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Title: “A Portuguese Heritage Project – The Restoration of the Palácio Fronteira”

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SYNOPSIS

Once at the outskirts of Lisbon and located at the Monsanto foothills, the “Palácio dos Marqueses de Fronteira e de Alorna”, in Benfica, has been undergoing an extensive restoration process under the Foundation that bears the above name. The construction of this Palace and its magnificent gardens goes back to the XVII-th century third quarter. After the 1755 Lisbon earthquake, the main building XVIII-th century west wing extension was built, when the Marquis and his family permanently settled in Benfica.

About fifteen years ago the author was invited by the late Arch. Prof. Emeritus Frederico George to work on the north loggia restoration and he was wonder-stricken by the master plan based on the drawings of the Italian Renaissance arch. Sebastiano Serlio, and the generous spatial dimensions created more than three hundred years ago.

An increasingly ageing European population, with a long historical tradition, is well aware of the need to maintain its cultural heritage. Current building techniques and special restoration procedures also need to be assessed before being implemented. Under an extensive restoration process, the Palace and its ensemble located at the Monsanto foothills is an important cultural asset that well deserves to be preserved.

1. INTRODUCTION

1.1. The Initial Conditions

On the Monsanto hill north side, one of the late XVII-th century most remarkable manor houses in Portugal, the “Palácio dos Marqueses de Fronteira e Alorna” (“Palácio Fronteira”) began to be built in 1667 (or 1668) and the construction lasted until 1675, Fig. 1. This Lisbon region was known for the running water, the rich farm land and the forests plenty of hunting resources. The built ensemble, i.e., the Palace, the gardens, the orchards, the farming plots and the forest, occupies an estimated area of 5 ha. (50,000 sq. mts.), enclosed within a tall stone-masonry wall that helped to create a certain level of intimacy and to protect from vandalism, [Geometral (1), C. M. Lisboa(2), I.G.E.(3)].

Twenty years ago, increasing traffic conditions in this Lisbon region area, associated with pollution and vibration effects due to the construction of a new expressway, the Sintra railway line tracks duplication, Fig. 2, accentuated the deterioration problems that were being observed in the building facades and its structure. A renewed attitude towards this three-hundred year old landmark building was then assumed – a Foundation with a Board of Curators was established and a well-structured, yet discreet, restoration strategy was implemented. This methodology included both the restoration of the built ensemble and the surrounding gardens and a public awareness marketing strategy towards cultural and national heritage aspects. The visitor’s program – the general public, the educational institutions (teachers, school students, retired persons), the cultural events (music, literature, poetry, television programs), catering, associated programs (the Friends of the Foundation) and word-of-mouth, helped to spread the message towards the need of urgent restoration measures with adequate funding. A more tolerant state and private funding policy also helped to start a medium, long-term program which can be an interesting case study for public institutions’ curators under an increasing pressure to maintain and publicise the built heritage under their grip.

1.2. – Contemporary Heritage Concepts

The modern international heritage concepts tend to encompass not only the constructed object, the built surrounding spaces, as well as, neighbouring increasingly vast domains such as natural or built landscapes. More than one hundred years ago, some of these concepts were established by visionaries, e.g., William Morris and, in 1877, an unique British society was founded - the S.P.A.B. – Society for the Protection of Ancient Buildings, with the following well-established principles [S.P.A.B. (4)]:

“(1)Repair not restoration – although no building can withstand decay, neglect and deprecation entirely, neither can aesthetic judgement nor archaeological proof justify the reproduction of worn or missing parts. Only as a practical expedient on a small-scale can a case for restoration be argued;

(2)Experimentation – old buildings are not the place to test unproved materials;

(3)Responsible methods – a repair done today should not preclude treatment tomorrow, nor should it result in further loss of fabric;

(4)Complement not parody – new work should express modern needs in a modern language: These are the only terms in which new can relate to old in a way which is positive and responsive at the same time. If an addition proves essential, it should not be made to out-do or out-last the original;

(5)Regular maintenance – this is the most practical and economic form of preservation;

(6)Information – to repair old buildings well, they must be understood. Appreciation of a building’s particular architectural qualities and a study of its construction, use and social development are all enlightening. These factors also help us to see why decay sets in and how it may be put right;

(7)Essential work - the only work which is unquestionably necessary (whether it be repair, renewal or addition) is that essential to a building’s survival;

(8)Integrity – as good buildings age, the bond with their sites strengthens. A beautiful, interesting or simply ancient building still belongs where it stands however corrupted that place may have become. Use and adaptation of buildings leave their marks and these, in time, we also see as aspects of the building’s integrity. This is why the Society will not condone the moving or gutting of buildings or their reduction to mere facades. Repairs carried out in place, rather than on elements dismantled and moved to the work-bench, help retain these qualities of veracity and continuity;

(9)Fit new to old – when repairs are made, new material should always be fitted to the old and not the old adapted to accept the new. In this way more ancient fabric will survive;

(10)Workmanship – why try to hide good repairs? Careful, considered workmanship does justice to fine buildings, leaving the most durable and useful record of what has been done. On the other hand, work concealed deliberately or artificially aged, even with the best intentions, is bound to mislead;

(11)Materials – the use of architectural from elsewhere confuses the understanding and appreciation of a building, even making the untouched parts seem spurious: Trade in salvaged building materials encourages the destruction of old buildings, whereas demand for the same material new helps keep them in production: The use of different but compatible materials can be an honest alternative;

(12)Respect for age – bulging, bowing, sagging and leaning are signs of age which deserve respect. Good repair will not officiously iron them out, smarten or hide the imperfections. Age can confer a beauty of its own. These are qualities to care for, not blemishes to be eradicated.”

Later on, another British agency – the English Heritage, which had been administering the Government grants established for the preservation of ancient monuments, from 1931, and of historic buildings, from 1953, [English Heritage (5)], also established

general guidelines regarding: (1) the purpose of repair; (2) the need for repair; (3) avoiding unnecessary damage; (4) analysing historic development; (5) analysing the causes of defects; (6) adopting proven techniques; (7) truth to materials; (8) removal of later alterations; (9) restoration of lost features; (10) safeguarding the future.

2. THE BUILT ENSEMBLE

2.1. The Palace

In 1667, after nearly thirty years of continuous battles against the Spanish armies – The Restoration Wars of National Independence, the Prince Dom Pedro challenged his friend the Field-Marshal Count Dom João de Mascarenhas (1632-1681), to invite him for a hunting party in his Benfica property outside Lisbon. The Count excused himself as he asked for some time to improve the existing modest hunting lodge to adequately host such a royal guest, [J. Gil et al. (6)].

Located at the footsteps of the Monsanto hill north zone and protected from the ocean winds and extreme hot summers, this Lisbon region area was an ideal location for the aristocratic hunting and leisure parties. Where an early XVI-th century small chapel and a hunting lodge already existed a new renovation project was under way. After some years of arduous construction works, which began in 1667 or 1668 and lasted until 1675, the Count Dom João de Mascarenhas nearly went into financial exhaustion.

The reason was the need of conveying all the water resources from the Monsanto hill to the Palace location and the extensive earthworks – landfills and excavations, deemed necessary for the garden's "*parterres*" being created. This remarkable feat of hydraulic engineering and public works surveying succeeded with the excellent integration of the new building under construction, surrounded by man-made magnificent "*parterres*". The Renaissance Italian architect Sebastiano Serlio (1475-1564) classical drawings [S. Frommel (7), C. Azevedo (8)], are probably the source of inspiration for the actual building design. Another possibility are Rubens "folio" engravings which shows the Genoa Palace – Villa Sauli designed by Galeazzo Alessi in 1555-1556 [G. Kubler (9)], Figs. 3, 4 and 5.

However the project unknown author is the accomplished final result has a classical proportion. The Mannerist style building façade, with the loggia main plane slightly recessed from the two adjacent turrets, the ground floor triple arcade with Doric-style

columns supporting the first floor triple arcade with Ionic-style marble columns, yields an accomplished final result of classical proportions. The Portuguese traditional features - the “azulejos” (glazed ceramic tiles), the painted stuccos, wisely included in the general design makes the whole ensemble unique.

After the 1640-64 Restoration Wars, the peace treaty with the Spanish kingdom created the desired conditions for a new construction period. The Lord’s residence was conceived as a small world with all the possible everyday life comfort. The ground floor was used to create storage rooms, kitchens and, the first floor (the “piano nobile”) for the family dwellings (bedrooms, dining hall, lounge areas, offices). The characteristic XVII-th century U-shape plan is incipient in this Palace layout where the small corner turrets are only slightly protruding from the façade surface. Later on, during the XVIII-th century construction works of the new west wing and the opposed single story storage rooms east building, the enclosed patio and the iron gate enhanced the spatial U-shape, partially closed layout [C. Azevedo (8)].

The initial building plan is supposed to have “absorbed” the original hunting lodge and incorporated within its structure the new spatial layout being built, Figs. 6 and 7. A central square shaped core with the plan dimensions of approximately 12.0m by 12.0m is surrounded longitudinally by three rectangles with an approximate size of 5.0m by 12.0m. Each one of the existing three corners is flanked by a protruding turret with a rectangular size in plan of 5.0m by 6.0m. The total square plan dimensions are 25.0m by 25.0m. The fourth rectangle and corner turret were partially demolished to adapt to the existing rock (basalt) foundation conditions and, again in the XVIII-th century, when the new NW- wing was built. The first floor is approx. +4.80m above ground level and the roof cornice is at approx. + 9.60m, Fig. 7 -b. The second floor area occupies the west-wing area at approx. + 7.20m from the same reference level.

The building design concept still encompasses the Renaissance idea of a manor house similar to a military fortress – the central square core “defended” by one turret located in each corner. These external turrets were then linked by external roof covered verandas – the loggias, which allowed to communicate between the adjacent corner turrets while enjoying the open air breeze and to contemplate the natural landscape. The actual East facade have the arch-shaped openings enclosed by wood-framed glass windows due either to space needs or comfort requirements whereas the North side is completely open.

During the construction phase, as the initial design plan evolves and the adjustments to local conditions are deemed necessary (ex. foundation problems, existing constructions, steep earth slopes; owner's change-of-orders), the SW turret was partially demolished and a first floor open-air promenade area – the “Passeio da Oratória”, with 30.0m length by a width of 6.0m, was built to connect the Palace main core with the existing chapel, Fig. 6, [H. Carita and A.H. Cardoso (10)].

After the dreadful 1755 Lisbon earthquake, the family that lived in the Lisbon Chiado area moved permanently to their Benfica property where they still inhabit, [J. Cassiano Neves (11)]. A new construction program was carried on, to accommodate more people and a new building was inserted into the NW-wing sector, adjacent to the existing Palace. This XVIII-th century construction reveals the traditional plain architectural style, with simple façade stone masonry bordered openings – doors, windows, with the absence of decorative ornaments. However, one exception should be made to the NW façade where the decorative stonework of the first floor balconies and window openings reveal an incipient baroque gesture in contrast with the existing Mannerist-style Palace façade, [G. Kubler(9), J.C. Neves(11)].

The traditional materials used in the Palace construction were: (1) stone masonry walls with lime mortar needed to assemble the stone blocks. The exterior façade finishing has several lime mortar layers and, the last one, incorporates a dark red oxide pigment that gives the traditional red colour to the wall surfaces. The interior wall surface is also made of several lime mortar layers and the last one has a painted stucco surface; (2) the north loggia ground floor exterior pavement is built with limestone slabs joined with lime mortar. The other interior ground floor pavement surfaces are made of ceramic floor tiles; (3) the first floor (“piano nobile”) pavement is built with wood beams supported on their edges into the masonry walls. Wide wood floor boards, with considerable length were used for the final floor surface. In some areas that were subjected to earlier renovation works, e.g., the Battle Room, a well-detailed, simply conceived pitch-pine floor is used which creates a balanced ambience.

Underneath this wood floor pavement and supporting beams, a lime mortar layer applied over fascia, i.e., small-sized closely spaced wood beams, is used to support the decorative stucco finishing; (4) the ceiling and the correspondent roof structure have a double “skin” concept, to improve temperature and acoustical comfort conditions. The interior shell with decorative paintings is made of a stucco finishing applied on a fascia

surface. The ceiling barrel vault shell is suspended from the wood roof trusses by nailing the fascia to the trusses wood legs. These “A-type” trusses are placed at close spacing, from 0.60m to 0.80m o.c., in order to support the juxtaposed wood boards. The external surface revetment is built with alternately placed ceramic tiles – the concave shape functions as a rainwater channel and the above placed convex shape fixed with lime mortar is the cover.

Due strong winds, material failure, construction errors, accumulated repair debris, these superimposed clay tiles tend to slide downwards the roof slopes. To refrain the tiles from sliding, traditional roof repair work techniques usually completely fill-in the tile U-section channel (Moorish-style roof), with lime or cement mortar, see Fig. 5-b, and a dramatic increase in the dead load (DL) design values is observed. This significant increase in the DL design value amplifies the amount of deflection and cracking observed on the exterior masonry wall facades, on the roof structure, and a slow decaying iterative step-by-step process takes place.

2.2. The Grandiose Outdoors – the Gardens and Water Tanks.

The existing Serlian-type façade inspired building, the XVIII-th century extension wing, the main entrance patio, the monumental gardens, the King’s Gallery, the extensive “azulejos” surfaces and the reflecting lake, Figs. 8 and 9, create an unique environment that can be considered an exception as compared with other contemporary XVII-th century buildings under construction with simple monotonous facades, yet, with dignity [C. Azevedo (8)].

These Portuguese gardens are well rooted into a two thousand year tradition that goes back to our common Roman and Islamic ancestors who lived in this European region. An extremely difficult major hydraulic engineering achievement was attained when at least three major water supply networks were successfully built. The Monsanto hill was “perforated” with man made small tunnels, i.e., “minas”, to reach the available water inside the limestone layers, under the extensively cracked basalt rock mantle. The water transportation in ground supported open-air channels, the storage procedures in water tanks with variable size in plan – “Tanque dos Negros”, “Lago Grande”, “Fonte da Carranquinha”, the special water effects in the fountains were also carefully considered.

The idea of a perfect garden is to try to recreate the lost Paradise on Earth, and some design concepts must have served as guidelines to conceive this Portuguese garden ensemble [H. Carita and A.H. Cardoso (10)]:

- (1) the need to imagine a secluded Universe protected from external “noise” and interferences, where the owner can display his prestige while entertaining his guests;
- (2) to provide an intimate and private ambience. The Portuguese garden is rooted in the Islamic tradition- an enclosed space that must be enjoyed within its walls as opposed to other European contemporary gardens (e.g. English, French) that absorbed the surrounding nature scenery into his design;
- (3) the garden must “melt” with the adjoining architectural spaces and domestic life – leisure areas, small lakes and fountains, benches, grottos, pergolas, tall exterior contour walls with “azulejos” applied on their surfaces, Figs 8 and 9;
- (4) natural environmental control – extreme climate conditions with excessive heat, humidity, wind, noise, are attenuated by the different types of trees, bushes, running water fountains, lakes and reflecting ponds, Fig.8, where this man-made space became an attractive Universe to stay outdoors,
- (5) the need of a perfumed breeze – the orange and lemon trees, the native natural plants, e.g. rosemary or the more elaborate roses, with their scent in the air, improves the quality of the Portuguese garden environment; and,
- (6) the cultural “exchange” – the “azulejos”, a must from the Islamic art and the shell-work (“embrechados”), where the glittering obtained from mother-of-pearl shells, crushed semi-precious stones, small pieces of broken crystal glasses and bits of ancient China porcelain, inlaid into the mortar surfaces of grottos, garden chapels, exterior veranda wall surfaces, try to recreate the exotic shimmering effect of Indian art.

The main outdoor constructed elements that are adjacent to the Palace building are: (1) the entrance patio; (2) the Formal Garden; (3) the Kings’ Gallery; (4) the Venus Garden; (5) the “Casa-do-Fresco”; (6) the “Tanque dos Negros”; (7) the Palatine Chapel; and, (8) the “Passeio da Oratória”, Fig. 10.

The entrance patio surrounded by the Palace buildings on its three sides and an iron gate on the north side, allows the visitor to get acquainted with the different spatial ambiences of this Estate – an access to a private indoor area after the front doors are crossed or, an outdoor promenade where several different ambiences are staged.

The open-air well kept formal garden with the magnificent dimensions in plan of 58.5m by 67.0m, is below the entrance level about one meter. However, at the northeast corner is about four meters above the exterior road level. A huge amount of human labour was deemed necessary to create this vast parterre and advanced surveying techniques were needed to control the earth movements. The access is made through a stone staircase near the East loggia Palace façade and the formal garden has an Italian taste with the classical statues, the intricacy of the bush designs, the vivid roses and the topiary, around a central fountain. The “azulejos” panels that border this rectangular-shaped garden four sides depict the twelve months of the year (E-side), the Zodiac signs (N-side), the planets and constellations (W-side) and the twelve chivalry nobles (S-side).

The south side adjacent to the formal garden, see Fig. 8, has a large recreational lake with a total length of 48.2m by a width of 18.2m, which can function as a storage reservoir with a total capacity of aprox. 1,000. cu. mts.. The south wall which depicts the twelve noble cavaliers “azulejos” panels is organized in four groups of three panels each, alternating with three small grottos. The two 4.0m-wide lateral stone-masonry staircases, each one with two flights of stairs, allow the access to the Kings’ Gallery where a superb upper view (approx. +4.0m) of the Palace and the Gardens is possible.

The Kings’ Gallery is flanked on both opposite sides by small turrets with steep square-pyramidal roofs covered with singular Seville-style “azulejos”, with a copper colour finish, that glitters against the sky while walking on this promenade space. The First and Second Dynasty Kings’ marble statues are spaced regularly around the central person being honoured – Prince Dom Fernando, the Infante Santo. This Prince, who became prisoner in North Africa and, later on a martyr in the Fortress of Fez, represents one of the saddest moments of the Portuguese History that strongly affected the Royal Family and the following generation’s policies towards maritime conquests.

On the southwest side, adjacent to the Formal Garden and the Kings’ Gallery is the Venus Garden built as a smaller parterre, with 30.0m by 40.0m plan dimensions, three meters above the previously mentioned formal garden plane. Tall and medium size trees, bushes, and other plants surround the marble statue of Venus with an ambience of

shade and green colours. This quiet and intimate Venus Garden lays just outside the palace Battle Room limiting the amount of light and heat on the South façade. This natural shade control cools the façade in the extremely hot summer day, filters the amount of natural light going through the windows and allows the serene contemplation of the battles fiercely fought against the Spanish armies more than three-hundred years ago [F. D. Costa (12a)], Fig. 11.

The “Casa do Fresco” – a cool dome-shaped space, with a running water fountain, “azulejos” covering the dome surface and the walls, shell and rock inlays (“embrechados”) on the ceilings, is able to provide a fresh moment during the hot summer days. The outside S-shaped curve walls water tank is surrounded with stone benches. The benches’ walls have the most famous “azulejos” surfaces with the humorous scenes depicting the monkeys and cats. The transition from this intermediate level to the upper level (“piano nobile”) which gives access to the Palatine Chapel and the large 6.0m wide veranda (“Passeio da Oratória”) is made through a very narrow (0.90m) and steep vaulted staircase completely filled with “azulejos”.

This discontinuous and discreet connection between the outdoor gardens and the Palace veranda is typical of the Mediterranean and Islamic tradition where a structuring axis doesn’t exist and the spaces are contiguous and self-contained. The “ambulatio” promenade follows the same concept of the Villa Adriana Roman era space where a large promenade walk (L = 230 m) was designed away from the Roman Emperor Hadrian dwellings, protected from the winds and under the shade of the trees. Similarly, the “Lago Grande” concept is identical to recreational great lake also found in the Villa Adrianna - the “canopus”, [H.Carita et al.(10)].

The “Passeio da Oratória” is flanked by full-size marble statues with the Greek gods and “azulejos” panels depicting the various areas of knowledge from that epoch, e.g., calculus, dialectics, geometry, music. The top façade has round medallions on the “De la Robbia”, Florence-style. However, as the supreme area of knowledge is Poetry, a larger size “azulejos” panel is dedicated to this theme, Fig. 10. This panel is flanked by two mythological statues depicting the legend of Apollo. On the other end of this veranda plane is the Palatine Chapel, where a keystone over the entrance door has the inscription date of 1584. The tradition goes that Saint Francis Xavier, “The Apostle of the India”, celebrated his last mess here before embarking, in April of 1541 to the East and he was deceased in the Far East China in 1584, [A. Gregory et al. (14)].

3. THE TOTAL RESTORATION CONCEPT

3.1. The General Procedure

The restoration strategy of this landmark ensemble to provide an adequate condition of public access was many-fold. Firstly, the manor house had to be restored to regain its pristine condition, so that visitors and other guests would feel attracted by the set. An extensive building survey was made and most of the roof systems were in very poor conditions due to broken tiles, water leaks, material decay, foundation settlements. The north loggia, the northeast turret, the east library, the Battle Room, the west wing, were all subjected to an extensive roof restoration process under a well established general plan. Secondly, the gardens and water network systems needed to be upgraded and the water mains were replaced allowing the water fountains to work again. The Kings' Gallery marble statues were cleaned, some of the Formal Garden lead metal statues were restored and some of the "azulejos" panels were disassembled, cleaned and assembled back into the original position. The gardens several retaining walls were appraised and a medium-size retaining wall dividing the Venus Garden from the Formal Garden was partially dismantled and built up again with traditional materials, after large top lateral deformations (tilt) were observed, indicating a pre-state of collapse. This slow paced procedure was done on a step-by-step basis whenever funding was becoming available. Thirdly, an in-house training was given to the staff so each of the tour guided visits could be a major success in hosting the visitors.

3.2. The North Loggia Restoration Process

In the early 1990's, one of the first major interventions carried out under the supervision of the late Prof. Arch. F. George was performed in the Palace north loggia. The amount of debris accumulated between the inner plaster fascia ceiling shell and the outer wood roof structure with clay tiles revetment was enormous and it represented more than 300-years of successive roof repairs. The observed cornice mid-span measured deflection had a stunning value of 25 cm, which represents a relative deformation index of $R = 2\%$ computed after the total span length, $L = 11.60\text{m}$. Due to this excessive, pre-collapse, bent shape, large cracks were observed on the masonry façade and the displaced clay tiles allowed rainwater infiltration through the cornice, Fig.12 A. The mid-span iron tension tie bar was corroded and ruptured, with subsequent cracking of the inner plaster

shell ceiling. The observed cracking patterns corresponded to a typical pre-collapse state, they developed longitudinally along the apex axis and extended from the mid region towards each one of the four corner supports.

The heavy compression loads originated by the roof structure dead loads, plaster inner ceiling shell, the accumulated debris and the masonry wall façade own weight combined with the iron tension tie collapse originated the first floor Loggia marble columns buckling. The wood A-type roof trusses also settled further increasing the horizontal thrust force on the facade cornice, as well as, the vertical crest deformation. The wood deterioration in the knee joints and at the support ends, in contact with the masonry wall, may be responsible for the observed state of conservation. After removing the tiles, the accumulated debris, the wood boards that supported the clay tiles, a better assessment of real local conditions was possible. The next step was to disassemble the roof structure, to dismantle the brick masonry cornice and to remove the first floor marble columns to clean and repair, while major design solutions were discussed and adopted. The Sintra technicians recommended a maximum load carrying design value of 6.0 kN (approx. 600. kgf) for the delicate Ionic-style marble columns. A structural steel engineered solution for the façade and the four-sided slope roof was designed to avoid excessive loading on these columns, Fig. 12B.

This lightweight solution made possible: (1) to reduce the total dead load of the roof system; (2) the adopted longitudinal steel girder carried the north edge roof loads to the lateral masonry walls; (3) a continuous spatial bracing between the U-shaped masonry walls plan, the “open” exterior façade wall and the roof system; and, (4) to increase the existing safety factor. One of the most difficult construction aspects was to fit millimetre designed steel members into an existing 300-year old deformed building, [J. N. Bastos (15)].

The other Palace areas were intervened sequentially after the north loggia repairs were completed – the NE turret, the East Library and the Battle Room. The Battle Room roof system with the largest plan dimensions of 9.5m by 12.0m was strengthened using a similar structural steel design concept as the north loggia solution. After an initial preliminary design solution was developed the former “DGEMN – Direcção Geral dos Edifícios e Monumentos Nacionais”, organised the tender bids without adjusting the design plans to the actual existing dimensions. Some lack-of-fit between the steel members and the supports was observed in the construction site.

The XVIII-th century west wing sector had the roof system disassembled and re-built with structural timber. The need of controlling joint detailing and the real lack-of-fit observed in the construction may have been the source of new wall cracks observed after the job completion.

3.3. Marketing Strategies

About twenty years ago, in order to maintain a perishable organism alive, within the total restoration process strategy, a well-organized visitor’s program was developed. The role of the media cannot be forgotten (TV, cinema, press). The early 1991 French writer Pascal Quignard – “La Frontière” and the Italian Antonio Tabucchi - “Requiem” novels stirred the attention and the curiosity of fellow countrymen readers. The Portuguese writer José Cassiano Neves book – “Jardim e Palácio dos Marqueses de Fronteira”, the current third edition completely sold out, with the sumptuous pictures and both the French and English versions also helped to promote this landmark ensemble overseas. Although current marketing strategies can be used to increase the number of annual visitors, the current trend is to improve their number during the low season months, Fig. 14.

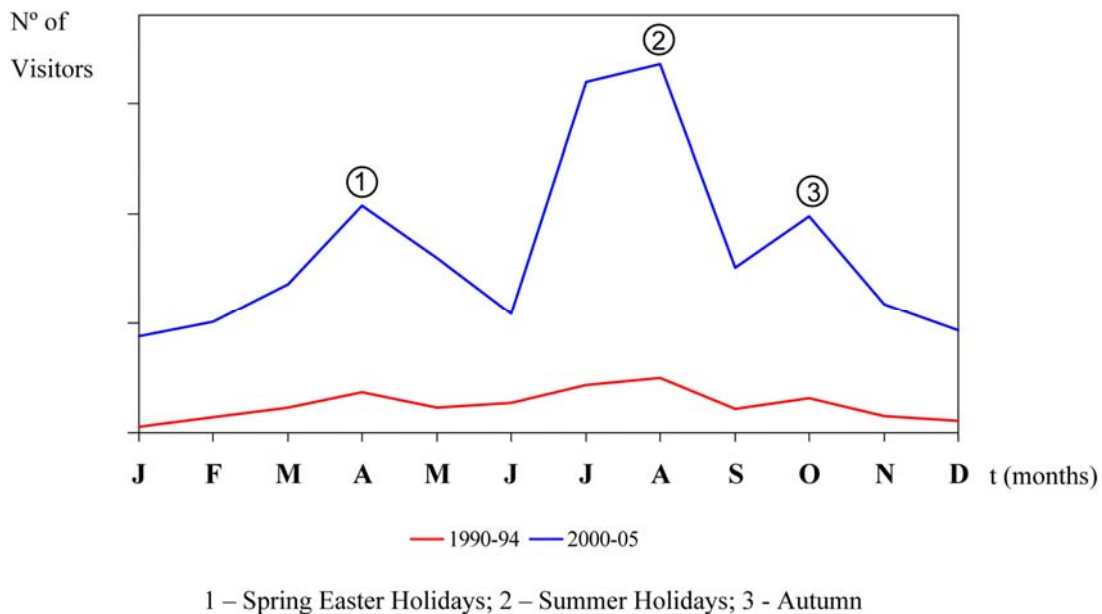


Fig. 14 – Observed Monthly Visitors Trend.

During the fifteen year sampling interval a dramatic increase in the monthly visitor's number was observed from the early beginnings period (1990-94) to the current value levels (2000-05), which reach an actual estimated value of 15,000 visitors per year. In this value one must include school children ("environmental education programs"), retired persons ("golden age visitors"), college students and teachers, and artists. An estimated ratio of 90 % foreign visitors vs. 10% nationals is currently observed and it is a matter of cultural concern.

This strategy of keeping the Palace and the Gardens Ensemble as a "living organism" [F. Mascarenhas (16)], is one of the best indicators for the levels of success that were reached. The excellence of the host tour guides, with their in-house training and a vast knowledge of the displayed items is able to capture any visitor's attention. Each visiting group after a brief evaluation by the responsible host tour guide has a "tailored" presentation where the "azulejos", the stuccos, the exquisite pieces of furniture, the paintings, the Persian carpets can be responsibly commented and appreciated by any individual visitor. The first ten minutes are critical in this interactive process between the visitors group and the tour host guide. The post-tour evaluation is also scrutinized through the written comments provided in the guest book pages. The idea of a live manor house, permanently inhabited during these last 300-years by the same family, spurs the imagination of every single visitor.

4. FINAL OBSERVATIONS AND RECOMMENDATIONS

A twenty year tailored plan to revive the magnificent Palácio Fronteira ensemble was established and their objectives attained through continuous monitoring. The current state-of-affairs with national historical monuments and other landmarks may suffer, in some cases, from a well-spread state of apathy. This Palácio Fronteira example can become an interesting case study for other Institutions with difficulties in getting results and the visitors motivated with their collections.

The global plan that aimed at restoring the Palace and the surrounding Gardens to their pristine levels, the continuous construction and repair works, the cultural approach to publicise this ensemble in the media (TV, movies, press), the knowledgeable and well prepared host tour guides are all valuable assets that must be emphasized.

This strategy is able to attract the well educated visitors that are able to enjoy better either a rare China porcelain vase, a Persian carpet or panel of “azulejos” *vis-à-vis* massive crowds of visitors with other interests that are able to easily destroy by ignorance any piece of art. It is interesting to notice that the usual better educated visitors tend to come to the Palace during the less crowded season, such as, springtime and the autumn.

The use of traditional repair techniques is time lengthy and expensive. However, the aim is to restore the different pieces to their near original condition. In some cases, new technological materials and structural solutions may be adopted to restore higher safety levels in sectors that showed a pre-collapse state.

Within the global environmental protection of the built heritage, not only historical landmark sets – the Palácio Fronteira ensemble, as well as, the surrounding landscape – the Monsanto Hill, deserve to be enjoyed and protected. The cultural heritage programs are a valuable source of revenue not only for the private Institutions but also for the public cultural services (museums, galleries, palaces).

British current trends to protect national historical landmarks recommend a continuous monitoring of the objects and a personal effort and enthusiasm to motivate fellow team mates. However, some historical landmarks due to increased cultural awareness and public interest (e.g. Stonehenge, Windsor Castle) are under great “pressure” that may lead the object to the brink of a collapse.

The actual “pressure” in the Palácio Fronteira is still under manageable levels at a estimated total number of 15,000 visitors per year. A selected group of visitors – regular, retired persons, school students, is still able to enjoy the whole environment without creating major disturbances in the building interiors or the outdoor gardens.

5. ACKNOWLEDGEMENTS

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