



CONSERVATION CRITERIA

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Definition of Monuments





Monument = historic building = site/place of cultural significance

Historic Buildings

Historic Monument
(protected by law)

Ensemble
(protected by law)

Venice Charter 1964: „Imbued with a message from the past, the historic monuments of generations of people remain to the present day as living witnesses to their age-old traditions.”

Historic Monuments:

- Created by humans
- Material witnesses to the past
- Object of cultural significance (aesthetic, historic, scientific, social or spiritual value)
- Public interest requires the preservation
- Authenticity of the object

- Shape and Design
the Art History Value



Preservation criteria

- Shape and Design
the Art History Value
- Use, Function, Tradition
the Historical Value



Preservation criteria

- Shape and Design
the Art History Value
- Use, Function, Tradition
the Historical Value
- Techniques
Heritage as Scientific Source



Preservation criteria

- Shape and Design
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- Use, Function, Tradition
the Historical Value
- Techniques
Heritage as Scientific Source
- Location and Setting
Urbanistic Value



Assessment criteria for cultural heritage preservation



Heritage Value

aesthetic

historic

scientific

cultural

social

.....

Character-defining Element

Material

Form

Location

Spatial configuration

Surface

.....

Preservation of cultural significance

Preservation of character defining elements

Preservation of historic fabric

With the implementation of a measure the preservation of the historic fabric must be guaranteed. An unavoidable loss of fabric is only acceptable, if it contributes to the maintenance of the monument.

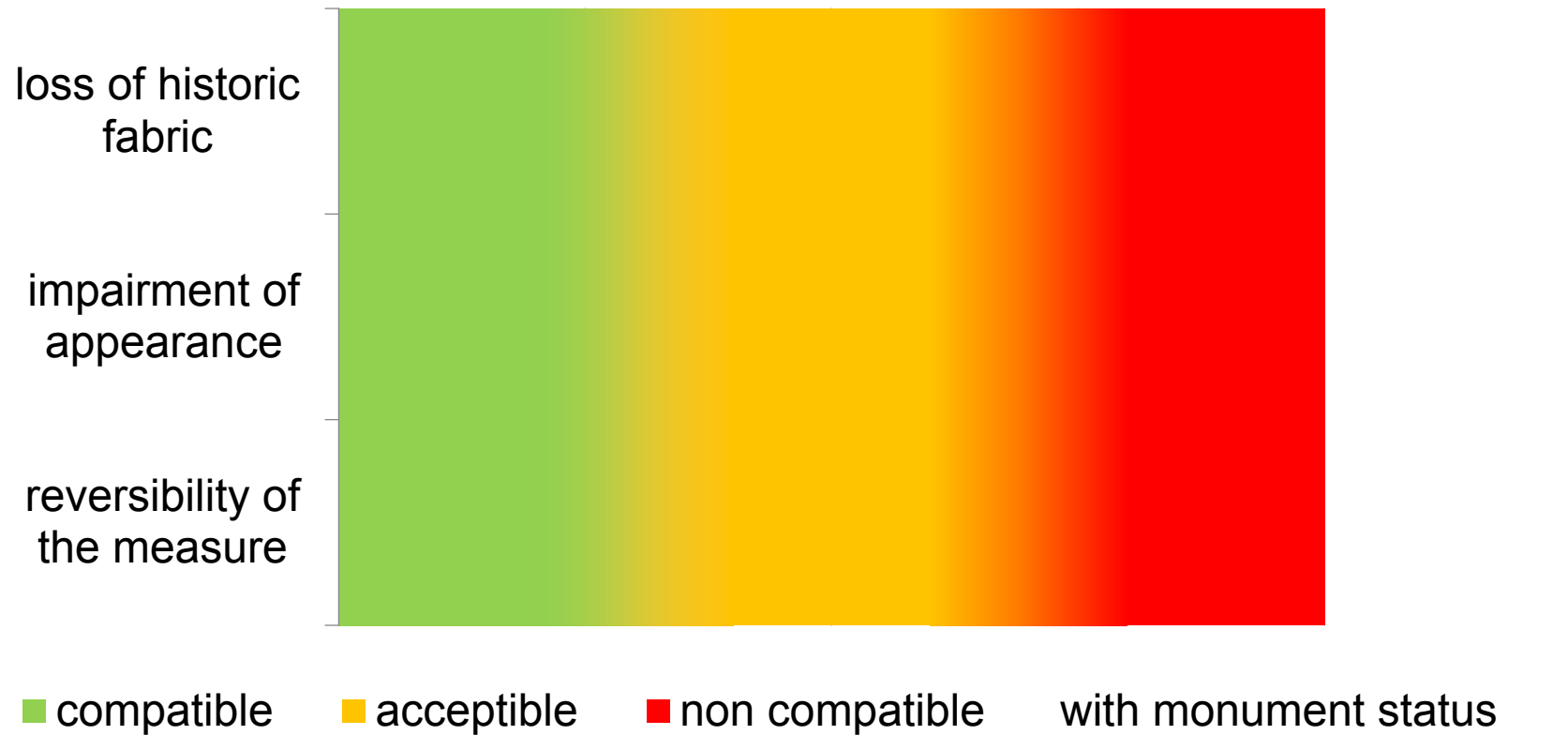
Preservation of the appearance

The identification of a monument is closely linked with its appearance. The surfaces have to keep with their historical message.

Reversibility of the measure

Capability of dismantling without damages.

Interventions



- Shape and Design
the Art History Value
- Use, Function, Tradition
the Historical Value
- Techniques
Heritage as Scientific Source
- Location and Setting
Urbanistic Value

Substance	Apparence	Reversibility
++	++	++
+	++	+
++	+	++
+	++	+

Questions

the conservator will ask

Questions the conservator will ask



- For which category/type of building is the measure applicable/not applicable?
(residential buildings; exhibition buildings; detached farmhouse; terraced buildings of the 19th century; ...)
- For what type of construction is the measure applicable/not applicable?
(insulation for natural stone masonry; internal insulation for timber framed walls; coated panes for single glazing windows; ...)
- Will the historical energy system be altered?
(a warm roof is changed to a cold roof; air tightness of the windows; warming source on the outside instead on an inner wall....)

Questions the conservator will ask



- Which parts of the surface will be affected? How can the new surface adapt to the historical one?

(Design of ventilation openings on the façade; demounting and replacement of the floor due to under floor heating; what aggregate can be added to a thermal insulation plaster; how can solar panels be adapted to the existing roof; free choice of the floor material above an insulation; ...)

- To what extent will be the historic substance destroyed or affected?

(The historic windows will be destroyed when installing new insulating windows; the attachment of an insulation can lead to dehydration of the masonry; removal of the plaster; drilling holes, preparation of openings; ...)

Questions the conservator will ask



- Is the measure reversible and consequently, are damages to be expected?

(Is it possible to remove subsequently added films of windows without any residue? Do adhesive and chemicals penetrate into the surface? ...)

- What are typical problems of implementation, how serious are they and how often do they occur? How error-prone is the workmanship?

(On thermal insulation composite systems it may lead to attack by rodents and insects and therefore damage to the external shell, which in turn lead to penetration of moisture and cause rot; Have typical structural-physical and structural problems of the historical construction influence to the measure, e.g. has the movement of timber framing effect on the thermal insulation plaster?; Noise pollution by heating or ventilation system; If interior insulation is not complete face-to-face, it may create condensation in the resulting hollow spaces; ...)

Questions the conservator will ask



- Which alternative measures will have similar effects? (Sealing and repair of historic windows instead of installing new windows; interior instead of exterior insulation; ...)
- Are there existing constructions/materials, which the measures are not compatible with? (historical setting mortar could chemically interact with new layers of plaster; ...)
- How durable is the measure and what influences could affect the effectiveness? (insulated windows lose their efficiency by incorrect ventilation behaviour of users; Collapse of plastic material by UV radiation; Cleaning and filter change in ventilation systems; ...)
- What experiences do exist? What long-term experiences do exist? (results from special monitoring projects; historical examples for the modern measure; ...)

Questions the conservator will ask



- What are the expected costs?
- What economical effects can be estimated?
- What is the whole amount of the expected energy retrofit and CO2 reduction?

(possibility of calculation; experienced data, total energy balance; total CO2 balance)

- What problems do exist with the sourcing and disposal of the used material?

(extruded polystyrene foam is not biodegradable; ...)

Questions the conservator will ask



- Which accompanying measures and pre-examinations may be essential?

(in the case of external insulation of the basement may need to accomplish archaeological excavations.; for the attachment of an insulation, the construction of the wall in all its layers has to be clarified.; ...)

- What other measures are not compatible? / What other measures are recommended in combination?

5 Theses

- Also an adequate usage of building can be a solution for energy efficiency. Energy efficiency can also be achieved by users behaviour.

- Solutions with mechanical services and use of renewable energy sources are by experience most compatible with the heritage character of buildings.

- Knowledge about original historic building climate systems can be the ground for solutions with high heritage compatibility.

- To provide total energy balances has to keep a central aim despite all difficulties.

- Every single historic building is an individual case and has to be analyzed exactly and to be planed by experts in this way.

10 basic rules

Austrian guideline “Energieeffizienz am Baudenkmal”.

1. ORIGINAL Oberste Zielsetzung von Denkmalschutz und Denkmalpflege ist die möglichst unveränderte Erhaltung der historisch überlieferten Substanz und Erscheinung. Im Falle notwendiger Veränderungen sind der Vorzustand, die Maßnahmen und der Zustand nach den Eingriffen gemäß denkmalpflegerischen Standards zu dokumentieren.

- 1. THE ORIGINAL Superior Objective of monument conservation is the unchanged preservation of the historic stock and its appearance as far as possible. In the case of necessary changes the pre-existing state, the measures and the state after the measures are to be documented under preservation standards.

2. ANALYSE Viele Baudenkmale weisen eine über die Zeit gewachsene, äußerst heterogene Substanz auf. Im Vorfeld einer Planung ist daher die möglichst vollständige Kenntnis des Bestands sowohl in bautechnischer als auch in bauphysikalischer Hinsicht notwendig.

- 2. ANALYSIS Most of the monuments exhibit a quite heterogeneous constitution grown in time. In the course of the planning a complete knowledge on the stock as well with respect to structurally as with respect to building physics is essential.

3. GESAMTPROJEKT Projekte sollen sich durch eine ganzheitliche Planung auszeichnen und sich nicht auf Einzelmaßnahmen fokussieren. Das Erreichen einzelner flächenbezogener U-Werte oder theoretischer Heizwärmebedarf-Angaben ist nicht zielführend, sondern es muss eine sinnvolle Optimierung des Gesamtenergiehaushalts eines Objekts angestrebt werden.

- 3. OVERALL PROJECT Measures shall be based on a holistic planning and not focus on single actions. The achievement of single U-values or theoretical demands on thermal heat is not adequate. The aim is to reach the sensible improvement of the total energy budget of the building.

4. NUTZERVERHALTEN Die Zielsetzung einer energetischen Sanierung kann nicht auf vorgegebenen Ansätzen wie beim normierten Energieausweis basieren, sondern muss konkret auf die Nutzung und das Nutzerverhalten im Objekt eingehen.

- 4. USER BEHAVIOR The aim of the energetic retrofit shall not be based of specified guidelines like the standardized Energy Performance Certificate, but has to refer to the practical use and the behavior of the user in the specified object.

5. INDIVIDUELL Baudenkmale erfordern Einzellösungen anstelle von Standardrezepten. Dies verlangt von den Beteiligten die Bereitschaft zu einem unter Umständen erhöhten Planungsaufwand, einer verbesserten Qualitätssicherung und verstärkter Kommunikation mit oder zwischen Baufachleuten, Bauherrschaft und Denkmalpflege bis zum Abschluss der Maßnahmen.

- 5. INDIVIDUAL Monuments need individual solutions instead of standard formulations. This asks all parties involved the readiness of probably increased planning efforts, an improved quality assurance and intensified communication with and between expert, owner, investor and monument preservation until the termination of the measures.

6. INSTANDSETZUNG Als erster Schritt sind Fehlerquellen am Baudenkmal zu erheben, Reparaturen auszuführen und ursprüngliche Funktionskonzepte zu reaktivieren, um das Potential der historischen Substanz wieder zur Geltung zu bringen. Erst wenn die Möglichkeiten einer Instandsetzung ausgeschöpft sind, wird über eventuelle Ergänzungen oder Auswechslungen entschieden.

- 6. REPAIRS The first step is to look for sources of errors on the monument, do repairs and reactivate original functions to promote the historic ideas. No until the chances of restoration exploited one may decide on amendments or exchanges.

7. MATERIALKONFORM Notwendige Ergänzungen im Zuge energetischer Verbesserungen sind in der Materialität möglichst konform mit dem überlieferten Bestand auszuführen.

- 7. MATERIAL ACCORDANT Necessary amendments in the course of energetic improvements have to be accordant to the existing materials.

8. FEHLERTOLERANT Da man sowohl in der Herstellung als auch in der Benutzung erfahrungsgemäß keine idealen Zustände vorfindet, sind fehlertolerante, reparaturfähige bzw. reversible Konstruktionen vorzuziehen.

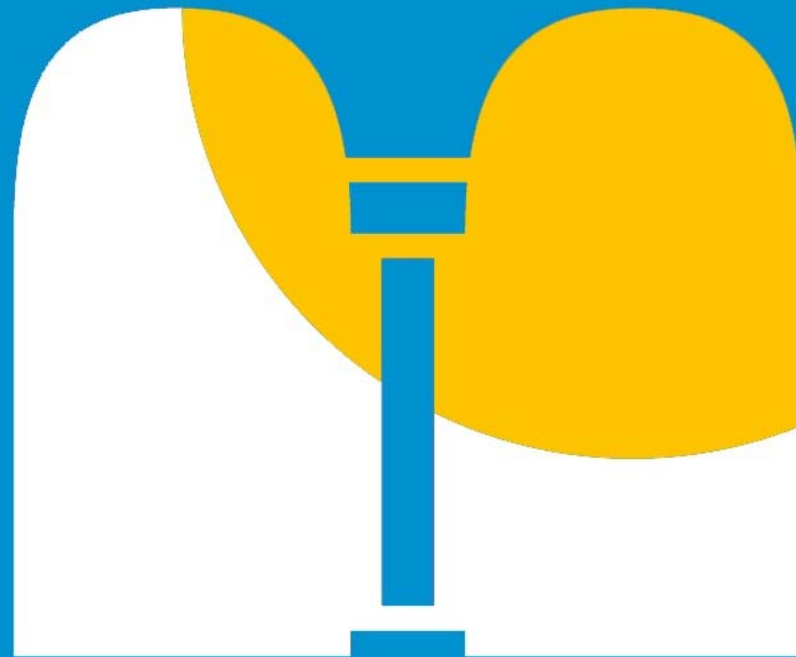
- 8 FAULT TOLERANT Given the fact that as well in production as in use there is never ideal conditions fault tolerant, repairable and reversible constructions are preferred.

9. RISIKOFREI Eine langjährige Schadensfreiheit ist zu gewährleisten. Die Beteiligung von BauphysikerInnen mit einschlägiger Erfahrung im Umgang mit der Sanierung von Baudenkmalen ist hierzu oft notwendig. Neuerungen beziehungsweise Versuche sind am Baudenkmal ausschließlich dann vertretbar, wenn sie im Rahmen eines wissenschaftlichen Projekts begleitet werden. Ansonsten gilt für alle Maßnahmen: lieber weniger und sicher – als viel und riskant.

- 9. RISK FREE A long standing damage freeness is to guaranteed. For this often the participation of experts in building physics with major experience in monument conservation is necessary. Innovations and experiments on monuments are solely justifiable if this is included in serious scientific projects. In other respects it is imperative: better less and save - than much and risky.

10. WEITBLICK Maßnahmen am Denkmal reihen sich in eine schrittweise Optimierung im Laufe der vergangenen Jahrhunderte ein. Eine Erhaltung erfordert von allen Beteiligten einen über die allgemeine Haftung oder Amortisationszeit hinaus gehenden Weitblick.

- 10. FAR-SIGHTEDNESS/VISION Measures on a monument queue in a stepwise development of the former centuries. Preservation forces all participants a vision beyond liability or time of depreciation.



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