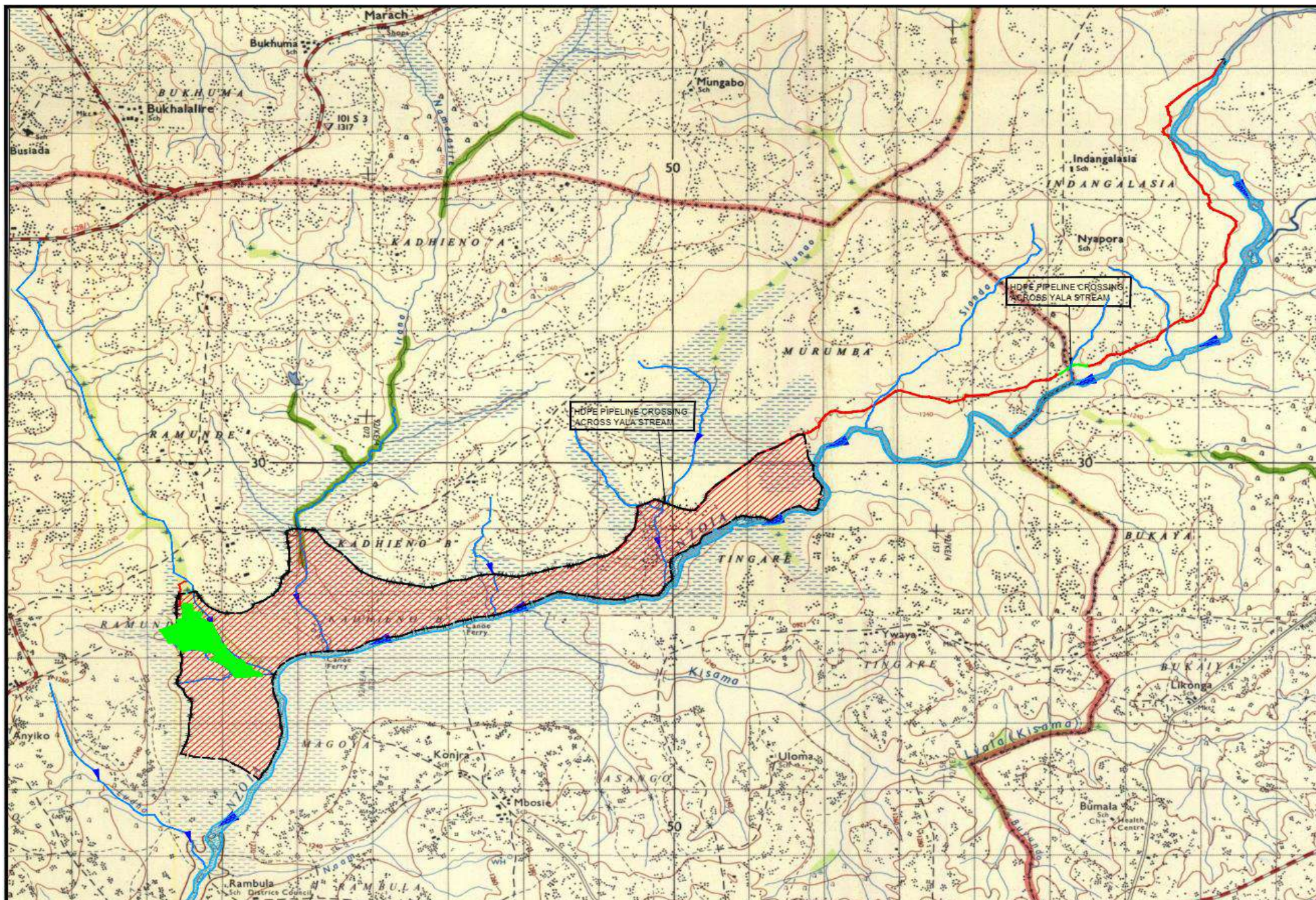


Eng. Henry Ndugah
Consulting Engineer

Suite A4 Machera Court,
Komo Lane off Wood Avenue Kilimani
P. O. Box 24103-00100, Nairobi, Kenya
Tel: +254 (0) 20 2621168



**CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAILED DESIGN AND PREPARATION OF
TENDER DOCUMENTS FOR ANYIKO - KATHIENO IRRIGATION DEVELOPMENT PROJECT,
SIAYA COUNTY**

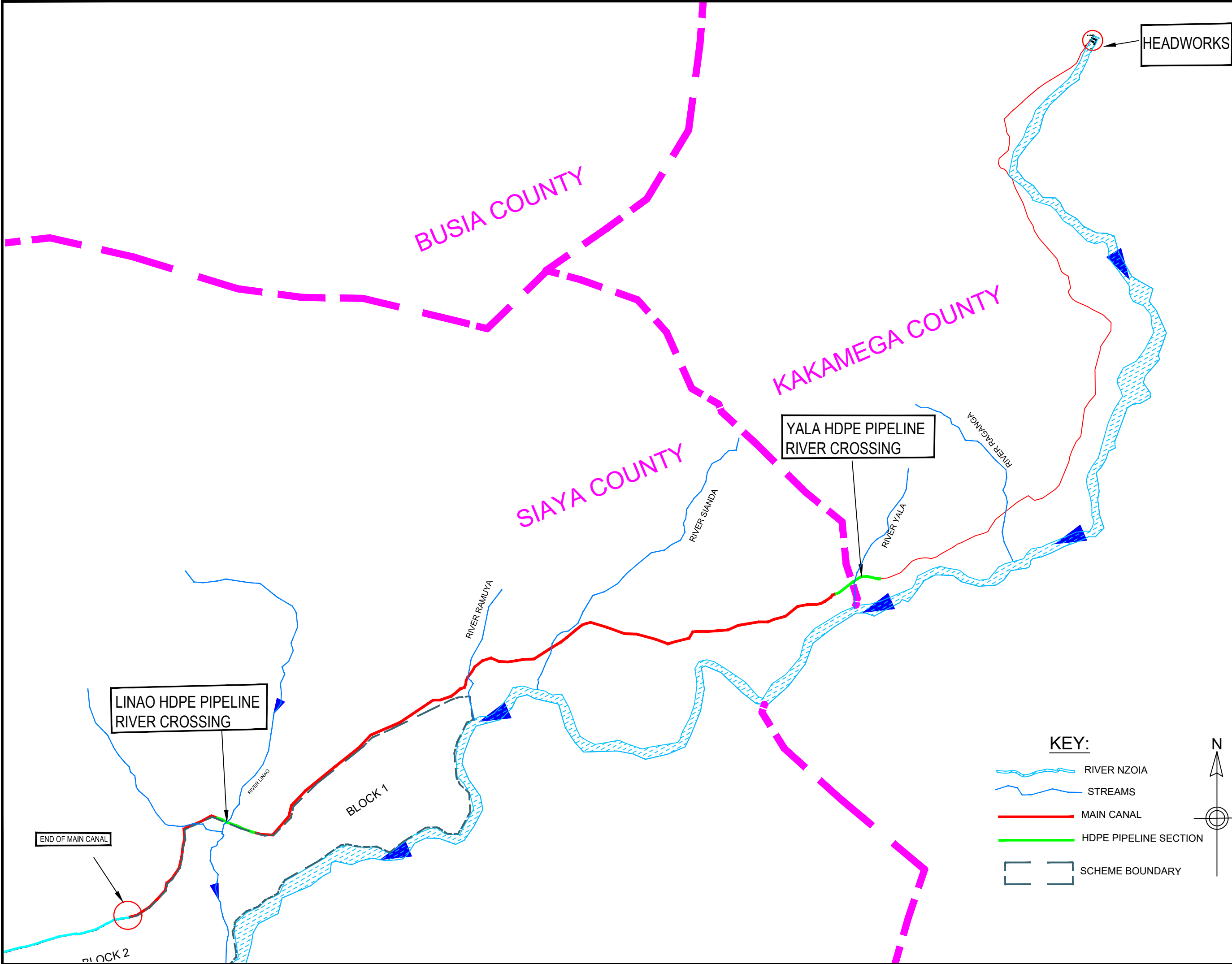


VOLUME 3 - TENDER DRAWINGS

JANUARY 2022

ANYIKO - KATHIENO IRRIGATION PROJECT DRAWING INDEX

DRG NO.	DRAWING DESCRIPTION	SHEET
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AKIDP/FFD/02	SCHEME AREA CONTOUR MAP	1
AKIDP/FFD/03	MAIN CANAL ALIGNMENT	1
	INTAKE AND SEDIMENTATION BASIN	
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AKIDP/FFD/12	INTAKE SITE LAYOUT	1
AKIDP/FFD/13	INTAKE PLAN AND SECTIONS	1
AKIDP/FFD/14	INTAKE SECTIONS	1
AKIDP/FFD/15	SEDIMENTATION BASIN PLAN AND SECTIONS	1
AKIDP/FFD/16	SEDIMENTATION BASIN PLAN AND SECTIONS	1
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AKIDP/FFD/42	SCHEDULE OF BOX CULVERTS	1
AKIDP/FFD/43	FLUME STRUCTURE	1
AKIDP/FFD/44	OVERCHUTE STRUCTURE	1
AKIDP/FFD/45	CROSS-DRAINAGE STRUCTURE	1
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AKIDP/FFD/50	TURNOUT ORIFICE STRUCTURE	1
AKIDP/FFD/51	DIVISION BOX	2
AKIDP/FFD/52	CHECK STRUCTURE	1
AKIDP/FFD/53	FOOT BRIDGE STRUCTURE	1
AKIDP/FFD/54	WASHING STEPS	1
AKIDP/FFD/55	CATTLE TROUGH	1
AKIDP/FFD/56	TAIL END STRUCTURE	1



NOTES:

1. DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE INDICATED
2. LEVELS ARE IN METRES

NO.	DESCRIPTION	DATE

REVISIONS

Client

 National Irrigation Authority

NATIONAL IRRIGATION AUTHORITY
LENANA ROAD, P.O. Box 30372, 00100
NAIROBI, KENYA

Civil and Structural Engineers

Eng. HENRY NDUGAH
CONSULTING ENGINEER
Suite A4 Machera Court

Project Title

ANYIKO - KATHIENO
IRRIGATION PROJECT

Drawing Title

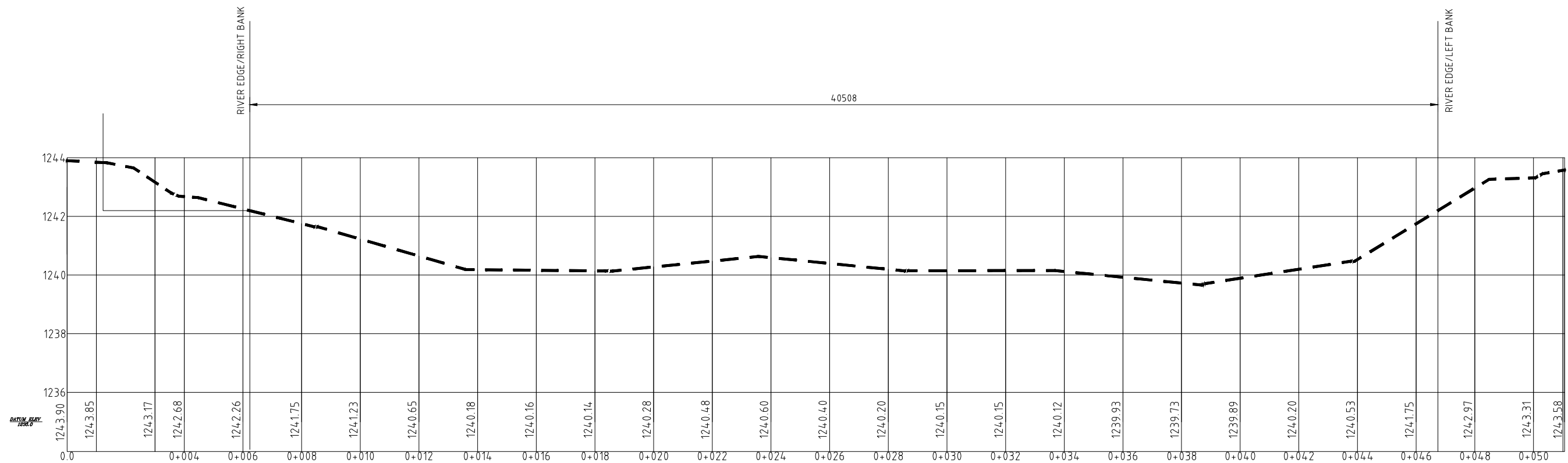
MAIN CANAL ALIGNMENT - 14.5KM LONG

Designed by	Checked By
SOD	HN

Drawn By	Approved By
SOD	HN

Scale	Date
AS SHOWN (A1)	JANUARY 2022

Drawing No.	Rev.	Drq status
AKIDP/FFD/03	0	



NOTES:

0.	DESCRIPTION	DATE

REVISIONS



Civil and Structural Engineers

Project Title

Drawing Title

Designed by JCOO	Checked By HN
Drawn By JCOO	Approved By HN
Scale AS SHOWN (A1)	Date JANUARY 2022
Drawing No. AKIDP/FDD/11	Rev. O
	Drg status



NOTES:

O.	DESCRIPTION	DATE

Client

NATIONAL IRRIGATION AUTHORITY
 KENYANA ROAD, P.O. Box 30372, 00100
 NAIROBI, KENYA

Eng. HENRY NDUGAH
CONSULTING ENGINEER
Suite A4 Machera Court

ANYIKO - KATHIENO
IRRIGATION PROJECT

HEAD WORKS

FLOOD DYKE LAYOUT

scale

Drawing No.
AKIDP/FDD/12



- NOTES:
1. DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE INDICATED
 2. LEVELS ARE IN METRES

NO.	DESCRIPTION	DATE

Client



NATIONAL IRRIGATION AUTHORITY
LENANA ROAD, P.O. Box 30372, 00100
NAIROBI, KENYA

Civil and Structural Engineers

Eng. HENRY NDUGAH
CONSULTING ENGINEER
Suite A4 Machera Court

Project Title

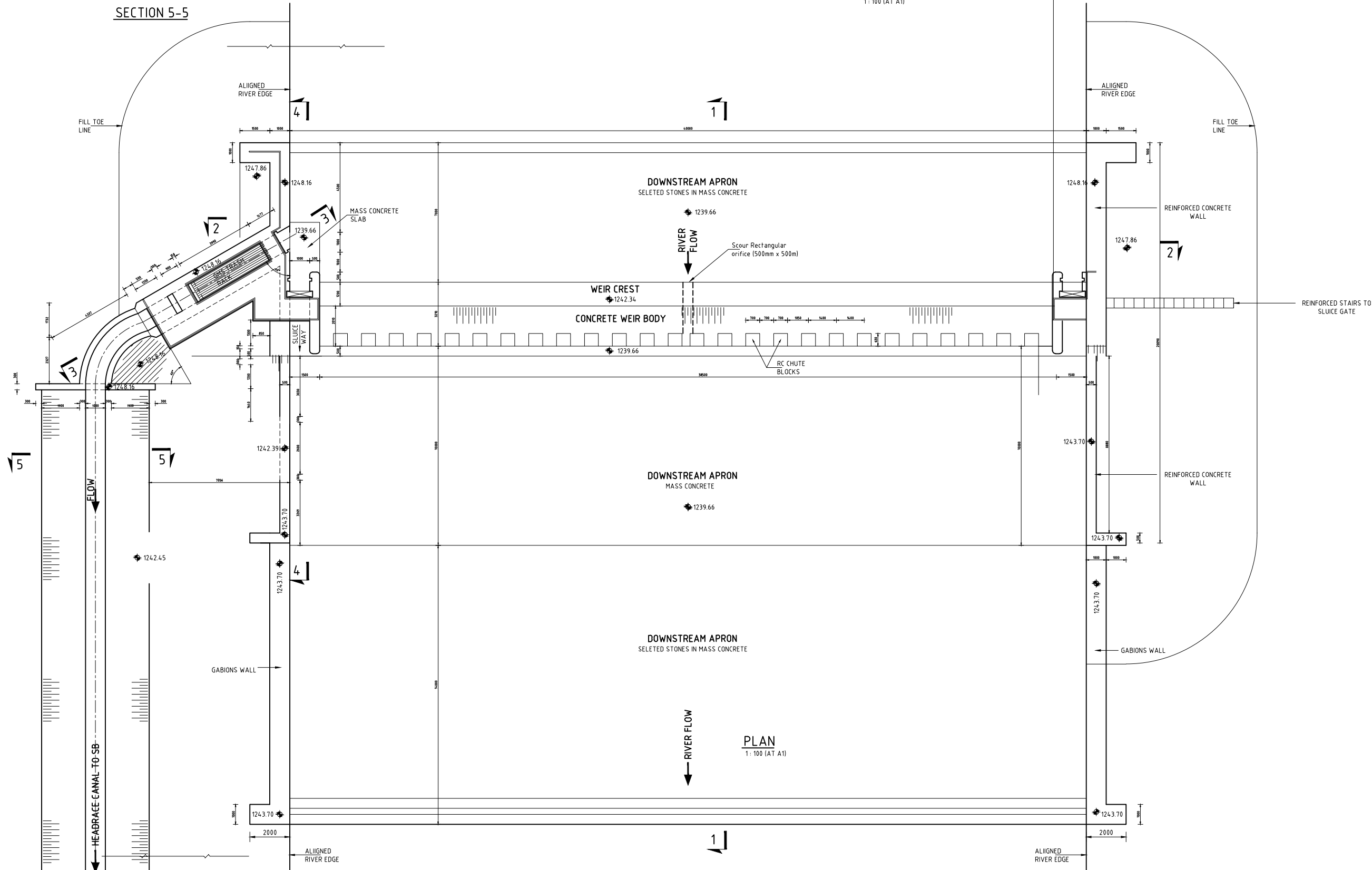
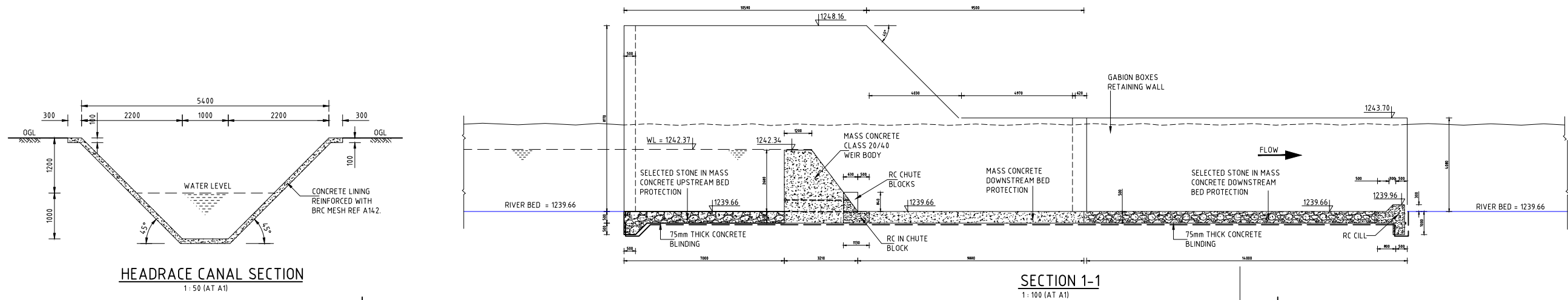
ANYIKO - KATHIENO
IRRIGATION PROJECT

Drawing Title

SEDIMENTATION BASIN
SITE LAYOUT

Designed by SOD	Checked By HN
Drawn By SOD	Approved By HN

Scale 1:200 (A1)	Date JANUARY 2022
Drawing No. AKIDP/FDD/14	Rev. 0 Drg status



- NOTES:
1. DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE INDICATED
 2. LEVELS ARE IN METRES

NO.	DESCRIPTION	DATE

Client


NATIONAL IRRIGATION AUTHORITY
LENANA ROAD, P.O. Box 30372, 00100
NAIROBI, KENYA

Civil and Structural Engineers

Eng. HENRY NDUGAH
CONSULTING ENGINEER
Suite A4 Machera Court

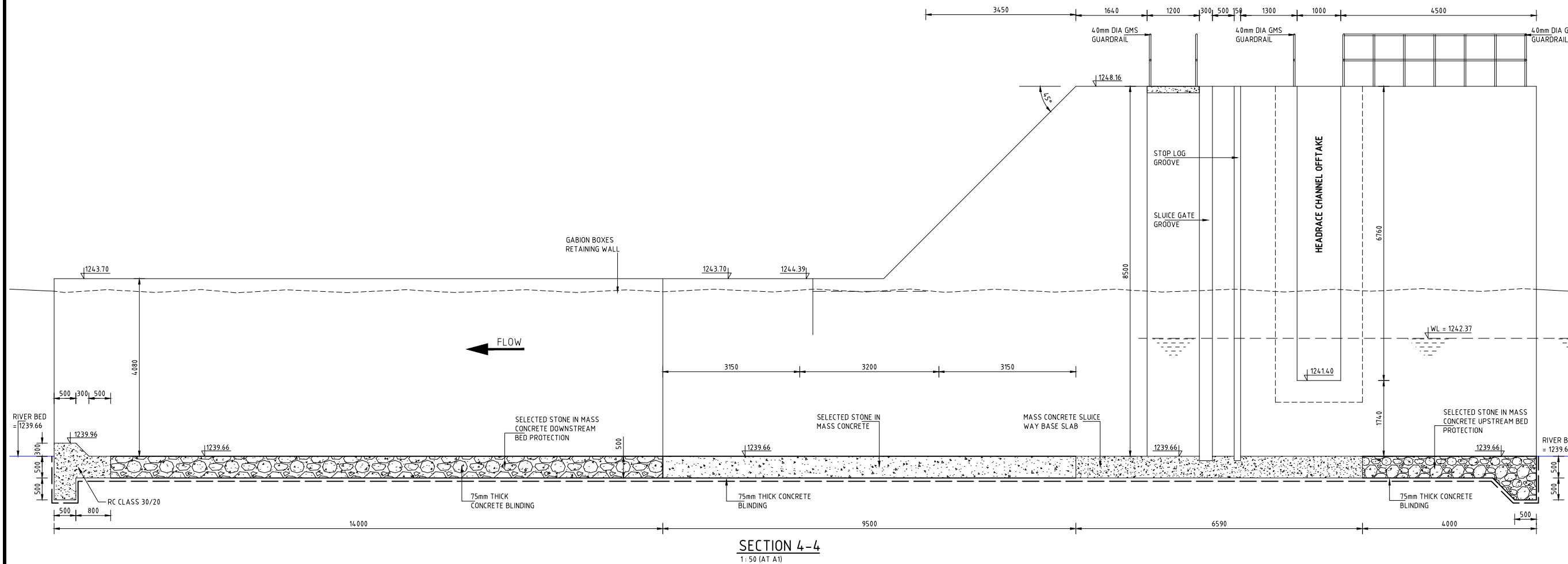
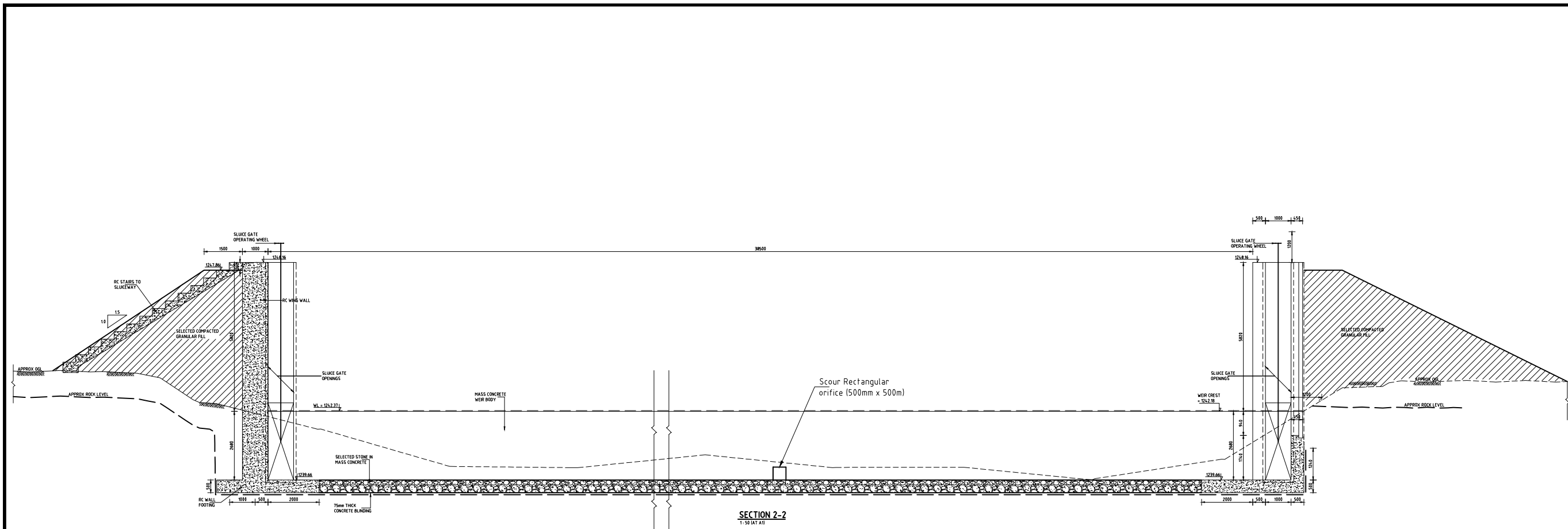
Project Title

**ANYIKO - KATHIENO
IRRIGATION PROJECT**

Drawing Title

**HEAD WORKS
PLAN AND SECTIONS**

Designed by SOD	Checked By HN
Drawn By SOD	Approved By HN
Scale AS SHOWN (A1)	Date JANUARY 2022
Drawing No. AKIDP/FDD/15	Rev. O Drg status



NOTES:

1. DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE INDICATED
2. LEVELS ARE IN METRES

NO. DESCRIPTION DATE

REVISIONS

Client



NATIONAL IRRIGATION AUTHORITY
LENANA ROAD, P.O. Box 30372, 00100
NAIROBI, KENYA

Civil and Structural Engineers

Eng. HENRY NDUGAH
CONSULTING ENGINEER
Suite A4 Machera Court

Project Title

ANYIKO - KATHIENO
IRRIGATION PROJECT

Drawing Title

HEAD WORKS
SECTIONS

Designed by

SOD

Drawn By

SOD

Scale

AS SHOWN (A1)

Drawing No.

AKIDP/FDD/16

Checked By

HN

Approved By

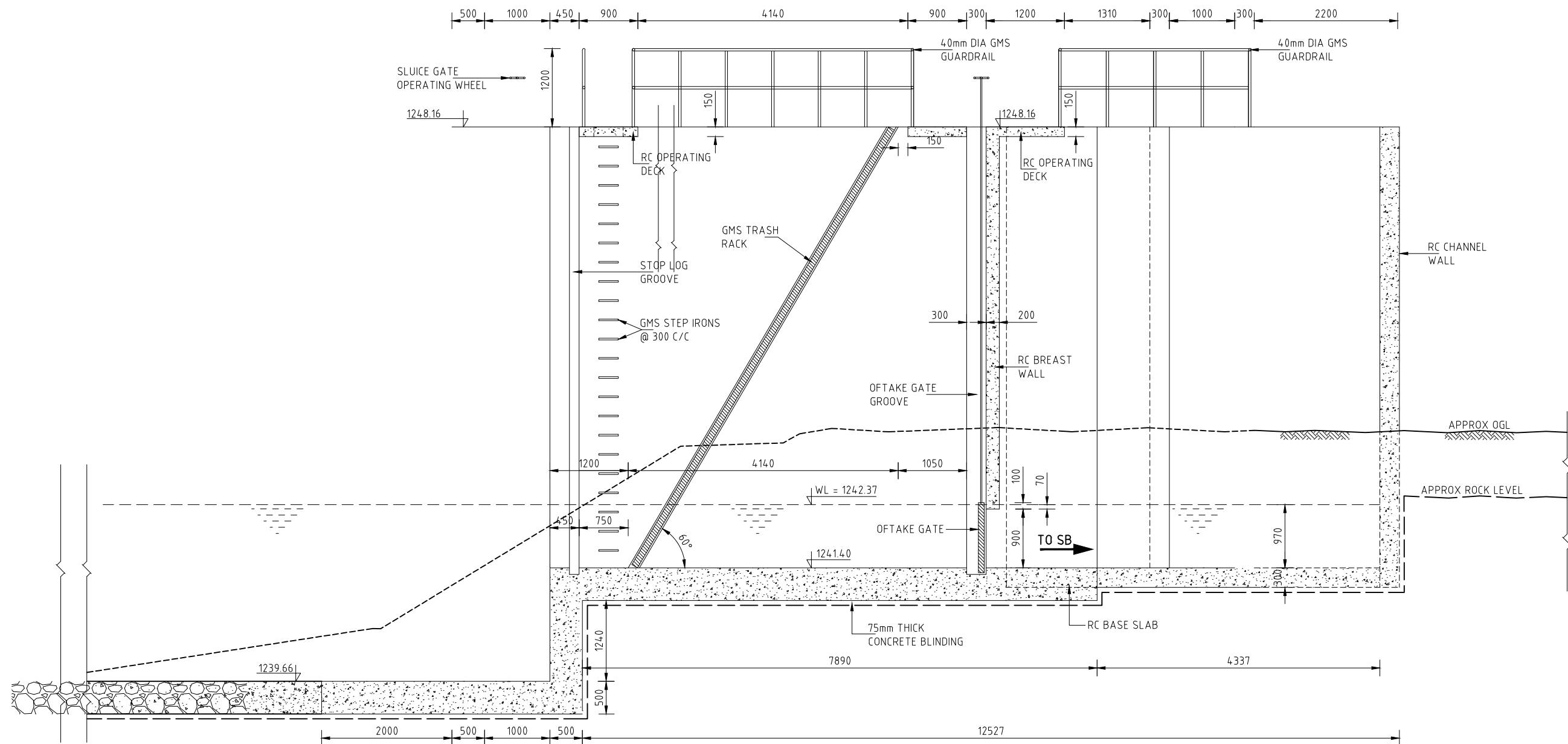
HN

Date

JANUARY 2022

Rev. O

Drq status



SECTION 3-3
1: 50 (AT A1)

- NOTES:
1. DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE INDICATED
 2. LEVELS ARE IN METRES

NO.	DESCRIPTION	DATE

REVISIONS	

Client



NATIONAL IRRIGATION AUTHORITY
LENANA ROAD, P.O. Box 30372, 00100
NAIROBI, KENYA

Civil and Structural Engineers

Eng. HENRY NDUGAH
CONSULTING ENGINEER
Suite A4 Machera Court

Project Title

ANYIKO - KATHIENO
IRRIGATION PROJECT

Drawing Title

HEAD WORKS
SECTIONS

Designed by
SOD

Checked By
HN

Drawn By
SOD

Approved By
HN

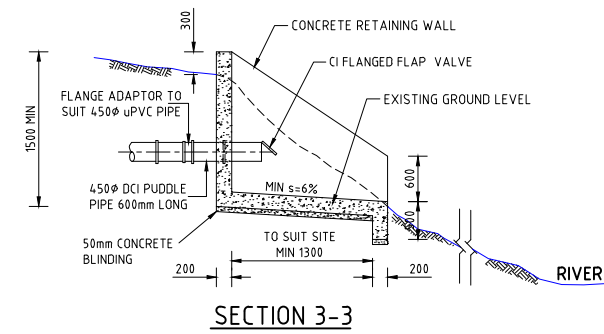
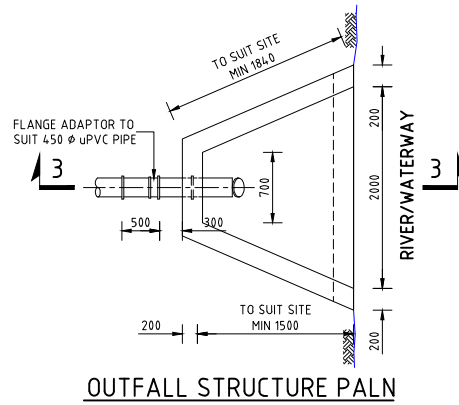
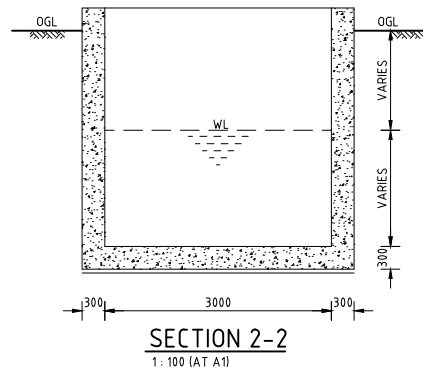
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AS SHOWN (A1)

Date
JANUARY 2022

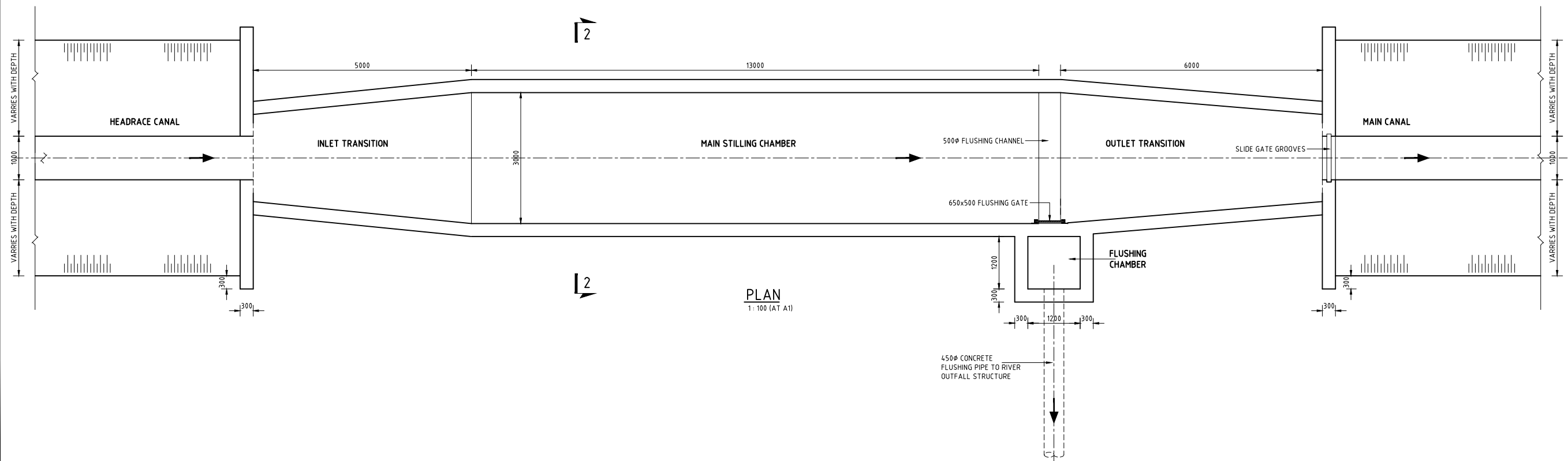
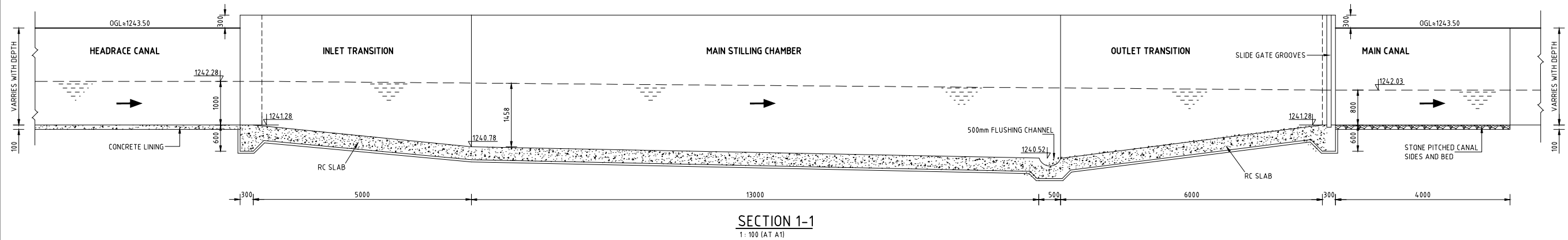
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AKIDP/FDD/17

Rev. O

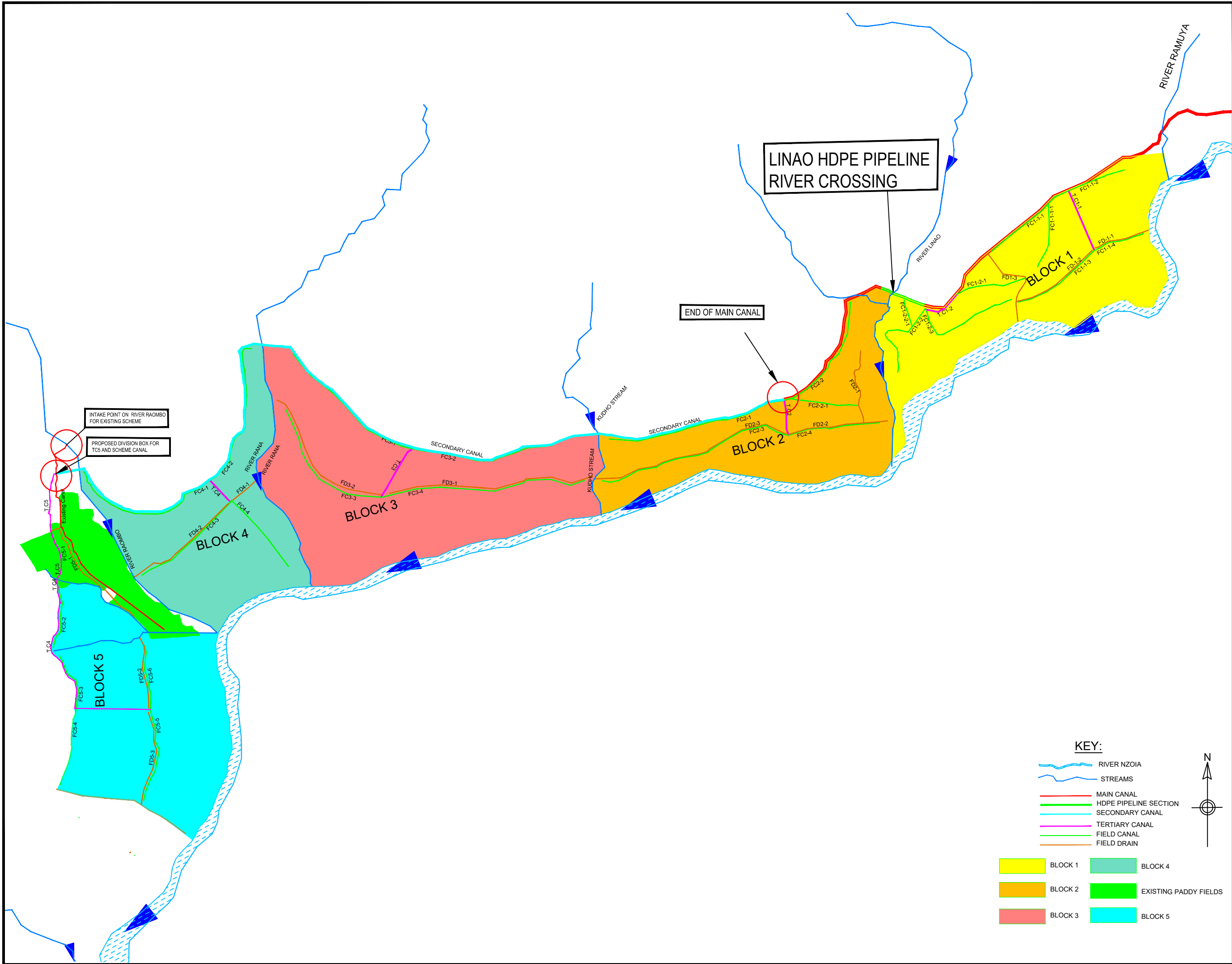
Drg status



- NOTES:
1. DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE INDICATED
 2. LEVELS ARE IN METRES



NO.	DESCRIPTION	DATE
REVISIONS		
Client		
		
NATIONAL IRRIGATION AUTHORITY LENANA ROAD, P.O. Box 30372, 00100 NAIROBI, KENYA		
Civil and Structural Engineers		
Eng. HENRY NDUGAH CONSULTING ENGINEER Suite A4 Machera Court		
Project Title		
ANYIKO - KATHIENO IRRIGATION PROJECT		
Drawing Title		
SEDIMENTATION BASIN PLAN AND SECTIONS		
Designed by SOD	Checked By HN	Date JANUARY 2022
Drawn By SOD	Approved By HN	
Scale AS SHOWN (A1)	Rev. O	Drg status
Drawing No. AKIDP/FDD/18		



NOTES:

- DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE INDICATED
- LEVELS ARE IN METRES

NO.	DESCRIPTION	DATE

REVISIONS

NO.	DESCRIPTION	DATE

Client



NATIONAL IRRIGATION AUTHORITY
LENANA ROAD, P.O. Box 30372, 00100
NAIROBI, KENYA

Civil and Structural Engineers

Eng. HENRY NDUGAH
CONSULTING ENGINEER
Suite A4 Machera Court

Project Title

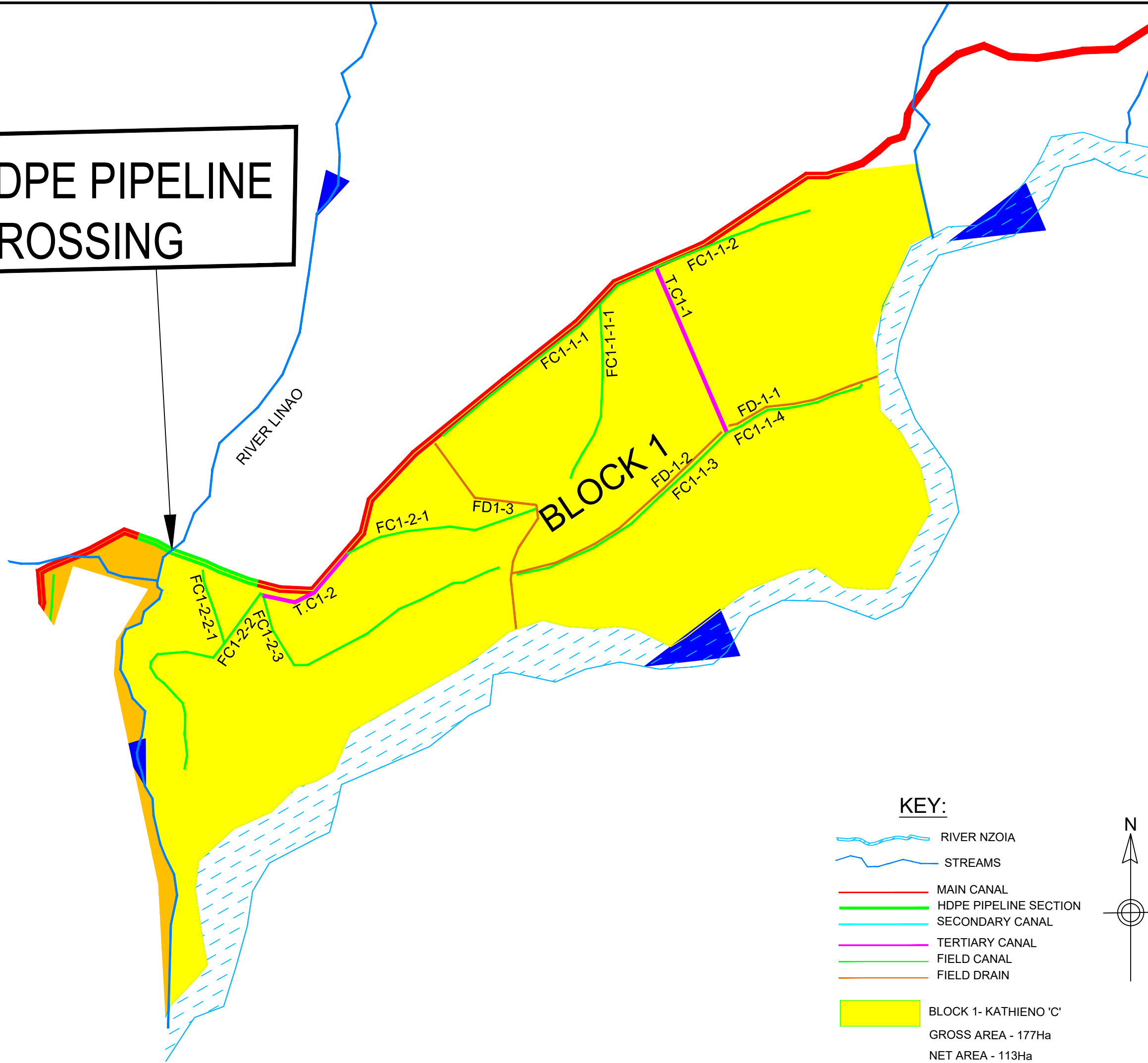
ANYIKO - KATHIENO
IRRIGATION PROJECT

Drawing Title

GENERAL DETAILED LAYOUT MAP

Designed by SOD	Checked By HN
Drawn By SOD	Approved By HN
Scale AS SHOWN (A1)	Date JANUARY 2022
Drawing No. AKIDP/FFD/21	Rev. 0 Drg status

LINAO HDPE PIPELINE RIVER CROSSING



KEY:

-  RIVER NZOIA
 -  STREAMS
 -  MAIN CANAL
 -  HDPE PIPELINE SECTION
 -  SECONDARY CANAL
 -  TERTIARY CANAL
 -  FIELD CANAL
 -  FIELD DRAIN
 -  BLOCK 1- KATHIENO 'C'
- GROSS AREA - 177Ha
NET AREA - 113Ha

NOTES:

1. DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE INDICATED
2. LEVELS ARE IN METRES

NO.	DESCRIPTION	DATE

Client



NATIONAL IRRIGATION AUTHORITY
LENANA ROAD, P.O. Box 30372, 00100
NAIROBI, KENYA

Civil and Structural Engineers

Eng. HENRY NDUGAH
CONSULTING ENGINEER
Suite A4 Machera Court

Project Title

ANYIKO - KATHIENO
IRRIGATION PROJECT

Drawing Title

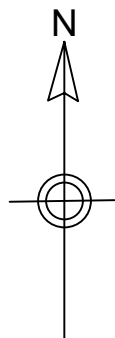
BLOCK 1 DETAILED LAYOUT MAP

Designed by SOD	Checked By HN
Drawn By SOD	Approved By HN
Scale AS SHOWN (A1)	Date JANUARY 2022
Drawing No. AKIDP/FFD/22	Rev. 0 Drg status

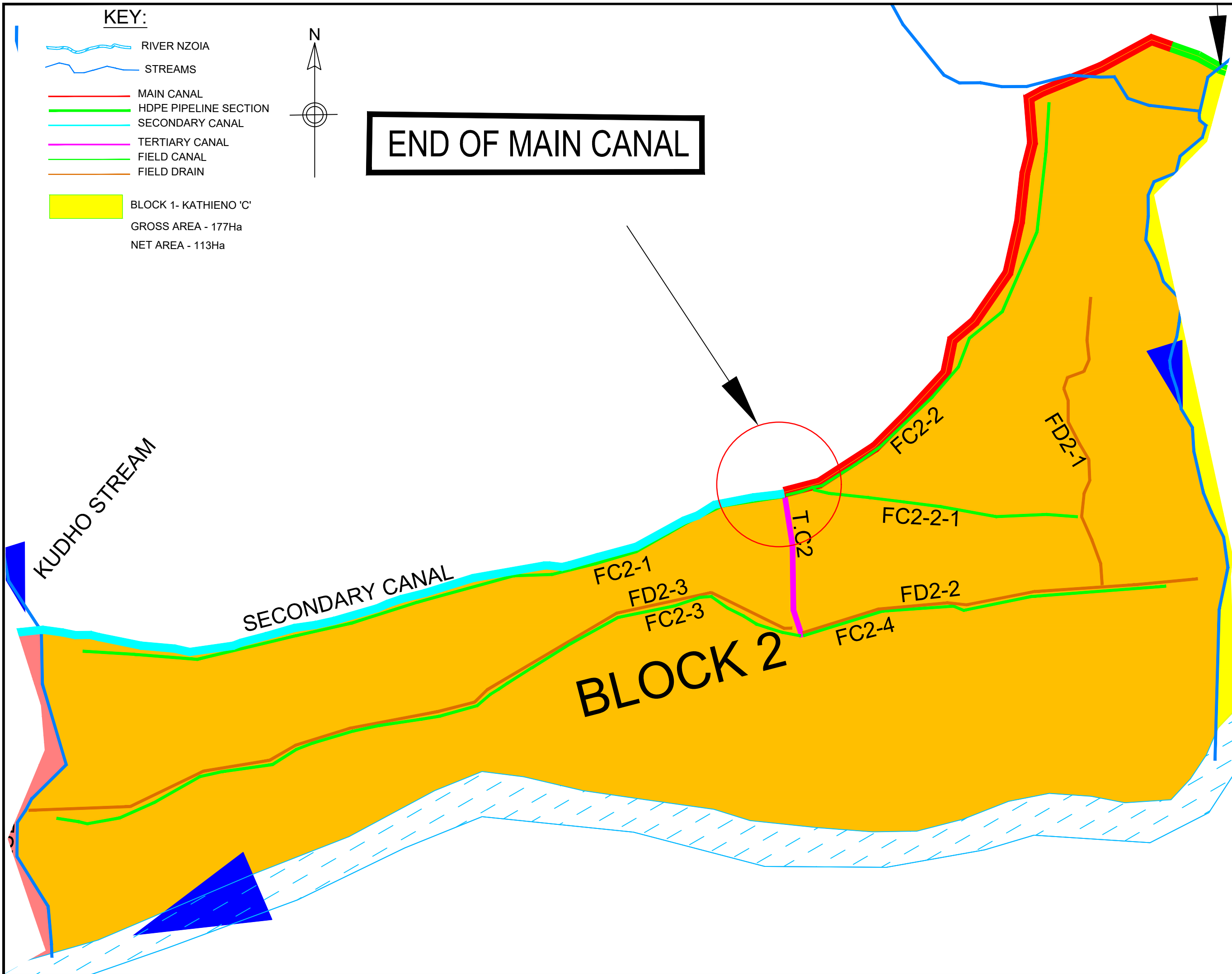
KEY:

- RIVER NZOIA
- STREAMS
- MAIN CANAL
- HDPE PIPELINE SECTION
- SECONDARY CANAL
- TERTIARY CANAL
- FIELD CANAL
- FIELD DRAIN

BLOCK 1- KATHIENO 'C'
GROSS AREA - 177Ha
NET AREA - 113Ha



END OF MAIN CANAL



NOTES:

- DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE INDICATED
- LEVELS ARE IN METRES

NO.	DESCRIPTION	DATE

REVISIONS

Client

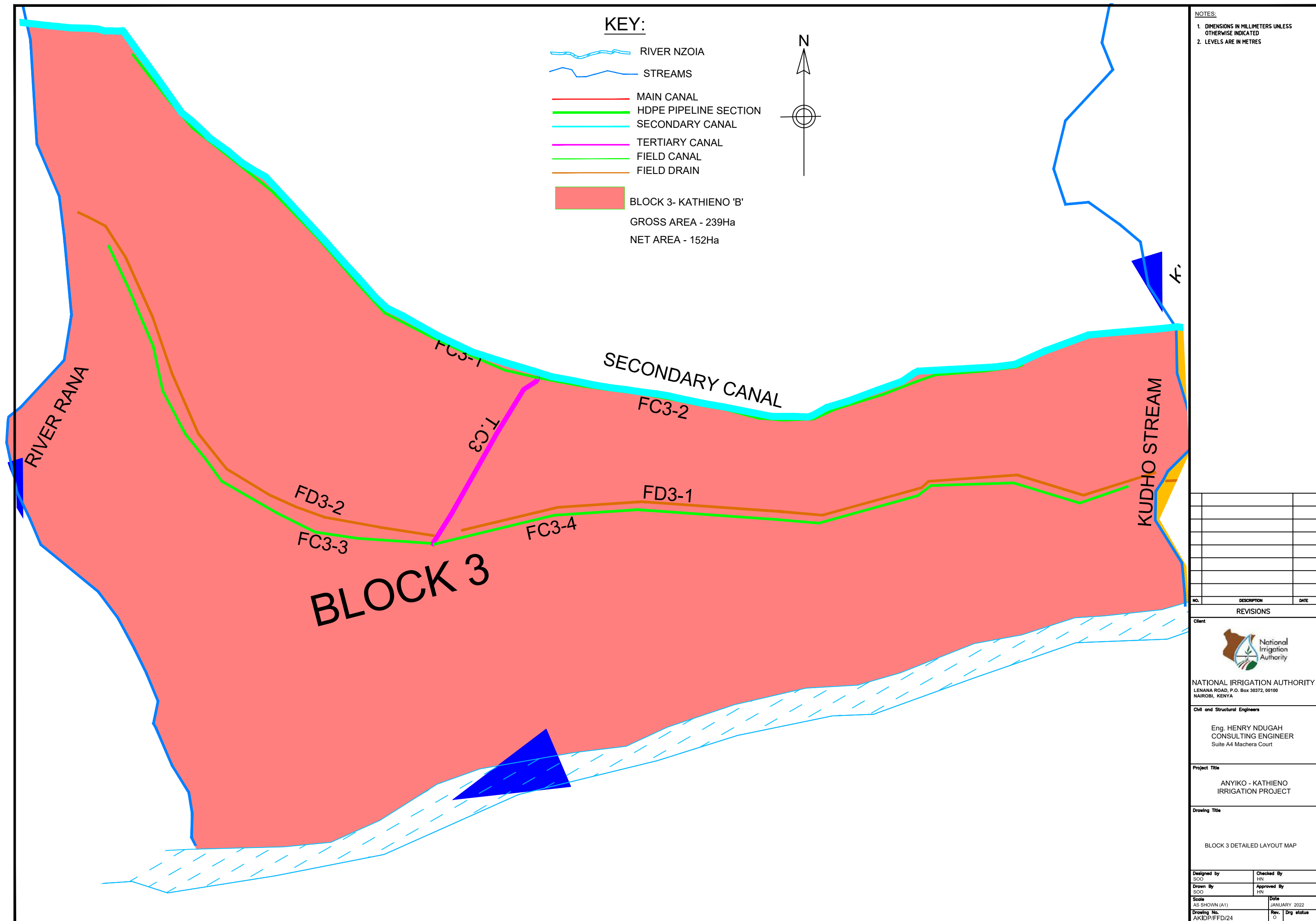
NATIONAL IRRIGATION AUTHORITY
LENANA ROAD, P.O. Box 30372, 00100
NAIROBI, KENYA

Civil and Structural Engineers
Eng. HENRY NDUGAH
CONSULTING ENGINEER
Suite A4 Machera Court

Project Title
ANYIKO - KATHIENO
IRRIGATION PROJECT

Drawing Title
BLOCK 2 DETAILED LAYOUT MAP

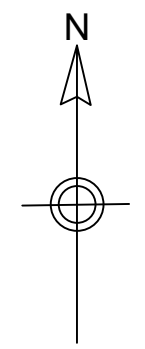
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Drawn By SOD	Approved By HN
Scale AS SHOWN (A1)	Date JANUARY 2022
Drawing No. AKIDP/FFD/23	Rev. 0 Drg status



KEY:

- RIVER NZOIA
- STREAMS
- MAIN CANAL
- HDPE PIPELINE SECTION
- SECONDARY CANAL
- TERTIARY CANAL
- FIELD CANAL
- FIELD DRAIN

BLOCK 4- SIHAY
GROSS AREA - 141Ha
NET AREA - 90Ha



INTAKE POINT ON RIVER RAOMBO
FOR EXISTING SCHEME

PROPOSED DIVISION BOX FOR
TC5 AND SCHEME CANAL

RIVER RAOMBO

RIVER RANA

BLOCK 4

FC4-1 T.C4
FC4-2
FD4-1
FC4-4
FD4-2
FC4-3

NOTES:

- DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE INDICATED
- LEVELS ARE IN METRES

NO.	DESCRIPTION	DATE

REVISIONS

Client

National Irrigation Authority

NATIONAL IRRIGATION AUTHORITY
LENANA ROAD, P.O. Box 30372, 00100
NAIROBI, KENYA

Civil and Structural Engineers

Eng. HENRY NDUGAH
CONSULTING ENGINEER
Suite A4 Machera Court

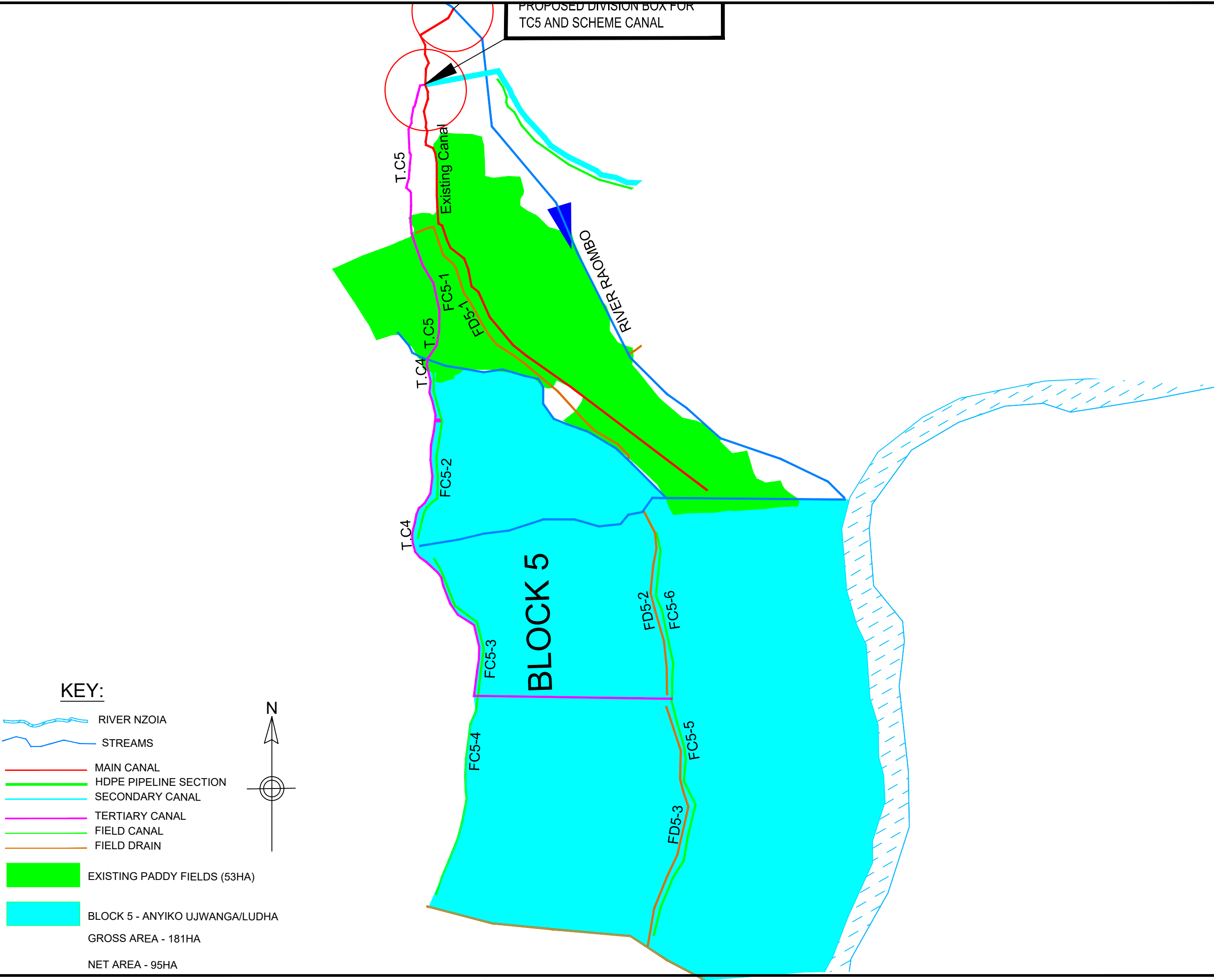
Project Title

ANYIKO - KATHIENO
IRRIGATION PROJECT

Drawing Title

BLOCK 4 DETAILED LAYOUT MAP

Designed by SOO	Checked By HN
Drawn By SOO	Approved By HN
Scale AS SHOWN (A1)	Date JANUARY 2022
Drawing No. AKIDP/FFD/25	Rev. 0 Drg status



NOTES:

- DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE INDICATED
- LEVELS ARE IN METRES

NO.	DESCRIPTION	DATE

REVISIONS

Client

National Irrigation Authority

NATIONAL IRRIGATION AUTHORITY
LENANA ROAD, P.O. Box 30372, 00100
NAIROBI, KENYA

Civil and Structural Engineers

Eng. HENRY NDUGAH
CONSULTING ENGINEER
Suite A4 Machera Court

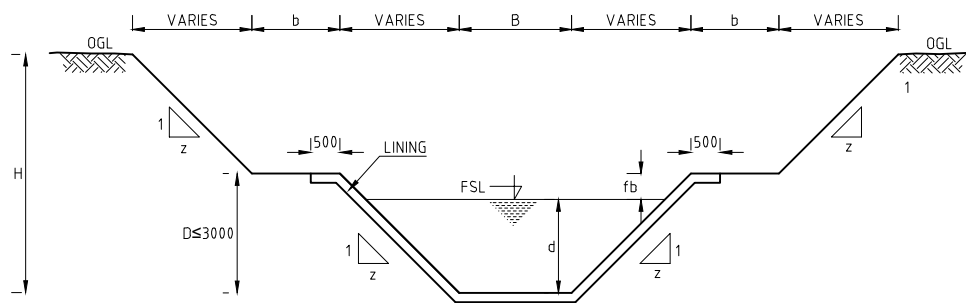
Project Title

ANYIKO - KATHIENO
IRRIGATION PROJECT

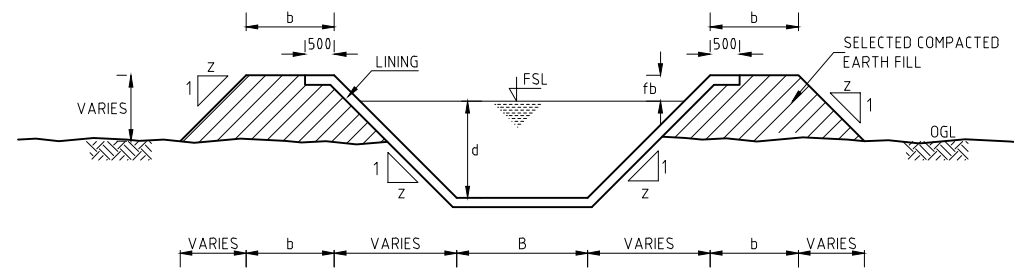
Drawing Title

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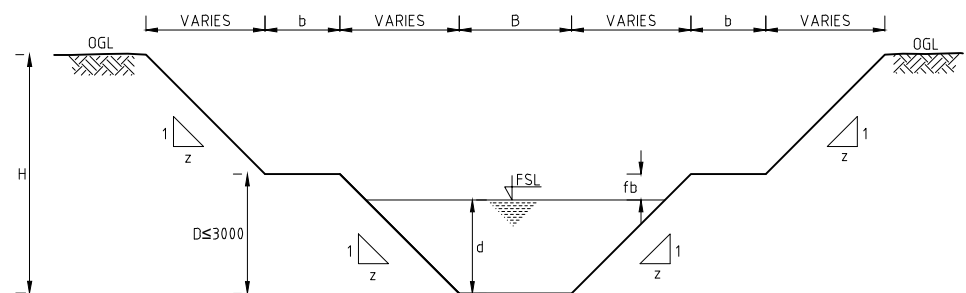
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Scale AS SHOWN (A1)	Date JANUARY 2022	
Drawing No. AKIDP/FFD/26	Rev. 0	Drq status



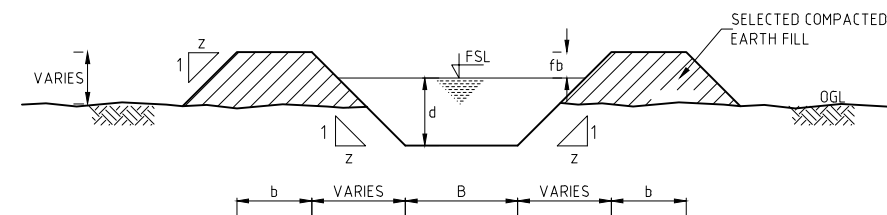
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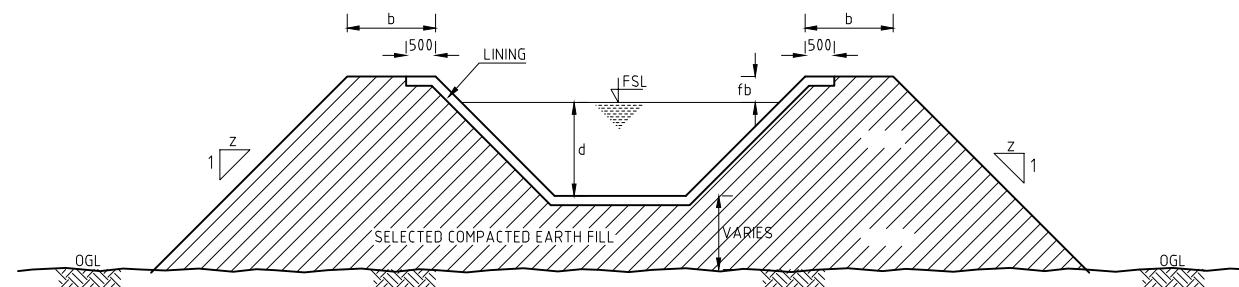
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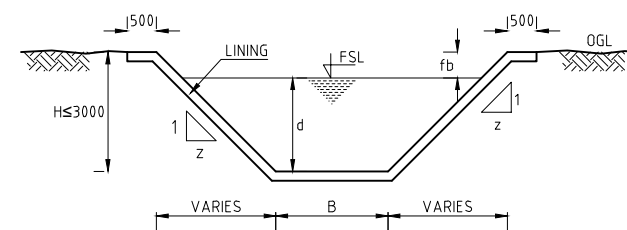
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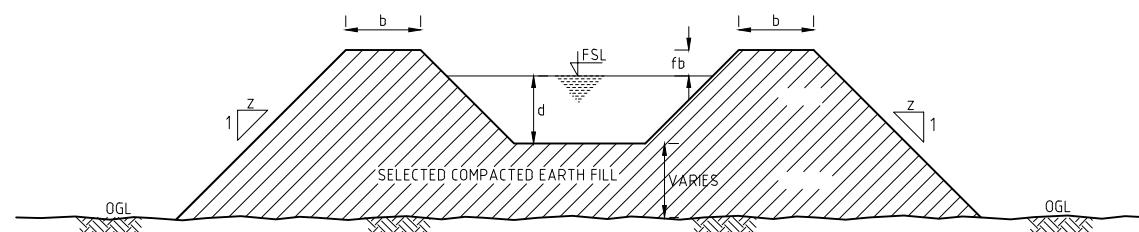
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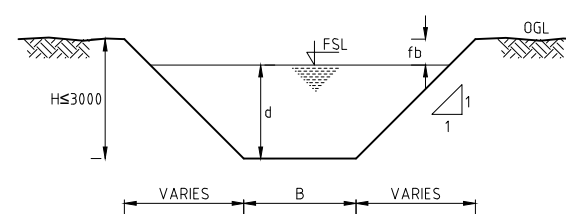
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TYPICAL LINED CANAL CROSS SECTION IN CUT



TYPICAL EARTHEN CANAL CROSS SECTION IN FILL



TYPICAL EARTHEN CANAL CROSS SECTION IN CUT

- NOTES:
1. DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE INDICATED
 2. LEVELS ARE IN METRES

NO. DESCRIPTION DATE

REVISIONS

Client



NATIONAL IRRIGATION AUTHORITY
LENANA ROAD, P.O. Box 30372, 00100
NAIROBI, KENYA

Civil and Structural Engineers

Eng. HENRY NDUGAH
CONSULTING ENGINEER
Suite A4 Machera Court

Project Title

ANYIKO - KATHIENO
IRRIGATION PROJECT

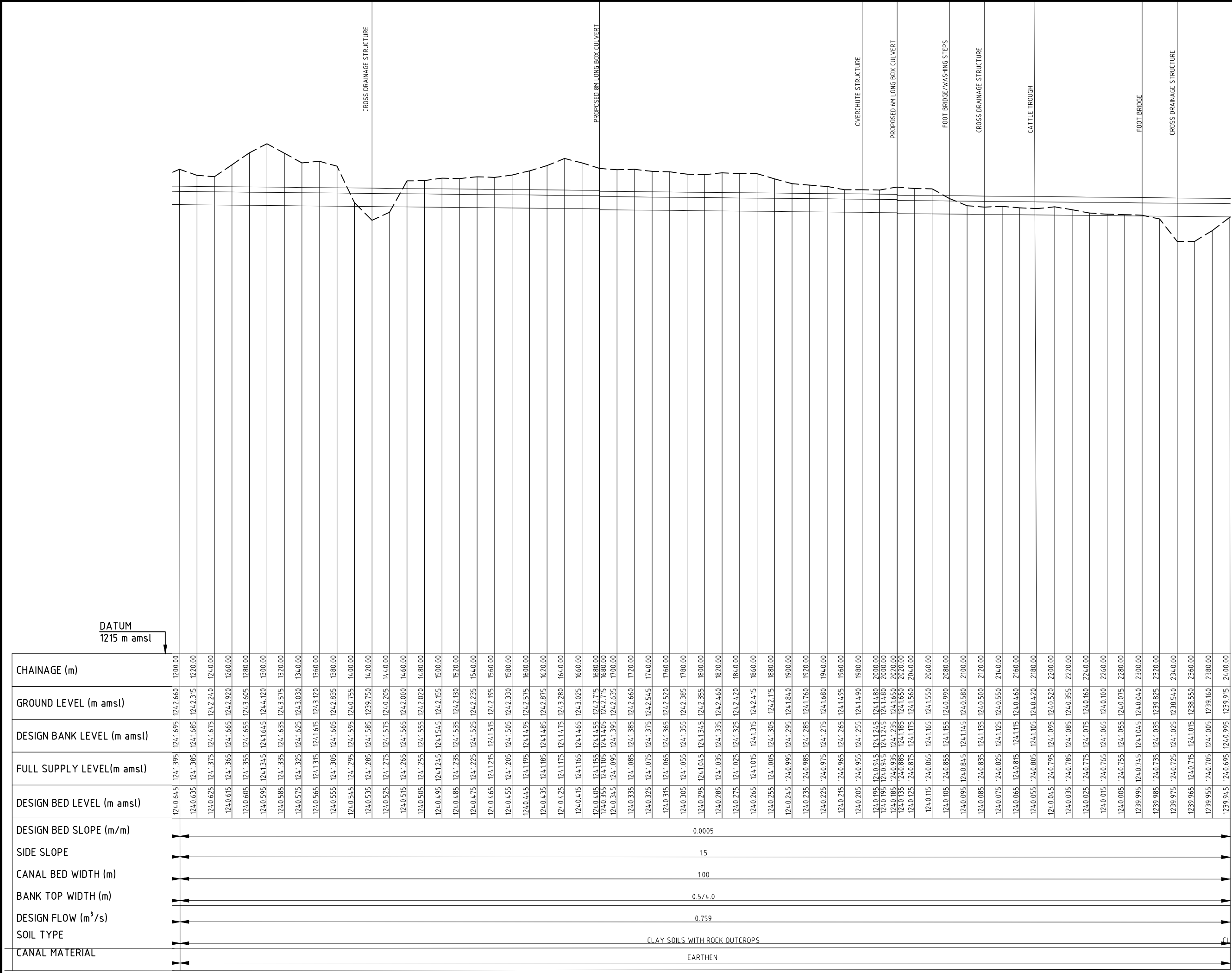
Drawing Title

TYPICAL CANAL CROSS-SECTION
SHEET 1 OF 2

Designed by SOD	Checked By HN
Drawn By SOD	Approved By HN
Scale AS SHOWN (A1)	Date JANUARY 2022
Drawing No. AKIDP/FFD/31	Rev. 0 Drg status



 National Irrigation Authority		
NATIONAL IRRIGATION AUTHORITY LENANA ROAD, P. O. BOX 30372, 00100 NAIROBI, KENYA		
Civil and Structural Engineers		
Eng. HENRY NDUGAH CONSULTING ENGINEER Suite A4 Machera Court		
Project Title		
ANYIKO - KATHIENO IRRIGATION PROJECT		
Drawing Title		
TYPICAL CANAL CROSS-SECTION SHEET 2 OF 2		
Designed by SOO	Checked By HN	
Drawn By SOC	Approved By HN	
Scale AS SHOWN (A1)	Date JANUARY 2022	
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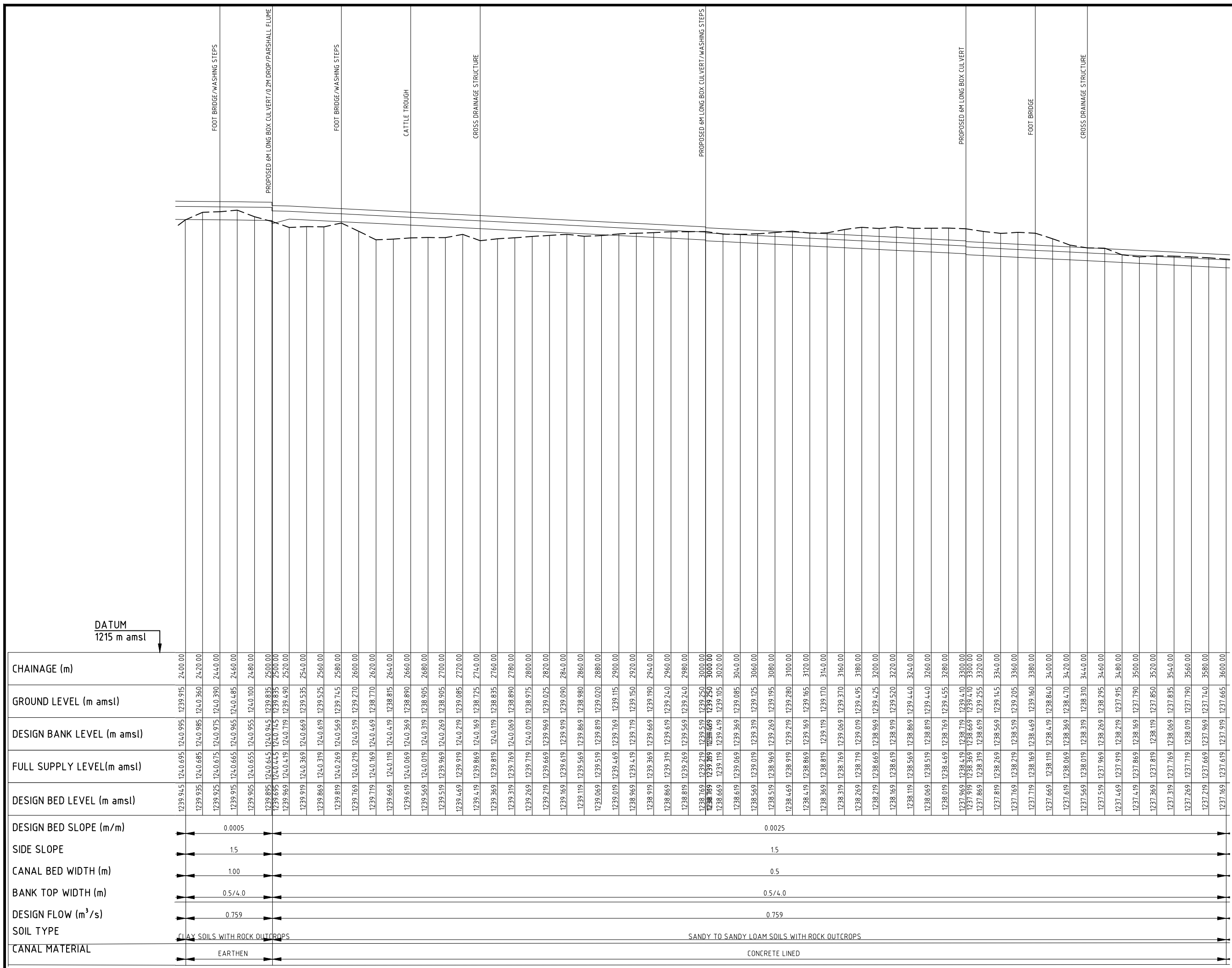


- NOTES:
- 1. DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE INDICATED
 - 2. LEVELS ARE IN METRES

LEGEND

- GROUND LEVEL
- DESIGN BANK LEVEL
- - - FULL SUPPLY LEVEL
- DESIGN BED LEVEL

NO.	DESCRIPTION	DATE
REVISIONS		
Client		
 NATIONAL IRRIGATION AUTHORITY LENANA ROAD, P.O. Box 30372, 00100 NAIROBI, KENYA		
Civil and Structural Engineers		
Eng. HENRY NDUGAH CONSULTING ENGINEER Suite A4 Machera Court		
Project Title		
ANYIKO - KATHIENO IRRIGATION PROJECT		
Drawing Title		
MAIN CANAL SHEET 2 OF 13		
Designed by SOO	Checked By HN	Date JANUARY 2022
Drawn By SOO	Approved By HN	Rev. 0
Scale HOR 1:200 VERT 1:2000 (A1)		Drng status
Drawing No. AKIDP/FFD/32		



NOTES:

1. DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE INDICATED
2. LEVELS ARE IN METRES

LEGEND

 GROUND LEVEL
 DESIGN BANK LEVEL
 FULL SUPPLY LEVEL
 DESIGN BED LEVEL

[illegible]

REVISIONS

Client _____



INTERNATIONAL IRRIGATION AUTHORITY
 KENYANA ROAD, P.O. Box 30372, 00100
 NAIROBI, KENYA

Civil and Structural Engineers

Eng. HENRY NDUGAH
CONSULTING ENGINEER
Suite A4 Machera Court

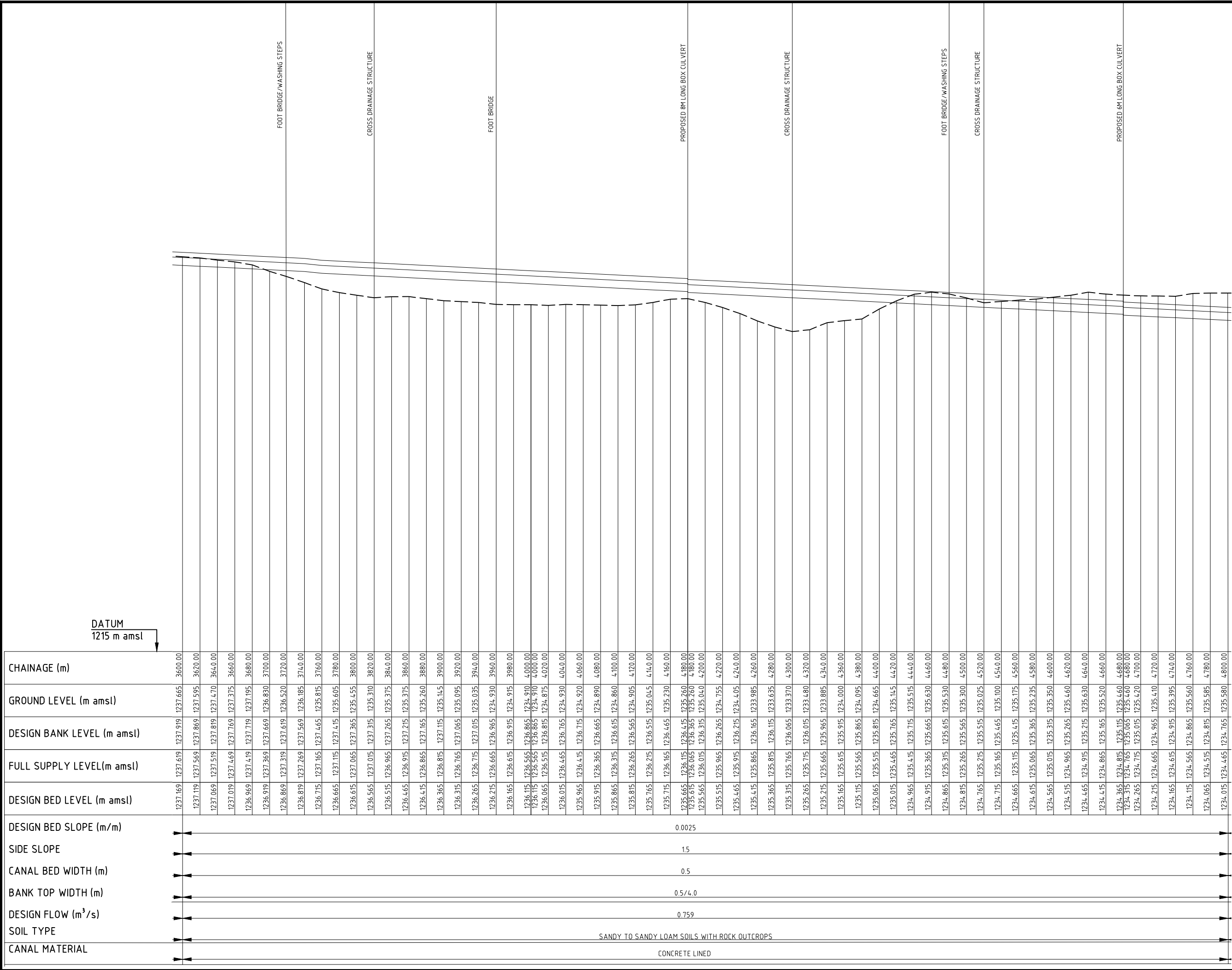
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ANYIKO - KATHIENO
IRRIGATION PROJECT

rowing Title

MAIN CANAL
SHEET 3 OF 13

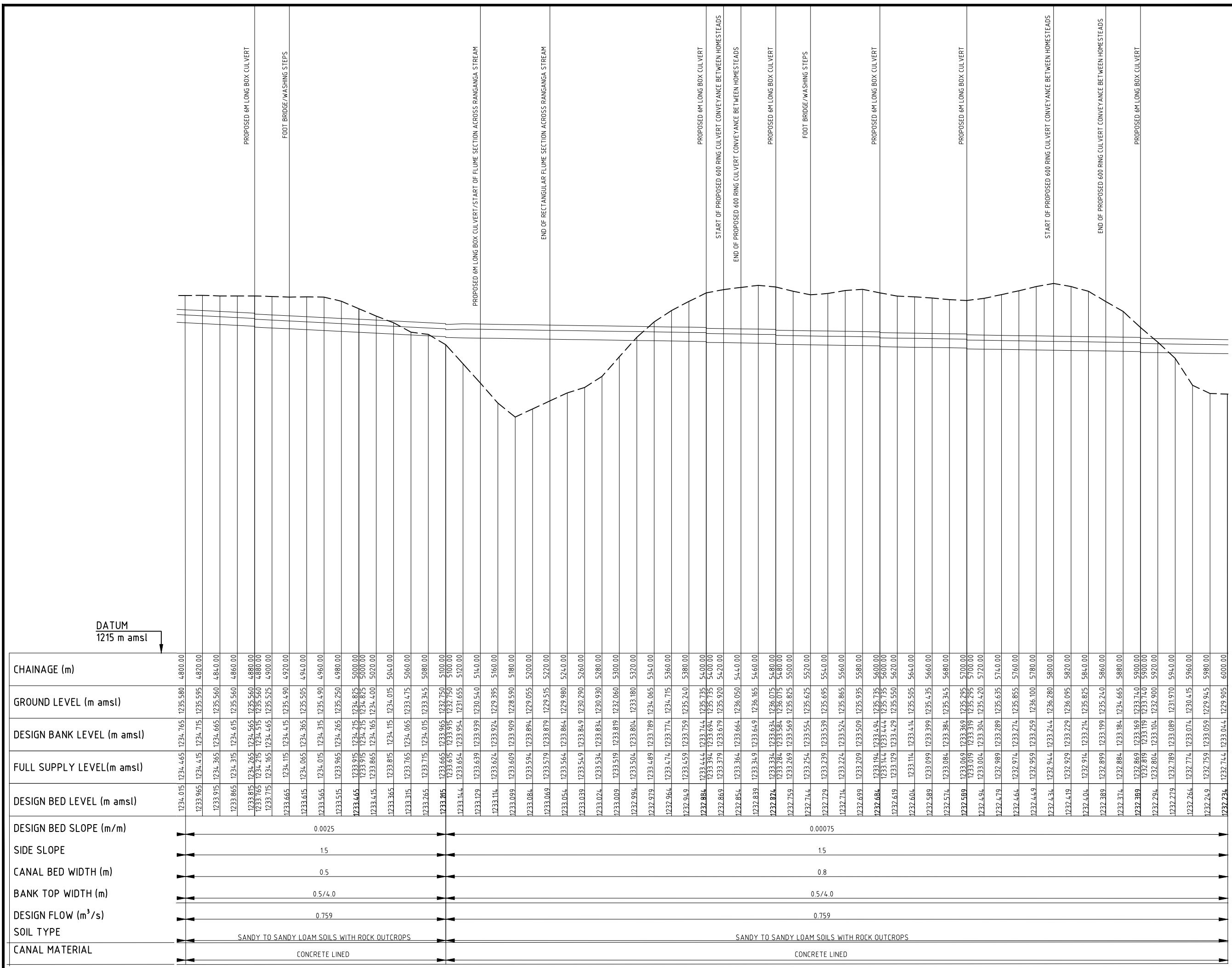
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Drawn By H00	Approved By HN	
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Drawing No. AKDIP/FFD/32	Rev. O	Drg status



- NOTES:
1. DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE INDICATED
 2. LEVELS ARE IN METRES

- LEGEND
- GROUND LEVEL
 - DESIGN BANK LEVEL
 - - - FULL SUPPLY LEVEL
 - DESIGN BED LEVEL

NO.	DESCRIPTION	DATE	
REVISIONS			
Client			
 National Irrigation Authority			
NATIONAL IRRIGATION AUTHORITY LENANA ROAD, P.O. Box 30372, 00100 NAIROBI, KENYA			
Civil and Structural Engineers			
Eng. HENRY NDUGAH CONSULTING ENGINEER Suite A4 Machera Court			
Project Title			
ANYIKO - KATHIENO IRRIGATION PROJECT			
Drawing Title			
MAIN CANAL SHEET 4 OF 13			
Designed by SOO		Checked By HN	
Drawn By SOO		Approved By HN	
Scale HOR 1:200 VERT 1:2000 (A1)		Date JANUARY 2022	
Drawing No. AKDIP/FFD/32		Rev. 0	Dwg status



NOTES:

1. DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE INDICATED
2. LEVELS ARE IN METRES

LEGEND

-  GROUND LEVEL
 DESIGN BANK LEVEL
 FULL SUPPLY LEVEL
 DESIGN BED LEVEL

D.	DESCRIPTION	DATE

REVISIONS



NATIONAL IRRIGATION AUTHORITY
LENANA ROAD, P.O. Box 30372, 00100
NAIROBI, KENYA

Civil and Structural Engineers

Eng. HENRY NDUGAH
CONSULTING ENGINEER
Suite A4 Machera Court

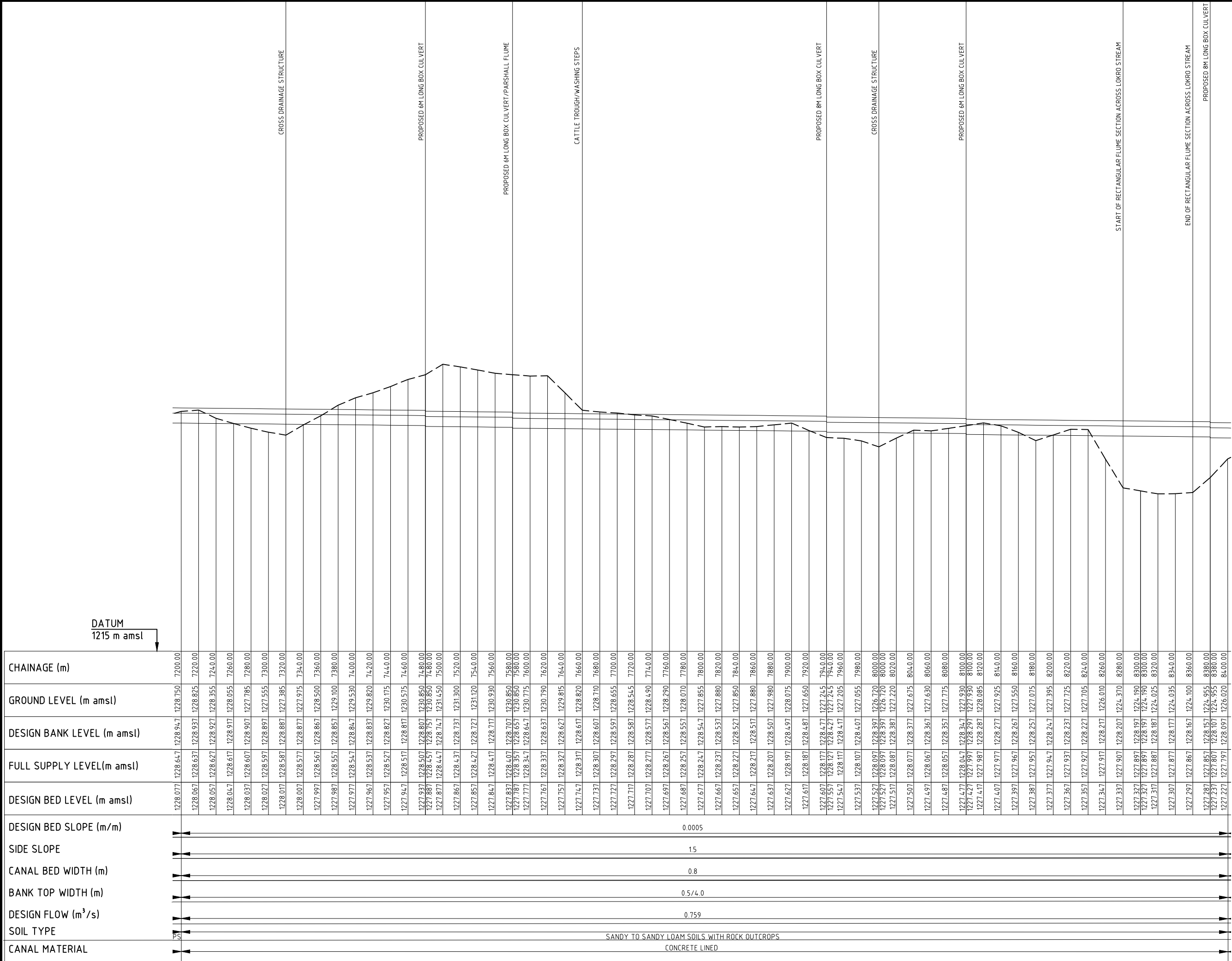
Project Title	
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ANYIKO - KATHIENO
IRRIGATION PROJECT

Drawing Title

MAIN CANAL
SHEET 5 OF 13

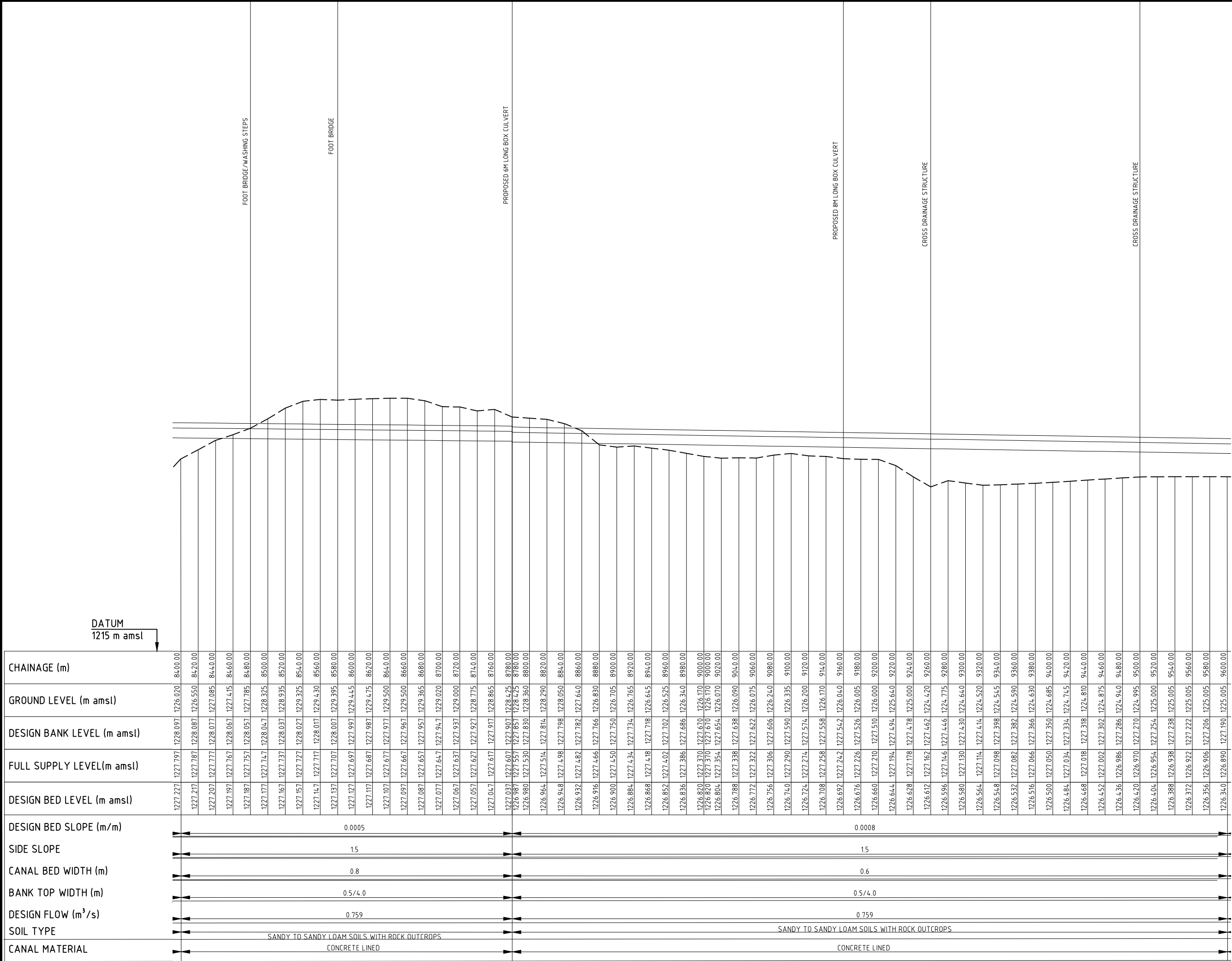
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Drawn By SOO	Approved By HN	
Scale HOR 1:200 VERT 1:2000 (A1)	Date JANUARY 2022	
Drawing No. AKDIP/FFD/32	Rev. 0	Drg status



NOTES:
1. DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE INDICATED
2. LEVELS ARE IN METRES

LEGEND
- - - GROUND LEVEL
- - - DESIGN BANK LEVEL
- - - FULL SUPPLY LEVEL
- - - DESIGN BED LEVEL

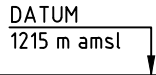
NO.	DESCRIPTION	DATE
REVISIONS		
Client		
 NATIONAL IRRIGATION AUTHORITY LENAMA ROAD, P.O. Box 30372, 00100 NAIROBI, KENYA		
Civil and Structural Engineers		
Eng. HENRY NDUGAH CONSULTING ENGINEER Suite A4 Machera Court		
Project Title		
ANYIKO - KATHIENO IRRIGATION PROJECT		
Drawing Title		
MAIN CANAL SHEET 7 OF 13		
Designed by SOO		Checked By HN
Drawn By SOO		Approved By HN
Scale HOR 1:200 VERT 1:2000 (A1)		Date JANUARY 2022
Drawing No. AKDIP/FFD/32		Rev. 0 Drg status



NOTES:
1. DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE INDICATED
2. LEVELS ARE IN METRES

LEGEND
--- GROUND LEVEL
--- DESIGN BANK LEVEL
--- FULL SUPPLY LEVEL
--- DESIGN BED LEVEL

NO.	DESCRIPTION	DATE
REVISIONS		
Client		
 NATIONAL IRRIGATION AUTHORITY LENAMA ROAD, P.O. Box 30372, 00100 NAIROBI, KENYA		
Civil and Structural Engineers		
Eng. HENRY NDUGAH CONSULTING ENGINEER Suite A4 Machera Court		
Project Title		
ANYIKO - KATHIENO IRRIGATION PROJECT		
Drawing Title		
MAIN CANAL SHEET 8 OF 13		
Designed by SOO		Checked By HN
Drawn By SOO		Approved By HN
Scale HOR 1:200 VERT 1:2000 (A1)		Date JANUARY 2022
Drawing No. AKDIP/FFD/32		Rev. 0 Dwg status

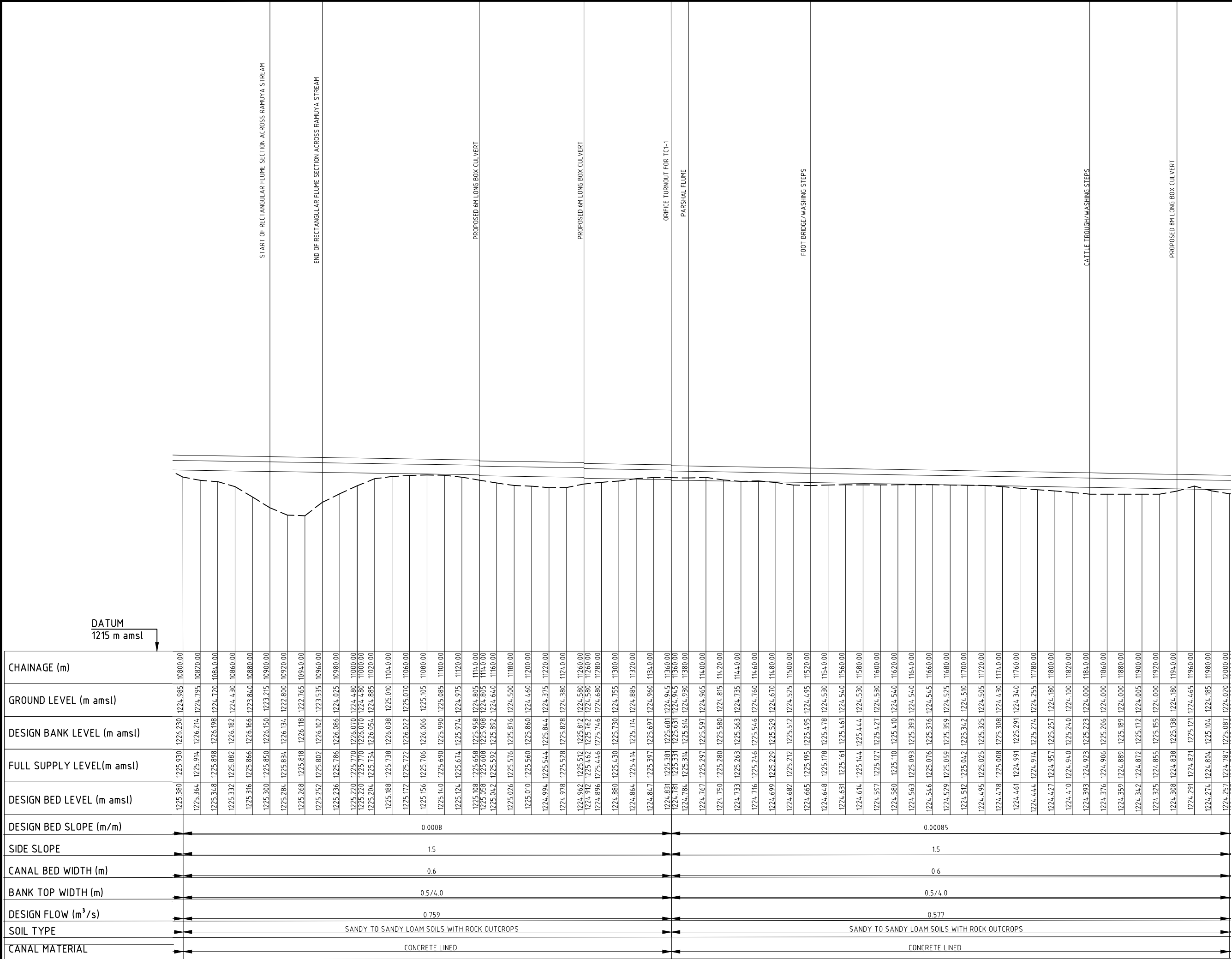


NOTES:

1. DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE INDICATED
2. LEVELS ARE IN METRES

LEGEND

-  GROUND LEVEL
 DESIGN BANK LEVEL
 FULL SUPPLY LEVEL
 DESIGN BED LEVEL



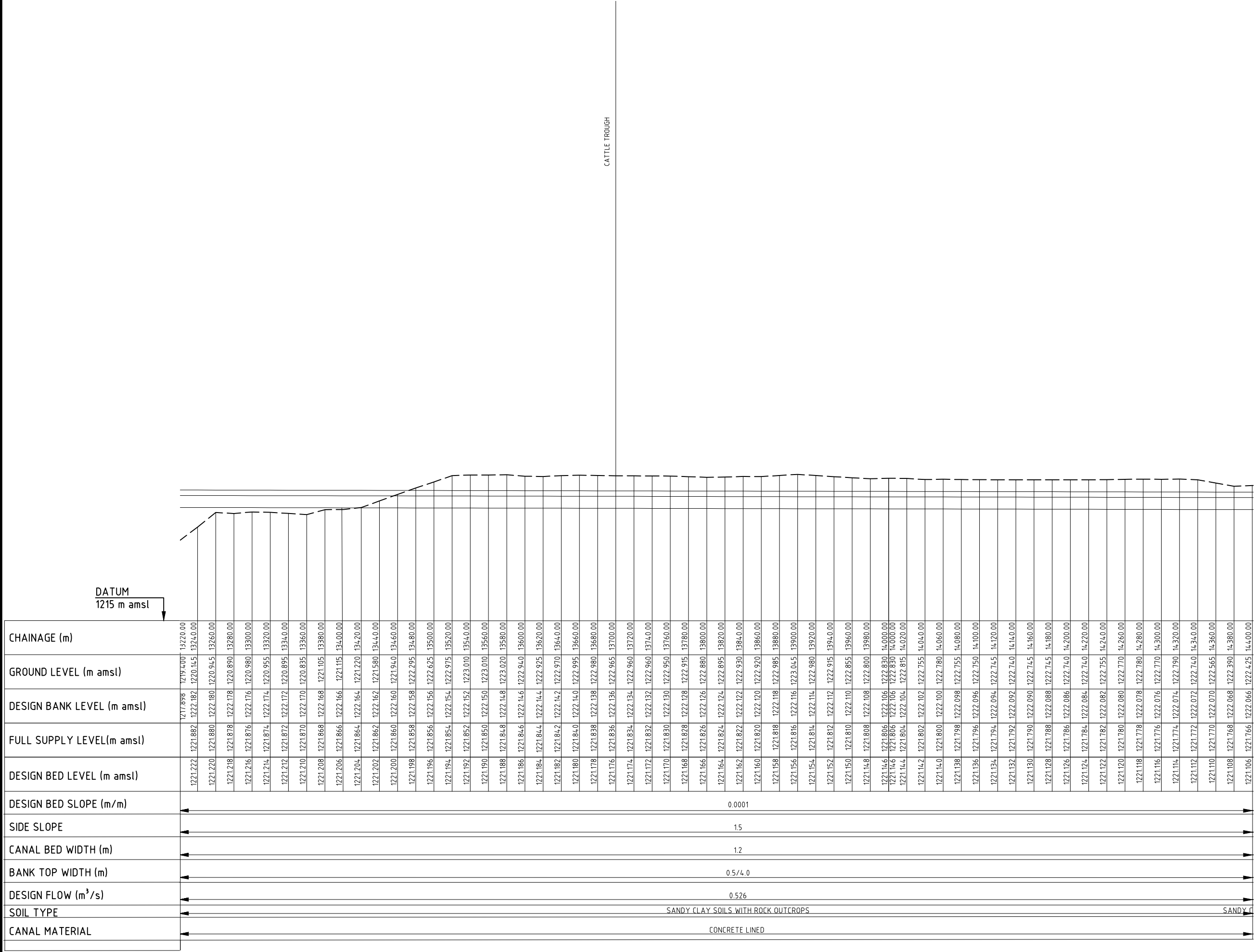
NOTES:

- DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE INDICATED
- LEVELS ARE IN METRES

LEGEND

- GROUND LEVEL
- DESIGN BANK LEVEL
- FULL SUPPLY LEVEL
- DESIGN BED LEVEL

NO.	DESCRIPTION	DATE
REVISIONS		
Client		
 NATIONAL IRRIGATION AUTHORITY LENANA ROAD, P.O. Box 30372, 00100 NAIROBI, KENYA		
Civil and Structural Engineers		
Eng. HENRY NDUGAH CONSULTING ENGINEER Suite A4 Machera Court		
Project Title		
ANYIKO - KATHIENO IRRIGATION PROJECT		
Drawing Title		
MAIN CANAL SHEET 10 OF 13		
Designed by SOO	Checked By HN	Date JANUARY 2022
Drawn By SOO	Approved By HN	Rev. 0
Scale HOR 1:200 VERT 1:2000 (A1)		Drg status
Drawing No. AKDIP/FFD/35		



- NOTES:
1. DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE INDICATED
 2. LEVELS ARE IN METRES

LEGEND

- GROUND LEVEL
- DESIGN BANK LEVEL
- - - FULL SUPPLY LEVEL
- DESIGN BED LEVEL

NO.	DESCRIPTION	DATE
REVISIONS		
Client		
 NATIONAL IRRIGATION AUTHORITY LENANA ROAD, P.O. Box 30372, 00100 NAIROBI, KENYA		
Civil and Structural Engineers		
Eng. HENRY NDUGAH CONSULTING ENGINEER Suite A4 Machera Court		
Project Title		
ANYIKO - KATHIENO IRRIGATION PROJECT		
Drawing Title		
MAIN CANAL SHEET 12 OF 13		
Designed by SOO	Checked By HN	Date JANUARY 2022
Drawn By SOO	Approved By HN	Rev. O
Scale HOR 1:200 VERT 1:2000 (A1)		Drng status
Drawing No. AKDIP/FFD/32		

1. DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE INDICATED
2. LEVELS ARE IN METRES

 GROUND LEVEL
 DESIGN BANK LEVEL
 FULL SUPPLY LEVEL
 DESIGN BED LEVEL

NO.	DESCRIPTION	DATE
-----	-------------	------

Client	
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Eng. HENRY NDUGAH
CONSULTING ENGINEER
Suite A4 Machera Court

ANYIKO - KATHIENO
IRRIGATION PROJECT

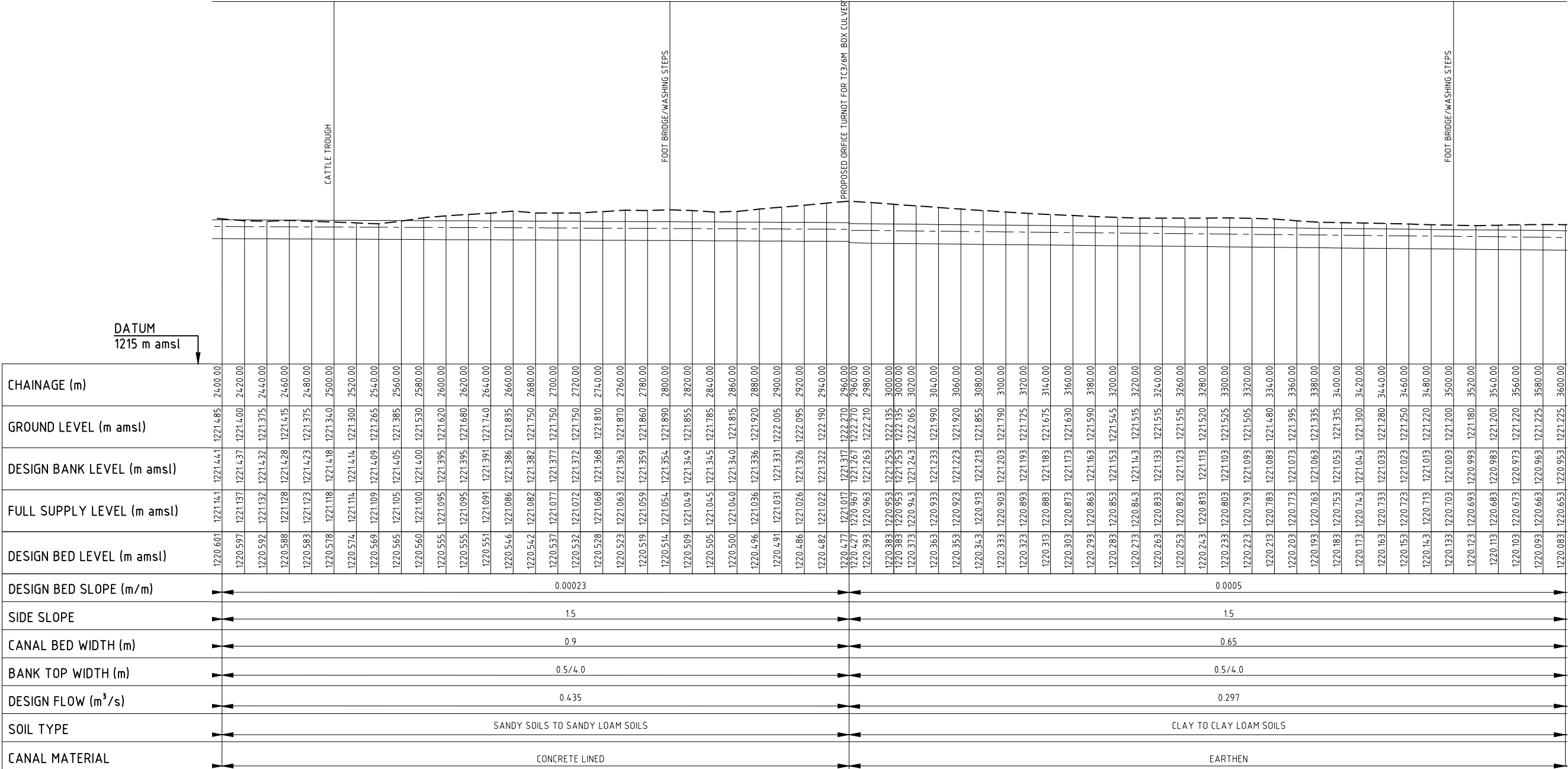
MAIN CANAL
SHEET 13 OF 13

Designed by SOO	Checked By HN
Drawn By SOO	Approved By HN
Scale HOR 1:200 VERT 1:200 (A1)	Date JANUARY 2022
Drawing No. AKDIP/FFD/35	Rev. O Drg status

CHAINAGE (m)		1220.927	1221.467	1221.767	1221.330	1220.00
GROUND LEVEL (m amsl)		1220.923	1221.463	1221.763	1221.785	1220.00
DESIGN BANK LEVEL (m amsl)		1220.918	1221.458	1221.758	1221.890	1240.00
FULL SUPPLY LEVEL (m amsl)		1220.914	1221.454	1221.754	1221.835	1260.00
DESIGN BED LEVEL (m amsl)		1220.909	1221.449	1221.749	1221.780	1280.00
DESIGN BED SLOPE (m/m)		1220.904	1221.444	1221.744	1221.770	1300.00
SIDE SLOPE		1220.900	1221.440	1221.740	1221.790	1320.00
CANAL BED WIDTH (m)		1220.895	1221.435	1221.735	1221.810	1340.00
BANK TOP WIDTH (m)		1220.891	1221.431	1221.731	1221.830	1360.00
DESIGN FLOW (m³/s)		1220.886	1221.426	1221.726	1221.855	1380.00
SOIL TYPE		1220.881	1221.421	1221.721	1221.845	1400.00
CANAL MATERIAL		1220.877	1221.417	1221.717	1221.810	1420.00
		1220.872	1221.412	1221.712	1221.830	1440.00
		1220.868	1221.408	1221.708	1221.835	1460.00
		1220.863	1221.403	1221.703	1221.650	1480.00
		1220.858	1221.398	1221.698	1221.405	1500.00
		1220.854	1221.394	1221.694	1221.400	1520.00
		1220.849	1221.389	1221.689	1221.410	1540.00
		1220.845	1221.385	1221.685	1221.425	1560.00
		1220.840	1221.380	1221.680	1221.440	1580.00
		1220.835	1221.375	1221.675	1221.460	1600.00
		1220.831	1221.371	1221.671	1221.475	1620.00
		1220.826	1221.366	1221.666	1221.485	1640.00
		1220.822	1221.362	1221.662	1221.490	1660.00
		1220.817	1221.357	1221.657	1221.500	1680.00
		1220.812	1221.352	1221.652	1221.455	1700.00
		1220.808	1221.348	1221.648	1221.460	1720.00
		1220.803	1221.343	1221.643	1221.465	1740.00
		1220.799	1221.339	1221.639	1221.475	1760.00
		1220.794	1221.334	1221.634	1221.485	1780.00
		1220.789	1221.329	1221.629	1221.470	1800.00
		1220.785	1221.325	1221.625	1221.445	1820.00
		1220.780	1221.320	1221.620	1221.420	1840.00
		1220.776	1221.316	1221.616	1221.420	1860.00
		1220.771	1221.311	1221.611	1221.420	1880.00
		1220.766	1221.306	1221.606	1221.420	1900.00
		1220.761	1221.301	1221.601	1221.420	1920.00
		1220.756	1221.296	1221.596	1221.420	1940.00
		1220.751	1221.291	1221.591	1221.420	1960.00
		1220.746	1221.286	1221.586	1221.420	1980.00
		1220.741	1221.281	1221.581	1221.420	2000.00
		1220.736	1221.276	1221.576	1221.420	2020.00
		1220.731	1221.271	1221.571	1221.420	2040.00
		1220.726	1221.266	1221.566	1221.420	2060.00
		1220.721	1221.261	1221.561	1221.420	2080.00
		1220.716	1221.256	1221.556	1221.420	2100.00
		1220.711	1221.251	1221.551	1221.420	2120.00
		1220.706	1221.246	1221.546	1221.420	2140.00
		1220.701	1221.241	1221.541	1221.420	2160.00
		1220.696	1221.236	1221.536	1221.420	2180.00
		1220.691	1221.231	1221.531	1221.420	2200.00
		1220.686	1221.226	1221.526	1221.420	2220.00
		1220.681	1221.221	1221.521	1221.420	2240.00
		1220.676	1221.2			

NOTES:

LEGEND



- NOTES:
1. DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE INDICATED
 2. LEVELS ARE IN METRES



NO.	DESCRIPTION	DATE
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REVISIONS



NATIONAL IRRIGATION AUTHORITY
LENANA ROAD, P.O. Box 30372, 00100
NAIROBI, KENYA

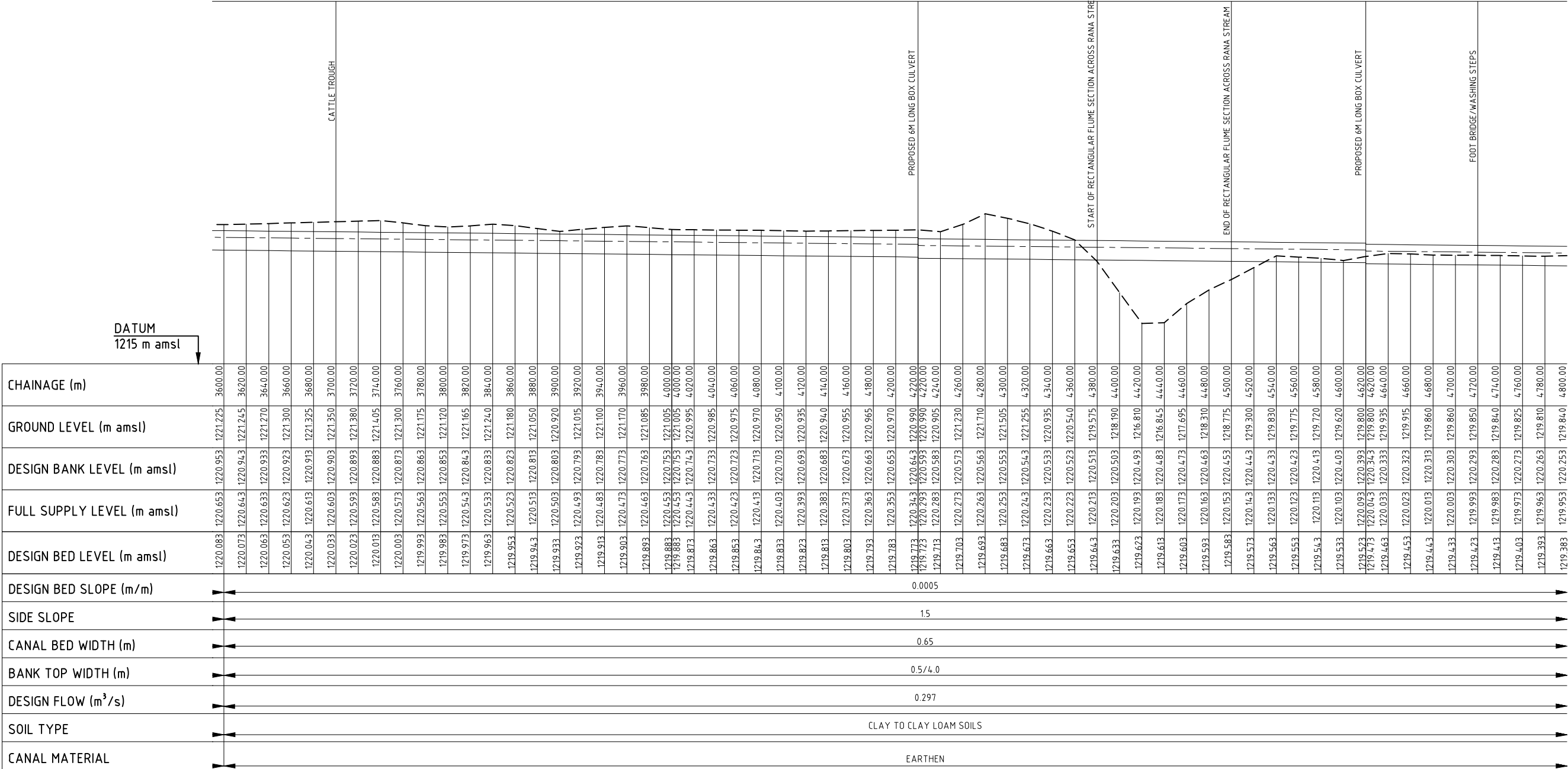
Civil and Structural Engineers

Eng. HENRY NDUGAH
CONSULTING ENGINEER
Suite A4 Machera Court

Project Title
**ANYIKO - KATHIENO
IRRIGATION PROJECT**

Drawing Title
**SECONDARY CANAL
SHEET 3 OF 6**

Designed by SOO	Checked By HN
Drawn By SOO	Approved By HN
Scale HOR 1:200 VERT 1:2000 (A1)	Date JANUARY 2022
Drawing No. AKDIP/FFD/33	Rev. O
	Dwg status



- NOTES:
1. DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE INDICATED
 2. LEVELS ARE IN METRES

- LEGEND
- GROUND LEVEL
 - DESIGN BANK LEVEL
 - FULL SUPPLY LEVEL
 - DESIGN BED LEVEL

NO.	DESCRIPTION	DATE
REVISIONS		

Client


NATIONAL IRRIGATION AUTHORITY
LENANA ROAD, P.O. Box 30372, 00100
NAIROBI, KENYA

Civil and Structural Engineers

Eng. HENRY NDUGAH
CONSULTING ENGINEER
Suite A4 Machera Court

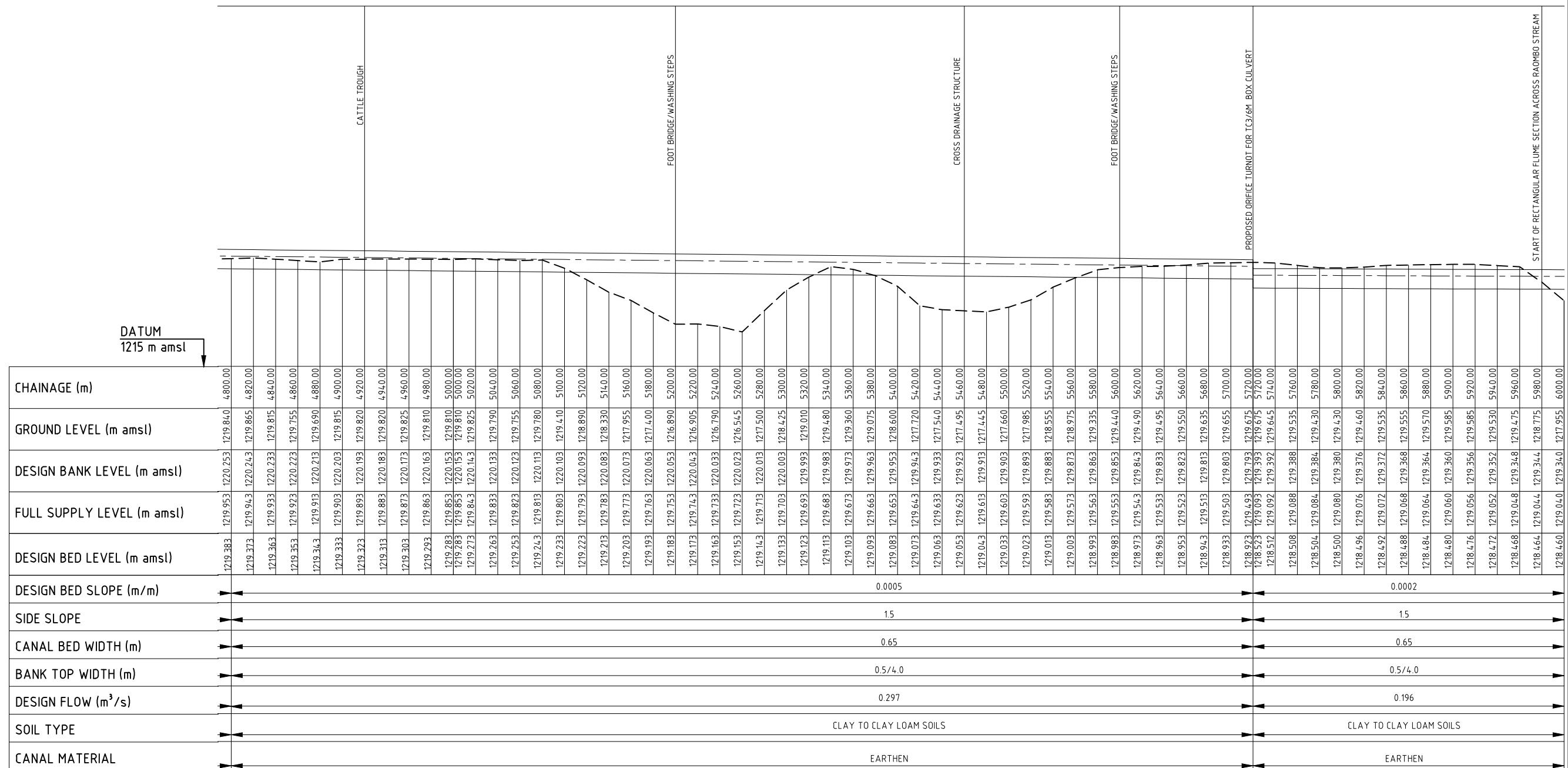
Project Title

**ANYIKO - KATHIENO
IRRIGATION PROJECT**

Drawing Title

**SECONDARY CANAL
SHEET 4 OF 6**

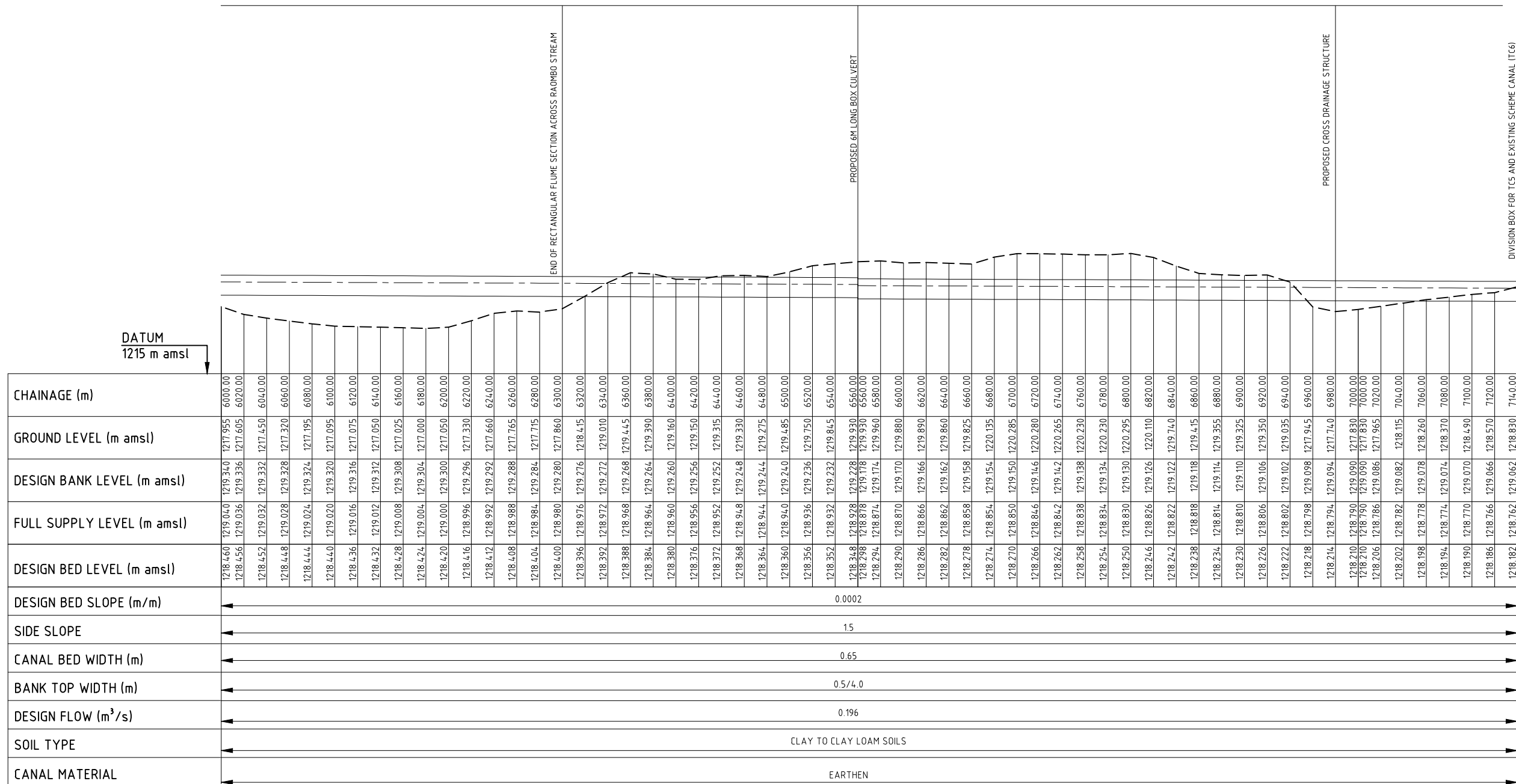
Designed by SOO	Checked By HN
Drawn By SOO	Approved By HN
Scale HOR 1:200 VERT 1:2000 (A1)	Date JANUARY 2022
Drawing No. AKDIP/FFD/33	Rev. 0
	Drq status



NOTES:

1. DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE INDICATED
2. LEVELS ARE IN METRES

	DESCRIPTION	DATE
REVISIONS		
Client  National Irrigation Authority NATIONAL IRRIGATION AUTHORITY ENANNA ROAD, P.O. Box 30372, 01010 NAIROBI, KENYA		
Civil and Structural Engineers		
Eng. HENRY NDUGAH CONSULTING ENGINEER Suite A4 Machera Court		
Project Title ANYIKO - KATHIENO IRRIGATION PROJECT		
rawing Title SECONDARY CANAL SHEET 5 OF 6		
Designed by JOO	Checked By HN	
Drawn By JOO	Approved By HN	
Scale AS OR 1:200 VERT 1:2000 (A1)	Date JANUARY 2022	
Drawing No. AKDIP/FFD/33	Rev. O	Drg status



END OF RECTANGULAR FLUME SECTION ACROSS RAQMBO STREAM

PROPOSED 6M LONG BOX CUL VERT

PROPOSED CROSS DRAINAGE STRUCTURE

DIVISION BOX FOR TC5 AND EXISTING SCHEME CANAL (TC6)

NOTES:

1. DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE INDICATED
2. LEVELS ARE IN METRES

LEGEND

- GROUND LEVEL
 DESIGN BANK LEVEL
 FULL SUPPLY LEVEL
 DESIGN BED LEVEL

N ^{O.}	DESCRIPTION	DATE

REVISIONS

Client



NATIONAL IRRIGATION AUTHORITY
LENANA ROAD, P.O. Box 30372, 00100
NAIROBI, KENYA

Civil and Structural Engineers

Eng. HENRY NDUGAH
CONSULTING ENGINEER
Suite A4 Machera Court

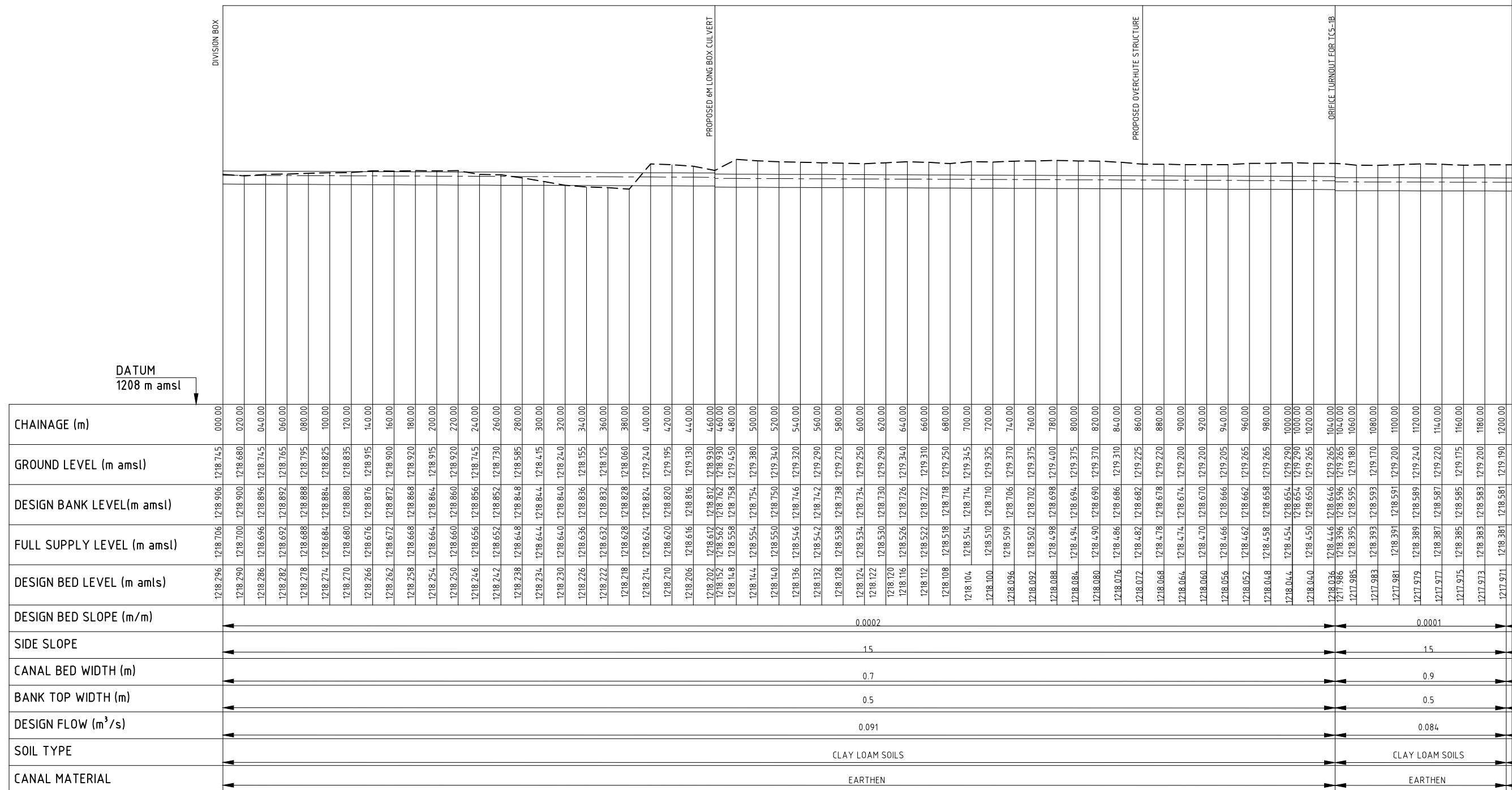
Project Title

ANYIKO - KATHIENO
IRRIGATION PROJECT

Drawing Title

SECONDARY CANAL
SHEET 6 OF 6

Designed by SOO	Checked By HN
Drawn By SOO	Approved By HN
Scale HOR 1:200 VERT 1:2000 (A1)	Date JANUARY 2022
Drawing No. AKDIP/FFD/33	Rev. O Drg status



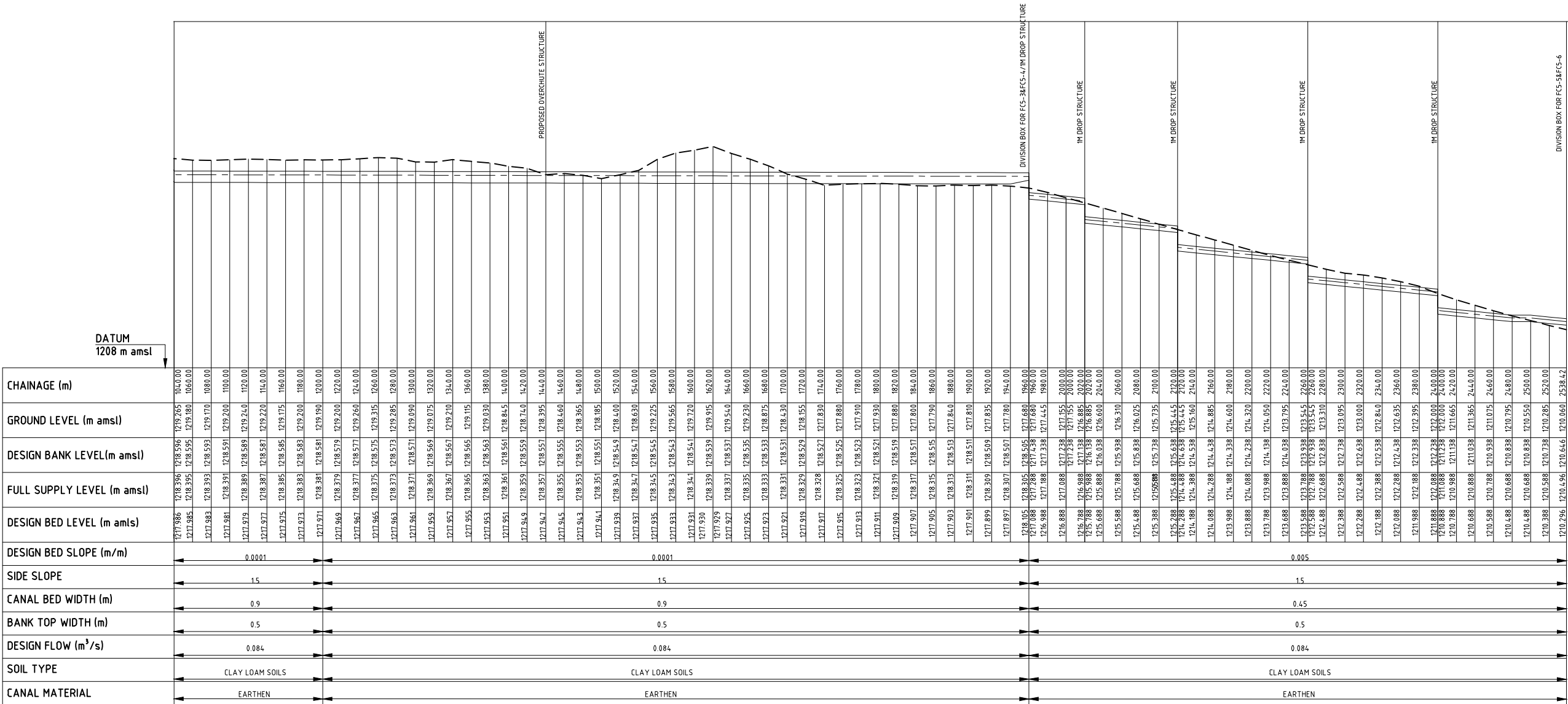
NOTES:

1. DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE INDICATED
2. LEVELS ARE IN METRES

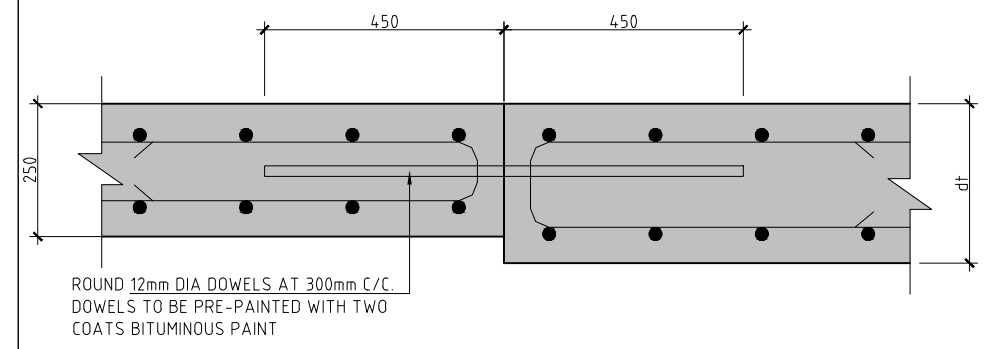
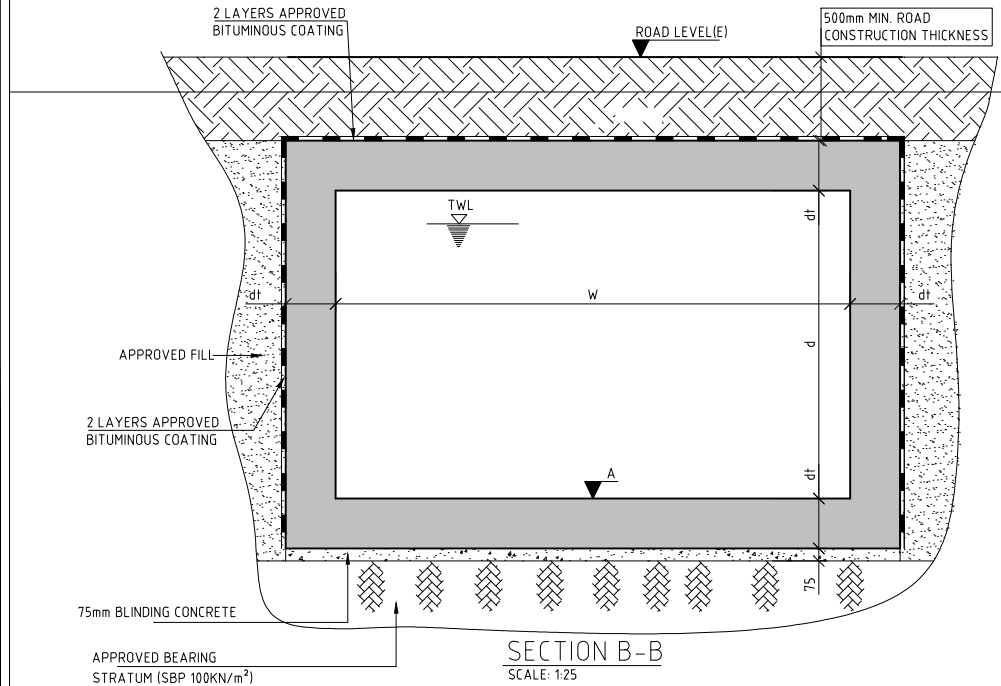
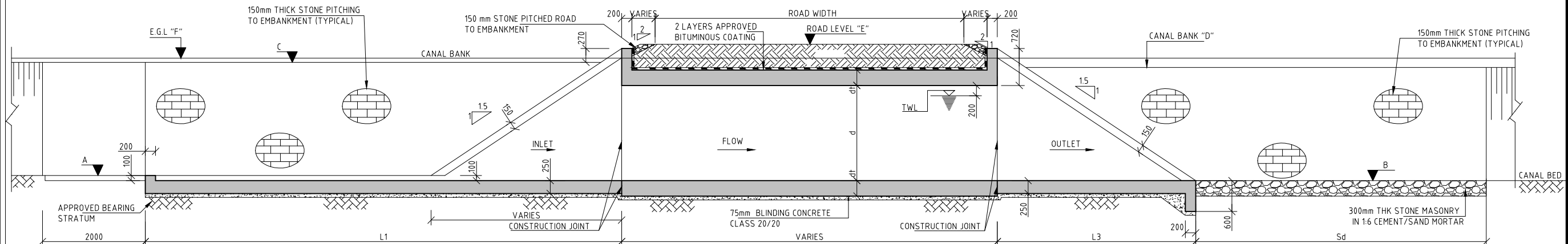
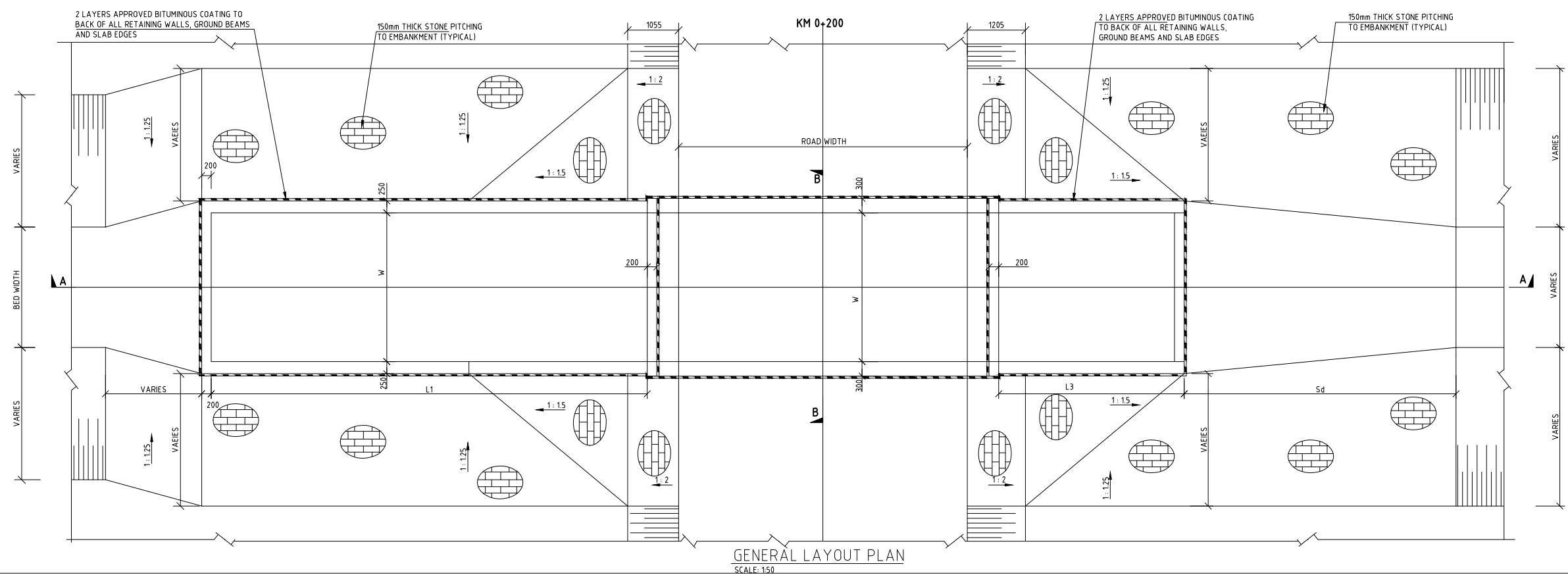
LEGEND

 GROUND LEVEL
 DESIGN BANK LEVEL
 FULL SUPPLY LEVEL
 DESIGN BED LEVEL

O.	DESCRIPTION			DATE	
REVISIONS					
Client					
 National Irrigation Authority					
NATIONAL IRRIGATION AUTHORITY					
LENANA ROAD, P.O. Box 30372, 00100 NAIROBI, KENYA					
Civil and Structural Engineers					
Eng. HENRY NDUGAH CONSULTING ENGINEER Suite A4 Machera Court					
Project Title					
ANYIKO - KATHIENO IRRIGATION PROJECT					
Drawing Title					
TERTIARY CANAL 5 SHEET 1 OF 2					
Designed by HN			Checked By HN		
Drawn By HN			Approved By HN		
Scale AS SHOWN 1:200 VERT 1:2000 (A1)			Date JANUARY 2022		
Drawing No. AKKDP/FFD/34-6			Rev. O	Drg status	



- NOTES:
1. DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE INDICATED
 2. LEVELS ARE IN METRES



- NOTES
1. DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE INDICATED
 2. LEVELS IN METRES ABOVE MEAN SEA LEVEL
 3. REINFORCED CONCRETE CLASS 30/20
 4. BLINDING CONCRETE CLASS 20/20
 5. MASS CONCRETE CLASS 20/40
 6. PROVIDE 50mm MINIMUM COVER TO REINFORCEMENT
 7. CONCRETE TO BE PLACED ON COMPACTED IN-SITU MATERIAL. ANY OVER EXCAVATION BELOW DESIGN LEVEL MUST BE MADE UP WITH MASS CONCRETE ONLY.
 8. BACKFILL TO STRUCTURE, INCLUDING CUTOFF WALLS TO BE PLACED ON HORIZONTAL, SCARIFIED AND WETTED IN-SITU MATERIAL. BACKFILL MATERIAL TO BE APPROVED SELECTED IN-SITU MATERIAL, COMPACTED IN 150mm LAYERS. MOISTURE CONTENT TO BE BETWEEN OPTIMUM MOISTURE CONTENT (OMC) LESS 3% AND OMC. COMPACTION TO 95% STANDARD PROCTOR TEST.
 9. GRADED FILTER MATERIAL TO BE APPROVED, CLEAN, WELL GRADED COARSE SAND AND GRAVEL
 10. TIPPED ROCK TO BE APPROVED, CLEAN WELL-GRADED HARD ROCK, SIZE 4.0 - 200mm
 11. ROAD TO BE RAMPED AS NECESSARY TO ACHIEVE MINIMUM COVER TO CULVERT
 12. ALL MATERIALS, WORK, QUALITY AND TESTING TO COMPLY WITH THE CONTRACT SPECIFICATIONS AND STANDARDS.
 13. FOUNDATION STRATUM (SBP 100 KN/M²) TO BE APPROVED BEFORE COMMENCING BLINDING
 14. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS

NO.	DESCRIPTION	DATE
REVISIONS		
Client		
 NATIONAL IRRIGATION AUTHORITY LENANA ROAD, P.O. Box 30372, 00100 NAIROBI, KENYA		
Civil and Structural Engineers		
Eng. HENRY NDUGAH CONSULTING ENGINEER Suite A4 Machera Court		
Project Title		
ANYIKO - KATHIENO IRRIGATION PROJECT		
Drawing Title		
TYPICAL BOX CULVERT STRUCTURE		
Designed by SOD	Checked By HN	Date JANUARY 2022
Drawn By SOD	Approved By HN	
Scale AS SHOWN (A1)	Rev. O	Drq status
Drawing No. AKIDP/FFD/41		

NOTES:
1. DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE INDICATED
2. LEVELS ARE IN METRES

MAIN CANAL CULVERTS SCHEDULE

Canal Name	Chainage	Design flow	Designed culvert depth	Structure internal width	Inlet structure length	Outside Structure Extension	Outside Structure Length	d/s protection	Slab thickness	Existing Ground Level	Bed Lvel - Upstream	Downstream Bed Level / Invert Level	Road Level	Canal Bank Upstream	Canal Bank- Downstream
	Ch	Q	d	W	L1	L2	L3	Sd	dt	F	A	B	E	C	D
	m	(m3/s)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)
Main Canal	0+280	0.656	1.30	1.2	2.6	0.00	2.60	3.6	0.20	1242.21	1,241.21	1,241.16	1,242.69	1,241.16	1,241.16
Main Canal	0+860	0.656	1.30	1.2	2.6	0.00	2.60	3.6	0.20	1241.87	1,240.87	1,240.82	1,242.35	1,240.82	1,240.82
Main Canal	1+680	0.656	1.30	1.2	2.6	0.00	2.60	3.6	0.20	1241.41	1,240.41	1,240.36	1,241.89	1,240.36	1,240.36
Main Canal	2+020	0.656	1.30	1.2	2.6	0.00	2.60	3.6	0.20	1241.19	1,240.19	1,240.14	1,241.67	1,240.14	1,240.14
Main Canal	2+500	0.656	1.30	1.2	2.6	0.00	2.60	3.6	0.20	1240.90	1,239.90	1,239.85	1,241.38	1,239.85	1,239.85
Main Canal	3+000	0.656	0.90	2.0	2.1	0.00	2.00	6.0	0.20	1239.48	1,238.77	1,238.73	1,239.88	1,238.73	1,238.73
Main Canal	3+300	0.656	0.91	2.0	2.1	0.00	2.00	6.0	0.20	1238.68	1,237.97	1,237.93	1,239.08	1,237.93	1,237.93
Main Canal	4+180	0.656	0.91	2.0	2.1	0.00	2.00	6.0	0.20	1236.37	1,235.67	1,235.62	1,236.78	1,235.62	1,235.62
Main Canal	4+680	0.656	0.93	2.0	2.1	0.00	2.00	6.0	0.20	1235.07	1,234.36	1,234.31	1,235.48	1,234.31	1,234.31
Main Canal	4+880	0.656	0.91	2.0	2.1	0.00	2.00	6.0	0.20	1234.52	1,233.82	1,233.77	1,234.93	1,233.77	1,233.77
Main Canal	5+100	0.656	0.91	2.0	2.1	0.00	2.00	6.0	0.20	1233.92	1,233.22	1,233.17	1,234.33	1,233.17	1,233.17
Main Canal	5+400	0.656	0.91	2.0	2.1	0.00	2.00	6.0	0.20	1,233.71	1,232.93	1,232.90	1234.122	1232.9	1232.9
Main Canal	5+480	0.656	0.91	2.0	2.1	0.00	2.00	6.0	0.20	1,233.60	1,232.82	1,232.79	1234.012	1232.79	1232.79
Main Canal	5+600	0.656	1.00	2.0	2.1	0.00	2.00	6.0	0.20	1,233.46	1,232.68	1,232.65	1233.872	1232.65	1232.65
Main Canal	5+700	0.656	1.00	2.0	2.1	0.00	2.00	6.0	0.20	1,233.34	1,232.56	1,232.53	1233.747	1232.525	1232.525
Main Canal	5+900	0.656	1.00	2.0	2.1	0.00	2.00	6.0	0.20	1,233.14	1,232.36	1,232.33	1233.547	1232.325	1232.325
Main Canal	6+420	0.656	1.00	2.0	2.1	0.00	2.00	6.0	0.20	1,232.70	1,231.92	1,231.89	1233.107	1231.885	1231.885
Main Canal	6+580	0.656	1.00	2.0	2.1	0.00	2.00	6.0	0.20	1,232.52	1,231.75	1,231.71	1232.937	1231.714	1231.714
Main Canal	7+480	0.656	1.10	1.5	2.2	0.00	1.50	4.5	0.20	1,228.76	1,227.94	1,227.89	1229.198	1227.888	1227.888
Main Canal	7+580	0.656	1.10	1.5	2.3	0.00	1.50	4.5	0.20	1,228.66	1,227.84	1,227.79	1229.098	1227.788	1227.788
Main Canal	7+940	0.656	1.10	1.6	2.3	0.00	1.60	4.8	0.20	1,228.43	1,227.61	1,227.56	1228.868	1227.563	1227.563
Main Canal	8+100	0.656	1.10	1.6	2.3	0.00	1.60	4.8	0.20	1,228.30	1,227.48	1,227.43	1228.738	1227.434	1227.434
Main Canal	8+380	0.656	1.10	1.6	2.3	0.00	1.60	4.8	0.20	1,228.11	1,227.29	1,227.24	1228.548	1227.243	1227.243
Main Canal	8+780	0.656	1.10	1.6	2.3	0.00	1.60	4.8	0.20	1,227.86	1,227.04	1,226.99	1228.298	1226.994	1226.994
Main Canal	9+160	0.656	1.00	1.5	2.3	0.00	1.50	4.5	0.20	1,227.49	1,226.69	1,226.64	1227.929	1226.638	1226.638
Main Canal	11+140	0.656	1.00	1.5	2.2	0.00	1.50	4.5	0.20	1,225.91	1,225.11	1,225.06	1226.345	1225.056	1225.056
Main Canal	11+260	0.656	1.00	1.5	2.2	0.00	1.50	4.5	0.20	1,225.76	1,224.96	1,224.91	1226.199	1224.91	1224.91
Main Canal	12+400	0.577	1.00	1.5	2.2	0.00	1.50	4.5	0.20	1,224.71	1,223.90	1,223.86	1225.134	1223.857	1223.857
Main Canal	13+680	0.526	1.00	1.5	2.2	0.00	1.50	4.5	0.20	1,221.81	1,221.00	1,220.96	1222.232	1220.961	1220.961

SECONDARY, TERTIARY AND FIELD CANAL CULVERTS SCHEDULE

Canal Name	Chainage	Design flow	Designed culvert depth	Structure internal width	Inlet structure length	Outside Structure Extension	Outside Structure Length	d/s protection	Slab thickness	Existing Ground Level	Bed Lvel - Upstream	Downstream Bed Level / Invert Level	Road Level	Canal Bank Upstream	Canal Bank- Downstream
	Ch	Q	d	W	L1	L2	L3	Sd	dt	F	A	B	E	C	D
	m	(m3/s)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)
Secondary Canal	0+260	0.435	1.00	1.10	2.2	0.00	2.20	3.3	0.20	1221.94	1,221.14	1,221.09	1,222.36	1,221.09	1,221.09
Secondary Canal	0+540	0.435	1.00	1.10	2.2	0.00	2.20	3.3	0.20	1221.88	1,221.08	1,221.03	1,222.30	1,221.03	1,221.03
Secondary Canal	0+900	0.435	1.00	1.10	2.2	0.00	2.20	3.3	0.20	1221.80	1,221.00	1,220.95	1,222.22	1,220.95	1,220.95
Secondary Canal	1+840	0.435	1.00	1.10	2.2	0.00	2.20	3.3	0.20	1221.59	1,220.78	1,220.73	1,222.00	1,220.73	1,220.73
Secondary Canal	1+960	0.435	1.00	1.10	2.2	0.00	2.20	3.3	0.20	1221.29	1,220.48	1,220.43	1,221.71	1,220.43	1,220.43
Secondary Canal	4+220	0.297	1.10	0.70	2.2	0.00	2.20	2.1	0.20	1220.62	1,219.77	1,219.72	1,221.03	1,219.72	1,219.72
Secondary Canal	4+620	0.297	1.10	0.70	2.2	0.00	2.20	2.1	0.20	1220.37	1,219.52	1,219.47	1,220.78	1,219.47	1,219.47
Secondary Canal	5+720	0.297	1.10	0.70	2.2	0.00	2.20	2.1	0.20	1219.76	1,218.92	1,218.87	1,220.18	1,218.87	1,218.87
Secondary Canal	6+560	0.197	1.10	0.70	2.3	0.00	2.30	2.1	0.20	1219.20	1,218.35	1,218.33	1,219.62	1,218.33	1,218.33
TCS	0+460	0.097	0.90	0.70	1.8	0.00	1.80	2.1	0.20	1218.77	1,218.20	1,218.16	1,219.18	1,218.16	1,218.16
FC1-2-1	0+000	0.020	0.44	0.35	1.1	0.00	1.10	1.0	0.20	1221.52	1,221.26	1,221.25	1,221.81	1,221.25	1,221.25
FC2-2	0+840	0.023	0.44	0.40	1.3	0.00	1.30	1.2	0.20	1221.26	1,220.89	1,220.88	1,221.55	1,220.88	1,220.88
FC2-3	0+000	0.025	0.44	0.40	1.3	0.00	1.30	1.2	0.20	1221.82	1,221.45	1,221.44	1,222.10	1,221.44	1,221.44
FC3-3	0+000	0.035	0.44	0.40	1.4	0.00	1.40	1.2	0.20	1214.91	1,214.48	1,214.46	1,215.21	1,214.46	1,214.46
FC4-3	0+000	0.040	0.44	0.45	1.4	0.00	1.40	1.4	0.20	1212.01	1,211.57	1,211.55	1,212.30	1,211.55	1,211.55
FC5-1	0+620	0.012	0.44	0.35	1.0	0.00	1.00	1.0	0.20	1218.17	1,217.87	1,217.87	1,218.45	1,217.87	1,217.87

NO. DESCRIPTION DATE

REVISIONS

Client



NATIONAL IRRIGATION AUTHORITY
LENANA ROAD, P.O. Box 30372, 00100
NAIROBI, KENYA

Civil and Structural Engineers

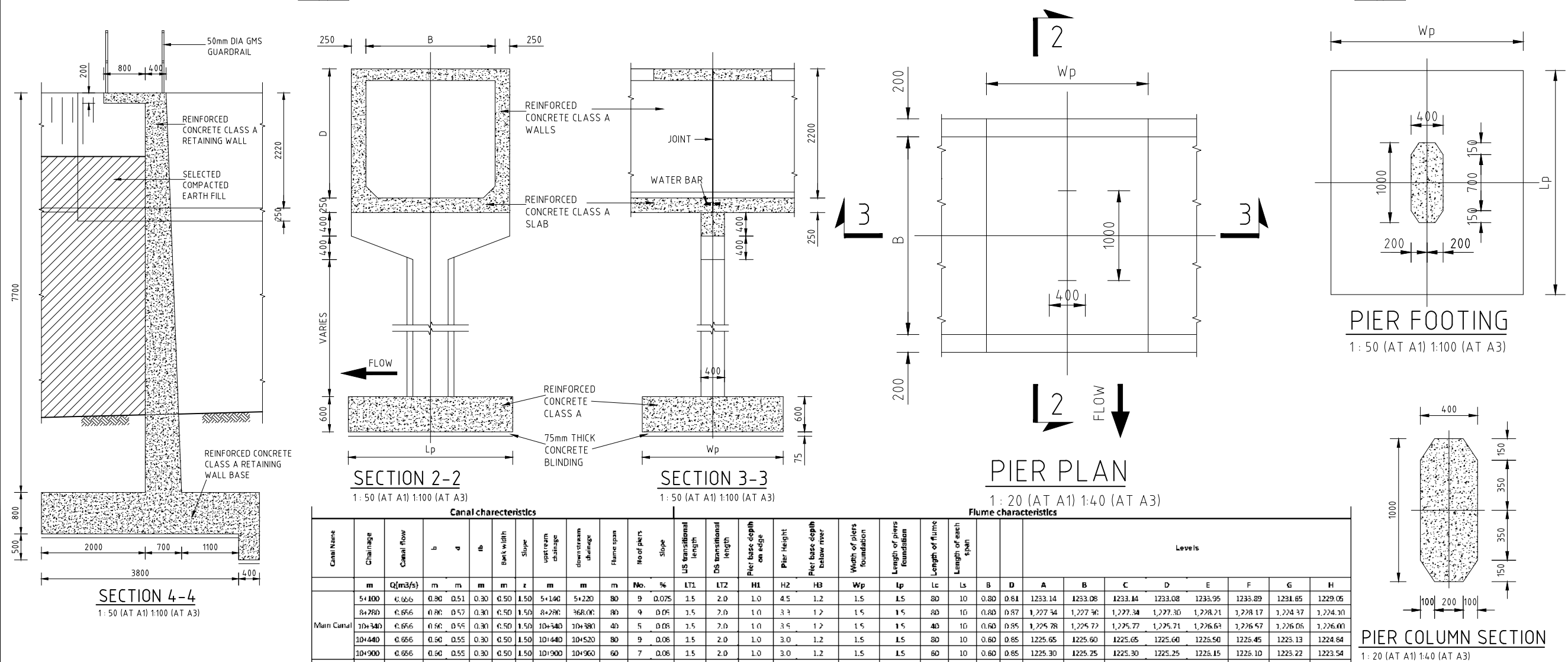
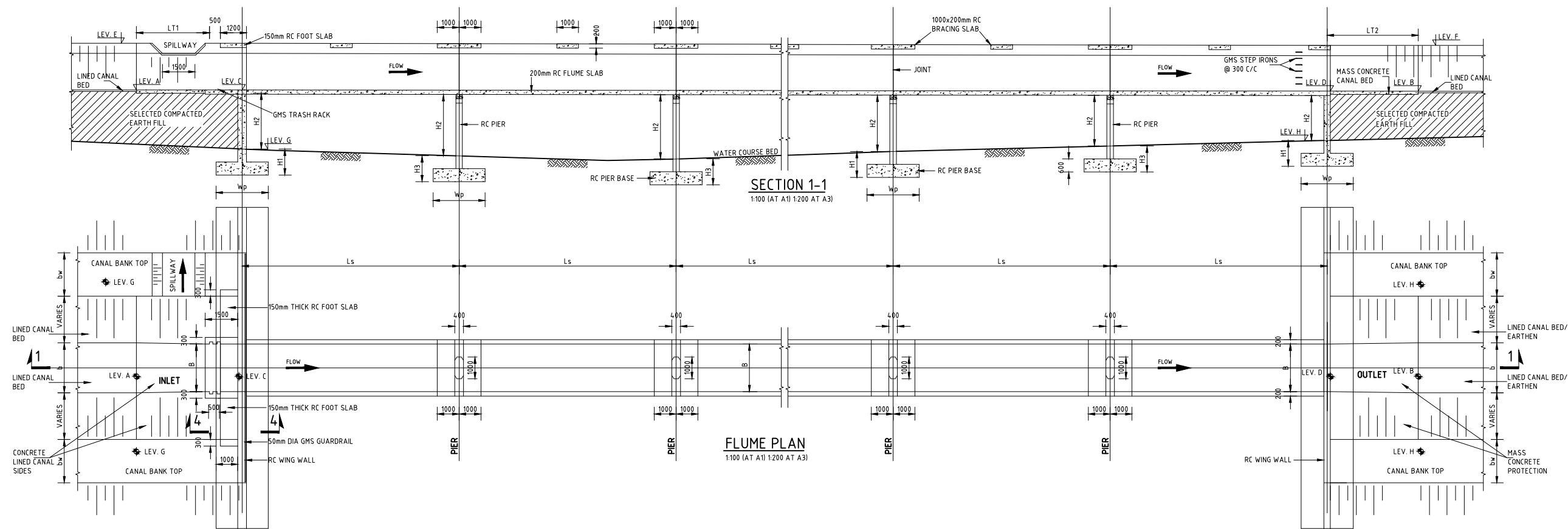
Eng. HENRY NDUGAH
CONSULTING ENGINEER
Suite A4 Machera Court

Project Title
ANYIKO - KATHIENO
IRRIGATION PROJECT

Drawing Title
SCHEDULE OF BOX CULVERTS

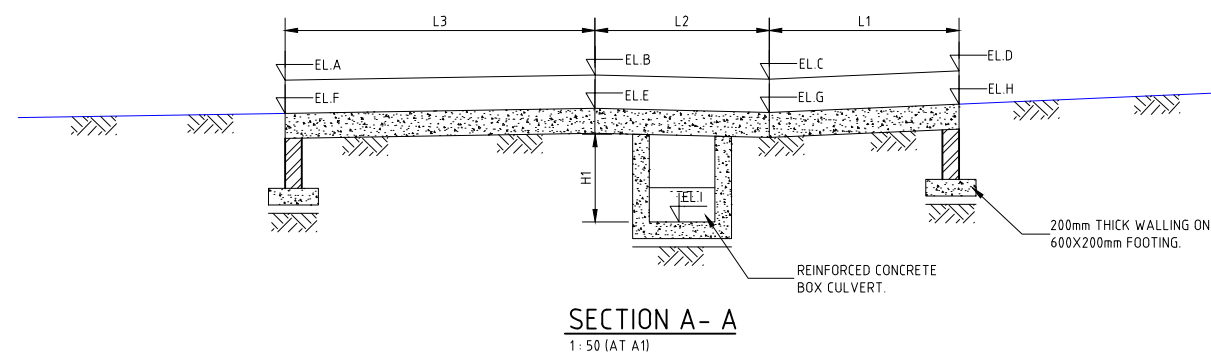
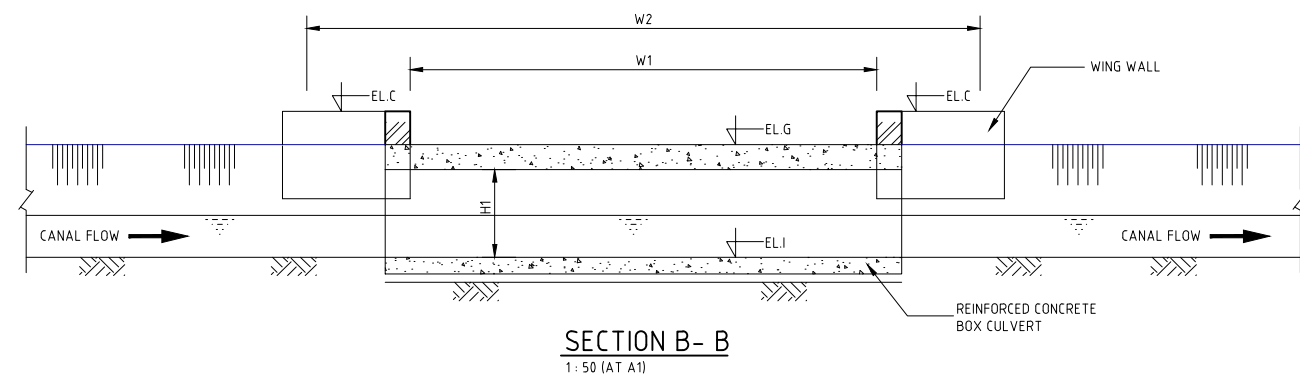
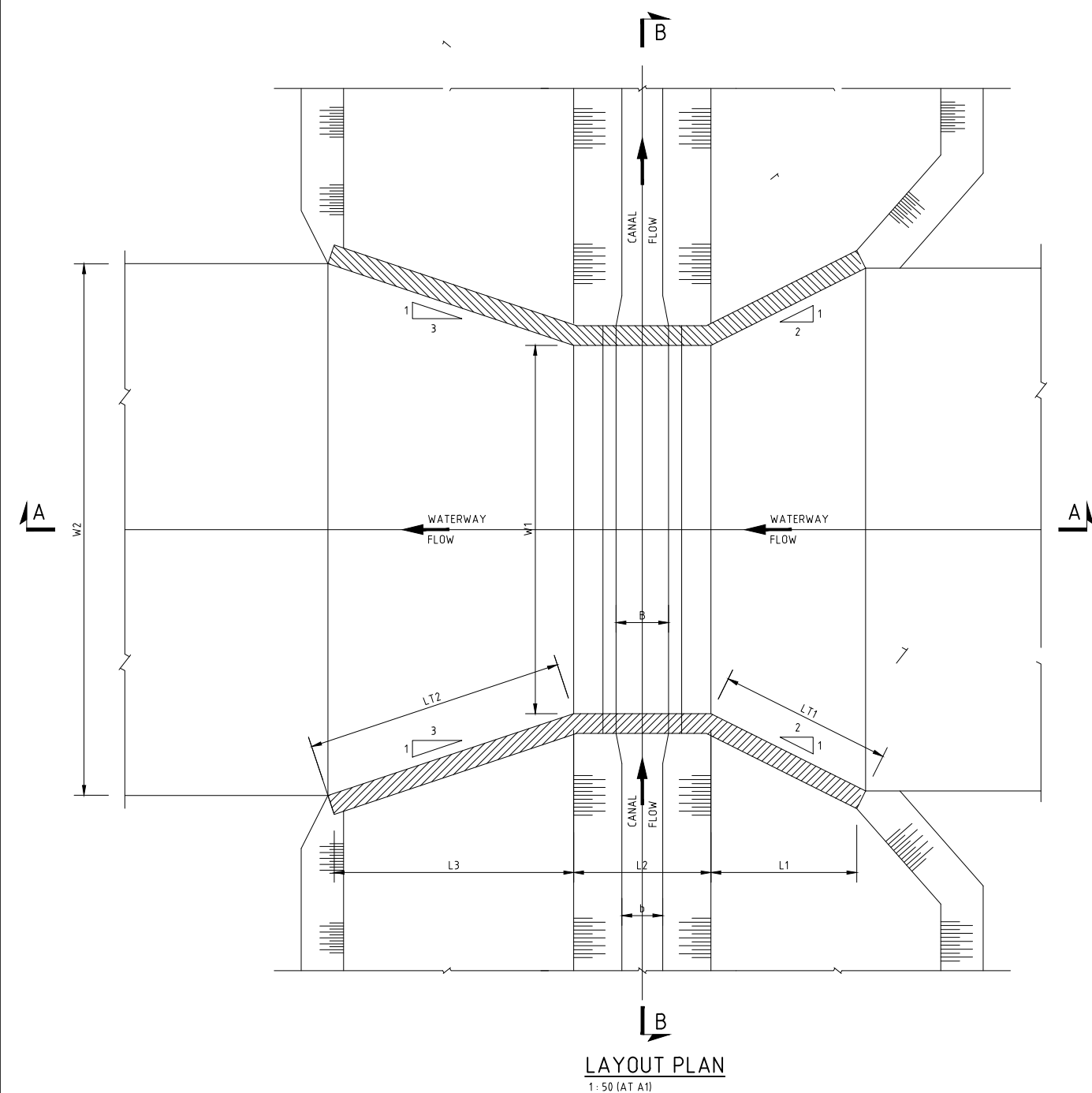
Designed by SOD	Checked By HN
Drawn By SOD	Approved By HN
Scale AS SHOWN (A1)	Date JANUARY 2022
Drawing No. AKIDP/FFD/42	Rev. O Drg status

- NOTES:
1. DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE INDICATED
 2. LEVELS ARE IN METRES



Canal characteristics													Flume characteristics																								
Canal Name	Chainage	Canal flow	b	d	fb	Back width	Slope	upstream chainage	downstream chainage	Flume span	No. of piers	Slope	US transitional length	DS transitional length	Pier base depth on edge	Pier Height	Pier base depth below river	Width of piers foundation	Length of piers foundation	Length of flume	Length of each span	Levels															
	m	Q(m³/s)	m	m	m	m	%	m	m	m	No.	%	LT1	LT2	H1	H2	H3	Wp	Lp	Lc	Ln	B	D	A	B	C	D	E	F	G	H						
Main Canal	5+100	0.666	0.30	0.51	0.30	0.50	1.50	5+140	5+220	80	9	0.075	1.5	2.0	1.0	4.5	1.2	1.5	1.5	80	10	0.80	0.81	1233.14	1233.08	1233.14	1233.08	1233.95	1233.89	1231.85	1229.05						
	8+280	0.656	0.30	0.52	0.30	0.50	1.50	8+290	8+300	80	9	0.05	1.5	2.0	1.0	3.3	1.2	1.5	1.5	80	10	0.80	0.87	1,227.34	1,227.30	1,227.34	1,227.30	1,228.21	1,228.17	1,224.37	1,224.30						
	10+340	0.656	0.30	0.55	0.30	0.50	1.50	10+340	10+380	40	5	0.05	1.5	2.0	1.0	3.5	1.2	1.5	1.5	40	10	0.60	0.85	1,225.78	1,225.72	1,225.77	1,225.71	1,226.63	1,226.57	1,226.05	1,226.00						
	10+440	0.656	0.30	0.55	0.30	0.50	1.50	10+440	10+520	80	9	0.05	1.5	2.0	1.0	3.0	1.2	1.5	1.5	80	10	0.60	0.85	1225.65	1225.60	1225.50	1225.45	1225.13	1224.64								
	10+900	0.656	0.30	0.55	0.30	0.50	1.50	10+900	10+960	60	7	0.05	1.5	2.0	1.0	3.0	1.2	1.5	1.5	60	10	0.60	0.85	1225.30	1225.25	1225.30	1225.25	1225.15	1225.10	1223.22	1223.54						
Secondary Canal	4+400	0.297	0.55	0.57	0.30	0.50	1.5	4+400	4+480	80	9	0.05	1.5	2.0	1.0	1.8	1.2	1.5	1.5	80	10	0.85	0.87	1219.63	1219.59	1219.63	1219.59	1220.5	1220.45	1218.19	1218.31						
	5+580	0.197	0.55	0.58	0.30	0.50	1.5	5+580	6+300	320	33	0.02	1.5	2.0	1.0	1.4	1.2	1.5	1.5	320	10	0.65	0.88	1218.46	1218.40	1218.46	1218.40	1219.34	1219.28	1218.75	1217.86						

NO.	DESCRIPTION	DATE
REVISIONS		
Client		
 National Irrigation Authority NATIONAL IRRIGATION AUTHORITY LENANA ROAD, P.O. Box 30372, 00100 NAIROBI, KENYA		
Civil and Structural Engineers		
Eng. HENRY NDUGAH CONSULTING ENGINEER Suite A4 Machera Court		
Project Title		
ANYIKO - KATHIENO IRRIGATION PROJECT		
Drawing Title		
FLUME STRUCTURE		
Designed by SDO		Checked By HN
Drawn By SDO		Approved By HN
Scale AS SHOWN (A1)		Date JANUARY 2022
Drawing No. AKIDP/FFD/43		Rev. O
		Drg status



NOTES:

1. DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE INDICATED
2. LEVELS ARE IN METRES

NO. DESCRIPTION DATE

REVISIONS

Client



NATIONAL IRRIGATION AUTHORITY
LENANA ROAD, P.O. Box 30372, 00100
NAIROBI, KENYA

Civil and Structural Engineers

Eng. HENRY NDUGAH
CONSULTING ENGINEER
Suite A4 Machera Court

Project Title

ANYIKO - KATHIENO
IRRIGATION PROJECT

Drawing Title

OVERCHUTE STRUCTURE

Designed by
SDO

Drawn By
SDO

Scale
AS SHOWN (A1)

Drawing No.
AKIDP/FFD/44

Checked By
HN

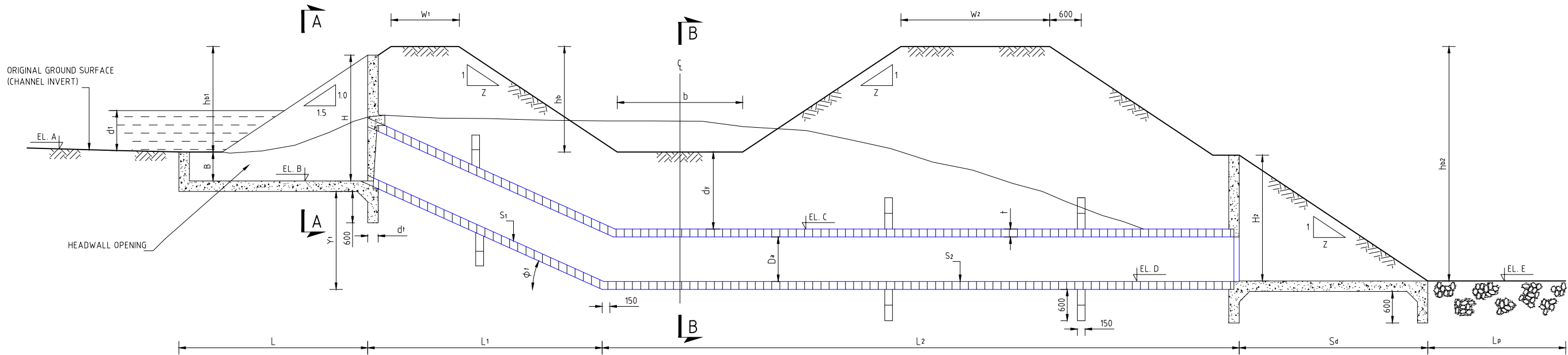
Approved By
HN

Date
JANUARY 2022

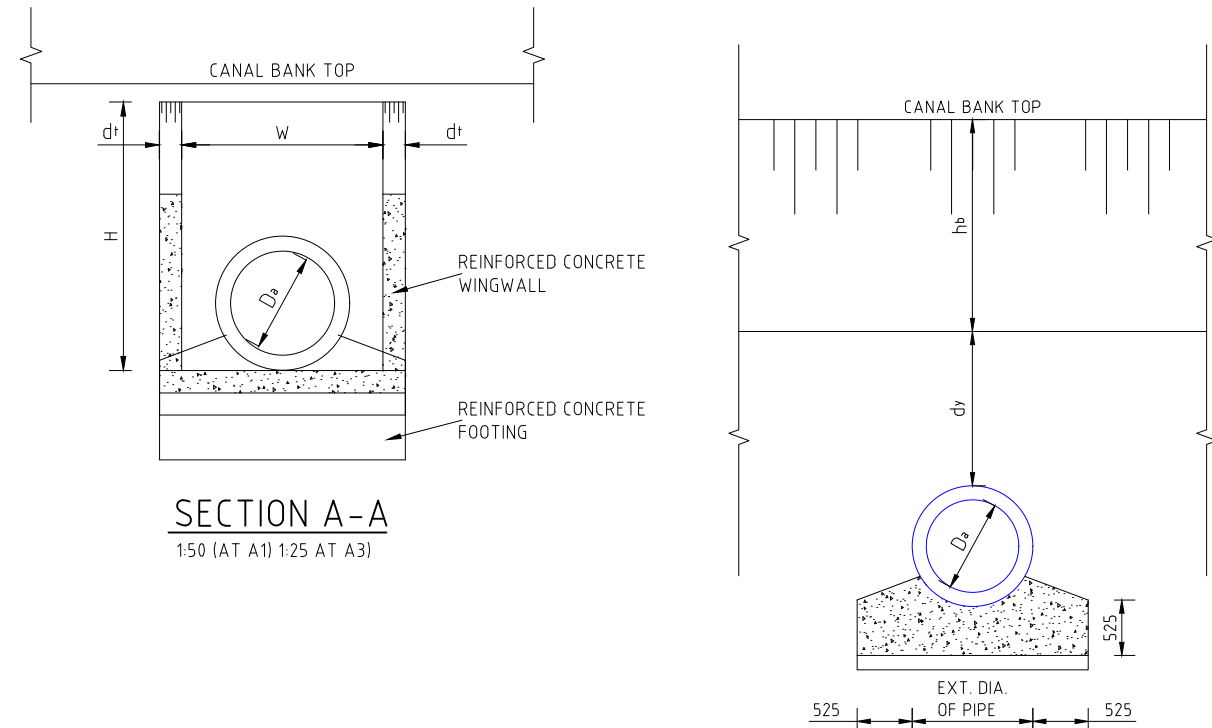
Rev. O

Drg status

Overchute/Canal characteristics																					
Canal Name	Chainage	Canal flow	Box Verical Height (H1)	Clear Water Way (W1)	Bed Width of Clear Water Way (W2)	US transitional length (LT1)	DS transitional length(LT2)	Inlet Length (L1)	Box Culvert Length (L2)	Outlet Length (L3)	Box Culvert Width (B)	Canal Bed Width (b)	Levels								
	m	Q(m3/s)	m	m	m	m	m	m	m	m	m	m	A	B	C	D	E	F	G	H	I
Main Canal	0+740	0.656	1.00	5.00	7.50	2.30	4.20	2.50	5.50	4.00	1.50	1.00	1241.5807	1242.47	1242.42	1243.67	1242.07	1241.1807	1242.02	1243.27	1240.87
	1+900	0.656	1.00	5.00	7.50	1.70	4.20	1.00	5.50	4.00	1.50	1.00	1,240.90	1,241.79	1,241.74	1,242.24	1,241.39	1,240.50	1,241.34	1,241.84	1,240.19
	3+460	0.656	0.80	5.00	7.50	1.00	3.20	0.50	5.00	3.00	2.00	0.50	1,237.60	1,238.49	1,238.44	1,238.69	1,238.09	1,237.20	1,238.04	1,238.29	1,237.09
Secondary Canal	1+480	0.297	0.80	3.00	5.00	1.00	3.20	0.5	3.50	3.00	1.50	0.90	1220.9607	1221.85	1221.8	1222.05	1221.45	1220.56	1221.40	1221.65	1220.45
	1+700	0.297	0.60	3.00	5.00	1.00	3.20	0.5	3.50	3.00	1.50	0.90	1220.7607	1221.65	1221.6	1221.85	1221.25	1220.36	1221.20	1221.45	1220.45
TC5	0+860	0.097	0.80	3.00	5.00	1.00	3.20	0.5	3.50	3.00	1.00	0.45	1218.5407	1219.43	1219.38	1219.63	1219.03	1218.1407	1218.98	1219.23	1218.03
TC5	1+420	0.084	0.80	3.00	5.00	1.00	3.20	0.5	3.50	3.00	1.00	0.45	1218.0507	1218.94	1218.89	1219.14	1218.54	1217.6507	1218.49	1218.74	1217.54



SECTIONAL PLAN
1:50 (AT A1) 1:100 (AT A3)



SECTION A-A
1:50 (AT A1) 1:25 (AT A3)

NOTES

- DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE INDICATED
- LEVELS IN METRES ABOVE MEAN SEA LEVEL
- REINFORCED CONCRETE CLASS A UNLESS OTHERWISE STATED
- MASS CONCRETE CLASS C UNLESS OTHERWISE STATED
- CHAMFER ALL EXPOSED CONCRETE EDGES - 25mm
- CONCRETE TO BE PLACED ON SCARIFIED, COMPACTED IN-SITU MATERIAL. ANY OVER-EXCAVATION BELOW DESIGN LEVEL TO BE MADE UP WITH MASS CONCRETE ONLY.
- BACKFILL TO STRUCTURE, INCLUDING CUTOFF WALLS TO BE PLACED ON HORIZONTAL, SCARIFIED AND WETTED IN-SITU MATERIAL.
- EXCAVATION TO PROCEED IN 0.5m LAYERS UNTIL SUCH LEVEL AS APPROVED BY THE ENGINEER
- ELEVATIONS ON CANAL PROFILE DRAWINGS
- REINFORCEMENT TO STRUCTURAL ENGINEERS DETAILS

Canal Name	Chainage	Drainage discharge	Canal bed width	Canal design water depth	Bank top width W1(RIGHT)	Bank top width W2(LEFT)	Canal side slope, z1	No of bords	Internal pipe diameter, Da	hb	hb1	hb2	L	W	B	H1	Y1	L1	S1	S2	L2	Y2	Clearance depth between canal and pipe dy	wall thickness	Total pipe Length	Outlet transition	Outlet Structure height	Outlet protection works Length	Ground Level	Canal Bank Level	Elevation A	Elevation B	Elevation C	Elevation D	Elevation E
Main Canal	m	Q(m3/s)	b,m	dL,m	W1(m)	W2	z1	No	Da	hb	hb1	hb2	L	W	B	H1	Y1	L1	S1	S2	L2	Y2	dy	dt	P1(m)	sd	H2 (m)	Lp(m)	m	m	m	m	m	m	m
	1+080	3.00	1.00	0.75	4.00	0.50	1.50	1.00	1.20	1.05	2.20	3.49	3.60	1.80	0.60	2.40	0.23	8.90	0.03	0.10	5.4	0.54	0.60	0.20	14	3.60	2.40	4.00	1,239.53	1,241.76	1,239.53	1,238.93	1,240.11	1,238.81	1,238.26
	1+420	3.00	1.00	0.75	4.00	0.50	1.50	1.00	1.20	1.05	1.80	3.43	3.60	1.80	0.60	2.40	0.61	8.30	0.07	0.10	4.8	0.48	0.60	0.20	13	3.60	2.40	4.00	1,239.75	1,241.99	1,239.75	1,239.15	1,239.94	1,238.64	1,238.15
	2+100	3.00	1.00	0.75	4.00	0.50	1.50	1.00	1.20	1.05	0.60	3.24	3.60	1.80	0.60	2.40	1.90	6.40	0.29	0.10	2.9	0.29	0.60	0.20	9	3.60	2.40	4.00	1,240.58	1,241.15	1,240.58	1,239.98	1,239.50	1,238.20	1,237.90
	2+360	3.00	1.00	0.75	4.00	0.50	1.50	1.00	1.20	1.05	2.50	3.83	3.60	1.80	0.60	2.40	0.30	9.30	0.03	0.10	5.8	0.58	0.90	0.20	15	3.60	2.40	4.00	1,238.55	1,241.02	1,238.55	1,237.95	1,239.07	1,237.77	1,237.19
	2+780	3.00	0.50	0.45	4.00	0.50	1.50	1.00	1.20	0.75	1.20	2.99	3.60	1.80	0.60	2.40	1.00	6.90	0.14	0.10	3.4	0.34	0.60	0.20	10	3.60	2.40	4.00	1,238.89	1,240.07	1,238.89	1,238.29	1,238.72	1,237.42	1,237.08
	3+820	3.00	0.50	0.45	4.00	0.50	1.50	1.00	1.20	0.75	2.00	3.11	3.60	1.80	0.60	2.40	0.14	8.10	0.02	0.10	4.6	0.46	0.60	0.20	13	3.60	2.40	4.00	1,235.31	1,237.32	1,235.31	1,234.71	1,235.97	1,234.67	1,234.20
	4+320	3.00	0.50	0.45	4.00	0.50	1.50	1.00	1.20	0.75	2.50	3.79	3.60	1.80	0.60	2.40	0.21	8.90	0.02	0.10	5.4	0.54	1.20	0.20	14	3.60	2.40	4.00	1,233.48	1,236.02	1,233.48	1,232.88	1,234.07	1,232.77	1,232.22
	4+540	3.00	0.50	0.45	4.00	0.50	1.50	1.00	1.20	0.75	0.40	2.87	3.60	1.80	0.60	2.40	1.80	5.70	0.31	0.10	2.2	0.22	0.60	0.20	8	3.60	2.40	4.00	1,235.10	1,235.47	1,235.10	1,234.50	1,234.12	1,232.82	1,232.60
	6+140	3.00	0.80	0.51	4.00	0.50	1.50	1.00	1.20	0.81	2.90	4.22	3.60	1.80	0.60	2.40	0.20	9.60	0.02	0.10	6.1	0.61	1.50	0.20	16	3.60	2.40	4.00	1,230.02	1,232.94	1,230.02	1,229.42	1,230.63	1,229.33	1,228.72
	6+220	3.00	0.80	0.51	4.00	0.50	1.50	1.00	1.20	0.81	2.80	4.19	3.60	1.80	0.60	2.40	0.40	9.30	0.04	0.10	5.8	0.58	1.50	0.20	15	3.60	2.40	4.00	1,230.13	1,232.88	1,230.13	1,229.53	1,230.57	1,229.27	1,228.69
	7+340	3.00	0.80	0.57	4.00	0.50	1.50	1.00	1.20	0.87	0.90	3.09	3.60	1.80	0.60	2.40	1.40	6.70	0.20	0.10	3.2	0.32	0.60	0.20	10	3.60	2.40	4.00	1,227.97	1,228.88	1,227.97	1,227.37	1,227.41	1,226.11	1,225.79
Secondary Canal	9+500	3.00	0.60	0.55	4.00	0.50	1.50	1.00	1.20	0.85	2.30	3.57	3.60	1.80	0.60	2.40	0.30	8.70	0.03	0.10	5.2	0.52	0.90	0.20	14	3.60	2.40	4.00	1,225.00	1,227.27	1,225.00	1,224.40	1,225.52	1,224.22	1,223.70
	9+560	3.00	0.60	0.55	4.00	0.50	1.50	1.00	1.20	0.85	2.20	3.51	3.60	1.80	0.60	2.40	0.30	8.60	0.034	0.10	5.1	0.51	0.85	0.20	14	3.60	2.40	4.00	1,225.01	1,227.22	1,225.01	1,224.41	1,225.52	1,224.22	1,223.71
Secondary Canal	5+460	3.00	0.65	0.57	4.00	0.50	1.50	1.00	1.20	0.87	2.40	3.62	3.60	1.80	0.60	2.40	0.14	9.00	0.015	0.10	5.40	0.55	0.90	0.20	14.00	3.60	2.40	4.00	1,217.49	1,219.92	1,217.49	1,216.89	1,218.15	1,216.85	1,216.31

- NOTES:
- DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE INDICATED
 - LEVELS ARE IN METRES

NO. DESCRIPTION DATE

REVISIONS

Client



NATIONAL IRRIGATION AUTHORITY
LENANA ROAD, P.O. Box 30372, 00100
NAIROBI, KENYA

Civil and Structural Engineers

Eng. HENRY NDUGAH
CONSULTING ENGINEER
Suite A4 Machera Court

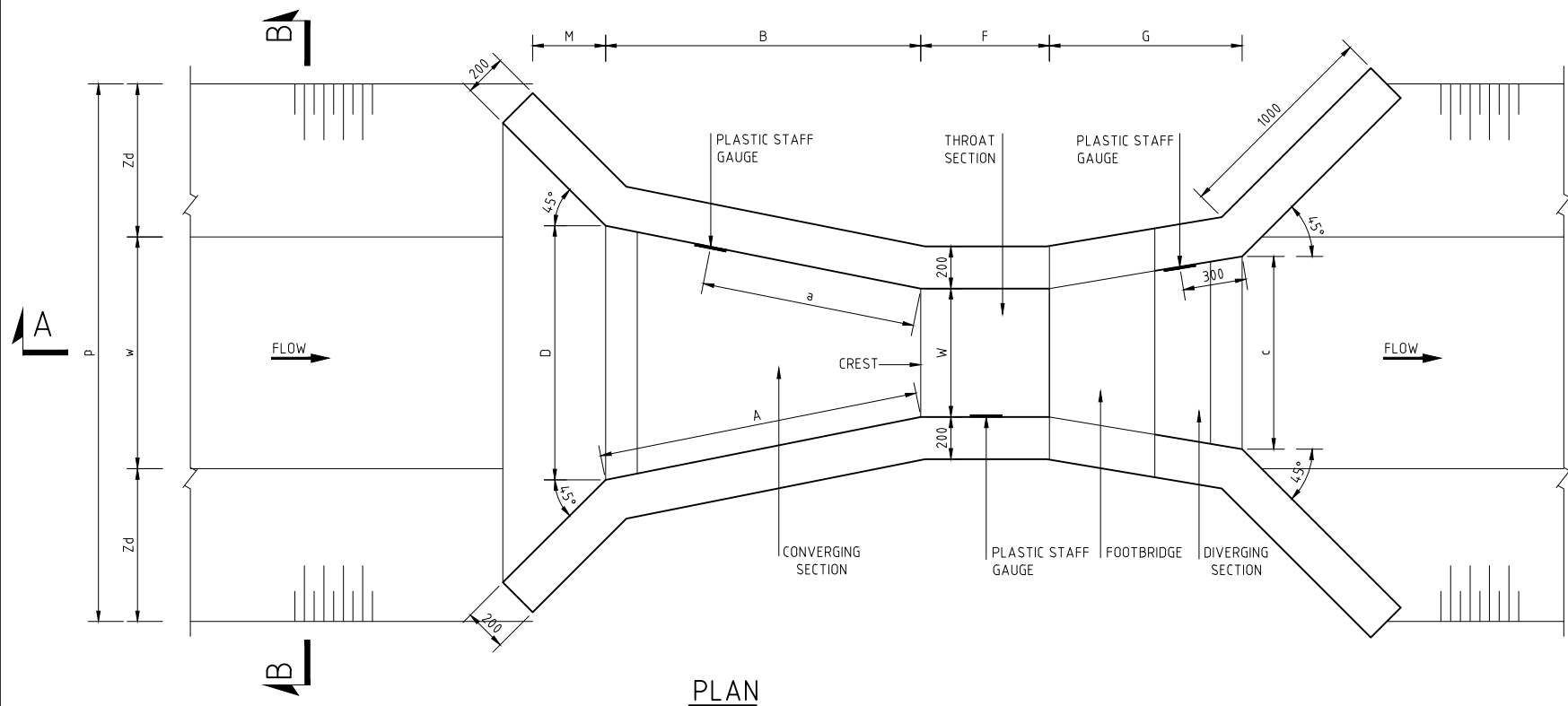
Project Title

ANYIKO - KATHIENO
IRRIGATION PROJECT

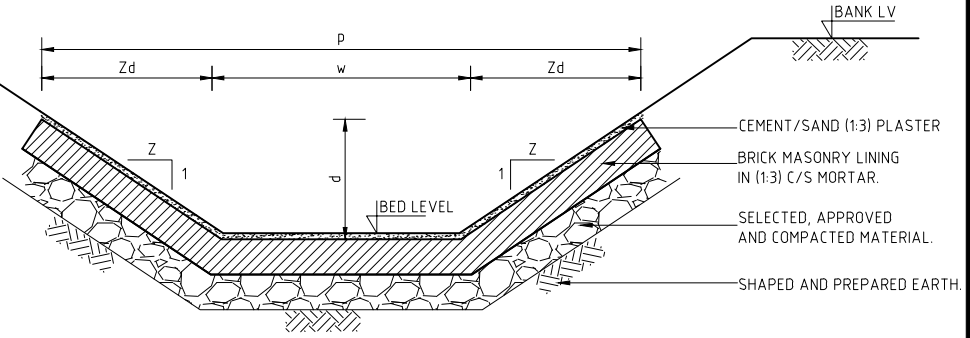
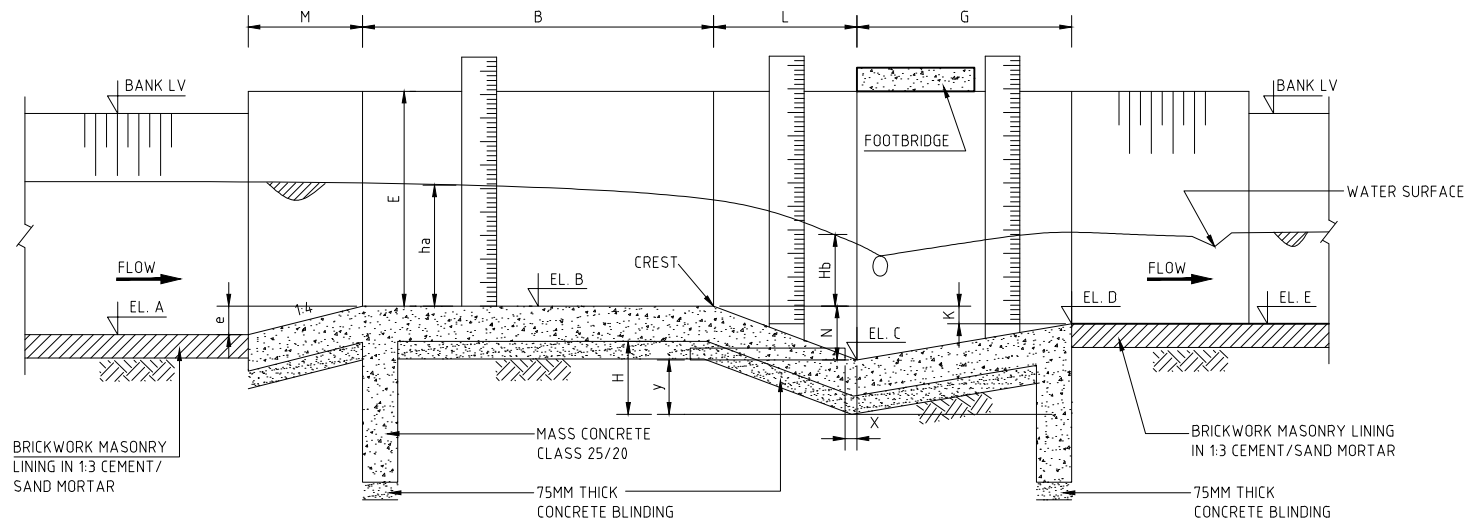
Drawing Title

OVERCHUTE STRUCTURE

Designed by SDO	Checked By HN
Drawn By SDO	Approved By HN
Scale AS SHOWN (A1)	Date JANUARY 2022
Drawing No. AKIDP/FFD/44	Rev. O Drg status



PLAN
1:20 (AT A1)

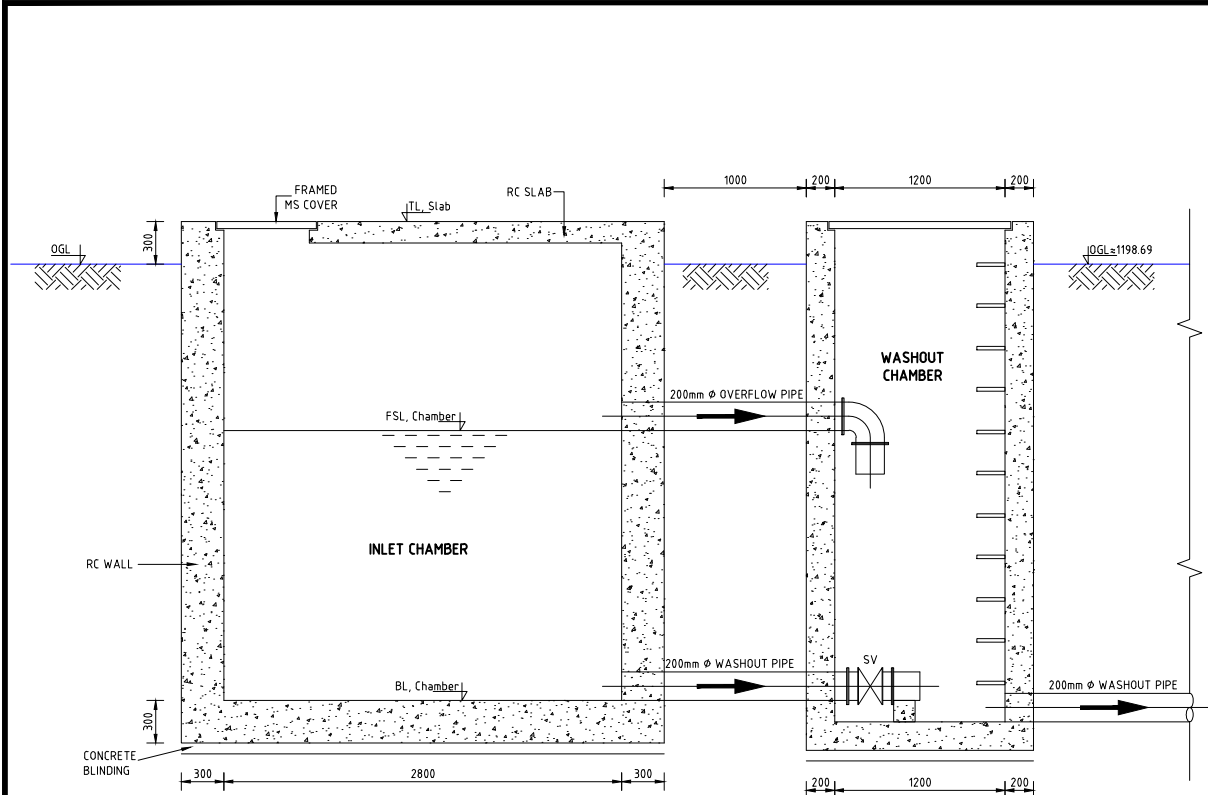


SECTION B - B
1:20 (AT A1)

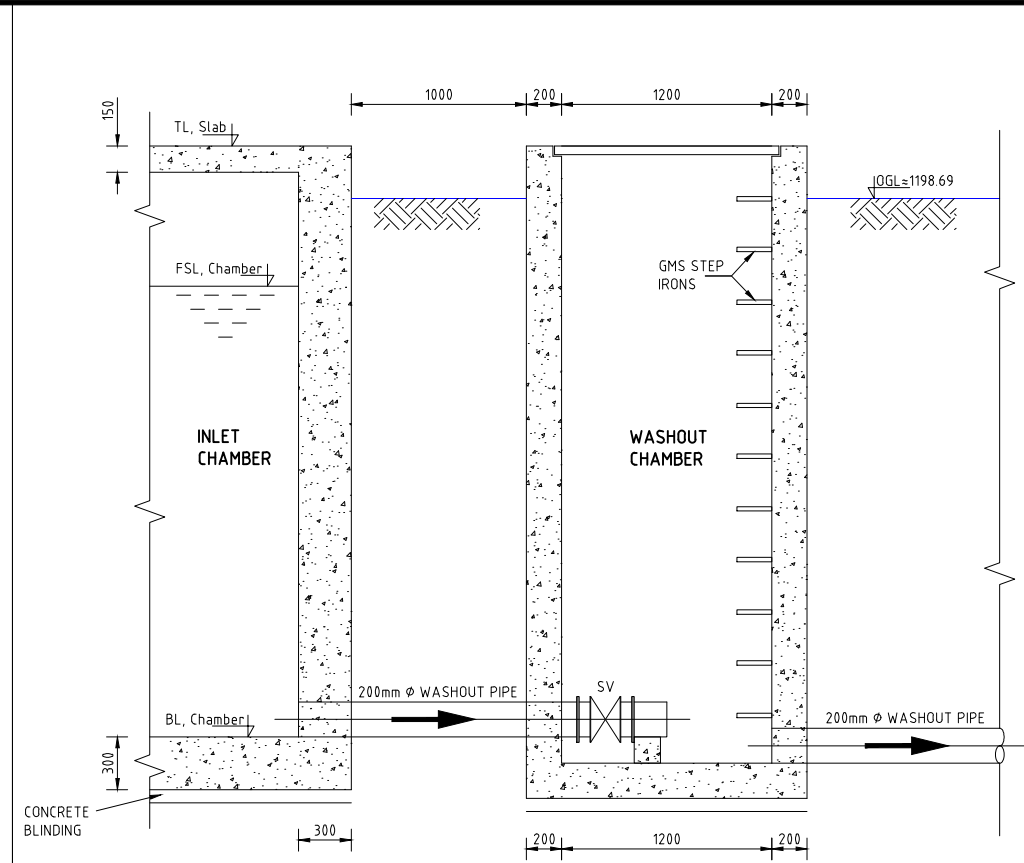
Parshall Flume Structure Dimensions																			Elevations				
Canal Name	Chainage	Design discharge	Maximum Q	Dimension A	2/3A	Dimension B	Dimension C	Dimension D	Dimension E	Dimension F	Dimension G	Dimension N	Dimension M	Dimension P	Dimension R	Dimension Hb	Dimension Ha	Throat width, W	Upstream Canal Invert Level	Parshall Flume Crest Level	Throat Invert Level	Tail water elevation/Elevation at End of Flume	Downstream Canal bed level
	m	Q(m3/s)		m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	A	B	C		D
Main Canal	0+140	0.66	0.68	1.7	1.1	1.6	1.2	1.6	0.9	0.6	0.91	0.23	0.38	2.22	0.51	0.29	0.46	0.9	1241.26	1241.36	1241.13	1241.64	1241.25
	2+500	0.66	0.68	1.7	1.1	1.6	1.2	1.6	0.9	0.6	0.91	0.23	0.38	2.22	0.51	0.29	0.46	0.9	1239.90	1239.99	1239.76	1240.28	1239.90
	7+580	0.66	0.68	1.7	1.1	1.6	1.2	1.6	0.9	0.6	0.91	0.23	0.38	2.22	0.51	0.29	0.46	0.9	1227.84	1227.93	1227.70	1228.22	1227.79
	11+380	0.66	0.68	1.7	1.1	1.6	1.2	1.6	0.9	0.6	0.91	0.23	0.38	2.22	0.51	0.29	0.46	0.9	1224.77	1224.86	1224.63	1225.15	1224.75

- NOTES:
1. DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE INDICATED
 2. LEVELS ARE IN METRES

NO.	DESCRIPTION	DATE
REVISIONS		
Client		
 NATIONAL IRRIGATION AUTHORITY LENANA ROAD, P.O. Box 30372, 00100 NAIROBI, KENYA		
Civil and Structural Engineers		
Eng. HENRY NDUGAH CONSULTING ENGINEER Suite A4 Machera Court		
Project Title		
ANYIKO - UJWANGA EXPANSION IRRIGATION PROJECT		
Drawing Title		
PARSHALL FLUME		
Designed by SDO	Checked By HN	Date SEPT 2021
Drawn By SDO	Approved By HN	Rev. O
Scale AS SHOWN (A1)		Drg status
Drawing No. AUEIP/FFD/46		



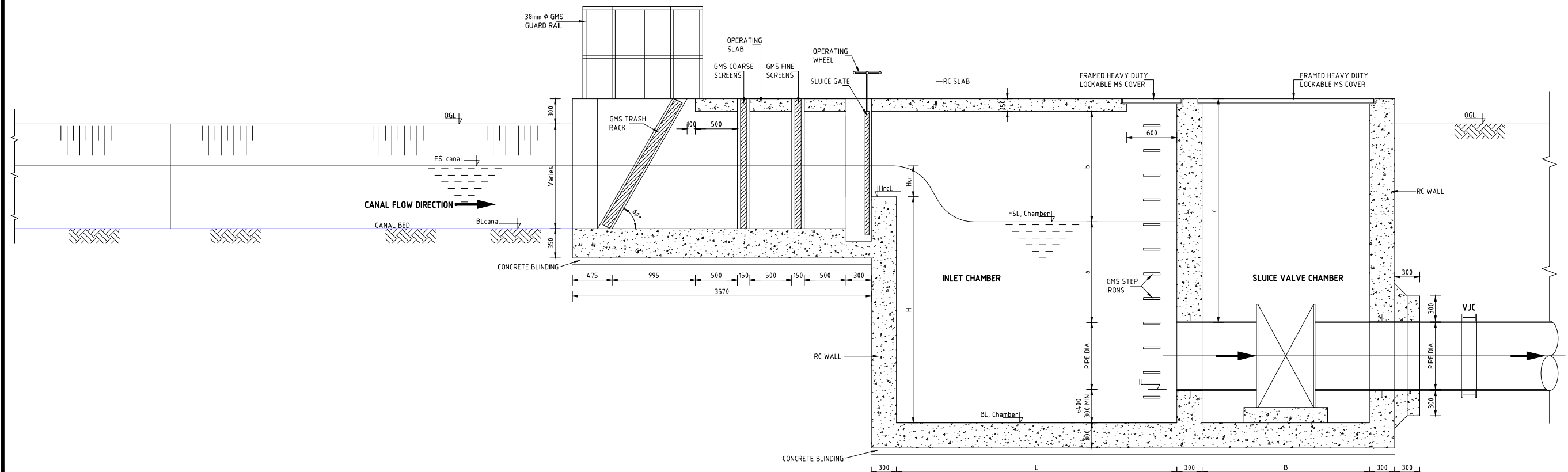
SECTION 3-3
1: 25 (AT A1), 1: 50 (AT A3)



SECTION 3-3
1: 50 (AT A1), 1: 25 (AT A1)

- NOTE**
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.
 2. ALL LEVELS ARE IN METERS.
 3. THE GATES GROOVE SIZES ARE TO BE CONFIRMED WITH GATES MANUFACTURER BEFORE CONCRETE CASTING.
 4. THE STRUCTURE IS TO BE FOUNDED ON SOUND GROUND APPROVED BY THE ENGINEER ON SITE.

- NOTES:**
1. DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE INDICATED
 2. LEVELS ARE IN METRES



SECTION 1-1
1: 25 (AT A1), 1: 50 (AT A3)

NO.	DESCRIPTION	DATE

REVISIONS



NATIONAL IRRIGATION AUTHORITY
LENANA ROAD, P.O. Box 30372, 00100
NAIROBI, KENYA

Civil and Structural Engineers

Eng. HENRY NDUGAH
CONSULTING ENGINEER
Suite A4 Machera Court

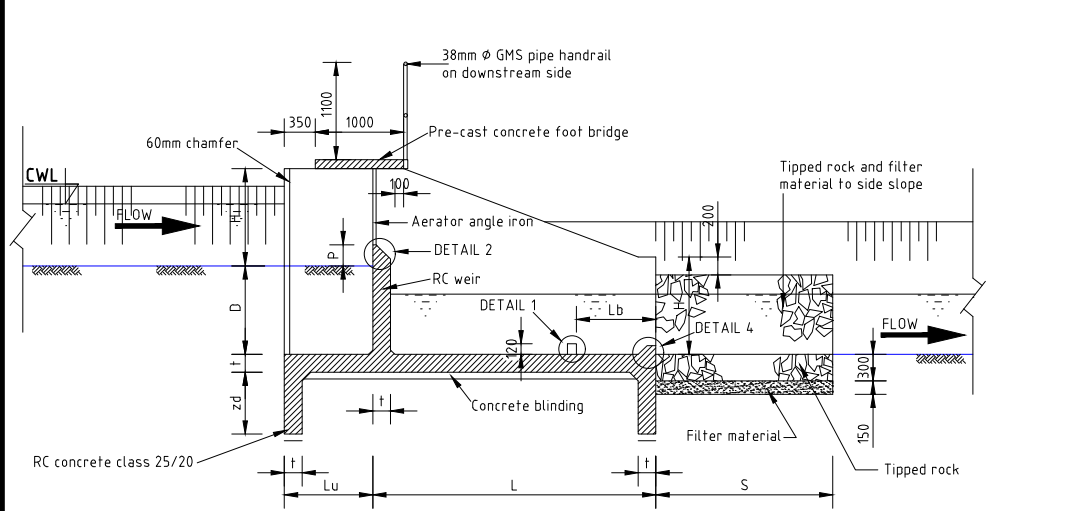
Project Title

ANYIKO - KATHIENO
IRRIGATION PROJECT

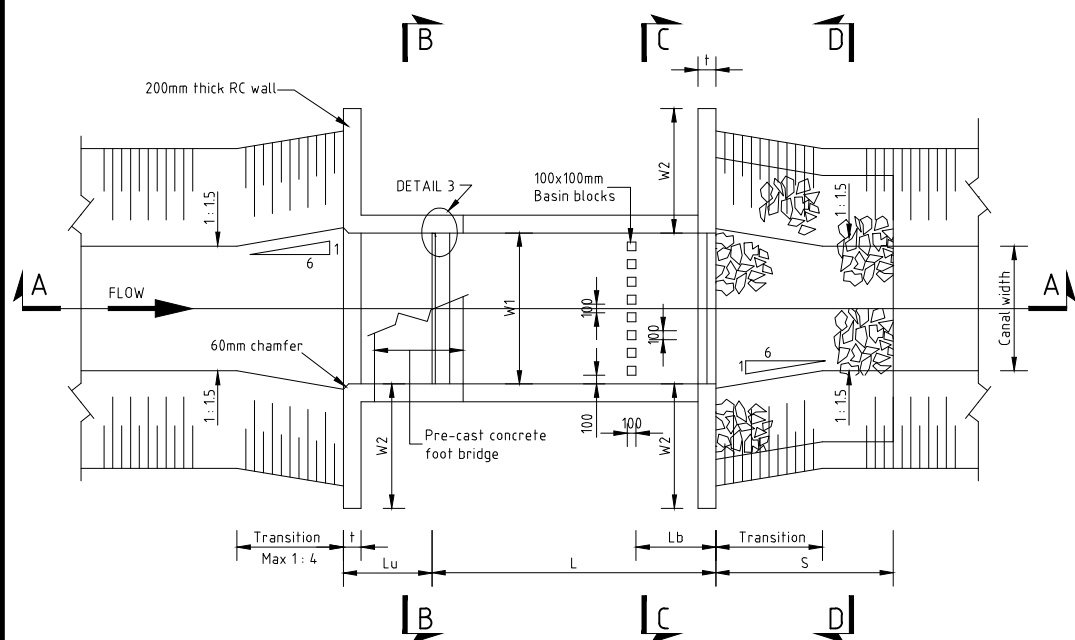
Drawing Title

PIPE INLET STRUCTURE
SHEET 2 OF 2

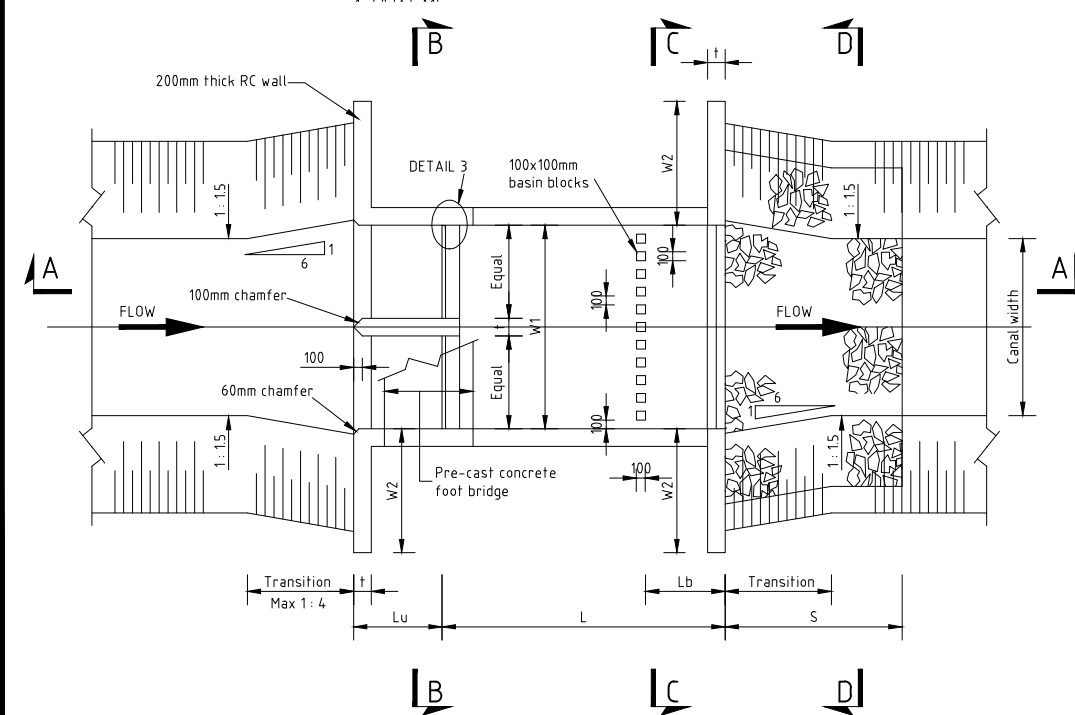
Designed by SOD	Checked By HN
Drawn By SOD	Approved By HN
Scale AS SHOWN (A1)	Date JANUARY 2022
Drawing No. AKIDP/FFD/47	Rev. O Drq status



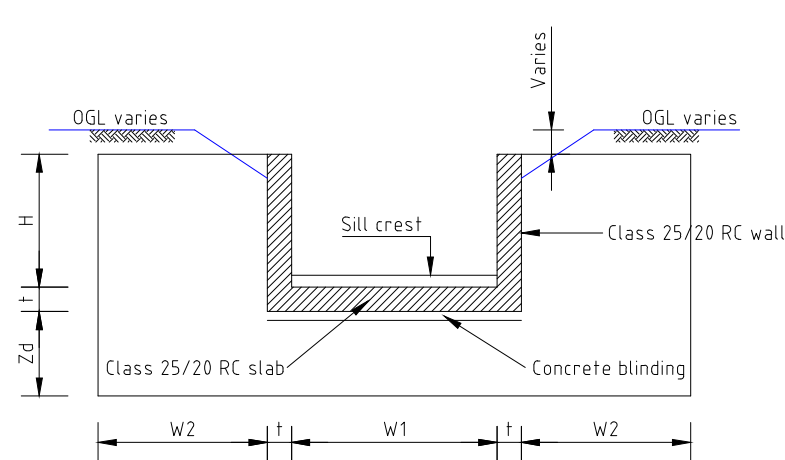
SECTION A-A
1:50 (AT A1)



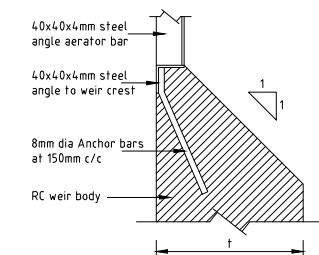
GENERAL ARRANGEMENT PLAN
WIDTH (W1) LESS THAN OR EQUAL TO 1.7m
1:50 (AT A1)



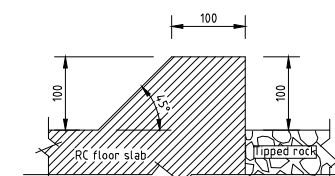
GENERAL ARRANGEMENT PLAN
WIDTH (W1) GREATER THAN 1.7m
1:50 (AT A1)



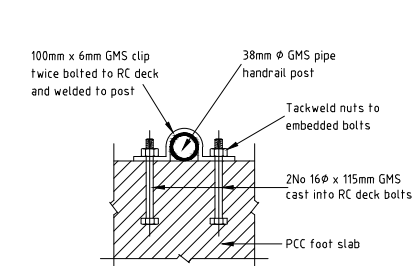
SECTION C-C
1:50 (AT A1)



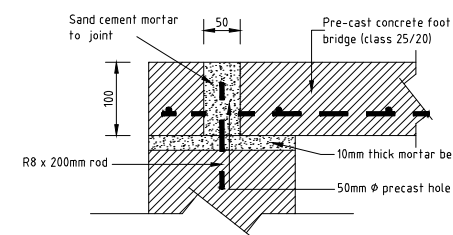
DETAIL 2
WEIR CREST SECTION
1:5 (AT A1)



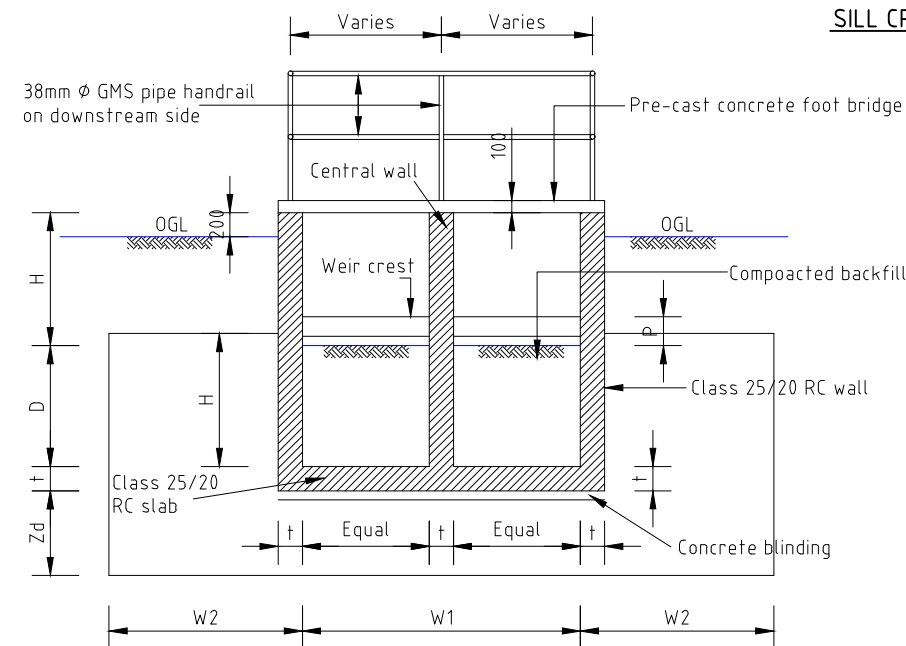
DETAIL 4
SILL CREST SECTION
1:5 (AT A1)



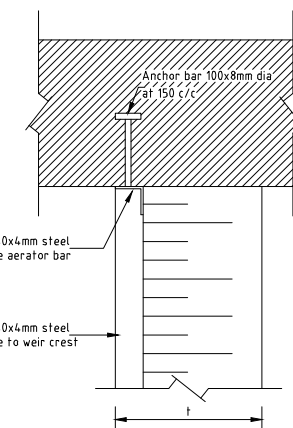
HANDRAIL POST FIXING DETAIL
1:5 (AT A1)



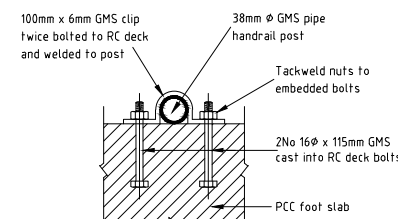
FOOT SLAB DETAIL
1:5 (AT A1)



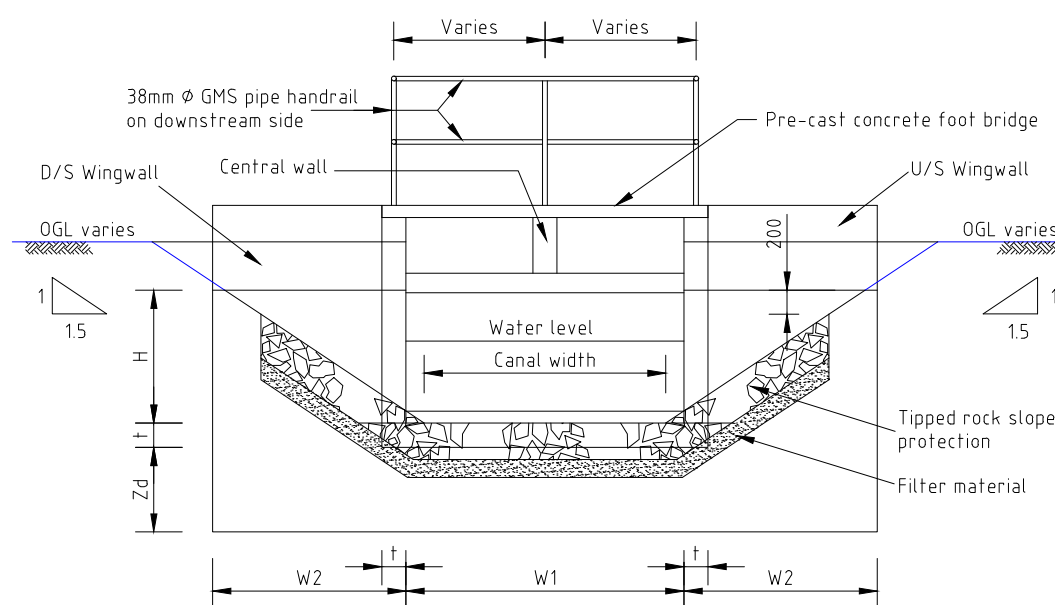
SECTION B-B
1:50 (AT A1)



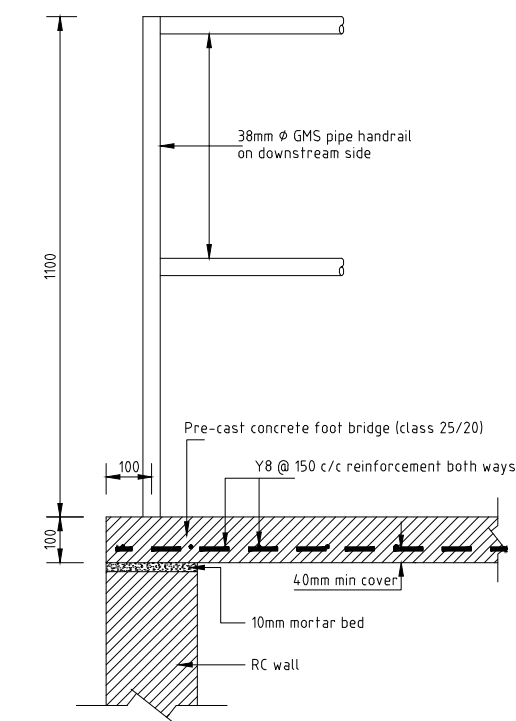
DETAIL 3
WEIR CREST SECTION PLAN
1:5 (AT A1)



HANDRAIL POST FIXING DETAIL
1:5 (AT A1)



SECTION D-D
1:50 (AT A1)



FOOT SLAB DETAIL
1:10 (AT A1)

NOTES:

1. DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE INDICATED
2. LEVELS ARE IN METRES

NO.	DESCRIPTION	DATE
-----	-------------	------

REVISIONS

Client



NATIONAL IRRIGATION AUTHORITY
LENANA ROAD, P.O. Box 30372, 00100
NAIROBI, KENYA

Civil and Structural Engineers

Eng. HENRY NDUGAH
CONSULTING ENGINEER
Suite A4 Machera Court

Project Title
**ANYIKO - KATHIENO
IRRIGATION PROJECT**

Drawing Title
DROP STRUCTURE

Designed by SIO	Checked By HN
Drawn By SIO	Approved By HN
Scale AS SHOWN (A1)	Date JANUARY 2022
Drawing No. AKDIP/FFD/49	Rev. O Drg status

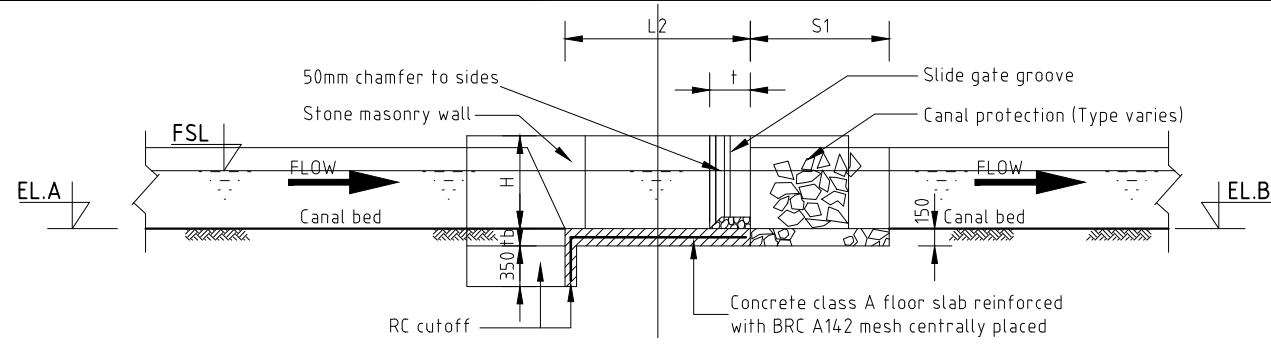
RULE OF DROP STRUCTURES											
Drop height	Maximum flow	Basin Length	Structure Width	Wingwall Width	Thickness	Length to blocks	u/s base Length	Wall height	Weir height	d/s protection	u/s Cutoff depth
H(m)	Q(l/s)	L (m)	W1 (m)	W2(m)	t(m)	Lb(m)	Lu(m)	Hu(m)	P(m)	S(m)	zd(m)
0.2	656	2.6	2	1.30	0.15	0.80	1.00	1.1	0.22	2	0.6
0.5	30	0.4	1.3	0.10	0.2	0.10	0.10	0.1	0.01	1	0.6
0.5	60	0.5	1.3	0.20	0.2	0.15	0.20	0.2	0.03	1	0.6
0.5	90	0.6	1.3	0.25	0.2	0.20	0.25	0.2	0.04	1	0.6
0.5	120	0.9	1.5	0.35	0.2	0.25	0.35	0.3	0.06	1	0.6
0.5	150	1.0	1.5	0.50	0.2	0.30	0.45	0.4	0.07	1	0.6
0.5	240	1.5	1.5	0.70	0.2	0.30	0.70	0.6	0.12	1	0.6
0.5	360	1.5	1.5	1.00	0.2	0.30	1.00	0.9	0.17	1	0.6
0.75	30	0.4	1.3	0.10	0.2	0.10	0.10	0.1	0.01	1	0.6
0.75	60	0.5	1.3	0.20	0.2	0.15	0.20	0.2	0.03	1	0.6
0.75	90	0.6	1.3	0.25	0.2	0.20	0.25	0.2	0.04	1	0.6
0.75	120	0.9	1.5	0.35	0.2	0.25	0.35	0.3	0.06	1	0.6
0.75	150	1.0	1.5	0.50	0.2	0.30	0.45	0.4	0.07	1	0.6
0.75	240	1.5	1.5	0.70	0.2	0.30	0.70	0.6	0.12	1	0.6
0.75	360	1.5	1.5	1.00	0.2	0.30	1.00	0.9	0.17	1	0.6
1	30	0.6	1.3	0.10	0.2	0.10	0.10	0.1	0.01	1	0.6
1	60	0.8	1.3	0.20	0.2	0.15	0.20	0.2	0.03	1	0.6
1	90	0.9	1.3	0.25	0.2	0.20	0.25	0.2	0.04	1	0.6
1	120	1.5	1.4	0.35	0.2	0.25	0.35	0.3	0.06	1	0.6
1	150	1.5	1.5	0.40	0.2	0.30	0.40	0.4	0.07	1	0.6
1	240	1.5	1.5	0.70	0.2	0.30	0.70	0.6	0.12	1	0.6
1	360	1.5	1.5	1.00	0.2	0.30	1.00	0.9	0.17	1	0.6

SELECTED TYPES OF DROP STRUCTURES

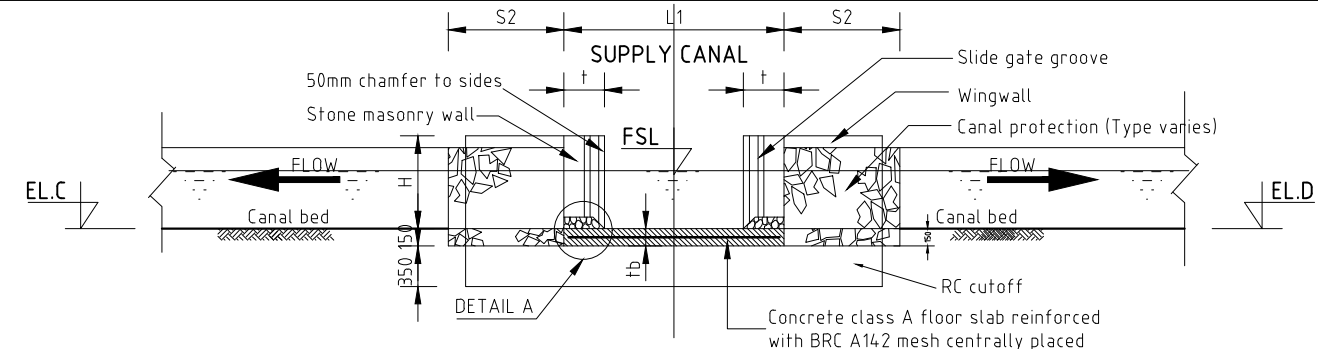
Canal Name	Chainage	Selected Drop Type
BC2	2+500	DRO1
TC1-1	0+000,0+100,0+300	DR43
	0+380	DR33
TC2	0+000,0+100,0+180,0+240	DR43
TC3	0+280	DR35
	0+060,0+120,0+180	DR45
TC4	0+200	DR24
	0+000,0+040,0+060,0+100,0+140	DR44
TC5	1+960,2+020,2+120,2+260, 2+400	DR43
FC1-1-1-1	0+000	DR21
FC1-1-2	0+000	DR21
FC1-1-3	0+380	DR21
FC1-2-2	0+280, 0+340, 0+440	DR41
FC1-2-2-1	0+060	DR21
FC1-2-3	0+080, 0+160, 0+180	DR41
FC2-2-1	0+260, 0+400, 0+460	DR41
FC2-4	0+480, 0+580	DR41
FC4-4	0+080, 0+340, 0+560	DR31

- NOTES:
1. DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE INDICATED
 2. LEVELS ARE IN METRES

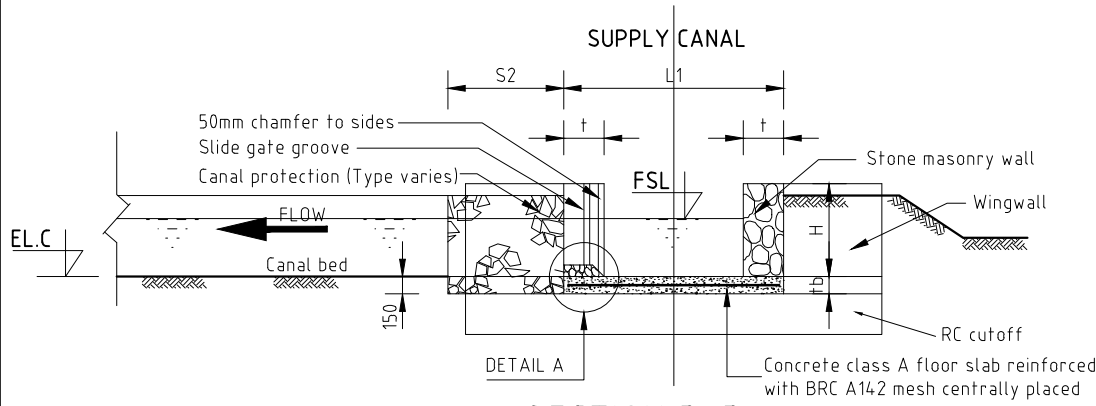
NO.	DESCRIPTION	DATE
REVISIONS		
Client		
 NATIONAL IRRIGATION AUTHORITY LEVANA ROAD, P.O. Box 30372, 00100 NAIROBI, KENYA		
Civil and Structural Engineers		
Eng. HENRY NDUGAH CONSULTING ENGINEER Suite A4 Machera Court		
Project Title		
ANYIKO - KATHIENO IRRIGATION PROJECT		
Drawing Title		
DROP STRUCTURE		
Designed by SOO	Checked By HN	
Drawn By SOO	Approved By HN	
Scale AS SHOWN (A1)	Date JANUARY 2022	
Drawing No. AKDIP/FFD/49	Rev. O	Drg status



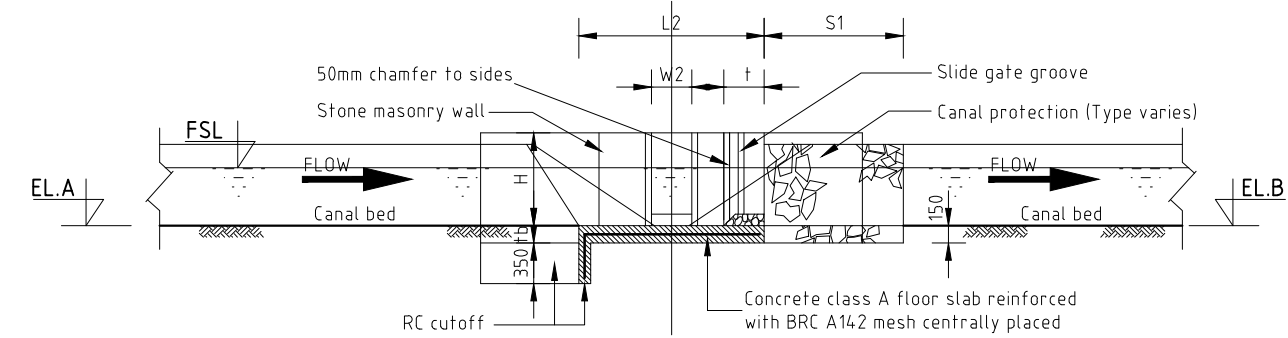
SECTION A-A
1: 50 (AT A1)



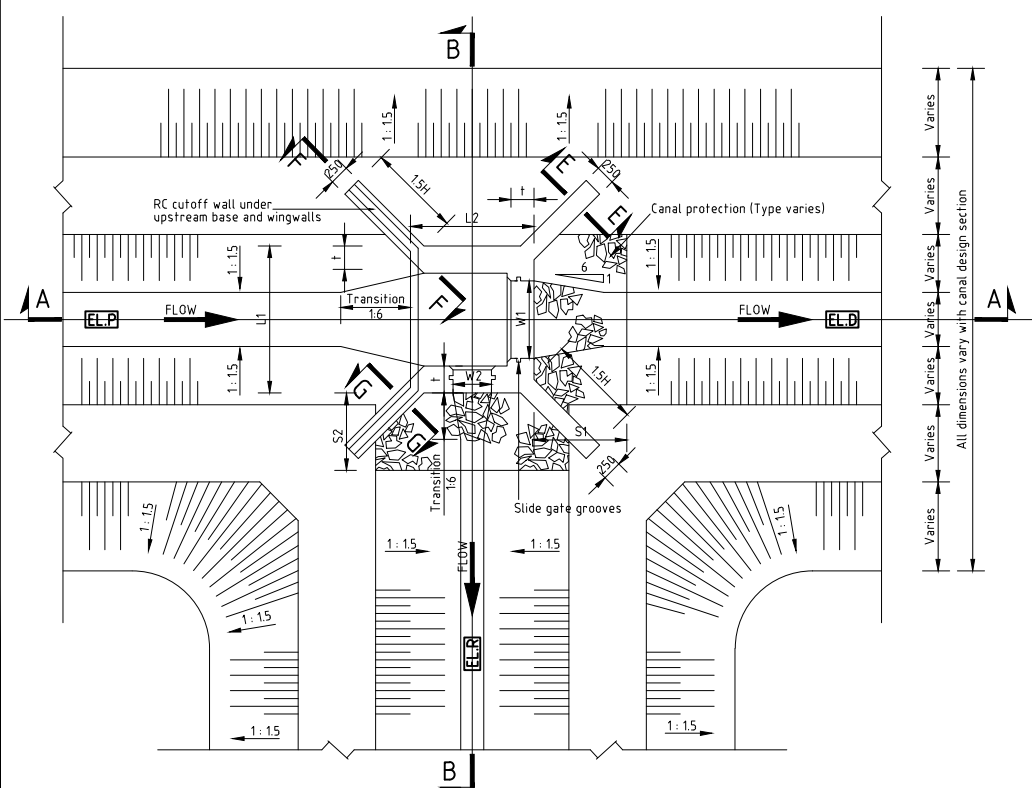
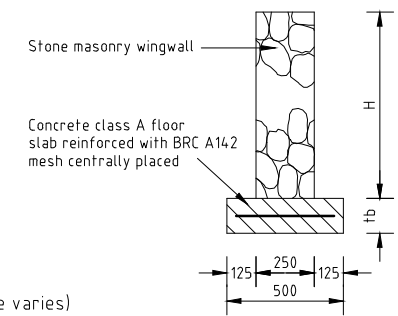
SECTION D-D
1: 50 (AT A1)



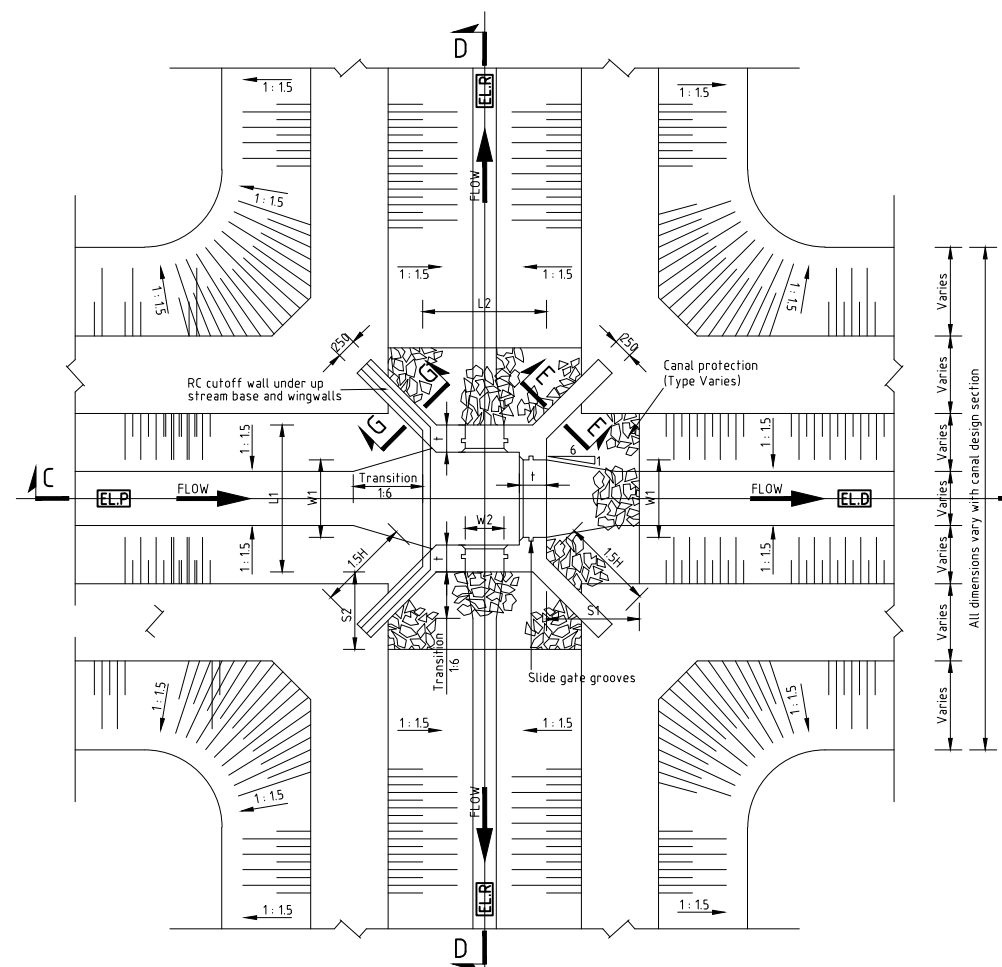
SECTION B-B
1: 50 (AT A1)



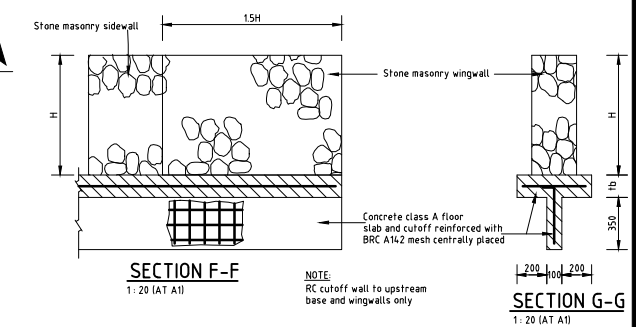
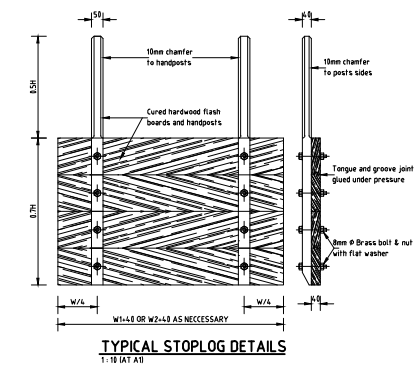
SECTION C-C
1: 50 (AT A1)



PLAN
1: 50 (AT A1)
TYPE 1

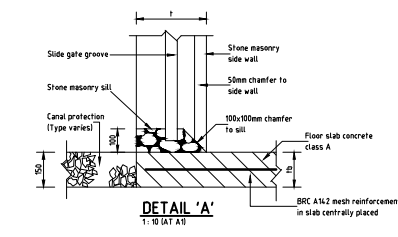


PLAN
1: 50 (AT A1)
TYPE 2



SECTION F-F
1: 20 (AT A1)

SECTION G-G
1: 20 (AT A1)

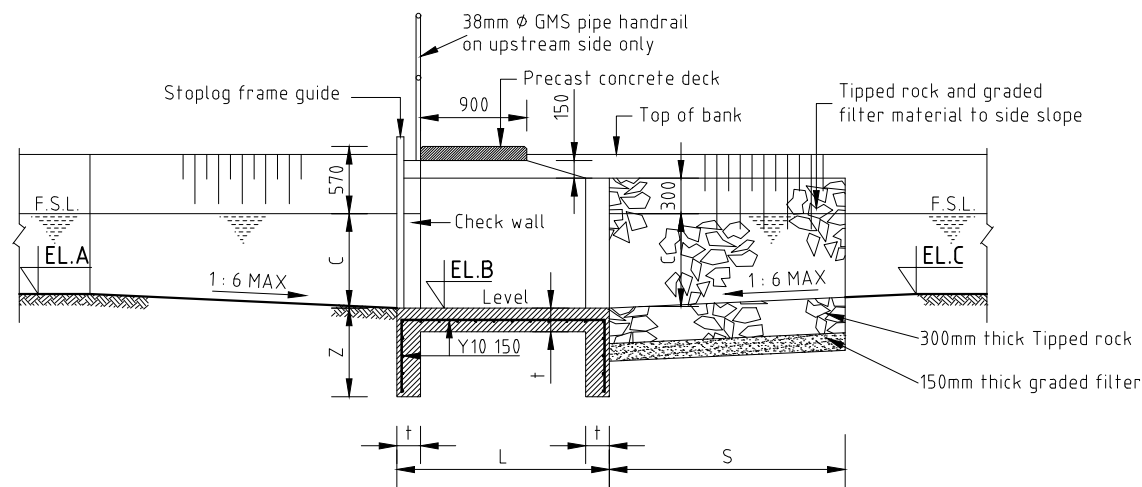


DETAIL 'A'
1: 10 (AT A1)

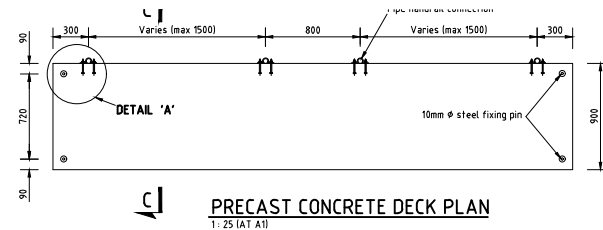
NOTES:

1. DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE INDICATED
2. LEVELS ARE IN METRES

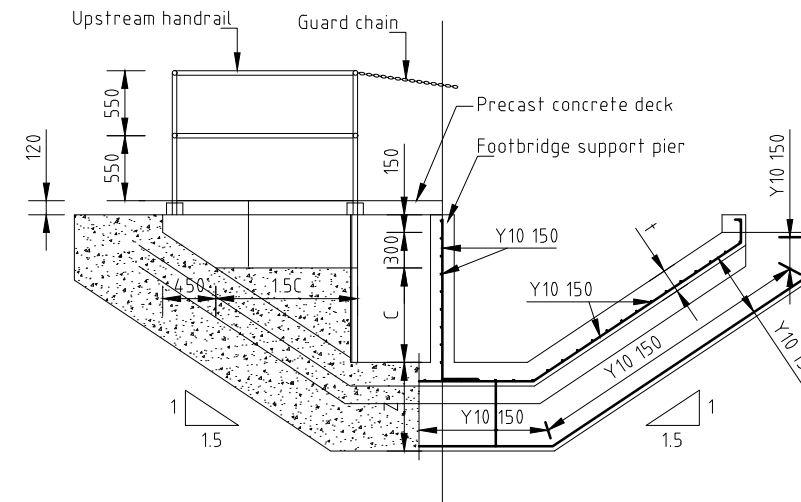
NO.	DESCRIPTION	DATE
REVISIONS		
Client		
 NATIONAL IRRIGATION AUTHORITY LENANA ROAD, P.O. Box 30372, 00100 NAIROBI, KENYA		
Civil and Structural Engineers		
Eng. HENRY NDUGAH CONSULTING ENGINEER Suite A4 Machera Court		
Project Title		
ANYIKO - UJWANGA EXPANSION IRRIGATION PROJECT		
Drawing Title		
DIVISION BOX STRUCTURE		
Designed by	Checked By	
SOO	HN	
Drawn By	Approved By	
SOO	HN	
Scale	Date	
AS SHOWN (A1)		
Drawing No.	Rev.	Drg status
AUEIP/FFD/51	0	



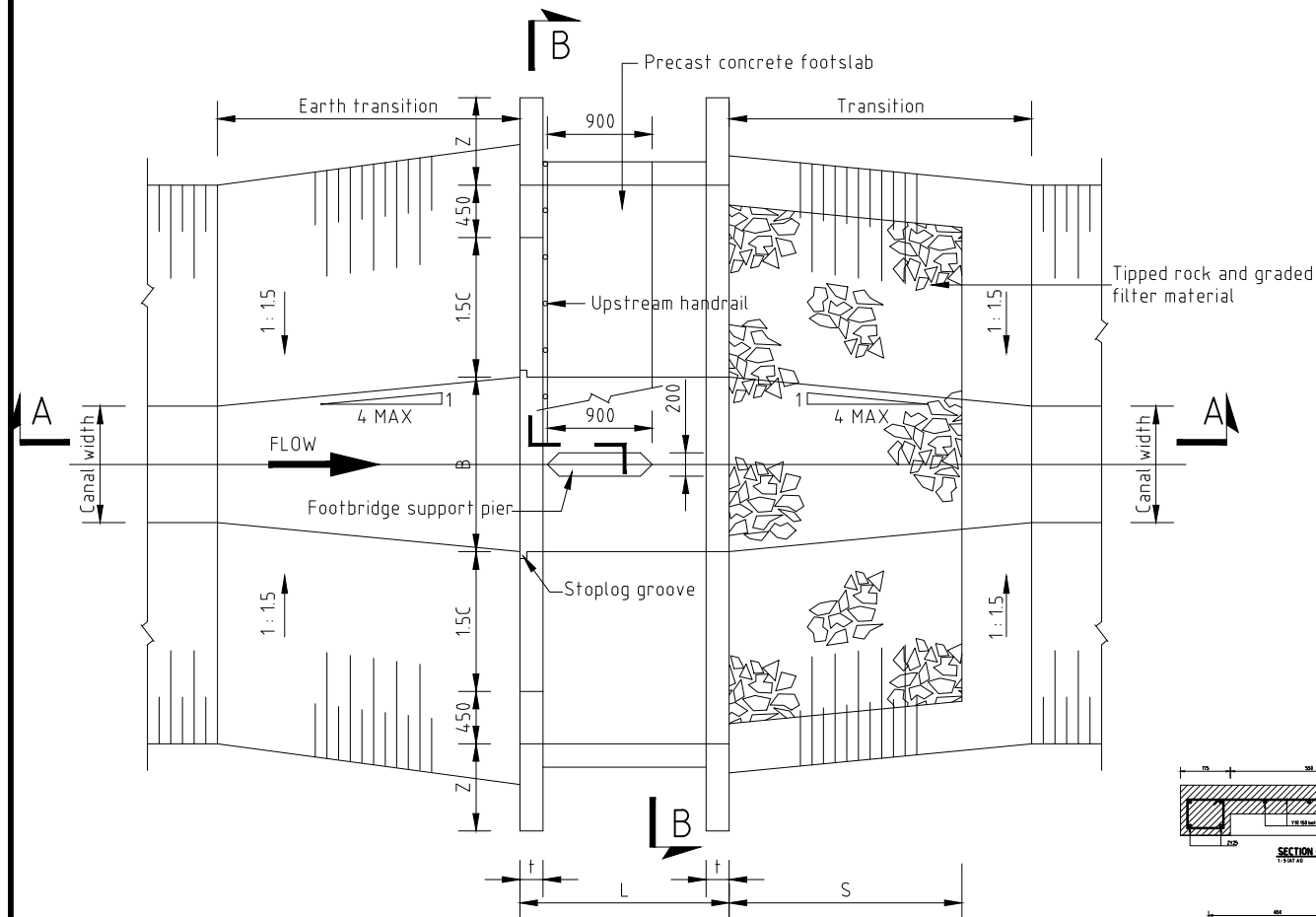
SECTION A-A
1: 50 (AT A1)



PRECAST CONCRETE DECK PLAN
1: 25 (AT A1)



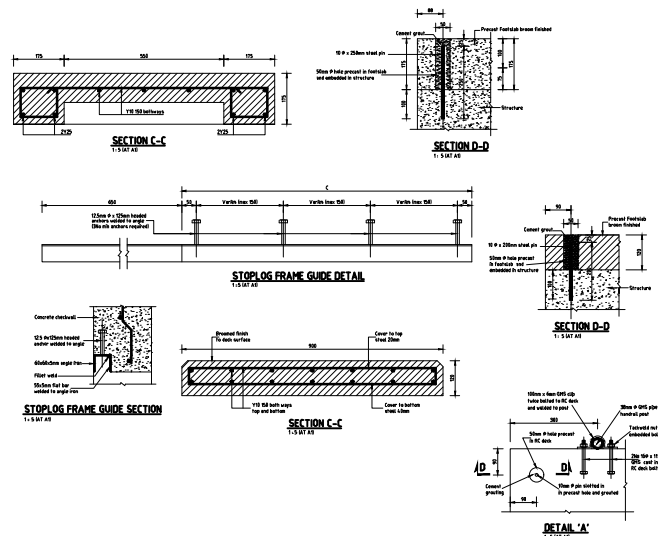
SECTION B-B
1: 50 (AT A1)



PLAN
1: 50 (AT A1)

CHECK DETAILS

Structure Number	Maximum flow	Stoplog width	Stoplog height	Basin Length	Concrete thickness	Cutoff depth	Downstream protection
	Q(l/s)	B (m)	C (m)	L (m)	t (mm)	Z (m)	S (m)
CH 01	30	0.50	0.40	1.40	0.15	0.6	1.50
CH 02	60	0.50	0.40	1.40	0.15	0.6	1.50
CH 03	120	0.55	0.40	1.40	0.15	0.6	1.50
CH 04	180	0.90	0.40	1.40	0.15	0.6	1.50
CH 05	240	0.95	0.50	1.40	0.15	0.6	2.00
CH 06	360	1.00	0.60	1.40	0.20	0.6	2.00



SELECTED CHECK STRUCTURE

Field Canal Name	Chainage	Selected Check Structure Type
FC2-2	0+440	CH01
	0+840	CH01
FC3-2	0+400	CH01
	1+120	CH01
	1+425	CH01

NOTES:

1. DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE INDICATED
2. LEVELS ARE IN METRES

NO.	DESCRIPTION	DATE
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REVISIONS

Client

NATIONAL IRRIGATION AUTHORITY
LENANA ROAD, P.O. Box 30372, 00100
NAIROBI, KENYA

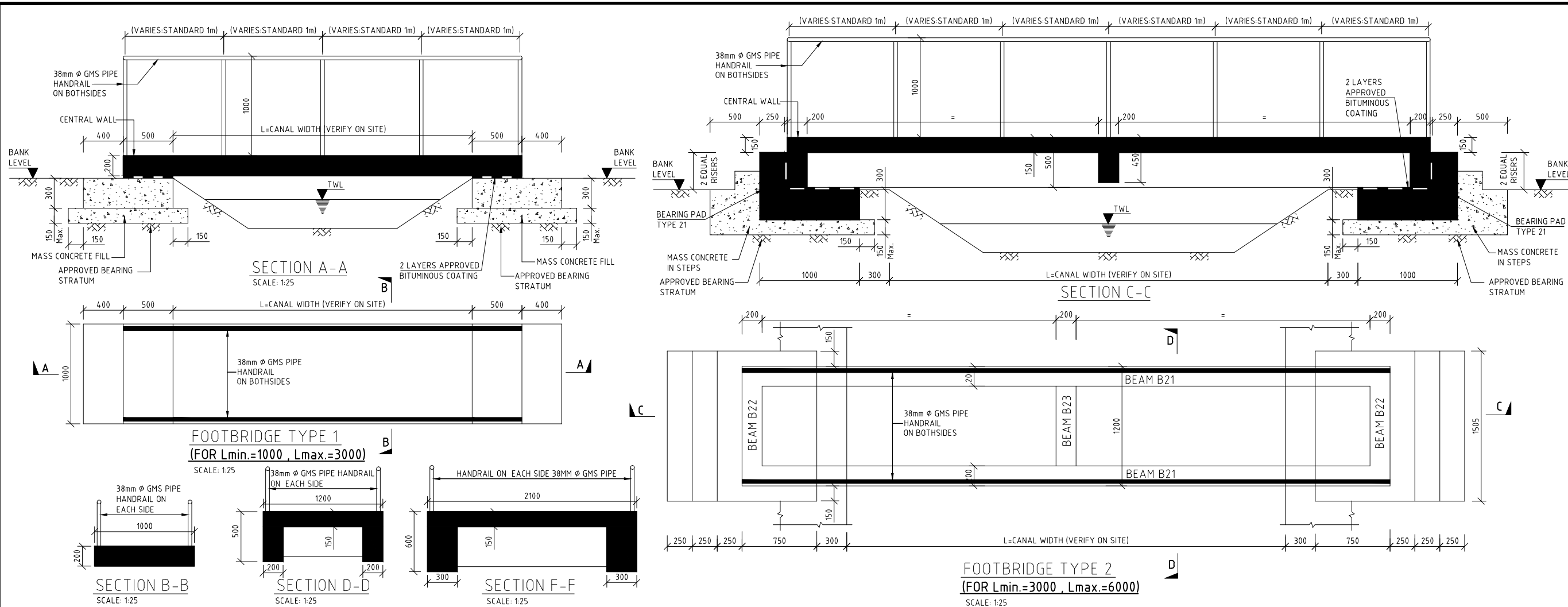
Civil and Structural Engineers

Eng. HENRY NDUGAH
CONSULTING ENGINEER
Suite A4 Machera Court

Project Title
**ANYIKO - UJWANGA
EXPANSION IRRIGATION
PROJECT**

Drawing Title
CHECK STRUCTURE

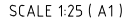
Designed by SOD	Checked By HN
Drawn By SOD	Approved By HN
Scale AS SHOWN (A1)	Date
Drawing No. AUEIP/FFD/52	Rev. 0 Drg status



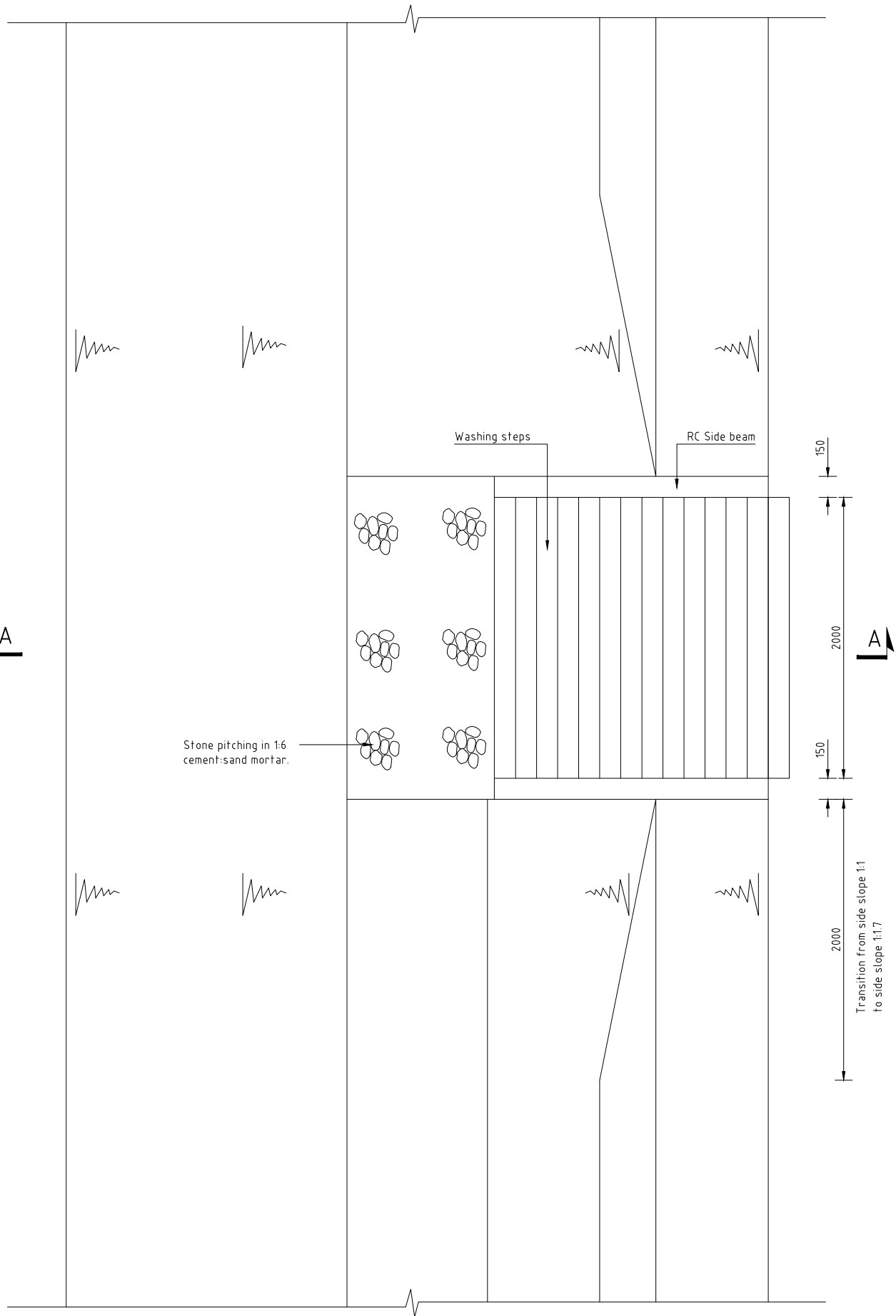
NOTES:
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FOOTBRIDGES SCHEDULES					
Canal Name	Chainage	Footbridge Type	Canal Top Width	Length of slab	Width of slab
			m	m	m
Main Canal	2+080	Type 2	4.2	6.2	1.5
	2+300	Type 2	4.2	6.2	1.5
	2+440	Type 2	4.2	6.2	1.5
	2+580	Type 1	2.8	4.8	1.0
	3+380	Type 1	2.8	4.8	1.0
	3+720	Type 1	2.8	4.8	1.0
	2+960	Type 1	2.8	4.8	1.0
	4+520	Type 1	2.8	4.8	1.0
	4+920	Type 1	2.8	4.8	1.0
	6+320	Type 2	3.2	4.2	1.5
	6+480	Type 2	3.2	4.2	1.5
	8+480	Type 2	3.4	4.4	1.5
	8+580	Type 2	3.4	4.4	1.5
	10+600	Type 2	3.2	4.2	1.5
Secondary Canal	11+520	Type 2	3.1	4.1	1.5
	12+180	Type 2	3.1	4.1	1.5
	12+680	Type 2	3.1	5.1	1.5
	0+700	Type 2	3.4	5.4	1.5
	1+200	Type 2	3.4	5.4	1.5
	2+300	Type 2	3.4	5.4	1.5
	2+800	Type 2	3.4	5.4	1.5
	3+500	Type 2	3.3	5.3	1.5
	4+720	Type 2	3.3	3.3	1.5
	5+200	Type 2	3.3	3.3	1.5
	5+600	Type 2	3.3	3.3	1.5

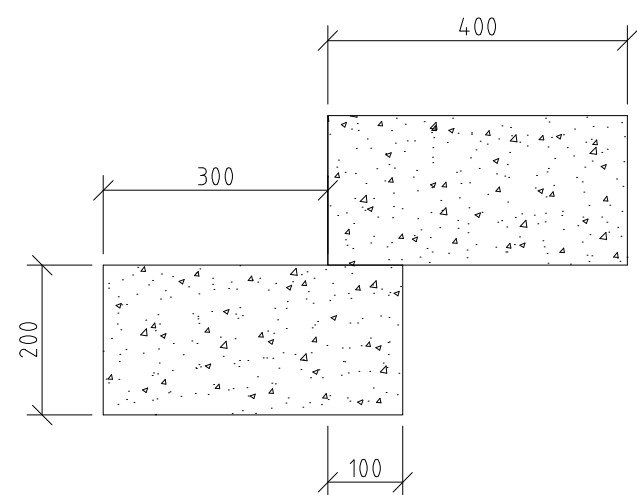
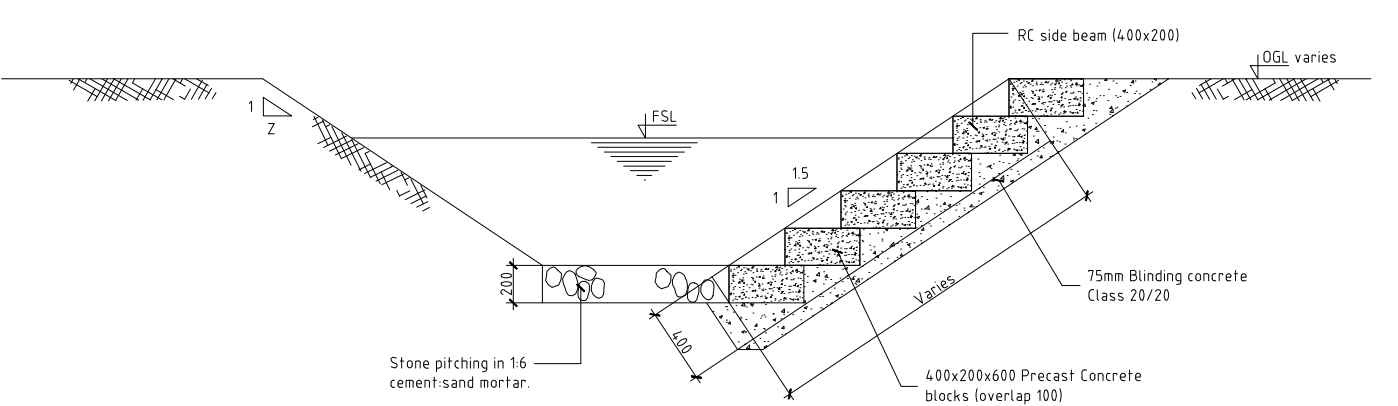
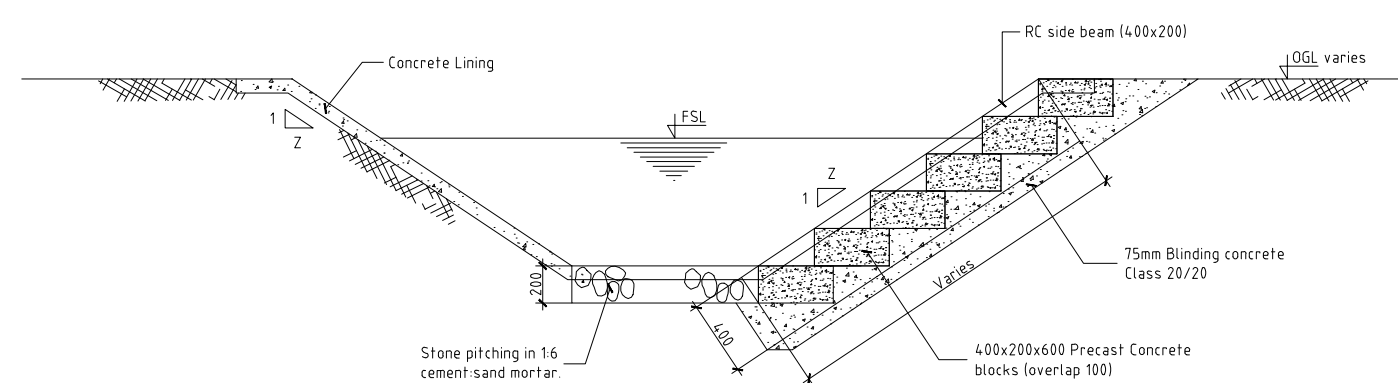
NO.	DESCRIPTION	DATE
REVISIONS		
Client		
		
NATIONAL IRRIGATION AUTHORITY LENANA ROAD, P.O. Box 30372, 00100 NAIROBI, KENYA		
Civil and Structural Engineers		
Eng. HENRY NDUGAH CONSULTING ENGINEER Suite A4 Machera Court		
Project Title		
ANYIKO - KATHIENO IRRIGATION PROJECT		
Drawing Title		
FOOT BRIDGE		
Designed by SOD	Checked By HN	Date JANUARY 2022
Drawn By SOD	Approved By HN	
Scale AS SHOWN (A1)	Rev. O	Drg status
Drawing No. AKDIP/FFD/53		



NOTES:		
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2. LEVELS ARE IN METRES		
NO.	DESCRIPTION	DATE
REVISIONS		
Client		
 National Irrigation Authority NATIONAL IRRIGATION AUTHORITY LENANA ROAD, P.O. Box 30372, 00100 NAIROBI, KENYA		
Civil and Structural Engineers		
Eng. HENRY NDUGAH CONSULTING ENGINEER Suite A4 Machera Court		
Project Title		
ANYIKO - KATHIENO IRRIGATION PROJECT		
Drawing Title		
WASHING STEPS		
Designed by SOO	Checked By HN	Date
Drawn By SOO	Approved By HN	JANUARY 2022
Scale AS SHOWN (A1)		Rev. O Drg status
Drawing No. AKDIP/FFD/54		



WASHING STEPS-PLAN
SCALE 1:25 (A1)



- NOTES:**
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NO.	DESCRIPTION	DATE

REVISIONS

Client

**National Irrigation Authority**
LENANA ROAD, P.O. Box 30372, 00100
NAIROBI, KENYA

Civil and Structural Engineers

Eng. HENRY NDUGAH
CONSULTING ENGINEER
Suite A4 Machera Court

Project Title

**ANYIKO - KATHIENO
IRRIGATION PROJECT**

Drawing Title

WASHING STEPS

Designed by SOD	Checked By HN
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