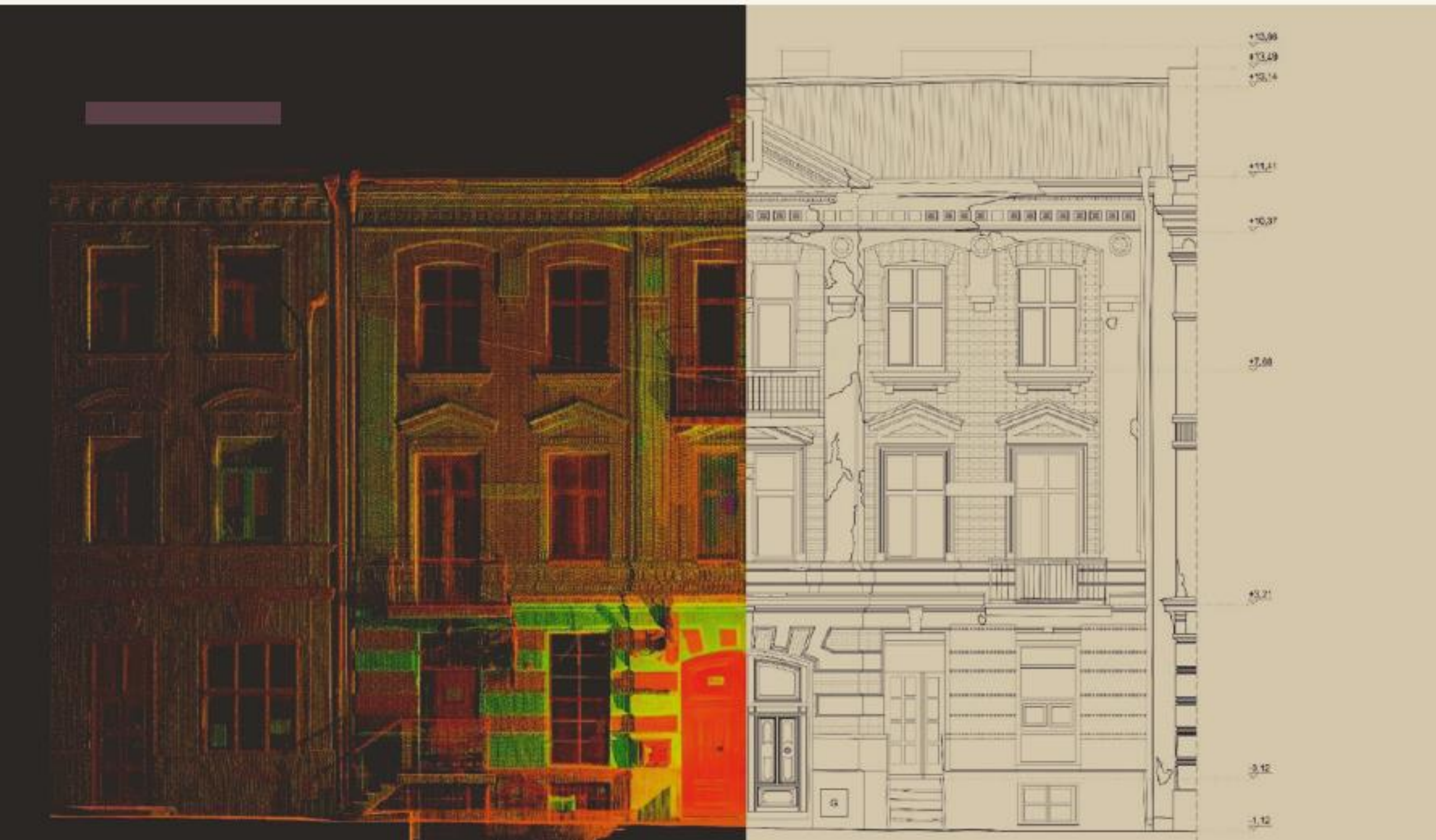
The Sheet of the Technical Condition Assessment for the Historic Building

Universal survey of historic object, supporting H-BIM modelling



The Sheet of the Technical Condition Assessment for the Historic Building

Universal survey of historic object, supporting H-BIM modelling

Developed within the project

HERITAGE BIM

Heritage BIM - enhancing digital competences of students of Architecture

by the consortium:

- **Politechnika Lubelska, Poland**
- **Politecnico di Milano, Italy**
- **Vysoke Uceni Technicke v Brne, Czech Republic**
- **BOSCO studio, Poland**
- **Harpaceas, Italy**
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1. INTRODUCTION

Documenting heritage buildings is one of the forms of their protection. Currently, documentation of construction objects is increasingly created in BIM technology. Many buildings erected earlier, including mainly historic buildings, do not have documentation in this technology. The premise of the Universal Survey of Historic Building is to systematize the method of collecting data so that it can be used later to create a BIM model. Currently, there are no such standards. The creation of such a document will allow for faster and more accurate collection of data that will be helpful in creating a BIM model.

The premise of the document is to help various groups. The document can be used by experts as well as students, engineers and facility managers. The transparent form of the document and the way of filling it in allows its use by everyone. To create basic models in BIM technique, in addition to knowledge of BIM software, you will need basic knowledge in the field of historic building and construction. Such knowledge can be gained during trainings, courses, as well as through experience while working on a historic building.

Another assumption of the document is such a form that not always the same person completes the form and creates a BIM model. The survey is a note from the site inspection, but in such a form that it can be passed on to another group responsible for the BIM model. Based on the data contained in the survey, experts working in the BIM environment will be able to supplement the data on the materials used, their historical value and their state of preservation. The creation of such a model, in addition to the educational value, is of huge value in the protection of historic buildings. Each work on a historic building and the creation of documentation of a historic building is a certain way of preserving it for future generations.

Currently, there are national and European standards for determining the state of preservation of objects. In the presented document, a mixture of different types of forms was made to make it clear and complete. The following document will contain the information necessary to create a BIM model of a historic object.

For example, the Universal Survey of Historic Object was completed in section 3.3.

2. BASIC INFORMATION

The primary purpose of the survey is to create a document that allows for the collection of information necessary to create a comprehensive H-BIM model for a historic object. Due to the individual nature of almost every historic building, it is very difficult to have one, universal survey template. The survey was created with a view to its editing and expansion (adding new information).

The survey contains basic information about the object and basic information on its particular elements. The description of each element is divided into 3 main parts:

- element description – basic element data to assist in creating a valid and usable H-BIM model,
- historical value – information concerning both the historical value and legal protection of the element itself and the construction phase in which it was created,
- technical condition – determination of the type and extent of the element damage.

On the basis of information gathered in the survey and field measurements made with traditional methods or modern inventory techniques, it will be possible to create a comprehensive H-BIM model containing not only the basic geometric data of the object but enriched with legal and technical aspects important from the point of preservation of the historic object.

The survey was created in a standard similar to the one proposed in *EN 16096:2012 Conservation of cultural property - Condition survey and report of built cultural heritage.*

Type of facility	Type of facility
Address of the facility	Address of the facility
Date of origin	Date of origin
Phases of facility construction	Phases of facility construction – the division into construction phases will allow more efficient valuation of historical elements
Legal protection of the facility	Whether the object is legally protected as a monument.

3. DESCRIPTION OF THE OBJECT

Performing the correct description of the object is related to its proper recognition. Correct recognition of the object involves a number of activities:

- site inspection and study of the facility documentation,
- making photographic documentation,
- making inventory measurements,
- making outcrops,
- gathering information and taking notes.

All these activities will allow for the correct recognition of the object. The information obtained during the site visit and the documentation study will allow for the determination of the phases of the facility expansion. Photographic documentation is a way of presenting the object and its technical problems. The use of various measurement techniques will allow you to recreate the geometry of the object. The outcrops will confirm material solutions. Collecting all this information will allow you to create a H-BIM model of the object.

In the case of historic buildings, an equally important aspect is the assessment of their technical condition. In order to perform a proper assessment of the technical condition, a number of tests and outcrops should be carried out in addition to the local inspection. All information regarding the technical condition should be recorded and then presented in the H-BIM model.

The technical condition assessment guide can be found in EN-16096. This manual distinguishes the classification of the object depending on the technical condition, necessity of repairs and their scale. The classification and commentary are presented in the table below:

Table 1 Classification according to EN-16096

Condition class (CC)	Symptoms
CC0	No symptoms
CC1	Minor symptoms
CC2	Moderately strong symptoms
CC3	Major symptoms
Urgency class (UC)	Symptoms
UC0	Long term
UC1	Intermediate term
UC2	Short term
UC3	Urgent and immediate

Recommendation class (RC)	Possible measures
RC0	No measures
RC1	Maintenance/Preventive conservation
RC2	Moderate repair and/or further investigation
RC3	Major intervention based on diagnosis

In addition to the visual assessment and measurements, a number of tests and outcrops will be required for proper technical assessment.

All works on a historic building must be notified and approved by the public Conservator of Monuments.

The outcrops are essentially non-destructive or semi-destructive. The outer layers (plaster) are removed, as a rule, the non-original ones, or the deep layers (boreholes), but then the surface is minimized. Always make sure that these layers are not subject to conservation protection before removing the top layers in order to expose the structure. The making of outcrops should be documented by drawing and photography.

There are different types of outcrops:

- point (wells)
- linear (cuts, furrows, linear excavations)
- surface (forgings, exposures, excavations)

Research on objects also includes:

- puncturing (with a knife blade, a skewer)
- loosening (with a knife blade)
- tapping (with a rubber hammer)

When making outcrops of ceilings, attention should be paid not only to construction materials, the method of supporting on walls or other construction elements, but also to non-construction materials (e.g. slab), which may also indicate the originality and age of the structure.

In the case of walls, most often (it is the most justified) surface excavations should be made in the corners of the walls and above the doors. The outcrop above the door or window will allow to determine the material, technology and type of lintels as well as the method of supporting the ceilings and the presence or not of the rims. The outcrop in the corner will allow the simultaneous examination of two walls with a slightly larger test area, and will also allow for an analysis of the method of joining these walls.

Type of outcrop	Type of information	Performing the test
Point outcrops	We can check: • homogeneity of the material (full depth or not full depth) • type of material (incomplete depth) • continuity of the partition (full depth) • partition thickness (full depth)	We perform the test using a drill with a drill of the appropriate type (for concrete, brick, wood, steel) and of the appropriate length. • while drilling, observe the drill cuttings (colour, type, humidity). This will allow us to determine the material of the element we are testing • we perform drilling with a constant force by analysing the size needed to drill through

		individual parts of the material (this will allow you to roughly assess the quality of the material) • we note (if it occurs) the abrupt nature of the drill's work, including noting the current depth of the borehole (this will allow us to approximate the homogeneity of the material, detect voids or change the material)
Linear outcrops	The purpose of the linear opencasts is to test repeating elements (e.g. stirrup reinforcement in reinforced concrete beams) or they are of a pilot nature before making surface or other outcrops (e.g. forging a groove until a bearing beam is encountered).	• the test is performed using a hammer drill with an appropriate tip, or manually. They should be preceded by manual cutting of the tested material in order to reduce the zone of damage.
Surface outcrops	In historic buildings, surface excavations for walls and ceilings are the most common. On their basis, we can define: • technical condition of the structure (preservation) • type of material • manufacturing technology • originality or redundancy of the solution	• Removal of successive layers of an element using hand or mechanical tools.

	• the age of the element	
Exposing	Excavations and drilling in the ground concern the exposure of the foundation walls and the foundations themselves. Their purpose is to determine the type of foundations and foundation walls and the method of their insulation, and the type and condition of the ground nearby.	• Removal of successive layers of an element using hand or mechanical tools.

It may be necessary to perform in situ tests and laboratory tests to complete the assessment of the technical condition. The scope of research on the structure of the facility will depend on its specificity.

3.1. Roof and attic

The roof is a very important element of any construction object. As a result of its damage, the remaining parts of the building are often destroyed. Additionally, as a building element, it consists of a large number of parts. Not only the elements of the roof structure are important, but also the finishing elements.

In order to properly create a H-BIM model of this part of the building, it is necessary to perform detailed inventory and assessment of the technical condition. The inventory will include the recognition of the geometry and materials of individual elements. In the case of the assessment of the technical condition, it will be a detailed assessment resulting from visual inspection and in situ tests or laboratory tests.

The universal survey shows the basic elements of the roof. If necessary, the universal survey can be expanded. We should fill in information on the geometry of the elements, the material they are made of, the historic value and technical condition.

The technical condition of the elements is additionally assessed taking into account the standard described in chapter 3. In the case of roof truss structures, in addition to mechanical and structural damage, the most common type of damage is biological corrosion.

3.1.1. Structure

Structure	Element description	Historical value	Technical condition
Rafters	Height: Width: Material: Spacing:	yes/~~no~~ construction phase:	Classification according to EN-16096: CC: …, UC:…, RC… Biological corrosion: pieces or percentage Mechanical damage: pieces or percentage Structural damage: pieces or percentage
Purlins	Height: Width: Material:	yes/~~no~~ construction phase:	Classification according to EN-16096: CC: …, UC:…, RC… Biological corrosion: Mechanical damage: Structural damage:

Mayflies	Height: Width: Material:	yes/~~no~~ construction phase:	Classification according to EN-16096: CC: …, UC:…, RC… Biological corrosion: Mechanical damage: Structural damage:
Stool frame	Height: Width: Material:	yes/~~no~~ construction phase:	Classification according to EN-16096: CC: …, UC:…, RC… Biological corrosion: Mechanical damage: Structural damage:
Base purlins	Height: Width: Material:	yes/~~no~~ construction phase:	Classification according to EN-16096: CC: …, UC:…, RC… Biological corrosion: Mechanical damage: Structural damage:

3.1.2. Finishing elements

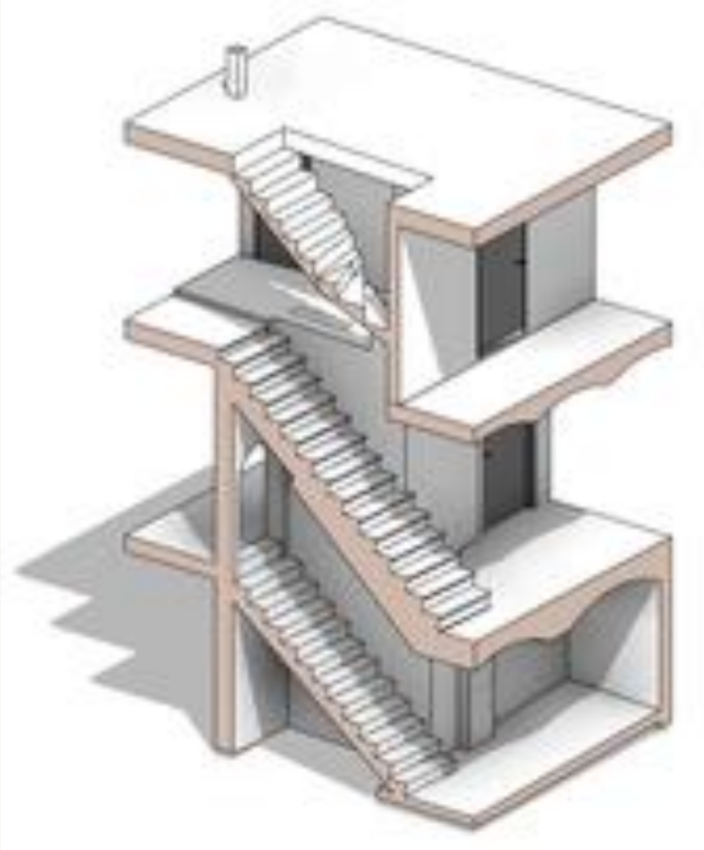
Finishing elements	Element description	Historical value	Technical condition
Knee walls	Material: Layers: Height: Width:	yes/~~no~~ construction phase:	Classification according to EN-16096: CC: …, UC:…, RC… Biological corrosion: percentage Mechanical damage: percentage Structural damage: percentage
Roof covering	Material: Colour:	yes/~~no~~ construction phase:	Classification according to EN-16096: CC: …, UC:…, RC… Biological corrosion: Mechanical damage:
Roof sheathing	Type: Height: Width: Spacing:	yes/~~no~~ construction phase:	Classification according to EN-16096: CC: …, UC:…, RC… Biological corrosion: Mechanical damage: Structural damage:

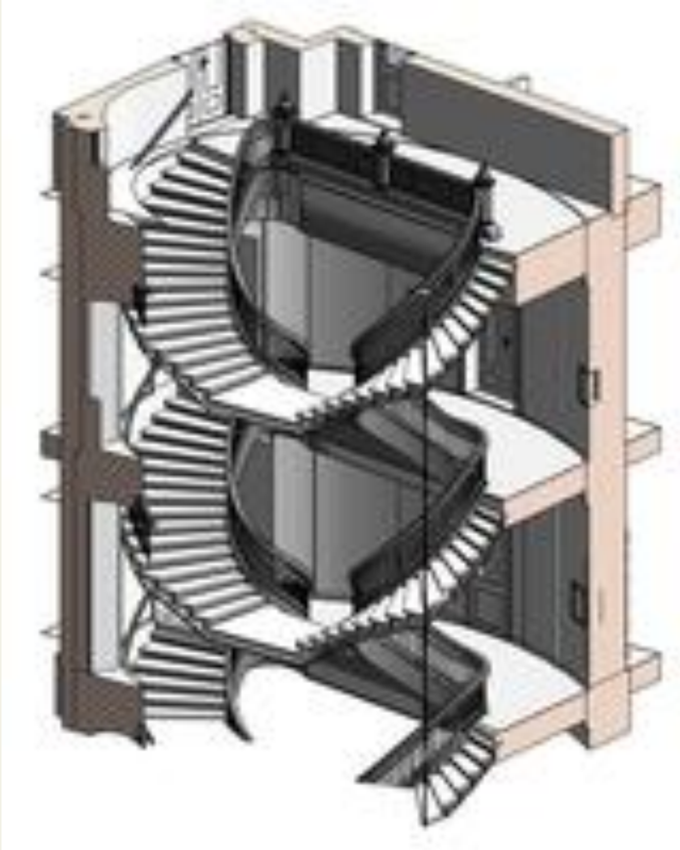
Gutters and downpipes	Material: Colour: Geometry:	yes/~~no~~ construction phase:	Classification according to EN-16096: CC: …, UC:…, RC… Biological corrosion: Mechanical damage
Flashings	Material: Colour: Width:	yes/~~no~~ construction phase:	Classification according to EN-16096: CC: …, UC:…, RC… Biological corrosion: Mechanical damage
Thermal insulations	Thickness: Material:	yes/~~no~~ construction phase:	Classification according to EN-16096: CC: …, UC:…, RC… Mechanical damage

3.2. Staircase

Staircases are a very important element of the building. Due to usage and the changing requirements for evacuation and fire protection, staircases are often replaced. It is very important to recognize in the building whether the staircase is historical or secondary. Staircases, apart from communication, often has an important structural role in the building - stiffening the structure.

This chapter lists all the elements of both the construction and finishing of staircases. Mechanical damage is frequent damage to staircases. Biological corrosion and structural damage occur much less frequently.





Parameters of stairs that are not included in the list can easily be added in the BIM software.

3.2.1. Structure

Structure	Element description	Historical value	Technical condition
Runs: Risers	Material: Timber Layers: none Height: 15cm Length: 150cm Width: 5cm	yes/~~no~~ construction phase: 1	Classification according to EN-16096: CC: …, UC:…, RC… Biological corrosion: none Mechanical damage: none Structural damage: none
Runs: Treads	Material: Timber Layers: none Depth: 35cm Length: 150cm Width: 5cm	yes/~~no~~ construction phase: 1	Biological corrosion: none Mechanical damage: none Structural damage: none

Landings	Material: Timber Layers: none Height: 15cm Length: 150cm Width: 300cm	yes/~~no~~ construction phase: 1	Biological corrosion: none Mechanical damage: none Structural damage: none
Staircase walls	Material: ceramic brick on lime mortar Layers: brick wall + plaster Height: approx.. 6m Width: 50cm	yes/~~no~~ construction phase: 1	Biological corrosion: Mechanical damage: Structural damage:
Wall Stringers	Material: Timber Layers: none Height:15cm Width: 2cm	yes/~~no~~ construction phase: 2	Biological corrosion: none Mechanical damage: none Structural damage: none
Cantilevers Not applicable	~~Material:~~ ~~Layers:~~	~~yes/no~~ ~~construction phase:~~	~~Biological corrosion:~~ ~~Mechanical damage:~~

	~~Height:~~ ~~Width:~~		~~Structural damage:~~
Carriage	Material: timer Layers: none Height: 30cm Width: 5cm Length: 3 m	yes/~~no~~ construction phase: 1	Biological corrosion: none Mechanical damage: none Structural damage: none

3.2.2. Finishing elements

Finishing elements	Element description	Historical value	Technical condition
Staircase finishing	Material: Timber Layers: Paint Color: Dark brown	~~yes/~~no construction phase: 3	Biological corrosion: none Mechanical damage: 30% of the surface

Staircase balustrades: handrail	Material: Timber	yes/~~no~~ construction phase: 1	Biological corrosion: none Mechanical damage: none
Staircase balustrades: newels	Material: Timber	yes/~~no~~ construction phase: 1	Biological corrosion: none Mechanical damage: none
Staircase balustrades: balluster	Material: Timber	yes/~~no~~ construction phase: 1	Biological corrosion: none Mechanical damage: none
Nosing Not applicable	~~Material:~~	~~yes/no~~ ~~construction phase:~~	~~Biological corrosion:~~ ~~Mechanical damage:~~
Plasters	Material: Lime plaster Thickness: 2cm	yes/~~no~~ construction phase: 2	Biological corrosion: 15% of the surface Mechanical damage: none Structural damage: 2 running meters of cracks
Paint layers	Material: Paint Color: White	~~yes~~/no construction phase: 3	Biological corrosion: 35% of the surface

			Mechanical damage: none Structural damage: 10 running meters of cracks
Door joinery Not applicable	~~Material:~~ ~~Type:~~ ~~Geometry: according to the sketch in appendix~~	~~yes/no~~ ~~construction phase:~~	~~Biological corrosion:~~ ~~Mechanical damage:~~
Window joinery Not applicable	~~Material:~~ ~~Type:~~ ~~Geometry: according to the sketch in appendix~~	~~yes/no~~ ~~construction phase:~~	~~Biological corrosion:~~ ~~Mechanical damage:~~

3.3. Storey (example)

The most extensive part of the study. All elements of construction and finishing of the storey will be described. Depending on the character of the object (open object in the form of a ruin or roofed object), external walls can be described separately. Their internal layers can be included in the storey description and external layers in the elevation description. This will be a considerable simplification. For open forms of historic buildings, it is recommended to make the description of walls in the Storey subsection.

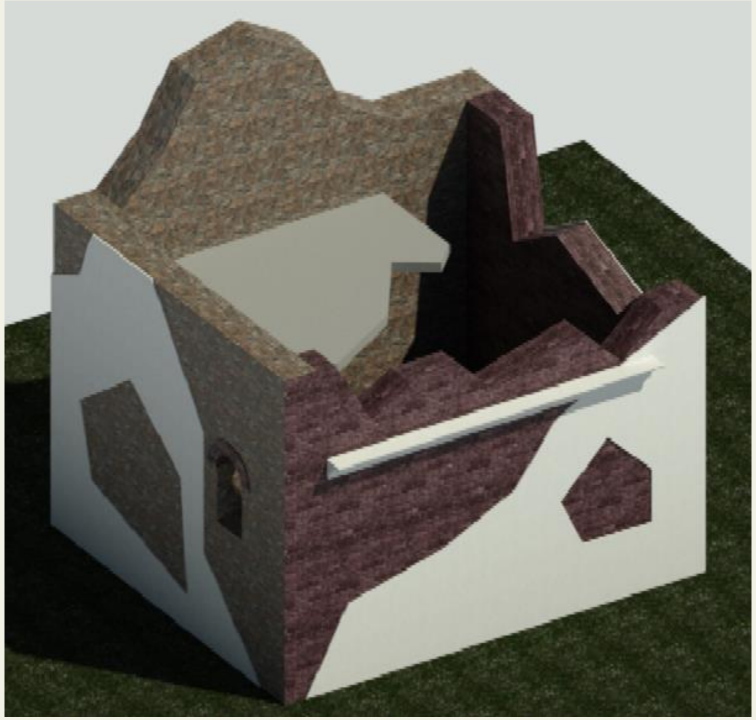


Figure 1 Example model of historic storey

3.3.1. Structure

Structure	Element description	Historical value	Technical condition
Walls			
North wall	Material: natural stone with lime mortar Layers: stone wall + plaster Height: approx. 5m Width: 0.65m	Historical value: yes Construction phase: 1	Classification according to EN-16096: CC: 1, UC:2, RC3 Biological corrosion: 10% of the surface Mechanical damage: none Structural damage: none
South wall	Material: ceramic brick with lime mortar Layers: brick wall + plaster Height: approx. 5m Width: 0.50m	Historical value: yes Construction phase: 2	Classification according to EN-16096: CC: 1, UC:2, RC3 Biological corrosion: 20% of the surface Mechanical damage: 10% of the surface Structural damage: 5 running meters of cracks
East wall	Material: ceramic brick on lime mortar	Historical value: yes Construction phase: 2	Classification by EN-16096: CC: 0, UC: 0, RC2 Biological corrosion: none

	Layers: brick wall + plaster Height: approx. 5 m Width: 0.50m		Mechanical damage: none Structural damage: none
Western wall	Material: natural stone on a lime mortar Layers: stone wall + plaster Height: approx. 5 m Width: 0.50m	Historical value: yes Construction phase: 1	Classification according to EN-16096: CC: 1, UC:2, RC3 Biological corrosion: 5% of the surface Mechanical damage: 15% of the surface Structural damage: 10 running meters of cracks
Lintels Curved lintel of the west wall.	Material: ceramic brick on lime mortar Geometry: arc, 0.50m radius	Historical value: yes Construction phase: 1	Classification by EN-16096: CC: 0, UC: 2, RC2 Biological corrosion: none Mechanical damage: none Structural damage: none
Ceilings	Material: reinforced concrete structure Layers: none Height: 0.15m	Historical value: yes Construction phase: 3	Classification by EN-16096: CC: 0, UC: 2, RC3 Biological corrosion: none Mechanical damage: none Structural damage: none

3.3.2. Finishing elements

Finishing elements	Element description	Historical value	Technical condition
Flooring Not applicable	~~Material:~~ ~~Layers:~~	~~yes/no~~ ~~construction phase:~~	~~Biological corrosion:~~ ~~Mechanical damage~~:
Plasters			
Plastering of the north wall	Material: Lime plaster Thickness: 1.5cm	Historical value: yes Construction phase: 2	Classification according to EN-16096: CC: 1, UC:2, RC3 Biological corrosion: 20% of the surface Mechanical damage: 10% of the surface Structural damage: 5 running meters of cracks
Plastering of the south wall	Material: Lime plaster Thickness: 1.5cm	Historical value: yes Construction phase: 2	Classification according to EN-16096: CC: 1, UC:2, RC3 Biological corrosion: 20% of the surface Mechanical damage: 10% of the surface Structural damage: 5 running meters of cracks

Plastering of the eastern wall	Material: Lime plaster Thickness: 1.5cm	Historical value: yes Construction phase: 2	Classification according to EN-16096: CC: 1, UC:2, RC3 Biological corrosion: 20% of the surface Mechanical damage: 10% of the surface Structural damage: 5 running meters of cracks
	Material: Lime plaster Thickness: 1.5cm	Historical value.: no Construction phase: 4	Classification according to EN-16096: CC: 0, UC:0, RC0 Biological corrosion: 10% of the surface Mechanical damage: none Structural damage: none
Plastering of the western wall	Material: Lime plaster Thickness: 1.5cm	Historical value.: yes Construction phase: 2	Classification according to EN-16096: CC: 1, UC:2, RC3 Biological corrosion: 20% of the surface Mechanical damage: 10% of the surface Structural damage: 5 running meters of cracks
Paint layers	~~Material:~~	~~yes/no~~	~~Biological corrosion:~~

Not applicable	~~Layers:~~	~~construction phase:~~	~~Mechanical damage:~~
Wall coverings Not applicable	~~Material:~~ ~~Layers:~~	~~yes/no~~ ~~construction phase:~~	~~Biological corrosion:~~ ~~Mechanical damage:~~
Door joinery Not applicable	~~Material:~~ ~~Type:~~ ~~Geometry: according to the sketch in appendix~~	~~yes/no~~ ~~construction phase:~~	~~Biological corrosion:~~ ~~Mechanical damage:~~
Window joinery Not applicable	~~Material:~~ ~~Type:~~ ~~Geometry: according to the sketch in appendix~~	~~yes/no~~ ~~construction phase:~~	~~Biological corrosion:~~ ~~Mechanical damage:~~
Cornice	Material: Gypsum Geometry: according to the sketch	Historical value.: no Construction phase: 3	Classification by EN-16096: CC: 0, UC: 0, RC0 Biological corrosion: none Mechanical damage: none Structural damage: none

3.4. Facade

The universal survey decided to describe the building facade separately. This is due to the fact that in the case of description and technical assessment of buildings, the facade is accessible. The facade wall can be treated as a whole. In the case of description and evaluation of technical condition, this should always be compared with the interior wall sections. The most common damage to the facade is mechanical damage and biological corrosion in the lower parts of the walls and structural damage, depending on the way in which the building is destroyed.

3.4.1. Structure

Facade wall construction	Element description	Historical value	Technical condition
Walls	Material: Layers: Height: Width:	yes/no construction phase:	Classification according to EN-16096: CC: …, UC:…, RC… Biological corrosion: Mechanical damage: Structural damage:

Lintels	Material: Geometry:	yes/no construction phase:	Classification according to EN-16096: CC: …, UC:…, RC… Biological corrosion: Mechanical damage: Structural damage:

3.4.2. Finishing elements

Finishing elements	Element description	Historical value	Technical condition
Plasters	Material: Layers:	yes/no construction phase:	Classification according to EN-16096: CC: …, UC:…, RC… Biological corrosion: Mechanical damage:
Painting layers	Material: Layers:	yes/no construction phase:	Classification according to EN-16096: CC: …, UC:…, RC… Biological corrosion: Mechanical damage:

Door joinery	Material: Type: Geometry: according to the sketch	yes/no construction phase:	Classification according to EN-16096: CC: …, UC:…, RC… Biological corrosion: Mechanical damage:
Window joinery	Material: Type: Geometry: according to the sketch	yes/no construction phase:	Classification according to EN-16096: CC: …, UC:…, RC… Biological corrosion: Mechanical damage:
Building drainage equipment	Material: Type:	yes/no construction phase:	Classification according to EN-16096: CC: …, UC:…, RC… Biological corrosion: Mechanical damage:

3.5. Foundations (another example of the description)

Another way of describing the elements is allowed. It is presented below.

This section describes the main characteristics that can be identified within historical foundations. In historic buildings there are different types of foundations. Regardless of whether the building is usable or abandoned, foundation structures can be identified according to a precise classification.

	Direct/indirect foundation	Type of foundation	Representation	Notes
1	**Direct**	Continuous	Inverted beam	These are beams drowned in the ground that connect all the foundation plinths to each other. In practice, the structural system of the building under foundation is overturned. These beams drowned in the ground have the shape of an inverted "T". This solution is particularly effective for counteracting differentiated soil sedging and earthquake-proof design.
2	**Direct**	Continuous	Curb	
3	**Direct**	Continuous	Normal	
4	**Direct**	Continuous	straight and reverse arches	

5	**Direct**	Continuous	Plate	• normal • box generally reinforced concrete is a kind of continuous plate that occupies the entire area of construction.
6	**Direct**	Continuous	Floating plate	
7	**Direct**	Discontinuous	Plinths	It is a kind of enlargement of the pillar, of such magnitude as to allocate the load according to the bearing capacity of the land. Enlargement can take different forms: • parallelepepe, • trunk-pyramidal • to the grades • ribs.
8	**Direct**	Discontinuous	Pillars	
9	**Indirect**		Wells	It consisted in the excavation of a well at depths such as to find suitably resistant soil. Subsequently, the well was filled, with concrete cast or masonry, obtaining pylons on which to rest (at the appropriate altitude) the base of the bearing structure. In turn, the pylons could be connected

				to each other by beams or arches that made the system stiffer and more supportive.
10	**Indirect**		Piles	In Concrete or wooden palisade
11	**Indirect**		Foundation on other foundations	
12	**geotechnics**		Soil analysis	

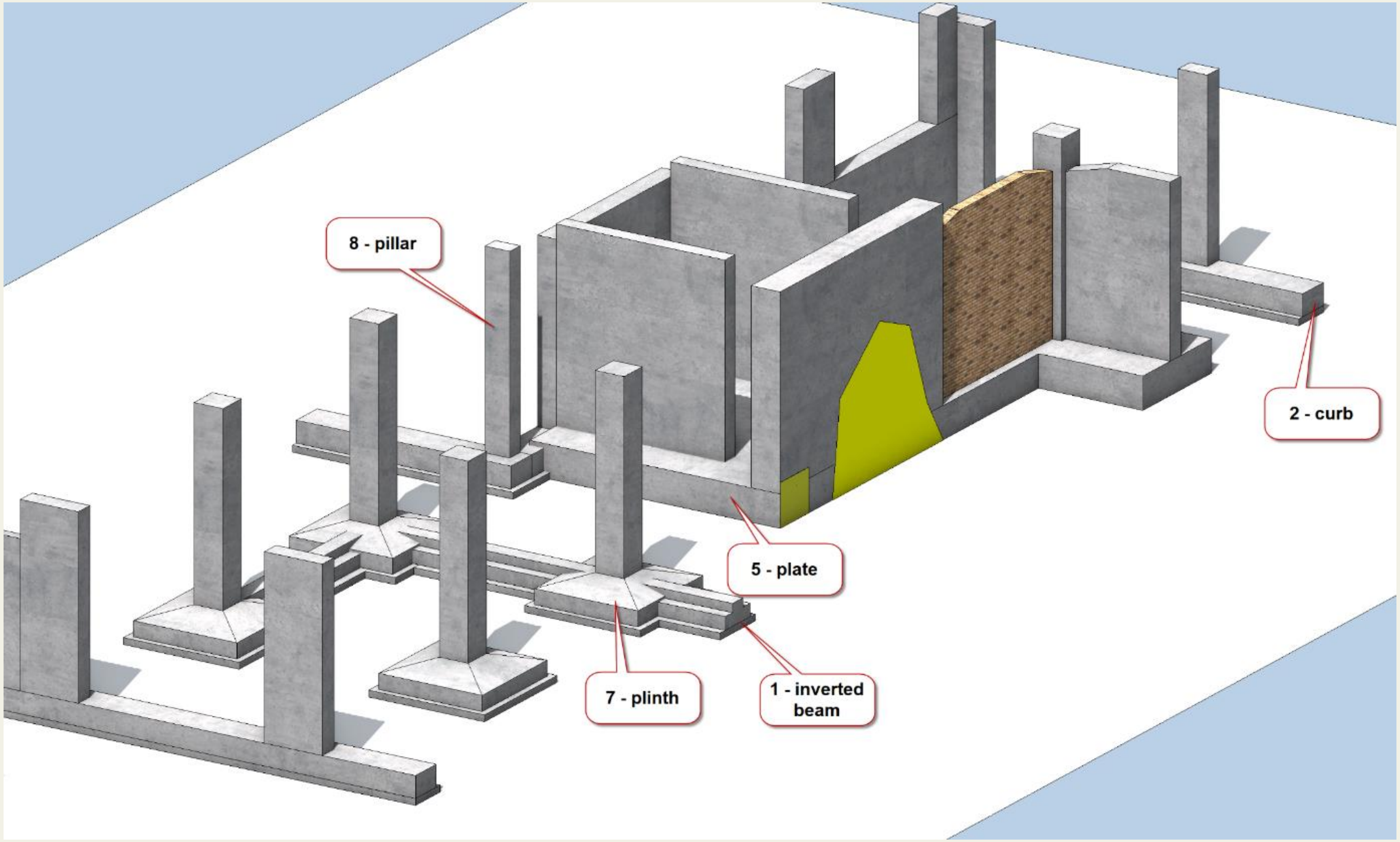


Figure 2 Description of the foundation elements

Attribute list for entries

Data type:

(A) alphanumeric (for example: qwertyuiopasdfghjkl123456789)

(I) integer (for example: 123456789)

(N) number with decimals (for example:1,50)

(D) date (for example: 18/06/2021)

(L) link (for example: https://harpaceas.it/)

Structural elements correspond to the following numbers:

1	2	3	4	5	6	7	8	9	10	11
Inverted beam	**Curb**	**Normal**	**Straight and reverse arches**	**Plate**	**Floating plate**	**Plinths**	**Pillars**	**Wells**	**Piles**	**Foundation on other foundations**

Material (A)	1	2	3	4	5	6	7	8	9	10	11
Concrete											
Squared natural stone											
wood											
Full bricks											
Cls bricks											
Unsquared stone											
Cement concrete											

Layers (A)	1	2	3	4	5	6	7	8	9	10	11
yes											
no											

Height / Width(N)	1	2	3	4	5	6	7	8	9	10	11
In meters											
no											

Historical value (A)	1	2	3	4	5	6	7	8	9	10	11
yes											
no											

Construction phase (I)	1	2	3	4	5	6	7	8	9	10	11
yes											
no											

Condition Class (CC) EN 16096 (A)	1	2	3	4	5	6	7	8	9	10	11
CC0 No symptoms											
CC1 Minor symptoms											
CC2 Moderately strong symptoms											
CC3 Major symptoms											

Urgency Risk Classification (UC) EN 16096 (A)	1	2	3	4	5	6	7	8	9	10	11
UC0 Long term											
UC1 Intermediate term											
UC2 Short term											
UC3 Urgent and immediate											

Recommendation Class (RC) EN 16096 (A)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
RC0 No measures											
RC1 Maintenance / Preventive conservation											
RC2 Moderate repair and/or further investigation											
RC3 Major intervention based on diagnosis											

Biological corrosion (A)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Yes											
no											

Biological corrosion photo archive (L)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
link photo archive											
no											

Mechanical damage (A)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
yes											
no											

Mechanical damage photo archive (L)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
link photo archive											
no											

Lean concrete (A)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Yes											
no											

Height / width lean concrete (N)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
In Meters											
no											

Insulation / sheath (A)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Yes											
no											

Sheath size (N)	1	2	3	4	5	6	7	8	9	10	11
In meters											
no											

Photographic documentation (L)	1	2	3	4	5	6	7	8	9	10	11
Archive link											
no											

Material specimens (L)	1	2	3	4	5	6	7	8	9	10	11
archive link											
no											

Soil analysis (L)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Archive link											
no											

4. SUMMARY AND CONCLUSION

There should be a summary at the end of the document. In this section, we should list the most important observations about the building. If the building contains any particularly valuable historical elements, this should be described. Additionally, in the summary and recommendations section, it is worth listing those elements that require intervention. If there is significant damage that may worsen the condition of the building, write about it in the summary. It is important to describe the general condition and historical value of the building after the technical assessment of the entire building.

The Sheet of the Technical Condition Assessment for the Historic Building

Developed within project

Heritage BIM - enhancing digital competences of students of Architecture

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