

# Building Maintenance for Institutions Based on Annual Budget-Portuguese Context

Nuno Dinis Corti ços

**Abstract**—Institutions with monthly management of budgets, derived from their mission and/or third-party financing - in this case, public entities - do not have, nowadays, ongoing maintenance mechanisms: desirable to prevent abnormalities in the early stages.

In general, we can state that, out of three hundred employees<sup>1</sup>, only one is directly responsible for maintenance, generally as a High Level Technician. Its work, in the construction bureau, presupposes the identification of intervention needs for assessment of their importance in comparison with other needs.

Our proposal suggests taking into account the undifferentiated and specific nature of the work to be developed in the services acquisition - human resources, tools, equipment and consumables - to one or more companies, on a retainer basis, in a 'time bank' system, which ensures the integration of maintenance on the set of functions.

Under the model proposed, the construction bureau will, at first, be responsible for identifying the intervention needs for later management/administration of materials, supplies and products, through the creation of an overall financial provision.

This paper is based on a case study being applied to the facilities of the Faculty of Architecture of the University of Lisbon: currently ongoing - year zero - until December 31st, 2016.

**Index Terms**—Construction, maintenance, institutions, annual budget, services acquisitions.

## I. INTRODUCTION

Over the last two centuries, Portugal went through periods with very unique realities, both social and political, which can be divided as follow.

### A. From Second World War (WW2) to April 25th, 1974

The neutral position assumed by Portugal, during WW2, allowed it to be spared from death and destruction which took over most European countries. Even so the country received Marshall Plan incentives applied, discreetly, in the modernization of industry, by imposition of the political regime. It was in this context of renewal that the industry knowledge, technologically evolved, was transmitted and developed in a more systematic and organized manner, which had led to increased imports of equipment, mostly U.S. but also in other countries with the same capacity. Portugal applied these resources in its industrial sector and encouraged

the manufacture of products for the internal market: Portugal (Mainland) and Islands (present territory - European) and the vast transcontinental, colonial empire, to date. This measure also contributes to increased employment and poverty reduction.

In social terms, the vast majority of the population came from rural areas, with little or no schooling and received low salaries. The birth rate was balanced. The Welfare State<sup>2</sup> was not implemented and was not even expected: the few social services existed only in large cities. The need for new public buildings was limited and not always a priority or usual<sup>3</sup>.

The construction market was not very diversified and circumscribed, in terms of production, depending on the installation of factories controlled by the Government<sup>4</sup>. This was, from the outset, an advantage for maintenance:

- 1) Production was tested on a large scale;
- 2) Industrial methods, developed over the years, underwent constant adjustments in order to maintain efficiency and durability - only possible due to an absence of competition;
- 3) Construction technology was assimilated and transversal to the Sector;
- 4) The production/manufacturing had simple principles, which guaranteed the possibility of component repair or replacement;
- 5) The availability of materials and products, in the majority unique, was guaranteed and available in Portuguese territory;
- 6) Components and accessories, provided separately;
- 7) Interventions were simple operations with basic tools;
- 8) Open articulation designed for interconnection with other systems.
- 9) Buildings had the following materials' characteristics:
- 10) Heavy, with a low degradation index (cleaning and superficial protection), immobile parts, e.g., stones, concrete, steel, ceramics and mortar, among others;
- 11) Or light, with unavoidable maintenance with seasonal interventions, mobile elements (openings), e.g., low-density woods, such as pines and ash trees, or of medium density, such as mahogany and oak, in public buildings or representatives thereof.

In terms of work organization, the maintenance team was

<sup>2</sup> The birth rate was balanced to guarantee inter-generational support.

<sup>3</sup> It was during the political regime of "Estado Novo" (New State) that most court houses were built, still standing to this day: it's important to note that part of the manpower consisted of prisoners.

<sup>4</sup> The Portuguese 'Industrial Constraint Law', ratified in 1952, aimed at regulating investment and protecting the Portuguese industry, with the objective of creating jobs and promoting the Portuguese market. It also affected the prices of raw materials, supplies and products.

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<sup>1</sup> This information is based on data collected within the 23 institutions of Universidade de Lisboa.

present - one, two or more elements with labor contract<sup>5</sup> -, and focused on abnormalities/failures always intending to keep its mission. Initially, these repairs were carried out by production staff but, later, these works were taken on by those who were not fit for other services. Facilities which required surveillance used security staff - known as doorman, watchman or guard - to do the necessary repairs. They were always present, working in shifts or full time; and were also carriers of knowledge and experience essential, to the space domain and operation. Simultaneously, when appropriate, those in charge took responsibility over the green areas, if there were any, the technical cleaning, as well as storage and load handling.

From the point of view of management, resources were used, if necessary, to respond to breakdowns from use or failure. The type of maintenance practiced - reactive - was carried out with focus on wearing down of materials and its replacement - degradation of mobile parts (e.g., hardware, latches and simple handling mechanisms) and low-tech electromechanical equipment.

During this period, the most demanding equipment was primarily based on Portuguese technology. Their usage in necessary interventions was carried out by technicians - limited to a small set of operations -, third-parties to the institutions and associated to the manufacturers. Those were maintained for the easiness and promptness to ensure support services, in addition to the recognized robustness displayed by the machines, when faced with the demands of the market.

#### *B. From April 25th, 1974, until Portugal Joined the European Economic Community (EEC), 1986*

The coup of April 25 ended the longest European dictatorship - begins a period of clear break with the past, with new political upheavals in the context of the revolutionary process, which only ended, in 1976, with the adoption of the The Portuguese Constitution. This transition allows access to financing from the International Monetary Fund (IMF) to support the people's aspirations, inspired now by the 'revolutionary thoughts', about the institution of a welfare state and to exclude the possibility of an entry of the Soviet Union (communist) in Portuguese territory. The assumed commitments are rapidly transformed into duties to the creditors, the economy failed to respond. And it becomes inevitable appearance of a technical support committee of the IMF in 1977. This episode of external assistance is repeated in 1981. The country's finances gain stability by joining the EEC in 1986.

The newly introduced participatory democracy and the new ideals exalted by the political and social actors, provoke the standstill of company' production lines: due to successive strikes and plenaries performed (often at company premises)<sup>6</sup>. The result was the end of the protection of Portuguese companies and the openness of the economy to foreign markets (increase in competition). Furthermore, in a

<sup>5</sup> At that time, the labour market was not protected: it foresaw the possibility of dismissal, without justification or compensation, for borderline cases.

<sup>6</sup> Despite these movements, salaries did not suffer significant increases. The favoured topics of discussion were mainly those related to social benefits and reduction in working hours. Others came about due to the imposition of new labour laws.

restrained manner, the import of supplies, materials and, for the first time, standardised construction systems. As a result, various traditional factories declared bankruptcy [1].

Despite the openness, however small, of the country to foreign investment, this proved to be unappealing. Some units were capitalized, others had access to credit - roughly, entities with ties to banks and/or in partnership with foreign investors, with industrial and/or business knowledge - took the opportunity to regenerate themselves through: technological upgrading, modernizing production and investment in machining/automation. This allowed them to compete with foreign counterparts, which gained increasing presence in the Portuguese market.

Despite the healthy technical renewal that distinguishes this phase, manpower - mostly migrants from rural areas - was characterised by its low level of education, empirical training, low cost and low appetite for technical innovations.

In the eighties, the construction was reorganized - 'imported' knowledge - with repercussions in the future and in a natural sequence. At first: at the project level; the organization of work; and, construction methods. And finally, in the care for buildings.

The Sector gained momentum with several rehousing operations established under the new Portuguese Constitution<sup>7</sup>: new needs were established, the public demand grew and the industry responded. This time, with less need for manpower since processes favouring mechanisation and application of new technologies were in place [2].

The construction industry suffered with the new social and political paradigms. The heritage, both old and new - referred to as "Português Suave" (Soft Portuguese Style)<sup>8</sup>, commended by the Estado Novo for its representation of 'Portugality' -, was abandoned. The Modern Movement itself was conditioned by the Political Regime, and this led to its late and exacerbated application<sup>9</sup>, post 1974. At the time, the path is imposed by freedom of thought.

During this period, many buildings are built to house the public institutions that are part of the new political configuration, there is a clear tendency towards the abandonment of previous structures, devaluing the maintenance/rehabilitation of buildings. The new is revered, the old is forgotten.

In 1980, the Construction sector went into decline. The Sector was forced to put pressure on leaders - especially those in government positions - for the reactivation of the industry which, to date, was one of the main driving forces of the economy. In this situation, decision makers and other intervening parties continued to deviate their focus away from maintenance.

<sup>7</sup> Article 65 - Housing and urban planning - 1. Everyone has the right, for themselves and family, to a house of adequate size, with hygienic conditions and comfort that preserves personal and family privacy.

<sup>8</sup> Architectural model used in both public and private buildings, in Portugal, essentially during the 1940s and the early 1950s. This architectural style is also known as **Nationalistic style**, **Traditionalistic style** and **New State style**, this last denomination is not very correct, since during the **Portuguese New State Regimen** diverse architectural styles have been applied in public buildings.

<sup>9</sup> The technical and artistic currents, shaped by Architecture and Engineering newspapers, were the order of the day.

*C. From Portugal Joining the EEC, in 1986, to the Financial Crisis of 2007-2008*

Portugal's entry into the EEC gave rise to a period of business opportunities and social and political openness unprecedented, in the recent history of the country. This phase was promising for the construction sector, which restructured its organization: there was need for more technicians; adaptation to new construction techniques, suitable to ECC standards; and, shorter deadlines (of work) less dilated. The appearance of new materials and construction solutions marked this vivid construction phase (in the transition 1980/90).

The EEC has urged the refurbishment and modernization of infrastructures and public institutions, overcoming several decades of delay in relation to the rest of Europe. To achieve these goals, funding - almost in full - by the community partners was crucial.

The economic impulse that remained throughout 1987 and 1988 allowed for the Sector to develop a base for consistent growth. There was greater investment in public and private buildings, which was, in part, due to the difficulties encountered to finance the late. New construction work was always favoured in detriment of heritage and maintenance.

The changes imposed on the restructuring of the labour market, especially in regards to construction, drove experienced and capable workers towards the establishment of small businesses or as independent workers.

There was a significant increase of the so-called subcontractors - liberal professionals and small companies, specialists in certain tasks/subcontracts. Those were, for the most part, taken on by specialists that held a leadership or production coordination position. Following a natural evolution, they occupied the position of team leaders acting within their field of expertise and experience. Due to the increasing competition, subcontractors started to seek volatile manpower, sometimes illegal, with the intention of cutting fixed costs to a minimum, namely salaries. The goal was to ensure that they remain relevant in the market not because of the quality of their work, but due to a speedy execution and ability to respond to more demanding solutions [3].

The small companies began to replace the maintenance services, human resources allocated to the frame are gradually dispensed as technology is introduced. Maintenance was only undertaken when unavoidable and, thus, was addressed with measures whereby the proportion between solution/problem was exact, through the occasional use of local service providers.

The paradigms that characterised the industry started to change. There is a strong push towards the internationalisation of these small companies - based on a manpower experienced with these new systems, going beyond the domain of traditional techniques -, with significant gains. Despite the agility of the constructive processes, none of these surplus resources were used for improvements, as a tool or for exponential quality increases [4].

The Kyoto Protocol, from 1997, brings new challenges to the industry: incorporation of new technologies, environmental concerns, energy savings, new materials and innovative ways of construction. With time, these ideas will

lead to a resurfacing of the gap between workers and technologies: this time, concerning issues of sustainability.

The possibility of indebtedness and the ability to obtain funds, alongside the development of the economy, produced immediate effects on the demand for civil construction - new construction<sup>10</sup> -, in both public and private sectors. This happened mainly due to the growth of other Economic sectors or new public investment policies: as for higher education.

In the mid-nineties, companies began to acquire skills to compete on equal terms with their counterparts, e.g., carrying out works in other European country (in particular, in newly unified Germany) and, also, in Portuguese-speaking African countries, as a result of social stability. This encouraged a greater organisation of the Sector: innovative methods, training and preparation of human resources and the introduction of safety mechanisms.

Employment policies, within EEC, favoured the emigration of countless professionals, qualified and specialised in a number of areas. During this period, there was an increasing need for specialised manpower (carpenters, masons, tilers, plasterers and others).

The companies of the Sector began to recruit manpower, even without training or expertise, in particular in the informal market, a growing phenomenon in Portugal. This industry absorbed more immigrant labour than any other, fuelled by the demand. Workers came from Eastern European countries, Brazil and Portuguese-speaking African countries. Their lack of experience with Portuguese construction, both new and old, gave way to intervention errors with the greatest impact being on maintenance [5].

Companies begin to dominate the contacts in the informal market, fed by manpower - national immigrant - with lower hiring costs, compared to the formal market. We should emphasize the precarious conditions given to these immigrant manpower - most often only on temporary visas, if not illegal - without access to social protection and occupational safety and hygiene.

Despite the growth in the market and availability in supply of manpower, the industry experienced a clear decrease in the use of manual labour toward automation and industrialisation of techniques and products to which the Sector was exposed by the scientific, economic and political situation. Between 1990 and 1998, there was a reduction, on average, from nine to seven workers in the companies.

The situation was favourable for companies to equip themselves - tools, techniques, materials, technology, training and means of quality control - helping to create a niche of excellence, with the aim and the ability to set themselves apart from others (consumer criticisms would begin to emerge a few years later).

*D. The Financial Crisis (International) of 2007-08 until 2014*

At the time, significant changes are implemented in the

<sup>10</sup> During the period in question, the Sector displayed a strong dynamism triggered by the execution of large projects, namely the Expo 98, the Vasco da Gama Bridge and set of transport infrastructures (e.g. the Porto Metropolitan network, the expansion of the Lisbon Metropolitan network, new highways), made possible due to the available community funds, the acceleration of economic activity and the decrease in interest rates, all of which sparked off strong growth in the construction for housing.

economy and in the workers' way of thinking.

The real estate market was considered one of the propellants of the collapse of the global economy - until then leveraged in the consumer credit system, characterized by the carelessness and the near absence of control mechanisms.

Construction that was living its apogee was, suddenly, surprised by the withdrawal of funding schemes - an unparalleled collapse in the history of Portuguese construction. Many projects were left abandoned, like 'sculptures', an ode to the decline in the Sector.

A profound restructuring is abruptly introduced in the Sector: the internationalisation of the companies. The large companies, with staff members comprising management, preparation and supervision technicians, exported their services to developing countries; the medium-sized companies "emigrated" part of their production capacity, despite retaining their headquarters in Portugal; and, the small-sized companies either struggled to stay in business, chose to completely relocate or declare insolvency. There is a common denominator in all the target economies: they are based on the oil industry, until then, immune to crisis.

The European sovereign debt crisis, in 2012, boosted the effects of the global financial crisis, 2007-08.

The investment shortage reflected in the job offer available to young technicians: Architects and Engineers, more capable than ever but without a curriculum that would open the "golden" emigration door - gradually begin to discover other related areas and construction appears as a natural option.

The Sector's Small and Medium-Sized Enterprises (SMEs) have never had technicians capable of involving themselves in the area of maintenance, because the focus has always been on new construction. In this new scenario, the technical manpower was remunerated at the same level of any undifferentiated worker. Gradually, companies, armed with specialised technicians at low cost, began to focus on the emerging trend, rehabilitation and building maintenance. De-capitalisation and lack of credit had changed the landscape.

#### *E. From 2014 to This Day*

The decrease in interest rates allows, at last, regular access to money markets. The Sector regains some normalcy.

The recovery, although slow, arises again through credit lines: this time with all parsimony and conservative character. The funds are primarily channelled to maintenance and more punctually to rehabilitation: lower cost and more ensured value operations.

For the first time, and in light of this scenario<sup>11</sup>, it was well-known and evident to be more advantageous to recover/maintain rather than to demolish in order to build from scratch.

The current situation enables a conscious bet in rehabilitation/maintenance, traditionally expressionless in European average, which gained unparalleled attention in recent history: in line with other European countries.

<sup>11</sup> The reduction of construction prices; openness to low-cost aviation operators and the consequent focus on tourism - the last two are responsible for the proliferation of tourists eager for contact with the heritage.

## II. THE PROBLEM

With the country openness to the world, came a wave, initially, of strikes, followed by redundancies, and finally emigration<sup>12,13</sup>. This resulted in the lost of the most capable and experienced workers - mainly due to galloping inflation and wage stagnation - despite their knowledge of traditional construction techniques with a strong artisanal component: a set of seemingly unattractive skills to the new order (new construction). This sequence of events had obvious impacts that persist to this day, since the focus is on recovery and rehabilitation, resources with knowledge acquired by the handed experience is needed. Due to manpower exodus we have, on one hand, the lack of knowledge of traditional construction and, on the other, imposition of new techniques.[6] Result: quality below expected and many constructive anomalies.

Prior to the proliferation of construction companies throughout the Portuguese territory, until 1986, building maintenance, in general, was provided by sectoral units, integrated in institutions. A workshop space, more or less equipped - mostly with rudimentary tools, based on simple, non-electrical mechanisms - and few human resources - qualified for a broad set of construction jobs - was all it took to ensure care to a medium-sized building (e.g. business premises/warehouse, a museum, a theatre, a university, among others). Any type of businesses/low technology mission - until the above mentioned date, the technology was inaccessible to the economic power of most organisations. There was nothing strange about the lack of works contracts/large-scale works to ensure quality throughout the useful life, nor did this even occur to those in charge. Maintenance was a requirement from the start, not a consequence forced over the passage of time.

Professions related to construction have always had a weak social recognition due to the work environment: air pollution; noise; dirt, in general; and, dangerousness and hardness of the work. It is important to understand that this Sector is the one showing the most work accidents, registering a level above the secondary sector average. Adding to these reasons are also the low salaries, a situation that promotes the distancing of the Portuguese youth. The shortage of manpower has made the sector receptive, on a large-scale, to immigration, often seasonal.

In the Portuguese landscape, the Sector's productivity remains below average, the Associação de Empresas de Construção e Obras Públicas e Serviços (association of construction companies) points to a difference of thirty percent: meaningful data given the much desired national economic growth.[7]

In the sector, training is almost non-existent in several specialties. It is transversal the bias that the investment in training does not pay, since the manpower is too fickle. For the workers, it is difficult to envision the profitability of training, since it does not offer immediate gains in salaries,

<sup>12</sup> Figures point to more than one million workers, commencing their working lives, initially in the agricultural sector and, in a second phase, in the construction sector.

<sup>13</sup> The first (free) trade unions appear, more concerned with working conditions - largely salaries, social benefits and reduction in working hours - than with the effectiveness of the developed work.

the volatility and the number of technologies do not guarantee a return on investment, in time and money. This situation clearly affects manpower productivity - quantity and quality -, however, the informality of the sector makes it impossible to be analyzed and systematized in specific documentation. [8]

To the lack of qualification of workers, we add the absence of suitability for a current performance; the scarcity of technology, based on demands; lethargy in innovating working methods; impractical and ineffective projects - poor use of tested products in support of experimentalism and use of prototype solutions; failures in conveying information; the absence of preparation of the site; and, insufficient standardization. [9]

The selection of imported materials and products - the rule - is characterized by: long delivery deadlines; lack of skill in preparation and application; and, the use of artificially compatible solutions. These increase, undesirably, maintenance / rehabilitation needs.

The projects and their specialities were, in principle, conservationist in their constructive approach, and protected by an "across the board" knowledge structure, parametrised by experience. At that time, projects were taken as indicative - they were not controlled in detail; when the works began, those were prepared for construction by 'construction' - work preparers, a position that does not exist anymore - under stringent control by the designers, maintaining their "idea" (decision) to the limit. The discussion of principles, variants and paths was extended to all participants, in search of the overall quality of the building - an equity value for the life of several generations.

The development of the economy and the importing of technology (knowledge, techniques and equipment) lead to a change in the approach on permanent maintenance. It moved on to another dimension, the need for investment resources, moving away from traditional construction techniques, the demand for technical training and specialisation, the imperative planning and the increasing rigour quickly led to a considerable growth of the departments in charge of the facilities, in such a way that they stopped being cost effective. They lost competitiveness to microenterprises - mainly family owned and without support structures - specialised and equipped with specific tools and equipment for a "closed" system, dominated by imported solutions.

From 2007 until today the situation has gained complexity - in Portugal and in the other developed economies - and it was dragged into the centre of the crisis of the sovereign debts. This situation resulted in a profound change in small-sized companies: lack of services, general bankruptcies and emigration of resources. The Sector's attention was focused on the rehabilitation, of undeniable historical interest. This was justified by the lack of credit, the abundance of inexperienced technical resources, low salaries, the rediscovery of common domain materials and solutions, around the safety of investment and assurances of some profit, as little as it was.

Introduction of novelties - supplies, materials, products and construction processes - is misunderstood by sector operators: technicians are slow to adapt and the same applies to production workers, still rooted in pure traditional methods.

In summary maintenance was practiced in an organized and

systematic way, until 1974, after this period, it was ignored at the expense of new construction. The current shortage of economic resources gave it a new meaning: the investment to maintain, rehabilitate and recover proved to be financially advantageous.

### III. APPLICATION FIELD

Buildings<sup>14</sup>, even those built about twenty years ago, show a state of degradation that, in no way, honours the institutions they house. In certain cases, endangering the proper conduct of the mission or the safety of the heritage and users.

In the case of the buildings, managed by public institutions with annual financing, in monthly endowments - adjusted to the needs of the mission, under the crisis that we are going through -, and without access to credit, there are difficulties in maintaining the minimum conditions of the facilities: a situation so prevalent that it has turned into an undesirable landscape.

Recent buildings shouldn't show signs of deterioration. Since maintenance costs are lower in these first few years, when duly addressed, in a simple way:

- 1) First - current and daily; crucial since the end of the warranty period, five years in case of real estate, especially for public buildings with a considerable number of users;
- 2) Second - scheduled; after the two-year warranty period, the electrical equipment start requiring slight intervention; maintenance costs arise, and, sometimes, the replacement of accessories, total or by components ;
- 3) Third - corrective; five years onwards, all composite parts, in particular those with moving parts tend to have abnormalities and, therefore, require intervention; facilities suffer minor adjustments arising from the organization of spaces;
- 4) Fourth - for rehabilitation (renovation) of the finishes; necessary from around ten/fifteen years through the wear and tear/degradation of the coatings, results in the imperative need of intervening on these and their frames.

In all of the cases the time, intervention postponing will result in higher costs, operating difficulties and increased complexity of the work.

### IV. POSSIBLE ANSWER

The proposal means to identify and provide for the repair of construction defects/anomalies. According to this research - since it is not possible to increase the engaged manpower - the solution is to resort to outsourced entities, specialised in their fields in order to provide a set of skilled professionals - as well as consumables, light tools and equipment - in a number adjusted to the needs, determined in accordance with the requirements of the building.

External entities would render services through contracts with a description of the work to be undertaken - detailed and technically justified as regards to the manner of execution. Efficiency controlled through fact sheets (in this case,

<sup>14</sup> Built to accommodate public services.

exclusive for intervention/day) and check-lists (to assess result/effectiveness) to be included in the specifications procedure contract (consultation/tender).

Since the proposed services are minimal and should be adjusted based on the size of the facilities - in the ongoing case, 'rehabilitation (renovation) of the finishes'<sup>15</sup> with a technical expert and an assistant - it is proposed that they do not work every working day, since that, on a limited work, with only one front, it is necessary to let some time pass for the work already done to stabilised, allowing the evaluation of the accomplished work and the preparation of the remaining. Another advantage results from management based on weather forecasting - always unstable during winter - enabling absences for short periods or, otherwise, the allocation of team to other jobs of shorter duration. Contracted times - for the pilot set in fifteen working days - allows management based on a "bank of hours": controlling the use of hourly units, negative and positive, according to the nature and urgency of the interventions, depending on possible damages.

Services with a Procurement Department can understand the acquisition in greater quantity of supplies, materials, products and solutions as advantageous. In order to do so, they must have storage capacity - in order not to divide expenses - or manage quantities at the supplier's facilities, by prior arrangement.

It is imperative, for the smooth running of these proposals, to delegate the preparation and monitoring to one, or more, technician(s) at the construction site, especially during rehabilitation and maintenance.

## V. CONCLUSIONS

The administration of any entity, responsible for management, which includes maintenance and rehabilitation, should hire a service or make use of a technician with in-depth knowledge of construction and process management: to have a complete understanding of the unique characteristics of the facilities - past, present and future.

Construction services, to be hired, shall be defined by prior strategy - decided by the contractor's site director - based on an Intervention Plan that should highlight the shortcomings, indicating the procedures with a definition of the solutions for the resolution of the problems.

The idea is to provide a light and periodic maintenance service, according to the existing financial resources: well-informed, mediated and assertive as to the needs, solutions and results, respectively.

Contrary to the above listed situations, a profound intervention, due to accelerated and urgent deterioration, can, in the absence of financial means, become an unsolvable problem. Delaying an intervention will result in further damages. With impact on the development of the mission are, firstly, the deterioration in construction systems; secondly, the allocation of human, resources and, lastly, economic resources.

At this moment, in the Faculdade de Arquitetura da Universidade de Lisboa, all types of maintenance works are underway, but we will only focus on the most complex ones - a pilot application of the intervention described in the

"Fourth": Procedure 020/CG/FA-ULisboa/2016 - Coatings Rehabilitation - under the Supervision of Prof. Carlos Mesquita.

This research follows the course of the services, assessing their application and development. In the future, adjustments can be introduced to the procedure for a second term. The intention is to repeat these procedures annually, ensuring that the facilities have all the necessary care for their perfect operation.

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<sup>15</sup> As pilot process.