



**INDASTRIA S.r.l.**

**GUIDES SUPPORT STRUCTURE AND ELEVATOR SHAFT  
CLADDING.**

**MANTEINANCE PLAN FOR STRUCTURAL PARTS EX D.M.  
14/01/2008 "TECHNICAL STANDARDS FOR BUILDINGS"**

## INTRODUCTION

“Maintenance plan of structures parts” it is a supplementary document that provides planning and program to the structural design, taking account of design of the entire executive work, maintenance activity in order to maintain over time functionality, quality, efficiency and economic value. The maintenance plan of the structures coordinated with the general construction plan it is an essential part of the structural design. It is accompanied by the user manual, maintenance manual and maintenance schedule of the structures.

The maintenance plan and its parts consists of the following operational documents:

- The user guide
- The maintenance manual
- The maintenance program

The user manual, the maintenance manual and the maintenance program written at design stage will be submitted by the project manager, at the end of interventions, control and verification of validity, with any updates made necessary by problems encountered during work execution.

Deadlines found in documents of maintenance work and its parts are indicative for similar works and are subject to change regarding special maintenance needs of management office.

The manual refers to the technological systems and especially lightning implant of the project. The manual contains all the informations necessary for the correct use of the property by the user, as well as all the elements necessary to limit as much as possible damage caused by improper use. Those information allow you to perform all measures to prevent damage(they do not require specialized knowledge) and an early recognition of anomalous deterioration phenomenon in order to solicit specialized interventions.

The user guide contains the following information:

- a) The position in the intervention of mentioned parties
- b) The graphic representation
- c) The description
- d) The procedures for proper use

The user manual is therefore composed of documentation not relating to the material supply of the Company Industria Srl.

The maintenance manual refers to the maintenance of technological systems; provides, in relation to the various technological units, characteristics of the materials or components involved, information necessary for proper maintenance and use of service centers or service.

The maintenance manual contains the following information:

- a) The position in the intervention of the parties mentioned
- b) The graphic representation
- c) The description of the resources required for the maintenance work
- d) The minimum level of performance
- e) The anomalies that can be founded
- f) The maintenance carried out directly by the user
- g) The maintenance to be performed by qualified personnel

The service manual is therefore composed of documentation not relating to the supply of the Company Industria Srl.

The maintenance program provides a system of controls and interventions, scheduled in order to ensure efficient management of the asset and its parts over the years.

It is divided into three sub-programs:

- a) The sub-program of performances, that takes into account by class requirement, benefits provided by the good and its parts throughout its life cycle
- b) The sub-program of controls, which defines the checks and controls program to detect the level of performance (qualitative and quantitative) in subsequent moments of the life of the asset, identifying the dynamics of the performance fall having as extremes the test value and the minimum standard of norm
- c) The sub-program of maintenance interventions, which contains in chronological order the different maintenance interventions, in order to provide the information for a correct preservation of the good.

In the chapter below, it is described, even if briefly, the maintenance program considering good technical standards (UNI) and the scheme proposed in Annex II to the European Union document 260/5/93.

The maintenance program is prepared based on state of the art and technical norms, and its designed to ensure the preservation of goods and the correct execution of the functions, while minimizing inconvenience to the user. Also contain an indication of the potential risks that the inspection and maintenance entail , due to the intrinsic characteristics of the works ( geometry of manufactured goods , nature of technical components and technology ,

technological system adopted , etc. ) , and the equipment a cleaning substances to be used for maintenance. Also it proposes , for any maintenance , possible solutions to security problem, indicating the equipment supplied for works and the collective and individual protection devices to be adopted.

For the correct interpretation of maintenance program it is recommended to consider the following:

- the frequency of maintenance should be revised over time, collecting the correct information of maintenance interventions; it will be the owner and / or user to evaluate the need to bring forward or postpone the dates indicated, in relation to particular environmental conditions;

- the owner and / or the user of the works must bear, in the specific blank space, names of the persons who will carry out maintenance;

- in the "risks" section, part of section dealing with "safety elements in maintenance", are shown the possible risks related to the intrinsic characteristics of handwork; The list contained can not be considered exhaustive but only indicative;

- the "equipment in operation" section, are listed the equipment and safety devices already available and present in the work;

- in the "safety equipment" section there is a list, although this is not exhaustive, of personal protective equipment (PPE) and / or collective (DPC) that will be used by professionals of maintenance;

- in the "observations" section are bringing the recommendations of a general and / or particular.

As part below shows the general data type of a work, it being understood that the phase manutentoria and subsequent related costs, should be checked and / or modified in subsequent phases of detail.

The picture shown is typological and must be considered and evaluated for each work in the project: metal structure constituting the elevator shaft, painting of the metal structure, glass curtain walls, curtain walls in sheet metal.

<b>Processing</b>	<b>Cadence</b>
<b><i>ELEVATOR SHAFT METAL STRUCTURE</i></b>	
Structure – verification of integrity and damage	Annual
Tightening bolts – check	Annual
Tightening bolts - total revision	Biennial
Welds - Visual verification	Annual
Joints – Integrity check	Biennial
Bolts replacement	If Necessary
Joints replacement	If Necessary
<b><i>METAL STRUCTURE PAINTING</i></b>	
Cleaning and check, eventual treatments for peeling or rusty spots repainting	Annual If necessary If necessary
<b><i>GLASS CLADDING</i></b>	
Cleaning	Six-month
Stability check	Annual
Repairing	When broken
Replacement	If necessary
<b><i>STEEL PLATE CLADDING</i></b>	
Cleaning	Six-month
Stability check	Annual
Repairing	When broken
Replacement	If necessary

Below the descriptive elements related to safety in maintenance works and the summary of the maintenance ordered by cadence.

## ***SAFETY RELATED ELEMENT FOR BUILDING MAINTENANCE***

### **SUBSYSTEM / component**

- ***METAL STRUCTURE OF ELEVATOR SHAFT*** / - Steel structure

### **DESCRIPTION OF MAINTENANCE INTERVENTION**

Integrity and damage check

### **RISKS**

Falls from a height

Cuts and abrasions

### **AUXILIARY DEVICES**

DPI

Protection gloves

Safety Shoes

Helmet for head protection

Proper clothing

DPC

Proper warning signs relating to "plant down for maintenance".

Using lifting platform or scaffolding or metal scaffolding as necessary.

### **PROCEDURE / COMMENTS**

The punctual check of the structure must be done adopting the same procedures provided for the maintenance of the elevator, thus operating in compliance with the regulations on safety given in the list is not exhaustive following:

D.M. n. 81/2008

UNI EN 81-1

UNI EN 81-2

UNI EN 81-80

**Subsystem / component**

- METAL STRUCTURE ELEVATOR SHAFT / - joints of uprights and crossbars

**DESCRIPTION OF SERVICE / INTERVENTION**

integrity verification – replacement

**RISKS**

Fall from high

Cuts and abrasions

**AUXILIARY DEVICES**

DPI

Protection gloves

Safety Shoes

Helmet head protection

Proper clothing suitable

DPC

Suitable warning signs relating to “plant down for maintenance”

Use of lifting platform or scaffolding or metal scaffolding as necessary.

**PROCEDURE / COMMENTS**

The punctual check of uprights and crossbars joints and the eventual replacement of elements constituting the junction, should be adopting the same procedures provided for the maintenance of the elevator, thus operating in compliance with the regulations on safety given in ' not limited to the following:

D.M. n. 81/2008

UNI EN 81-1

UNI EN 81-2

UNI EN 81-80

**Subsystem / component**

- METAL STRUCTURE ELEVATOR SHAFT / - bolts

**DESCRIPTION OF SERVICE / INTERVENTION**

tightening control - total revision of tightness - Replacement

**RISKS**

Fall from high

Cuts and abrasions

**AUXILIARY DEVICES**

DPI

Protection gloves

Safety Shoes

Helmet head protection

Proper clothing suitable

DPC

Suitable warning signs relating to “plant down for maintenance”

Use of lifting platform or scaffolding or metal scaffolding as necessary.

**PROCEDURE / COMMENTS**

The control of bolts tightening, the total revision of the tightening and replacement must be adopting the same procedures provided for the maintenance of the elevator, thus operating in compliance with the regulations on safety given in the list is not exhaustive following :

D.M. n. 81/2008

UNI EN 81-1

UNI EN 81-2

UNI EN 81-80



**Subsystem / component**

- METAL STRUCTURE ELEVATOR SHAFT / - welding

**DESCRIPTION OF SERVICE / INTERVENTION**

visual inspection

**RISKS**

Fall from high

Cuts and abrasions

**AUXILIARY DEVICES**

DPI

Protection gloves

Safety Shoes

Helmet head protection

Proper clothing suitable

DPC

Suitable warning signs relating to “plant down for maintenance”

Use of lifting platform or scaffolding or metal scaffolding as necessary.

**PROCEDURE / COMMENTS**

Visual inspection of the welds must be adopting the same procedures provided for the maintenance of the elevator, thus operating in compliance with the regulations on safety given in the list is not exhaustive following:

D.M. n. 81/2008

UNI EN 81-1

UNI EN 81-2

UNI EN 81-80

**Subsystem / component**

- PAINTING OF METAL STRUCTURE / - paint

**DESCRIPTION OF SERVICE / INTERVENTION**

verification - cleaning - small issues treatment – repainting

**RISKS**

Fall from high

Cuts and abrasions

**AUXILIARY DEVICES**

DPI

Protection gloves

Safety Shoes

Helmet head protection

Proper clothing suitable

DPC

Suitable warning signs relating to “plant down for maintenance”

Use of lifting platform or scaffolding or metal scaffolding as necessary.

**PROCEDURE / COMMENTS**

The processes related to the painting of the metal structure (cleaning, treating small problems, repainting) must be adopting the same procedures provided for the maintenance of the elevator, thus operating in compliance with the regulations on safety given in the list is not exhaustive following :

D.M. n. 81/2008

UNI EN 81-1

UNI EN 81-2

UNI EN 81-80

**Subsystem / component**

- Glass Cladding / - glass

**DESCRIPTION OF SERVICE / INTERVENTION**

cleaning - stability checking - repair – replacement

**RISKS**

Fall from high

Cuts and abrasions

**AUXILIARY DEVICES**

DPI

Protection gloves

Safety Shoes

Helmet head protection

Proper clothing suitable

DPC

Suitable warning signs relating to “plant down for maintenance”

Use of lifting platform or scaffolding or metal scaffolding as necessary.

**PROCEDURE / COMMENTS**

The processes related to the structure’s glass cladding (cleaning, checking stability, repair, replacement) should be adopting the same procedures provided for the maintenance of the elevator, thus operating in compliance with the regulations on safety given in the list does not exhaustive following:

D.M. n. 81/2008

UNI EN 81-1

UNI EN 81-2

UNI EN 81-80

**Subsystem / component**

- SHEET METAL CLADDING / - sheet metal

**DESCRIPTION OF SERVICE / INTERVENTION**

cleaning - stability checking - repair – replacement

**RISKS**

Fall from high

Cuts and abrasions

**AUXILIARY DEVICES**

DPI

Protection gloves

Safety Shoes

Helmet head protection

Proper clothing suitable

DPC

Suitable warning signs relating to “plant down for maintenance”

Use of lifting platform or scaffolding or metal scaffolding as necessary.

**PROCEDURE / COMMENTS**

The processes related to the structure’s sheet metal cladding (cleaning, checking stability, repair, replacement) should be adopting the same procedures provided for the maintenance of the elevator, thus operating in compliance with the regulations on safety given in the list not limited to the following:

D.M. n. 81/2008

UNI EN 81-1

UNI EN 81-2

UNI EN 81-80

**SUMMARY OF MAINTENANCE FOR CADENCE Cadence: when broken**

<b>Sub – system/ component</b>	<b>MAINTENANCE DESCRIPTION</b>
Glass cladding	Repair
Sheet metal cladding	Repair

**SUMMARY OF MAINTENANCE FOR CADENCE: Cadence: Six-month**

<b>Sub - system/ components</b>	<b>MAINTENANCE DESCRIPTION</b>
Glass cladding	Cleaning
Sheet metal cladding	Cleaning

**SUMMARY OF MAINTENANCE FOR CADENCE: Cadence: Annual**

<b>Sub - system/ components</b>	<b>MAINTENANCE DESCRIPTION</b>
Struttura metallica vano ascensore	Integrity and damages check
Serraggio bulloni	Check
Saldature	Visual check
Verniciatura struttura metallica	Check and cleaning
Glass cladding	Stability check
Sheet metal cladding	Stability check

**SUMMARY OF MAINTENANCE FOR CADENCE: Cadence: Biennial**

<b>Sub - system/ components</b>	<b>MAINTENANCE DESCRIPTION</b>
Uprights and crossbars joints	Integrity check
Bolts tightening	Total check