



**MINISTRY OF PUBLIC  
WORKS AND TRANSPORT**

General Directorate of Techniques  
Road Infrastructure Department

# **Bridge Inspection Handbook**



**2017**



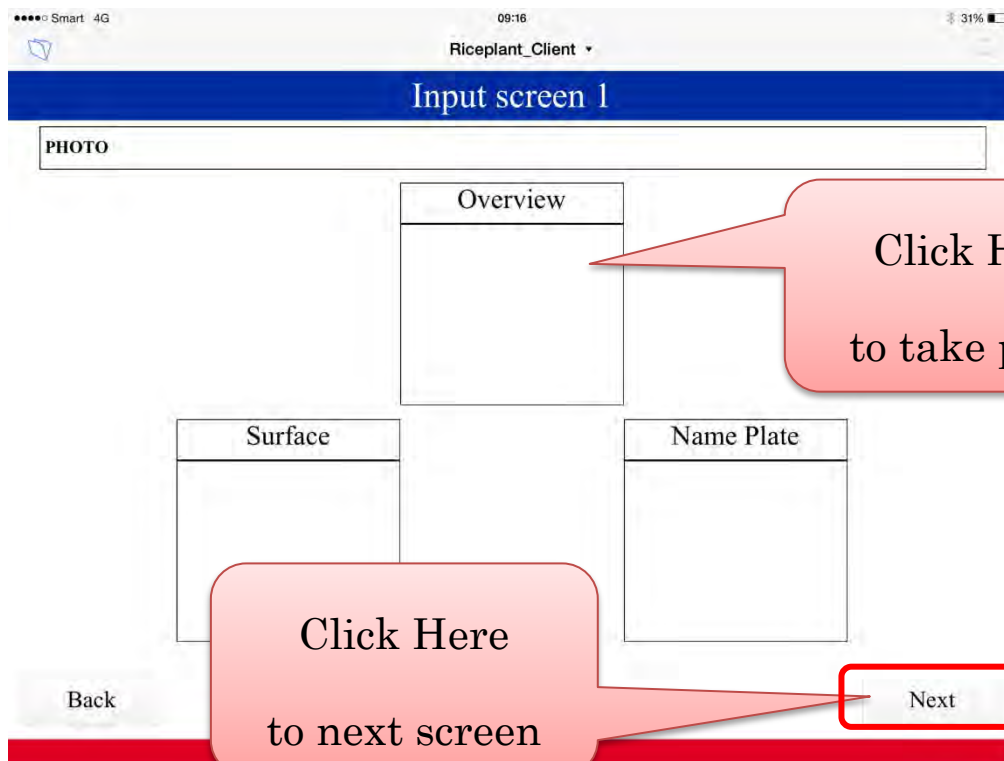
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# Follow of ipad system

## First Step Input Bridge Inventory





Smart 4G 09:17 31%

Riceplant\_Client

### Input screen 2

**GENERAL**

Bridge Name		Road Category	<input type="radio"/> National <input type="radio"/> Provincial		
Province		Village/Commune			
Road Name		PK	+		
Location	Latitude	11.627726	Longitude	104.924041	
Bridge Length	m	Number of Span		Max. Span Length	m
Left Sidewalk Width	m	Carriageway Width	m	Right Sidewalk Width	m
Total Width (including Curb)	m	Number of Lane		Constructed Year	
Contractor		uilt drawings	<input type="radio"/> Yes <input type="radio"/> No		

Back Click Here to next screen Next



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Riceplant\_Client

### Input screen 3

**SLAB/PAVEMENT**

Slab Material		Pavement	
---------------	--	----------	--

**ACCESSARY**

Bearing	<input type="radio"/> Yes <input type="radio"/> No	Expansion Joint	<input type="radio"/> Yes <input type="radio"/> No
Bridge Railing	<input type="radio"/> Yes <input type="radio"/> No	Attachment	<input type="radio"/> Yes <input type="radio"/> No

**SUPERSTRUCTURE**

Material		Superstructure Type	
Number of Girders/Span		Continuous	<input type="radio"/> Yes <input type="radio"/> No

Back Click Here to next screen Next



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### Input screen 4

Underside

COLUMNS AND PIERS							
Material				StructureType			
Size of Column/Pier	Rectangle		mm ×		mm	Circle	φ
Foundation Type				Number of Column / Pier			

ABUTMENTS							
Material				eType			
Foundation Type	A1		m	A2		m	

Back Confirm

Click Here  
inventory end



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### Inventoried Bridges List

Update Location Information

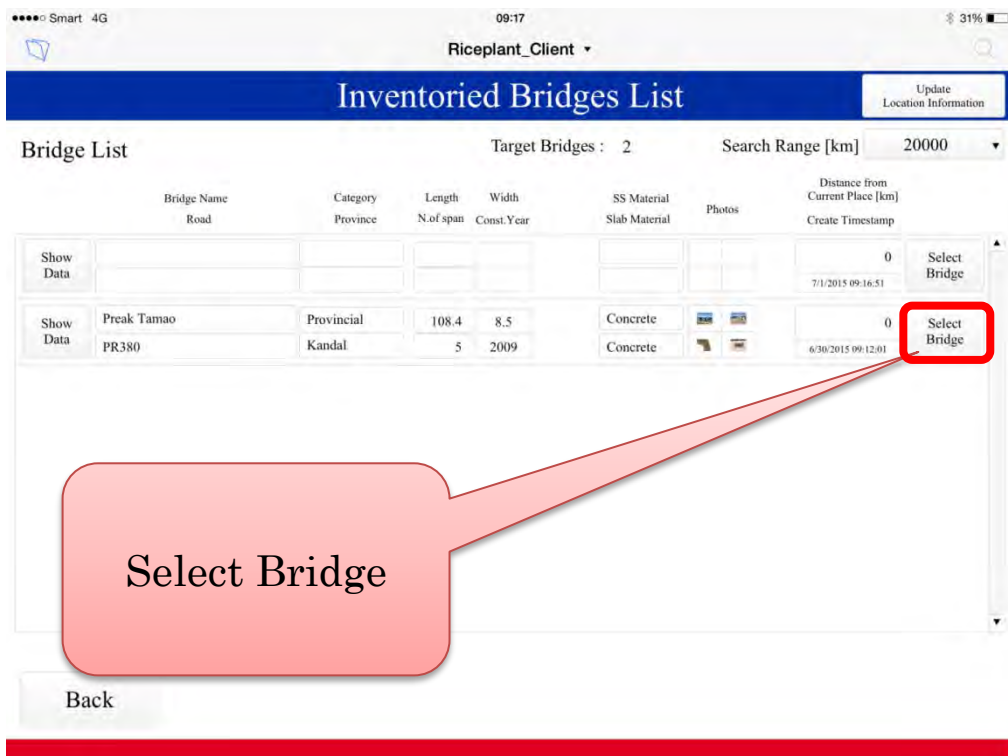
Bridge List Target Bridges : 2 Search Range [km] 20000

	Bridge Name	Category	Length	Width	SS Material	Photos	Distance from Current Place [km]	
	Road	Province	N. of span	Const. Year	Slab Material		Create Timestamp	
Show Data							0	Select Bridge
							7/1/2015 09:16:51	
Show Data	Preak Tamao	Provincial	108.4	8.5	Concrete		0	Select Bridge
	PR380	Kandal	5	2009	Concrete		6/30/2015 09:12:01	

Registered inventory

Back

## Second Step Bridge Inspection







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### Inspection Data List

Inspection List

Bridge Name: Preak Tamao

**New Inspection**

Road Surface	Sub-structure	Slab	Bearing	Sub-structure	Create Timestamp	
Preak Tamao	steel	wood	steel	RC	wood	6/30/2015 10:05:30

Show Inspection Sheet

Back Go to CoverPage



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Bridge Name: Preak Tamao SS\_Material: Concrete SlabMaterial: Concrete

Road Surface

1 Pavement

Unevenness / Pot hole / Rutting / Crack

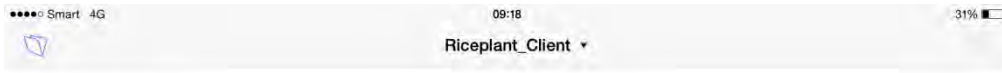
**No Damage** **Damaged**

Back

In case No Damage, next question

In case Damage, take photo

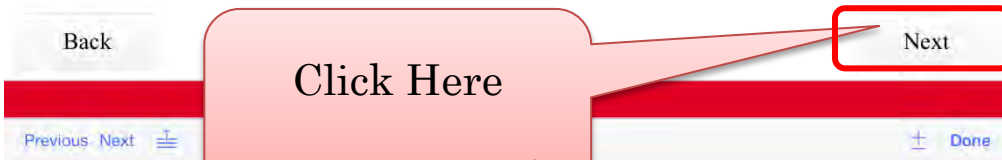
Select to click Here Each question



Commen

A large, empty rectangular text input field with a thin blue border. A red callout box points to it from below.

Input comments. (Bridge condition, damage situation ,your feeling, etc)



Click Here  
inspection end

# How to Collect Bridge Data - using iPad system -

The top screen is below.

At first, bridge inventory data collection is started.

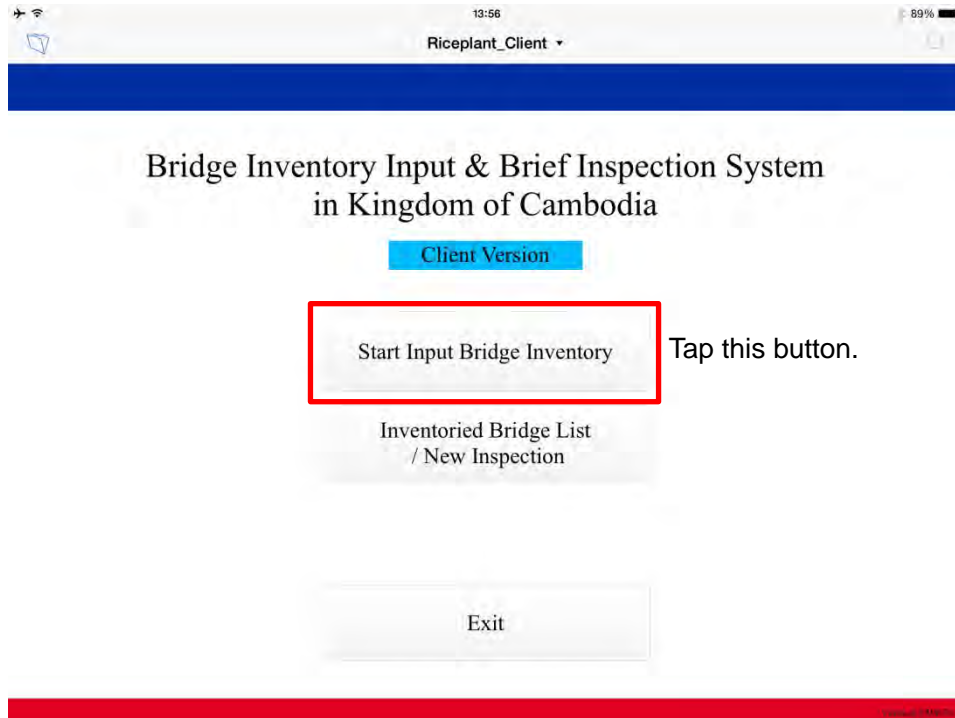


Fig-1 First screen of the iPad system (Front screen)

## 1. Bridge Photos

Firstly, 3 photos should be taken.

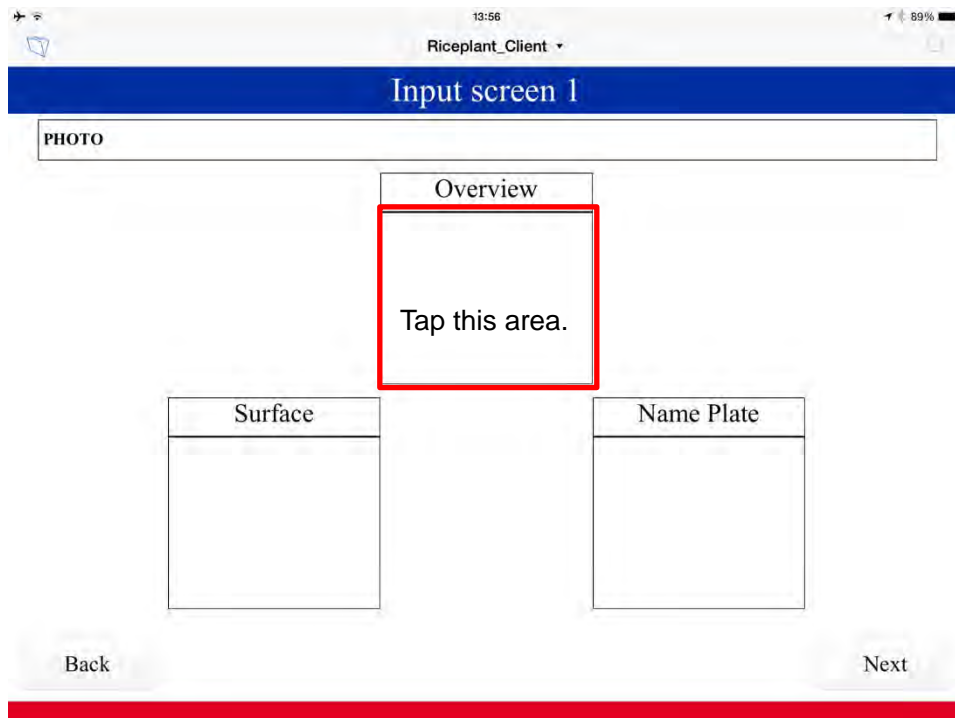


Fig-2 Second screen of the iPad system (Input Screen 1)

Photos should be taken from the directions below.

- 1) Overview (including abutment to abutment)

Sample picture is below.



- 2) Road Surface

Sample picture is below.



3) Bridge Nameplate (If present)

Sample picture is below.



2. Bridge Basic Information (1)

GENERAL									
Bridge Name					Road Category	<input type="radio"/> National <input type="radio"/> Provincial			
Province					Village/Commune				
Road Name					PK		+		
Location	Latitude	42.870571		Longitude	74.590697				
Bridge Length		m	Number of Span		Max. Span Length		m		
Left Sidewalk Width		m	Carriageway Width		m	Right Sidewalk Width		m	
Total Width (including Curb)		m	Number of Lane		Constructed Year				
Contractor					As_built drawings	<input type="radio"/> Yes <input type="radio"/> No			

Fig-3 Third screen of the iPad system (Input Screen 2)

Red parts are the information should be filled up. Location is automatically filled up from GPS information by iPad. If impossible to fill up the cell, it is OK to remain red.

Contents of “A. GENERAL” are below.

- Bridge Name (Manually input)
- Road Category (Selection input)
- Province (Selection input, Pull down menu)
- Village/Commune (Manually input)
- Road Name (Road Number), PK (Manually input)
- Location (Latitude, Longitude) (Automatically input)
- Bridge Length (Manually input)
- Number of Span (Manually input)
- Max. Span Length (Manually input)
- Width (Manually input)
  - Left sidewalk
  - Carriageway
  - Right sidewalk
  - Total width
- Number of Lane (Manually input)
- Constructed Year (Manually input)
- Contractor (Manually input)
- As built drawing (Selection input)

### 3. Bridge Basic Information (2)

The screenshot shows the 'Input screen 3' of the iPad system. The screen is titled 'Riceplant\_Client' and has a blue header with the text 'Input screen 3'. The form is organized into three main sections: 'SLAB/PAVEMENT', 'ACCESSARY', and 'SUPERSTRUCTURE'. Each section contains several input fields. The 'SLAB/PAVEMENT' section has 'Slab Material' and 'Pavement' fields. The 'ACCESSARY' section has 'Bearing', 'Expansion Joint', 'Bridge Railing', and 'Attachment' fields, each with radio buttons for 'Yes' and 'No'. The 'SUPERSTRUCTURE' section has 'Material', 'Superstructure Type', 'Number of Girders/Span', and 'Continuous' fields. The 'Continuous' field has radio buttons for 'Yes' and 'No'. The 'Back' and 'Next' buttons are located at the bottom of the screen.

Fig-4 Fourth screen of the iPad system (Input Screen 3)

Red parts are the information should be filled up. If impossible to fill up the cell, it is OK to remain red.

Contents of “SLAB/PAVEMENT” are below.

- Slab Material (Selection input, Pull down menu)
- Pavement (Selection input, Pull down menu)

Contents of “ACCESSARY” are below.

- Bearing (Yes or No) (Selection input)
  - Expansion Joint (Yes or No) (Selection input)
  - Bridge Railing (Yes or No) (Selection input)
  - Attachment (Yes or No) (Selection input)
- Attachment means lifeline (electric cable, communication cable, water supply, etc.).

Contents of “SUPERSTRUCTURE” are below.

- Material (Selection input, Pull down menu)
- Superstructure Type (Selection input, Pull down menu)
- Number of Girder / one span (Manually input)
- Continuous (Yes or No) (Selection input)

#### 4. Bridge Basic Information (3)

Input screen 4

Underside

Tap this area.

COLUMNS AND PIERS					
Material		StructureType			
Size of Column/Pier	Rectangle	mm ×	mm	Circle	φ mm
Foundation Type		Number of Column / Pier			

ABUTMENTS					
Material		StructureType			
Foundation Type		Height	A1	m	A2 m

Back Confirm

Fig-5 Fifth screen of the iPad system (Input Screen 4)

Firstly, tap the area of red square, then take a photo of the bridge from underside.

Sample picture is below. It should be taken care to take a photo including deck slab and substructure.



And, red parts are the information should be filled up. If impossible to fill up the cell, it is OK to remain red.

Contents of “COLUMNS AND PIERS” are below.

- Material (Selection input, Pull down menu)
- Structure Type (Selection input, Pull down menu)
- Size of Column/Pier (Manually input)
- Foundation Type (Selection input, Pull down menu)
- Number of Column/Pier (Manually input)

Contents of “ABUTMENT” are below.

- Material (Selection input, Pull down menu)
- Structure Type (Selection input, Pull down menu)
- Foundation Type (Selection input, Pull down menu)
- Height (Manually input, Abutment 1 and Abutment 2)



## 5. Inventory Data Sheet





Bridge inventory data sheet with 4 photos is automatically formed like below.

Smart 10:27 67%

Riceplant\_Client

Bridge Inventory Sheet

Back
Delete this  
bridge data

Fill in		2015/05/29	
Revised in		2015/05/29	
<b>A. GENERAL</b>			
Bridge Name			Road Category
DPWT			Prov./City
Road Name			Kp <span style="float: right;">km +</span>
Location	Latitude	11.574191	Longitude
			104.922699
Bridge Length	m	Number of Span	Max. Span Length
			m
Left Sidewalk Width	m	Carriageway Width	Right Sidewalk Width
		m	m
Total Width (including Kerb)	m	Number of Lane	Constructed Year
Contractor			As_built drawings <input type="radio"/> Yes <input type="radio"/> No
<b>B. SUPERSTRUCTURE</b>			
Material			Superstructure Type
Number of Girders/Span			Continuous <input type="radio"/> Yes <input type="radio"/> No
<b>C. SLAB/PAVEMENT</b>			
Slab Material			Pavement
<b>D. ABUTMENTS</b>			
Material			StructureType
Foundation Type		Height	A1 <span style="float: right;">m</span> A2 <span style="float: right;">m</span>
<b>E. COLUMNS AND PIERS</b>			
Material			StructureType
Size of Column/Pier	Rectangle	mm × mm	Circle <span style="float: right;">φ mm</span>
Foundation Type			Number of Column / Pier
<b>F. ACCESSARY</b>			
Bearing	<input type="radio"/> Yes <input type="radio"/> No	Expansion Joint	<input type="radio"/> Yes <input type="radio"/> No
Bridge Railing	<input type="radio"/> Yes <input type="radio"/> No	Attachment	<input type="radio"/> Yes <input type="radio"/> No
<b>G. PHOTO</b>			
			
			

6. Definition of each dimension

1) Each Length and Each Width

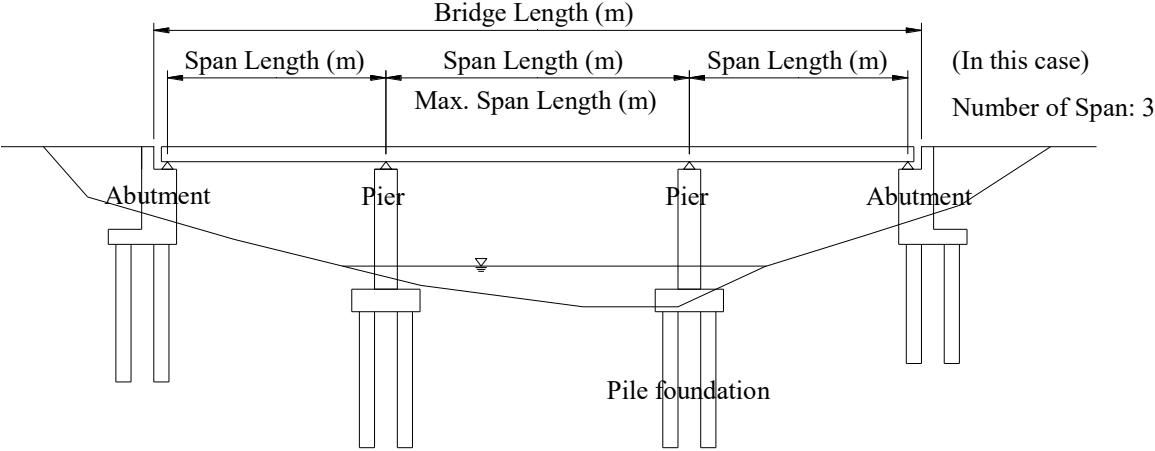
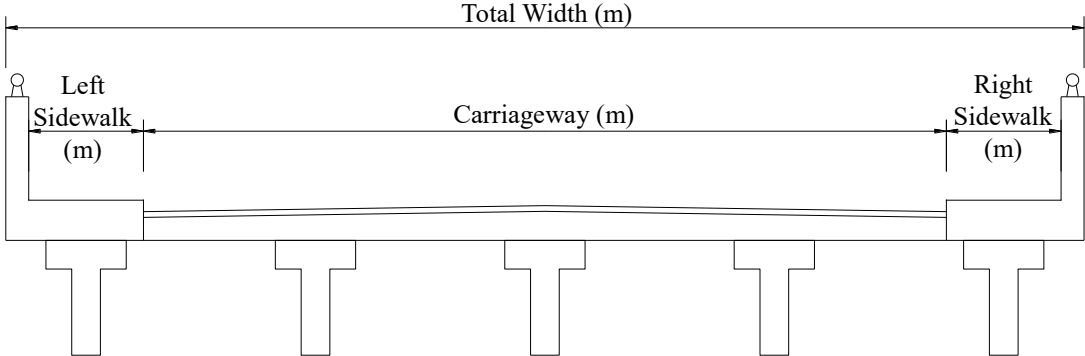


Fig-6 Length








(In this case) Number of Girder: 5






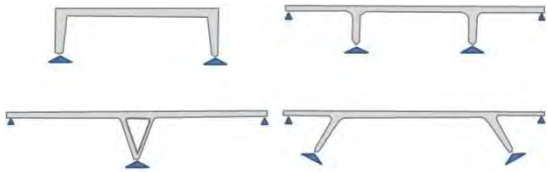


Fig-7 Width

7. Superstructure

Material for superstructure is selected from 5 items below.





<p>(1) Concrete</p> 	<p>(2) Steel</p> 
<p>(3) Wooden</p> 	<p>(4) Masonry</p> 
<p>(5) Others</p>  <p>Above bridge is a bridge for pedestrian which is made from Glass Fiber Reinforced Plastic.</p>	

As superstructure type in pull down menu is prepared 6 items below.





(1) Girder	(2) Slab girder
	
(3) Truss	(4) Arch
	
(5) Frame (Rigid Frame)	
	 <p>Other types of Rigid Frame</p>
(6) Cable-stayed	(7) Others
	

8. Slab / Pavement

As slab material in pull down menu is prepared 4 items below.





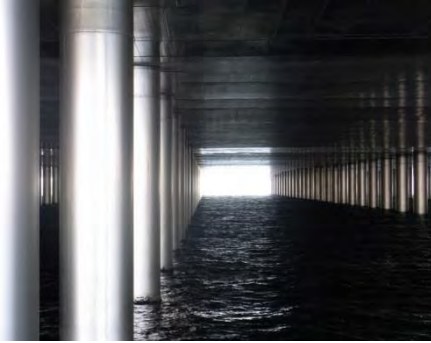
(1) Concrete	(2) Steel
	
(3) Wooden	(4) Others (If present)
	

As pavement type in pull down menu is prepared 4 items below.

(1) Asphalt Concrete	(2) DBST or SBST
	
(3) Concrete	(4) No pavement
	

9. Substructure (Abutment, and Column and Pier)





As abutment material in pull down menu is prepared 5 items below.

<p>(1) Concrete</p>	<p>(2) Steel</p>
 <p>A photograph showing several concrete bridge piers supporting a bridge deck over a body of water. The piers are rectangular and spaced evenly along the bridge.</p>	 <p>A photograph of a steel bridge under construction. The bridge deck is supported by a network of red steel beams. A red box highlights a section of the bridge's substructure, showing several vertical steel columns (piers) supporting the structure.</p>
<p>(3) Wooden</p>	<p>(4) Masonry</p>
 <p>A photograph of a long wooden bridge spanning a river. The bridge is supported by numerous wooden piers and cross-braces, creating a complex lattice structure.</p>	 <p>A close-up photograph of a masonry bridge pier. The pier is constructed from large, rectangular stone blocks stacked in a regular pattern, supporting a bridge deck above.</p>
<p>(5) Others (If present)</p>	
 <p>A photograph showing a series of vertical, cylindrical piers made of a shiny, metallic material (titanium) supporting a bridge deck over water. The piers are arranged in a long, straight line, receding into the distance.</p> <p>These piers are made of titanium.</p>	

As structure type of pier in pull down menu is prepared 4 items below.

<p>(1) Wall Type</p> 
<p>(2) Single Column</p> 
<p>(3) Multi Columns</p> 
<p>(4) Others</p> 

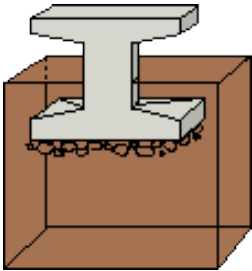
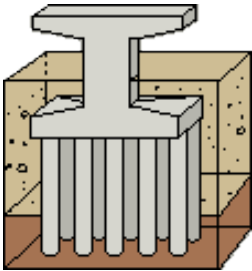
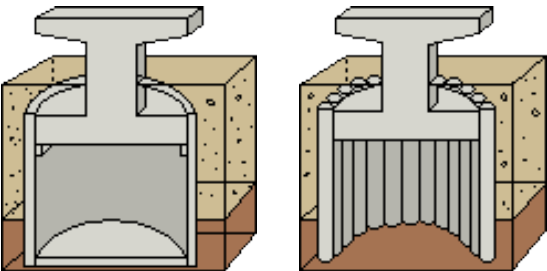
As structure type of abutment in pull down menu is prepared 4 items below.

(1) Full-Retaining ( $h > 5m$ )	(2) Semi-Retaining ( $h < 5m$ )
	
(3) Spill Through (Open)	(4) Others
	 <p>There is a bridge without abutment mainly in case of wooden bridge and masonry bridge.</p>





## 10. Foundation

As structure type of foundation of abutment and pier in pull down menu is prepared 4 items below. But, it is difficult to find bridge foundation after construction. So, when it is difficult to estimate bridge foundation type in consideration around bridge, "(4) unknown" should be selected.

<p>(1) Spread Foundation</p> 	<p>(2) Pile Foundation</p> 
<p>(3) Others</p> 	<p>(4) Unknown</p>

## 11. Accessories

As bridge accessories, it should be checked that 4 items below is existed or not.

<p>(1) Bearing</p> 	<p>(2) Expansion Joint</p> 
--	---

(3) Bridge Railing







(4) Attachment








Ex) Electric Cable, Water supply line,  
Communication Cable, etc.




## Sample Photos of each damage

Location	Part	Inspection item	Check point	Score	Sample of Photo
Road Surface	Bridge Railing /	Damage	No Damage	0	
	Guardrail / Curb		Damage	1	
			Damage (Possibility of harm third party)	10	
Road Surface	Expansion Joint	Step	No damage	0	
			Step under 20mm	1	<p>Step is less than 20 mm.</p> 
			Step over 20mm	3	<p>Step is more than 20 mm.</p> 
Road Surface		Deformation / Damage	No damage	0	

Location	Part	Inspection item	Check point	Score	Sample of Photo
Road Surface			Abnormal expansion gap (More than 2cm)	2	
			Deformation / Damage	3	
			Abnormal sound	3	If hear abnormal sound at vehicle traveling, then record the sound by audio function in iPad.
Road Surface	Drainage System	Clog of drainage pipe	No Damage	0	
			Partial no function ( Impossibility flood )	1	 Only this pipe can fall through rainwater.
Road Surface			Almost no function(stuffed, broken, etc)	3	 Almost of drainage pipes are clogged.
Bridge Girder	Superstructure (Steel)	Corrosion / Rust	No Damage	0	





Location	Part	Inspection item	Check point	Score	Sample of Photo
			Corrosion on steel members	1	
Bridge Girder	Superstructure (Steel)		Hole by corrosion	4	
			Invisible		
			Crack, Deformation,	No Damage	0
Bridge Girder	Superstructure (Steel)	Loss, Break	Steel members deformation	1	
			Crack on steel member	3	
			Steel member loss/broken (Secondary member	5	

Location	Part	Inspection item	Check point	Score	Sample of Photo
Bridge Girder	Superstructure (Steel)		Steel member loss/broken (Primary member)	10	
			Invisible		
Bridge Girder	Superstructure (Steel)		Missing bolt	0	
			Missing less than 10%.	2	
			Missing more than 10%.	10	
			Invisible		
Bridge Girder	Superstructure (Concrete)	Honeycomb / Flaking /	No Damage	0	






Location	Part	Inspection item	Check point	Score	Sample of Photo
	Superstructure (Concrete)	Exposure of rebar /Crack	Free lime/ Honeycomb/ Flaking and/or Lacking concrete	1	
			Exposure of rebar	1	
		(Crack width)	Rebar rusting	2	
		Rust fluid from crack	2		
	RC: >about 0.3mm	Crack on girder	3		
	PC: >about 0.2mm	Crack on girder (above Bearing)	8		
		Invisible			


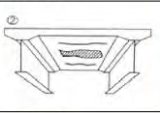

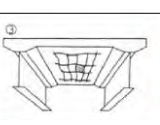

Location	Part	Inspection item	Check point	Score	Sample of Photo	
Bailey Bridge	Superstructure (Bailey Bridge)	Missing pin	No Damage	0		
			Loosing pin on bailey bridge	4		
			Missing pin on bailey bridge (Connecting part)	15		
Bailey Bridge	Superstructure (Bailey Bridge)	Truss Girder	No Damage	0		
			Corrosion / Rust / Crack /	Corrosion on steel member	1	
			Deformation /Loss /Break	Steel member deformation	1	
Bailey Bridge	Superstructure (Bailey Bridge)		Hole by corrosion	3		






Location	Part	Inspection item	Check point	Score	Sample of Photo
			Crack on steel member	5	
			Steel member loss/broken	15	
Bailey Bridge	Superstructure (Bailey Bridge)		Invisible		
		Slab	No Damage	0	
		Corrosion / Crack	Corrosion and/or Rust on steel member	1	
Bailey Bridge	Superstructure (Bailey Bridge)		Crack	15	
			Hole	15	




Location	Part	Inspection item	Check point	Score	Sample of Photo
			Invisible		
Bridge Slab	Superstructure (Woodn)	Rotting	No Damage	0	
			Rot of wood	1	
			Reduction of cross section	2	
Bridge Slab	Superstructure (Woodn)		Invisible		
		Crack / Damage	No Damage	0	
	Damage ( Crack / Partial loss)		2		

Location	Part	Inspection item	Check point	Score	Sample of Photo	
Bridge Slab	Superstructure (Woodn)		Big damage (collaspe risk / Impassable)	3		
			Invisible			
Bridge Slab	Slab (Concrete)	Honeycomb / Flaking /	No Damage	0		
	Slab (Concrete)	Exposure of rebar	Free lime/ Honeycomb/ Flaking and/or Lacking concrete	1		
			Crack / Hole	Exposure of rebar	1	
				Rebar rusting	1	
				Rust fluid from crack	2	

Location	Part	Inspection item	Check point	Score	Sample of Photo
Bridge Slab		(Crack width)	Crack on undersurface (Longitudinal)	2	 
		RC: >about 0.3mm	Crack on undersurface (Transversal)	3	 
	Slab (Concrete)	PC: >about 0.2mm	Hole	8	
			Invisible		

Location	Part	Inspection item	Check point	Score	Sample of Photo
Bridge Slab	Slab (Wooden)	Rotting	No Damage	0	
			Rot of wood	1	
			Reduction of cross section	2	
Bridge Slab	Slab (Wooden)	Crack / Damage	Invisible		
			No Damage	0	
			Big damage (collaspe risk) / Impassable	5	
Bridge Slab	Slab (Wooden)		Hole / Missing slab plate	5	

Location	Part	Inspection item	Check point	Score	Sample of Photo
			Invisible		
		Vibration, Abnormal Sound	No Damage	0	
			Vibration and/or Abnormal sound at travelling	1	If feel vibration and/or abnormal sound at vehicle traveling, then record the sound by audio function in iPad.
Sub-structure	Bearing	Sedimentation / Damage	No Damage	0	
			Partial sedimentation	1	
Sub-structure	Bearing		Corrosion and/or damage	2	
			Partial sedimentation (Cannot see bearings)	3	

Location	Part	Inspection item	Check point	Score	Sample of Photo
Sub-structure			No function (Include rusting)	3	 <p>Steel pad is fall out. Bearing is not supporting to superstructure.</p>
	Bearing		Invisible		
Sub-structure	Pier / Abutment	Scouring / Settlement	No Damage	0	
			Scouring around substructure	4	
	Pier / Abutment	Settlement of substructure		10	
			Invisible		
		Honeycomb / Flaking / (Crack width) RC: >about 0.3mm PC: >about 0.2mm	No Damage	0	

Location	Part	Inspection item	Check point	Score	Sample of Photo
Sub-structure	Pier / Abutment	Exposure of rebar /	Free lime/ Honeycomb/ Flaking and/or Lacking concrete	1	
			Crack	Exposure of rebar	1
			Rebar rusting	2	
Sub-structure	Pier / Abutment	(Crack width)	Rust fluid from crack	2	
			RC: >about 0.3mm	Crack on surface (Horizontal Direction)	5
		PC: >about 0.2mm	Crack on surface (Vertical Direction)	5	
			Invisible		



# Scoring Inspection Results

# Bridge Score

Results of bridge inspection should be evaluated appropriately based on bridge (soundness or damage) score.

38

Bridge soundness score 100 : No damage

>85 : Good Condition

85>, <60 : Damaged

60> : Serious Damaged

# Basis of Scoring

<b><u>Score of each defect</u></b>	0-15
<b><u>Scoring every parts</u></b>	0-100
<b><u>Effect factor in Bridge</u></b>	
Road Surface	10%
Bridge Girder	30%
Bridge Slab	30%
Bearing	10%
Pier/Abutment	20%

**Bridge Score is calculated automatically.**

# Defect and Scoring

Location	Part	Inspection item	Check point	Score	Score	Part	Part	Effect	Damage
					total	Score	Total	factor	Score
					a	b	c=b/a	d	c*d
Road Surface	Bridge Railing / Guardrail / Curb	Damage	No Damage	0	27		0	10%	0
			Damage	1					
			Damage (Possibility of harm third party)	10					
	Expansion Joint	Step	No damage	0					
			Step under 20mm	1					
			Step over 20mm	3					
		Deformation / Damage	No damage	0					
			Abnormal expansion gap (More than 2cm)	2					
			Deformation / Damage	3					
			Abnormal sound	3					
	Drainage System	Clog of drainage pipe	No Damage	0					
			Partial no function ( Impossibility flood )	1					
			Almost no function(stuffed, broken, etc)	3					

Defect should be repaired urgently (Urgent Repair)

Location	Part	Inspection item	Check point	Score	Score	Part	Part	Effect	Damage
					total	Score	Total	factor	Score
					a	b	c=b/a	d	c*d
Bridge Girder	Superstructure (Steel)	Corrosion / Rust	No Damage	0	36		0	30%	0
			Corrosion on steel members	1					
			Hole by corrosion	4					
			Invisible						
		Crack, Deformation, Loss, Break	No Damage	0					
			Steel members deformation	1					
			Crack on steel member	3					
			Steel member loss/broken (Secondary member)	5					
			Steel member loss/broken (Primary member)	10					
			Invisible						
		Missing bolt	No Damage	0					
			Missing less than 10%.	2					
			Missing more than 10%.	10					
			Invisible						
	Superstructure (Concrete)	Honeycomb / Flaking / Exposure of rebar /Crack	No Damage	0	17				
			Free lime/ Honeycomb/ Flaking and/or Lacking concrete	1					
		Exposure of rebar	1						
		Rebar rusting	2						
		(Crack width) RC: >about 0.3mm PC: >about 0.2mm	Rust fluid from crack	2					
		Crack on girder	3						
Crack on girder (above Bearing)		8							
Invisible									

Defect should be repaired urgently (Urgent Repair)

Location	Part	Inspection item	Check point	Score	Score	Part Score	Part Total	Effect factor	Damage Score
					total				
					a				
Bailey Bridge	Superstructure (Bailey Bridge)	Missing pin	No Damage	0	75		0		0
			Loosing pin on bailey bridge	4					
			Missing pin on bailey bridge (Connecting part)	15					
		Truss Girder	No Damage	0					
			Corrosion / Rust / Crack /	Corrosion on steel member	1				
				Deformation /Loss /Break	Steel member deformation				
			Hole by corrosion		3				
			Crack on steel member		5				
			Steel member loss/broken		15				
			Invisible						
			Slab	No Damage	0				
		Corrosion / Crack		Corrosion and/or Rust on steel member	1				
				Crack	15				
		Hole		15					
		Invisible							

	Defect should be repaired urgently (Urgent Repair)
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Location	Part	Inspection item	Check point	Score	Score	Part Score	Part Total	Effect factor	Damage Score
					total				
					a				
Bridge Slab	Superstructure (Wooden)	Rotting	No Damage	0	8		0	30%	0
			Rot of wood	1					
			Reduction of cross section	2					
			Invisible						
		Crack / Damage	No Damage	0					
			Damage ( Crack / Partial loss)	2					
			Big damage (collaspe risk / Impassable)	3					
			Invisible						
	Slab (Concrete)	Honeycomb / Flaking / Exposure of rebar Crack / Hole  (Crack width) RC: >about 0.3mm PC: >about 0.2mm	No Damage	0	18				
			Free lime/ Honeycomb/ Flaking and/or Lacking concrete	1					
			Exposure of rebar	1					
			Rebar rusting	1					
			Rust fluid from crack	2					
			Crack on undersurface (Longitudinal)	2					
			Crack on undersurface (Transversal)	3					
			Hole	8					
Invisible									

Defect should be repaired urgently (Urgent Repair)

Location	Part	Inspection item	Check point	Score	Score	Part Score	Part Total	Effect factor	Damage Score
					total				
					a				
Bridge Slab	Slab (Wooden)	Rotting	No Damage	0	14		0	30%	0
			Rot of wood	1					
			Reduction of cross section	2					
			Invisible						
		Crack / Damage	No Damage	0					
			Big damage (collapse risk) / Impassable	5					
			Hole / Missing slab plate	5					
			Invisible						
		Vibration, Abnormal Sound	No Damage	0					
			Vibration and/or Abnormal sound at travelling	1					
Sub-structure	Bearing	Sedimentation / Damage	No Damage	0	9		0	10%	0
			Partial sedimentation	1					
			Corrosion and/or damage	2					
			Partial sedimentation (Cannot see bearings)	3					
			No function (Include rusting)	3					
			Invisible						

Defect should be repaired urgently (Urgent Repair)



Location	Part	Inspection item	Check point	Score	Score	Part	Part	Effect	Damage
					total	Score	Total	factor	Score
					a	b	c=b/a	d	c*d
	Pier / Abutment	Scouring / Settlement	No Damage	0	30		0	20%	0
			Scouring around substructure	4					
			Settlement of substructure	10					
			Invisible						
		Honeycomb / Flaking / Exposure of rebar / Crack  (Crack width) RC: >about 0.3mm PC: >about 0.2mm	No Damage	0					
			Free lime/ Honeycomb/ Flaking and/or Lacking concrete	1					
			Exposure of rebar	1					
			Rebar rusting	2					
			Rust fluid from crack	2					
			Crack on surface (Horizontal Direction)	5					
			Crack on surface (Vertical Direction)	5					
			Invisible						
			Total Damage Score						
Total Soundness Score of Bridge									100.0

Defect should be repaired urgently (Urgent Repair)

Damage Level	Damage Score	Judgement	
Damage Level III	>40	SD	Defect should be repaired as emergency
Damage Level II	40> >15 or CD	D	Defect should be repaired as periodic
Damage Level I	<15	O	Defect should be observed



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