

### 7.1.Emirler Bath (Bilecik city)

Emirler bath was located in the city center of Bilecik. There was no inscription about the bath and its built date. According to the 2006 inventory of Bilecik Culture, this building was belong to the early period of Ottoman Empire H.699-911 (1299-1505A.D.) (Mülayim, Öztürk, 2011).

In the early period of Ottoman Empire the mortar was a mixture of lime and soil (Kolay, 1999). The sample from the Emirler bath mortar was similar specifications related with lime and soil mixture. Therefore the building date of this bath was in early period of Ottoman era.

The plan typology of Emirler bath was single. Bath was composed of undressing, warm and hot spaces. The undressing space was rectangular plan shape and closure structure of this space was collapsed. Warm space was connected to the undressing part with an arched shaped door opening. The closure of warm space was dome structure. The squinches were used in transitional elements. Between the rectangular plan shaped water tank and the warm space there was a window opening. The closure structure of the water tank was vault. On south west side of the water tank there was furnace (Mülayim, Öztürk, 2011), (Ünal, 2008).

Hot space was connected to the warm area. The plan shape of this space was square and closed with dome structure (Ünal, 2008).

In masonry wall structure of the building, rough stone was used. In transitional elements brick was used. There was a retaining wall for preventing the slipping of the structure (Ünal, 2008).



Fig 7.1: Emirler bath south-east view (Endowment office Bursa, 2012)



Fig 7.2: Emirler bath west view (Endowment office Bursa, 2012)



Fig 7.3: Emirler bath north view (Endowment office Bursa, 2012)



Fig 7.4: Emirler bath south-west view (Endowment office Bursa, 2012)

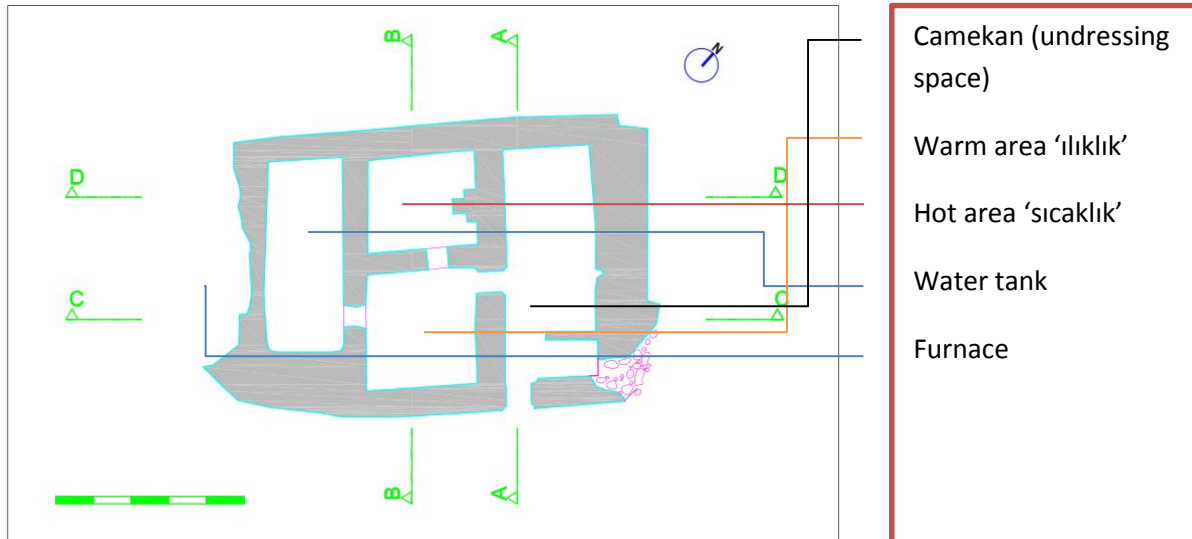


Fig 7.5: Emirlers Bath plan, functional specifications (*Endowment office Bursa, 2012*)



Fig 7.6: Emirlers Bath section A-A (*Endowment office Bursa, 2012*)



Fig 7.7: Emirlers Bath section B-B (*Endowment office Bursa, 2012*)

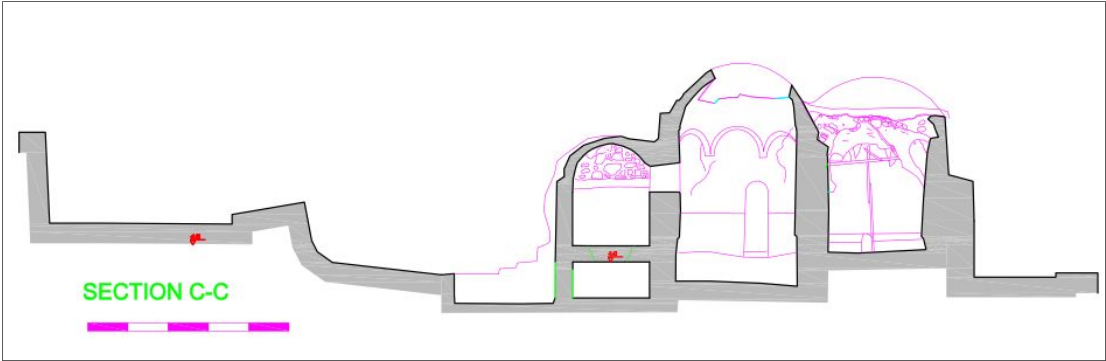


Fig 7.8: Emirler Bath section C-C (*Endowment office Bursa, 2012*)


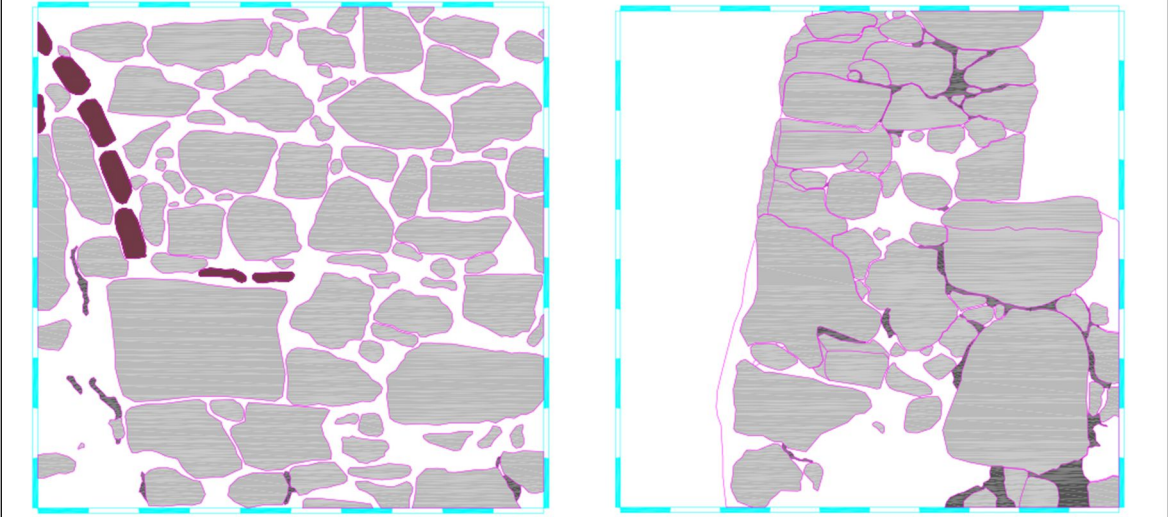


Fig 7.9: Emirler Bath section D-D (*Endowment office Bursa, 2012*)

CHAPTER 7: CASE STUDIES



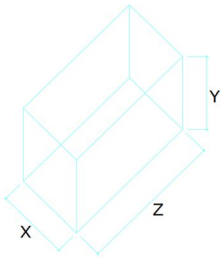
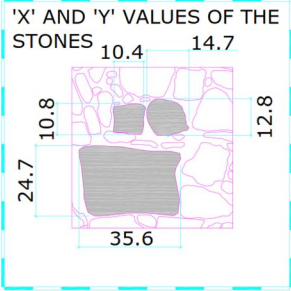
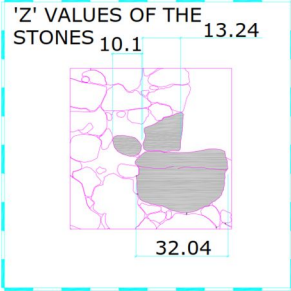
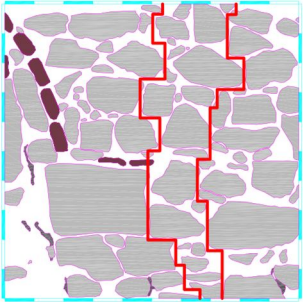
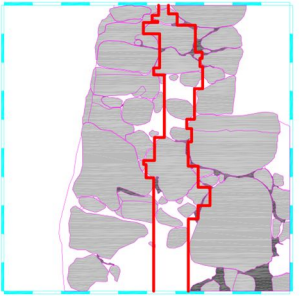
7.1.1. Methodological application (A)

Table 7.1: Qualitative methods for evaluating the quality of the walls in Emirler bath: A

<b>Qualitative Methods for Evaluating the Quality of the Walls</b>	
<b>Bilecik City, Emirler Bath</b>	
<b>Stone masonry of minute size, mixed with natural pebbles or split and stones</b>	
	<b>PHOTOS</b>
	<b>SCHEMA</b>

CHAPTER 7: CASE STUDIES

Table 7.2: Qualitative methods for evaluating the quality of the walls in Emirler bath: B

<p><b>Description of Emirler Bath:</b>                  Masonry stone structure is composed with various sizes and irregular shapes of stones. There was no clue for timber tie beam connection inside of the masonry stone walls. On the sections of the masonry wall small pebbles and stones could be seen. The wall fabric is chaotic, it was not respected to the horizontal rows or offset of the vertical joints. Diatone stones are not used inside of the masonry stone wall structure. There was an effort for horizontal linearity.</p>		<b>DESCRIPTION</b>	
<p>In Emirler bath; stone material is composed of green color sand stone which is extract from Osmaneli mine.</p>			
		<b>MATERIAL</b>	
<p>Stone Sample</p>	<p>Brick Sample</p>		
	<p>'X' AND 'Y' VALUES OF THE STONES</p> 	<p>'Z' VALUES OF THE STONES</p> 	<b>GEOMETRY OF THE MATERIAL</b>
<p><b>APPROXIMATION OF STONE DIMENSIONS OF THE MASONRY</b>  <math>X=10.4\text{cm} - 35.6\text{cm} / Y= 10.8\text{cm}-24.7\text{cm} / Z=10.1\text{cm} - 32.04\text{cm}</math></p>			
<p>LMT 1 LMT 2</p> 	<p>LMT 1 LMT 2</p> 	<b>LMT</b>	

CHAPTER 7: CASE STUDIES

Table 7.3: Qualitative methods for evaluating the quality of the walls in Emirler bath: C

<i>P.D.</i>	<i>Q.M.</i>	<i>F.R.E.</i>	<i>S.V.J.</i>	<i>Q.R.E.</i>	<i>P.H.R.</i>	<i>S.R.E.</i>	<i>Category</i>	<i>Vertical</i>	<i>Out of Plane</i>	<i>In the Plane</i>	<b>ANALYSIS OF IQM</b>	
NR	NR	NR	NR	R	PR	PR	<i>Method of</i>	<b>C</b>	<b>C</b>	<b>C</b>		
<b>Vertical IQM</b>							<i>Scoring</i>					
0	0	0	0	1	1	0.5	<i>LMT</i>		LMT 1=131,6	LMT 1=144,4		
<b>Out of Plane IQM</b>										LMT 2=137,1		LMT 2=132,8
0	0	0	0	1	1	0.5	<i>IQM</i>	1.5	1.5	0.25		
<b>In the Plane IQM</b>												
0	0	0	0	1	0.5	0.5						
<b>IQM=QRE x (PHR+PD+FRE+SVJ+SRE+QM)</b>												
<b><i>f<sub>m</sub></i> (N/cm<sup>2</sup>)</b>		min=130.9 max=227.4										<b>MECHANIC PARAMETERS (MIN-MAX)</b>
<b><i>E</i> (N/mm<sup>2</sup>)</b>		min=711.6 max=1049.3										
<b><i>T<sub>o</sub></i> (N/cm<sup>2</sup>)</b>		min=1.9 max=3.1										

## 7.2. Süleymanpa a Bath (Bilecik city)

Süleymanpa a bath was located in Bilecik city in the middle of the valley near the stream, south direction of the Orhan Gazi mosque. The exact building date of this bath wasn't known. There were two bibliographic sources related with the building date of this bath. In the first bibliographic source; Süleymanpa a bath was built in the similar periods with ' eyh Edebalı Külliyesi' complex buildings in early period of Ottoman Empire (1230-1402 A.D.) (*Mülayim, Öztürk, 2011*), (*Ünal, 2008*).

Second clue of Süleymanpa a bath built period in early Ottoman era was decided according to its construction style. In early period of Ottoman Empire; arch was used under the closure structures for support them. As well a dome was used in the middle of the vault structure. Similar examples of uses of these types of structures were seen in Bursa Ye il mosque which arch used as support of the closure structure.



Fig 7.10: Bursa Ye il Mosque, general view (*Wikipedia.org, 2012*)

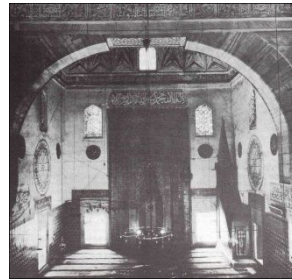


Fig 7.11: Bursa Ye il Mosque (1424), interior view of supporting arch (*Ayverdi II, 1989*)

znik Ye il mosque; a dome structure was used in the middle of the vault structure.



Fig 7.12: znik Ye il Mosque (1391), general view (*Wikipedia.org, 2012*)

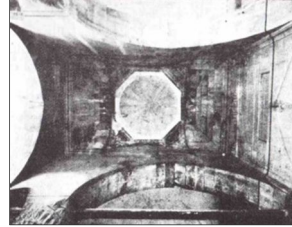


Fig 7.13: znik Ye il Mosque (1391), dome structure in the middle of the vault structure (*Ayverdi II, 1989*)

The plan typology of Süleymanpa a bath was single. The plan shape of the building was rectangular which composed of four different sections and two cells of 'halvet'. The building of the undressing space and warm space which were located on the west side was not remained until now. Both of the closure structures of these spaces were collapsed. However according to the traces, it understood that dome structures were used to cover these spaces (*Mülayim, Öztürk, 2011*).

Hot area of this bath was a connection with two 'halvet' on the east and warm area on the west. In addition there were two cells for toilet and shaving.

The water tank of this bath was rectangular and located on the east side. There were windows on the south wall of the water tank and on the west wall which opened to the 'halvet' (*Mülayim, Öztürk, 2011*).

In the structure of the bath; rough stone and brick were used. Inside of the building was plastered with cement based mixture. Therefore it was understood that this bath was maintained in later periods and used in a long time (*Mülayim, Öztürk, 2011*).



Fig 7.14: Süleymanpa a bath general view (*Mülayim, Öztürk, 2011*)



Fig 7.15: Süleymanpa a bath warm area view



Fig 7.16: Süleymanpa a bath south wall view 1



Fig 7.17: Süleymanpa a bath south wall view 2



Fig 7.18: Süleymanpa a bath south wall view 3



Fig 7.19: Süleymanpa a bath top view



The bath typology in Bilecik was similar in differentiated bath buildings. Most of the baths in this region was single plan type.

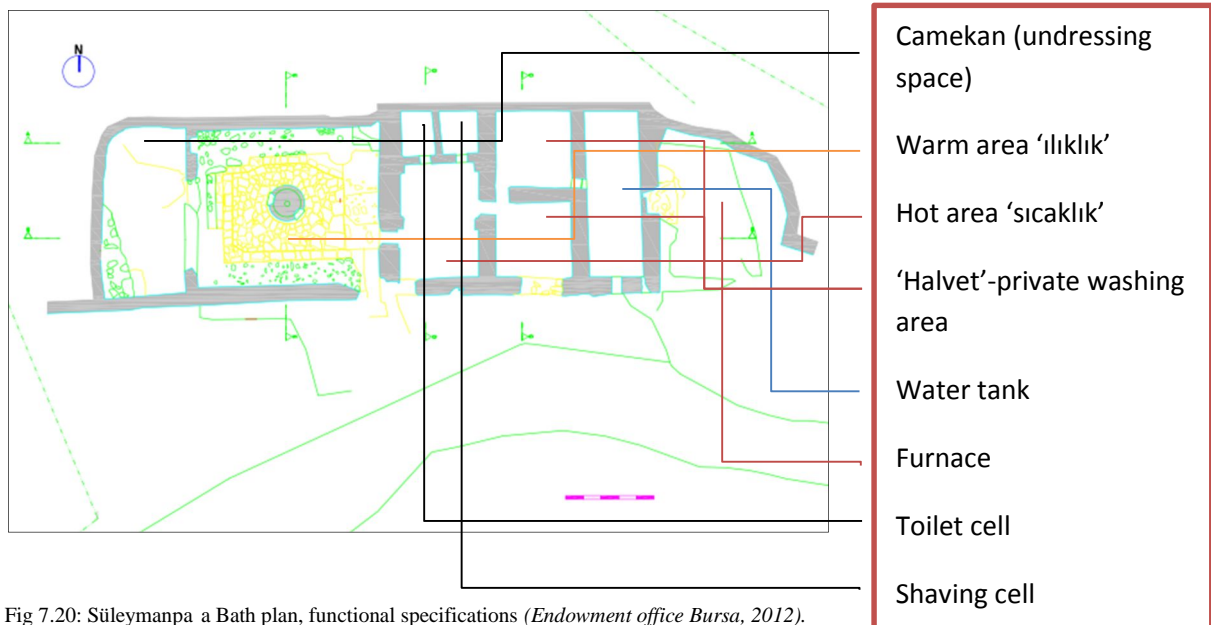


Fig 7.20: Süleymanpaşa Bath plan, functional specifications (Endowment office Bursa, 2012).

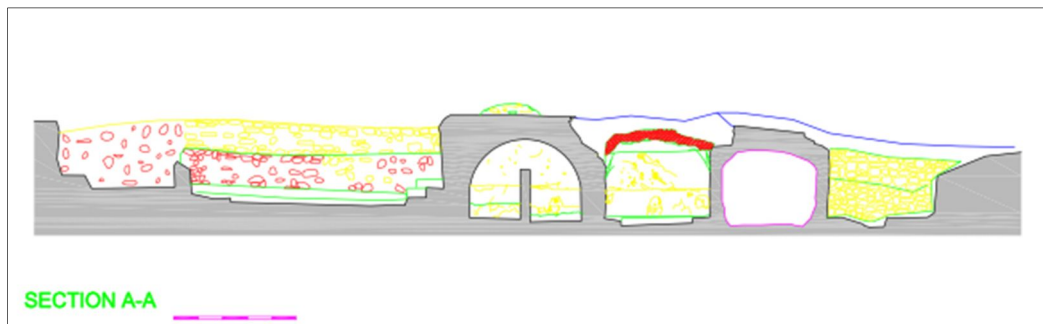


Fig 7.21: Süleymanpaşa Bath section A-A (Endowment office Bursa, 2012).

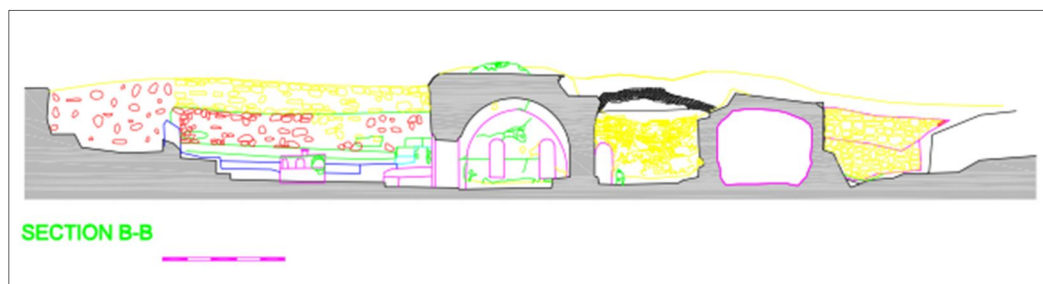


Fig 7.22: Süleymanpaşa Bath section B-B (Endowment office Bursa, 2012).

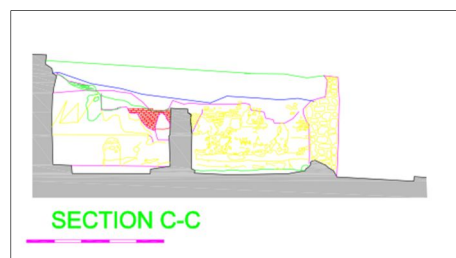


Fig 7.23: Süleymanpaşa Bath section C-C (Endowment office Bursa, 2012).

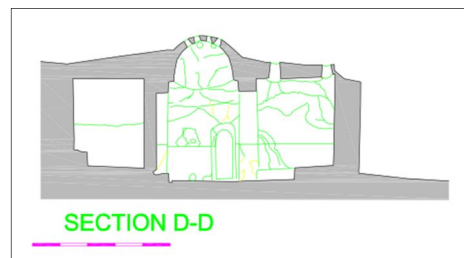

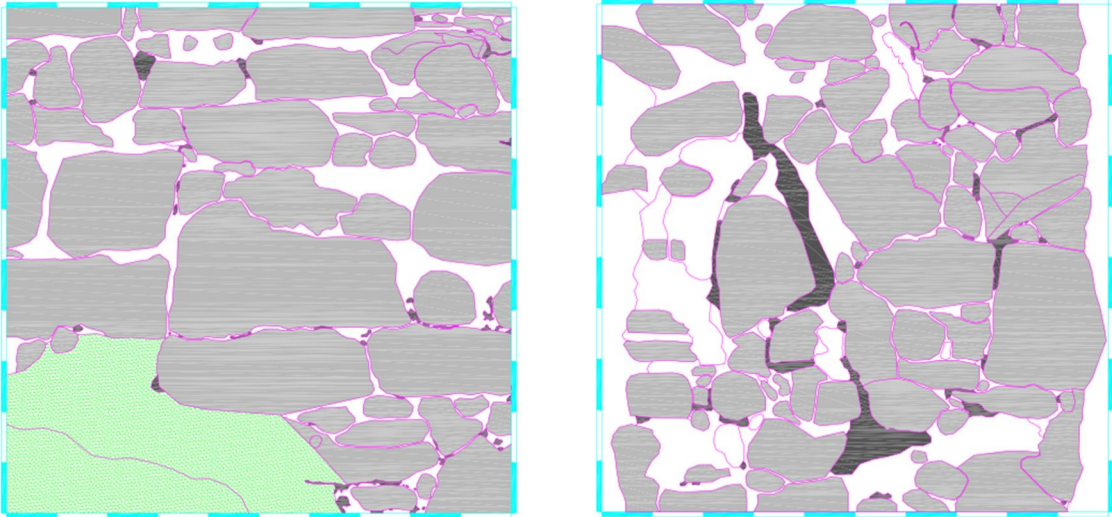


Fig 7.24: Süleymanpaşa Bath D-D (Endowment office Bursa, 2012).

CHAPTER 7: CASE STUDIES



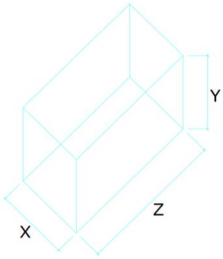
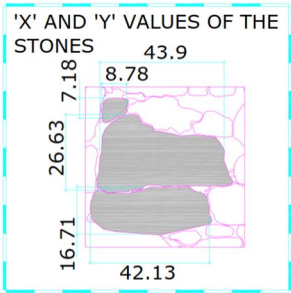
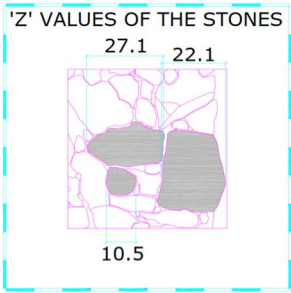
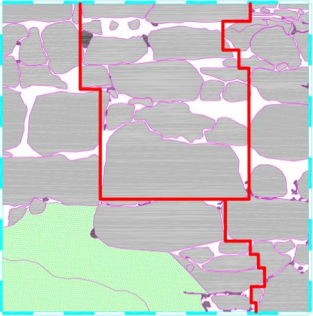
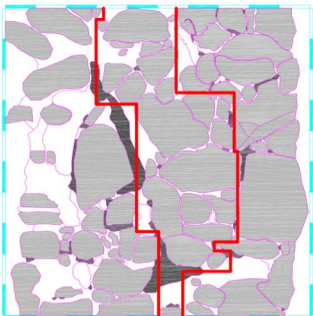
7.2.1. Methodological application (A)

Table 7.4: Qualitative methods for evaluating the quality of the walls in Süleymanpa a bath: A

<b>Qualitative Methods for Evaluating the Quality of the Walls</b>	
<b>Bilecik City, Süleyman Paşa Bath</b>	
<b>Stone masonry of minute size, mixed with natural pebbles or split and stones</b>	
	<b>PHOTOS</b>
	<b>SCHEMA</b>

CHAPTER 7: CASE STUDIES

Table 7.5: Qualitative methods for evaluating the quality of the walls in Süleymanpaşa bath: B

<p><b>Description of Süleymanpaşa Bath:</b>  Masonry stone structure is composed with various sizes and irregular shapes of stones. There was no clue for timber tie beam connection inside of the masonry stone walls. On the sections of the masonry wall small pebbles and stones could be seen. The wall fabric is chaotic, it was not respected to the horizontal rows or offset of the vertical joints. Diatone stones are not used inside of the masonry stone wall structure. There was an effort for horizontal linearity.</p>	<b>DESCRIPTION</b>
<p>Stones are composed of coarse grain sand stone with quartz and feldspar minerals. The amount of the feldspar minerals are in a high percentage in the compound of the stone. The stones are identified as; coarse grain with quartz and feldspar minerals sand stone.</p>	
<div style="display: flex; justify-content: space-around;">   </div>	<b>MATERIAL</b>
<p>Stone Sample</p>	
<div style="display: flex; justify-content: space-around;">  <div style="border: 1px dashed cyan; padding: 5px;"> <p><b>'X' AND 'Y' VALUES OF THE STONES</b></p>  </div> <div style="border: 1px dashed cyan; padding: 5px;"> <p><b>'Z' VALUES OF THE STONES</b></p>  </div> </div>	<b>GEOMETRY OF THE MATERIAL</b>
<p><b>APPROXIMATION OF STONE DIMENTIONS OF THE MASONRY</b> <span style="float: right;">X=</span></p> <p>8.7cm - 43.9cm / Y= 7.1cm - 26.6cm / Z= 10.5cm - 27.1cm</p>	
<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>LMT 1      LMT 2</p>  </div> <div style="text-align: center;"> <p>LMT 1      LMT 2</p>  </div> </div>	<b>LMT</b>

CHAPTER 7: CASE STUDIES

Table 7.6: Qualitative methods for evaluating the quality of the walls in Süleymanpa a bath: C

<i>P.D.</i>	<i>Q.M.</i>	<i>F.R.E.</i>	<i>S.V.J.</i>	<i>Q.R.E.</i>	<i>P.H.R.</i>	<i>S.R.E.</i>	<i>Category</i>	<i>Vertical</i>	<i>Out of Plane</i>	<i>In the Plane</i>	<b>ANALYSIS OF IQM</b>
NR	NR	NR	NR	R	PR	PR	<i>Method of</i>	<b>C</b>	<b>C</b>	<b>C</b>	
<b>Vertical IQM</b>							<i>Scoring</i>				
0	0	0	0	1	1	0.5	<i>LMT</i>		LMT 1=123.1	LMT1=166.1	
<b>Out of Plane IQM</b>									LMT 2=148.8	LMT2=143.9	
0	0	0	0	1	1	0.5	<i>IQM</i>	1.5	1.5	1	
<b>In the Plane IQM</b>											
0	0	0	0	1	0.5	0.5					
<b>IQM=QRE x (PHR+PD+FRE+SVJ+SRE+QM)</b>											
<i>fm (N/cm<sup>2</sup>)</i>	min=130.9 max=227.4										
<i>E (N/mm<sup>2</sup>)</i>	min=711.6 max=1049.3										
<i>To (N/cm<sup>2</sup>)</i>	min=2.3 max=3.6										
											<b>MECHANIC PARAMETERS (MIN-MAX)</b>

7.2.2. Methodological application (B)

Perspective views and general bird eye views of “Süleymanpa a” bath is shown on the following pictures.



Fig 7.25: Perspective view of “Süleymanpa a” bath

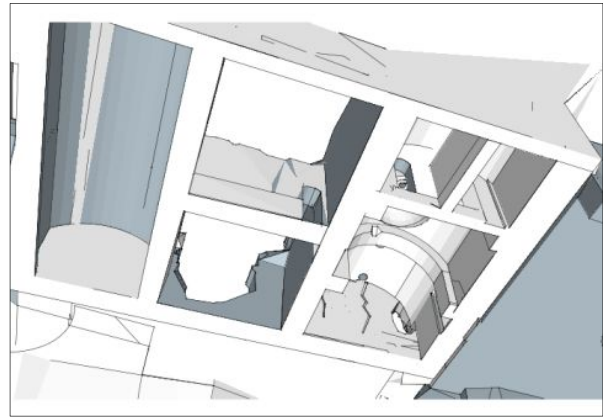


Fig 7.26: Perspective view of interior spaces “Süleymanpa a” bath

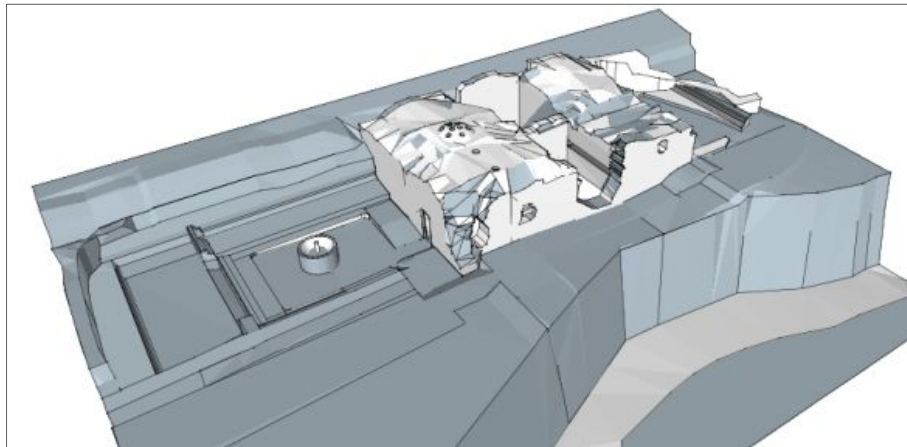


Fig 7.27: South-west view of “Süleymanpa a” bath

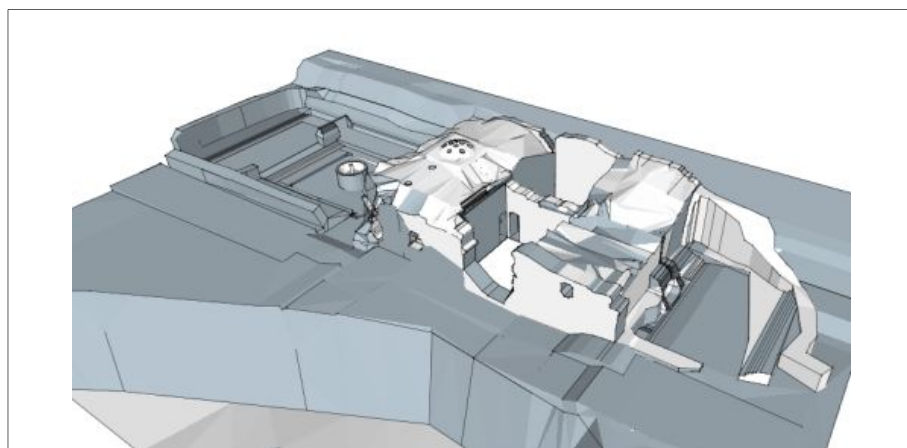


Fig 7.28: South-east view of “Süleymanpa a” bath