

**Ministry of Works, Transport and Communications  
Reli Assets Holding Company  
United Republic of Tanzania**

**Preparatory Survey on  
Flood Protection Measures for  
Central Railway Line  
in the United Republic of Tanzania**

**Final Report  
Volume 3: Appendices Related to Drawings**

**July 2016**

**JAPAN INTERNATIONAL COOPERATION AGENCY**

**PADECO Co., Ltd.**

**Nippon Koei Co., Ltd.**

**Japan International Consultants for Transportation Co., Ltd.**

**Fukken Engineering Co., Ltd.**

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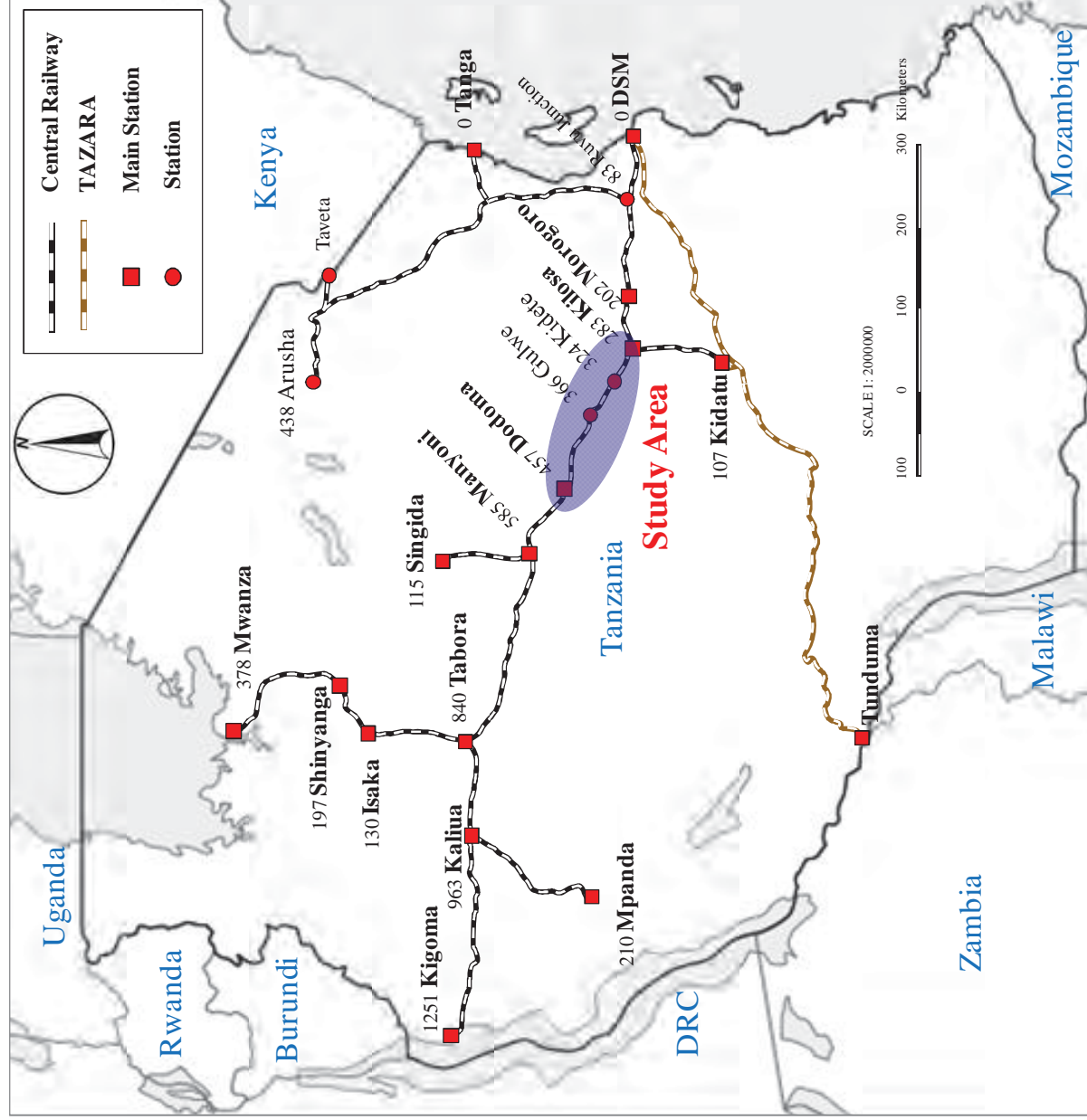
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GOVERNMENT AGENCIES:



Rail Assets Holding Company (RAHCO), Tanzania

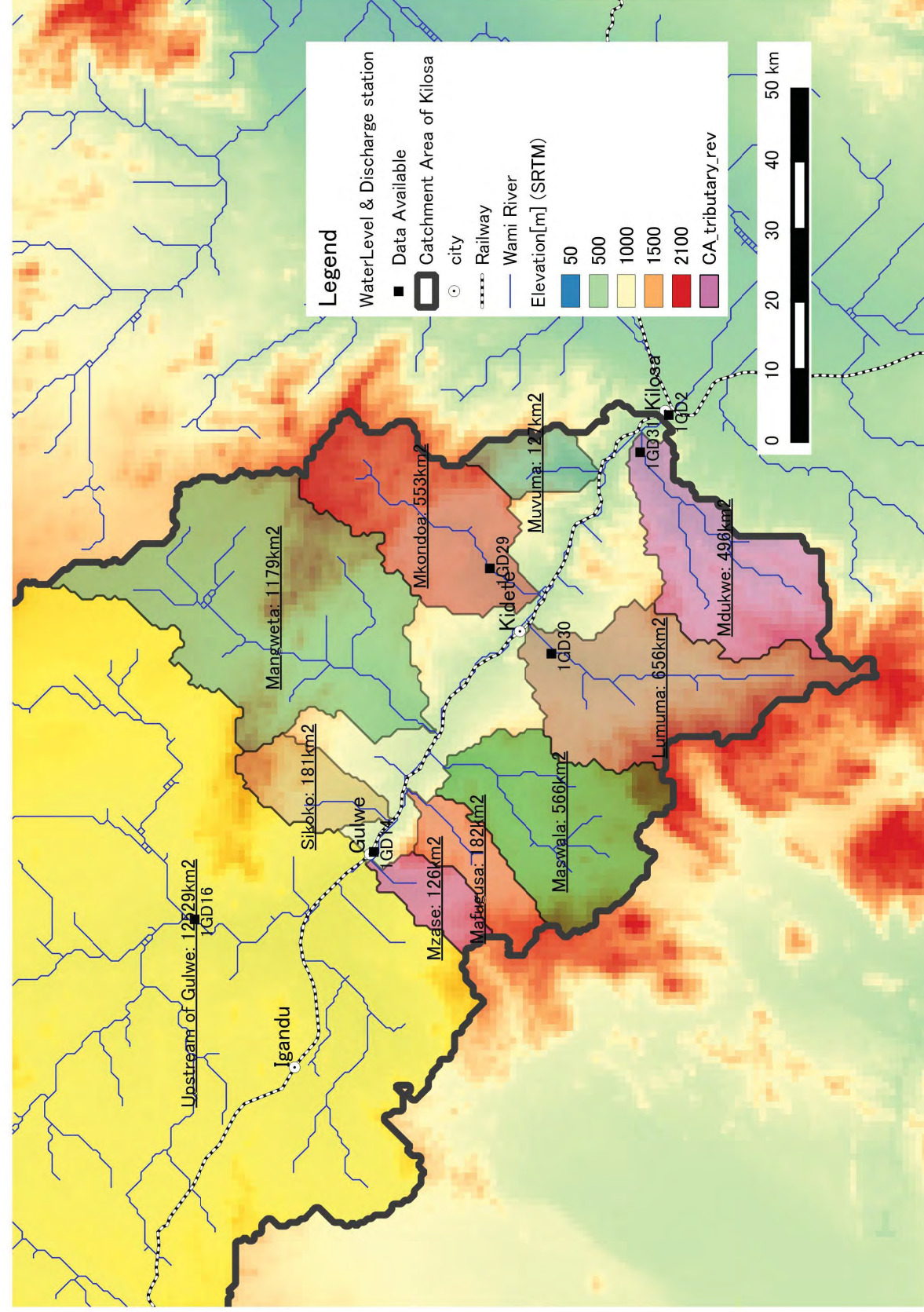
JICA STUDY TEAM:  
PADECO Co., Ltd.,  
Nippon Koei Co., Ltd.,  
Japan International Consultants for  
Transportation Co., Ltd., and  
Fukken Engineering Co., Ltd.

PROJECT & LOCATION:  
PREPARATORY SURVEY ON FLOOD  
PROTECTION MEASURES  
FOR CENTRAL RAILWAY LINE IN THE  
UNITED REPUBLIC OF TANZANIA

SHEET CONTENTS:

Project Location Map

DWG NUM



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Rail Assets Holding Company (RAHCO), Tanzania

JICA STUDY TEAM:  
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Japan International Consultants for  
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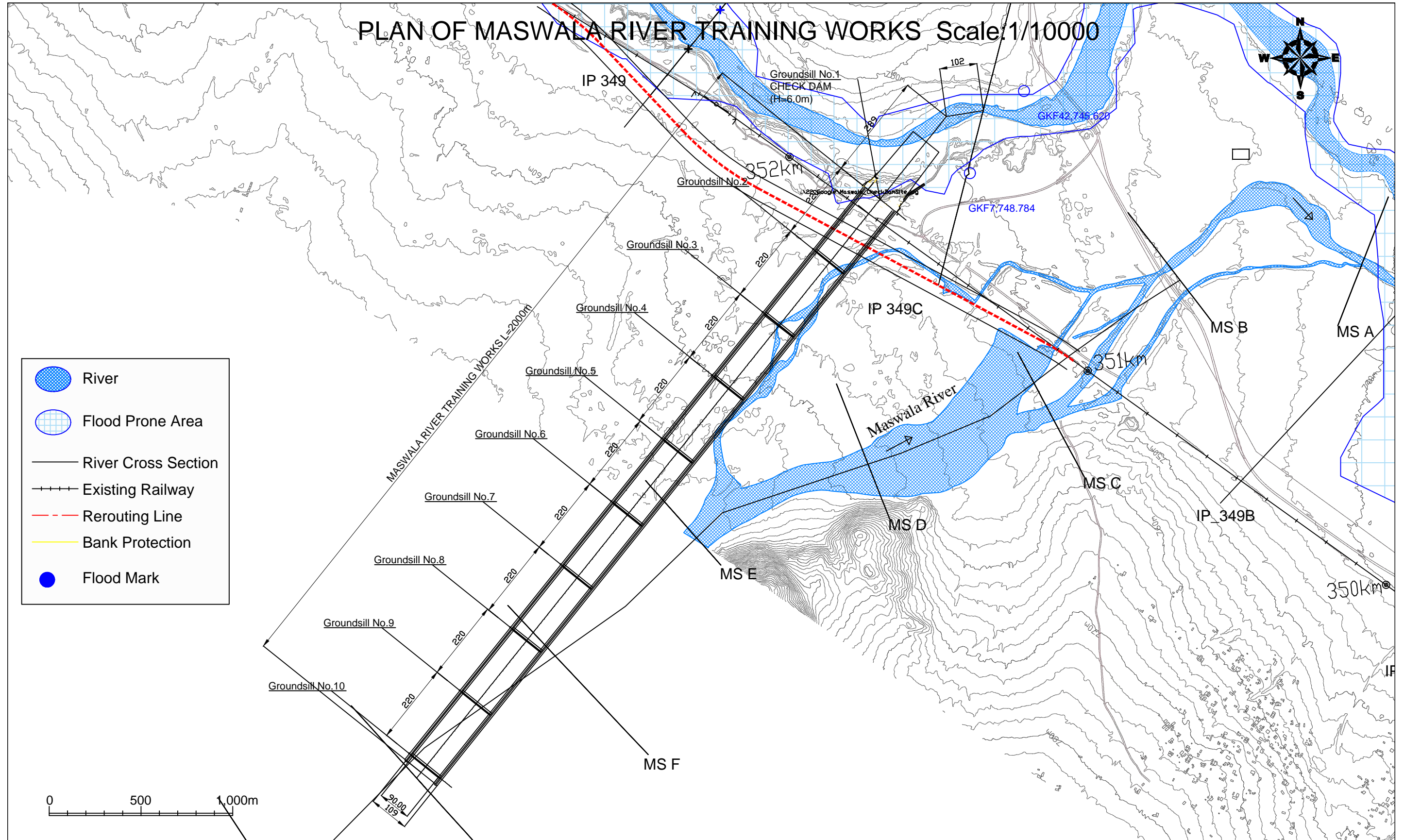
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






River Basin Map

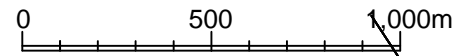
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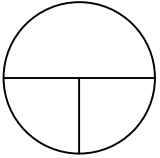


# PLAN OF MASWALA RIVER TRAINING WORKS Scale:1/10000



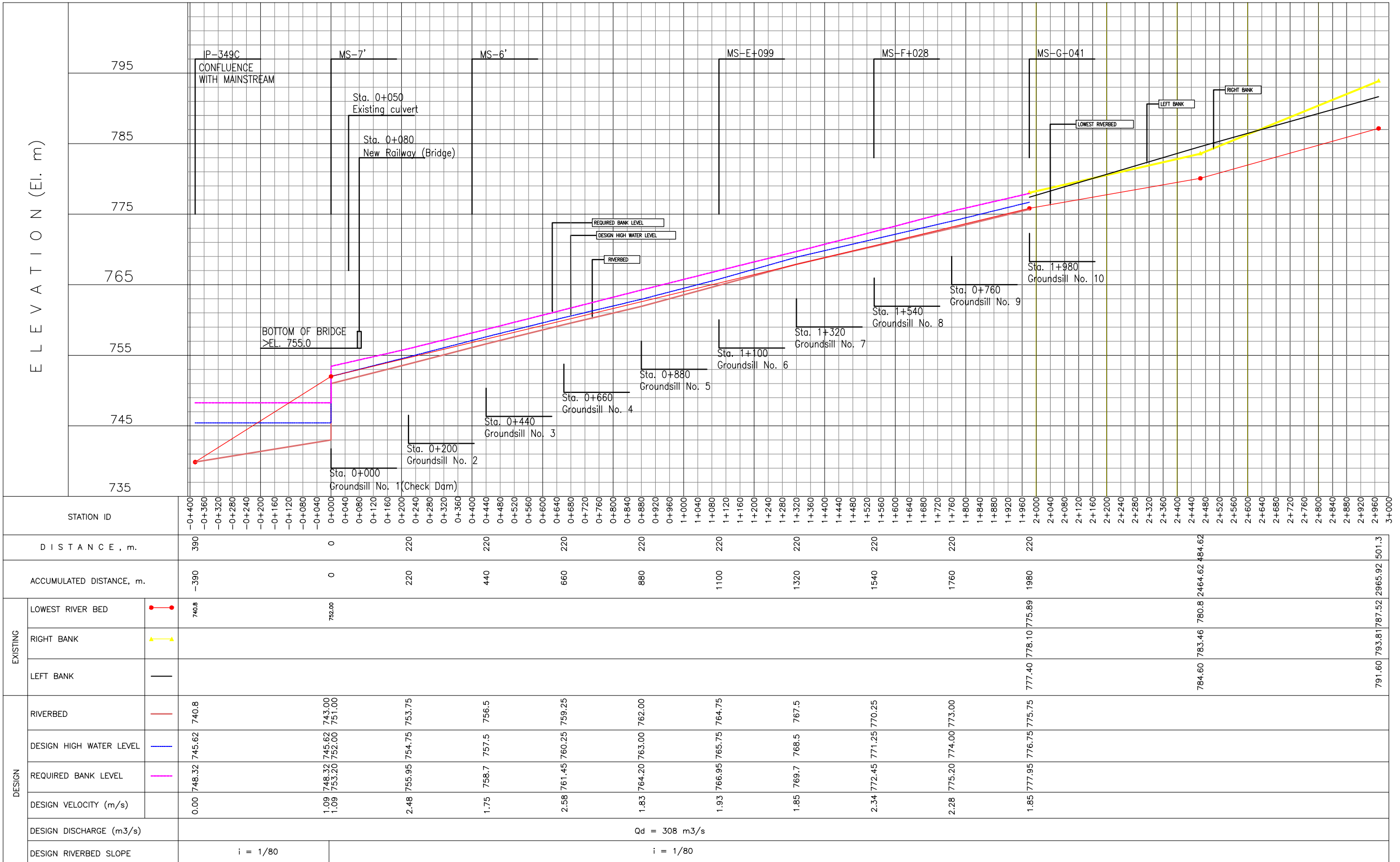
-  River
-  Flood Prone Area
-  River Cross Section
-  Existing Railway
-  Rerouting Line
-  Bank Protection
-  Flood Mark



GOVERNMENT AGENCIES:		JICA STUDY TEAM:		PROJECT & LOCATION:	SHEET CONTENTS:	DWG NUM
 JAPAN International Cooperation Agency	 Reli Assets Holding Company (RAHCO), Tanzania	PADECO Co., Ltd., Nippon Koei Co., Ltd., Japan International Consultants for Transportation Co., Ltd., and Fukken Engineering Co., Ltd.		Preparatory Survey on Flood Protection Measures for Central Railway Line in the United Republic of Tanzania	PLAN OF MASWALA RIVER TRAINING WORKS Scale:1/10000	

# LONGITUDINAL PROFILE OF MASWALA RIVER

Scale H: 1/10000  
V: 1/500

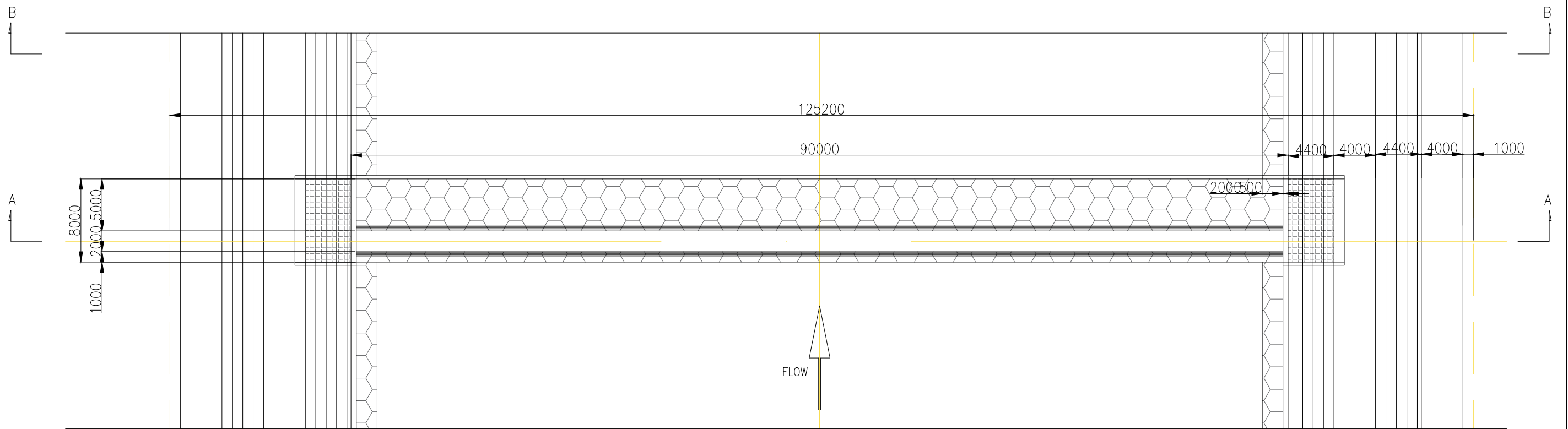


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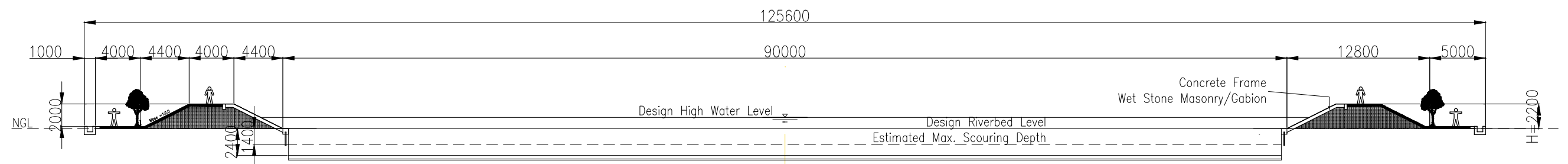


# TYPICAL SECTION OF RIVER CHANNEL AND GROUND SILL, AND PLAN OF GROUND SILL IN MASWALA RIVER

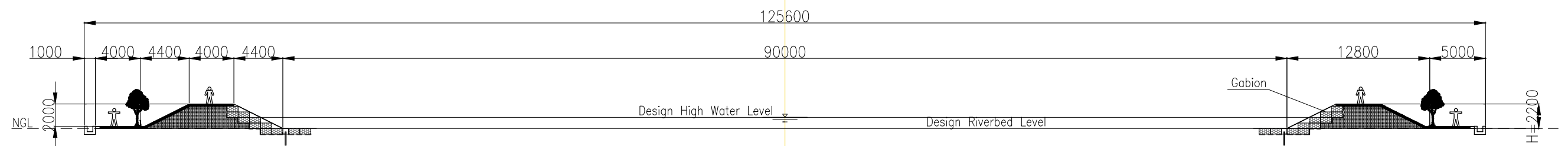
## Scale 1/400



SECTION A-A

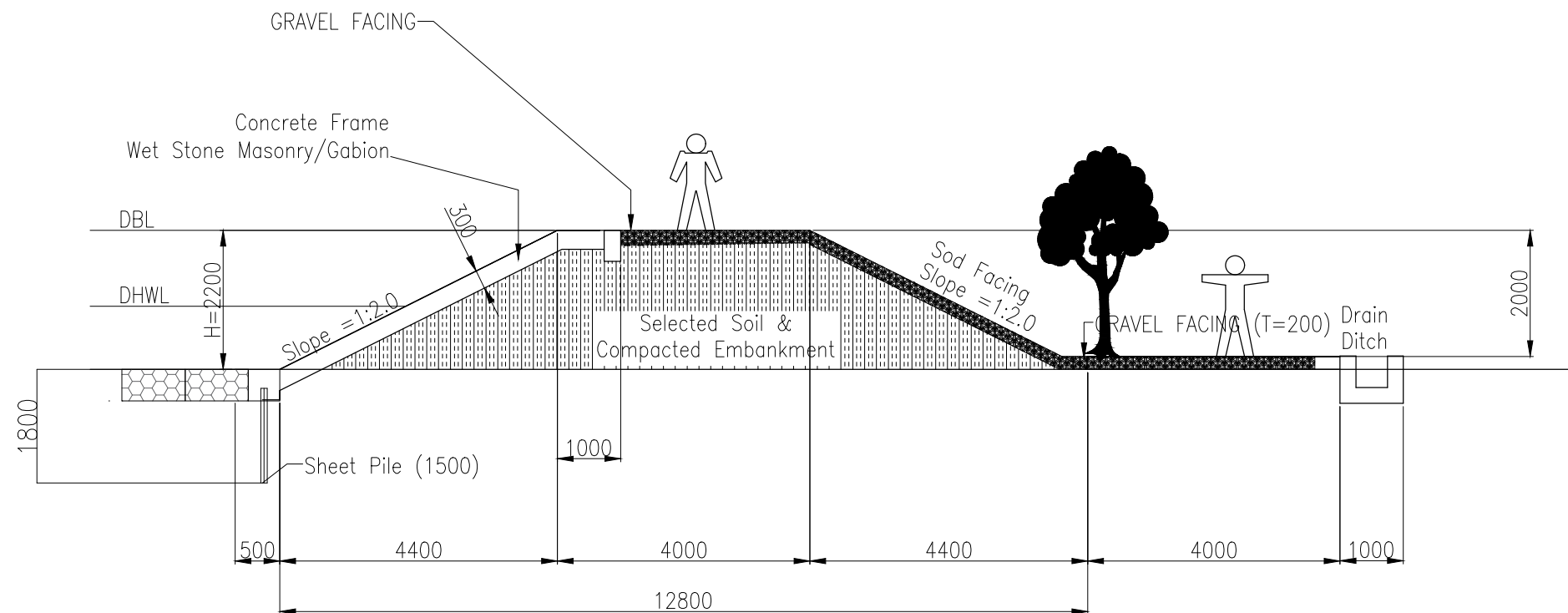
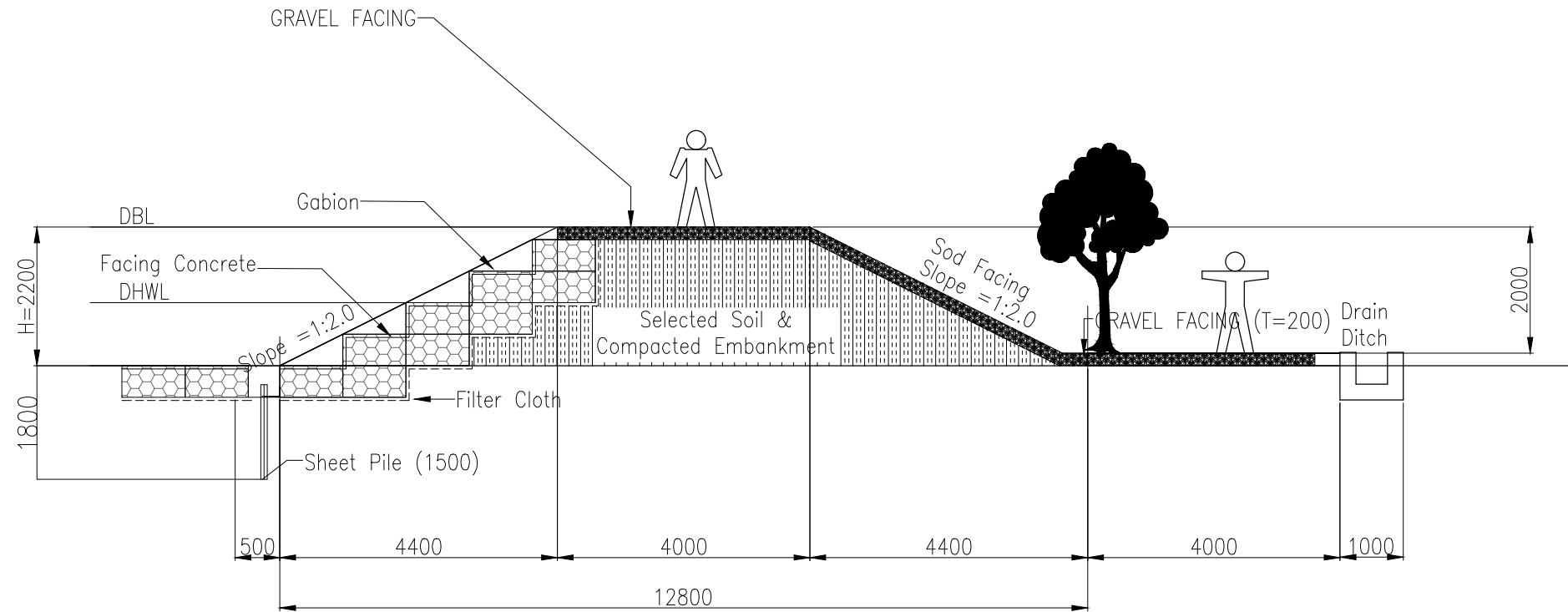




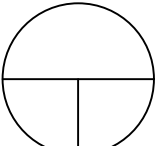
SECTION B-B



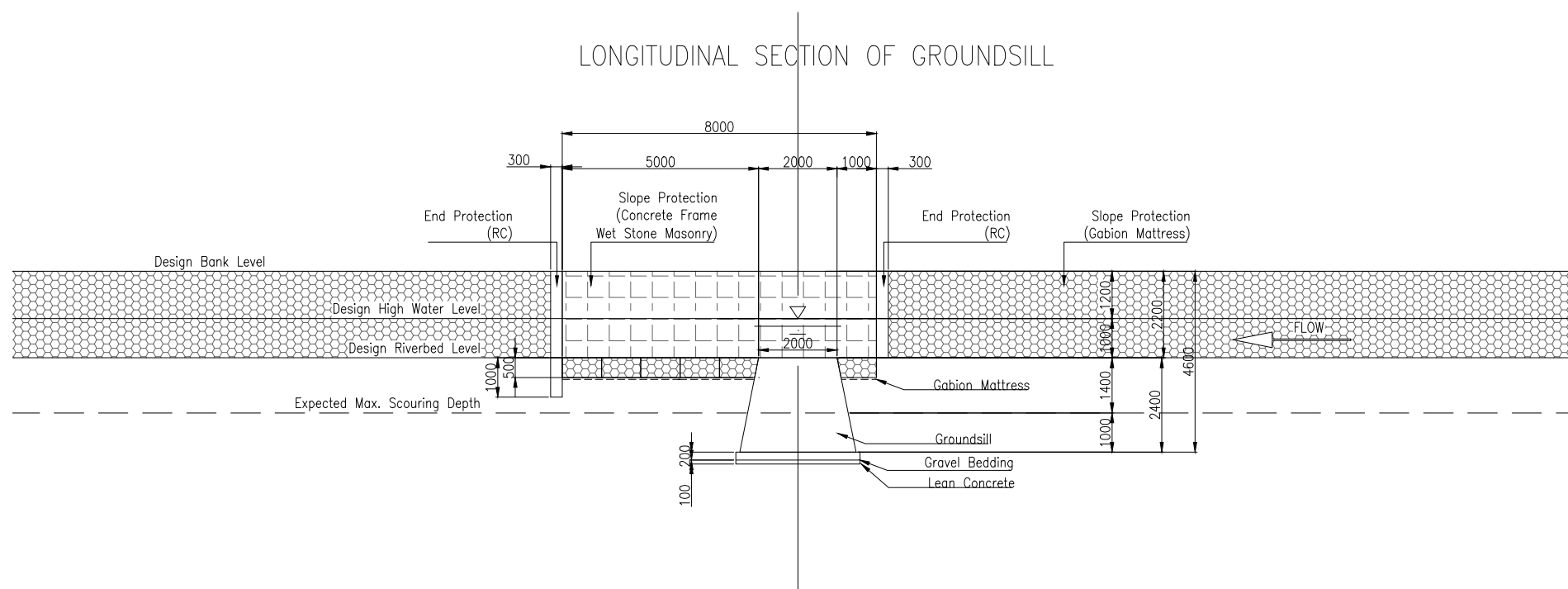
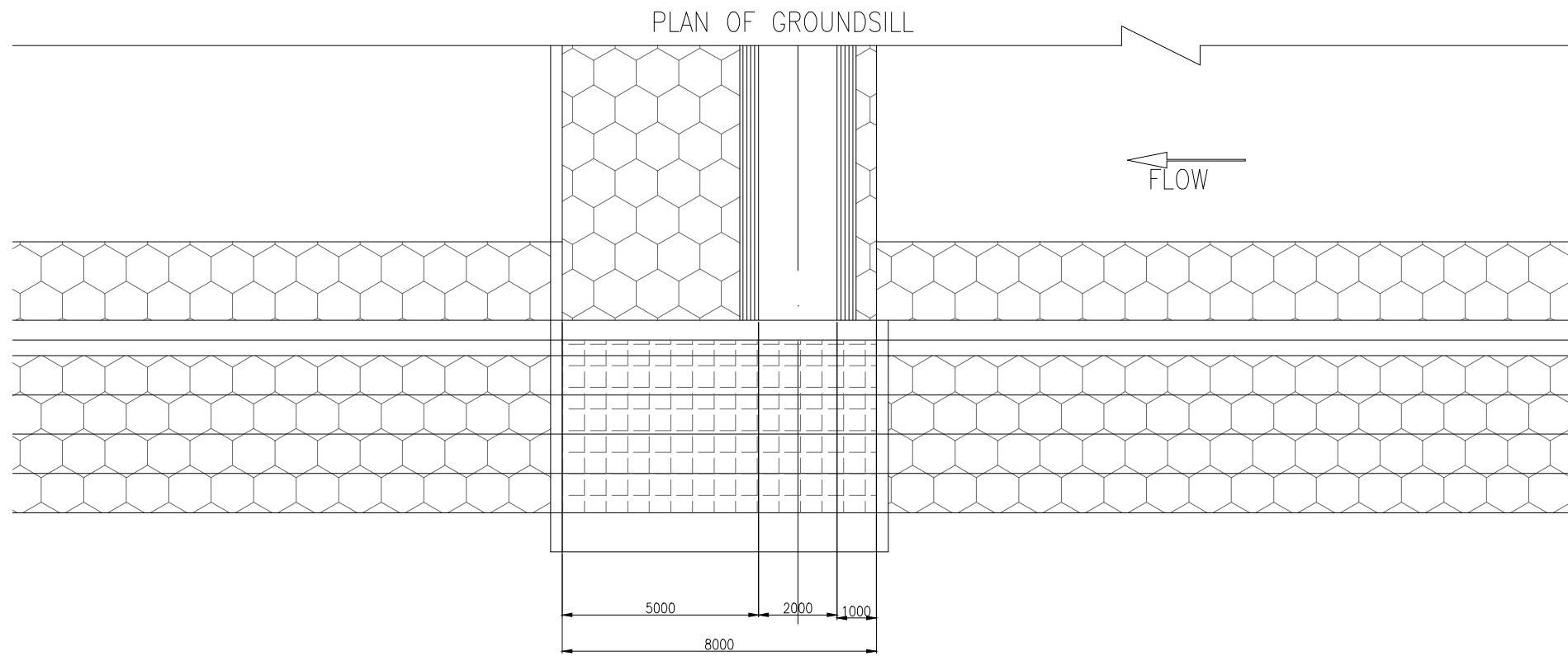
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<p>JAPAN International Cooperation Agency</p>	<p>Reli Assets Holding Company (RAHCO), Tanzania</p>	<p>PADECO Co., Ltd., Nippon Koei Co., Ltd., Japan International Consultants for Transportation Co., Ltd., and Fukken Engineering Co., Ltd.</p>	<p>Preparatory Survey on Flood Protection Measures for Central Railway Line in the United Republic of Tanzania</p>		



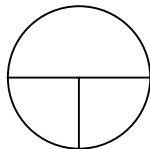
# TYPICAL SECTION OF DIKE AND BANK PROTECTION WORKS IN MASWALA RIVER TRAINING WORKS



GOVERNMENT AGENCIES:		JICA STUDY TEAM:	PROJECT & LOCATION:	SHEET CONTENTS:	DWG NUM
 JAPAN International Cooperation Agency	 Reli Assets Holding Company (RAHCO), Tanzania	PADECO Co., Ltd., Nippon Koei Co., Ltd., Japan International Consultants for Transportation Co., Ltd., and Fukken Engineering Co., Ltd.	Preparatory Survey on Flood Protection Measures for Central Railway Line in the United Republic of Tanzania	TYPICAL SECTION OF DIKE AND BANK PROTECTION WORKS IN MASWALA RIVER TRAINING WORKS	

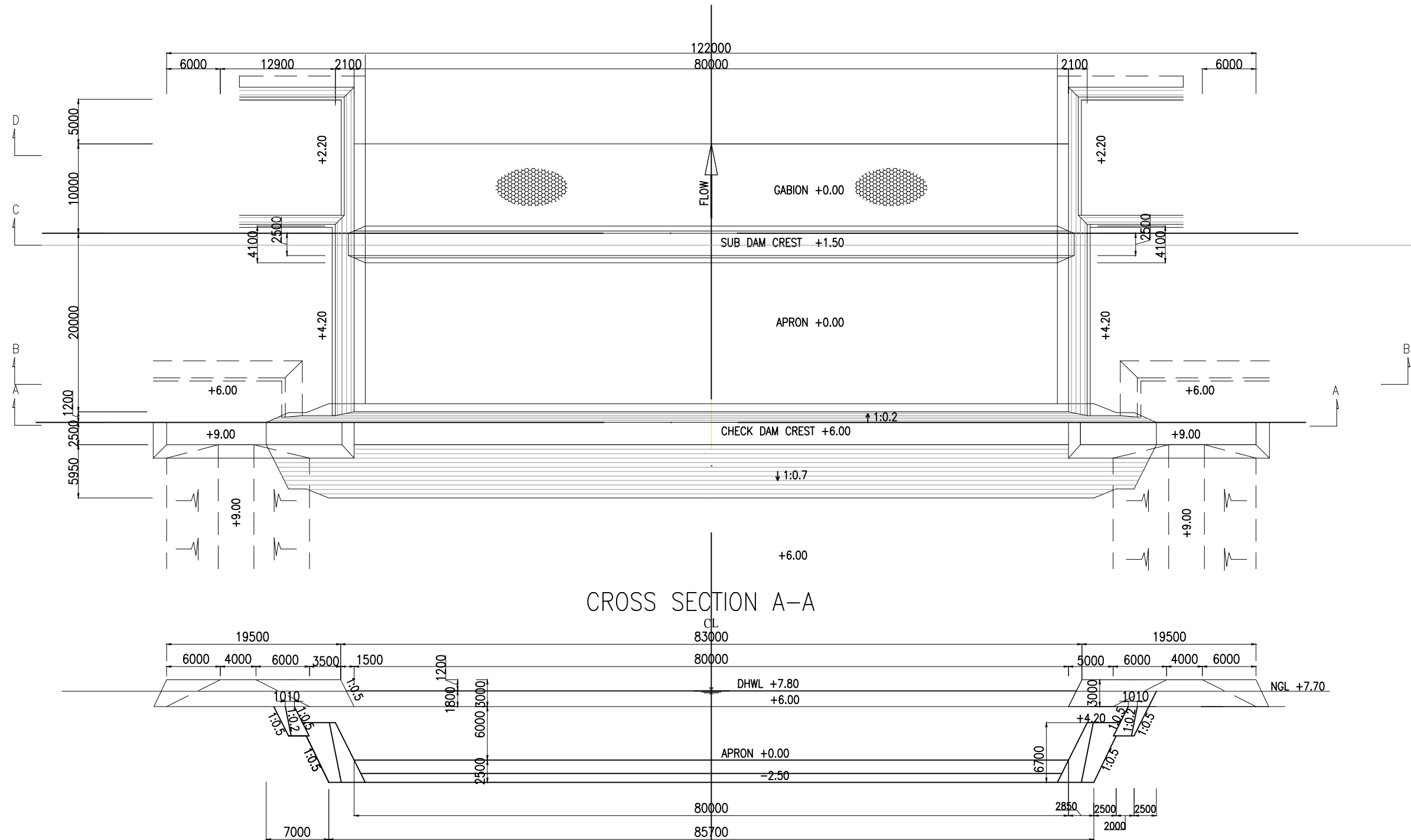
# LONGITUDINAL SECTION OF GROUNDSILL IN MASWALA RIVER TRAINING WORKS





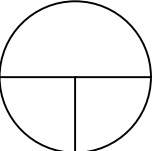
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# PLAN AND CROSS SECTION OF CHECK DAM IN MASWALA RIVER

Scale 1/500

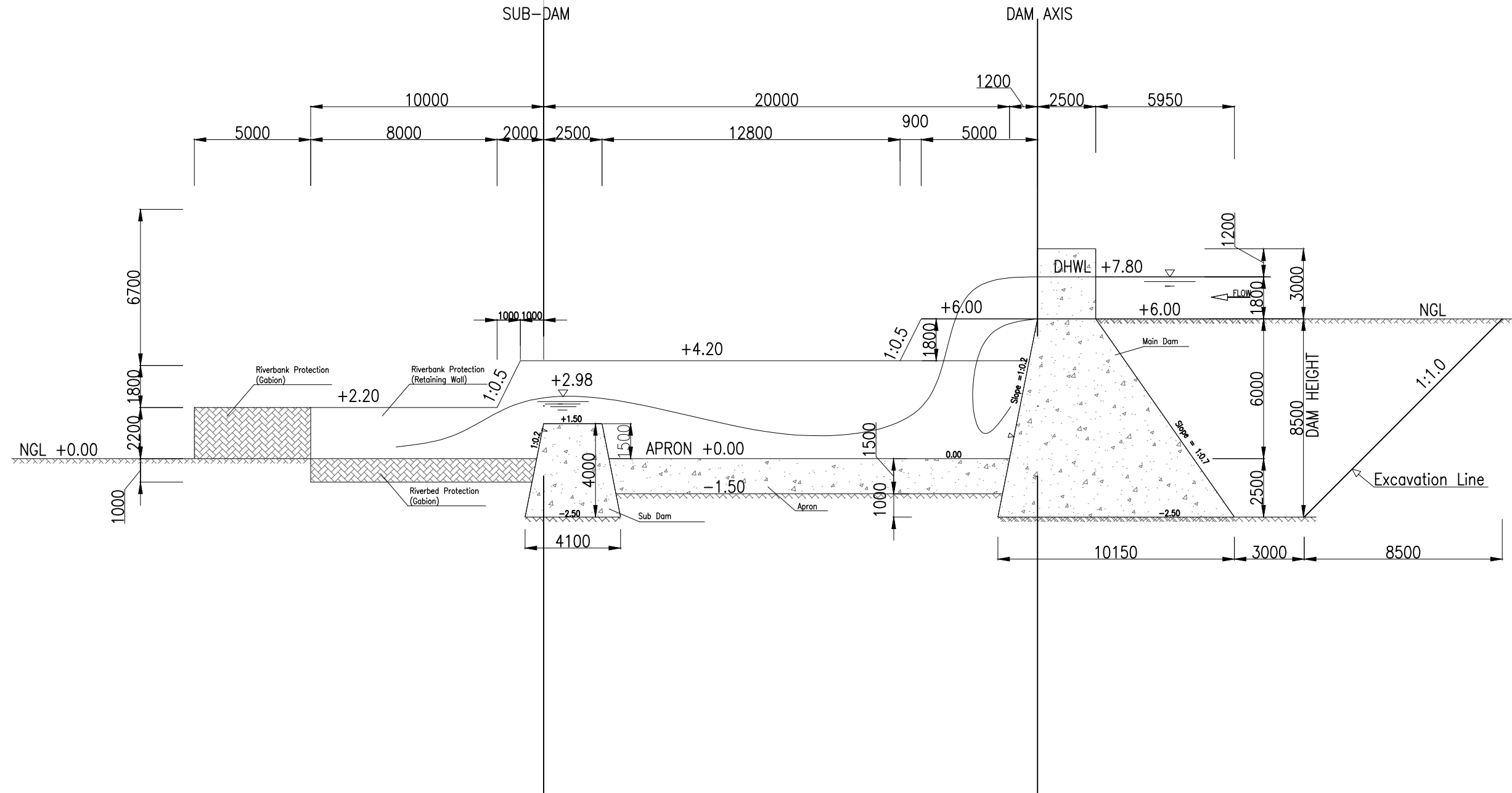




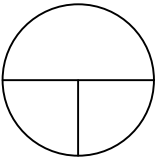
CROSS SECTION A-A

GOVERNMENT AGENCIES:		JICA STUDY TEAM:	PROJECT & LOCATION:	SHEET CONTENTS:	DWG NUM
 <p>JAPAN International Cooperation Agency</p>	 <p>Reli Assets Holding Company (RAHCO), Tanzania</p>	<p>PADECO Co., Ltd., Nippon Koei Co., Ltd., Japan International Consultants for Transportation Co., Ltd., and Fukken Engineering Co., Ltd.</p>	<p>Preparatory Survey on Flood Protection Measures for Central Railway Line in the United Republic of Tanzania</p>	<p>PLAN AND CROSS SECTION OF CHECK DAM IN MASWALA RIVER Scale 1/500</p>	

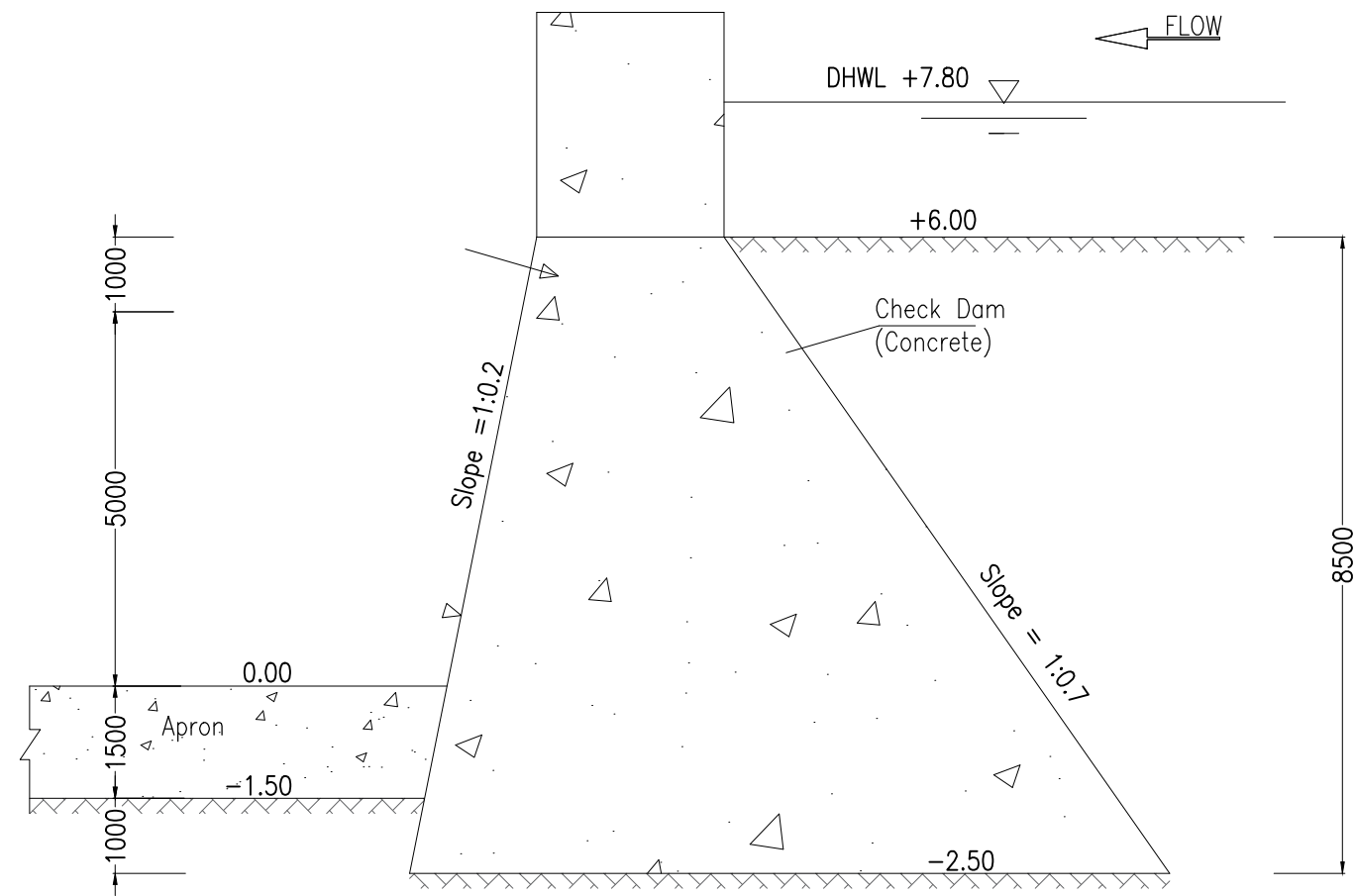
# LONGITUDINAL SECTION OF CHECK DAM IN MASWALA RIVER

## Scale 1/200

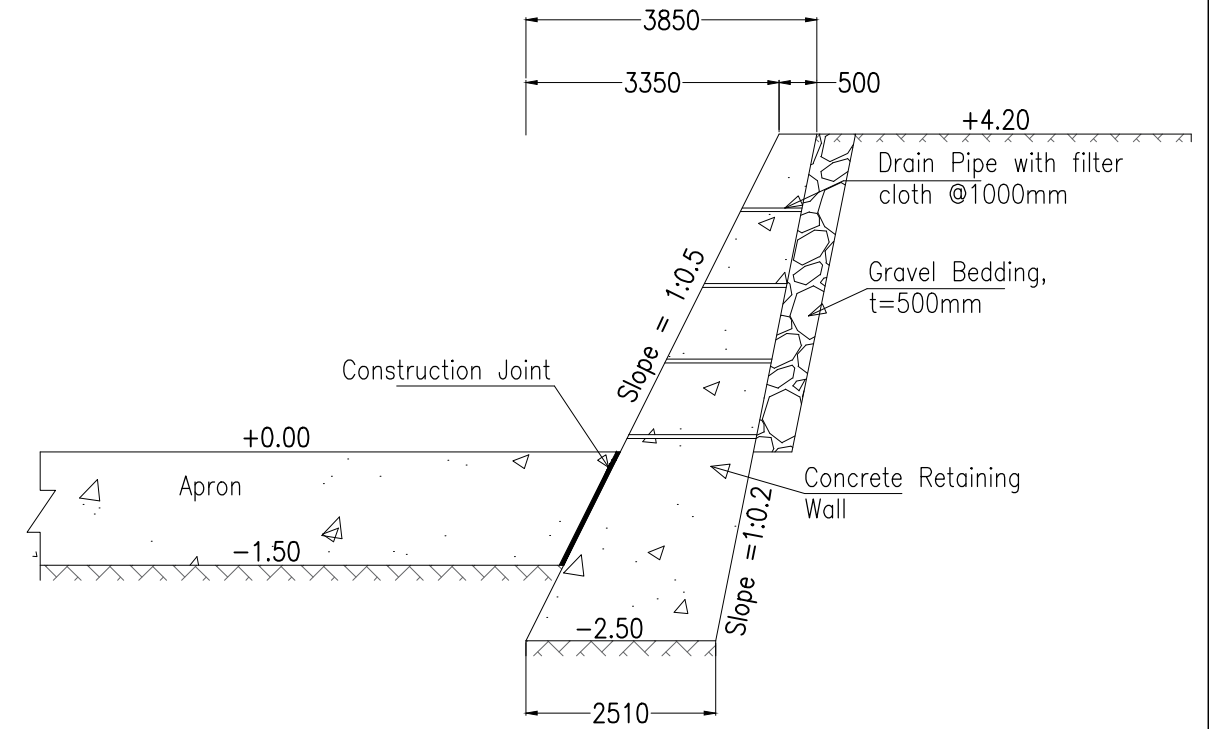


GOVERNMENT AGENCIES:		JICA STUDY TEAM:	PROJECT & LOCATION:	SHEET CONTENTS:	DWG NUM
	JAPAN International Cooperation Agency	 Reli Assets Holding Company (RAHCO), Tanzania	PADECO Co., Ltd., Nippon Koei Co., Ltd., Japan International Consultants for Transportation Co., Ltd., and Fukken Engineering Co., Ltd.	Preparatory Survey on Flood Protection Measures for Central Railway Line in the United Republic of Tanzania	

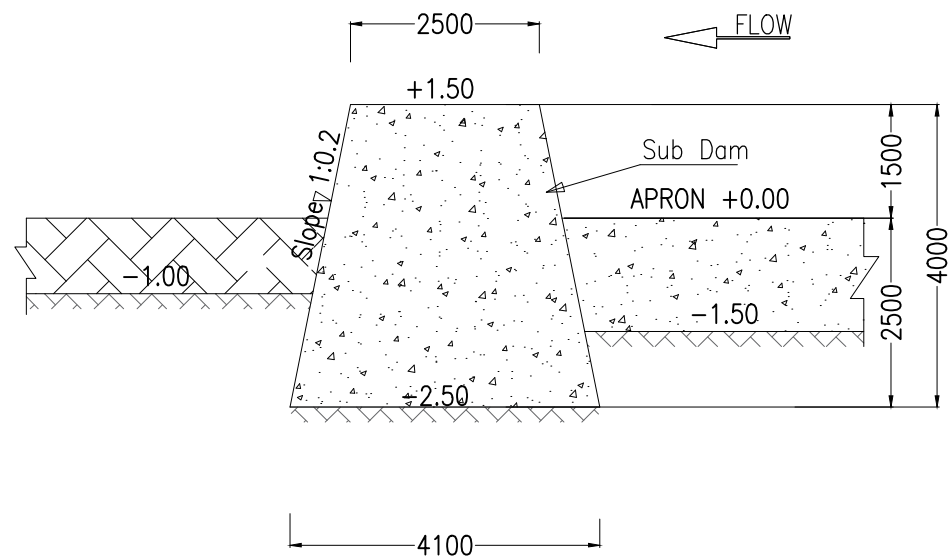
MAIN DAM PROTECTION DETAILS  
SCALE; 1:1



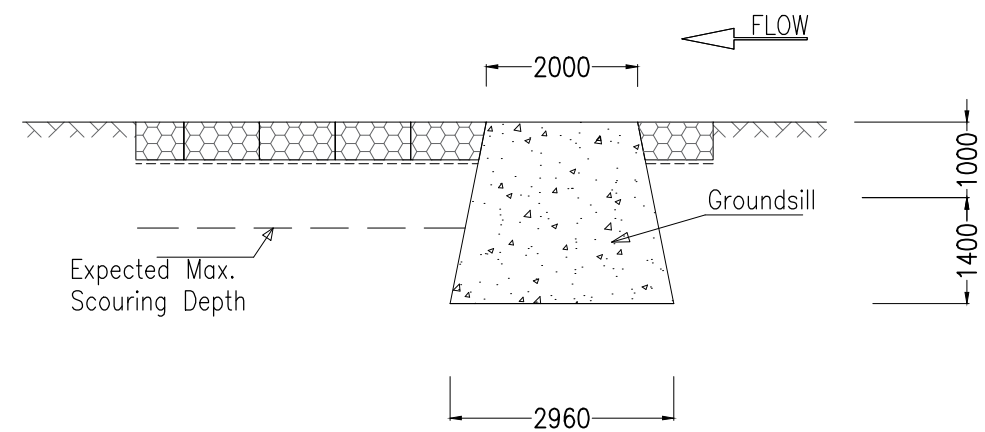
RETAINING WALL



SUB DAM PROTECTION DETAILS



GROUNDSILL PROTECTION DETAILS



GOVERNMENT AGENCIES:



JAPAN International  
Cooperation Agency



Reli Assets Holding  
Company (RAHCO),  
Tanzania

JICA STUDY TEAM:

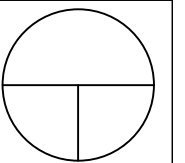
PADECO Co., Ltd.,  
Nippon Koei Co., Ltd.,  
Japan International Consultants  
for Transportation Co., Ltd., and  
Fukken Engineering Co., Ltd.

PROJECT & LOCATION:

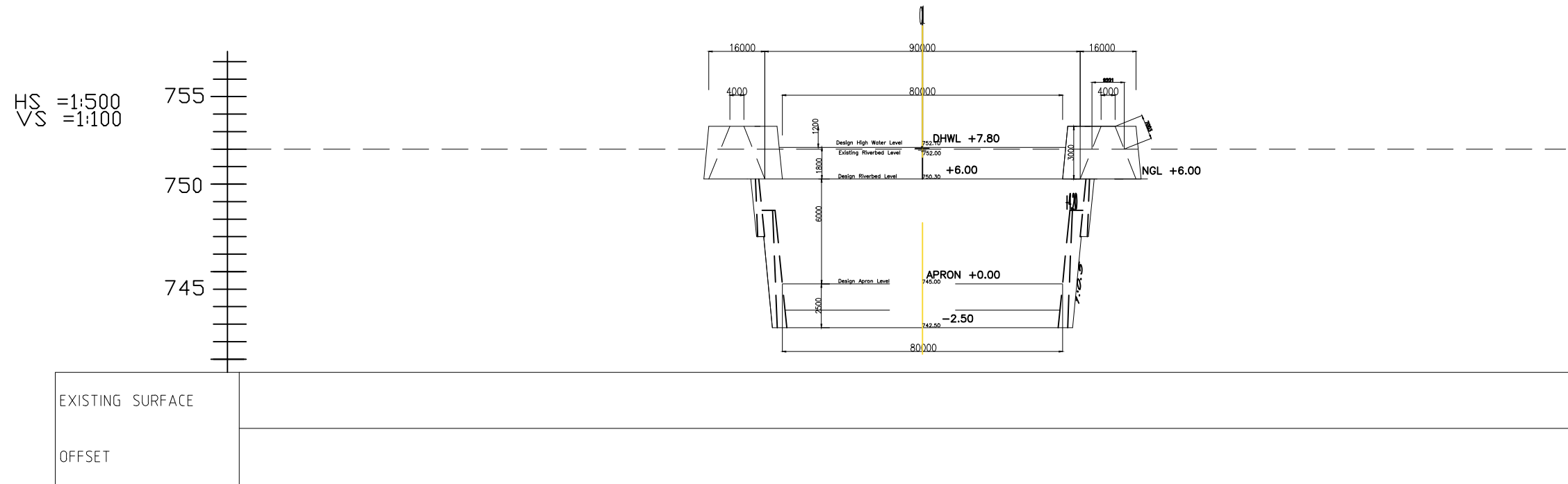
Preparatory Survey on  
Flood Protection  
Measures for Central  
Railway Line in the United  
Republic of Tanzania

SHEET CONTENTS:

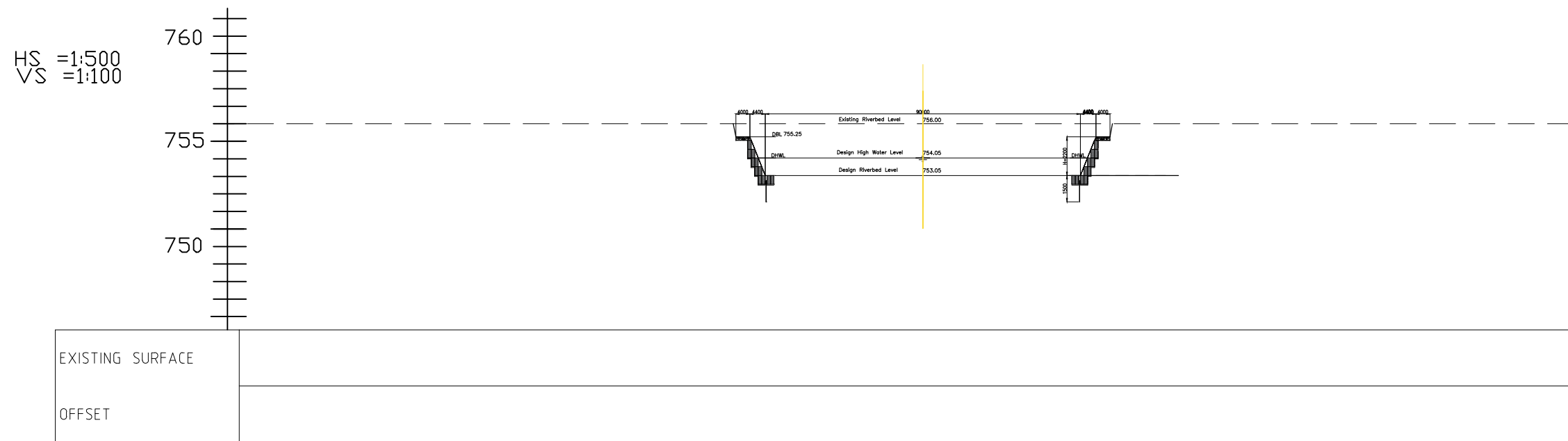
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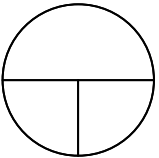
# CROSS SECTION OF RIVER CHANNEL IN MASWALA RIVER (1/3)



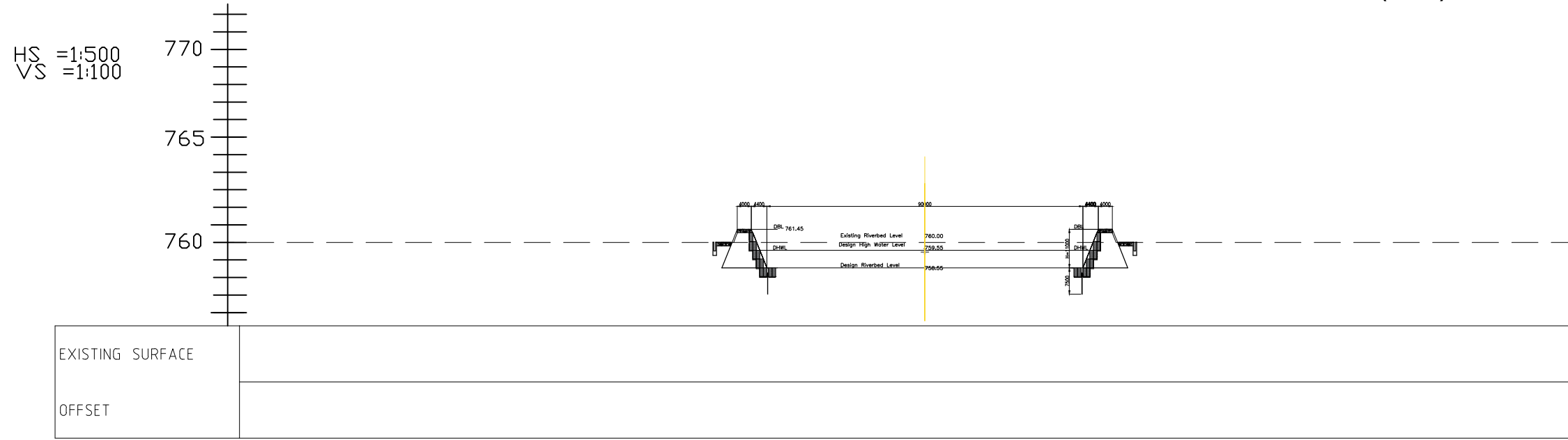
Sta.0+000 (MS-Groundsill No.1: CHECK DAM))



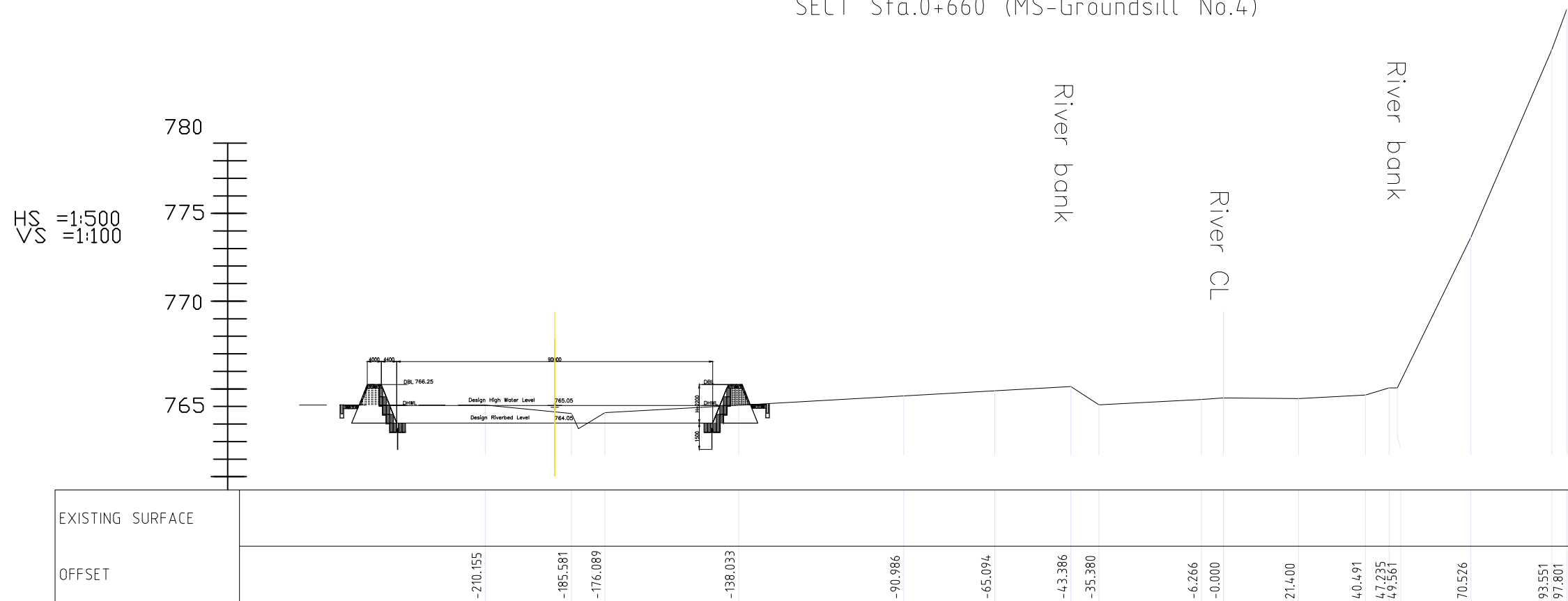
Sta.0+220 (MS-Groundsill No.2)

GOVERNMENT AGENCIES:		JICA STUDY TEAM:		PROJECT & LOCATION:		SHEET CONTENTS:		DWG NUM
 <b>JAPAN International Cooperation Agency</b>	 <b>Reli Assets Holding Company (RAHCO), Tanzania</b>	<b>PADECO Co., Ltd., Nippon Koei Co., Ltd., Japan International Consultants for Transportation Co., Ltd., and Fukken Engineering Co., Ltd.</b>	<b>Preparatory Survey on Flood Protection Measures for Central Railway Line in the United Republic of Tanzania</b>					



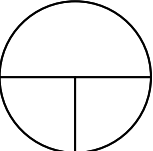
# CROSS SECTION OF RIVER CHANNEL IN MASWALA RIVER (2/3)



SECT Sta.0+660 (MS-Groundsill No.4)



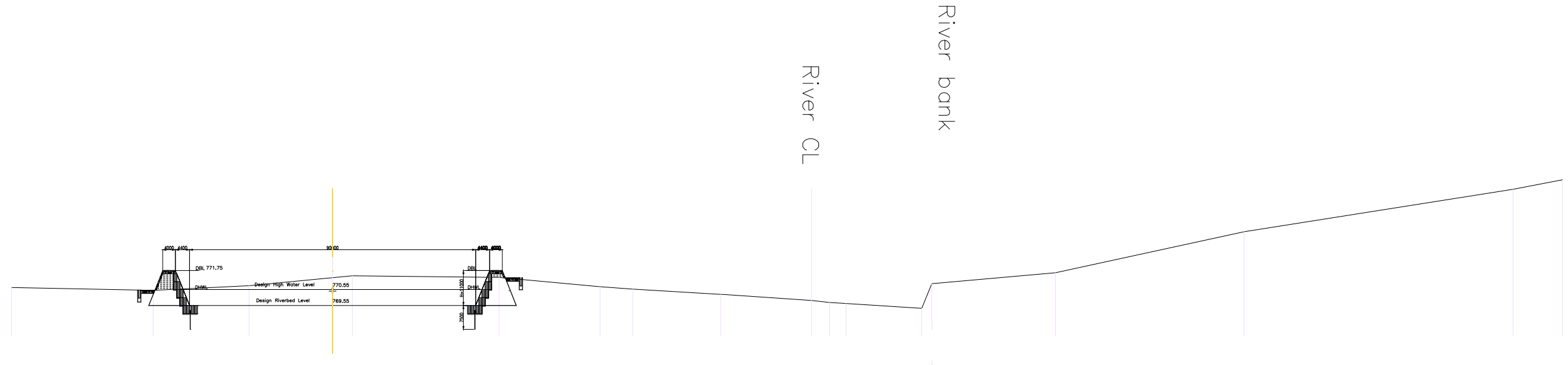
SECT MS E+099: Sta.1+100 (MS-Groundsill No.6)

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 JAPAN International Cooperation Agency	 Reli Assets Holding Company (RAHCO), Tanzania	PADECO Co., Ltd., Nippon Koei Co., Ltd., Japan International Consultants for Transportation Co., Ltd., and Fukken Engineering Co., Ltd.		Preparatory Survey on Flood Protection Measures for Central Railway Line in the United Republic of Tanzania		



# CROSS SECTION OF RIVER CHANNEL IN MASWALA RIVER (3/3)

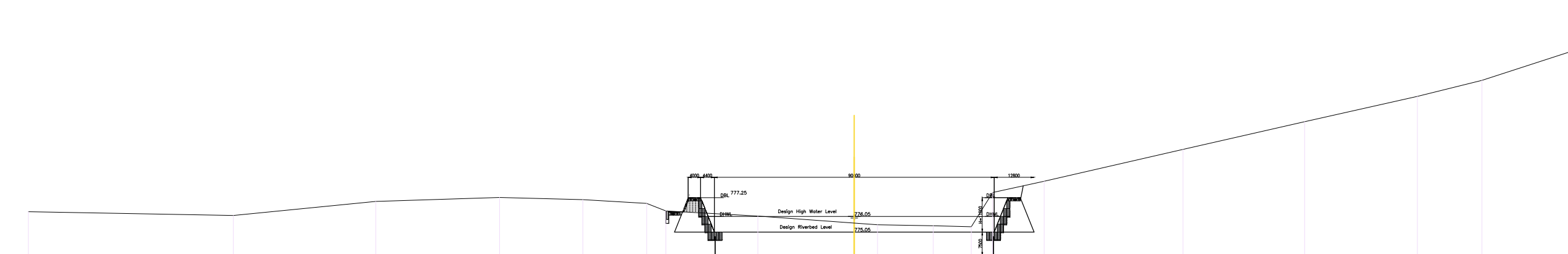
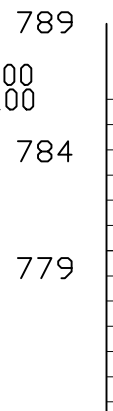
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VS =1:100



EXISTING SURFACE	771.030	770.856	771.141	771.771	771.662	771.081	770.928	770.604	770.226	770.093	770.026	769.719	771.276	771.956	774.543	777.205	777.800
OFFSET	-251.582	-207.005	-176.865	-144.417	-98.194	-66.494	-56.092	-28.487	0.000	5.658	10.877	34.674	37.879	76.703	136.111	220.652	236.214



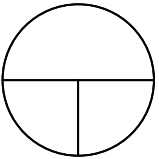
SECT MS F+028.Sta1+540 (MS-Groundsill No.8)

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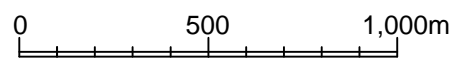
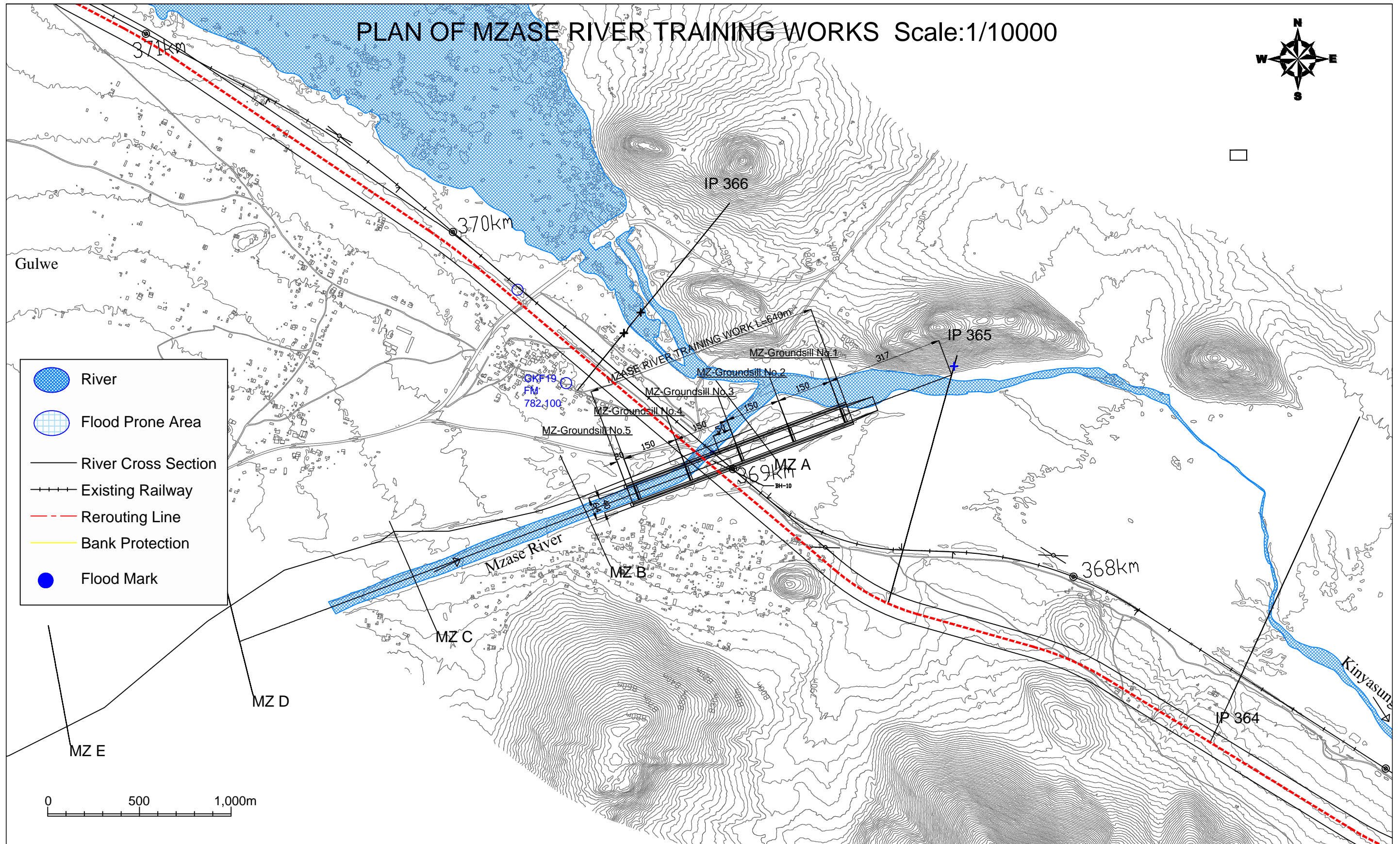
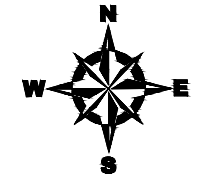


EXISTING SURFACE	776.869	776.621	777.529	777.774	777.643	777.402	776.911	776.585	776.027	775.960	775.895	778.095	778.813	780.858	782.646	784.269	785.300	787.150
OFFSET	-273.022	-207.116	-161.363	-121.534	-94.737	-74.180	-68.041	-38.434	-0.000	17.945	30.167	37.022	53.601	98.232	137.348	173.640	194.415	223.024

SECT MS G-041: Sta.1+980(MS-Groundsill No.10)

GOVERNMENT AGENCIES:		JICA STUDY TEAM:		PROJECT & LOCATION:	SHEET CONTENTS:	DWG NUM
	JAPAN International Cooperation Agency		Reli Assets Holding Company (RAHCO), Tanzania	PADECO Co., Ltd., Nippon Koei Co., Ltd., Japan International Consultants for Transportation Co., Ltd., and Fukken Engineering Co., Ltd.	Preparatory Survey on Flood Protection Measures for Central Railway Line in the United Republic of Tanzania	

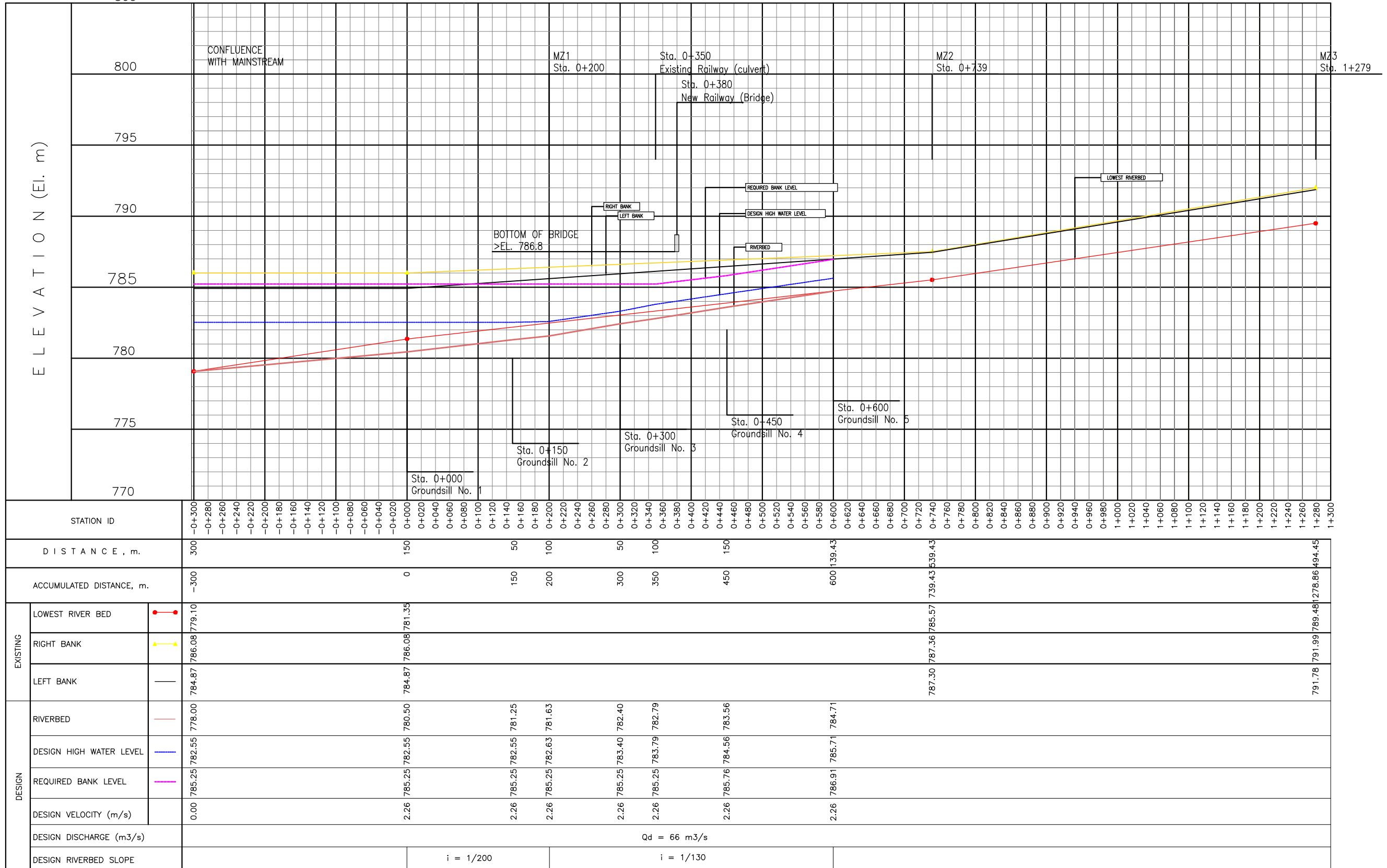
# PLAN OF MZASE RIVER TRAINING WORKS Scale:1/10000



GOVERNMENT AGENCIES:		JICA STUDY TEAM:	PROJECT & LOCATION:	SHEET CONTENTS:	DWG NUM
JAPAN International Cooperation Agency	Reli Assets Holding Company (RAHCO), Tanzania	PADECO Co., Ltd., Nippon Koei Co., Ltd., Japan International Consultants for Transportation Co., Ltd., and Fukken Engineering Co., Ltd.	Preparatory Survey on Flood Protection Measures for Central Railway Line in the United Republic of Tanzania	PLAN OF MZASE RIVER TRAINING WORKS Scale:1/10000	

# LONGITUDINAL PROFILE OF MZASE RIVER

Scale H: 1/5000  
V: 1/250



GOVERNMENT AGENCIES:

JICA STUDY TEAM:

PROJECT & LOCATION:

SHEET CONTENTS:

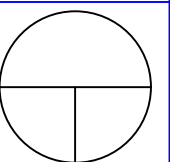
DWG NUM



PADECO Co., Ltd.,  
Nippon Koei Co., Ltd.,  
Japan International Consultants  
for Transportation Co., Ltd., and  
Fukken Engineering Co., Ltd.

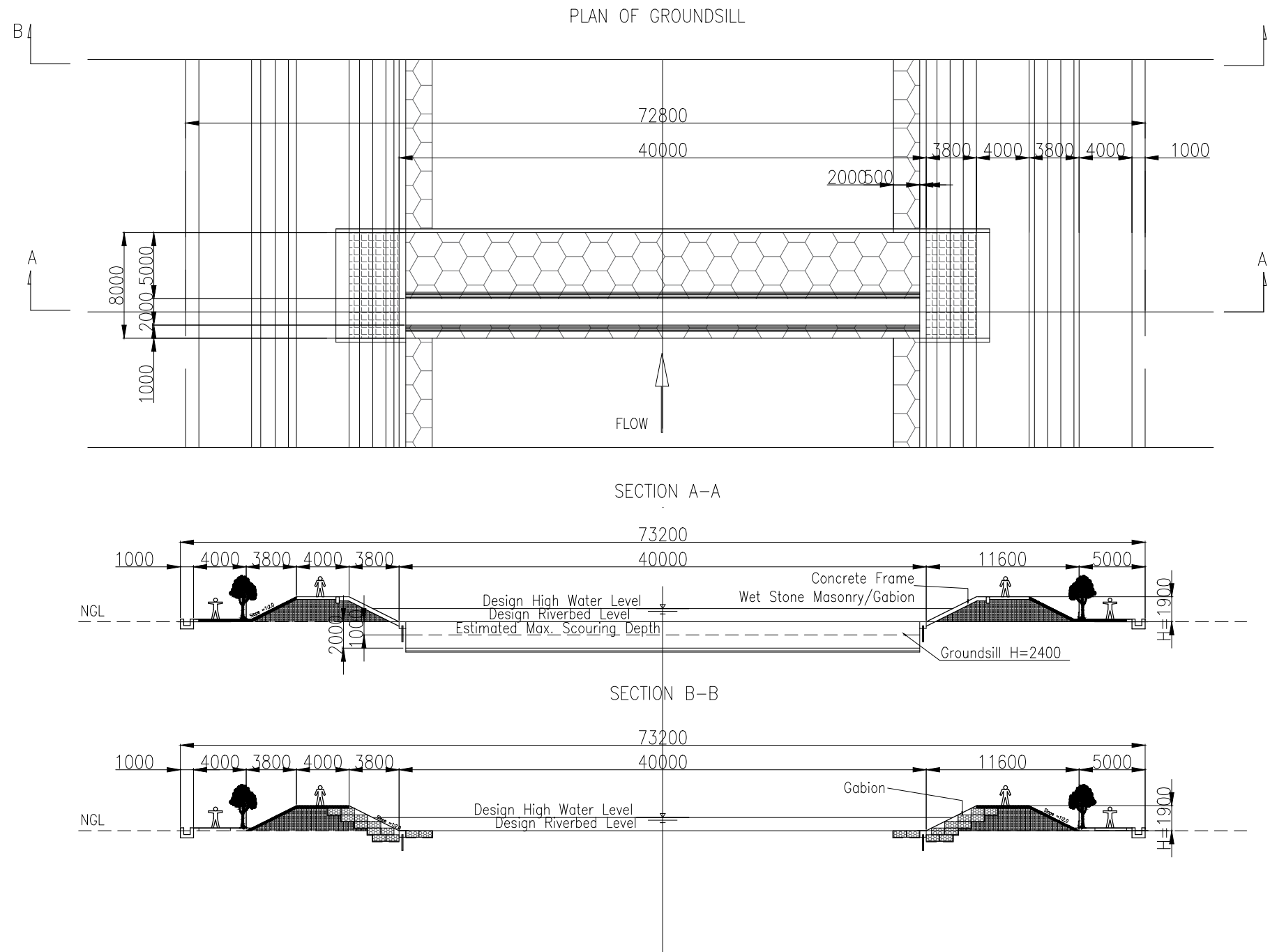
Preparatory Survey on  
Flood Protection  
Measures for Central  
Railway Line in the United  
Republic of Tanzania



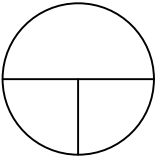
LONGITUDINAL PROFILE OF MZASE RIVER  
Scale: H:1/5000, V:1/250



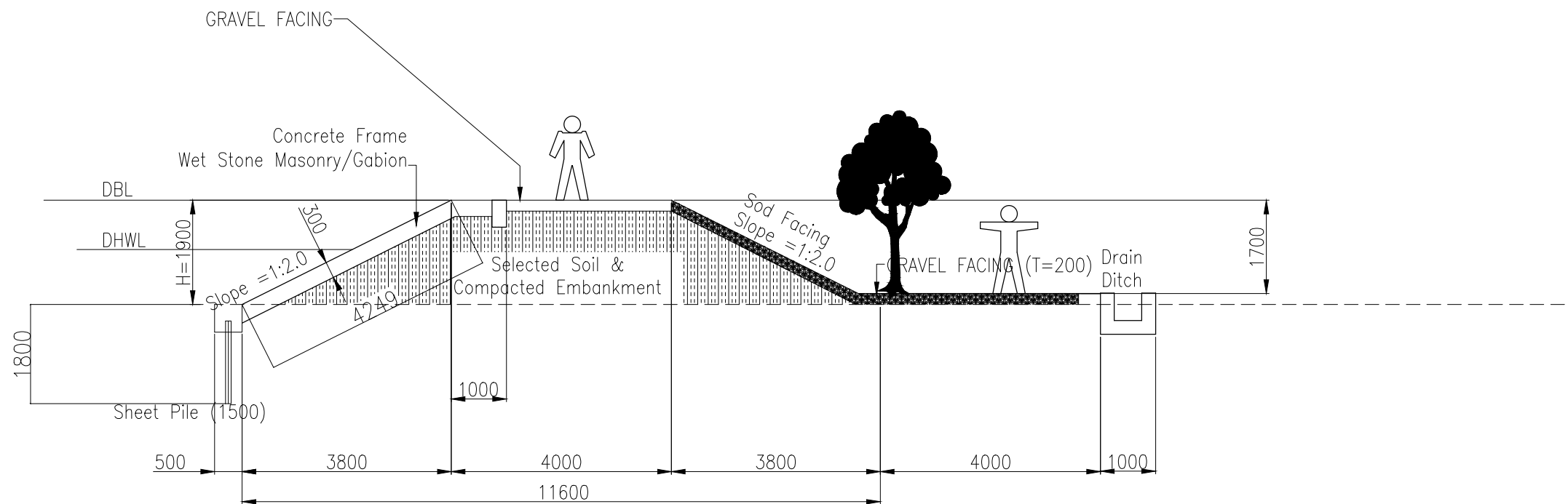
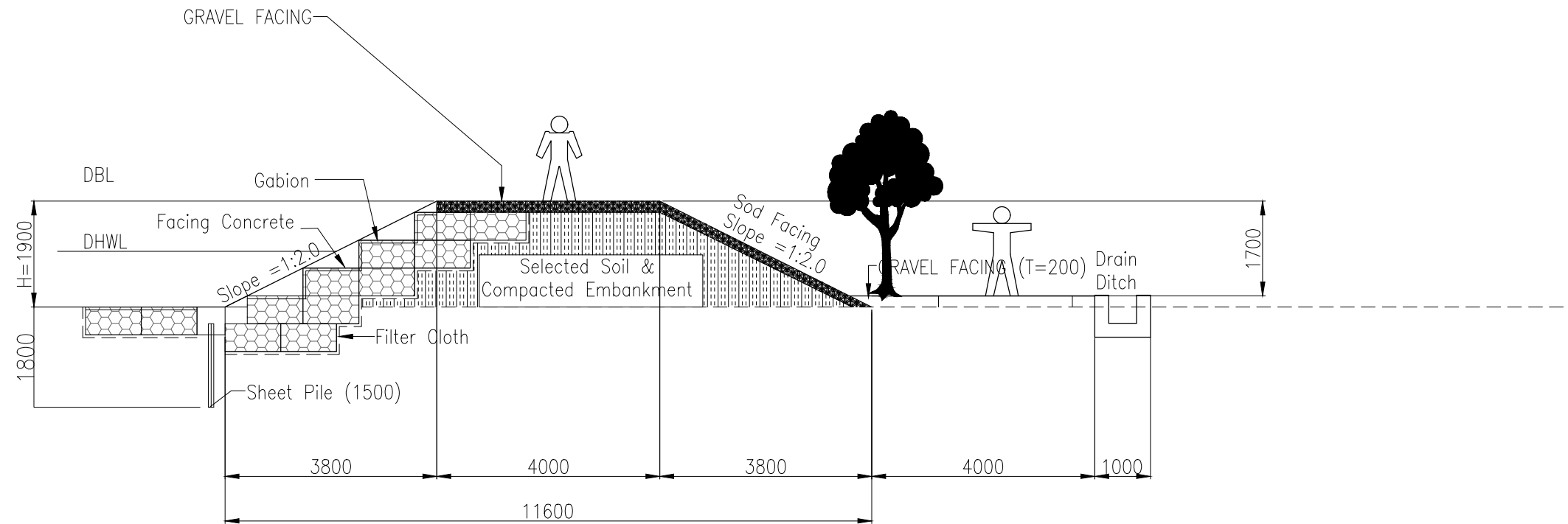
# PLAN AND TYPICAL SECTION OF RIVER CHANNEL, AND GROUNDSILL IN MZASE RIVER



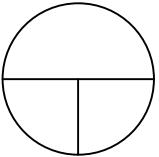
## Scale 1/400



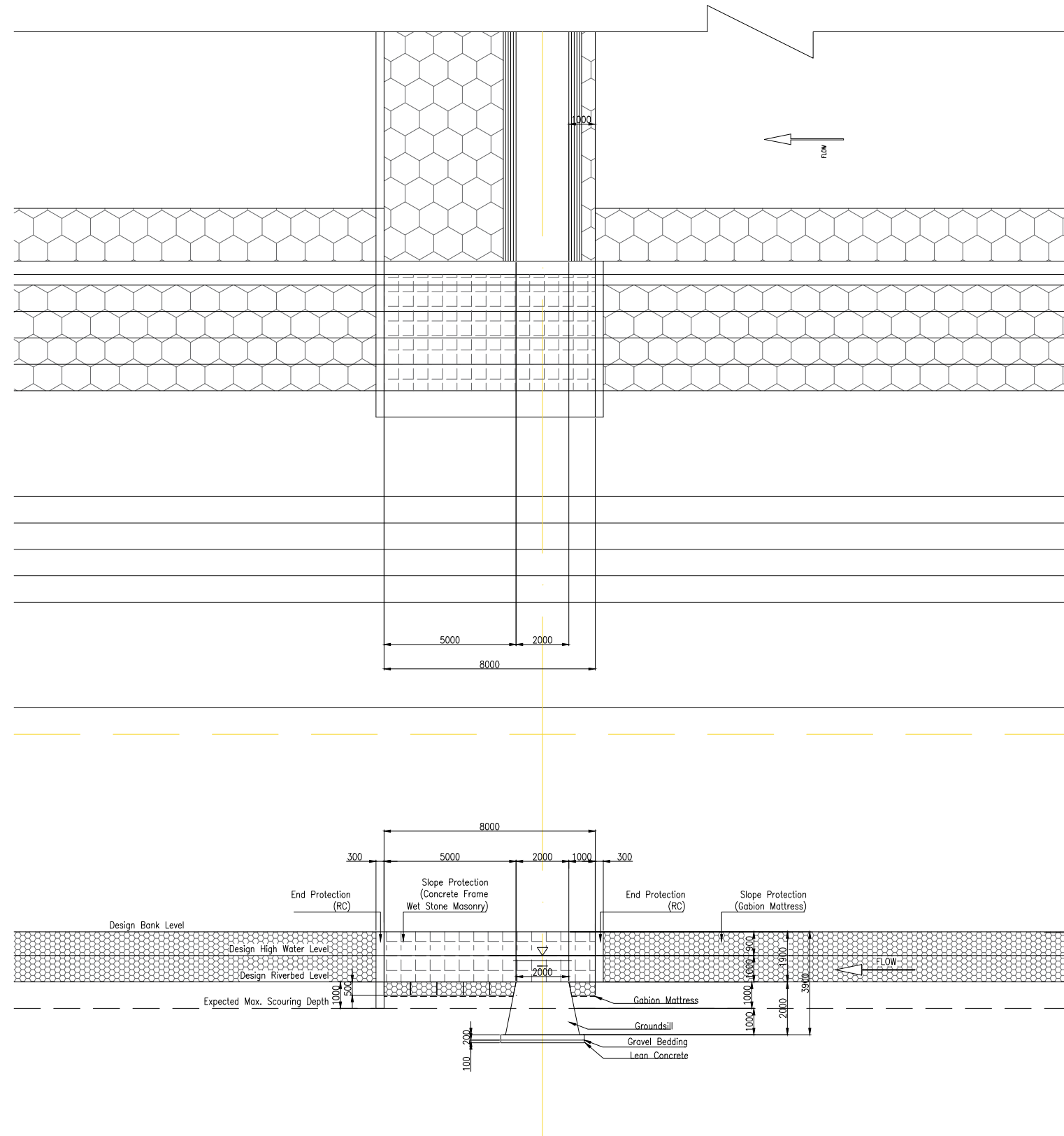
GOVERNMENT AGENCIES:		JICA STUDY TEAM:	PROJECT & LOCATION:	SHEET CONTENTS:	DWG NUM
	JAPAN International Cooperation Agency	 Reli Assets Holding Company (RAHCO), Tanzania	PADECO Co., Ltd., Nippon Koei Co., Ltd., Japan International Consultants for Transportation Co., Ltd., and Fukken Engineering Co., Ltd.	Preparatory Survey on Flood Protection Measures for Central Railway Line in the United Republic of Tanzania	



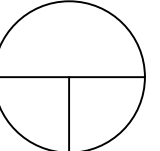
# TYPICAL SECTION OF DIKE AND BANK PROTECTION WORKS IM MZASE RIVER



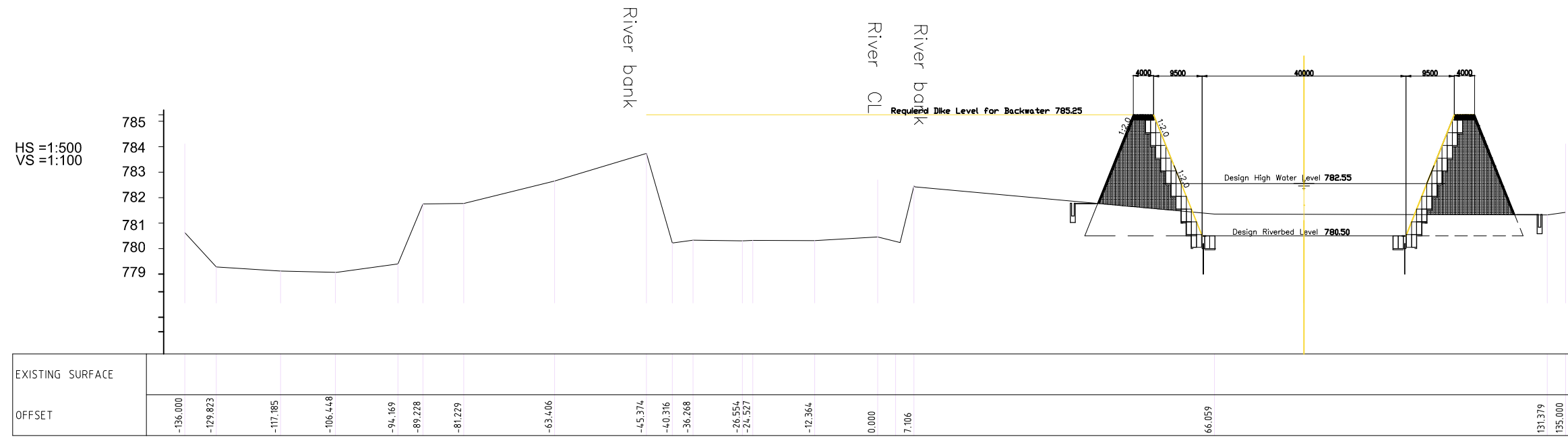
GOVERNMENT AGENCIES:		JICA STUDY TEAM:		PROJECT & LOCATION:	SHEET CONTENTS:	DWG NUM
 JAPAN International Cooperation Agency	 Reli Assets Holding Company (RAHCO), Tanzania	PADECO Co., Ltd., Nippon Koei Co., Ltd., Japan International Consultants for Transportation Co., Ltd., and Fukken Engineering Co., Ltd.		Preparatory Survey on Flood Protection Measures for Central Railway Line in the United Republic of Tanzania		

# LONGITUDINAL SECTION OF GROUNDSILL IN MZASE RIVER TRAINING WORKS

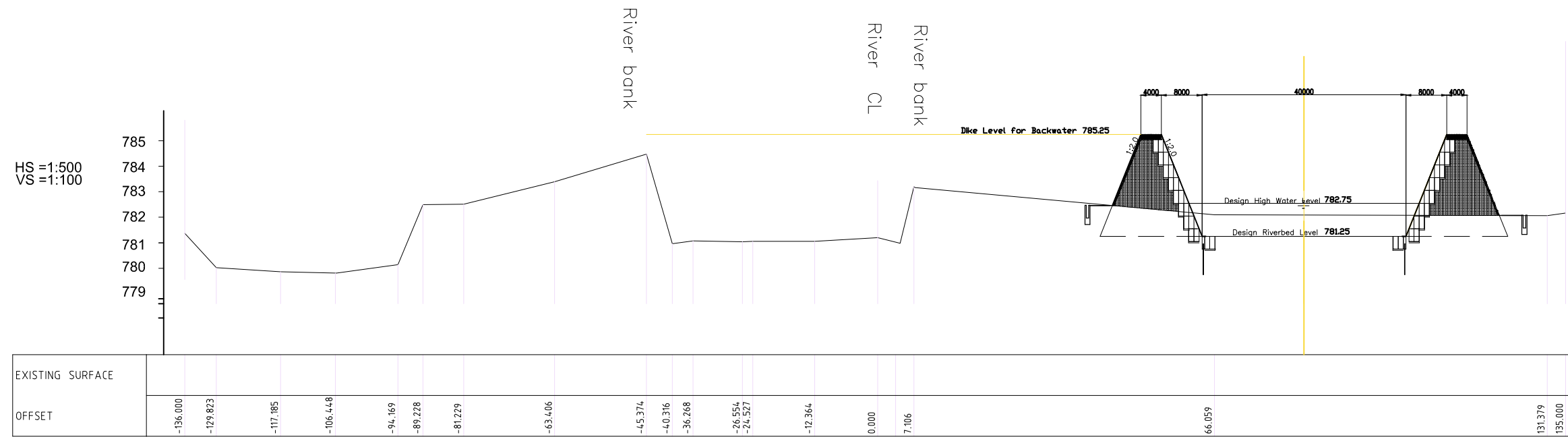


GOVERNMENT AGENCIES:		JICA STUDY TEAM:	PROJECT & LOCATION:	SHEET CONTENTS:	DWG NUM
 JAPAN International Cooperation Agency	 Reli Assets Holding Company (RAHCO), Tanzania	PADECO Co., Ltd., Nippon Koei Co., Ltd., Japan International Consultants for Transportation Co., Ltd., and Fukken Engineering Co., Ltd.	Preparatory Survey on Flood Protection Measures for Central Railway Line in the United Republic of Tanzania		



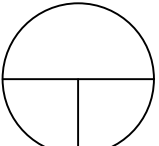
# CROSS SECTION OF RIVER CHANNEL IN MZASE RIVER (1/3)



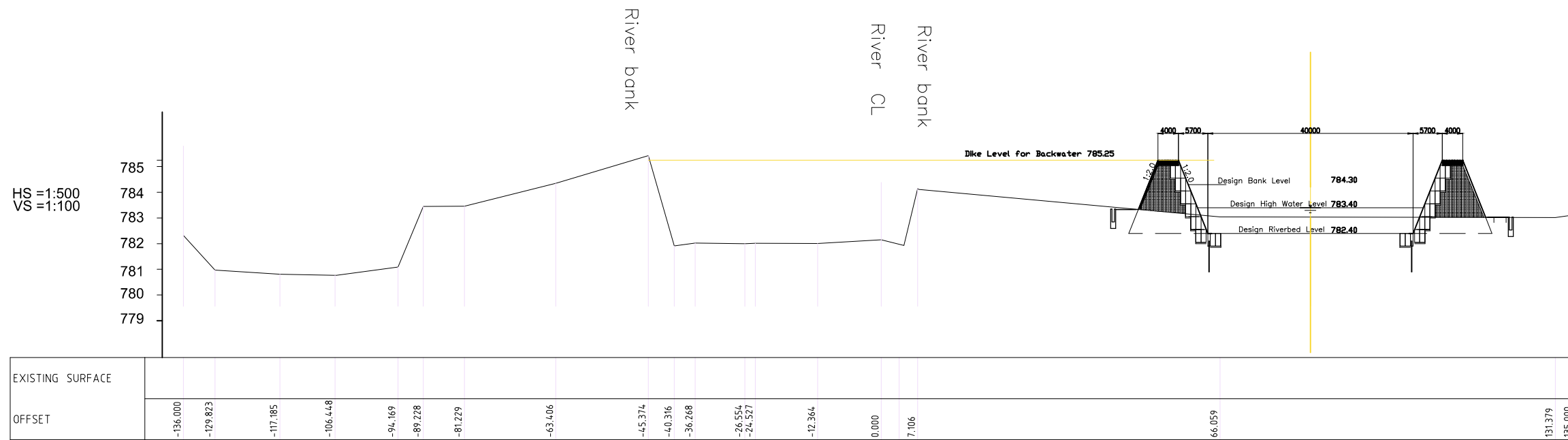
SECT MZ 01-227 (Sta.0+000: MZ-Groundsill No.1)



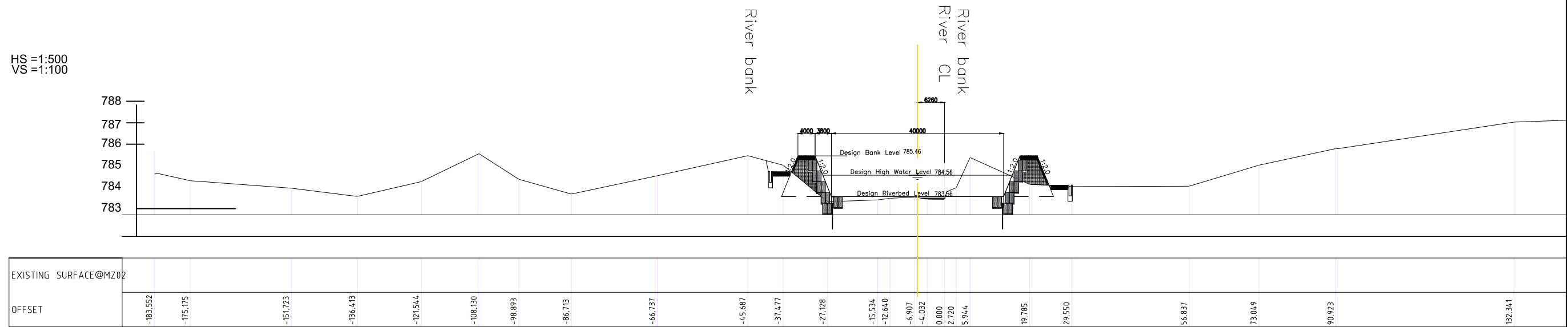
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GOVERNMENT AGENCIES:		JICA STUDY TEAM:		PROJECT & LOCATION:	SHEET CONTENTS:	DWG NUM
	JAPAN International Cooperation Agency		Reli Assets Holding Company (RAHCO), Tanzania	PADECO Co., Ltd., Nippon Koei Co., Ltd., Japan International Consultants for Transportation Co., Ltd., and Fukken Engineering Co., Ltd.	Preparatory Survey on Flood Protection Measures for Central Railway Line in the United Republic of Tanzania	

# CROSS SECTION OF RIVER CHANNEL IN MZASE RIVER (2/3)



SECT MZ 01+073 (Sta.0+300: MZ-Groundsill No.3)



SECT MZ 02-298 (Sta.0+450: MZ-Groundsill No.4)

GOVERNMENT AGENCIES:



JAPAN International Cooperation Agency



Reli Assets Holding Company (RAHCO), Tanzania

JICA STUDY TEAM:

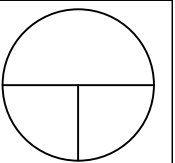
PADECO Co., Ltd.,  
Nippon Koei Co., Ltd.,  
Japan International Consultants for Transportation Co., Ltd., and  
Fukken Engineering Co., Ltd.

PROJECT & LOCATION:

Preparatory Survey on Flood Protection Measures for Central Railway Line in the United Republic of Tanzania

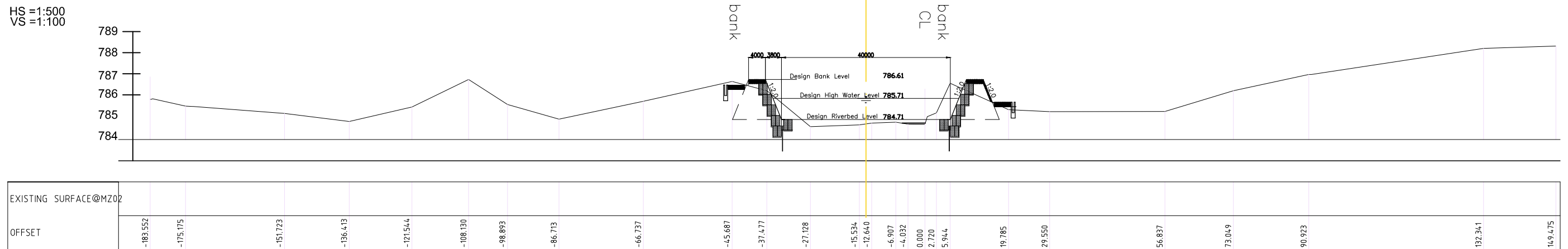
SHEET CONTENTS:

DWG NUM





# CROSS SECTION OF RIVER CHANNEL IN MZASE RIVER (3/3)

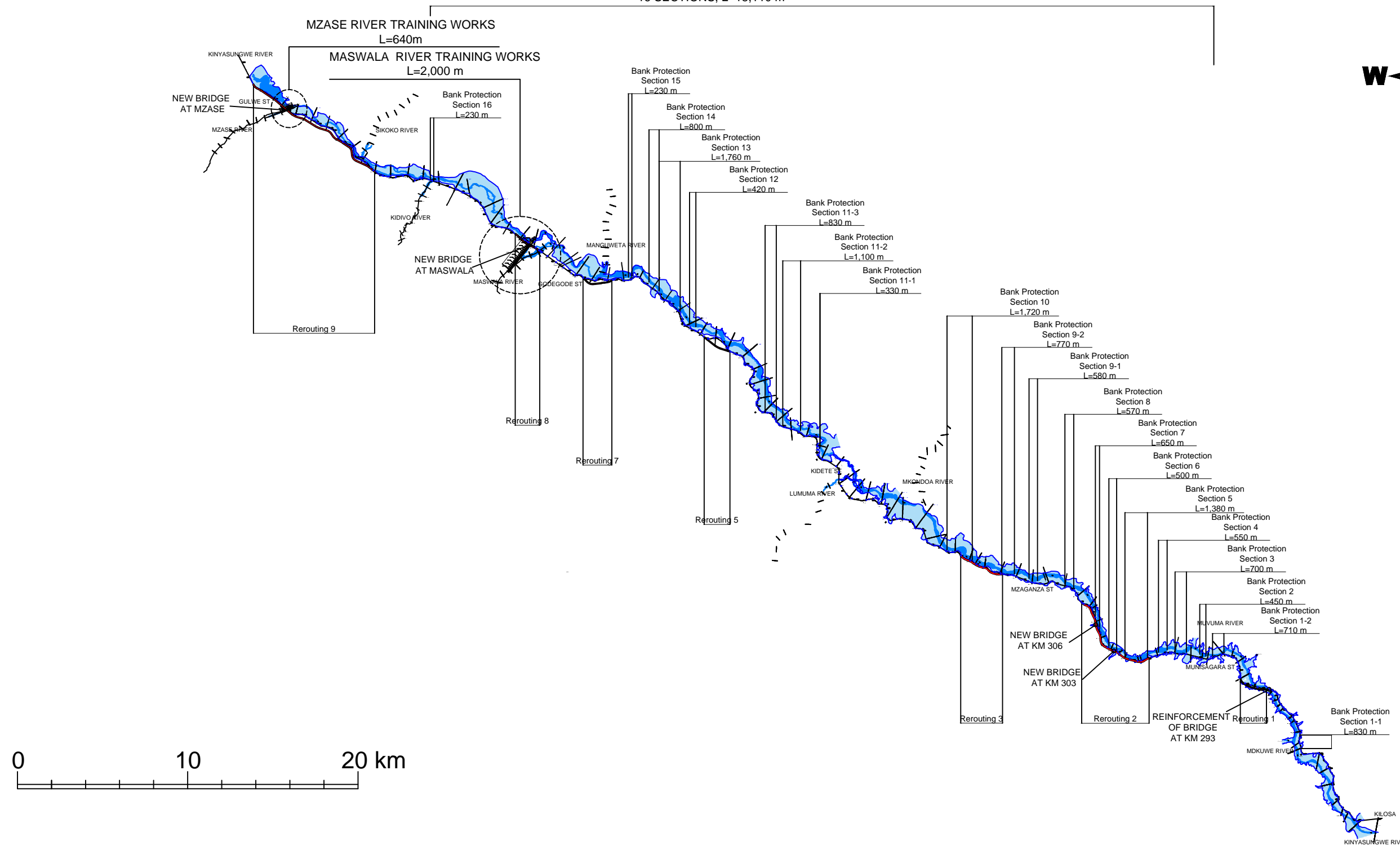
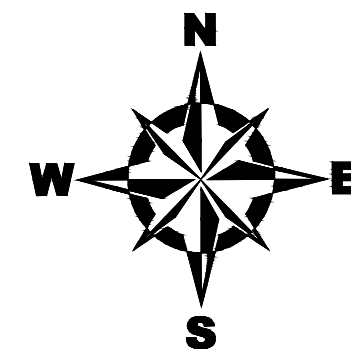




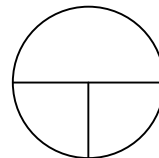
SECT MZ 02-148 (Sta.0+600: MZ-Groundsill No.5)

GOVERNMENT AGENCIES:	JICA STUDY TEAM:	PROJECT & LOCATION:	SHEET CONTENTS:	DWG NUM
<b>JAPAN International Cooperation Agency</b>	<b>Reli Assets Holding Company (RAHCO), Tanzania</b>	<b>PADECO Co., Ltd., Nippon Koei Co., Ltd., Japan International Consultants for Transportation Co., Ltd., and Fukken Engineering Co., Ltd.</b>	<b>Preparatory Survey on Flood Protection Measures for Central Railway Line in the United Republic of Tanzania</b>	

**GENERAL PLAN OF FLOOD PROTECTION WORKS**  
Scale:1/250,000

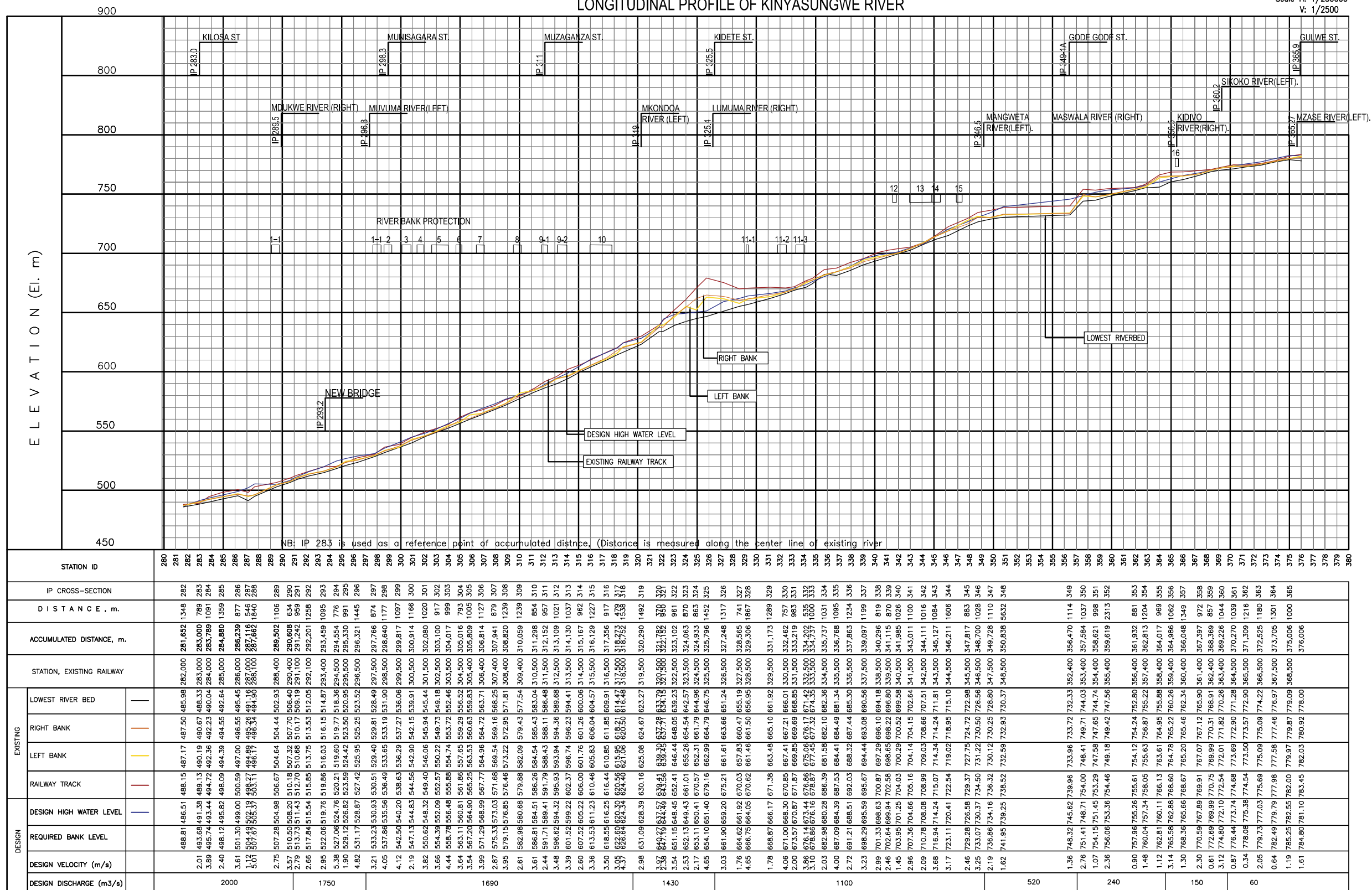
RIVER BANK PROTECTION WORKS ALONG MAINSTREAM  
16 SECTIONS, L=15,110 m



GOVERNMENT AGENCIES:		JICA STUDY TEAM:	PROJECT & LOCATION:	SHEET CONTENTS:	DWG NUM
 JAPAN International Cooperation Agency	 Reli Assets Holding Company (RAHCO), Tanzania	PADECO Co., Ltd., Nippon Koei Co., Ltd., Japan International Consultants for Transportation Co., Ltd., and Fukken Engineering Co., Ltd.	Preparatory Survey on Flood Protection Measures for Central Railway Line in the United Republic of Tanzania	<b>GENERAL PLAN OF FLOOD PROTECTION WORKS</b> Scale:1/250,000	

### LONGITUDINAL PROFILE OF KINYASUNGWE RIVER

Scale H: 1/25000  
V: 1/2500



**GOVERNMENT AGENCIES:**



JAPAN International Cooperation Agency



Reli Assets Holding Company (RAHCO), Tanzania

**JICA STUDY TEAM:**

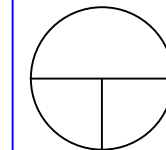
PADECO Co., Ltd.,  
Nippon Koei Co., Ltd.,  
Japan International Consultants for Transportation Co., Ltd., and  
Fukken Engineering Co., Ltd.

**PROJECT & LOCATION:**

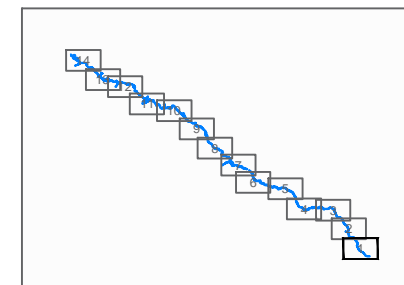
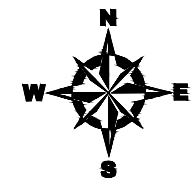
Preparatory Survey on Flood Protection Measures for Central Railway Line in the United Republic of Tanzania








**SHEET CONTENTS:**

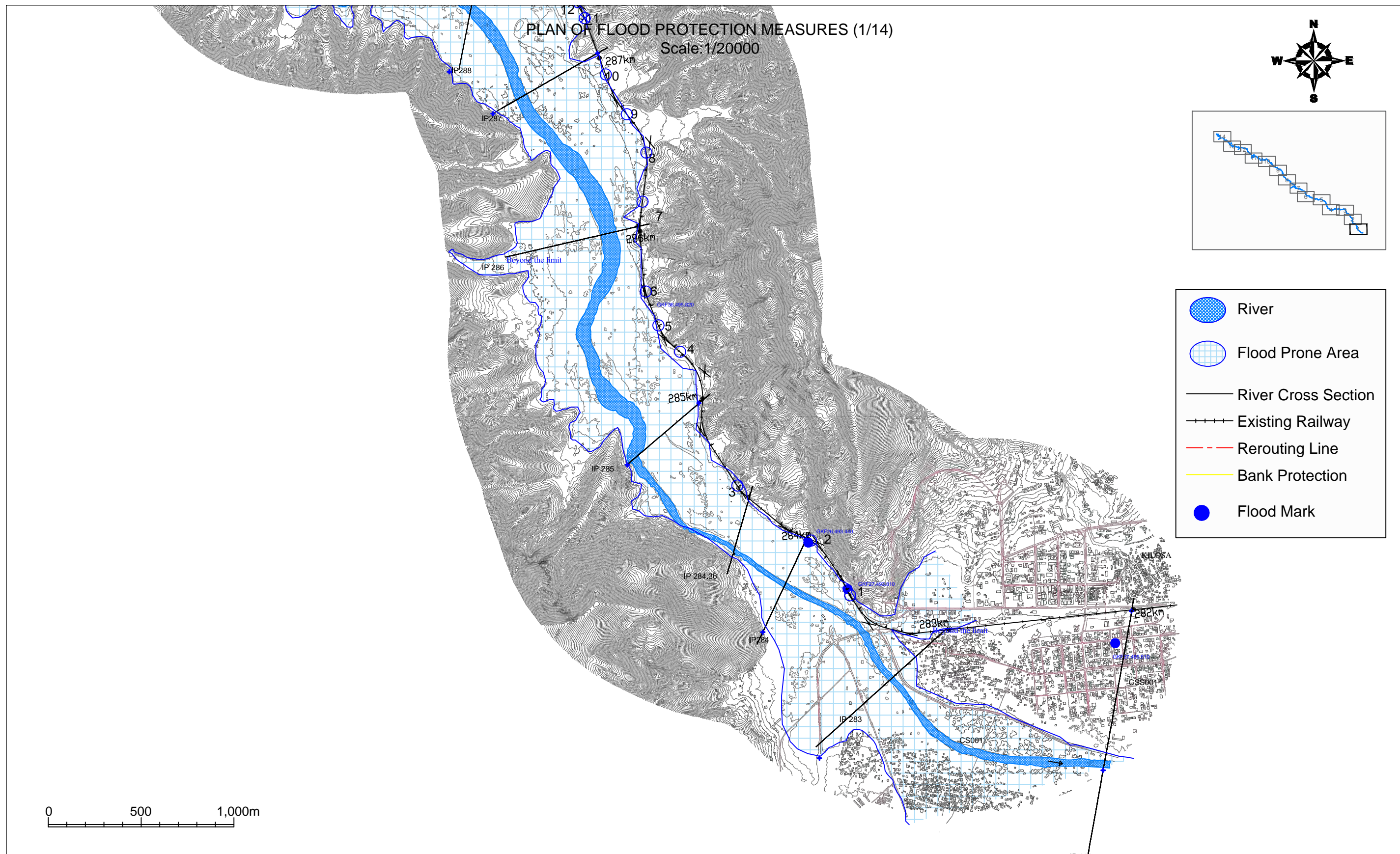
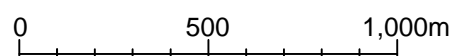
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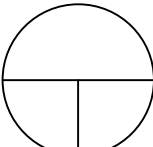


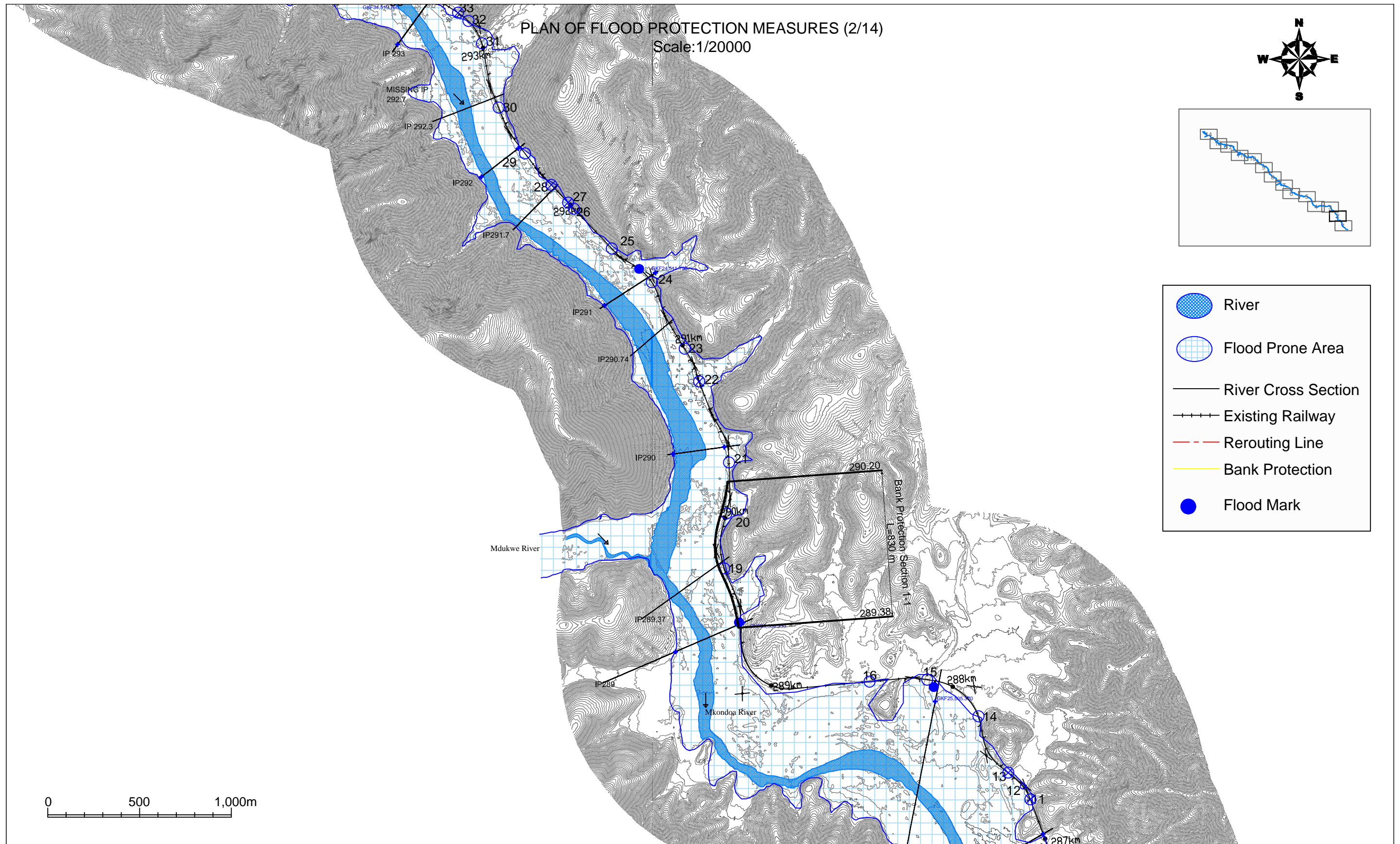
PLAN OF FLOOD PROTECTION MEASURES (1/14)  
Scale: 1/20000



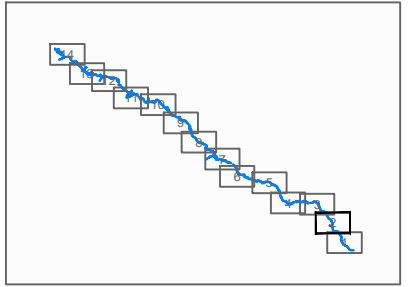
-  River
-  Flood Prone Area
-  River Cross Section
-  Existing Railway
-  Rerouting Line
-  Bank Protection
-  Flood Mark










GOVERNMENT AGENCIES:		JICA STUDY TEAM:	PROJECT & LOCATION:	SHEET CONTENTS:	DWG NUM
 JAPAN International Cooperation Agency	 Reli Assets Holding Company (RAHCO), Tanzania	PADECO Co., Ltd., Nippon Koei Co., Ltd., Japan International Consultants for Transportation Co., Ltd., and Fukken Engineering Co., Ltd.	Preparatory Survey on Flood Protection Measures for Central Railway Line in the United Republic of Tanzania	PLAN OF FLOOD PROTECTION MEASURES (1/14) Scale: 1/20000	



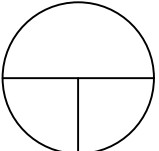


PLAN OF FLOOD PROTECTION MEASURES (2/14)  
Scale:1/20000

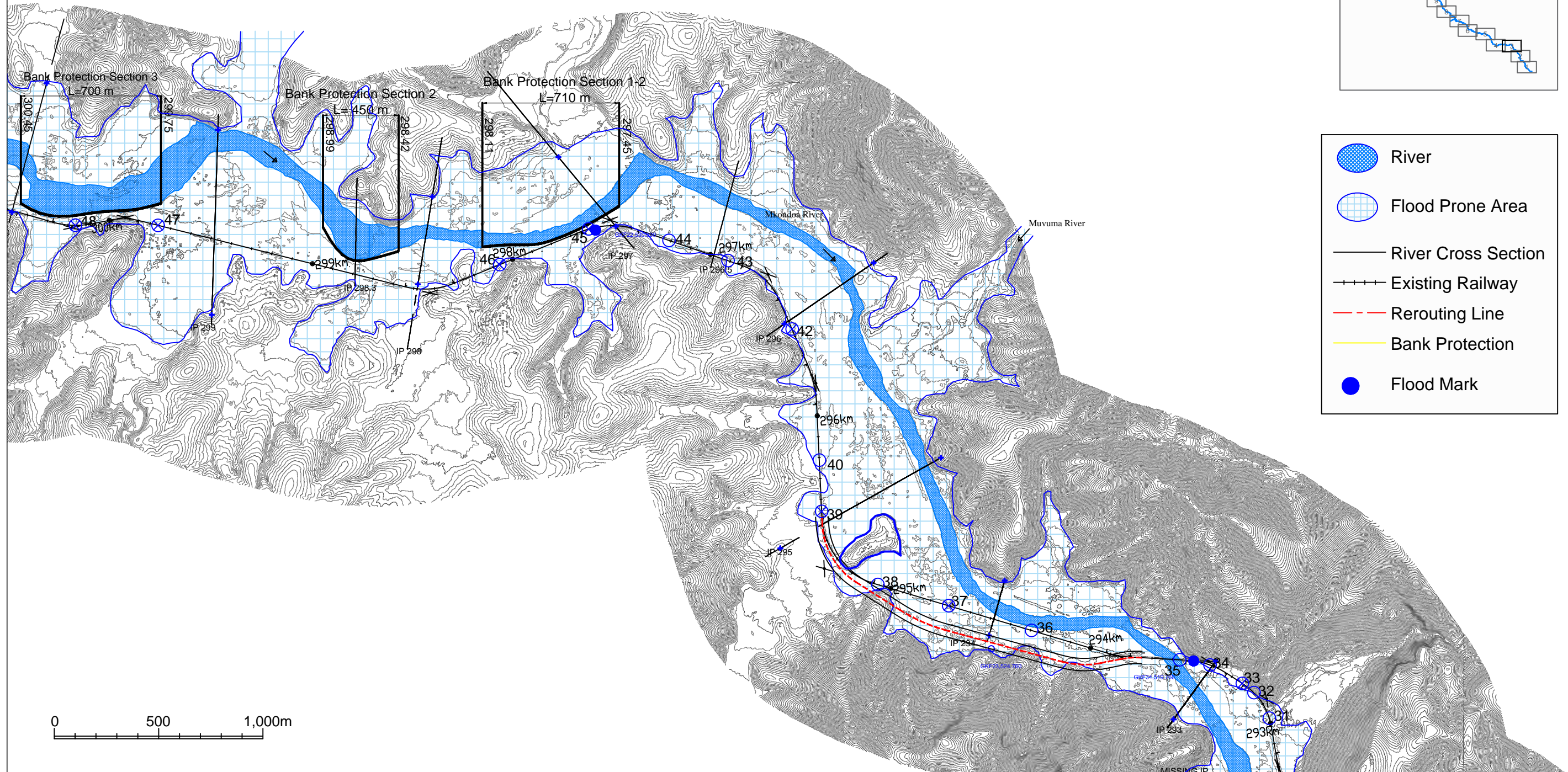
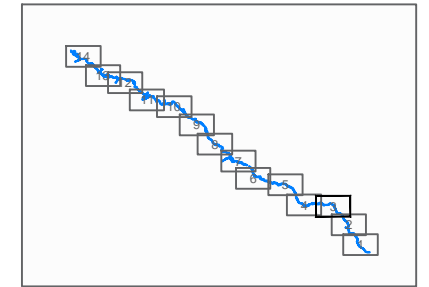
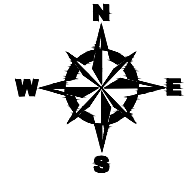


-  River
-  Flood Prone Area
-  River Cross Section
-  Existing Railway
-  Rerouting Line
-  Bank Protection
-  Flood Mark

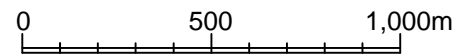
0 500 1,000m

GOVERNMENT AGENCIES:		JICA STUDY TEAM:	PROJECT & LOCATION:	SHEET CONTENTS:	DWG NUM
 JAPAN International Cooperation Agency	 Reli Assets Holding Company (RAHCO), Tanzania	PADECO Co., Ltd., Nippon Koei Co., Ltd., Japan International Consultants for Transportation Co., Ltd., and Fukken Engineering Co., Ltd.	Preparatory Survey on Flood Protection Measures for Central Railway Line in the United Republic of Tanzania	PLAN OF FLOOD PROTECTION MEASURES (2/14) Scale:1/20000	

PLAN OF FLOOD PROTECTION MEASURES (3/14)  
Scale: 1/20000

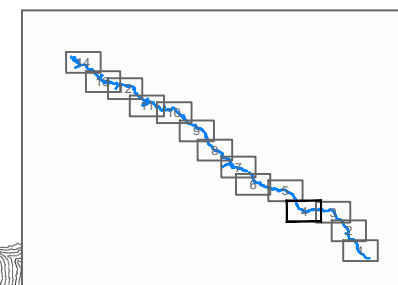
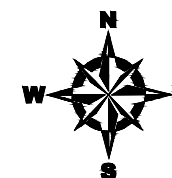









- River
- Flood Prone Area
- River Cross Section
- Existing Railway
- Rerouting Line
- Bank Protection
- Flood Mark

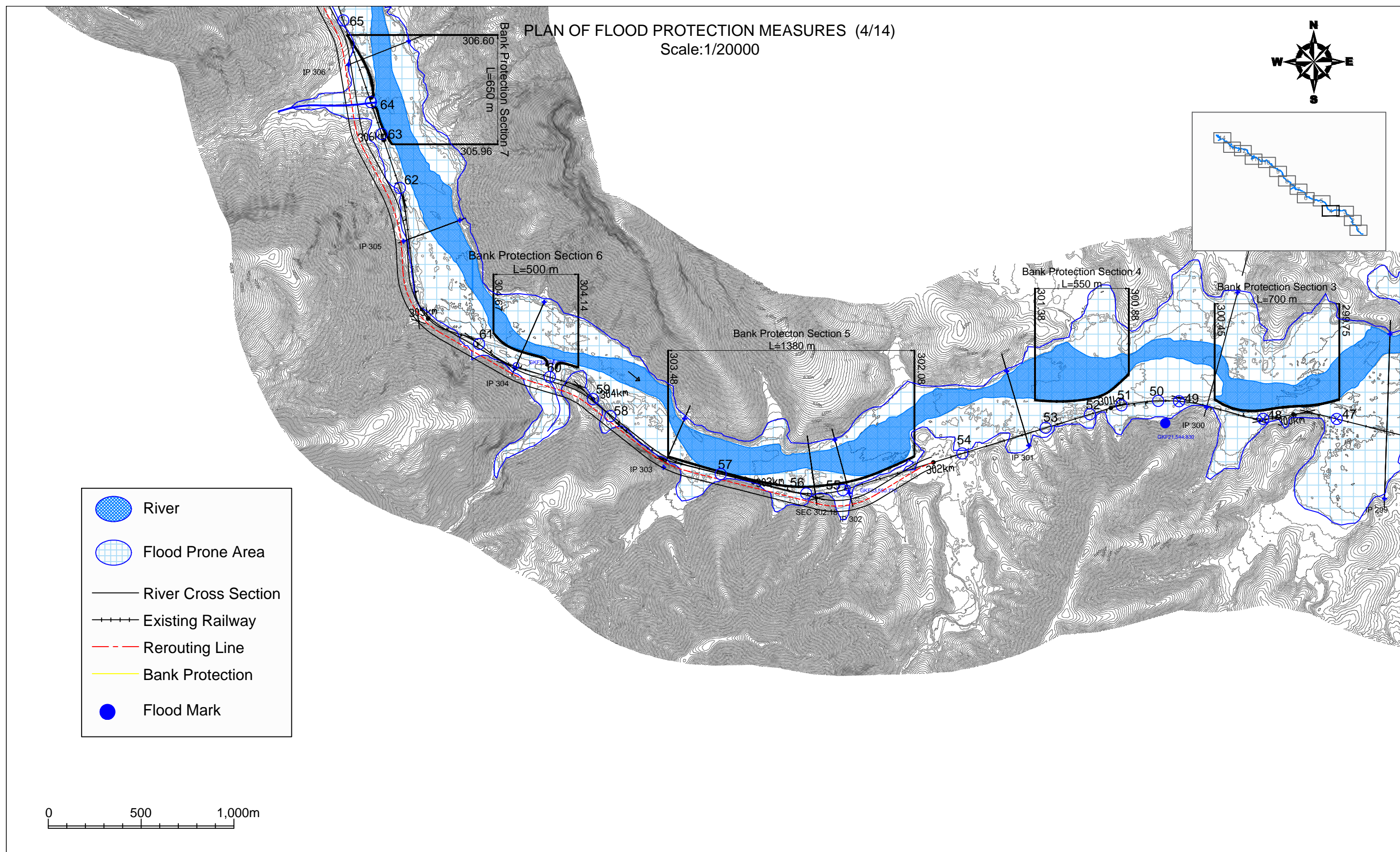
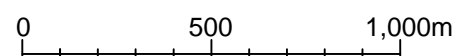




GOVERNMENT AGENCIES:		JICA STUDY TEAM:	PROJECT & LOCATION:	SHEET CONTENTS:	DWG NUM
JAPAN International Cooperation Agency	Reli Assets Holding Company (RAHCO), Tanzania	PADECO Co., Ltd., Nippon Koei Co., Ltd., Japan International Consultants for Transportation Co., Ltd., and Fukken Engineering Co., Ltd.	Preparatory Survey on Flood Protection Measures for Central Railway Line in the United Republic of Tanzania	PLAN OF FLOOD PROTECTION MEASURES (3/14) Scale: 1/20000	

PLAN OF FLOOD PROTECTION MEASURES (4/14)  
Scale: 1/20000



-  River
-  Flood Prone Area
-  River Cross Section
-  Existing Railway
-  Rerouting Line
-  Bank Protection
-  Flood Mark



GOVERNMENT AGENCIES:		JICA STUDY TEAM:	PROJECT & LOCATION:	SHEET CONTENTS:	DWG NUM
 JAPAN International Cooperation Agency	 Reli Assets Holding Company (RAHCO), Tanzania	PADECO Co., Ltd., Nippon Koei Co., Ltd., Japan International Consultants for Transportation Co., Ltd., and Fukken Engineering Co., Ltd.	Preparatory Survey on Flood Protection Measures for Central Railway Line in the United Republic of Tanzania	PLAN OF FLOOD PROTECTION MEASURES (4/14) Scale: 1/20000	