



**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 NYAKABAALE 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

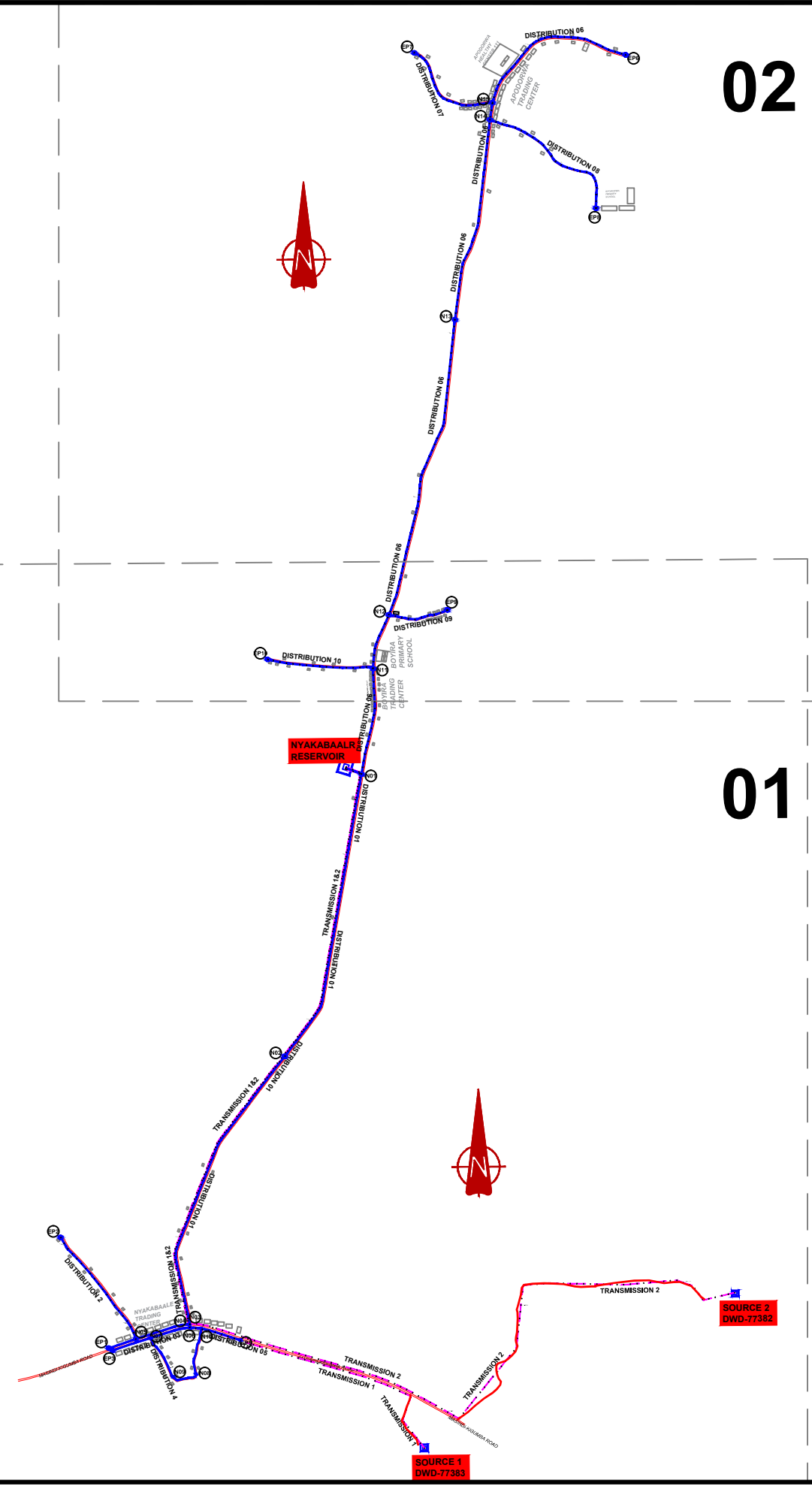
<b>DRAWING No</b>	<b>DRAWING TITLE</b>	<b>DRAWING No</b>	<b>DRAWING TITLE</b>
NYA/WS/0.0.0	GENERAL LAYOUT (TRANSMISSION AND DISTIRBUTION)	NYA/WS/2.2.5	TRANSMISSION LINE 02 (2+400.00 – 3+000.00)
NYA/WS/0.0.1	GENERAL LAYOUT (SHEET 01 OF 02)	NYA/WS/2.2.6	TRANSMISSION LINE 02 (3+000.00 – 3+600.00)
NYA/WS/0.0.2	GENERAL LAYOUT (SHEET 02 OF 02)	NYA/WS/2.2.7	TRANSMISSION LINE 02 (3+600.00 – 4+200.00)
		NYA/WS/2.2.8	TRANSMISSION LINE 02 (4+200.00 – 4+800.00)
		NYA/WS/2.2.9	TRANSMISSION LINE 02 (4+800.00 – 5+400.00)
NYA/WS/1.1.0	BOREHOLE DWD-77382 PUMP HOUSE AND SOLAR ARRAY (SITE PLAN LAYOUT)	NYA/WS/2.2.10	TRANSMISSION LINE 02 (5+400.00 – 6+000.00)
NYA/WS/1.1.1	TYPICAL BOREHOLE PUMP HOUSE (PLAN AND SECTION)	NYA/WS/2.2.11	TRANSMISSION LINE 02 (6+000.00 – 6+600.00)
NYA/WS/1.1.2	DWD-77382 BOREHOLE PUMP HOUSE (DETAILS)	NYA/WS/2.2.12	TRANSMISSION LINE 02 (6+600.00 – 7+200.00)
NYA/WS/1.1.3	DWD-77382 SOLAR ARRAY (ELECTRICAL LAYOUT)	NYA/WS/2.2.13	TRANSMISSION LINE 02 (7+200.00 – 7+643.70)
NYA/WS/1.1.4	DWD-77382 SOLAR ARRAY (SOLAR PANEL LAYOUT, ELEVATION & DETAILS)		
NYA/WS/1.1.5	DWD-77383 BOREHOLE PUMP HOUSE (DETAILS)	NYA/WS/3.1.1	300M3 NYAKABAALE RESERVOIR – PLAN LAYOUT
NYA/WS/1.1.6	TYPICAL BOREHOLE PUMP HOUSE (ELECTRICAL INSTALLATION)	NYA/WS/3.1.2	300M3 NYAKABAALE RESERVOIR – SECTION A-A & SECTION B-B
NYA/WS/1.1.7	BOREHOLE DWD-77383 PUMP HOUSE AND SOLAR ARRAY (SITE PLAN LAYOUT)	NYA/WS/3.1.3	300M3 NYAKABAALE RESERVOIR – FOUNDATION LAYOUT AND DETAILS
NYA/WS/1.1.8	DWD-77383 SOLAR ARRAY (ELECTRICAL LAYOUT)	NYA/WS/3.1.4	300M3 NYAKABAALE RESERVOIR – STRUCTURAL DETAILS
NYA/WS/1.1.9	DWD-77383 SOLAR ARRAY (SOLAR PANEL LAYOUT, ELEVATION & DETAILS)		
		NYA/WS/4.1.1	CHLORINE HOUSE – PLAN AND ELEVATIONS
		NYA/WS/4.1.2	CHLORINE HOUSE – SECTIONS
NYA/WS/1.2.1	BOREHOLE PUMP ATTENDANT, GUARD HOUSE & ECOSAN (PLAN & SECTION)		
NYA/WS/1.2.2	BOREHOLE PUMP ATTENDANT, GUARD HOUSE & ECOSAN (ELEVATION)	NYA/WS/5.0.0	GENERAL LAYOUT (DISTIRBUTION NETWORK)
NYA/WS/2.0.0	GENERAL LAYOUT TRANSMISSION NETWORK		
NYA/WS/2.1.1	TRANSMISSION LINE 01 (0+000.00 – 0+600.00)	NYA/WS/5.1.1	DISTRIBUTION LINE 01 (0+000.00 – 0+600.00)
NYA/WS/2.1.2	TRANSMISSION LINE 01 (0+600.00 – 1+200.00)	NYA/WS/5.1.2	DISTRIBUTION LINE 01 (0+600.00 – 1+200.00)
NYA/WS/2.1.3	TRANSMISSION LINE 01 (1+200.00 – 1+800.00)	NYA/WS/5.1.3	DISTRIBUTION LINE 01 (1+200.00 – 1+800.00)
NYA/WS/2.1.4	TRANSMISSION LINE 01 (1+800.00 – 2+400.00)	NYA/WS/5.1.4	DISTRIBUTION LINE 01 (1+800.00 – 2+400.00)
NYA/WS/2.1.5	TRANSMISSION LINE 01 (2+400.00 – 3+000.00)	NYA/WS/5.1.5	DISTRIBUTION LINE 01 (2+400.00 – 3+000.00)
NYA/WS/2.1.6	TRANSMISSION LINE 01 (3+000.00 – 3+600.00)	NYA/WS/5.1.6	DISTRIBUTION LINE 01 (3+000.00 – 3+600.00)
NYA/WS/2.1.7	TRANSMISSION LINE 01 (3+600.00 – 4+200.00)	NYA/WS/5.1.7	DISTRIBUTION LINE 01 (3+600.00 – 4+183.50)
NYA/WS/2.1.8	TRANSMISSION LINE 01 (4+200.00 – 4+800.00)		
NYA/WS/2.1.9	TRANSMISSION LINE 01 (4+800.00 – 5+448.90)	NYA/WS/5.2.1	DISTRIBUTION LINE 02 (0+000.00 – 0+754.10)
NYA/WS/2.2.1	TRANSMISSION LINE 02 (0+000.00 – 0+600.00)		
NYA/WS/2.2.2	TRANSMISSION LINE 02 (0+600.00 – 1+200.00)	NYA/WS/5.3.1	DISTRIBUTION LINE 03 (0+000.00 – 0+504.60)
NYA/WS/2.2.3	TRANSMISSION LINE 02 (1+200.00 – 1+800.00)		
NYA/WS/2.2.4	TRANSMISSION LINE 02 (1+800.00 – 2+400.00)	NYA/WS/5.4.1	DISTRIBUTION LINE 04 (0+000.00 – 0+713.00)
		NYA/WS/5.5.1	DISTRIBUTION LINE 05 (0+000.00 – 0+314.30)

<b>DRAWING No</b>	<b>DRAWING TITLE</b>
NYA/WS/7.1.1	WATER OFFICE – PLAN AND SECTION
NYA/WS/7.1.2	WATER OFFICE – ELEVATIONS
NYA/WS/8.1.1	PUBLIC STAND POST- CONNECTION AND SOAK PIT DETAILS
NYA/WS/8.1.2	TYPICAL YARD CONNECTION- CONNECTION AND SOAK PIT DETAILS
NYA/S/1.1.1	INSTITUTIONAL TOILET - INCENERATOR
NYA/S/1.1.2	INSTITUTIONAL TOILET - BOYS
NYA/S/1.1.3	INSTITUTIONAL TOILET - GIRLS
NYA/S/1.2.1	WATER BORNE TOILET – FLOOR PLAN
NYA/S/1.2.2	WATER BORNE TOILET – SECTIONS
NYA/S/1.2.3	WATER BORNE TOILET – ELEVATIONS, DOOR & WINDOW SCHEDULE
NYA/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)
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

<b>DRAWING No</b>	<b>DRAWING TITLE</b>
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 DETAILS 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
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











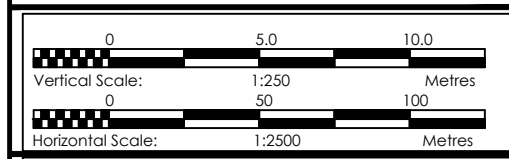
02

01

**NOTES**

**LEGEND**

-  Transmission Pipeline
-  Distribution Pipeline
-  Ground Level
-  Building/House
-  Contours
-  Road
- DAV Double Orifice Air Valve
-  End pipe
-  Node N01
- WO-1 Washout Type1
- WO-2 Washout Type2



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

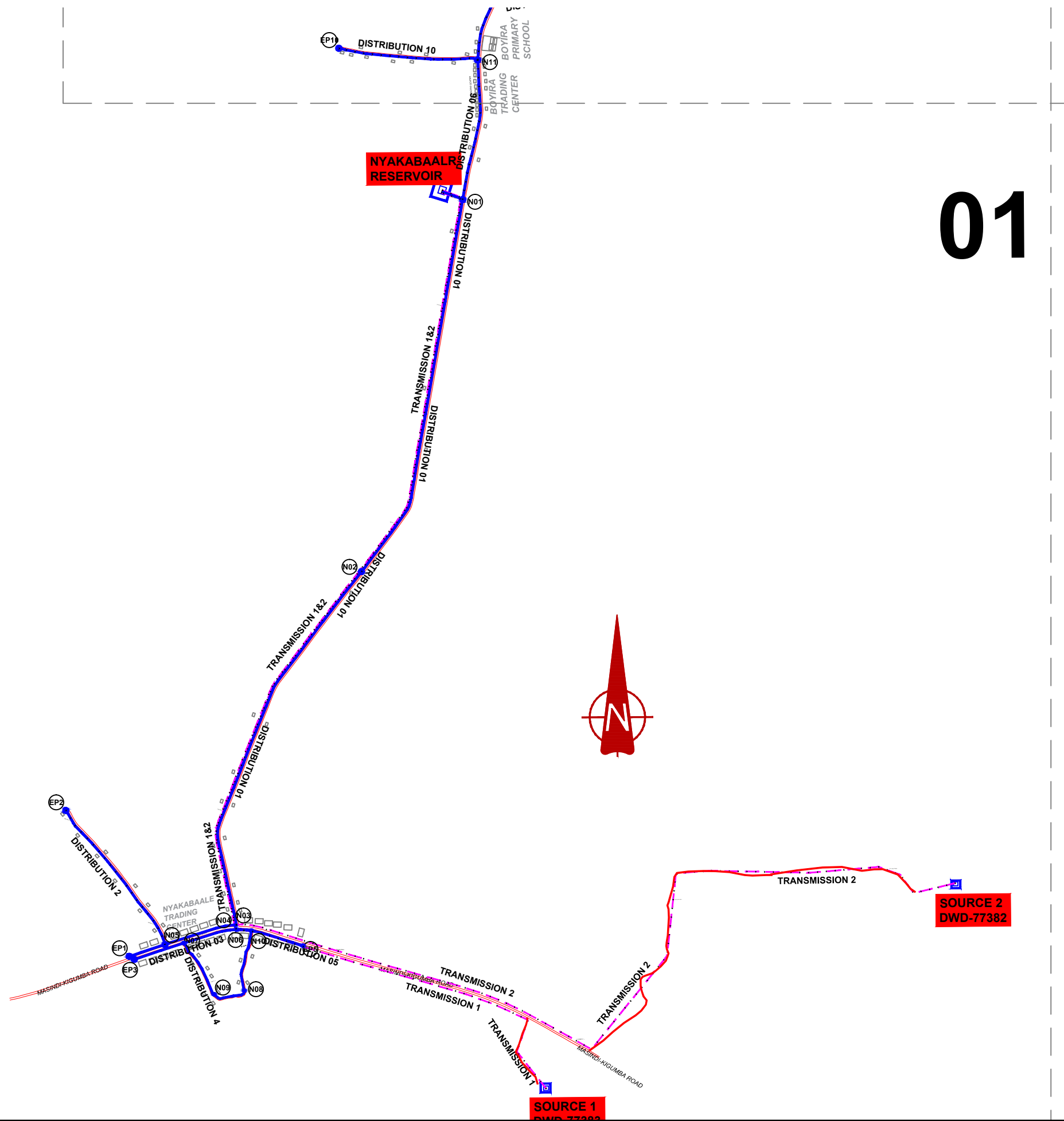
**NYAKABAAL WATER SUPPLY SYSTEM**

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

CONTRACTOR

**DETAILED ENGINEERING DESIGN**  
 DRAWING TITLE **GENERAL LAYOUT TRANSMISSION AND DISTRIBUTION NETWORK**

SCALE	DRAWING No.	NYA/WS/0.0.0
SURVEYED	DESIGNED	Otwane Dan.
DRAWN Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE April 2021	APPROVED	Rodney Barugahare.

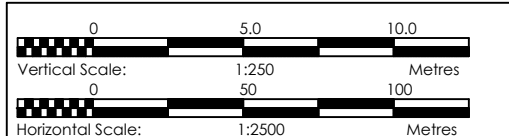


# 01

### NOTES

### LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- End pipe
- Node N01
- WO-1 Washout Type1
- WO-2 Washout Type2



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

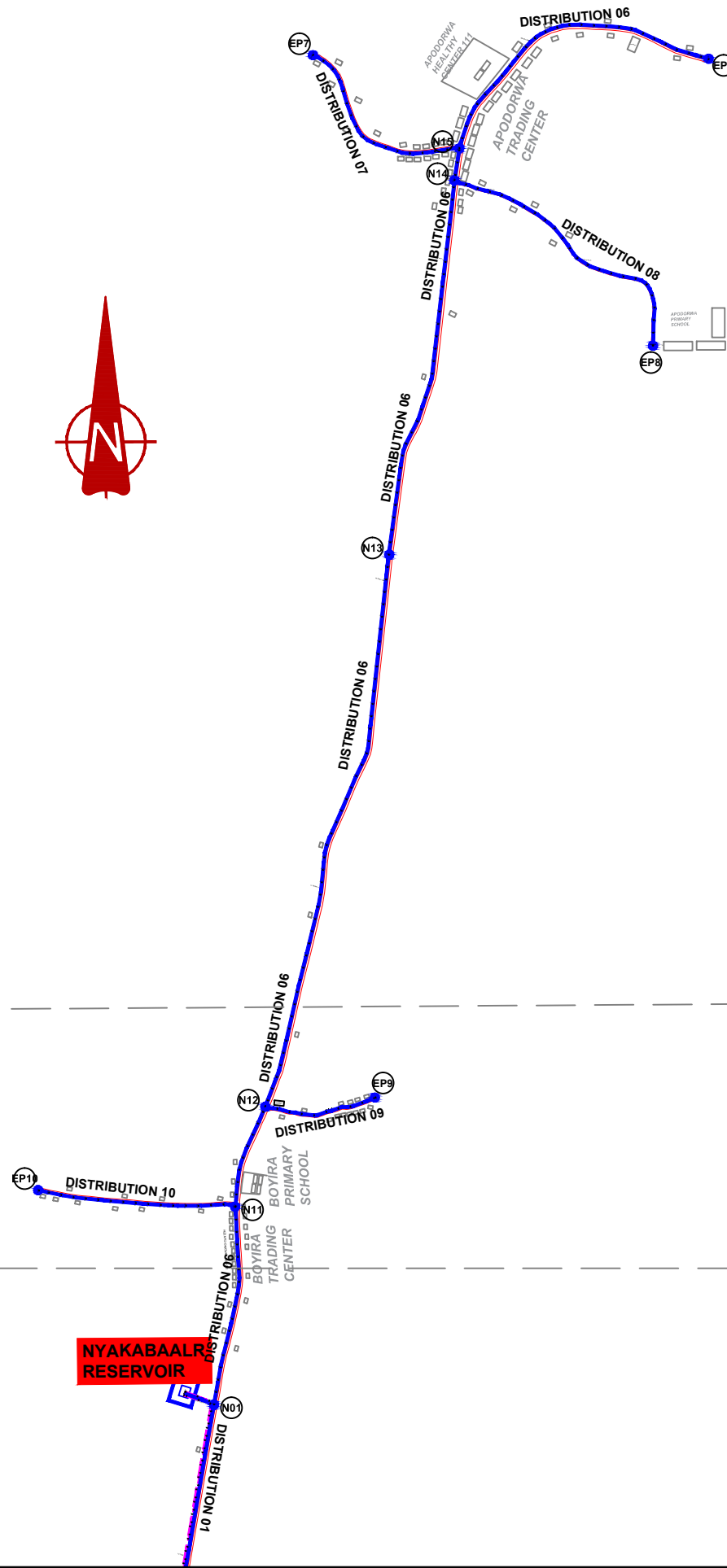
## NYAKABAAL WATER SUPPLY SYSTEM

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

CONTRACTOR

DETAILED ENGINEERING DESIGN  
 DRAWING TITLE **GENERAL LAYOUT**  
**TRANSMISSION AND DISTRIBUTION NETWORK**  
 (Sheet 01 of 02)

SCALE	DRAWING No.	NYA/WS/0.0.1
SURVEYED	DESIGNED	Otwane Dan.
DRAWN	CHECKED	Rodney Barugahare
DATE	APPROVED	Rodney Barugahare.



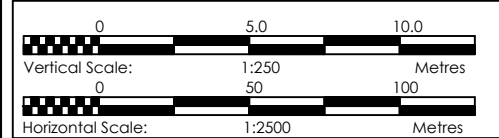
02

01

**NOTES**

**LEGEND**

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- End pipe
- Node N01
- Washout Type1
- Washout Type2



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

**NYAKABAAL WATER SUPPLY SYSTEM**

CONSULTANT

In Joint Venture with

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

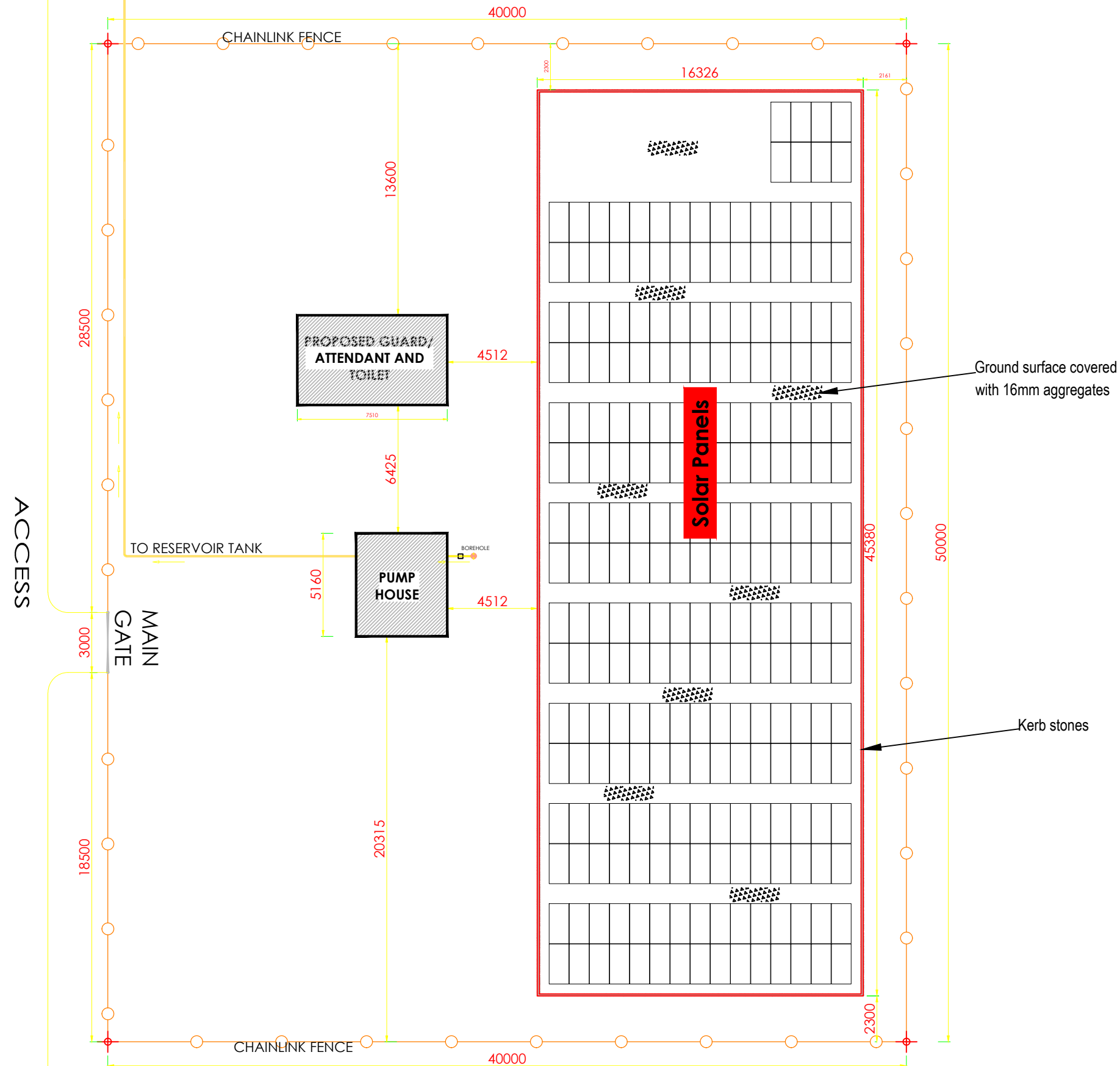
CONTRACTOR

**DETAILED ENGINEERING DESIGN**

DRAWING TITLE **GENERAL LAYOUT TRANSMISSION AND DISTRIBUTION NETWORK (Sheet 02 of 02)**

SCALE	DRAWING No.	NYA/WS/0.0.2
SURVEYED	DESIGNED	Otwane Dan.
DRAWN Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE April 2021	APPROVED	Rodney Barugahare.

**NOTES**



**SITE LAYOUT\_NYAKABALE DWD 77382**



Scale 1:250

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

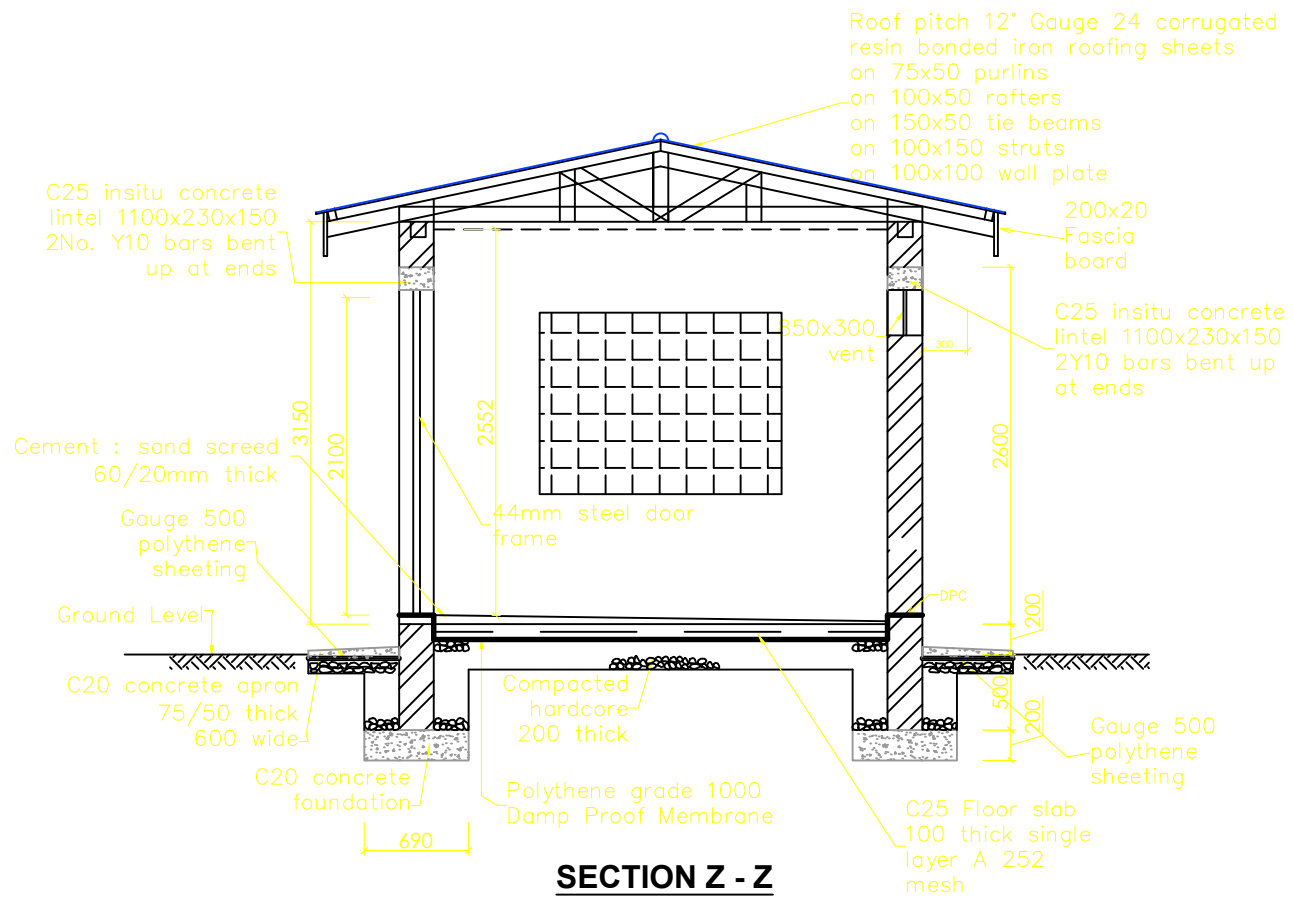
**NYAKABALE WATER SUPPLY SYSTEM**

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

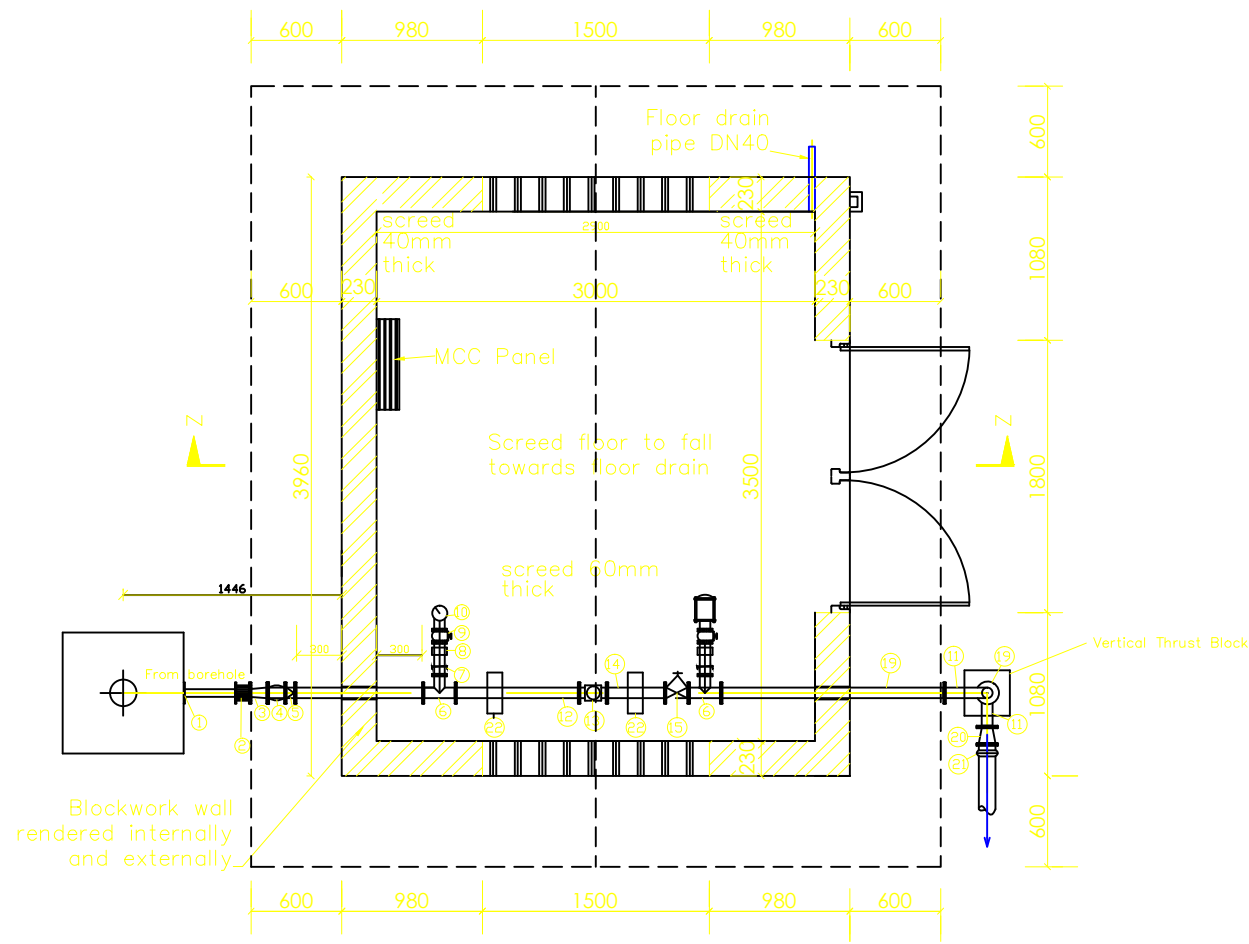
CONTRACTOR

**DETAILED ENGINEERING DESIGN**  
 DRAWING TITLE  
**DWD 77382 BOREHOLE PUMP HOUSE AND SOLAR ARRAY**  
 SITE PLAN LAYOUT

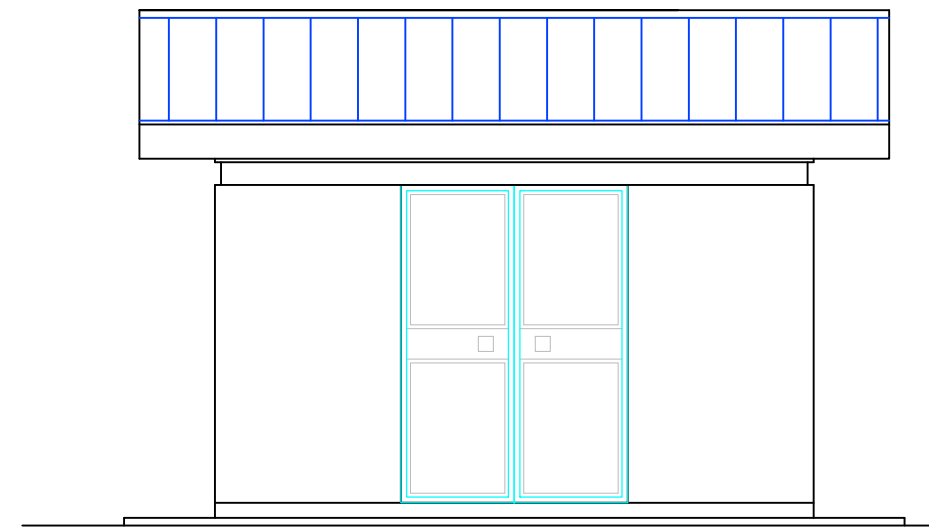
SCALE	AS SHOWN	DRAWING No.	NYA/WS/1.1.0
SURVEYED		DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	JUNE 2022	APPROVED	Rodney Barugahare.



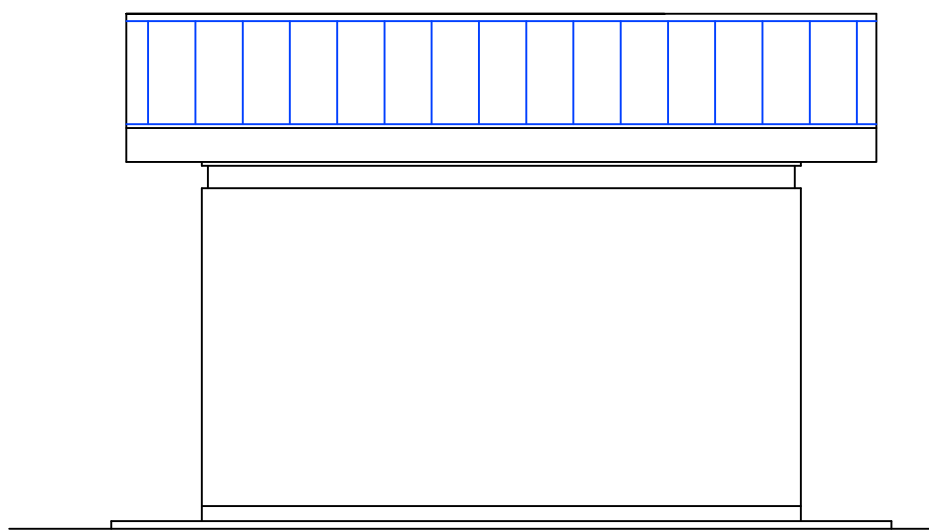
**SECTION Z - Z**



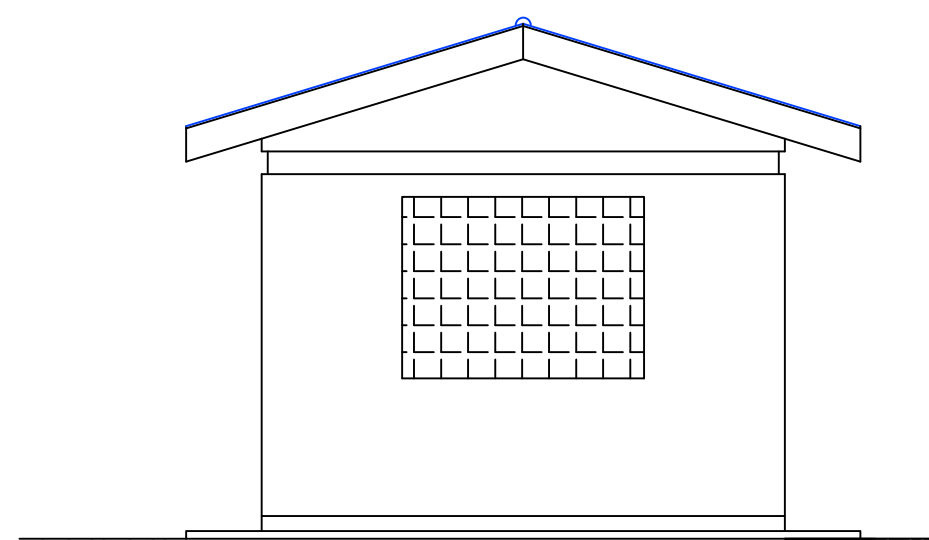
**PLAN**  
Scale:1:50



**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 (SPUTOISK) 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. 90°x50mmØ Double Flanged Steel Bend Small Radius.  
 BH2. 25mmØ Hexagon Nipple.  
 BH2. 25mmØ Brass Stopcock.  
 BH2. Concrete Support Block 300mm Wide.

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

CO-FINANCED BY:

AND

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

**NYAKABAALÉ WATER SUPPLY SYSTEM**

CONSULTANT

In Joint Venture with

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

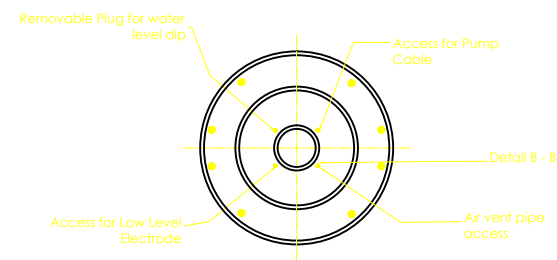
CONTRACTOR

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

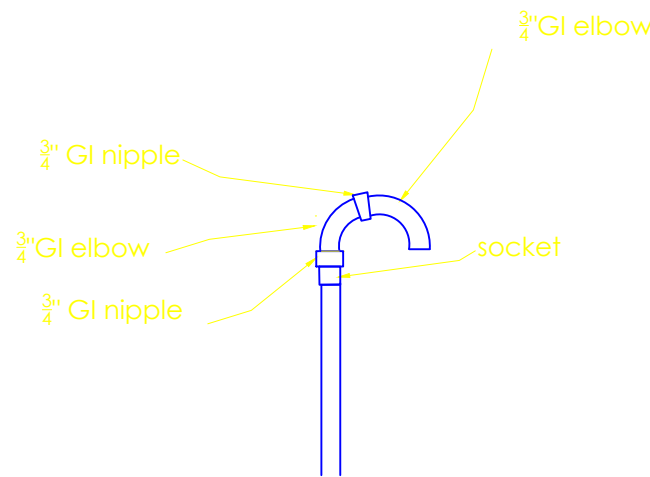
SCALE	AS SHOWN	DRAWING No.	NYA/WS/1.1.1
SURVEYED		DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



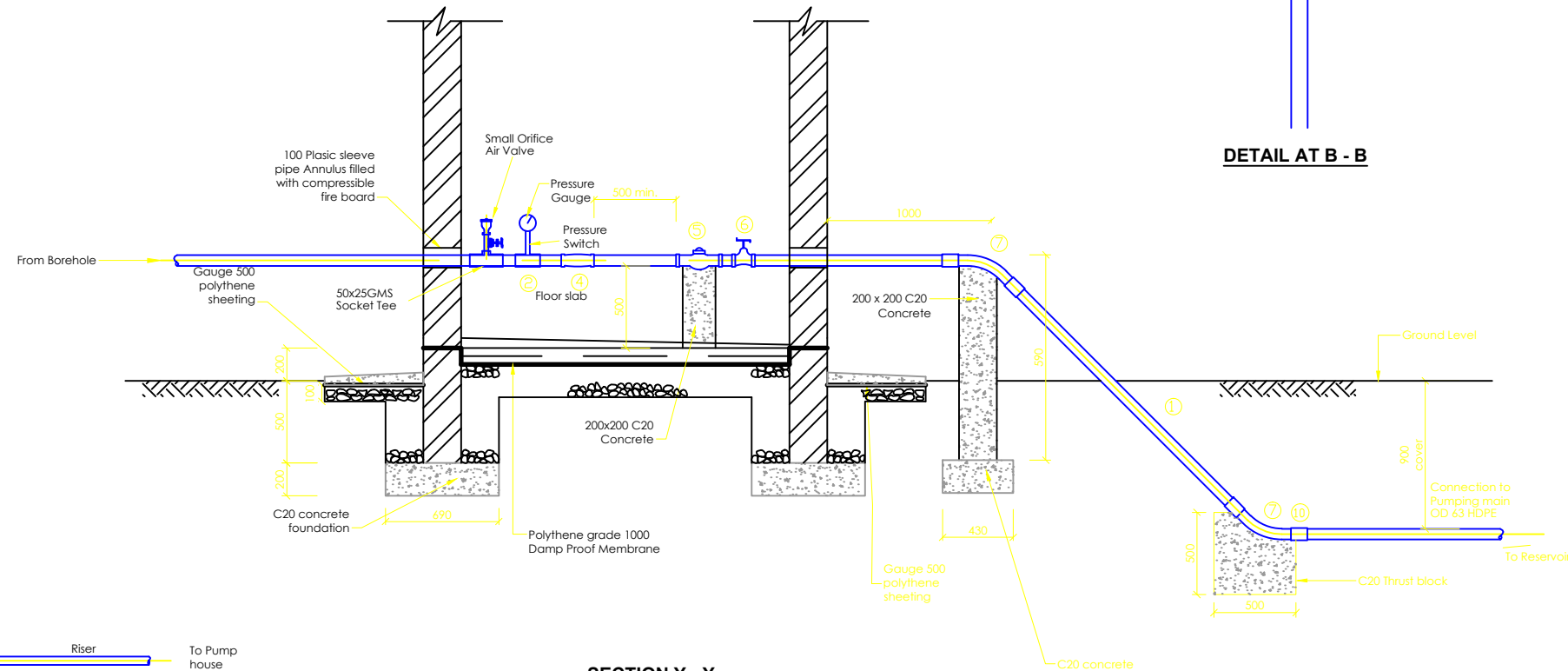
**NOTES**



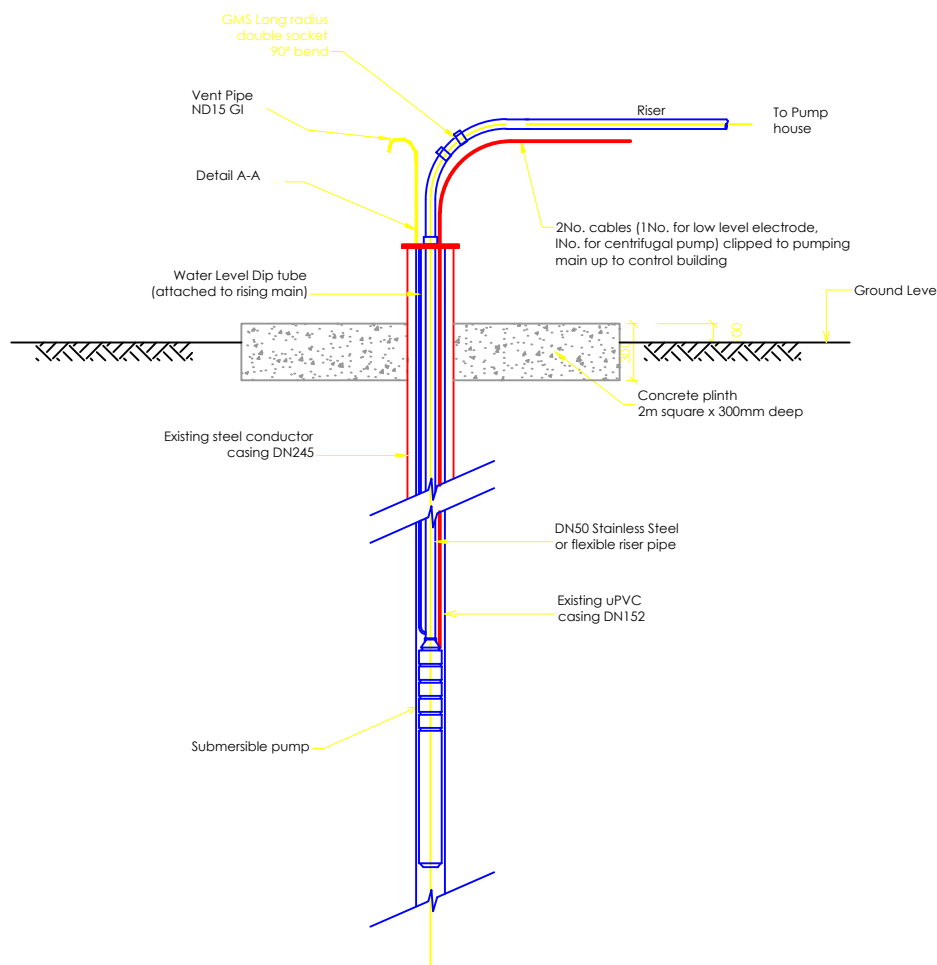
**DETAIL AT A-A**  
Scale: 1:20



**DETAIL AT B - B**



**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

CLIENT



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

CO-FINANCED BY:



AND



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

**NYAKABAALE 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

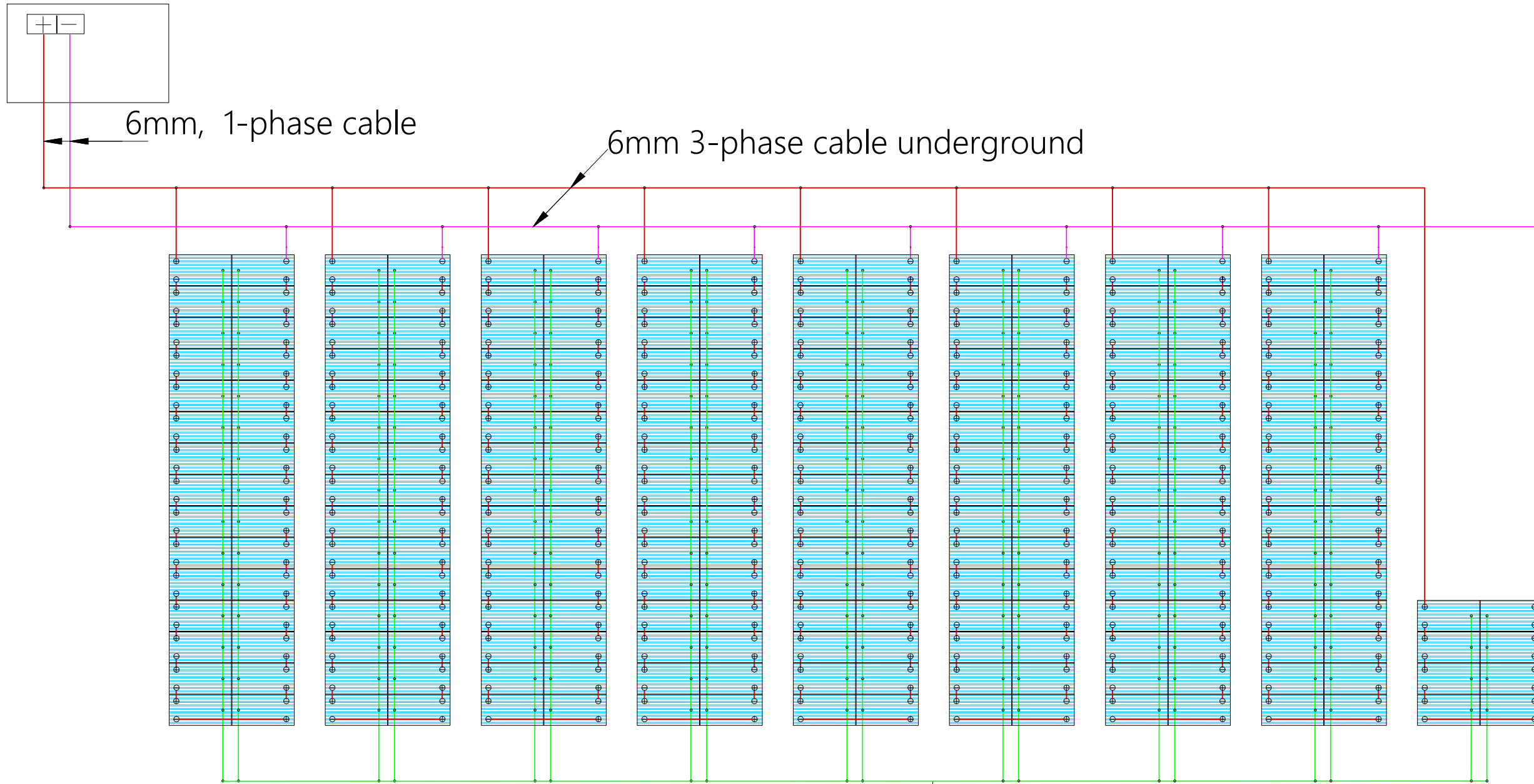
**TYPICAL BOREHOLE PUMP HOUSE**  
(DWD-77382) PIPE DETAILS

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

**NOTES**

**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



Earthing



**SOLAR ARRAY ELECTRICAL LAYOUT**

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

**NYAKABAALE WATER SUPPLY SYSTEM**

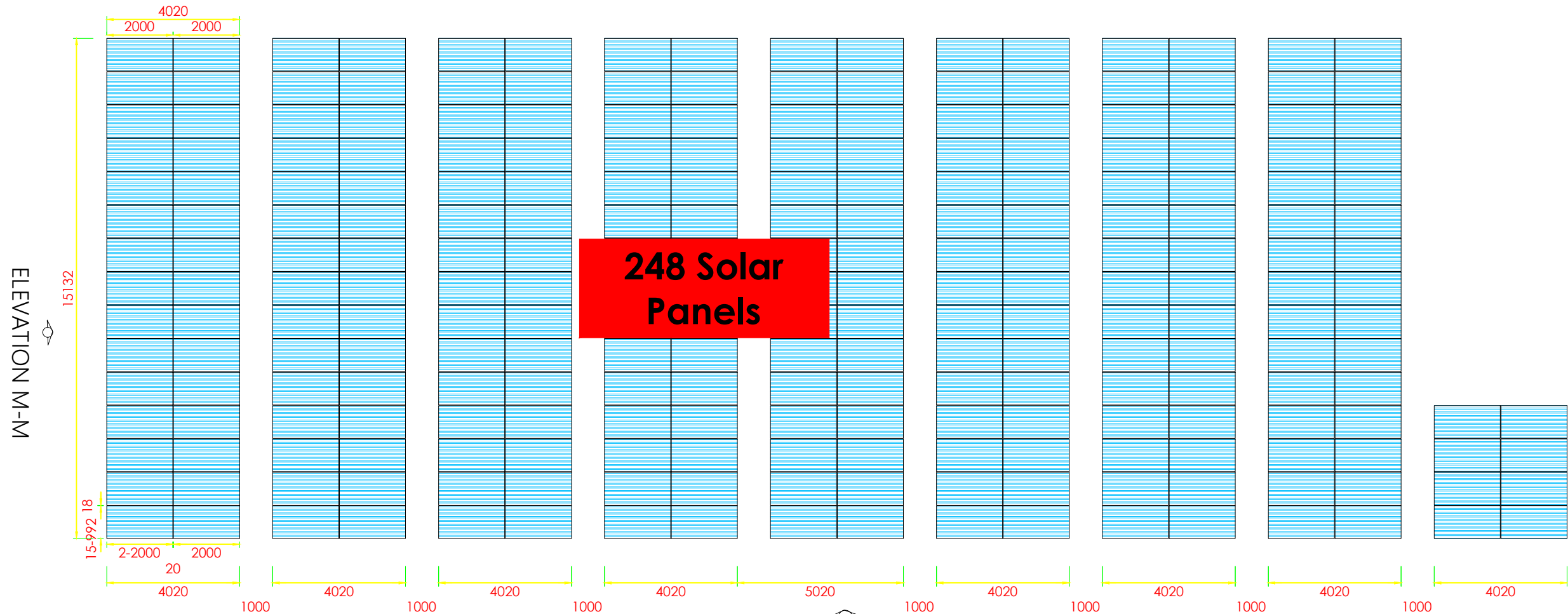
CONSULTANT  
 In Joint Venture with   
 Corporate Headquarter  
 10 Philpot Lane, 1st Floor,  
 London EC3M 8AA,  
 United Kingdom

CONTRACTOR

**DETAILED ENGINEERING DESIGN**  
 DRAWING TITLE  
**DWD-77382 SOLAR ARRAY**  
 ELECTRICAL LAYOUT

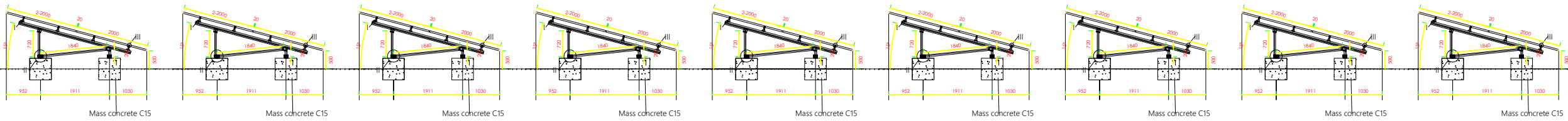
SCALE	AS SHOWN	DRAWING No.	NYA/WS/1.1.3
SURVEYED		DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	JUNE 2022	APPROVED	Rodney Barugahare.

**NOTES**

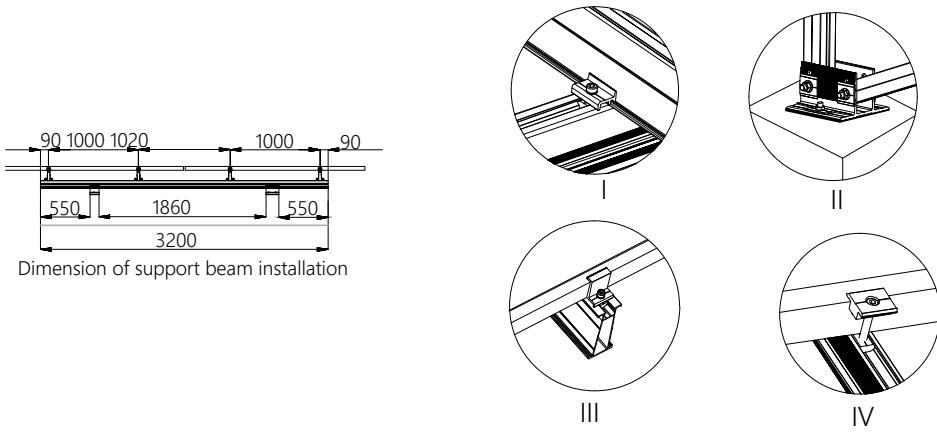


**248 Solar Panels**

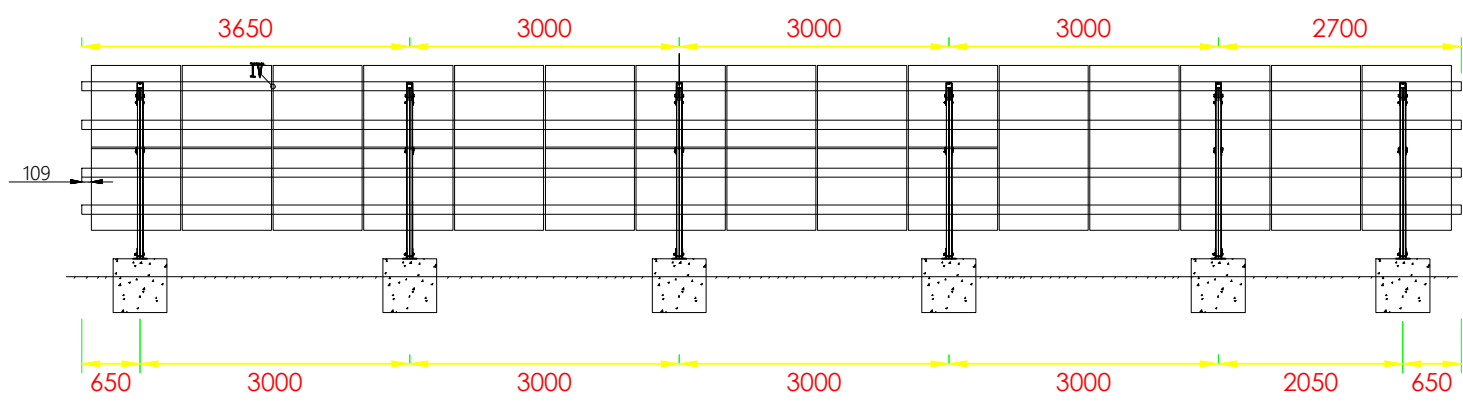
**ELEVATION Y-Y  
SOLAR PANELS LAYOUT**



**ELEVATION Y-Y**



Dimension of support beam installation





**ELEVATION M-M**

**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

**NYAKABAALE WATER SUPPLY SYSTEM**

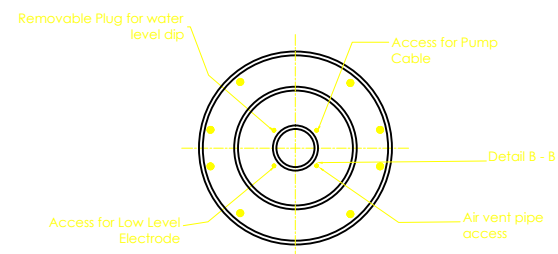
**CONSULTANT**  
 In Joint Venture with   
 Corporate Headquarter  
 10 Philip Lane, 1st Floor,  
 London EC3M 8AA,  
 United Kingdom

**CONTRACTOR**

**DETAILED ENGINEERING DESIGN**  
**DRAWING TITLE**  
**DWD-77382 SOLAR ARRAY**  
 SOLAR PANEL LAYOUT, ELEVATIONS AND DETAILS

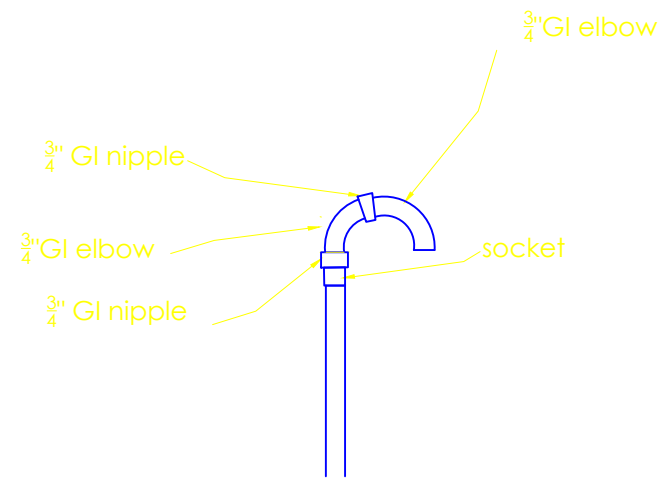
<b>SCALE</b>	AS SHOWN	<b>DRAWING No.</b>	NYA/WS/1.1.4
<b>SURVEYED</b>		<b>DESIGNED</b>	Otwane Dan.
<b>DRAWN</b>	Joshua Nyarwanda	<b>CHECKED</b>	Rodney Barugahare
<b>DATE</b>	JUNE 2022	<b>APPROVED</b>	Rodney Barugahare.

**NOTES**

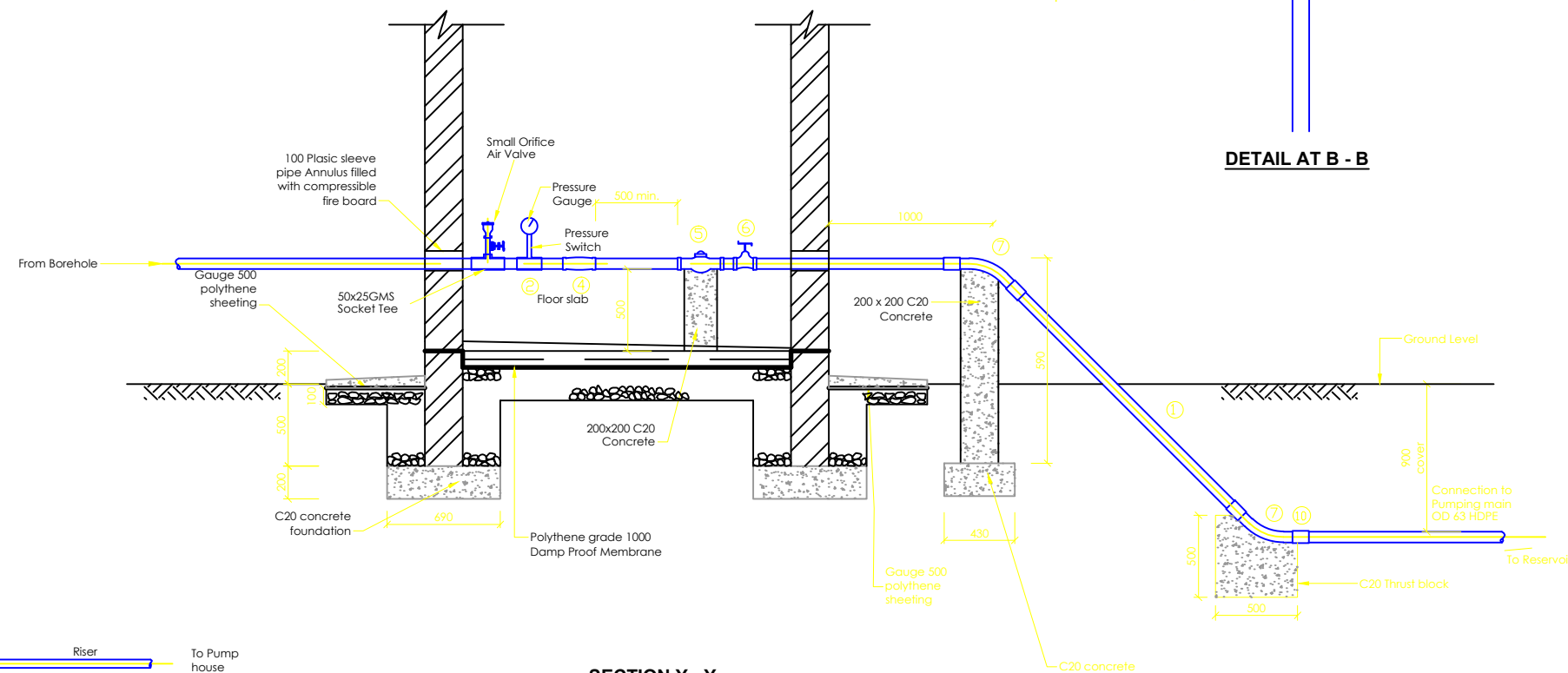


**DETAIL AT A-A**

Scale: 1:20

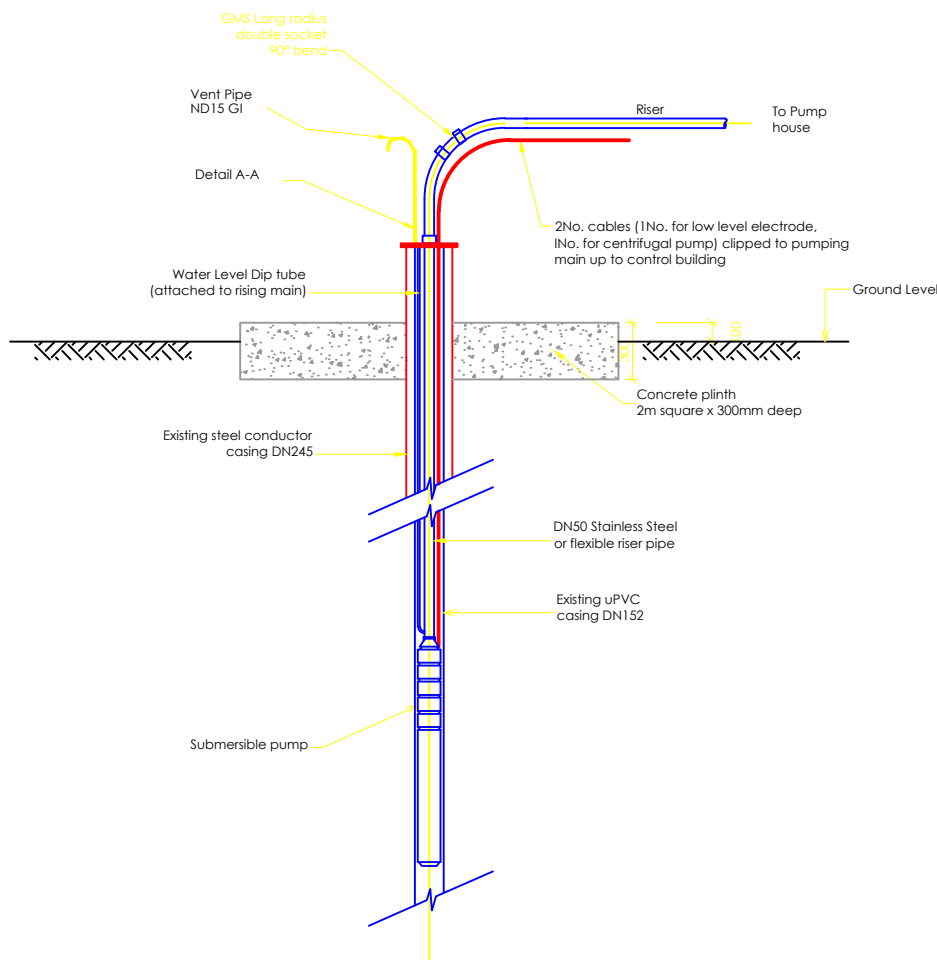


**DETAIL AT B - B**



**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

CLIENT



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

CO-FINANCED BY:



AND



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**

**NYAKABAALE WATER SUPPLY SYSTEM**

CONSULTANT



In Joint Venture with



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

CONTRACTOR

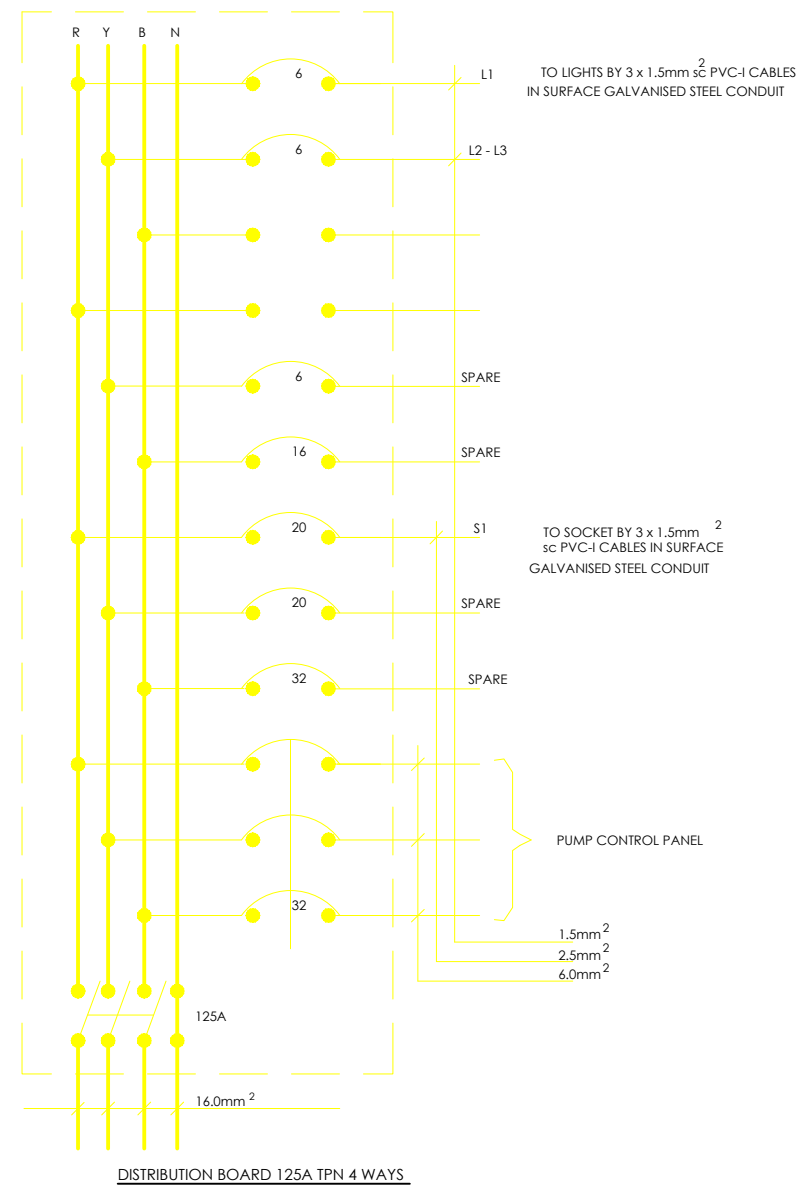
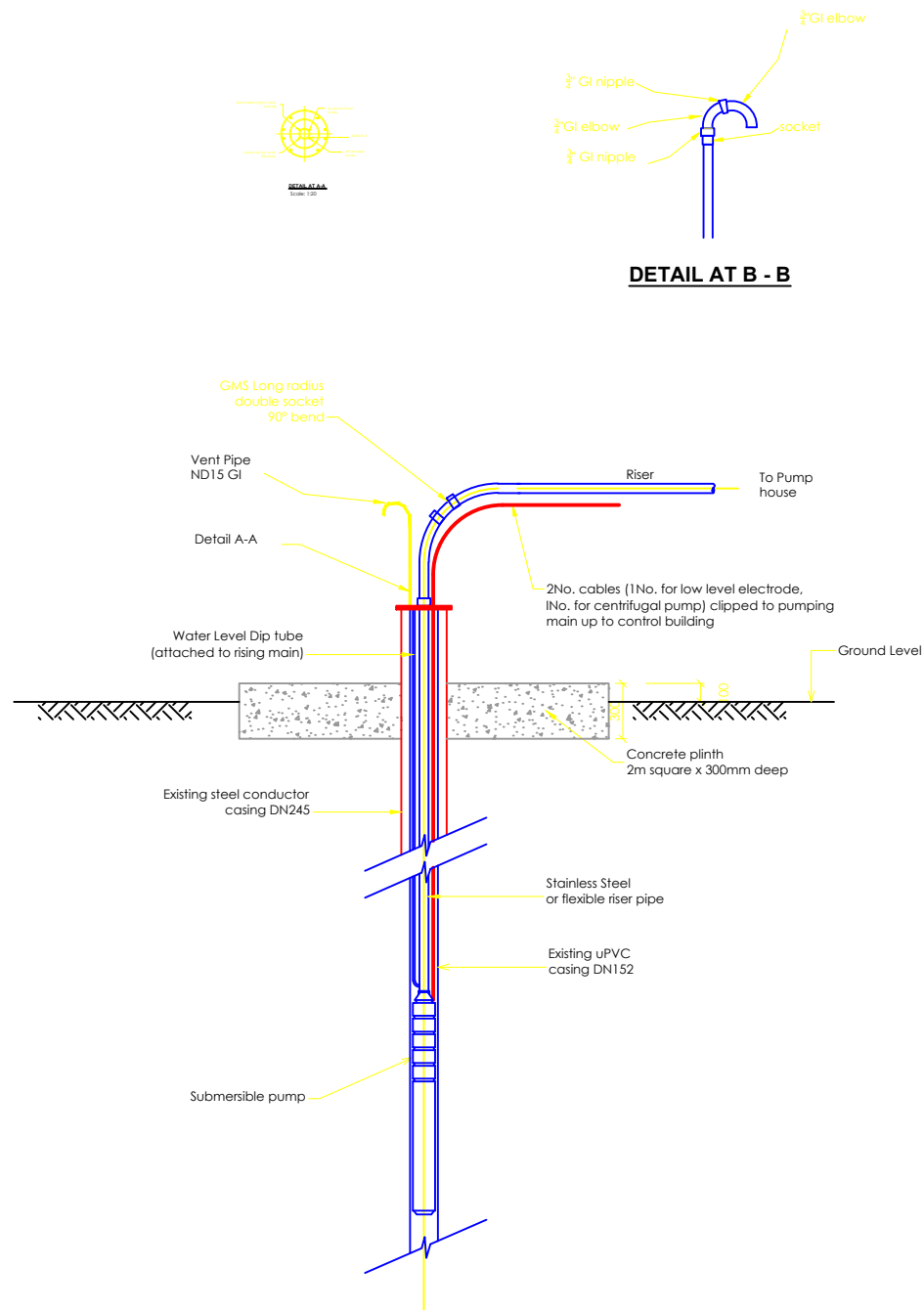
**DETAILED ENGINEERING DESIGN**

DRAWING TITLE

**TYPICAL BOREHOLE PUMP HOUSE**  
(DWD-77383) PIPE DETAILS

SCALE	AS SHOWN	DRAWING No.	NYA/WS/1.1.5
SURVEYED		DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.

**NOTES**



- LEGEND**
- Luminaire type A, 1X18W f600mm waterproof fluorescent 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

**CLIENT**

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

**CO-FINANCED BY:**

AND

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

**NYAKABAALE WATER SUPPLY SYSTEM**

**CONSULTANT**

In Joint Venture with

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

**CONTRACTOR**

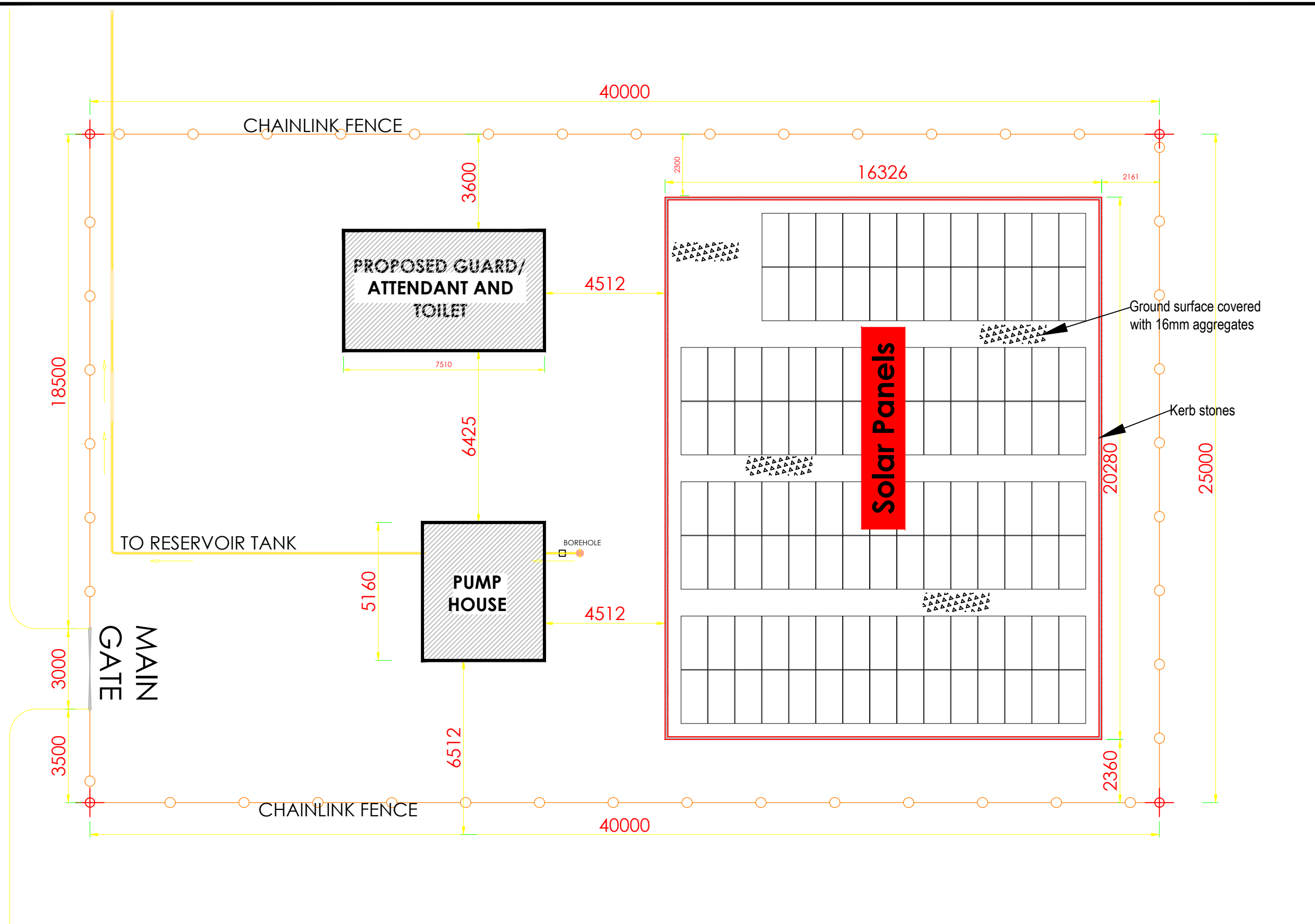
**DETAILED ENGINEERING DESIGN**

**DRAWING TITLE**

**TYPICAL BOREHOLE PUMP HOUSE**  
 ELECTRICAL INSTALLATION

<b>SCALE</b>	AS SHOWN	<b>DRAWING No.</b>	NYA/WS/1.1.6
<b>SURVEYED</b>		<b>DESIGNED</b>	Otwane Dan.
<b>DRAWN</b>	Joshua Nyarwanda	<b>CHECKED</b>	Rodney Barugahare
<b>DATE</b>	OCT 2021	<b>APPROVED</b>	Rodney Barugahare.

**NOTES**



**SITE LAYOUT\_NYAKABALE DWD 77383**

Scale 1:150

CLIENT



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

CO-FINANCED BY:



AND




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

**NYAKABALE WATER SUPPLY SYSTEM**

CONSULTANT



In Joint Venture with



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

CONTRACTOR

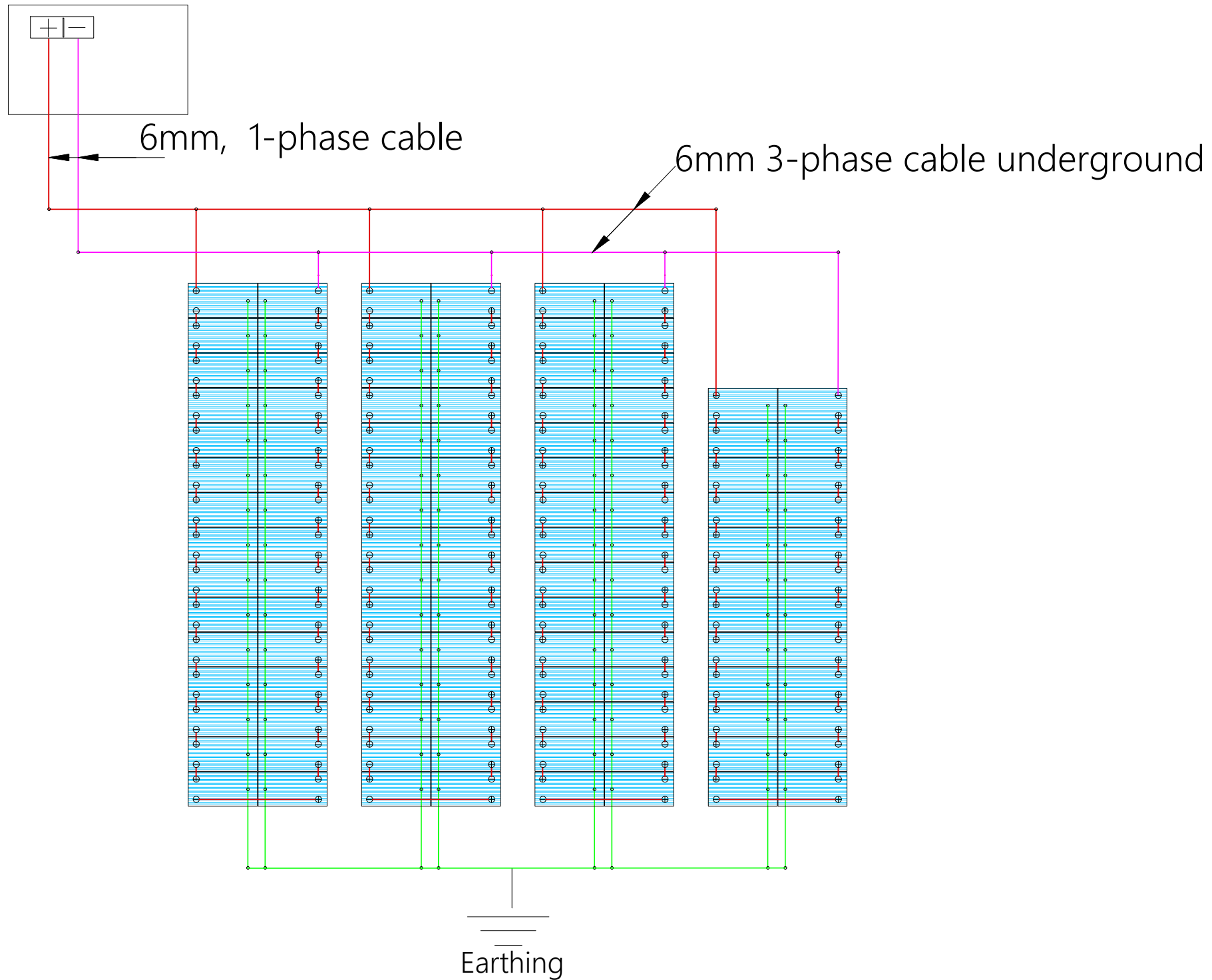
**DETAILED ENGINEERING DESIGN**

DRAWING TITLE  
**DWD 77383 BOREHOLE PUMP HOUSE AND SOLAR ARRAY**  
SITE PLAN LAYOUT

SCALE	AS SHOWN	DRAWING No.	NYA/WS/1.1.7
SURVEYED		DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	JUNE 2022	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

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

### NYAKABAALE WATER SUPPLY SYSTEM

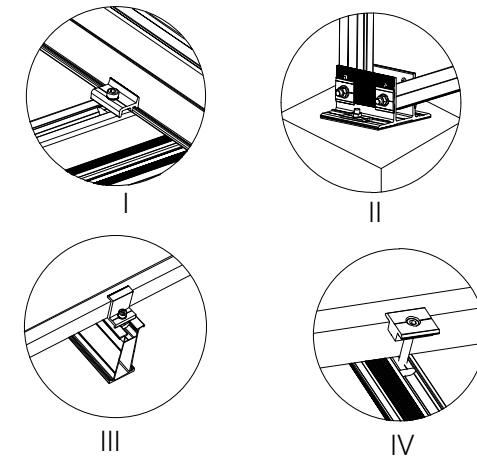
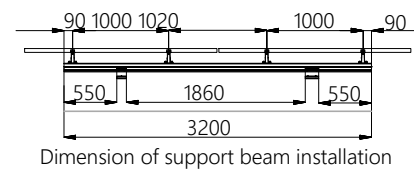
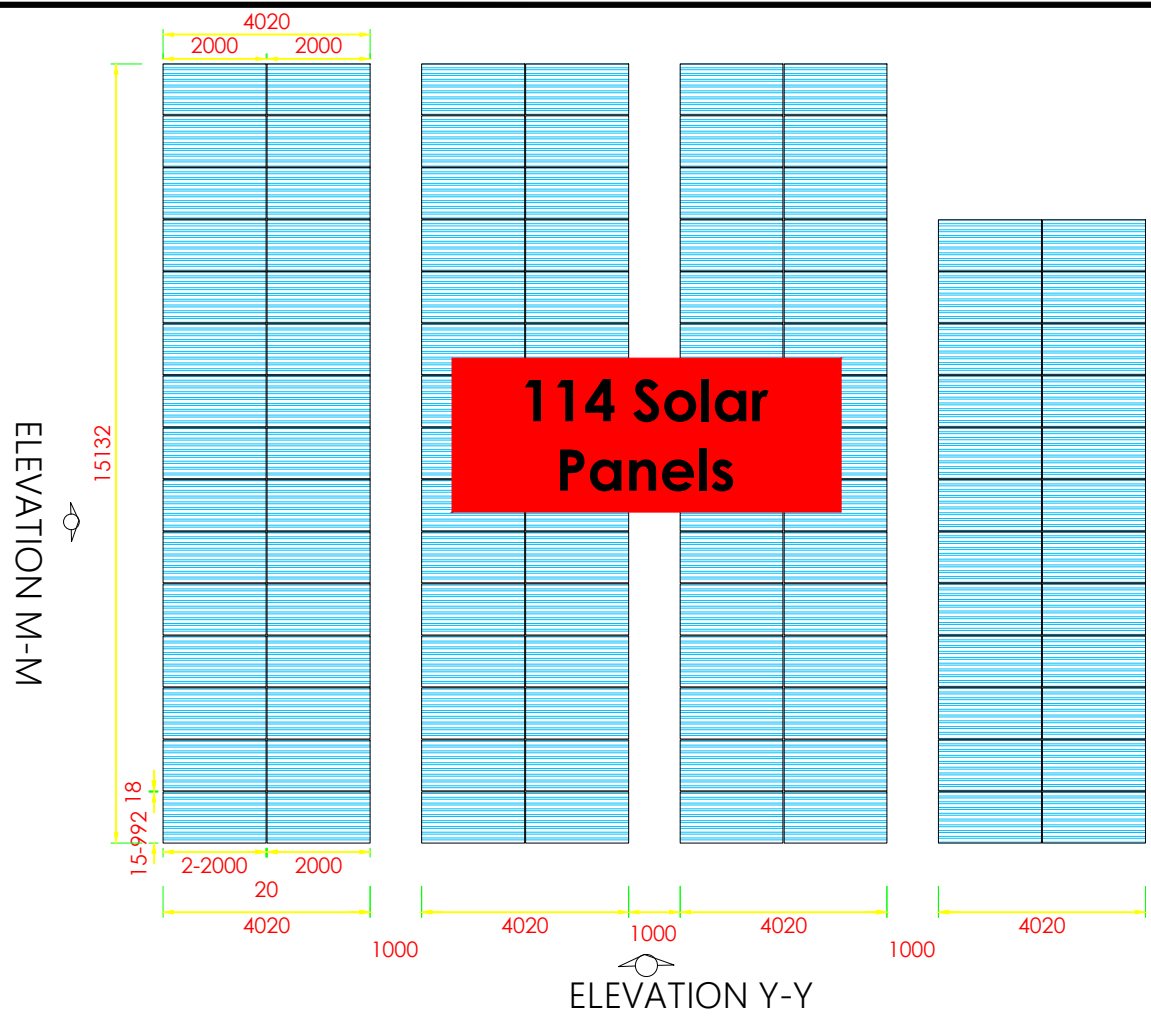
CONSULTANT  
 In Joint Venture with   
 Corporate Headquarter  
 10 Philipot Lane, 1st Floor,  
 London EC3M 8AA,  
 United Kingdom

CONTRACTOR

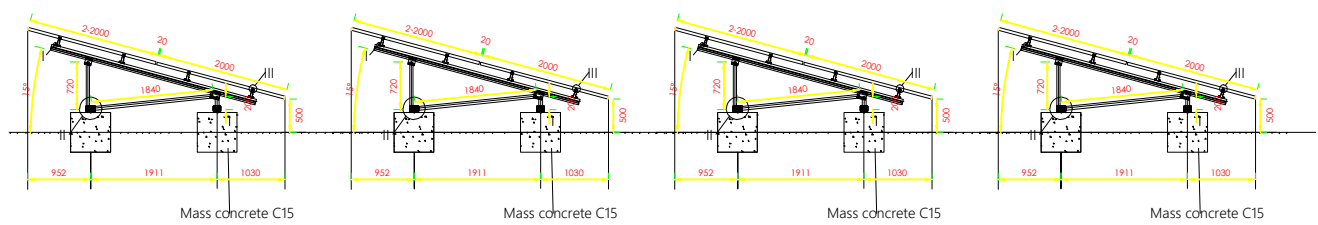
**DETAILED ENGINEERING DESIGN**  
 DRAWING TITLE  
**DWD-77383 SOLAR ARRAY**  
 ELECTRICAL LAYOUT

SCALE	AS SHOWN	DRAWING No.	NYA/WS/1.1.8
SURVEYED		DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	JUNE 2022	APPROVED	Rodney Barugahare.

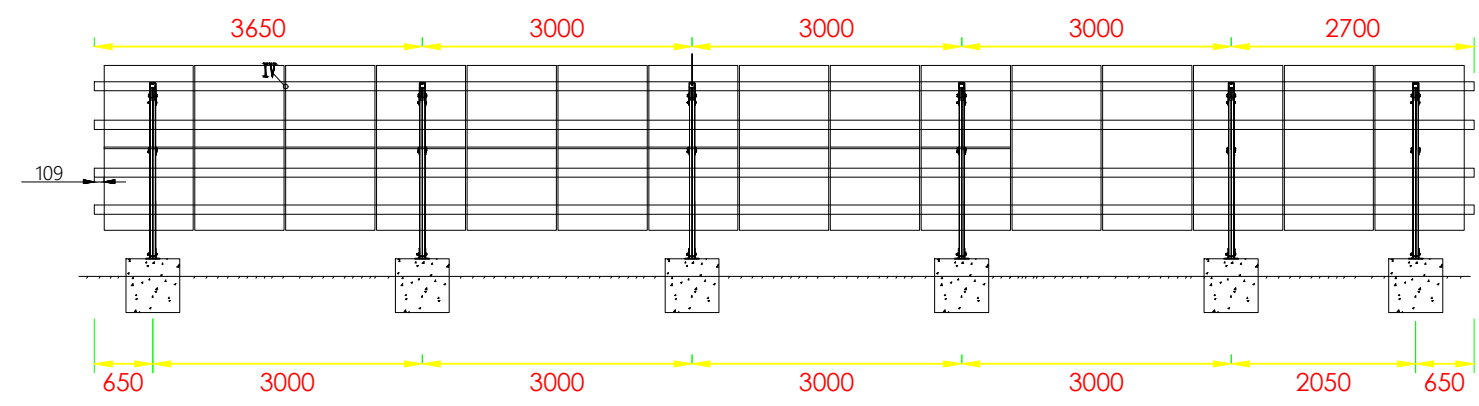
**NOTES**



**ELEVATION Y-Y**  
**SOLAR PANELS LAYOUT**





**ELEVATION Y-Y**





**ELEVATION M-M**

**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

**NYAKABAALE WATER SUPPLY SYSTEM**

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

**CONTRACTOR**

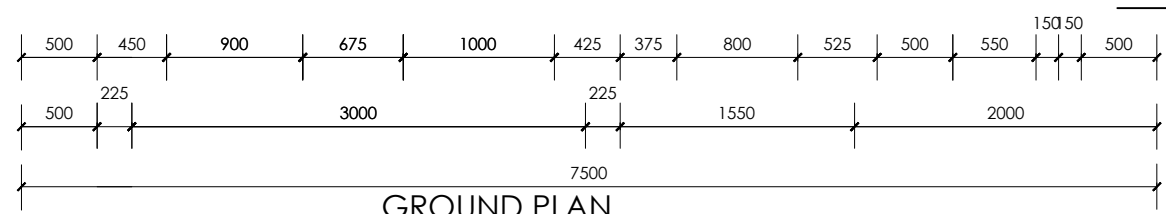
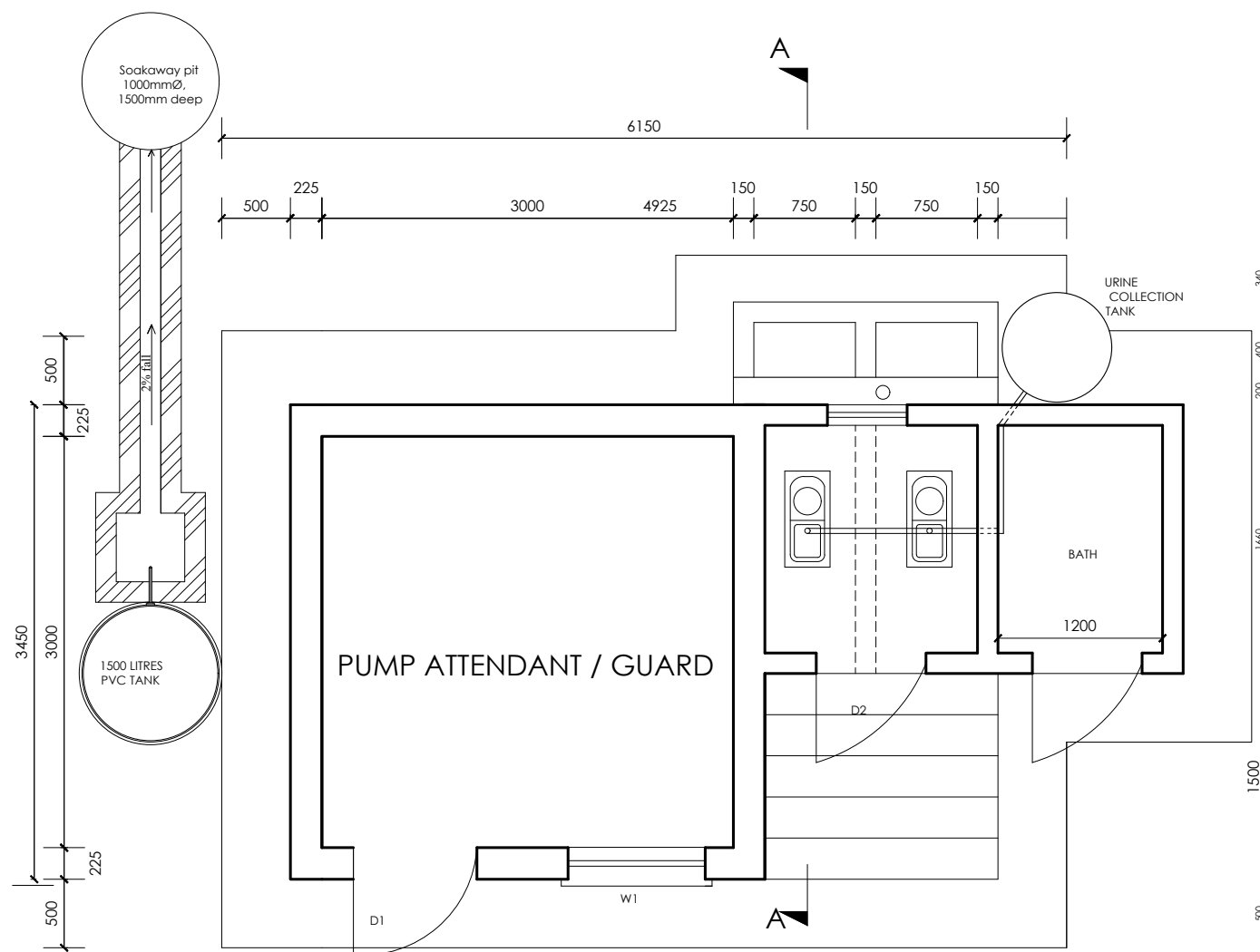
**DETAILED ENGINEERING DESIGN**  
**DRAWING TITLE**  
**DWD-77383 SOLAR ARRAY**  
 SOLAR PANEL LAYOUT, ELEVATIONS AND DETAILS

<b>SCALE</b>	AS SHOWN	<b>DRAWING No.</b>	NYA/WS/1.1.9
<b>SURVEYED</b>		<b>DESIGNED</b>	Otwane Dan.
<b>DRAWN</b>	Joshua Nyarwanda	<b>CHECKED</b>	Rodney Barugahare
<b>DATE</b>	JUNE 2022	<b>APPROVED</b>	Rodney Barugahare.



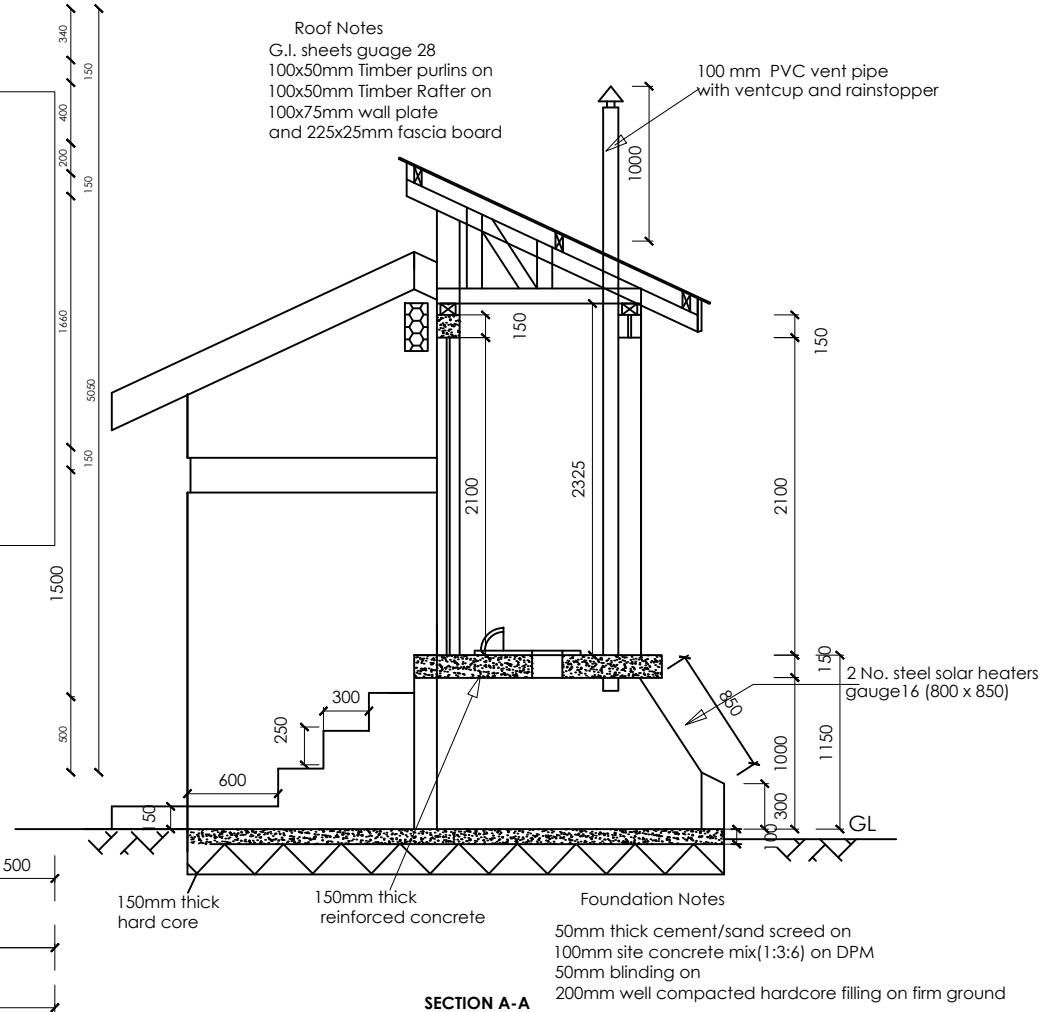
**PIPE FITTING SCHEDULE**

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.



**GROUND PLAN**

Scale 1:50



**SECTION A-A**

CLIENT



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

CO-FINANCED BY:



AND



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

**NYAKABAALE WATER SUPPLY SYSTEM**

CONSULTANT



In Joint Venture with



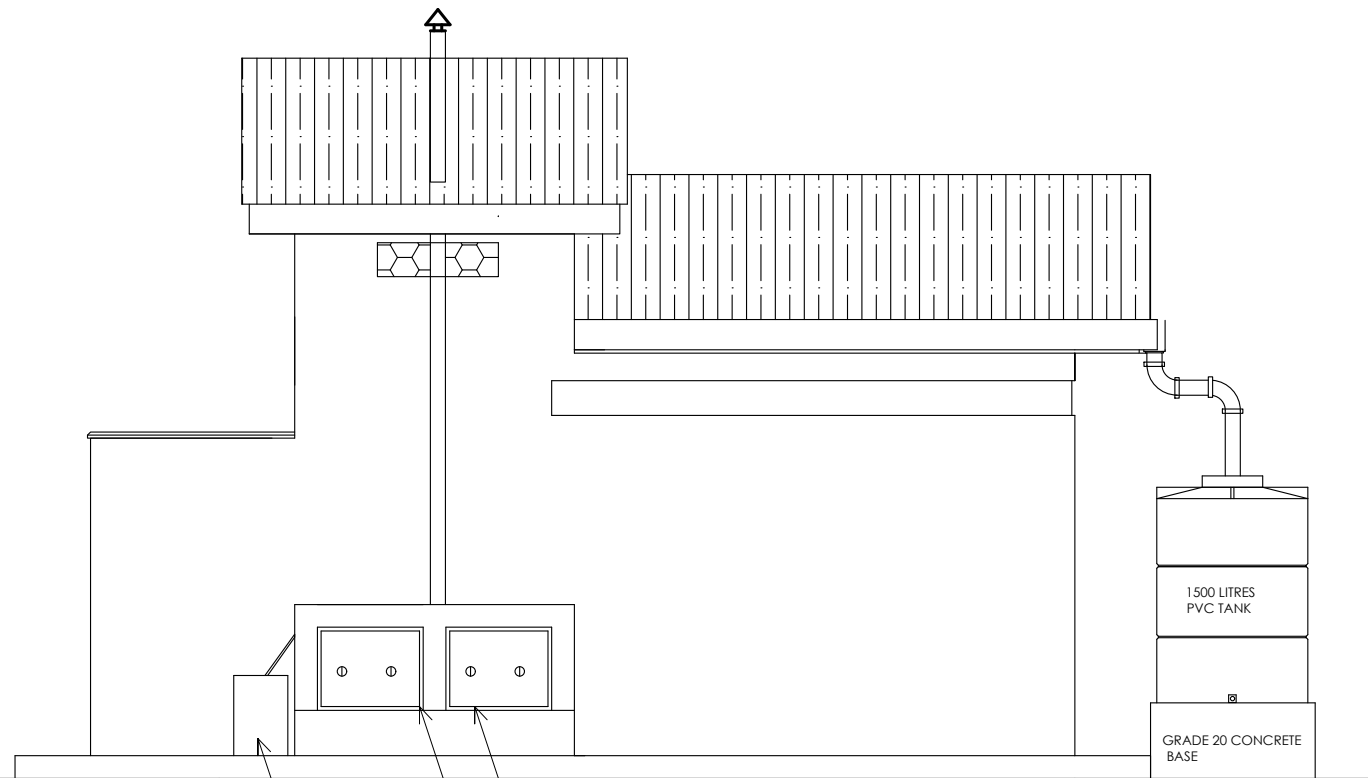
**SARI**  
Corporate Headquarters  
19 Plot 1/10, 1st Floor  
Lusaka ECMP/HA  
United Kingdom

CONTRACTOR

**DETAILED ENGINEERING DESIGN**

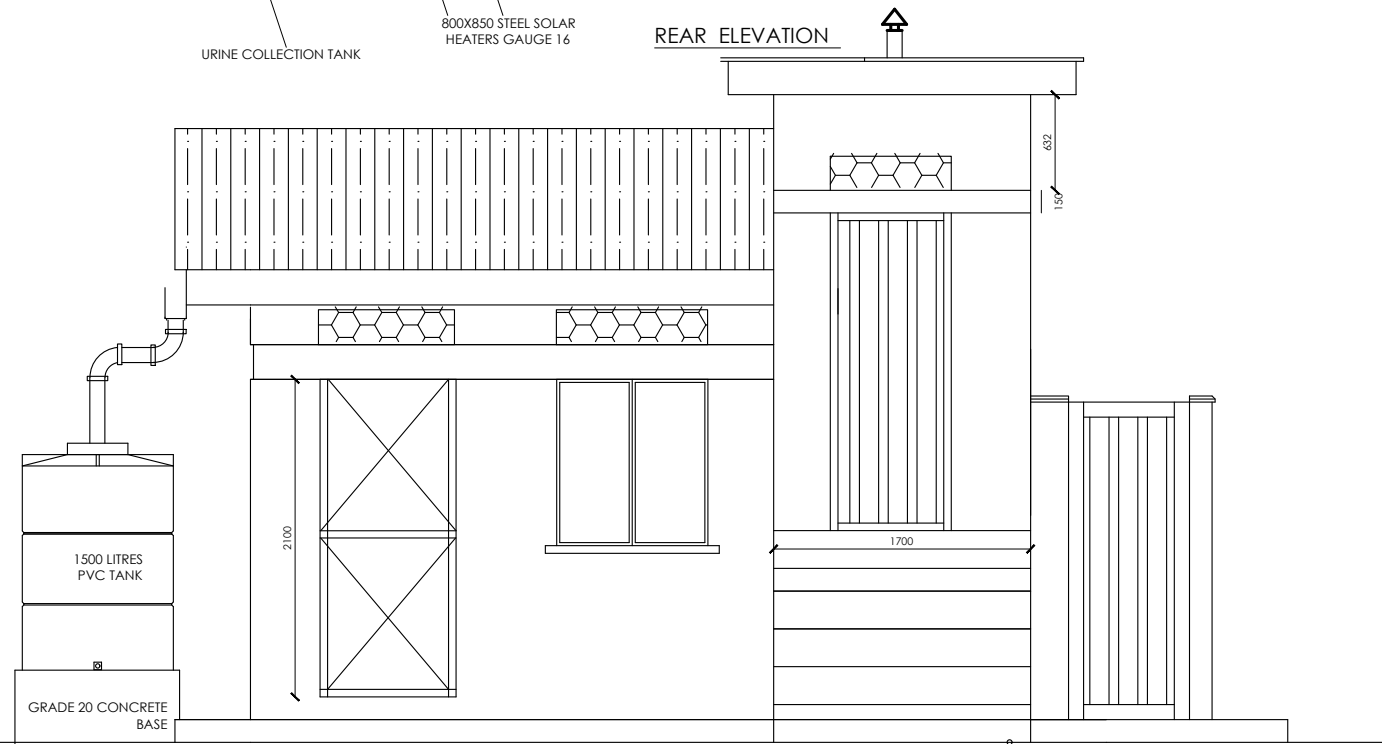
DRAWING TITLE  
**PUMP ATTENDANT / GUARD + ECOSAN  
PLAN AND SECTION A-A**

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

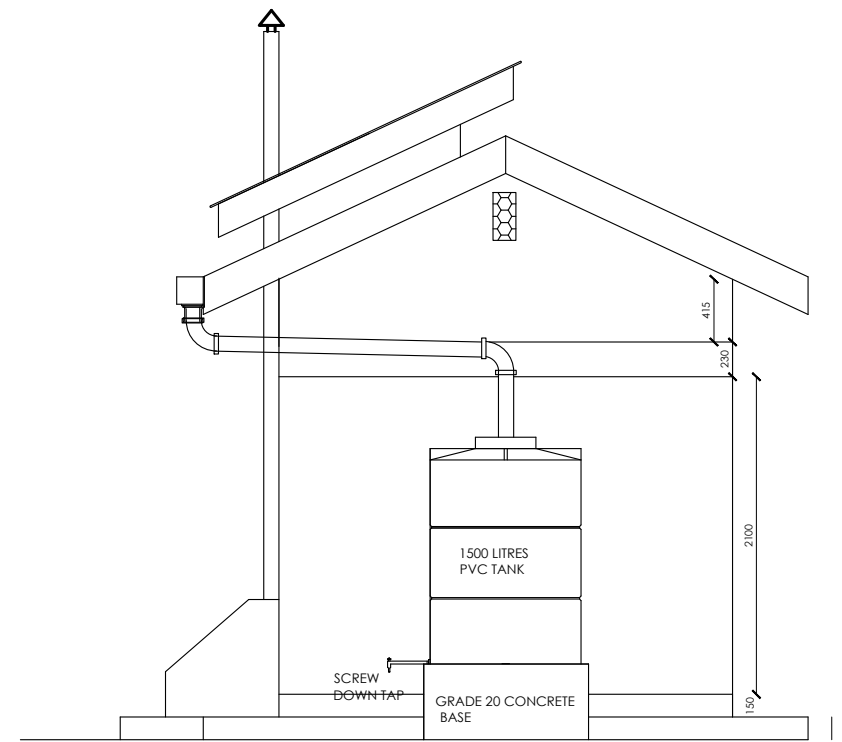


URINE COLLECTION TANK  
800X850 STEEL SOLAR HEATERS GAUGE 16

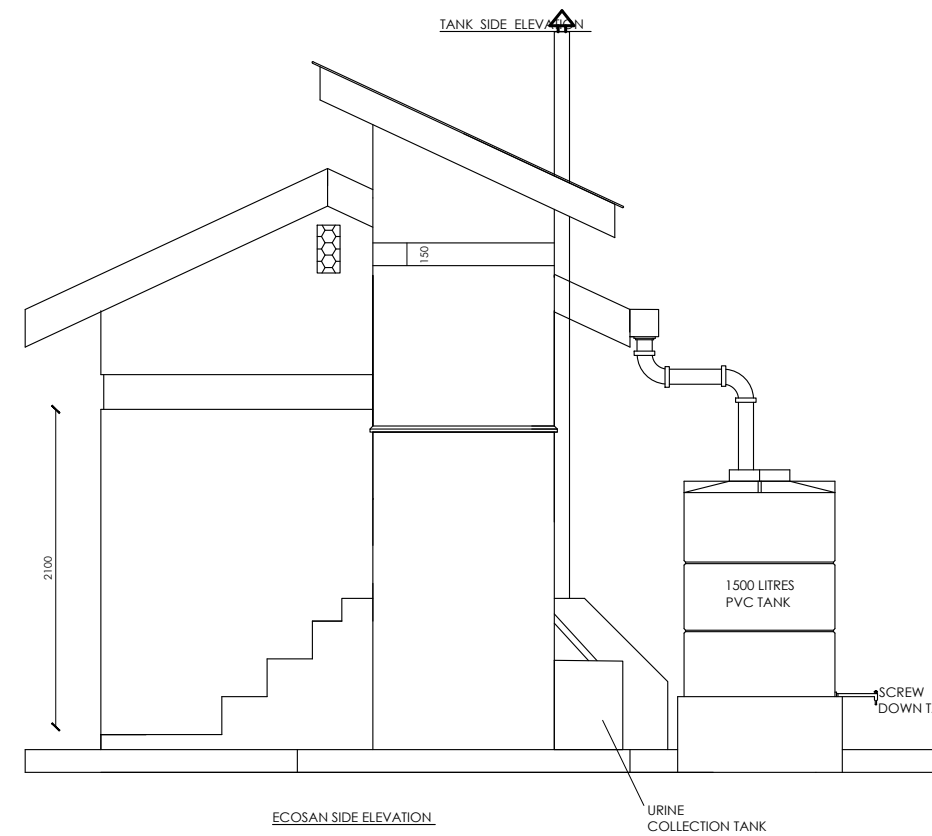
REAR ELEVATION



FRONT ELEVATION



TANK SIDE ELEVATION



ECOSAN SIDE ELEVATION

URINE COLLECTION TANK

**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:  
 **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

**NYAKABAALE WATER SUPPLY SYSTEM**

CONSULTANT  
 **SARI** In Joint Venture with  **SGAPI**  
Corporate Headquarter  
10 Pipet Lane, 1st Floor,  
London EC3N 8AA,  
United Kingdom

CONTRACTOR

**DETAILED ENGINEERING DESIGN**

DRAWING TITLE  
**PUMP ATTENDANT / GUARD + ECOSAN ELEVATIONS**

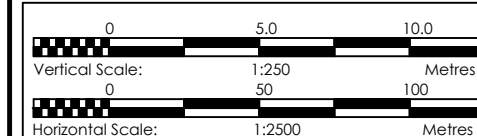
SCALE	AS SHOWN	DRAWING No.	NYA/WS.1.2.2
SURVEYED		DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



**NOTES**

**LEGEND**

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- End pipe
- Node N01
- WO-1 Washout Type1
- WO-2 Washout Type2



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

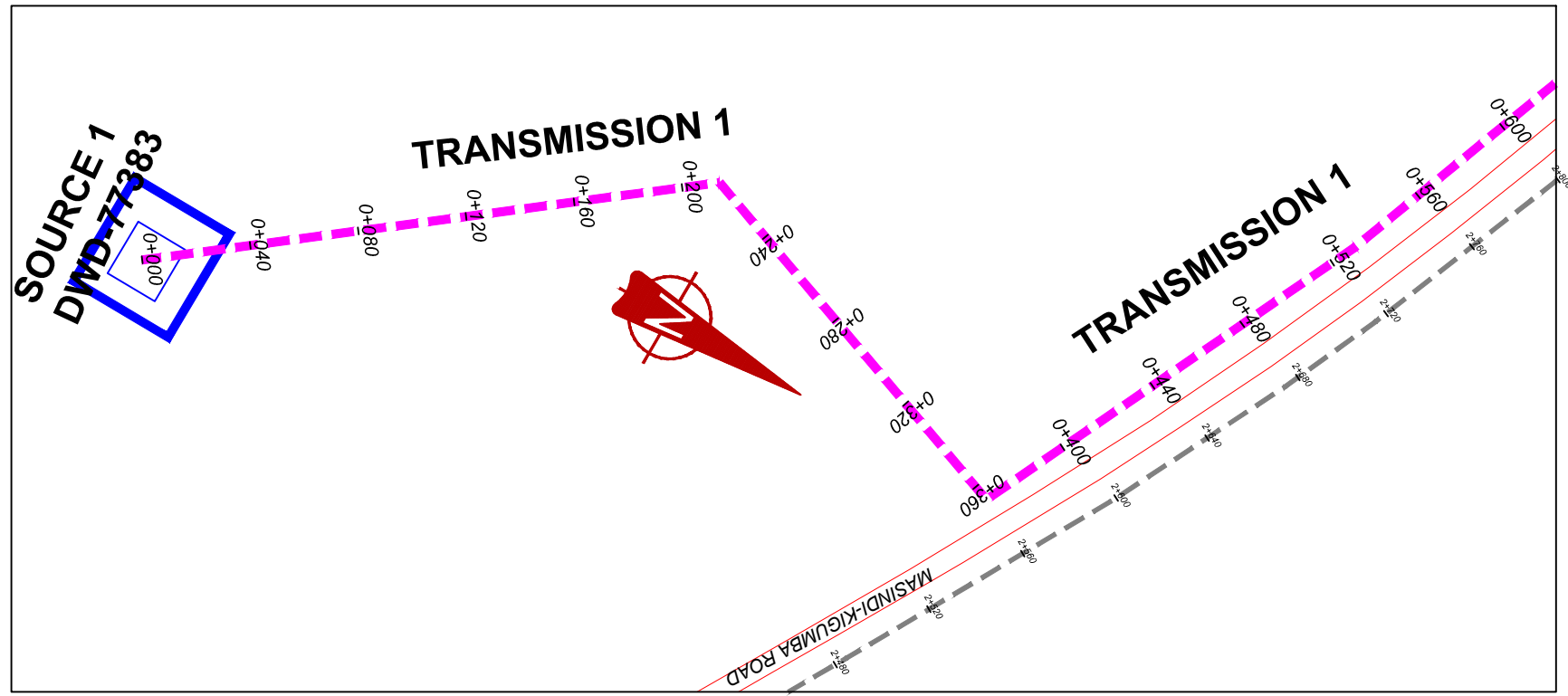
**NYAKABAALE WATER SUPPLY SYSTEM**

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

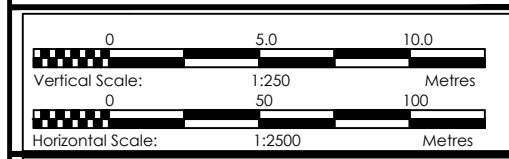
CONTRACTOR

**DETAILED ENGINEERING DESIGN**  
 DRAWING TITLE **GENERAL LAYOUT TRANSMISSION NETWORK**

SCALE	DRAWING No. NYA/WS/2.0.0
SURVEYED	DESIGNED Otwane Dan.
DRAWN Joshua Nyarwanda	CHECKED Rodney Barugahare
DATE April 2021	APPROVED Rodney Barugahare.



- NOTES**
- LEGEND**
- Transmission Pipeline
  - Distribution Pipeline
  - Ground Level
  - Building/House
  - Contours
  - Road
  - DAV Double Orifice Air Valve
  - End pipe
  - Node N01
  - Washout Type1
  - Washout Type2



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

**NYAKABAALE WATER SUPPLY SYSTEM**

CONSULTANT

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

CONTRACTOR

**DETAILED ENGINEERING DESIGN**

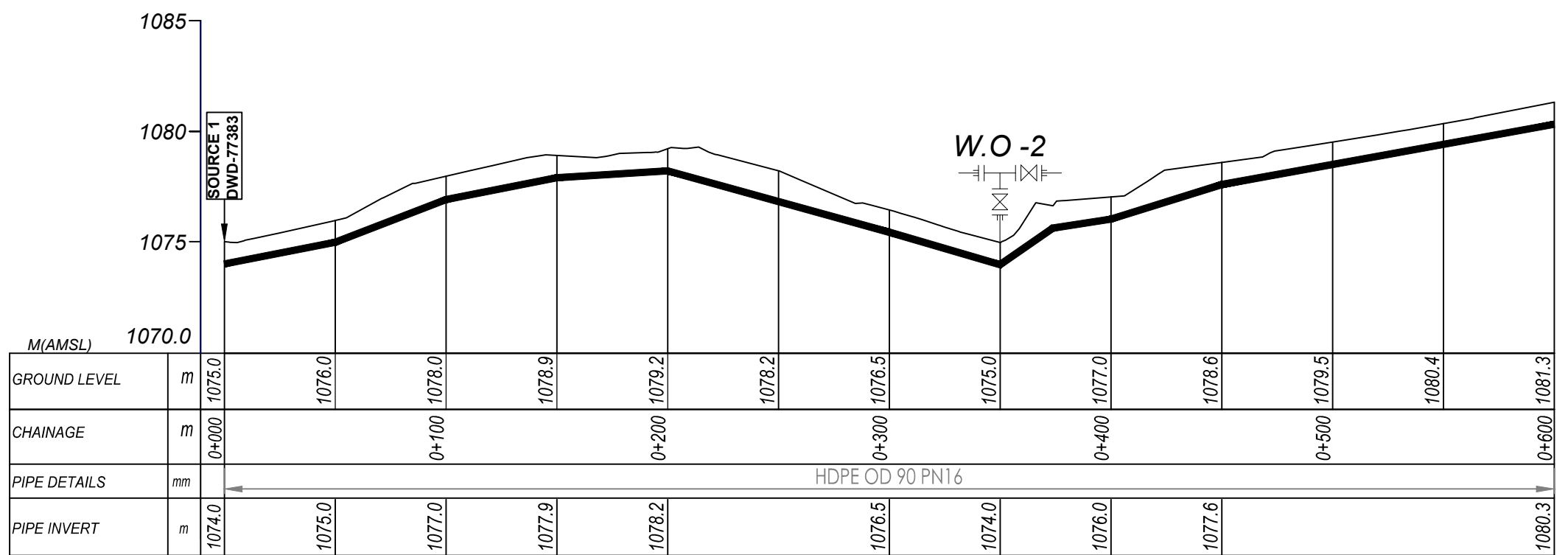
DRAWING TITLE **TRANSMISSION 01**  
**(0+000.00 - 0+600.00)**

SCALE *Vert. 1:250* DRAWING No. *Hori. 1:2500* NYA/WS/2.1.1

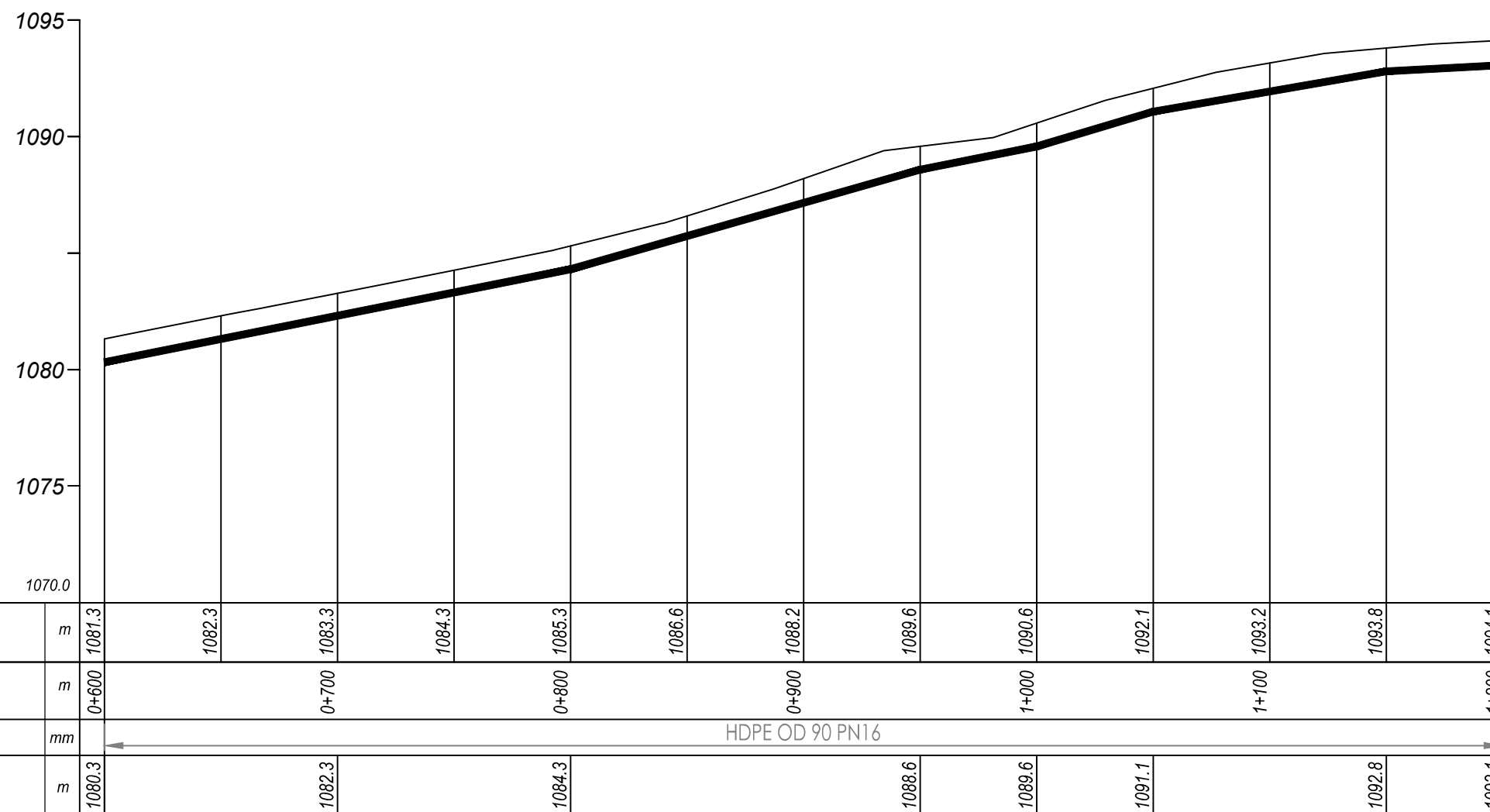
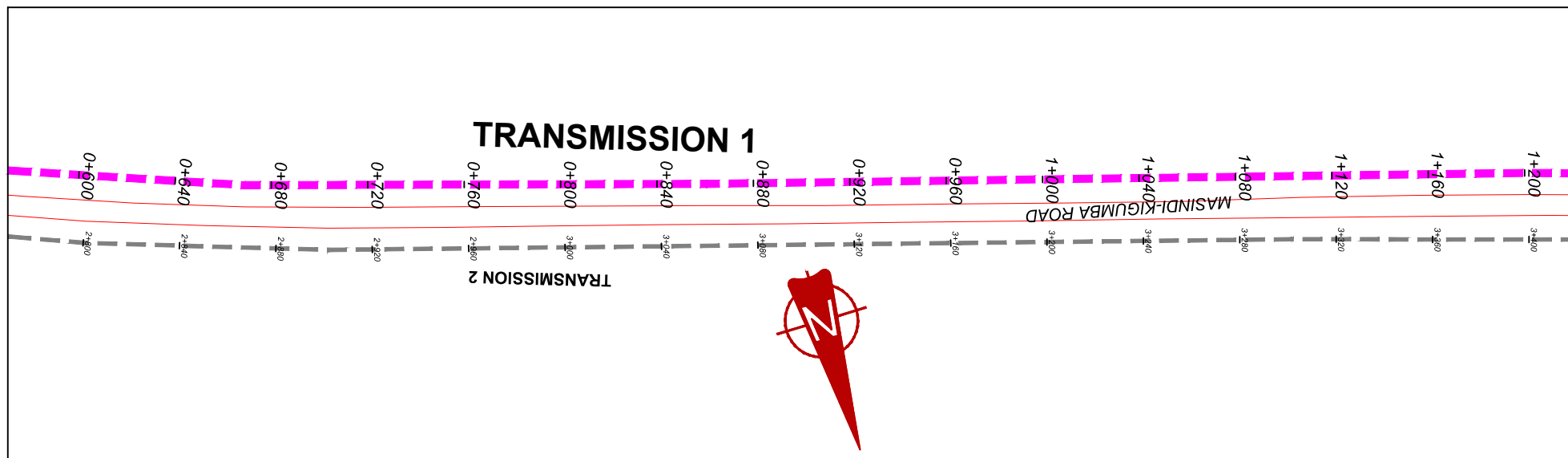
SURVEYED .... DESIGNED Otwane Dan.

DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare

DATE April 2021 APPROVED Rodney Barugahare.



**TRANSMISSION 1 (0+000.00 - 0+600.00)**

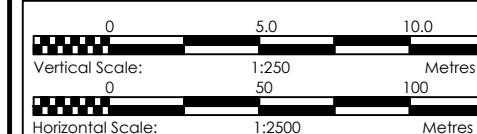


# TRANSMISSION 1 (0+600.00 - 1+200.00)

## NOTES

### LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- End pipe
- Node N01
- WO-1 Washout Type1
- WO-2 Washout Type2



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

## NYAKABAALE WATER SUPPLY SYSTEM

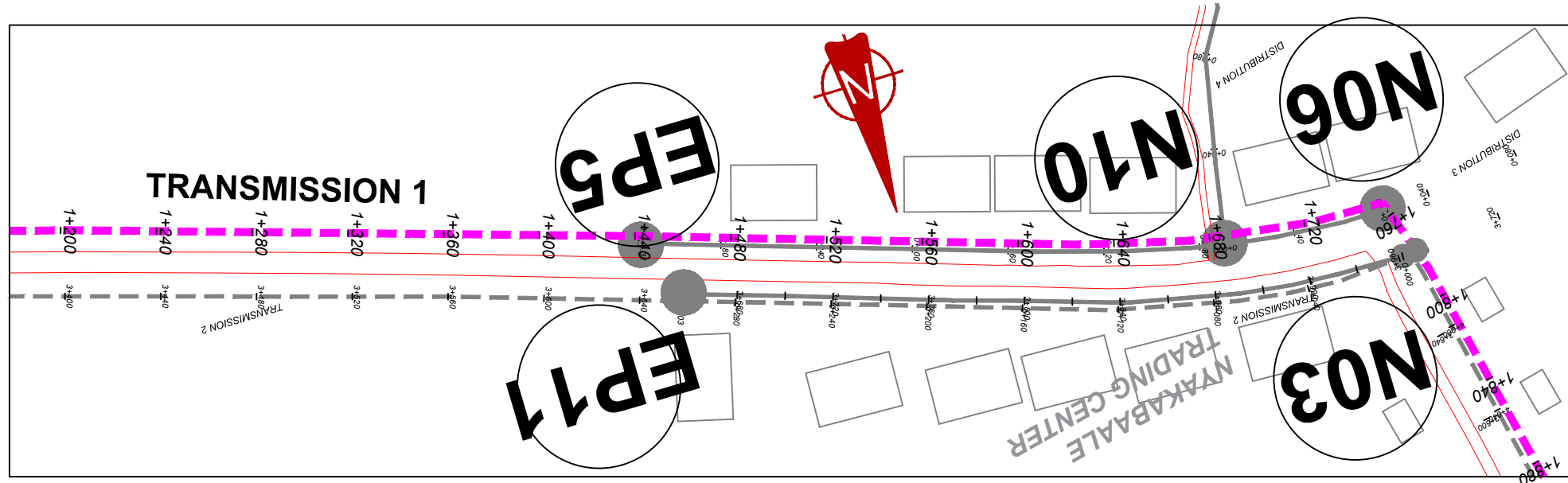
CONSULTANT  
**SARI** In Joint Venture with **SGAPI**  
 Corporate Headquarter  
 10 Phidip Lane, 1st Floor,  
 London EC3M 8AA,  
 United Kingdom

CONTRACTOR

### DETAILED ENGINEERING DESIGN

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

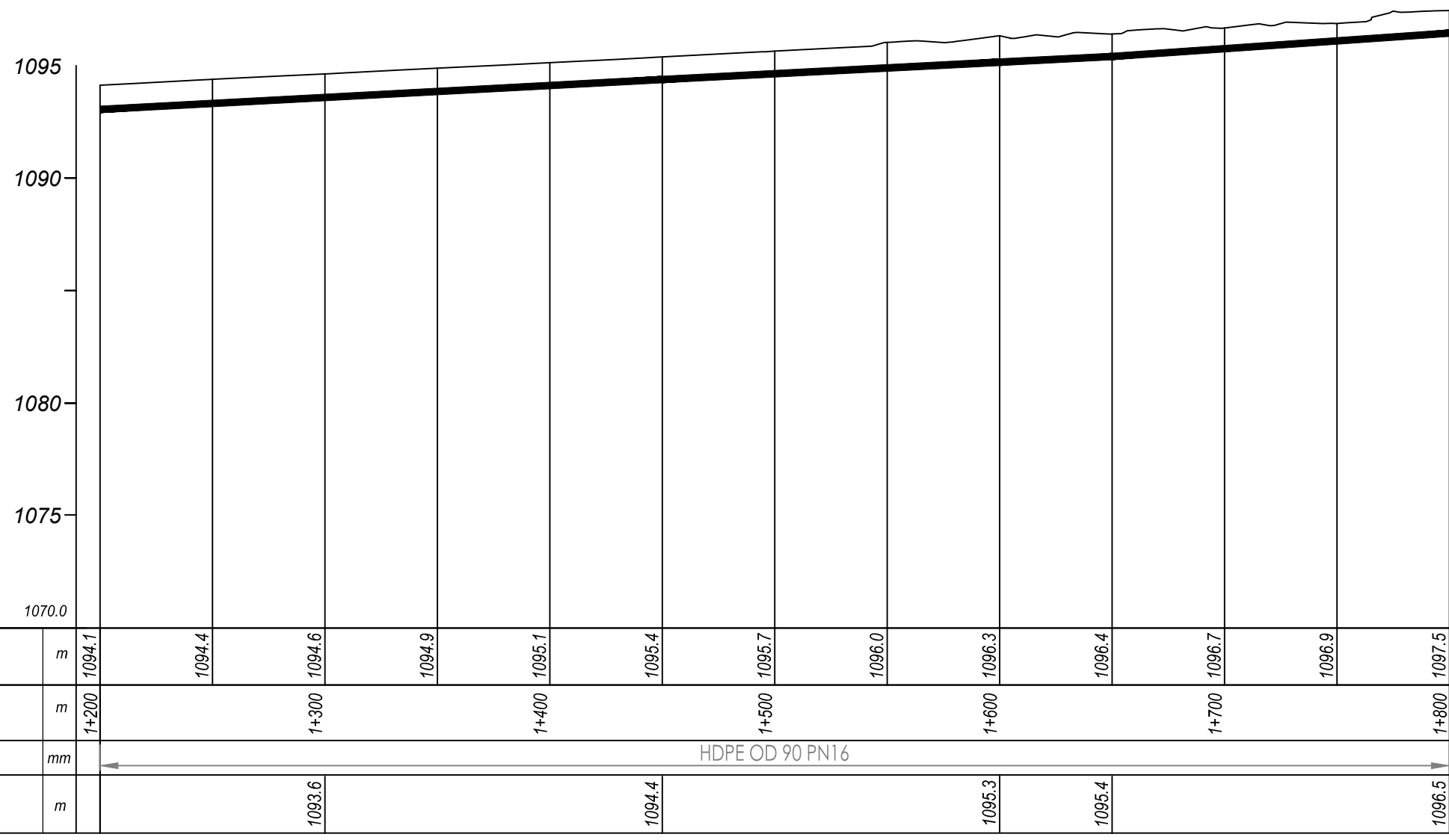
SCALE *Vert, 1:250* DRAWING No. NYA/WS/2.1.2  
*Hor, 1:2500*  
 SURVEYED ... DESIGNED Otwane Dan.  
 DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare  
 DATE April 2021 APPROVED Rodney Barugahare.



**NOTES**

**LEGEND**

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- End pipe
- Node N01
- Washout Type1
- Washout Type2



**TRANSMISSION 1 (1+200.00 - 1+800.00)**

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:**  
 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

**NYAKABAALE WATER SUPPLY SYSTEM**

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

**CONTRACTOR**

---

**DETAILED ENGINEERING DESIGN**

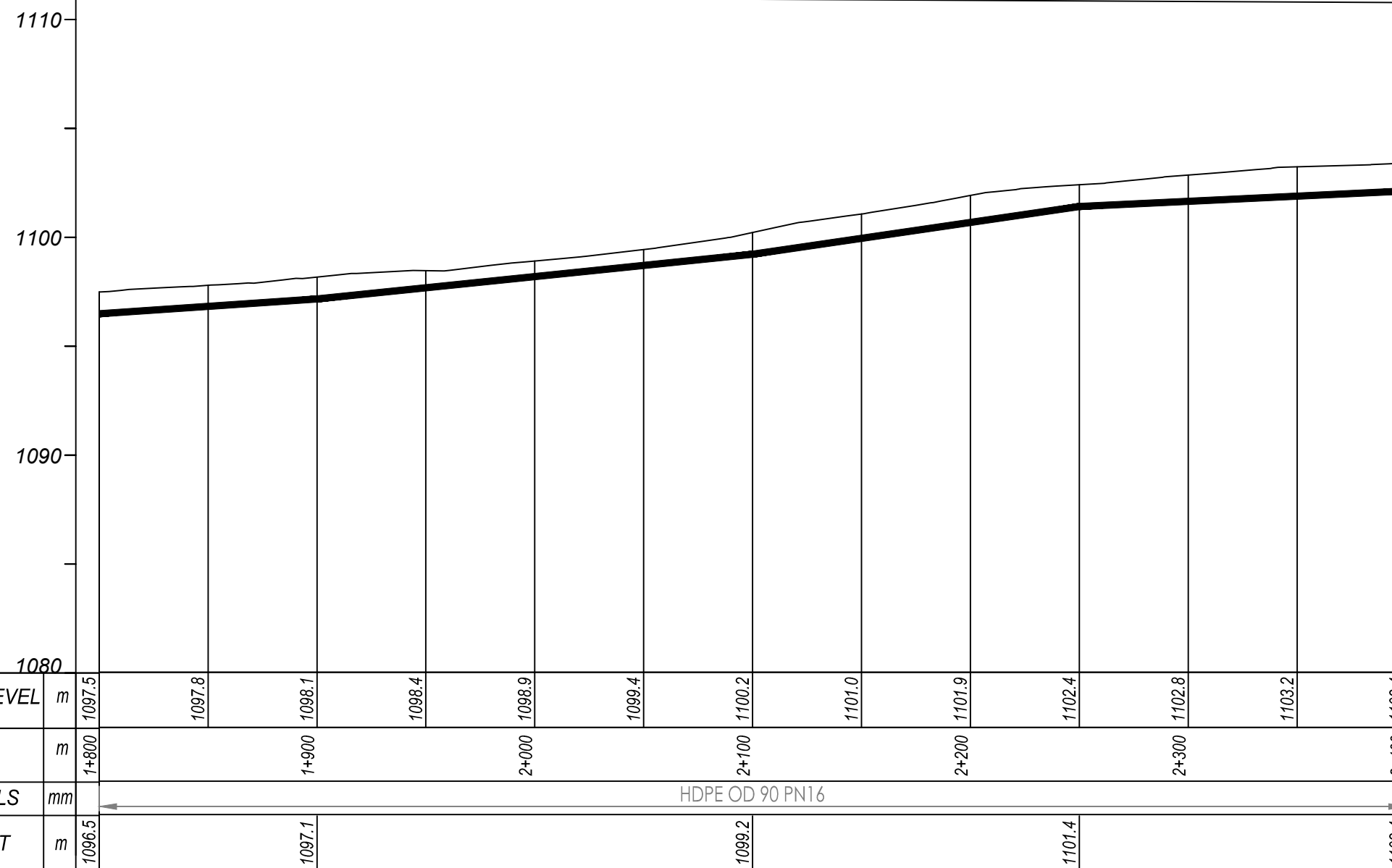
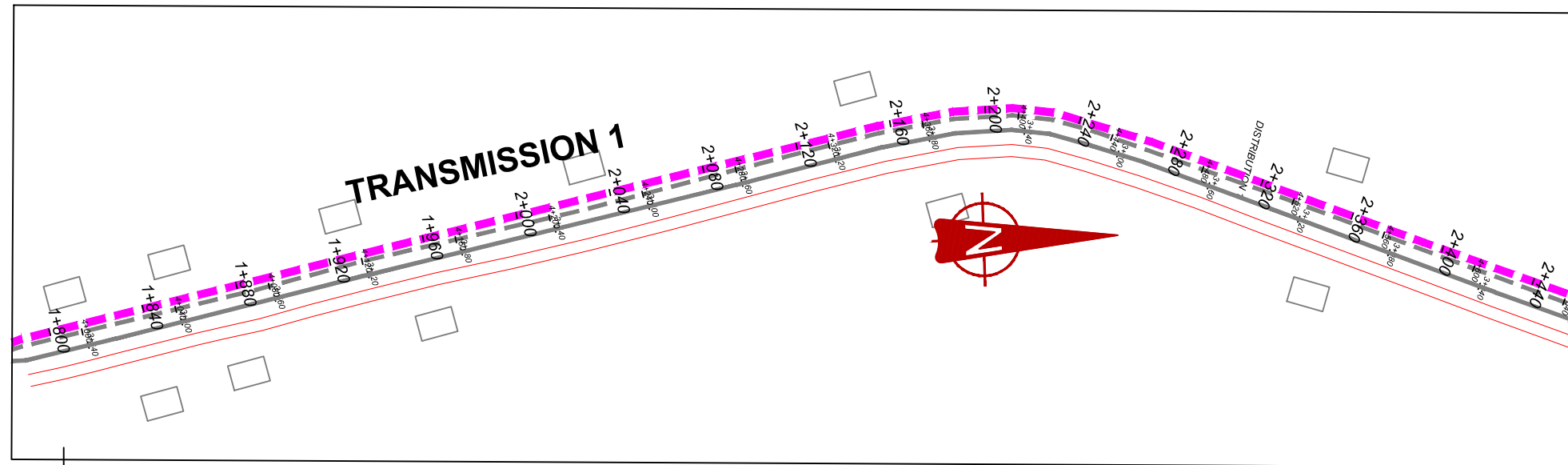
**DRAWING TITLE** TRANSMISSION 01  
(1+200.00 - 1+800.00)

**SCALE** Vert, 1:250      **DRAWING No.** NYA/WS/2.1.3  
 Horz, 1:2500

**SURVEYED** ....      **DESIGNED** Otwane Dan.

**DRAWN** Joshua Nyarwanda      **CHECKED** Rodney Barugahare

**DATE** April 2021      **APPROVED** Rodney Barugahare.

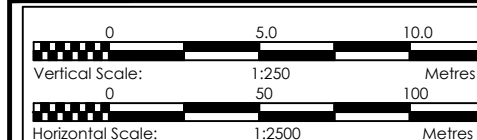


## TRANSMISSION 1 (1+800.00 - 2+400.00)

### 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
- WO-2 Washout Type2



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

CO-FINANCED BY:  
 AND **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

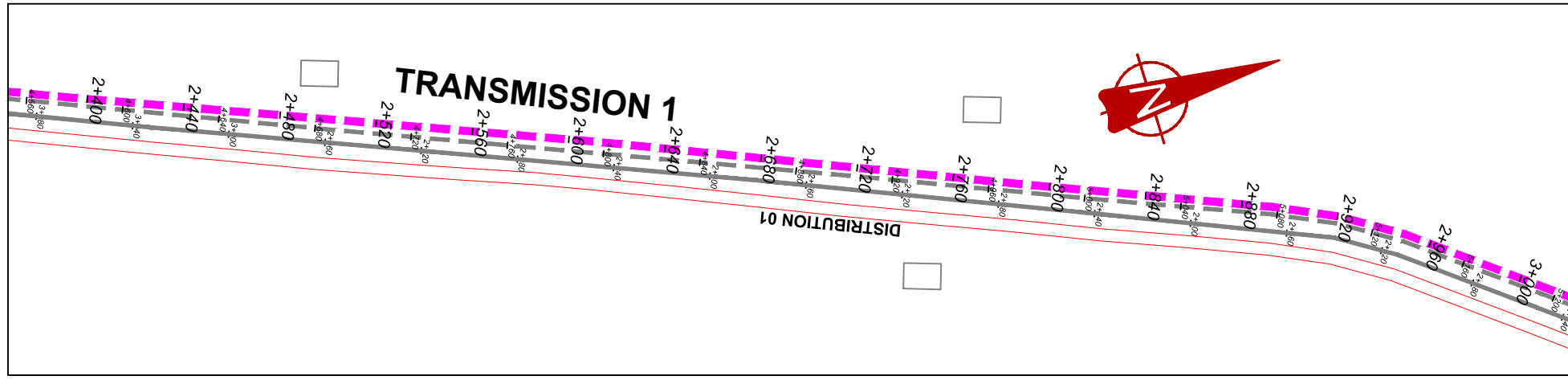
### NYAKABAALE WATER SUPPLY SYSTEM

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

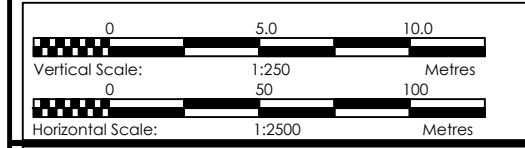
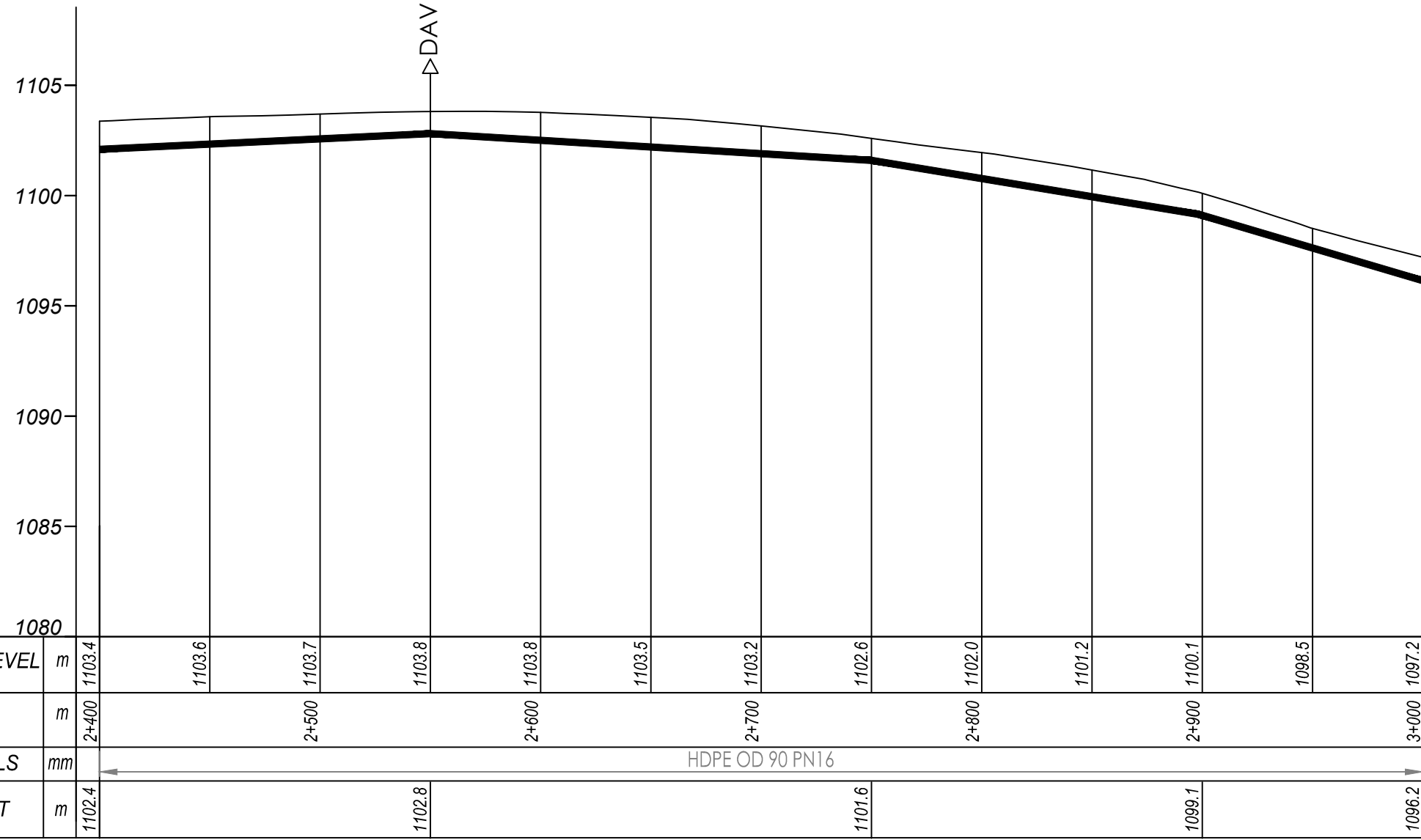
CONTRACTOR

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

SCALE	Vert, 1:250 Hor, 1:2500	DRAWING No.	NYA/WS/2.1.4
SURVEYED	....	DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	April 2021	APPROVED	Rodney Barugahare.



- NOTES**
- LEGEND**
- Transmission Pipeline
  - Distribution Pipeline
  - Ground Level
  - Building/House
  - Contours
  - Road
  - DAV Double Orifice Air Valve
  - End pipe
  - Node N01
  - Washout Type1
  - Washout Type2



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

**NYAKABAALE WATER SUPPLY SYSTEM**

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

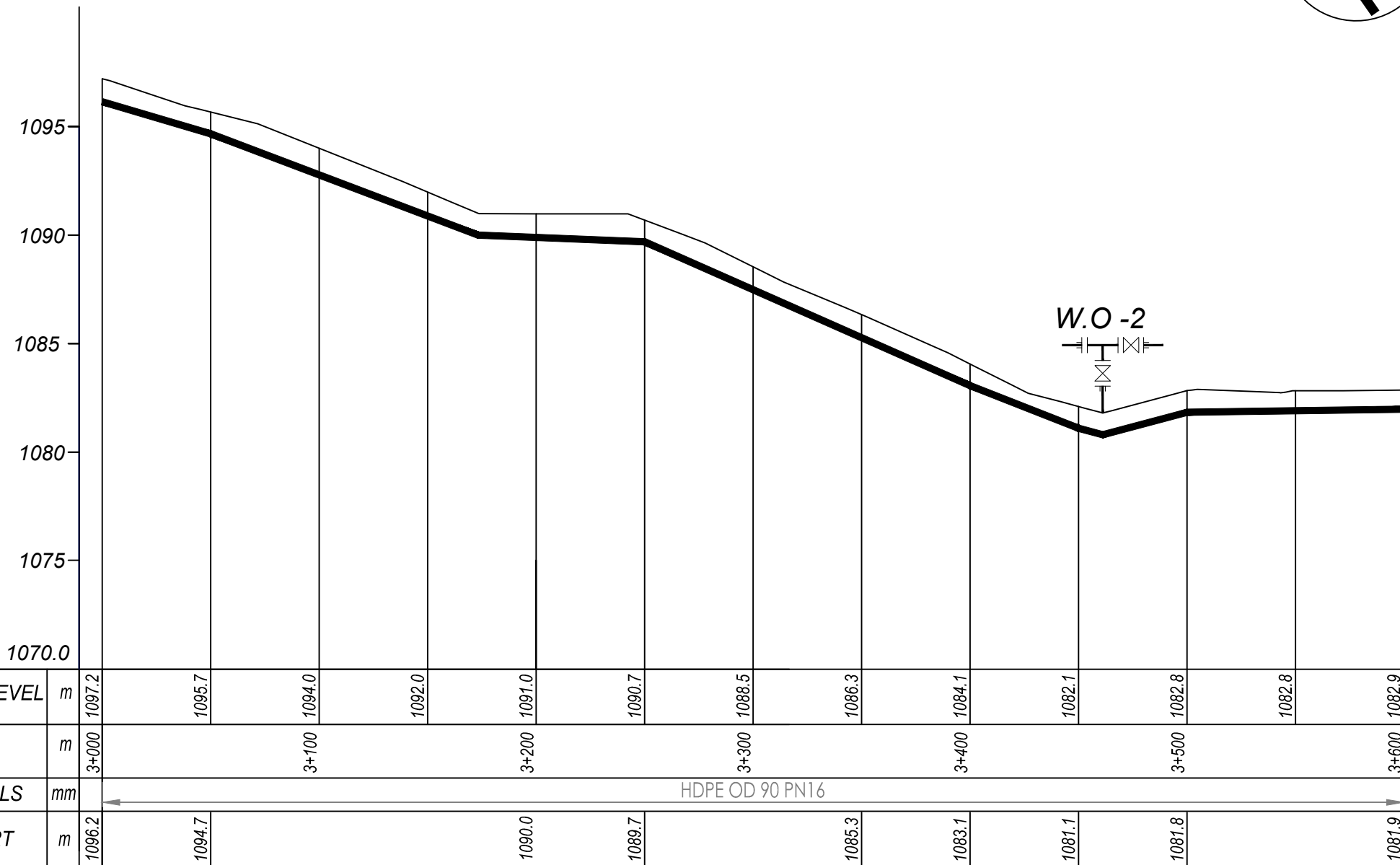
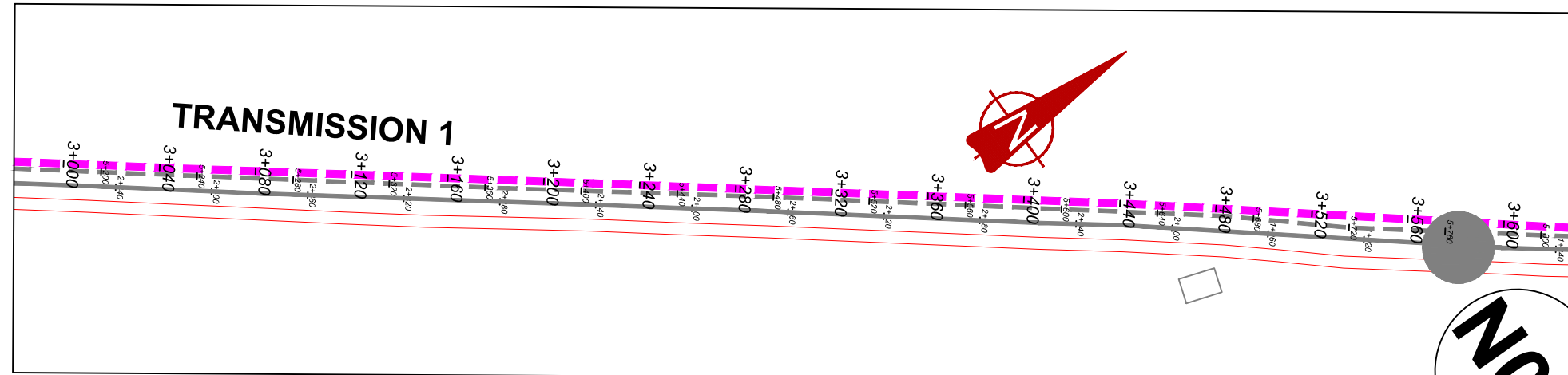
CONTRACTOR

**DETAILED ENGINEERING DESIGN**  
 DRAWING TITLE **TRANSMISSION 01**  
**(2+400.00 - 3+000.00)**

**TRANSMISSION 1 (2+400.00 - 3+000.00)**

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



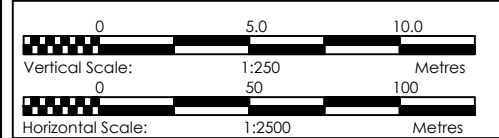


## TRANSMISSION 1 (3+000.00 - 3+600.00)

### 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
- WO-2 Washout Type2



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

CO-FINANCED BY:  
 AND **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

### NYAKABAALE WATER SUPPLY SYSTEM

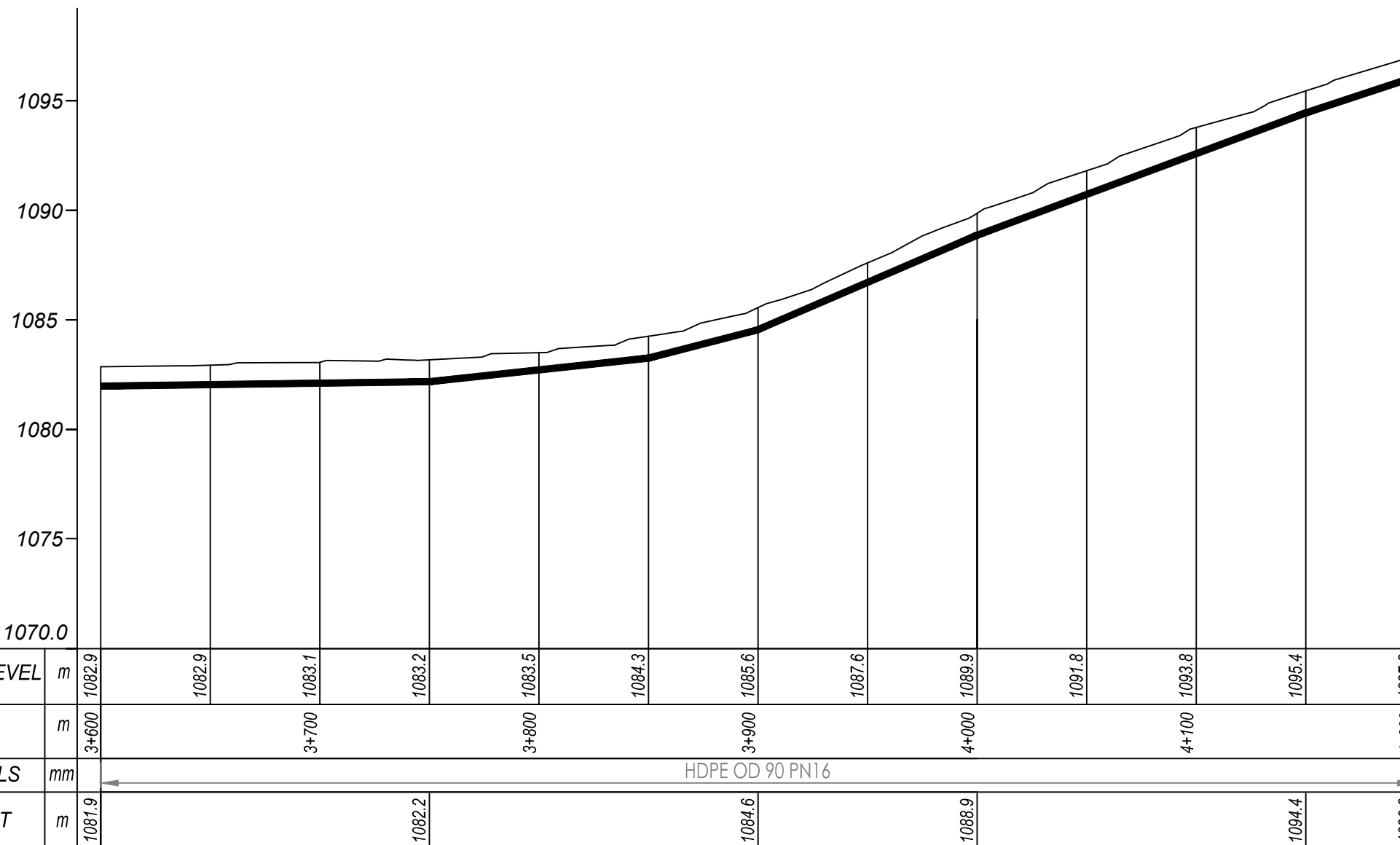
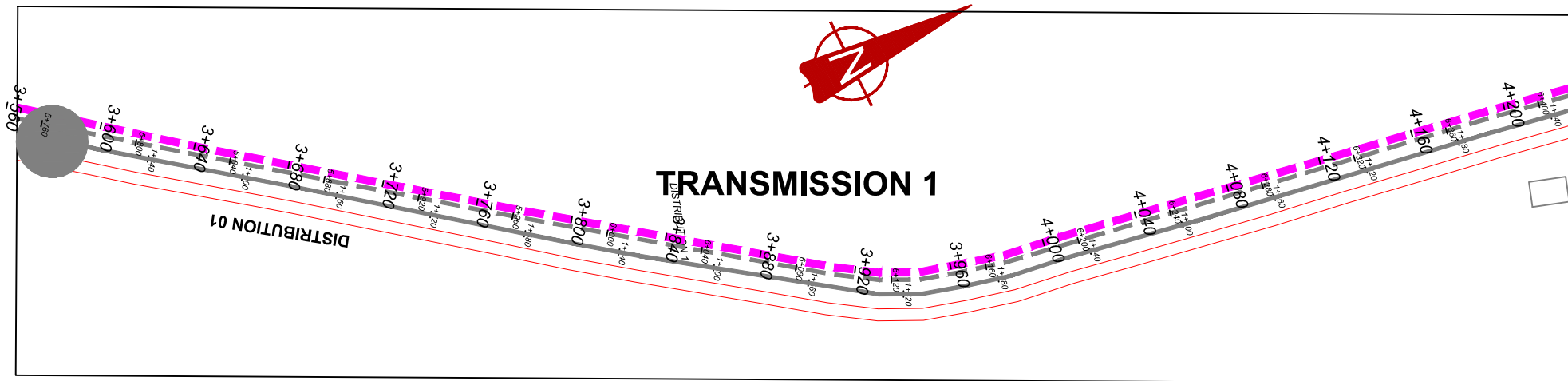
CONSULTANT  
 In Joint Venture with   
 Corporate Headquarter  
 10 Phidip Lane, 1st Floor,  
 London EC3M 8AA,  
 United Kingdom

CONTRACTOR

#### DETAILED ENGINEERING DESIGN

DRAWING TITLE **TRANSMISSION 01**  
**(3+000.00 - 3+600.00)**



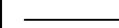





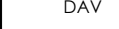


SCALE	Vert. 1:250 Horiz. 1:2500	DRAWING No.	NYA/WS/2.1.6
SURVEYED	....	DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	April 2021	APPROVED	Rodney Barugahare.

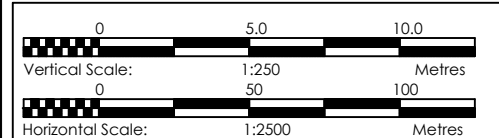


## TRANSMISSION 1 (3+600.00 - 4+200.00)

### NOTES

#### LEGEND

-  Transmission Pipeline
-  Distribution Pipeline
-  Ground Level
-  Building/House
-  Contours
-  Road
-  DAV Double Orifice Air Valve
-  End pipe
-  Node N01
-  Washout Type1
-  Washout Type2





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

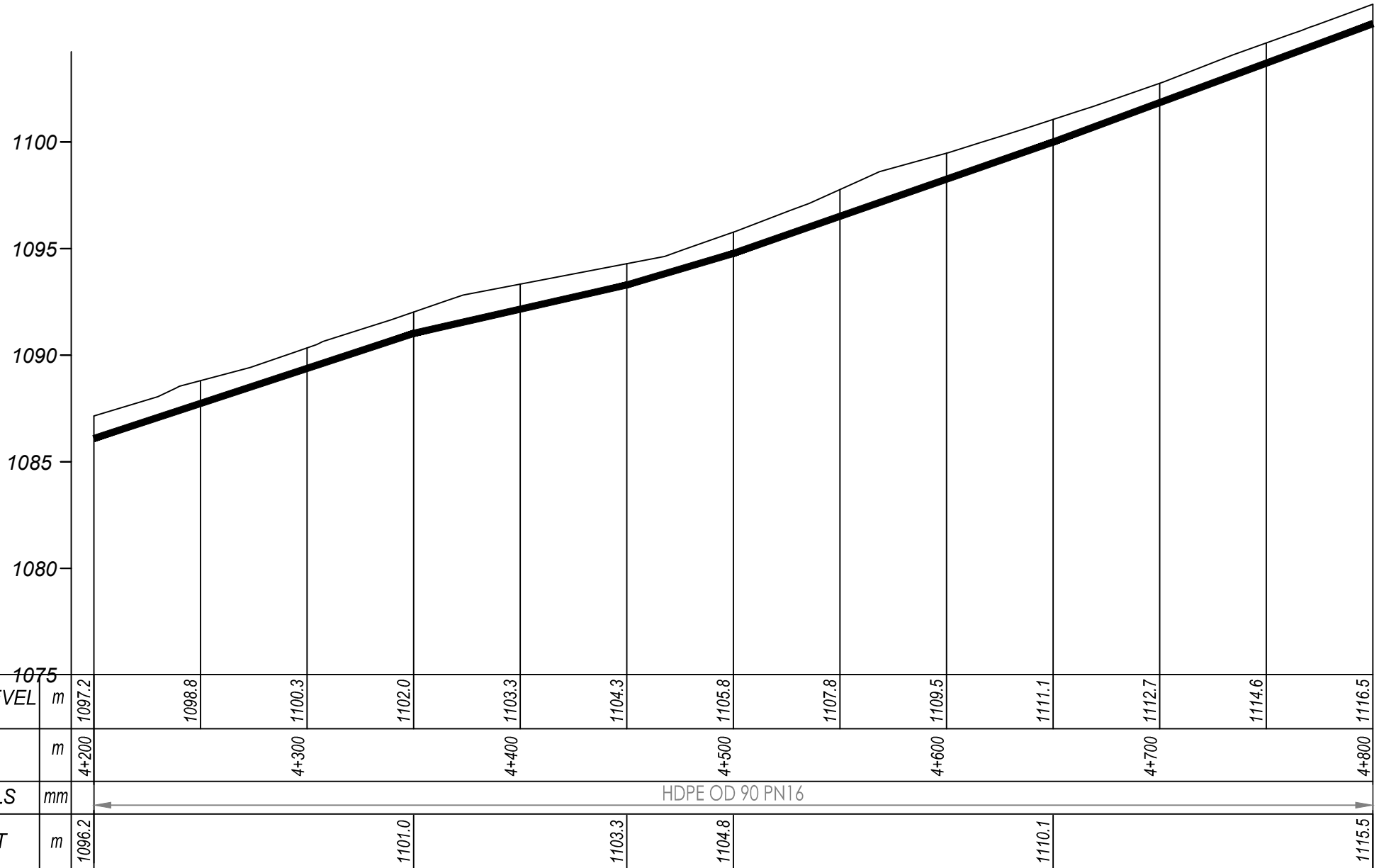
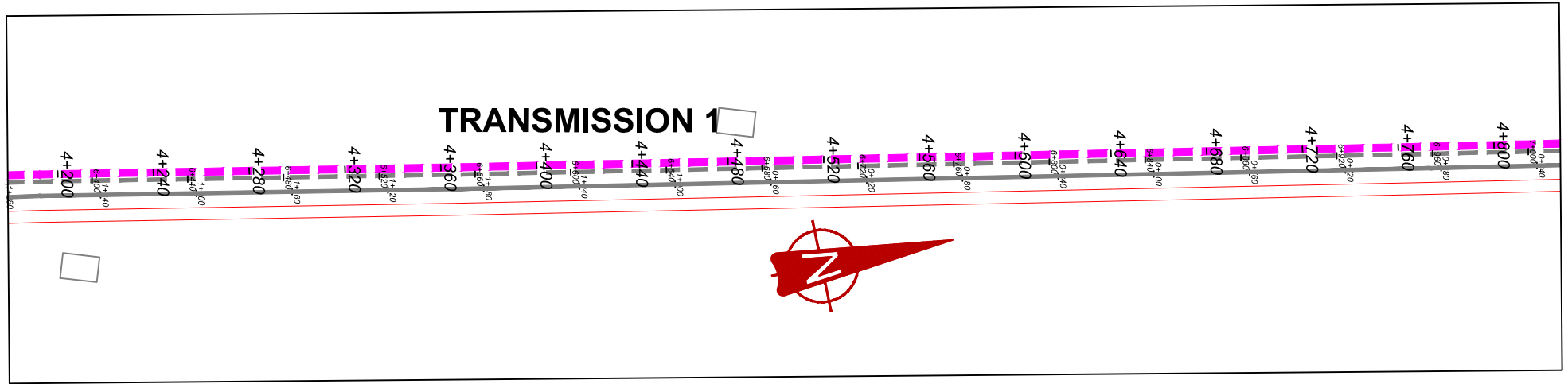
### NYAKABAAL WATER SUPPLY SYSTEM

CONSULTANT  
 In Joint Venture with   
 Corporate Headquarter  
 10 Phidip 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* DRAWING No. NYA/WS/2.1.7  
*Horiz, 1:2500*  
 SURVEYED .... DESIGNED Otwane Dan.  
 DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare  
 DATE April 2021 APPROVED Rodney Barugahare.

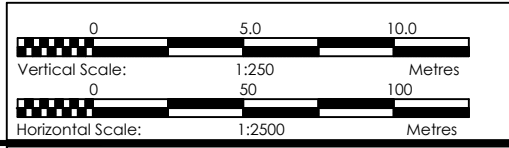


## TRANSMISSION 1 (4+200.00 - 4+800.00)

### NOTES

#### LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- End pipe
- Node N01
- WO-1 Washout Type1
- WO-2 Washout Type2



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

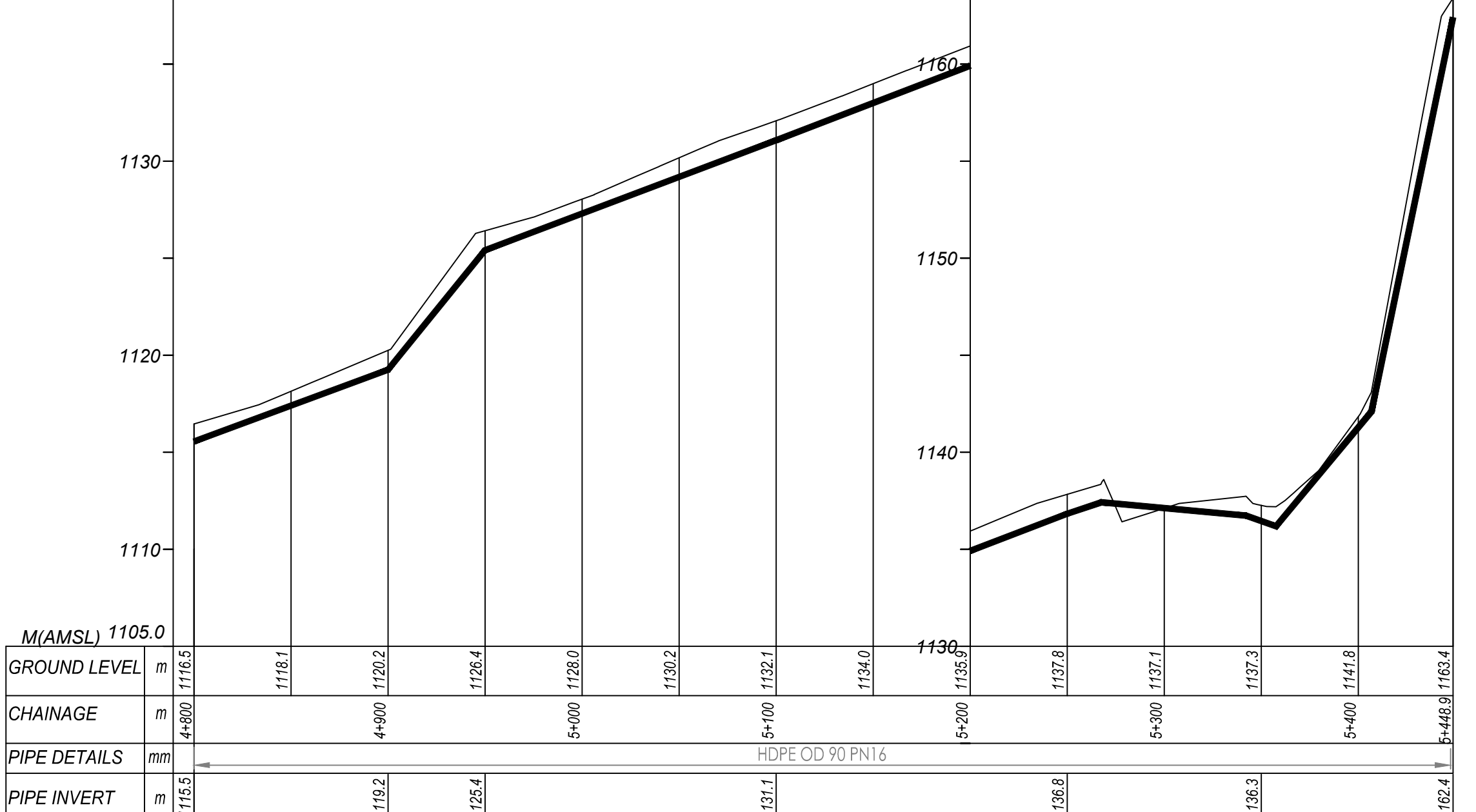
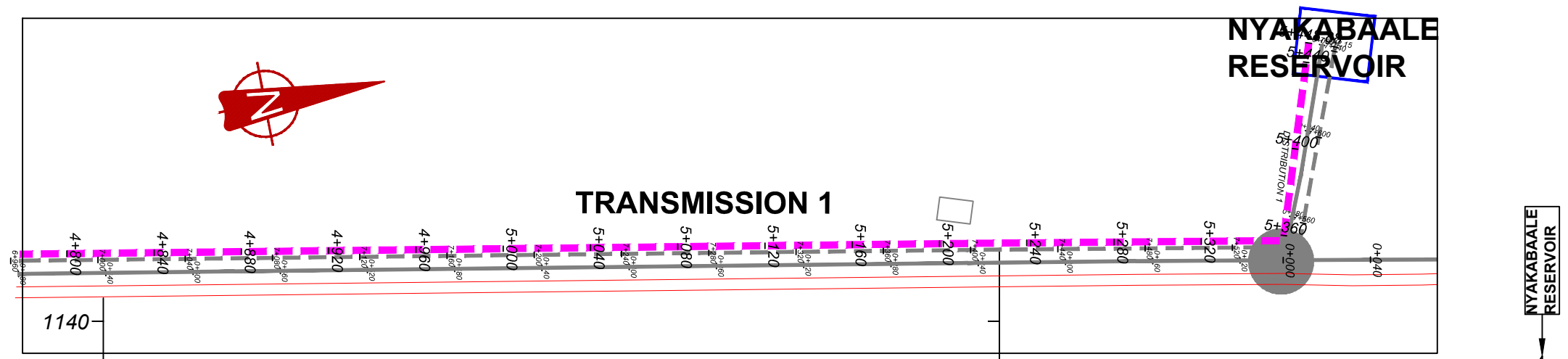
### NYAKABAALE WATER SUPPLY SYSTEM

CONSULTANT  
**SARI** In Joint Venture with **SGAPI**  
 Corporate Headquarter  
 10 Phidip 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. NYA/WS/2.1.8  
 SURVEYED .... DESIGNED Otwane Dan.  
 DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare  
 DATE April 2021 APPROVED Rodney Barugahare.

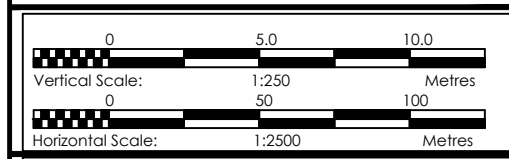


# TRANSMISSION 1 (4+800.00 - 5+448.90)

## NOTES

### LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- End pipe
- Node N01
- Washout Type1
- Washout Type2



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

## NYAKABAALÉ WATER SUPPLY SYSTEM

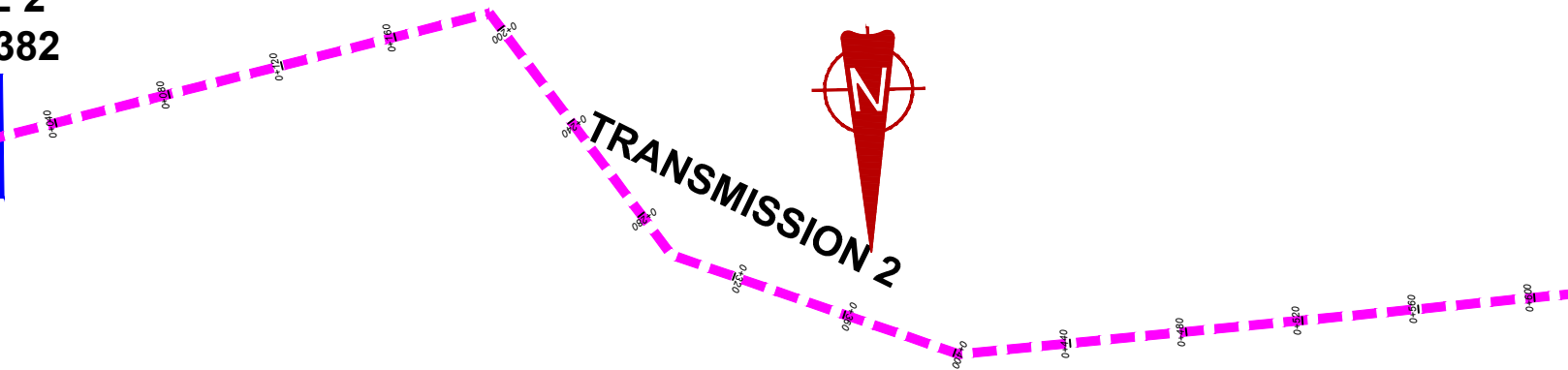
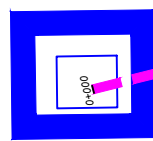
CONSULTANT  
 In Joint Venture with   
 Corporate Headquarter  
 10 Phidip Lane, 1st Floor,  
 London EC3M 8AA,  
 United Kingdom

CONTRACTOR

DETAILED ENGINEERING DESIGN  
 DRAWING TITLE **TRANSMISSION 01**  
**(4+800.00 - 5+448.90)**

SCALE *Vert. 1:250* DRAWING No. NYA/WS/2.1.9  
*Horiz. 1:2500*  
 SURVEYED .... DESIGNED Otwane Dan.  
 DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare  
 DATE April 2021 APPROVED Rodney Barugahare.

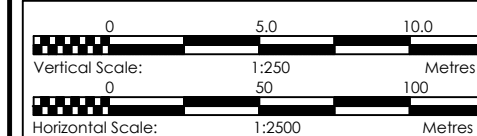
**SOURCE 2  
DWD-77382**



**NOTES**

**LEGEND**

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- End pipe
- Node N01
- WO-1 Washout Type1
- WO-2 Washout Type2



**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

**NYAKABAAL WATER SUPPLY SYSTEM**

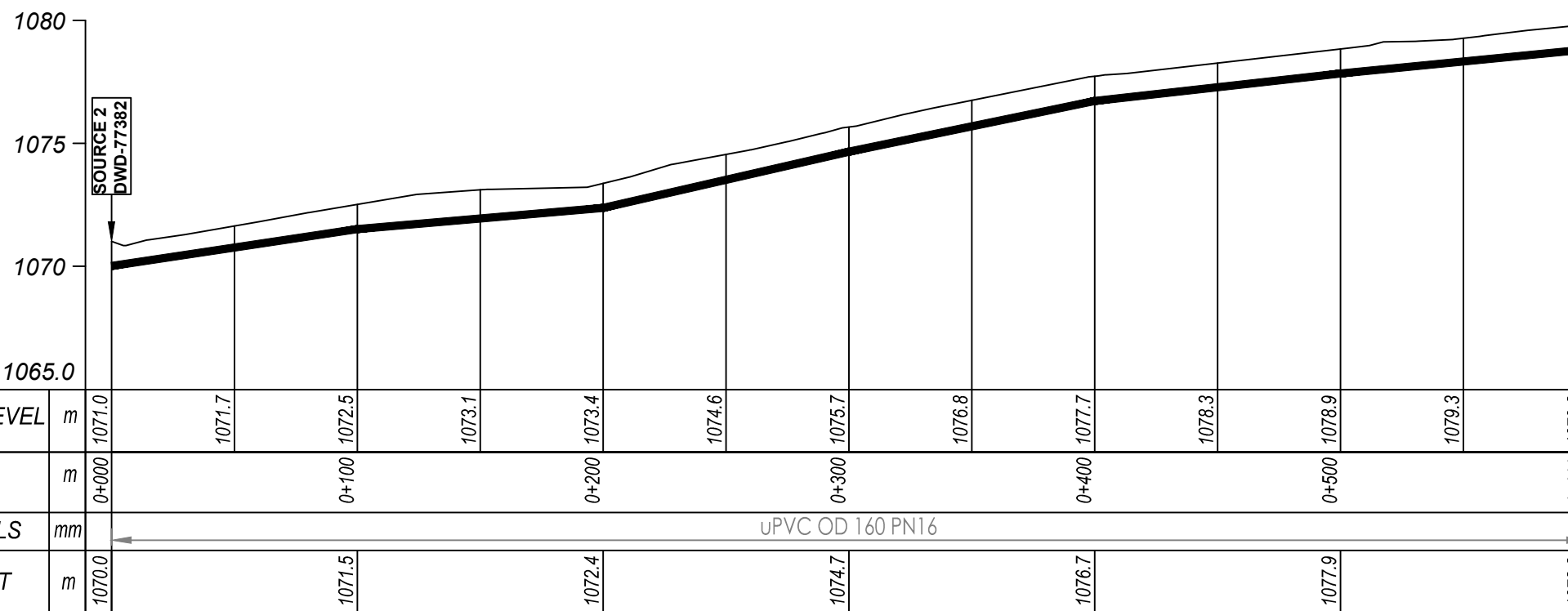
**CONSULTANT**  
 In Joint Venture with   
 Corporate Headquarter  
 10 Phidip Lane, 1st Floor,  
 London EC3M 8AA,  
 United Kingdom

**CONTRACTOR**

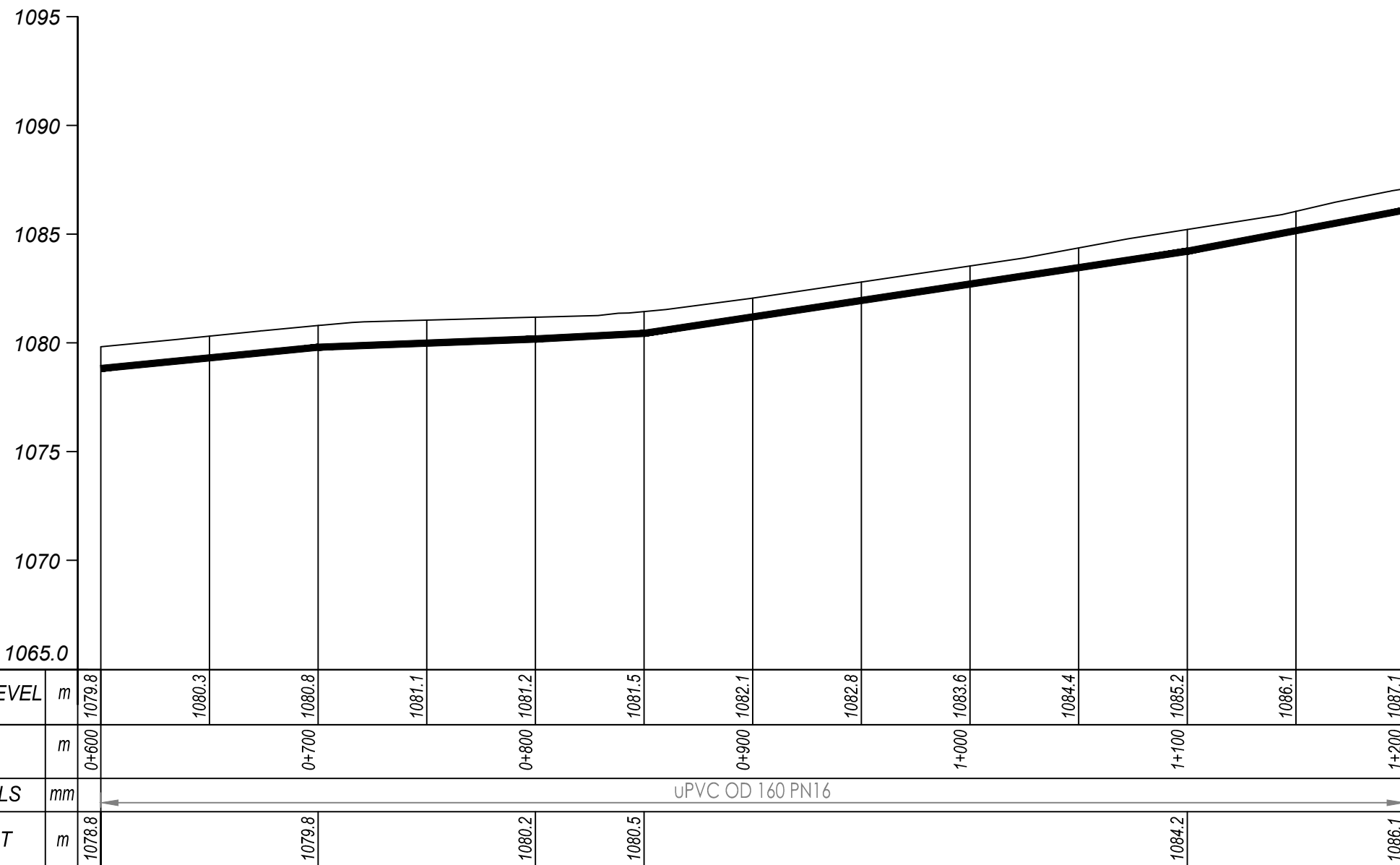
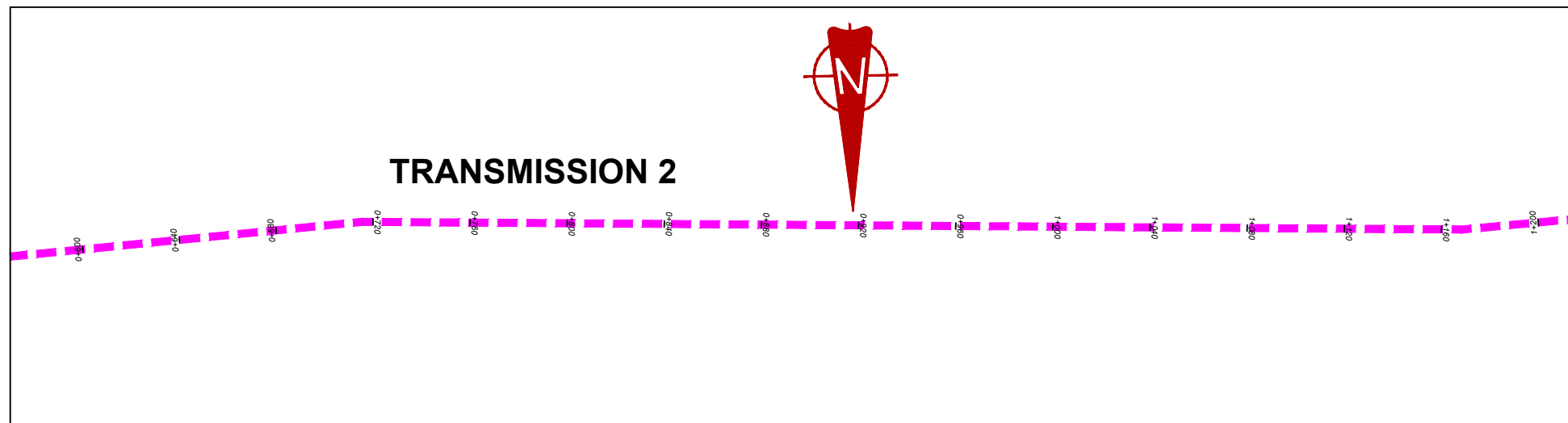
**DETAILED ENGINEERING DESIGN**

**DRAWING TITLE**  
**TRANSMISSION 02**  
**(0+000.00 - 0+600.00)**

**SCALE** Vert. 1:250 DRAWING No. NYA/WS/2.2.1  
 Horz. 1:2500  
**SURVEYED** ... **DESIGNED** Otwane Dan.  
**DRAWN** Joshua Nyarwanda **CHECKED** Rodney Barugahare  
**DATE** April 2021 **APPROVED** Rodney Barugahare.



**TRANSMISSION 2 (0+000.00 - 0+600.00)**

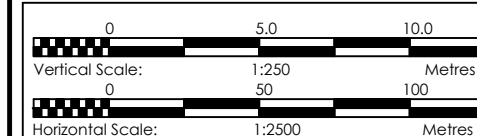


## TRANSMISSION 2 (0+600.00 - 1+200.00)

### NOTES

#### LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- End pipe
- Node N01
- WO-1 Washout Type1
- WO-2 Washout Type2



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

CO-FINANCED BY:  
 AND **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

### NYAKABAALE WATER SUPPLY SYSTEM

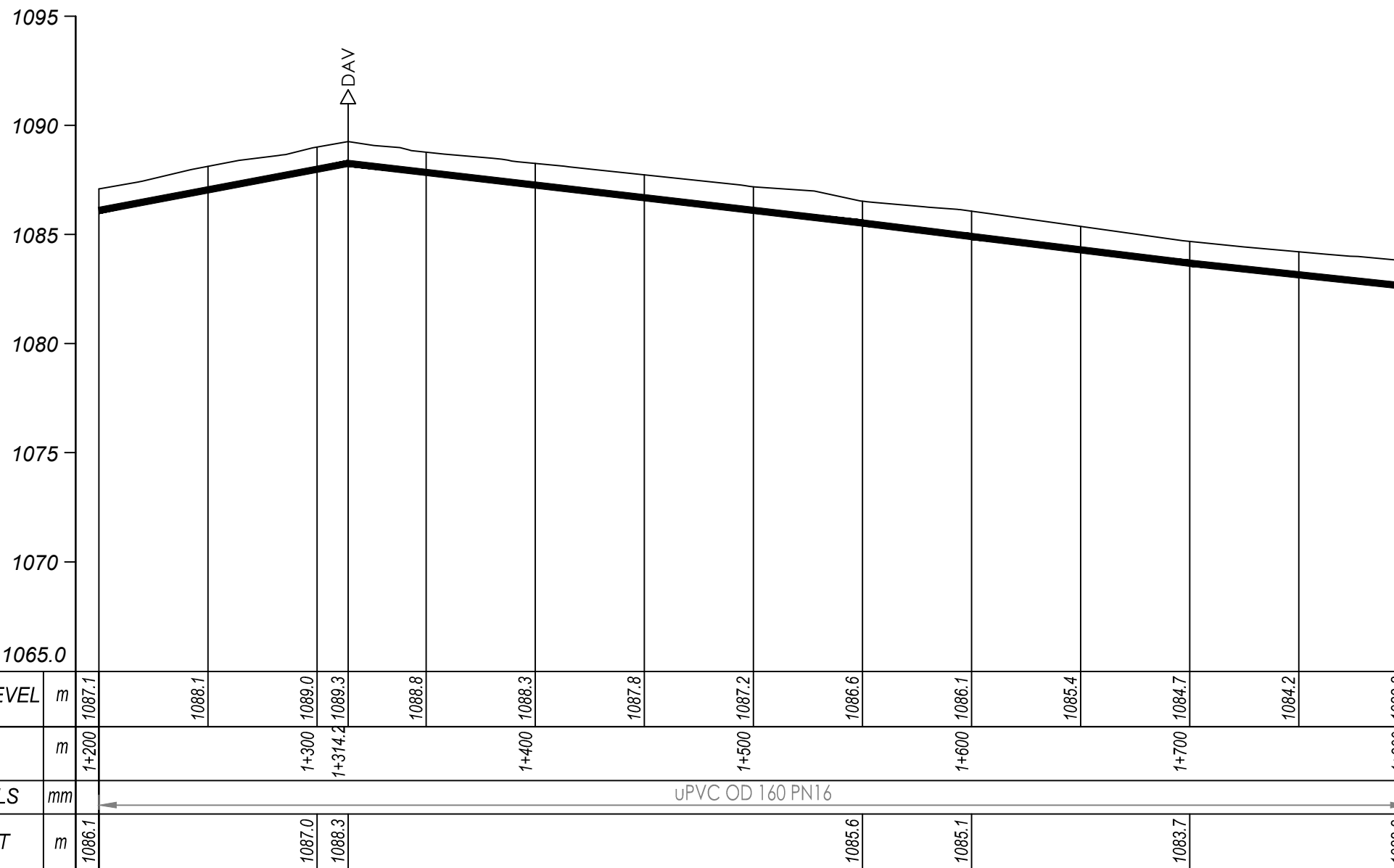
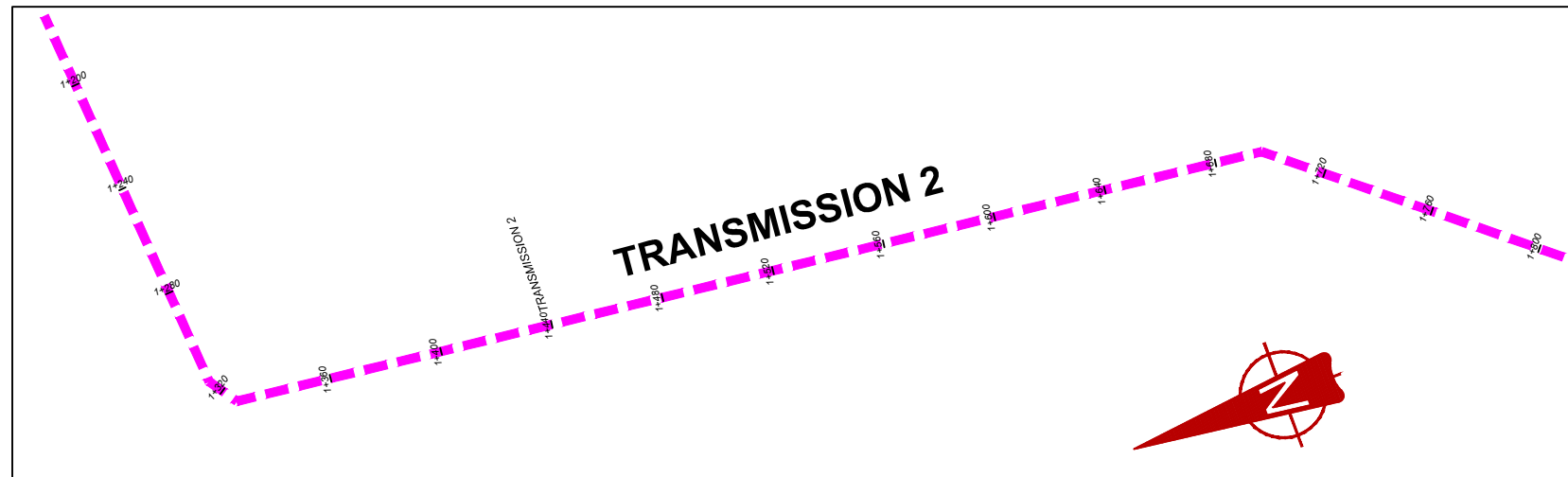
CONSULTANT  
 In Joint Venture with   
 Corporate Headquarter  
 10 Phidip Lane, 1st Floor,  
 London EC3M 8AA,  
 United Kingdom

CONTRACTOR

#### DETAILED ENGINEERING DESIGN

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

SCALE *Vert. 1:250* DRAWING No. NYA/WS/2.2.2  
*Horiz. 1:2500*  
 SURVEYED .... DESIGNED Otwane Dan.  
 DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare  
 DATE April 2021 APPROVED Rodney Barugahare.

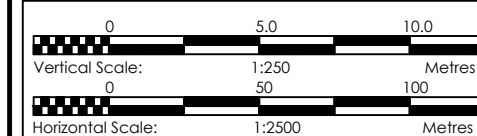


## TRANSMISSION 2 (1+200.00 - 1+800.00)

### NOTES

#### LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- End pipe
- Node N01
- WO-1 Washout Type1
- WO-2 Washout Type2



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

CO-FINANCED BY:  
 AND **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

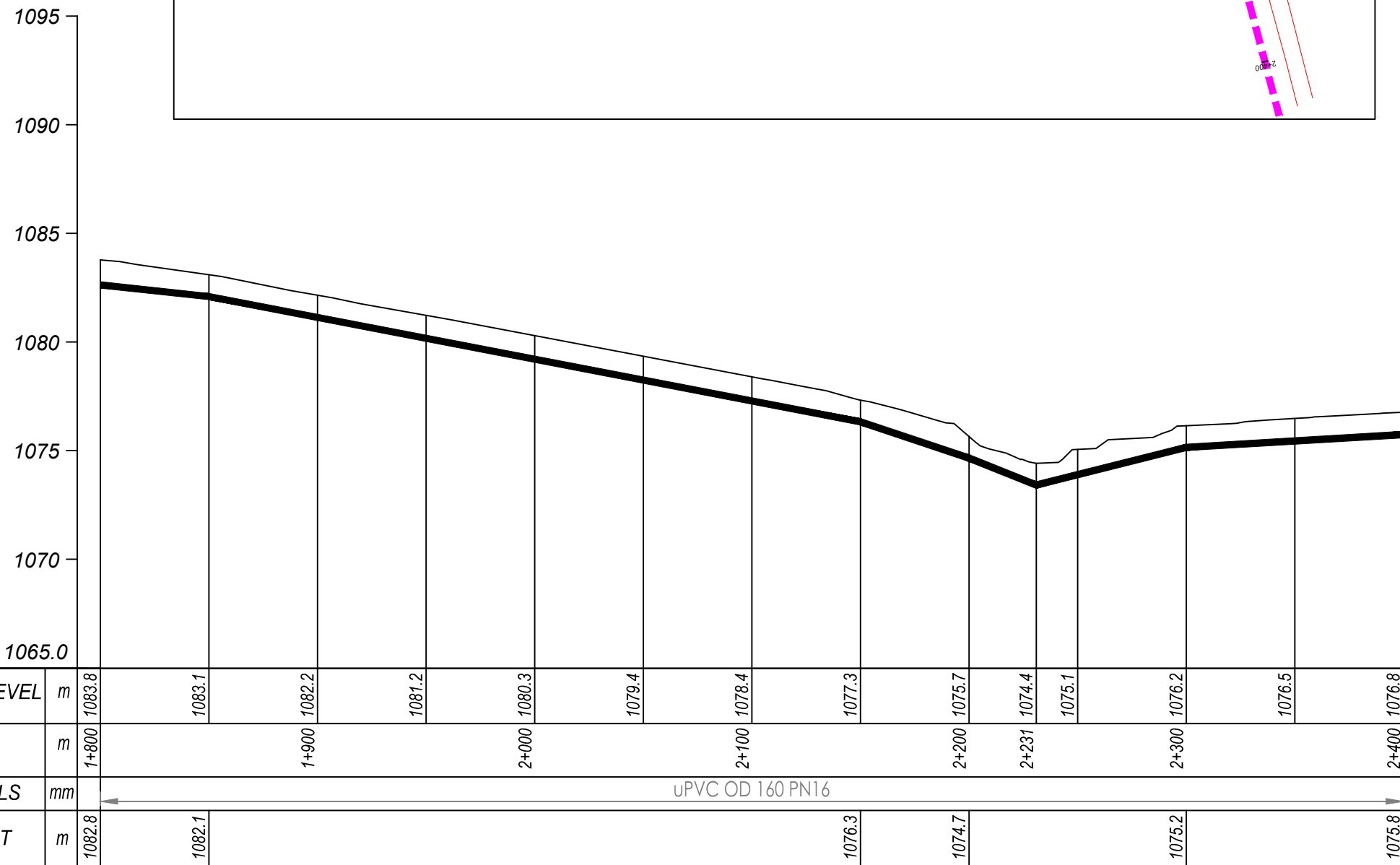
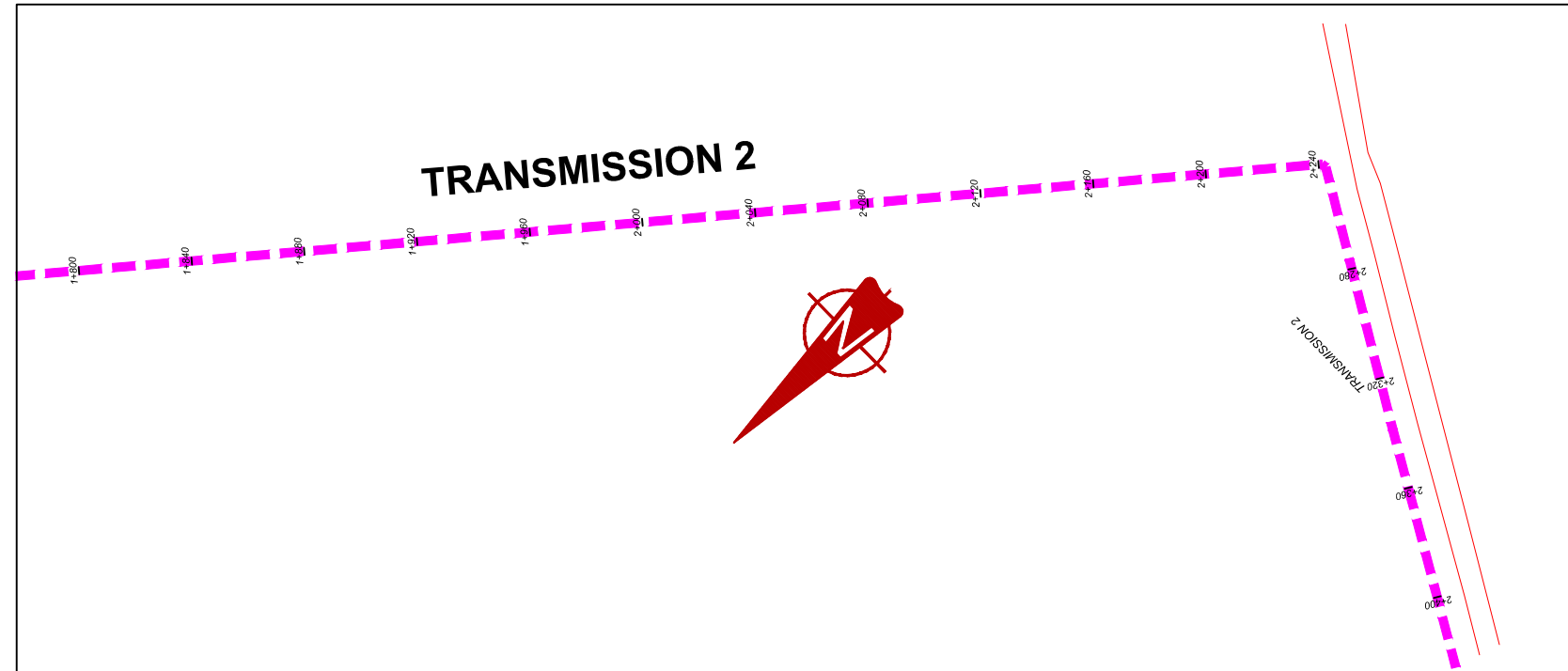
### NYAKABAAL WATER SUPPLY SYSTEM

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

CONTRACTOR

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

SCALE *Vert, 1:250* DRAWING No. NYA/WS/2.2.3  
*Hor, 1:2500*  
 SURVEYED .... DESIGNED Otwane Dan.  
 DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare  
 DATE April 2021 APPROVED Rodney Barugahare.

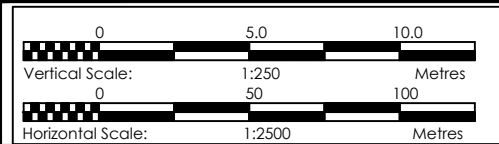


## TRANSMISSION 2 (1+800.00 - 2+400.00)

### NOTES

#### LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- End pipe
- Node N01
- WO-1 Washout Type1
- WO-2 Washout Type2



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

CO-FINANCED BY:  
 AND **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

### NYAKABAAL WATER SUPPLY SYSTEM

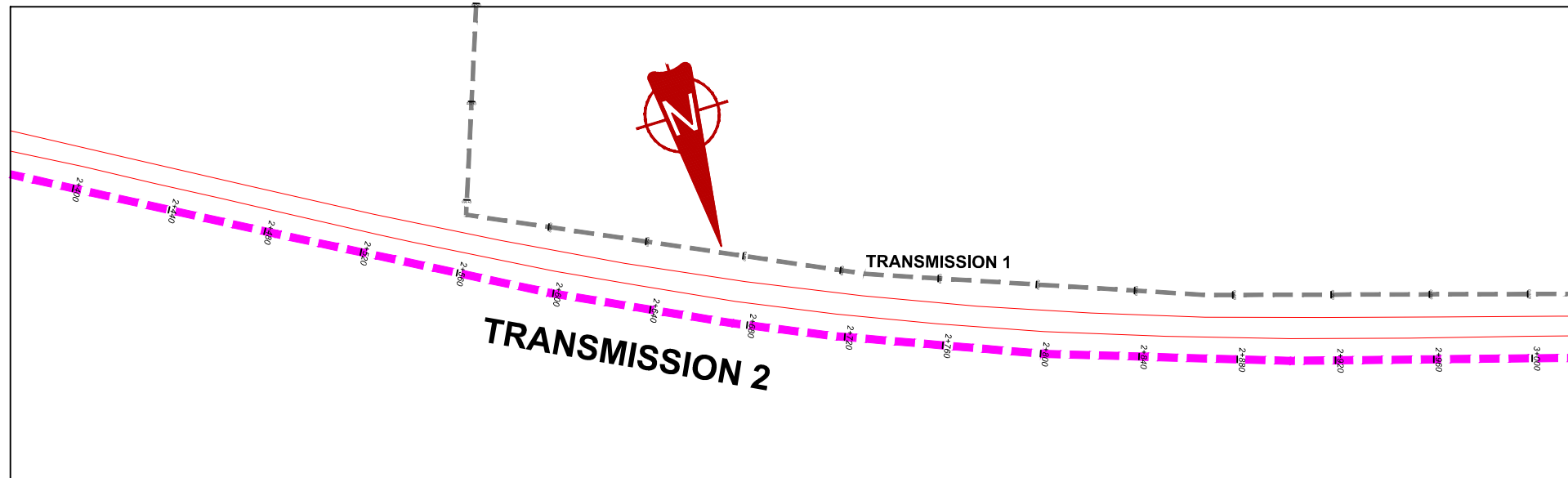
CONSULTANT  
 In Joint Venture with   
 Corporate Headquarter  
 10 Phidip Lane, 1st Floor,  
 London EC3M 8AA,  
 United Kingdom

CONTRACTOR

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

SCALE *Vert, 1:250* DRAWING No. **NYA/WS/2.2.4**  
*Horiz, 1:2500*  
 SURVEYED .... DESIGNED Otwane Dan.  
 DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare  
 DATE April 2021 APPROVED Rodney Barugahare.

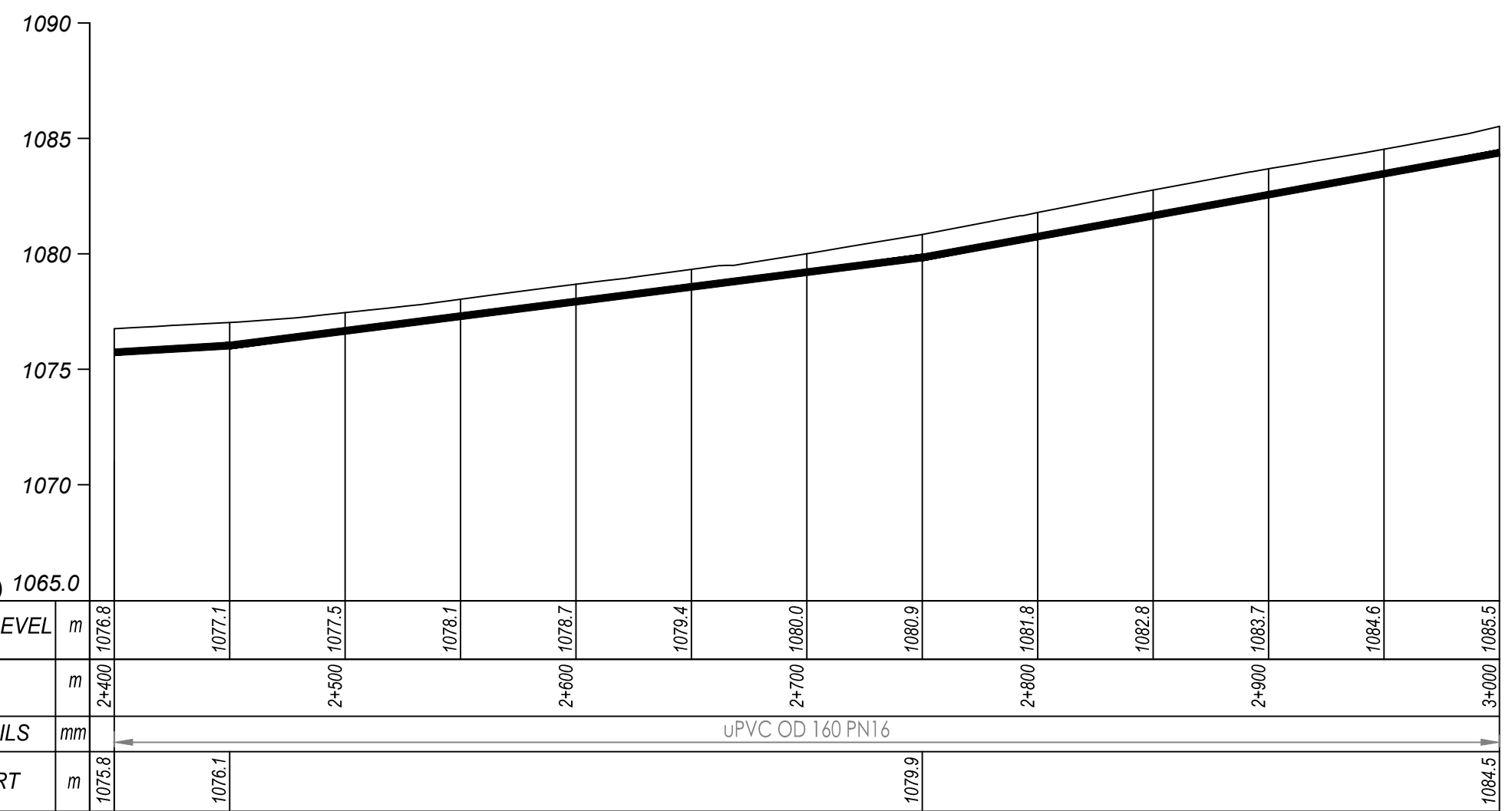




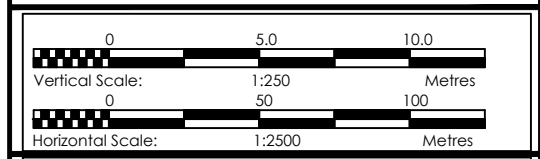
**NOTES**

**LEGEND**

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- End pipe
- Node N01
- WO-1 Washout Type1
- WO-2 Washout Type2



**TRANSMISSION 2 (2+400.00 - 3+000.00)**



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

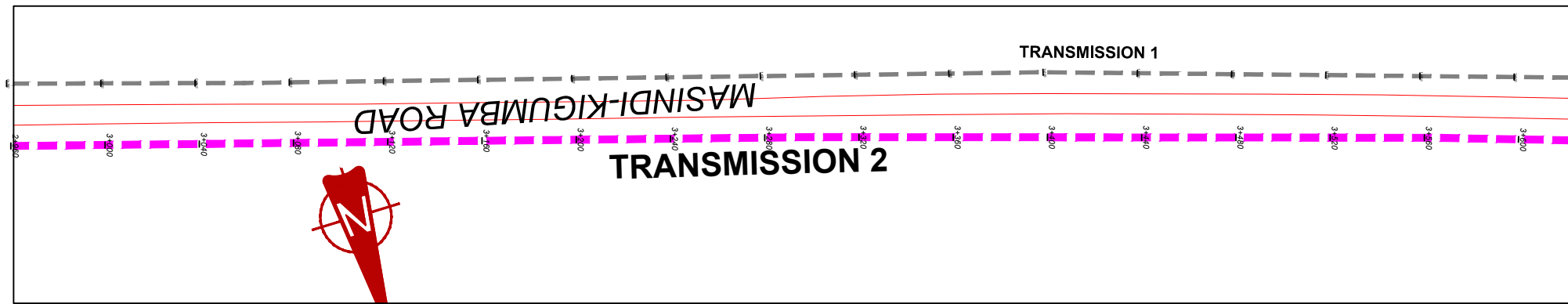
**NYAKABAALE WATER SUPPLY SYSTEM**

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

CONTRACTOR

**DETAILED ENGINEERING DESIGN**  
 DRAWING TITLE **TRANSMISSION 02 (2+400.00 - 3+000.00)**

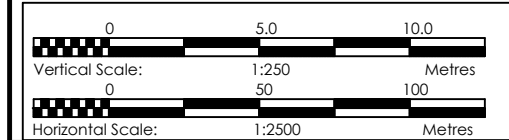
SCALE	Vert, 1:250 Horiz, 1:2500	DRAWING No.	NYA/WS/2.2.5
SURVEYED	....	DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	April 2021	APPROVED	Rodney Barugahare.



**NOTES**

**LEGEND**

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- End pipe
- Node N01
- WO-1 Washout Type1
- WO-2 Washout Type2



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

**NYAKABAALE WATER SUPPLY SYSTEM**

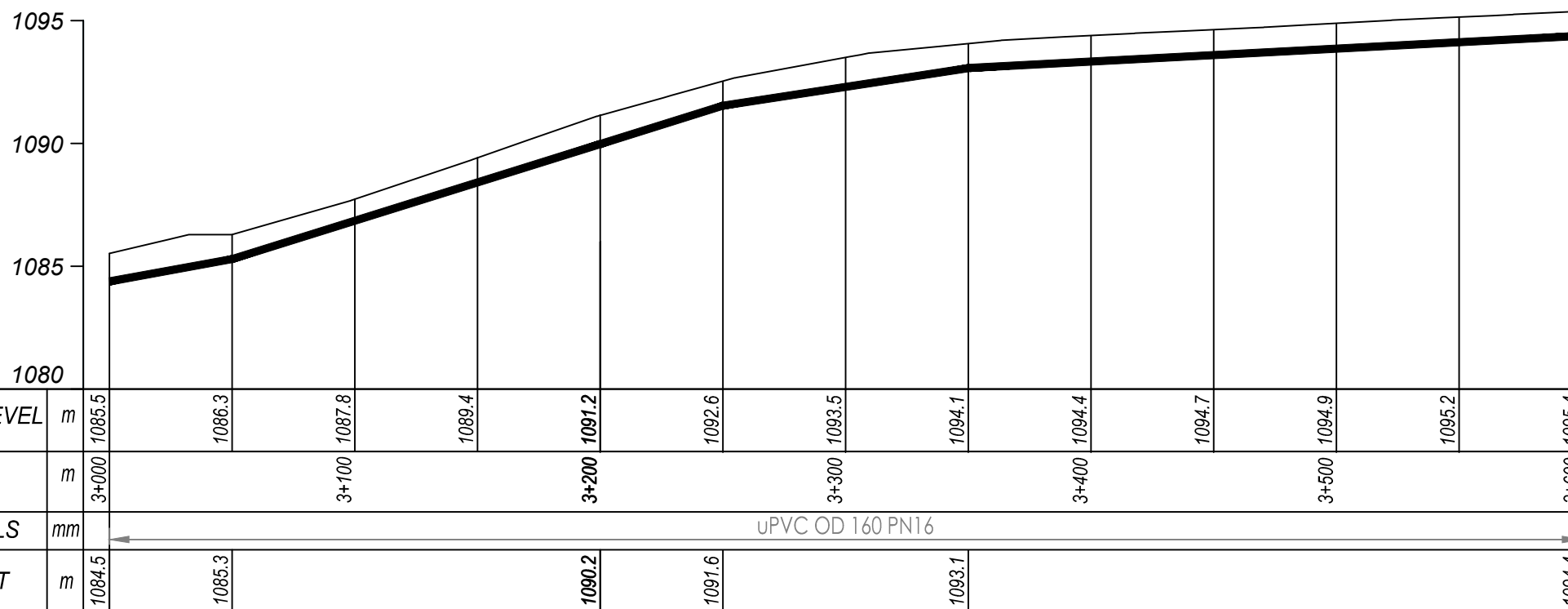
CONSULTANT  
 In Joint Venture with   
 Corporate Headquarter  
 10 Phidip Lane, 1st Floor,  
 London EC3M 8AA,  
 United Kingdom

CONTRACTOR

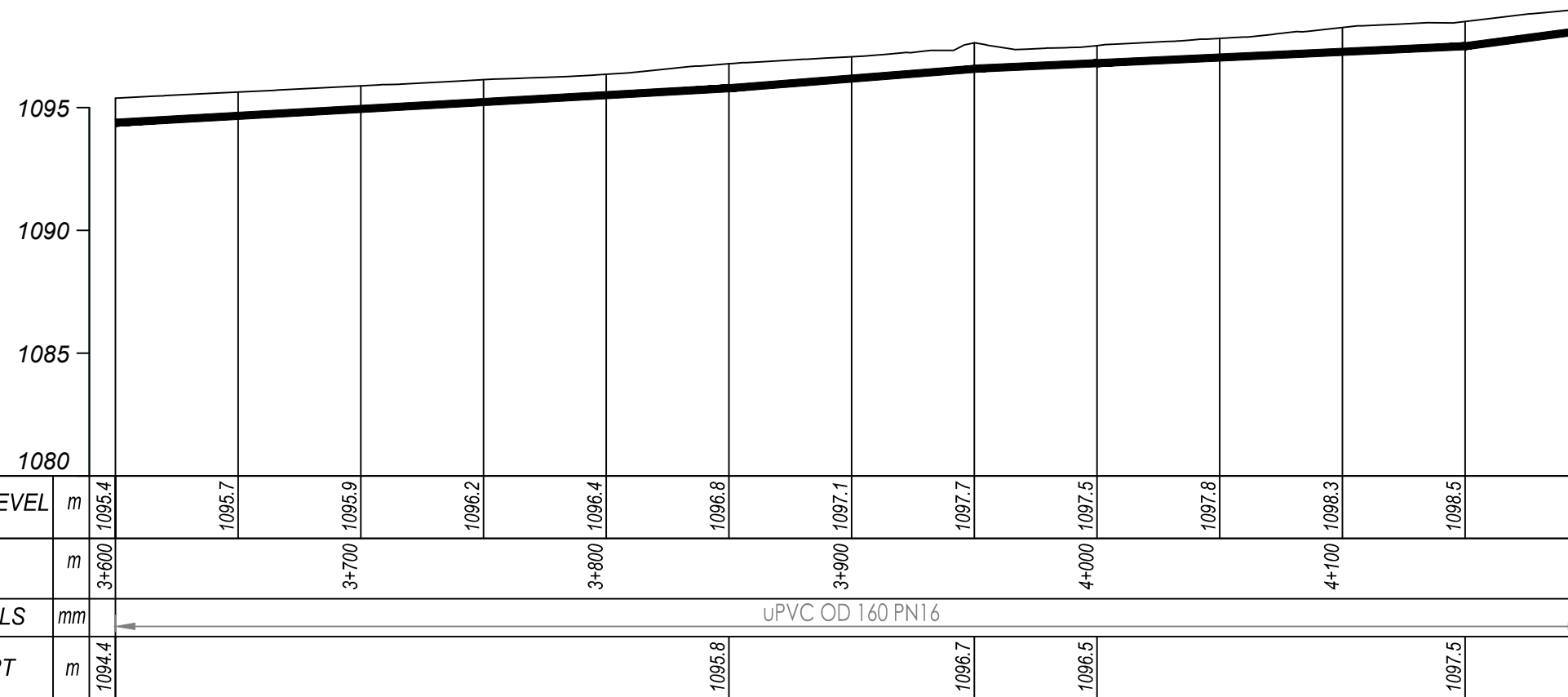
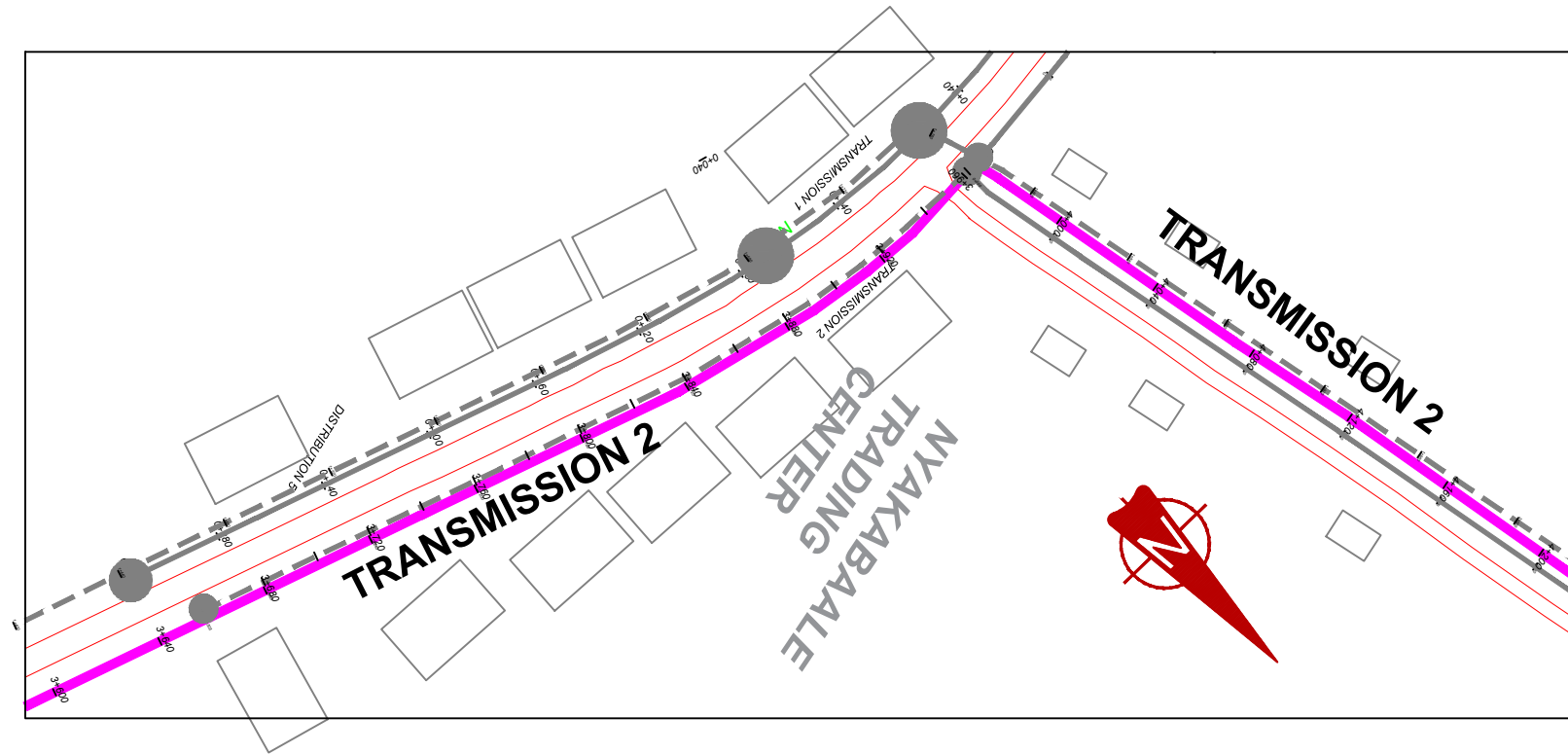
**DETAILED ENGINEERING DESIGN**

DRAWING TITLE **TRANSMISSION 02 (3+000.00 - 3+600.00)**

SCALE	Vert, 1:250 Horiz, 1:2500	DRAWING No.	NYA/WS/2.2.6
SURVEYED	....	DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	April 2021	APPROVED	Rodney Barugahare.



**TRANSMISSION 2 (3+000.00 - 3+600.00)**

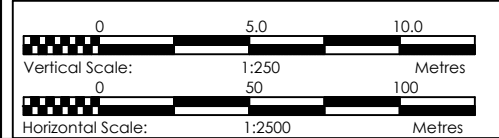


## TRANSMISSION 2 (3+600.00 - 4+200.00)

### NOTES

#### LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- End pipe
- Node N01
- Washout Type1
- Washout Type2



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

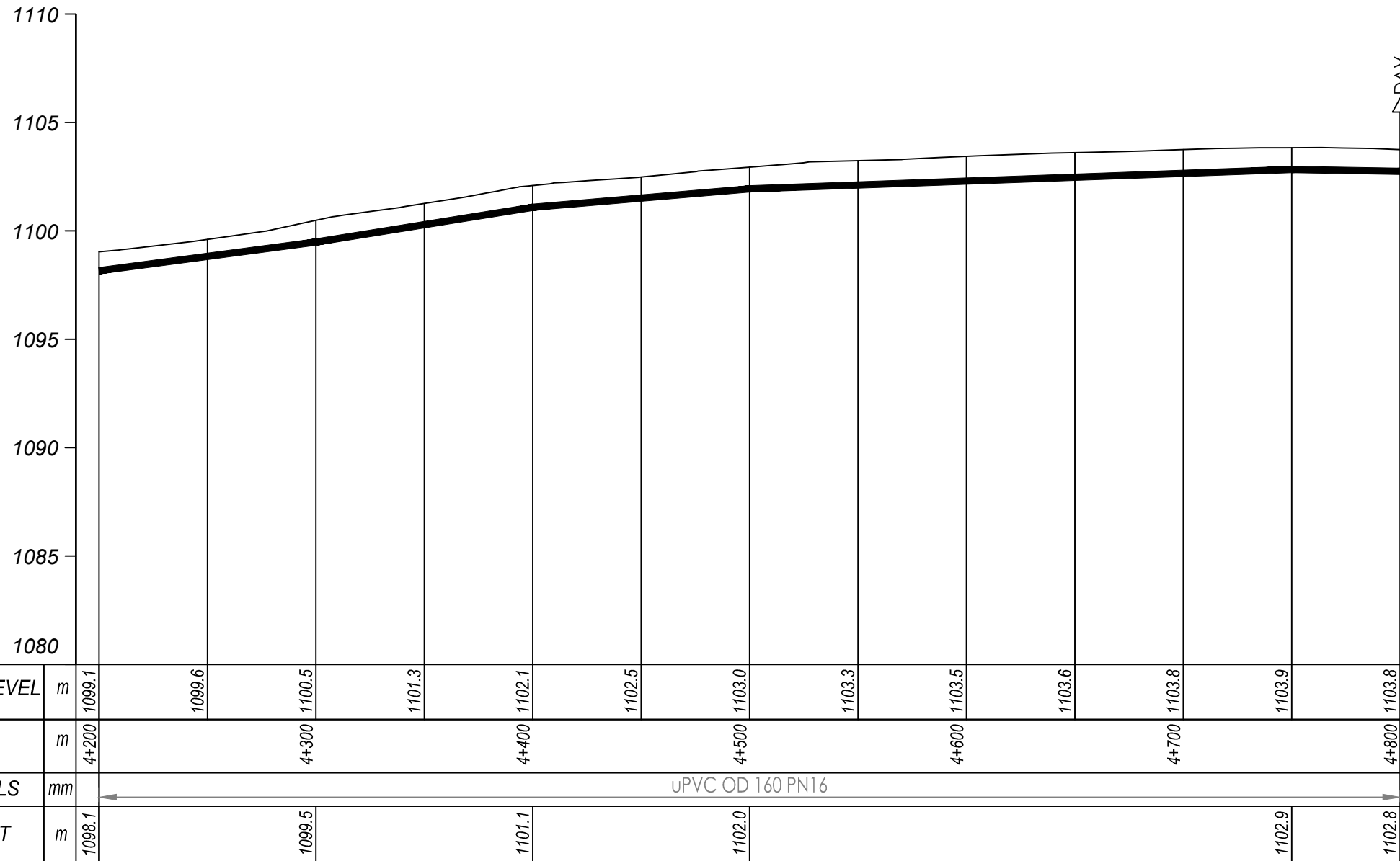
### NYAKABAILE WATER SUPPLY SYSTEM

CONSULTANT  
 In Joint Venture with   
 Corporate Headquarter  
 10 Phidip 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* DRAWING No. NYA/WS/2.2.7  
*Horiz. 1:2500*  
 SURVEYED .... DESIGNED Otwane Dan.  
 DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare  
 DATE April 2021 APPROVED Rodney Barugahare.

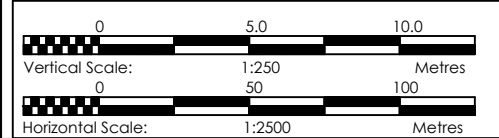


## TRANSMISSION 2 (4+200.00 - 4+800.00)

### NOTES

#### LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- End pipe
- Node N01
- WO-1 Washout Type1
- WO-2 Washout Type2



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

CO-FINANCED BY:  
 AND **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

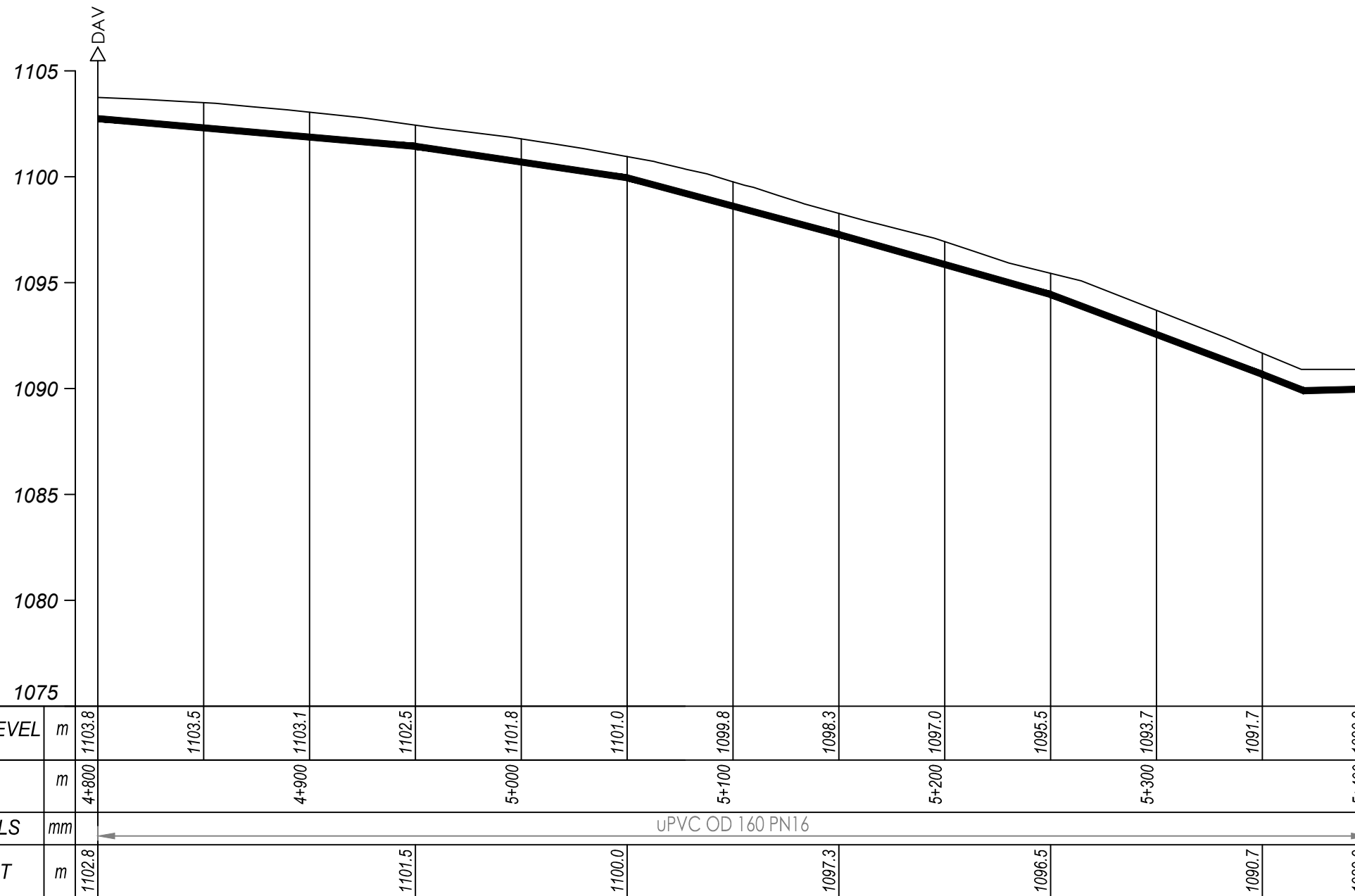
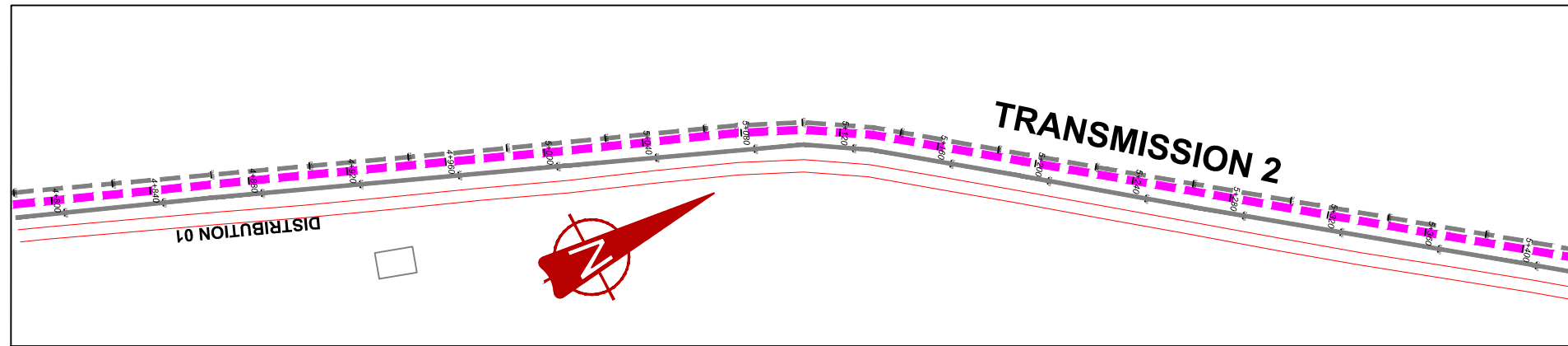
### NYAKABAALE WATER SUPPLY SYSTEM

CONSULTANT  
 In Joint Venture with   
 Corporate Headquarter  
 10 Phidip 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* DRAWING No. NYA/WS/2.2.8  
*Horiz, 1:2500*  
 SURVEYED .... DESIGNED Otwane Dan.  
 DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare  
 DATE April 2021 APPROVED Rodney Barugahare.

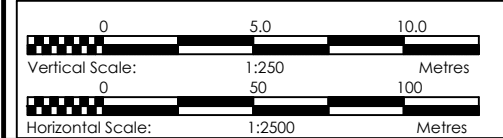


## TRANSMISSION 2 (4+800.00 - 5+400.00)

### NOTES

#### LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- End pipe
- Node N01
- WO-1 Washout Type1
- WO-2 Washout Type2



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

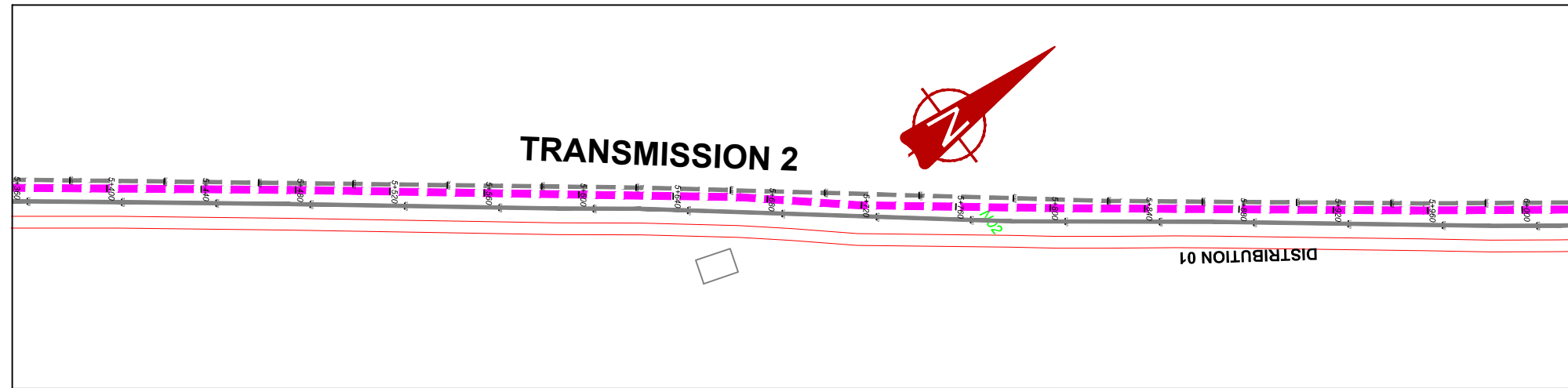
### NYAKABAALE WATER SUPPLY SYSTEM

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

CONTRACTOR

DETAILED ENGINEERING DESIGN  
 DRAWING TITLE **TRANSMISSION 02**  
**(4+800.00 - 5+400.00)**

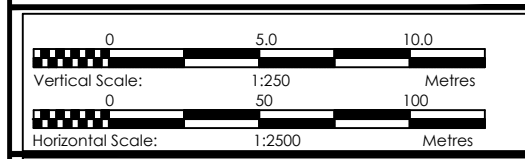
SCALE *Vert, 1:250* DRAWING No. NYA/WS/2.2.9  
*Hori, 1:2500*  
 SURVEYED .... DESIGNED Otwane Dan.  
 DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare  
 DATE April 2021 APPROVED Rodney Barugahare.



**NOTES**

**LEGEND**

- - - Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- End pipe
- Node N01
- WO-1 Washout Type1
- WO-2 Washout Type2



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

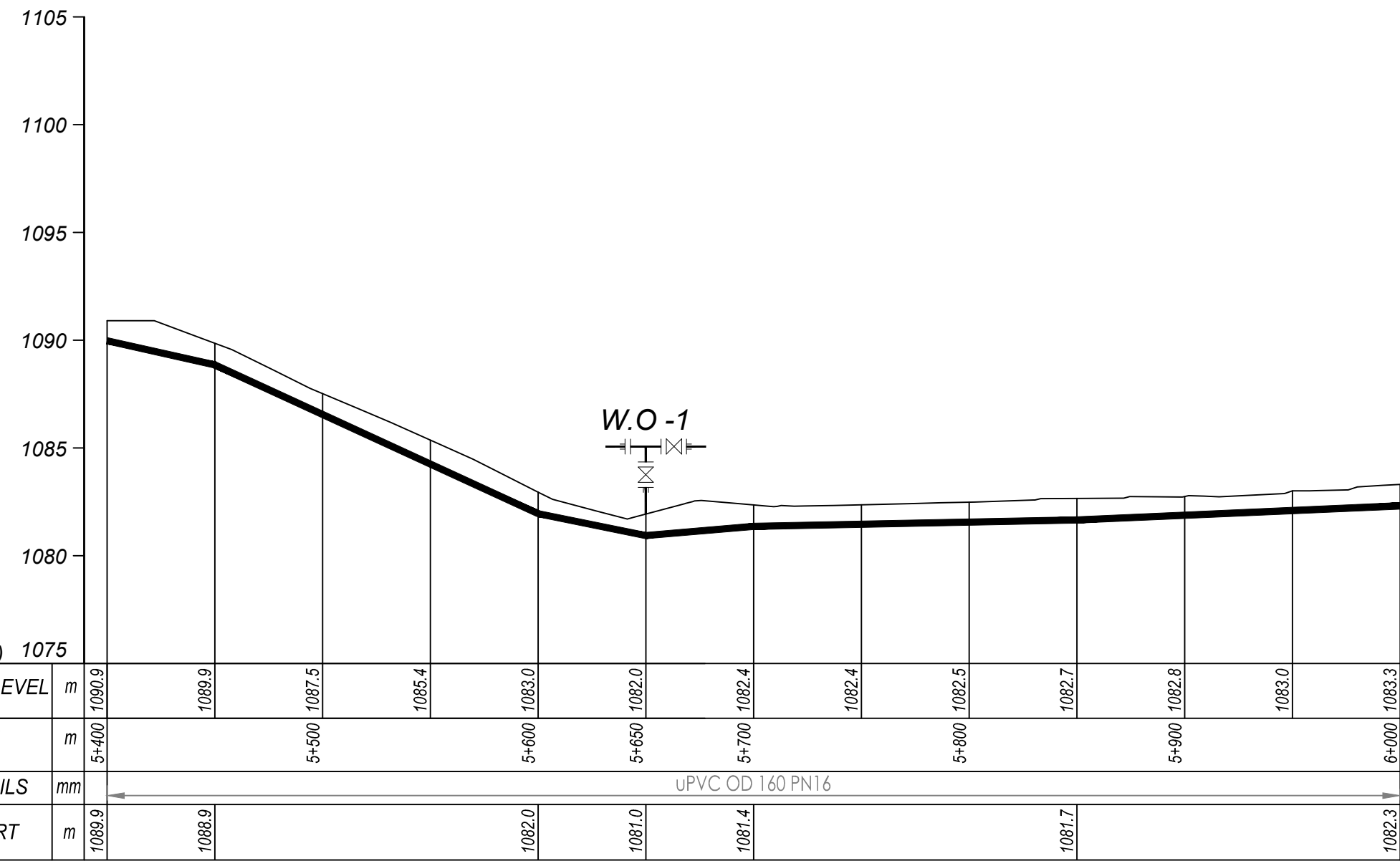
**NYAKABAALE WATER SUPPLY SYSTEM**

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

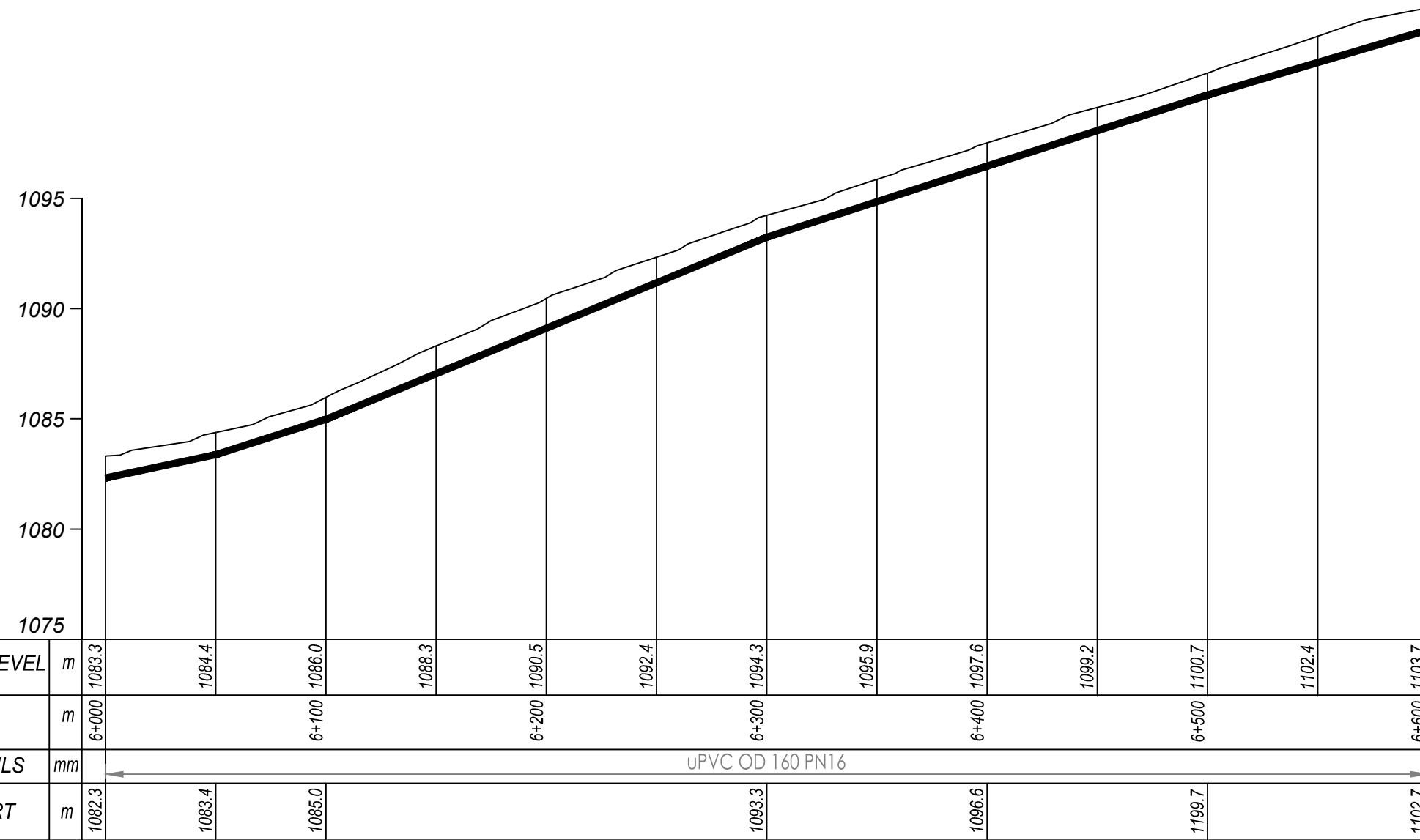
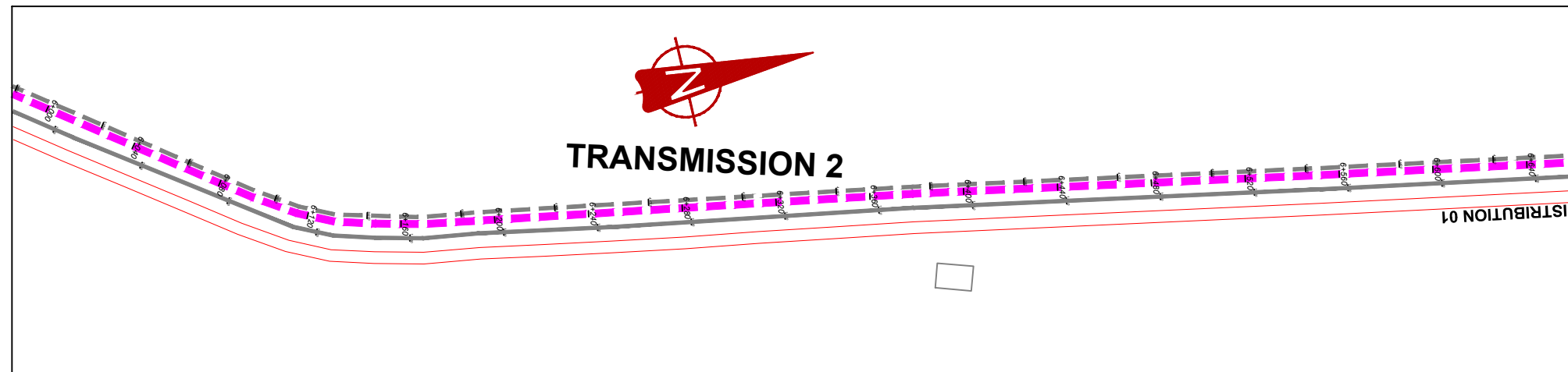
CONTRACTOR

**DETAILED ENGINEERING DESIGN**  
 DRAWING TITLE **TRANSMISSION 02**  
**(5+400.00 - 6+000.00)**

SCALE	Vert, 1:250 Horiz, 1:2500	DRAWING No.	NYA/WS/2.2.10
SURVEYED	....	DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	April 2021	APPROVED	Rodney Barugahare.



**TRANSMISSION 2 (5+400.00 - 6+000.00)**

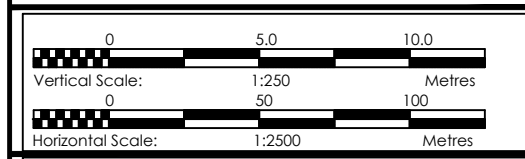


## TRANSMISSION 2 (6+000.00 - 6+600.00)

### NOTES

#### LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- End pipe
- Node N01
- WO-1 Washout Type1
- WO-2 Washout Type2



**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

### NYAKABAALE WATER SUPPLY SYSTEM

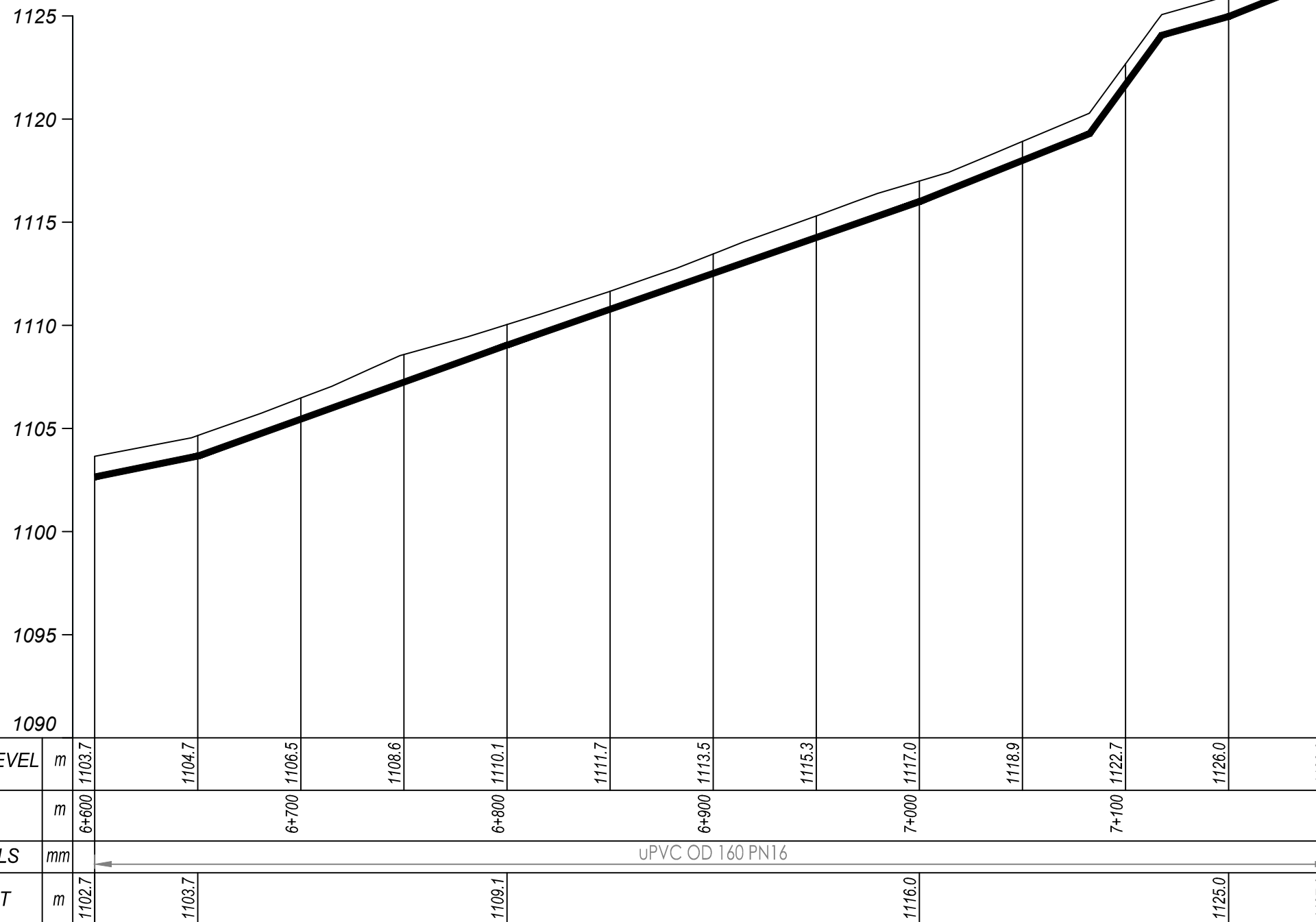
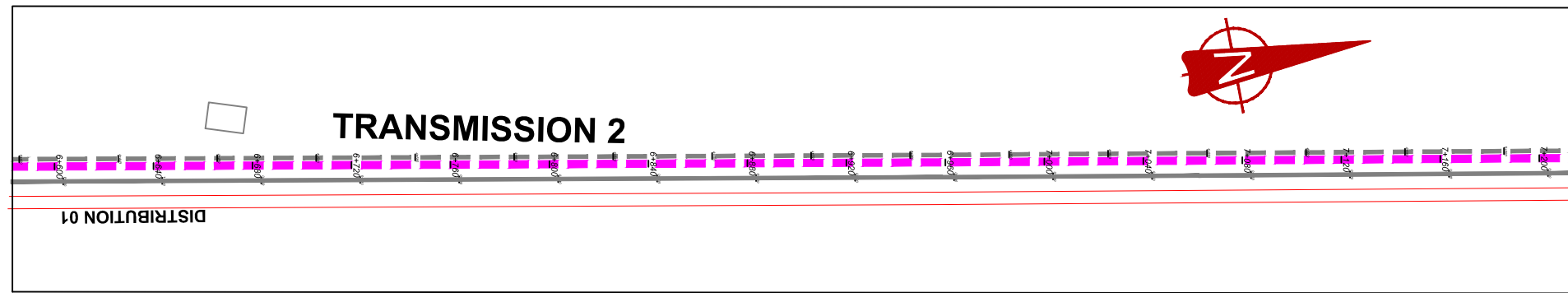
**CONSULTANT**  
 In Joint Venture with   
 Corporate Headquarter  
 10 Phidip Lane, 1st Floor,  
 London EC3M 8AA,  
 United Kingdom

**CONTRACTOR**

**DETAILED ENGINEERING DESIGN**

**DRAWING TITLE** TRANSMISSION 02  
(6+000.00 - 6+600.00)

<b>SCALE</b> Vert, 1:250 Horiz, 1:2500	<b>DRAWING No.</b> NYA/WS/2.2.11
<b>SURVEYED</b> .....	<b>DESIGNED</b> Otwane Dan.
<b>DRAWN</b> Joshua Nyarwanda	<b>CHECKED</b> Rodney Barugahare
<b>DATE</b> April 2021	<b>APPROVED</b> Rodney Barugahare.

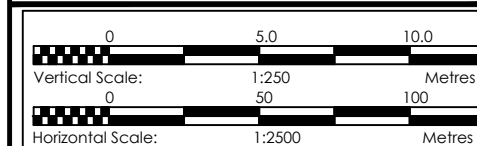


## TRANSMISSION 2 (6+600.00 - 7+200.00)

### NOTES

#### LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- End pipe
- Node N01
- WO-1 Washout Type1
- WO-2 Washout Type2



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

### NYAKABAALE WATER SUPPLY SYSTEM

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

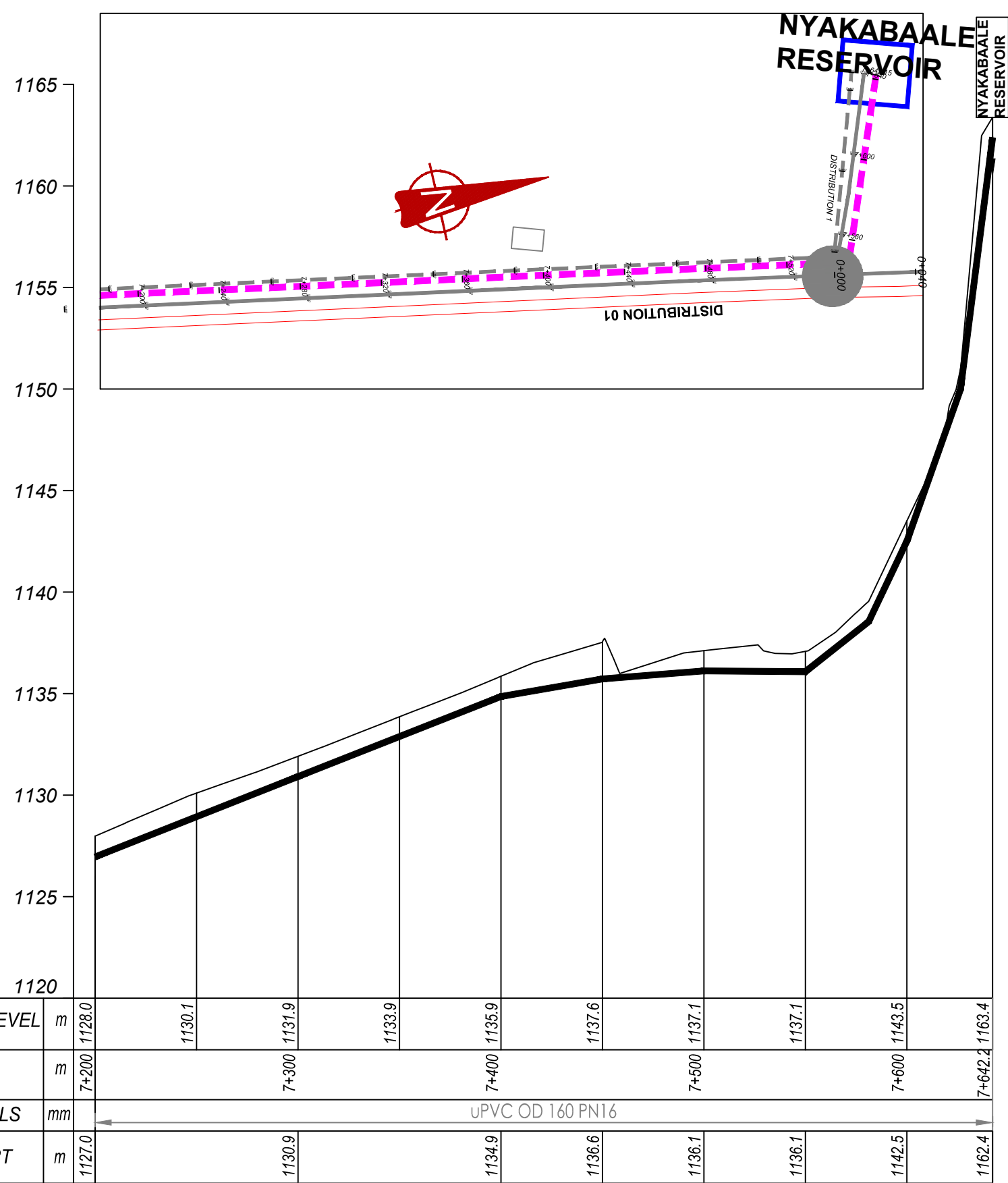
CONTRACTOR

#### DETAILED ENGINEERING DESIGN

DRAWING TITLE **TRANSMISSION 02**  
**(6+600.00 - 7+200.00)**

SCALE Vert. 1:250  
 Horiz. 1:2500 DRAWING No. NYA/WS/2.2.12  
 SURVEYED ... DESIGNED Otwane Dan.  
 DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare  
 DATE April 2021 APPROVED Rodney Barugahare.



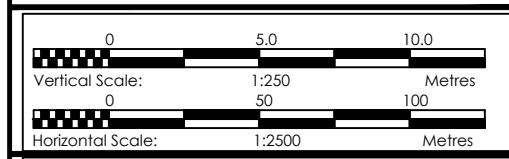


## TRANSMISSION 2 (7+200 - 7+642.2)

### 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
- WO-2 Washout Type2



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

CO-FINANCED BY:  
 AND **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

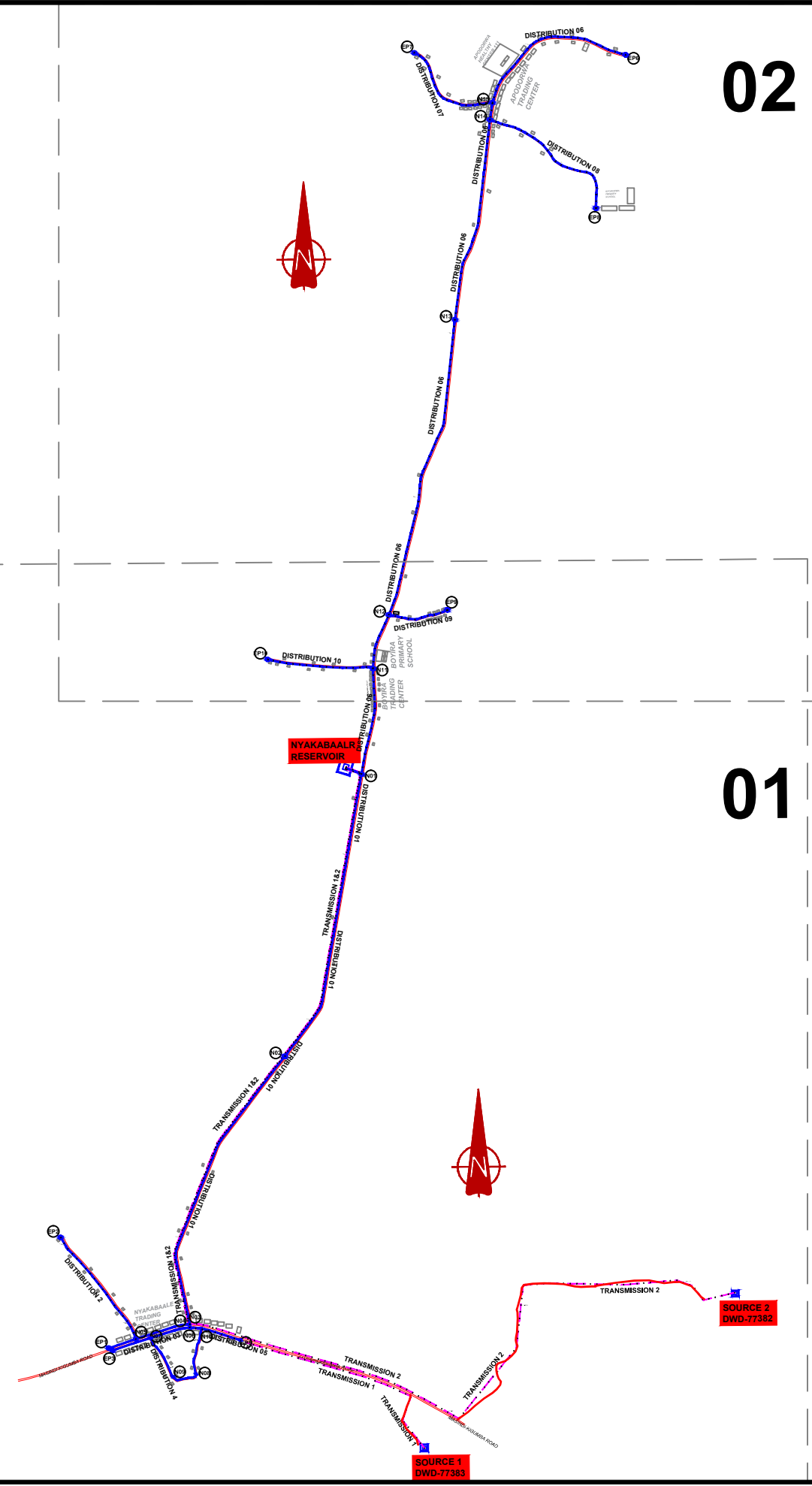
### NYAKABAAL WATER SUPPLY SYSTEM

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

CONTRACTOR

DETAILED ENGINEERING DESIGN  
 DRAWING TITLE **TRANSMISSION 02 (7+200 - 7+642.2)**

SCALE	Vert, 1:250 Hor, 1:2500	DRAWING No.	NYA/WS/2.2.13
SURVEYED	....	DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	April 2021	APPROVED	Rodney Barugahare.



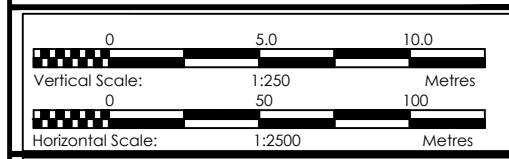
02

01

**NOTES**

**LEGEND**

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- End pipe
- Node N01
- WO-1 Washout Type1
- WO-2 Washout Type2



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

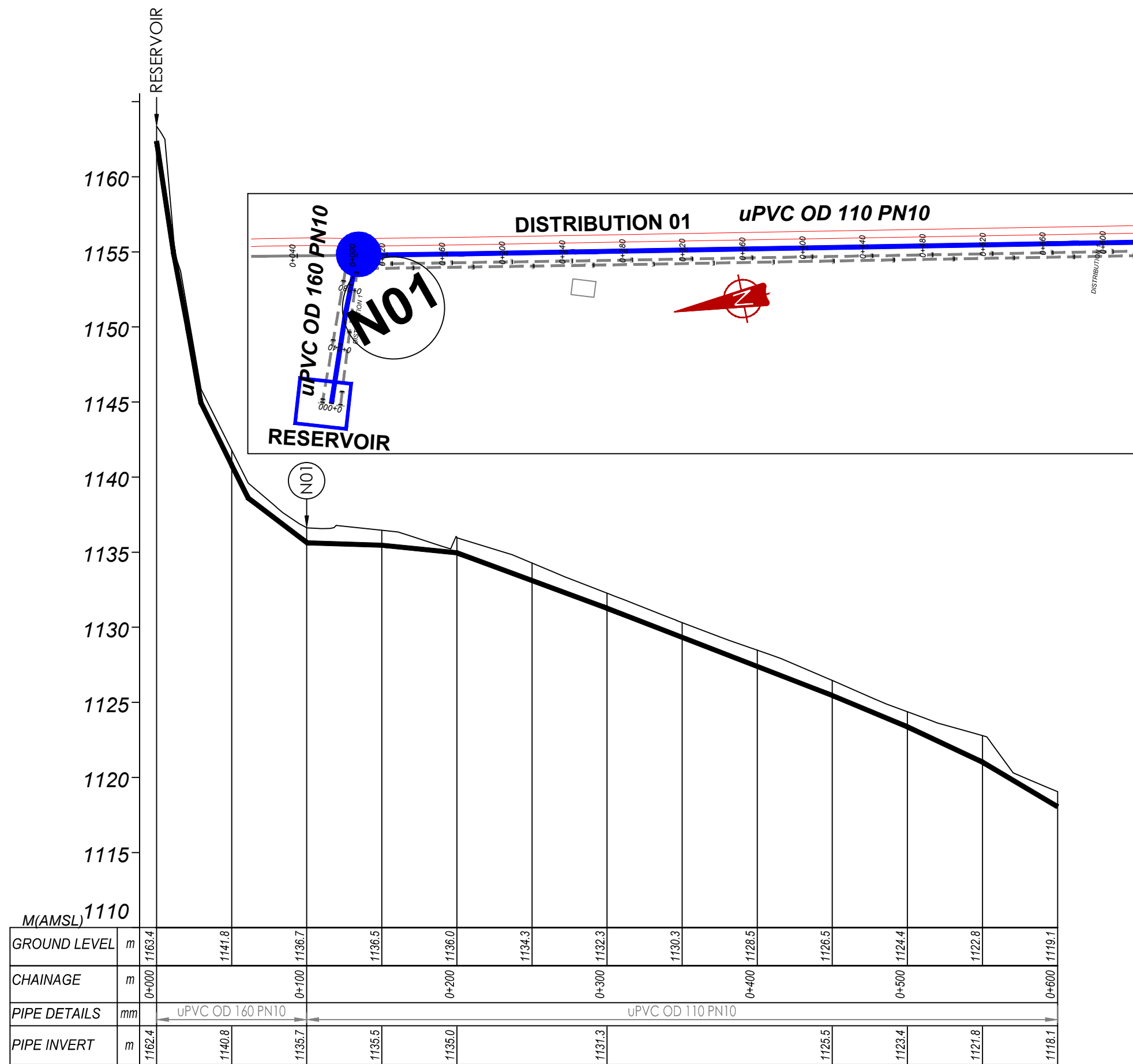
**NYAKABAAL WATER SUPPLY SYSTEM**

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

CONTRACTOR

**DETAILED ENGINEERING DESIGN**  
 DRAWING TITLE **GENERAL LAYOUT TRANSMISSION AND DISTRIBUTION NETWORK**

SCALE	DRAWING No.	NYA/WS/0.0.0
SURVEYED	DESIGNED	Otwane Dan.
DRAWN Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE April 2021	APPROVED	Rodney Barugahare.

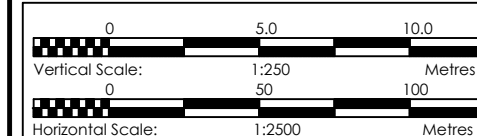


**DISTRIBUTION 1 (0+000.00 - 0+600.00)**

**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
- WO-2 Washout Type2



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

CO-FINANCED BY:  
 AND **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

**NYAKABAAL WATER SUPPLY SYSTEM**

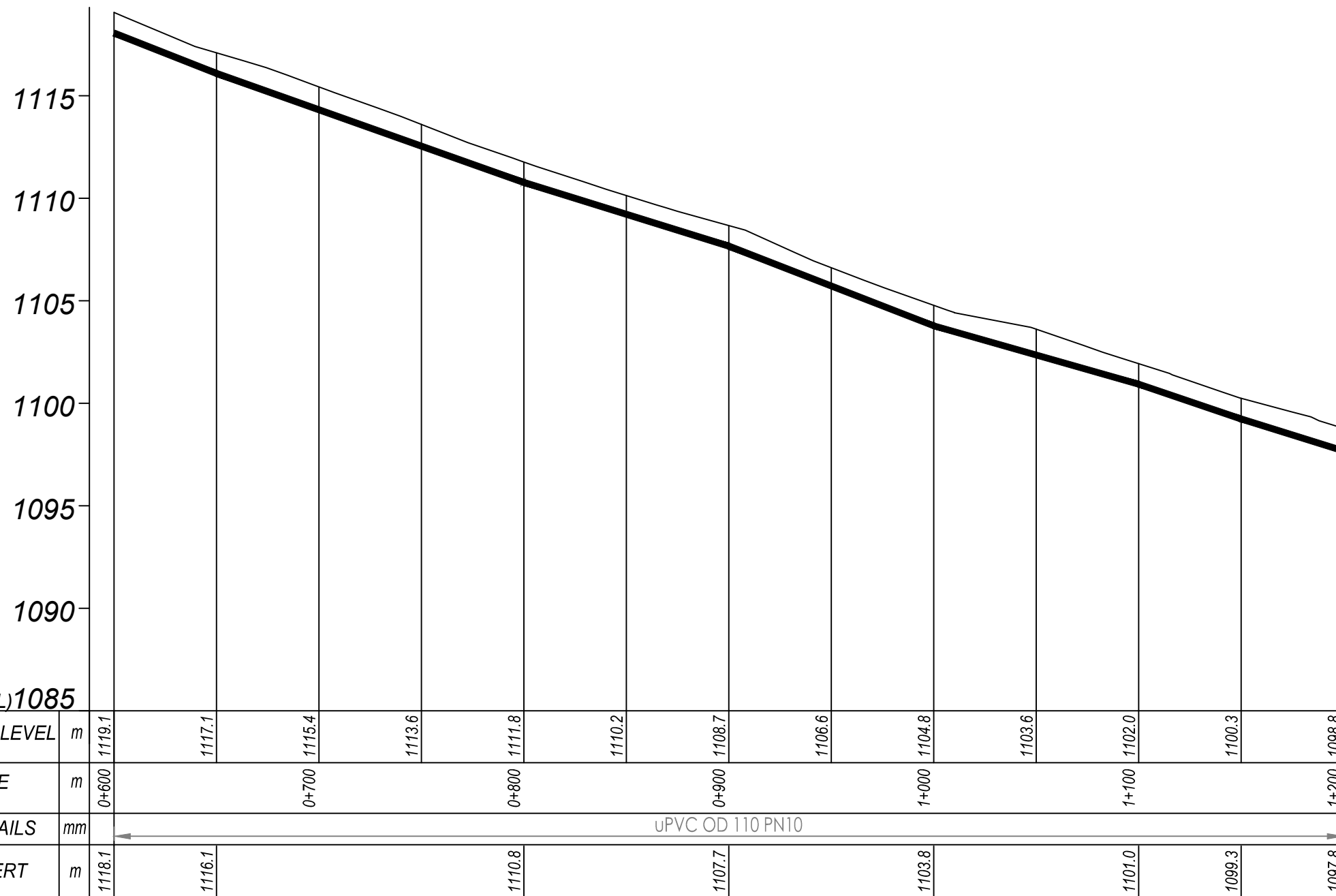
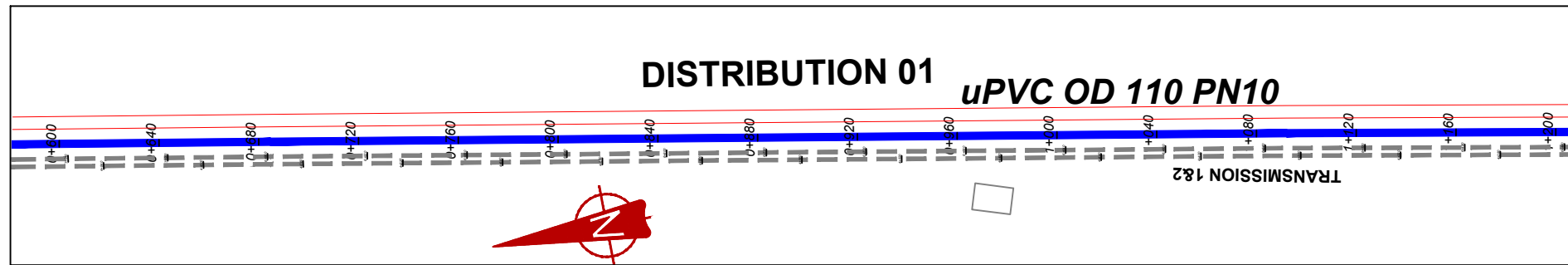
CONSULTANT  
**SARI** In Joint Venture with **SGAPI**  
 Corporate Headquarter  
 10 Phidip Lane, 1st Floor,  
 London EC3M 8AA,  
 United Kingdom

CONTRACTOR

**DETAILED ENGINEERING DESIGN**

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

SCALE *Vert. 1:250* DRAWING No. *Hori. 1:2500* NYA/WS/5.1.1  
 SURVEYED .... DESIGNED Otwane Dan.  
 DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare  
 DATE April 2021 APPROVED Rodney Barugahare.

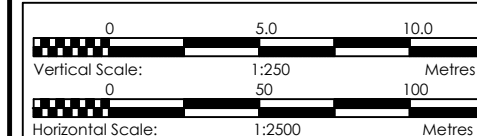


## DISTRIBUTION 1 (0+600.00 - 1+200.00)

### NOTES

#### LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- End pipe
- Node N01
- Washout Type1
- Washout Type2



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

CO-FINANCED BY:  
 AND **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

### NYAKABAAL WATER SUPPLY SYSTEM

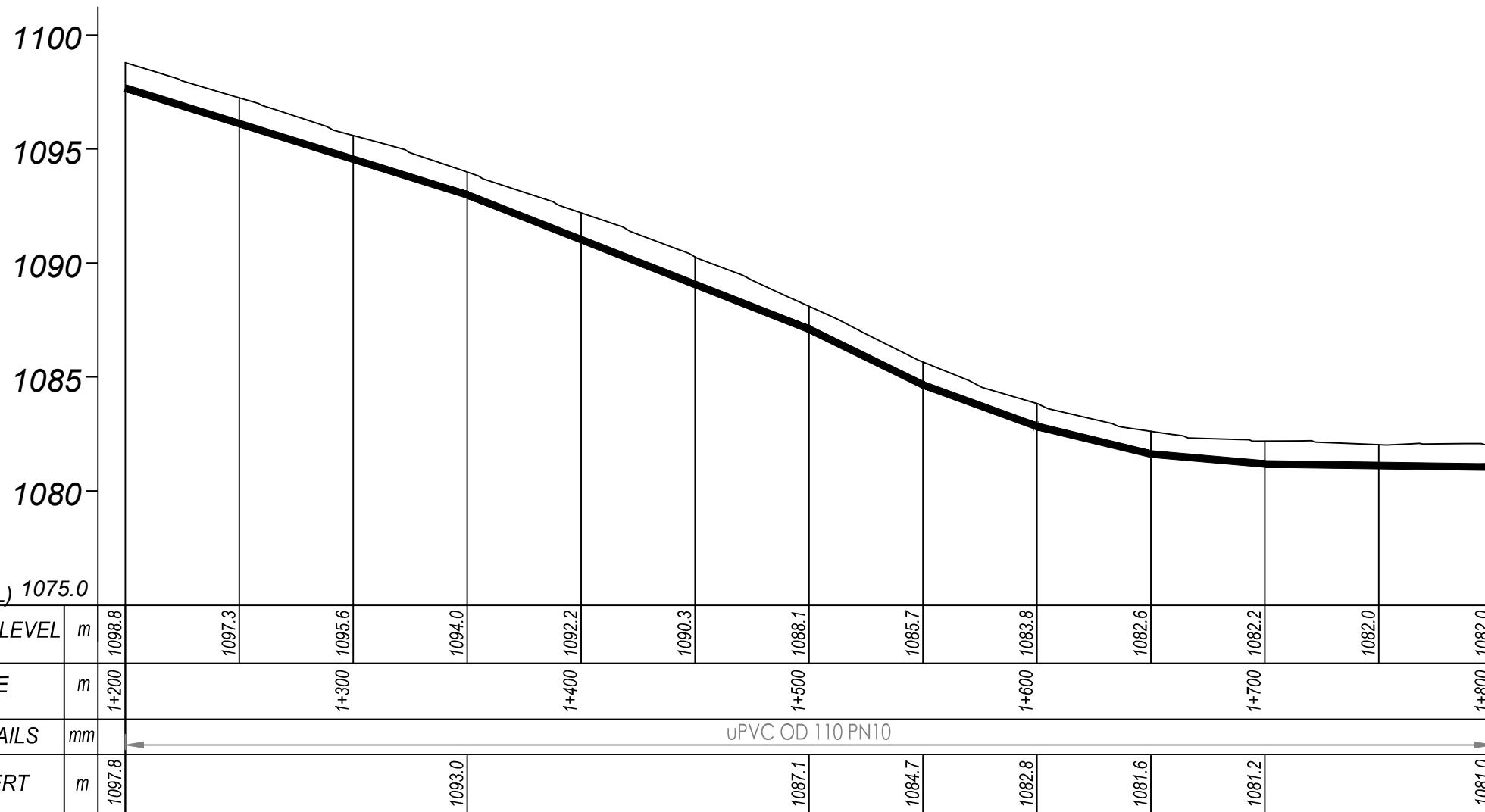
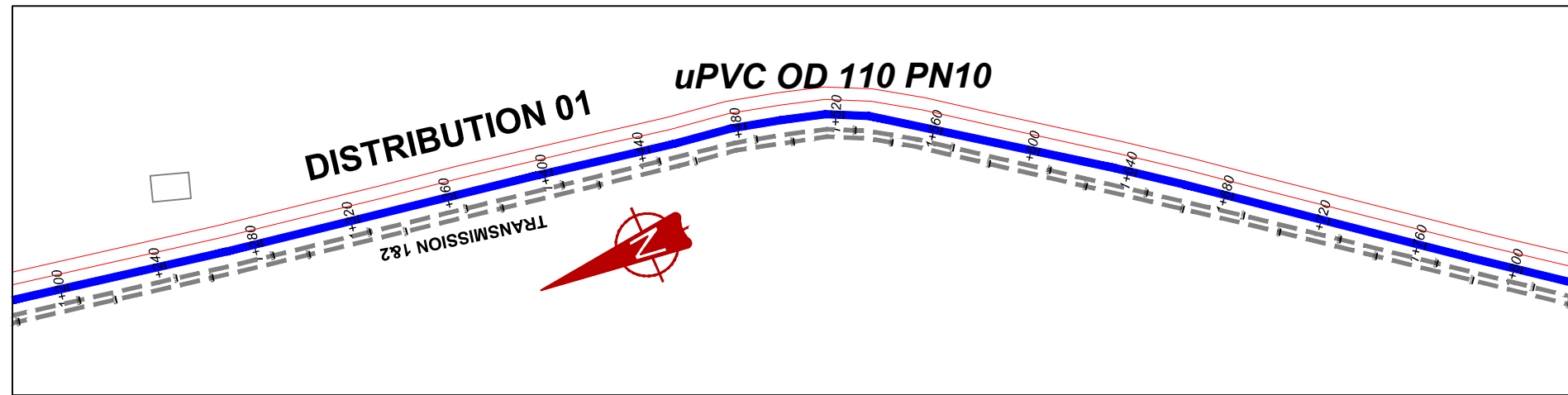
CONSULTANT  
**SARI** In Joint Venture with **SGAPI**  
 Corporate Headquarter  
 10 Phisgod Lane, 1st Floor,  
 London EC3M 8AA,  
 United Kingdom

CONTRACTOR

#### DETAILED ENGINEERING DESIGN

DRAWING TITLE **DISTRIBUTION 01**  
**(0+600.00 - 1+200.00)**

SCALE *Vert. 1:250* DRAWING No. **NYA/WS/5.1.2**  
*Horiz. 1:2500*  
 SURVEYED ... DESIGNED *Otwane Dan.*  
 DRAWN *Joshua Nyarwanda* CHECKED *Rodney Barugahare*  
 DATE *April 2021* APPROVED *Rodney Barugahare.*

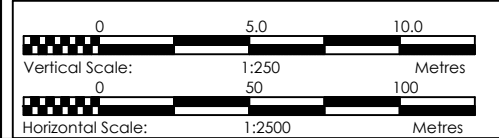


**DISTRIBUTION 1 (1+200.00 - 1+800.00)**

**NOTES**

**LEGEND**

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- End pipe
- Node N01
- Washout Type1
- Washout Type2



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

CO-FINANCED BY:  
 AND **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

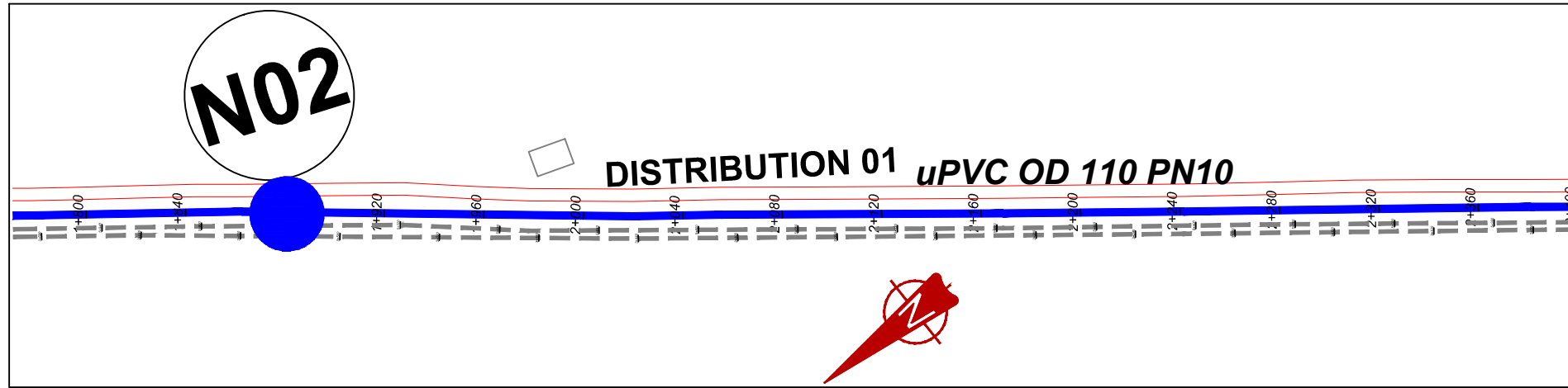
**NYAKABAALE WATER SUPPLY SYSTEM**

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

CONTRACTOR

**DETAILED ENGINEERING DESIGN**  
 DRAWING TITLE **DISTRIBUTION 01**  
**1+200.00 - 1+800.00**

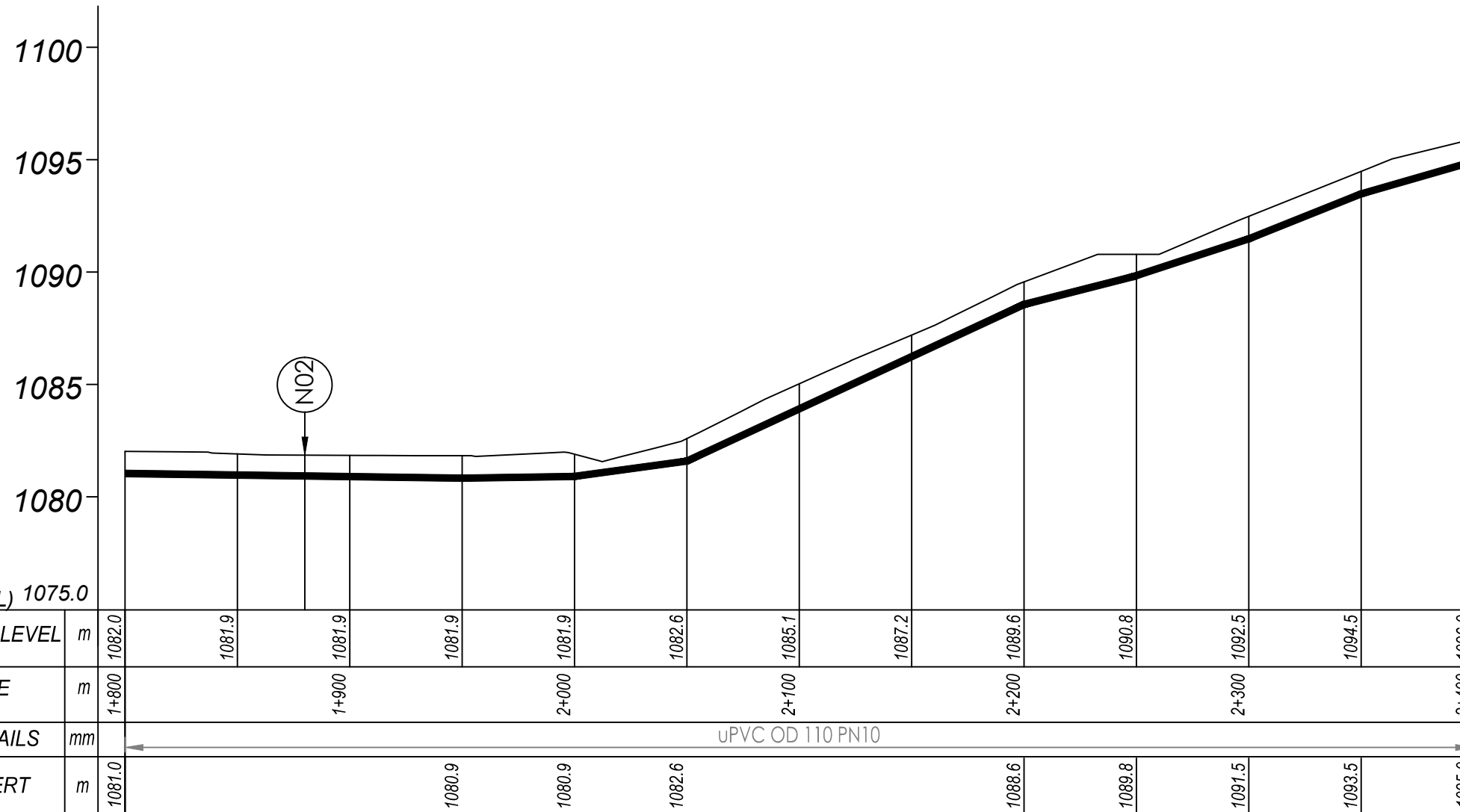
SCALE *Vert, 1:250* DRAWING No. NYA/WS/5.1.3  
*Horiz, 1:2500*  
 SURVEYED .... DESIGNED Otwane Dan.  
 DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare  
 DATE April 2021 APPROVED Rodney Barugahare.



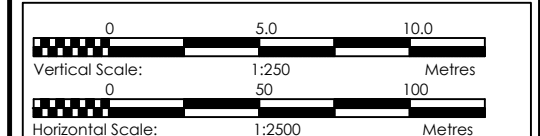
**NOTES**

**LEGEND**

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- End pipe
- Node N01
- WO-1 Washout Type1
- WO-2 Washout Type2



**DISTRIBUTION 1 (1+800.00 - 2+400.00)**



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

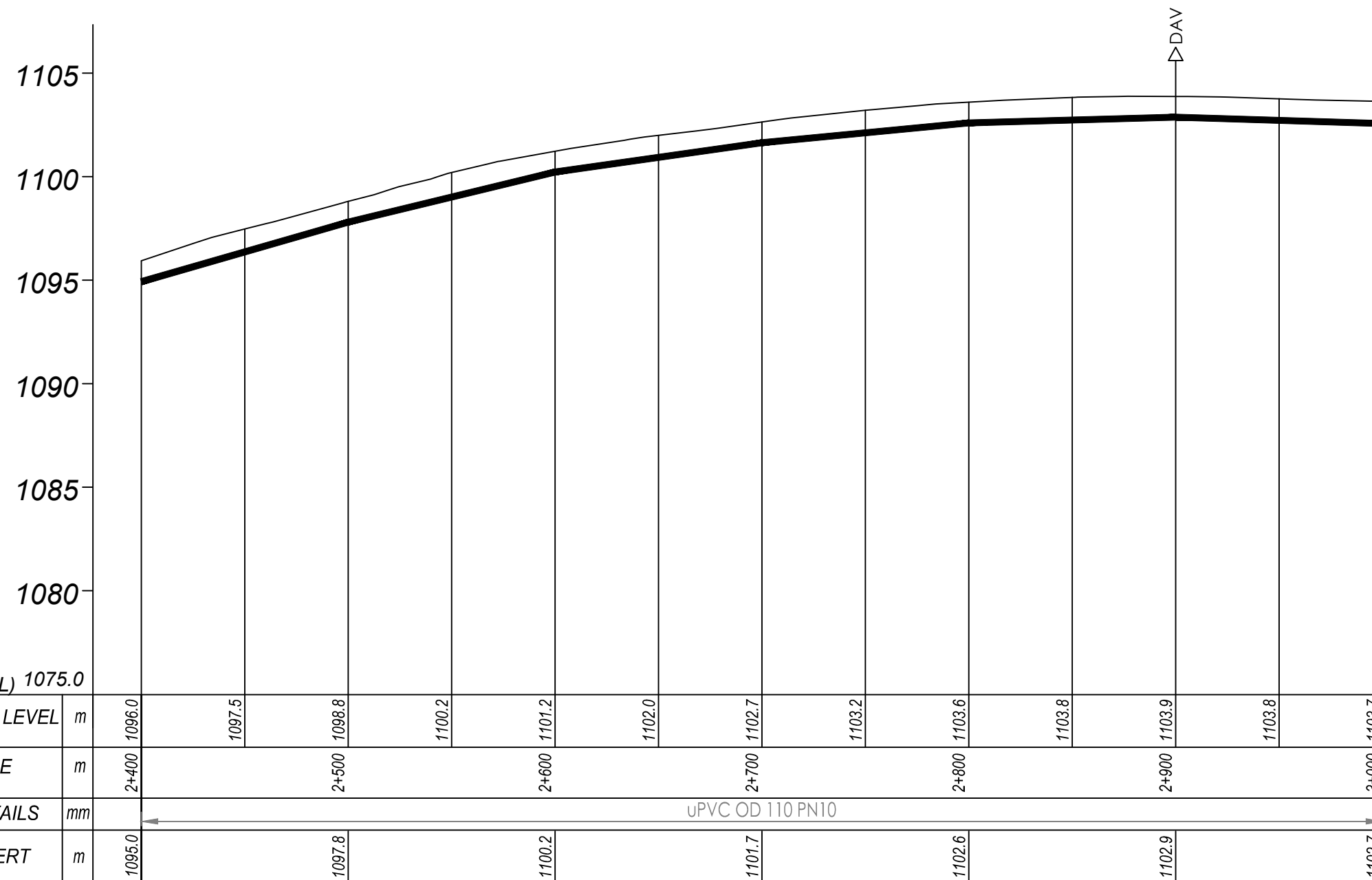
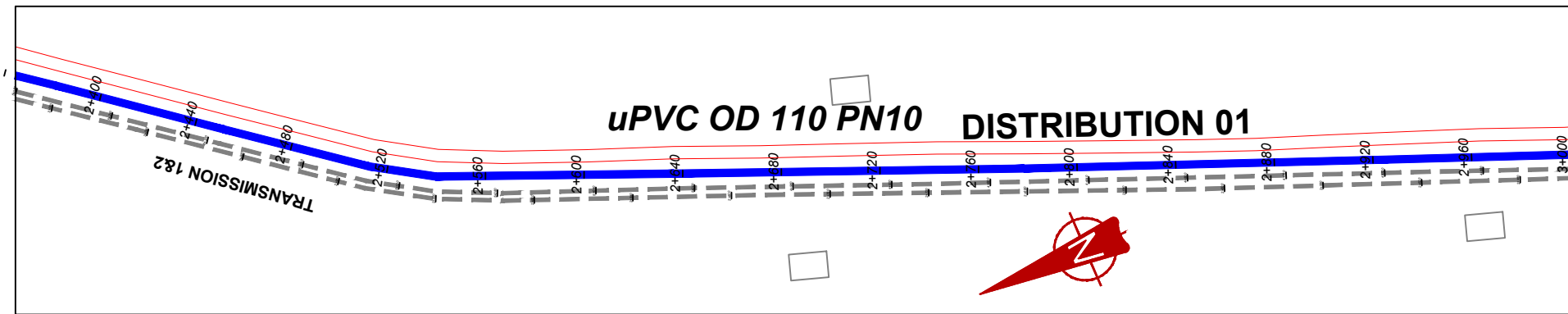
**NYAKABAALE WATER SUPPLY SYSTEM**

CONSULTANT  
 In Joint Venture with   
 Corporate Headquarter  
 10 Phidip 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 Horiz. 1:2500	DRAWING No.	NYA/WS/5.1.4
SURVEYED	....	DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	April 2021	APPROVED	Rodney Barugahare.

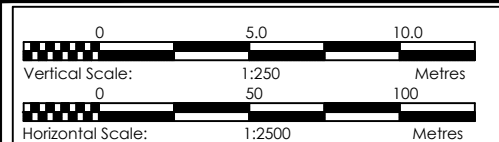


## DISTRIBUTION 1 (2+400.00 - 3+000.00)

### 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
- WO-2 Washout Type2



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

CO-FINANCED BY:  
 AND **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

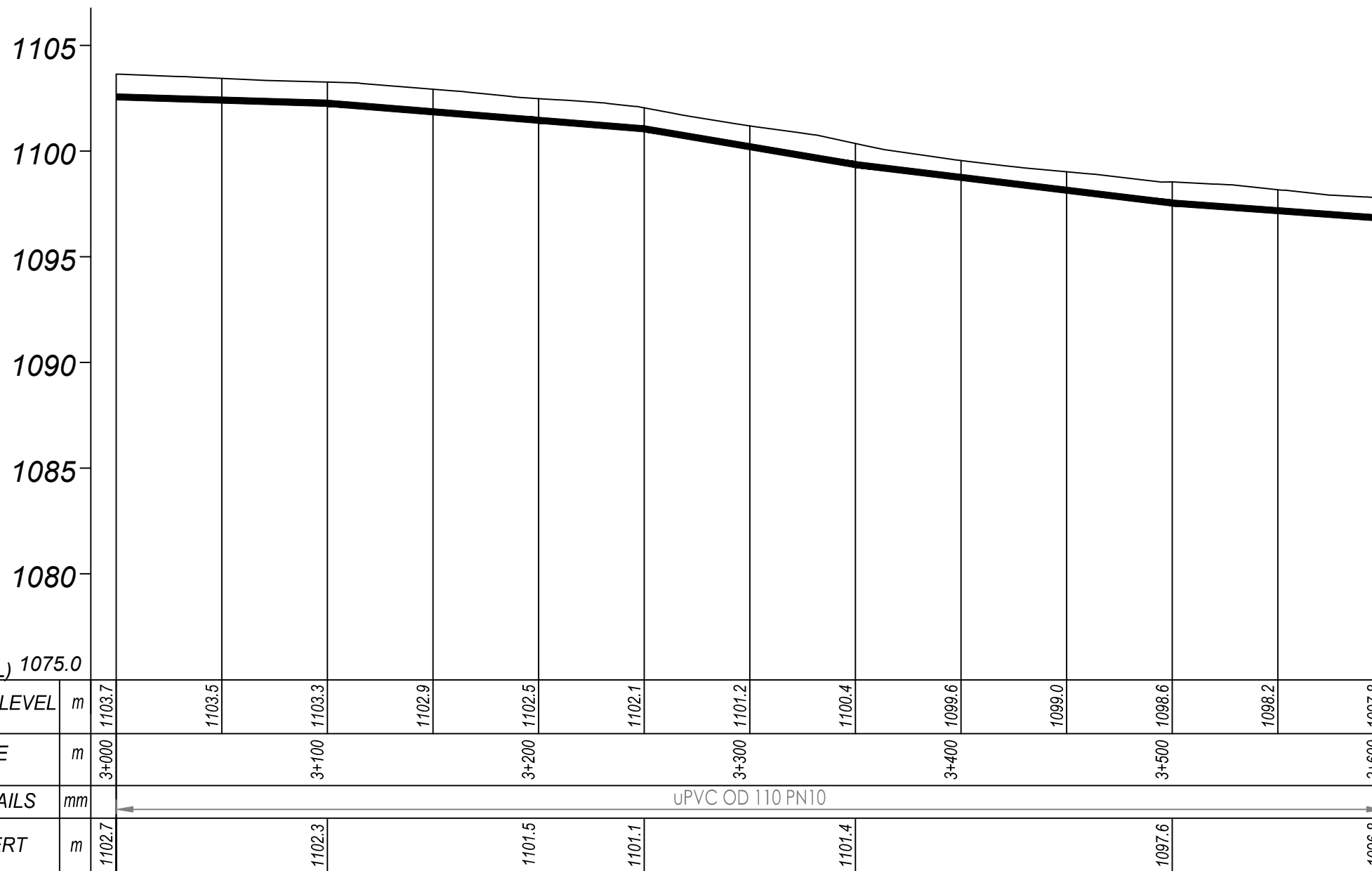
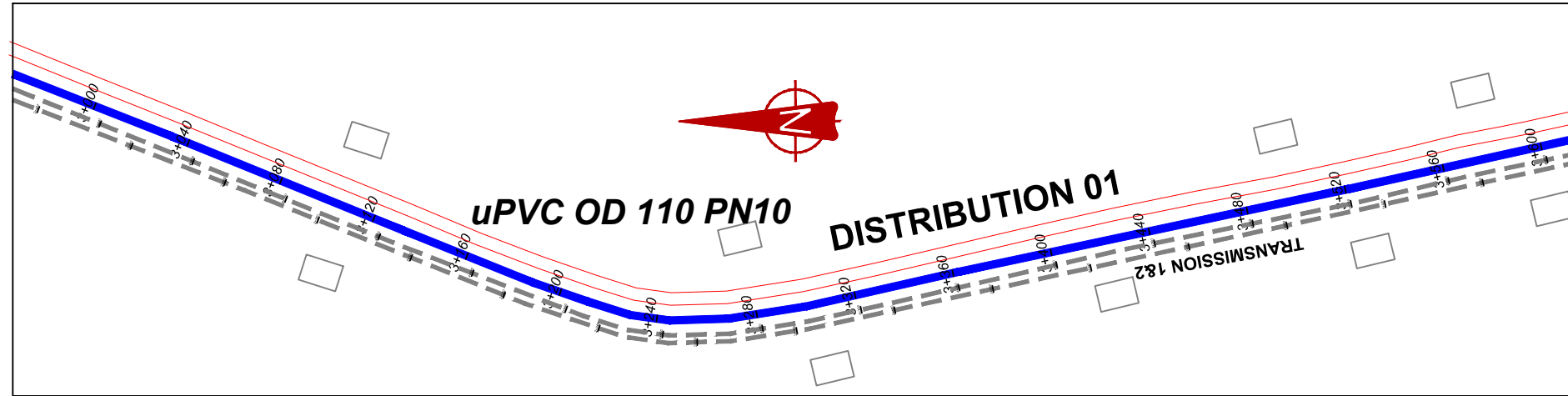
### NYAKABAAL WATER SUPPLY SYSTEM

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

CONTRACTOR

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

SCALE *Vert. 1:250* DRAWING No. NYA/WS/5.1.5  
*Horiz. 1:2500*  
 SURVEYED ... DESIGNED Otwane Dan.  
 DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare  
 DATE April 2021 APPROVED Rodney Barugahare.

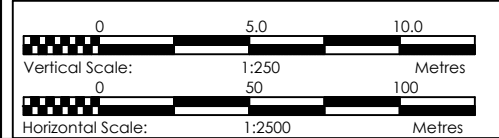


## DISTRIBUTION 1 (3+000.00 - 3+600.00)

### NOTES

#### LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- End pipe
- Node N01
- WO-1 Washout Type1
- WO-2 Washout Type2



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

### NYAKABAALE WATER SUPPLY SYSTEM

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

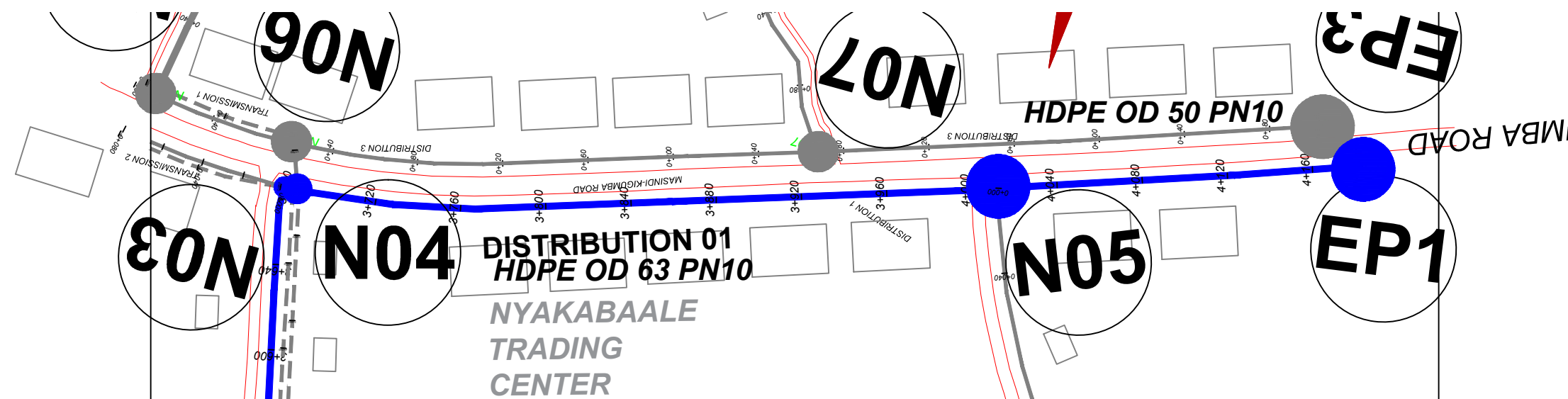
CONTRACTOR

**DETAILED ENGINEERING DESIGN**

DRAWING TITLE **DISTRIBUTION 01**  
**(3+000.00 - 3+600.00)**

SCALE	Vert. 1:250 Horiz. 1:2500	DRAWING No.	NYA/WS/5.1.6
SURVEYED	....	DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	April 2021	APPROVED	Rodney Barugahare.

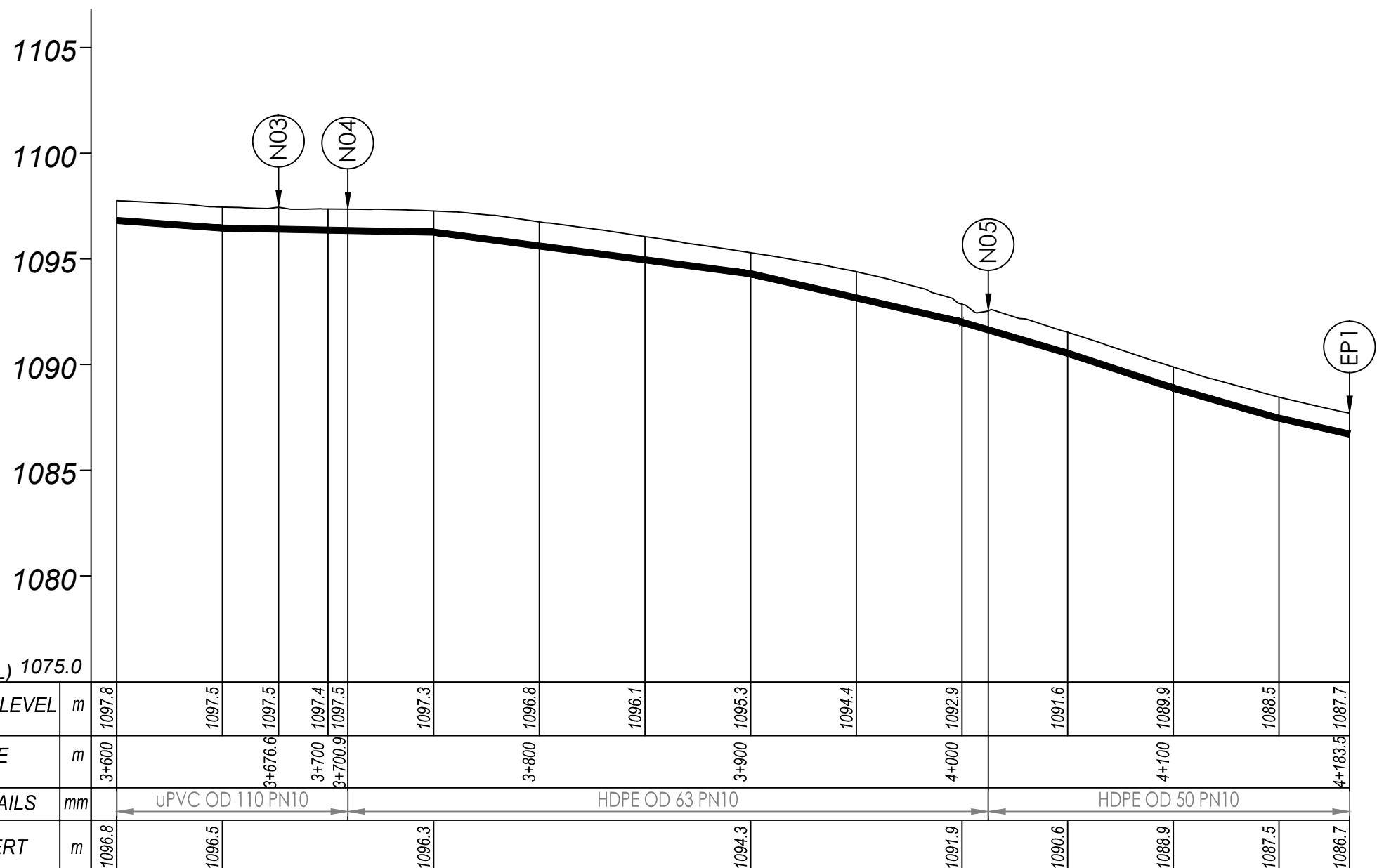




**NOTES**

**LEGEND**

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- End pipe
- Node N01
- Washout Type1
- Washout Type2



**DISTRIBUTION 1 (3+600.00 - 4+183.50)**

**Scale:**  
 Vertical Scale: 1:250  
 Horizontal Scale: 1:2500

**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

**NYAKABAALE WATER SUPPLY SYSTEM**

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

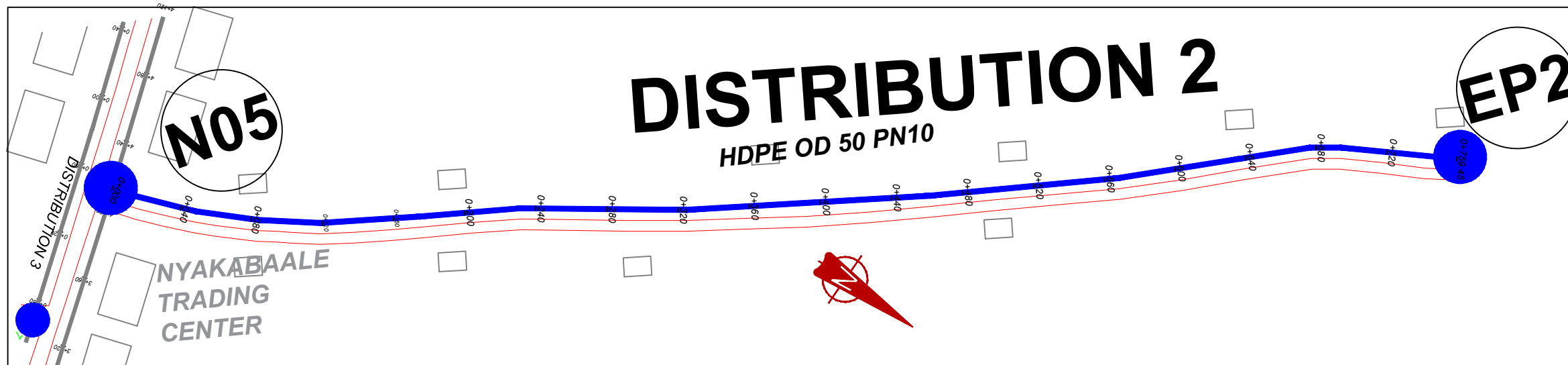
**CONTRACTOR:**

**DETAILED ENGINEERING DESIGN**

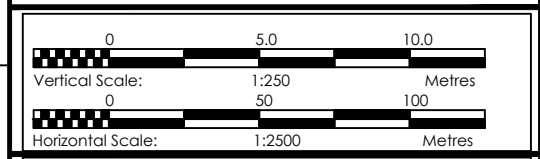
**DRAWING TITLE:**  
 DISTRIBUTION 01  
 (3+600.00 - 4+183.50)

**SCALE:** Vert. 1:250, Horiz. 1:2500  
**DRAWING No.:** NYA/WS/5.1.7

**SURVEYED:** ... **DESIGNED:** Otwane Dan.  
**DRAWN:** Joshua Nyarwanda **CHECKED:** Rodney Barugahare  
**DATE:** April 2021 **APPROVED:** Rodney Barugahare.



- ### NOTES
- #### LEGEND
- Transmission Pipeline
  - Distribution Pipeline
  - Ground Level
  - Building/House
  - Contours
  - Road
  - DAV Double Orifice Air Valve
  - End pipe
  - Node N01
  - Washout Type1
  - Washout Type2



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

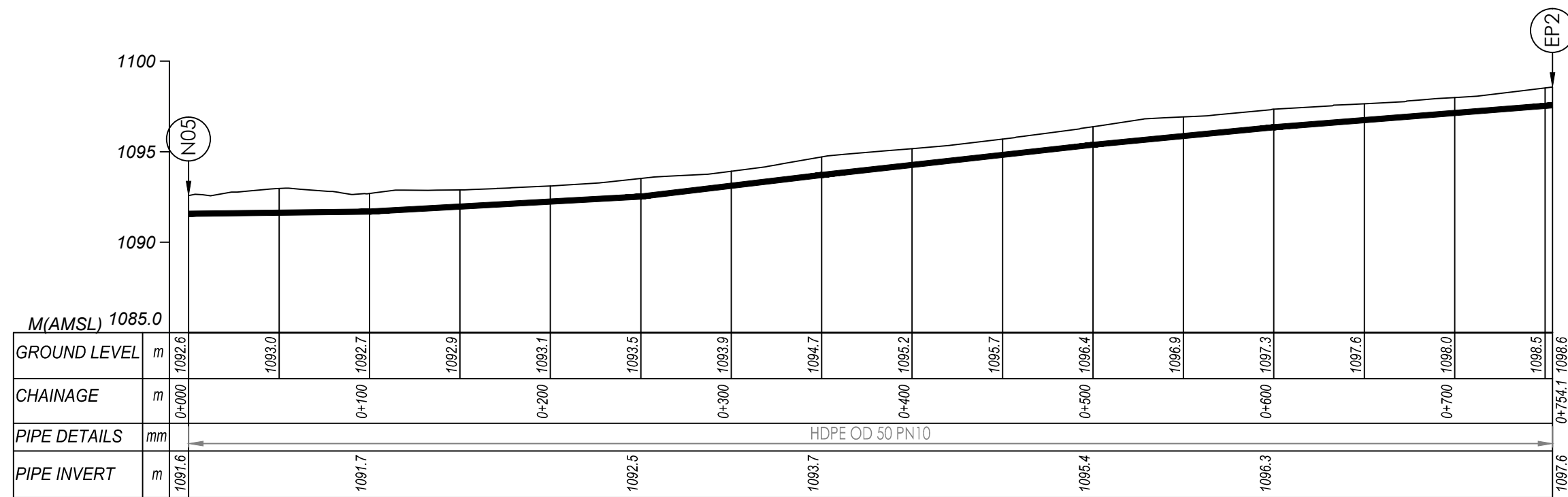
### NYAKABAALÉ WATER SUPPLY SYSTEM

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

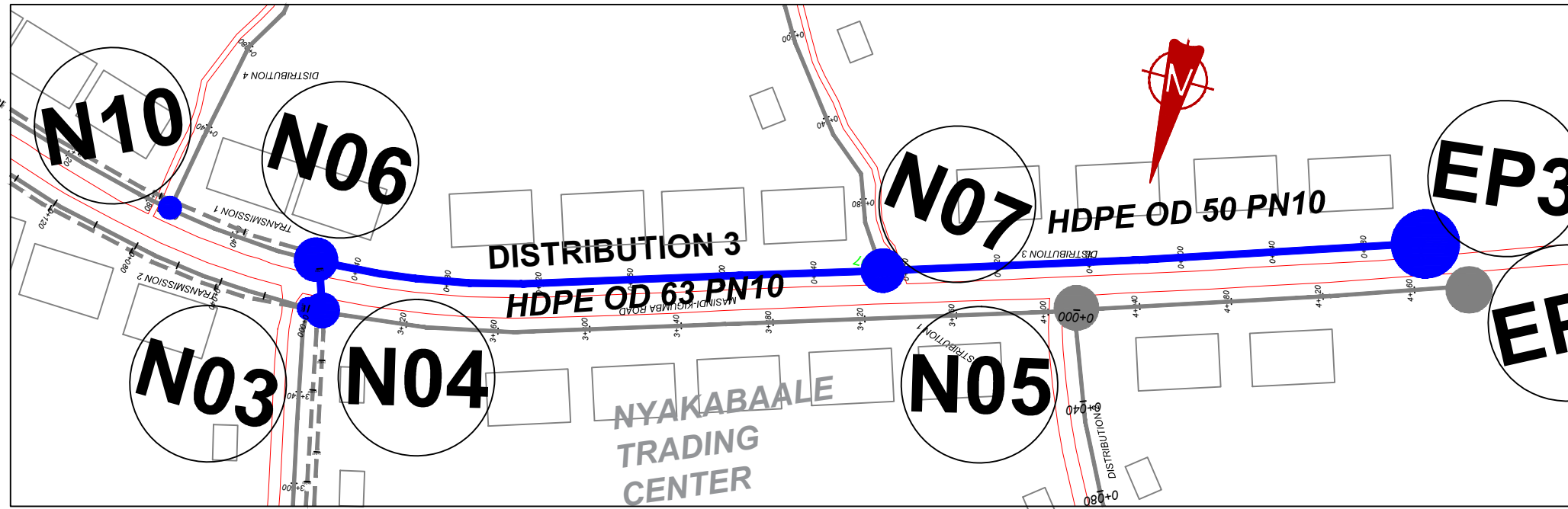
CONTRACTOR

DETAILED ENGINEERING DESIGN  
DRAWING TITLE **DISTRIBUTION 02**  
(0+000.00 - 0+754.10)

SCALE Vert. 1:250, Horiz. 1:2500  
DRAWING No. NYA/WS/5.2.1  
SURVEYED ... DESIGNED Otwane Dan.  
DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare  
DATE April 2021 APPROVED Rodney Barugahare.



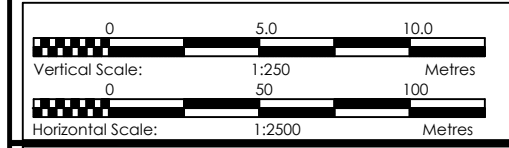
**DISTRIBUTION 2 (0+000.00 - 0+754.10)**



**NOTES**

**LEGEND**

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- End pipe
- Node N01
- Washout Type1
- Washout Type2



**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

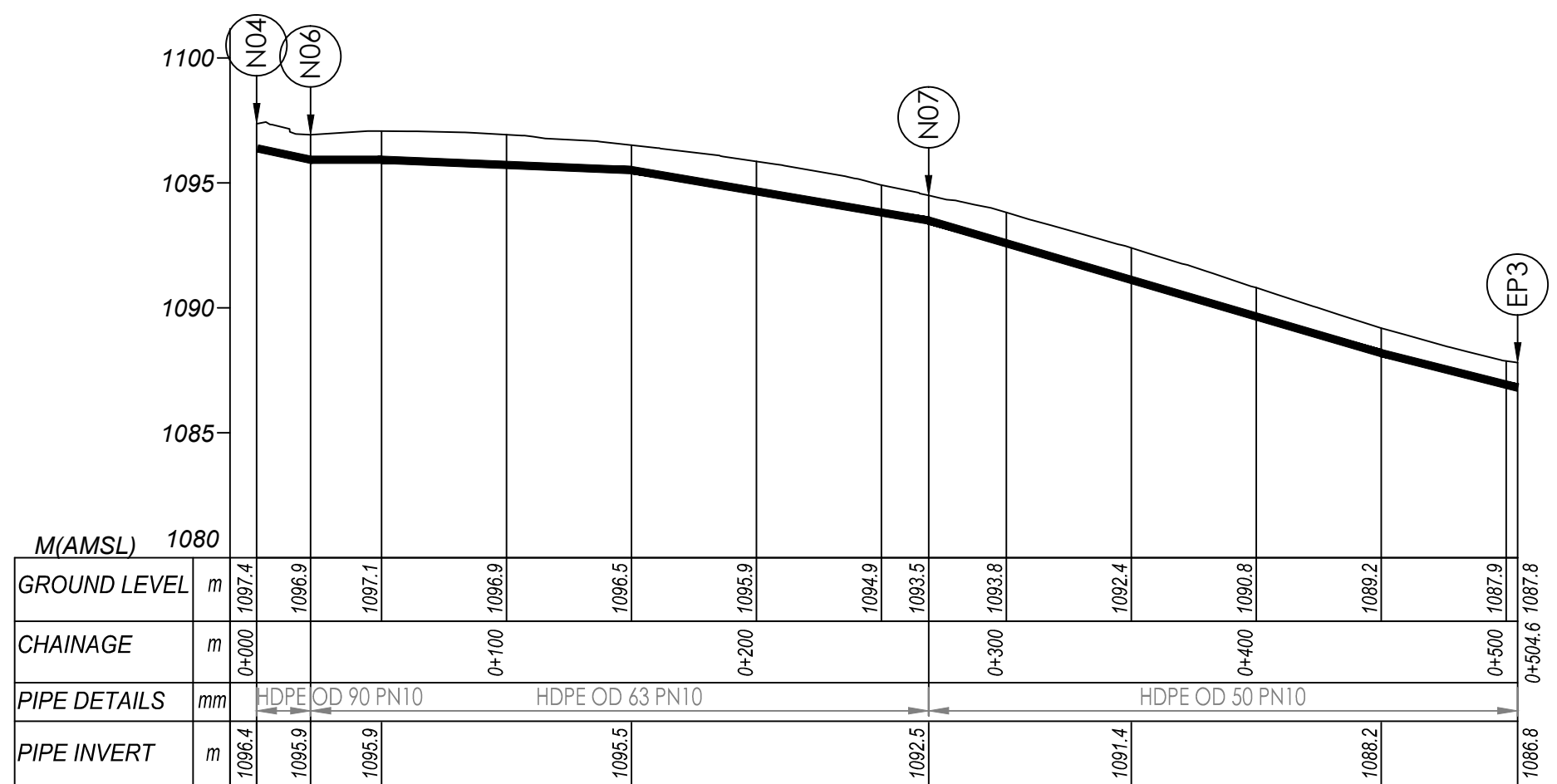
**NYAKABAALE WATER SUPPLY SYSTEM**

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

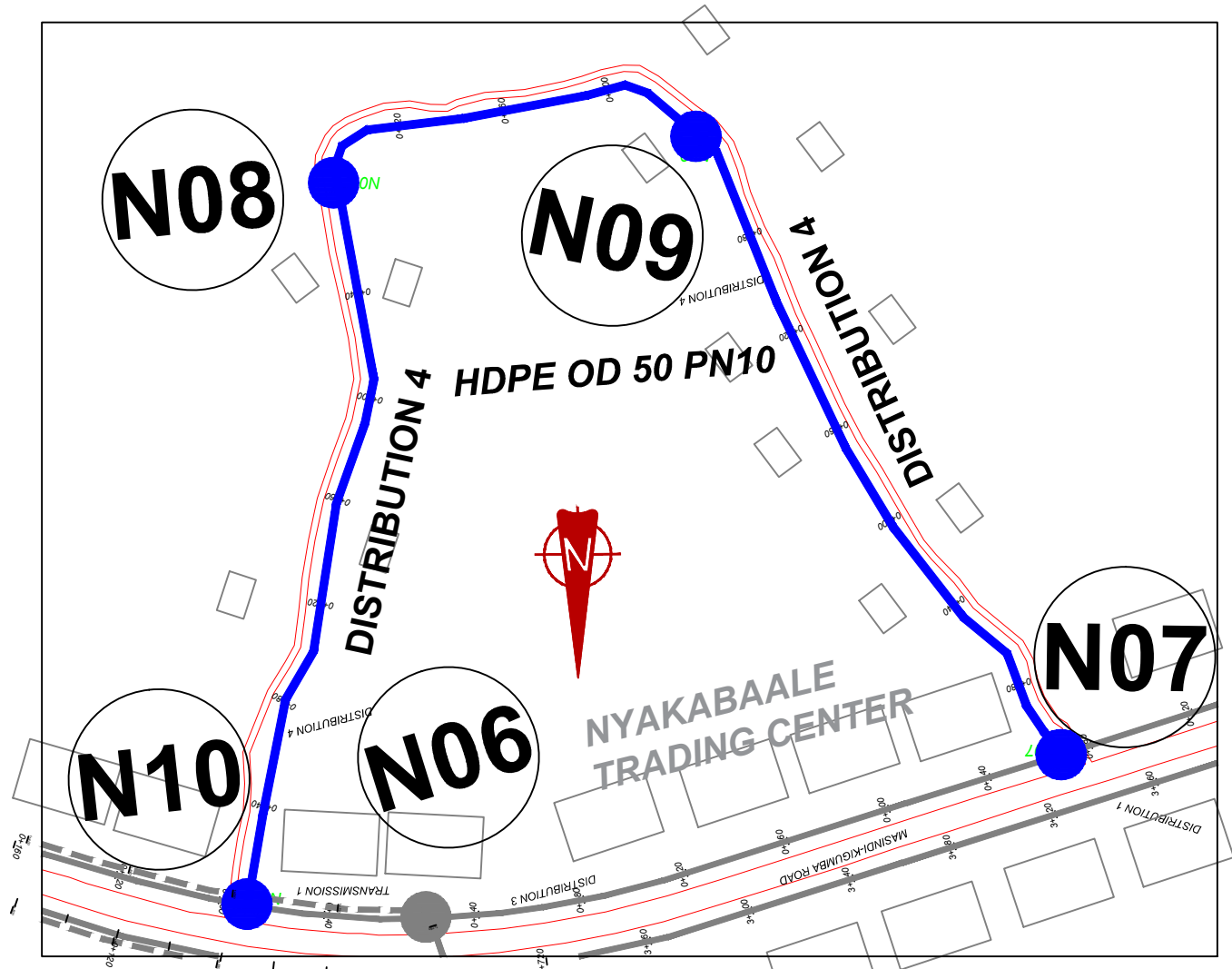
**CONTRACTOR**

**DETAILED ENGINEERING DESIGN**  
**DRAWING TITLE** DISTRIBUTION 03  
 (0+000.00 - 0+504.60)

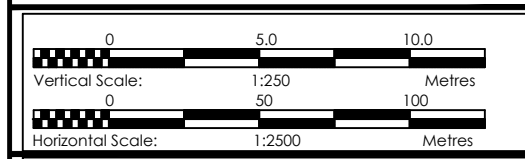
**SCALE** Vert, 1:250 **DRAWING No.** NYA/WS/5.3.1  
**Hori, 1:2500**  
**SURVEYED** .... **DESIGNED** Otwane Dan.  
**DRAWN** Joshua Nyarwanda **CHECKED** Rodney Barugahare  
**DATE** April 2021 **APPROVED** Rodney Barugahare.



**DISTRIBUTION 3 (0+000.00 - 0+504.60)**



- 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
  - WO-2 Washout Type2



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

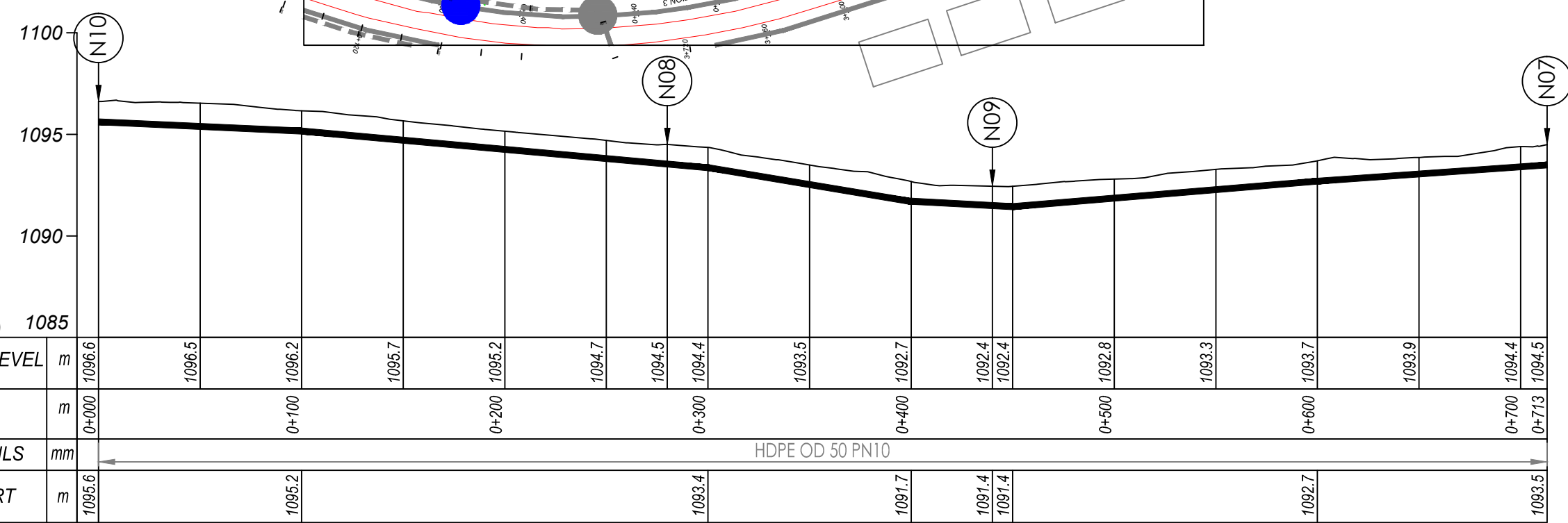
**NYAKABAALE WATER SUPPLY SYSTEM**

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

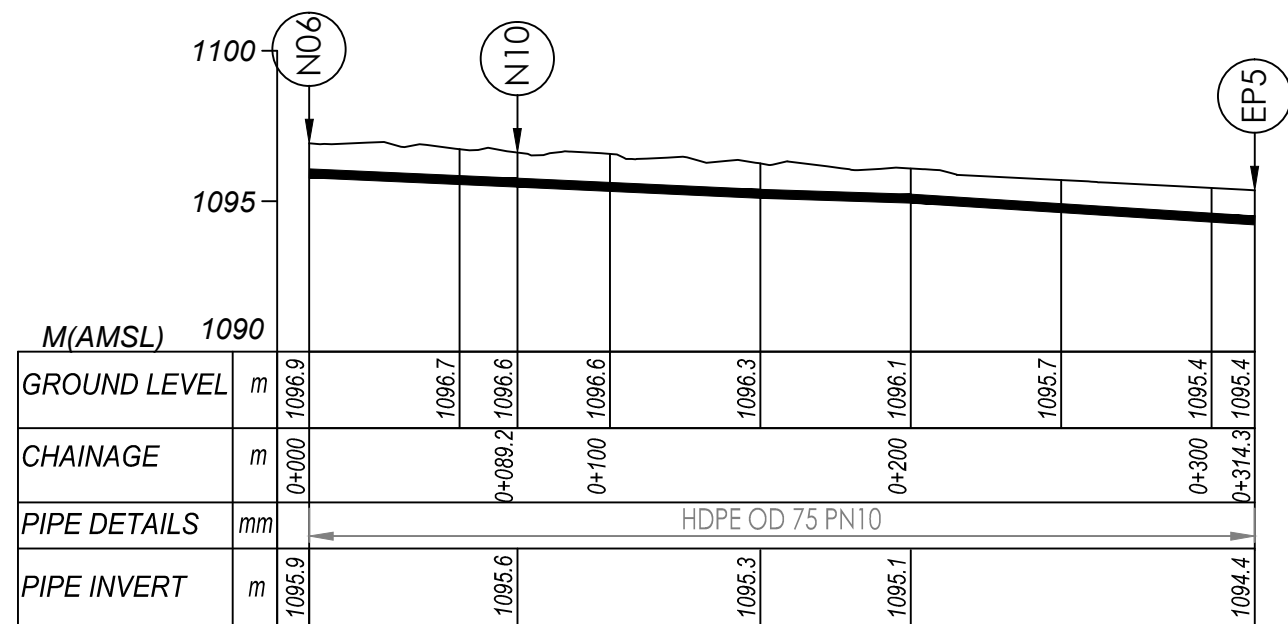
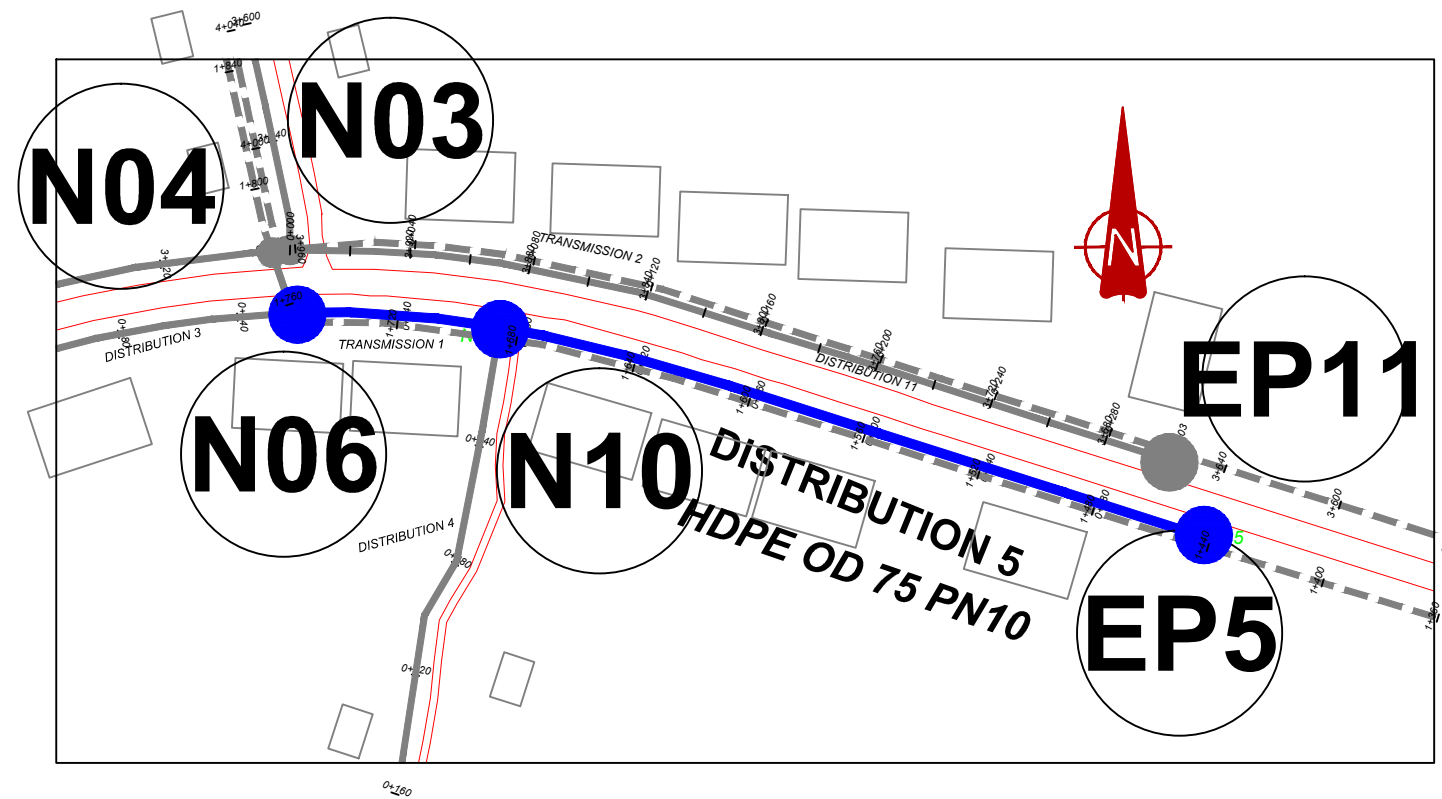
CONTRACTOR

**DETAILED ENGINEERING DESIGN**  
 DRAWING TITLE **DISTRIBUTION 04**  
**(0+000.00 - 0+713.00)**

SCALE *Vert. 1:250* *Horiz. 1:2500* DRAWING No. **NYA/WS/5.4.1**  
 SURVEYED .... DESIGNED Otwane Dan.  
 DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare  
 DATE April 2021 APPROVED Rodney Barugahare.



**DISTRIBUTION 4 (0+000.00 - 0+713.00)**

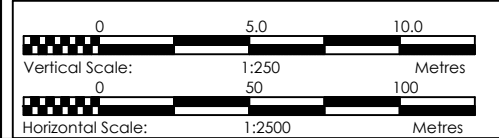


**DISTRIBUTION 5 (0+000.00 - 0+314.3.00)**

**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
- WO-2 Washout Type2



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

CO-FINANCED BY:  
 AND **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

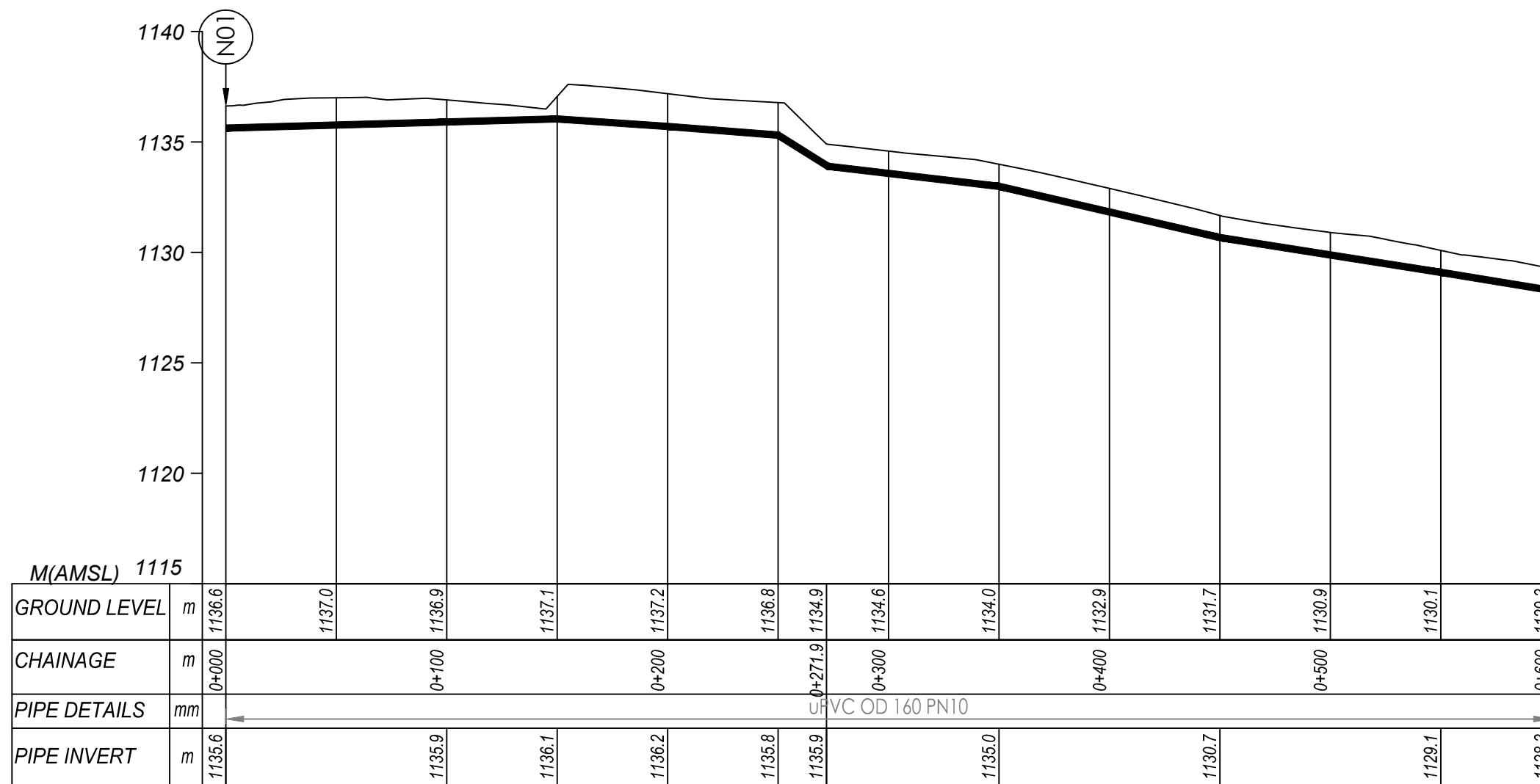
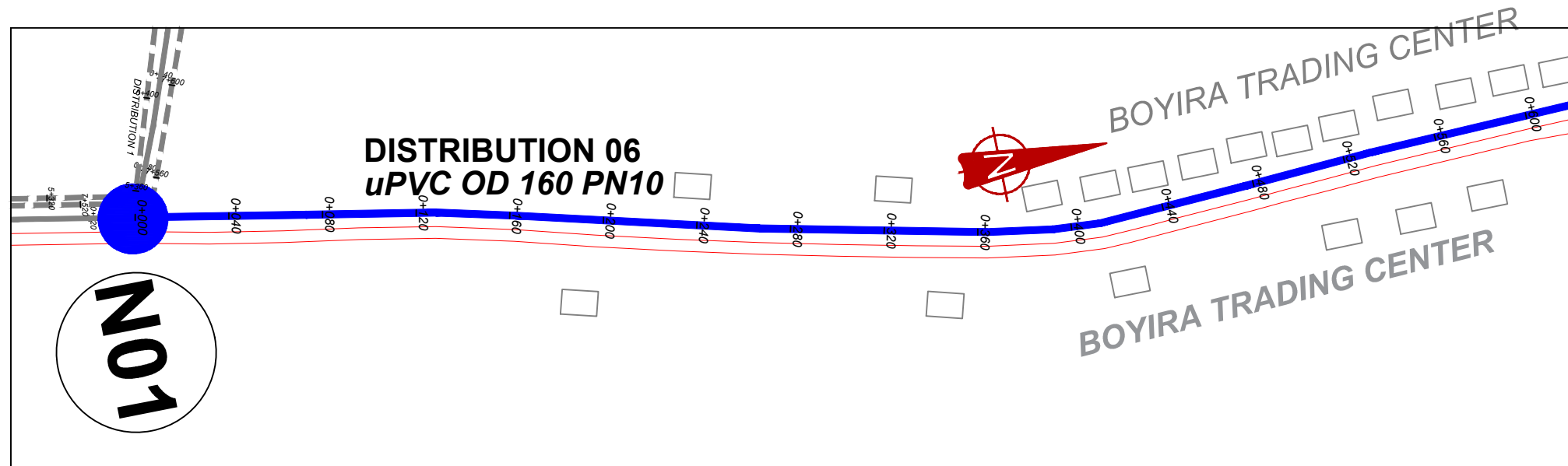
**NYAKABAALE WATER SUPPLY SYSTEM**

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

CONTRACTOR

**DETAILED ENGINEERING DESIGN**  
 DRAWING TITLE **DISTRIBUTION 05**  
**(0+000.00 - 0+314.3.00)**

SCALE	Vert, 1:250 Hor, 1:2500	DRAWING No.	NYA/WS/5.5.1
SURVEYED	....	DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	April 2021	APPROVED	Rodney Barugahare.

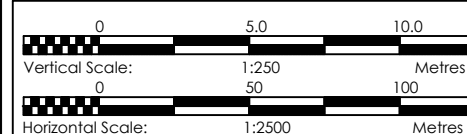


**DISTRIBUTION 6 (0+000.00 - 0+600.00)**

**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
- WO-2 Washout Type2



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

CO-FINANCED BY:  
 AND **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

**NYAKABAALE WATER SUPPLY SYSTEM**

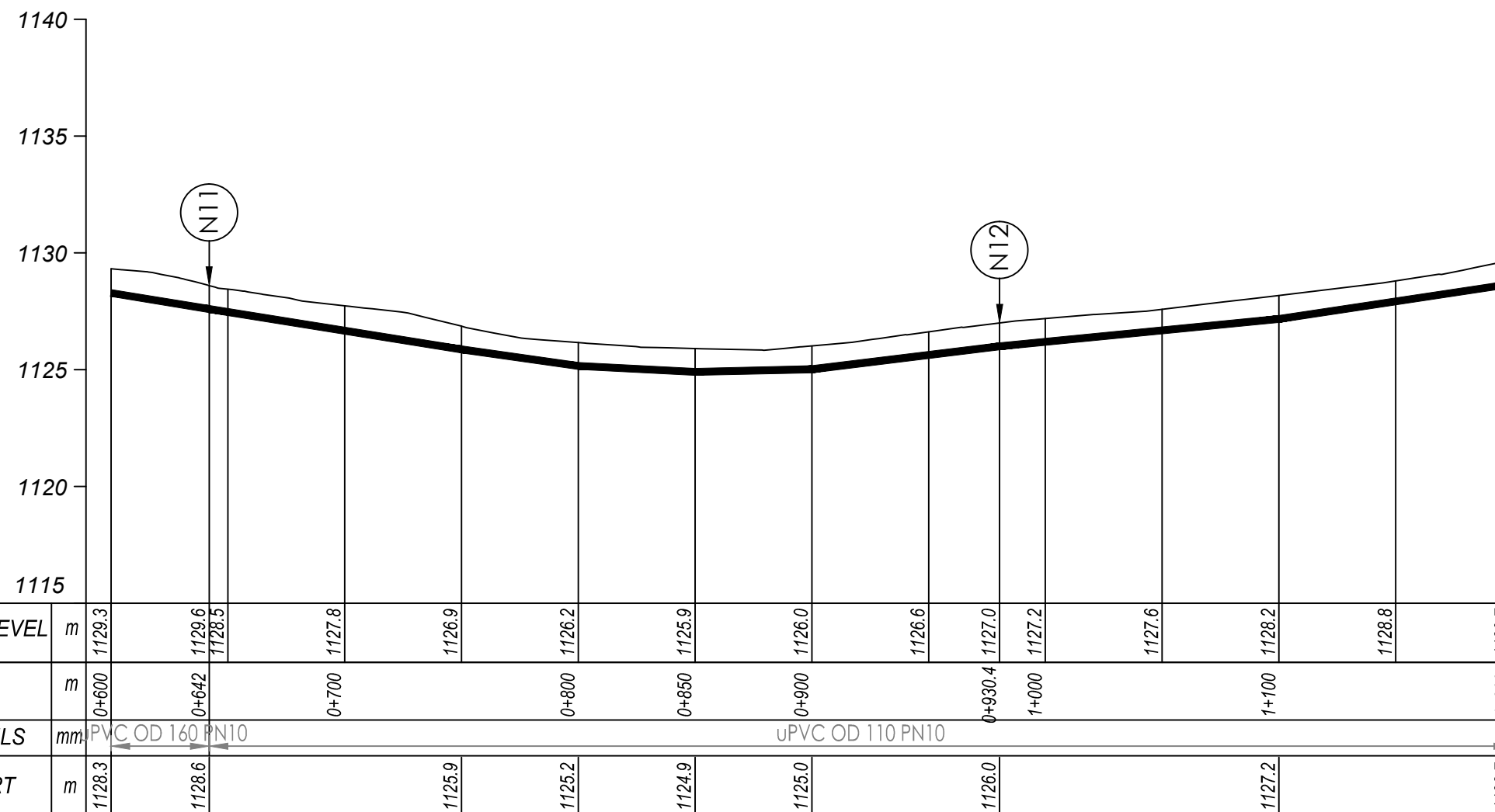
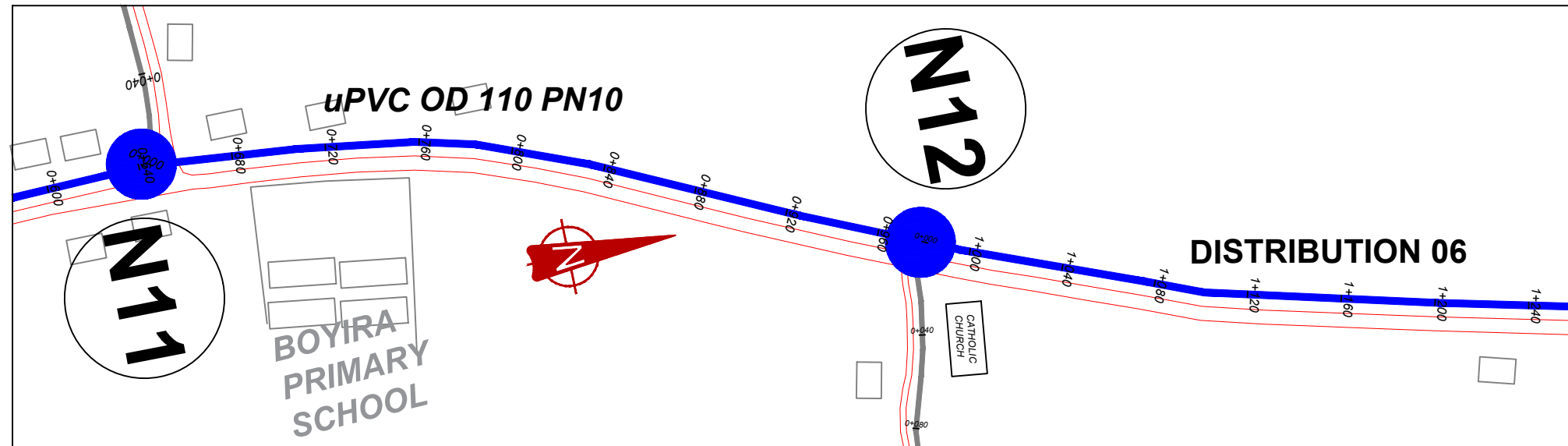
CONSULTANT  
 In Joint Venture with   
 Corporate Headquarter  
 10 Phidiot Lane, 1st Floor,  
 London EC3M 8AA,  
 United Kingdom

CONTRACTOR

**DETAILED ENGINEERING DESIGN**

DRAWING TITLE **DISTRIBUTION 06 (0+000.00 - 0+600.00)**

SCALE	Vert. 1:250 Horiz. 1:2500	DRAWING No.	NYA/WS/5.6.1
SURVEYED	....	DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	April 2021	APPROVED	Rodney Barugahare.

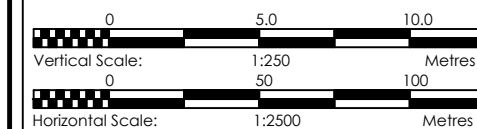


## DISTRIBUTION 6 (0+600.00 - 1+200.00)

### NOTES

#### LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- End pipe
- Node N01
- Washout Type1
- Washout Type2



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

CO-FINANCED BY:  
 AND **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

### NYAKABAALE WATER SUPPLY SYSTEM

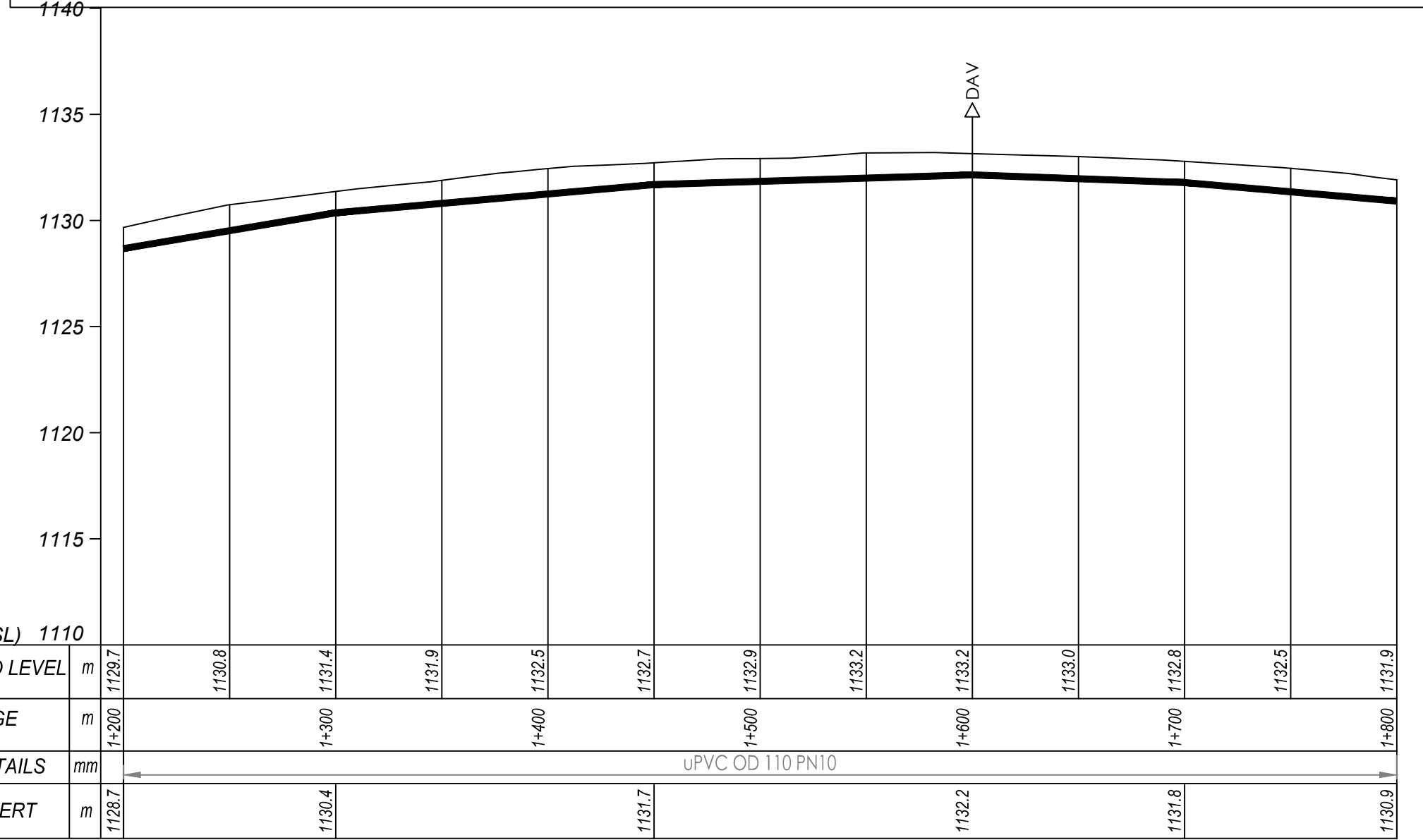
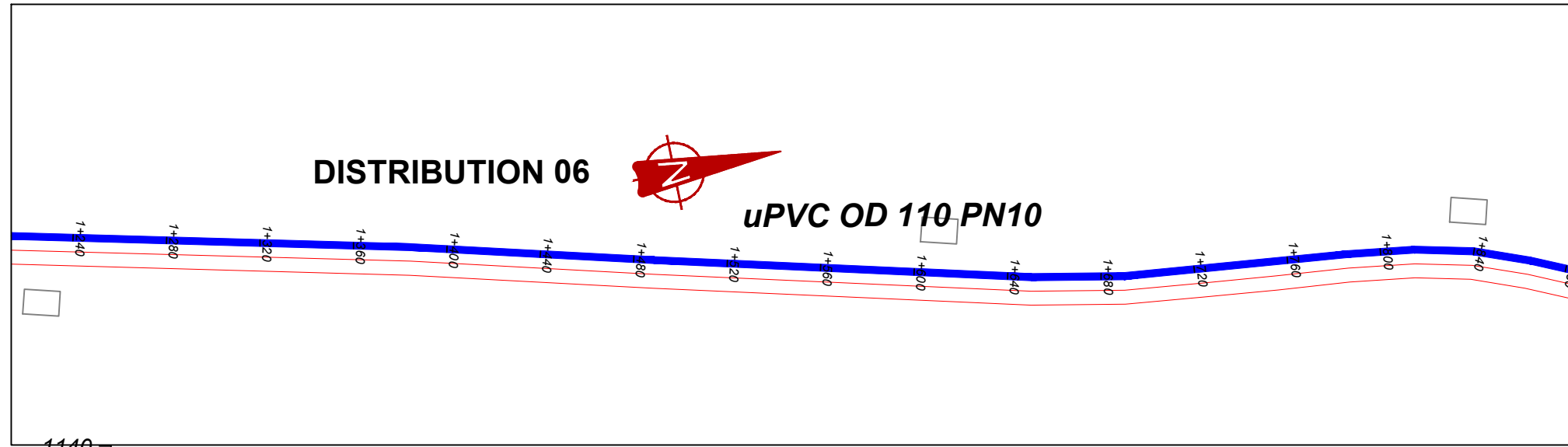
CONSULTANT  
**SARI** In Joint Venture with **SGAPI**  
 Corporate Headquarter  
 10 Phidip Lane, 1st Floor,  
 London EC3M 8AA,  
 United Kingdom

CONTRACTOR

#### DETAILED ENGINEERING DESIGN

DRAWING TITLE **DISTRIBUTION 06**  
**(0+600.00 - 1+200.00)**

SCALE *Vert, 1:250* DRAWING No. NYA/WS/5.6.2  
*Horiz, 1:2500*  
 SURVEYED ... DESIGNED Otwane Dan.  
 DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare  
 DATE April 2021 APPROVED Rodney Barugahare.

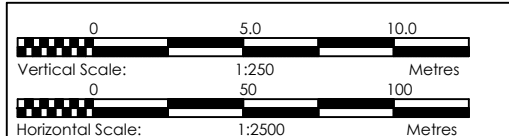


## DISTRIBUTION 6 (1+200.00 - 1+800.00)

### NOTES

#### LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- End pipe
- Node N01
- WO-1 Washout Type1
- WO-2 Washout Type2



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

### NYAKABAALE WATER SUPPLY SYSTEM

CONSULTANT

SARI In Joint Venture with SGAPI

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

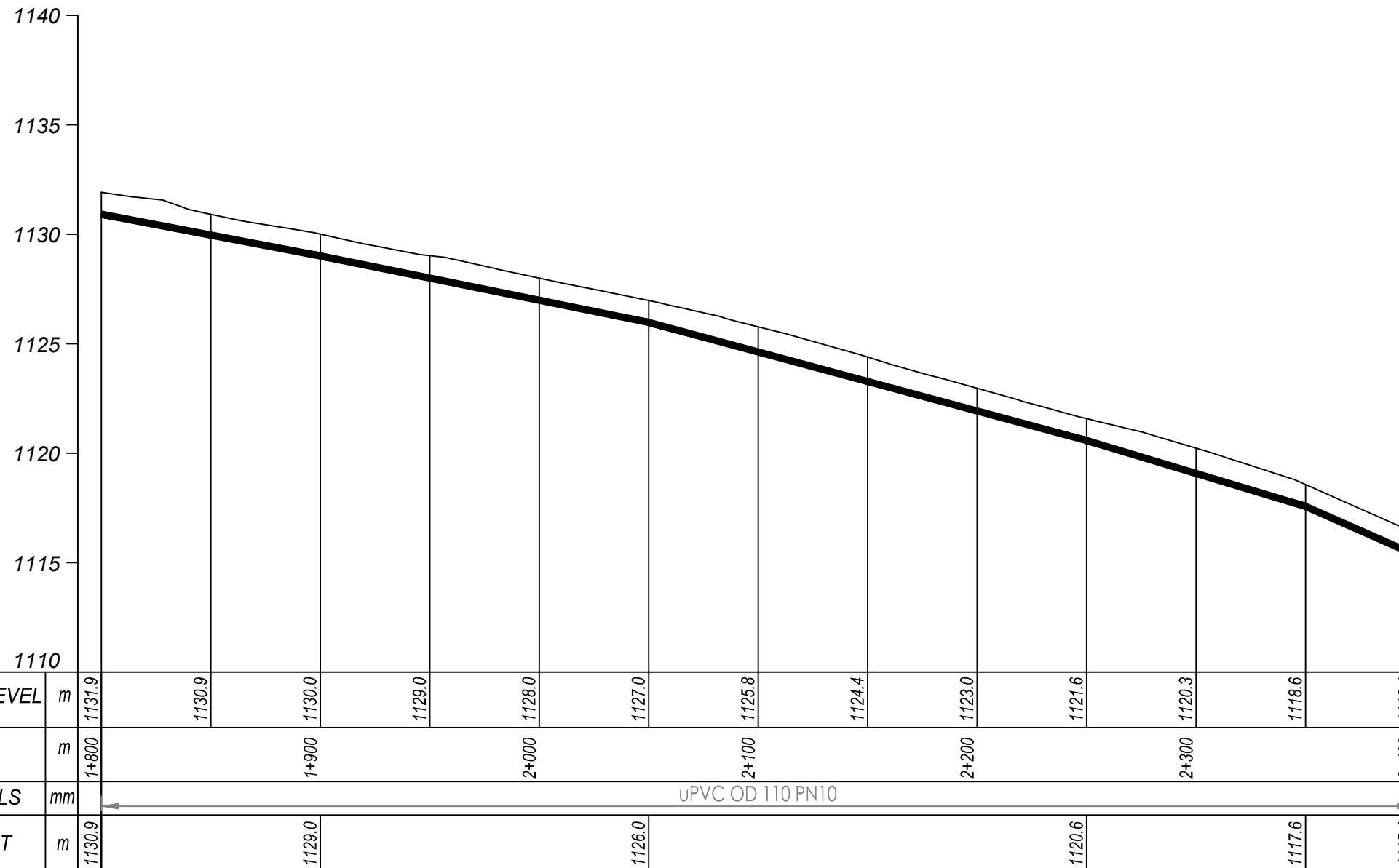
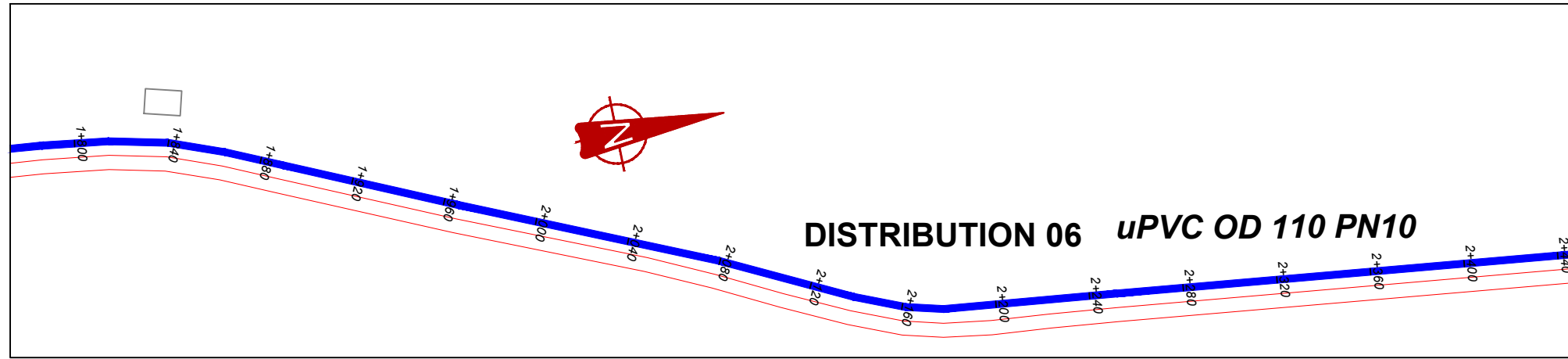
CONTRACTOR

**DETAILED ENGINEERING DESIGN**

DRAWING TITLE **DISTRIBUTION 06**  
**(1+200.00 - 1+800.00)**

SCALE	Vert, 1:250 Hor, 1:2500	DRAWING No.	NYA/WS/5.6.3
SURVEYED	....	DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	April 2021	APPROVED	Rodney Barugahare.



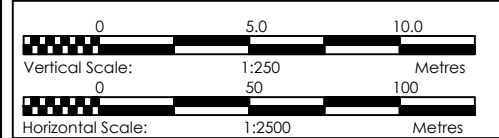


## DISTRIBUTION 6 (1+800.00 - 2+400.00)

### NOTES

#### LEGEND

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- End pipe
- Node N01
- WO-1 Washout Type1
- WO-2 Washout Type2



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

CO-FINANCED BY:  
 AND **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

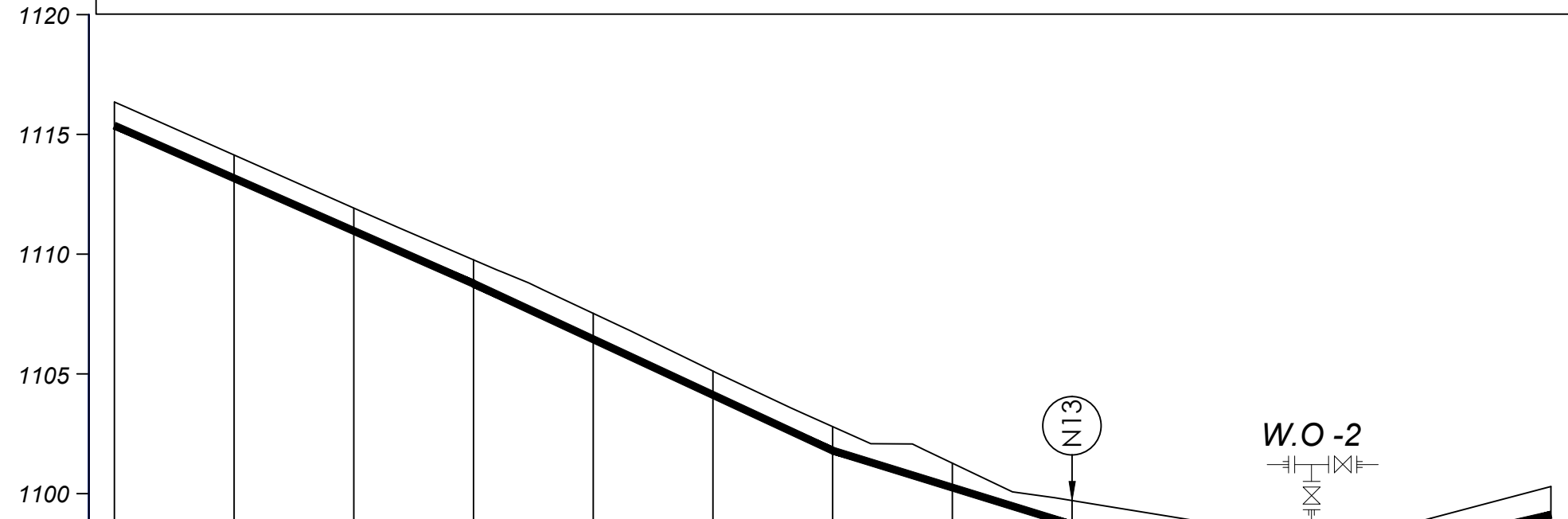
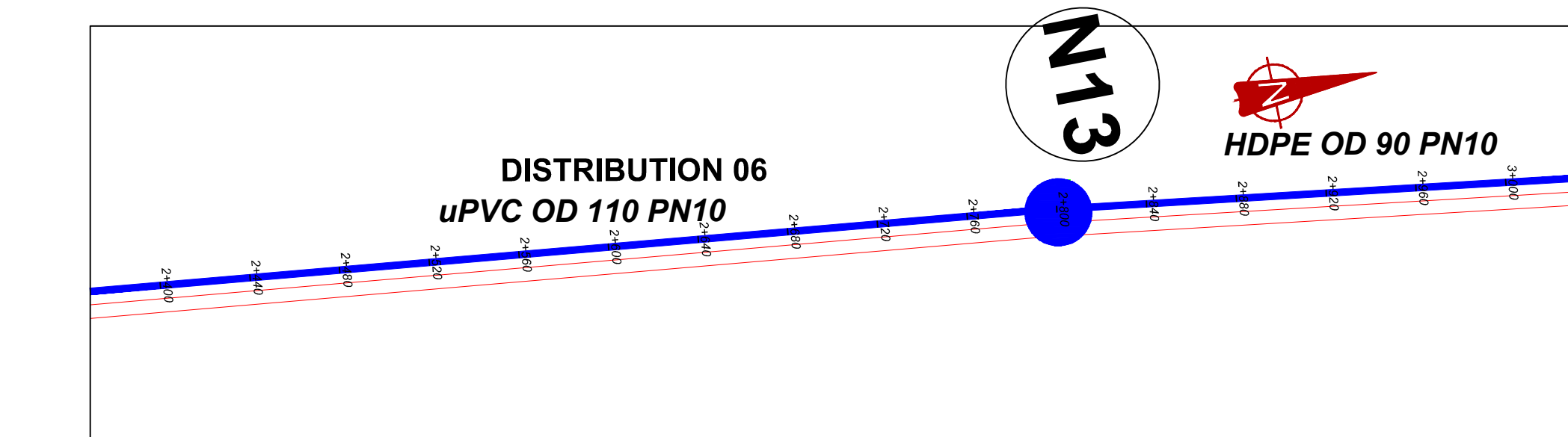
### NYAKABAALE WATER SUPPLY SYSTEM

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

CONTRACTOR

DETAILED ENGINEERING DESIGN  
 DRAWING TITLE **DISTRIBUTION 06 (1+800.00 - 2+400.00)**

SCALE *Vert, 1:250* DRAWING No. **NYA/WS/5.6.4**  
*Horiz, 1:2500*  
 SURVEYED .... DESIGNED *Otwane Dan.*  
 DRAWN *Joshua Nyarwanda* CHECKED *Rodney Barugahare*  
 DATE *April 2021* APPROVED *Rodney Barugahare.*



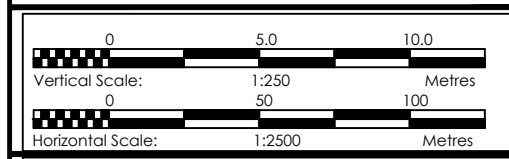
M(AMSL) 1090.0	
GROUND LEVEL	m
CHAINAGE	m
PIPE DETAILS	mm
PIPE INVERT	m
	1116.4
	1114.2
	1111.9
	1109.8
	1107.5
	1105.1
	1102.8
	1101.3
	1099.7
	1098.9
	1098.1
	1099.0
	1100.3
	2+400
	2+500
	2+600
	2+700
	2+800
	2+900
	3+000
	uPVC OD 110 PN10
	HDPE OD 90 PN10
	1115.4
	1108.8
	1101.8
	1098.7
	1097.1
	1098.0
	1099.3

### DISTRIBUTION 6 (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
- WO-2 Washout Type2



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

CO-FINANCED BY:  
 AND **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

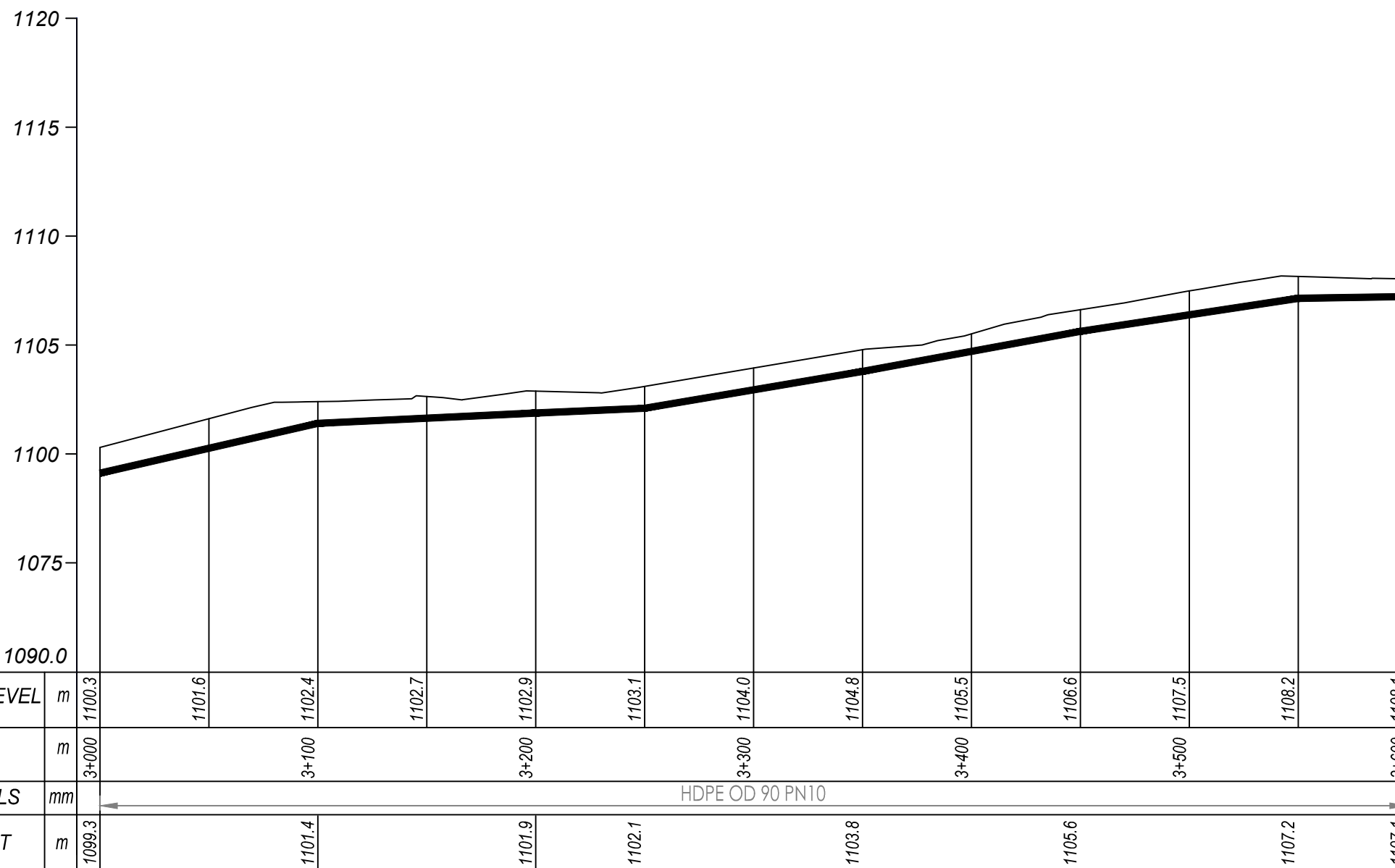
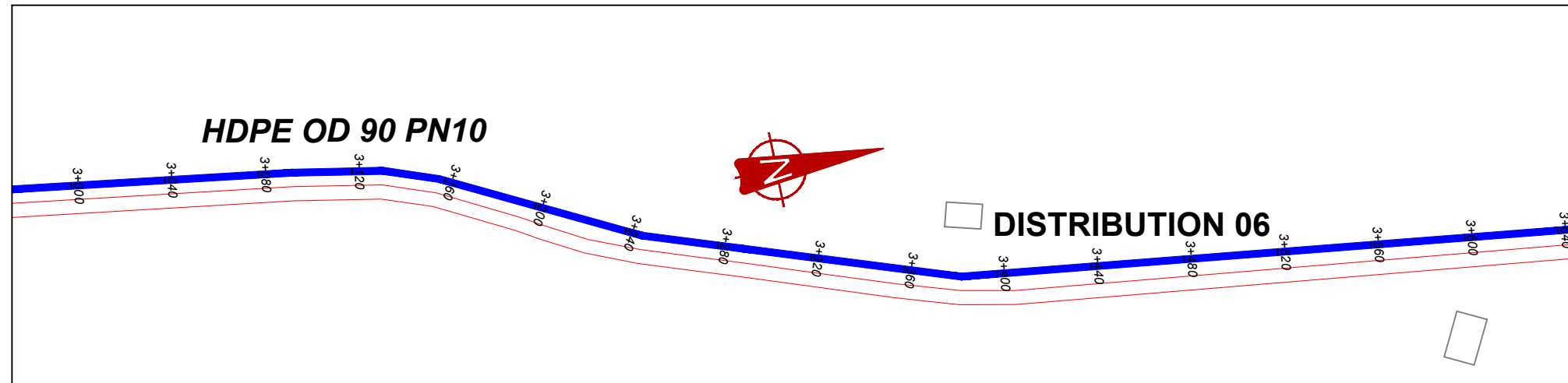
### NYAKABAALE WATER SUPPLY SYSTEM

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

CONTRACTOR

DETAILED ENGINEERING DESIGN  
 DRAWING TITLE **DISTRIBUTION 06 (2+400.00 - 3+000.00)**

SCALE	Vert, 1:250 Hori, 1:2500	DRAWING No.	NYA/WS/5.6.5
SURVEYED	....	DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	April 2021	APPROVED	Rodney Barugahare.

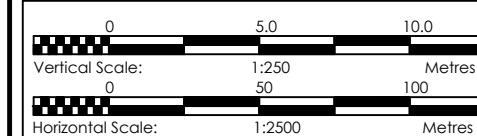


## DISTRIBUTION 6 (3+000.00 - 3+600.00)

### 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
- WO-2 Washout Type2



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

CO-FINANCED BY:  
 AND **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

### NYAKABAALE WATER SUPPLY SYSTEM

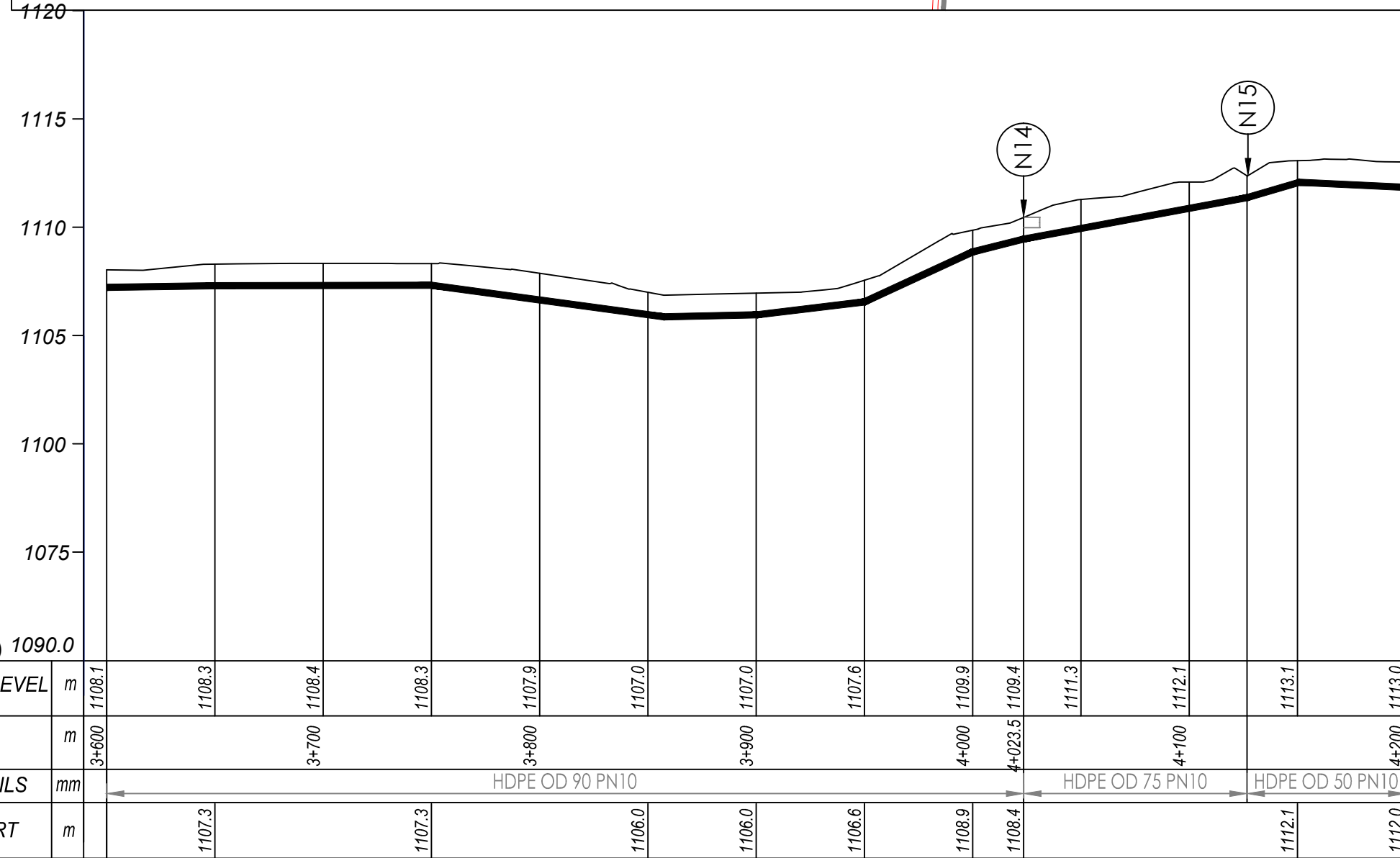
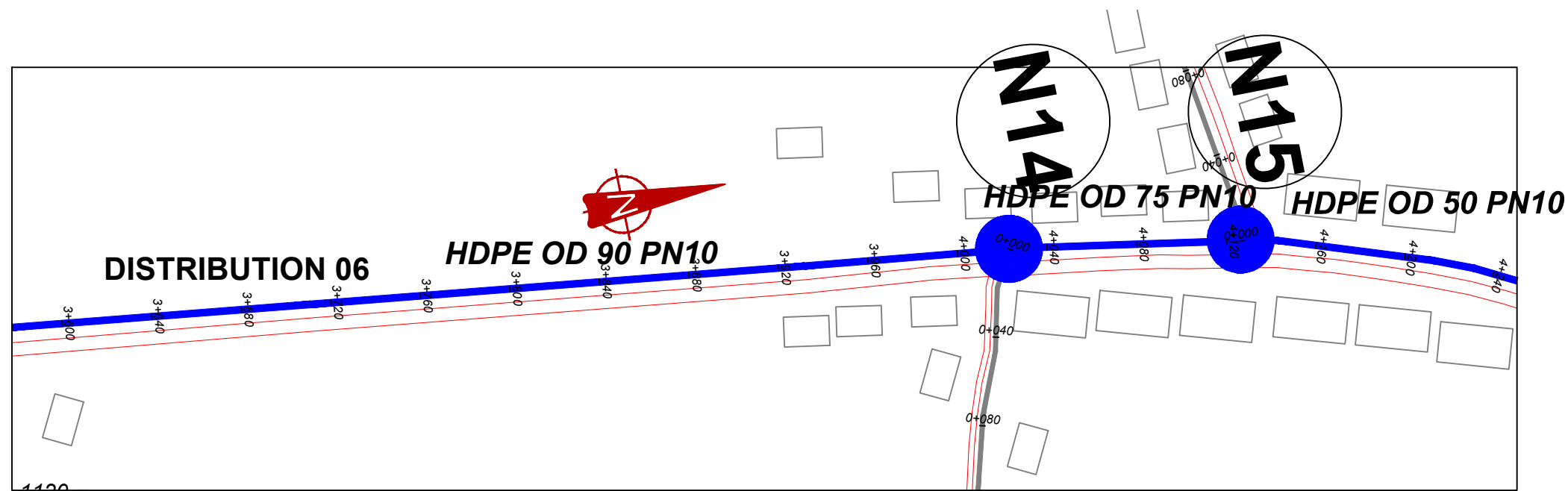
CONSULTANT  
**SARI** In Joint Venture with **SGAPI**  
 Corporate Headquarter  
 10 Phidip Lane, 1st Floor,  
 London EC3M 8AA,  
 United Kingdom

CONTRACTOR

#### DETAILED ENGINEERING DESIGN

DRAWING TITLE **DISTRIBUTION 06**  
**(3+000.00 - 3+600.00)**

SCALE *Vert, 1:250* DRAWING No. **NYA/WS/5.6.6**  
*Horiz, 1:2500*  
 SURVEYED ... DESIGNED Otwane Dan.  
 DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare  
 DATE April 2021 APPROVED Rodney Barugahare.

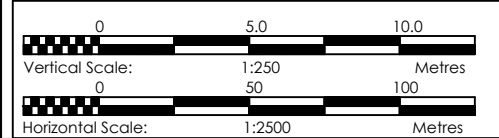


## DISTRIBUTION 6 (3+600.00 - 4+200.00)

### 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
- WO-2 Washout Type2



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

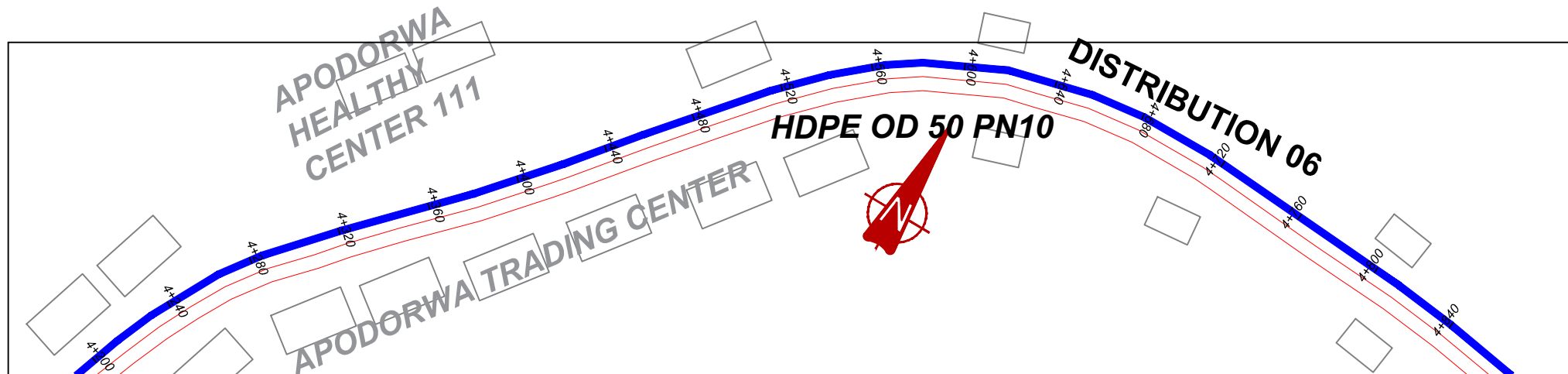
### NYAKABAALE WATER SUPPLY SYSTEM

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

CONTRACTOR

DETAILED ENGINEERING DESIGN  
DRAWING TITLE **DISTRIBUTION 06**  
**(3+600.00 - 4+200.00)**

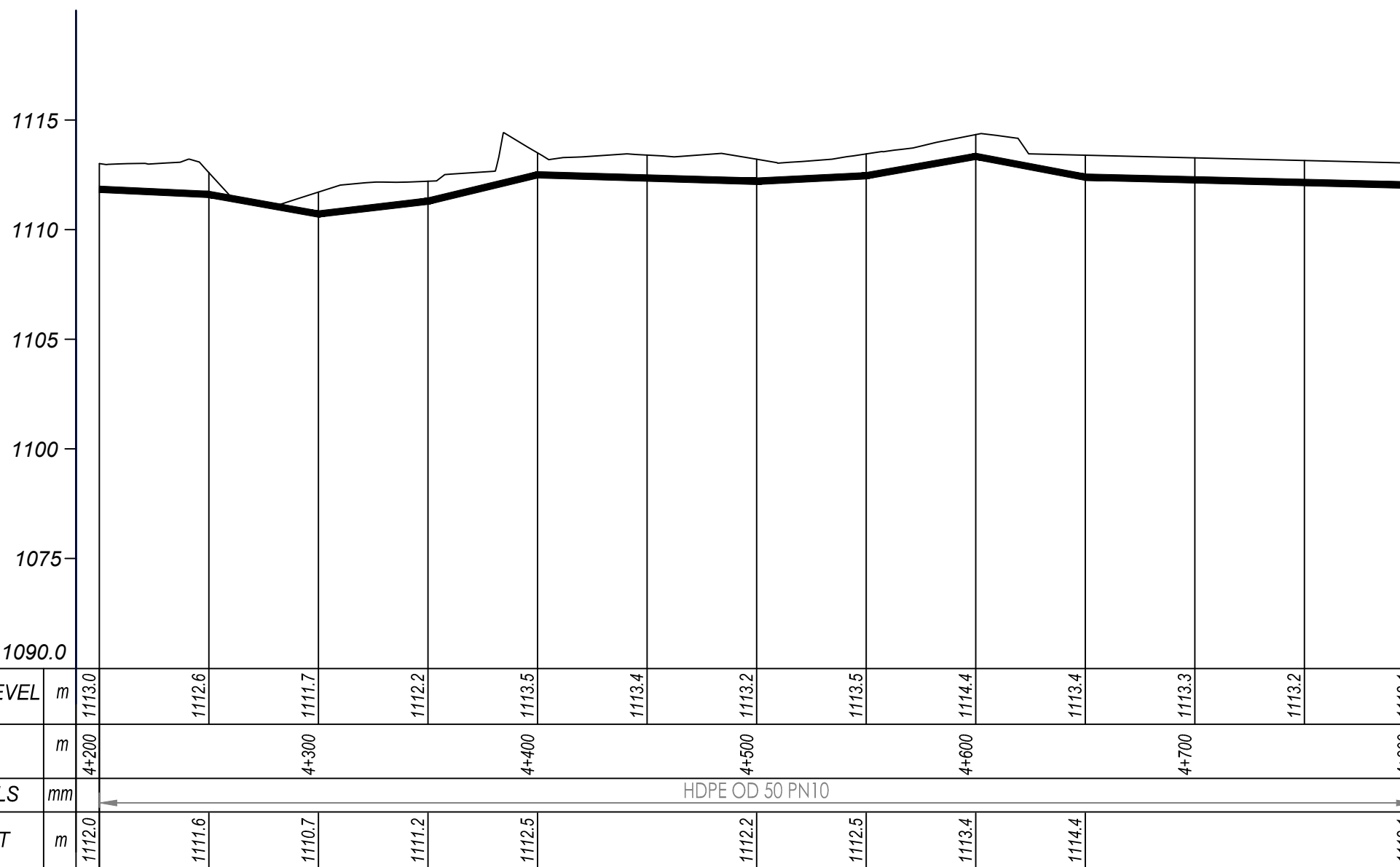
SCALE Vert. 1:250  
Horiz. 1:2500  
DRAWING No. NYA/WS/5.6.7  
SURVEYED ... DESIGNED Otwane Dan.  
DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare  
DATE April 2021 APPROVED Rodney Barugahare.



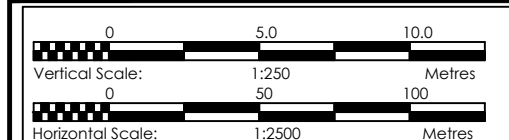
**NOTES**

**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
- WO-2 Washout Type2



**DISTRIBUTION 6 (4+200.00 - 4+800.00)**



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

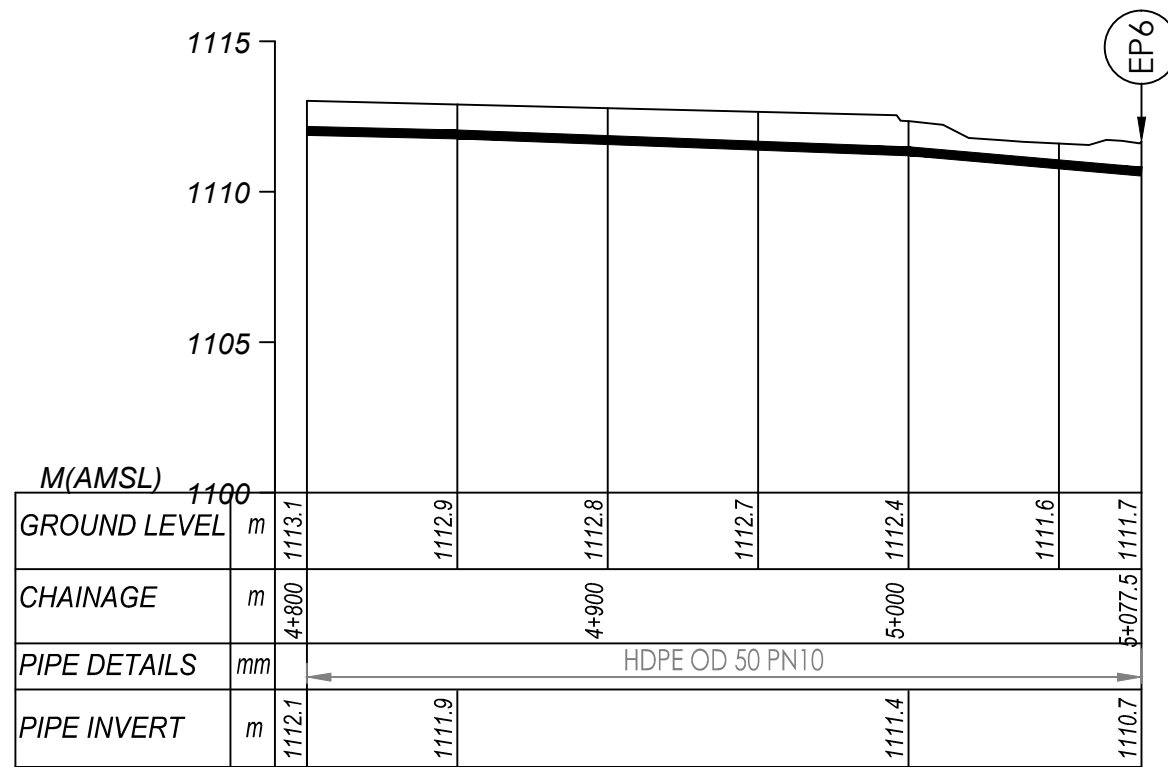
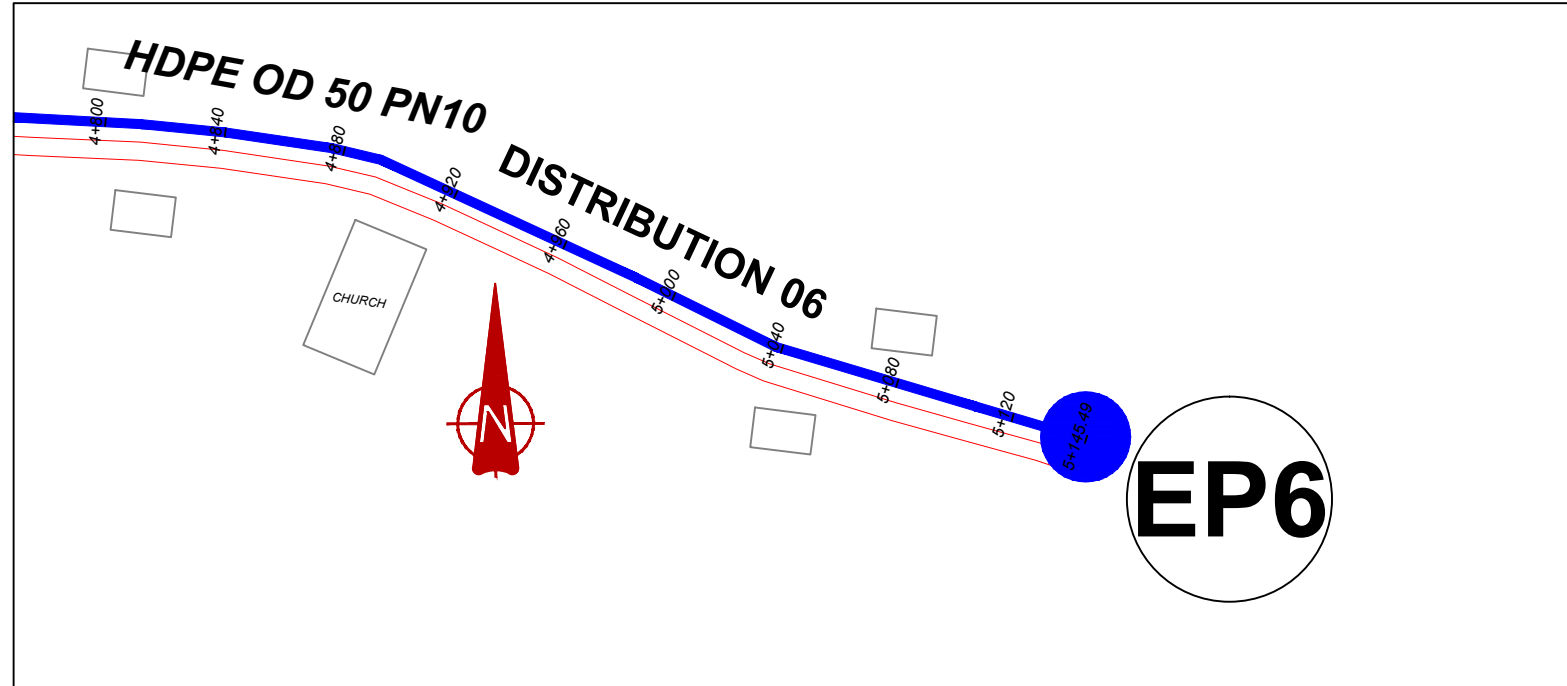
**NYAKABAALE WATER SUPPLY SYSTEM**

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

CONTRACTOR

**DETAILED ENGINEERING DESIGN**  
 DRAWING TITLE **DISTRIBUTION 06 (4+200.00 - 4+800.00)**

SCALE	Vert, 1:250 Hor, 1:2500	DRAWING No.	NYA/WS/5.6.8
SURVEYED	....	DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	April 2021	APPROVED	Rodney Barugahare.

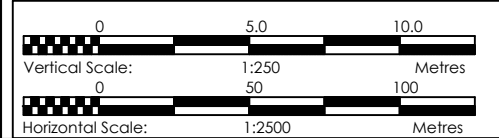


**DISTRIBUTION 6 (4+800.00 - 5+077.50)**

**NOTES**

**LEGEND**

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- End pipe
- Node N01
- WO-1 Washout Type1
- WO-2 Washout Type2



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

CO-FINANCED BY:  
 AND **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

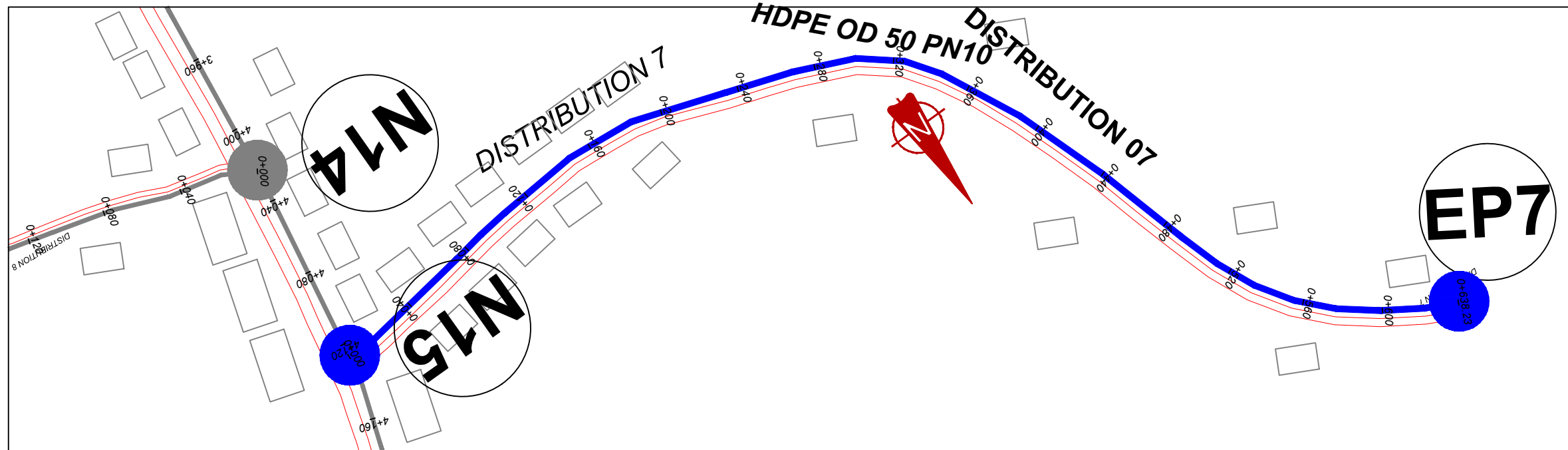
**NYAKABAALE WATER SUPPLY SYSTEM**

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

CONTRACTOR

**DETAILED ENGINEERING DESIGN**  
 DRAWING TITLE **DISTRIBUTION 06**  
**(4+800.00 - 5+077.50)**

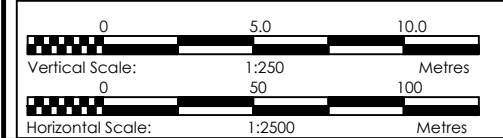
SCALE	Vert, 1:250 Horiz, 1:2500	DRAWING No.	NYA/WS/5.6.9
SURVEYED	....	DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	April 2021	APPROVED	Rodney Barugahare.



**NOTES**

**LEGEND**

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- End pipe
- Node N01
- Washout Type1
- Washout Type2



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

**NYAKABAALE WATER SUPPLY SYSTEM**

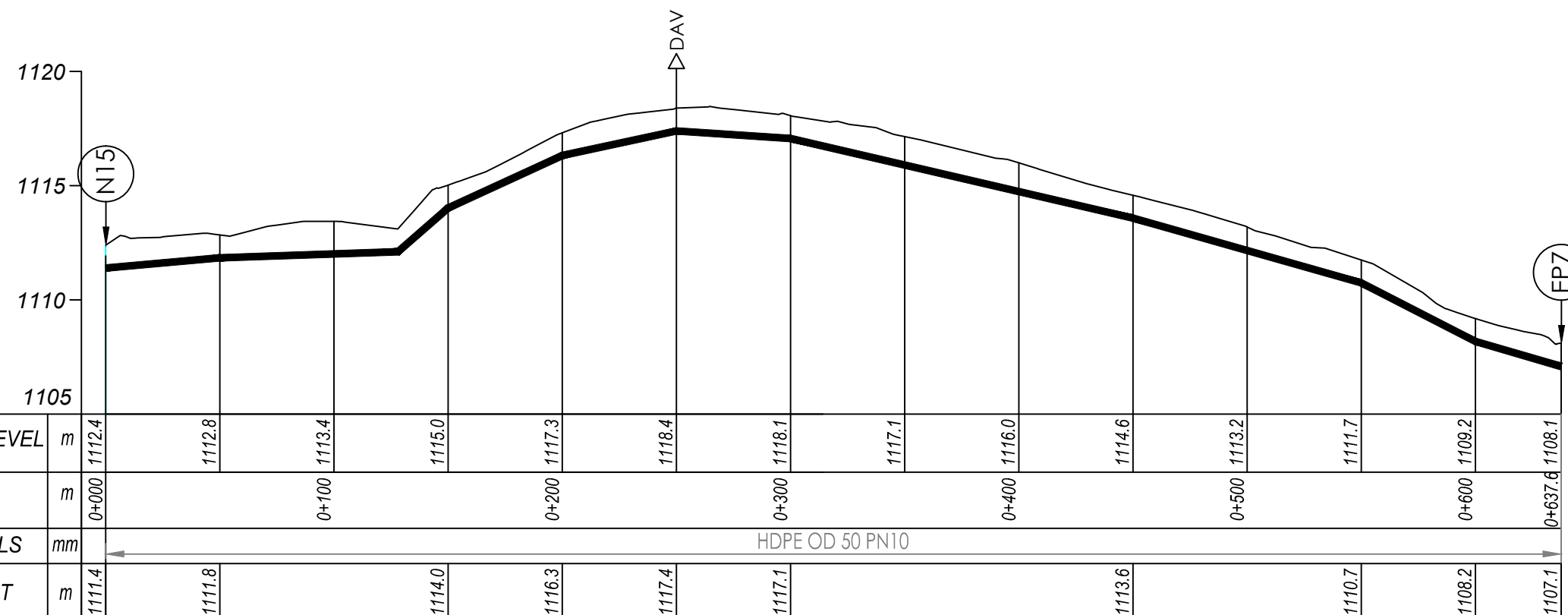
CONSULTANT  
 In Joint Venture with   
 Corporate Headquarter  
 10 Phidip Lane, 1st Floor,  
 London EC3M 8AA,  
 United Kingdom

CONTRACTOR

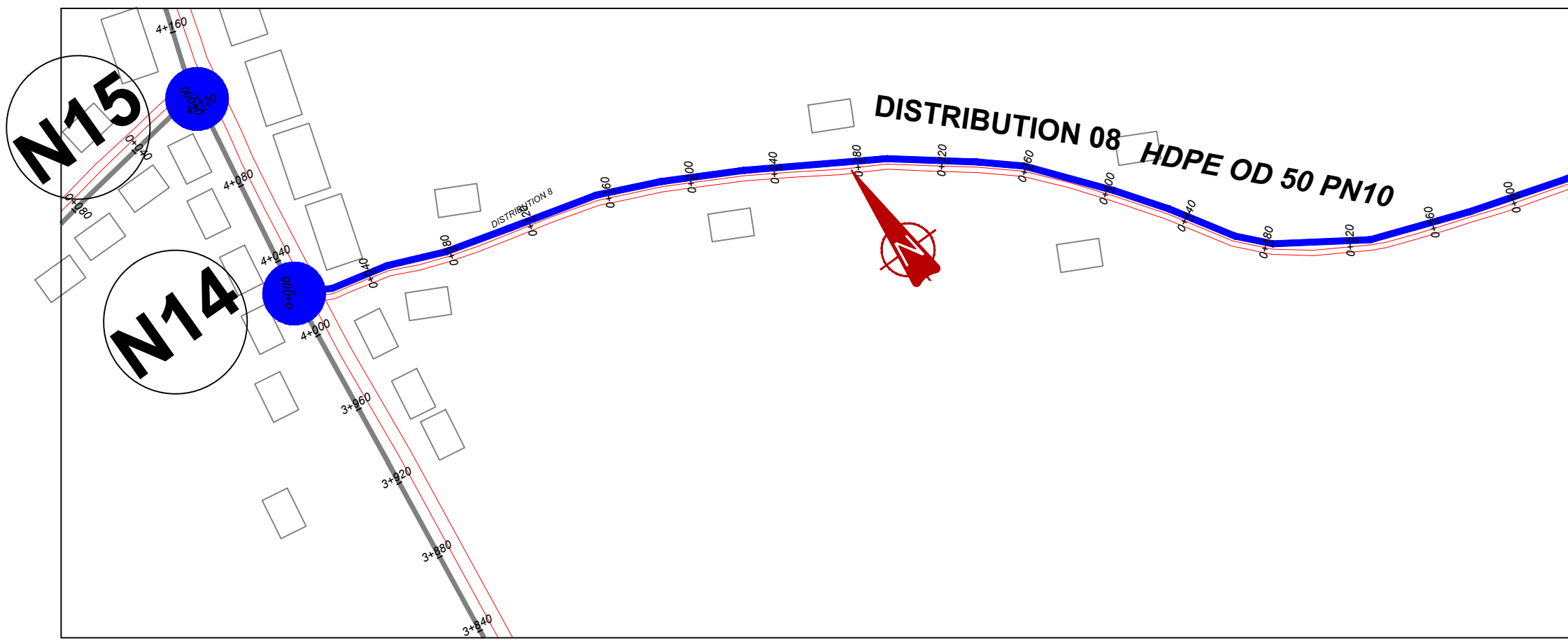
**DETAILED ENGINEERING DESIGN**

DRAWING TITLE **DISTRIBUTION 07**  
**(0+000.00 - 0+637.60)**

SCALE	Vert, 1:250 Horiz, 1:2500	DRAWING No.	NYA/WS/5.7.1
SURVEYED	....	DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	April 2021	APPROVED	Rodney Barugahare.



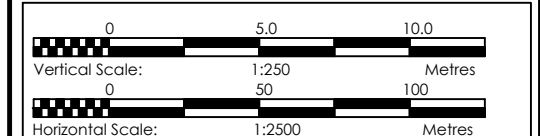
**DISTRIBUTION 7 (0+000.00 - 0+637.60)**



**NOTES**

**LEGEND**

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- End pipe
- Node N01
- Washout Type1
- Washout Type2



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

**NYAKABAALE WATER SUPPLY SYSTEM**

CONSULTANT

**SARI** In Joint Venture with **SGAPI**

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

CONTRACTOR

**DETAILED ENGINEERING DESIGN**

DRAWING TITLE **DISTRIBUTION 08**  
(0+000.00 - 0+600.00)

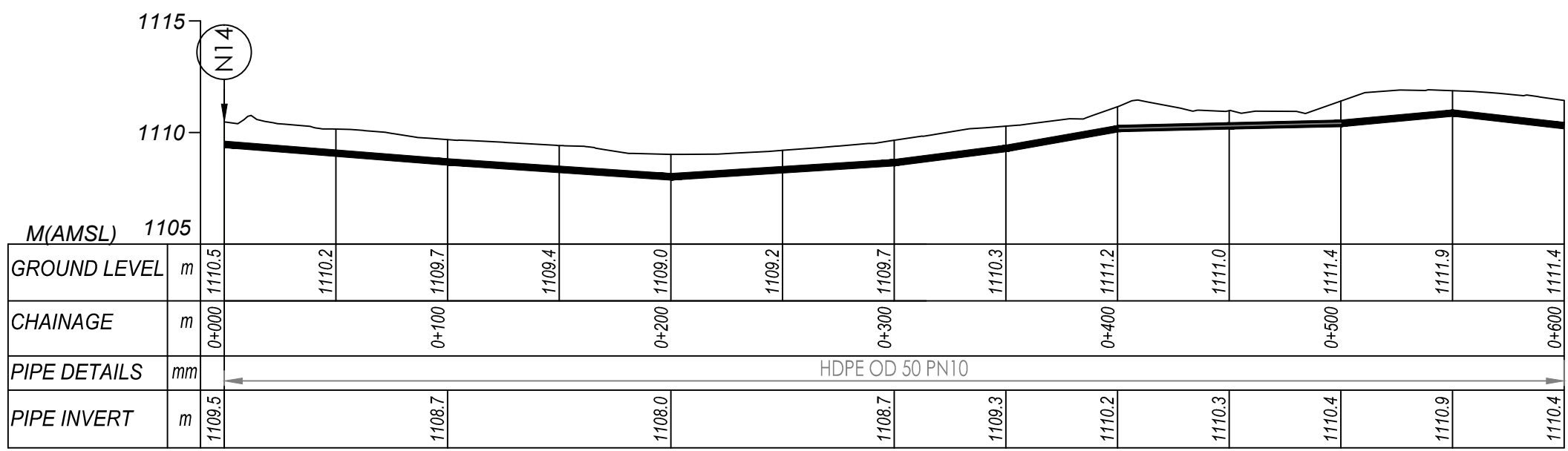
SCALE Vert. 1:250  
Horiz. 1:2500

DRAWING No. NYA/WS/5.8.1

SURVEYED .... DESIGNED Otwane Dan.

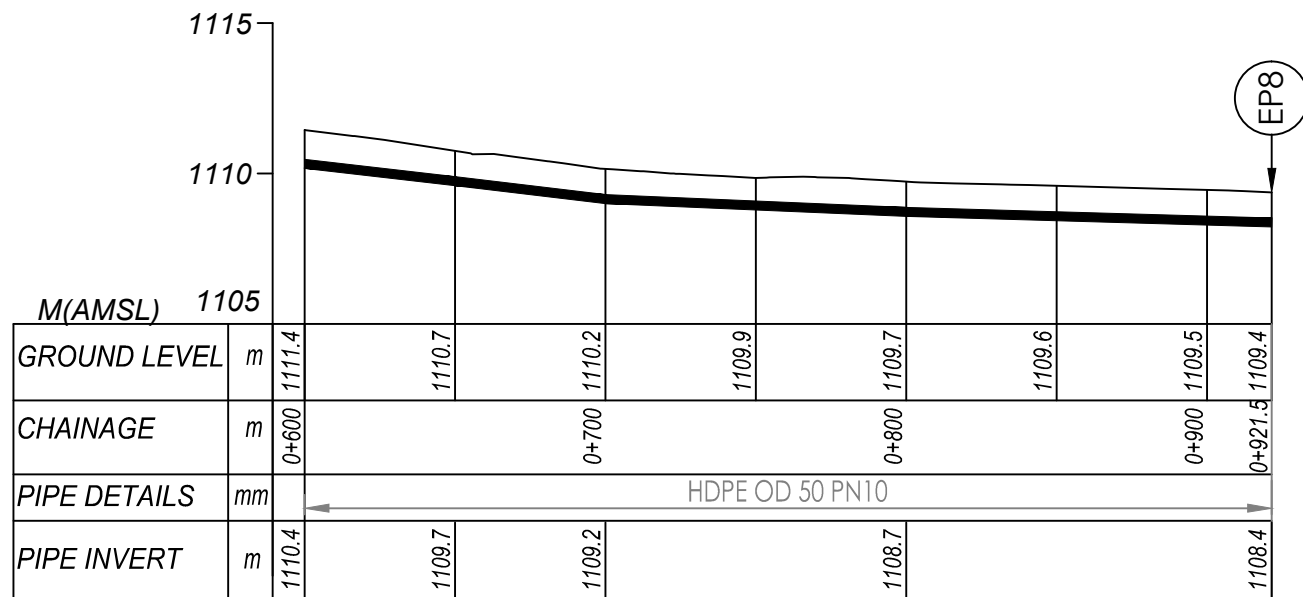
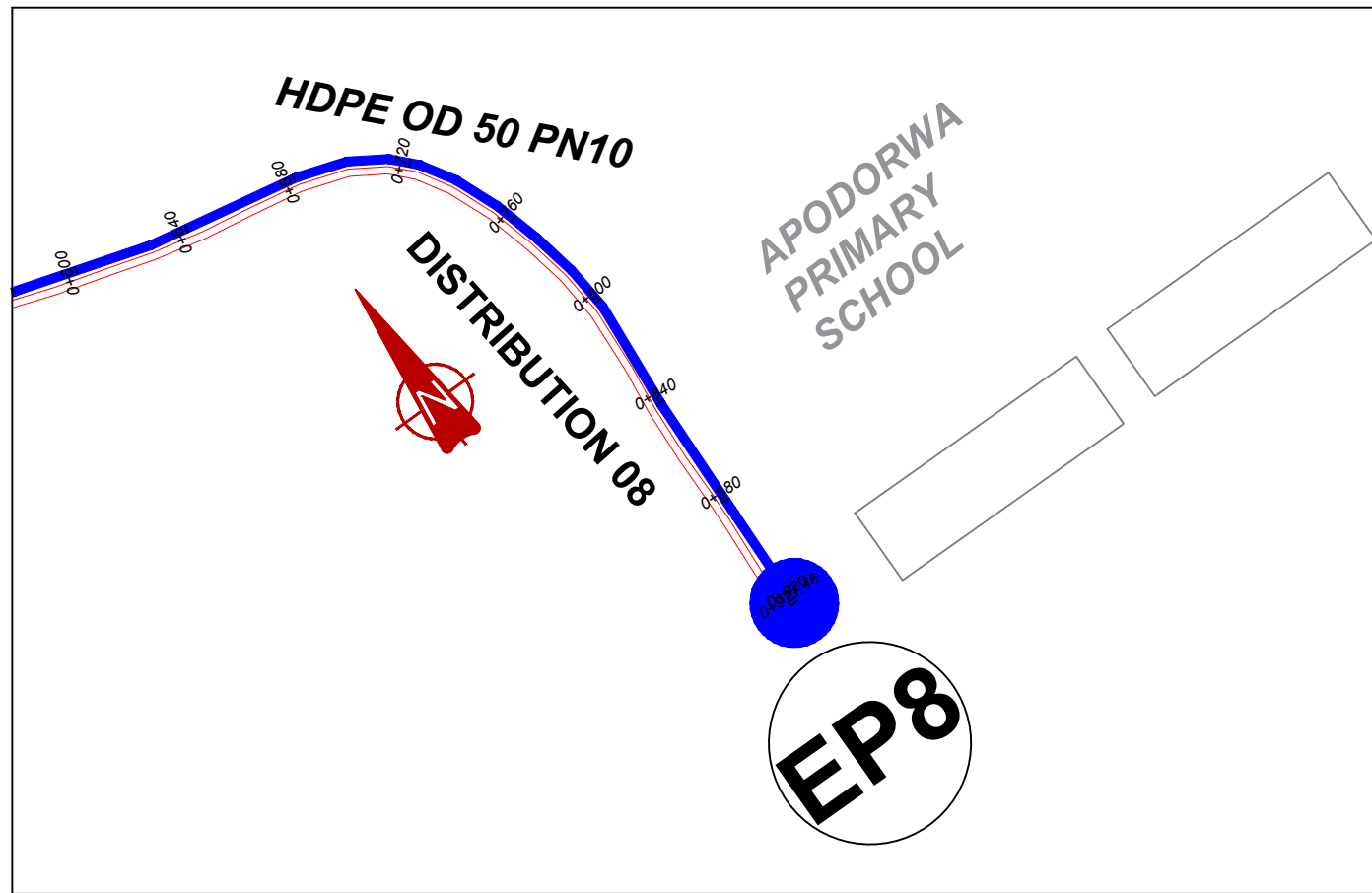
DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare

DATE April 2021 APPROVED Rodney Barugahare.



**DISTRIBUTION 8 (0+000.00 - 0+600.00)**



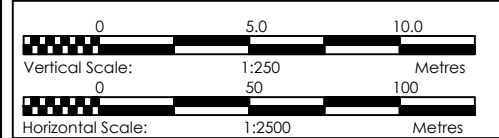


**DISTRIBUTION 8 (0+600.00 - 0+921.50)**

**NOTES**

**LEGEND**

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- End pipe
- Node N01
- WO-1 Washout Type1
- WO-2 Washout Type2



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

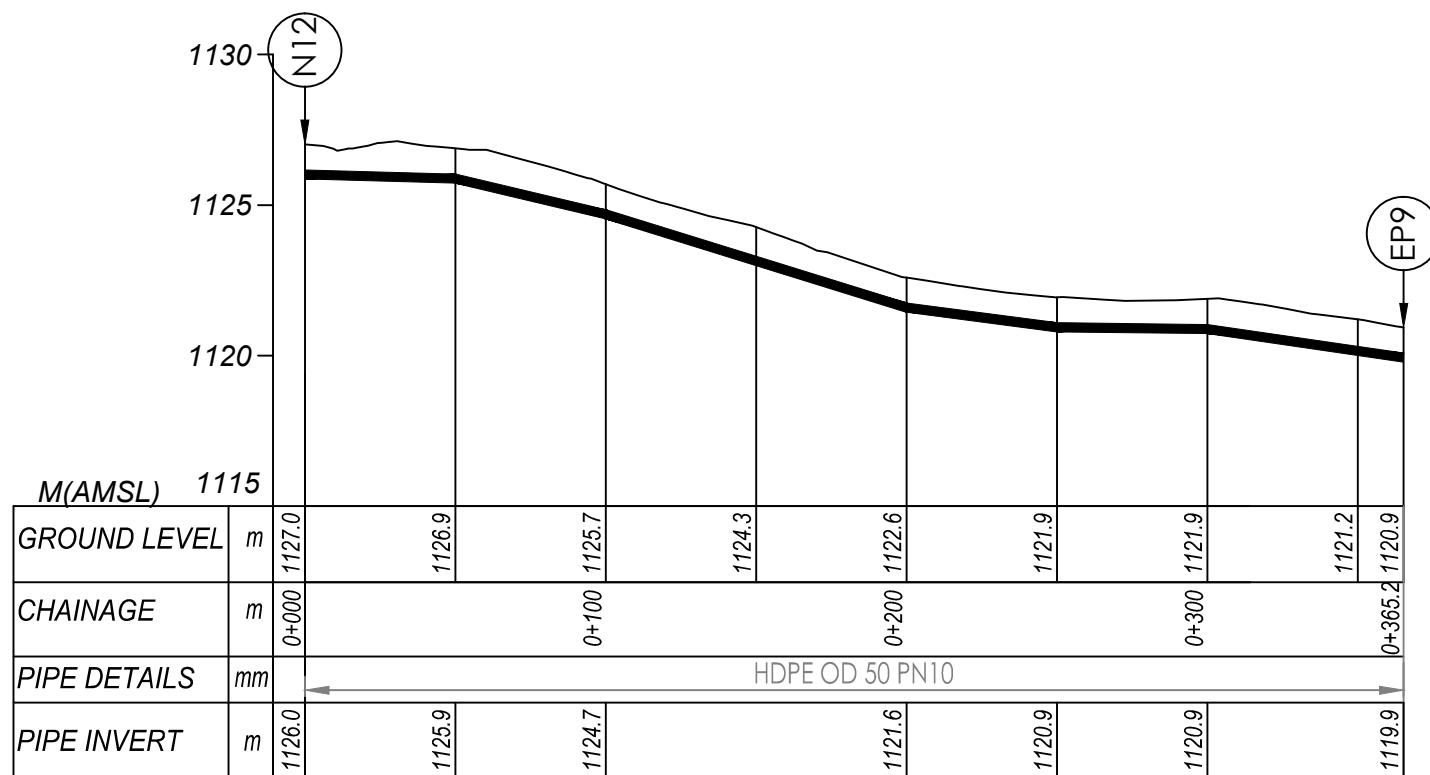
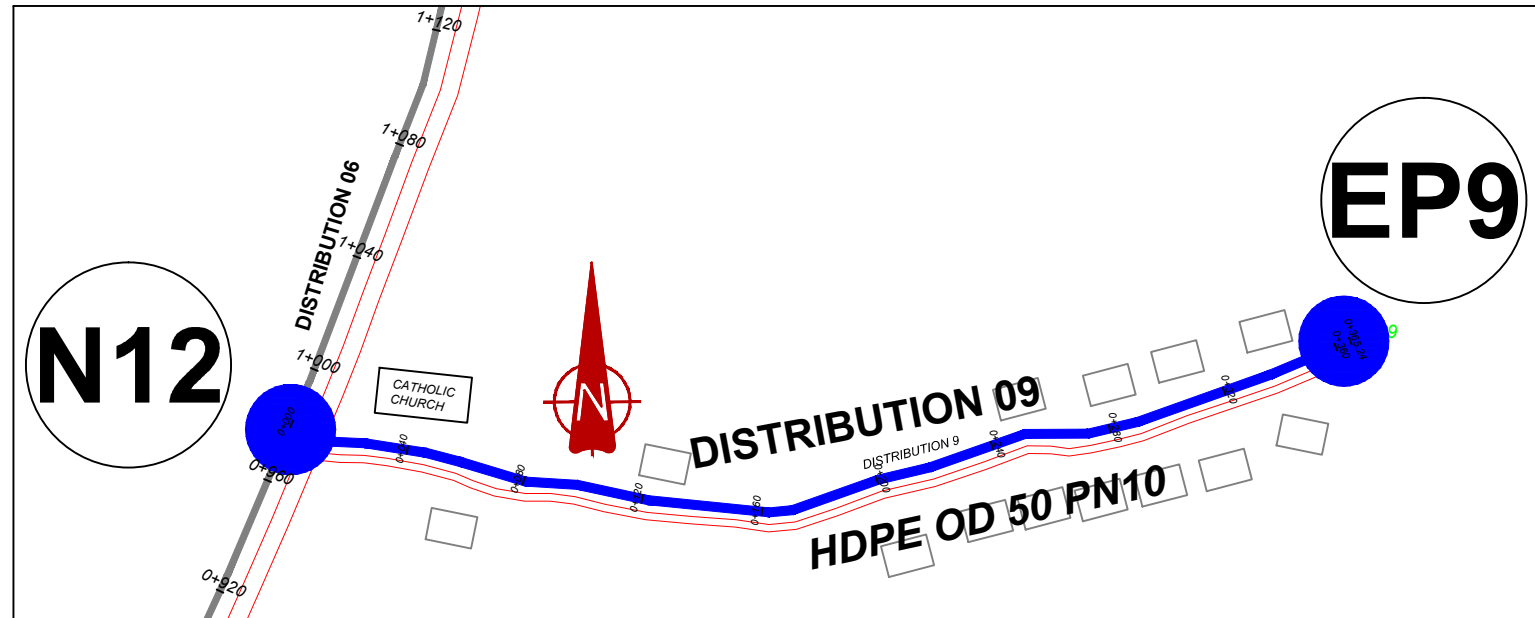
**NYAKABAAL WATER SUPPLY SYSTEM**

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

CONTRACTOR

**DETAILED ENGINEERING DESIGN**  
 DRAWING TITLE **DISTRIBUTION 08**  
**(0+600.00 - 0+921.50)**

SCALE	Vert, 1:250 Hor, 1:2500	DRAWING No.	NYA/WS/5.8.2
SURVEYED	....	DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	April 2021	APPROVED	Rodney Barugahare.

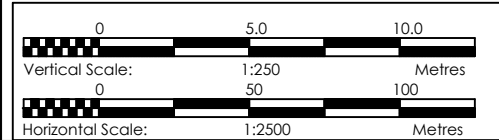


**DISTRIBUTION 9 (0+000.00 - 0+365.20)**

**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
- WO-2 Washout Type2



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

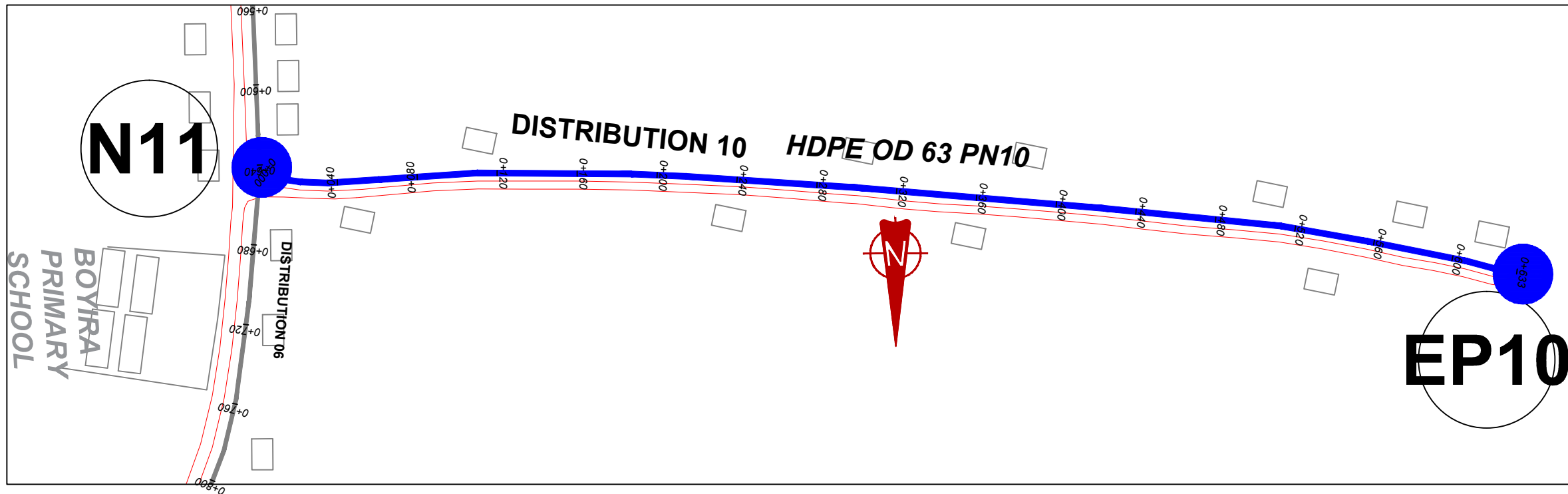
**NYAKABAALE WATER SUPPLY SYSTEM**

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

CONTRACTOR

**DETAILED ENGINEERING DESIGN**  
 DRAWING TITLE **DISTRIBUTION 09**  
**(0+600.00 - 0+921.50)**

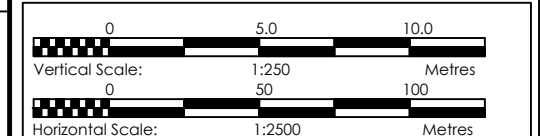
SCALE	Vert, 1:250 Horiz, 1:2500	DRAWING No.	NYA/WS/5.9.1
SURVEYED	....	DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	April 2021	APPROVED	Rodney Barugahare.



**NOTES**

**LEGEND**

- Transmission Pipeline
- Distribution Pipeline
- Ground Level
- Building/House
- Contours
- Road
- DAV Double Orifice Air Valve
- End pipe
- Node N01
- Washout Type1
- Washout Type2



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

**NYAKABAALE WATER SUPPLY SYSTEM**

CONSULTANT

SARI In Joint Venture with SGAPI

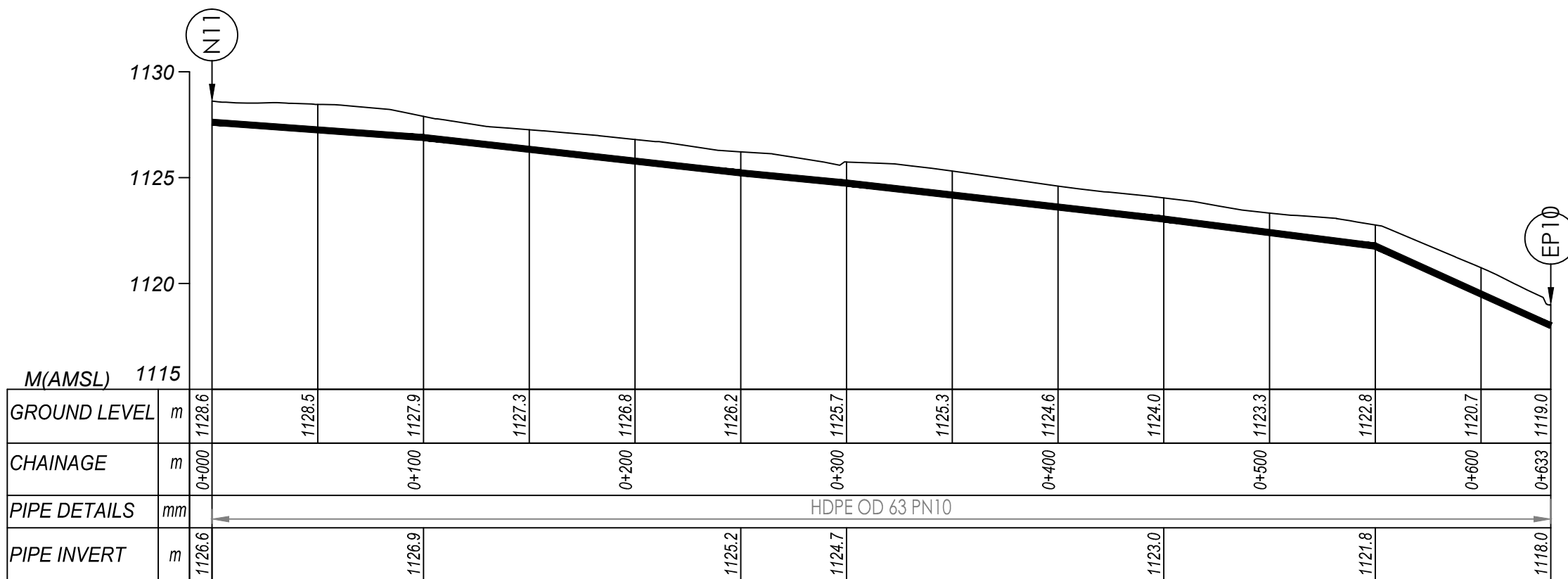
Corporate Headquarter  
10 Phidip Lane, 1st Floor,  
London EC3M 8AA,  
United Kingdom

CONTRACTOR

**DETAILED ENGINEERING DESIGN**

DRAWING TITLE **DISTRIBUTION 10 (0+000.00 - 0+633.00)**

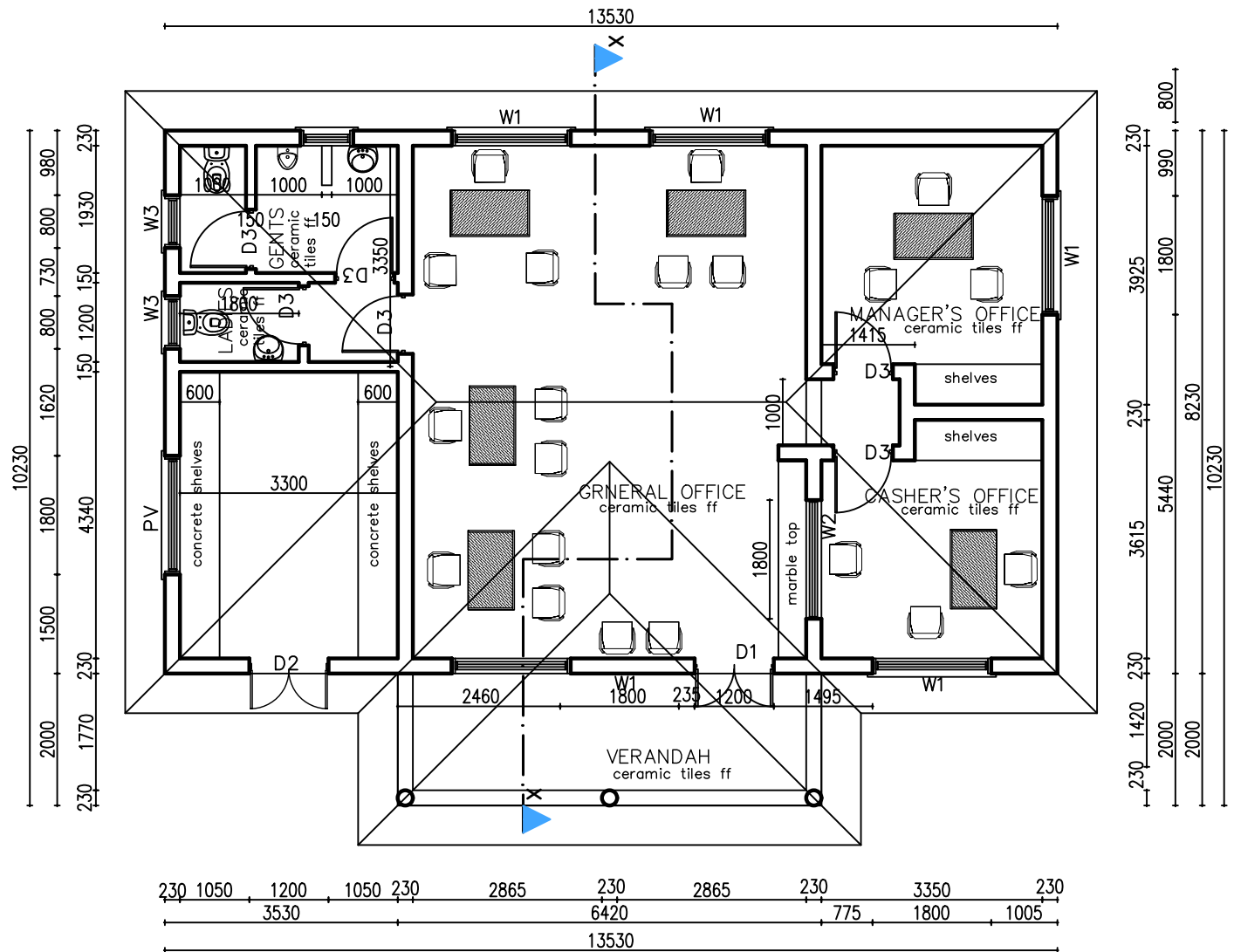
SCALE	Vert, 1:250 Hor, 1:2500	DRAWING No.	NYA/WS/5.10.1
SURVEYED	....	DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	April 2021	APPROVED	Rodney Barugahare.



**DISTRIBUTION 10 (0+000.00 - 0+633.00)**

**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.



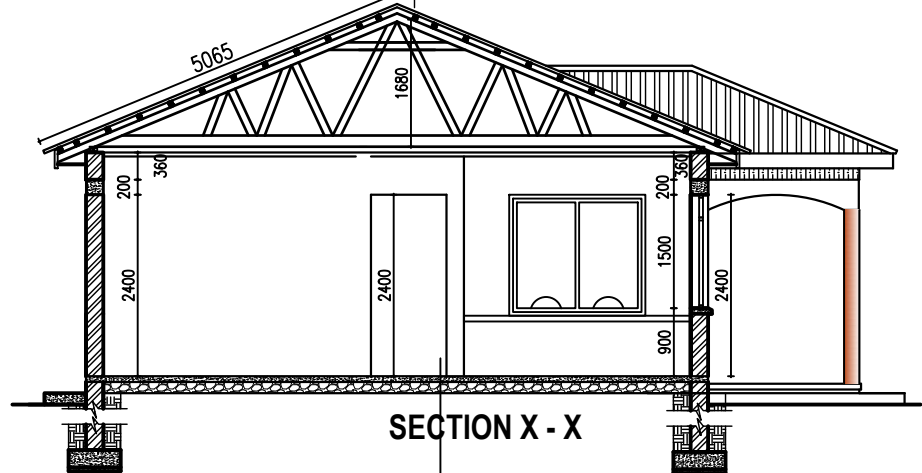
FLOOR PLAN scale 1:100

**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

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

CO-FINANCED BY: AND 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

**NYAKABALE WATER SUPPLY SYSTEM**

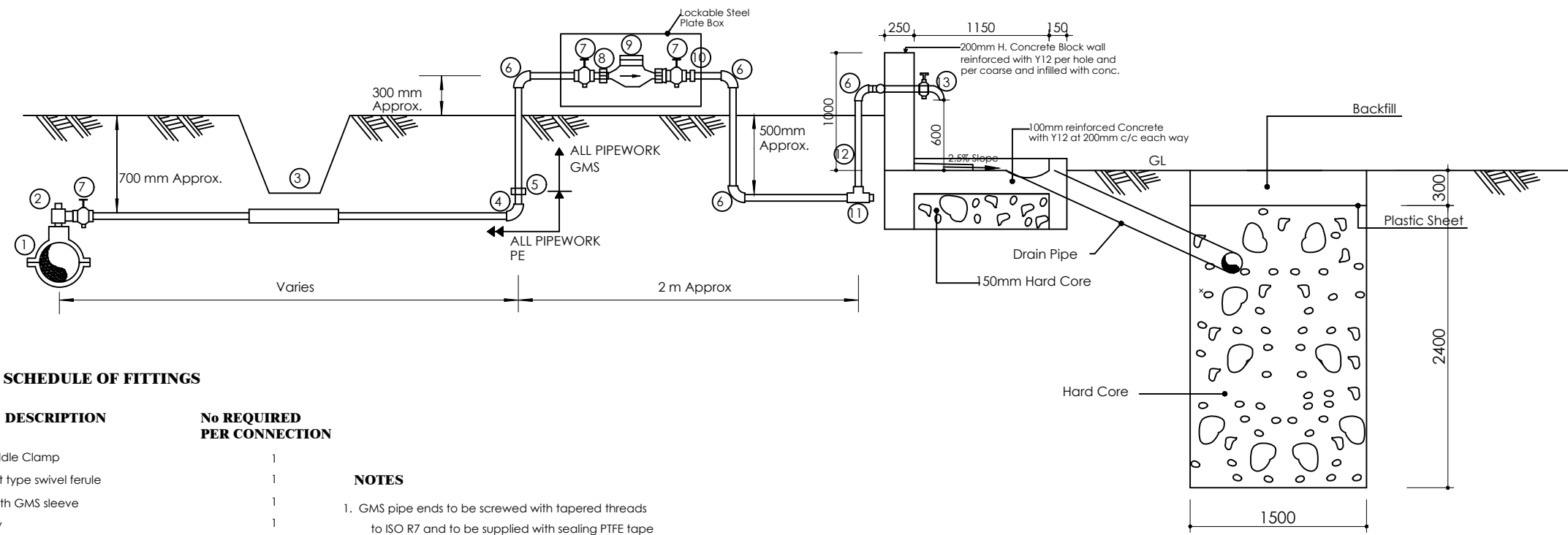
CONSULTANT In Joint Venture with **SARI** Corporate Headquarter 10 Philpot Lane, 1st Floor, London EC3M 8AA, United Kingdom

CONTRACTOR

**DETAILED ENGINEERING DESIGN**

DRAWING TITLE **WATER OFFICE FLOOR PLAN & SECTION**

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



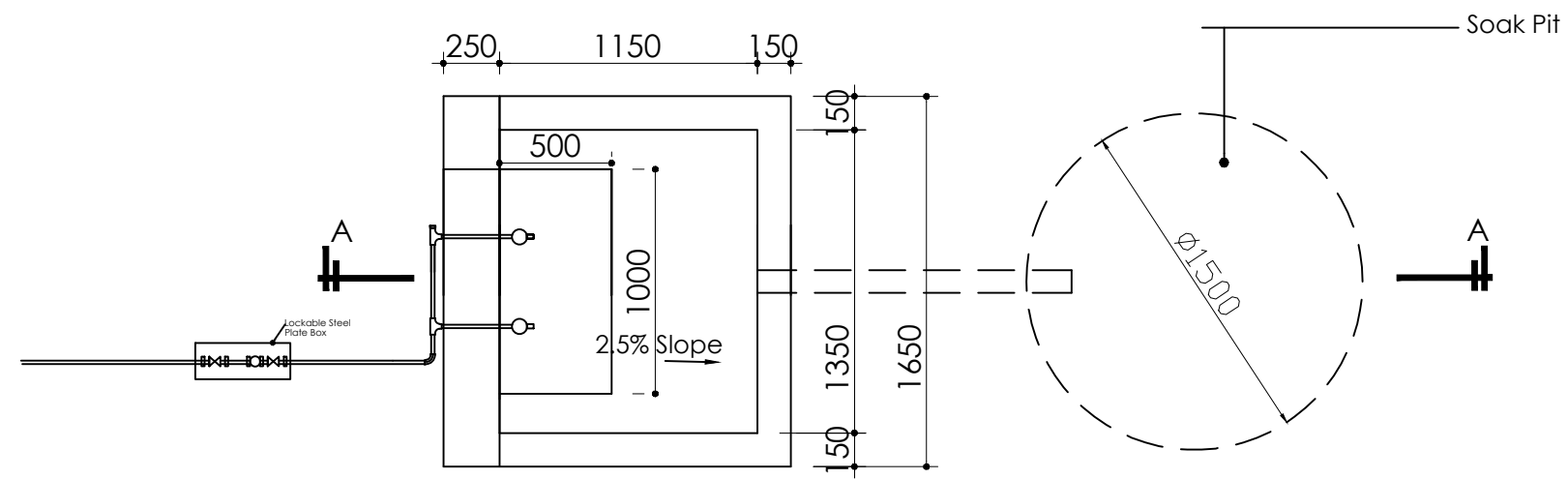
**SCHEDULE OF FITTINGS**

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. NYA/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

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

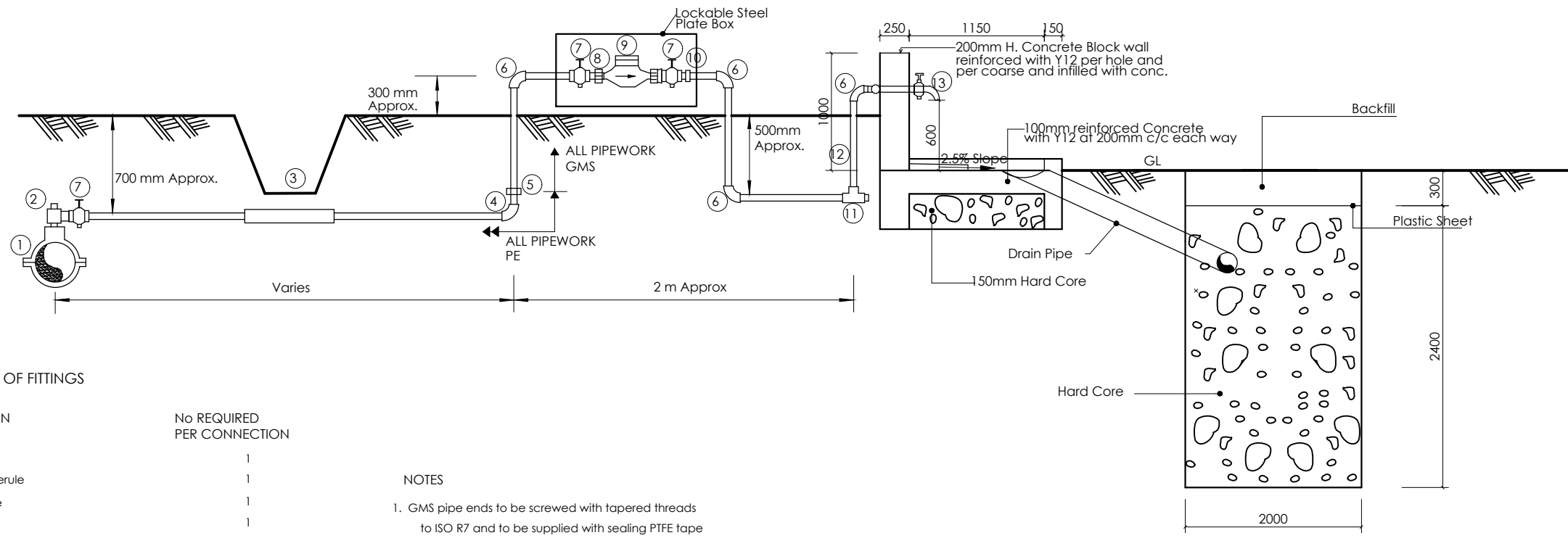
**NYAKABAALE WATER SUPPLY SYSTEM**

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

CONTRACTOR

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

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



**NOTES**

1. For site location see dwg. NYA/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

**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**

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

CLIENT

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

CO-FINANCED BY:

AND

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**

**NYAKABAALE WATER SUPPLY SYSTEM**

CONSULTANT

In Joint Venture with

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

CONTRACTOR

**DETAILED ENGINEERING DESIGN**

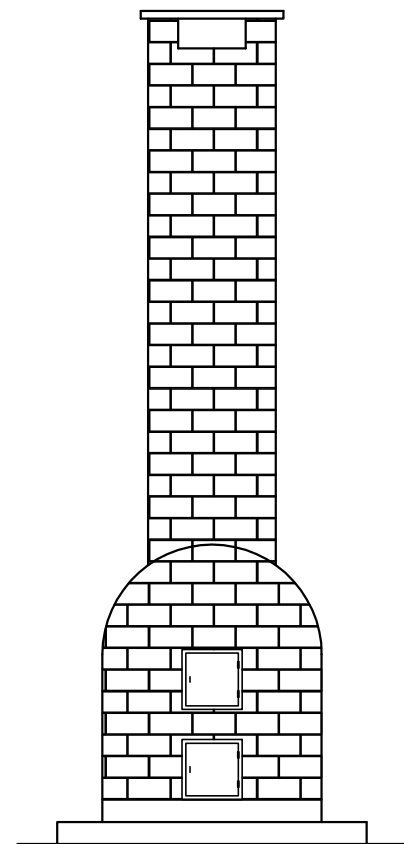
DRAWING TITLE

**TYPICAL YARD CONNECTION CONNECTION AND SOAK PIT DETAILS**

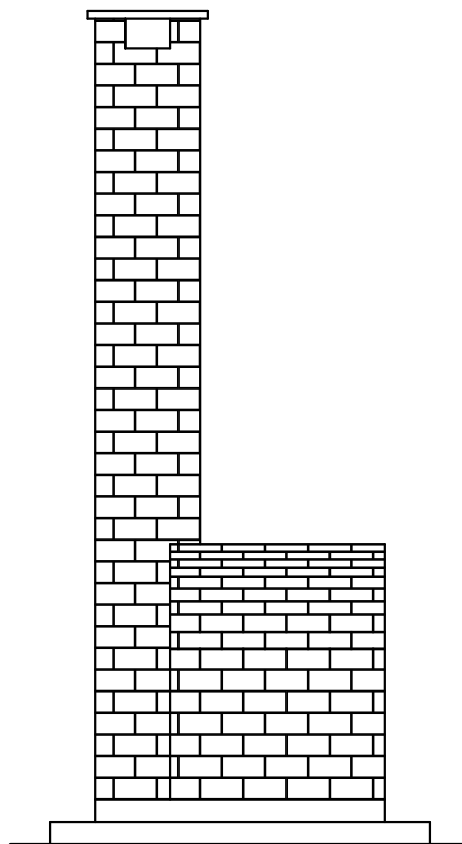
SCALE	As Shown	DRAWING No.	NYA/W/8.1.2
SURVEYED		DESIGNED	Othwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.

**NOTES**

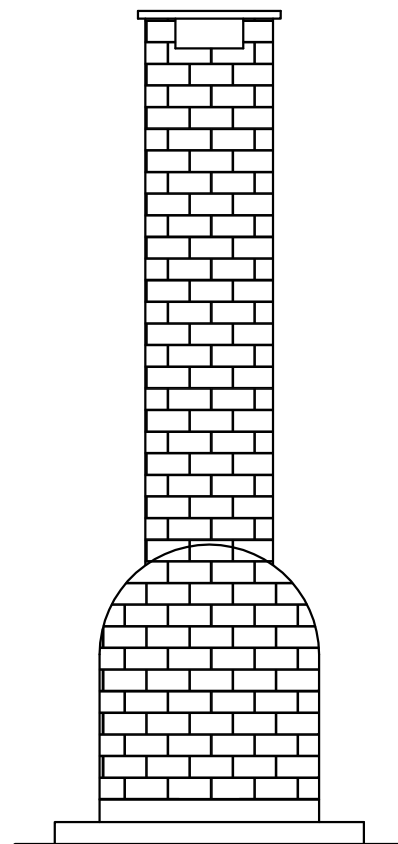
1. Unless otherwise stated, all dimensions are in mm
2. Concrete grade to be C20/10.
3. All levels in metres above mean sea level.



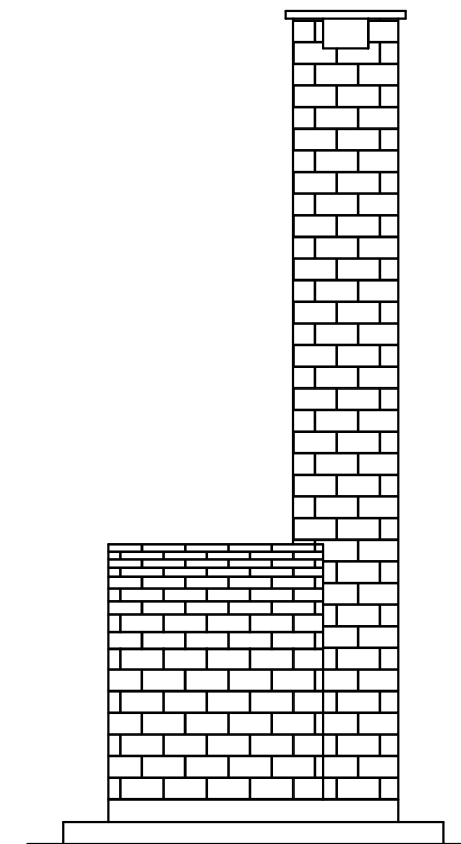
ELEVATION A



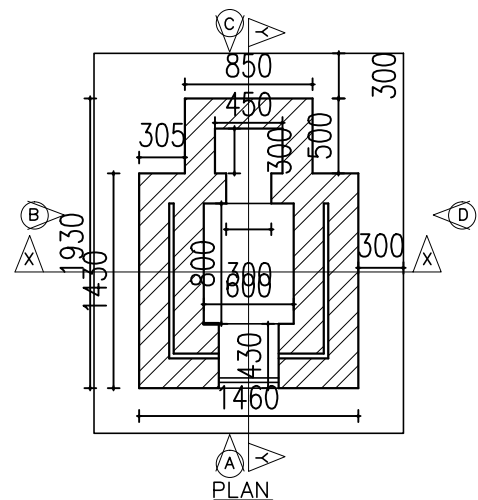
ELEVATION B



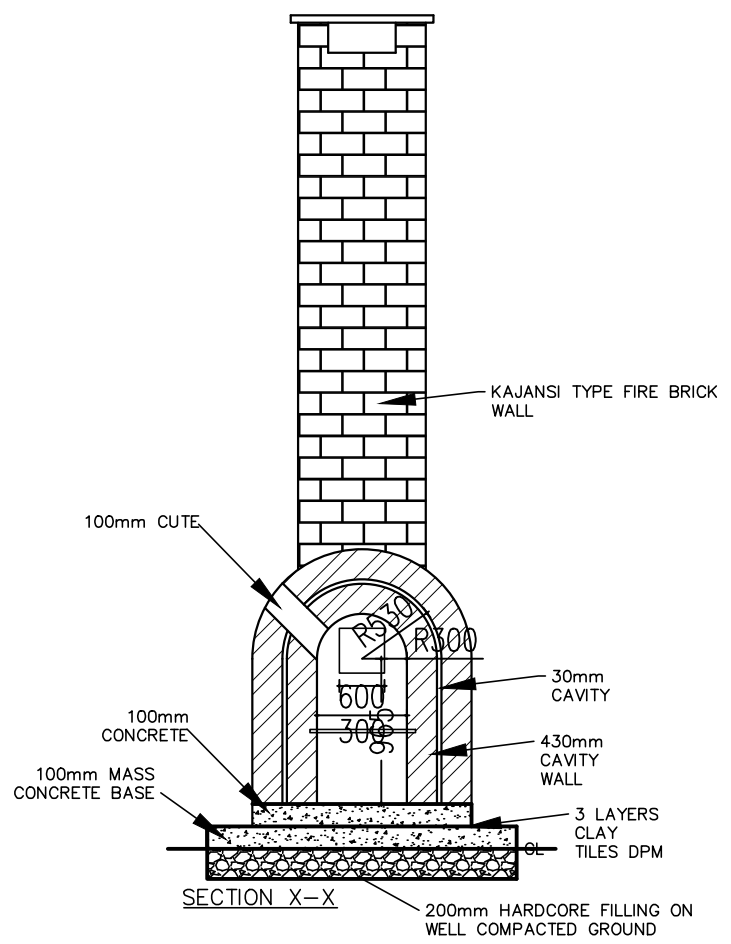
ELEVATION C



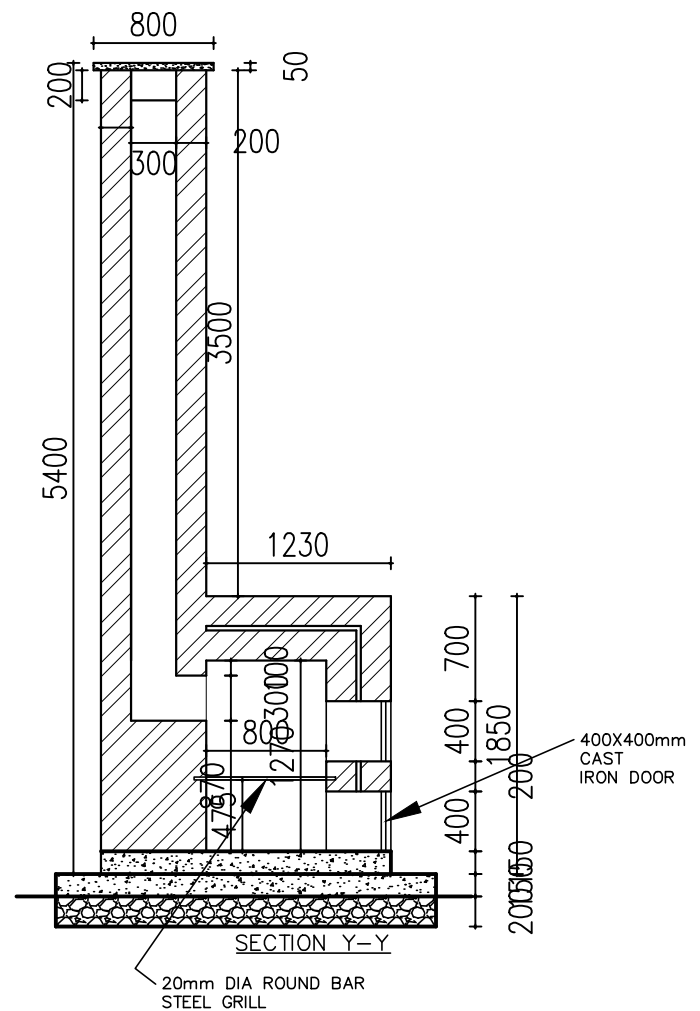
ELEVATION D



PLAN



SECTION X-X



SECTION Y-Y

CLIENT



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

CO-FINANCED BY:



AND



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

**NYAKABAALE 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

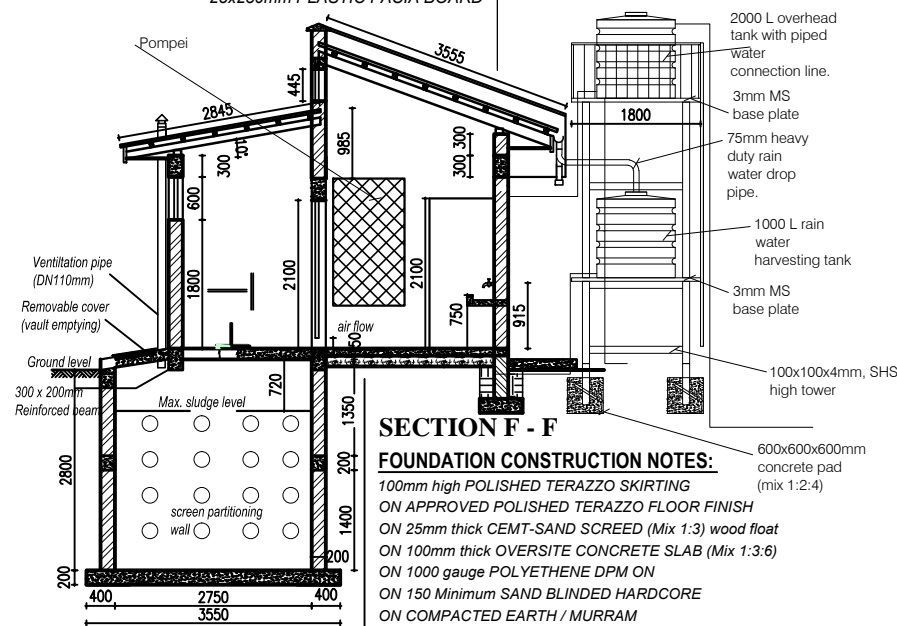
**INSTITUTIONAL TOILET - INCINERATOR**

SCALE	As Shown	DRAWING No.	NYA/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°*  
 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



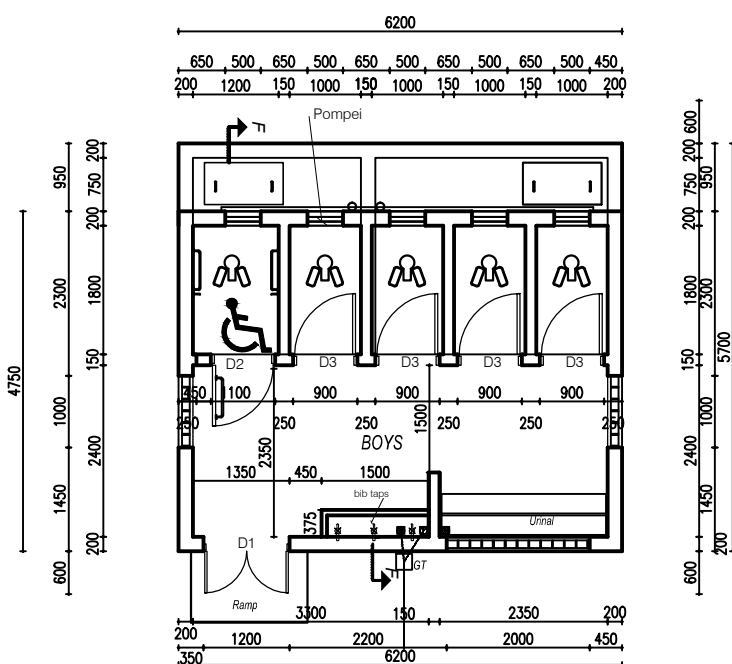
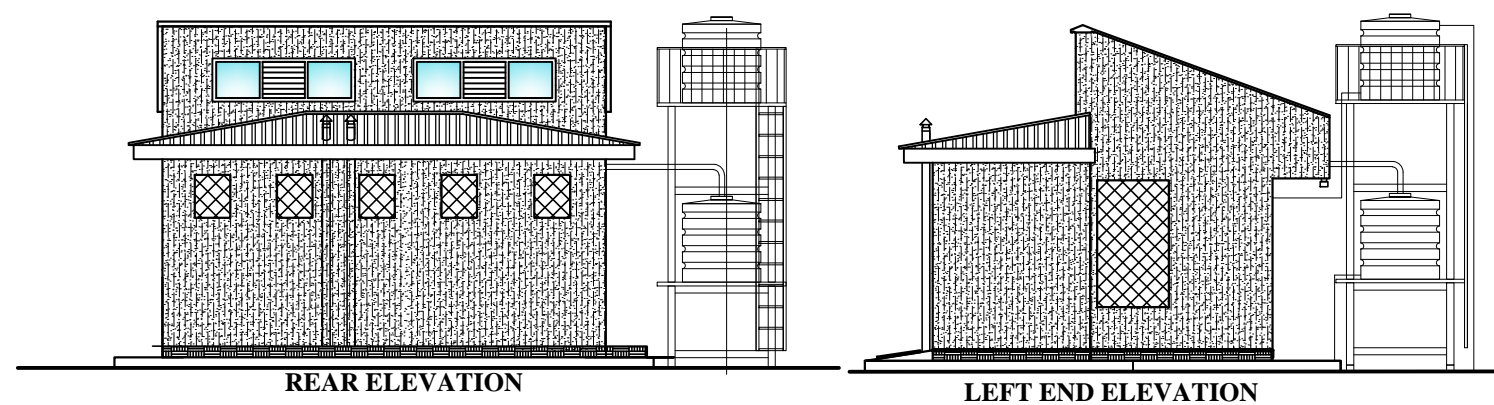
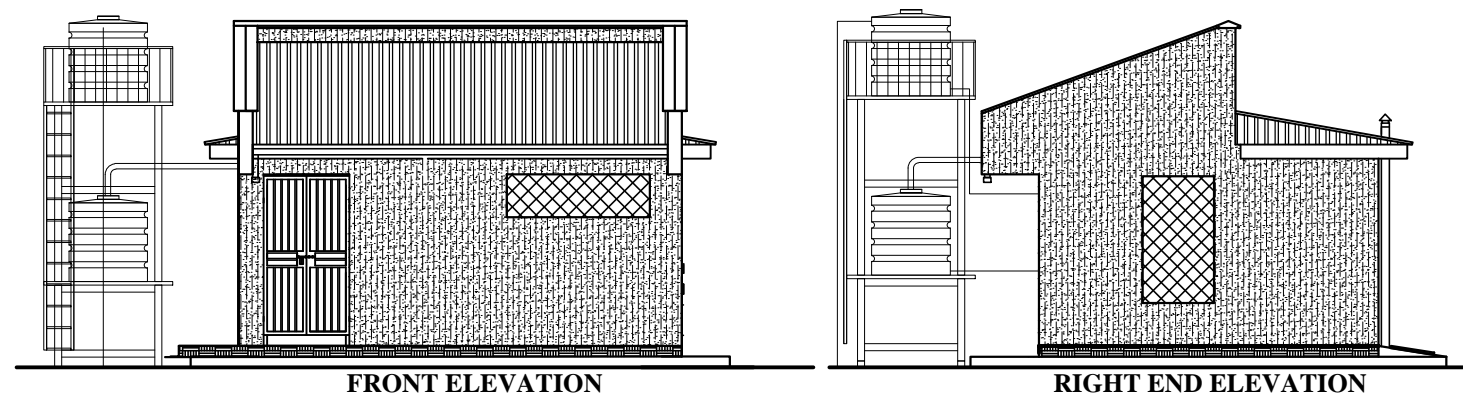
**SECTION F - F**

**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 POLYETHENE 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)			
<b>Mark</b>	D1/pv	D2	D3
<b>Quantity</b>	2 No.	1 No.	6 No.
<b>Type &amp; Remarks</b>	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
			<b>W3/pv</b>
			02 No.
			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**  
  
**GOVERNMENT OF UGANDA**  
 MINISTRY OF WATER AND ENVIRONMENT

**CO-FINANCED BY:**  
 AND   
 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

**NYAKABAALE WATER SUPPLY SYSTEM**

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

**CONTRACTOR**

**DETAILED ENGINEERING DESIGN**  
**DRAWING TITLE**  
**INSTITUTIONAL TOILET - BOYS**

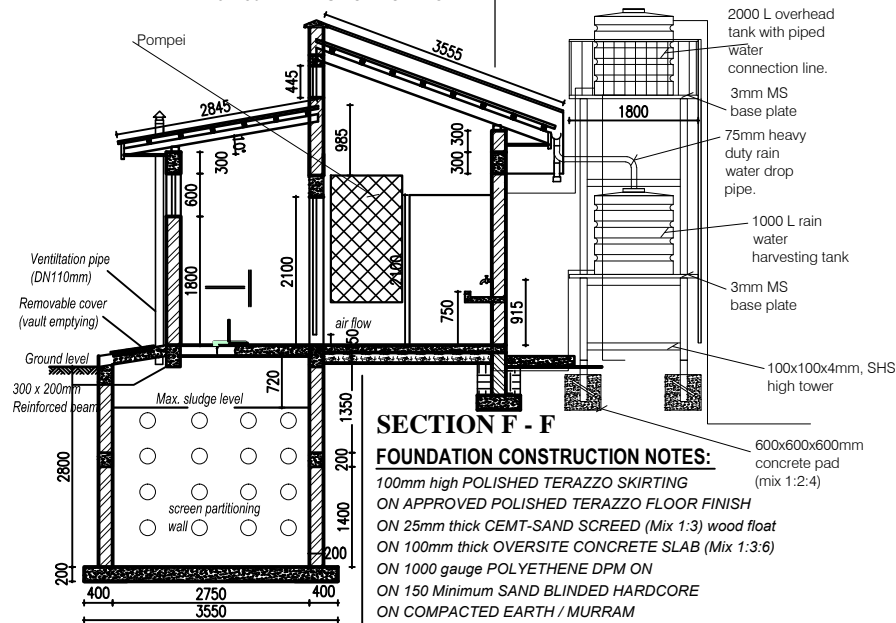
**SCALE** As Shown **DRAWING No.** NYA/S/1.1.2  
**SURVEYED** **DESIGNED** Otwane Dan.  
**DRAWN** Joshua Nyarwanda **CHECKED** Rodney Barugahare  
**DATE** OCT 2022 **APPROVED** Rodney Barugahare.



**NOTES**

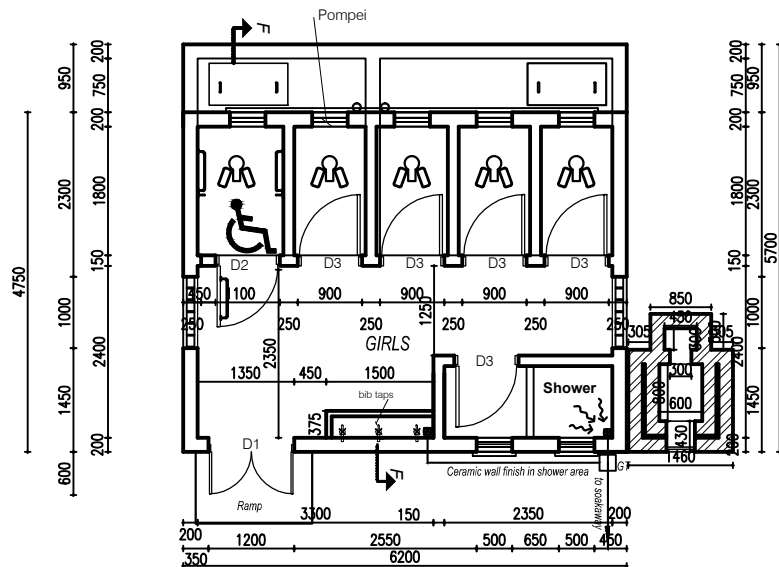
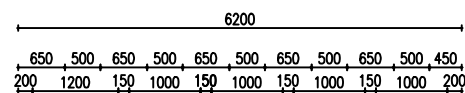
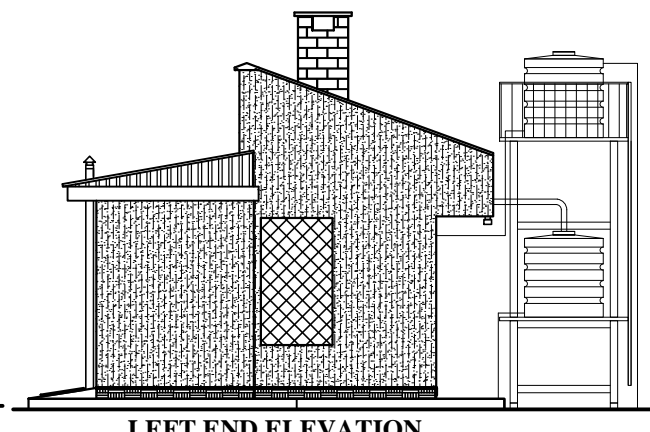
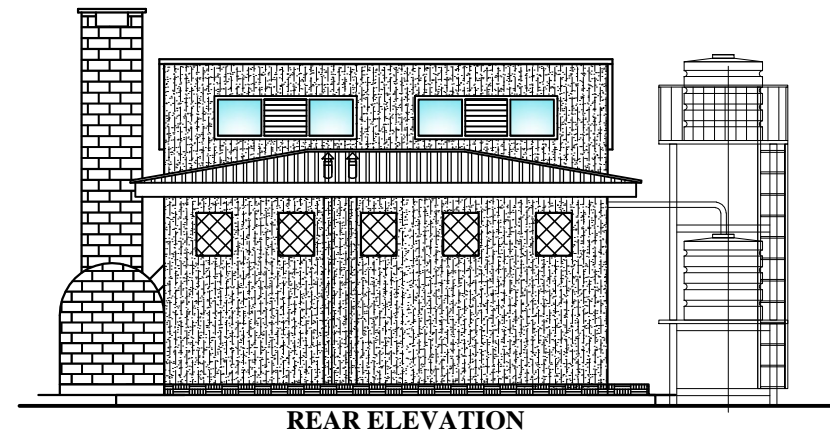
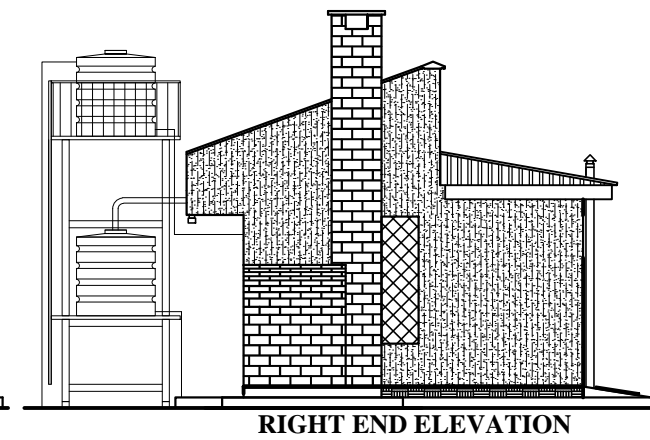
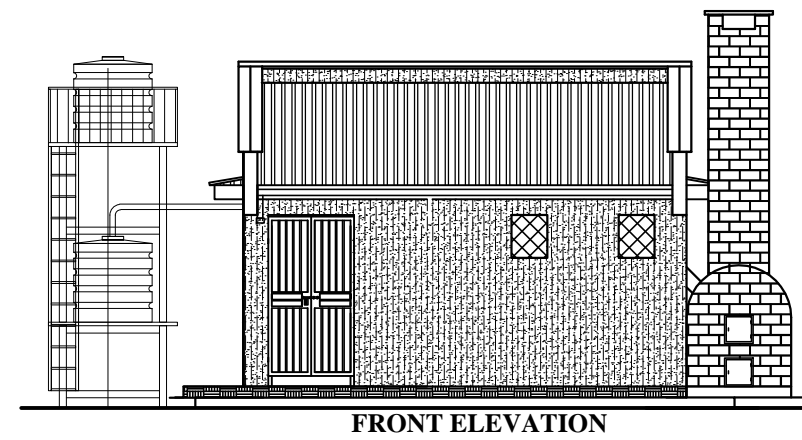
1. Unless otherwise stated, all dimensions are in mm
2. Concrete grade to be C20/10.
3. All levels in metres above mean sea level.

**ROOF SPECIFICATIONS:** *pitch=10/20°*  
 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



**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)			
<b>Mark</b>	D1/pv	D2	D3
<b>Quantity</b>	2 No.	1 No.	6 No.
<b>Type &amp; Remarks</b>	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
			<b>W3/pv</b>
			02 No.
			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**  
**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

**NYAKABALE WATER SUPPLY SYSTEM**

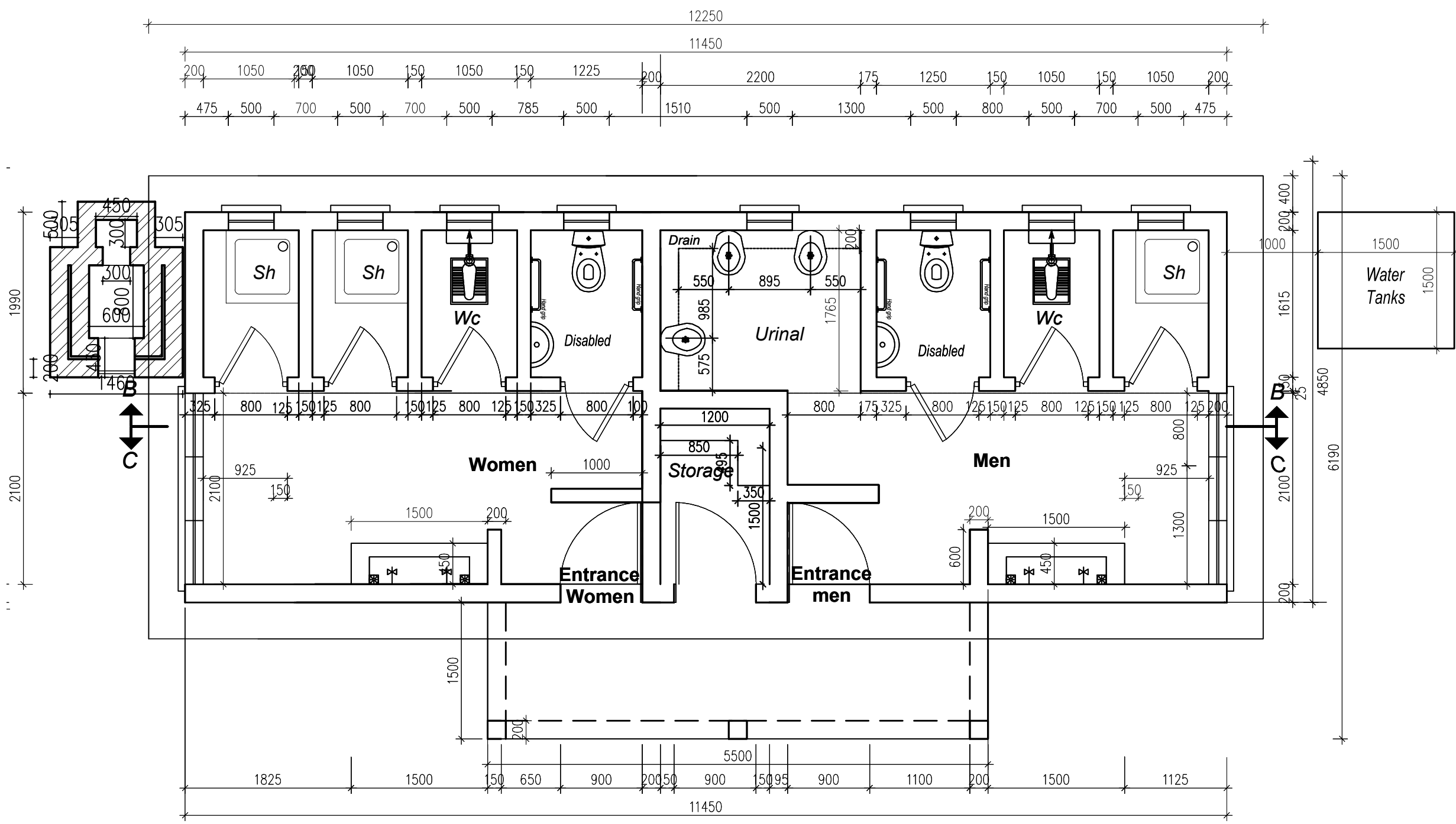
**CONSULTANT**  
 In Joint Venture with   
 Corporate Headquarter  
 10 Philpot Lane, 1st Floor,  
 London EC3M 8AA,  
 United Kingdom

**CONTRACTOR**

**DETAILED ENGINEERING DESIGN**  
**DRAWING TITLE**  
**INSTITUTIONAL TOILET - GIRLS**

**SCALE** As Shown **DRAWING No.** NYA/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:  
 AND   
 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

**NYAKABAAL WATER SUPPLY SYSTEM**

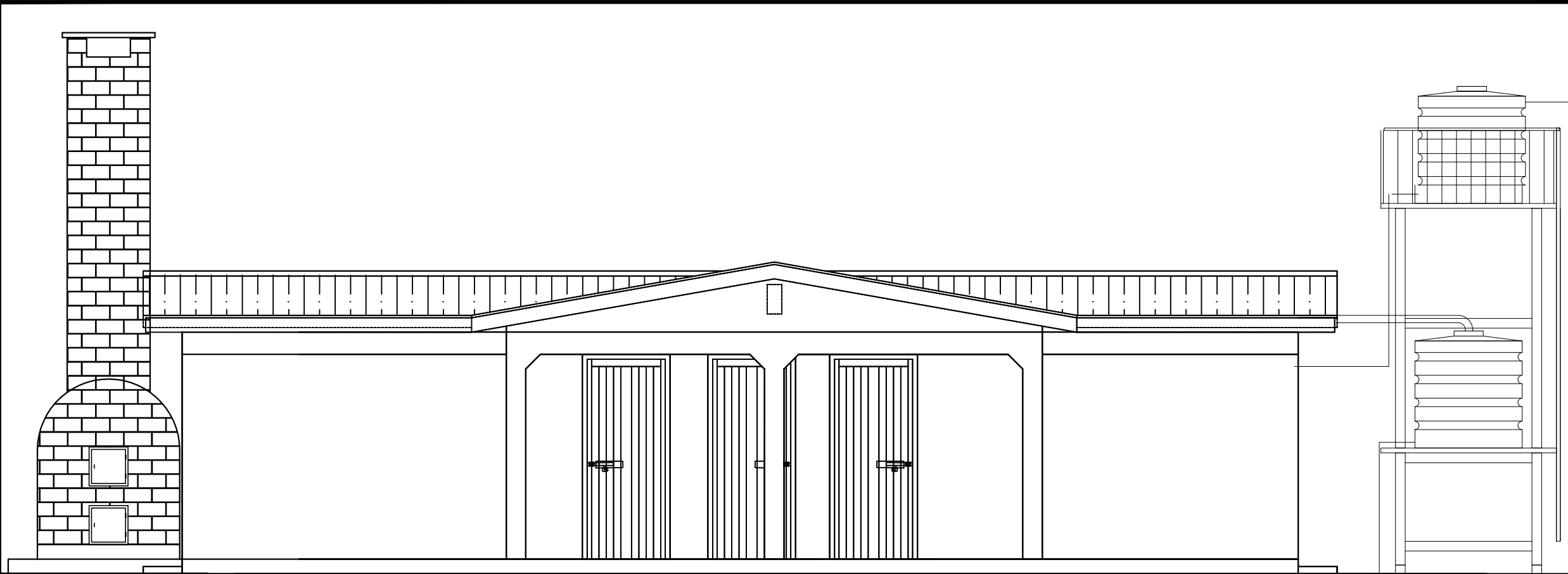
CONSULTANT  
 In Joint Venture with   
 Corporate Headquarter  
 10 Philpot Lane, 1st Floor,  
 London EC3M 8AA,  
 United Kingdom

CONTRACTOR

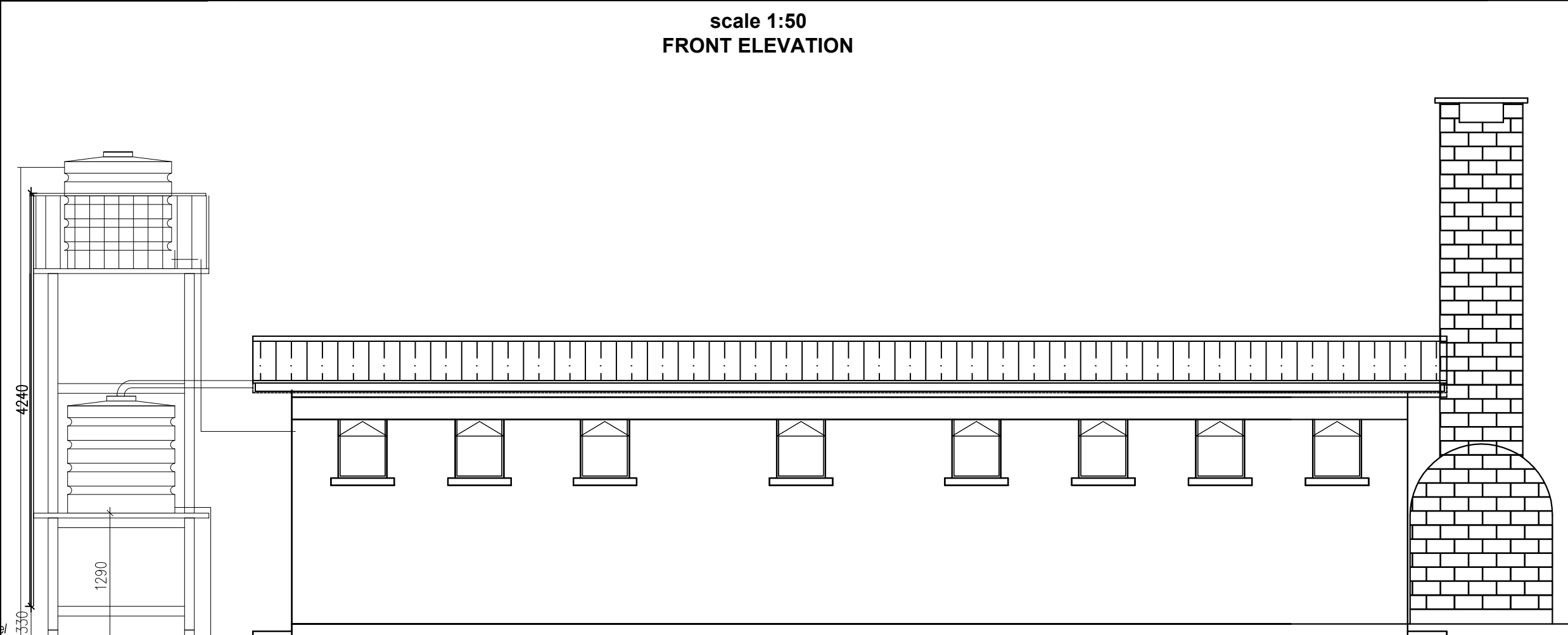
**DETAILED ENGINEERING DESIGN**  
 DRAWING TITLE  
**4 STANCE WATER BORNE TOILETS  
 FLOOR PLAN**

SCALE	As Shown	DRAWING No.	NYA/S/2.1.1
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  
FRONT ELEVATION





scale 1:50  
REAR ELEVATION

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

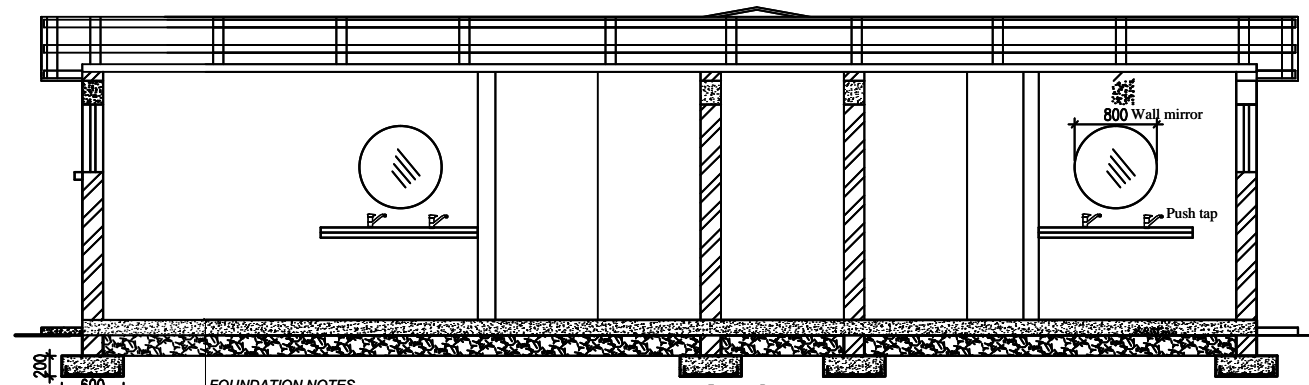
**NYAKABAAL WATER SUPPLY SYSTEM**

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

CONTRACTOR

**DETAILED ENGINEERING DESIGN**  
DRAWING TITLE  
**4 STANCE WATER BORNE TOILETS ELEVATIONS**

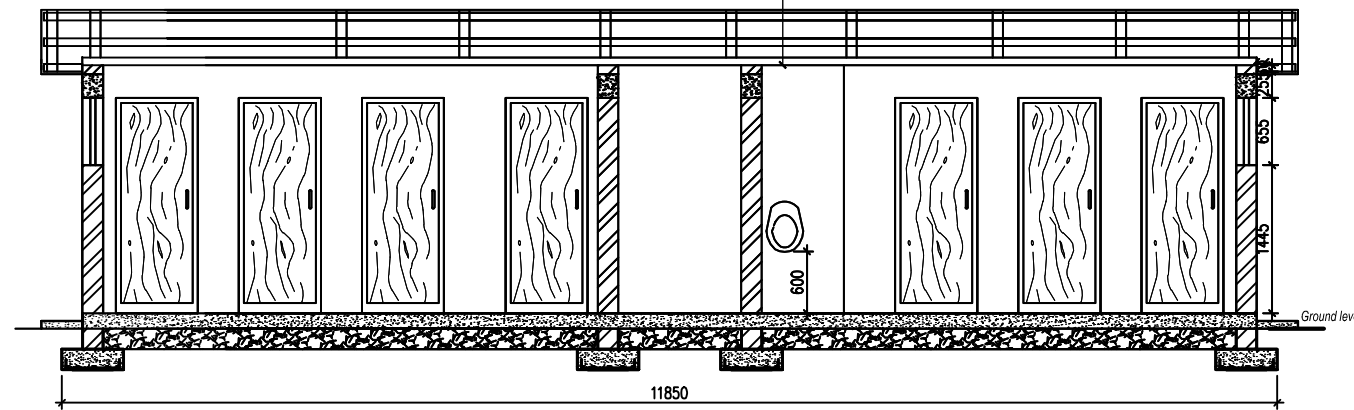
SCALE	As Shown	DRAWING No.	NYA/S/2.1.2
SURVEYED		DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2022	APPROVED	Rodney Barugahare.



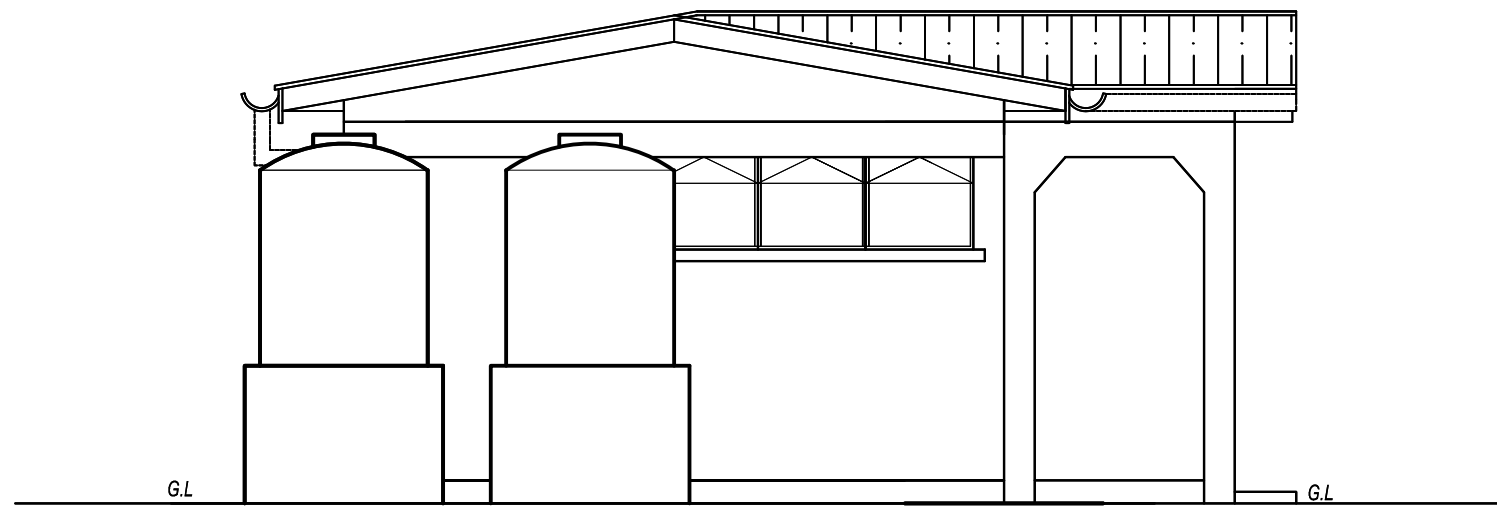
**FOUNDATION NOTES**  
 Floor finish as specified on  
 25mm thick cement screed on  
 150mm thick concrete floor slab C20/10 agg on  
 200mm thick well compacted & approved hardcore filling on  
 well compacted and levelled ground

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

CLIENT



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

CO-FINANCED BY:



AND




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

**NYAKABAALÉ WATER SUPPLY SYSTEM**

CONSULTANT



In Joint Venture with



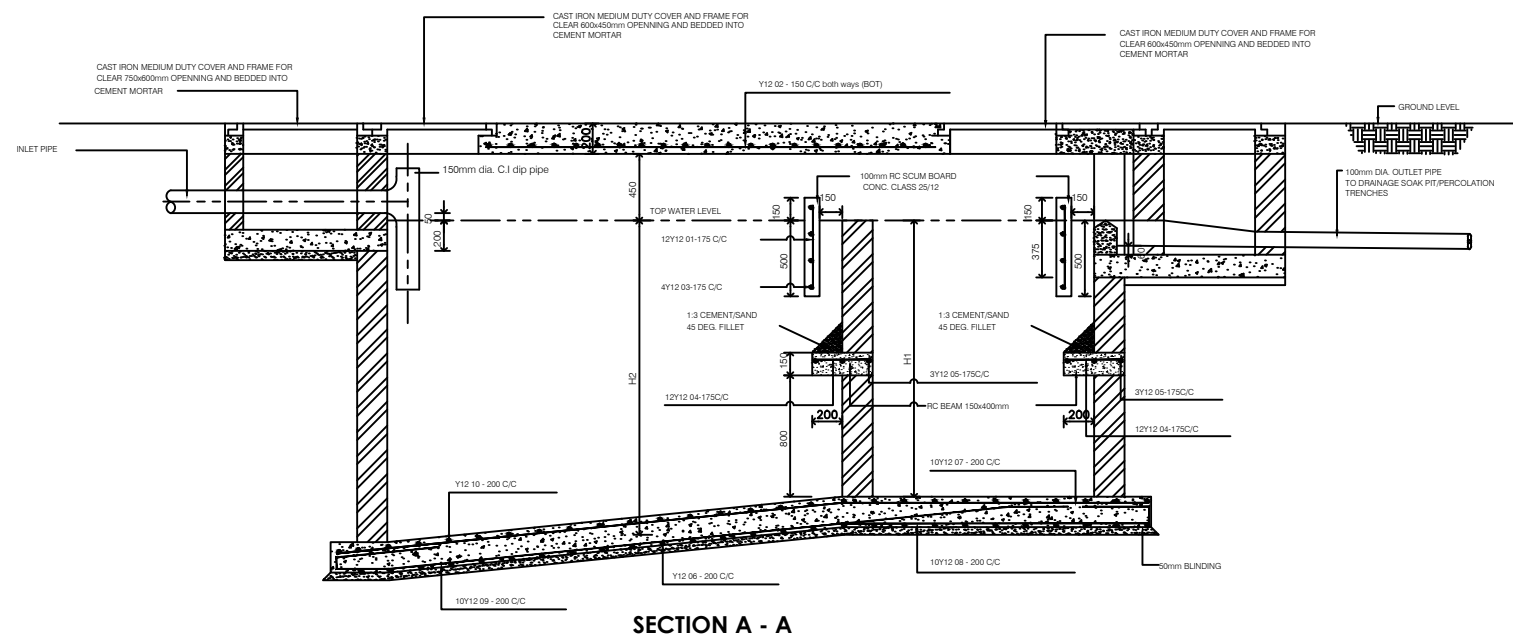
Corporate Headquarter  
 10 Philpot Lane, 1st Floor,  
 London EC3M 8AA,  
 United Kingdom

CONTRACTOR

**DETAILED ENGINEERING DESIGN**

DRAWING TITLE  
**4 STANCE WATER BORNE TOILETS**  
 SECTIONS AND ELEVATIONS

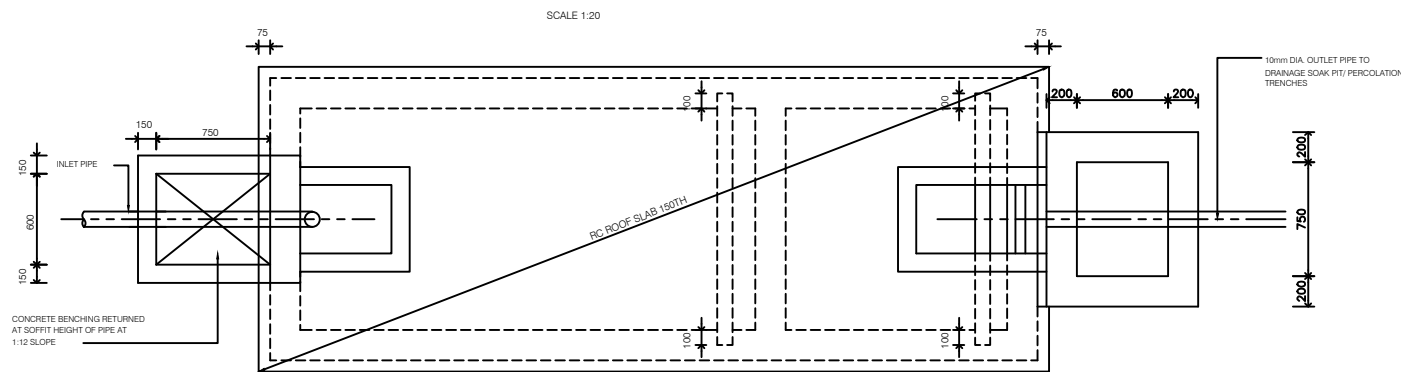
SCALE	As Shown	DRAWING No.	NYA/S/2.1.3
SURVEYED		DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2022	APPROVED	Rodney Barugahare.



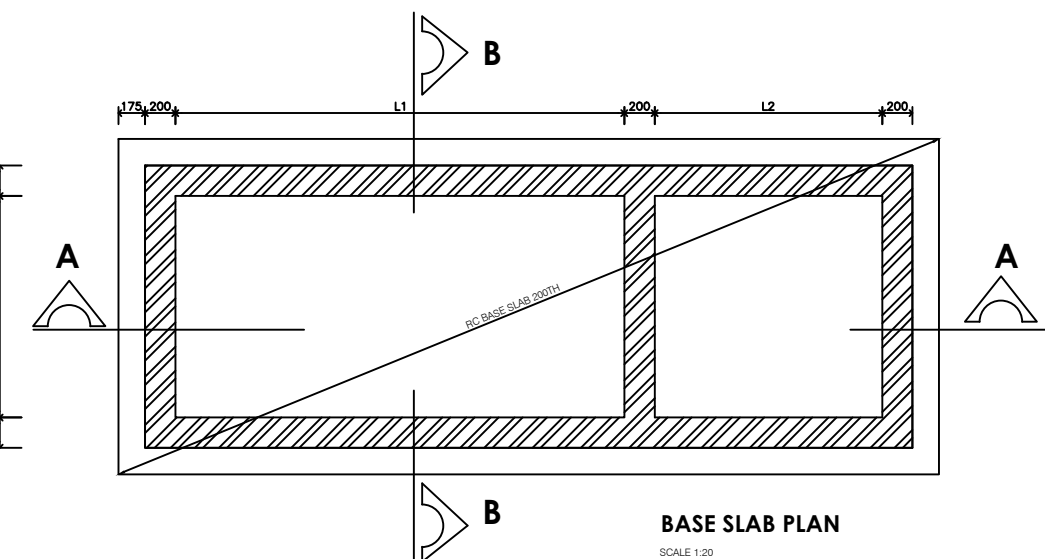
SECTION A - A

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	2000mm	1800mm	2100mm	2100mm	24	150
4500mm	2700mm	1800mm	2100mm	2650mm	34.3	200

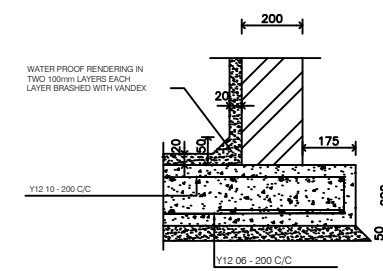
1) All dimension are in mm



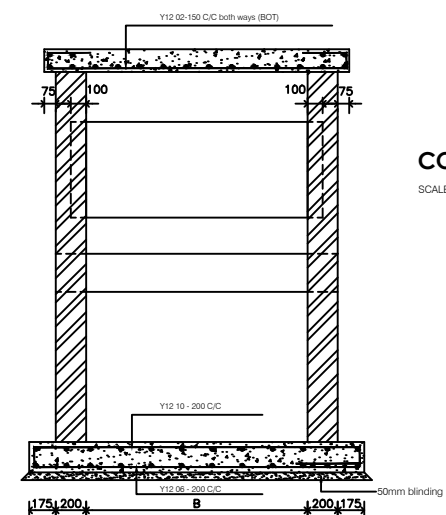
ROOF SLAB PLAN



BASE SLAB PLAN



INTERNAL WATER PROOF TO WALLS AND SLABS



SECTION B - B

CONC. WEIR BLOCK DETAIL

CLIENT



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

CO-FINANCED BY:



AND



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

**NYAKABAAL WATER SUPPLY SYSTEM**

CONSULTANT



In Joint Venture with



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

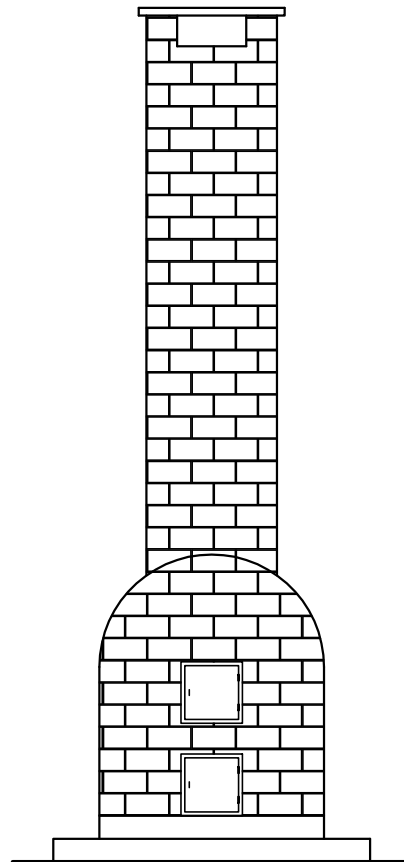
CONTRACTOR

DETAILED ENGINEERING DESIGN

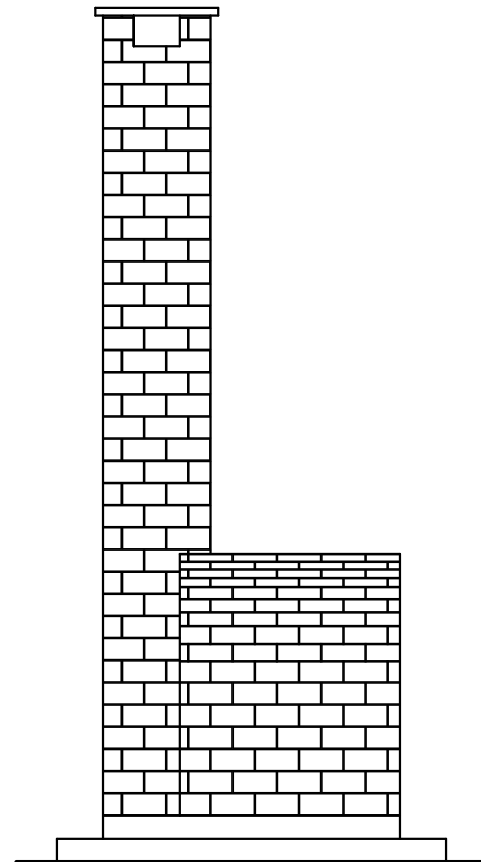
DRAWING TITLE

**WATER BORNE TOILETS  
SEPTIC TANK DETAILS**

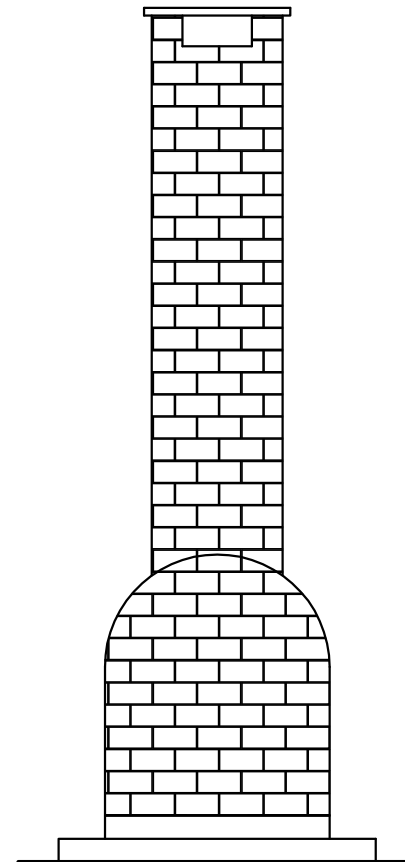
SCALE	As Shown	DRAWING No.	NYA/S/2.1.4
SURVEYED		DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2022	APPROVED	Rodney Barugahare.



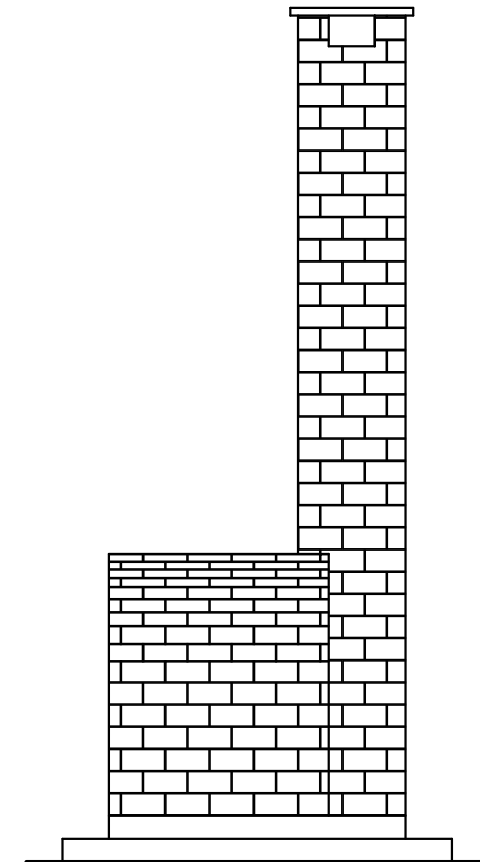
ELEVATION A



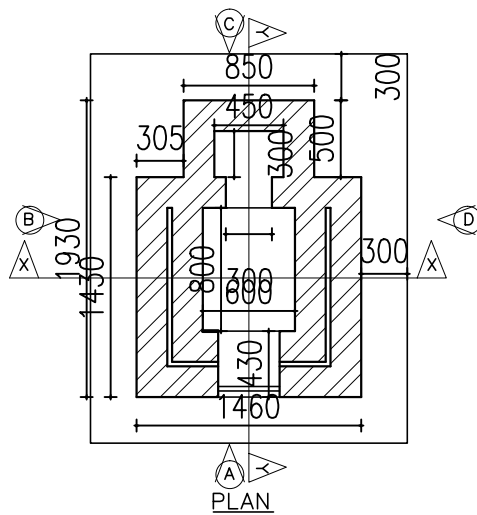
ELEVATION B



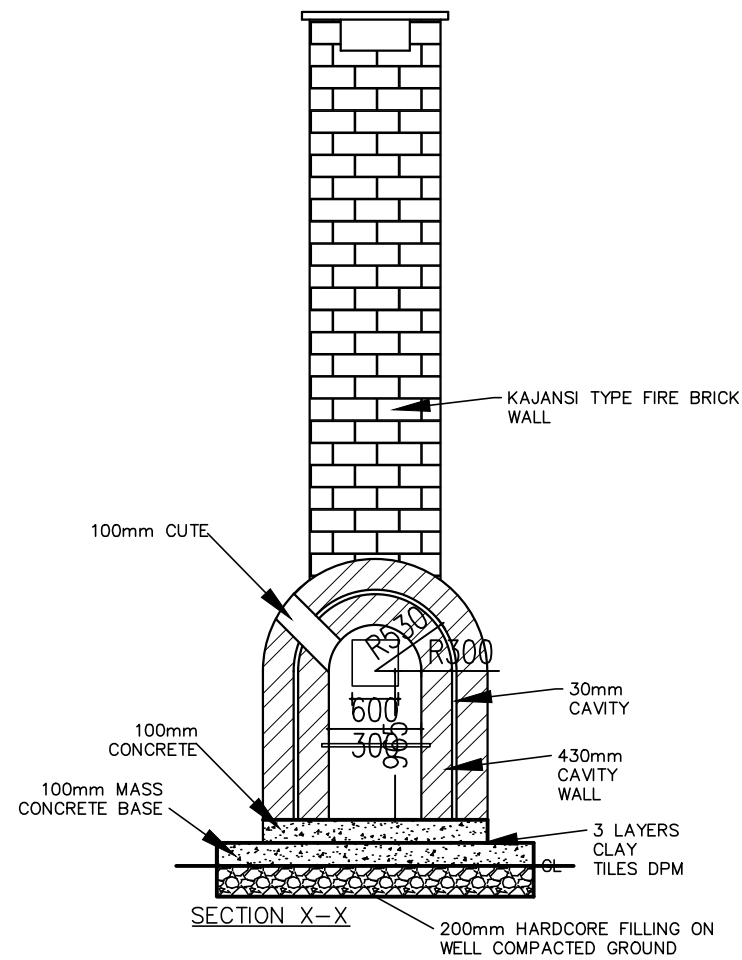
ELEVATION C



ELEVATION D

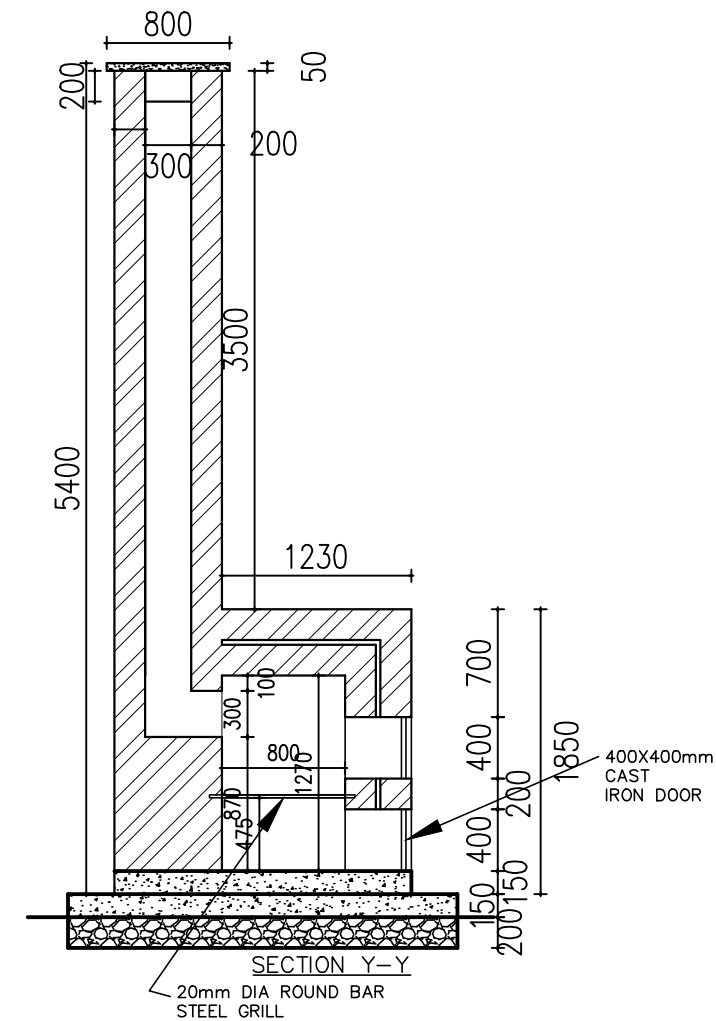


PLAN



SECTION X-X

200



SECTION Y-Y

1) All dimension are in mm

CLIENT



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

CO-FINANCED BY:



AND




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

**NYAKABAAL 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  
**WATER BORNE TOILETS**  
Incinerator

SCALE	As Shown	DRAWING No.	NYA/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/m<sup>3</sup>
  - Submerged soil density: 1090 kg/m<sup>3</sup>
  - 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/mm<sup>2</sup>): 30
    - Maximum aggregate size (mm): 20
    - Cement type: SR
    - Minimum cement content (kg/m<sup>3</sup>): 330
    - Maximum cement content (kg/m<sup>3</sup>): 400
    - Maximum free water/cement ratio: 0.47
  - b) Concrete in blinding
    - Characteristic strength (N/mm<sup>2</sup>): 1030
    - Maximum aggregate size (mm): 40
    - Cement type: SR
    - Minimum cement content (kg/m<sup>3</sup>): 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.

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**

**NYAKABAAL WATER SUPPLY SYSTEM**

CONSULTANT



**SARI**  
Corporate Headquarter  
10 Philipst Lane, 1st Floor,  
London EC3M 8AA,  
United Kingdom

In Joint Venture with



**SGAPI**

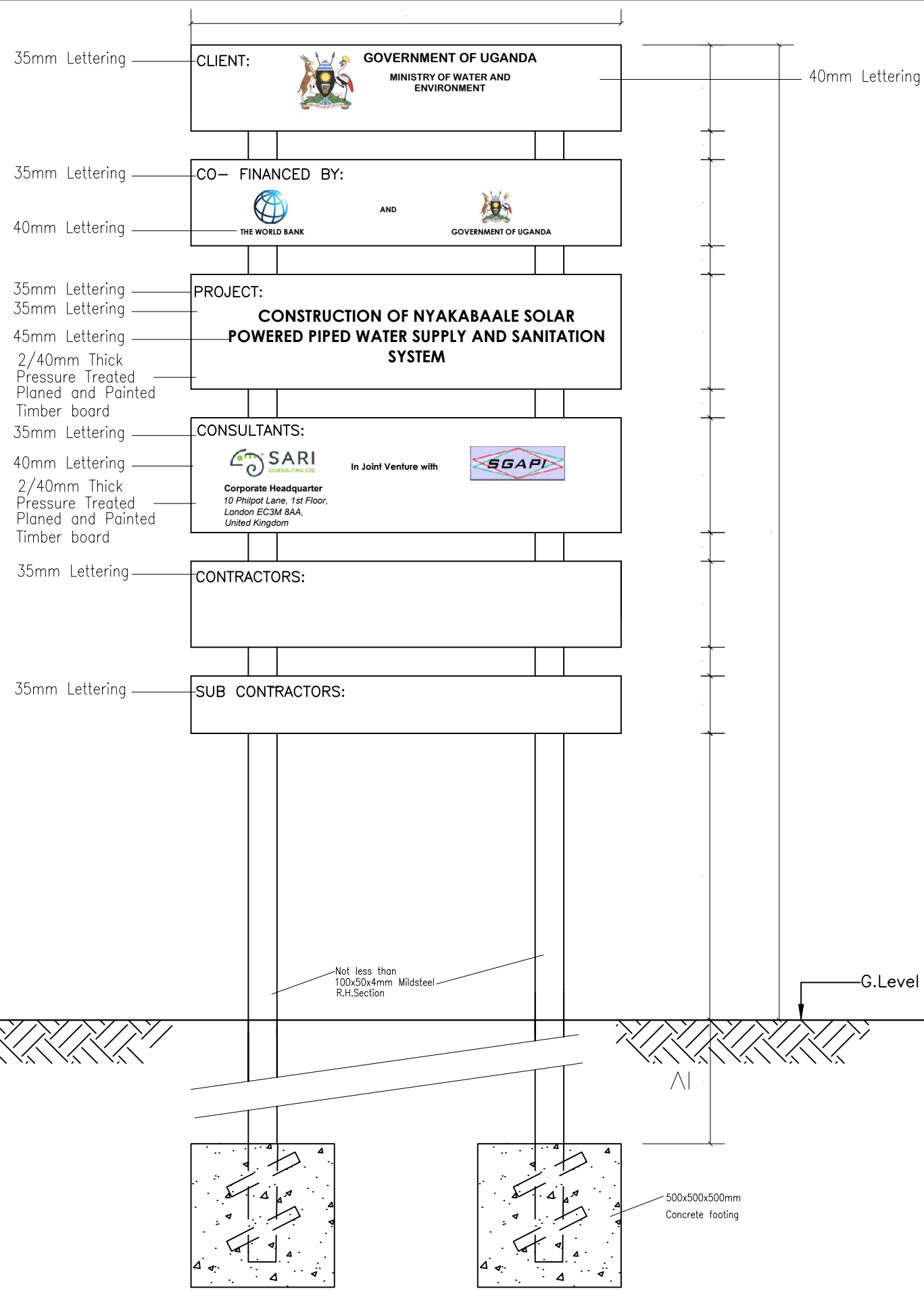
CONTRACTOR

**DETAILED ENGINEERING DESIGN**

DRAWING TITLE

**GENERAL NOTES FOR STANDARD DRAWINGS**

SCALE	As Shown	DRAWING No.	SD100
SURVEYED		DESIGNED	Otwane 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.

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

**NYAKABAAL WATER SUPPLY SYSTEM**

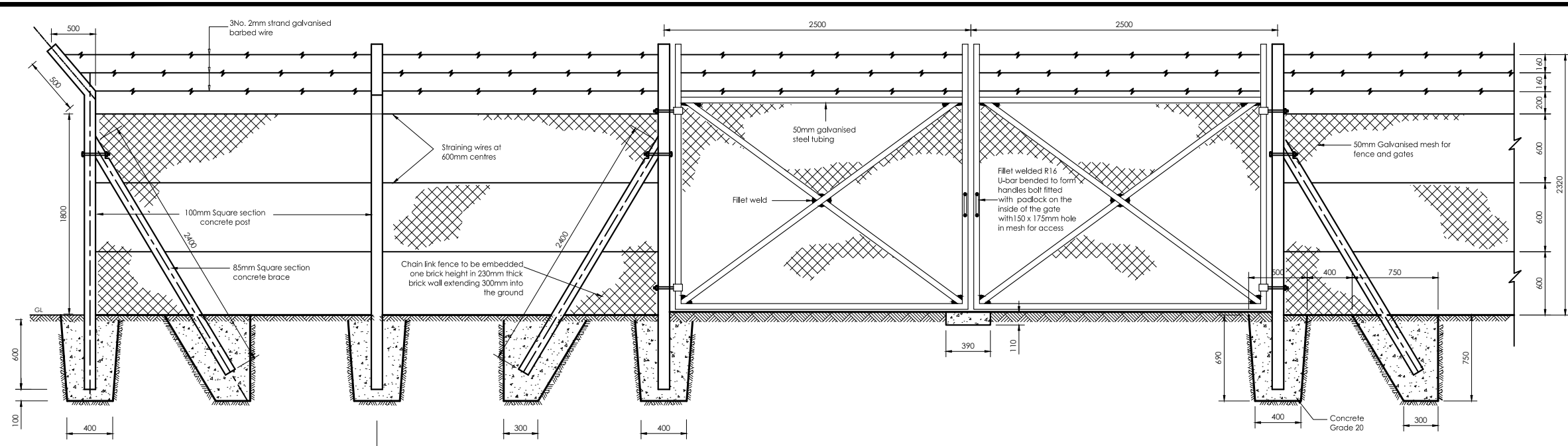
CONSULTANT  
SARI In Joint Venture with SGAPI  
Corporate Headquarter  
10 Philpot Lane, 1st Floor,  
London EC3M 8AA,  
United Kingdom

CONTRACTOR

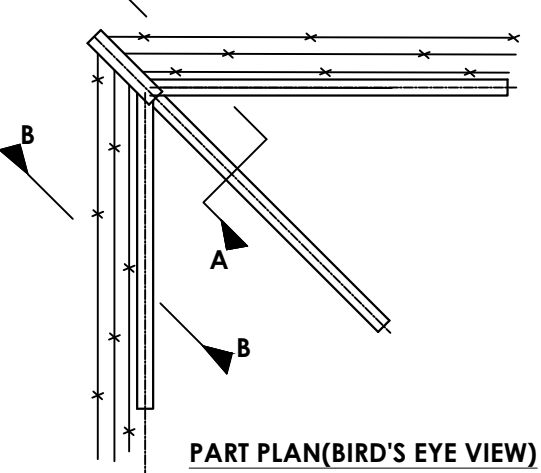
**DETAILED ENGINEERING DESIGN**  
DRAWING TITLE  
**CONTRACT SIGN BOARD**

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

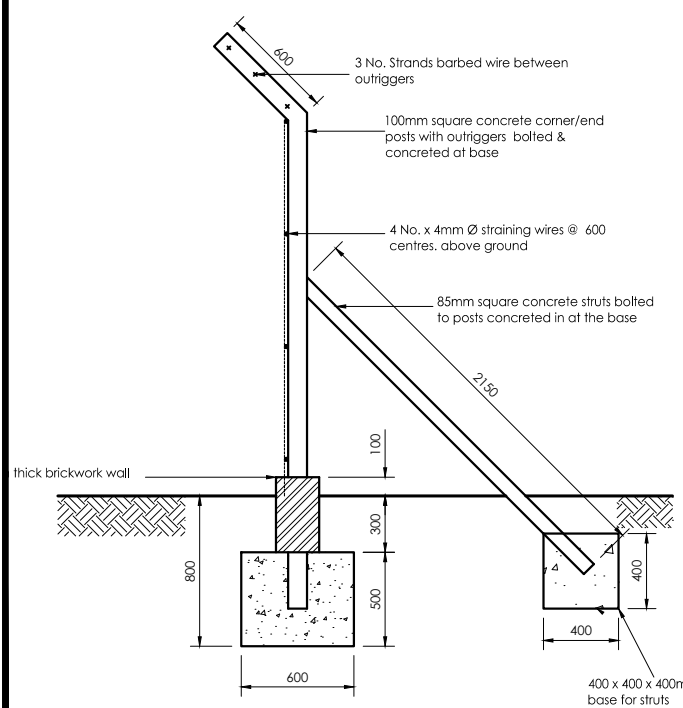




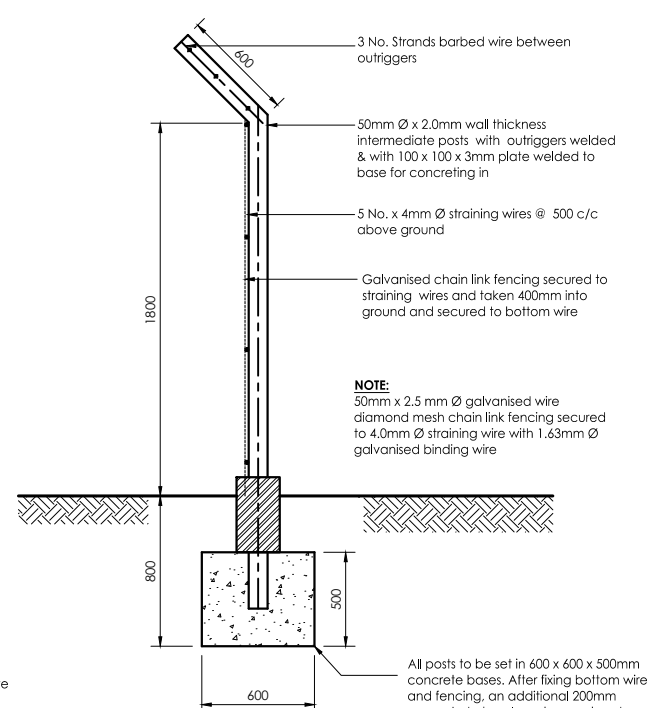
**DOUBLE GATE AND FENCE DETAILS**  
1800mm HIGH



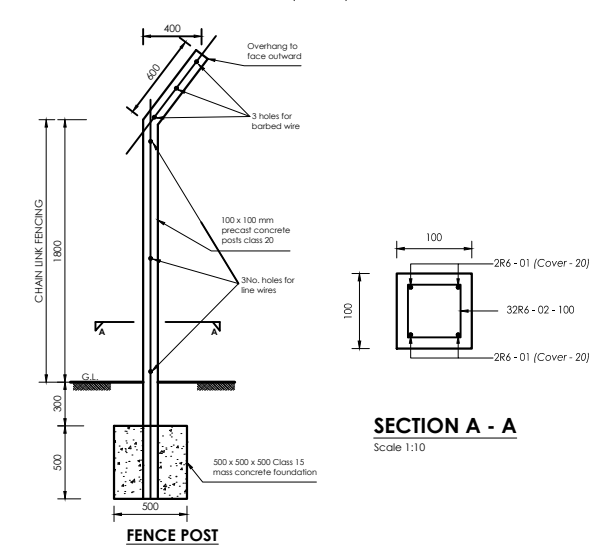
**PART PLAN (BIRD'S EYE VIEW)**



**CORNER/END POSTS**



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



**SECTION A - A**  
Scale 1:10

- 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



**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

**NYAKABAAL WATER SUPPLY SYSTEM**

**CONSULTANT**

**SARI** In Joint Venture with **SGAPI**

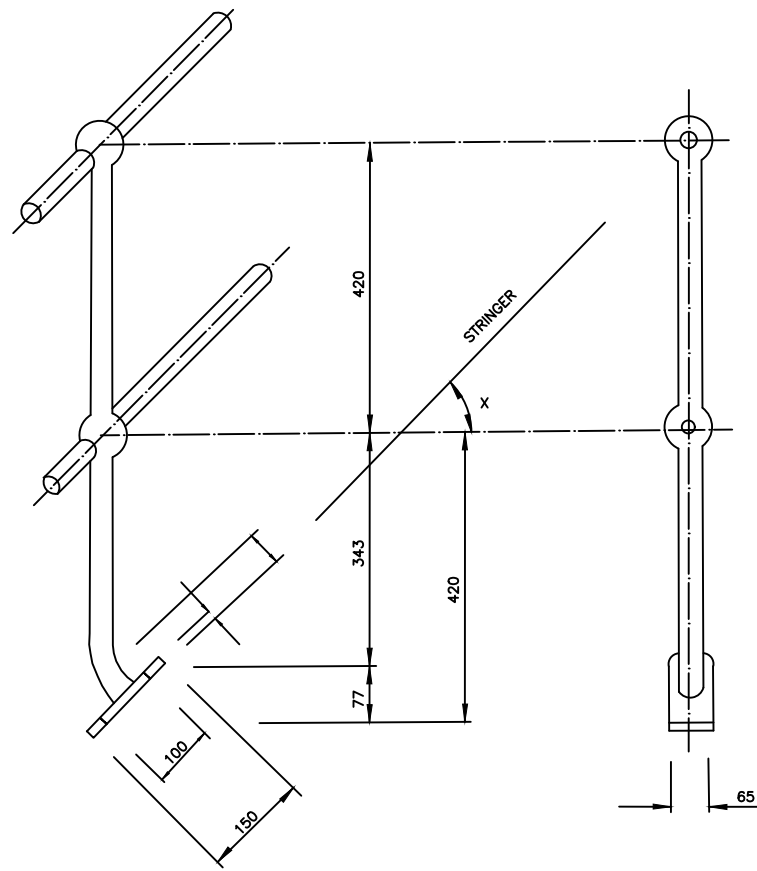
Corporate Headquarter  
10 Philip Lane, 1st Floor,  
London EC3M 8AA,  
United Kingdom

**CONTRACTOR**

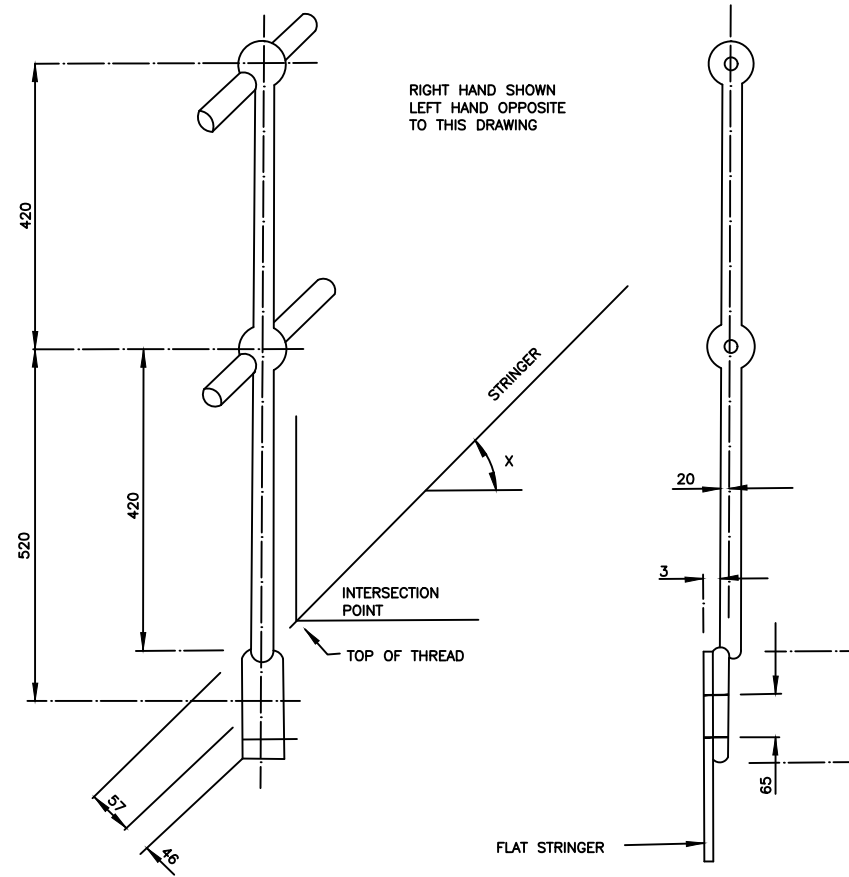
**DETAILED ENGINEERING DESIGN**

**DRAWING TITLE**  
**CHAIN LINK FENCE DETAILS**

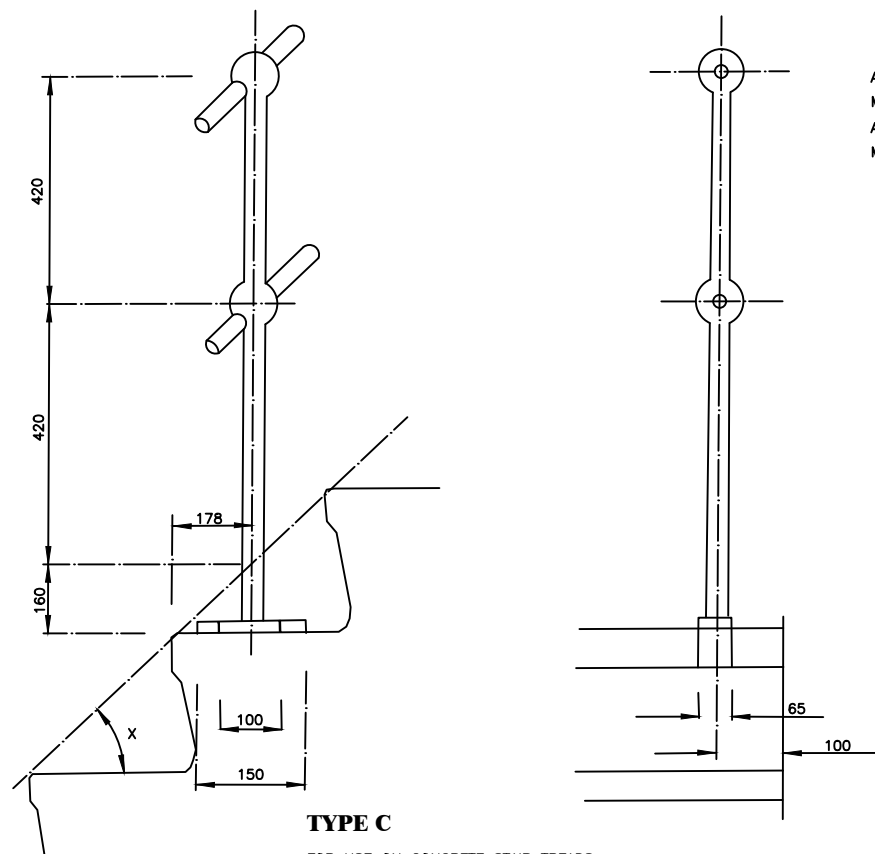
<b>SCALE</b>	As Shown	<b>DRAWING No.</b>	SD104
<b>SURVEYED</b>		<b>DESIGNED</b>	Otwane Dan.
<b>DRAWN</b>	Joshua Nyarwanda	<b>CHECKED</b>	Rodney Barugahare
<b>DATE</b>	OCT 2021	<b>APPROVED</b>	Rodney Barugahare.



**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

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

**NYAKABAAL WATER SUPPLY SYSTEM**

CONSULTANT



In Joint Venture with



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

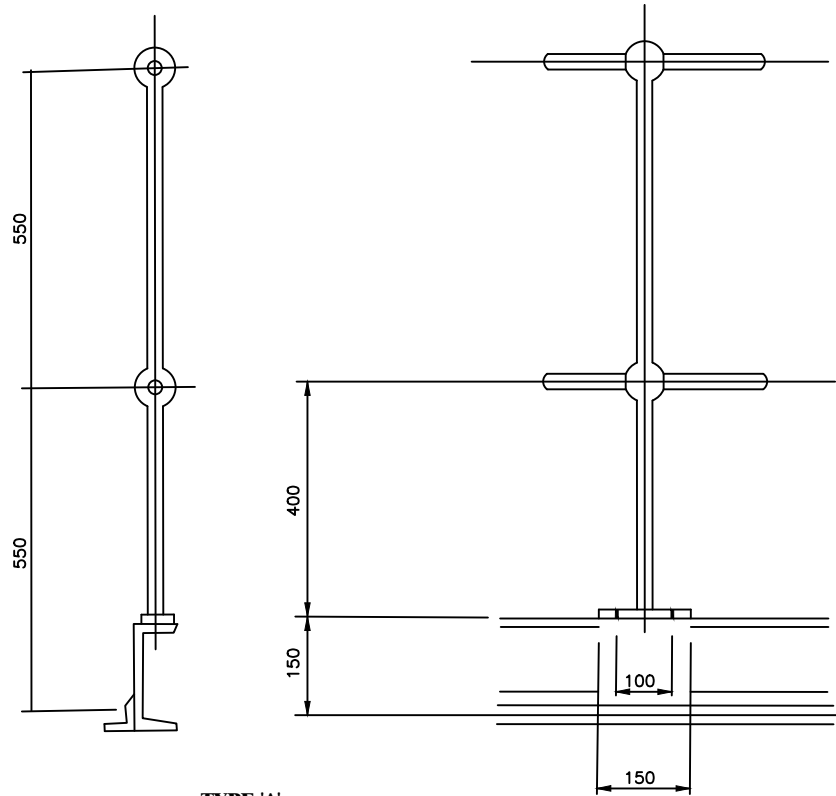
CONTRACTOR

DETAILED ENGINEERING DESIGN

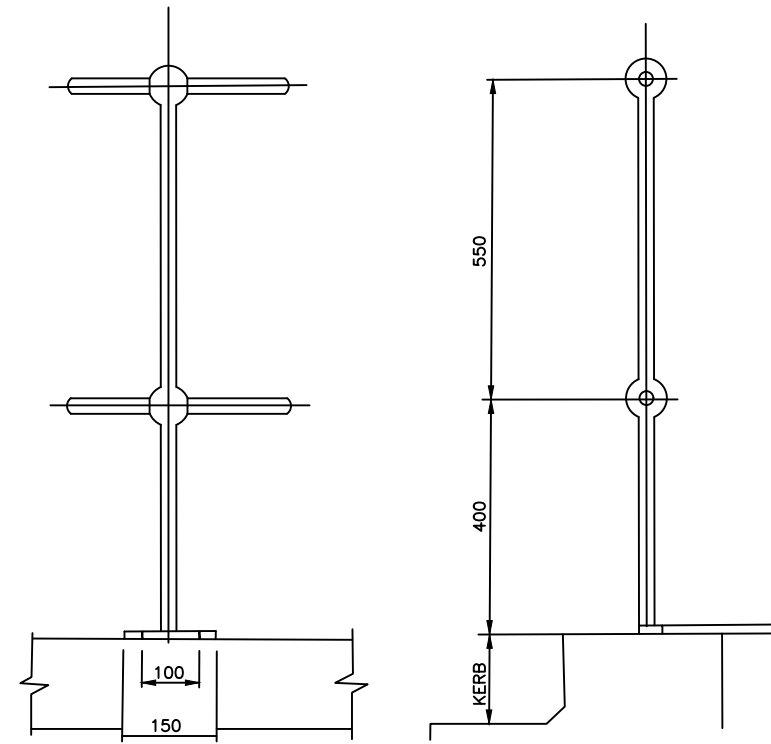
DRAWING TITLE

**FORGED STEEL STANCHIONS FOR STAIRWAYS**

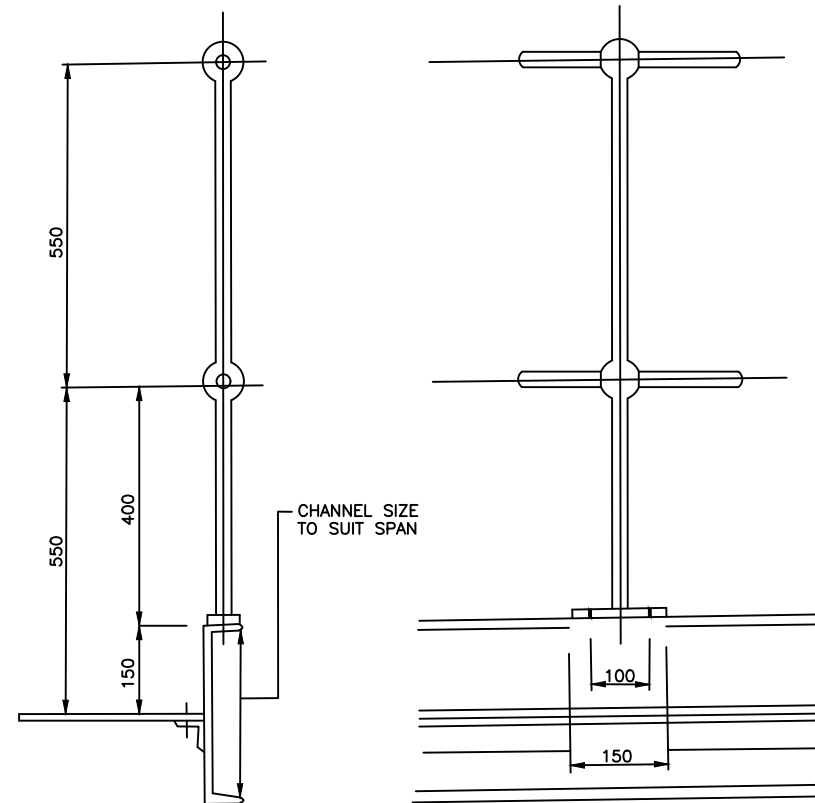
SCALE	As Shown	DRAWING No.	SD106A
SURVEYED		DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



**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.

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

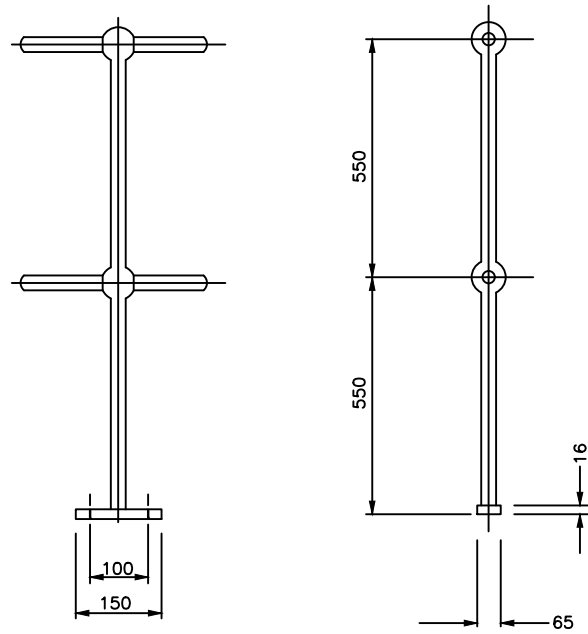
**NYAKABAALE WATER SUPPLY SYSTEM**

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

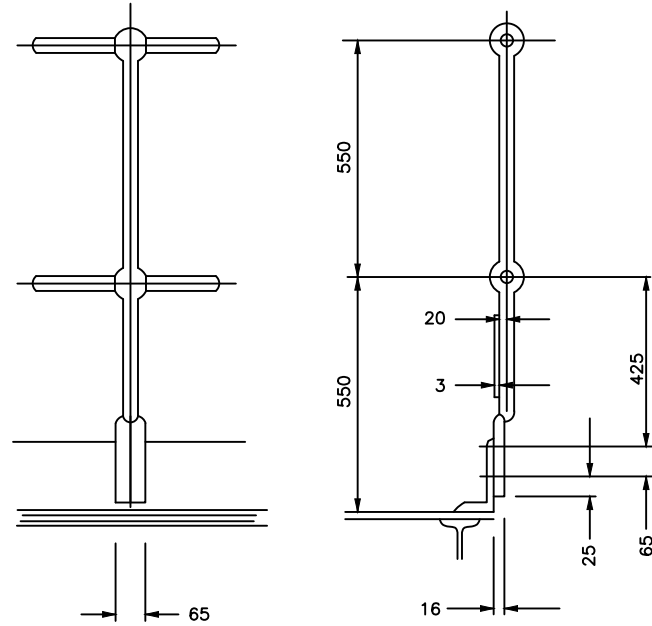
CONTRACTOR

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

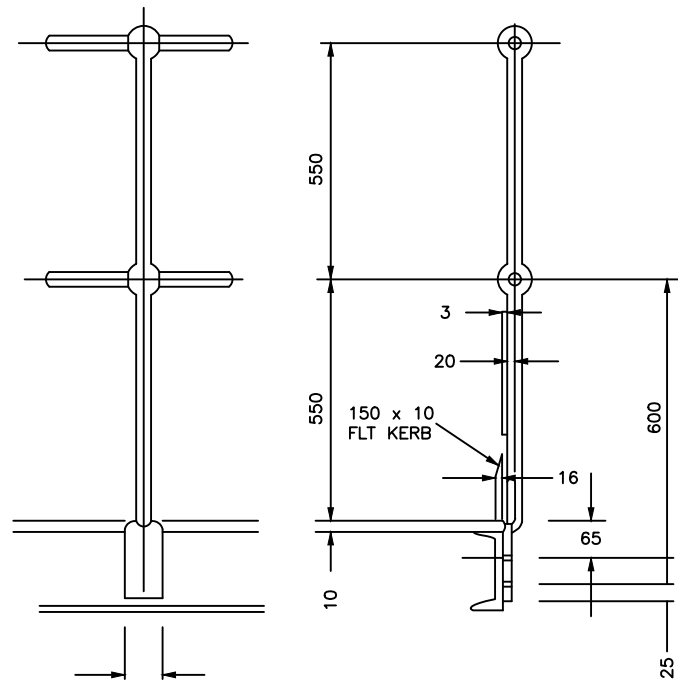
SCALE	As Shown	DRAWING No.	SD106B
SURVEYED		DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



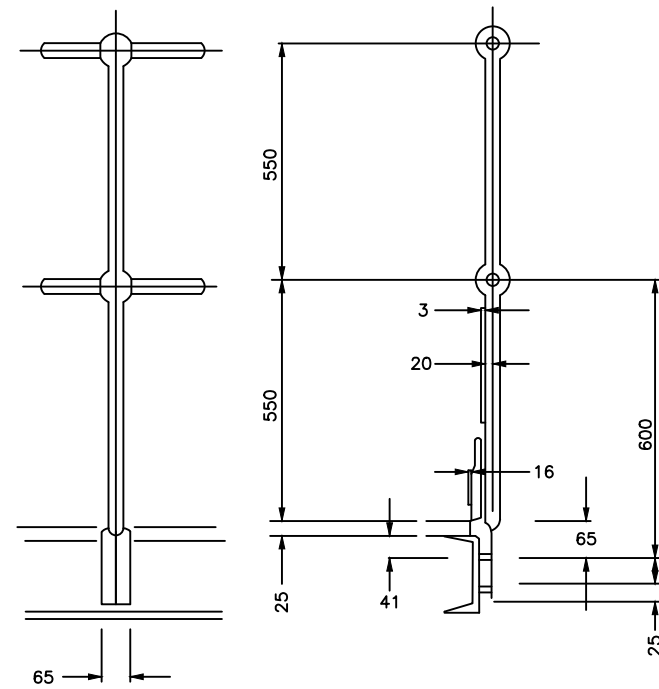
**TYPE 'D'**  
FOR USE ON FLAT SURFACES



**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.

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

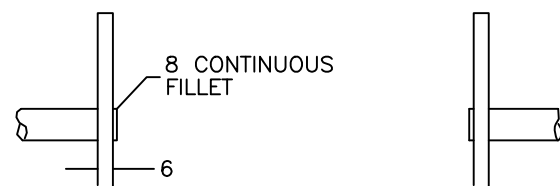
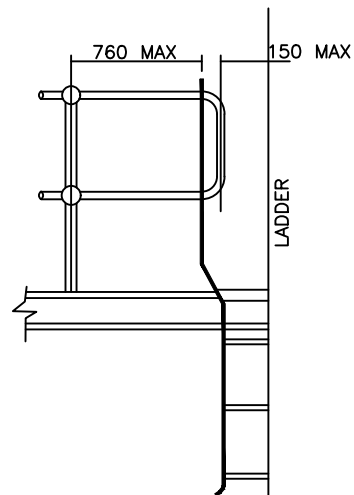
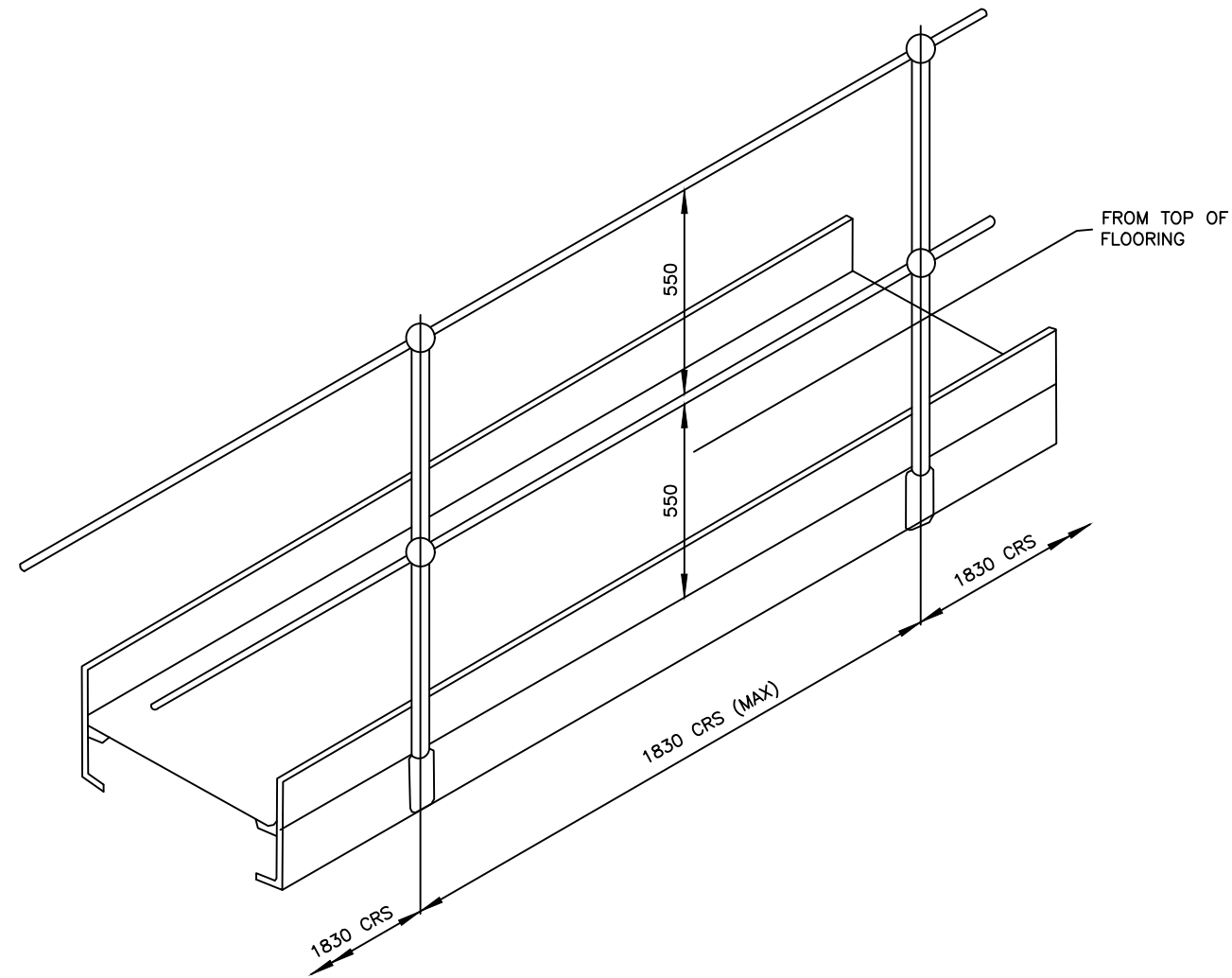
**NYAKABAAL WATER SUPPLY SYSTEM**

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

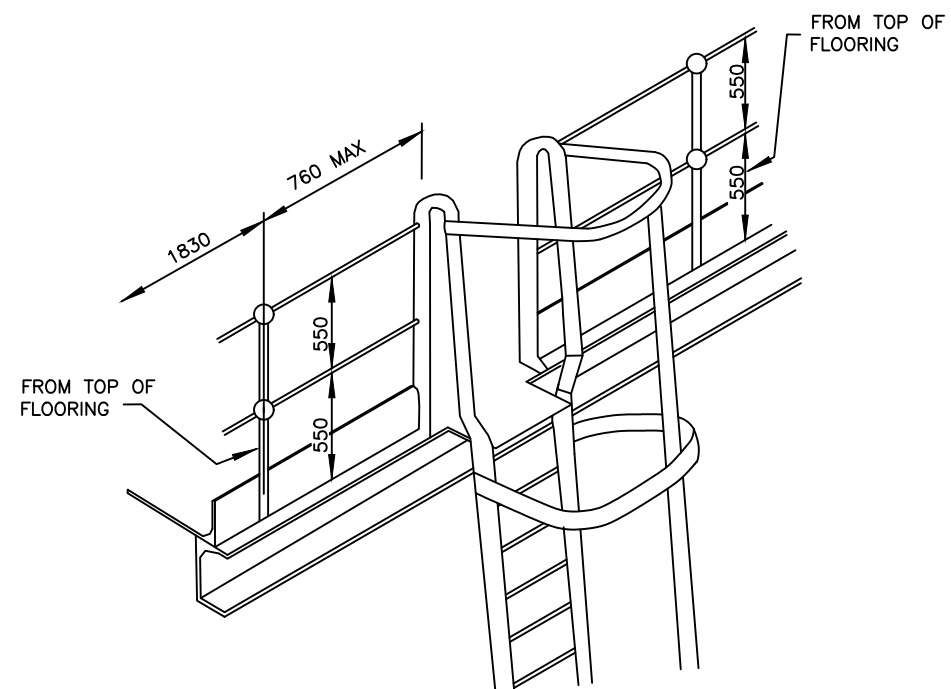
CONTRACTOR

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

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



DETAIL OF RUNG WELDING



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

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

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

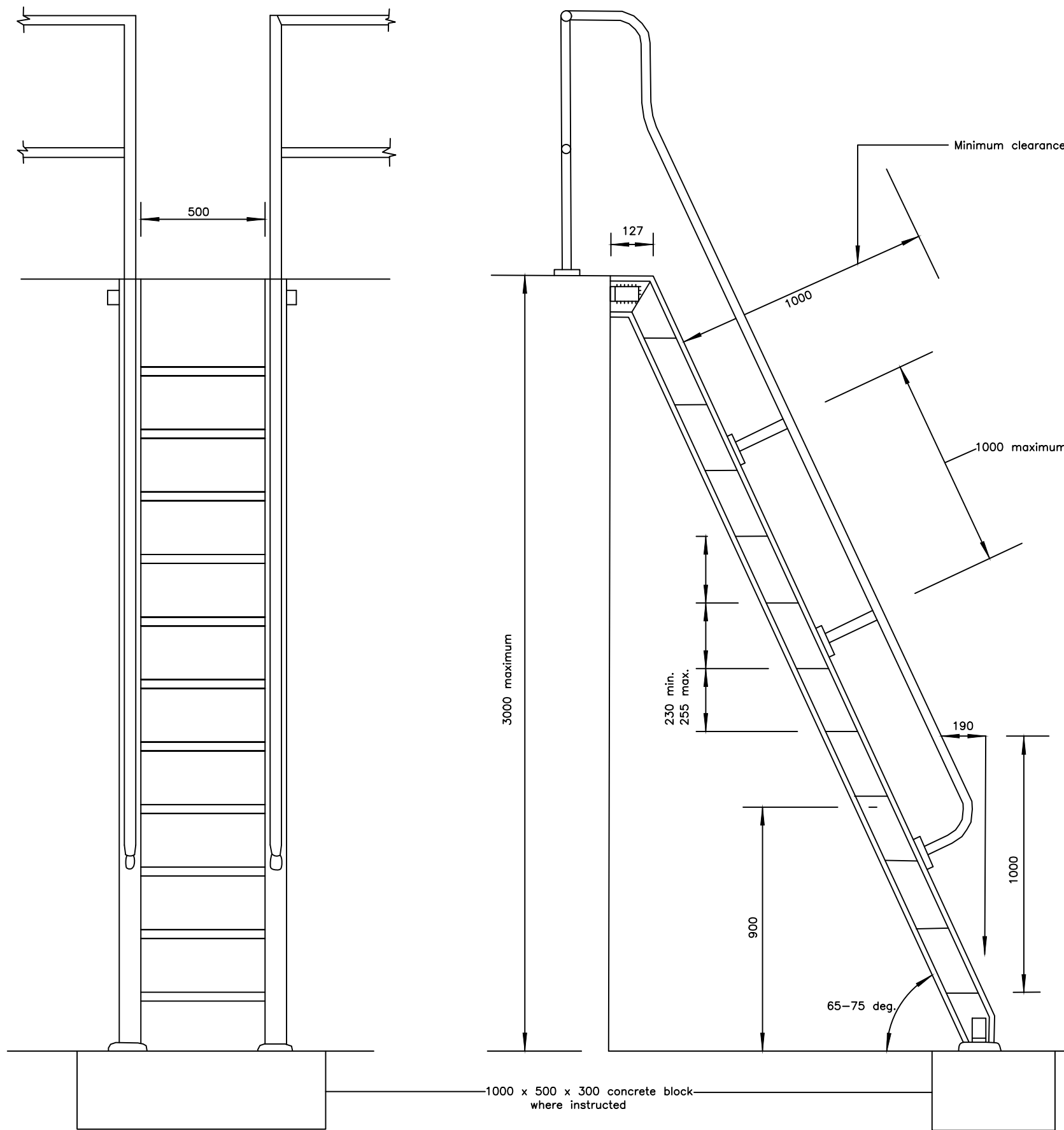
**NYAKABAAL WATER SUPPLY SYSTEM**

CONSULTANT  
**SARI** In Joint Venture with **SGAPI**  
Corporate Headquarter  
10 Philip Lane, 1st Floor,  
London EC3M 6AA,  
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	Otwane 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
2. Steps 8 mm thick chequer plate with nosed
3. Step supports 30 x 30 x 5 angle welded to 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.

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

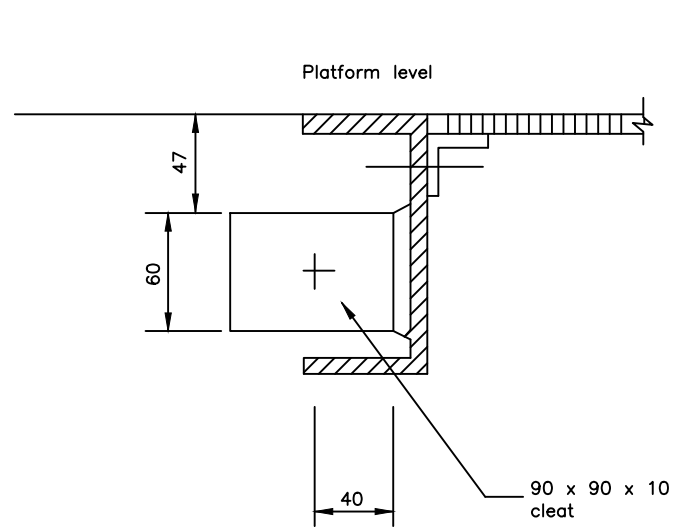
**NYAKABAAL WATER SUPPLY SYSTEM**

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

CONTRACTOR

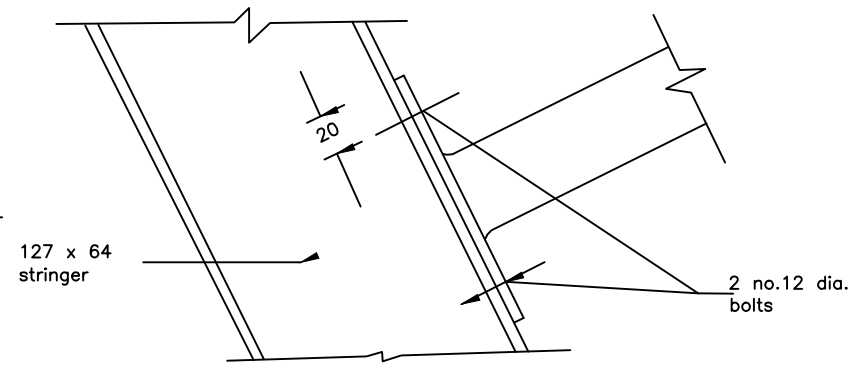
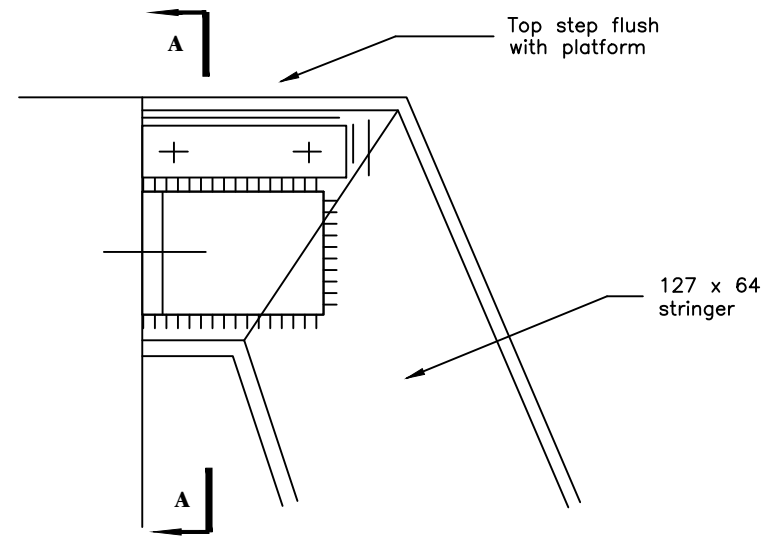
DETAILED ENGINEERING DESIGN  
 DRAWING TITLE  
**ARRANGEMENT OF HANDRAILING ON WALKWAYS AND TOP OF LADDERS**

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

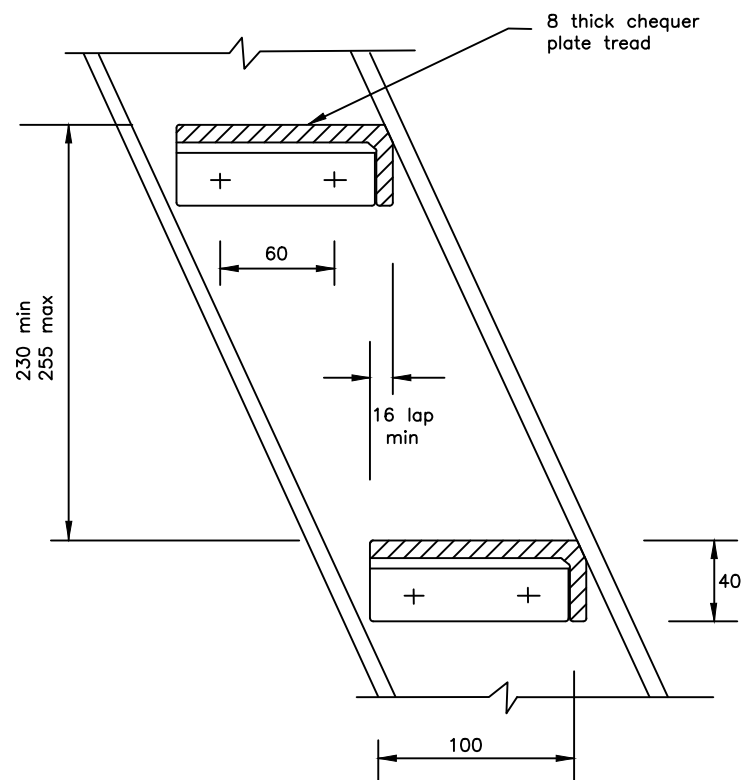


SECTION A-A

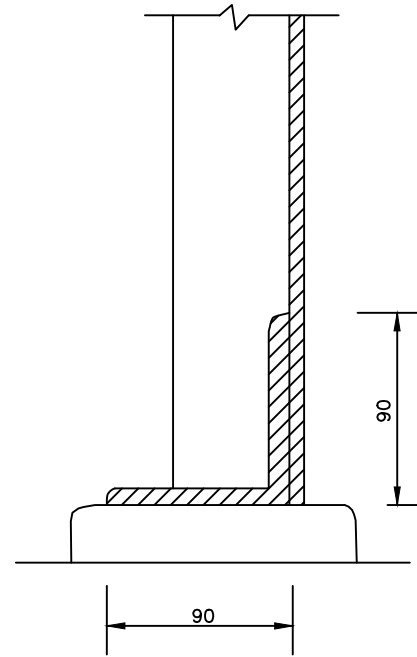
DETAIL AT HEAD



HANDRAIL FIXING

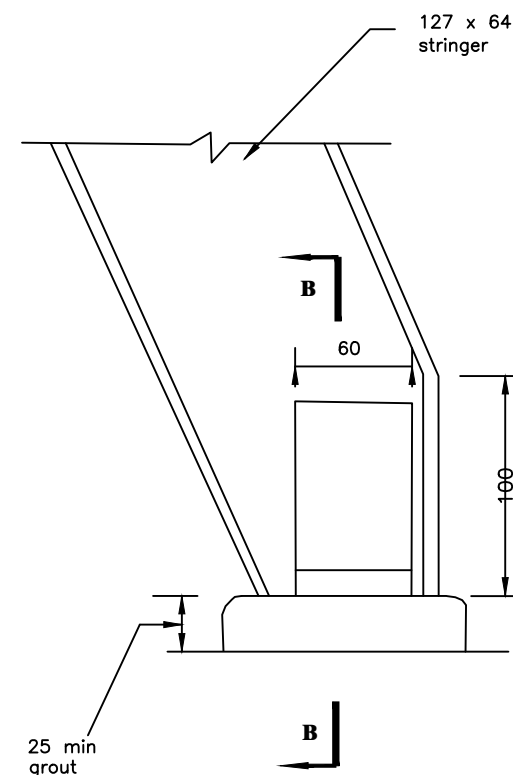


TREAD DETAIL



SECTION B-B

DETAIL AT FOOT



**NOTES**

1. All welds to be ~~blow~~ <sup>blow</sup> welds
2. Holding down ~~bolts~~ <sup>bolts</sup>.

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

**NYAKABAALE WATER SUPPLY SYSTEM**

CONSULTANT



In Joint Venture with



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

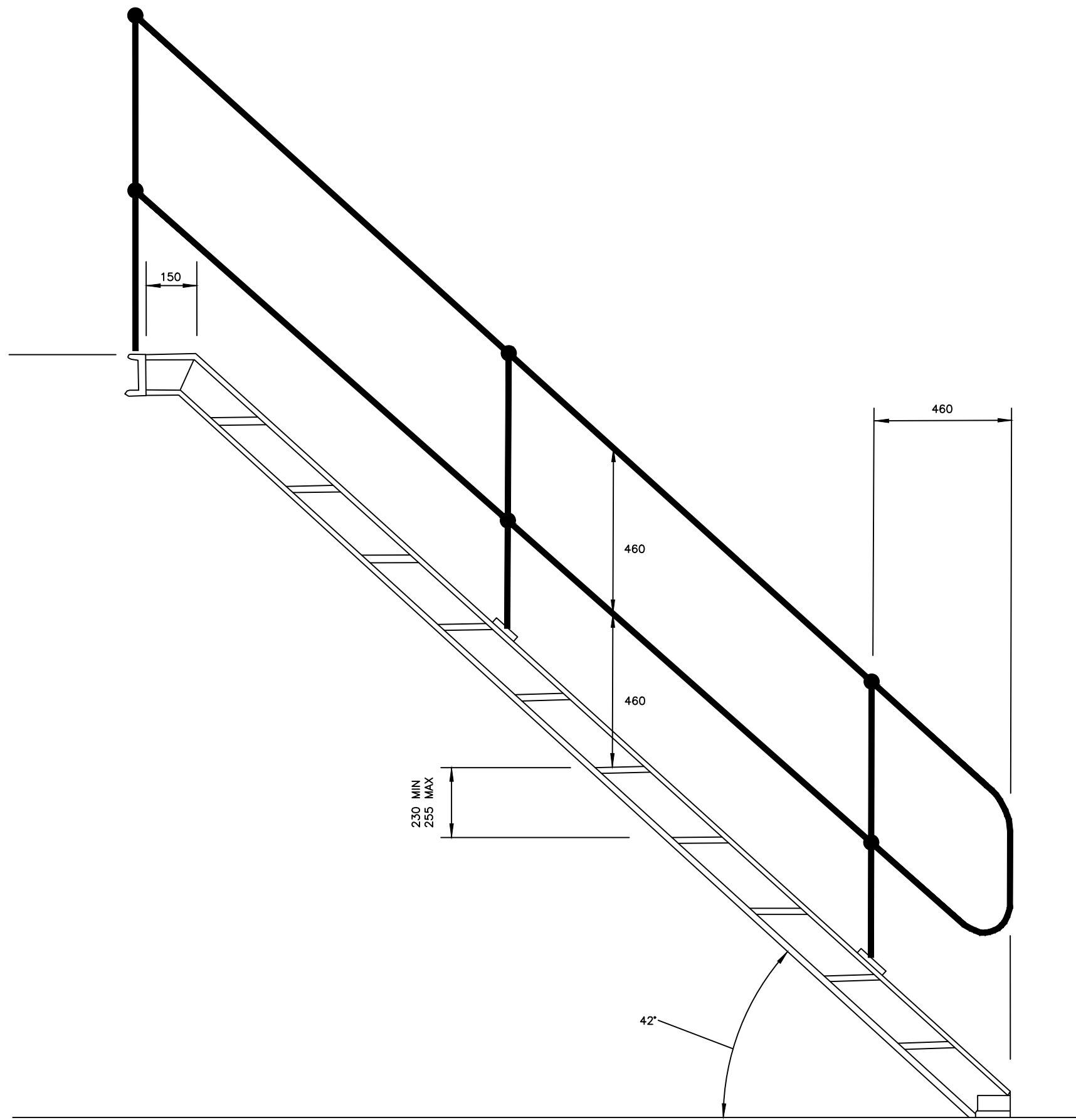
CONTRACTOR

DETAILED ENGINEERING DESIGN

DRAWING TITLE

**MILD STEEL SHIPTYPE LADDER - DETAIL**

SCALE	As Shown	DRAWING No.	SD107B
SURVEYED		DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



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

**NYAKABAALE WATER SUPPLY SYSTEM**

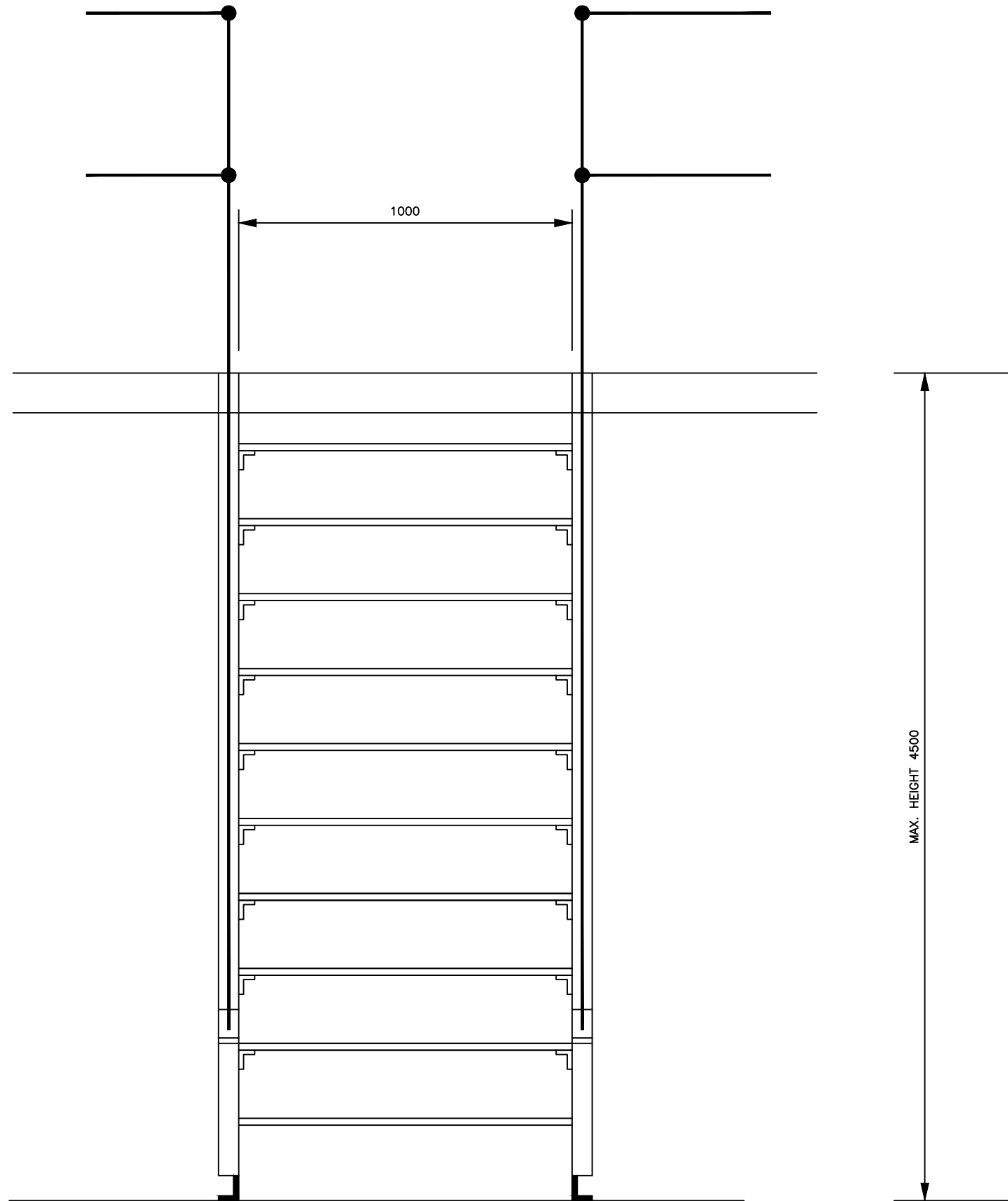
CONSULTANT  
 SARI In Joint Venture with   
 Corporate Headquarter  
 10 Philip Lane, 1st Floor,  
 London EC3M 8AA,  
 United Kingdom

CONTRACTOR

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

SCALE	As Shown	DRAWING No.	SD107C
SURVEYED		DESIGNED	Otwane 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 STEEL
2. STEPS 10 mm THICK CHEQUER PLATE WITH NOSED
3. STEPS SUPPORTS 50 X 50 X 5 THK. ANGLE WELDED 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

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

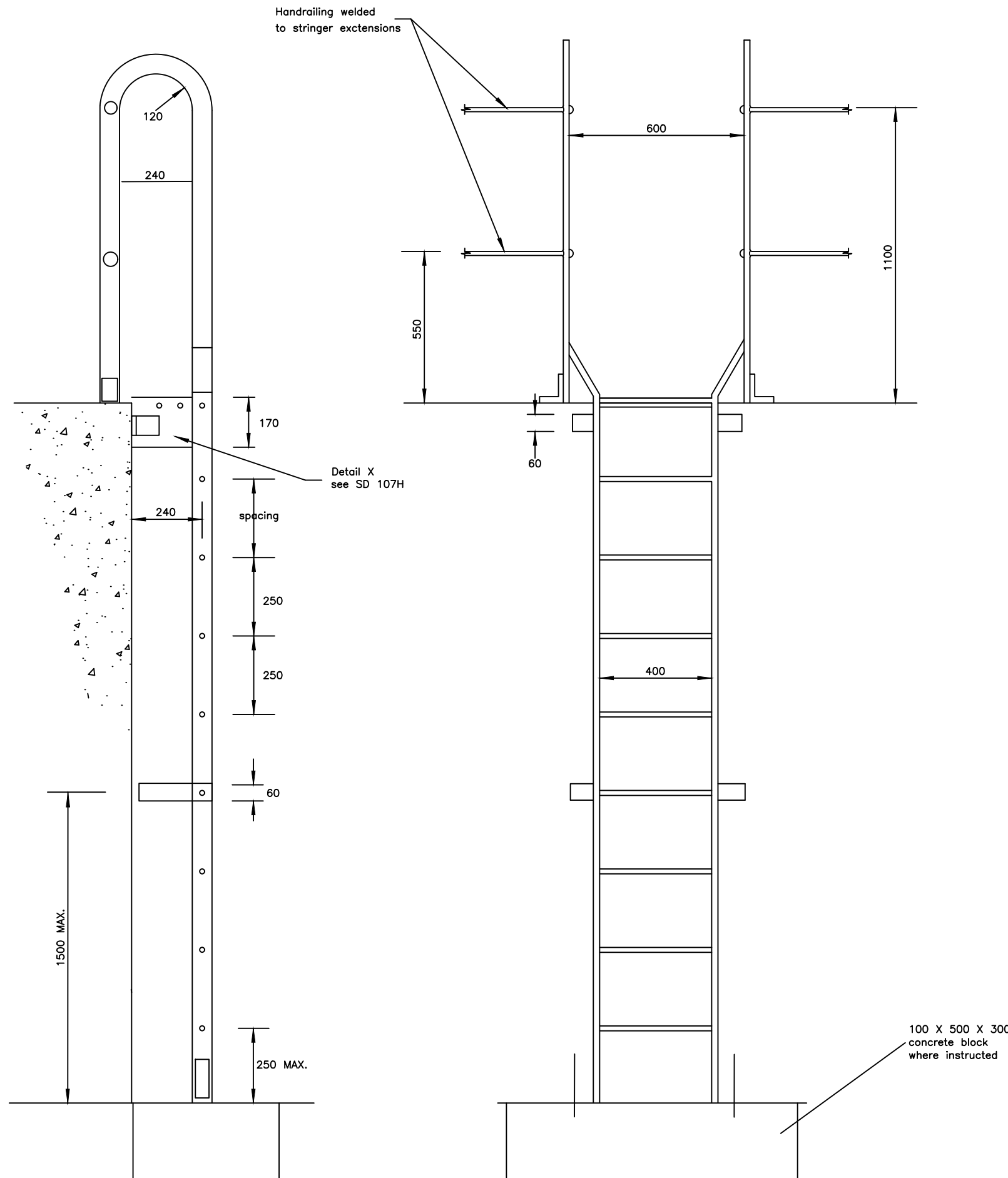
**NYAKABAALE WATER SUPPLY SYSTEM**

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

CONTRACTOR

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

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





**NOTES**

**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

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

**NYAKABAALE WATER SUPPLY SYSTEM**

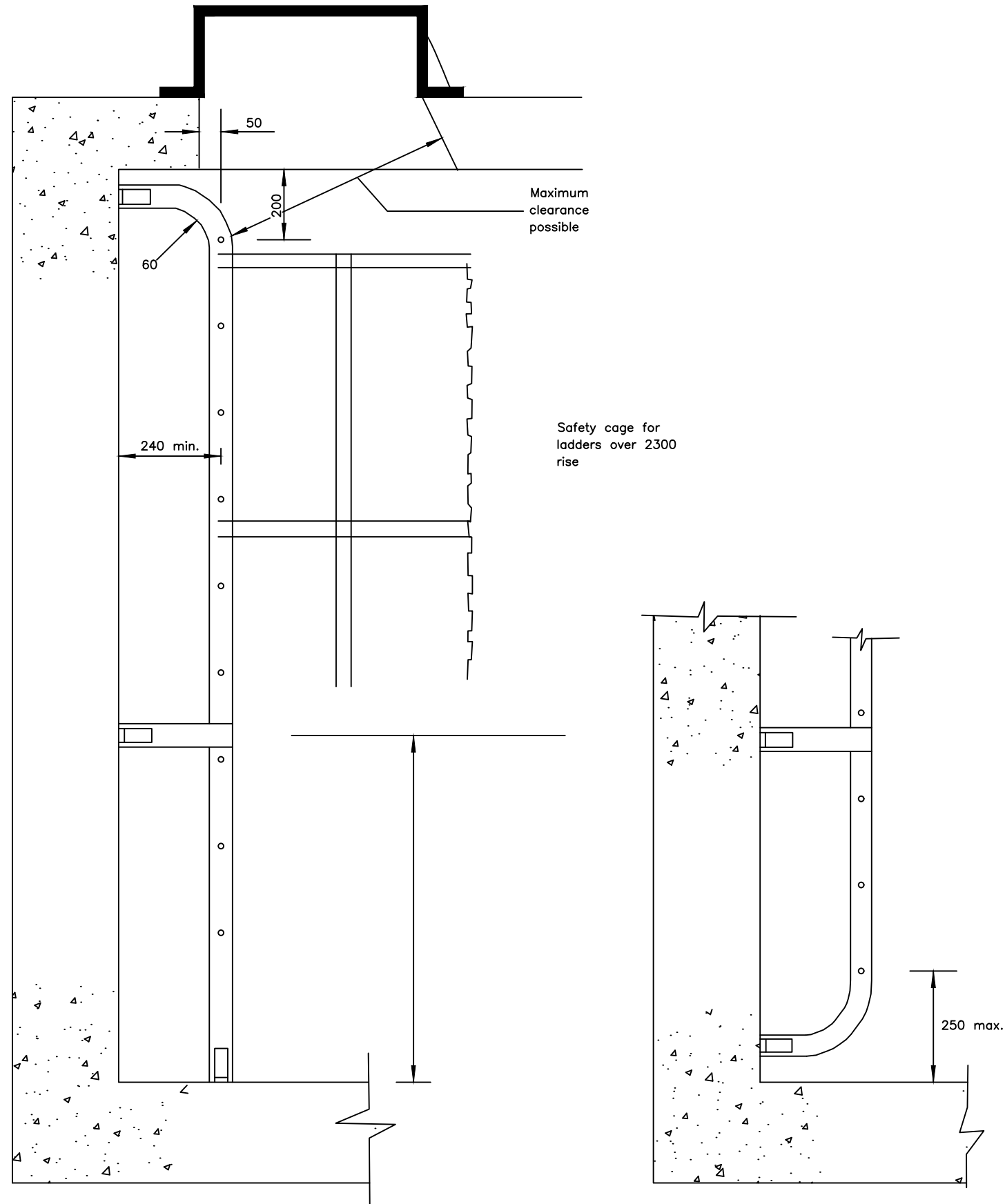
CONSULTANT  
 In Joint Venture with   
 Corporate Headquarter  
 10 Philip Lane, 1st Floor,  
 London EC3M 8AA,  
 United Kingdom

CONTRACTOR

**DETAILED ENGINEERING DESIGN**  
 DRAWING TITLE  
**MILD STEEL ACCESS LADDER - TYPE A  
 (NOT EXCEEDING 2.3 RISE)**

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

TYPE C – INSIDE COVERED  
TANKS AND CHAMBERS



**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

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

**NYAKABAAL WATER SUPPLY SYSTEM**

CONSULTANT



In Joint Venture with



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

CONTRACTOR

**DETAILED ENGINEERING DESIGN**

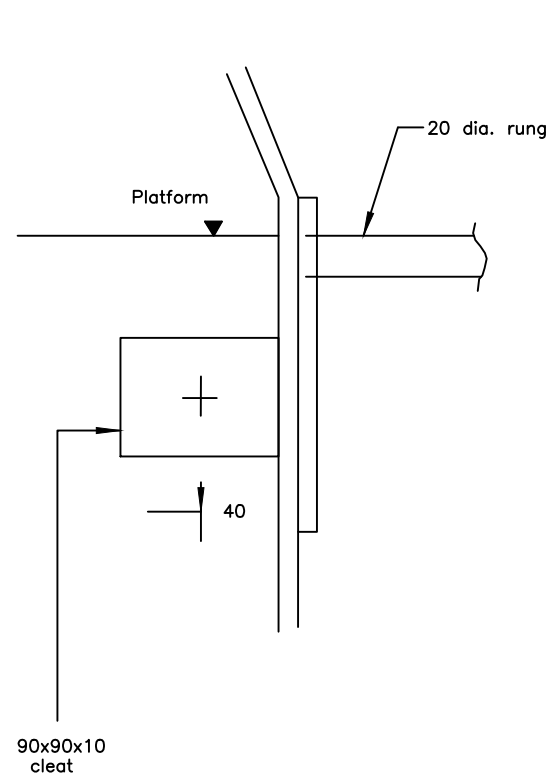
DRAWING TITLE

**MILD STEEL ACCESS LADDERS - TYPE C**

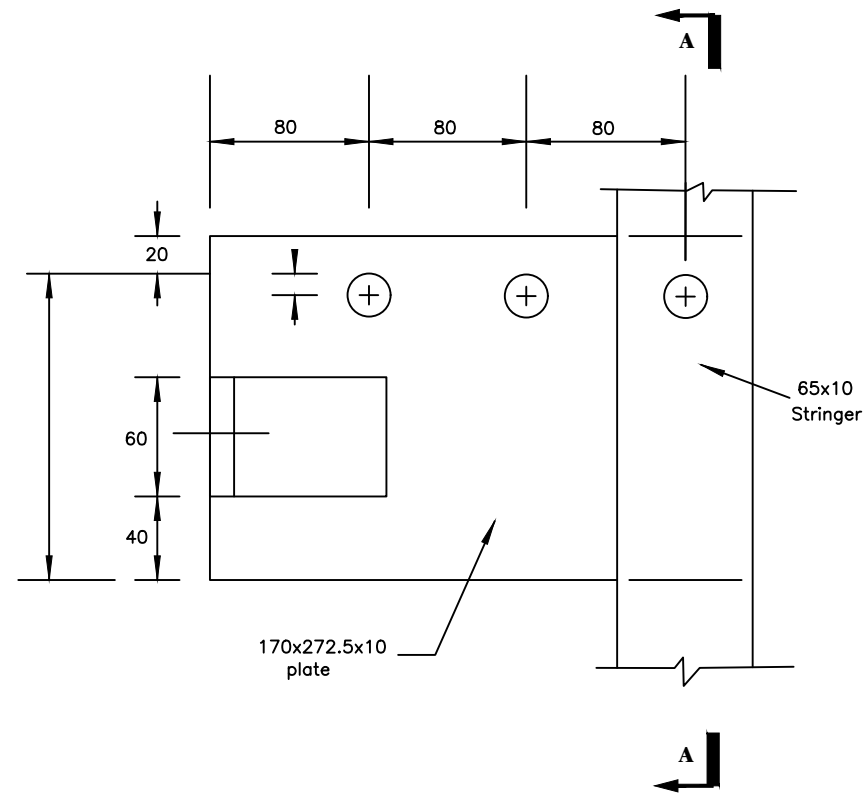
SCALE	As Shown	DRAWING No.	SD107G
SURVEYED		DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.

**NOTES**

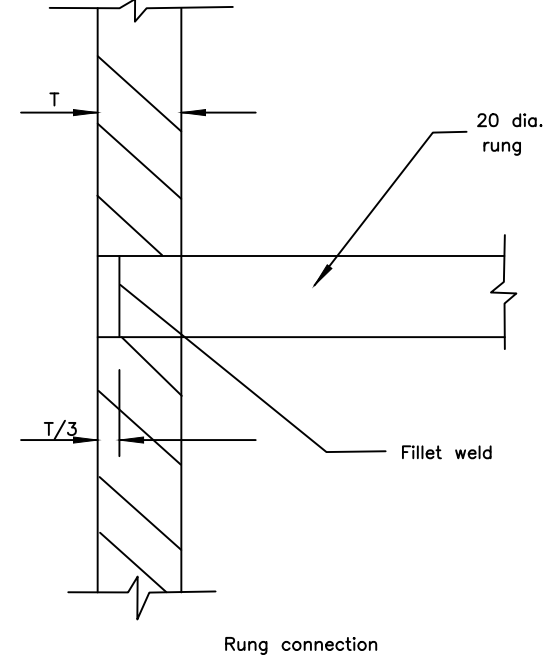
1. All welds to be 8 mm fillet welds
2. Hoops and vertical cage members to be 50x10 flat welded together or fixed with 12 dia. bolts and nuts
3. Holding down bolts 20 dia.



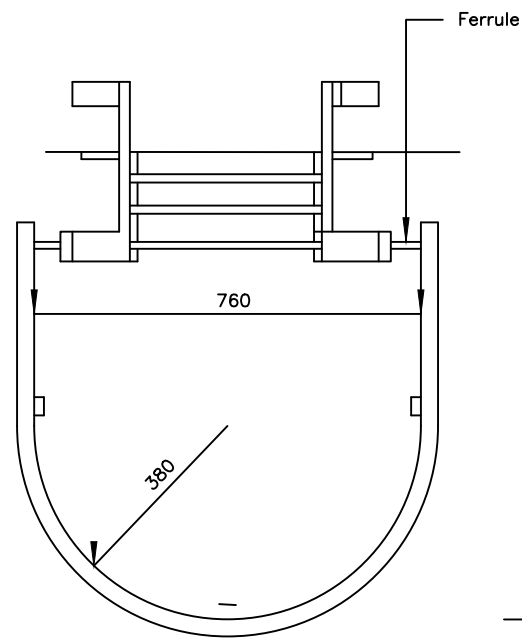
SECTION A - A



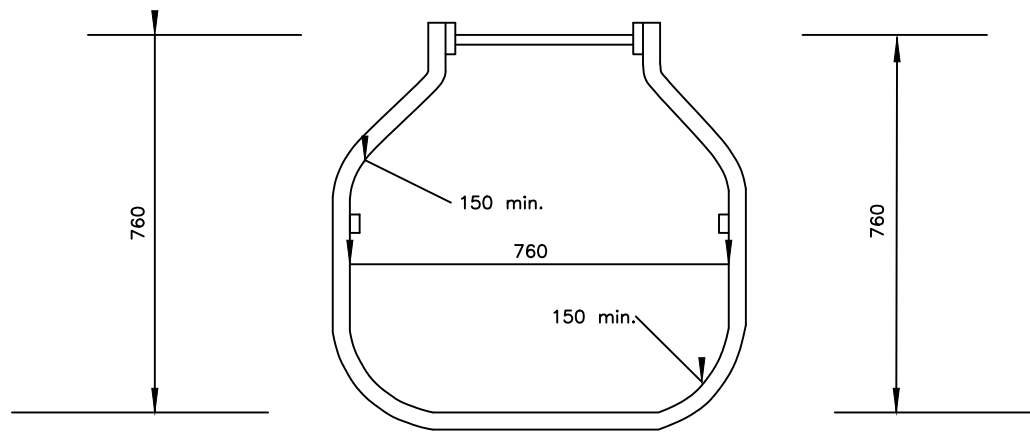
Detail "X" at platform level



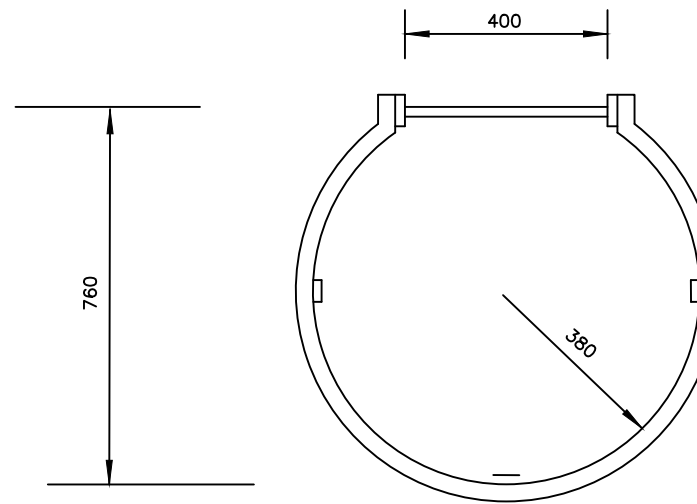
Rung connection



Semi circular hoop



Rectangular hoop




Circular hoop

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

**NYAKABAALE WATER SUPPLY SYSTEM**

CONSULTANT



In Joint Venture with



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

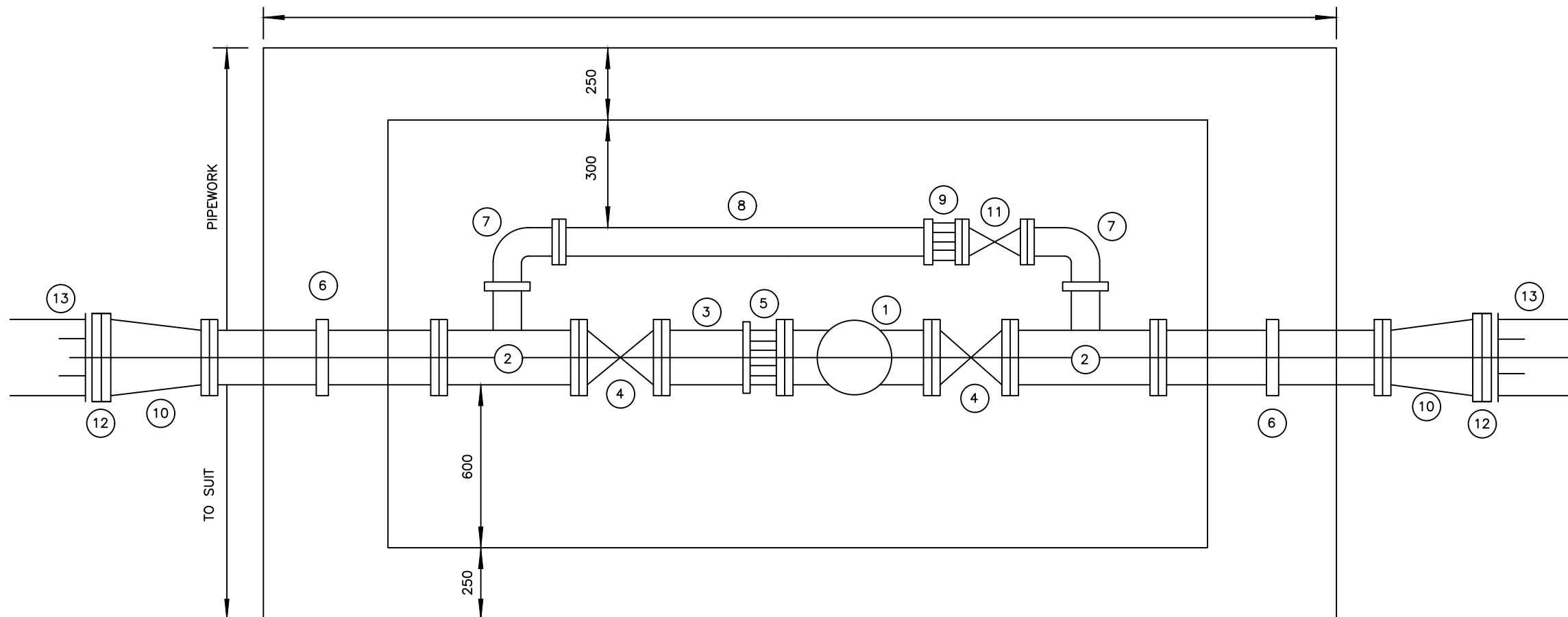
CONTRACTOR

**DETAILED ENGINEERING DESIGN**

DRAWING TITLE

**MILD STEEL ACCESS LADDERS - DETAILS**

SCALE	As Shown	DRAWING No.	SD107H
SURVEYED		DESIGNED	Otwane 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**

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

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

**NYAKABAALE WATER SUPPLY SYSTEM**

CONSULTANT



In Joint Venture with



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

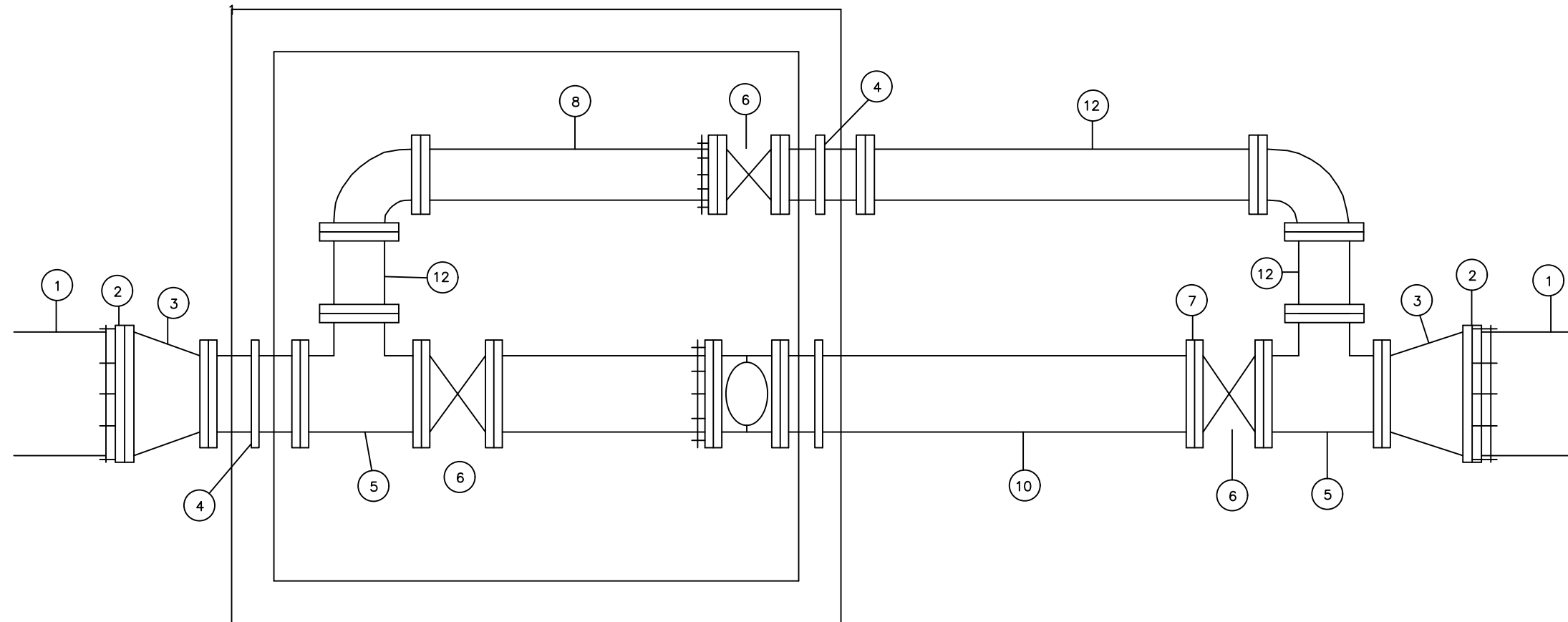
CONTRACTOR

DETAILED ENGINEERING DESIGN

DRAWING TITLE

**PRESSURE REDUCING VALVE - PIPEWORK**

SCALE	As Shown	DRAWING No.	SD109
SURVEYED		DESIGNED	Otwane 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 Flange 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

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

## NYAKABAALE 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

**FLOWMETER - PIPEWORK**

SCALE

As Shown

DRAWING No. SD110

SURVEYED

DESIGNED Otwane Dan.

DRAWN

Joshua Nyarwanda

CHECKED

Rodney Barugahare

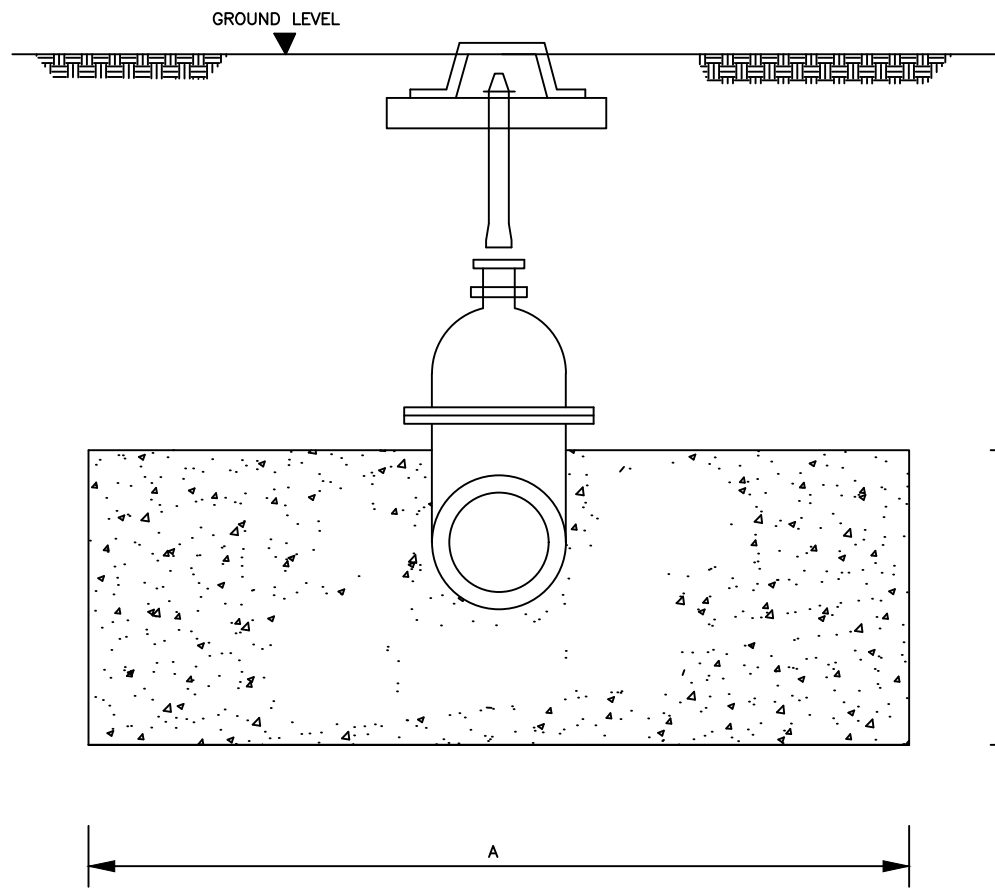
DATE

OCT 2021

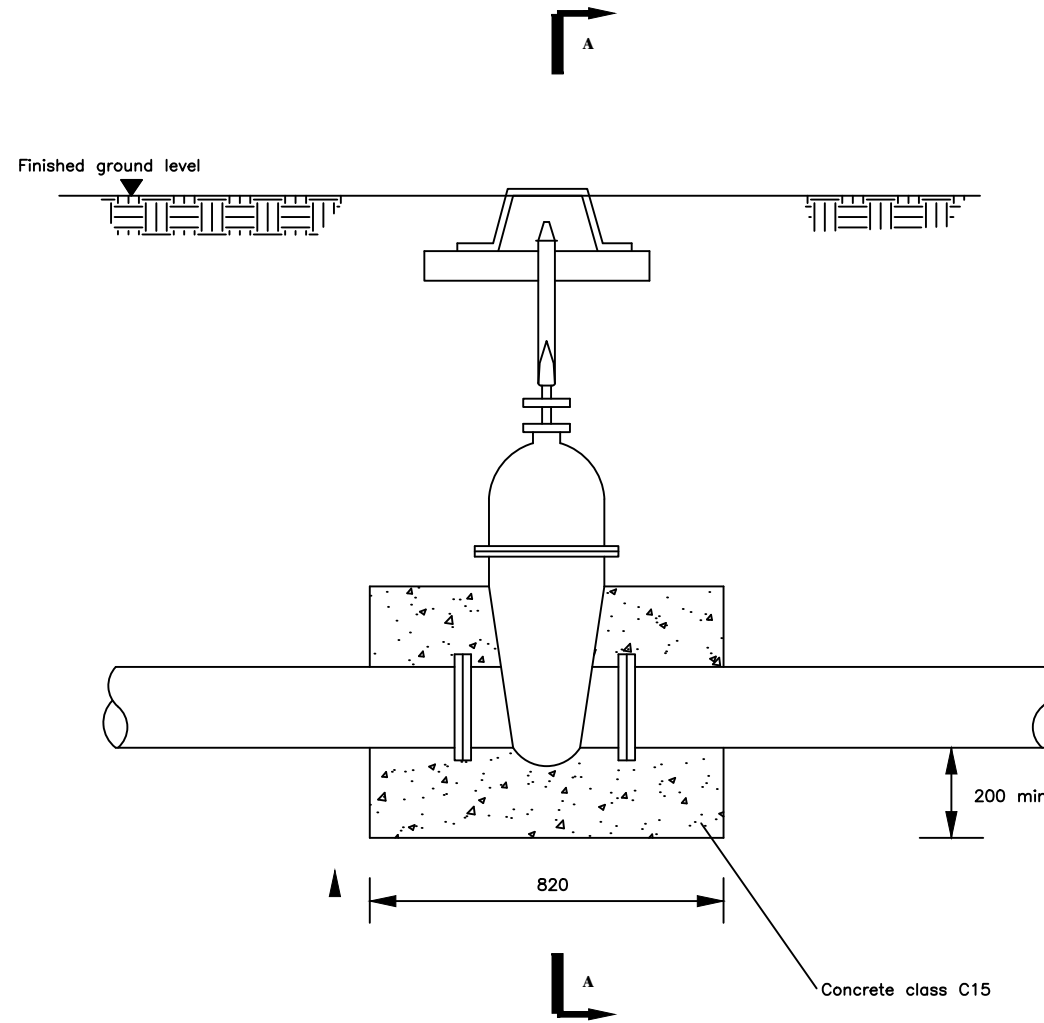
APPROVED

Rodney Barugahare.

**NOTES**



**SECTION A-A**



D+400 min.

**NOTES**

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

**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

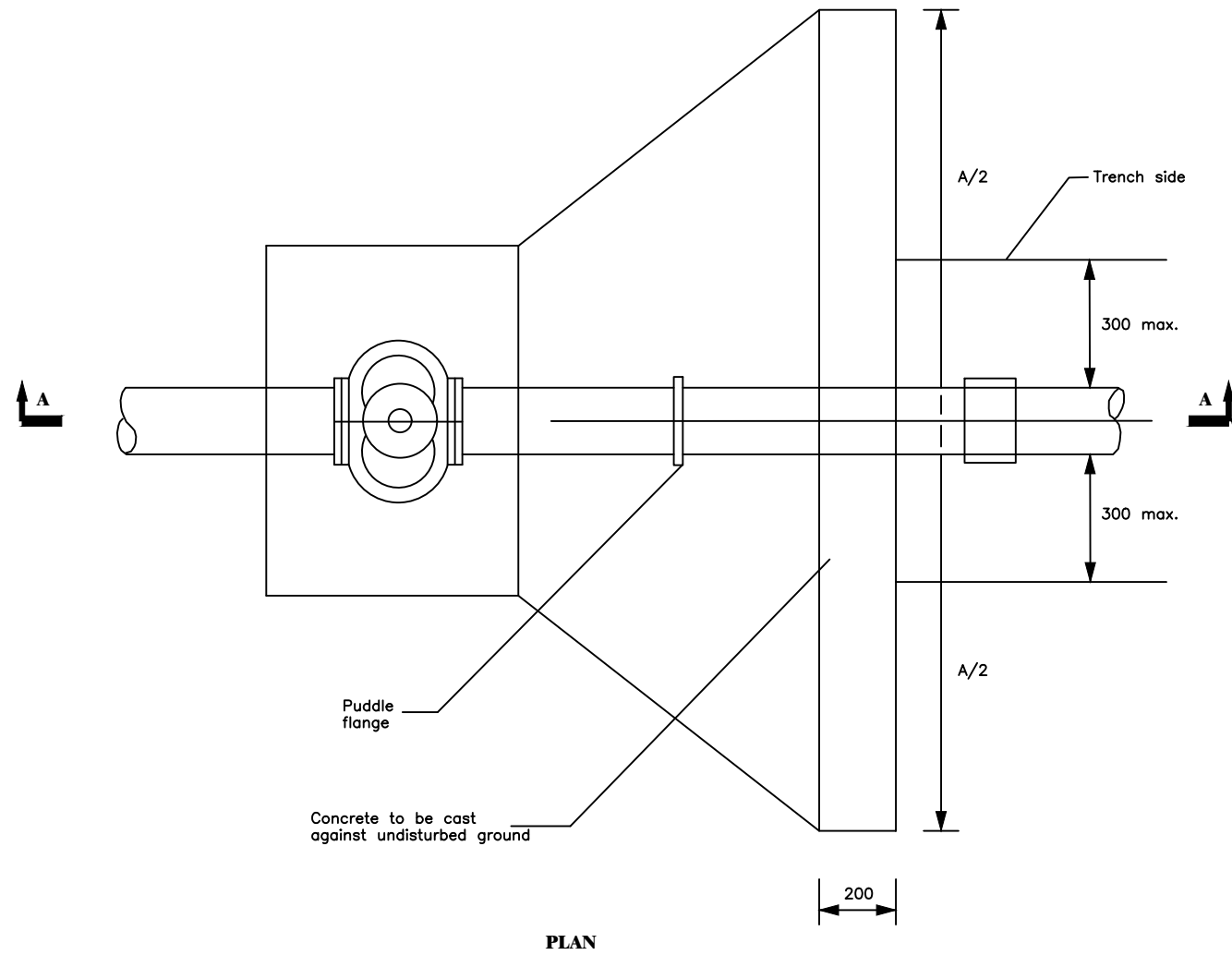
**NYAKABAAL WATER SUPPLY SYSTEM**

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

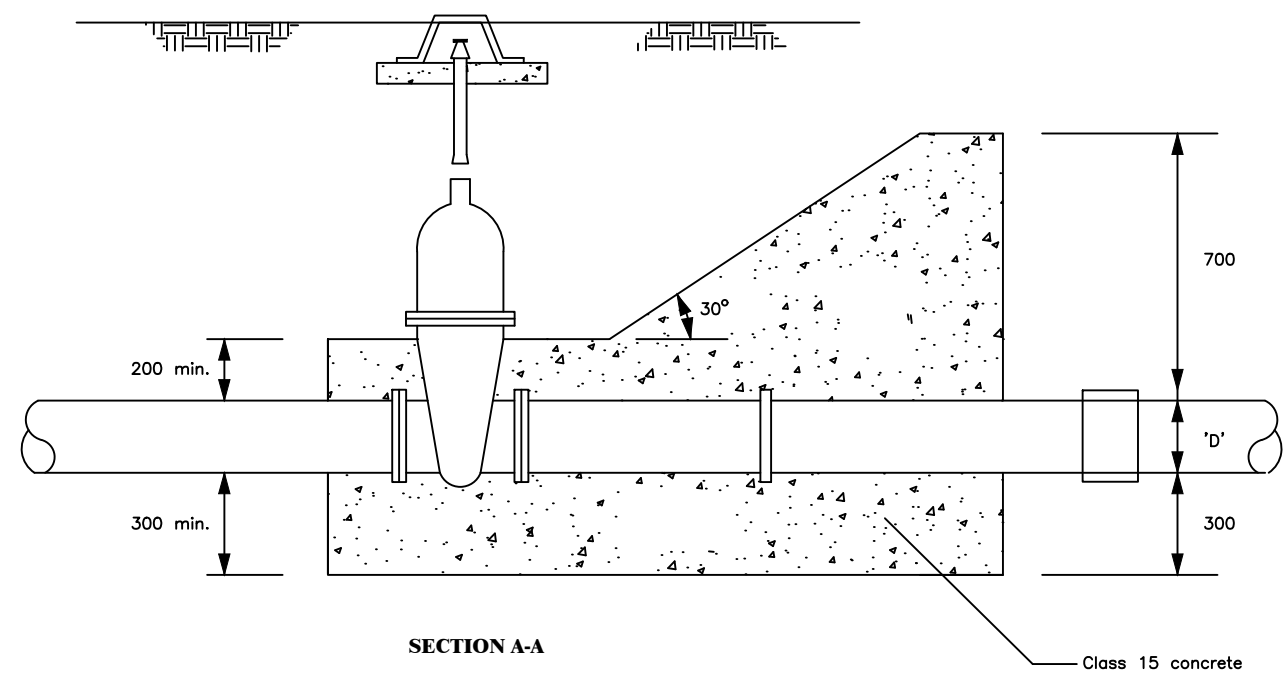
**CONTRACTOR**

**DETAILED ENGINEERING DESIGN**  
**DRAWING TITLE**  
**FLOWMETER - PIPEWORK**

<b>SCALE</b>	As Shown	<b>DRAWING No.</b>	SD111A
<b>SURVEYED</b>		<b>DESIGNED</b>	Otwane Dan.
<b>DRAWN</b>	Joshua Nyarwanda	<b>CHECKED</b>	Rodney Barugahare
<b>DATE</b>	OCT 2021	<b>APPROVED</b>	Rodney Barugahare.



PLAN



SECTION A-A

**NOTES**

1. For details of surface box see SD122
2. For dimension 'A' see SD 111 D and E

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

**NYAKABAAL WATER SUPPLY SYSTEM**

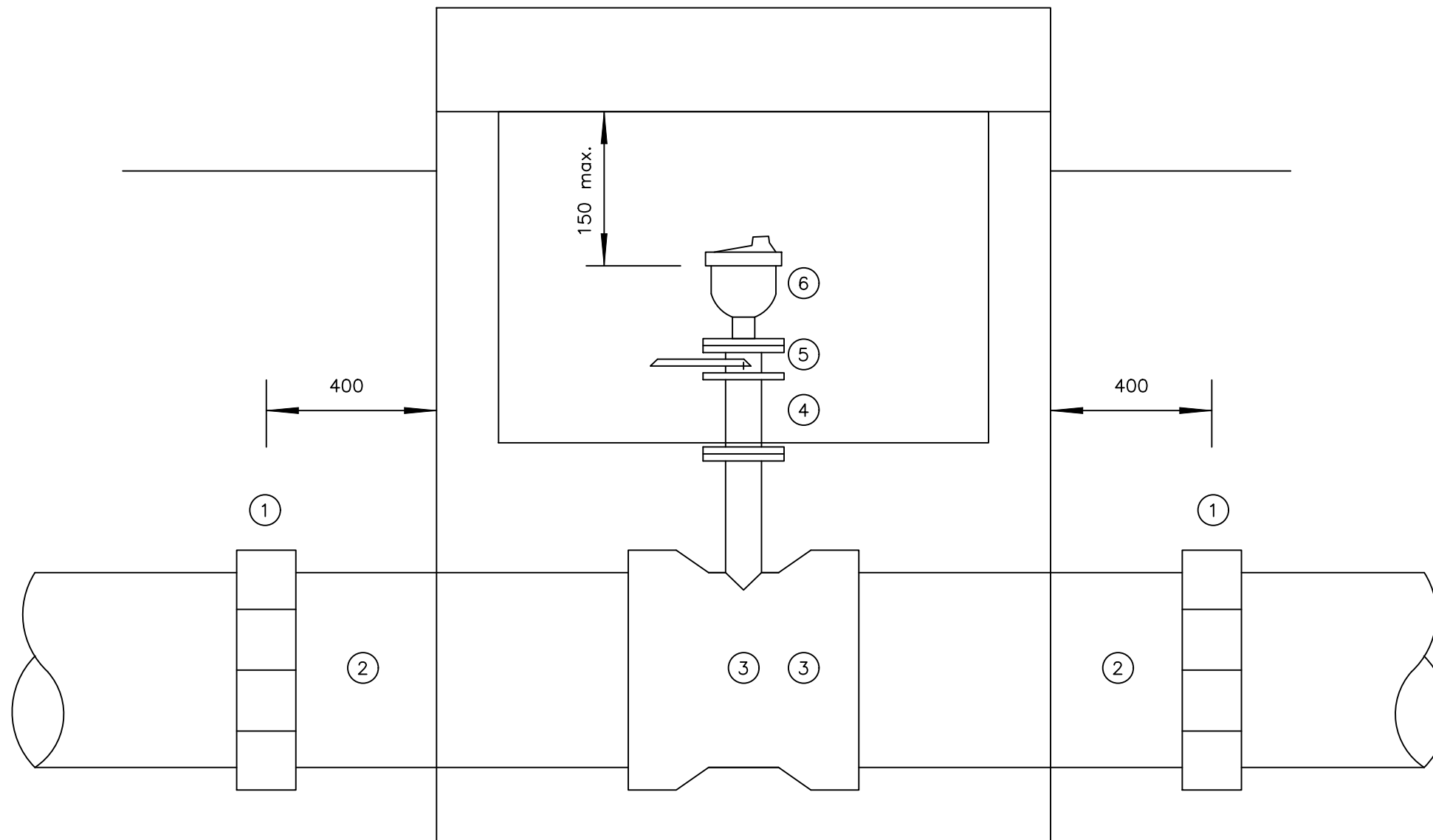
CONSULTANT  
 SARI  
 Corporate Headquarter  
 10 Philip Lane, 1st Floor,  
 London EC3M 6SA,  
 United Kingdom  
 In Joint Venture with  SGAPI

CONTRACTOR

**DETAILED ENGINEERING DESIGN**  
 DRAWING TITLE  
**GATE VALVE - TYPE 2**

SCALE	As Shown	DRAWING No.	SD111B
SURVEYED		DESIGNED	Otwane 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 main 100-300dia valve 50 dia
6	Air valve main 350-600dia valve 80dia

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

**NYAKABAAL WATER SUPPLY SYSTEM**

CONSULTANT



In Joint Venture with



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

CONTRACTOR

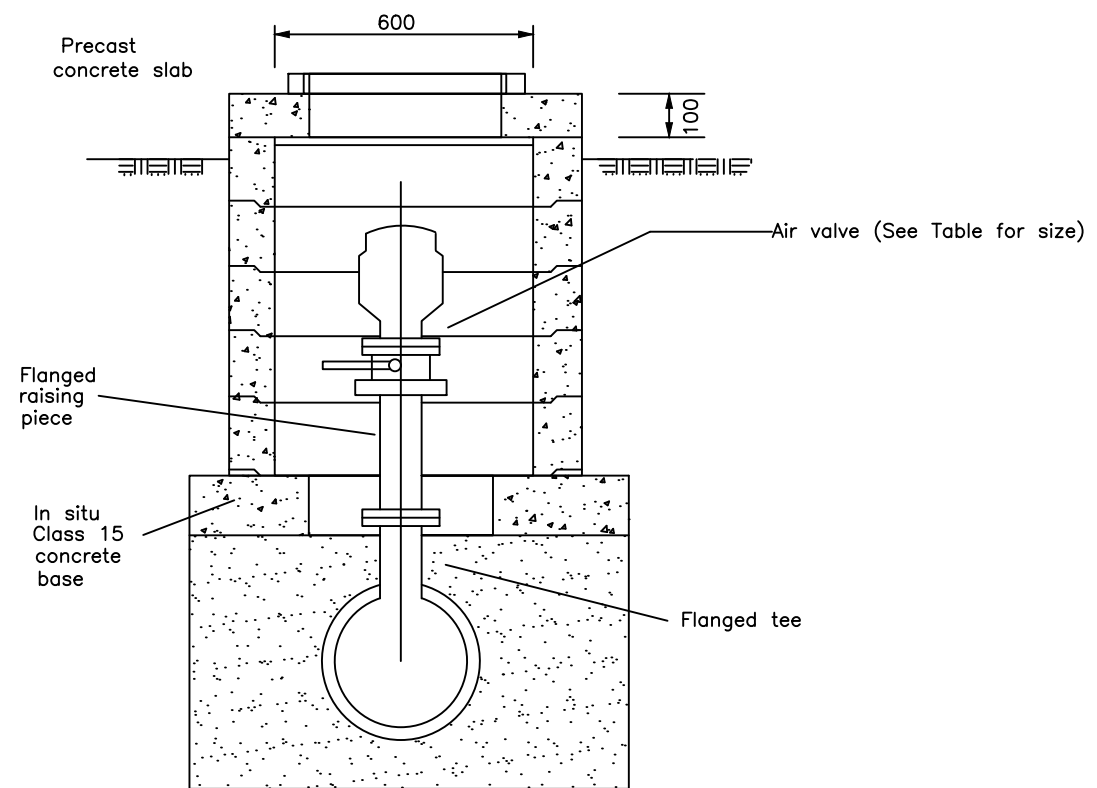
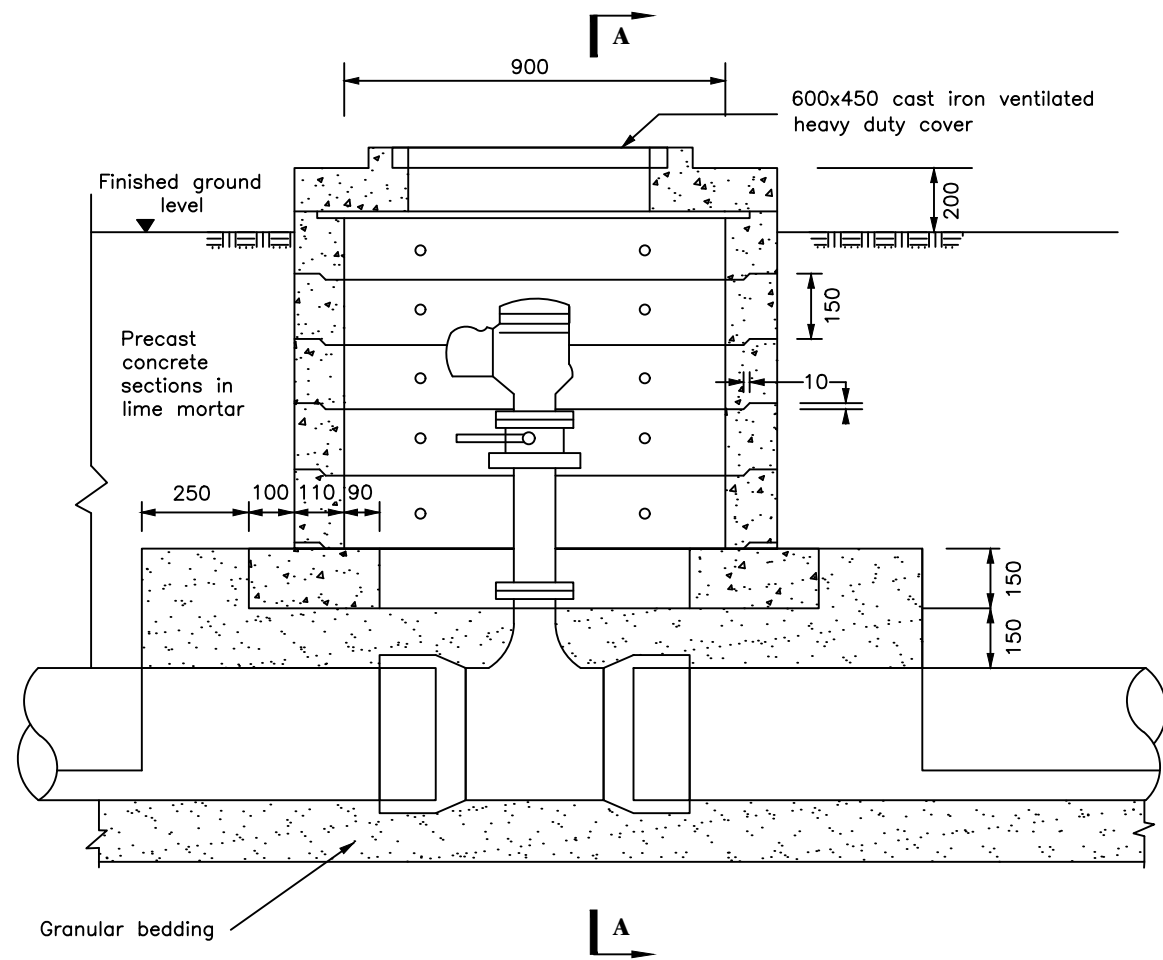
**DETAILED ENGINEERING DESIGN**

DRAWING TITLE

**AIR VALVE PIPEWORK**

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

**NOTES**



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

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

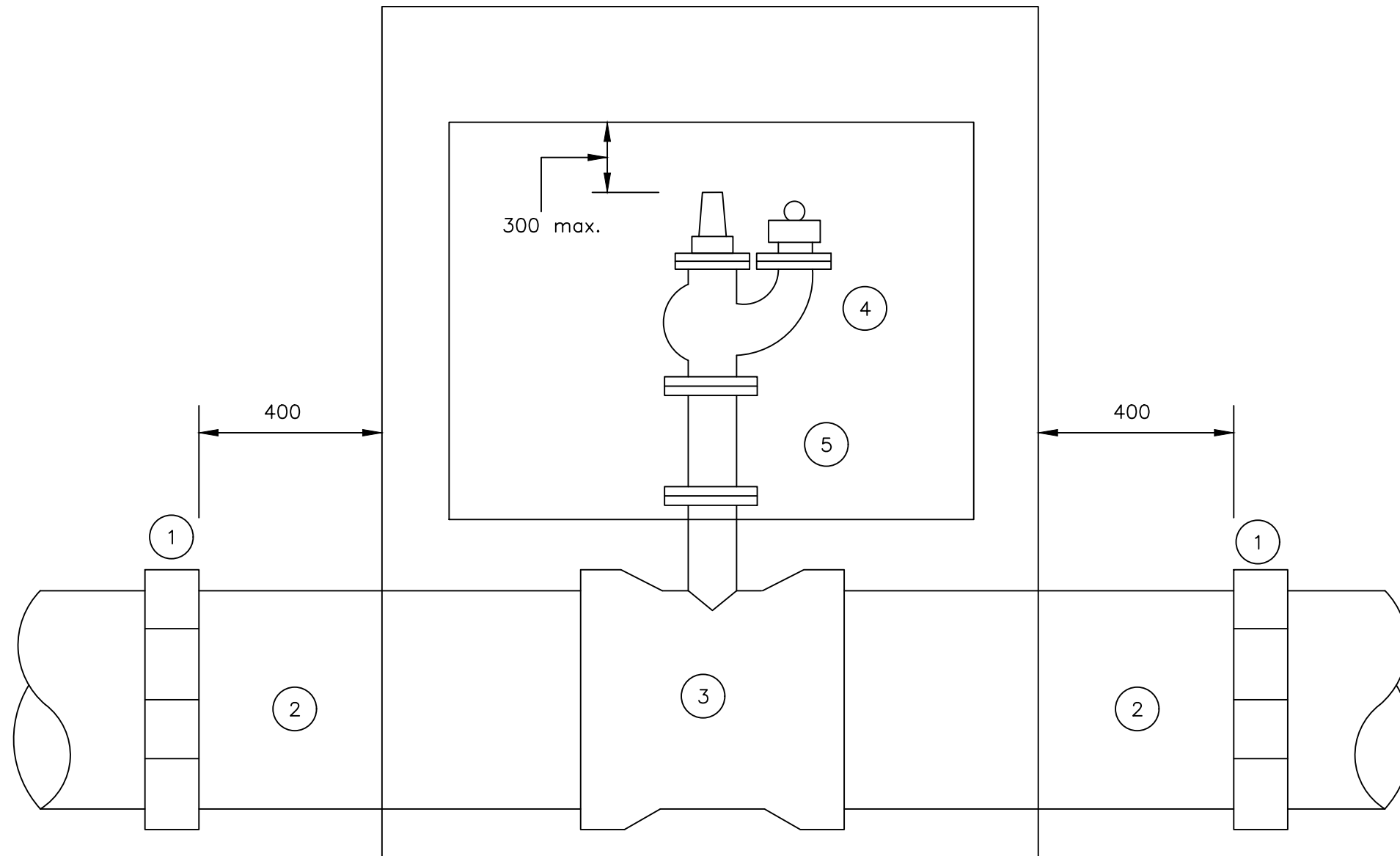
**NYAKABAAL WATER SUPPLY SYSTEM**

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

CONTRACTOR

**DETAILED ENGINEERING DESIGN**  
 DRAWING TITLE  
**AIR VALVE CHAMBER**

SCALE As Shown DRAWING No. SD112B  
 SURVEYED DESIGNED Otwane Dan.  
 DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare  
 DATE OCT 2021 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

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

**NYAKABAALE WATER SUPPLY SYSTEM**

CONSULTANT



In Joint Venture with



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

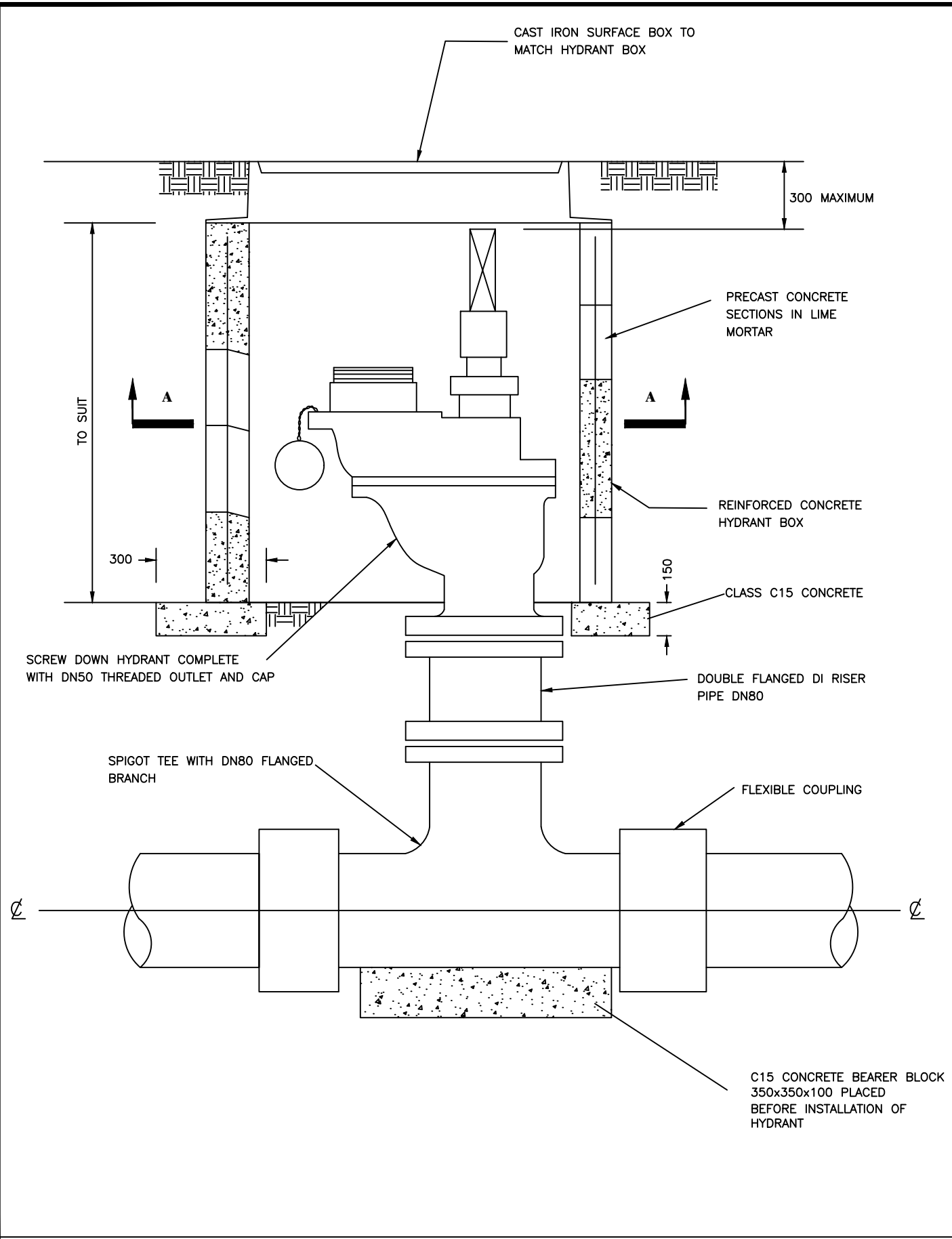
CONTRACTOR

**DETAILED ENGINEERING DESIGN**

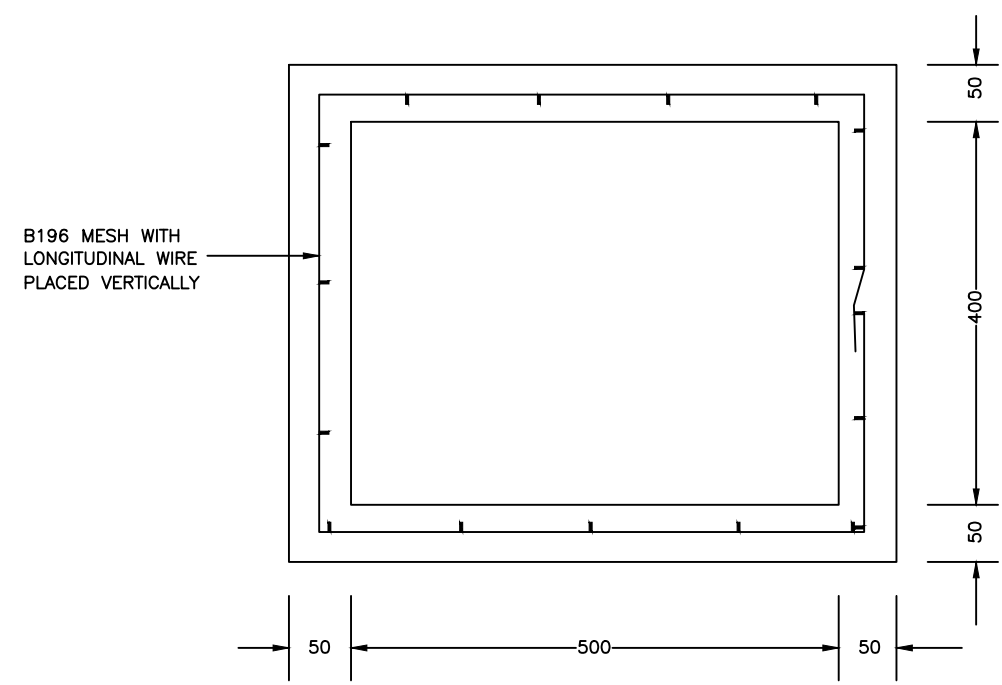
DRAWING TITLE

**FIRE HYDRANT - PIPEWORK**

SCALE	As Shown	DRAWING No.	SD113A
SURVEYED		DESIGNED	Otwane 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 AND HYDRANT



SECTION A-A

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

**NYAKABAAL WATER SUPPLY SYSTEM**

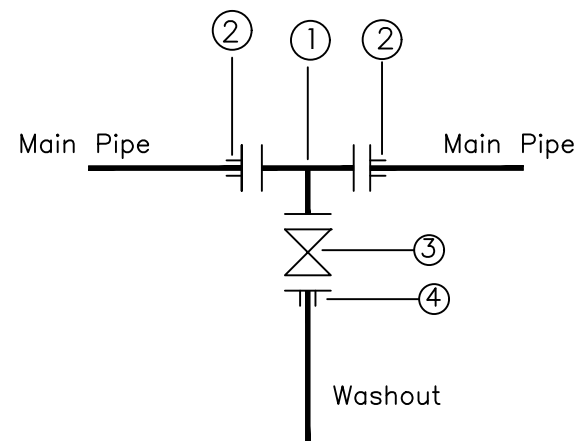
CONSULTANT  
**SARI** In Joint Venture with **SGAPI**  
Corporate Headquarter  
10 Philip Lane, 1st Floor,  
London EC3M 8AA,  
United Kingdom

CONTRACTOR

DETAILED ENGINEERING DESIGN  
DRAWING TITLE  
**FIRE HYDRANT CHAMBER**

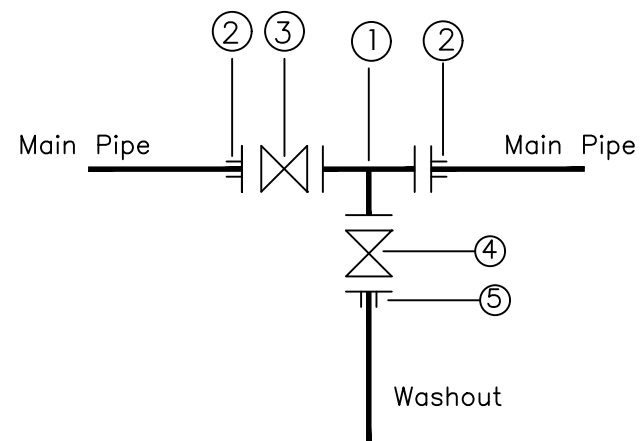
SCALE	As Shown	DRAWING No.	SD113B
SURVEYED		DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.

**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

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

**NYAKABAAL WATER SUPPLY SYSTEM**

CONSULTANT



In Joint Venture with



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

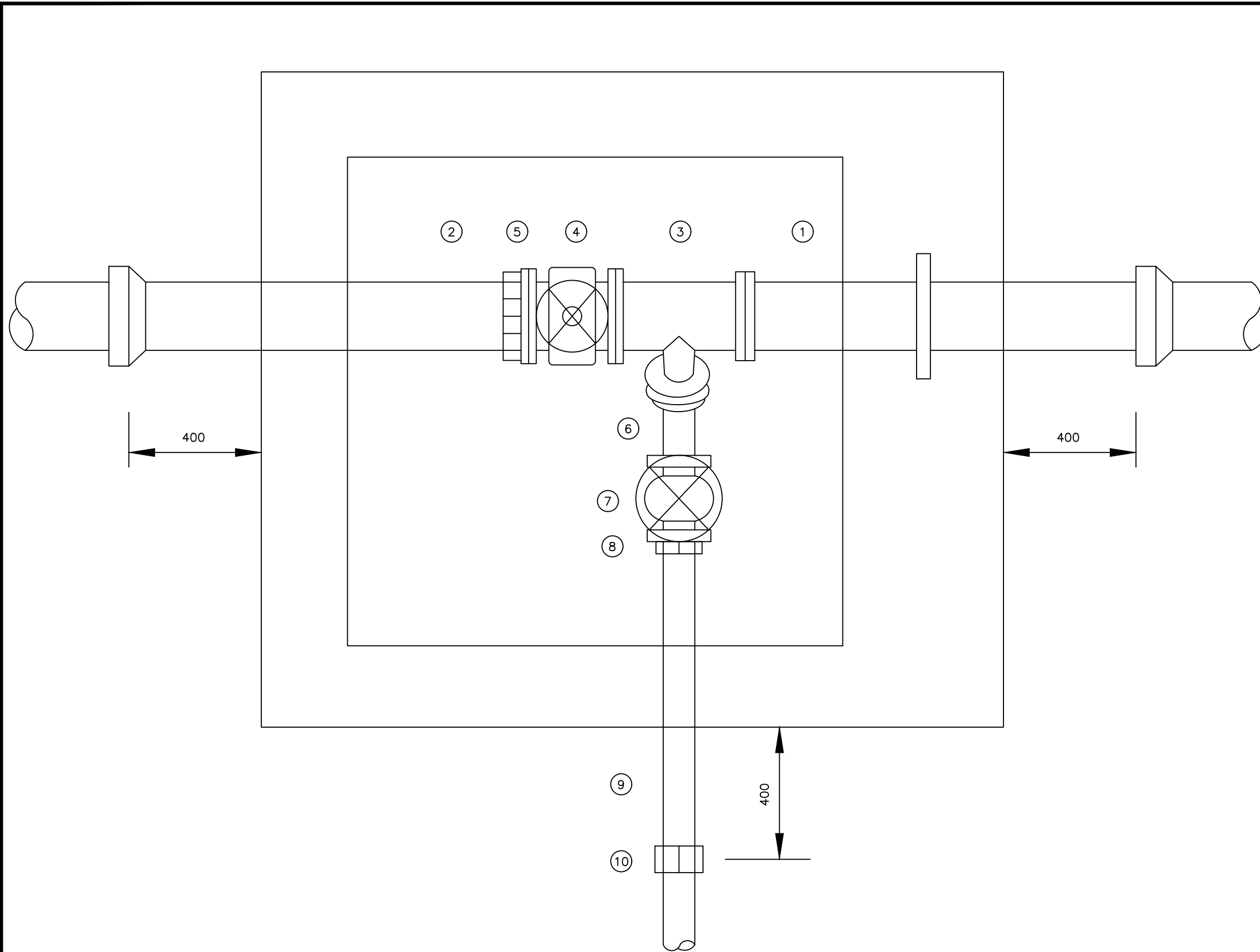
CONTRACTOR

DETAILED ENGINEERING DESIGN

DRAWING TITLE

**WASHOUT DETAILS  
TYPE 1 & 2**

SCALE	As Shown	DRAWING No.	SD114A
SURVEYED		DESIGNED	Otwane 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 SD13

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

**NYAKABAALE WATER SUPPLY SYSTEM**

CONSULTANT



In Joint Venture with



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

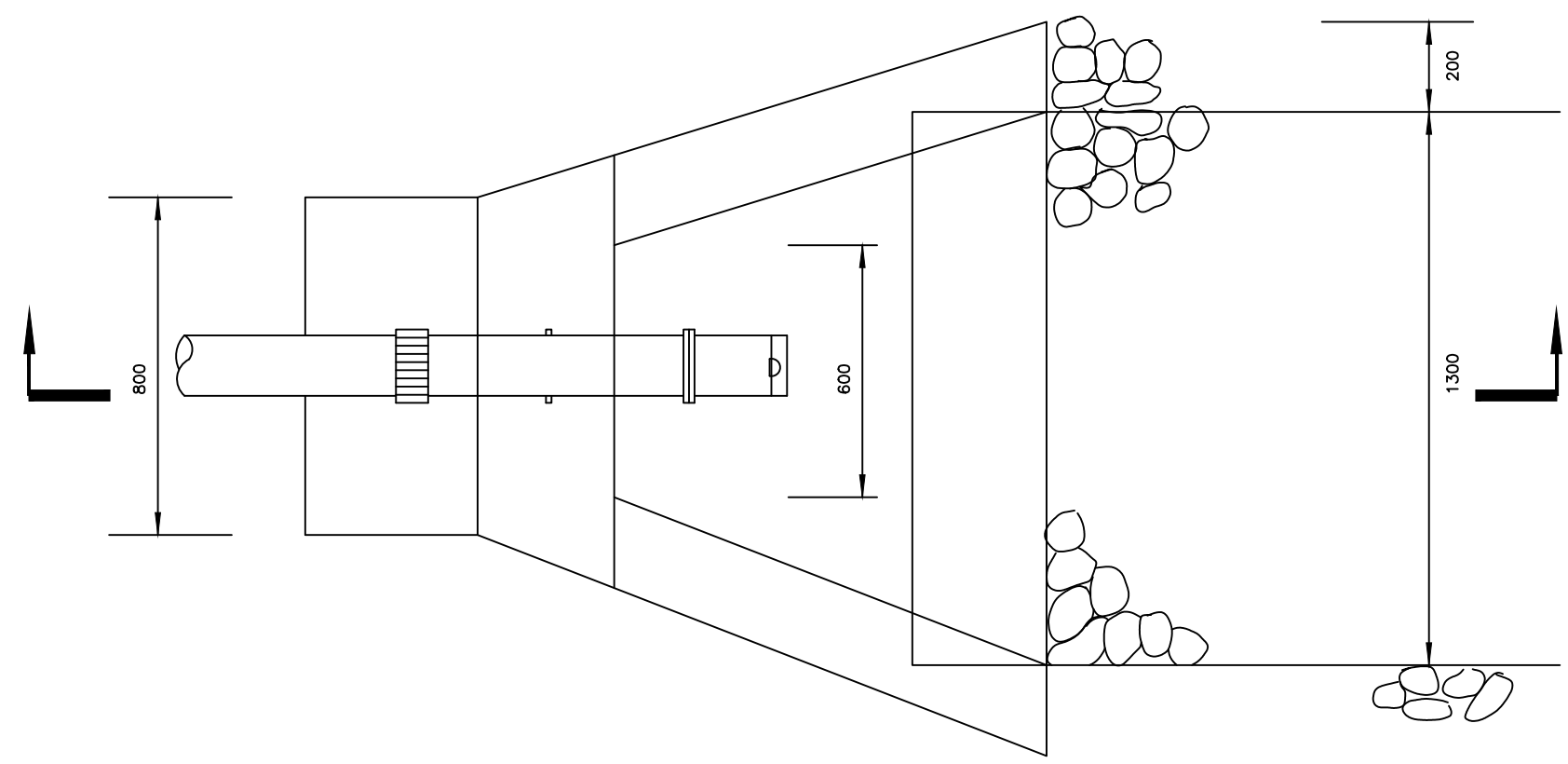
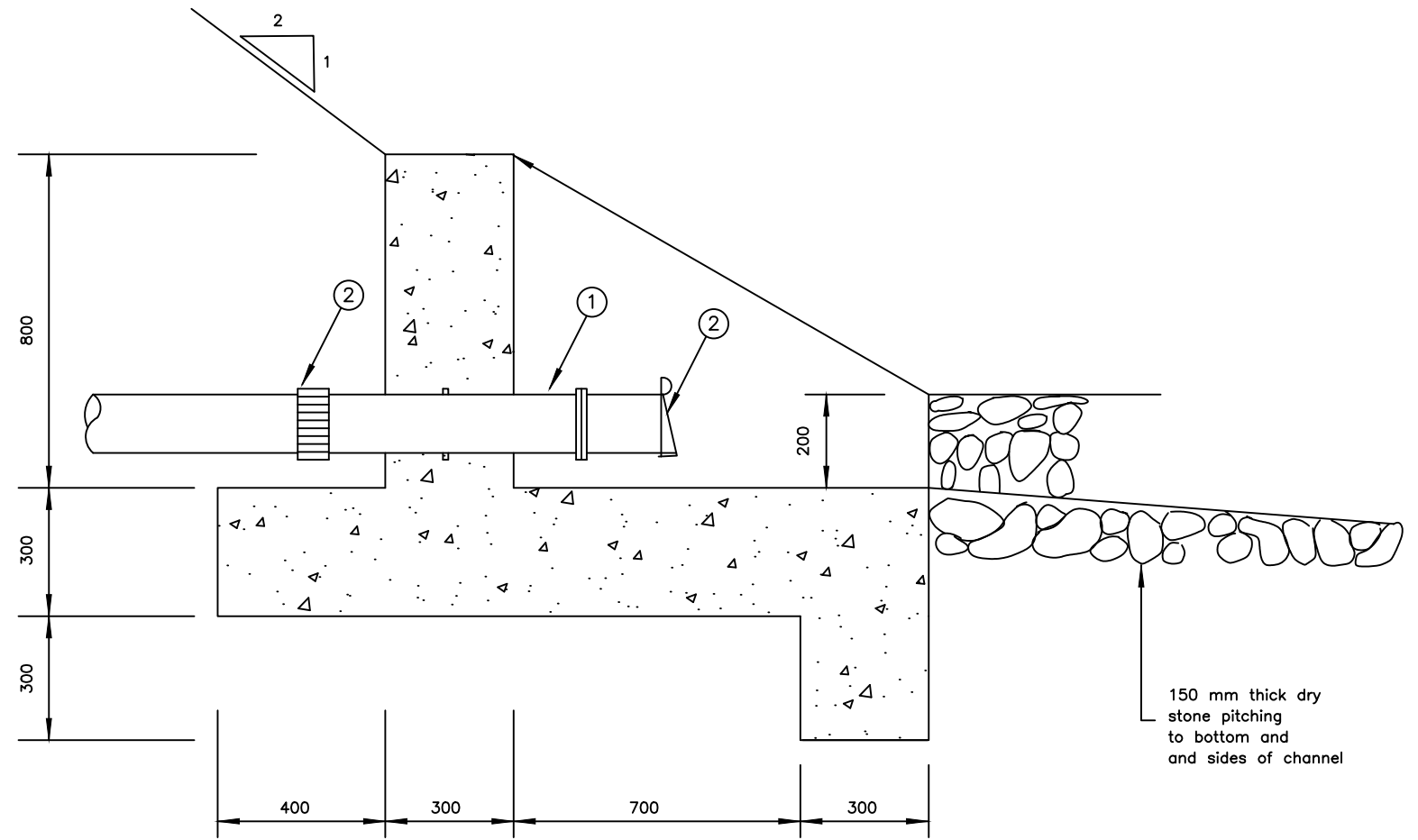
CONTRACTOR

**DETAILED ENGINEERING DESIGN**

DRAWING TITLE

**WASHOUT - PIPEWORK WITH CHAMBER**

SCALE	As Shown	DRAWING No.	SD114B
SURVEYED		DESIGNED	Otwane 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 1No. Flanged socket piece with paddle flange 350mm from flange, length not exceeding 750mm

② 1No. Flange flap valve

③ 1No. Viking Johnson flexible coupling

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

**NYAKABAAL WATER SUPPLY SYSTEM**

CONSULTANT

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

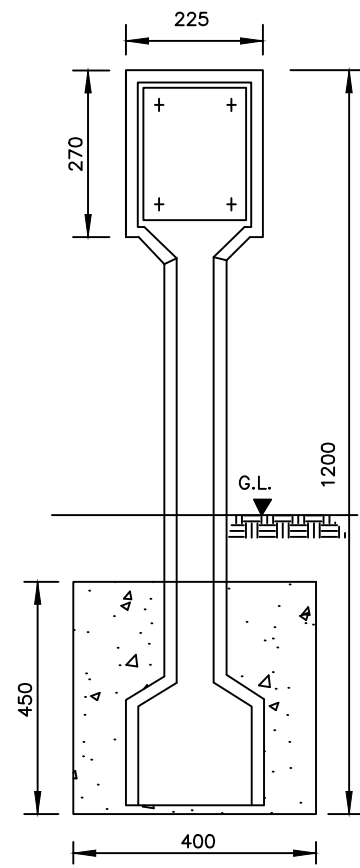
CONTRACTOR

**DETAILED ENGINEERING DESIGN**

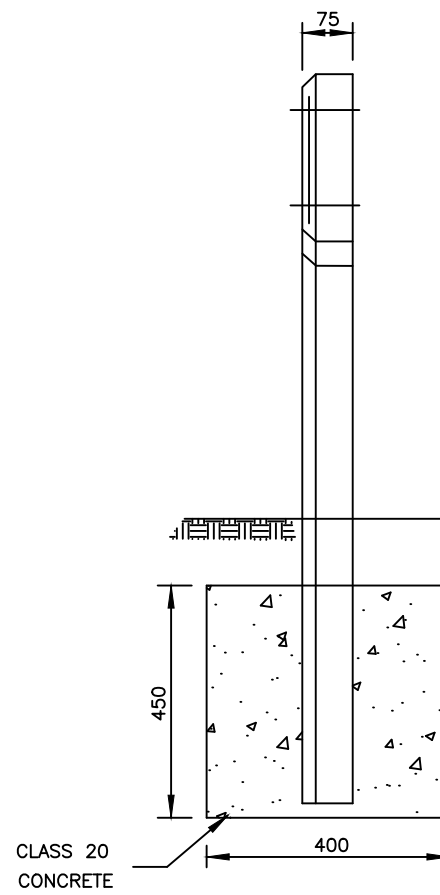
DRAWING TITLE

**OUTFALL**

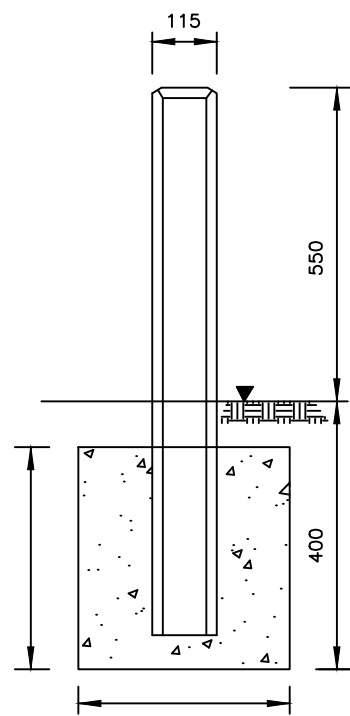
SCALE	As Shown	DRAWING No.	SD116
SURVEYED		DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



FRONT ELEVATION

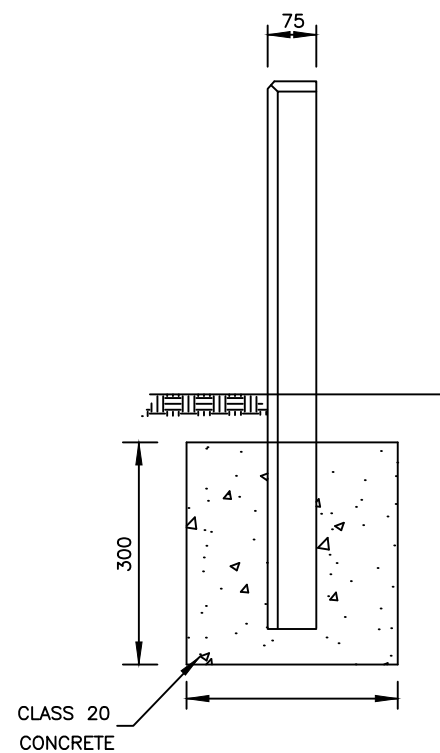


SIDE ELEVATION



FRONT ELEVATION

MAKER POSTS



SIDE ELEVATION

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

**NYAKABAAL WATER SUPPLY SYSTEM**

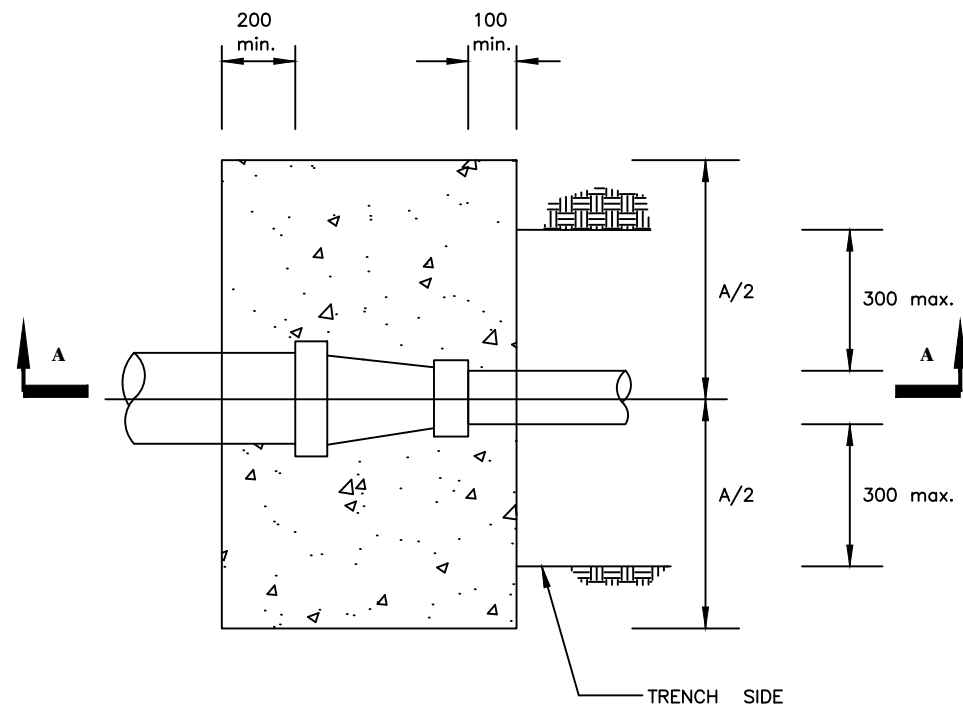
CONSULTANT  
 SARI  
 Corporate Headquarter  
 10 Philip Lane, 1st Floor,  
 London EC3M 8AA,  
 United Kingdom  
 In Joint Venture with  SGAPI

CONTRACTOR

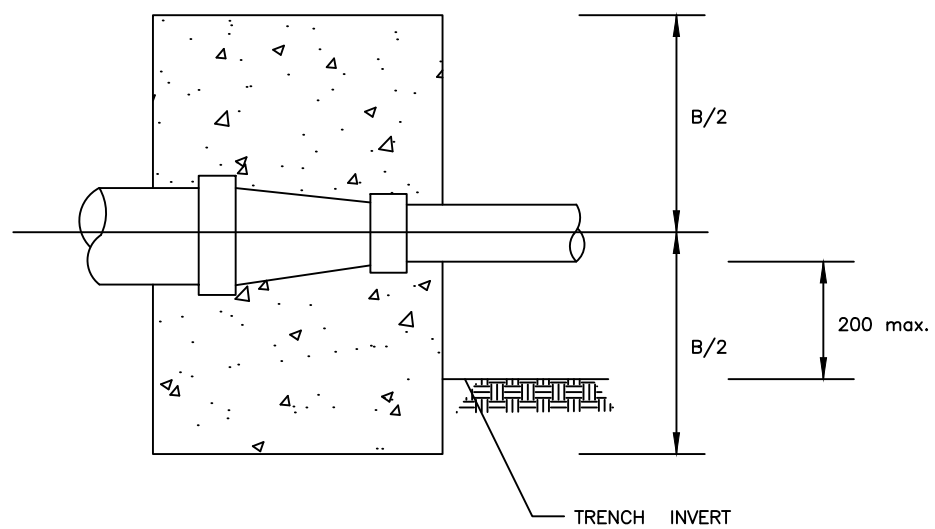
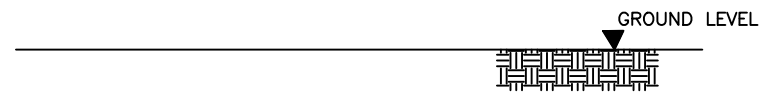
DETAILED ENGINEERING DESIGN  
 DRAWING TITLE  
**MARKER POSTS**

SCALE	As Shown	DRAWING No.	SD117
SURVEYED		DESIGNED	Otwane 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	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



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

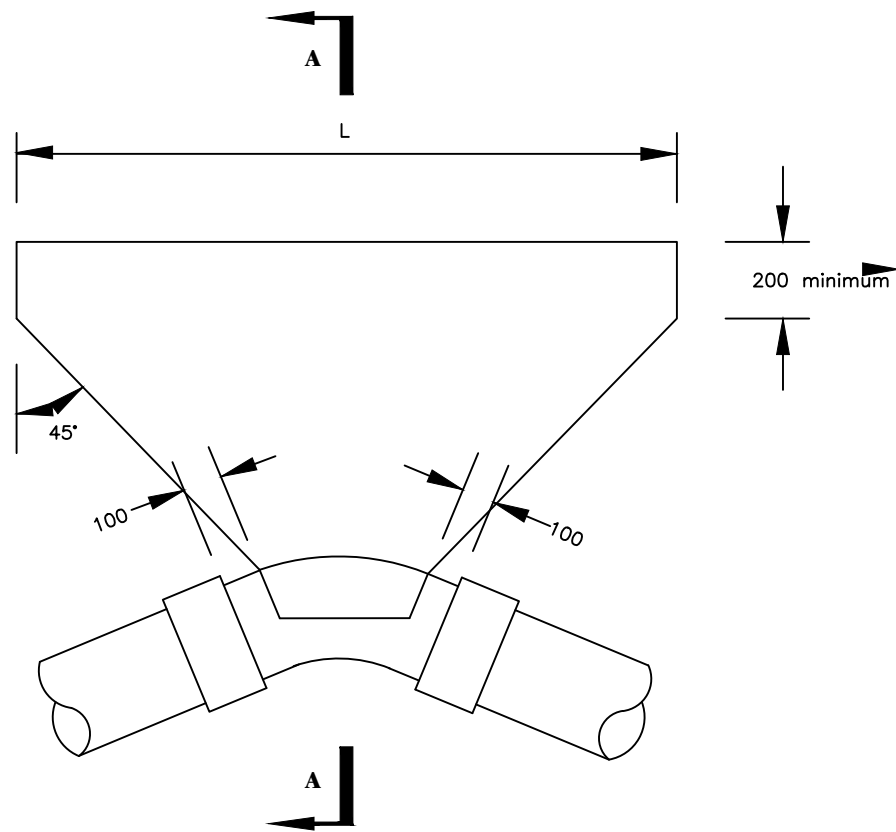
**NYAKABAAL WATER SUPPLY SYSTEM**

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

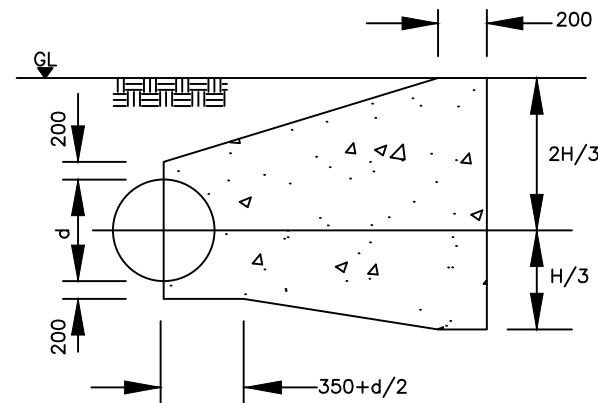
CONTRACTOR

DETAILED ENGINEERING DESIGN  
 DRAWING TITLE  
**ANCHOR BLOCKS FOR TAPERS**

SCALE As Shown DRAWING No. SD118A  
 SURVEYED DESIGNED Otwane Dan.  
 DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare  
 DATE OCT 2021 APPROVED Rodney Barugahare.



PLAN



SECTION A-A

Ground Condition		DRY				
Test Pressure (Bar)		15				
Bend Angle		11¼°	22½°	45°	90°	
PIPE DIAMETER (mm)	80	H	SEE SD 118C			
		L				
	80 < d < 150	H				
		L				
	150 < d < 300	H				
		L				
	300 < d < 400	H	1600	1600		
		L	2450	4530		
	450	H	1650	1650		
		L	2900	5330		
	500	H	1000	1350	1800	1800
		L	1250	1950	3050	5650

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

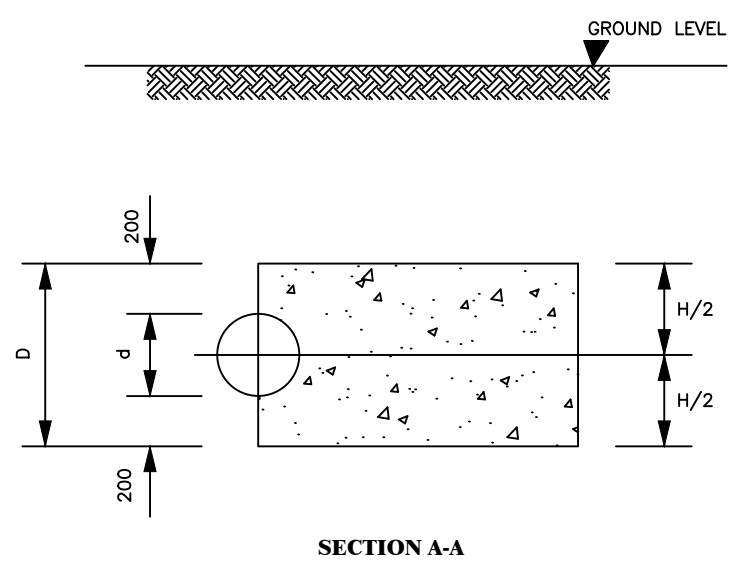
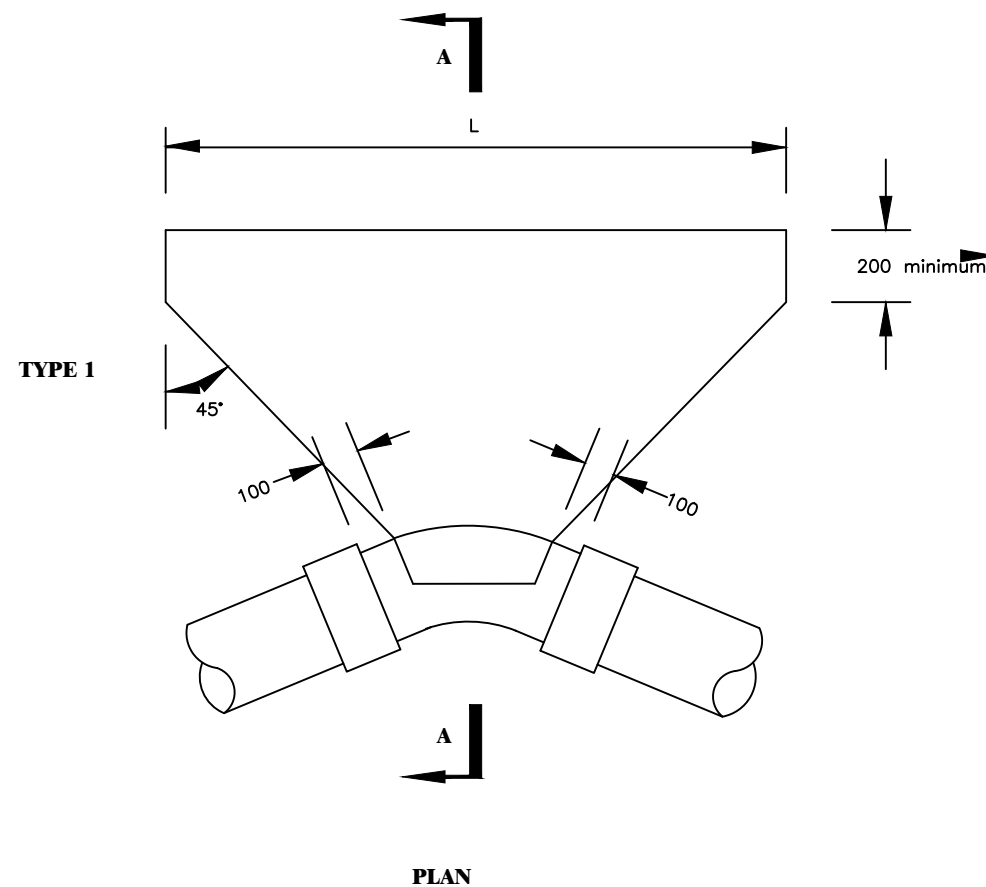
**NYAKABAAL WATER SUPPLY SYSTEM**

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  
**ANCHOR BLOCKS FOR BENDS - 1**

SCALE As Shown DRAWING No. SD118B  
 SURVEYED DESIGNED Otwane Dan.  
 DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare  
 DATE OCT 2021 APPROVED Rodney Barugahare.



PLAN

SECTION A-A

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

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

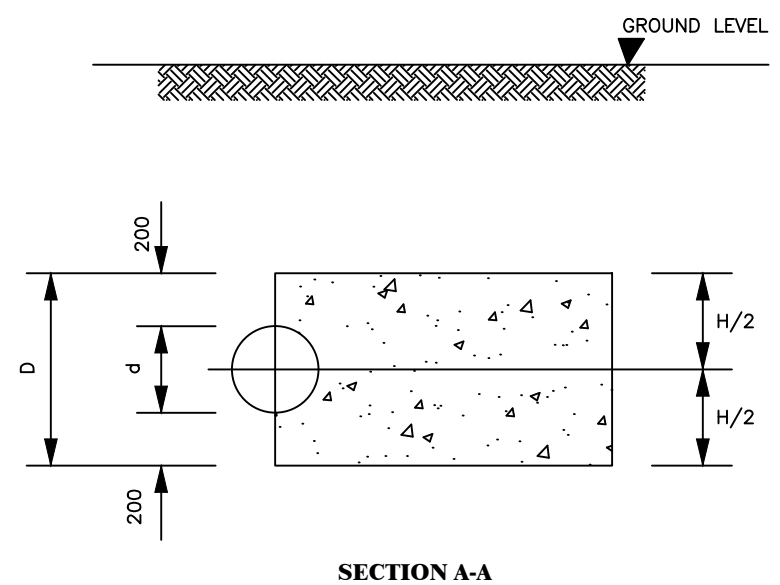
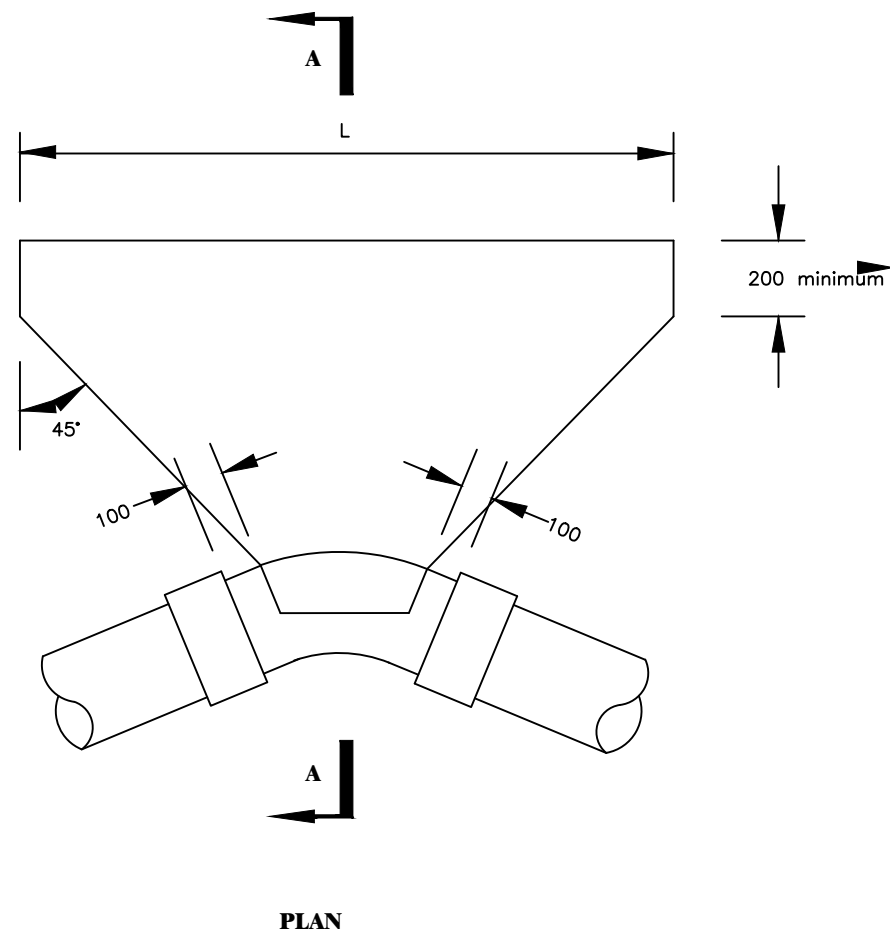
**NYAKABAAL WATER SUPPLY SYSTEM**

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  
**ANCHOR BLOCKS FOR BENDS - 2**

SCALE As Shown DRAWING No. SD118C  
 SURVEYED DESIGNED Otwane 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

GROUND CONDITION			SUBMERGED			
TEST PRESSURE (Bar)			15			
BEND ANGLE			11¼°	22½°	45°	90°
PIPE DIAMETER (mm)	80	H	450	480	480	480
		L	250	300	600	1100
	80 < d < 150	H	550	550	550	
		L	400	750	1500	
	150 < d < 300	H	700	700		
		L	1050	2050		
300 < d < 400	H	800	800			
	L	1500	1500			
450	H	900				
	L	4200				
500	H					
	L				SEE SD 118E	

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

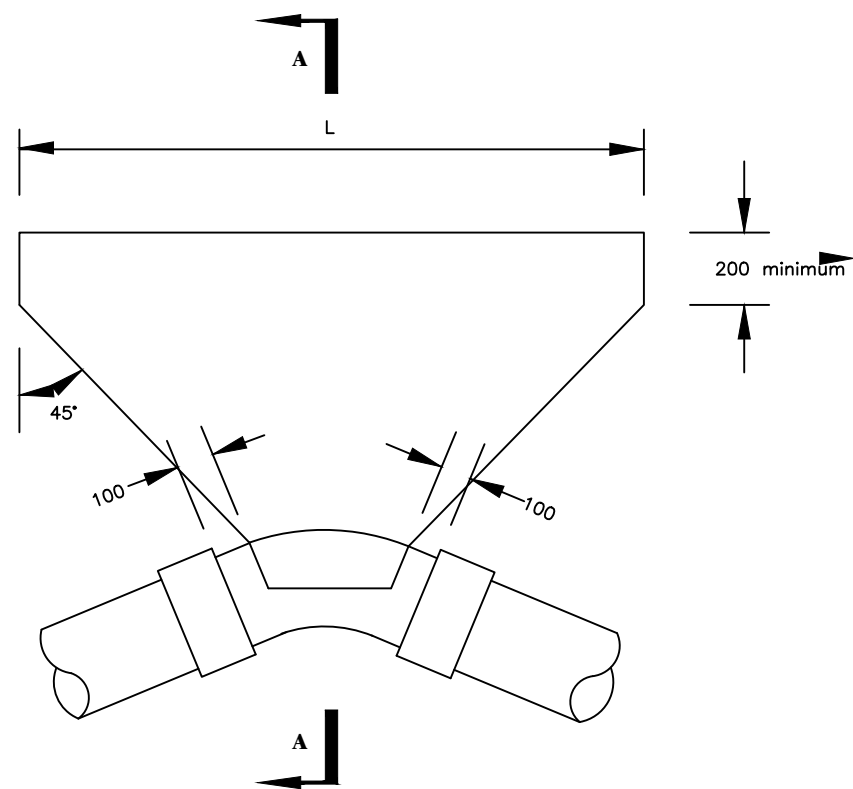
**NYAKABAAL WATER SUPPLY SYSTEM**

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

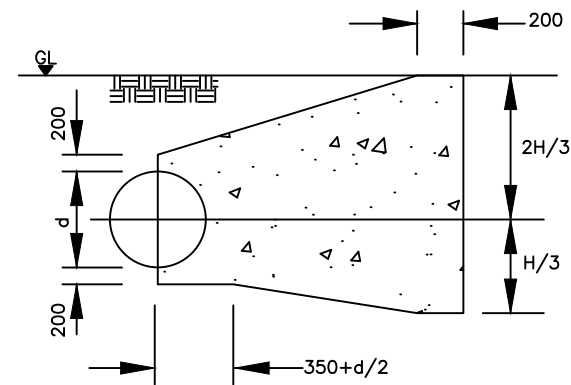
CONTRACTOR

DETAILED ENGINEERING DESIGN  
 DRAWING TITLE  
**ANCHOR BLOCKS FOR BENDS - 3**

SCALE As Shown DRAWING No. SD118D  
 SURVEYED DESIGNED Otwane 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			11¼°	22½°	45°	90°
PIPE DIAMETER (mm)	80	H L	SEE SD 118D			1350
	80 < d < 150	H L				1650
	150 < d < 300	H	1500	1500		
		L	2650	4900		
	300 < d < 400	H	1600	1700		
		L	4050	6650		
	450	H	1650	1650	1800	
L		2450	4750	6650		
500	H	1400	1800	1800	1800	
	L	1650	2850	5450	10150	

**NOTE:**



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

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

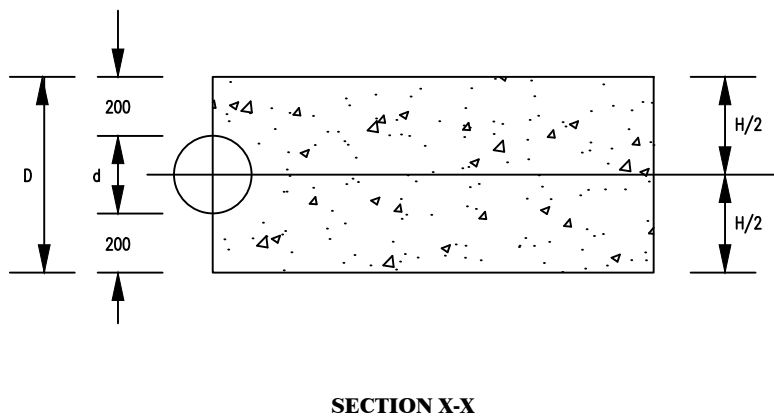
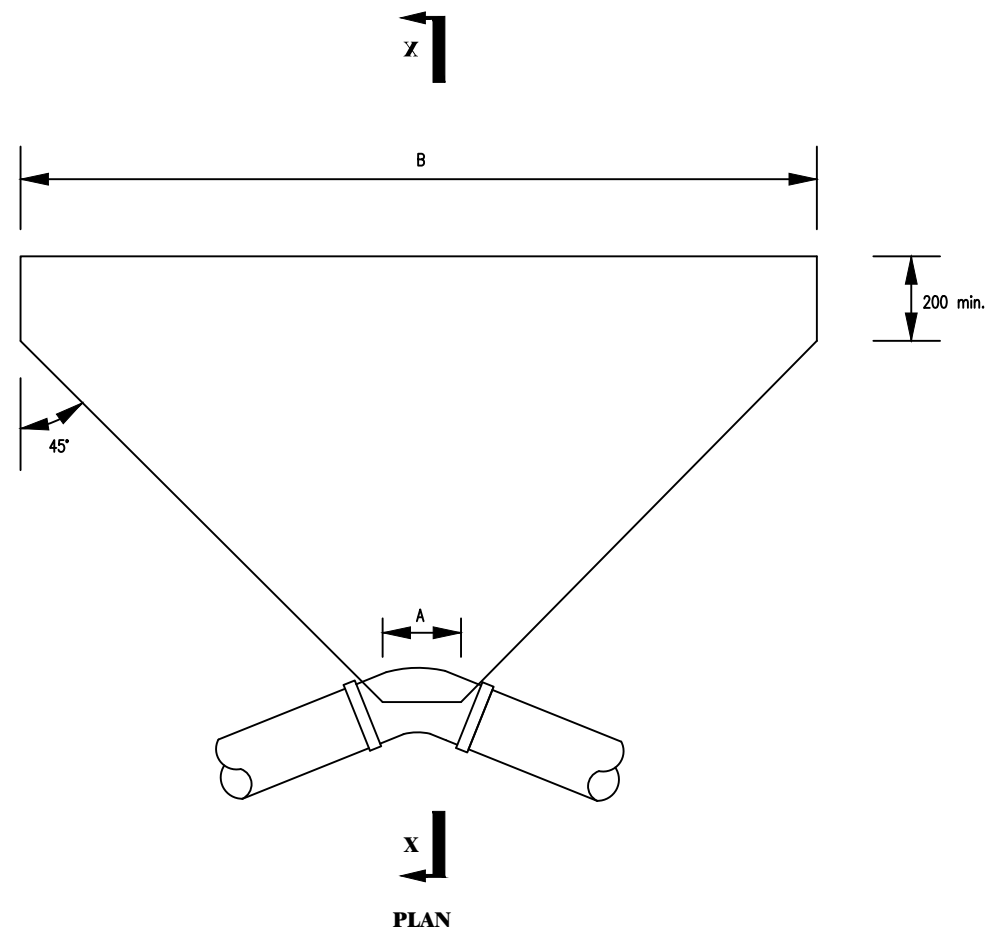
**NYAKABAAL WATER SUPPLY SYSTEM**

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

CONTRACTOR

DETAILED ENGINEERING DESIGN  
DRAWING TITLE  
**ANCHOR BLOCKS FOR BENDS - 4**

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



GROUND CONDITION		DRY							
TEST PRESSURE		18				24			
PIPE DIA (mm)	BEND	11¼°	22½°	45°	90°	11¼°	22½°	45°	90°
		90	H	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

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

**NYAKABAAL WATER SUPPLY SYSTEM**

CONSULTANT



In Joint Venture with



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

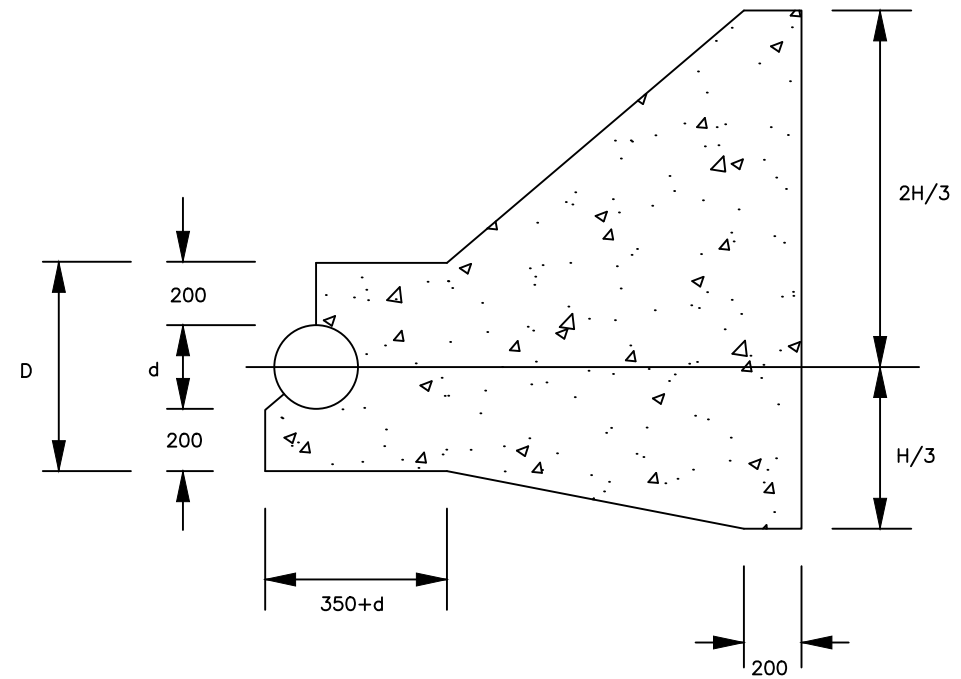
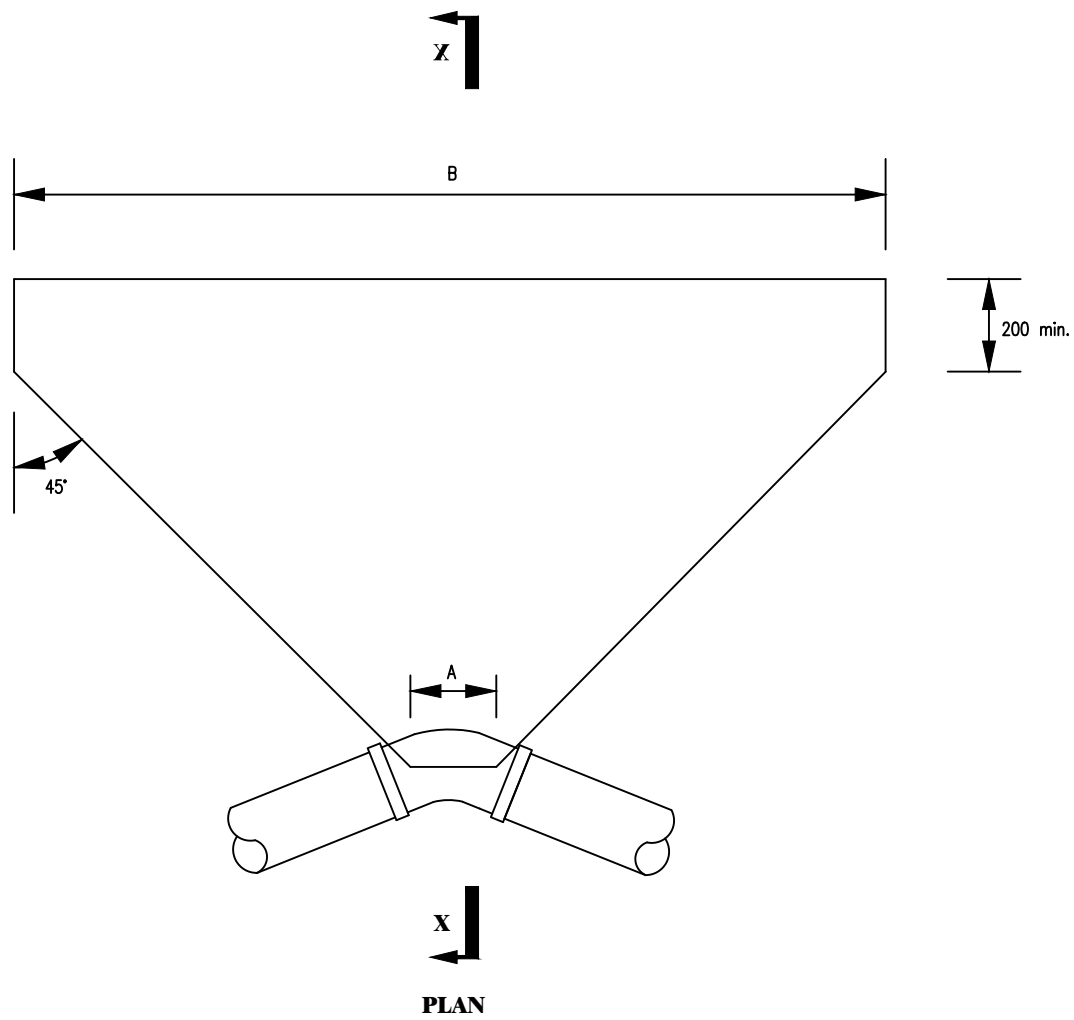
CONTRACTOR

**DETAILED ENGINEERING DESIGN**

DRAWING TITLE

**ANCHOR BLOCKS FOR BENDS - 5**

SCALE	As Shown	DRAWING No.	SD118F
SURVEYED		DESIGNED	Otwane 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			1500	1500			1500	1500	
	A			350	500			350	500	
350 - 400	B			1930	3560			3520	4760	
	H			1600	1600			1600	1800	
450	A			550	850			550	850	
	B			2950	5440			3920	5700	
450	H		1650	1650	1650		1650	1650	1900	
	A		400	650	1050		400	650	1050	
	B		1760	346	6400		2350	4600	6450	

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

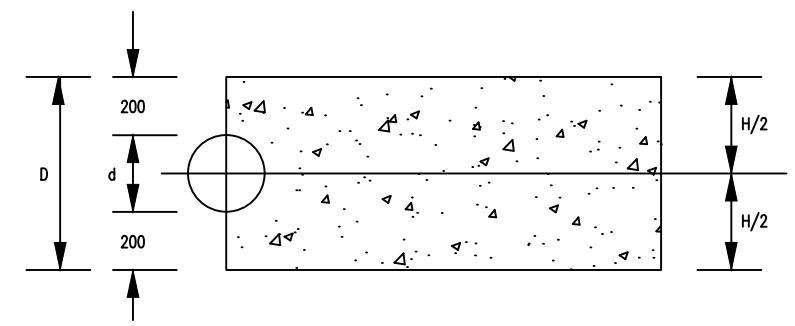
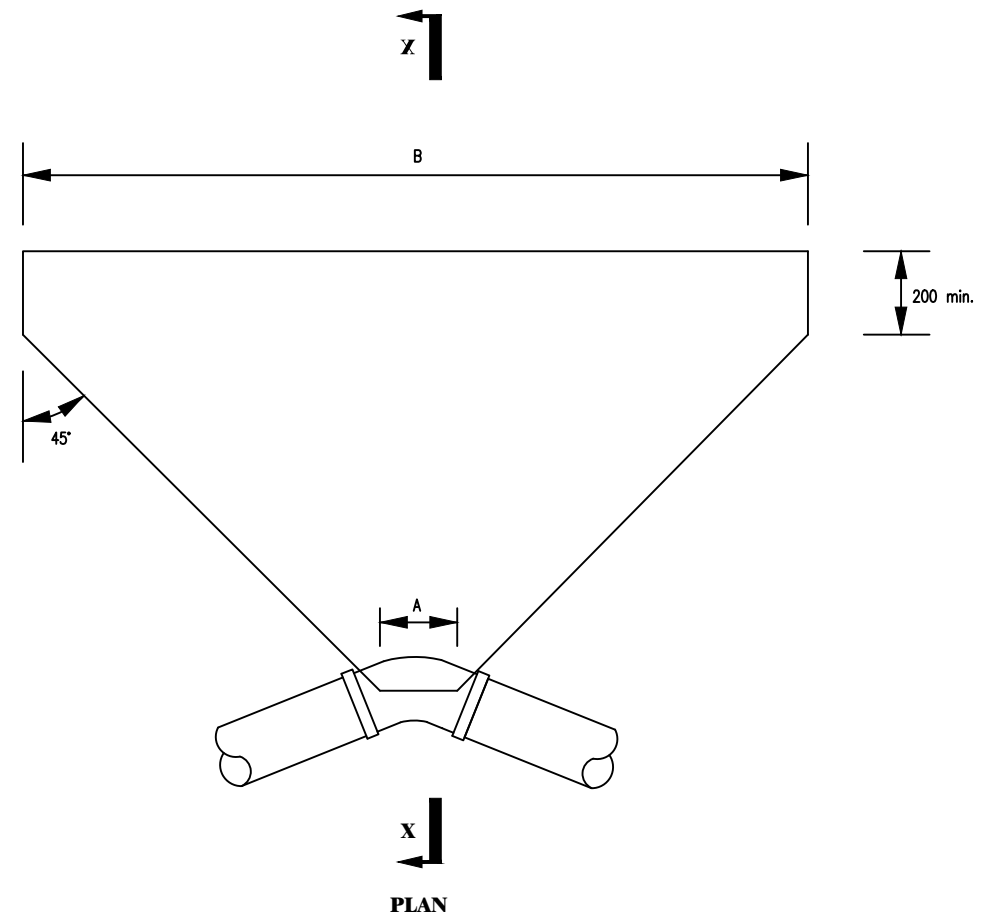
**NYAKABAAL WATER SUPPLY SYSTEM**

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

CONTRACTOR

DETAILED ENGINEERING DESIGN  
 DRAWING TITLE  
**ANCHOR BLOCKS FOR BENDS - 6**

SCALE As Shown DRAWING No. SD118G  
 SURVEYED DESIGNED Otwane 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°
		80	H	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		SEE SD118 I		2480		SEE SD118 I	
450	H	900							
	A	300							
	B	5000							

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

**NYAKABAALE WATER SUPPLY SYSTEM**

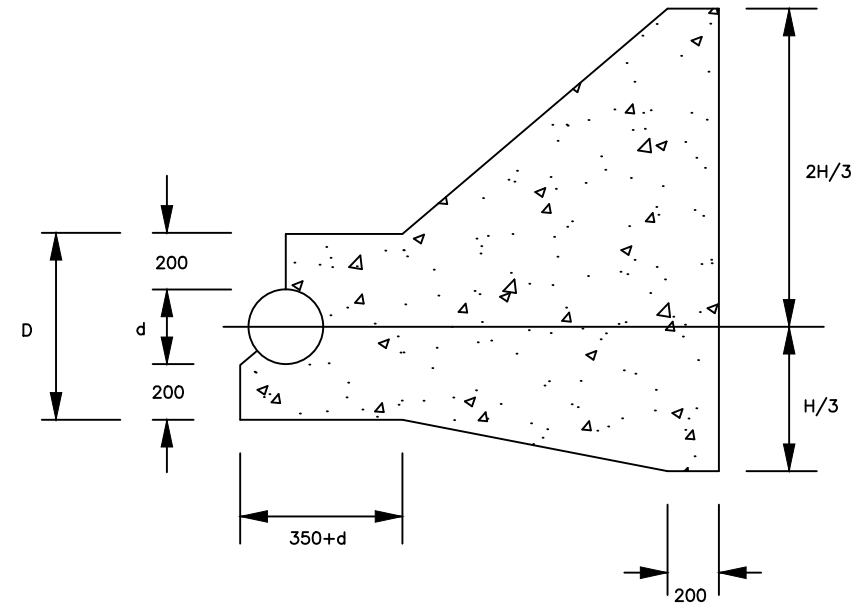
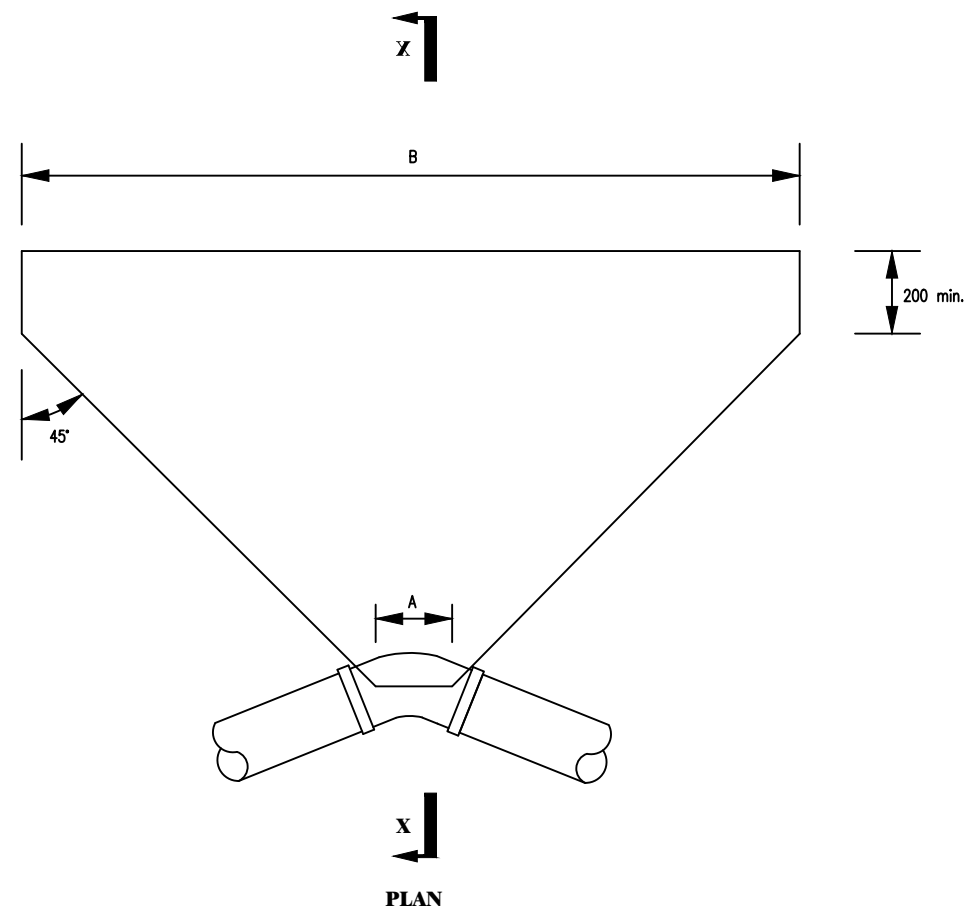
CONSULTANT  
 SARI  
 Corporate Headquarter  
 10 Philip Lane, 1st Floor,  
 London EC3M 8AA,  
 United Kingdom  
 In Joint Venture with  SGAPI

CONTRACTOR

DETAILED ENGINEERING DESIGN  
 DRAWING TITLE  
**ANCHOR BLOCKS FOR BENDS - 7**

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





SECTION X-X

Ground Condition		SUBMERGED							
Test Pressure		18				24			
Pipe Dia (mm)	Bend	11¼°	22½°	45°	90°	11¼°	22½°	45°	90°
		100 - 150	H A B	SEE SD 118D			1350 300 2000	SEE SD 118D	
200-300	H				1500				1500
	A B				350 500 3200	1500 250 2150	1500 350 4250	1500 500 7850	
350 - 400	H				1600				1600
	A B	1600 350 2500	1600 550 4850	1800 850 7100	1600 350 3300	1600 550 6500	2000 850 7650		
450	H				1650				1650
	A B	1650 400 2900	1650 650 5700	2000 1050 7200	1650 250 1950	1650 400 3900	1650 650 7600	2200 1050 7900	

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

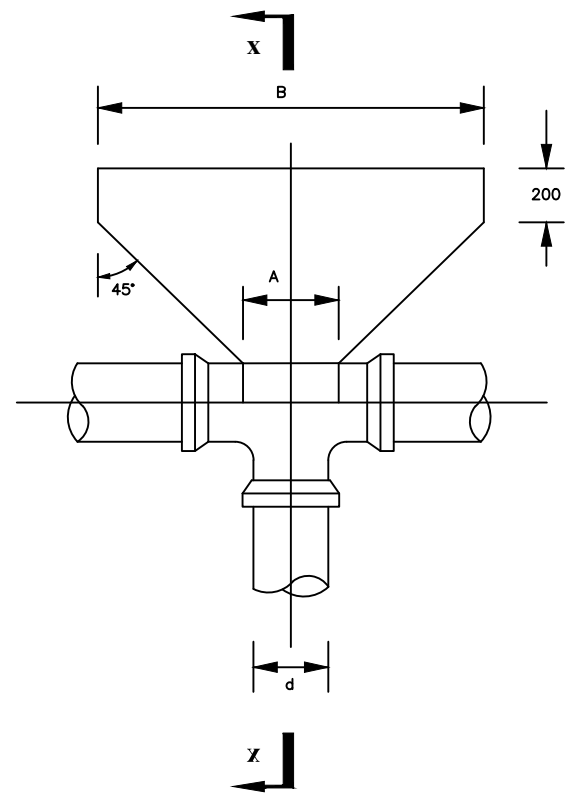
**NYAKABAAL WATER SUPPLY SYSTEM**

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

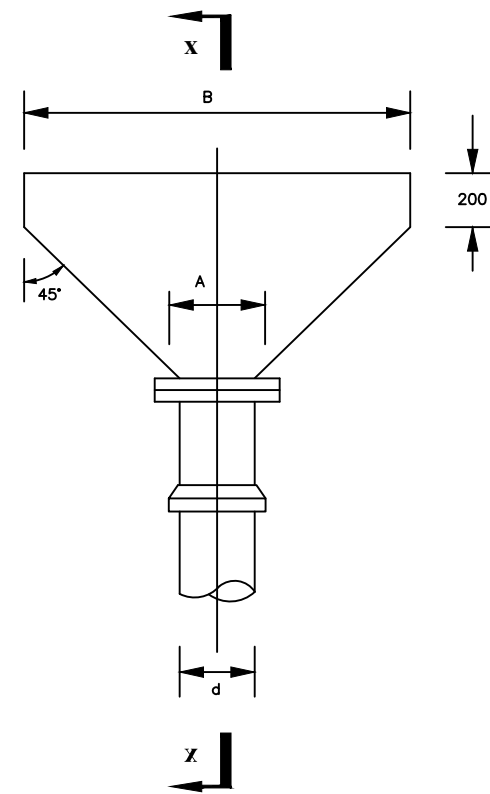
CONTRACTOR

DETAILED ENGINEERING DESIGN  
 DRAWING TITLE  
**ANCHOR BLOCKS FOR BENDS - 8**

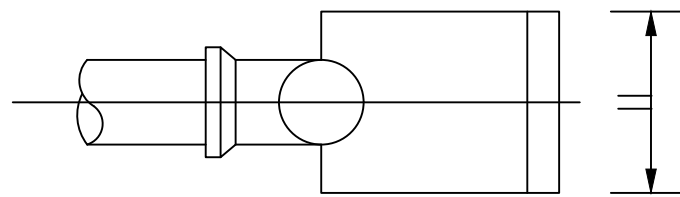
SCALE As Shown DRAWING No. SD1181  
 SURVEYED DESIGNED Otwane Dan.  
 DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare  
 DATE OCT 2021 APPROVED Rodney Barugahare.



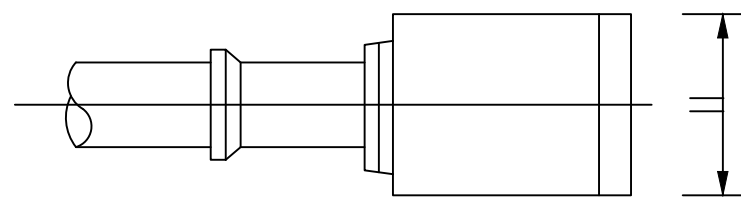
PLAN



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	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		SEE SD 118K					
	A							
	B							
450	H		SEE SD 118K					
	A							
	B							



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

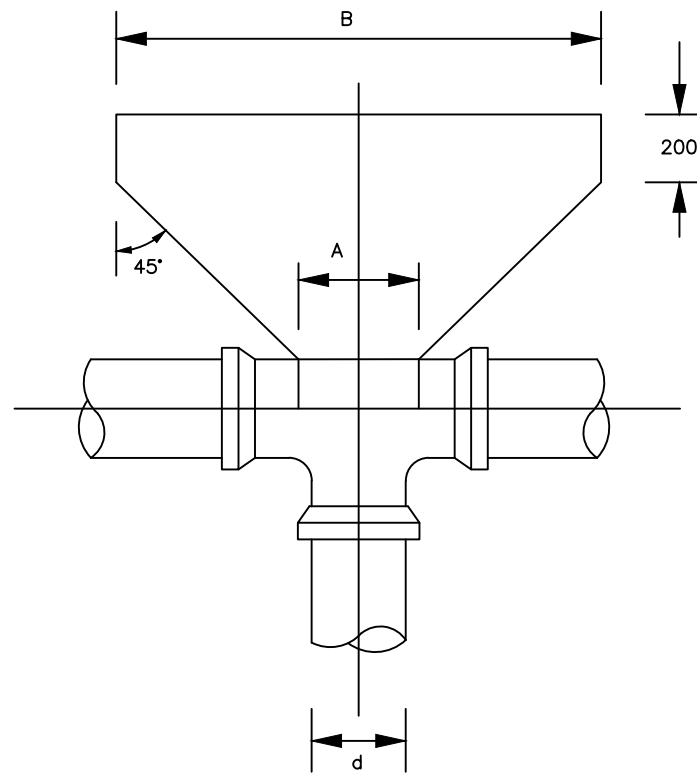
**NYAKABAAL WATER SUPPLY SYSTEM**

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

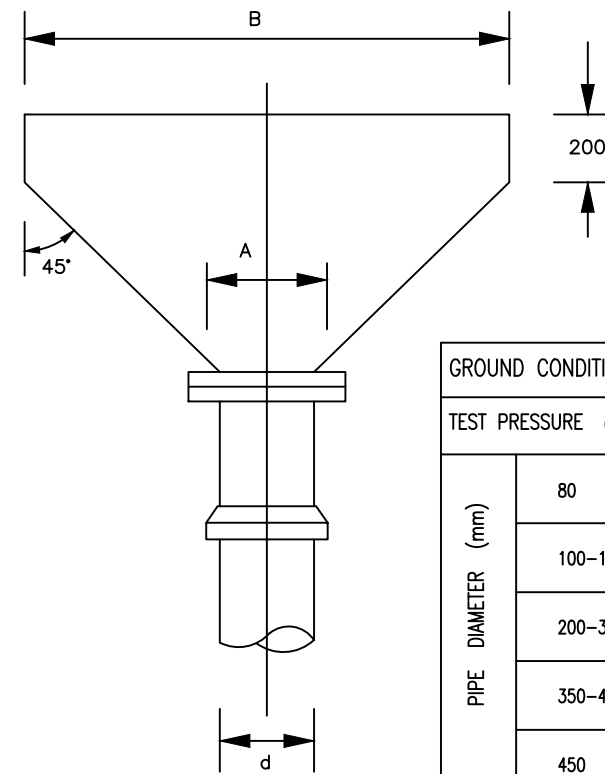
CONTRACTOR

**DETAILED ENGINEERING DESIGN**  
 DRAWING TITLE  
**ANCHOR BLOCKS FOR TEES AND DEAD ENDS - 1**

SCALE As Shown DRAWING No. SD118J  
 SURVEYED DESIGNED Otwane Dan.  
 DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare  
 DATE OCT 2021 APPROVED Rodney Barugahare.

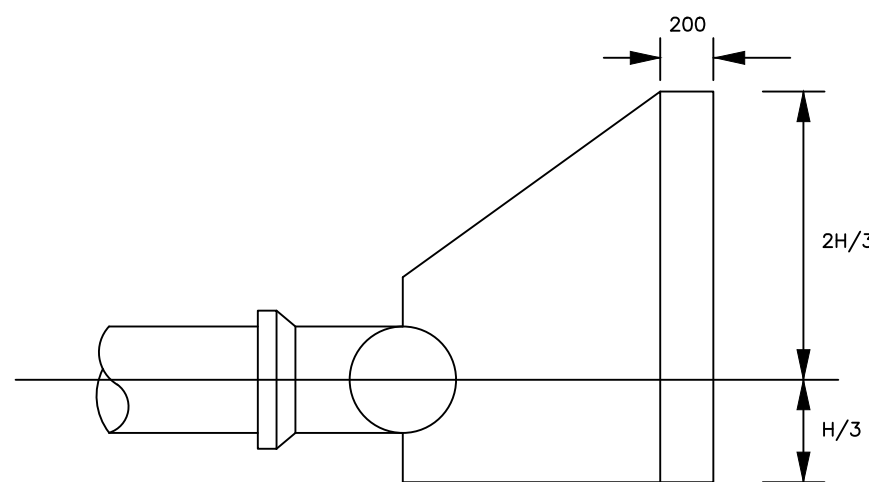


PLAN

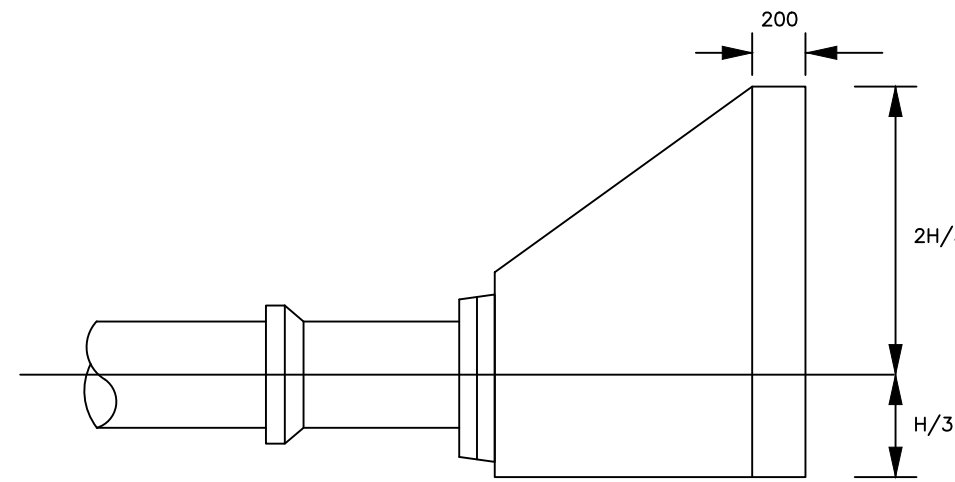


PLAN

GROUND CONDITION		DRY					
TEST PRESSURE (Bar)		12	15	18	24	30	36
PIPE DIAMETER (mm)	80	SEE SD 118E					
	100-150	1500 350 1100					
	200-300	1450 450 2200		1500 450 2450		1650 450 2800	
	350-400	1600 600 2550	1750 600 2700	1750 600 3250	1750 600 4300	1750 600 5000	1750 600 6000
	450	1750 750 2700	1800 750 3150	1800 750 3800	1800 750 5050	1800 750 6100	1800 750 7300



SECTION X-X



SECTION X-X

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

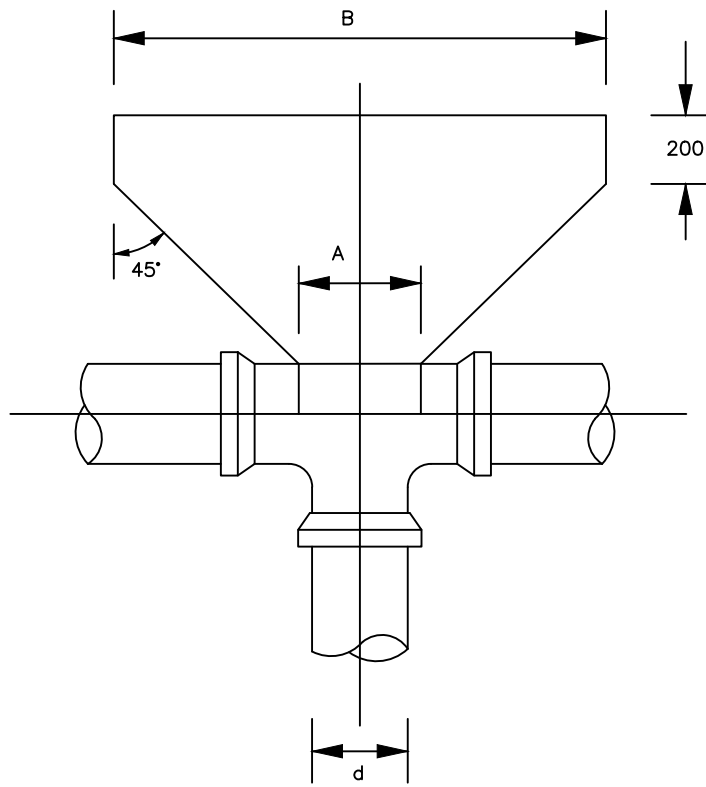
**NYAKABAALE WATER SUPPLY SYSTEM**

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

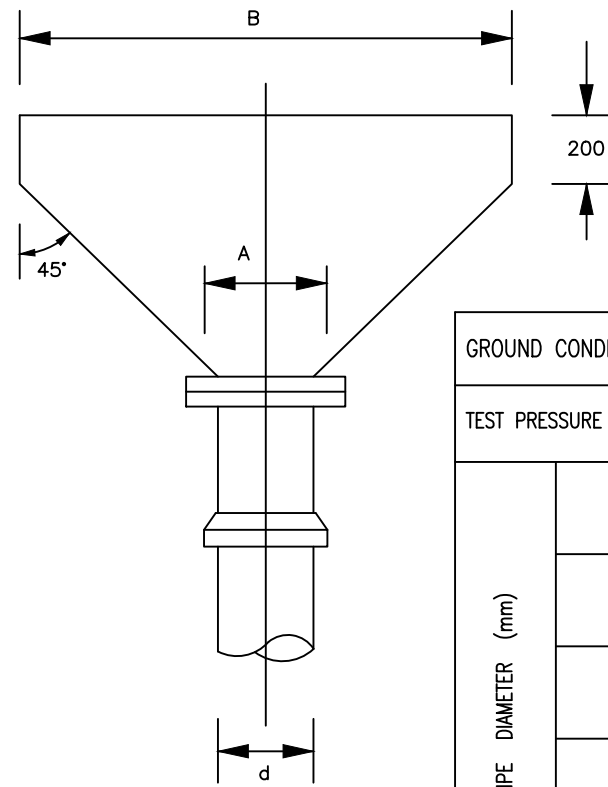
CONTRACTOR

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

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

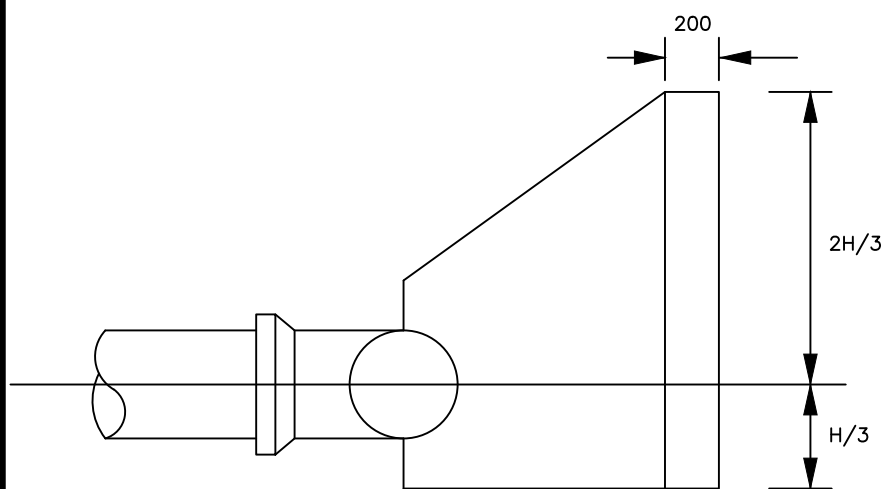


PLAN

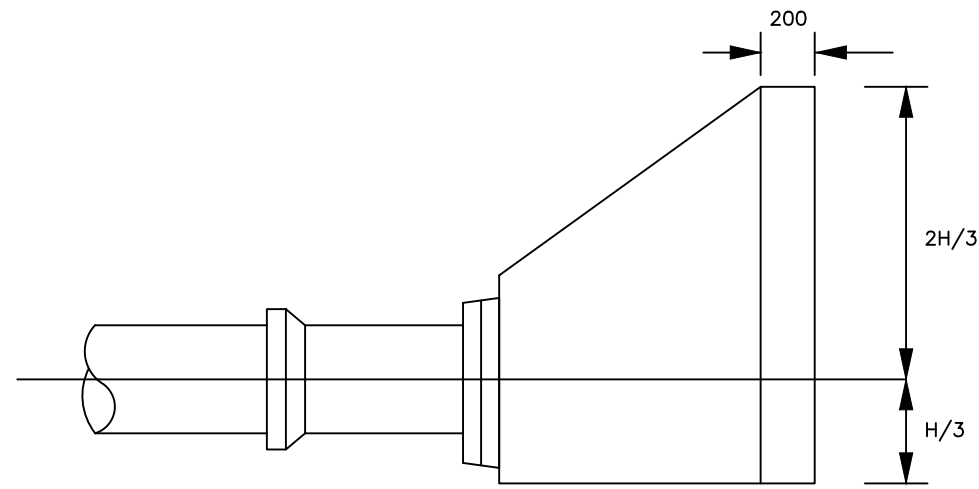


PLAN

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

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

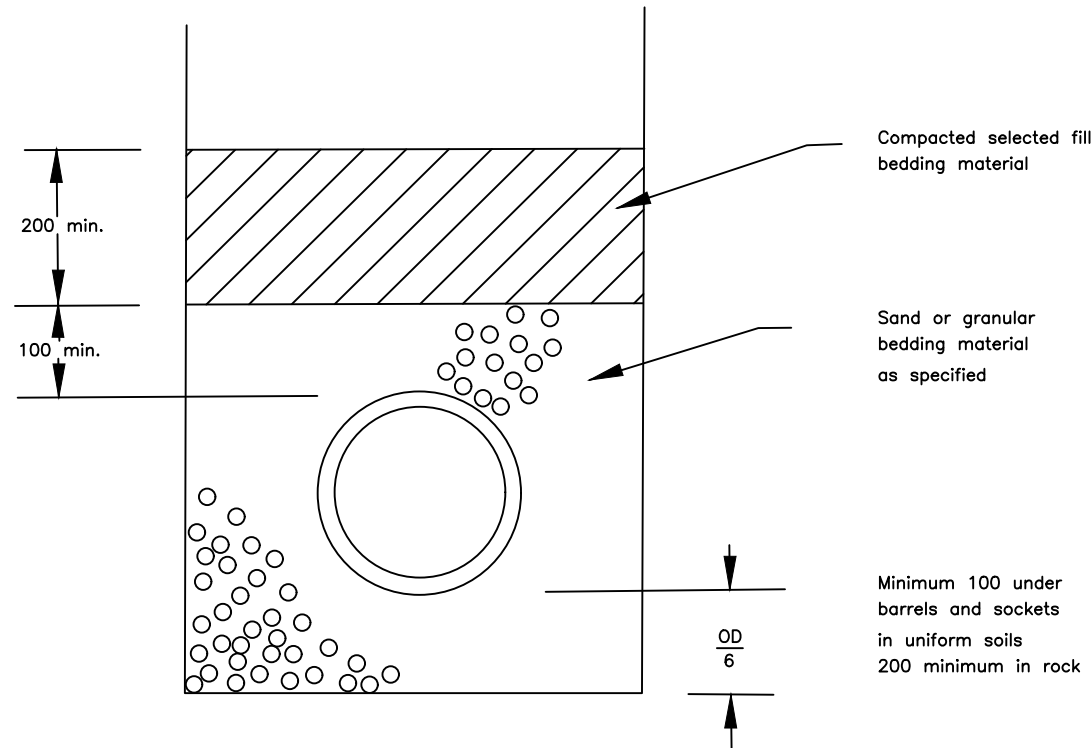
**NYAKABAALE WATER SUPPLY SYSTEM**

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

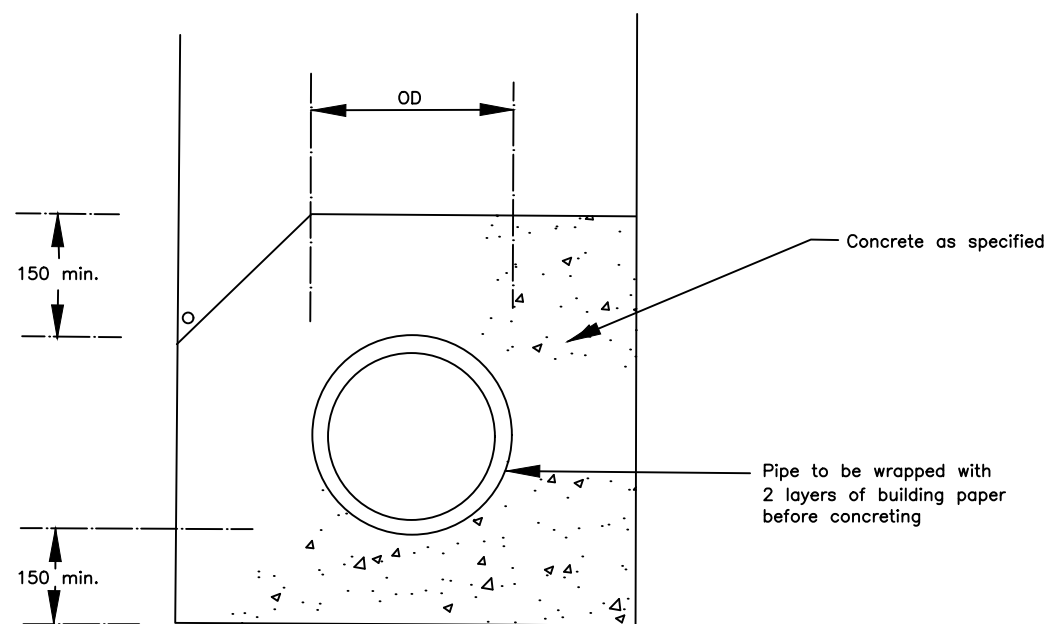
CONTRACTOR

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

SCALE As Shown DRAWING No. SD118L  
 SURVEYED DESIGNED Otwane 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

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

**NYAKABAALE WATER SUPPLY SYSTEM**

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

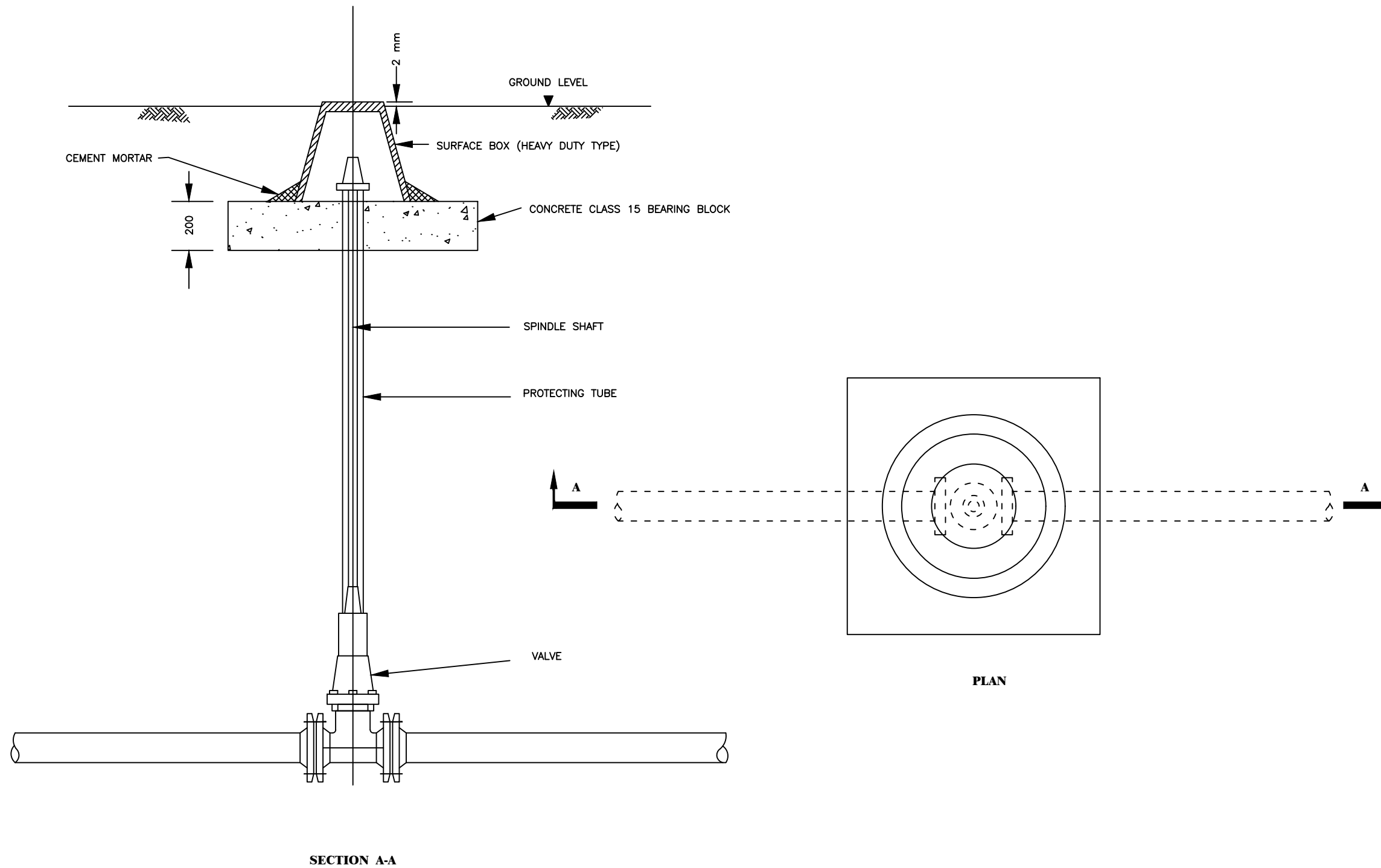
CONTRACTOR

**DETAILED ENGINEERING DESIGN**

DRAWING TITLE  
**PIPE BEDDING**

SCALE	As Shown	DRAWING No.	SD121
SURVEYED		DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.

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



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

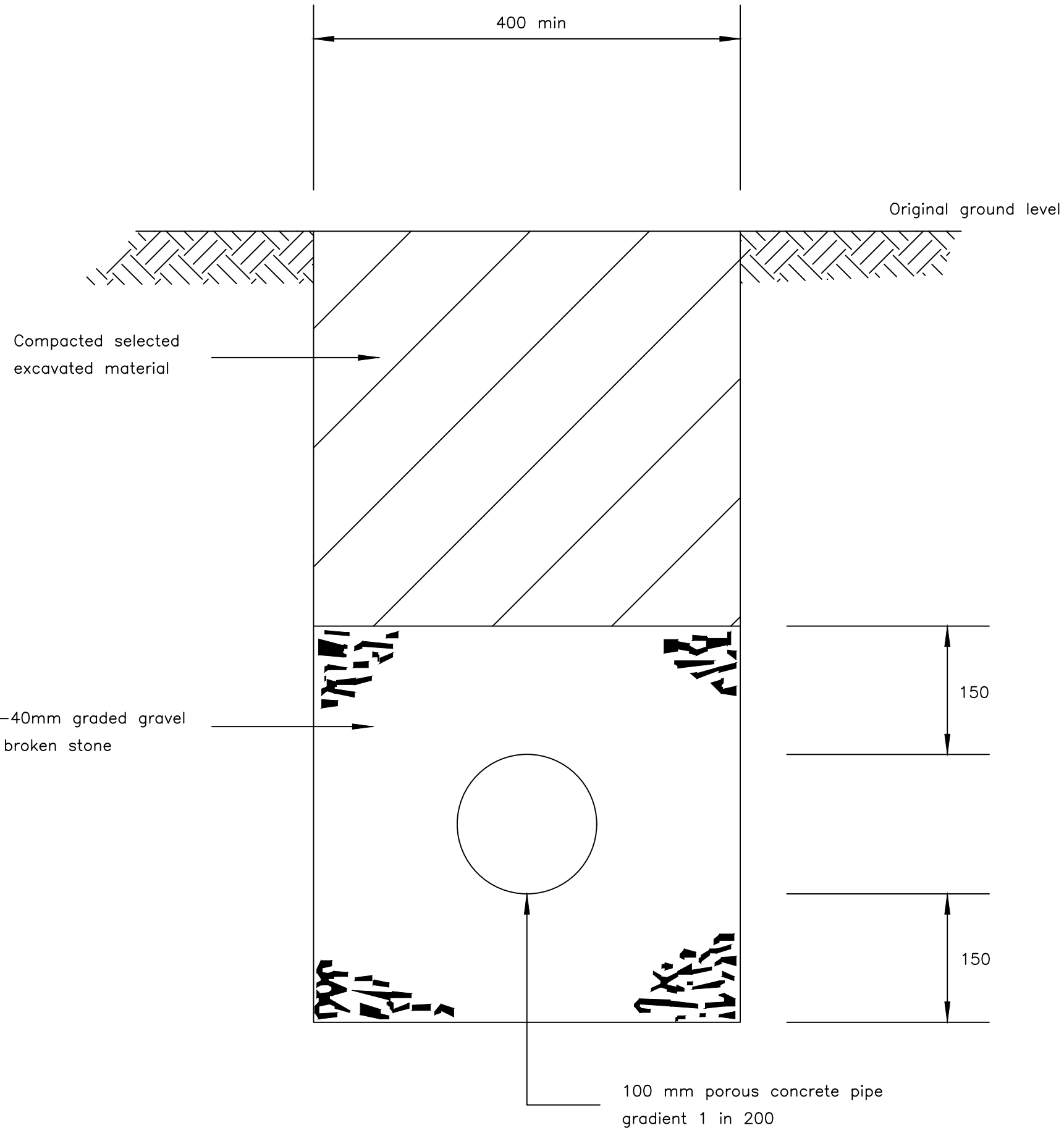
**NYAKABAALE WATER SUPPLY SYSTEM**

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  
**SURFACE BOX AND FIELD DRAIN**

SCALE	As Shown	DRAWING No.	SD122
SURVEYED		DESIGNED	Otwane 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.

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

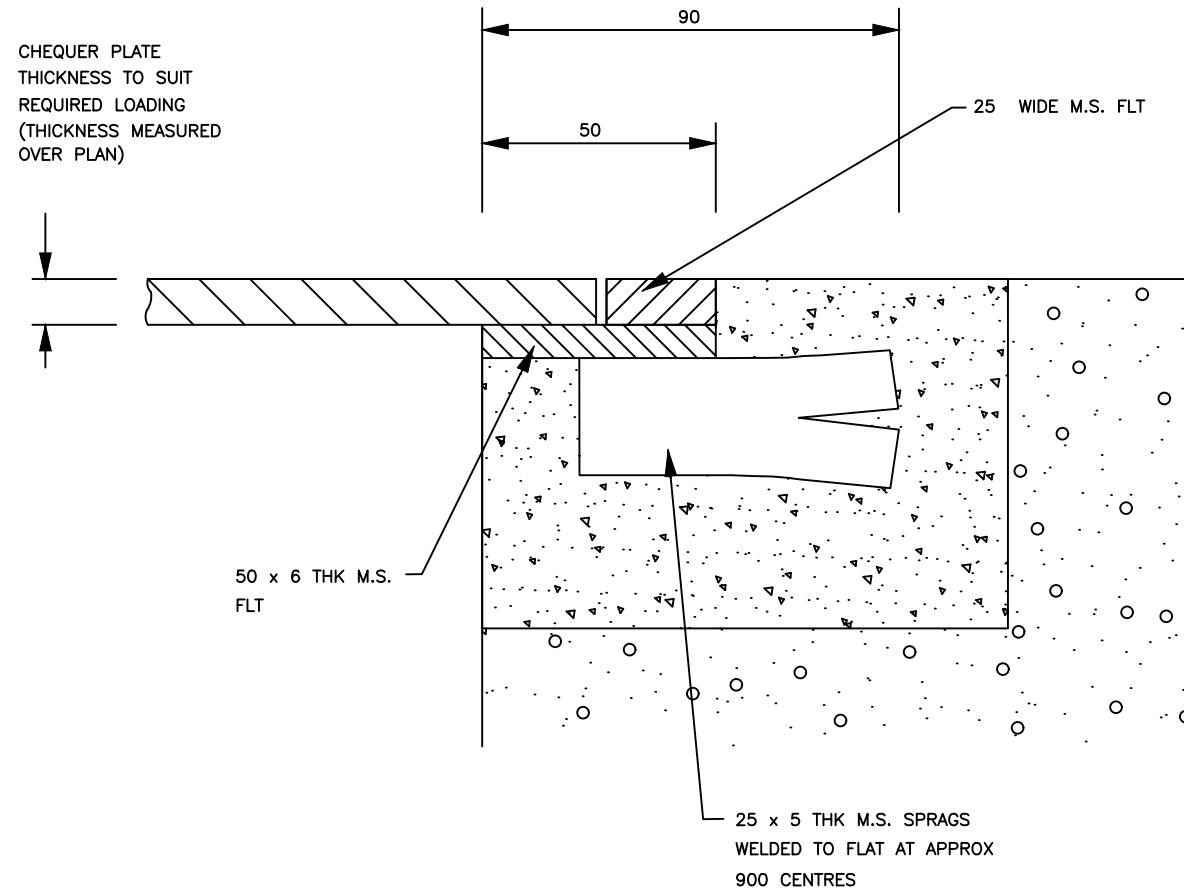
**NYAKABAALE WATER SUPPLY SYSTEM**

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

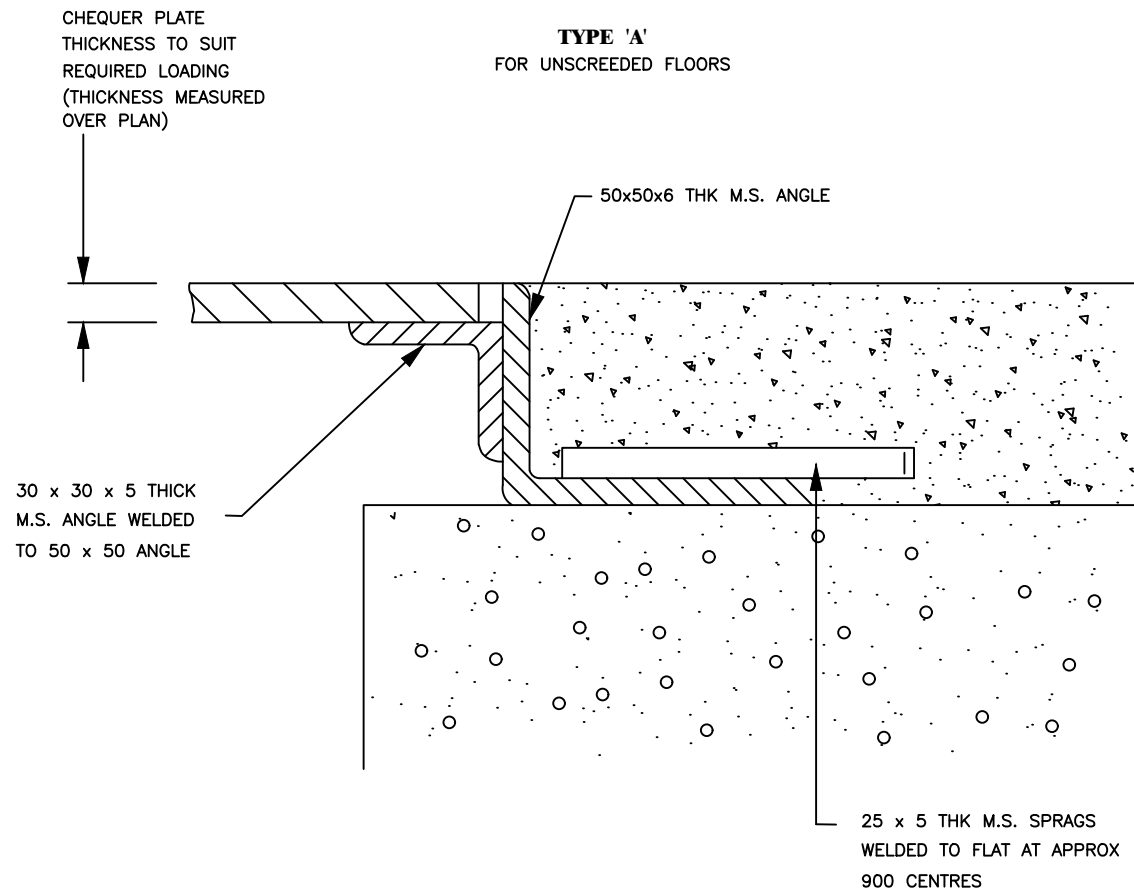
CONTRACTOR

**DETAILED ENGINEERING DESIGN**  
 DRAWING TITLE  
**FIELD DRAIN**

SCALE	As Shown	DRAWING No.	SD124
SURVEYED		DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



**TYPE 'A'**  
FOR UNSCREENED FLOORS



**TYPE 'B'**  
FOR UNSCREENED FLOORS

**NOTE**  
CONSTRUCT TO SUIT THICKNESS OF FLOOR PLATES AND SCREED SPECIFIED

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

**NYAKABAAL WATER SUPPLY SYSTEM**

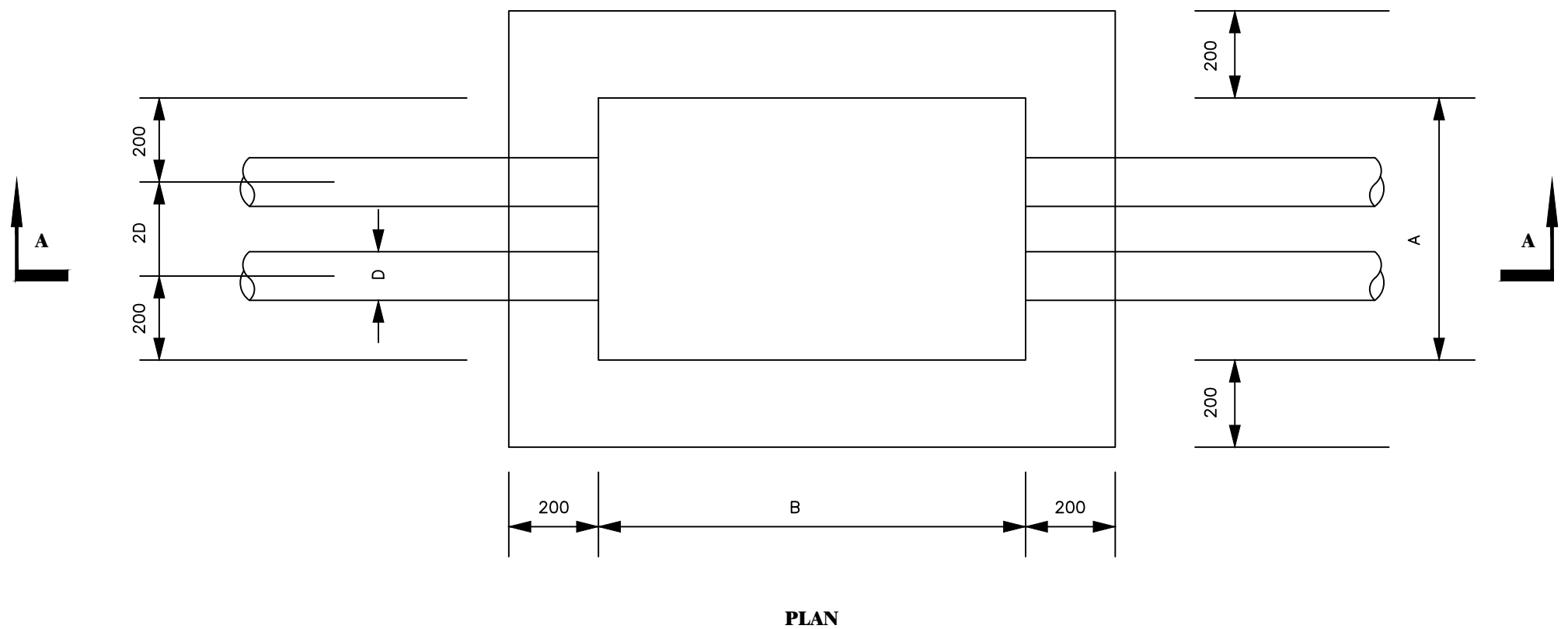
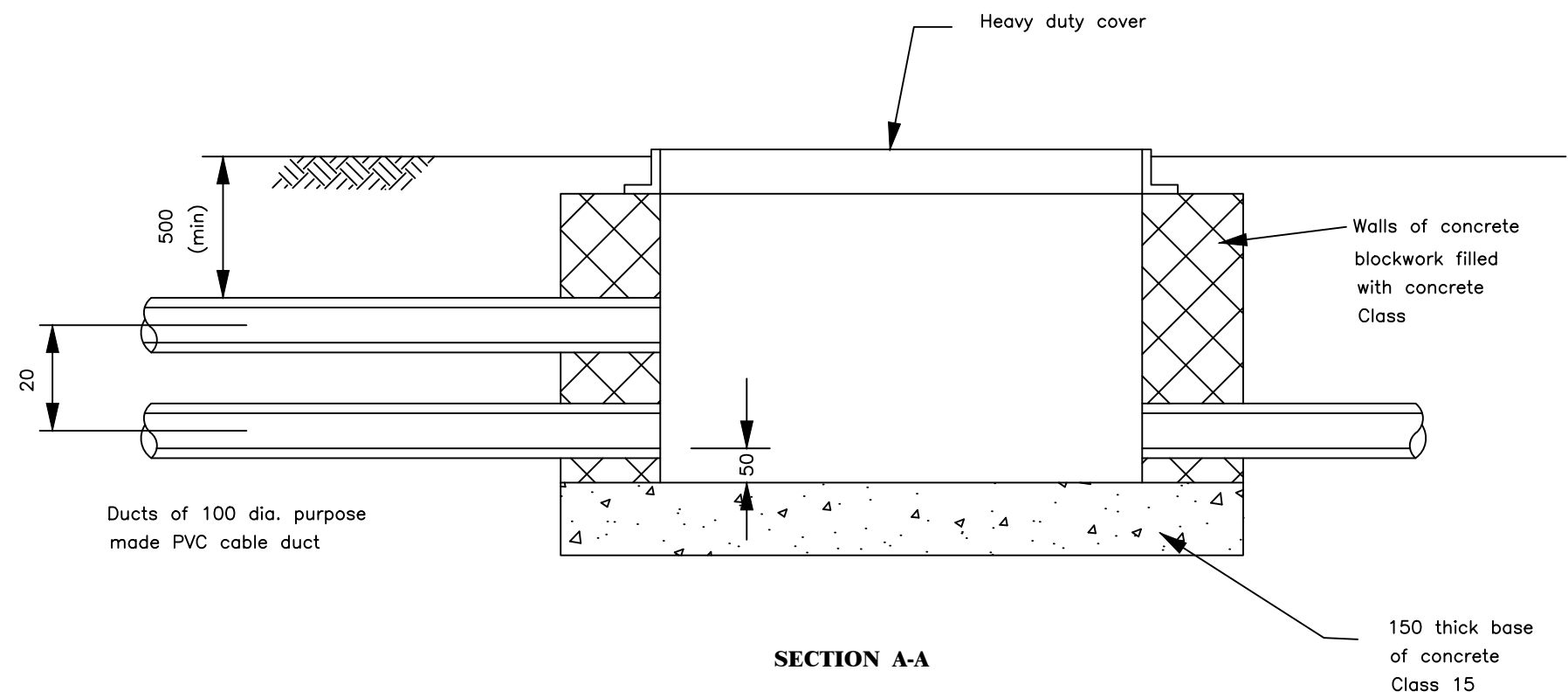
CONSULTANT  
 In Joint Venture with   
 Corporate Headquarter  
 10 Philip Lane, 1st Floor,  
 London EC3M 8AA,  
 United Kingdom

CONTRACTOR

**DETAILED ENGINEERING DESIGN**  
 DRAWING TITLE  
**DUCT COVERS**

SCALE	As Shown	DRAWING No.	SD126
SURVEYED		DESIGNED	Otwane 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

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**

**NYAKABAALE WATER SUPPLY SYSTEM**

CONSULTANT

**SARI**  
In Joint Venture with

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

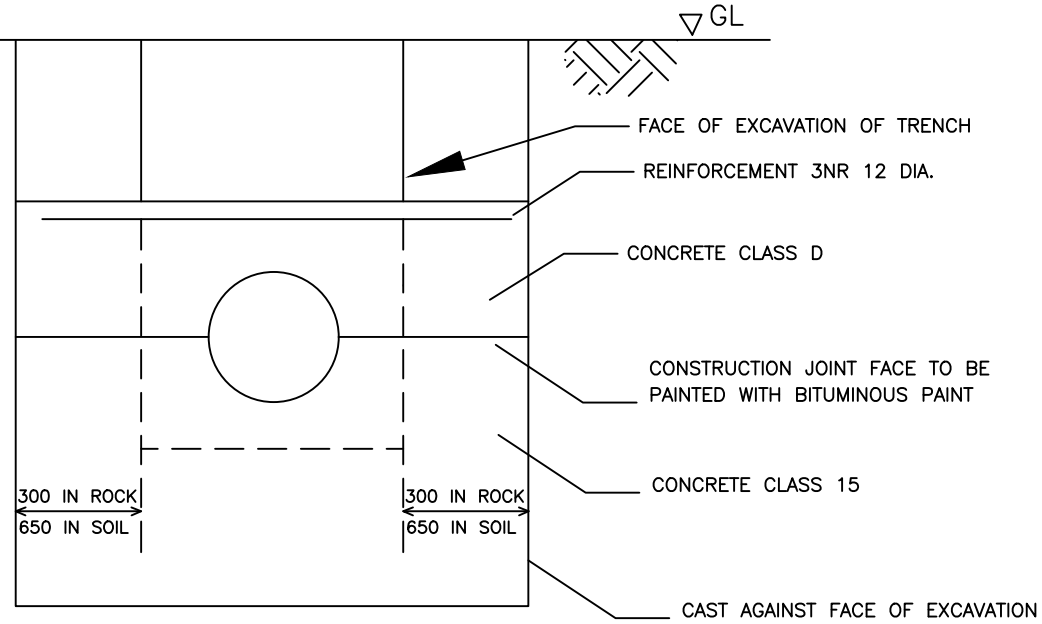
CONTRACTOR

**DETAILED ENGINEERING DESIGN**

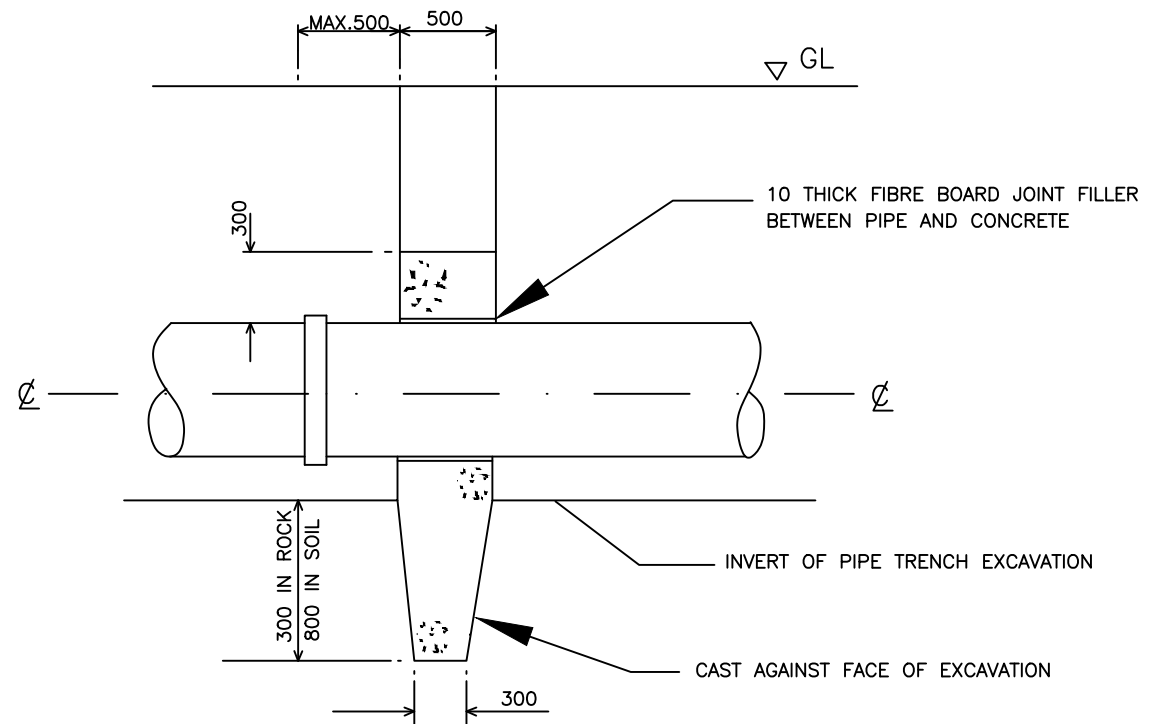
DRAWING TITLE

**DRAW PITS**

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



TRANSVERSE SECTION



LONGITUDINAL SECTION

CLIENT  

**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

**NYAKABAAL WATER SUPPLY SYSTEM**

CONSULTANT  

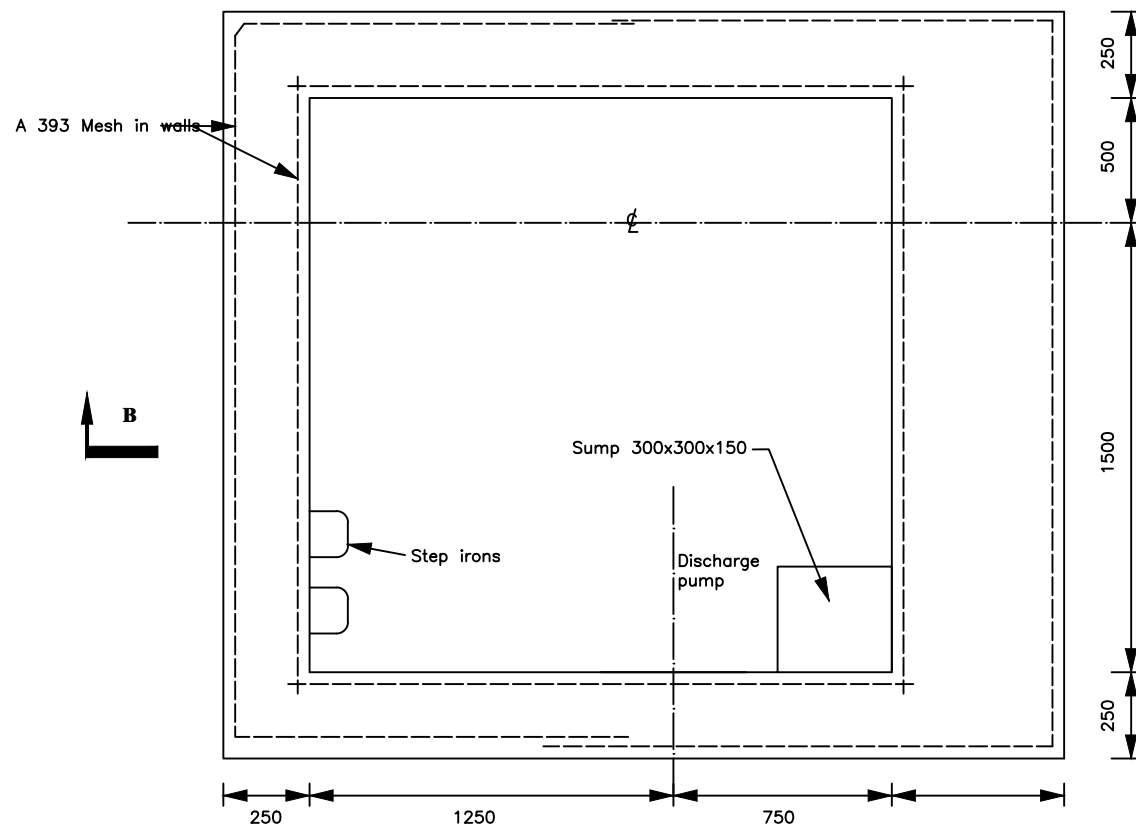
 In Joint Venture with  
  
 Corporate Headquarter  
 10 Philip Lane, 1st Floor,  
 London EC3M 8AA,  
 United Kingdom

CONTRACTOR

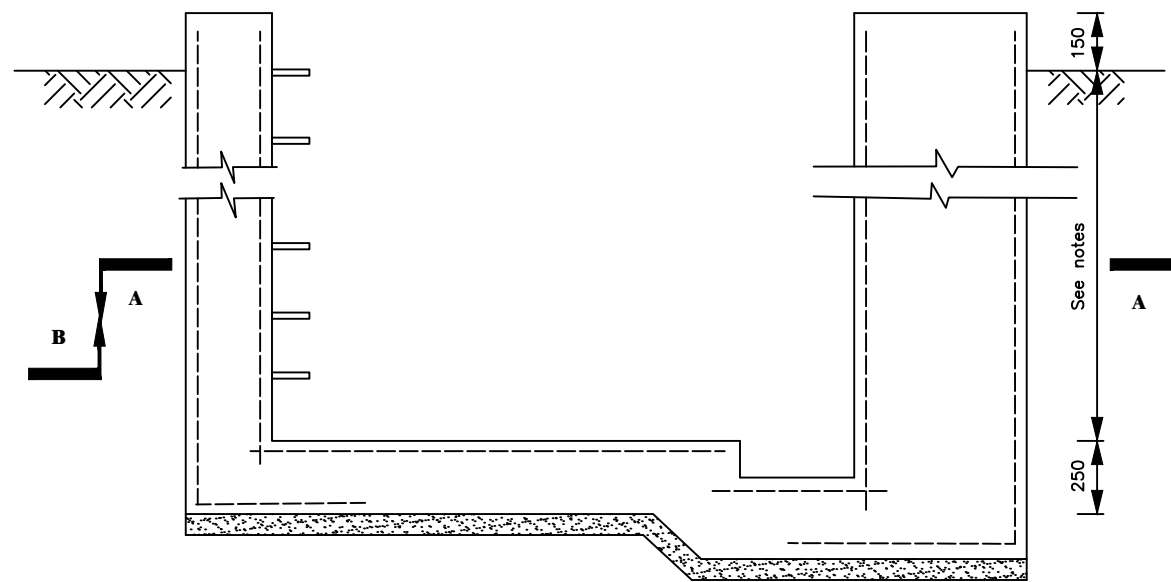
**DETAILED ENGINEERING DESIGN**

DRAWING TITLE  
**TRENCH CUT OFF**

SCALE	As Shown	DRAWING No.	SD132
SURVEYED		DESIGNED	Otwane 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. Fore details of cover slab see Drawing SD 135C
3. See General notes.
4. Use SD 135b if additional thrust block is required

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

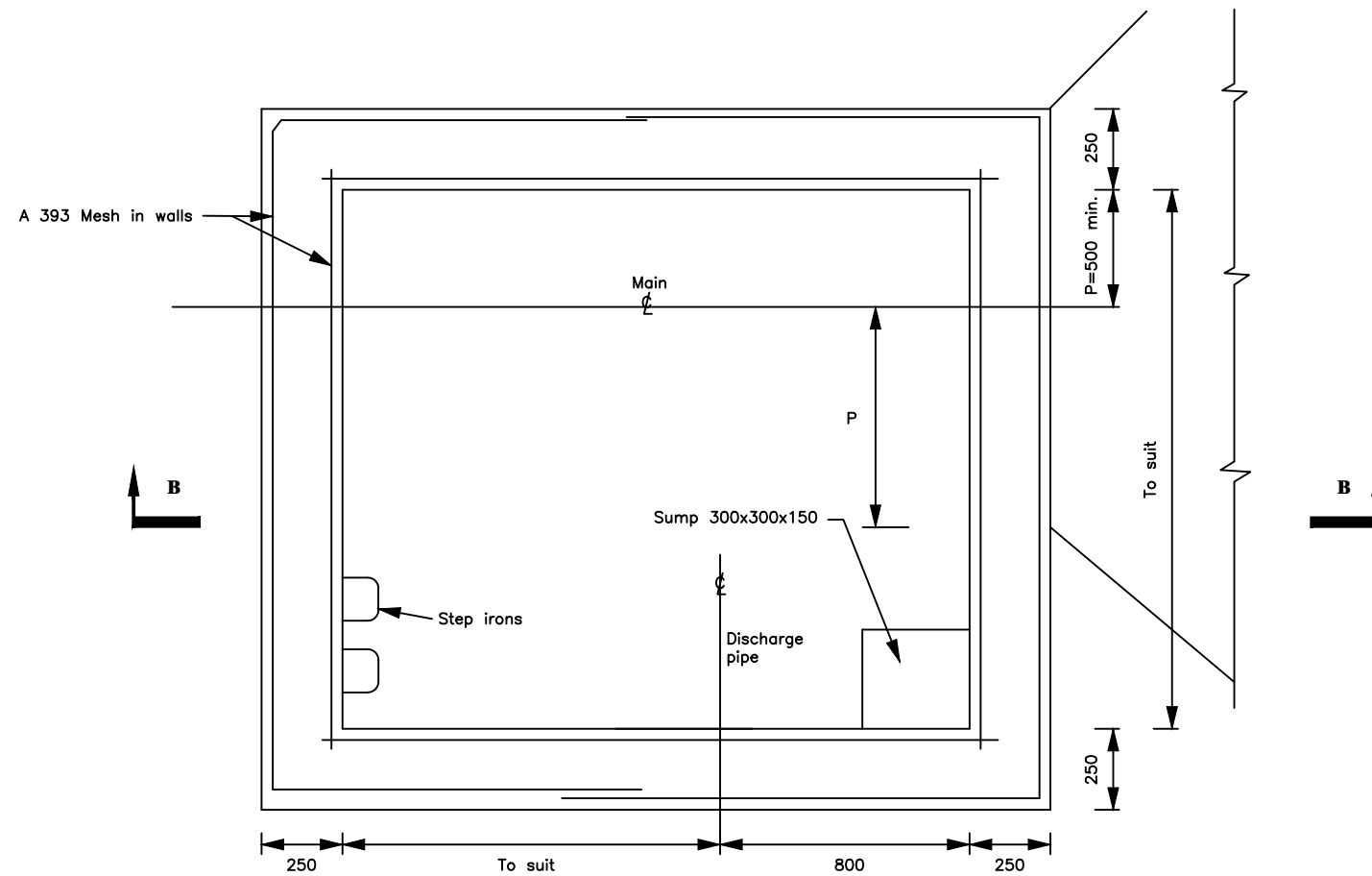
**NYAKABAAL WATER SUPPLY SYSTEM**

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

CONTRACTOR

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

SCALE	As Shown	DRAWING No.	SD135A
SURVEYED		DESIGNED	Otwane 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. Fore details of cover slab see Drawing SD 135C
3. See General notes.

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

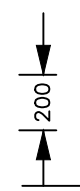
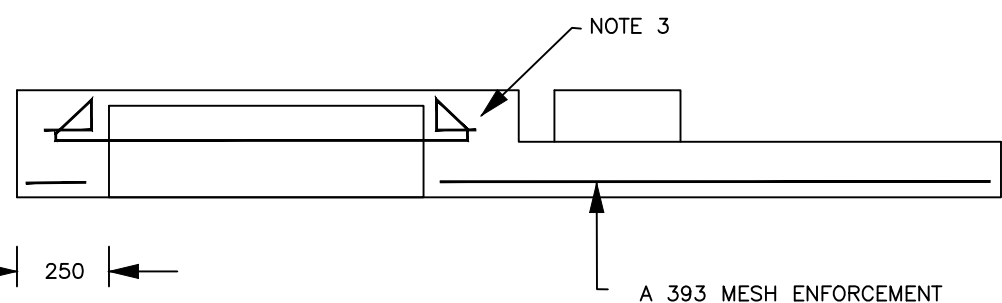
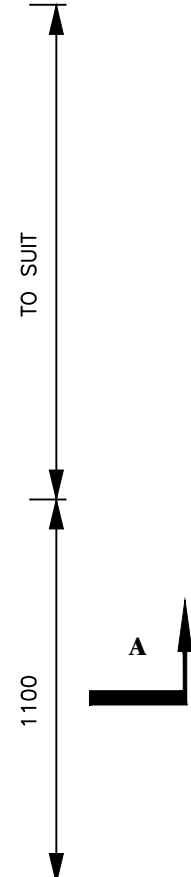
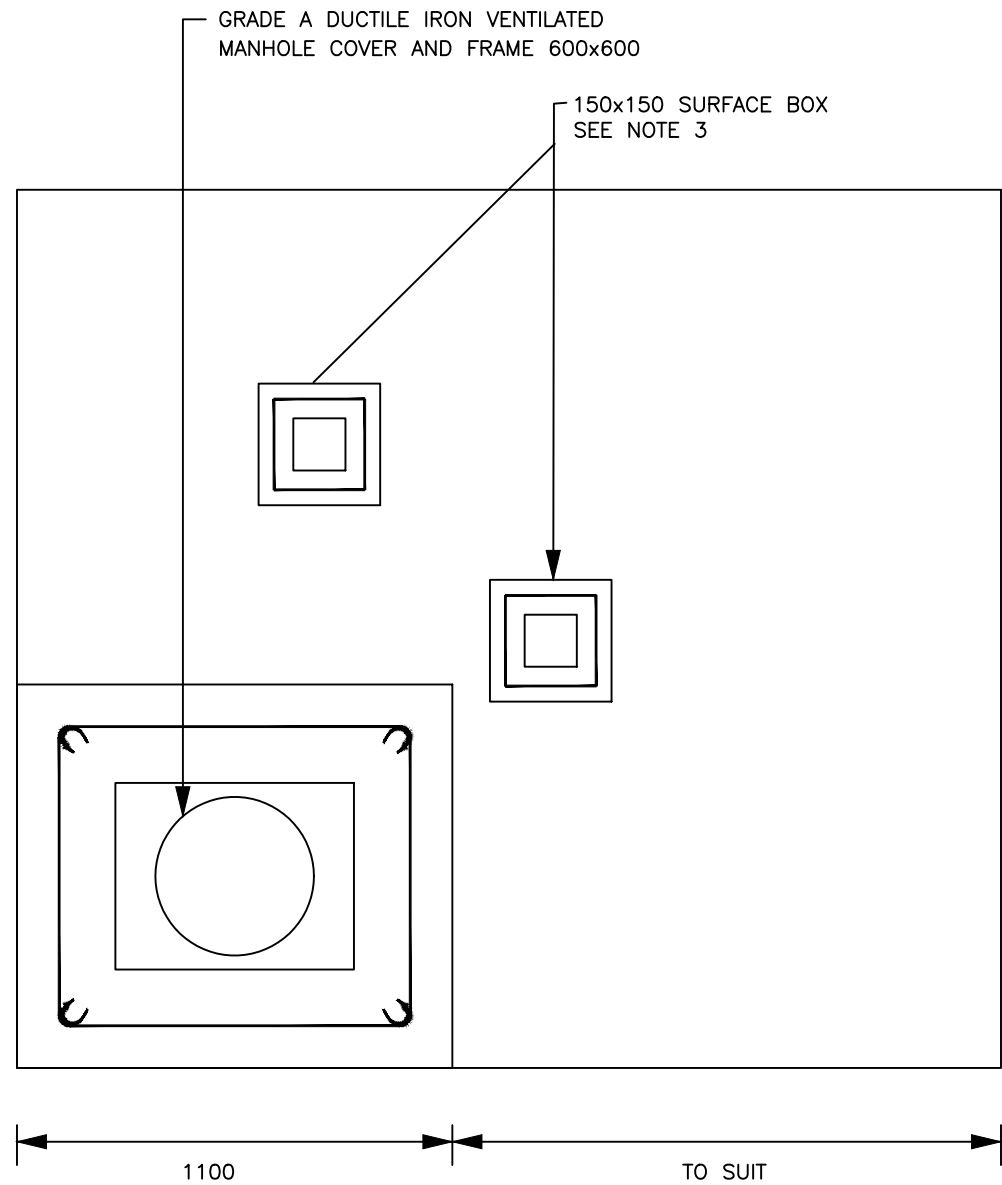
**NYAKABAAL WATER SUPPLY SYSTEM**

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

CONTRACTOR

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

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



**PLAN**


**SECTION A-A**

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

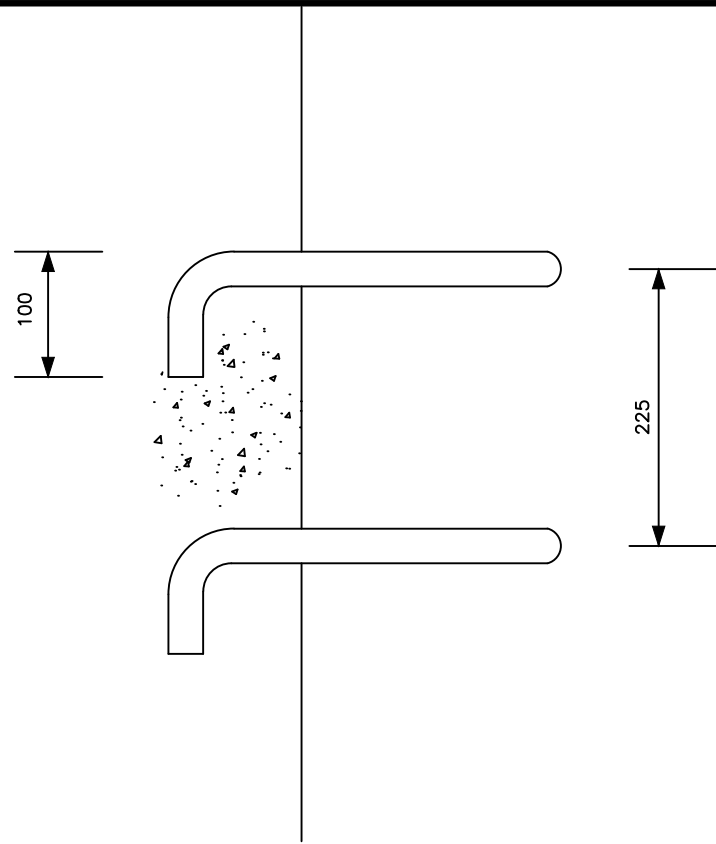
**NYAKABAAL WATER SUPPLY SYSTEM**

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

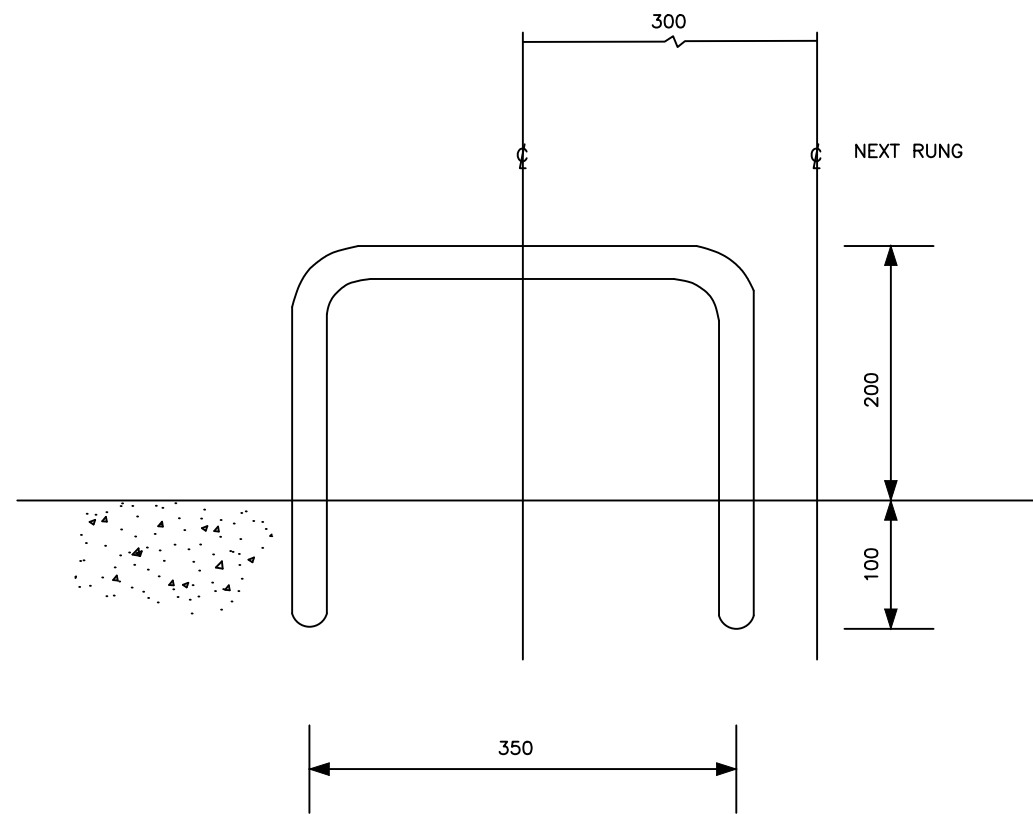
CONTRACTOR

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

SCALE	As Shown	DRAWING No.	SD135C
SURVEYED		DESIGNED	Otwane 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

**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

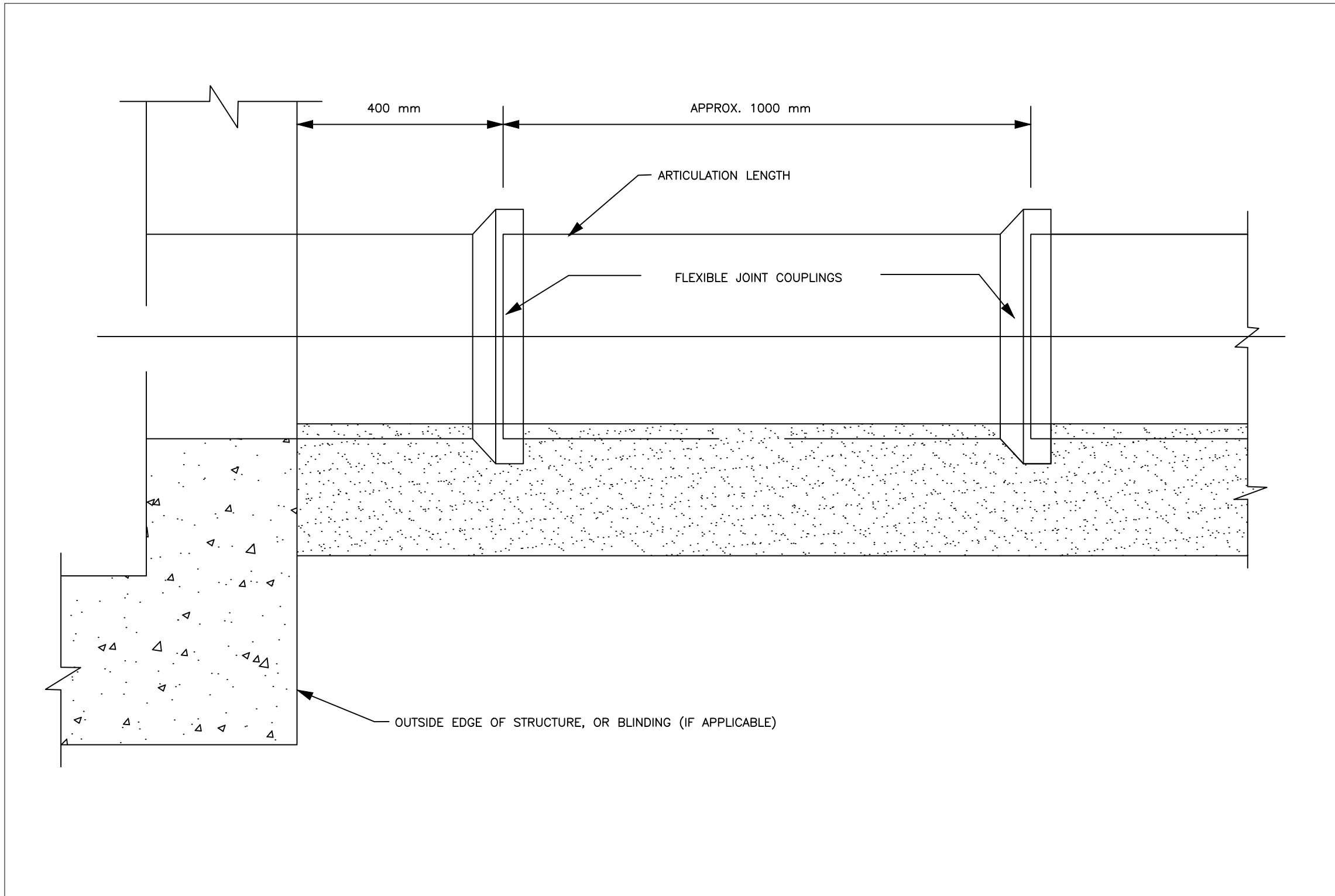
**NYAKABAAL WATER SUPPLY SYSTEM**

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

**CONTRACTOR**

**DETAILED ENGINEERING DESIGN**  
**DRAWING TITLE**  
**STEP IRON DETAIL**

<b>SCALE</b>	As Shown	<b>DRAWING No.</b>	SD136
<b>SURVEYED</b>		<b>DESIGNED</b>	Otwane Dan.
<b>DRAWN</b>	Joshua Nyarwanda	<b>CHECKED</b>	Rodney Barugahare
<b>DATE</b>	OCT 2021	<b>APPROVED</b>	Rodney Barugahare.





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

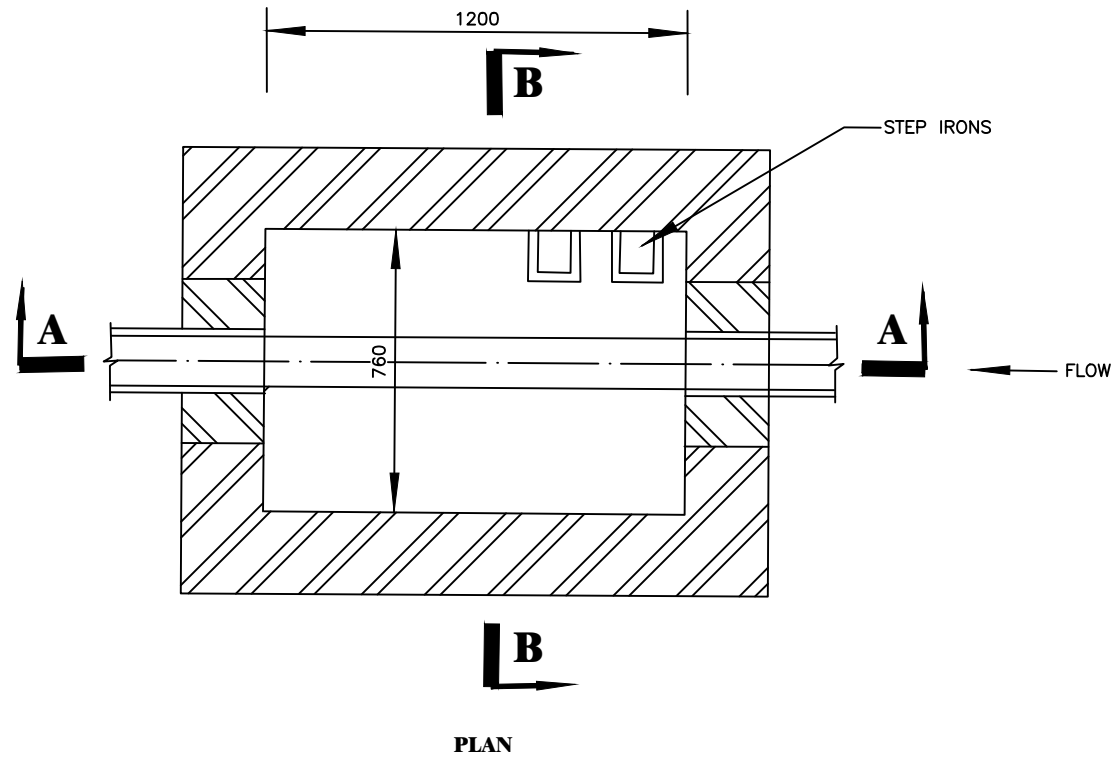
**NYAKABAAL WATER SUPPLY SYSTEM**

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

CONTRACTOR

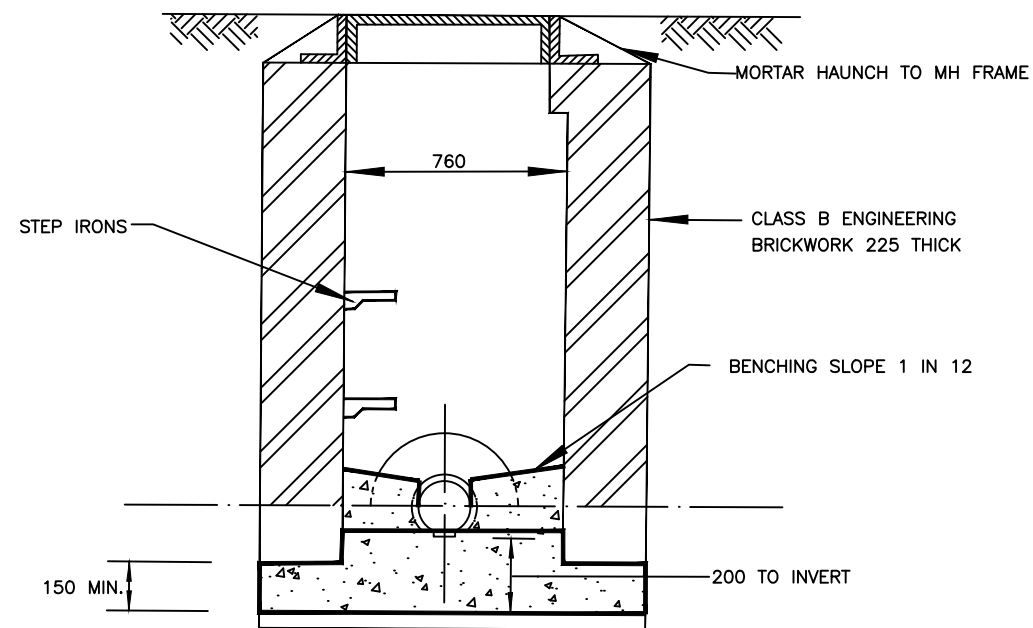
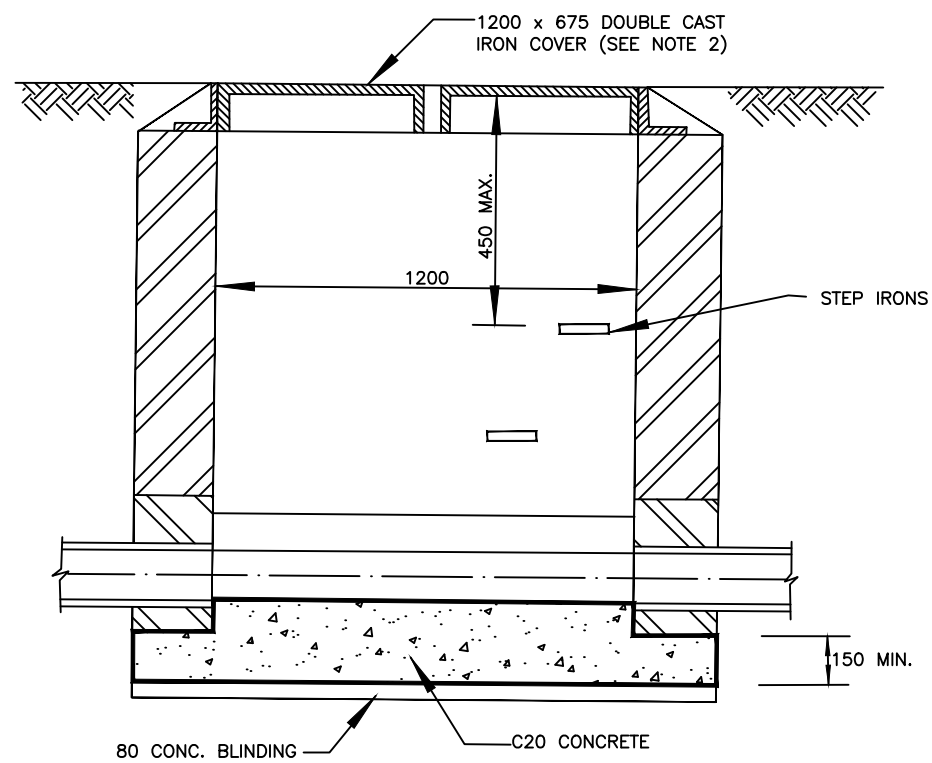
**DETAILED ENGINEERING DESIGN**  
 DRAWING TITLE **FLEXIBLE PIPE JOINT DETAILS FOR PIPES ENTERING OR LEAVING CONCRETE STRUCTURES**

SCALE	As Shown	DRAWING No.	SD137
SURVEYED		DESIGNED	Otwane 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 FIT 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 DOWN STREAM 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 CRIBBLED DOWN TO 675.
6. ALL DIMENSIONS ARE IN MILLIMETRES.



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

**NYAKABAAL WATER SUPPLY SYSTEM**

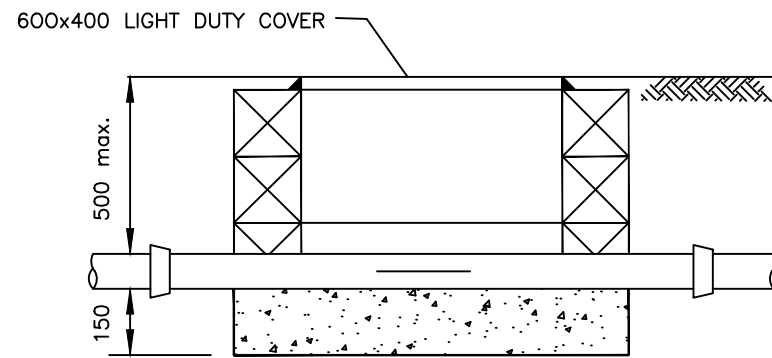
CONSULTANT  
 In Joint Venture with   
 Corporate Headquarter  
 10 Philip Lane, 1st Floor,  
 London EC3M 8AA,  
 United Kingdom

CONTRACTOR

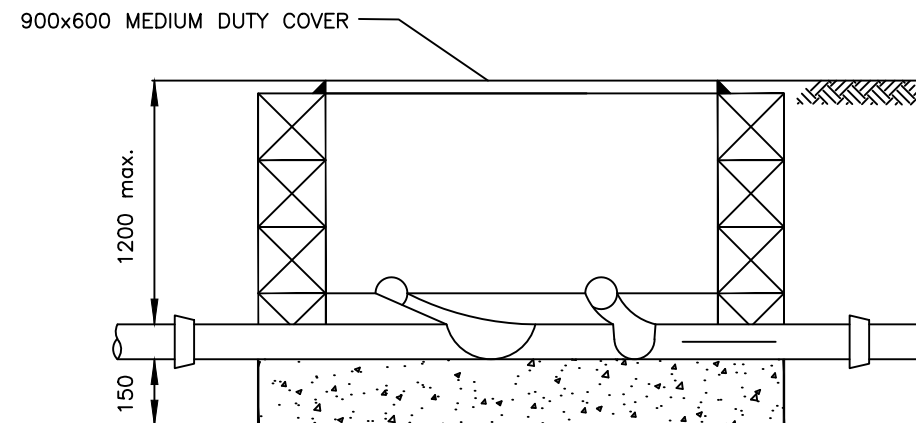
**DETAILED ENGINEERING DESIGN**  
 DRAWING TITLE  
**MANHOLE - TYPE C**

SCALE	As Shown	DRAWING No.	SD202
SURVEYED		DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.

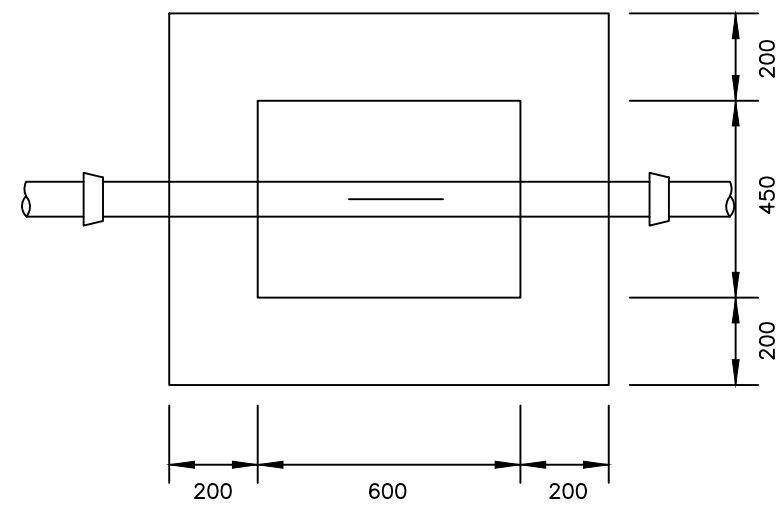




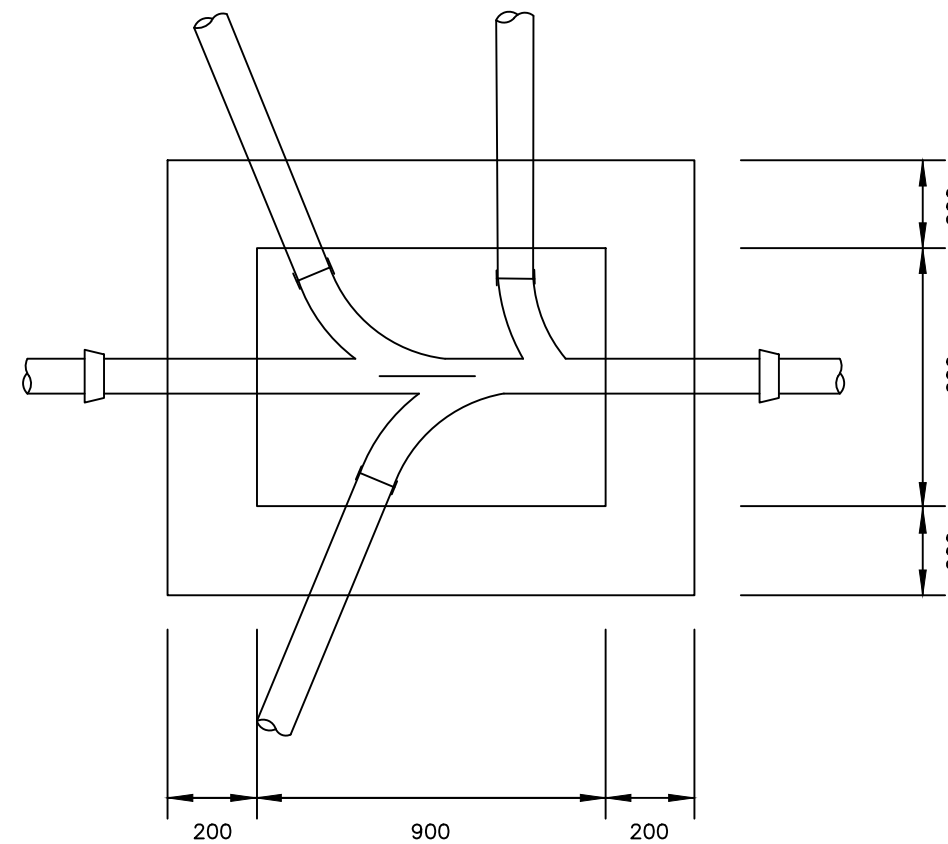
**SECTION (TYPE 1)**



**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.

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

**NYAKABAAL WATER SUPPLY SYSTEM**

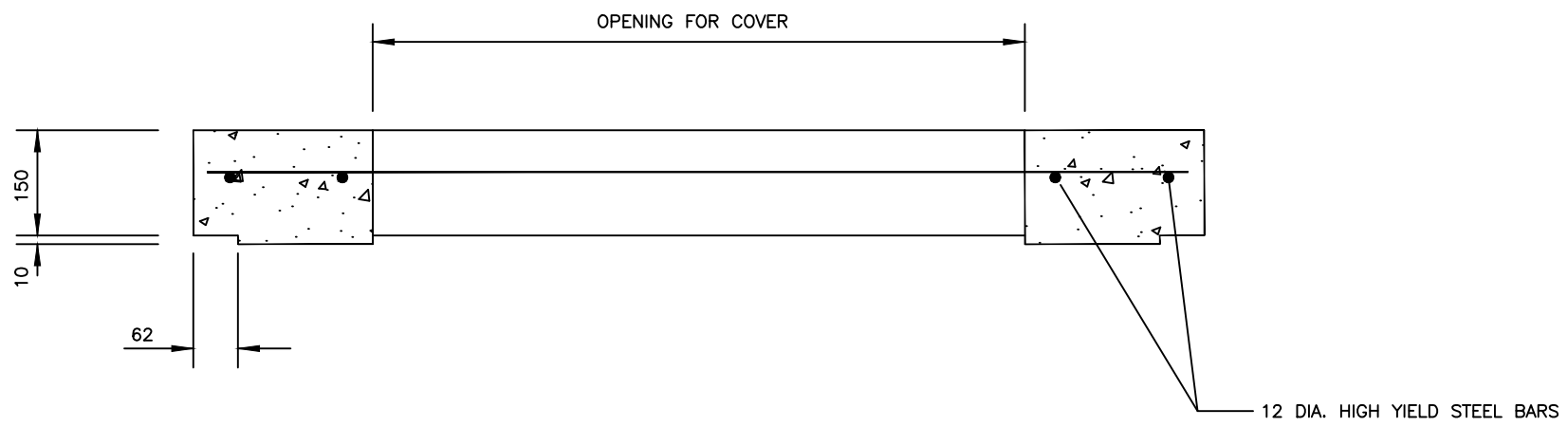
CONSULTANT  
 **SARI** In Joint Venture with  **SGAPI**  
 Corporate Headquarter  
 10 Philip Lane, 1st Floor,  
 London EC3M 8AA,  
 United Kingdom

CONTRACTOR

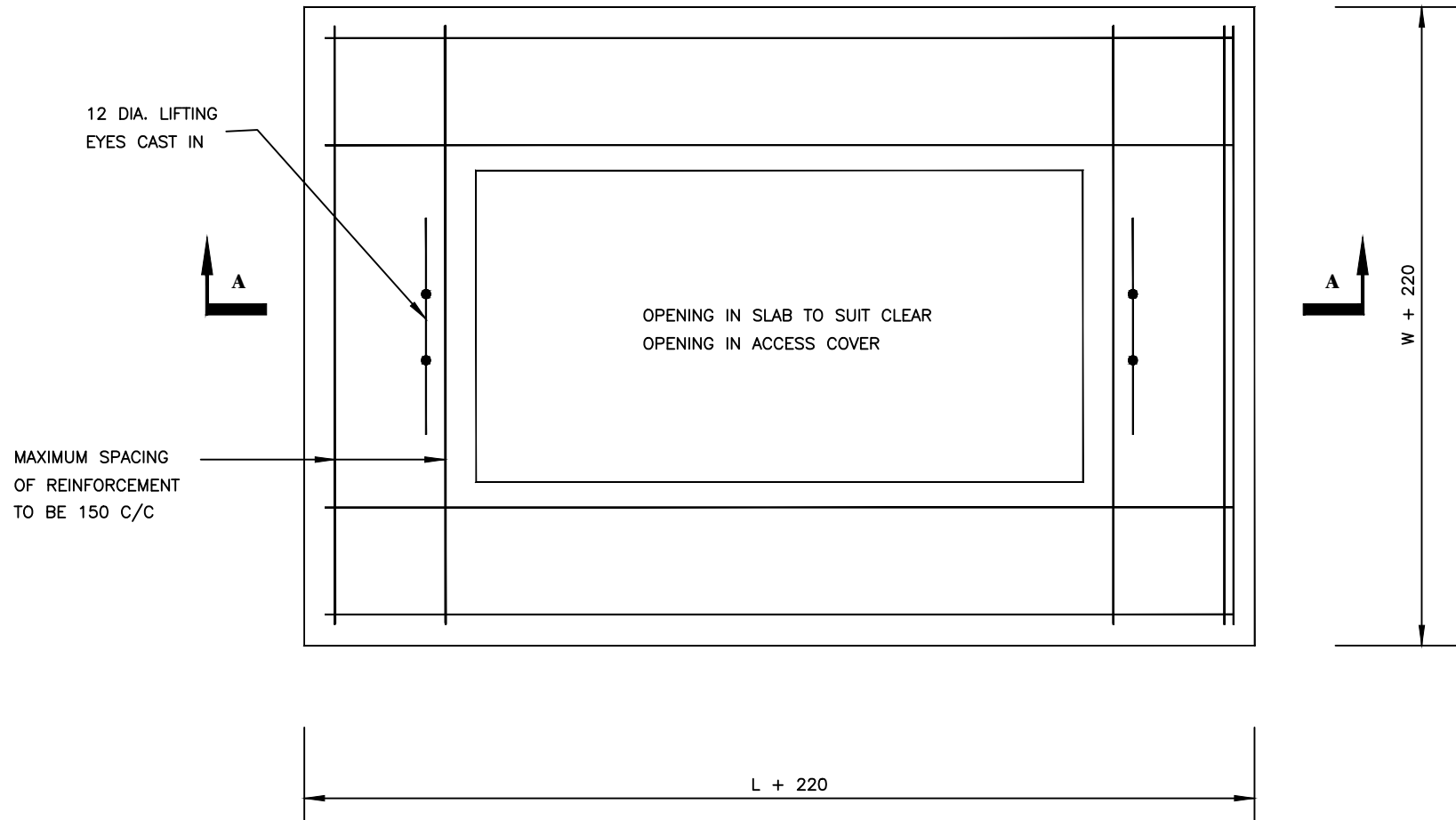
**DETAILED ENGINEERING DESIGN**

DRAWING TITLE  
**INSPECTION CHAMBERS- TYPES 1 AND 2**

SCALE	As Shown	DRAWING No.	SD206
SURVEYED		DESIGNED	Otwane 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.

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

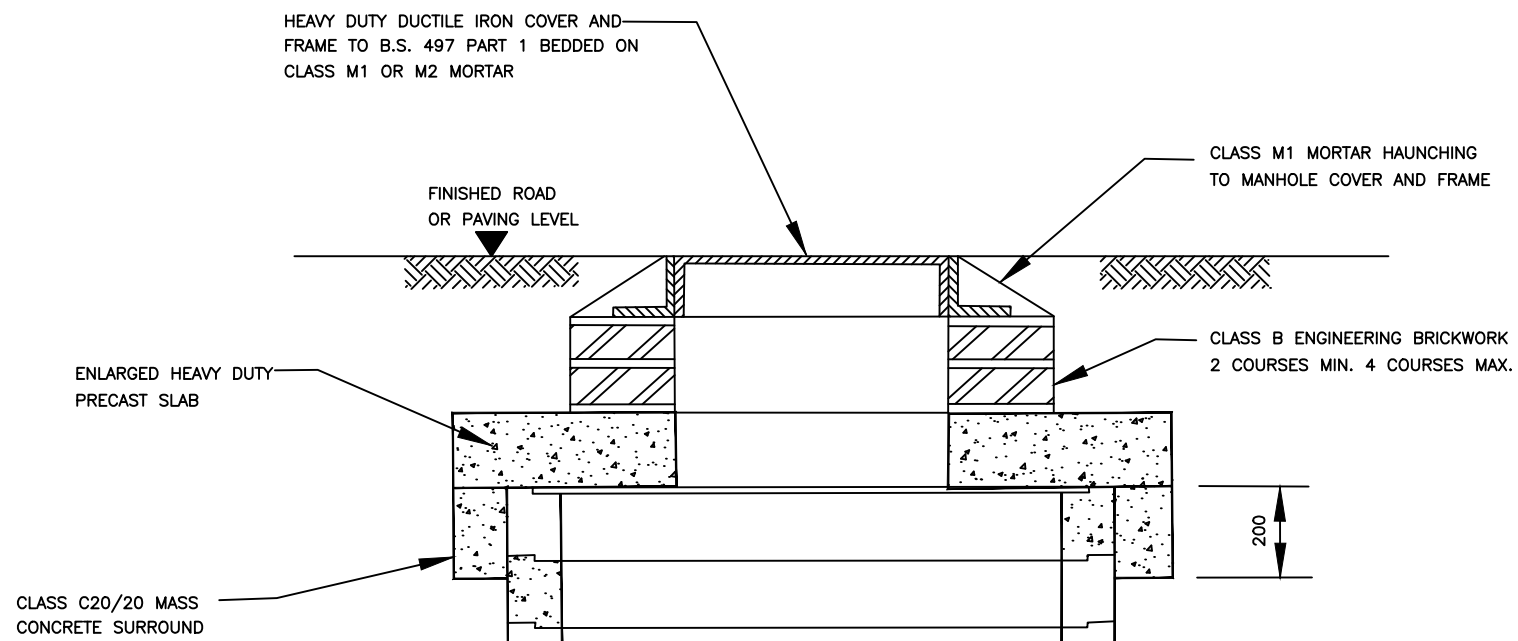
**NYAKABAALE WATER SUPPLY SYSTEM**

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

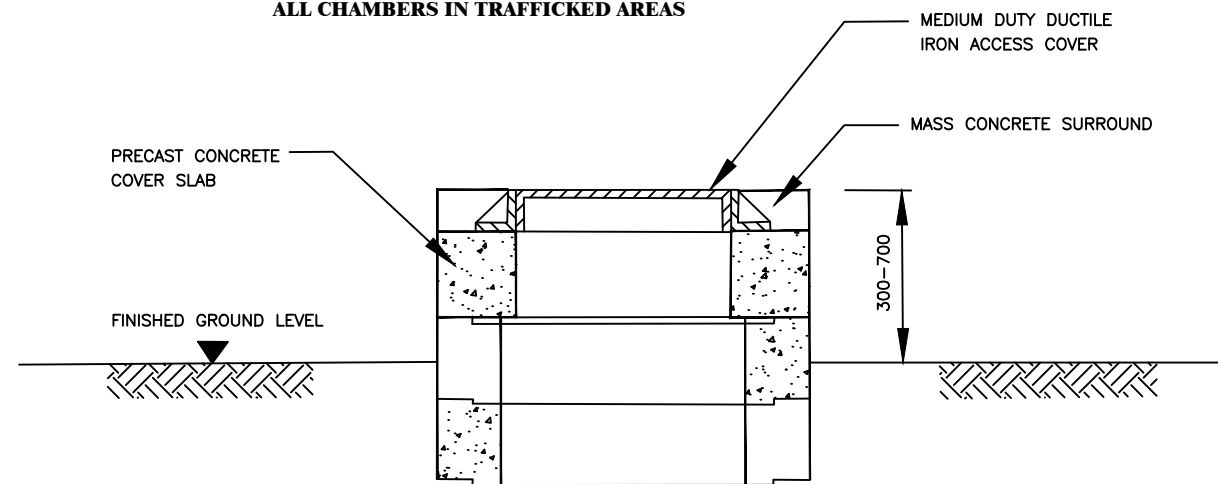
CONTRACTOR

**DETAILED ENGINEERING DESIGN**  
 DRAWING TITLE  
**PRECAST CONCRETE COVER SLAB OPEN AREAS**

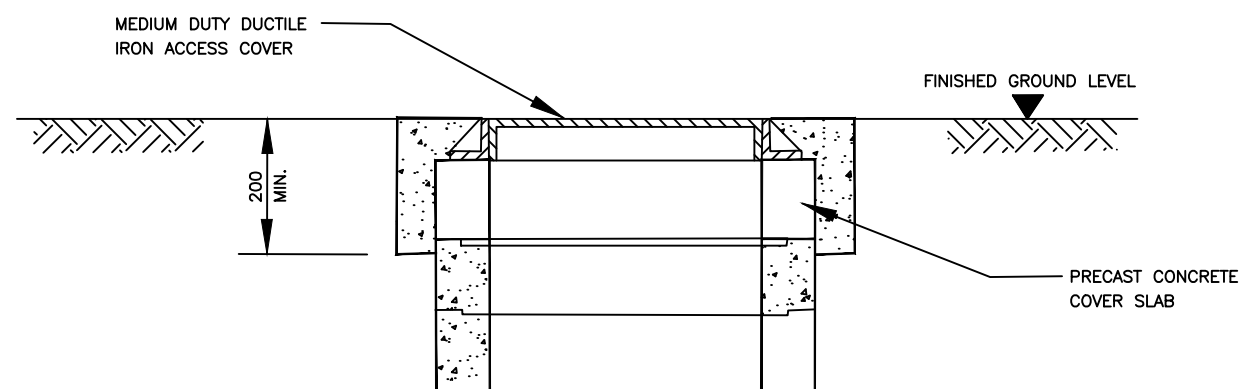
SCALE	As Shown	DRAWING No.	SD211
SURVEYED		DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



**ALL CHAMBERS IN TRAFFICKED AREAS**



**CHAMBERS IN OPEN AREAS**



**FLUSH FITTING CHAMBERS IN NON-TRAFFICKED AREAS**

**NOTES :**

1. ALL DIMENSIONS ARE IN MILLIMETRES.

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

**NYAKABAAL WATER SUPPLY SYSTEM**

CONSULTANT



In Joint Venture with



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

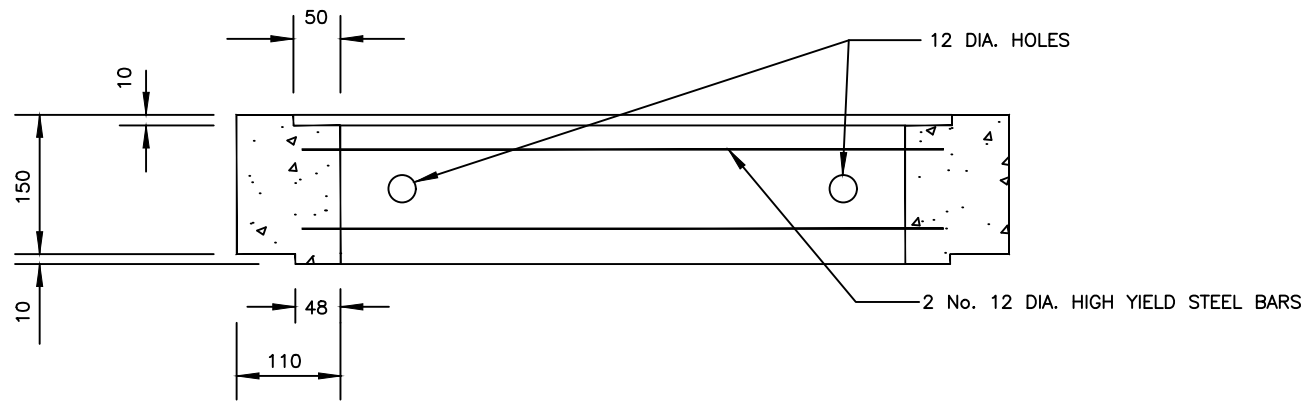
CONTRACTOR

**DETAILED ENGINEERING DESIGN**

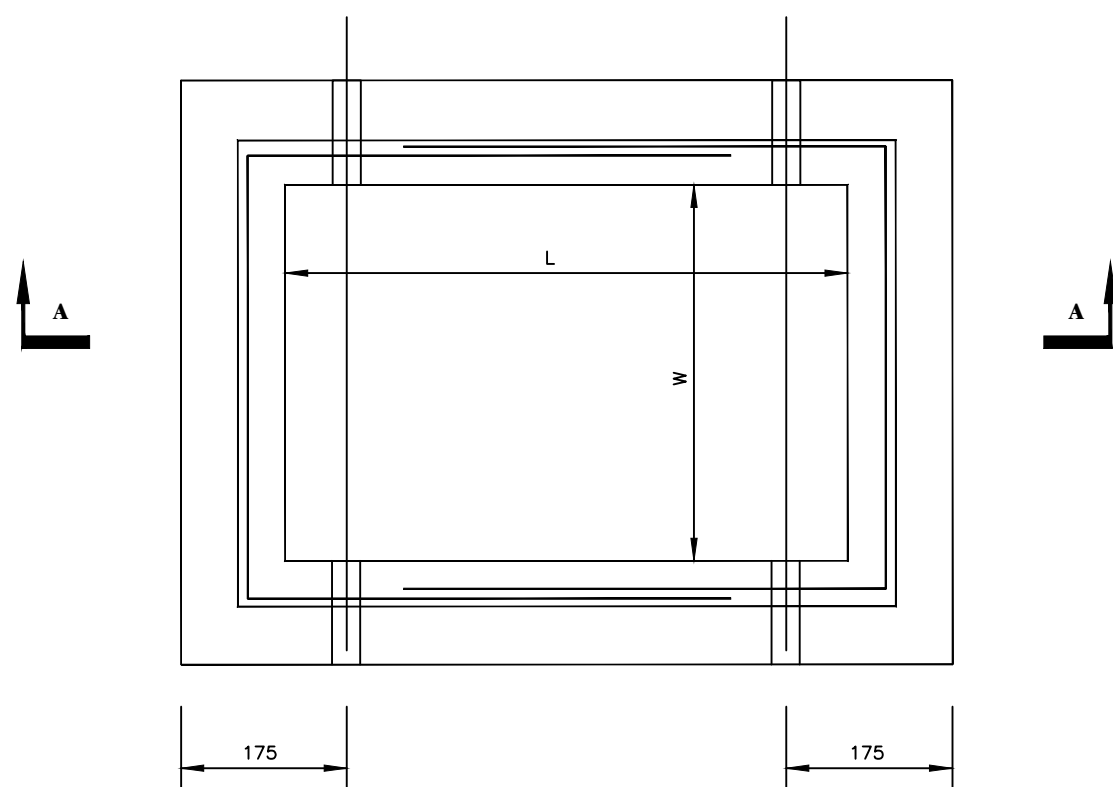
DRAWING TITLE

**PRECAST CHAMBER COVER SLAB INSTALLATION**

SCALE	As Shown	DRAWING No.	SD213
SURVEYED		DESIGNED	Otwane 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. SD100.

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

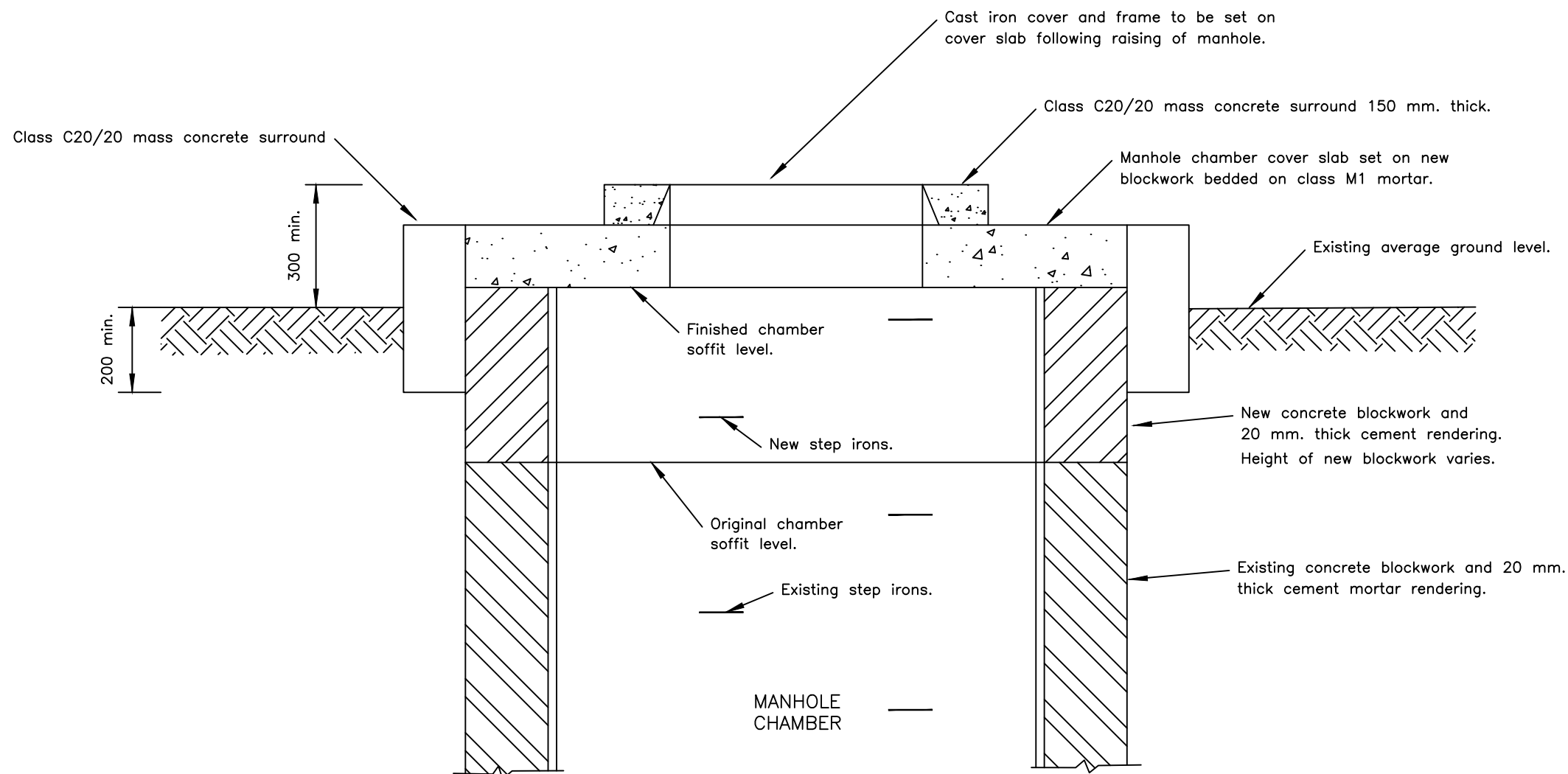
**NYAKABAAL WATER SUPPLY SYSTEM**

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  
**PRECAST CONCRETE CHAMBER SECTIONS**

SCALE	As Shown	DRAWING No.	SD214
SURVEYED		DESIGNED	Otwane 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.

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

**NYAKABAAL 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  
**ALTERATIONS TO CHAMBERS IN OPEN AREAS**

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

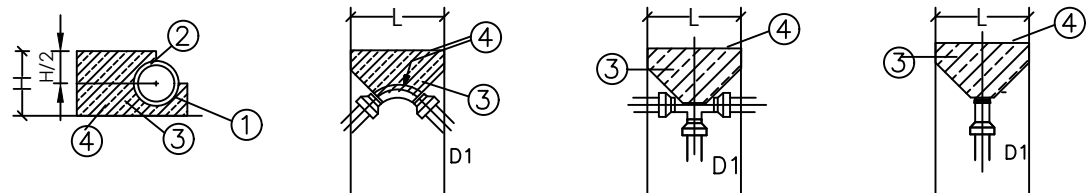
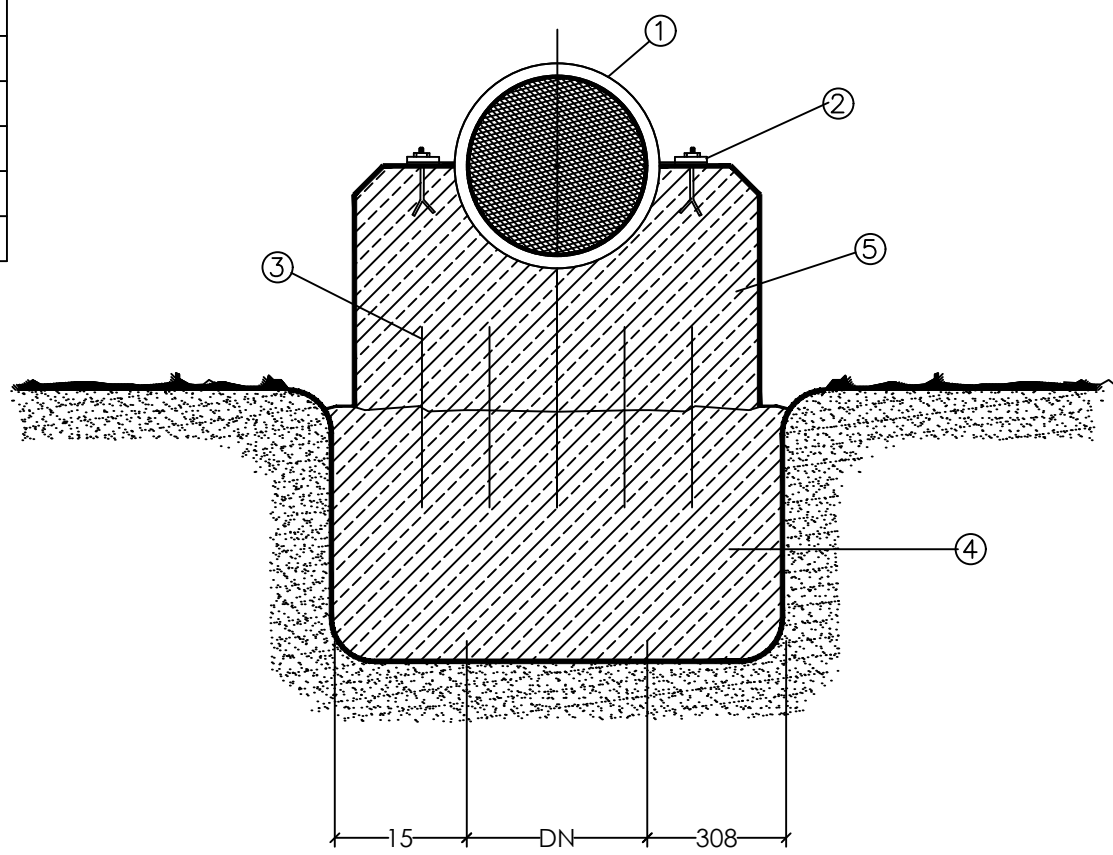
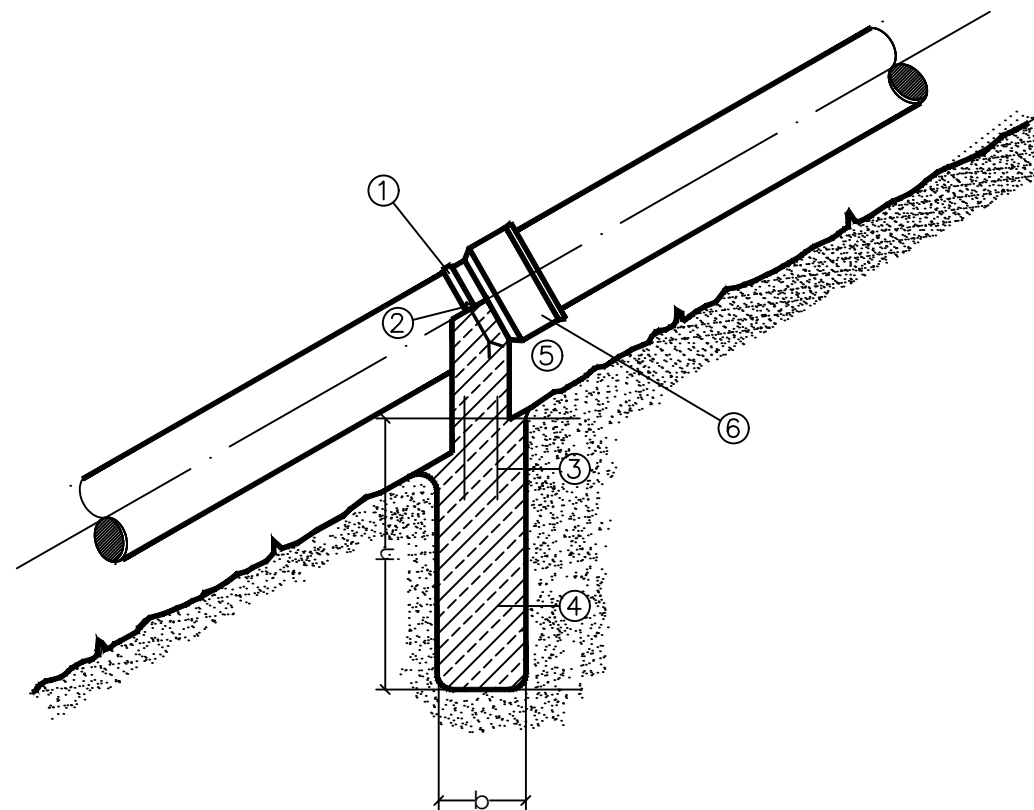


TABLE I

	C	B	A1	A2	A3	A4	A5	A6
D1								
mm	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>	mm <sup>2</sup>
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	3.51	2.78	1.88	1.41	0.72
7.00	4.90	4.90	5.91	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

P2(bar) \ 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



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

**NYAKABAAL WATER SUPPLY SYSTEM**

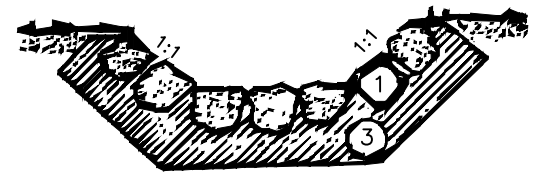
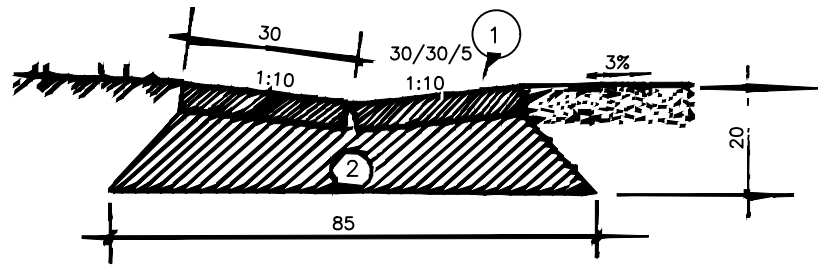
CONSULTANT  
 SARI  
 Corporate Headquarter  
 10 Philip Lane, 1st Floor,  
 London EC3M 8EA,  
 United Kingdom  
 In Joint Venture with  SGAPI

CONTRACTOR

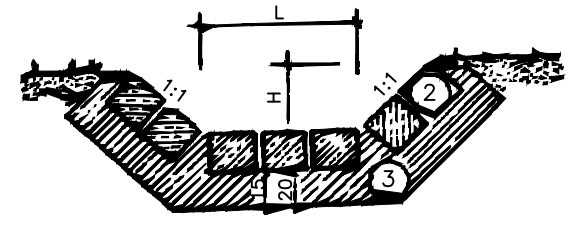
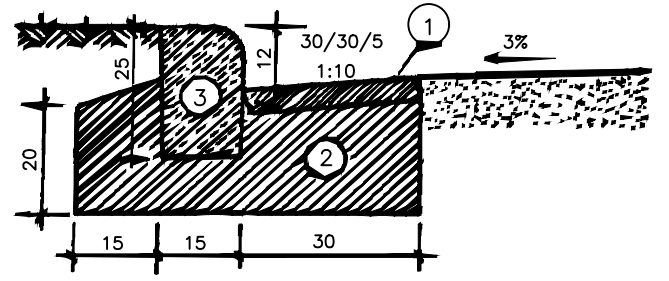
**DETAILED ENGINEERING DESIGN**  
 DRAWING TITLE  
 THRUST BLOCK

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

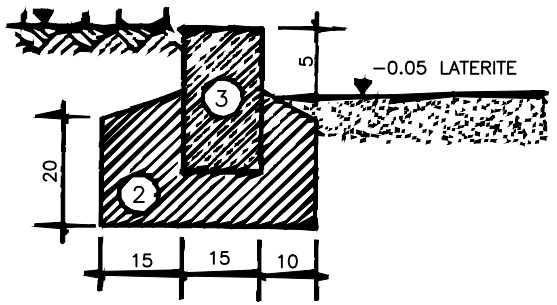
A



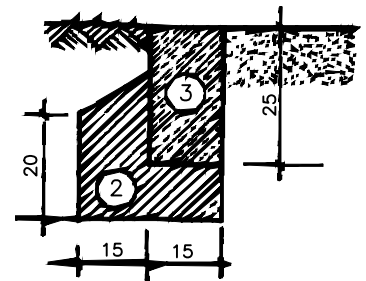
B



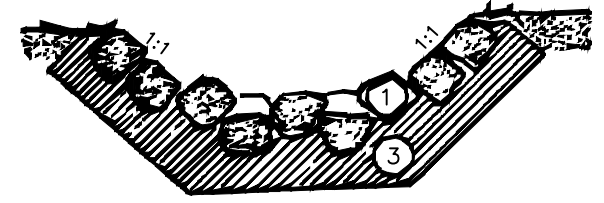
C



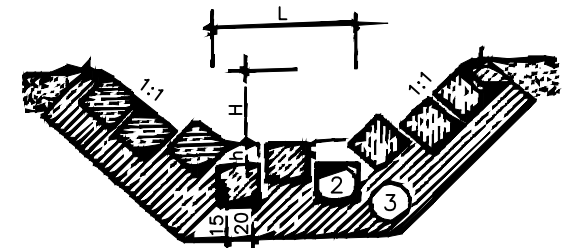
D



A



B



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

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

**NYAKABAAL WATER SUPPLY SYSTEM**

CONSULTANT



In Joint Venture with



Corporate Headquarter  
10 Philipps Lane, 1st Floor,  
London EC3M 8EA,  
United Kingdom

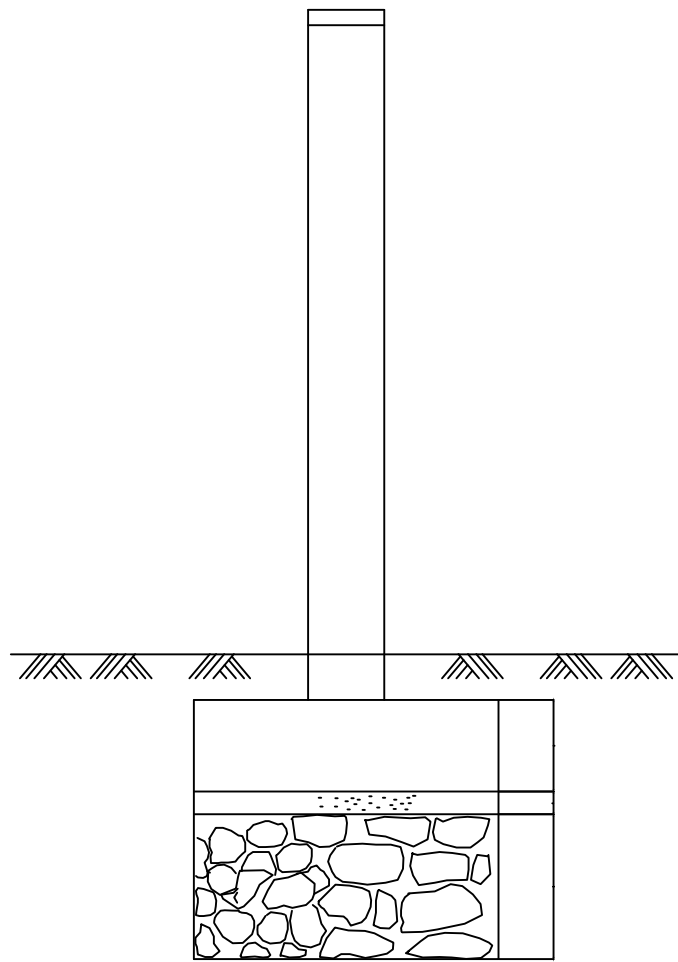
CONTRACTOR

**DETAILED ENGINEERING DESIGN**

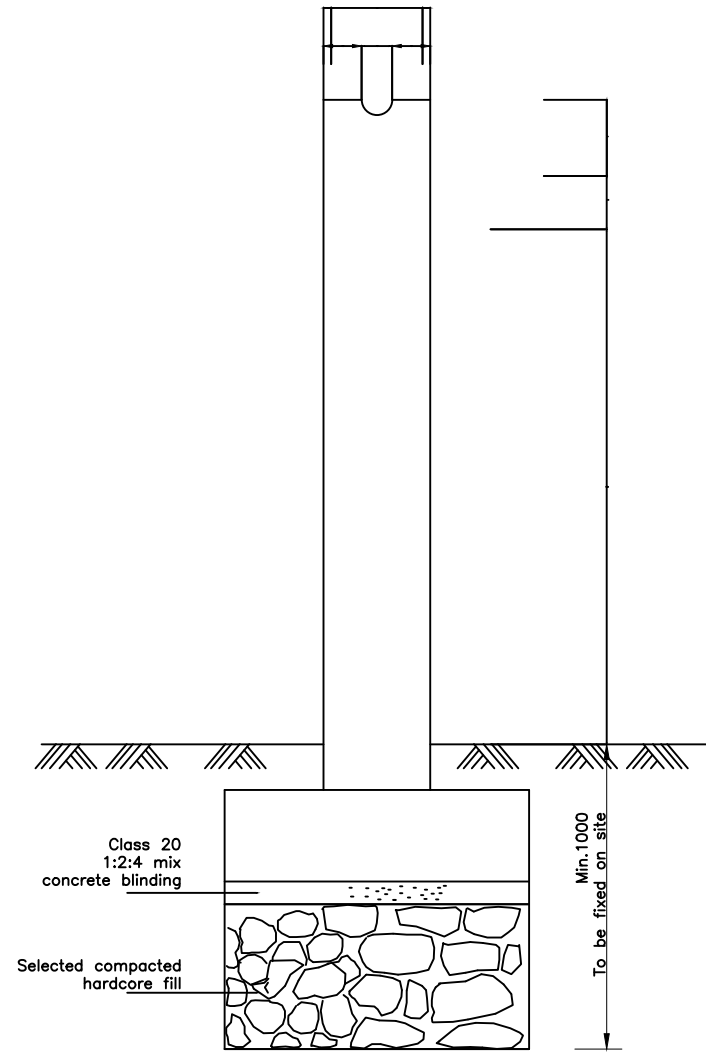
DRAWING TITLE

OPEN DRAINAGE CHANNEL AND KERB

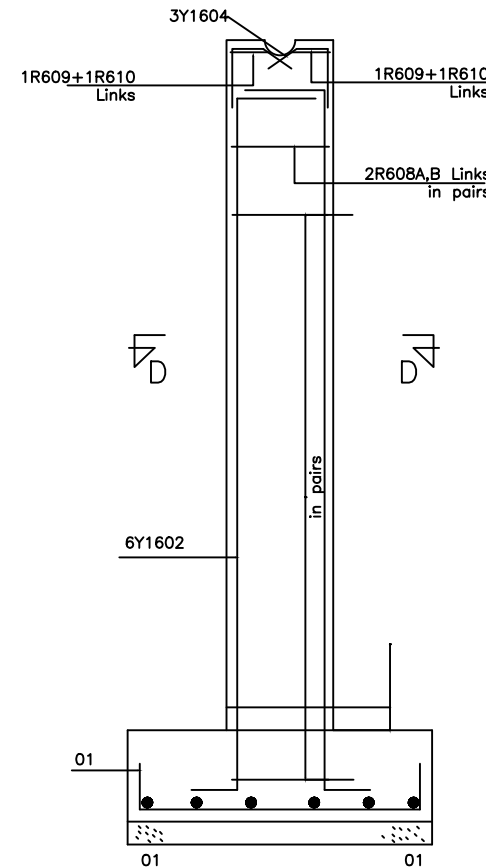
SCALE	As Shown	DRAWING No.	SD218
SURVEYED		DESIGNED	Otwane Dan.
DRAWN	Joshua Nyarwanda	CHECKED	Rodney Barugahare
DATE	OCT 2021	APPROVED	Rodney Barugahare.



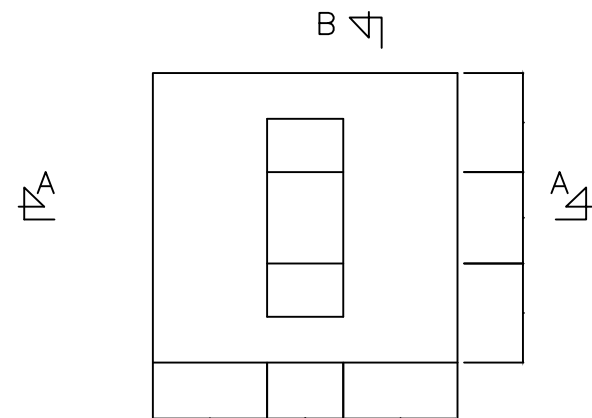
SECTION A-A



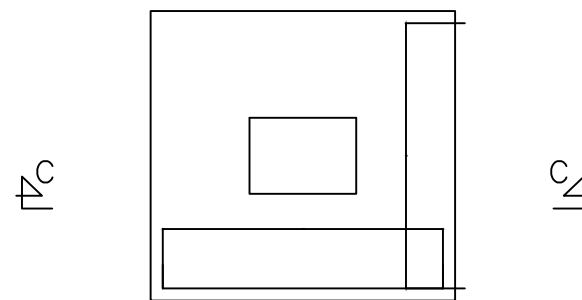
SECTION B-B



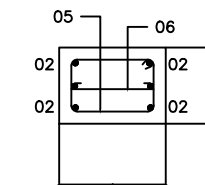
SECTION C-C



FOUNDATION PLAN




FOUNDATION TYPE 1  
12 No. OFF THUS



SECTION D-D

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

**NYAKABAALE WATER SUPPLY SYSTEM**

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

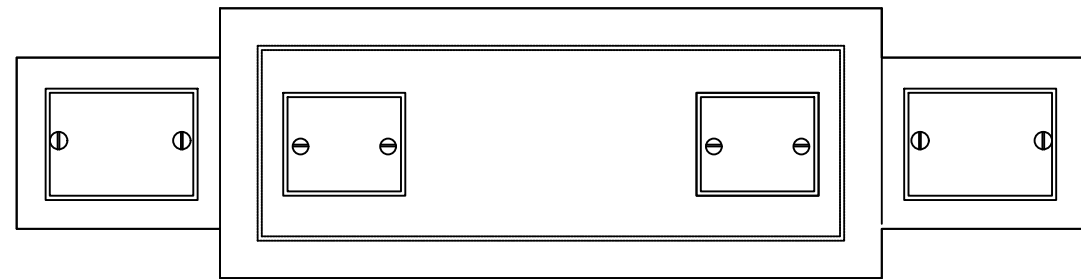
CONTRACTOR

**DETAILED ENGINEERING DESIGN**

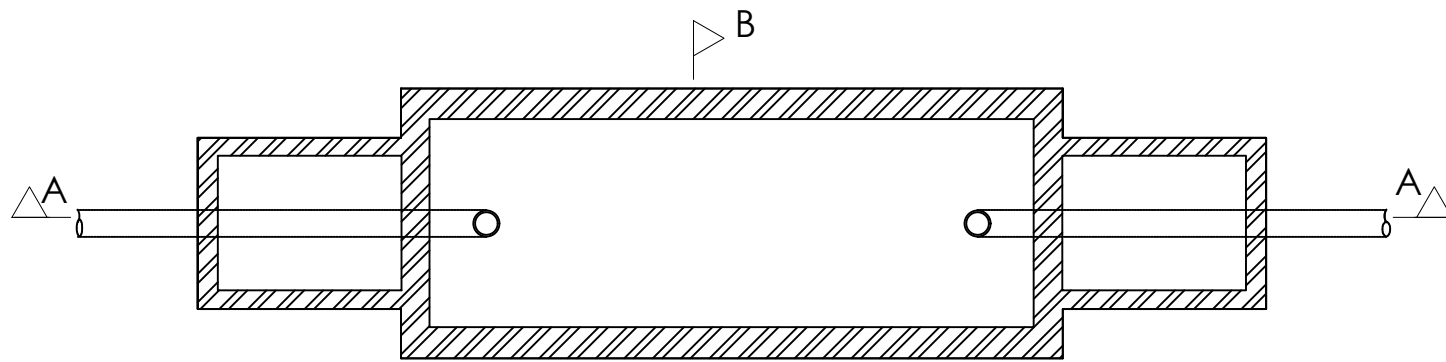
DRAWING TITLE  
 PIPE SUPPORTS R.C DETAILS

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





PLAN OF TOP



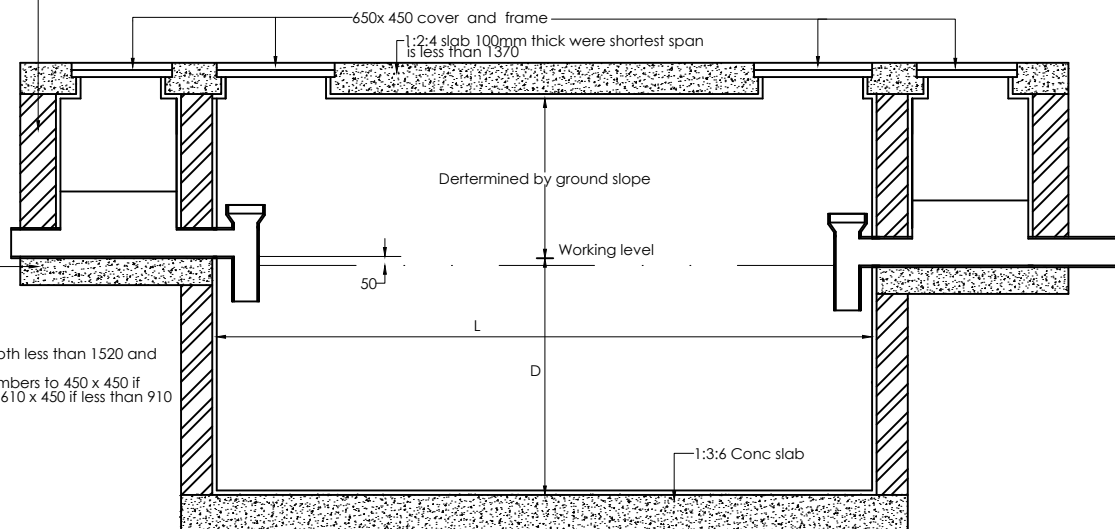
PLAN

SIZES OF INSPECTION CHAMBER			
DEPTH TO INVERTS	INTERNAL DIMENSIONS	WALL THICKNESS	FOUNDATION THICKNESS
UP TO 450	450x450	100	150
475	900	450x600	100
925	1500	750x1050	225
OVER	1500	750x1050	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

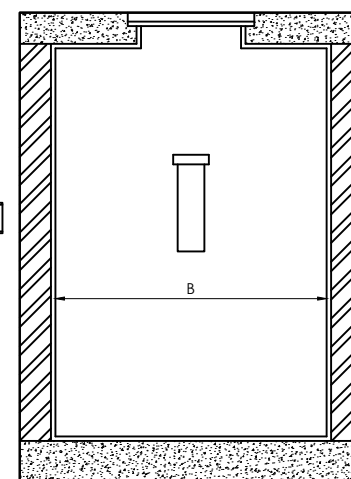
DIMENSIONS OF SEPTIC TANK				
No. of Users	L	B	D	Capacity Liters
6	1800	625	900	1137
10	2250	625	900	1435
15	2475	625	900	1707
20	2860	625	900	1820
25	3300	625	900	2117
30	2400	900	1050	2388
35	2550	900	1050	2530
40	3000	900	1050	2980
45	3300	900	1050	3276
50	3750	900	1050	3727
60	3150	925	1200	4460
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

Block wall built in 1:3 cem mortar, or 1:3:6 rendered with 1:2 mortar 13mm thick Walls to be 175 thick for walls less than 910 high a and 240 otherwise

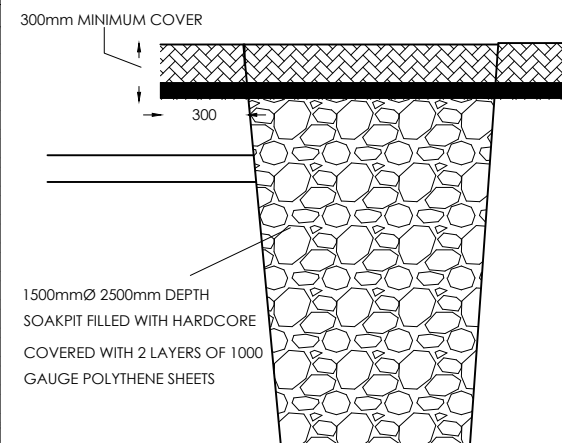


SECTION A-A

125mm conc slab (1:3:6) for invert depth less than 1520 and 200mm if more than 1520. Internal dimensions of inspection chambers to 450 x 450 if depth to invert does not exceed 450, 610 x 450 if less than 910 and 1050 x 760 if more than 1520.





SECTION B-B





SOAK PIT

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

**NYAKABAAL WATER SUPPLY SYSTEM**

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

CONTRACTOR

**DETAILED ENGINEERING DESIGN**

DRAWING TITLE  
 SEPTIC TANK DETAIL

SCALE As Shown DRAWING No. SD221  
 SURVEYED DESIGNED Otwane Dan.  
 DRAWN Joshua Nyarwanda CHECKED Rodney Barugahare  
 DATE OCT 2021 APPROVED Rodney Barugahare.