# Degradation, Pollution and Decay of Harem Baths in Topkapı Palace

Assist.Prof. Dr. Fatma SEDES
Istanbul Aydin University -Head of Architectural Restoration Department.
fatmasedes@aydin.edu.tr

**Abstract**
It is known that the Sultan's bath was built by Mimar Sinan in the 15'th century and it is stated that it has preserved its originality until today. It is also known that the Valide Sultan bath was built in the 18'th century. The Valide Sultan bath was added next to the Hünkar's bath. The bath rooms are rectangular in plan. Access to the Sultan's bath is provided from the Sultan's Sofa and the Sultan's bedroom via the bath corridor. The Hamam corridor, which is also connected to the corridor of the Valide Sultan suite, also provides easy access to the Valide Sultan Hamam. Harem baths are spacious places with their illuminated domes, height and interior decoration. The Sultan's bath consists of three sections, cold, warm and hot sections. There is a large rectangular planned area on the right side of the entrance, this area is the cold room of the bath. The cold section is illuminated with the help of bottle-shaped windows called ''elephant eyes'' on its dome. To the left of the entrance door, there is a warm room, in this area there is a basin. At the entrance to the hot section of the bath, there is the area where the Sultan had his bath on the left, and this area is surrounded by gilded bronze metal motifs. There is a selsabil (fountain) right next to this area. There is a large basin opposite the entrance door of the warm area. And there is a selsabil (fountain) on the right side. There is also a basin on the right at the entrance of the hot area. There is a 19'th century ornaments in the bath. Classical period details were not found. The cubes that provide the acoustics of the Sultan's Bath are located in two spaces above the area where the Sultan's basin is located.

**Keywords:** Topkapi Palace, Harem, Hunkar (Sultan's) bath, Valide Sultan's bath, conservation, analytical survey.

## Introduction

It is known that the Valide Sultan Bath was built in the 18'th century. The Valide Sultan Hamam is located next to the Hünkar Hamam. The bath consists three parts. Its parts are coldness, warmth and tepidness. It has a small volume compared to the Hünkar hamam. There is a cold room on the right side of the entrance, and the place is illuminated by bottle windows called elephant eyes (Fig 1).

There is a basin in the warm section. At the entrance of the hot room, there is also a basin of the Valide Sultan on the left, and this area is surrounded by gilded bronze metal motifs. There is another basin in the opposite section (Mualla Anhegger Eyüboğlu, Topkapı Sarayında Padişah Evi (Harem), 1986, s. 105. 34).

The Hünkar Hamam (Fig.2) was restored in 1990 with the sponsorship of the a company, and its ornamented and metallic surfaces were gilded. Passing through the Sultan's corridor to the next room, one encounters a marble door – a landing and a second marble door. The first thing to notice on the entrance surface of the marble door is the greasy dirt stains and traces caused by rubbing hands and friction. It is seen that there are cracks in the marble on both sides of the door jamb and bonding was done on the left jamb crack. In the pediment section of the door, iron nails are standing there in an oxidized form, at the level of the column capitals on the right and left. There has been some bleeding in the yellow primer paint under the leaves on the decoration surfaces. In addition, the door has dirty stripes that have swelled in the form of a thin film layer, especially

Figure 1

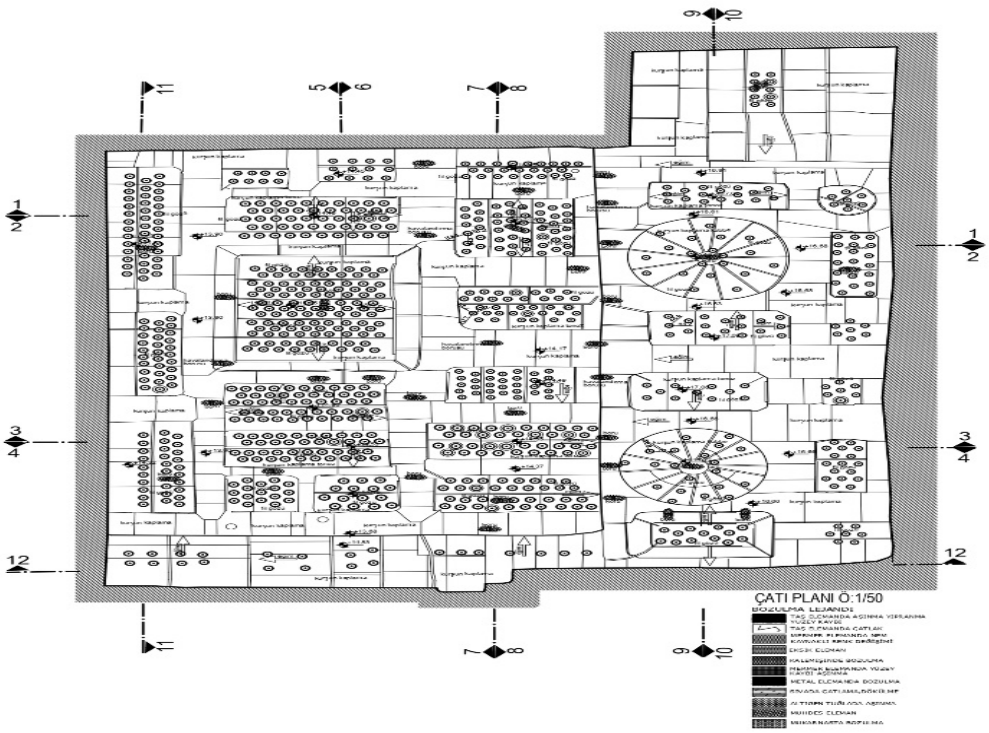


Figure 2

on the pediment, and there are light dirt accumulations on the edges.

In the lower right and left corners of the door landing, there are parts breakage, dirt accumulations that are thought to be irreversible due to years of use. When one passes the landing and enters the room, can see greasy dirt stains on the inner surface of the marble door caused by friction and contact, traces of metal nails in the upper two corners of the door, and the junction points of the marble blocks, which are not monolithic but cut on the door jambs.

The floor, which comes out of a threshold, is covered with marble and the marbles consist of blocks of different sizes. The wall surfaces are also covered with marble blocks up to half a meter high. Intense rust stains on the floor marbles (probably the blocks were connected from the bottom with iron clamps or lead clamps and oxidized due to water and moisture leaking over time and this oxide layer was absorbed by the marble and spread to the surfaces), abrasions caused by use on the surface, small cavities in places. There are dirt accumulations, joint discharges, and linear surface losses at a depth of about half a millimeter in the marble on the side wall surfaces. This place, which has three niches on the right and left of the entrance (Fig.3), also has wear and oily dirt accumulations caused by use on the seats in the niches. On one of the wall surfaces of the room, there are two pieces of old wall remains, the surface of which has been scraped in separate pieces and the hand-drawn decorations have come out of the lower surface. Reinforcement was made using Portland cement on one side of the larger piece. Also, on plastered wall surfaces (there is the same application throughout the bath).

Figure 3

The application was made using cement-bonded plaster. Due to moisture and leaking water on the plastered wall surfaces (soluble salts crystallized under the paint layer and the paint swelled), there are swellings and spills in the paints. In addition, there were occasional thin cracks on the wall surface, and more pronounced cracks in the form of curves, running parallel to each other, on the lower surface of the beam. These cracks are deeper in some places. There are remnants of old pencilwork on the ceiling vault of this unit. The water flowing by finding its way through the lighting glasses of the vault also caused water stains on the side surface of the vault (Fig.4).

The room which is entered by passing through told space, is a toilet. Its floor is covered with block marbles and its walls are surrounded by block marbles up to a height of about half a meter (This application is available both technically and aesthetically in the entire bath). This place also has a lower landing. The toilet is reached by crossing the threshold. The landing area consists of a combination of two pieces of marble blocks. The block joint is inclined inward so that the accumulated water can easily reach the opened trough. On the surface of the marbles here; there are abrasions, small breaks at the edge joints, and blackish dirt accumulations that penetrate the structure of the material, resulting from use over time, on the parts towards the bottom of the wall. The toilet stone is made of a single piece and on this stone surface, abrasions, dirt accumulations, and especially at the bottom parts of the limestone layer and black dirt accumulation have increased. It was probably specially carved for the water bowl where it coincides with the mirror stone containing the double faucet.

Figure 4

There is a carved area. The faucets have been cleaned, foiled and appear to be in good condition during the last repair (Figs.5,6,7,8,9) There are only traces of stains from the water that has probably already seeped down from the area where the faucets are mounted to the wall. There is a slight accumulation of dirt in the upper left corner of the mirror stone. The traces of oily dirt on the marble block surfaces surrounding the wall inside the room appear more intense, especially at the points in contact with the plastered wall. On the wall surfaces of the toilet plastered with cement-binding plaster, paint swells, and on the parts near the upper ceiling, paint flaking is more intense, and there are plaster swells in places. There are also stains and paint blisters around the electrical panel on the right side of the entrance of this place. There are gilded linear contours on the outer surface of the marble door jambs at the entrance of the toilet, and there are traces of oily dirt caused by friction and touching.

Figure 5

Figure 6

Figure 7

Figure 8


Figure 9

There is a transitional space with connection to three separate places. It has a vaulted ceiling, and the surfaces are plastered just like the others, with paint scaling near the ceiling in the plaster. The floor covering consists of a combination of several pieces of marble, and there is a slight inward deformation with cracking in one of the marble pieces. There are traces of dirt on the bottom of the walls in the same way, which have penetrated into the old texture. There are linear foils on the surface of the door jamb opening to the Sultan's Sofa. Oily black stains caused by human contact on these surfaces, ruptures at the inward turning points of the jambs there are breaks and more noticeable black dirt accumulations on the inner surface. In the same way, there are traces of dirt caused by friction on the door jambs of the transition door. Iron hinges (on the right) are still present on the decorated and gold leaf door jamb at the transition (front face) .There was a crack in the marble at the point where the lower hinge was located. On the left, there is a trace of a sloppily opened slot where the door lock tongue entered. There are cracks in both directions at the end of the door molding and the starting points of the door arch, and fillings made in place of broken pieces in one or two places (a part of the filling has been poured out on the left). In addition, a recess was dug in the lower left corner of the door for the water to drain at the threshold crossing. On the inner surface of the door facing the room, the door pediment is simpler and the hinges are on the right jamb. Especially since the hinge iron on the top was oxidized, rust stains penetrated the marble.

Figure 10

There are hinges on the left side of the door jamb facing the interior of the room, and a slot opened for the lock tongue to sit on the right. On the side of the hinges, an iron nail driven into the jamb floated (because the nail was oxidized), and there were longitudinal and transverse cracks in the marble and rust stains spread around the nail. There are also dirt residues on this door surface caused by people touching and rubbing. In the corners, there is a water channel that surrounds the area and is made for the water to go. Especially along this channel, dirt deposits penetrating into the structure of the material are more evident. There are cracks in the marble blocks surrounding the porphyry stone, dirt accumulations (built-in) stuck to the joint filler made at the joint joints of the blocks, joint discharges, surface almost restored. abrasions caused by use, and non-recyclable dirt accumulations at the bottoms. All are cleaned and restored now (Fig10).

On the right and left sides of the entrance, there are two more rooms, which are reached by a sill elevation and divided by low parapets and columns. In the room to the left of the entrance, there is a marble basin and a fountain decorated with oyster shell and flower-decorated mirrorstone. The decoration contours and the faucet are made of gold leaf. It appears to be in pretty good condition. An irregularly shaped circular crack was formed on the inside of the marble basin and there were dirt deposits around that crack. On the lower parts of the basin, there are discoloration, very small breaks and limestone formations on the bottoms, dirt deposits that have become stable due to use, and superficial abrasions. On the floor marbles, especially in the back-row marble blocks, there are staining and dirt accumulations (especially in the part where the water trough is made), local cavities, surface abrasions and small cracks. Oily dirt traces are seen on the surface of the parapets and columns. On the left side of the fountain, there is a niche covered with tiles of different patterns and colors. The tiles are dished and when the surfaces are clicked, the back part gives a space sound from the part. In addition, there were fragments in the corners of some tiles, and the broken parts were filled with a mortar mixture (bone colored). There was a loss of an inverted v-shaped piece at the bottom of the marble frame surrounding the niche, and a filling was made instead. On the surface of the marble frame, there are light abrasions from use and local dirt deposits infiltrated into the pores. On the right side, there is no basin or fountain in the parapet and

Figure 11

columned space that comes out of the threshold. There are intense surface abrasions, crack formations, local carvings, intense rust stains, dirt accumulations at the bottoms and between the joints, and joint discharges on the floor stones, especially on the back-row marbles. The front row blocks also have rust stains, but not as intensely as the back row. There were also slight code differences between the blocks. On the marble blocks surrounding the wall, there are wear, discoloration and capillary cracks caused by use. On the front foliated surfaces of the parapets dividing this space, dirt accumulation is more evident compared to the rear surfaces, and on the ground wall close to the passage door, joint discharges between the blocks are also higher. On the column surfaces (up to the height of a human being) traces of oily stains are seen, again caused by touching. Column base bracelets and column capitals are gold leafed and bronze bracelets are not visible. However, old, crystalline dirt can be seen on the column capitals.

There are cracks in places on the plastered walls in the whole place, water stains on the upper vault surfaces caused by the water that finds its way from outside and crack formations (possibly plaster cracks) on all vault surfaces.

The surface of the decorations on the front surface of the entrance to the room the façade facing the next room is covered with gold leaf. On the left side of the door, there is a part of the hinge at the bottom (Fig.11, 12).

However, the metal pieces, which were present in two separate places in the upper part, oxidized and caused cracks in the jamb (there is a transverse and longitudinal split) and rust stains. On the right jam.There are traces of dirt caused by friction and touching throughout the door. There are small part breaks on the outer edge contours of the door jamb. On the door surface facing the mentioned room, there are dirt accumulation due to crawling and touching, crack formation in the upper right parts of the jamb, very small breaks in the outer contour. The hinges on this door are on the right side and are still in place. In addition, there is a metal clamp on the jamb surface, which is interlocking with each other. On the left side of the door jamb, there are metal nails on the inturning part of the jamb and a hinge (hook) near the upper arch. There is a crack in the door sill stone between the two doors. When entering room, a water channel passes in front of the inner threshold. This channel surrounds the base, which is located in the middle and consists of six block pieces. Like here, along this channel, there is an accumulation of dirt embedded in the marble on the marble surfaces.

On the surface of the ground blocks, there were abrasions and occasional inward indentations. Again, there are rust stains originating from the sub-surface, although not common. Hairline cracks also occurred in a few blocks. In this place, there is a central dome rising with a column and vault system in the middle (Figs.13,14). There are serious surface losses in the marble muqarnas (it can be understood from a

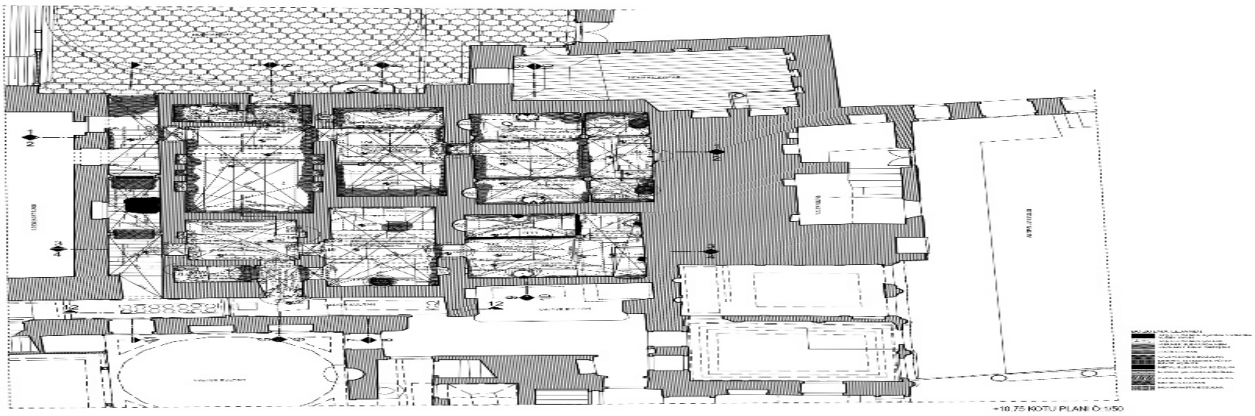

Figure 12

distance, as well as marble-smash) adorning the corners of the dome.

At the entrance, in front of the large rectangular marble bathtub standing directly opposite, there is a large and decorated mirror stone containing three taps.

Between the point where the herringbone decoration ends and the transition point to the seashell decorated turn, cracks have formed in the marble. On the upper part of the faucet standing in the middle, there is a narrow and thin water trough, and small circular cavities opened to prevent the accumulation of water in this trough. The fillings in the lower parts of the small pillars on the right and left sides of this small water trough were poured. The large bathtub is entered by descending the stairs placed inside. On the right and left sides of the tub, there are marble benches decorated with parapets at the front and back and with seats inside. There is also wear and color change on these marble stone surfaces. There are also joint discharges at the marble parapet junctions surrounding them. Among the gilded faucets found in the mirror stone, the bronze faucet on the far right started to oxidize and the green oxide layer came to the surface of the gold leaf.

Again, on the side of this faucet, both the joint between the tub blocks were emptied and the metallic connection that held the tub stones together disappeared. There are also surface abrasions, crack formations and staining (yellow paint and different paint residues from the outside) as well as slight yellowing on the inside of the tub. Again, on the upper parts of the mirror stone, small pillars were filled with horosani mortar in the corner of the column on the left.

There are capillary crack formations on the plastered wall surfaces surrounding the entire space, paint blisters and spills due to salting on the upper parts.

Figure 13

On the left side of the entrance, there is a gilded lattice and a place with a fountain next to it. Metal railings appear to be in good condition. When you enter the cage, there is a decorated and foliated fountain with a two-eyed niche on the front stone right across. There are traces of hollows with metal nails in the upper right and left corners of the gold leaf covered faucet of the fountain, which is mounted on the front stone. On the top pediment of the mirror stone, there is a thin tension entry and just below it, there is an iron nail that has oxidized and spread rust stains around it. The mirror stone is generally in good condition and there are very small breaks and abrasions on the outer edge contours. The interior of the niches (possibly tiled before) was plastered with cement-binding plaster. There has been an abrasion around the water trough on the inside of the marble basin, and darkening marks have formed on the worn parts due to the accumulation of dirt. There are also small ruptures and hollow formations on the upper walls of the basin. In the lower parts of the basin, in the groove where the water is discharged, there are abrasions, discolorations and slight calcareous formation caused by the water flow(Ok,Ismet).

On the upper part of the gilded faucet, there are traces of an iron hook (placed for hanging the bowls) on the right and left sides. A part of the one on the right is still in place, while the one on the left is not in place, there are traces of rust around it due to oxidation. There is color change and surface wear caused by use on the inner surface of the marble basin of the fountain, there is a slight trace of water flow on the bottom of the basin, and there is a limestone layer formation and dirt accumulation at the ground connection. There was also joint discharge at the mirrorstone and basin connection points. There are abrasions, small-sized cavities and dirt accumulations in the formed cavities on the floor covering of this place. Especially at the bottom (at the bottom of the wall just opposite the faucet), there is a large grout and a clear, ingrained dirt accumulation on the surface of that jointed layer. There were ruptures in the upper part of the parapet on the right side of the entrance to this unit, and it was mounted with a mortar mixture instead of the broken pieces. In addition, there are obvious gaps in the joints of the inward facing parapet blocks.

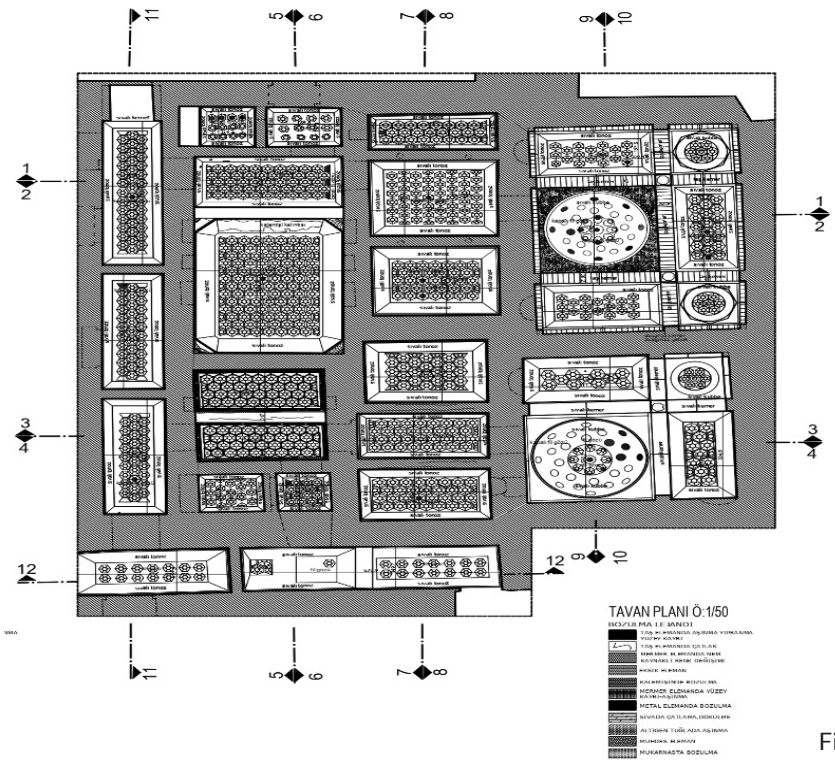


Figure 14

On the right side there is an open front with a fountain with cracks in the floor stones, dirt accumulations and joint gaps at the bottom and a wavy rust staining. In the mirror stone of the fountain of this place, there are two-eyed and flower-patterned tile-covered niches. There have been intense spalling and loss of parts on the surface of the tiles. Existing ones also have crack formations. The mirror stone of the fountain is generally in good condition. There are traces carved for hooks only on the right and left upper parts of the gilded faucet. Color change and slight wear are seen on the inner surface of the basin due to use.

There is joint discharge. There is a niche at the bottom right of this unit, as in the opposite unit. There is a slight color change on the sitting stone of the niche (figs.15,16,17).

On the left side of the tiled fountain, there is another unit with a fountain, which is divided by a marble parapet. On the upper part of the mirror stone of the fountain inside this place, there are oval-shaped lids made of bronze and foliated, which can be opened and closed. There is a water pipe outlet at the bottom of this covered section used for ventilation. This outlet is made for the water formed by condensation to flow down. There has been a lot of wear on the edge contours of the marble on which the covers are mounted. The lower water pipe also has a distinct appearance and a gap formation between it and the marble. There is a single niche in the middle of this mirror stone. However, there is no tiles on the inner surface of this niche, and the surface is plastered with cement-based plaster. The traces of metal cavities on the fountain faucet (on the right and left corners) were covered by filling. There is a slight rusty staining on the back surface of the faucet and the underside of the faucet due to water.

A square hollow formation and a small rectangular piece of marble on the right-facing façade of the parapet are thought to have changed later. There are hairline cracks on the plastered wall surfaces in this place, paint blisters and saltiness on the upper parts. It is seen that there are paint blisters caused by water infiltration in places on the ceiling that allow light to enter.

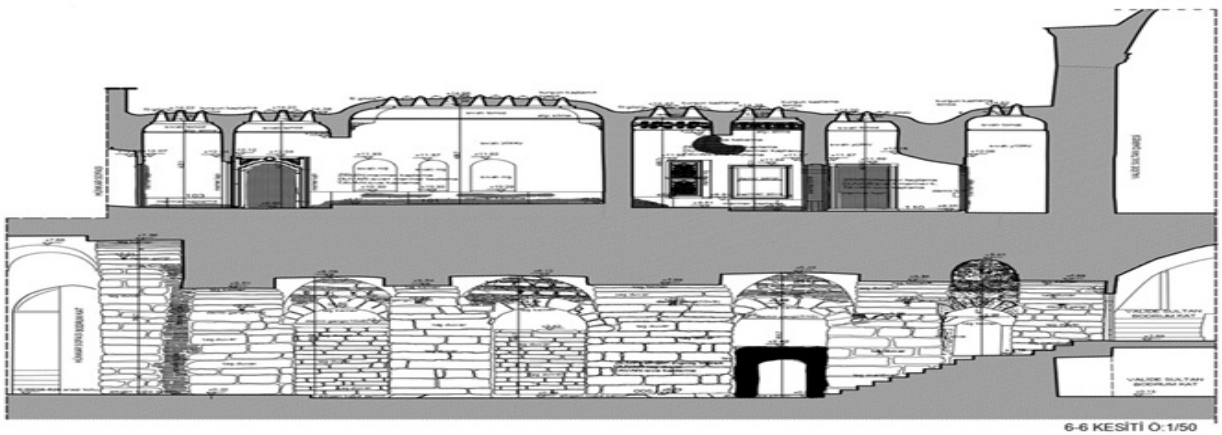


Figure 15

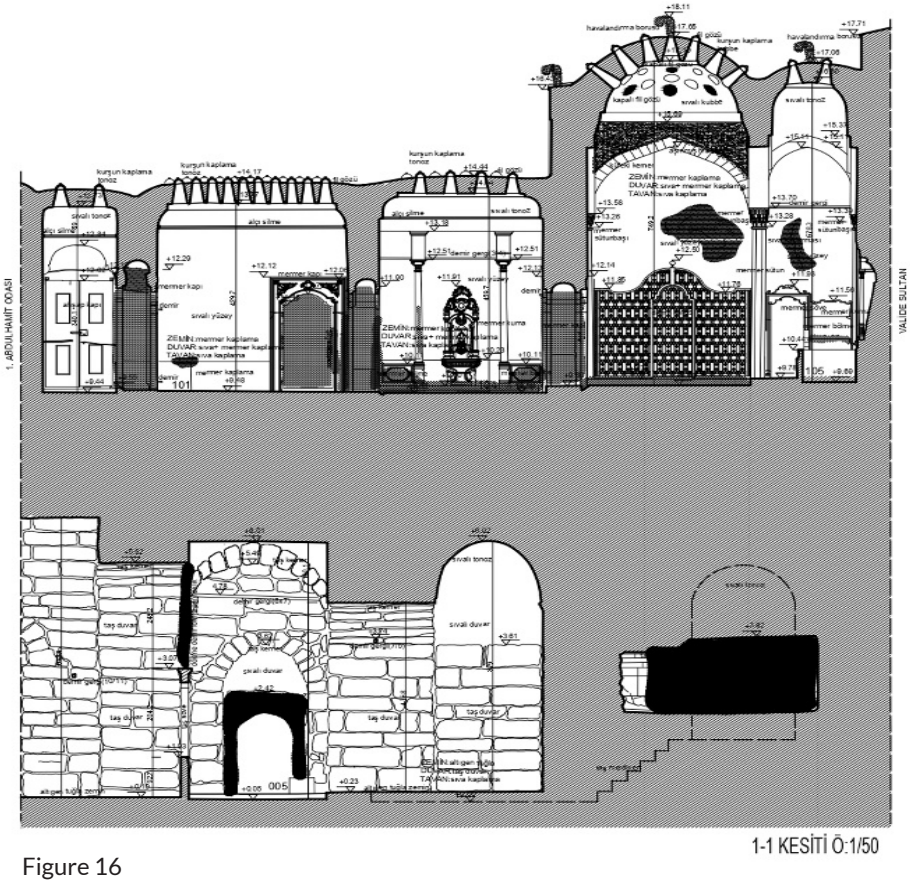


Figure 16

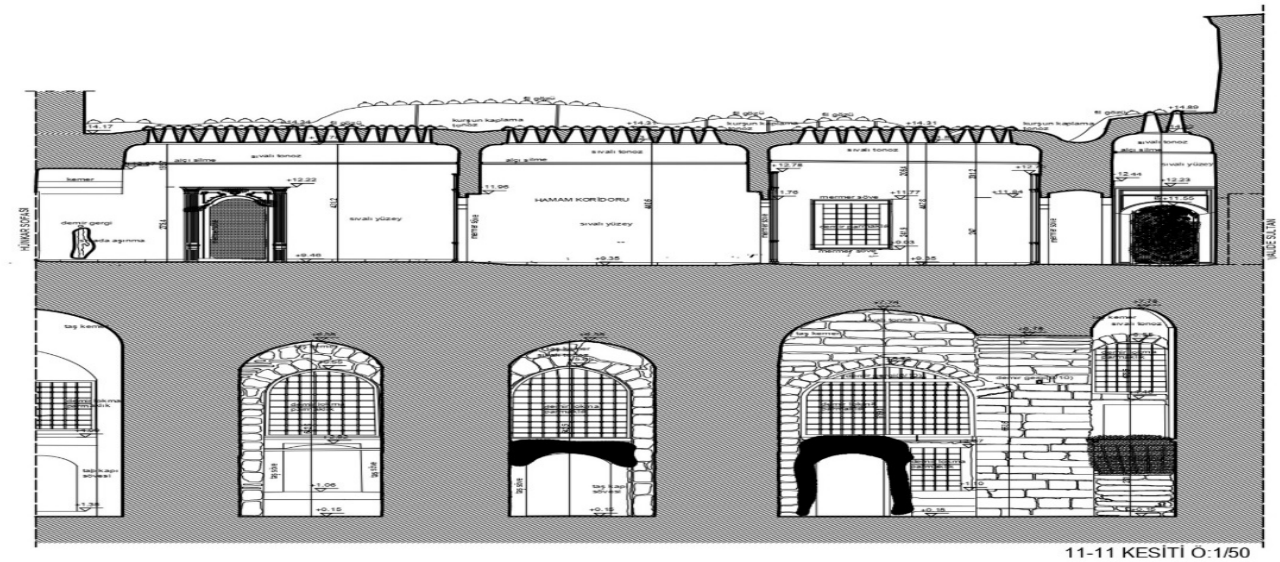


Figure 17

As the cement-bound plasters used in the Sultan's bath continue to absorb moisture (due to the presence of soluble salts in the material structure), they will swell more and cause paint and plaster spills. Gray cement fillings, especially in places where there are old hand-drawn samples, must be removed.

Even if there are places that will require local cleaning from place to place and places with empty joints, there is generally no situation that requires more application at the moment.

**Conclusion**

There are two types of chemical methods of cleaning the marble and stone surfaces that we can explain here. These; made with cleansing gels and absorbent clay and paper pulp are applications.

Cleansing gels are very weakly basic with added thickeners for application to vertical surfaces.

They are mixtures. Thus, the active substance in solution is in constant contact with the surface to be cleaned. However, its penetration into the inner parts of the stone is reduced Ph is 7-8 (neutral or slightly basic) to reduce corrosive effects and prevent harmful side effects. To increase the effectiveness of the gel, during the process, cover the solvent with a thin plastic cover or aluminum foil. Evaporation must be prevented. The gel is removed from the stone and the surface is washed with water and if necessary. After cleaning with a plastic brush, the stone is washed with deionized water and basic chemicals should be completely removed. This method is used to remove chemicals by washing them. It is undesirable to apply it on porous stones where it is very difficult.

Another method is cleaning with absorbent clay and paper pulp. among the clay

sepiolite and attapulgite are the ones that give the best results. Their composition and structure are similar feature. When clays are placed on the surface to be cleaned, they are effective due to their structure. They pick up unwanted impurities. You can use this method on surfaces with salt, oil, wax, etc. problems. It is very useful to use it for cleaning. Paper pulp, which is used extensively.

In stones and marbles with a high-water absorption value and a porous structure, dry surfaces can be applied to worn surfaces. Choosing cleaning methods and using hand tools as small as possible.

**Harmful cleaning methods;**

Cleaning using acid-base,

Cleaning with uncontrolled dry and wet sandblasting,

Mechanical cleaning with comb, wire brush, spiral or sandpaper

Cleaning with high pressure water or steam,

Cleaning by burning

They are harmful methods and cannot be used within the scope of restoration of ancient works except in very special cases. It is undesirable to implement.

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Sedes Mimarlık Arşivi

Kültür ve Turizm Bakanlığı, *İstanbul Konservasyon ve Restorasyon Merkez Laboratuarı Müdürlüğü Arşivi ,Ok, İsmet*

Kültür ve Turizm Bakanlığı , *İstanbul Directorate of Monuments and Surveys.*