

35/20.3.2013



RAASEPORIN LINNA - VAURIOKARTOITUS - MUSEOVIRASTO - SANTINA AMBROSINI-2012

VAURIOITYYPIT



VÄRIMUUTOS

Modification of the material that does not necessarily imply a worsening of its characteristics from the point of view of conservation. For instance, a reversible coating applied on a stone may be considered as an alteration.



PUUTTUVA OSA

Empty space, obviously located in the place of some formerly existing stone part. Protruding and particularly exposed parts of sculptures (nose, fingers..) are typical locations for material loss resulting in missing parts.



KRUSTA

Generally coherent accumulation of materials on the surface. A crust may include exogenic deposits in combination with materials derived from the stone. A crust is frequently dark coloured (black crust) but light colours can also be found. Crusts may have anhomogeneous thickness, and thus replicate the stone surface, or have irregular thickness and disturb the reading of the stone surface details.



SAMMAL-LEVÄ-JÄKÄLÄ

Vegetal organism forming rounded millimetric to centimetric crusty or bushy patches, often having a leathery appearance, growing generally on outside parts of a building. Lichen are most commonly grey, yellow, orange, green or black and show no differentiation into stem, root and leaf.



KITEYTYMÄ

Compact, hard, mineral outer layer adhering to the stone. Surface morphology and colour are usually different from those of the stone.



JAUHOONTUMINEN



HÄRMEITÄ

Generally whitish, powdery or whisker-like crystals on the surface. Efflorescences are generally poorly cohesive and commonly made of soluble salt crystals.



KASVILLISUUTTA

Vegetal living being, having, when complete, root, stem, and leaves, though consisting sometimes only of a single leafy expansion (e.g. Tree, fern, herb).

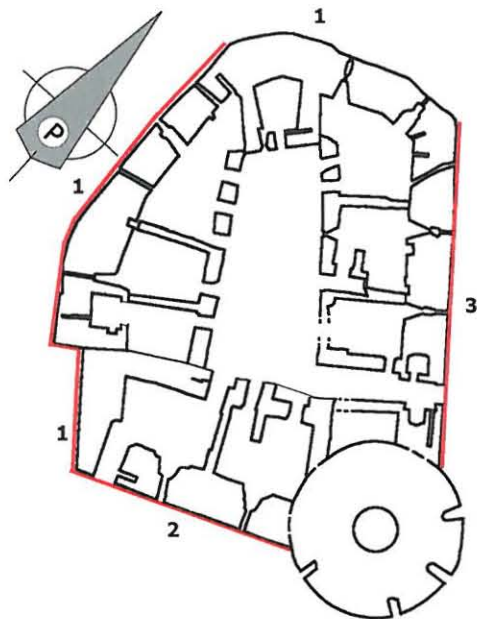


HALKEAMA

Individual fissure, clearly visible by the naked eye, resulting from separation of one part from another.



Julkisivuja ulkopuolella



KITEYTYMÄ



JAUHOONTUMINEN



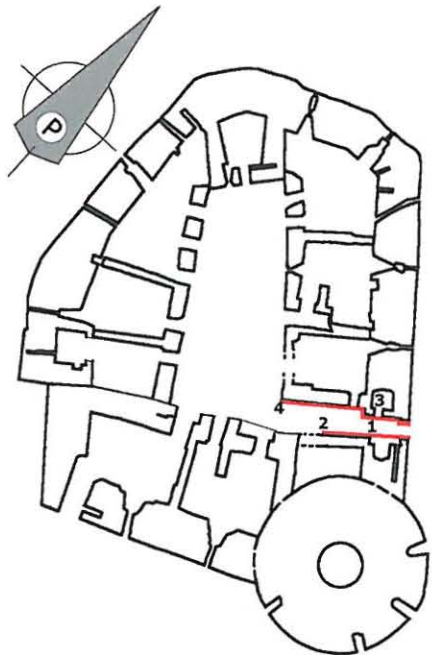
PINTA LIKAANTUNUT



KASVILLISUUTTA



J-sisäänkäytävä



VÄRIMUUTOS



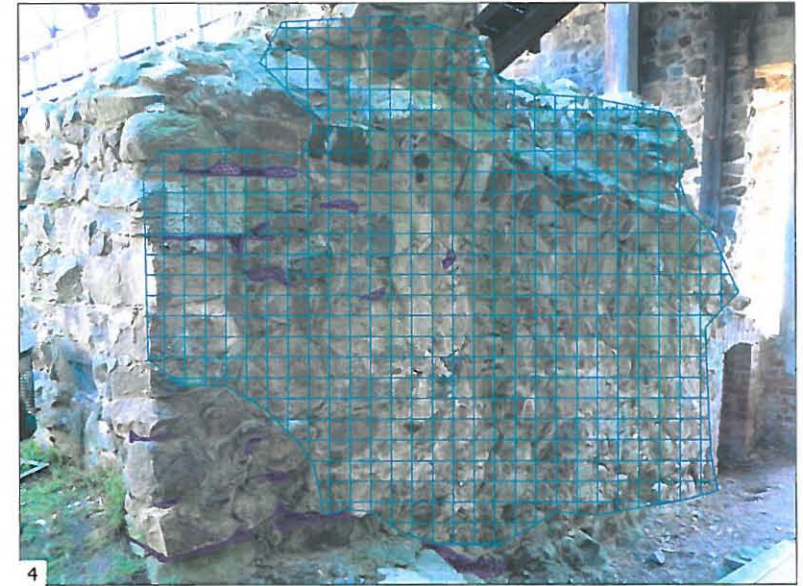
PUUTTUVA OSA



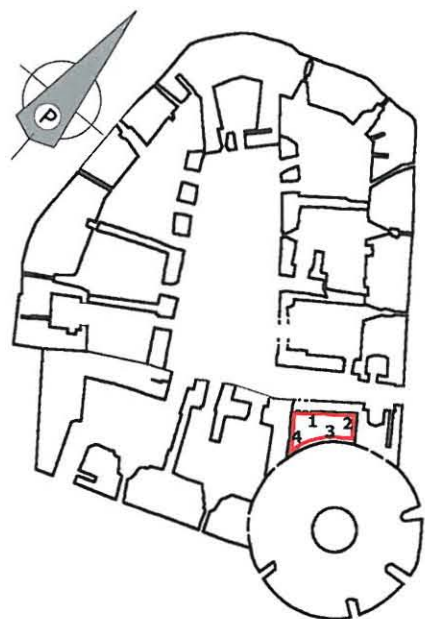
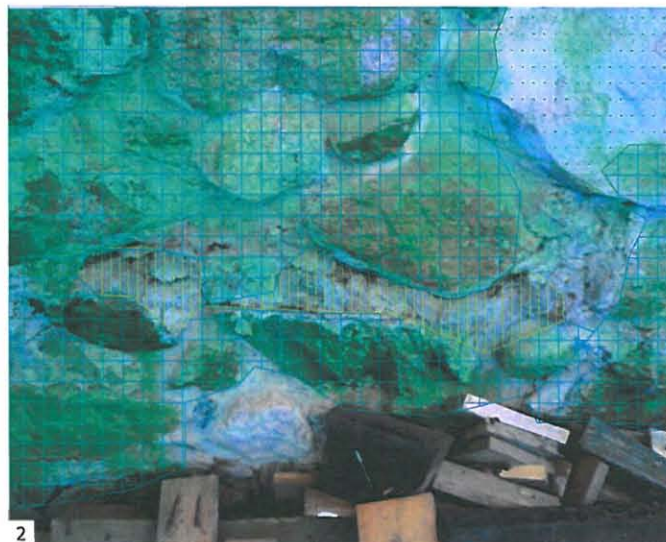
HALKEAMA



JAUHOONTUMINEN



Å huone



VÄRIMUUTOS



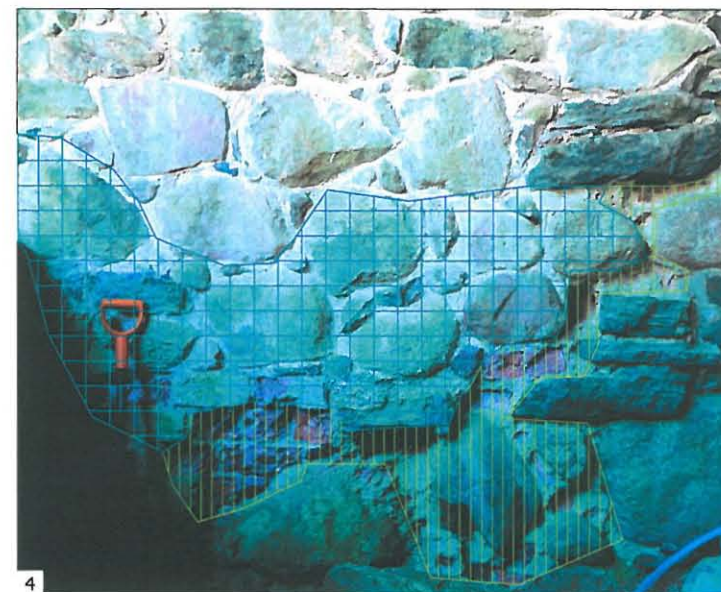
PUUTTUVA OSA



KITEITYMÄ

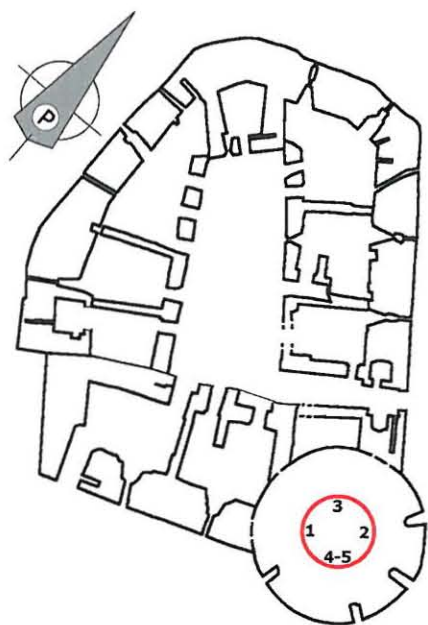


JAUHOONTUMINEN



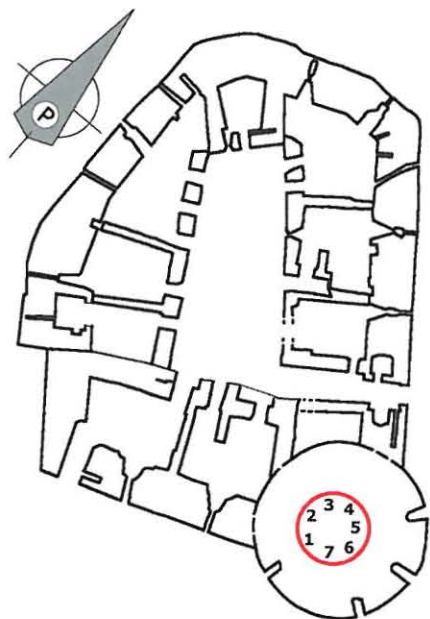
Ä torni

Kellari



Ä torni

II taso



Ä torni

III taso

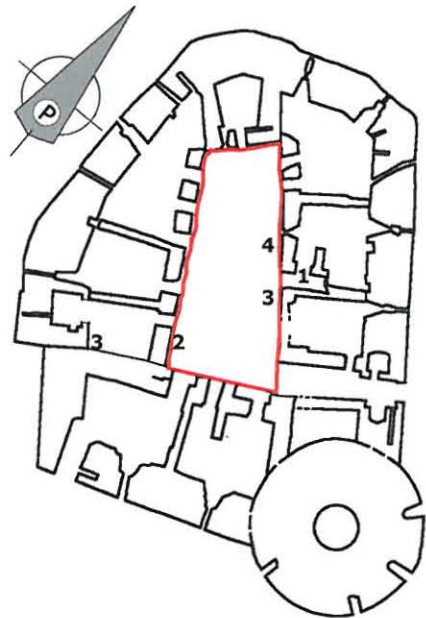


Ä torni

Katto



Sisäpiha



PUUTTUVA OSA



SAMMAL-LEVÄ-JÄKÄLÄ



KITEITYMÄ



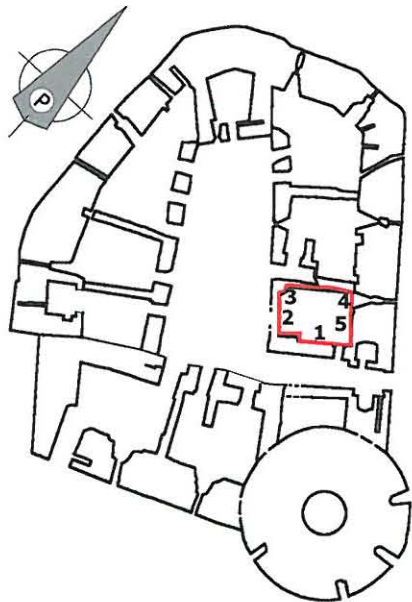
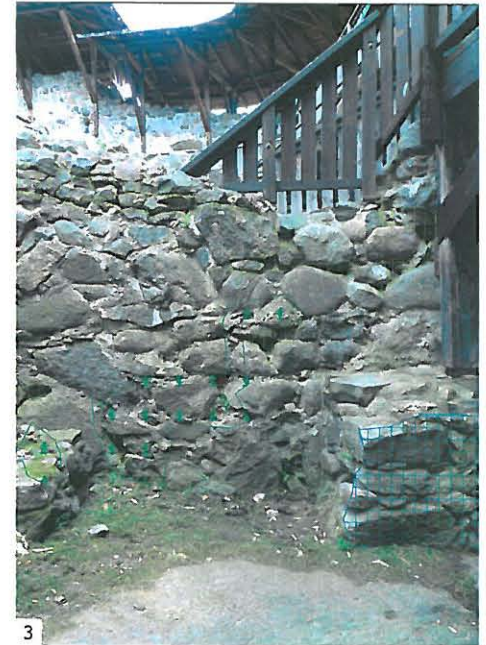
JAUHOONTUMINEN



HALKEAMA



K-huone



VÄRIMUUTOS



KITEITYMÄ



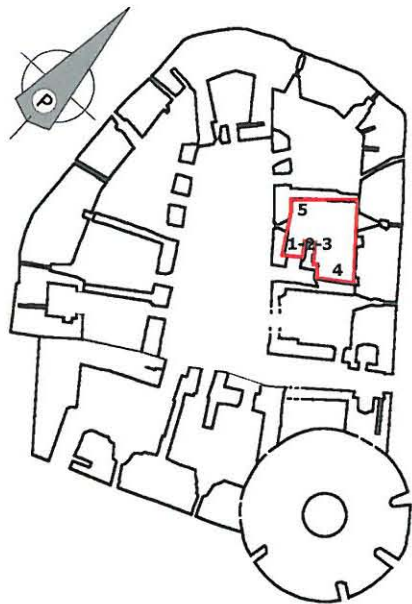
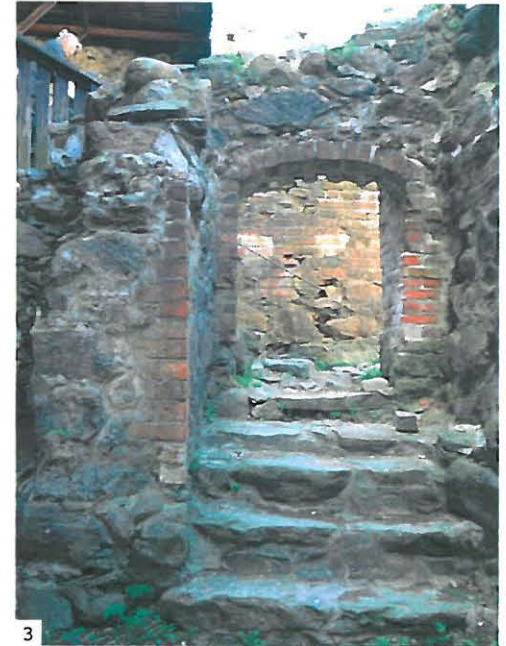
PUUTTUVA OSA



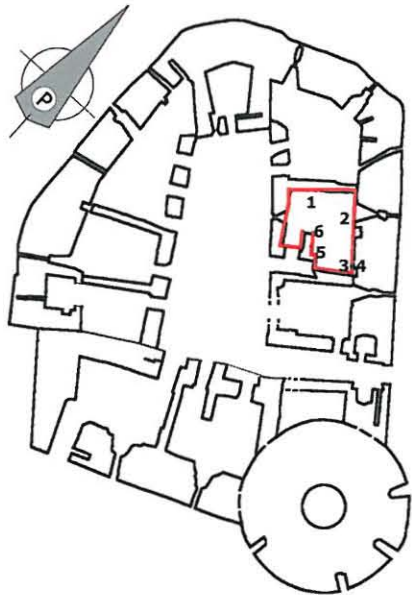
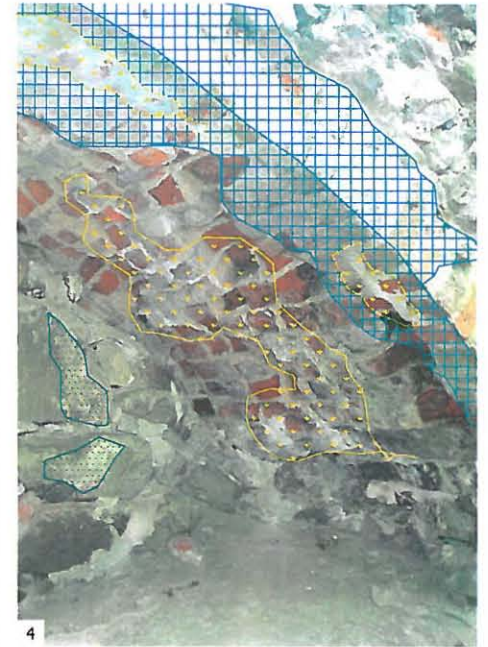
KASVILLISUUTTA



M_L huone



M_L huone



 VÄRIMUUTOS

 PUUTTUVA OSA

 KASVILLISUUTTA

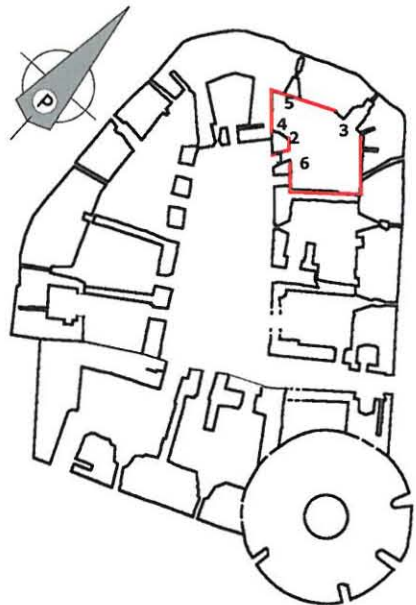
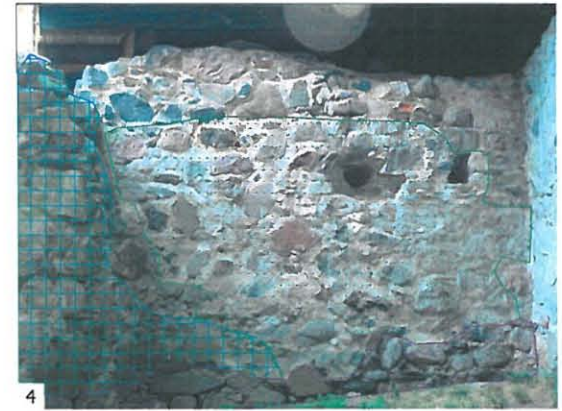
 KITEYTYMÄ

 HÄRMETTÄ

 KRUSTA



N_0 huone



VÄRIMUUTOS



PUUTTUVA OSA



JAUHOONTUMINEN



KASVILLISUUTTA



KITEITYMÄ

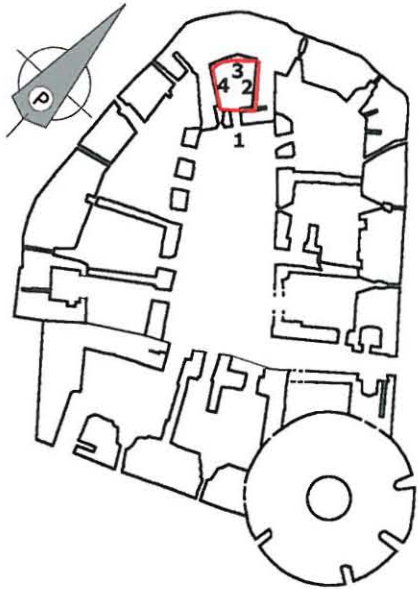
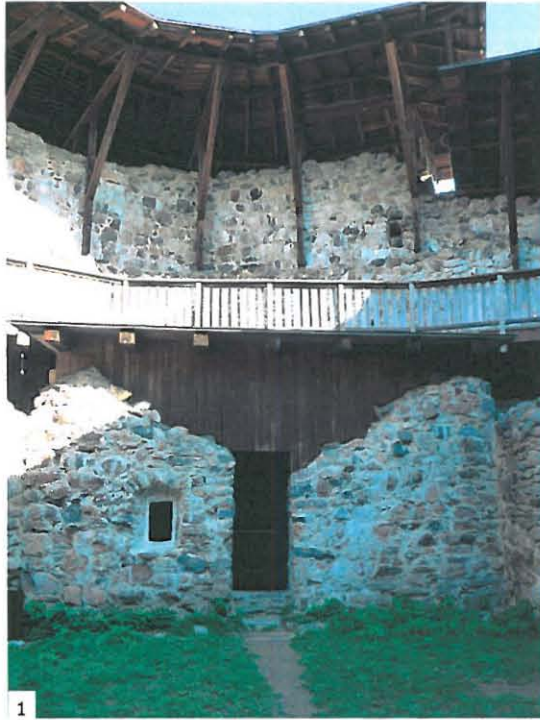


PINTA LIKAANTUNUT

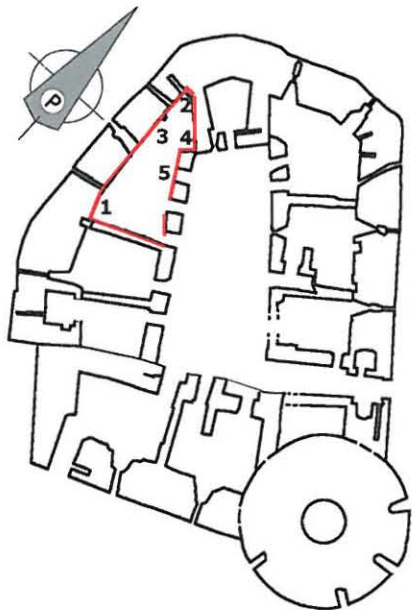








SAMMAL-LEVÄ-JÄKÄLÄ

P huone



R_S_Q huone



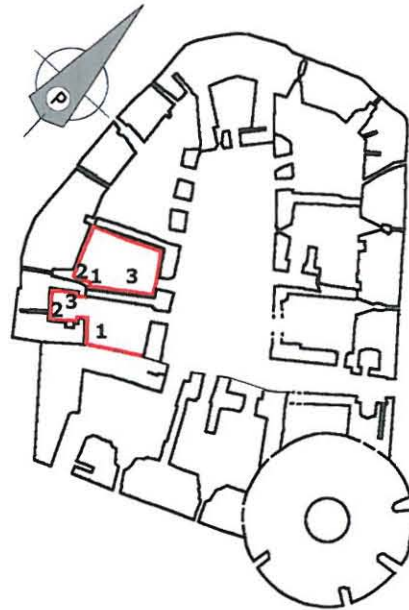
-  KITEYTYMÄ
-  KRUSTA
-  PUUTTUVA OSA
-  SAMMAL-LEVÄ-JÄKÄLÄ
-  JAUHOONTUMINEN
-  KASVILLISUUTTA



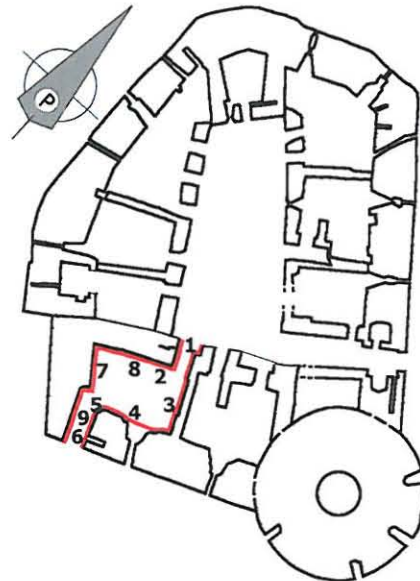
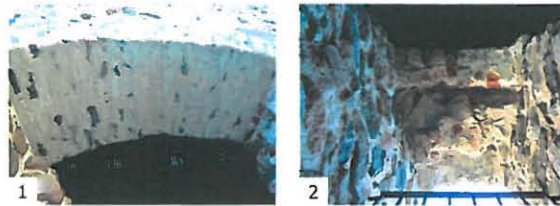
T huone



U_V huone

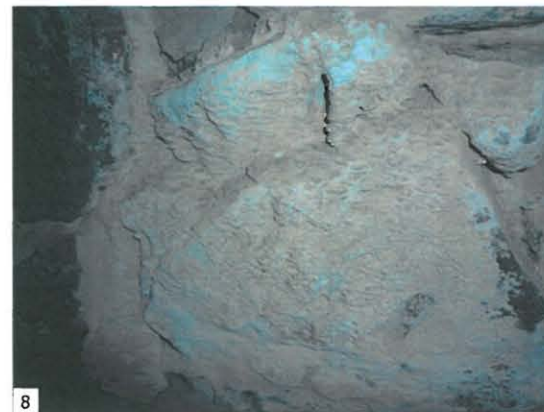
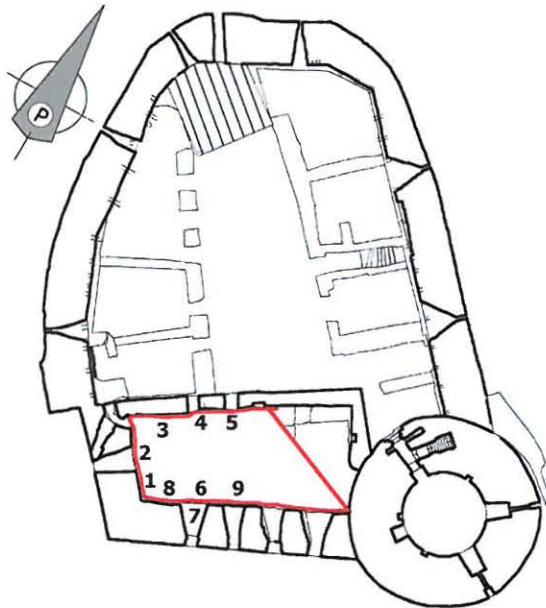


X_Y huone





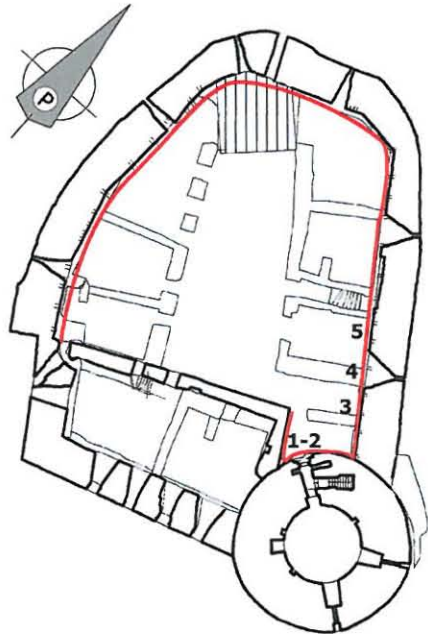
Riitarisali

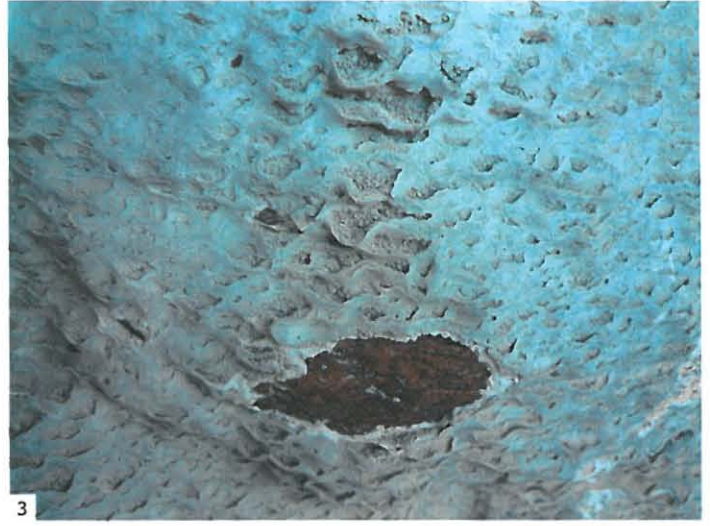


Riitarisali

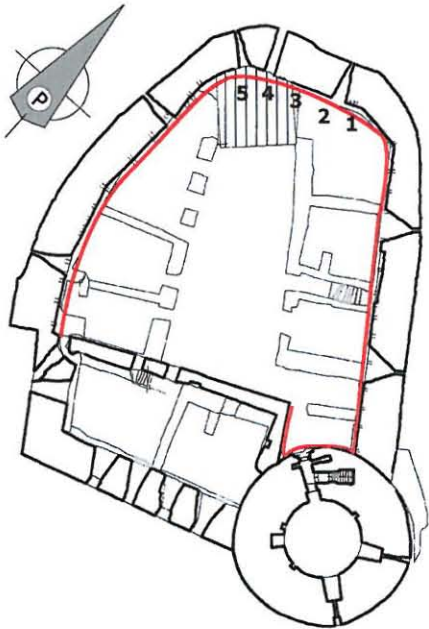


Kävelytaso

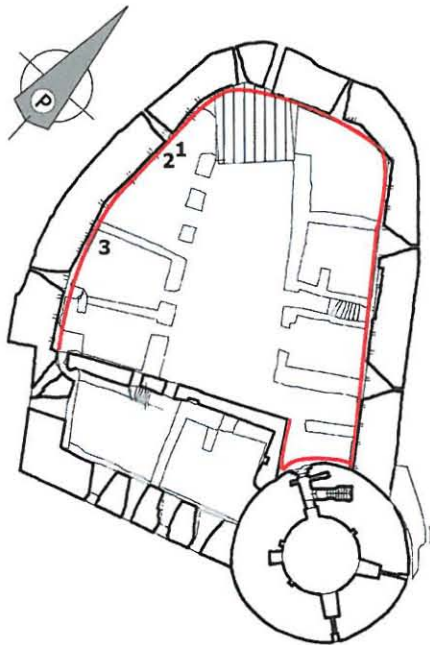




Kävelytaso



Kävelytaso





VÄRIMUUTOS DISCOLOURATION



Definition :

Change of the stone colour in one to three of the colour parameters : hue, value and chroma.

- hue corresponds to the most prominent characteristic of a colour (blue, red, yellow, orange etc..).
- value corresponds to the darkness (low hues) or lightness (high hues) of a colour.
- chroma corresponds to the purity of a colour. High chroma colours look rich and full. Low chroma colours look dull and grayish. Sometimes chroma is called saturation.

Relationship with the substrate :

It may affect the surface and/or be present in depth of the stone.

Equivalent terms to be found in other glossaries :

Chromatic alteration.

Other spelling :

Discoloration (US).

Sub-type(s) :

- Colouration (to be preferred to colouring) : change in hue, Bleaching (or fading) : gain in value due to chemical weathering of minerals (e.g. reduction of iron and manganese compounds) or extraction of coloring matter (leaching, washing out), or loss of polish, generally very superficial. Dark and bright color marbles often show bleaching as a result of exposure to weather.
- Moist area : corresponds to the darkening (lower hue) of a surface due to dampness. The denomination moist area is preferred to moist spot, moist zone or visible damp area.
- Staining : kind of discoloration of limited extent and generally of unattractive appearance.

Not to be confused with :

- Patina : superficial modification of the material perceivable as a discoloration, in often having a favourable connotation.

- Soiling : refers to a tangible deposit and has a negative connotation

- Deposit : refers to the accumulation of material of variable thickness, possibly having a color different from that of the stone.

Other remarks :

Discolouration is frequently produced by salts, by the corrosion of metals (e.g. iron, lead, copper), by micro-organisms, or by exposure to fire.

Some typical yellow, orange, brown and black discoloration patterns are due to the presence of carotenoids and melanins produced by fungi and cyanobacteria.

Darkened areas due to moistening may have different shapes and extension according to their origin : pipe leakage, rising damp, hygroscopic behaviour due to the presence of salts, condensation.



HALKEAMA JOINT



Definition :

Individual fissure, clearly visible by the naked eye, resulting from separation of one part from another.

Equivalent terms to be found in other glossaries : **Fissure, fault, joint.**

Sub-type(s) :

- **Fracture** : Crack that crosses completely the stone piece
- **Star crack** : Crack having the form of a star. Rusting iron or mechanical impact are possible causes of this type of damage.

- **Hair crack** : Minor crack with width dimension < 0.1 mm

- **Craquele** : Network of minor cracks also called crack network. The term crazing is not appropriate for stone, as this term should be used for describing the development of a crack network on glazed terracotta.

- **Splitting** : Fracturing of a stone along planes of weakness such as microcracks or clay/silt layers, in case where the structural elements are orientated vertically. For instance, a column may split into several parts along bedding planes if the load above it is too high.

Not to be confused with :

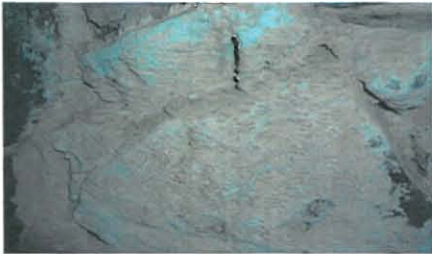
- **Delamination**, which consists of detachment along bedding or schistosity planes, not necessarily orientated vertically. In delamination, mechanical overload is not noticeable. Delamination is transitional to splitting.

Other remarks :

Cracking may be due to weathering, flaws in the stone, static problems, rusting dowels, too hard repointing mortar. Vibrations caused by earth tremors, fire, frost may also induce cracking. Cracks and fractures occurring on rock carved surfaces are usually named after the geological terminology : joint if there is no displacement of one side with respect to the other, fault if there is a displacement.



KRUSTA
CRUST



Definition :

Generally coherent accumulation of materials on the surface. A crust may include exogenic deposits in combination with materials derived from the stone.

A crust is frequently dark coloured (black crust) but light colours can also be found. Crusts may have an inhomogeneous thickness, and thus replicate the stone surface, or have irregular thickness and disturb the reading of the stone surface details.

Relationship with the substrate :

A crust may be weakly or strongly bonded to the substrate. Often, crusts detached from the substrate include stone material.

Sub-type(s) :

- **Black crust** : Kind of crust developing generally on areas protected against direct rainfall or water runoff in urban environment. Black crusts usually adhere firmly to the substrate. They are composed mainly of particles from the atmosphere, trapped into a gypsum ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$) matrix.

- **Salt crust** : Crust composed of soluble salts, which develop in the presence of high salt levels, and form from wetting and drying cycles.

Not to be confused with :

- **Encrustation**, which is also a coherent layer, but is always adherent to the substrate. The term encrustation is preferred to crust when the accumulation clearly results from water infiltration followed by precipitation.

- **Alga** : Algae often have a dark colour during the dry season and may be confused with black crusts. Oppositely to black crusts, algae do not adhere to the substrate, and are usually located, in outdoor situations, in areas exposed to direct rain impact, or on water pathways. These two characteristics differentiate algae from black crusts.

- **Patina** : Black iron-rich patinas, which develop usually as a thin layer enriched in iron/clay minerals on iron-containing sandstones, and are located on all exposed parts of the building/ sculpture, not only on parts sheltered from the rain impact.



PUUTTUVU OSA
MISSING PART



Definition :

Empty space, obviously located in the place of some formerly existing stone part. Protruding and particularly exposed parts of sculptures (nose, fingers..) are typical locations for material loss resulting in missing parts. Equivalent terms to be found in other glossaries : Lacuna.

Subtype(s) :

- **Gap** : hollow place in the stone surface, hole.



HÄRMETTÄ
EFFLORESCENCE



Definition :

Generally whitish, powdery or whisker-like crystals on the surface. Efflorescences are generally poorly cohesive and commonly made of soluble salt crystals.

Relationship with the substrate :

Efflorescences are generally poorly bonded to the stone surface.

Equivalent terms to be found in other glossaries :

Efflorescence is preferred to the expression loose salt deposits.

Not to be confused with :

- Subflorescence : Term employed in the case where crystallization occurs inside the material.
- Deposit : To the naked eye, efflorescences often look like deposits. However, their constituents come from the stone itself whereas deposits come from outside.

Other remarks :

Efflorescence is commonly the result of evaporation of saline water present in the porous structure of the stone. Efflorescences are often constituted of soluble salts such as sodium chloride (halite : NaCl) or sulphate (thenardite : Na₂SO₄), magnesium sulphate (epsomite : MgSO₄ · 7H₂O), but they may also be made of less soluble minerals such as calcite (CaCO₃), barium sulphate (BaSO₄) and amorphous silica (SiO₂ · nH₂O).



KITEYTYMÄ
ENCRUSTATION



Definition :

Compact, hard, mineral outer layer adhering to the stone. Surface morphology and colour are usually different from those of the stone.

Relationship with the substrate :

Encrustations generally adhere firmly to the stone surface. When an encrustation is removed, adhering stone materials may be taken away with it.

Location :

Encrustations are generally found below areas of the building where water is percolating or has percolated in the past.

Equivalent terms to be found in other glossaries : Incrustation.

Sub-type(s) :

- **Concretion** : Kind of encrustation having a specific shape: nodular, botryoidal (grape-like) or framboidal (raspberry like). Concretions may even have conic shapes of form drapery-like vertical sheets. Stalagmites and stalactites are kinds of concretions. In general, concretions do not outline, contour the surface of the stone, and are of limited extent.

Not to be confused with :

- **Crust** : The term encrustation is used when the feature is clearly due to a precipitation process, following any kind of leaching. If there is no evidence of leaching and precipitation, the term crust will be employed.
- **Lichen** : Some lichens (the so-called crustose ones) can look like encrustations. Lichens are not usually hard. When scratched, one can see blackish or green traces resulting from algae or cyanobacteria hosted by the lichen.

Other remarks :

Encrustations on monuments are frequently deposits of materials mobilized by water percolation and thus coming from the building itself : Carbonates, sulphates, metalloxides and silica are frequently found.



SAMMAL-LEVÄ-JÄKÄLÄ MOSS-ALGAE-LICHEN



Definition :ALGAE

Algae are microscopic vegetal organisms without stem nor leaves which can be seen outdoors and indoors, as powdery or viscous deposits (thickness : tenth of mm to several mm). Algae form green, red, brown, or black veil like zones and can be found mainly in situations where the substrate remains moistened for long periods of time. Depending on the environmental conditions and substrate type, algae may form solid layers or smooth films. On monuments, algae are constituted of unicellular to pluricellular clusters, and they never form macroorganisms.

Relationship with the substrate :

Algae generally constitute superficial films. They may be found also deeper into the substrate (under scales, in cracks).

Other orthograph :

Plural form : algae.

Not to be confused with :

Algae may be confused with epilithic lichen, with fungae and sometimes with soot or mineral deposits soiling the stone surface. If algae are present, wetting and brushing the surface will turn it to green due to the presence of chlorophyll.

Other remarks :

Several groups of algae may grow on and in stone depending on climate and stone type. Green algae (sometimes red, e.g. trentepohlia) diatoms (usually yellow to brown), and in rare cases red algae may occur. Cyanobacteria (formerly called blue-green algae) are very frequent stone dwellers and can cause black, bluish or even violet stains. In some cases the stone serves as a source of nutrients. However usually

Definition :MOSS-Mousse

Vegetal organism forming small, soft and green cushions of centimetric size. Mosses look generally like dense micro-leaves (sub- to millimetric size) tightly packed together. Mosses often grow on stone surface open cavities, cracks, and in any place permanently or frequently wet (masonry joints), and usually shady.

Relationship with the substrate :

Mosses develop brown rhizines and may create a micro-soil zone between the stone surface and the green part.

Not to be confused with :

- Lichen, which are composed of a thallus and do not have the typical organisation of micro-leaves tightly packed together.
- Algae : Algae are green during the humid season, but look different from mosses (viscous consistency, absence of microleaves).

Other remarks :

Mosses often change morphology and colour under lack or excess of water. During dry periods of the year, the cushions shrink, become harder and brittle, and their colour turns to brown.

Definition :LICHEN

Vegetal organism forming rounded millimetric to centimetric crusty or bushy patches, often having a leathery appearance, growing generally on outside parts of a building. Lichen are most commonly grey, yellow, orange, green or black and show no differentiation into stem, root and leaf.

Relationship with the substrate :

A lichen is composed of a thallus, eventually bearing fruiting bodies, generally developed on the stone surface, and rhizines that may penetrate deep into the stone (tens to several millimeters).

Sub-type(s) :

Lichen usually are divided into crustose, foliouse and epilithic types. When their thallus is mainly inside the stone, they are called endolithic lichen.

Not to be confused with :

Moss, alga, mould : see those terms.

Other remarks :

All lichen represent symbiotic growth of a fungus and green alga or a cyanobacterium. Lichen is a common feature on outdoor stone and is generally best developed under clean air conditions, but growth may be facilitated by certain pollutants such as nitrogen oxides derived primarily from vehicle pollution or agriculture. Former lichen growth may be detected by typical pitting structures (see this term) or lobate or mosaic patterns and even depressions.



JAUHOONTUMINEN PULVERIZATION



Definition :

Detachment of single grains or aggregates of grains.

Relationship with the substrate :

It affects only the surface of the stone or can occur in depth. Damage generally starts from the surface of the material. On crystalline marble, granular disintegration may reach several centimeters in depth, sometimes more.

Equivalent terms to be found in other glossaries :

Loss of cohesion, incoherence, decohesion, friability, disaggregation, intergranular incoherence, pulverization.

Sub-type(s) :

- Crumbling : Detachment of aggregates of grains from the substrate. These aggregates are generally limited in size (less than 2 cm). This size depends of the nature of the stone and its environment.
- Granular disintegration : Occurs in granular sedimentary (e.g. sandstone) and granular crystalline (e.g. granite) stones. Granular disintegration produces debris referred to as a rock meal and can often be seen accumulating at the foot of wall actively deteriorating. If the stone surface forms a cavity (coving), the detached material may accumulate through gravity on the lower part of the cavity. The grain size of the stone determines the size of the resulting detached material. The following specific terms, all related to granular disintegration, refer either to the size, or to the aspect of corresponding grains :

- . **Powdering, Chalking:** terms sometimes employed for describing granular disintegration of finely grained stones.
- . **Sugaring :** employed mainly for white crystalline marble,
- . **Sanding :** used to describe granular disintegration of sandstones and granites.

Other remarks :

In the case of crystalline marbles, thermal stresses are known to be one of the main causes of granular disintegration, thus leading occasionally to deformation patterns. Stones may display deterioration patterns intermediate between granular disintegration and crumbling, scaling or delamination. Partial or selective granular disintegration often leads to surface features such as alveolization or rounding. When occurring inside crystalline marble, granular disintegration may lead to deformation patterns.



KASVILLISUUTTA VEGETATION



Definition :

Colonization of the stone by plants and micro-organisms such as bacteria, cyanobacteria, algae, fungi and lichen (symbioses of the latter three). Biological colonization also includes influences by other organisms such as animals nesting on and in stone.

Relationship with the substrate :

Direct growth on and in stone or stone cavities ; also indirect influences by nearby trees and other organisms.

Equivalent terms to be found in other glossaries :

Biological growth, biological overgrowth, living exogenous material.

Other spelling :

Biological colonisation.

Not to be confused with :

- Deposit : consists of an accumulation of exogenic material, such as dust, droppings, on the stone surface. For instance, a bird nest, a spider web are part of biological colonization, but bird or bat droppings are deposits.

Other remarks :

Biological colonization may be used when a mixture of different types of organisms are present on a stone, and are not distinguishable from each other.

Biofilm : Mono- to multilayered microbial colony attached to surfaces with varying thickness of up to 2mm. Often a biofilm consists of very few cells of different microorganisms embedded in large amounts of extracellular slime. These cohesive often sticky layers may shrink and expand according to the supply of water. Biofilms often create multicoloured biopatina by production of colouring agents. Higher plants grow sometimes to a considerable size at unexpected locations.