

# A Study of Pathologies at Plaza de España

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**Abstract** Plaza de España<sup>1</sup>: The major problem is due to water presence, the buildings north tower has faced major problems, now the water has been removed and scaffolding has been placed to support the structure. This survey is divided into two parts: in the first part the major problem of the building is discussed. In the second part, minor problems are discussed in detail.

**Keywords** Conservation, Heritage Preservation

## 1. Introduction

Integrated conservation is achieved by the application of sensitive restoration techniques and the correct choice of appropriate functions. It should be noted that integrated conservation does not rule out the introduction of modern architecture into areas containing old buildings provided that the existing context, proportions, forms, sizes and scale are fully respected and traditional materials are used. (Page 3 European Charter of the Architectural Heritage Adopted by the Council of Europe, October 1975)

### 1.1. The Technique of Conservation

In the case of ruins, scrupulous conservation is necessary, and steps should be taken to reinstate any original fragments that may be recovered (anastylosis), whenever this is possible; the new materials used for this purpose should in all cases be recognisable. (The Athens Charter for the Restoration of Historic Monuments Adopted at the First International Congress of Architects and Technicians of Historic Monuments, Athens 1931)

ARTICLE 2. The conservation and restoration of monuments must have recourse to all the sciences and techniques which can contribute to the study and safeguarding of the architectural heritage.

#### 1.1.1. Aim

ARTICLE 3. The intention in conserving and restoring

monuments is to safeguard them no less as works of art than as historical evidence.

#### 1.1.2. Conservation

ARTICLE 4. It is essential to the conservation of monuments that they be maintained on a permanent basis. (Page 2 The Venice Charter international charter for the conservation and restoration of monuments and sites)



**Figure 1.** The plaza now without water (see above) and before with water (see left) scaffolding showing the damaged part

#### 1.1.3. Restoration

ARTICLE 9. The process of restoration is a highly specialized operation. Its aim is to preserve and reveal the aesthetic and historic value of the monument and is based on respect for original material and authentic documents. It must stop at the point where conjecture begins, and in this case moreover any extra work which is indispensable must be distinct from the architectural composition and must bear a contemporary stamp. The restoration in any case must be preceded and followed by an archaeological and historical study of the monument.

ARTICLE 10. Where traditional techniques prove inadequate, the consolidation of a monument can be

<sup>1</sup> <http://en.wikipedia.org>

achieved by the use of any modern technique for conservation and construction, the efficacy of which has been shown by scientific data and proved by experience.

ARTICLE 12. Replacements of missing parts must integrate harmoniously with the whole, but at the same time must be distinguishable from the original so that restoration does not falsify the artistic or historic evidence. (Page 4 The Venice Charter international charter for the conservation and restoration of monuments and sites)

Integrated conservation requires the promotion of methods, techniques and skills for restoration and rehabilitation.

Methods and techniques of the restoration and rehabilitation of historic complexes should be better exploited and their range developed. Specialized techniques which have been developed for the restoration of important historic complexes should be henceforth applied to the wide range of buildings and complexes of less outstanding artistic merit.

Steps should be taken to ensure that traditional building materials remain available and that traditional crafts and techniques continue to be used. Permanent maintenance of the architectural heritage, will, in the long run, obviate costly rehabilitation operations.

Every rehabilitation scheme should be studied thoroughly before it is carried out. Comprehensive documentation should be assembled about materials and techniques and an analysis of costs should be made. This documentation should be collected and housed in appropriate centres. New materials and techniques should be used only after approval by independent scientific institutions. (Page seven congress on the European architectural heritage 21 - 25 October 1975 The Declaration of Amsterdam)

**1.2. History of Conservation**

Conservation started as a movement; essentially it is a western phenomenon in attaching importance to the built (tangible) remains of the past. Initially the view was of minimum tampering and intervention enough to 'stave of the decay'; this view continues to be followed till today in some parts of the world. Whereas the European world continued to improve the method, and discovered new and unique approaches towards preservation, so much that every monument's conservation has its own theory and approach towards conservation.

**2. Ten Points of Conservation: Those are Considered in this Revitalization of Tower**

**2.1. Respect for Documentary Evidence**

Conservation work is based on historic documentation such as historic photographs, drawings and physical

evidence. As shown in Figure 2 the hierarchy of conservation below list is seen in Plaza as shown in Table. 1

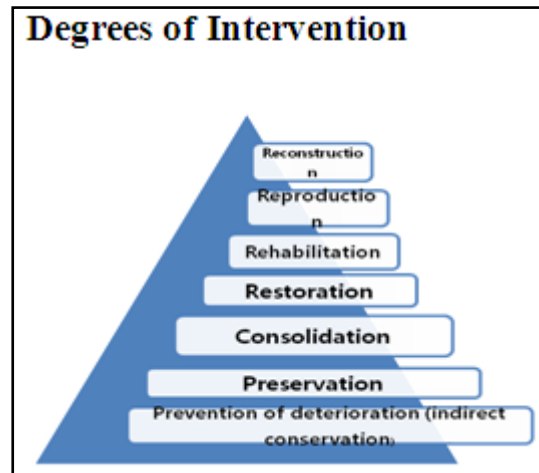


Figure2. shows the hierarchy of the conservation techniques

Table 1. Soil Classifications

Maximum Recommended Depths of Cover (m) (Access Roads, Soil Type C, Bedding in 100mm Loose Material)			
Nominal Size (mm)	Class	Trench Type II	Trench Type III
100	K9	40	40
150	K9	18	19
200	K9	12	13
250	K9	9.9	10

**2.2. Respect for the Original Location**

Site is an integral component of a building. Change in site diminishes heritage value considerably. AS seen in Figure 2 but the water is displaced. So the original setting is not visible.

**2.3. Respect for Historic Material**

Rather than replacing building materials and finishes, except where absolutely necessary. Minimal intervention maintains the historical content of the resource. As seen in Figure 8 the wiring is not original setting.

**2.4. Respect for Original Fabric**

Repairing with like materials. Repair in way that returning the resource to its prior condition, without altering its integrity. The integrity is lost by the graphic as shown in Figure 7.

**2.5. Respect for the Building's History**

No restoration to be taken place on the basis of one period at the expense of another period. No destruction of later additions to the urban fabric solely to restore to a single time

period. As cracks shown in Figure 4, it has to be restored in a correct form.

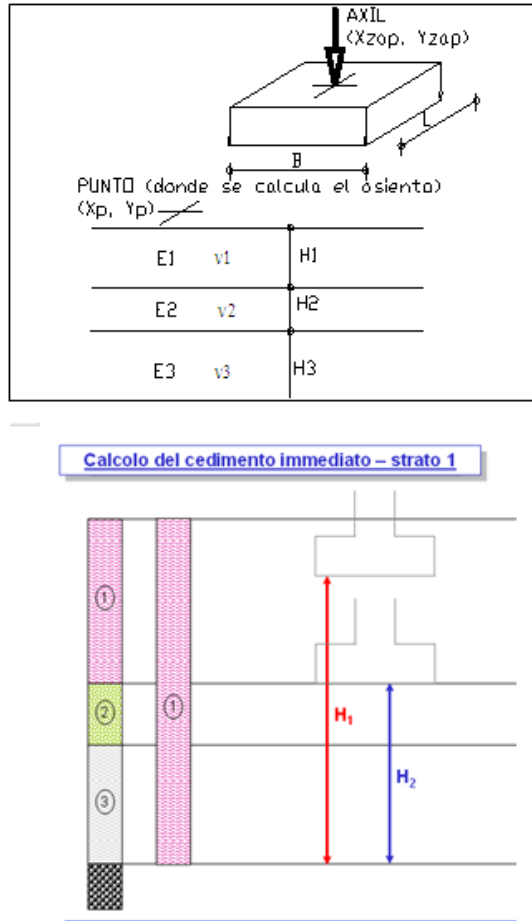


Figure 3. The above figure represents the displacement in the foundation due to humidity.



Figure 4. Crack of more than two inches appeared

### 2.5.1. Soil Classifications

The following ASTM D2487/US Bureau of Reclamation Soil Groups classify different soils for embedment, i.e., soils which are used for placement in the trench surrounding the pipe, compacted or uncompacted, to provide support for the pipeline. These groups classify naturally occurring soils as well as manufactured materials. The groups are also for use in classifying undisturbed trench wall materials.

- GROUP A -- Angular graded stone (6mm - 40mm),

including a number of fill materials that have regional significance, such as crushed stone, crushed gravel, and crushed shell.

- GROUP B (GW, GP, SW, SP) -- Coarse-grained soils with little or no fines, no particles larger than 40mm, including a number of fill materials that have regional significance which have rounded grains, such as pea gravel.
- GROUP C (GM, GC, SM, SC, CL, ML, ML-CL, CL-CH, ML-MH) -- Coarse-grained soils with fines and fine-grained soils with medium to no plasticity, with greater than 25% coarse particles, liquid limit (LL) less than 50%.\*
- GROUP D (CL, ML, ML-CL, CL-CH, ML-MH) -- Fine-grained soils with medium to no plasticity, with less than 25% coarse particles, liquid limit (LL) less than 50%.\* refer to Table. 1
- GROUP E (CL, MH, CH, MH) -- Fine-grained soils with medium to high plasticity, liquid limit (LL) greater than 50%.
- GROUP F (PT) -- Organic soils.

\*Designer must determine percentage of coarse particles to accurately determine soil group.

INT Maximum Recommended Depths of Cover (m) (Access Roads, Soil Type C, Bedding in 100mm Loose Material)

### 2.6. Reversibility

Alterations should be able to be returned to original conditions. This conserves earlier building design and technique. e.g. When a new door opening is put into a stone wall, the original stones are numbered, removed and stored, allowing for future restoration, (Figure.1)



Figure 5. Interior and exterior of the north tower, major problems and huge cracks have developed.

## 2.7. Legibility

New work should be distinguishable from old.

Buildings should be recognized as products of their own time, and new additions should not blur the distinction between old and new. (Figure.4)

## 2.8. Maintenance

With continuous care, future restoration will not be necessary. With regular upkeep, major conservation projects and their high costs can be avoided. (Figure.5)

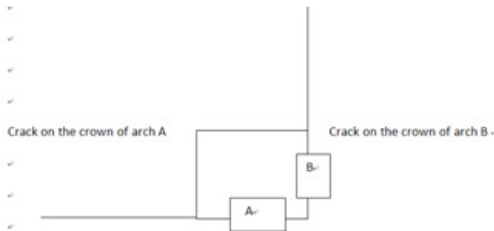


Figure 6. Crack on the crown of arch A



Figure 7. Texts on the walls need to be cleaned

## 2.9. Role of Indigenous Craftsmanship

Wherever possible use of local talent.

Imperative to employ local craftsmen to ensure that the building crafts tradition do not die and are available or conservation.

## 2.10. Multi-Disciplinary Approach to Conservation

To facilitate the role of available expertise for a holistic

understanding of the monument/site and for undertaking conservation works. In-house capacity building and engagement of experts from outside as and when a need for the same arises. (Figure. 3)



Figure 8. Bad electric wiring

## 2.11. The Important Question Here Arises is that Who Can/Should Conserve

As known conservation a multi-disciplinary approach Archaeologist, conservation architect, architect, structural engineer, town planner, urban designer, interior designer, hydrologist, landscape architect, art conservator, chemist, lighting expert, craftsman, seismologist, contractor, surveyor, sociologist, anthropologist, geographer, heritage manager, tourism expert, historian, art historian, bureaucrat, politician, etc., and interested citizen.

## 3. Classification of Deterioration Reasons of Building Structures and Materials

### 3.1. Stone Replacement

Can be the most viable approach for restoring large areas of damage. A new anchoring system may be required.

### 3.2. Resetting

Returns displaced stone to its original position.

### 3.3. Building Stone

Building stone classification

Rock - a naturally occurring, consolidated aggregation of one or more minerals constituting the crust of the Earth

(ASTM Dictionary 2005)

- i. save it from the inevitable demolition and destruction
- ii. introduce a novel method, an alternative way, to save our architectural heritage as shown in Figure 4 and 6.

### 3.4. Re-Anchoring

Is usually necessary when movement of the stone from its original position has broken existing anchors or fractured the back of the stone.

### 3.5. Crack Repair

Can be accomplished by injecting an adhesive material into the fissure to provide water impermeability and prevent further cracking. A minor crack can be successfully repaired by routing the crack and filling it with patching material. The crack is visible in (Figure. 4)

### 3.6. Consolidation

Is a time-tested technique of reconstituting softened or deteriorated stone by filling the voids and binding the grains within the stone. Consolidation has many applications for the preservation of historic structures, but requires thorough testing and evaluation to ensure that the consolidate leaves a compatible vapor-permeable surface.

## 4. Conclusion

The plaza is our pride and we professionals have to come together to save it, first the minor problems need to be solved and then the major problems should be tackled with.

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- [3] UNESCO Asia-Pacific Heritage Awards for Culture Heritage Conservation.
- [4] Architectural Conservation Programme at The University of Hong Kong, Asia's leading postgraduate-level professional programme in built-heritage conservation.
- [5] Cultural Heritage Management Programme in the School of Professional and Continuing Education at The University of Hong Kong, a postgraduate-level professional programme
- [6] Antiquities and Monuments Office, responsible for the conservation of local cultural heritage.
- [7] Conservation of local cultural heritage.