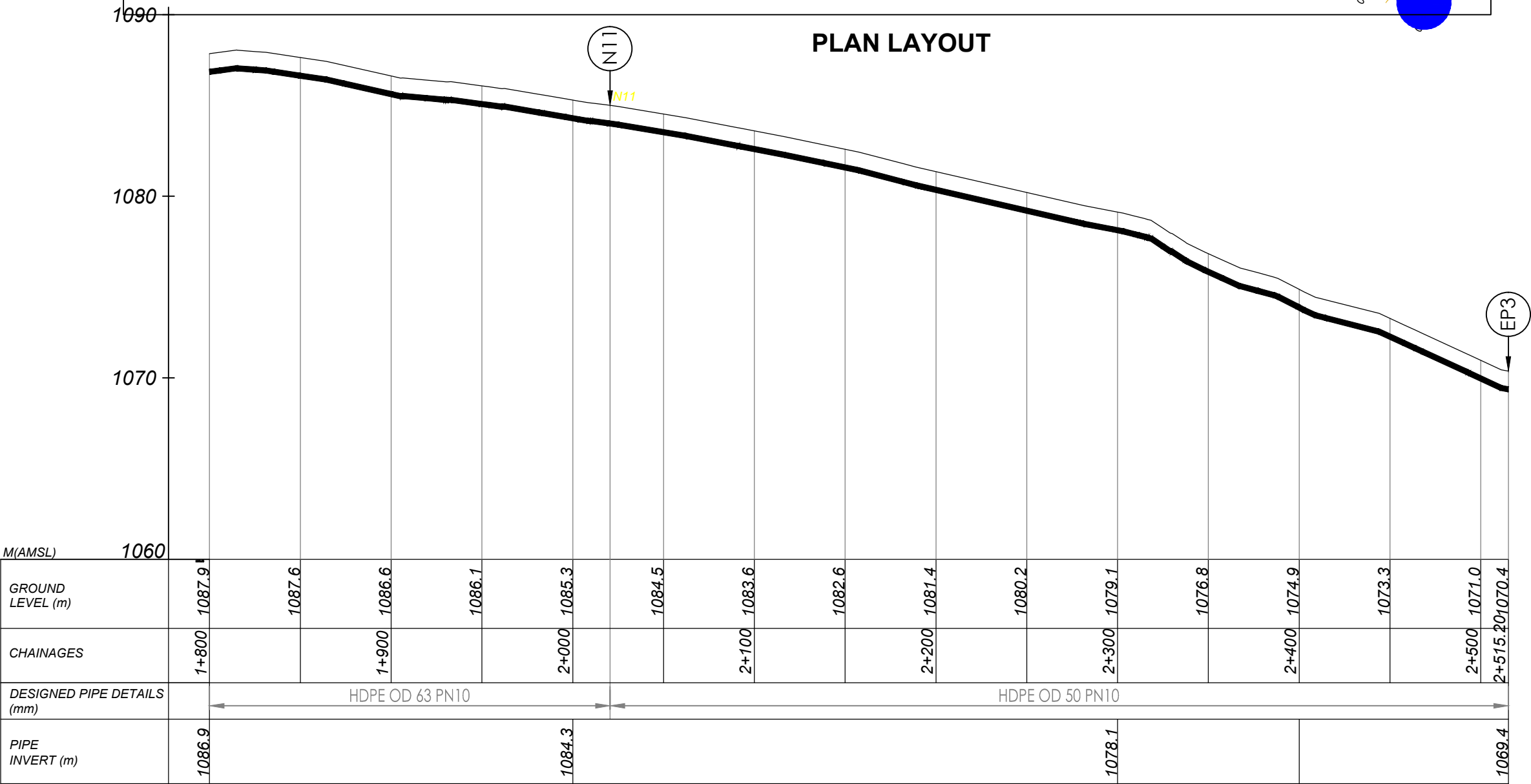
CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE
DISTRIBUTION 03
(1+200.00 - 1+800.00)

SCALE
Vert, 1:250
Hori, 1:2500
DRAWING No. GPA/WS/5.3.3
SURVEYED Evans Mpanga
DESIGNED Otwane Dan.
DRAWN Joshua Nyarwanda
CHECKED Rodney Barugahare
DATE Oct 2021
APPROVED Rodney Barugahare.



PLAN LAYOUT

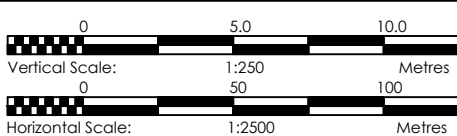


DISTRIBUTION 3 (1+800.00 - 2+515.20)

NOTES

LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- EP End pipe
- N01 Node N01
- WO-1 Washout Type1



CLIENT
GOVERNMENT OF UGANDA
MINISTRY OF WATER AND ENVIRONMENT

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PROJECT
CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

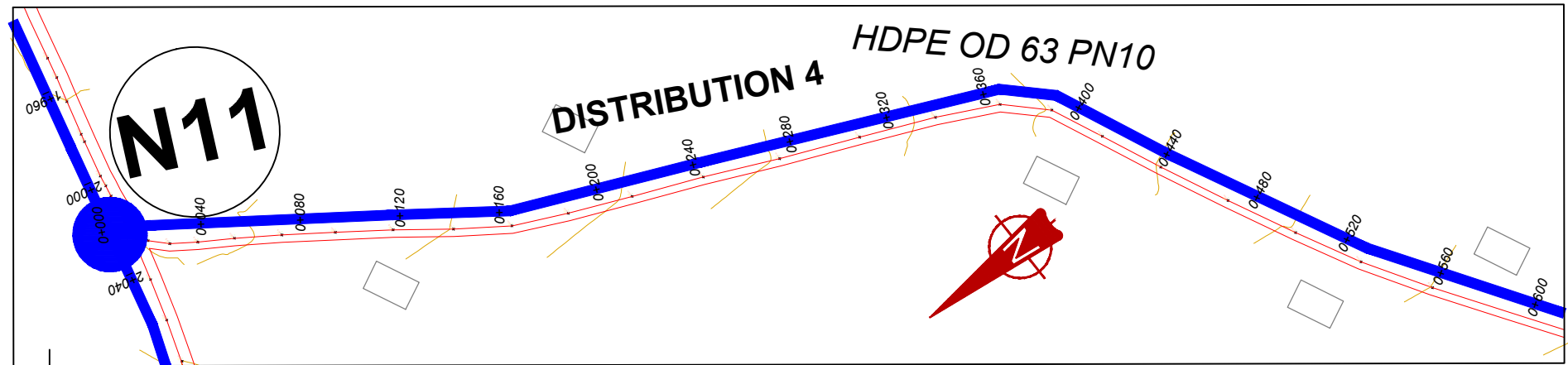
GASPA WATER SUPPLY SYSTEM

CONSULTANT
SARI In Joint Venture with **SGAPI**
Corporate Headquarter
10 Philip Lane, 1st Floor,
London EC3M 8AA,
United Kingdom

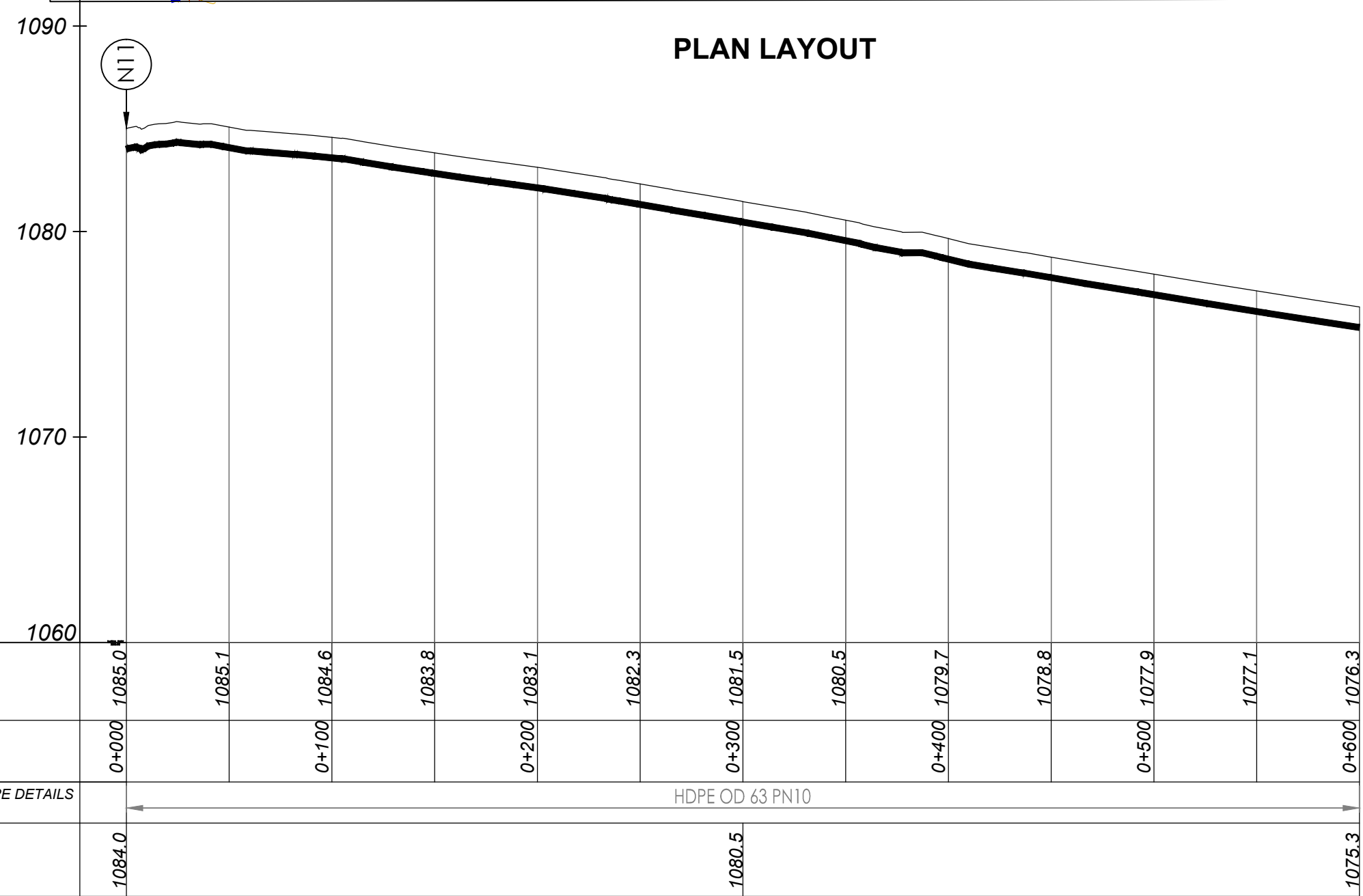
CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE **DISTRIBUTION 03**
(1+800.00 - 2+515.20)

SCALE	Vert, 1:250 Hor, 1:2500	DRAWING No.	GPA/WS/5.3.4
SURVEYED	Evans Mpanga	DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	Oct 2021	APPROVED	Rodney Barugahare.



PLAN LAYOUT

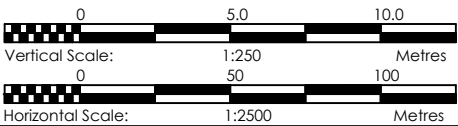


DISTRIBUTION 4 (0+000.00 - 0+600.00)

NOTES

LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- EP End pipe
- N01 Node N01
- WO-1 Washout Type1



CLIENT
GOVERNMENT OF UGANDA
MINISTRY OF WATER AND ENVIRONMENT

CO-FINANCED BY:
THE WORLD BANK AND GOVERNMENT OF UGANDA

PROJECT
CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

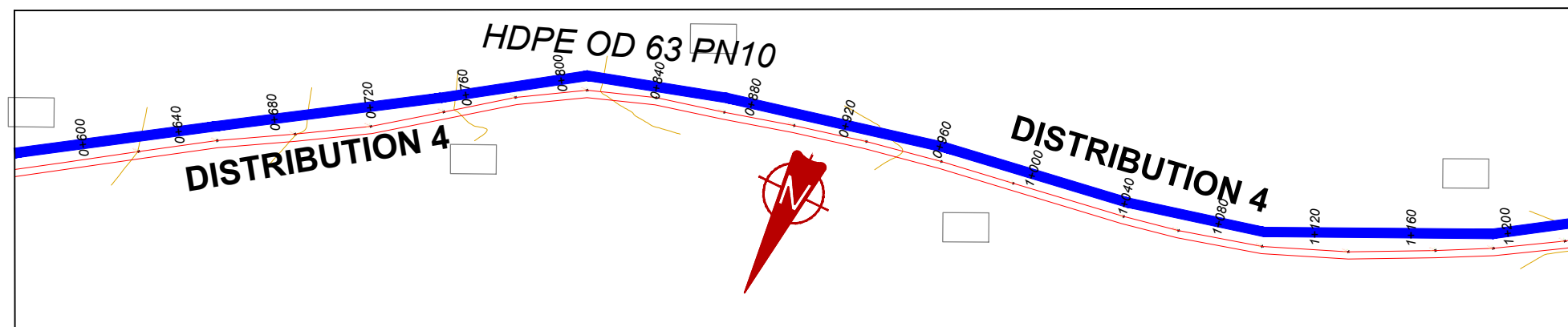
GASPA WATER SUPPLY SYSTEM

CONSULTANT
SARI In Joint Venture with **SGAPI**
Corporate Headquarter
10 Philip Lane, 1st Floor,
London EC3M 8AA,
United Kingdom

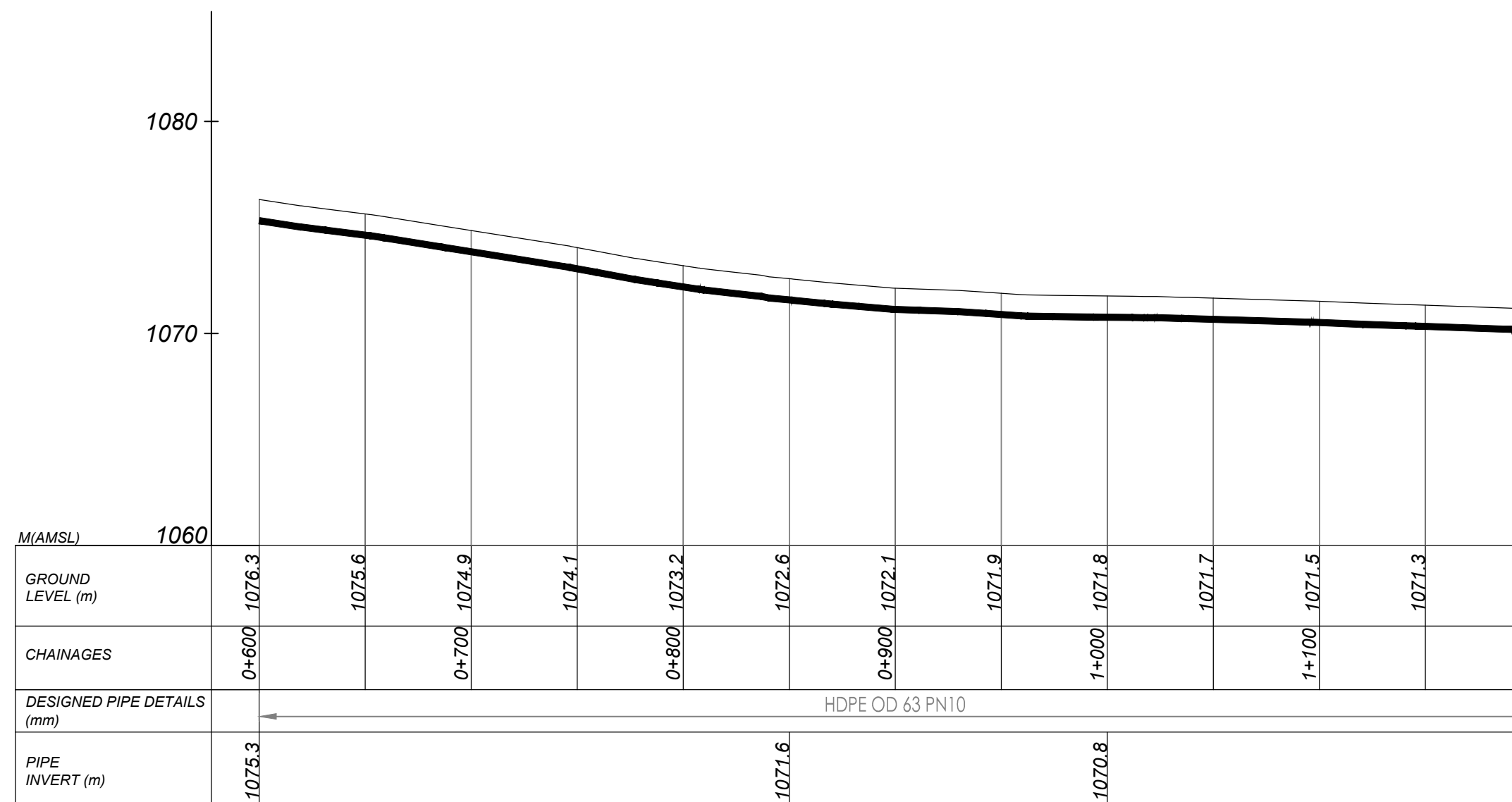
CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE **DISTRIBUTION 04**
(0+000.00 - 0+600.00)

SCALE Vert, 1:250
Hori, 1:2500
DRAWING No. GPA/WS/5.4.1
SURVEYED Evans Mpanga DESIGNED Otwane Dan.
DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare
DATE Oct 2021 APPROVED Rodney Barugahare.



PLAN LAYOUT

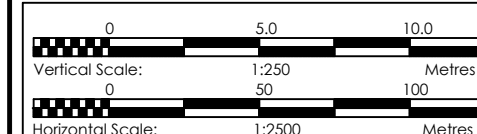


DISTRIBUTION 4 (0+600.00 - 1+200.00)

NOTES

LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- EP End pipe
- N01 Node N01
- WO-1 Washout Type1



CLIENT
GOVERNMENT OF UGANDA
MINISTRY OF WATER AND ENVIRONMENT

CO-FINANCED BY:
THE WORLD BANK AND GOVERNMENT OF UGANDA

PROJECT
CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

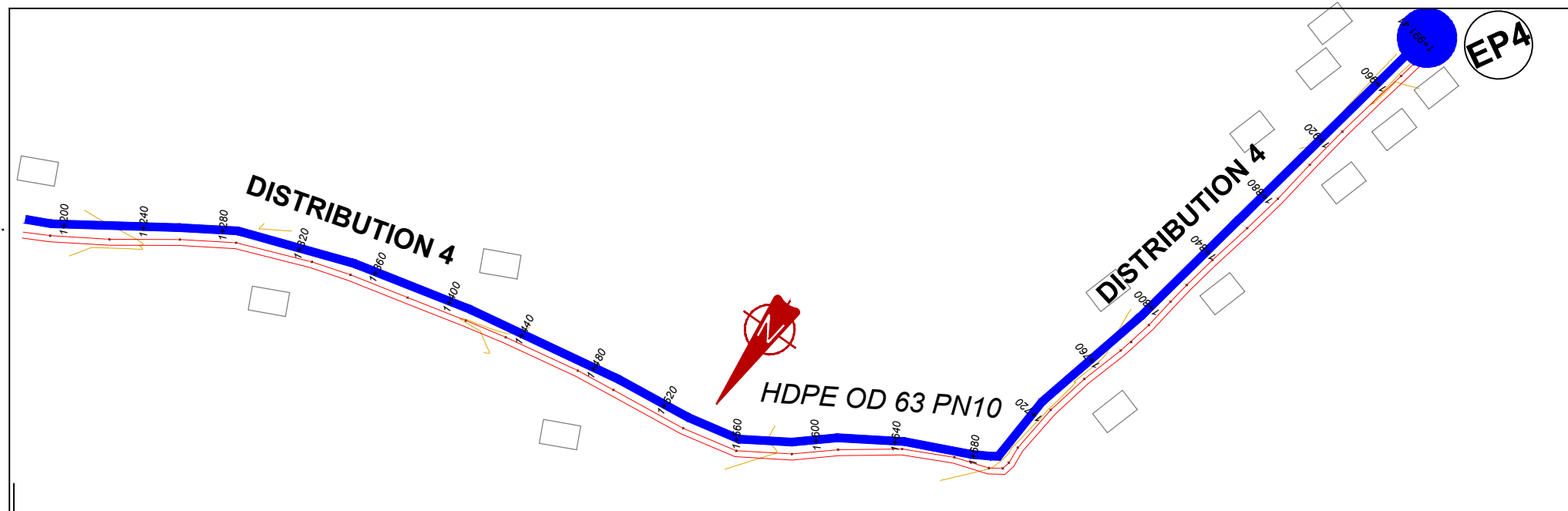
GASPA WATER SUPPLY SYSTEM

CONSULTANT
SARI
Corporate Headquarter
10 Philip Lane, 1st Floor,
London EC3M 8AA,
United Kingdom
In Joint Venture with
SGAPI

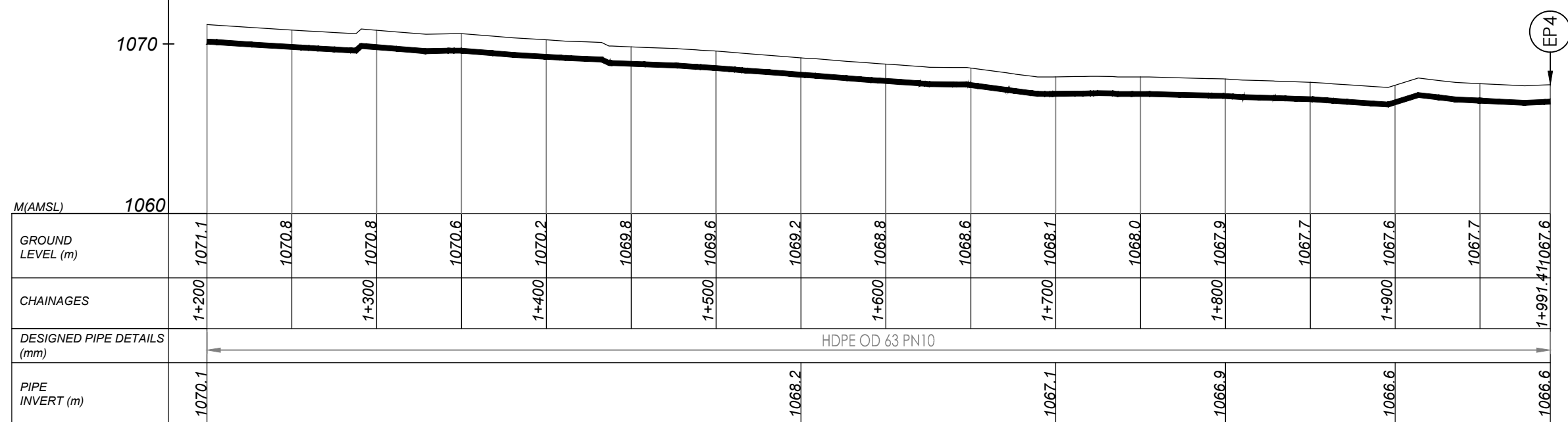
CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE
DISTRIBUTION 04
(0+600.00 - 1+200.00)

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SURVEYED	Evans Mpanga	DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	Oct 2021	APPROVED	Rodney Barugahare.



PLAN LAYOUT

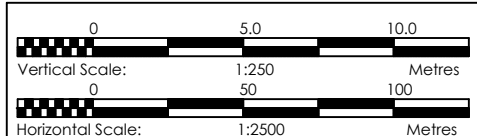


DISTRIBUTION 4 (1+200.00 - 1+991.41)

NOTES

LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- EP End pipe
- N01 Node N01
- WO-1 Washout Type1



CLIENT
GOVERNMENT OF UGANDA
MINISTRY OF WATER AND ENVIRONMENT

CO-FINANCED BY:
THE WORLD BANK AND GOVERNMENT OF UGANDA

PROJECT
CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

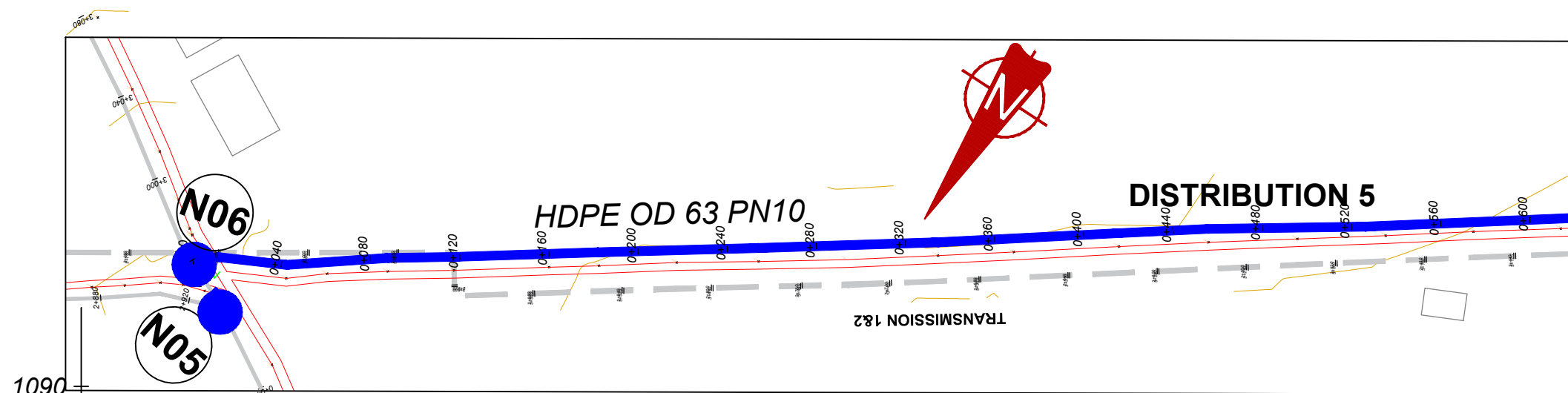
GASPA WATER SUPPLY SYSTEM

CONSULTANT
SARI In Joint Venture with **SGAPI**
Corporate Headquarter
10 Philip Lane, 1st Floor,
London EC3M 8AA,
United Kingdom

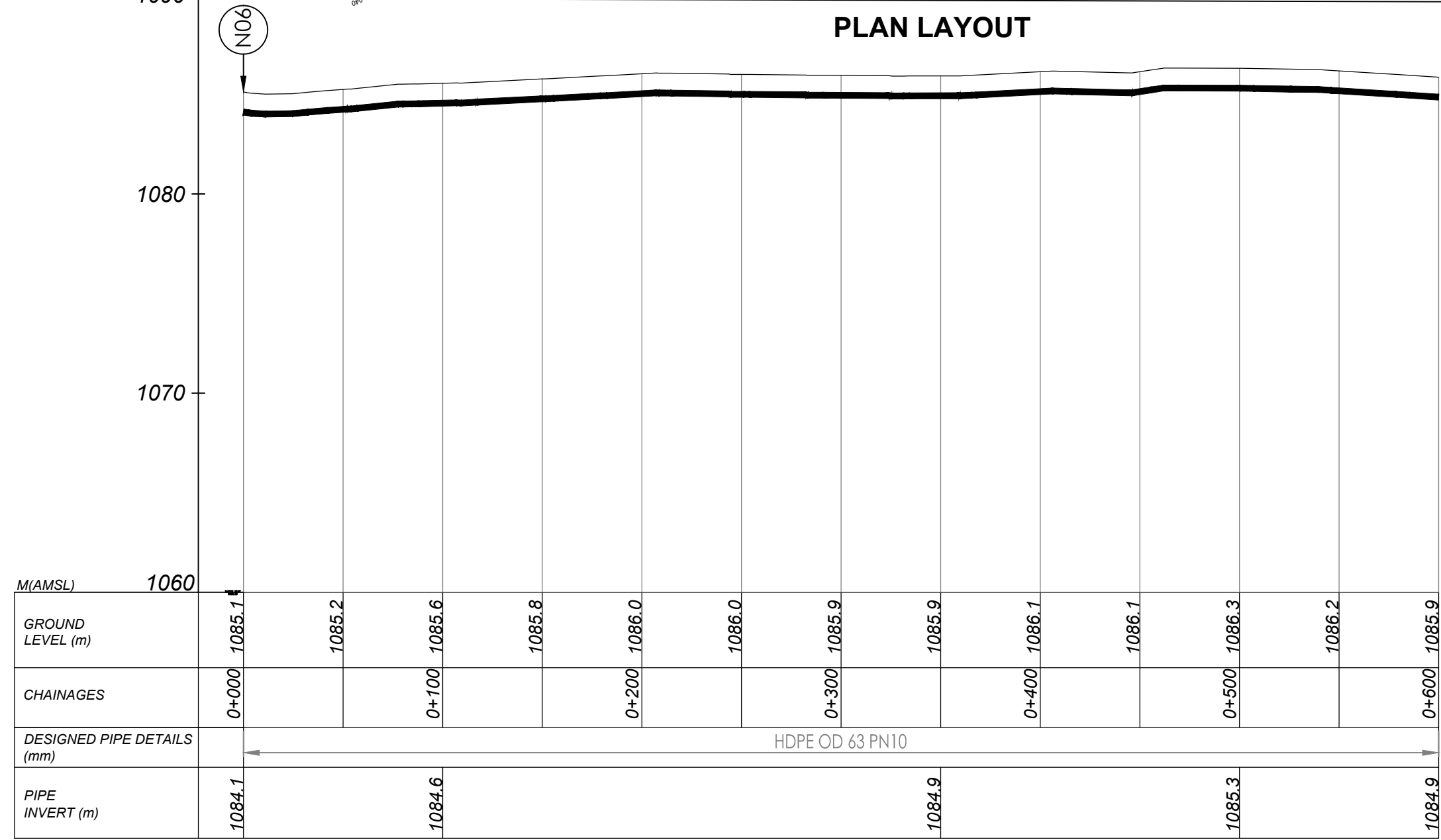
CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE **DISTRIBUTION 04**
(1+200.00 - 1+991.41)

SCALE	Vert, 1:250 Hori, 1:2500	DRAWING No.	GPA/WS/5.4.3
SURVEYED	Evans Mpanga	DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	Oct 2021	APPROVED	Rodney Barugahare.



PLAN LAYOUT

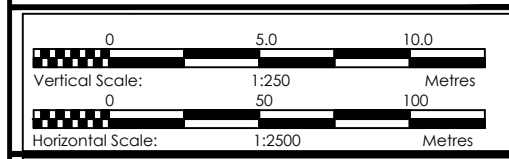


DISTRIBUTION 5 (0+000.00 - 0+600.00)

NOTES

LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- EP End pipe
- N01 Node N01
- WO-1 Washout Type1



CLIENT
GOVERNMENT OF UGANDA
MINISTRY OF WATER AND ENVIRONMENT

CO-FINANCED BY:
THE WORLD BANK AND GOVERNMENT OF UGANDA

PROJECT
CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

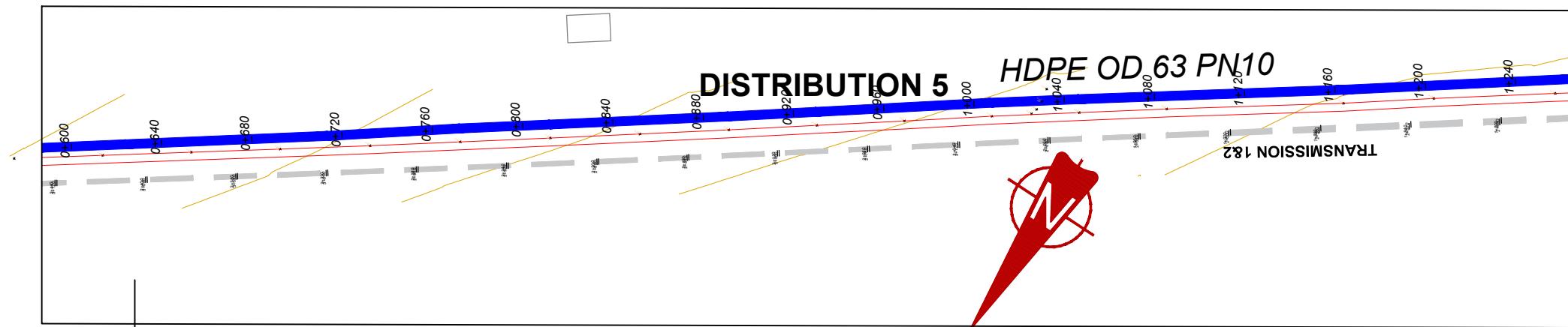
GASPA WATER SUPPLY SYSTEM

CONSULTANT
SARI In Joint Venture with **SGAPI**
Corporate Headquarter
10 Philip Lane, 1st Floor,
London EC3M 8AA,
United Kingdom

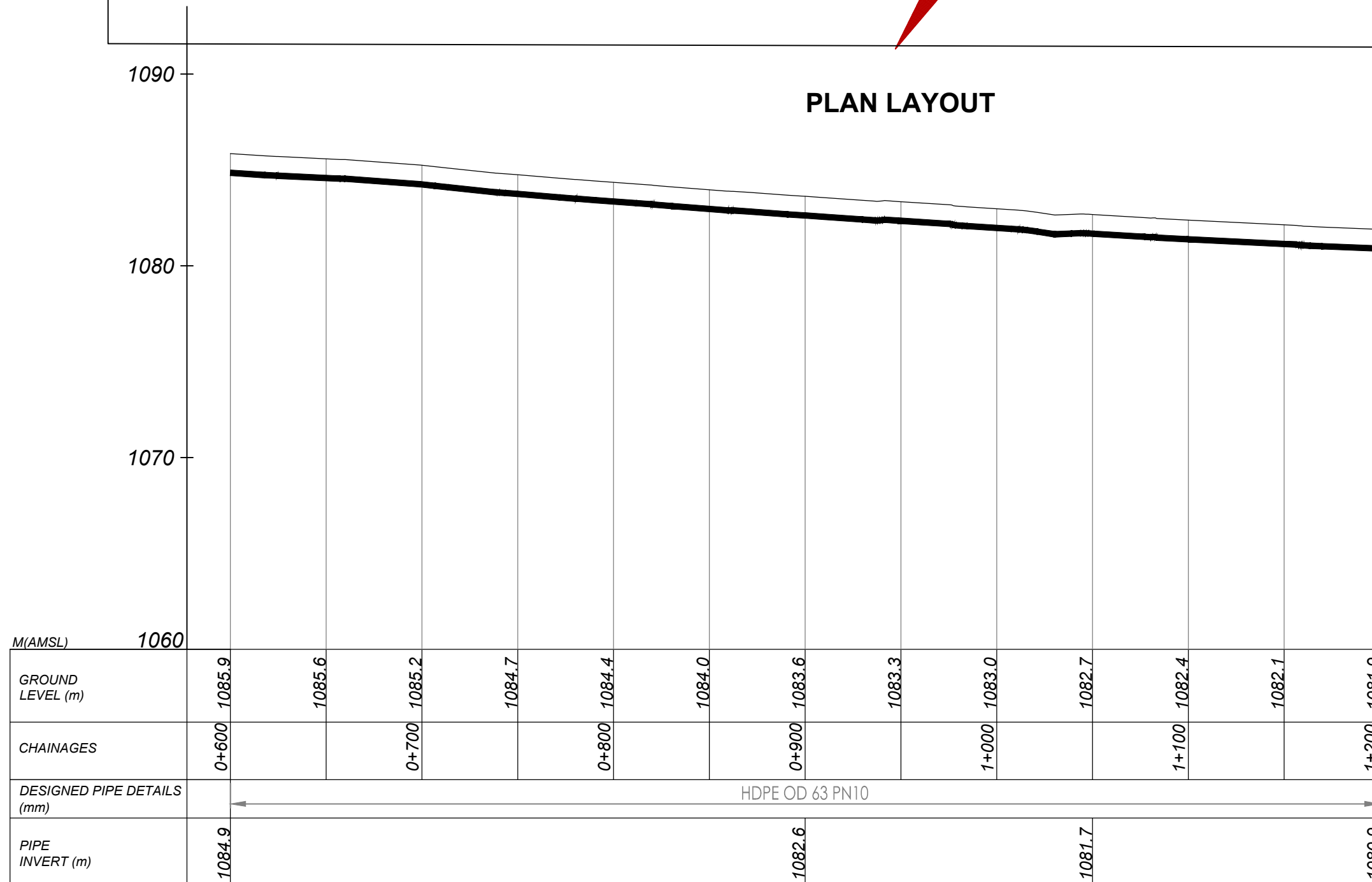
CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE **DISTRIBUTION 05**
(0+000.00 - 0+600.00)

SCALE	Vert, 1:250 Hori, 1:2500	DRAWING No.	GPA/WS/5.5.1
SURVEYED	Evans Mpanga	DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	Oct 2021	APPROVED	Rodney Barugahare.



PLAN LAYOUT

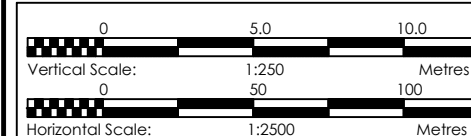


DISTRIBUTION 5 (0+600.00 - 1+200.00)

NOTES

LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- EP End pipe
- N01 Node N01
- WO-1 Washout Type1



CLIENT
GOVERNMENT OF UGANDA
MINISTRY OF WATER AND ENVIRONMENT

CO-FINANCED BY:
THE WORLD BANK AND GOVERNMENT OF UGANDA

PROJECT
CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

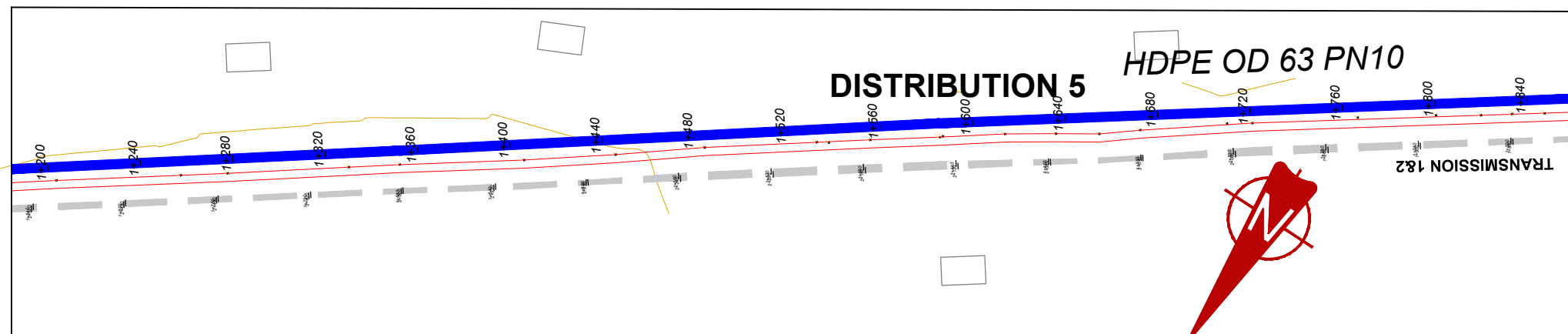
GASPA WATER SUPPLY SYSTEM

CONSULTANT
SARI In Joint Venture with **SGAPI**
Corporate Headquarter
10 Philip Lane, 1st Floor,
London EC3M 8AA,
United Kingdom

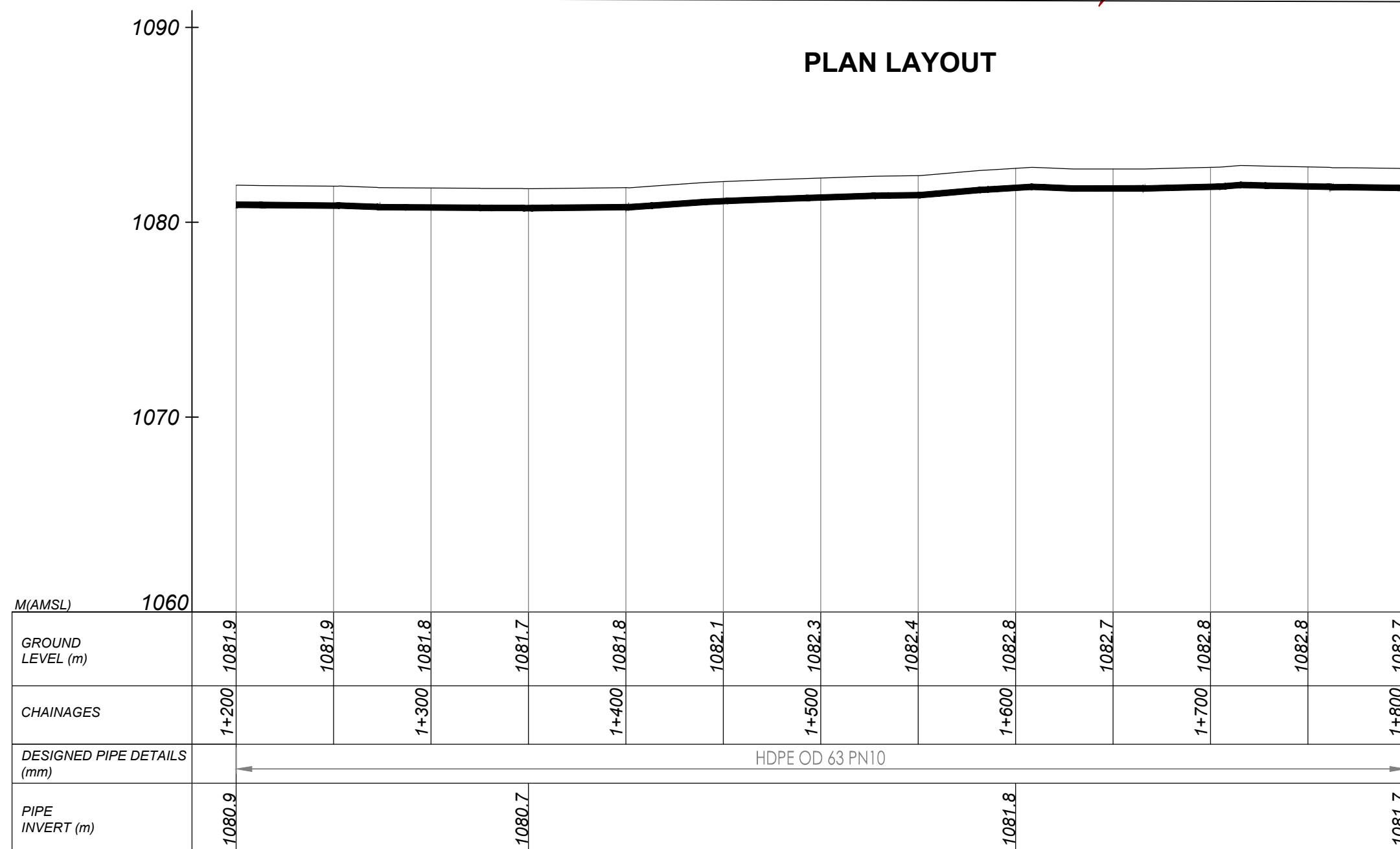
CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE **DISTRIBUTION 05**
(0+600.00 - 1+200.00)

SCALE	Vert, 1:250 Hor, 1:2500	DRAWING No.	GPA/WS/5.5.2
SURVEYED	Evans Mpanga	DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	Oct 2021	APPROVED	Rodney Barugahare.



PLAN LAYOUT

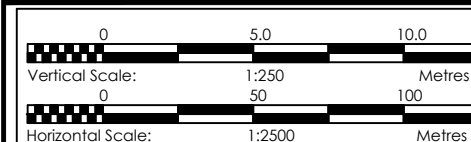


DISTRIBUTION 5 (1+200.00 - 1+800.00)

NOTES

LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- EP End pipe
- N01 Node N01
- WO-1 Washout Type1



CLIENT
GOVERNMENT OF UGANDA
MINISTRY OF WATER AND ENVIRONMENT

CO-FINANCED BY:
THE WORLD BANK AND GOVERNMENT OF UGANDA

PROJECT
CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

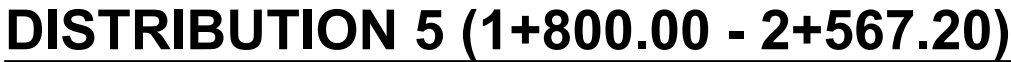
GASPA WATER SUPPLY SYSTEM

CONSULTANT
SARI In Joint Venture with **SGAPI**
Corporate Headquarter
10 Philip Lane, 1st Floor,
London EC3M 8AA,
United Kingdom

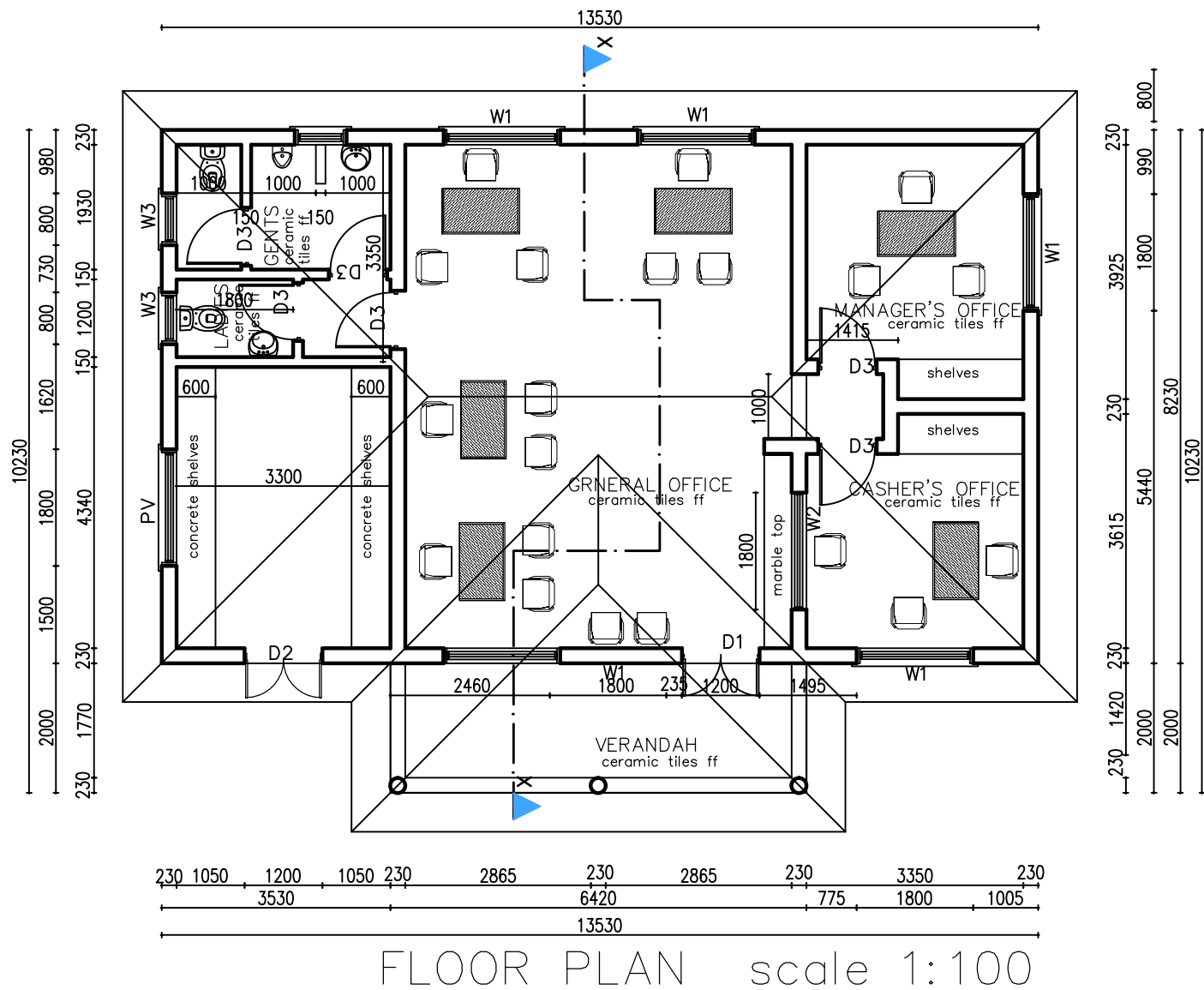
CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE **DISTRIBUTION 05**
(1+200.00 - 1+800.00)

SCALE Vert. 1:250
Hor. 1:2500
DRAWING No. GPA/WS/5.5.3
SURVEYED Evans Mpanga DESIGNED Otwane Dan.
DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare
DATE Oct 2021 APPROVED Rodney Barugahare.



SCALE	<i>Vert. 1:250</i> <i>Hori. 1:2500</i>	DRAWING No.	GPA/WS/5.5.4
SURVEYED	Evans Mpanga	DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	Oct 2021	APPROVED	Rodney Barugahare

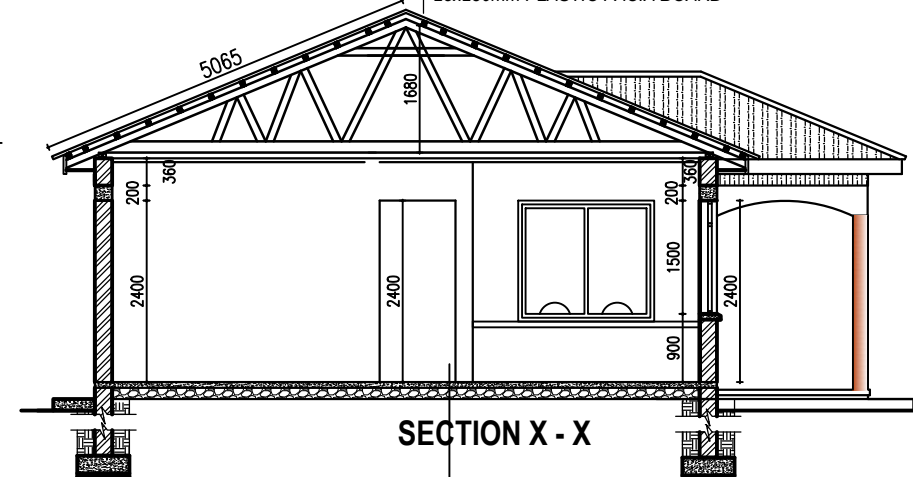


DOOR AND WINDOW SCHEDULES

DOOR SCHEDULE				
MARK	WIDTH	HEIGHT	No.	DESCRIPTION
D1	1200	2400	01	Steel Casement door, with 300mm vent over with clear glass panels, 4mm thick
D2	1200	2400	01	Steel Casement louver door, with 300mm vent over with mild steel plate panels, 1.5mm thick
D3	1500	2100	06	Solid Flush Door
WINDOW SCHEDULE				
W1	1800	1500	04	Casement steel window, with 300mm vent over with clear glass panels, 4mm thick
W2	1800	1500	01	Casement Aluminum window with 4mm thick glass panel and service opening
W3	800	900	01	Casement steel window, with 300mm vent over with frosted glass panels, 4mm thick
PV	1800	900	01	Casement steel Permanent Vent

GENERAL CEILING:
12.5mm thick CEMENT-SAND (mix 1:3) CAST ON EXPANDED METAL WIRE NAILED ONTO 100 x 50 TIMBER JOISTS AT 600 c/c AND 50 x 50 BRANDERINGS AT 600 c/c
12.5mm thick STEEL FLOAT FINISHED PLASTERED SOFFIT (mix 1:3)

ROOF SPECIFICATIONS: pitch=22.5°
APPROVED PREPAINTED HALF ROUND RIDGE ON Gauge 28, PREPAINTED ROOFING IRON TILE SHEETS ON 75 x 50 TIMBER PURLINS AT 450 c/c ON 100 x 50 RAFTERS, TIES & STRUTS SUPPORTED ON 150 x 50 TIE BEAMS AT 1800 c/c ON 100 x 75 WALL PLATE 25x230mm PLASTIC FACIA BOARD



FOUNDATION CONSTRUCTION NOTES:
100mm high CERAMIC TILE SKIRTING ON APPROVED FLOOR TILES FINISH ON 25mm thick CEMENT-SAND SCREED (Mix 1:3) wood float ON 100mm thick OVERSITE CONCRETE SLAB (Mix 1:3:6) ON 1000 gauge POLYETHENE DPM ON 150 Minimum SAND BLINDED HARDCORE ON COMPACTED EARTH / MURRAM

FOUNDATION DETAILS:
200mm THICK PLINTH WALL ON 200X690mm STRIP CONCRETE FOUNDATION ON 50mm CONCRETE BLINDING ON APPROVED LOAD BEARING SOIL FOUNDATION DEPTH TO BE DETERMINED ON SITE

NOTES



1. All dimensions are in mm unless stated otherwise.
2. All levels are in metres above sea level.
3. For Site location see Dwg. GOD/0.0.0
4. Structural details are not included.
5. All structural concrete is Class 25/10.
6. All mass concrete is Class 15/10.

CLIENT
 **GOVERNMENT OF UGANDA**
MINISTRY OF WATER AND ENVIRONMENT

CO-FINANCED BY:
 THE WORLD BANK AND  GOVERNMENT OF UGANDA

PROJECT
CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

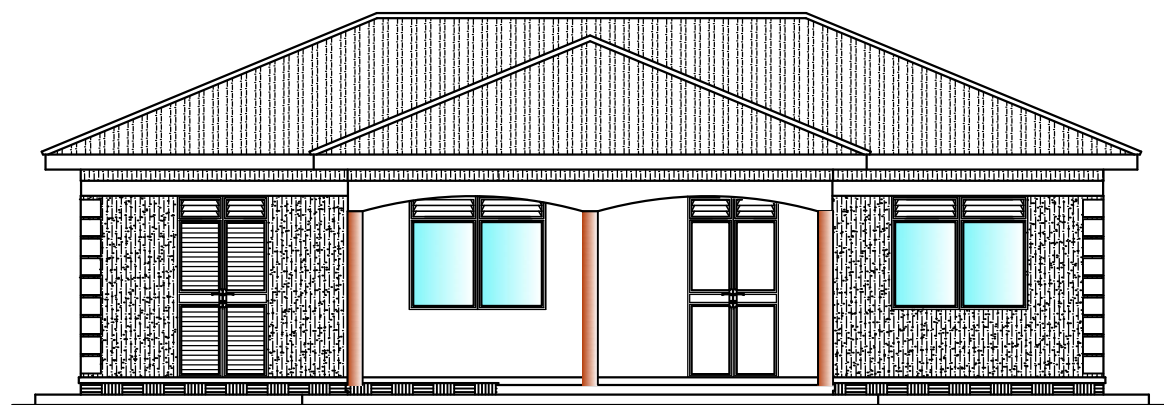
GASPA WATER SUPPLY SYSTEM

CONSULTANT
 **SARI**
Corporate Headquarter
10 Philpot Lane, 1st Floor,
London EC3M 8AA,
United Kingdom
In Joint Venture with  **SGAPI**

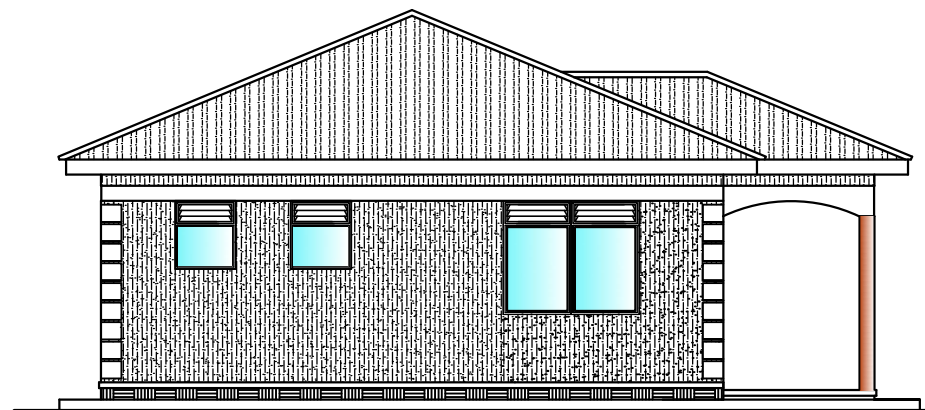
CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE
WATER OFFICE
FLOOR PLAN & SECTION

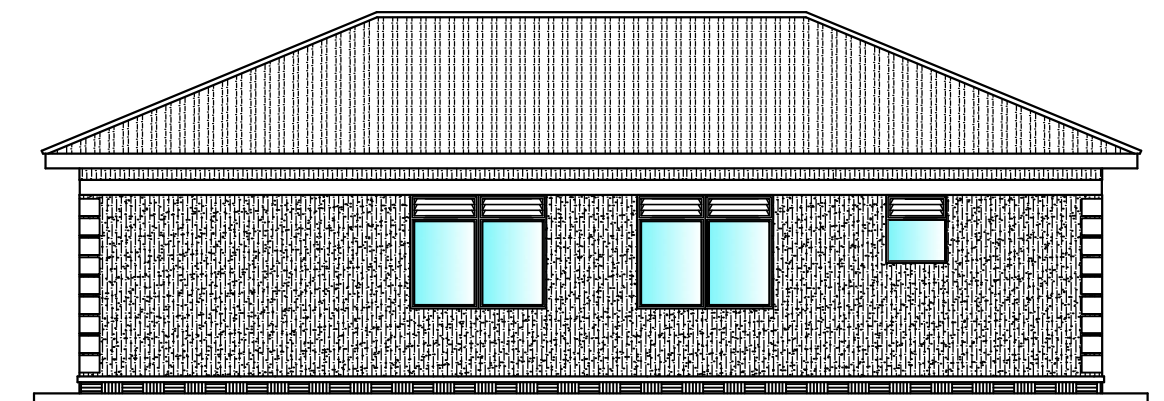
SCALE As Shown DRAWING No. GPA/WS/7.1
SURVEYED DESIGNED Otwane Dan.
DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare
DATE OCT 2021 APPROVED Rodney Barugahare.



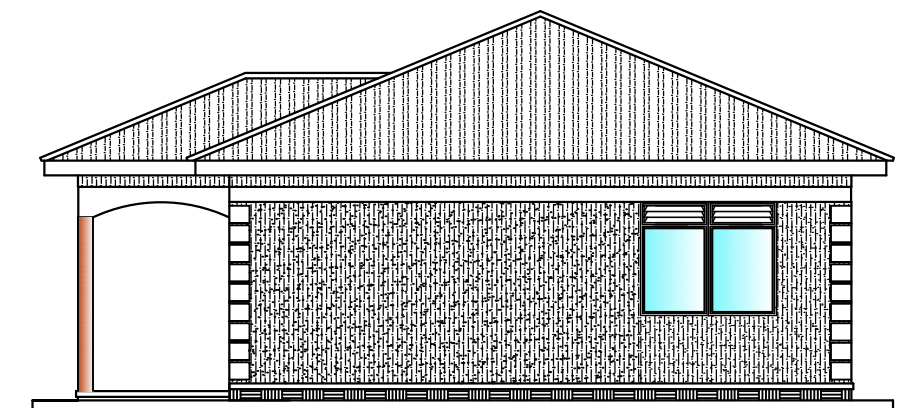
FRONT ELEVATION scale 1:100



LEFT END ELEVATION scale 1:100



BACK ELEVATION scale 1:100





RIGHT END ELEVATION scale 1:100

CLIENT
 **GOVERNMENT OF UGANDA**
MINISTRY OF WATER AND
ENVIRONMENT

CO-FINANCED BY:  AND 
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PROJECT
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,
DETAILED ENGINEERING DESIGN AND CONSTRUCTION
SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY
SYSTEMS AND SANITATION FACILITIES IN REFUGEE
SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND
NORTHERN UGANDA IN KIRYANDONGO DISTRICT

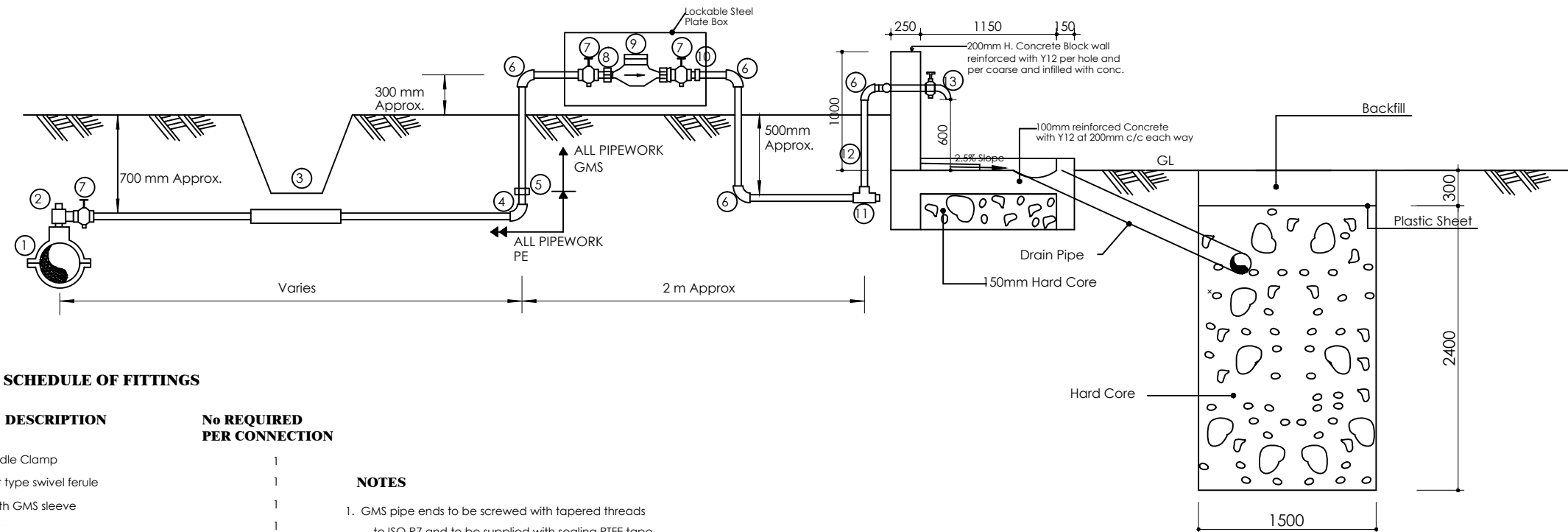
GASPA WATER SUPPLY SYSTEM

CONSULTANT
 **SARI** In Joint Venture with 
Corporate Headquarter
10 Philpot Lane, 1st Floor,
London EC3M 8AA,
United Kingdom

CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE
**WATER OFFICE
ELEVATIONS**

SCALE	As Shown	DRAWING No.	GPA/WS/7.2
SURVEYED		DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



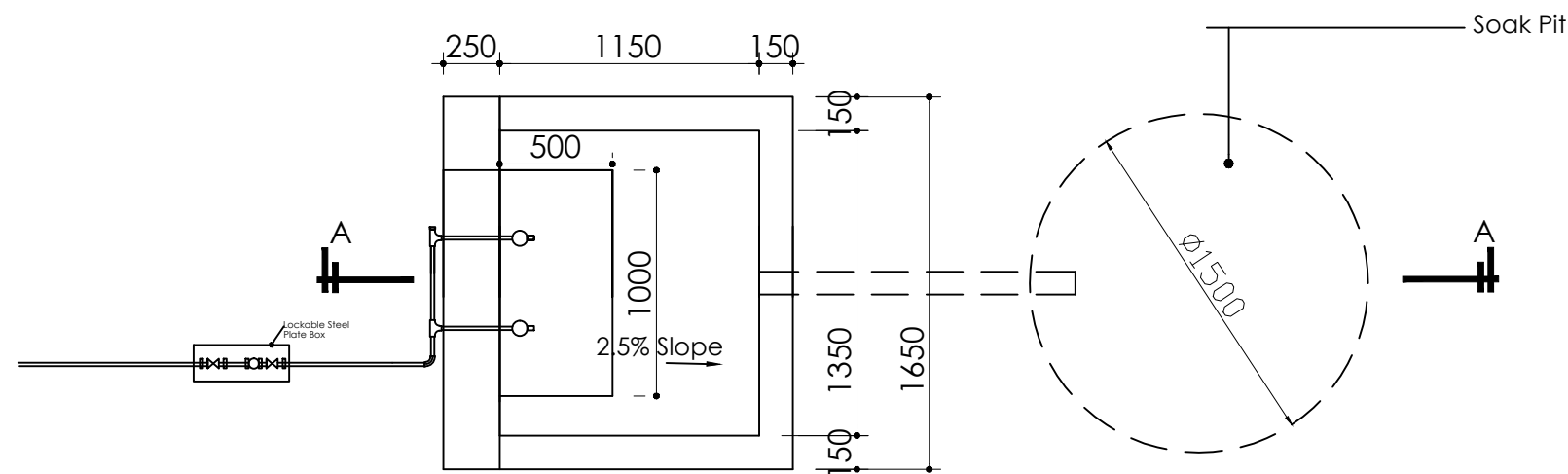
SCHEDULE OF FITTINGS

ITEM No	DESCRIPTION	No REQUIRED PER CONNECTION
1.	PVC Saddle Clamp	1
2.	PE Outlet type swivel ferule	1
3.	1m Length GMS sleeve	1
4.	PE Elbow	1
5.	PE/GMS Adaptor	1
6.	GMS Elbow	4
7.	Stop tap	3
8.	Male threaded connector	1
9.	Water meter	1
10.	Adjusting coupling	1
11.	GMS equal tee	1
12.	Plug	1
13.	Tap	1

NOTES

- GMS pipe ends to be screwed with tapered threads to ISO R7 and to be supplied with sealing PTFE tape
- GMS pipe fittings to be malleable cast iron to BS 143 and BS 1256 with female threaded ends
- The adjusting coupling shall be made of bronze or brass with a threaded female connection at the outlet end. It shall incorporate sufficient adjustment to permit removal at the meter
- All PE connections shall be of the push fit type
- Diameter of pipe varies

SECTION A-A



Standpost With 2 No. Faucets
PLAN

NOTES

- For site location see dwg. GPA/WS/0.0.0
- All levels in metres above mean sea level
- Unless otherwise stated, all dimensions are in mm
- Check all dimensions and elevations on site



PROJECT
CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

GASPA WATER SUPPLY SYSTEM



CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE
PUBLIC STAND POST
CONNECTION AND SOAK PIT DETAILS

SCALE	DRAWING No.	GPA/WS/8.1.1
SURVEYED	DESIGNED	Otwane Dan.
DRAWN Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE OCT 2021	APPROVED	Rodney Barugahare.



NOTES

1. GMS pipe ends to be screwed with tapered threads to ISO R7 and to be supplied with sealing PTFE tape
2. GMS pipe fittings to be malleable cast iron to BS 143 and BS 1256 with female threaded ends
3. The adjusting coupling shall be made of bronze or brass with a threaded female connection at the outlet end. It shall incorporate sufficient adjustment to permit removal at the meter
4. All PE connections shall be of the push fit type
5. Diameter of pipe varies

NOTES

1. For site location see dwg. GPA/WS/0.0.0
2. All levels in metres above mean sea level
3. Unless otherwise stated, all dimensions are in mm
4. Check all dimensions and elevations on site



GOVERNMENT OF UGANDA
MINISTRY OF WATER AND ENVIRONMENT

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AND



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PROJECT

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DETAILED ENGINEERING DESIGN AND CONSTRUCTION
SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY
SYSTEMS AND SANITATION FACILITIES IN REFUGEE
SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND
NORTHERN UGANDA IN KIRYANDONGO DISTRICT

GASPA WATER SUPPLY SYSTEM

CONSULTANT



CONTRACTOR

DETAILED ENGINEERING DESIGN

DRAWING TITLE

TYPICAL YARD CONNECTION CONNECTION AND SOAK PIT DETAILS

SCALE

As Shown

DRAWING No.

GPA/W/8.1.2

DRAWN

Joshua Nyarwanda

CHECKED

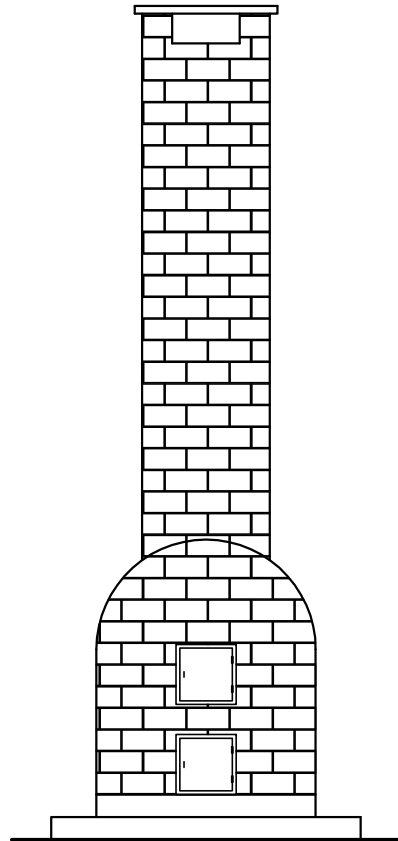
Rodney Barugahare

DATE	OCT 2021
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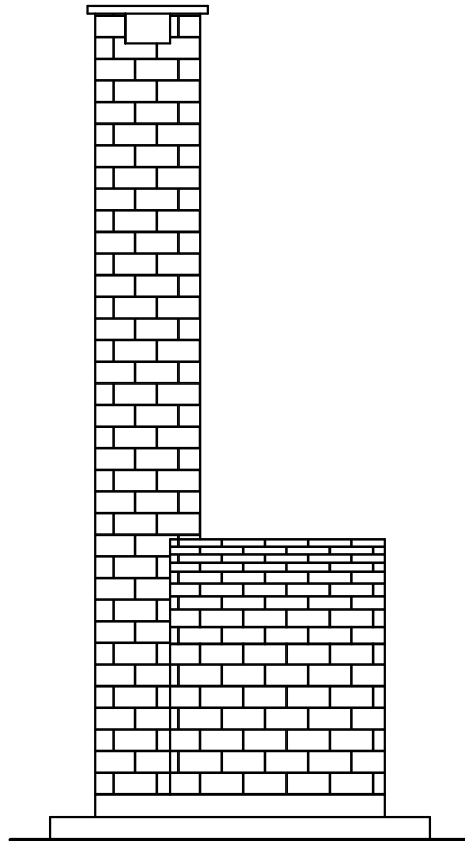
OCT 2021

APPROVED

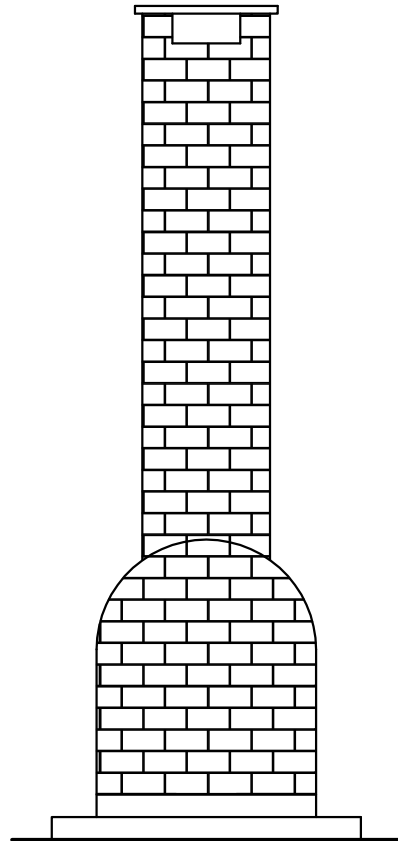
Rodney Barugahare.



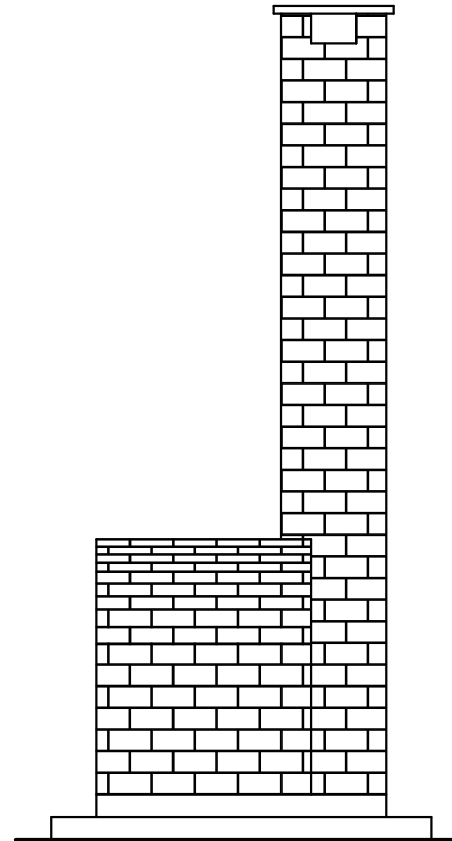
ELEVATION A



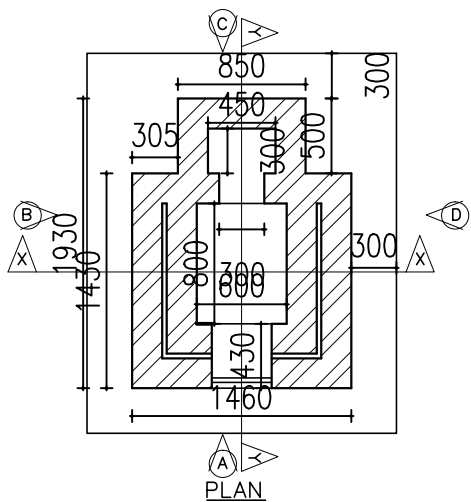
ELEVATION B



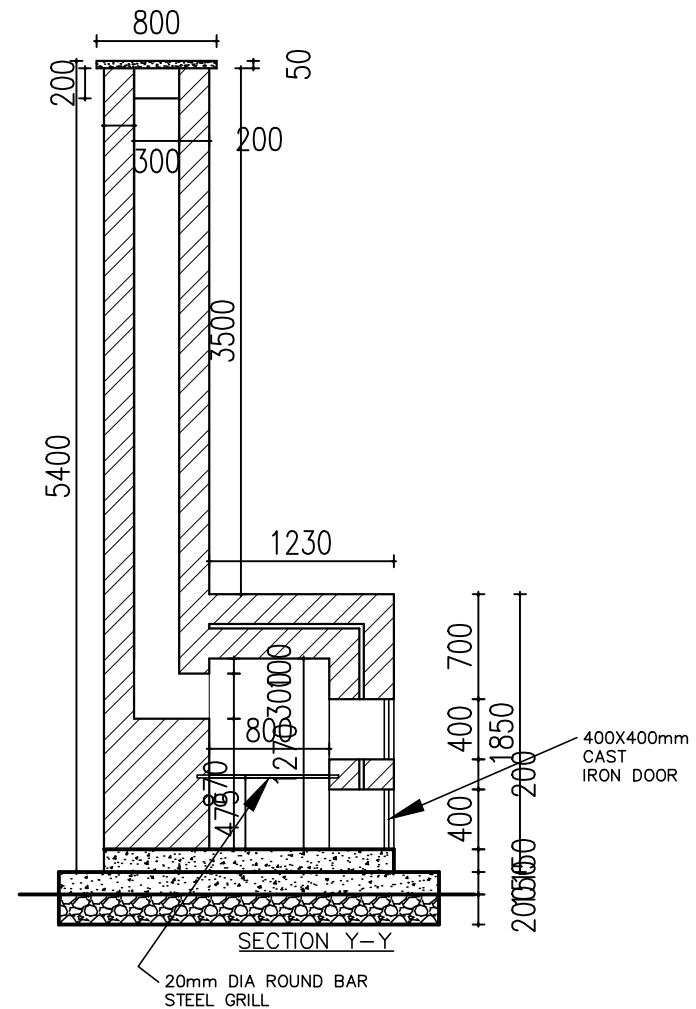
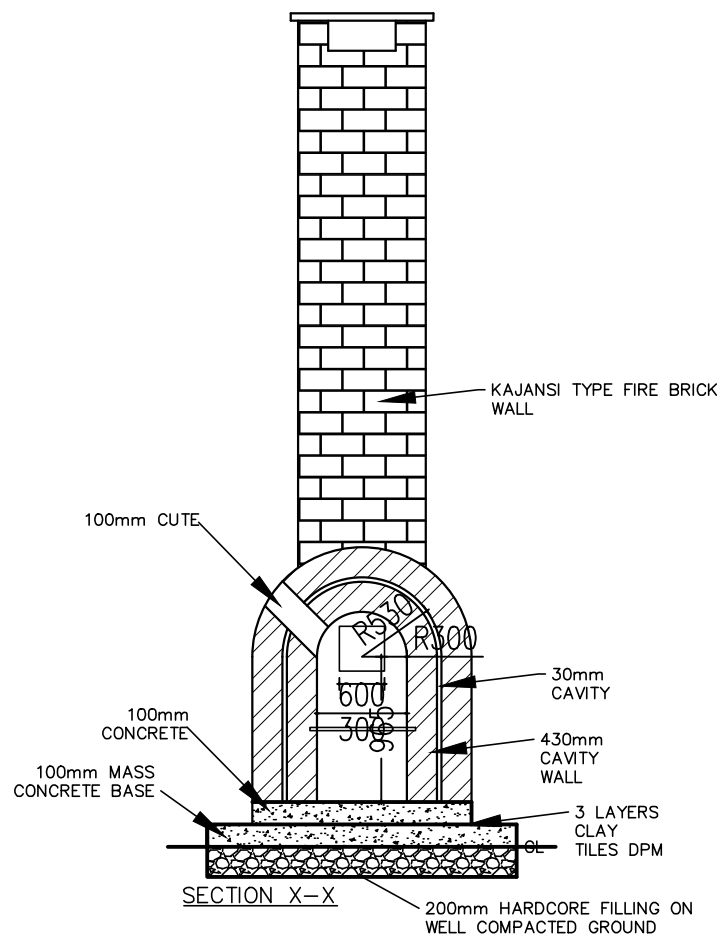
ELEVATION C



ELEVATION D



PLAN



NOTES

1. Unless otherwise stated, all dimensions are in mm
2. Concrete grade to be C20/10.
3. All levels in metres above mean sea level.

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 **GOVERNMENT OF UGANDA**
MINISTRY OF WATER AND ENVIRONMENT

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CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

GASPA WATER SUPPLY SYSTEM

CONSULTANT
 In Joint Venture with 
Corporate Headquarter
10 Philpot Lane, 1st Floor,
London EC3M 8AA,
United Kingdom

CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE
INSTITUTIONAL TOILET - INCENERATOR

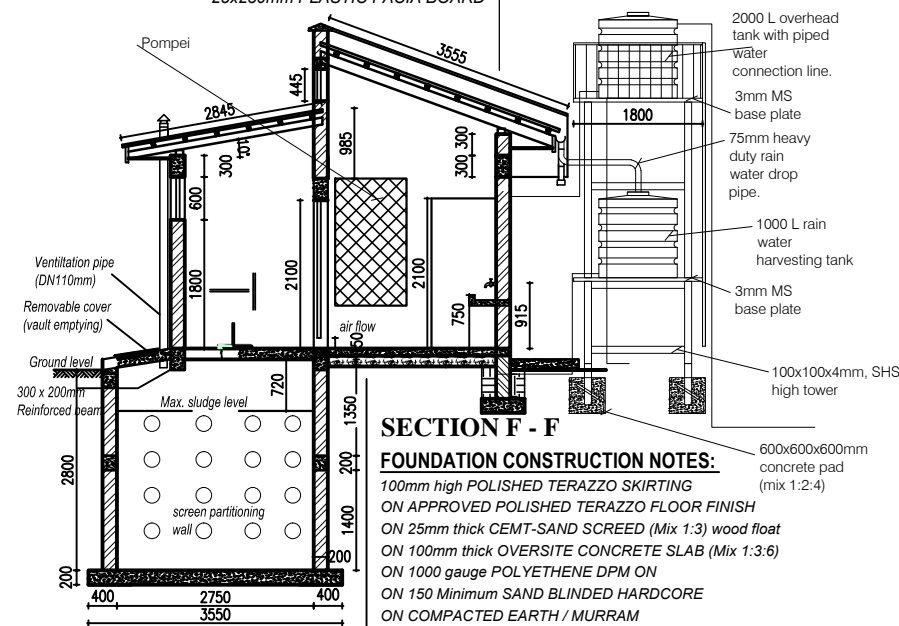
SCALE	As Shown	DRAWING No.	GPA/S/1.1.1
SURVEYED		DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2022	APPROVED	Rodney Barugahare.

NOTES

1. Unless otherwise stated, all dimensions are in mm
2. Concrete grade to be C20/10.
3. All levels in metres above mean sea level.

ROOF SPECIFICATIONS: $pitch=10/20^\circ$

200mm HIGH PARAPET WALL /
28 Gauge V-SHAPED RIDGES ON
Gauge 28, PREPAINTED ROOFING IT4 IRON SHEETS
ON 75 x 50 TIMBER PURLINS AT 450 c/c
ON 150 x 50 RAFTERS SUPPORTED AT 900 c/c
ON 100 x 75 WALL PLATE
25x230mm PLASTIC FACIA BOARD



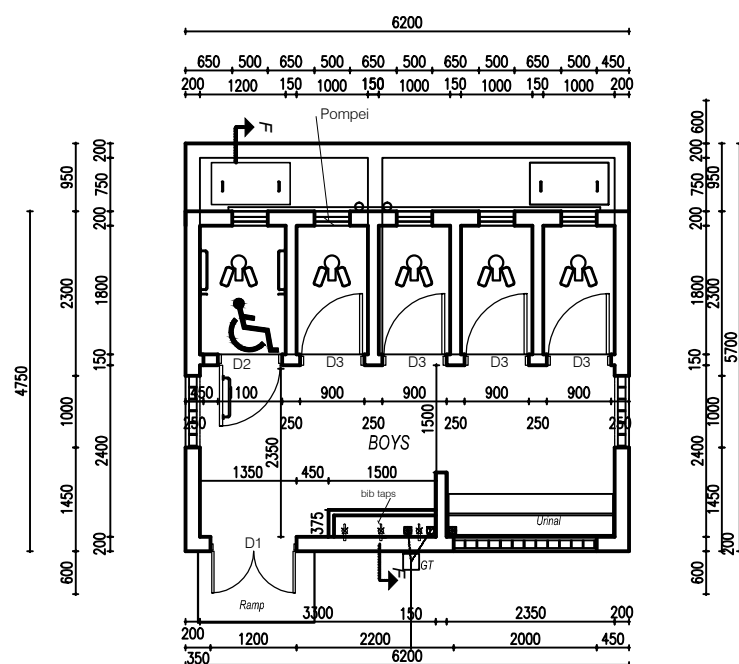
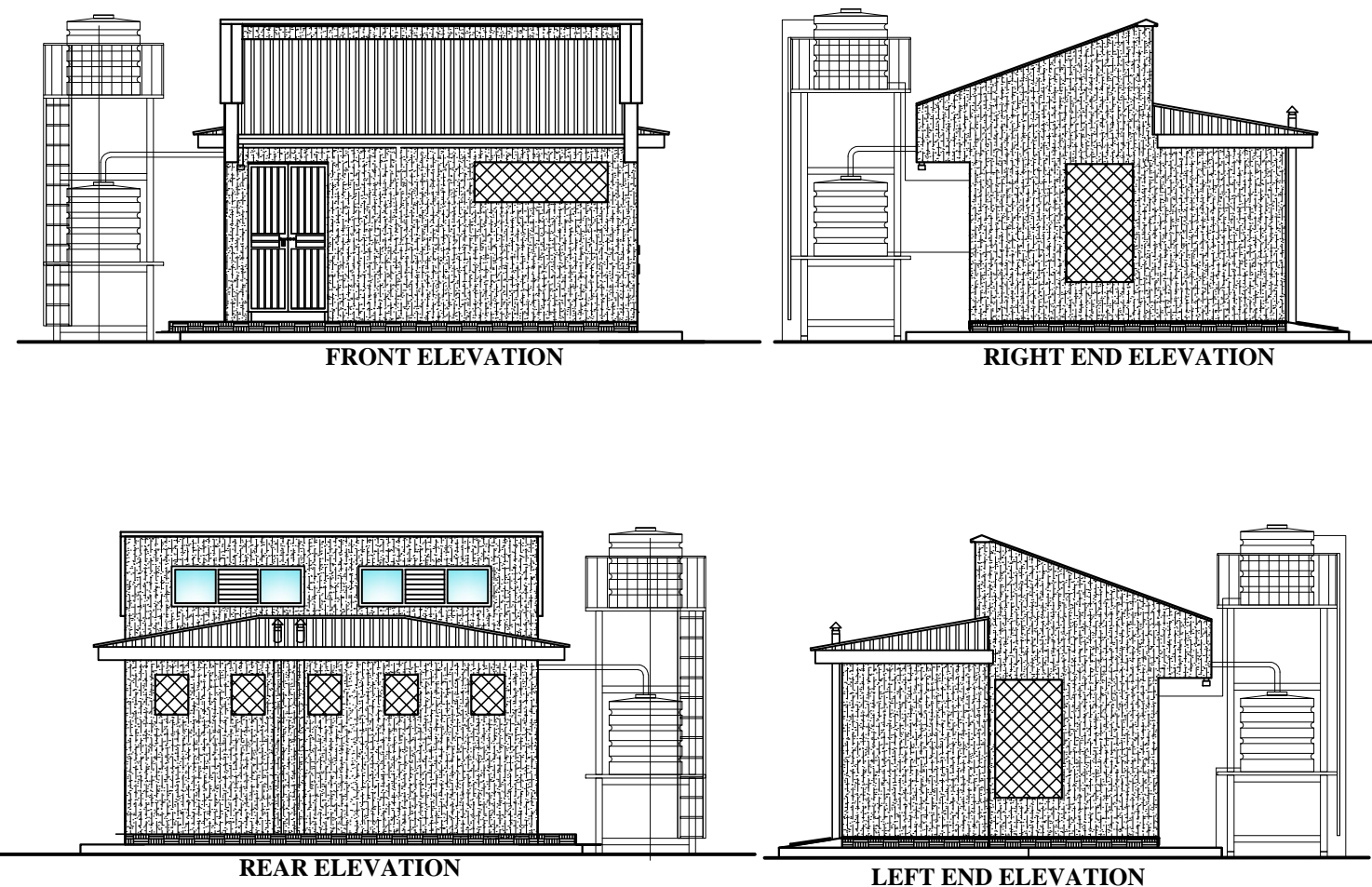
SECTION F - F

FOUNDATION CONSTRUCTION NOTES:

100mm high POLISHED TERAZZO SKIRTING
ON APPROVED POLISHED TERAZZO FLOOR FINISH
ON 25mm thick CEMENT-SAND SCREED (Mix 1:3) wood float
ON 100mm thick OVERSITE CONCRETE SLAB (Mix 1:3:6)
ON 1000 gauge POLYETHYLENE DPM ON
ON 150 Minimum SAND BLINDED HARDCORE
ON COMPACTED EARTH / MURRAM

FOUNDATION DETAILS:

230mm THICK BLOCK PLINTH WALL ON
250X690mm REINFORCED STRIP CONCRETE FOUNDATION ON
50mm CONCRETE BLINDING ON
APPROVED LOAD BEARING SOIL
FOUNDATION DEPTH TO BE DETERMINED ON SITE
BUT NOT LESS THAN 900MM FROM SGL



FLOOR PLAN

Door Schedule (Scale 1:100)				
Mark	D1/pv	D2	D3	W3/pv
Quantity	2 No.	1 No.	6 No.	02 No.
Type & Remarks	Lockable, mahogany hardwood timber-frame and solid TNG door.	Standard solid flush door lockable both internally and externally with low level indicator locks complete with grab bar both internally and externally	Standard solid flush door lockable both internally and externally with indicator locks	40x40x2mm SHS framed, Steel casement profile window with 4mm clear glass panels & internally fixed burglar proofs with centered permanent vent

DOOR AND WINDOW SCHEDULE

CLIENT	 <p>GOVERNMENT OF UGANDA MINISTRY OF WATER AND ENVIRONMENT</p>
--------	--

CO-FINANCED BY:

 AND 

THE WORLD BANK GOVERNMENT OF UGANDA

PROJECT

**CONSULTANCY SERVICES FOR FEASIBILITY STUDY,
DETAILED ENGINEERING DESIGN AND CONSTRUCTION
SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY
SYSTEMS AND SANITATION FACILITIES IN REFUGEE
SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND
NORTHERN UGANDA IN KIRYANDONGO DISTRICT**

GASPA WATER SUPPLY SYSTEM



SARI
SUSTAINABLE ADVANCED RESEARCH INITIATIVE

In Joint Venture with



Corporate Headquarter
10 Philpot Lane, 1st Floor,
London EC3M 8AA,
United Kingdom

CONTRACTOR

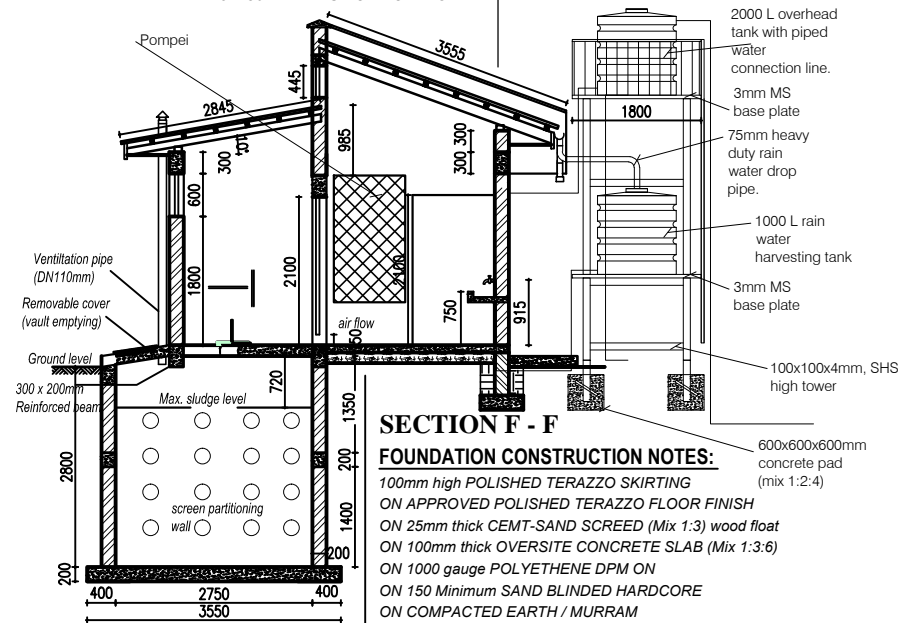
DETAILED ENGINEERING DESIGN

DRAWING TITLE	INSTITUTIONAL TOILET - BOYS
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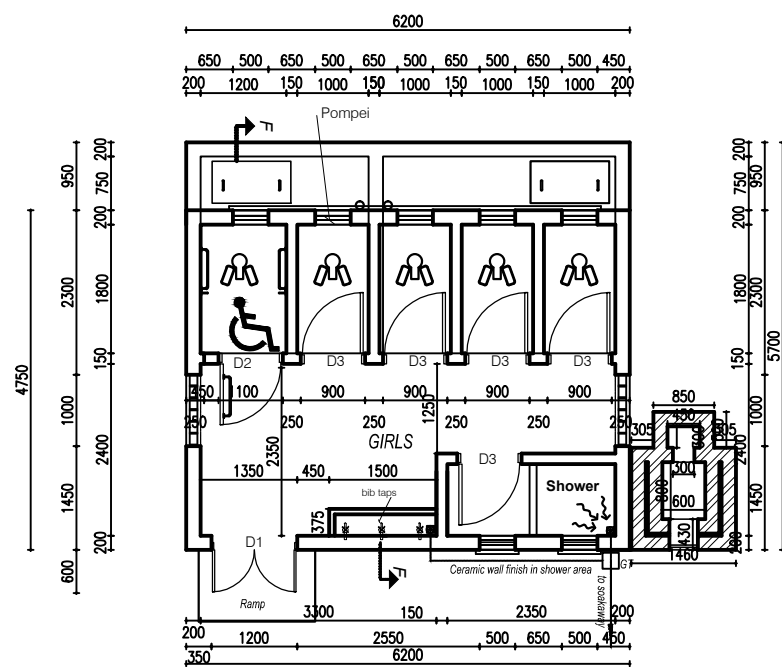
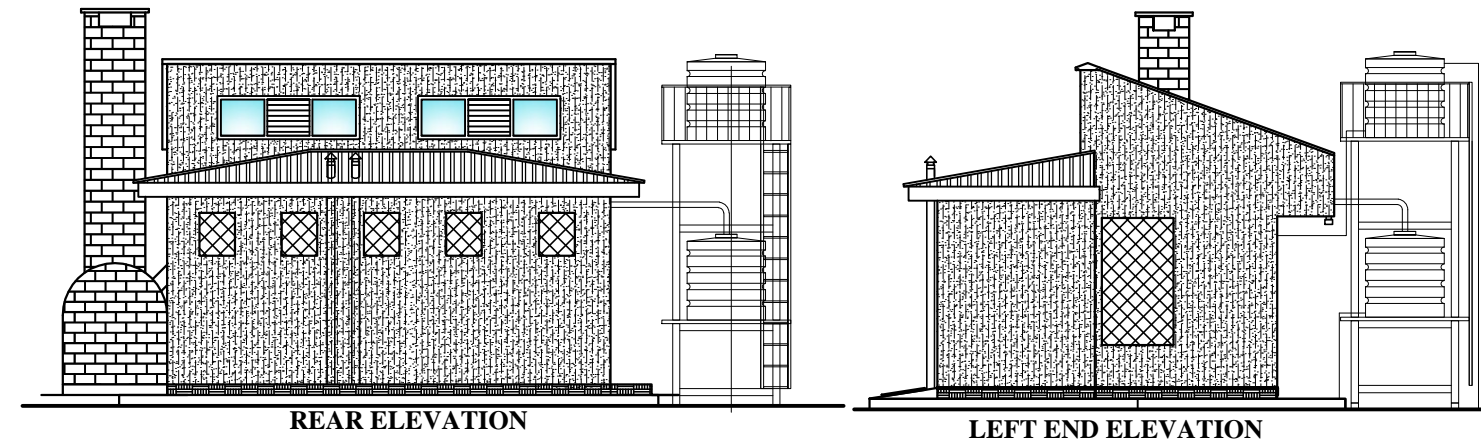
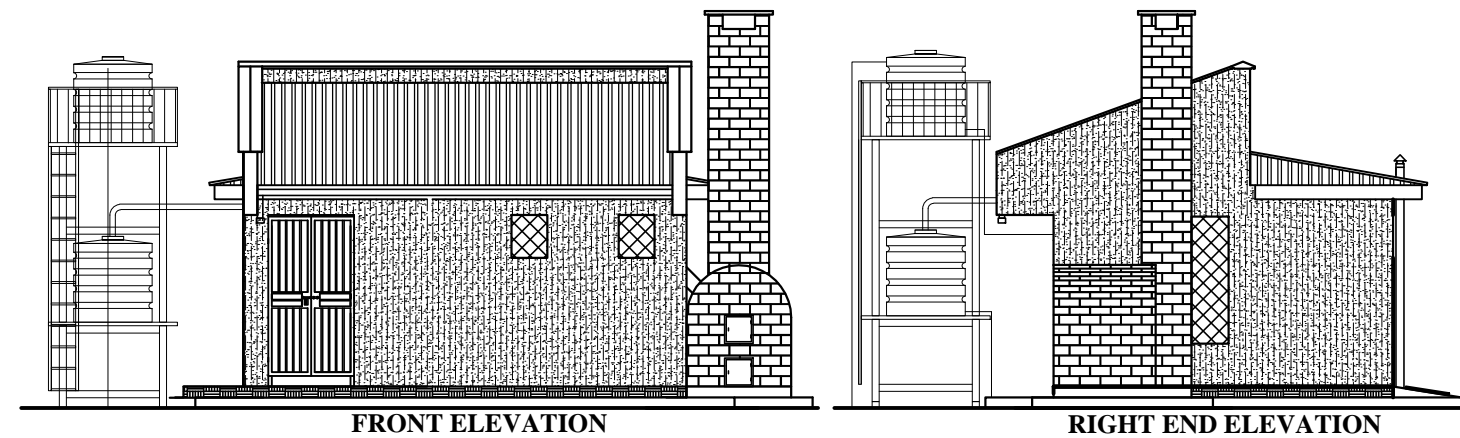
SCALE	As Shown	DRAWING No.	GPA/S/1.1.2
SURVEYED		DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2022	APPROVED	Rodney Barugahare.

1. Unless otherwise stated, all dimensions are in mm
2. Concrete grade to be C20/10.
3. All levels in metres above mean sea level.

200mm HIGH PARAPET WALL /
28 Gauge V-SHAPED RIDGES ON
Gauge 28, PREPAINTED ROOFING IT4 IRON SHEETS
ON 75 x 50 TIMBER PURLINS AT 450 c/c
ON 150 x 50 RAFTERS SUPPORTED AT 900 c/c
ON 100 x 75 WALL PLATE
25x230mm PLASTIC FACIA BOARD



230mm THICK BLOCK PLINTH WALL ON
250X690mm REINFORCED STRIP CONCRETE FOUNDATION ON
50mm CONCRETE BLINDING ON
APPROVED LOAD BEARING SOIL
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Door Schedule (Scale 1:100)				
Mark	D1/pv	D2	D3	W3/pv
Quantity	2 No.	1 No.	6 No.	02 No.
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DOOR AND WINDOW SCHEDULE

CLIENT	 <p>GOVERNMENT OF UGANDA MINISTRY OF WATER AND ENVIRONMENT</p>
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CO-FINANCED BY:


 AND 

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PROJECT	CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT
---------	--

GASPA WATER SUPPLY SYSTEM

CONSULTANT

 **SARI**
CONSULTING LTD

In Joint Venture with

 **SGAPI**

Corporate Headquarter
10 Philpot Lane, 1st Floor,
London EC3M 8AA,
United Kingdom

CONTRACTOR

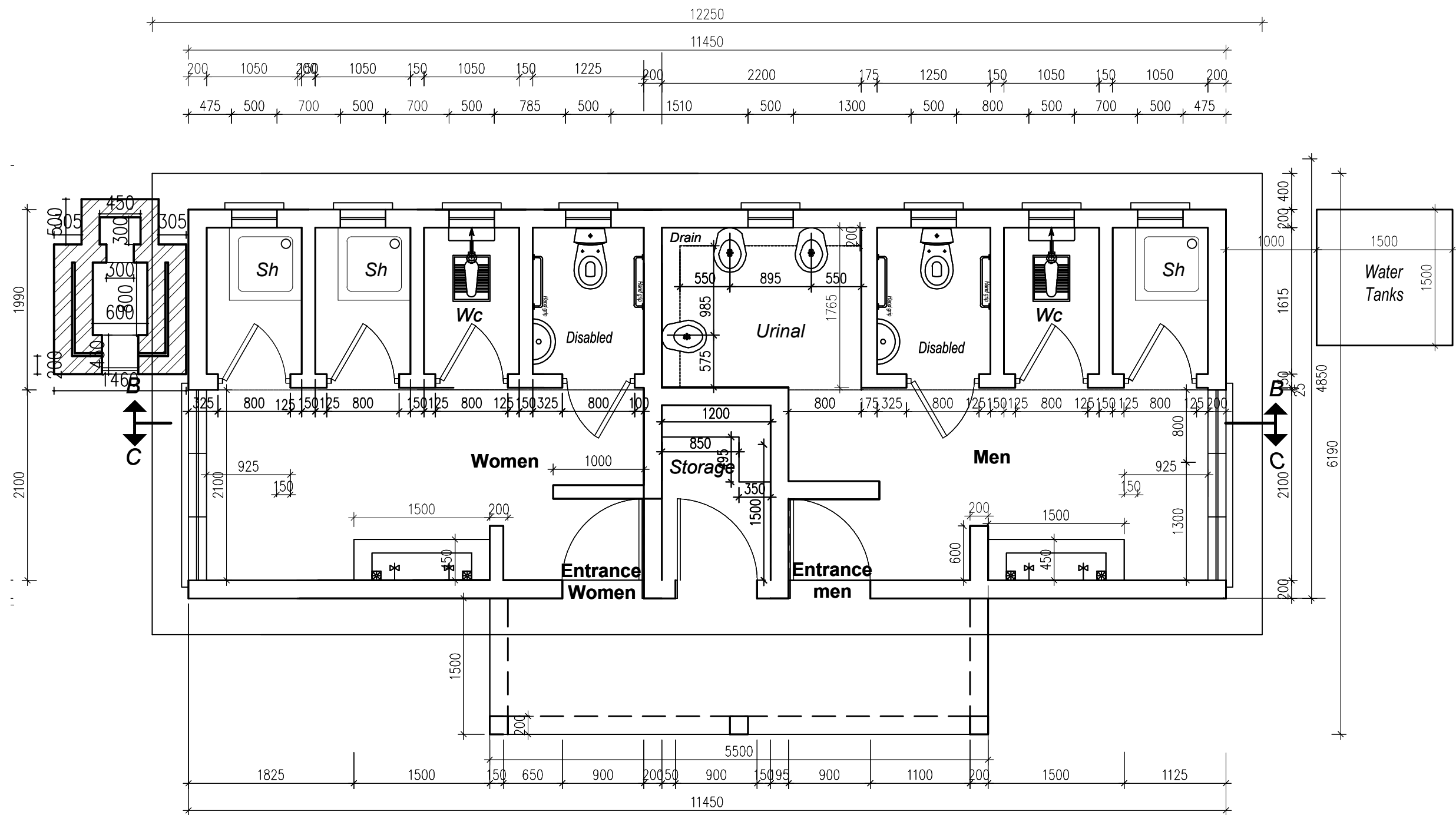
DETAILED ENGINEERING DESIGN

DRAWING TITLE

INSTITUTIONAL TOILET - GIRLS

SCALE	As Shown	DRAWING No.	GPA/S/1.1.3
SURVEYED		DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2022	APPROVED	Rodney Barugahare.

1) All dimension are in mm





scale 1:50
GROUND PLAN

CLIENT
 **GOVERNMENT OF UGANDA**
MINISTRY OF WATER AND ENVIRONMENT

CO-FINANCED BY:
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PROJECT
CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

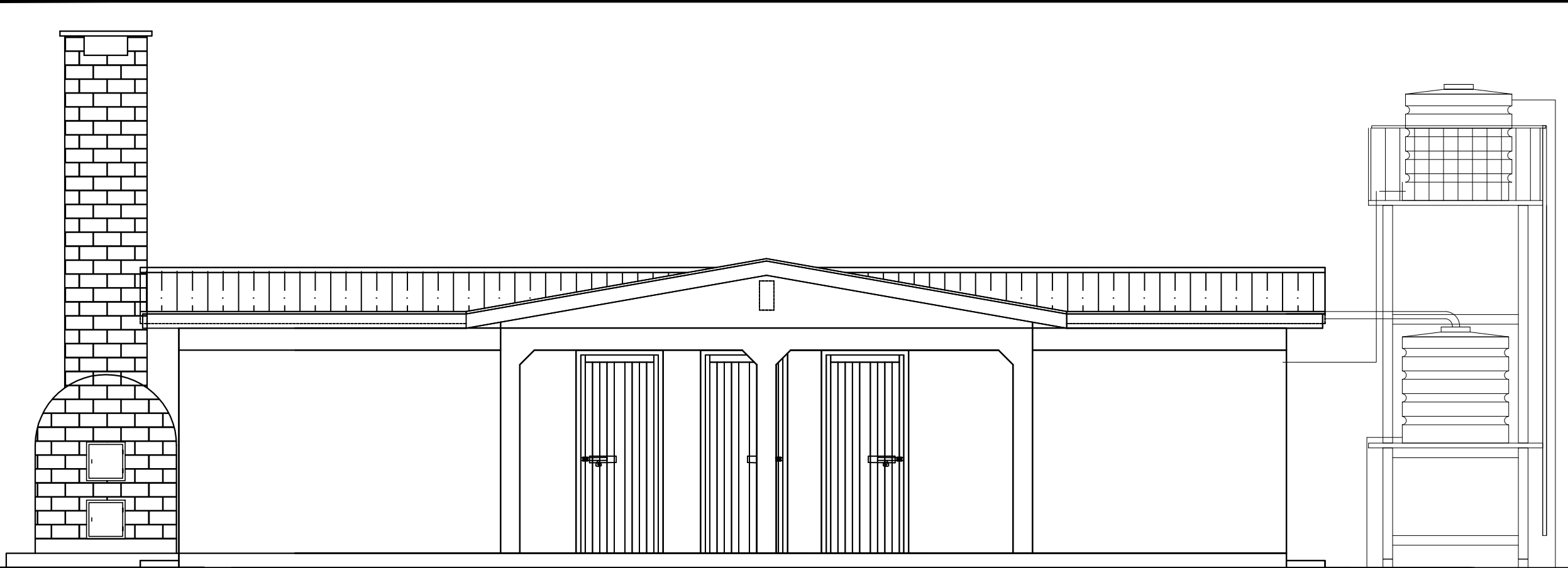
GASPA WATER SUPPLY SYSTEM

CONSULTANT
 **SARI** In Joint Venture with  **SGAPI**
Corporate Headquarter
10 Philpot Lane, 1st Floor,
London EC3M 8AA,
United Kingdom

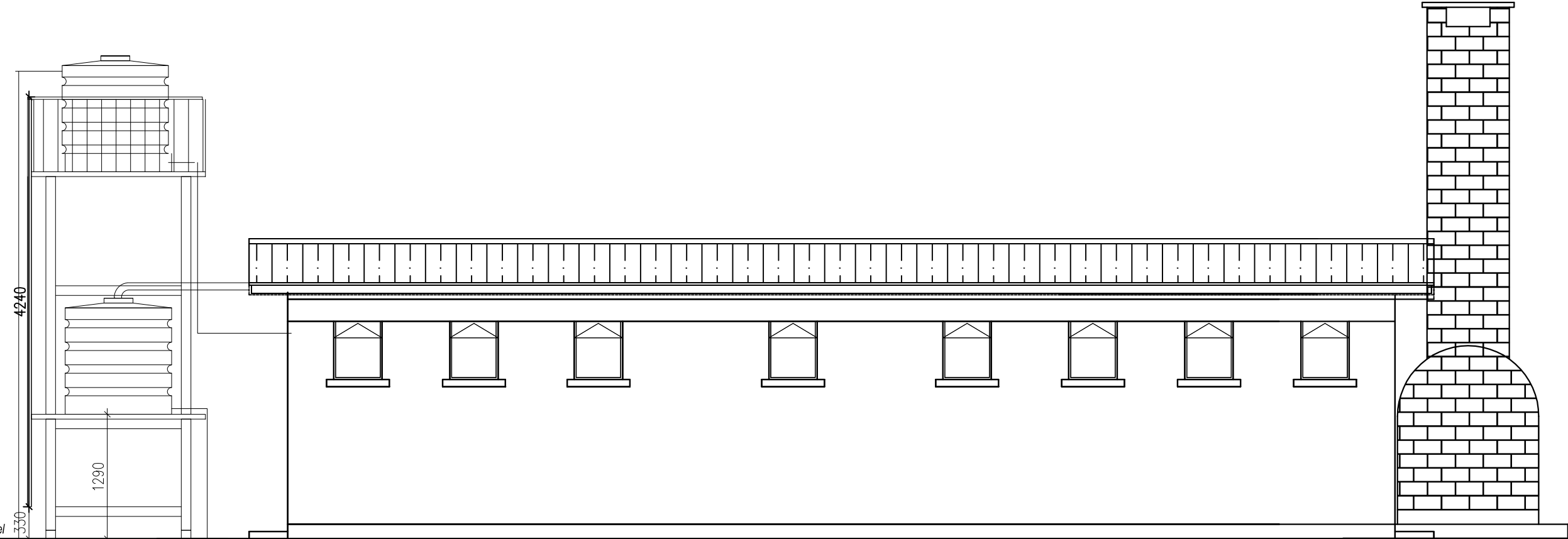
CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE
**4 STANCE WATER BORNE TOILETS
FLOOR PLAN**

SCALE	As Shown	DRAWING No.	GPA/S/2.1.1
SURVEYED		DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2022	APPROVED	Rodney Barugahare.








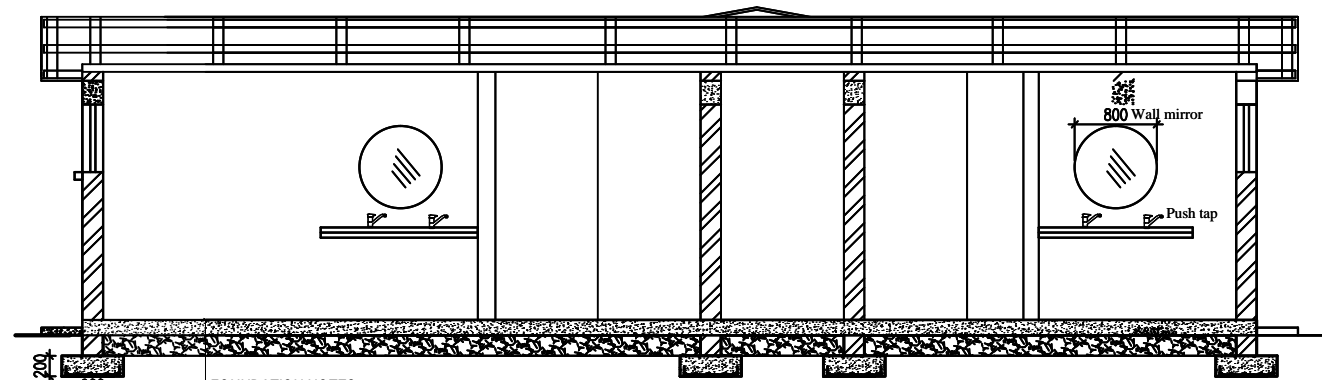
scale 1:50
FRONT ELEVATION



scale 1:50
REAR ELEVATION

1) All dimension are in mm

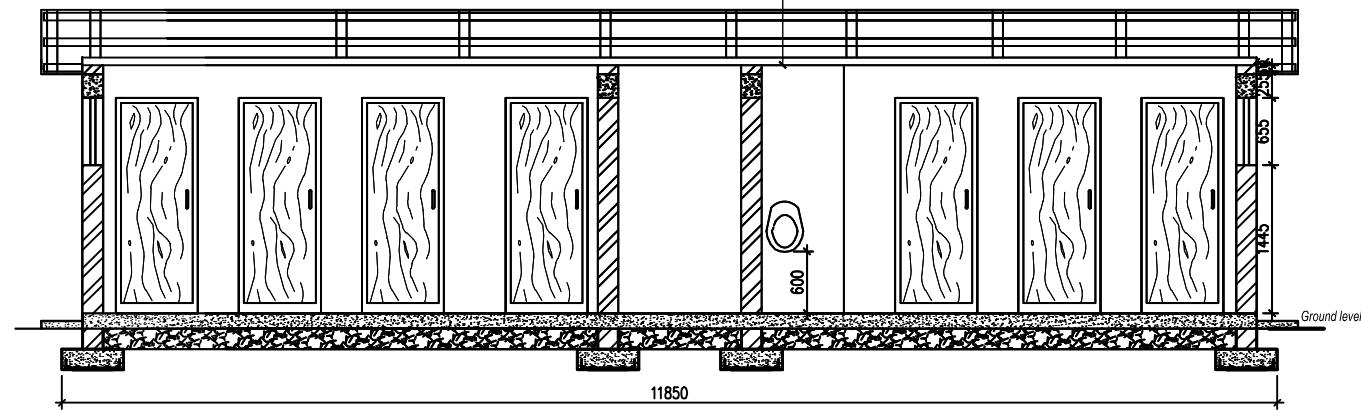
CLIENT		 GOVERNMENT OF UGANDA MINISTRY OF WATER AND ENVIRONMENT	
CO-FINANCED BY:		 THE WORLD BANK	AND  GOVERNMENT OF UGANDA
PROJECT		CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT	
CONSULTANT		 SARI Corporate Headquarter 10 Philpot Lane, 1st Floor, London EC3M 8AA, United Kingdom In Joint Venture with  SGAPI	
CONTRACTOR			
DRAWING TITLE		DETAILED ENGINEERING DESIGN 4 STANCE WATER BORNE TOILETS ELEVATIONS	
SCALE	As Shown	DRAWING No.	GPA/S/2.1.2
SURVEYED		DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2022	APPROVED	Rodney Barugahare.



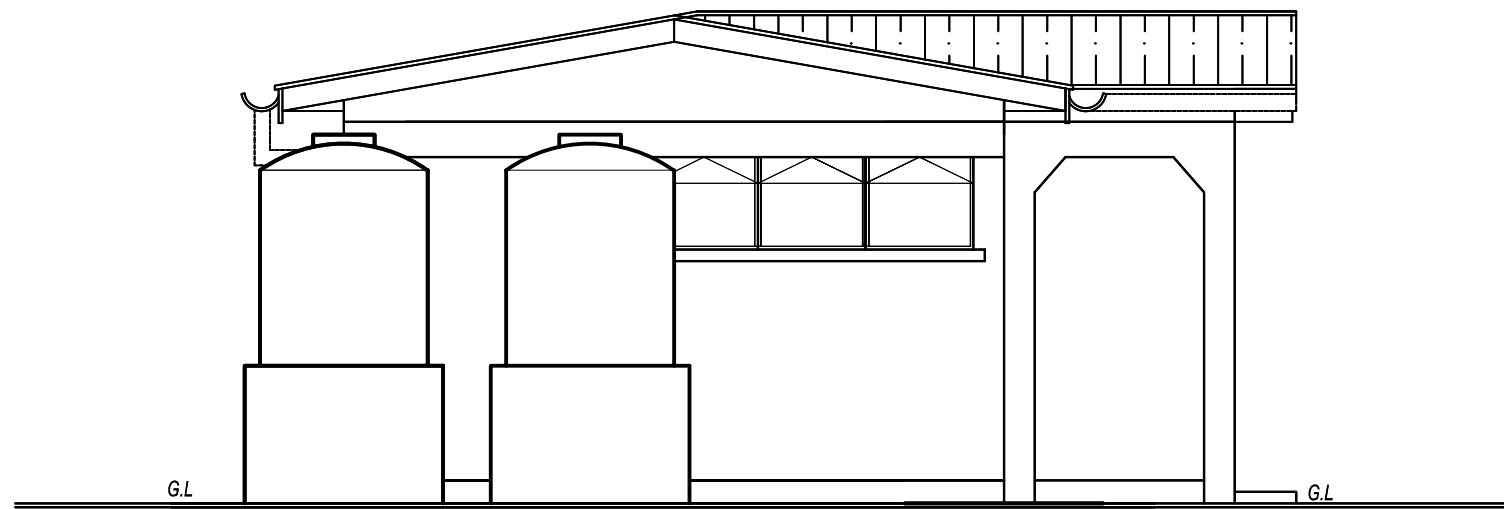
FOUNDATION NOTES
Floor finish as specified on
25mm thick cement screed on
150mm thick concrete floor slab C20/10 agg on
200mm thick well compacted & approved hardcore filling on
well compacted and levelled ground

scale 1:75
SECTION C-C

ROOF DETAILS
10 Deg. Roof Pitch
Galvanised prepainted Iron Sheet on
75 X 50mm Purlins spaced at 1200mm C/C on
100 X 50mm Tie Beam on
100 X 50mm Wall Plate



scale 1:75 **SECTION B-B**



scale 1:50 **SIDE VIEW**

1) All dimension are in mm

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GOVERNMENT OF UGANDA
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PROJECT

CONSULTANCY SERVICES FOR FEASIBILITY STUDY,
DETAILED ENGINEERING DESIGN AND CONSTRUCTION
SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY
SYSTEMS AND SANITATION FACILITIES IN REFUGEE
SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND
NORTHERN UGANDA IN KIRYANDONGO DISTRICT

GASPA WATER SUPPLY SYSTEM

CONSULTANT

SARI
SARINTEGRATED
Corporate Headquarter
10 Philpot Lane, 1st Floor,
London EC3M 8AA,
United Kingdom

In Joint Venture with



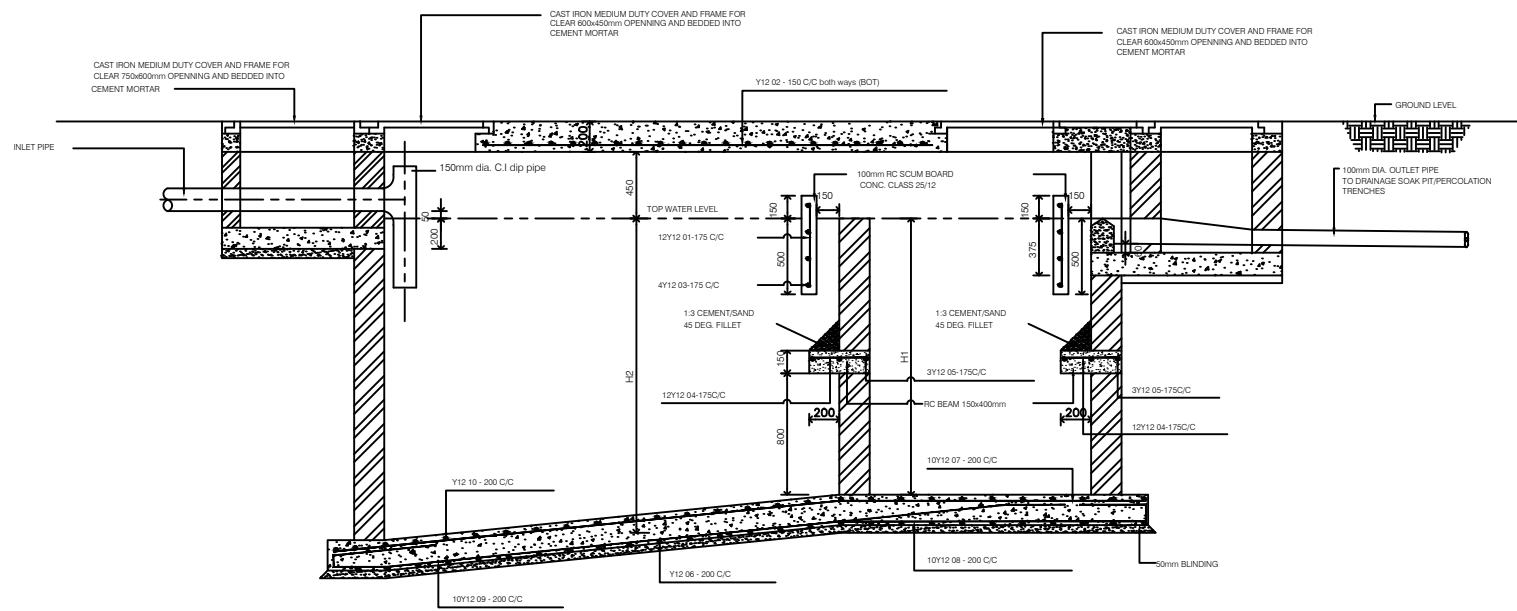
CONTRACTOR

DETAILED ENGINEERING DESIGN

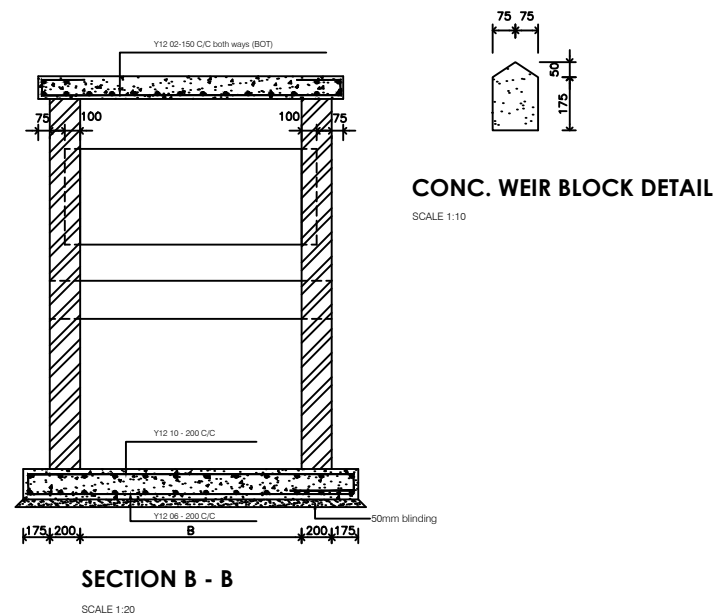
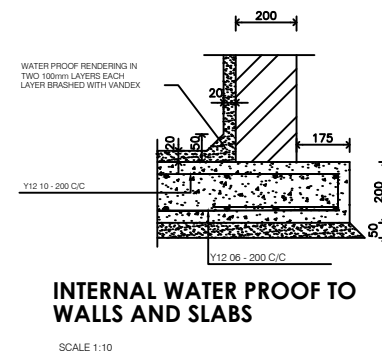
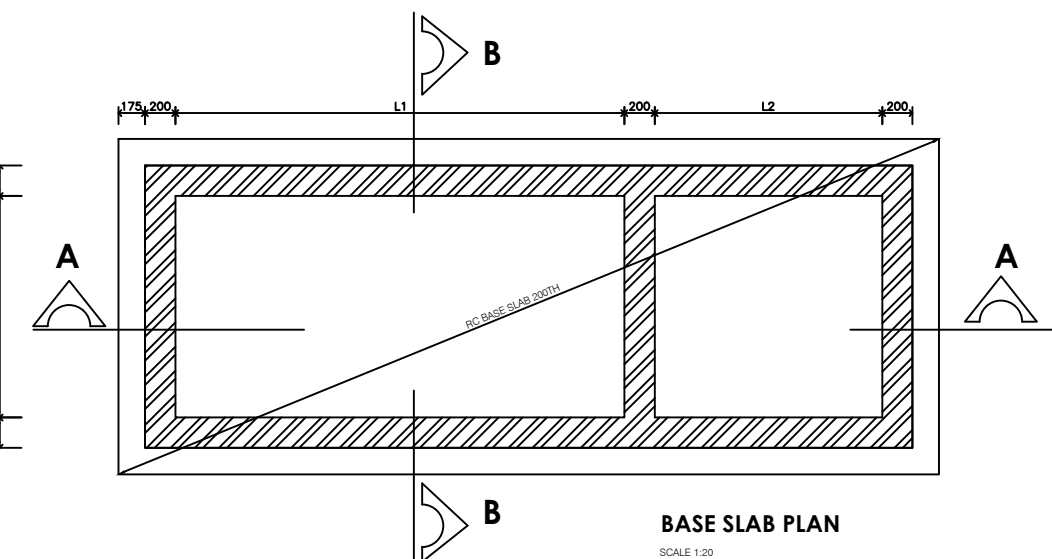
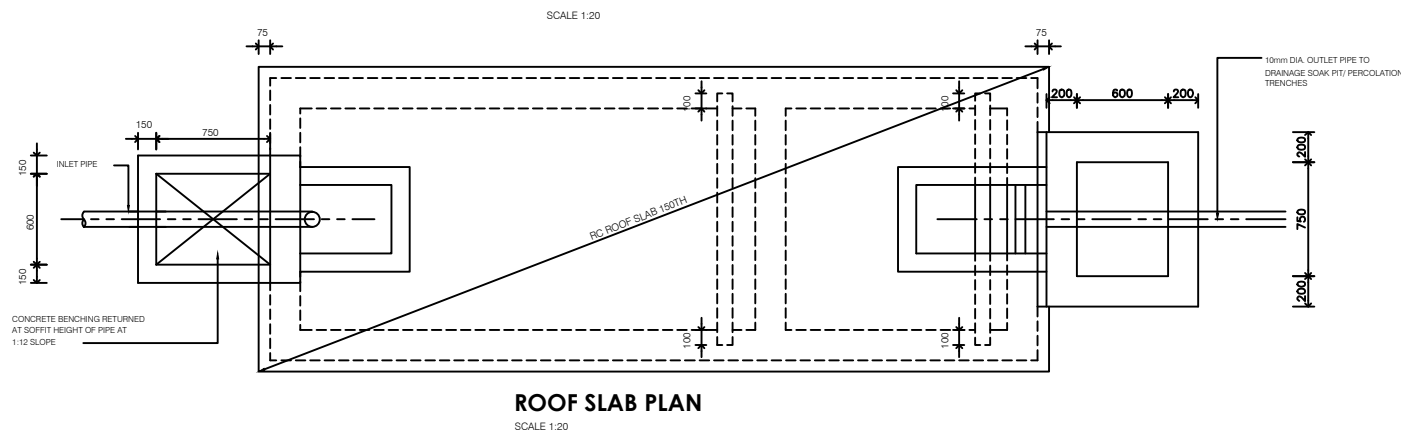
DRAWING TITLE

4 STANCE WATER BORNE TOILETS
SECTIONS AND ELEVATIONS

SCALE	As Shown	DRAWING No.	GPA/S/2.1.3
SURVEYED		DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2022	APPROVED	Rodney Barugahare.



INTERNAL DIMENSIONS					CAPACITY	NO. OF USERS
L1	L2	H1	H2	B	Cu. M	
1540mm	760mm	1600mm	1750mm	760mm	3.2	10
1900mm	900mm	1800mm	2000mm	900mm	4.5	20
2000mm	1000mm	1800mm	2100mm	1100mm	5.9	30
2400mm	1100mm	1800mm	2100mm	1150mm	7.24	40
2500mm	1200mm	1800mm	2100mm	1300mm	8.6	50
2700mm	1300mm	1800mm	2100mm	1400mm	10	60
2900mm	1400mm	1800mm	2100mm	1450mm	11.3	70
3000mm	1500mm	1800mm	2100mm	1560mm	12.7	80
3200mm	1600mm	1800mm	2100mm	1600mm	14	90
3300mm	1700mm	1800mm	2100mm	1700mm	15.4	100
4000mm	2200mm	1800mm	2100mm	2190mm	24	150
4500mm	2700mm	1800mm	2100mm	2650mm	34.3	200



1) All dimension are in mm

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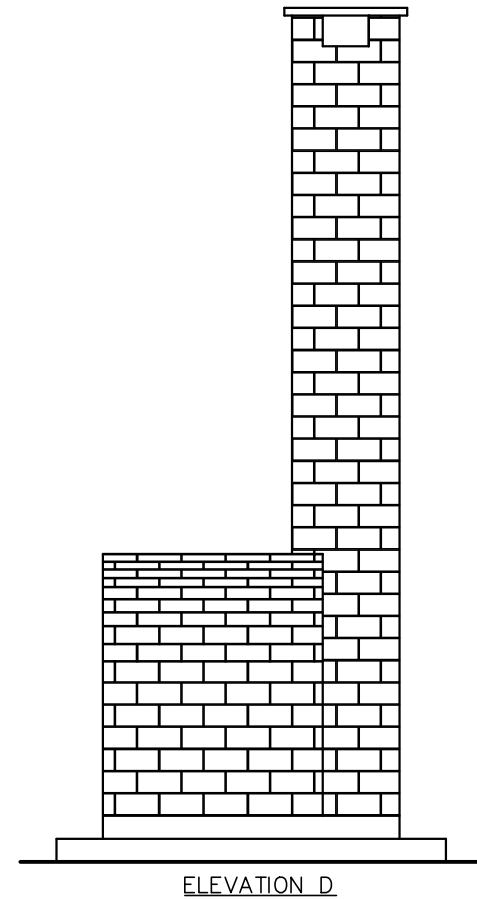
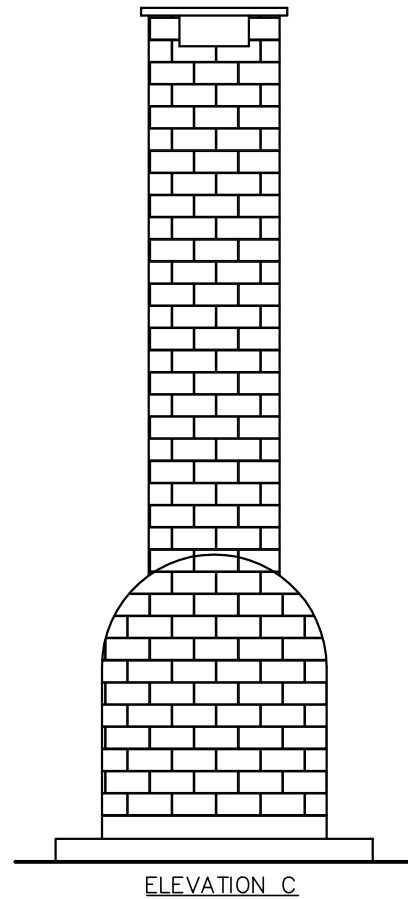
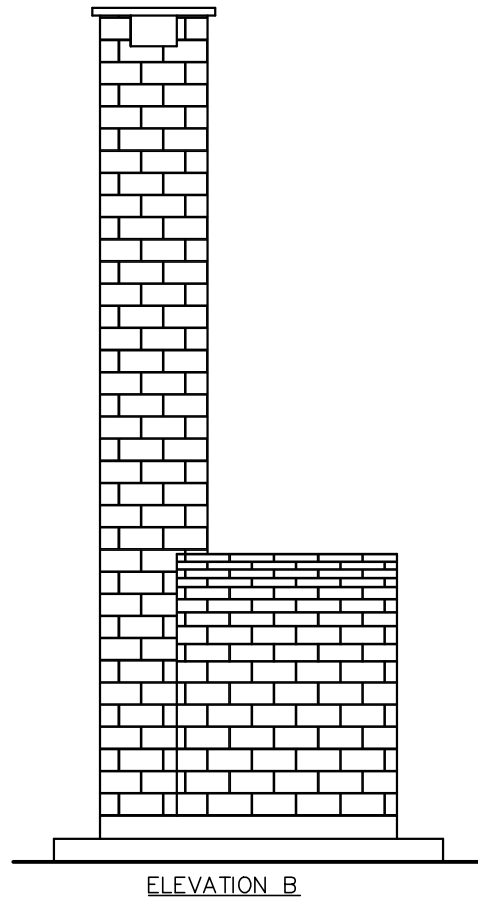
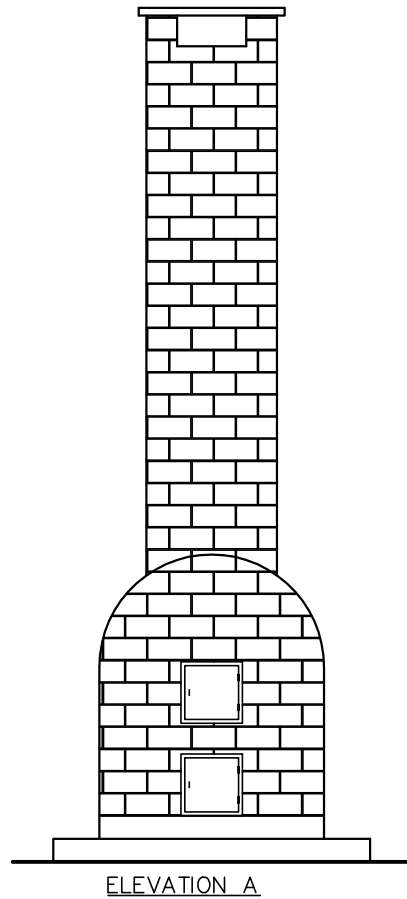
GASPA WATER SUPPLY SYSTEM

CONSULTANT
SARI In Joint Venture with **SGAPI**
Corporate Headquarter
10 Philpot Lane, 1st Floor,
London EC3M 8AA,
United Kingdom

CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE
WATER BORNE TOILETS
SEPTIC TANK DETAILS

SCALE As Shown DRAWING No. GPA/S/2.1.4
SURVEYED DESIGNED Otwane Dan.
DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare
DATE OCT 2022 APPROVED Rodney Barugahare.





1) All dimension are in mm

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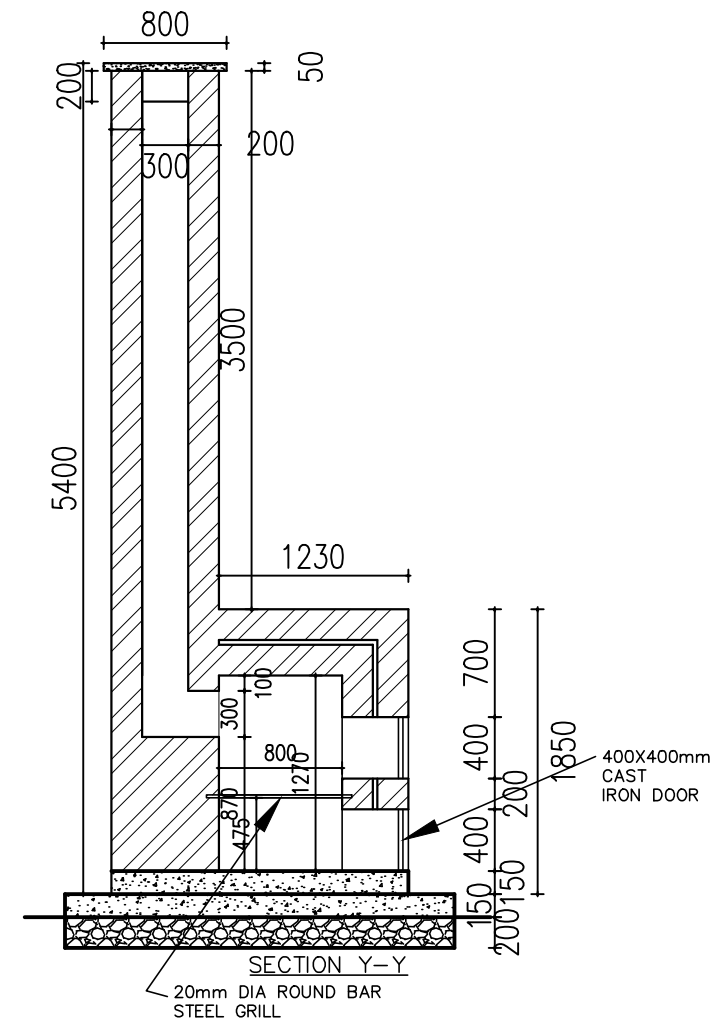
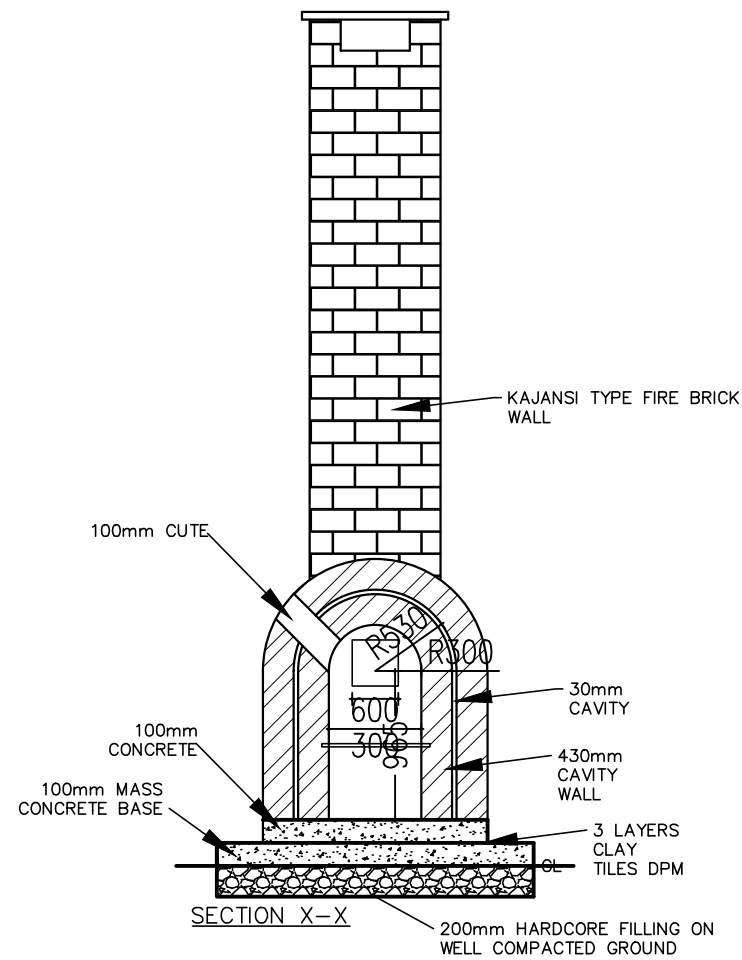
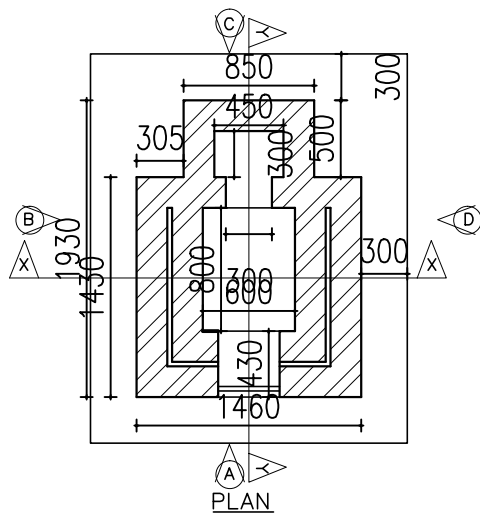
GASPA WATER SUPPLY SYSTEM

CONSULTANT
 **SARI** In Joint Venture with 
Corporate Headquarter
10 Philpot Lane, 1st Floor,
London EC3M 8AA,
United Kingdom

CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE
WATER BORNE TOILETS
Incinerator

SCALE	As Shown	DRAWING No.	GPA/S/2.1.5
SURVEYED		DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2022	APPROVED	Rodney Barugahare.



GENERAL NOTES FOR STANDARD DETAIL DRAWINGS

- 1) Unless flexibility is otherwise provided, where pipes enter or leave concrete structures, or anchor blocks, flexible joints are to be provided as shown in standard Detail Nr SD 137 .
- 2) Anchor block designs are based on the following ground conditions.

Dry soil density:1800 kg/m³

Submerged soil density:1090 kg/m³

Angle of internal friction:30°

Passive resistance factor:3

Where considerably better ground conditions, such as rock, are encountered, the dimensions of anchor blocks may be reduced. Supporting calculations for any reduced size anchor blocks must be submitted to the Project Manager 48 hours before construction of the particular anchor block commences and may be concreted only after his approval.

- 3) Bases and thrust faces of anchor blocks are to be cast against undisturbed ground, or against blinding cast against undisturbed ground.
- 4) Pipework joints as shown for the water supply details are diagrammatic only.
- 5) The following notes apply to reinforced concrete chambers.

a) Concrete in walls and base and cover slab

Characteristic strength (N/mm²):30

Maximum aggregate size (mm):20

Cement type:SR

Minimum cement content (kg/m³):330

Maximum cement content (kg/m³):400

Maximum free water/cement ratio:0.47

b) Concrete in blinding

Characteristic strength (N/mm²):1030

Maximum aggregate size (mm):40

Cement type:SR

Minimum cement content (kg/m³):230

c) Cover to reinforcement 40mm unless positioned centrally

- d) Minimum reinforcement lap 300 mm
- e) For details of step irons see Standard Detail Nr SD 136
- f) Corners of rectangular openings to have T8 bars 500 mm long set diagonally
- 6) All dimensions are in millimetres unless shown otherwise.
- 7) Do not scale dimensions from standard Detail drawings.


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GASPA WATER SUPPLY SYSTEM

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CONSULTANTS LTD

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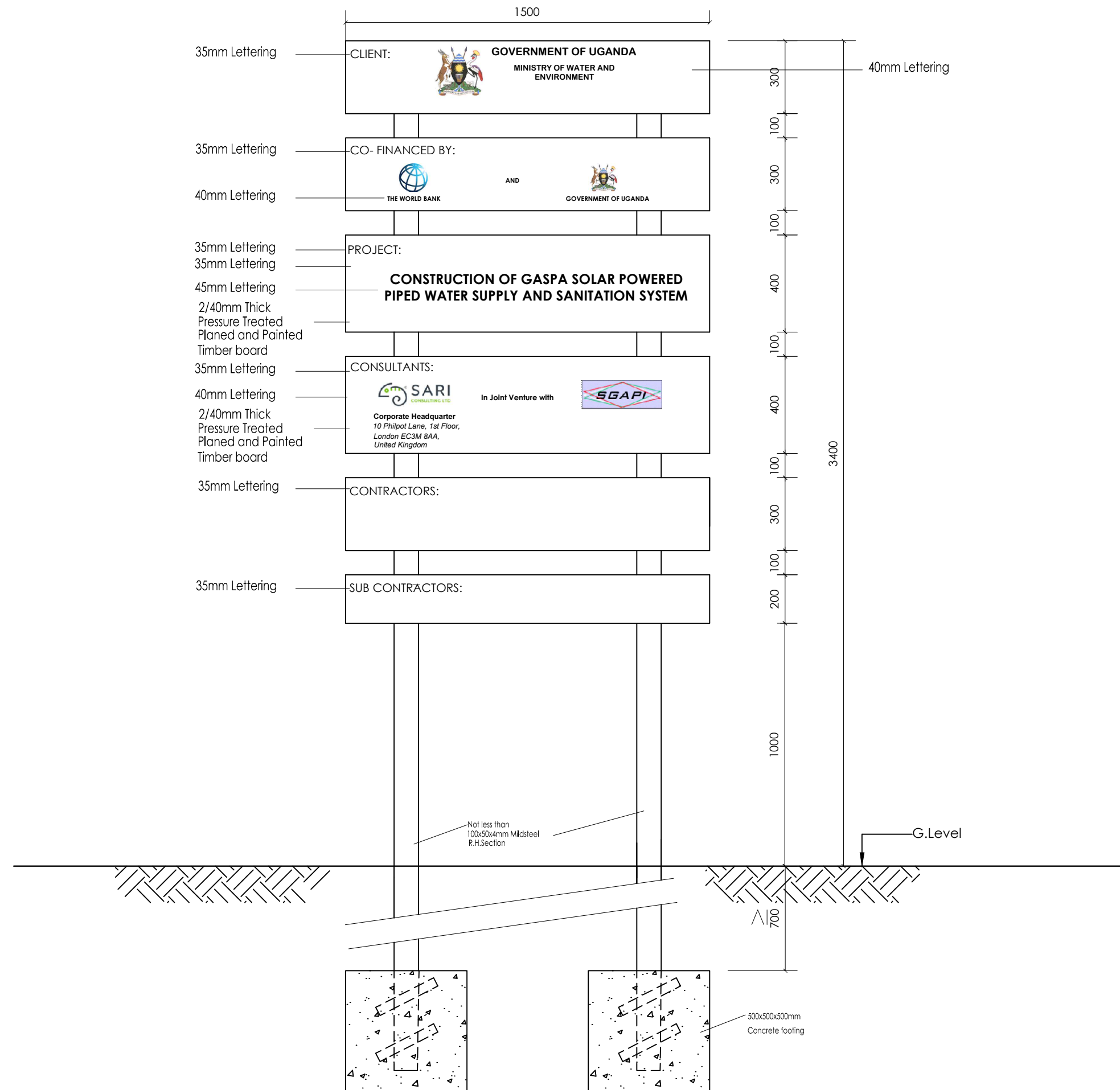
CONTRACTOR

DETAILED ENGINEERING DESIGN

DRAWING TITLE

GENERAL NOTES FOR STANDARD DRAWINGS

SCALE	As Shown	DRAWING No.	SD100
SURVEYED		DESIGNED	Othmane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



NOTES

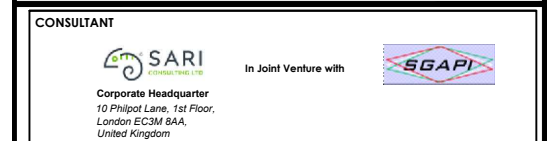
1. Each sign board shall have two faces.
2. The contractor shall use a black lettering on white back ground.
3. The contractor shall use a sticker measuring 350 x 200, to display her particulars and contract number on the sign board.



PROJECT

CONSULTANCY SERVICES FOR FEASIBILITY STUDY,
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SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND
NORTHERN UGANDA IN KIRYANDONGO DISTRICT

GASPA WATER SUPPLY SYSTEM



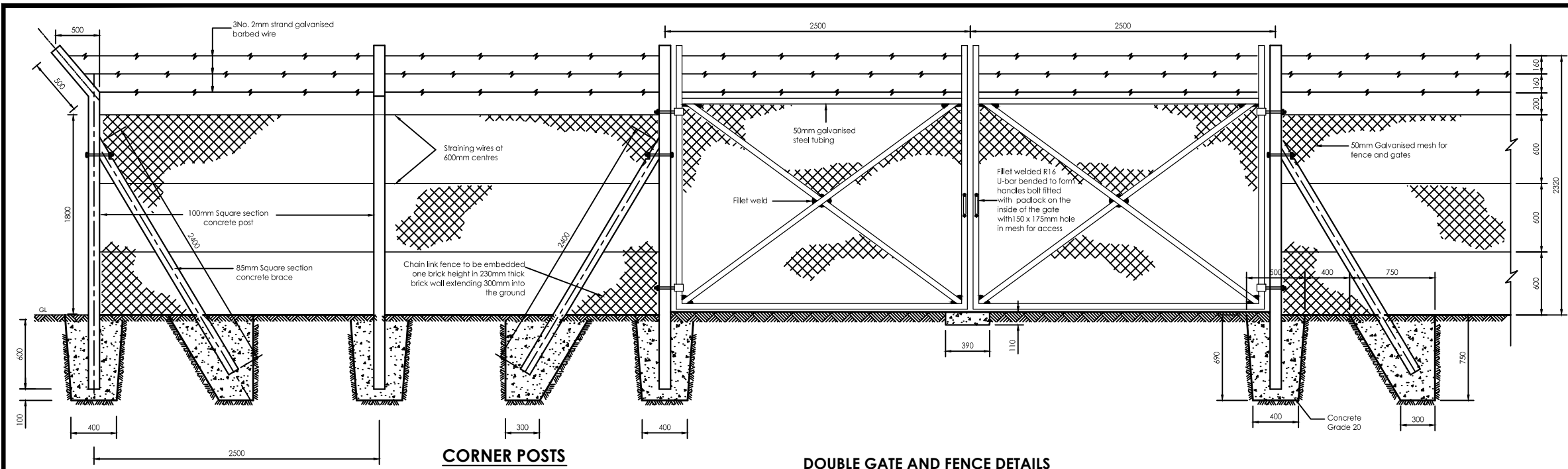
CONTRACTOR

DETAILED ENGINEERING DESIGN

DRAWING TITLE

CONTRACT SIGN BOARD

SCALE	As Shown	DRAWING No.	SD101
SURVEYED		DESIGNED	Othmane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.

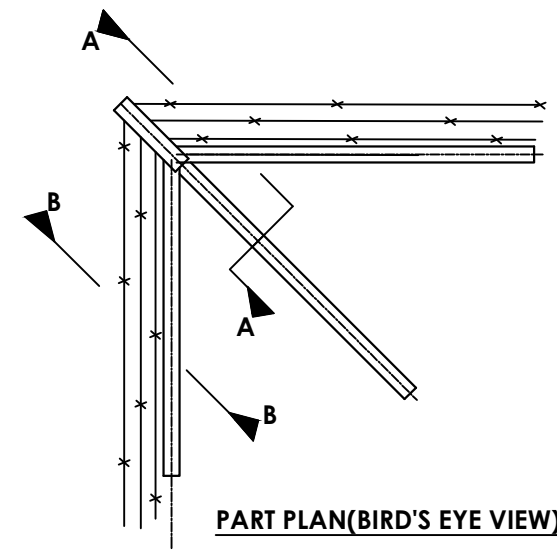


CORNER POSTS

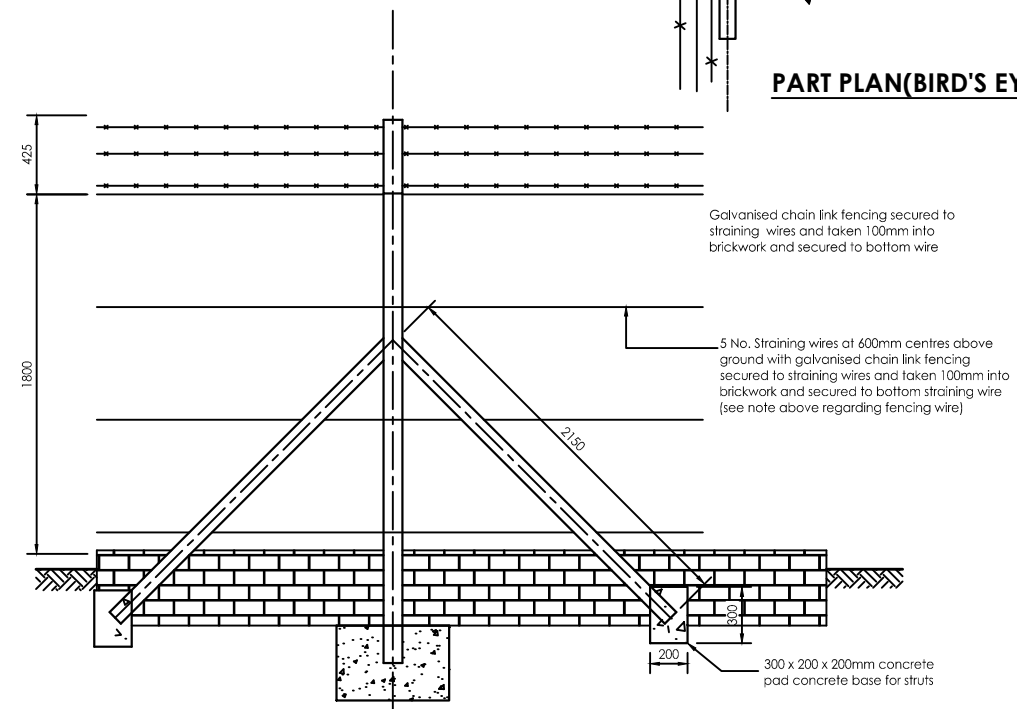
150 x 4mm wall thickness at corners end and change in direction.

DOUBLE GATE AND FENCE DETAILS

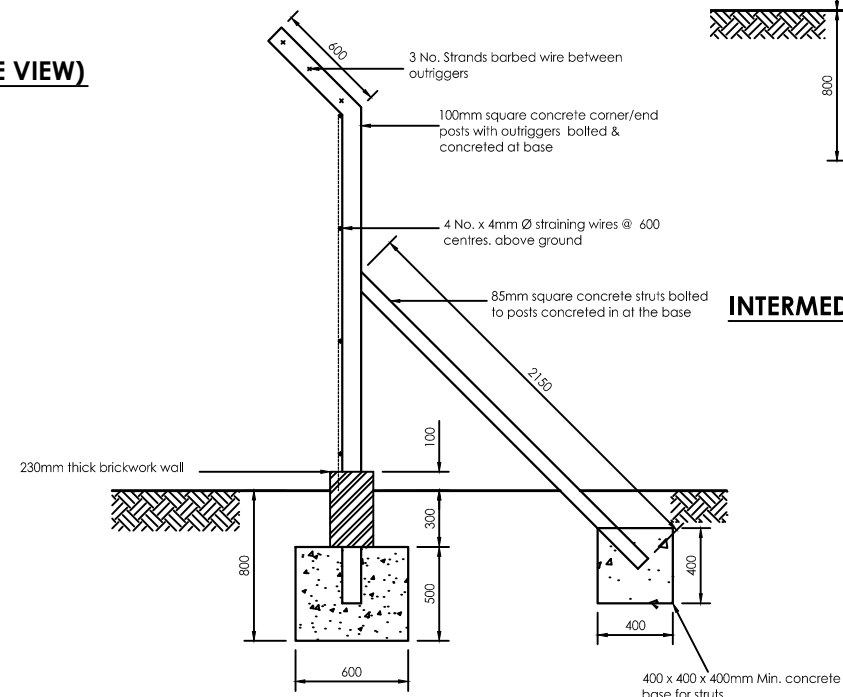
1800mm HIGH



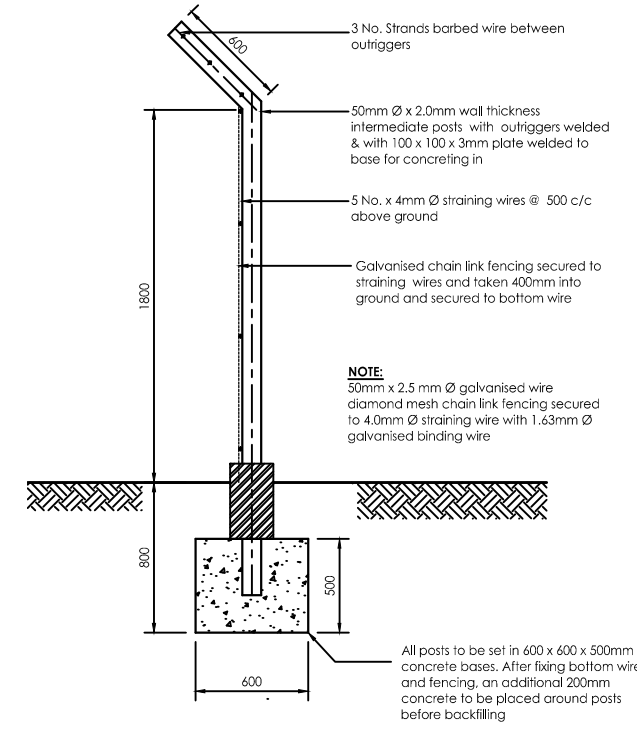
PART PLAN(BIRD'S EYE VIEW)



INTERMEDIATE POST WITH STRUTS - ELEVATION (30.00m c/c)



CORNER/END POSTS



INTERMEDIATE POSTS - SECTIONAL VIEW (3.00m c/c)

NOTES

1. All dimensions are in millimetres unless stated otherwise.
2. Figured dimensions are to be taken in preference to scaling
3. Blinding concrete to be Class 15/20.
4. Concrete to chamber bases and support/anchor blocks to be Class 25/20
5. Concrete to precast concrete cover slabs to be Class 25/20.
6. All exposed angles on concrete surfaces to have a 25mm chamfer.
7. All pipes to be wrapped with 2 layers of pvc 10 micron sheeting through walls

ABBREVIATIONS

- G.S. GALVANISED STEEL
V.J.C. VIKING JOHNSON COUPLING
C.I. CAST IRON
D.I. DUCTILE IRON



Concrete



Brickwork

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GASPA WATER SUPPLY SYSTEM

CONSULTANT

SARI
In Joint Venture with **SGAPI**

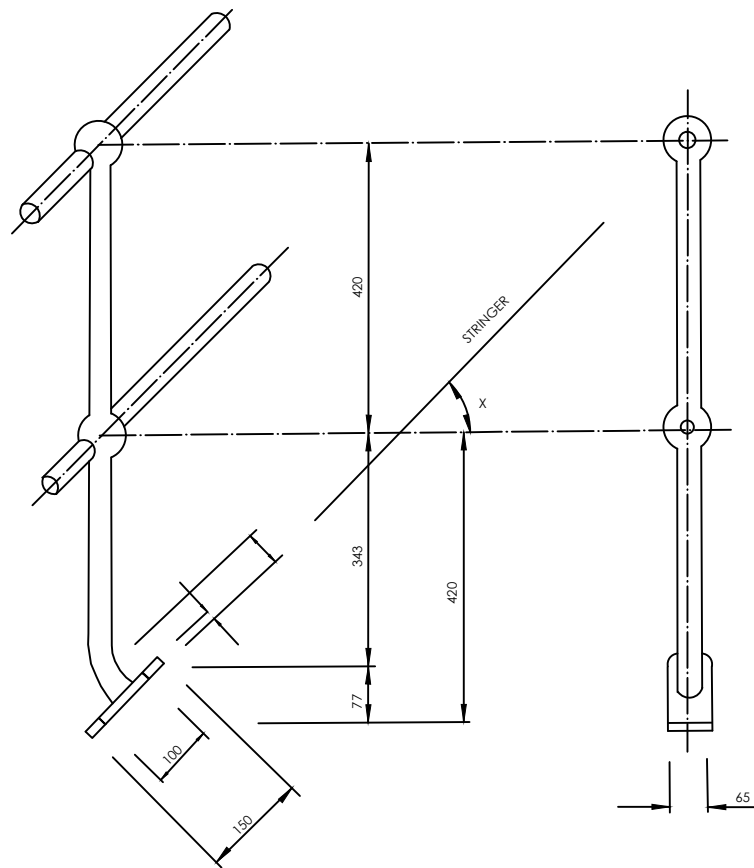
Corporate Headquarter
10 Philipot Lane, 1st Floor,
London EC3M 9AA,
United Kingdom

CONTRACTOR

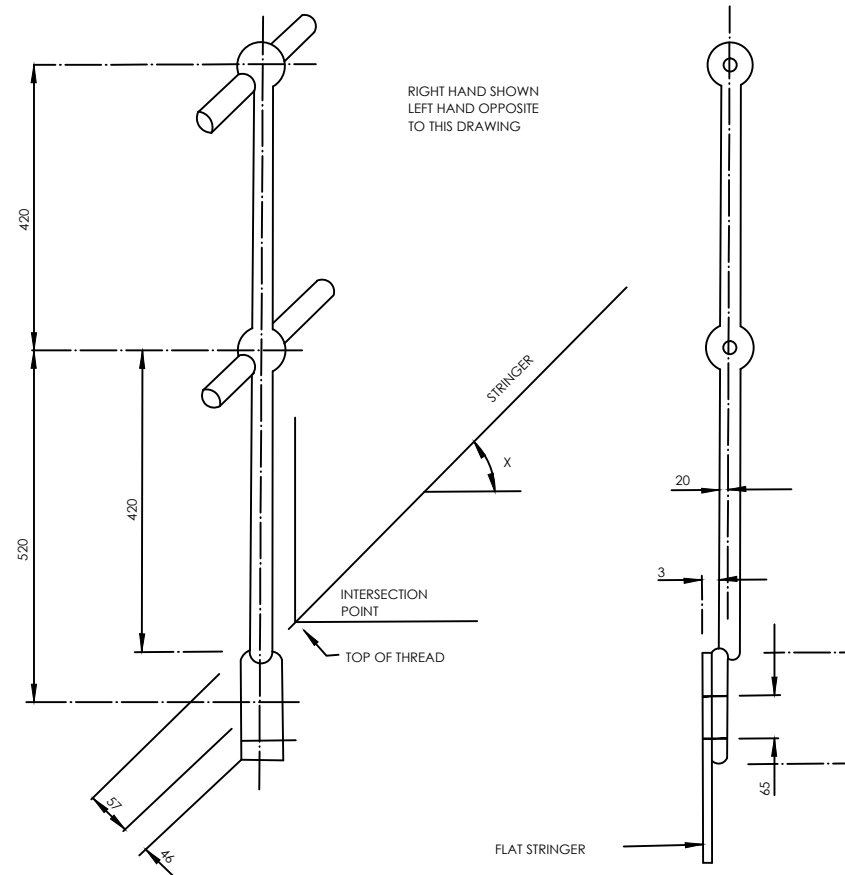
DETAILED ENGINEERING DESIGN

DRAWING TITLE
CHAIN LINK FENCE DETAILS

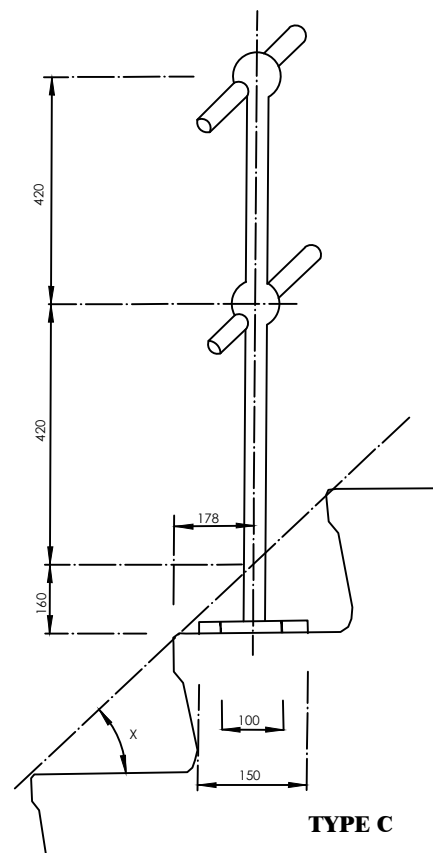
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SURVEYED		DESIGNED	Othmane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



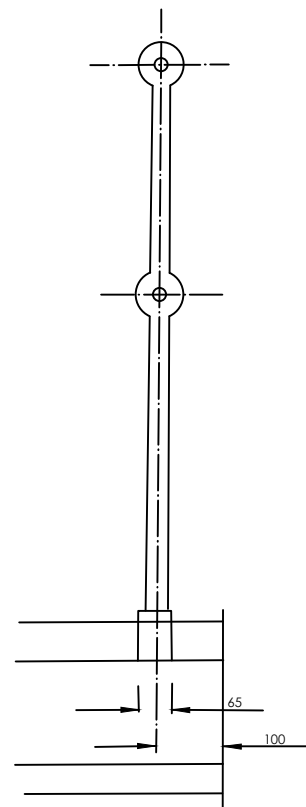
TYPE A
FOR USE ON STAIR CASES



TYPE B
FOR USE ON FLAT STAIR CASE STRINGER



TYPE C
FOR USE ON CONCRETE STAIR TREADS



ALL STANCHIONS TO BE SOLID FORGED STEEL TO BS 4360 OR BS 24 PART 4
MINIMUM DIAMETER 32mm, MIN. BALL DIA. 60mm DRILLED 35mm FOR HAND RAIL
ALL FIXING HOLES 18mm DIAMETER FOR M16 BOLTS.
MAXIMUM SPACING OF VERTICALS 1830mm

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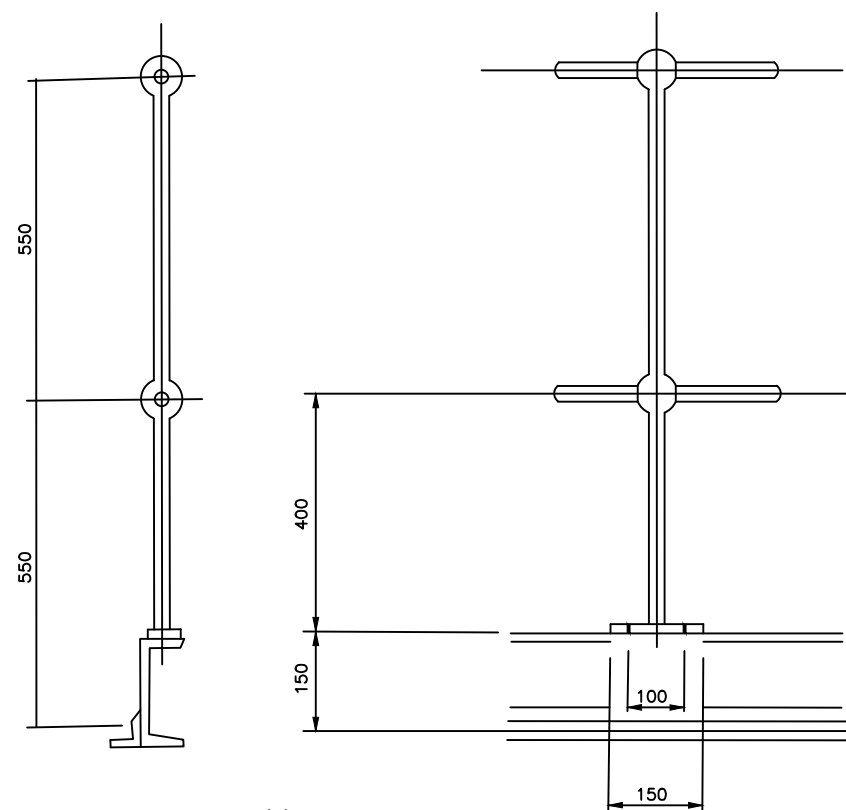
GASPA WATER SUPPLY SYSTEM

CONSULTANT
SARI
Corporate Headquarter
10 Philipot Lane, 1st Floor,
London EC3M 9AA,
United Kingdom
In Joint Venture with
SGAPI

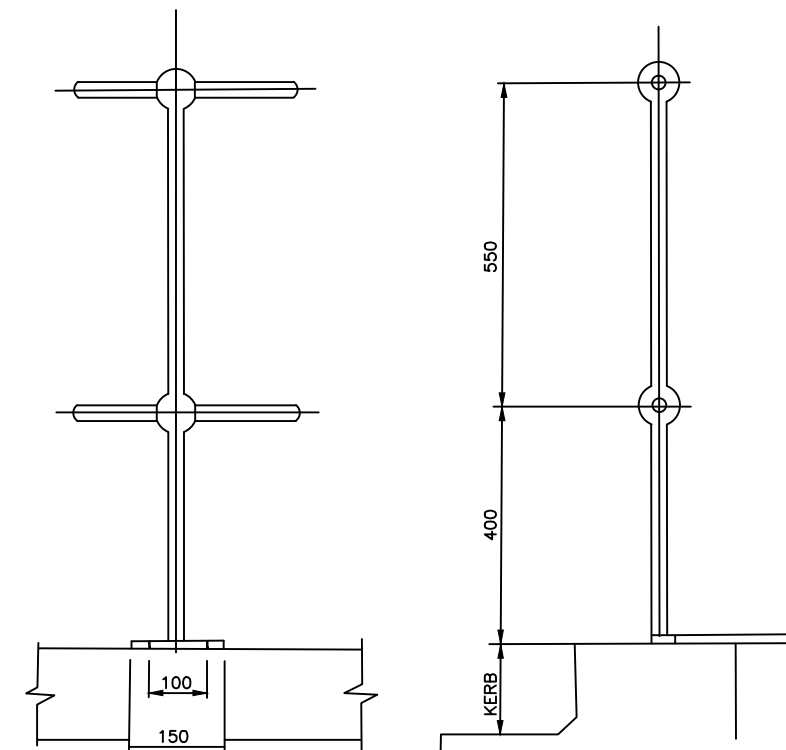
CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE
FORGED STEEL STANCHIONS FOR STAIRWAYS

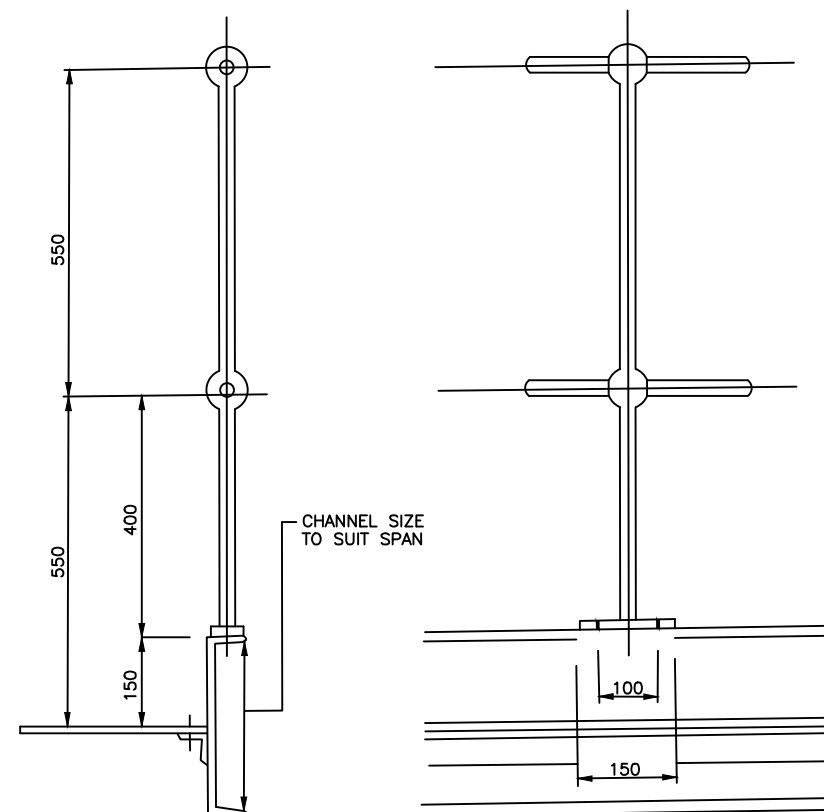
SCALE	As Shown	DRAWING No.	SD106A
SURVEYED		DESIGNED	Othmane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



TYPE 'A'
FOR USE ON WALKWAYS AND LANDINGS



TYPE 'B'
FOR USE WITH 150 HIGH CONCRETE KERB



TYPE 'C'
FOR USE ON LONG SPAN WALKWAYS



ALL STANCHIONS TO BE SOLID FORGED STEEL TO BS.4360 OR BS.24
PART 4, MIN DIA. 60mm, DRILLED 35mm DIA. FOR
HANDRAIL. ALL FIXING HOLES 18mm DIA. FOR M16 BOLTS.
MAXIMUM SPACING OF VERTICALS 1830mm.

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SYSTEMS AND SANITATION FACILITIES IN REFUGEE
SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND
NORTHERN UGANDA IN KIRYANDONGO DISTRICT

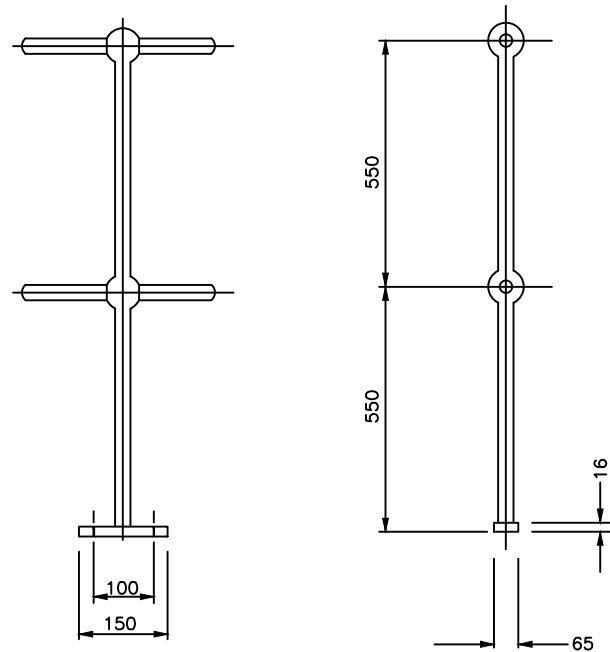
GASPA WATER SUPPLY SYSTEM

CONSULTANT
 **SARI**
Corporate Headquarter
10 Philipot Lane, 1st Floor,
London EC3M 9AA,
United Kingdom
In Joint Venture with
 **SGAPI**

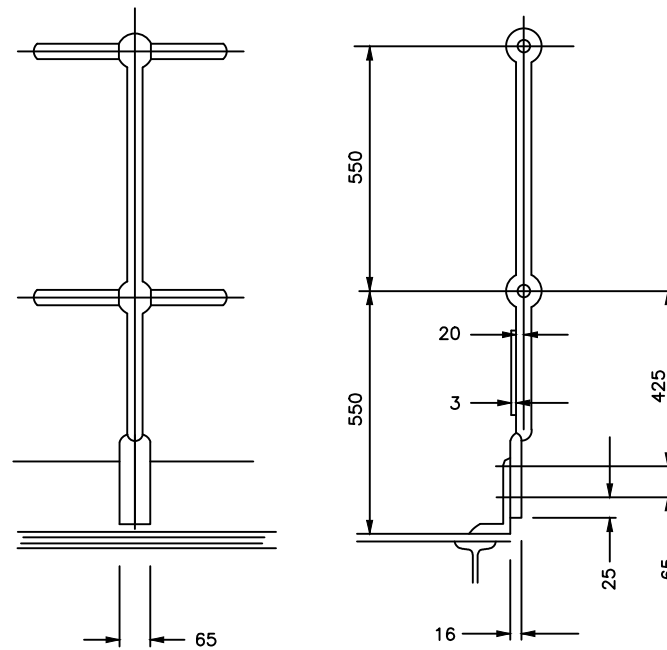
CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE
**FORCED STEEL STANCHIONS FOR
PLATFORMS AND WALKWAYS-1**

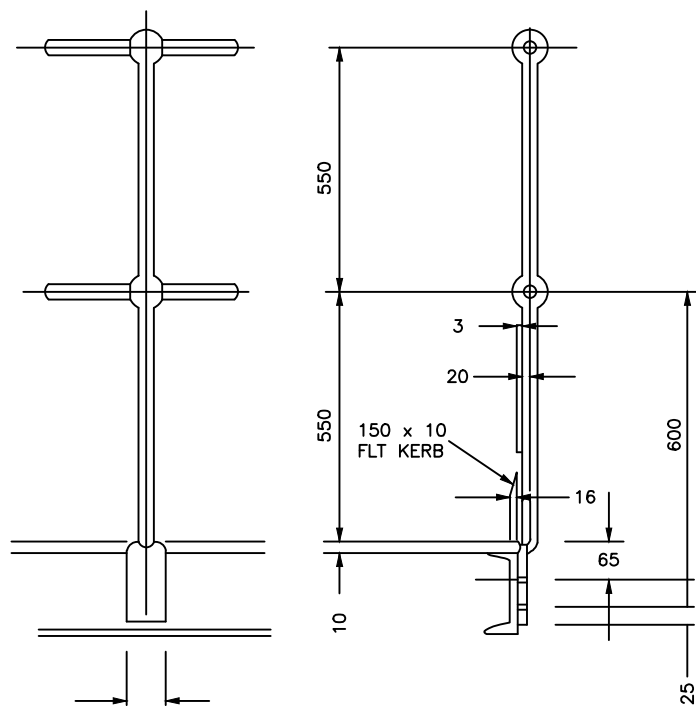
SCALE	As Shown	DRAWING No.	SD106B
SURVEYED		DESIGNED	Othmane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



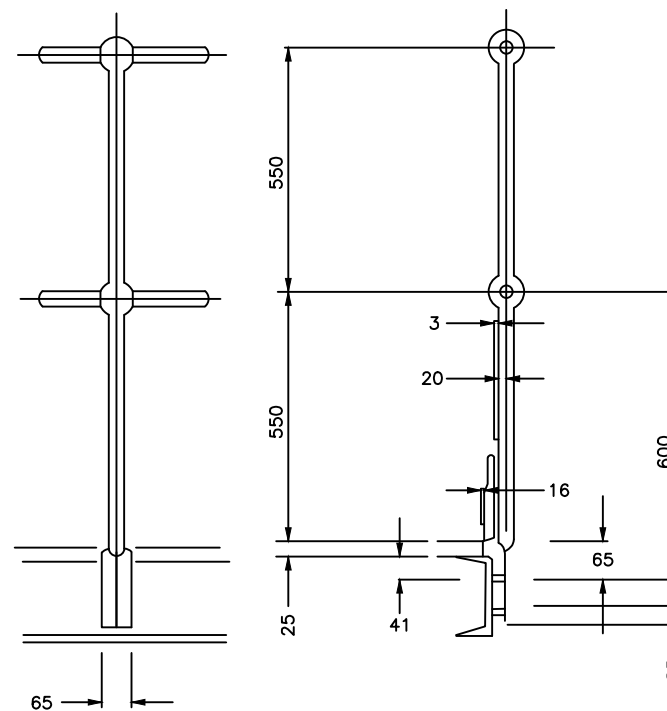
TYPE 'D'
FOR USE ON FLAT SURFACES



TYPE 'E'
FOR USE ON KERB ANGLES



TYPE 'F'
FOR USE ON PLATFORMS
HAVING 10 THK. CHEQUER
PLATE DECKING



TYPE 'H'
FOR USE ON PLATFORMS
HAVING 20 THK. OPEN
GRILL DECKING



ALL STANCHIONS TO BE SOLID FORGED STEEL TO BSS. 4360 OR BS.24 PART 4
MIN DIA. 32mm MIN BALL DIA. 60mm. DRILLED 35mm DIA. FOR HANDRAIL
ALL FIXING HOLES 18mm DIA. FOR M16 BOLTS.
MAXIMUM SPACING OF VERTICALS 1830mm.

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SYSTEMS AND SANITATION FACILITIES IN REFUGEE
SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND
NORTHERN UGANDA IN KIRYANDONGO DISTRICT

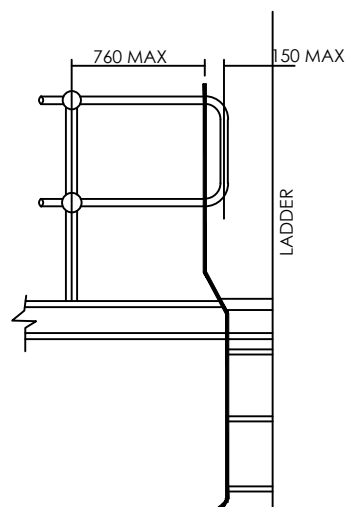
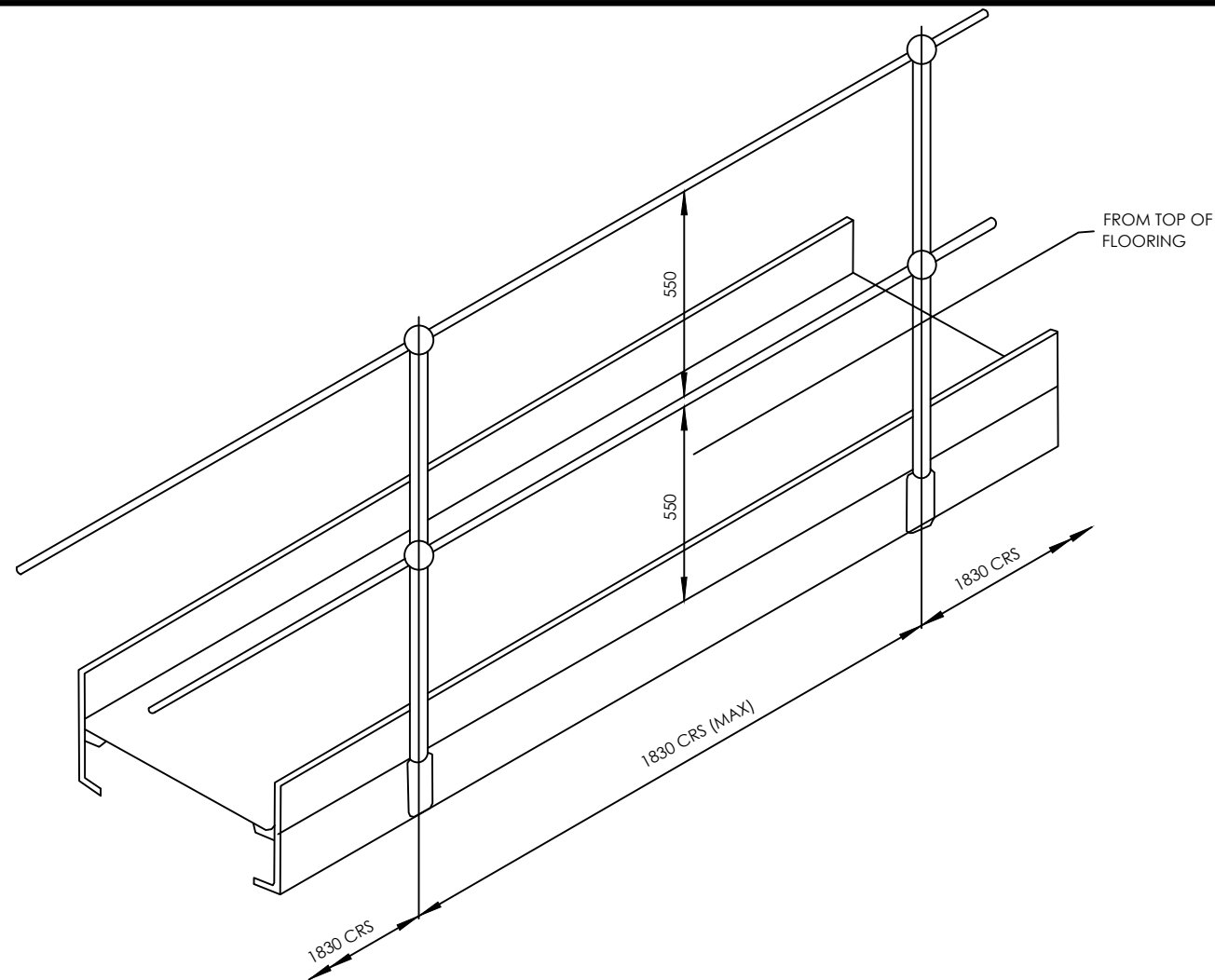
GASPA WATER SUPPLY SYSTEM

CONSULTANT
 **SARI**
Corporate Headquarter
10 Philipot Lane, 1st Floor,
London EC3M 9AA,
United Kingdom
In Joint Venture with
 **SGAPI**

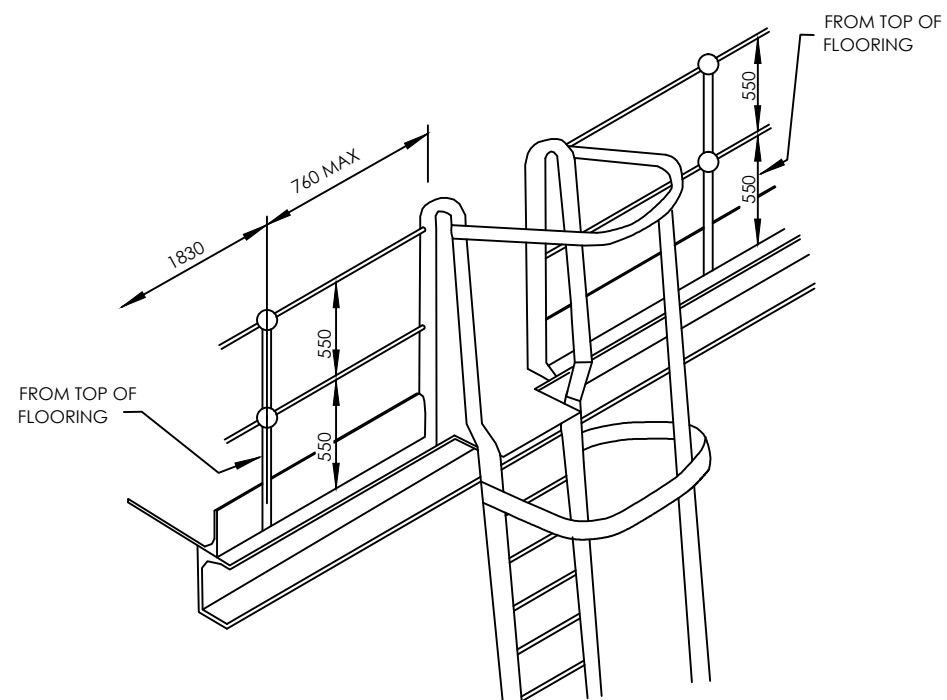
CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE
**FORCED STEEL STANCHIONS FOR
PLATFORMS AND WALKWAYS-2**

SCALE	As Shown	DRAWING No.	SD106C
SURVEYED		DESIGNED	Othmane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



DETAIL OF RUNG WELDING



HANDRAILING TUBING 1" NOM. BOREx1.28" THICK MINIMUM TO BS 1387 CLASS B OR FOR CORROSIVE CONTIONS BS 1387 CLASS B OR C GALVANIZED. STANCHIONS TO BE AS MES 1010 OR 1011

ALL JOINTS IN PIPE FORMING TOP RAIL SHOULD BE MADE AT STANCHION POINTS TO AVOID POSSIBLE HAND INJURY

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GASPA WATER SUPPLY SYSTEM

CONSULTANT



In Joint Venture with



Corporate Headquarter
10 Philpot Lane, 1st Floor,
London EC3M 9AA,
United Kingdom

CONTRACTOR

DETAILED ENGINEERING DESIGN

DRAWING TITLE

ARRANGEMENT OF HANDRAILING ON WALKWAYS AND TOP OF LADDERS

SCALE

As Shown

DRAWING No.

SD106D

SURVEYED

DESIGNED

Othmane Dan.

DRAWN

Joshua Nyarwanda

CHECKED

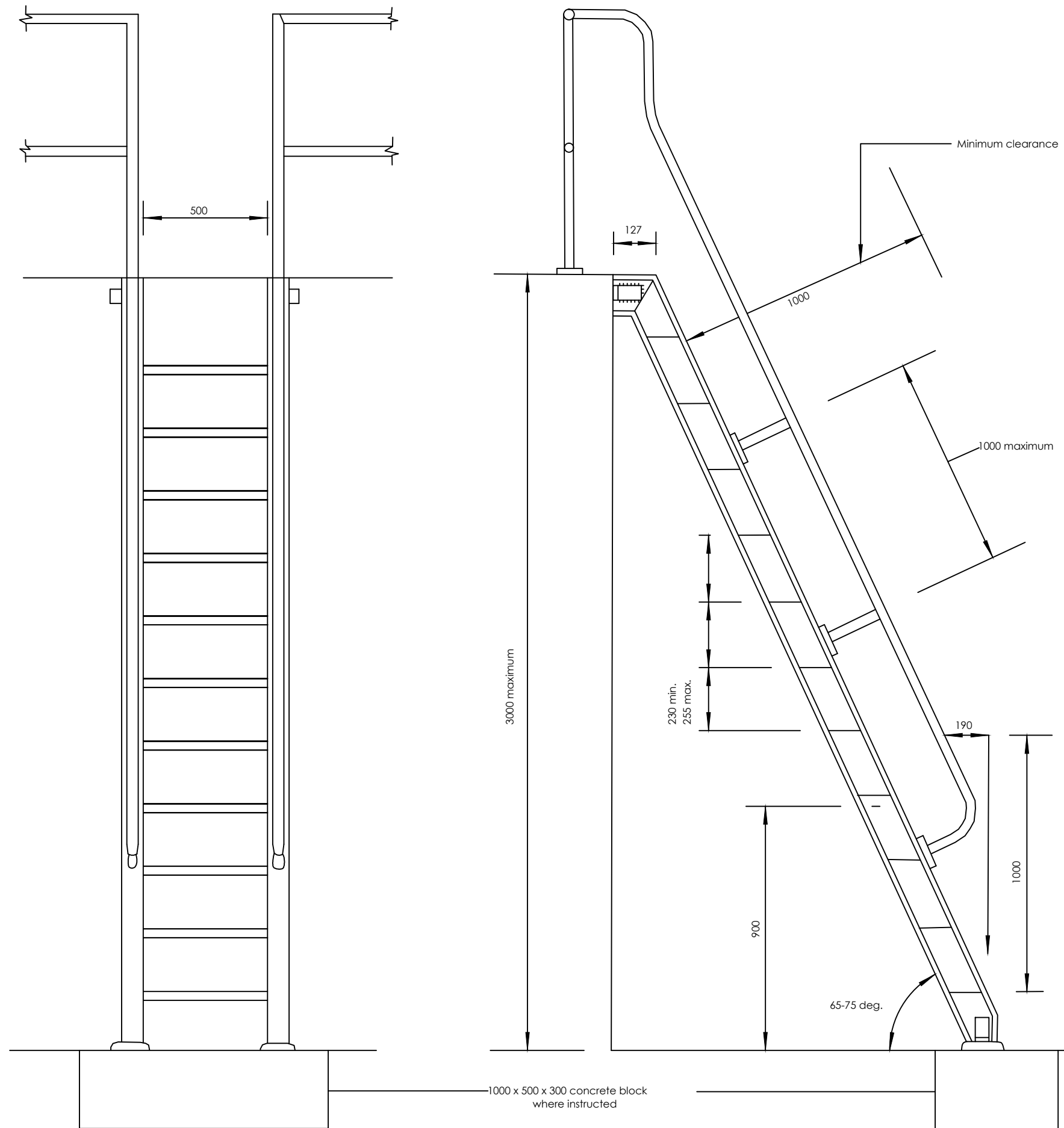
Rodney Barugahare

DATE

OCT 2021

APPROVED

Rodney Barugahare.



NOTES

1. Stringers 127 x 64 x 14.9 kg/m rolled steel channel.
2. Steps 8 mm thick chequer plate with nosed front edge.
3. Step supports 30 x 30 x 5 angle welded to treads and fixed to stringers with 12 dia bolts and nuts.
4. All welds to be 8 mm fillet welds.
5. Cleats 90 x 90 x 10 angle.
6. Holding down bolts 20 dia.
7. Handrailing in accordance with the specification.
8. For details see SD107B.

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DETAILED ENGINEERING DESIGN AND CONSTRUCTION
SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY
SYSTEMS AND SANITATION FACILITIES IN REFUGEE
SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND
NORTHERN UGANDA IN KIRYANDONGO DISTRICT

GASPA WATER SUPPLY SYSTEM

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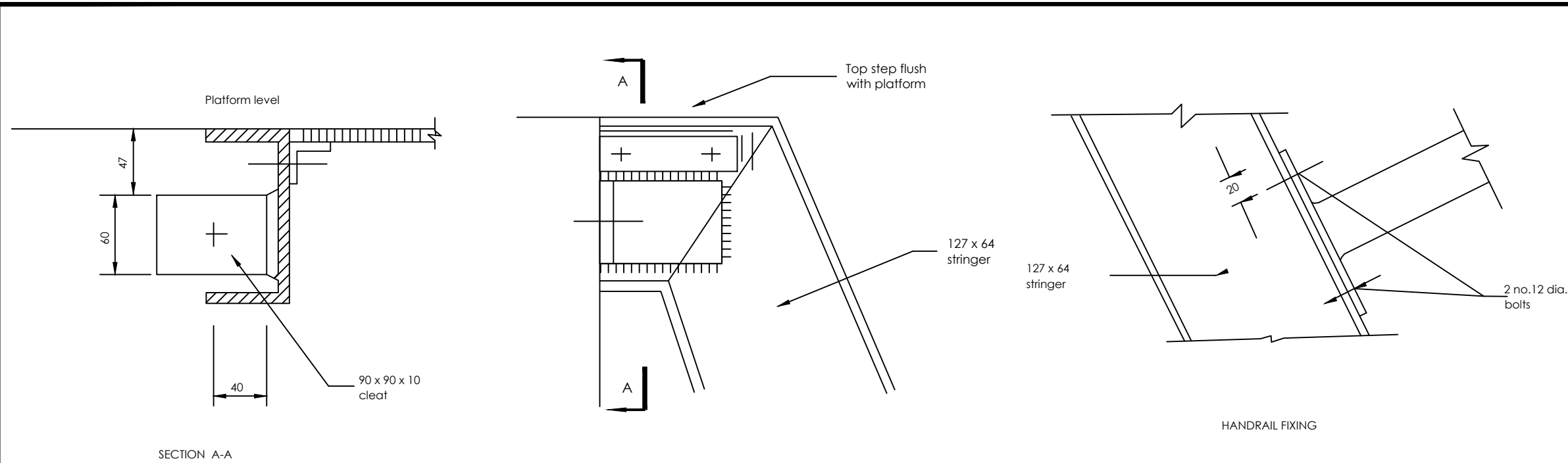
CONTRACTOR

DETAILED ENGINEERING DESIGN

DRAWING TITLE

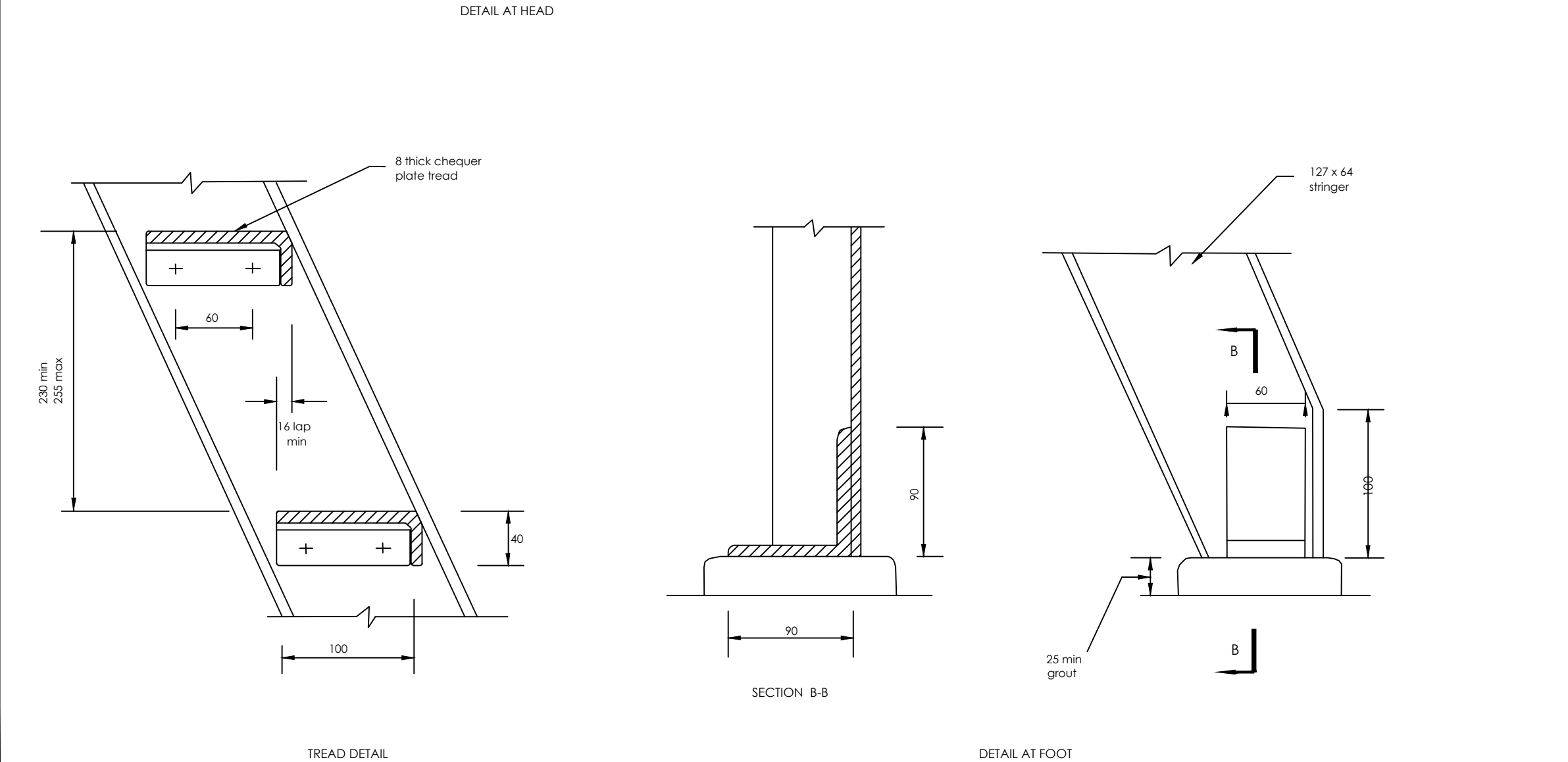
**ARRANGEMENT OF HANDRAILING ON
WALKWAYS AND TOP OF LADDERS**






SCALE	As Shown	DRAWING No.	SD107A
SURVEYED		DESIGNED	Othmane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.

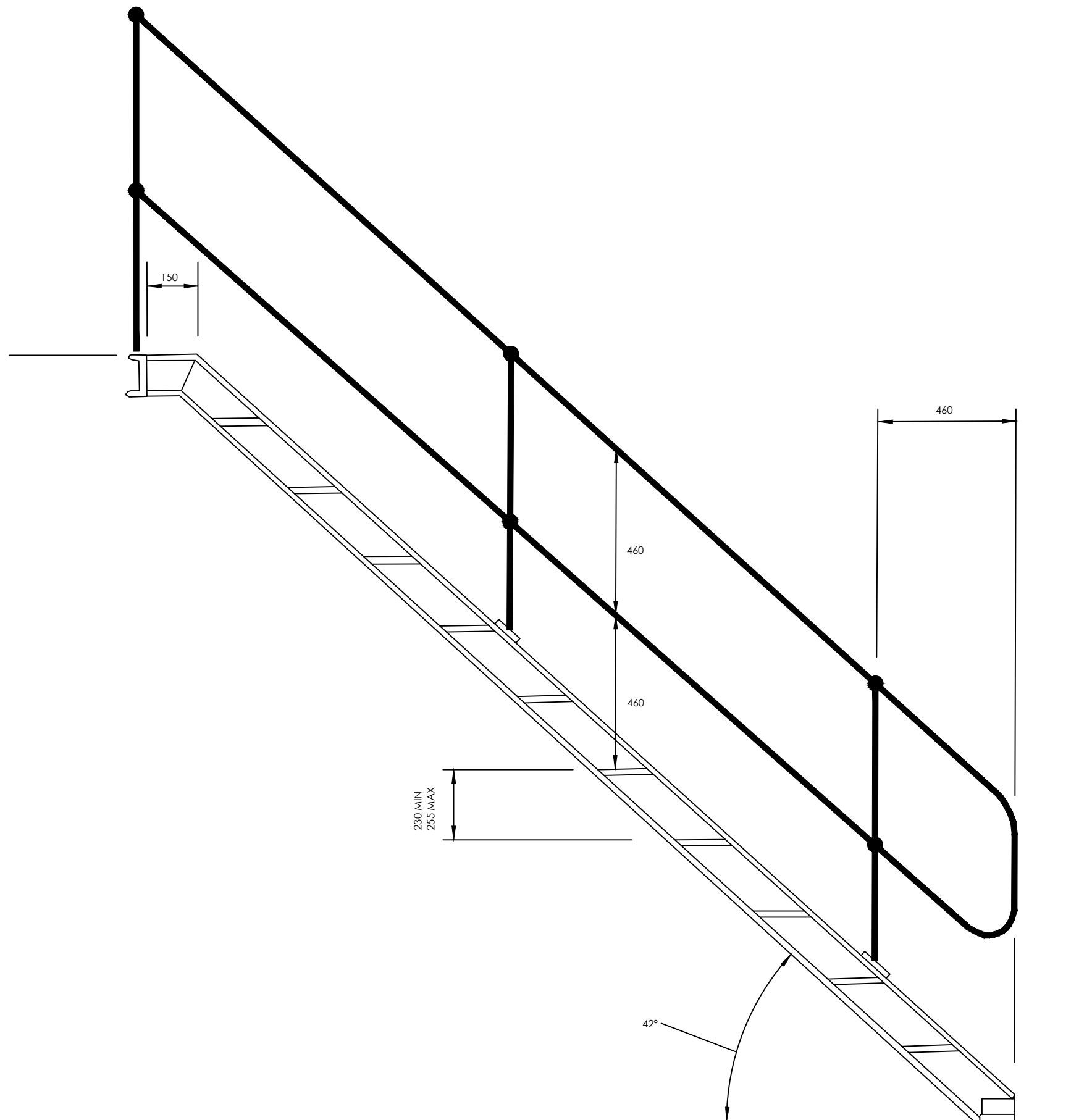


NOTES

1. All welds to be 8mm fillet welds
2. Holding down bolts 20 dia.



CUENT		 GOVERNMENT OF UGANDA MINISTRY OF WATER AND ENVIRONMENT	
CO-FINANCED BY:		 AND  THE WORLD BANK GOVERNMENT OF UGANDA	
PROJECT		CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT	
CONSULTANT		 In Joint Venture with  Corporate Headquarter 10 Philipot Lane, 1st Floor, London EC3M 9AA, United Kingdom	
CONTRACTOR			
DRAWING TITLE		MILD STEEL SHIPTYPE LADDER - DETAIL	
SCALE	As Shown	DRAWING No.	SD107B
SURVEYED		DESIGNED	Othmane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.





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NORTHERN UGANDA IN KIRYANDONGO DISTRICT

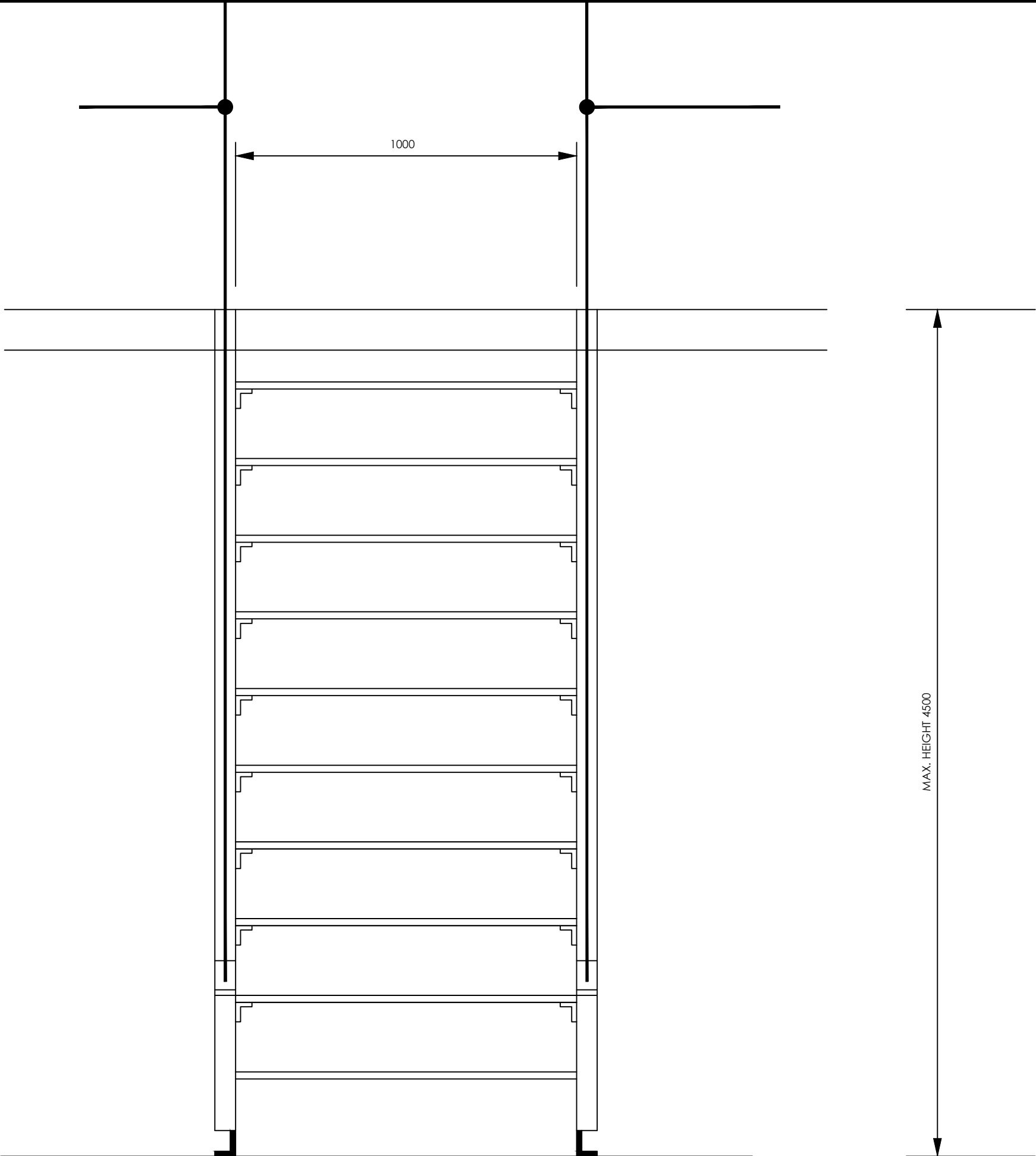
GASPA WATER SUPPLY SYSTEM

CONSULTANT
 **SARI**
Corporate Headquarter
10 Philipot Lane, 1st Floor,
London EC3M 9AA,
United Kingdom
In Joint Venture with  **SGAPI**

CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE
**MILD STEEL STAIRWAY
SIDE ELEVATION**

SCALE	As Shown	DRAWING No.	SD107C
SURVEYED		DESIGNED	Othmane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



NOTES

- 1. STRINGERS 152 X 76 X 17.88 kg/m ROLLED SSTEEL CHANNEL
- 2. STEPS 10 mm THICK CHEQUER PLATE WITH NOSED FRONT EDGE
- 3. STEPS SUPPORTS 50 X 50 X 5 THK. ANGLE WELDED TO TREADS AND FIXED TO STRINGERS WITH M12 BOLTS AND NUTS
- 4. ALL WELDS TO BE 8 mm FILLET
- 5. CLEATS 90 X 90 X 10 ANGLE
- 6. HOLDING DOWN BOLTS 20 DIA.
- 7. HANDRAILS IN ACCORDANCE WITH SPECIFICATION
- 8. SURFACE FINISH IN ACCORDANCE WITH SPECIFICATION

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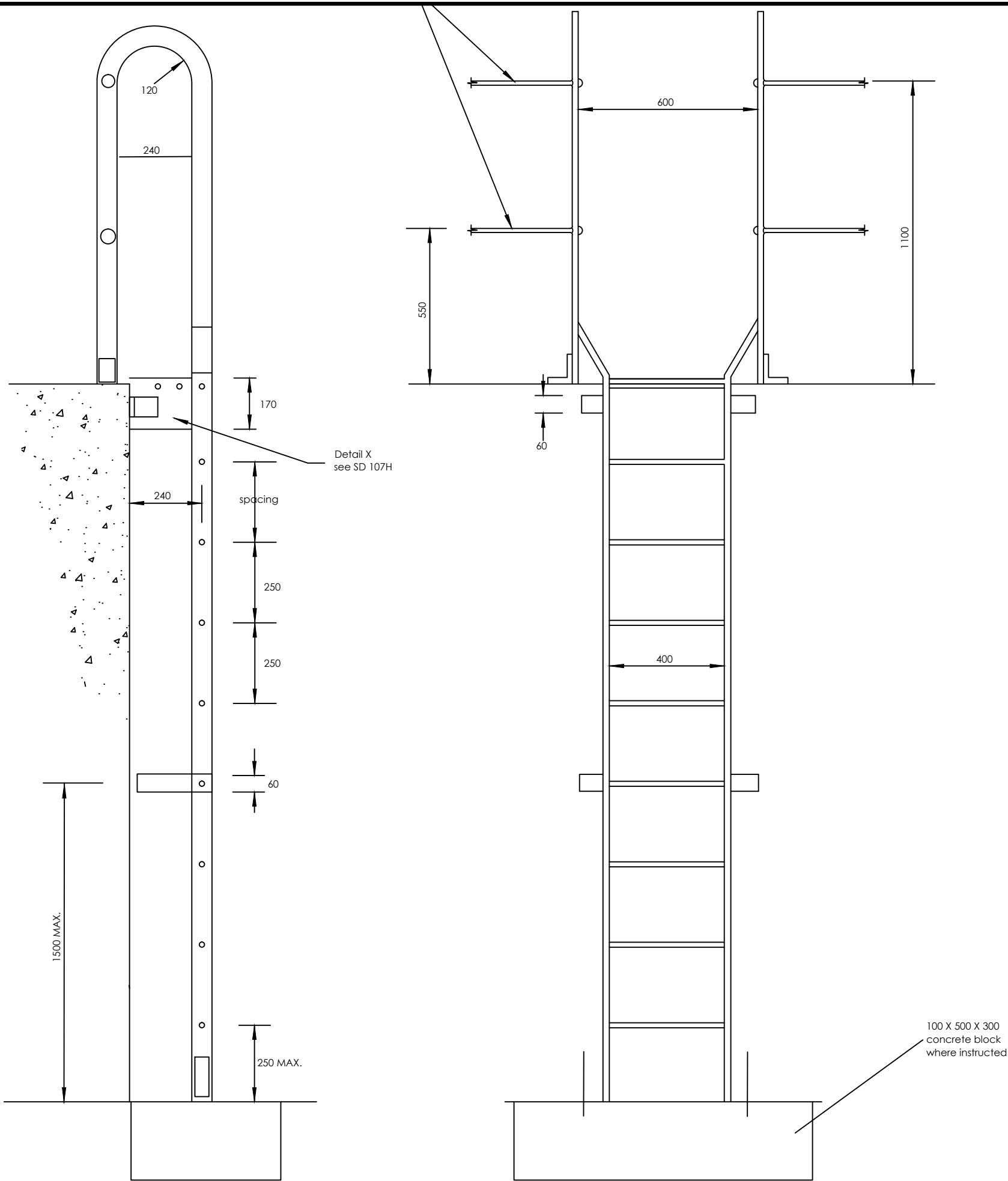
CONTRACTOR

DETAILED ENGINEERING DESIGN

DRAWING TITLE

MILD STEEL STAIRWAY
FRONT ELEVATION

SCALE	As Shown	DRAWING No.	SD107D
SURVEYED		DESIGNED	Othwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



NOTES

1. Stringers 65 x 10 flat
2. Rungs 20 dia. solid bar
3. Cleats 90 x 90 x 10 angle
4. All welds to be 8 mm fillet welds
5. holding down bolts 20 dia.
6. Surface finish in accordance with the specification
7. For details see SD 107H

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Sustainable Access to Rural Infrastructure

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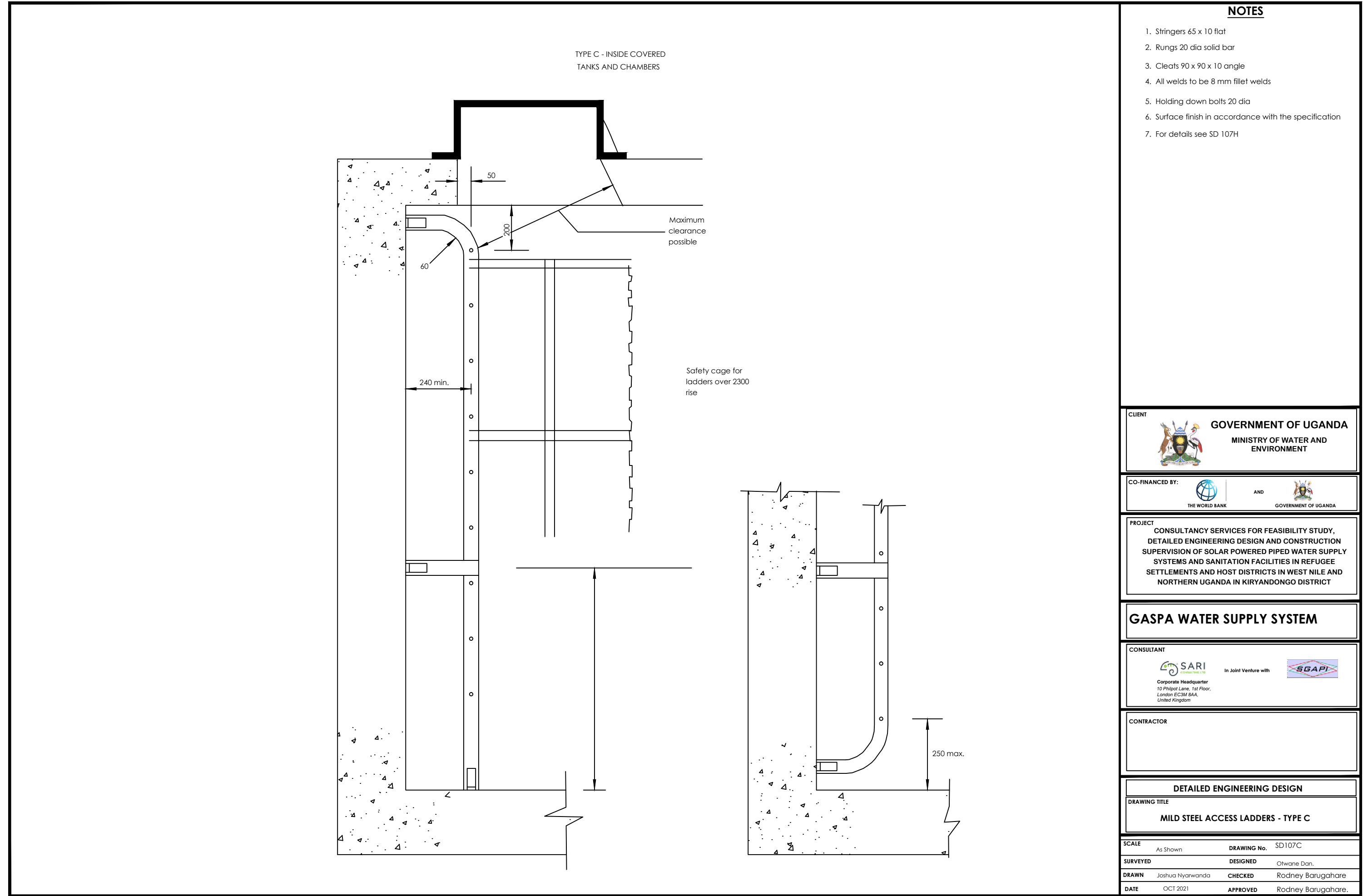
CONTRACTOR

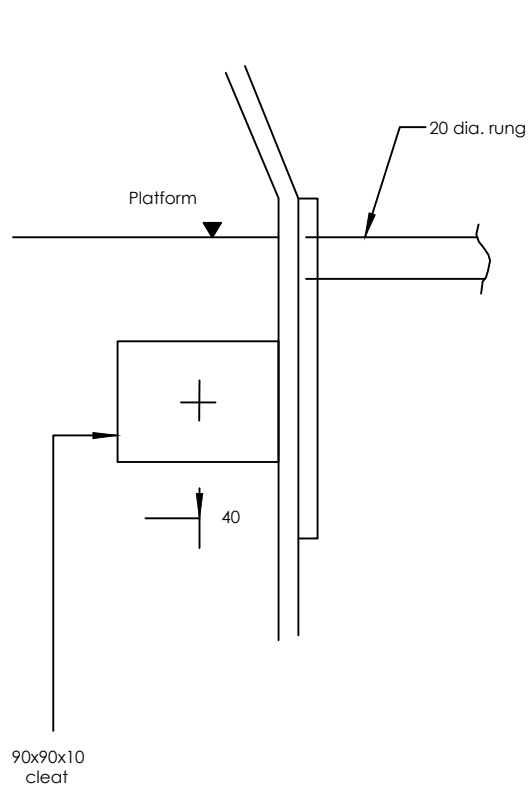
DETAILED ENGINEERING DESIGN

DRAWING TITLE

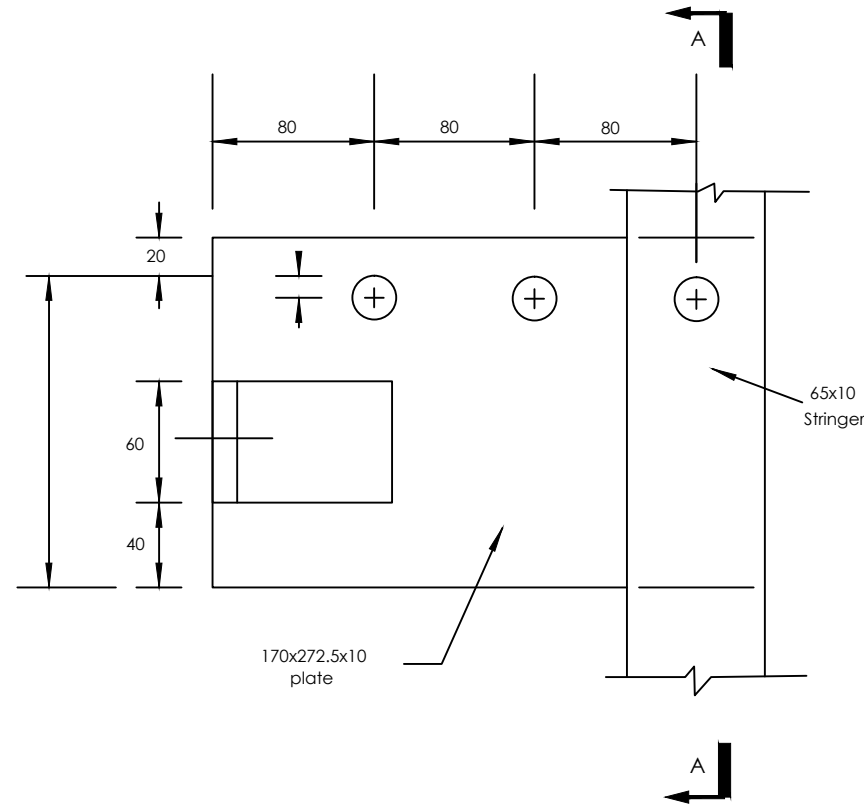
**MILD STEEL ACCESS LADDER - TYPE A
(NOT EXCEEDING 2.3 RISE)**

SCALE	As Shown	DRAWING No.	SD107E
SURVEYED		DESIGNED	Othmane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.

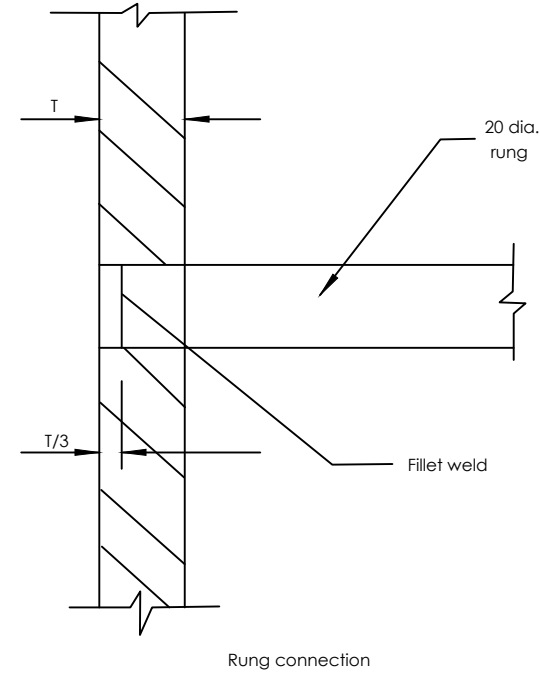




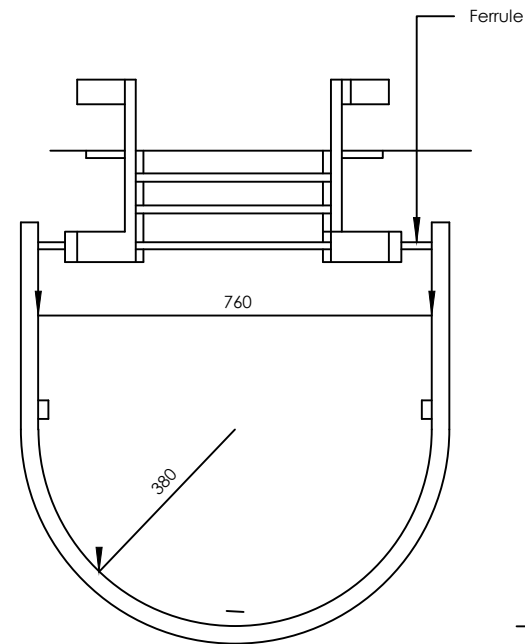
SECTION A - A



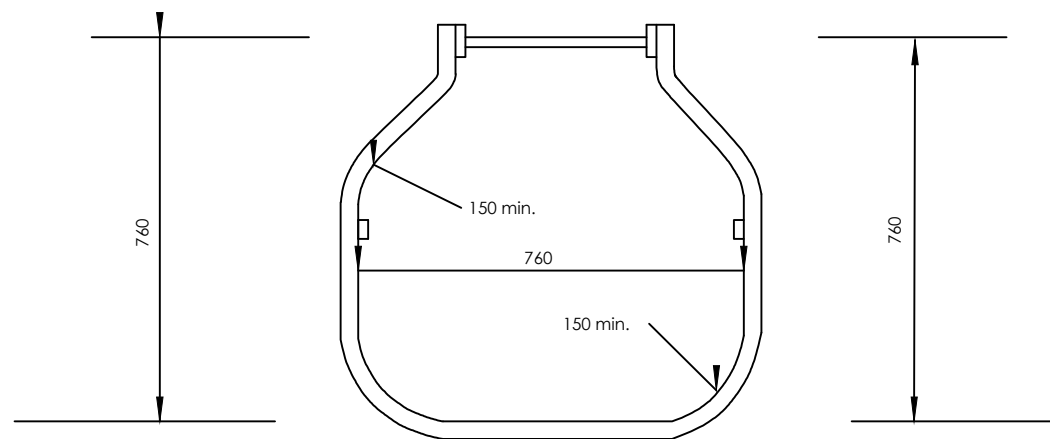
Detail "X" at platform level



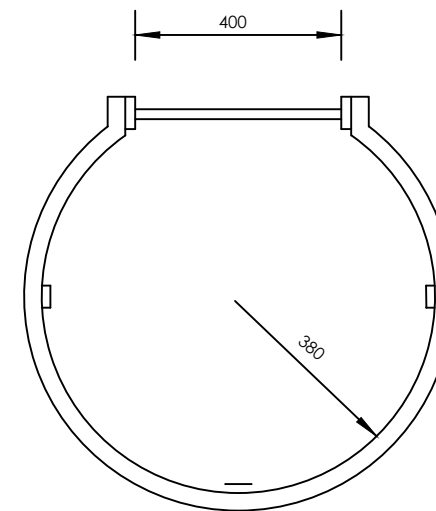
Rung connection



Semi circular
hoop



Rectangular
hoop



Circular
hoop

NOTES

1. All welds to be 8 mm fillet welds
2. Hoops and vertical cage members to be 50x10 flat welded together or fixed with 12 dia. bolts and nuts
3. Holding down bolts 20 dia.

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CONSULTANT

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Corporate Headquarter
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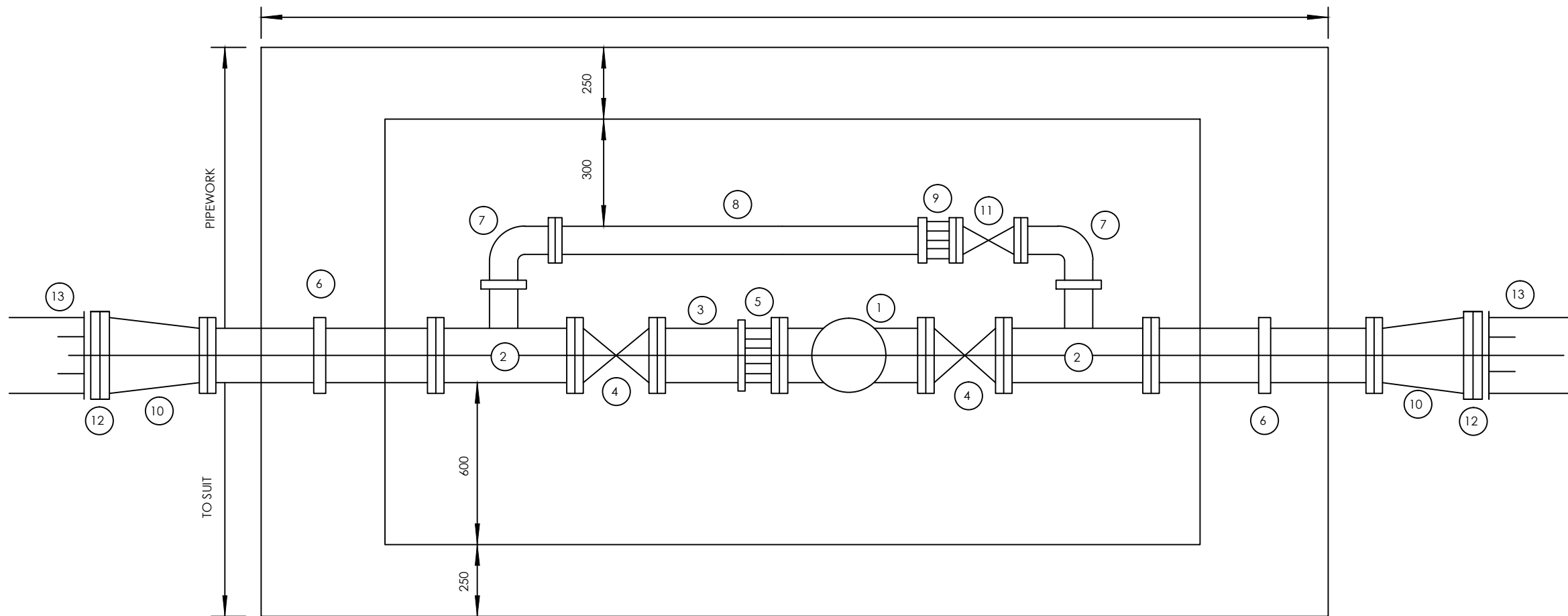
CONTRACTOR

DETAILED ENGINEERING DESIGN

DRAWING TITLE

MILD STEEL ACCESS LADDERS - DETAILS

SCALE	As Shown	DRAWING No.	SD107H
SURVEYED		DESIGNED	Othmane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



(SD 131 PRV CHAMBER)

MAIN SIZE (mm DIAMETER)	PRV SIZE (mm DIAMETER)
100	80
150	100
200	150
250	200
300	250
350	300

NOTES

- All dimensions in millimetres
- For details of reinforced concrete chamber see SD 132
- See general notes
- ITEM
- Pressure reducing valve
- All flanged tee (DN100 branch)
- Flanged spigot pipe
- Flanged gate valve
- Flange adaptor
- Flange spigot pipe with puddle Flange
- Flanged 90° bend DN100
- Flanged spigot pipe cut to fit
- Flanged adaptor DN100
- Flanged taper
- Gate valve DN100
- Flange adaptor (Viking Johnson 'maxi' or similar approved)
- Distribution main

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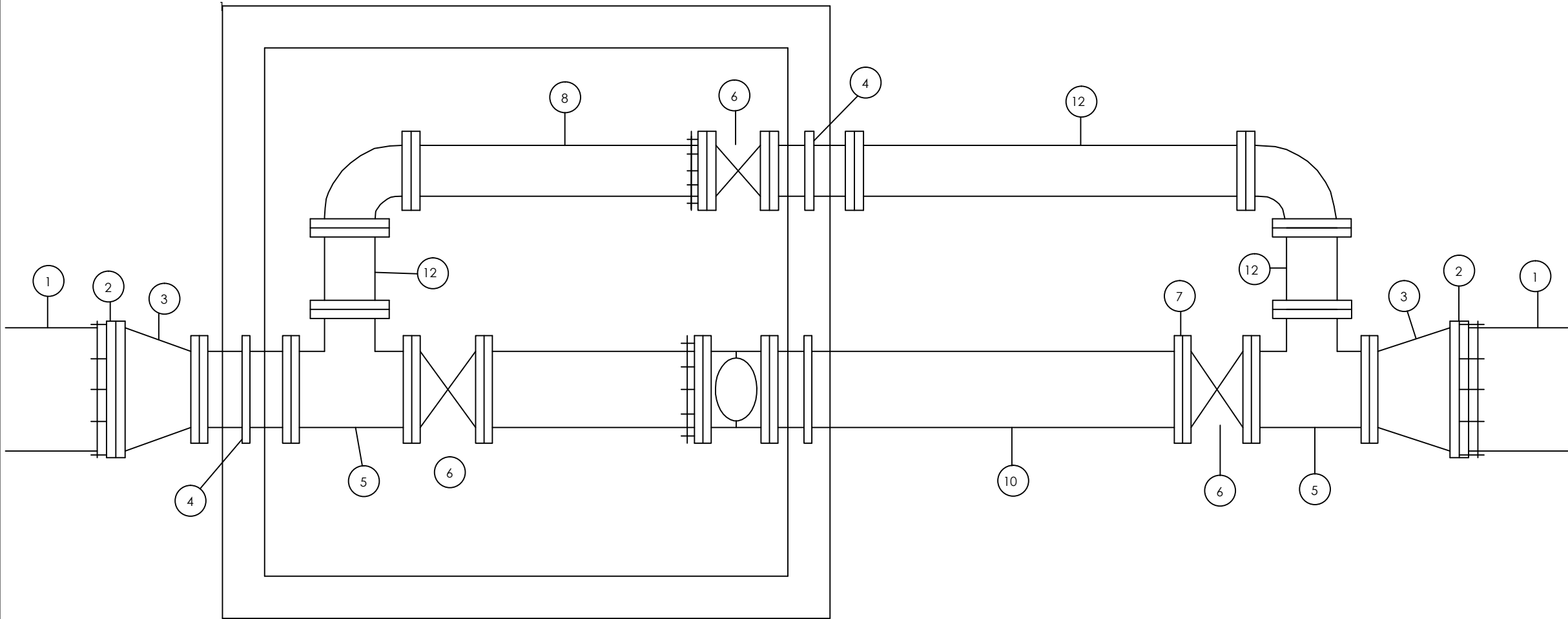
CONTRACTOR

DETAILED ENGINEERING DESIGN

DRAWING TITLE

PRESSURE REDUCING VALVE - PIPEWORK

SCALE	As Shown	DRAWING No.	SD109
SURVEYED		DESIGNED	Othmane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



MAIN SIZE (mm DIAMETER)	FLOWMETER SIZE (mm DIAMETER)
100	80
150	100
200	150
250	200
300	250
350	300

NOTES

- 1 All dimensions in millimetres
- 2 For details of reinforced concrete chamber see SD 132
- 3 Length of each item of pipework shall be specified by the Project Manager
- 4 See general notes

ITEM

- 1 Distribution main
- 2 Flange adaptor (Viking Johnson 'maxi' or similar approved)
- 3 Flanged taper
- 4 All flanged piece with central thrust flange
- 5 All flanged equal tee
- 6 Flange gate valve
- 7 Flanged adaptor
- 8 Flanged spigot pipe
- 9 Water meter
- 10 Flanged spigot with thrust flange 500mm from flanged end
- 11 Flanged 90° bend
- 12 Double flanged pipe

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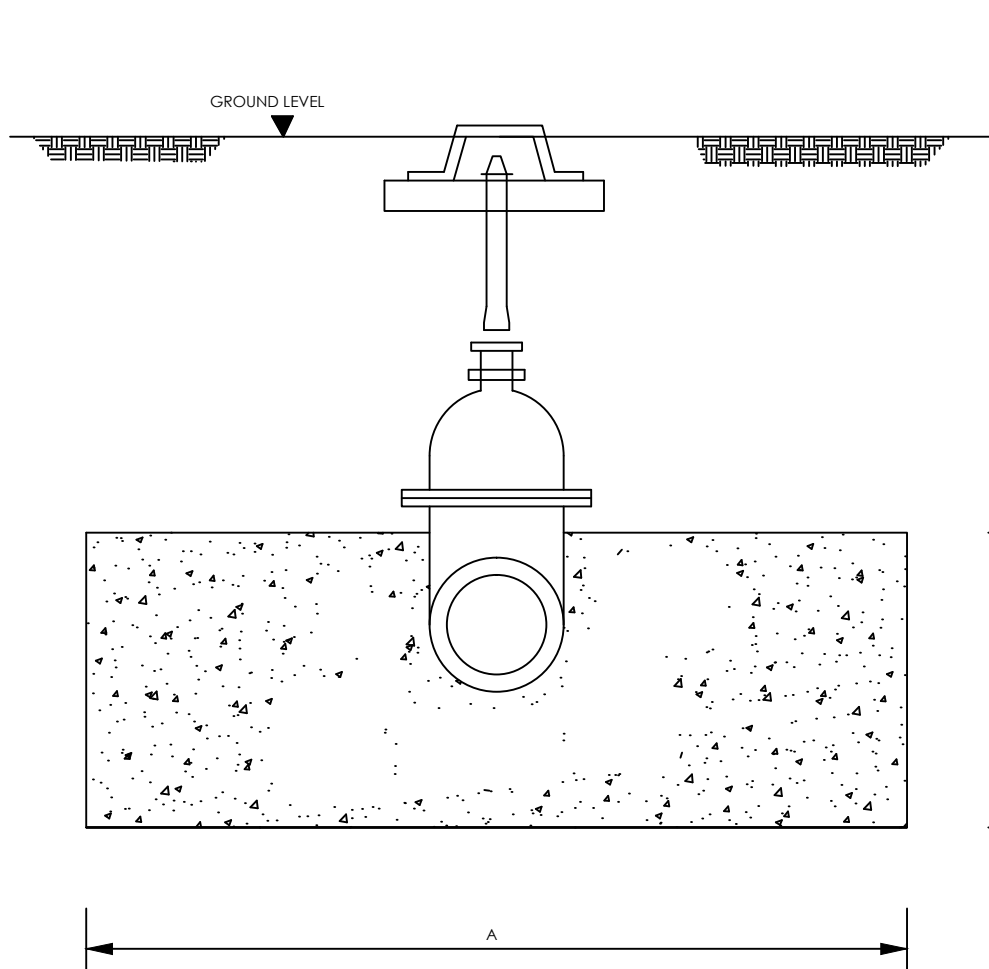
CONTRACTOR

DETAILED ENGINEERING DESIGN

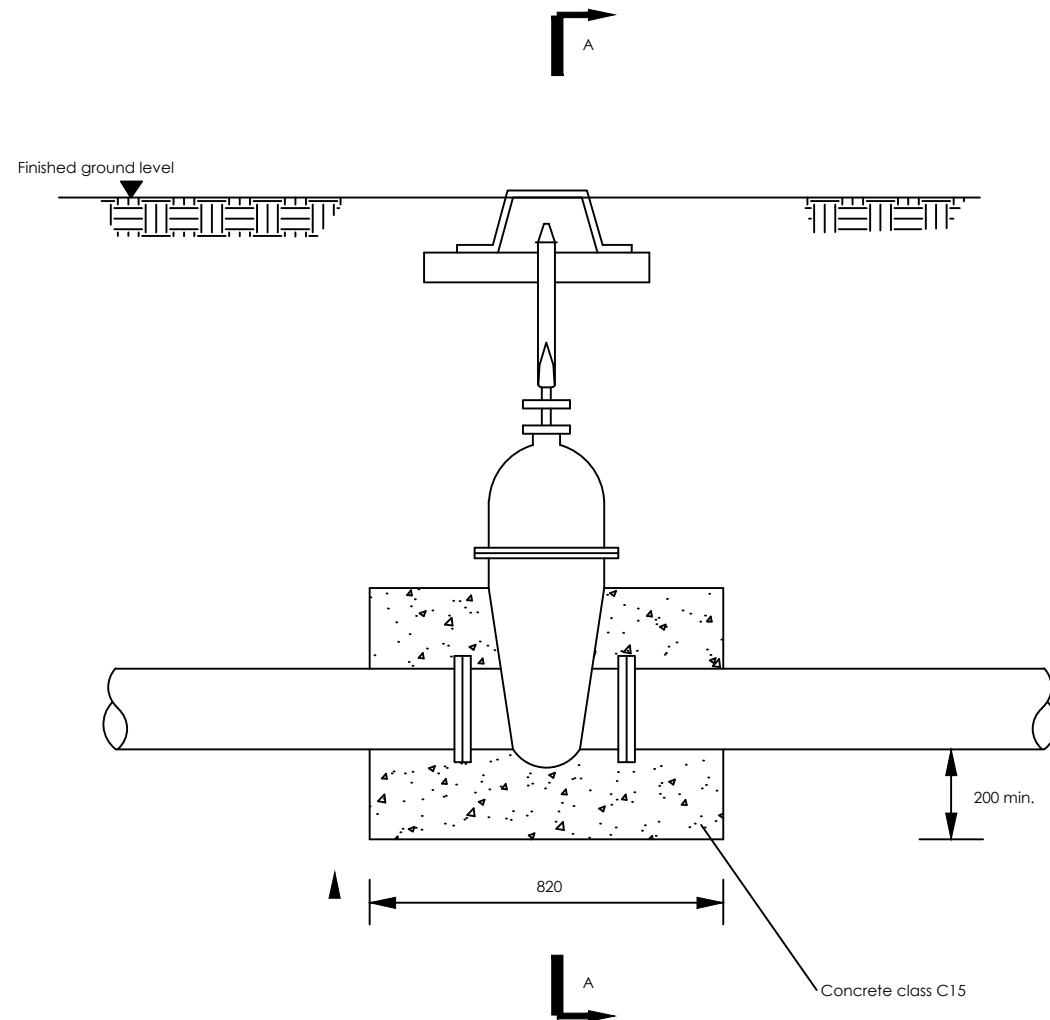
DRAWING TITLE

FLOWMETER - PIPEWORK

SCALE	As Shown	DRAWING No.	SD110
SURVEYED		DESIGNED	Othmane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



SECTION A-A



NOTES



1. For details of Valve
box see SD122
2. For dimension A see
S.T. 111 D and E

NOTES

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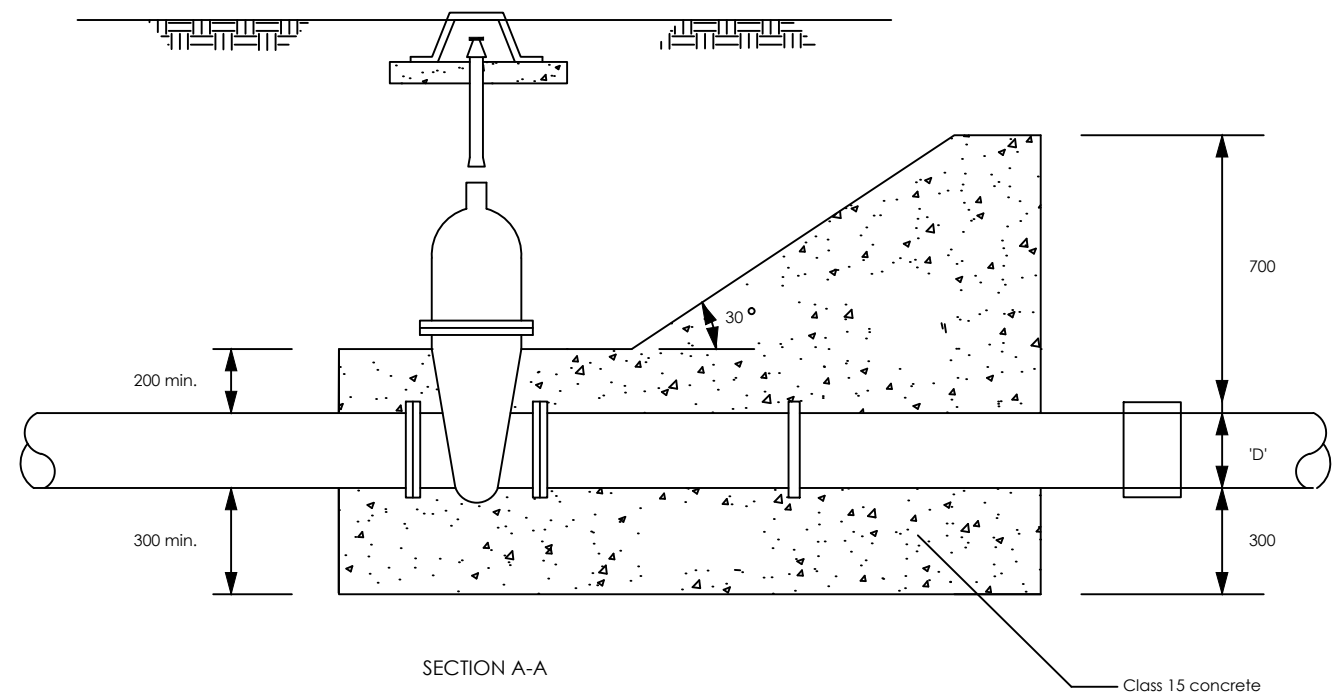
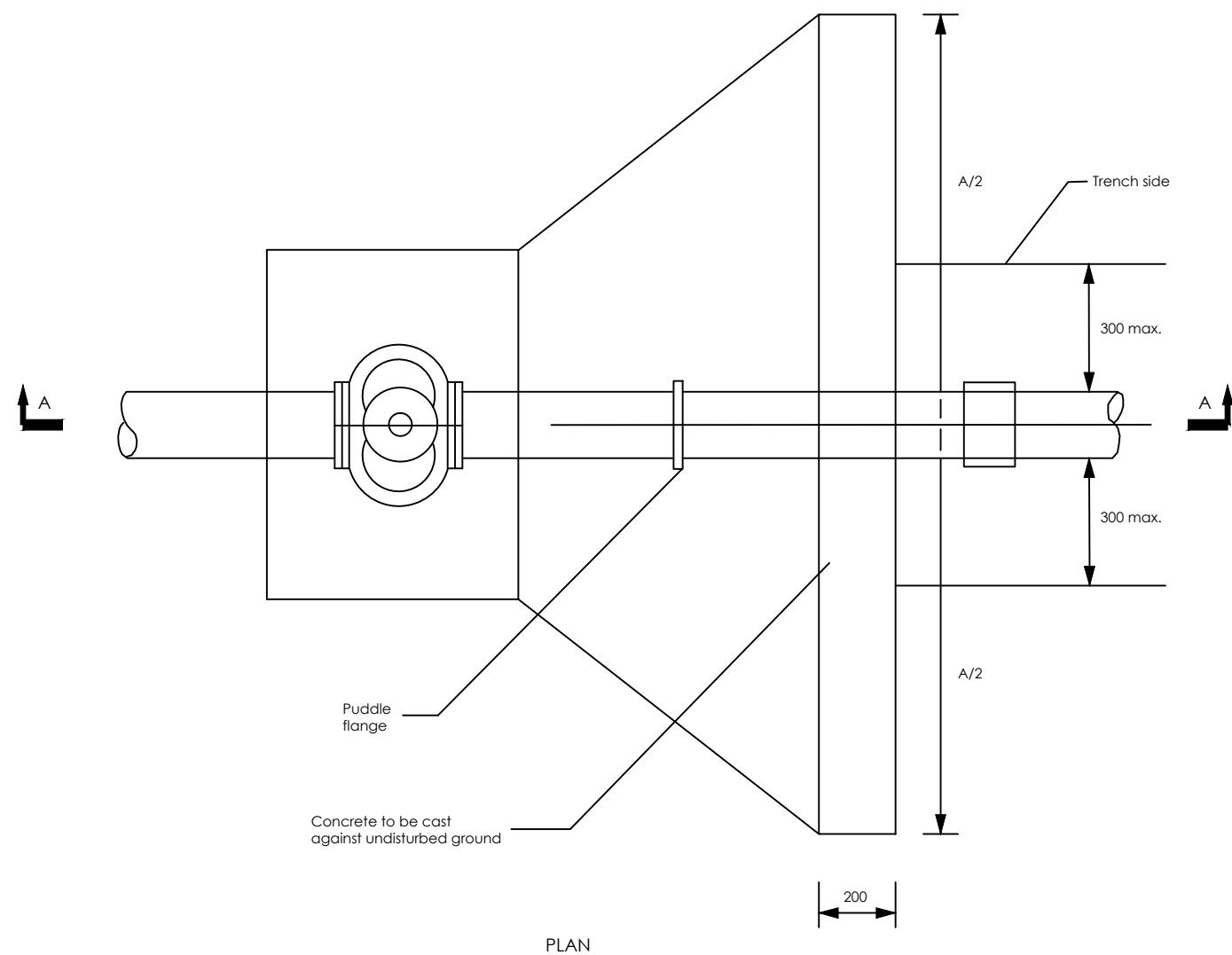
CONTRACTOR

DETAILED ENGINEERING DESIGN

DRAWING TITLE

FLOWMETER - PIPEWORK

SCALE	As Shown	DRAWING No.	SD111A
SURVEYED		DESIGNED	Othmane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



NOTES



- For details of surface box see SD122
- For dimension A see SD 111 D and E

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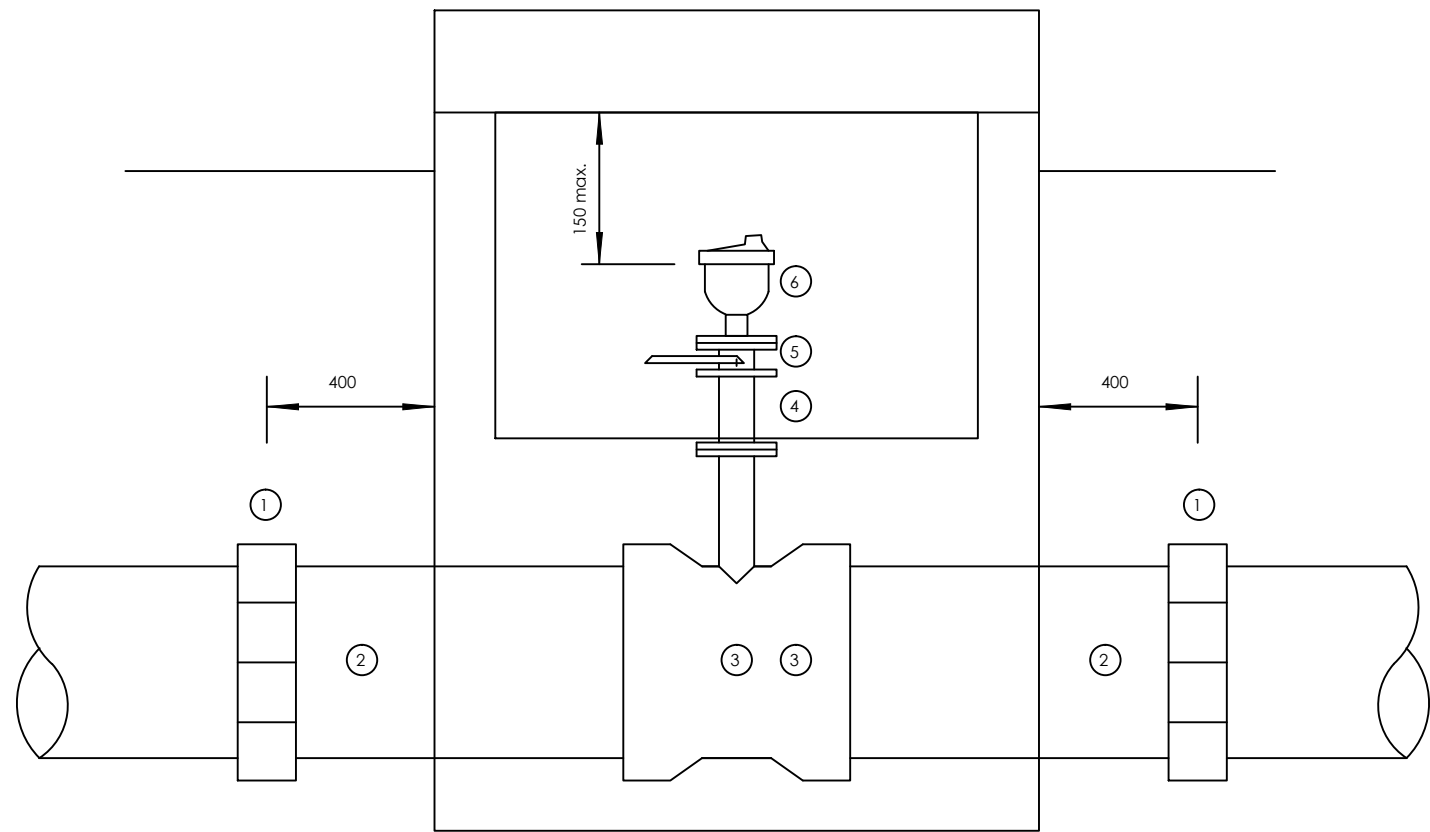
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CONTRACTOR

DETAILED ENGINEERING DESIGN
 DRAWING TITLE
GATE VALVE - TYPE 2

SCALE	As Shown	DRAWING No.	SD111B
SURVEYED		DESIGNED	Othmane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



NOTES

- 1 All dimensions are in millimetres
- 2 Flanged pipework to be ductile iron
- 3 Make up pipes to be ductile iron
- 4 Chamber to be 1200x900 internal dimensions
- For details see standard drawing SD 112D
- 5 See General Notes

SCHEDULE

ITEM	DESCRIPTION
1	Flexible adaptor if required
2	Make-up pipe
3	Socket tee flanged branch 80/50 dia as required
4	Flanged pipe 80/50 dia as required
5	Isolating valve
6	Air valve

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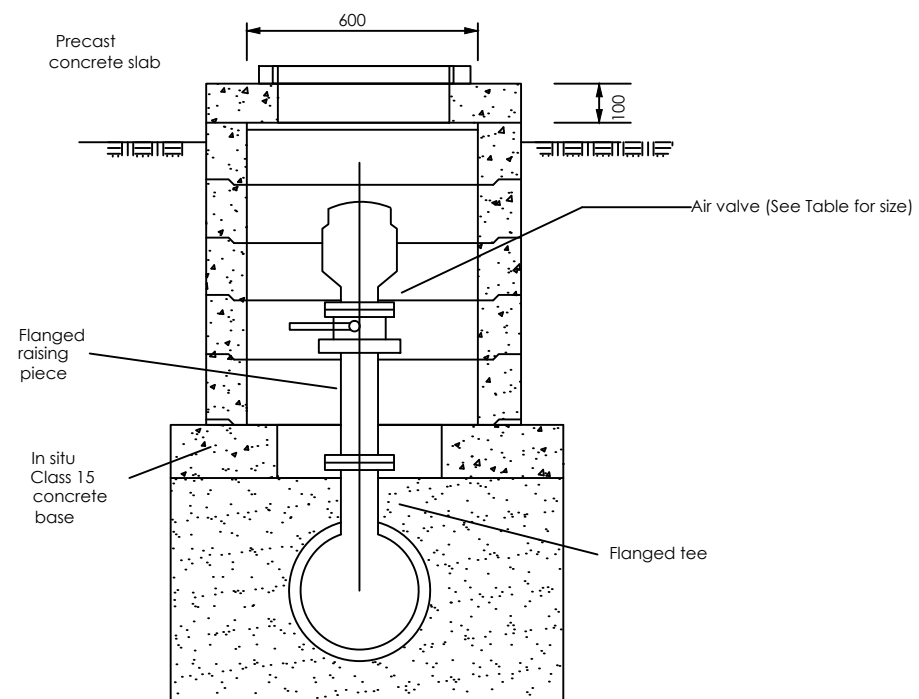
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DETAILED ENGINEERING DESIGN

DRAWING TITLE

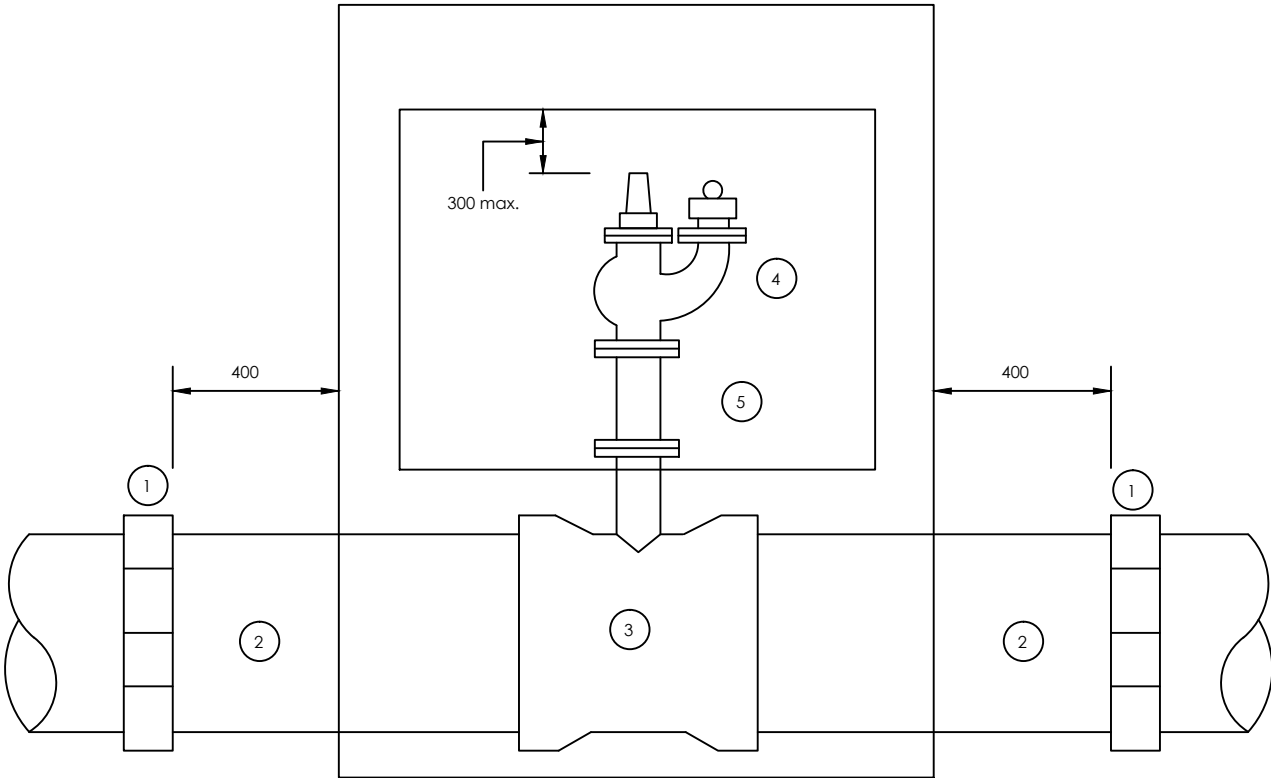
AIR VALVE PIPEWORK

SCALE	As Shown	DRAWING No.	SD112A
SURVEYED		DESIGNED	Othmane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



Main dia.	Air valve inlet dia.
100-300	50
350-500	80

APPROVED Rodney Barugahare.



SCHEDULE

ITEM DESCRIPTION

- 1 Flexible adaptor if required
- 2 Make-up pipe
- 3 Socket tee flanged branch 80 dia.
- 4 Flanged pipe 80 dia. As required
- 5 Screwdown hydrant

NOTES

- 1. Flanged pipework to be ductile iron
- 2. Make up pipes to be ductile iron or asbestos cement
- 3. For chamber details see SD113 B

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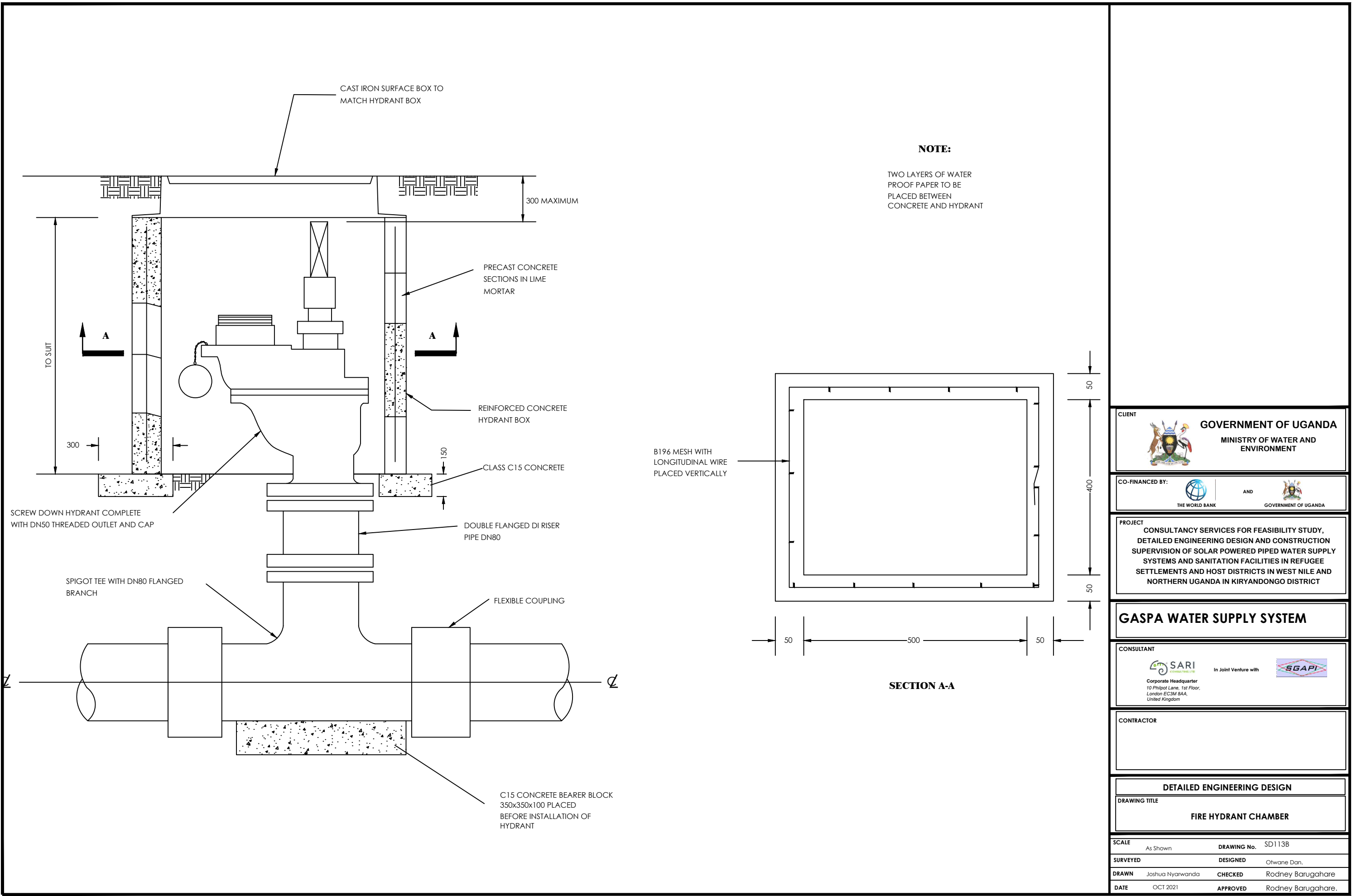
CONTRACTOR

DETAILED ENGINEERING DESIGN

DRAWING TITLE

FIRE HYDRANT - PIPEWORK

SCALE	As Shown	DRAWING No.	SD113A
SURVEYED		DESIGNED	Othmane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



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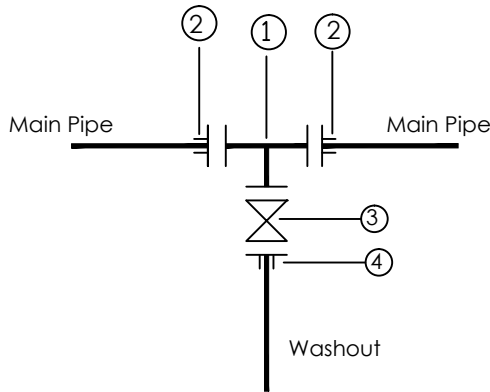
DETAILED ENGINEERING DESIGN

DRAWING TITLE

FIRE HYDRANT CHAMBER

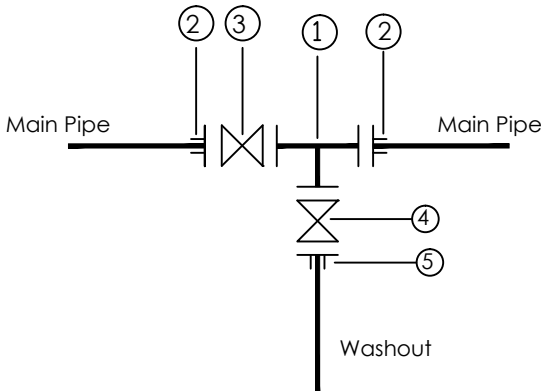
SCALE	As Shown	DRAWING No.	SD113B
SURVEYED		DESIGNED	Othmane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.

WO TYPE 1



- ① 1No CI Flanged Tee DN A/B
- ② 2No DI Flange Adaptor, Maxi type or similar type DN A
- ③ 1No CI Flanged Gate Valve DN A
- ④ 1No DI Flange Adaptor, Maxi type or similar DN B

WO TYPE 2



- ① 1No CI Flanged Tee DN A/B
- ② 2No DI Flange Adaptor, Maxi type or similar type DN A
- ③ 1No CI Flanged Gate Valve DN A
- ④ 1No DI Flanged Gate Valve DN B
- ⑤ 1No DI Flange Adaptor, Maxi type or similar DN B

Pipe Diameter		Fittings Diameter	
Main Pipe	Washout	A	B
OD 50	OD 50	DN 40	DN 40
OD 63	OD 63	DN 50	OD 50
OD 90	OD 63	DN 80	OD 50
OD 110	OD 63	DN 100	OD 50
OD 160	OD 63	DN 150	OD 50
OD 218	OD 110	DN 200	OD 100
OD 250	OD 110	DN 250	OD 100
OD 300	OD 110	DN 300	OD 100
OD 350	OD 110	DN 350	OD 100
OD 400	OD 110	DN 400	OD 100
OD 500	OD 110	DN 450	OD 100


NOTE: Pressure ratings of Washouts and Fittings shall be similar to those of the main pipe on which the washout is to be installed

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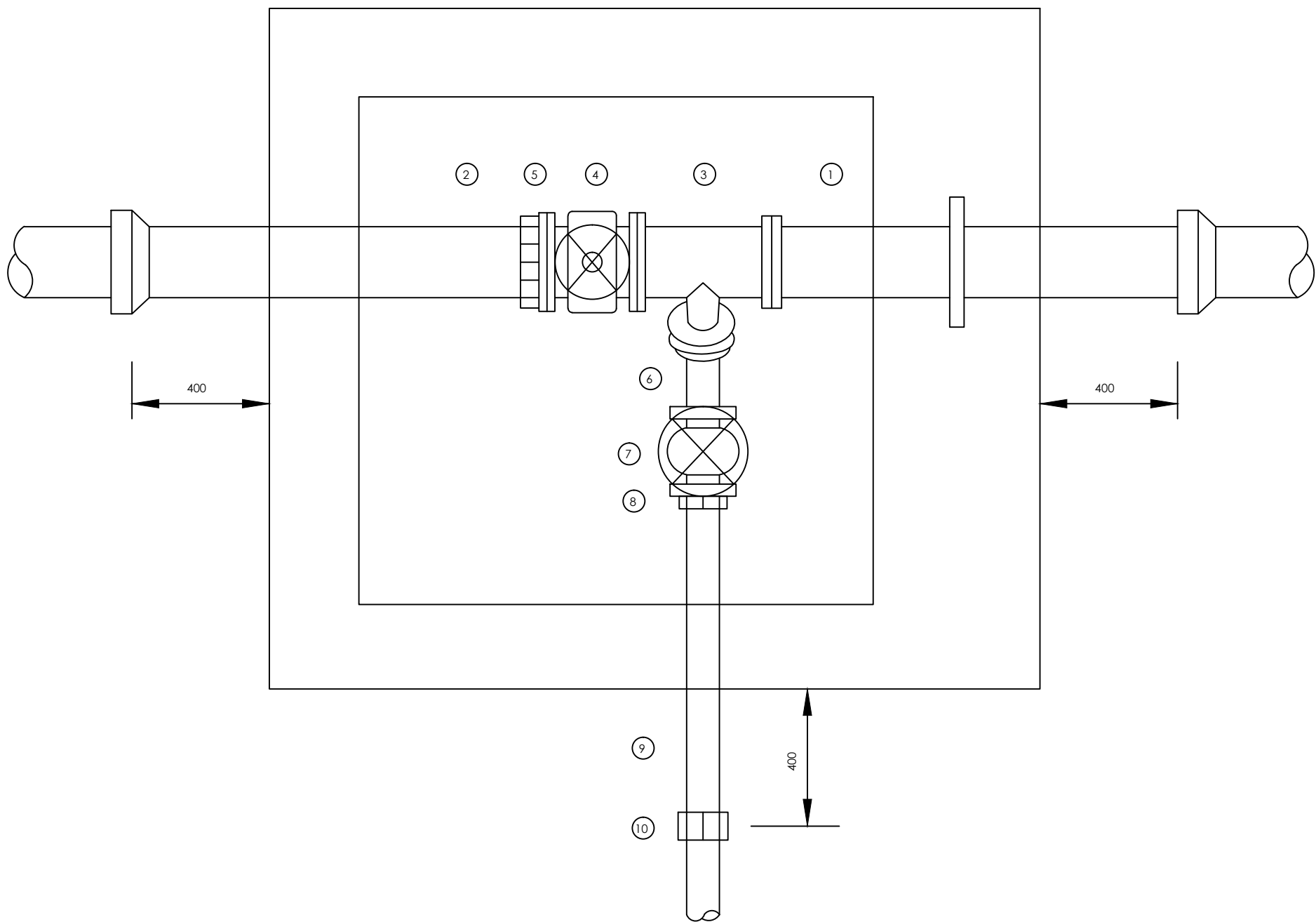
CONTRACTOR

DETAILED ENGINEERING DESIGN

DRAWING TITLE

WASHOUT DETAILS
TYPE 1 & 2

SCALE	As Shown	DRAWING No.	SD114A
SURVEYED		DESIGNED	Othmane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



SCHEDULE

ITEM	DESCRIPTION
1	Flanged spigot pipe 1200 long with thrust flange
2	Make-up pipe
3	All flanged tee, branch DN 80
4	Flanged in-line gate valve
5	Flange adaptor
6	Flanged 45o bend DN 80
7	Flanged gate valve DN 80
8	Flanged adaptor DN 80
9	Spigot pipe DN 80
10	Flexible adaptor if required

NOTES


- 1 Dimension in millimetres
- 2 Max. main size DN 500
- 3 Pipework within chamber to be ductile iron
- 4 For details of chamber see standard detail drawing SD135

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GASPA WATER SUPPLY SYSTEM

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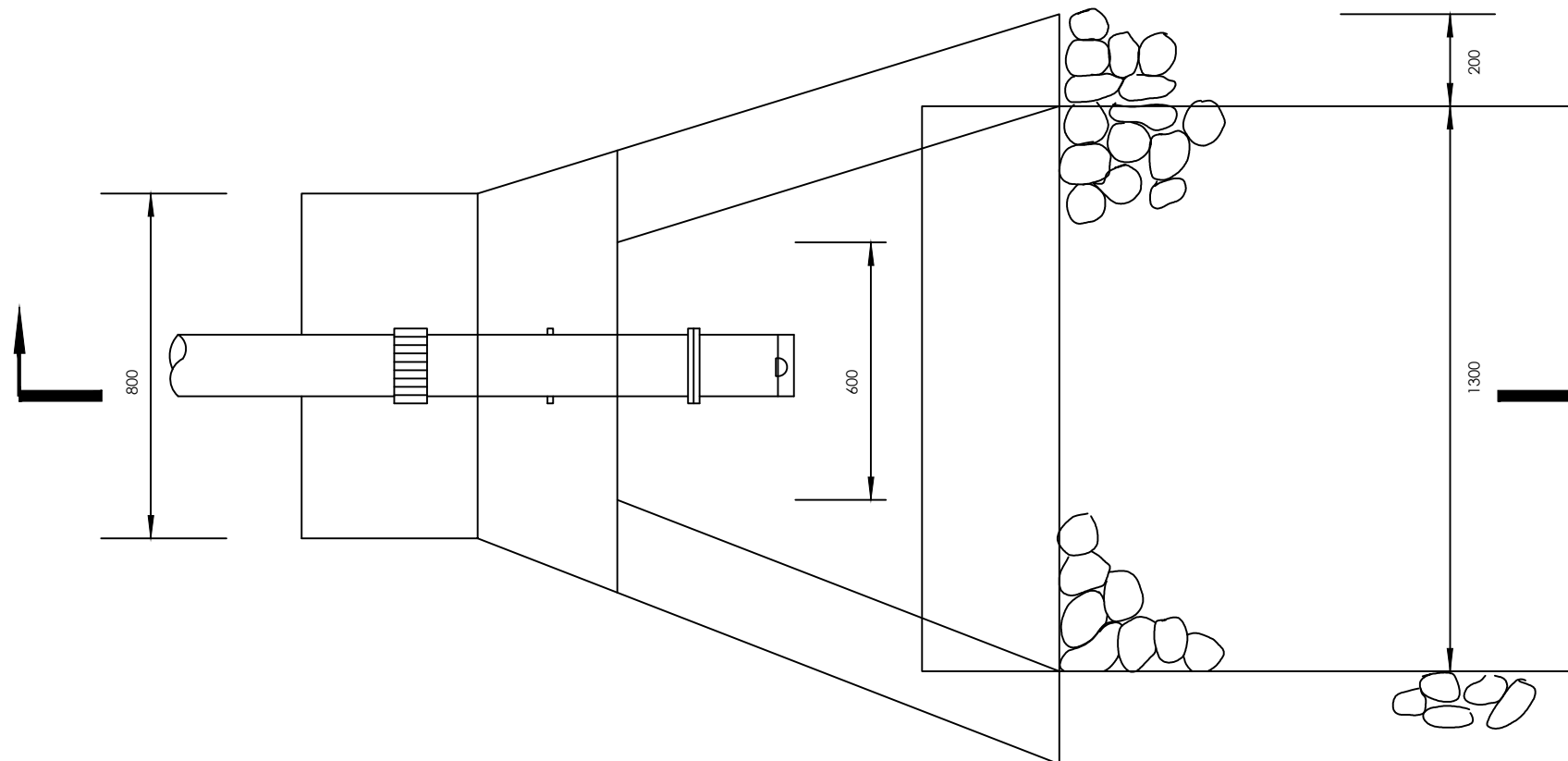
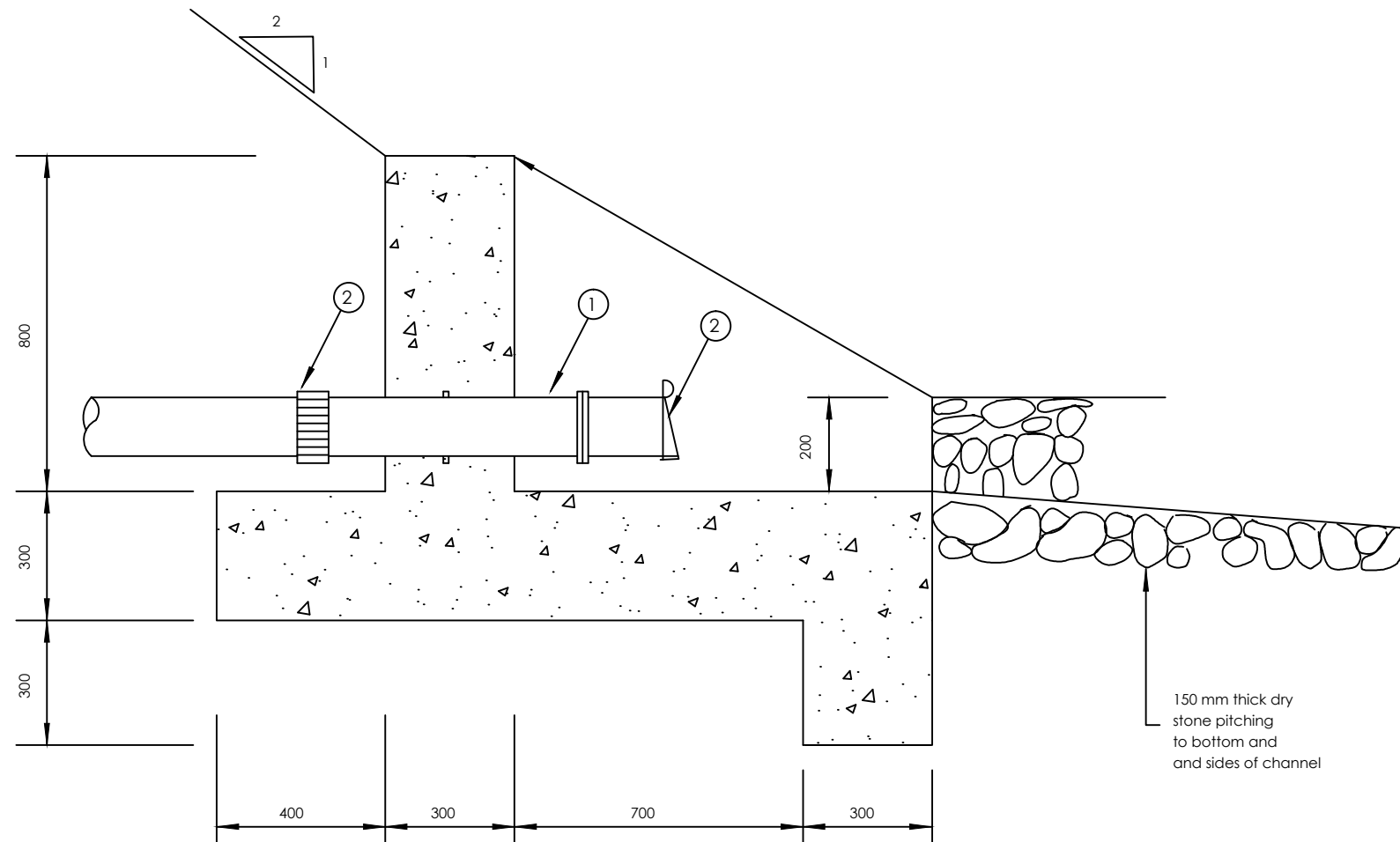
CONTRACTOR

DETAILED ENGINEERING DESIGN

DRAWING TITLE

WASHOUT - PIPEWORK
WITH CHAMBER

SCALE	As Shown	DRAWING No.	SD114B
SURVEYED		DESIGNED	Othmane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



NOTES

Reinforcement to be one layer A252 mesh throughout

For Pipe fittings diameter and pressure ratings, see drawing No. SD 114

① No. Flanged socket piece with paddle flange 350mm from flange, length not exceeding 750mm

② No. Flange flap valve

③ No. Viking Johnson flexible coupling

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CONTRACTOR

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DRAWING TITLE

OUTFALL

SCALE

As Shown

DRAWING No.

SD116

SURVEYED

DESIGNED

Othmane Dan.

DRAWN

Joshua Nyarwanda

CHECKED

Rodney Barugahare

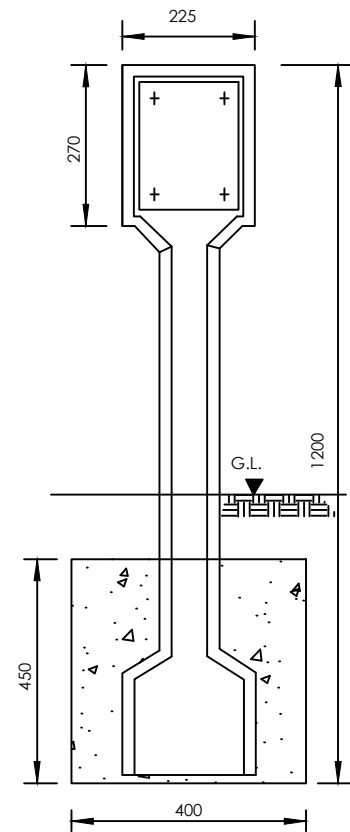
DATE

OCT 2021

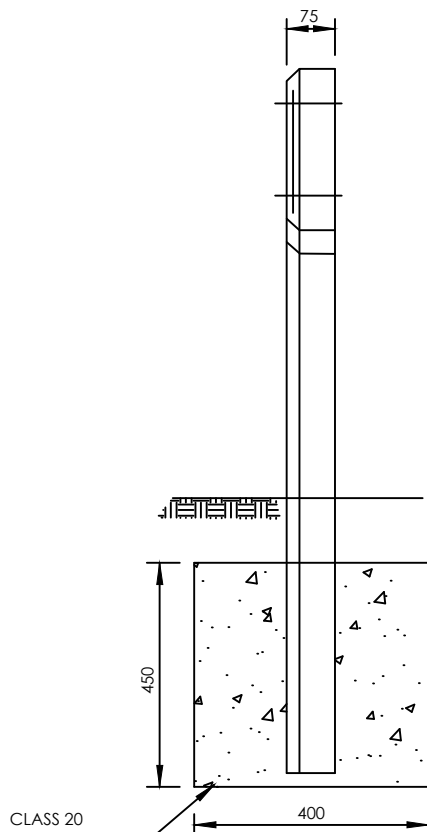
APPROVED

Rodney Barugahare.

INDICATOR POSTS



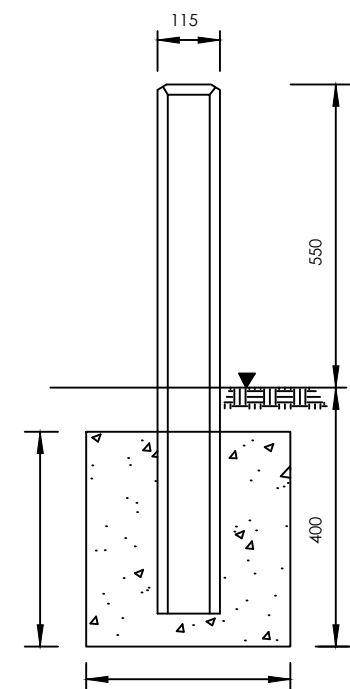
FRONT ELEVATION



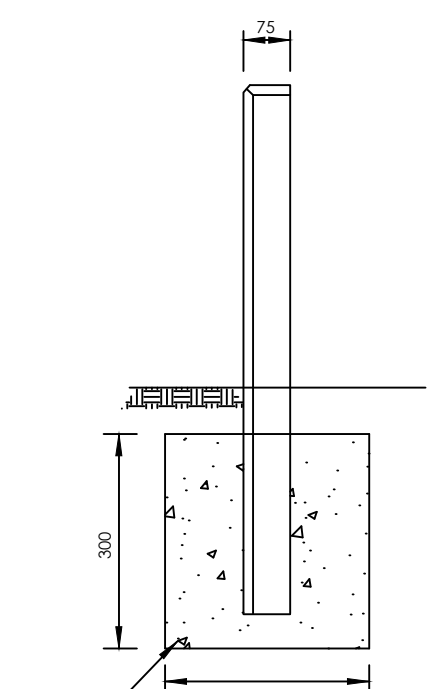
SIDE ELEVATION

CLASS 20
CONCRETE

MAKER POSTS



FRONT ELEVATION



SIDE ELEVATION

CLASS 20
CONCRETE

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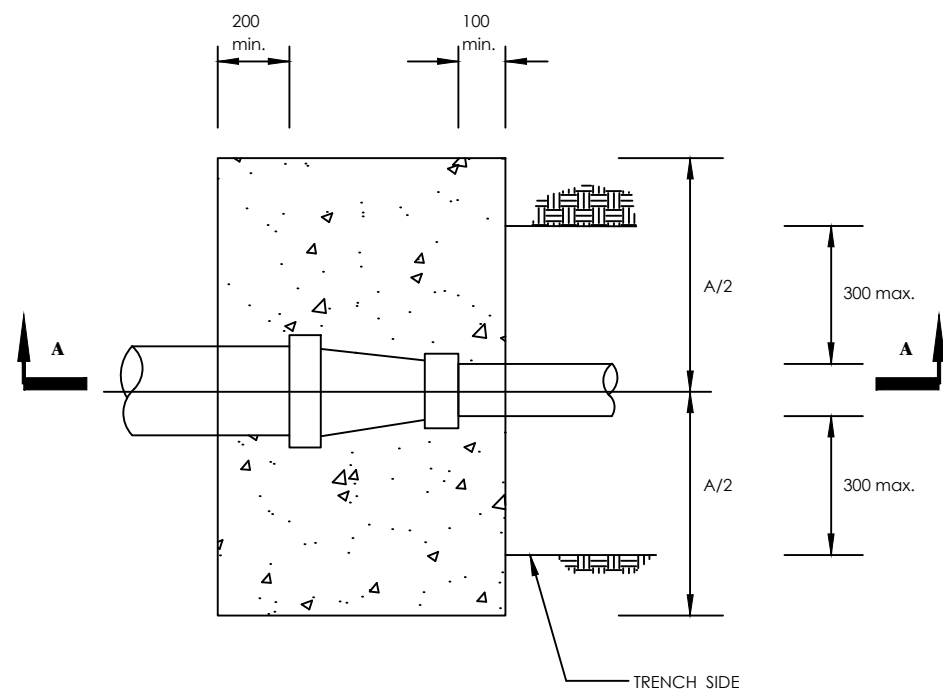
CONTRACTOR

DETAILED ENGINEERING DESIGN

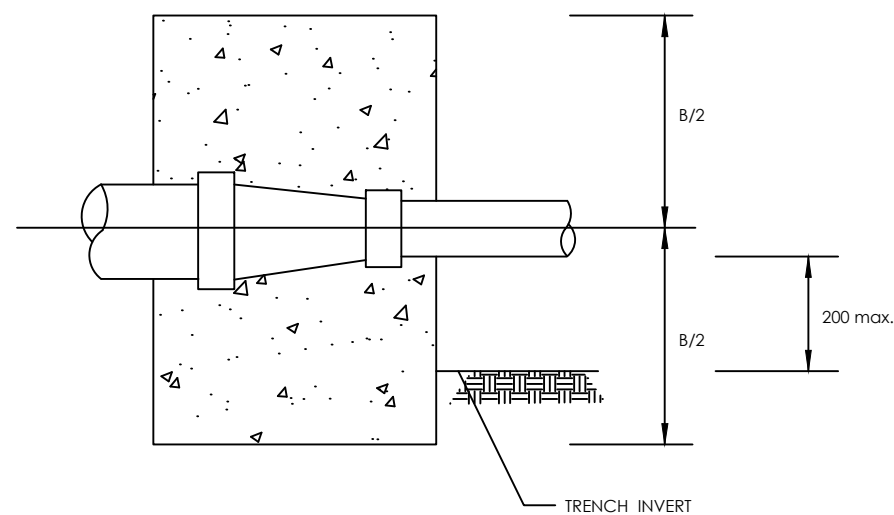
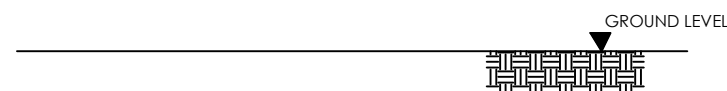
DRAWING TITLE

MARKER POSTS

SCALE	As Shown	DRAWING No.	SD117
SURVEYED		DESIGNED	Othmane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



PLAN



SECTION A-A

GROUND CONDITION			DRY	SUBMERGED
TEST PRESSURE (BAR)			15	15
80 - 50	A		850	850
	B		650	650
100 - 50 100 - 80	A		1020	1020
	B		680	680
150 - 100	A		1300	1300
	B		700	1000
200 - 100	A		1700	1900
	B		700	1000
200 - 150	A		1350	1350
	B		750	950
250 - 100	A		2150	2250
	B		750	1250
250 - 150	A		1950	1950
	B		750	1250
250 - 200	A		1400	1400
	B		800	1200
300 - 200	A		2050	2050
	B		1000	1600
300 - 250	A		1450	1450
	B		850	1350
350 - 300	A		1250	1650
	B		1000	1200
500 - 400	A		2000	2300
	B		1400	1800

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DRAWING TITLE

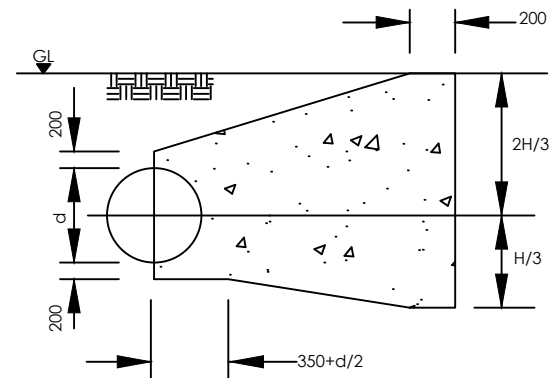
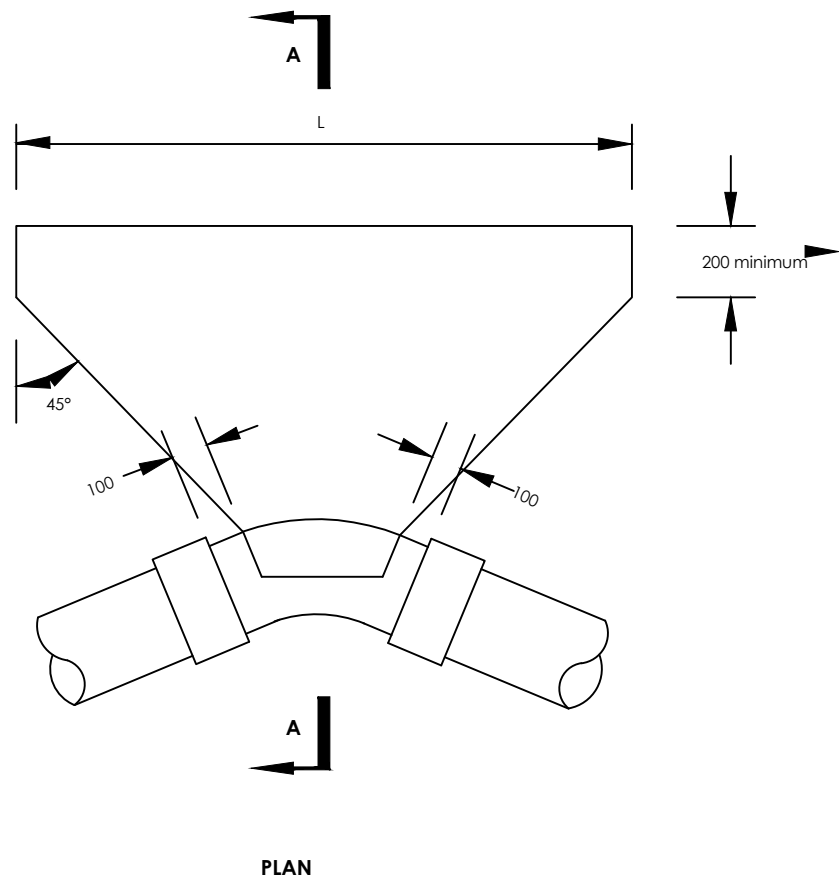
ANCHOR BLOCKS FOR TAPERS

SCALE As Shown DRAWING No. SD118A

SURVEYED DESIGNED Othmane Dan.

DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare

DATE OCT 2021 APPROVED Rodney Barugahare.



Ground Condition			DRY			
Test Pressure (Bar)			15			
Bend Angle			11½°	22½°	45°	90°
PIPE DIAMETER (mm)	80	H L	SEE SD 118C			
	80 < d < 150	H L				
	150 < d < 300	H L				
	300 < d < 400	H L				
	450	H L			1600 2450	1600 4530
	500	H L	1000 1250	1350 1950	1800 3050	1800 5650

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DRAWING TITLE

ANCHOR BLOCKS FOR BENDS - 1

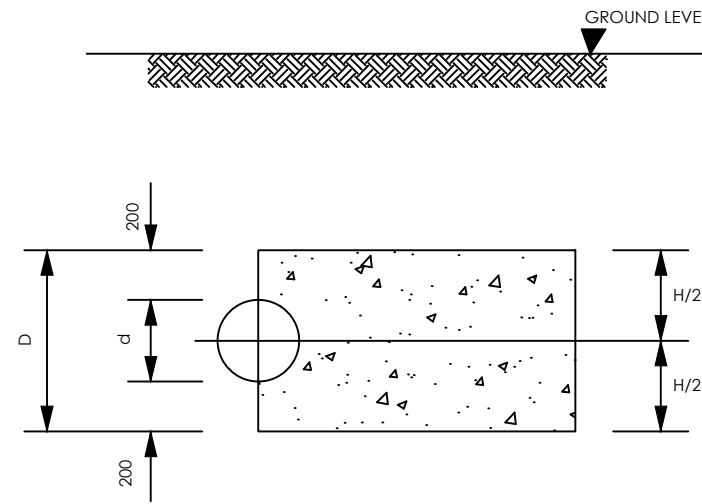
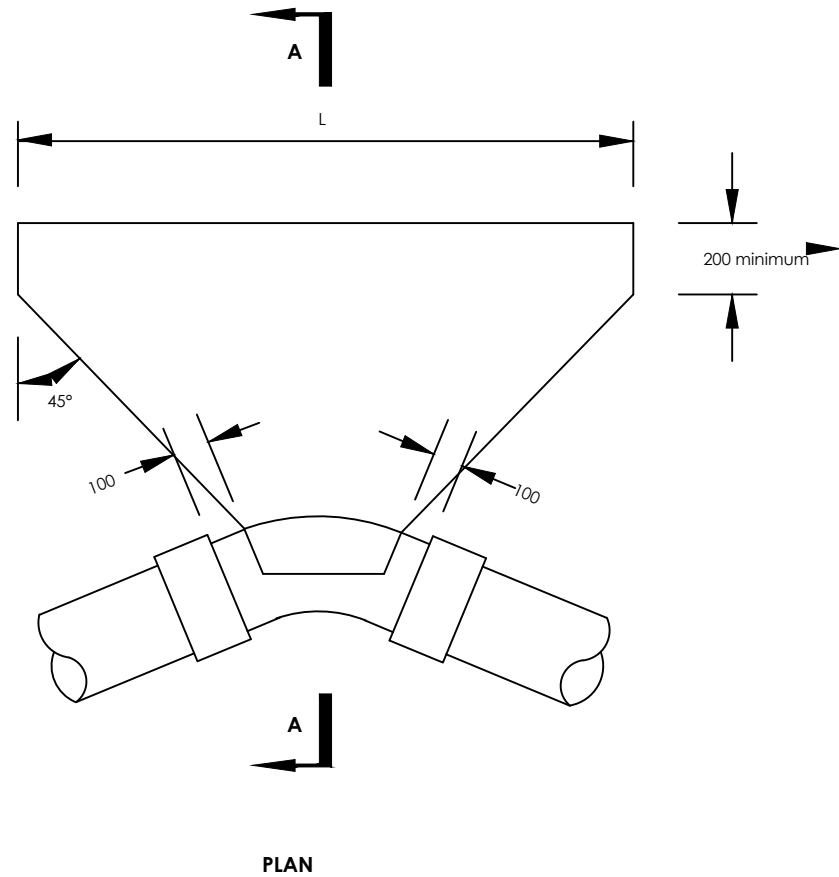
SCALE As Shown **DRAWING No.** SD118B

SURVEYED **DESIGNED** Othmane Dan.

DRAWN Joshua Nyarwanda **CHECKED** Rodney Barugahare

DATE OCT 2021 **APPROVED** Rodney Barugahare.

TYPE 1



SECTION A-A

PLAN

GROUND CONDITION			DRY			
TEST PRESSURE (Bar)			15			
BEND ANGLE			11¼°	22½°	45°	90°
PIPE DIAMETER (mm)	80	H L	480 200	460 300	480 350	460 700
	80 < d < 150 ↘	H L	550 300	550 750	550 900	550 1700
	150 < d < 300 ↘	H L	700 650	700 1250	700 2500	
	300 < d < 400 ↘	H L	800 900	800 1800		
	450	H L	900 2500	900 5000		
	500		SEE SD 118A			

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DRAWING TITLE

ANCHOR BLOCKS FOR BENDS - 2

SCALE	As Shown	DRAWING No.	SD118C
SURVEYED		DESIGNED	Othmane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.

NOTE:
Two layers of water
proof paper to be
placed between
concrete fitting

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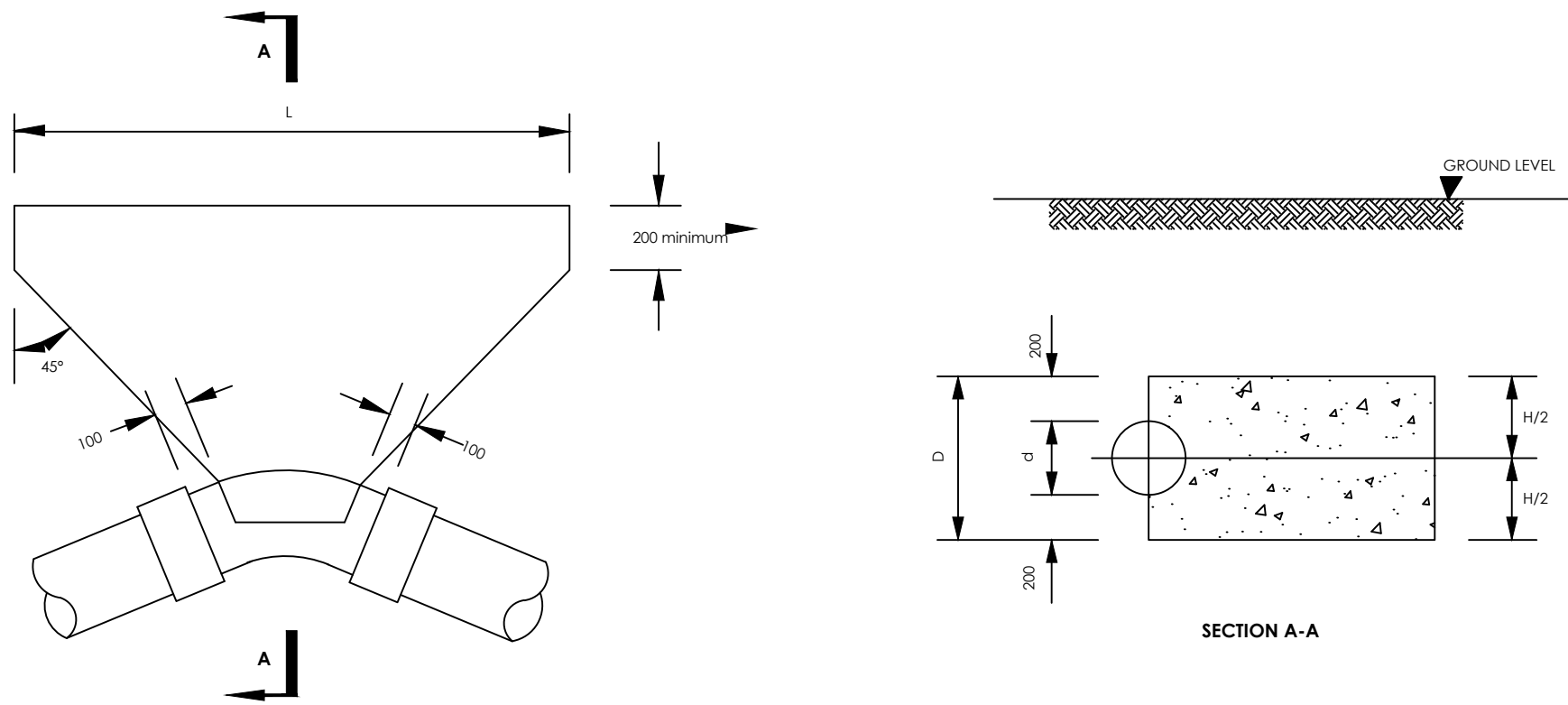
CONTRACTOR

DETAILED ENGINEERING DESIGN

DRAWING TITLE

ANCHOR BLOCKS FOR BENDS - 3

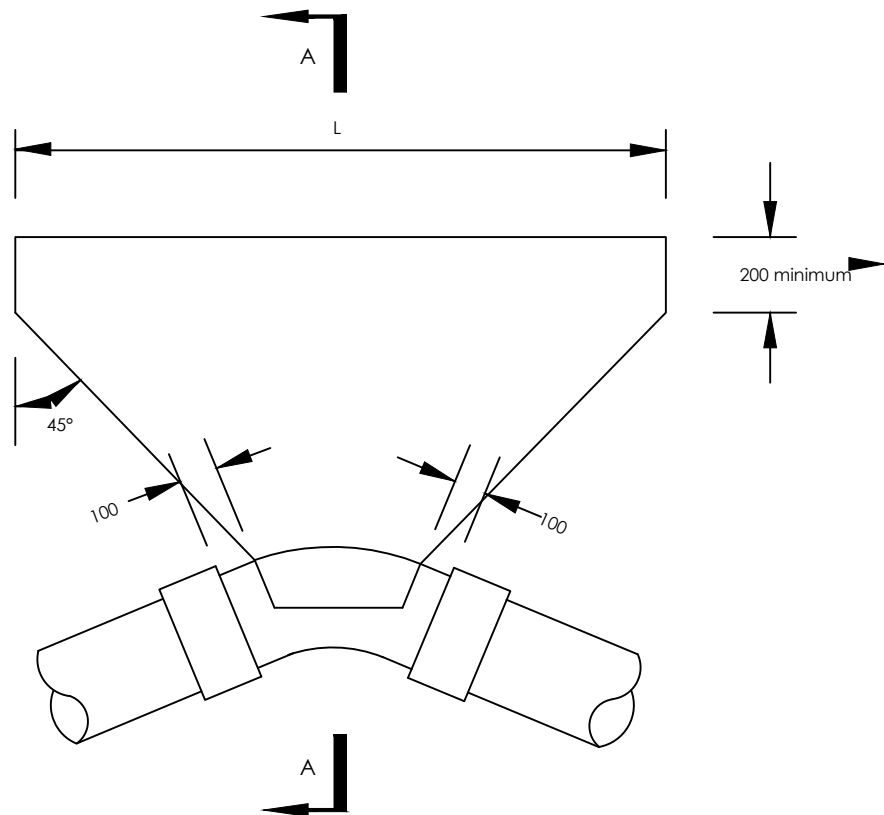
SCALE	As Shown	DRAWING No.	SD118D
SURVEYED		DESIGNED	Othmane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



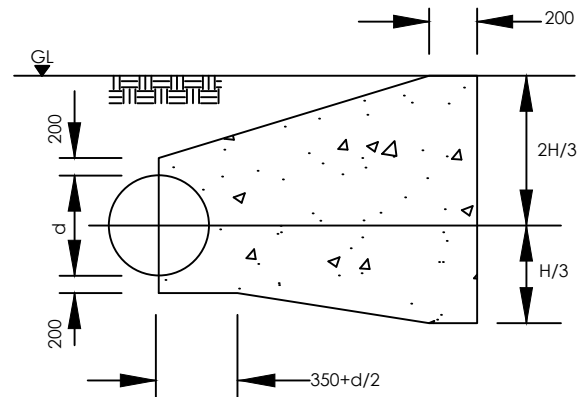
PLAN

SECTION A-A

GROUND CONDITION			SUBMERGED			
TEST PRESSURE (Bar)			15			
BEND ANGLE			11½°	22½°	45°	90°
PIPE DIAMETER (mm)	80	H L	450 250	480 300	480 600	480 1100
	80 < d < 150	H L	550 400	550 750	550 1500	
	150 < d < 300	H L	700 1050	700 2050		
	300 < d < 400	H L	800 1500	800 1500		
	450	H L	900 4200			
	500	H L		SEE SD 118E		



PLAN





SECTION A-A

Ground Condition			SUBMERGED			
Test Pressure (Bar)			15			
Bend Angle			11¼°	22½°	45°	90°
PIPE DIAMETER (mm)	80	H L	SEE SD 118D			
	80 < d < 150 ↘	H L				
	150 < d < 300 ↘	H L	1500 2650	1500 4900		
	300 < d < 400 ↘	H L	1600 4050	1700 6650		
	450	H L	1650 2450	1650 4750	1800 6650	
	500	H L	1400 1650	1800 2850	1800 5450	1800 10150

NOTE:

Two layers of water
proof paper to be
placed between
concrete fitting

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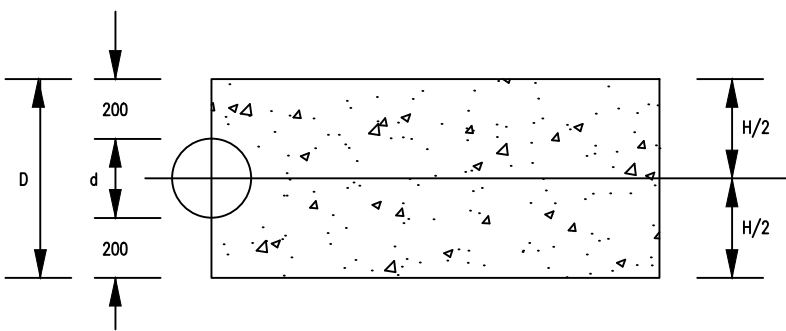
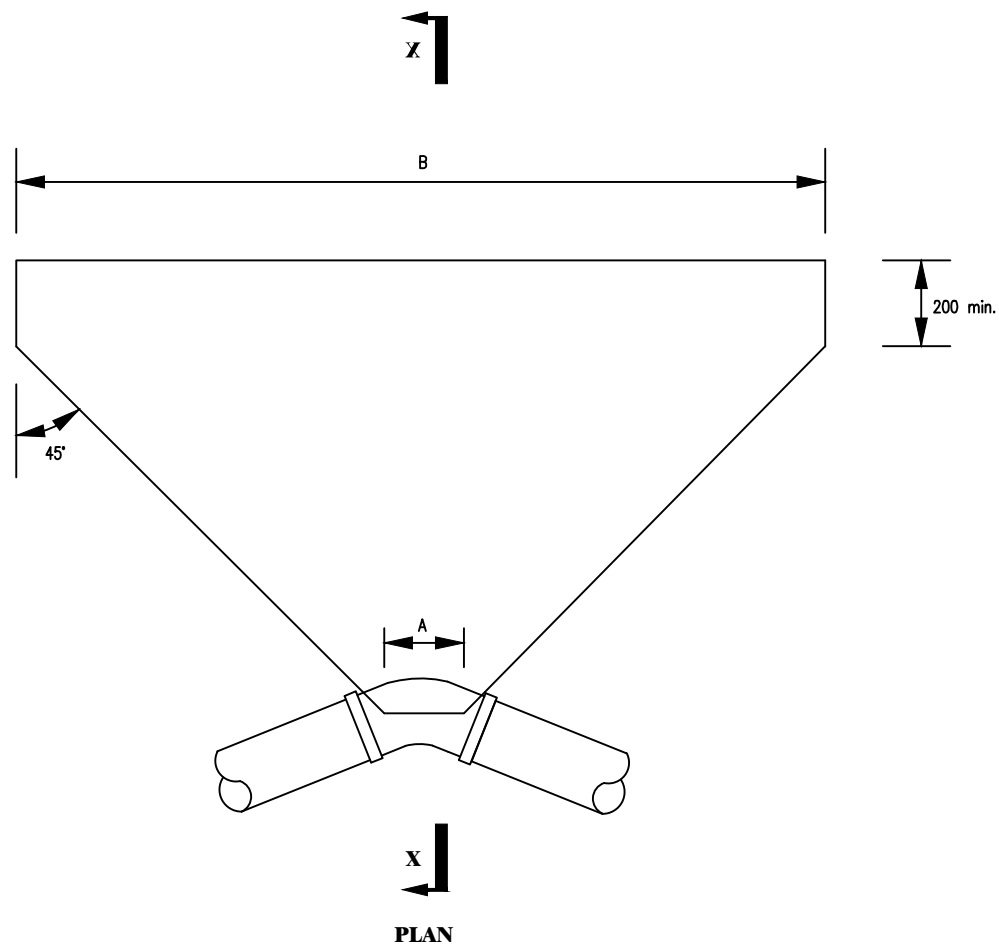
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DRAWING TITLE
ANCHOR BLOCKS FOR BENDS - 4

SCALE As Shown DRAWING No. SD118E
SURVEYED DESIGNED Othmane Dan.
DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare
DATE OCT 2021 APPROVED Rodney Barugahare.



GROUND CONDITION		DRY							
TEST PRESSURE		18				24			
BEND		11¼°	22½°	45°	90°	11¼°	22½°	45°	90°
PIPE DIA (mm)									
90	H	480	480	480	480	480	480	480	480
	A	150	200	200	250	150	200	200	250
	B	200	300	450	800	200	300	600	1100
100–150	H	550	550	550	550	550	550	550	
	A	200	200	250	300	200	200	250	
	B	300	950	1100	2050	400	1250	1500	
200–300	H	700	700			700	700		
	A	200	250			200	250		
	B	750	1500			1000	2000		
350–400	H	800	800			800	800		
	A	250	350			250	350		
	B	1100	2200			1450	2900		
450	H	900	SEE SD 118G			900	SEE SD 118G		
	A	300				300			
	B	3000				4050			

NOTE:

Two layers of water proof paper to be placed between concrete fitting

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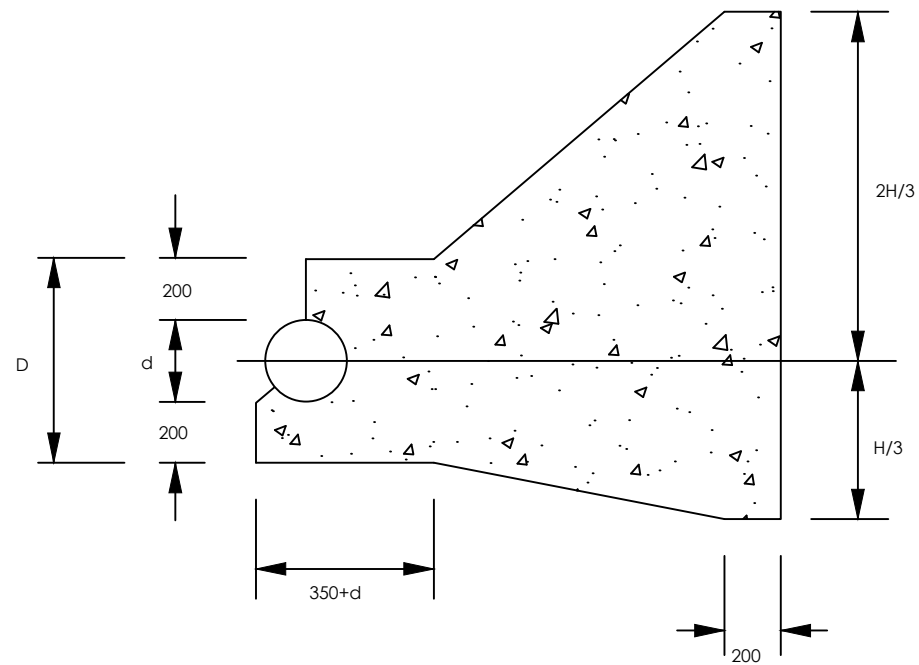
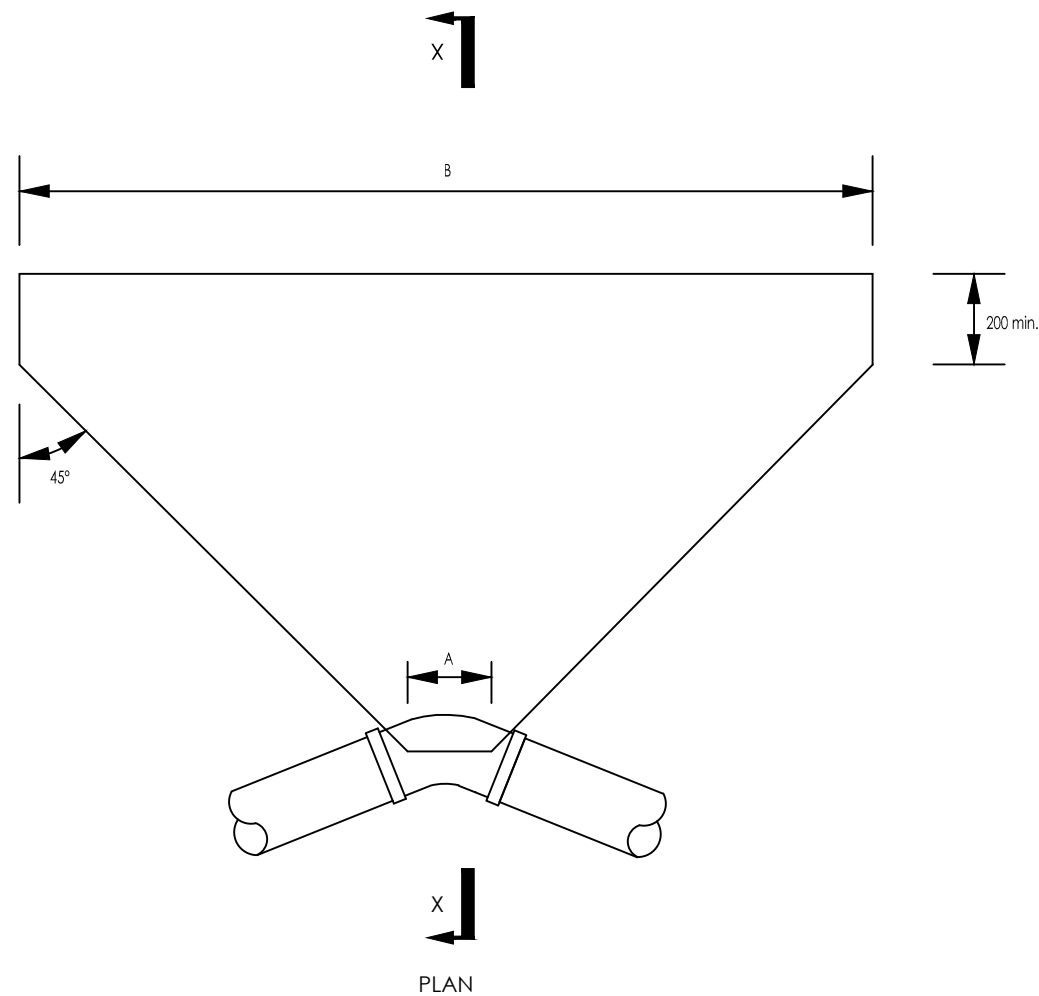
CONTRACTOR

DETAILED ENGINEERING DESIGN

DRAWING TITLE

ANCHOR BLOCKS FOR BENDS - 5

SCALE	As Shown	DRAWING No.	SD118F
SURVEYED		DESIGNED	Othmane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.





SECTION X-X

Ground Condition		DRY							
Test Pressure		18				24			
Pipe Dia (mm)	Bend	11¼°	22½°	45°	90°	11¼°	22½°	45°	90°
100 - 150	H A B	SEE SD 118C				SEE SD 118C			
200-300	H A B								
350 - 400	H A B								
450	H A B								

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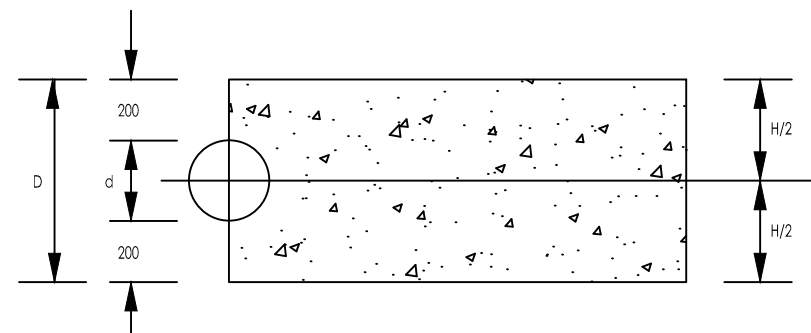
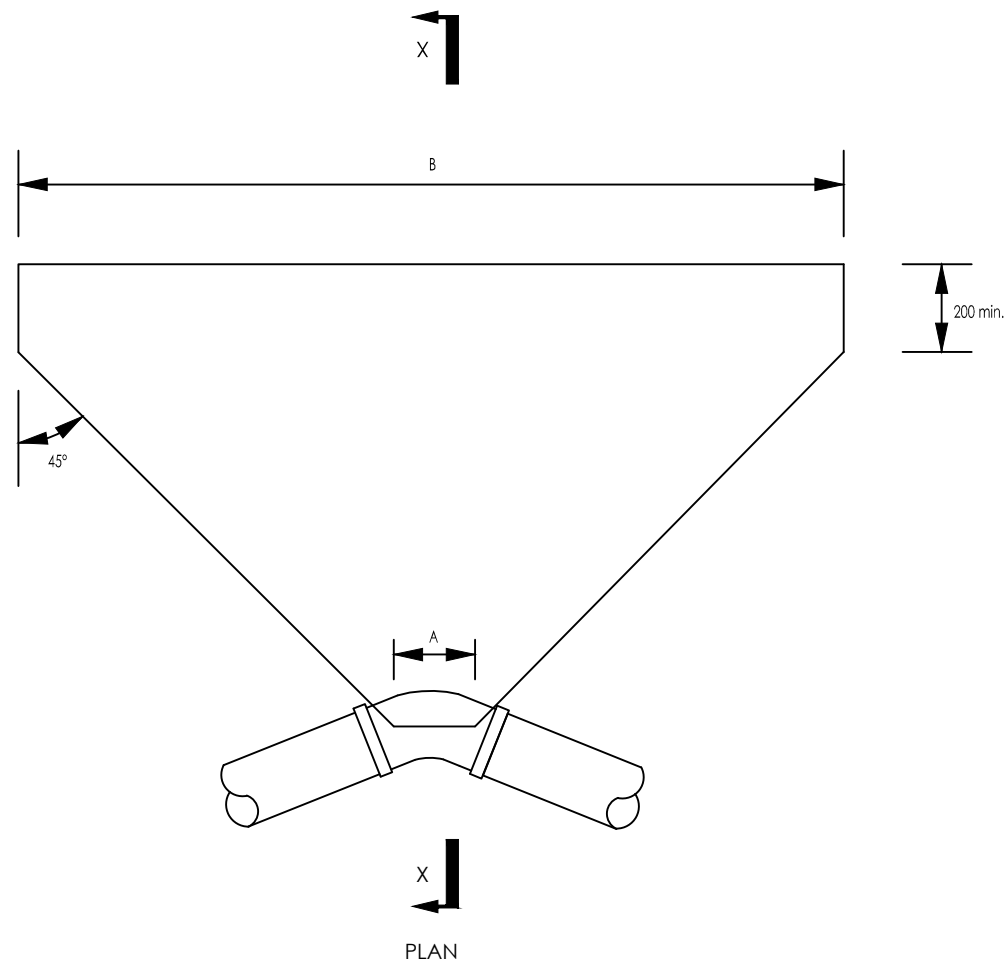
ANCHOR BLOCKS FOR BENDS - 6

SCALE As Shown DRAWING No. SD118G

SURVEYED DESIGNED Othmane Dan.

DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare

DATE OCT 2021 APPROVED Rodney Barugahare.



SECTION X-X



GROUND CONDITION		SUBMERGED							
TEST PRESSURE (BAR)		18				24			
PIPE DIA	BEND	11¼°	22½°	45°	90°	11¼°	22½°	45°	90°
		H	A	B		H	A	B	
80	H	480	480	480	480	480	480	480	480
	A	150	200	200	250	150	200	200	250
	B	250	400	700	1350	250	500	950	1750
100 - 150	H	D	D	D		D	D	D	
	A	200	200	250		200	200	250	
	B	450	950	1850		600	1250	9000	
200-300	H	D	D			D			
	A	200	250			200			
	B	1250	2520			1650			
350 - 400	H	D				D			
	A	250				250			
	B	1800				2480			
450	H	900							
	A	300							
	B	5000							

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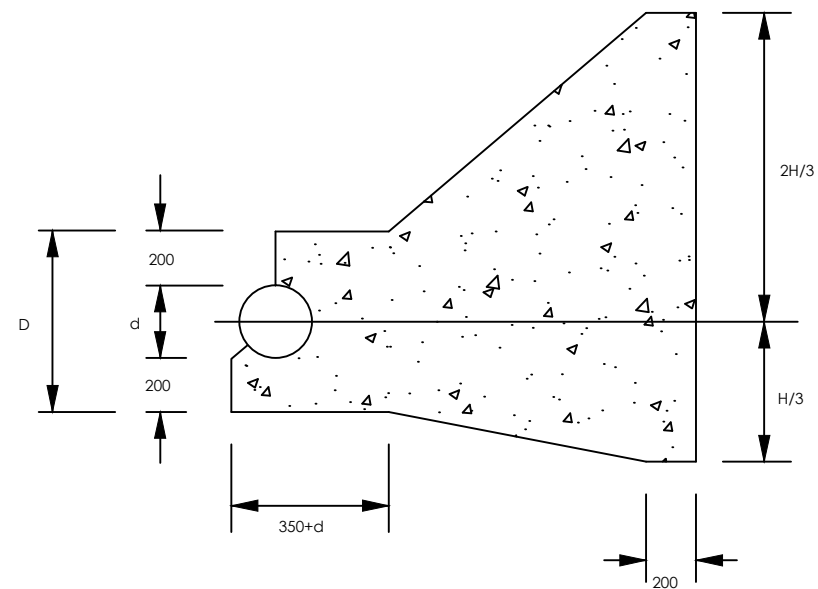
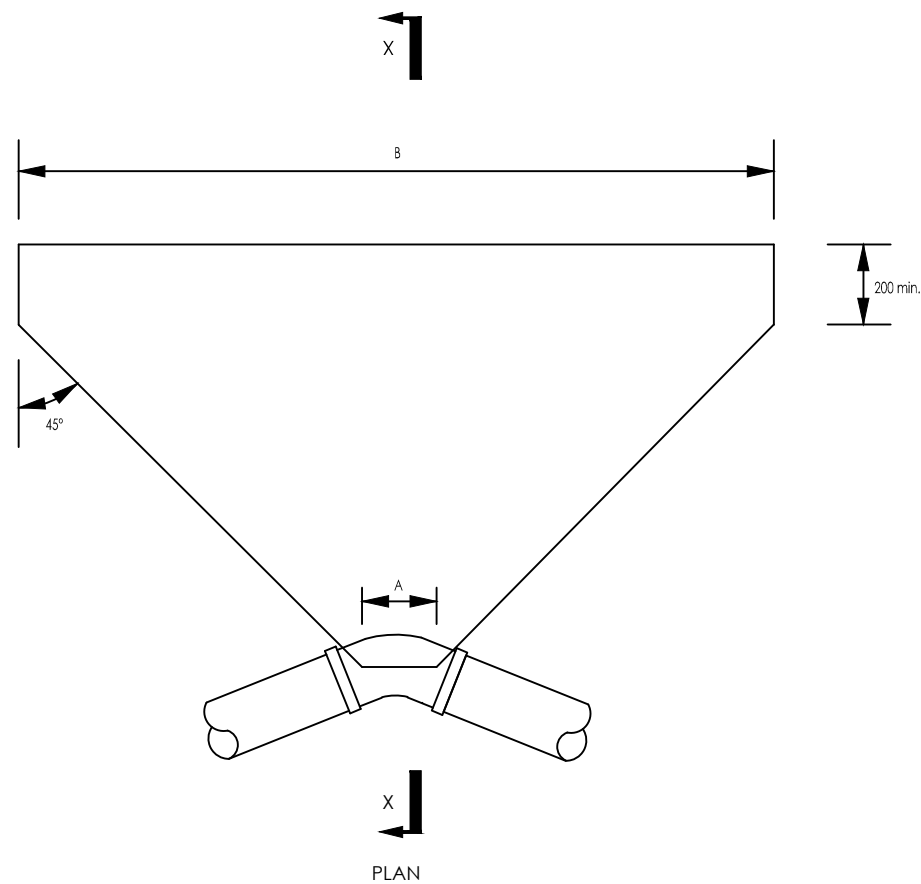
GASPA WATER SUPPLY SYSTEM

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CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE
ANCHOR BLOCKS FOR BENDS - 7

SCALE	As Shown	DRAWING No.	SD118H
SURVEYED		DESIGNED	Othmane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



Ground Condition		SUBMERGED							
Test Pressure		18				24			
Pipe Dia (mm)	Bend	11¼°	22½°	45°	90°	11¼°	22½°	45°	90°
	H A B	SEE SD 118D			1350 300 2000	SEE SD 118D			1350 300 2650
100 - 150	H A B	SEE SD 118D			1350 300 2000	SEE SD 118D			1350 300 2650
200-300	H A B				1500 350 3200				1500 350 3200
350 - 400	H A B	1600 350 2500	1600 550 4850	1800 850 7100	1600 350 3300	1600 550 6500	2000 850 7650		
450	H A B	1650 400 2900	1650 650 5700	2000 1050 7200	1650 250 1950	1650 400 3900	1650 650 7600	2200 1050 7900	

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DETAILED ENGINEERING DESIGN

DRAWING TITLE

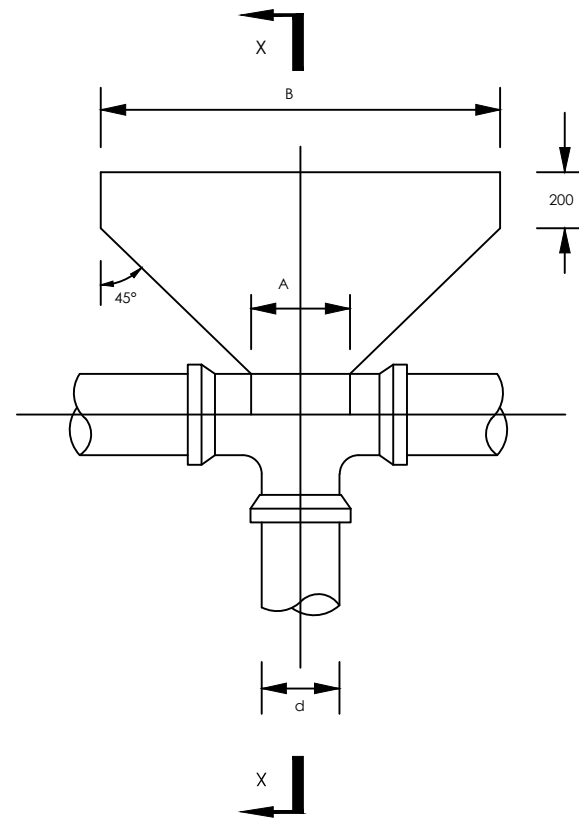
ANCHOR BLOCKS FOR BENDS - 8

SCALE As Shown DRAWING No. SD1181

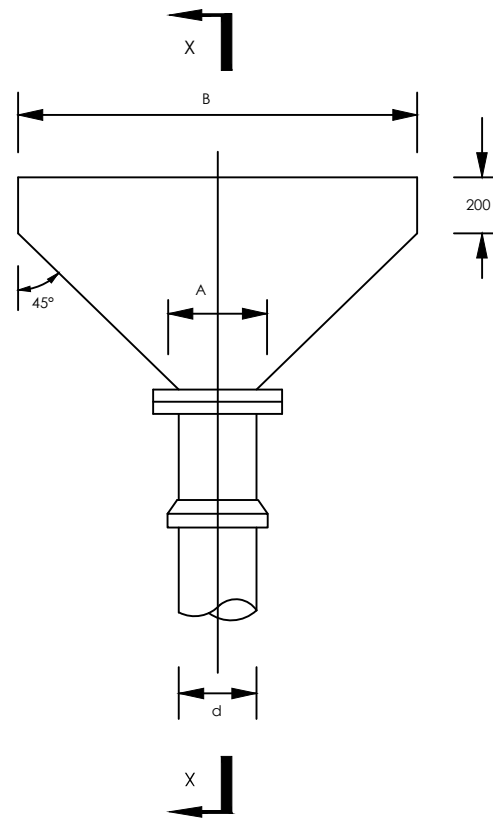
SURVEYED DESIGNED Othmane Dan.

DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare

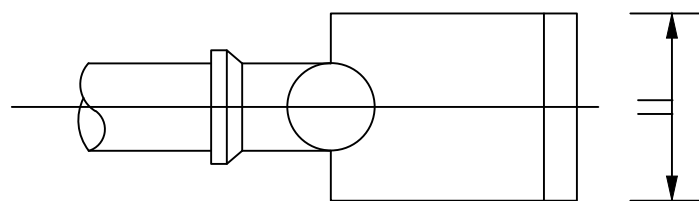
DATE OCT 2021 APPROVED Rodney Barugahare.



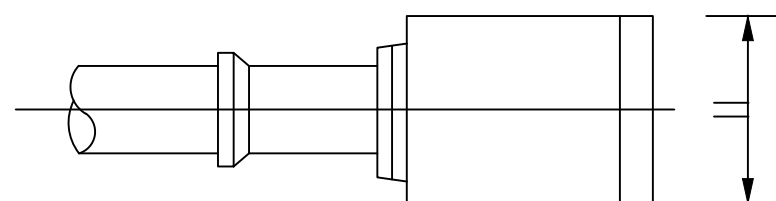
PLAN



PLAN




SECTION X-X



SECTION X-X


GROUND CONDITION			DRY											
TEST PRESSURE (Bar)			12	15	18	24	30	36						
PIPE DIAMETER (mm)	80	H	480	480	480	480	480	480						
		A	250	250	250	250	250							
		B	400	500	600	800	950	1150						
	100-150	H	550	550	550	550	550							
		A	300	300	300	300	300							
		B	1000	1200	1500	2000	2500							
	200-300	H	550	SEE SD 118K										
		A	300											
		B	1000											
	350-400	H												
		A												
		B												
	450	H												
		A												
		B												

CIENT




GOVERNMENT OF UGANDA
MINISTRY OF WATER AND ENVIRONMENT

CO-FINANCED BY:



THE WORLD BANK

AND




GOVERNMENT OF UGANDA

PROJECT

CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

GASPA WATER SUPPLY SYSTEM


CONSULTANT



SARI

Corporate Headquarter
10 Philipot Lane, 1st Floor,
London EC3M 9AA,
United Kingdom

In Joint Venture with



SGAPI

CONTRACTOR

DETAILED ENGINEERING DESIGN

DRAWING TITLE

ANCHOR BLOCKS FOR TEES AND DEAD ENDS - 1

SCALE

As Shown

DRAWING No.

SD118J

SURVEYED

DESIGNED

Othmane Dan.

DRAWN

Joshua Nyarwanda

CHECKED

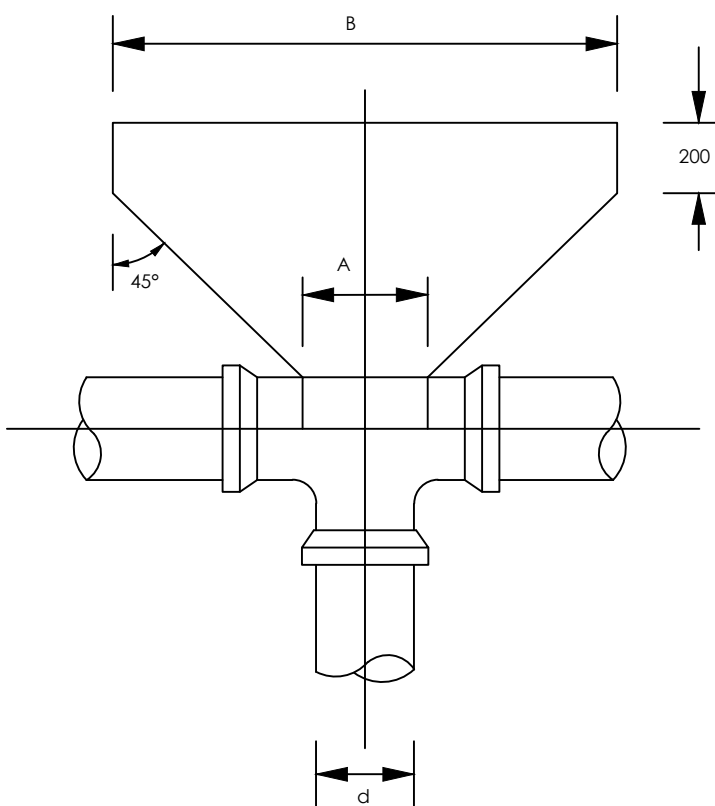
Rodney Barugahare

DATE

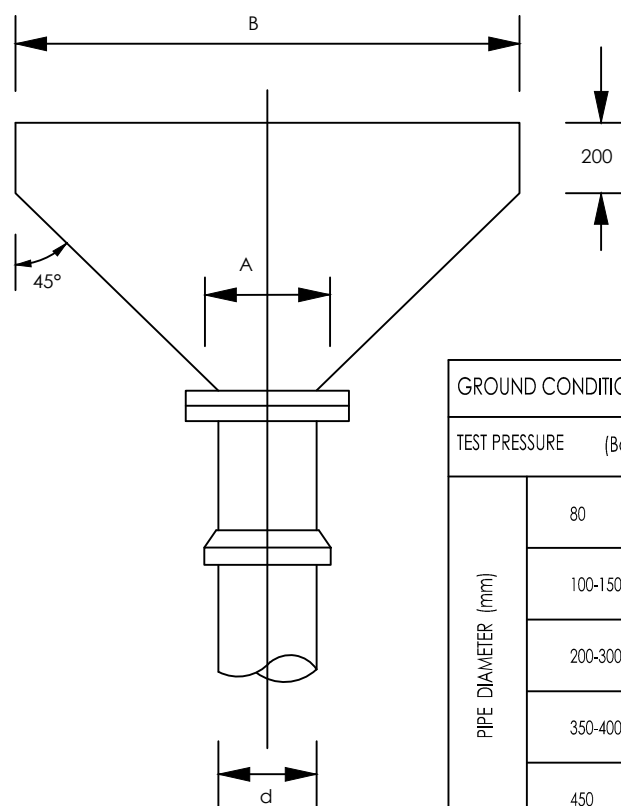
OCT 2021

APPROVED

Rodney Barugahare.

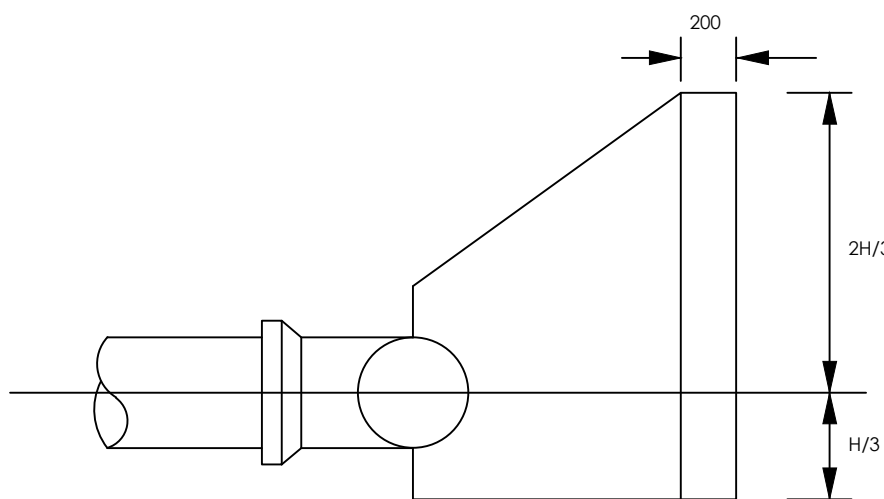


PLAN

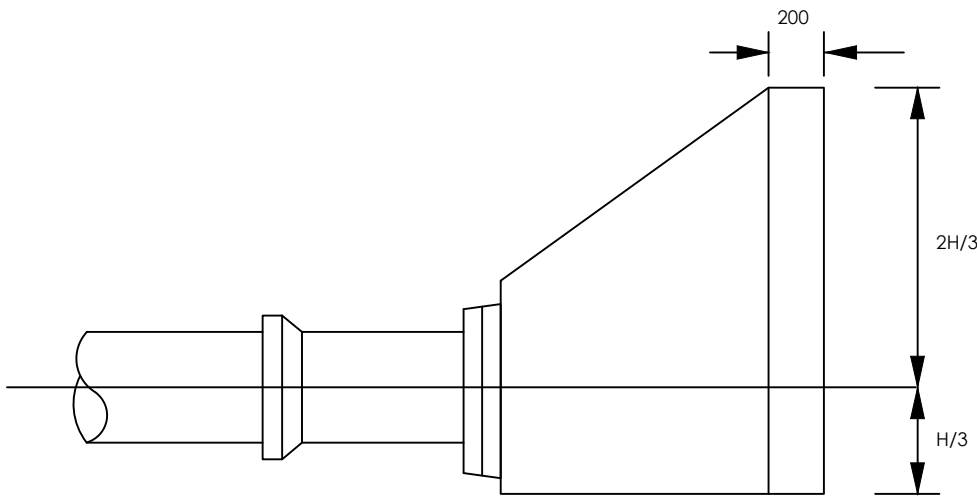


PLAN

GROUND CONDITION			DRY					
TEST PRESSURE (Bar)			12	15	18	24	30	36
PIPE DIAMETER (mm)	80	H A B	SEE SD 118E					
	100-150	H A B						
	200-300	H A B	1450 450 2200	1500 450 2450	1650 450 2800	1650 450 3100	1650 450 3700	
	350-400	H A B	1600 600 2550	1750 600 2700	1750 600 3250	1750 600 4300	1750 600 5000	1750 600 6000
	450	H A B	1750 750 2700	1800 750 3150	1800 750 3800	1800 750 5050	1800 750 6100	1800 750 7300



SECTION X-X





SECTION X-X

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SYSTEMS AND SANITATION FACILITIES IN REFUGEE
SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND
NORTHERN UGANDA IN KIRYANDONGO DISTRICT

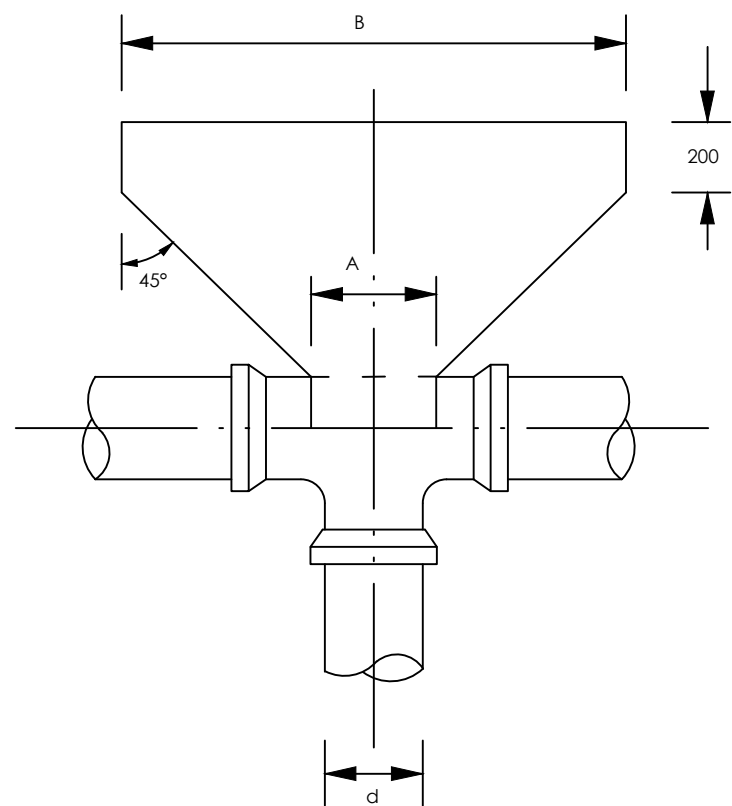
GASPA WATER SUPPLY SYSTEM

CONSULTANT
 **SARI**
Corporate Headquarter
10 Philpot Lane, 1st Floor,
London EC3M 9AA,
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In Joint Venture with  **SGAPI**

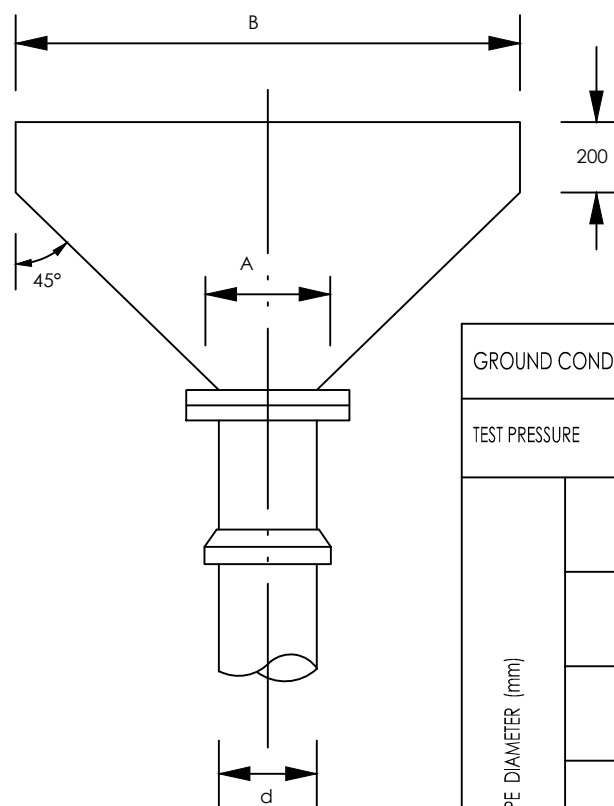
CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE
**ANCHOR BLOCKS FOR TEES AND
DEAD ENDS - 2**

SCALE As Shown DRAWING No. SD118K
SURVEYED DESIGNED Othmane Dan.
DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare
DATE OCT 2021 APPROVED Rodney Barugahare.

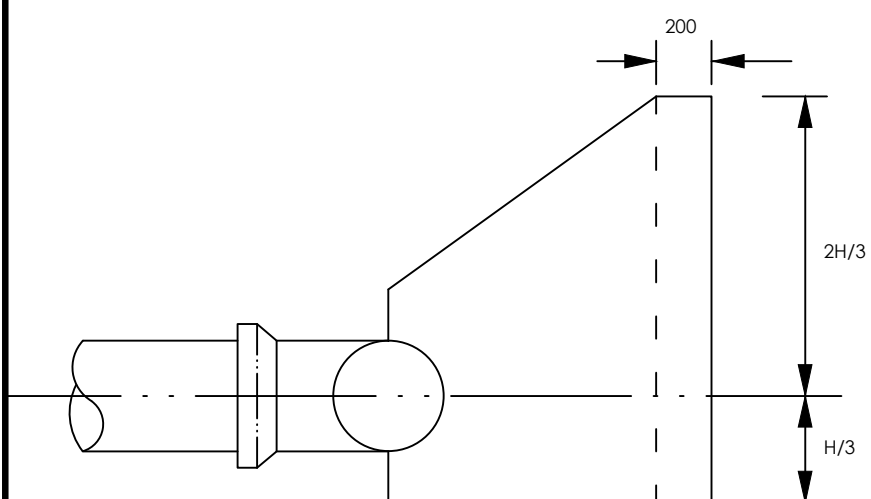


PLAN

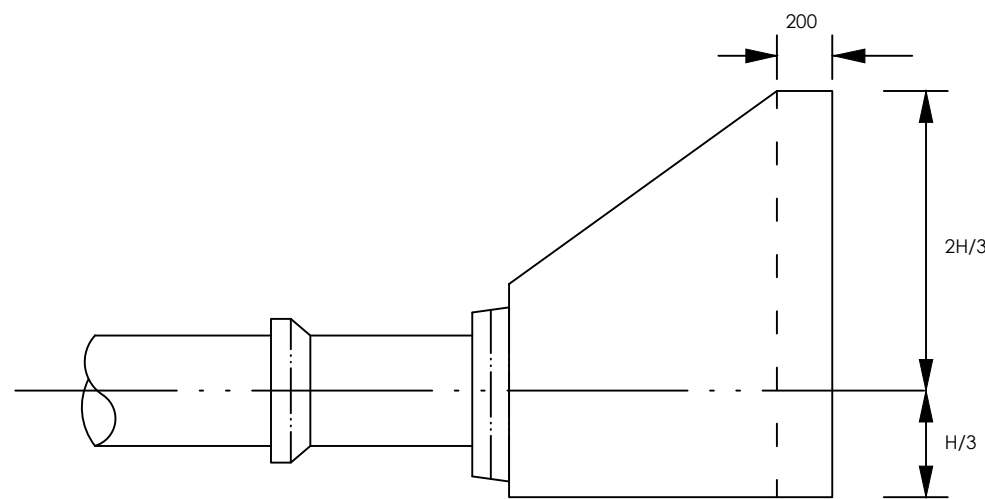


PLAN

GROUND CONDITION			SUBMERGED					
TEST PRESSURE (Bar)			12	15	18	24	30	36
PIPE DIAMETER (mm)	80	H	480	480	480	480		
		A	250	250	250	250		
		B	700	800	1000	1300		
	100-150	H	550	550	550	550		
		A	300	300	300	300		
		B	1600	2000	2400	3200		
	200-300	H	1650	1650	1500	1650		
		A	450	450	450	450		
		B	2350	2900	3450	4650		
	350-400	H	1750	1750	1750	1750		
		A	600	600	600	600		
		B	3550	4450	5300	7900		
	450	H	1800	1800	1800	1800		
		A	750	750	750	750		
		B	4200	5250	6300	8400		



SECTION X-X





SECTION X-X

CUENT
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SYSTEMS AND SANITATION FACILITIES IN REFUGEE
SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND
NORTHERN UGANDA IN KIRYANDONGO DISTRICT

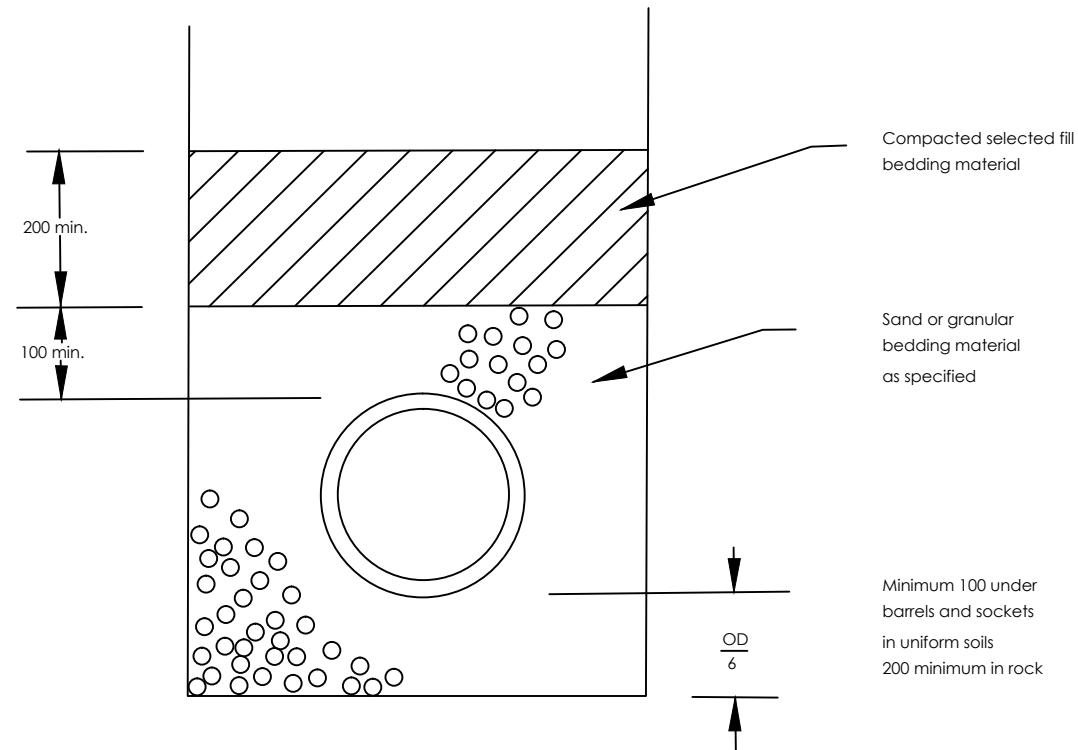
GASPA WATER SUPPLY SYSTEM

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United Kingdom
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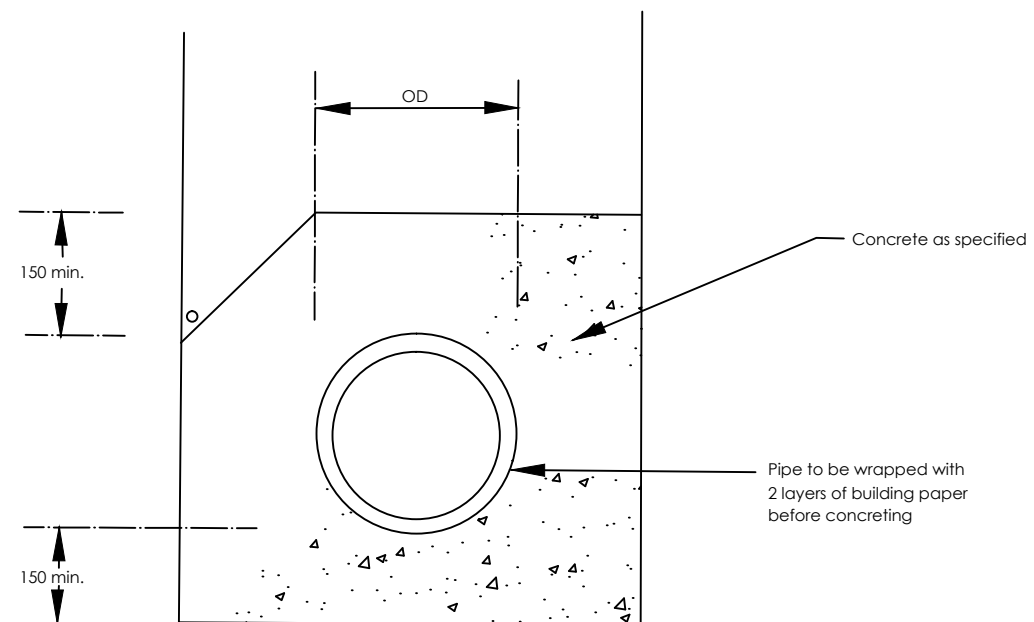
CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE
**ANCHOR BLOCKS FOR TEES AND
DEAD ENDS - 3**

SCALE	As Shown	DRAWING No.	SD118L
SURVEYED		DESIGNED	Othmane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



CLASS B BED



CONCRETE SURROUND

Notes

1. OD = Outside diameter pipe
2. o Indicates cable position where cable is to be laid in pipe trench
3. Minimum trench width for uPVC pipes = $OD + 300$ (to a minimum width of 600)
4. Minimum trench width for Ductile Iron pipes = $OD + 600$

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GASPA WATER SUPPLY SYSTEM

CONSULTANT

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Sustainable Infrastructure
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London EC3M 9AA,
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CONTRACTOR

DETAILED ENGINEERING DESIGN

DRAWING TITLE

PIPE BEDDING

SCALE

As Shown

DRAWING No.

SD121

SURVEYED

DESIGNED

Othmane Dan.

DRAWN

Joshua Nyarwanda

CHECKED

Rodney Barugahare

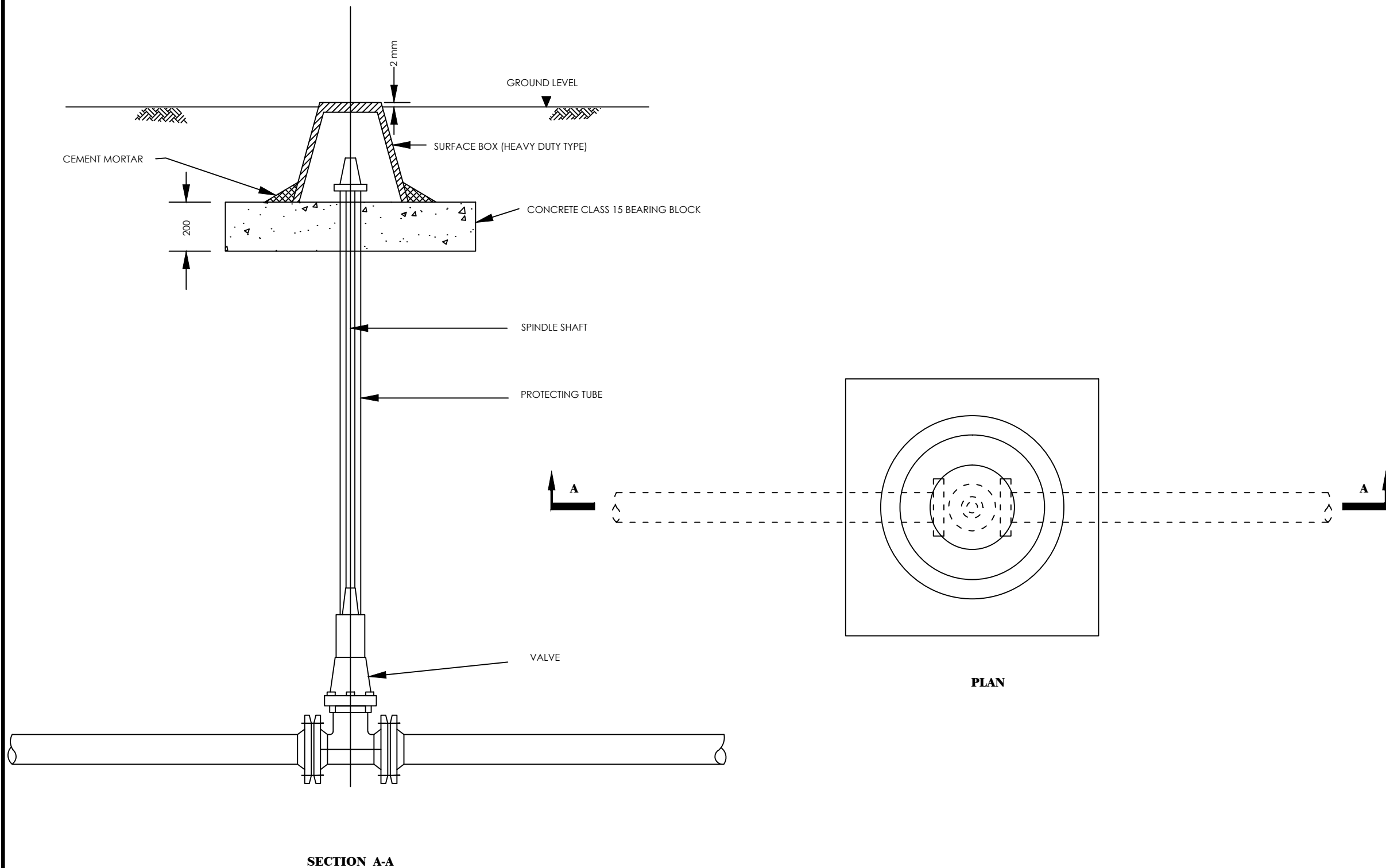
DATE

OCT 2021

APPROVED

Rodney Barugahare.

TYPICAL GATE VALVE, EXTENSION SPINDLE, PROTECTION TUBE
AND SURFACE BOX



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GASPA WATER SUPPLY SYSTEM

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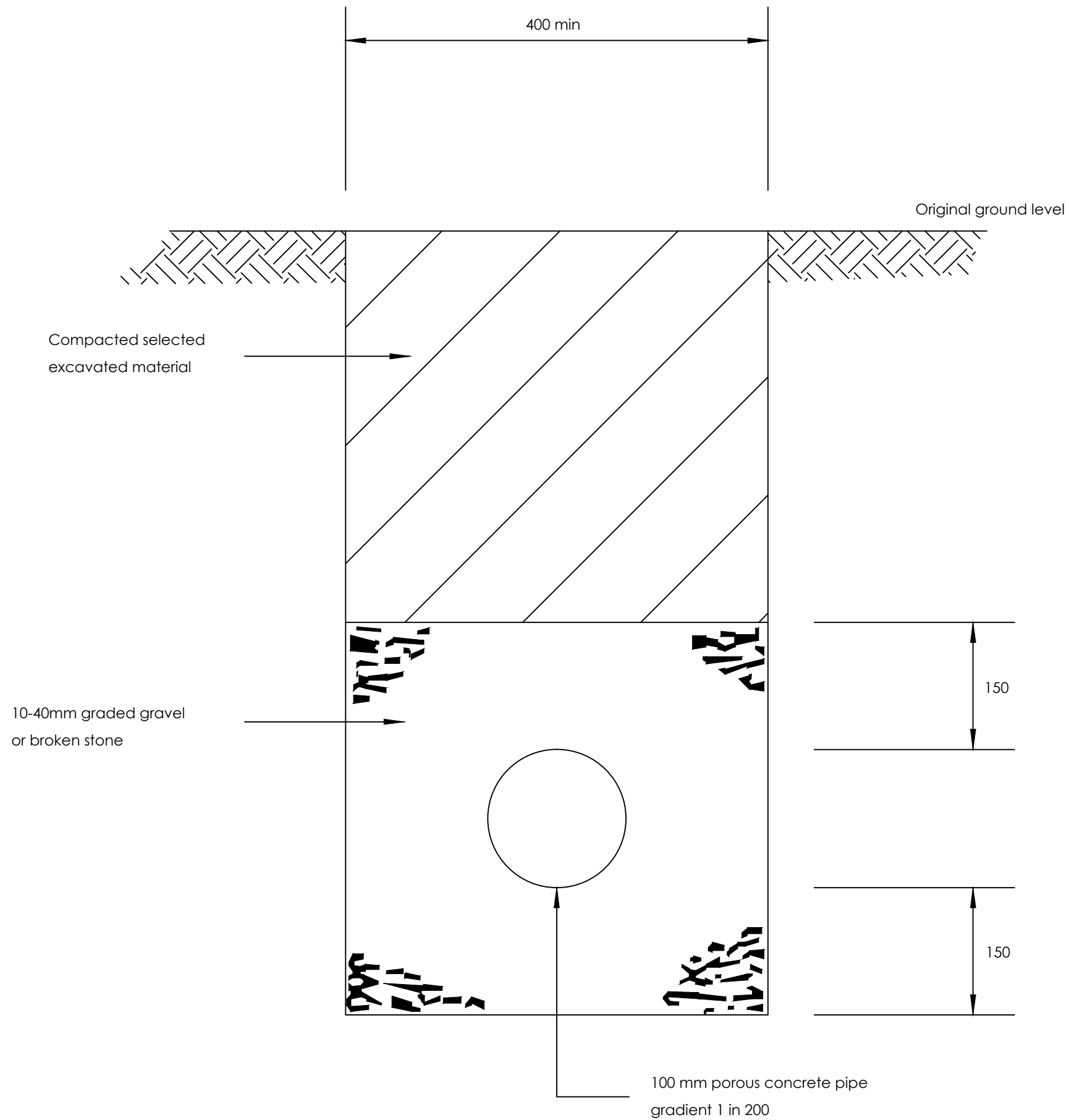
CONTRACTOR

DETAILED ENGINEERING DESIGN

DRAWING TITLE






SURFACE BOX AND FIELD DRAIN

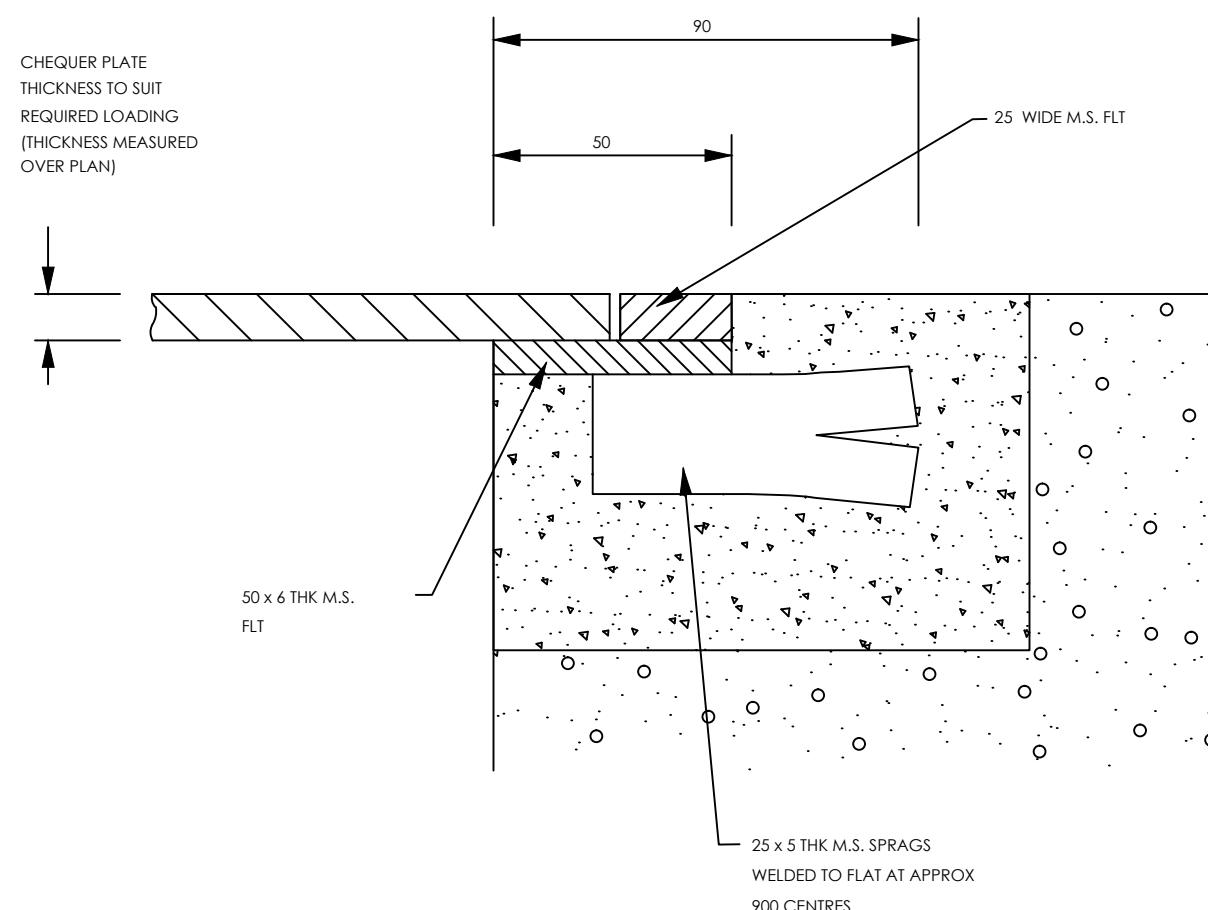
SCALE	As Shown	DRAWING No.	SD122
SURVEYED		DESIGNED	Othmane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



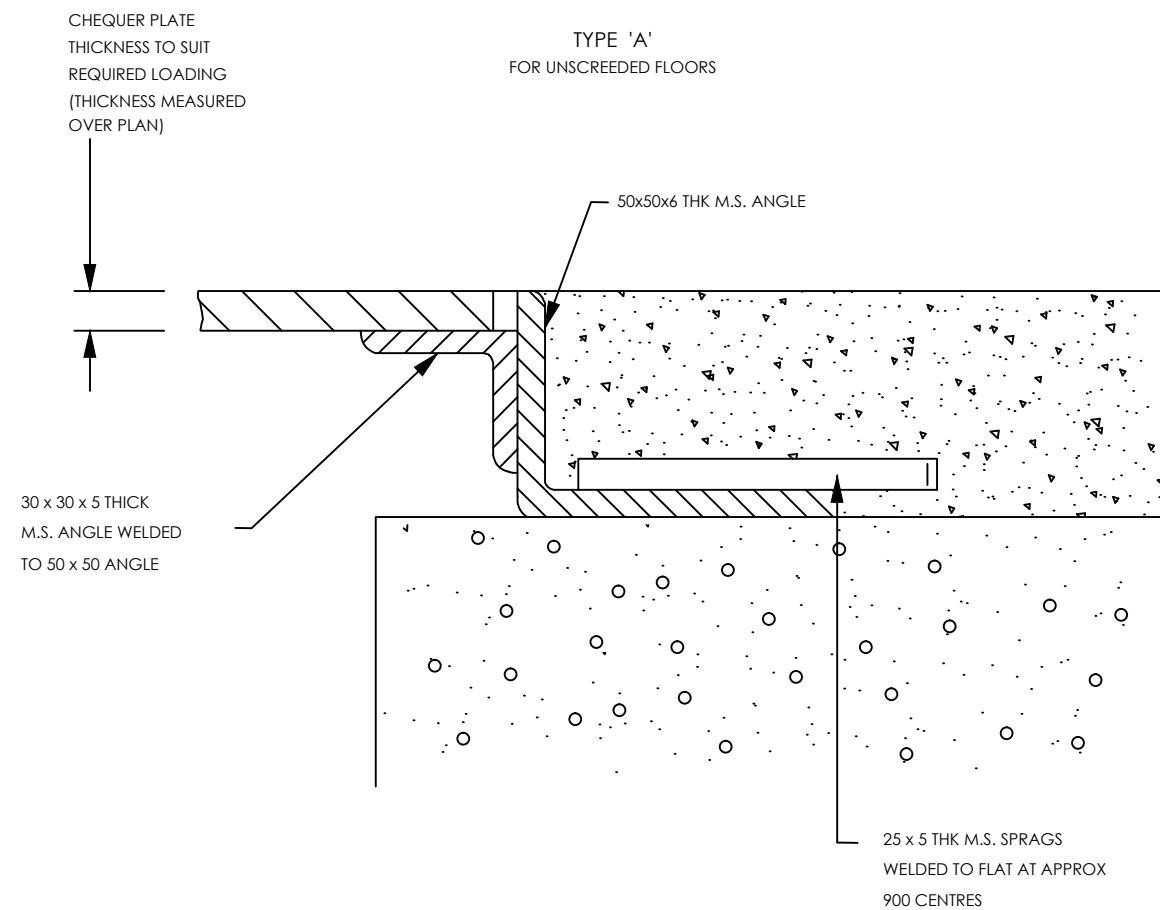
NOTE

1. Open jointed non porous pipes may be used provided joints are at a maximum of 500 mm centres.

CIENT	 GOVERNMENT OF UGANDA MINISTRY OF WATER AND ENVIRONMENT		
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GASPA WATER SUPPLY SYSTEM			
CONSULTANT	 SARI Corporate Headquarter 10 Philipot Lane, 1st Floor, London EC3M 9AA, United Kingdom In Joint Venture with  SGAPI		
CONTRACTOR			
DETAILED ENGINEERING DESIGN			
DRAWING TITLE	FIELD DRAIN		
SCALE	As Shown	DRAWING No.	SD124
SURVEYED		DESIGNED	Othwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



TYPE 'A'
FOR UNSCREED FLOORS



TYPE 'B'
FOR UNSCREED FLOORS

NOTE

CONSTRUCT TO SUIT THICKNESS OF FLOOR PLATES AND SCREED SPECIFIED

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GASPA WATER SUPPLY SYSTEM

CONSULTANT

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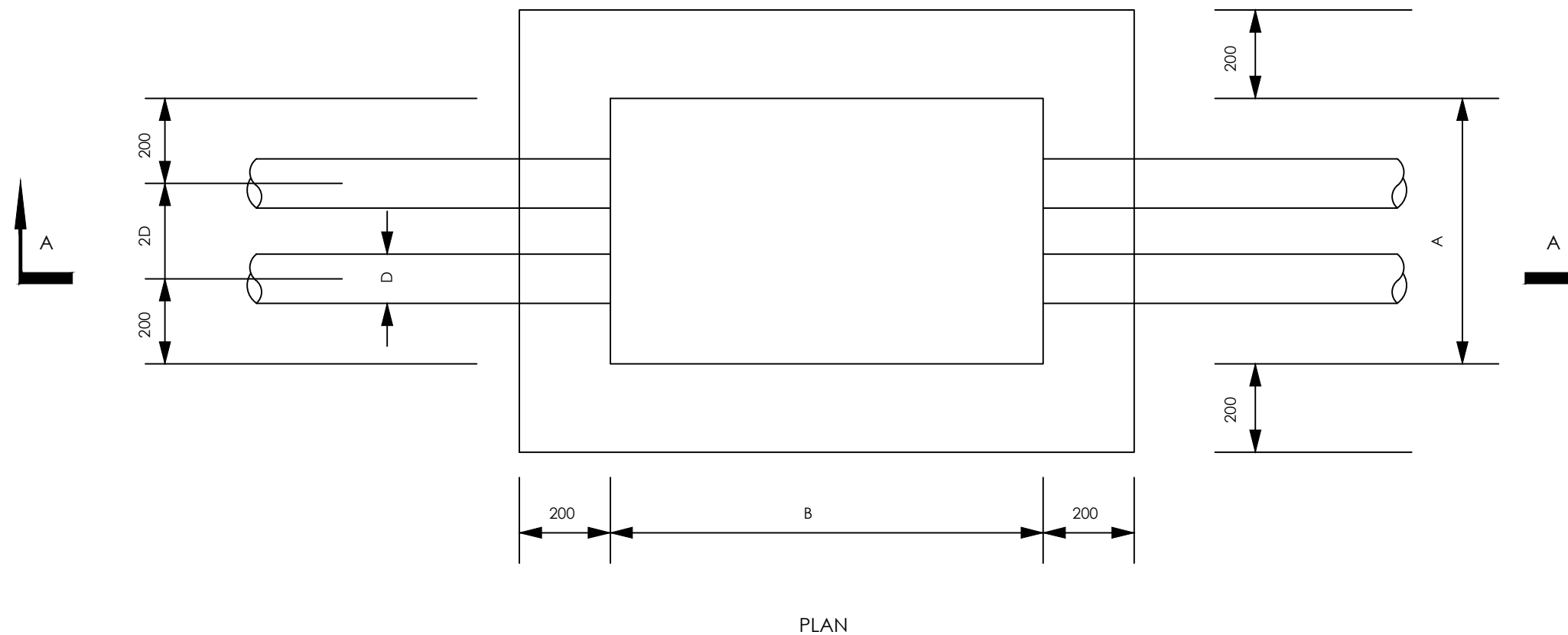
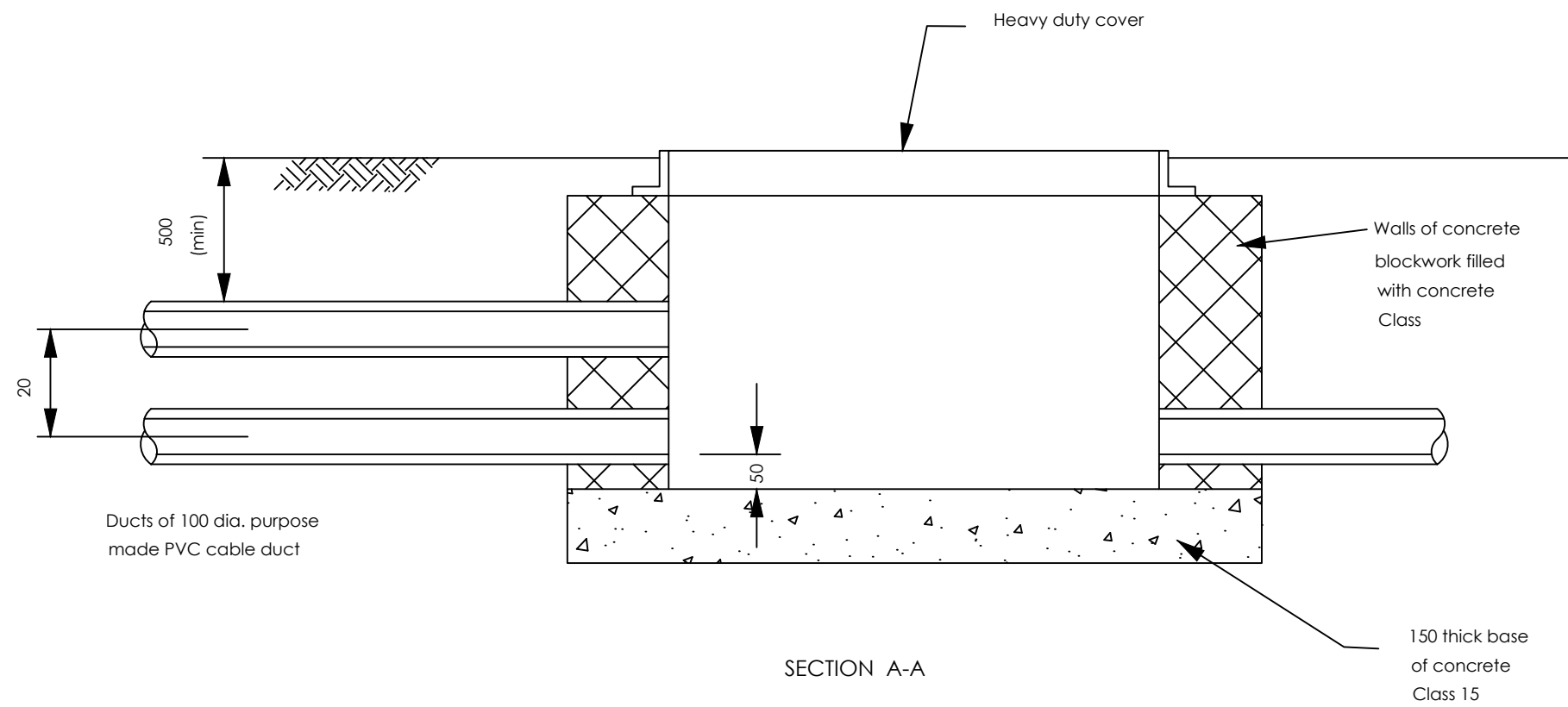
CONTRACTOR

DETAILED ENGINEERING DESIGN

DRAWING TITLE

DUCT COVERS

SCALE	As Shown	DRAWING No.	SD126
SURVEYED		DESIGNED	Othmane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



	A	B
1 Way 50 mm. dia. duct	400	500
1 Way 100 mm. dia. duct	400	600
4 & 2 Way 100 mm. dia. ducts	600	900
6 & 3 Way 100 mm. dia. ducts	800	1000

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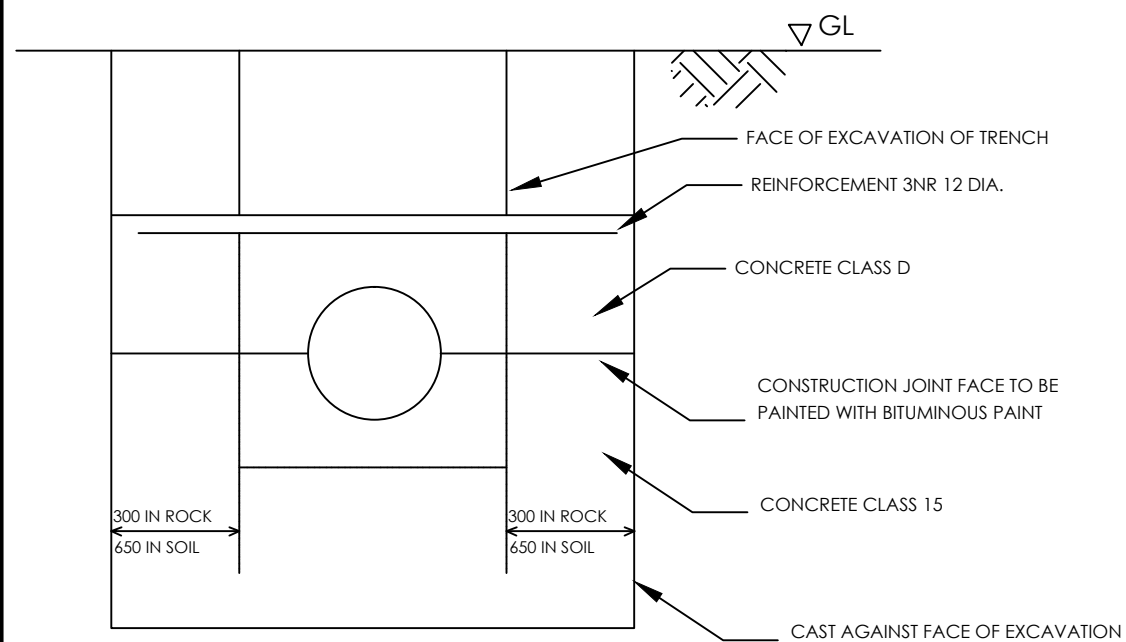
CONTRACTOR

DETAILED ENGINEERING DESIGN

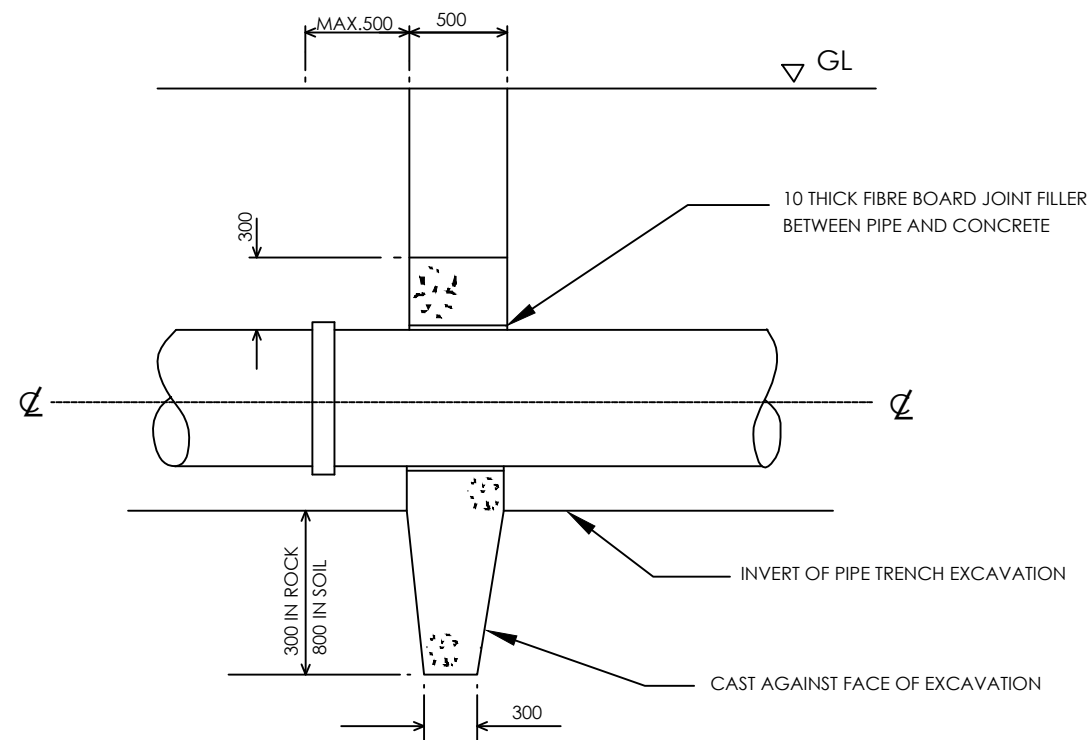
DRAWING TITLE

DRAW PITS

SCALE	As Shown	DRAWING No.	SD130
SURVEYED		DESIGNED	Othmane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



TRANSVERSE SECTION





LONGITUDINAL SECTION

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GASPA WATER SUPPLY SYSTEM

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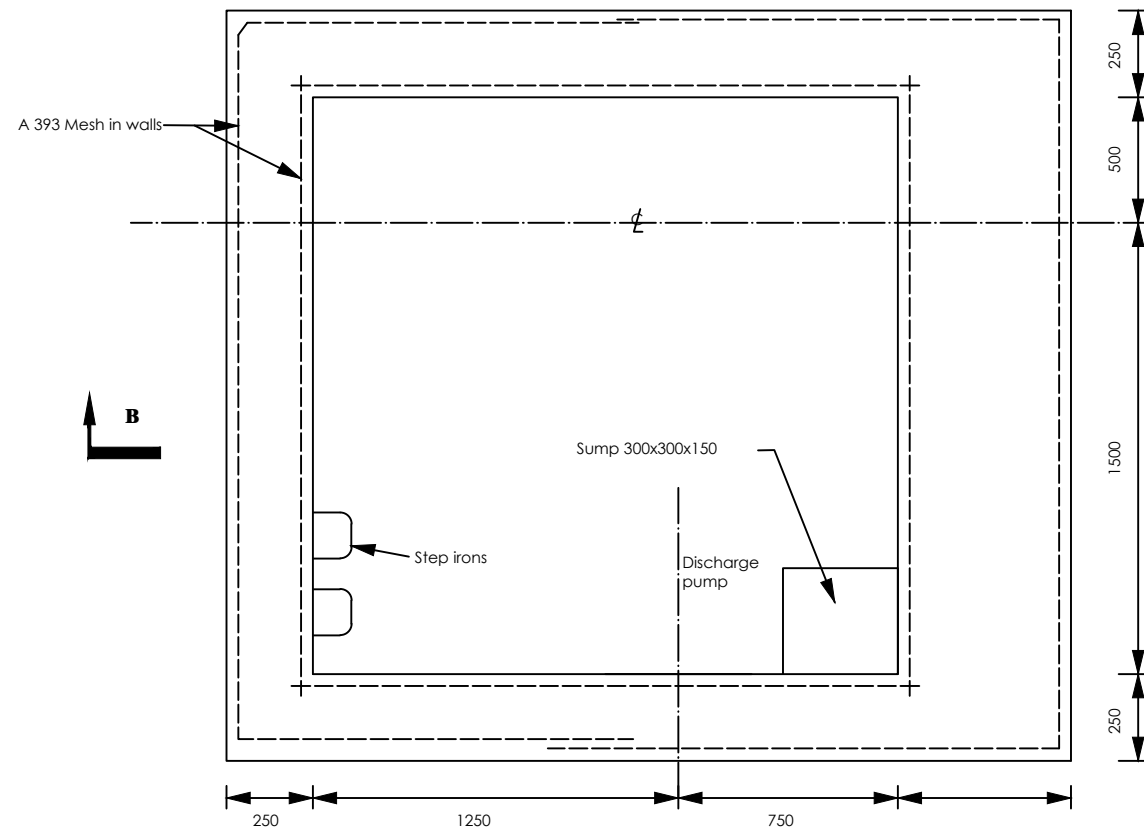
CONTRACTOR

DETAILED ENGINEERING DESIGN

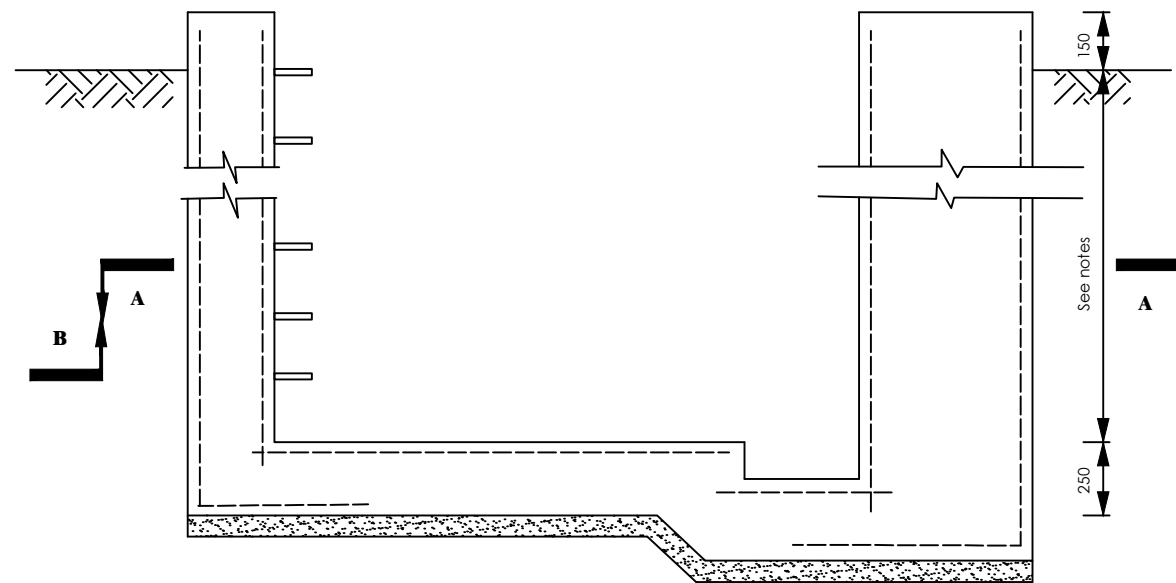
DRAWING TITLE

TRENCH CUT OFF

SCALE	As Shown	DRAWING No.	SD132
SURVEYED		DESIGNED	Othmane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



SECTION A-A





SECTION B-B

NOTES



1. Floor of chamber to be 250 below pipe IL – min depth 1700 below ground level.
2. For details of cover slab see Drawing SD 135C
3. See General notes.
4. Use SD 135b if additional thrust block is required

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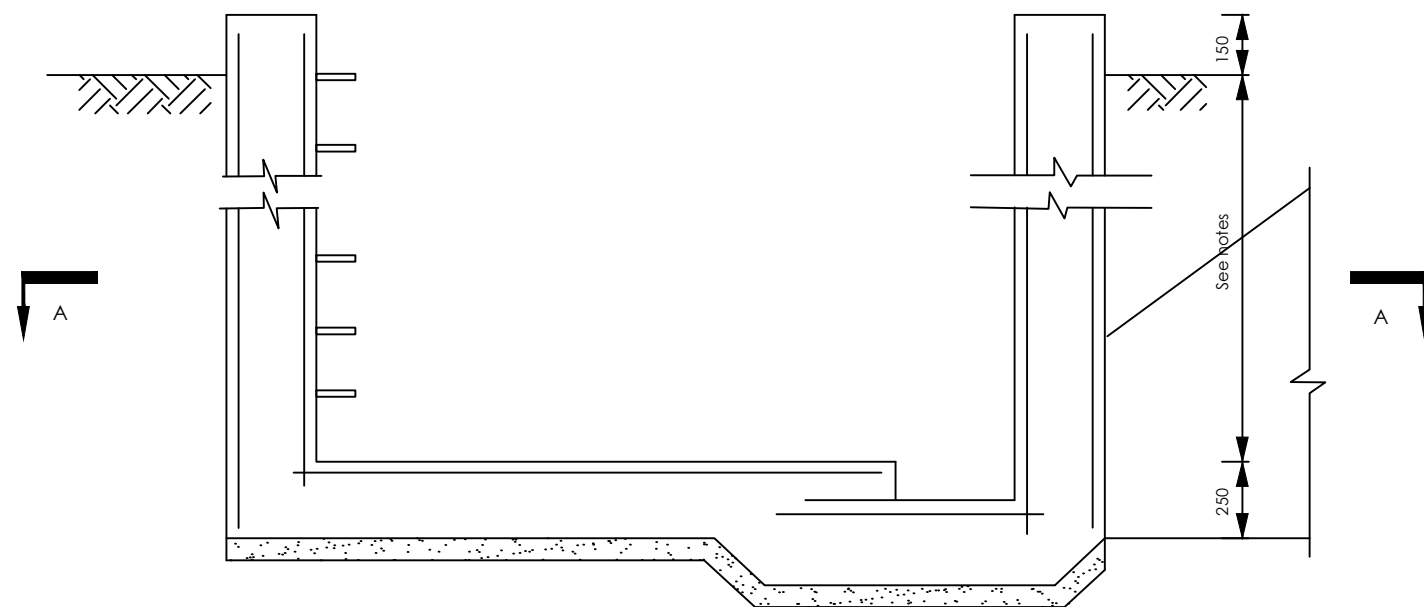
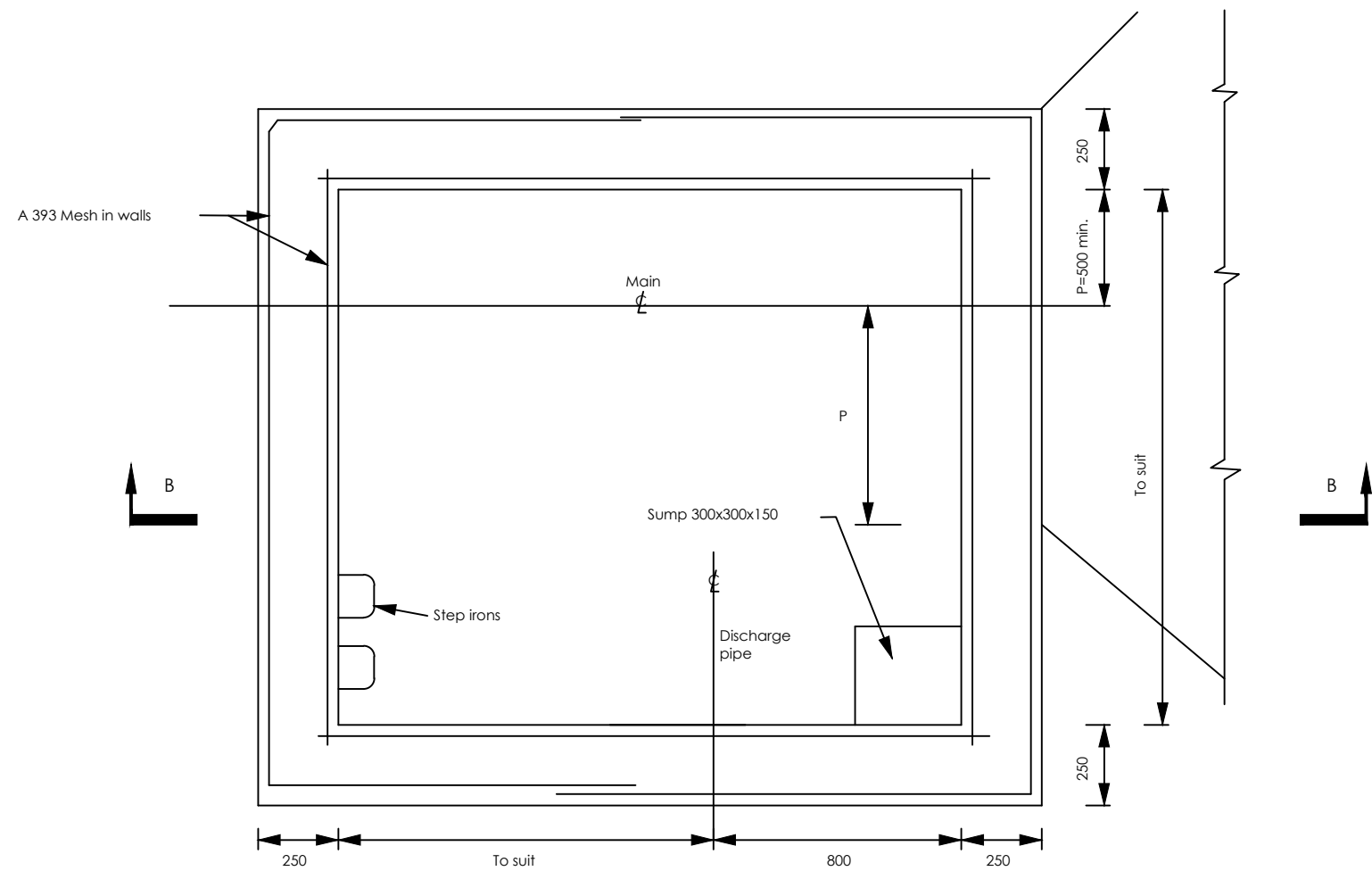
GASPA WATER SUPPLY SYSTEM

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 London EC3M 9AA,
 United Kingdom
 In Joint Venture with  **SGAPI**

CONTRACTOR

DETAILED ENGINEERING DESIGN
 DRAWING TITLE
**WASHOUT/GATE VALVE CHAMBER-
 R.C. DETAILS**

SCALE	As Shown	DRAWING No.	SD135A
SURVEYED		DESIGNED	Othmane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.




NOTES

1. Floor of chamber to be 250 below pipe IL – min depth 1700 below ground level.
2. Fore details of cover slab see Drawing SD 135C
3. See General notes.

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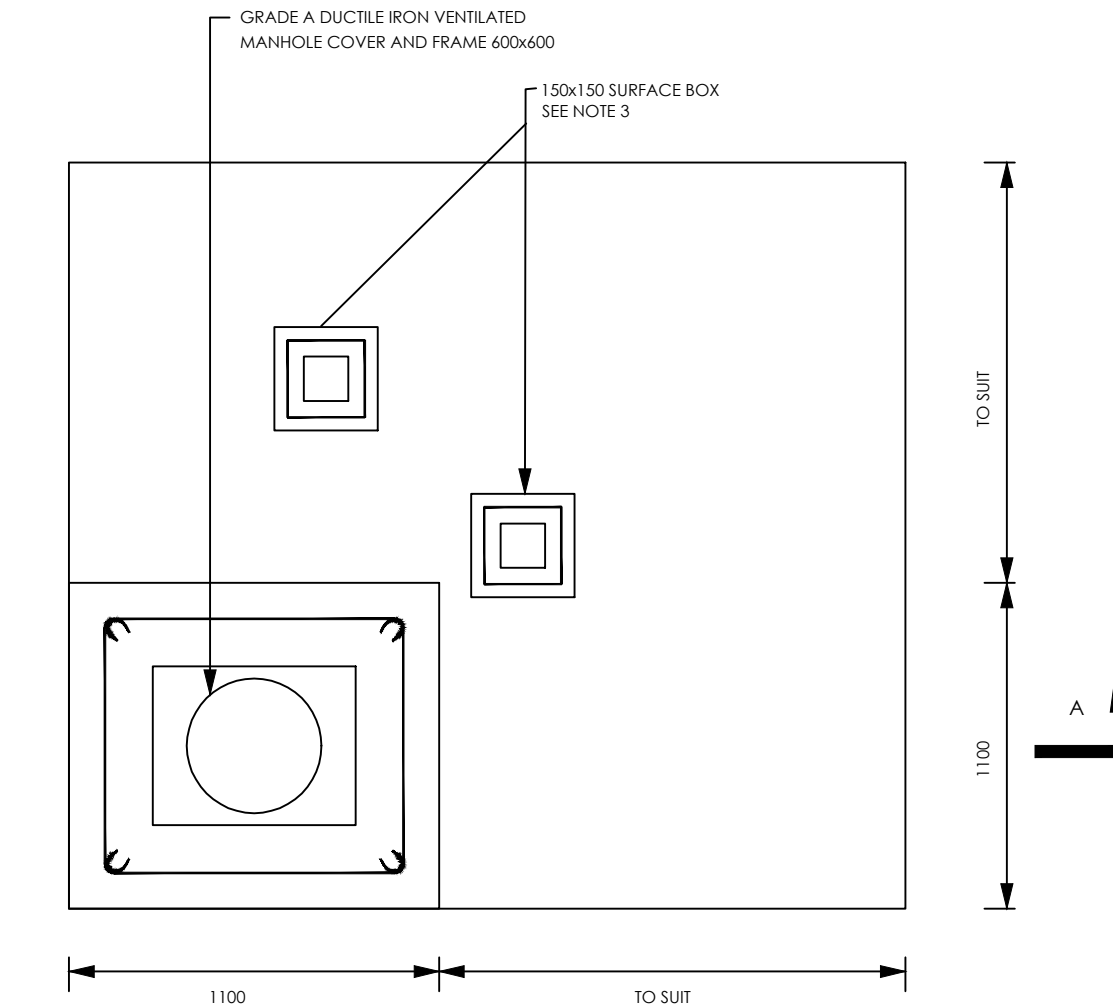
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DETAILED ENGINEERING DESIGN

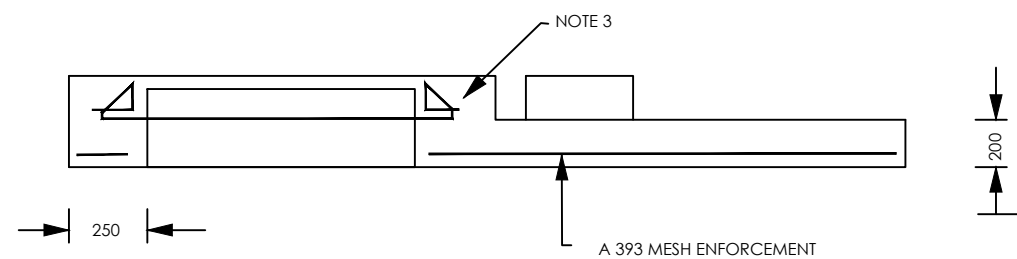
DRAWING TITLE

WASHOUT/GATE VALVE CHAMBER WITH THRUST BLOCK - R.C. DETAILS

SCALE	As Shown	DRAWING No.	SD135B
SURVEYED		DESIGNED	Othmane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



PLAN





SECTION A-A

CIENT

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NORTHERN UGANDA IN KIRYANDONGO DISTRICT

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CONSULTANT

 **SARI**
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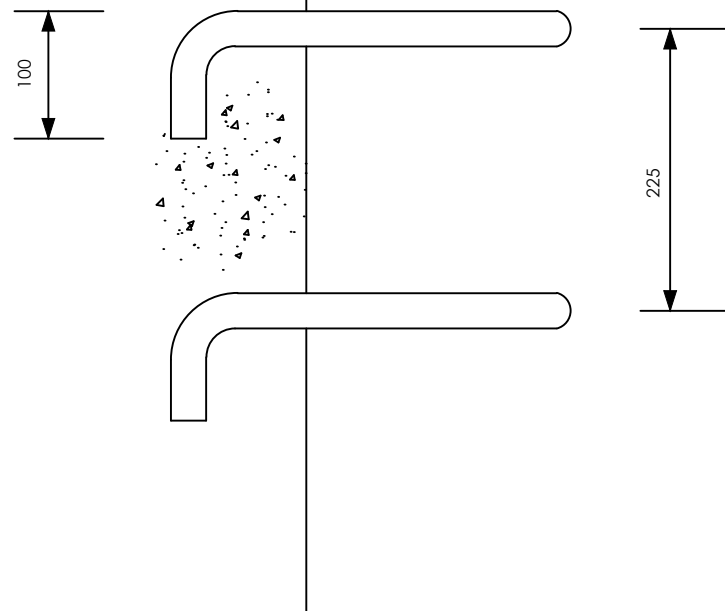
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CONTRACTOR

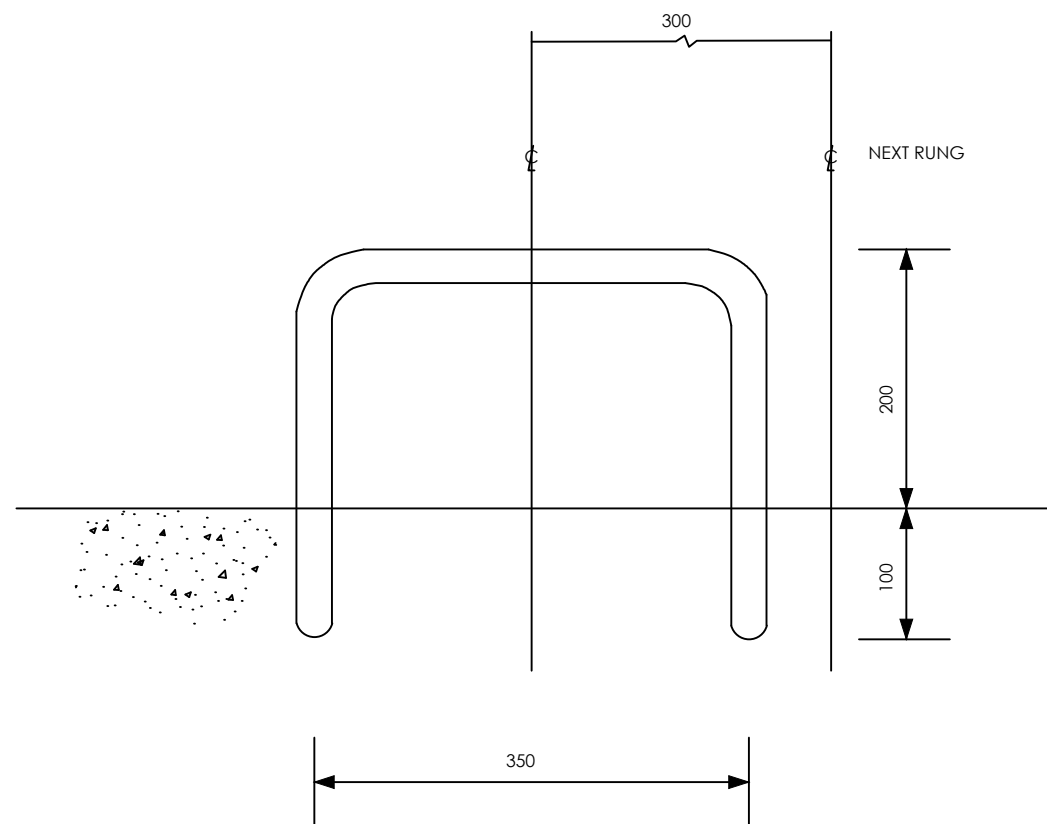
DETAILED ENGINEERING DESIGN

DRAWING TITLE
**WASHOUT/GATE VALVE CHAMBER
ROOF SLAB-R.C. DETAILS**

SCALE	As Shown	DRAWING No.	SD135C
SURVEYED		DESIGNED	Othmane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



ELEVATION



PLAN

Step irons are to be to B1247, or made from 25 dia. reinforcing bars bent as shown
(if approved)

Bars should be placed at 225 centres vertically and at alternate centres 300 vertically

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DETAILED ENGINEERING DESIGN AND CONSTRUCTION
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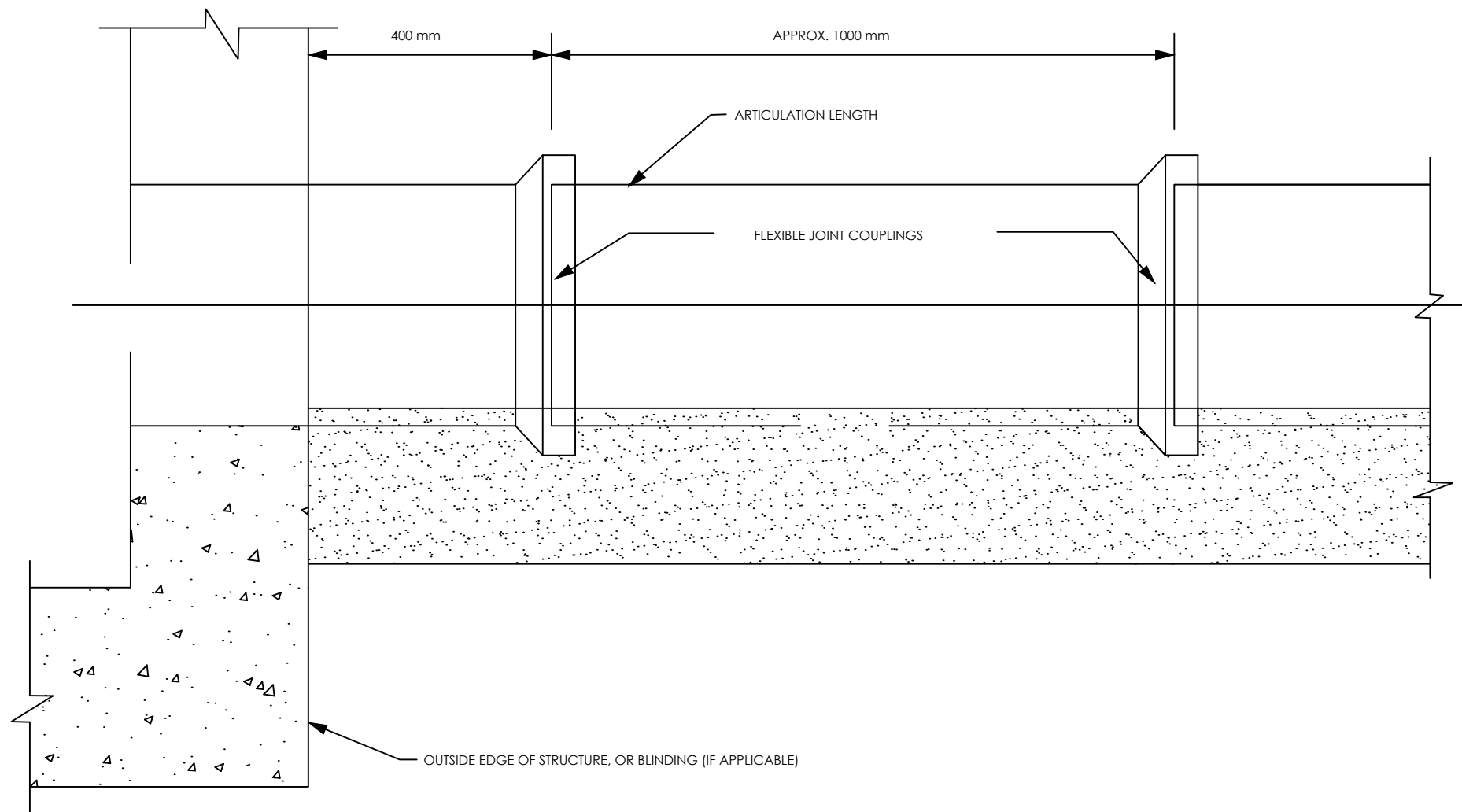
CONTRACTOR

DETAILED ENGINEERING DESIGN



DRAWING TITLE

STEP IRON DETAIL

SCALE	As Shown	DRAWING No.	SD136
SURVEYED		DESIGNED	Othmane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.





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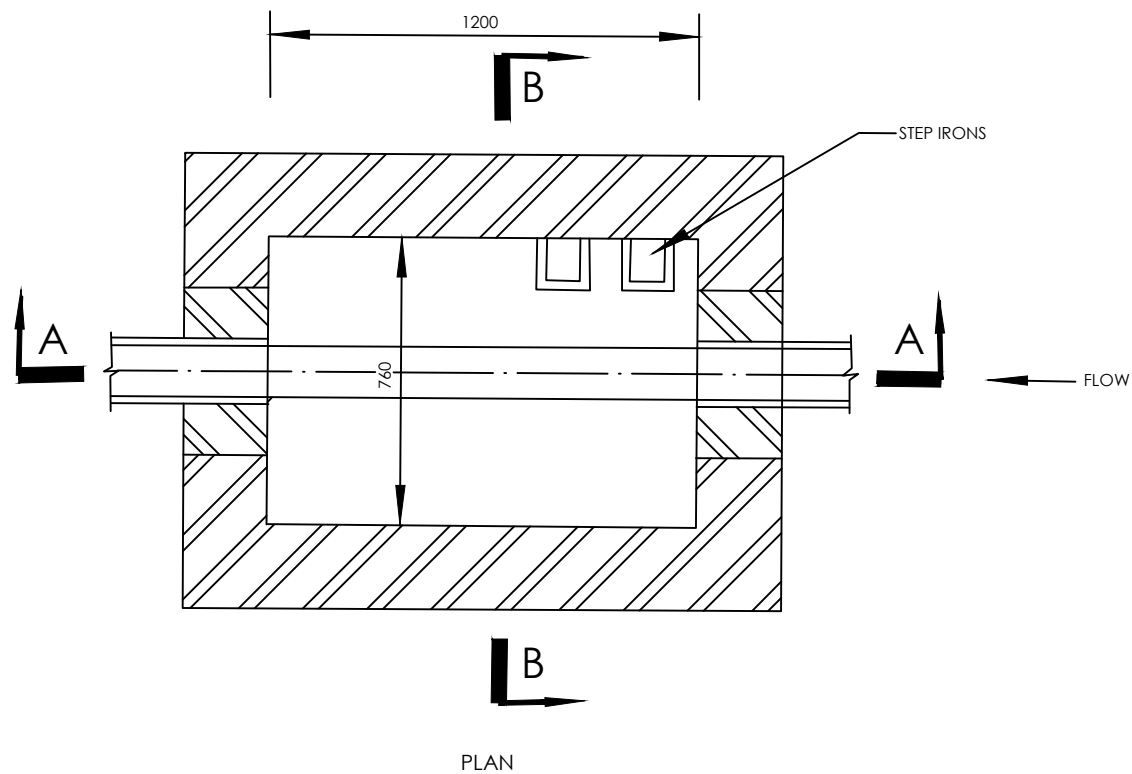
GASPA WATER SUPPLY SYSTEM

CONSULTANT
 **SARI**
Corporate Headquarter
10 Philpot Lane, 1st Floor,
London EC3M 9AA,
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CONTRACTOR

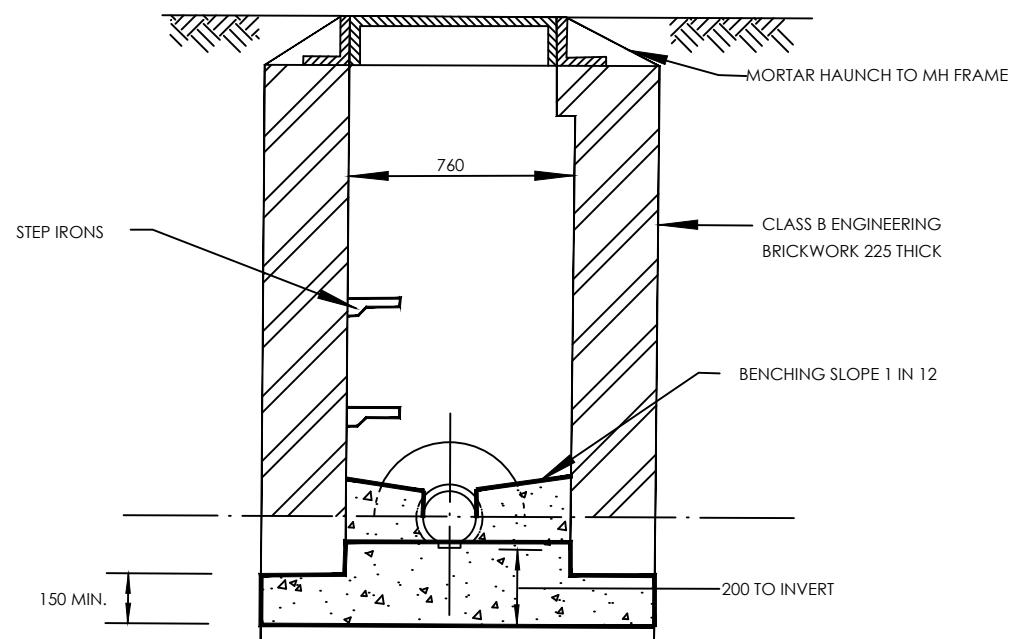
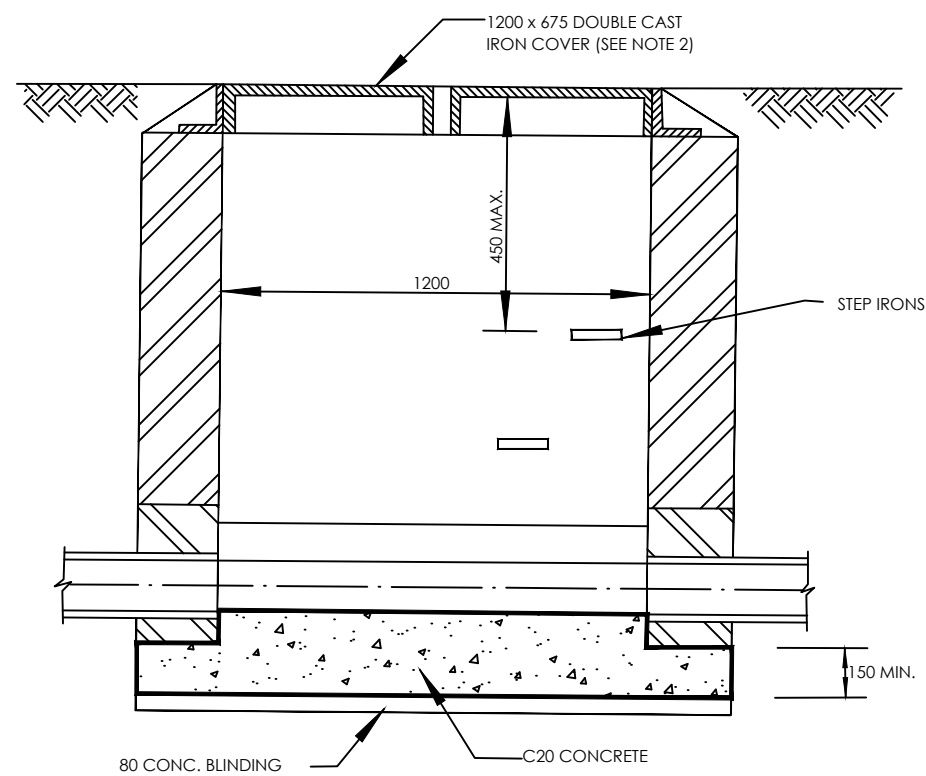
DETAILED ENGINEERING DESIGN
DRAWING TITLE **FLEXIBLE PIPE JOINT DETAILS FOR
PIPES ENTERING OR LEAVING
CONCRETE STRUCTURES**

SCALE	As Shown	DRAWING No.	SD137
SURVEYED		DESIGNED	Othmane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



NOTES:

1. MANHOLES FOR SEWER SIZES UP TO AND INCLUDING 900 DIA. DEPTH TO SOFFIT EXCEEDING 1000 BUT NOT EXCEEDING 1350
2. MANHOLE FRAMES AND MULTIPLE COVERS WITH A MINIMUM CLEAR OPENING OF 1200x675 SHALL OTHERWISE COMPLY WITH BS497 PART 1 GRADE A.
3. CHAMBERS WITH OUTGOING PIPES GREATER THAN 700 DIA. SHALL BE FITTED WITH REMOVABLE SAFETY CHAIN AT DOWNSTREAM END.
4. PIPES ENTERING MANHOLES SHALL HAVE A FLEXIBLE JOINT WITHIN 600 OF THE INSIDE FACE OF THE MANHOLE FOR PIPES UP TO 450 AND WITHIN 1000 OF THE INSIDE FACE OF THE MANHOLE FOR PIPES UP TO 1000. THIS SHALL BE FOLLOWED BY A SHORT ROCKER PIPE.
5. INTERNAL DIMENSIONS OF CHAMBER NORMALLY 1200x675 (AS CLEAR OPENING IN FRAME) BUT CHAMBER WIDTH SHOULD BE INCREASED FOR PIPES LARGER THAN 225 DIA. TO GIVE 225 BENCHING EACH SIDE WITH THE BRICKWORK CRIBBELLED DOWN TO 675.
6. ALL DIMENSIONS ARE IN MILLIMETRES.



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GASPA WATER SUPPLY SYSTEM

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DETAILED ENGINEERING DESIGN

DRAWING TITLE

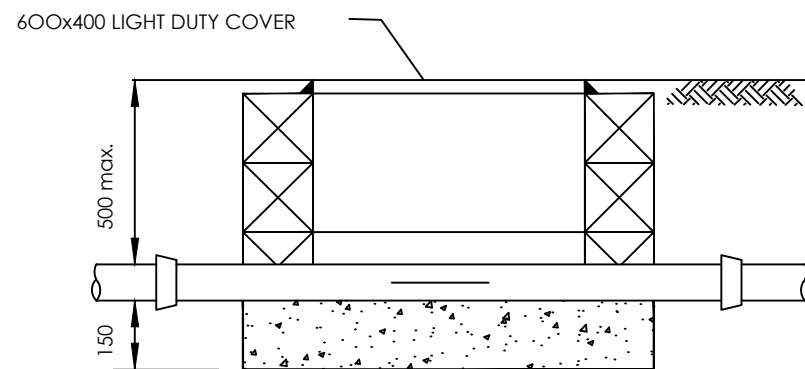
MANHOLE - TYPE C

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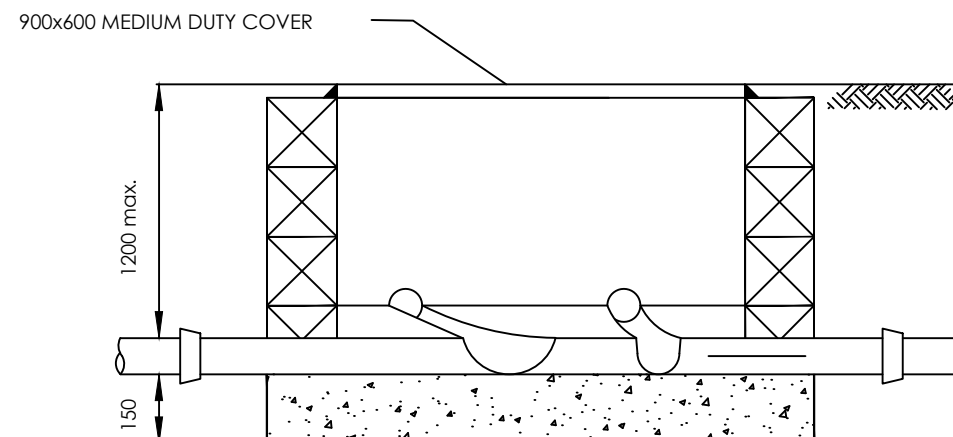
SURVEYED DESIGNED Othmane Dan.

DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare

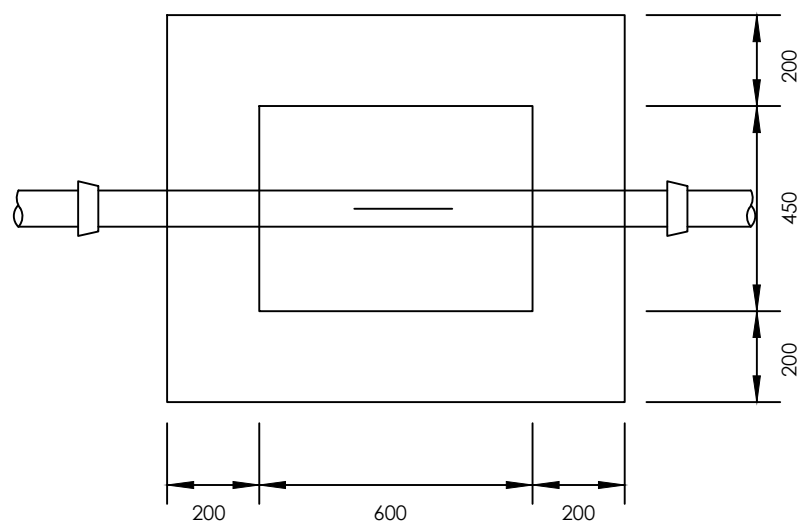
DATE OCT 2021 APPROVED Rodney Barugahare.



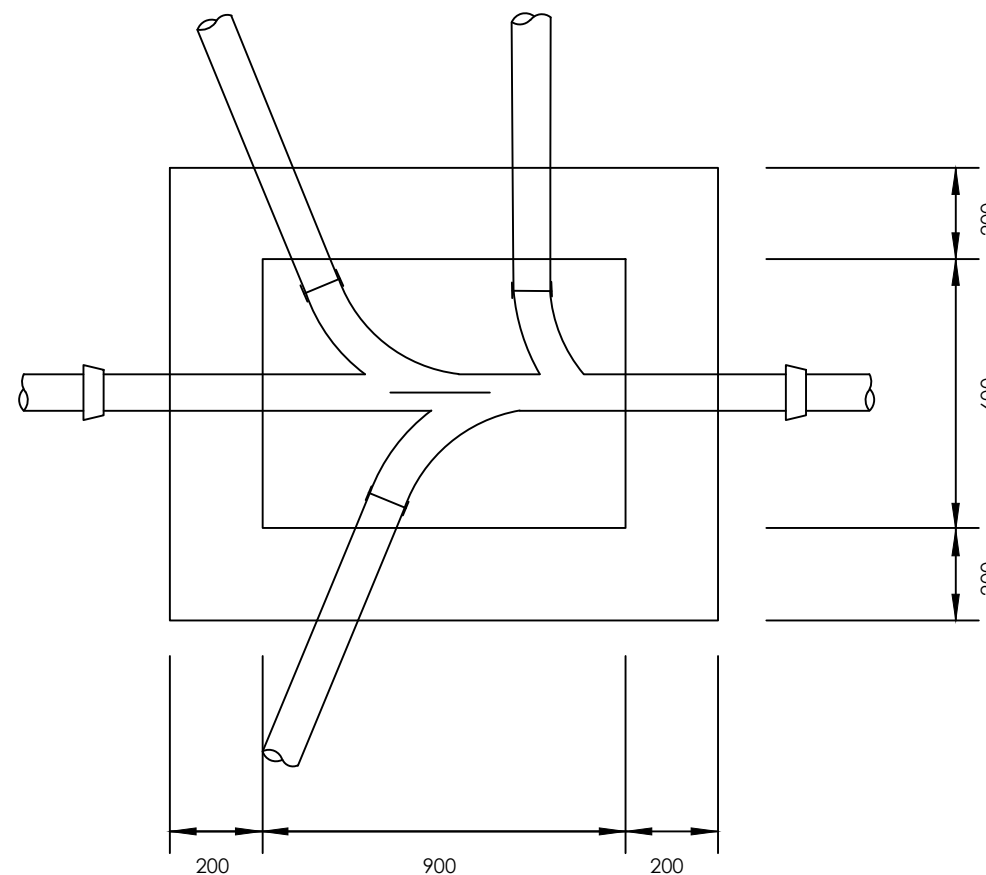
SECTION (TYPE 1)



SECTION (TYPE 2)



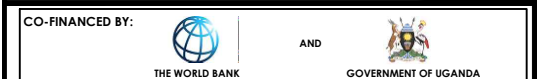
PLAN (TYPE 1)



PLAN (TYPE 2)

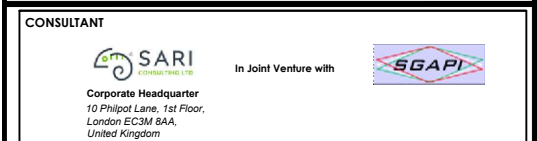
NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES
2. CONSTRUCTION OF BASE SLAB TO BE CLASS 30/40S CONCRETE AND WALLS TO BE EITHER CLASS 30/40S CONCRETE OR CONCRETE BLOCKWORK WITH 20 THICK CEMENT MORTAR RENDER TO BOTH INTERNAL AND EXTERNAL FACES.
3. BENCHING TO BE CLASS 30/20S CONCRETE WITH 20 THICK CEMENT MORTAR TO SURFACE.



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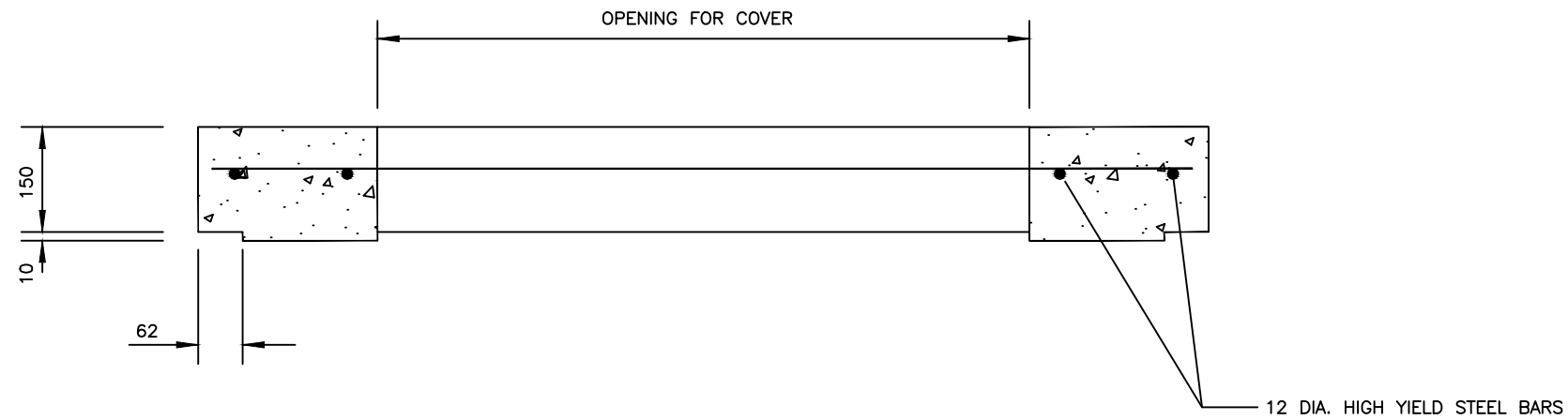
GASPA WATER SUPPLY SYSTEM



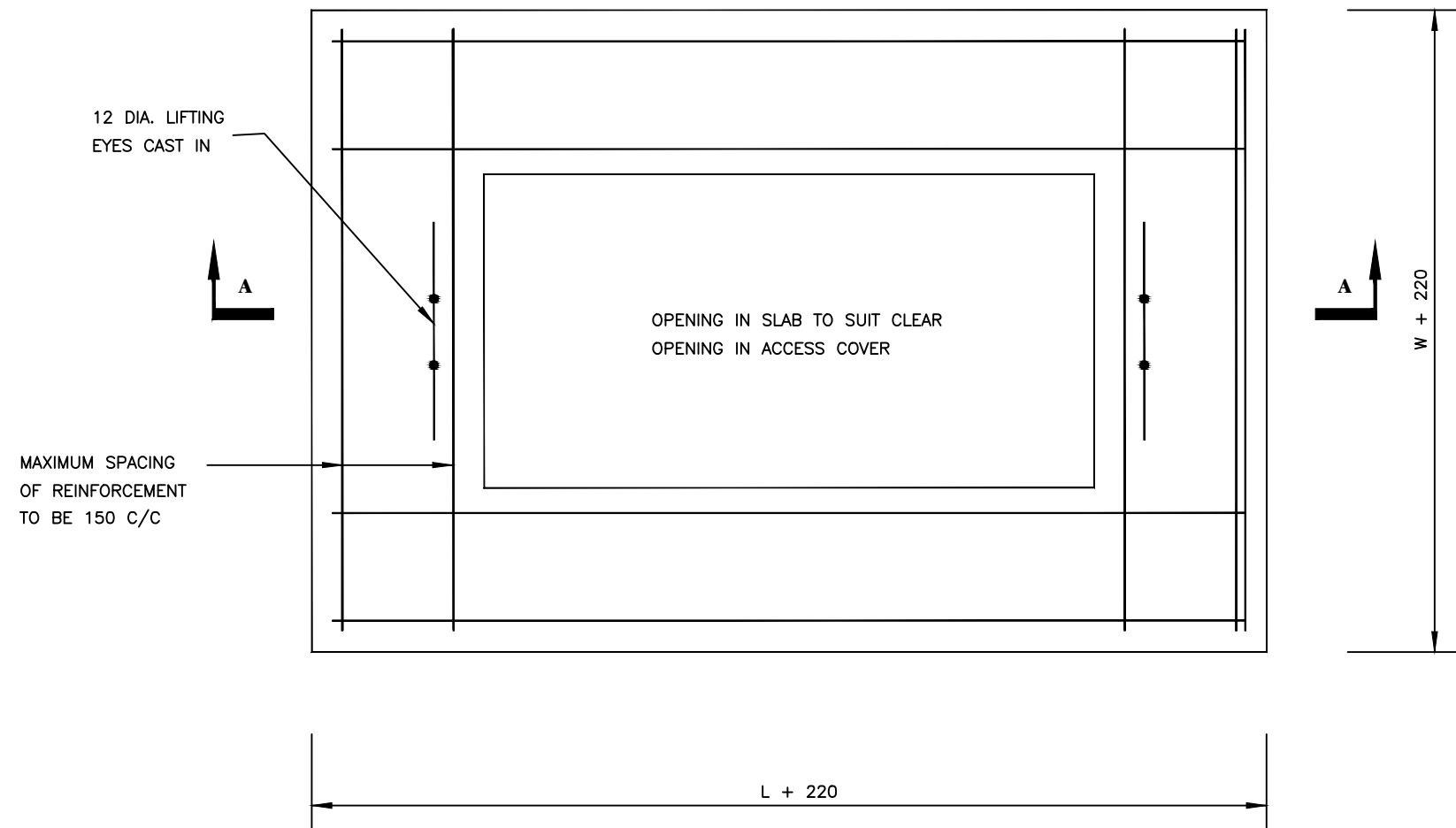
CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE
INSPECTION CHAMBERS- TYPES 1 AND 2

SCALE	As Shown	DRAWING No.	SD206
SURVEYED		DESIGNED	Othmane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



SECTION A-A



PLAN

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES
2. FOR GENERAL NOTES SEE STANDARD DETAIL No. V/G/NOTE/01.
3. FRAME TO BE SET IN CONCRETE UPSTAND MINIMUM DEPTH 150 DOWELLED TO SLAB WITH 6 No. T18 BARS 200 LONG.
4. L AND W ARE INTERNAL CHAMBER DIMENSIONS. SEE STANDARD DETAIL No. SD 214.

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GASPA WATER SUPPLY SYSTEM

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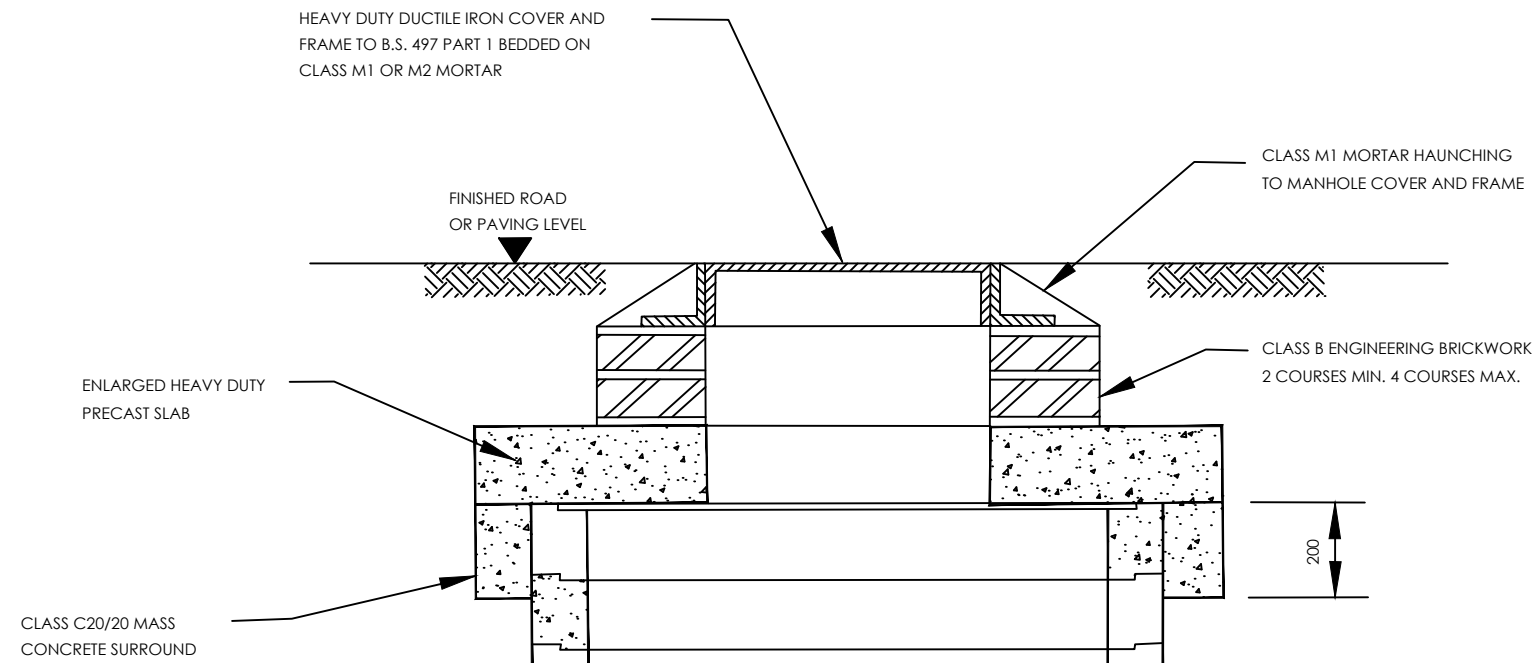
CONTRACTOR

DETAILED ENGINEERING DESIGN

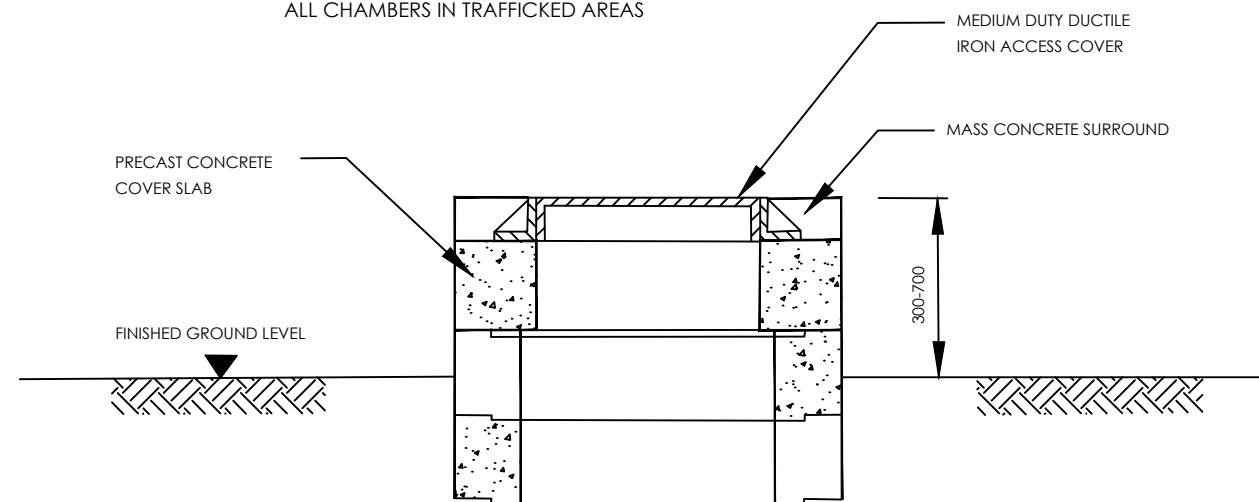
DRAWING TITLE

PRECAST CONCRETE COVER SLAB OPEN AREAS

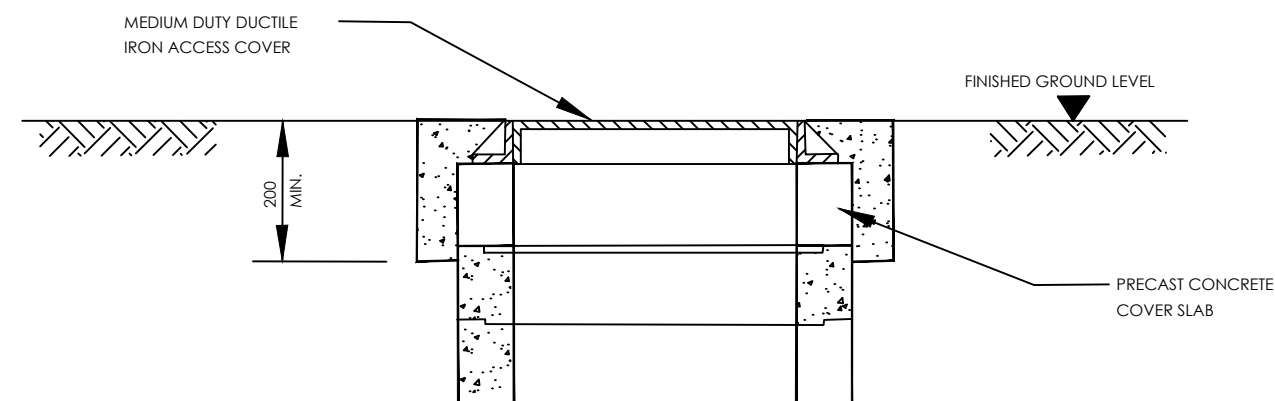
SCALE	As Shown	DRAWING No.	SD211
SURVEYED		DESIGNED	Othmane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



ALL CHAMBERS IN TRAFFICKED AREAS



CHAMBERS IN OPEN AREAS



FLUSH FITTING CHAMBERS IN NON-TRAFFICKED AREAS

NOTES :



1. ALL DIMENSIONS ARE IN MILLIMETRES.

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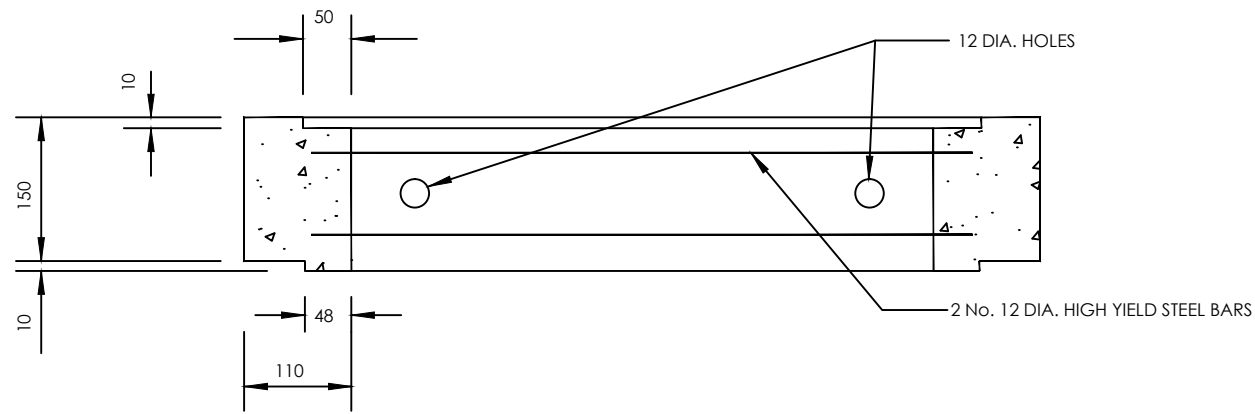
GASPA WATER SUPPLY SYSTEM

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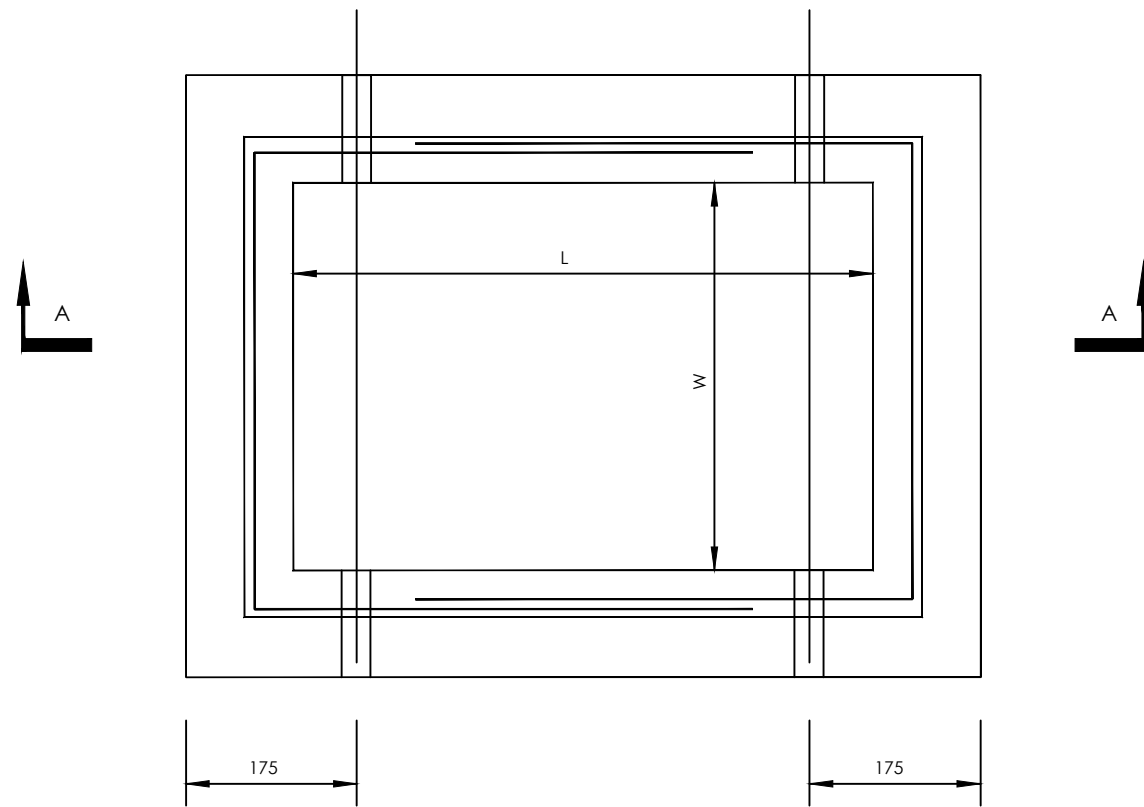
CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE
PRECAST CHAMBER COVER SLAB INSTALLATIONS

SCALE	As Shown	DRAWING No.	SD213
SURVEYED		DESIGNED	Othmane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



SECTION A-A



PLAN

TYPE	L	W
A	430	280
B	600	450
C	750	600
D	900	600
E	1200	600
F	1200	900

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES
2. CONCRETE TO BE CLASS 30/20.
3. COVER TO REINFORCEMENT TO BE 40mm.
4. DIMENSIONS L AND W FROM TABLE SHOWN.
5. FOR GENERAL NOTES SEE STANDARD DRAWING No. V/G/NOTE/01.

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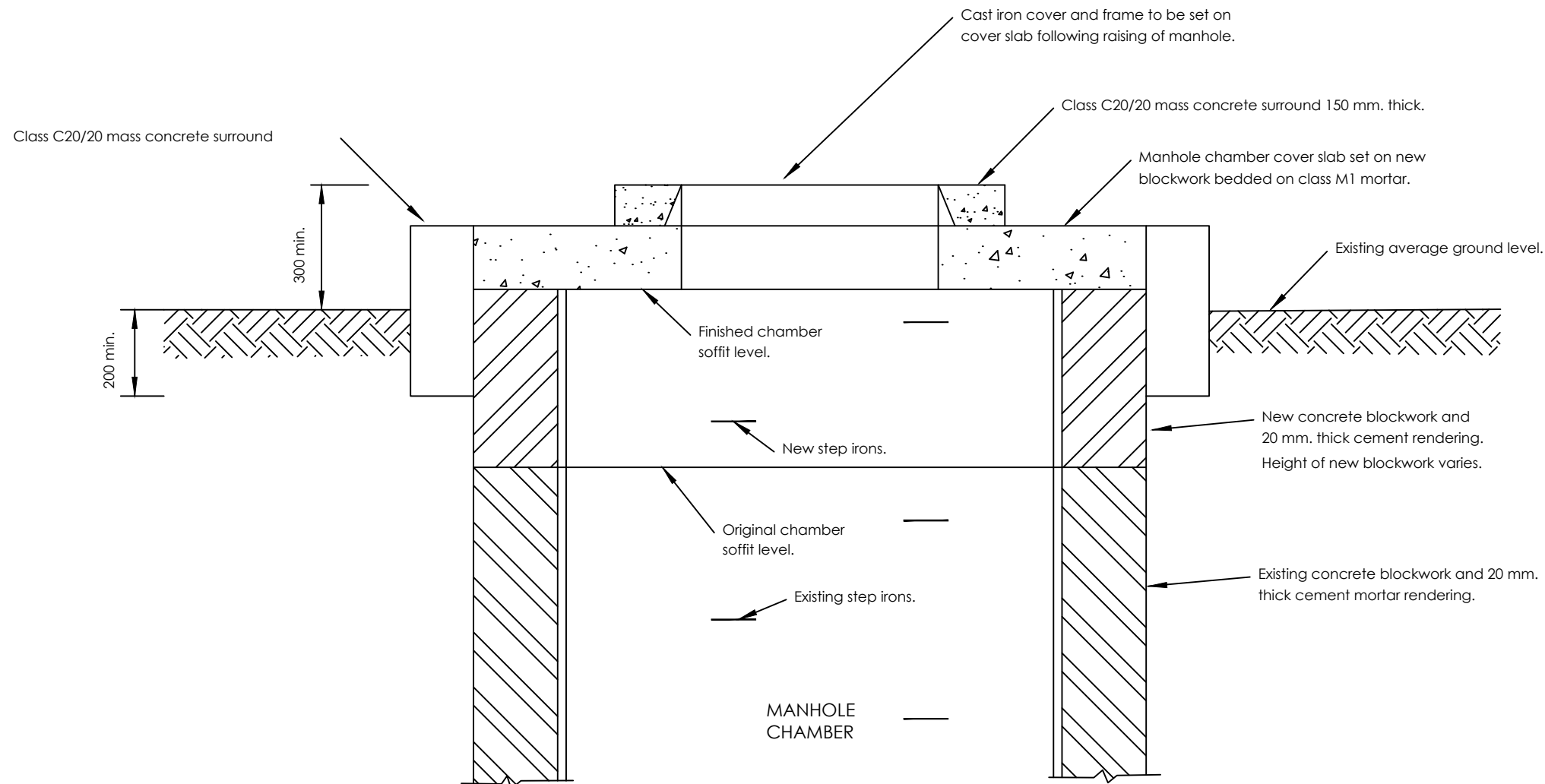
CONTRACTOR

DETAILED ENGINEERING DESIGN

DRAWING TITLE

PRECAST CONCRETE CHAMBER SECTIONS

SCALE	As Shown	DRAWING No.	SD214
SURVEYED		DESIGNED	Othmane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



NOTES

1. The existing manhole chamber cover slab shall be re-used where possible. If existing slab is damaged it shall be replaced by a new slab as per standard detail SD 211.
2. Manhole chambers are generally square in plan with 1200 x 1200 internal dimensions. Dimensions to be confirmed by the contractor prior to casting new manhole chamber cover slab
3. The existing cast iron cover and frame shall be re-used where possible. If the cover or frame is damaged, it shall be replaced by a medium duty cover and frame supplied by the Employer.
4. Width of the new concrete blocks shall be the same as existing chamber walls.
5. The final cove level shall be agreed with the Engineer prior to placing mass concrete surrounds.
6. New step irons as per SD 206.

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DETAILED ENGINEERING DESIGN

DRAWING TITLE

ALTERATIONS TO CHAMBERS IN OPEN AREAS

SCALE	As Shown	DRAWING No.	SD215
SURVEYED		DESIGNED	Othmane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.

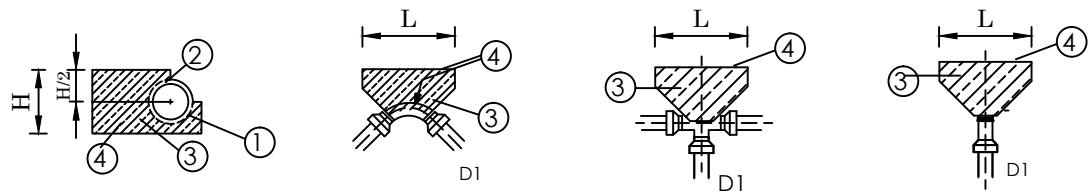
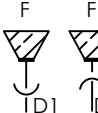
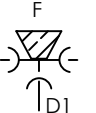
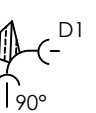

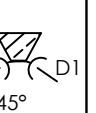
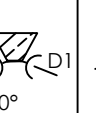
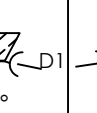
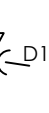


TABLE I

	C	B	A1	A2	A3	A4	A5	A6
D1								
mm	mm ²	mm ²	mm ²	mm ²	mm ²	mm ²	mm ²	mm ²
65	0.05	0.05	0.07	0.05	0.04	0.03	0.02	0.01
80	0.08	0.08	0.11	0.08	0.06	0.04	0.03	0.02
1.00	0.11	0.11	0.16	0.11	0.08	0.06	0.04	0.02
1.50	0.25	0.25	0.35	0.25	0.19	0.13	0.10	0.05
2.00	0.40	0.40	0.56	0.40	0.31	0.21	0.16	0.08
2.50	0.66	0.66	0.93	0.66	0.51	0.34	0.25	0.13
3.00	0.94	0.94	1.33	0.94	0.72	0.49	0.37	0.19
4.00	1.66	1.66	2.34	1.66	1.29	0.86	0.65	0.33
5.00	2.50	2.50	3.53	2.50	1.93	1.30	0.98	0.50
6.00	3.61	3.61	5.09	3.61	2.78	1.88	1.41	0.72
7.00	4.90	4.90	6.91	4.90	3.77	2.55	1.91	0.98
8.00	6.39	6.39	9.01	6.39	4.92	3.32	2.49	1.29
9.00	8.10	8.10	11.42	8.10	6.24	4.21	3.16	1.62

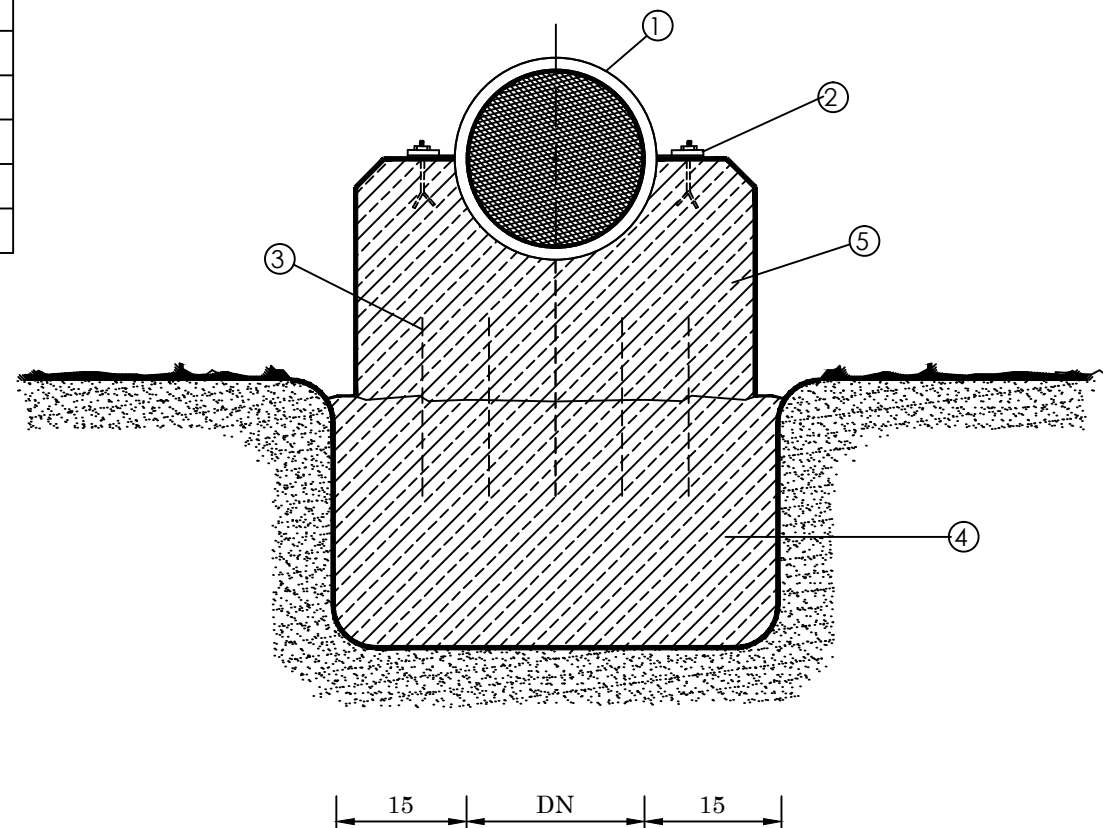
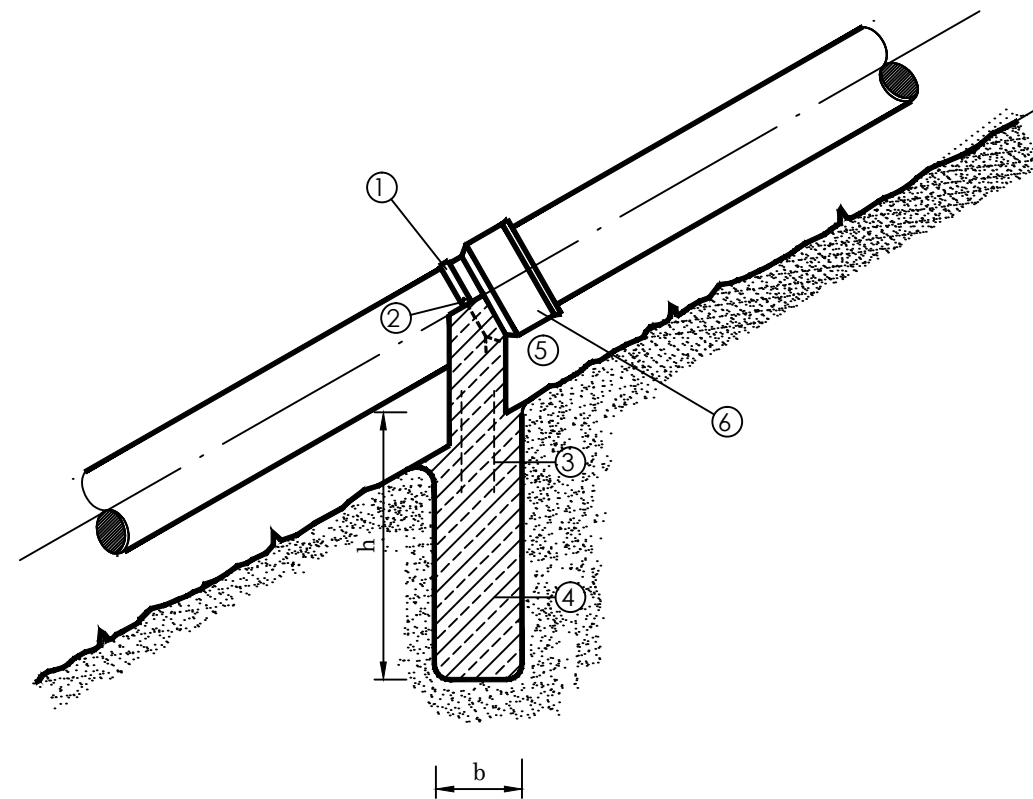


TABLE II

P1(bar)	10	15	20	25	30
2.0	0.5	0.75	1.0	1.25	1.5
1.5	0.67	1.0	1.33	1.57	2.0
1.0	1.0	1.5	2.0	2.5	3.0
0.5	2.0	3.0	4.0	5.0	6.0

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GASPA WATER SUPPLY SYSTEM

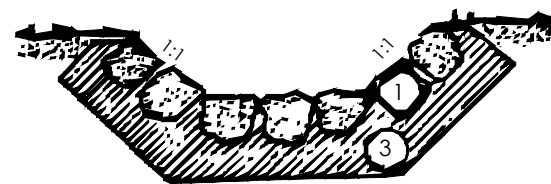
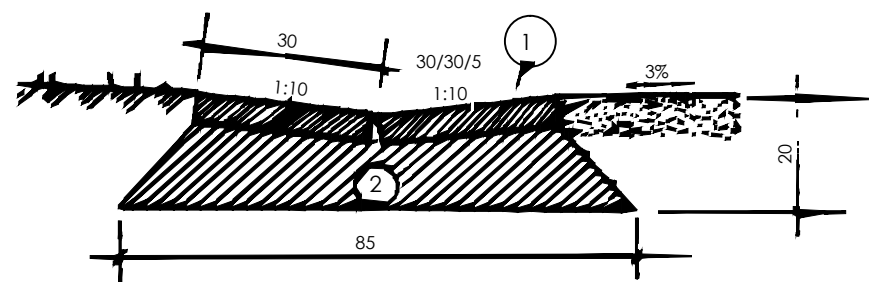
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CONTRACTOR

DETAILED ENGINEERING DESIGN
DRAWING TITLE
THRUST BLOCK

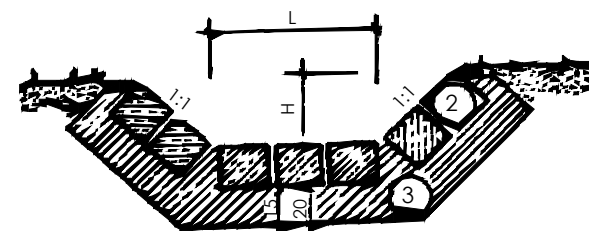
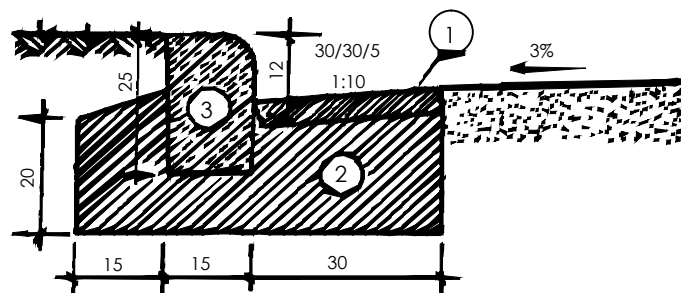
SCALE As Shown DRAWING No. SD216
SURVEYED DESIGNED Othmane Dan.
DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare
DATE OCT 2021 APPROVED Rodney Barugahare.

A



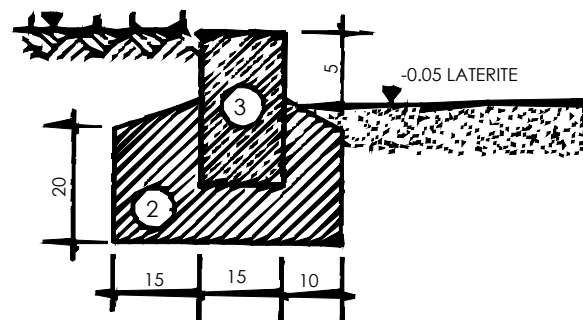
A

B

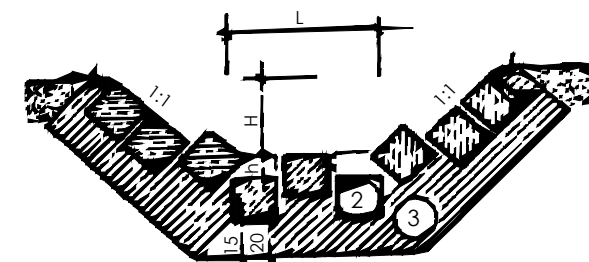
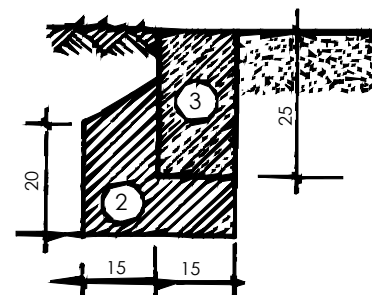


B

C



D



L	cm	40	60	80	100	120
H	cm	20	40	40	60	60
h	cm	5	10	10	15	15

KERB & DRAIN

- A. Open drain
B. Concrete slab half drain
C. Kerb
D. Embedded Kerb
1. Prefabricated concrete slabs of class as specified
 2. Concrete foundation class as specified
 3. Prefabricated concrete kerbs class as specified
- The excavation and other works are specified
Kerbs at road junctions and bends with $R < 10$ m have to be rounded off. In that case the length of the kerbstone depth must be doubled.

OPEN DRAINAGE CHANNEL

- A. Open drain channel
B. Open drain channel with obstacles
1. Stones
 2. Cement blocks
 3. Concrete class as specified
- The lining & works include
- excavation class as specified
 - concrete class as specified
 - Rock or cement blocks
 - Planting of a 50 cm ~ grass a strip on either side of the channel

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CONTRACTOR

DETAILED ENGINEERING DESIGN

DRAWING TITLE

OPEN DRAINAGE CHANNEL AND KERB

SCALE

As Shown

DRAWING No.

SD218

SURVEYED

DESIGNED

Othmane Dan.

DRAWN

Joshua Nyarwanda

CHECKED

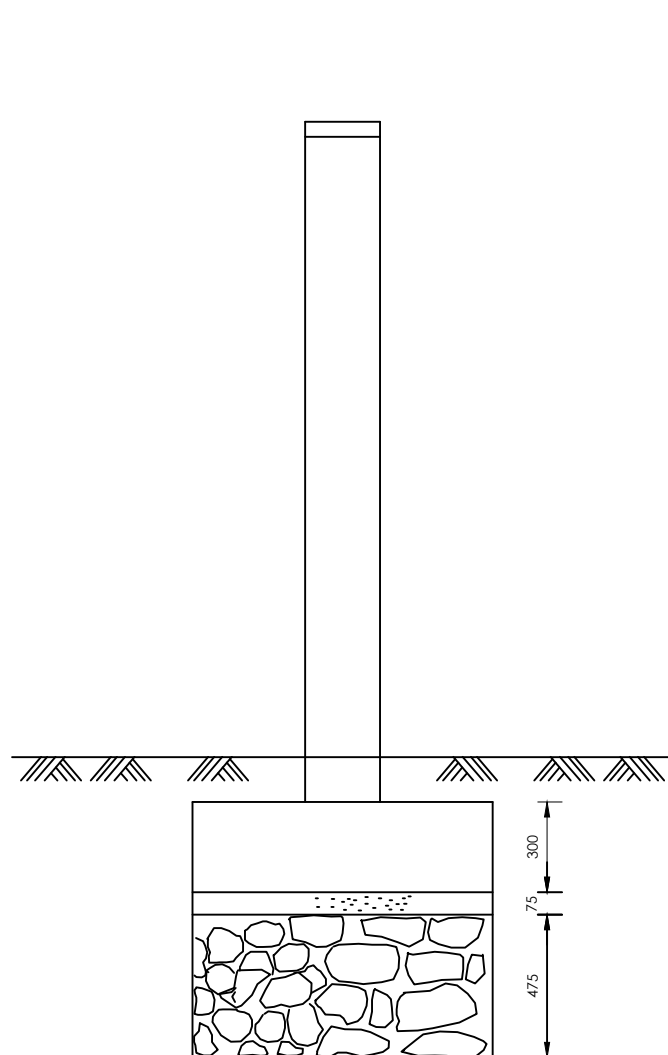
Rodney Barugahare

DATE

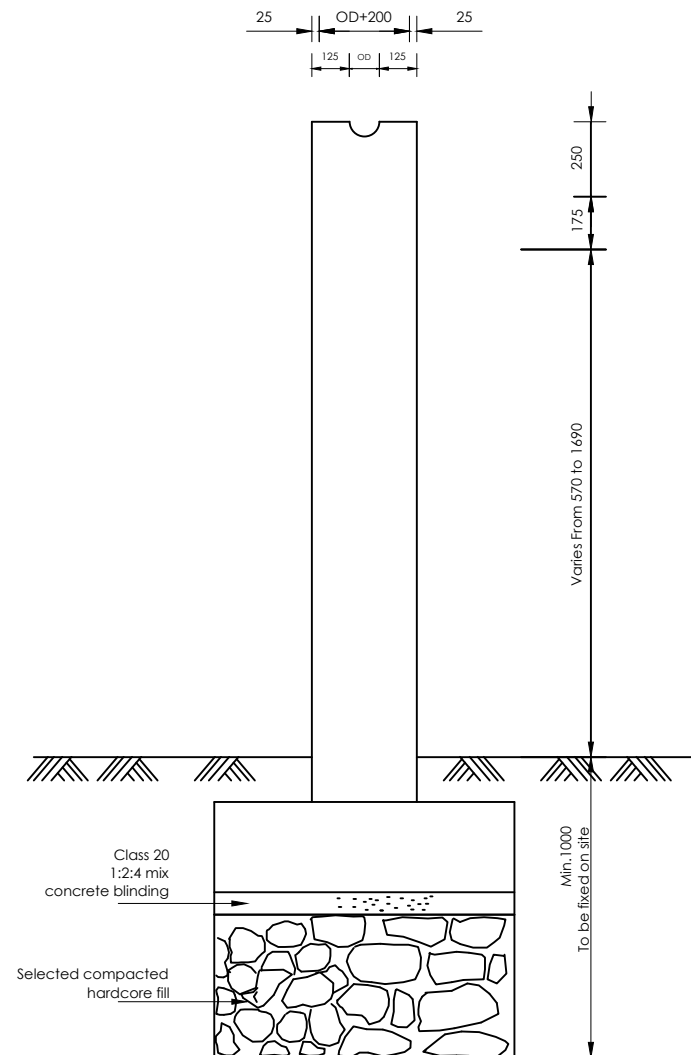
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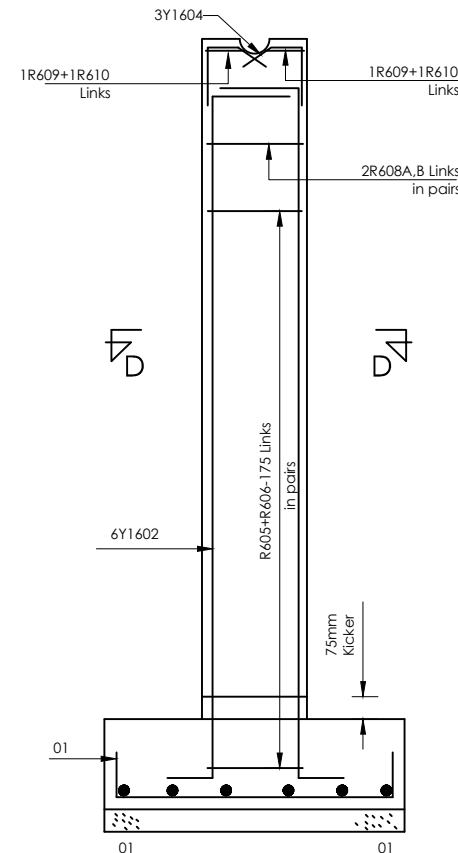
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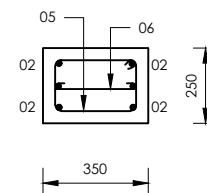
SECTION A-A



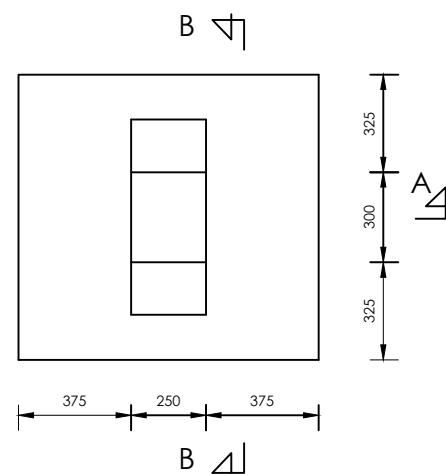
SECTION B-B



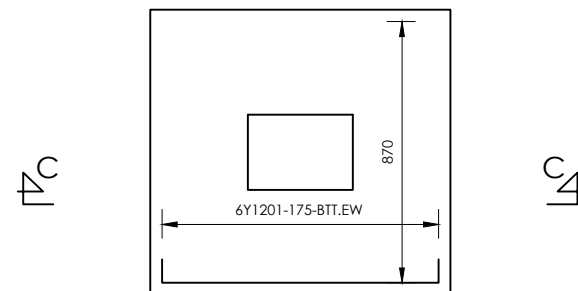
SECTION C-C



SECTION D-D



FOUNDATION PLAN



FOUNDATION TYPE 1
12 No. OFF THUS

CIENT
GOVERNMENT OF UGANDA
MINISTRY OF WATER AND ENVIRONMENT

CO-FINANCED BY:
THE WORLD BANK AND GOVERNMENT OF UGANDA

PROJECT
CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT

GASPA WATER SUPPLY SYSTEM

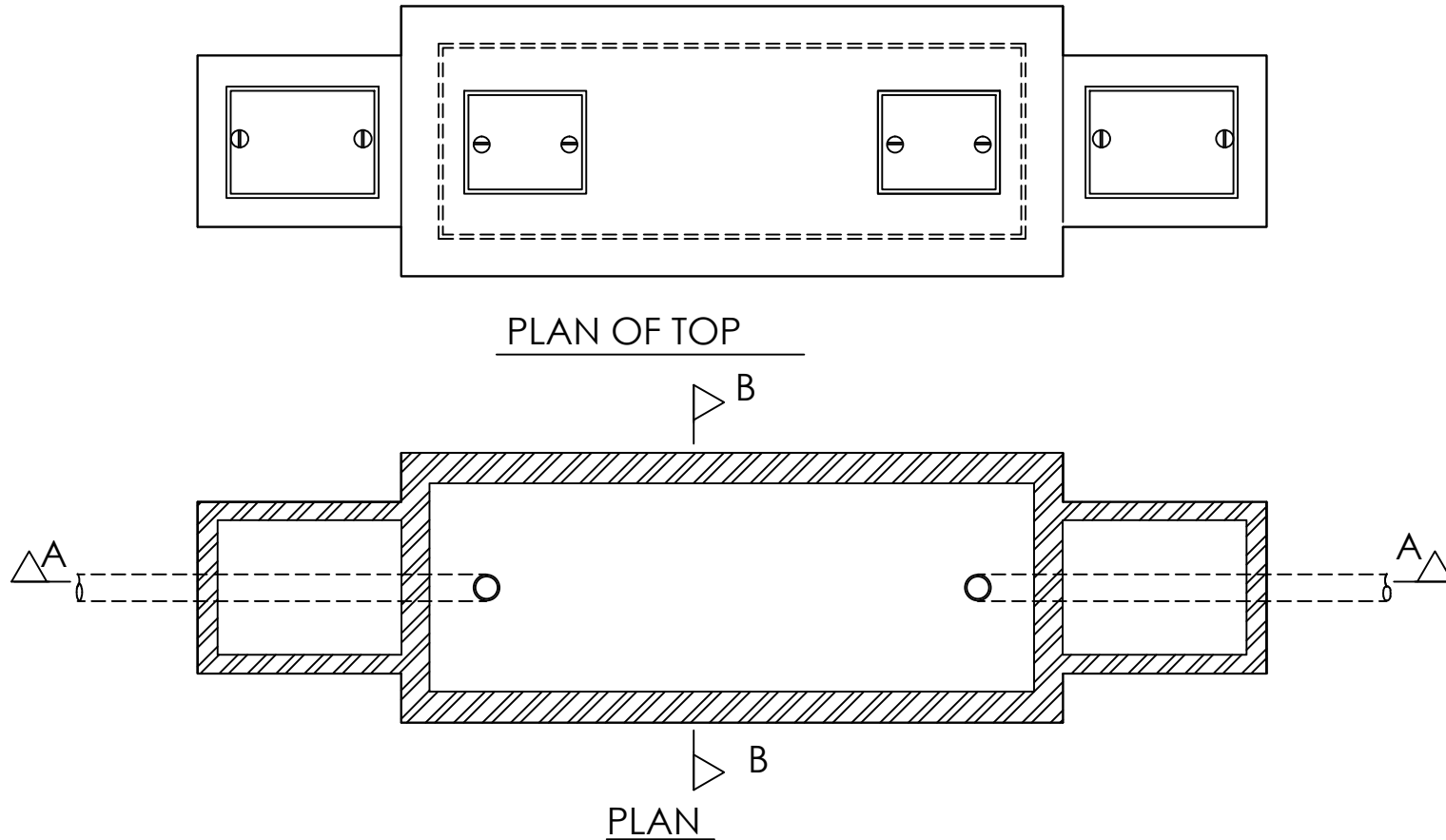
CONSULTANT
SARI
Corporate Headquarter
10 Philip Lane, 1st Floor,
London EC3M 9AA,
United Kingdom
In Joint Venture with
SGAPI

CONTRACTOR

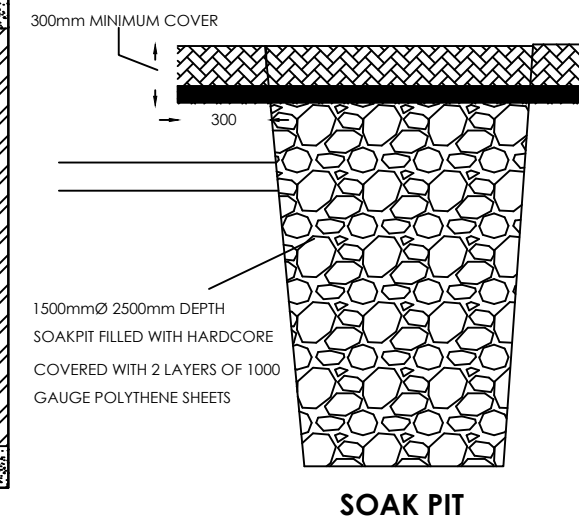
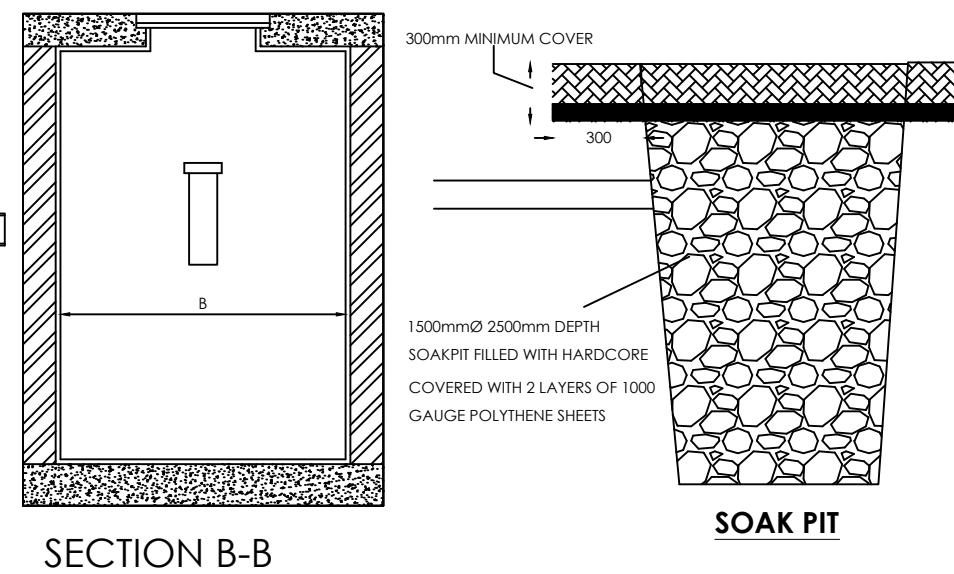
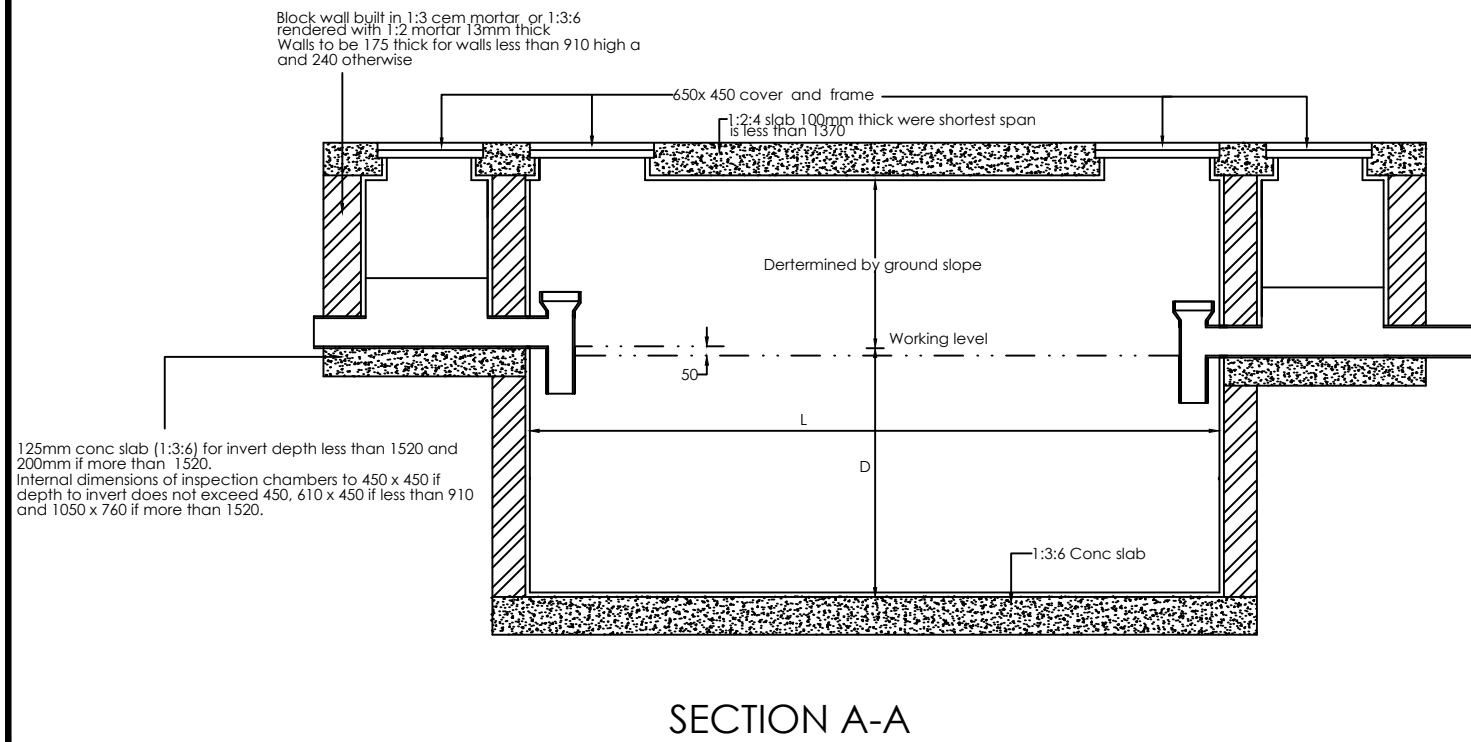
DETAILED ENGINEERING DESIGN






DRAWING TITLE
PIPE SUPPORTS R.C DETAILS

SCALE	As Shown	DRAWING No.	SD220
SURVEYED		DESIGNED	Othmane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



SIZES OF INSPECTION CHAMBER				
DEPTH TO INVERTS		INTERNAL DIMENSIONS	WALL THICKNESS	FOUNDATION THICKNESS
UP TO 450		450x450	100	150
475	900	450x600	100	150
925	1500	750x1050	225	225
OVER	1500	750x1050	225	225
BRICKWORK TO BE BUILT IN CEMENT MORTAR 1:6 AND RENDERED INTERNALLY IN 1:3 CEMENT PLASTER 13mm THICK FOUNDATION TO BE 1:3:6 CONCRETE MIX OF CEMENT				
DIMENSIONS OF SEPTIC TANK				
No. of Users	L	B	D	Capacity Liters
6	1800	625	900	1137
10	2250	625	900	1435
15	2475	625	900	1707
20	2860	625	900	1820
25	3300	625	900	2117
30	2400	900	1050	2388
35	2550	900	1050	2530
40	3000	900	1050	2980
45	3300	900	1050	3276
50	3750	900	1050	3727
60	3150	925	1200	4460
70	3750	925	1200	5312
80	4200	925	1200	5890
90	4850	925	1200	6597
100	4950	1125	1200	7462
150	5250	1350	1500	10533
200	6450	1350	1500	12697
250	7050	1350	1650	16513
300	7500	1350	1800	18155



CUENT		 GOVERNMENT OF UGANDA MINISTRY OF WATER AND ENVIRONMENT	
CO-FINANCED BY:		 AND  GOVERNMENT OF UGANDA	
PROJECT		CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN AND CONSTRUCTION SUPERVISION OF SOLAR POWERED PIPED WATER SUPPLY SYSTEMS AND SANITATION FACILITIES IN REFUGEE SETTLEMENTS AND HOST DISTRICTS IN WEST NILE AND NORTHERN UGANDA IN KIRYANDONGO DISTRICT	
CONSULTANT		 In Joint Venture with 	
CONTRACTOR			
DETAILED ENGINEERING DESIGN			
DRAWING TITLE		SEPTIC TANK DETAIL	
SCALE	As Shown	DRAWING No.	SD221
SURVEYED		DESIGNED	Othmane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.