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**Corrosion of metals and alloys —  
Determination of the corrosion rates  
of embedded steel reinforcement in  
concrete exposed to simulated marine  
environments**

*Corrosion des métaux et alliages — Détermination des vitesses de  
corrosion de l'acier encastrés simulée de l'armature dans le béton  
exposé à l'environnement marin*



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below or ISO's member body in the country of the requester.

CP 401 • Ch. de Blandonnet 8

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## Foreword

expressions related to conformity assessment, as well as information about ISO's adherence

*C*

## Introduction





3.1  
breaking of specimens

## 4 Apparatus

### 4.1 Simulation chamber.

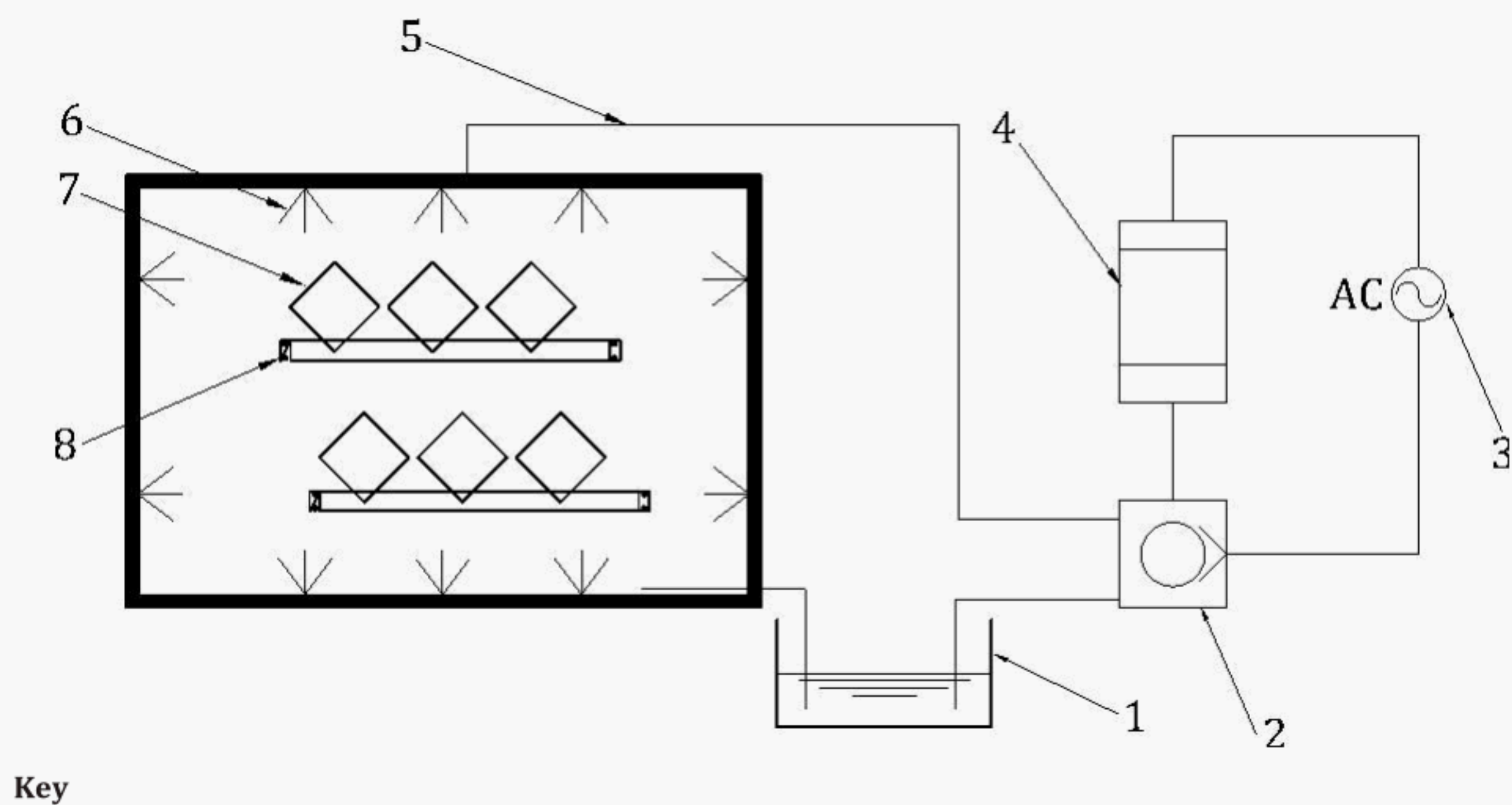
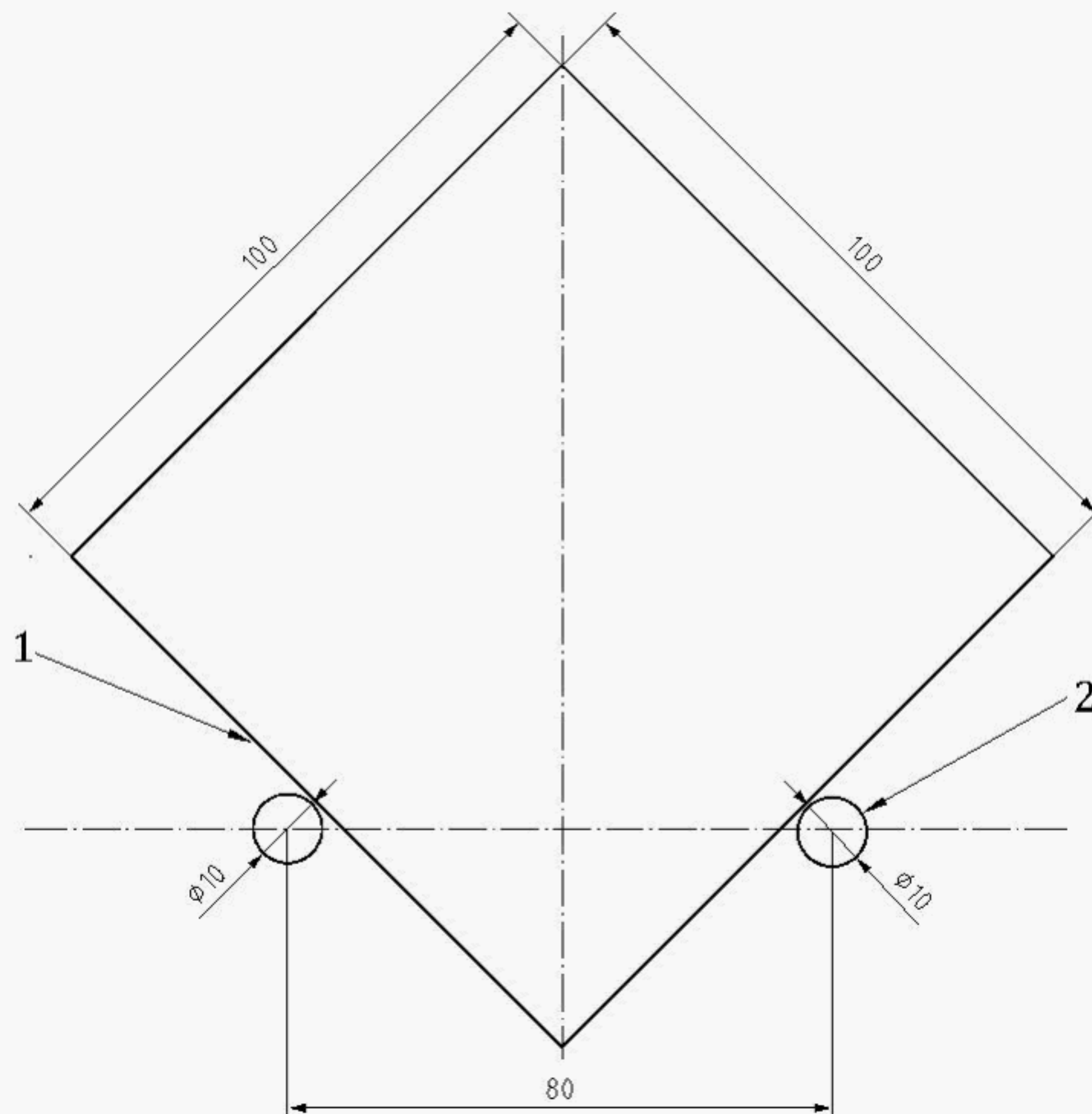


Figure 1 — Typical design of simulation chamber





Key

Figure 2 — Placement of concrete specimens

4.2 Spraying device.

4.3 System for forced drying.

## **5 Test materials**

### **5.1 Reinforcing steel.**

### **5.2 Benchmark bar.**

### **5.3 Test bars.**

### **5.4 Concrete.**

### **5.5 Industrial salt.**

The recommended quality indicators of industrial salt are  $\text{NaCl} \geq 94,5 \%$ ,  $\text{Ca}^{2+} + \text{Mg}^{2+} \leq 0,40 \%$  and  $2^- \leq 0,70 \%$ .

## **6 Preparation of specimens**

### **6.1 Reinforcing steel cleaning**

### **6.2 Reinforcing steel coating ends**

### **6.3 Adding industrial salt**

## 6.4 Making concrete specimens

2# and 3# are placed together in each specimen. Countries can adjust the thickness of the bars' thickness of the bars' protective layer is 15 mm. It takes 24 h for the concrete (5.4) to harden. Then,

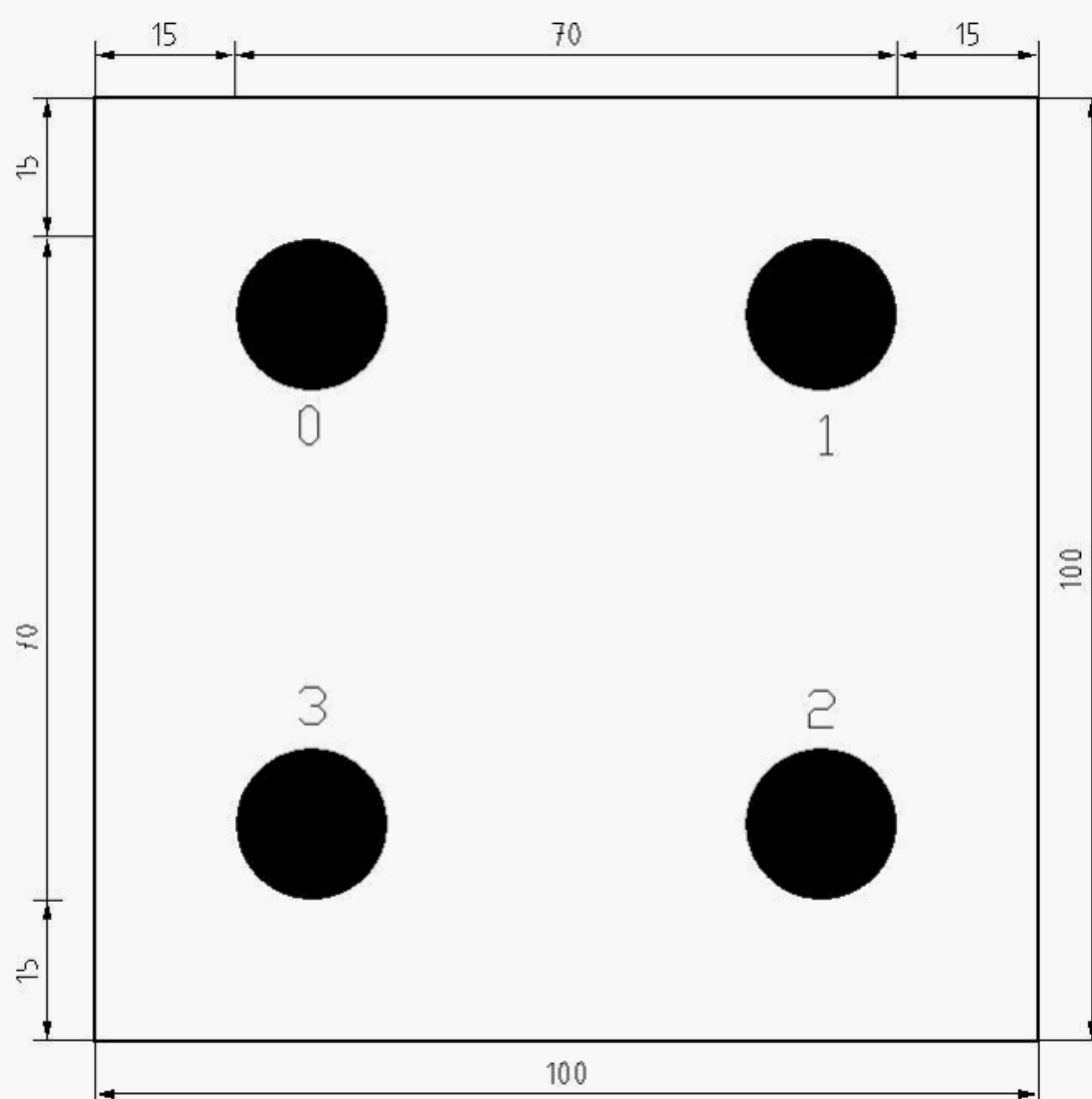


Figure 3 — Cross section of concrete specimen

## 7 Test procedure

### 7.1 Initial performance test

#### 7.1.1 Mechanical properties and chemical compositions of reinforcing bars

**7.1.2 Mass**

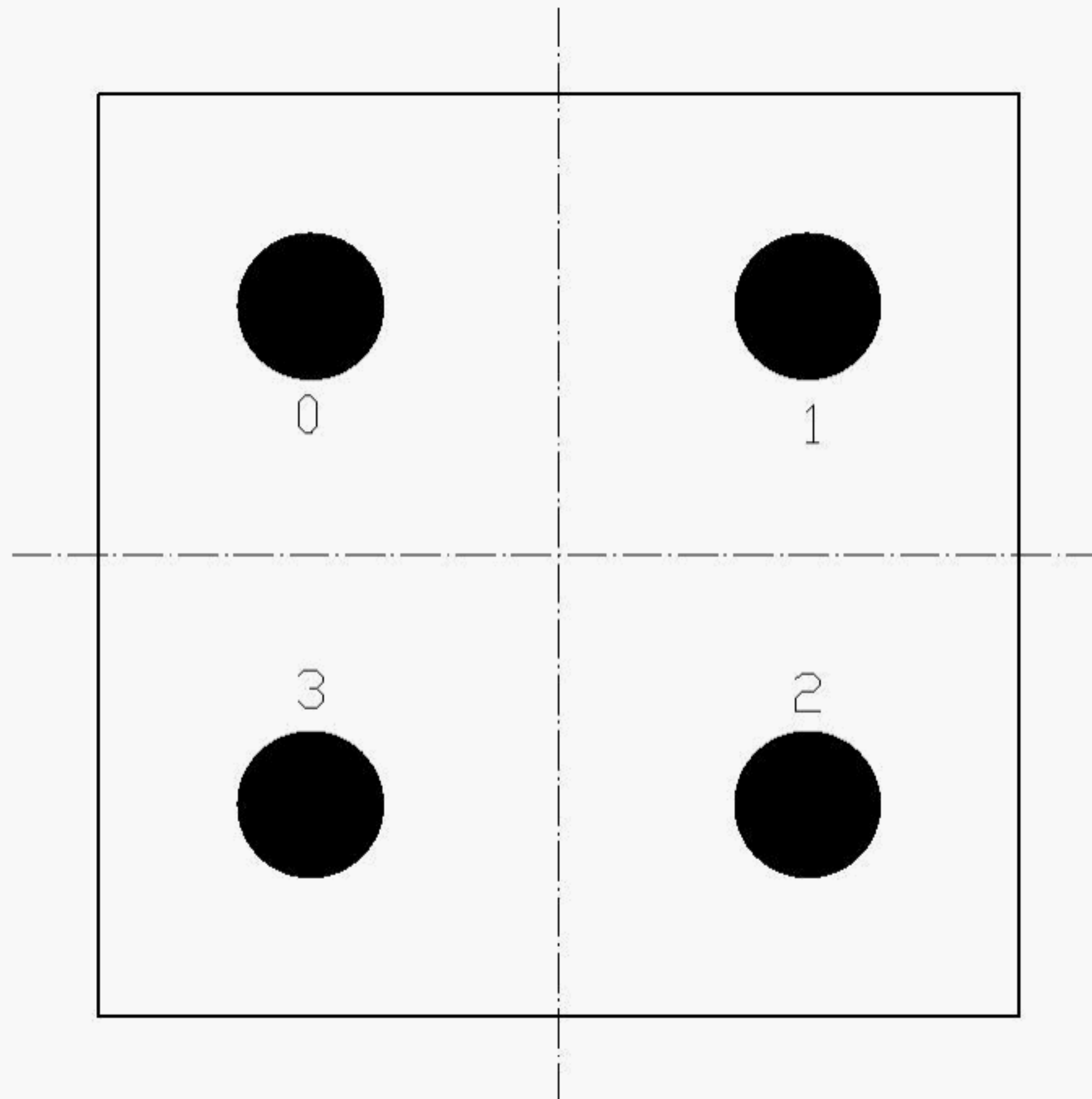
**7.1.3 Dimensions**

**7.1.4 Concrete strength**

**7.2 Test data recording**

**7.2.1 Test time**

**7.2.2 Cracks record**



**Figure 4 — Component cracks corresponding schematic diagram area**

### **7.3 Breaking of specimens**

#### **7.3.1 General**

#### **7.3.2 Mechanical properties**

#### **7.3.3 Mass**

#### **7.3.4 Dimensions**

## 8 Test result

### 8.1 Mass loss rate of test bar

$$\eta_i = \frac{m_{io} - m_i}{m_{io}} \times 100$$

$-m_i$  is the mass loss of each reinforcing bar, in g;

### 8.2 Average mass loss rate of test bar

$$\eta = \overline{\eta_i}$$

### 8.3 Ratio of the mass loss rate of the benchmark bar and the test bar

### 8.4 Average ratio of the mass loss rate of the benchmark bar and the test bar

$$k = \overline{k_i}$$

## 9 Test report

specimens' cracking time, description and photos of cracks;



Annex A

Examples of experimental results

A.1 Chemical composition of benchmark bar

T

C	Si	Mn	P	S	Cu	Cr	Ni	Nb

A.2 Preparation of concrete specimens

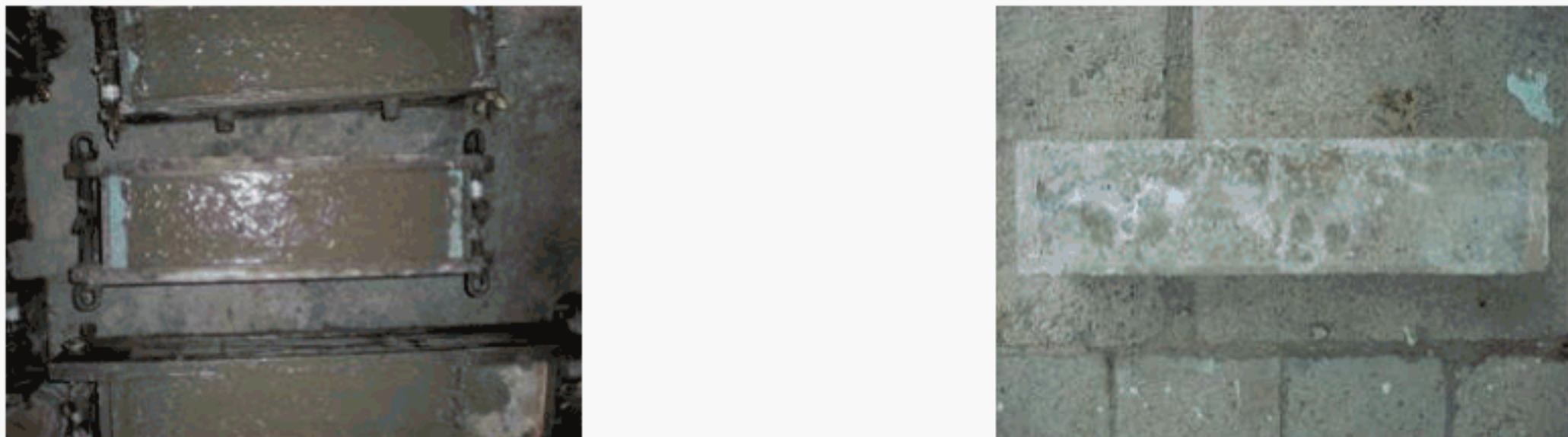


Figure A.1 — Procedure to make concrete specimens

A.3 Breaking of specimens





Figure A.2 — Breaking of specimens

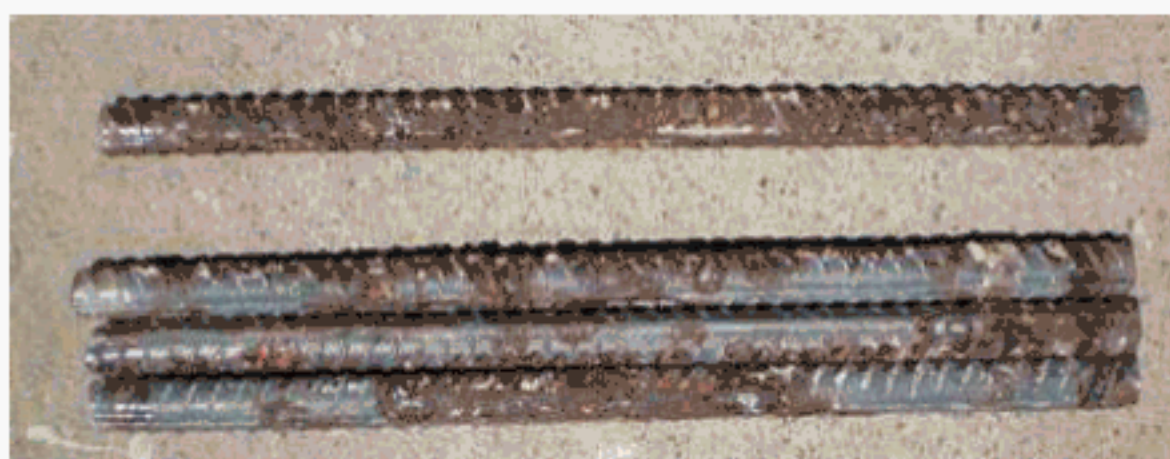


Figure A.3 — Removal of rust

## A.4 Test result

$\eta$

