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1.

1-1.

가 ,

가

가 ,

Road salt

RC Spall 5.1~7.6cm

Spall 가

185.8~278.7cm 가

가 가

Spall Pothole

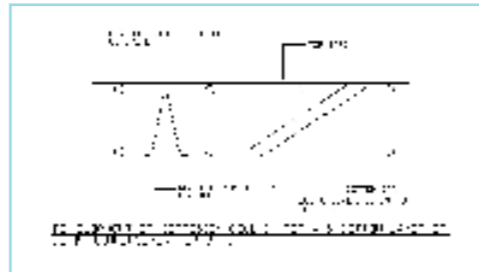
가

가

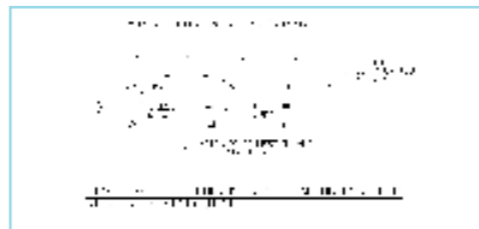
Chain-drag survey

# Troubleshooting

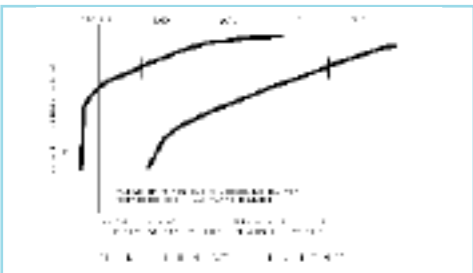
Traffic action Spall 가  
 Chloride 15 ~ 1,000 가  
 Chloride 2  
 0.2% Acid-soluble chloride



1-1



1-2



Element	Atomic No.	Atomic Radius	Ionic Radius
Cl	17	0.99	1.81
Ca <sup>+</sup>	20	1.97	0.99
Na <sup>+</sup>	11	1.86	0.95
) Cl	1.81		

가  
 pH , pH  
 12 ~ 13  
 2.5  
 5% 가

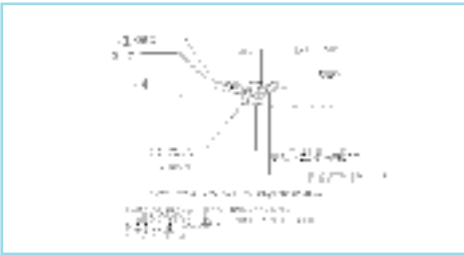
가 , Support  
 settlement,  
 ACI 224R , 0.18 mm  
 0.25 mm  
 ACI code .(  
 )  
 , Pre-cast pre-tensioned  
 Floor slab joint ,

Joint  
 가 . 가 가  
 Expansion joint Joint  
 Joint distress & leakage  
 Construction joint 1-2. 가  
 Visual examination & documentation  
 Fine(F) : 0.25mm  
 Medium(M) : 0.25~0.75mm  
 Wide(W) : 0.75mm  
 Control joint  
 Plastic concrete , / / / /  
 sealant , /  
 Joint , 가  
 Debris  
 8 ~ 10  
 , Deck  
 Joint 가  
 Joint-system ,  
 Chloride ion content of concrete  
 FHWA(Federal Highway Admin) 280 ~ 410ppm  
 Acid soluble chloride 가  
 Half-cell corrosion-potential testing  
 Expansion joint 가  
 Creep,  
 30cm  
 가  
 Joint ,  
 system , Debris - Potential : -0.02V CSE :  
 Expansion 가 90%  
 joint Parking structure - Potential : -0.02 ~ 0.35 V CSE :  
 Joint , 가  
 가 - Potential : -0.35 V CSE :  
 가 가 90%

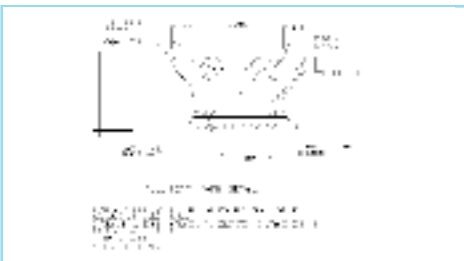
# Troubleshooting

1-3.

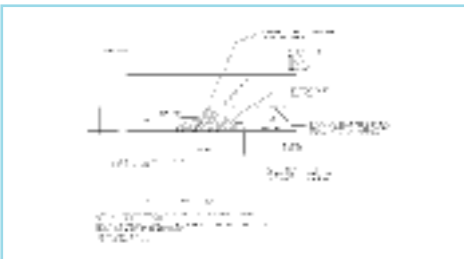
- Patching
- Protective coating
- Replacement
- Cathodic protection
- Sealing



Patching 1-1



Patching 1-2



Patching 1-3



Patching 1-4

## Patching

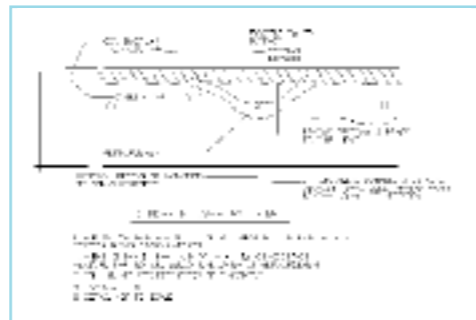
Patching 가 ,  
(Full-Depth) 12.7cm 가

Patching 가  
1.9cm Feather-edge Patch

## Coating

Sealer 가  
Sealer 3-5 가

Sealer 가  
Sealer 가  
Sealer 가



Bonded-concrete overlay

Overlay ,가  
, Overlay + , + ,

## Replacement

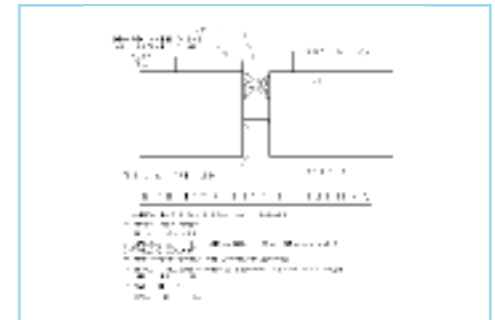
가 , 0.16cm , 0.32cm  
12.7cm 가 Pan-  
joist, Patch

4-5 Patch 가  
Patch 가  
depth 가 Patch

## Cathodic protection

Floor system , Bridge  
deck 가 가

, 10 가  
steel , Prestressing  
Sealing



- Expansion joint Patch 1-2  
- Construction joint Seal Patch  
- Control joint / Isolation joint 3-5  
- Construction Servicelated crack 가 Strip  
patch( )

## 1-4. Basic requirement

Bonding medium 가 , Overlay( )  
+ , , , , )

# Troubleshooting

10~20 Cathodic < 1> 가\$30,000,000  
 protection 20 , Full- 20  
 depth( , A , B  
 )  
 20~40 가 . 8 ,  
 , A 13  
 Sealer  
 \$200,000

## 2. System

2-1. 가  
 . 17  
 \$1,000,000  
 Rebar가 , 3 B  
 Sealer 가 \$300,000, \$2,000자

Year	Non Monitoring Building		Monitoring Building		
	1 <sup>st</sup> Cost.	Repairs	1 <sup>st</sup> Cost.	Monitor	Repairs
1	30,000,000		30,000,000	300,000	
2				2,000	
3				2,000	
4				2,000	
5				2,000	
6				2,000	
7				2,000	
8				2,000	
9				2,000	
10				2,000	80,000
11				2,000	
12				2,000	
13		200,000		2,000	80,000
14				2,000	
15				2,000	
16				2,000	80,000
17		1,000,000		2,000	
18				2,000	
19				2,000	80,000
20				2,000	
Total		1,200,000		338,000	320,000

10 Corrosion sensor ,  
 가 , \$80,000  
 Sealer . 2-4.  
 Sealer 3 , Ctholic Univ.  
 4 100  
 가 , 가  
 가 , 가

## 2-2. Building monitoring sensors

3.  
 Visual survey ,  
 가  
 Semi-smart 가 가 ,  
 가 가

## 2-3. Distributed sensor & fiber optics

가 , 가 가 ,  
 (Moisture sensor) Bay  
 가 (Strain gage) . S  
 가  
 Optic fiber 1.  
 2.