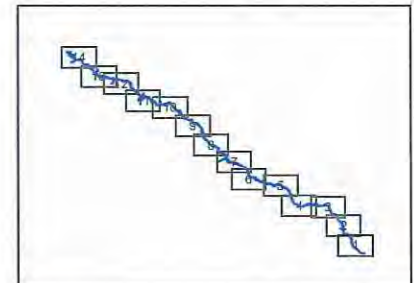


## **APPENDIX T**

### **HAZARD MAPS ALONG KINYASUNGWE/MKONDOA RIVER**



**LEGEND OF FLOODED AREA:**

- Dec.1997/Jan.1998 Flood (Source:TRL)
- ★ 2011/2012 Flood (Source:CPCS)

**LEGEND OF PIPE / BOX CULVERTS:**

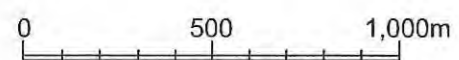
- Pipe or Box Culvert
- ⊗ Pipe or Box Culvert at high risk identified by "Flood Risk Assessment" conducted in Dec.2014

- River
- Flood Prone Area
- River Cross Section (March-June,2015)
- ++++ Existing Railway
- - - - Rerouting Line
- Bank Protection
- ++□++ Railway Station
- Flood Mark

Location of Staff Gauges

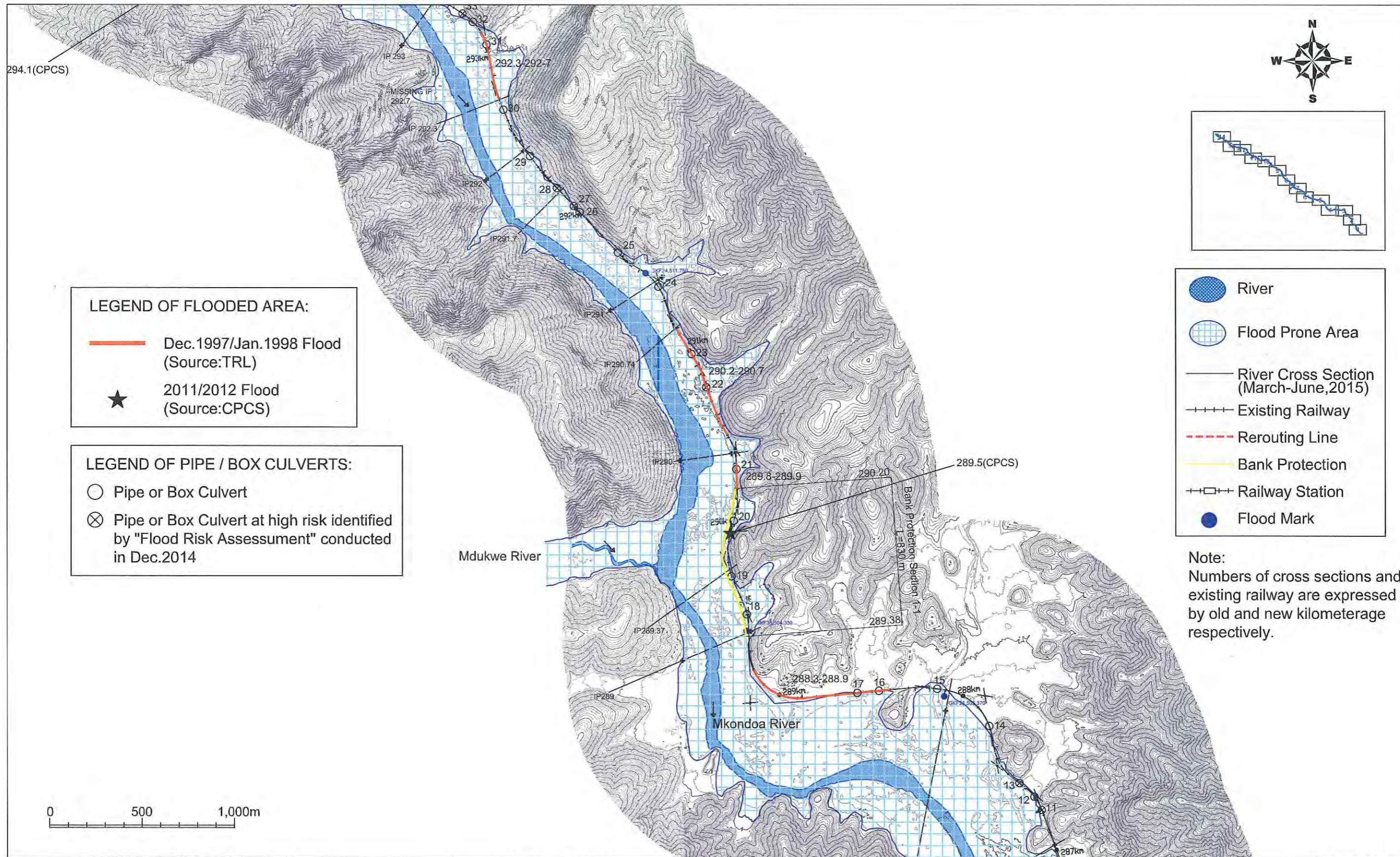
| Location           | River             | Latitude    | Longitude    | River Bank |
|--------------------|-------------------|-------------|--------------|------------|
| Kilosa             | Mkondoa River     | S6°49'54.4" | E36°58'41.2" | Left       |
| Lumuma Bridge      | Lumuma River      | S6°38'57"   | E36°42'19"   | Left       |
| Matomondo Village* | Mangweta River    | S6°26'30.4" | E36°38'26.4" | Left       |
| Gulwe              | Kinyasungwe River | S6°26'58"   | E36°24'48.9" | Left       |
| Mzase River*       | Mzase River       | S6°27'22.5" | E36°24'11.1" | Right      |

Note:Installed by the current study  
 \*, Beyond the limit of map area



Note:  
 Numbers of cross sections and existing railway are expressed by old and new kilometerage respectively.

|  |   |   |  |   |  |   |
|--|---|---|--|---|--|---|
| 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 | FLOOD HAZARD MAP (1/14)<br>Scale:1/20000 | <div style="border: 1px solid black; border-radius: 50%; width: 40px; height: 40px; margin: 0 auto; display: flex; align-items: center; justify-content: center;"> <div style="border: 1px solid black; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center;">DFR</div> <div style="border: 1px solid black; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center;">H</div> <div style="border: 1px solid black; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center;">1</div> </div> |

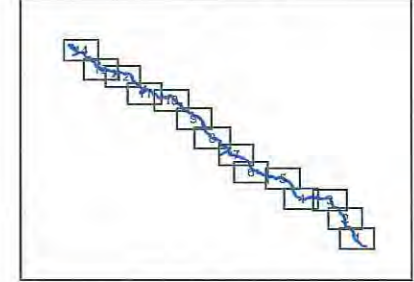


| GOVERNMENT AGENCIES:                   |   | JICA STUDY TEAM:   | PROJECT & LOCATION:   | SHEET CONTENTS:                          | DWG NUM      |
|--|---|--|---|--|--------------|
| JAPAN International Cooperation Agency | Reli Assets Holding Company (RAHCO), Tanzania | PADECO Co., Ltd.,<br>Nippon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



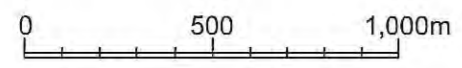
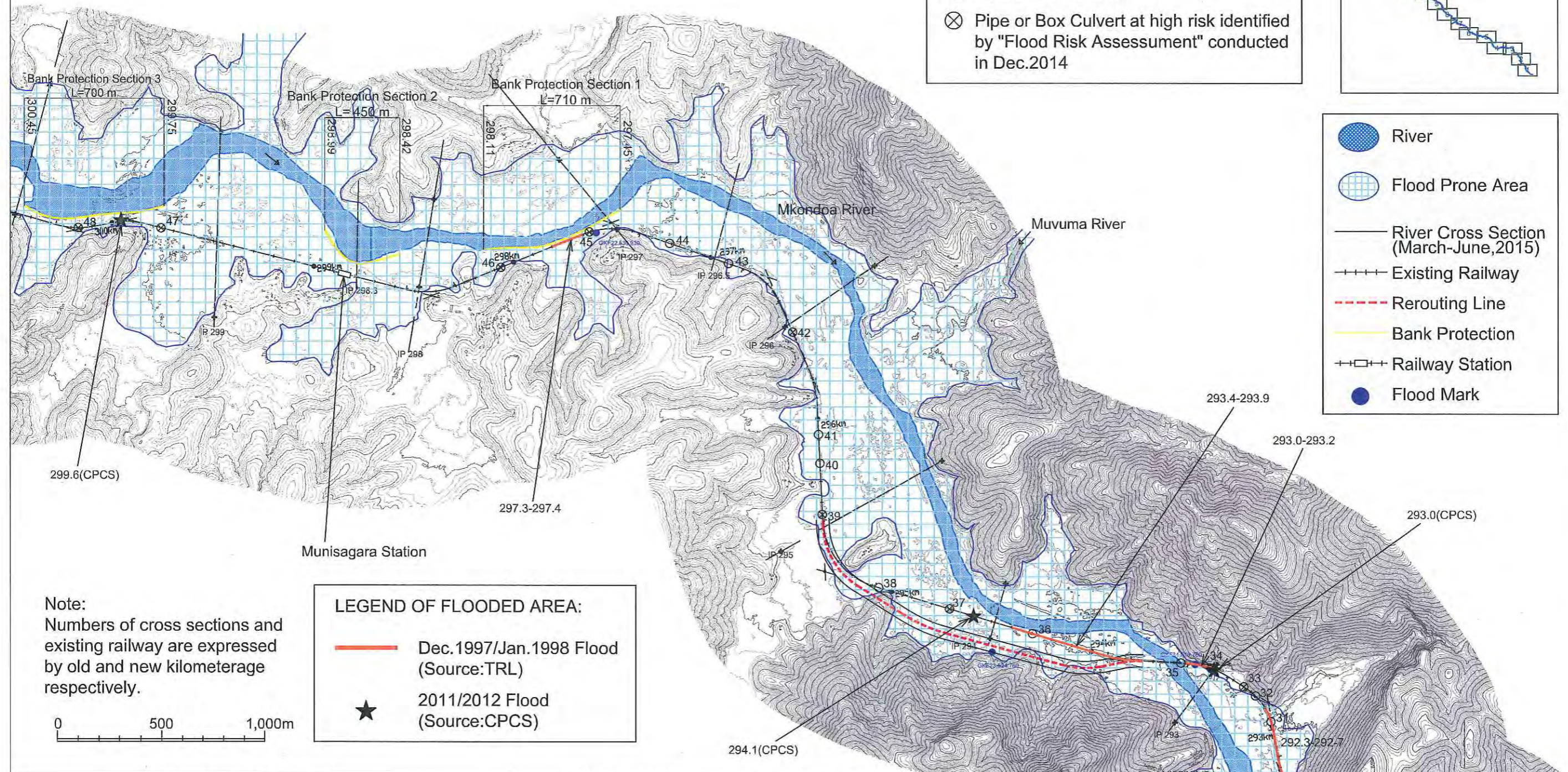
**LEGEND OF PIPE / BOX CULVERTS:**

- Pipe or Box Culvert
- ⊗ Pipe or Box Culvert at high risk identified by "Flood Risk Assessment" conducted in Dec.2014





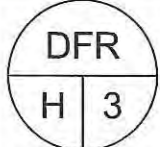
**LEGEND OF FLOODED AREA:**

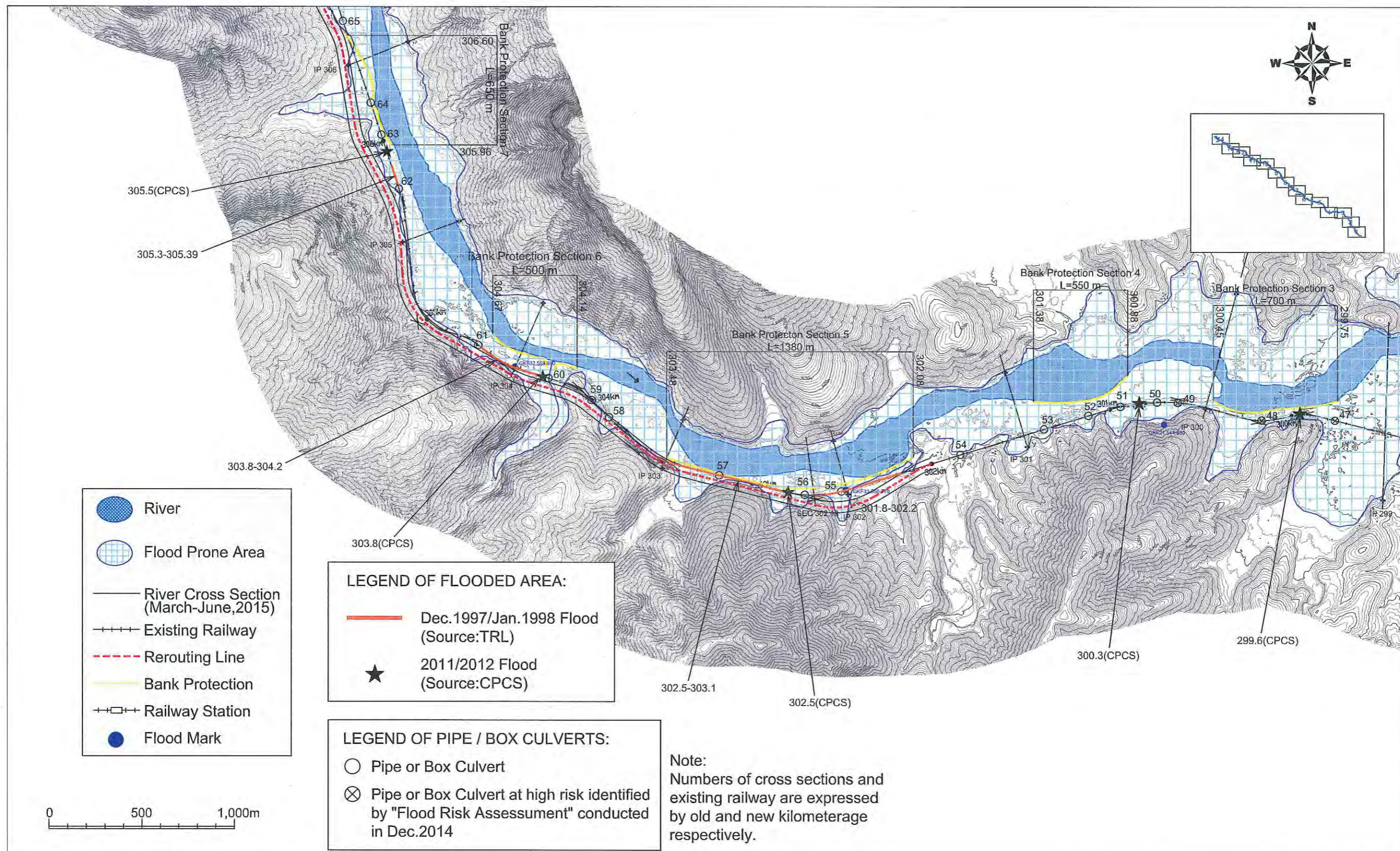
- River
- ◻ Flood Prone Area
- River Cross Section (March-June,2015)
- Existing Railway
- - - Rerouting Line
- Bank Protection
- ⊠ Railway Station
- Flood Mark



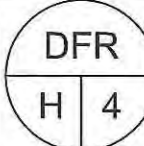


**LEGEND OF FLOODED AREA:**

- Dec.1997/Jan.1998 Flood (Source:TRL)
- ★ 2011/2012 Flood (Source:CPCS)

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

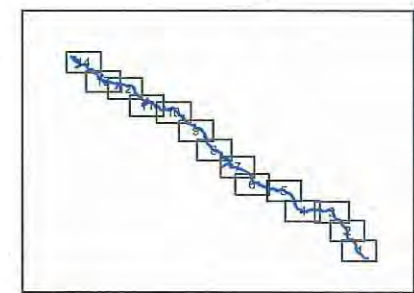


| GOVERNMENT AGENCIES:   |   | JICA STUDY TEAM:   | PROJECT & LOCATION:   | SHEET CONTENTS:                          | DWG NUM   |
|--|---|--|---|--|---|
|  JAPAN International Cooperation Agency |  Reli Assets Holding Company (RAHCO), Tanzania | PADECO Co., Ltd.,<br>Nippon Koei Co., Ltd.,<br>Japan International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



**LEGEND OF FLOODED AREA:**

- Dec.1997/Jan.1998 Flood (Source:TRL)
- ★ 2011/2012 Flood (Source:CPCS)

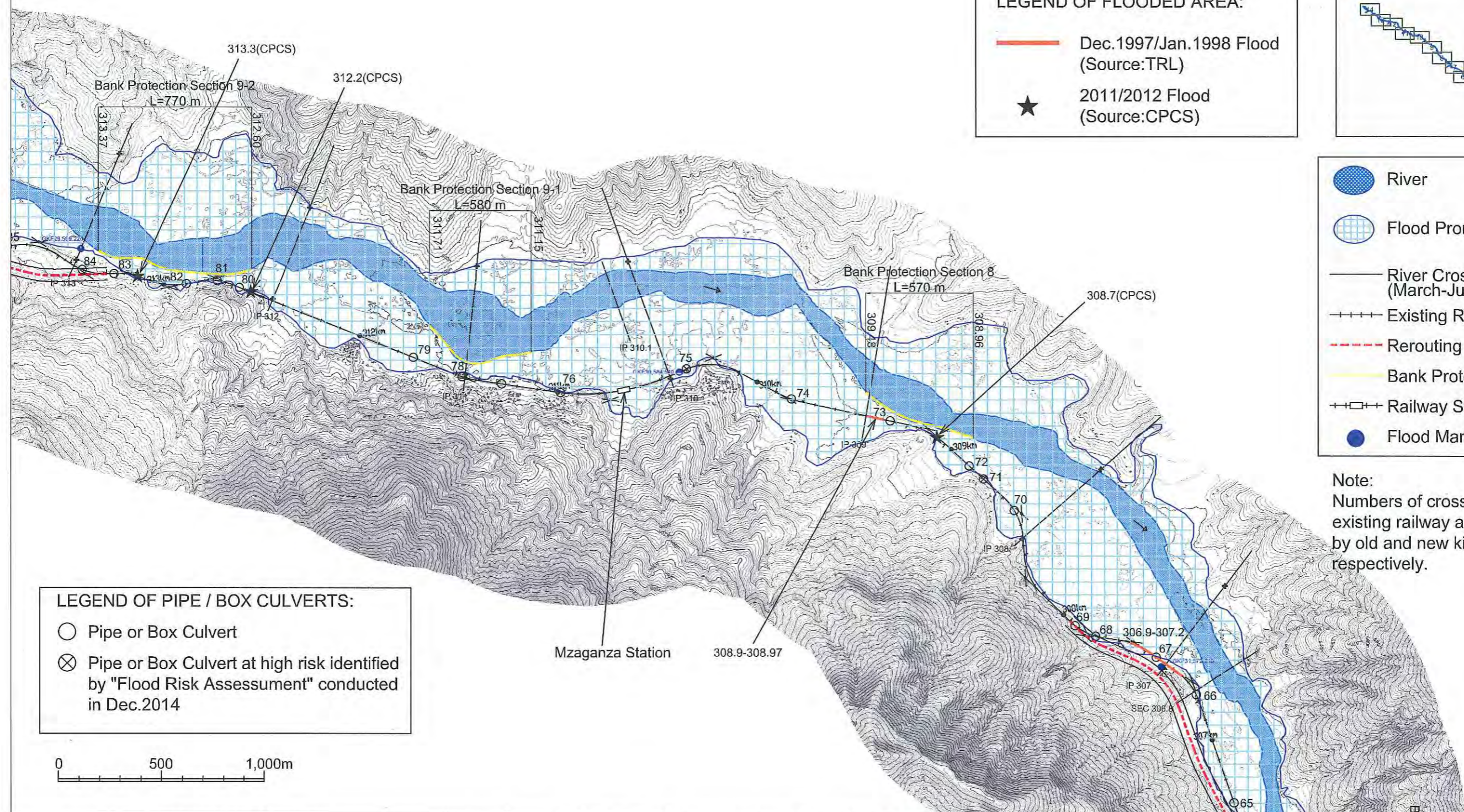
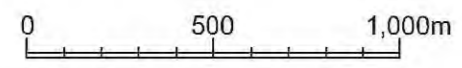


- River
- Flood Prone Area
- River Cross Section (March-June,2015)
- Existing Railway
- Rerouting Line
- Bank Protection
- Railway Station
- Flood Mark

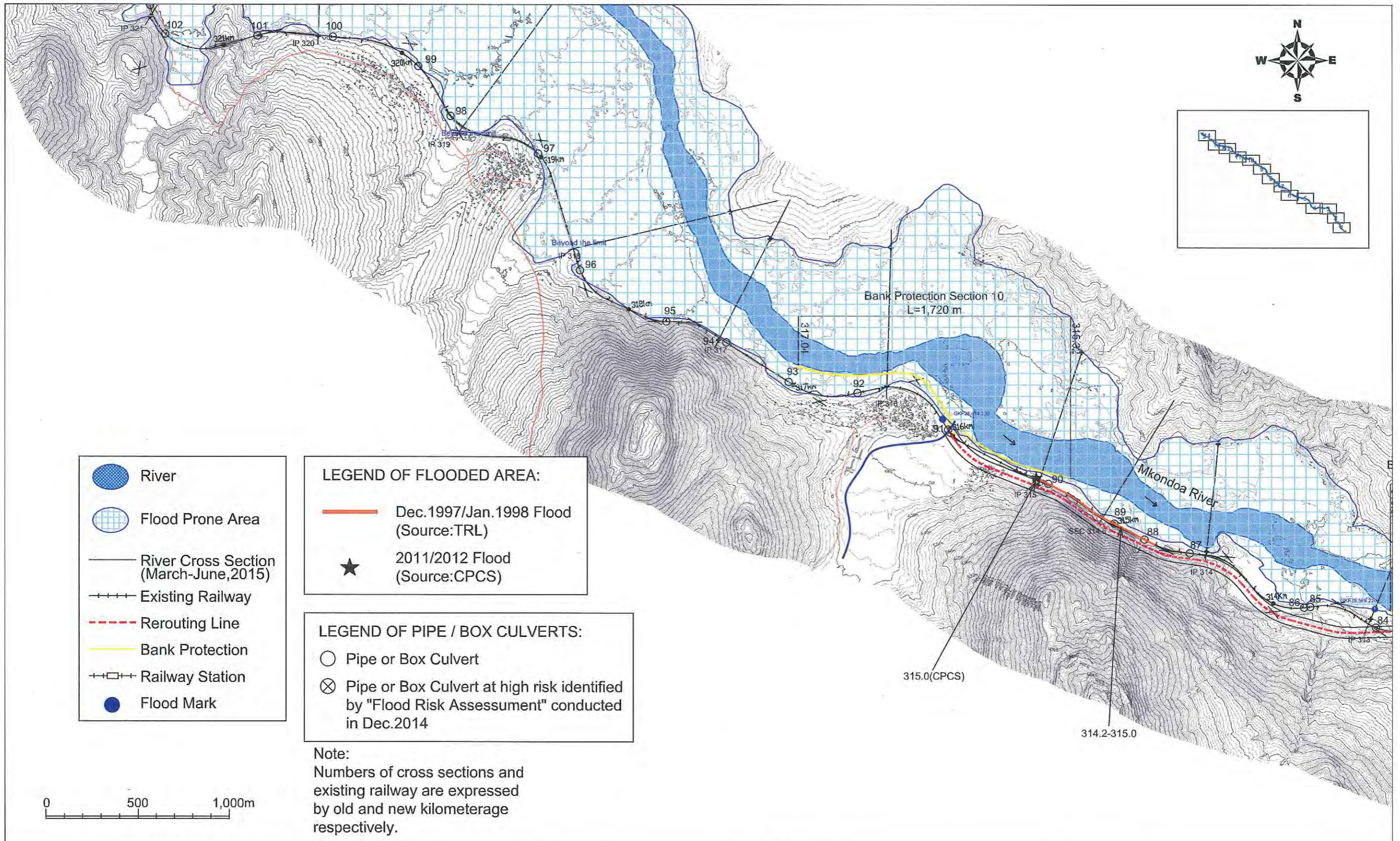
**Note:**  
Numbers of cross sections and existing railway are expressed by old and new kilometrage respectively.

**LEGEND OF PIPE / BOX CULVERTS:**

- Pipe or Box Culvert
- ⊗ Pipe or Box Culvert at high risk identified by "Flood Risk Assessment" conducted in Dec.2014



| GOVERNMENT AGENCIES:                   |   | JICA STUDY TEAM:   | PROJECT & LOCATION:   | SHEET CONTENTS:                          | DWG NUM |
|--|---|--|---|--|---------|
| JAPAN International Cooperation Agency | Reli Assets Holding Company (RAHCO), Tanzania | PADECO Co., Ltd.,<br>Nippon Koei Co., Ltd.,<br>Japan International Consultants for Transportation Co., Ltd., and<br>Fukken Engineering Co., Ltd. | Preparatory Survey on Flood Protection Measures for Central Railway Line in the United Republic of Tanzania | FLOOD HAZARD MAP (5/14)<br>Scale:1/20000 |         |



- River
- Flood Prone Area
- River Cross Section (March-June, 2015)
- Existing Railway
- Rerouting Line
- Bank Protection
- Railway Station
- Flood Mark

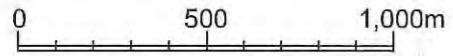
**LEGEND OF FLOODED AREA:**

- Dec. 1997/Jan. 1998 Flood (Source:TRL)
- 2011/2012 Flood (Source:CPCS)

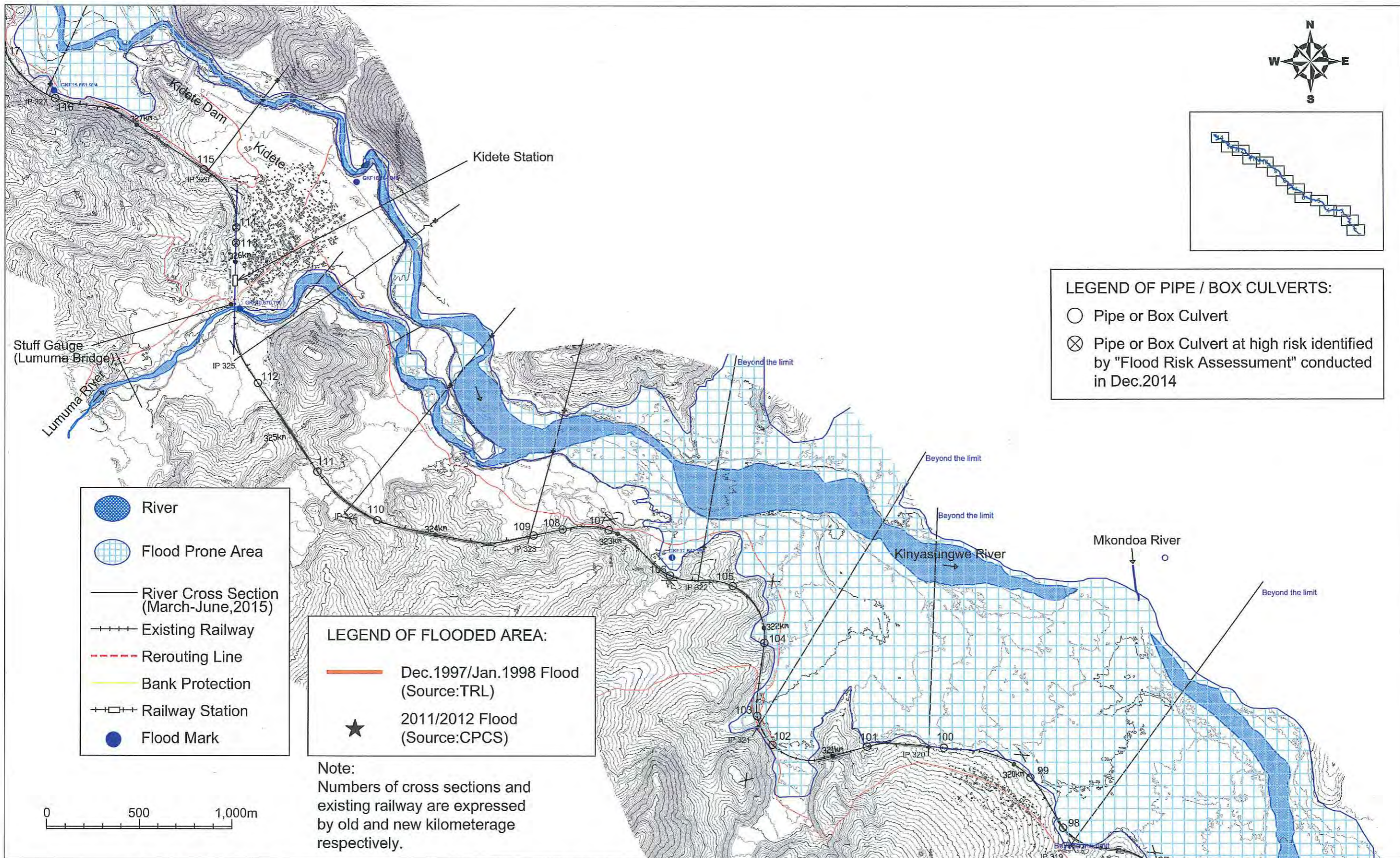
**LEGEND OF PIPE / BOX CULVERTS:**

- Pipe or Box Culvert
- Pipe or Box Culvert at high risk identified by "Flood Risk Assessment" conducted in Dec. 2014

Note:  
Numbers of cross sections and existing railway are expressed by old and new kilometerage respectively.



| GOVERNMENT AGENCIES:                       |   | JICA STUDY TEAM:   | PROJECT & LOCATION:   | SHEET CONTENTS:                                  | DWG NUM   |
|--|---|--|---|--|---|
| <br>JAPAN International Cooperation Agency | <br>Reli Assets Holding Company (RAHCO), Tanzania | PADECO Co., Ltd.,<br>Nippon Koei Co., Ltd.,<br>Japan International Consultants for Transportation Co., Ltd., and<br>Fukken Engineering Co., Ltd. | Preparatory Survey on Flood Protection Measures for Central Railway Line in the United Republic of Tanzania | <b>FLOOD HAZARD MAP (6/14)</b><br>Scale: 1/20000 | <div style="border: 1px solid black; border-radius: 50%; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center; margin: 0 auto;"> <div style="border: 1px solid black; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center; margin: 0 auto;">             DFR           </div> <div style="border: 1px solid black; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center; margin: 0 auto;">             H   6           </div> </div> |



**LEGEND OF PIPE / BOX CULVERTS:**

- Pipe or Box Culvert
- ⊗ Pipe or Box Culvert at high risk identified by "Flood Risk Assessment" conducted in Dec.2014

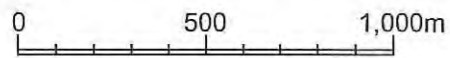
**LEGEND OF FLOODED AREA:**

- River
- Flood Prone Area
- River Cross Section (March-June,2015)
- Existing Railway
- Rerouting Line
- Bank Protection
- Railway Station
- Flood Mark

**LEGEND OF FLOODED AREA:**

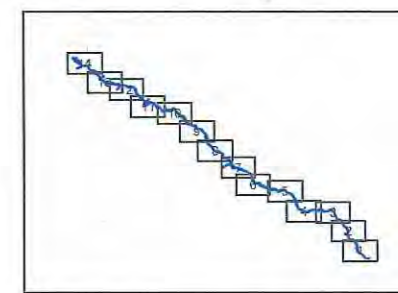
- Dec.1997/Jan.1998 Flood (Source:TRL)
- 2011/2012 Flood (Source:CPCS)

Note:  
Numbers of cross sections and existing railway are expressed by old and new kilometerage respectively.



| GOVERNMENT AGENCIES:                   |   | JICA STUDY TEAM:   | PROJECT & LOCATION:   | SHEET CONTENTS:                          | DWG NUM |
|--|---|--|---|--|---------|
| JAPAN International Cooperation Agency | Reli Assets Holding Company (RAHCO), Tanzania | PADECO Co., Ltd.,<br>Nippon Koei Co., Ltd.,<br>Japan International Consultants for Transportation Co., Ltd., and<br>Fukken Engineering Co., Ltd. | Preparatory Survey on Flood Protection Measures for Central Railway Line in the United Republic of Tanzania | FLOOD HAZARD MAP (7/14)<br>Scale:1/20000 |         |





**LEGEND OF PIPE / BOX CULVERTS:**

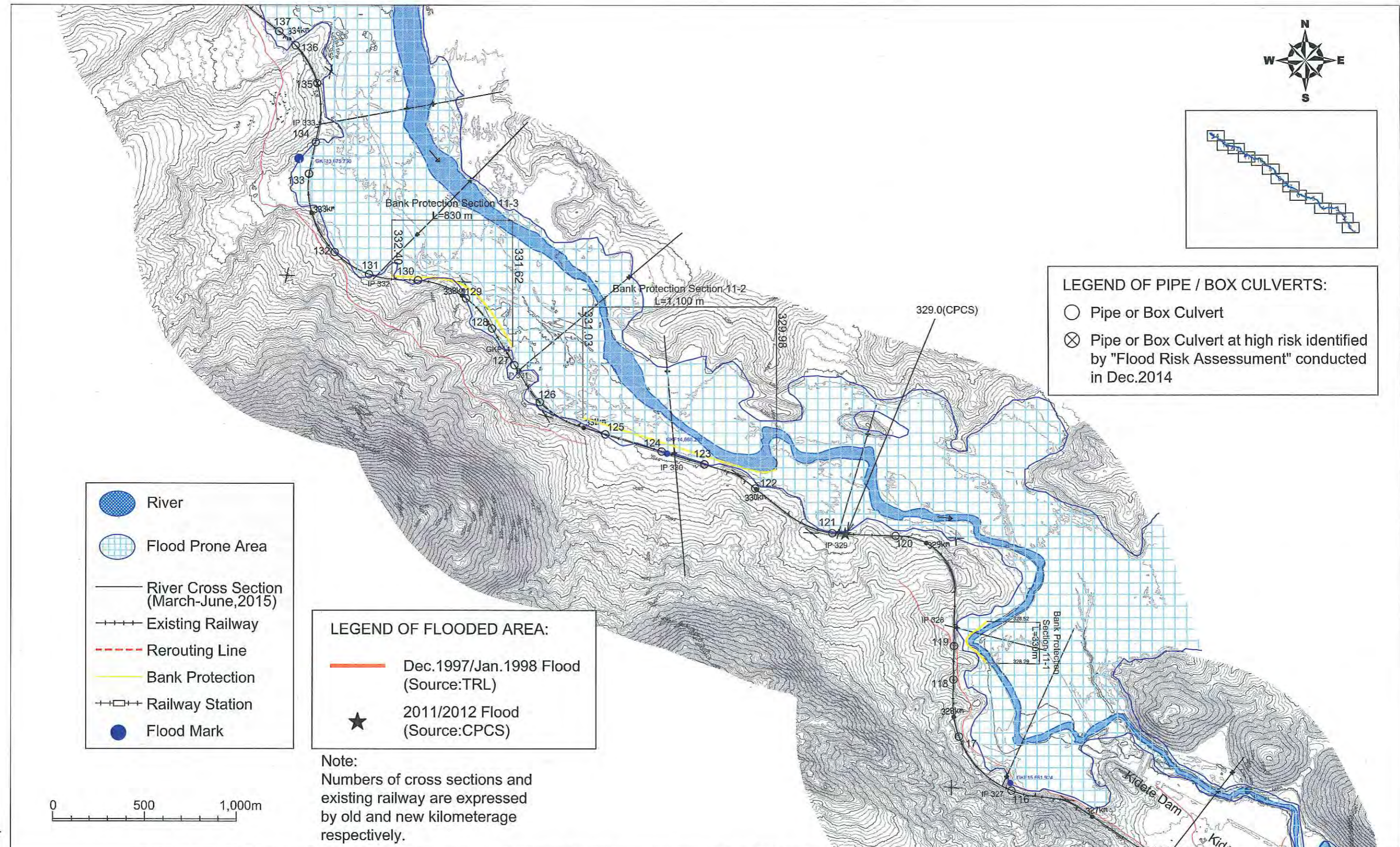
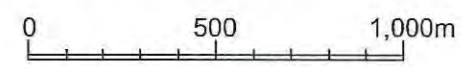
- Pipe or Box Culvert
- ⊗ Pipe or Box Culvert at high risk identified by "Flood Risk Assessment" conducted in Dec.2014

- River
- Flood Prone Area
- River Cross Section (March-June,2015)
- Existing Railway
- Rerouting Line
- Bank Protection
- Railway Station
- Flood Mark

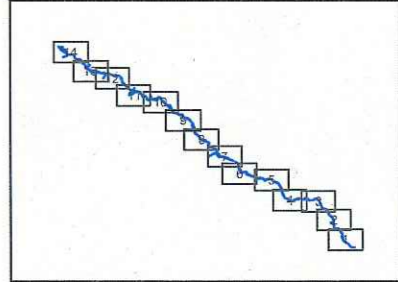
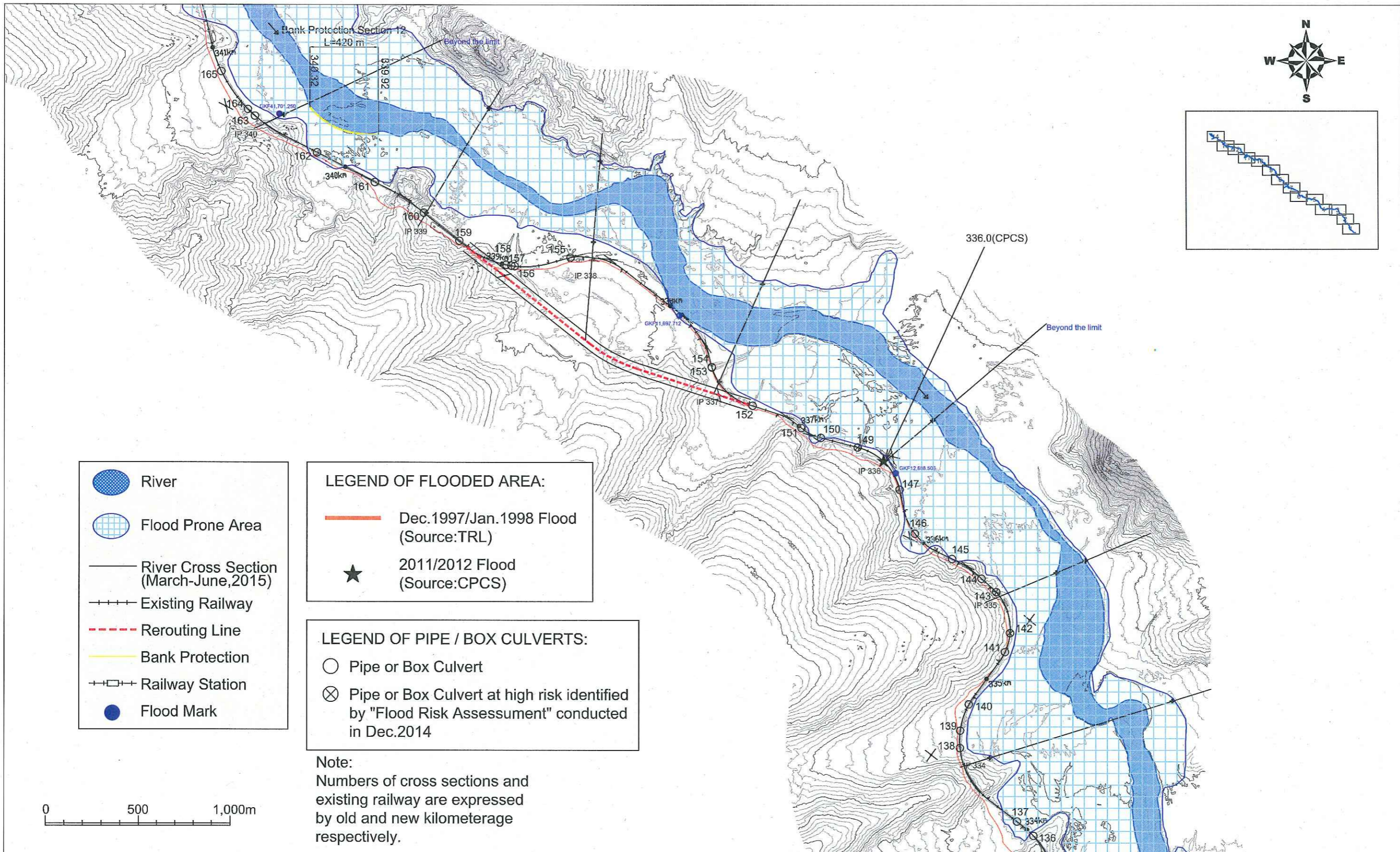
**LEGEND OF FLOODED AREA:**

- Dec.1997/Jan.1998 Flood (Source:TRL)
- 2011/2012 Flood (Source:CPCS)

Note:  
Numbers of cross sections and existing railway are expressed by old and new kilometrage respectively.



| GOVERNMENT AGENCIES:                   |   | JICA STUDY TEAM:   | PROJECT & LOCATION:   | SHEET CONTENTS:                          | DWG NUM |
|--|---|--|---|--|---------|
| JAPAN International Cooperation Agency | Reli Assets Holding Company (RAHCO), Tanzania | PADECO Co., Ltd.,<br>Nippon Koei Co., Ltd.,<br>Japan International Consultants for Transportation Co., Ltd., and<br>Fukken Engineering Co., Ltd. | Preparatory Survey on<br>Flood Protection<br>Measures for Central<br>Railway Line in the United<br>Republic of Tanzania | FLOOD HAZARD MAP (8/14)<br>Scale:1/20000 |         |



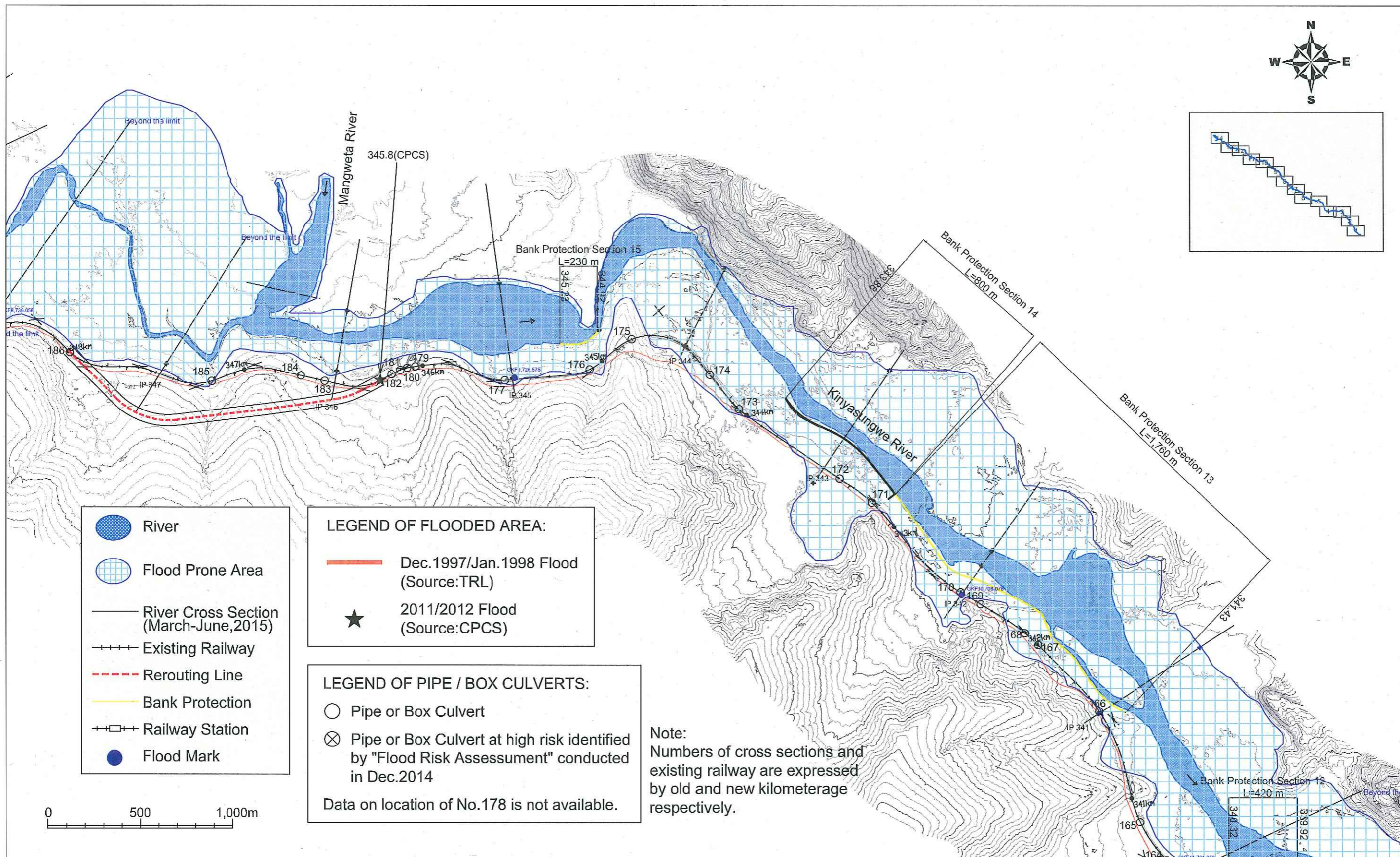
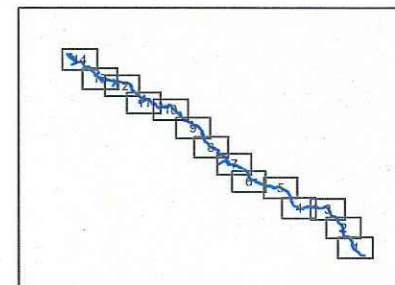
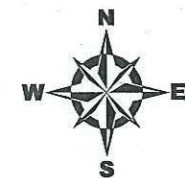
- River
- Flood Prone Area
- River Cross Section (March-June, 2015)
- Existing Railway
- Rerouting Line
- Bank Protection
- Railway Station
- Flood Mark

- LEGEND OF FLOODED AREA:**
- Dec. 1997/Jan. 1998 Flood (Source:TRL)
  - 2011/2012 Flood (Source:CPCS)

- LEGEND OF PIPE / BOX CULVERTS:**
- Pipe or Box Culvert
  - Pipe or Box Culvert at high risk identified by "Flood Risk Assessment" conducted in Dec. 2014

Note:  
Numbers of cross sections and existing railway are expressed by old and new kilometerage respectively.

| GOVERNMENT AGENCIES:                   |   | JICA STUDY TEAM:   | PROJECT & LOCATION:   | SHEET CONTENTS:                          | DWG NUM |
|--|---|--|---|--|---------|
| JAPAN International Cooperation Agency | Reli Assets Holding Company (RAHCO), Tanzania | PADECO Co., Ltd.,<br>Nippon Koei Co., Ltd.,<br>Japan International Consultants for Transportation Co., Ltd., and<br>Fukken Engineering Co., Ltd. | Preparatory Survey on Flood Protection Measures for Central Railway Line in the United Republic of Tanzania | FLOOD HAZARD MAP (9/14)<br>Scale:1/20000 |         |

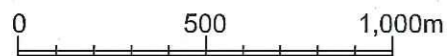


- River
- Flood Prone Area
- River Cross Section (March-June, 2015)
- Existing Railway
- Rerouting Line
- Bank Protection
- Railway Station
- Flood Mark

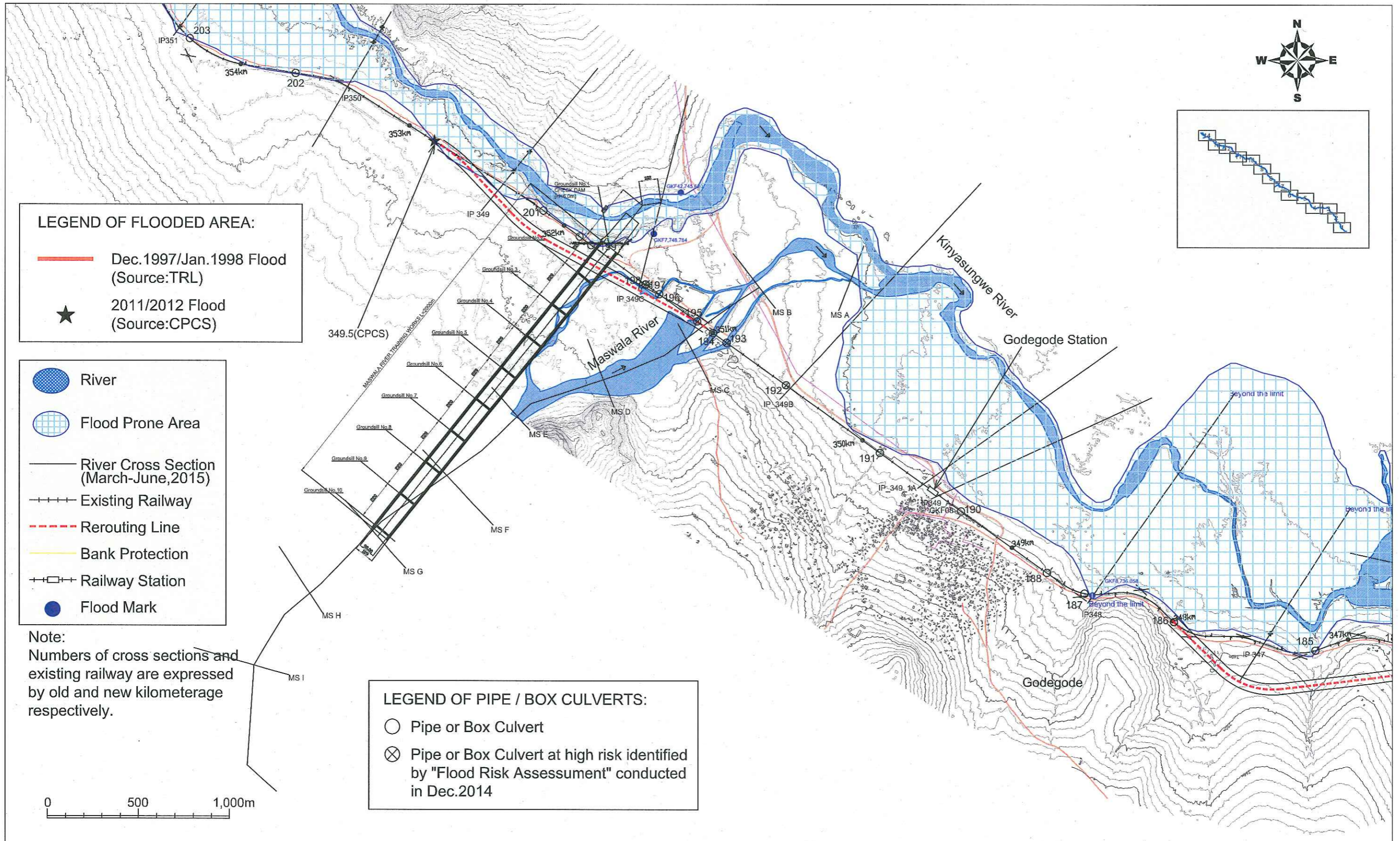
- LEGEND OF FLOODED AREA:**
- Dec. 1997/Jan. 1998 Flood (Source:TRL)
  - 2011/2012 Flood (Source:CPCS)

- LEGEND OF PIPE / BOX CULVERTS:**
- Pipe or Box Culvert
  - Pipe or Box Culvert at high risk identified by "Flood Risk Assessment" conducted in Dec. 2014
- Data on location of No. 178 is not available.

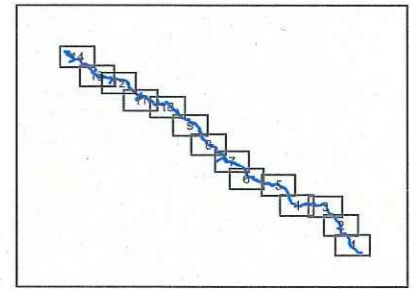
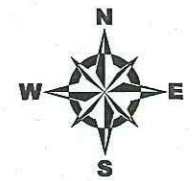
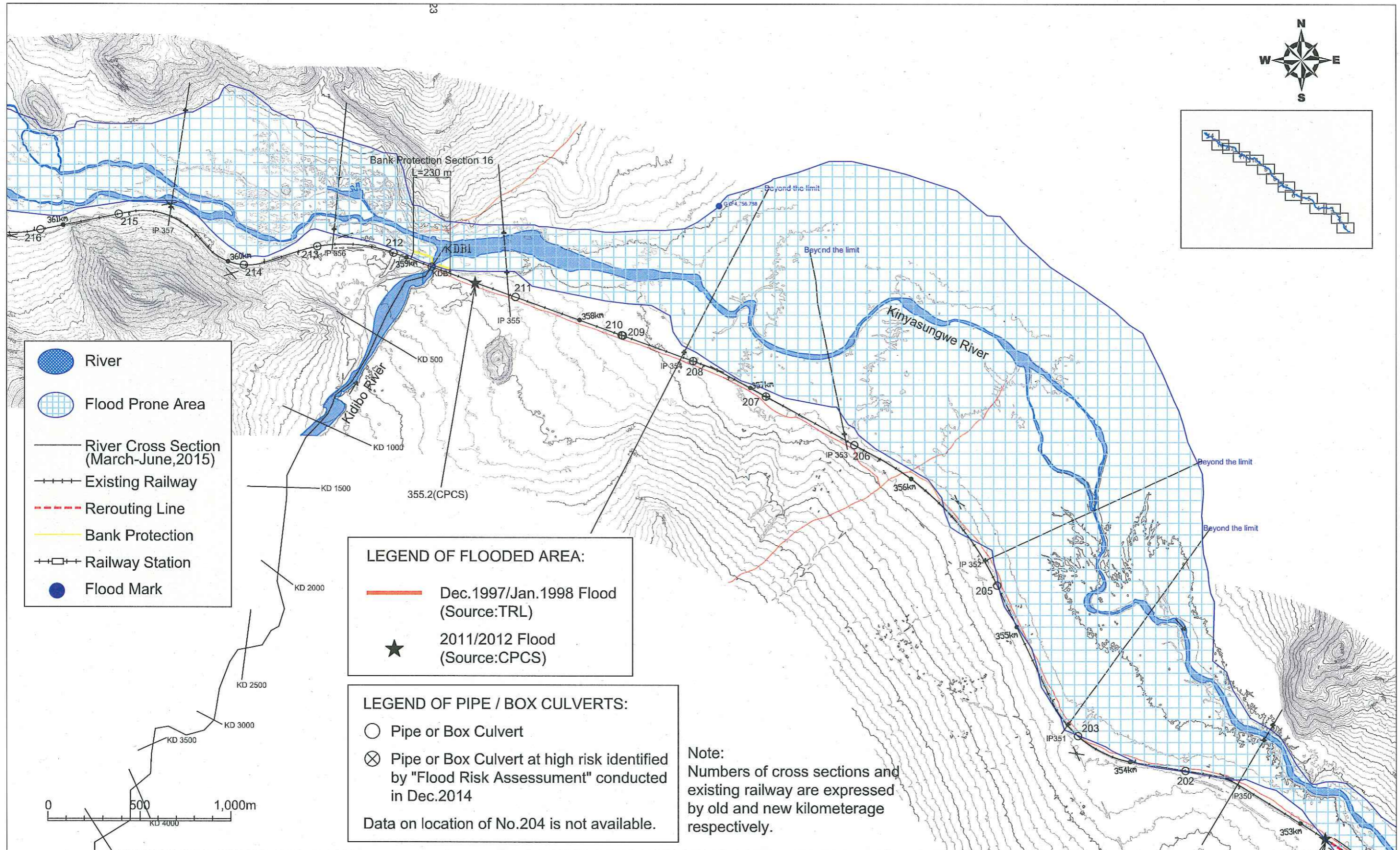
Note:  
Numbers of cross sections and existing railway are expressed by old and new kilometrage respectively.



| GOVERNMENT AGENCIES:                   |   | JICA STUDY TEAM:   | PROJECT & LOCATION:   | SHEET CONTENTS:                            | DWG NUM |
|--|---|--|---|--|---------|
| JAPAN International Cooperation Agency | Reli Assets Holding Company (RAHCO), Tanzania | PADECO Co., Ltd.,<br>Nippon Koei Co., Ltd.,<br>Japan International Consultants for Transportation Co., Ltd., and<br>Fukken Engineering Co., Ltd. | Preparatory Survey on Flood Protection Measures for Central Railway Line in the United Republic of Tanzania | FLOOD HAZARD MAP (10/14)<br>Scale: 1/20000 |         |



| GOVERNMENT AGENCIES:                   |   | JICA STUDY TEAM:   | PROJECT & LOCATION:   | SHEET CONTENTS:                           | DWG NUM     |
|--|---|--|---|---|-------------|
| JAPAN International Cooperation Agency | Reli Assets Holding Company (RAHCO), Tanzania | PADECO Co., Ltd.,<br>Nippon Koei Co., Ltd.,<br>Japan International Consultants for Transportation Co., Ltd., and<br>Fukken Engineering Co., Ltd. | Preparatory Survey on Flood Protection Measures for Central Railway Line in the United Republic of Tanzania | FLOOD HAZARD MAP (11/14)<br>Scale:1/20000 | DFR<br>H 11 |

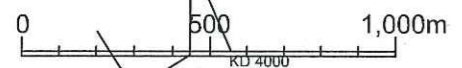


- River
- Flood Prone Area
- River Cross Section (March-June, 2015)
- Existing Railway
- Rerouting Line
- Bank Protection
- Railway Station
- Flood Mark

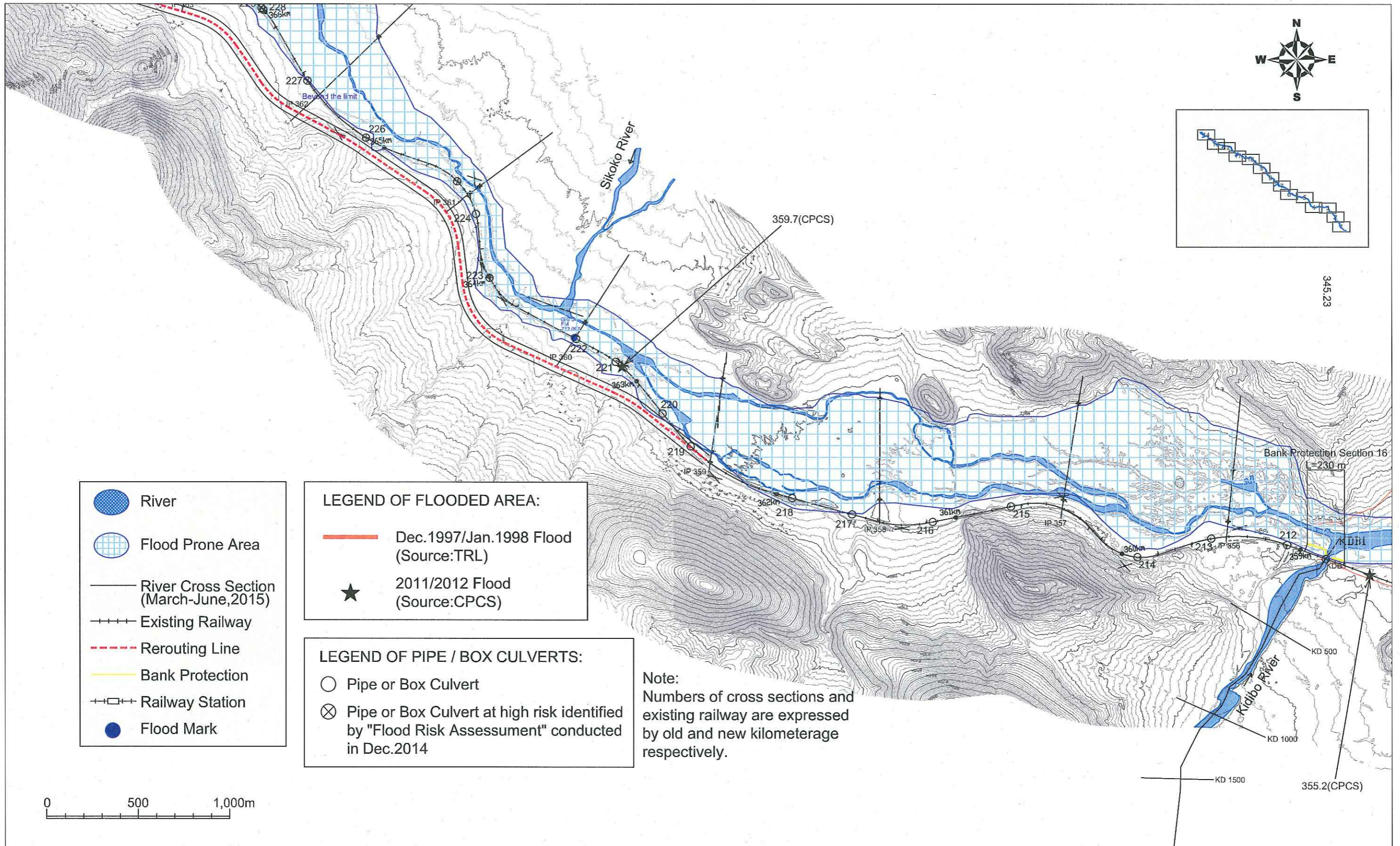
- LEGEND OF FLOODED AREA:**
- Dec. 1997/Jan. 1998 Flood (Source:TRL)
  - 2011/2012 Flood (Source:CPCS)

- LEGEND OF PIPE / BOX CULVERTS:**
- Pipe or Box Culvert
  - Pipe or Box Culvert at high risk identified by "Flood Risk Assessment" conducted in Dec. 2014
- Data on location of No. 204 is not available.

Note:  
Numbers of cross sections and existing railway are expressed by old and new kilometerage respectively.



| GOVERNMENT AGENCIES:                   |   | JICA STUDY TEAM:   | PROJECT & LOCATION:   | SHEET CONTENTS:                           | DWG NUM |
|--|---|--|---|---|---------|
| JAPAN International Cooperation Agency | Reli Assets Holding Company (RAHCO), Tanzania | PADECO Co., Ltd.,<br>Nippon Koei Co., Ltd.,<br>Japan International Consultants for Transportation Co., Ltd., and<br>Fukken Engineering Co., Ltd. | Preparatory Survey on Flood Protection Measures for Central Railway Line in the United Republic of Tanzania | FLOOD HAZARD MAP (12/14)<br>Scale:1/20000 |         |

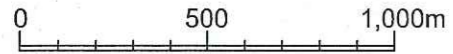


- River
- Flood Prone Area
- River Cross Section (March-June, 2015)
- Existing Railway
- Rerouting Line
- Bank Protection
- Railway Station
- Flood Mark

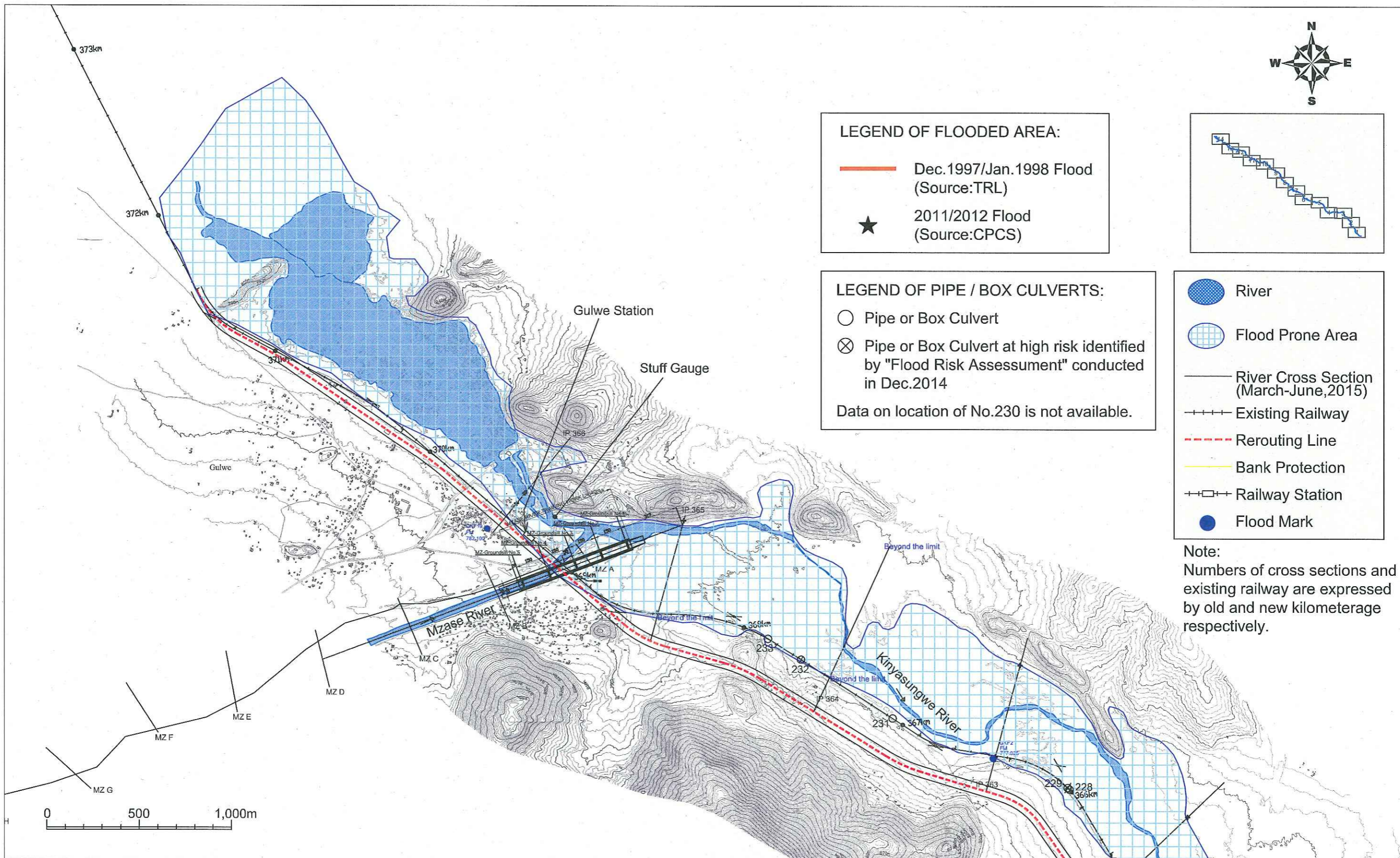
- LEGEND OF FLOODED AREA:**
- Dec. 1997/Jan. 1998 Flood (Source:TRL)
  - 2011/2012 Flood (Source:CPCS)

- LEGEND OF PIPE / BOX CULVERTS:**
- Pipe or Box Culvert
  - Pipe or Box Culvert at high risk identified by "Flood Risk Assessment" conducted in Dec. 2014

Note:  
Numbers of cross sections and existing railway are expressed by old and new kilometerage respectively.



| GOVERNMENT AGENCIES:                   |   | JICA STUDY TEAM:   | PROJECT & LOCATION:   | SHEET CONTENTS:                           | DWG NUM |
|--|---|--|---|---|---------|
| JAPAN International Cooperation Agency | Reli Assets Holding Company (RAHCO), Tanzania | PADECO Co., Ltd.,<br>Nippon Koei Co., Ltd.,<br>Japan International Consultants for Transportation Co., Ltd., and<br>Fukken Engineering Co., Ltd. | Preparatory Survey on Flood Protection Measures for Central Railway Line in the United Republic of Tanzania | FLOOD HAZARD MAP (13/14)<br>Scale:1/20000 |         |



**LEGEND OF FLOODED AREA:**

— Dec.1997/Jan.1998 Flood (Source:TRL)

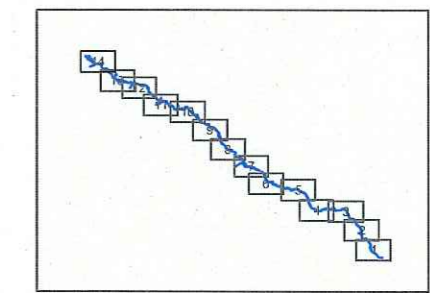
★ 2011/2012 Flood (Source:CPCS)

**LEGEND OF PIPE / BOX CULVERTS:**

○ Pipe or Box Culvert

⊗ Pipe or Box Culvert at high risk identified by "Flood Risk Assessment" conducted in Dec.2014

Data on location of No.230 is not available.



● River

▨ Flood Prone Area

— River Cross Section (March-June,2015)

++++ Existing Railway

- - - - Rerouting Line

— Bank Protection

+□+ Railway Station

● Flood Mark

Note:  
Numbers of cross sections and existing railway are expressed by old and new kilometrage respectively.

|   |  |   |  |   |  |   |  |                    |
|---|--|---|--|---|--|---|--|--------------------|
| <b>GOVERNMENT AGENCIES:</b><br>JAPAN International Cooperation Agency |  | <b>JICA STUDY TEAM:</b><br>PADECO Co., Ltd.,<br>Nippon Koei Co., Ltd.,<br>Japan International Consultants for Transportation Co., Ltd., and<br>Fukken Engineering Co., Ltd. |  | <b>PROJECT &amp; LOCATION:</b><br>Preparatory Survey on Flood Protection Measures for Central Railway Line in the United Republic of Tanzania |  | <b>SHEET CONTENTS:</b><br>FLOOD HAZARD MAP (14/14)<br>Scale:1/20000 |  | <b>DWG NUM</b><br> |
|---|--|---|--|---|--|---|--|--------------------|