

NORTHERN WATER WORKS DEVELOPMENT AGENCY



P.O BOX 495 GARISSA

VOLUME III

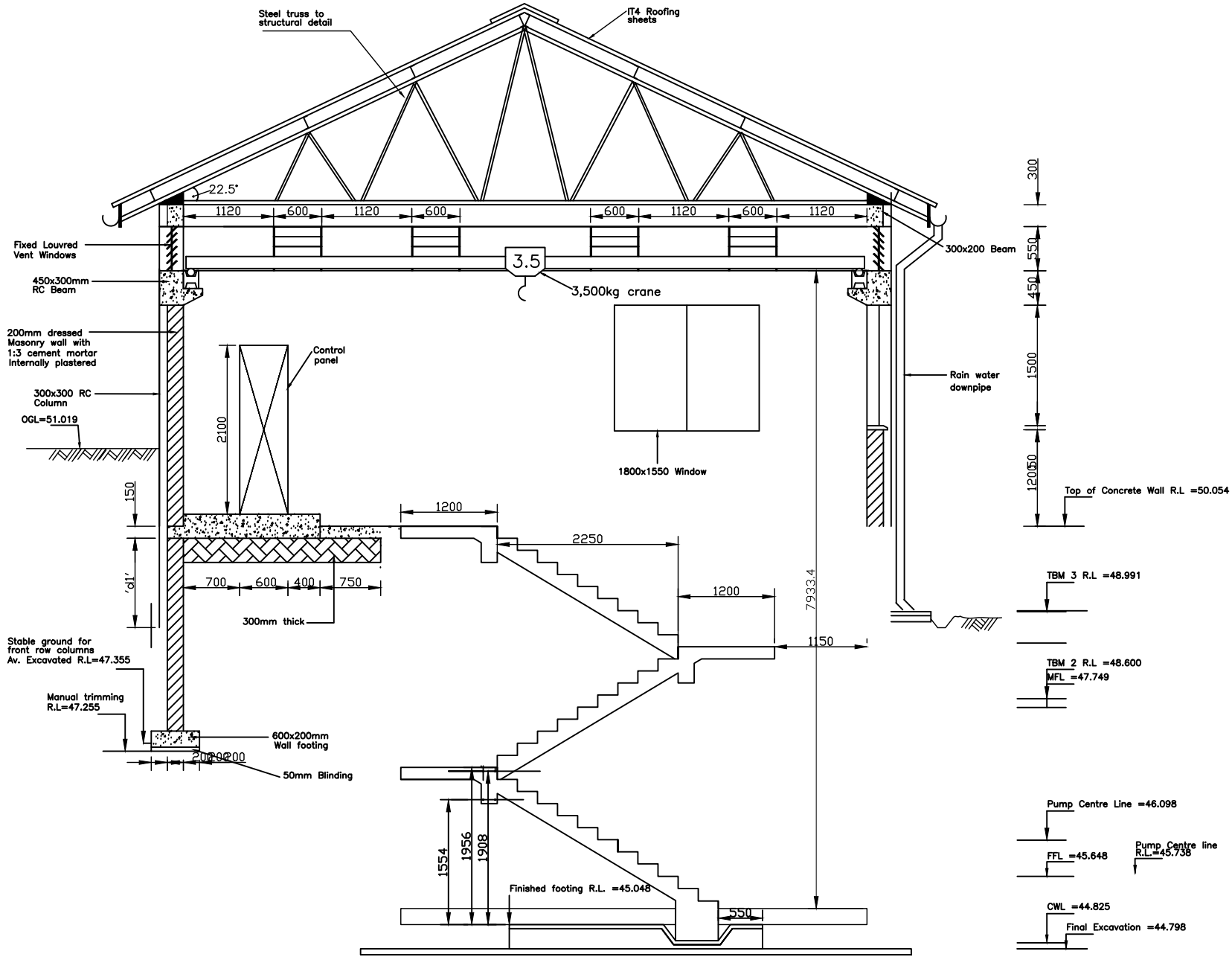
TECHNICAL DRAWINGS

CONSTRUCTION OF IJARA WATER SUPPLY PROJECT:-

PROPOSED MASALANI-GABABA PIPELINE EXTENSION AND ANCILLARY WORKS PROJECT

TENDER NO: NWWDA/CW/T/004/2022-2023

DECEMBER 2022



PUMP HOUSE ELEVATION DETAILS

- NOTES:**
1. All dimensions are in millimetres unless otherwise stated.
 2. Only figured dimensions to be taken from this drawing.
 3. Drawing to scale only in A1 size.
 4. Concrete Grade 25/20 to be used for all concrete

REV	REVISIONS	By	Checked	Sign	Date	Approved
C			CHECKED			
B			CHECKED			
A			CHECKED			
0			CHECKED			

Client:
 NORTHERN WATER WORKS
 DEVELOPMENT AGENCY
 P.o.Box 495-GARISSA

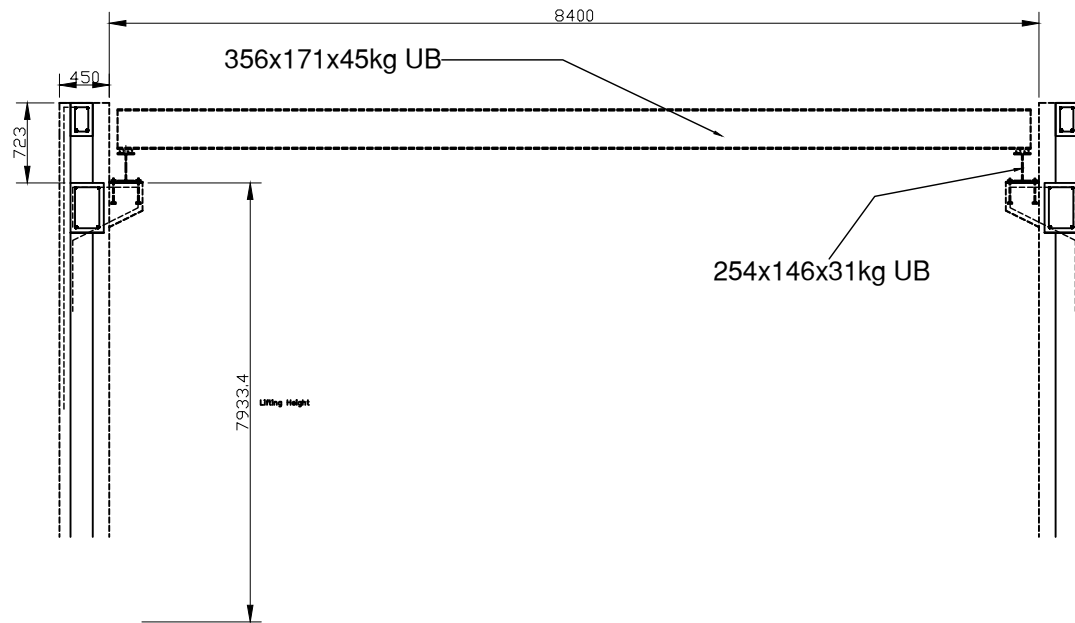
Project:
 IJARA WATER SUPPLY PROJECT
 MASALANI-GABABA WORKS

Designed by _____ Drawn by _____
 Checked by _____ Approved by _____

Title:
 INTAKE PUMP HOUSE
 TRAVELING GIRDER CRANE
 (Sheet 2 of 4)

Section Head	Date	Division Head	Date
Branch Head	Date	Director	Date
Scale	1 : 25	Date	FEB 2022
Job No.		ACAD File:	
STATUS	DRAWING No.	WW/WD/874/TW/087GD2	REV. 2

DETAIL "A"



GIRDER SECTIONAL ELEVATION

- NOTES:**
1. All dimensions are in millimetres unless otherwise stated.
 2. Only figured dimensions to be taken from this drawing.
 3. Drawing to scale only in A1 size.

C		BY			
		CHECKED			
B		BY			
		CHECKED			
A		BY			
		CHECKED			
O		BY			
		CHECKED			

REV	REVISIONS	Des. No.	SIGN	DATE	APPROVED
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Client:

NORTHERN WATER WORKS
DEVELOPMENT AGENCY
P.o.Box 495-GARISSA

Project:

IJARA WATER SUPPLY PROJECT
MASALANI-GABABA WORKS

Designed by _____ Drawn by _____
Checked by _____ Approved by _____

Title:
INTAKE PUMP HOUSE
TRAVELING GIRDER CRANE
(Sheet 3 of 4)

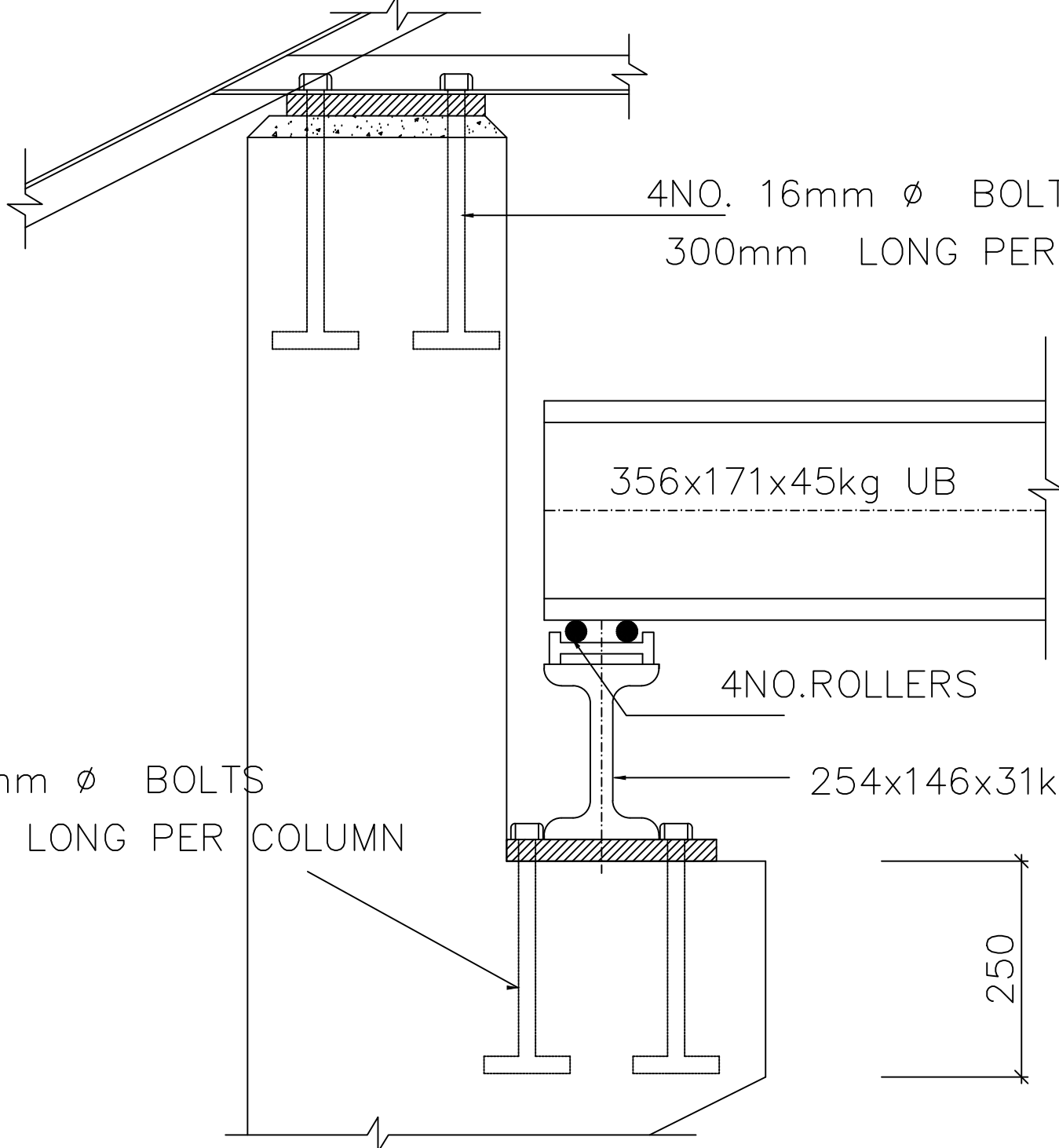
Section Head	Date	Division Head	Date
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Branch Head	Date	Director	Date
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Scale AS SHOWN Date FEB 2022

Job No. _____ ACAD File: _____

STATUS DRAWING No. WW/WD/874/TW/087GD3 REV.3



4NO. 16mm ϕ BOLTS
300mm LONG PER COLUMN

356x171x45kg UB

4NO.ROLLERS

254x146x31kg UB

4NO. 20mm ϕ BOLTS
250mm LONG PER COLUMN

250

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REV	REVISIONS	Drp. No.	BY	CHECKED	SIGN	DATE	APPROVED
C			BY	CHECKED			
B			BY	CHECKED			
A			BY	CHECKED			
0			BY	CHECKED			

Client:

NORTHERN WATER WORKS
DEVELOPMENT AGENCY
P.o.Box 495-GARISSA

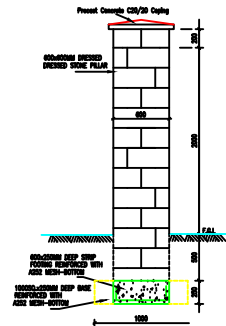
Project:
IJARA WATER SUPPLY PROJECT

MASALANI-GABABA WORKS

Designed by	Drawn by
Checked by	Approved by

Title:
INTAKE PUMP HOUSE
TRAVELING GIRDER CRANE
(Sheet 4 of 4)

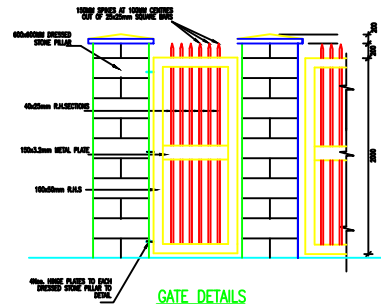
Section Head	Date	Division Head	Date
Branch Head	Date	Director	Date
Scale	AS SHOWN	Date	FEB 2022
Job No.	ACAD File:		
STATUS	DRAWING No.	WW/WD/874/TW/087GD4	REV.4



SECTION 1 - 1
SCALE: 1:50



SECTION 2 - 2
SCALE: 1:20



GATE DETAILS
SCALE: 1:50

NOTES:

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3. Drawing to scale only in A1 size.

REVISORS	Des. No.	DATE	APPROVED

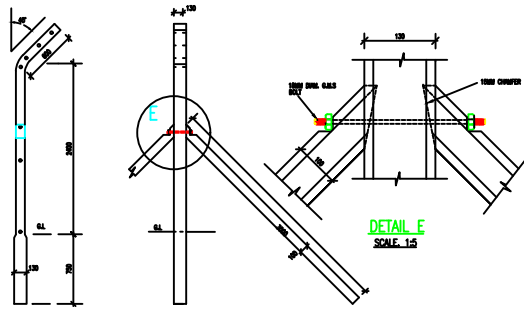
NORTHERN WATER WORKS
DEVELOPMENT AGENCY
P.O.BOX 495-GARSSA

PROJECT TITLE
LAMA WATER SUPPLY
SOURCE IMPROVEMENT
WORKS

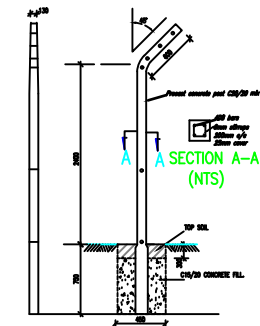
DRAWING TITLE
INTAKE WORKS
GATE AND FENCING DETAILS

Checked & Approved by: _____
Scale: As shown Date: June 2022

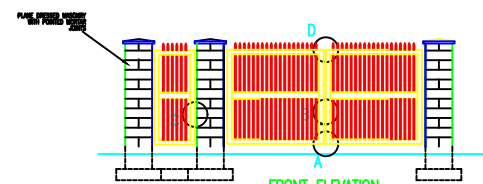
Drawing No. WW/10/074/SD/000(0)



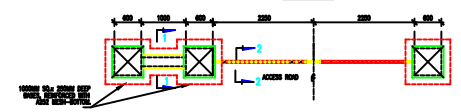
FRONT STRAINING POST
SCALE: 1:50
SIDE
PRECAST CONCRETE POST



FRONT INTERMEDIATE POST
SCALE: 1:50
SIDE



FRONT ELEVATION
SCALE: 1:100



GATE ENTRANCE DETAIL
PLAN
SCALE: 1:100

- NOTES:**
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 2. Only figured dimensions to be taken from this drawing.
 3. Drawing to scale only in A1 size.

	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			
	BY			
	CHECKED			
REVISIONS	Dep. No.	SN	DATE	APPROVED

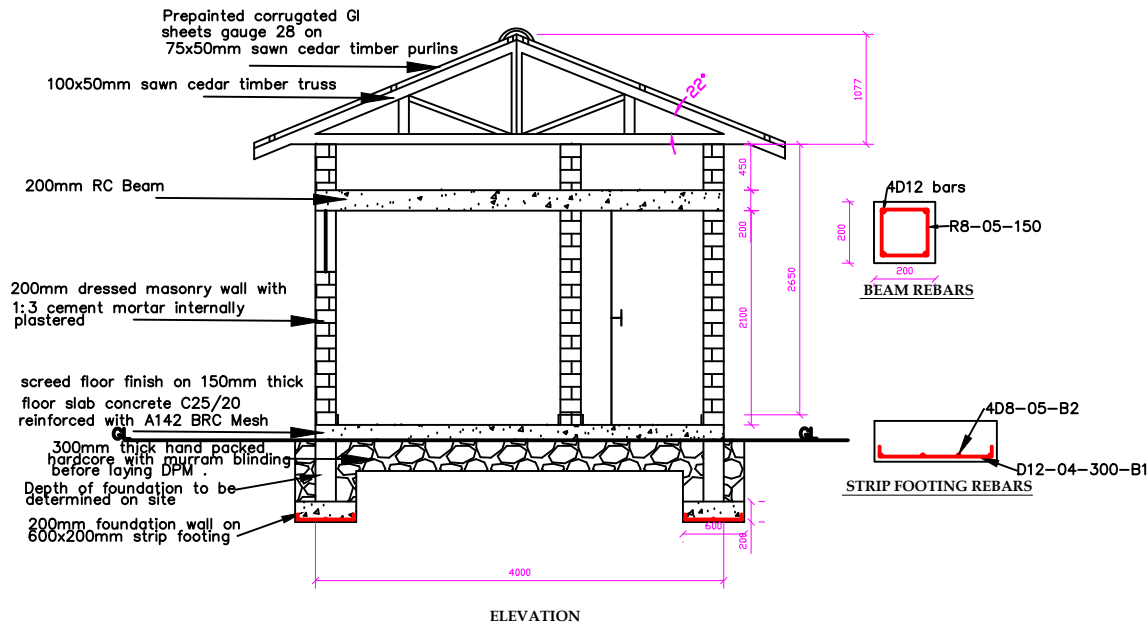
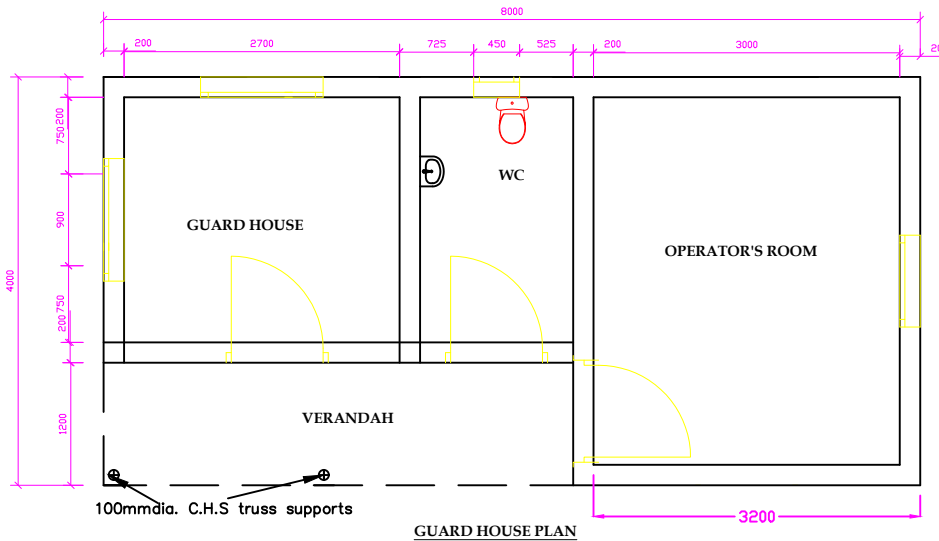
NORTHERN WATER WORKS
DEVELOPMENT AGENCY
P.O.BOX 495-GARISSA

PROJECT TITLE
MARA WATER SUPPLY PROJECT
WASHALAW-GABARA
WORKS

DRAWING TITLE
INTAKE WORKS
GATE AND FENCING DETAILS

Checked & Approved by: [Signature] Date: June 2022
Scale: As shown
Drawing No. WW/WD/874/SD/006(n)

Sheet 1 of 3



NOTES

1. All dimensions are in mm unless otherwise stated
2. Concrete to be class 25/20 unless otherwise stated
3. 25mm cover to reinforcement unless otherwise stated

REV	REVISIONS	DATE	BY	CHKD	APPROVED
C			BY	CHECKED	
B			BY	CHECKED	
A			BY	CHECKED	
0			BY	CHECKED	

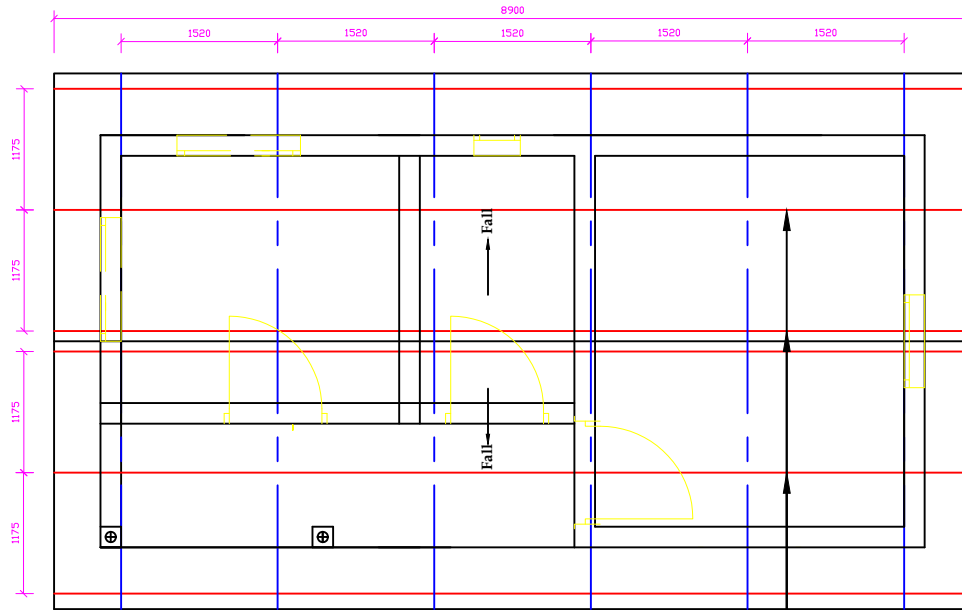
Client:
**NORTHERN WATER WORKS
 DEVELOPMENT AGENCY
 P.o.BoX 495-GARISSA**

Project:
**IJARA WATER SUPPLY PROJECT
 MASALANI-GABABA
 WORKS**

Approved by: _____
 Designed by: _____
 Checked by: _____

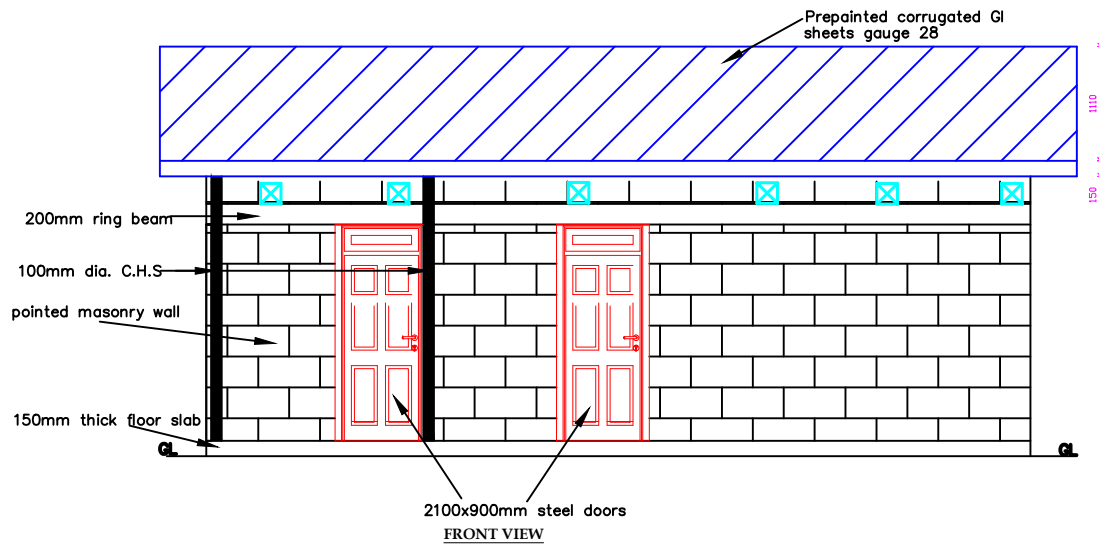
Title:
**STANDARD DETAILS
 INTAKE GUARD HOUSE DETAILS**

Section Head	Date	Division Head	Date
Branch Head	Date	Director	Date
Scale	AS SHOWN	Date	JPC 2022
Sheet	1 of 3	ACAD File:	
STATUS	DRAWING No. WW/WD/874/SD/013	REV	



ROOF PLAN (GUARD HOUSE)

75x50mm timber purlins



FRONT VIEW

NOTES

1. All dimensions are in mm unless otherwise stated
2. Concrete to be class 25/20 unless otherwise stated
3. 25mm cover to reinforcement unless otherwise stated

C		BY			
		CHECKED			
B		BY			
		CHECKED			
A		BY			
		CHECKED			
D		BY			
		CHECKED			
REV	REVISIONS	Des. No.	CHKD	DATE	APPROVED

Client:

NORTHERN WATER WORKS
DEVELOPMENT AGENCY
P.o.Box 495-GARISSA

Project:

IJARA WATER SUPPLY PROJECT
MASALANI-GABABA
WORKS

Approved by

Designed by

Drawn by

Checked by

Title:

STANDARD DETAILS

INTAKE GUARD HOUSE DETAILS

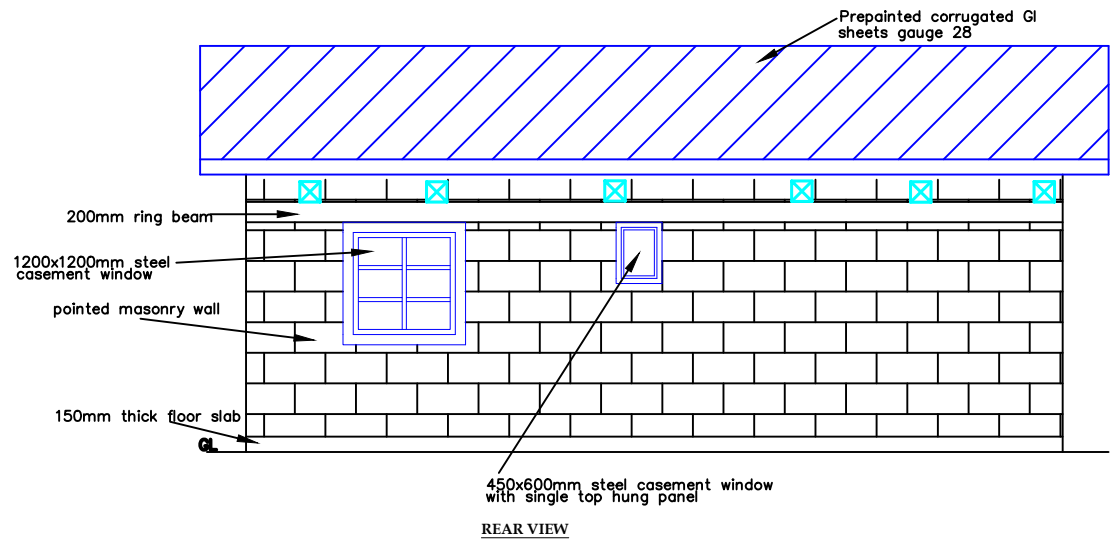
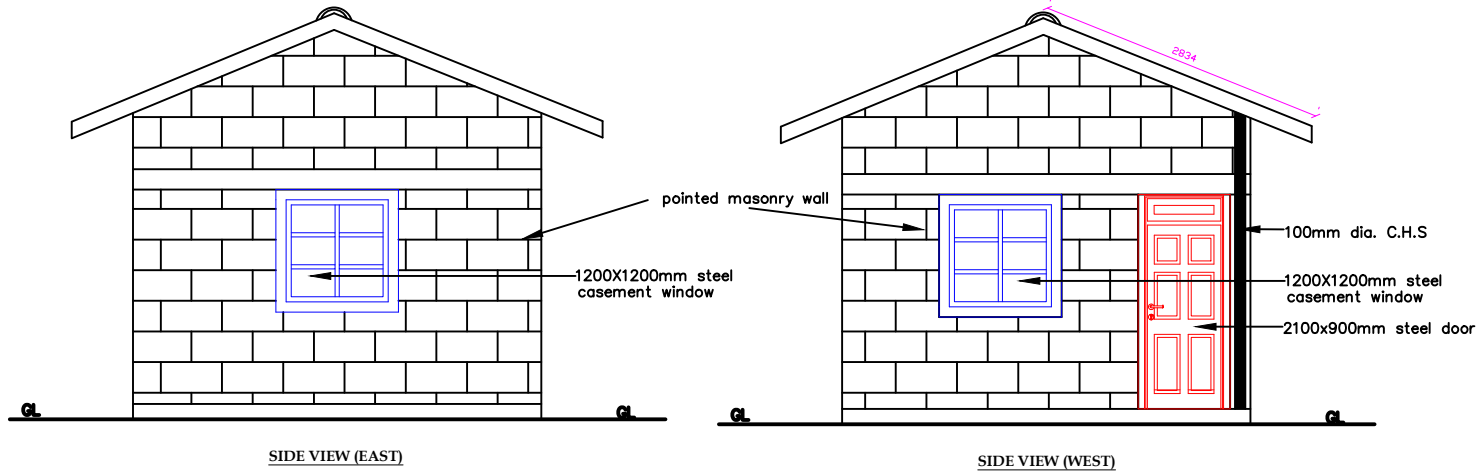
Section Head	Date	Division Head	Date
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Branch Head	Date	Director	Date
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Scale: AS SHOWN Date: 2022

Sheet 2 of 3 ACAD File:

DRAWING No. WW/WD/874/SD/013



- NOTES**
1. All dimensions are in mm unless otherwise stated
 2. Concrete to be class 25/20 unless otherwise stated
 3. 25mm cover to reinforcement unless otherwise stated

C	BY		
	CHECKED		
B	BY		
	CHECKED		
A	BY		
	CHECKED		
0	BY		
	CHECKED		

REV	REVISIONS	DR. No.	ISS. DATE	APPROV.
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Client:
 NORTHERN WATER WORKS
 DEVELOPMENT AGENCY
 P.o.Box 495-GARISSA

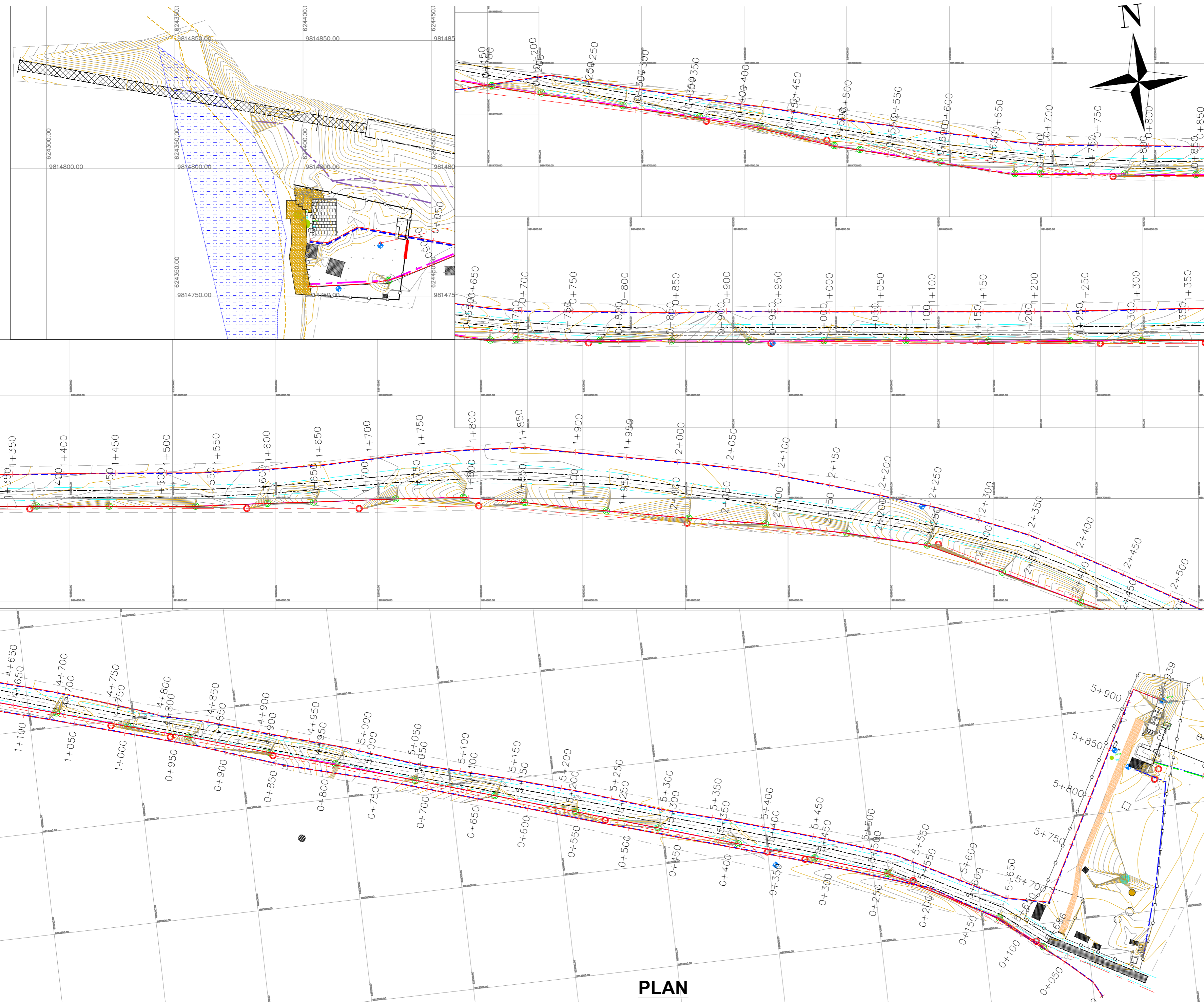
Project:
 IJARA WATER SUPPLY PROJECT
 MASALANI-GABABA
 WORKS

Approved by _____
 Designed by _____ Drawn by _____
 Checked by _____

Title:
 STANDARD DETAILS

INTAKE GUARD HOUSE DETAILS

Section Head	Date	Division Head	Date
Branch Head	Date	Director	Date
Scale	AS SHOWN	Date	DEC 2022
Sheet	3 of 3	ACAD File:	
ISSUE	DRAWING No.	WI/WD/574/SD/013	REV



- NOTES:**
1. CONTOUR LEVELS ARE IN METERS AT ONE METER INTERVALS
 2. GRID VALUES ARE IN METERS AT 100 METER INTERVALS
 3. GEOLOGICAL CONDITIONS INDICATED ON DRAWING ARE FOR GENERAL GUIDANCE ONLY
 4. MINIMUM PIPELINE SLOPES TO BE 1:500
 5. DRAWING TO BE READ IN CONJUNCTION WITH STANDARD DRAWINGS
 6. ALL PIPE FITTINGS TO BE CONFIRMED ON SITE DURING SETTING OUT
- LEGEND:**
- ROAD (TARMAC)
 - ROAD / TRACK (EARTH / MURRAM)
 - POWERLINE
 - CONTOURS, 1m INTERVAL
 - ELECTRIC POST
 - CULVERT
 - GATE
 - BUILDINGS
 - PROPOSED WATER MAIN
 - EXISTING WATER MAIN
 - TP10 TRAVERSE POINT & No.
 - TREES
 - BENCHMARKS
 - HORIZONTAL BEND (H) OR VERTICAL BEND (V) WITH ANGLE INDICATED
 - GV GATE VALVE
 - BRIDGE
 - WO-01 WASHOUT VALVE & No.
 - WM WATER METER
 - PIPELINE GRADIENT WITH SLOPE DIRECTION (SLOPE MIN. OR 1 IN n)
 - FENCE
 - DRAINAGE

BENCHMARKS				
NO.	NORTHINGS	EASTINGS	ELEVATIONS	DESCRIPTION
1.	9813458.690m	62947.550m	76.570m	TBM TW1
2.	9813442.185m	62995.970m	76.936m	TBM2

REVISIONS				
NO.	DESCRIPTION	SIGN	DATE	APPROVED

THE CHIEF EXECUTIVE OFFICER
 WATER SERVICES BOARD
 P.O. BOX
 KENYA

CONTRACTOR:
COMPANY LIMITED
 P.O. BOX
 KENYA
 E-MAIL:@gmail.com
 TEL:

PROJECT NAME:

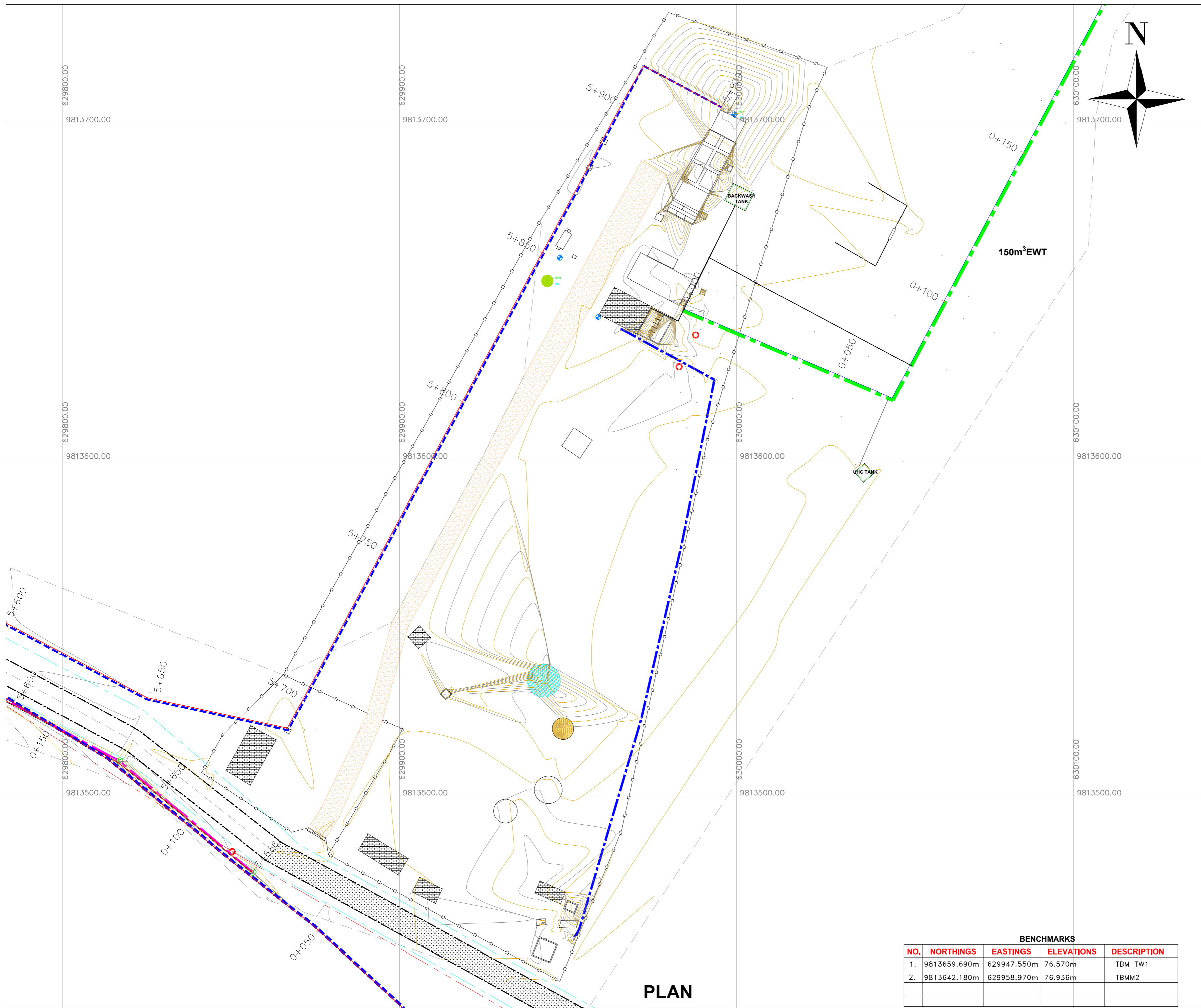
CONTRACT NAME:

MASALANI TOWN

DRAWING TITLE:
T-WORKS GENERAL LAYOUT
SHEET 1 OF 1

Designed by:	Drawn by:
Checked by:	Approved by:
Scale: H- 1:1000, V- 1:100	Date: JUNE 2022
DRG No.	

PLAN



- NOTES:**
1. CONTOUR LEVELS ARE IN METERS AT ONE METER INTERVALS
 2. GRID VALUES ARE IN METERS AT 100 METER INTERVALS
 3. GEOLOGICAL CONDITIONS INDICATED ON DRAWING ARE FOR GENERAL GUIDANCE ONLY
 4. MINIMUM PIPELINE SLOPES TO BE 1:500
 5. DRAWING TO BE READ IN CONJUNCTION WITH STANDARD DRAWINGS
 6. ALL PIPE FITTINGS TO BE CONFIRMED ON SITE DURING SETTING OUT
 7. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THE DRAWING

- LEGEND:**
- ROAD (TARMAC)
 - ROAD / TRACK (EARTH / MURRAM)
 - POWERLINE
 - 75 CONTOURS, 1m INTERVAL
 - ELECTRIC POST
 - CULVERT
 - GATE
 - BUILDINGS
 - PROPOSED WATER MAIN
 - EXISTING WATER MAIN
 - TP10 TRAVERSE POINT & No.
 - TREES
 - BENCHMARKS
 - HORIZONTAL BEND (H) OR VERTICAL BEND (V) WITH ANGLE INDICATED
 - GV GATE VALVE
 - BRIDGE
 - WO-01 WASHOUT VALVE & No.
 - WM WATER METER
 - PIPELINE GRADIENT WITH SLOPE DIRECTION (SLOPE MIN. OR 1 IN n)
 - FENCE
 - DRAINAGE

REVISIONS				SIGN	DATE	APPROVED

**THE CHIEF EXECUTIVE OFFICER
NORTHERN WATER WORKS
DEVELOPMENT AGENCY**

CONTRACTOR:

PROJECT NAME:
**IJARA WATER SUPPLY
PROJECT**
TREATMENT WORKS

DRAWING TITLE:
**T-WORKS GENERAL LAYOUT
SHEET 1 OF 1**

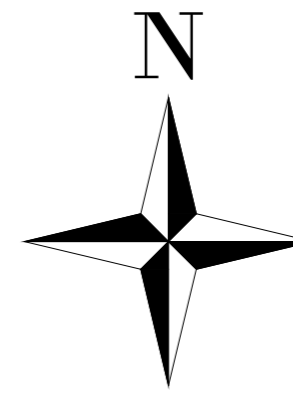
Designed by: _____ Drawn by: _____
Checked by: _____ Approved by: _____
Scale: **H- 1:1000, V- 1:100** Date: **JUNE 2022**

DRG No. _____

BENCHMARKS

NO.	NORTHINGS	EASTINGS	ELEVATIONS	DESCRIPTION
1.	9813659.690m	629947.550m	76.570m	TBM TW1
2.	9813642.180m	629958.970m	76.936m	TBMM2

PLAN



- NOTES:**
1. CONTOUR LEVELS ARE IN METERS AT ONE METER INTERVALS
 2. GRID VALUES ARE IN METERS AT 100 METER INTERVALS
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 4. MINIMUM PIPELINE SLOPES TO BE 1:500
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 6. ALL PIPE FITTINGS TO BE CONFIRMED ON SITE DURING SETTING OUT
 7. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THE DRAWING

- LEGEND:**
- ROAD (TARMAC)
 - ROAD / TRACK (EARTH / MURRAM)
 - POWERLINE
 - CONTOURS, 1m INTERVAL
 - ELECTRIC POST
 - CULVERT
 - GATE
 - BUILDINGS
 - PROPOSED WATER MAIN
 - EXISTING WATER MAIN
 - TRAVERSE POINT & No.
 - TREES
 - BENCHMARKS
 - HORIZONTAL BEND (H) OR VERTICAL BEND (V) WITH ANGLE INDICATED
 - GATE VALVE
 - BRIDGE
 - WASHOUT VALVE & No.
 - WATER METER
 - PIPELINE GRADIENT WITH SLOPE DIRECTION (SLOPE MIN. OR 1 IN n)
 - FENCE
 - DRAINAGE

REVISIONS				SIGN	DATE	APPROVED

THE CHIEF EXECUTIVE OFFICER
NORTHERN WATER WORKS
DEVELOPMENT AGENCY

CONTRACTOR:

PROJECT NAME:
IJARA WATER SUPPLY PROJECT
INTAKE WORKS

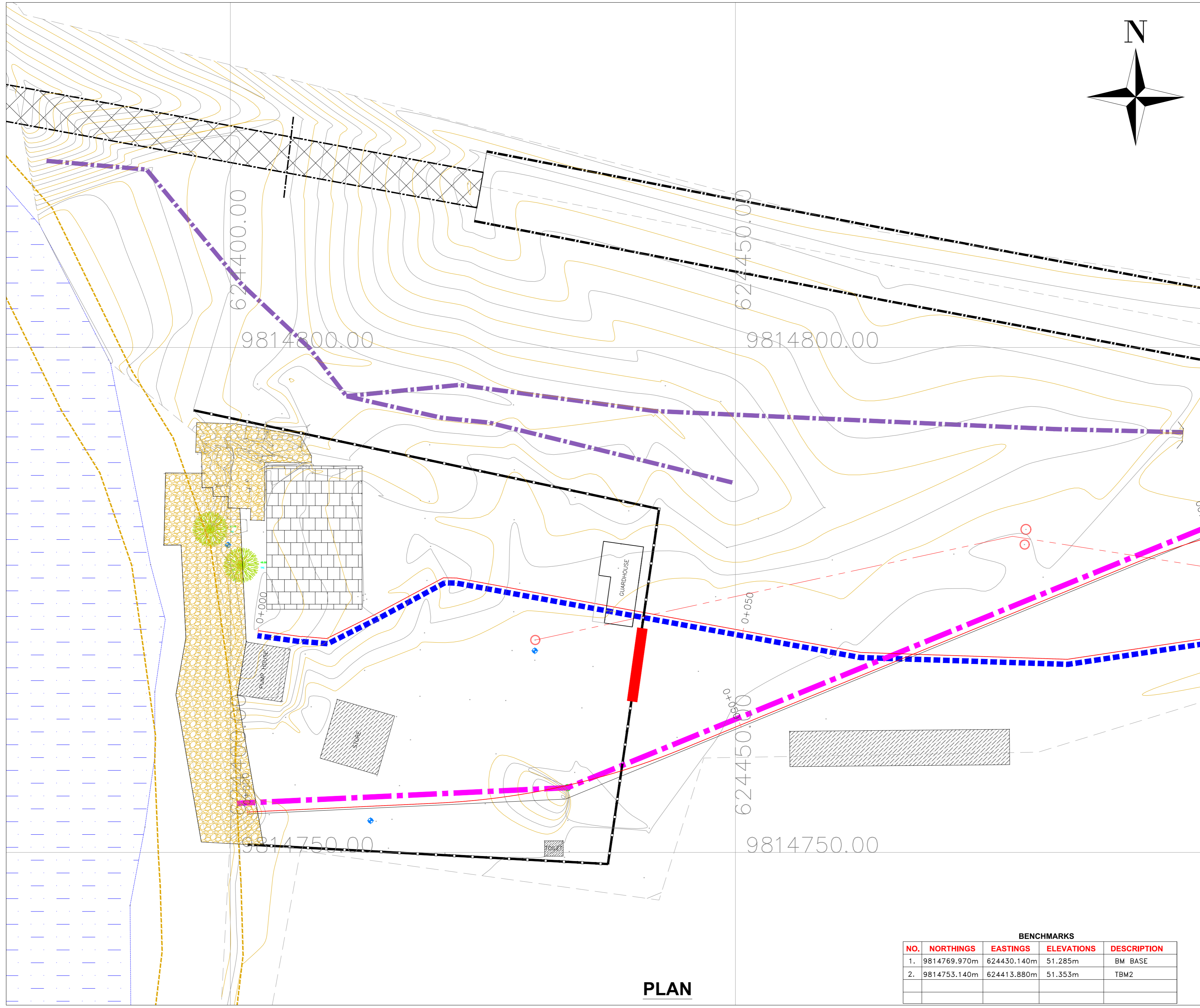
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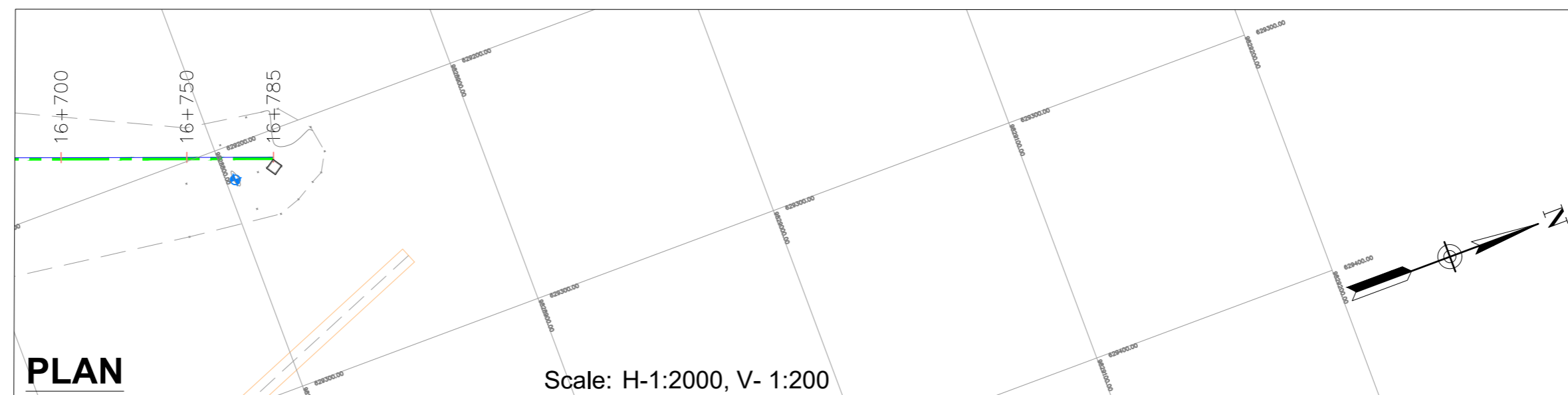
Designed by: _____ Drawn by: _____
Checked by: _____ Approved by: _____
Scale: H- 1:1000, V- 1:100 Date: **JUNE 2022**
DRG No. _____

BENCHMARKS

NO.	NORTHINGS	EASTINGS	ELEVATIONS	DESCRIPTION
1.	9814769.970m	624430.140m	51.285m	BM BASE
2.	9814753.140m	624413.880m	51.353m	TBM2

PLAN

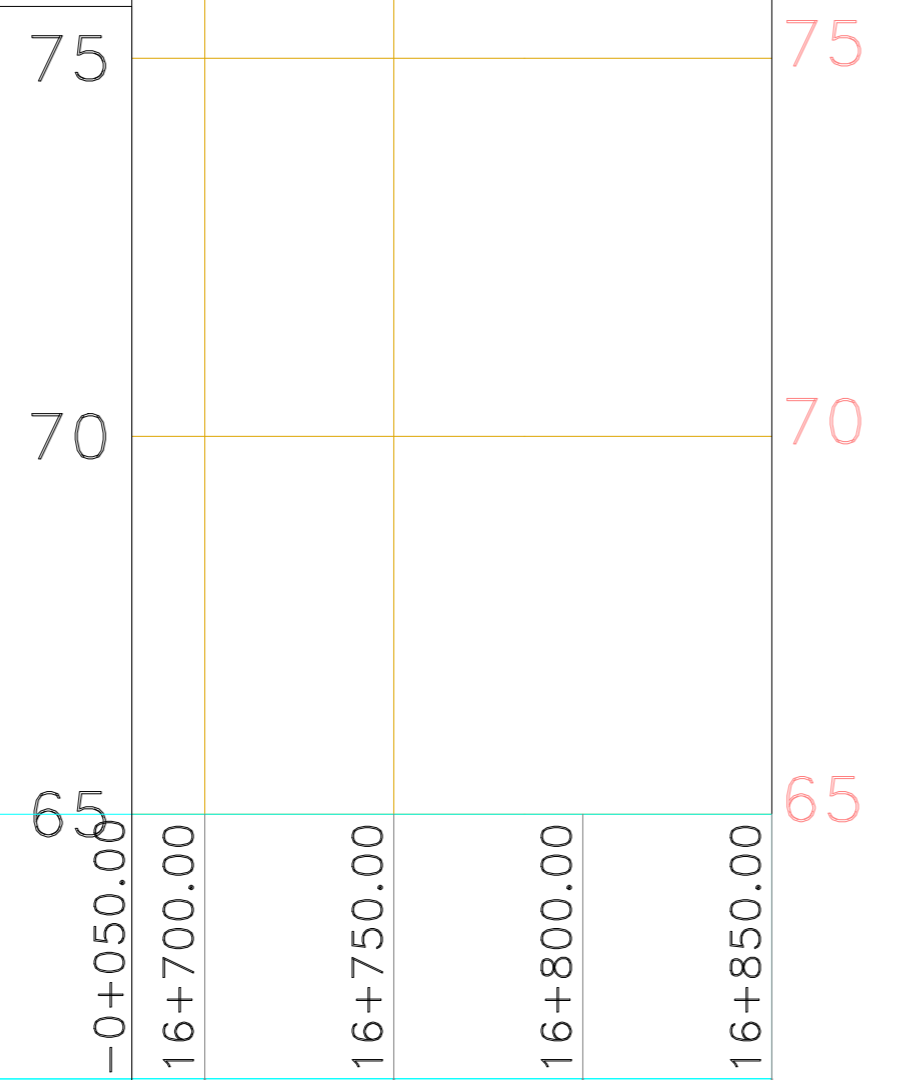




- NOTES:**
1. CONTOUR LEVELS ARE IN METERS AT ONE METER INTERVALS
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- LEGEND:**
- ROAD (TARMAC)
 - ROAD / TRACK (EARTH / MURRAM)
 - FENCE / HEDGE
 - CONTOURS, 1m INTERVAL
 - ELECTRIC POST
 - CULVERT
 - GATE
 - BUILDINGS
 - PROPOSED WATER MAIN
 - EXISTING WATER MAIN
 - TP10 TRAVERSE POINT & No.
 - TREES
 - TRIAL HOLE
 - HORIZONTAL BEND (H) OR VERTICAL BEND (V) WITH ANGLE INDICATED
 - GV GATE VALVE
 - FH FIRE HYDRANT
 - WO-01 WASHOUT VALVE & No.
 - WM WATER METER
 - PIPELINE GRADIENT WITH SLOPE DIRECTION (SLOPE MIN. OR 1 IN n)
 - FENCE

Scale: H-1:2000, V- 1:200



CHAINAGE (m)	-0+050.00	16+700.00	16+750.00	16+800.00	16+850.00
EXISTING GROUND LEVEL (m)		86.67	86.68		
INVERT LEVELS (m)		85.52	85.57		
TYPE AND SIZE OF PIPE	HDPE DN110 PN 12.5				
DESIGN FLOW (m ³ /sec)					
TYPE OF SOIL	BLACK COTTON SOIL				

REVISIONS				SIGN	DATE	APPROVED
	BY					
	CHECKED					
	BY					
	CHECKED					
	BY					
	CHECKED					

**THE CHIEF EXECUTIVE OFFICER
NORTHERN WATER WORKS
DEVELOPMENT AGENCY**

CONTRACTOR:

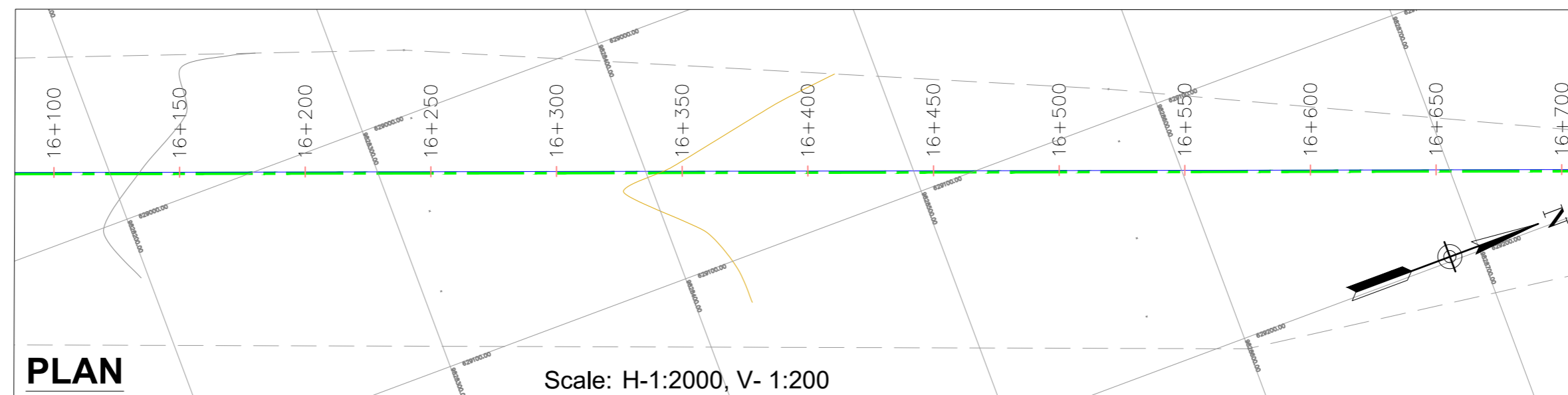
PROJECT NAME:
**IJARA WATER SUPPLY
PROJECT
MASALANI - GABABA PIPELINE
EXTENSION WORKS**

DRAWING TITLE:
**LINE
PLAN & LONGITUDINAL SECTION
(CH 16+700.00 - 16+800.00)
SHEET 29 OF 29**

Designed by: _____ Drawn by: _____
Checked by: _____ Approved by: _____
Scale: H- 1:1000, V- 1:100 Date: JUNE 2022

DRG No.

LONGITUDINAL SECTION



PLAN

Scale: H-1:2000, V- 1:200

Scale: H-1:2000, V- 1:200

- NOTES:**
1. CONTOUR LEVELS ARE IN METERS AT ONE METER INTERVALS
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 7. FIGURED DIMENSION ONLY TO BE TAKEN FROM THIS DRAWING

- LEGEND:**
- ROAD (TARMAC)
 - ROAD / TRACK (EARTH / MURRAM)
 - FENCE / HEDGE
 - 75 CONTOURS, 1m INTERVAL
 - ELECTRIC POST
 - CULVERT
 - GATE
 - BUILDINGS
 - PROPOSED WATER MAIN
 - EXISTING WATER MAIN
 - TP10 TRAVERSE POINT & No.
 - TREES
 - TRIAL HOLE
 - HORIZONTAL BEND (H) OR VERTICAL BEND (V) WITH ANGLE INDICATED
 - GV GATE VALVE
 - FH FIRE HYDRANT
 - WO-01 WASHOUT VALVE & No.
 - WM WATER METER
 - PIPELINE GRADIENT WITH SLOPE DIRECTION (SLOPE MIN. OR 1 IN n)
 - FENCE

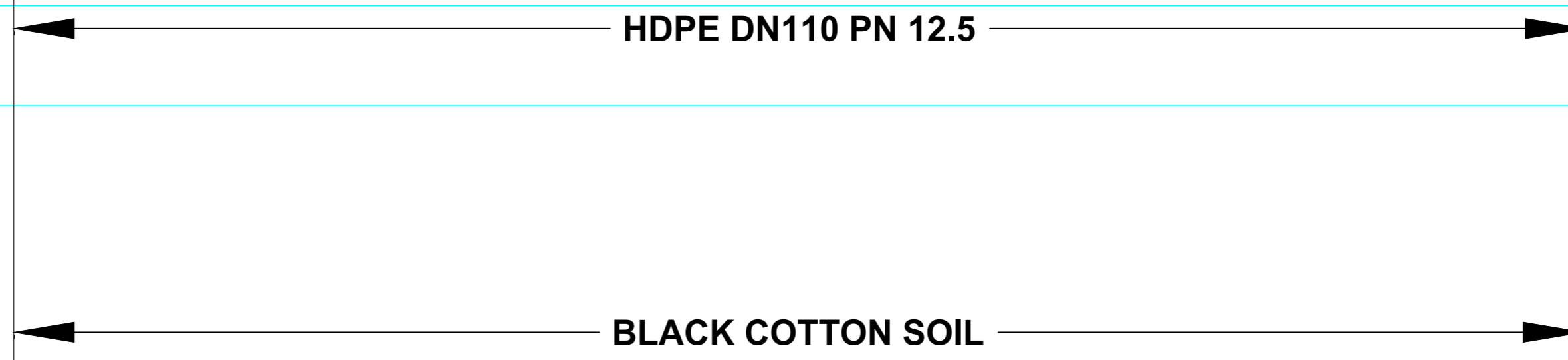
75
70
65

CHAINAGE (m)	-0+050.00	16+100.00	16+150.00	16+200.00	16+250.00	16+300.00	16+350.00	16+400.00	16+450.00	16+500.00	16+550.00	16+600.00	16+650.00	16+700.00
EXISTING GROUND LEVEL (m)		85.91	86.04	86.17	86.29	86.35	86.41	86.47	86.52	86.56	86.60	86.63	86.66	86.67
INVERT LEVELS (m)		84.69	84.79	84.90	85.00	85.10	85.17	85.24	85.30	85.34	85.39	85.43	85.48	85.52

TYPE AND SIZE OF PIPE

DESIGN FLOW (m³/sec)

TYPE OF SOIL



LONGITUDINAL SECTION

REVISIONS				SIGN	DATE	APPROVED
	BY	CHECKED				
	BY	CHECKED				
	BY	CHECKED				
	BY	CHECKED				

THE CHIEF EXECUTIVE OFFICER
NORTHERN WATER WORKS
DEVELOPMENT AGENCY

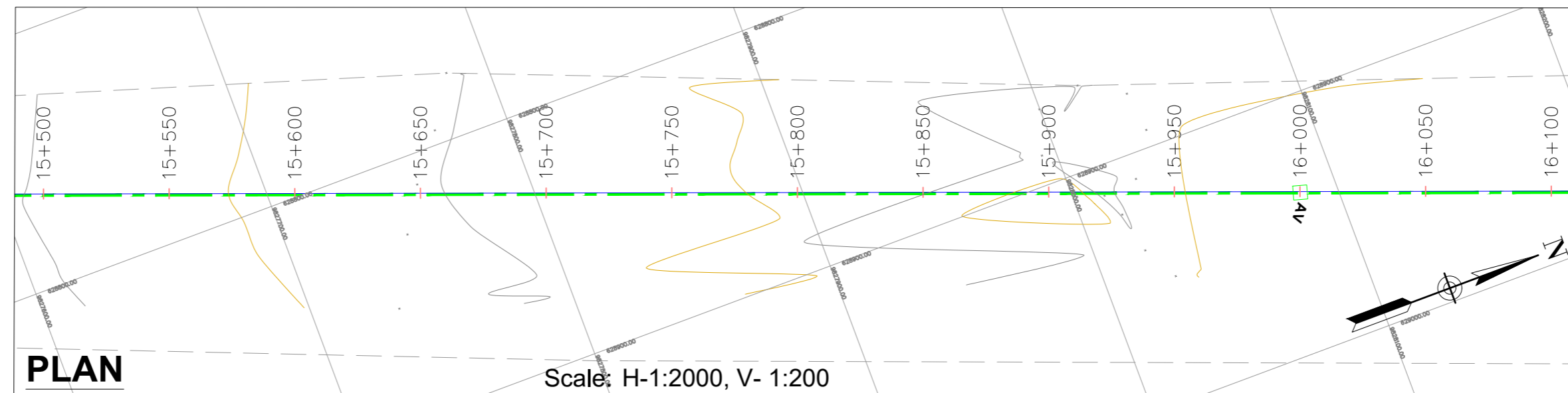
CONTRACTOR:

PROJECT NAME:
IJARA WATER SUPPLY PROJECT
MASALANI - GABABA PIPELINE EXTENSION WORKS

DRAWING TITLE:
LINE
PLAN & LONGITUDINAL SECTION
(CH 16+100.00 - 16+700.00)
SHEET 28 OF 29

Designed by:	Drawn by:
Checked by:	Approved by:
Scale: H- 1:1000, V- 1:100	Date: JUNE 2022

DRG No.



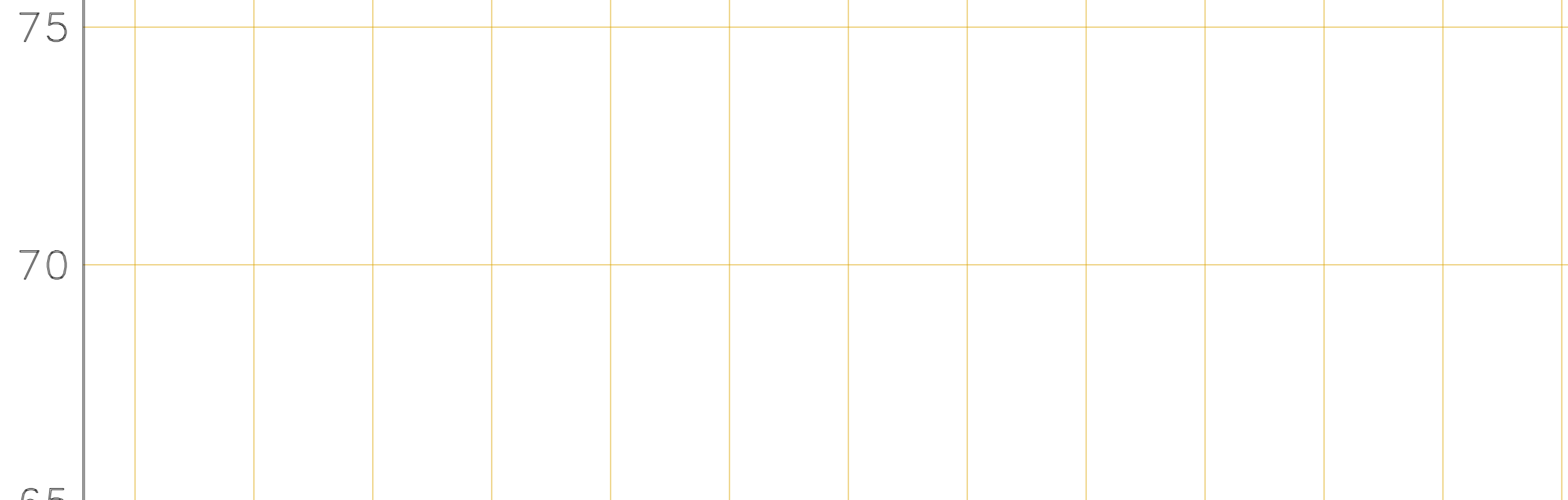
PLAN

Scale: H-1:2000, V- 1:200

Scale: H-1:2000, V- 1:200

- NOTES:**
1. CONTOUR LEVELS ARE IN METERS AT ONE METER INTERVALS
 2. GRID VALUES ARE IN METERS AT 100 METER INTERVALS
 3. GEOLOGICAL CONDITIONS INDICATED ON DRAWING ARE FOR GENERAL GUIDANCE ONLY
 4. MINIMUM PIPELINE SLOPES TO BE 1:500
 5. DRAWING TO BE READ IN CONJUNCTION WITH STANDARD DRAWINGS
 6. ALL PIPE FITTINGS TO BE CONFIRMED ON SITE DURING SETTING OUT
 7. FIGURED DIMENSION ONLY TO BE TAKEN FROM THIS DRAWING

- LEGEND:**
- ROAD (TARMAC)
 - ROAD / TRACK (EARTH / MURRAM)
 - FENCE / HEDGE
 - CONTOURS, 1m INTERVAL
 - ELECTRIC POST
 - CULVERT
 - GATE
 - BUILDINGS
 - PROPOSED WATER MAIN
 - EXISTING WATER MAIN
 - TP10 TRAVERSE POINT & No.
 - TREES
 - TRIAL HOLE
 - HORIZONTAL BEND (H) OR VERTICAL BEND (V) WITH ANGLE INDICATED
 - GV GATE VALVE
 - FH FIRE HYDRANT
 - WO-01 WASHOUT VALVE & No.
 - WM WATER METER
 - PIPELINE GRADIENT WITH SLOPE DIRECTION (SLOPE MIN. OR 1 IN n)
 - FENCE



CHAINAGE (m)	-0+050.00	15+500.00	15+550.00	15+600.00	15+650.00	15+700.00	15+750.00	15+800.00	15+850.00	15+900.00	15+950.00	16+000.00	16+050.00	16+100.00
EXISTING GROUND LEVEL (m)		83.64	83.88	84.13	84.36	84.53	84.70	84.86	85.14	85.71	85.59	85.69	85.79	85.91
INVERT LEVELS (m)		82.44	82.65	82.86	83.06	83.27	83.50	83.73	83.95	84.18	84.37	84.48	84.58	84.69
TYPE AND SIZE OF PIPE	HDPE DN110 PN 12.5													
DESIGN FLOW (m ³ /sec)														
TYPE OF SOIL	BLACK COTTON SOIL													

REVISIONS				SIGN	DATE	APPROVED
	BY	CHECKED				
	BY	CHECKED				
	BY	CHECKED				
	BY	CHECKED				

THE CHIEF EXECUTIVE OFFICER
NORTHERN WATER WORKS
DEVELOPMENT AGENCY

CONTRACTOR:

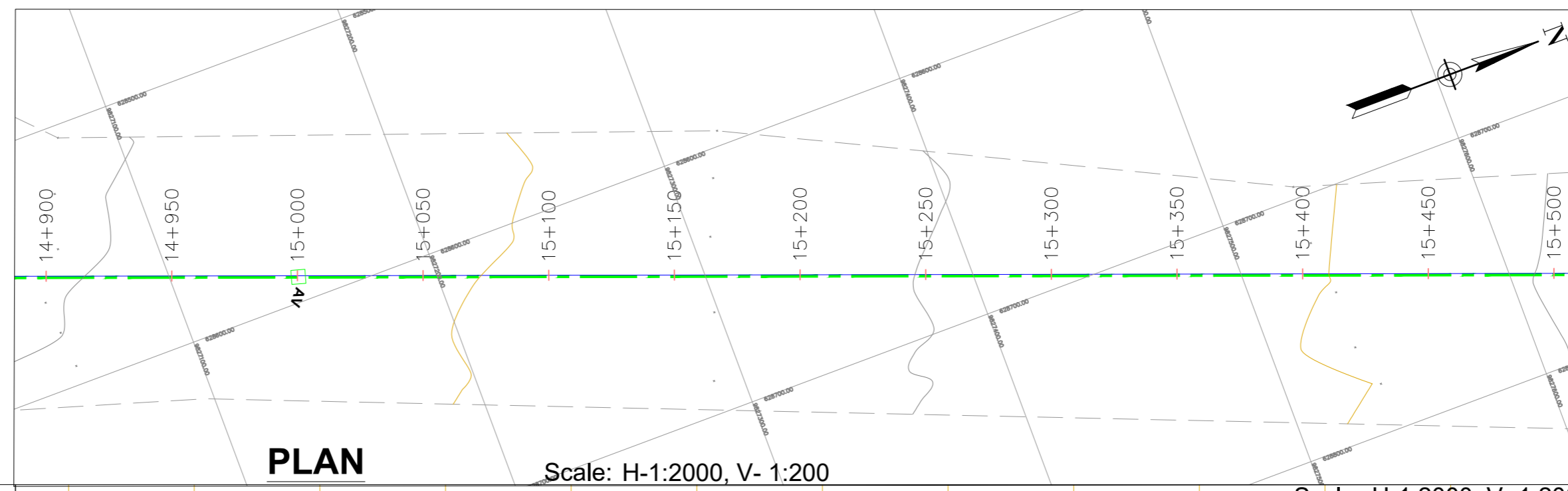
PROJECT NAME:
IJARA WATER SUPPLY PROJECT
MASALANI - GABABA PIPELINE EXTENSION WORKS

DRAWING TITLE:
LINE
PLAN & LONGITUDINAL SECTION
(CH 15+500.00 - 16+100.00)
SHEET 27 OF 29

Designed by:	Drawn by:
Checked by:	Approved by:
Scale: H- 1:1000, V- 1:100	Date: JUNE 2022

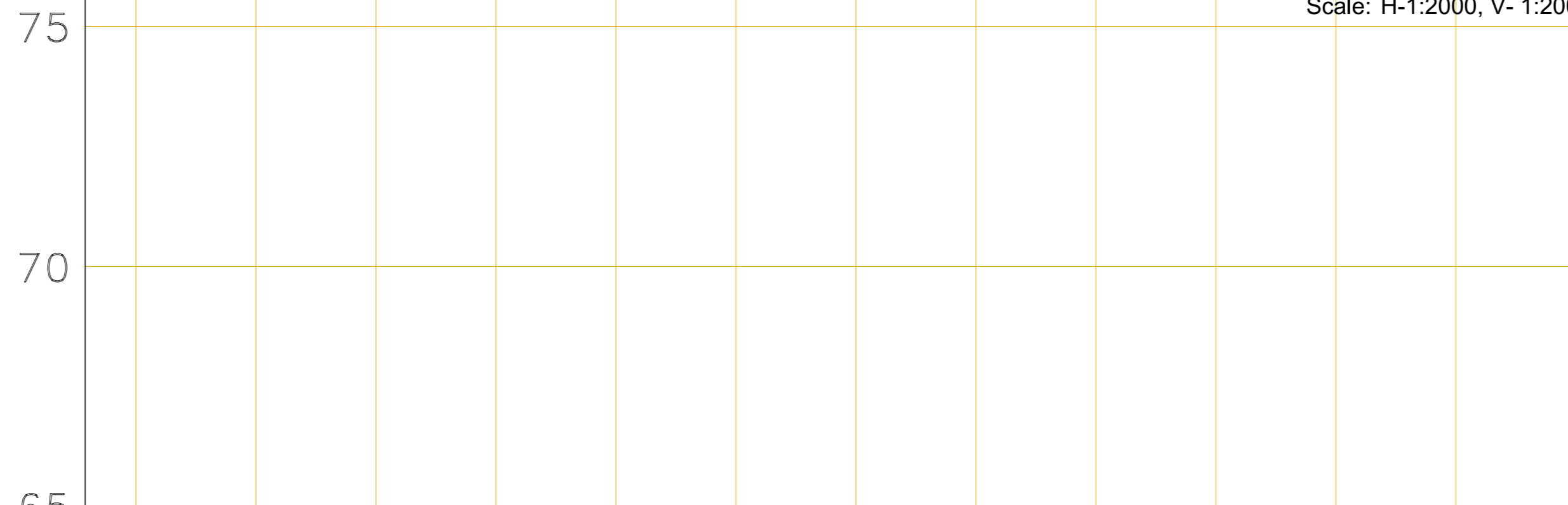
DRG No.

LONGITUDINAL SECTION



- NOTES:**
1. CONTOUR LEVELS ARE IN METERS AT ONE METER INTERVALS
 2. GRID VALUES ARE IN METERS AT 100 METER INTERVALS
 3. GEOLOGICAL CONDITIONS INDICATED ON DRAWING ARE FOR GENERAL GUIDANCE ONLY
 4. MINIMUM PIPELINE SLOPES TO BE 1:500
 5. DRAWING TO BE READ IN CONJUNCTION WITH STANDARD DRAWINGS
 6. ALL PIPE FITTINGS TO BE CONFIRMED ON SITE DURING SETTING OUT
 7. FIGURED DIMENSION ONLY TO BE TAKEN FROM THIS DRAWING

- LEGEND:**
- ROAD (TARMAC)
 - ROAD / TRACK (EARTH / MURRAM)
 - FENCE / HEDGE
 - CONTOURS, 1m INTERVAL
 - ELECTRIC POST
 - CULVERT
 - GATE
 - BUILDINGS
 - PROPOSED WATER MAIN
 - EXISTING WATER MAIN
 - TP10 TRAVERSE POINT & No.
 - TREES
 - TRIAL HOLE
 - HORIZONTAL BEND (H) OR VERTICAL BEND (V) WITH ANGLE INDICATED
 - GV GATE VALVE
 - FH FIRE HYDRANT
 - WO-01 WASHOUT VALVE & No.
 - WM WATER METER
 - PIPELINE GRADIENT WITH SLOPE DIRECTION (SLOPE MIN. OR 1 IN n)
 - FENCE



CHAINAGE (m)	EXISTING GROUND LEVEL (m)	INVERT LEVELS (m)	TYPE AND SIZE OF PIPE	DESIGN FLOW (m ³ /sec)	TYPE OF SOIL
-0+050.00					
14+900.00	81.98	80.72			
14+950.00	82.09	80.82			
15+000.00	82.21	80.92			
15+050.00	82.34	81.03			
15+100.00	82.46	81.16			
15+150.00	82.58	81.31			
15+200.00	82.69	81.47			
15+250.00	82.81	81.62			
15+300.00	82.92	81.78			
15+350.00	83.02	81.93			
15+400.00	83.16	82.08			
15+450.00	83.39	82.24			
15+500.00	83.64	82.44			

←
→

HDPE DN110 PN 12.5

←
→

BLACK COTTON SOIL

REVISIONS				SIGN	DATE	APPROVED
	BY					
	CHECKED					
	BY					
	CHECKED					
	BY					
	CHECKED					

**THE CHIEF EXECUTIVE OFFICER
NORTHERN WATER WORKS
DEVELOPMENT AGENCY**

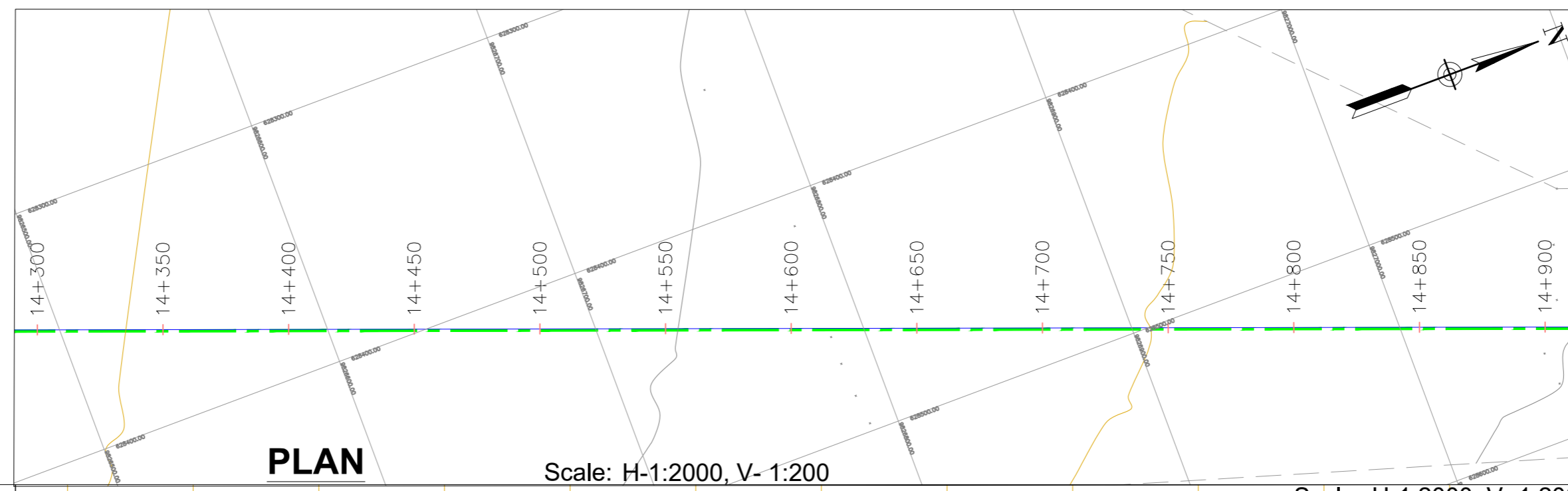
CONTRACTOR:

PROJECT NAME:
**IJARA WATER SUPPLY
PROJECT
MASALANI - GABABA PIPELINE
EXTENSION WORKS**

DRAWING TITLE:
**LINE
PLAN & LONGITUDINAL SECTION
(CH 14+900.00 - 15+500.00)
SHEET 26 OF 29**

Designed by:	Drawn by:
Checked by:	Approved by:
Scale: H- 1:1000, V- 1:100	Date: JUNE 2022

LONGITUDINAL SECTION



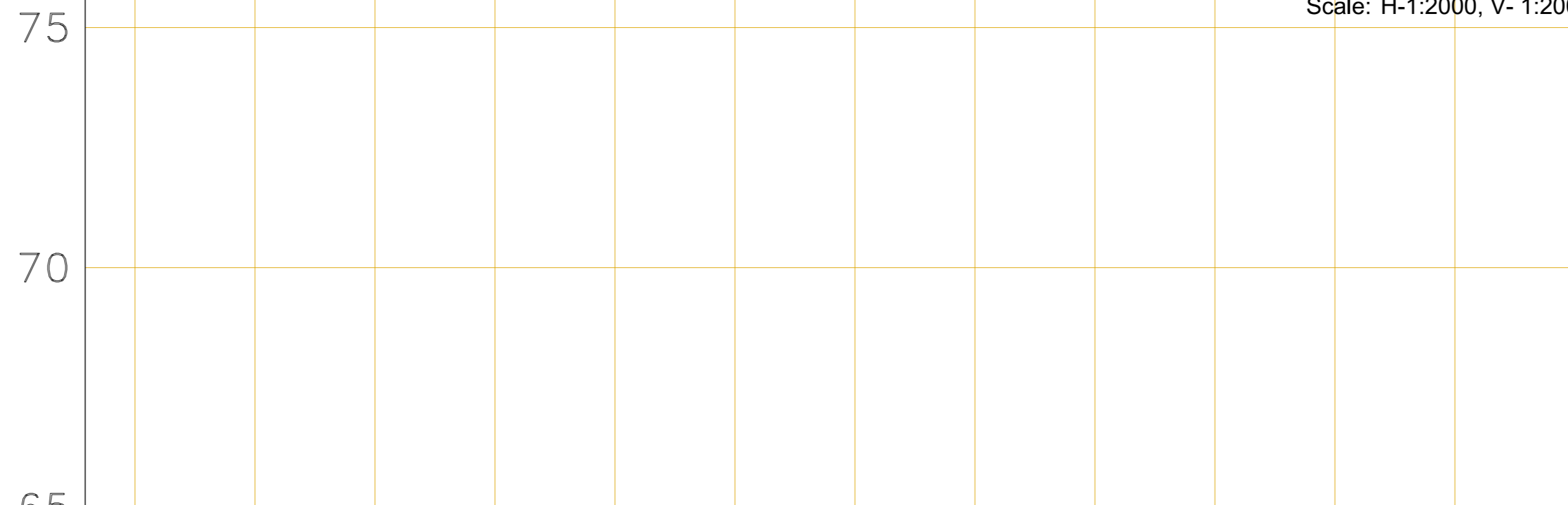
PLAN

Scale: H-1:2000, V- 1:200

Scale: H-1:2000, V- 1:200

- NOTES:**
1. CONTOUR LEVELS ARE IN METERS AT ONE METER INTERVALS
 2. GRID VALUES ARE IN METERS AT 100 METER INTERVALS
 3. GEOLOGICAL CONDITIONS INDICATED ON DRAWING ARE FOR GENERAL GUIDANCE ONLY
 4. MINIMUM PIPELINE SLOPES TO BE 1:500
 5. DRAWING TO BE READ IN CONJUNCTION WITH STANDARD DRAWINGS
 6. ALL PIPE FITTINGS TO BE CONFIRMED ON SITE DURING SETTING OUT
 7. FIGURED DIMENSION ONLY TO BE TAKEN FROM THIS DRAWING

- LEGEND:**
- ROAD (TARMAC)
 - ROAD / TRACK (EARTH / MURRAM)
 - FENCE / HEDGE
 - 75 CONTOURS, 1m INTERVAL
 - ELECTRIC POST
 - CULVERT
 - GATE
 - BUILDINGS
 - PROPOSED WATER MAIN
 - EXISTING WATER MAIN
 - TP10 TRAVERSE POINT & No.
 - TREES
 - TRIAL HOLE
 - HORIZONTAL BEND (H) OR VERTICAL BEND (V) WITH ANGLE INDICATED
 - GV GATE VALVE
 - FH FIRE HYDRANT
 - WO-01 WASHOUT VALVE & No.
 - WM WATER METER
 - PIPELINE GRADIENT WITH SLOPE DIRECTION (SLOPE MIN. OR 1 IN n)
 - FENCE

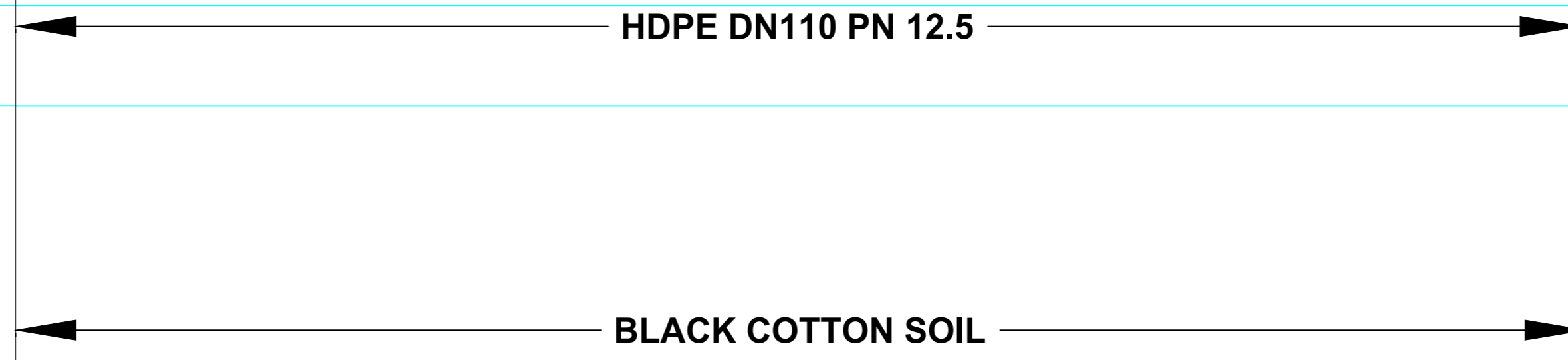


CHAINAGE (m)	-0+050.00	14+300.00	14+350.00	14+400.00	14+450.00	14+500.00	14+550.00	14+600.00	14+650.00	14+700.00	14+750.00	14+800.00	14+850.00	14+900.00
EXISTING GROUND LEVEL (m)		80.74	80.83	80.92	81.01	81.10	81.19	81.28	81.39	81.51	81.61	81.73	81.85	81.98
INVERT LEVELS (m)		79.54	79.63	79.72	79.82	79.92	80.02	80.12	80.22	80.32	80.42	80.52	80.62	80.72

TYPE AND SIZE OF PIPE

DESIGN FLOW (m³/sec)

TYPE OF SOIL



REVISIONS				SIGN	DATE	APPROVED
	BY	CHECKED				
	BY	CHECKED				
	BY	CHECKED				
	BY	CHECKED				

THE CHIEF EXECUTIVE OFFICER
NORTHERN WATER WORKS
DEVELOPMENT AGENCY

CONTRACTOR:

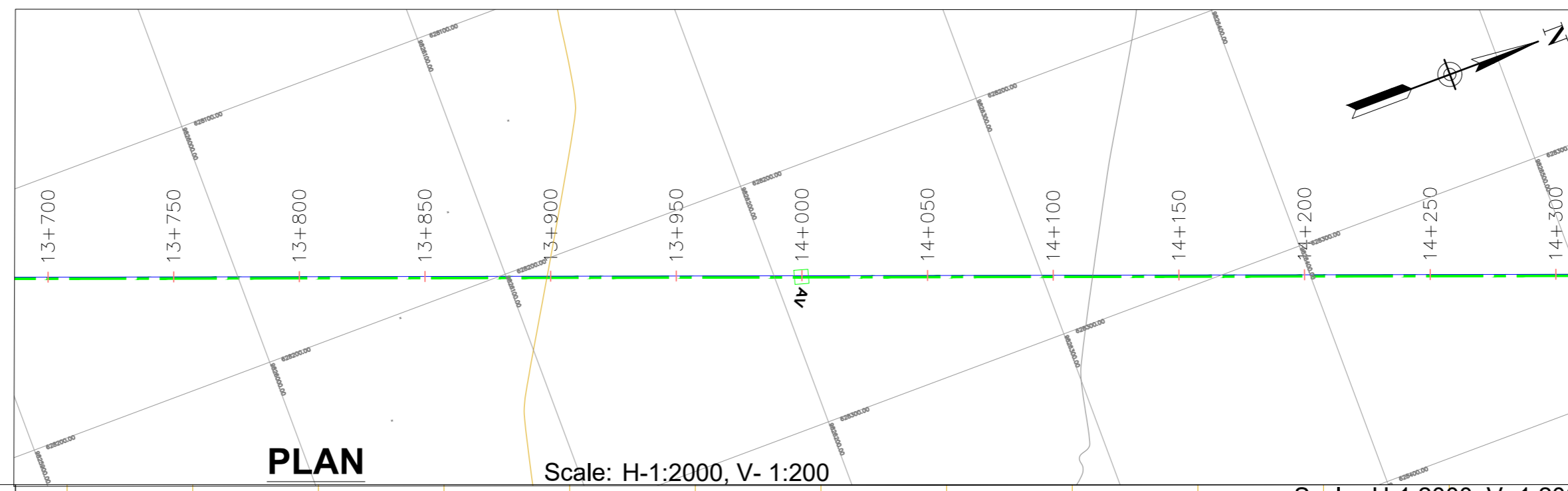
PROJECT NAME:
IJARA WATER SUPPLY PROJECT
MASALANI - GABABA PIPELINE EXTENSION WORKS

DRAWING TITLE:
LINE
PLAN & LONGITUDINAL SECTION
(CH 14+300.00 - 14+900.00)
SHEET 25 OF 29

Designed by:	Drawn by:
Checked by:	Approved by:
Scale: H- 1:1000, V- 1:100	Date: JUNE 2022

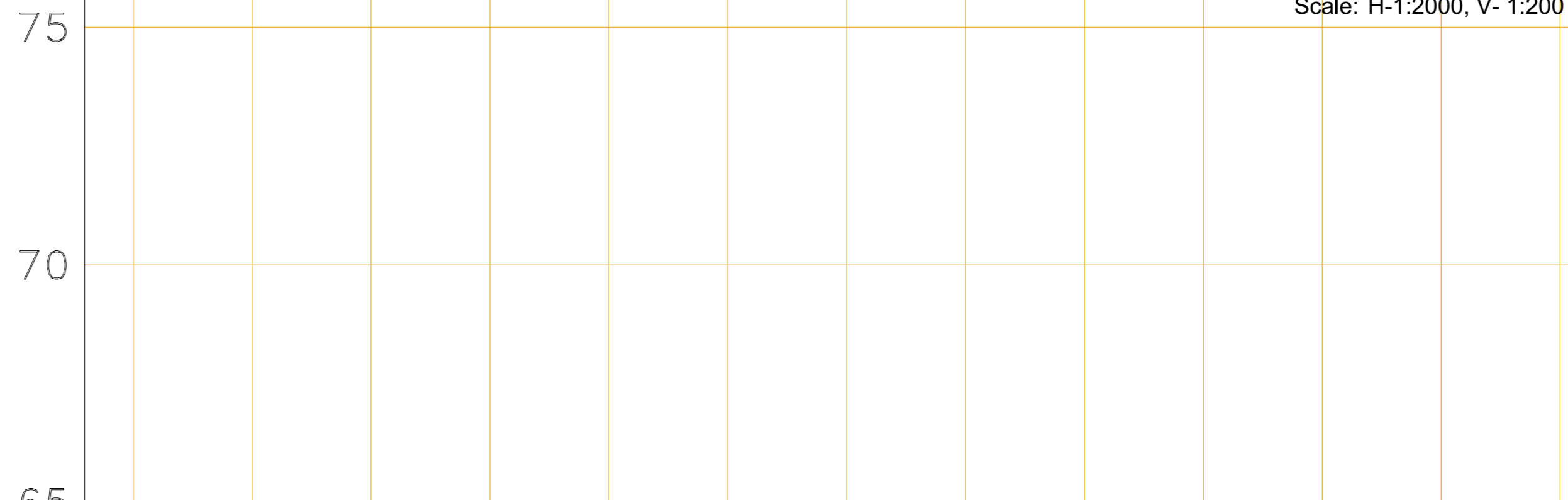
DRG No.

LONGITUDINAL SECTION



- NOTES:**
1. CONTOUR LEVELS ARE IN METERS AT ONE METER INTERVALS
 2. GRID VALUES ARE IN METERS AT 100 METER INTERVALS
 3. GEOLOGICAL CONDITIONS INDICATED ON DRAWING ARE FOR GENERAL GUIDANCE ONLY
 4. MINIMUM PIPELINE SLOPES TO BE 1:500
 5. DRAWING TO BE READ IN CONJUNCTION WITH STANDARD DRAWINGS
 6. ALL PIPE FITTINGS TO BE CONFIRMED ON SITE DURING SETTING OUT
 7. FIGURED DIMENSION ONLY TO BE TAKEN FROM THIS DRAWING

- LEGEND:**
- ROAD (TARMAC)
 - ROAD / TRACK (EARTH / MURRAM)
 - FENCE / HEDGE
 - 75 CONTOURS, 1m INTERVAL
 - ELECTRIC POST
 - CULVERT
 - GATE
 - BUILDINGS
 - PROPOSED WATER MAIN
 - EXISTING WATER MAIN
 - TP10 TRAVERSE POINT & No.
 - TREES
 - TRIAL HOLE
 - HORIZONTAL BEND (H) OR VERTICAL BEND (V) WITH ANGLE INDICATED
 - GV GATE VALVE
 - FH FIRE HYDRANT
 - WO-01 WASHOUT VALVE & No.
 - WM WATER METER
 - PIPELINE GRADIENT WITH SLOPE DIRECTION (SLOPE MIN. OR 1 IN n)
 - FENCE



CHAINAGE (m)	-0+050.00	13+700.00	13+750.00	13+800.00	13+850.00	13+900.00	13+950.00	14+000.00	14+050.00	14+100.00	14+150.00	14+200.00	14+250.00	14+300.00
EXISTING GROUND LEVEL (m)		79.64	79.74	79.83	79.93	80.00	80.10	80.19	80.28	80.37	80.46	80.55	80.64	80.74
INVERT LEVELS (m)		78.40	78.50	78.60	78.70	78.80	78.89	78.99	79.08	79.17	79.26	79.35	79.44	79.54
TYPE AND SIZE OF PIPE	HDPE DN110 PN 12.5													
DESIGN FLOW (m ³ /sec)														
TYPE OF SOIL	BLACK COTTON SOIL													

REVISIONS				SIGN	DATE	APPROVED
BY	CHECKED					
BY	CHECKED					
BY	CHECKED					
BY	CHECKED					

**THE CHIEF EXECUTIVE OFFICER
NORTHERN WATER WORKS
DEVELOPMENT AGENCY**

CONTRACTOR:

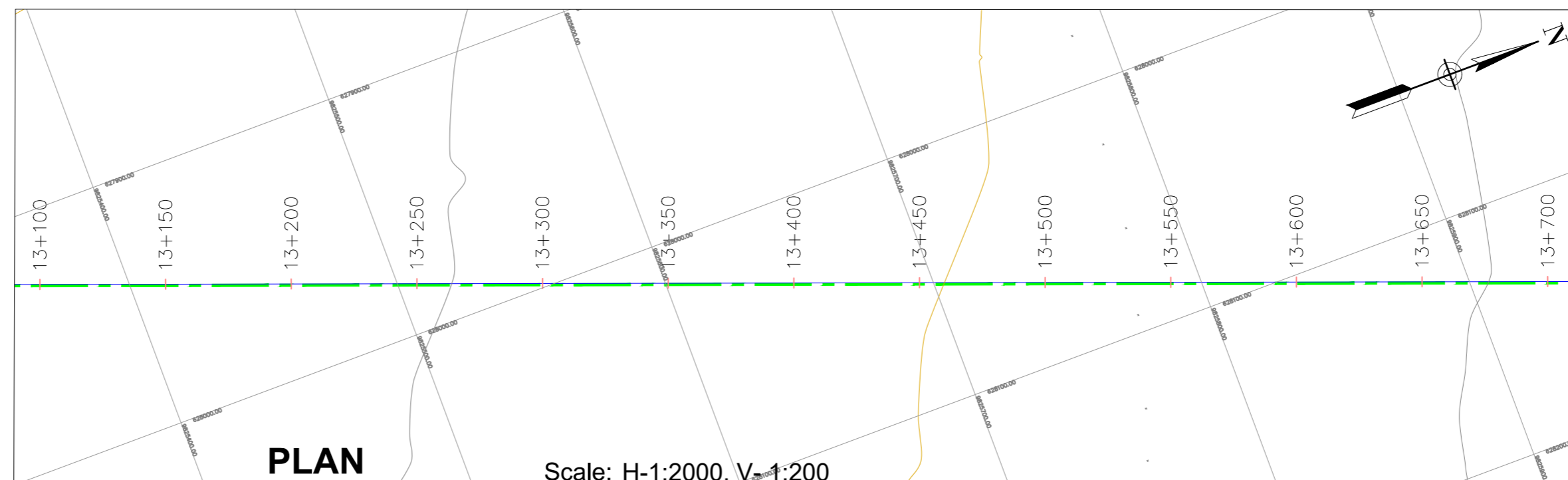
PROJECT NAME:
**IJARA WATER SUPPLY
PROJECT
MASALANI - GABABA PIPELINE
EXTENSION WORKS**

DRAWING TITLE:
**LINE
PLAN & LONGITUDINAL SECTION
(CH 13+700.00 - 14+300.00)
SHEET 24 OF 29**

Designed by:	Drawn by:
Checked by:	Approved by:
Scale: H- 1:1000, V- 1:100	Date: JUNE 2022

DRG No.

LONGITUDINAL SECTION



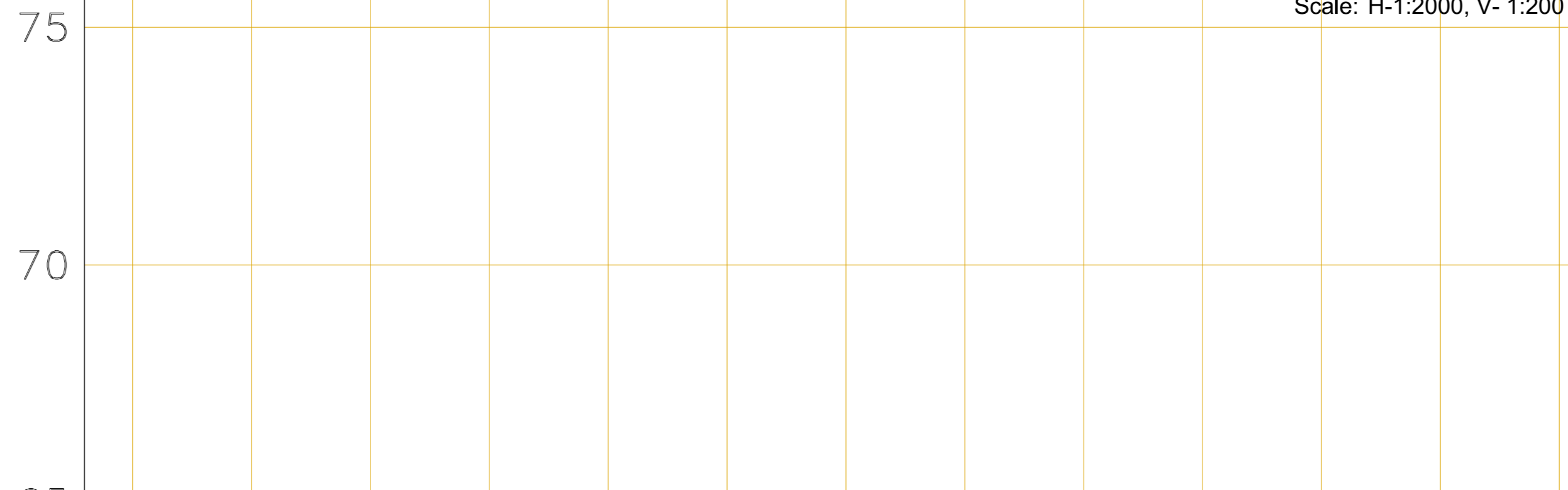
PLAN

Scale: H-1:2000, V-1:200

Scale: H-1:2000, V-1:200

- NOTES:**
1. CONTOUR LEVELS ARE IN METERS AT ONE METER INTERVALS
 2. GRID VALUES ARE IN METERS AT 100 METER INTERVALS
 3. GEOLOGICAL CONDITIONS INDICATED ON DRAWING ARE FOR GENERAL GUIDANCE ONLY
 4. MINIMUM PIPELINE SLOPES TO BE 1:500
 5. DRAWING TO BE READ IN CONJUNCTION WITH STANDARD DRAWINGS
 6. ALL PIPE FITTINGS TO BE CONFIRMED ON SITE DURING SETTING OUT
 7. FIGURED DIMENSION ONLY TO BE TAKEN FROM THIS DRAWING

- LEGEND:**
- ROAD (TARMAC)
 - ROAD / TRACK (EARTH / MURRAM)
 - FENCE / HEDGE
 - 75 CONTOURS, 1m INTERVAL
 - ELECTRIC POST
 - CULVERT
 - GATE
 - BUILDINGS
 - PROPOSED WATER MAIN
 - EXISTING WATER MAIN
 - TP10 TRAVERSE POINT & No.
 - TREES
 - TRIAL HOLE
 - HORIZONTAL BEND (H) OR VERTICAL BEND (V) WITH ANGLE INDICATED
 - GV GATE VALVE
 - FH FIRE HYDRANT
 - WO-01 WASHOUT VALVE & No.
 - WM WATER METER
 - PIPELINE GRADIENT WITH SLOPE DIRECTION (SLOPE MIN. OR 1 IN n)
 - FENCE



CHAINAGE (m)	-0+050.00	13+100.00	13+150.00	13+200.00	13+250.00	13+300.00	13+350.00	13+400.00	13+450.00	13+500.00	13+550.00	13+600.00	13+650.00	13+700.00
EXISTING GROUND LEVEL (m)		78.47	78.59	78.68	78.77	78.87	78.98	79.08	79.18	79.28	79.38	79.47	79.55	79.64
INVERT LEVELS (m)		77.28	77.37	77.45	77.53	77.62	77.70	77.78	77.89	77.99	78.10	78.20	78.30	78.40
TYPE AND SIZE OF PIPE	HDPE DN110 PN 12.5													
DESIGN FLOW (m ³ /sec)														
TYPE OF SOIL	BLACK COTTON SOIL													

REVISIONS				SIGN	DATE	APPROVED
	BY	CHECKED				
	BY	CHECKED				
	BY	CHECKED				
	BY	CHECKED				

THE CHIEF EXECUTIVE OFFICER
NORTHERN WATER WORKS
DEVELOPMENT AGENCY

CONTRACTOR:

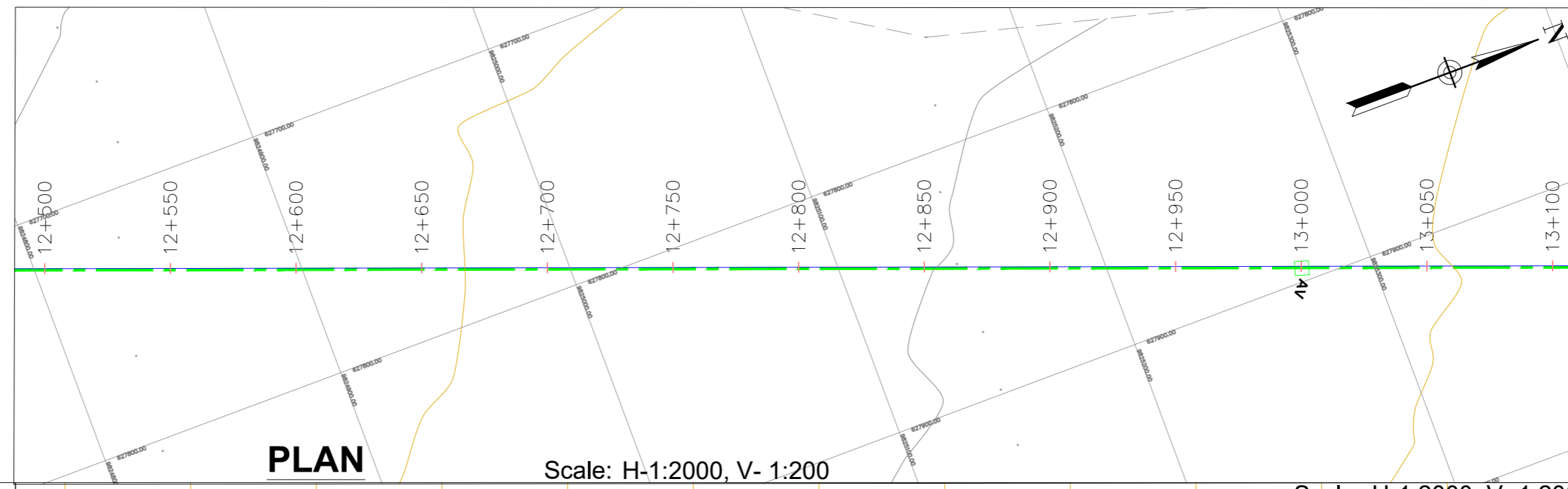
PROJECT NAME:
IJARA WATER SUPPLY PROJECT
MASALANI - GABABA PIPELINE EXTENSION WORKS

DRAWING TITLE:
LINE
PLAN & LONGITUDINAL SECTION
(CH 13+100.00 - 13+700.00)
SHEET 23 OF 29

Designed by:	Drawn by:
Checked by:	Approved by:
Scale: H-1:1000, V-1:100	Date: JUNE 2022

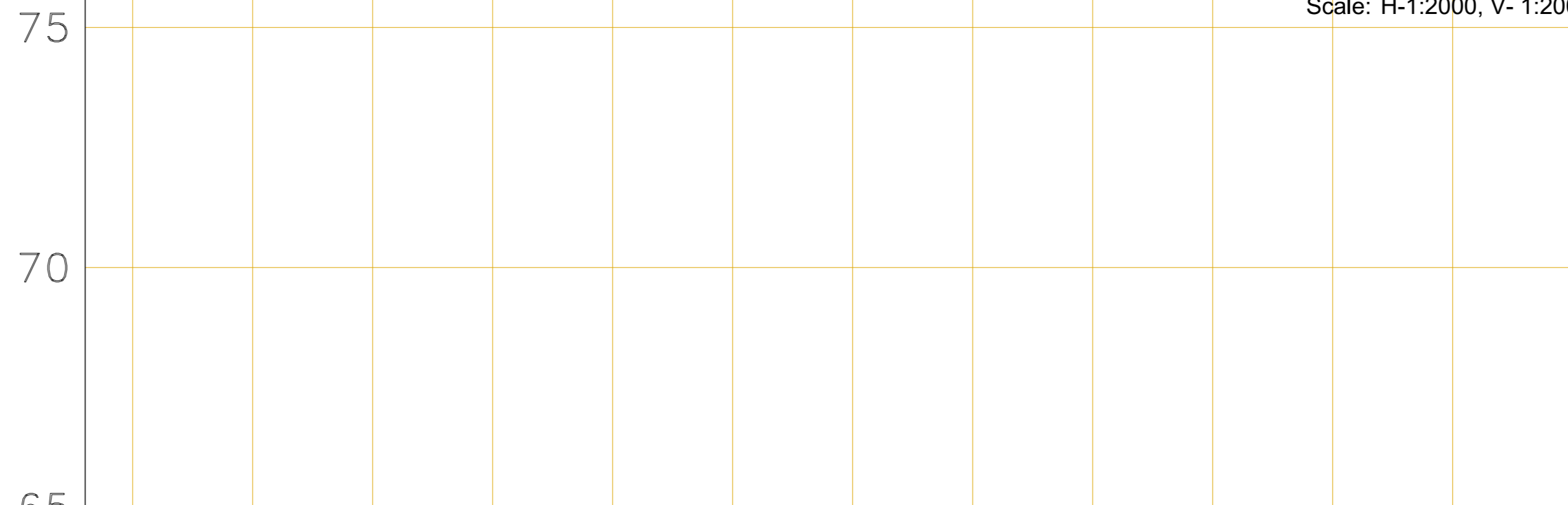
DRG No.

LONGITUDINAL SECTION



- NOTES:**
1. CONTOUR LEVELS ARE IN METERS AT ONE METER INTERVALS
 2. GRID VALUES ARE IN METERS AT 100 METER INTERVALS
 3. GEOLOGICAL CONDITIONS INDICATED ON DRAWING ARE FOR GENERAL GUIDANCE ONLY
 4. MINIMUM PIPELINE SLOPES TO BE 1:500
 5. DRAWING TO BE READ IN CONJUNCTION WITH STANDARD DRAWINGS
 6. ALL PIPE FITTINGS TO BE CONFIRMED ON SITE DURING SETTING OUT
 7. FIGURED DIMENSION ONLY TO BE TAKEN FROM THIS DRAWING

- LEGEND:**
- ROAD (TARMAC)
 - ROAD / TRACK (EARTH / MURRAM)
 - FENCE / HEDGE
 - CONTOURS, 1m INTERVAL
 - ELECTRIC POST
 - CULVERT
 - GATE
 - BUILDINGS
 - PROPOSED WATER MAIN
 - EXISTING WATER MAIN
 - TP10 TRAVERSE POINT & No.
 - TREES
 - TRIAL HOLE
 - HORIZONTAL BEND (H) OR VERTICAL BEND (V) WITH ANGLE INDICATED
 - GV GATE VALVE
 - FH FIRE HYDRANT
 - WO-01 WASHOUT VALVE & No.
 - WM WATER METER
 - PIPELINE GRADIENT WITH SLOPE DIRECTION (SLOPE MIN. OR 1 IN n)
 - FENCE



CHAINAGE (m)	-0+050.00	12+500.00	12+550.00	12+600.00	12+650.00	12+700.00	12+750.00	12+800.00	12+850.00	12+900.00	12+950.00	13+000.00	13+050.00	13+100.00
EXISTING GROUND LEVEL (m)		77.29	77.39	77.48	77.57	77.66	77.75	77.86	77.99	78.10	78.20	78.30	78.38	78.47
INVERT LEVELS (m)		76.07	76.18	76.28	76.38	76.48	76.58	76.68	76.78	76.88	76.98	77.08	77.18	77.28

TYPE AND SIZE OF PIPE

DESIGN FLOW (m³/sec)

TYPE OF SOIL

HDPE DN110 PN 12.5

BLACK COTTON SOIL

REVISIONS				SIGN	DATE	APPROVED
	BY	CHECKED				
	BY	CHECKED				
	BY	CHECKED				
	BY	CHECKED				

THE CHIEF EXECUTIVE OFFICER
NORTHERN WATER WORKS
DEVELOPMENT AGENCY

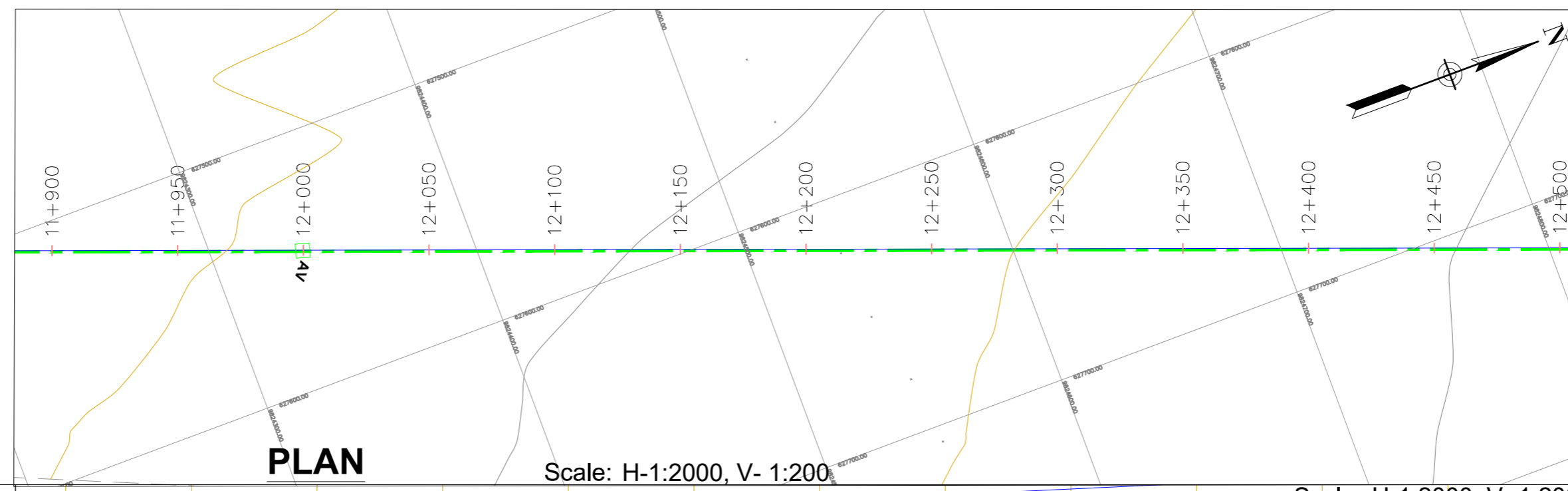
CONTRACTOR:

PROJECT NAME:
IJARA WATER SUPPLY PROJECT
MASALANI - GABABA PIPELINE EXTENSION WORKS

DRAWING TITLE:
LINE
PLAN & LONGITUDINAL SECTION
(CH 12+500.00 - 13+100.00)
SHEET 22 OF 29

Designed by:	Drawn by:
Checked by:	Approved by:
Scale: H-1:1000, V-1:100	Date: JUNE 2022

LONGITUDINAL SECTION



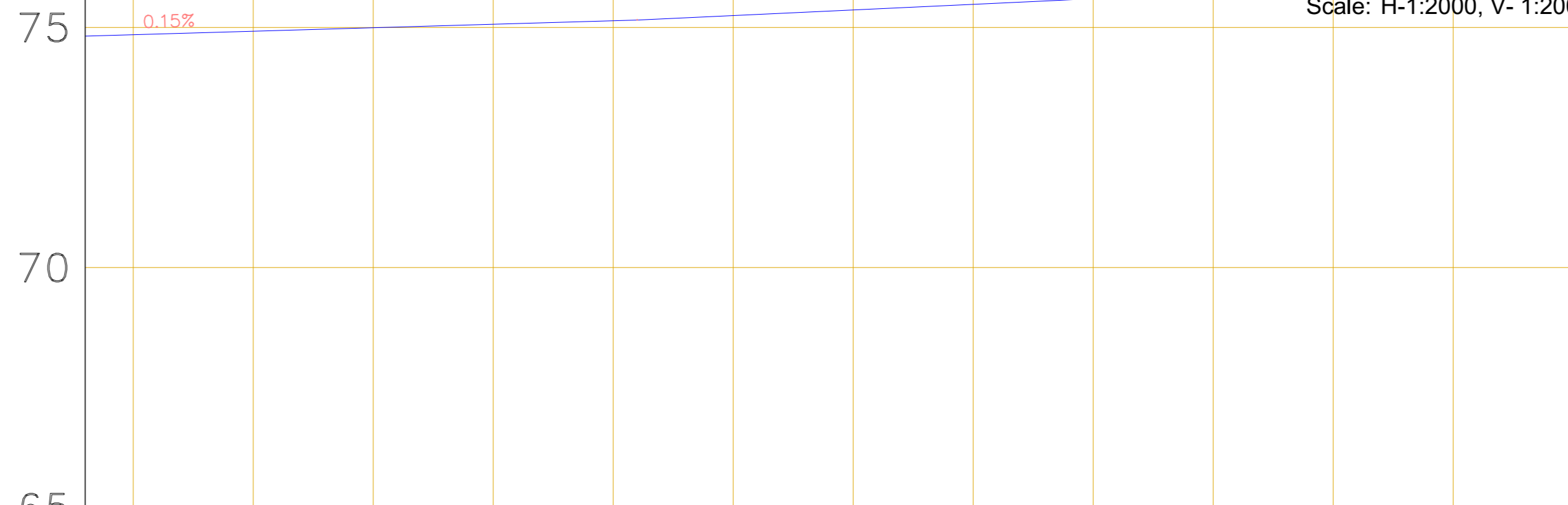
PLAN

Scale: H-1:2000, V-1:200

Scale: H-1:2000, V-1:200

- NOTES:**
1. CONTOUR LEVELS ARE IN METERS AT ONE METER INTERVALS
 2. GRID VALUES ARE IN METERS AT 100 METER INTERVALS
 3. GEOLOGICAL CONDITIONS INDICATED ON DRAWING ARE FOR GENERAL GUIDANCE ONLY
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 5. DRAWING TO BE READ IN CONJUNCTION WITH STANDARD DRAWINGS
 6. ALL PIPE FITTINGS TO BE CONFIRMED ON SITE DURING SETTING OUT
 7. FIGURED DIMENSION ONLY TO BE TAKEN FROM THIS DRAWING

- LEGEND:**
- ROAD (TARMAC)
 - ROAD / TRACK (EARTH / MURRAM)
 - FENCE / HEDGE
 - CONTOURS, 1m INTERVAL
 - ELECTRIC POST
 - CULVERT
 - GATE
 - BUILDINGS
 - PROPOSED WATER MAIN
 - EXISTING WATER MAIN
 - TP10 TRAVERSE POINT & No.
 - TREES
 - TRIAL HOLE
 - HORIZONTAL BEND (H) OR VERTICAL BEND (V) WITH ANGLE INDICATED
 - GV GATE VALVE
 - FH FIRE HYDRANT
 - WO-01 WASHOUT VALVE & No.
 - WM WATER METER
 - PIPELINE GRADIENT WITH SLOPE DIRECTION (SLOPE MIN. OR 1 IN n)
 - FENCE

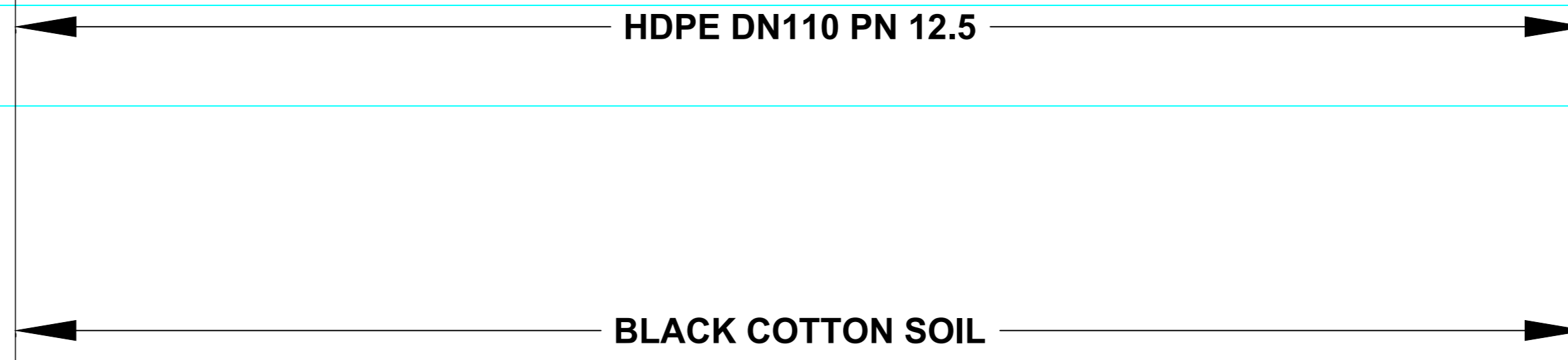


CHAINAGE (m)	-0+050.00	11+900.00	11+950.00	12+000.00	12+050.00	12+100.00	12+150.00	12+200.00	12+250.00	12+300.00	12+350.00	12+400.00	12+450.00	12+500.00
EXISTING GROUND LEVEL (m)		75.88	75.97	76.07	76.17	76.31	76.45	76.58	76.71	76.83	76.94	77.06	77.18	77.29
INVERT LEVELS (m)		74.85	74.92	74.99	75.07	75.14	75.25	75.37	75.48	75.60	75.72	75.83	75.95	76.07

TYPE AND SIZE OF PIPE

DESIGN FLOW (m³/sec)

TYPE OF SOIL



REVISIONS				SIGN	DATE	APPROVED
	BY	CHECKED				
	BY	CHECKED				
	BY	CHECKED				
	BY	CHECKED				

THE CHIEF EXECUTIVE OFFICER
NORTHERN WATER WORKS
DEVELOPMENT AGENCY

CONTRACTOR:

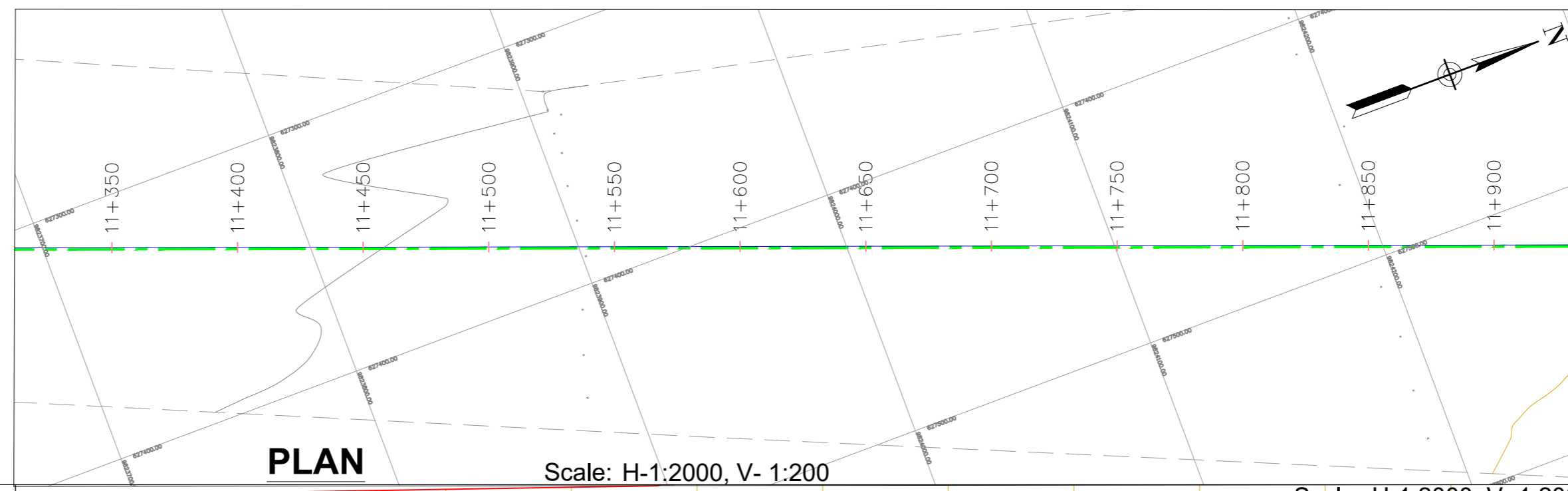
PROJECT NAME:
IJARA WATER SUPPLY PROJECT
MASALANI - GABABA PIPELINE EXTENSION WORKS

DRAWING TITLE:
LINE
PLAN & LONGITUDINAL SECTION
(CH 11+900.00 - 12+500.00)
SHEET 21 OF 29

Designed by: _____ Drawn by: _____
 Checked by: _____ Approved by: _____
 Scale: H-1:1000, V-1:100 Date: JUNE 2022

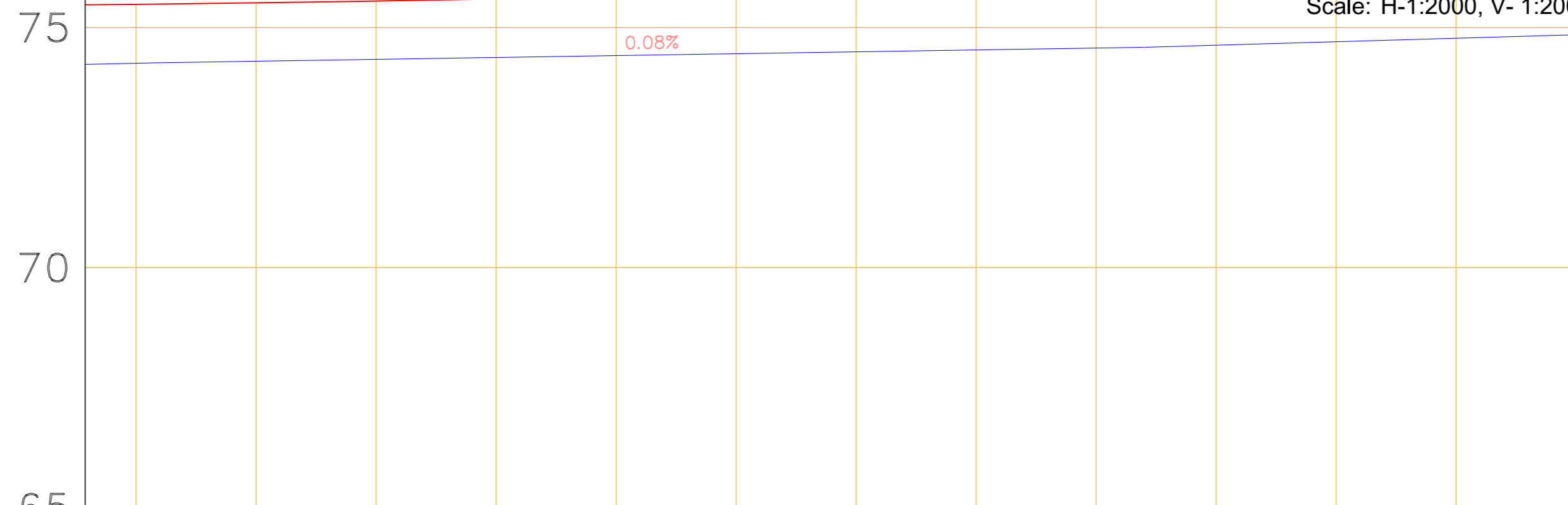
DRG No.

LONGITUDINAL SECTION



- NOTES:**
1. CONTOUR LEVELS ARE IN METERS AT ONE METER INTERVALS
 2. GRID VALUES ARE IN METERS AT 100 METER INTERVALS
 3. GEOLOGICAL CONDITIONS INDICATED ON DRAWING ARE FOR GENERAL GUIDANCE ONLY
 4. MINIMUM PIPELINE SLOPES TO BE 1:500
 5. DRAWING TO BE READ IN CONJUNCTION WITH STANDARD DRAWINGS
 6. ALL PIPE FITTINGS TO BE CONFIRMED ON SITE DURING SETTING OUT
 7. FIGURED DIMENSION ONLY TO BE TAKEN FROM THIS DRAWING

- LEGEND:**
- ROAD (TARMAC)
 - ROAD / TRACK (EARTH / MURRAM)
 - FENCE / HEDGE
 - CONTOURS, 1m INTERVAL
 - ELECTRIC POST
 - CULVERT
 - GATE
 - BUILDINGS
 - PROPOSED WATER MAIN
 - EXISTING WATER MAIN
 - TP10 TRAVERSE POINT & No.
 - TREES
 - TRIAL HOLE
 - HORIZONTAL BEND (H) OR VERTICAL BEND (V) WITH ANGLE INDICATED
 - GV GATE VALVE
 - FH FIRE HYDRANT
 - WO-01 WASHOUT VALVE & No.
 - WM WATER METER
 - PIPELINE GRADIENT WITH SLOPE DIRECTION (SLOPE MIN. OR 1 IN n)
 - FENCE



CHAINAGE (m)	-0+050.00	11+300.00	11+350.00	11+400.00	11+450.00	11+500.00	11+550.00	11+600.00	11+650.00	11+700.00	11+750.00	11+800.00	11+850.00	11+900.00
EXISTING GROUND LEVEL (m)		75.48	75.51	75.55	75.59	75.63	75.69	75.72	75.75	75.78	75.80	75.82	75.85	75.88
INVERT LEVELS (m)		74.25	74.30	74.34	74.38	74.41	74.45	74.49	74.53	74.57	74.63	74.70	74.78	74.85
TYPE AND SIZE OF PIPE	HDPE DN110 PN 12.5													
DESIGN FLOW (m/sec)														
TYPE OF SOIL	BLACK COTTON SOIL													

REVISIONS				SIGN	DATE	APPROVED
BY	CHECKED					
BY	CHECKED					
BY	CHECKED					
BY	CHECKED					

THE CHIEF EXECUTIVE OFFICER
NORTHERN WATER WORKS
DEVELOPMENT AGENCY

CONTRACTOR:

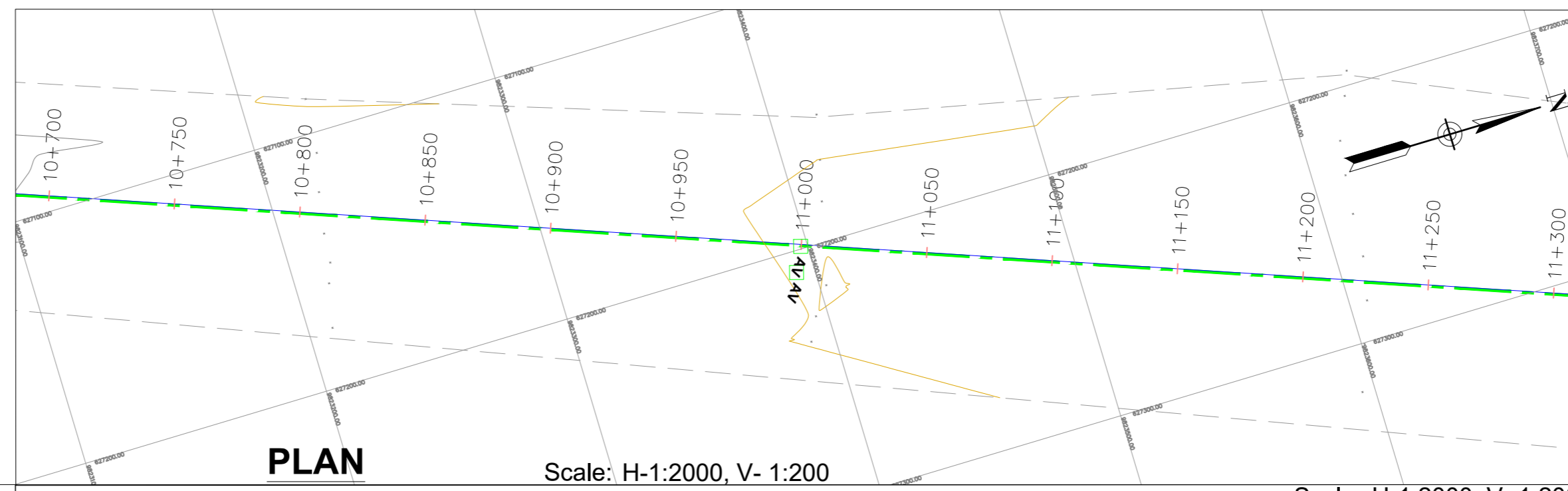
PROJECT NAME:
IJARA WATER SUPPLY PROJECT
MASALANI - GABABA PIPELINE EXTENSION WORKS

DRAWING TITLE:
LINE
PLAN & LONGITUDINAL SECTION
(CH 11+300.00 - 11+900.00)
SHEET 20 OF 29

Designed by:	Drawn by:
Checked by:	Approved by:
Scale: H- 1:1000, V- 1:100	Date: JUNE 2022

DRG No.

LONGITUDINAL SECTION



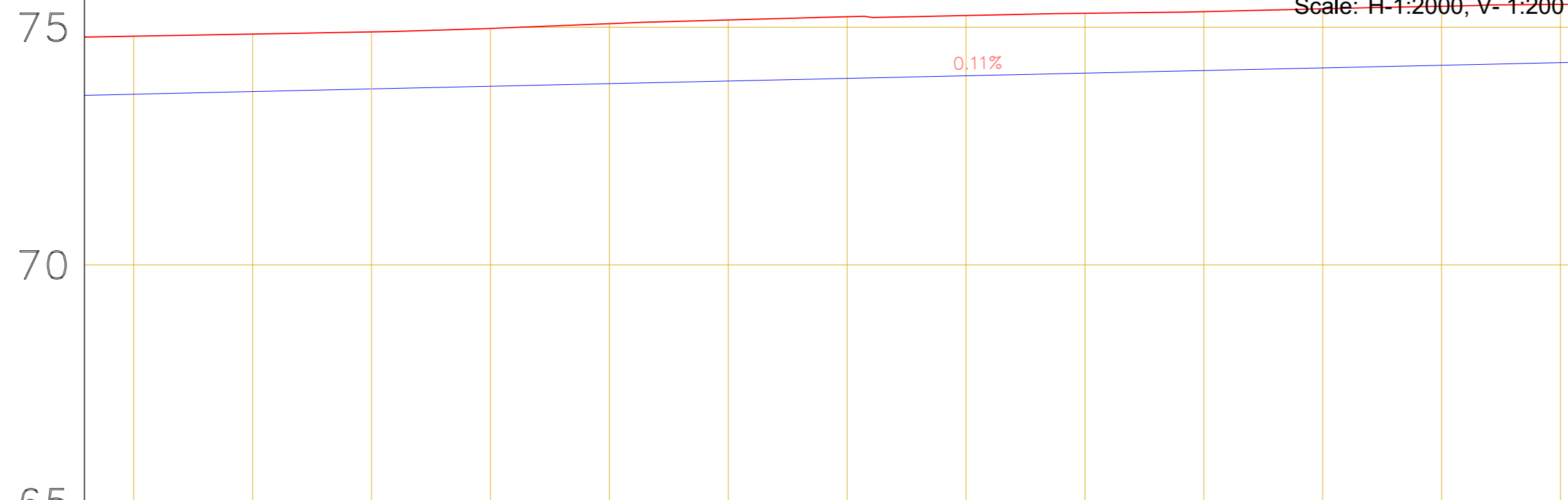
PLAN

Scale: H-1:2000, V- 1:200

Scale: H-1:2000, V- 1:200

- NOTES:**
1. CONTOUR LEVELS ARE IN METERS AT ONE METER INTERVALS
 2. GRID VALUES ARE IN METERS AT 100 METER INTERVALS
 3. GEOLOGICAL CONDITIONS INDICATED ON DRAWING ARE FOR GENERAL GUIDANCE ONLY
 4. MINIMUM PIPELINE SLOPES TO BE 1:500
 5. DRAWINGS TO BE READ IN CONJUNCTION WITH STANDARD DRAWINGS
 6. ALL PIPE FITTINGS TO BE CONFIRMED ON SITE DURING SETTING OUT
 7. FIGURED DIMENSION ONLY TO BE TAKEN FROM THIS DRAWING

- LEGEND:**
- ROAD (TARMAC)
 - ROAD / TRACK (EARTH / MURRAM)
 - FENCE / HEDGE
 - CONTOURS, 1m INTERVAL
 - ELECTRIC POST
 - CULVERT
 - GATE
 - BUILDINGS
 - PROPOSED WATER MAIN
 - EXISTING WATER MAIN
 - TP10 TRAVERSE POINT & No.
 - TREES
 - TRIAL HOLE
 - HORIZONTAL BEND (H) OR VERTICAL BEND (V) WITH ANGLE INDICATED
 - GV GATE VALVE
 - FH FIRE HYDRANT
 - WO-01 WASHOUT VALVE & No.
 - WM WATER METER
 - PIPELINE GRADIENT WITH SLOPE DIRECTION (SLOPE MIN. OR 1 IN n)
 - FENCE



CHAINAGE (m)	EXISTING GROUND LEVEL (m)	INVERT LEVELS (m)
-0+050.00		
10+700.00	74.81	73.59
10+750.00	74.86	73.65
10+800.00	74.90	73.70
10+850.00	74.97	73.76
10+900.00	75.08	73.81
10+950.00	75.15	73.87
11+000.00	75.22	73.92
11+050.00	75.24	73.98
11+100.00	75.29	74.03
11+150.00	75.33	74.09
11+200.00	75.39	74.14
11+250.00	75.44	74.20
11+300.00	75.48	74.25

TYPE AND SIZE OF PIPE

DESIGN FLOW (m³/sec)

TYPE OF SOIL

HDPE DN110 PN 12.5

BLACK COTTON SOIL

REVISIONS				SIGN	DATE	APPROVED
	BY	CHECKED				
	BY	CHECKED				
	BY	CHECKED				
	BY	CHECKED				

THE CHIEF EXECUTIVE OFFICER
NORTHERN WATER WORKS
DEVELOPMENT AGENCY

CONTRACTOR:

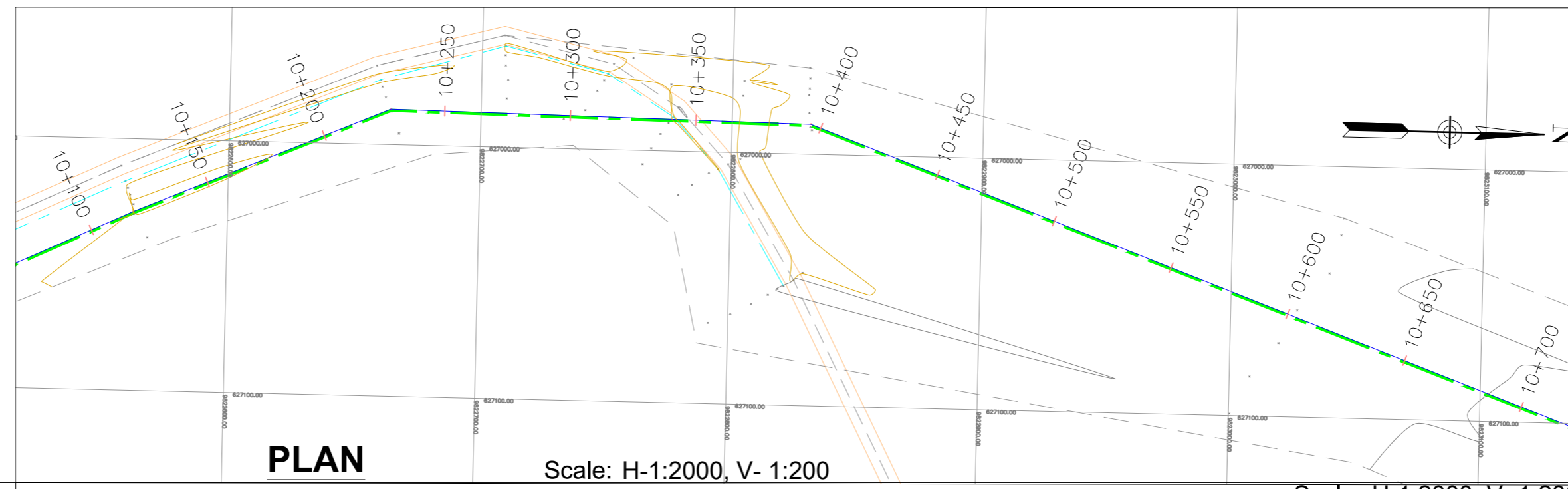
PROJECT NAME:
IJARA WATER SUPPLY PROJECT
MASALANI - GABABA PIPELINE EXTENSION WORKS

DRAWING TITLE:
LINE
PLAN & LONGITUDINAL SECTION
(CH 10+700.00 - 11+300.00)
SHEET 19 OF 29

Designed by: _____ Drawn by: _____
Checked by: _____ Approved by: _____
Scale: H- 1:1000, V- 1:100 Date: JUNE 2022

DRG No.

LONGITUDINAL SECTION



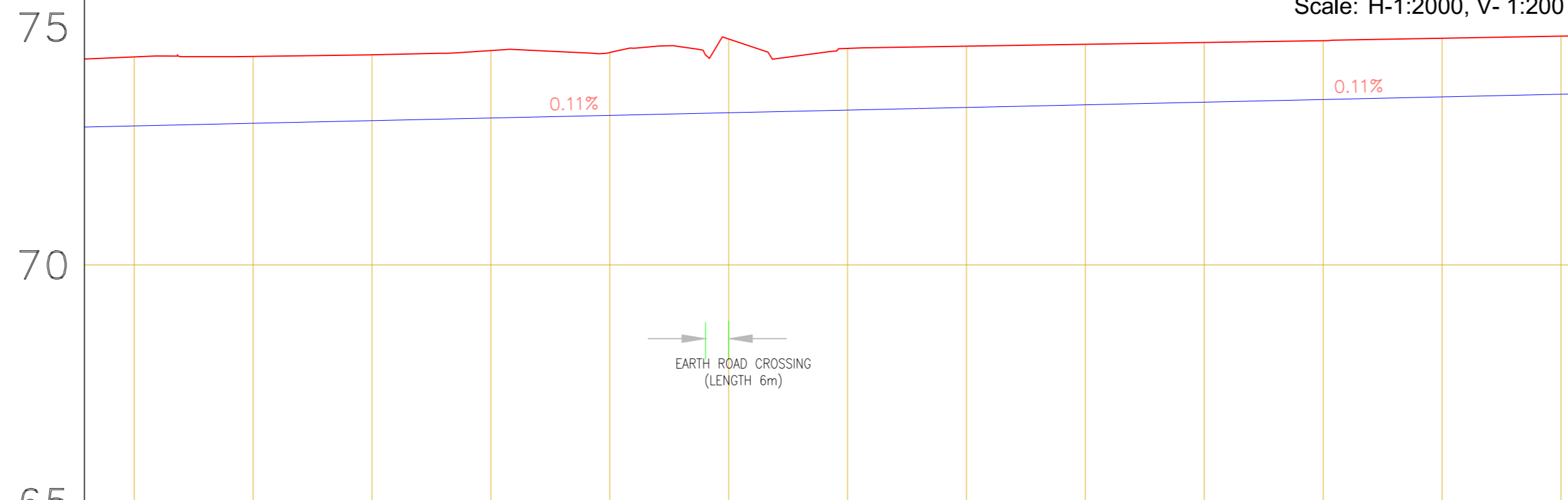
PLAN

Scale: H-1:2000, V- 1:200

Scale: H-1:2000, V- 1:200

- NOTES:**
1. CONTOUR LEVELS ARE IN METERS AT ONE METER INTERVALS
 2. GRID VALUES ARE IN METERS AT 100 METER INTERVALS
 3. GEOLOGICAL CONDITIONS INDICATED ON DRAWING ARE FOR GENERAL GUIDANCE ONLY
 4. MINIMUM PIPELINE SLOPES TO BE 1:500
 5. DRAWING TO BE READ IN CONJUNCTION WITH STANDARD DRAWINGS
 6. ALL PIPE FITTINGS TO BE CONFIRMED ON SITE DURING SETTING OUT
 7. FIGURED DIMENSION ONLY TO BE TAKEN FROM THIS DRAWING

- LEGEND:**
- ROAD (TARMAC)
 - ROAD / TRACK (EARTH / MURRAM)
 - FENCE / HEDGE
 - 75 CONTOURS, 1m INTERVAL
 - ELECTRIC POST
 - CULVERT
 - GATE
 - BUILDINGS
 - PROPOSED WATER MAIN
 - EXISTING WATER MAIN
 - TP10 TRAVERSE POINT & No.
 - TREES
 - TRIAL HOLE
 - HORIZONTAL BEND (H) OR VERTICAL BEND (V) WITH ANGLE INDICATED
 - GV GATE VALVE
 - FH FIRE HYDRANT
 - WO-01 WASHOUT VALVE & No.
 - WM WATER METER
 - PIPELINE GRADIENT WITH SLOPE DIRECTION (SLOPE MIN. OR 1 IN n)
 - FENCE



CHAINAGE (m)	-0+050.00	10+100.00	10+150.00	10+200.00	10+250.00	10+300.00	10+350.00	10+400.00	10+450.00	10+500.00	10+550.00	10+600.00	10+650.00	10+700.00
EXISTING GROUND LEVEL (m)		74.37	74.39	74.42	74.51	74.47	74.75	74.55	74.60	74.64	74.68	74.72	74.77	74.81
INVERT LEVELS (m)		72.92	72.98	73.03	73.09	73.15	73.20	73.26	73.31	73.37	73.42	73.48	73.53	73.59
TYPE AND SIZE OF PIPE	HDPE DN110 PN 12.5													
DESIGN FLOW (m ³ /sec)														
TYPE OF SOIL	BLACK COTTON SOIL													

REVISIONS				SIGN	DATE	APPROVED
	BY	CHECKED				
	BY	CHECKED				
	BY	CHECKED				
	BY	CHECKED				

THE CHIEF EXECUTIVE OFFICER
NORTHERN WATER WORKS
DEVELOPMENT AGENCY

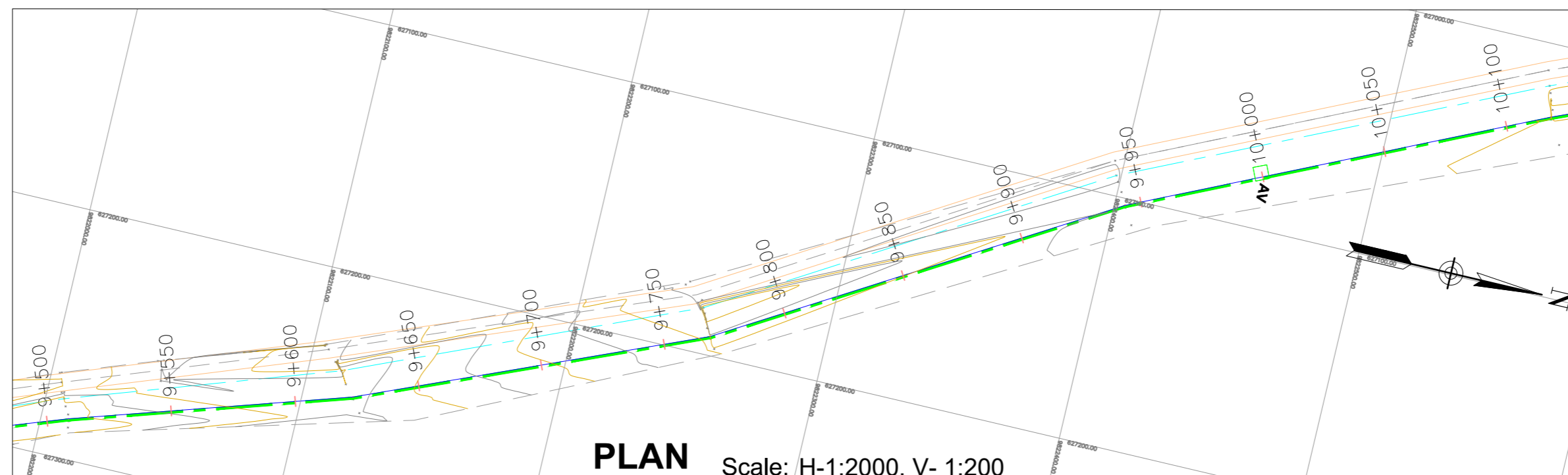
CONTRACTOR:

PROJECT NAME:
IJARA WATER SUPPLY PROJECT
MASALANI - GABABA PIPELINE EXTENSION WORKS

DRAWING TITLE:
LINE
PLAN & LONGITUDINAL SECTION
(CH 10+100.00 - 10+700.00)
SHEET 18 OF 29

Designed by:	Drawn by:
Checked by:	Approved by:
Scale: H- 1:1000, V- 1:100	Date: JUNE 2022

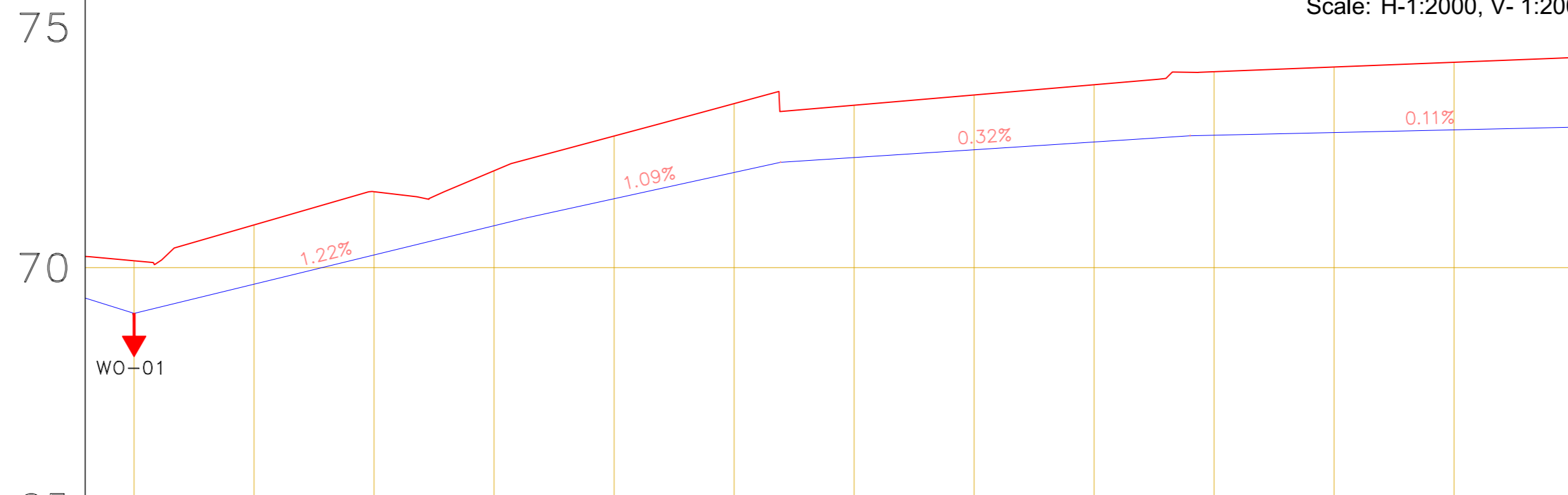
LONGITUDINAL SECTION



PLAN Scale: H-1:2000, V- 1:200

- NOTES:**
1. CONTOUR LEVELS ARE IN METERS AT ONE METER INTERVALS
 2. GRID VALUES ARE IN METERS AT 100 METER INTERVALS
 3. GEOLOGICAL CONDITIONS INDICATED ON DRAWING ARE FOR GENERAL GUIDANCE ONLY
 4. MINIMUM PIPELINE SLOPES TO BE 1:500
 5. DRAWING TO BE READ IN CONJUNCTION WITH STANDARD DRAWINGS
 6. ALL PIPE FITTINGS TO BE CONFIRMED ON SITE DURING SETTING OUT
 7. FIGURED DIMENSION ONLY TO BE TAKEN FROM THIS DRAWING

- LEGEND:**
- ROAD (TARMAC)
 - ROAD / TRACK (EARTH / MURRAM)
 - FENCE / HEDGE
 - 75 CONTOURS, 1m INTERVAL
 - ELECTRIC POST
 - CULVERT
 - GATE
 - BUILDINGS
 - PROPOSED WATER MAIN
 - EXISTING WATER MAIN
 - TP10 TRAVERSE POINT & No.
 - TREES
 - TRIAL HOLE
 - HORIZONTAL BEND (H) OR VERTICAL BEND (V) WITH ANGLE INDICATED
 - GV GATE VALVE
 - FH FIRE HYDRANT
 - WO-01 WASHOUT VALVE & No.
 - WM WATER METER
 - PIPELINE GRADIENT WITH SLOPE DIRECTION (SLOPE MIN. OR 1 IN n)
 - FENCE



Scale: H-1:2000, V- 1:200

CHAINAGE (m)	-0+050.00	9+500.00	9+550.00	9+600.00	9+650.00	9+700.00	9+750.00	9+800.00	9+850.00	9+900.00	9+950.00	10+000.00	10+050.00	10+100.00
EXISTING GROUND LEVEL (m)		70.14	70.89	71.58	72.02	72.74	73.42	73.38	73.60	73.81	74.08	74.18	74.28	74.37
INVERT LEVELS (m)		69.05	69.66	70.26	70.87	71.44	71.98	72.29	72.46	72.62	72.76	72.81	72.87	72.92
TYPE AND SIZE OF PIPE	HDPE DN110 PN 12.5													
DESIGN FLOW (m/sec)														
TYPE OF SOIL														

REVISIONS				SIGN	DATE	APPROVED
	BY	CHECKED				
	BY	CHECKED				
	BY	CHECKED				
	BY	CHECKED				

THE CHIEF EXECUTIVE OFFICER
NORTHERN WATER WORKS
DEVELOPMENT AGENCY

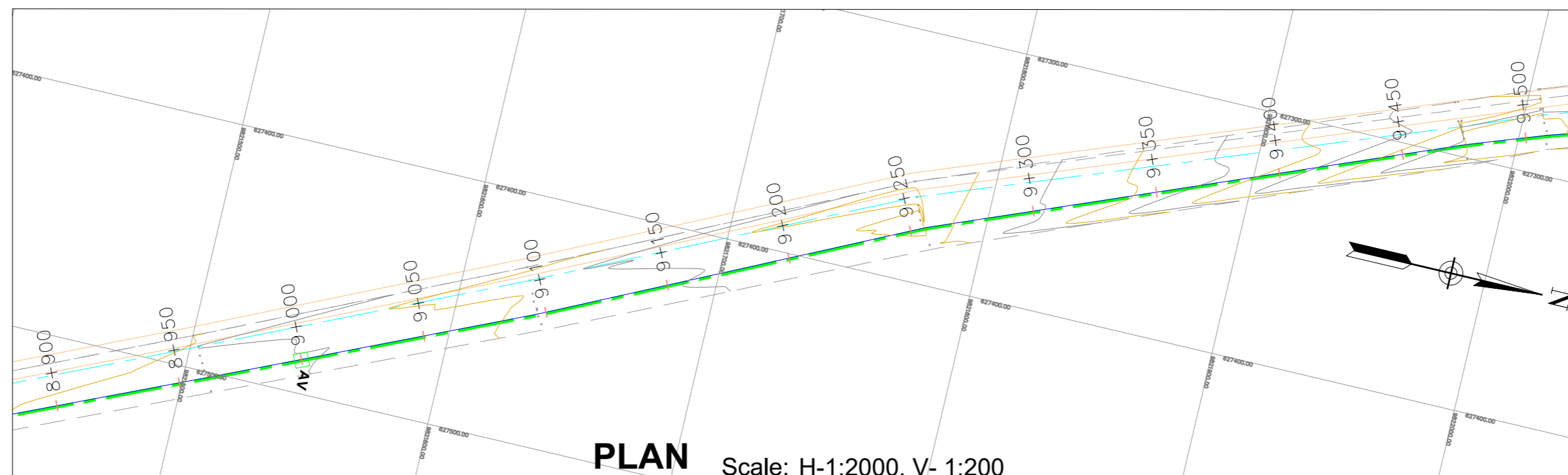
CONTRACTOR:

PROJECT NAME:
IJARA WATER SUPPLY PROJECT
MASALANI - GABABA PIPELINE EXTENSION WORKS

DRAWING TITLE:
LINE
PLAN & LONGITUDINAL SECTION
(CH 9+500.00 - 10+100.00)
SHEET 17 OF 29

Designed by: _____ Drawn by: _____
 Checked by: _____ Approved by: _____
 Scale: H- 1:1000, V- 1:100 Date: **JUNE 2022**
 DRG No. _____

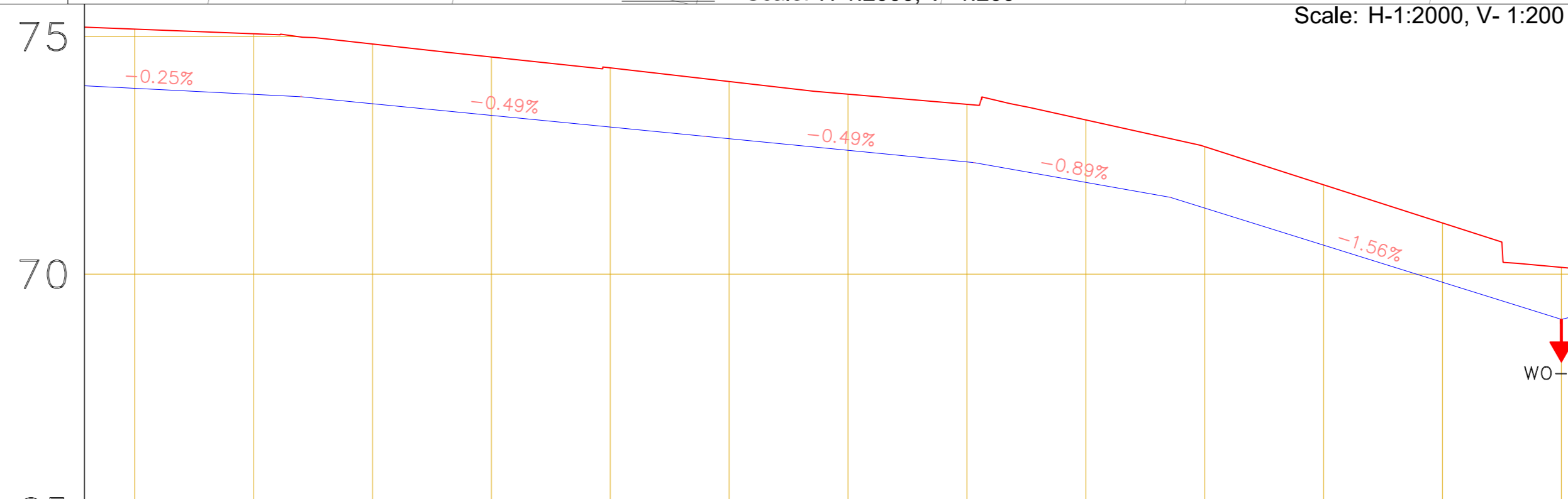
LONGITUDINAL SECTION



PLAN Scale: H-1:2000, V- 1:200

- NOTES:**
1. CONTOUR LEVELS ARE IN METERS AT ONE METER INTERVALS
 2. GRID VALUES ARE IN METERS AT 100 METER INTERVALS
 3. GEOLOGICAL CONDITIONS INDICATED ON DRAWING ARE FOR GENERAL GUIDANCE ONLY
 4. MINIMUM PIPELINE SLOPES TO BE 1:500
 5. DRAWING TO BE READ IN CONJUNCTION WITH STANDARD DRAWINGS
 6. ALL PIPE FITTINGS TO BE CONFIRMED ON SITE DURING SETTING OUT
 7. FIGURED DIMENSION ONLY TO BE TAKEN FROM THIS DRAWING

- LEGEND:**
- ROAD (TARMAC)
 - ROAD / TRACK (EARTH / MURRAM)
 - FENCE / HEDGE
 - CONTOURS, 1m INTERVAL
 - ELECTRIC POST
 - CULVERT
 - GATE
 - BUILDINGS
 - PROPOSED WATER MAIN
 - EXISTING WATER MAIN
 - TP10 TRAVERSE POINT & No.
 - TREES
 - TRIAL HOLE
 - HORIZONTAL BEND (H) OR VERTICAL BEND (V) WITH ANGLE INDICATED
 - GV GATE VALVE
 - FH FIRE HYDRANT
 - WO-01 WASHOUT VALVE & No.
 - WM WATER METER
 - PIPELINE GRADIENT WITH SLOPE DIRECTION (SLOPE MIN. OR 1 IN n)
 - FENCE



Scale: H-1:2000, V- 1:200

CHAINAGE (m)	-0+050.00	8+900.00	8+950.00	9+000.00	9+050.00	9+100.00	9+150.00	9+200.00	9+250.00	9+300.00	9+350.00	9+400.00	9+450.00	9+500.00
EXISTING GROUND LEVEL (m)		75.16	75.06	74.84	74.57	74.34	74.05	73.79	73.57	73.25	72.68	71.88	71.08	70.14
INVERT LEVELS (m)		73.91	73.79	73.59	73.34	73.10	72.85	72.61	72.36	71.93	71.39	70.61	69.83	69.05
TYPE AND SIZE OF PIPE	HDPE DN110 PN 12.5													
DESIGN FLOW (m/sec)														
TYPE OF SOIL	BLACK COTTON SOIL													

REVISIONS				SIGN	DATE	APPROVED
	BY	CHECKED				
	BY	CHECKED				
	BY	CHECKED				
	BY	CHECKED				

THE CHIEF EXECUTIVE OFFICER
NORTHERN WATER WORKS
DEVELOPMENT AGENCY

CONTRACTOR:

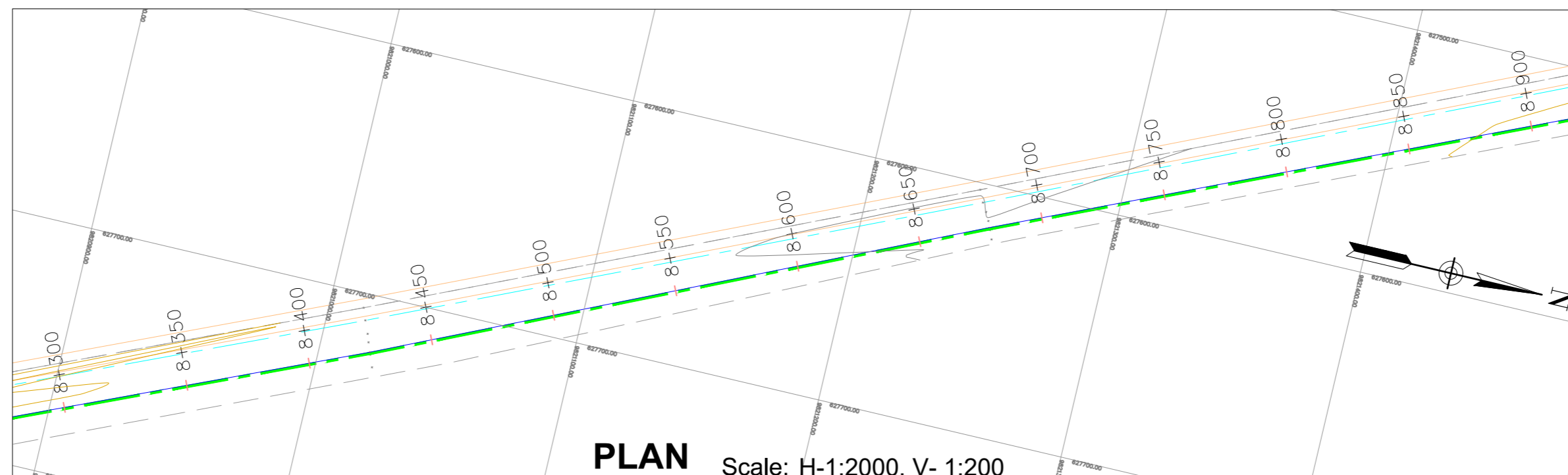
PROJECT NAME:
IJARA WATER SUPPLY PROJECT
MASALANI - GABABA PIPELINE EXTENSION WORKS

DRAWING TITLE:
LINE
PLAN & LONGITUDINAL SECTION
(CH 8+900.00 - 9+500.00)
SHEET 16 OF 29

Designed by:	Drawn by:
Checked by:	Approved by:
Scale: H- 1:1000, V- 1:100	Date: JUNE 2022

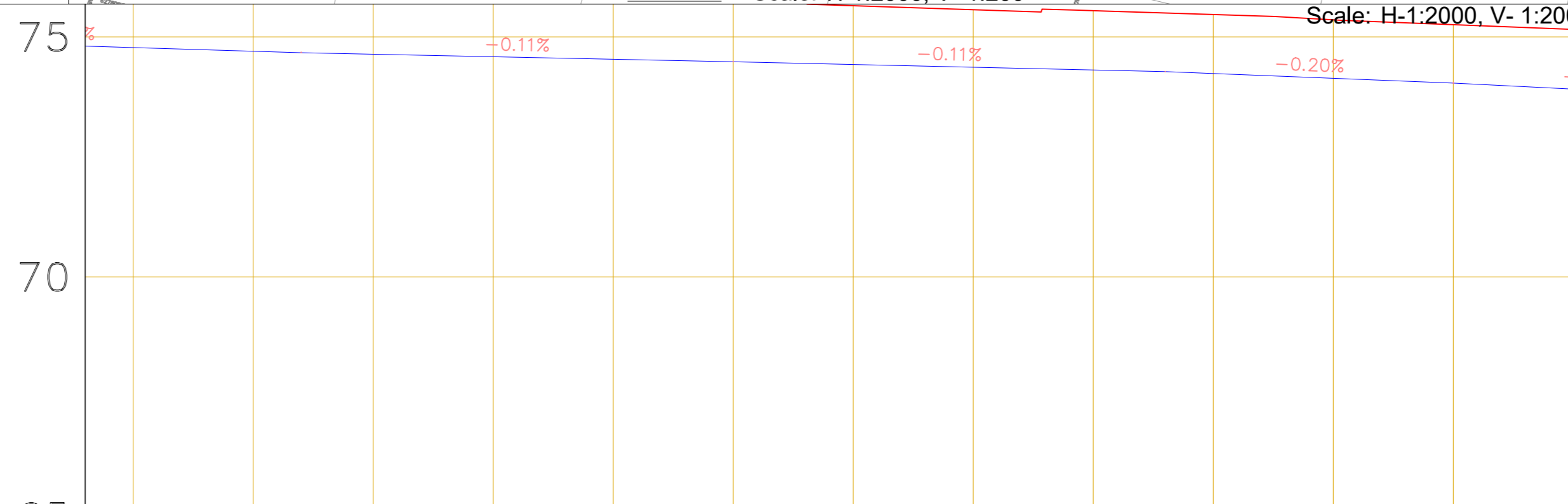
DRG No.

LONGITUDINAL SECTION



- NOTES:**
1. CONTOUR LEVELS ARE IN METERS AT ONE METER INTERVALS
 2. GRID VALUES ARE IN METERS AT 100 METER INTERVALS
 3. GEOLOGICAL CONDITIONS INDICATED ON DRAWING ARE FOR GENERAL GUIDANCE ONLY
 4. MINIMUM PIPELINE SLOPES TO BE 1:500
 5. DRAWING TO BE READ IN CONJUNCTION WITH STANDARD DRAWINGS
 6. ALL PIPE FITTINGS TO BE CONFIRMED ON SITE DURING SETTING OUT
 7. FIGURED DIMENSION ONLY TO BE TAKEN FROM THIS DRAWING

- LEGEND:**
- ROAD (TARMAC)
 - ROAD / TRACK (EARTH / MURRAM)
 - FENCE / HEDGE
 - 75m CONTOURS, 1m INTERVAL
 - ELECTRIC POST
 - CULVERT
 - GATE
 - BUILDINGS
 - PROPOSED WATER MAIN
 - EXISTING WATER MAIN
 - TP10 TRAVERSE POINT & No.
 - TREES
 - TRIAL HOLE
 - HORIZONTAL BEND (H) OR VERTICAL BEND (V) WITH ANGLE INDICATED
 - GV GATE VALVE
 - FH FIRE HYDRANT
 - WO-01 WASHOUT VALVE & No.
 - WM WATER METER
 - PIPELINE GRADIENT WITH SLOPE DIRECTION (SLOPE MIN. OR 1 IN n)
 - FENCE



CHAINAGE (m)	-0+050.00	8+300.00	8+350.00	8+400.00	8+450.00	8+500.00	8+550.00	8+600.00	8+650.00	8+700.00	8+750.00	8+800.00	8+850.00	8+900.00
EXISTING GROUND LEVEL (m)		75.96	75.90	75.85	75.79	75.75	75.71	75.65	75.57	75.55	75.47	75.36	75.25	75.16
INVERT LEVELS (m)		74.78	74.70	74.64	74.59	74.53	74.48	74.43	74.37	74.31	74.24	74.14	74.04	73.91
TYPE AND SIZE OF PIPE	HDPE DN110 PN 12.5													
DESIGN FLOW (m ³ /sec)														
TYPE OF SOIL	BLACK COTTON SOIL													

REVISIONS				SIGN	DATE	APPROVED

THE CHIEF EXECUTIVE OFFICER
NORTHERN WATER WORKS
DEVELOPMENT AGENCY

CONTRACTOR:

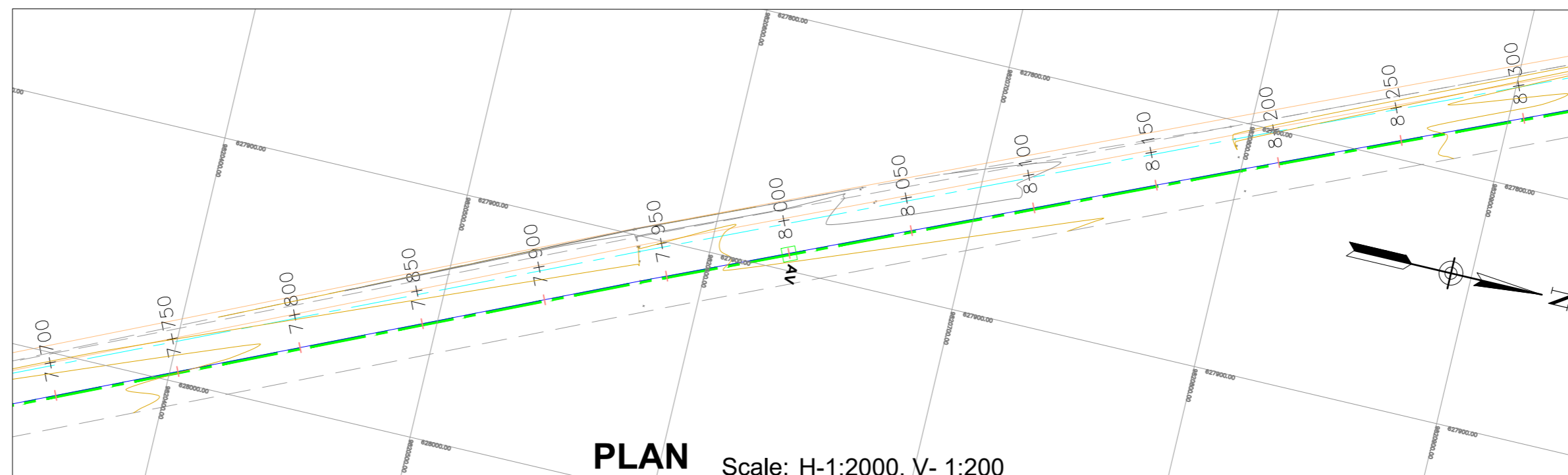
PROJECT NAME:
IJARA WATER SUPPLY PROJECT
MASALANI - GABABA PIPELINE EXTENSION WORKS

DRAWING TITLE:
LINE
PLAN & LONGITUDINAL SECTION
(CH 8+300.00 - 8+900.00)
SHEET 15 OF 29

Designed by:	Drawn by:
Checked by:	Approved by:
Scale: H- 1:1000, V- 1:100	Date: JUNE 2022

DRG No.

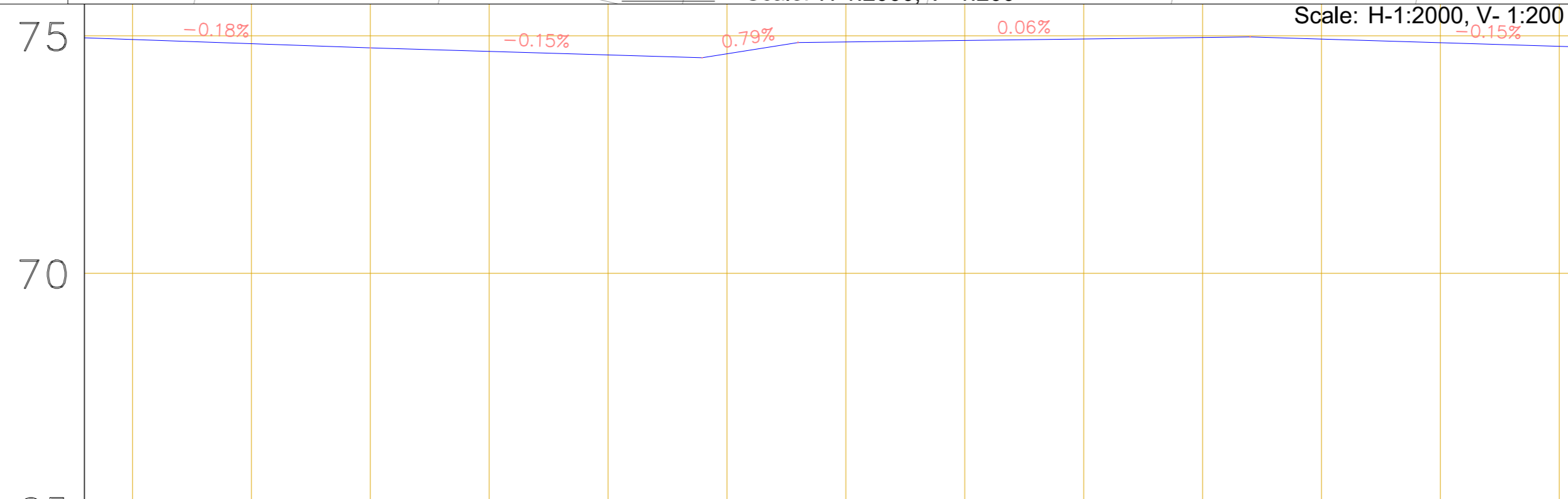
LONGITUDINAL SECTION



PLAN Scale: H-1:2000, V- 1:200

- NOTES:**
1. CONTOUR LEVELS ARE IN METERS AT ONE METER INTERVALS
 2. GRID VALUES ARE IN METERS AT 100 METER INTERVALS
 3. GEOLOGICAL CONDITIONS INDICATED ON DRAWING ARE FOR GENERAL GUIDANCE ONLY
 4. MINIMUM PIPELINE SLOPES TO BE 1:500
 5. DRAWING TO BE READ IN CONJUNCTION WITH STANDARD DRAWINGS
 6. ALL PIPE FITTINGS TO BE CONFIRMED ON SITE DURING SETTING OUT
 7. FIGURED DIMENSION ONLY TO BE TAKEN FROM THIS DRAWING

- LEGEND:**
- ROAD (TARMAC)
 - ROAD / TRACK (EARTH / MURRAM)
 - FENCE / HEDGE
 - CONTOURS, 1m INTERVAL
 - ELECTRIC POST
 - CULVERT
 - GATE
 - BUILDINGS
 - PROPOSED WATER MAIN
 - EXISTING WATER MAIN
 - TP10 TRAVERSE POINT & No.
 - TREES
 - TRIAL HOLE
 - HORIZONTAL BEND (H) OR VERTICAL BEND (V) WITH ANGLE INDICATED
 - GV GATE VALVE
 - FH FIRE HYDRANT
 - WO-01 WASHOUT VALVE & No.
 - WM WATER METER
 - PIPELINE GRADIENT WITH SLOPE DIRECTION (SLOPE MIN. OR 1 IN n)
 - FENCE



Scale: H-1:2000, V- 1:200

CHAINAGE (m)	-0+050.00	7+700.00	7+750.00	7+800.00	7+850.00	7+900.00	7+950.00	8+000.00	8+050.00	8+100.00	8+150.00	8+200.00	8+250.00	8+300.00
EXISTING GROUND LEVEL (m)		76.07	76.01	75.95	75.88	75.81	75.82	76.10	76.17	76.25	76.22	76.08	76.02	75.96
INVERT LEVELS (m)		74.92	74.83	74.75	74.67	74.60	74.62	74.87	74.90	74.93	74.96	74.93	74.85	74.78
TYPE AND SIZE OF PIPE	HDPE DN110 PN 12.5													
DESIGN FLOW (m ³ /sec)														
TYPE OF SOIL	BLACK COTTON SOIL													

REVISIONS				SIGN	DATE	APPROVED
	BY	CHECKED				
	BY	CHECKED				
	BY	CHECKED				
	BY	CHECKED				

**THE CHIEF EXECUTIVE OFFICER
NORTHERN WATER WORKS
DEVELOPMENT AGENCY**

CONTRACTOR:

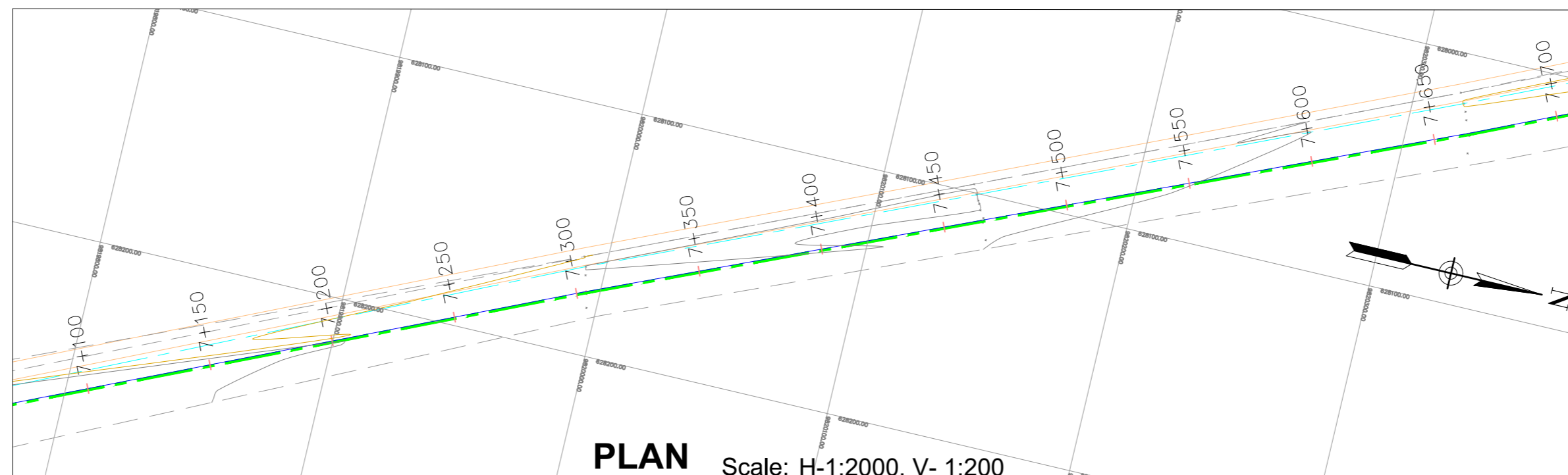
PROJECT NAME:
**IJARA WATER SUPPLY
PROJECT
MASALANI - GABABA PIPELINE
EXTENSION WORKS**

DRAWING TITLE:
**LINE
PLAN & LONGITUDINAL SECTION
(CH 7+700.00 - 8+300.00)
SHEET 14 OF 29**

Designed by: _____ Drawn by: _____
 Checked by: _____ Approved by: _____
 Scale: **H- 1:1000, V- 1:100** Date: **JUNE 2022**

DRG No. _____

LONGITUDINAL SECTION



PLAN Scale: H-1:2000, V- 1:200

- NOTES:**
1. CONTOUR LEVELS ARE IN METERS AT ONE METER INTERVALS
 2. GRID VALUES ARE IN METERS AT 100 METER INTERVALS
 3. GEOLOGICAL CONDITIONS INDICATED ON DRAWING ARE FOR GENERAL GUIDANCE ONLY
 4. MINIMUM PIPELINE SLOPES TO BE 1:500
 5. DRAWING TO BE READ IN CONJUNCTION WITH STANDARD DRAWINGS
 6. ALL PIPE FITTINGS TO BE CONFIRMED ON SITE DURING SETTING OUT
 7. FIGURED DIMENSION ONLY TO BE TAKEN FROM THIS DRAWING

- LEGEND:**
- ROAD (TARMAC)
 - ROAD / TRACK (EARTH / MURRAM)
 - FENCE / HEDGE
 - CONTOURS, 1m INTERVAL
 - ELECTRIC POST
 - CULVERT
 - GATE
 - BUILDINGS
 - PROPOSED WATER MAIN
 - EXISTING WATER MAIN
 - TP10 TRAVERSE POINT & No.
 - TREES
 - TRIAL HOLE
 - HORIZONTAL BEND (H) OR VERTICAL BEND (V) WITH ANGLE INDICATED
 - GV GATE VALVE
 - FH FIRE HYDRANT
 - WO-01 WASHOUT VALVE & No.
 - WM WATER METER
 - PIPELINE GRADIENT WITH SLOPE DIRECTION (SLOPE MIN. OR 1 IN n)
 - FENCE



Scale: H-1:2000, V- 1:200

CHAINAGE (m)	-0+050.00	7+100.00	7+150.00	7+200.00	7+250.00	7+300.00	7+350.00	7+400.00	7+450.00	7+500.00	7+550.00	7+600.00	7+650.00	7+700.00
EXISTING GROUND LEVEL (m)		76.26	76.31	76.61	76.68	76.65	76.49	76.40	76.42	76.50	76.41	76.31	76.21	76.07
INVERT LEVELS (m)		75.19	75.18	75.39	75.47	75.41	75.35	75.28	75.22	75.17	75.11	75.05	75.00	74.92
TYPE AND SIZE OF PIPE	HDPE DN110 PN 12.5													
DESIGN FLOW (m ³ /sec)														
TYPE OF SOIL	BLACK COTTON SOIL													

REVISIONS				SIGN	DATE	APPROVED
	BY	CHECKED				
	BY	CHECKED				
	BY	CHECKED				
	BY	CHECKED				

THE CHIEF EXECUTIVE OFFICER
NORTHERN WATER WORKS
DEVELOPMENT AGENCY

CONTRACTOR:

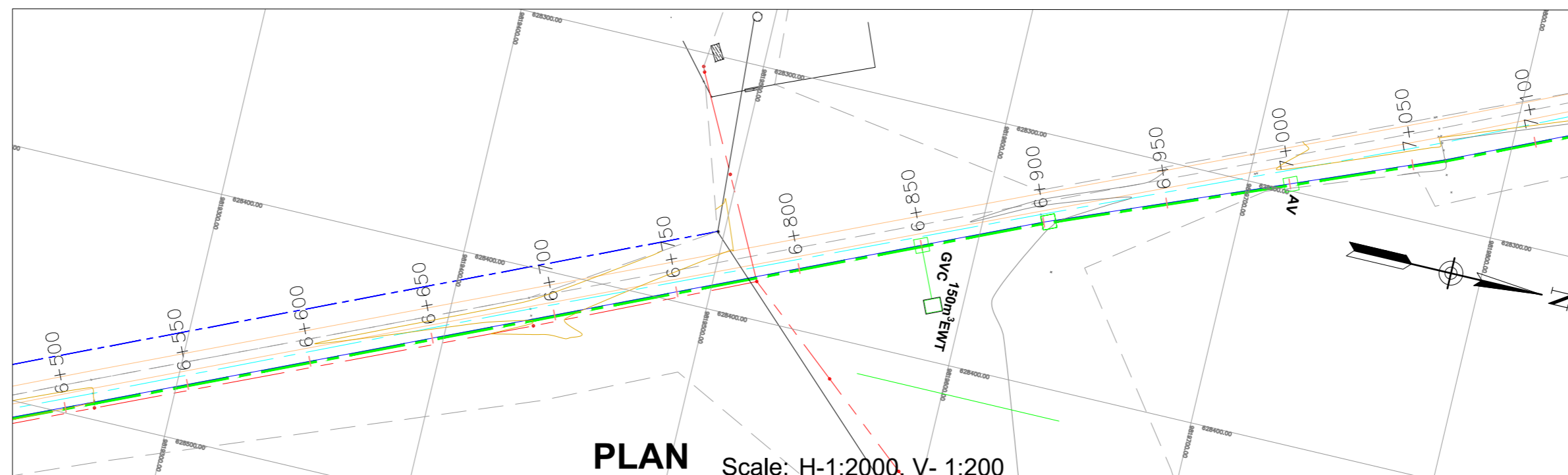
PROJECT NAME:
IJARA WATER SUPPLY PROJECT
MASALANI - GABABA PIPELINE EXTENSION WORKS

DRAWING TITLE:
LINE
PLAN & LONGITUDINAL SECTION
(CH 7+100.00 - 7+700.00)
SHEET 13 OF 29

Designed by:	Drawn by:
Checked by:	Approved by:
Scale: H- 1:1000, V- 1:100	Date: JUNE 2022

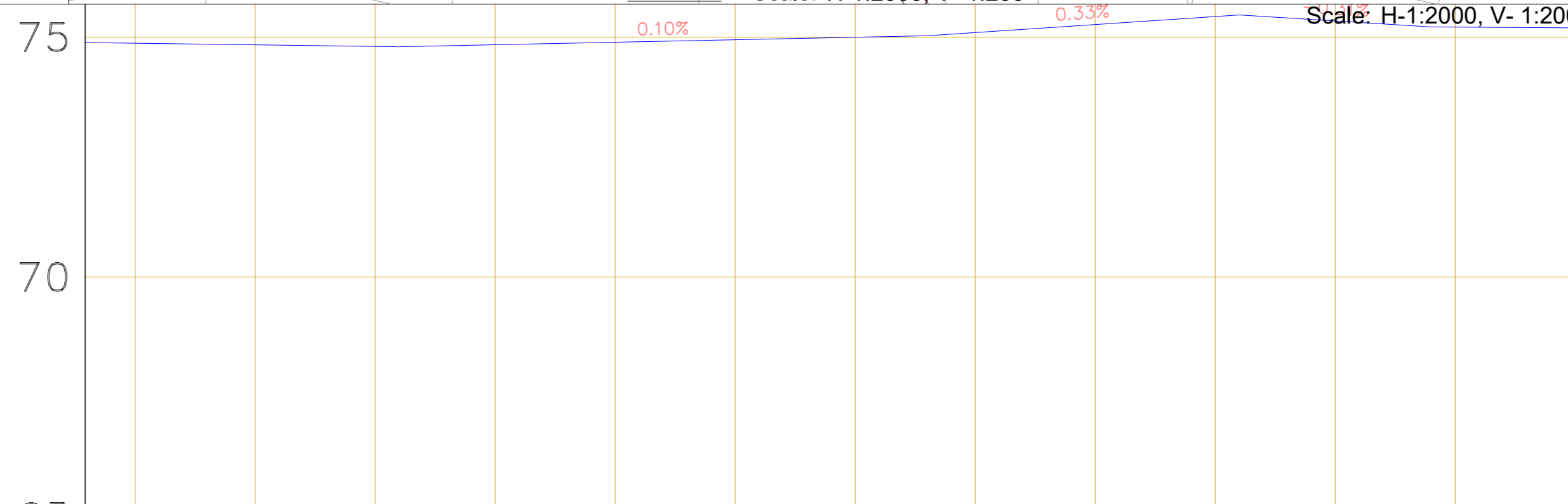
DRG No.

LONGITUDINAL SECTION



PLAN Scale: H-1:2000, V- 1:200

- NOTES:**
- CONTOUR LEVELS ARE IN METERS AT ONE METER INTERVALS
 - GRID VALUES ARE IN METERS AT 100 METER INTERVALS
 - GEOLOGICAL CONDITIONS INDICATED ON DRAWING ARE FOR GENERAL GUIDANCE ONLY
 - MINIMUM PIPELINE SLOPES TO BE 1:500
 - DRAWING TO BE READ IN CONJUNCTION WITH STANDARD DRAWINGS
 - ALL PIPE FITTINGS TO BE CONFIRMED ON SITE DURING SETTING OUT
 - FIGURED DIMENSION ONLY TO BE TAKEN FROM THIS DRAWING
- LEGEND:**
- ROAD (TARMAC)
 - ROAD / TRACK (EARTH / MURRAM)
 - FENCE / HEDGE
 - 75 CONTOURS, 1m INTERVAL
 - ELECTRIC POST
 - CULVERT
 - GATE
 - BUILDINGS
 - PROPOSED WATER MAIN
 - EXISTING WATER MAIN
 - TP10 TRAVERSE POINT & No.
 - TREES
 - TRIAL HOLE
 - HORIZONTAL BEND (H) OR VERTICAL BEND (V) WITH ANGLE INDICATED
 - GV GATE VALVE
 - FH FIRE HYDRANT
 - WO-01 WASHOUT VALVE & No.
 - WM WATER METER
 - PIPELINE GRADIENT WITH SLOPE DIRECTION (SLOPE MIN. OR 1 IN n)
 - FENCE



Scale: H-1:2000, V- 1:200

CHAINAGE (m)	-0+050.00	6+500.00	6+550.00	6+600.00	6+650.00	6+700.00	6+750.00	6+800.00	6+850.00	6+900.00	6+950.00	7+000.00	7+050.00	7+100.00	
EXISTING GROUND LEVEL (m)		75.98	76.13	76.09	76.05	75.98	76.04	76.10	76.16	76.32	76.63	76.69	76.55	76.26	
INVERT LEVELS (m)		74.87	74.84	74.81	74.84	74.89	74.94	75.00	75.09	75.26	75.43	75.34	75.21	75.19	
TYPE AND SIZE OF PIPE		HDPE DN160 PN 12.5										HDPE DN110 PN 12.5			
DESIGN FLOW (m ³ /sec)															
TYPE OF SOIL		BLACK COTTON SOIL													

REVISIONS				SIGN	DATE	APPROVED
BY	CHECKED					
BY	CHECKED					
BY	CHECKED					
BY	CHECKED					

THE CHIEF EXECUTIVE OFFICER
NORTHERN WATER WORKS
DEVELOPMENT AGENCY

CONTRACTOR:

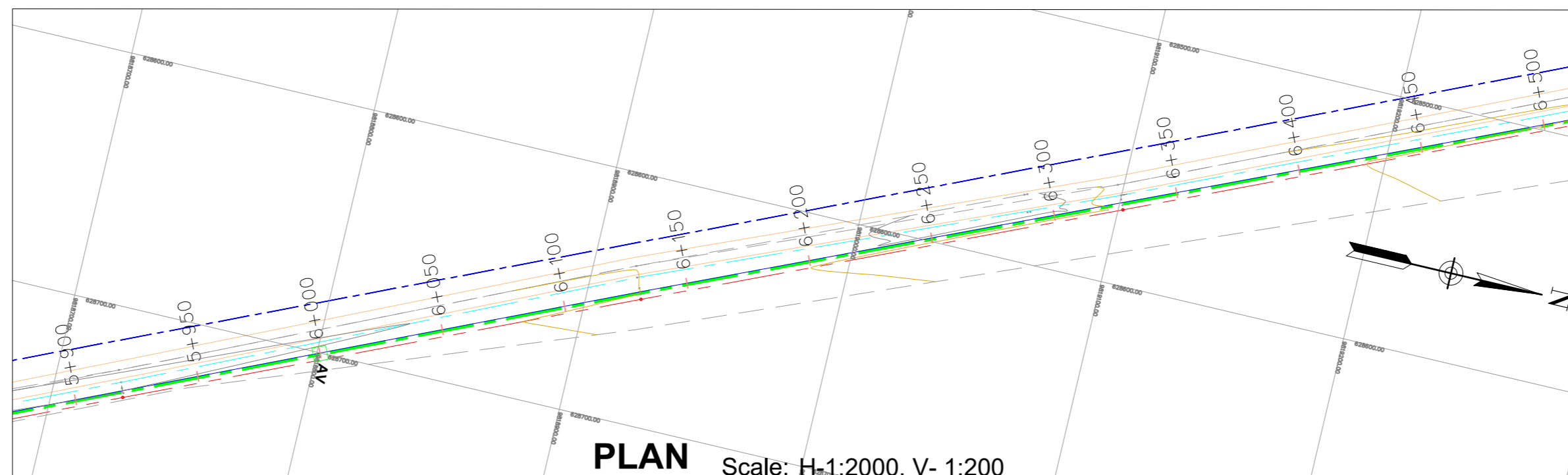
PROJECT NAME:
IJARA WATER SUPPLY PROJECT
MASALANI - GABABA PIPELINE
EXTENSION WORKS

DRAWING TITLE:
LINE
PLAN & LONGITUDINAL SECTION
(CH 6+500.00 - 7+100.00)
SHEET 12 OF 29

Designed by:	Drawn by:
Checked by:	Approved by:
Scale: H- 1:1000, V- 1:100	Date: JUNE 2022

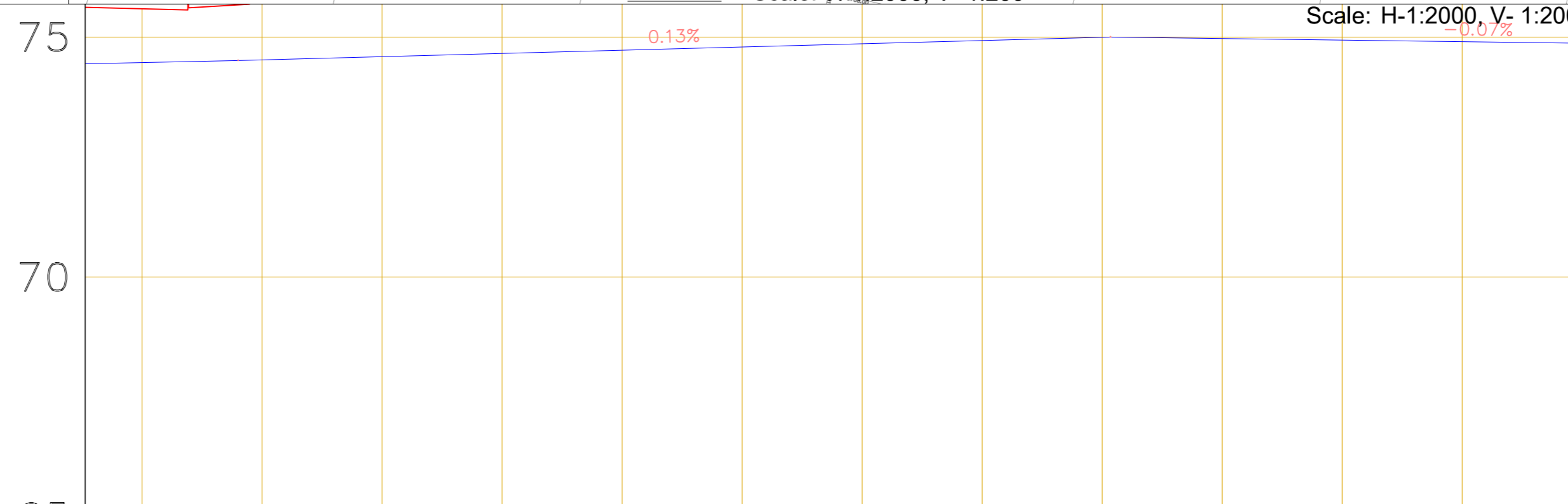
DRG No.

LONGITUDINAL SECTION



- NOTES:**
1. CONTOUR LEVELS ARE IN METERS AT ONE METER INTERVALS
 2. GRID VALUES ARE IN METERS AT 100 METER INTERVALS
 3. GEOLOGICAL CONDITIONS INDICATED ON DRAWING ARE FOR GENERAL GUIDANCE ONLY
 4. MINIMUM PIPELINE SLOPES TO BE 1:500
 5. DRAWING TO BE READ IN CONJUNCTION WITH STANDARD DRAWINGS
 6. ALL PIPE FITTINGS TO BE CONFIRMED ON SITE DURING SETTING OUT
 7. FIGURED DIMENSION ONLY TO BE TAKEN FROM THIS DRAWING

- LEGEND:**
- ROAD (TARMAC)
 - ROAD / TRACK (EARTH / MURRAM)
 - FENCE / HEDGE
 - CONTOURS, 1m INTERVAL
 - ELECTRIC POST
 - CULVERT
 - GATE
 - BUILDINGS
 - PROPOSED WATER MAIN
 - EXISTING WATER MAIN
 - TP10 TRAVERSE POINT & No.
 - TREES
 - TRIAL HOLE
 - HORIZONTAL BEND (H) OR VERTICAL BEND (V) WITH ANGLE INDICATED
 - GV GATE VALVE
 - FH FIRE HYDRANT
 - WO-01 WASHOUT VALVE & No.
 - WM WATER METER
 - PIPELINE GRADIENT WITH SLOPE DIRECTION (SLOPE MIN. OR 1 IN n)
 - FENCE



CHAINAGE (m)	-0+050.00	5+900.00	5+950.00	6+000.00	6+050.00	6+100.00	6+150.00	6+200.00	6+250.00	6+300.00	6+350.00	6+400.00	6+450.00	6+500.00
EXISTING GROUND LEVEL (m)		75.59	75.70	75.78	75.86	75.94	76.10	76.30	76.29	76.23	75.79	75.85	75.92	75.98
INVERT LEVELS (m)		74.47	74.52	74.59	74.66	74.73	74.79	74.86	74.93	75.00	74.97	74.94	74.90	74.87
TYPE AND SIZE OF PIPE	HDPE DN160 PN 12.5													
DESIGN FLOW (m ³ /sec)														
TYPE OF SOIL	BLACK COTTON SOIL													

REVISIONS				SIGN	DATE	APPROVED
	BY	CHECKED				
	BY	CHECKED				
	BY	CHECKED				
	BY	CHECKED				

THE CHIEF EXECUTIVE OFFICER
NORTHERN WATER WORKS
DEVELOPMENT AGENCY

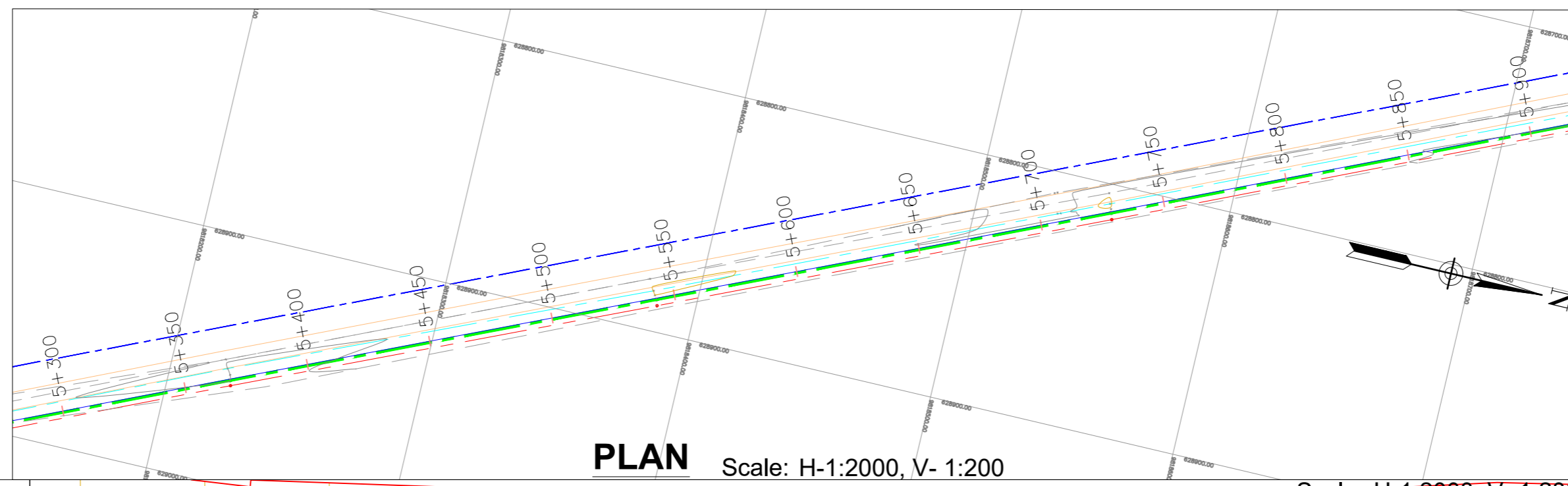
CONTRACTOR:

PROJECT NAME:
IJARA WATER SUPPLY PROJECT
MASALANI - GABABA PIPELINE
EXTENSION WORKS

DRAWING TITLE:
LINE
PLAN & LONGITUDINAL SECTION
(CH 5+900.00 - 6+500.00)
SHEET 11 OF 29

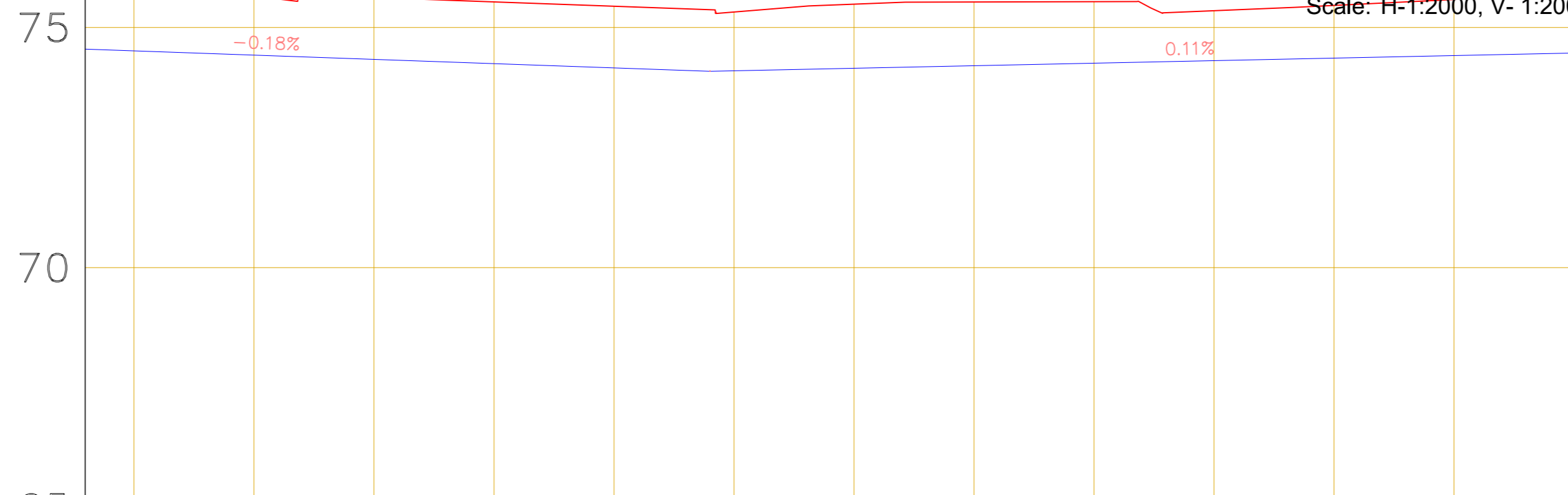
Designed by:	Drawn by:
Checked by:	Approved by:
Scale: H- 1:1000, V- 1:100	Date: JUNE 2022

LONGITUDINAL SECTION



- NOTES:**
1. CONTOUR LEVELS ARE IN METERS AT ONE METER INTERVALS
 2. GRID VALUES ARE IN METERS AT 100 METER INTERVALS
 3. GEOLOGICAL CONDITIONS INDICATED ON DRAWING ARE FOR GENERAL GUIDANCE ONLY
 4. MINIMUM PIPELINE SLOPES TO BE 1:500
 5. DRAWING TO BE READ IN CONJUNCTION WITH STANDARD DRAWINGS
 6. ALL PIPE FITTINGS TO BE CONFIRMED ON SITE DURING SETTING OUT
 7. FIGURED DIMENSION ONLY TO BE TAKEN FROM THIS DRAWING

- LEGEND:**
- ROAD (TARMAC)
 - ROAD / TRACK (EARTH / MURRAM)
 - FENCE / HEDGE
 - CONTOURS, 1m INTERVAL
 - ELECTRIC POST
 - CULVERT
 - GATE
 - BUILDINGS
 - PROPOSED WATER MAIN
 - EXISTING WATER MAIN
 - TP10 TRAVERSE POINT & No.
 - TREES
 - TRIAL HOLE
 - HORIZONTAL BEND (H) OR VERTICAL BEND (V) WITH ANGLE INDICATED
 - GV GATE VALVE
 - FH FIRE HYDRANT
 - WO-01 WASHOUT VALVE & No.
 - WM WATER METER
 - PIPELINE GRADIENT WITH SLOPE DIRECTION (SLOPE MIN. OR 1 IN n)
 - FENCE



CHAINAGE (m)	-0+050.00	5+300.00	5+350.00	5+400.00	5+450.00	5+500.00	5+550.00	5+600.00	5+650.00	5+700.00	5+750.00	5+800.00	5+850.00	5+900.00
EXISTING GROUND LEVEL (m)		75.84	75.65	75.62	75.53	75.44	75.32	75.49	75.53	75.54	75.35	75.46	75.58	75.59
INVERT LEVELS (m)		74.51	74.42	74.34	74.25	74.16	74.10	74.15	74.20	74.26	74.31	74.36	74.42	74.47
TYPE AND SIZE OF PIPE	HDPE DN160 PN 12.5													
DESIGN FLOW (m ³ /sec)														
TYPE OF SOIL	BLACK COTTON SOIL													

REVISIONS				SIGN	DATE	APPROVED
	BY	CHECKED				
	BY	CHECKED				
	BY	CHECKED				
	BY	CHECKED				

**THE CHIEF EXECUTIVE OFFICER
NORTHERN WATER WORKS
DEVELOPMENT AGENCY**

CONTRACTOR:

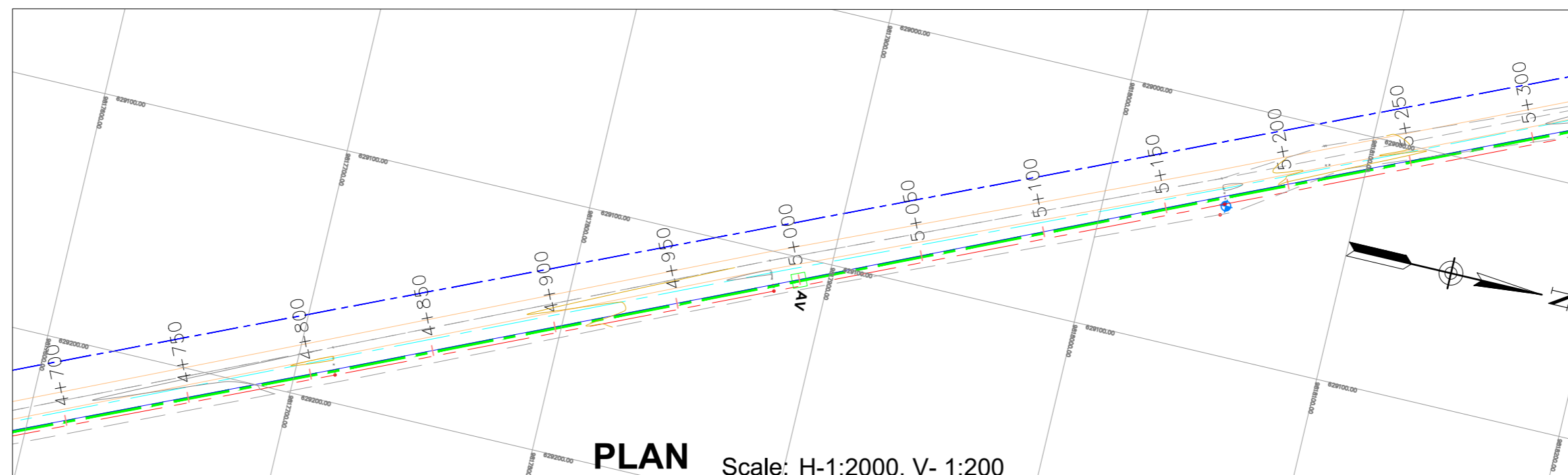
PROJECT NAME:
**IJARA WATER SUPPLY PROJECT
MASALANI - GABABA PIPELINE
EXTENSION WORKS**

DRAWING TITLE:
**LINE
PLAN & LONGITUDINAL SECTION
(CH 5+300.00 - 5+900.00)
SHEET 10 OF 29**

Designed by:	Drawn by:
Checked by:	Approved by:
Scale: H- 1:1000, V- 1:100	Date: JUNE 2022

DRG No.

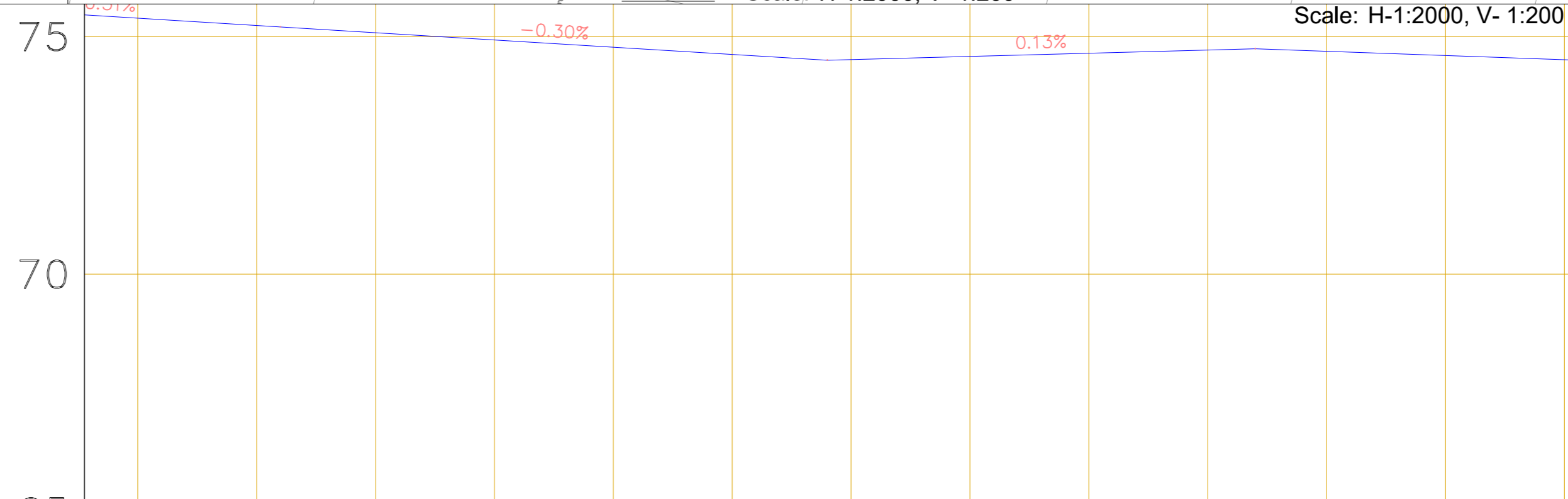
LONGITUDINAL SECTION



PLAN Scale: H-1:2000, V- 1:200

- NOTES:**
1. CONTOUR LEVELS ARE IN METERS AT ONE METER INTERVALS
 2. GRID VALUES ARE IN METERS AT 100 METER INTERVALS
 3. GEOLOGICAL CONDITIONS INDICATED ON DRAWING ARE FOR GENERAL GUIDANCE ONLY
 4. MINIMUM PIPELINE SLOPES TO BE 1:500
 5. DRAWING TO BE READ IN CONJUNCTION WITH STANDARD DRAWINGS
 6. ALL PIPE FITTINGS TO BE CONFIRMED ON SITE DURING SETTING OUT
 7. FIGURED DIMENSION ONLY TO BE TAKEN FROM THIS DRAWING

- LEGEND:**
- ROAD (TARMAC)
 - ROAD / TRACK (EARTH / MURRAM)
 - FENCE / HEDGE
 - CONTOURS, 1m INTERVAL
 - ELECTRIC POST
 - CULVERT
 - GATE
 - BUILDINGS
 - PROPOSED WATER MAIN
 - EXISTING WATER MAIN
 - TP10 TRAVERSE POINT & No.
 - TREES
 - TRIAL HOLE
 - HORIZONTAL BEND (H) OR VERTICAL BEND (V) WITH ANGLE INDICATED
 - GV GATE VALVE
 - FH FIRE HYDRANT
 - WO-01 WASHOUT VALVE & No.
 - WM WATER METER
 - PIPELINE GRADIENT WITH SLOPE DIRECTION (SLOPE MIN. OR 1 IN n)
 - FENCE



Scale: H-1:2000, V- 1:200

CHAINAGE (m)	-0+050.00	4+700.00	4+750.00	4+800.00	4+850.00	4+900.00	4+950.00	5+000.00	5+050.00	5+100.00	5+150.00	5+200.00	5+250.00	5+300.00
EXISTING GROUND LEVEL (m)		76.64	76.49	76.32	76.18	76.06	75.93	75.78	75.81	75.84	75.84	75.96	75.90	75.84
INVERT LEVELS (m)		75.39	75.23	75.08	74.93	74.78	74.63	74.52	74.58	74.65	74.72	74.69	74.60	74.51
TYPE AND SIZE OF PIPE	HDPE DN160 PN 12.5													
DESIGN FLOW (m ³ /sec)														
TYPE OF SOIL	BLACK COTTON SOIL													

REVISIONS				SIGN	DATE	APPROVED
	BY	CHECKED				
	BY	CHECKED				
	BY	CHECKED				
	BY	CHECKED				

THE CHIEF EXECUTIVE OFFICER
NORTHERN WATER WORKS
DEVELOPMENT AGENCY

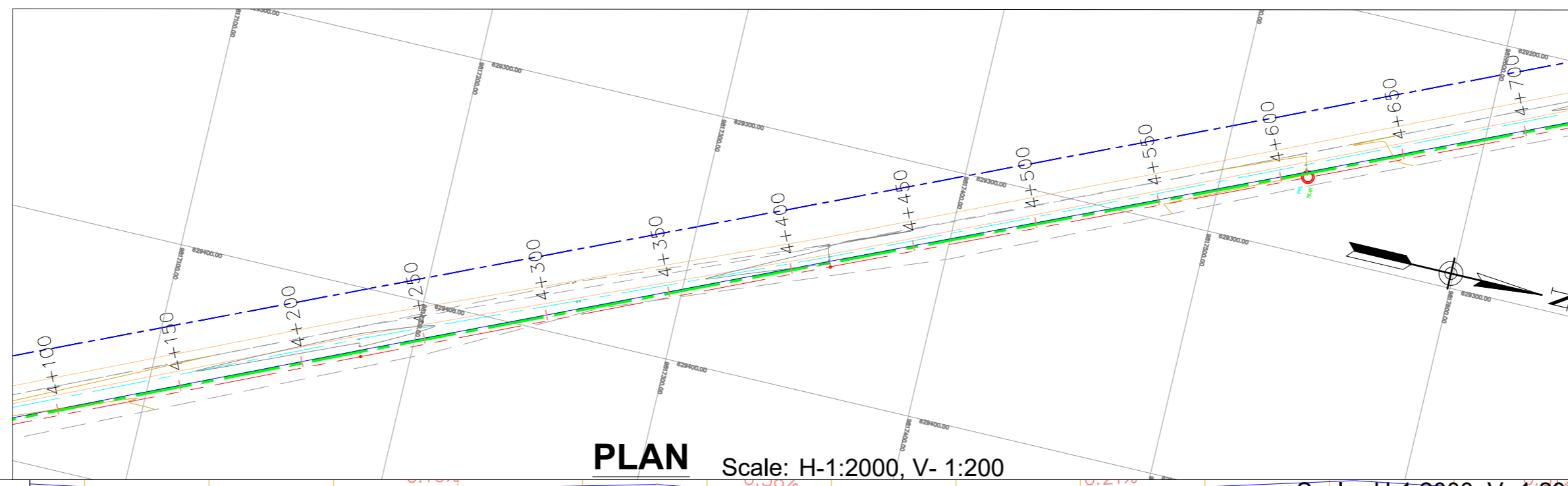
CONTRACTOR:

PROJECT NAME:
IJARA WATER SUPPLY PROJECT
MASALANI - GABABA PIPELINE EXTENSION WORKS

DRAWING TITLE:
LINE
PLAN & LONGITUDINAL SECTION
(CH 4+700.00 - 5+300.00)
SHEET 9 OF 29

Designed by: _____ Drawn by: _____
 Checked by: _____ Approved by: _____
 Scale: H- 1:1000, V- 1:100 Date: **JUNE 2022**
 DRG No. _____

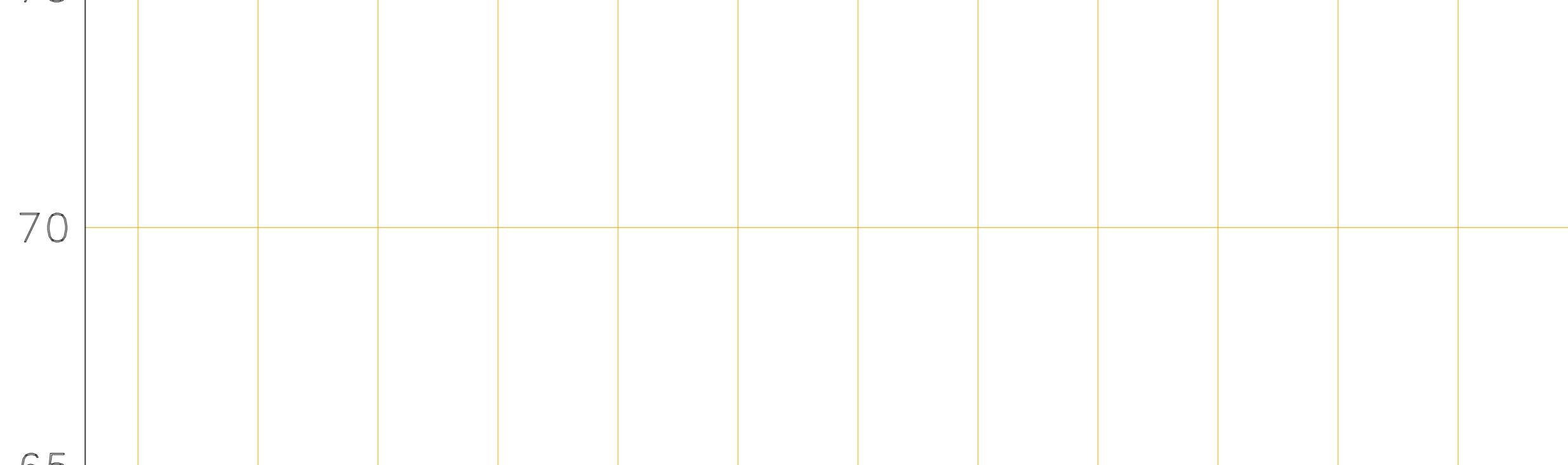
LONGITUDINAL SECTION



- NOTES:**
1. CONTOUR LEVELS ARE IN METERS AT ONE METER INTERVALS
 2. GRID VALUES ARE IN METERS AT 100 METER INTERVALS
 3. GEOLOGICAL CONDITIONS INDICATED ON DRAWING ARE FOR GENERAL GUIDANCE ONLY
 4. MINIMUM PIPELINE SLOPES TO BE 1:500
 5. DRAWING TO BE READ IN CONJUNCTION WITH STANDARD DRAWINGS
 6. ALL PIPE FITTINGS TO BE CONFIRMED ON SITE DURING SETTING OUT
 7. FIGURED DIMENSION ONLY TO BE TAKEN FROM THIS DRAWING

- LEGEND:**
- ROAD (TARMAC)
 - ROAD / TRACK (EARTH / MURRAM)
 - FENCE / HEDGE
 - CONTOURS, 1m INTERVAL
 - ELECTRIC POST
 - CULVERT
 - GATE
 - BUILDINGS
 - PROPOSED WATER MAIN
 - EXISTING WATER MAIN
 - TP10 TRAVERSE POINT & No.
 - TREES
 - TRIAL HOLE
 - HORIZONTAL BEND (H) OR VERTICAL BEND (V) WITH ANGLE INDICATED
 - GV GATE VALVE
 - FH FIRE HYDRANT
 - WO-01 WASHOUT VALVE & No.
 - WM WATER METER
 - PIPELINE GRADIENT WITH SLOPE DIRECTION (SLOPE MIN. OR 1 IN n)
 - FENCE

PLAN Scale: H-1:2000, V- 1:200



CHAINAGE (m)	4+100	4+150	4+200	4+250	4+300	4+350	4+400	4+450	4+500	4+550	4+600	4+650	4+700
EXISTING GROUND LEVEL (m)	76.79	76.62	76.56	76.60	76.63	76.62	76.41	76.55	76.62	76.69	76.71	76.79	76.64
INVERT LEVELS (m)	75.54	75.42	75.46	75.51	75.56	75.51	75.32	75.34	75.44	75.54	75.65	75.54	75.39
TYPE AND SIZE OF PIPE	HDPE DN160 PN 12.5												
DESIGN FLOW (m ³ /sec)													
TYPE OF SOIL	BLACK COTTON SOIL												

REVISIONS				SIGN	DATE	APPROVED
BY	CHECKED					
BY	CHECKED					
BY	CHECKED					
BY	CHECKED					

**THE CHIEF EXECUTIVE OFFICER
NORTHERN WATER WORKS
DEVELOPMENT AGENCY**

CONTRACTOR:

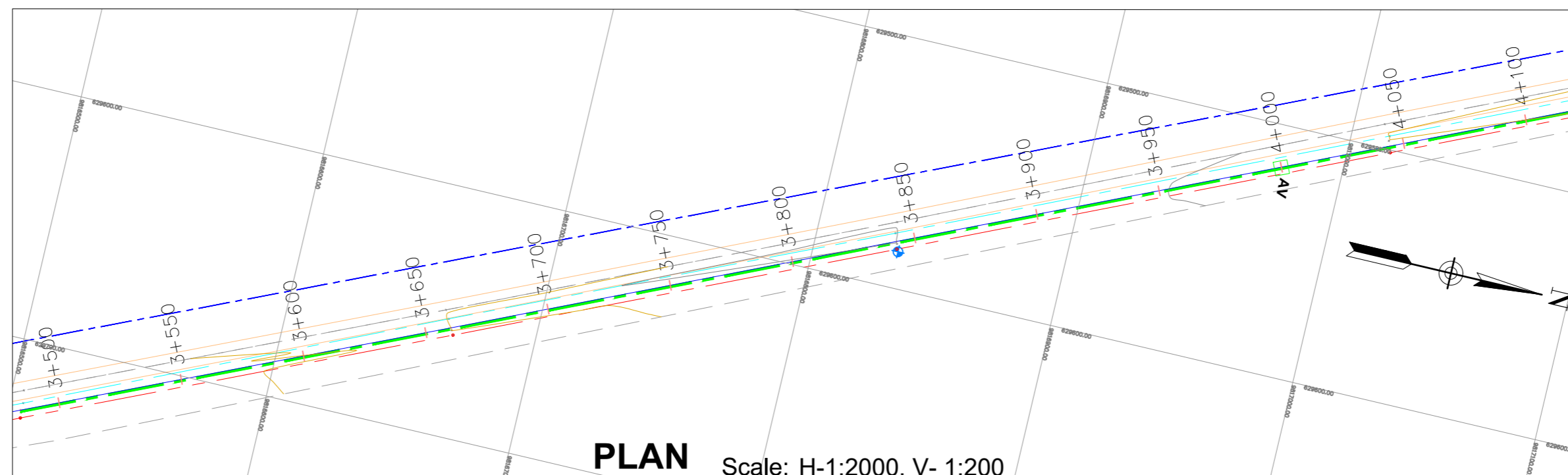
PROJECT NAME:
**IJARA WATER SUPPLY
PROJECT
MASALANI - GABABA PIPELINE
EXTENSION WORKS**

DRAWING TITLE:
**LINE
PLAN & LONGITUDINAL SECTION
(CH 4+100.00 - 4+700.00)
SHEET 8 OF 29**

Designed by: _____ Drawn by: _____
Checked by: _____ Approved by: _____
Scale: H- 1:1000, V- 1:100 Date: JUNE 2022

DRG No.

LONGITUDINAL SECTION

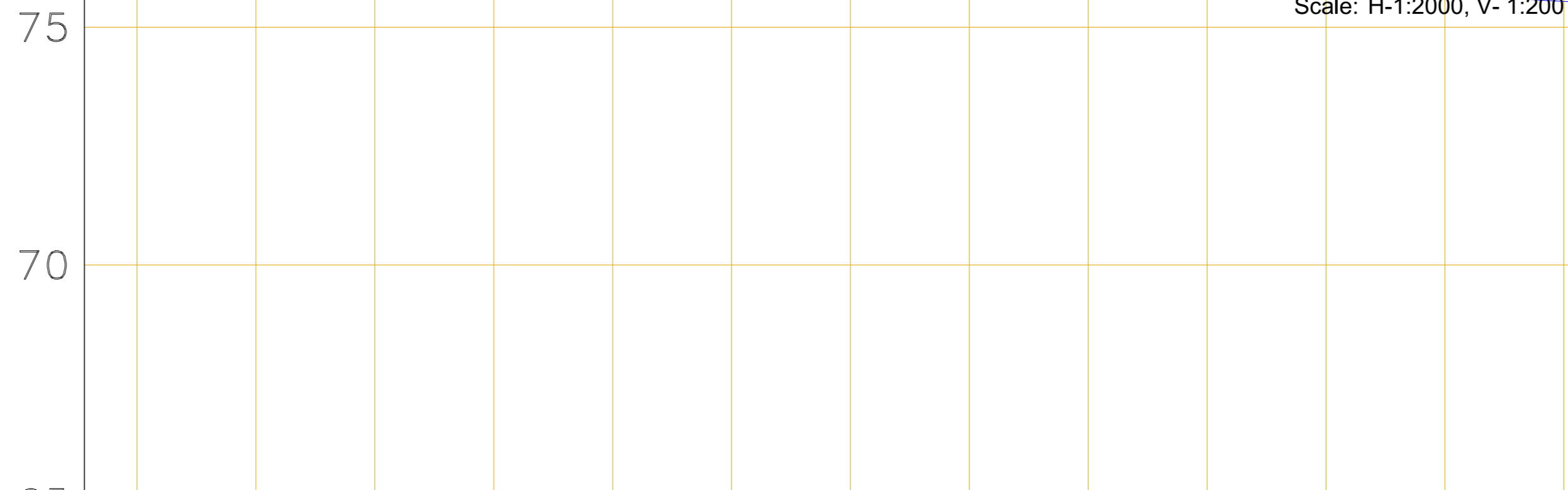


PLAN Scale: H-1:2000, V- 1:200

Scale: H-1:2000, V- 1:200

- NOTES:**
1. CONTOUR LEVELS ARE IN METERS AT ONE METER INTERVALS
 2. GRID VALUES ARE IN METERS AT 100 METER INTERVALS
 3. GEOLOGICAL CONDITIONS INDICATED ON DRAWING ARE FOR GENERAL GUIDANCE ONLY
 4. MINIMUM PIPELINE SLOPES TO BE 1:500
 5. DRAWING TO BE READ IN CONJUNCTION WITH STANDARD DRAWINGS
 6. ALL PIPE FITTINGS TO BE CONFIRMED ON SITE DURING SETTING OUT
 7. FIGURED DIMENSION ONLY TO BE TAKEN FROM THIS DRAWING

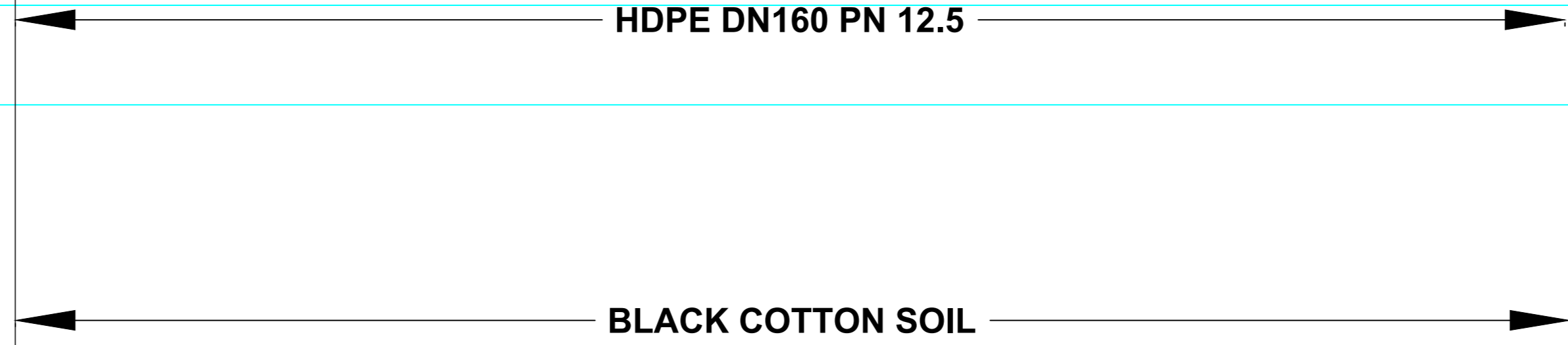
- LEGEND:**
- ROAD (TARMAC)
 - ROAD / TRACK (EARTH / MURRAM)
 - FENCE / HEDGE
 - 75 CONTOURS, 1m INTERVAL
 - ELECTRIC POST
 - CULVERT
 - GATE
 - BUILDINGS
 - PROPOSED WATER MAIN
 - EXISTING WATER MAIN
 - TP10 TRAVERSE POINT & No.
 - TREES
 - TRIAL HOLE
 - HORIZONTAL BEND (H) OR VERTICAL BEND (V) WITH ANGLE INDICATED
 - GV GATE VALVE
 - FH FIRE HYDRANT
 - WO-01 WASHOUT VALVE & No.
 - WM WATER METER
 - PIPELINE GRADIENT WITH SLOPE DIRECTION (SLOPE MIN. OR 1 IN n)
 - FENCE



CHAINAGE (m)	-0+050.00	3+500.00	3+550.00	3+600.00	3+650.00	3+700.00	3+750.00	3+800.00	3+850.00	3+900.00	3+950.00	4+000.00	4+050.00	4+100.00
EXISTING GROUND LEVEL (m)		77.37	77.44	77.60	77.66	77.46	77.36	77.26	77.40	77.31	77.21	77.11	76.96	76.79
INVERT LEVELS (m)		76.24	76.32	76.39	76.42	76.29	76.17	76.05	75.97	75.96	75.93	75.80	75.67	75.54

TYPE AND SIZE OF PIPE

DESIGN FLOW (m/sec)



LONGITUDINAL SECTION

REVISIONS				SIGN	DATE	APPROVED
BY	CHECKED					
BY	CHECKED					
BY	CHECKED					
BY	CHECKED					

THE CHIEF EXECUTIVE OFFICER
NORTHERN WATER WORKS
DEVELOPMENT AGENCY

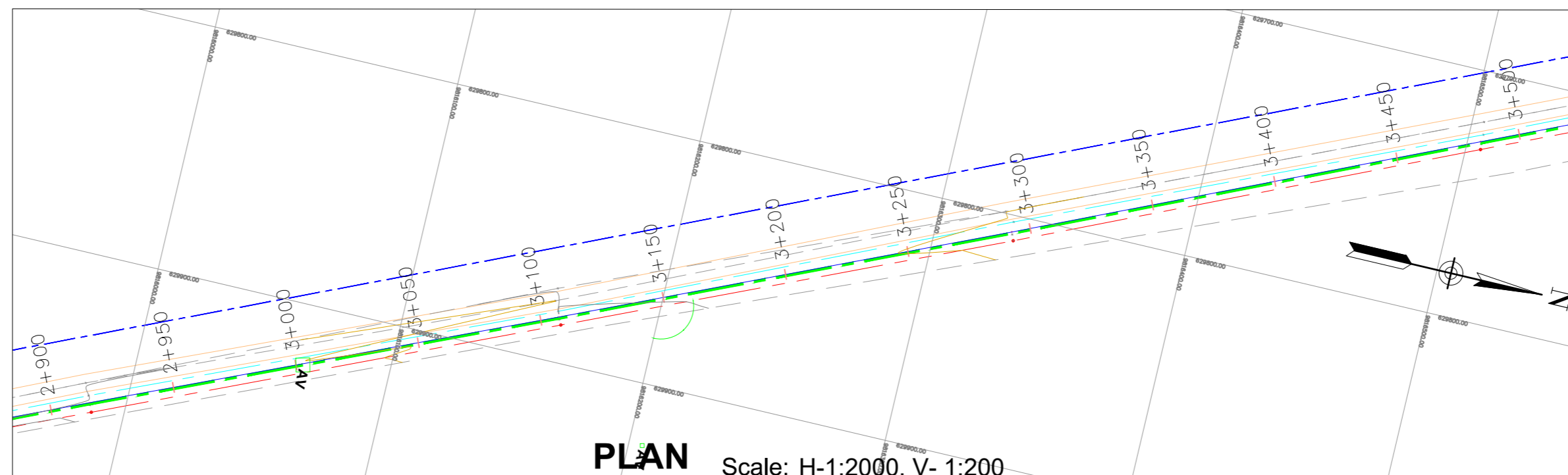
CONTRACTOR:

PROJECT NAME:
IJARA WATER SUPPLY PROJECT
MASALANI - GABABA PIPELINE EXTENSION WORKS

DRAWING TITLE:
LINE
PLAN & LONGITUDINAL SECTION
(CH 3+500.00 - 4+100.00)
SHEET 7 OF 29

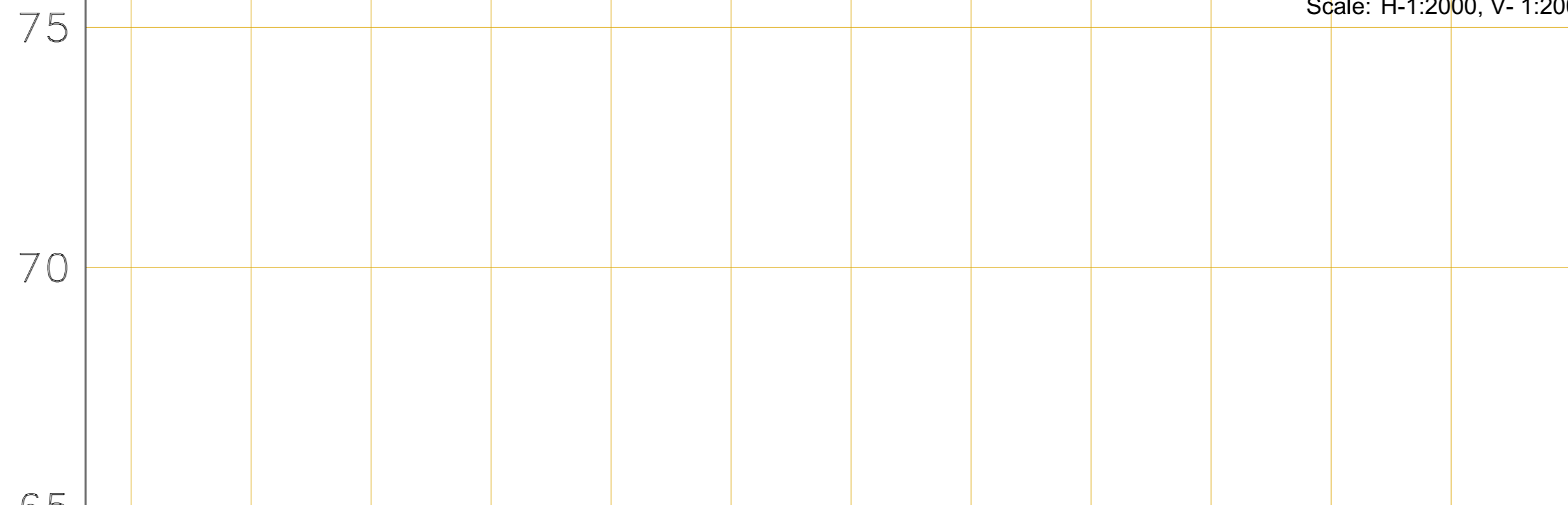
Designed by:	Drawn by:
Checked by:	Approved by:
Scale: H- 1:1000, V- 1:100	Date: JUNE 2022

DRG No.

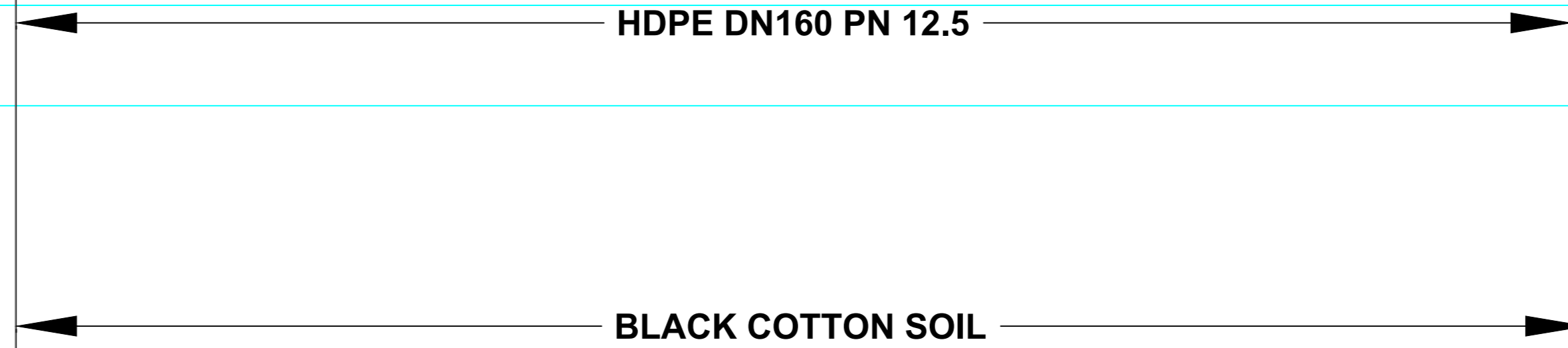


- NOTES:**
1. CONTOUR LEVELS ARE IN METERS AT ONE METER INTERVALS
 2. GRID VALUES ARE IN METERS AT 100 METER INTERVALS
 3. GEOLOGICAL CONDITIONS INDICATED ON DRAWING ARE FOR GENERAL GUIDANCE ONLY
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 7. FIGURED DIMENSION ONLY TO BE TAKEN FROM THIS DRAWING

- LEGEND:**
- ROAD (TARMAC)
 - ROAD / TRACK (EARTH / MURRAM)
 - FENCE / HEDGE
 - CONTOURS, 1m INTERVAL
 - ELECTRIC POST
 - CULVERT
 - GATE
 - BUILDINGS
 - PROPOSED WATER MAIN
 - EXISTING WATER MAIN
 - TP10 TRAVERSE POINT & No.
 - TREES
 - TRIAL HOLE
 - HORIZONTAL BEND (H) OR VERTICAL BEND (V) WITH ANGLE INDICATED
 - GV GATE VALVE
 - FH FIRE HYDRANT
 - WO-01 WASHOUT VALVE & No.
 - WM WATER METER
 - PIPELINE GRADIENT WITH SLOPE DIRECTION (SLOPE MIN. OR 1 IN n)
 - FENCE



CHAINAGE (m)	EXISTING GROUND LEVEL (m)	INVERT LEVELS (m)	TYPE AND SIZE OF PIPE	DESIGN FLOW (m ³ /sec)	TYPE OF SOIL
-0+050.00					
2+900.00	78.80	77.58			
2+950.00	78.62	77.49			
3+000.00	78.47	77.40			
3+050.00	78.33	77.31			
3+100.00	78.26	77.15			
3+150.00	77.95	76.91			
3+200.00	77.77	76.66			
3+250.00	77.59	76.41			
3+300.00	77.41	76.20			
3+350.00	77.40	76.18			
3+400.00	77.39	76.17			
3+450.00	77.52	76.17			
3+500.00	77.37	76.24			



REVISIONS				SIGN	DATE	APPROVED
BY	CHECKED					
BY	CHECKED					
BY	CHECKED					
BY	CHECKED					

**THE CHIEF EXECUTIVE OFFICER
NORTHERN WATER WORKS
DEVELOPMENT AGENCY**

CONTRACTOR:

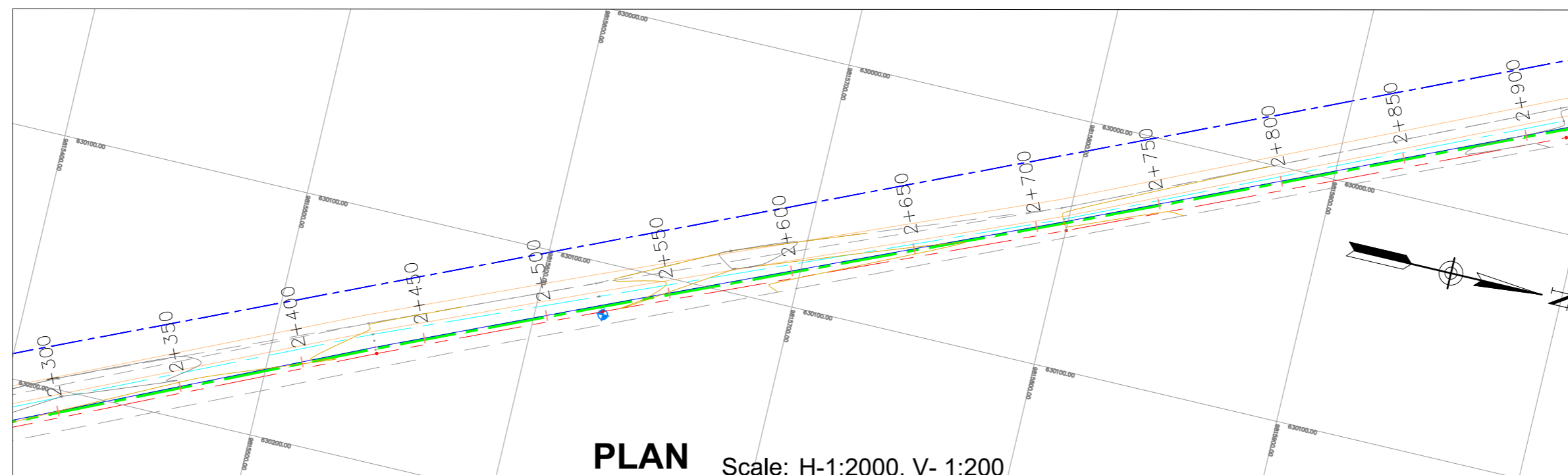
PROJECT NAME:
**IJARA WATER SUPPLY
PROJECT
MASALANI - GABABA PIPELINE
EXTENSION WORKS**

DRAWING TITLE:
**LINE
PLAN & LONGITUDINAL SECTION
(CH 2+900.00 - 3+500.00)
SHEET 6 OF 29**

Designed by: _____ Drawn by: _____
Checked by: _____ Approved by: _____
Scale: H- 1:1000, V- 1:100 Date: JUNE 2022

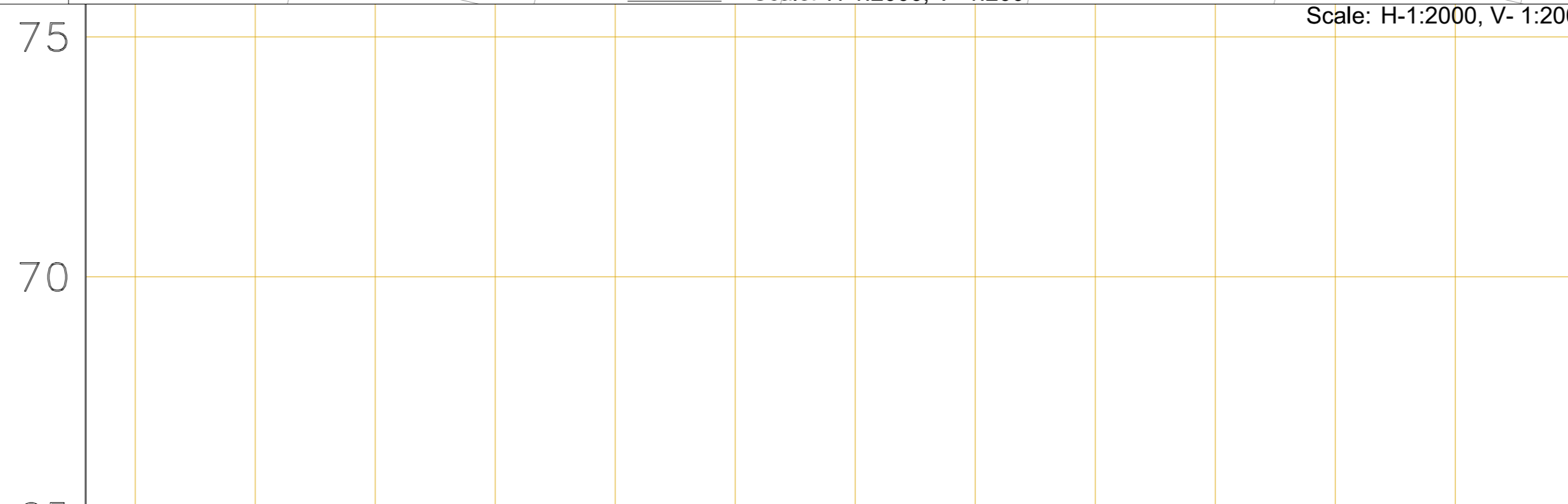
DRG No.

LONGITUDINAL SECTION



- NOTES:**
1. CONTOUR LEVELS ARE IN METERS AT ONE METER INTERVALS
 2. GRID VALUES ARE IN METERS AT 100 METER INTERVALS
 3. GEOLOGICAL CONDITIONS INDICATED ON DRAWING ARE FOR GENERAL GUIDANCE ONLY
 4. MINIMUM PIPELINE SLOPES TO BE 1:500
 5. DRAWING TO BE READ IN CONJUNCTION WITH STANDARD DRAWINGS
 6. ALL PIPE FITTINGS TO BE CONFIRMED ON SITE DURING SETTING OUT
 7. FIGURED DIMENSION ONLY TO BE TAKEN FROM THIS DRAWING

- LEGEND:**
- ROAD (TARMAC)
 - ROAD / TRACK (EARTH / MURRAM)
 - FENCE / HEDGE
 - CONTOURS, 1m INTERVAL
 - ELECTRIC POST
 - CULVERT
 - GATE
 - BUILDINGS
 - PROPOSED WATER MAIN
 - EXISTING WATER MAIN
 - TP10 TRAVERSE POINT & No.
 - TREES
 - TRIAL HOLE
 - HORIZONTAL BEND (H) OR VERTICAL BEND (V) WITH ANGLE INDICATED
 - GV GATE VALVE
 - FH FIRE HYDRANT
 - WO-01 WASHOUT VALVE & No.
 - WM WATER METER
 - PIPELINE GRADIENT WITH SLOPE DIRECTION (SLOPE MIN. OR 1 IN n)
 - FENCE



CHAINAGE (m)	-0+050.00	2+300.00	2+350.00	2+400.00	2+450.00	2+500.00	2+550.00	2+600.00	2+650.00	2+700.00	2+750.00	2+800.00	2+850.00	2+900.00
EXISTING GROUND LEVEL (m)		79.20	79.18	79.25	79.05	78.98	79.06	79.10	79.15	79.25	78.91	78.86	78.83	78.80
INVERT LEVELS (m)		77.98	77.95	77.97	77.99	78.02	78.04	78.07	78.09	77.98	77.87	77.77	77.67	77.58
TYPE AND SIZE OF PIPE	HDPE DN160 PN 12.5													
DESIGN FLOW (m ³ /sec)														
TYPE OF SOIL	BLACK COTTON SOIL													

REVISIONS				SIGN	DATE	APPROVED
	BY	CHECKED				
	BY	CHECKED				
	BY	CHECKED				
	BY	CHECKED				

THE CHIEF EXECUTIVE OFFICER
NORTHERN WATER WORKS
DEVELOPMENT AGENCY

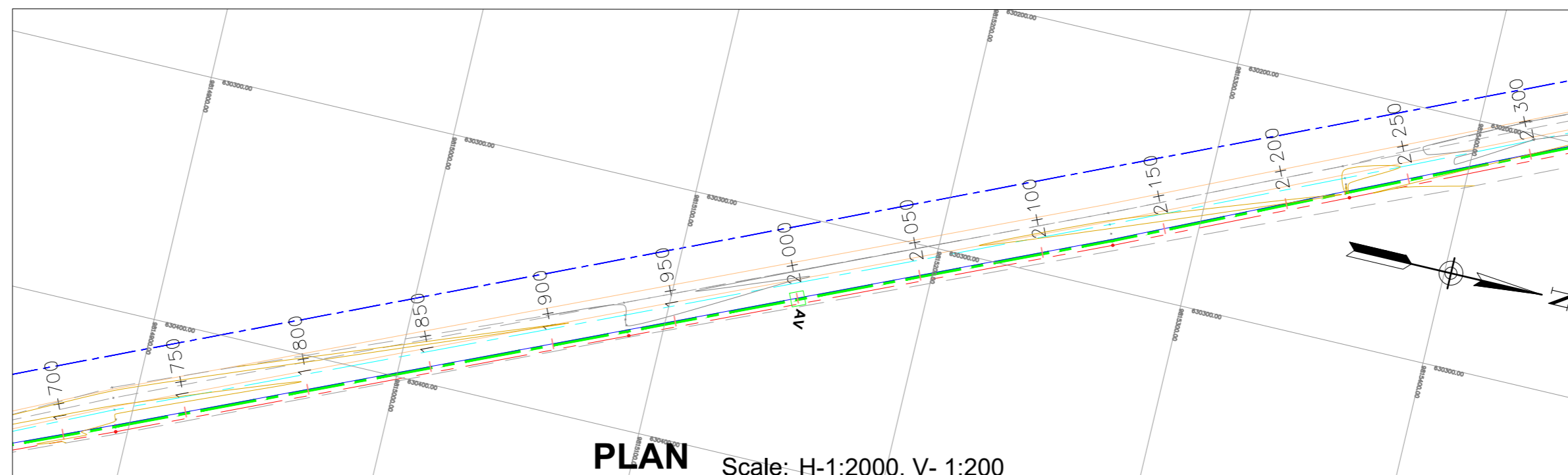
CONTRACTOR:

PROJECT NAME:
IJARA WATER SUPPLY PROJECT
MASALANI - GABABA PIPELINE EXTENSION WORKS

DRAWING TITLE:
LINE
PLAN & LONGITUDINAL SECTION
(CH 2+300.00 - 2+900.00)
SHEET 5 OF 29

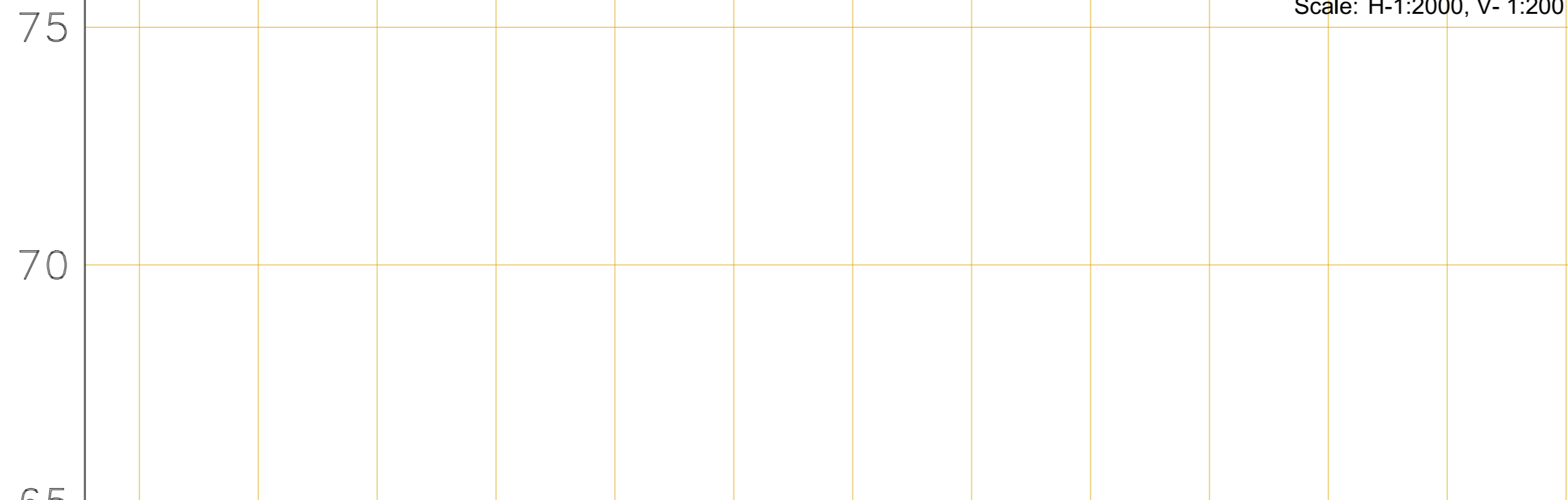
Designed by: Drawn by:
 Checked by: Approved by:
 Scale: H- 1:1000, V- 1:100 Date: **JUNE 2022**
 DRG No.

LONGITUDINAL SECTION



- NOTES:**
1. CONTOUR LEVELS ARE IN METERS AT ONE METER INTERVALS
 2. GRID VALUES ARE IN METERS AT 100 METER INTERVALS
 3. GEOLOGICAL CONDITIONS INDICATED ON DRAWING ARE FOR GENERAL GUIDANCE ONLY
 4. MINIMUM PIPELINE SLOPES TO BE 1:500
 5. DRAWING TO BE READ IN CONJUNCTION WITH STANDARD DRAWINGS
 6. ALL PIPE FITTINGS TO BE CONFIRMED ON SITE DURING SETTING OUT
 7. FIGURED DIMENSION ONLY TO BE TAKEN FROM THIS DRAWING

- LEGEND:**
- ROAD (TARMAC)
 - ROAD / TRACK (EARTH / MURRAM)
 - FENCE / HEDGE
 - 75 CONTOURS, 1m INTERVAL
 - ELECTRIC POST
 - CULVERT
 - GATE
 - BUILDINGS
 - PROPOSED WATER MAIN
 - EXISTING WATER MAIN
 - TP10 TRAVERSE POINT & No.
 - TREES
 - TRIAL HOLE
 - HORIZONTAL BEND (H) OR VERTICAL BEND (V) WITH ANGLE INDICATED
 - GV GATE VALVE
 - FH FIRE HYDRANT
 - WO-01 WASHOUT VALVE & No.
 - WM WATER METER
 - PIPELINE GRADIENT WITH SLOPE DIRECTION (SLOPE MIN. OR 1 IN n)
 - FENCE



CHAINAGE (m)	-0+050.00	1+700.00	1+750.00	1+800.00	1+850.00	1+900.00	1+950.00	2+000.00	2+050.00	2+100.00	2+150.00	2+200.00	2+250.00	2+300.00
EXISTING GROUND LEVEL (m)		79.14	79.39	79.43	79.48	79.45	79.57	79.52	79.48	79.43	79.38	79.24	79.43	79.20
INVERT LEVELS (m)		77.92	78.05	78.18	78.23	78.23	78.23	78.23	78.19	78.15	78.11	78.07	78.03	77.98
TYPE AND SIZE OF PIPE	HDPE DN160 PN 12.5													
DESIGN FLOW (m/sec)														
TYPE OF SOIL	BLACK COTTON SOIL													

REVISIONS				SIGN	DATE	APPROVED
	BY	CHECKED				
	BY	CHECKED				
	BY	CHECKED				
	BY	CHECKED				

THE CHIEF EXECUTIVE OFFICER
NORTHERN WATER WORKS
DEVELOPMENT AGENCY

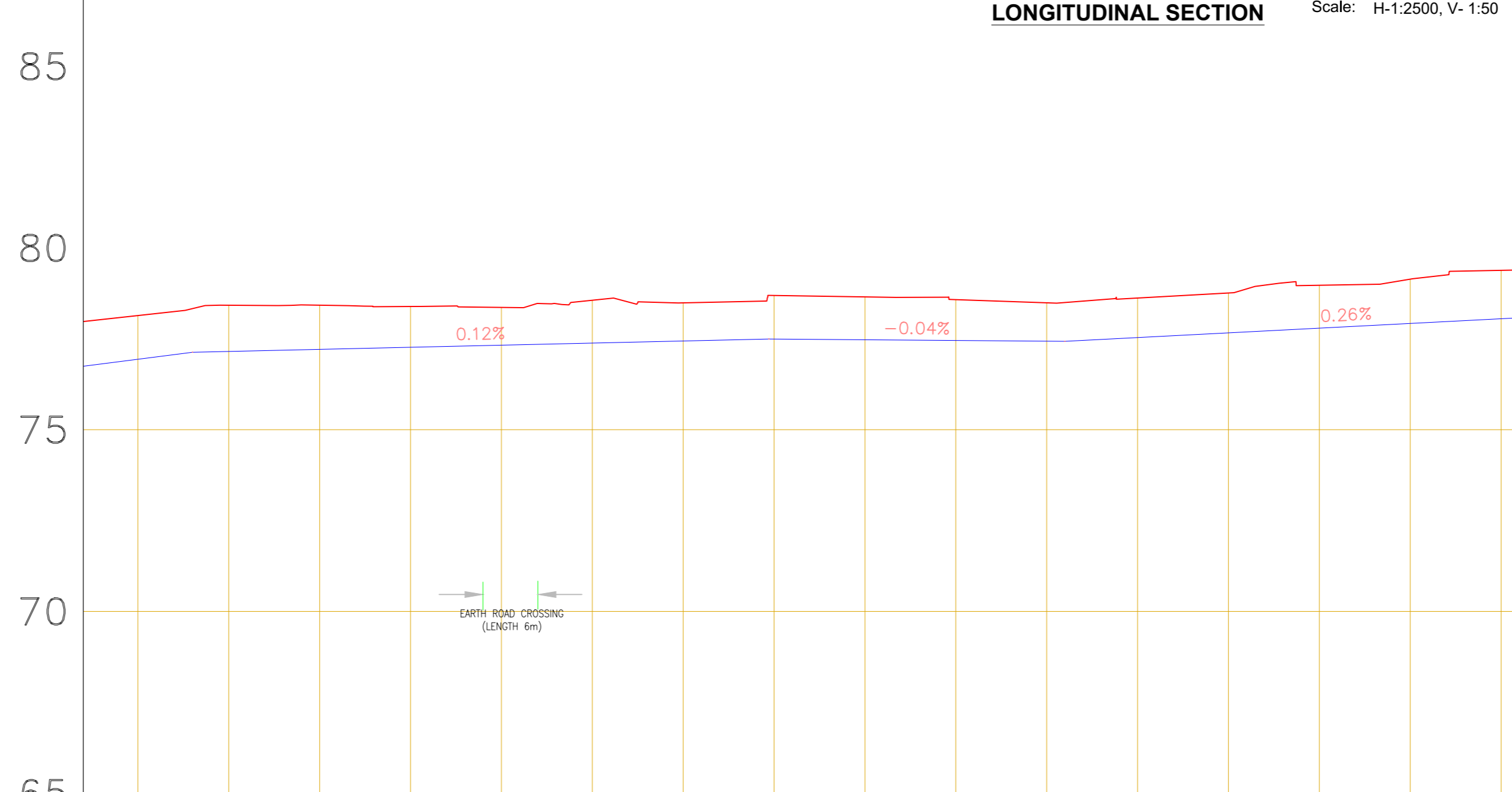
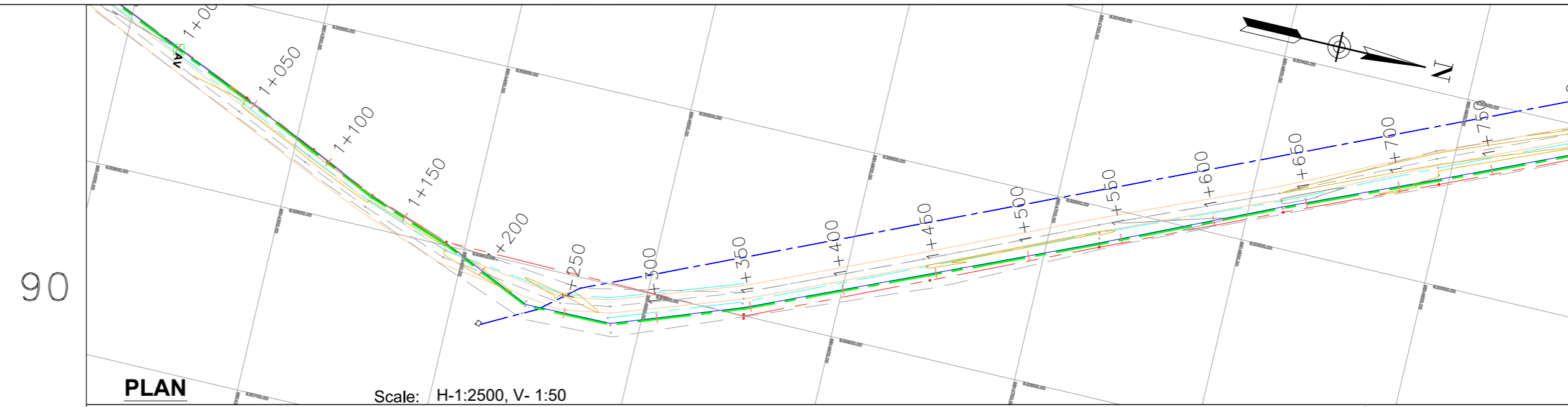
CONTRACTOR:

PROJECT NAME:
IJARA WATER SUPPLY PROJECT
MASALANI - GABABA PIPELINE EXTENSION WORKS

DRAWING TITLE:
LINE
PLAN & LONGITUDINAL SECTION
(CH 1+700.00 - 2+300.00)
SHEET 4 OF 29

Designed by:	Drawn by:
Checked by:	Approved by:
Scale: H- 1:1000, V- 1:100	Date: JUNE 2022

LONGITUDINAL SECTION



- NOTES:**
1. CONTOUR LEVELS ARE IN METERS AT ONE METER INTERVALS
 2. GRID VALUES ARE IN METERS AT 100 METER INTERVALS
 3. GEOLOGICAL CONDITIONS INDICATED ON DRAWING ARE FOR GENERAL GUIDANCE ONLY
 4. MINIMUM PIPELINE SLOPES TO BE 1:500
 5. DRAWING TO BE READ IN CONJUNCTION WITH STANDARD DRAWINGS
 6. ALL PIPE FITTINGS TO BE CONFIRMED ON SITE DURING SETTING OUT
 7. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING

- LEGEND:**
- ROAD (TARMAC)
 - ROAD / TRACK (EARTH / MURRAM)
 - FENCE / HEDGE
 - CONTOURS, 1m INTERVAL
 - ELECTRIC POST
 - CULVERT
 - GATE
 - BUILDINGS
 - PROPOSED WATER MAIN
 - EXISTING WATER MAIN
 - TP10 TRAVERSE POINT & No.
 - TREES
 - TRIAL HOLE
 - HORIZONTAL BEND (H) OR VERTICAL BEND (V) WITH ANGLE INDICATED
 - GV GATE VALVE
 - FH FIRE HYDRANT
 - WO-01 WASHOUT VALVE & No.
 - WM WATER METER
 - PIPELINE GRADIENT WITH SLOPE DIRECTION (SLOPE MIN. OR 1 IN n)
 - FENCE

REVISIONS				SIGN	DATE	APPROVED

**THE CHIEF EXECUTIVE OFFICER
NORTHERN WATER WORKS
DEVELOPMENT AGENCY**

CONTRACTOR:

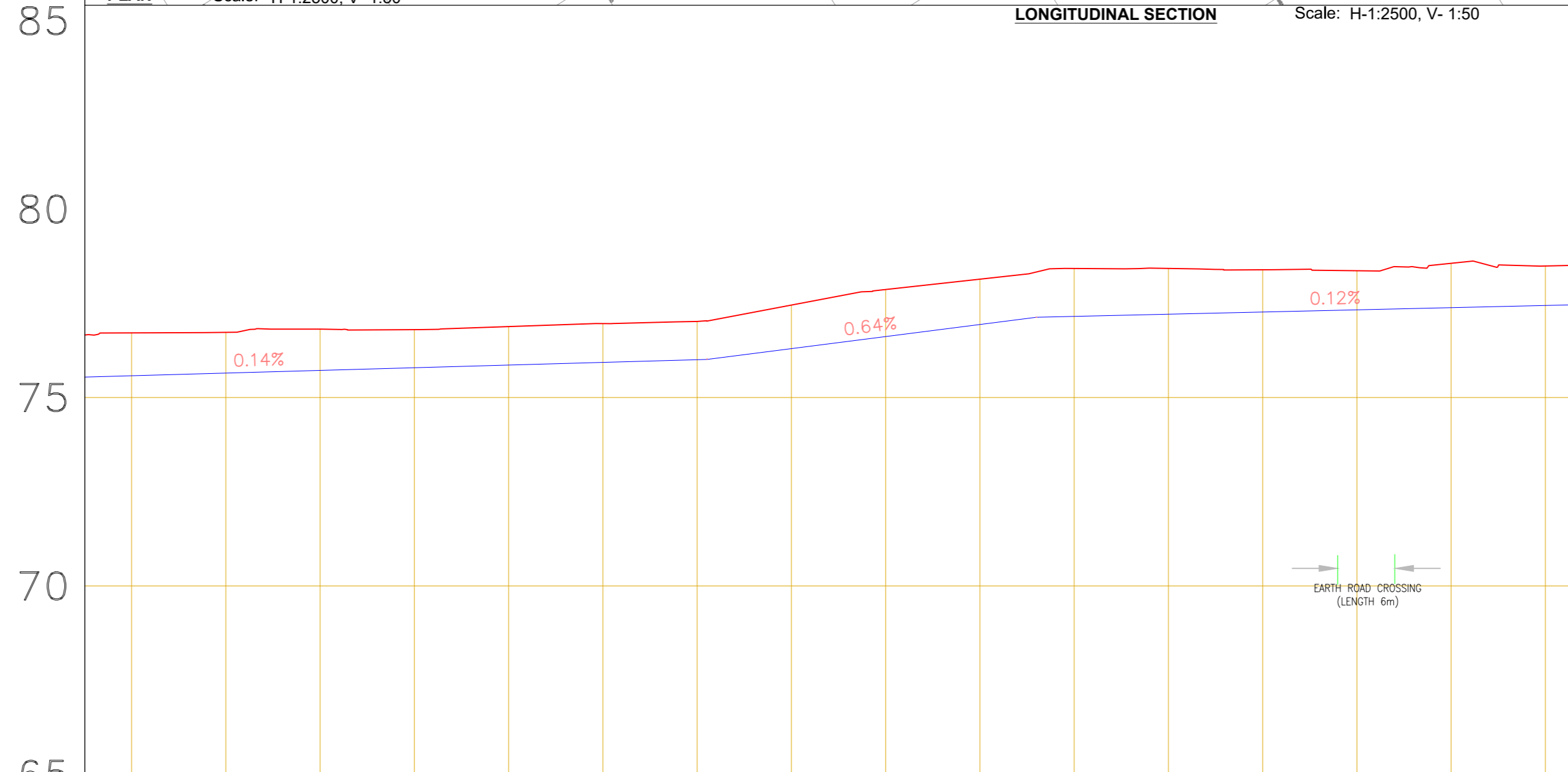
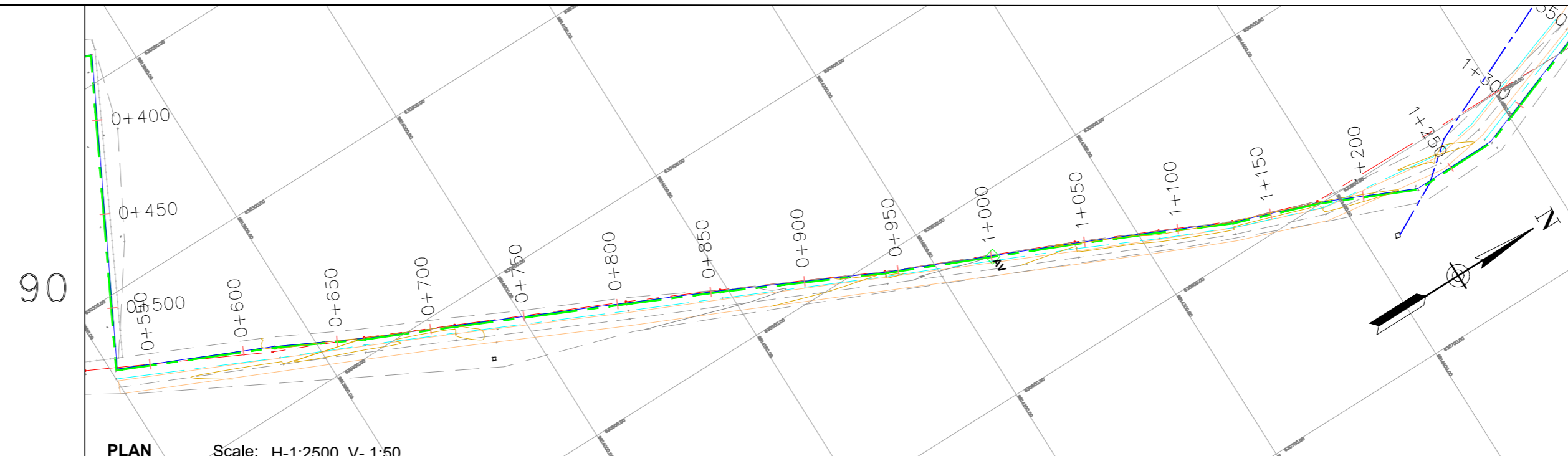
PROJECT NAME:
**IJARA WATER SUPPLY
PROJECT**
**MASALANI - GABABA PIPELINE
EXTENSION WORKS**

DRAWING TITLE:
**LINE
PLAN & LONGITUDINAL SECTION
(CH 1+100.00 - 1+750.00)
SHEET 3 OF 29**

Designed by: _____ Drawn by: _____
Checked by: _____ Approved by: _____
Scale: **H- 1:1000, V- 1:100** Date: **JUNE 2022**

CHAINAGE (m)	-0+050.00	1+000.00	1+050.00	1+100.00	1+150.00	1+200.00	1+250.00	1+300.00	1+350.00	1+400.00	1+450.00	1+500.00	1+550.00	1+600.00	1+650.00	1+700.00	1+750.00
EXISTING GROUND LEVEL (m)		78.14	78.42	78.43	78.39	78.36	78.56	78.49	78.69	78.65	78.58	78.49	78.62	78.76	78.97	79.14	79.39
INVERT LEVELS (m)		76.94	77.15	77.21	77.27	77.33	77.38	77.44	77.50	77.48	77.46	77.44	77.54	77.67	77.79	77.92	78.05
TYPE AND SIZE OF PIPE	HDPE DN160 PN 16																
DESIGN FLOW (m/sec)																	
TYPE OF SOIL	BLACK COTTON SOIL																

DRG No.



- NOTES:**
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 2. GRID VALUES ARE IN METERS AT 100 METER INTERVALS
 3. GEOLOGICAL CONDITIONS INDICATED ON DRAWING ARE FOR GENERAL GUIDANCE ONLY
 4. MINIMUM PIPELINE SLOPES TO BE 1:500
 5. DRAWING TO BE READ IN CONJUNCTION WITH STANDARD DRAWINGS
 6. ALL PIPE FITTINGS TO BE CONFIRMED ON SITE DURING SETTING OUT
 7. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THE DRAWING

- LEGEND:**
- ROAD (TARMAC)
 - ROAD / TRACK (EARTH / MURRAM)
 - FENCE / HEDGE
 - 75 CONTOURS, 1m INTERVAL
 - ELECTRIC POST
 - CULVERT
 - GATE
 - BUILDINGS
 - PROPOSED WATER MAIN
 - EXISTING WATER MAIN
 - TP10 TRAVERSE POINT & No.
 - TREES
 - TRIAL HOLE
 - HORIZONTAL BEND (H) OR VERTICAL BEND (V) WITH ANGLE INDICATED
 - GV GATE VALVE
 - FH FIRE HYDRANT
 - WO-01 WASHOUT VALVE & No.
 - WM WATER METER
 - PIPELINE GRADIENT WITH SLOPE DIRECTION (SLOPE MIN. OR 1 IN n)
 - FENCE

CHAINAGE (m)	-0+050.00	0+550.00	0+600.00	0+650.00	0+700.00	0+750.00	0+800.00	0+850.00	0+900.00	0+950.00	1+000.00	1+050.00	1+100.00	1+150.00	1+200.00	1+250.00	1+300.00
EXISTING GROUND LEVEL (m)		76.72	76.73	76.81	76.80	76.88	76.96	77.02	77.45	77.87	78.14	78.42	78.43	78.39	78.36	78.56	78.49
INVERT LEVELS (m)		75.58	75.65	75.72	75.79	75.86	75.93	76.00	76.30	76.62	76.94	77.15	77.21	77.27	77.33	77.38	77.44
TYPE AND SIZE OF PIPE	HDPE DN160 PN 12.5																
DESIGN FLOW (m/sec)																	
TYPE OF SOIL	BLACK COTTON SOIL																

REVISIONS				SIGN	DATE	APPROVED
	BY					
	CHECKED					
	BY					
	CHECKED					
	BY					
	CHECKED					

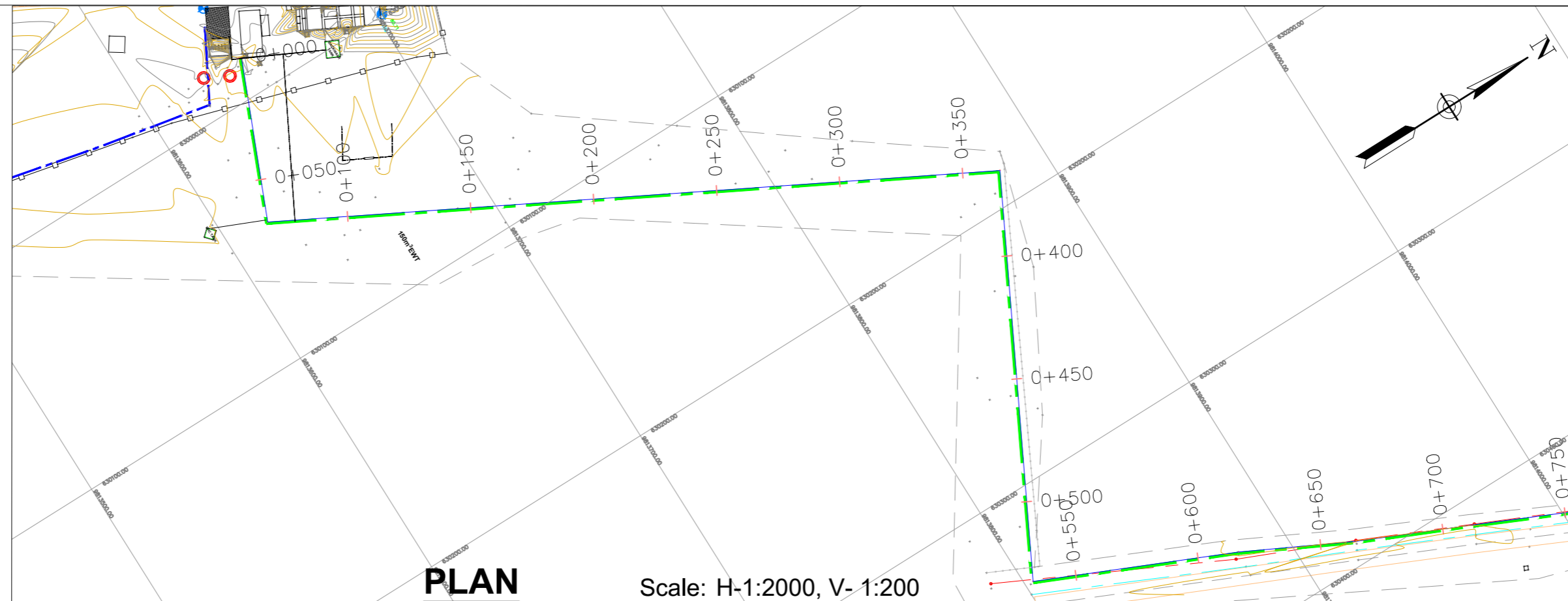
THE CHIEF EXECUTIVE OFFICER
NORTHERN WATER WORKS
DEVELOPMENT AGENCY

CONTRACTOR:

PROJECT NAME:
IJARA WATER SUPPLY PROJECT
MASALANI - GABABA PIPELINE
EXTENSION WORKS

DRAWING TITLE:
LINE
PLAN & LONGITUDINAL SECTION
(CH 0+550.00 - 1+300.00)
SHEET 2 OF 29

Designed by: _____ Drawn by: _____
 Checked by: _____ Approved by: _____
 Scale: H-1:1000, V-1:100 Date: JUNE 2022
 DRG No. _____



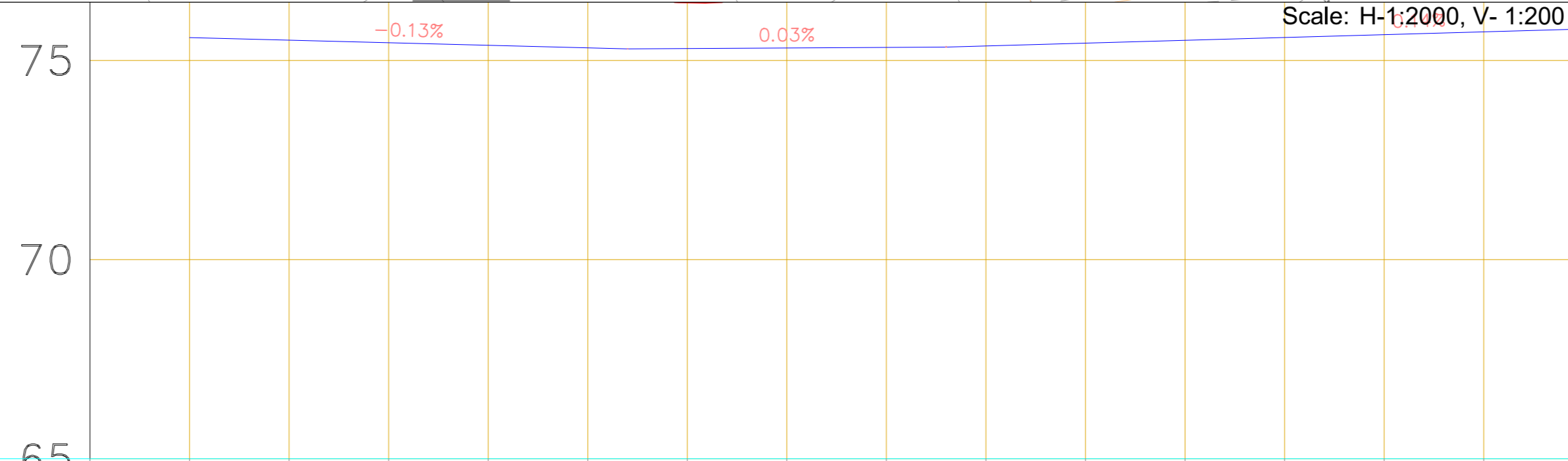
PLAN

Scale: H-1:2000, V- 1:200

Scale: H-1:2000, V- 1:200

- NOTES:**
1. CONTOUR LEVELS ARE IN METERS AT ONE METER INTERVALS
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- LEGEND:**
- ROAD (TARMAC)
 - ROAD / TRACK (EARTH / MURRAM)
 - FENCE / HEDGE
 - CONTOURS, 1m INTERVAL
 - ELECTRIC POST
 - CULVERT
 - GATE
 - BUILDINGS
 - PROPOSED WATER MAIN
 - EXISTING WATER MAIN
 - TP10 TRAVERSE POINT & No.
 - TREES
 - TRIAL HOLE
 - HORIZONTAL BEND (H) OR VERTICAL BEND (V) WITH ANGLE INDICATED
 - GV GATE VALVE
 - FH FIRE HYDRANT
 - WO-01 WASHOUT VALVE & No.
 - WM WATER METER
 - PIPELINE GRADIENT WITH SLOPE DIRECTION (SLOPE MIN. OR 1 IN n)
 - FENCE



CHAINAGE (m)	EXISTING GROUND LEVEL (m)	INVERT LEVELS (m)	TYPE AND SIZE OF PIPE	DESIGN FLOW (m ³ /sec)	TYPE OF SOIL
-0+050.00					
0+000.00	77.03	75.58	UPVC DN 160 CLASS C		
0+050.00	76.58	75.51	HDPE DN160 PN 12.5		
0+100.00	76.61	75.45			
0+150.00	76.53	75.38			
0+200.00	76.56	75.32			
0+250.00	76.45	75.30			
0+300.00	76.51	75.31			
0+350.00	76.51	75.33			
0+400.00	76.54	75.37			
0+450.00	76.59	75.44			
0+500.00	76.59	75.51			
0+550.00	76.72	75.58			
0+600.00	76.73	75.65			
0+650.00	76.81	75.72			
0+700.00	76.80	75.79			

REVISIONS				SIGN	DATE	APPROVED
BY	CHECKED					
BY	CHECKED					
BY	CHECKED					
BY	CHECKED					

THE CHIEF EXECUTIVE OFFICER
NORTHERN WATER WORKS
DEVELOPMENT AGENCY

CONTRACTOR:

PROJECT NAME:
IJARA WATER SUPPLY PROJECT
MASALANI - GABABA PIPELINE EXTENSION WORKS

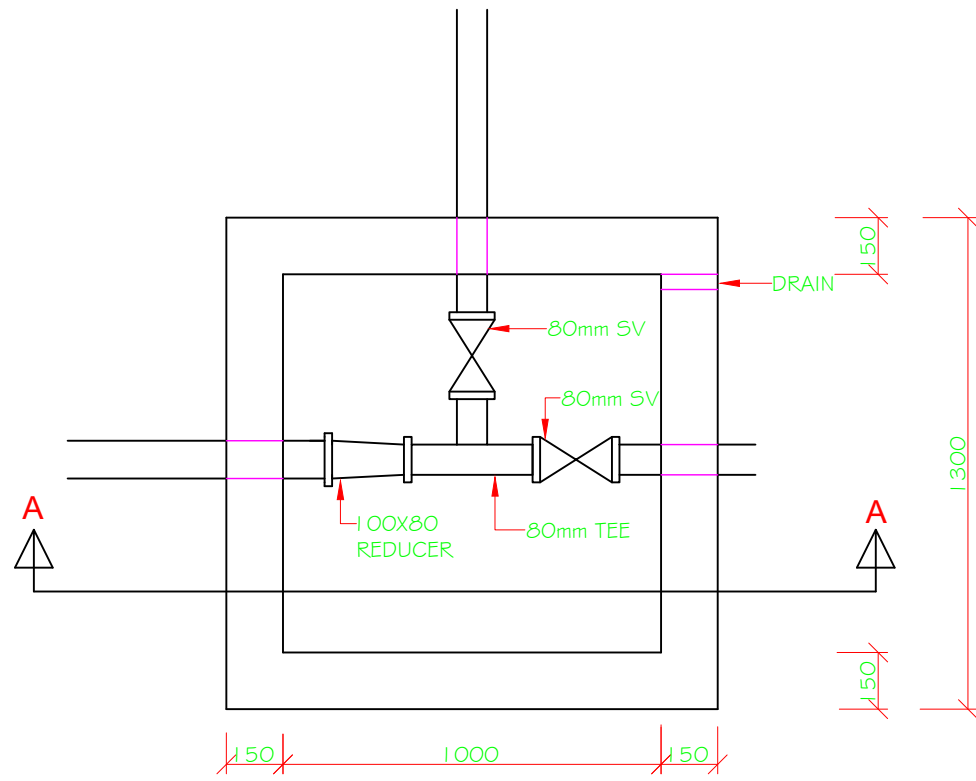
DRAWING TITLE:
LINE
PLAN & LONGITUDINAL SECTION
(CH 0+000.00 - 0+550.00)
SHEET 1 OF 29

Designed by: _____ Drawn by: _____
 Checked by: _____ Approved by: _____
 Scale: H- 1:1000, V- 1:100 Date: JUNE 2022

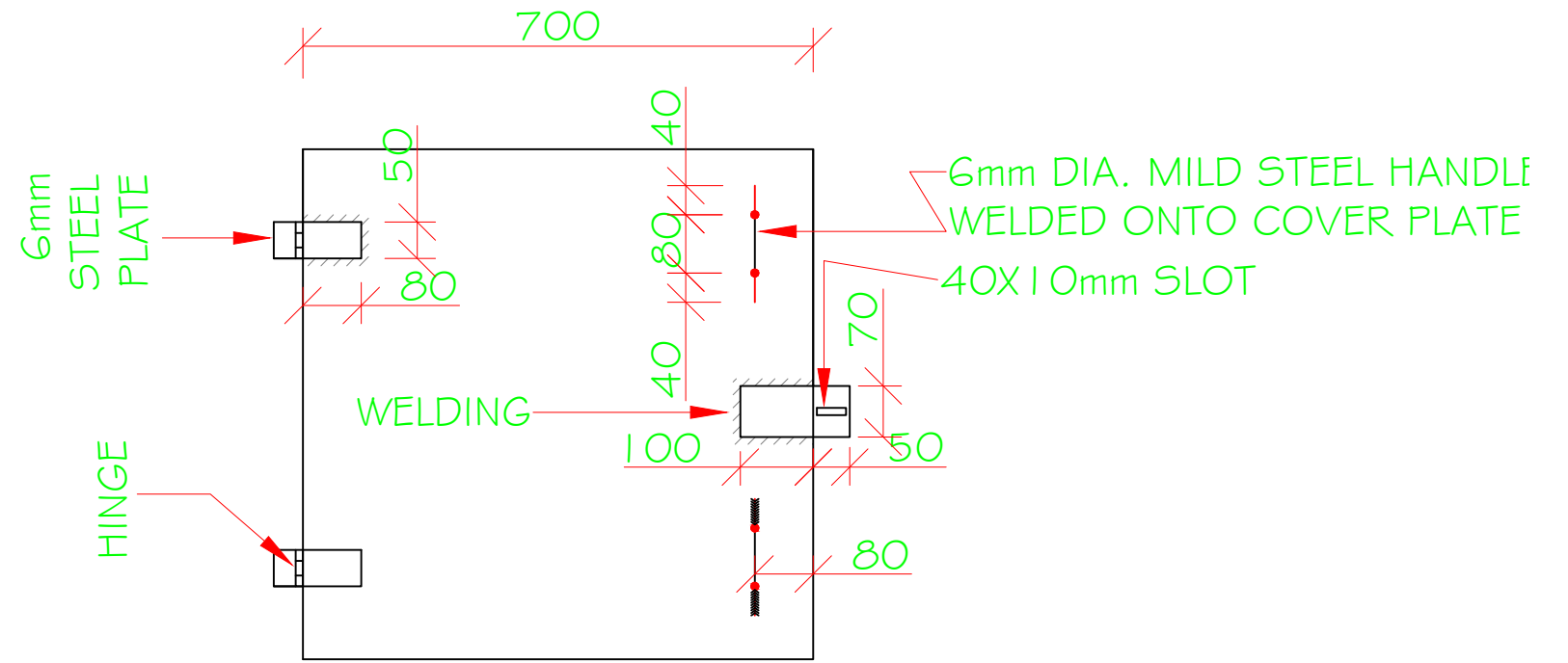
DRG No. _____

BLACK COTTON SOIL

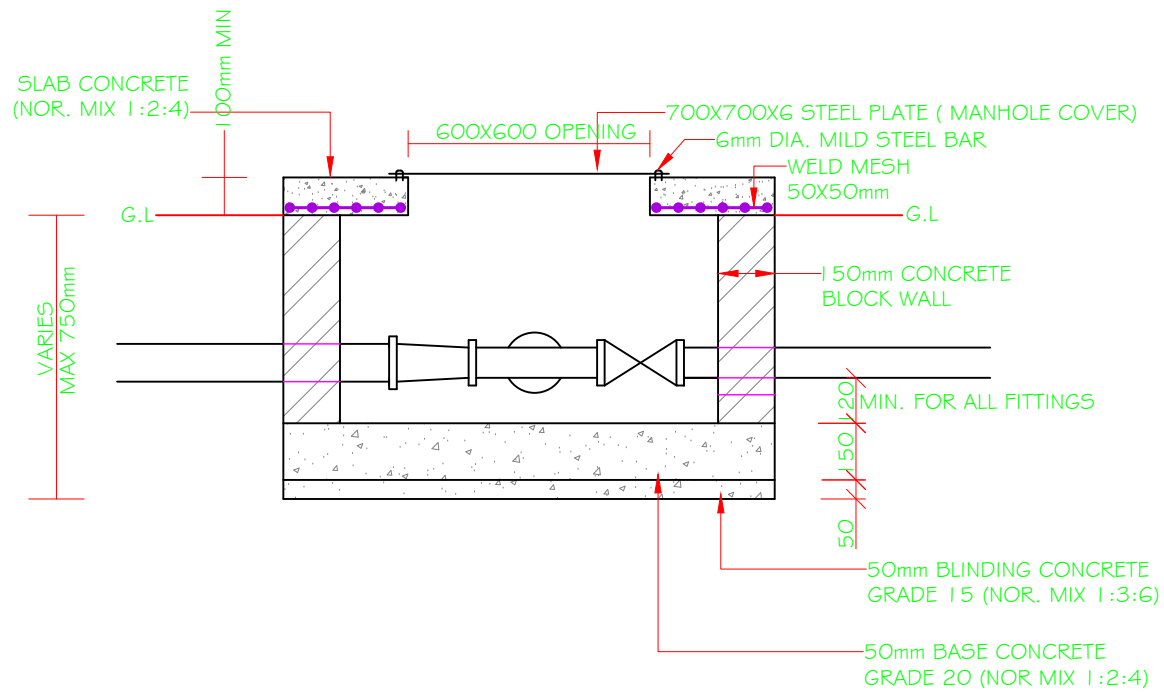
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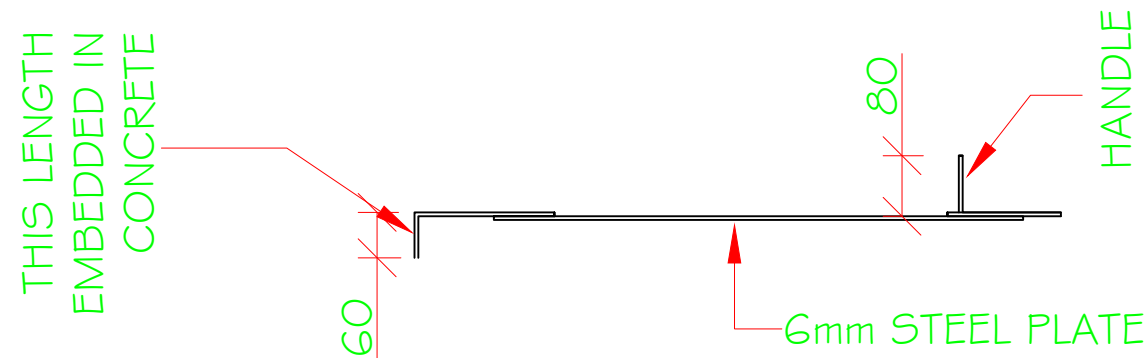
PLAN OF MAN HOLE TYPE A
SCALE 1:20



PLAN OF COVER PLATE
SCALE 1:10



SECTION A-A
SCALE 1:20



FRONT VIEW
SCALE 1:10

REVISION		
No.	DATE	DESCRIPTION

REFERENCE DRAWINGS

H.O. No.	DESCRIPTION

MINISTRY OF WATER
& IRRIGATION

HEADQUARTERS

MANHOLES & MARKER POST

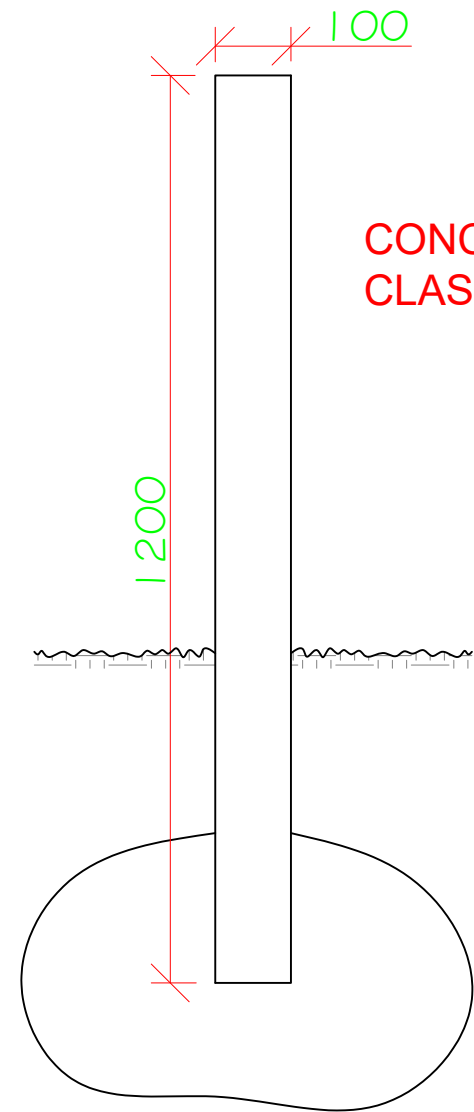
SHEET 1 OF 4

SCALE AS SHOWN

FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS

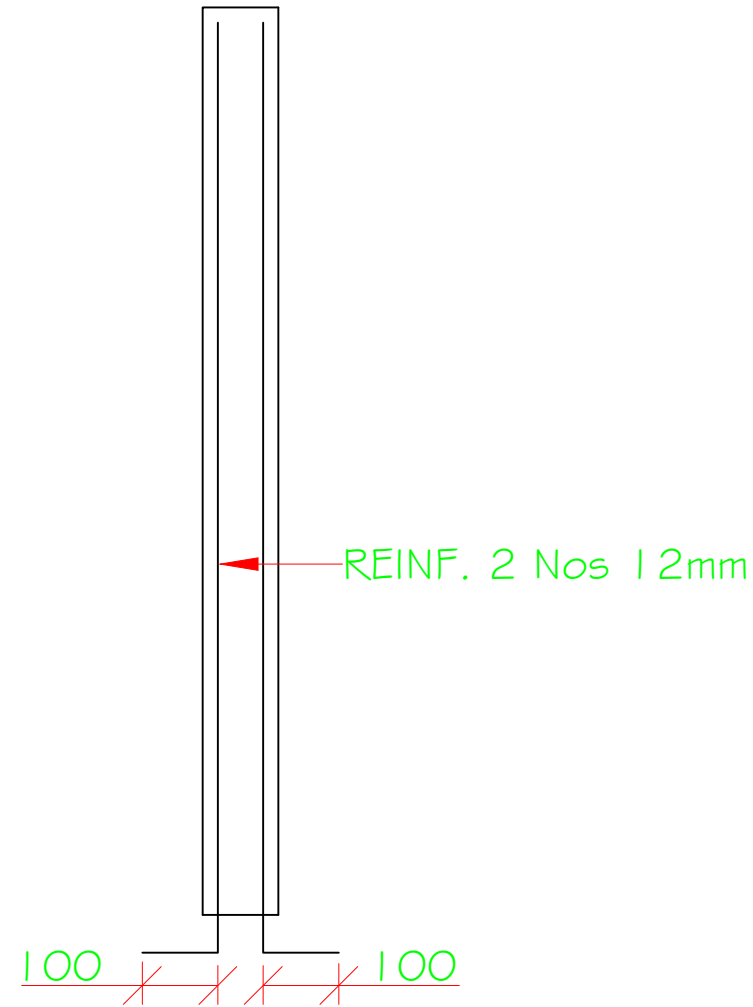
M.o.W.I	DRG. No.	017-TYPE-008
	FILE No.	

DESIGNED/ DRAWN	J. N. MAINA	DATE :
CHECKED:	ENG. KASABULI	DATE : MARCH 10, 20



CONCRETE
CLASS CC

MASS CONCRETE
CLASS D



REINF. 2 Nos 12mm

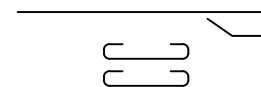
PIPELINE MARKER TYPE II

SCALE 1:10

BAR BENDING CHART

BAR MARK	DIAMETER IN mm	No. OF BARS	LENGTH (mm)	TOTAL LENGTH (mm)
1	10	2	1640	3250
2	6	3	340	1020
3	6	16	140	2240

BAR BENDING DETAILS



REVISION		
No.	DATE	DESCRIPTION

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H.O. No.	DESCRIPTION

MINISTRY OF WATER
& IRRIGATION

HEADQUARTERS

MANHOLES & MARKER POST

SHEET 3 OF 4

SCALE AS SHOWN

FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS

M.o.W.I	DRG. No.	017-TYPE-008
	FILE No.	

DESIGNED/ DRAWN	J. N. MAINA	DATE :
--------------------	-------------	--------

CHECKED:	ENG. KASABULI	DATE : MARCH 10, 20
----------	---------------	---------------------

AIR VALVES

DETAILS OF FITTINGS IN MANHOLES

1. AIR VALVE ON 100mm DIA. G.S PIPE
MANHOLE TYPE A

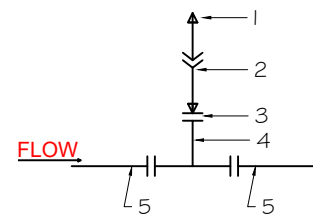


FIG. 1
SCALE 1:10

DESCRIPTION	No. OF ITEMS
SINGLE ORIFICE AIR VALVE (SMALL ORIFICE TYPE)	1
G.S REDUCING BUSH 50mmX50mm	1
STEEL FLANGE, FEMALE THREADED 50mm N.I.D	1
FLANGED STEEL TEE 100mmX50mm	1
FLANGED STEEL PIPE 100mm N.I.D	

2. AIR VALVE ON 80mm DIA. G.S PIPE
MANHOLE TYPE A

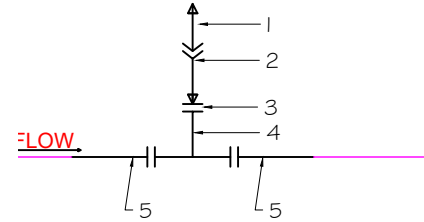


FIG. 2
SCALE 1:10

DESCRIPTION	No. OF ITEMS
SINGLE ORIFICE AIR VALVE (SMALL ORIFICE TYPE)	1
G.S REDUCING BUSH 50mmX25mm	1
G.S FLANGE, FEMALE THREADED 50mm N.I.D	1
FLANGED STEEL TEE 100mmX50mm	
80mm DIA. G.S PIPES FLANGED	

3. AIR VALVE ON 50mm DIA. PVC PIPE
MANHOLE TYPE A

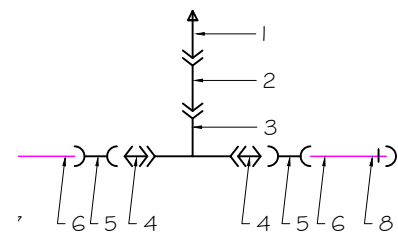


FIG. 3
SCALE 1:10

DESCRIPTION	No. OF ITEMS
SINGLE ORIFICE AIR VALVE (SMALL ORIFICE TYPE)	1
3.S REDUCING BUSH 50mmX25mm	1
STEEL TEE 50mm N.I.D FEMALE THREADED	1
STEEL NIPPLE 50mm DIA.	2
3.S SOCKET 50mm DIA.	2
3.S PIPE 50mm N.I.D	-
ADAPTER UNION PVC/ BRASS 50mm N.I.D	1
ADAPTER UNION BRASS/ PVC 50mm N.I.D	1

- S:**
 1. ADAPTERS ARE SUITED OUTSIDE THE MANHOLES
 2. AIR VALVES SHALL BE SCREWED TYPE WITH MALE THREADS.
- S:**
 1. PIPES CROSSING MANHOLE WALLS SHALL BE WRAPPED WITH THREE (3) LAYERS OF POLYTHENE SHEETING.
 2. MANHOLES ARE OF TYPE A
 3. EVERY MANHOLE SHALL HAVE A MARKER POST INDICATING THE PURPOSE i.e. SW & AV FOR SLUICE VALVE WASHOUT AIR VALVE

WASH-OUT

DETAILS OF FITTINGS IN MANHOLES

1. WASH-OUT ON 100mm DIA. G.S PIPE
MANHOLE TYPE A

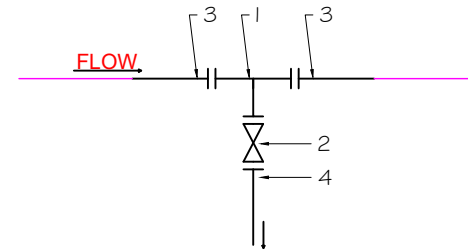


FIG. 4
SCALE 1:10

ITEM No.	DESCRIPTION	No. OF ITEMS
1.	FLANGED STEEL TEE 100mmX50mm	1
2.	FLANGED C.I SLUICE VALVE 50mm N.I.D	1
3.	FLANGED G.S PIPE (MAIN LINE) 100mm N.I.D	-
4.	FLANGED G.S PIPE (DRAIN) 50mm N.I.D	-

2. WASH-OUT ON 80mm DIA. G.S PIPE
MANHOLE TYPE A

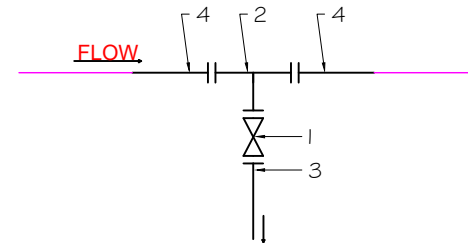


FIG. 5
SCALE 1:10

ITEM No.	DESCRIPTION	No. OF ITEMS
1.	FLANGED C.I SLUICE VALVE 50mm N.I.D	1
2.	FLANGED STEEL TEE 80mmX40mm	1
3.	G.S PIPE (DRAIN) 50mm N.I.D	1
4.	G.S PIPE (MAIN LINE) 80mm N.I.D	1

3. WASH-OUT ON 50mm DIA. PVC PIPE
MANHOLE TYPE A

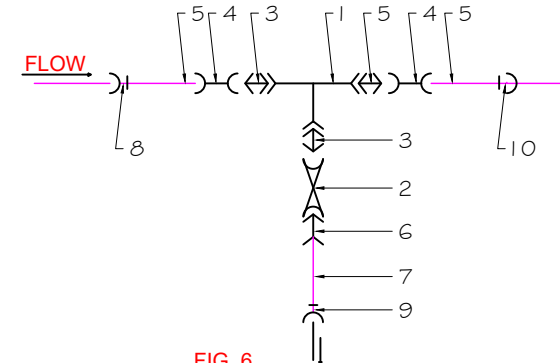


FIG. 6
SCALE 1:10

ITEM No.	DESCRIPTION	No. OF ITEMS
1.	STEEL TEE 50mm N.I.D	1
2.	GATE VALVE 80mm DIA.	1
3.	HEXAGONAL NIPPLE 50mm DIA.	3
4.	G.S SOCKET 50mm DIA.	2
5.	G.S PIPE 50mm DIA.	-
6.	G.S REDUCING BUSH 50mmX25mm	1
7.	G.S PIPE 25mm DIA.	-
8.	ADAPTER UNION PVC/ BRASS 50mm N.I.D	1
9.	ADAPTER UNION BRASS/ PVC 25mm N.I.D	1
10.	ADAPTER UNION BRASS/ PVC 50mm N.I.D	1

- NOTES:**
 1. THE DRAIN PIPES TO TERMINATE ON A NATURAL DEPRESSION OR FALLOW.
 2. THE PIPE ADAPTERS TO BE OUTSIDE THE MANHOLES

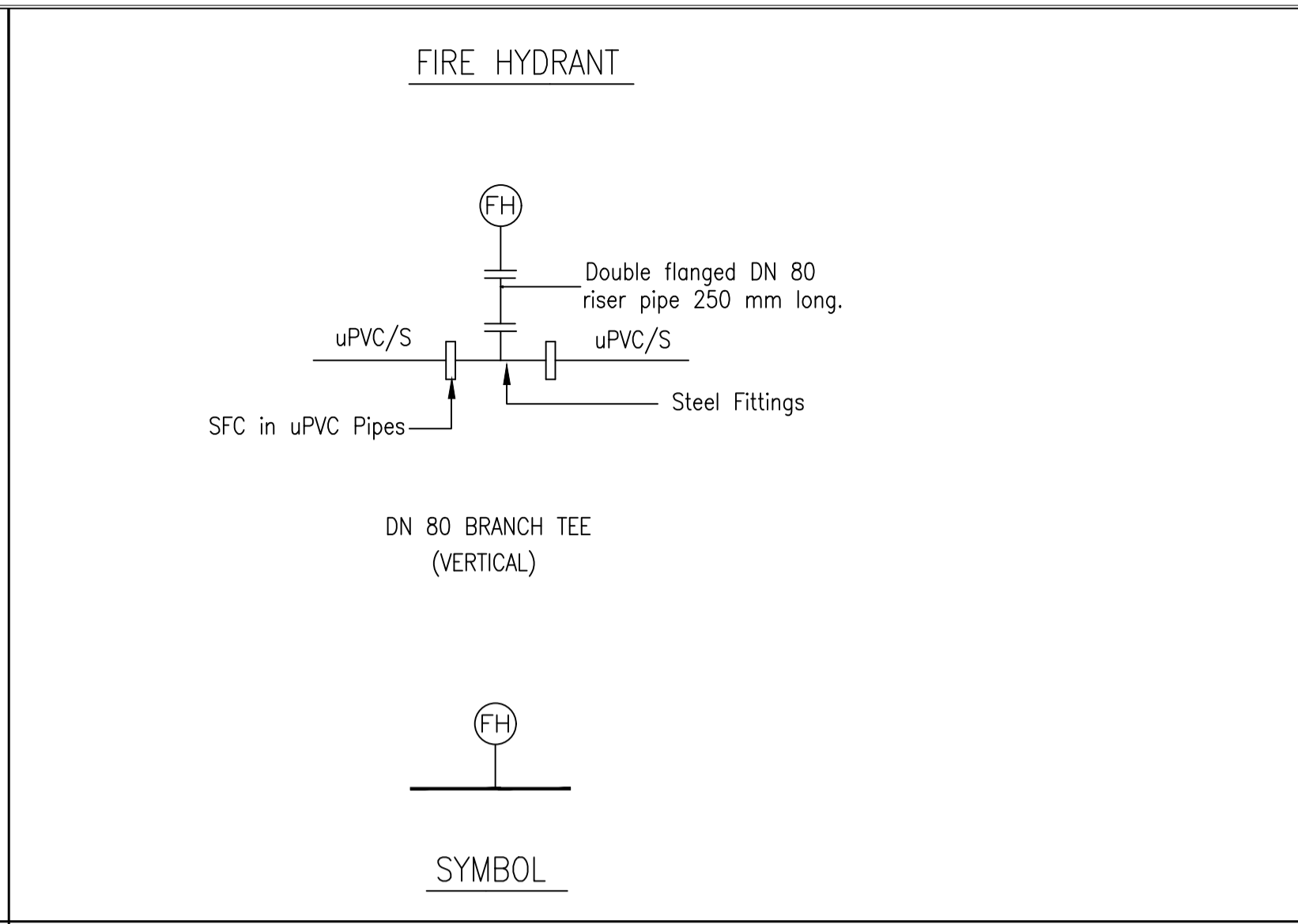
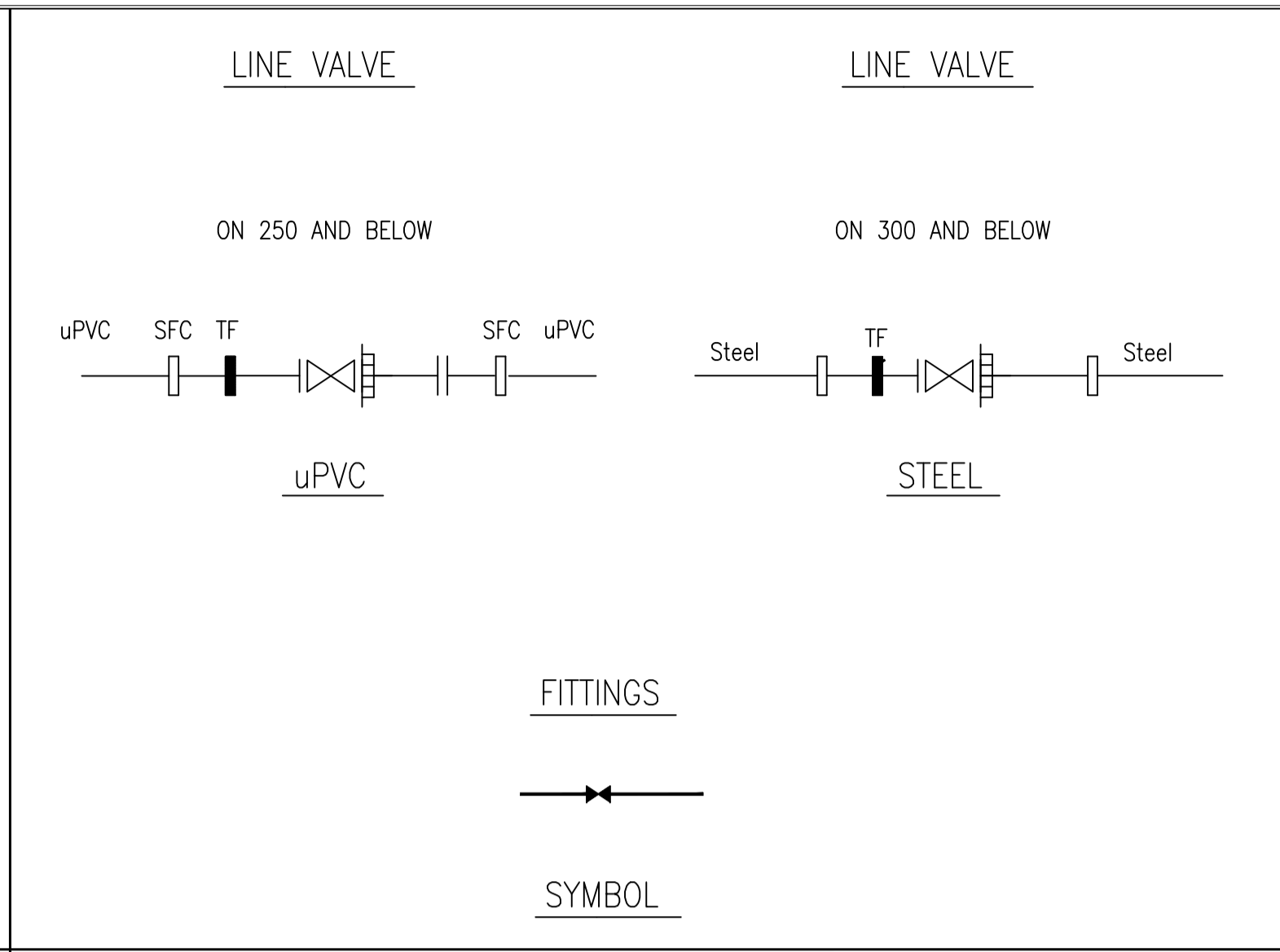
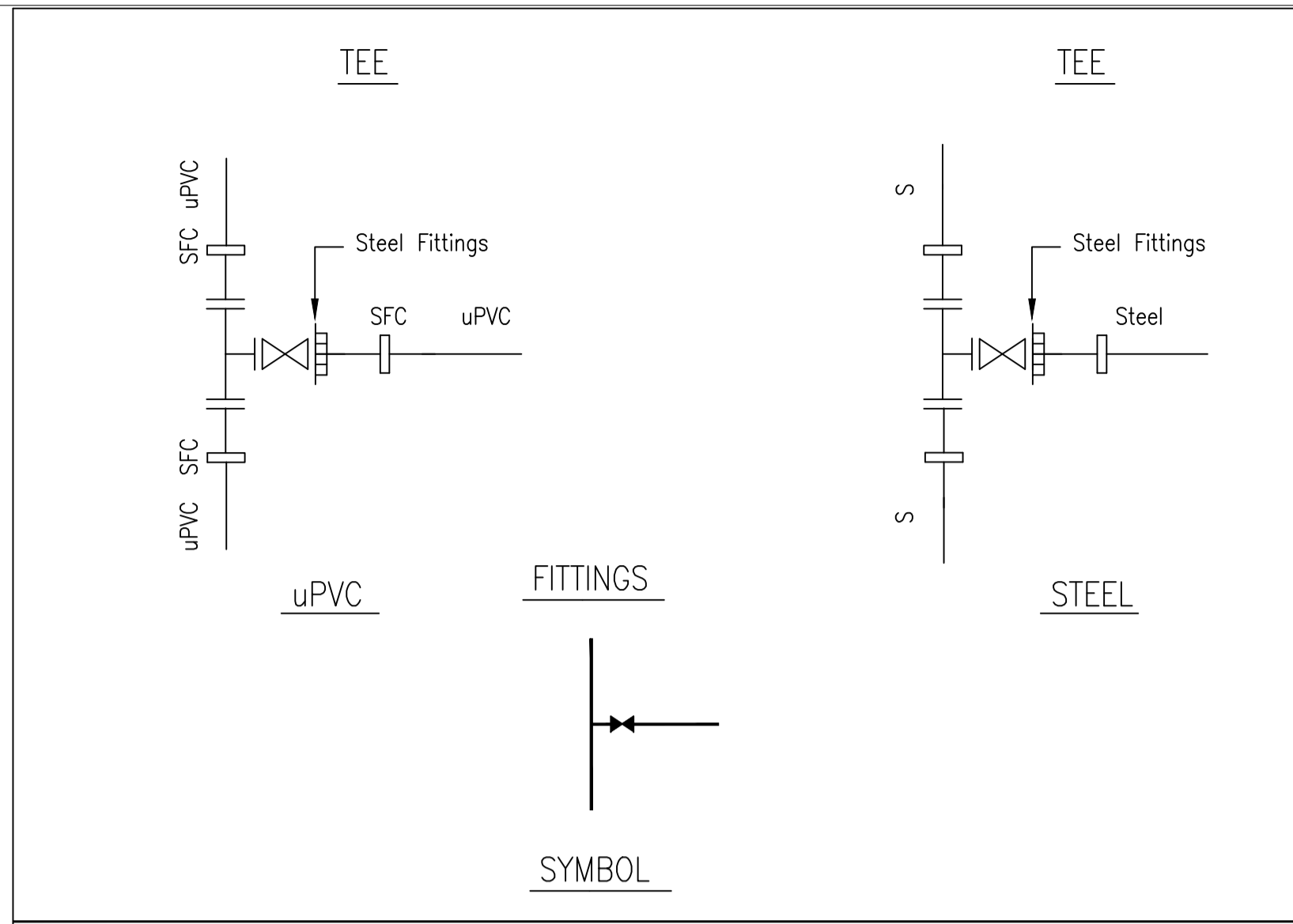
REVISION		
No.	DATE	DESCRIPTION

REFERENCE DRAWINGS	
H.O. No.	DESCRIPTION

MINISTRY OF WATER
& IRRIGATION
HEADQUARTERS

MANHOLES & MARKER POST

SHEET 4 OF 4		
SCALE AS SHOWN		
FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS		
M.o.W.I	DRG. No.	017-TYPE-008
	FILE No.	
DESIGNED/ DRAWN	J. N. MAINA	DATE :
CHECKED:	ENG. KASABULI	DATE : MARCH 10, 20

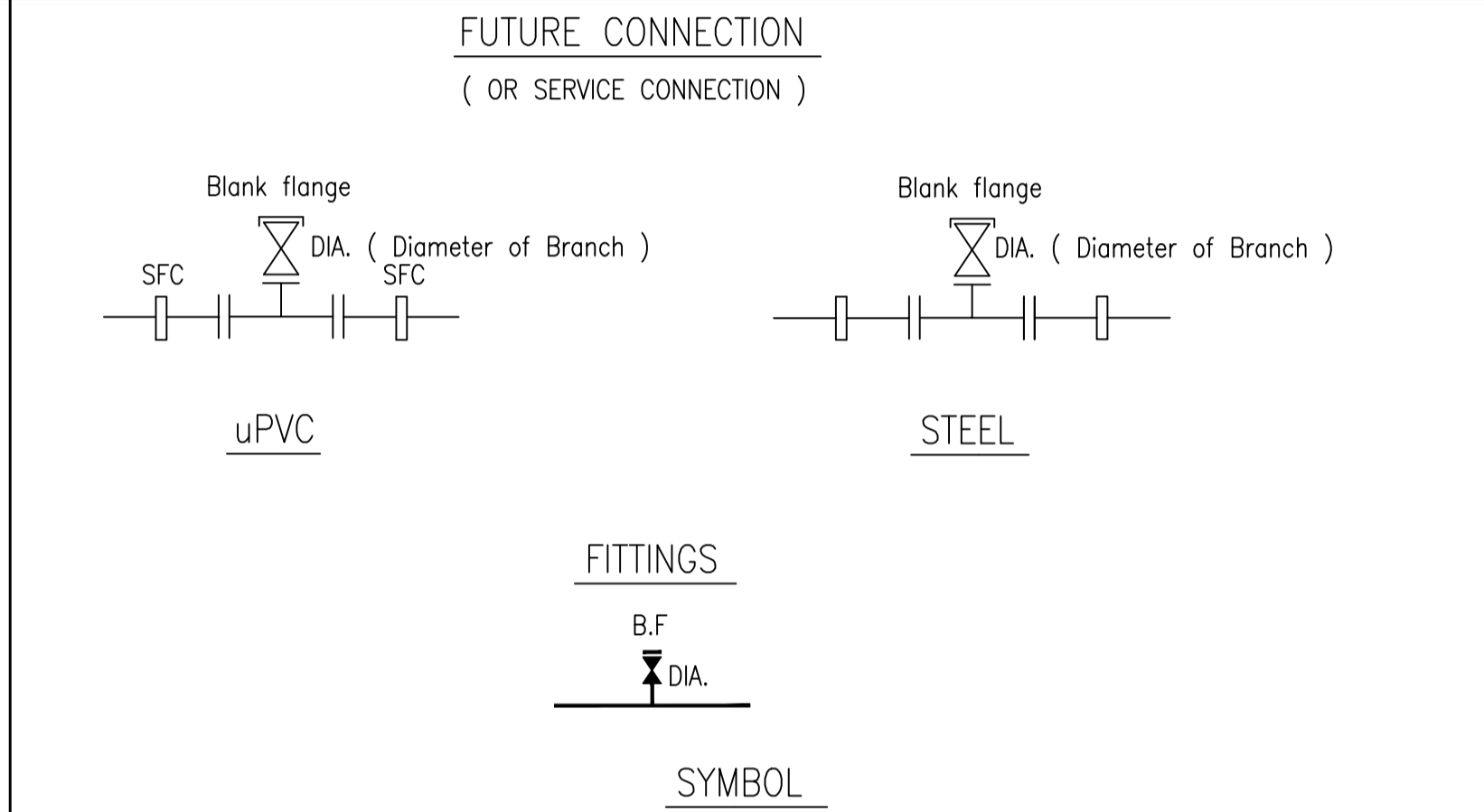
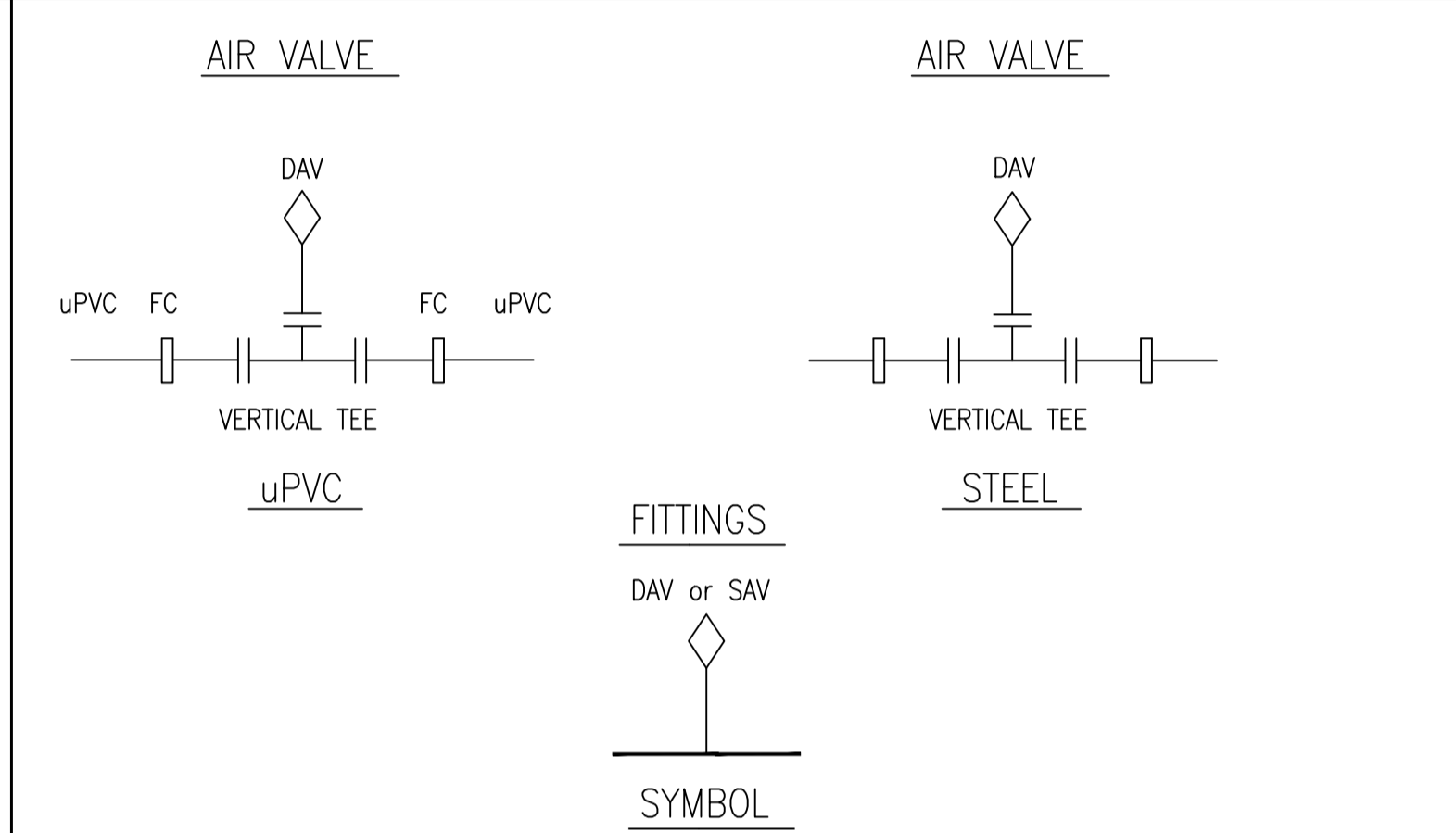
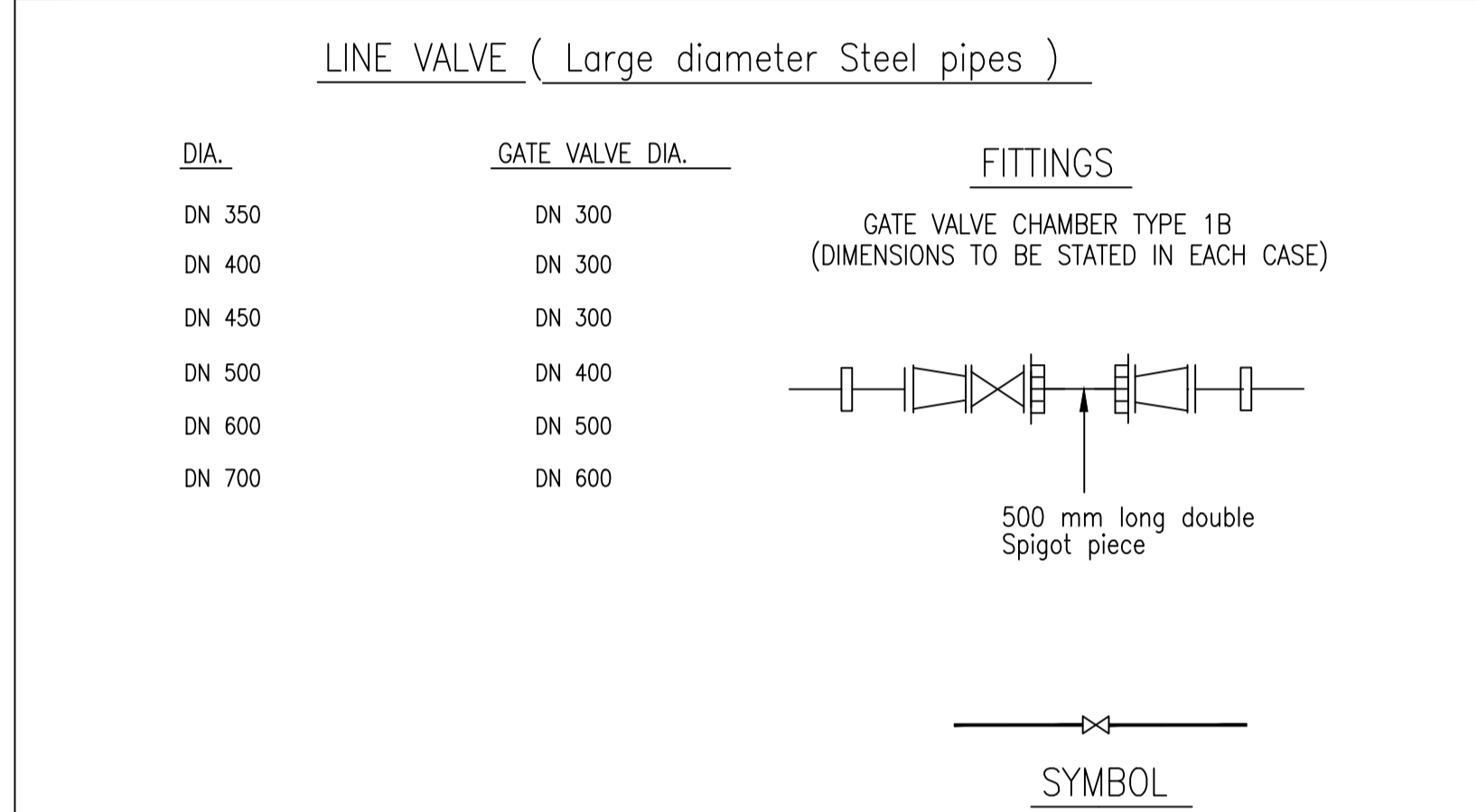


NOTES

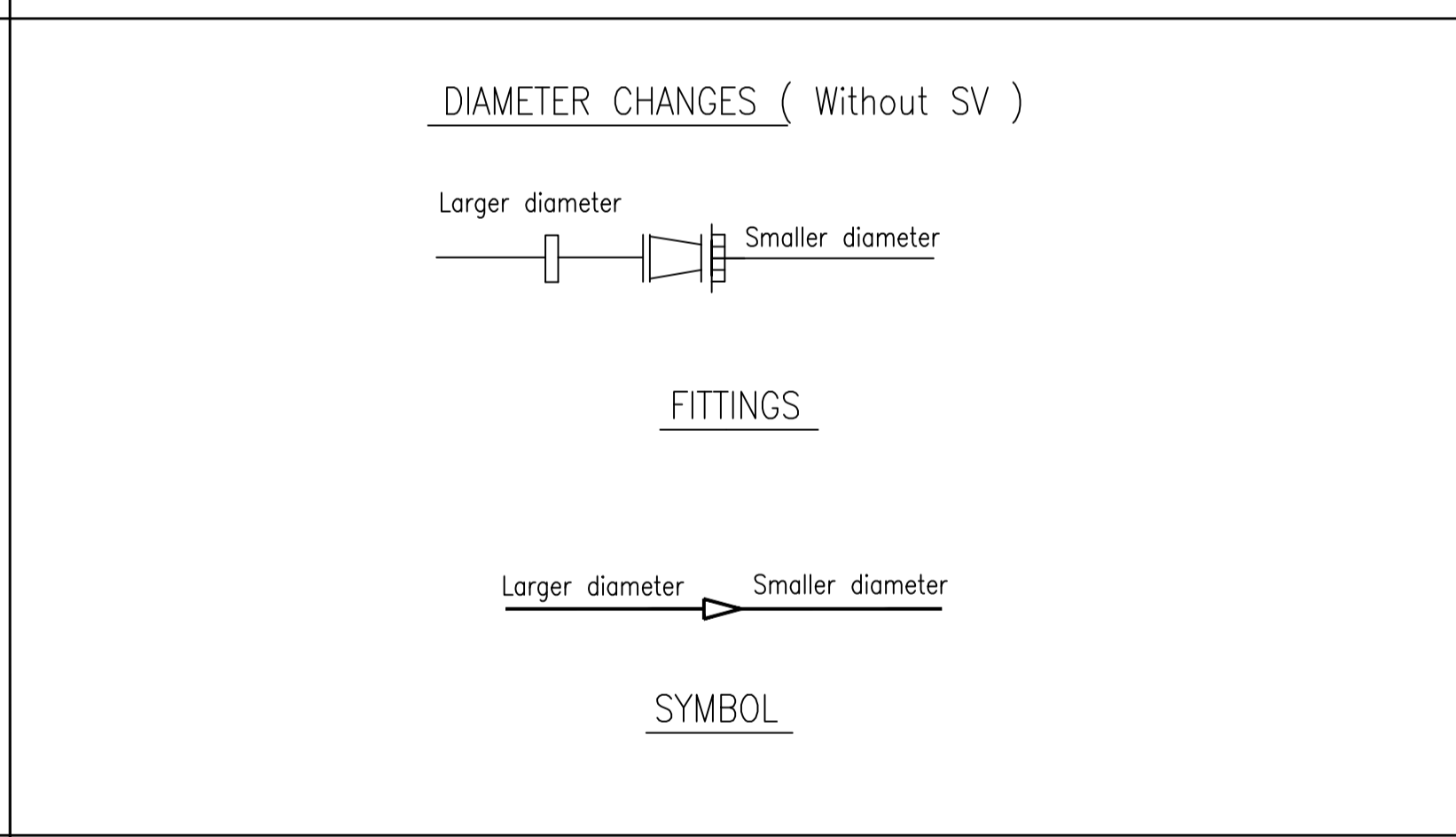
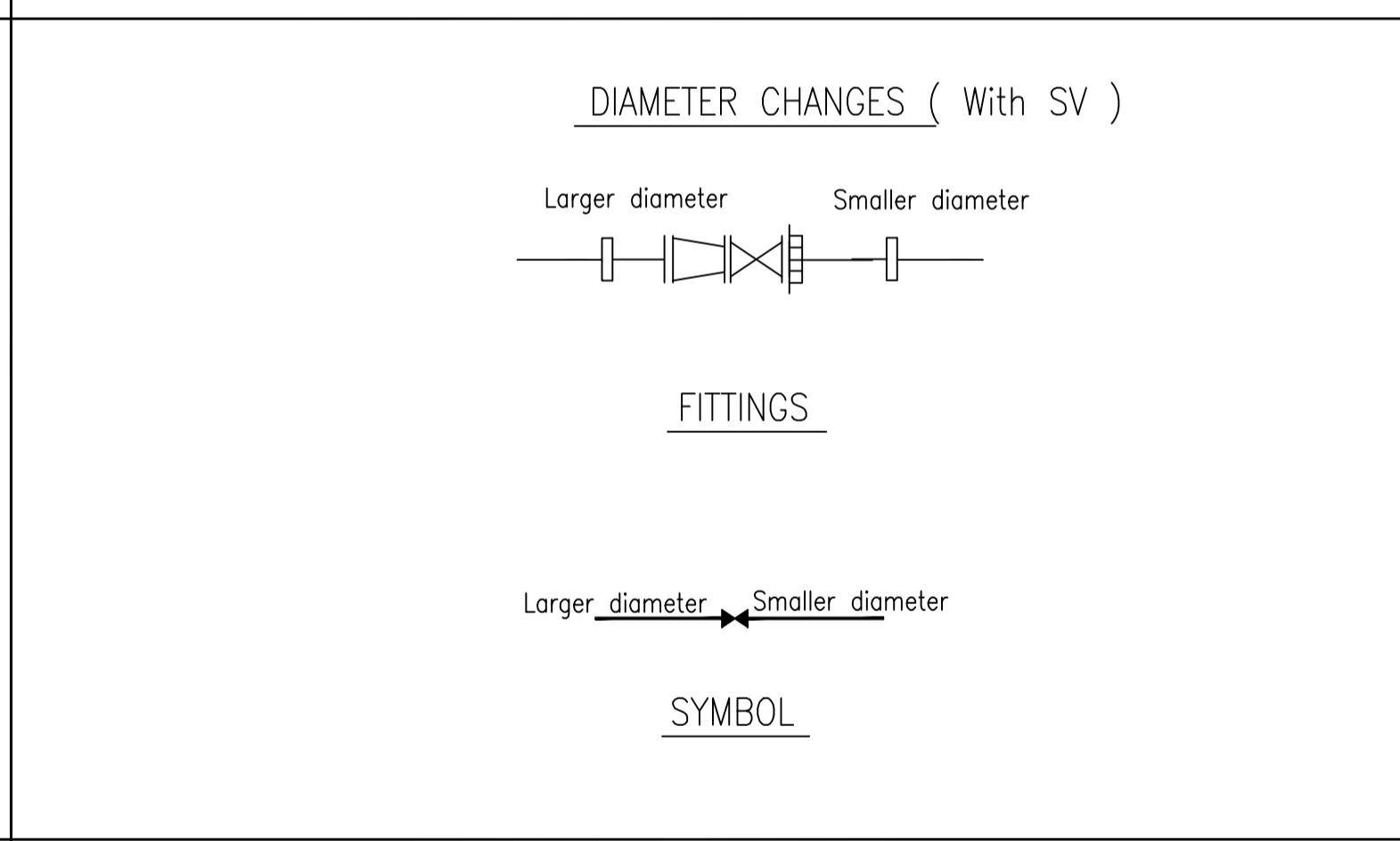
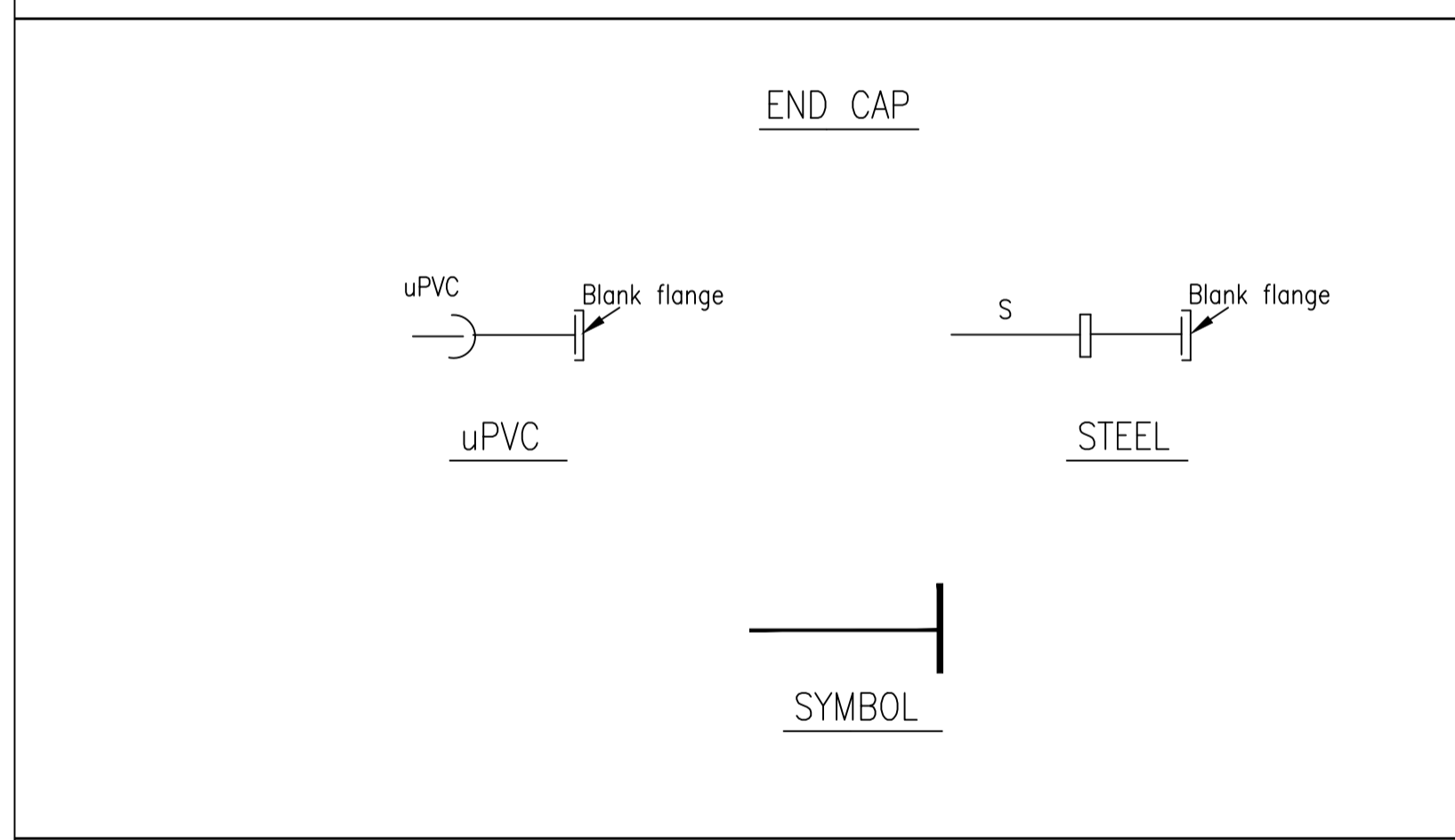
- All drawings have been prepared in accordance with details for steel pipework. Tenderers offering Ductile Iron pipes should ensure that the pipes and fittings offered comply with the design requirements related to anchorage of the pipes and flexibility at and within structures
- All fittings are steel unless otherwise stated. Along uPVC pipelines, uPVC/S stepped couplings or flanged sockets to be used to connect the two pipeline materials.

LEGEND

- Flexible Coupling (FC) (SFC-Stepped FC)
- Flange Adaptor
- Flange Spigot
- Sluice Valve
- Flange Socket Adaptor
- Thrust Flange
- All flanged taper
- Blank Flange
- DAV Double Air Valve
- FH Fire Hydrant
- S - Steel
- uPVC - Unplasticised Polyvinyl Chloride

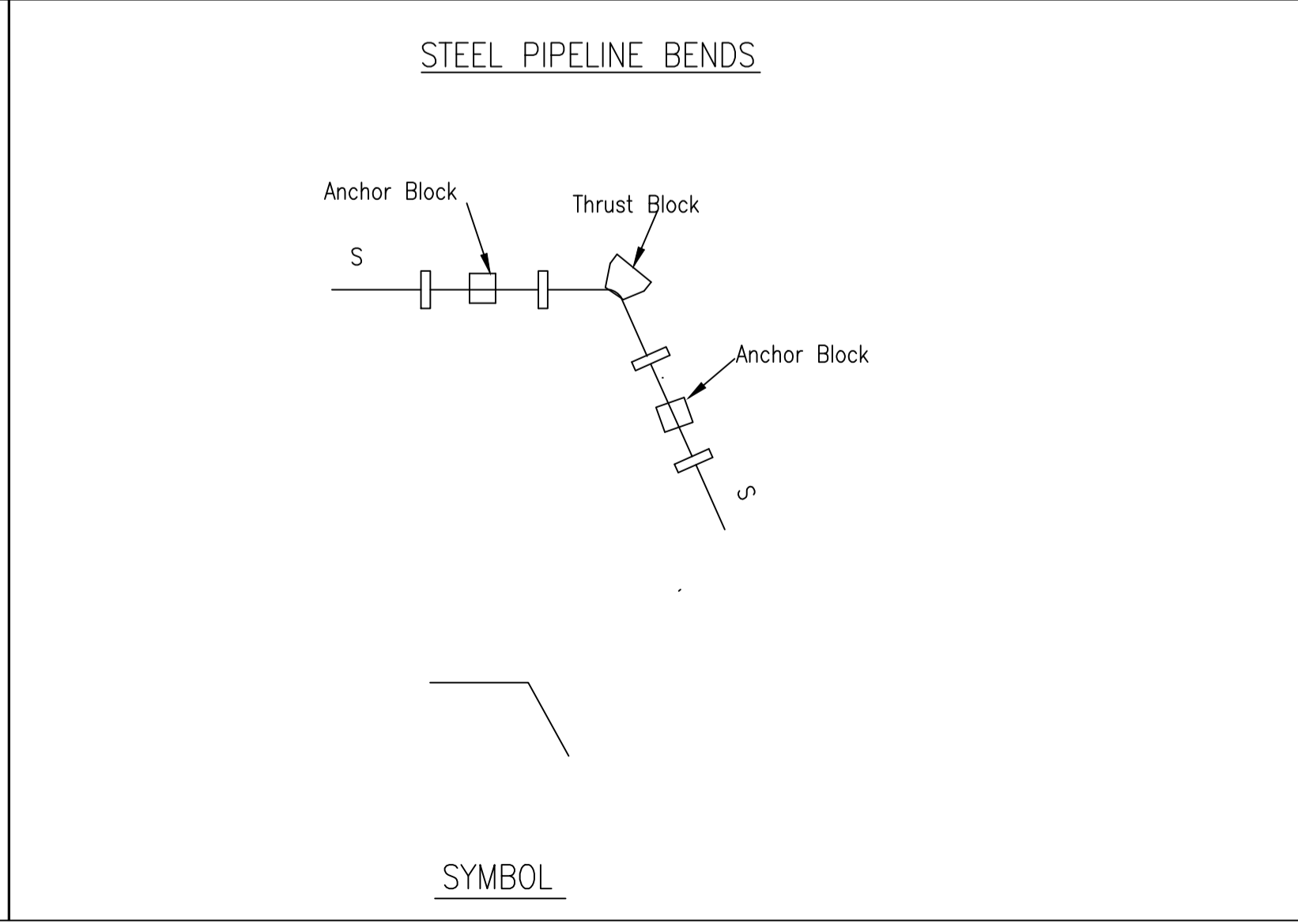
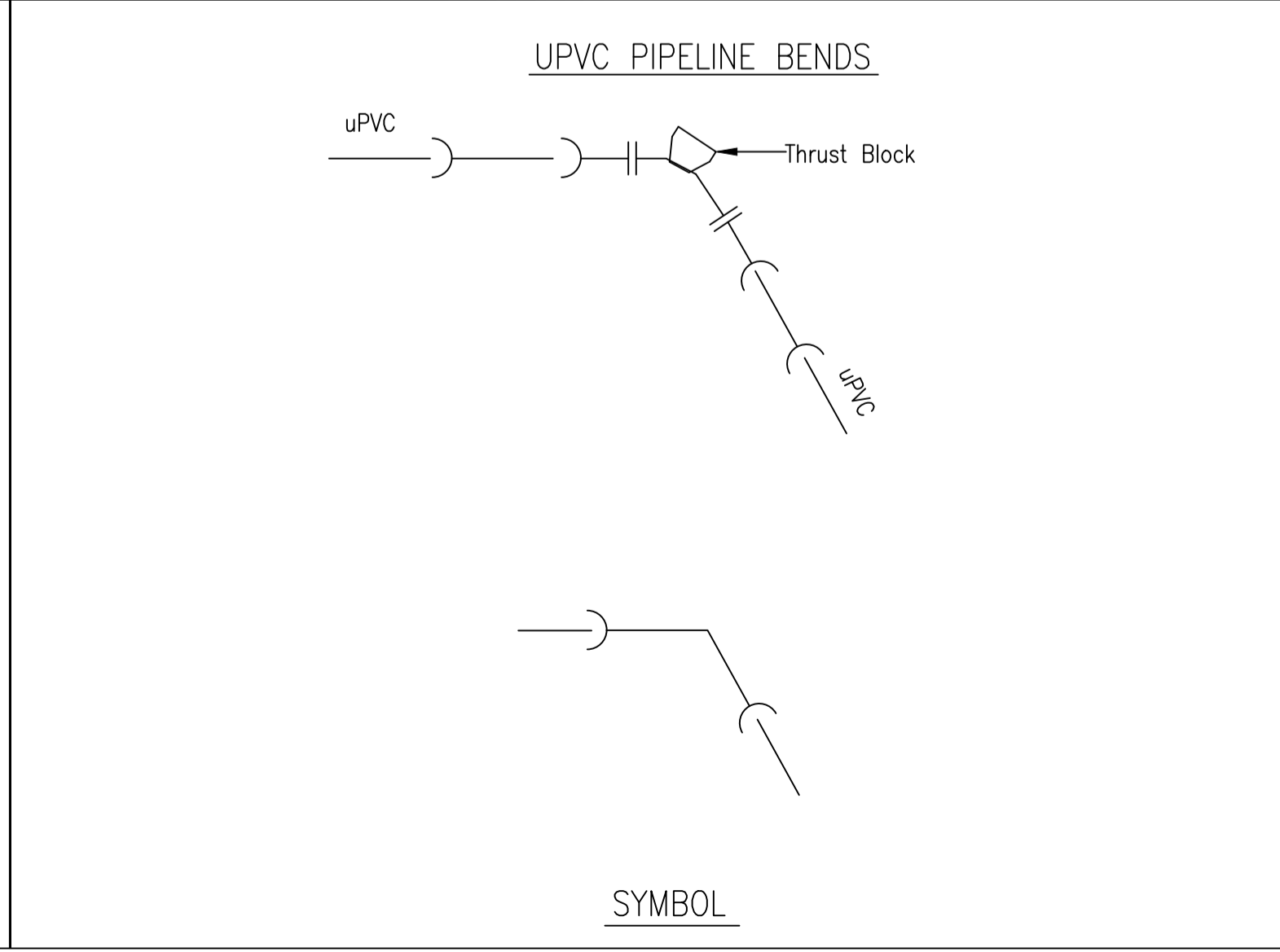
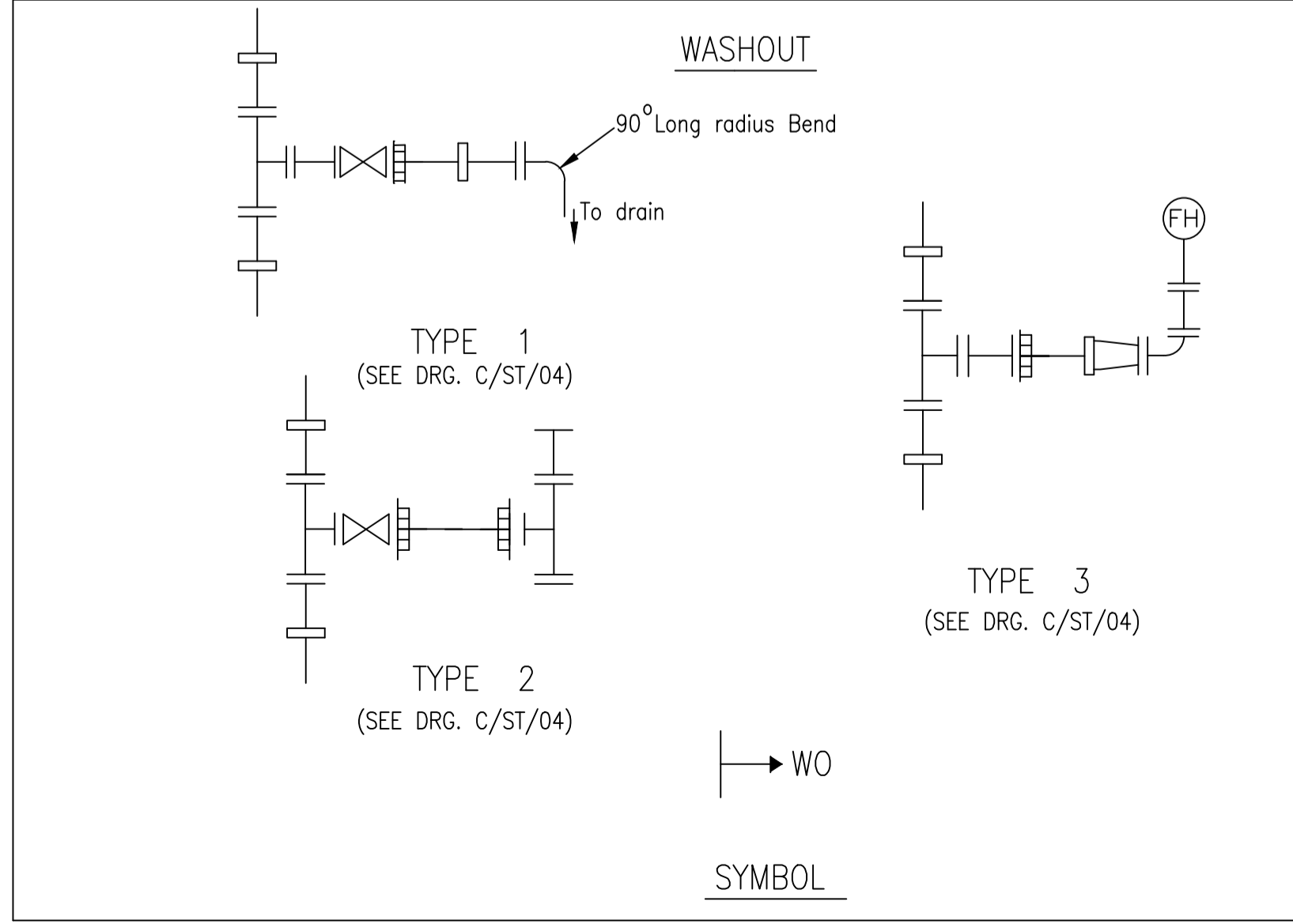


REV	REVISIONS	Dr. No.	SIGN	DATE	APPROVED
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B			BY		CHECKED
A			BY		CHECKED
0			BY		CHECKED

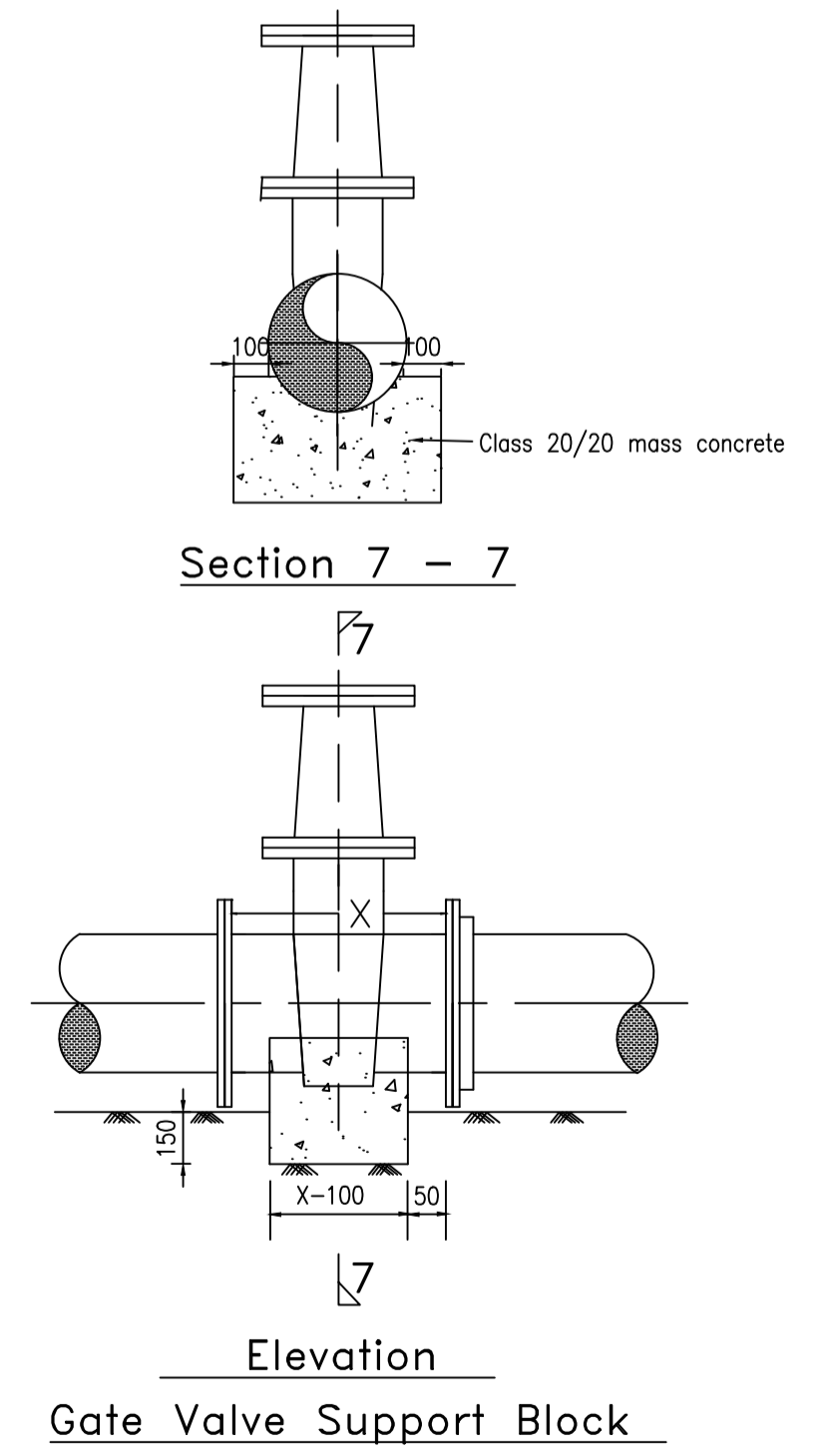
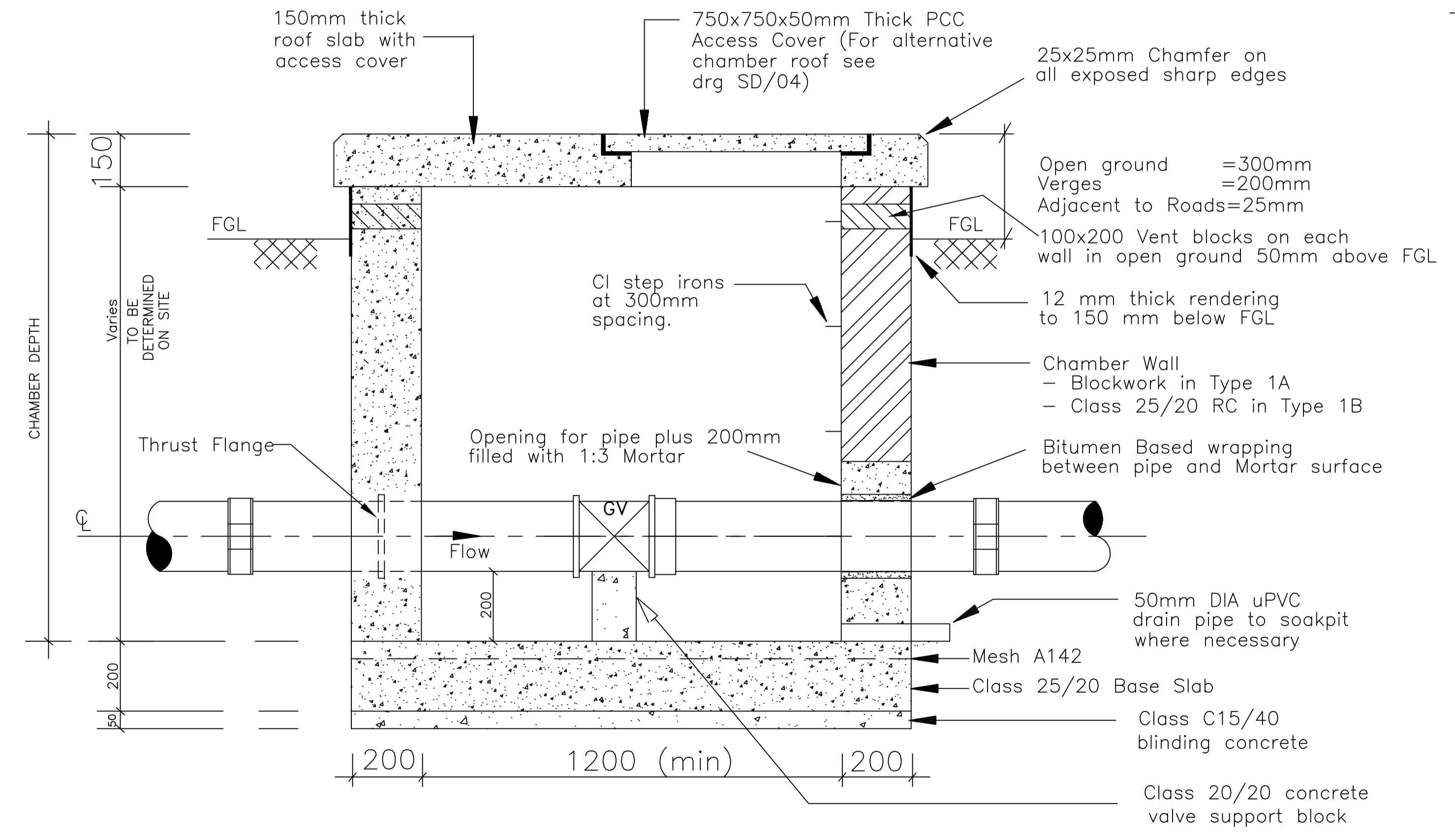
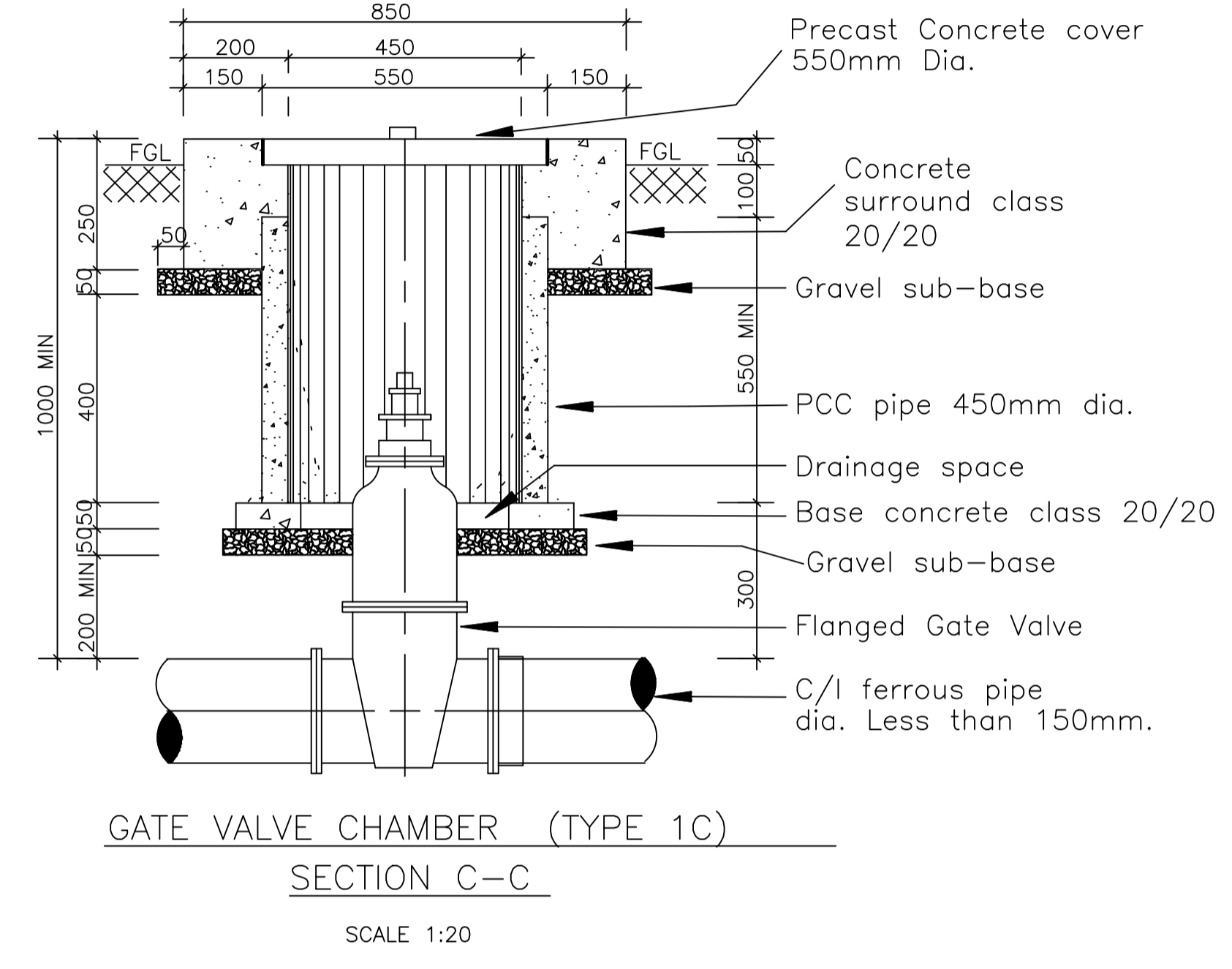
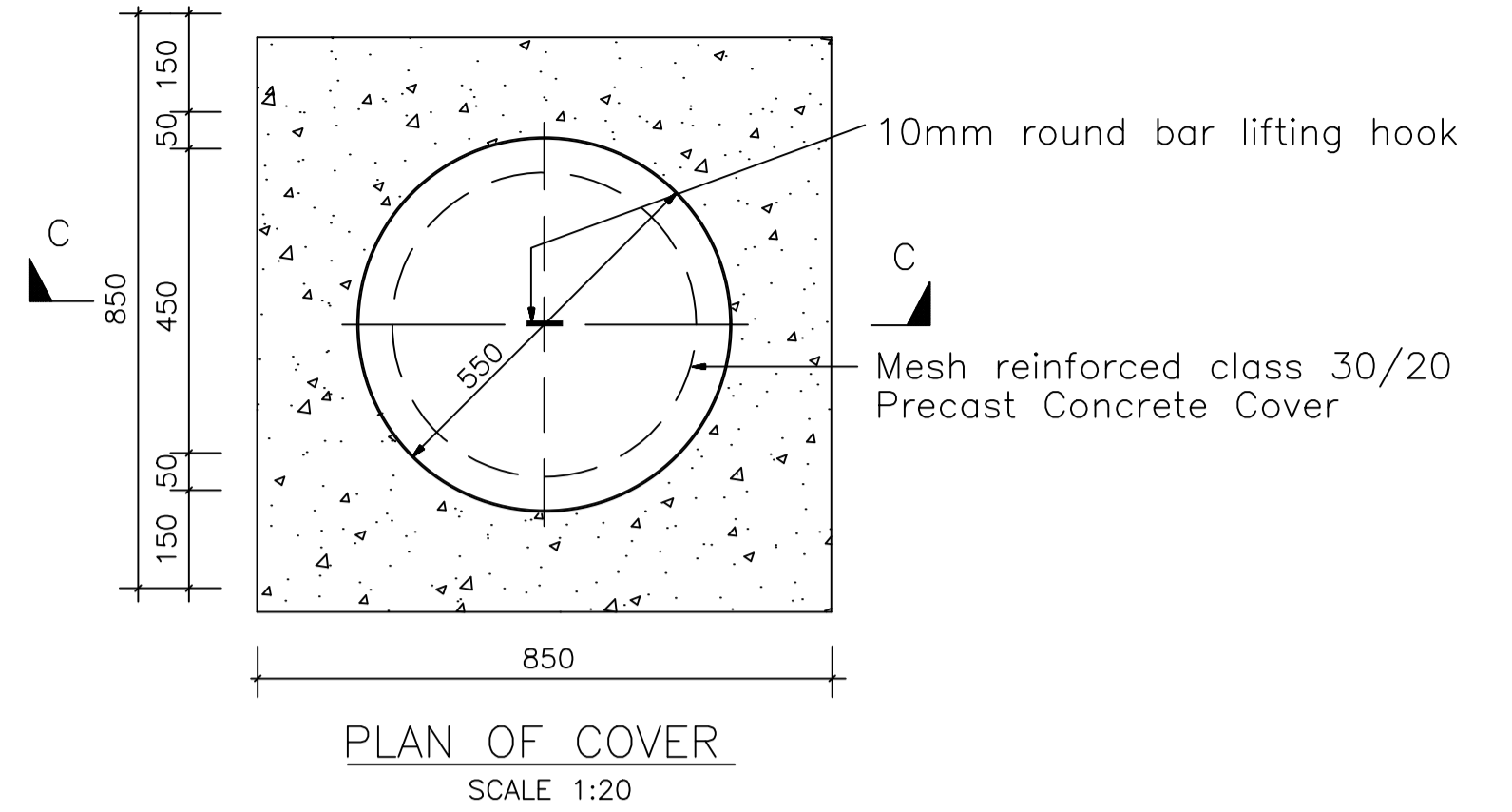
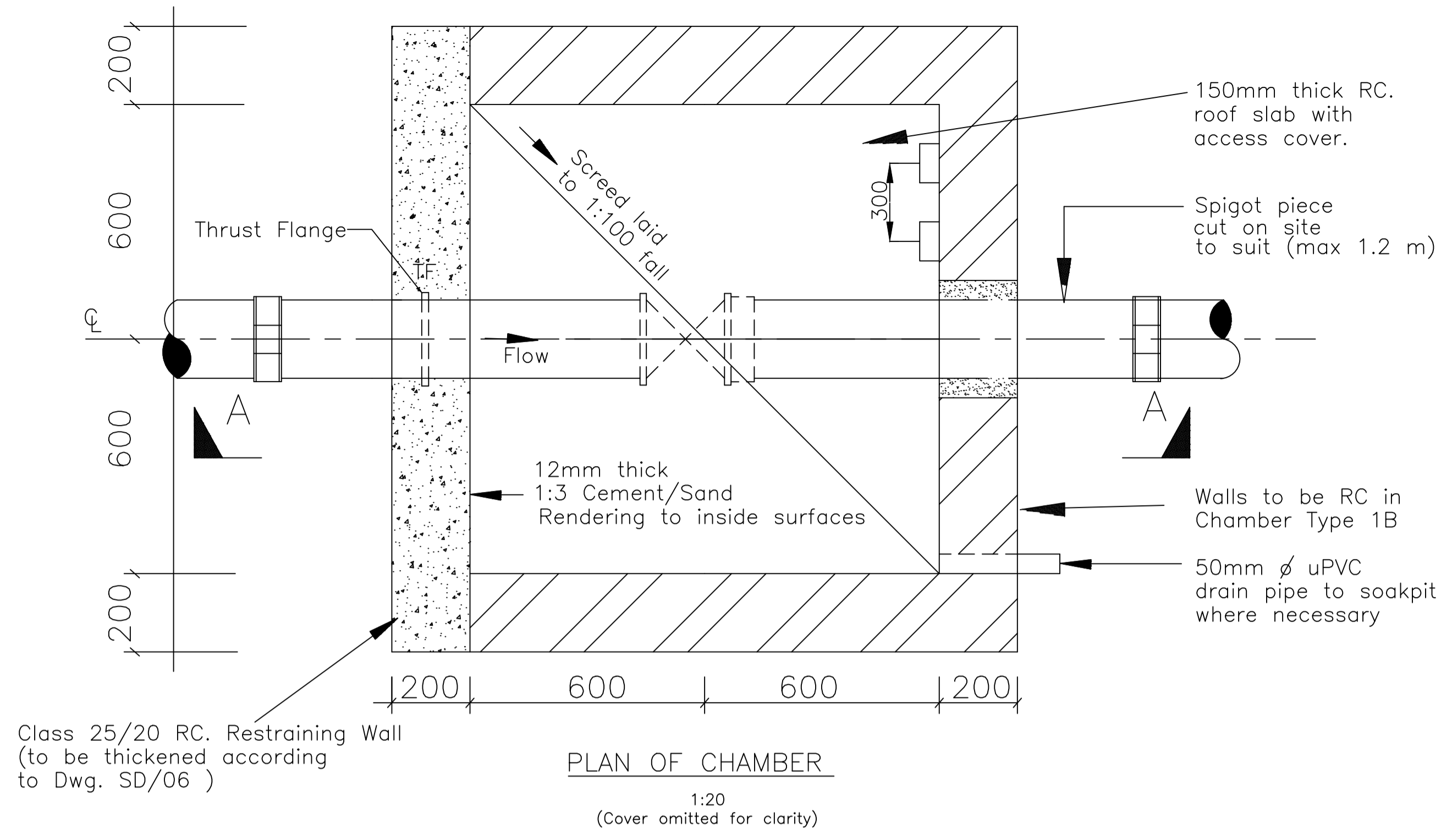


Client:
NORTHERN WATER WORKS
DEVELOPMENT AGENCY
P.o.BoX 495-GARISSA

Project:
IJARA WATER SUPPLY PROJECT
MASALANI-GABABA
WORKS



Designed by	Drawn by		
Checked by	Approved by		
Title: STANDARD DETAILS PIPE FITTINGS			
Section Head	Date	Division Head	Date
Branch Head	Date	Director	Date
Scale	M/S	Date	
Job No.	ACAD File:		
STATUS	DRAWING No.NWDA/GSA/2019/SD/01	REV	



MAIN SIZE (mm)	GATE VALVE DIAMETER (mm)
100	100
150	150
200	200
250	250
300	300
350	300
400	300
500	400
600	500
700	600
800	600

GATE VALVE DIAMETER

- NOTES**
- Chamber type to be used as follows:
 - TYPE 1A** : To be used in unbuilt areas and where chamber depth do not exceed 2m.
 - TYPE 1B** : To be used in built up areas and where chamber depth exceeds 2.0m.
 - TYPE 1C** : To be used for valves Dia less than 150mm in all areas.
 - Where the Chamber wall is used for anchorage, the restraining wall thickness to be according to Drawing SD/06.
 - Chamber wall to be backfilled with 300mm thick granular fill around walls
 - Where the chamber is along footpath in built up areas, the cover may be flush with the footpath

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B			BY	CHECKED	
A			BY	CHECKED	
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P.o.Box 495-GARISSA

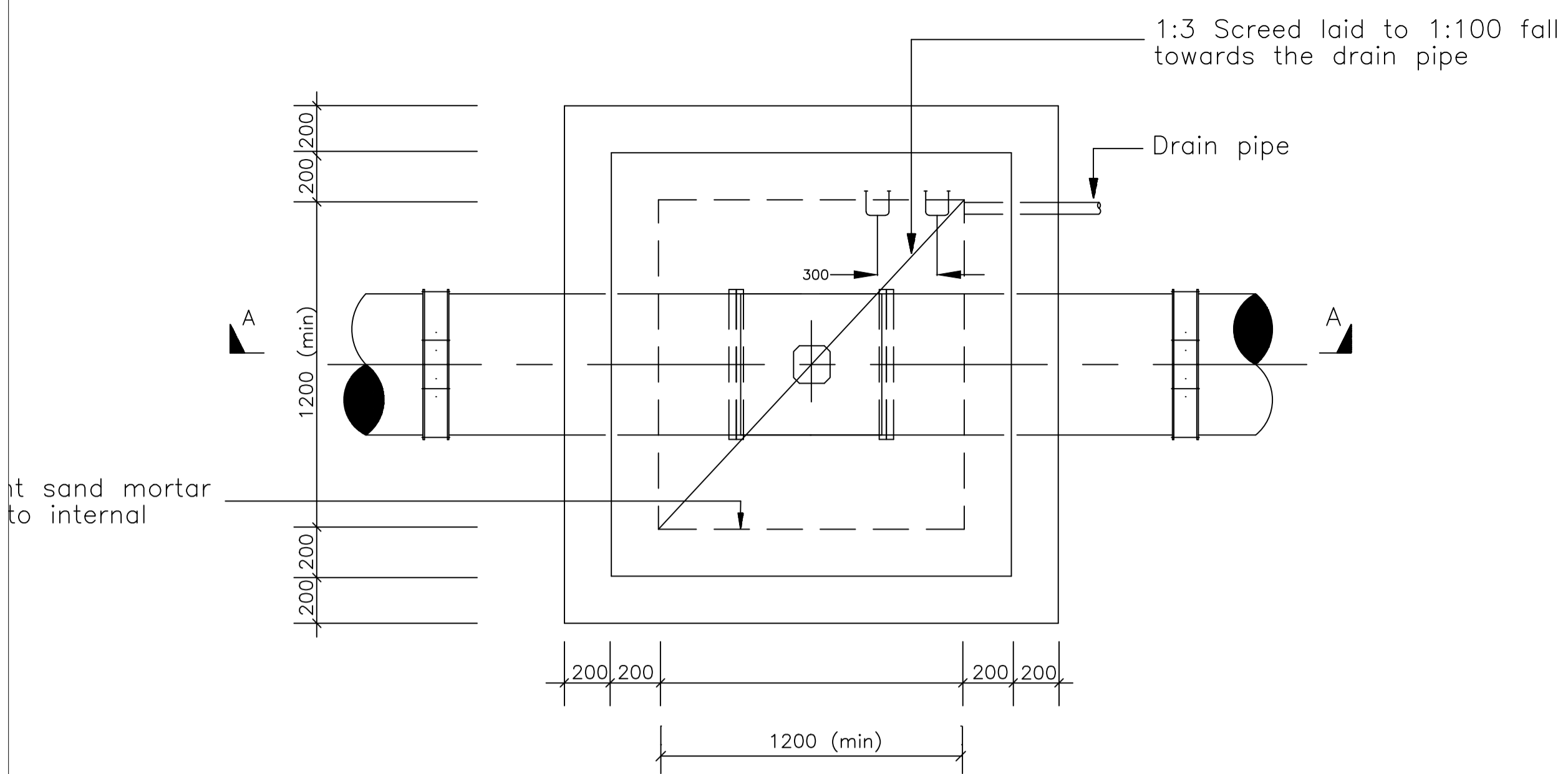
Project:
IJARA WATER SUPPLY PROJECT
MASALANI-GABABA
WORKS

Designed by _____ Drawn by _____
Checked by _____ Approved by _____

Title:
STANDARD DETAILS
GATE VALVE CHAMBERS

Section Head	Date	Division Head	Date
Branch Head	Date	Director	Date
Scale	AS SHOWN	Date	DEC 2022
Job No.		ACAD File:	
STATUS	DRAWING No.	WW/WD/874/SD/002	REV

PLOT FAC
MAGENTA - 0.
WHITE - 0.25
RED - 0.2
COLOUR 8 -
COLOUR 9 -
REST - 0.15
NOTES



PLAN OF CHAMBER
(Roof omitted for clarity)
Scale 1:40

TABLE OF AIR VALVE BRANCH

MAIN SIZE (mm)	AIR VALVE BRANCH DIAMETER (mm)
100	25
150	50
200	50
250	75
300	75
350	75
400	100
500	100
600	100
700	150
800	150

AIR VALVE CHAMBER WALLS

TYPE 2A – MASONRY OR BLOCKWORK WALL.
TYPE 2B – REINFORCED CONCRETE WALL..

NOTES

- All dimensions are in mm unless otherwise stated
- All Mesh reinforcement should conform to BS.4483
- Air valve chamber wall to be masonry or blockwork in rural areas where depth is less than 2m. In urban areas and rural areas where depths exceeds 2m. the Chamber wall to be reinforced concrete
- Step irons are only required where chamber is greater than 1000mm deep
- Chamber to be backfilled with 300mm thick granular fill around walls

REV	REVISIONS	Drw. No.	SIGN	DATE	APPROVED
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A			BY		
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O			BY		
			CHECKED		

Client

NORTHERN WATER WORKS
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P.o.Box 495-GARISSA

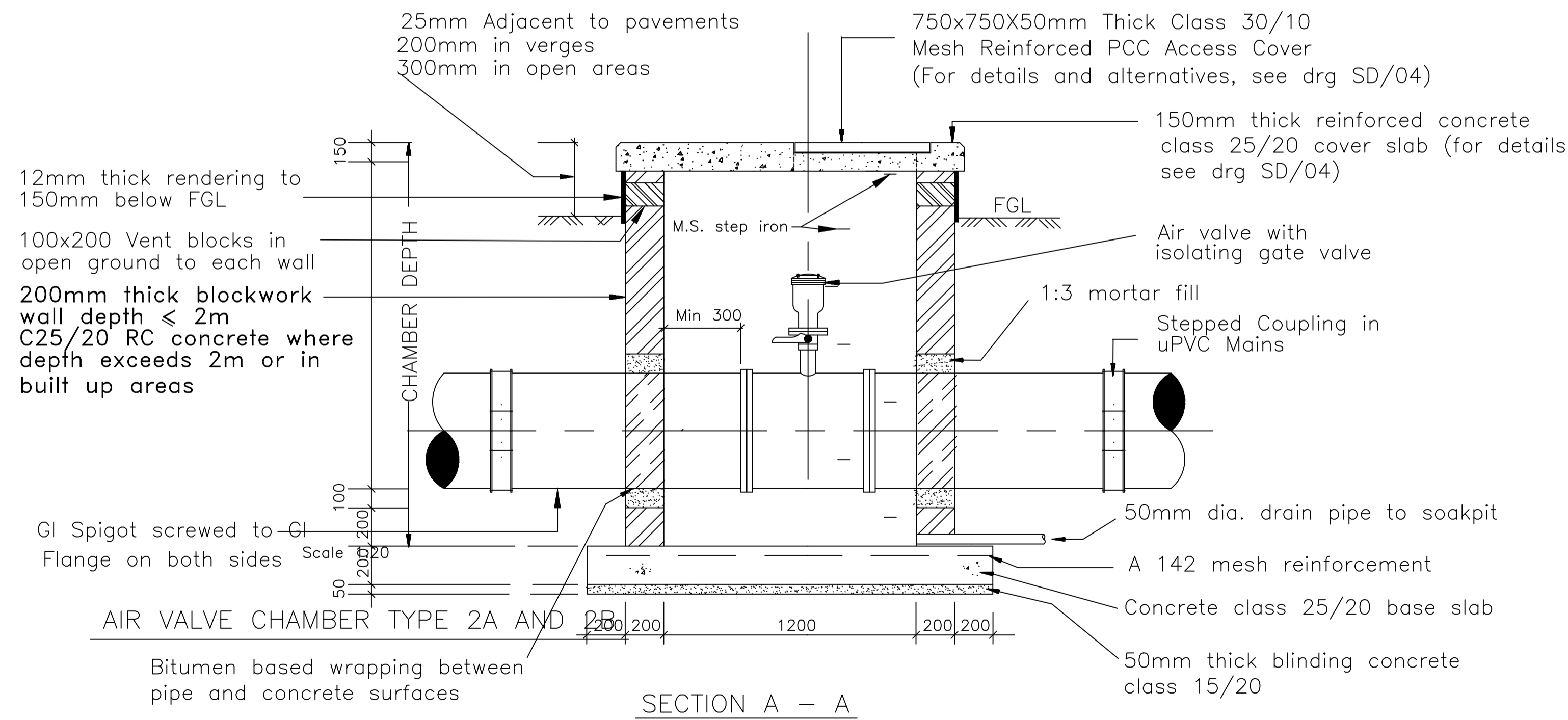
Project:

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MASALANI-GABABA
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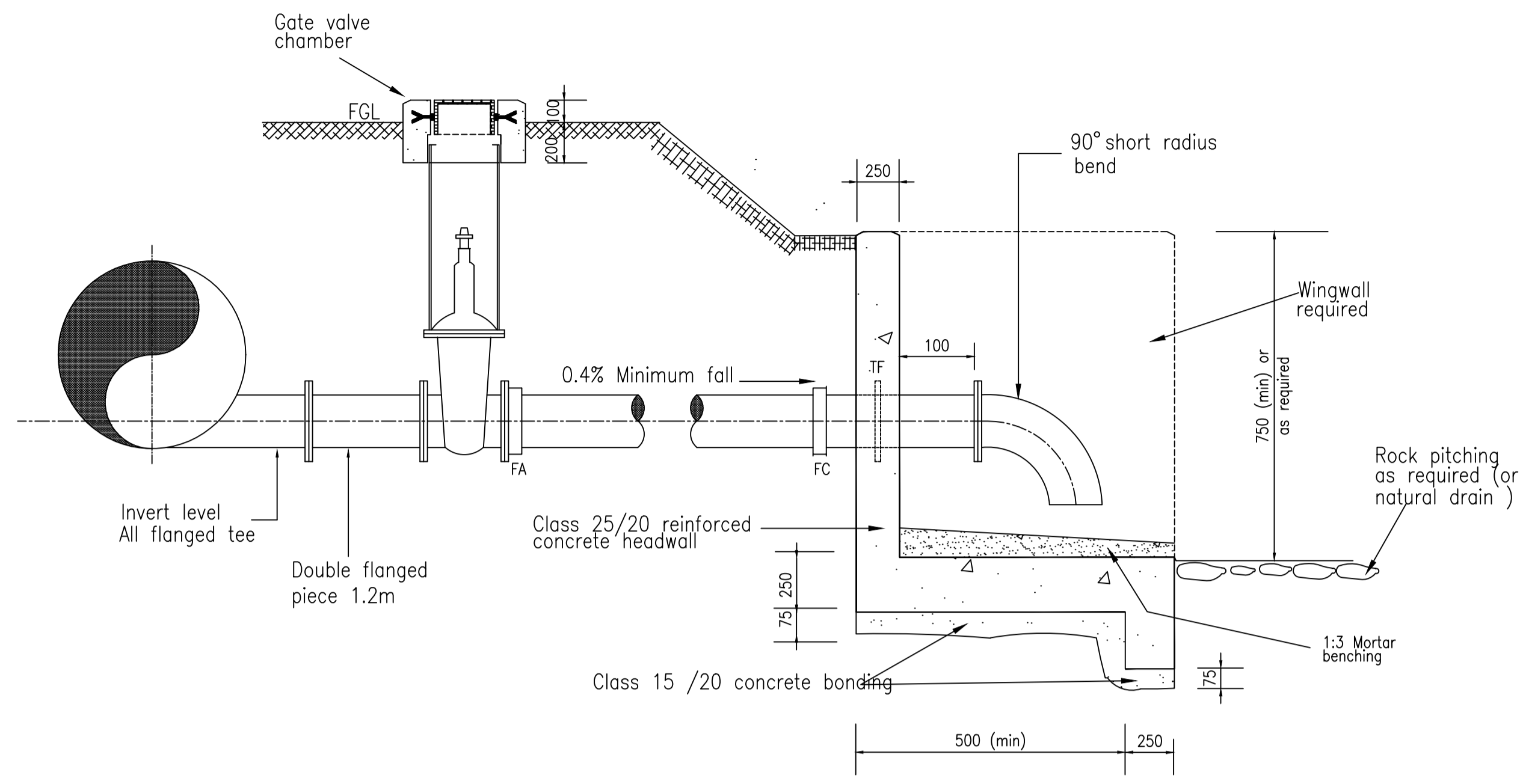
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Checked by _____ Approved by *DNS*

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STANDARD DETAILS
AIR VALVE CHAMBER

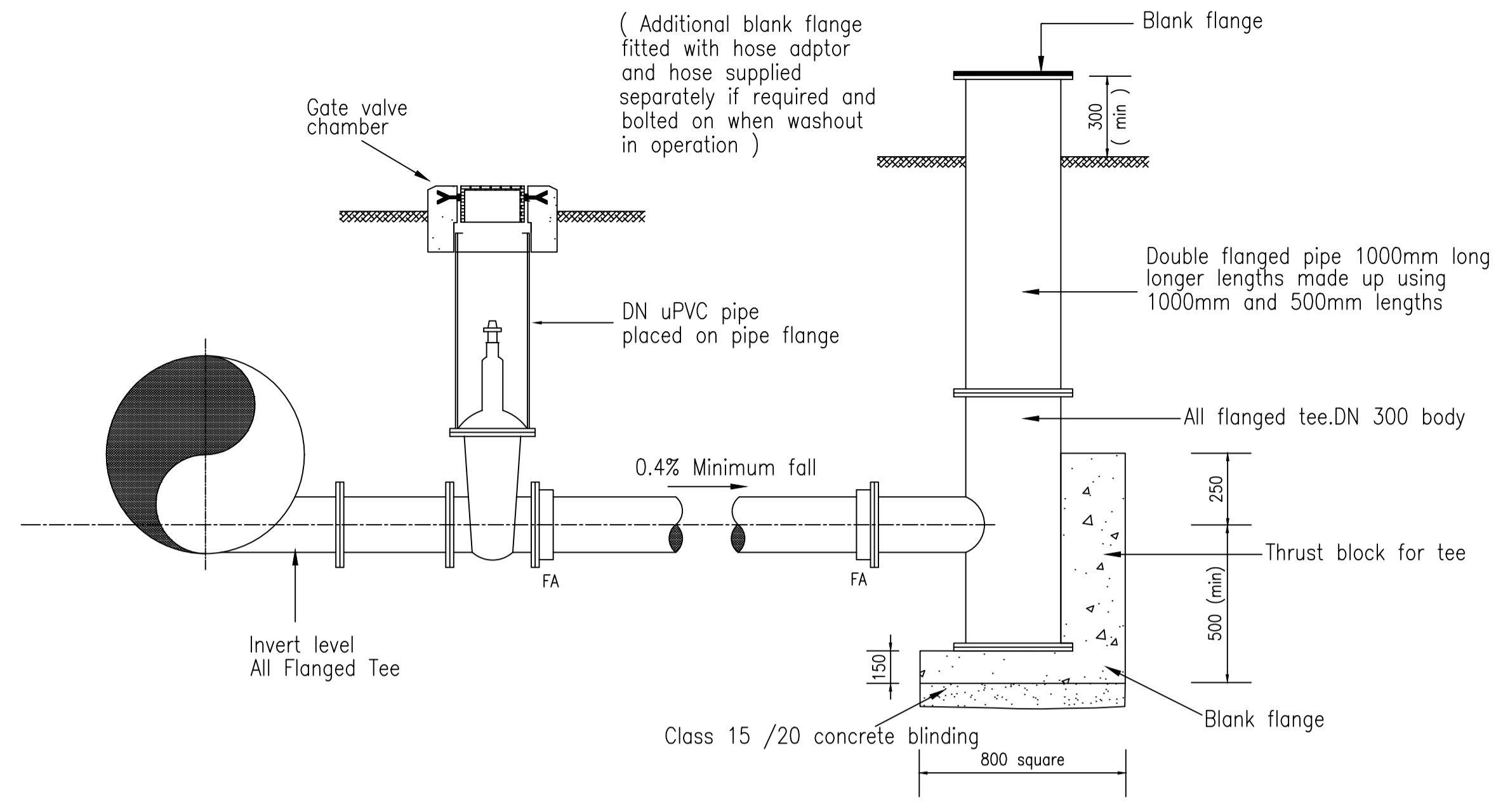
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Branch Head	Date	Director	Date
Scale	<i>AS SHOWN</i>	Date	<i>DEC 2022</i>
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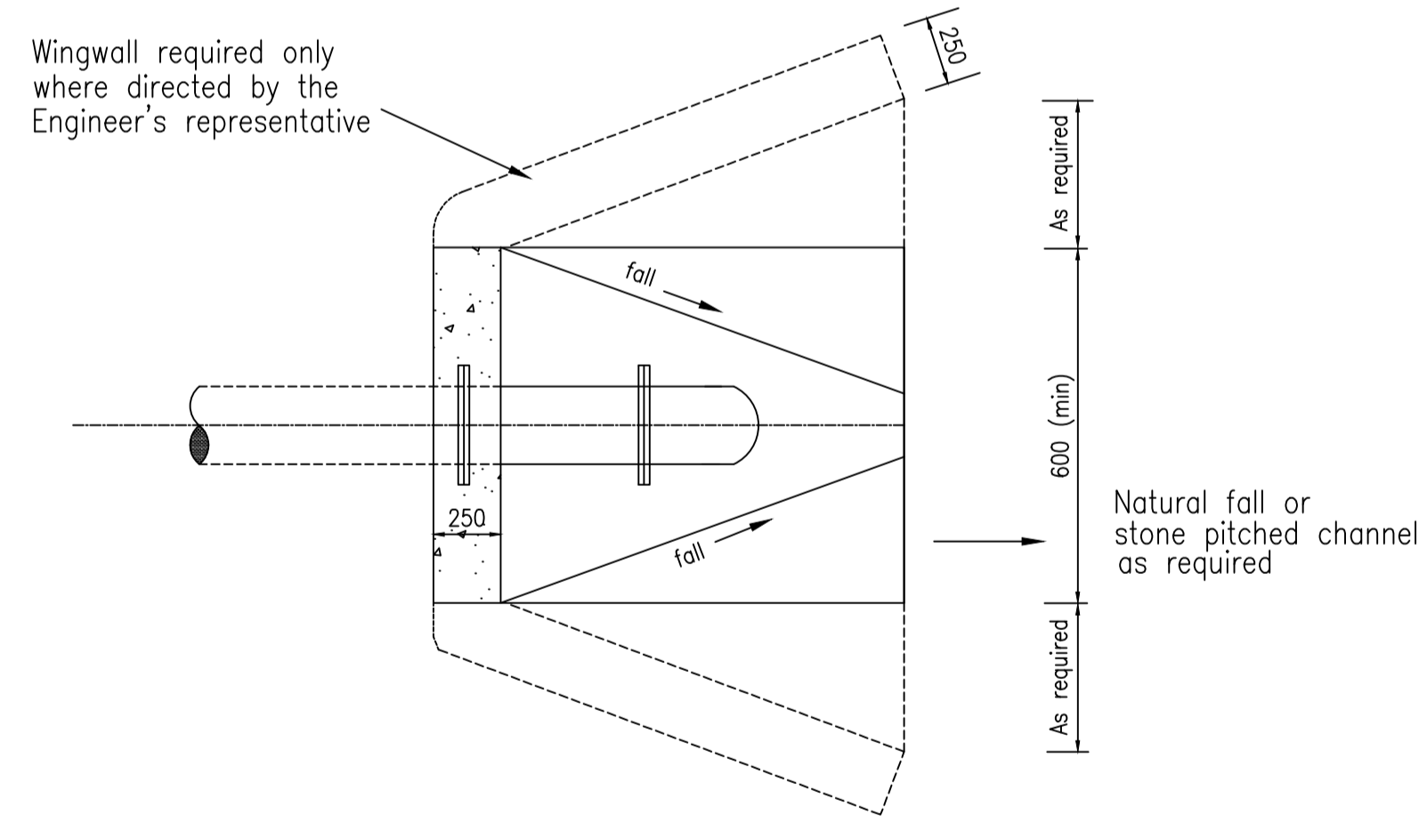
AIR VALVE CHAMBER TYPE 2A AND 2B
SECTION A - A



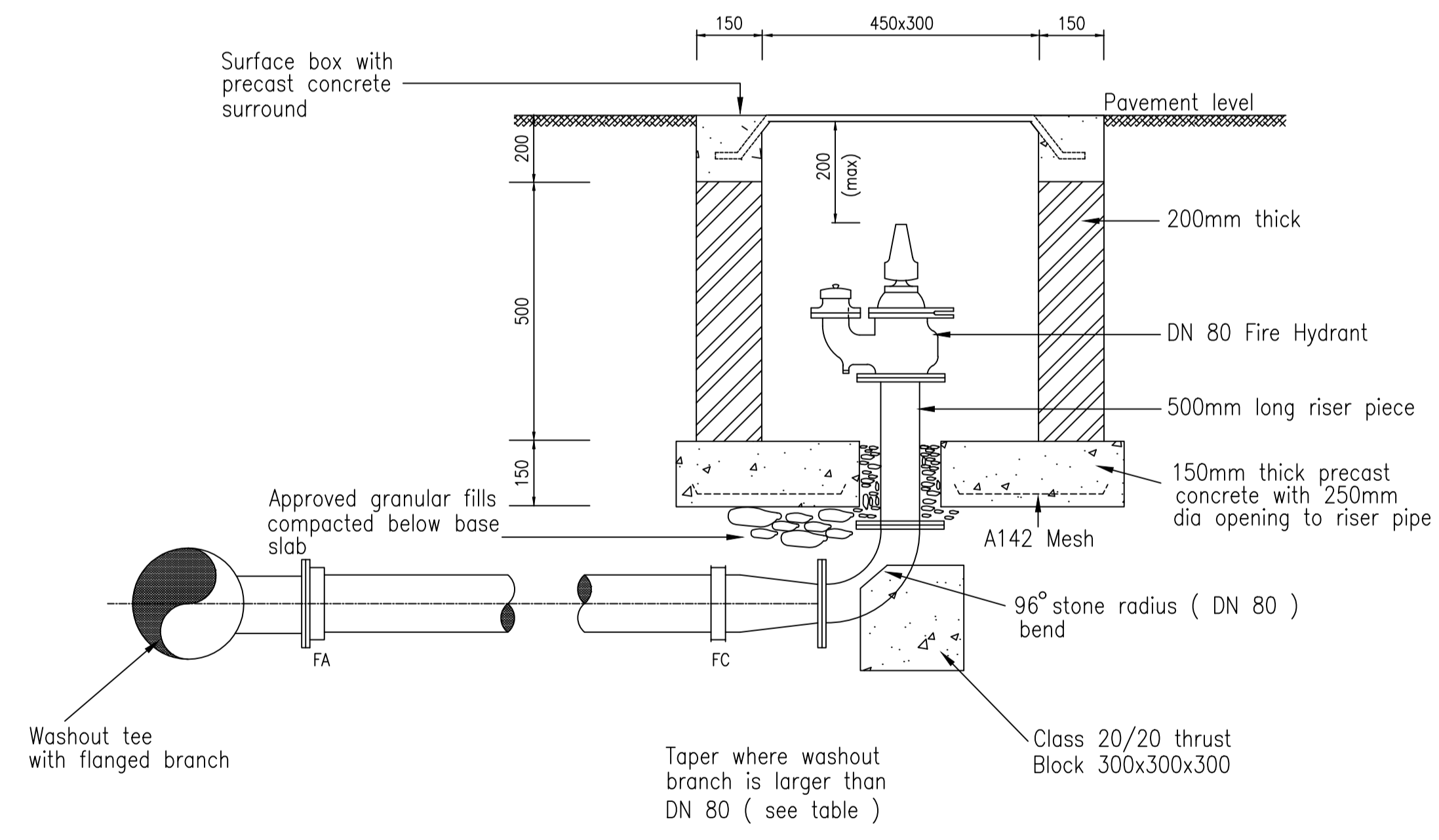
WASHOUT TYPE 1
ARRANGEMENT WITH NATURAL DRAINAGE



Washout Type 2
(ARRANGEMENT WHERE NATURAL DRAINAGE IS NOT POSSIBLE)



PLAN OF OUTFALL
Washout Type 1
(ARRANGEMENT WHERE NATURAL DRAINAGE IS POSSIBLE)



WASHOUT TYPE 3
WHERE NATURAL DRAINAGE IS NOT POSSIBLE AND THEN
WASHOUT LOCATED IN BUILT UP WHERE IT COULD BE
USED FOR FIRE FIGHTING) FOR MAIN SIZES LESS THAN 500 DN

TABLE OF WASHOUT BRANCH SIZES.

MAIN DIAMETER	WASHOUT BRANCH
100 - 300	80
350 - 500	100
600 - 700	150
ABOVE 700	200

NOTES

1. All dimensions are in mm unless otherwise stated
2. Surface boxes to chambers to be of cast iron
3. All external edges to be chamfered (25x25mm)
4. Precast Concrete to Class 30/10

REV	REVISIONS	Drng. No.	SIGN	DATE	APPROVED
C			BY		
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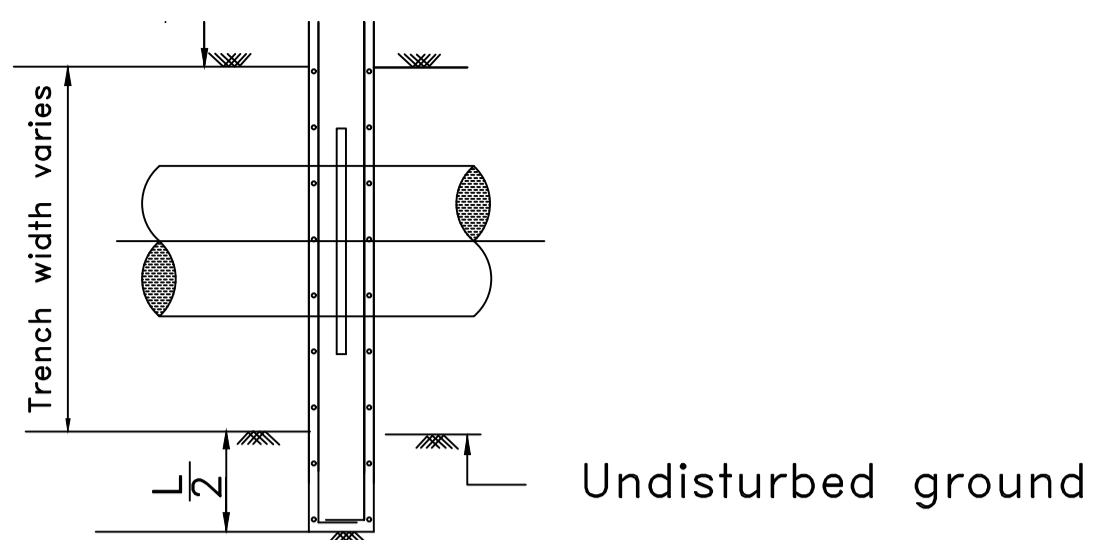
Client:
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DEVELOPMENT AGENCY
P.o.Box 495-GARISSA

Project:
IJARA WATER SUPPLY PROJECT
MASALANI-GABABA
WORKS

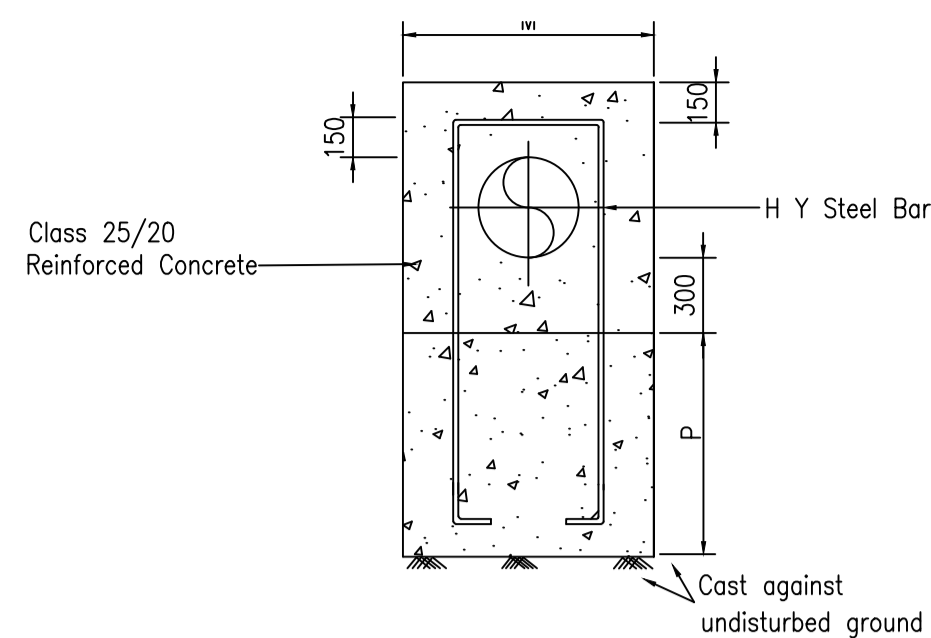
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Checked by _____ Approved by _____

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STANDARD DETAILS
WASHOUTS DETAILS

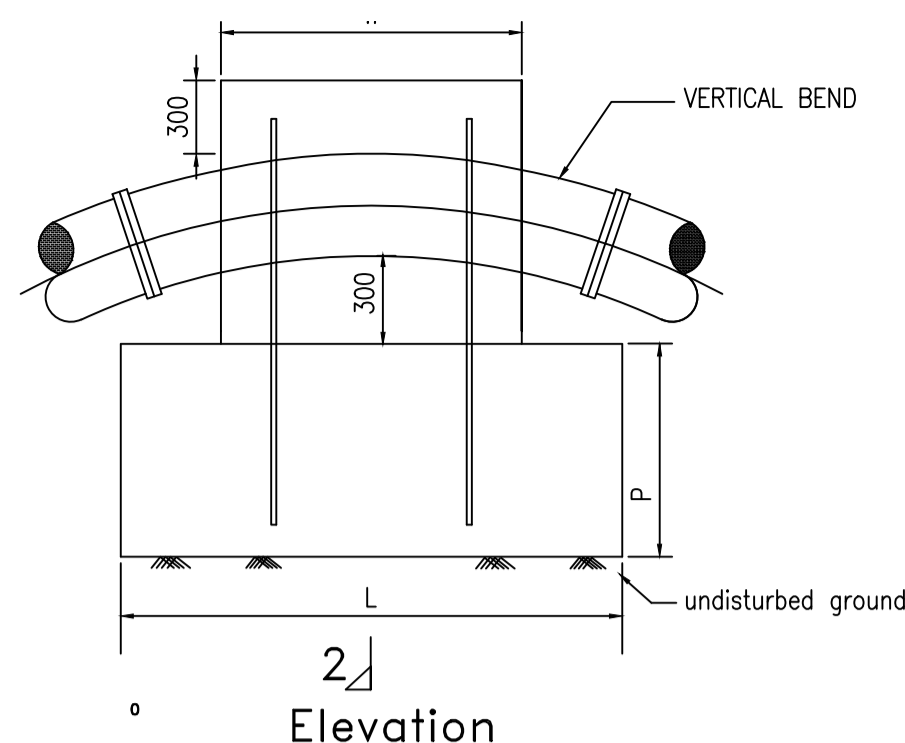
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Branch Head	Date	Director	Date
Scale	M/S	Date	DEC 2022
Job No.		ACAD File:	



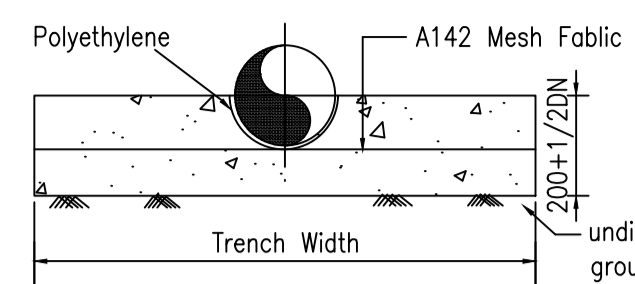
Section 1 - 1



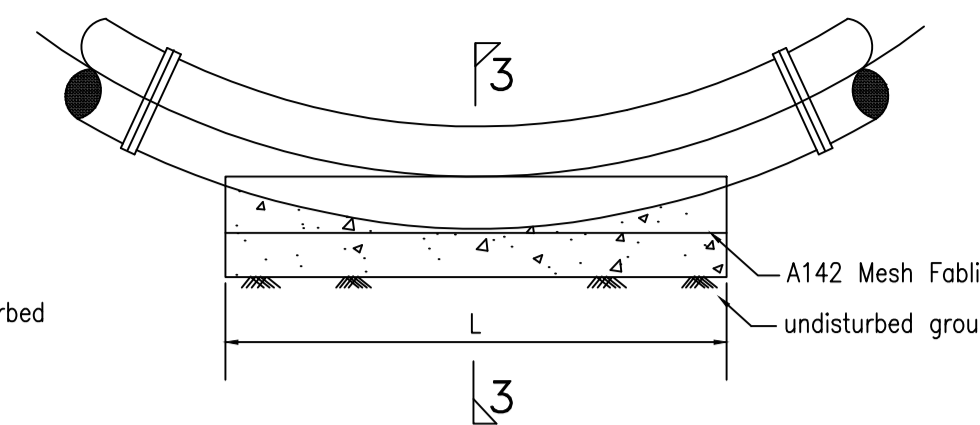
Section 2 - 2



Elevation



Section 3 - 3



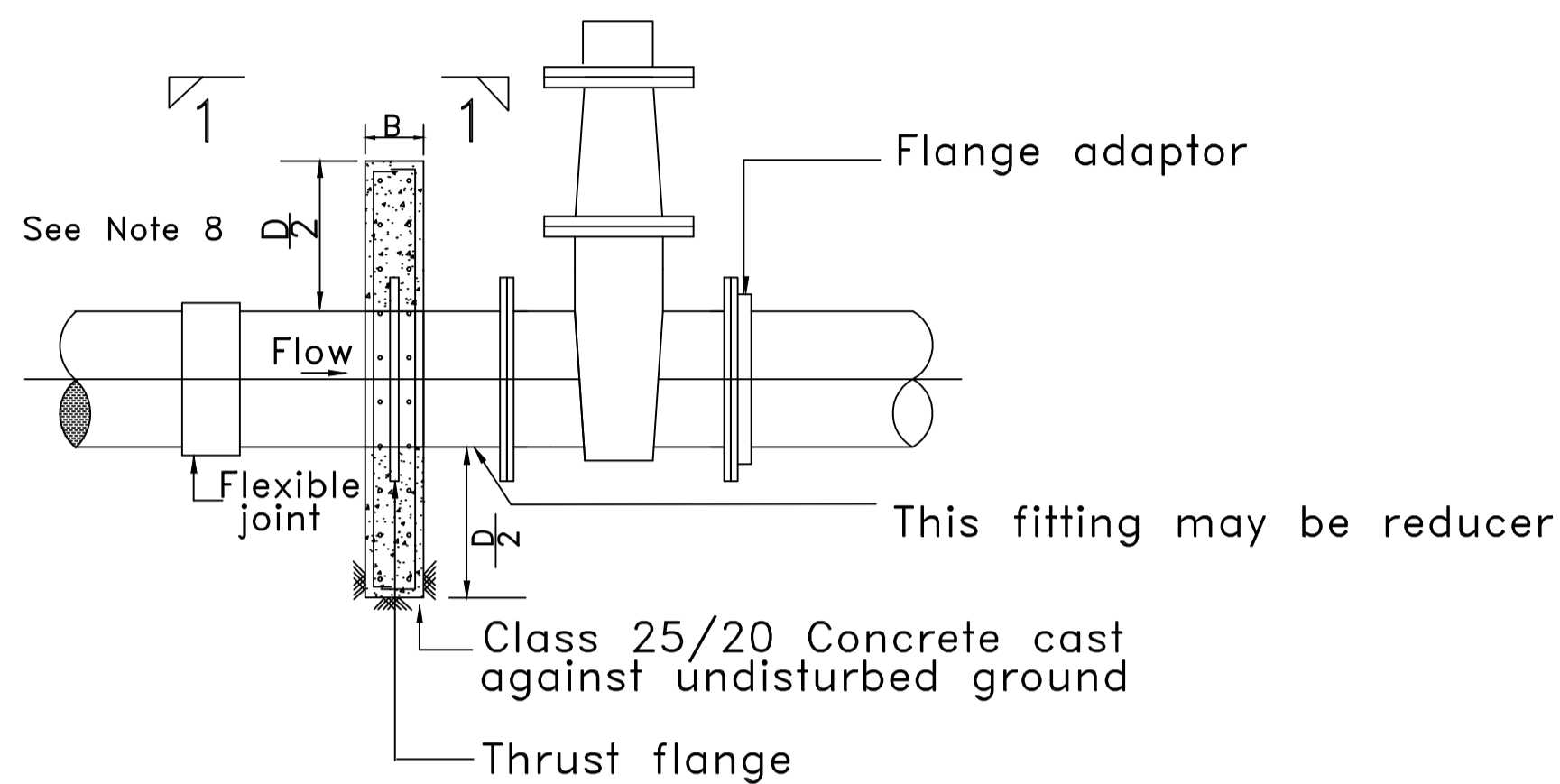
Elevation

IJARA WATER SUPPLY Vertical Bends - Typical

(SEE NOTE 7)

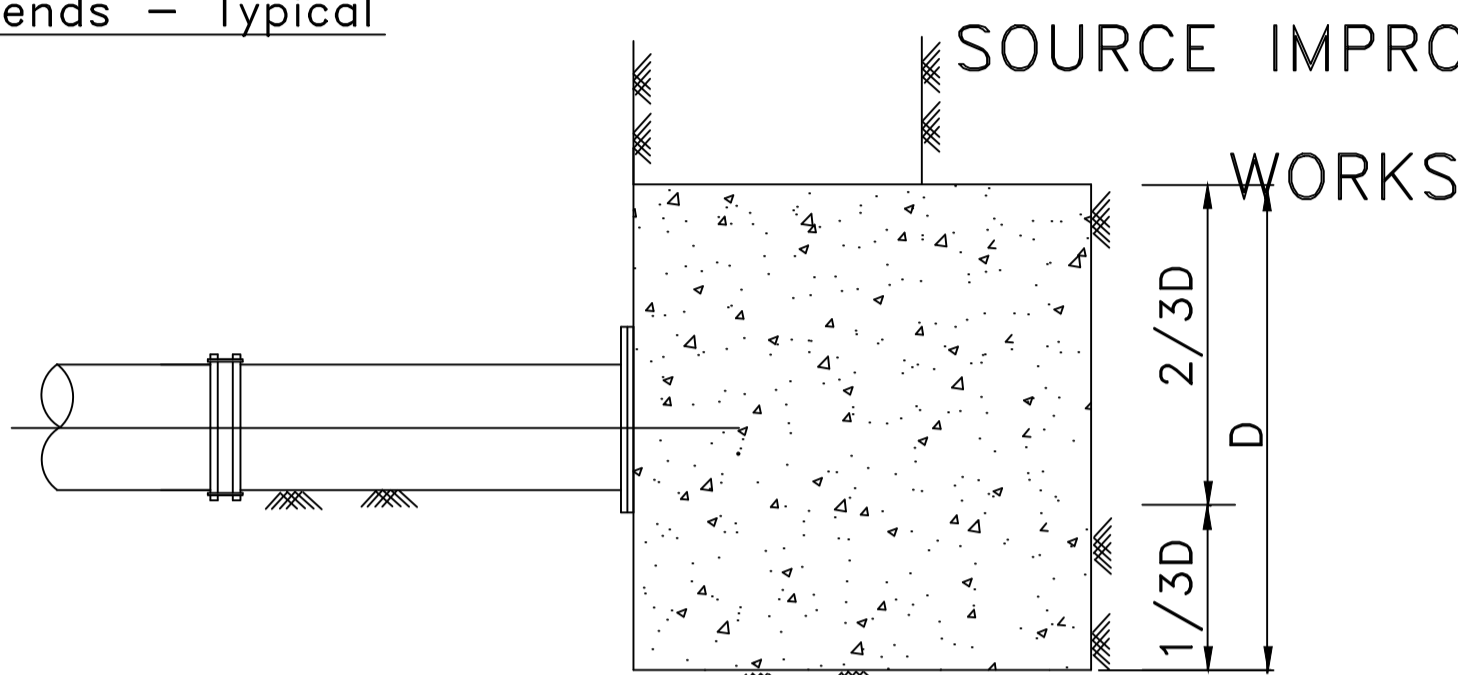
Upthrust Vertical Bends - Typical

(SEE NOTE 7)

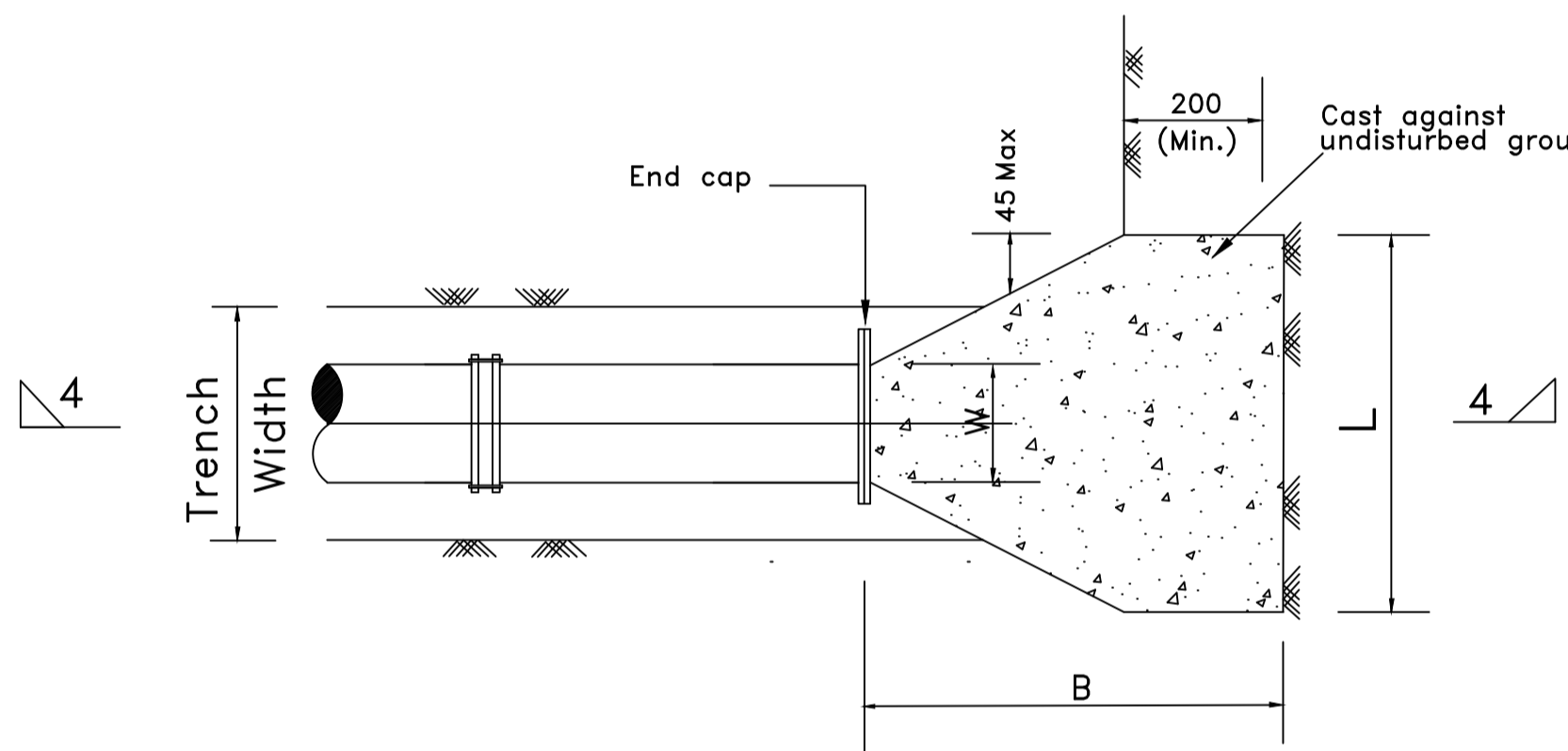


Elevation

Anchor Block for Gate Valves



Section 4 - 4



Plan

Thrust Block for Blank Ends

TEST HEAD (m)	PIPE DIA mm	D (m)	L (m)	B (mm)	CONCRETE VOL m3
100	600	1.4	2.4	1.0	2.3
	500	1.3	1.8	0.9	1.4
	450	1.3	1.6	0.9	1.2
	400	1.0	1.6	0.8	0.8
	350	1.0	1.2	0.6	0.5
160	300	0.8	1.0	0.6	0.3
	250	0.8	0.8	0.5	0.2
	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
	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

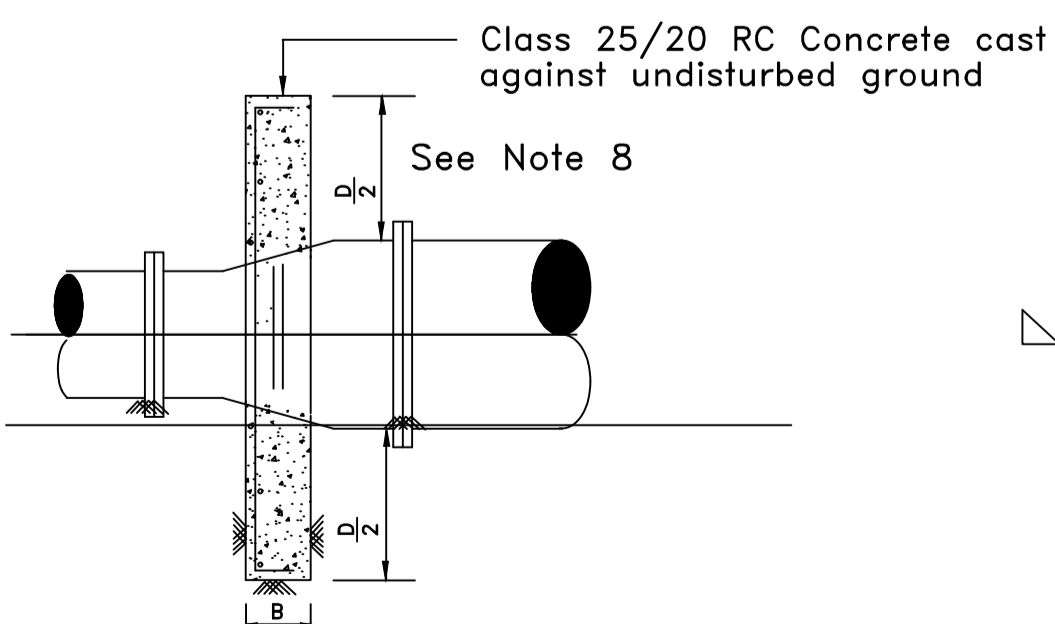
MAIN SIZE (mm)	BLOCK TYPE	
	100m Head	160m Head
600	E	E
500	D	E
450	D	D
400	C	D
350	C	C
300	B	C
250	B	B
200	A	A
150	A	A
100	A	A

Table of Anchor Blocks For Gate Valves

BLOCK TYPE	D (m)	L (m)	B (mm)	MAIN STEEL	DISTRIBUTION STEEL
A	0.6	0.8	200	Y10 - 150	Y10 - 150
B	0.8	1.0	300	Y10 - 150	Y10 - 150
C	1.0	1.6	300	Y12 - 150	Y10 - 150
D	1.2	2.0	400	Y16 - 150	Y12 - 150
E	1.4	2.6	500	Y20 - 150	Y12 - 150

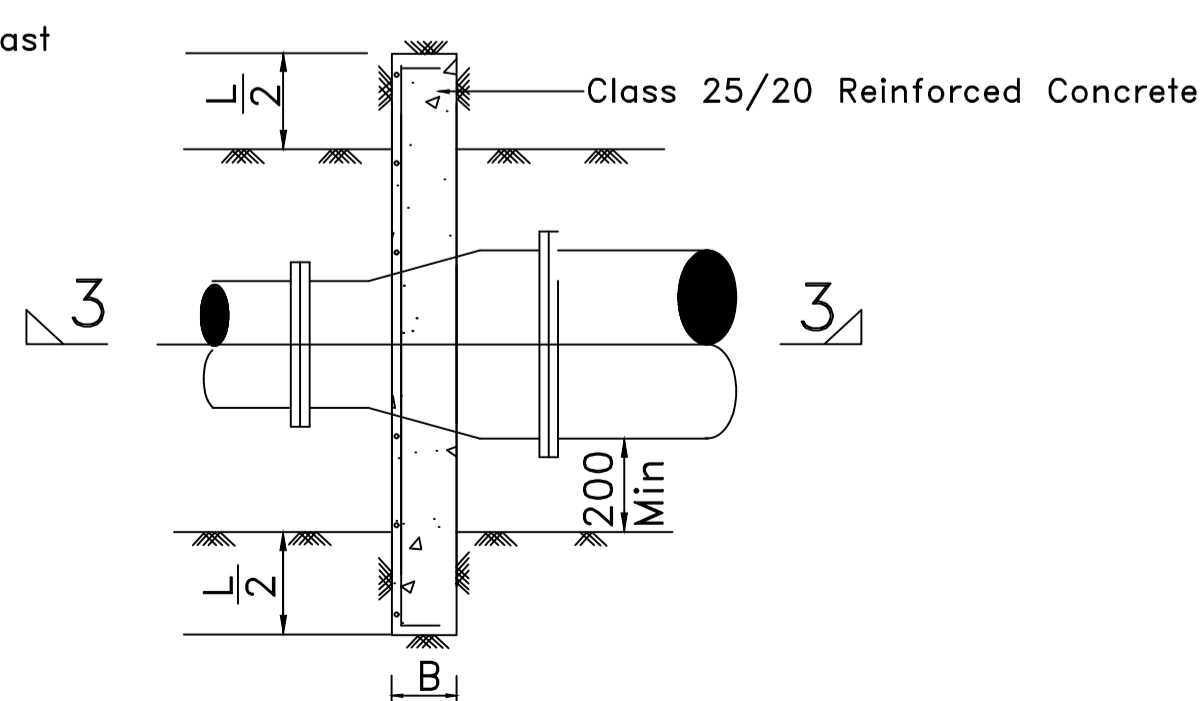
Details of Anchor Blocks for Gate Valves and Tapers

(CLASS '25/20' CONCRETE)



Section 3 - 3

Thrust Blocks for Tapers - Typical



Plan

MAIN SIZE (mm)	DIMENSIONS (See table 4)																	
	TAPER (SMALLER SIZE) mm									TAPER (SMALLER SIZE) mm								
	100 m HEAD TEST PRESSURE									160 m HEAD TEST PRESSURE								
	500	450	400	350	300	250	200	150	100	500	450	400	350	300	250	200	150	100
600	C	D	D	E	E	—	—	—	—	C	D	E	E	E	—	—	—	—
500	—	B	C	C	D	—	—	—	—	—	B	C	D	D	—	—	—	—
450	—	—	B	C	C	D	—	—	—	—	—	B	C	D	D	—	—	—
400	—	—	—	A	B	C	C	—	—	—	—	B	C	C	D	—	—	—
350	—	—	—	—	A	B	B	C	—	—	—	—	B	C	C	D	—	—
300	—	—	—	—	—	A	B	B	—	—	—	—	—	A	B	C	—	—
250	—	—	—	—	—	—	A	A	B	—	—	—	—	—	B	C	—	—
200	—	—	—	—	—	—	—	A	A	—	—	—	—	—	A	B	B	—
150	—	—	—	—	—	—	—	—	A	—	—	—	—	—	—	—	—	A

Table of Anchor Blocks for Tapers

(CLASS '20/20' CONCRETE)

- All concrete thrust blocks shall be constructed on and against firm ground directly. The thrust or anchor blocks shall not be cast against black cotton soil and reference shall be made to the Engineer's Representative for further instructions.
- The concrete thrust blocks are designed to bear on the original earth surface with bearing pressure of 100KN/m²
- Concrete to be Class '20/20' unless otherwise stated.
- Concrete in thrust and anchor blocks must be cast clear of joints
- Dimensions 'W' for thrust blocks on vertical bends to suit the size of bend and clearance required for joints.
- The steel anchoring reinforcement and the dimensions L, P and M are to be decided by the Engineer's Representative to suit each individual bend.
- Where D/2 exceeds the cover, increase the depth below the pipe to make the total = D.

LEGEND

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

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			CHECKED		
A			BY		
			CHECKED		
O			BY		
			CHECKED		

Client:

NORTHERN WATER WORKS
DEVELOPMENT AGENCY
P.o.Box 495-GARISSA

Project:

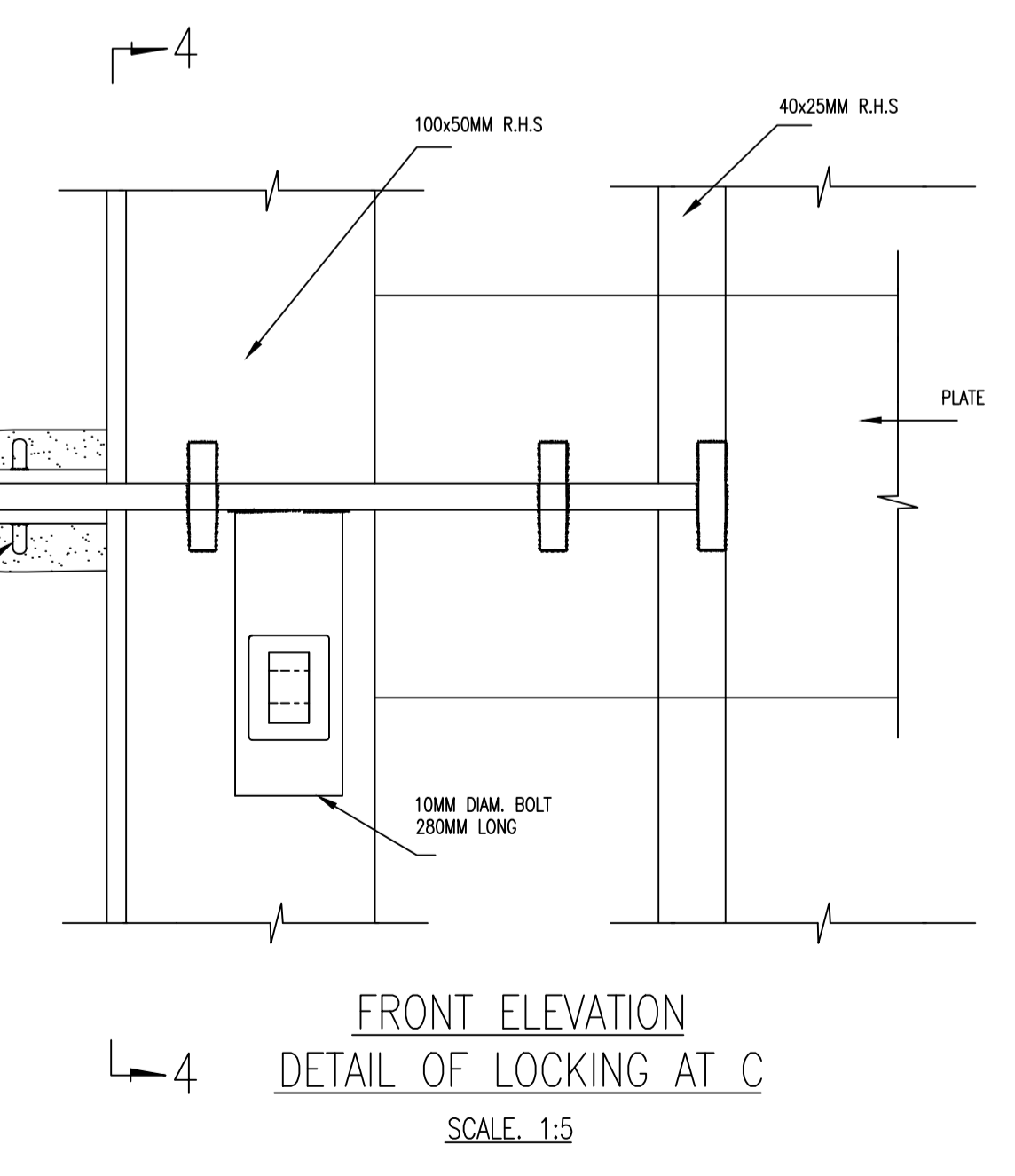
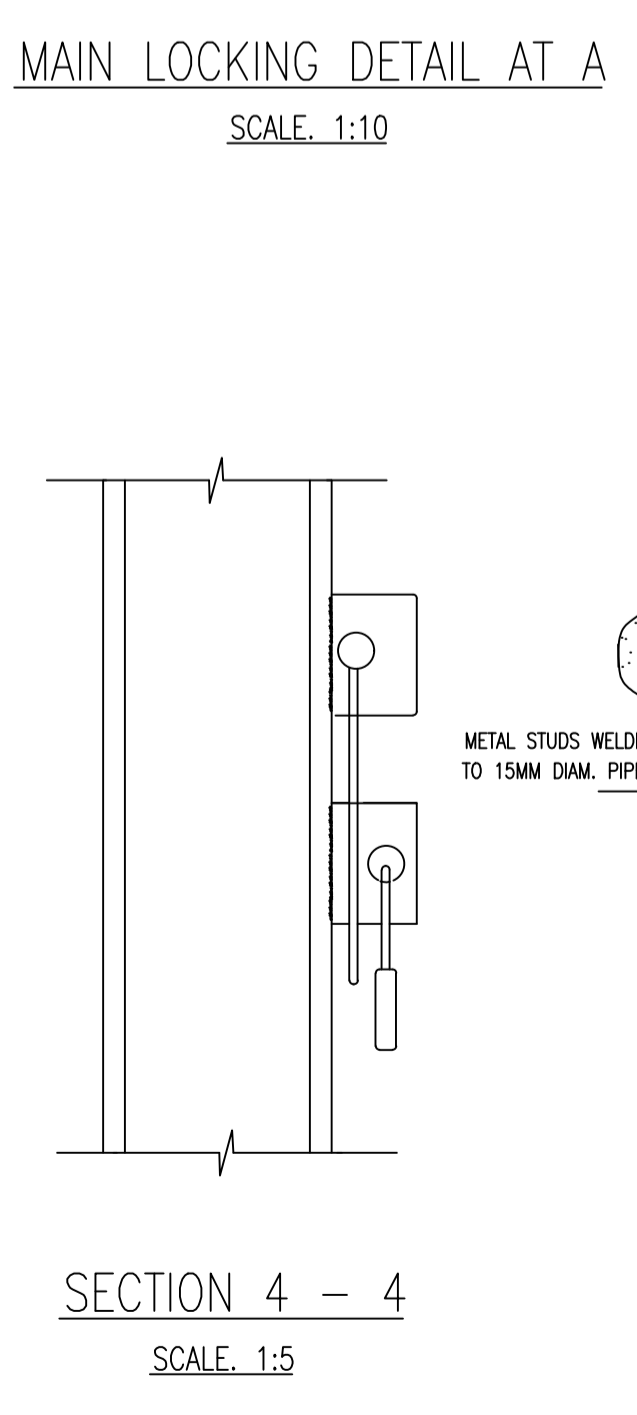
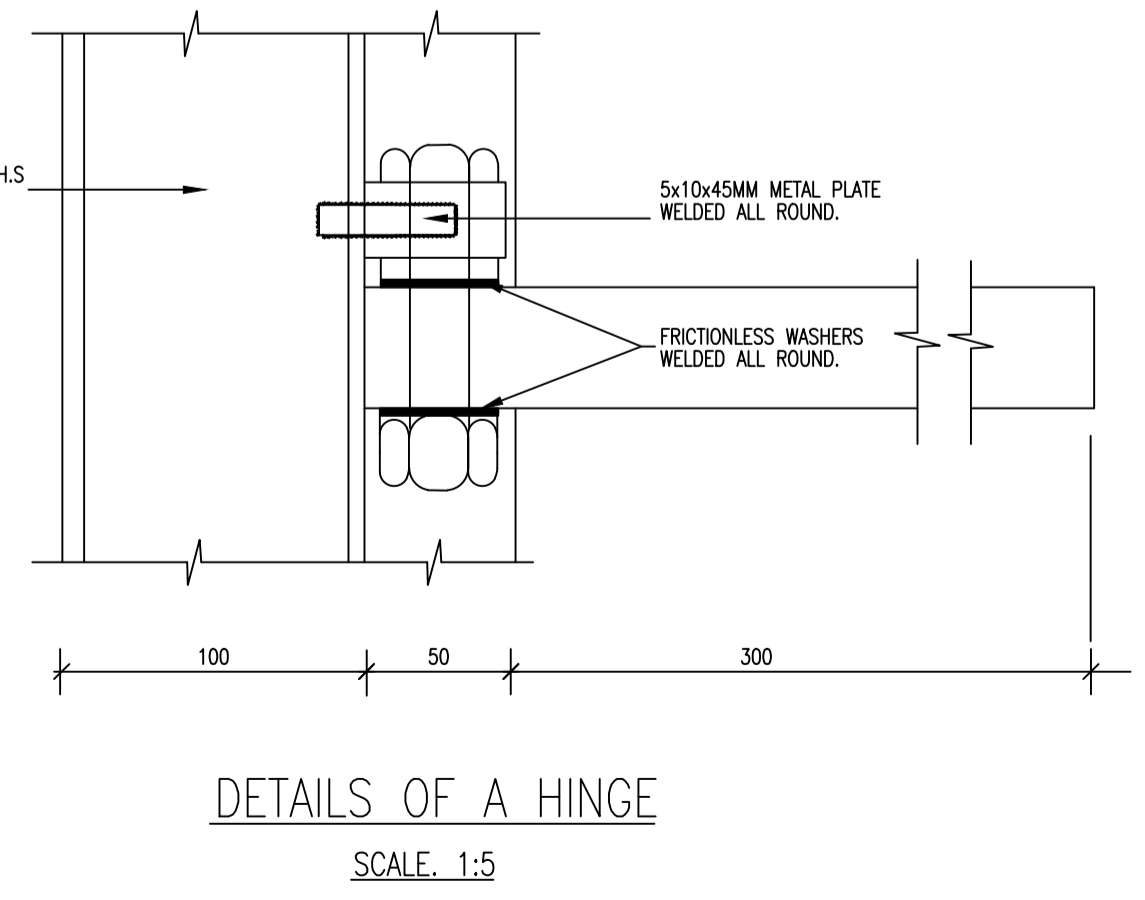
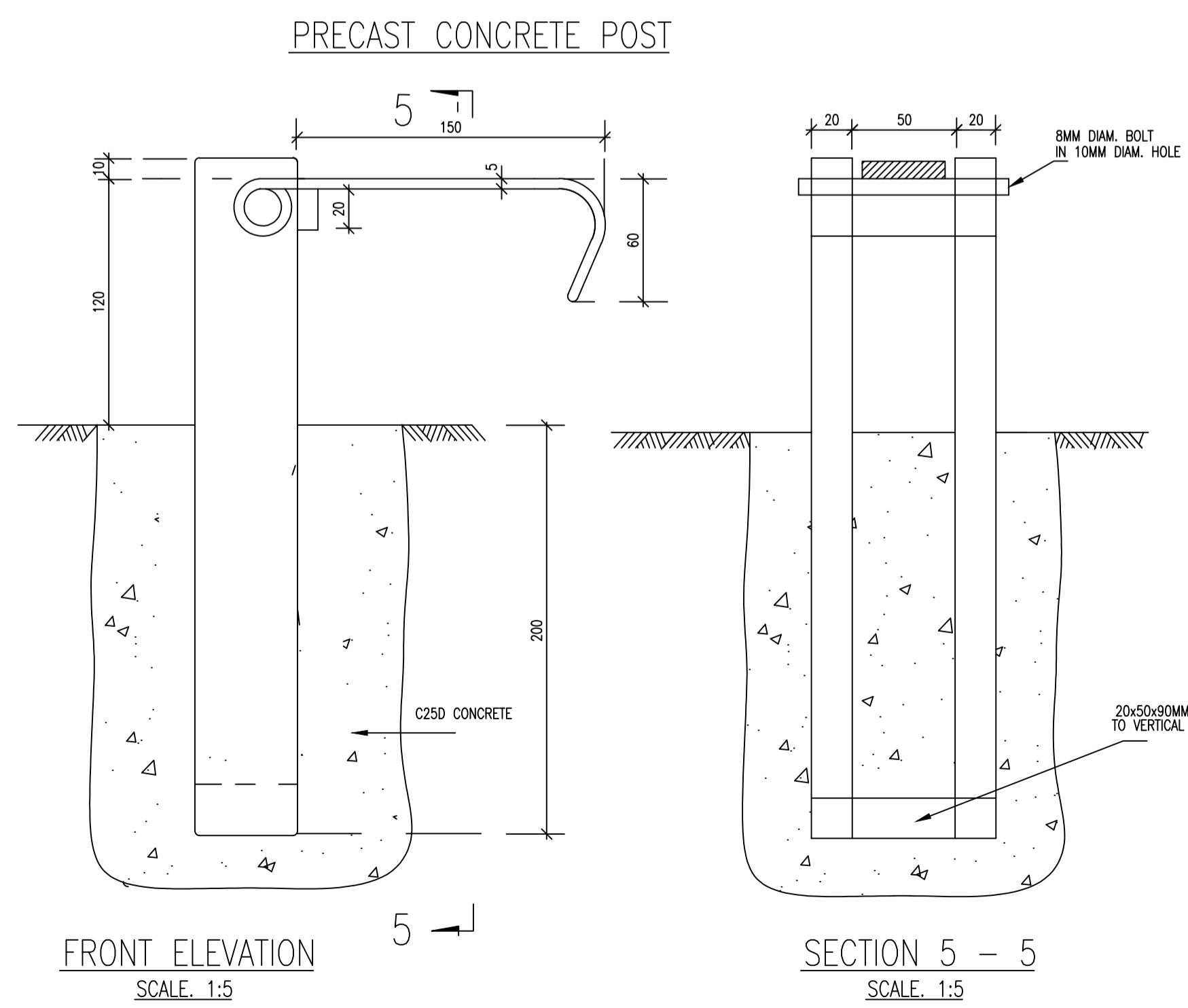
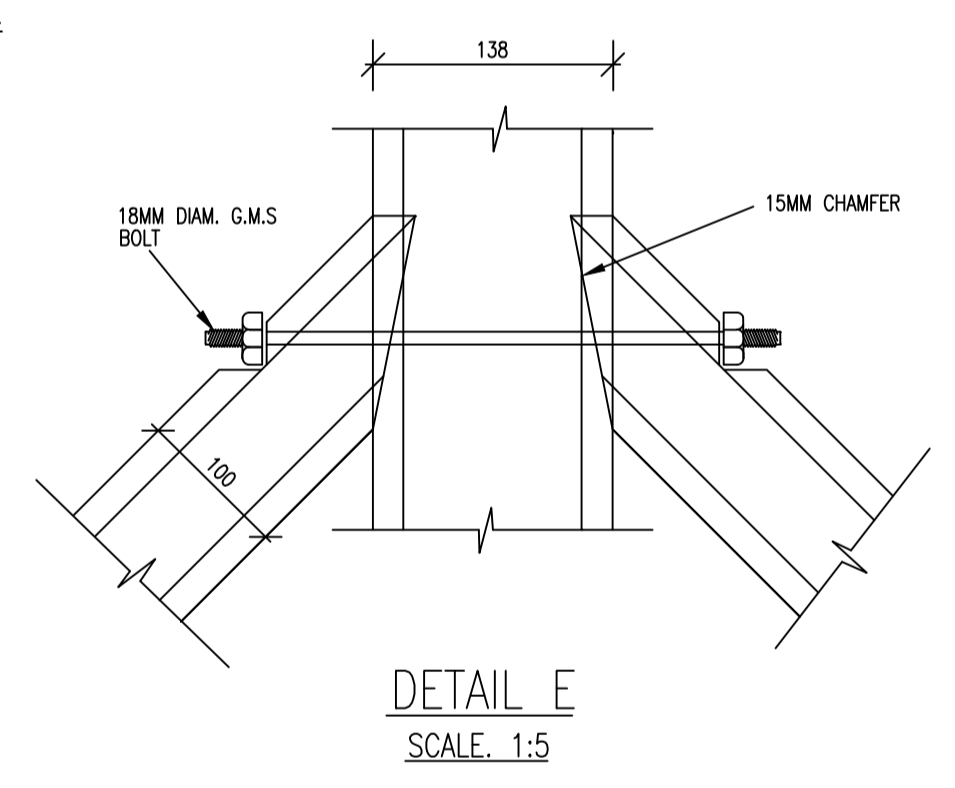
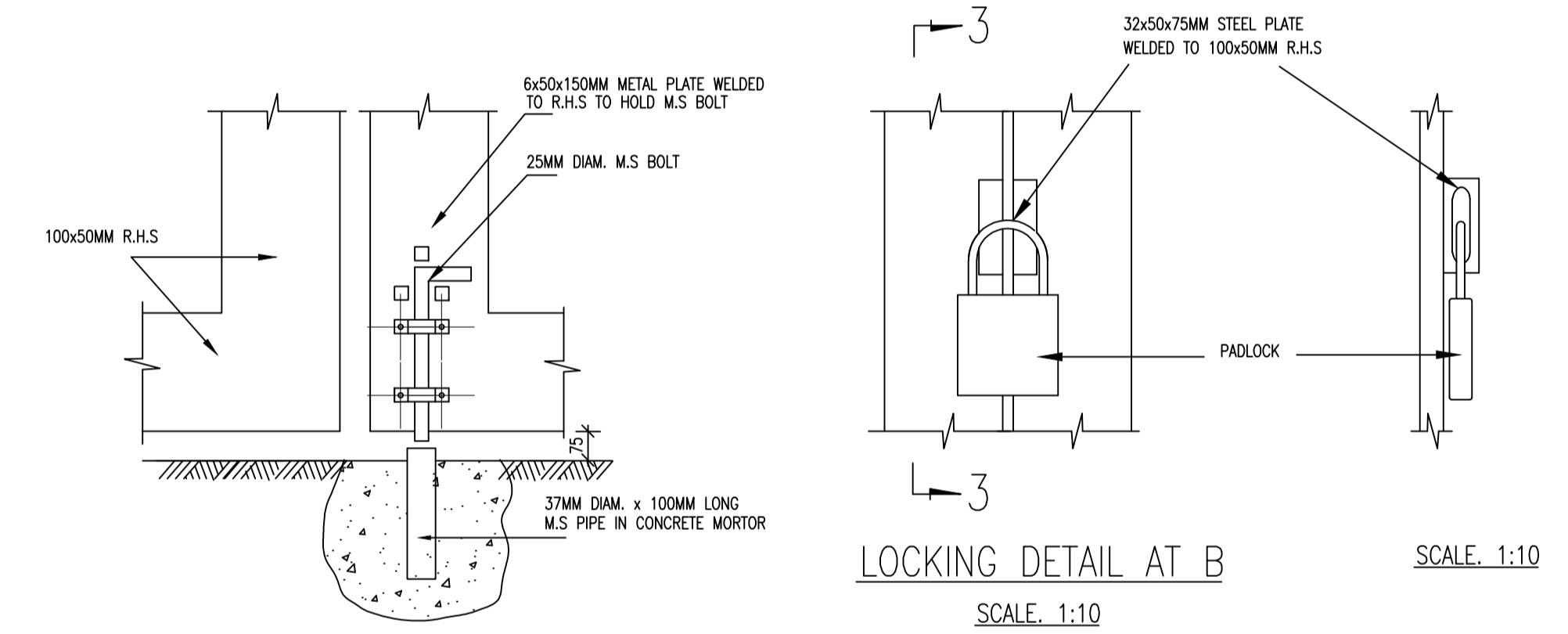
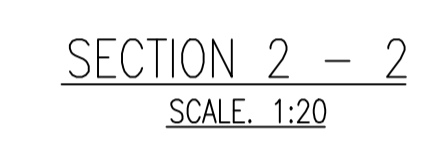
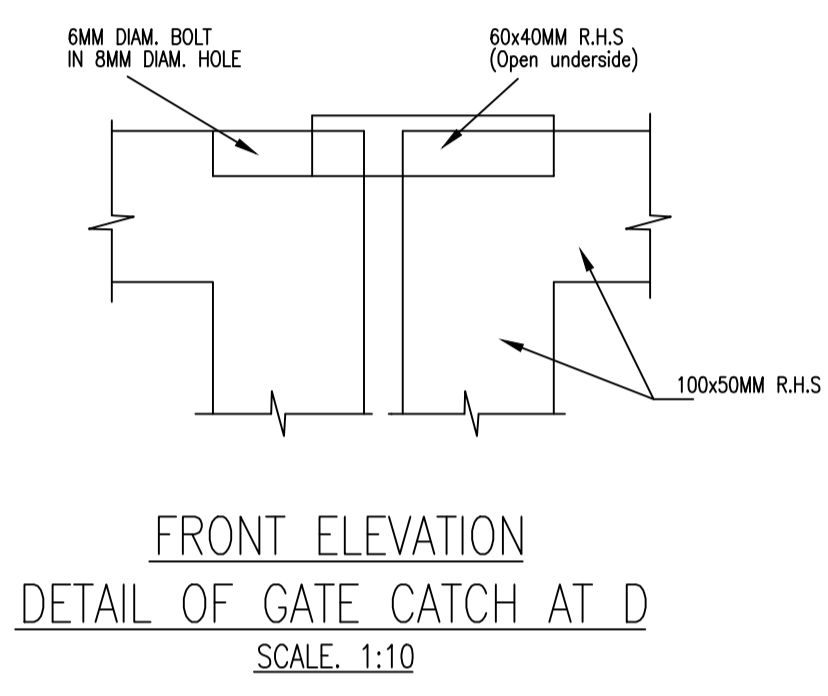
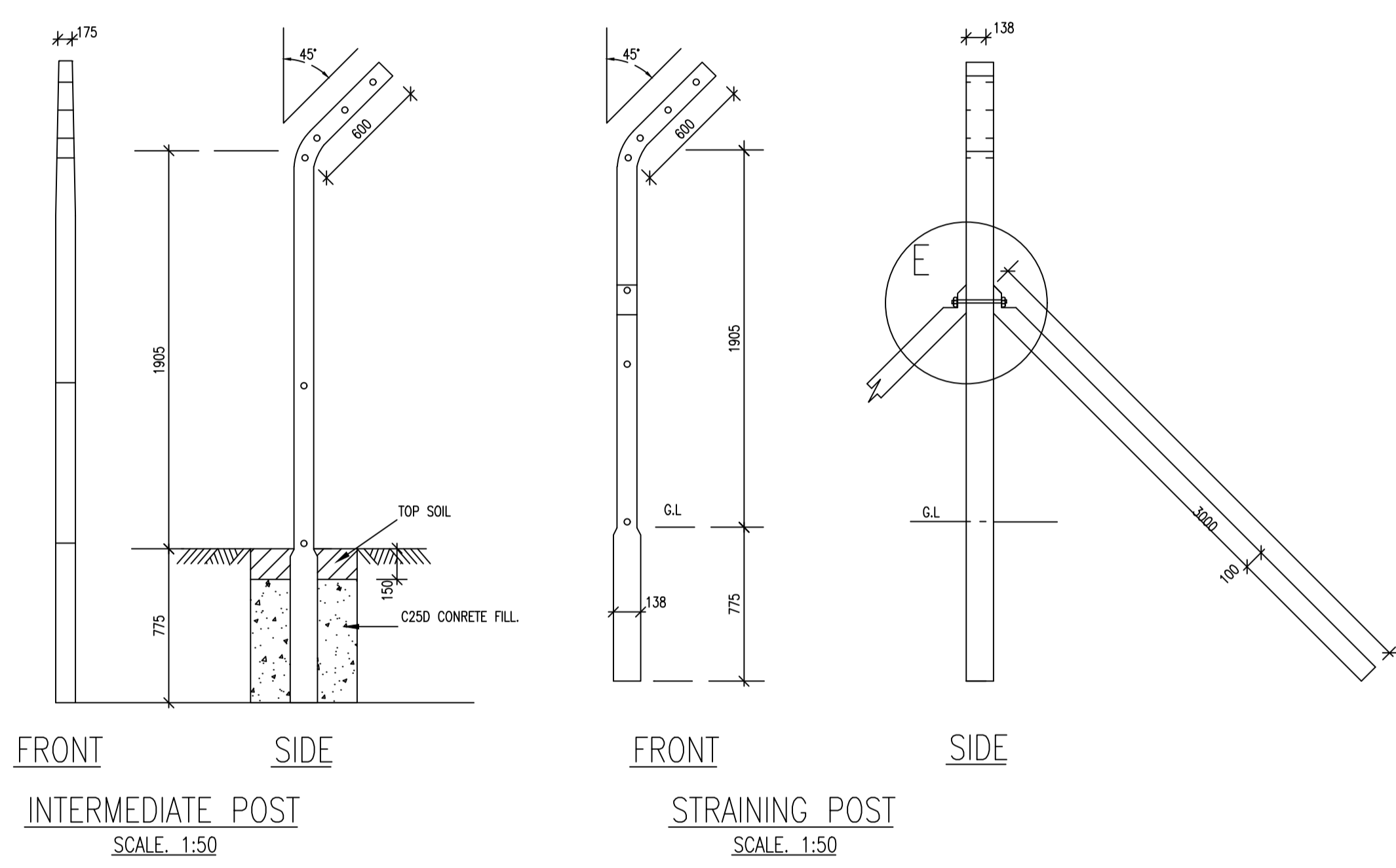
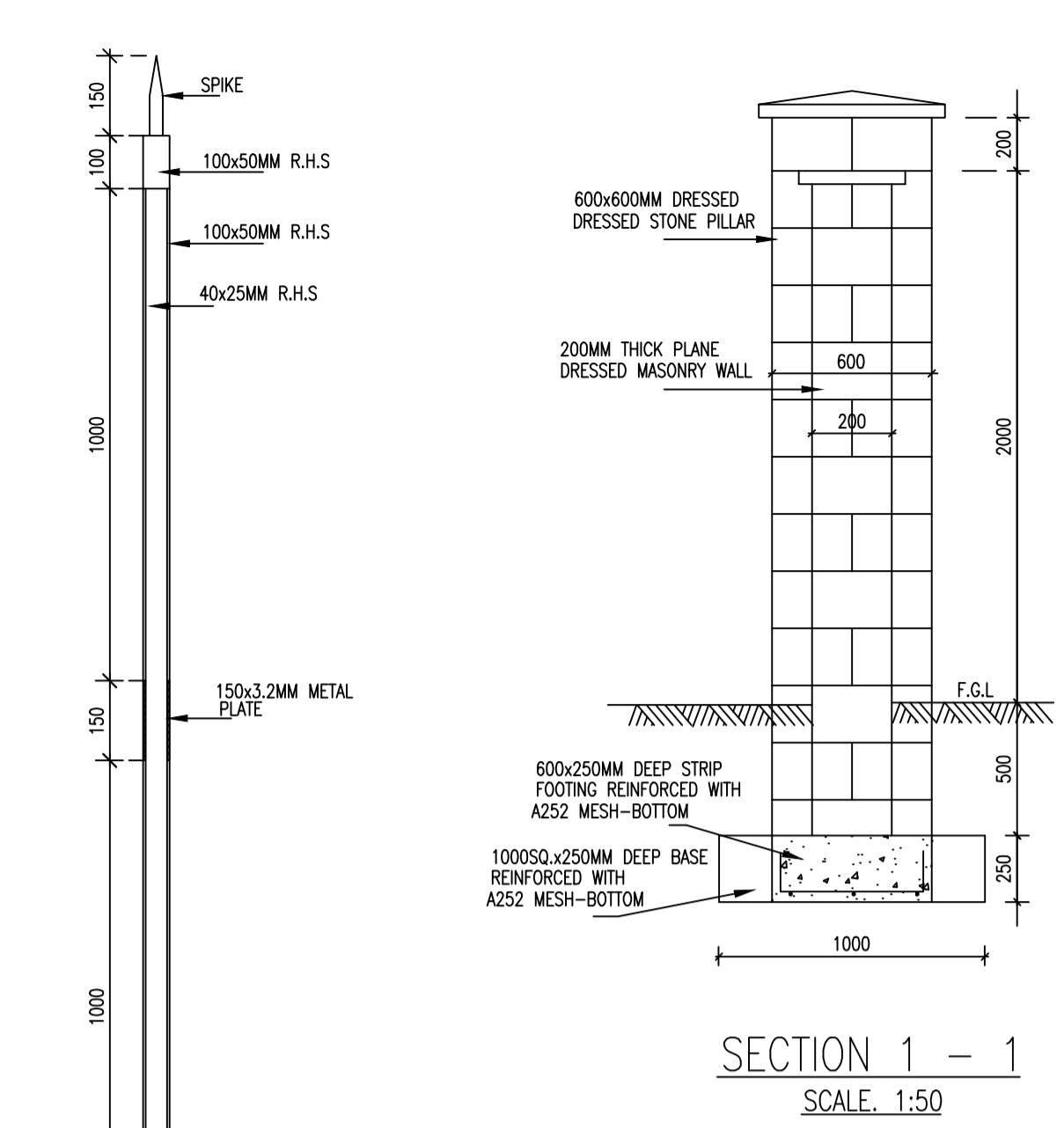
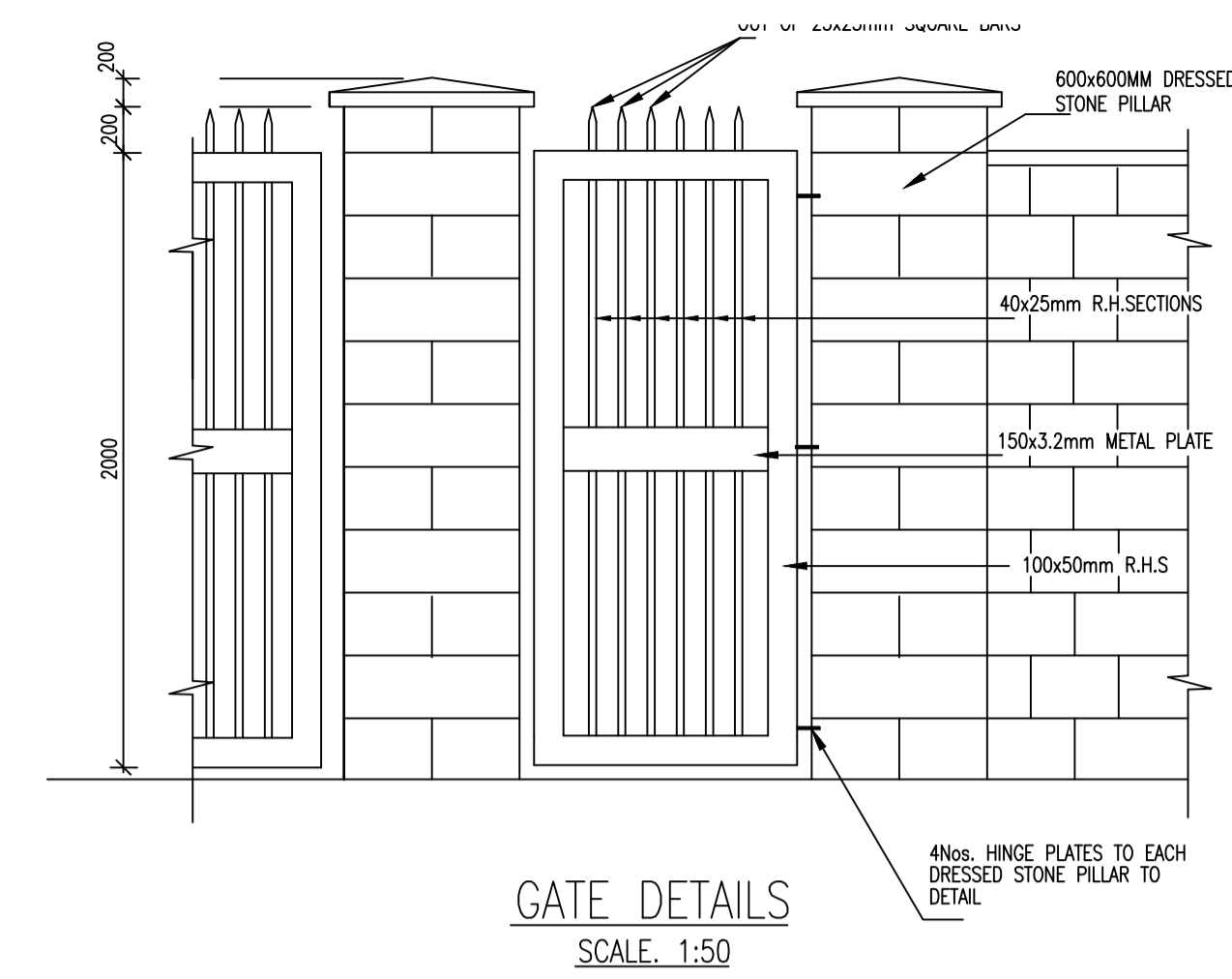
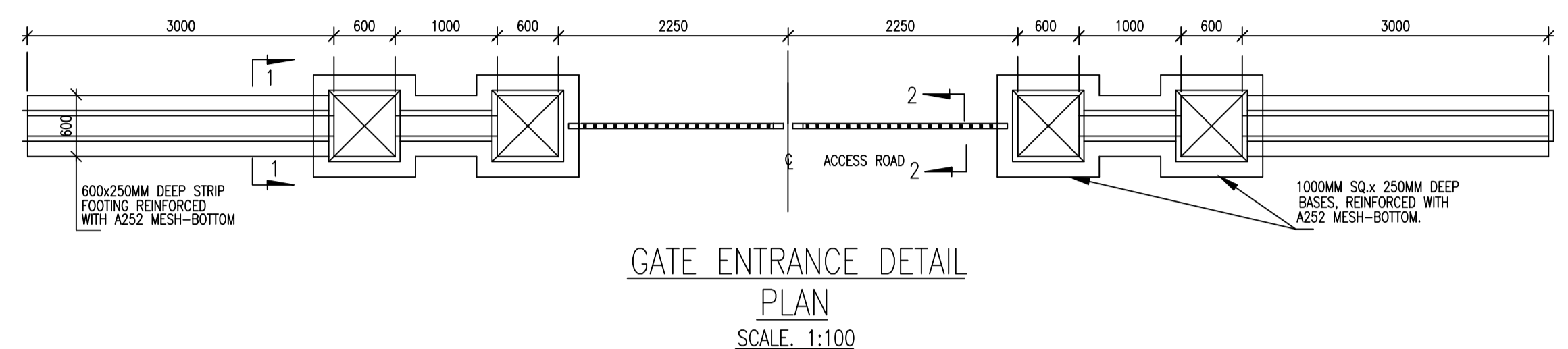
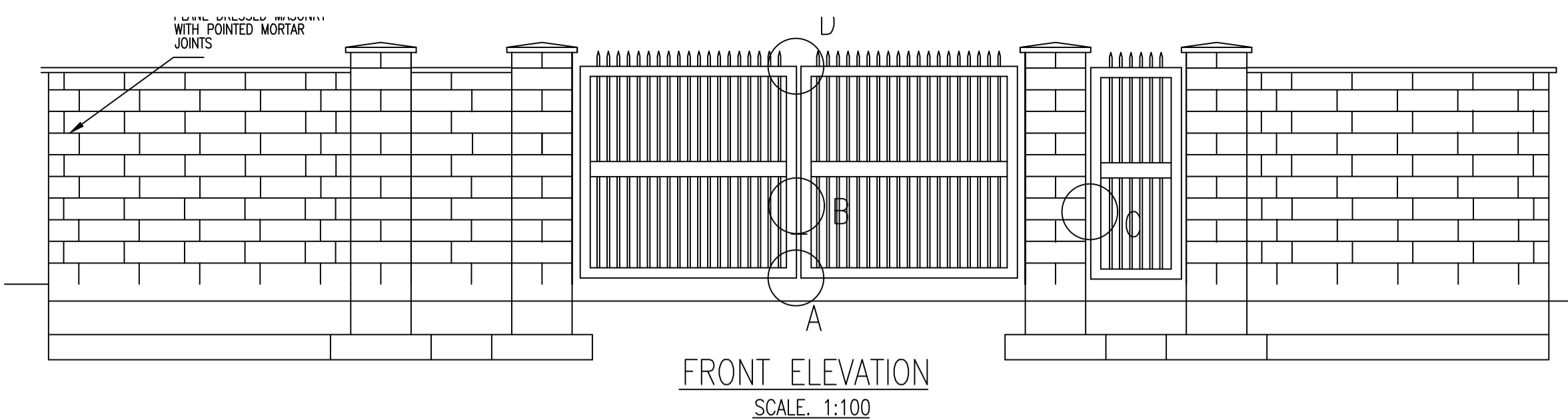
IJARA WATER SUPPLY PROJECT
MASALANI- GABABA
WORKS

Designed by	Drawn by
Checked by	Approved by

Title:

TRUNK DISTRIBUTION MAINS
THRUST BLOCKS FOR VERTICAL BENDS, TAPERS
GATE VALVES AND BLANK ENDS

Section Head	Date	Division Head	Date
Branch Head	Date	Director	Date
Scale	M/S	Date	DEC 2022
Job No.		ACAD File:	
STATUS	DRAWING No. NWWDA/GSA/2019/SD/007	REV	



1. All dimensions are in millimetres unless otherwise stated.
2. Only figured dimensions to be taken from this drawing.
3. Drawing to scale only in A1 size.

C		BY			
B		CHECKED			
A		BY			
O		CHECKED			
		BY			
		CHECKED			
REV	R E V I S I O N S	Drq. No.	SIGN	DATE	APPROVED

Client:

NORTHERN WATER WORKS
DEVELOPMENT AGENCY
P.o.Box 495-GARISSA

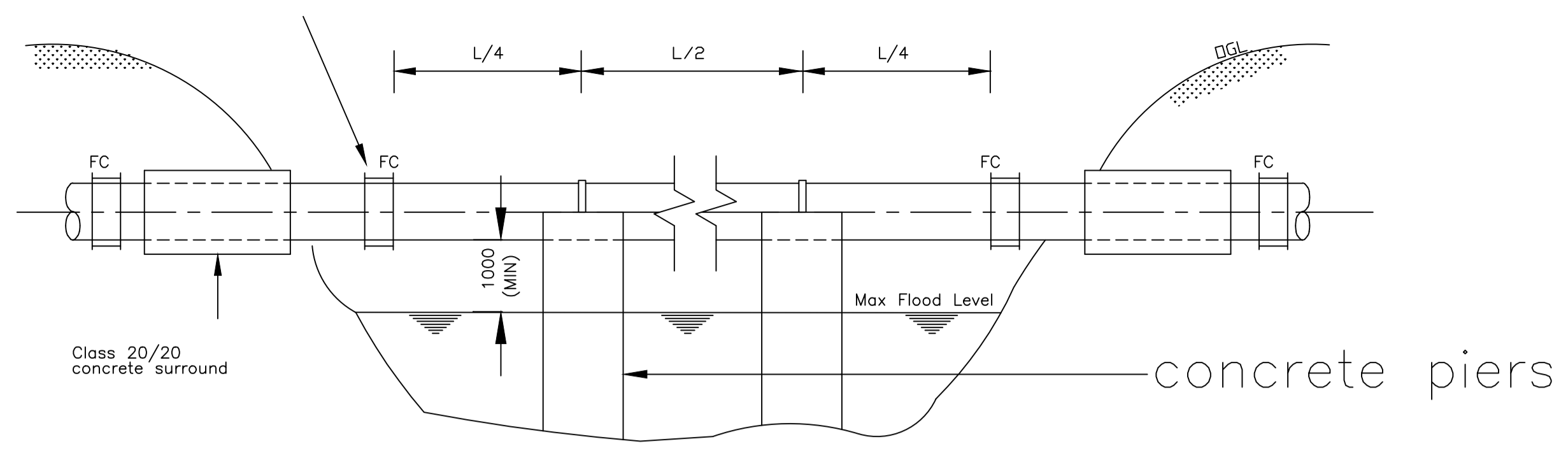
Project:

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MASALANI-GABABA
WORKS

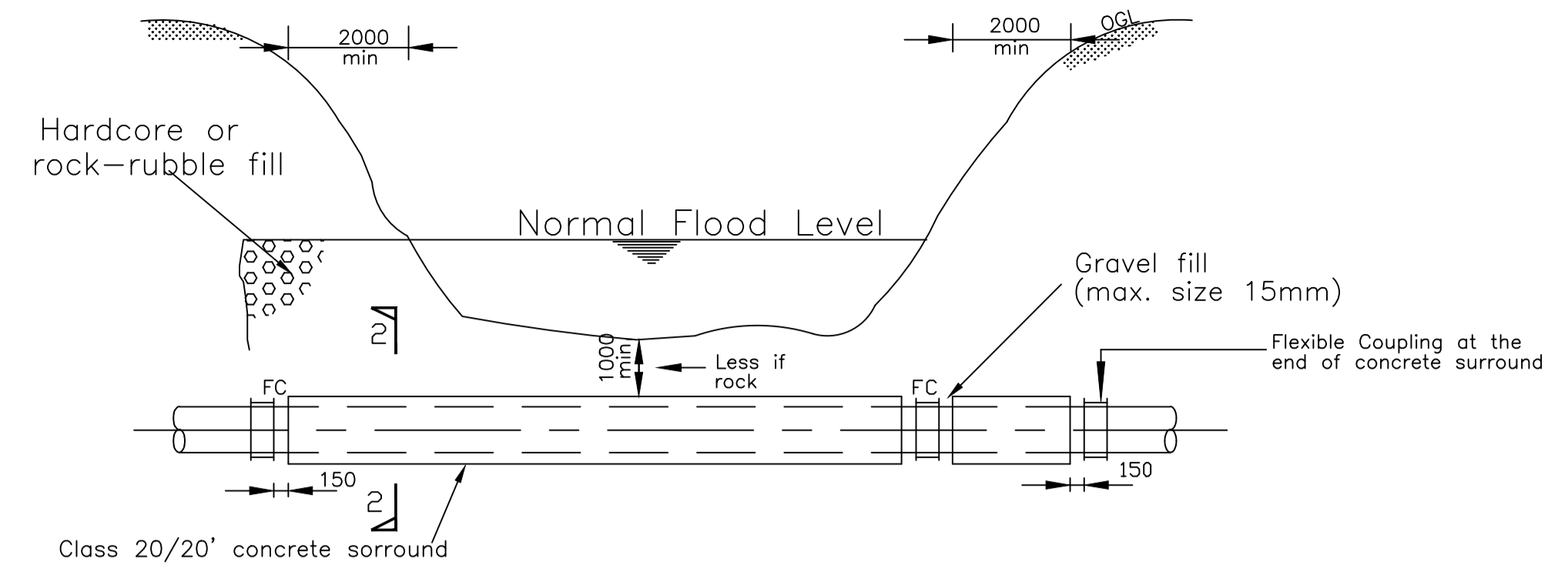
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Checked by _____ Approved by _____

Title:
**STANDARD DETAILS
FENCE AND GATE DETAILS**

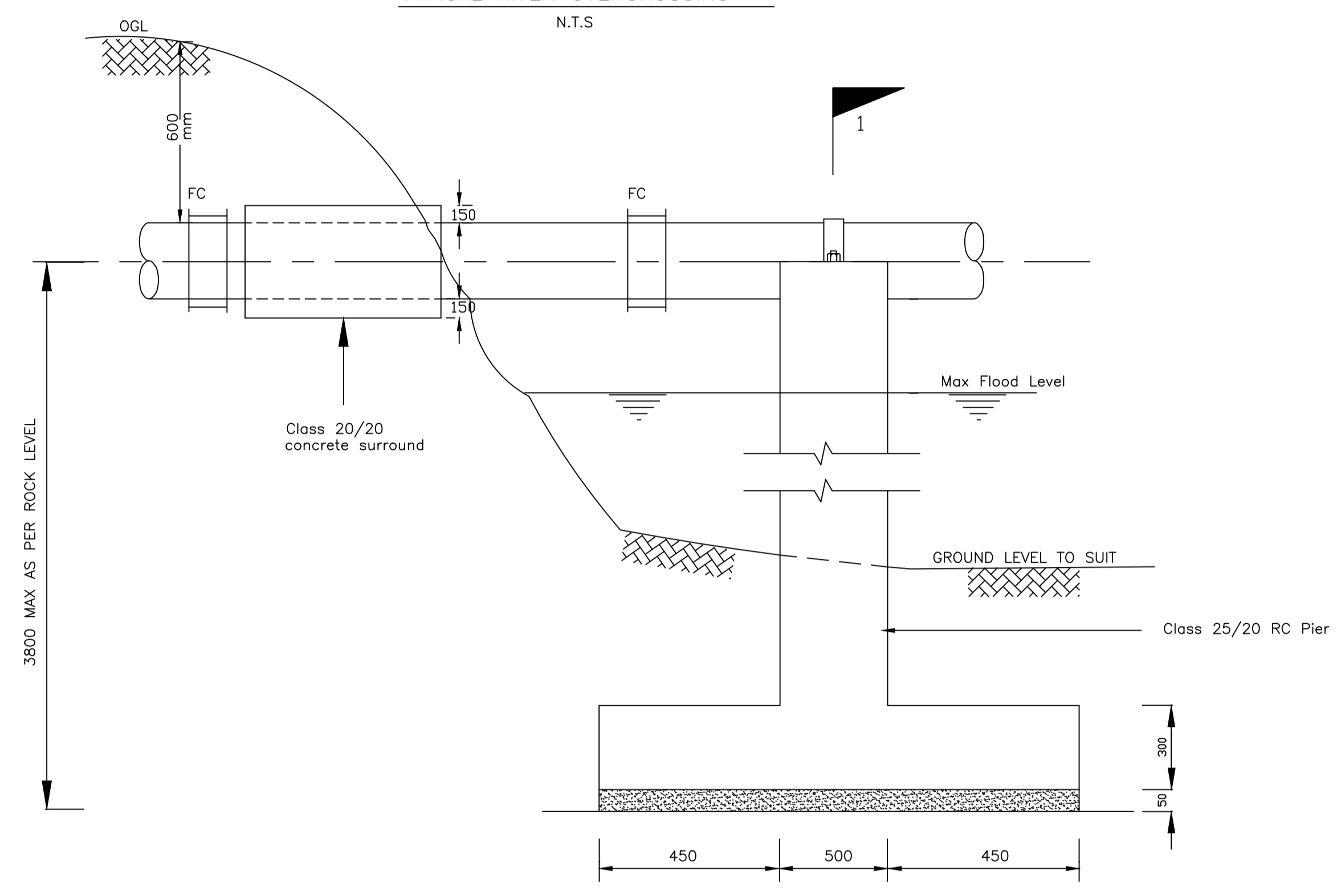
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Branch Head	Date	Director	Date
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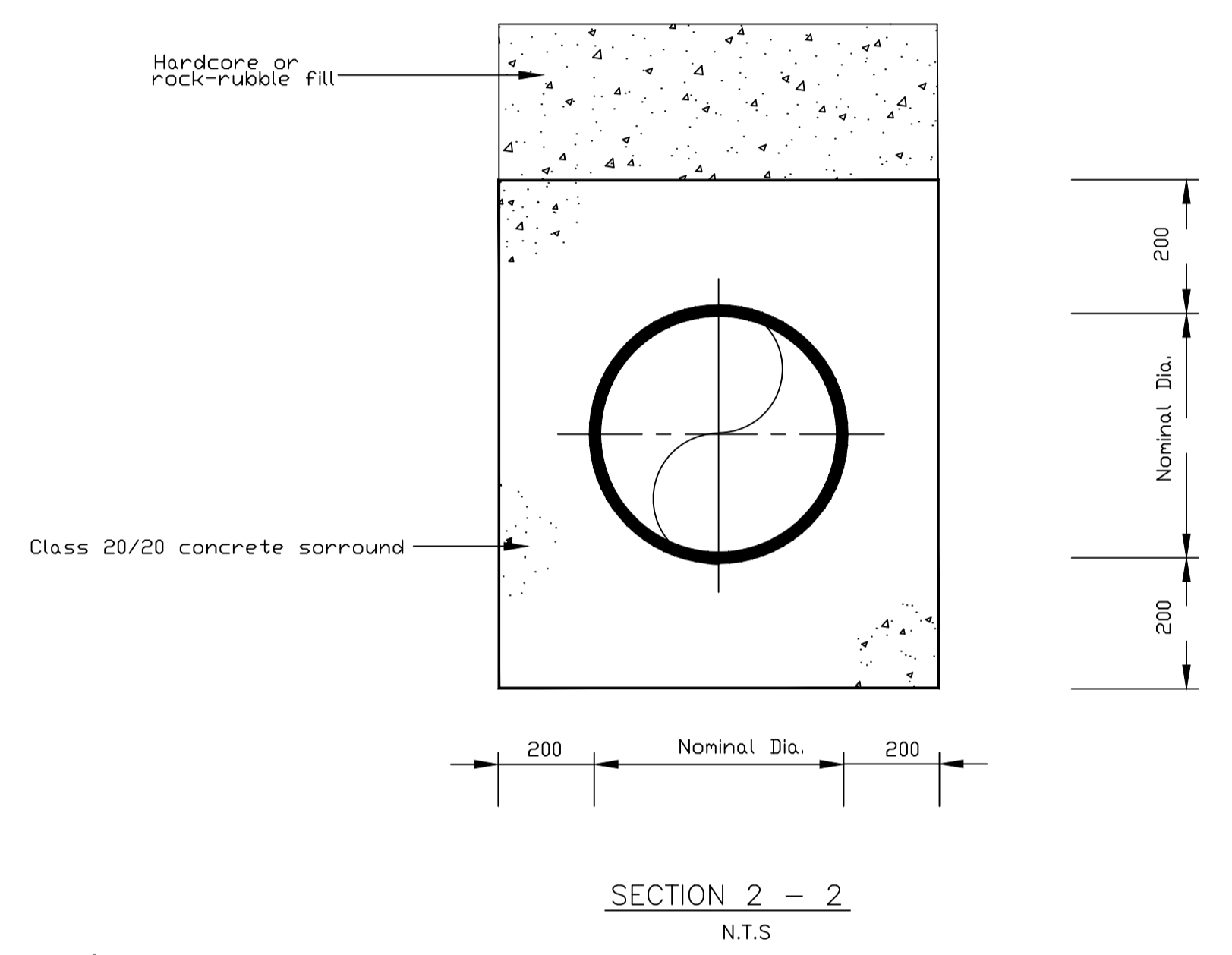
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N.T.S.



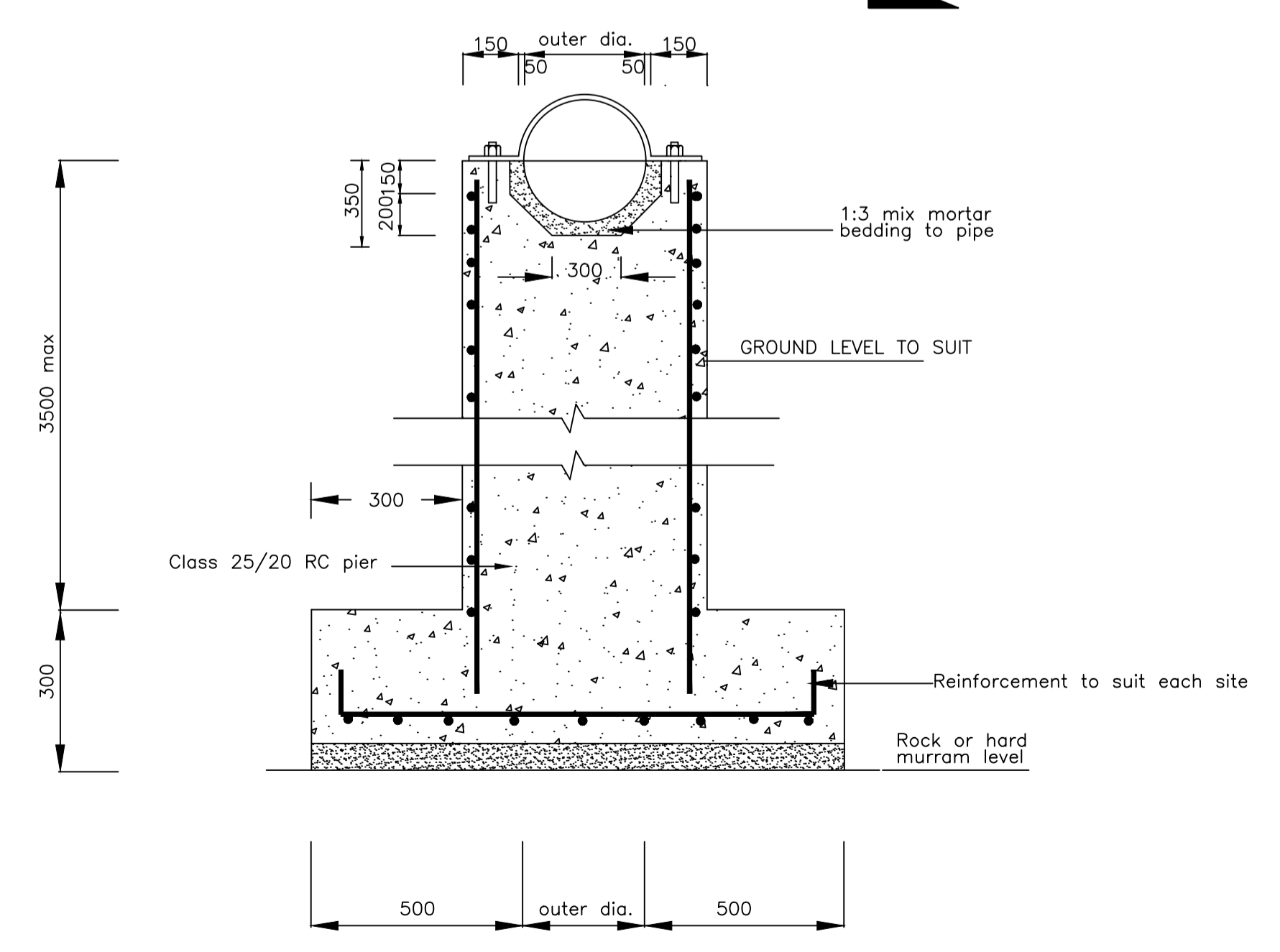
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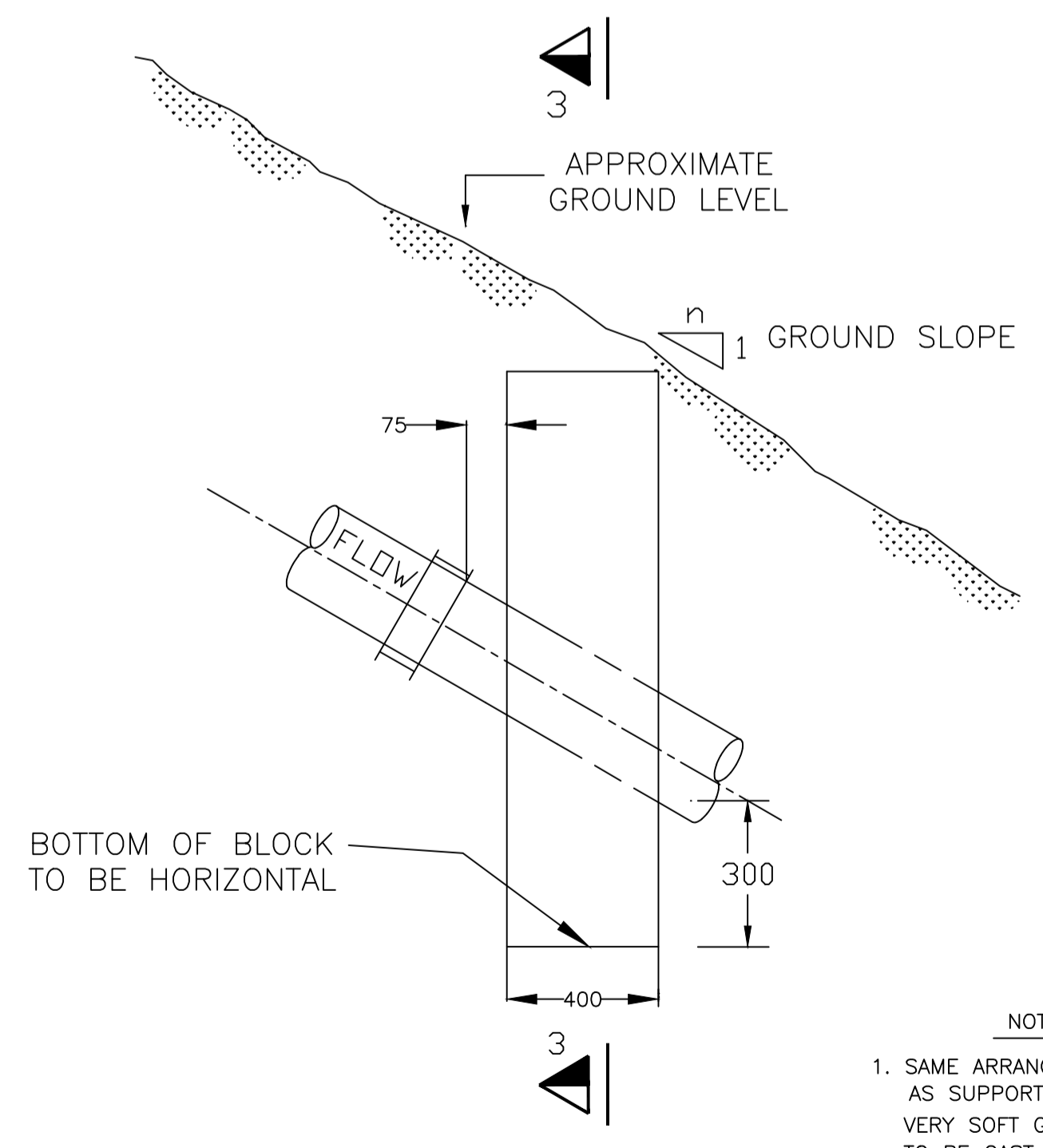
TYPICAL RIVER/LUGGA OVERCROSSING
N.T.S.



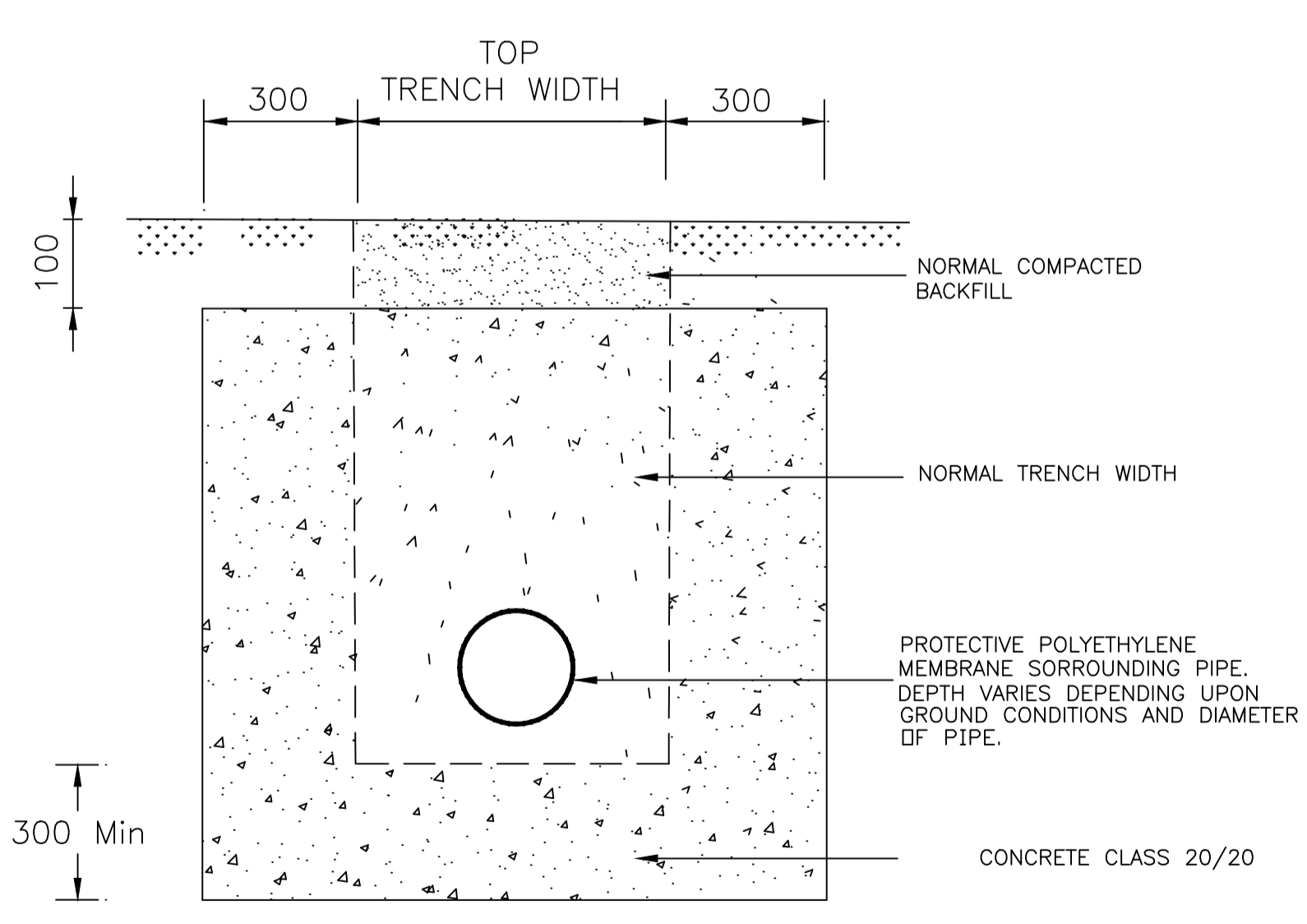
SECTION 2 - 2
N.T.S.



SECTION 1 - 1
N.T.S.



SIDE ELEVATION
SCALE 1:20



SECTION 3-3
SCALE 1:20

- 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.

SLIP ANCHOR BLOCKS DETAILS

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

C		BY				
		CHECKED				
B		BY				
		CHECKED				
A		BY				
		CHECKED				
O		BY				
		CHECKED				
REV	REVISIONS	Dr. No.	SIGN	DATE	APPROVED	

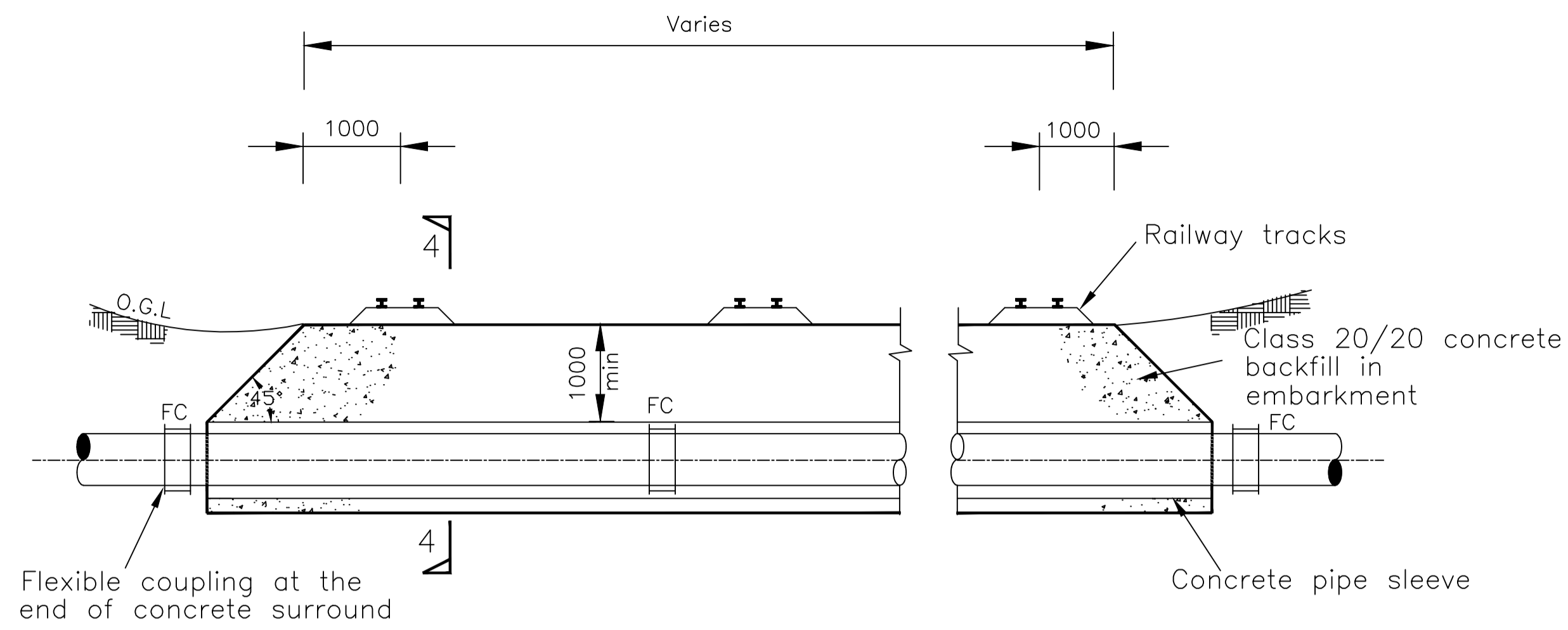
Client:
NORTHERN WATER WORKS
DEVELOPMENT AGENCY
P.o.Box 495-GARISSA

Project:
IJARA WATER SUPPLY PROJECT
MASALANI-GABABA
WORKS

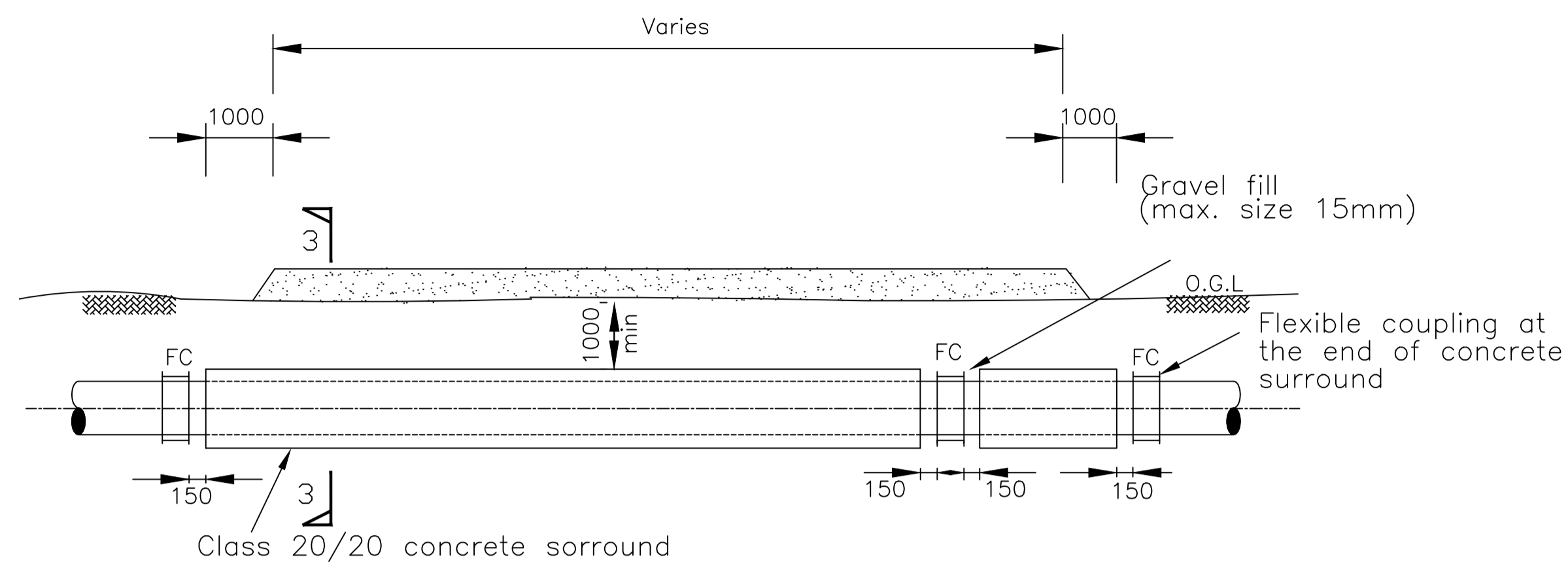
Designed by _____ Drawn by _____
Checked by _____ Approved by _____

Title:
STANDARD DETAILS
RIVER CROSSINGS AND
SLIP ANCHOR DETAILS

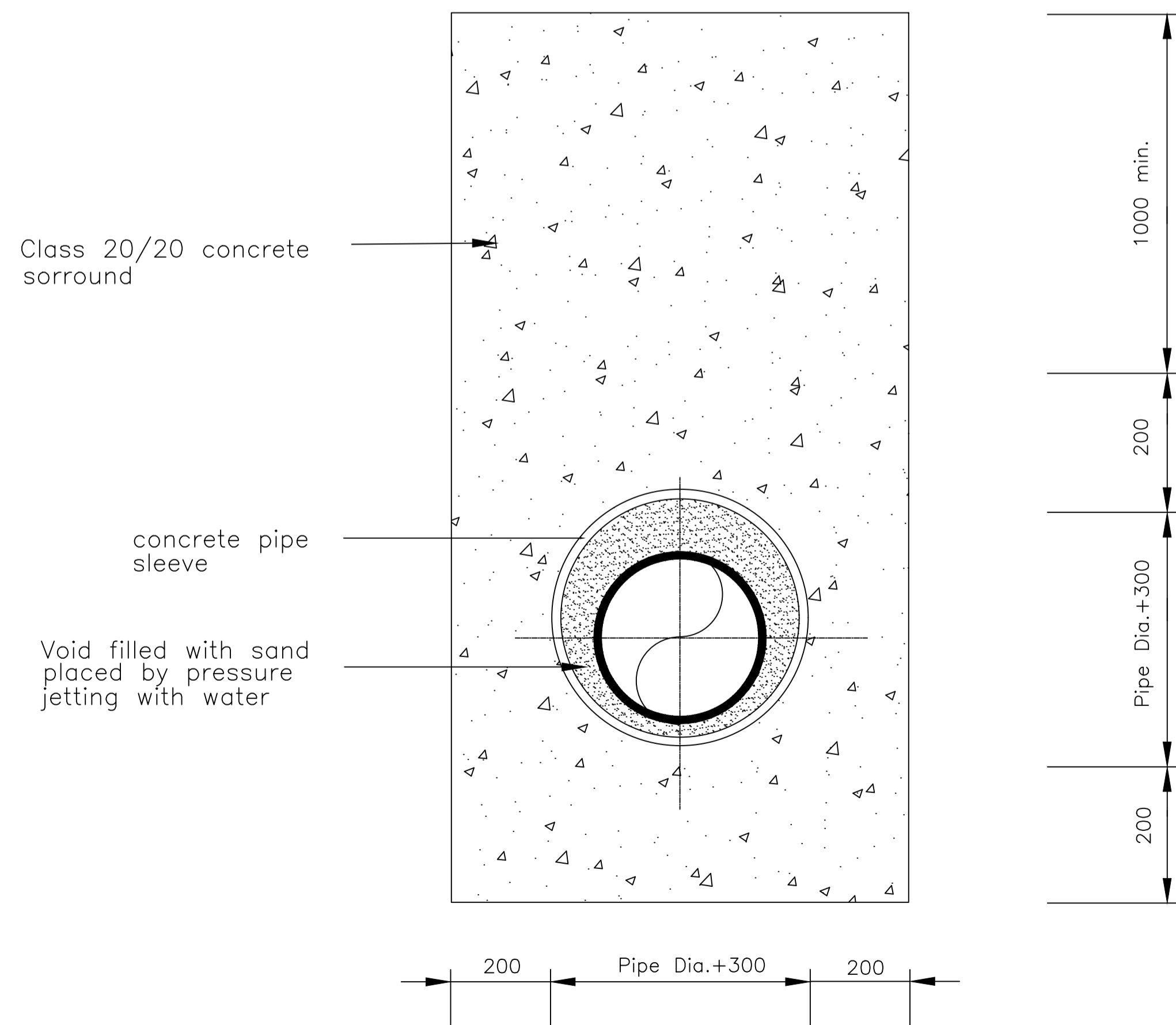
Section Head	Date	Division Head	Date
Branch Head	Date	Director	Date
Scale	AS SHOWN	Date	DEC 2022
Job No.		ACAD File:	
STATUS	DRAWING No. WW/WD/874/SD/010		REV



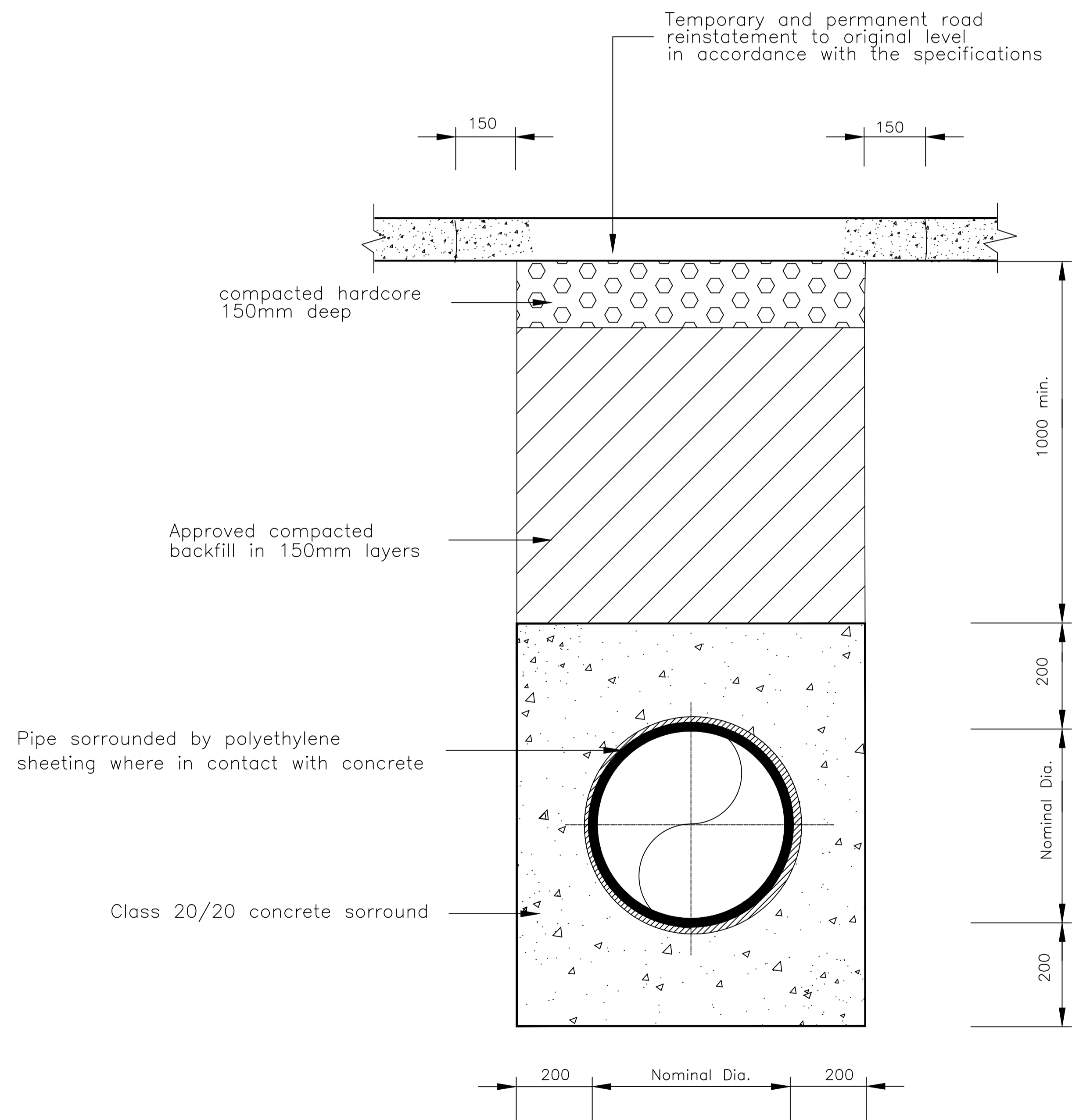
TYPICAL RAILWAY CROSSING
N.T.S



TYPICAL ROAD CROSSING
N.T.S



SECTION 4 - 4
N.T.S



SECTION 3 - 3
N.T.S

1. All dimensions are in mm unless otherwise stated.
2. All railway crossings shall be constructed on approval and in accordance with the requirements of Kenya Railways.
3. Steel pipes to be used under all rail and road crossings.

LEGEND

OGL - Original ground level
FC - Flexible coupling

REV	REVISIONS	Drng. No.	SIGN	DATE	APPROVED
C			BY		
			CHECKED		
B			BY		
			CHECKED		
A			BY		
			CHECKED		
0			BY		
			CHECKED		

Client:

NORTHERN WATER WORKS
DEVELOPMENT AGENCY
P.o.Box 495-GARISSA

Project:

IJARA WATER SUPPLY PROJECT
MASALANI-GABABA
WORKS

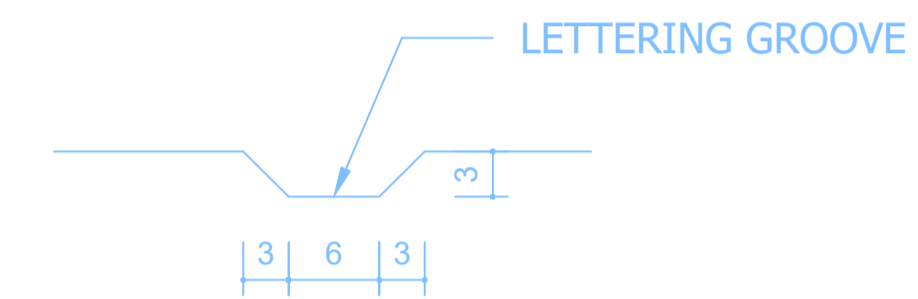
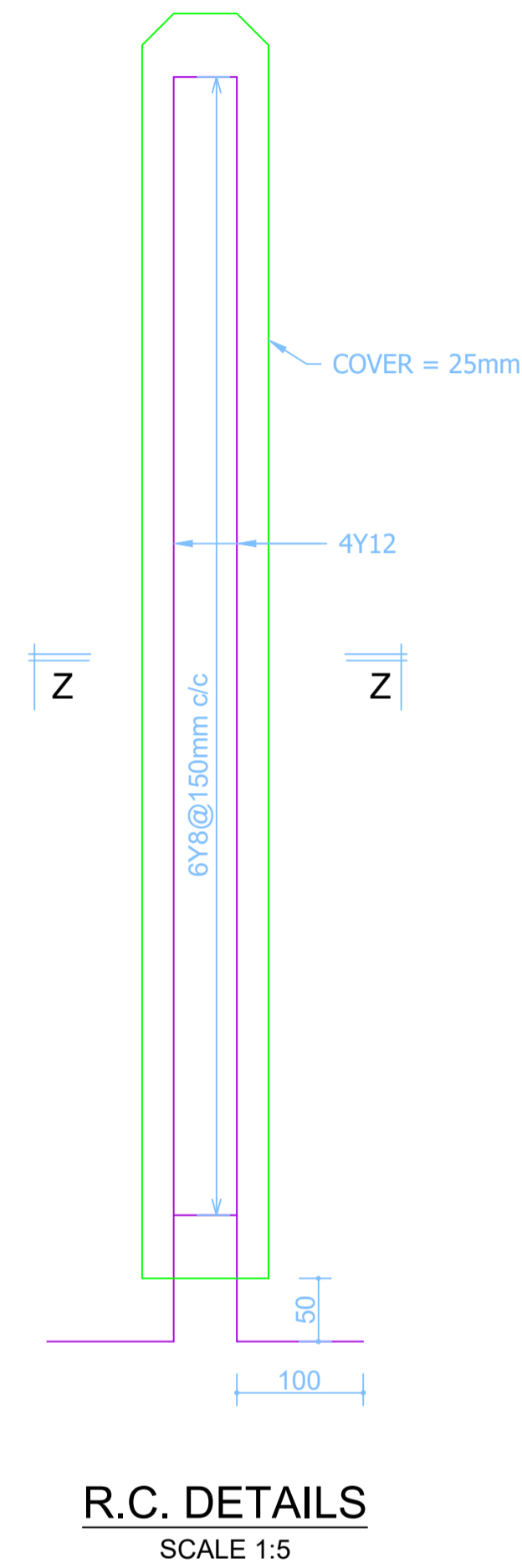
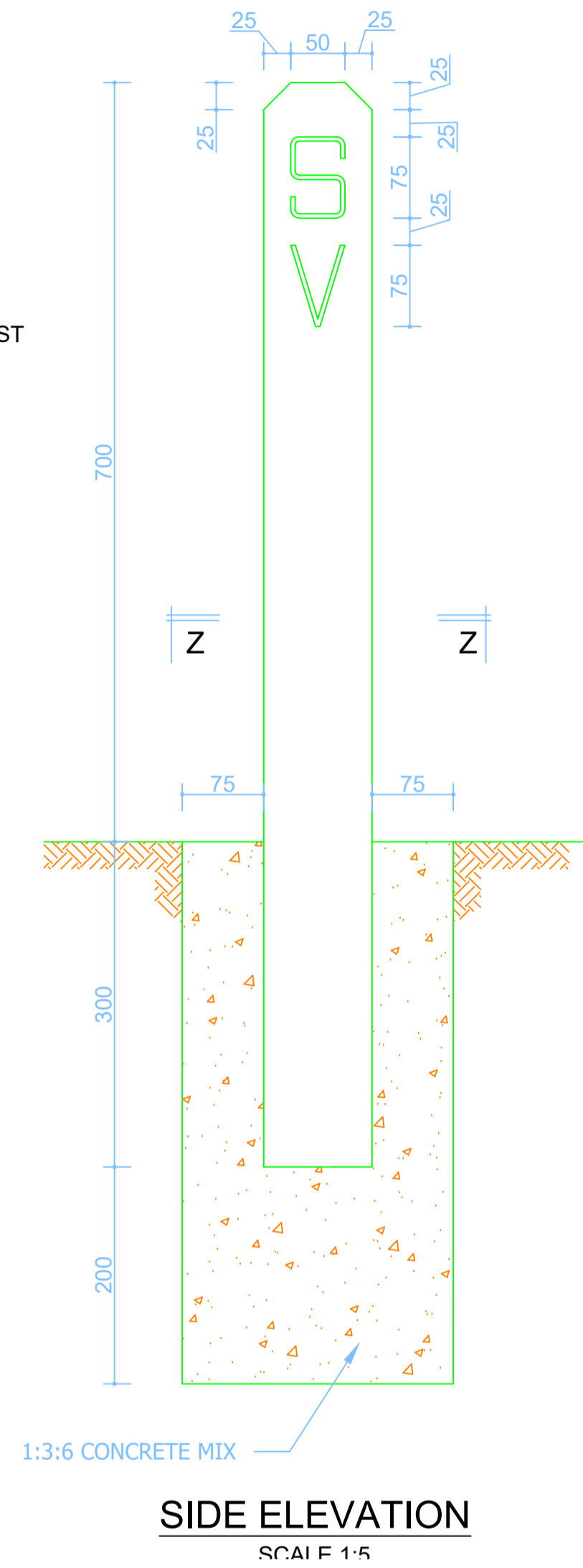
Designed by	Drawn by
Checked by	Approved by

Title:

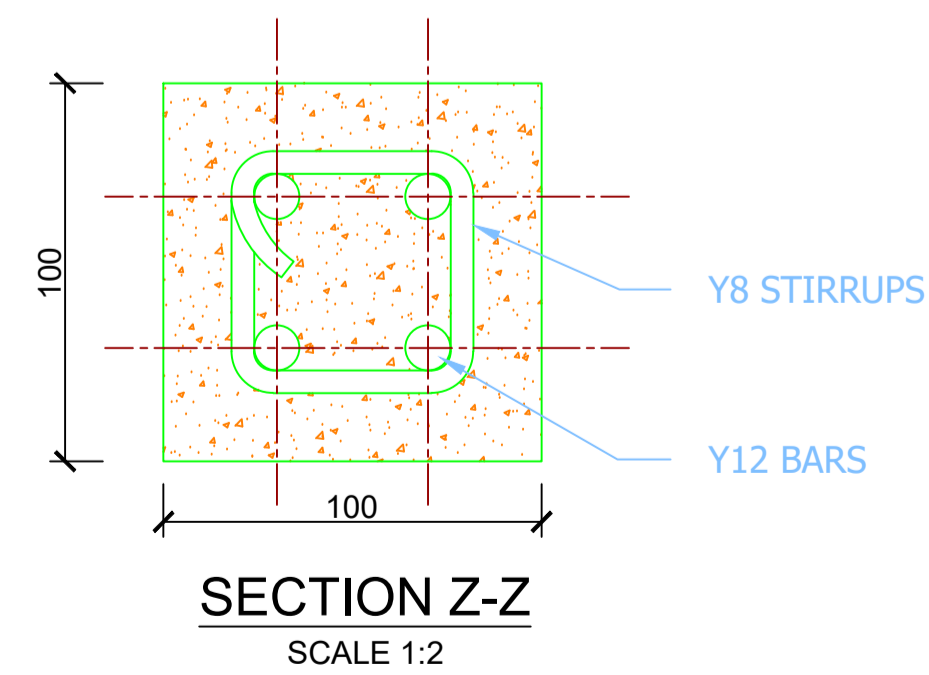
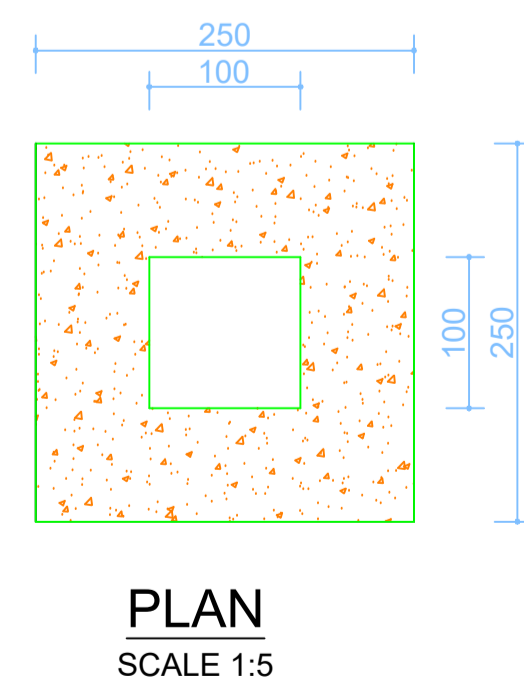
STANDARD DETAILS
ROAD AND RAIL CROSSINGS

Section Head	Date	Division Head	Date
Branch Head	Date	Director	Date
Scale	AS SHOWN	Date	DEC 2022
Job No.		ACAD File:	
STATUS	DRAWING No. NWWDA/GSA/2019/SD/011	REV	

LETTERING ON INDICATOR POST
TO BE W.D, S.V, W.O, A.V.



NOTE: PAINTED BLUE WITH WHITE LETTERS



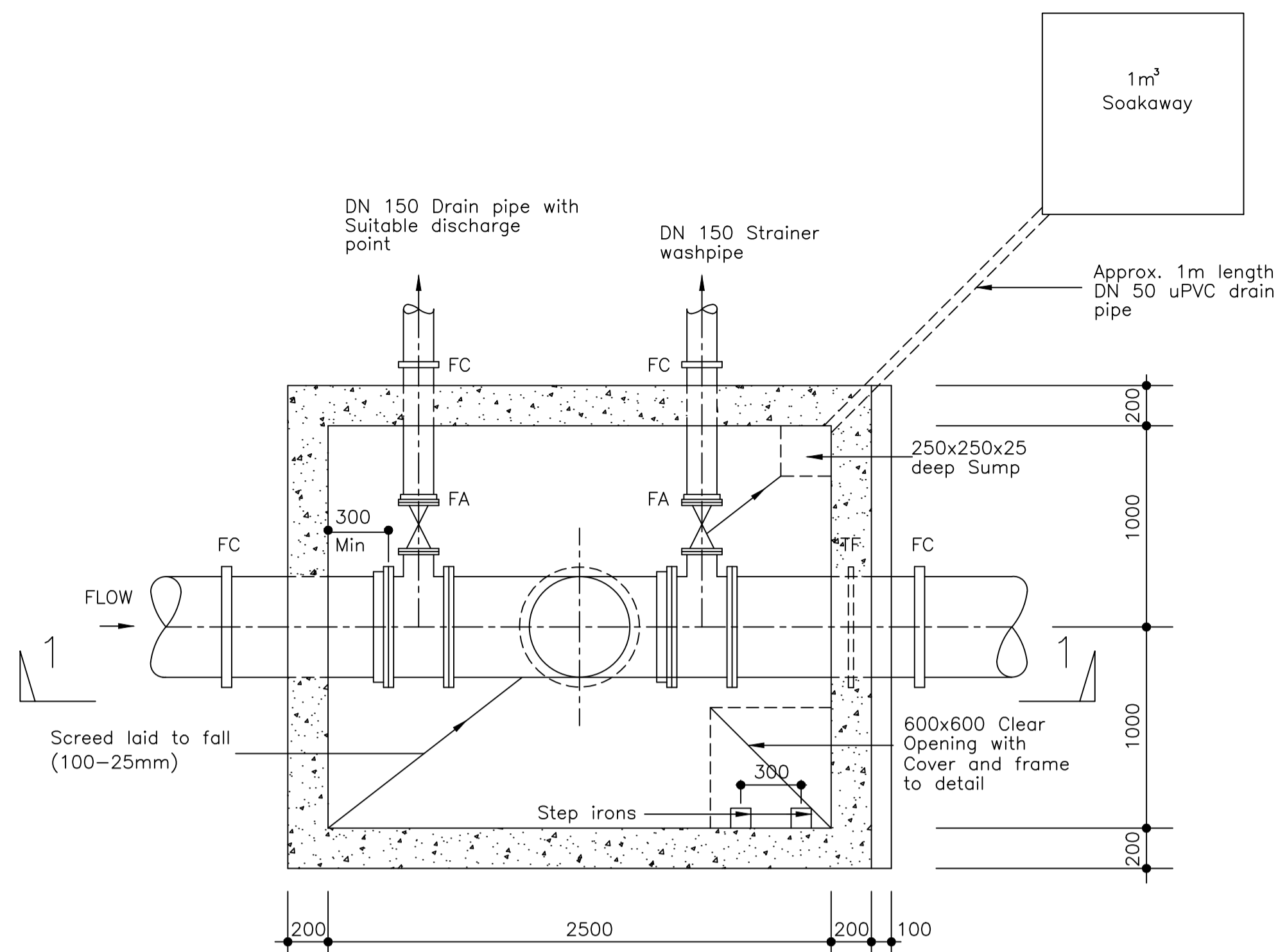
**MINISTRY OF WATER &
IRRIGATION- MAJI HOUSE**



**INDICATOR POSTS FOR PIPELINE
MARKERS**

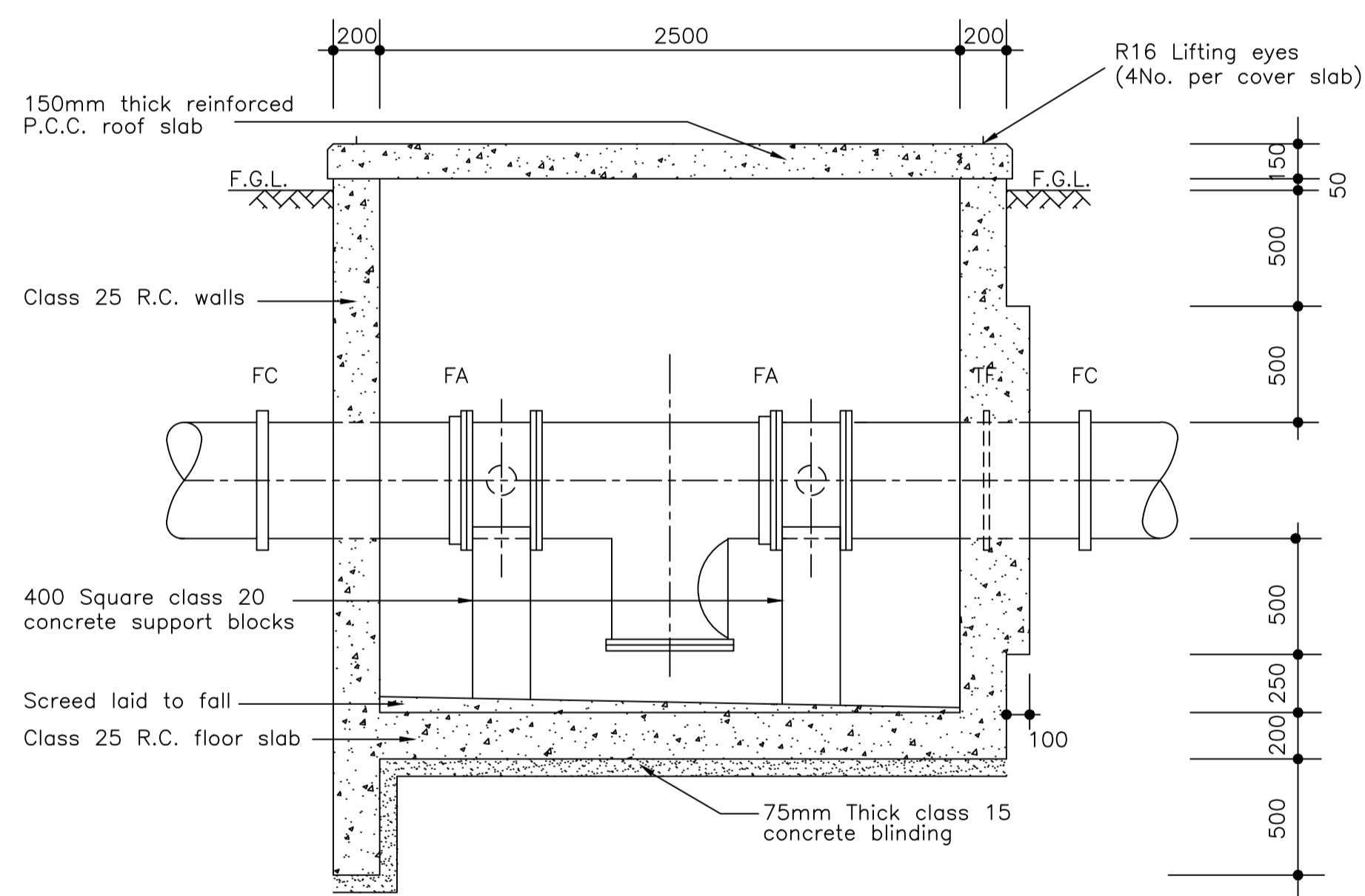
DESIGNED	P.N. Machiri	MAY 1977	SHEET: 1 of 1	
TRACED	N.K. Kakui	MAY 1977	SCALE: AS SHOWN	
DIGITIZED	J.G. Muturi	APRIL 2010		
CHECKED	ENG. B.I. Kasabuli	APRIL 2010	DRG. No.	M.W.I 016-TYPE-001
APPROVED	D.W.S	APRIL 2010		

INDICATOR POSTS FOR PIPELINE, SECTION VALVES, AIR VALVES & WASH OUT



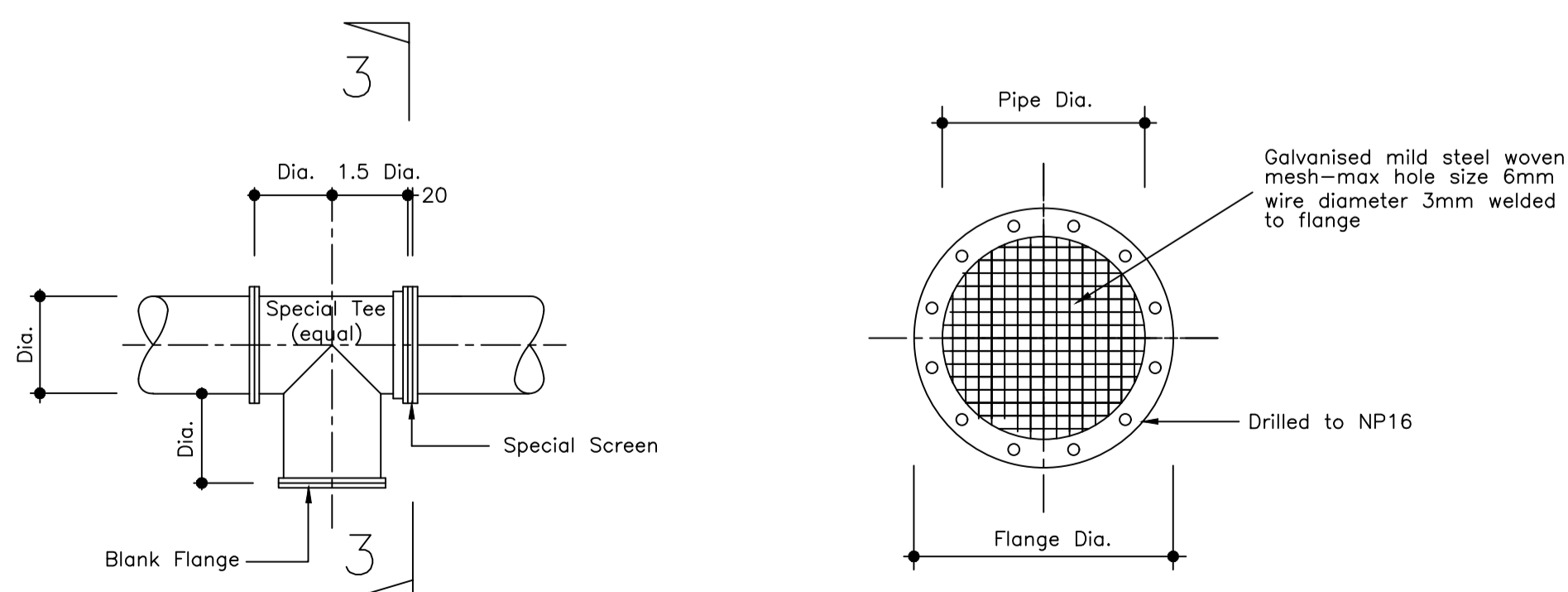
SECTIONAL PLAN OF STRAINER CHAMBER

1:25



SECTION 1 - 1

1:25

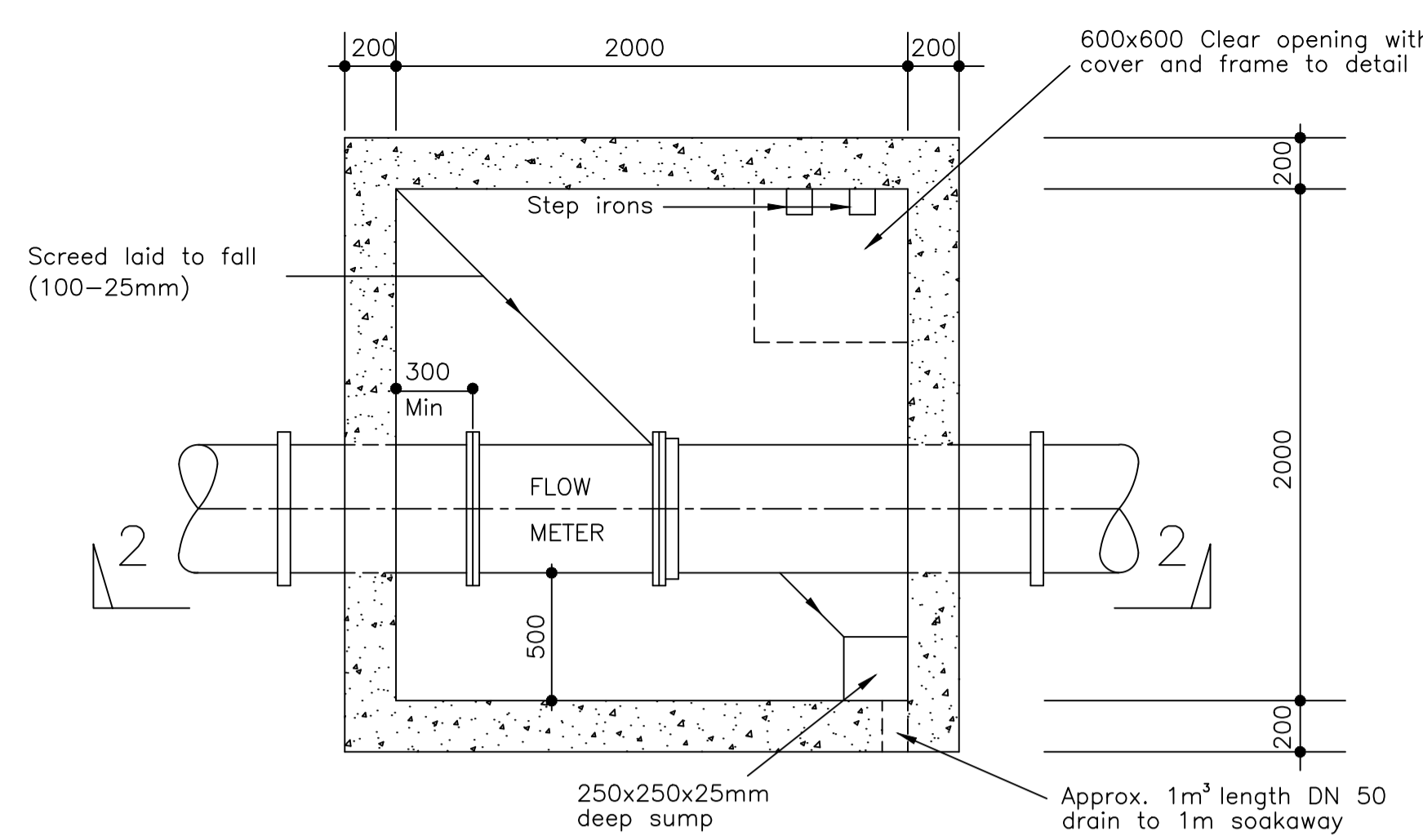


DETAILS OF STRAINER

ALTERNATIVE STRAINER MAY BE USED FOR PIPES DIAMETER LESS THAN 250 MM

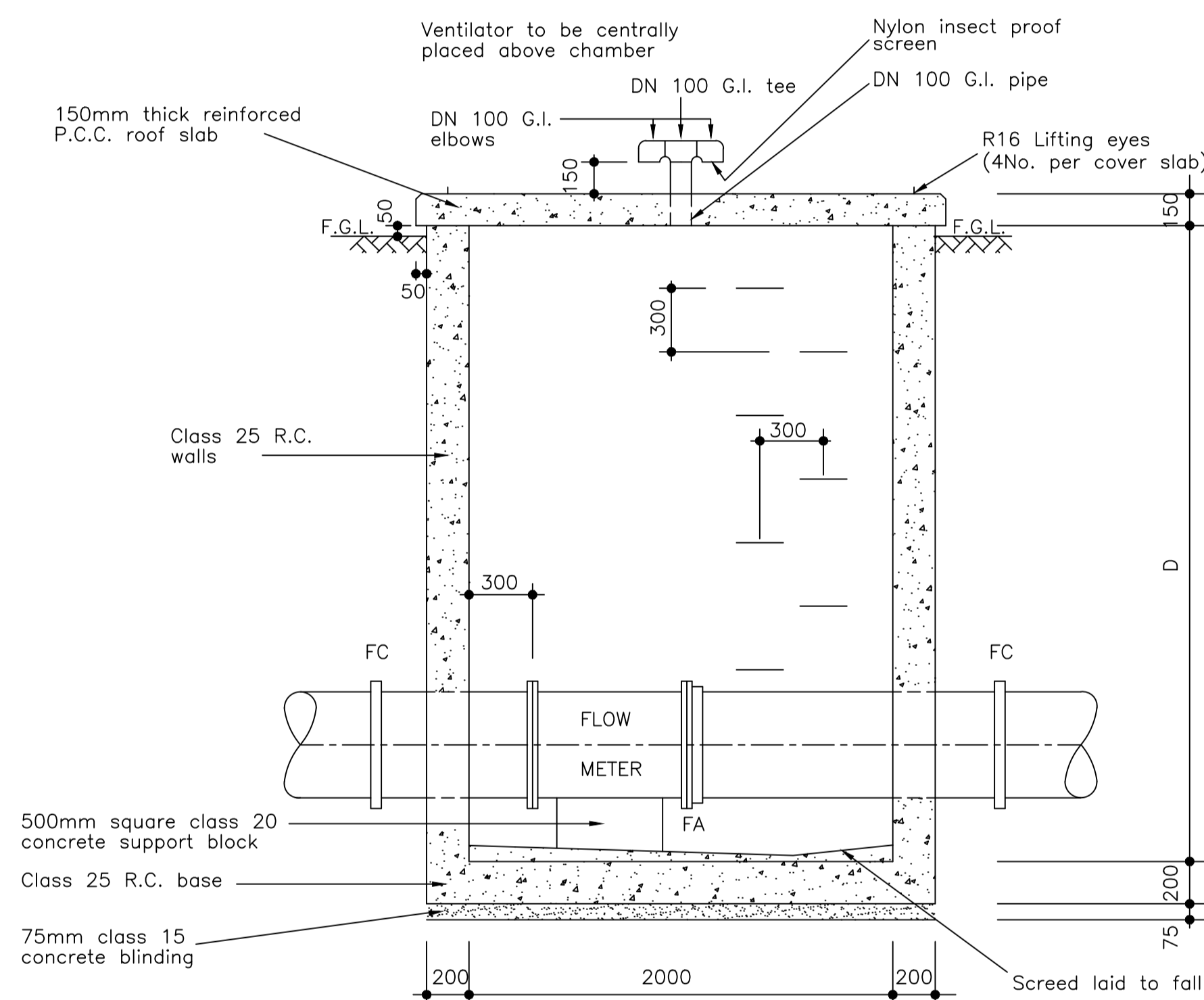
SCALE N.T.S.

SECTION 3 - 3



SECTIONAL PLAN OF BULKMETER CHAMBER

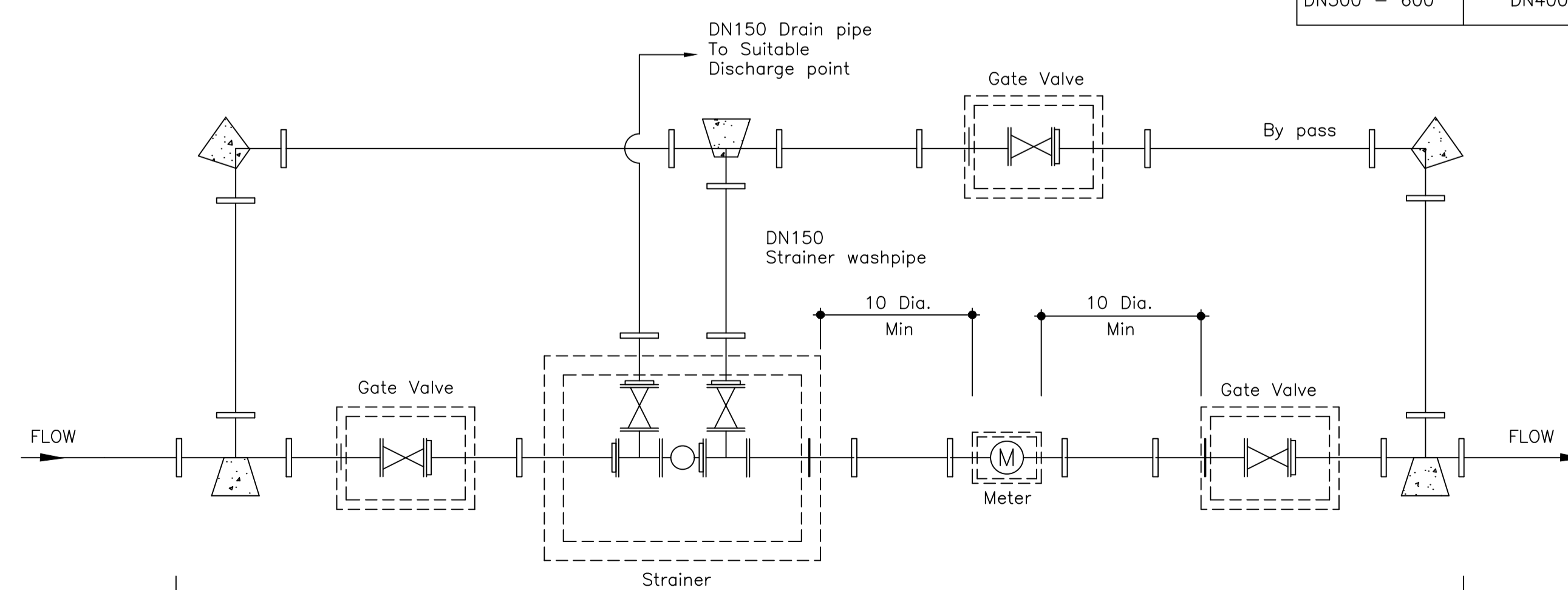
1:25



SECTION 2 - 2

1:25

Size Main (mm)	Size of Bypass (mm)
DN150 - 250	DN150
DN300 - 450	DN250
DN500 - 600	DN400



SCHEMATIC PLAN OF BULKMETER, STRAINER AND BYPASS PIPEWORK AND CHAMBERS

SCALE N.T.S.

NOTES

- All dimensions are in mm unless otherwise stated
- Concrete to be class 25/20 unless otherwise stated
- Gate Valve chambers to be Type 1B as shown on drg. SD/02
- Step irons are only required where chamber is greater than 1000mm deep
- Chamber to be backfilled with 300mm thick granular fill around walls
- All exposed concrete members to have a chamber of 25mm and to wrought finish

REV	REVISIONS	Dwg. No.	SIGN	DATE	APPROVED
C			BY	CHECKED	
B			BY	CHECKED	
A			BY	CHECKED	
0			BY	CHECKED	

Client:

NORTHERN WATER WORKS
DEVELOPMENT AGENCY

P.o.BoX 495-GARISSA

Project:

IJARA WATER SUPPLY PROJECT
MASALANI-GABABA
WORKS

Approved by

Designed by

Drawn by

Checked by

Title:

STANDARD DETAILS
BULKMETER, STRAINER
AND BYPASS ARRANGEMENT

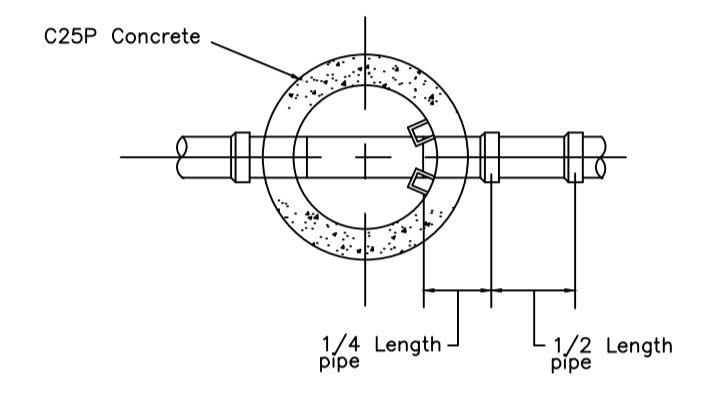
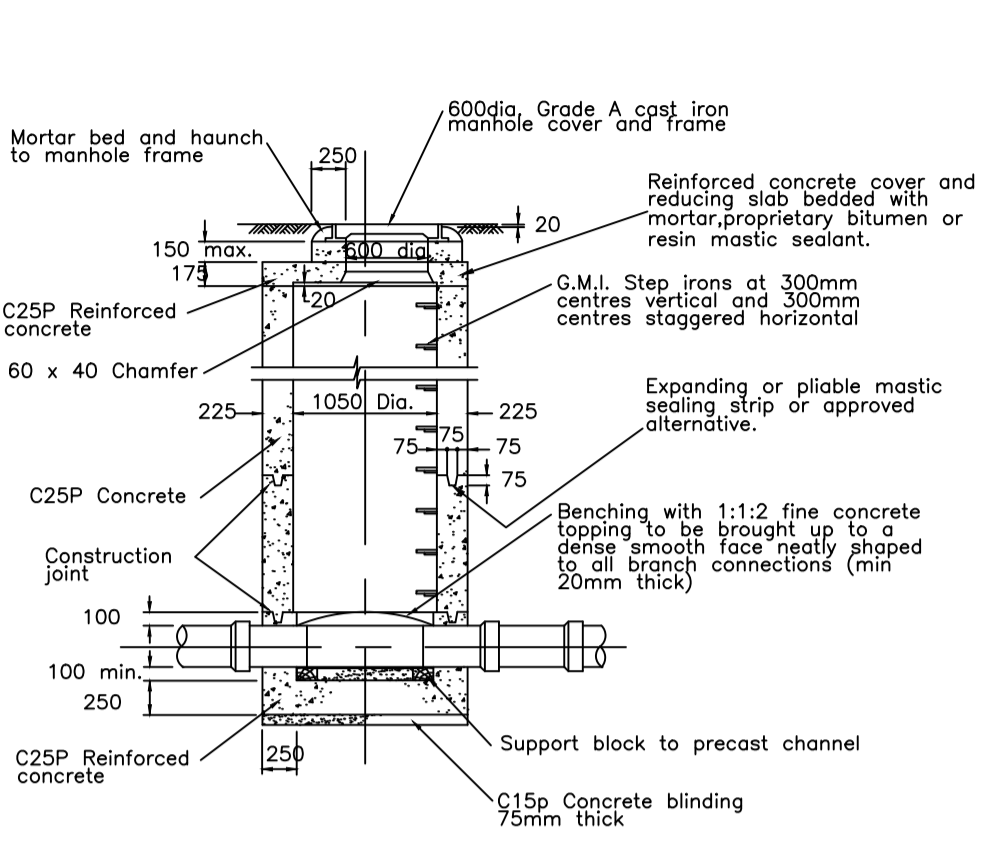
Section Head Date Division Head Date

Branch Head Date Director Date

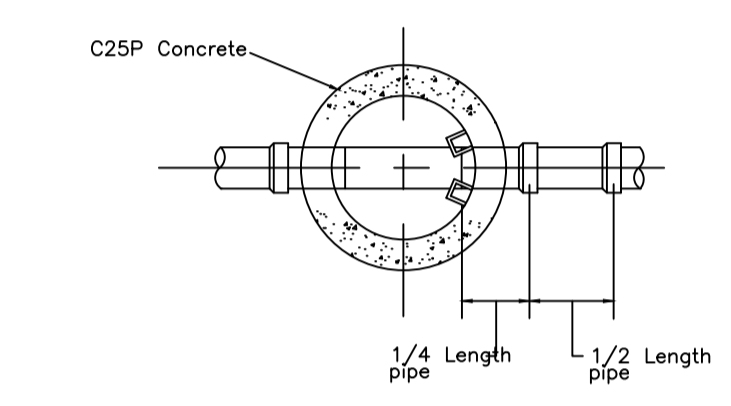
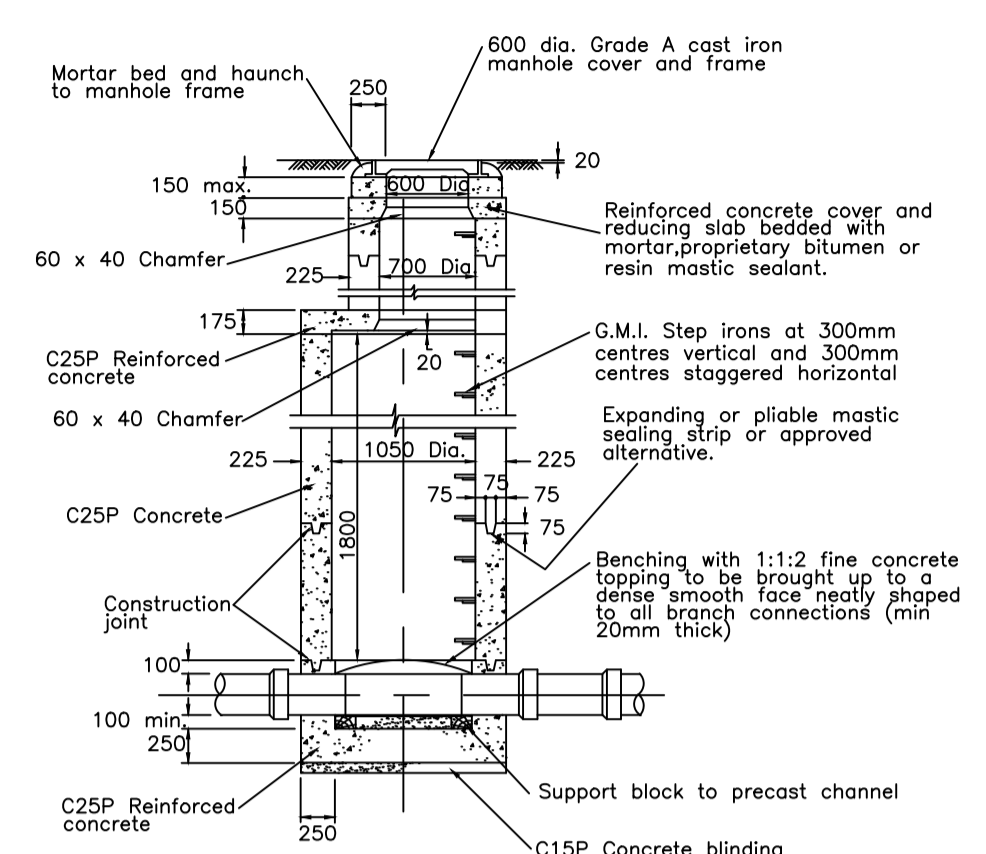
Scale AS SHOWN Date DEC 2022

Job No. ACAD File:

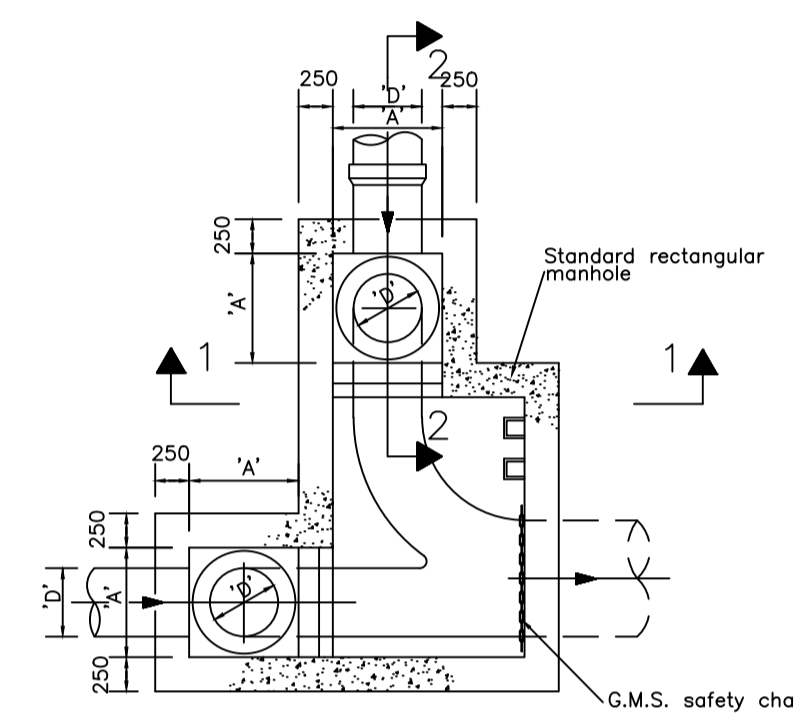
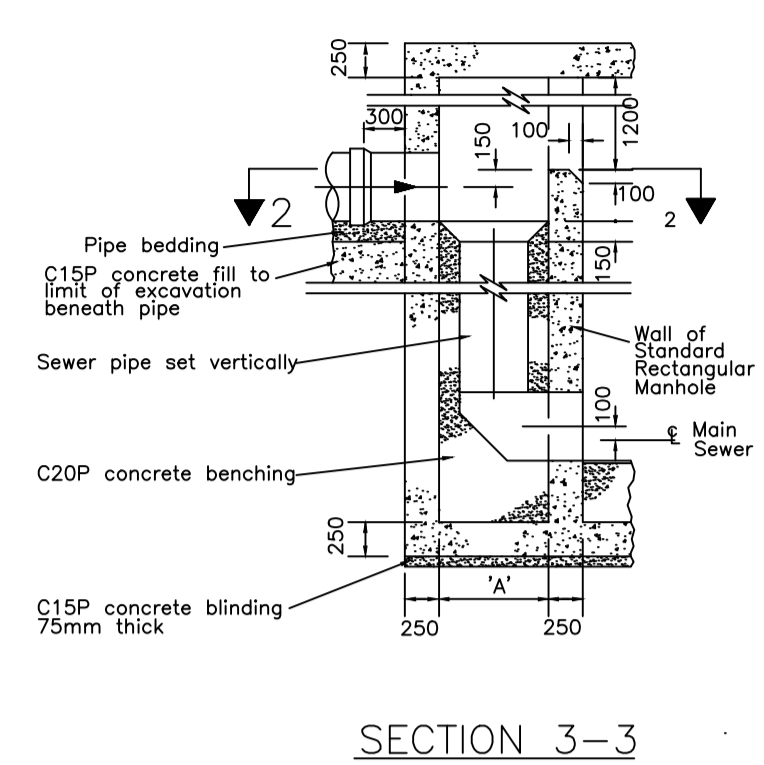
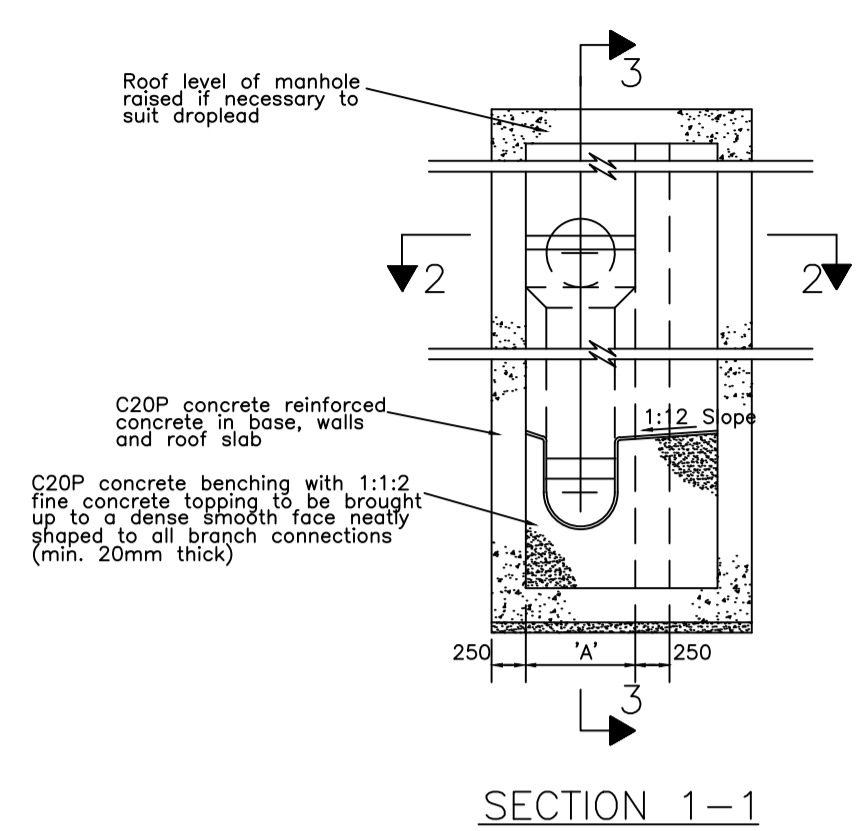
STATUS DRAWING No. WW/WD/874/SD/013 REV



MANHOLE TYPE 1
PRECAST OR IN-SITU CONCRETE MANHOLE
DEPTH TO INVERT 1.35 TO 3m
PIPES 150 – 500mm DIA.



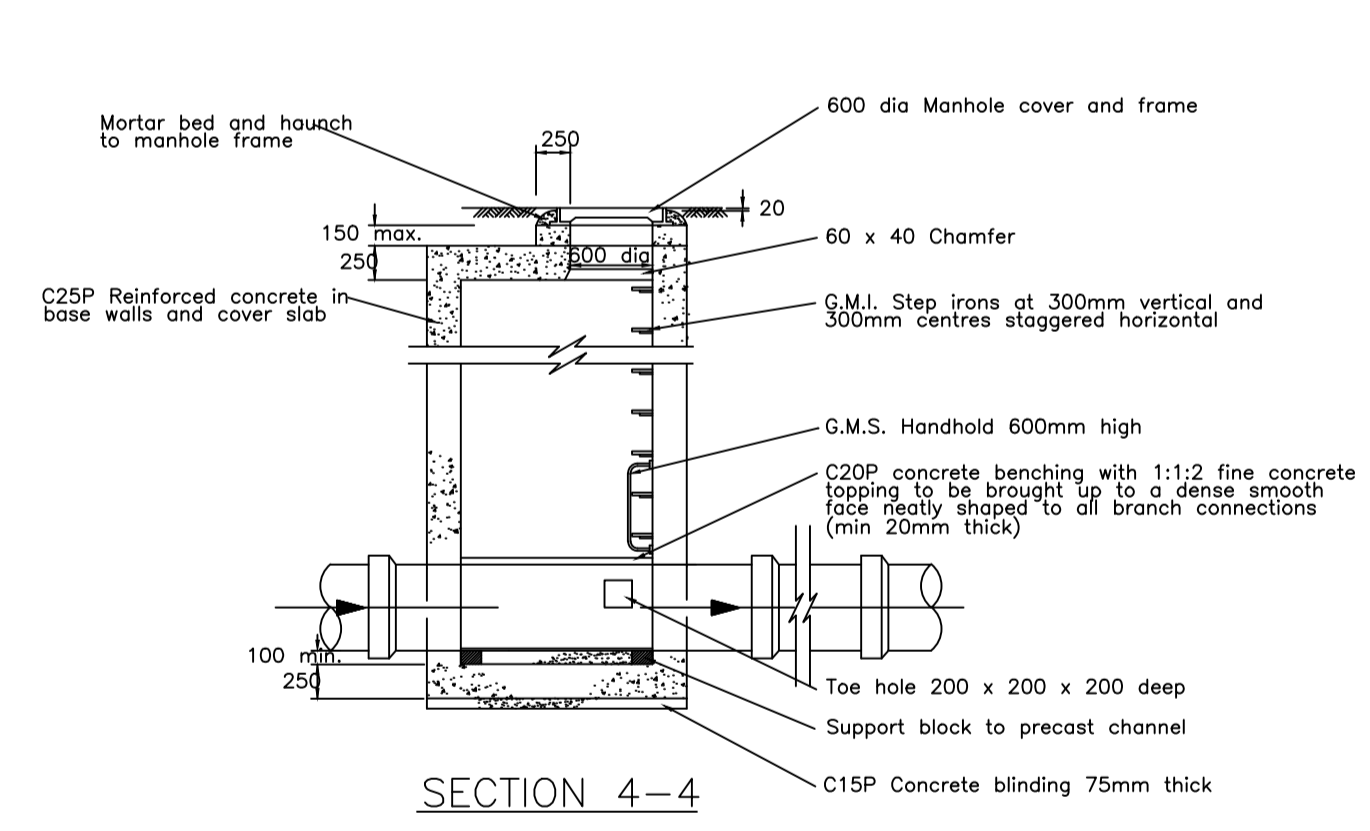
MANHOLE TYPE 2
PRECAST OR IN-SITU CONCRETE MANHOLE
DEPTH TO INVERT 3 TO 6m
PIPES 150 – 500mm DIA.



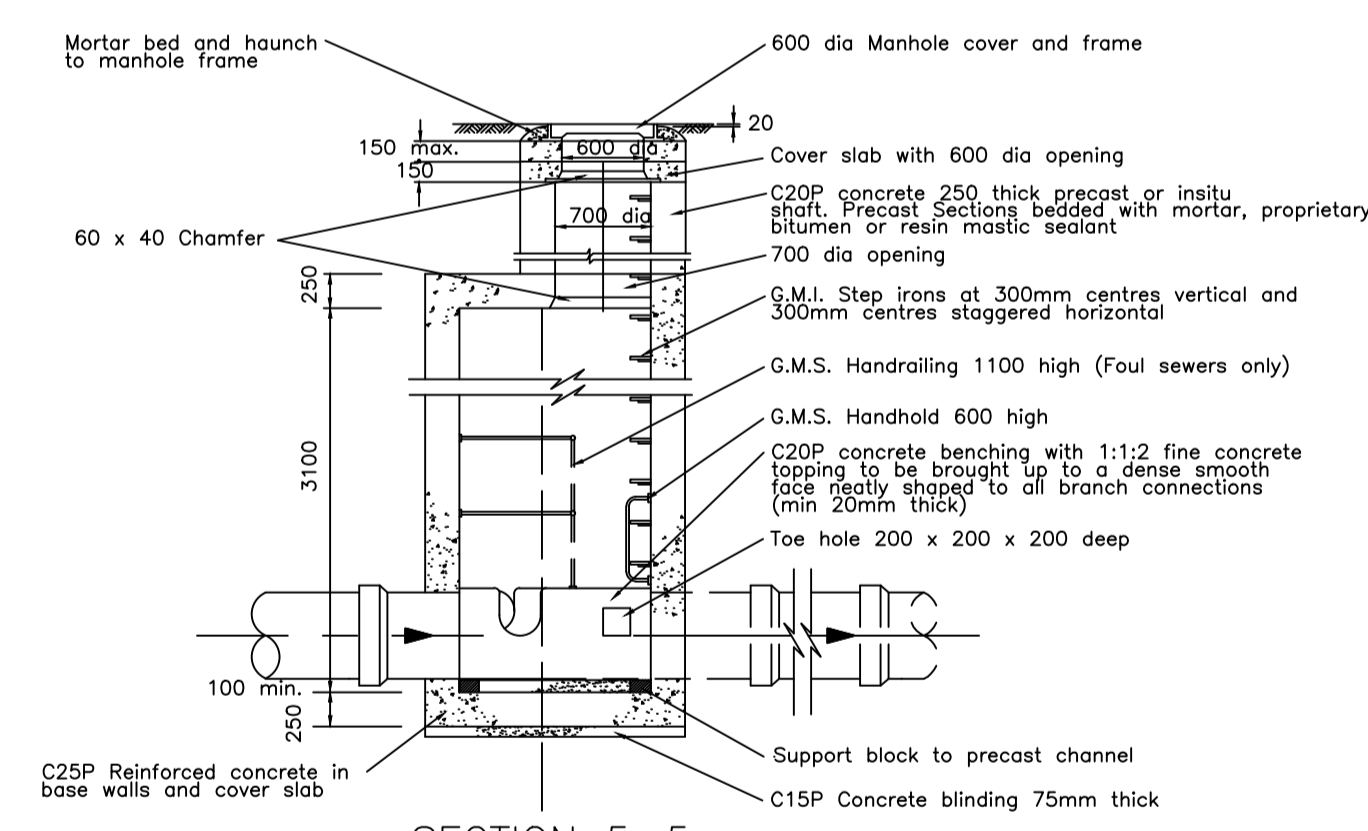
Inlet chamber to mm	Internal dimensions 'A' mm
350 – 500	800
501 – 800	1100
801 – 1100	1400

SECTIONAL PLAN 2-2

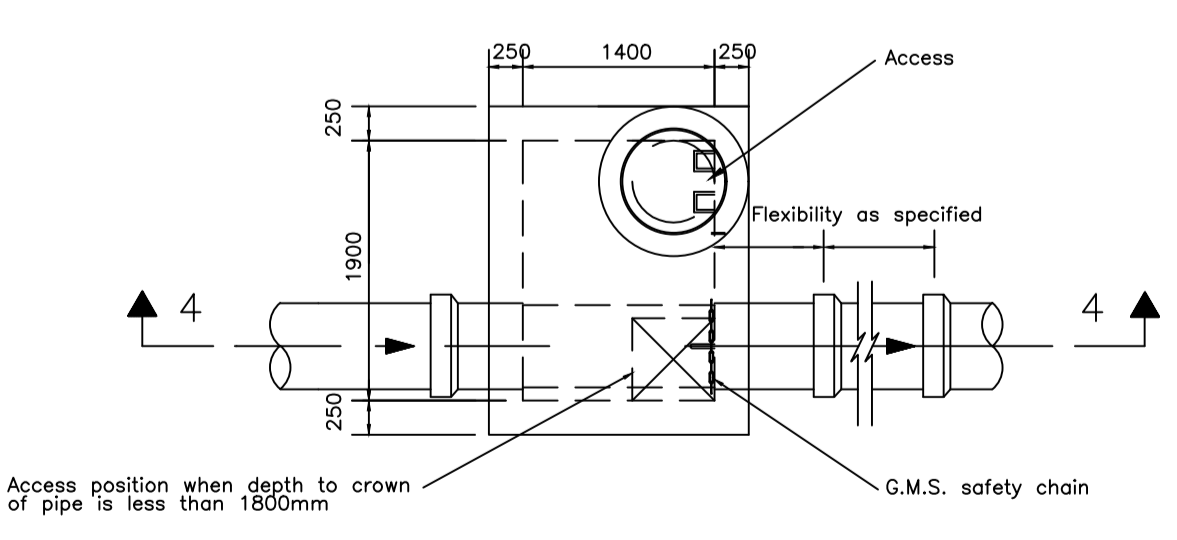
DROPLEAD EXTENSION FOR PIPES 350-1100DIA. TO MANHOLES TYPE 3 & 4



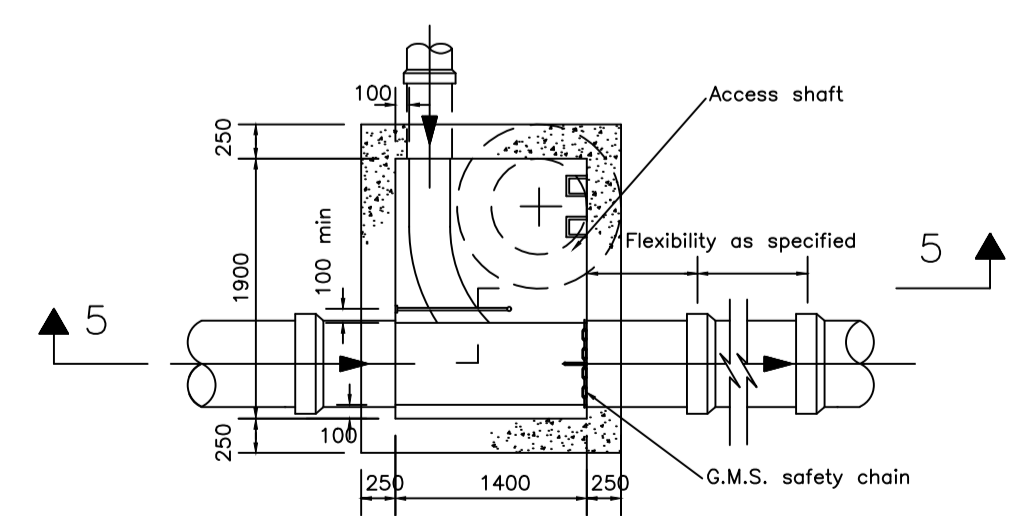
SECTION 4-4



SECTION 5-5



MANHOLE TYPE 3
IN-SITU CONCRETE MANHOLE
DEPTH TO INVERT n/e 4m
PIPES 600 – 1200mm DIA.



MANHOLE TYPE 4
IN-SITU CONCRETE MANHOLE
DEPTH TO INVERT EXCEEDING 4m
PIPES 600 – 1200mm DIA.

- NOTES:**
- All dimensions are in millimetres unless otherwise stated.
 - Only figured dimensions to be taken from this drawing.
 - Drawing to scale only in A1 size.

- PLOT FACTOR**
- GREEN – 0.25
 - WHITE – 0.18
 - YELLOW – 0.25
 - MAGENTA – 0.60
 - COLOUR 8 – 0.15
 - COLOUR 9 – 0.18

REV	REVISIONS	Dwg. No.	SIGN	DATE	APPROVED
C			BY	CHECKED	
B			BY	CHECKED	
A			BY	CHECKED	
			BY	CHECKED	
0			BY	CHECKED	

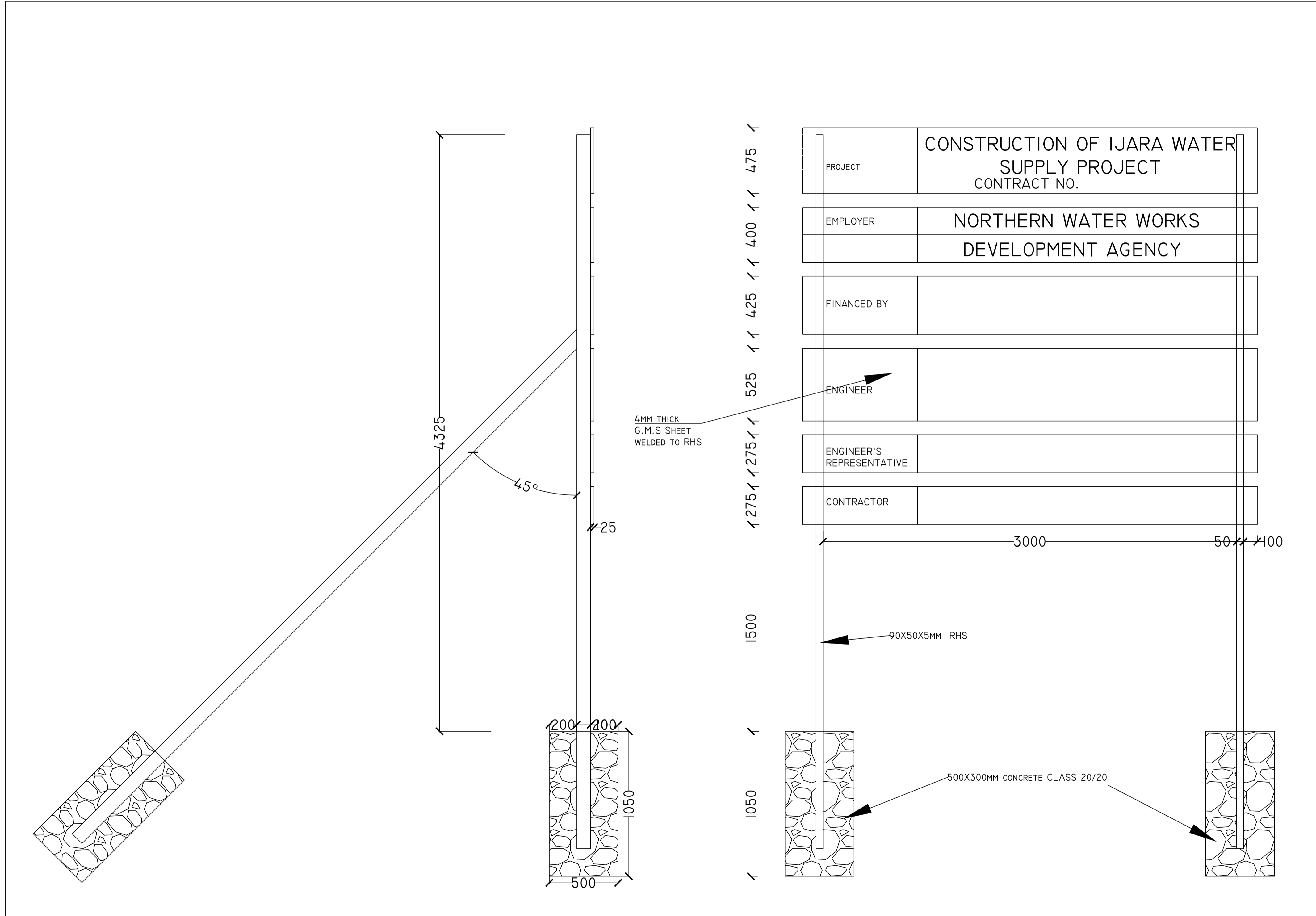
Client:
NORTHERN WATER WORKS
DEVELOPMENT AGENCY
P.o.Box 495-GARISSA

Project:
IJARA WATER SUPPLY PROJECT
MASALANI-GABABA
WORKS

Designed by _____ Drawn by _____
 Checked by _____ Approved by _____

Title:
STANDARD DETAILS
MANHOLES – TYPE 1,2,3 & 4
AND DROPLEAD EXTENSION

Section Head	Date	Division Head	Date
Branch Head	Date	Director	Date
Scale	AS SHOWN	Date	DEC 2022
Job No.	ACAD File:		
STATUS	DRAWING No.	NWDA/GSA/2019/SD/017	REV



NOTES

- All dimensions are in mm unless otherwise stated
- Final wording on all signboards to be decided/approved by the Employer before fabrication of signboards

REVISIONS	Dep. No.	SIGN	DATE	APPROVED
C		BY		
		CHECKED		
B		BY		
		CHECKED		
A		BY		
		CHECKED		
D		BY		
		CHECKED		

Client:
NORTHERN WATER WORKS
DEVELOPMENT AGENCY
P.o.Box 495-GARISSA

Project:
IJARA WATER SUPPLY PROJECT
MASALANI-GABABA
WORKS

Approved by: _____
Designed by: _____
Checked by: _____
Drawn by: _____

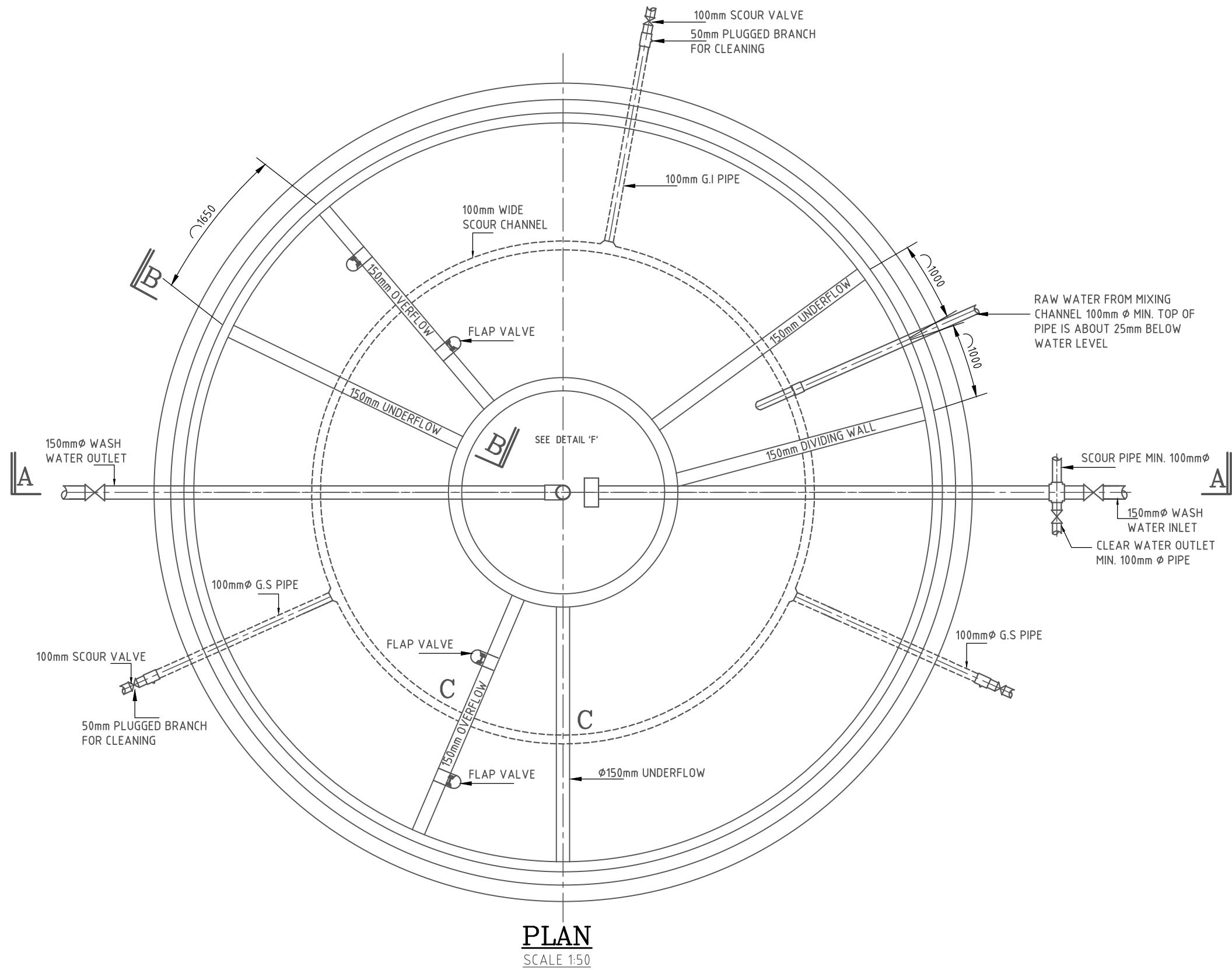
Title:
STANDARD DETAILS
SIGNBOARD DETAILS

Section Head	Date	Division Head	Date
Branch Head	Date	Director	Date


Scale: AS SHOWN Date: DEC 2022

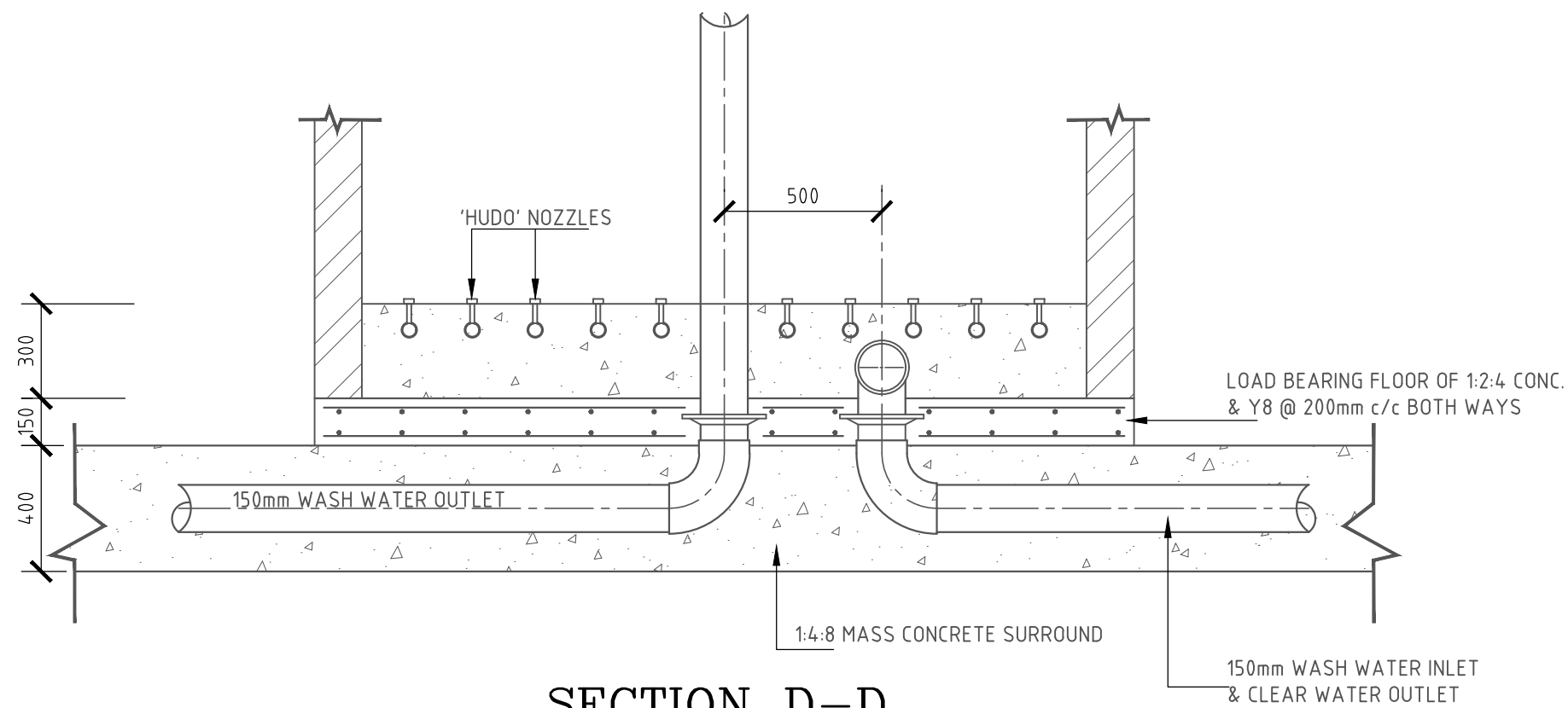
Job No. _____ ACAD File: _____

DRAWING No. WW/WD/874/SD/013 REV



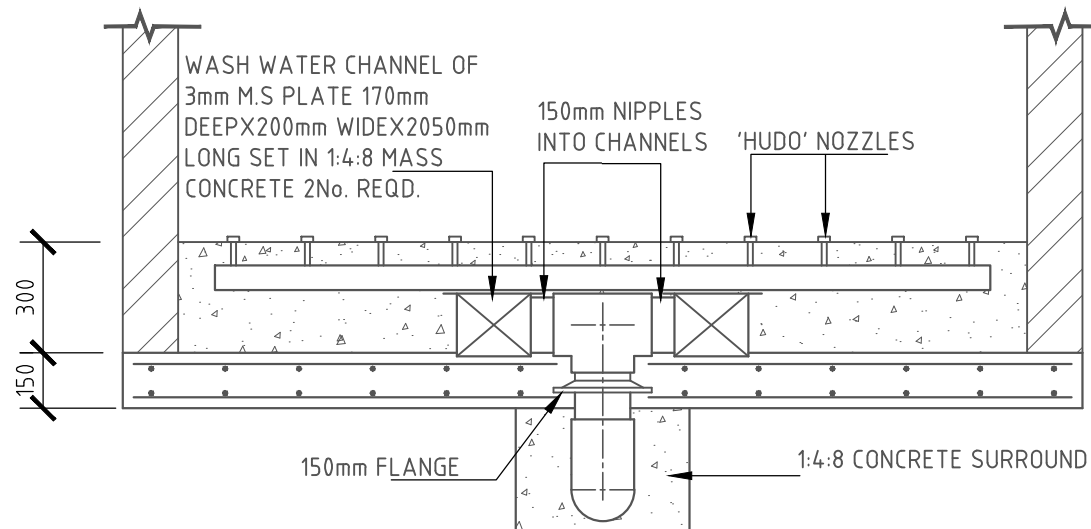
PLAN
SCALE 1:50

MINISTRY OF WATER & IRRIGATION- MAJI HOUSE			
20 m³/H CAPACITY COMPOSITE FILTRATION UNIT (USEFUL RANGE 15-25m³/H)			
DESIGNED	C. BRENDHECKE		SHEET 2 OF 4
DRAWN	P. MATUNDURA	APRIL 1973	SCALE: AS SHOWN
DIGITIZED	ALUCHID M.F	JUNE 2009	DRG. NO.
CHECKED	ENG. B.I KASABULI	JUNE 2009	M.W.I
APPROVED	D.W.S	JUNE 2009	F2/15A



SECTION D-D


SCALE 1:25

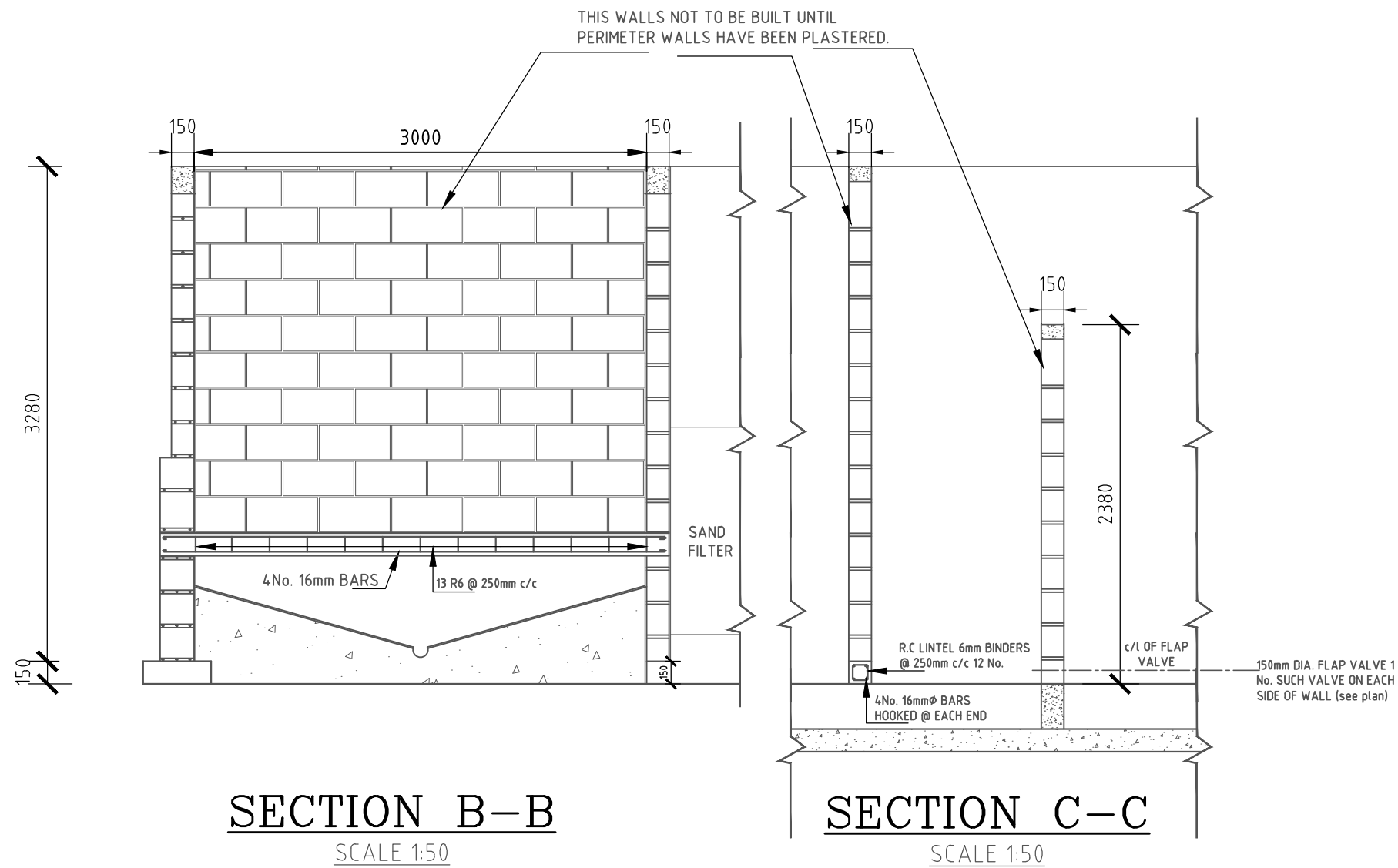


SECTION E-E

SCALE 1:25

NOTE
 UNDERDRAIN PIPES & CHANNELS TO BE SECURED AS DIRECTED BY THE ENGINEER WITH No. 8 GAUGE WIRE STIRRUPS PRIOR TO PLACEMENT OF MASS CONCRETE.


MINISTRY OF WATER & IRRIGATION- MAJI HOUSE			
20 m ³ /H CAPACITY COMPOSITE FILTRATION UNIT (USEFUL RANGE 15-25m ³ /H)			
DESIGNED	C. BRENDKECKE		SHEET 3 OF 4
DRAWN	P. MATUNDURA	APRIL 1973	SCALE: AS SHOWN
DIGITIZED	ALUCHID M.F	JUNE 2009	DRG. NO.
CHECKED	ENG. B.I KASABULI	JUNE 2009	M.W.I
APPROVED	D.W.S	JUNE 2009	F2/15A



50mm ϕ G.I PIPES REQUIRED		
OVERALL LENGTH	NO. OF HOLES PER PIPE	NUMBER REQUIRED
900mm	5	4
1300mm	7	2
1700mm	9	2
2100mm	11	4
TOTAL NUMBER OF NOZZLES REQUIRED = 96		

FILTER CONSTRUCTION			
MATERIAL	DIA. (mm)	DEPTH (mm)	LOCATION
GRAVEL	38-20	75	BOTTOM
	20-12	75	"
	12-5	75	"
	5-2	75	"
COARSE SAND EFFECTIVE SIZE	1.0	75	MIDDLE
SAND EFFECTIVE SIZE UNIFORMITY COEFFICIENT	0.5	750	TOP
TOTAL THICKNESS OF STRUCTURE		1125	

150mm DIA. FLAP VALVE 1 No. SUCH VALVE ON EACH SIDE OF WALL (see plan)

MINISTRY OF WATER & IRRIGATION- MAJI HOUSE 

20 m³/H CAPACITY COMPOSITE FILTRATION UNIT (USEFUL RANGE 15-25m³/H)

DESIGNED	C. BRENDHECKE		SHEET 4 OF 4
DRAWN	P. MATUNDURA	APRIL 1973	SCALE: AS SHOWN
DIGITIZED	ALUCHID M.F	JUNE 2009	DRG. NO.
CHECKED	ENG. B.I KASABULI	JUNE 2009	M.W.I
APPROVED	D.W.S	JUNE 2009	F2/15A