

**PROJECT NAME: MOYALE  
INTEGRATED WATER PROJECTS:  
SOLOLO RAMATA WATER PAN,  
SOLOLO WATER SUPPLY, DABEL  
WATER SUPPLY.  
MARSABIT COUNTY  
VOLUME 3.**

CLIENT:

**CONCERN WORLDWIDE**



*in conjunction  
with*



*for*



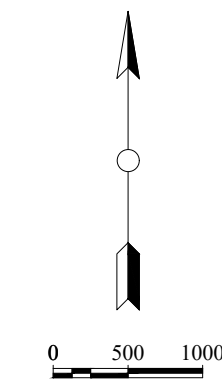
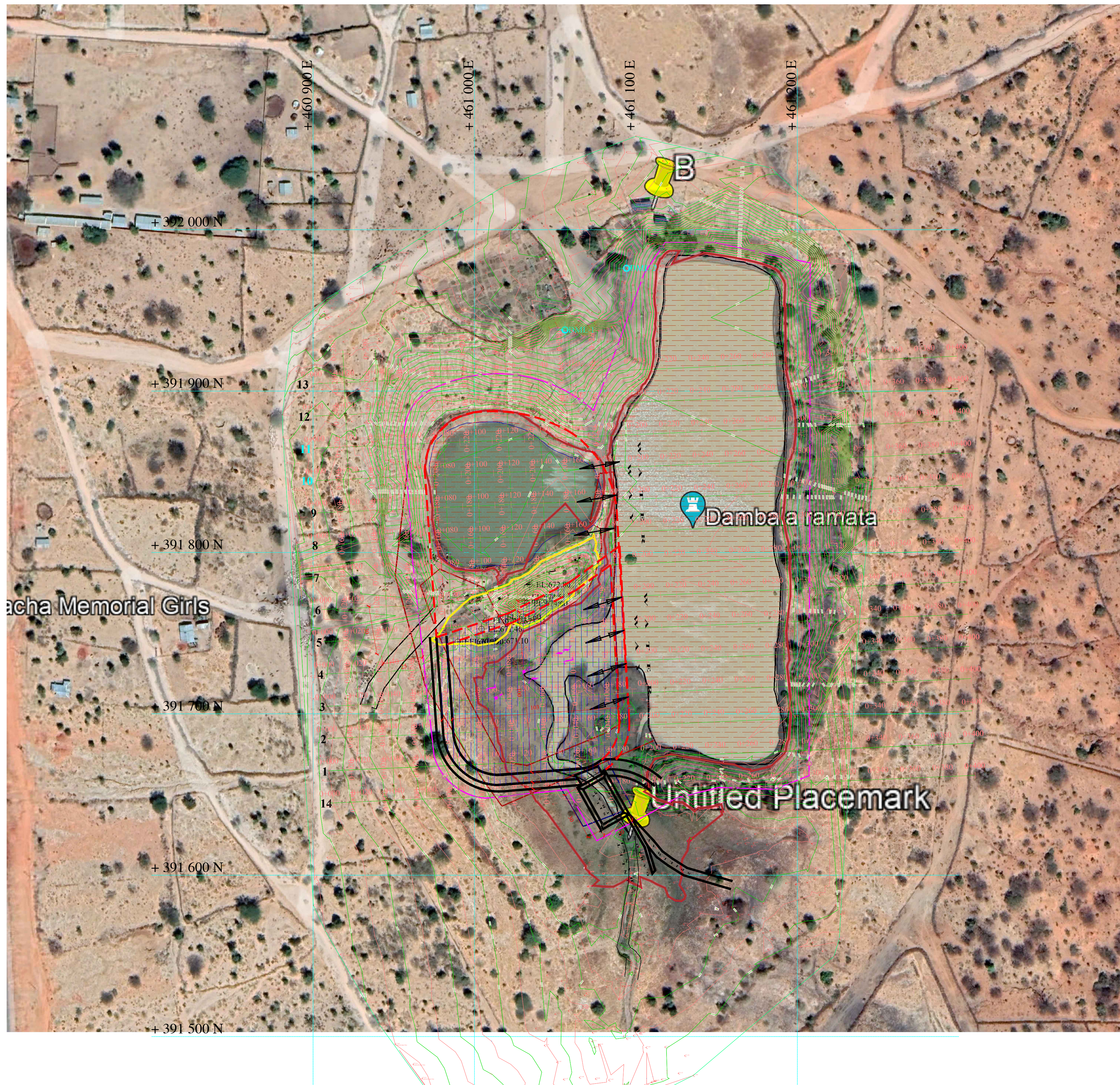
**MARSABIT  
COUNTY**

CONSULTANT:

**GEO CONSULTANTS**

MOYALE INTEGRATED WATER PROJECT TECHNICAL DRAWINGS		
Drawing No	Drawing Name	SHEET NO
1	Sololo Google image overlay	1 OF 1
2	Sololo waterpan Location layout	1 OF 1
3	Sololo Water pan Sections	1 OF 1
4	Sololo Silt trap drawing	1 OF 1
5	Sololo Spill way	1 OF 1
6	Sololo Rising main Profile	1 OF 1
7	Sololo Floating Suction	1 OF 1
8	Dabel water Supply: Met 1 and 2 Rising Main pipeline Profile	1 OF 1
9	Dabel Water Supply :Met 1 and 2 Rising Main pipeline Profile	2 OF 2
10	Dabel Water Supply: Eldera BH Pipeline Profile	1 OF 1
11	Dabel Water Supply: Eldera BH Pipeline Profile	2 OF 2
12	50m <sup>3</sup> Elevated steel tank	1 OF 1
13	50m <sup>3</sup> Elevated steel tank Foundation details	1 OF 1
14	50m <sup>3</sup> Elevated steel tank tower	1 OF 1
15	Livestock trough	1 OF 1
16	Marker Post	1 OF 1
17	Standard Drawing	5 OF 5
18	Water Kiosk	14 OF 14
19	Sololo Pipeline Layout	1 OF 1
20	Dabel Pipeline Layout	1 OF 1
21	Sign Board Model	1 OF 1





**General Notes**

STORAGE CAPACITY: 31,615m<sup>3</sup>  
 EXCAVATION VOLUME: 26,094m<sup>3</sup>  
 IMPOUNDED AREA: 12,646m<sup>2</sup>  
 MAXIMUM WALL HEIGHT: 2.7m  
 GROSS FREE BOARD: 1.5m  
 GATE: 6m  
 FENCE LENGTH: 1137m

SLOPES - UPSTREAM: 1 : 2.5  
 WETTED SURFACE AREA: 12,430m<sup>2</sup>  
 TOTAL SURFACE AREA WHEN FULL: 12,646m<sup>2</sup>

SPILLWAY TOP WIDTH: 10m  
 SPILLWAY LENGTH: 15m  
 SPILLWAY SLOPES: 1 : 0.5

REFERENCE: DML-1:  
 E. 461056.055M  
 N. 391937.912M  
 Elevation: 676.978m asl  
 DML-2:  
 E. 461094.195  
 N. 391976.071  
 Elevation: 673.448m asl

1. All measurements are in metres
2. Contour interval is 0.2m

**SURVEYED & DRAWN BY:**

**GEOFFREY OKOTH**

**DESIGNED BY:**

**P.K.W**

**CHECKED BY:**

**P.K.W**

**APPROVED BY:**

**Eng. ANDREW MESSO  
 (A3007)**

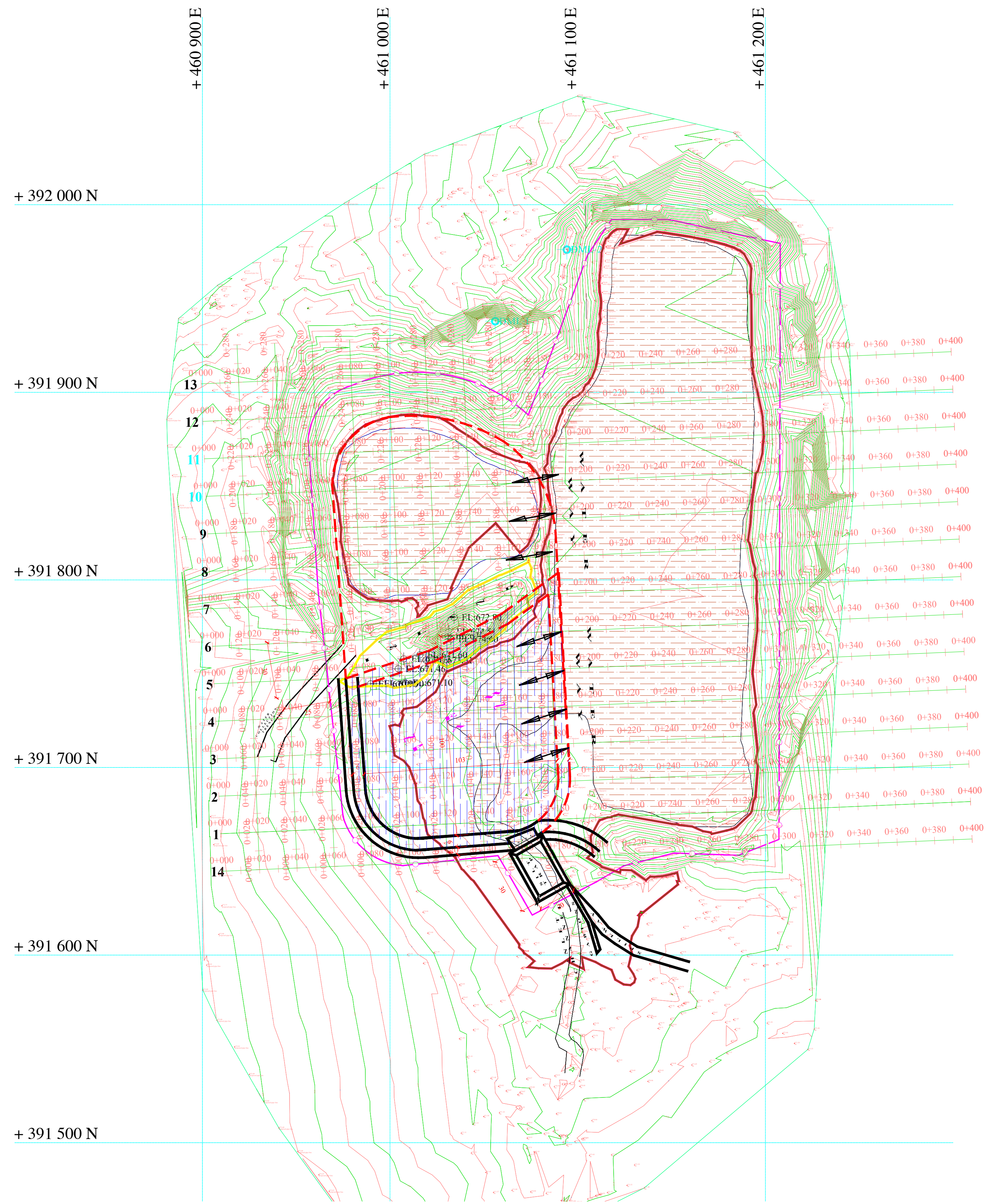
No.	Revision/Issue	Date

**Firm Name and Address**  
 CLIENT: **CONCERN WORLDWIDE**  
 Consultant: **GEO Consultants**  
 0727-456089  
 P.O BOX 103677-00101  
 consultantsgeo47@gmail.com  
 Signature:.....

**Project Name and Address**  
**PROPOSED .**  
**REHABILITATION OF**  
**SOLOILO WATER PAN.**  
**GENERAL PLAN LAYOUT**  
 SOLOILO - WARD  
 MOYALE SUB-COUNTY  
 MARSABIT - COUNTY

<b>Project</b>	<b>EARTH DAM</b>	<b>Sheet</b>	<b>1 of 5</b>
<b>Date</b>	<b>04 AUGUST/2023</b>	PRINT ON A1 PAPER SIZE	
<b>Scale</b>	<b>1:750</b>		





**General Notes**

STORAGE CAPACITY: 31,615m<sup>3</sup>  
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 Elevation: 673.448m asl

- All measurements are in metres
- Contour interval is 0.2m

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<b>GEOFFREY OKOTH</b>	
.....	
DESIGNED BY:	
<b>P.K.W</b>	
.....	
CHECKED BY:	
<b>P.K.W</b>	
.....	
APPROVED BY:	
<b>Eng. ANDREW MESSO (A3007)</b>	
.....	

No.	Revision/Issue	Date

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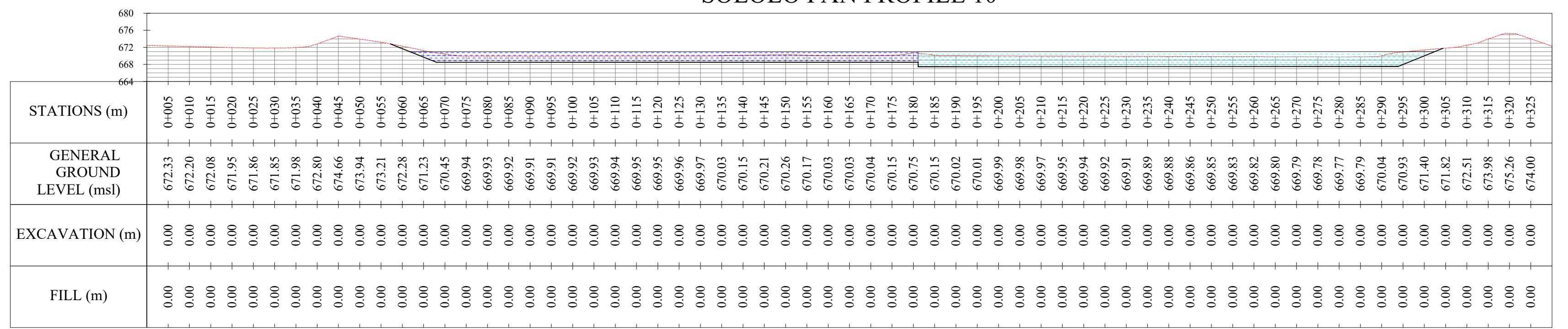
Project Name and Address  
**PROPOSED .**  
**REHABILITATION OF**  
**SOLOLO WATER PAN.**  
**GENERAL PLAN LAYOUT**

**SOLOLO - WARD**  
**MOYALE SUB-COUNTY**  
**MARSABIT - COUNTY**

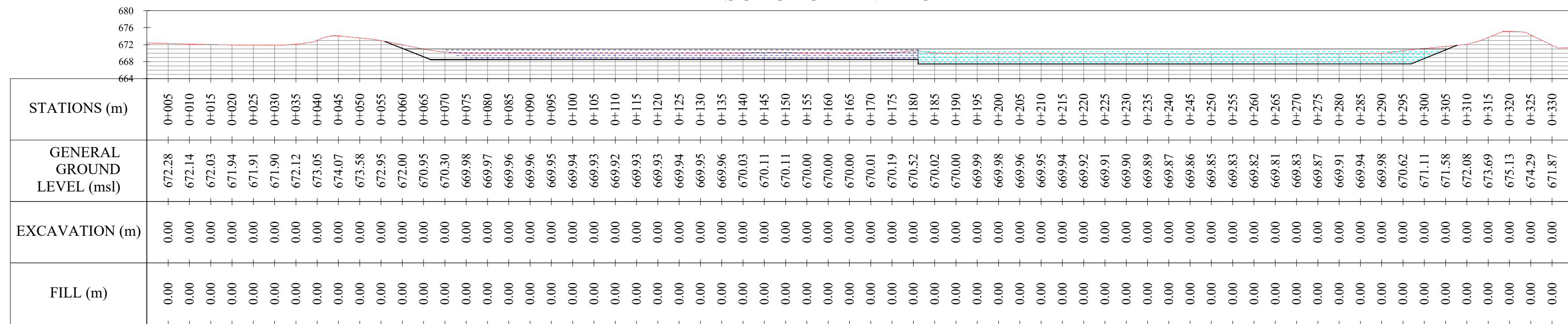
Project	<b>EARTH DAM</b>	Sheet	
Date	<b>04 AUGUST/2023</b>		<b>1 of 5</b>
Scale	<b>1:750</b>		PRINT ON A1 PAPER SIZE



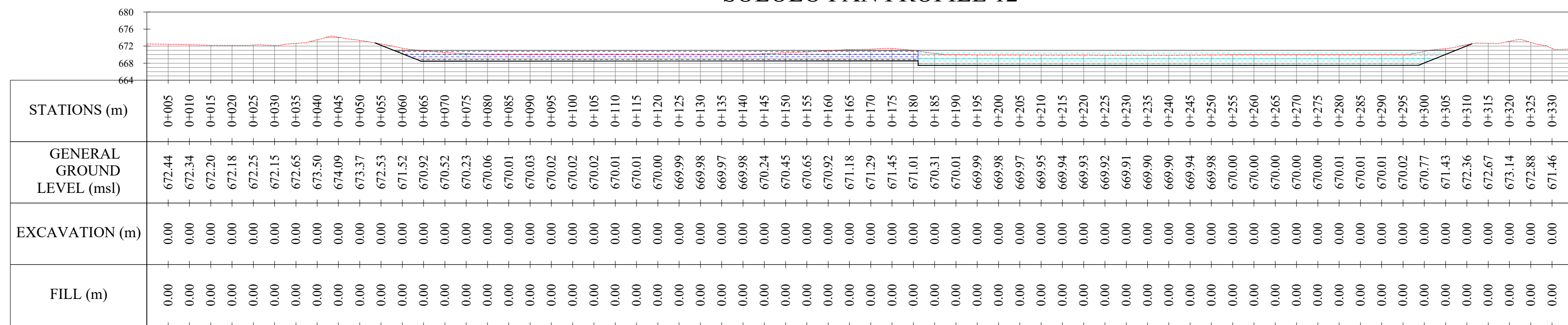
SOLOLO PAN PROFILE 10



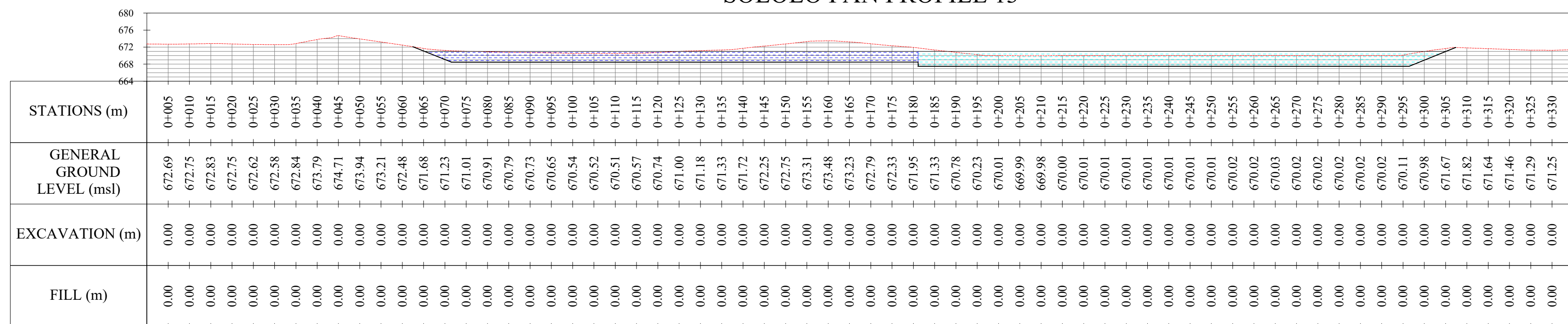
SOLOLO PAN PROFILE 11



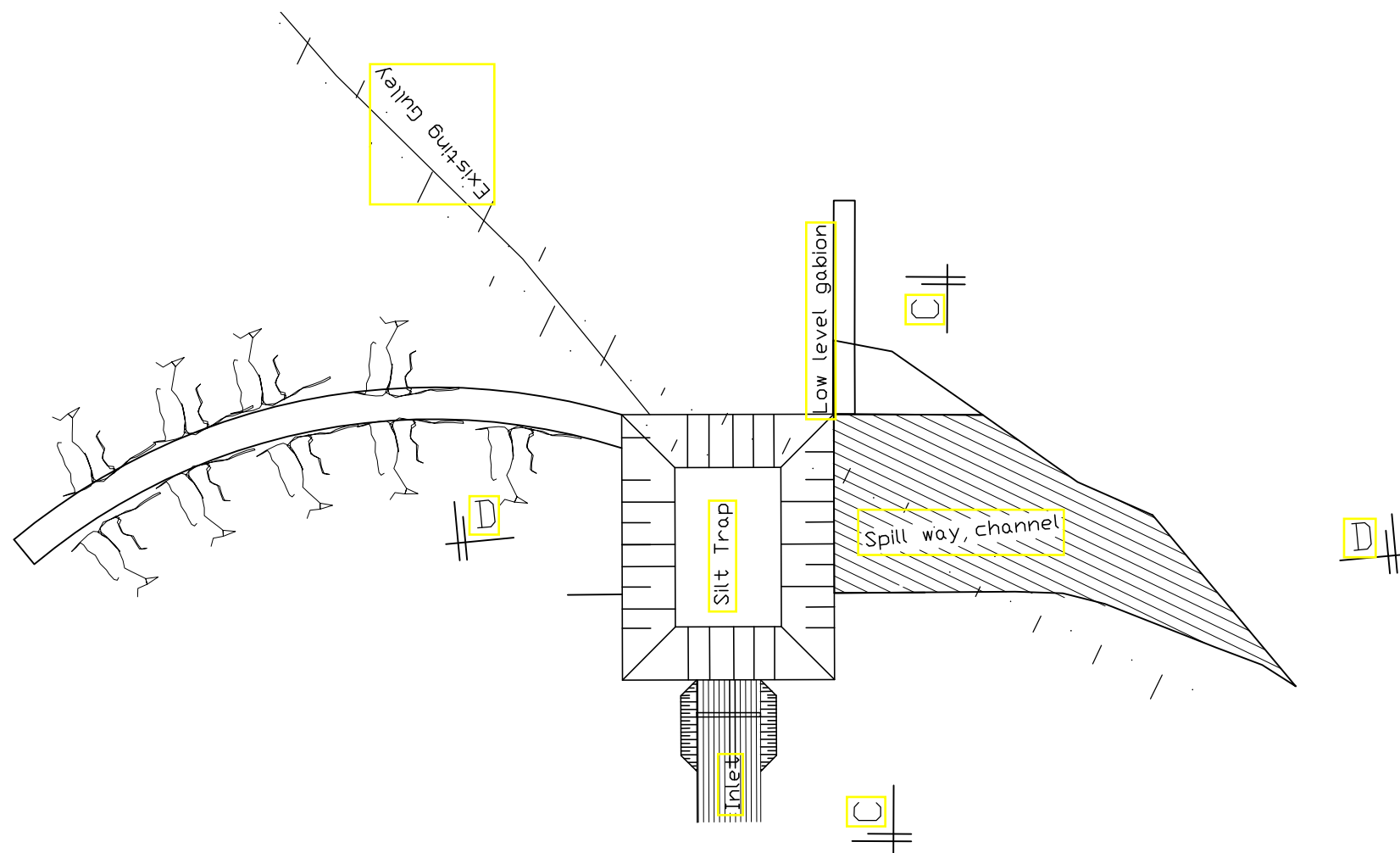
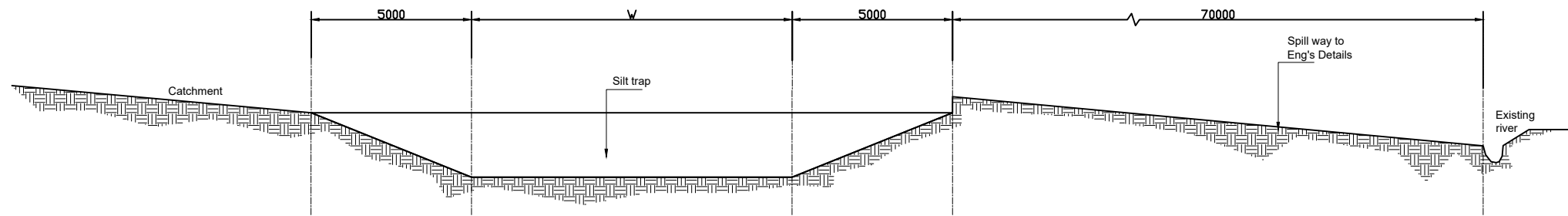
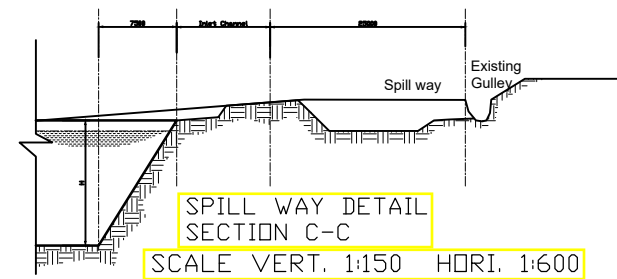
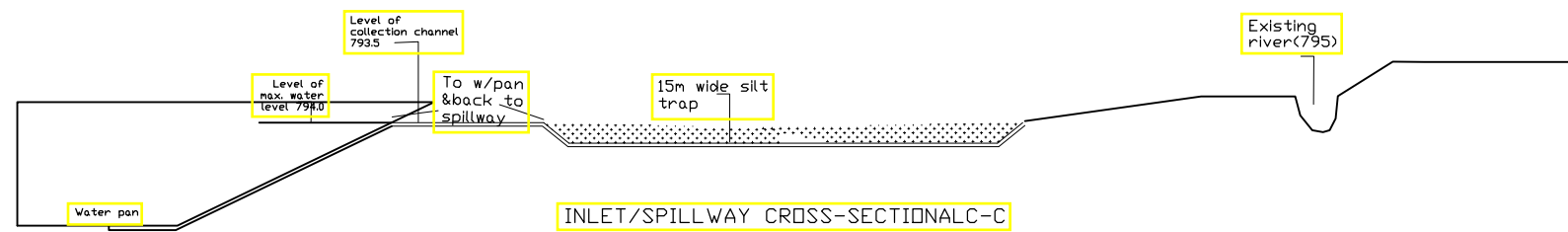
SOLOLO PAN PROFILE 12



SOLOLO PAN PROFILE 13







**General Notes**

1. All measurements are in metres

**DRAWN BY:**  
MMN

**DESIGNED BY:**  
ENG. PAUL WAGURA

**CHECKED BY:**  
ENG. PAUL WAGURA

**APPROVED BY:**  
ENG. ANDREW MESSO (AS007)

No.	Revision/Issue	Date

**Firm Name and Address**  
 CONCERN WORLDWIDE

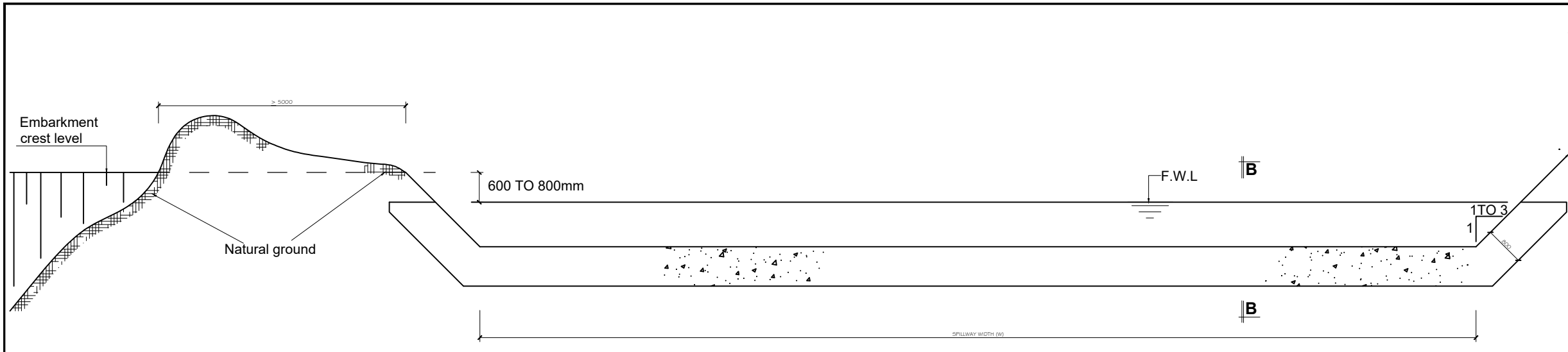
Consultant:  
 GEO Consultants  
 0727-456889  
 P.O BOX 103677-00101  
 consultantsgeo47@gmail.com

Signature:.....

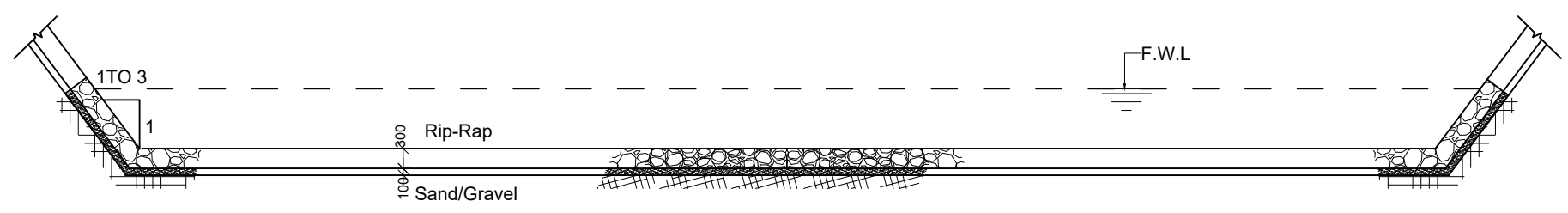
**Project Name and Address**  
 PROPOSED -  
 KONON GOS  
 SILT TRAP  
 NORTH HORN - WARD  
 NORTH HORN SUB-COUNTY  
 MARSABIT - COUNTY

<b>Project</b>	<b>Sheet</b>
<b>Date</b> 04 AUGUST/2023	1 of 1
<b>Scale</b> AS SHOWN	<b>PRINT ON A4 PAPER SIZE</b>



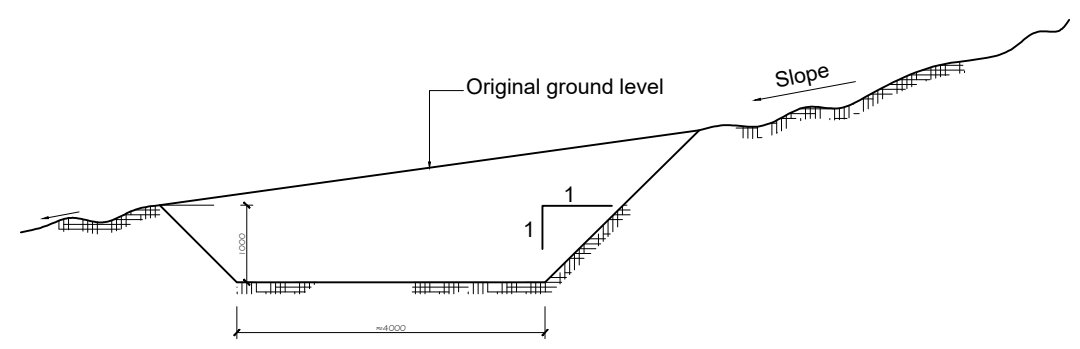


**CROSS-SECTION A-A (SPILLWAY CREST)**



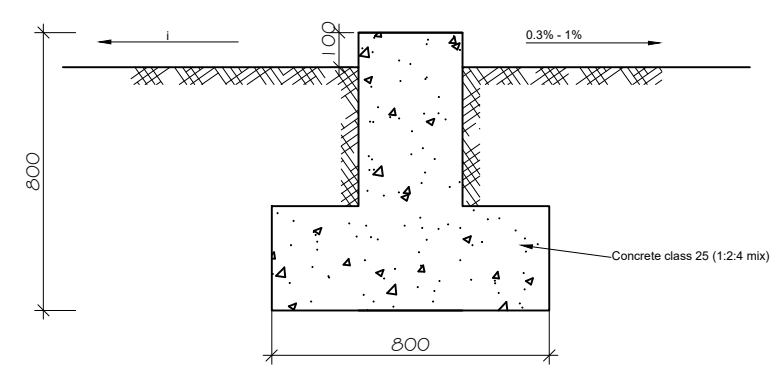
**SPILLWAY PROTECTION ARRANGEMENT**

Scale 1:100



**CROSS-SECTION C-C (PROTECTIVE TRENCH)**

Scale 1:100



**SILL CROSS SECTION B-B**

Scale 1:10

**General Notes**

1. All measurements are in metres

<b>DRAWN BY:</b> MMN
<b>DESIGNED BY:</b> ENG. PAUL WAGURA
<b>CHECKED BY:</b> ENG. PAUL WAGURA
<b>APPROVED BY:</b> ENG. ANDREW MESSO (AS007)

No.	Revision/Issue	Date

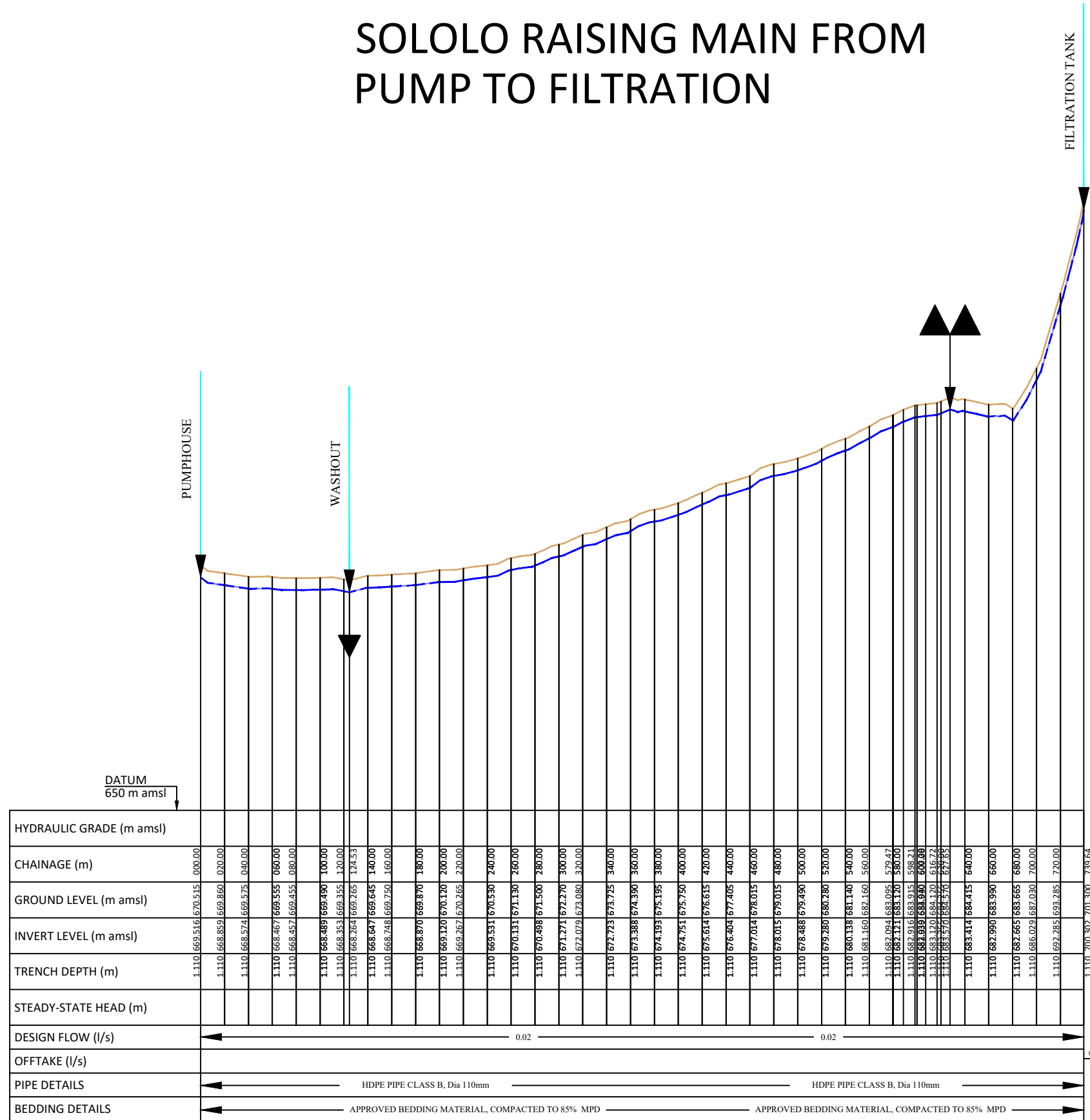
**Firm Name and Address**  
 CONCERN WORLDWIDE  
 Consultant:  
 GEO Consultants  
 0727-456089  
 P.O BOX 103677-00101  
 consultantsgeo47@gmail.com  
 Signature:.....

**Project Name and Address**  
 PROPOSED -  
 KONON GOS SPILLWAY  
 NORTH HERR - WARD  
 NORTH HERR SUB-COUNTY  
 MARSABIT - COUNTY

<b>Project</b>	<b>Sheet</b>
<b>Date</b> 04 AUGUST/2023	1 of 1
<b>Scale</b> AS SHOWN	<b>PRINT ON A4 PAPER SIZE</b>



# SOLOLO RAISING MAIN FROM PUMP TO FILTRATION



**NOTES**  
 1. Dimensions are in metres unless otherwise stated.  
 2. This drawing is to be read in conjunction with the designs and other relevant drawings.  
 3. Scales in A1 paper size.

**SCALES**  
 Horizontal Scale 1:2000  
 Vertical Scale 1:200

**LEGEND**

- EXISTING GROUND PROFILE
- PIPE INVERT
- SINGLE AIR VALVE
- DOUBLE AIR VALVE
- WASHOUT VALVE



MARSABIT COUNTY

No.	APPROVAL	DATE	REFERENCE

CLIENT:  
**CONCERN WORLDWIDE**

in conjunction with  
**WaterFund**  
 Financing the Water Sector

CONSULTANT:  
**GEO CONSULTANTS**

PROJECT TITLE:  
**SOLOLO RAMATA AND DABEL INTEGRATED PROJECT**

TITLE OF DRAWING:  
**SOLOLO RAISING MAIN TO FILTRATION PROFILE**  
 Chainage 0+000 to 0+739.64

DWG. No. **KAM/DD/203**  
 Sheet No. **1/1**

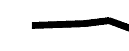




Designed: <b>P. K.W</b>	Date: <b>Aug 2023</b>
Drawn: <b>MMN</b>	Date: <b>Aug 2023</b>
Checked: <b>P. K.W</b>	Date: <b>Aug 2023</b>
Approved: <b>ENG ANDREW MESSO (A3007)</b>	Date: <b>Aug 2023</b>



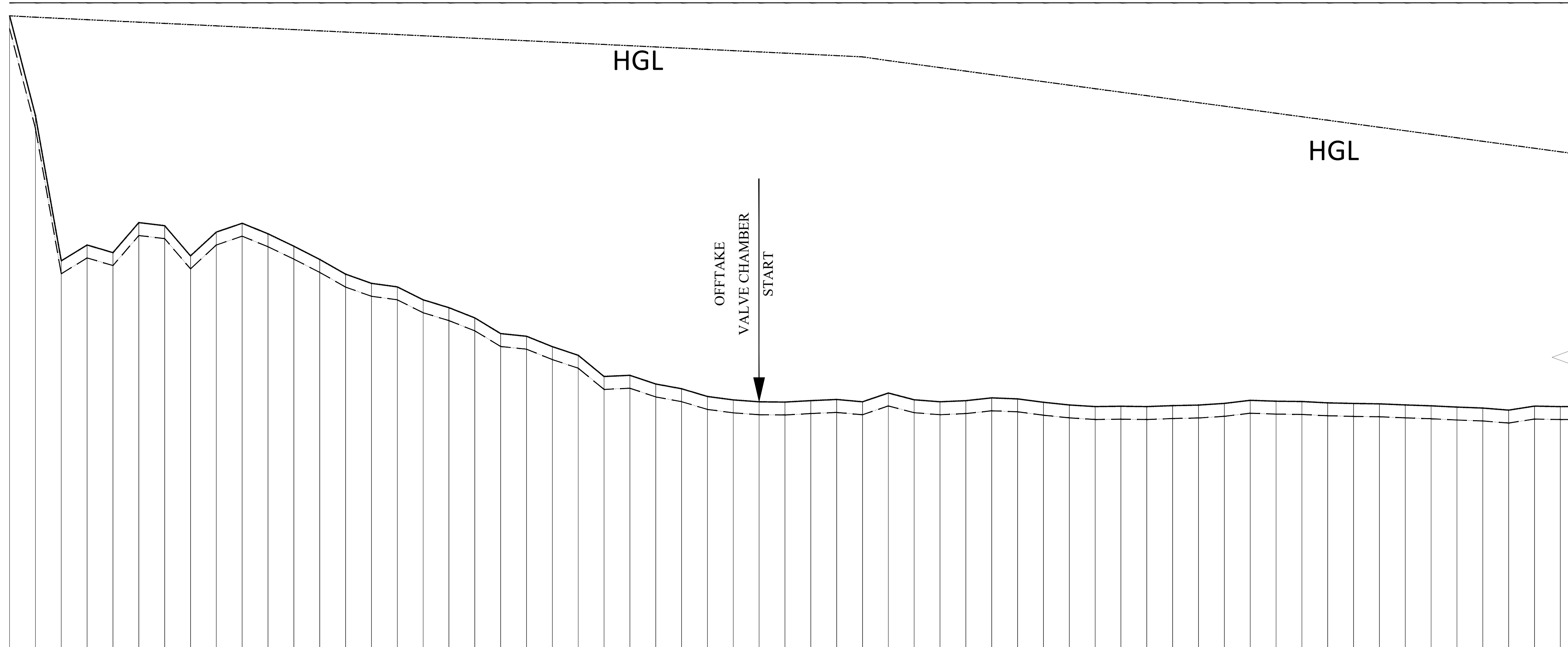
**NOTES**  
 1. Dimensions are in metres unless otherwise stated.  
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 Horizontal Scale 1:2000  
 Vertical Scale 1:200

**LEGEND**

-  EXISTING GROUND PROFILE
-  PIPE INVERT
-  SINGLE AIR VALVE
-  DOUBLE AIR VALVE
-  WASHOUT VALVE

EL STATIC = 701m



HYDRAULIC GRADE (m amsl)	CHAINAGE (m)	GROUND LEVEL (m amsl)	INVERT LEVEL (m amsl)	TRENCH DEPTH (m)	STEADY-STATE HEAD (m)	DESIGN FLOW (l/s)	OFFTAKE (l/s)	PIPE DETAILS	BEDDING DETAILS	GRADIENT (m/km)	VERTICAL ANGULAR DEVIATION
1.110 699.000	000.00	700.000	699.000	1.110				HDPE PIPE CLASS B, Dia 110mm	APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-385.75	8.3°
1.110 691.285	020.00	692.285	691.285	1.110				HDPE PIPE CLASS B, Dia 75mm	APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-29.50	32.9°
1.110 680.029	040.00	681.030	680.029	1.110				HDPE PIPE CLASS B, Dia 63mm	APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	5.2°
1.110 681.255	060.00	682.255	681.255	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	8.3°
1.110 680.665	080.00	681.665	680.665	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	7.3°
1.110 682.990	100.00	683.990	682.990	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	6.0°
1.110 682.750	120.00	683.750	682.750	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	11.9°
1.110 680.414	140.00	681.415	680.414	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	3.3°
1.110 682.255	160.00	683.255	682.255	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	4.3°
1.110 682.939	180.00	683.940	682.939	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	0.4°
1.110 682.121	200.00	683.120	682.121	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	0.2°
1.110 681.160	220.00	682.160	681.160	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	0.3°
1.110 680.138	240.00	681.140	680.138	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	1.2°
1.110 679.000	260.00	680.000	679.000	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	1.3°
1.110 678.288	280.00	679.290	678.288	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	2.1°
1.110 678.015	300.00	679.015	678.015	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	1.1°
1.110 677.014	320.00	678.015	677.014	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	0.5°
1.110 676.404	340.00	677.405	676.404	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	1.2°
1.110 675.614	360.00	676.615	675.614	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	2.9°
1.110 674.400	380.00	675.400	674.400	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	1.7°
1.110 674.193	400.00	675.195	674.193	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	0.4°
1.110 673.388	420.00	674.390	673.388	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	2.8°
1.110 672.723	440.00	673.725	672.723	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	5.0°
1.110 671.079	460.00	672.080	671.079	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	2.2°
1.110 671.171	480.00	672.170	671.171	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	0.9°
1.110 670.498	500.00	671.500	670.498	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	0.7°
1.110 670.131	520.00	671.130	670.131	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	1.0°
1.110 669.531	540.00	670.530	669.531	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	0.3°
1.110 669.267	560.00	670.265	669.267	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	0.4°
1.110 669.120	580.00	670.120	669.120	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	0.4°
1.110 669.100	600.00	670.100	669.100	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	0.1°
1.110 669.210	620.00	670.210	669.210	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	0.8°
1.110 669.300	640.00	670.300	669.300	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	2.5°
1.110 669.120	660.00	670.120	669.120	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	3.4°
1.110 669.800	680.00	670.800	669.800	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	1.1°
1.110 669.276	700.00	670.275	669.276	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	0.7°
1.110 669.122	720.00	670.120	669.122	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	0.4°
1.110 669.208	740.00	670.210	669.208	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	0.9°
1.110 669.425	760.00	670.425	669.425	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	0.5°
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1.110 669.084	800.00	670.085	669.084	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	0.2°
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1.110 668.750	840.00	669.750	668.750	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	0.1°
1.110 668.776	860.00	669.775	668.776	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	0.3°
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1.110 668.824	900.00	669.825	668.824	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	0.1°
1.110 668.867	920.00	669.865	668.867	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	0.2°
1.110 668.996	940.00	669.995	668.996	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	0.3°
1.110 669.235	960.00	670.235	669.235	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	0.9°
1.110 669.166	980.00	670.165	669.166	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	0.1°
1.110 669.142	1000.00	670.140	669.142	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	0.2°
1.110 669.038	1020.00	670.040	669.038	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	0.2°
1.110 668.992	1040.00	669.990	668.992	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	0.0°
1.110 668.961	1060.00	669.960	668.961	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	0.1°
1.110 668.878	1080.00	669.880	668.878	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	0.0°
1.110 668.808	1100.00	669.810	668.808	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	0.1°
1.110 668.711	1120.00	669.710	668.711	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	0.1°
1.110 668.636	1140.00	669.635	668.636	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	0.2°
1.110 668.475	1160.00	669.475	668.475	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	1.4°
1.110 668.787	1180.00	669.785	668.787	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	1.0°
1.110 668.746	1200.00	669.745	668.746	1.110					APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD	-14.25	0.1°

 MARSABIT COUNTY	No.	APPROVAL	DATE	REFERENCE	CLIENT:	CONCERN WORLDWIDE	CONSULTANT:	GEO CONSULTANTS	PROJECT TITLE:	SOLOLO RAMATA AND DABEL INTEGRATED PROJECT	TITLE OF DRAWING:	SOLOLO PIPELINE EXTENSION PROFILE Chainage 0+000 to 1+200.00	Designed:	R. KAMANDI	Date:	Aug 2023	
						 					Dwg. No.	KAM/DD/203	Drawn:	MMN	Date:	Aug 2023	
												Sheet No.	1/2	Checked:	R. KAMANDI	Date:	Aug 2023
														Approved:	ENG ANDREW MESSO (A3007)	Date:	Aug 2023

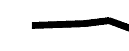






- NOTES**
1. Dimensions are in metres unless otherwise stated.
  2. This drawing is to be read in conjunction with the designs and other relevant drawings.
  3. Scales in A1 paper size.

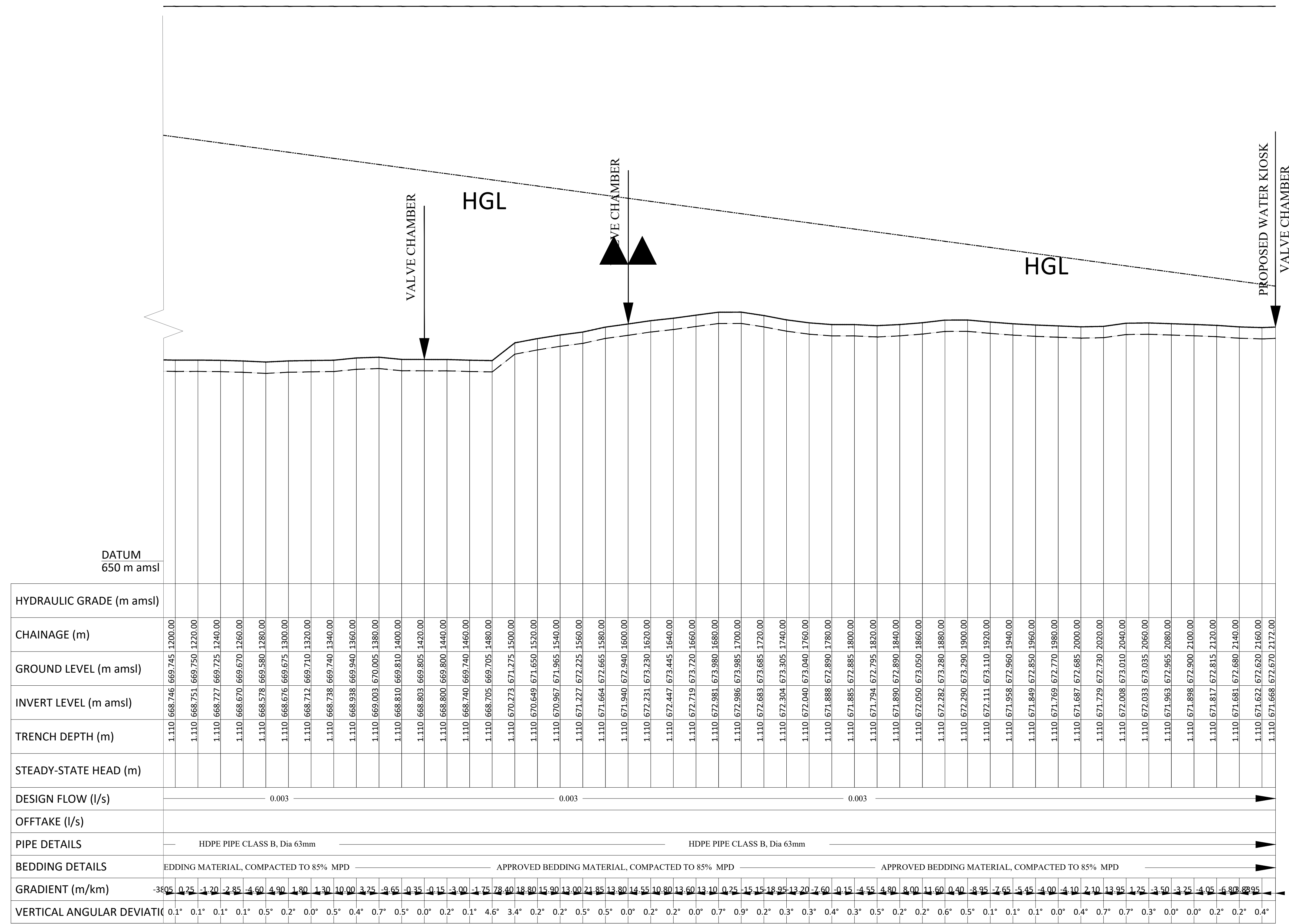
**SCALES**

Horizontal Scale 1:2000  
Vertical Scale 1:200

**LEGEND**

-  EXISTING GROUND PROFILE
-  PIPE INVERT
-  SINGLE AIR VALVE
-  DOUBLE AIR VALVE
-  WASHOUT VALVE

EL STATIC = 701m



No.	APPROVAL	DATE	REFERENCE

CLIENT:  
**CONCERN WORLDWIDE**

in conjunction with  
**WaterFund**  
Financing the Water Sector

CONSULTANT:  
**GEO CONSULTANTS**

PROJECT TITLE:  
**SOLOLO RAMATA AND DABEL INTEGRATED PROJECT**

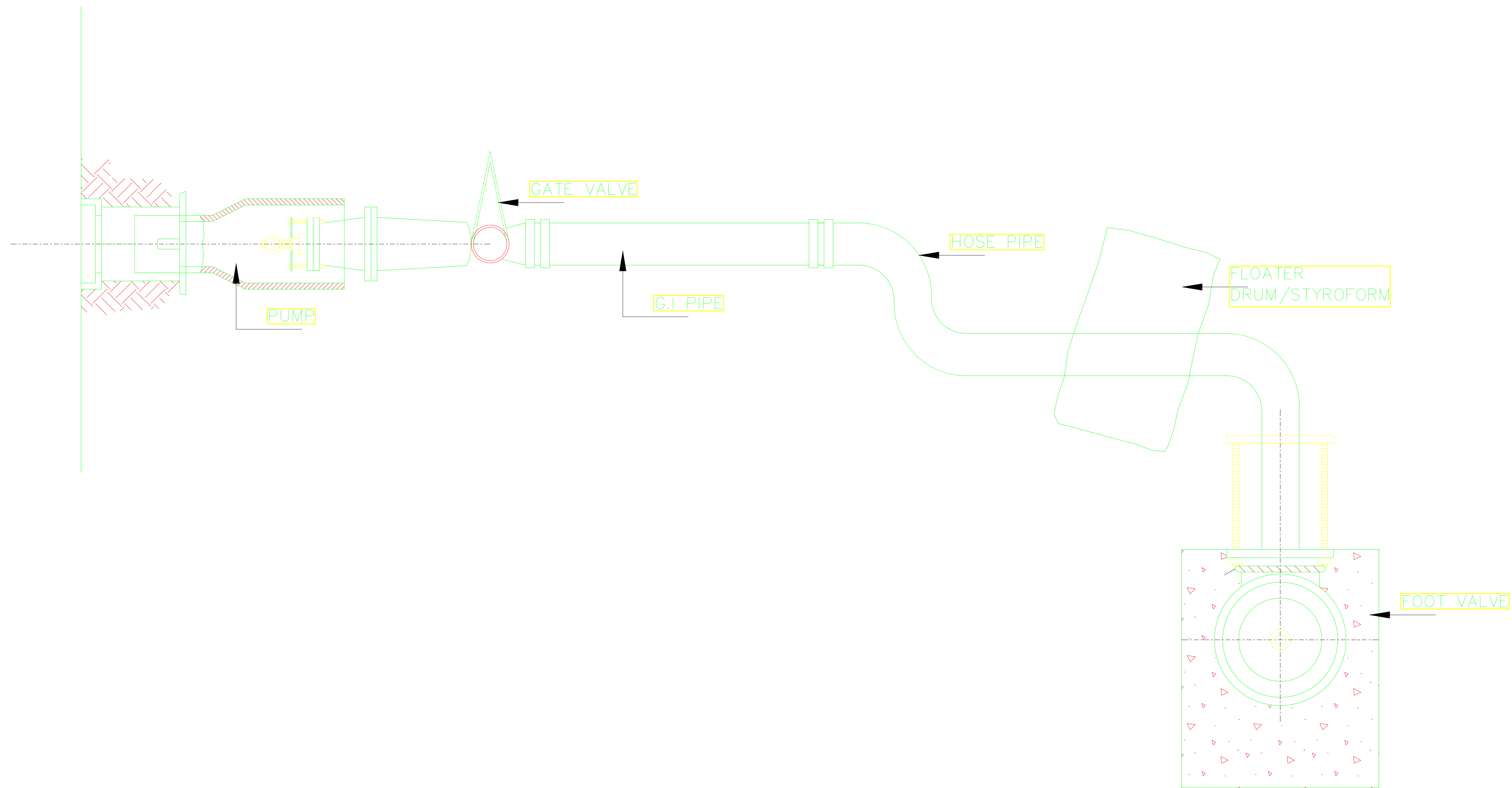
TITLE OF DRAWING:  
**SOLOLO PIPELINE EXTENSION PROFILE**  
Chainage 1+200.00 to 2+172.00

Dwg. No. **KAM/DD/203**  
Sheet No. **2/2**

Designed by: **R. KAMANDI** Date: **Aug 2023**  
 Drawn by: **MMN** Date: **Aug 2023**  
 Checked by: **R. KAMANDI** Date: **Aug 2023**  
 Approved by: **ENG ANDREW MESSO (A3007)** Date: **Aug 2023**



# SOLOLO FLOATING SUNCTION



 MARSABIT COUNTY	No.	APPROVAL	DATE	REFERENCE	CLIENT: <b>CONCERN WORLDWIDE</b>	CONSULTANT: <b>GEO CONSULTANTS</b>	PROJECT TITLE: <b>SOLOLO RAMATA AND DABEL INTEGRATED PROJECT</b>	TITLE OF DRAWING: <b>SOLOLO FLOATING SUCTION LAYOUT</b>	Designed: <b>P.K.W</b>	Date: <b>Aug 2023</b>
					 in conjunction with 			Drawn: <b>MMN</b>	Date: <b>Aug 2023</b>	
							Checked: <b>P. K.W</b>	Date: <b>Aug 2023</b>		
							DWG. No. <b>KAM/DD/203</b>	Sheet No. <b>1/1</b>	Approved: <b>ENG ANDREW MESSO (A3007)</b>	Date: <b>Aug 2023</b>



DATUM  
600m amsl

HYDRAULIC GRADE (m amsl)	
CHAINAGE (m)	1,200 659,000 660,000 000.00 1,200 651,479 652,480 017.81 1,200 651,125 652,125 020.00 1,200 647,891 648,890 040.00 1,200 647,355 648,355 060.00 1,200 646,752 647,750 080.00 1,200 647,251 648,250 100.00 1,200 648,243 649,245 120.00 1,200 647,814 648,815 140.00 1,200 646,512 647,510 160.00 1,200 644,425 645,425 180.00 1,200 641,503 642,505 200.00 1,200 637,052 638,050 220.00 1,200 632,833 633,835 240.00 1,200 628,907 629,905 260.00 1,200 626,516 627,515 280.00 1,200 625,591 626,590 300.00 1,200 624,996 625,995 320.00 1,200 624,626 625,625 340.00 1,200 624,225 625,225 360.00 1,200 624,084 625,085 380.00 1,200 623,987 624,985 400.00 1,200 623,743 624,745 420.00 1,200 623,722 624,720 440.00 1,200 623,550 624,550 460.00 1,200 623,175 624,175 480.00 1,200 622,746 623,745 500.00 1,200 622,332 623,330 520.00 1,200 621,976 622,975 540.00 1,200 621,691 622,690 560.00 1,200 621,429 622,430 580.00 1,200 620,893 621,895 600.00 1,200 620,850 621,850 620.00 1,200 620,689 621,690 640.00 1,200 620,385 621,385 660.00 1,200 620,056 621,055 680.00 1,200 619,714 620,715 700.00 1,200 619,491 620,490 720.00 1,200 619,240 620,240 740.00 1,200 618,989 619,990 760.00 1,200 618,872 619,870 780.00 1,200 618,872 619,870 800.00 1,200 618,716 619,715 820.00 1,200 618,655 619,655 840.00 1,200 618,560 619,560 860.00 1,200 618,531 619,530 880.00 1,200 618,479 619,480 900.00 1,200 618,424 619,425 920.00 1,200 618,391 619,390 940.00 1,200 618,336 619,335 960.00 1,200 618,210 619,210 980.00 1,200 618,142 619,140 1,000.00 1,200 618,071 619,070 1,020.00 1,200 617,985 618,985 1,040.00 1,200 617,915 618,915 1,060.00 1,200 617,880 618,880 1,080.00 1,200 617,754 618,755 1,100.00 1,200 617,661 618,660 1,120.00 1,200 617,565 618,565 1,140.00 1,200 617,527 618,525 1,160.00 1,200 617,462 618,460 1,180.00 1,200 617,387 618,385 1,200.00
GROUND LEVEL (m amsl)	
INVERT LEVEL (m amsl)	
TRENCH DEPTH (m)	
DESIGN FLOW (m <sup>3</sup> /s)	0.01
OFFTAKE (l/s)	
PIPE DETAILS	GI PIPE CLASS B DIA 150mm

EL static =661.00

EL static =661.00

EL static =661.00

HGL

HGL

HGL

- NOTES**
1. Dimensions are in metres unless otherwise stated.
  2. This drawing is to be read in conjunction with the designs and other relevant drawings.
  3. Scales in A1 paper size.

**LEGEND**

- EXISTING GROUND PROFILE
- PIPE INVERT

- SINGLE AIR VALVE
- DOUBLE AIR VALVE
- WASHOUT VALVE

**SCALES**

Horizontal Scale 1:2000  
Vertical Scale 1:200



MARSABIT COUNTY

No.	APPROVAL	DATE	REFERENCE

CLIENT:  
**CONCERN WORLDWIDE**

in conjunction with  
**WaterFund**  
Financing the Water Sector

CONSULTANT:  
**GEO CONSULTANTS**

PROJECT TITLE:  
**MET 1 AND MET 2 PIPELINE EXTENSION**  
**MOYALE INTERGRATED DABEL WATER SUPPLY PROJECT**

TITLE OF DRAWING:  
**MET 1 AND 2 PIPELINE PROFILE**  
**Chainage 0+000 to 1+200**

DWG. No. **KAM/DD/203**  
Sheet No. **1/2**

Designed: **P.K.W**  
Date: **Aug 2023**

Drawn: **MMN**  
Date: **Aug 2023**






Checked: **P. K.W**  
Date: **Aug 2023**

Approved: **ENG ANDREW MESSO (A3007)**  
Date: **Aug 2023**



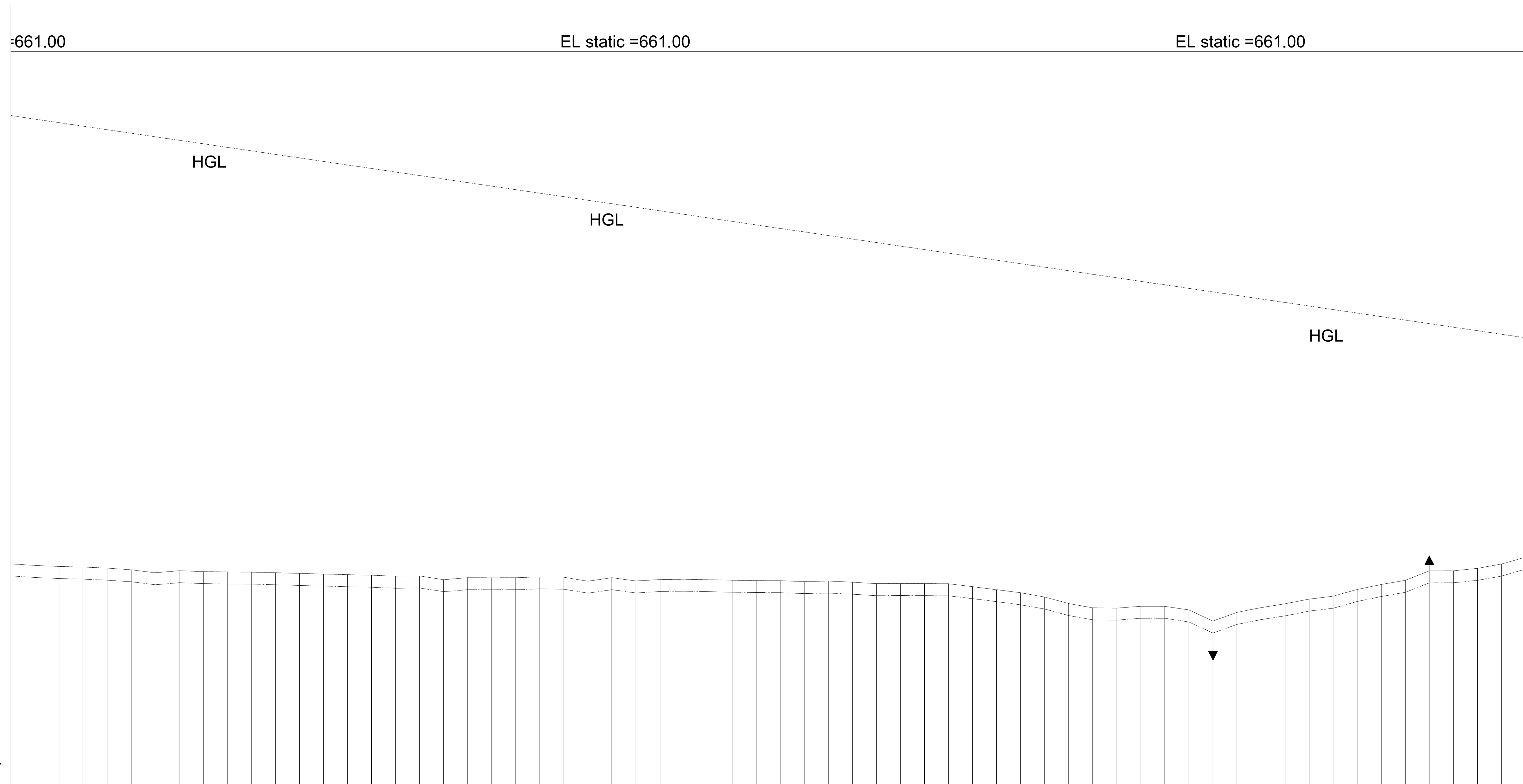
**NOTES**  
 1. Dimensions are in metres unless otherwise stated.  
 2. This drawing is to be read in conjunction with the designs and other relevant drawings.  
 3. Scales in A1 paper size.

**LEGEND**

-  EXISTING GROUND PROFILE
-  PIPE INVERT
-  SINGLE AIR VALVE
-  DOUBLE AIR VALVE
-  WASHOUT VALVE

**SCALES**

Horizontal Scale 1:2000  
 Vertical Scale 1:200



**DATUM**  
 600m amsl

HYDRAULIC GRADE (m amsl)	
CHAINAGE (m)	1.200 617.235 616.235 1220.00 1.200 617.151 616.150 1240.00 1.200 617.102 616.100 1260.00 1.200 617.017 616.015 1280.00 1.200 616.877 617.875 1300.00 1.200 616.627 617.625 1320.00 1.200 616.799 617.800 1340.00 1.200 616.725 617.725 1360.00 1.200 616.695 617.695 1380.00 1.200 616.679 617.680 1400.00 1.200 616.631 617.630 1420.00 1.200 616.571 617.570 1440.00 1.200 616.521 617.520 1460.00 1.200 616.469 617.470 1480.00 1.200 616.422 617.420 1500.00 1.200 616.342 617.340 1520.00 1.200 616.364 617.365 1540.00 1.200 616.053 617.055 1560.00 1.200 616.221 617.220 1580.00 1.200 616.214 617.215 1600.00 1.200 616.218 617.220 1620.00 1.200 616.288 617.290 1640.00 1.200 616.258 617.260 1660.00 1.200 615.925 616.925 1680.00 1.200 616.221 617.220 1700.00 1.200 615.944 616.945 1720.00 1.200 616.067 617.065 1740.00 1.200 616.090 617.090 1760.00 1.200 616.053 617.055 1780.00 1.200 616.008 617.010 1800.00 1.200 615.980 616.980 1820.00 1.200 615.967 616.965 1840.00 1.200 615.893 616.895 1860.00 1.200 615.940 616.940 1880.00 1.200 615.842 616.840 1900.00 1.200 615.719 616.720 1920.00 1.200 615.736 616.735 1940.00 1.200 615.727 616.725 1960.00 1.200 615.711 616.710 1980.00 1.200 615.474 616.475 2000.00 1.200 615.218 616.220 2020.00 1.200 614.963 615.965 2040.00 1.200 614.609 615.610 2060.00 1.200 614.067 615.065 2080.00 1.200 613.712 614.710 2100.00 1.200 613.685 614.685 2120.00 1.200 613.841 614.840 2140.00 1.200 613.836 614.835 2160.00 1.200 613.535 614.535 2180.00 1.200 612.612 613.610 2200.00 1.200 613.331 614.330 2220.00 1.200 613.729 614.730 2240.00 1.200 614.045 615.045 2260.00 1.200 614.434 615.435 2280.00 1.200 614.681 615.680 2300.00 1.200 615.237 616.235 2320.00 1.200 615.650 616.650 2340.00 1.200 615.997 616.995 2360.00 1.200 616.787 617.785 2380.00 1.200 616.790 617.790 2400.00 1.200 616.995 617.995 2420.00 1.200 617.351 618.350 2440.00 1.200 617.927 618.925 2460.00
GROUND LEVEL (m amsl)	
INVERT LEVEL (m amsl)	
TRENCH DEPTH (m)	
DESIGN FLOW (m3/s)	0.01
OFFTAKE (l/s)	
PIPE DETAILS	GI PIPE CLASS B DIA 100mm      GI PIPE CLASS B DIA 100mm      HDPE PIPE CLASS B DIA 110mm

No.	APPROVAL	DATE	REFERENCE

CLIENT:  
**CONCERN WORLDWIDE**

in conjunction with  


CONSULTANT:  
**GEO CONSULTANTS**

PROJECT TITLE:  
**MET 1 AND MET 2 PIPELINE EXTENSION**  
**MOYALE INTERGRATED DABEL WATER SUPPLY PROJECT**

TITLE OF DRAWING:  
**MET 1 AND 2 PIPELINE PROFILE**  
**Chainage 1+200 to 2+460**

DWG. No. **KAM/DD/203**      Sheet No. **2/2**

Designed: **P. K.W**      Date: **Aug 2023**  
 Drawn: **MMN**      Date: **Aug 2023**  
 Checked: **P. K.W**      Date: **Aug 2023**  
 Approved: **ENG ANDREW MESSO (A3007)**      Date: **Aug 2023**



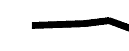






- NOTES**
1. Dimensions are in metres unless otherwise stated.
  2. This drawing is to be read in conjunction with the designs and other relevant drawings.
  3. Scales in A1 paper size.

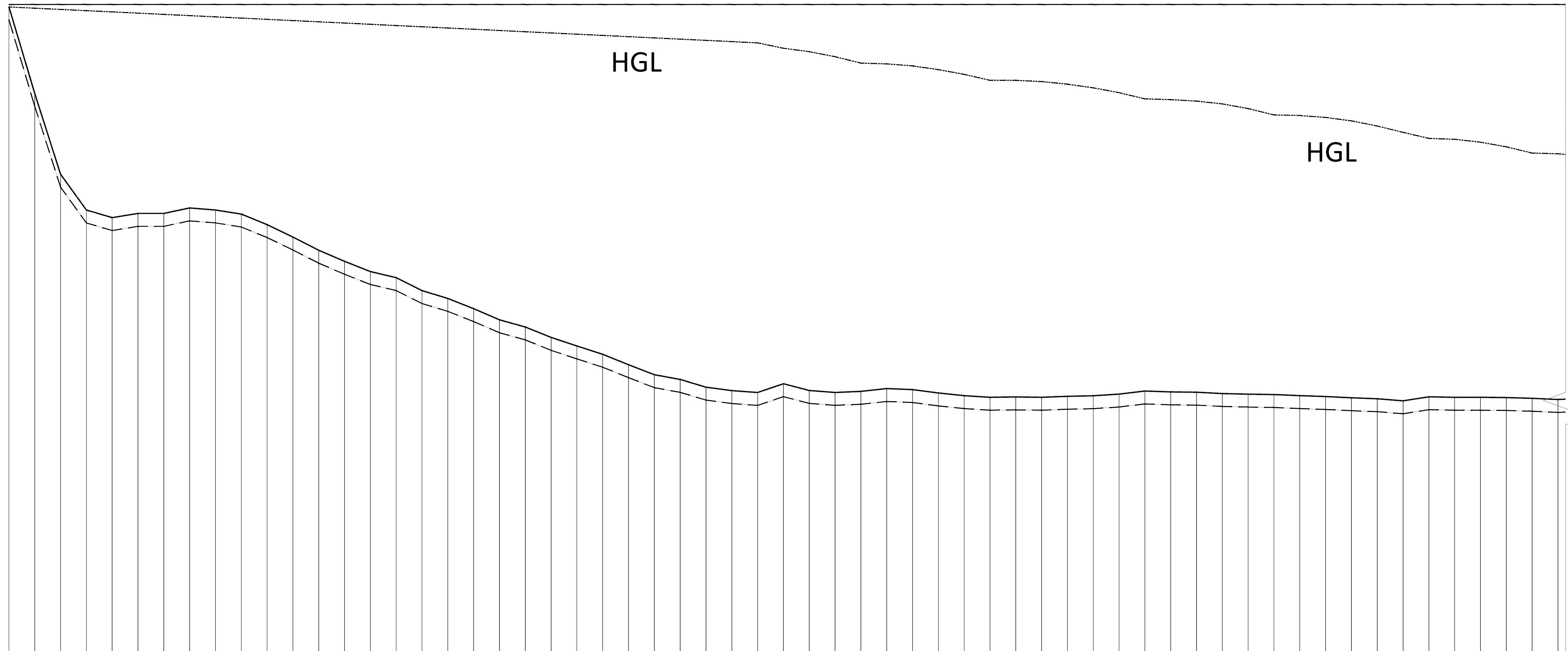
**SCALES**

Horizontal Scale 1:2000  
Vertical Scale 1:200

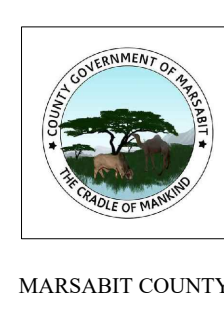
**LEGEND**

-  EXISTING GROUND PROFILE
-  PIPE INVERT
-  SINGLE AIR VALVE
-  DOUBLE AIR VALVE
-  WASHOUT VALVE

EL STATIC = 701m



DATUM 650 m amsl	
HYDRAULIC GRADE (m amsl)	
CHAINAGE (m)	000.00
GROUND LEVEL (m amsl)	700.000
INVERT LEVEL (m amsl)	699.000
TRENCH DEPTH (m)	0.000
STEADY-STATE HEAD (m)	
DESIGN FLOW (l/s)	0.003
OFFTAKE (l/s)	
PIPE DETAILS	HDPE PIPE CLASS B, Dia 110mm
BEDDING DETAILS	APPROVED BEDDING MATERIAL, COMPACTED TO 85% MPD
GRADIENT (m/km)	-335.7, -12.8, 138.7, 0.29, 5.0, 16.25, 0.00, 21.20, -7.40, 30.40, 0.05, -42.90, 30.60, 23.65, 50.05, 30.50, 39.50, 50.43, 15.27, 90.40, 25.33, 25.32, 20.40, 40.38, 65.30, 0.00, 35.13, 20.00, -7.20, 4.30, 10.85, 4.00, 4.05, -6.25, 1.30, -1.30, 3.70, 2.15, 6.45, 11.95, -3.45, -1.20, -5.20, -2.30, -1.55, -4.15, -3.50, -4.85, -3.75, -8.05, 15.60, -2.05, 0.25, -1.20, -2.85, -4.60, 4.00
VERTICAL ANGULAR DEVIATION	1.2°, 9.5°, 6.2°, 2.6°, 0.9°, 1.2°, 1.7°, 0.4°, 1.4°, 0.4°, 0.2°, 0.5°, 0.2°, 0.9°, 1.5°, 1.1°, 0.5°, 0.2°, 0.9°, 0.7°, 0.4°, 0.1°, 0.5°, 0.1°, 1.2°, 0.7°, 1.0°, 0.3°, 2.4°, 3.4°, 1.1°, 0.7°, 0.4°, 0.9°, 0.5°, 0.1°, 0.2°, 0.4°, 0.1°, 0.3°, 0.1°, 0.2°, 0.3°, 0.9°, 0.1°, 0.2°, 0.2°, 0.0°, 0.1°, 0.0°, 0.1°, 0.1°, 0.1°, 0.1°, 0.1°, 0.1°, 0.1°, 0.5°



No.	APPROVAL	DATE	REFERENCE

CLIENT:  
**CONCERN WORLDWIDE**

in conjunction with  
**WaterFund**  
Financing the Water Sector

CONSULTANT:  
**GEO CONSULTANTS**

PROJECT TITLE:  
**SOLOLO RAMATA AND DABEL INTEGRATED PROJECT**

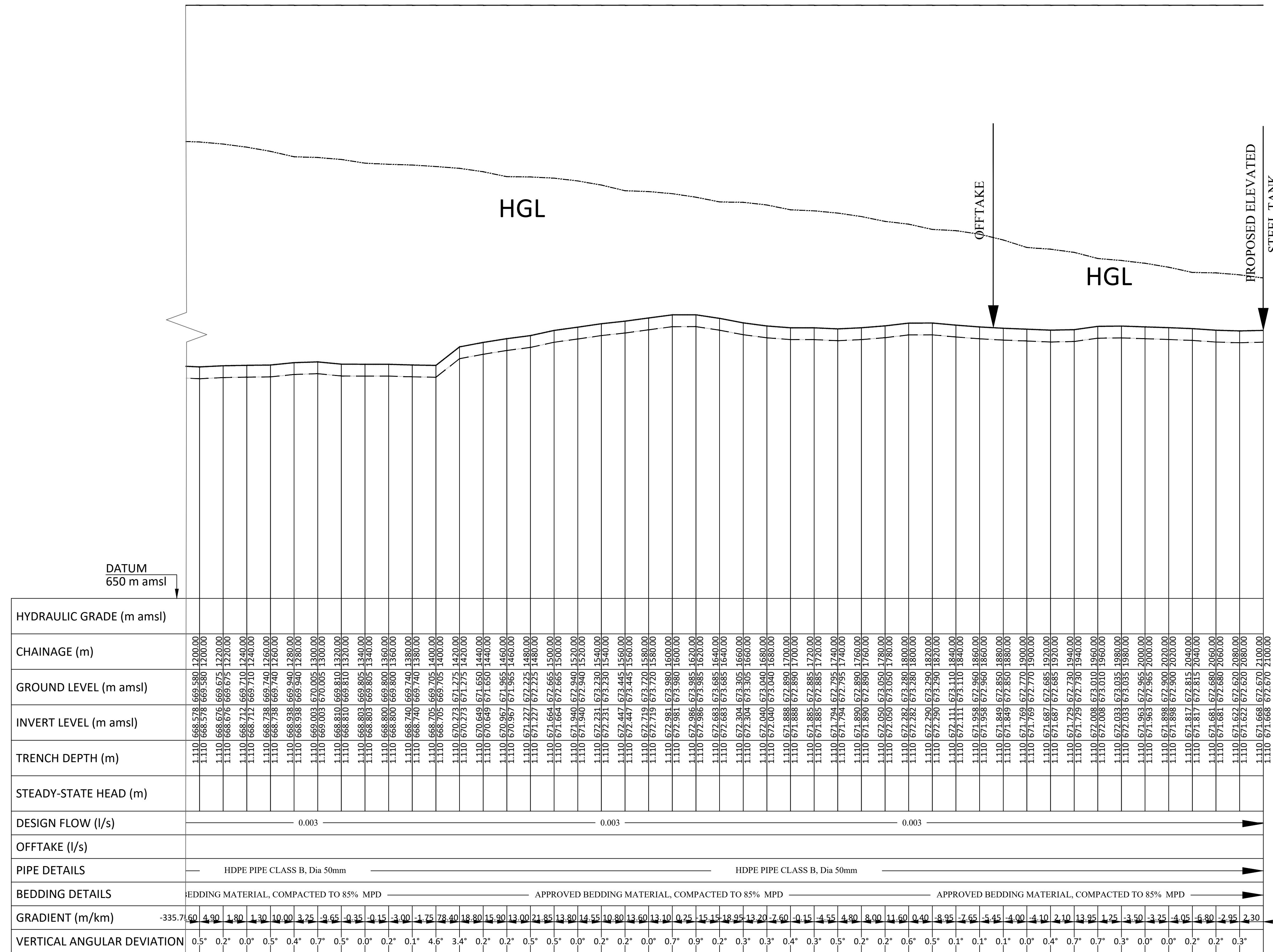
TITLE OF DRAWING:  
**DABEL ELDERA BOREHOLE PIPELINE TO TANK PROFILE**  
Chainage 0+000 to 1+200.00

Dwg. No. **KAM/DD/203/10**  
Sheet No. **1/2**

Designed: <b>P. K.W</b>	Date: <b>Aug 2023</b>
Drawn: <b>MMN</b>	Date: <b>Aug 2023</b>
Checked: <b>P. K.W</b>	Date: <b>Aug 2023</b>
Approved: <b>ENG ANDREW MESSO (A3007)</b>	Date: <b>Aug 2023</b>



EL STATIC = 701m



**NOTES**  
 1. Dimensions are in metres unless otherwise stated.  
 2. This drawing is to be read in conjunction with the designs and other relevant drawings.  
 3. Scales in A1 paper size.

**SCALES**  
 Horizontal Scale 1:2000  
 Vertical Scale 1:200

**LEGEND**

- EXISTING GROUND PROFILE
- PIPE INVERT
- SINGLE AIR VALVE
- DOUBLE AIR VALVE
- WASHOUT VALVE



No.	APPROVAL	DATE	REFERENCE

CLIENT:  
**CONCERN WORLDWIDE**

in conjunction with  
**WaterFund**  
 Financing the Water Sector

CONSULTANT:  
**GEO CONSULTANTS**

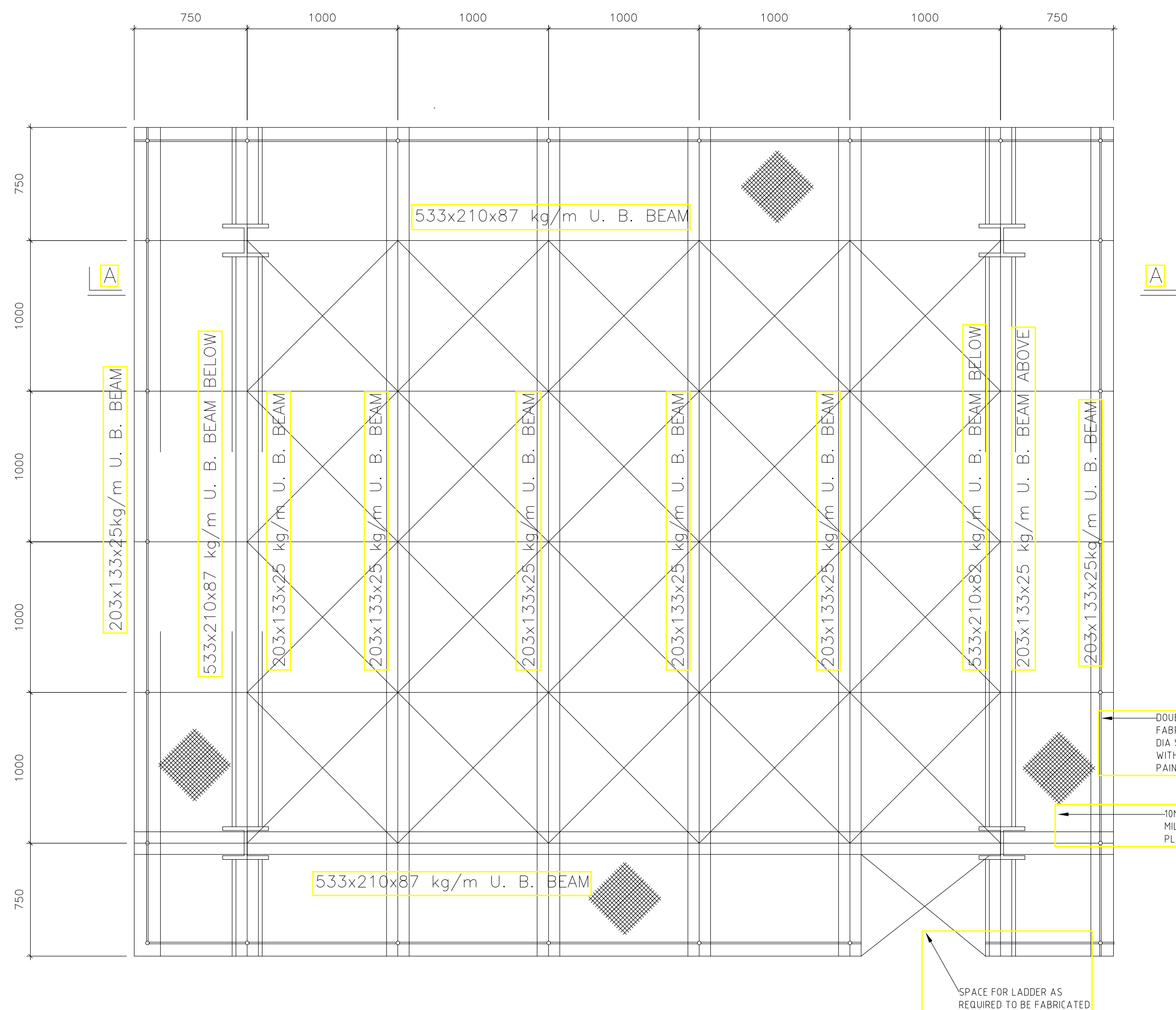
PROJECT TITLE:  
**SOLOLO RAMATA AND DABEL INTEGRATED PROJECT**

TITLE OF DRAWING:  
**DABEL ELDERA BOREHOLE PIPELINE TO TANK PROFILE**  
 Chainage 1+200.00 to 2+100.00

DWG. No. **KAM/DD/203** Sheet No. **2/2**

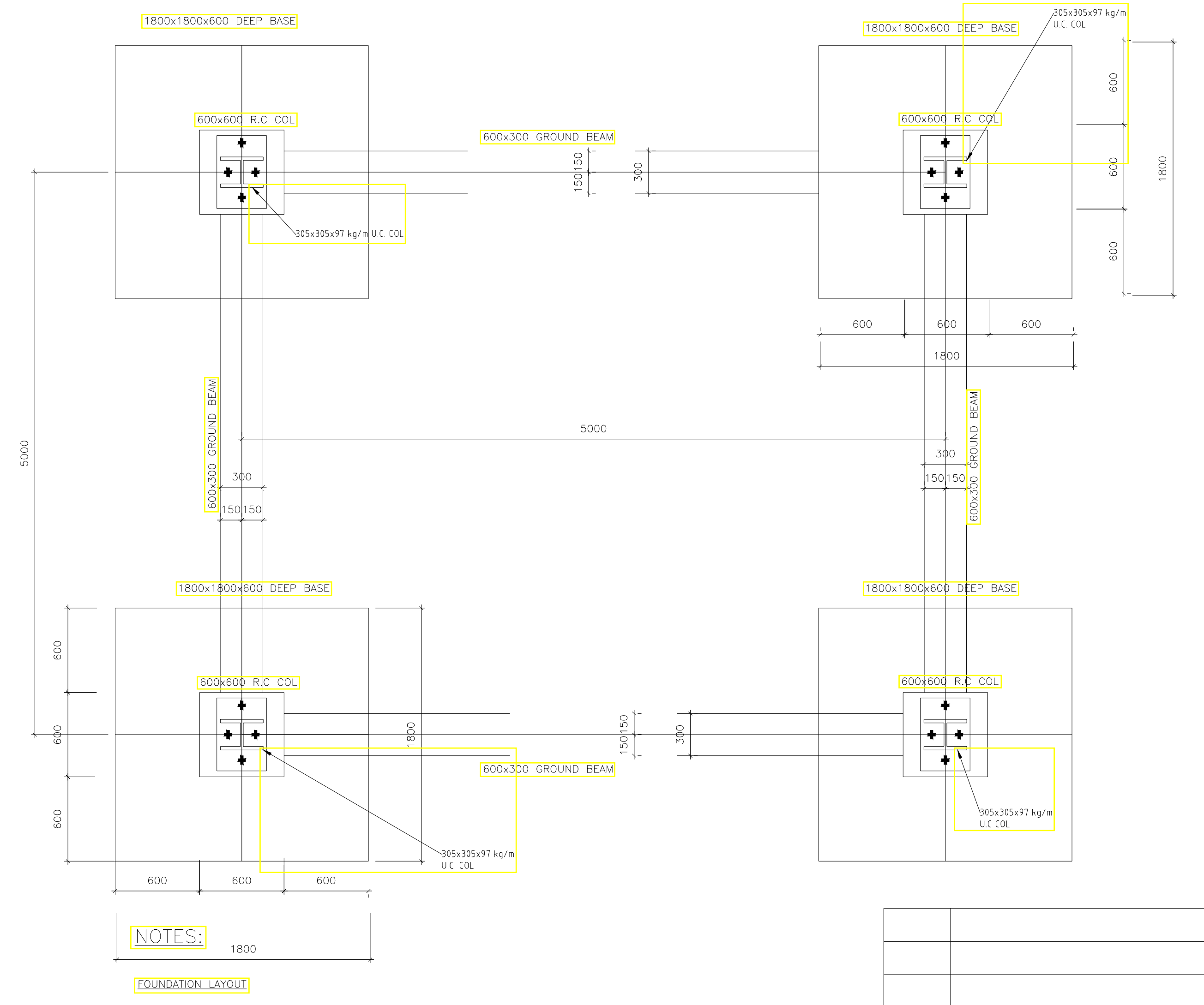
Designed: <b>P. K.W</b>	Date: <b>Aug 2023</b>
Drawn: <b>MMN</b>	Date: <b>Aug 2023</b>
Checked: <b>P. K.W</b>	Date: <b>Aug 2023</b>
Approved: <b>ENG ANDREW MESSO (A3007)</b>	Date: <b>Aug 2023</b>





**NOTES:**

1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED.
2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL RELEVANT DRAWINGS.
3. ALL DIMENSIONS MUST BE CHECKED ON SITE BEFORE COMMENCING ANY WORK & IF ANY DISCREPANCY IN DIMENSIONING TO BE REPORTED TO THE ENGINEER IMMEDIATELY.
4. DRAWING TO SCALE IN A1 SIZE.
5. ONLY FIGURED DIMENSION TO BE TAKEN FROM THIS DRAWING.

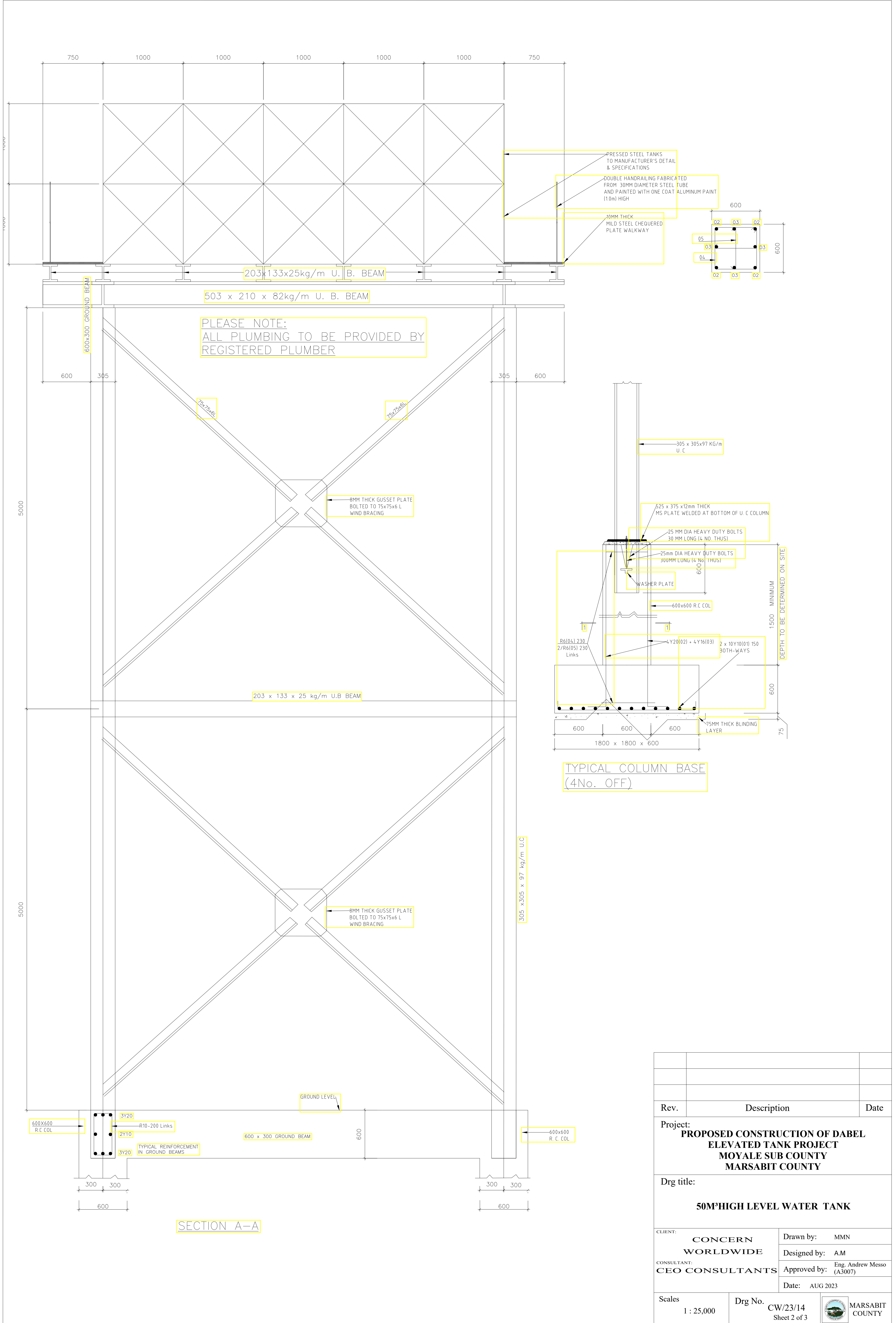


**NOTES:**

**FOUNDATION LAYOUT**

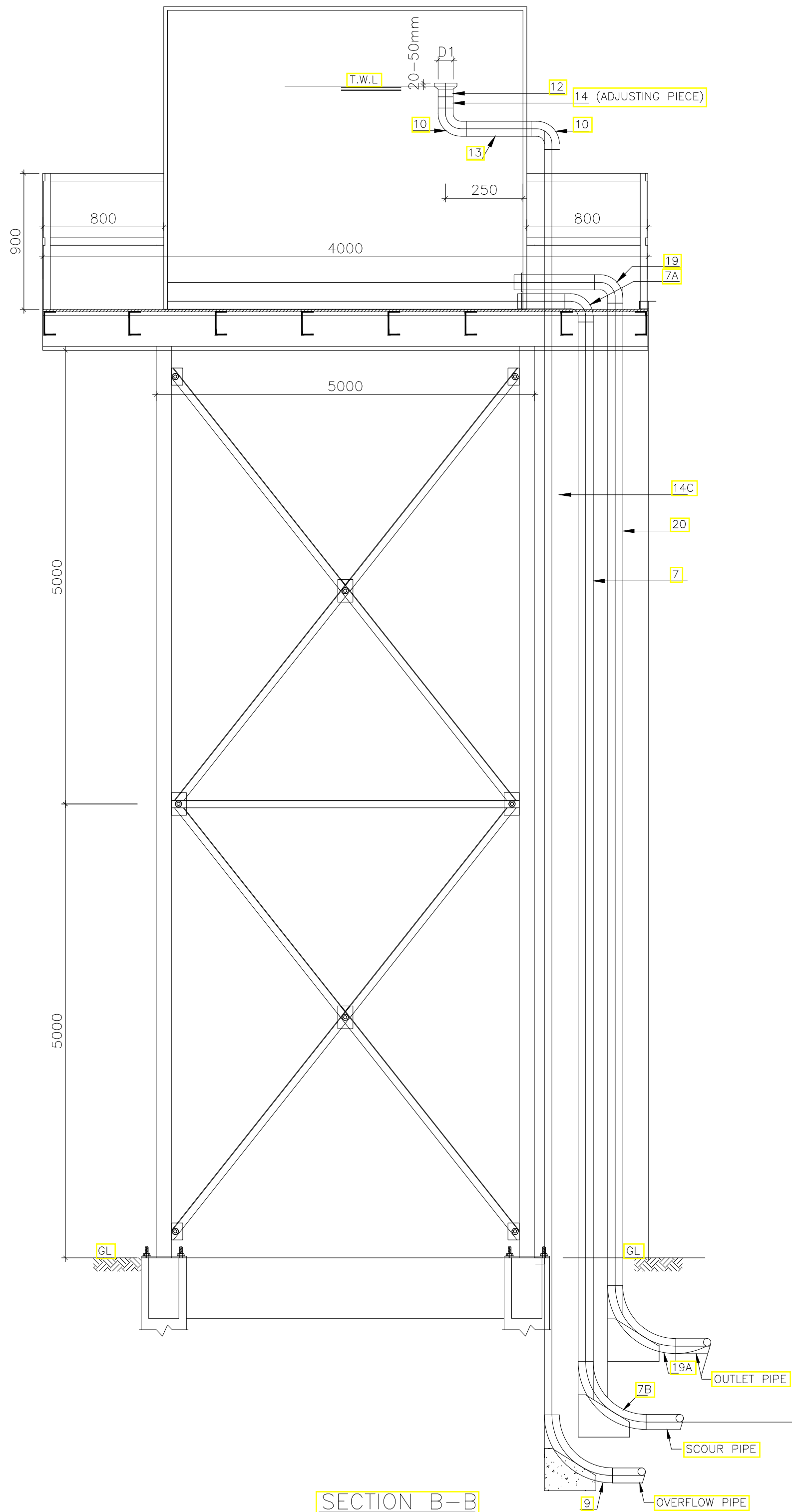
Rev.	Description	Date
Project: <b>PROPOSED CONSTRUCTION OF DABEL ELEVATED TANK PROJECT MOYALE SUB COUNTY MARSABIT COUNTY</b>		
Drg title: <b>50M<sup>H</sup>HIGH LEVEL WATER TANK</b>		
CLIENT: <b>CONCERN WORLDWIDE</b>		Drawn by: MMN
CONSULTANT: <b>GEO CONSULTANTS</b>		Designed by: A.M
		Approved by: Eng. Andrew Messo (A3007)
		Date: AUG 2023
Scales 1 : 25,000	Drg No. CW/23/13 Sheet 1 of 3	MARSABIT COUNTY





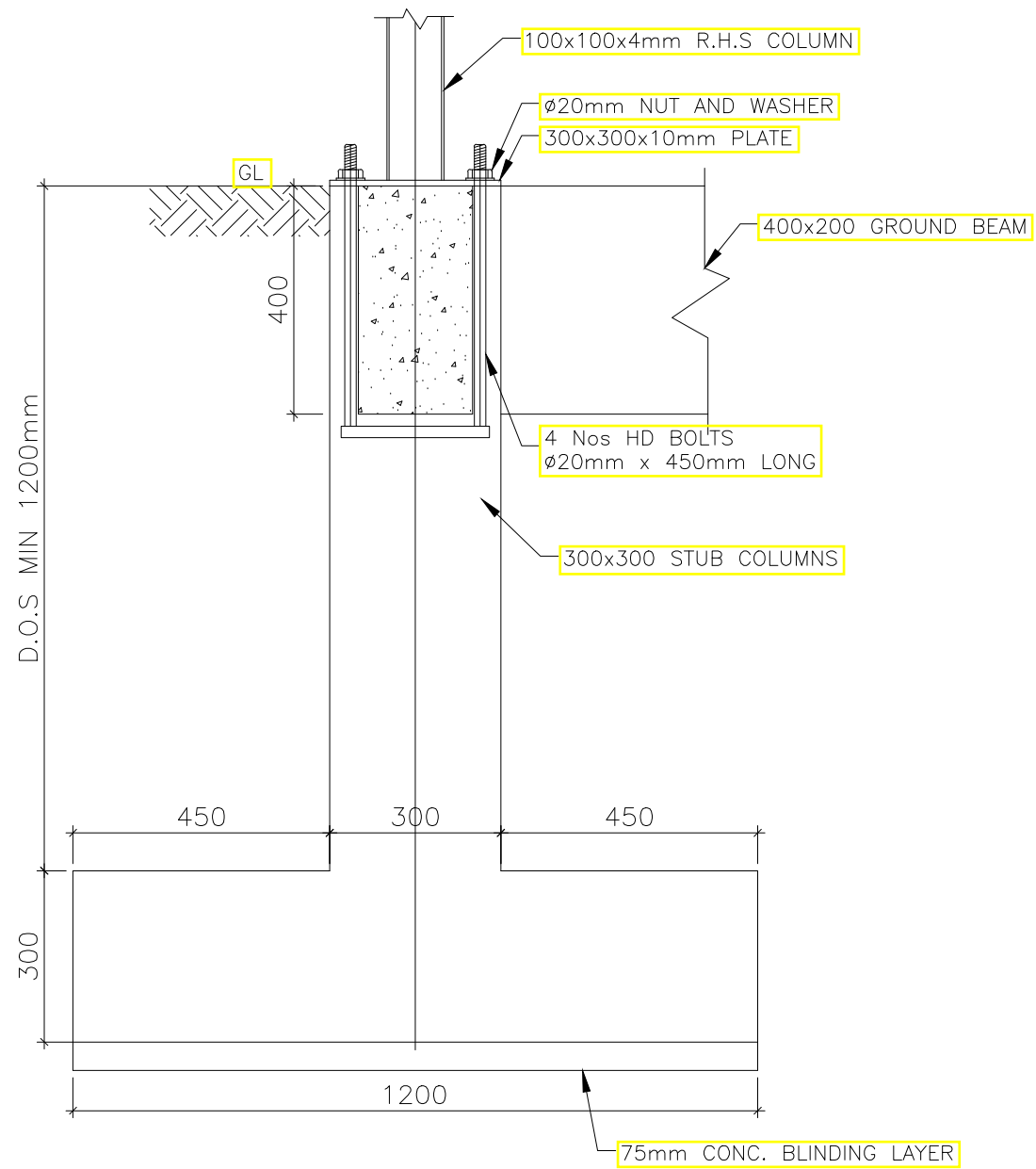
Rev.	Description	Date
<b>Project:</b> <b>PROPOSED CONSTRUCTION OF DABEL ELEVATED TANK PROJECT</b> <b>MOYALE SUB COUNTY</b> <b>MARSABIT COUNTY</b>		
<b>Drg title:</b> <b>50M<sup>H</sup>HIGH LEVEL WATER TANK</b>		
<b>CLIENT:</b> <b>CONCERN WORLDWIDE</b>		Drawn by: MMN Designed by: A.M
<b>CONSULTANT:</b> <b>CEO CONSULTANTS</b>		Approved by: Eng. Andrew Messo (A3007) Date: AUG 2023
<b>Scales</b> 1 : 25,000	<b>Drg No.</b> CW/23/14 Sheet 2 of 3	<b>MARSABIT COUNTY</b>



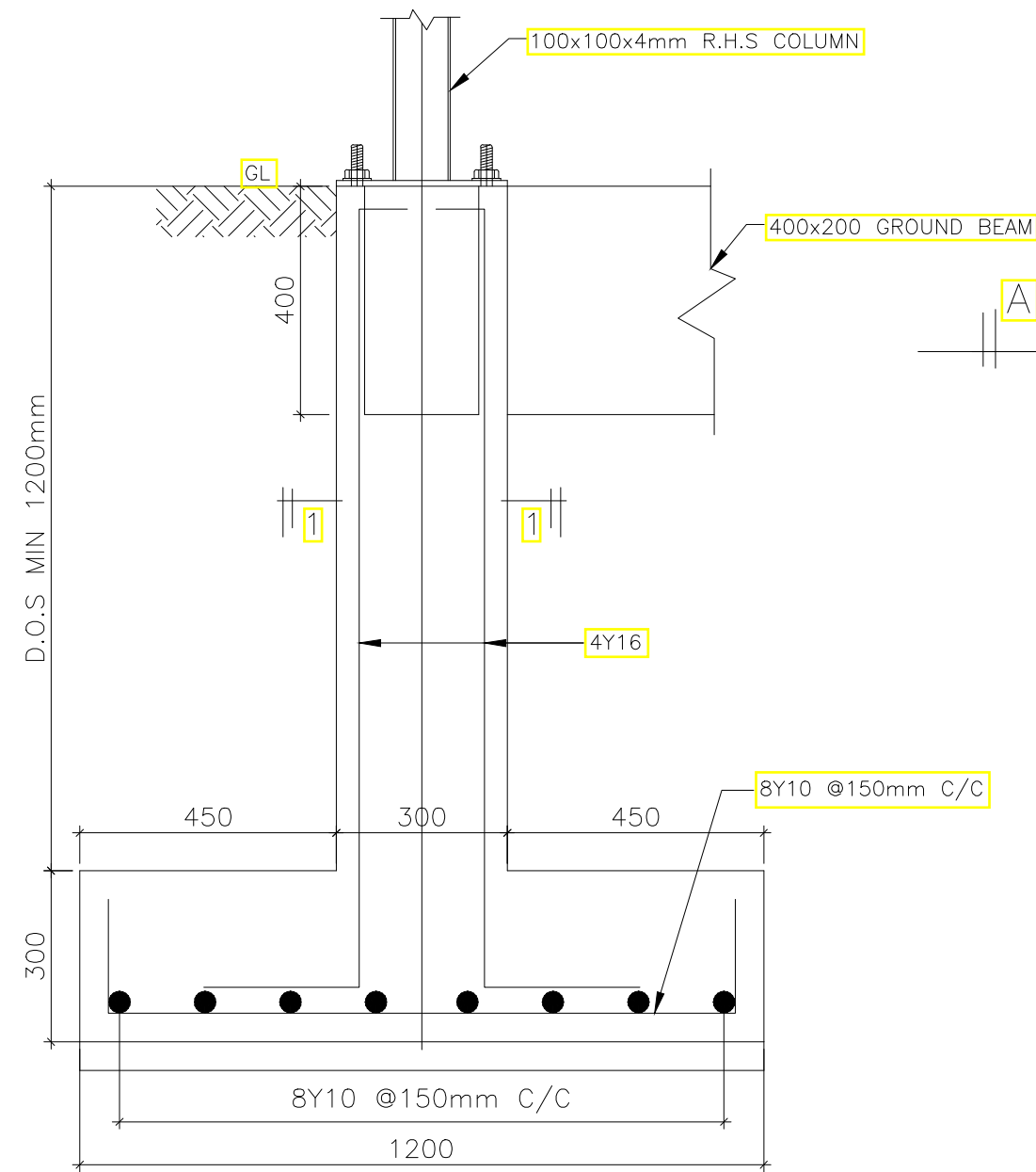


SECTION B-B  
OVERFLOW PIPE  
SCALE 1:20

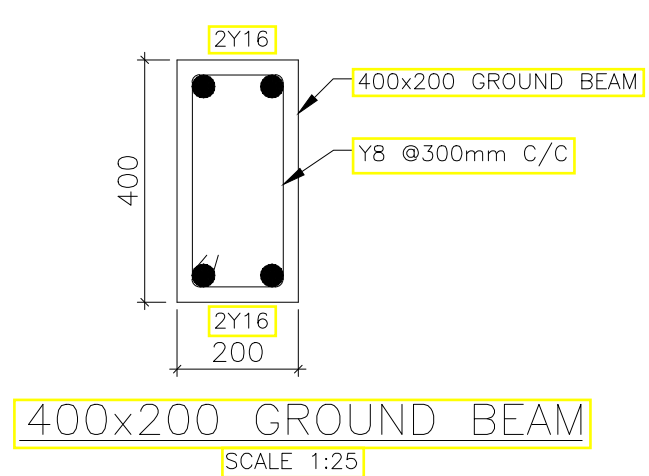
PIPE INSTALLATIONS				
POS. No.	FITTING	DIA.	No.	REMARKS
1	FLANGED SLUICE VALVE	100	1	
2	VIKING JOHNSON FLANGE ADAPTOR	100	1	
3	HEXAGONAL NIPPLE	100	1	
4	SCREWED FLANGE	100	1	
5	PIPE THREADED BOTH ENDS	100	1	LENGTH TO BE CUT ON SIZE
6	FLEXIBLE COUPLING (FC)	100	1	
7	PIPE ONE END THREADED ONE PLAIN, ONE PIECE WITH PUDDLE FLANGE	100	2	LENGTH TO BE CUT ON SIZE
7A	ROUND ELBOW (F)	100	1	
7B	BEND 90° (F)	100	1	
8	TEE EQUAL (F)	100	1	
9	BEND 90° (F)	100	2	
10	ROUND ELBOW (F)	100	2	
11	HEXAGON NIPPLE	100	1	
12	REDUCING SOCKET (F)	100	1	SEE NOTES ON OVERFLOW PIPE
13	PIPE THREADED BOTH ENDS	100	1	L = 600mm
14	PIPE ONE END THREADED, ONE END PLAIN WITH PUDDLE FLANGE	100	1	LENGTH TO BE CUT ON SITE
14A	FLEXIBLE COUPLING (FC)	100	1	
14B	PIPE ONE END THREADED, ONE END PLAIN	100	1	LENGTH TO BE CUT ON SITE
14C	PIPE THREADED BOTH ENDS	100	1	LENGTH TO BE CUT ON SITE
15	STEPPED FLEXIBLE COUPLING (SFC)	100	1	
15A	PIPE ONE END THREADED, ONE END PLAIN, WITH PUDDLE FLANGE	100	1	LENGTH TO BE CUT ON SITE
16	SLUICE VALVE FLANGED	80	2	
17	TEE EQUAL (F)	80	1	
18	VIKING JOHNSON FLANGE ADAPTOR	80	2	
19	ROUND ELBOW (F)	80	1	
19A	BEND 90° (F)	80	1	
20	PIPE THREADED BOTH ENDS	80	1	LENGTH TO BE CUT ON SITE
21	PIPE THREADED BOTH ENDS	80	1	L = 600mm
22	FLEXIBLE COUPLING (FC)	80	1	
23	PIPE PLAIN BOTH ENDS, WITH PUDDLE FLANGE	80	2	LENGTH TO BE CUT ON SITE
24	BALL VALVE FLANGED	100	1	
25	ROUND ELBOW (F)	100	1	
26	BEND 90° (F)	100	1	
27	PIPE THREADED BOTH ENDS	100	1	L = 600mm
28	SCREWED FLANGE	100	2	
29	PIPE PLAIN BOTH ENDS, WITH PUDDLE FLANGE	100	1	LENGTH TO BE CUT ON SITE
30	PIPE THREADED BOTH ENDS	100	2	LENGTH TO BE CUT ON SITE
30A	FLEXIBLE COUPLING (FC)	100	1	
31	VIKING JOHNSON FLANGE ADAPTOR	100	1	
32	SLUICE VALVE FLANGED	100	1	
33	TEE EQUAL (F)	100	1	LENGTH TO BE CUT ON SITE
34	REDUCER	100/80	1	
35	STEPPED FLEXIBLE COUPLING (SFC)	100	1	
35A	PIPE ONE END FLANGED, ONE END PLAIN, WITH PUDDLE FLANGE	100	1	LENGTH TO BE CUT ON SITE



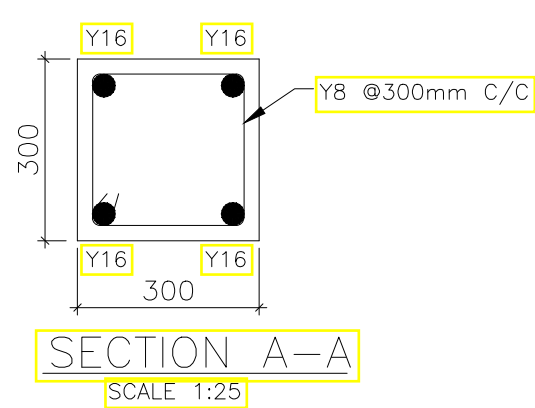
STUB COLUMN DETAIL  
SCALE 1:25



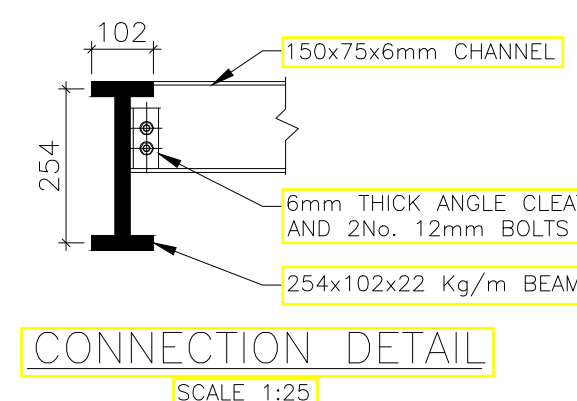
STUB COLUMN R.C DETAIL  
SCALE 1:25



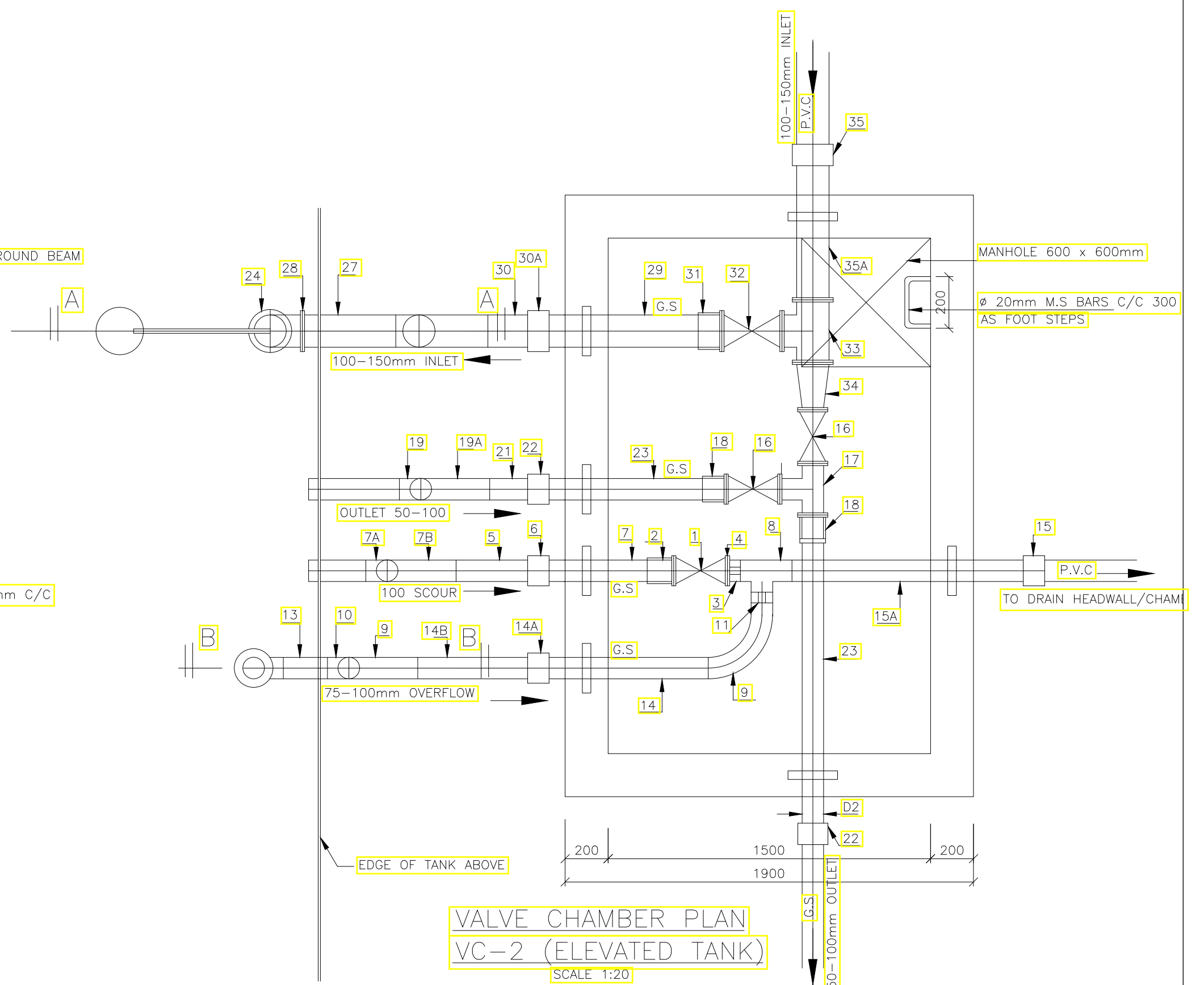
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SCALE 1:25



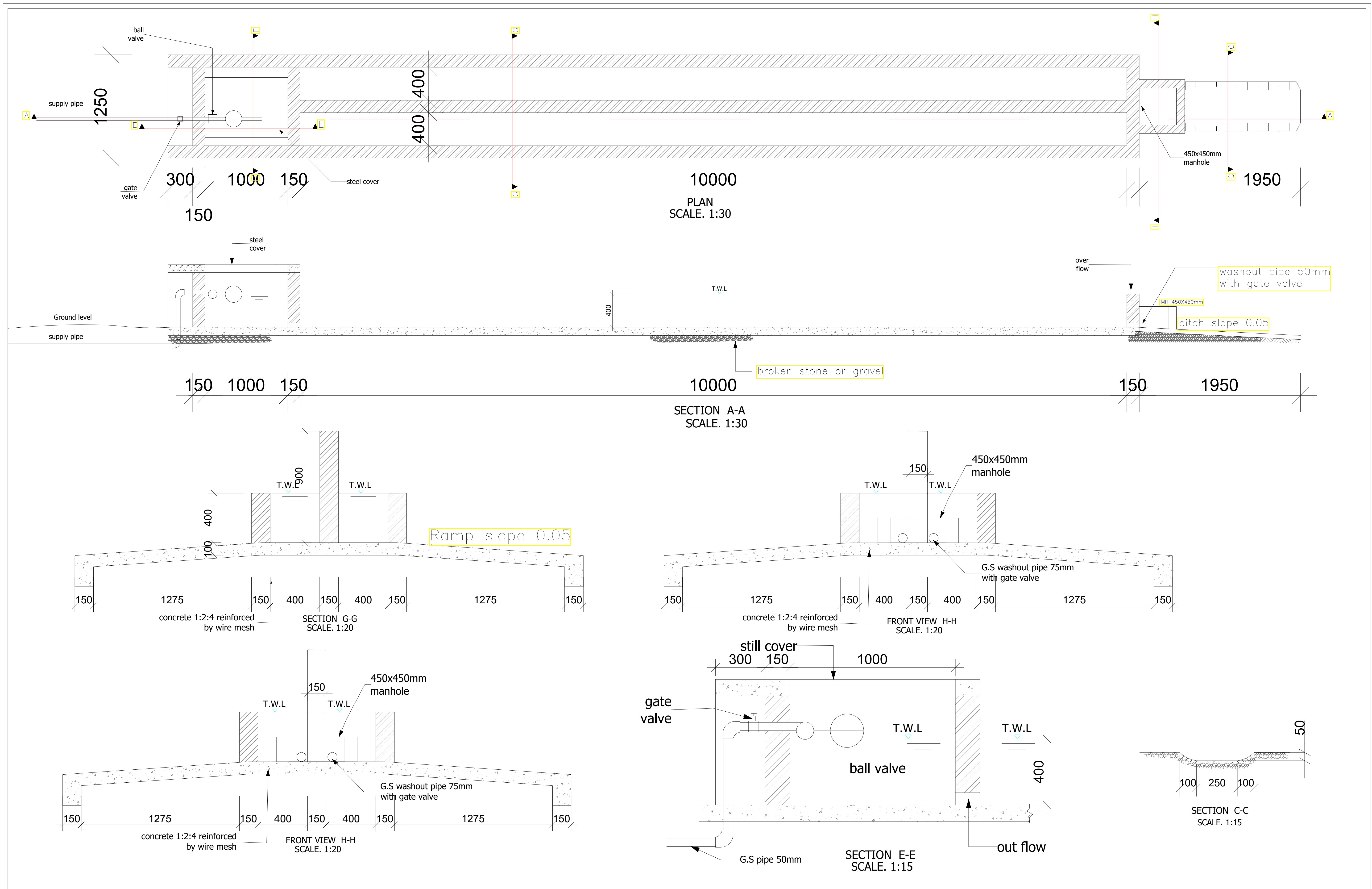
SCALE 1:25



VALVE CHAMBER PLAN  
VC-2 (ELEVATED TANK)  
SCALE 1:20

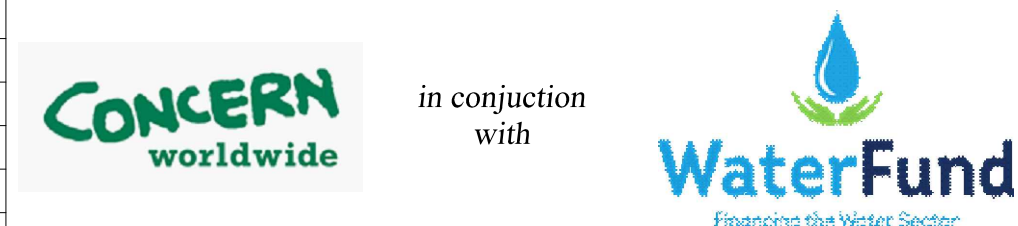
Rev.	Description	Date
Project: <b>PROPOSED CONSTRUCTION OF LABEL ELEVATED TANK PROJECT MOYALE SUB COUNTY MARSABIT COUNTY</b>		
Drg title: <b>50M<sup>3</sup> HIGH LEVEL WATER TANK</b>		
CLIENT: <b>CONCERN WORLDWIDE</b>	Drawn by: MMN	
CONSULTANT: <b>CEO CONSULTANTS</b>	Designed by: A.M	
	Approved by: Eng. Andrew Messo (A3007)	
	Date: AUG 2023	
Scales 1 : 25,000	Drg No. CW/23/12 Sheet 3 of 3	MARSABIT COUNTY



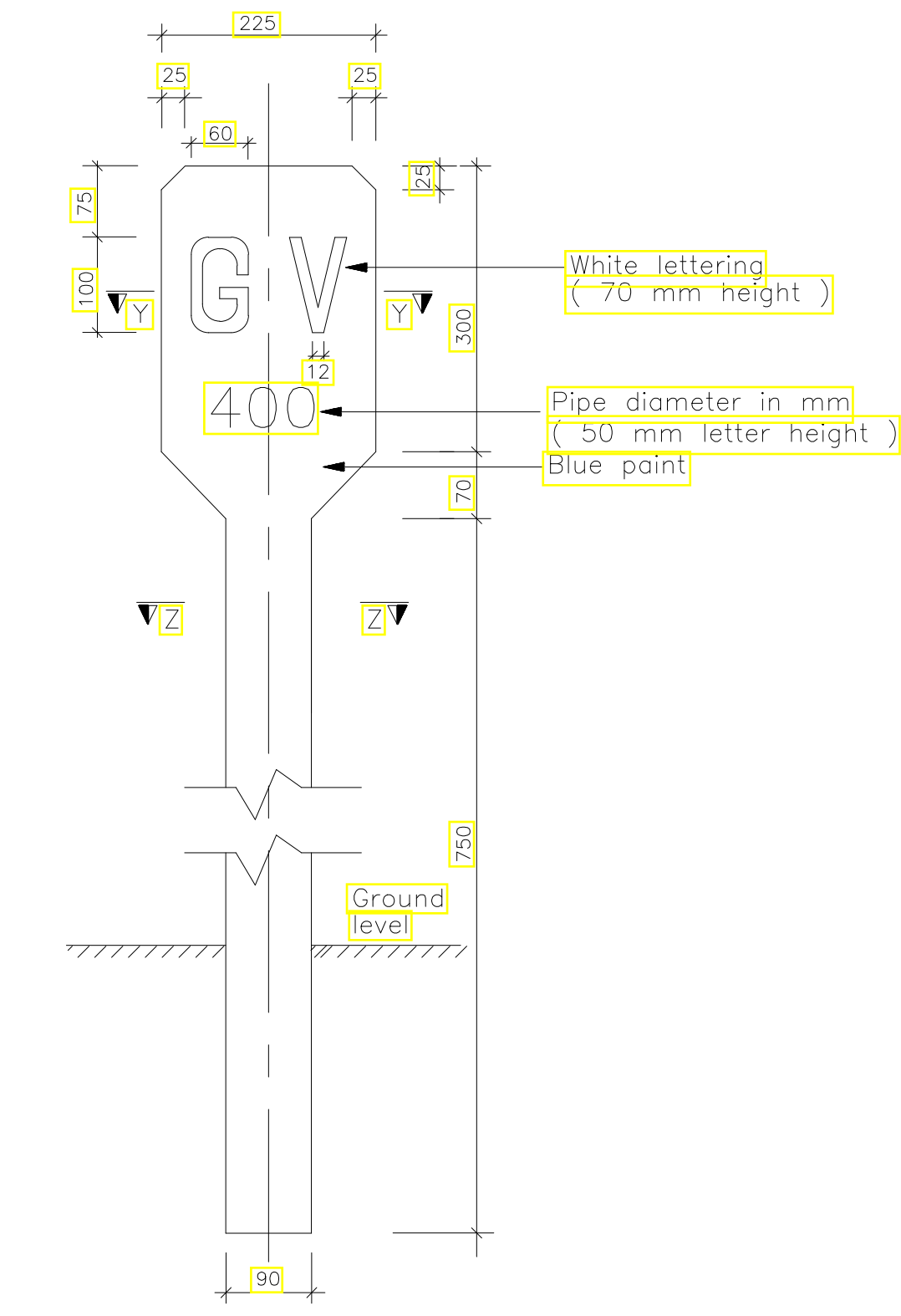


DRAWING TO SCALE IN A2 SIZE

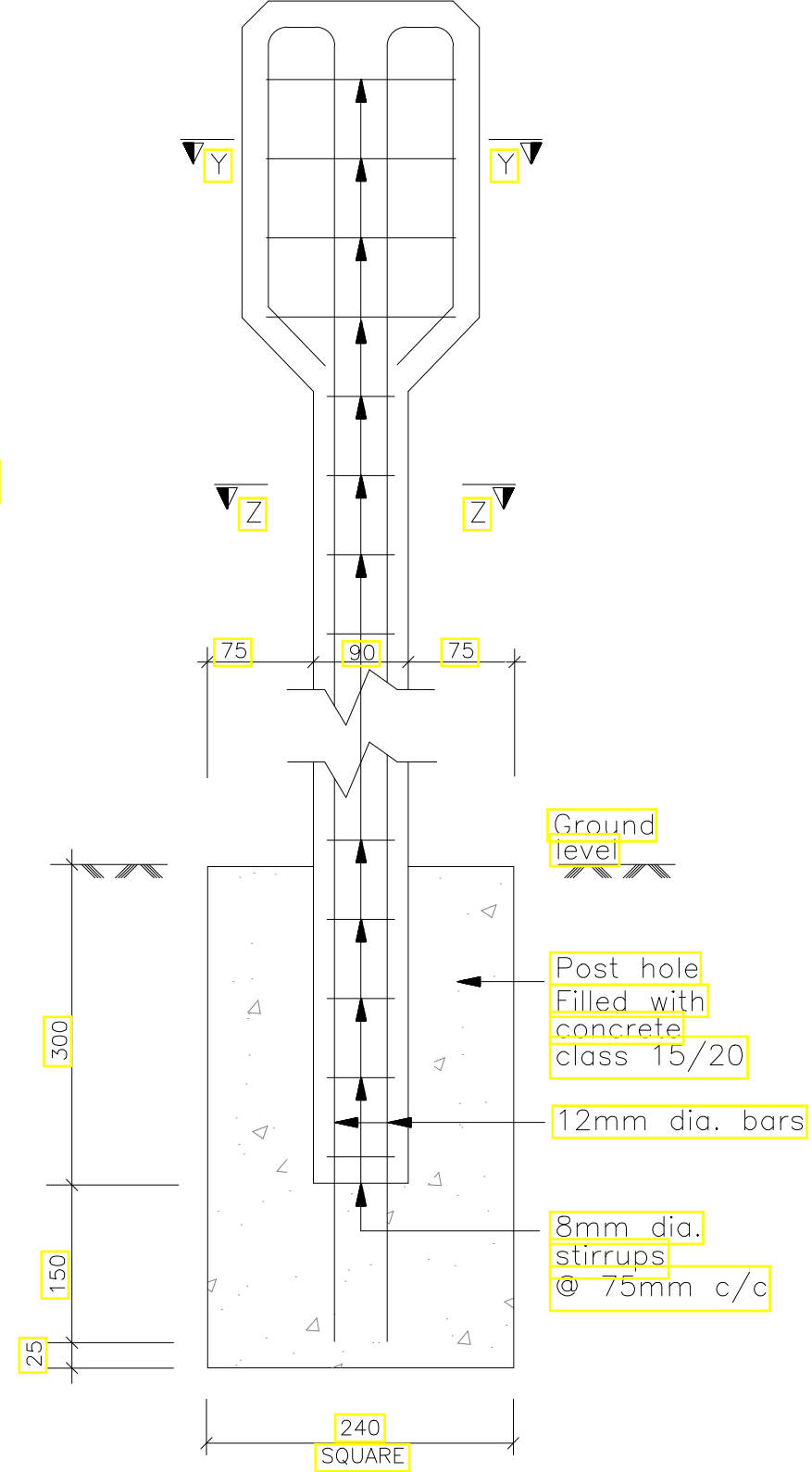
No.	APPROVAL	DATE	REFERENCE	CLIENT:	CONSULTANT:	PROJECT TITLE:	TITLE OF DRAWING:	Designed:	Date:
				CONCERN WORLDWIDE	GEO CONSULTANTS	DABEL WATER PROJECT	DABEL WATER	P. K.W	Aug 2023
				in conjunction with		MOYALE INTEGRATED PROJECT	WATERING TROUGH DETAILS	MMN	Aug 2023
				WaterFund				P. K.W	Aug 2023
								Approved:	Date:
								ENG ANDREW MESSO (A3007)	Aug 2023
							DWG. No. KAM/DD/203/16	Sheet No. 1/1	



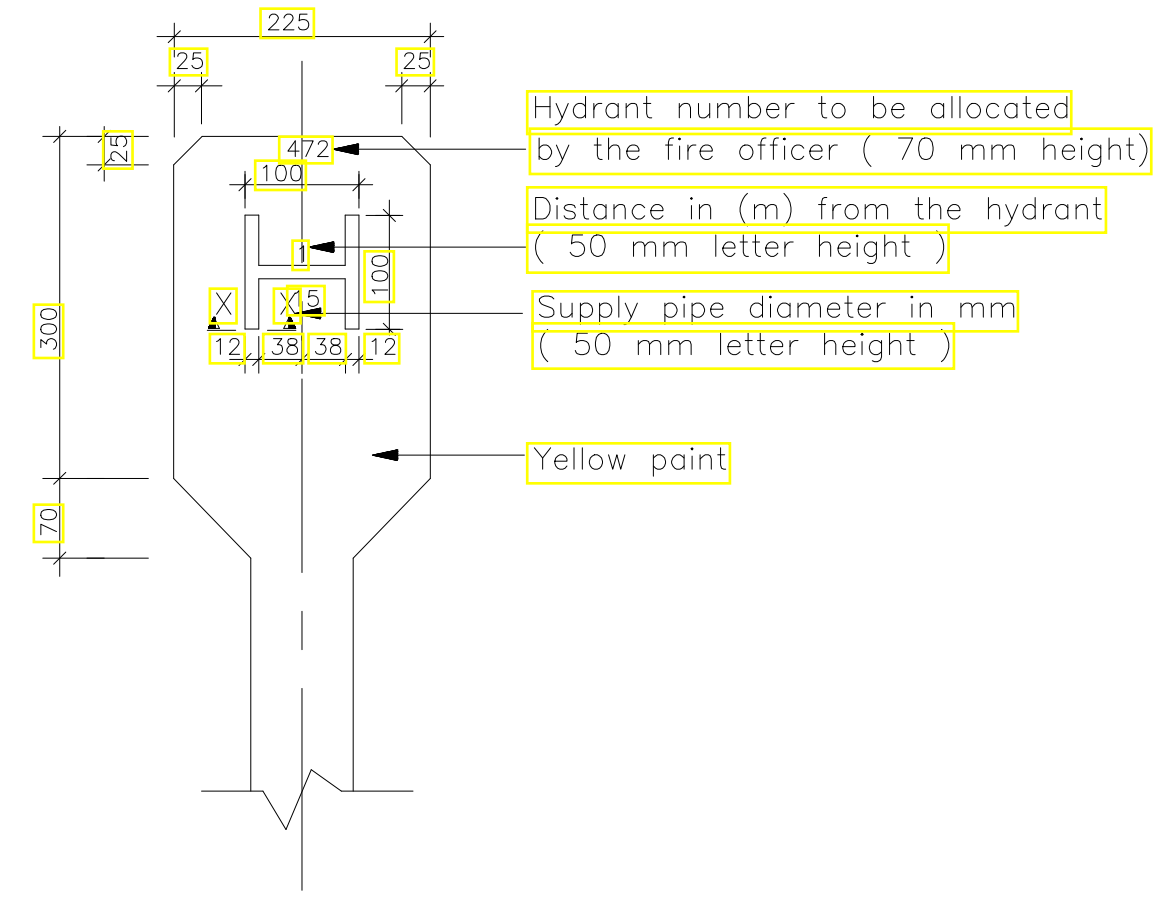




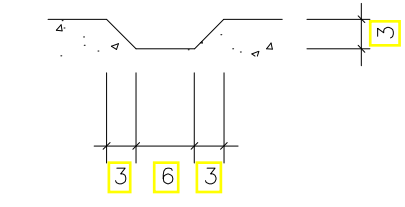
GATE VALVE INDICATOR POST  
SCALE 1:10



INDICATOR POST REINFORCEMENT  
DETAILS  
SCALE 1:10

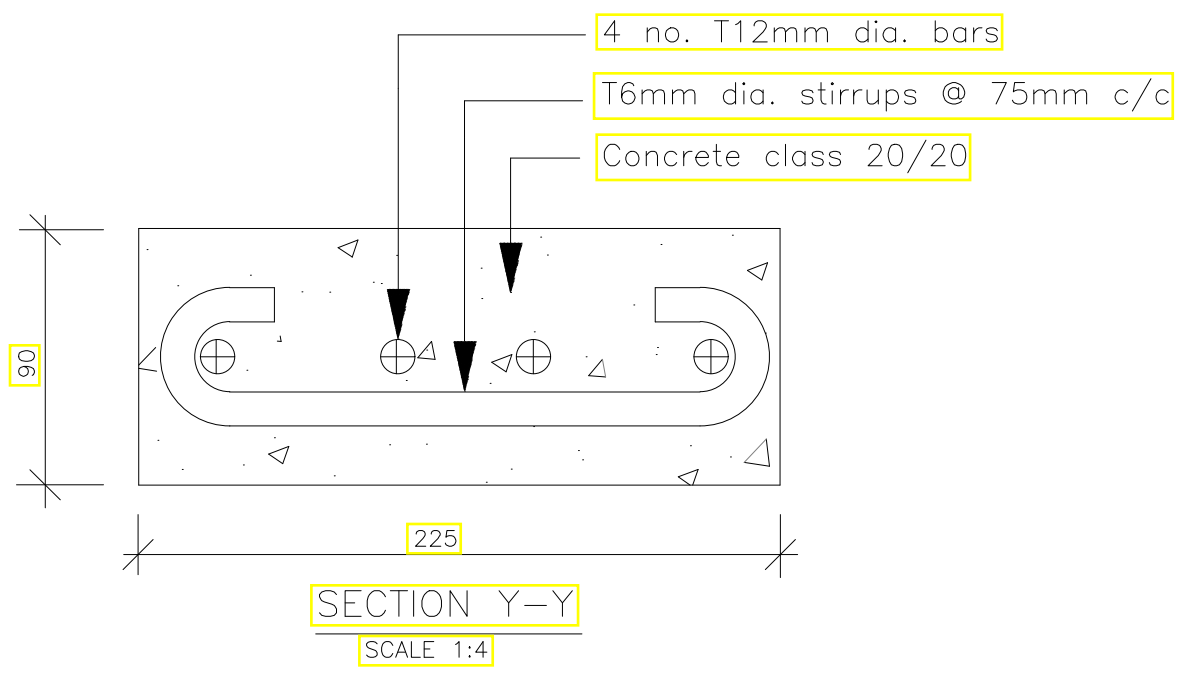


FIRE HYDRANT POST  
SCALE 1:10

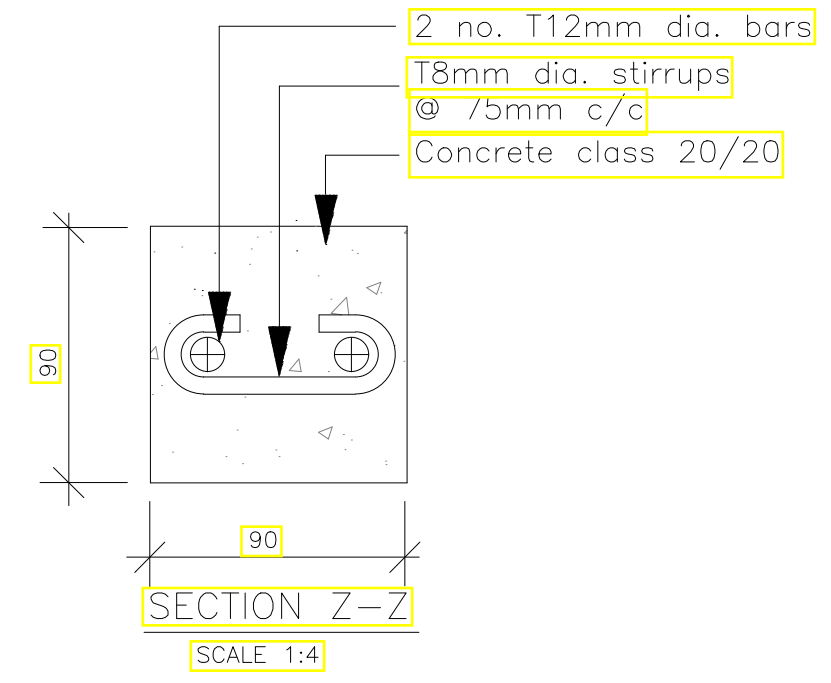


SECTION X-X  
N.T.S.

- NOTES**
- All dimensions are in mm unless otherwise stated.
  - Details for indicator posts to be as for gate valve but lettering to be as follows
- |              |     |
|--------------|-----|
| FOR          | USE |
| gate valve   | GV  |
| air valve    | AV  |
| washout      | WO  |
| fire hydrant | H   |
| water main   | WM  |
| bulk meter   | M   |
- All indicator posts except fire hydrant posts to be painted with 2 coats blue oil based paint and lettering to engineer's approval.
  - Maker posts to be positioned in safe locations where possible against boundary of road reserve



SECTION Y-Y  
SCALE 1:4

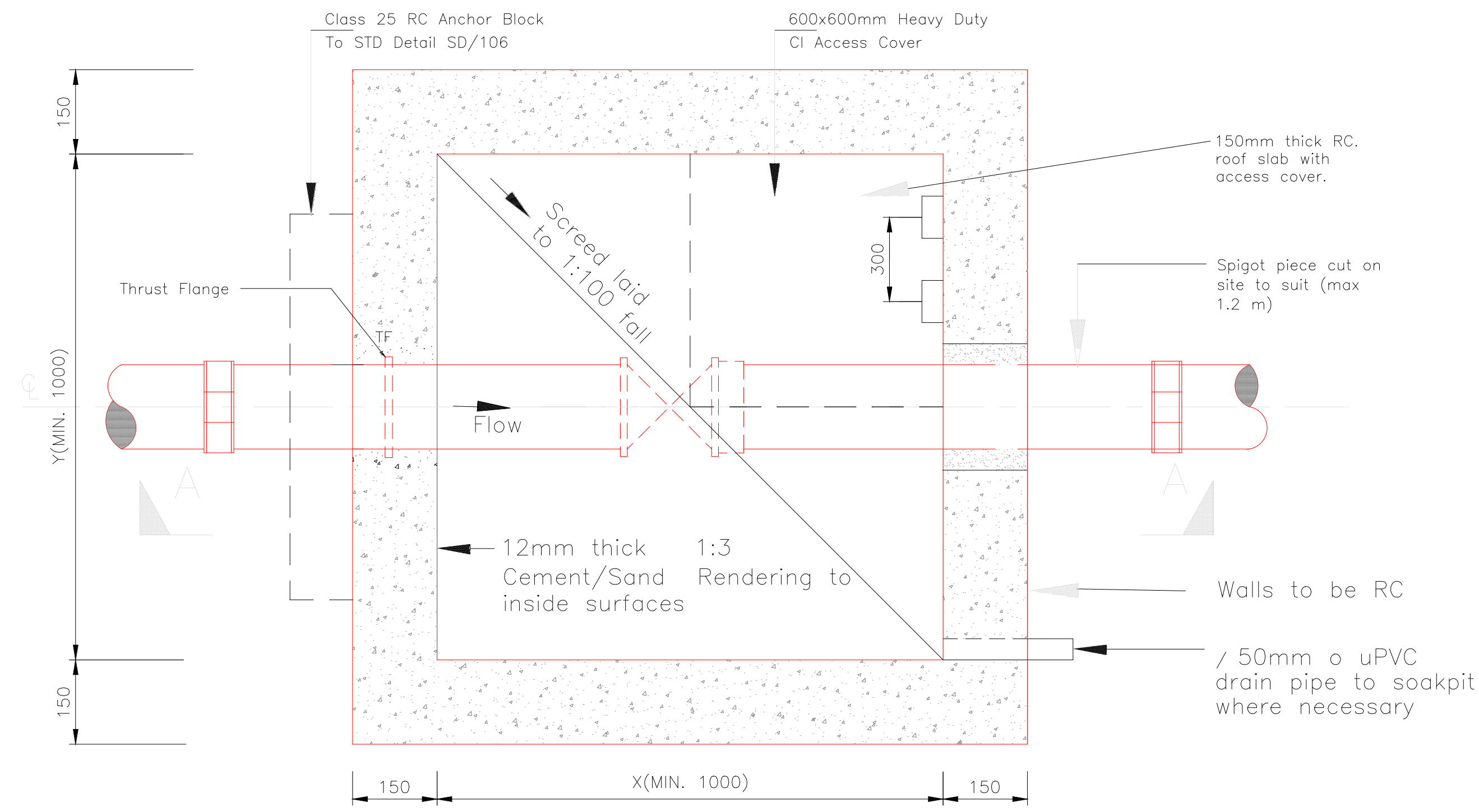


SECTION Z-Z  
SCALE 1:4

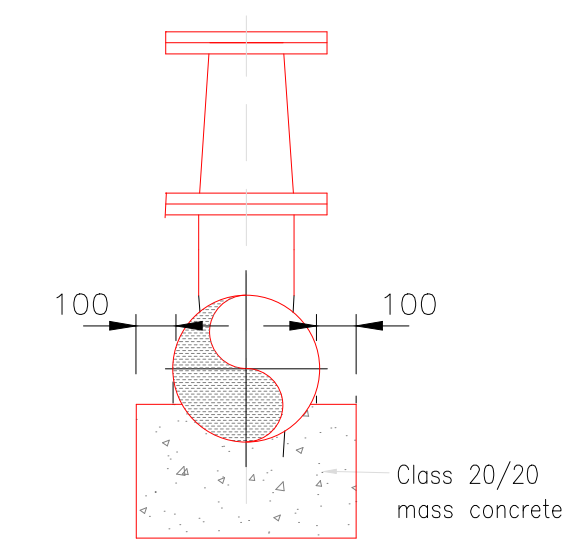
DRAWING TO SCALE IN A1 SIZE

<p>MARSABIT COUNTY</p>	No.	APPROVAL	DATE	REFERENCE	<p>CLIENT:</p> <p><b>CONCERN WORLDWIDE</b></p> <p><b>CONCERN worldwide</b> in conjunction with <b>WaterFund</b> Financing the Water Sector</p>	<p>CONSULTANT:</p> <p><b>GEO CONSULTANTS</b></p>	<p>PROJECT TITLE:</p> <p><b>PROJECT</b></p>	TITLE OF DRAWING:		<p>Designed: <b>P. K.W</b> Date: <b>Aug 2023</b></p> <p>Drawn: <b>MMN</b> Date: <b>Aug 2023</b></p> <p>Checked: <b>P. K.W</b> Date: <b>Aug 2023</b></p> <p>Approved: <b>ENG ANDREW MESSO (A3007)</b> Date: <b>Aug 2023</b></p>
	MARKER POSTS DETAILS		DWG. No.	Sheet No.						
			<b>KAM/DD/203</b>	<b>1/1</b>						



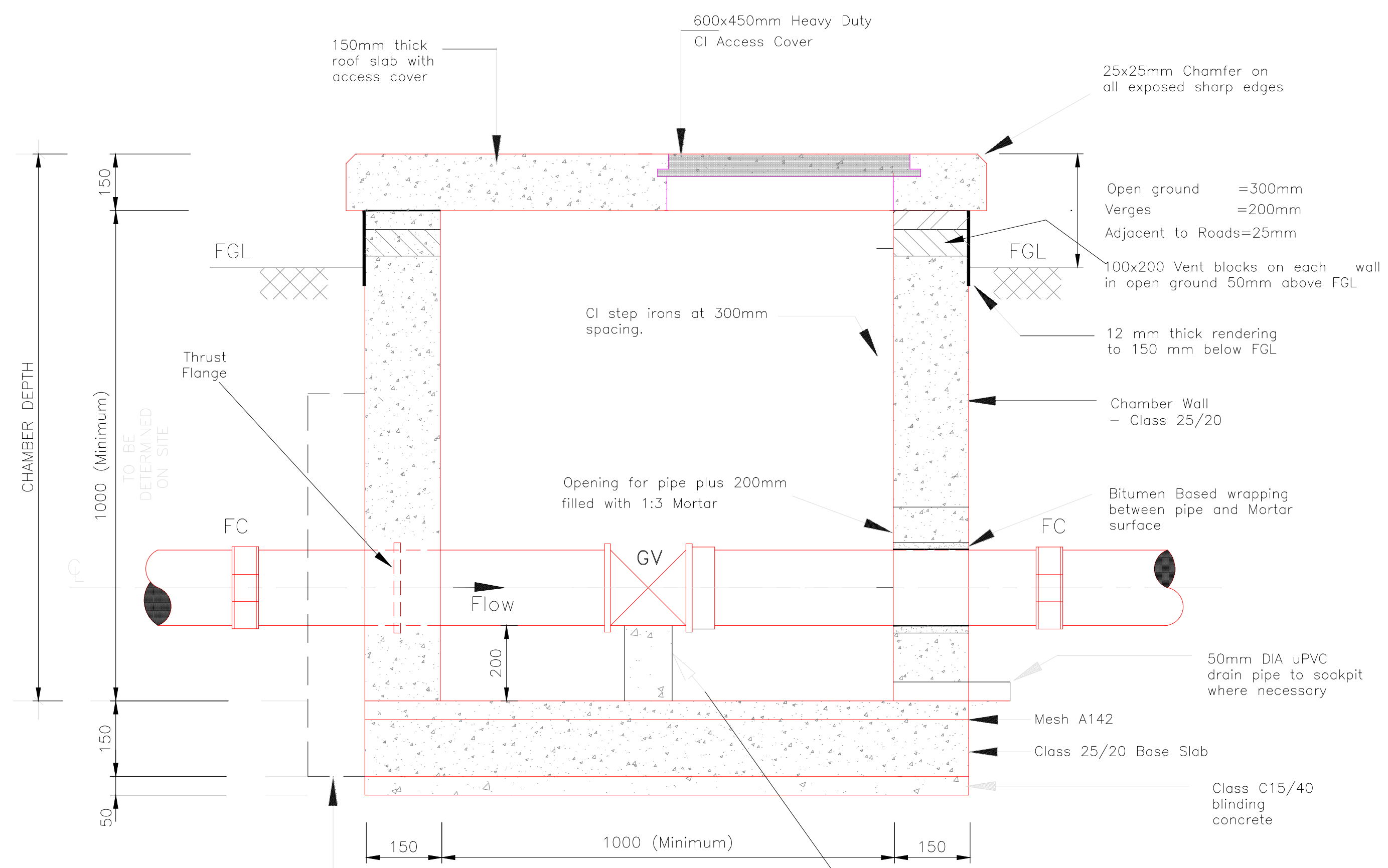


PLAN OF CHAMBER  
1:20  
(Cover omitted for clarity)

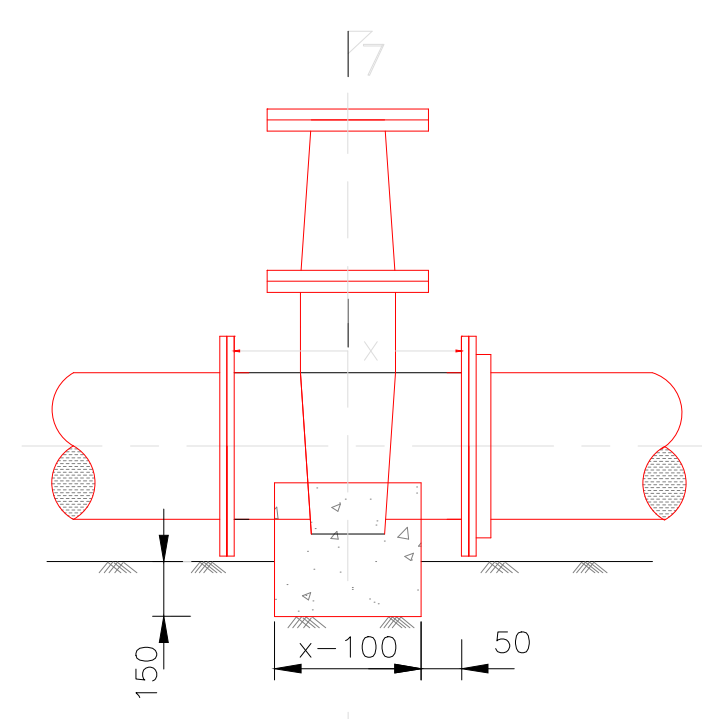


Section 7 - 7

- NOTES**
- All dimensions are in mm unless otherwise stated
  - Where the Chamber wall is used for anchorage, the restraining to be according to Drawing SD/06.
  - Chamber wall to be backfilled wall thickness with 300mm thick granular fill around walls
  - Where the chamber is along footpath in built up areas, the cover may be flushed with the footpath



GATE VALVE CHAMBER  
SECTION A-A  
SCALE 1:20



ELEVATION  
Gate Valve Support Block

DRAWING TO SCALE IN A1 SIZE

No.	APPROVAL	DATE	REFERENCE

CLIENT:  
**CONCERN WORLDWIDE**

in conjunction with  
**WaterFund**  
Financing the Water Sector

CONSULTANT:  
**GEO CONSULTANTS**

PROJECT TITLE:  
**SOLOLO AND DABEL WATER PROJECT**  
**MOYALE INTEGRATED PROJECT**

TITLE OF DRAWING:  
**GATE VALVE CHAMBERS**

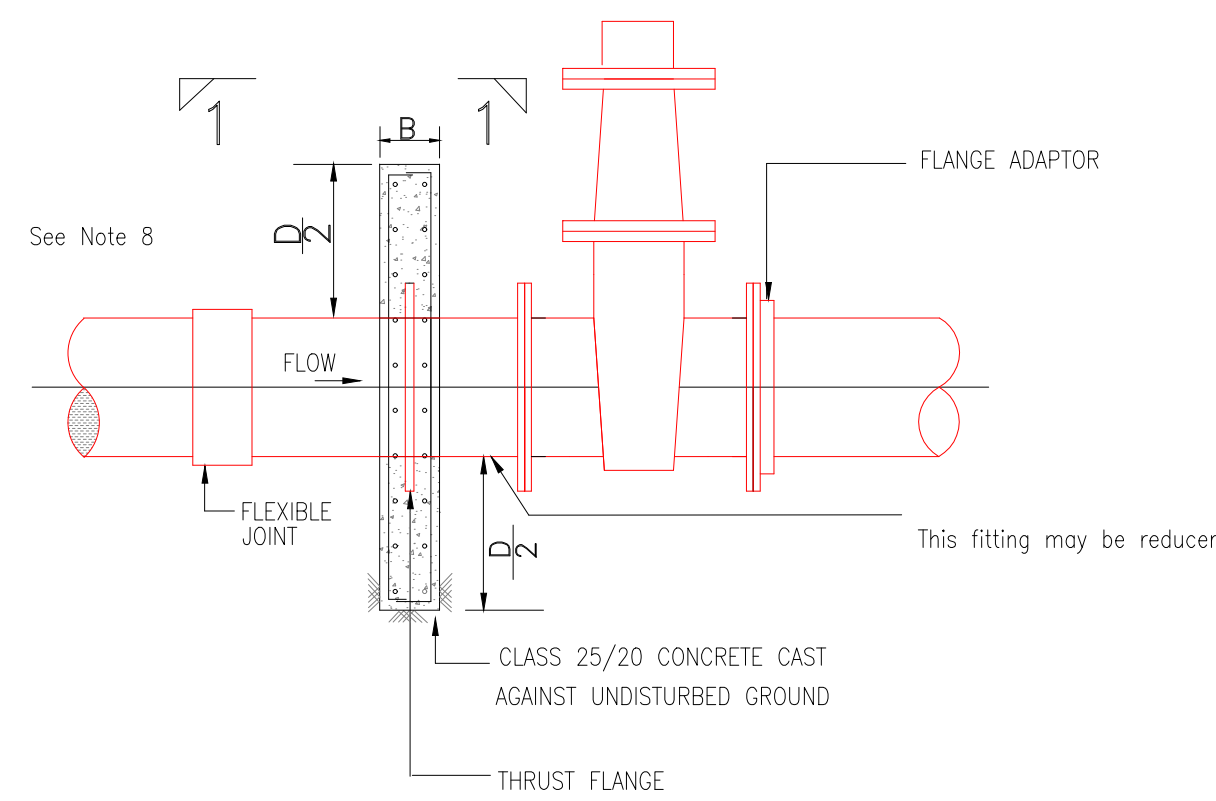
DWG. No. **KAM/DD/203/19**  
Sheet No. **1/1**

Designed: <b>P. K.W</b>	Date: <b>Aug 2023</b>
Drawn: <b>MMN</b>	Date: <b>Aug 2023</b>
Checked: <b>P. K.W</b>	Date: <b>Aug 2023</b>
Approved: <b>ENG ANDREW MESSO (A3007)</b>	Date: <b>Aug 2023</b>

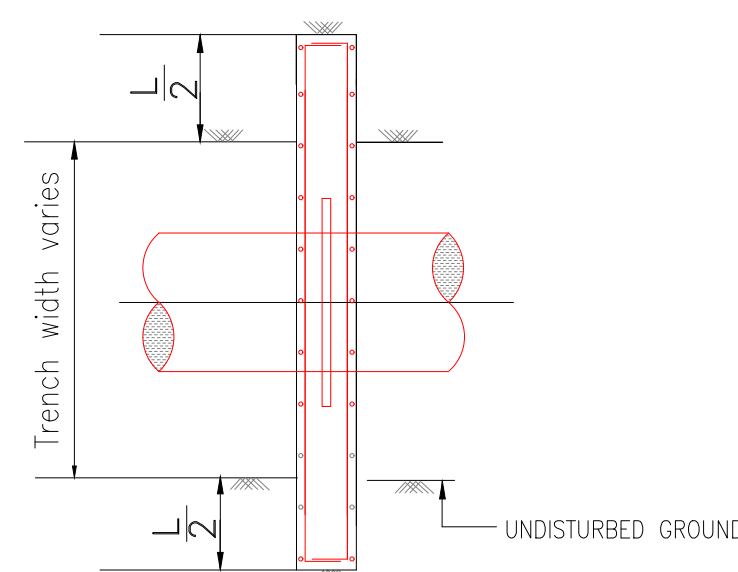


MARSABIT COUNTY

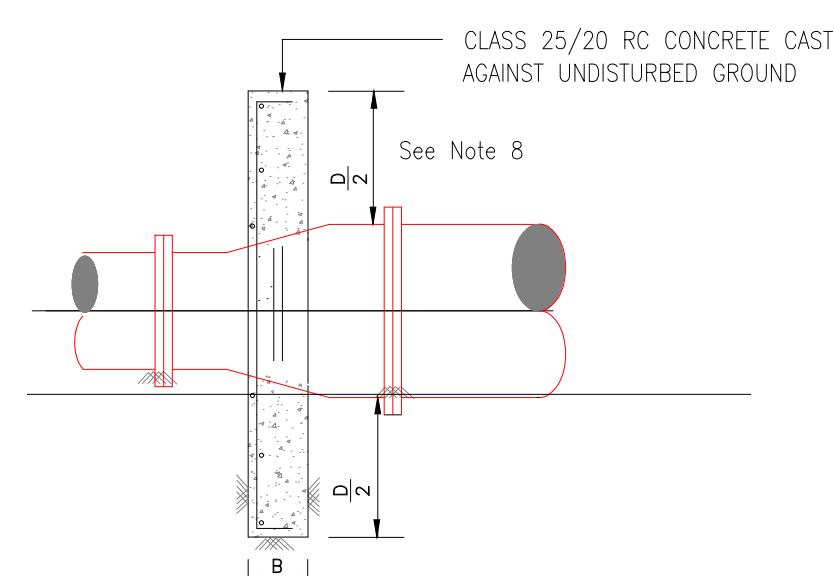




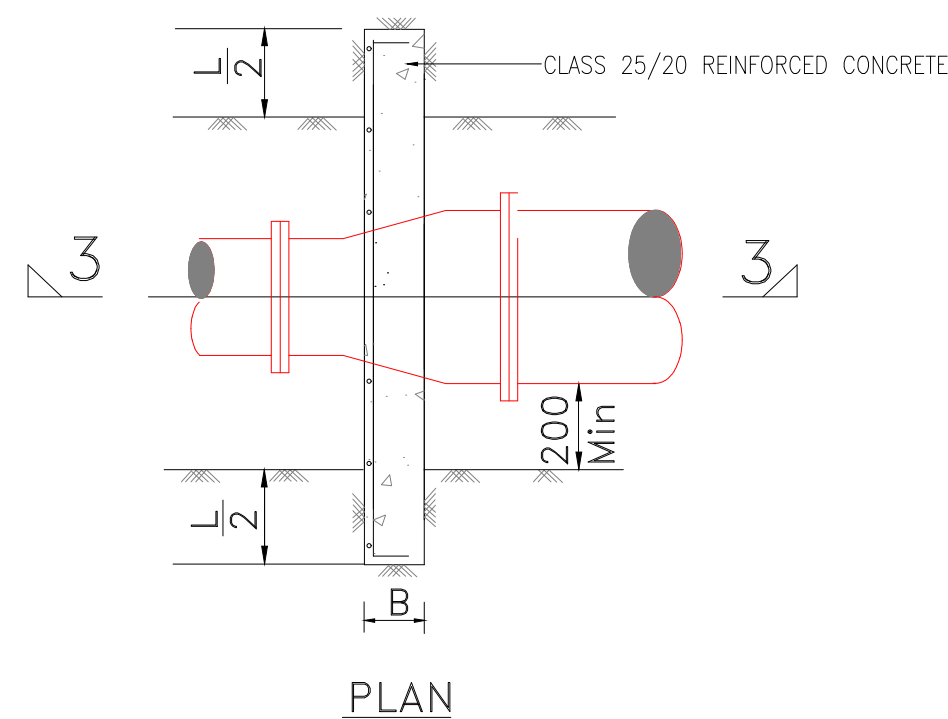
ELEVATION  
ANCHOR BLOCK  
FOR GATE VALVES



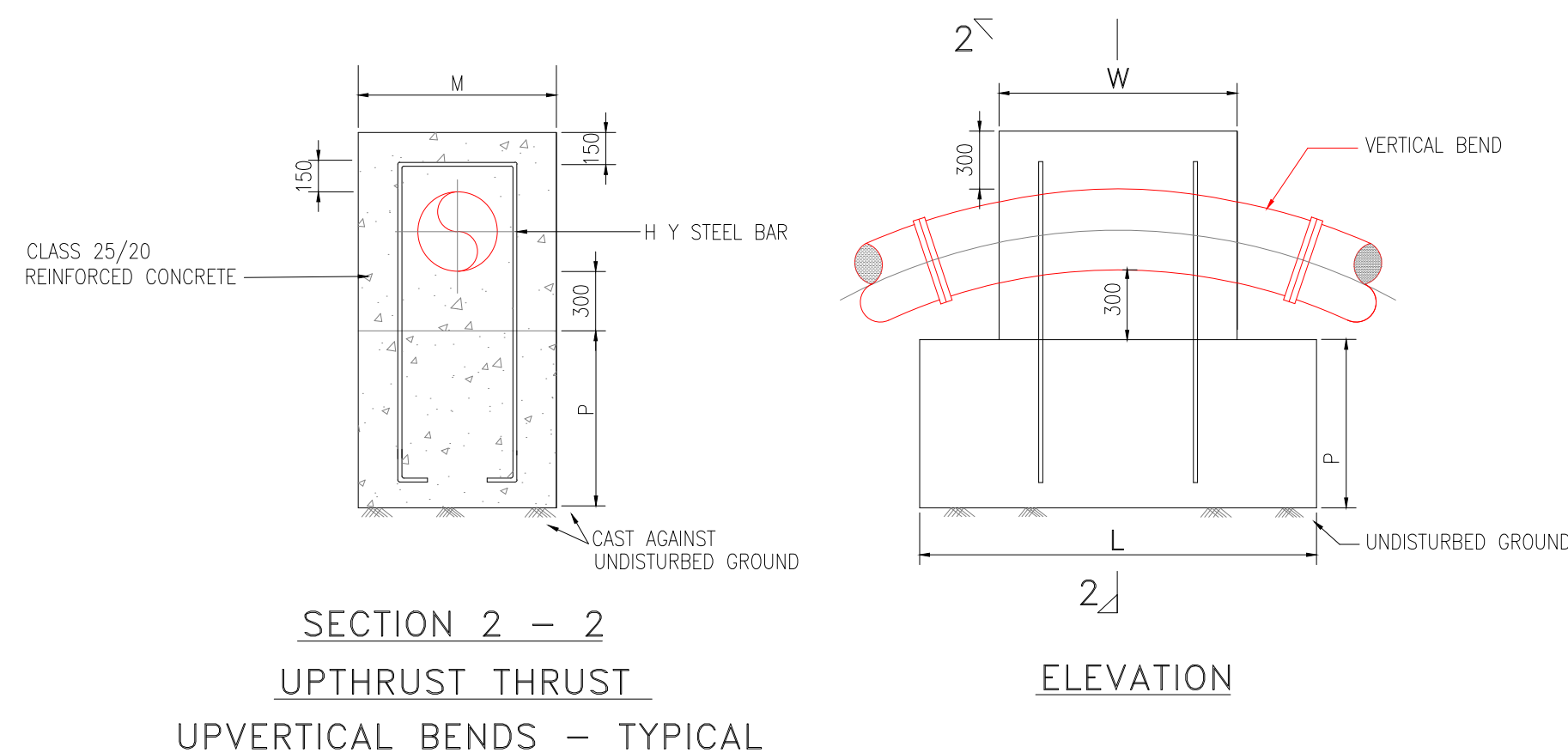
SECTION 1 - 1



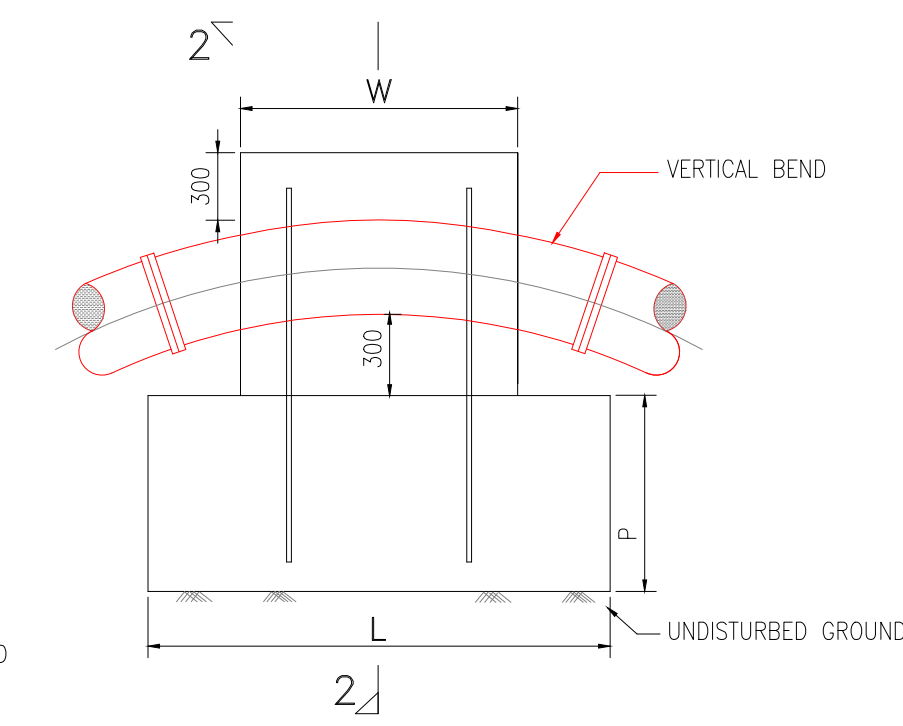
SECTION 3 - 3  
THRUST BLOCKS FOR TAPERS



PLAN

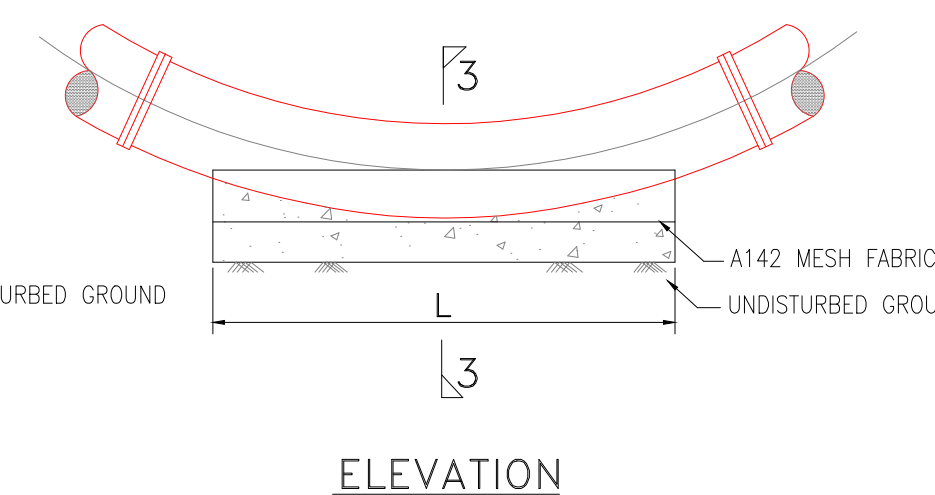


SECTION 2 - 2  
UPTHRUST THRUST  
UPVERTICAL BENDS - TYPICAL

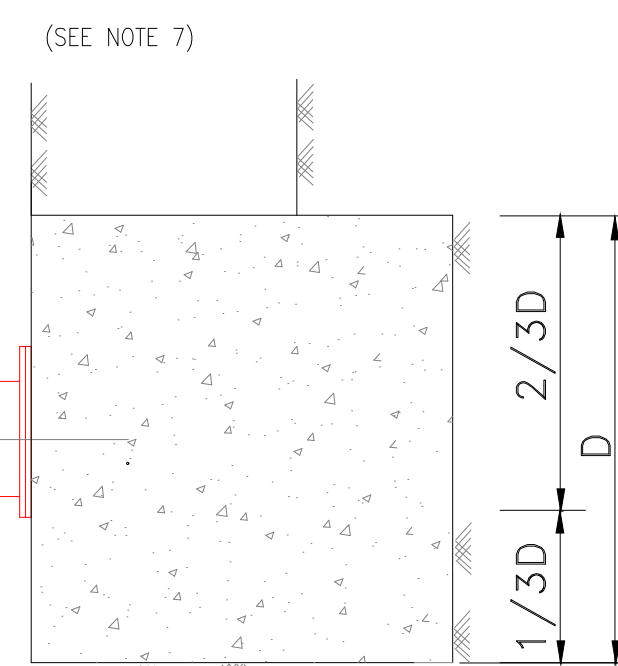


SECTION 3 - 3

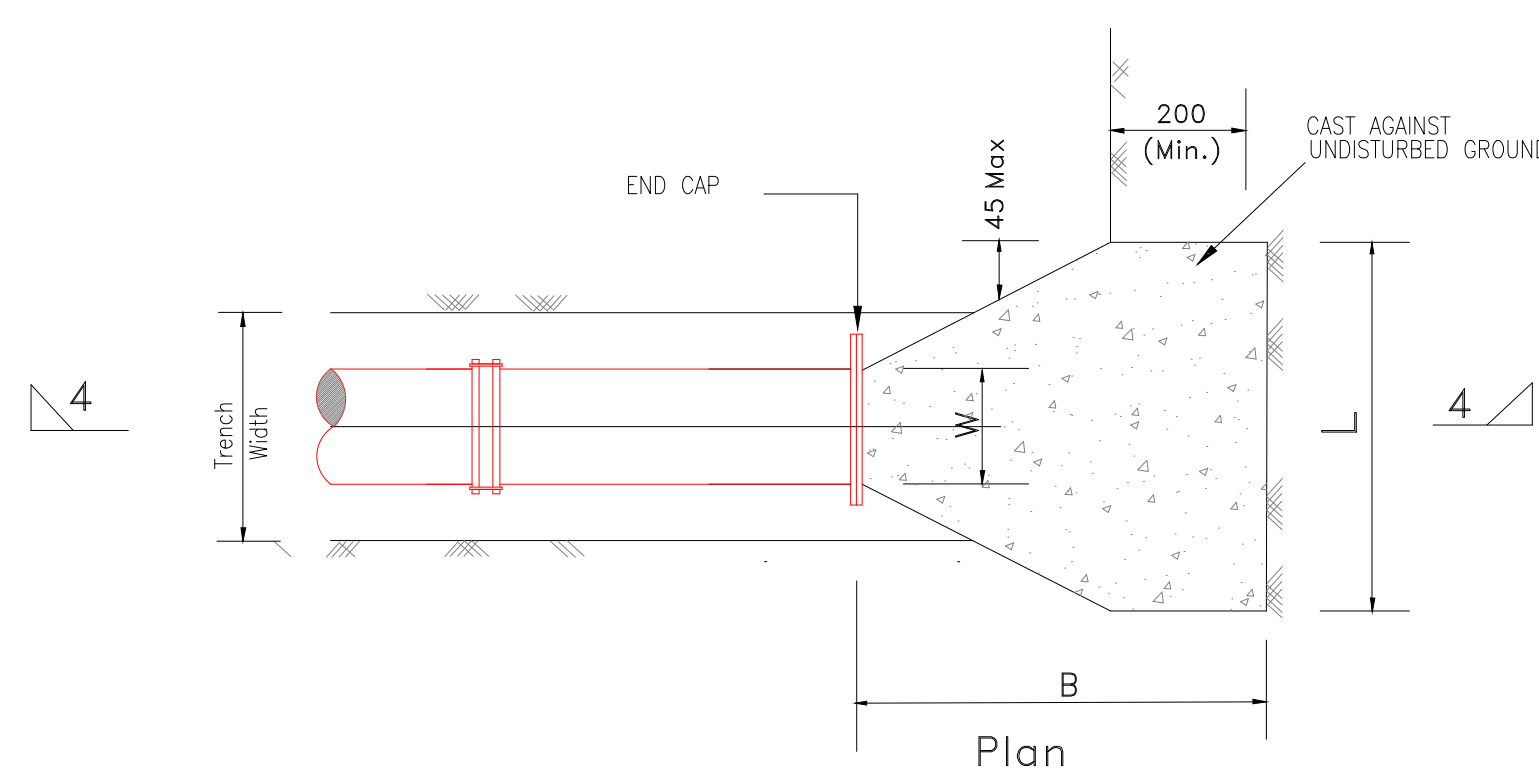
DOWNTHRUST VERTICAL  
BENDS - TYPICAL



ELEVATION



Section 4 - 4



Thrust Block for Blank Ends

MAIN SIZE (mm)	BLOCK TYPE	
	100m Head	160m Head
600	E	E
500	D	E
450	D	D
400	C	D
350	C	C
300	B	C
250	B	B
200	A	A
150	A	A
100	A	A

Table of Anchor Blocks  
For Gate Valves

TEST HEAD (m)	PIPE DIA (mm)	(SEE NOTE 7)			CONCRETE VOL (m <sup>3</sup> )
		D (m)	L (m)	B (m)	
100	600	1.6	2.6	1.2	3.1
	500	1.4	2.2	1.1	2.1
	450	1.2	2.0	1.0	1.5
	400	1.2	1.6	0.8	1.0
	350	1.0	1.5	0.8	0.7
	300	1.0	1.2	0.7	0.5
	250	0.8	1.0	0.5	0.3
	200	0.6	0.8	0.5	0.2
	150	0.5	0.6	0.5	0.1
	100	0.5	0.6	0.5	0.1

TABLE OF ANCHOR BLOCKS FOR BLANK ENDS

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

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

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

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

NOTES

- All dimensions are in mm, unless otherwise stated
- All concrete thrust blocks shall be constructed on and against firm ground directly. The thrust or anchor blocks shall not be cast against black cotton soil and reference shall be made to the Engineer's Representative for further instructions.
- The concrete thrust blocks are designed to bear on the original earth surface with bearing pressure of 100kN/m
- Concrete to be Class '20/20' unless otherwise stated.
- Concrete in thrust and anchor blocks must be cast clear of joints
- Dimensions 'W' for thrust blocks on vertical bends to suit the size of bend and clearance required for joints.
- The steel anchoring reinforcement and the dimensions L, P and M are to be decided by the Engineer's Representative to suit each individual bend.
- Where D/2 exceeds the cover, increase the depth below the pipe to make the total = D.

LEGEND

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

DRAWING TO SCALE IN A1 SIZE



MARSABIT COUNTY

No.	APPROVAL	DATE	REFERENCE

CLIENT:  
**CONCERN WORLDWIDE**

in conjunction with  
**WaterFund**  
Financing the Water Sector

CONSULTANT:  
**GEO CONSULTANTS**

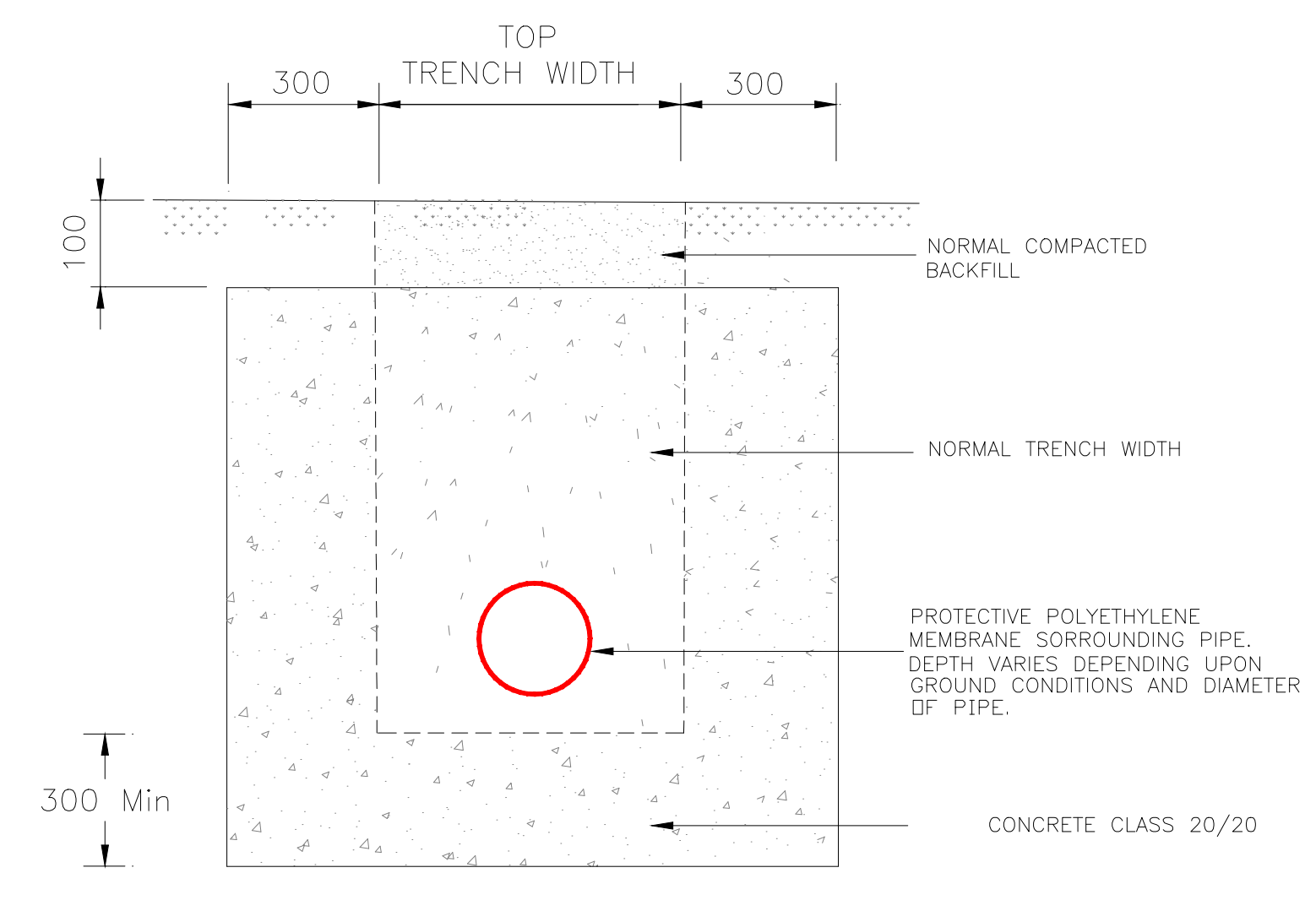
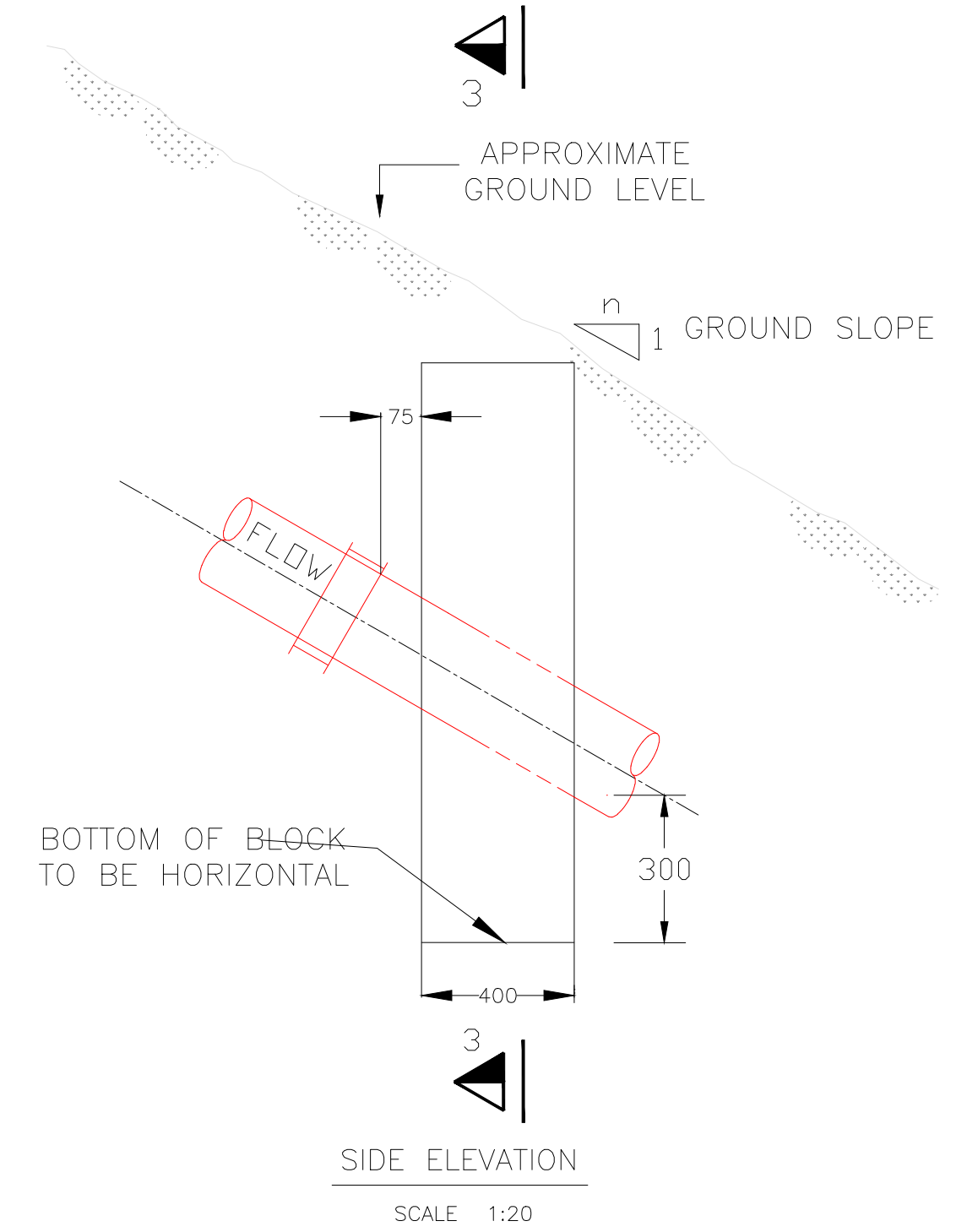
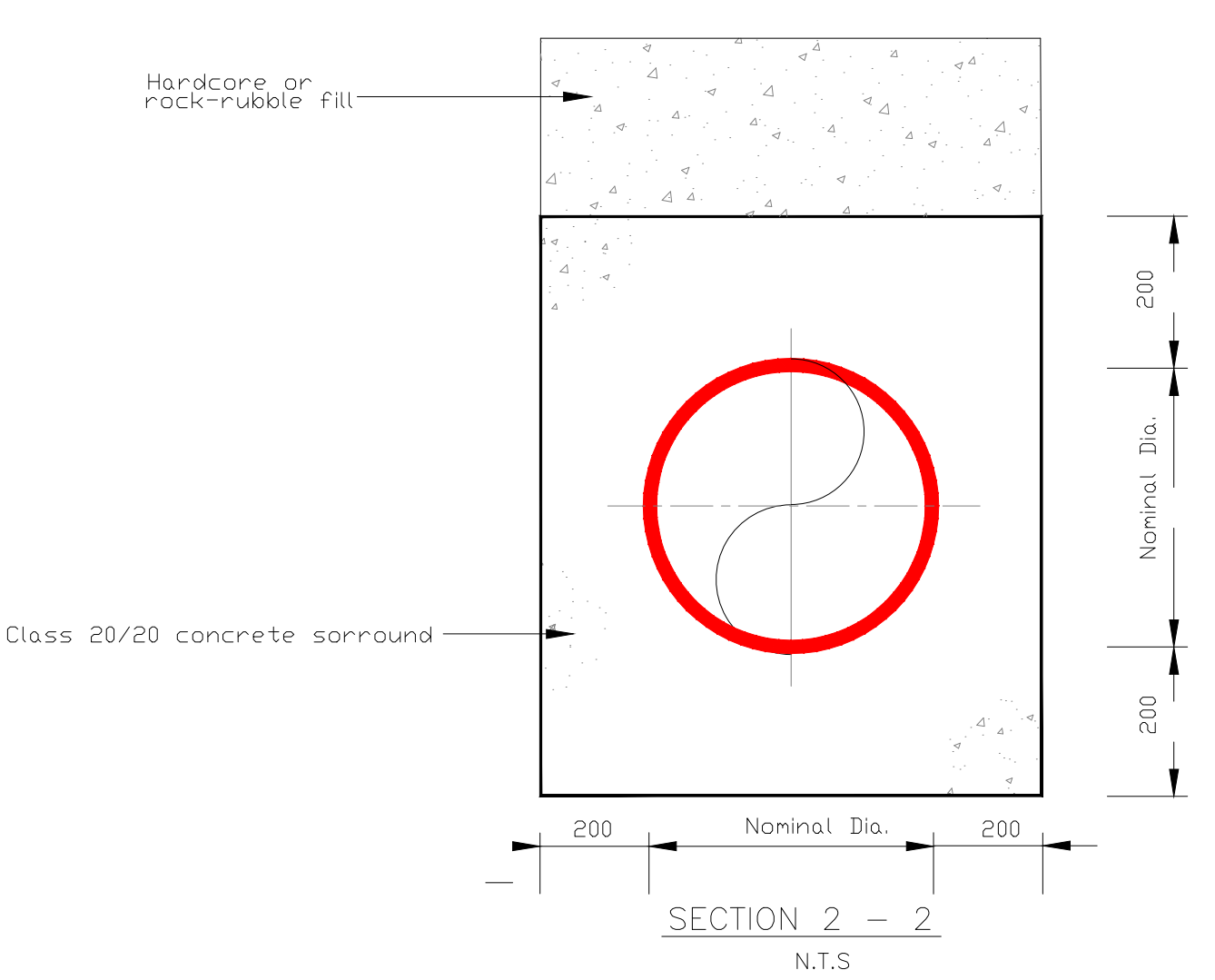
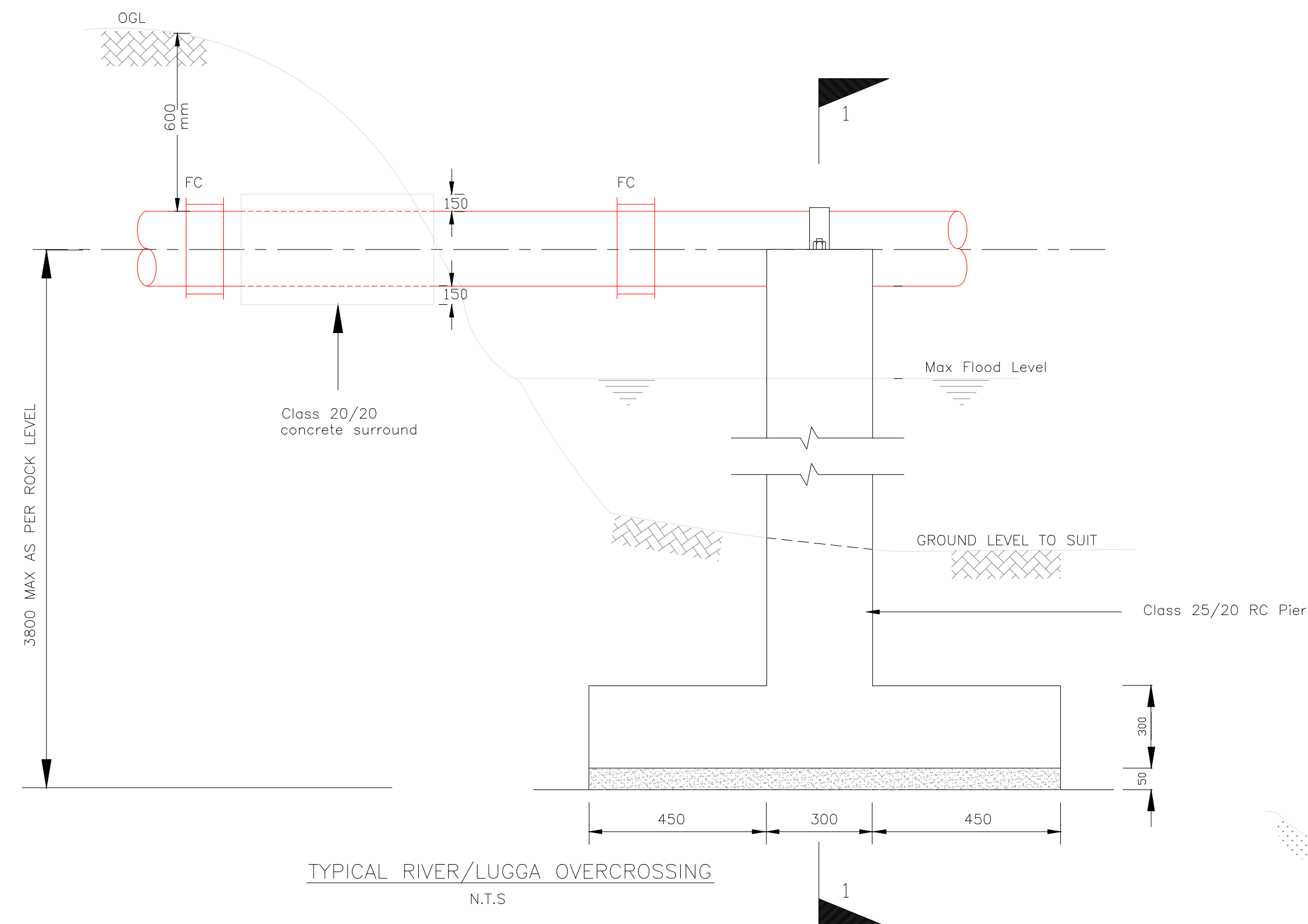
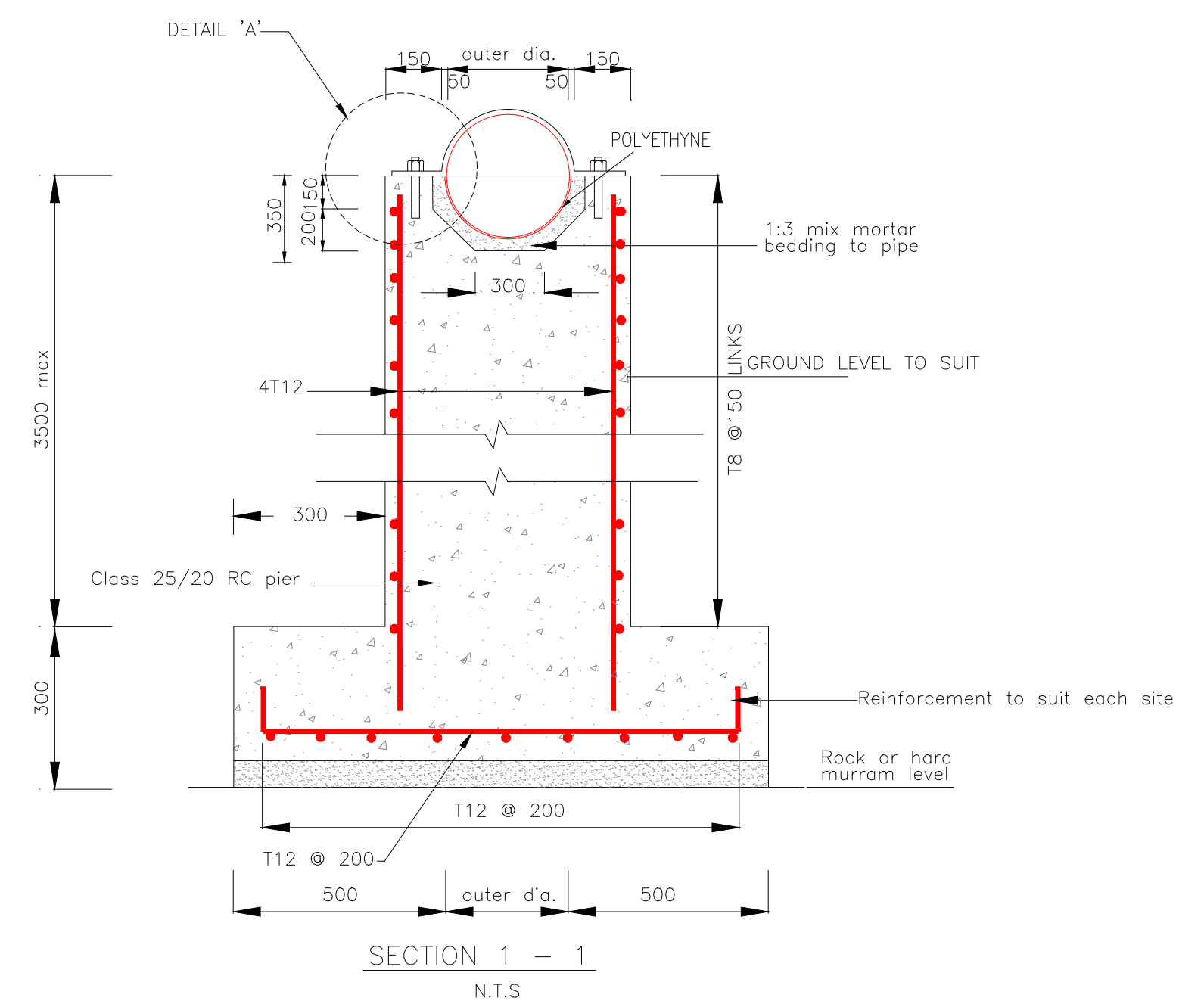
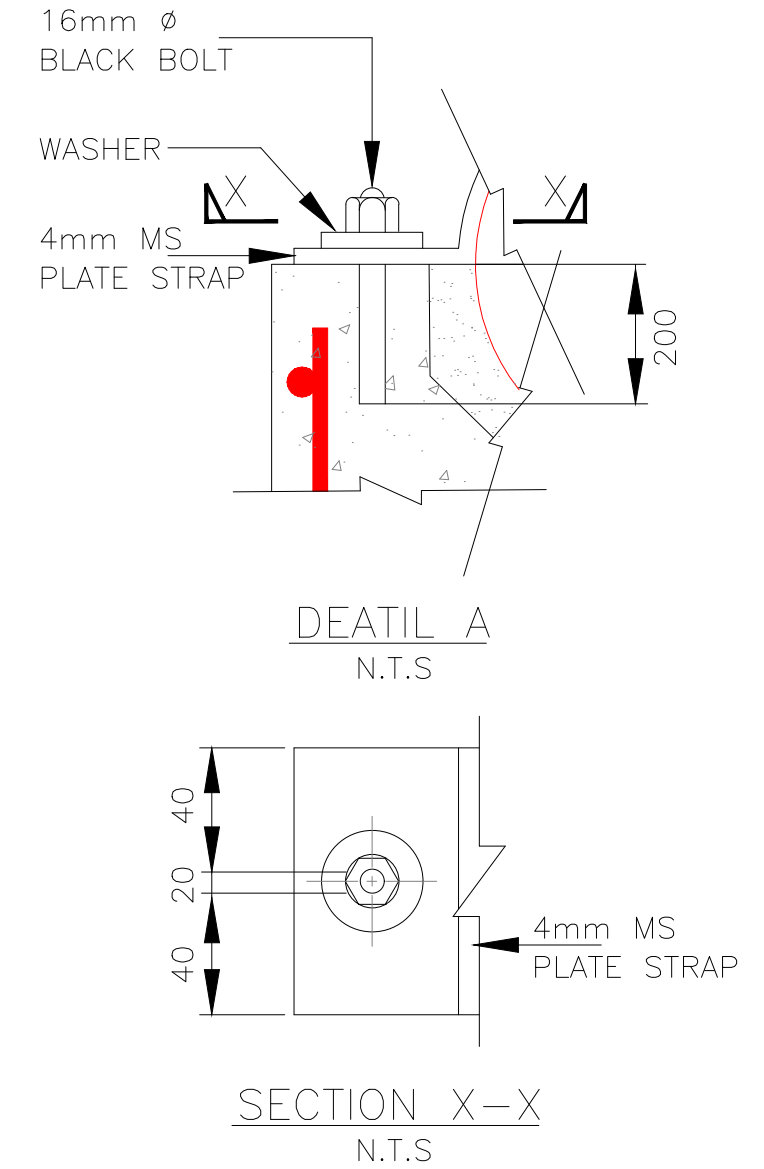
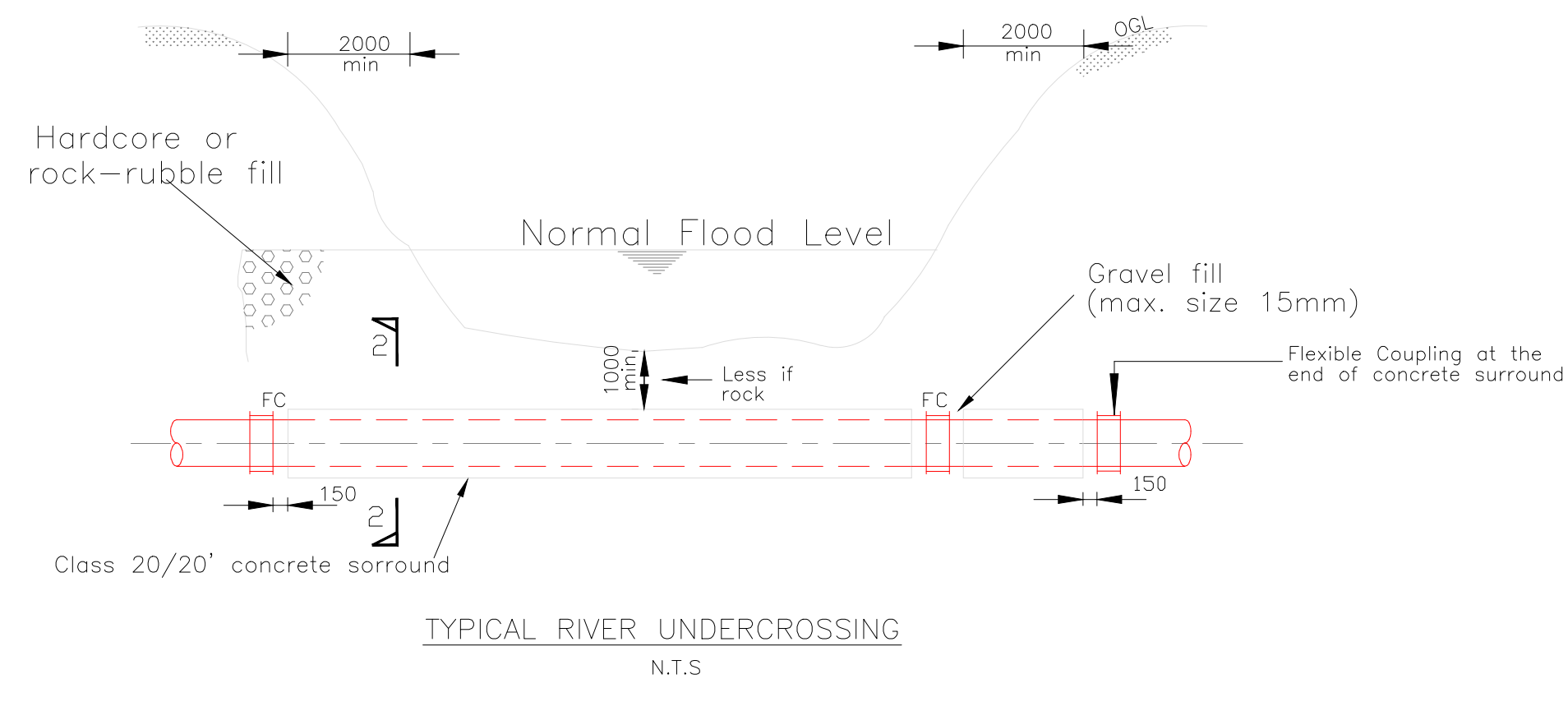
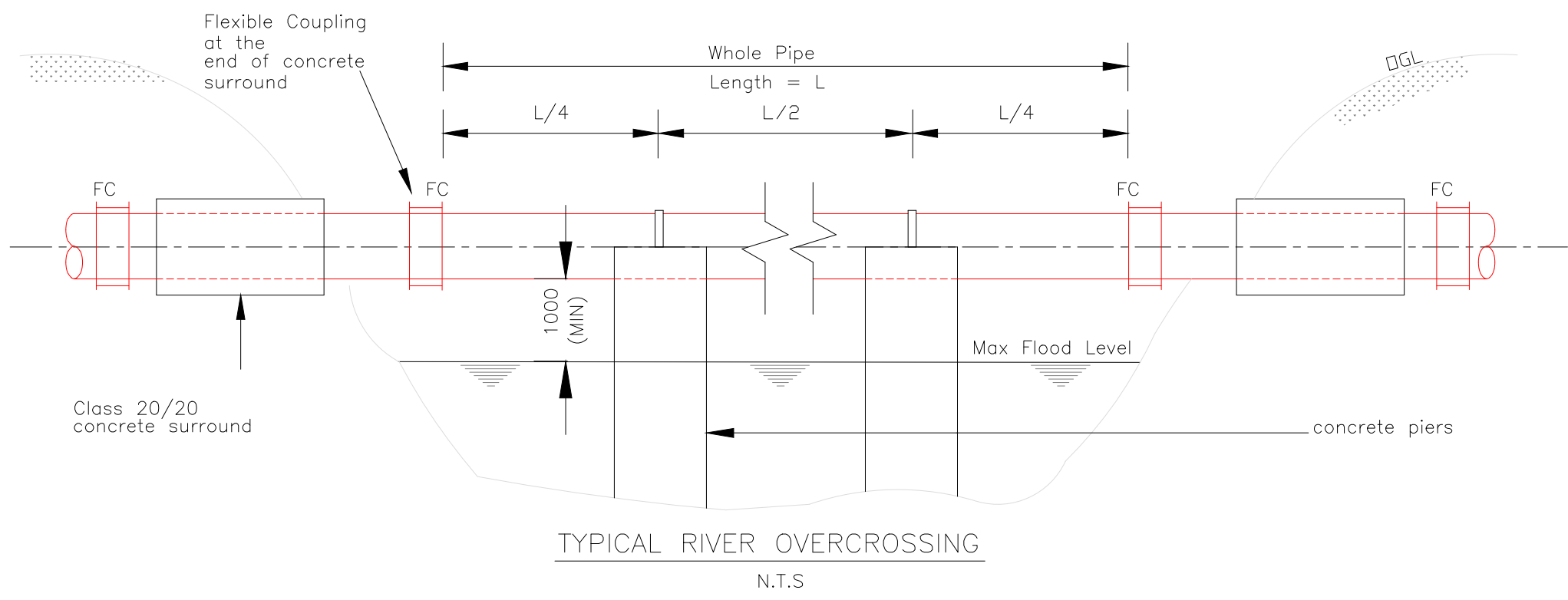
PROJECT TITLE:  
**SOLOLO AND DABEL, WATER PROJECT**  
**MOYALE INTEGRATED PROJECT**

TITLE OF DRAWING:  
**TRUNK DISTRIBUTION MAINS THRUST BLOCKS FOR VERTICAL BENDS, TAPERS GATE VALVES AND BLANK ENDS**

DWG. No. **KAM/DD/203/19**  
Sheet No. **1/1**

Designed: <b>P. K.W</b>	Date: <b>Aug 2023</b>
Drawn: <b>MMN</b>	Date: <b>Aug 2023</b>
Checked: <b>P. K.W</b>	Date: <b>Aug 2023</b>
Approved: <b>ENG ANDREW MESSO (A3007)</b>	Date: <b>Aug 2023</b>





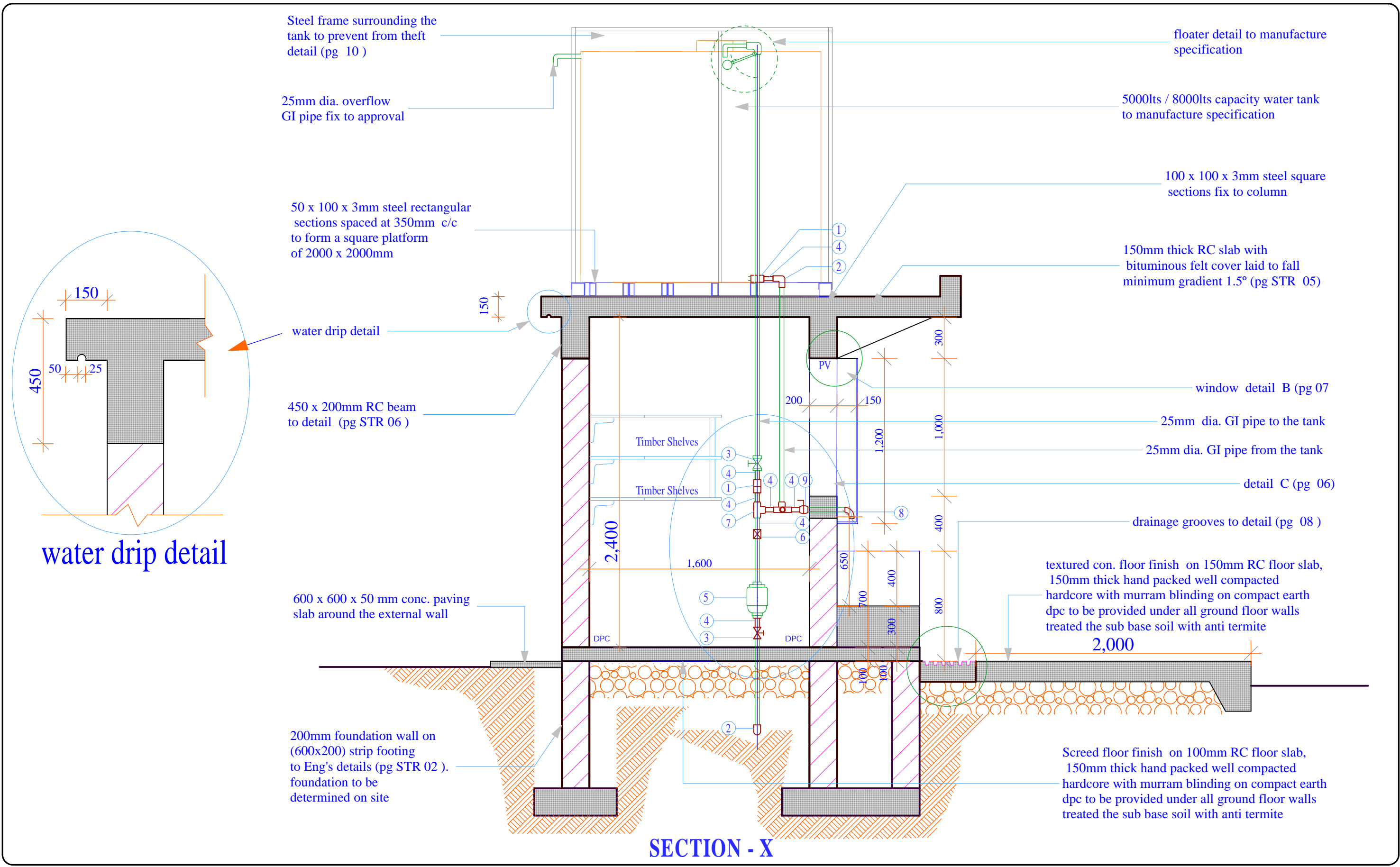
- NOTES
1. SAME ARRANGEMENT CAN BE USED AS SUPPORTS FOR PIPES LAID IN VERY SOFT GROUND BUT BLOCKS TO BE CAST ON SOUND ROCK OR HARD STRATUM.
  2. ANCHOR BLOCK TO BE CONSTRUCTED ON LOWER SIDE OF JOINT.

- NOTES
1. All dimensions are in mm unless otherwise stated
  2. River overcrossing details are applicable to pipes upto 500mm dia. 12m length
  3. Maximum flood level to be decided by the Engineer
  4. For river overcrossing a 10mm gap shall be left between pipes at couplings to permit expansion
  5. Slip anchors to be provided where;
    - a) Longitudinal slope exceeds 1:6
    - b) Cross fall exceeds 1:3
  6. Pipe wrap to be removed 50mm inside the concrete at slip anchors
  7. Class 20/20 surround shall be provided for undercrossing of large open drains in accordance to details of river undercrossing

DRAWING TO SCALE IN A1 SIZE

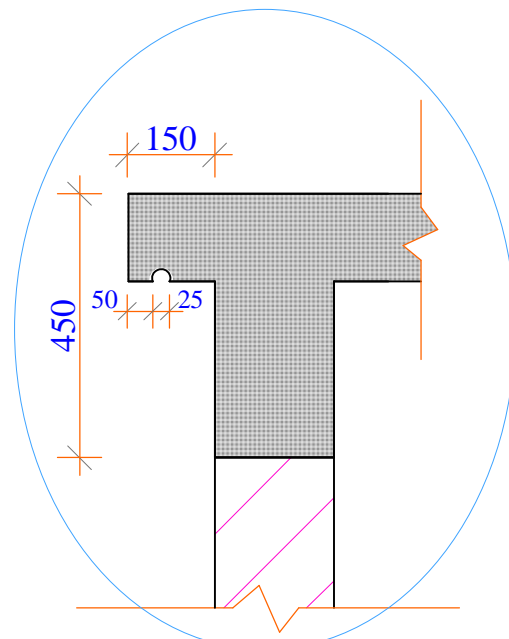
 MARSABIT COUNTY	No.	APPROVAL	DATE	REFERENCE	CLIENT: <b>CONCERN WORLDWIDE</b>	CONSULTANT: <b>GEO CONSULTANTS</b>	PROJECT TITLE: <b>SOLOLO RAMATA, SOLOLO AND DABEL MOYALE INTEGRATED PROJECT</b>	TITLE OF DRAWING: <b>DRAIN CROSSINGS AND SLIP ANCHOR DETAILS</b>	Designed: <b>P. K.W</b> Date: <b>Aug 2023</b>
					 in conjunction with	 Financing the Water Sector		DWG. No. <b>KAM/DD/203</b>	Drawn: <b>MMN</b> Date: <b>Aug 2023</b>
									Checked: <b>P. K.W</b> Date: <b>Aug 2023</b>
								Approved: <b>ENG ANDREW MESSO (A3007)</b> Date: <b>Aug 2023</b>	Sheet No. <b>1/1</b>



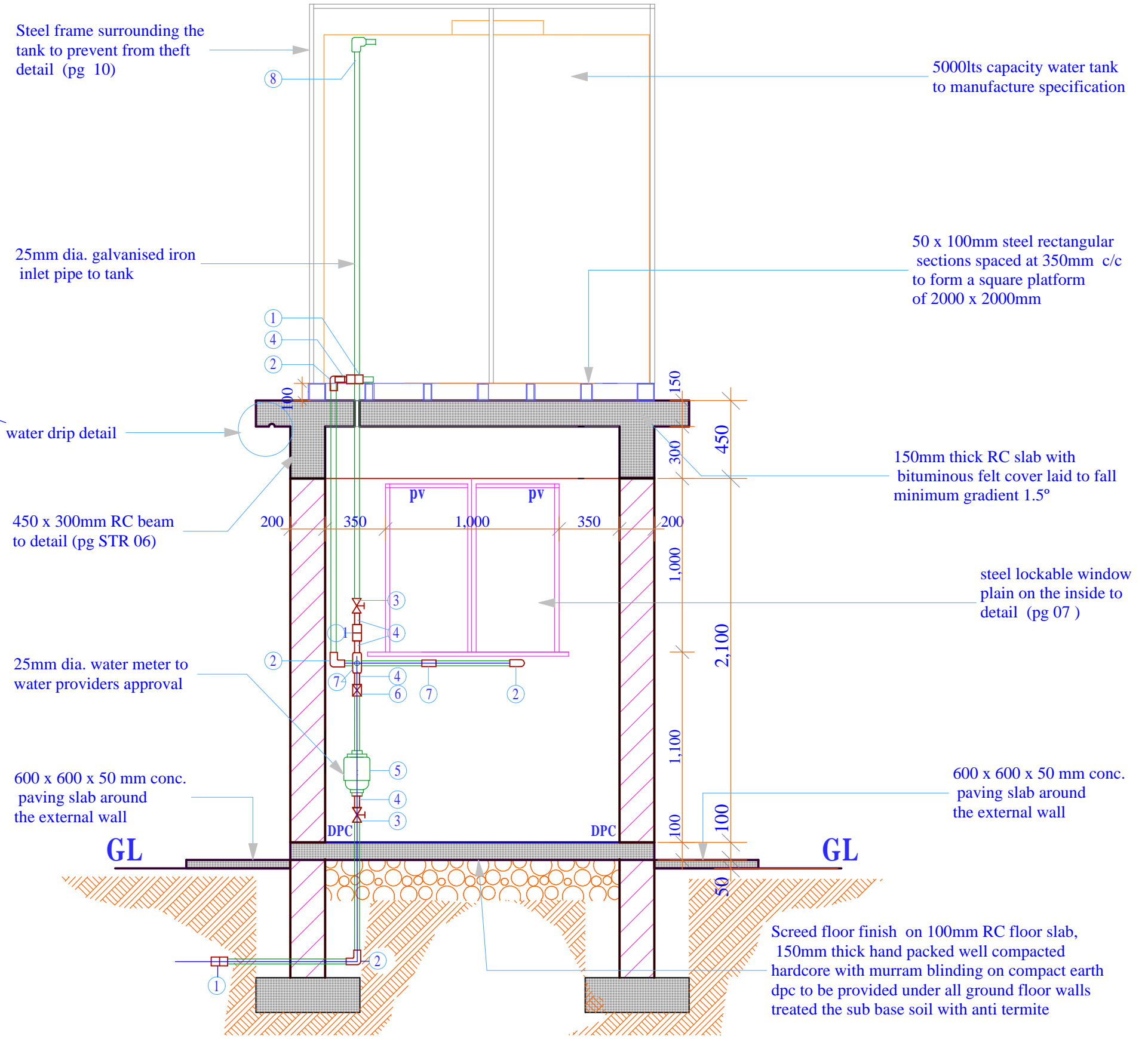


**SECTION - X**

<p><u>Project Title:</u> WATER KIOSK (Type Closed) PREFABRICATED</p>	<p><u>Client:</u> WATER SERVICES TRUST FUND (WSTF)</p>	<p><u>drq title:</u> SECTION</p>	<p><u>drq no.:</u> ARC 02</p>	<p><u>Consultant:</u> Edward Kung'u</p>	<p><u>Designed By</u> Eden Mati</p>	<p><u>Checked By</u> John Orwa</p>	<p><u>Approved by</u> CEO - Water Services Trust Fund Signature.....</p>	<p>Scale 1 : 25 Date: FEBRUARY 2009 page 02</p>
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water drip detail



SECTION - Y

<p><u>Project Title:</u> WATER KIOSK (Type Closed) PREFABRICATED</p>	<p><u>Client:</u> WATER SERVICES TRUST FUND (WSTF)</p>	<p><u>drq title:</u> SECTION</p>	<p><u>drq no.:</u> ARC 03</p>	<p><u>Consultant:</u> Edward Kung'u</p>	<p><u>Designed By</u> Eden Mati</p>	<p><u>Checked By</u> John Orwa</p>	<p><u>Approved by</u> CEO - Water Services Trust Fund Signature.....</p>	<p>Scale 1 : 25 Date: FEBRUARY 2009 page 03</p>
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tank to prevent from theft.  
detail (pg 10)

5000lts / 8000lts capacity  
water tank to manufacture  
specification

25mm dia. galvanised  
iron pipe

masonry wall keyed  
to approval

steel lockable window  
plain on the inside to  
detail (pg 07 )

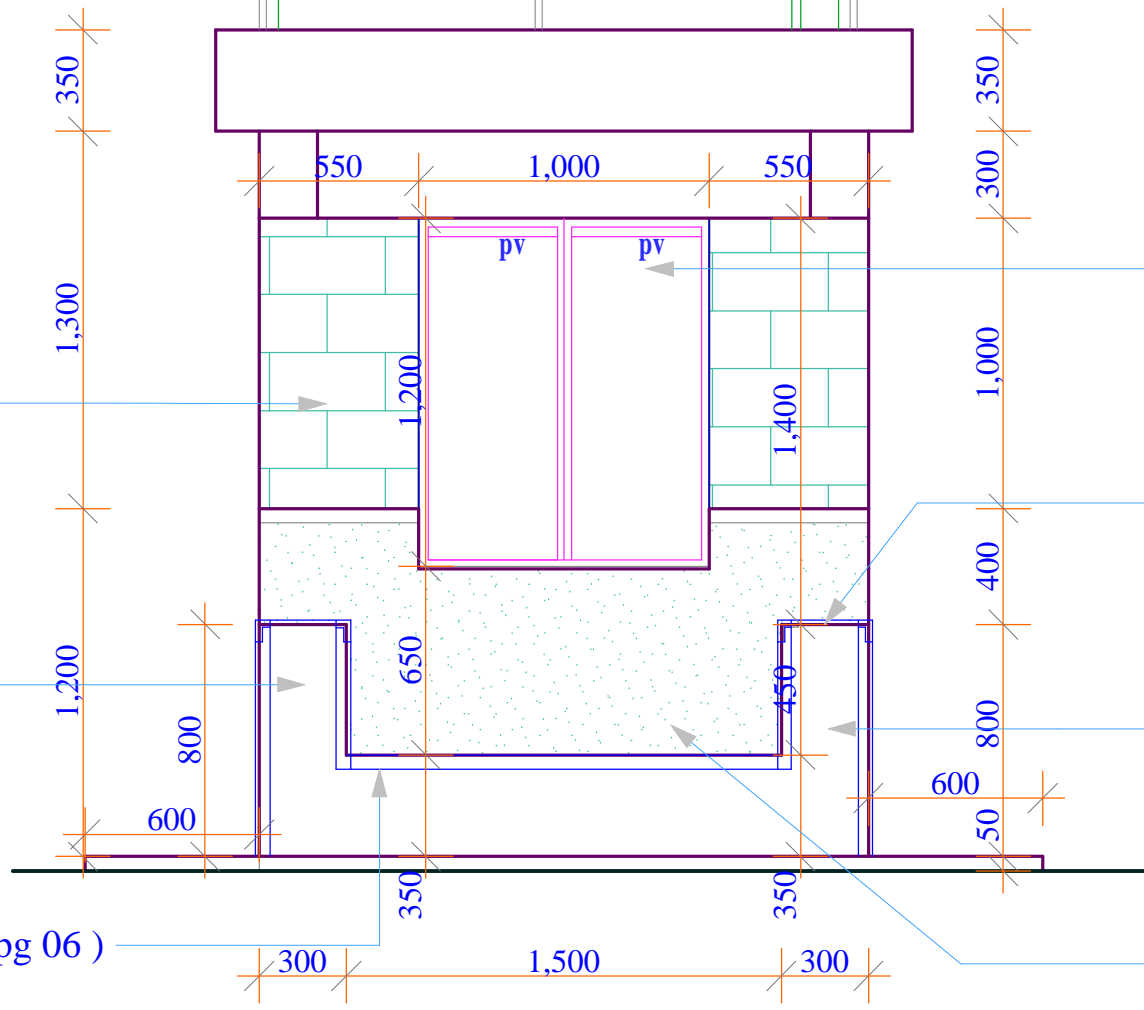
800mm high RC wall  
bucket placing bay

50 x 50mm angle section  
fixed all round to  
detail (pg 06 )

800mm high RC wall  
bucket placing bay

50 x 50mm angle section  
fixed to approval detail (pg 06 )

plaster to approval



**FRONT ELEVATION**

Project Title:  
WATER KIOSK  
(Type Closed)  
PREFABRICATED

Client:  
WATER SERVICES  
TRUST FUND (WSTF)

drq title:  
FRONT ELEVATION

drq no.:  
ARC 04

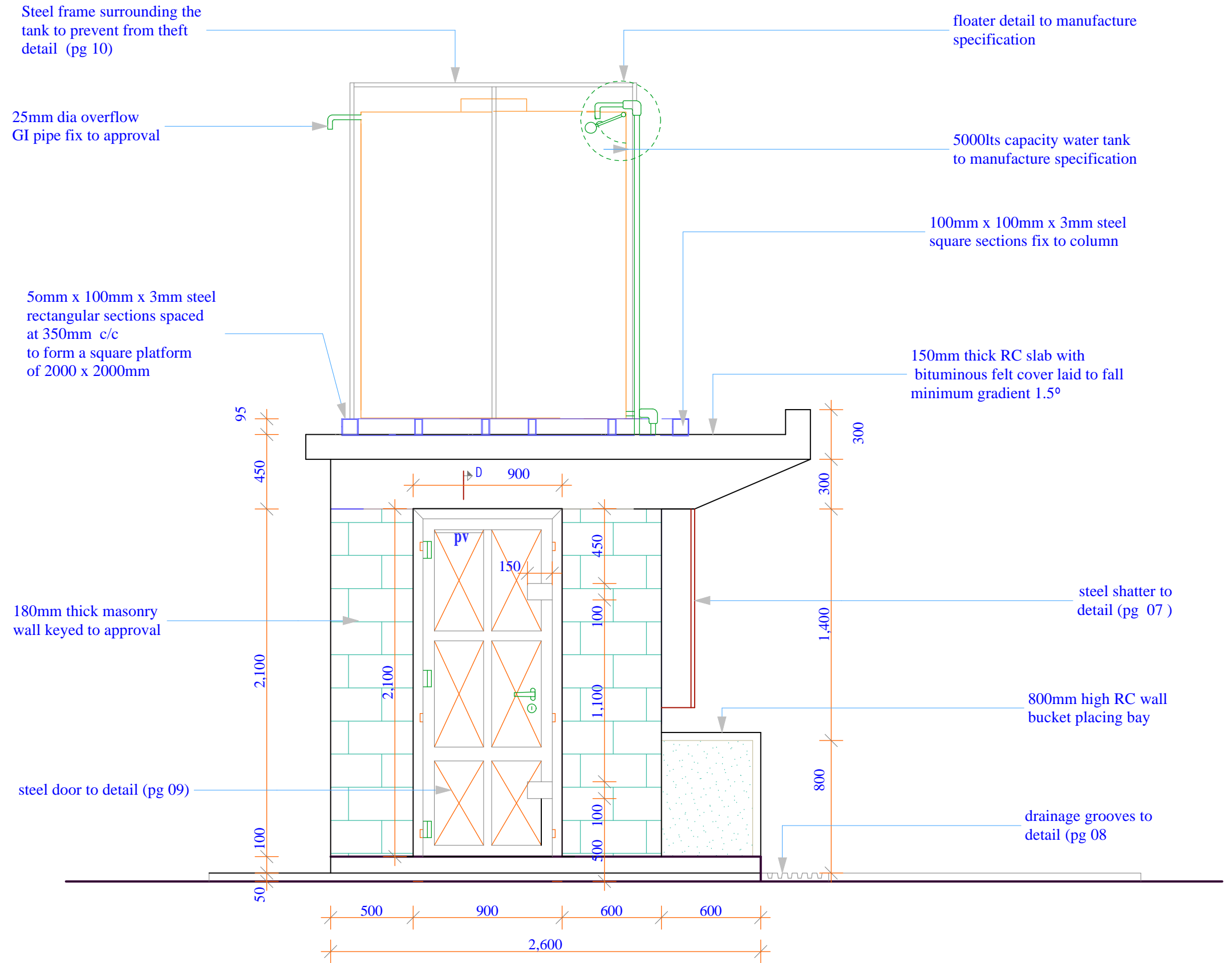
Consultant:  
Edward Kung'u

Designed By  
Eden Mati

Checked By  
John Orwa

Approved by  
CEO - Water Services Trust Fund  
Signature.....

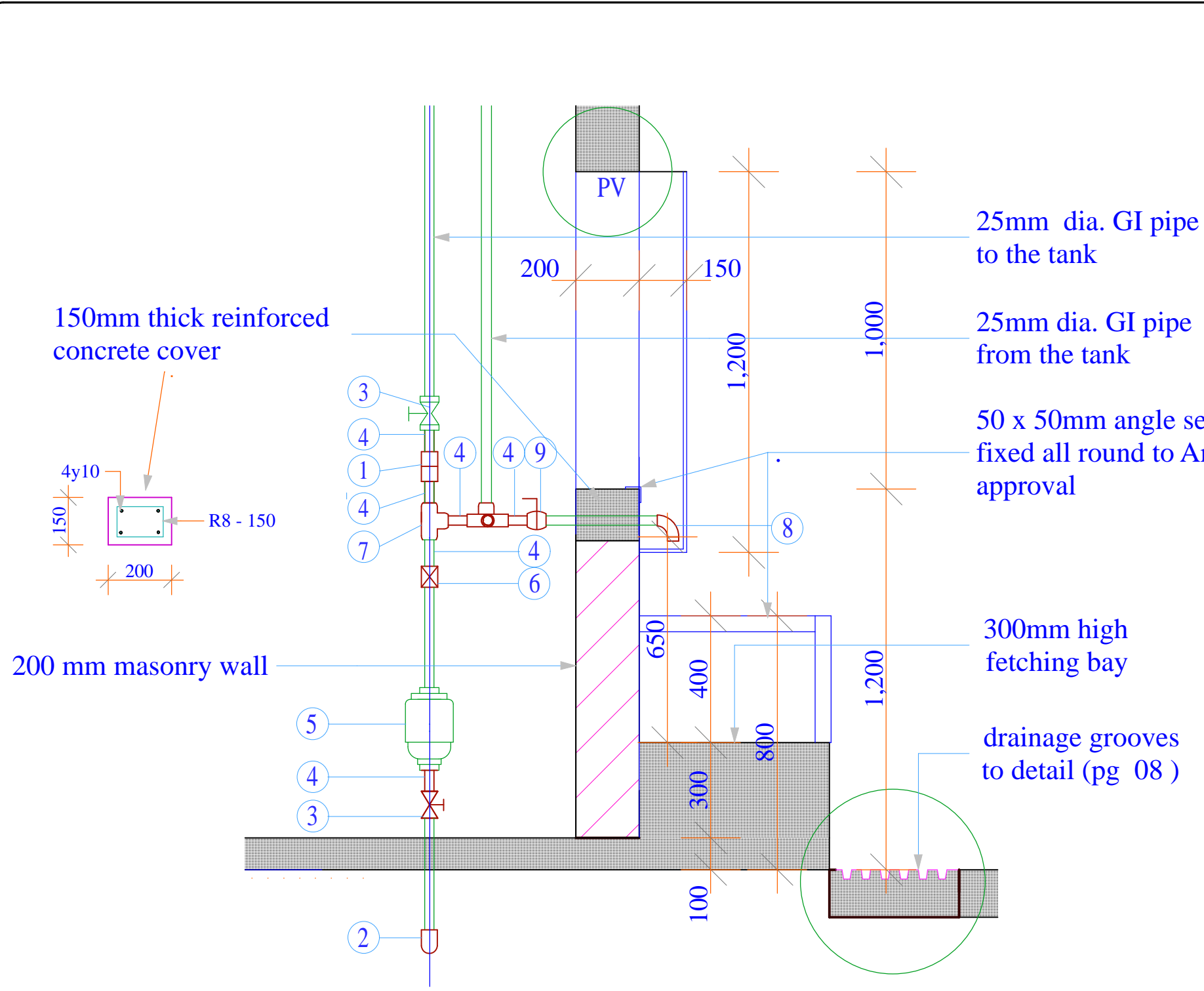
Scale 1 : 25  
Date:  
FEBRUARY 2009  
page 04



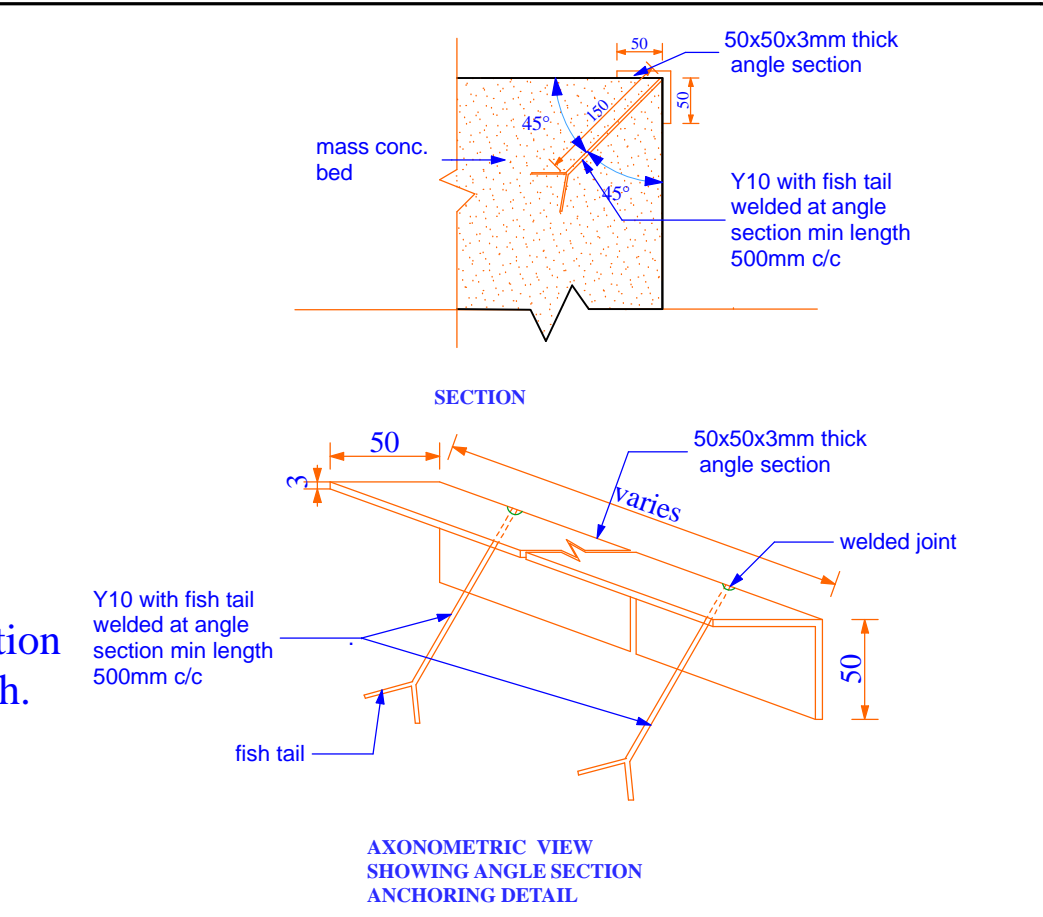
**SIDE ELEVATION**

<p><u>Project Title:</u> WATER KIOSK (Type Closed) PREFABRICATED</p>	<p><u>Client:</u> WATER SERVICES TRUST FUND (WSTF)</p>	<p><u>drq title:</u> SIDE ELEVATION</p>	<p><u>drq no.:</u> ARC 05</p>	<p><u>Consultant:</u> Edward Kung'u</p>	<p><u>Designed By</u> Eden Mati</p>	<p><u>Checked By</u> John Orwa</p>	<p><u>Approved by</u> CEO - Water Services Trust Fund Signature.....</p>	<p>Scale 1 : 25 Date: FEBRUARY 2009 page 05</p>
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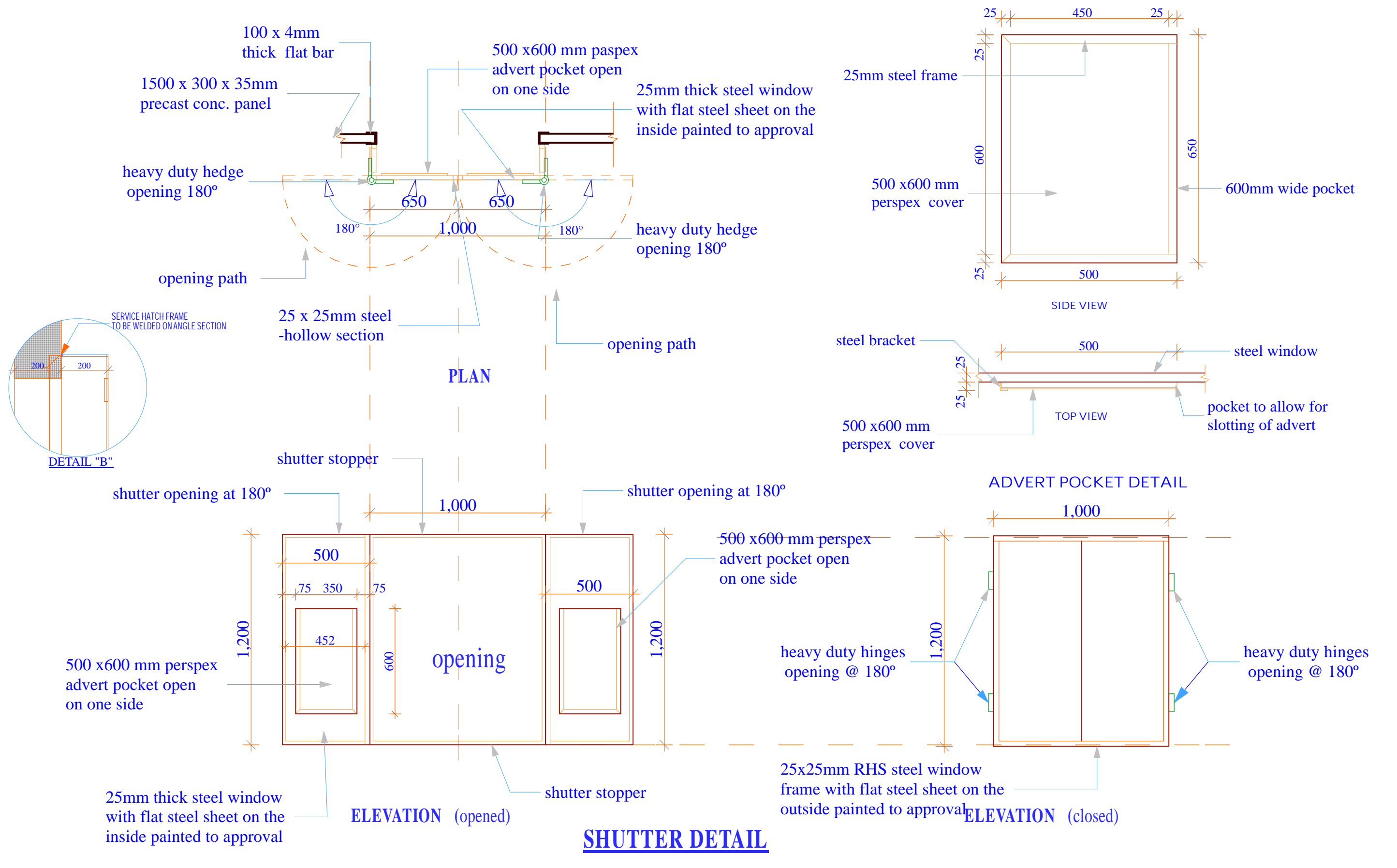


**DETAIL C**



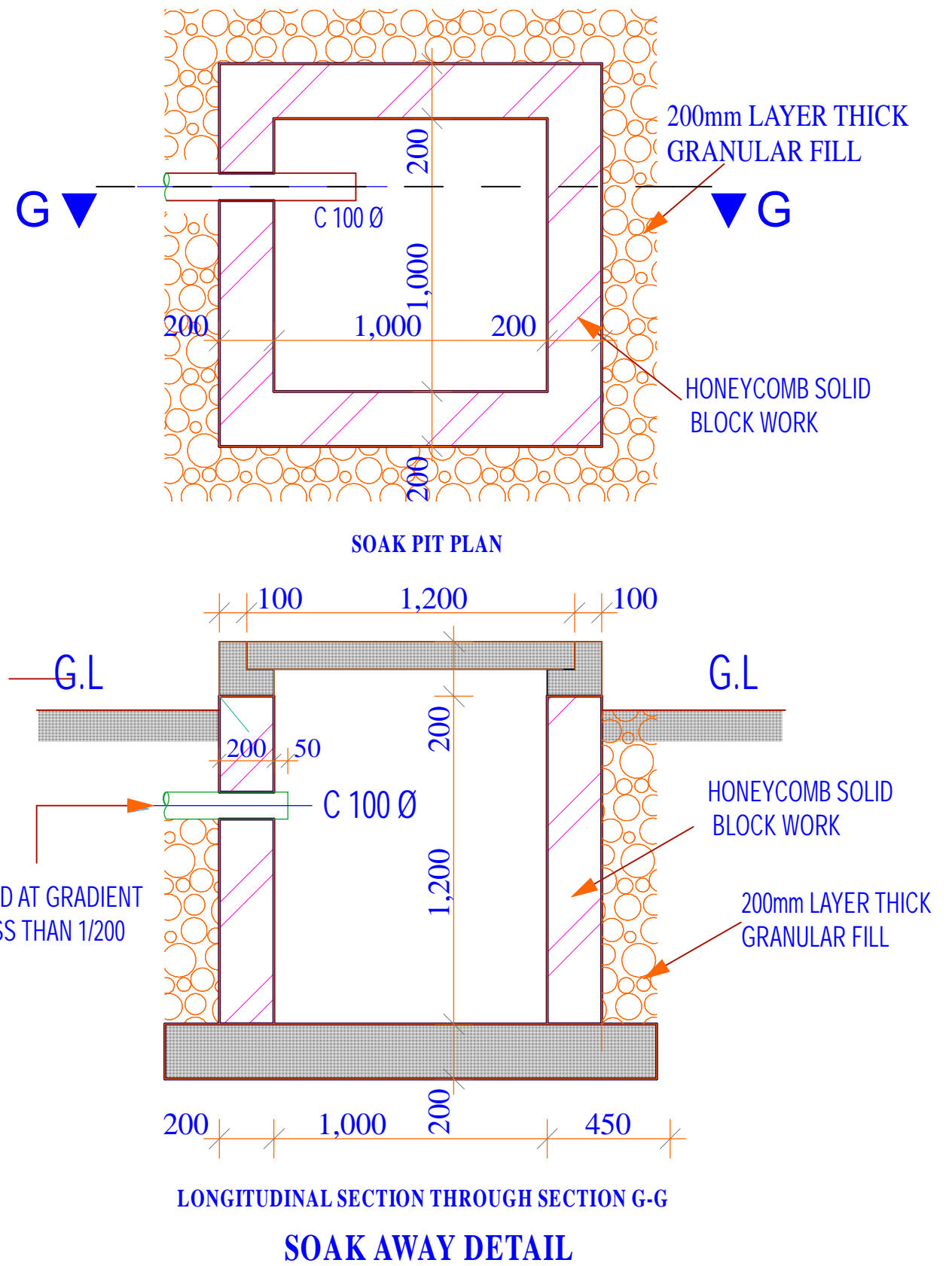
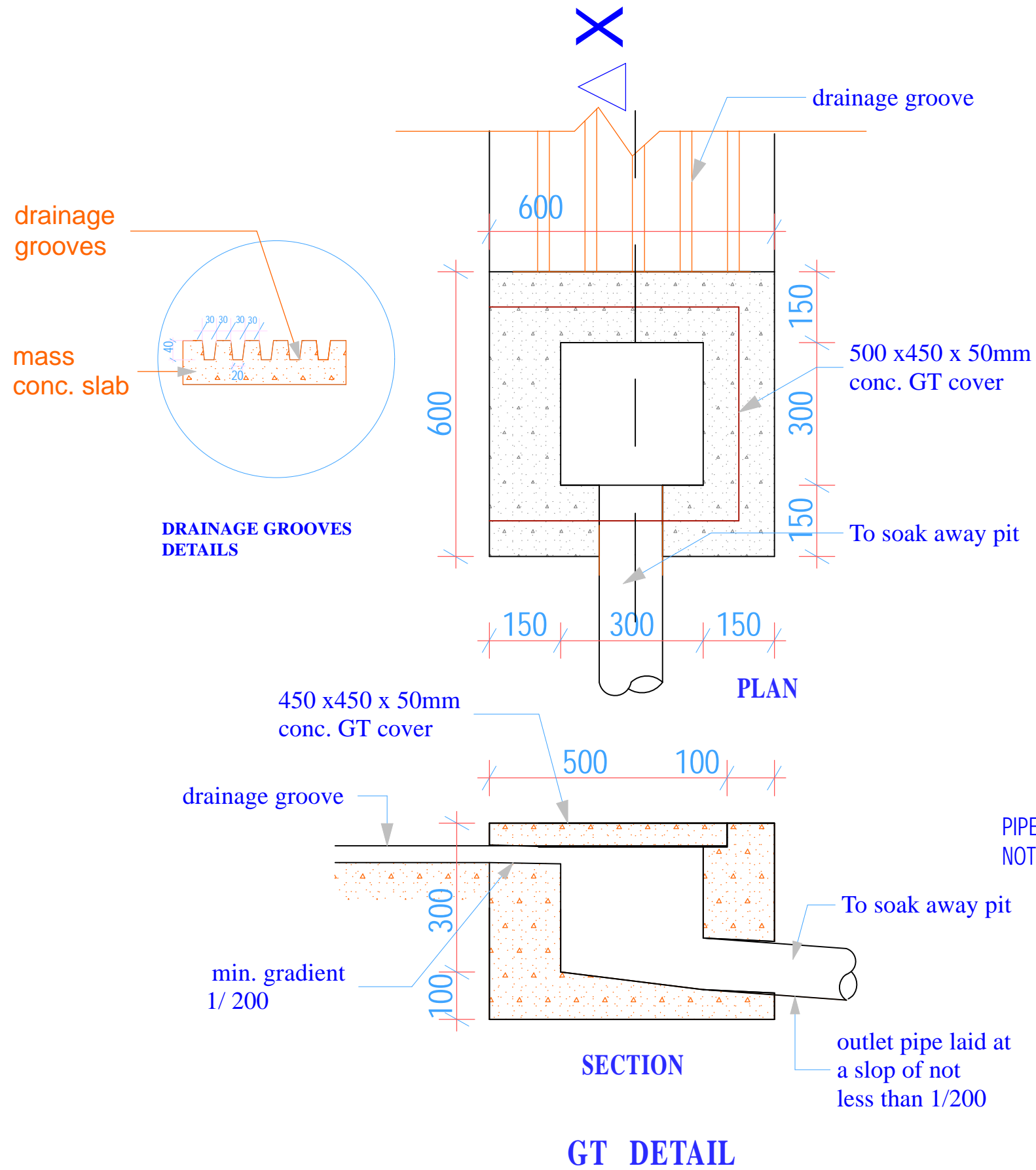
ITEM NO.	DESCRIPTION (ALL 25NN DIA)	UNIT)	QTY
1	Galvanised Iron Union	No.	3
2	Galvanised Iron Elbows	No.	3
3	Galvanised Iron Gate Valve (Pegler)	No.	2
4	Galvanised Iron Nipples	No.	11
5	Water Meter	No.	1
6	Non Return Valve	No.	1
7	Galvanised Iron Equal Tee	No.	5
8	Galvanised Iron Bend	No.	4
9	Ball Cock Water Taps	No.	3
10	Galvanised Iron Long Thread Nipples	No.	2
17	Galvanised Iron Black Nuts	No.	4
12	Galvanised Iron Class B Pipe (per metres)	No.	4
13	Boss white (400g)	No.	3
14	Temp Thread	LM..	2

<b>Project Title:</b> WATER KIOSK (Type Closed) PREFABRICATED	<b>Client:</b> WATER SERVICES TRUST FUND (WSTF)	<b>drq title:</b> PLUMBING DETAIL	<b>drq no.:</b> ARC 06	<b>Consultant:</b> Edward Kung'u	<b>Designed By</b> Eden Mati	<b>Checked By</b> John Orwa	<b>Approved by</b> CEO - Water Services Trust Fund Signature.....	Scale 1 : 10 Date: FEBRUARY 2009 page 06
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<b>Project Title:</b> WATER KIOSK (Type Closed) PREFABRICATED	<b>Client:</b> WATER SERVICES TRUST FUND (WSTF)	<b>drq title:</b> SHUTTER DETAIL	<b>drq no.:</b> ARC 07	<b>Consultant:</b> Edward Kung'u	<b>Designed By:</b> Eden Mati	<b>Checked By:</b> John Orwa	<b>Approved by:</b> CEO - Water Services Trust Fund Signature.....	<b>Scale</b> 1 : 20 <b>Date:</b> FEBRUARY 2009 <b>page</b> 07
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**Project Title:**  
WATER KIOSK  
(Type Closed)  
PREFABRICATED

**Client:**  
WATER SERVICES  
TRUST FUND (WSTF)

**drq title:**  
DRAINAGE DETAILS

**drq no.:**  
ARC 08

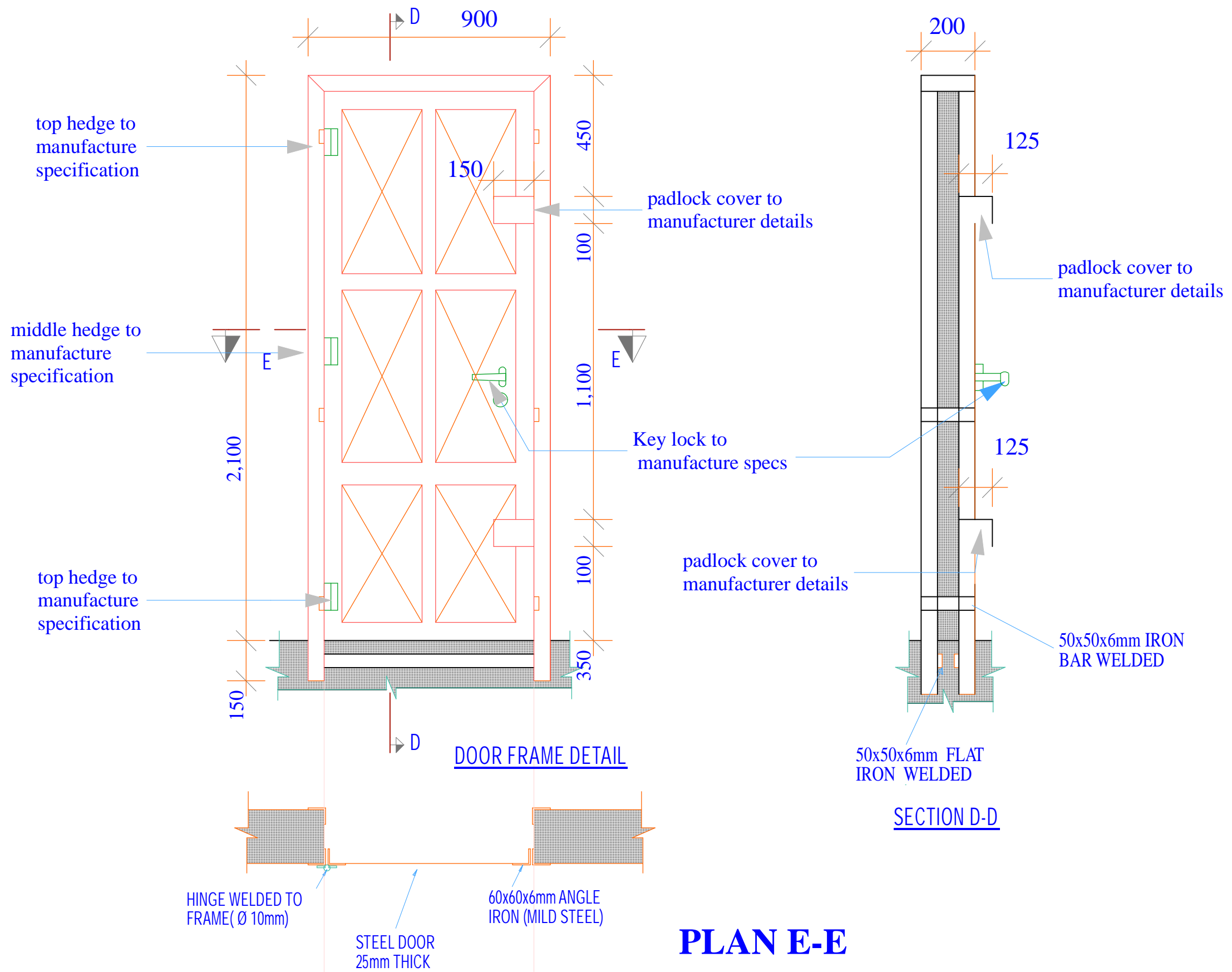
**Consultant:**  
Edward Kung'u

**Designed By**  
Eden Mati

**Checked By**  
John Orwa

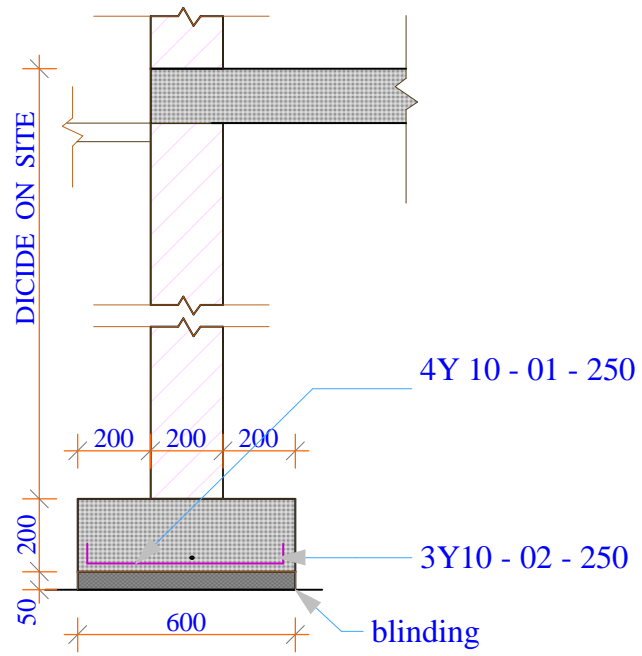
**Approved by**  
CEO - Water Services Trust Fund  
Signature.....

**Scale 1 : 10 1 : 20**  
**Date:**  
FEBRUARY 2009  
**page** 08

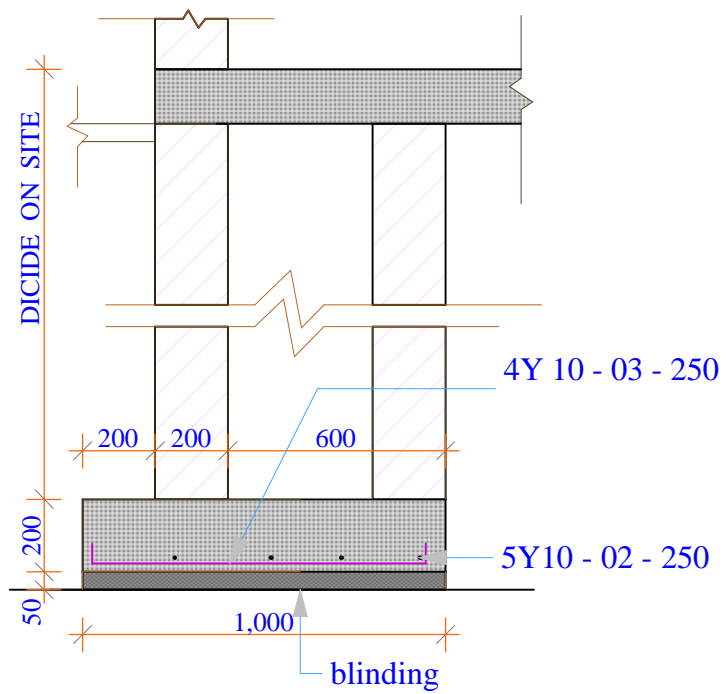


<b>Project Title:</b> WATER KIOSK (Type Closed) PREFABRICATED	<b>Client:</b> WATER SERVICES TRUST FUND (WSTF)	<b>drq title:</b> STEEL DOOR DETAIL	<b>drq no.:</b> ARC 9	<b>Consultant:</b> Edward Kung'u	<b>Designed By</b> Eden Mati	<b>Checked By</b> John Orwa	<b>Approved by</b> CEO - Water Services Trust Fund Signature.....	Scale 1 : 15 Date: FEBRUARY 2009 page 09
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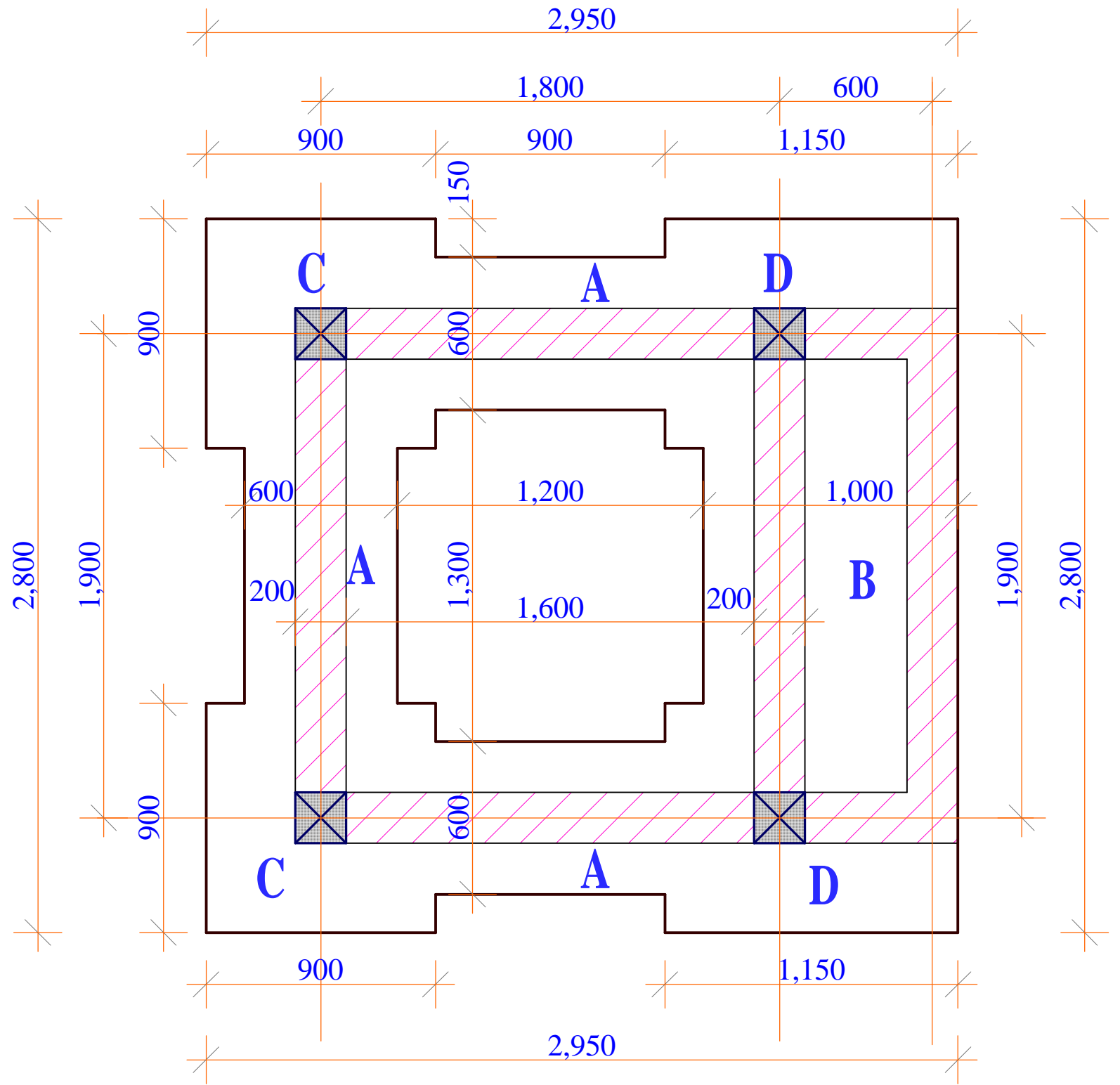




**DETAIL FOR STRIP FOOTING SHOWN THUS A**



**DETAIL FOR STRIP FOOTING SHOWN THUS B**



**FOUNDATION PLAN**

**Project Title:**  
WATER KIOSK  
(Type Closed)  
PREFABRICATED

**Client:**  
WATER SERVICES  
TRUST FUND (WSTF)

**drq title:**  
FOUNDATION PLAN

**drq no.:**  
STR 01

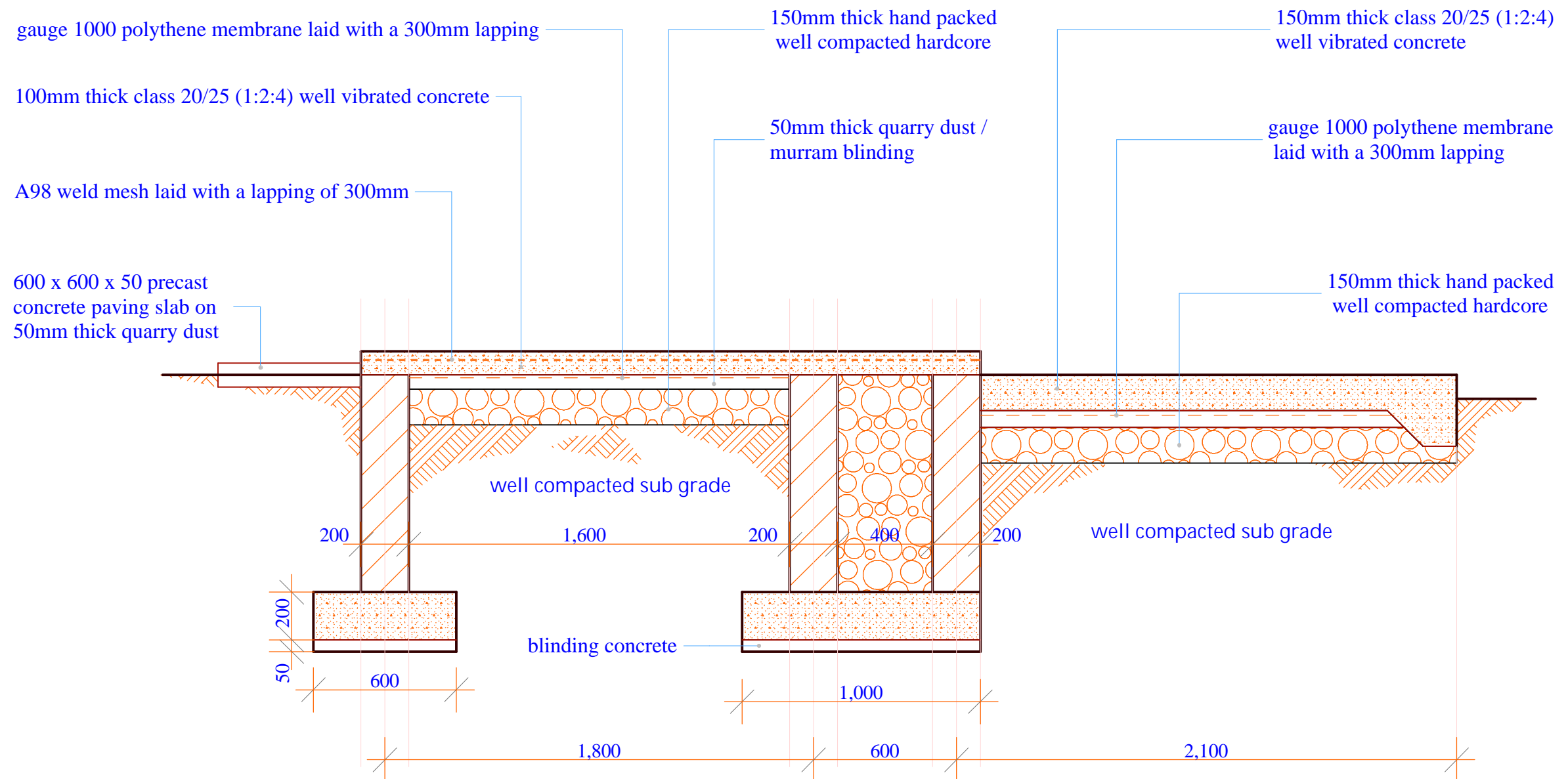
**Consultant:**  
Edward Kung'u

**Designed By**  
Eden Mati

**Checked By**  
John Orwa

**Approved by**  
CEO - Water Services Trust Fund  
Signature.....

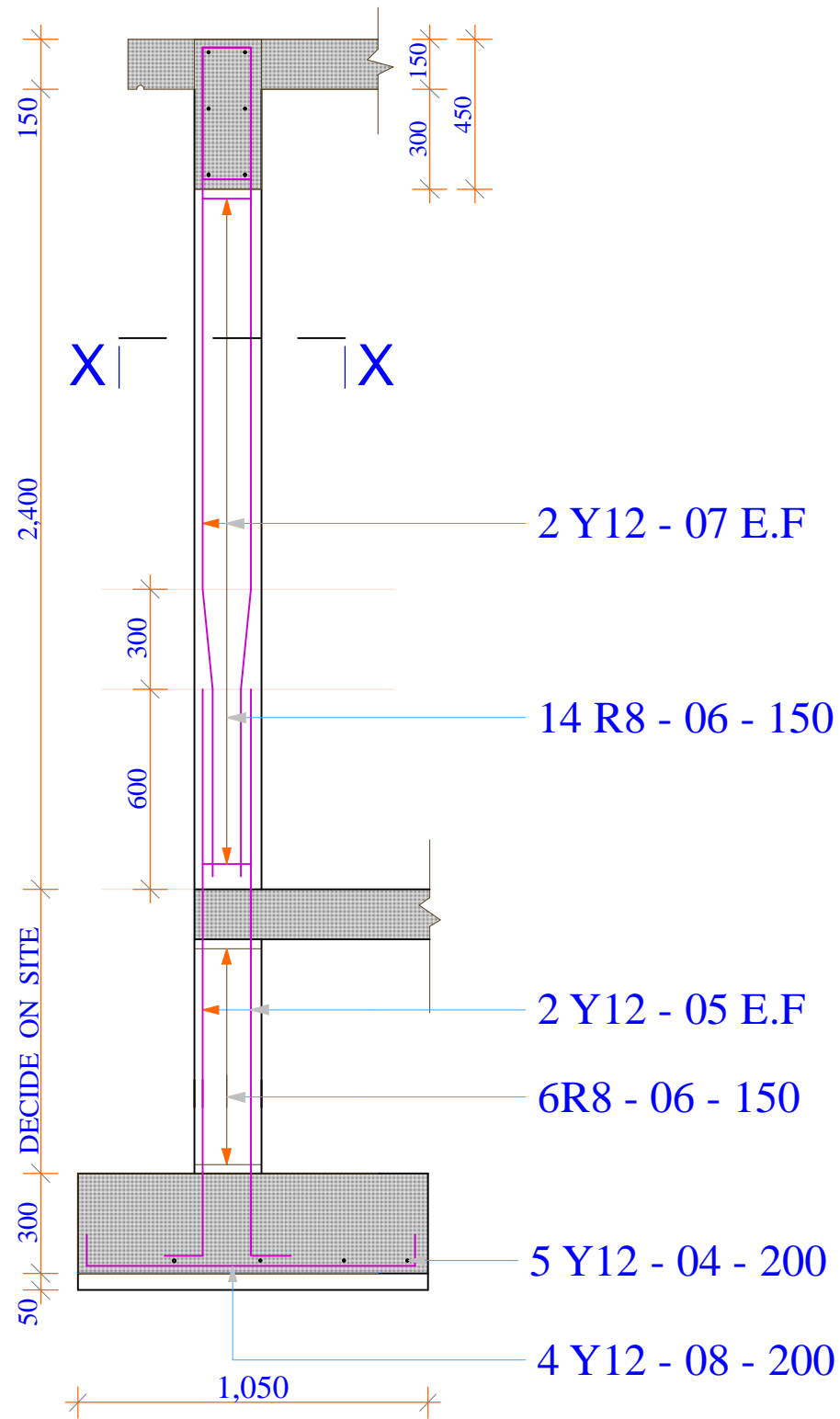
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**Date:**  
FEBRUARY 2009  
**page** 01



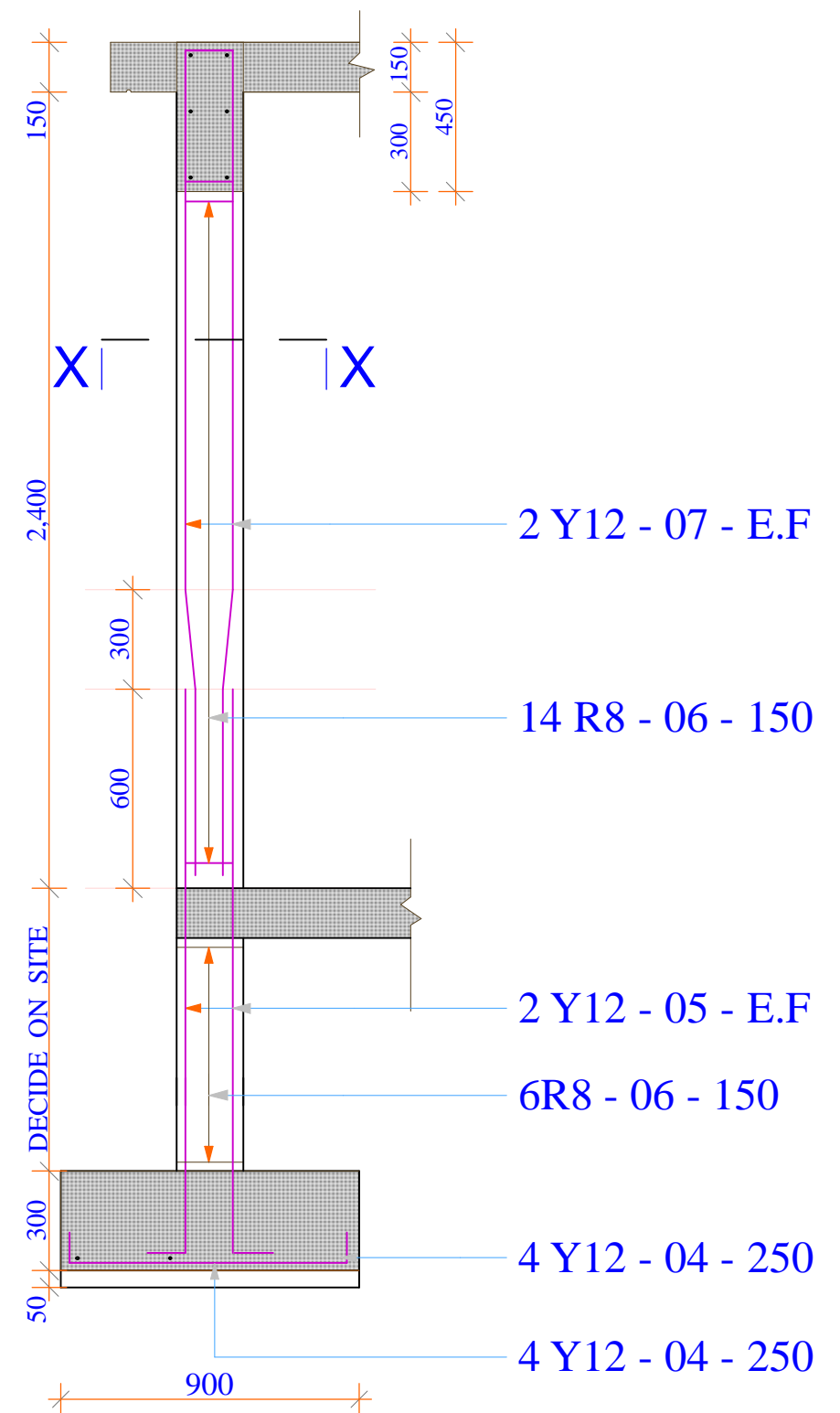
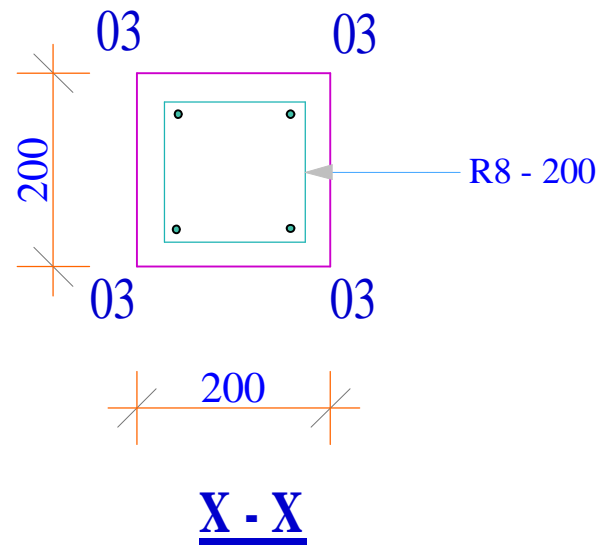
## FOUNDATION SECTION

<u>Project Title:</u> <b>WATER KIOSK          (Type Closed)          PREFABRICATED</b>	<u>Client:</u> <b>WATER SERVICES          TRUST FUND (WSTF)</b>	<u>drq title:</u> <b>FOUNDATION SECTION</b>	<u>drq no.:</u> <b>STR 02</b>	<u>Consultant:</u> <b>Edward Kung'u</b>	<u>Designed By</u> <b>Eden Mati</b>	<u>Checked By</u> <b>John Orwa</b>	<u>Approved by</u> <b>CEO - Water Services Trust Fund</b>  Signature.....	<u>Scale</u> <b>1 : 20</b> <u>Date:</u> <b>FEBRUARY 2009</b> <u>page</u> <b>02</b>
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**DETAIL FOR COLUMN & COL. BASE**  
**SHOWN THUS D 2no.**



**DETAIL FOR COLUMN & COL. BASE**  
**SHOWN THUS C 2no.**

**Project Title:**  
 WATER KIOSK  
 (Type Closed)  
 PREFABRICATED

**Client:**  
 WATER SERVICES  
 TRUST FUND (WSTF)

**drq title:**  
 COLUMNS REINFORCEMENT  
 DETAIL

**drq no:**  
 STR 03

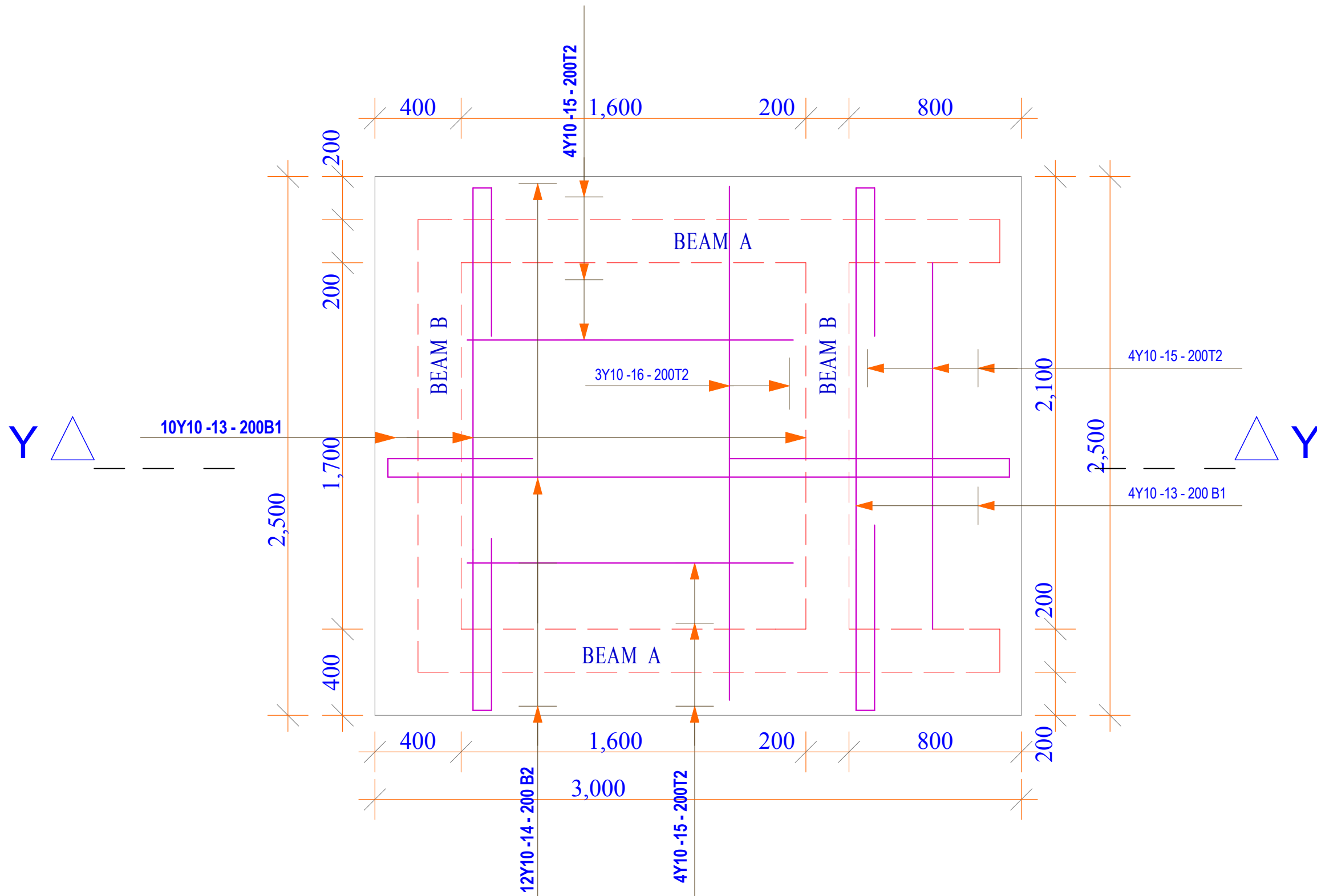
**Consultant:**  
 Edward Kung'u

**Designed By**  
 Eden Mati

**Checked By**  
 John Orwa

**Approved by**  
 CEO - Water Services Trust Fund  
 Signature.....

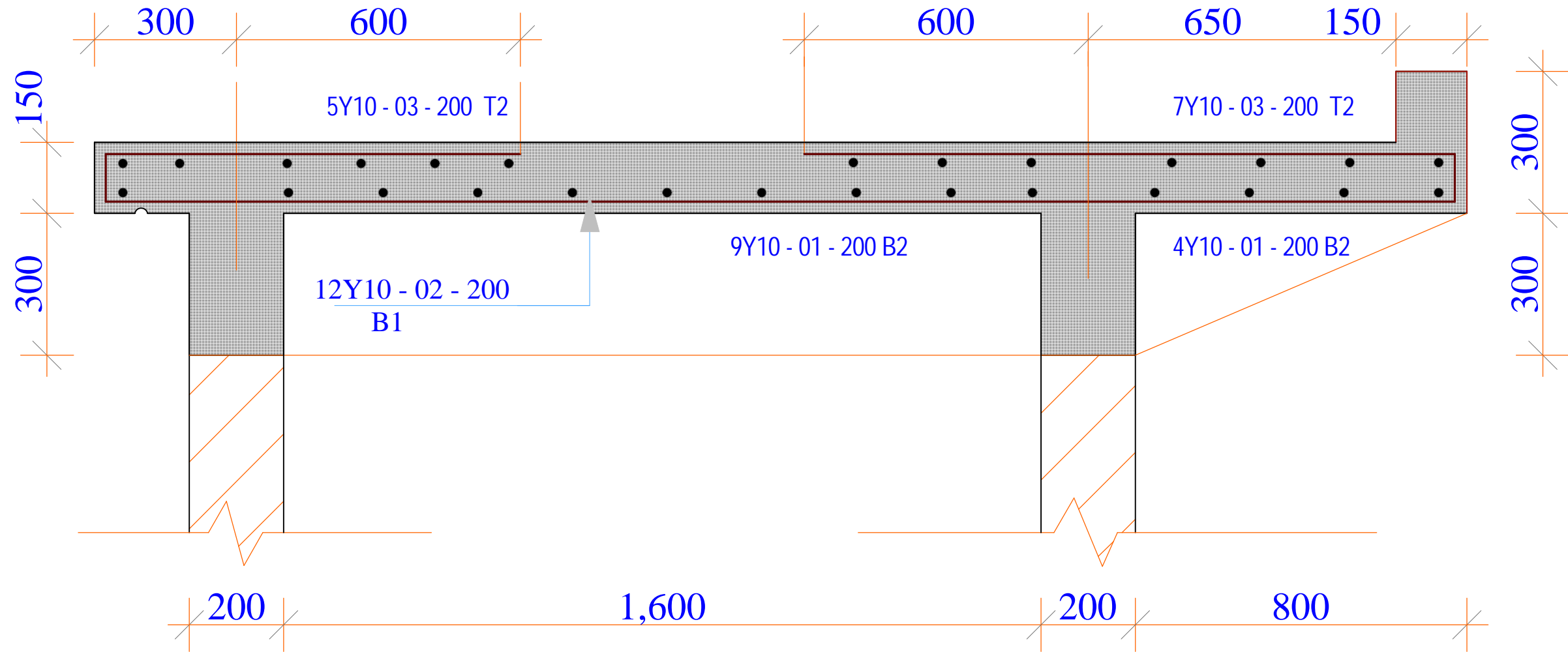
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 Date: FEBRUARY 2009  
 page 03



### R. C. SLAB DETAILS

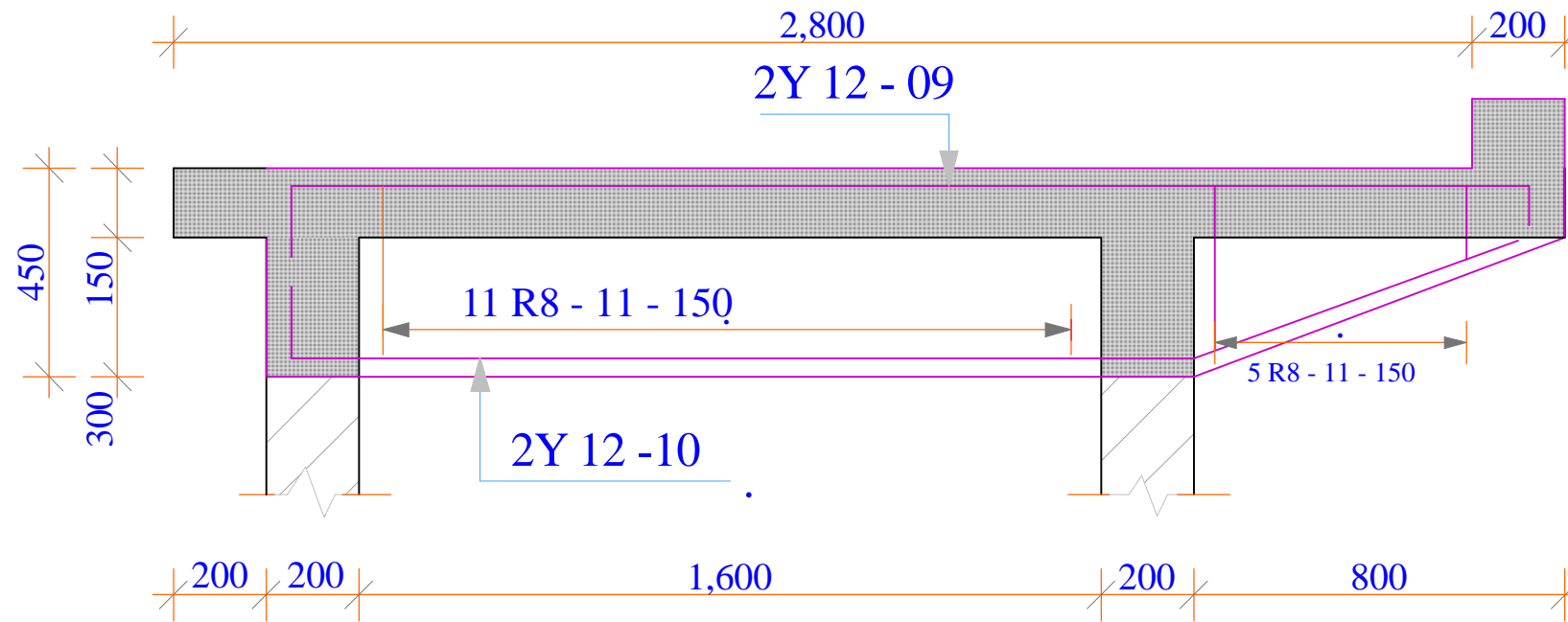
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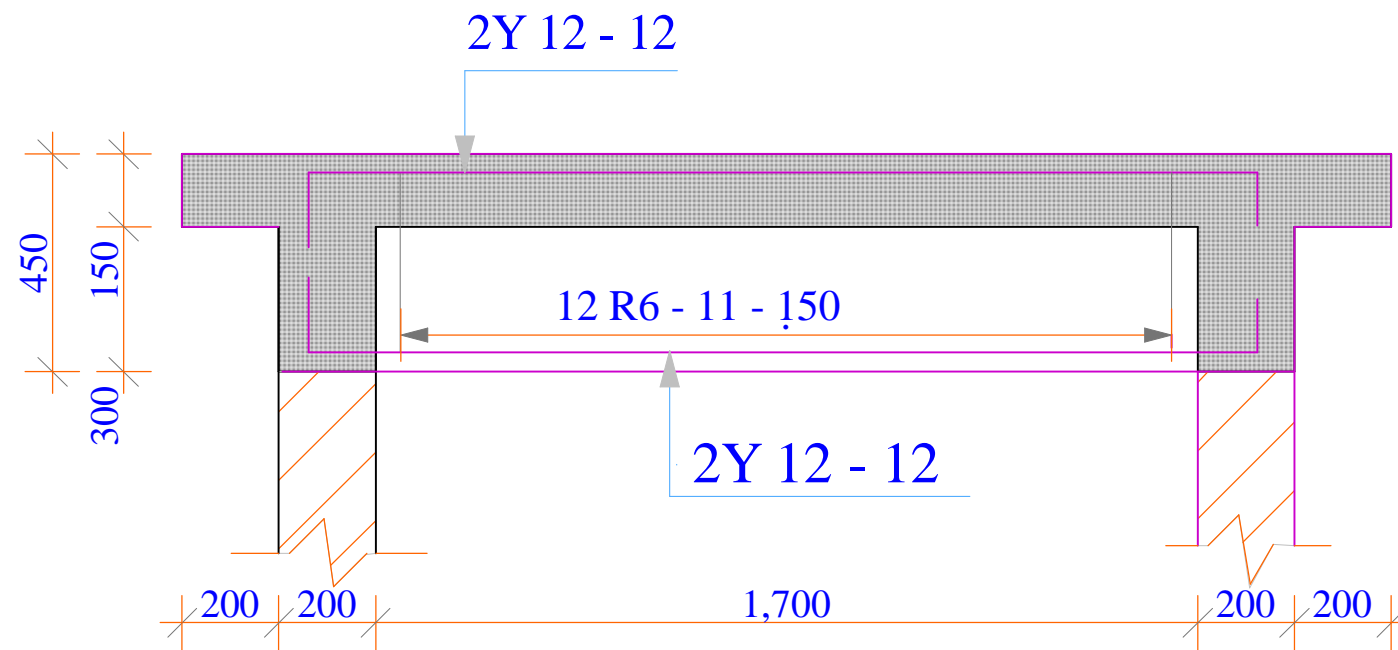


**R. C. SLAB SECTION Y-Y**

<p><b>Project Title:</b> WATER KIOSK (Type Closed) PREFABRICATED</p>	<p><b>Client:</b> WATER SERVICES TRUST FUND (WSTF)</p>	<p><b>drq title:</b> RC SLAB SECTION</p>	<p><b>drq no:</b> STR 05</p>	<p><b>Consultant:</b> Edward Kung'u</p>	<p><b>Designed By</b> Eden Mati</p>	<p><b>Checked By</b> John Orwa</p>	<p><b>Approved by</b> CEO - Water Services Trust Fund Signature.....</p>	<p>Scale 1 : 20 Date: FEBRUARY 2009 page 05</p>
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**BEAM A 2No.**



**BEAM B 2No.**

**Project Title:**  
WATER KIOSK  
(Type Closed)  
PREFABRICATED

**Client:**  
WATER SERVICES  
TRUST FUND (WSTF)

**drq title:**  
BEAMS REINFORCEMENT  
DETAILS

**drq no:**  
STR 06

**Consultant:**  
Edward Kung'u

**Designed By**  
Eden Mati

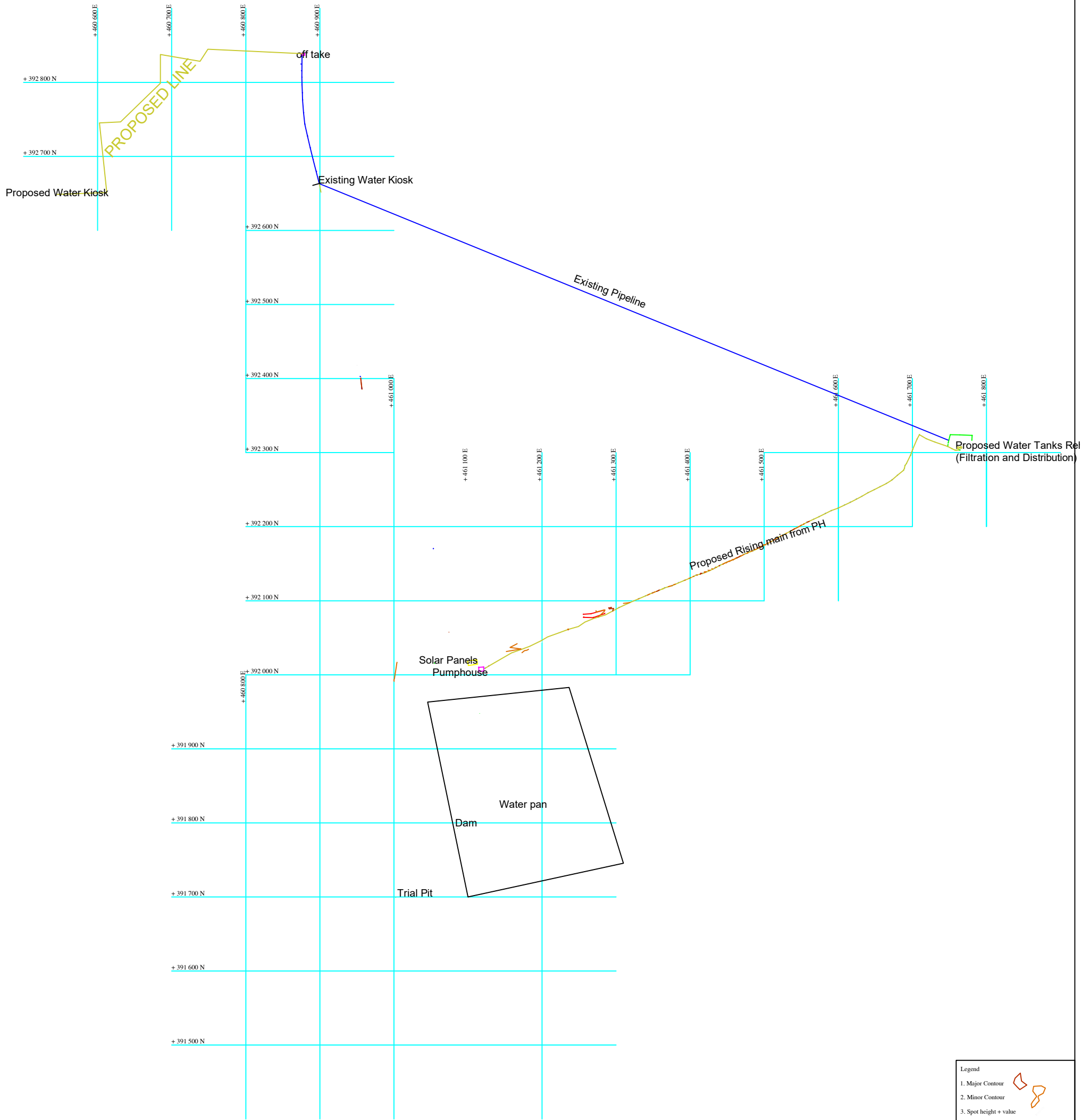
**Checked By**  
John Orwa

**Approved by**  
CEO - Water Services Trust Fund  
Signature.....

**Scale** 1 : 15  
**Date:**  
FEBRUARY 2009  
**page** 06



# TOPOGRAPHICAL SURVEY LAYOUT OF SOLOLO WATER SUPPLY PIPELINES



**NOTES**  
 1. All measurements are in metres  
 2. Contour interval is 0.2m

Consultant:  
 GEO Consultants  
 0727-456089  
 P.O BOX 103677-00101  
 consultantsgeo7@gmail.com

Signature:.....

Client:

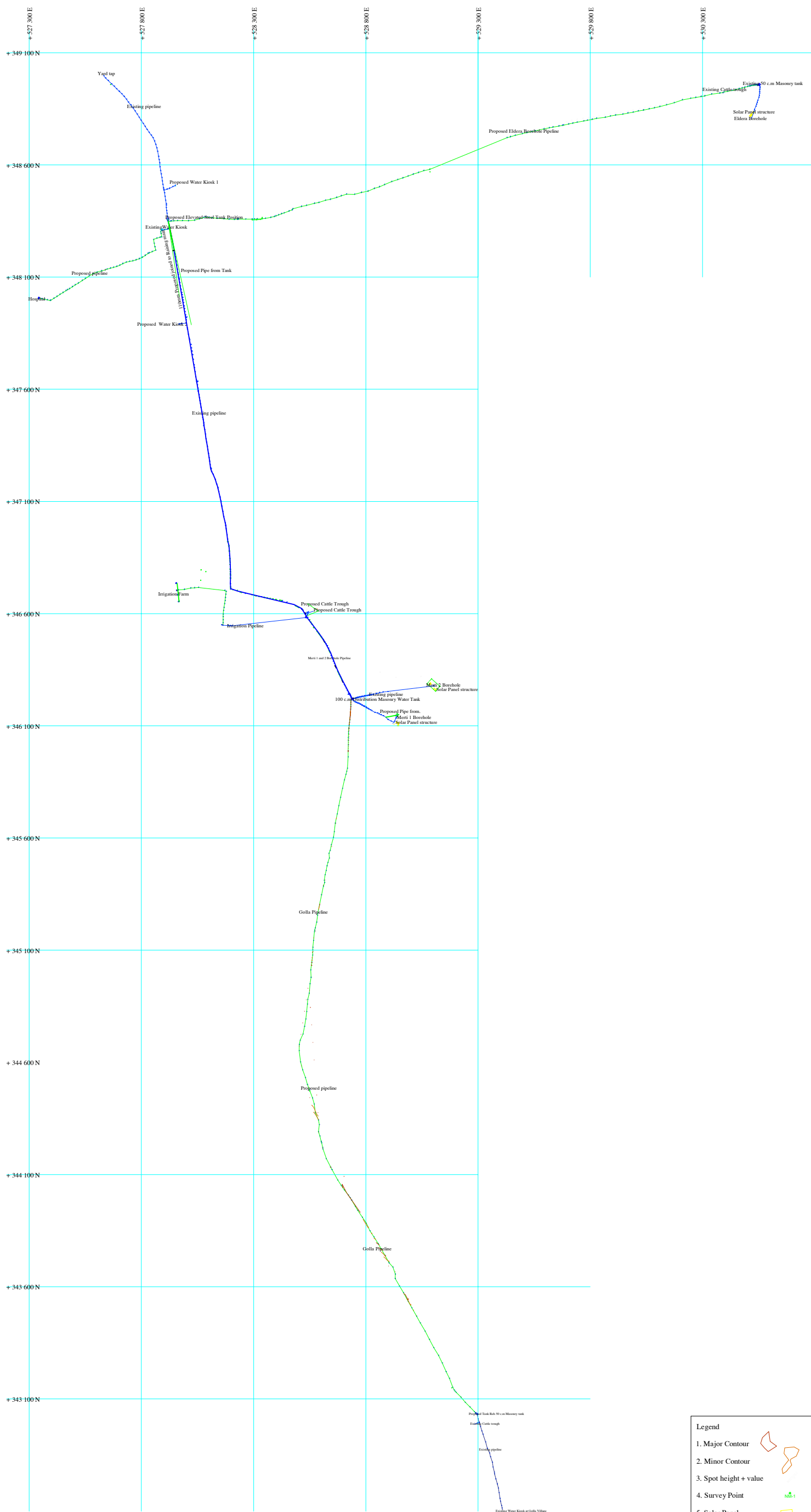
Signature:.....

Drawn	G.S.O
Checked	
Date	July 2023
Scale	1 : 10000
Map Parameters	
Grid	UTM Zone 36° N
Projection	Universal Transverse Mercator
Spheroid	WGS84
Units	Metres
Datum	WGS84

**Legend**

- 1. Major Contour
- 2. Minor Contour
- 3. Spot height + value
- 4. Survey Point
- 5. Solar Panel
- 6. Building
- 7. Proposed Pipeline
- 8. Existing Pipeline

# TOPOGRAPHICAL LAYOUT SURVEY OF DABEL WATER SUPPLY



**NOTES**  
 1. All measurements are in metres  
 2. Contour interval is 0.2m

**Consultant:**  
 GEO Consultants  
 0727-456089  
 P.O BOX 103677-00101  
 consultantsgeo47@gmail.com

Signature:.....

**Client:**

Signature:.....

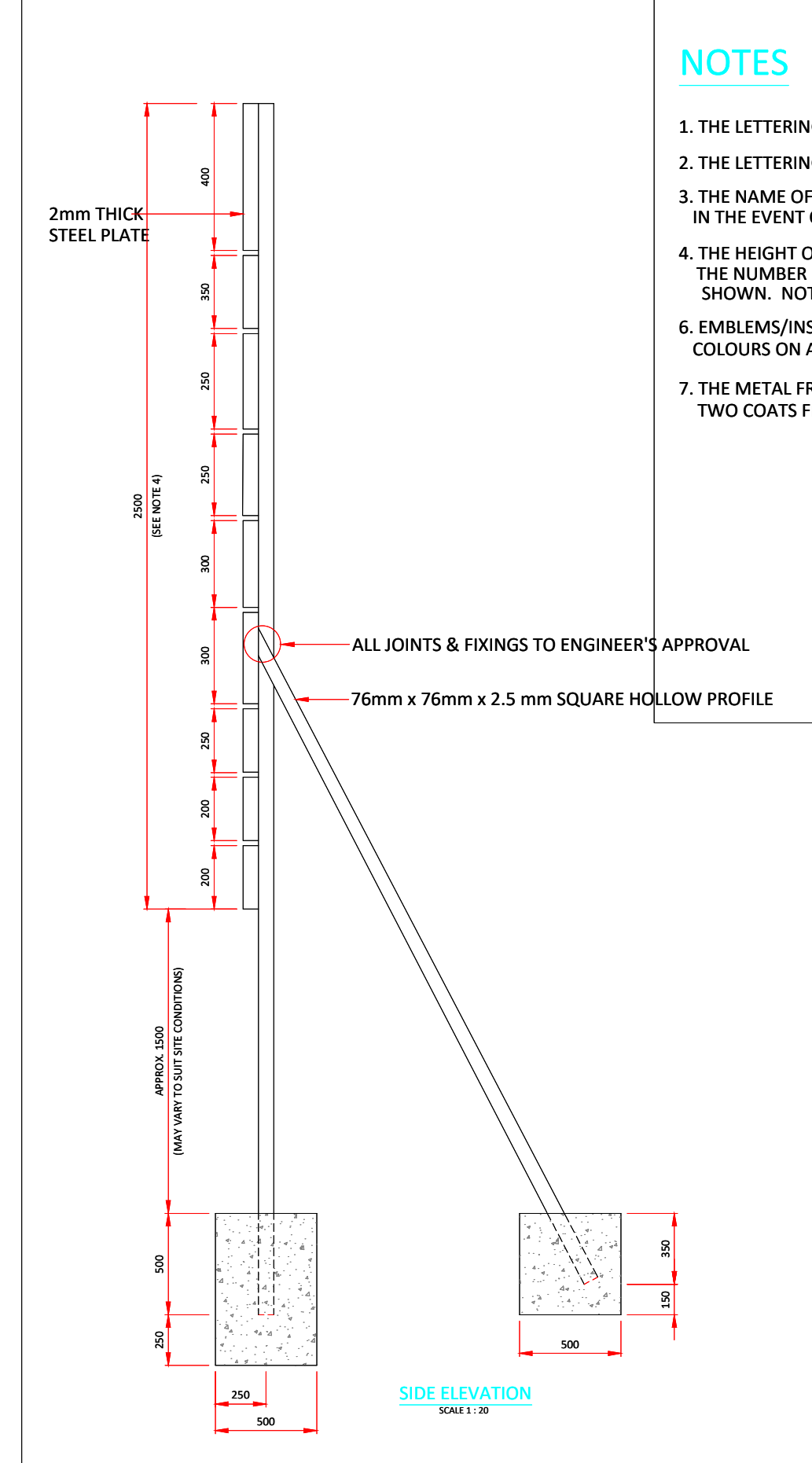
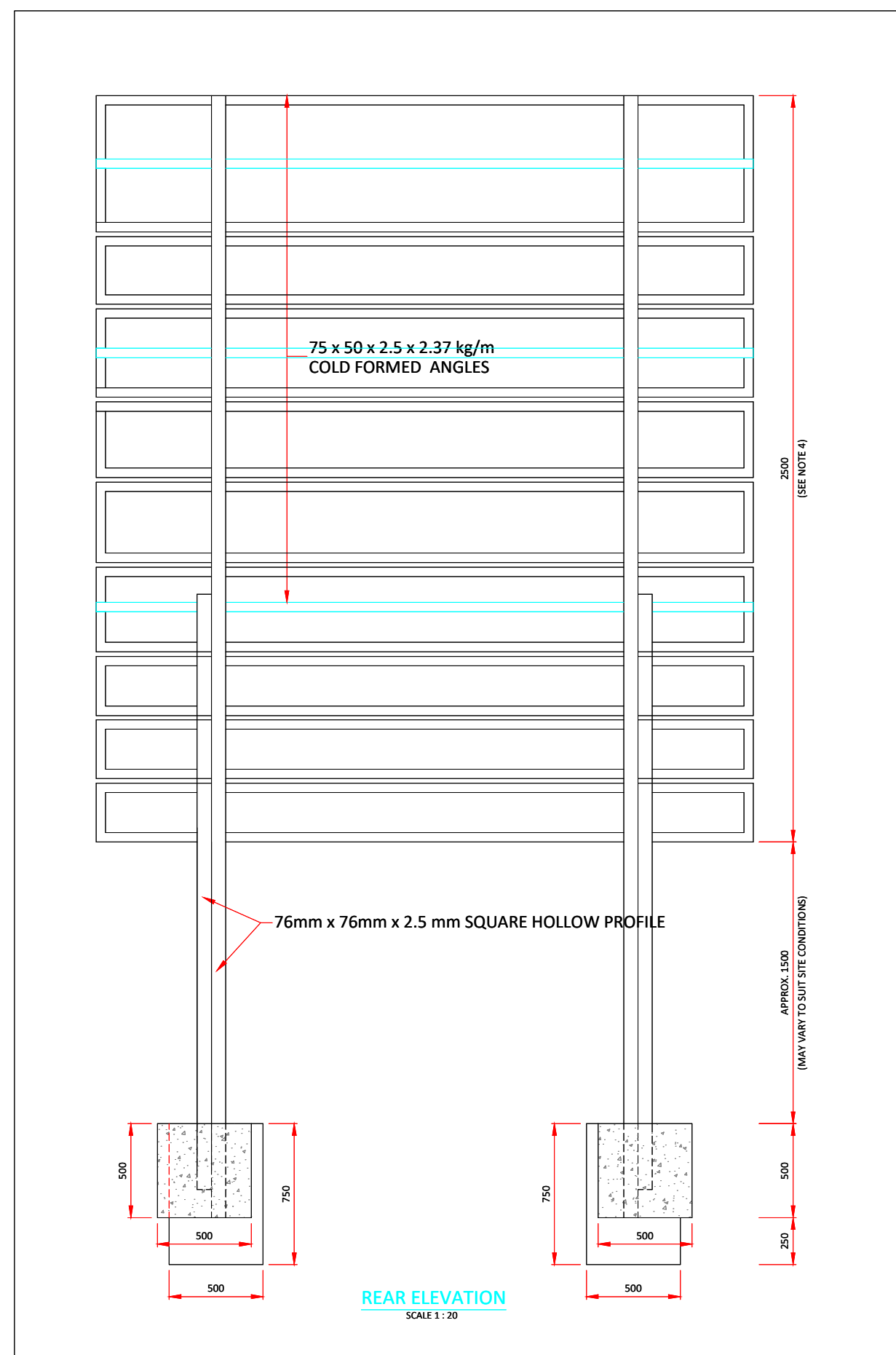
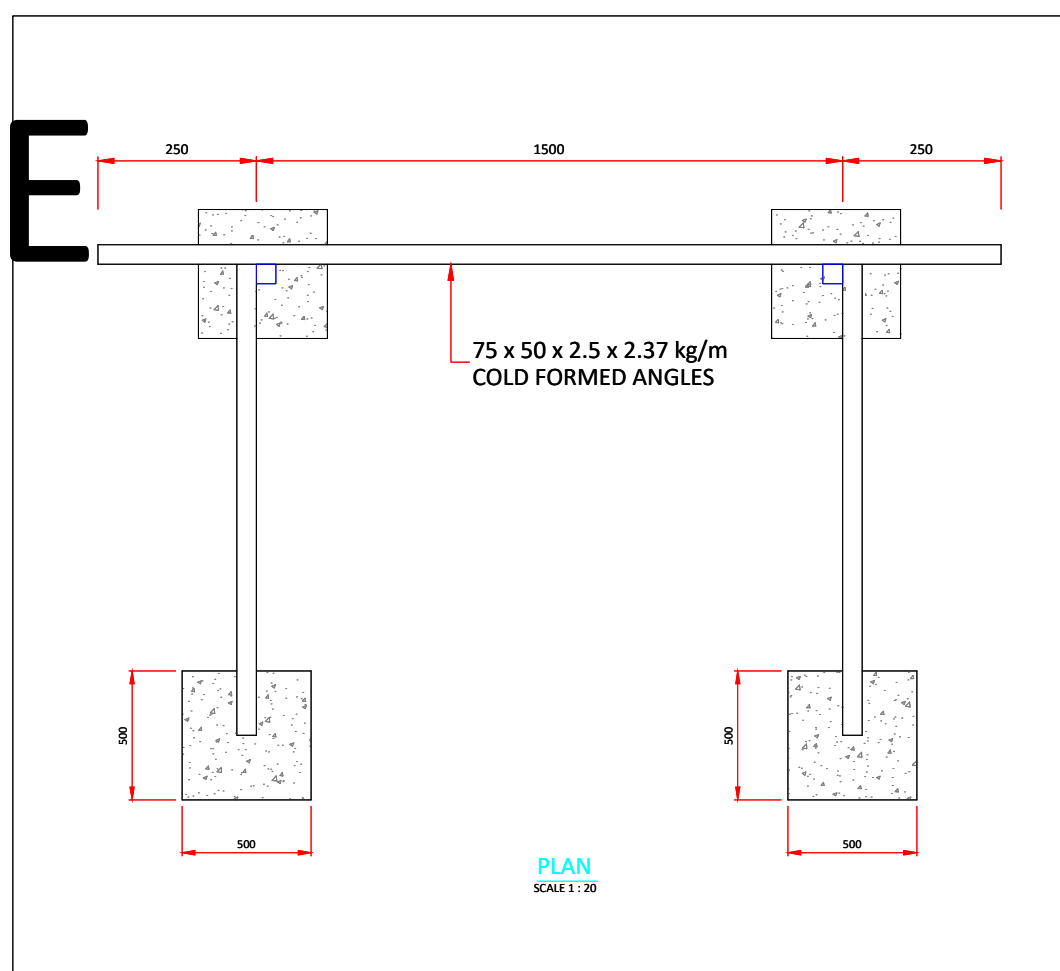
Drawn	G.S.O
Checked	
Date	July 2023
Scale	1 : 10000

**NORTH**

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Projection	Universal Transverse Mercator
Spheroid	WGS84
Units	Metres
Datum	WGS84

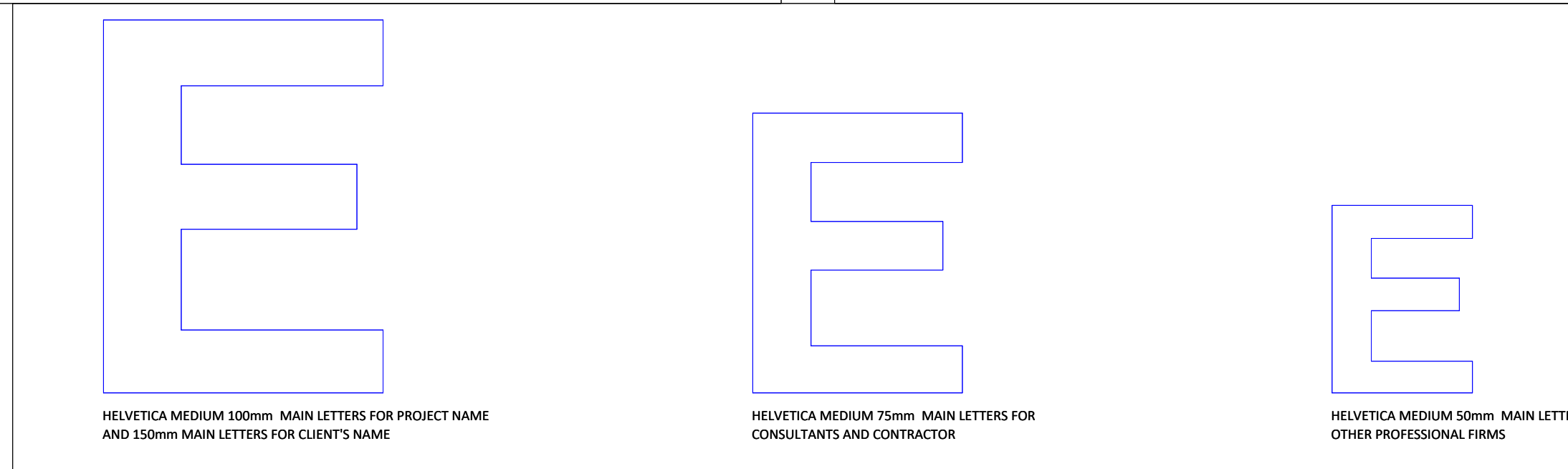
- Legend**
- 1. Major Contour —
  - 2. Minor Contour —
  - 3. Spot height + value +
  - 4. Survey Point •
  - 5. Solar Panel □
  - 6. Building □
  - 7. Proposed Pipeline —
  - 8. Existing Pipeline —





**NOTES**

1. THE LETTERING TYPE TO BE USED IS HELVETICA MEDIUM.
2. THE LETTERING SIZE AND DIMENSIONS ARE AS SHOWN.
3. THE NAME OF THE PROJECT AND CLIENT MAY BE RE-SIZED PROPORTIONATE IN THE EVENT OF IT BEING TOO LONG.
4. THE HEIGHT OF THE SIGN BOARD MAY VARY DEPENDING ON THE NUMBER OF PROFESSIONAL SERVICES THAT ARE TO BE SHOWN. NOTE THAT ALL THE PROFESSIONAL SERVICES ARE TO BE SHOWN.
5. EMBLEMS/INSIGNIA/COMPANY LOGOS ARE TO BE IN THEIR CORRECT RESPECTIVE COLOURS ON A WHITE BACKGROUND AND ARE TO BE PLACED AS SHOWN.
6. THE METAL FRAME AND SUPPORTS TO BE PAINTED WITH ONE COAT PRIMER AND TWO COATS FINISH. PAINT TO THE ENGINEER'S APPROVAL.



DRAWING TO SCALE IN A1 SIZE

<p>MARSABIT COUNTY</p>	No.	APPROVAL	DATE	REFERENCE	CLIENT: <b>CONCERN WORLDWIDE</b>	CONSULTANT: <b>GEO CONSULTANTS</b>	PROJECT TITLE: <b>PROJECT</b>	TITLE OF DRAWING: <b>SIGN BOARD DETAILS</b>	Designed: <b>P. K.W</b>	Date: <b>Aug 2023</b>
					<b>CONCERN worldwide</b> in conjunction with <b>WaterFund</b>			DWG. No. <b>KAM/DD/203</b>	Drawn: <b>MMN</b>	Date: <b>Aug 2023</b>
								Sheet No. <b>1/1</b>	Checked: <b>P. K.W</b>	Date: <b>Aug 2023</b>
									Approved: <b>ENG ANDREW MESSO (A3007)</b>	Date: <b>Aug 2023</b>