
APPENDIX 5.
RECORDS OF BRIDGE SURVEY

1. Visual inspection survey

1. OBJECTIVE

The objective of visual survey is to figure out the present condition of existing bridges for establishing the rehabilitation plan. The visual inspection was conducted for three bridges; Kanchpur, Maghna and Gumti.

2. METHOD OF SURVEY

Proximity visual inspection was conducted for accessible structure such as; abutments, lower part of piers, expansion joints.

Distant visual inspection was conducted for no-accessible structure such as; superstructures, higher part of piers.

3. SURVEY ITEMS

As concrete damages turn to serious, steel bars will be exposed to the air. Survey items are shown in Table 3.1.1.

Table 3.1.1 Survey Items

Survey Items	Damage level	Survey Location	Distant Visual Inspection	Proximity Visual Inspection	Remarks
Cracks, water leakage, isolated lime	a-e	Beams Cross Beams Substructure	○	○	Shown in Table
Cracks, water leakage, isolated lime	a-e	Slab around pier	○	○	Shown in Table
Exposure of reinforcement	Exist or not exist	Beams Cross Beams Slabs Substructure	○		Shown in Table
Uneven road surface	Exist or not exist	Road		○	Shown in Table


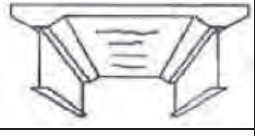



Damage diagnosis criteria from survey results are shown in Table 3.1.1 are defined in Table 3.1.2 to Table 3.1.5.

Table 3.1.2 Damage Level

Crack width	Condition	Damage Level
No crack	-	a
Less than 0.2mm	-	b
More than 0.2mm	Crack only	c
	Water leakage only	d
	Small amount of isolated lime	d
	Much isolated lime	e

The water penetration starts from crack width 0.2 mm. The level of crack damage level is identified crack width, water penetration.

Table 3.1.3 Cracks in Concrete Slab

Condition	Drawing	Damage level
No cracks or crack widths are less than 0.2mm and crack intervals are over 1.0m. Water leakage through cracks and isolated lime are not confirmed.		a
Crack width less than 0.2 mm occurs in one direction. These crack intervals are more than 0.5m. Water leakage through cracks and isolated lime are not confirmed.		b
Crack width is about 0.2mm and confined within a grid. But water leakage through cracks and isolated lime are not confirmed. Or Crack widths are about 0.2mm and confined to one direction. But water leakage through cracks and isolated lime are confirmed.		c
Crack widths are about 0.2mm and confined within a grid. Water leakage through cracks and isolated lime are confirmed. Or There exist many cracks with widths more than 0.2mm and concrete chips are spalling off. But water leakage through cracks and isolated lime are not confirmed.		d
Many concrete chips are spalling off and water leakage through cracks and isolated lime are confirmed.		e

The progress of deck cracks is shown above table to define the level of damages.

Table 3.1.4 Damage Level and Exposure of Reinforcement

Exposure of reinforcement	Area	Condition	Damage
No damage	-	-	No
Existence of damage	Small	Corrosion in reinforcement	No
		Decrease in reinforcing bar cross section	No
	Large	Corrosion in reinforcement	No
		Decrease in reinforcing bar cross section	Exist

The exposure of reinforcement steel bar is the final stage of concrete damage. This time the rehabilitation work will cover the damaged area so that the widely and severely corroded case for replace of damaged rebar should be identified.

Table 3.1.5 Unevenness of Road Surface

Condition	Damage level
Uneven less than 20mm	No
Uneven more than 20mm	Exist

The evenness of expansion joints or pavement surface should be identified from above mentioned criteria.


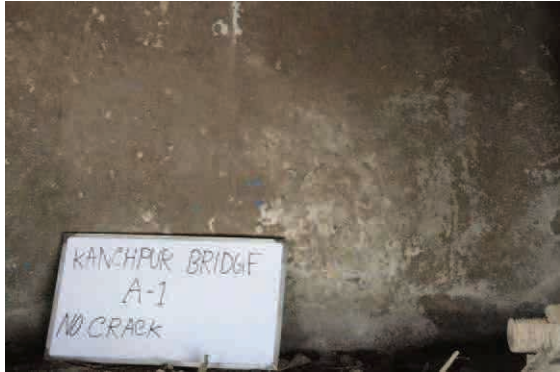
4. RESULT OF VISUAL SURVEY



Survey results are still under processing. Some results are shown from next page.



4.1 Kanchpur Bridge



4.1.1 Crack, water leakage, isolated lime



(1) Substructure



Abutment 01	
Damage: d	Damage: a
	
Crack width over 0.2mm Water leakage only	No crack



Pier 01	
Damage: a	Damage: a
	
No crack	No crack



Pier 02	
Damage: a	Damage: a
	
No crack	No crack



Pier 03	
Damage: a	Damage: a
	
No crack	No crack

Pier 04	
Damage: a	Damage: a
	
No crack	No crack



Pier 05	
Damage: a	Damage: a
	
No crack	No crack



Pier 06	
Damage: a	Damage: a
	
No crack	No crack



Pier 07	
Damage: a	Damage: a
	
No crack	No crack

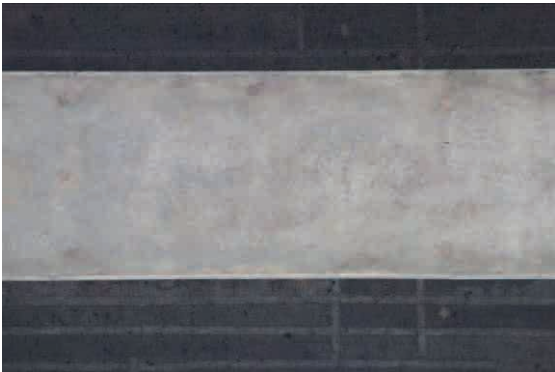

Abutment 02	
Damage: a	Damage: c
	
No crack	Crack width over 0.2mm Crack only



(2) Superstructure



Superstructure A1-P1	
Damage: a	Damage: a
	
No crack	No crack

Superstructure P1-P2	
Damage: a	Damage: a
	
No crack	No crack

Superstructure P2-P3	
Damage: a	Damage: a
	
No crack	No crack



Superstructure P3-P4	
Damage: a	Damage: a
	
No crack	No crack



Superstructure P6-P7	
Damage: a	Damage: a
	
No crack	No crack



Superstructure P7-A2	
Damage: a	Damage: a
	
No crack	No crack



4.1.2 Exposure of reinforcement



(1) Substructure



Abutment 01	
Damage: Not exist	Damage: Not exist
	
No damage	No damage



Pier 01	
Damage: Not exist	Damage: Not exist
	
No damage	No damage in reinforcement



Pier 02	
Damage: Not exist	Damage: Existence of damage
	
No damage	Corrosion in reinforcement



Pier 03	
Damage: Not exist	Damage: Existence of damage
	
No damage	Corrosion in reinforcement

Pier 04	
Damage: Not exist	Damage: Not exist
	
No damage	No damage in reinforcement



Pier 05	
Damage: Not exist	Damage: Not exist
	
No damage	No damage


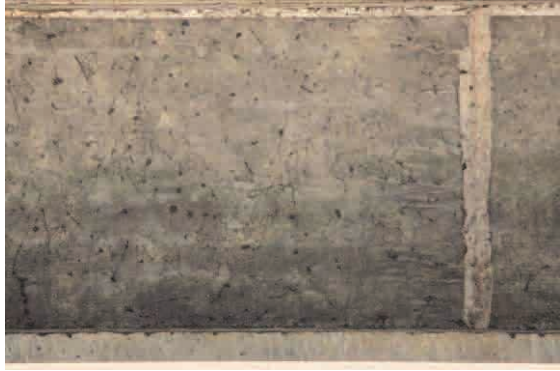
Pier 06	
Damage: Not exist	Damage: Not exist
	
No damage	No damage in reinforcement


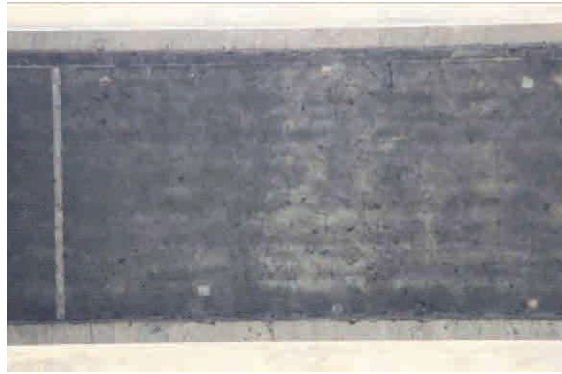
Pier 07	
Damage: Not exist	Damage: Not exist
	
No damage	No damage in reinforcement



Abutment 02	
Damage: Not exist	Damage: Not exist
	
No damage	No damage


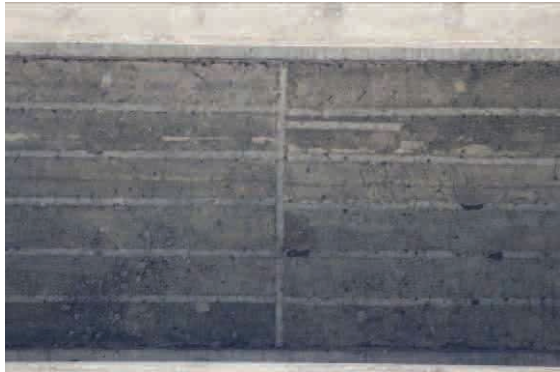
(2) Superstructure



Superstructure A1-P1	
Damage: Not exist	Damage: Not exist
	
No damage in reinforcement	No damage in reinforcement

Superstructure P1-P2	
Damage: Not exist	Damage: Not exist
	
No damage in reinforcement	No damage in reinforcement

Superstructure P2-P3	
Damage: Not exist	Damage: Not exist
	
No damage	No damage in reinforcement



Superstructure P3-P4	
Damage: Not exist	Damage: Not exist
	
No damage in reinforcement	No damage in reinforcement



Superstructure P6-P7	
Damage: Not exist	Damage: Not exist
	
No damage in reinforcement	No damage in reinforcement



Superstructure P7-A2	
Damage: Not exist	Damage: Not exist
	
No damage in reinforcement	No damage in reinforcement



4.1.3 Falling out damaged particle and Crack in concrete slab



(1) Slab



Slab A1-P1	
Damage: Not exist	Damage: Not exist
	
No damage	No damage

Slab P1-P2	
Damage: Not exist	Damage: Not exist
	
No damage	No damage



Slab P2-P3	
Damage: Not exist	Damage: Not exist
	
No damage	No damage

Slab P3-P4	
Damage: Not exist	Damage: Not exist
	
No damage	No damage

Slab P6-P7	
Damage: Not exist	Damage: Not exist
	
No damage	No damage

Slab P7-A2	
Damage: Not exist	Damage: Not exist
	
No damage	No damage



4.1.4 Uneven on road surface



Surface	
Damage: Exist	Damage: Exist
	
Uneven more than 20mm	Uneven more than 20mm



4.2 Meghna Bridge



4.2.1 Crack, water leakage, isolated lime



(1) Substructure



Abutment 01	
Damage: a	Damage: a
	
No crack	No crack



Pier 01	
Damage: a	Damage: c
	
No crack	Crack width over 0.2mm



Pier 02	
Damage: a	Damage: a
	
No crack	No crack



Pier 03	
Damage: a	Damage: c
	
No crack	Crack width over 0.2mm



Pier 04	
Damage: a	Damage: a
	
No crack	No crack



Pier 05	
Damage: a	Damage: a
	
No crack	No crack



Pier 06	
Damage: a	Damage: c
	
No crack	Crack width over 0.2mm



Pier 07	
Damage: a	Damage: a
	
No crack	No crack



Pier 08	
Damage: a	Damage: c
	
No crack	Crack width over 0.2mm

Pier 09	
Damage: a	Damage: c
	
No crack	Crack width over 0.2mm

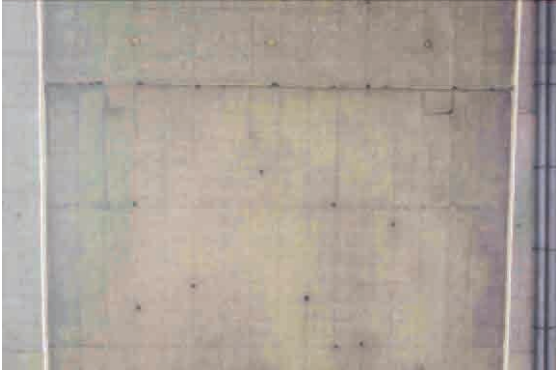

Pier 10	
Damage: a	Damage: c
	
No crack	Crack width over 0.2mm



Pier 11	
Damage: a	Damage: c
	
No crack	Crack width over 0.2mm



Pier 12	
Damage: a	Damage: a
	
No crack	No crack



Abutment 02	
Damage: a	Damage: c
	
No crack	Crack width over 0.2mm



(2) Superstructure



Superstructure P1	
Damage: a	Damage: a
	
No crack	No crack



Superstructure P2	
Damage: a	Damage: a
	
No crack	No crack



Superstructure P3	
Damage: a	Damage: a
	
No crack	No crack


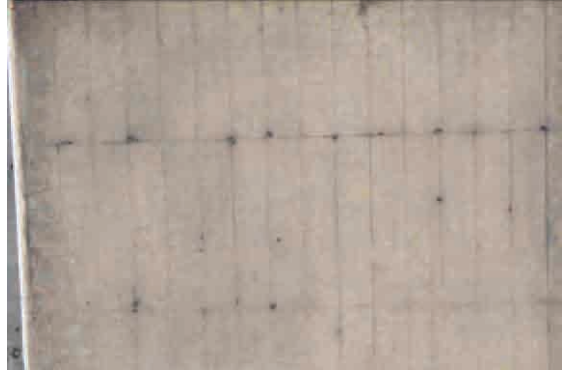
Superstructure P4	
Damage: a	Damage: a
	
No crack	No crack



Superstructure P5	
Damage: a	Damage: a
	
No crack	No crack



Superstructure P6	
Damage: a	Damage: a
	
No crack	No crack

Superstructure P7	
Damage: a	Damage: a
	
No crack	No crack

Superstructure P8	
Damage: a	Damage: a
	
No crack	No crack



Superstructure P10	
Damage: a	Damage: a
	
No crack	No crack



Superstructure P11-P12	
Damage: a	Damage: a
	
No crack	No crack



Superstructure P12-A2	
Damage: d	Damage: a
	
<p>Crack width over 0.2mm Small isolated lime</p>	<p>No crack</p>



4.2.2 Exposure of reinforcement



(1) Substructure



Abutment 01	
Damage: Not exist	Damage: Not exist
	
No damage	No damage



Pier 01	
Damage: Not exist	Damage: Not exist
	
No damage	No damage in reinforcement



Pier 02	
Damage: Not exist	Damage: Not exist
	
No damage	No damage in reinforcement



Pier 03	
Damage: Not exist	Damage: Not exist
	
No damage	No damage in reinforcement



Pier 04	
Damage: Not exist	Damage: Not exist
 A photograph showing a concrete pier column supporting a bridge deck over a body of water. The column is cylindrical and appears to be in good condition.	 A close-up photograph of the concrete surface of the pier column, showing some texture and minor discoloration but no significant damage.
No damage	No damage in reinforcement



Pier 05	
Damage: Not exist	Damage: Not exist
 A photograph showing a concrete pier column supporting a bridge deck over a body of water. The column is rectangular and appears to be in good condition.	 A close-up photograph of the concrete surface of the pier column, showing some texture and minor discoloration but no significant damage.
No damage	No damage in reinforcement



Pier 06	
Damage: Not exist	Damage: Not exist
	
No damage	No damage in reinforcement



Pier 07	
Damage: Not exist	Damage: Not exist
	
No damage	No damage in reinforcement



Pier 08	
Damage: Not exist	Damage: Not exist
	
No damage	No damage in reinforcement

Pier 09	
Damage: Not exist	Damage: Not exist
	
No damage	No damage in reinforcement

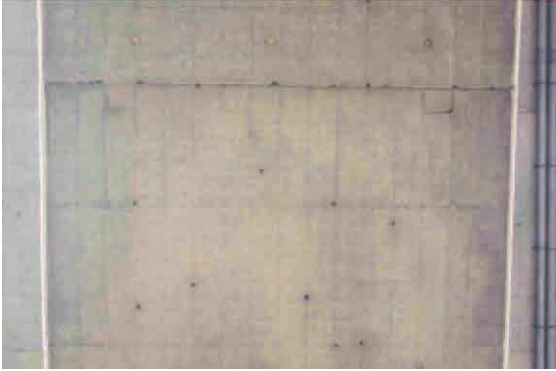

Pier 10	
Damage: Not exist	Damage: Not exist
	
No damage	No damage in reinforcement



Pier 11	
Damage: Not exist	Damage: Not exist
	
No damage	No damage



Pier 12	
Damage: Not exist	Damage: Not exist
	
No damage	No damage in reinforcement



Abutment 02	
Damage: Not exist	Damage: Not exist
	
No damage	No damage



(2) Superstructure



Superstructure P1	
Damage: Not exist	Damage: Not exist
	
No damage	No damage



Superstructure P2	
Damage: Not exist	Damage: Not exist
	
No damage	No damage


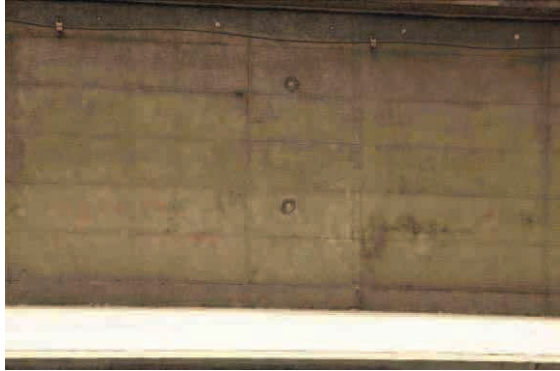
Superstructure P3	
Damage: Not exist	Damage: Not exist
	
No damage	No damage



Superstructure P4	
Damage: Not exist	Damage: Not exist
	
No damage	No damage



Superstructure P5	
Damage: Not exist	Damage: Not exist
	
No damage	No damage



Superstructure P6	
Damage: Not exist	Damage: Not exist
	
No damage	No damage

Superstructure P7	
Damage: Not exist	Damage: Not exist
	
No damage	No damage

Superstructure P8	
Damage: Not exist	Damage: Not exist
	
No damage	No damage



Superstructure P10	
Damage: Not exist	Damage: Not exist
	
No damage	No damage



Superstructure P11-P12	
Damage: Not exist	Damage: Not exist
	
No damage	No damage



Superstructure P12-A2	
Damage: Exist	Damage: Not exist
	
<p>Small area Corrosion in reinforcement</p>	<p>No damage</p>



4.2.3 Falling out damaged particle and Crack in concrete slab



(1) Slab



Slab P1	
Damage: Not exist	Damage: a
	
No damage	No crack



Slab P2	
Damage: Not exist	Damage: a
	
No damage	No crack



Slab P3	
Damage: Not exist	Damage: a
	
No damage	No crack



Slab P4	
Damage: Not exist	Damage: a
	
No damage	No crack



Slab P5	
Damage: Not exist	Damage: a
	
No damage	No crack

Slab P6	
Damage: Not exist	Damage: a
	
No damage	No crack

Slab P7	
Damage: Not exist	Damage: a
	
No damage	No crack

Slab P8	
Damage: Not exist	Damage: a
	
No damage	No crack

Slab P10	
Damage: Not exist	Damage: a
	
No damage	No crack

Slab P11-P12	
Damage: Not exist	Damage: a
	
No damage	No crack

Slab P12-A2

Damage: Not exist





Damage: a



No damage

No crack



4.2.4 Uneven on road surface



Surface	
Damage: Exist	Damage: Exist
	
Uneven more than 20mm	Uneven more than 20mm



4.3 Gumti Bridge



4.3.1 Crack, water leakage, isolated lime



(1) Substructure



Abutment 01	
Damage: a	Damage: a
	
No crack	No crack



Pier 01	
Damage: a	Damage: b
	
No crack	Crack width less 0.2mm



Pier 02	
Damage: a	Damage: c
	
No crack	Crack width over 0.2mm



Pier 03	
Damage: a	Damage: c
	
No crack	Crack width over 0.2mm



Pier 04	
Damage: a	Damage: c
	
No crack	Crack width over 0.2mm



Pier 05	
Damage: a	Damage: c
	
No crack	Crack width over 0.2mm



Pier 06	
Damage: a	Damage: c
	
No crack	Crack width over 0.2mm



Pier 07	
Damage: a	Damage: c
	
No crack	Crack width over 0.2mm



Pier 08	
Damage: a	Damage: c
	
No crack	Crack width over 0.2mm



Pier 09	
Damage: a	Damage: c
	
No crack	Crack width over 0.2mm



Pier 10	
Damage: a	Damage: c
	
No crack	Crack width over 0.2mm



Pier 11	
Damage: a	Damage: a
	
No crack	No crack



Pier 12	
Damage: a	Damage: a
	
No crack	No crack

Pier 13	
Damage: a	Damage: c
	
No crack	Crack width over 0.2mm



Pier 14	
Damage: a	Damage: d
	
No crack	Crack width over 0.2mm Water leakage only



Pier 15	
Damage: a	Damage: c
	
No crack	Crack width over 0.2mm


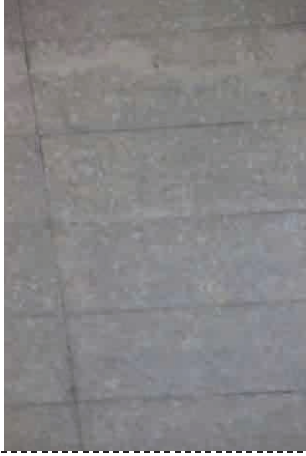
Pier 16	
Damage: a	Damage: d
	
No crack	Crack width over 0.2mm Water leakage only



Abutment 02	
Damage: a	Damage: a
	
No crack	No crack



(2) Superstructure

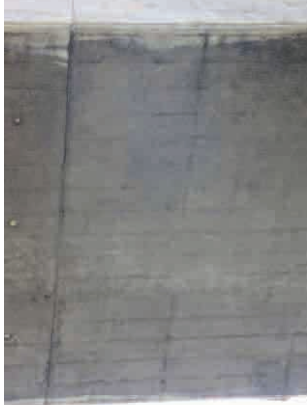

Superstructure P1	
Damage: a	Damage: c
	
No crack	Crack width over 0.2mm



Superstructure P2	
Damage: a	Damage: a
	
No crack	No crack


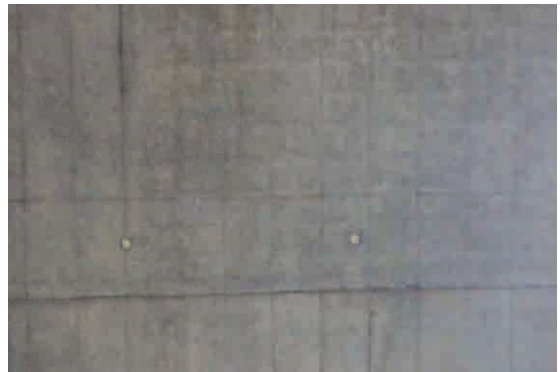
Superstructure P3	
Damage: a	Damage: a
	
No crack	No crack



Superstructure P4	
Damage: a	Damage: a
	
No crack	No crack



Superstructure P5	
Damage: a	Damage: d
	
No crack	Crack width over 0.2mm Water leakage only



Superstructure P6	
Damage: a	Damage: d
	
No crack	Crack width over 0.2mm Water leakage only



Superstructure P7	
Damage: c	Damage: d
	
Crack width over 0.2mm	Crack width over 0.2mm Water leakage only



Superstructure P8	
Damage: a	Damage: a
	
No crack	No crack



Superstructure P9	
Damage: a	Damage: a
	
No crack	No crack



Superstructure P10	
Damage: a	Damage: d
	
No crack	Crack width over 0.2mm Water leakage only



Superstructure P11	
Damage: a	Damage: a
	
No crack	No crack

Superstructure P12	
Damage: a	Damage: a
	
No crack	No crack

Superstructure P13	
Damage: a	Damage: a
	
No crack	No crack

Superstructure P14	
Damage: a	Damage: a
	
No crack	No crack

Superstructure P15	
Damage: a	Damage: a
	
No crack	No crack

Superstructure P16	
Damage: a	Damage: a
	
No crack	No crack