



MINISTRY OF WATER SANITATION AND IRRIGATION



NATIONAL IRRIGATION AUTHORITY

CONTRACT No. NIA/T/276/2020-2021

**INDIVIDUAL CONSULTANT SERVICES FOR
DETAILED DESIGN AND TENDER DOCUMENT PREPARATION FOR
MPEPENI - 543 ACRES AND WAGA-MACHAME - 668 ACRES
IRRIGATION SCHEMES ALONG UMBA RIVER IN KWALE COUNTY**

BOOK OF DRAWINGS

FEBRUARY 2022

CLIENT

Chief Executive Officer
National Irrigation Authority,
Unyunyizi House, Lenana Road,
Nairobi.
Kenya

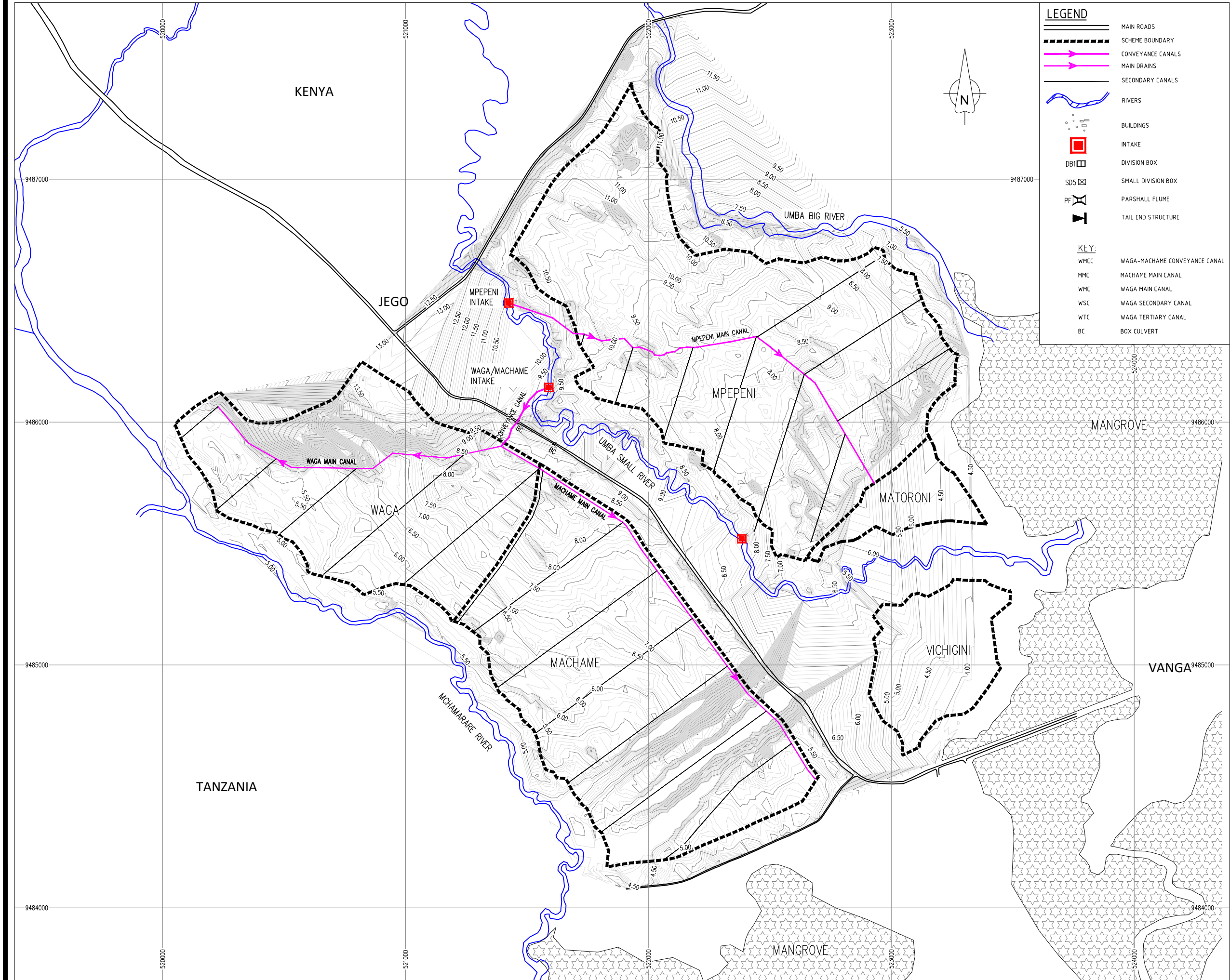
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Steven M. Ojiambo,
Registered Consulting Engineer and Member of Institution of Engineers of Kenya,
P. O. Box 779-00200,
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**INDIVIDUAL CONSULTANT SERVICES FOR
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MACHAME - 668 ACRES IRRIGATION SCHEMES ALONG UMBA RIVER IN KWALE COUNTY**

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CLIENT:
Ministry of Water Sanitation and Irrigation
Maji House, Nairobi



National Irrigation Authority
Unyunyizi House, Lenana Road
P.O.Box 30372-00100 Nairobi



Kwale County Government



PROJECT:
VANGA IRRIGATION CLUSTER
Detailed Design of Mpepeni & Machame Irrigation Schemes

CONSULTANT:
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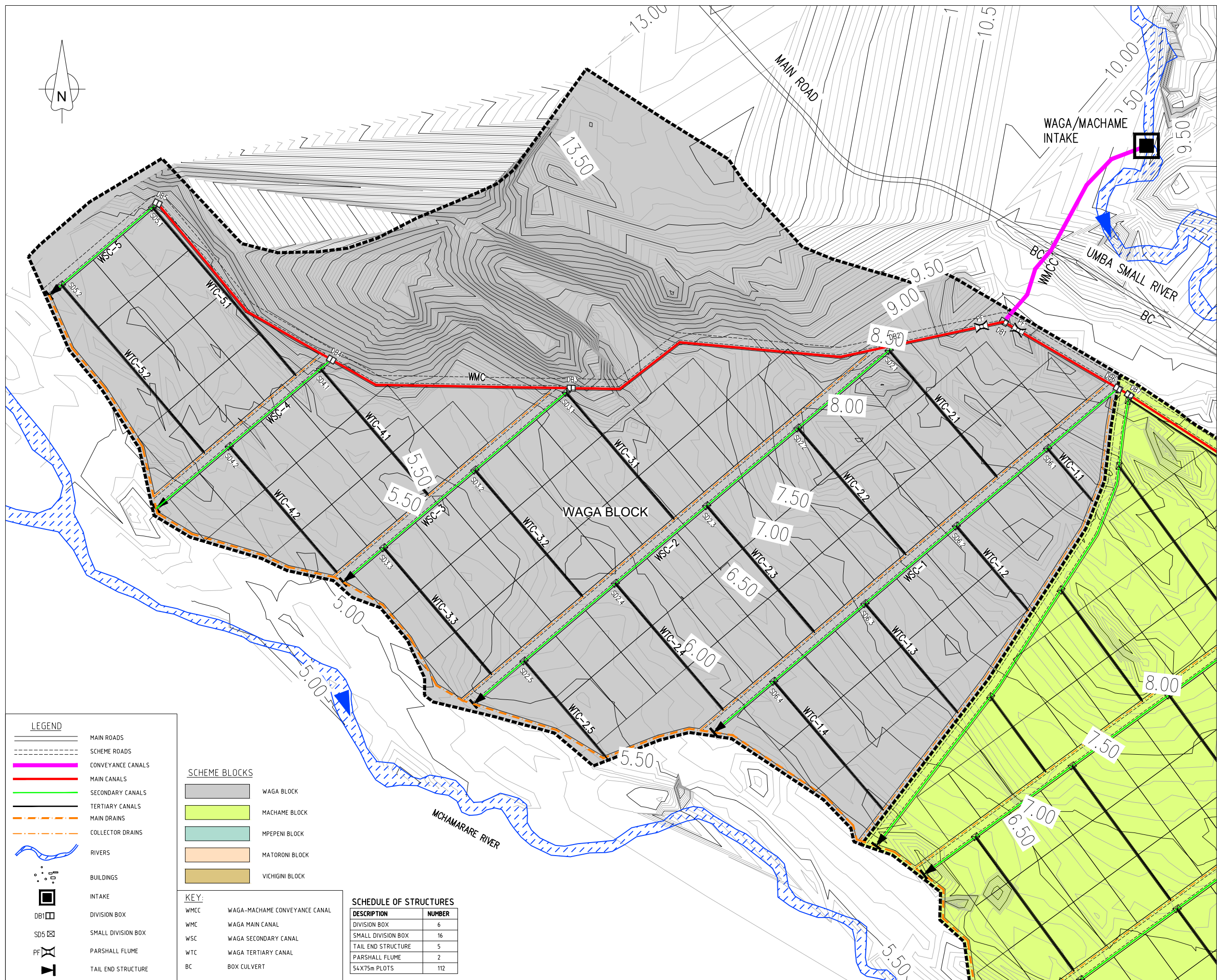
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Grad. Member of Institute of Surveyors of Kenya

APPROVED BY:
DIRECTOR OF IRRIGATION
Ministry of Water Sanitation and Irrigation

DRAWING TITLE & DESCRIPTION:
CONTOURED SCHEME
GENERAL LAYOUT

Date	Feb. 2022	Sheet	
Scale	1:7,500 (AT A1)		01
Dwg No.	VIP/DD/21/07/01		PAPER SIZE A1



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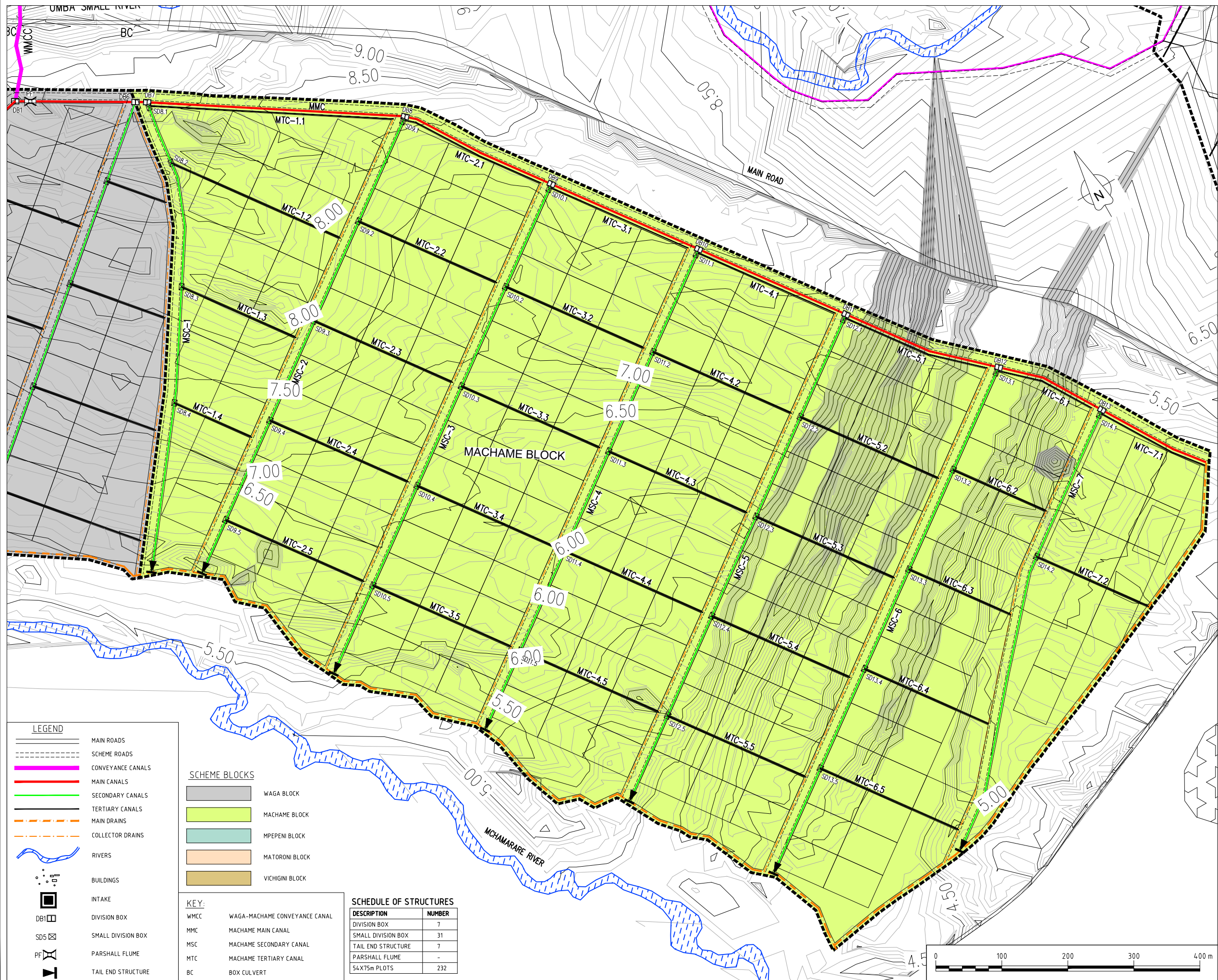
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DRAWING TITLE & DESCRIPTION:
WAGA BLOCK LAYOUT

Date Feb. 2022	Sheet 01
Scale 1:2500	PAPER SIZE A1
Dwg No. VIP/DD/21/07/02	



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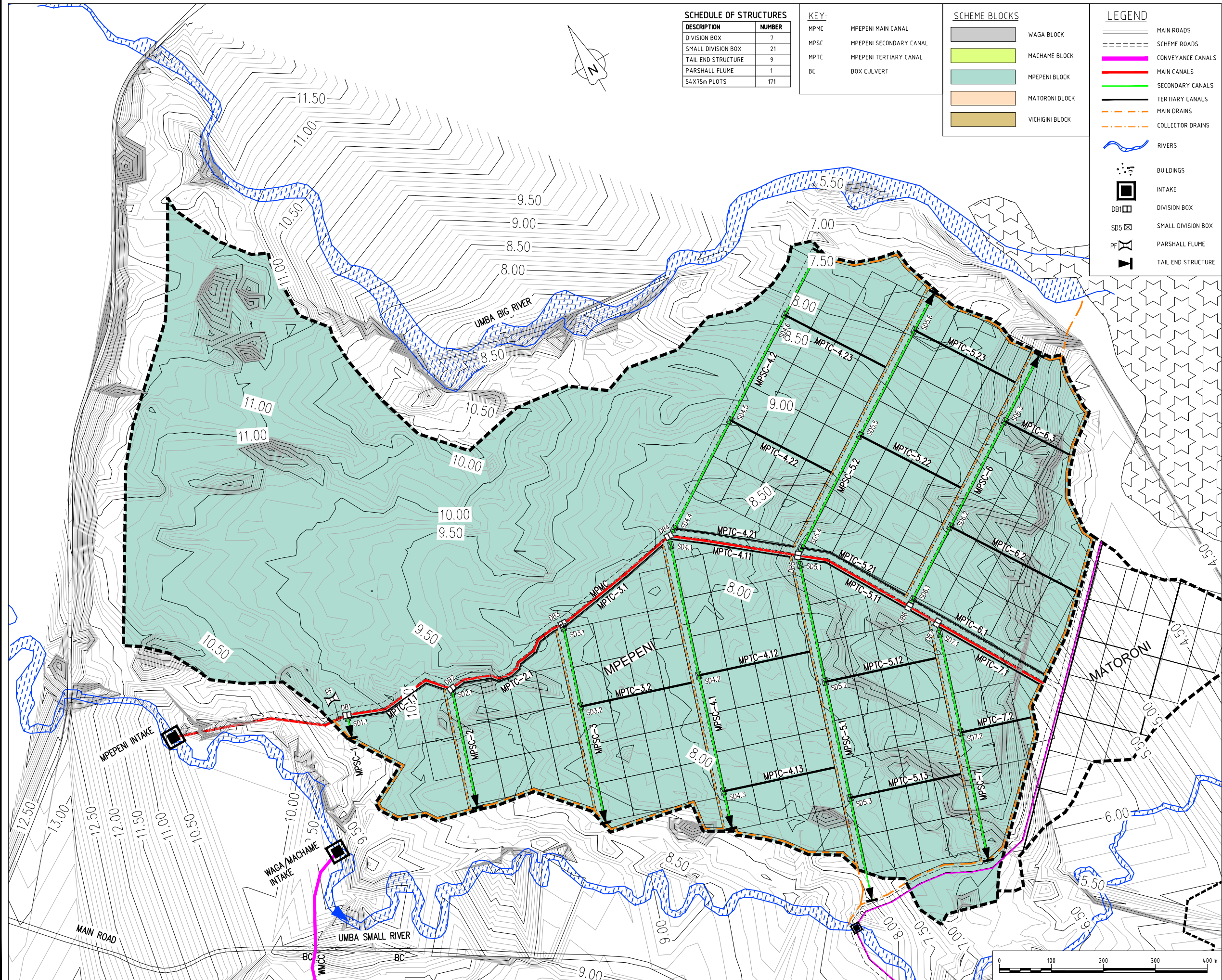
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DRAWING TITLE & DESCRIPTION:
MACHAME BLOCK LAYOUT

Date Feb. 2022	Sheet 01
Scale SCALE BAR	PAPER SIZE A1
Dwg No. VIP/DD/21/07/03	



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DRAWING TITLE & DESCRIPTION:
MPEPENI BLOCK LAYOUT

Date Feb. 2022	Sheet 01
Scale SCALE BAR	PAPER SIZE A1
Dwg No. VIP/DD/21/07/04	

800mm WIDE METAL GIRDER BRIDGE WITH CHECKERED PLATE DECK (800mm WIDE)

600x600x50mm THICK P.C.C. PAVING SLABS

12.6418 FGL

600x600x50mm THICK P.C.C. PAVING SLABS

APPROVED EXCAVATED FILL MATERIAL COMPACTED TO ENGINEER'S APPROVAL

12.6418 FGL

INTAKE BUILDING

2100

12.6908

800

2700

9.6908

9000

500

1150

75

5000

19350

5350

1600

1500

350mm THICK R.C. RETAINING WALL

EG

EXISTING RIVER BED LEVEL APPROX. 9.6908

CREST LEVEL 11.1908

MAIN WEIR

WEIR SEPARATING WALL

2000

SECONDARY WEIR

10.7908

INTAKE CHAMBER

Date Feb. 2022	Sheet 01 PAPER SIZE A1
Scale 1:75 (AT A1)	
Dwg No. VIP/DD/21/07/05	

SECTION C-C

INTAKE BUILDING

INTAKE CHAMBER

350 mm THICK R.C RETAINING WALL

DOWNSTREAM BED WITH ROCK FILLED GABIONS (APPROX. 10m OR AS DIRECTED ON SITE)

DOWNSTREAM APRON (STILLING POOL)

BAFFLE BLOCK

CHUTE BLOCK

SECONDARY WEIR LEVEL 10.7908

SECONDARY WEIR

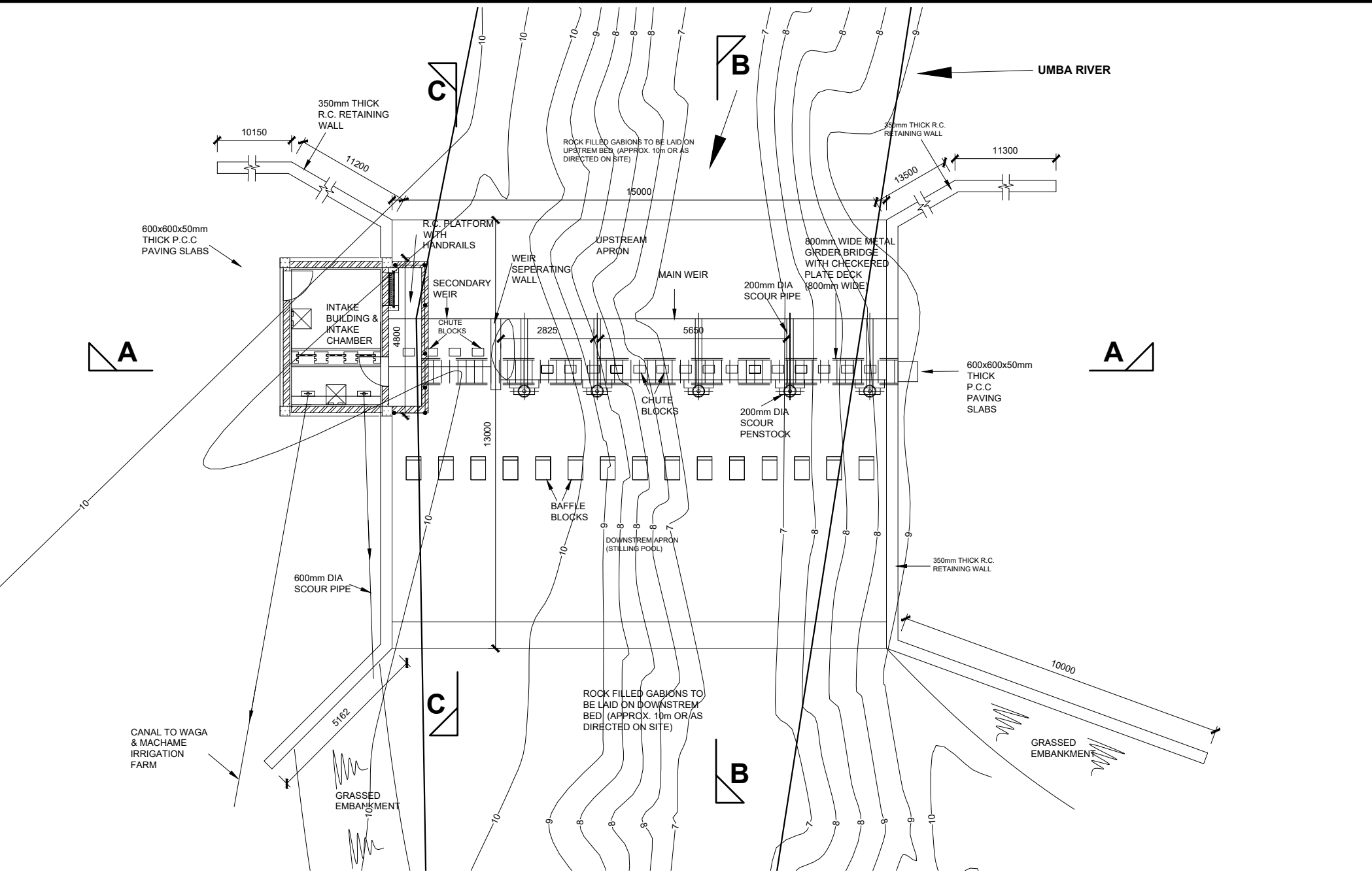
COARSE SCREEN TO DETAIL

UPSTREAM BED WITH ROCK FILLED GABIONS (APPROX. 10m OR AS DIRECTED ON SITE)

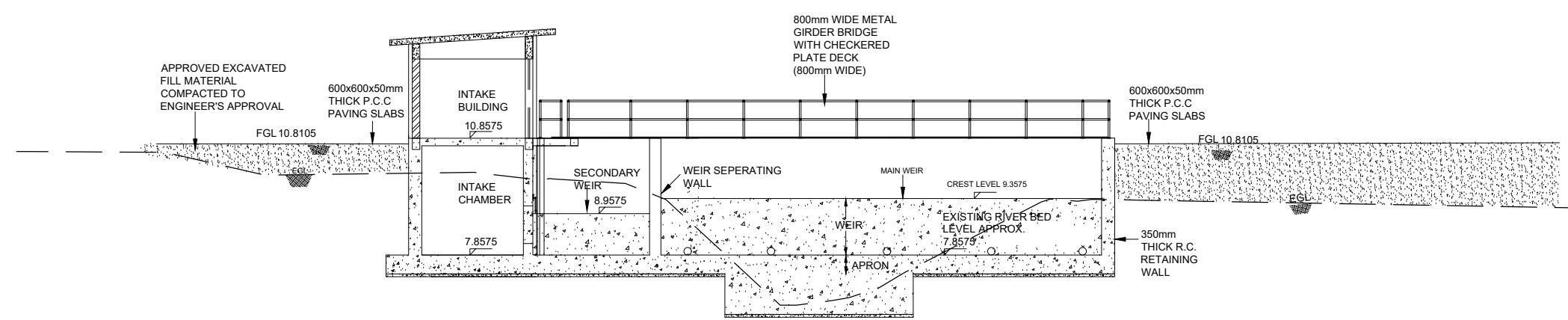
75 mm CLASS15/20 CONCRETE BLINDING

FLOW

Date Feb. 2022	Sheet 02 PAPER SIZE A1
Scale 1:25 (AT A1)	
Dwg No. VIP/DD/21/07/05	



INTAKE WEIR, INTAKE CHAMBER & INTAKE BUILDING
PLAN



SECTION A-A

CLIENT:
Ministry of Water Sanitation and Irrigation
Maji House, Nairobi

National Irrigation Authority
Unyanyizi House, Lenana Road
P.O.Box 30372-00100 Nairobi

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Detailed Design of Mpepeni & Machame Irrigation Schemes

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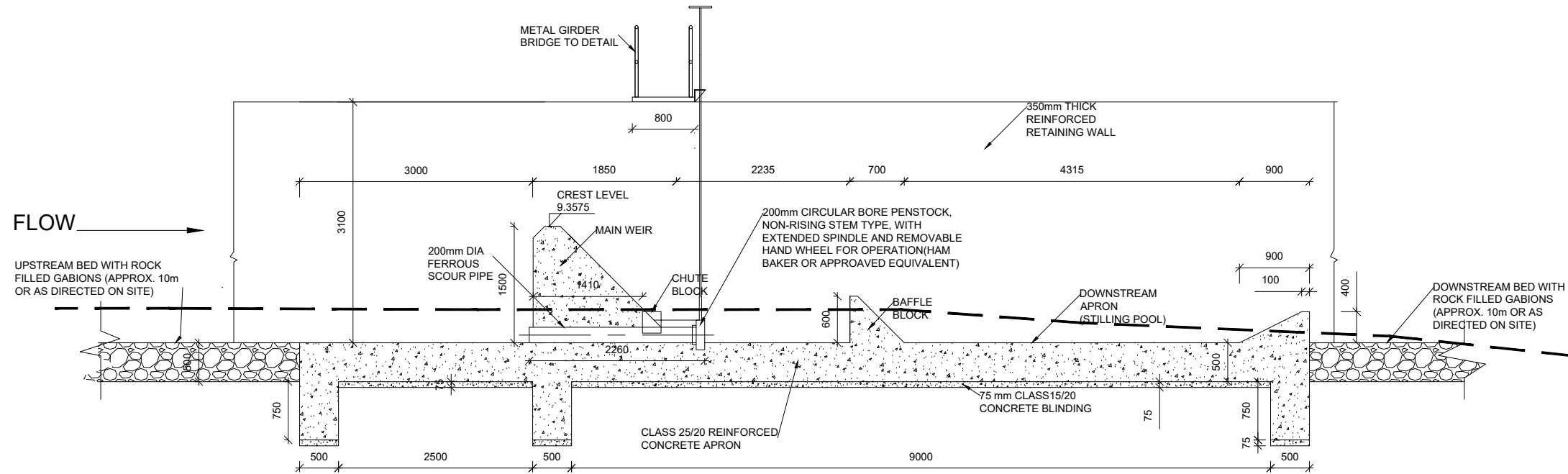
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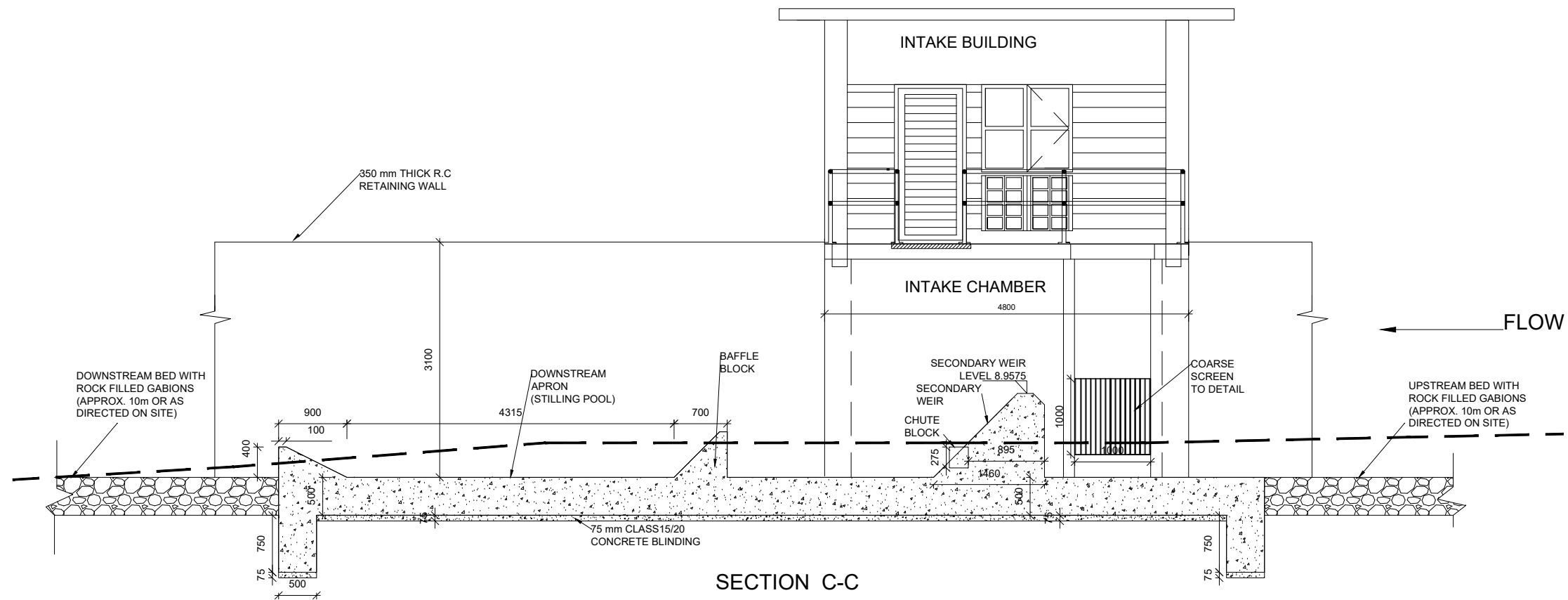
APPROVED BY:
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Ministry of Water Sanitation and Irrigation

DRAWING TITLE & DESCRIPTION:
WAGA/MACHAME INTAKE
WEIR, CHAMBER & BUILDING
LAYOUT & SECTION

Date	Feb. 2022	Sheet	01
Scale	1:75 (AT A1)	PAPER SIZE A1	
Dwg. No.	VIP/DD/21/07/06		



SECTION B-B
SECTION THROUGH THE MAIN WEIR



SECTION C-C
SECTION THROUGH THE SECONDARY WEIR

CLIENT:
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DRAWING TITLE & DESCRIPTION:
WAGA / MACHAME INTAKE
WORKS
SECTIONS

Date Feb. 2022	Sheet 02
Scale 1:25 (AT A1)	PAPER SIZE A1
Dwg No. VIP/DD/21/07/06	

600x600mm ACCESS MANHOLE WITH LOCKABLE GMS COVER

690mm WIDE GMS GRATING COVER OVER 600mm WIDE ACCESS OPENING FOR FINE SCREENS MADE IN THREE SECTIONS, EACH 900mm LONG)(SEE DETAIL ON DRG No. M384/LOT 6/M/IW/05)

600mm Ø CIRCULAR BORE PENSTOCK, NON-RISING STEM TYPE, WITH EXTENDED SPINDLE AND HEADSTOCK FOR OPERATION (HAM BAKER OR APPROVED EQUIVALENT)

GMS COARSE SCREEN TO DETAIL

GMS FINE SCREEN TO DETAIL

FINE SCREEN SUPPORT COLUMN

GROOVE FOR FINE SCREEN

CLASS 20 CONCRETE SCREED LAID TO SLOPE (DEPTH 0 - 50mm) TO SCOUR PIPE OPENING

CANAL

75mm CLASS 15/20 CONCRETE BLINDING

NOTE:
A = 200mm FOR RAW WATER GRAVITY MAIN
FOR SCOUR PIPE

350

150mm WIDE x12mm THICK GMS PLATE FIXED TO CONCRETE WALL WITH FISH TAIL LUGS

FISH TAIL LUGS, 150mm LONG, AT 200mm SPACING

INTAKE CHAMBER WALL

GMS COARSE SCREEN MADE OF 20mm DIA BARS AT 40mm SPACING

1000mm x1000mm OPENING IN WALL

R=50

225

1000

225

INTAKE CHAMBER BASE

A

1300

1600

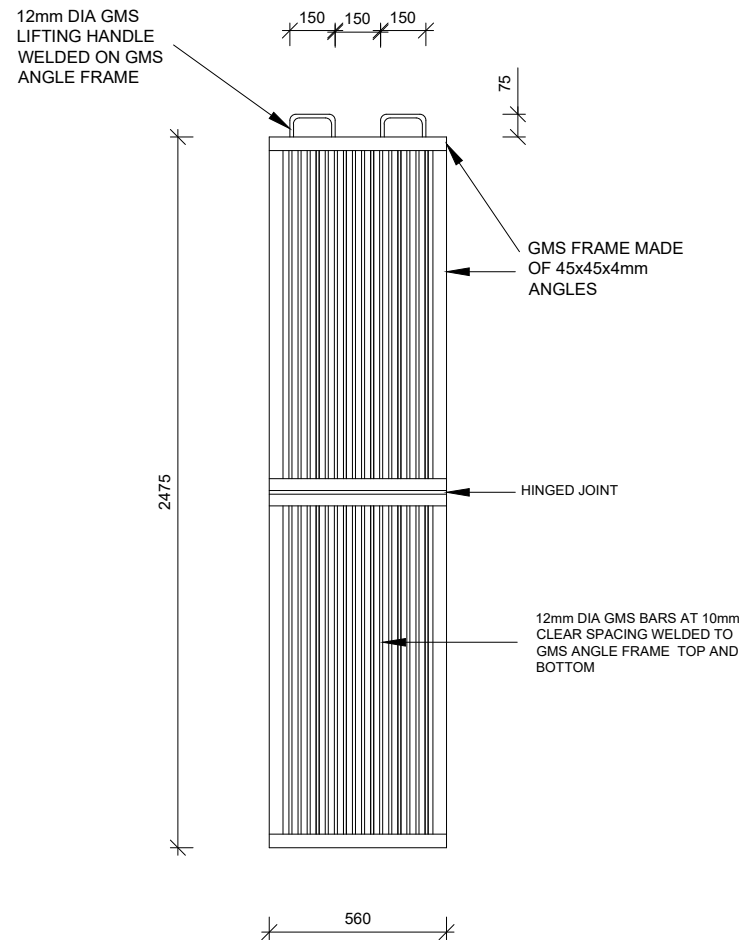
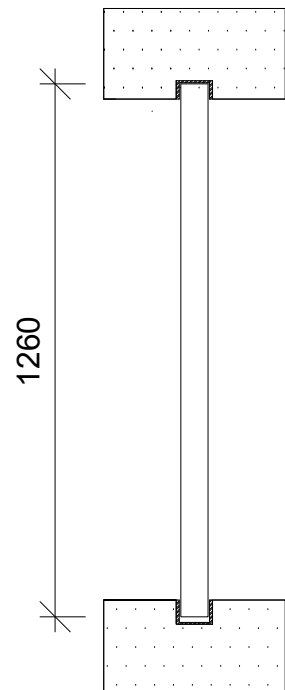
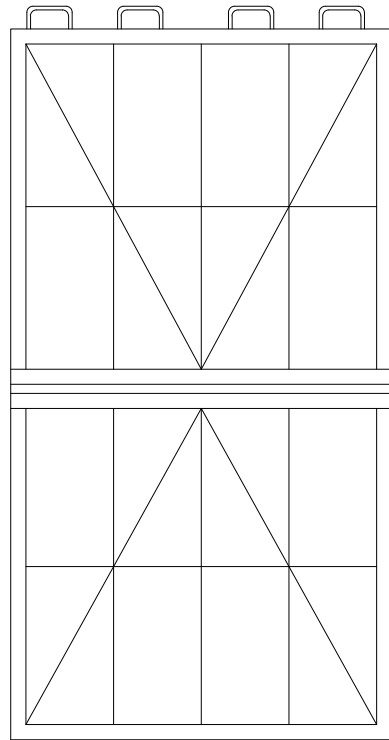
150

150

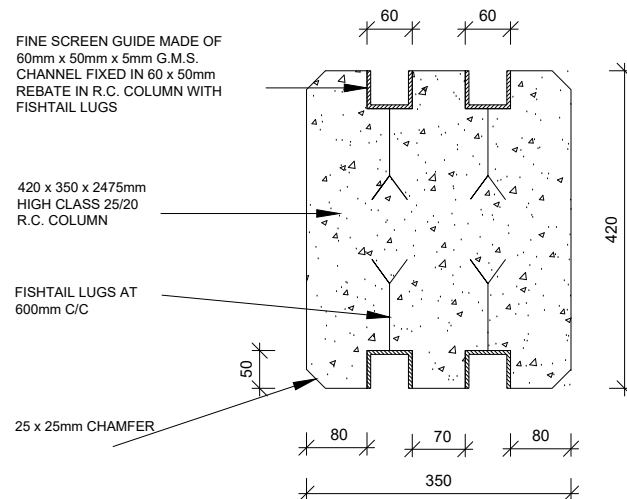
150mm WIDE x12mm THICK GMS PLATE FIXED TO RC WALLS WITH FISH TAIL LUGS (BOTTOM PLATE SIMILAR)

20mm DIA GMS BARS AT 40mm CLEAR SPACING WELDED TO GMS PLATES TOP AND BOTTOM

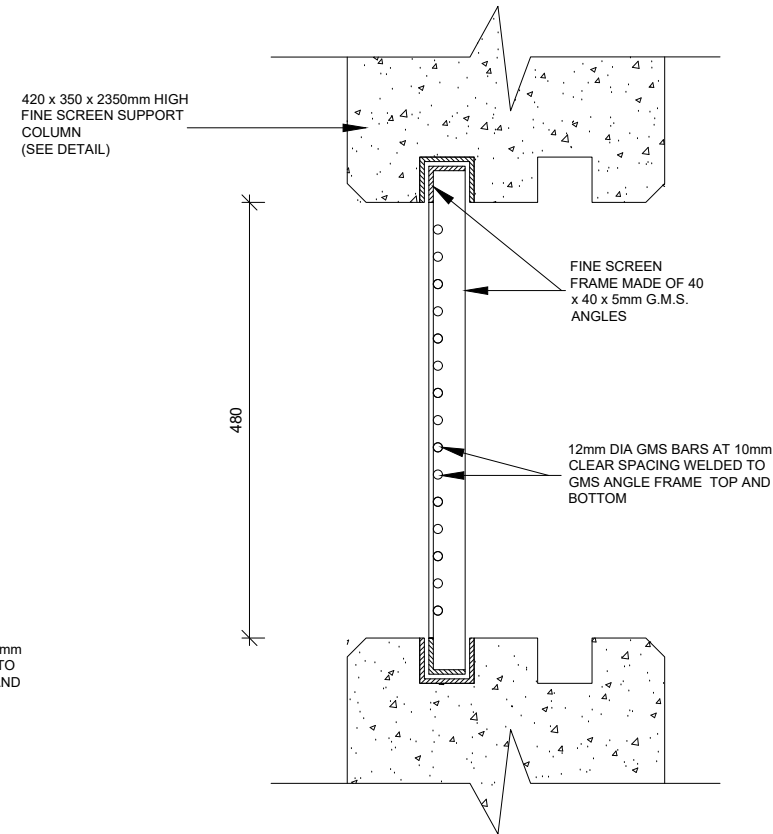
PAPER SIZE A1



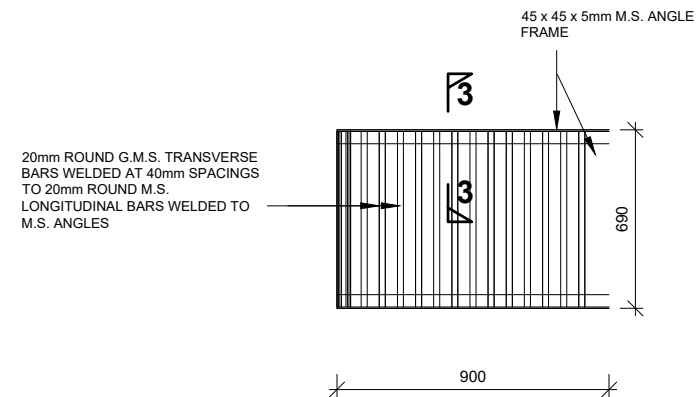
FINE SCREEN ELEVATION
SCALE 1:25



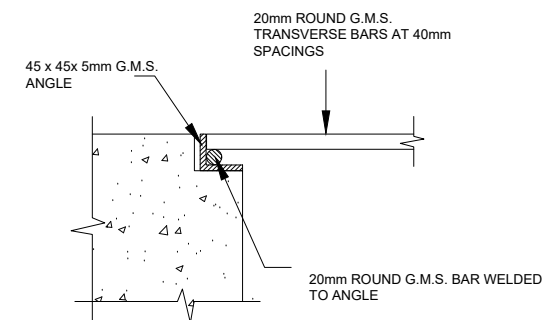
FINE SCREEN SUPPORT COLUMN DETAIL
PLAN
SCALE 1:10



FINE SCREEN AND SUPPORT COLUMN
SECTIONAL PLAN
NTS



GMS GRATING COVER OVER FINE SCREEN ACCESS
OPENING
PLAN
NTS



SECTION 3-3
(NTS)

CLIENT:
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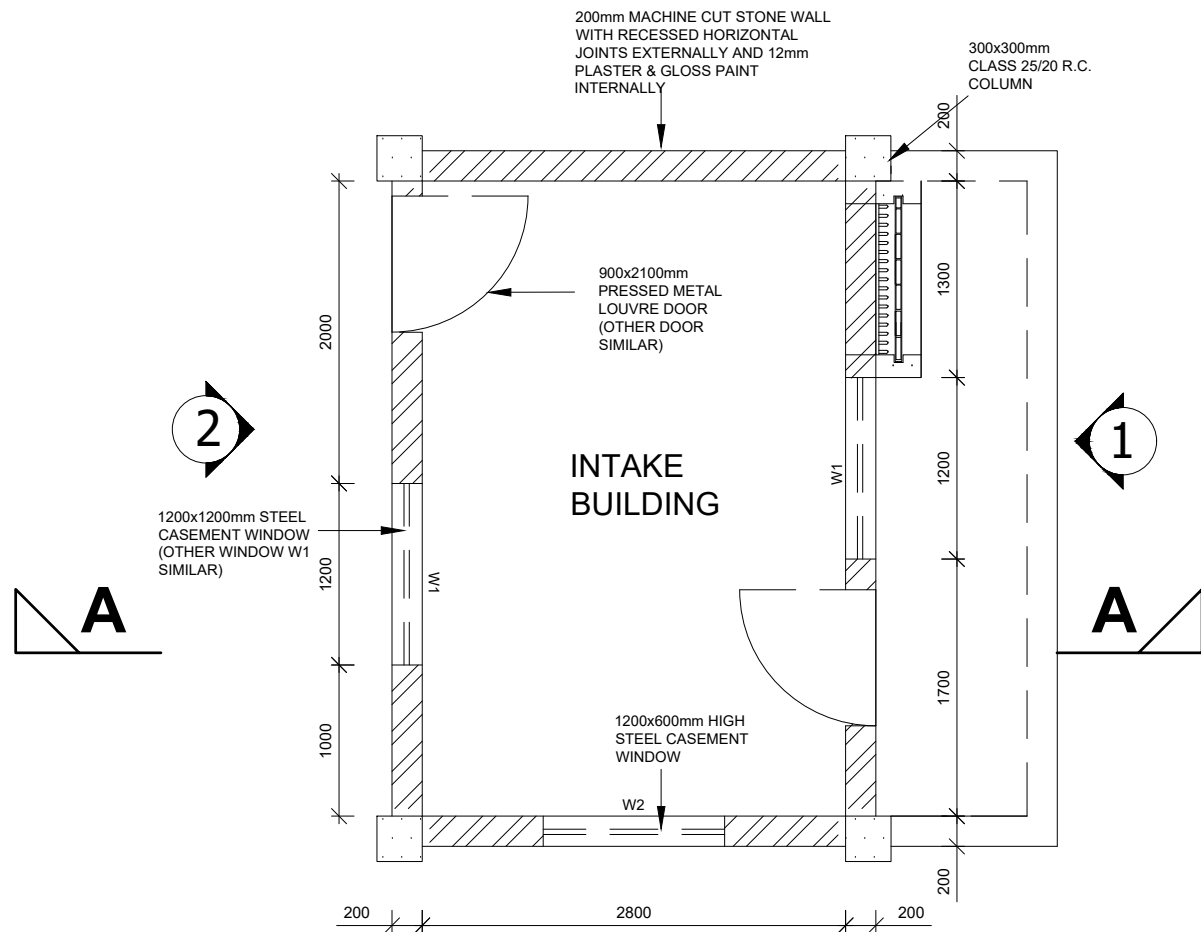
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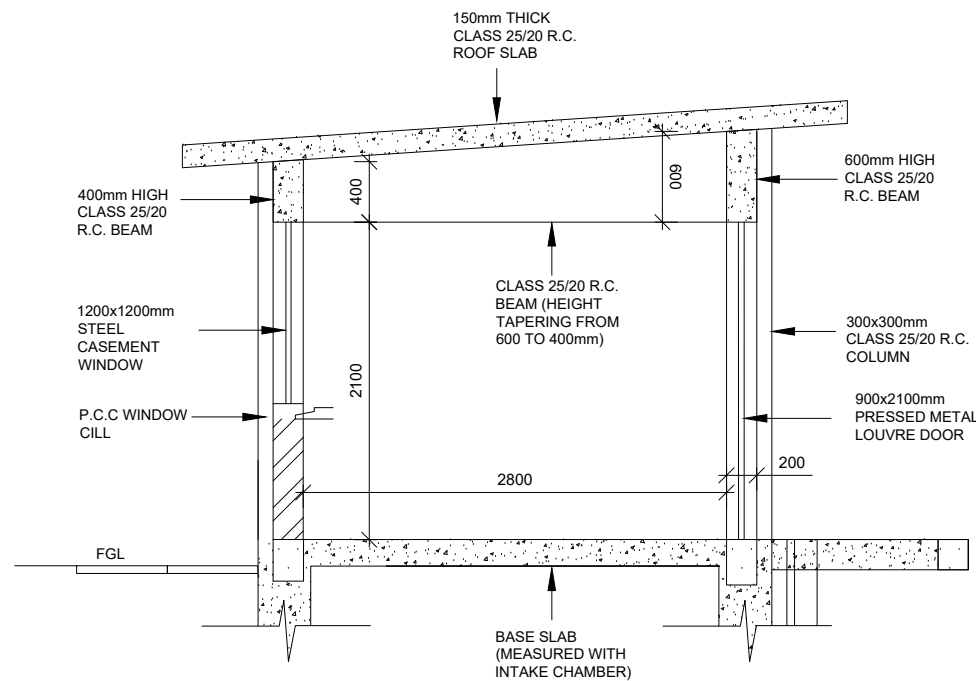
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DRAWING TITLE & DESCRIPTION:
WAGA / MACHAME / MPEPENI
INTAKE WORKS
FINE SCREEN DETAILS

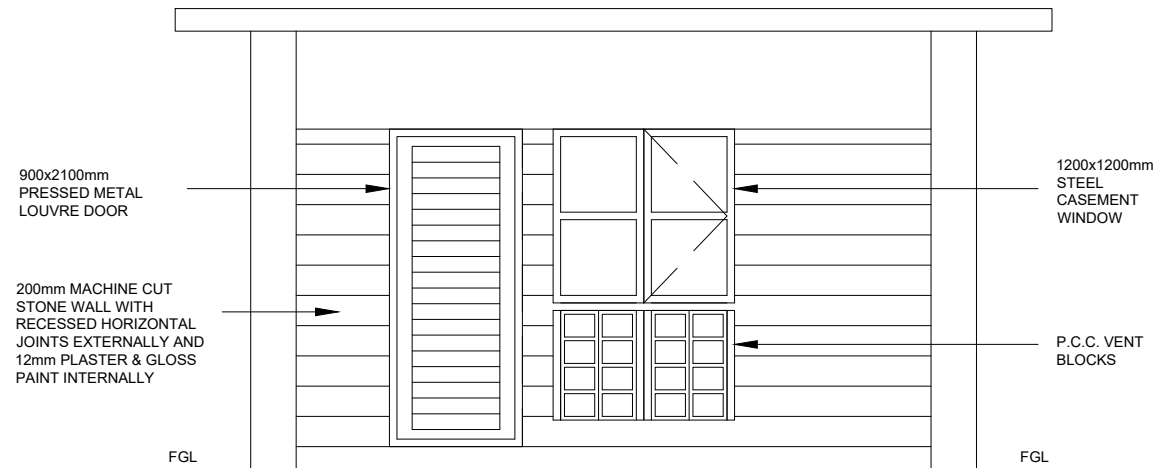
Date Feb. 2022	Sheet 01
Scale 1:10 (AT A1)	PAPER SIZE A1
Dwg No. VIP/DD/21/07/08	



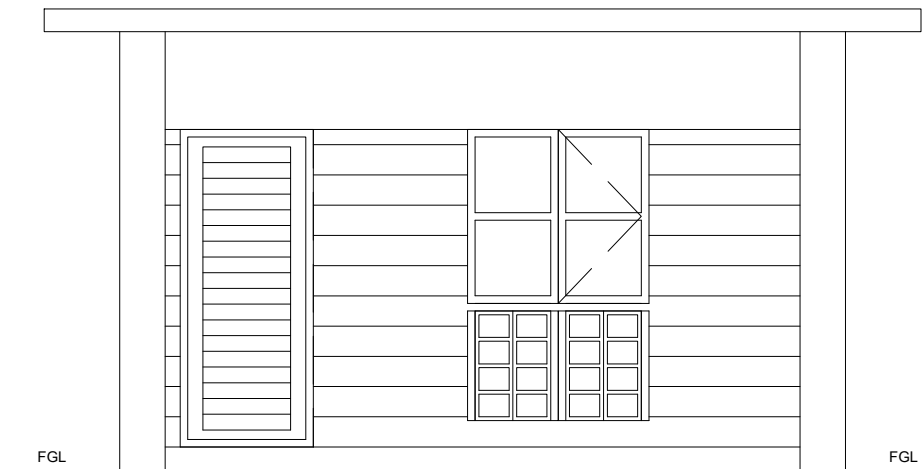
INTAKE BUILDING PLAN



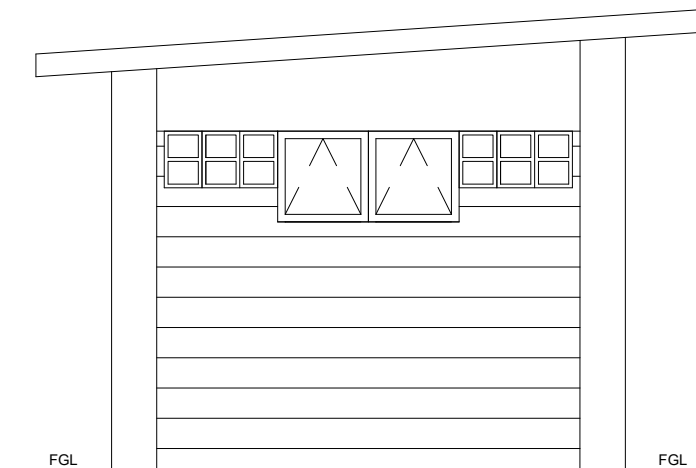
SECTION A-A



ELEVATION 1



ELEVATION 2



ELEVATION 3

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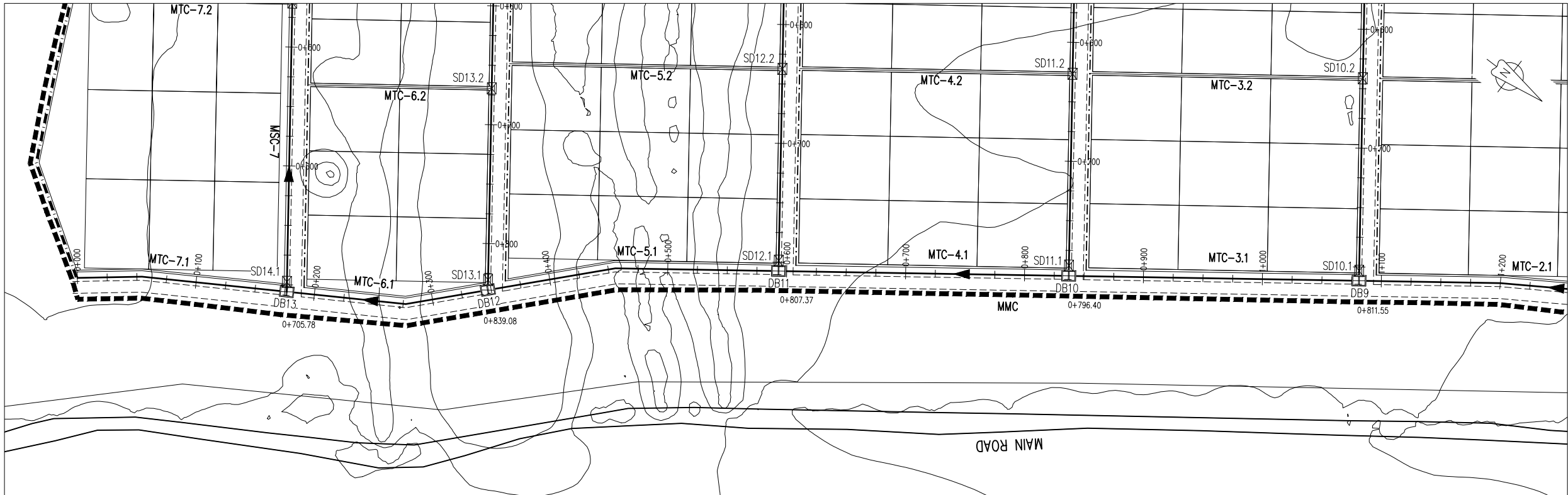
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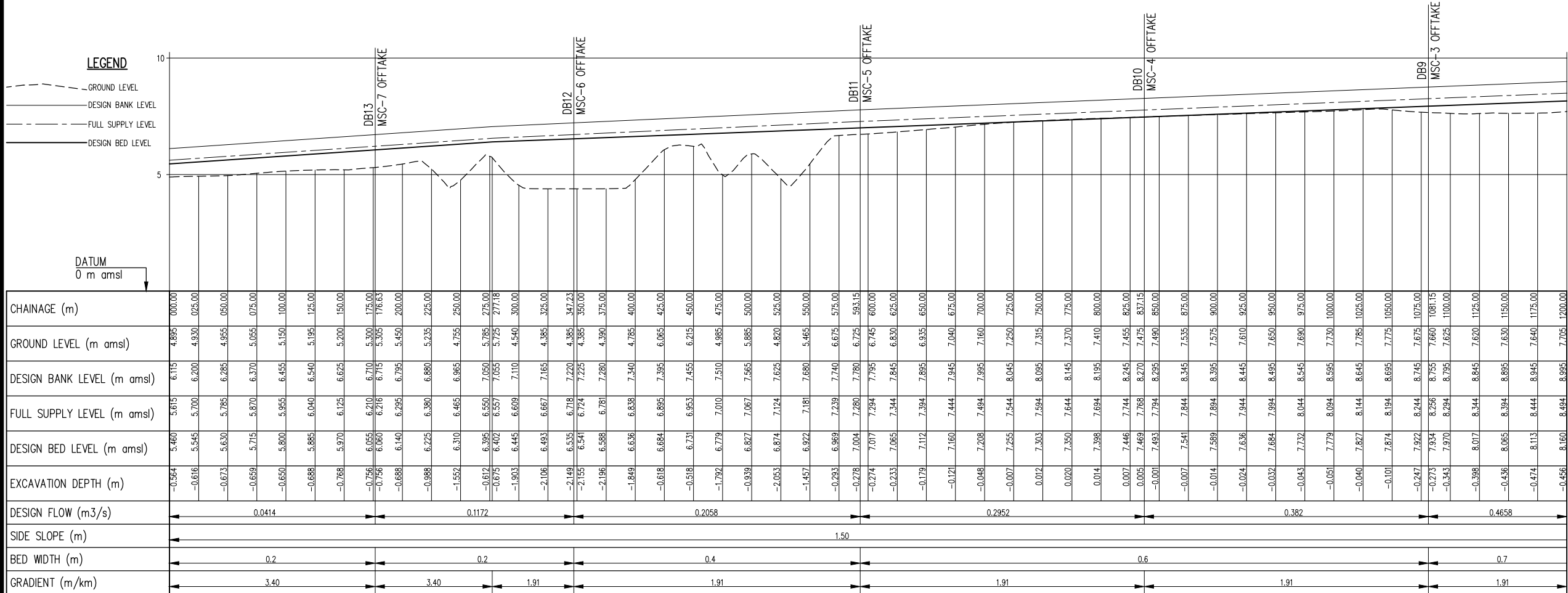
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DRAWING TITLE & DESCRIPTION:
WAGA / MACHAME / MPEPENI
INTAKE WORKS
INTAKE BUILDING DETAILS

Date Feb. 2022	Sheet 01
Scale 1:25 (AT A1)	PAPER SIZE A1
Dwg No. VIP/DD/21/07/09	



MMC / WMCC PLAN
SCALE 1:2000



MMC / WMCC PROFILE
SCALE: Hor 1:2000, Ver 1:100

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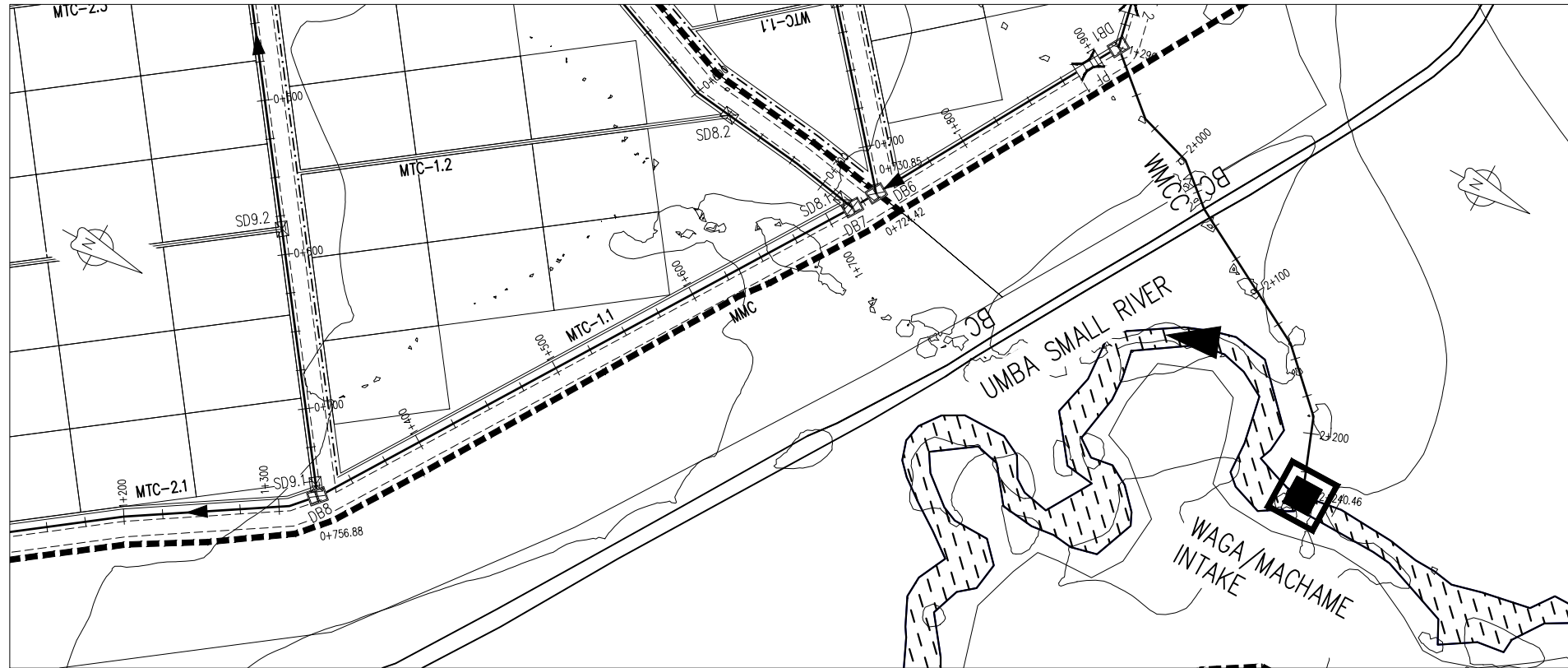
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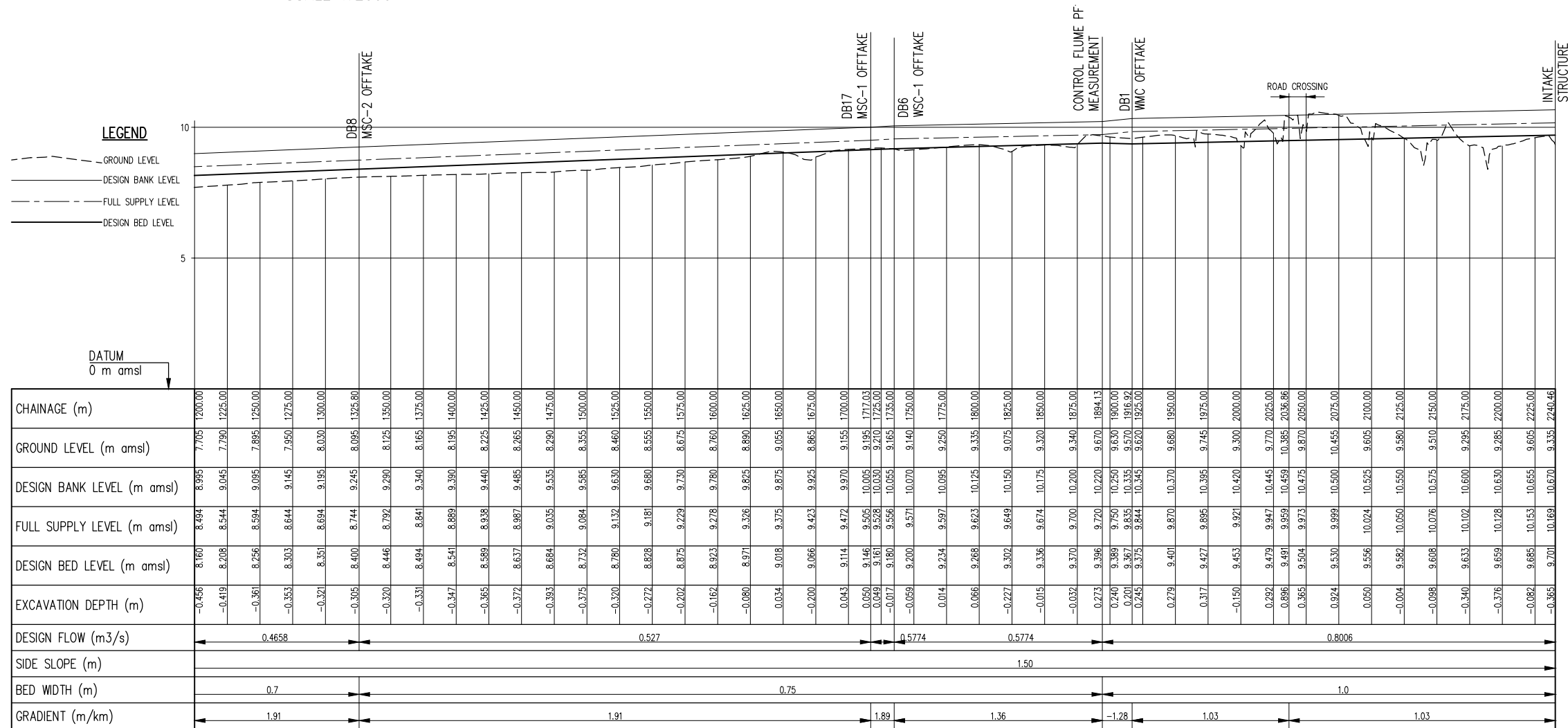
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DRAWING TITLE & DESCRIPTION:
MMC / WMCC CANAL
PLAN AND PROFILE

Date Feb. 2022	Sheet 01
Scale Hor 1:2000, Ver 1:100	PAPER SIZE A1
Dwg No. VIP/DD/21/07/11	



MMC / WMCC PLAN
SCALE 1: 2000



MMC / WMCC PROFILE
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CLIENT:
Ministry of Water Sanitation and
Irrigation
Maji House, Nairobi



National Irrigation Authority
Unyanyizi House, Lenana Road
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Kwale County Government



PROJECT:
VANGA IRRIGATION CLUSTER
Detailed Design of Mpepeni &
Machame Irrigation Schemes

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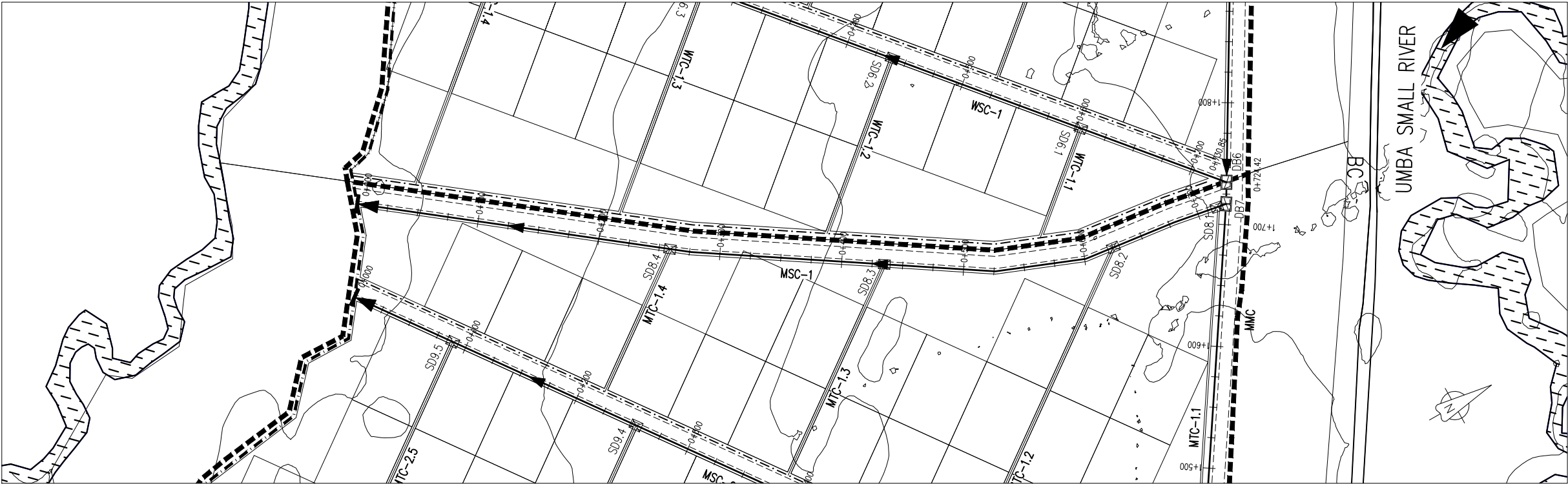
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SURVEYOR / GIS EXPERT:
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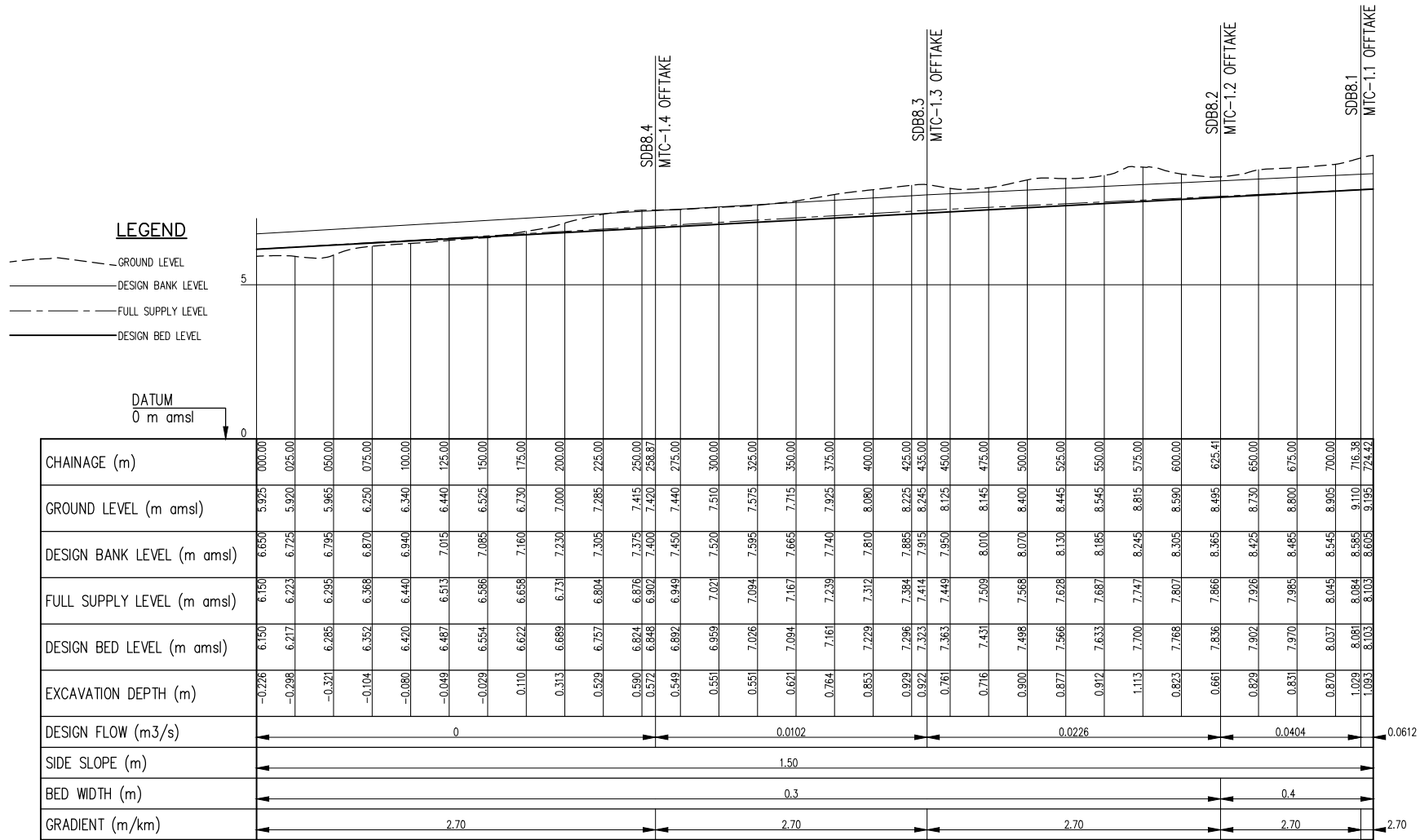
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MSC-1 PLAN
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MSC-1 PROFILE
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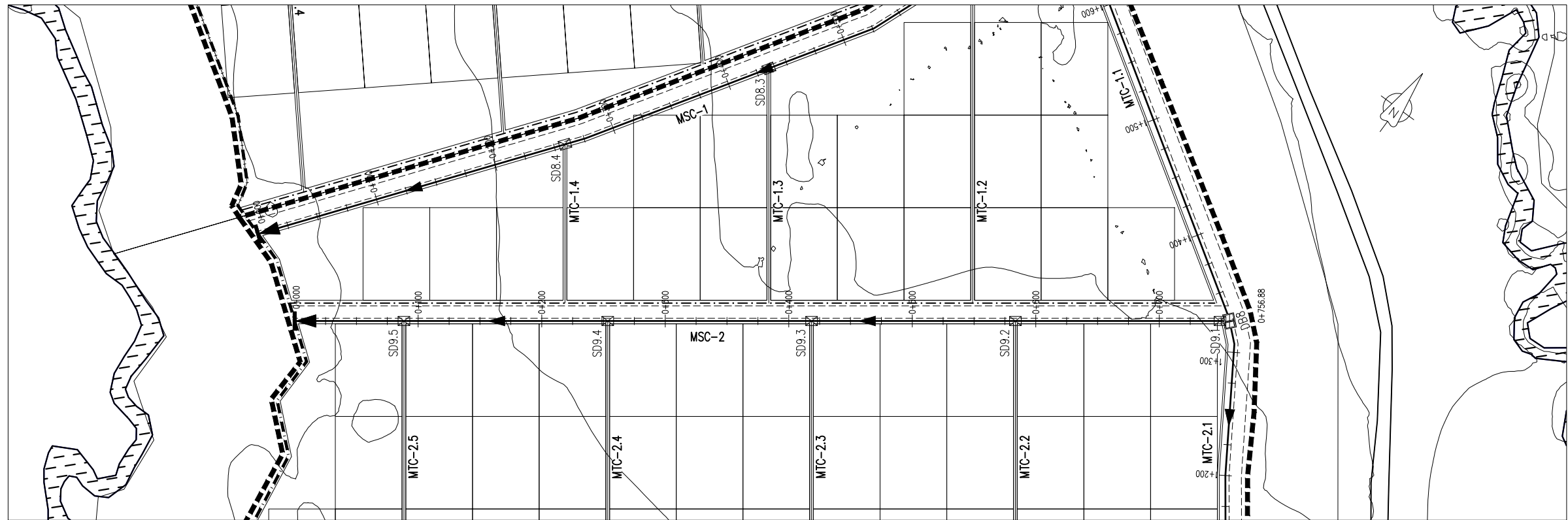
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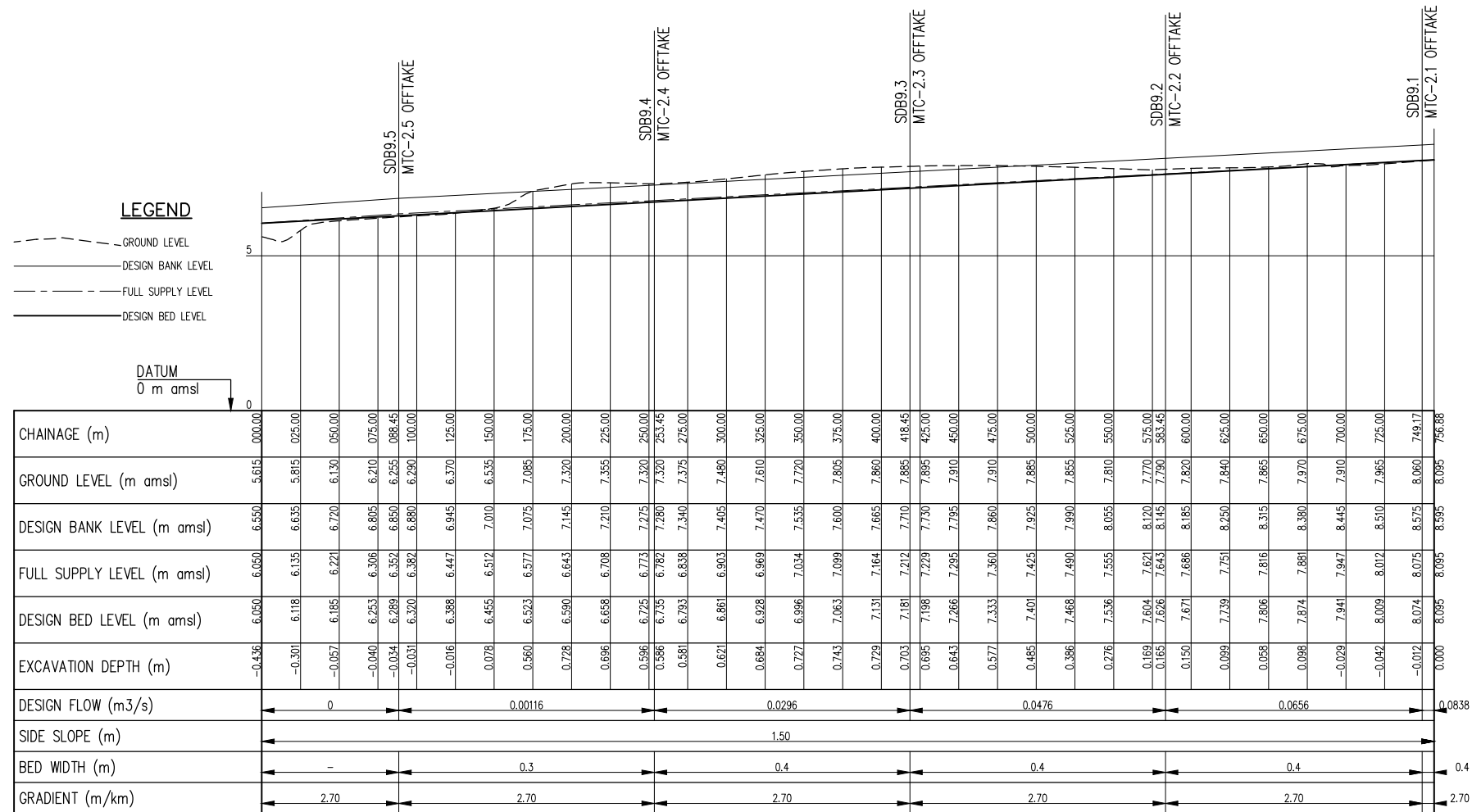
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MSC-1 CANAL
PLAN AND PROFILE

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MSC-2 PLAN
SCALE 1:2000



MSC-2 PROFILE
SCALE: Hor 1:2000, Ver 1:100

CLIENT:
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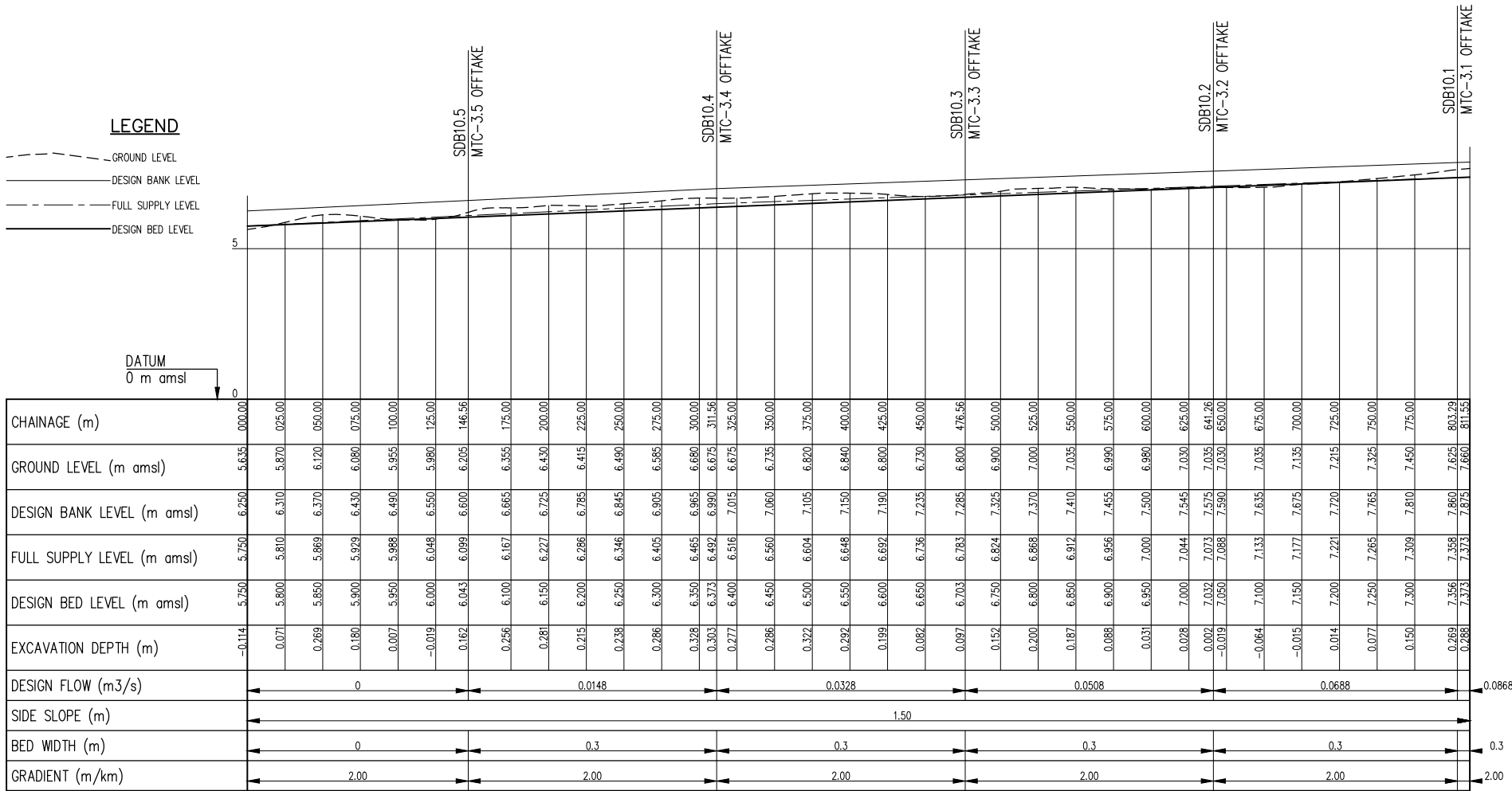
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MSC-2 CANAL
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MSC-3 PLAN
SCALE 1:2000



MSC-3 PROFILE
SCALE: Hor 1:2000, Ver 1:100

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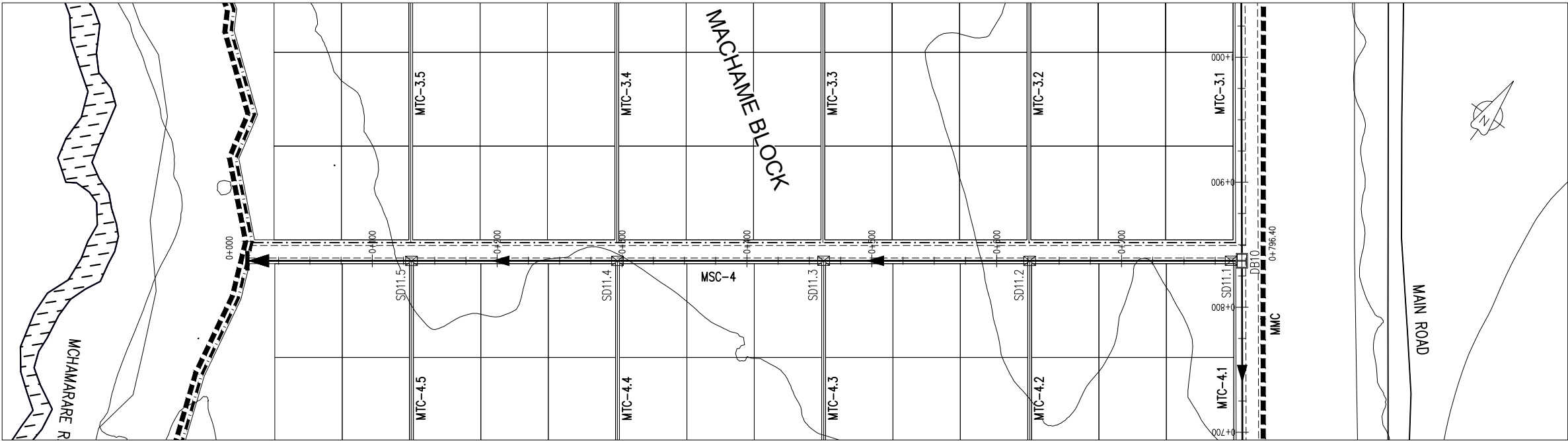
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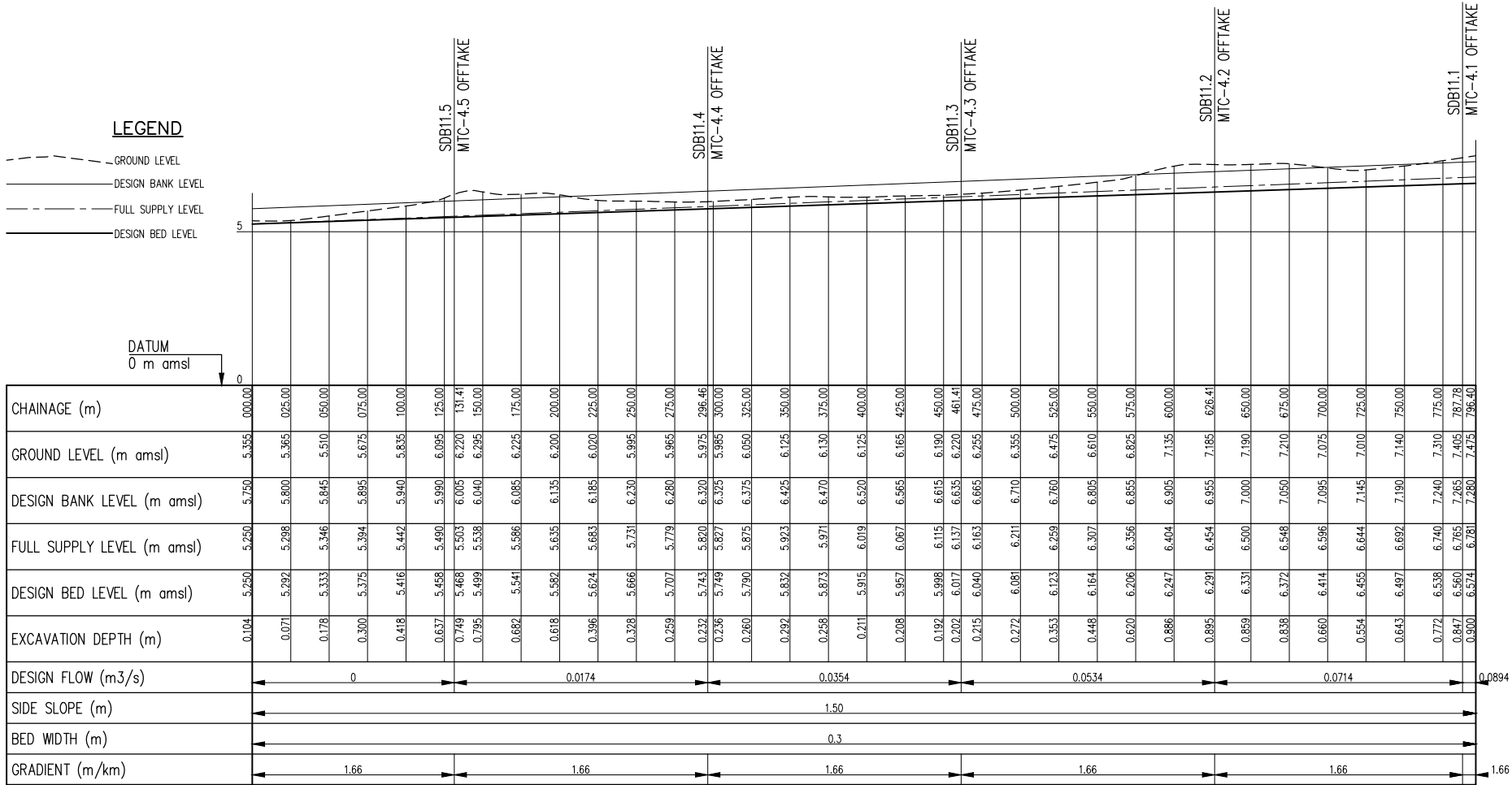
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MSC-3 CANAL
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MSC-4 PLAN
SCALE 1:2000



MSC-4 PROFILE
SCALE: Hor 1:2000, Ver 1:100

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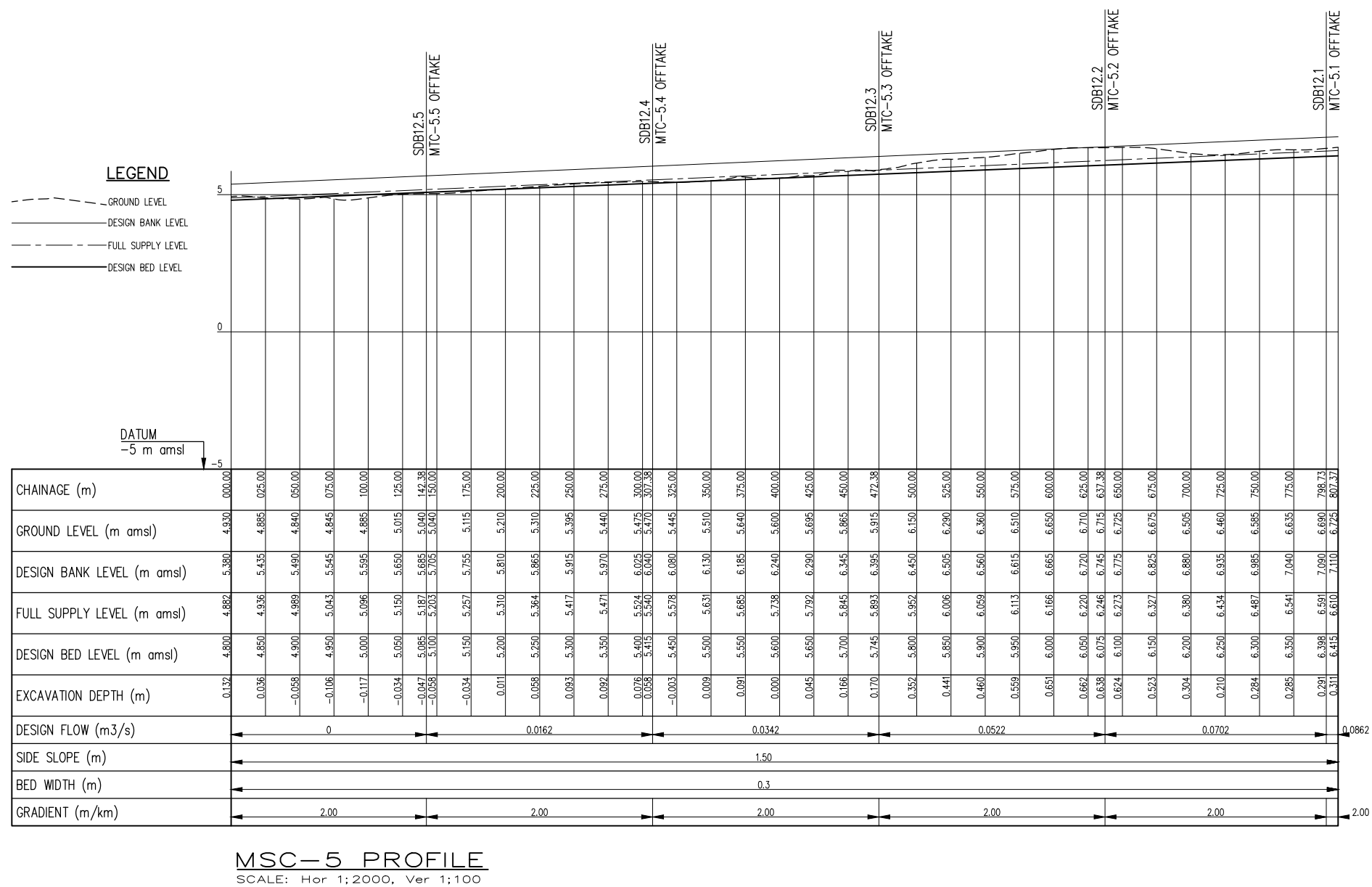
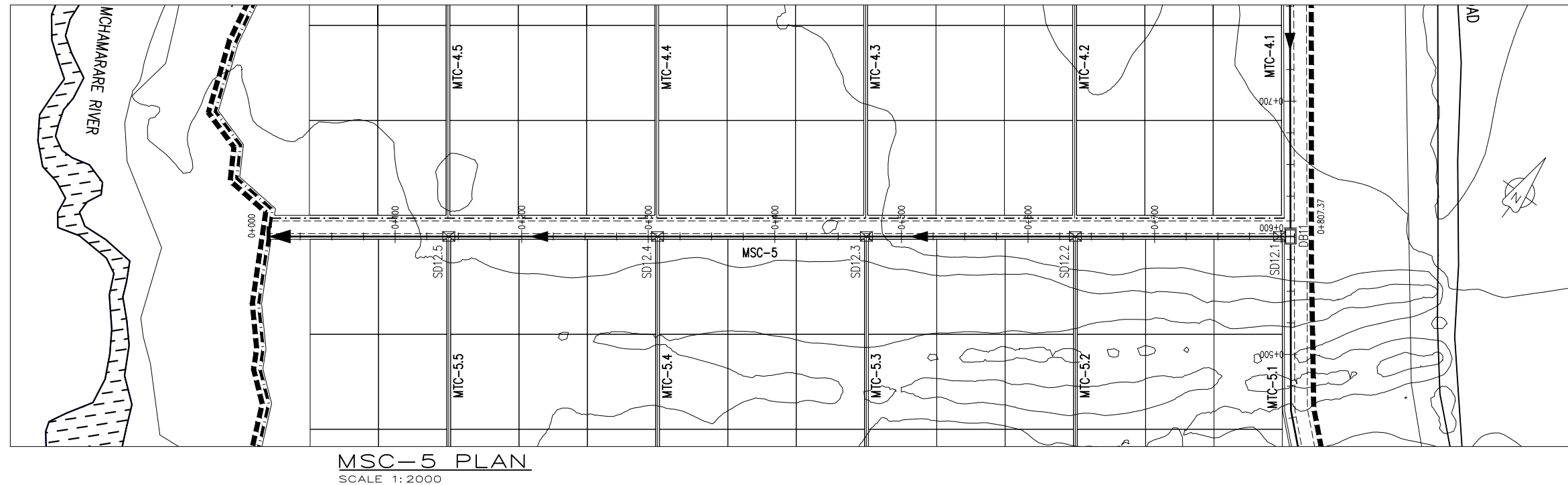
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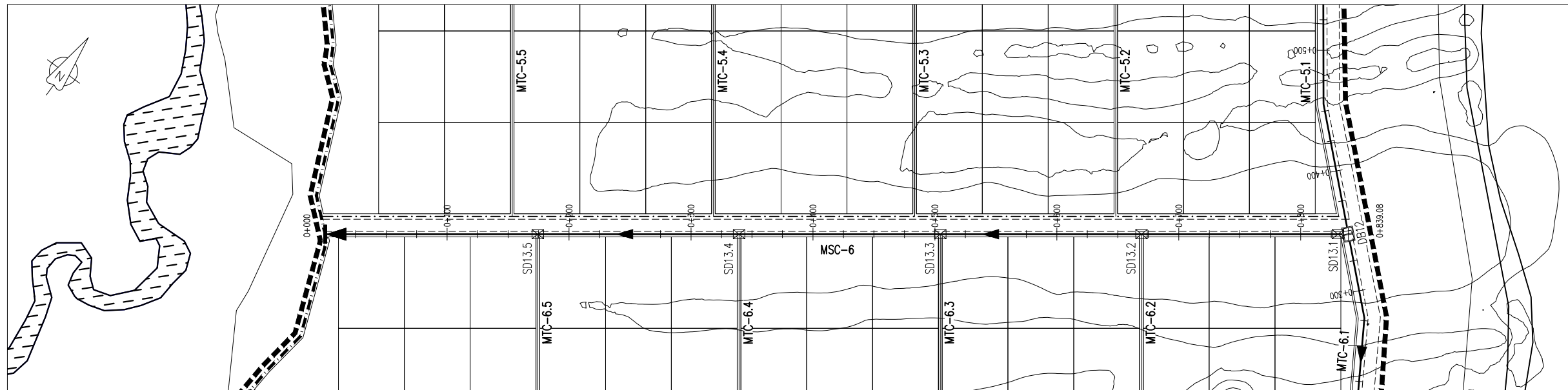
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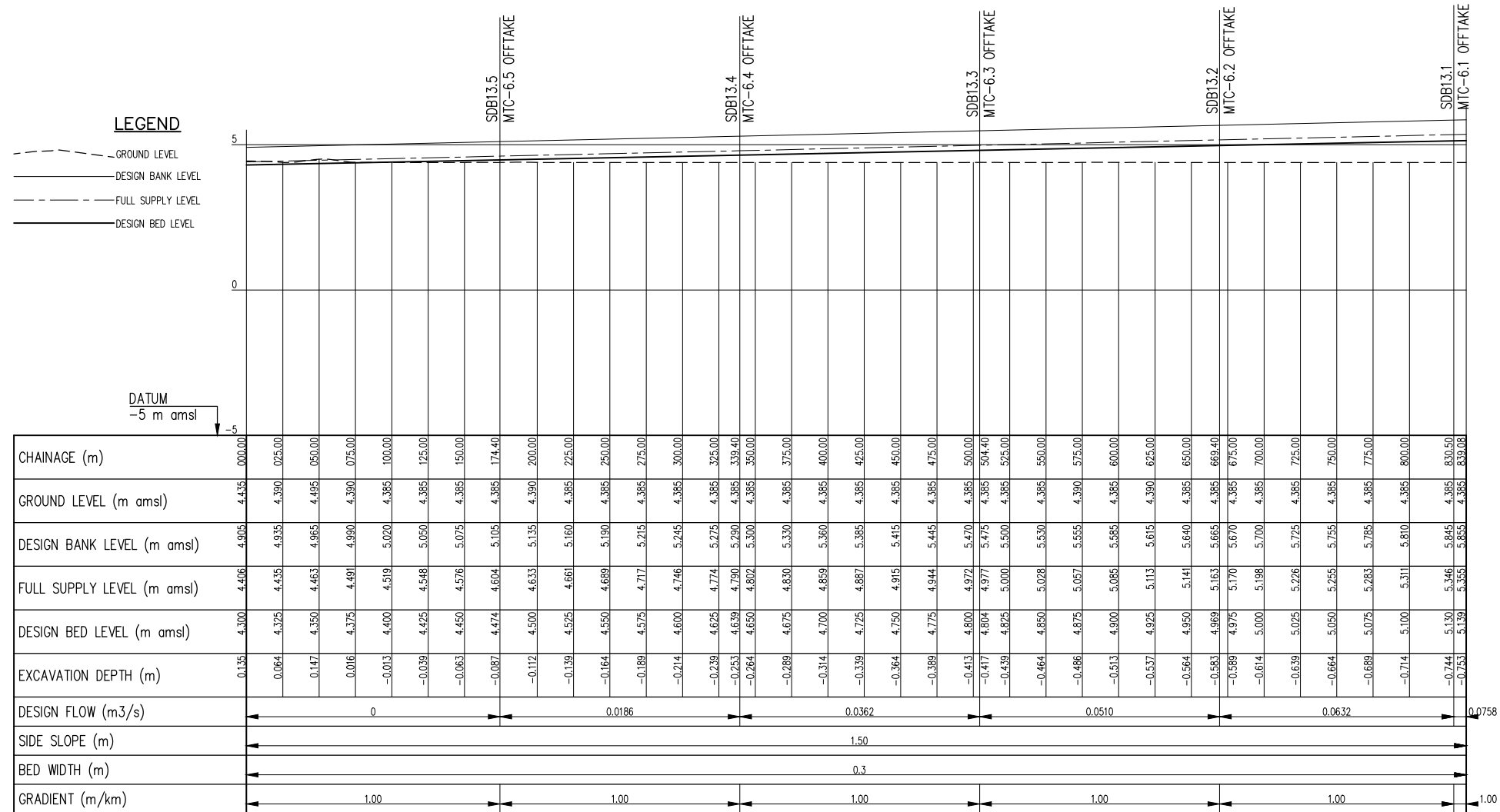
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MSC-6 PLAN
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MSC-6 PROFILE
SCALE: Hor 1:2000, Ver 1:100

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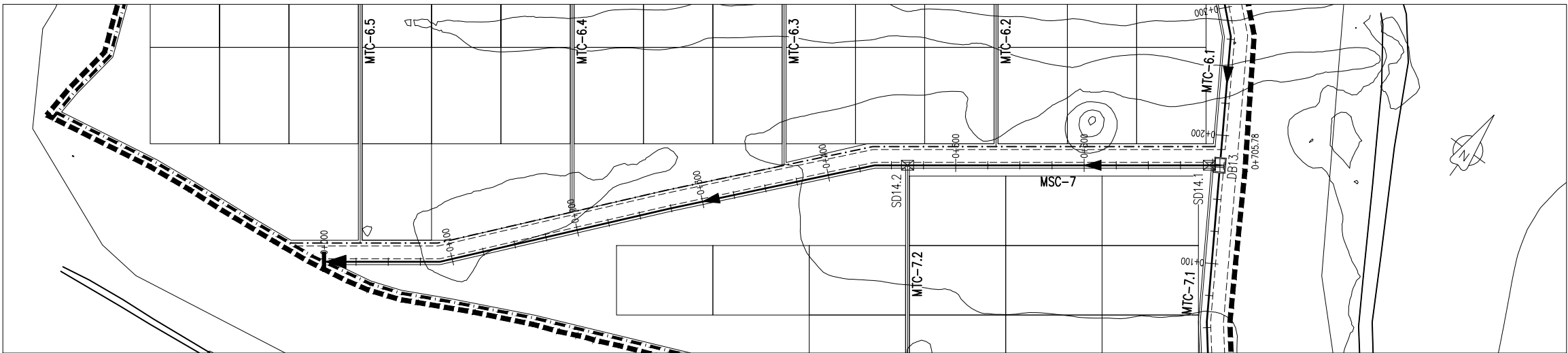
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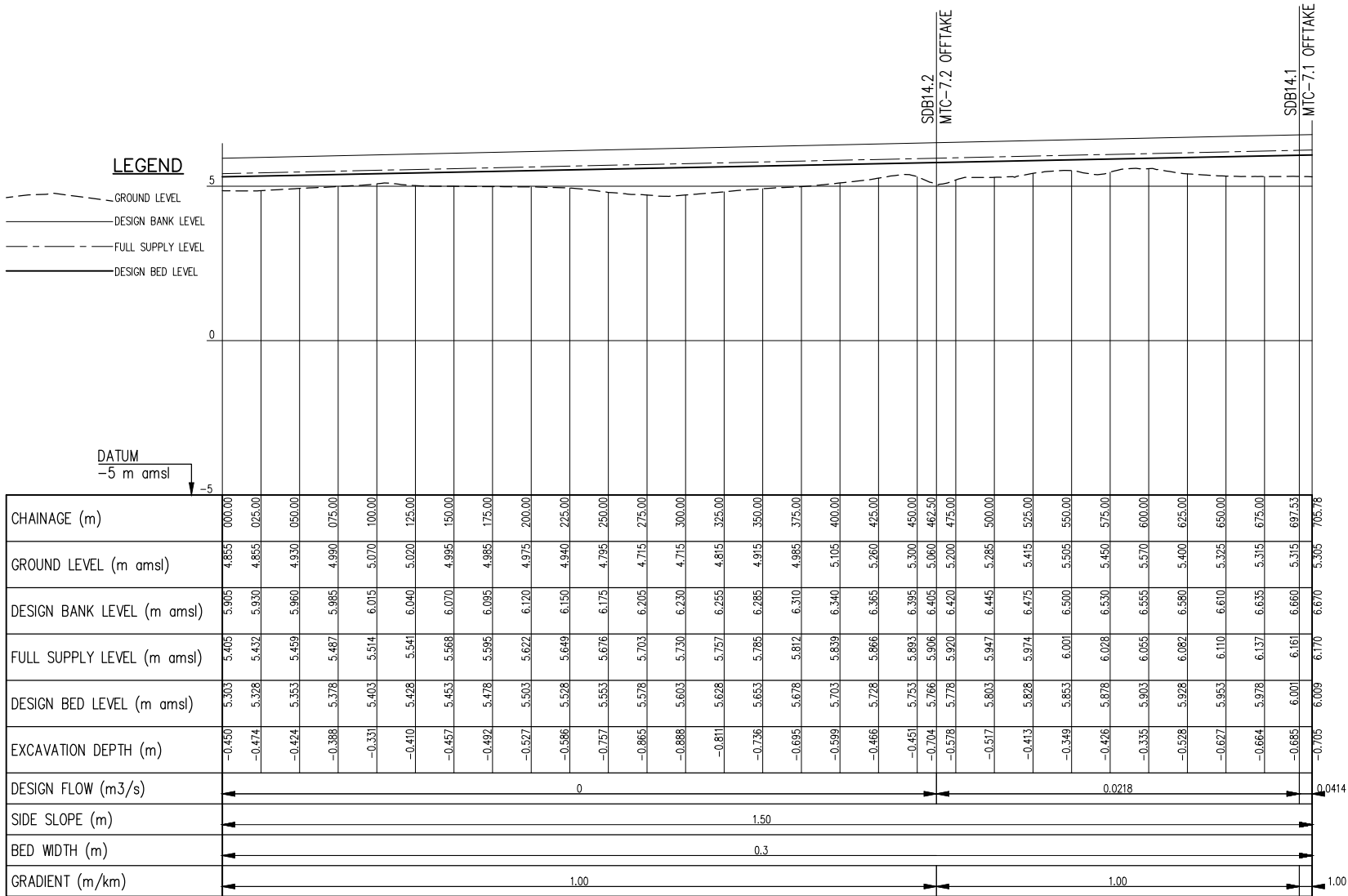
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MSC-6 CANAL
PLAN AND PROFILE

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MSC-7 PLAN
SCALE 1: 2000



MSC-7 PROFILE
SCALE: Hor 1:2000, Ver 1:100

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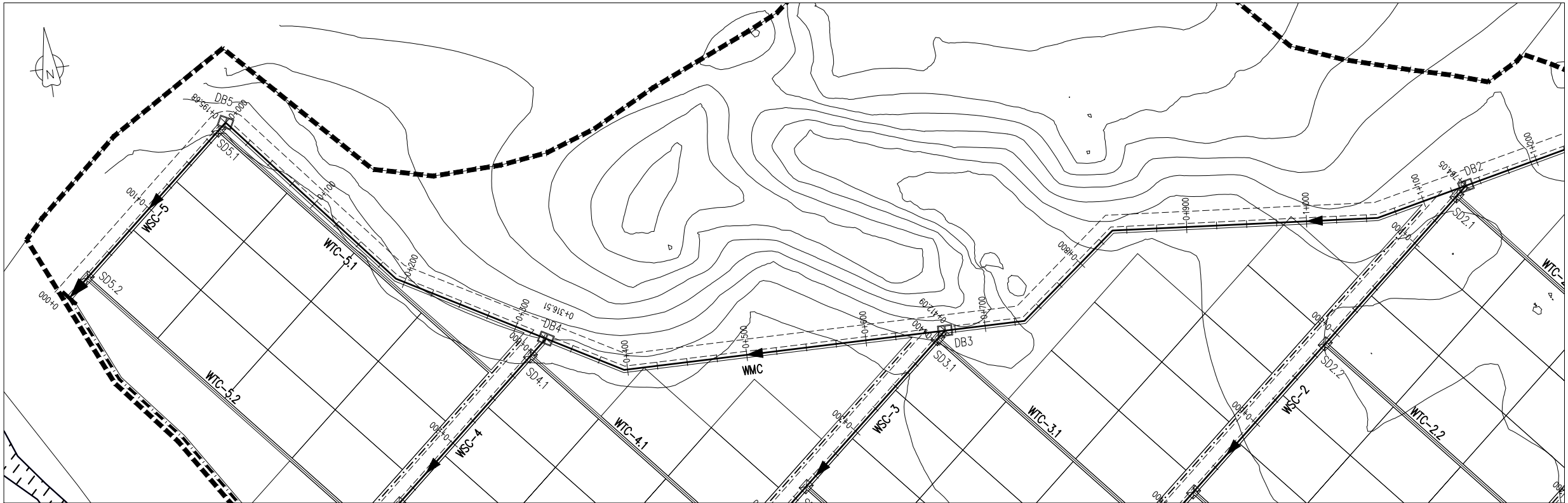
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MSC-7 CANAL
PLAN AND PROFILE

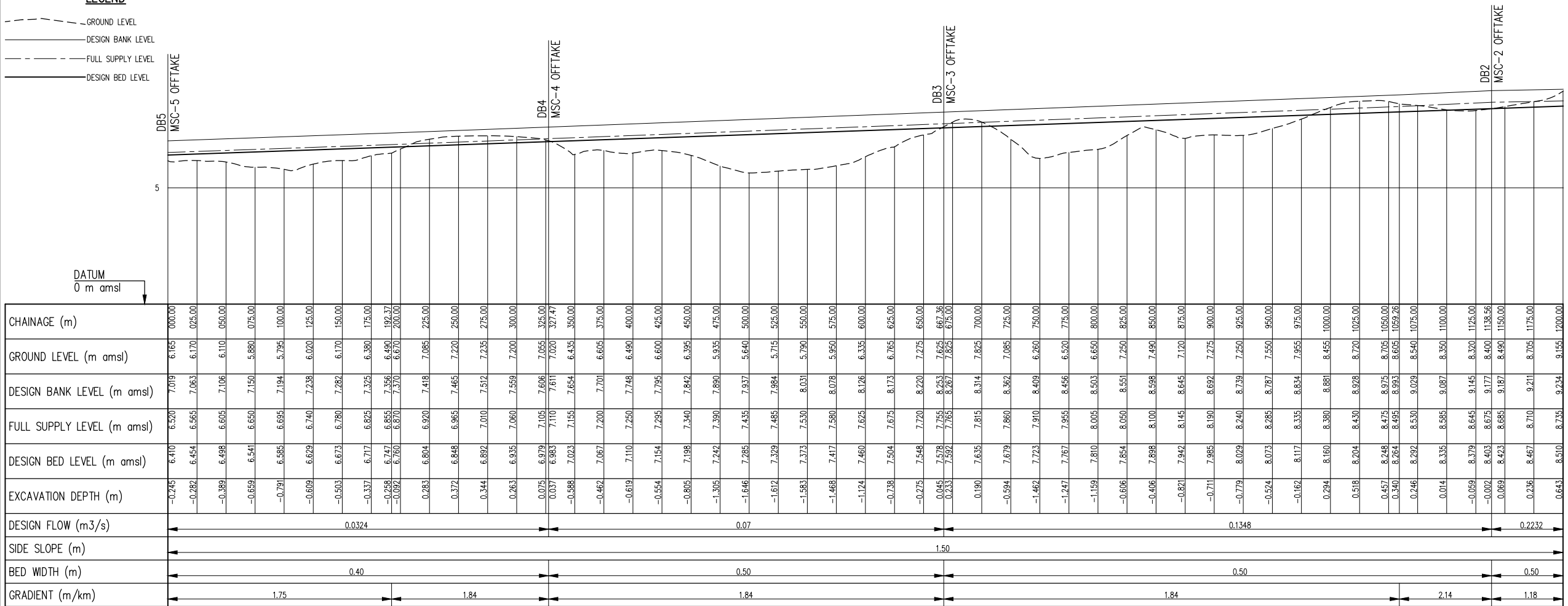
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WMC PLAN
SCALE 1:2000

LEGEND

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



WMC PROFILE
SCALE: Hor 1:2000, Ver 1:100

CLIENT:
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Maji House, Nairobi



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Kwale County Government



PROJECT:
VANGA IRRIGATION CLUSTER
Detailed Design of Mpepeni &
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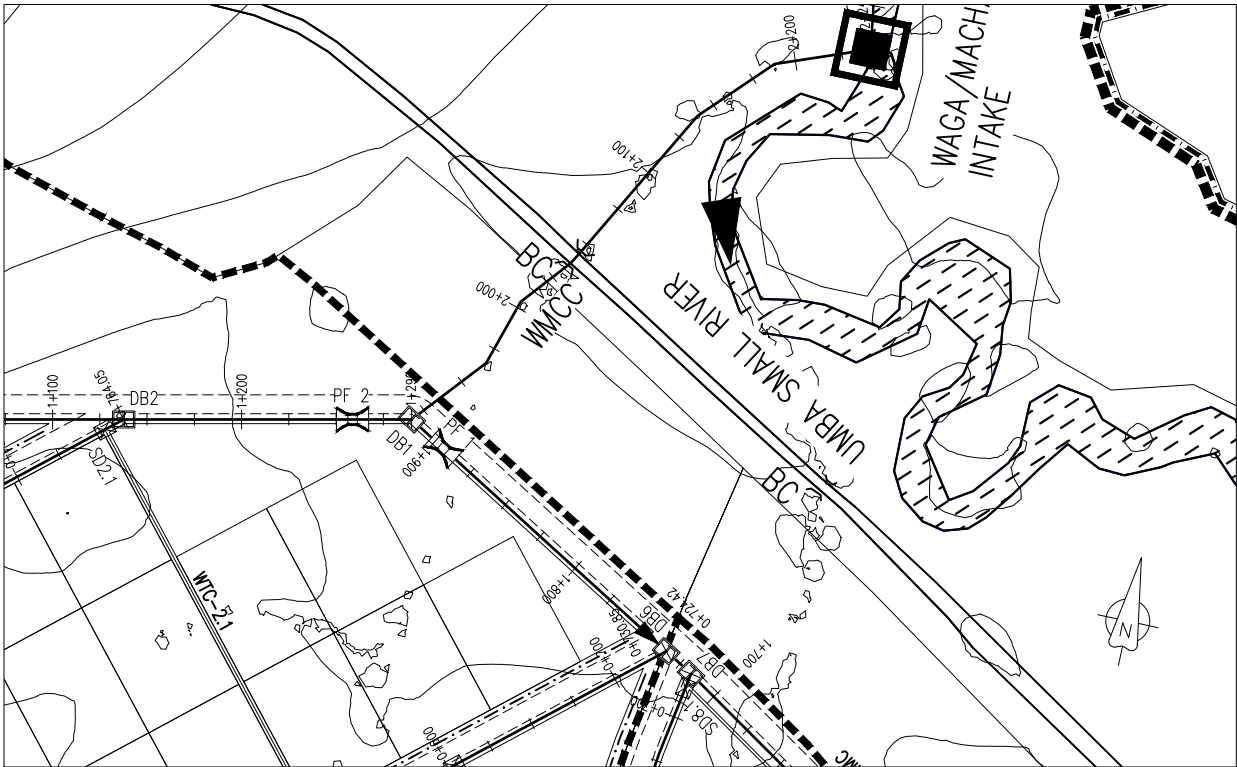
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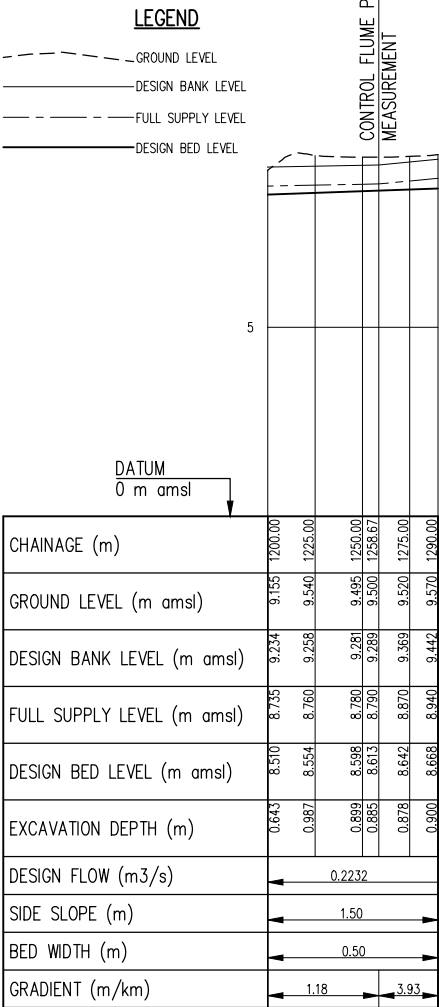
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Ministry of Water Sanitation and
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WMC CANAL
PLAN AND PROFILE

Date Feb. 2022	Sheet 01
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WMC PLAN
SCALE 1:2000



WMC PROFILE
SCALE: Hor 1:2000, Ver 1:100

CLIENT:
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Kwale County Government



PROJECT:
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Detailed Design of Mpepeni &
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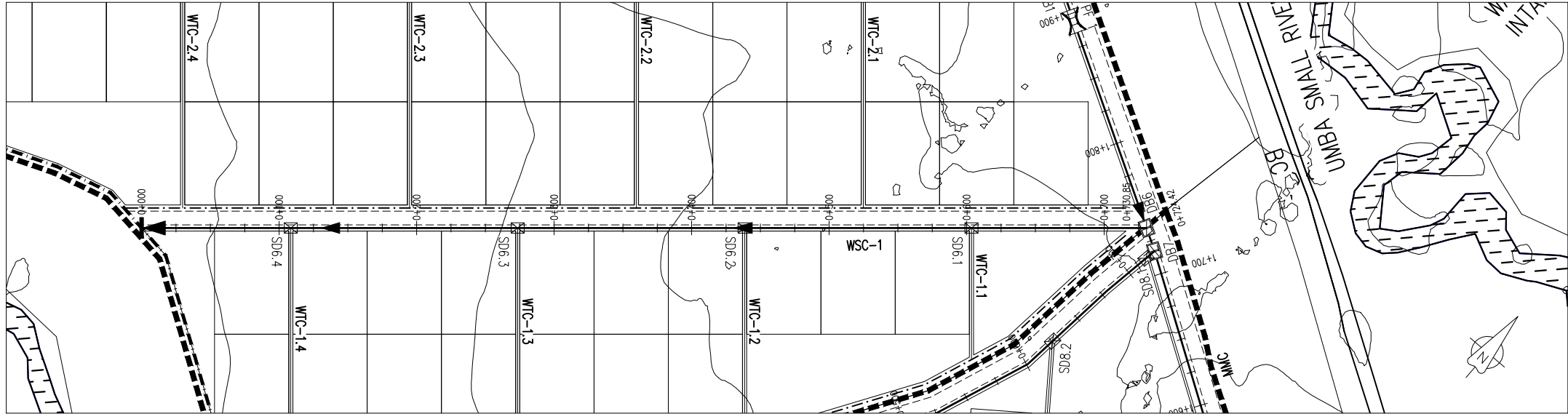
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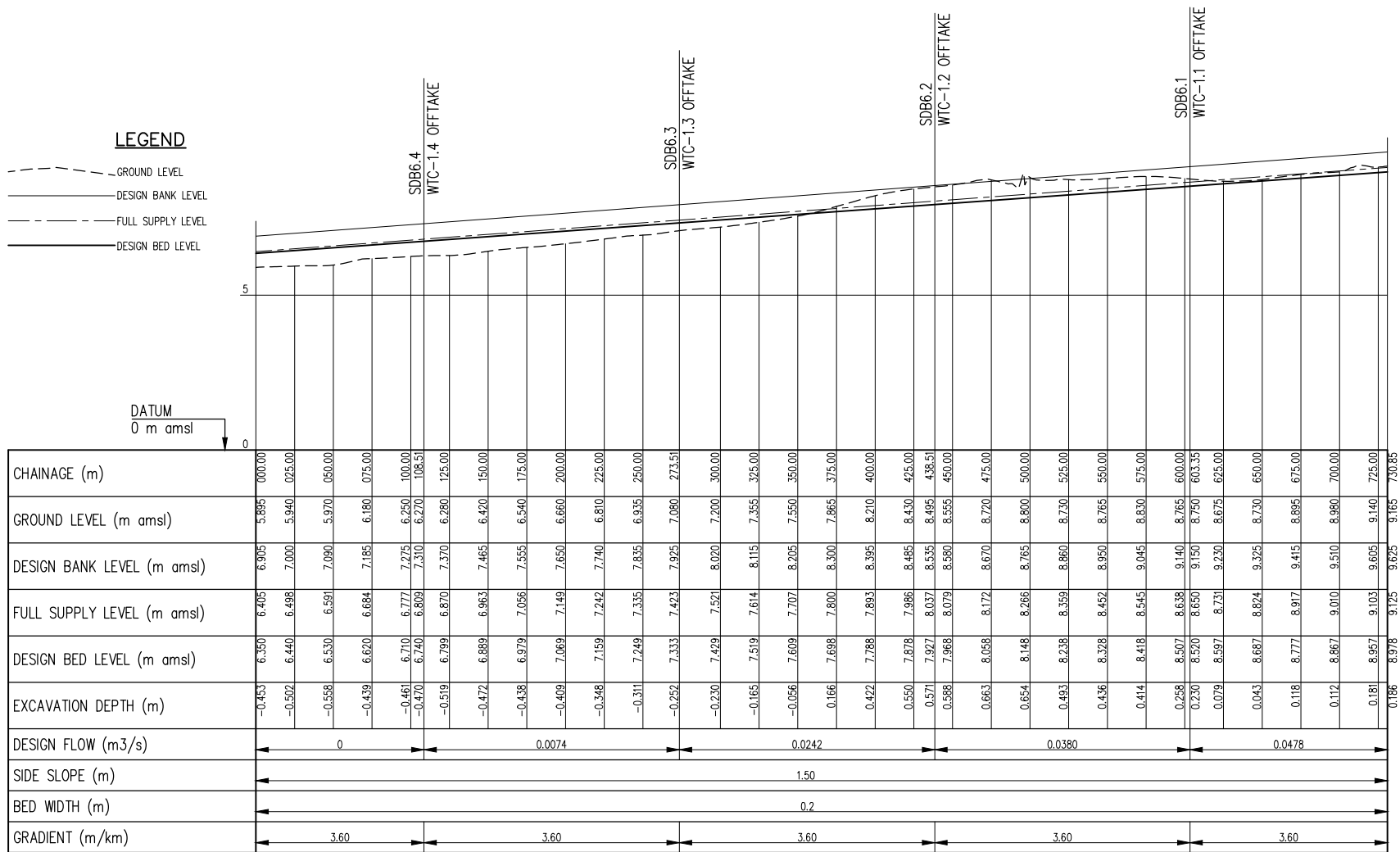
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WMC CANAL
PLAN AND PROFILE

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WSC-1 PLAN
SCALE 1:2000



WSC-1 PROFILE
SCALE: Hor 1:2000, Ver 1:100

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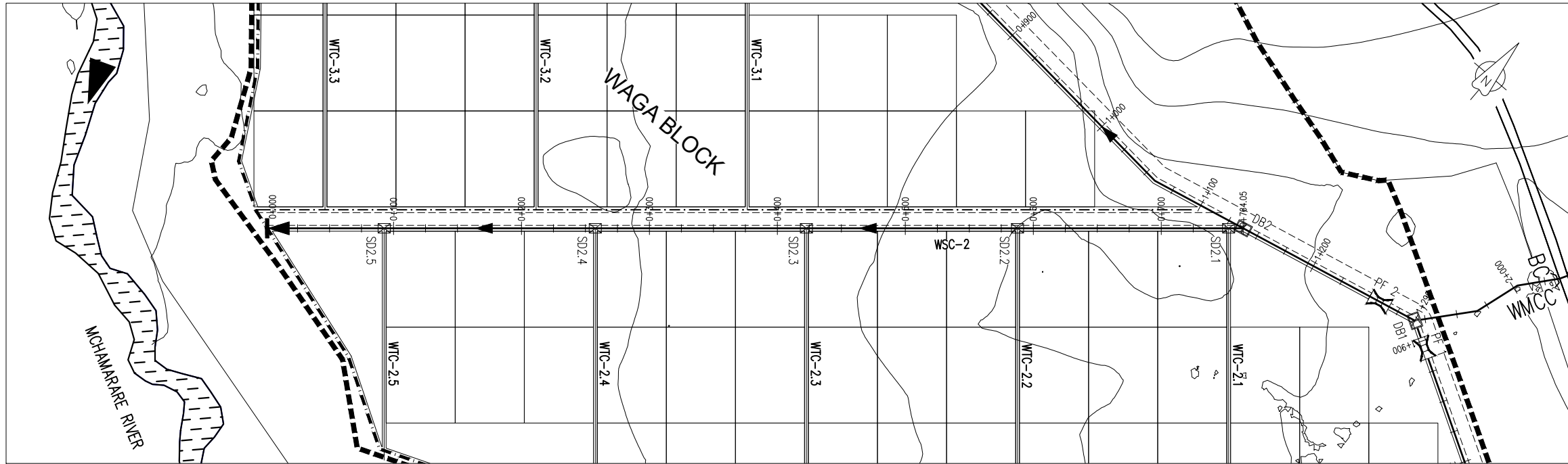
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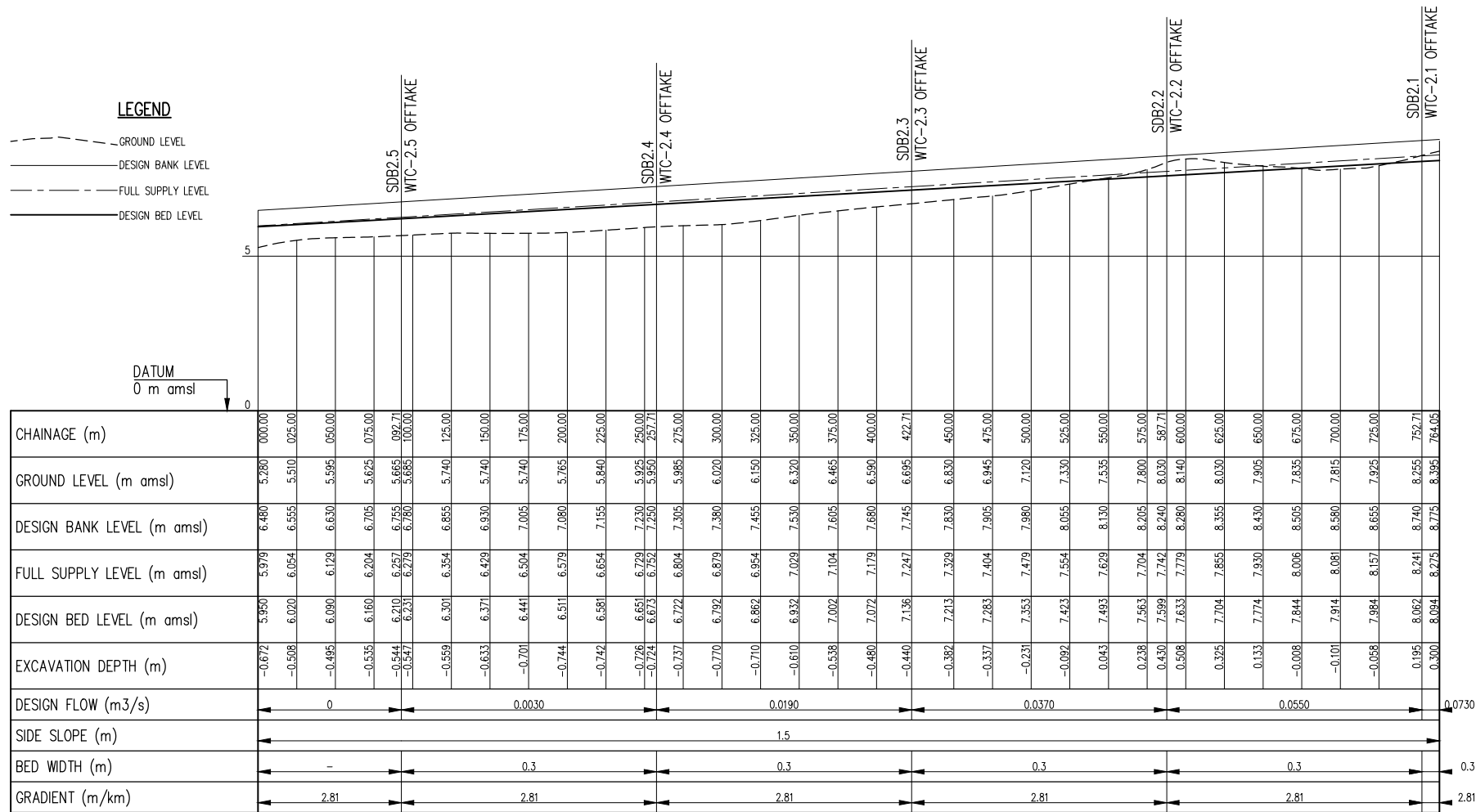
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WSC-1 CANAL
PLAN AND PROFILE

Date Feb. 2022	Sheet 01
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WSC-2 PLAN
SCALE 1:2000



WSC-2 PROFILE
SCALE: Hor 1:2000, Ver 1:100

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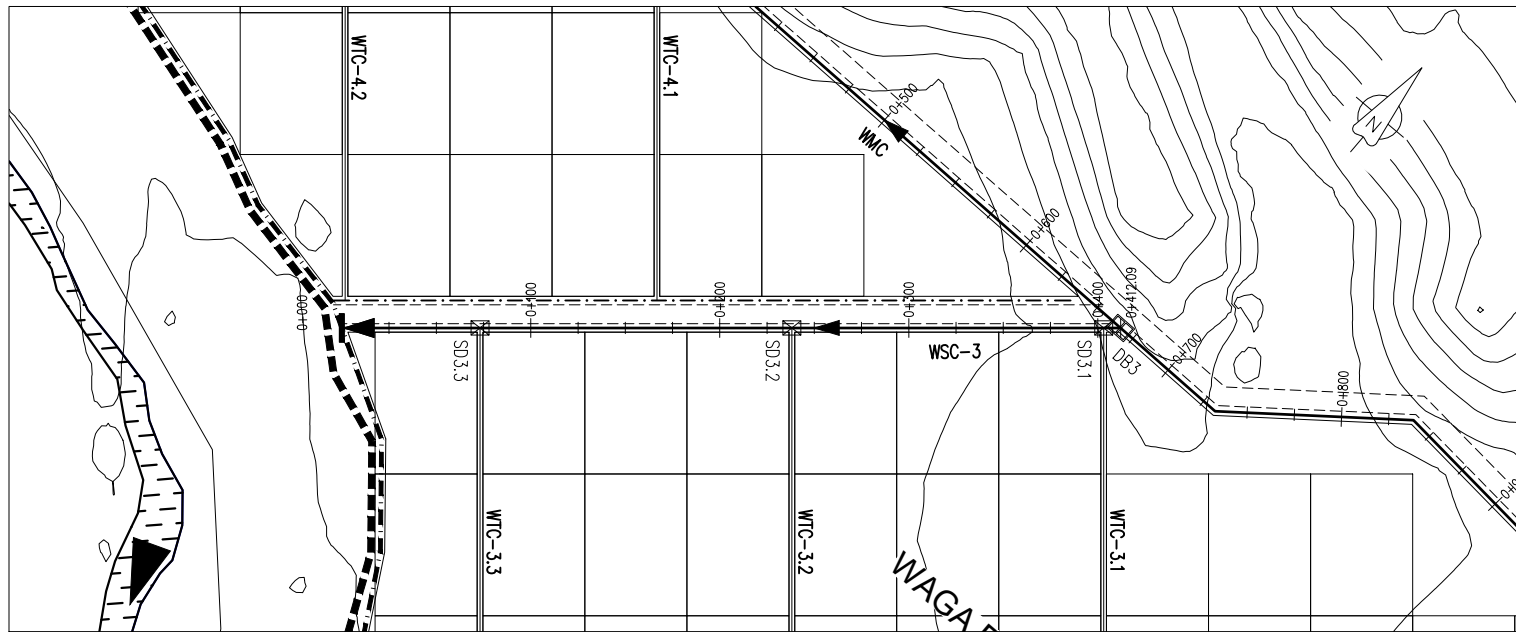
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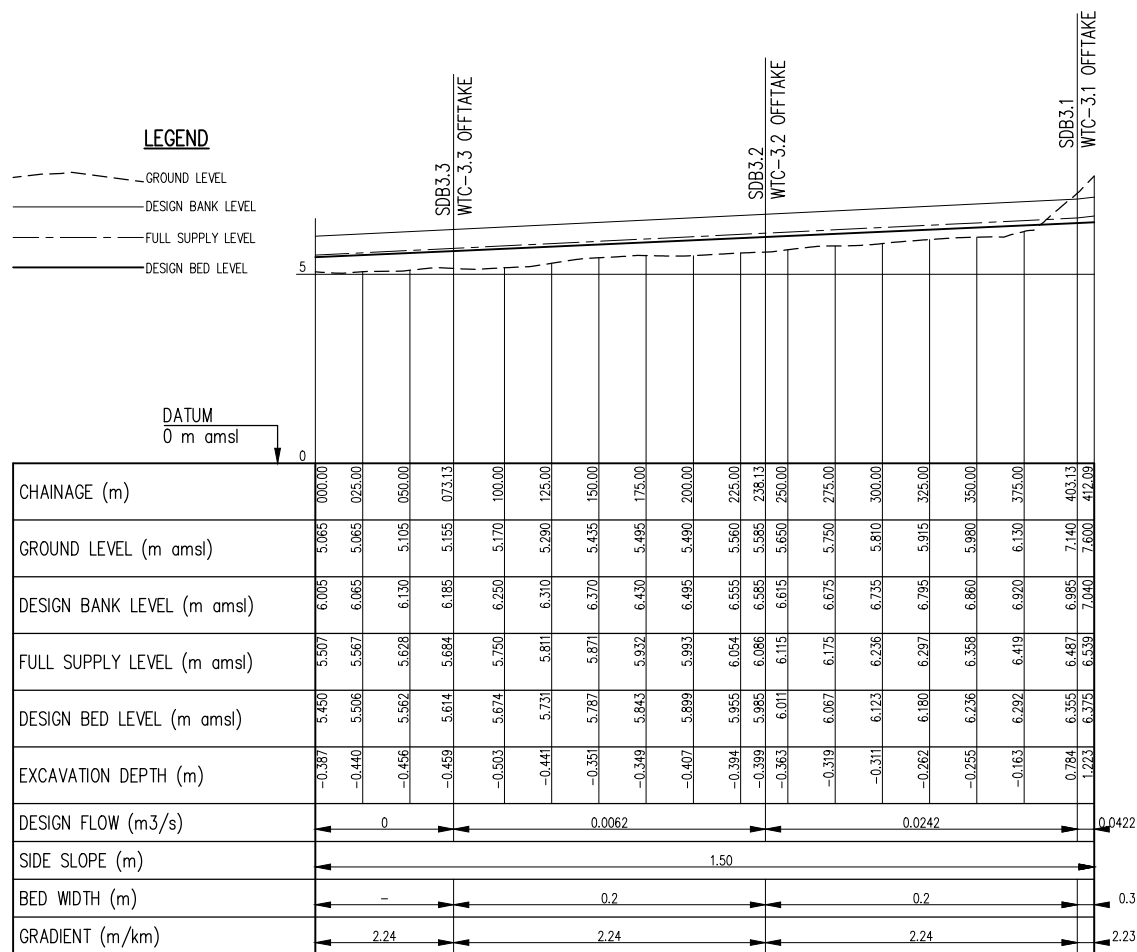
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WSC-2 CANAL
PLAN AND PROFILE

Date Feb. 2022	Sheet 01
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WSC-3 PLAN
SCALE 1:2000



WSC-3 PROFILE
SCALE: Hor 1:2000, Ver 1:100

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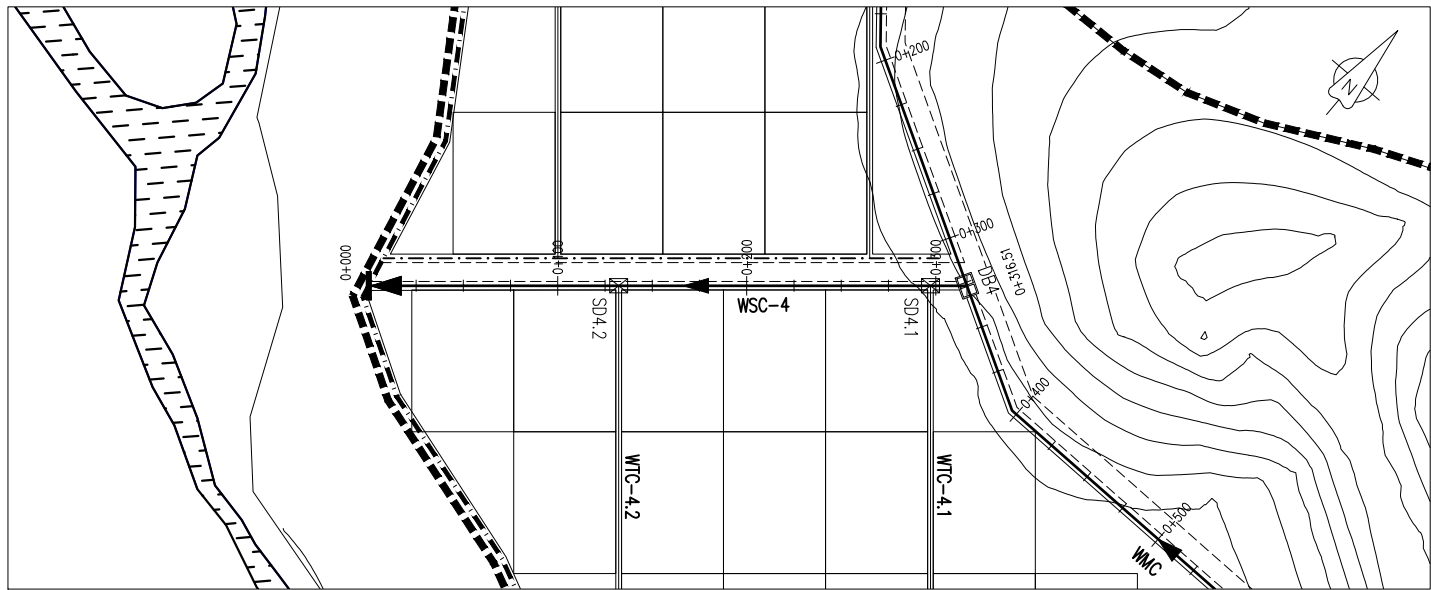
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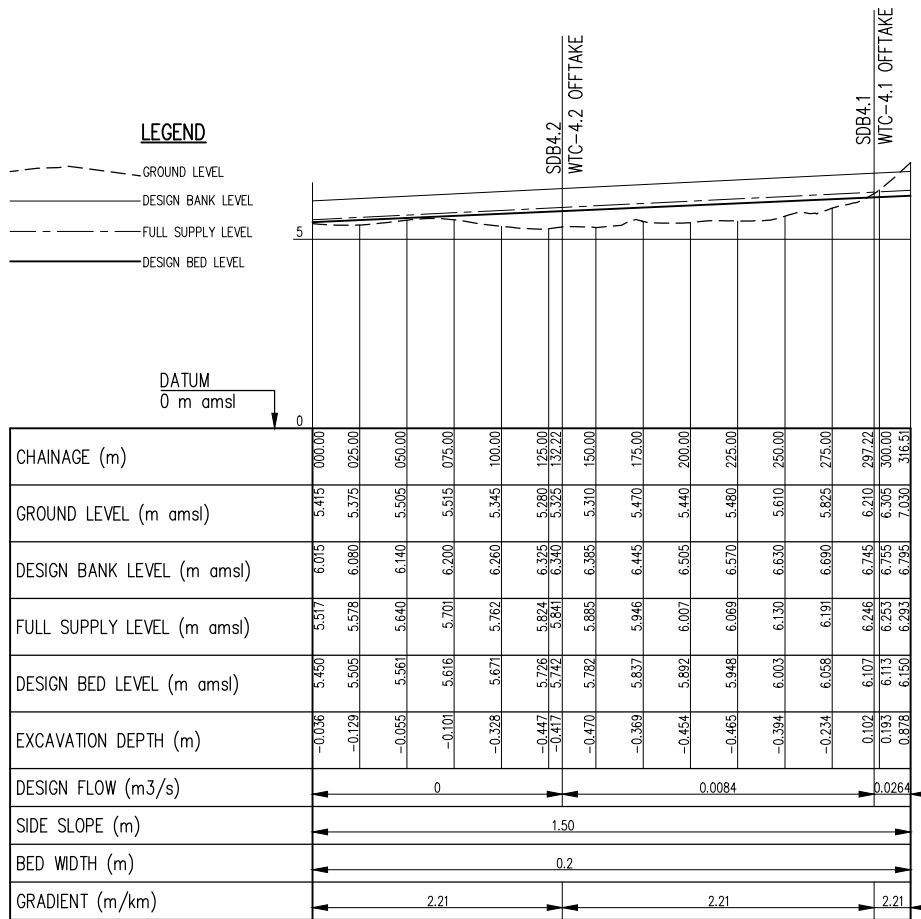
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WSC-3 CANAL
PLAN AND PROFILE

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WSC-4 PLAN
SCALE 1:2000



WSC-4 PROFILE
SCALE: Hor 1:2000, Ver 1:100

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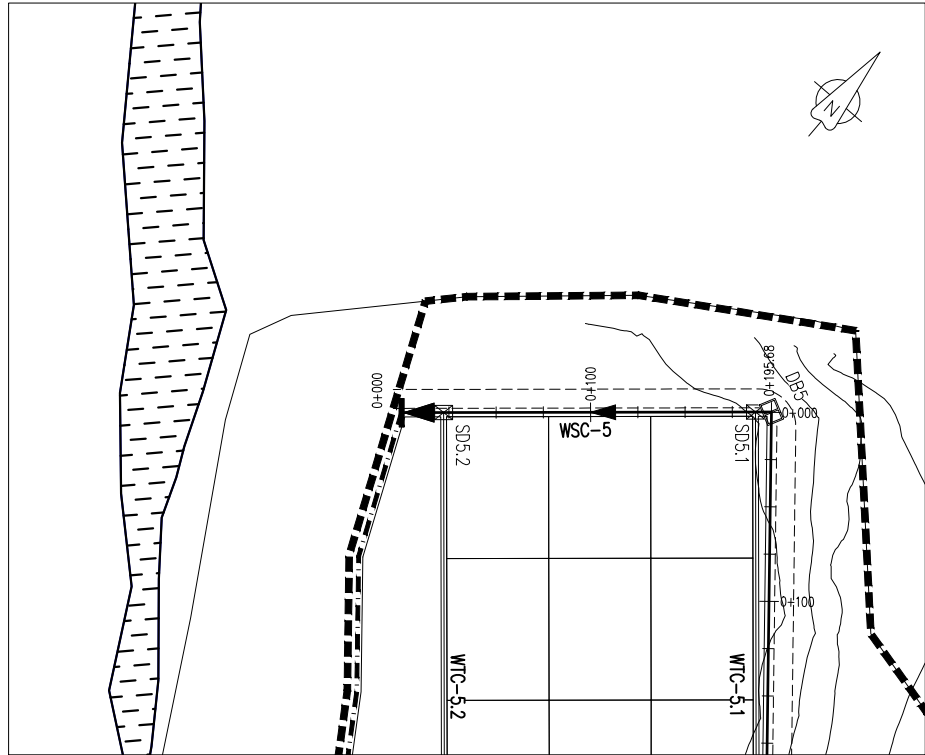
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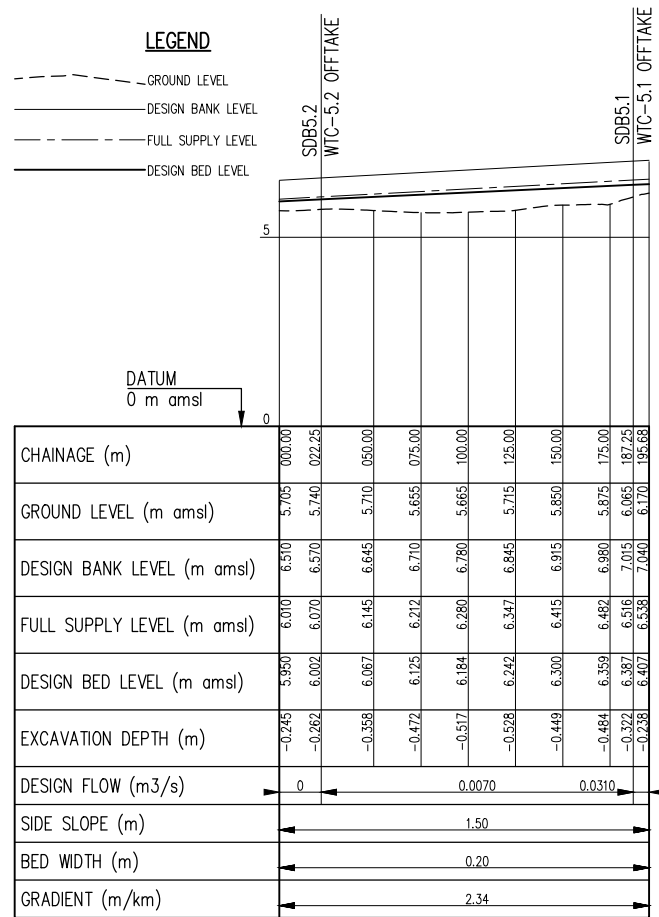
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WSC-4 CANAL
PLAN AND PROFILE

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WSC-5 PROFILE PLAN
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WSC-5 PROFILE
SCALE: Hor 1:2000, Ver 1:100

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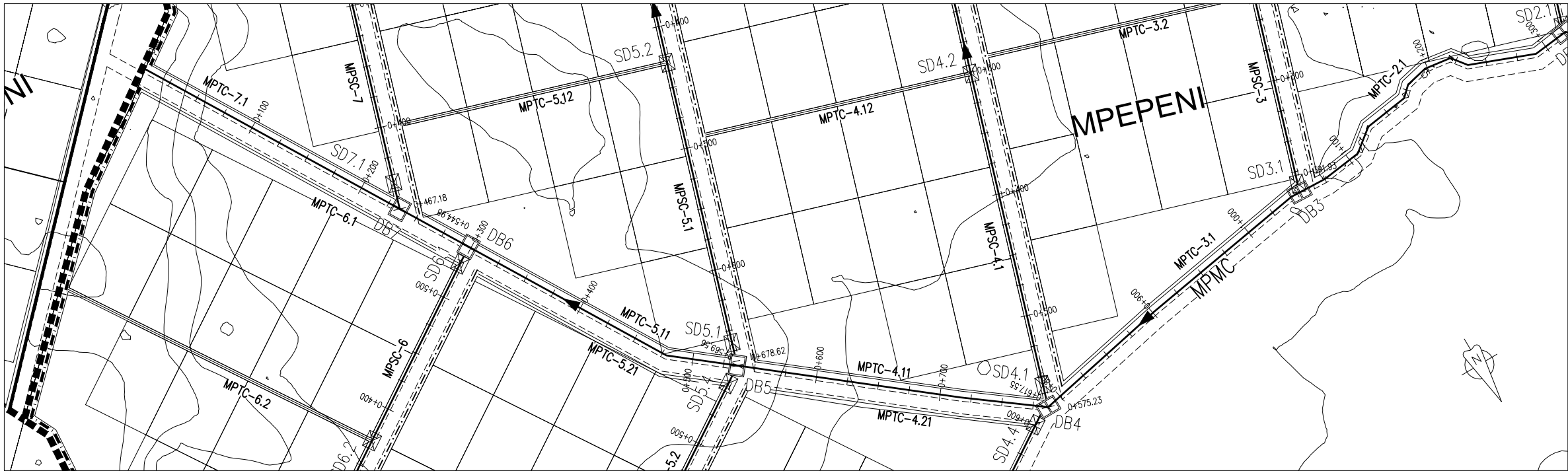
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DRAWING TITLE & DESCRIPTION:
WSC-5 CANAL
PLAN AND PROFILE

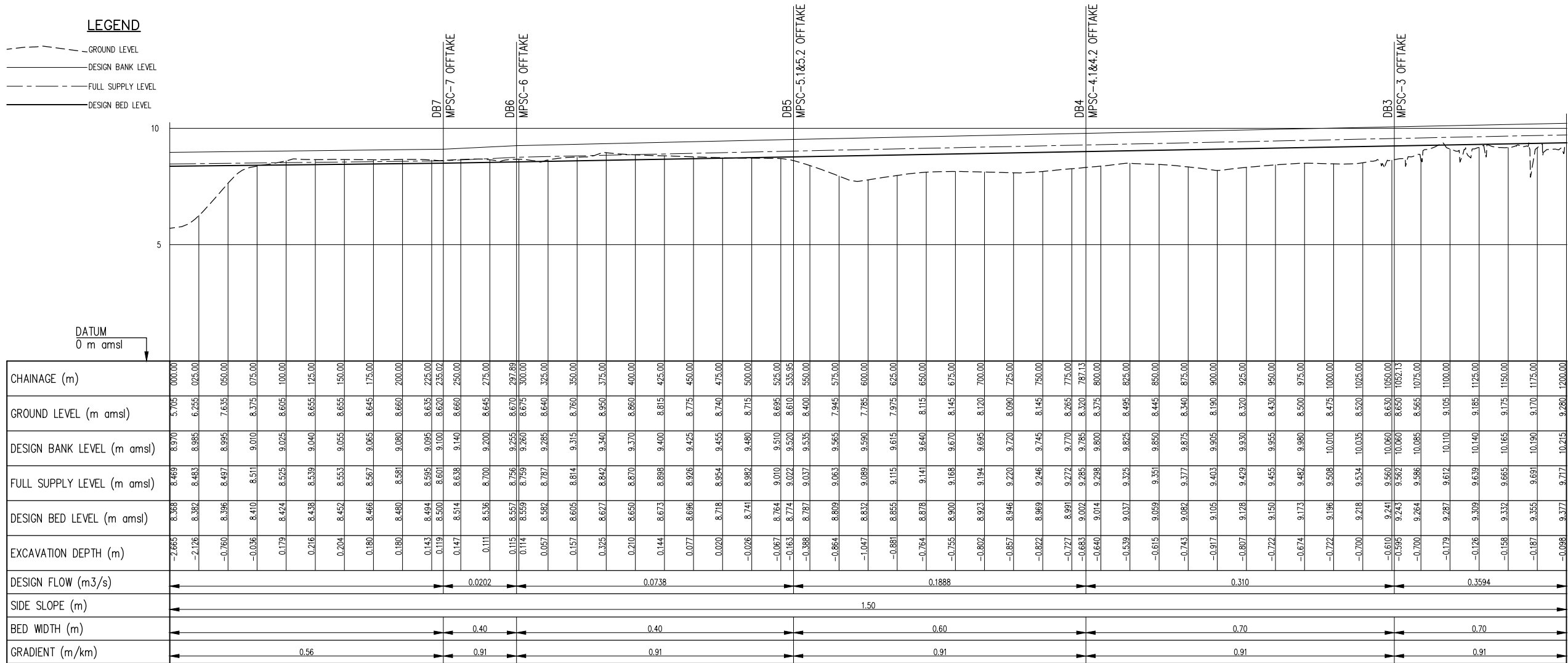
Date Feb. 2022	Sheet 01
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Dwg No. VIP/DD/21/07/26	



MPMC PLAN
SCALE 1:2000

LEGEND

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



MPMC PROFILE
SCALE: Hor 1:2000, Ver 1:100

CLIENT:
Ministry of Water Sanitation and
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Maji House, Nairobi



National Irrigation Authority
Unyanyizi House, Lenana Road
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Kwale County Government



PROJECT:
VANGA IRRIGATION CLUSTER
Detailed Design of Mpepeni &
Machame Irrigation Schemes

CONSULTANT:
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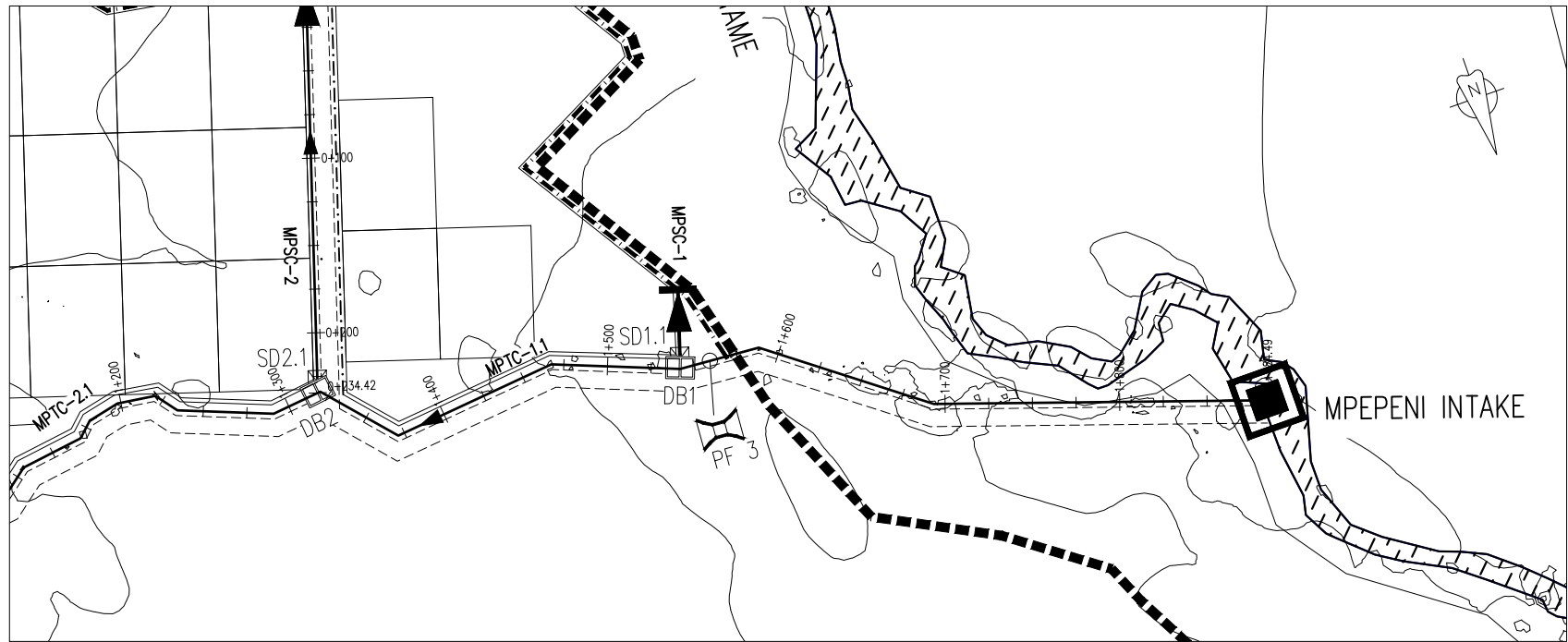
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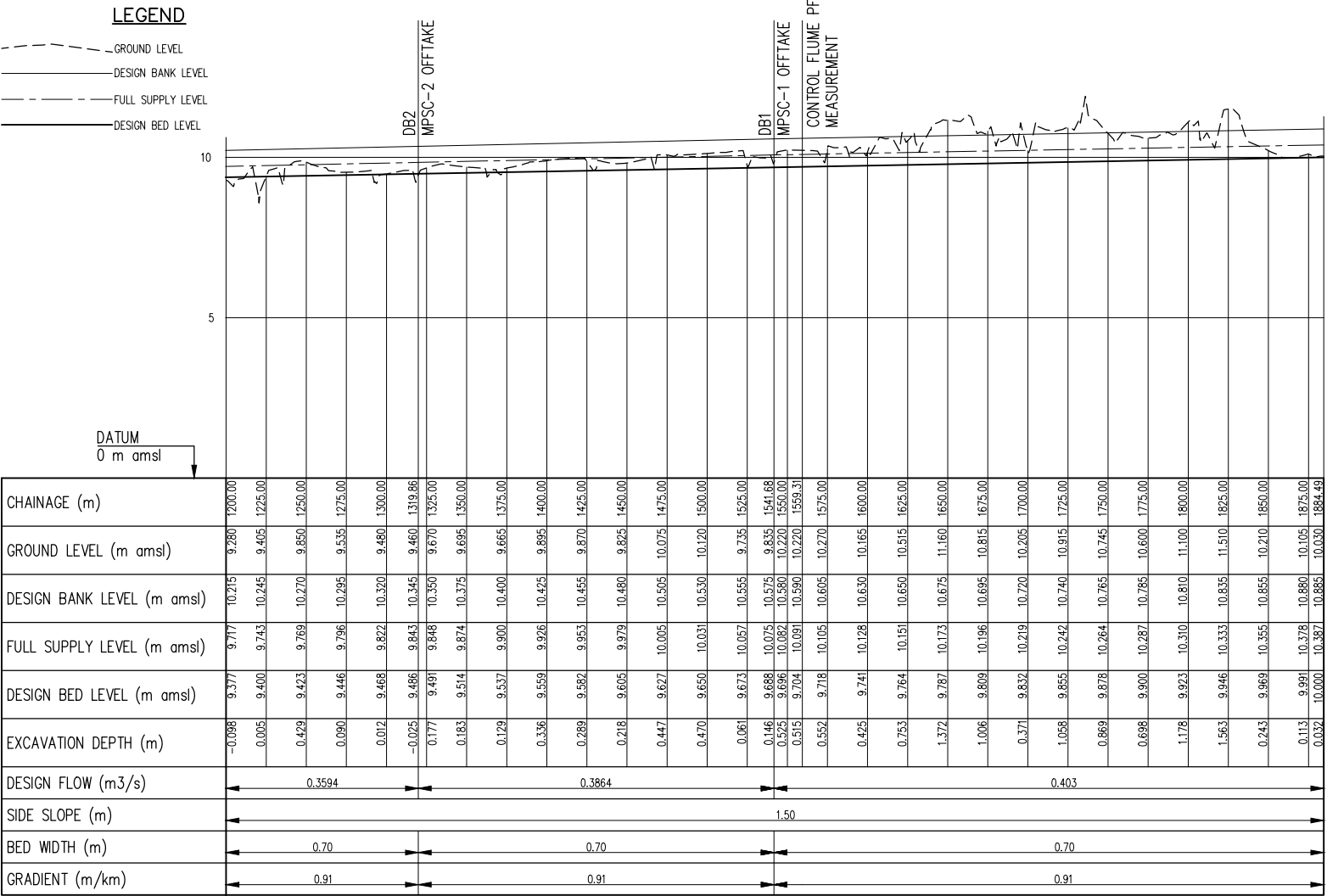
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MPMC CANAL
PLAN AND PROFILE

Date Feb. 2022	Sheet 01
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Dwg No. VIP/DD/21/07/31	



MPMC PLAN
SCALE 1:2000



MPMC PROFILE
SCALE: Hor 1:2000, Ver 1:100

CLIENT:
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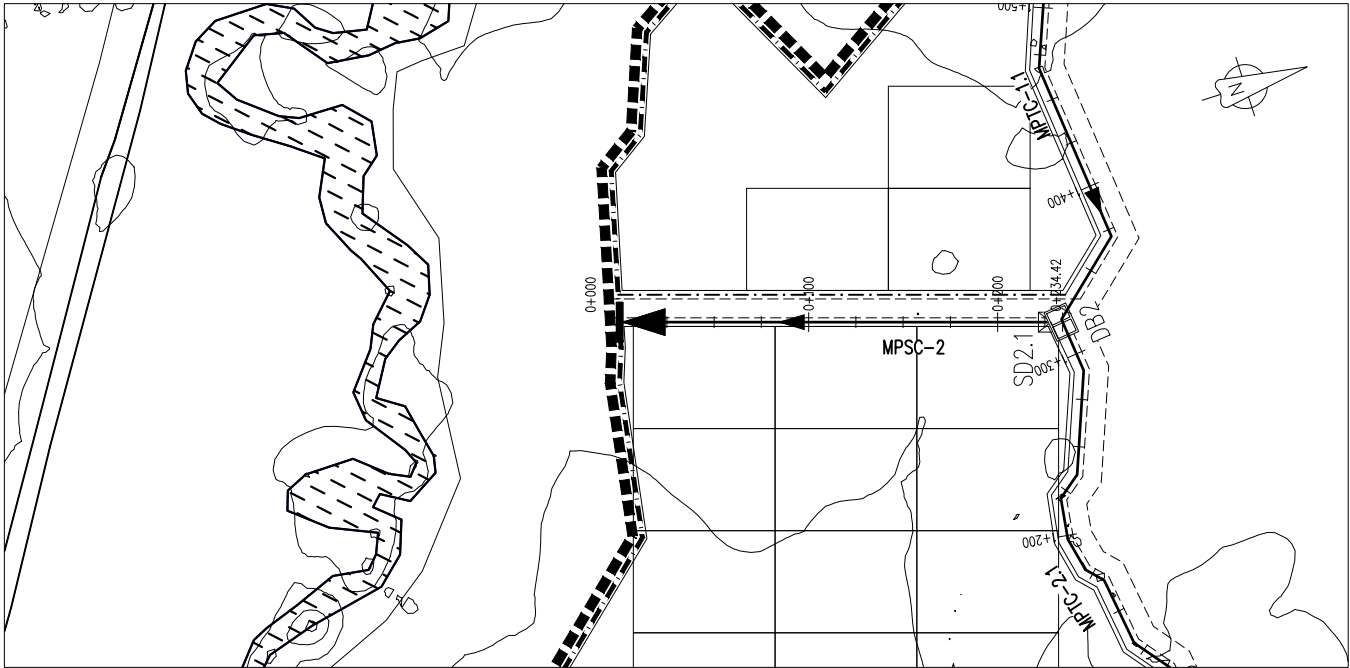
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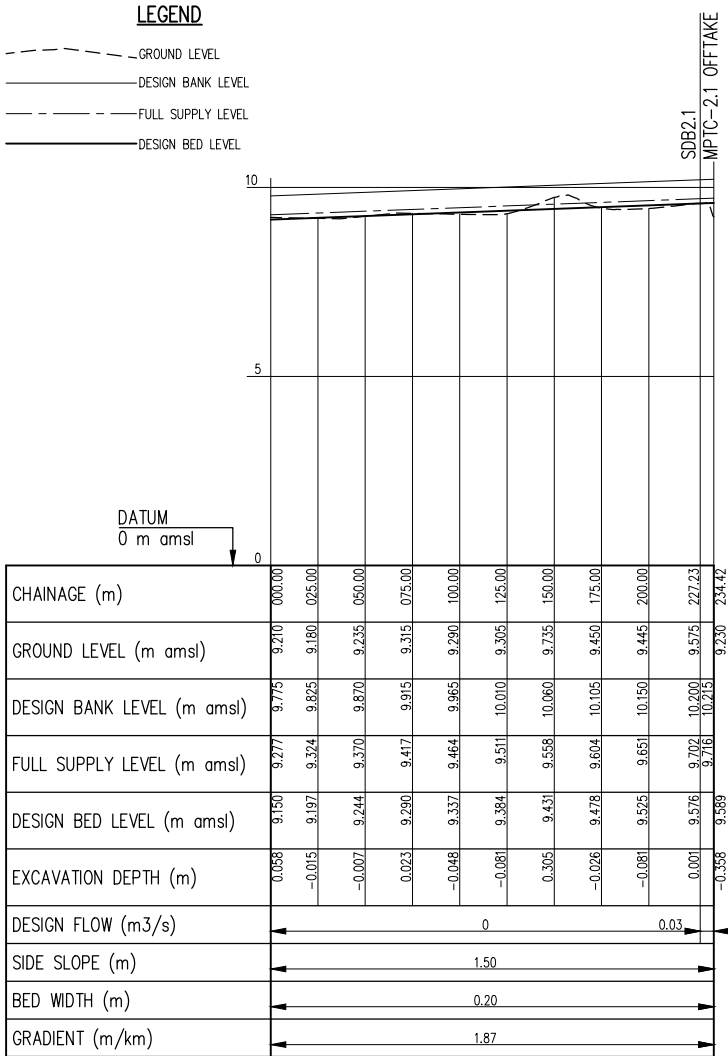
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MPMC CANAL
PLAN AND PROFILE

Date Feb. 2022	Sheet 02
Scale Hor 1:2000; Ver 1:100	PAPER SIZE A1
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MPSC-2 PLAN
SCALE 1:2000



MPSC-2 PROFILE
SCALE: Hor 1:2000, Ver 1:100

CLIENT:
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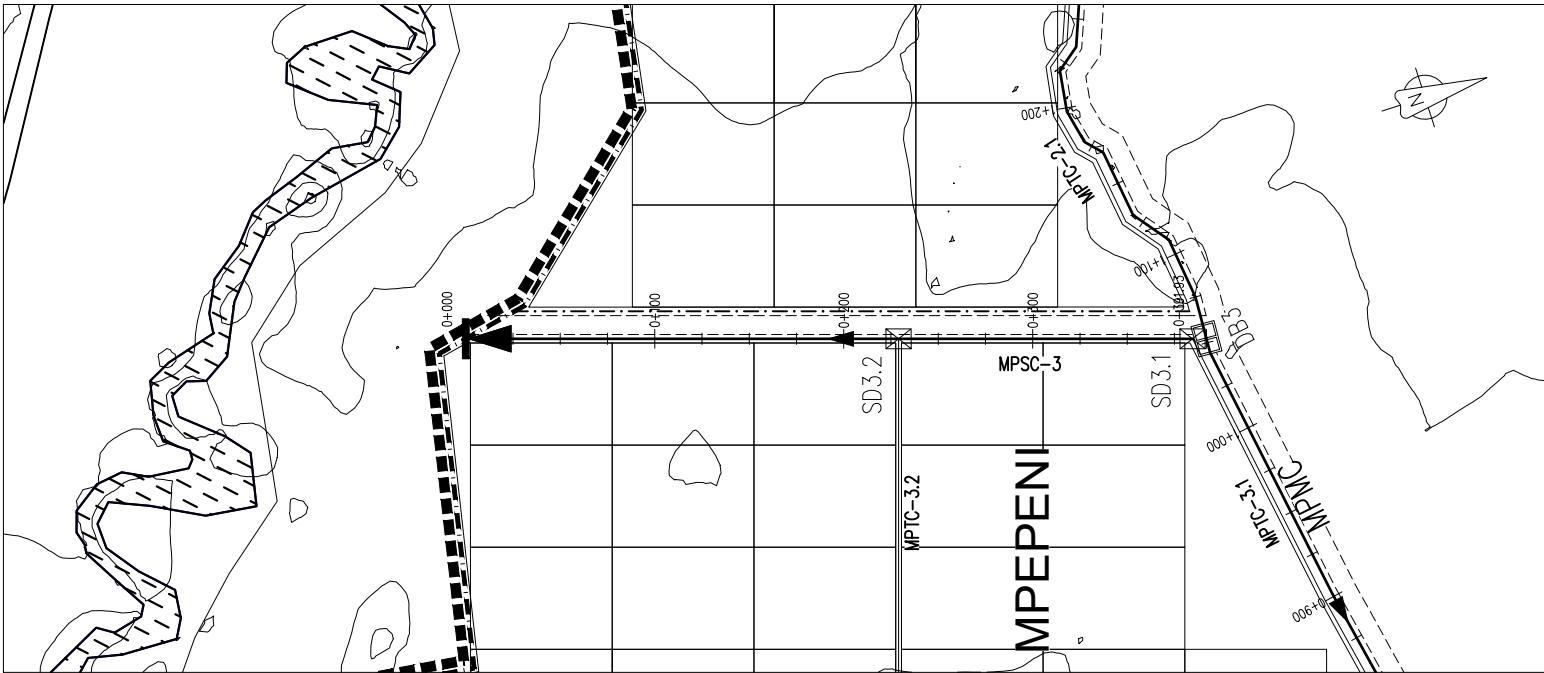
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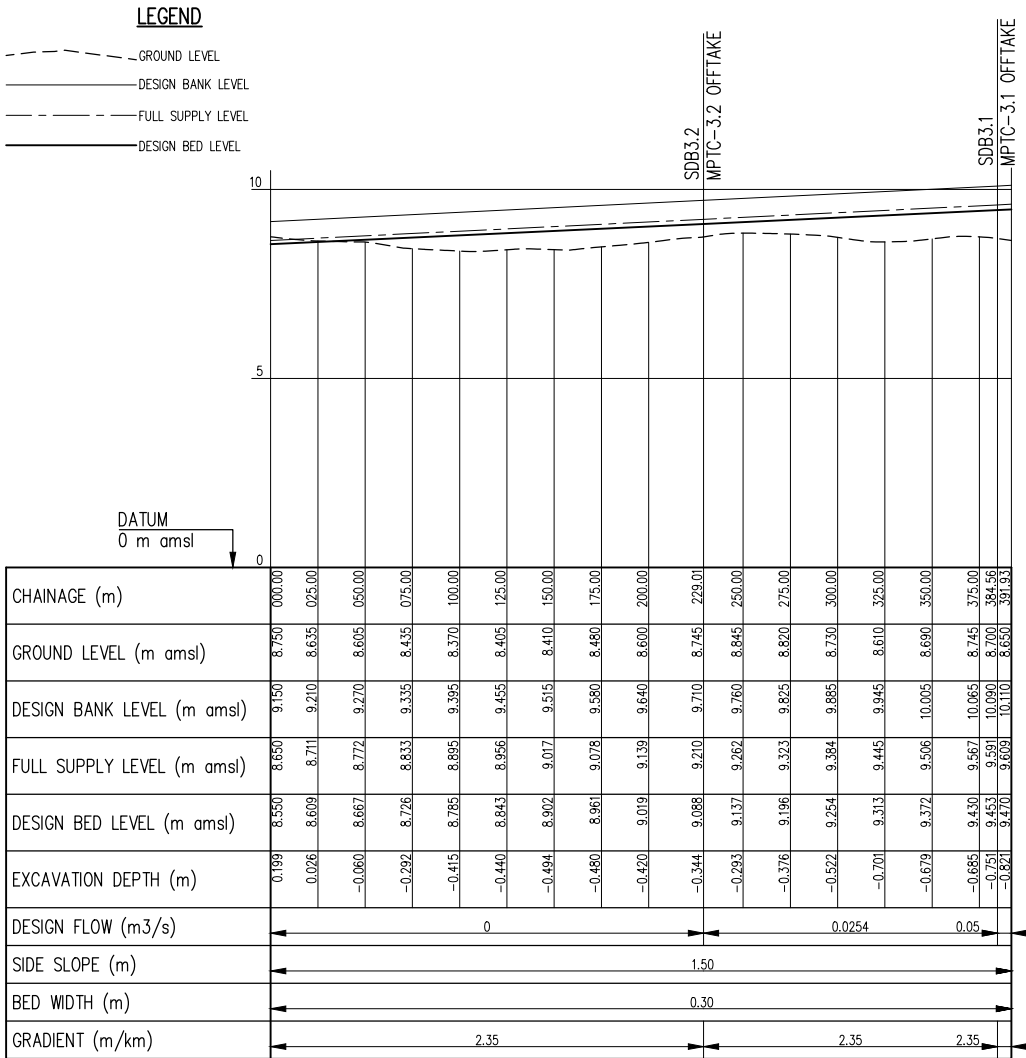
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MPSC-2 CANAL
PLAN AND PROFILE

Date Feb. 2022	Sheet 01
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Dwg No. VIP/DD/21/07/32	



MPSC-3 PLAN
SCALE 1:2000



MPSC-3 PROFILE
SCALE: Hor 1:2000, Ver 1:100

CLIENT:
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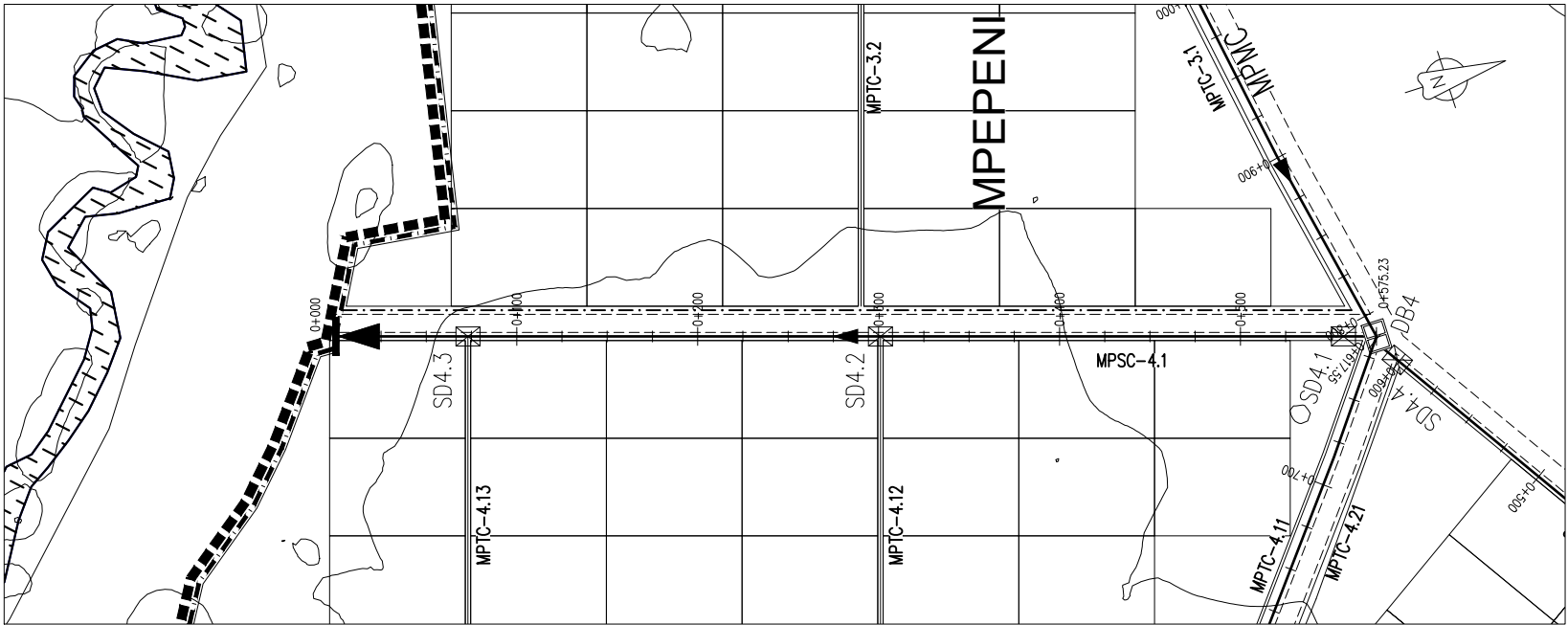
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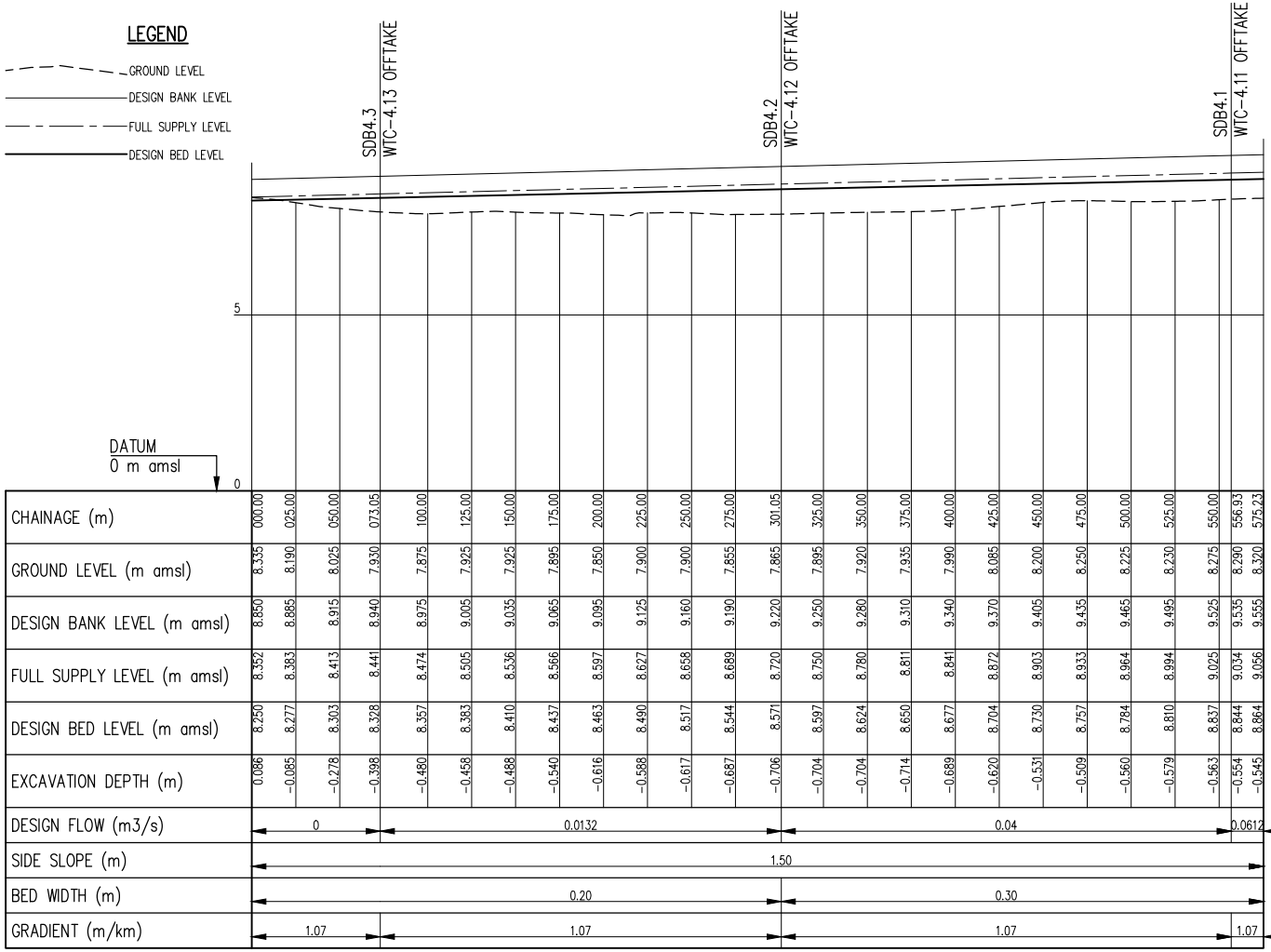
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MPSC-3 CANAL
PLAN AND PROFILE

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MPSC-4.1 PLAN
SCALE 1:2000



MPSC-4.1 PROFILE
SCALE: Hor 1:2000, Ver 1:100

CLIENT:
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Maji House, Nairobi



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PROJECT:
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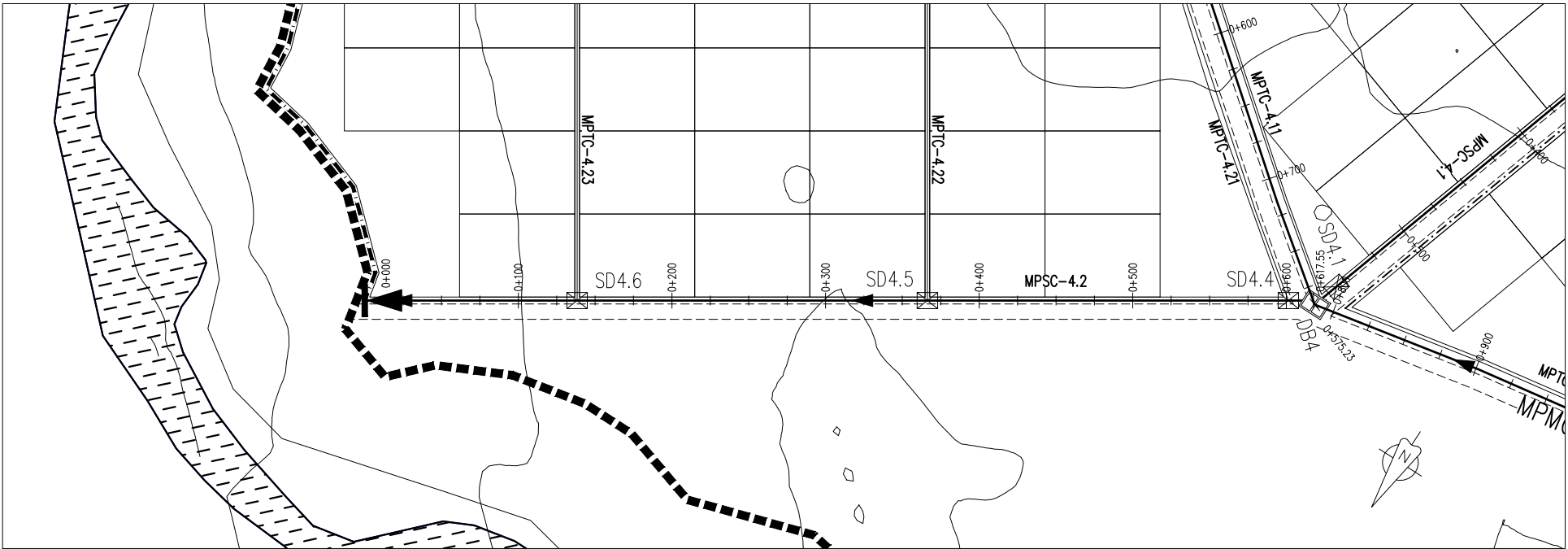
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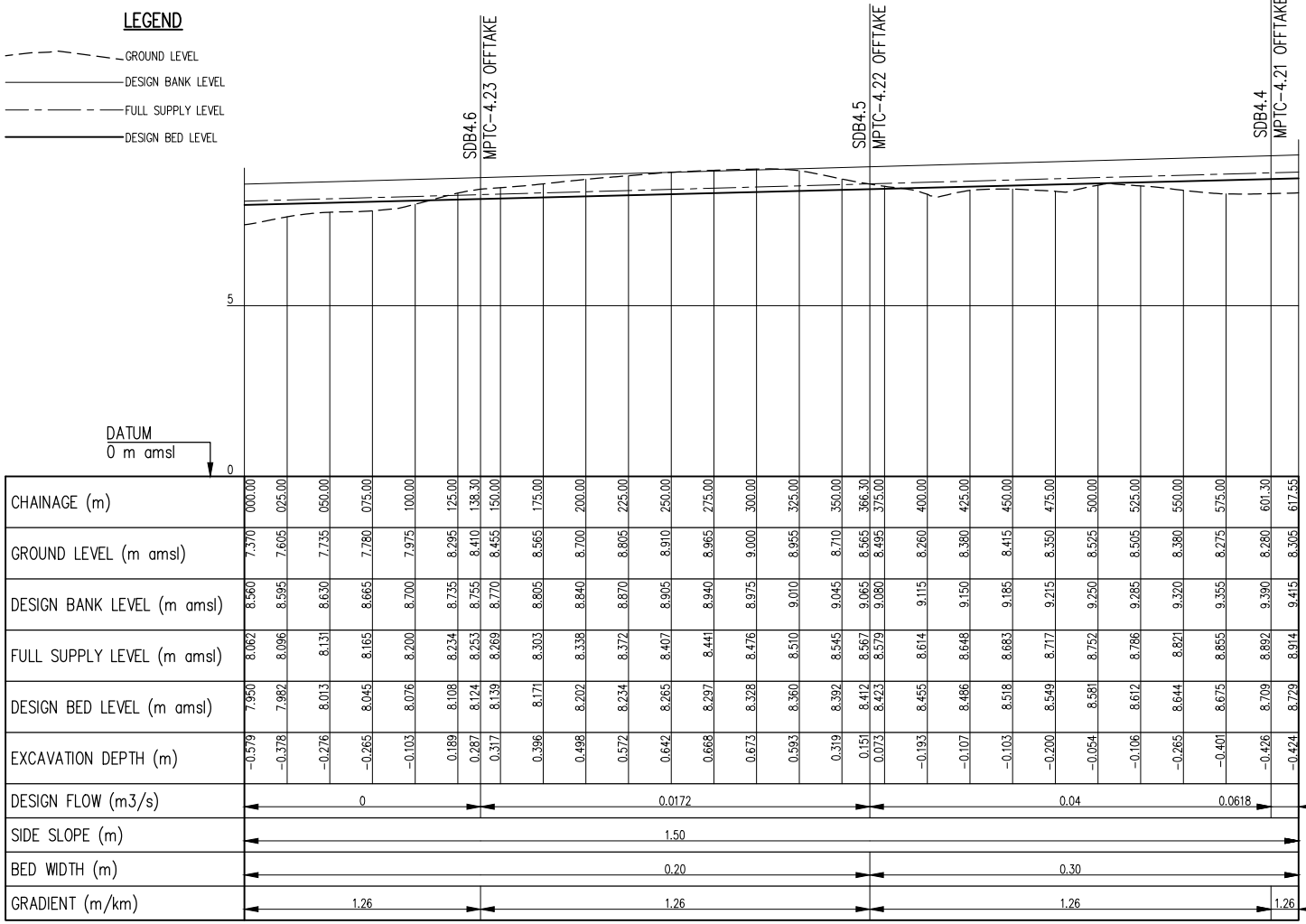
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MPSC-4.1 CANAL
PLAN AND PROFILE

Date Feb. 2022	Sheet 01
Scale Hor 1:2000; Ver 1:100	PAPER SIZE A1
Dwg No. VIP/DD/21/07/34	



MPSC-4.2 PLAN
SCALE 1:2000



MPSC-4.2 PROFILE
SCALE: Hor 1:2000, Ver 1:100

CLIENT:
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PROJECT:
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Detailed Design of Mpepeni & Machame Irrigation Schemes

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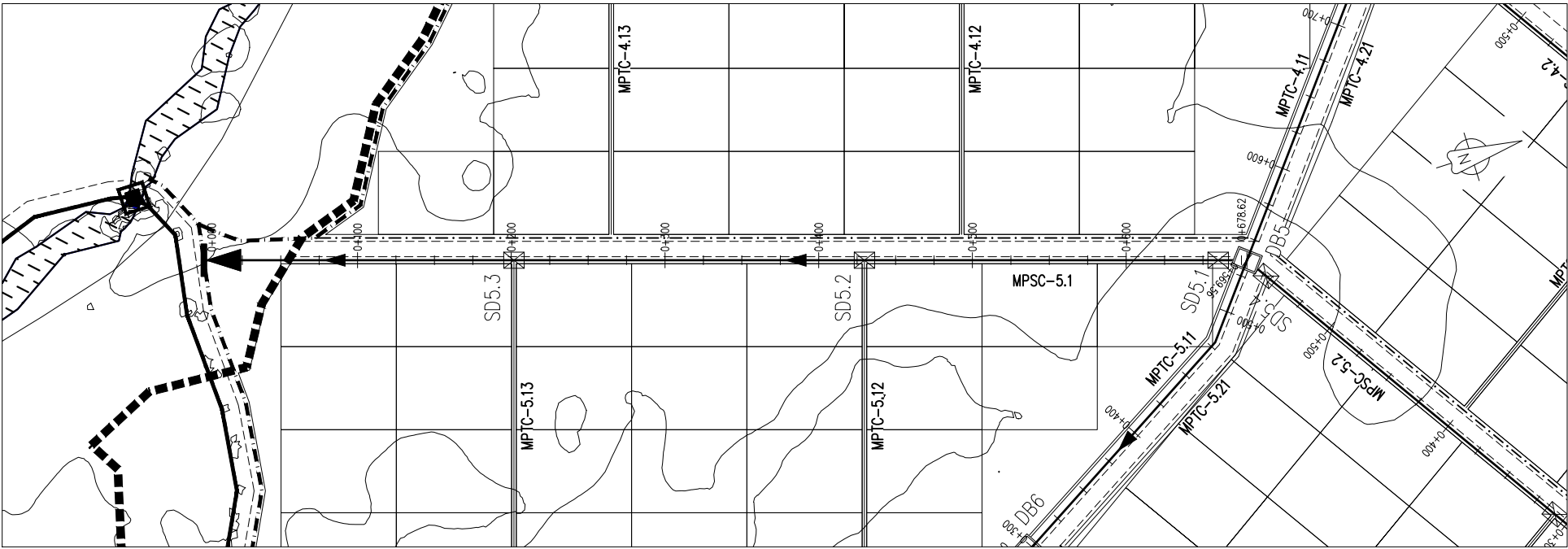
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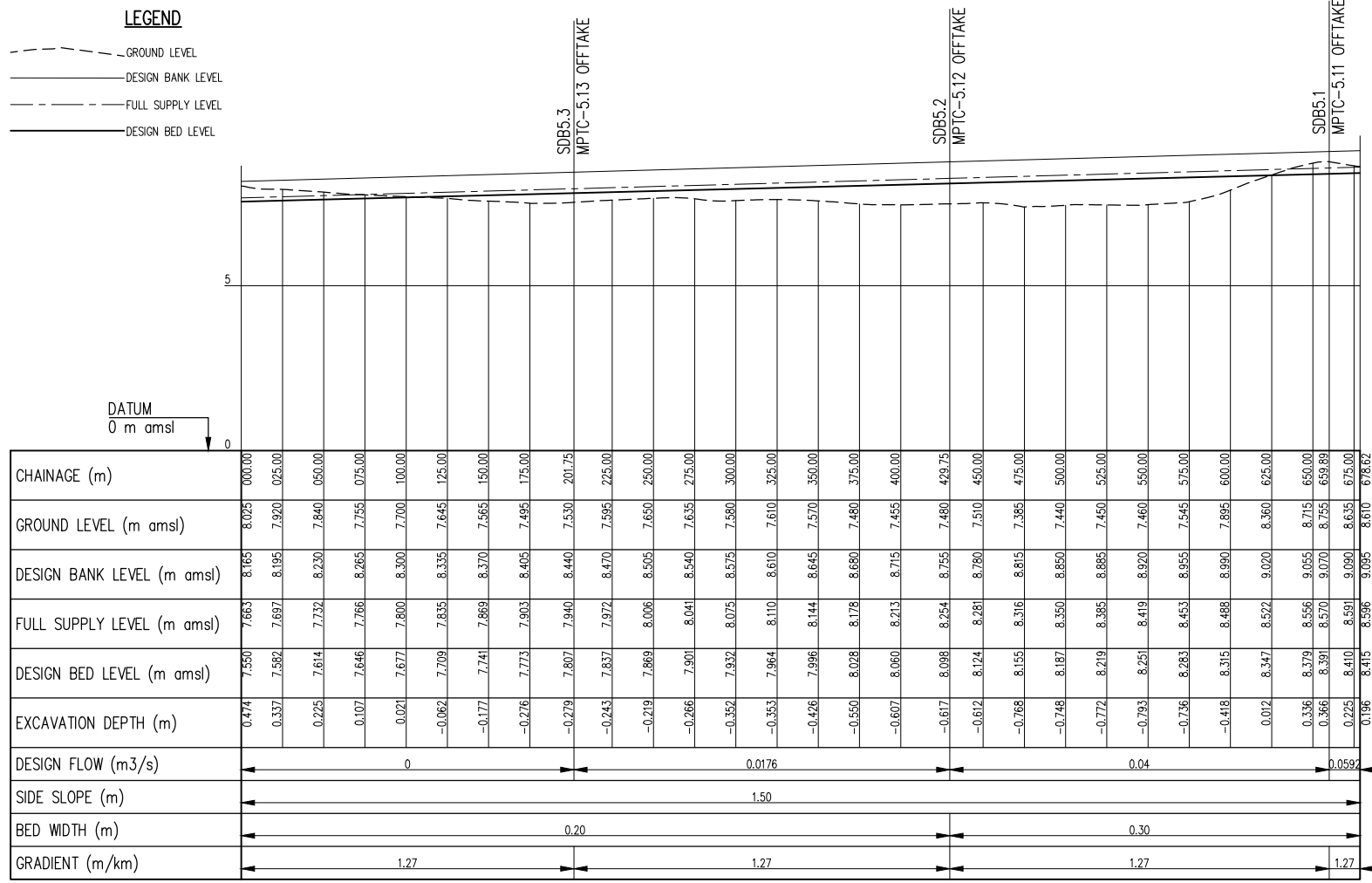
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MPSC-4.2 CANAL
PLAN AND PROFILE

Date Feb. 2022	Sheet 01
Scale Hor 1:2000; Ver 1:100	PAPER SIZE A1
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MPSC-5.1 PLAN
SCALE 1:2000



MPSC-5.1 PROFILE
SCALE: Hor 1:2000, Ver 1:100

CLIENT:
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PROJECT:
VANGA IRRIGATION CLUSTER
Detailed Design of Mpepeni & Machame Irrigation Schemes

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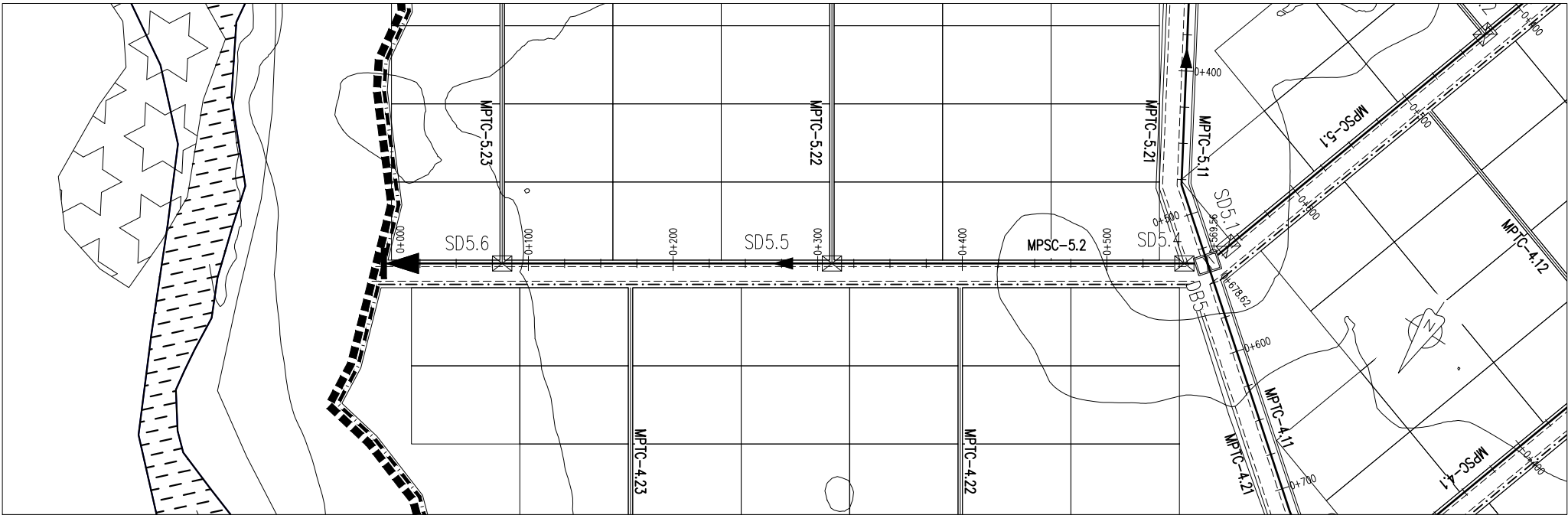
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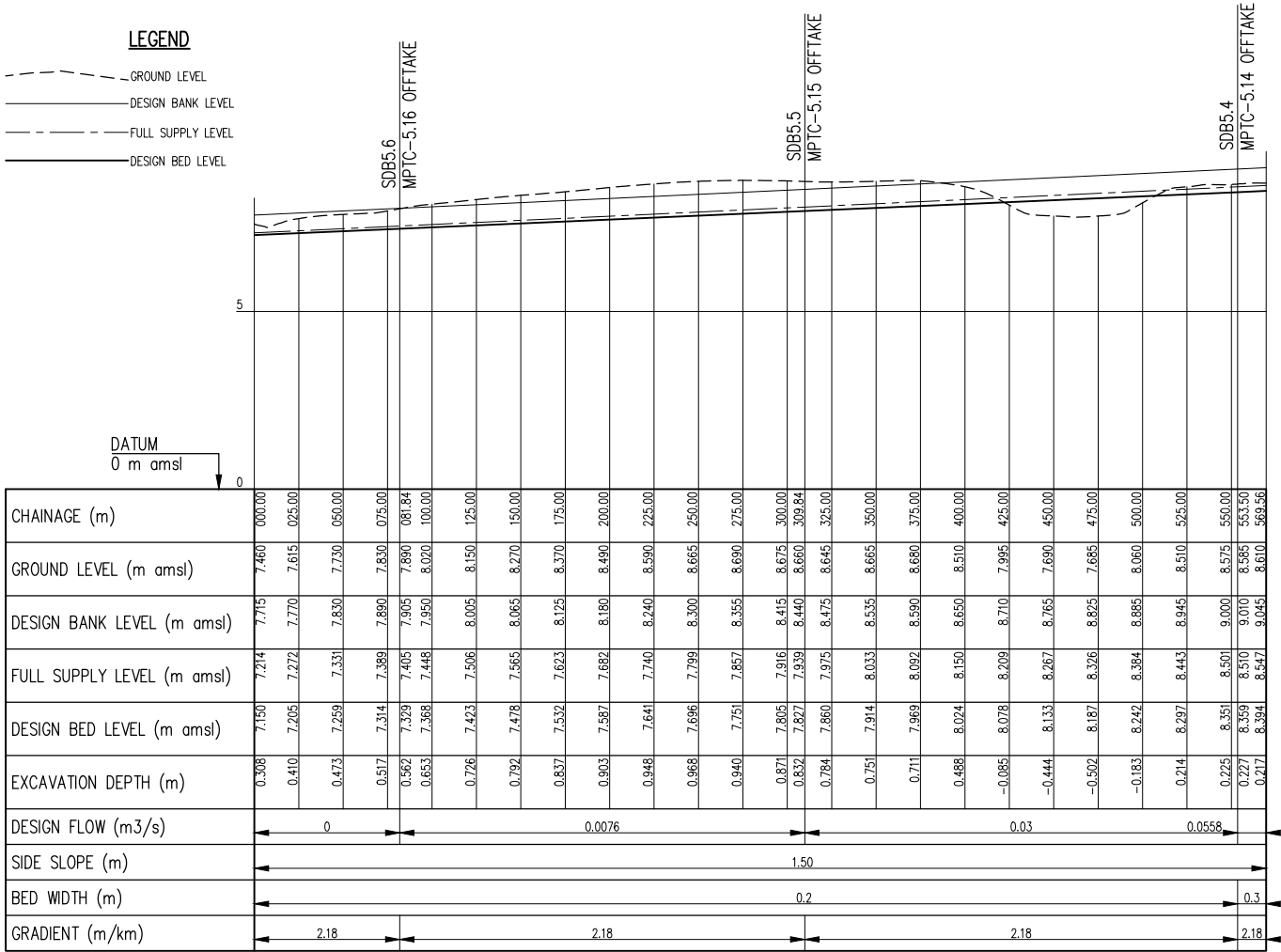
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MPSC-5.1 CANAL
PLAN AND PROFILE

Date Feb. 2022	Sheet 01
Scale Hor 1:2000; Ver 1:100	PAPER SIZE A1
Dwg No. VIP/DD/21/07/36	



MPSC-5.2 PLAN
SCALE 1:2000



MPSC-5.2 PROFILE
SCALE: Hor 1:2000, Ver 1:100

CLIENT:
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PROJECT:
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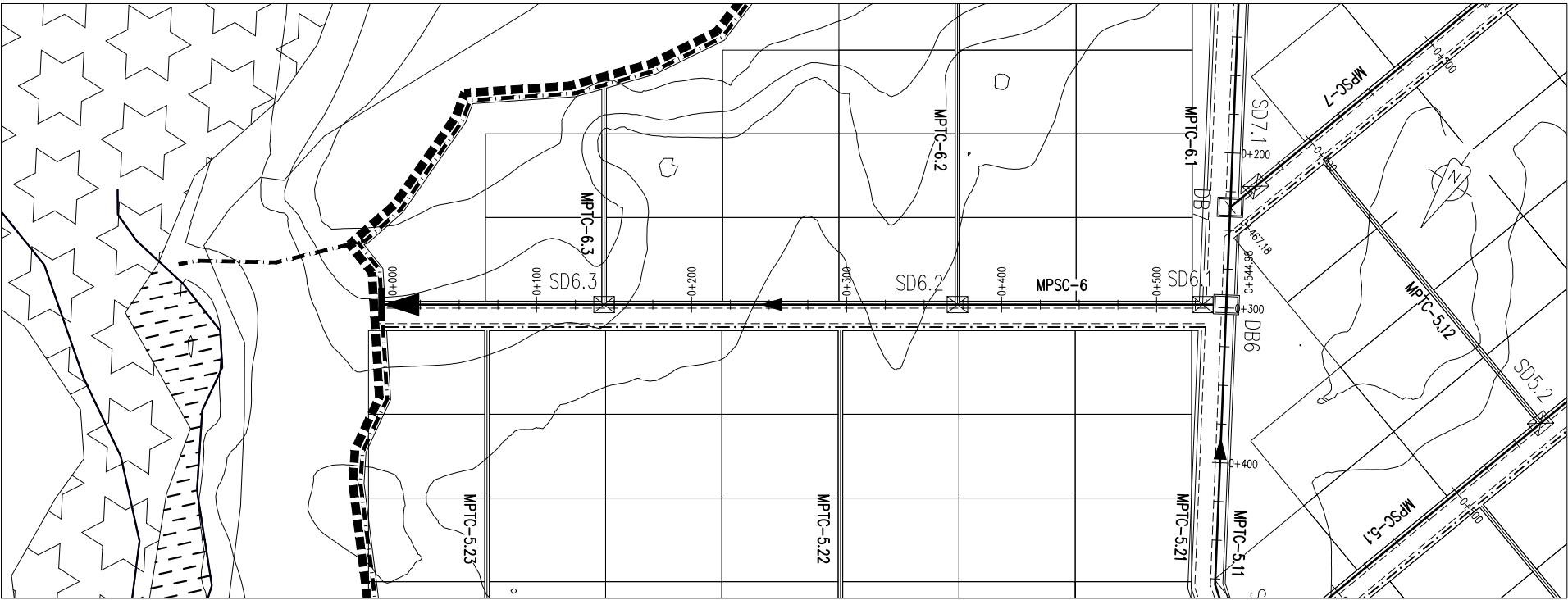
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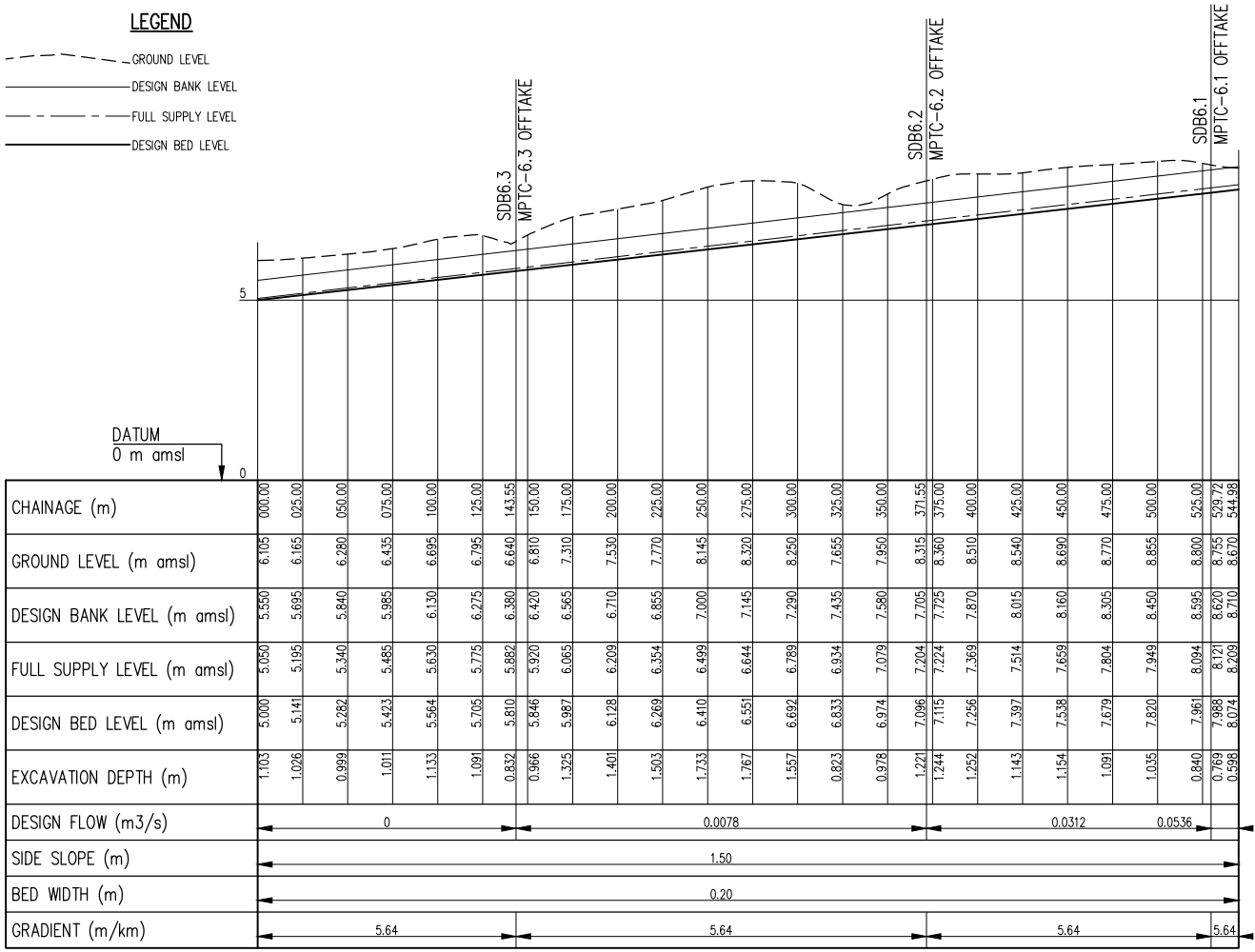
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MPSC-5.2 CANAL
PLAN AND PROFILE

Date Feb. 2022	Sheet 01
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MPSC-6 PLAN
SCALE 1: 2000



MPSC-6 PROFILE
SCALE: Hor 1:2000, Ver 1:100

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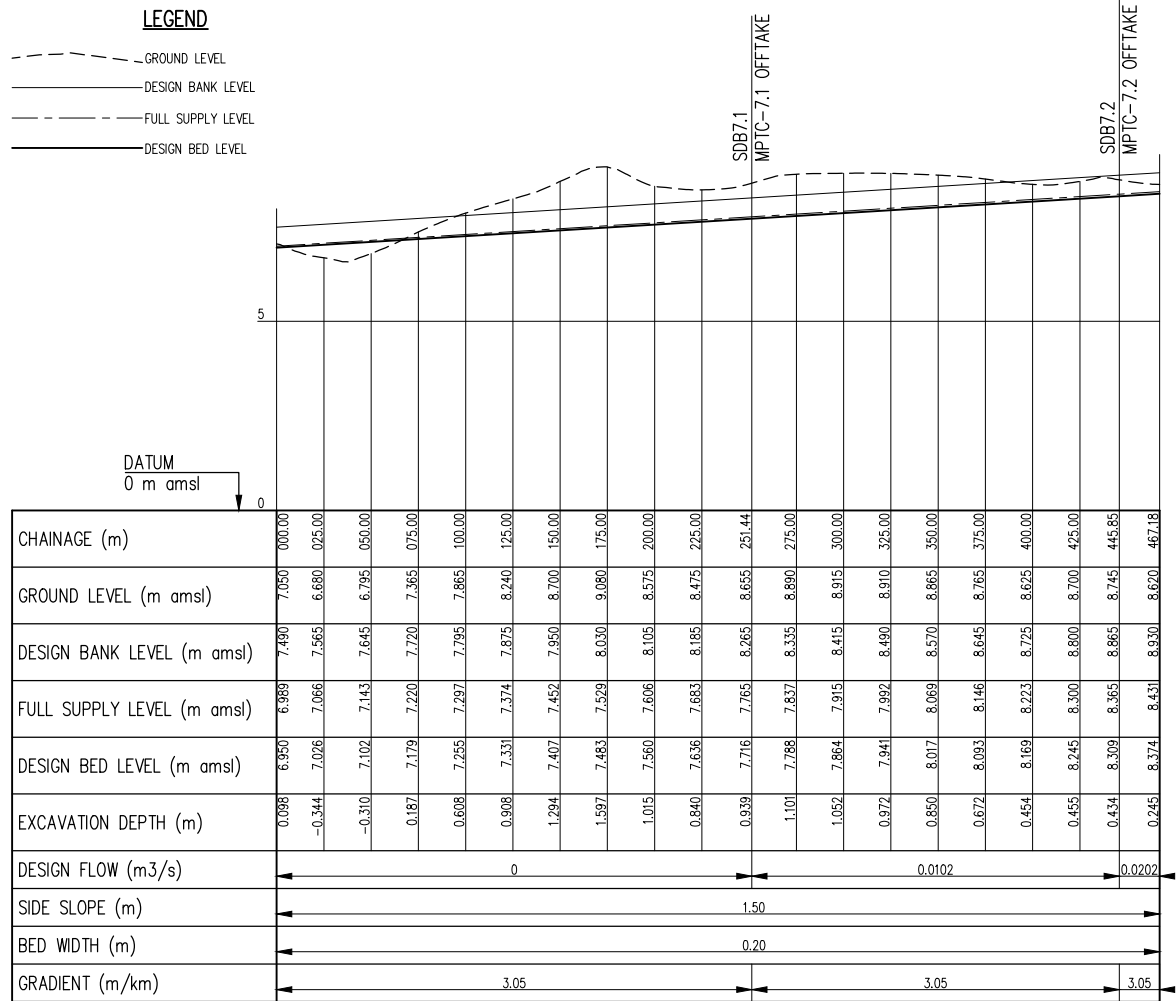
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MPSC-6 CANAL
PLAN AND PROFILE

Date Feb. 2022	Sheet 01
Scale Hor 1:2000; Ver 1:100	PAPER SIZE A1
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MPSC-7 PLAN
SCALE 1:2000



MPSC-7 PROFILE
SCALE: Hor 1:2000, Ver 1:100

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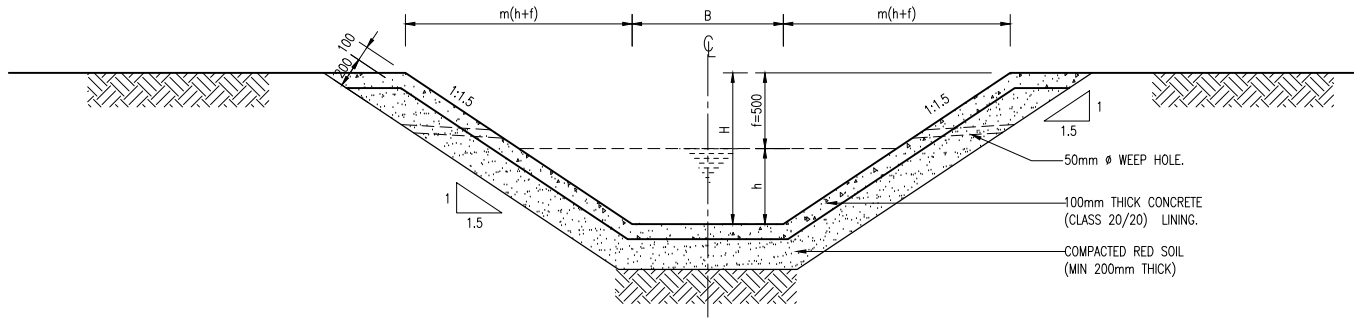
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MPSC-7 CANAL
PLAN AND PROFILE

Date Feb. 2022	Sheet 01
Scale Hor 1:2000; Ver 1:100	PAPER SIZE A1
Dwg No. VIP/DD/21/07/39	

NOTE:
B = CANAL BED WIDTH
h = DEPTH OF WATER
H = TOTAL CANAL DEPTH
f = FREE BOARD
1.5 = CANAL SIDE SLOPE



CONCRETE LINED CANAL CROSS SECTION
SCALE 1:25

SUMMARY TABLE OF DIMENSIONS (MACHAME AREA)

CANAL	CHAINAGE		BED WIDTH B (mm)	WATER DEPTH h (mm)	CANAL DEPTH H (mm)
	FROM (m)	TO (m)			
MMC	0.00	176.63	200.00	200.00	700.00
	176.63	347.23	200.00	300.00	800.00
	347.23	593.15	400.00	300.00	800.00
	593.15	837.15	600.00	300.00	800.00
	837.15	1081.15	600.00	400.00	900.00
	1081.15	1325.80	700.00	400.00	900.00
	1325.80	1717.03	750.00	400.00	900.00
	1717.03	1735.00	750.00	400.00	900.00
WMCC	1735.00	1894.13	750.00	400.00	900.00
	1894.13	2240.46	1000.00	500.00	1000.00
WMC	0.00	327.47	400.00	200.00	700.00
	327.47	667.36	500.00	200.00	700.00
	667.36	1138.56	500.00	300.00	800.00
	1138.56	1290.00	500.00	300.00	800.00
MSC1	0.00	258.87	300.00	-	-
	258.87	435.00	300.00	100.00	600.00
	435.00	625.41	300.00	100.00	600.00
	625.41	716.38	400.00	200.00	700.00
	716.38	724.42	400.00	200.00	700.00
MSC2	0.00	88.45	0.00	-	-
	88.45	253.45	300.00	100.00	600.00
	253.45	418.45	400.00	100.00	600.00
	418.45	583.45	400.00	200.00	700.00
	583.45	749.17	400.00	200.00	700.00
MSC3	0.00	146.56	0.00	-	-
	146.56	311.56	300.00	100.00	600.00
	311.56	476.56	300.00	200.00	700.00
	476.56	641.26	300.00	200.00	700.00
	641.26	803.29	300.00	200.00	700.00
MSC4	0.00	131.41	0.00	-	-
	131.41	296.46	300.00	100.00	600.00
	296.46	461.41	300.00	200.00	700.00
	461.41	626.41	300.00	200.00	700.00
	626.41	787.78	300.00	200.00	700.00
MSC5	0.00	142.38	0.00	-	-
	142.38	307.38	300.00	100.00	600.00
	307.38	472.38	300.00	200.00	700.00
	472.38	637.38	300.00	200.00	700.00
	637.38	798.73	300.00	200.00	700.00
MSC6	0.00	174.40	0.00	500.00	0.00
	174.40	339.40	300.00	200.00	700.00
	339.40	504.40	300.00	200.00	700.00
	504.40	669.40	300.00	200.00	700.00
	669.40	830.50	300.00	200.00	700.00
MSC7	0.00	462.50	0.00	-	-
	462.50	697.53	300.00	200.00	700.00
	697.53	705.78	300.00	200.00	700.00

SUMMARY TABLE OF DIMENSIONS (WAGA AREA)

CANAL	CHAINAGE		BED WIDTH B (mm)	WATER DEPTH h (mm)	CANAL DEPTH H (mm)
	FROM (m)	TO (m)			
WSC1	0.00	108.51	0.00	-	-
	108.51	273.51	200.00	100.00	600.00
	273.51	438.51	200.00	200.00	700.00
	438.51	603.35	200.00	200.00	700.00
	603.35	730.85	200.00	200.00	700.00
WSC2	0.00	92.71	0.00	-	-
	92.71	257.71	300.00	100.00	600.00
	257.71	422.71	300.00	100.00	600.00
	422.71	587.71	300.00	200.00	700.00
	587.71	752.71	300.00	200.00	700.00
WSC3	0.00	73.13	0.00	-	-
	73.13	238.13	200.00	100.00	600.00
	238.13	403.13	200.00	200.00	700.00
	403.13	412.09	300.00	200.00	700.00
	412.09	0.00	300.00	200.00	700.00
WSC4	0.00	132.22	0.00	-	-
	132.22	297.22	200.00	100.00	600.00
	297.22	316.51	200.00	200.00	700.00
	316.51	0.00	200.00	200.00	700.00
	0.00	22.25	0.00	-	-
WSC5	22.25	187.25	200.00	100.00	600.00
	187.25	195.68	200.00	200.00	700.00
	195.68	0.00	200.00	200.00	700.00

SUMMARY TABLE OF DIMENSIONS (MPEPENI AREA)

CANAL	CHAINAGE		BED WIDTH B (mm)	WATER DEPTH h (mm)	CANAL DEPTH H (mm)
	FROM (m)	TO (m)			
MPMC	0.00	235.02	0.00	-	-
	235.02	297.89	400.00	200.00	700.00
	297.89	535.95	400.00	200.00	700.00
	535.95	787.13	600.00	300.00	800.00
	787.13	1052.13	700.00	400.00	900.00
MPSC2	0.00	227.23	0.00	-	-
	227.23	234.42	200.00	200.00	700.00
	234.42	229.01	0.00	-	-
	229.01	384.56	300.00	100.00	600.00
	384.56	391.93	300.00	200.00	700.00
MPSC4.1	0.00	73.05	0.00	-	-
	73.05	301.05	200.00	200.00	700.00
	301.05	556.93	300.00	200.00	700.00
	556.93	575.23	300.00	200.00	700.00
	575.23	138.30	0.00	-	-
MPSC4.2	0.00	138.30	0.00	-	-
	138.30	366.30	200.00	200.00	700.00
	366.30	601.30	300.00	200.00	700.00
	601.30	617.55	300.00	200.00	700.00
	617.55	201.75	0.00	-	-
MPSC5.1	0.00	201.75	0.00	-	-
	201.75	429.75	200.00	200.00	700.00
	429.75	659.89	300.00	200.00	700.00
	659.89	678.62	300.00	200.00	700.00
	678.62	81.84	0.00	-	-
MPSC5.2	0.00	81.84	0.00	-	-
	81.84	309.84	200.00	100.00	600.00
	309.84	553.50	200.00	200.00	700.00
	553.50	569.56	300.00	200.00	700.00
	569.56	143.55	0.00	-	-
MPSC6	0.00	143.55	0.00	-	-
	143.55	371.55	200.00	100.00	600.00
	371.55	529.72	200.00	200.00	700.00
	529.72	544.98	200.00	200.00	700.00
	544.98	0.00	0.00	-	-
MPSC7	0.00	251.44	0.00	-	-
	251.44	445.85	200.00	100.00	600.00
	445.85	467.18	200.00	100.00	600.00

CLIENT:
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Irrigation
Maji House, Nairobi



National Irrigation Authority
Unyanyizi House, Lenana Road
P.O.Box 30372-00100 Nairobi



Kwale County Government



PROJECT:
VANGA IRRIGATION CLUSTER
Detailed Design of Mpepeni &
Machame Irrigation Schemes

CONSULTANT:
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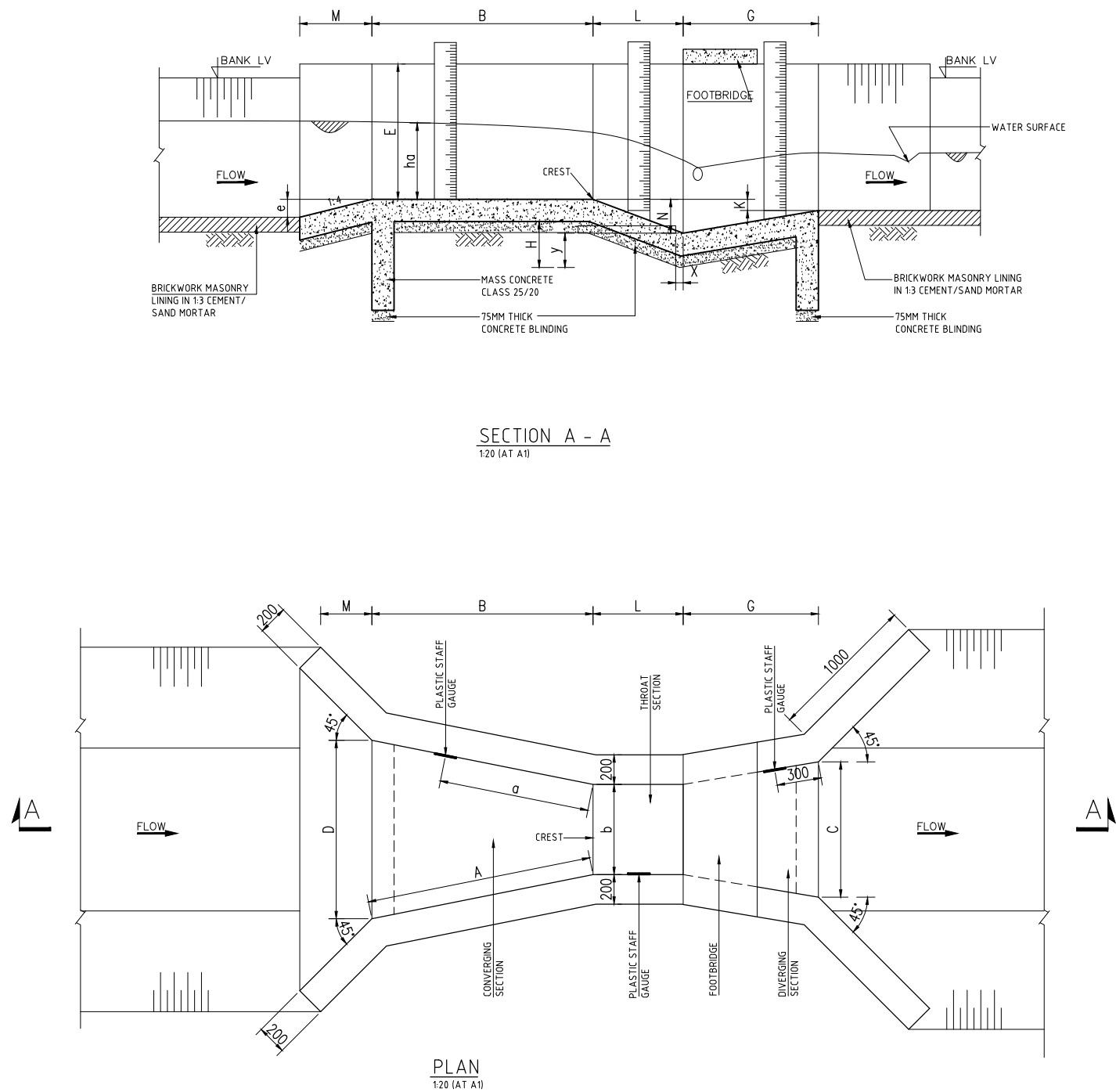
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DRAWING TITLE & DESCRIPTION:
CANAL CROSS - SECTIONS

Date
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PARSHALL FLUME SCHEDULES

TYPE	a (mm)	b (mm)	e (mm)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	G (mm)	H (mm)	K (mm)	L (mm)	M (mm)	N (mm)	x (mm)	y (mm)
PF 1	-	430	60	-	1142	1000	1000	500	1710	-	-	1200	-	-	-	-
PF 2	-	960	60	-	1376	274	274	300	2060	-	-	1200	-	-	-	-
PF 3	-	50	60	-	500	300	300	400	750	-	-	1200	-	-	-	-

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DRAWING TITLE & DESCRIPTION:
PARSHALL FLUME DETAILS

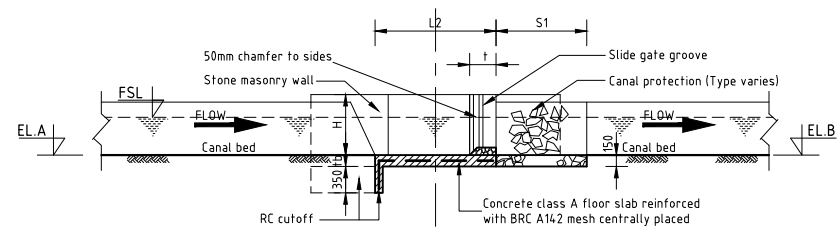
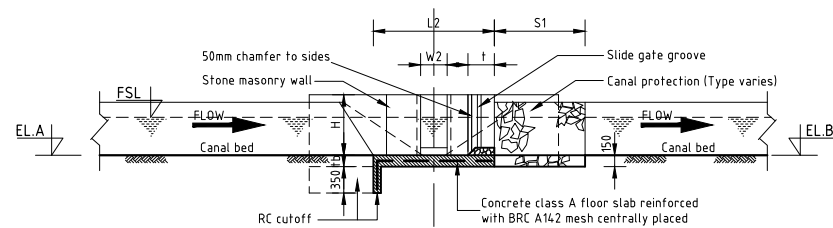
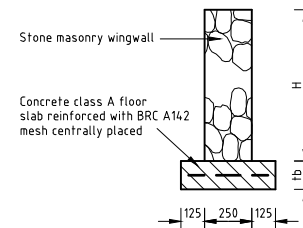
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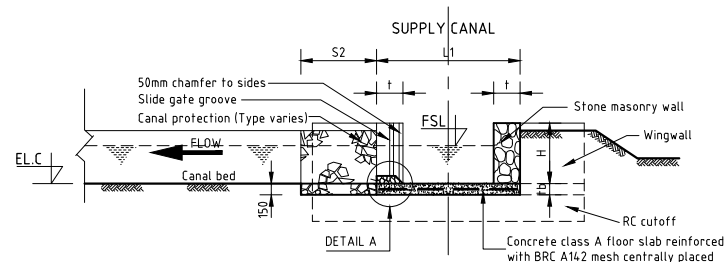
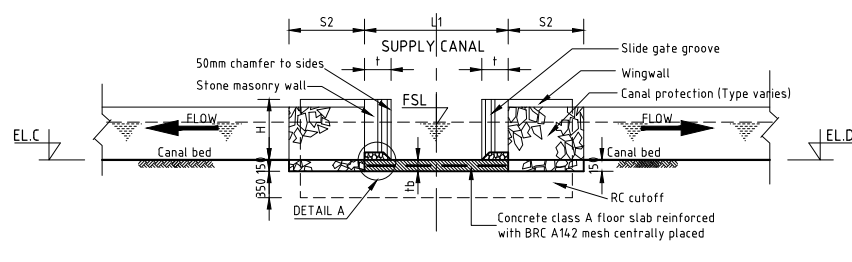
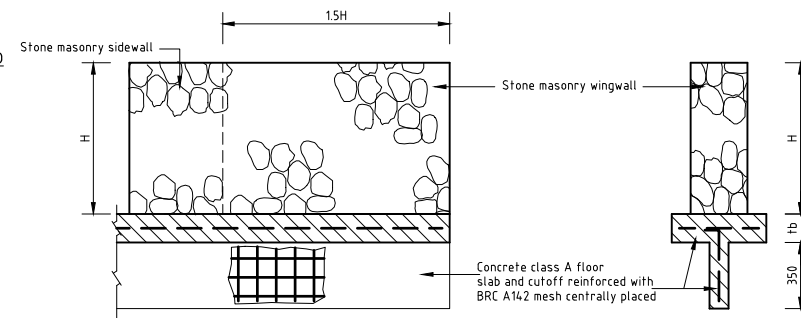
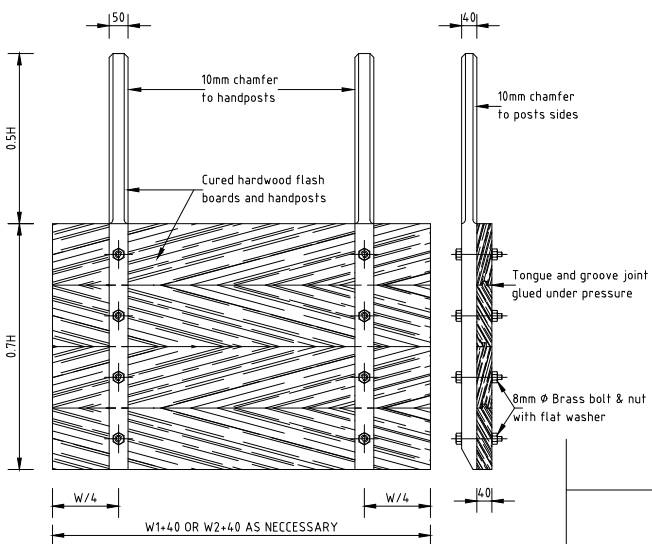
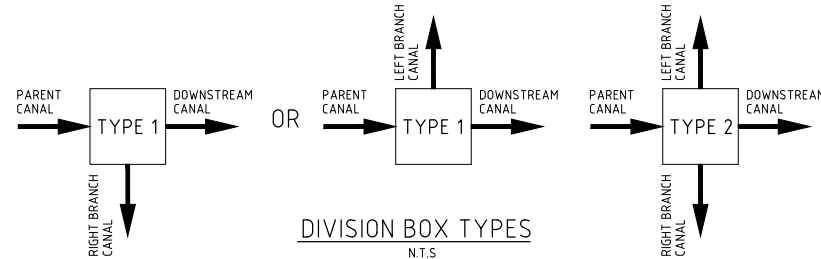
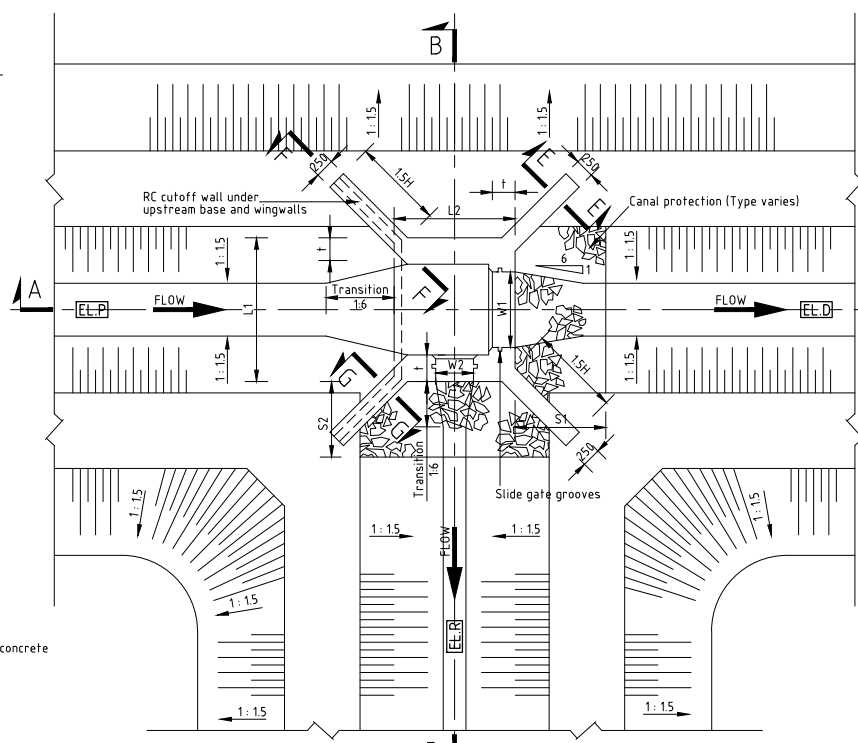
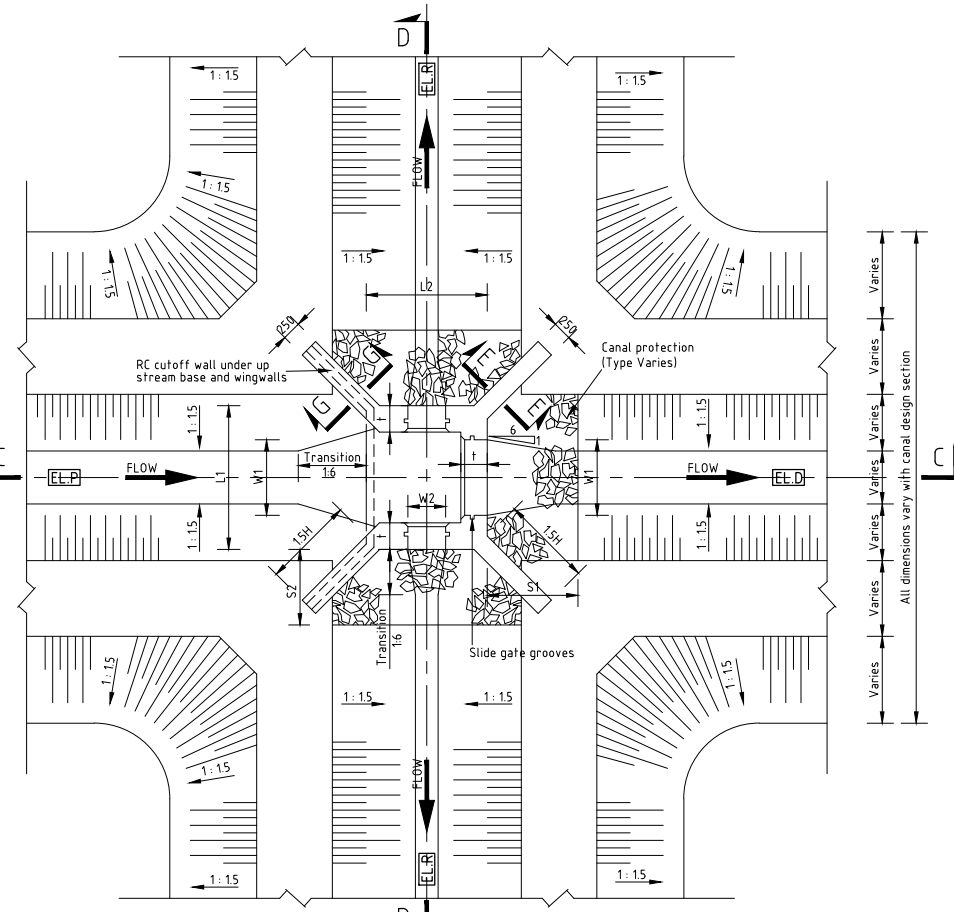
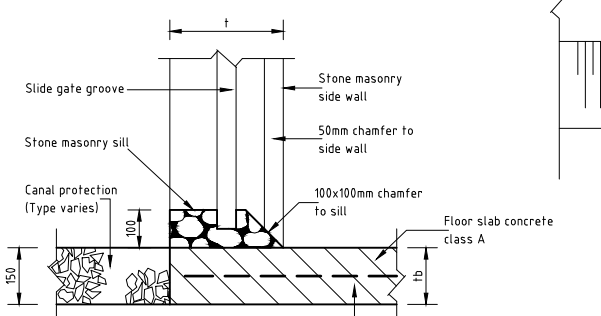
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PAPER SIZE A1

SECTION A-A
1:50 (AT A1)SECTION C-C
1:50 (AT A1)SECTION E-E
1:20 (AT A1)

NOTES

1. DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE INDICATED
2. LEVELS IN METRES ABOVE MEAN SEA LEVEL
3. REINFORCED CONCRETE CLASS A UNLESS OTHERWISE STATED
4. MASS CONCRETE CLASS C UNLESS OTHERWISE STATED
5. CHAMFER ALL EXPOSED CONCRETE EDGES - 25MM
6. CONCRETE TO BE PLACED ON SCARIFIED, COMPACTED IN-SITU MATERIAL. ANY OVER-EXCAVATION BELOW DESIGN LEVEL TO BE MADE UP WITH MASS CONCRETE ONLY.
7. BACKFILL TO STRUCTURE, INCLUDING CUTOFF WALLS TO BE PLACED ON HORIZONTAL, SCARIFIED AND WETTED IN-SITU MATERIAL.
8. WATER DEPTH GAUGE PLATES AS PER SPECIFICATION FROM INVERT LEVEL TO WALL TOP LEVEL.
9. EXCAVATION BELOW WEIR SLAB TO PROCEED IN 0.5M LAYERS UNTIL SUCH LEVEL AS APPROVED BY THE ENGINEER.
10. CANAL EROSION PROTECTION-
 - TYPE F - TIPPED ROCK AS PER SPECIFICATIONS
 - TYPE M - STONE MASONRY (RANDOM RUBBLE) IN 1:3 CEMENT SAND MORTAR

SECTION B-B
1:50 (AT A1)SECTION D-D
1:50 (AT A1)SECTION F-F
1:20 (AT A1)SECTION G-G
1:20 (AT A1)NOTE:
RC cutoff wall to upstream base and wingwalls onlyTYPICAL STOPLOG DETAILS
1:10 (AT A1)DIVISION BOX TYPES
N.T.S.PLAN
1:50 (AT A1)
TYPE 1PLAN
1:50 (AT A1)
TYPE 2DETAIL 'A'
1:10 (AT A1)

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DIVISION BOX DETAILS

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