

Unit 9 - Week 7

Course outline

How does an NPTEL online course work?

Prerequisite Assignment

Week 1

Week 2

Week 3

Week 4

Week 5

Week 6

Week 7

Surface preparation and Protective treatments

Surface preparation and Protective treatments

Surface preparation and protective treatments

Surface preparation and protective treatments

Quiz : Assignment 7

Maintenance and Repair of Concrete Structures : Week 7 Feedback Form

Lecture Materials

Week 8

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Week 12

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Assignment 7

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2020-03-18, 23:59 IST.

1) Select the key features of a good galvanic anode system for applications in concrete structures should have **3 points**

- Large surface area of the anode metal to be able to meet the high current demand
- Encapsulating mortar with neutral pH to ensure that the zinc anode will continue to corrode
- Highly alkaline encapsulating mortar to ensure that the zinc anode will continue to corrode
- Encapsulating mortar with disconnected pores
- Anode tie wires should be die-cast into the anode

No, the answer is incorrect.
Score: 0

Accepted Answers:

Large surface area of the anode metal to be able to meet the high current demand

Highly alkaline encapsulating mortar to ensure that the zinc anode will continue to corrode

Anode tie wires should be die-cast into the anode

2) RC piles of a dry dock in Cochin Port are experiencing severe corrosion-induced spalling of cover concrete. The following operations are considered during the patch repair processes **3 points**

- i.Coating the rebar with an alkaline slurry, which could be an electrical insulator
- ii.Connecting sacrificial galvanic anodes to the cleaned rebars
- iii.Removing the cover concrete, undercutting, and removing the rust scales on rebar
- iv.Providing additional rebars to account for the lost steel cross-section, if required
- v.Placing the repair material in the patch region

Which of the following sequence of operation will be appropriate to protect the piles from further corrosion? Only one choice is correct answer

$iii \rightarrow iv \rightarrow i \rightarrow ii \rightarrow v$

$i \rightarrow iv \rightarrow v \rightarrow ii$

$iii \rightarrow iv \rightarrow ii \rightarrow v$

$iii \rightarrow v \rightarrow i \rightarrow ii \rightarrow v$

No, the answer is incorrect.
Score: 0

Accepted Answers:

$iii \rightarrow iv \rightarrow ii \rightarrow v$

3) Cathodic protection using galvanic anodes or using impressed current techniques will regain some of the corroded steel cross-section in concrete. True or False? **1 point**

- True
- False

No, the answer is incorrect.
Score: 0

Accepted Answers:

False

4) In impressed current cathodic protection (ICCP) systems, Titanium is widely used as the anode material because of its high corrosion resistance and least maintenance. Based on this, select the most suitable anode material from the list given below **1 point**

- Zinc
- Iron
- Magnesium
- Stainless steel

No, the answer is incorrect.
Score: 0

Accepted Answers:

Stainless steel

5) Select the appropriate statement(s) about Electrochemical Chloride Extraction (ECE) **2 points**

- ECE is a long-term treatment, which may reduce the chloride ion concentration in the system
- ECE can repassivate the embedded steel
- ECE is a destructive method
- ECE can increase the pH of the cover concrete
- ECE can increase the pH of a thin layer of concrete surrounding the rebar

No, the answer is incorrect.
Score: 0

Accepted Answers:

ECE can repassivate the embedded steel

ECE can increase the pH of a thin layer of concrete surrounding the rebar

6) Rust stains have been observed on the concrete girders of an overpass located above a traffic signal in an urban area. Which strategy would you recommend to extend the residual service life of the bridge? Laboratory test results conducted on concrete samples collected from the girder are given below: **3 points**

Chloride content = 0.01% by weight of concrete
Oxygen permeability index = 9.1
Wenner 4-probe surface resistivity = 50 kΩ cm

- Cement based coating and anti-carbonation coating over the girders
- Surface cleaning and anti-carbonation coating
- Anti-carbonation coating followed by electrochemical chloride extraction
- Electrochemical re-alkalization followed by anti-carbonation coating

No, the answer is incorrect.
Score: 0

Accepted Answers:

Electrochemical re-alkalization followed by anti-carbonation coating

7) "Sealing of the mixing water (to prevent evaporation)" and "supply of additional water" are considered as two approaches to cure concrete. Which of the following are not 'exclusively' representing the former approach? **2 points**

- Spraying of curing compounds
- Placing polyethylene film on concrete surface
- Ponding and fogging
- Wet burlap/cloth/sack

No, the answer is incorrect.
Score: 0

Accepted Answers:

Ponding and fogging

Wet burlap/cloth/sack