

# MUI Corrosion Monitoring System

## Multi-Depth Sensor

### Detecting Corrosion and Chloride Intrusion



Multi-Depth Ladder-Type Sensor is to monitor the chloride or carbonation penetration depth with time by embedded in new concrete structures that provide an early indication of corrosion events that may lead to a degradation of the integrity of the structure before it becomes a major issue.

This is achieved by measuring the corrosion conditions of steel elements at 4 or 6 different depths in concrete cover over the most outer reinforcing steel bar (rebar), and then the corrosion ingress from the concrete surface to the rebar depth can be determined.

Standard Multi-Depth Sensor comprises the following elements:

- Carbon steel working electrodes (or anode) in stainless steel frame
- Silver-silver chloride (Ag/AgCl/KCl) or manganese dioxide (MnO<sub>2</sub>/NaOH) reference electrode
- MMO coated titanium auxiliary electrode (or cathode)
- Thermistor temperature sensor, PT1000 (optional)
- Portable LPR meter



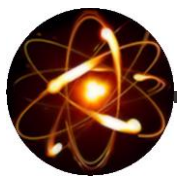
MMO coated titanium auxiliary electrode (or cathode)



Silver-silver chloride Reference Electrode

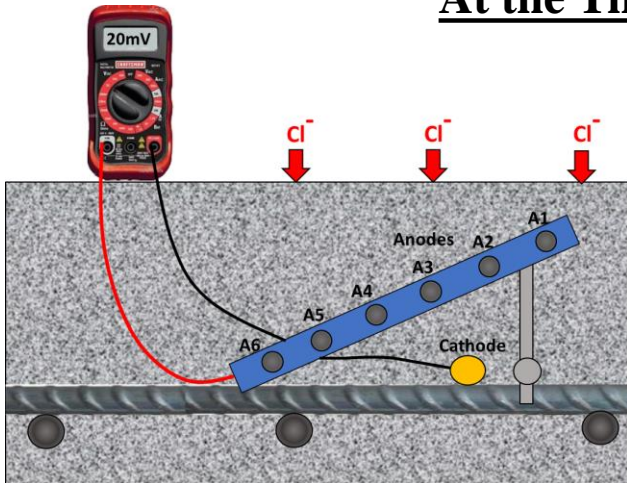


LPR meter



# How to Detect Corrosion and Chloride Intrusion

## At the Time of Installation

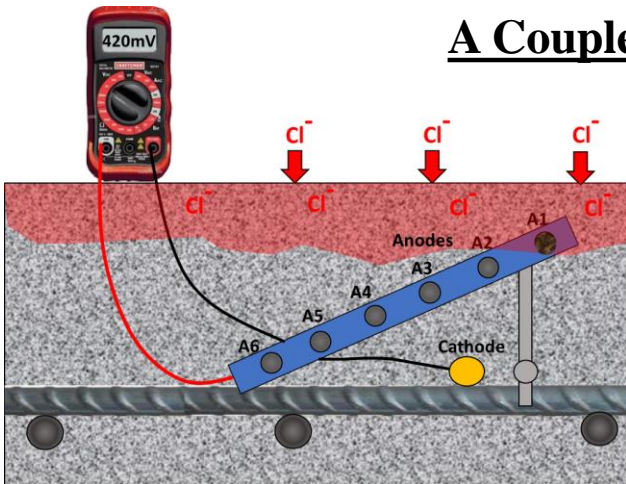


Blue No. : No corrosion      Red No.: Corrosion

MDS Element	A1	A2	A3	A4	A5	A6
Voltage (mV) Anode - Cathode	20	23	42	28	31	22



## A Couple of Years Later

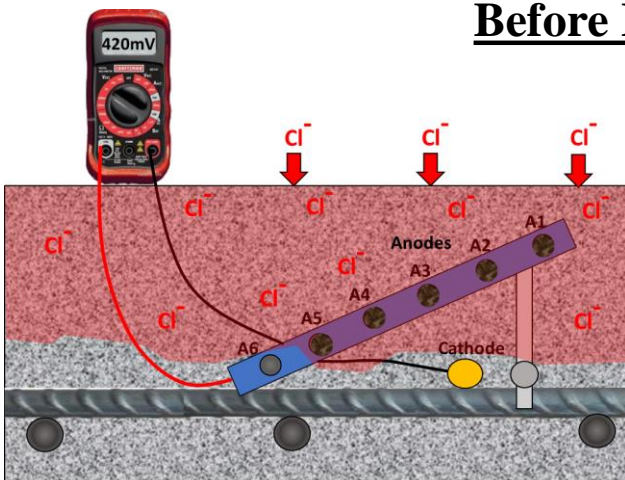


Blue No.: No corrosion      Red No.: Corrosion

MDS Element	A1	A2	A3	A4	A5	A6
Voltage (mV) Anode - Cathode	230	28	47	32	29	42

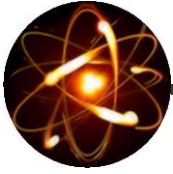


## Before Rebar Corrosion

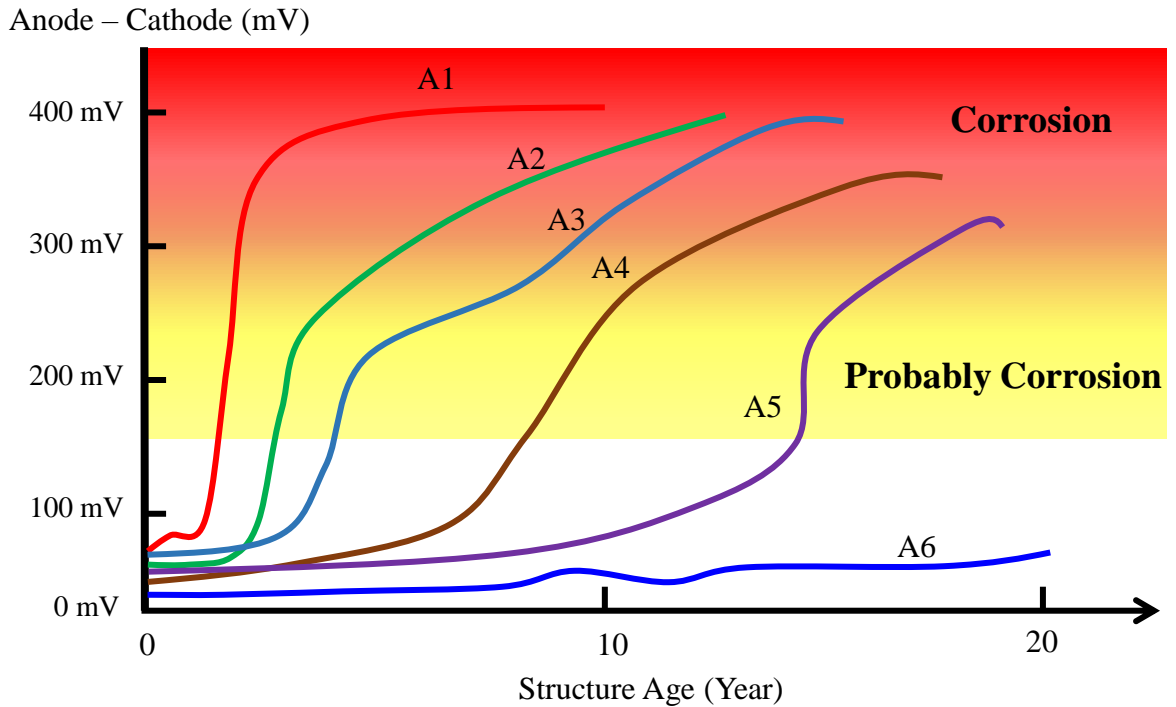


Blue No.: No corrosion      Red No.: Corrosion

MDS Element	A1	A2	A3	A4	A5	A6
Voltage (mV) Anode - Cathode	340	275	359	392	414	29



# Corrosion Progress with Time By Each Anode Element



## Corrosion Progress by Anode Elements



Installation on Wall



Installation on Pile Cap Soffit



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