

## 添付資料

- ◇ 添付 1. 研修資料（出典：提案企業作成資料）
- ◇ 添付 2. 点検報告書（出典：提案企業作成資料）
- ◇ 添付 3. 報道資料
- ◇ 添付 4. 現地法人事業の財務モデル（出典：提案企業作成資料）
- ◇ 添付 5. ADM の損益計算書（2015 年 6 月決算値）（出典：ADM 提供資料）

## 添付 1. 研修資料





To advanced road service

## Quality Road Management

The introduction of its basic philosophy with a case of an expressway company in Japan



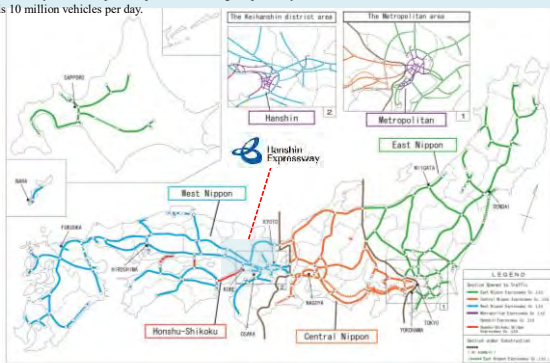
**“The roads of Japan are incredibly bad. No other industrial nation has so completely neglected its highway system”**



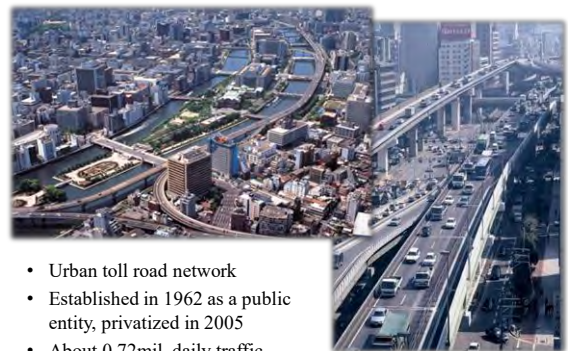
Source: Hagen, E. E., F. W. Herring, G. E. McLaughlin, W. Owen, H. M. Sapir, and R. J. Watkins (1956), *Report on Kobe-Nagoya Expressway Survey*, Ministry of Construction.

## Highway Network in Japan Now

The total length of the expressway network has reached about 9,500km since its commencement of the first section about 50 years. 6 companies operate and manage expressways on which the traffic volume is 10 million vehicles per day.



## Who is Hanshin Expressway?



- Urban toll road network
- Established in 1962 as a public entity, privatized in 2005
- About 0.72mil. daily traffic

## Hanshin Expressway at a glance



## Hanshin Expressway's Business Domain



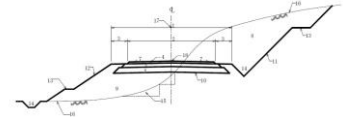
- Planning
- Project Management
- Land Acquisition
- Traffic Management
- Toll Management
- Maintenance

## What can Hanshin Expressway Provide for Quality Road

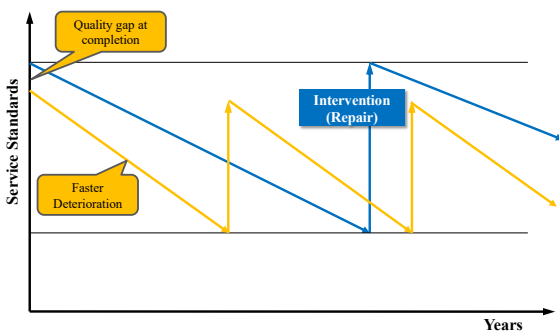


- Abundant assets and development capacity of applied technologies and know-hows on road operation and maintenance
- Project management capability on the employer's side
- Empirical and need-matching approaches

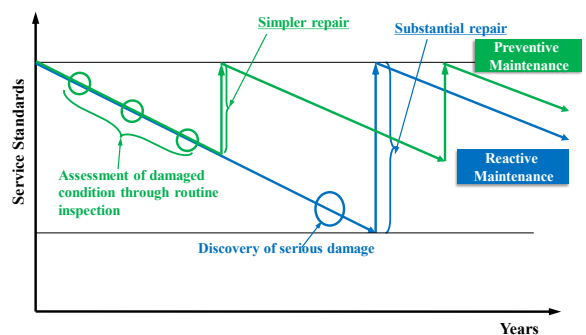
## Road Structure = Human Body Road Maintenance = Health Care



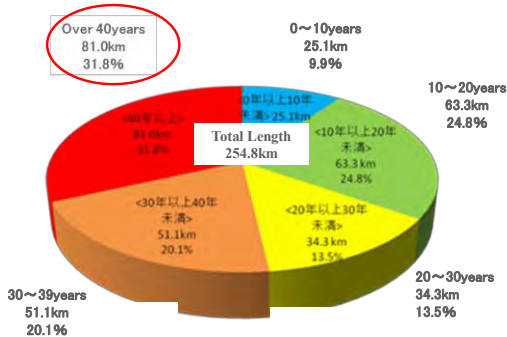
## The Meaning of Quality in Road Management (1)



## The Meaning of Quality in Road Management (2)



## Ailing Bridge Structures in Hanshin Expressway



(As of March, 2013)

## Legal Framework on Structural Inspection in Japan

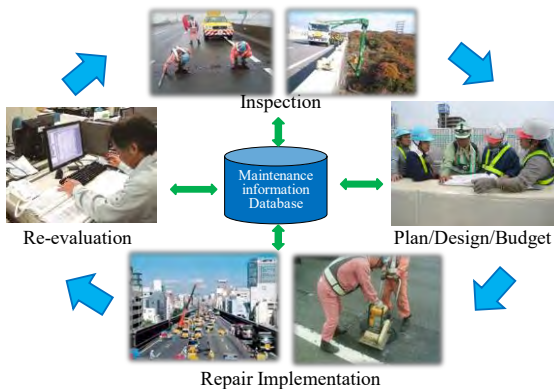


Mandatory structural inspection policy was established by the National government with the momentum of the fatal tunnel ceiling collapse accident in 2012.



All bridge whose span is over 12m (about 0.7M) and tunnel (about 10K) in Japan have to be checked by close visual inspection at least once in every 5 years with the common methodologies.

## Basic Road Maintenance Cycle



### ◆ Basics of Maintenance Cycle

- ✓ Inspection shall be carried out as one function of maintenance cycle, and its main object is to discover damages, to identify their severity and impact level for diagnosis and to obtain basic information for repair planning
- ✓ Therefore conducting inspection itself is not the final outcome.
- ✓ Inspection is an important first step in the cycle in order to smooth annual rotation of the cycle every year to grasp the soundness of structures and to realize preventive maintenance with prompt intervention in time.

#### 【Objects of inspection】

By conducting close-range visual inspection adequately once every 5 years,

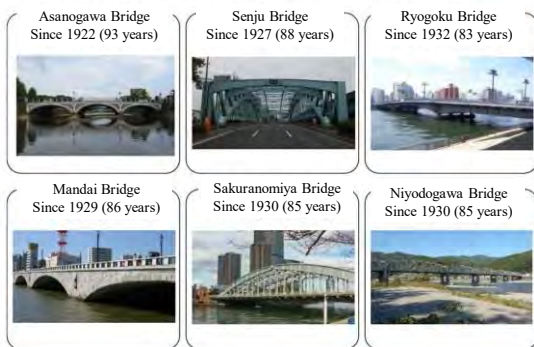
- (1) identifying the extent of structural damages correctly, and
- (2) collection necessary information for diagnosis procedure.

#### 【Objects of diagnosis】

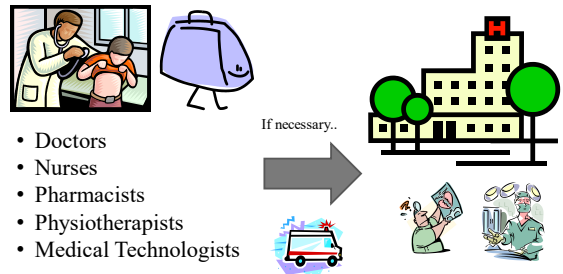
With the common standard,

- (1) judging the soundness of each structures adequately, and
- (2) linking the results with subsequent maintenance activities.

### ◆ Examples of very old bridges in service by keeping their soundness with appropriate maintenance



## Road Authority should be a Home Doctor



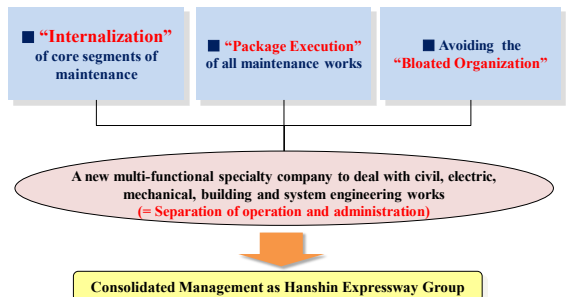
- Doctors
- Nurses
- Pharmacists
- Physiotherapists
- Medical Technologists

## Partial Internalization of Maintenance Works

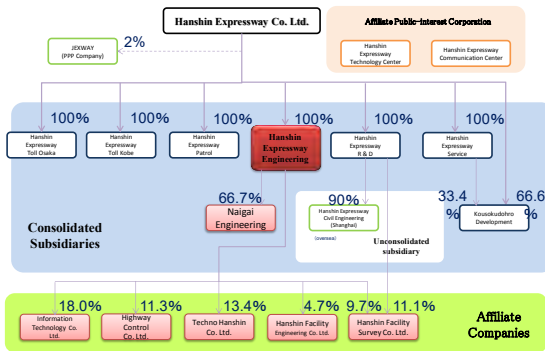


## The Foundation of Hanshin Expressway Engineering

At the time of privatization, the new subsidiary company was founded to implement all routine maintenance works of Hanshin Expressway



## Capital Relationship of Hanshin Expressway Group (as of May 2014)



## Basic Facts about Hanshin Expressway Engineering

- Corporate Name: Hanshin Expressway Engineering Company Limited
- Headquarter: Osaka, Japan
- Foundation: October 5<sup>th</sup>, 2005
- Capital: ¥80,000,000 (capital reserve: ¥20,000,000, capital increase: ¥60,000,000 in 2010)
- Shareholder: Hanshin Expressway Company Limited (100%)
- Representative: Atsushi Nanjo, President CEO
- Employees: about 350

## Corporate Philosophy, Business Policy and Action Guidelines

### Corporate Philosophy

We contribute the enrichment of the society as a whole through the maintenance the safety, security and comfort of expressway network as an important social asset.

### Business Policies

- 1 Achieve and inherit the one-step further quality and technologies
- 2 Aim at the corporate structure to obtain higher reliability by customers
- 3 Seek for the clearness, smoothness, transparency and efficiency in the execution of operation and achieve the consequent cost reduction
- 4 System and capacity building to sustain various maintenance activities.
- 5 **Dedicate to the overall enhancement of Hanshin Expressway Group as a member company**

### Action Guidelines

Gain the customers' satisfaction and reliability by comprehending the changing business environment and always aspiring the one level ahead from others

## Business Outlines

"Maintenance of highway Structures", "Maintenance of Highway Facilities" and "Development, maintenance and operation of ITS" are our core responsibilities and we also dedicate to the maintenance of bridges and tunnels of other highway and road in a contract basis.

### Civil Engineering



Inspection



Diagnosis, Database Repair Work Planning



Repair Works

## Business Outlines (cont'd)

### Highway Facility Maintenance



Electric Facilities



Tunnel Facilities



Toll Booth Facilities



Central Monitoring System

## Business Outlines (cont'd)

### Information Systems



Management of ITS (ETC and Traffic Control) Systems



Development and Management of Road Work Coordination System



## Business Outlines (cont'd)

### R & D of Maintenance Technology



"Doctor Patrol"  
(Automatic Road  
Surface Inspection  
Vehicle)



Fatigue Damage Detection Device  
of Orthotropic Steel Deck



Infra-red Measurement System  
for detecting void in pavement



Phased Array Ultrasonic Testing Device

## Business Outlines (cont'd)

### Affiliate Business



Road and tunnel  
management  
contracts from other  
road authorities



Tunnel soil  
recycling  
project



Maintenance  
Vehicle Rental  
Business

## Training of Hanshin Expressway Inspectors

Inspectors for Hanshin Expressway structures are all required to get a certification after participation of workshop and passing the examinations both provided by HE Engineering.

Type of Inspectors

Chief Inspector, Inspector, Assistant Inspector

1. Workshop: one-day

- Purpose and techniques of the structures inspection
- The safety management of inspection site
- The features of structural damages and their typical examples (Concrete, Steel, Tunnel, Earthwork, Pavement)

2. Paper test and practical exams at actual site: one-day

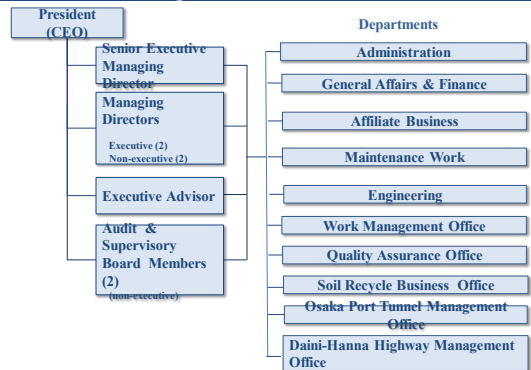


Workshop



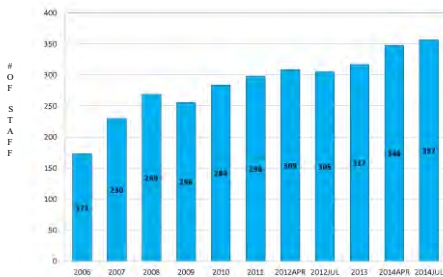
Practical Exams

## Organizational Structures



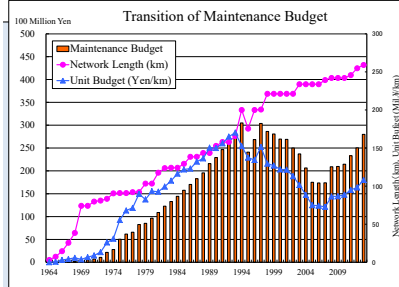
## Transition of Staff Composition

Since the foundation, the number of staff has been steadily increased, and about 350 engineers and officers are employed as of now.



## History of Business Performance

- The core business is routine maintenance including repairing
- The main client is the parent company. 60 - 70% of Maintenance of HE are done by HE Engineering.
- Most of routine maintenance works of Hanshin Expressway is outsourced to us by agreement
- The efficient maintenance is carried out under the limited budget while meeting the required service level

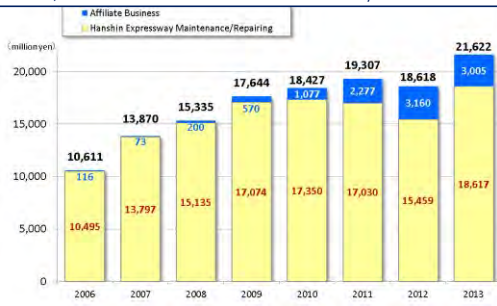


Note: Maintenance budget include the spending of routine maintenance and improve/rehabilitation



### History of Business Performance (cont'd) - Transition of Revenue -

- The revenue has been steadily increasing, and 2013FY marked the highest earning due to the growing demand of maintenance and consequent repairing orders from parent company
- Since 2010FY, revenue from affiliate business has been remarkably increased



### Growing Affiliate Business with other Clients

#### Type of Business and the main clients

- ◆ Engineering Contracts (Inspection and Survey of bridge structures)
  - Clients: local municipalities
- ◆ Maintenance Contracts
  - Clients: local municipalities, toll road authorities
- ◆ System Development/Management/Upgrading Contracts
  - Clients: toll road authorities
- ◆ Comprehensive Toll Road Management Contracts
  - Clients: toll road authorities adjacent to Hanshin Expressway network
- ◆ Leasing Business (Solar power plant operation)
- ◆ Vehicle Rental
  - Clients: subcontractors

### Inspection Contracts from other Road Authorities

- Contract Name: Inspection of Taicho Bridge and 3 other Bridges
- Client: Kakogawa City Government
- Contract Period: Jul. 2012 – Dec. 2012
- Contract Sum: ¥3,045,000



- Contract Name: Inspection of Hyosaka Tunnel, 8 other Tunnels and 386 Traffic Signs
- Client: Kinki Regional Development Bureau, Ministry of Land, Infrastructure and Transport
- Contract Period: Oct. 2013 – Mar. 2014
- Contract Sum: ¥39,585,000,000



### Merits of Doing Maintenance within the Group

- Child company shares the common concepts and long-term visions of management as a road asset owner with parent company, with which efficient maintenance activities comes before corporate profits.
- A firm trust relationship and communication between the employer and employee lead to the sharing of inspection or repairing results without hesitation and scapegoating.
- Examples of damage and maintenance failure can be accumulated within the group, which can be a quick feedback to the development of new maintenance technology through the experiments and trial applications on actual road structures
- Maintenance experts can be trained through the experience on the actual field

### Keys of Quality Road Management



➢ Sustainability and long-term vision

➢ Empirical Approach

➢ Skill Transfer



<http://www.hanshin-exp.co.jp/english/>  
<https://www.facebook.com/#!/hanshin.exp>



To advanced road service

## Bridge Maintenance Management Inspection / Diagnosis / Repair



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## Why maintenance is Necessary?



- We should aware that structural durability is not permanent
- ✓ Damages due to aging are inevitable, and
- ✓ Damages are progressive followed by the degradation of strength and functionality

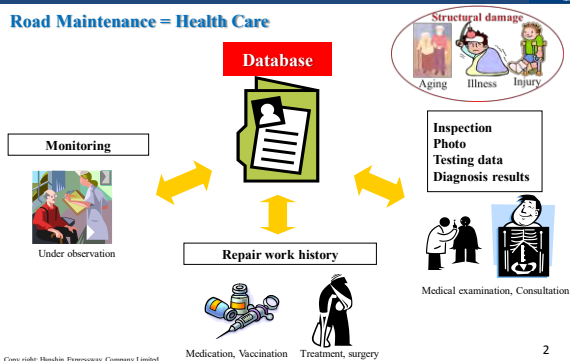


- In order to put structures in to service in a good condition, we have to
- ✓ Inspect structures in a planned and sustainable manners,
- ✓ Identify damages before getting out of hand, and
- ✓ Repair the damages timely and appropriately.

## Why maintenance is Necessary?



### Road Maintenance = Health Care



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## Concept of Road Maintenance



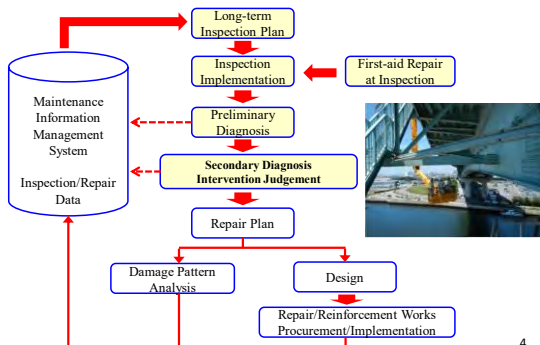
**Road maintenance is to choose intervention method according to extent and causation of damage identified by inspection result**

- ◆ Identify extent of structural deterioration and damage
  - Position of concrete crack, crack width, surroundings condition
  - Member deformation
- ◆ Identify causation of structural deterioration and damage
  - Environment, material, loading, etc.
- ◆ Judge intervention necessity
  - Future impact level (damage progressivity and extent of redundancy)
  - Impact level on third party disaster
  - Importance of the intervention, accountability

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## Road Maintenance Flows (Inspection to Repairing)



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## Types of Inspection



- Initial Inspection
  - Overlook the initial conditions of structures after the completion and acceptance (Visual checks from close range in principle)
- Routine Inspection
  - Confirm that there is no irregularity against safe and smooth traffic (Road surface checks, remote visual checks)
- Periodical Inspection
  - Identify and assess the level of damage and its consequence (Detail checks of road structures from close range with a specified interval (once every 5 years))
- Ad-hoc Inspection
  - Discover any irregularities right after disaster or incident
  - Supplement routine/periodical inspection

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## Routine Inspection



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## Periodical Inspection



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## Inspection Result Classification



Failure Level	Classification	Definition
High	S1	There is a <b>significant functional decline</b> and immediate intervention is necessary from the structural safety perspective
	S2	There is a <b>high risk of affecting on people, vehicle or any property under or adjacent to structures</b> and immediate intervention is necessary
Low	A	There is a <b>functional decline</b> and an intervention is necessary
	B	There is a failure whose progress should be <b>monitored</b>
	C	There is a <b>minor failure</b> for which no intervention is necessary for the moment
	OK	There is <b>no failure</b>

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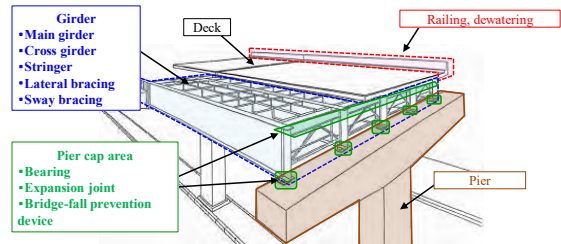
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## Bridge Member Terms



5 structural category in inspection

(1) Girder (2) Pier (3) Pier cap area (3) Deck (4) Railing, dewatering



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## Typical Bridge Damages



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## Typical bridge damages



### Concrete structure

Damage type	Causation	Phenomenon
Structural damage	Cyclic load, vibration	Fatigue, seismic damage
Material deterioration	Ambient environment, material condition	ASR, neutralization, chloride damage
Initial defect	Construction failure, material condition	Honeycomb, cold joint, rough surface

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## Typical Bridge Damages

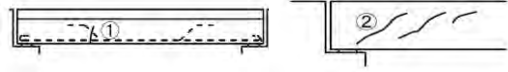


### ● Steel structure

Damage type	Causation	Phenomenon
Structural damage	Cyclic load, vibration	Member deformation, Fatigue cracking
Material deterioration	Ambient environment, material condition	Corrosion, fatigue, bolt looseness
Initial defect	Construction failure, material condition	Deformation/stress due to welding/assembly failure, inefficient bolt tightening

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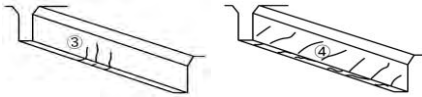
## Reinforced Concrete Girder (1)



No.	Position	Crack pattern and possible causation
1	1/4 of Span	Vertical cracks on the web and the underside of girder at the main bar bending point Possible causation: reinforcing bar deficiency due to bending
2	Supporting point	Diagonal cracks on the web Possible causation: crack due to shear stress. Deficiency of diagonal tensile bar or excessive applied load.

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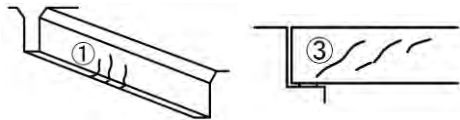
## Reinforced Concrete Girder (2)



No.	Position	Crack pattern and possible causation
3	Mid-span	Vertical cracks on web and the underside of girder. Possible causation: crack due to bending moment. Large crack with more than 0.2mm in width shall be paid attention
4	Others	Diagonal cracks on all over the girder surfaces. Possible causation: girder torsion due to pier inclination triggers the crack in case of box girder with triple supporting points.

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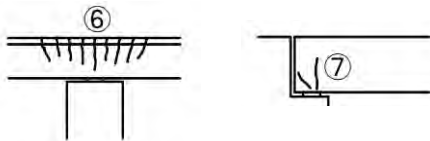
## Pre-stressed Concrete Girder (1)



No.	Position	Crack pattern and possible causation
1	Mid span	Vertical cracks on the web and the underside of girder Possible causation: crack due to bending moment. Pre-stressing deficiency, PC bar corrosion fracture due to grouting deficiency or excessive loading
3	Supporting point	Diagonal cracks on the web near the supporting point Possible causation: crack due to shear stress. Deficiency of diagonal tensile bar or excessive applied loading.

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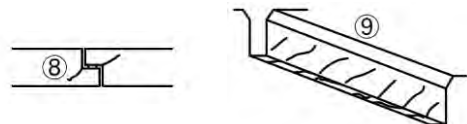
## Pre-stressed Concrete Girder (2)



No.	Position	Crack pattern and possible causation
6	Supporting point	Vertical cracks in the upper part of intermediate supporting point of continuous girder. Possible causation: negative bending moment, pre-stressing deficiency against negative bending moment, PC bar fracture or subsidence at the supporting point.
7	Supporting point	Vertical or diagonal cracks on the underside or the web of girder on the end supporting point. Possible causation: excessive support friction or local.

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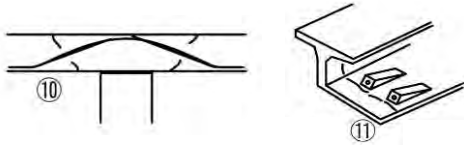
## Pre-stressed Concrete Girder (3)



No.	Position	Crack pattern and possible causation
8	Supporting point	Cracks on the corner points of Gerber girder hinge Possible causation: crack due to local stress. Reinforcement steel material deficiency or excessive loading.
9	Other	Diagonal cracks on all over the girder surfaces Possible causation: girder torsion due to pier inclination triggers the crack in case of box girder with triple supporting points.

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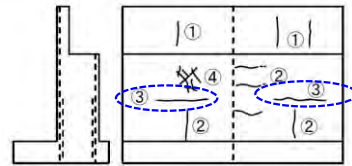
### Pre-stressed Concrete Girder (4)



No.	Position	Crack pattern and possible causation
10	PC bar Inflection point	Diagonal cracks at PC bar inflection point of intermediate supporting point of continuous girder. Possible causation: reinforcement steel material deficiency at the upper or lower margin area or excessive loading.
11	Other	Cracks near the PC bar anchorage points. Possible causation: local tensile stress near the anchorage points.

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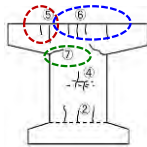
### Reinforced Concrete Abutment (1)



No.	Position	Crack pattern and possible causation
3	Front side surface	Cracks near the termination points of main reinforcements Possible causation: reinforcement deficiency due to termination or stress concentration due to sharp cross-sectional change.

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### Reinforced Concrete T-shaped Pier



No.	Position	Crack pattern and possible causation
5	Pier Top Beam	Vertical cracks on the upper side surface of pier top beam. Possible causation: Excessive bending moment. Large crack with more than 0.2mm in width shall be paid attention.
6	Pier Top Beam	Vertical cracks around the pier center point. Possible causation: insufficient reinforcement overlapping length
7	Main Column	Cracks on the underside of the corner point between main column and pier top beam Possible causation: local stress at the corner due to uneven loading

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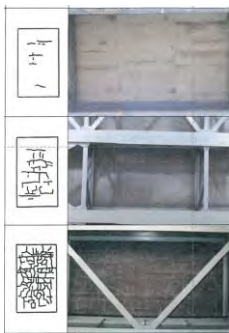
### Reinforced Concrete Rigid Frame Pier



No.	Position	Crack pattern and possible causation
8	Corner Point	Cracks at the end points of column and beam haunch Possible causation: shift or rotation of footing or excessive horizontal loading on the pier
9	Column and Beam	Cracks around column surface (9) Cracks around beam haunch area at the upper end of the column (10) Possible causation: Footing subsidence
11	Beam Center	Vertical cracks on the underside surface of the beam center. Possible causation: excessive loading, reinforcement deficiency, or shift/rotation of the pier

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### Reinforced Concrete Deck (1)



Cracking in a single direction  
(Main re-bar direction)



Grid Cracking (Main and distribution re-bar directions)



Alligator cracking

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### Reinforced Concrete Deck (2)



Crack penetration with leakage of Isolated lime



Crack edge defects



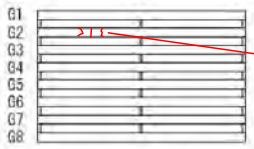
Punch-out defects

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### Reinforced Concrete Girder Defect (1)



Type of Cracks	Crack width	Judgement
	More than 0.3mm	A
	More than 0.2mm and less than 0.3mm	B
	Less than 0.2mm	C



Crack width less than 0.2mm

Member	Location	Damage condition	Judgement
RC girder	G2-1	Crack width less than 0.2mm	C

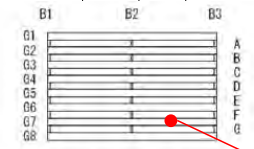
### Reinforced Concrete Girder Defect (2)



### Reinforced Concrete Girder Defect (2) cont'd



Item	Rank S	Rank A	Rank B	Rank C	
Water leakage Isolated lime	PC girder	Possibility of concrete particle or isolated lime falling	(1) Water leakage (2) Isolated lime is sticks around crack (3) Serious water saturation in box girder (4) Water saturation triggers A rank damage	(1) Trace of water leakage (2) Crack surface color is changed in white (3) Water saturation in box girder (4) Water saturation triggers B rank damage	Trace of water saturation is found
			(1) Outflow of rust with total area of water leakage, isolated lime more than 0.3m <sup>2</sup> (2) Water saturation triggers A rank damage	(1) Outflow of rust with total area of water leakage, isolated lime less than 0.3m <sup>2</sup> (2) Water saturation triggers B rank damage	



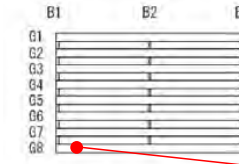
Member	Location	Damage condition	Judgement
RC girder	G7-2	Water leakage, isolated lime, rust more than 0.3m <sup>2</sup>	A

Water leakage, isolated lime

### Reinforced Concrete Girder Defect (3)



Item	Rank S
Crack	Load carrying capacity is deteriorated due to extremely large crack



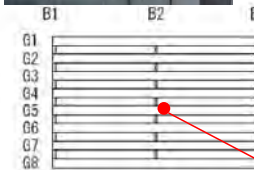
Member	Location	Damage condition	Judgement
RC girder	G8-1	Shear failure	S

Shear failure

### Pre-stressed Concrete Girder Defect



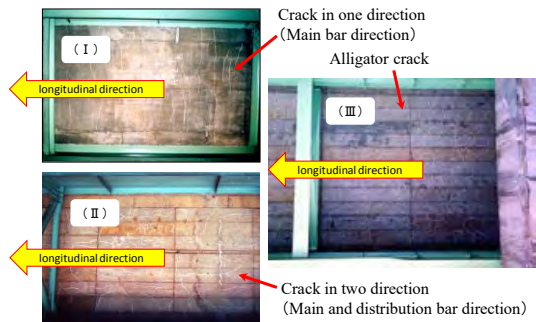
Item	Rank A
Exposure of PC bar, sheath, anchor	PC bar, sheath, anchor are exposed



Member	Position	Damage condition	Judgement
PC girder	G5-2	PC bar exposure	A

PC bar exposure

### Concrete Deck Defect (1)

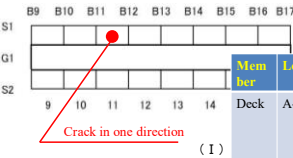


### Concrete Deck Defect (2)



Crack in one direction  
(Main bar direction)

Item	Crack width	Crack interval	Judgement
Average crack density	More than 0.2mm	Less than 50cm	A
	0.1 to 0.2 mm	50cm to 1m	B
	0.1 to 0.2 mm	More than 1m	C
Locally concentrated crack	More than 0.2mm	Less than 1m	B
	0.1 to 0.2 mm	More than 1m	C



Mem ber	Location	Damage condition	Judge ment
Deck	A-11	Crack in one direction (More than crack width of 0.1mm and average interval of 1m)	C

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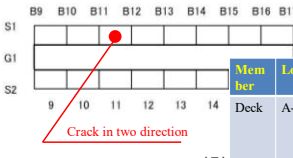
30

### Concrete Deck Defect (3)



Crack in two direction  
(Main and distribution bar direction)

Item	Crack width	Crack interval	Judgement
Average crack density	More than 0.1mm	Less than 40cm	A
	0.1 to 0.2 mm	40cm to 60cm	B
	0.1 to 0.2 mm	More than 60cm	C
Locally concentrated crack	More than 0.2mm	-	A
	0.1 to 0.2 mm	-	B
Crack edge defect or gap	-	-	A



Mem ber	Location	Damage condition	Judge ment
Deck	A-11	Crack in two direction (Crack width more than 1mm and average interval of 0.4 to 0.6 m)	B

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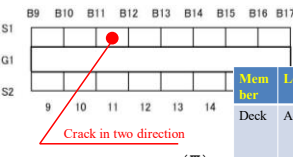
31

### Concrete Deck Defect (4)



Crack in two direction  
(Alligator crack)

Item	Crack width	Crack interval	Judgement
Average crack density	More than 0.1mm	Less than 40cm	A
	0.1 to 0.2 mm	40cm to 60cm	B
	0.1 to 0.2 mm	More than 60cm	C
Locally concentrated crack	More than 0.2mm	-	A
Crack edge defect or gap	0.1 to 0.2 mm	-	B
	-	-	A



Mem ber	Location	Damage condition	Judge ment
Deck	A-11	Crack in two direction (Alligator crack, crack width more than 0.2mm)	A

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### Concrete Pier Defect (1)



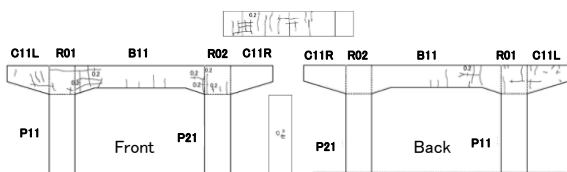
Classification of Cracks	Factors of Judgement		Judgement	Note
	Width of Crack	Distance of Cracks		
RC Structure	0.3mm ≤	-	A	
	0.2mm ≤ x < 0.3mm	-	B	
	< 0.2mm	-	C	
PC Structure	0.2mm ≤	-	A	
	0.1mm ≤ x < 0.2mm	-	B	
	< 0.1mm	-	C	
RC Structure	0.3mm ≤	< 50cm	A	
	0.2mm ≤ x < 0.3mm	50cm ≤	B	
	< 0.2mm	< 50cm	C	
	< 0.2mm	50cm ≤	C	

No.	Crack Pattern
①	Regularly vertical cracks
②	Cracks perpendicular to the cold joint
③	Cracks near the termination of main reinforcement
④	Alligator crack, map crack
⑤	Cracks on the upper side of the overhanging beam
⑥	Vertical cracks on the center of the pier
⑦	Cracks on the underside of the overhanging beam
⑧	Cracks at the end of column or end of the haunch
⑨	Cracks go around column
⑩	Cracks go around haunch at the upper end of the column
⑪	Cracks on the underside at the center of the beam
⑫	Horizontal cracks on the beam

### Concrete Pier Defect (2)



Member	Damage Location	Damage Condition (Situation)	Judgement
RC Pier	B11	Cracks of the RC structure 0.2mm ≤ x < 0.3mm	B
RC Pier	C11L	Cracks of the RC structure < 0.2mm	C
RC Pier	R01-P11	Cracks of the RC structure < 0.2mm	C
RC Pier	R02-P21	Cracks of the RC structure 0.2mm ≤ x < 0.3mm	B

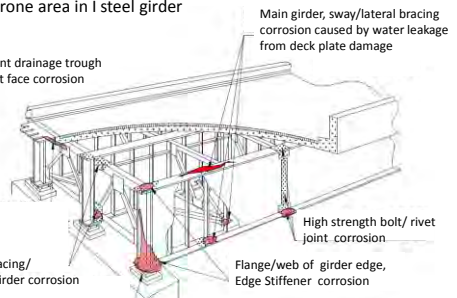


### Steel Pier Defect (1)



Corrosion prone area in I steel girder

Silt piling in joint drainage trough  
Expansion joint face corrosion



Bearing corrosion, bearing function failure, silt/dust piling

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### Steel Pier Defect (2)



Corrosion of steel girder due to water leakage  
(Thickness reduction more than 10%)



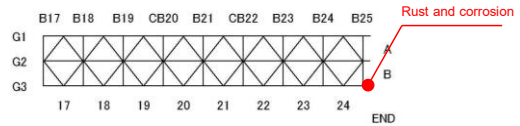
36

### Steel Pier Defect (3)



Damage Item	Rank S	Rank A	Rank B	Rank C
Rust and corrosion	Dangerous condition which may leads traffic accident	Section loss is more than 10% of thickness	Wide area is rusted Partly corroded	Slightly rusted

Member	Location	Damage condition	Judgement
Steel girder	3G-E	Rust and corrosion (Thickness loss is more than 10%)	A



37

### Judgment Trial



#### Question :

Let's try Judgement for damages shown in the photos!  
(S, A, B, C, OK)

※Refer to Inspection Manual



### Judgment Trial



[Q1] Steel Girder

Rust on the upper flange (Partial corrosion)



[A1] Rank C

Evidence: Sporadic rust

39

### Judgment Trial



[Q2] Steel Girder

Thickness loss of vertical stiffener on the main girder 2/9mm



[A2] Rank A

Comment: Thickness loss is more than 10% of member thickness.  
(In case of just above the bearing, the damage is judged as rank T1 (Priority Repair) for secondary judgement considering structural safety.)

40

### Judgment Trial



[Q3] Pre-stressed Concrete Girder

Crack on PC girder 0.1~0.2mm



[A3] Rank B

Comment:  $0.1\text{mm} \leq x < 0.2\text{mm}$  cracks on PC girder is judged as Rank B.

※In case of reinforced concrete girder, this crack is judged as Rank C

41



### Judgment Trial



[Q4] Pre-stressed Concrete Girder

Exposure of tendon anchor



[A4] Rank A

Comment: Exposure of tendon or sheath or anchor

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### Judgment Trial



[Q5] Reinforced Concrete Girder

Cracks on the side of RC girder 0.2~0.3mm



[A5] Rank B

Comment:  $0.2\text{mm} \leq x < 0.3\text{mm}$  cracks on RC girder is judged as Rank B.

※In case of reinforced concrete girder, this crack is judged as Rank A

43

### Judgment Trial



[Q6] Reinforced Concrete Pier

RC Pier  $0.3\text{m}^2 \leq$  water leakage or free lime



[A6] Rank A

Comment: Total area of water leakage and free lime and rust is  $0.3\text{m}^2$  or more

44

### Judgment Trial



[Q7] Steel Pier

Bend of splice plate  
(Side: 10mm, Underside: 5mm)



[A7] Rank A

Comment: Bend of splice plate is occurred by corrosion

45

### Judgment Trial



[Q8] Reinforced Concrete Deck

Local alligator cracks on RC Deck (Crack width : 0.1~0.2mm)



[A8] Rank B

Comment: Local alligator cracks with 0.1~0.2mm width on RC deck is judged as Rank B

46

### Judgment Trial



[Q9] On the Substructure Beam

Anchor Bolt for Bearing Touch between upper member and bolt



[A9] Rank C

Comment: Touch between members

※In case of touch and rust, damage is judged as Rank B

47

## Judgement Trial



### [Q10] Expansion Joint

Breakage of Gutter (L=1150mm)

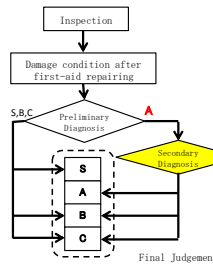


[A10] Rank S2

Comment: The damage is remarkable and broken member is expected to fall

48

## Secondary Diagnosis (1)



✓ Preliminary diagnosis is the initial judgement on mere damage conditions and is based solely on classification standards by structural type prescribed in the Inspection Manual.

✓ Secondary diagnosis adds on A-class damages the judgement regarding their future impact level such as **damage progressivity and the extent of redundancy**.

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## Secondary Diagnosis (2)



### ➢ Damage Progressivity (speed of proliferation)

Judging when the identified damage extends and reaches to the state where the member ruptures and loses its function completely, or whether the speed to reach to such state is within the interval up to the next inspection and there is enough time to give any preventive intervention.

### ➢ Damage Redundancy (functional margin as the whole structural system)

Evaluating whether the function as the whole structural system can be lost such as collapsing when the identified damage extends and reaches to the state where the member lose its function such as rupturing

Preliminary diagnosis	Secondary diagnosis			
	Redundancy	Progressivity		
		Small	Middle	Large
S	S			
A	Small	A	A	B
	Middle	A	B	B
	Large	B	B	C
B	B			
C	C			

50

## Intervention Judgement (1)



Class	Intervention	Definition
T1	Individual Repairing	<ul style="list-style-type: none"> <li>To recover or upgrade the structure's durability, usability and functionality, to mitigate the negative impact on the third parties, and to regain the structure's physical strength such as stiffness of structural members or the structure as a whole</li> <li><b>Preventive repairing which should be taken immediately judging from the current condition or which is rather economical than proactive interventions.</b> Either permanent or first-aid repair method shall be chosen according to the current damage status.</li> </ul>
T2	Planned Repairing	<ul style="list-style-type: none"> <li>To recover or upgrade the structure's durability, usability and functionality, to mitigate the negative impact on the third parties, and to regain the structure's physical strength such as stiffness of structural members or the structure as a whole</li> <li><b>A systematic repairing which enables more efficient functional recovery coupled with other associated middle- or long-term maintenance plans.</b></li> </ul>
T3	Supplementary Inspection/ Testing	<ul style="list-style-type: none"> <li>Further examination of the identified damages such as detail inspection, sampling and/or non-destructive testing <b>to estimate their cause and to predict the extent and speed of their progress.</b></li> </ul>

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## Intervention Judgement (2)



Further classification to determine the contract types of repair works

Class	Intervention	Sub-Class	Intervention timing and contract type
T1	Individual Repairing	T1	<ul style="list-style-type: none"> <li>Giving higher priority</li> </ul>
T2	Planned Repairing	T2t	<ul style="list-style-type: none"> <li>Repair work is undertaken in an internal repair work</li> </ul>
		T2a	<ul style="list-style-type: none"> <li>Repair work is packaged with other similar failures and outsourced to contractors</li> </ul>
		T2b	<ul style="list-style-type: none"> <li>Repair work can be undertaken independently in the scaffolding set for other contracts</li> </ul>
		T2c	<ul style="list-style-type: none"> <li>Repair work is undertaken after the work methodology is determined</li> </ul>
T3	Supplementary Inspection/ Testing	T3	<ul style="list-style-type: none"> <li>Planning of mid-term or ad-hoc inspection/testing</li> </ul>

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## First-aid Treatment during Inspection



First-aid treatment should be conducted by making the most of close range visual inspection opportunity

Advantageous in cost and time consumption

~ Concrete surface protector ~



• After removal of loose concrete, honeycomb  
• Exposed rebar

~ Cleaning and removal of jamming on the structure ~



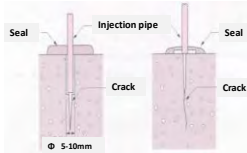
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## Concrete Structure Repair (Crack injection)



Injection of epoxy resin or cement mortar by automatic low pressure injector



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## Concrete Structure Repair (Surface Restoration)



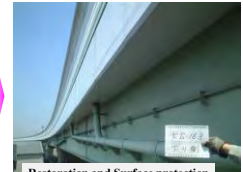
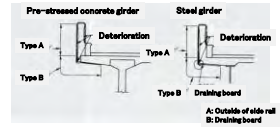
Removal of broken concrete, corrosion protect, restoration, surface protection



Removal of broken concrete



Corrosion protect



Restoration and Surface protection

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## Concrete Structure Reconstruction



Shear cracks on the reinforced concrete girder



Removal of RC girder



Replacement of pre-cast concrete girder



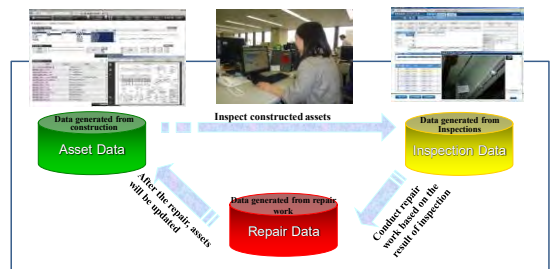
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## Organizing Database for Maintenance Management



- A "Maintenance Information Management System," which is an unified management concept of associated various types of data and information, shall be built and operated.



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## Conclusion



Road maintenance management is ...

Maintain road structures efficiently and in planned manner by estimating condition of structure objectively, predicting future deterioration and determining maintenance plan under budget constraints.



- ◆ Assessment of structural condition by inspection
- ◆ Development of database
- ◆ Prediction of structural deterioration
- ◆ Optimum plan of maintenance work

Inspection and diagnosis are the basis of maintenance cycle

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## 添付 2. 点検報告書

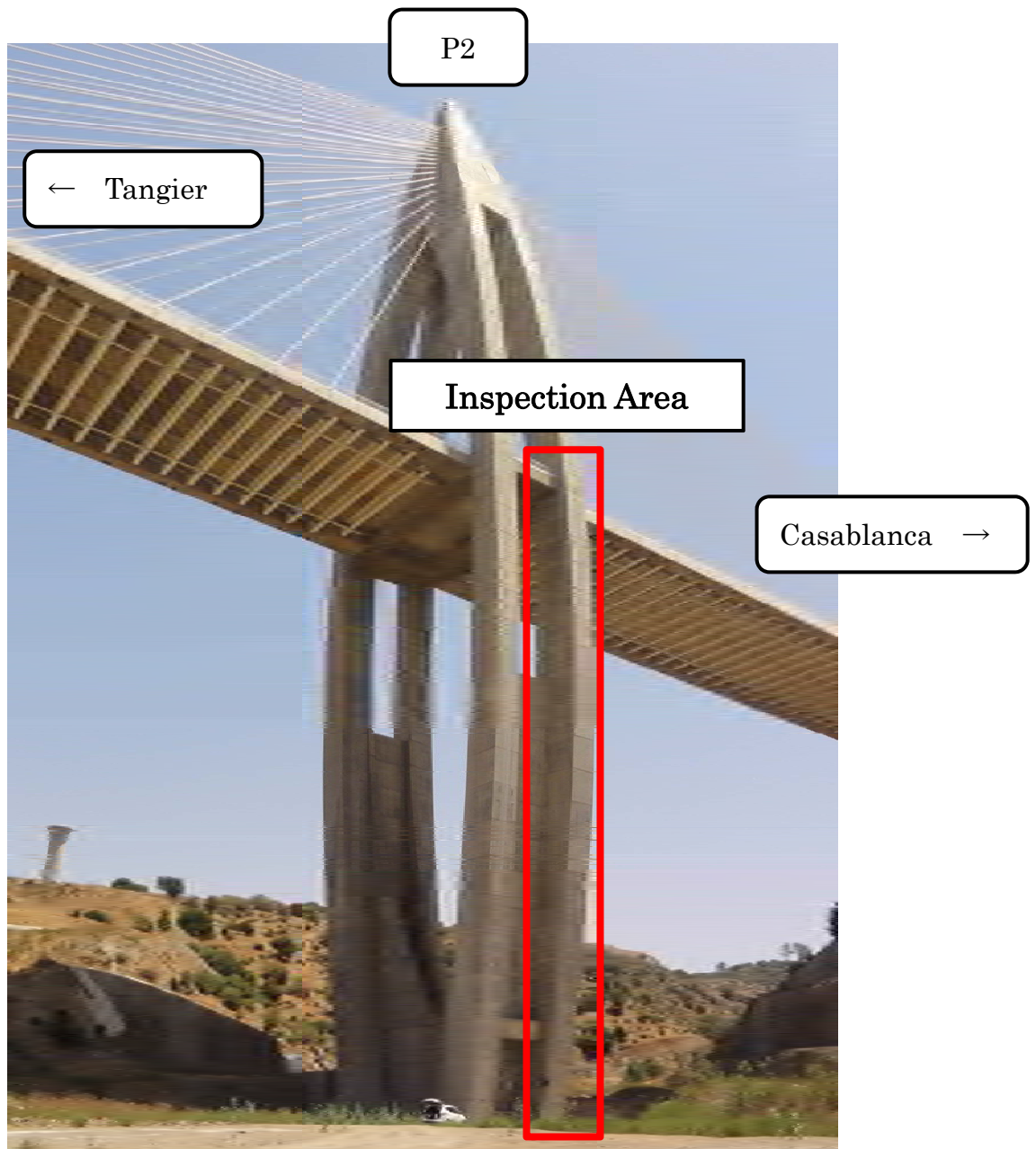


Inspection Result Report  
Bouregreg Bridge  
- 3<sup>rd</sup> Ninja-tech On-the-Job Training in Morocco-

July, 2017

Societe Nationale des Autoroutes du Maroc  
Hanshin Expressway Company Limited  
Tokusyu Kousyo Gijyutsu Inc.

Inspection Area





Bouregreg Bridge

P2

E00m\_1

Residue



Bouregreg Bridge

P2

E00m\_2

Residue



Bouregreg Bridge

P2

E00m\_3

Residue





Bouregreg Bridge

P2

N00m\_1

Residue



Bouregreg Bridge

P2

N00m\_2

Residue



Bouregreg Bridge

P2

N02m\_1

Residue



Bouregreg Bridge

P2

N02m\_2

Residue

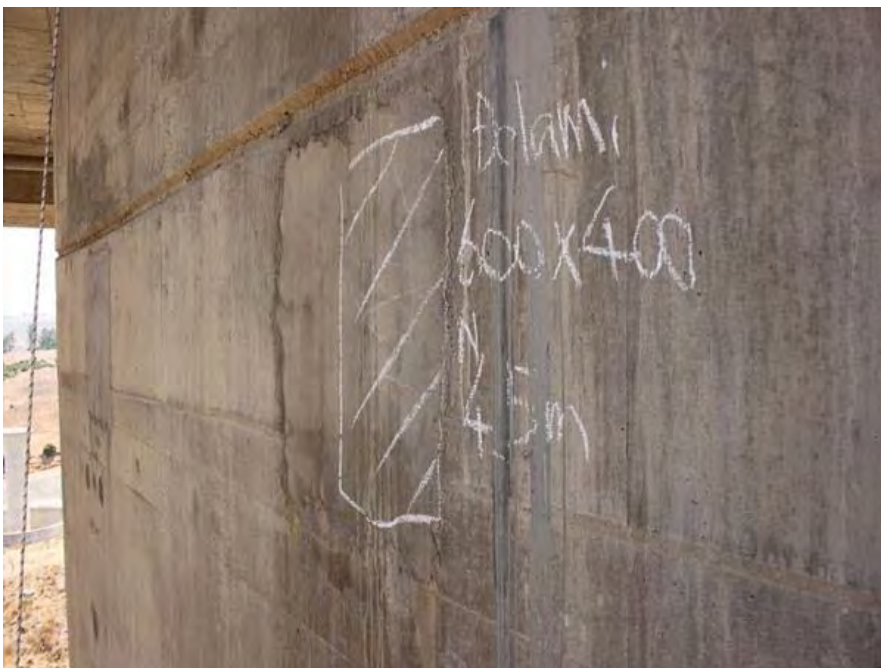


Bouregreg Bridge

P2

N02m\_3

Residue



Bouregreg Bridge

P2

N05m\_1

Delamination 600x400



Bouregreg Bridge

P2

N05m\_2

Delamination 600x400



Bouregreg Bridge

P2

N05m\_3

Delamination 600x400



Bouregreg Bridge

P2

N15m\_1

Exposed Rebar 40x70



Bouregreg Bridge

P2

N15m\_2

Exposed Rebar 40x70



Bouregreg Bridge

P2

N15m\_3

Exposed Rebar 40x70



Bouregreg Bridge

P2

N17m\_1

Stain

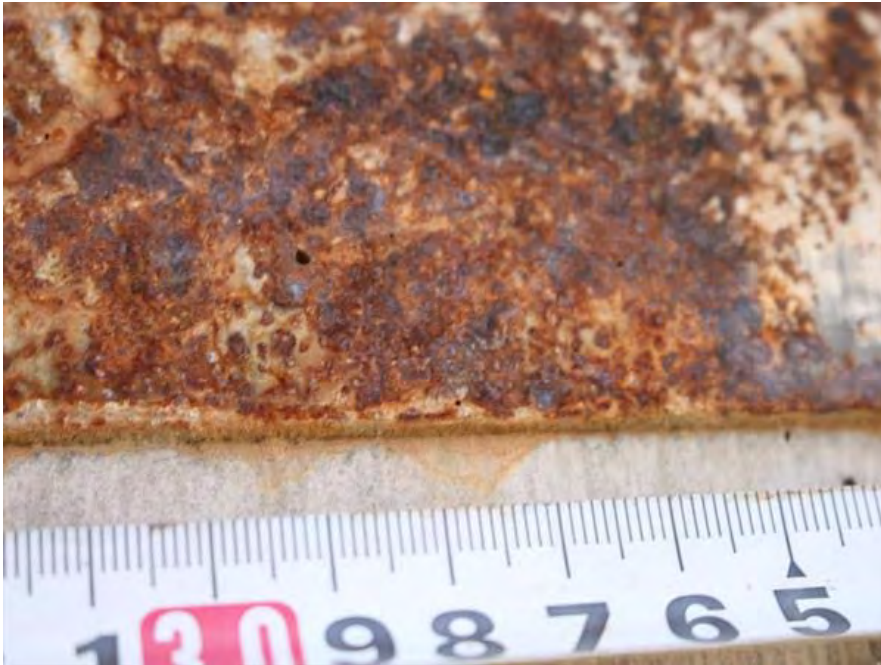


Bouregreg Bridge

P2

N17m\_2

Stain



Bouregreg Bridge

P2

N17m\_3

Stain



Bouregreg Bridge

P2

N37m\_1

Exposed Rebar 330x100



Bouregreg Bridge

P2

N37m\_2

Exposed Rebar 330x100

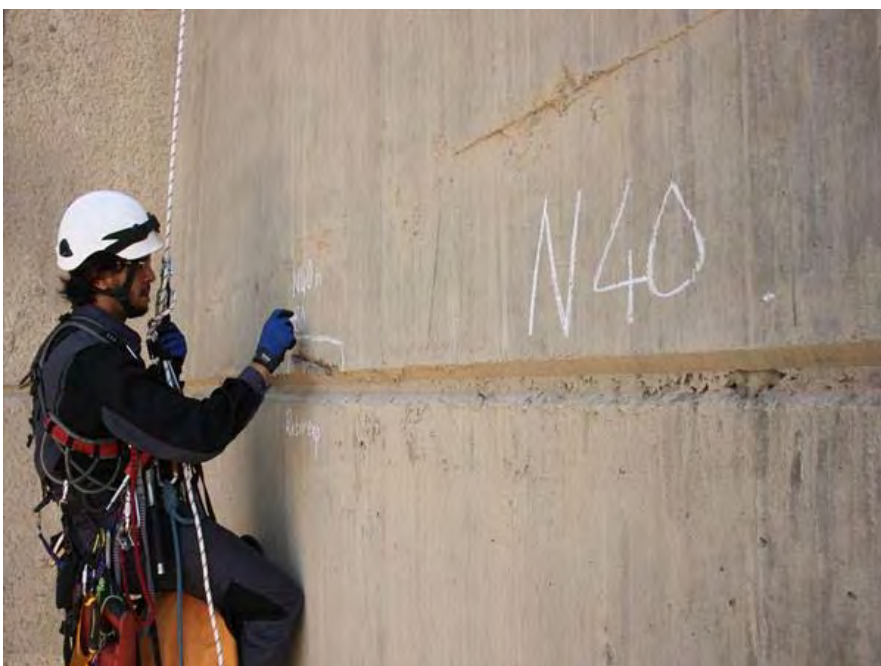


Bouregreg Bridge

P2

N37m\_3

Exposed Rebar 330x100



Bouregreg Bridge

P2

N40m\_1

Exposed Rebar 80x420



Bouregreg Bridge

P2

N40m\_2

Exposed Rebar 80x420



Bouregreg Bridge

P2

N40m\_3

Exposed Rebar 80x420



Bouregreg Bridge

P2

S00m\_1

Residue

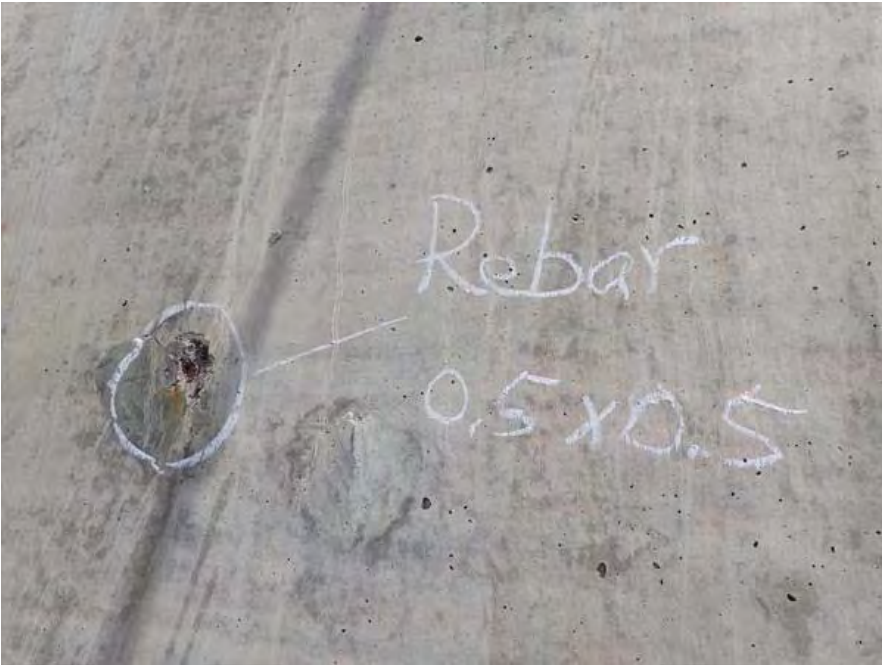


Bouregreg Bridge

P2

S00m\_2

Residue



Bouregreg Bridge

P2

S04m\_1

Exposed Rebar 50x50



Bouregreg Bridge

P2

S04m\_2

Exposed Rebar 50x50





Bouregreg Bridge

P2

W20m\_1

Residue



Bouregreg Bridge

P2

W20m\_2

Residue



Bouregreg Bridge

P2

W28m\_1

Residue



Bouregreg Bridge

P2

W28m\_2

Residue

余 白

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## 添付 3. 報道資料



(English translation of an article of local newspaper “Les Eco” dated 12/05/2016)

## **Cable-Stayed bridge on the Bouregreg River : “Ninjas” keep eye open on for trouble**



*The main piece of the highway of by-passing of Rabat, this bridge is the concentrate of technology.*

*The Japanese technology NINJA TECH is utilized for controlling the quality of the bridge thanks to the highly qualified persons.*

The cable-stayed bridge, on the Bouregreg River, the symbol of the new highway of bypassing of Rabat, having the length of 41 km, was presented yesterday to the press.

The bridge, the first in Africa, has length of 950 m with two pylons of 200 m of height.

Inspired by the doors of Rabat and of Sale, the bridge utilizes 1000 km of wires, 3,200 tons of steel, imported from China.

The significant fact, it encompasses the longest wire put under tightness in the world, which is of 261 m.

The bridge is so high that due to violent wind, the canopy accommodating the officials and the journalists, has been shaken so much and there was a moment of panic and of rushing.

Not hurt so much as frightened fortunately.

As to the roadway, it has 3 lanes in each direction and it is supported by 160 stays.

When it will enter into function (the date has not been informed), the bridge will enable users of the highway coming from north and from Fes to by-pass Rabat in order to go to the south.

This by-pass will relieve congestion definitely in the transit traffic in the capital, showing a strong component of heavy vehicles.

For Mohamed Najib BOULIF, minister of Equipment and of Transportation, it is an important ceremony which demonstrates the strong relations with Japan.

“Autoroutes du Maroc has, to his name, several projects, but the cable-stayed bridge is the first in Africa and the technical masterpiece. It shows that Morocco has capacities to be in tune world-widely with and capable to compete with the big projects in terms of highway”, emphasized the minister.

And to add that with 1,800 km of highways, Morocco gives a good impression on the subject of the connectivity that classifies Morocco in the second position.

The ambassador of Japan in Morocco, Tsuneo KUROKAWA, emphasized the importance of development and maintenance of road infrastructures.

He quoted in this connection the technic of control from close position, Ninja Tech, in partnership with a leading Japanese company in this field.

“I am convinced that Ninja Tech will help Morocco for the maintenance of the infrastructures”.

The Japanese company has contributed to re-construct the stricken regions with zero accident.

On the other hand, the partnership with the Japanese concessionaire of highways HANSHIN EXPRESSWAY, has been decisive for carrying through the infrastructures to a successful conclusion.

For Anouar BENZAOUZ, DG of ADM, the apprenticeship passes by the Human Resources.

In this sense, three persons will be trained in the technics of Ninja Tech.

“We are the footbridge between Morocco and Japan concerning this technology, which can also profit by MASEN in the control of its wind infrastructures, especially”.

**(English translation of an article of local newspaper « L'Economiste » dated 12/05/2016)**

## **The highway of by-passing of Rabat soon opened**

The highway of by-passing of rabat is finally ready.

It is, in fact, proceeded to the last finalization for its opening to the traffic in coming several weeks.

The information has been announced by Mohamed Najib Boulif, the delegated minister of the Transportation at the time of a visit to the big cable-stayed bridge, which is a part of this project.

With a length of nearly 40 km, this highway necessitated an investment of nearly 4 billion DH.

This visit has also been an occasion for the Japanese company HANSHIN to present the technic of auscultation Ninja Tech which will be adopted for the maintenance and the preventive maintenance of the cable-stayed bridge of Bouregreg with a real demonstration by a team of the company.

(English translation of an article of local newspaper "La Nouvelle Tribune" dated 12/05/2016)

## **ADM presents the method of auscultation "Ninja Tech**

A demonstration of new technic, called « Ninja Tech », specialized in the inspection and the auscultation of big structures, including the bridges, took place Wednesday in Rabat.

Presented at the time of a meeting initiated by Autoroutes du Maroc (ADM), « Ninja Tech », is based on revolutionary technology for the structures in inaccessible high zones and is consist of a visual auscultation from close position, enabling the immediate interventions.

On this occasion, the delegated minister of Transportation, Mohamed Najib Boulif, indicated that the adoption of this technic of auscultation of structures, to be specific, the bridge of the River Bouregreg, is inscribed in the framework of a partnership agreement between ADM and the Japanese company « Hanshin Expressway Ltd ».

It is a new technic to be able to preserve and prolong the life duration of this bridge, indicated the minister in a declaration to MAP, marking that it is the first in its genre in African and Arabic countries. This solution will enable the inspection and the auscultation, far away from traditional method, of numerous structures and bridges, he said.

During this meeting, which took place in presence of the Ambassador of Japan in Morocco, Tsuneo Kurokawa, of the Director General of Japan International Cooperation Agency (JICA), Koichi Shoji, M. Boulif announced that the cable-stayed bridge on the River Bouregreg, the works of which have been achieved, will be operational in June 2016.

On his side, the Director General of ADM, Anouar Benazzouz, noticed that this event is an occasion for presenting the project « Ninja Tech » which constitute one of the major challenges in terms of maintenance of the structures and of the infrastructures, raising, in this viewpoint, that the company will work in partnership with « Hanshin Expressway » for the training of the Moroccan experts for inspection of structures and structures of general civil, presenting the difficulties of access.

On its side, the Director of the Cooperation in Japanese company « Hanshin Expressway », Nishi Bayashi, stated precisely that this demonstration is supposed to be an occasion for introducing « Ninja Tech », a unique method in its genre and utilized for the first time outside of Japan, expressing the expectation to reinforce the cooperation in the field of road.

In parallel with this meeting, ADM and the company « Hanshin Expressway » proceeded to the real demonstration of an auscultation on the cable-stayed bridge of Bouregreg on a pylon of 200 meters (m) of height.



The cable-stayed bridge over the River of Bouregreg is an integral part of the project of construction of the highway of by-passing of Rabat.

It is a work of 950 m of length with two pylons of 200 m of height, while the roadway has 4 lanes in each direction and is supported by 160 cables.

(English translation of an article of local newspaper “La Vie Eco” dated 12/05/2016)

## **【 Ninja Tech 】, the Japanese technology for the service of Moroccan working sites**

**A demonstration of a new technic, called 【 Ninja Tech 】, specialized in the inspection and the auscultation of big structures, including the bridges, has taken place Wednesday on 11 May 2016 in Rabat.**

Presented at the time of meeting initiated by the Autoroutes du Maroc (ADM), 【 Ninja Tech 】, is based on a revolutionary technology for the structures in inaccessible high zones and is consist of a visual auscultation from close position, enabling the immediate interventions.

This technic will be utilized for the cable-stayed bridge of the river Bouregreg.

It is a new technic in order to enable to preserve and to prolong the life duration of this bridge, indicated the delegated minister in charge of the Transportation, Mohamed Najib BOULIF, marking that it is the first in its genre on African and Arab scale.

Before pursuing, this solution will enable the inspection and the auscultation, far away from the traditional methods, of numerous structures and bridges.

During this meeting, which has taken place in presence of the Ambassador of Japan in Morocco, Tusneo KUROKAWA and the resident representative of Japanese International Cooperation Agency (JICA), Hitoshi TOJIMA, Mr. Boulif announced that the cable-stayed bridge on the River of Bouregreg, the works of which have been achieved, will be operational in June 2016.

(English translation of an article of local newspaper « Le Matin » dated 30/11/2016)

## Preservation of the bridges

# Autoroutes du Maroc involves the Japanese expertise



*The choice of Japan for perpetuating the bridges in Morocco, states precisely ADM, is explained by the pertinence of the model Nippon.*

Autoroutes du Maroc (ADM) has concluded a partnership with Japanese Hanshin Expressway Company Ltd for the training of her staff.

The Japanese enterprise trains the officers and technicians of ADM for the professions of preservation of Moroccan bridges, not existing in the country.

“The partnership with Hanshin Expressway Company Ltd enabled the Moroccan officers to benefit by a training for technics of auscultation of several months in Japan and In Morocco”, indicates ADM.

The officers have been trained on the concrete case of Japanese bridges with a view to initiate them for the technics of knowledge of the real status of the bridges (examinations, specific measures, etc.)

and for the materialization of eventual diagnostics.

Ensured under cooperation with Japanese International Cooperation Agency (JICA), the training is ratified by a certificate of expertise which enables the Moroccan officers to train on their turn other collaborators of ADM.

The choice of Japan for perpetuating the bridges in Morocco, states precisely ADM, is explained by the pertinence of the model Nippon.

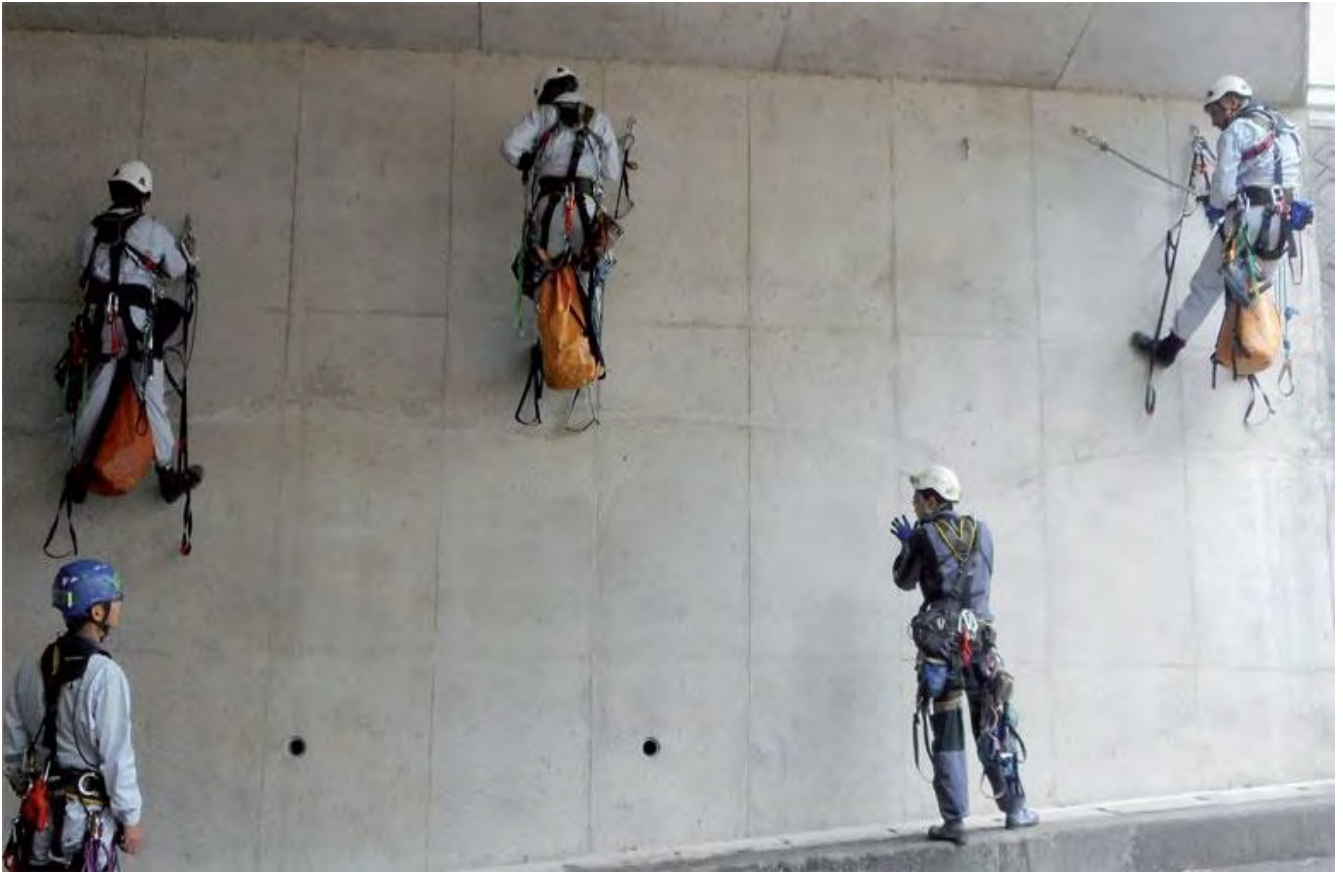
The latter makes, in fact, the reference in the world, because it is obligation to do inspection of the bridges minimum once in every five years.

Real specialist, Hanshin Expressway Company Ltd has experience of more than a half century and is considered as a model in this area.

(English translation of an article of local newspaper « Le Matin » dated 01/12/2016)

## Preservation of bridges

# A training for the officers of Autoroutes du Maroc



*The Moroccan officers have been initiated for technics of diagnostics of bridges.*

Autoroutes du Maroc has trained her officers for the preservation of bridges. This training, not existing in Morocco and ensured by Japanese group, has enabled them to learn to diagnose with precision the real status of the bridges. On their turn, they could train their colleagues.

Perpetuate the bridges beyond a century.

Such is the objective of partnership concluded between Autoroutes du Maroc (ADM) and Japanese Hanshin Expressway Company Ltd. This agreement is concerned with the training of staff of the Moroccan company for the preservation of bridges of the country. "This agreement has enabled the Moroccan officers to benefit by a training for technics of auscultation of several months in Japan and In Morocco", indicates ADM.

Not existing in Morocco, this training was concerned with the concrete case of bridges in Japan with a view to initiate the Moroccan officers for technics of knowledge of the real status of the bridges

(examination, specific measures, etc.) and for the materialization of eventual diagnostics.

Ensured in cooperation with Japan International Cooperation Agency (JICA), the training is approved by a certificate of expertise which enables the Moroccan officers to train on their turn other collaborators of ADM. The choice of Japan for perpetuating the bridges in Morocco public company, is explained by the pertinence of the model Nippon.

The latter makes in fact reference in the world, because it is obligatory to inspect the bridges minimum once in every five years. Veritable specialist, Hanshin Expressway Company Ltd has experience of more than a half century.

Her partnership with ADM has provoked the interest of Japanese media and especially of TV Tokyo.

The latter "has dispatched a team of shooting for materializing a reportage on ADM from 28 November to 9 December 2016. This reportage will reveal the progress of Morocco in the field of highway infrastructures as well as her strategy of preservation of patrimony", shares ADM.

Several sites are concerned : the bridges Oued Sebou adjacent to Kenitra, Oued Oum Rbiaa adjacent to El Jadida and Ksar Nord adjacent to Tanger.

Since creation in 1989, ADM has constructed more than 1,800 km of national highway network, ensuring the development of territory by linking the most important cities in Morocco.

(English translation of an article of local newspaper « Aujourd'hui Le Maroc » dated 01/12/2016

## The officers of ADM trained by the Japanese company HANSHIN EXPRESSWAY



*“Veritable specialist, Hanshin Expressway Company Ltd has an experience of more than a half century and is considered as a model in the concerned field .....”*

Morocco involves the Japanese expertise in terms of preservation of bridges.

La Société Nationale des Autoroutes du Maroc (ADM) has become allied with Japanese company Hanshin Expressway Company Ltd with a view to train her officers in the field of auscultation of the bridges.

This partnership first in its genre, has ambition to perpetuate and valorize the national patrimony in particular the bridges beyond one century.

The training of the officers of La Société Nationale des Autoroutes du Maroc has been made in the two countries.

“The Moroccan officers have benefited by training for the technics of auscultation of several months in Japan and in Morocco.

They have been trained on the concrete cases of Japanese bridges with a view to initiate them for technics of knowledge of the real status of the bridges, to be specific, the examinations and the specific measures, as well as for the materialization of eventual diagnostics”, emphasizes in this connection ADM. And state precisely that “the training, materialized by Hanshin Expressway Company, Ltd, in cooperation

with Japan International Cooperation Agency (JICA), is approved by handing-over of a certificate of expertise which enables the Moroccan officers to train on their turn other collaborators of ADM and to participate at the end into transmission of know-how of the company in Morocco and in Africa”.

Explaining about the choice of Japan as partner, La Société Nationale des Autoroutes du Maroc explains it by the pertinence of the model Nippon.

“Veritable specialist, Hanshin Expressway Company Ltd has experience of more than a half century and is considered as a model in the field concerned. Japan makes in fact reference in the world, because it is obligation to do inspection of the bridges minimum once in every five years”, we learn from ADM.

The partnership sealed by La Société Nationale des Autoroutes du Maroc and Hanshin Expressway Company Ltd is followed closely by Japanese medias.

Besides, a team of shooting belonging to TV Tokyo is doing at this moment and until 9 December a reportage which will reveal the progress of Morocco in the field of highway infrastructures as well as its strategy of preservation of patrimony.

The sites which will be brought out are to be specific, the bridges : Oued Sebou adjacent to Kenitra, Oued Oum Rbiaa adjacent to El Jadida and Ksar Nord adjacent to Tanger.

Let's remember that ADM has put on the rails a new policy of human resources.

ADM has, in this sense, implemented a program of training and of accompanying of competency which covers all of the aspects of highway infrastructures.

ADM has, on the other hand launched ADM Academy.

A structure which proposes the cycle of training to the officers, managers, technicians and supervisors.

Supporting the strategy of competitiveness of ADM, this institution is dedicated to the expertise, to the research and to the innovation.

ADM Academy plays role of catalyst in the acquisition of new competencies for the collaborators of ADM.

## 添付 4. 現地法人事業の財務モデル







	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>損益計算書</b>										
売上高	k JPY	19,803	19,803	19,803	19,803	19,803	19,803	19,803	19,803	19,803
販管費(除減価償却)	k JPY	(17,869)	(17,869)	(17,869)	(17,869)	(17,869)	(17,869)	(17,869)	(17,869)	(17,869)
減価償却(-)	k JPY	0	0	0	0	0	0	0	0	0
営業利益	k JPY	1,934	1,934	1,934	1,934	1,934	1,934	1,934	1,934	1,934
営業外収益	k JPY	0	0	0	0	0	0	0	0	0
営業外費用	k JPY	0	0	0	0	0	0	0	0	0
経常利益	k JPY	1,934	1,934	1,934	1,934	1,934	1,934	1,934	1,934	1,934
特別損益	k JPY	0	0	0	0	0	0	0	0	0
税前当期純利益	k JPY	1,934	1,934	1,934	1,934	1,934	1,934	1,934	1,934	1,934
法人税	k JPY	(193)	(193)	(193)	(193)	(193)	(193)	(193)	(193)	(193)
当期純利益	k JPY	1,741	1,741	1,741	1,741	1,741	1,741	1,741	1,741	1,741
利益剰余金期首残	k JPY	0	0	0	0	0	0	0	0	0
当期純利益	k JPY	1,741	1,741	1,741	1,741	1,741	1,741	1,741	1,741	1,741
配当金	k JPY	(1,741)	(1,741)	(1,741)	(1,741)	(1,741)	(1,741)	(1,741)	(1,741)	(1,741)
利益剰余金期末残	k JPY	0	0	0	0	0	0	0	0	0

<b>貸借対照表</b>										
現金	k JPY	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400
売掛金	k JPY	0	0	0	0	0	0	0	0	0
在庫	k JPY	0	0	0	0	0	0	0	0	0
投資有価証券	k JPY	0	0	0	0	0	0	0	0	0
固定資産	k JPY	0	0	0	0	0	0	0	0	0
<b>総資産</b>	k JPY	<b>8,400</b>	<b>8,400</b>	<b>8,400</b>	<b>8,400</b>	<b>8,400</b>	<b>8,400</b>	<b>8,400</b>	<b>8,400</b>	<b>8,400</b>
買掛金	k JPY	0	0	0	0	0	0	0	0	0
借入金	k JPY	0	0	0	0	0	0	0	0	0
資本金	k JPY	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400
利益剰余金	k JPY	0	0	0	0	0	0	0	0	0
<b>負債+資本</b>	k JPY	<b>8,400</b>	<b>8,400</b>	<b>8,400</b>	<b>8,400</b>	<b>8,400</b>	<b>8,400</b>	<b>8,400</b>	<b>8,400</b>	<b>8,400</b>

<b>キャッシュフロー計算書</b>										
期首現金残	k JPY	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400
営業CF: 当期純利益	k JPY	1,741	1,741	1,741	1,741	1,741	1,741	1,741	1,741	1,741
営業CF: 減価償却	k JPY	0	0	0	0	0	0	0	0	0
営業CF: 売掛金の増減	k JPY	0	0	0	0	0	0	0	0	0
営業CF: 在庫の増減	k JPY	0	0	0	0	0	0	0	0	0
営業CF: 買掛金の増減	k JPY	0	0	0	0	0	0	0	0	0
投資CF: 投資有価証券	k JPY	0	0	0	0	0	0	0	0	0
投資CF: 資産	k JPY	0	0	0	0	0	0	0	0	0
財務CF: 借入金	k JPY	0	0	0	0	0	0	0	0	0
財務CF: 資本金	k JPY	0	0	0	0	0	0	0	0	0
財務CF: 配当金	k JPY	(1,741)	(1,741)	(1,741)	(1,741)	(1,741)	(1,741)	(1,741)	(1,741)	(1,741)
期末現金残	k JPY	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400
期首現金残	k JPY	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400
営業CF	k JPY	1,741	1,741	1,741	1,741	1,741	1,741	1,741	1,741	1,741
投資CF	k JPY	0	0	0	0	0	0	0	0	0
財務CF	k JPY	(1,741)	(1,741)	(1,741)	(1,741)	(1,741)	(1,741)	(1,741)	(1,741)	(1,741)
期末現金残	k JPY	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400

<b>配当</b>										
手元現金残高	k JPY	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400
配当可能資金	k JPY	10,141	10,141	10,141	10,141	10,141	10,141	10,141	10,141	10,141
手元現金残高	k JPY	(8,400)	(8,400)	(8,400)	(8,400)	(8,400)	(8,400)	(8,400)	(8,400)	(8,400)
配当額	k JPY	1,741	1,741	1,741	1,741	1,741	1,741	1,741	1,741	1,741

#### 配当源泉税引後配当額

配当額	k JPY	1,741	1,741	1,741	1,741	1,741	1,741	1,741	1,741	1,741
配当源泉税	k JPY	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
税引後配当額	k JPY	1,480	1,480	1,480	1,480	1,480	1,480	1,480	1,480	1,480

EIRR 17% (8,400) 1,480 1,480 1,480 1,480 1,480 1,480 1,480 1,480 1,480 1,480 8,400

## 添付 5. ADM の損益計算書

(2015 年 6 月決算値)



モロッコ国 ADM 2015年半期(2015年1月～6月)損益計算書(税前 単体)

「営業損益」		
I	<b>売上高</b>	
	商品売上高	0.00
	製品・サービス売上高	1 041 490 230.68
	売上高	1 041 490 230.68
	製品棚卸増減額 (= 期末ストック - 期首ストック)	0.00
	固定資産自家建設高	0.00
	営業助成金	0.00
	その他営業収益	0.00
	営業修正益:費用振替	20 275 273.69
	<b>I 計</b>	1 061 765 504.37
II	<b>営業費用</b>	
	再販製品仕入れ (= 製品購入費 - ストック製品)	0.00
	消費原材料・調達品 (= 原材料購入費 - ストック製品)	96 033 899.11
	その他外部費用	105 048 690.68
	租税公課	2 992 364.69
	人件費	78 892 024.90
	その他営業費用	0.00
	営業引当金	501 960 130.89
<b>II 計</b>	784 927 110.27	
III	<b>営業利益(I-II)</b>	276 838 394.10
「財務損益」		
IV	<b>財務収益</b>	
	資本参加収益及びその他投資収益	0.00
	為替差益	23 646 087.13
	受取利息及びその他財務収益	23 432 761.20
	財務取崩及び費用振替	203 878 270.24
<b>IV 計</b>	250 957 118.57	
V	<b>財務費用</b>	
	支払利息	754 978 057.53
	為替差損	16 998 045.86
	その他財務費用	511.55
財務引当金	166 643 423.58	
<b>V 計</b>	938 620 038.52	
VI	<b>財務損益 (IV - V)</b>	-687 662 919.95
VII	<b>経常利益 (III + VI)</b>	-410 824 525.85
「特別損益」		
VIII	<b>特別収益</b>	
	資産譲渡益	0.00
	損失補償助成金	0.00
	投資助成金取り崩し	115 874.05
	その他特別収益	4 063 430.37
	特別収益取崩、費用振替	0.00
<b>VIII 計</b>	4 179 304.42	
IX	<b>特別費用</b>	
	譲渡資産の減価償却費	0.00
	充当助成金	0.00
	その他特別費用	21 790.44
	減価償却 & 準備金への特別引当金	0.00
<b>IX 計</b>	21 790.44	
	<b>特別損益(VIII - IX)</b>	4 157 513.98
XI	<b>税前損益</b>	-406 667 011.87
XII	<b>法人税</b>	5 459 990.61
XIII	<b>未処分利益(XI - XII)</b>	-412 127 002.48
XIV	<b>利益合計 (I ; IV ; VIII)</b>	1 316 901 927.36
XV	<b>費用合計 (III + V + IX + XII)</b>	1 729 028 929.84
XVI	<b>未処分利益 (XIV - XV)</b>	-412 127 002.48