

Damage analysis of “Ke an” case study bath structure:  
 Table 7.47: Damage analysis of “Ke an” case study bath structure, “Cell A”



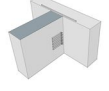
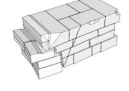


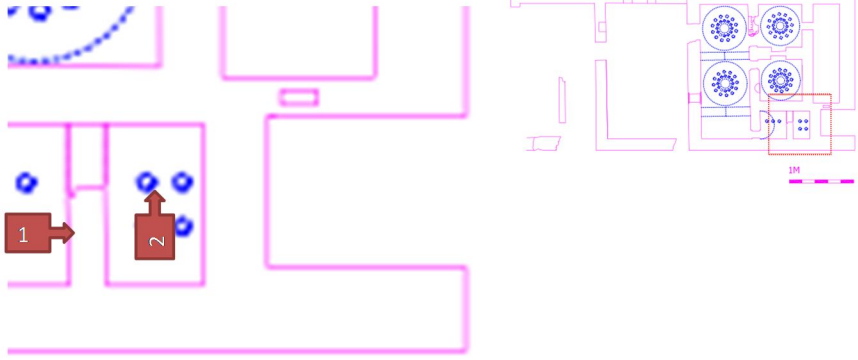
Damage Analysis of "Keşan Bath"										
Damaged Part Number	Damaged Parts of Case Studies	Quality of Masonry		Construction Characteristics			Cracking and Instability			
				Structural Discontinuities	Degradation of structural elements	Conditions	General Description	Physical Damage	Geometrical Modifications	Loss of verticality
Cell "A"		Vertical A B C	Qualitative methods of for evaluation is rated, "B" in vertical, "C" out of plane and "C" in plane actions.	Fig: 1	Fig: All		Between the masonry walls there is a consistency of the structure. However the partition wall and the structure do not any connecton. There is a deterioration of stone wall construction. The masonry walls of the structure is too wide. The dome and the transitional elements made up of brick material.	Fig: 1	Fig: 2	In figure 1: The masonry wall structure was partly collapsed. However it is not a load bearing wall of the structure. It is a partition wall. The arch and jamb of the walls are made up of brick material. In figure 2: The stone slab structure is partly collapsed. And it will affect the stability of the masonry walls.
		Out of Plane A B C		In the Plane A B C						
										

Table 7.48: Damage analysis of “Ke an” case study bath structure, “Cell B”

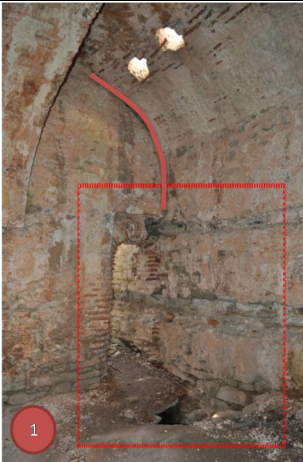


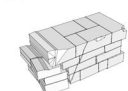


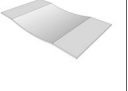



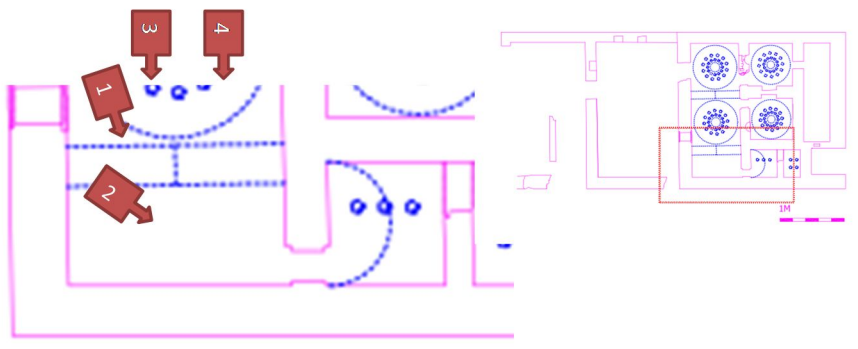
Damage Analysis of "Keşan Bath"											
Damaged Part Number	Damaged Parts of Case Studies	Quality of Masonry	Construction Characteristics			General Description	Cracking and Instability				
			Structural Discontinuities	Degradation structural elements	Conditions		Physical Damage	Geometrical Modifications	Loss of verticality	General Description	
Cell "B-C"	 	<p>Vertical</p> <p>A</p> <p>(B)</p> <p>C</p>	<p>Fig: 1</p> 	<p>Fig: 1,2,3</p> 		<p>Between the masonry walls there is a consistency of the structure. However the partition wall and the structure do not any connecton. There is a deterioration of stone wall construction. The masonry walls of the structure is too wide. The dome and the transitional elements made up of brick material.</p>	<p>Fig: 1</p> 	<p>Fig: 1</p> 		<p>In figure 1: There is a crack between the wall and the vault. Interior walls of the masonry wall there are empty sockets for the piping system. In front of the wall the stone slab was broken down. The empty sockets and the broken slab affects the stability of the wall.</p>	
		<p>Out of Plane</p> <p>A</p> <p>B</p> <p>(C)</p>					<p>Qualitative methods of for evaluation is rated, "B" in vertical, "C" out of plane and "C" in plane actions.</p>	<p>Fig: 2,3</p> 			
		<p>In the Plane</p> <p>A</p> <p>B</p> <p>(C)</p>									<p>In detail cell "B"; irregular shape and longitudinal stones were used. Leaves of the masonry were bonded with diatones. Rows between stones were constructed irregularly. But there is an intension to horizontal linearity.</p>
											



Table 7.49: Damage analysis of “Ke an” case study bath structure, “Cell C”

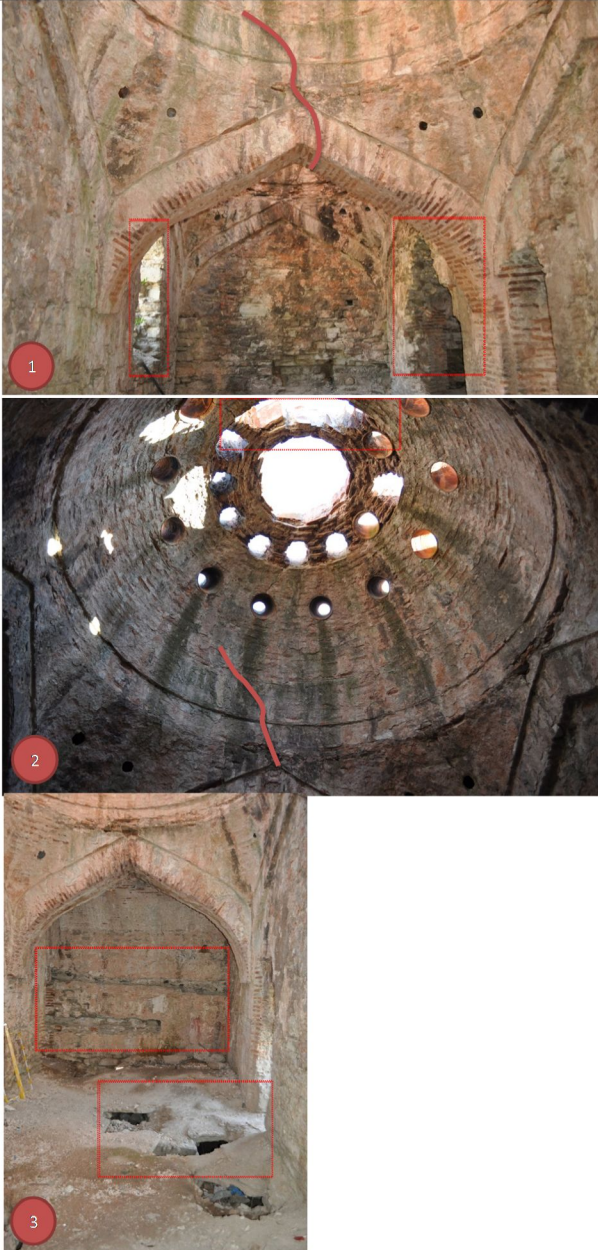





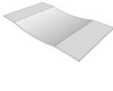
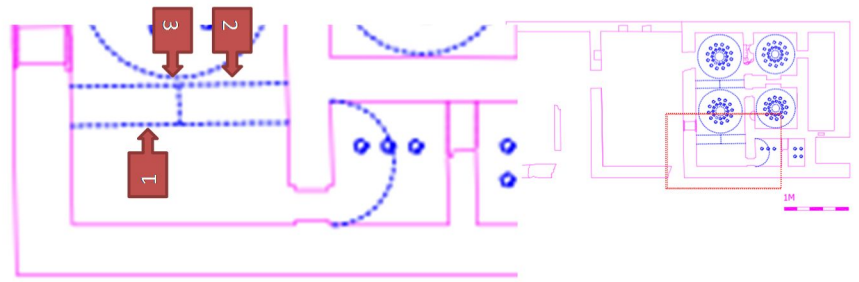
Damage Analysis of "Keşan Bath"										
Damaged Part Number	Damaged Parts of Case Studies	Quality of Masonry	Construction Characteristics				Cracking and Instability			
			Structural Discontinuities	Degradation of structural elements	Conditions	General Description	Physical Damage	Geometrical Modifications	Loss of verticality	General Description
Cell "B-C"		<p>Vertical</p> <p>A</p> <p>(B)</p> <p>C</p> <p>Out of Plane</p> <p>A</p> <p>B</p> <p>(C)</p> <p>In the Plane</p> <p>A</p> <p>B</p> <p>(C)</p> <p>Qualitative methods of for evaluation is rated, "B" in vertical, "C" out of plane and "C" in plane actions.</p> <p>In detail cell "C"; irregular shape and longitudinal stones were used. Leaves of the masonry were bonded with diatones. Rows between stones were constructed irregularly. But there is an intension to horizontal linearity.</p>	<p>Fig: 1,3</p> 	<p>Fig: A"</p> 		<p>Between the masonry walls there is a consistency of the structure. There is a deterioration of stone wall construction. The masonry walls of the structure is too wide. The dome and the transitional elements made up of brick material. Pointed arches are used in this structure.</p>	<p>Fig: 1,3</p>  <p>Fig: 3</p> 	<p>Fig: 3</p> 		<p>In figure 1: There is a crack on the top of arch element. This crack is started from the point arch to the perimeter of the dome. This crack is very tiny. On the masonry walls there are two big cracks which are probaby made by users. In figure 2: The crack is same in figure 1. On the top of the dome there is damages on the middle lantern part. In figure 3: On the elevaton of the wall there are cracks and empty sockets for the piping system. On the stone floor there are some parts is broken down.</p>
										

Table 7.50: Damage analysis of “Ke an” case study bath structure, “Cell C, D, E” elevation







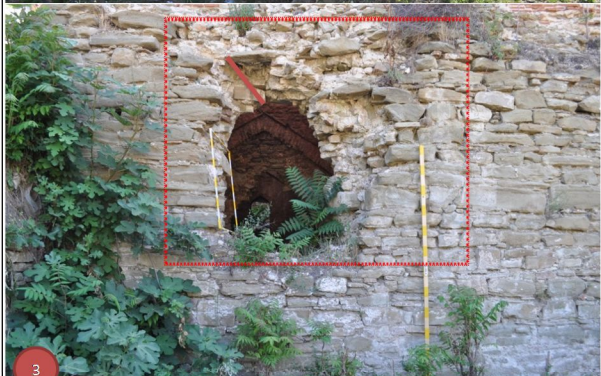
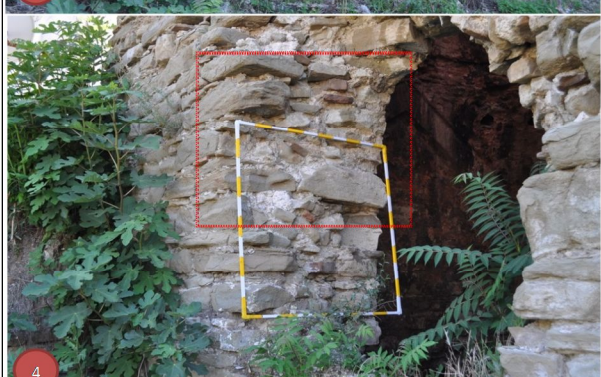
Damage Analysis of "Ismail Bey Bath"											
Damaged Part Number	Damaged Parts of Case Studies	Quality of Masonry		Construction Characteristics			Cracking and Instability				
				Structural Discontinuities	Degradation of structural elements	Conditions	General Description	Physical Damage	Geometrical Modifications	Loss of verticality	General Description
Cell "C,D,E" Elevation		Vertical A B C	Qualitative methods of for evaluation is rated, "B" in vertical, "C" out of plane and "C" in plane actions.	Fig: All 	Fig: All 		Between the masonry walls there is a consistency of the structure. There is a deterioration of stone wall construction. The masonry walls of the structure is too wide. The dome and the transitional elements made up of brick material. Pointed arches are used in this structure.	Fig: 3 			In figure 1,2,3: Around the door openings of the structure is deteriorated and collapsed. On the corner of the structure was deteriorated and collapsed. In figure 4: The section of the masonry structure is seen. The diatone stones are used for connecting the two leaves of the masonry.
		Out of Plane A B C						In detail cell "C,D,E" elevation; irregular shape and longitudinal stones were used. Leaves of the masonry were bonded with diatones. Rows between stones were constructed irregularly. But there is an intension to horizontal linearity.			
		In the Plane A B C									
											



Table 7.51: Damage analysis of “Ke an” case study bath structure, “Cell C, B, E” elevation


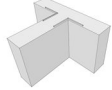
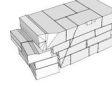


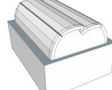
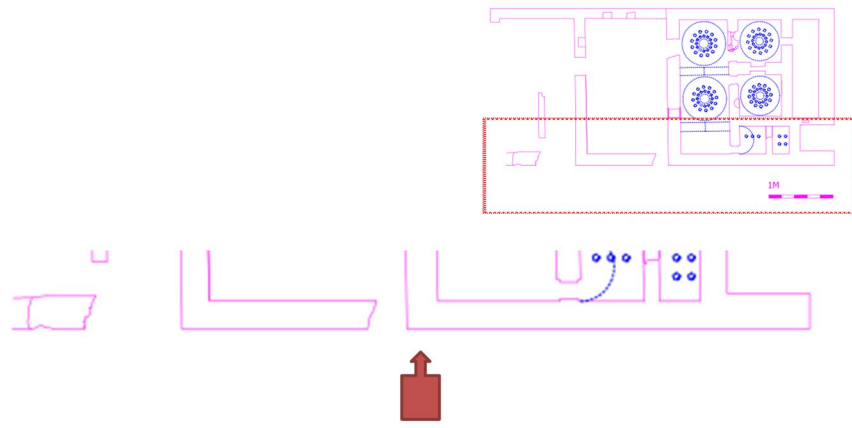

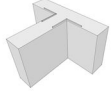





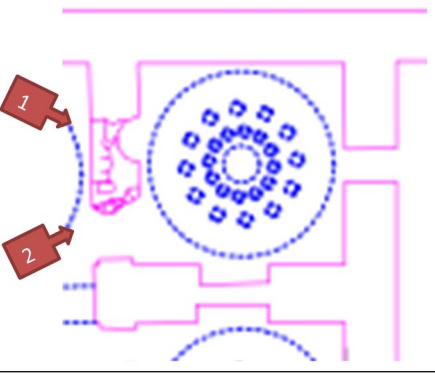
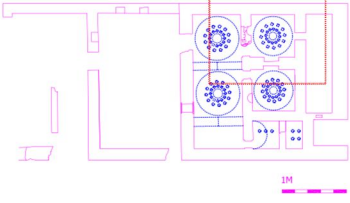
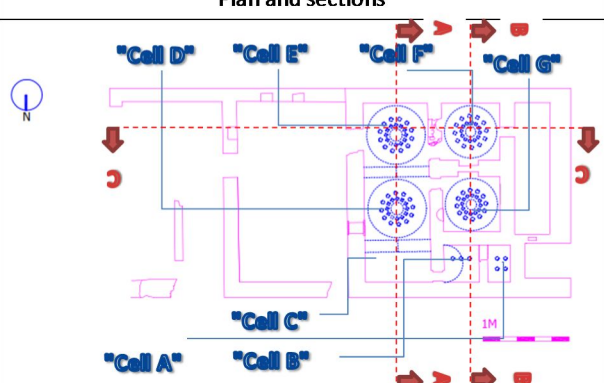
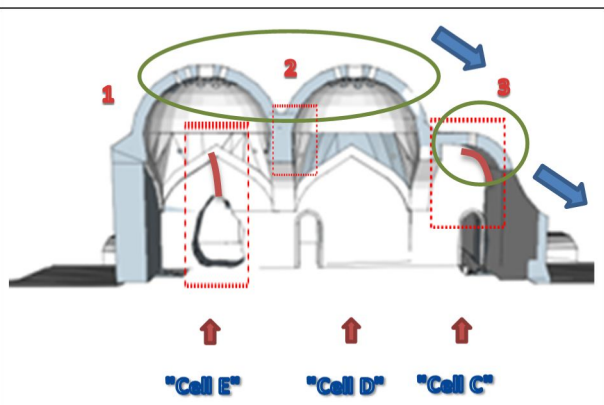
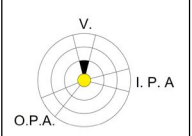

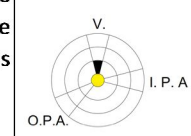

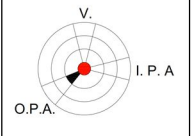
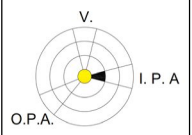
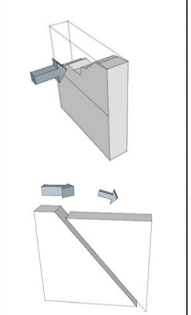
Damage Analysis of "Keşan Bath"											
Damaged Part Number	Damaged Parts of Case Studies	Quality of Masonry		Construction Characteristics			Cracking and Instability				
				Structural Discontinuities	Degradation of structural elements	Conditions	General Description	Physical Damage	Geometrical Modifications	Loss of verticality	General Description
Cell "C,B,A" Elevation		Vertical A B C	Qualitative methods of for evaluation is rated, "B" in vertical, "C" out of plane and "C" in plane actions.				Between the masonry walls there is a consistency of the structure. There is a deterioration of stone wall construction. The masonry walls of the structure is too wide. The dome and the transitional elements made up of brick material. Pointed arches are used in this structure.				In figure 1: There is a deterioration on the structure. Part of the vault structure was collapsed. The "C, B, A" elevation of the structure was deteriorated and the joints of the stones were delaminated.
		Out of Plane A B C									
		In the Plane A B C									

Table 7.52: Damage analysis of “Ke an” case study bath structure, “Cell F”

Damage Analysis of "Keşan Bath"											
Damaged Part Number	Damaged Parts of Case Studies	Quality of Masonry		Construction Characteristics			Cracking and Instability				
				Structural Discontinuities	Degradation of structural elements	Conditions	General Description	Physical Damage	Geometrical Modifications	Loss of verticality	General Description
Cell "F"		<p>Vertical</p> <p>A</p> <p>(B)</p> <p>C</p>	<p>Qualitative methods of for evaluation is rated, "B" in vertical, "C" out of plane and "C" in plane actions.</p>	<p>Fig: All</p> 	<p>Fig: 1</p> 		<p>Between the masonry walls there is a consistency of the structure. There is a deterioration of stone wall construction. The masonry walls of the structure is too wide. The dome and the transitional elements made up of brick material. Pointed arches are used in this structure.</p>	<p>Fig: 1</p> 			<p>In figure 1,2: There was a tiny cracks on the arches. In the first picture the crack was ended under the arch. However the second crack was started top of the window arch and it will continue to the transitional elements.</p>
		<p>Out of Plane</p> <p>A</p> <p>B</p> <p>(C)</p>						<p>In the Plane</p> <p>A</p> <p>B</p> <p>(C)</p> <p>In detail cell "F"; irregular shape and longitudinal stones were used. Leaves of the masonry were bonded with diatones. Rows between stones were constructed irregularly. But there is an intension to horizontal linearity.</p>			
											

Collapsed analysis of “Ke an” case study bath structure:

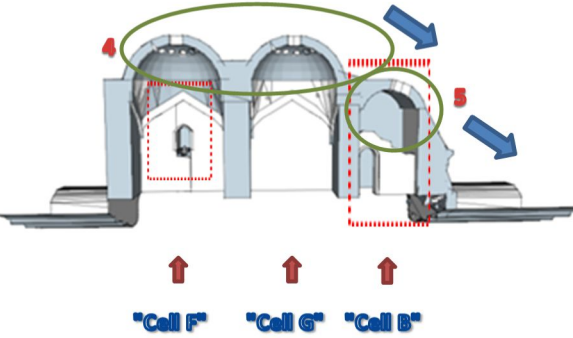
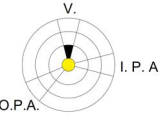

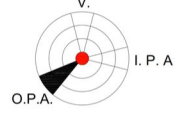
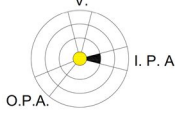
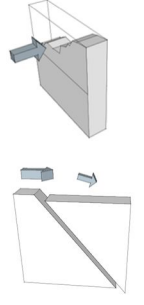
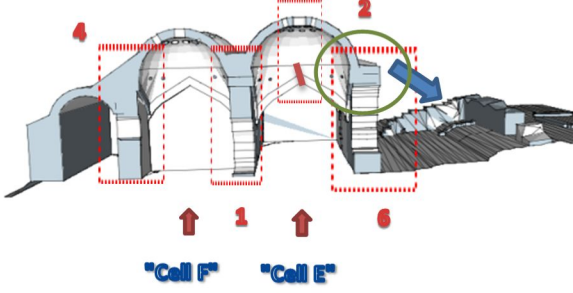
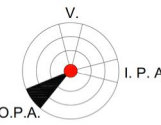
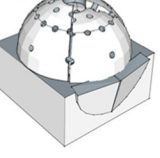
Table 7.53: Collapsed analysis of “Ke an” case study bath structure, Section A-A

Collapse Analysis of Critical Damaged Parts of "Keşan Bey" bath						
<p>Plan and sections</p> 		<p>Details</p>				
<p>Section A-A</p> 		<p>Detail 1</p>		<p>Detail 2</p>		
<p>Symbolic Description of Action Analysis</p>		<p>Symbolic Collapse Mechanism</p>	<p>Description of Collapse Analysis</p>	<p>Symbolic Description of Action Analysis</p>	<p>Symbolic Collapse Mechanism</p>	<p>Description of Collapse Analysis</p>
<p>Low risk of collapse if this element is under vertical actions.</p> 			<p>Detail 1; There is tiny crack starting from the collapsed part of the wall to the end of the supporter arch of the dome. The collapsed part of the wall did not cause any collapse kinematic chain in the structure. The possible collapse mechanism is shown in the symbolic part.</p>	<p>Low risk of collapse if this element is under vertical actions.</p> 		<p>Detail 2; There is tiny crack starting from support arch of the masonry cell and it continue to dome. The possible collapse mechanism is shown in the symbolic part.</p>
		<p>Detail 3</p>				
<p>Symbolic Description of Action Analysis</p>		<p>Symbolic Collapse Mechanism</p>	<p>Description of Collapse Analysis</p>			
<p>Low risk of collapse if this element is under out of plane and in plane actions.</p>  			<p>Detail 3; The crack is between the vault and the partition masonry wall. The upper part of the masonry wall is free for out of plane actions. Therefore collapse mechanism is occurred according to this mechanism. In second scenario; two domes are tend to move to the direction of vault. And the crack was occurred. This action occurred in plane that cause a slipping affect of domes and vault of the structure to the right direction according to the section A-A.</p>			



CHAPTER 7: CASE STUDIES

Table 7.54: Collapsed analysis of “Ke an” case study bath structure, Section B-B / C-C

Section B-B	Detail 4			Detail 5		
	Symbolic Description of Action Analysis	Symbolic Collapse Mechanism	Description of Collapse Analysis	Symbolic Description of Action Analysis	Symbolic Collapse Mechanism	Description of Collapse Analysis
	<p>Low risk of collapse if this element is under vertical actions.</p> 		<p>Detail 4; There is tiny crack starting from the window opening part of the wall to the end of the supporter arch of the dome. The possible collapse mechanism is shown in the symbolic part.</p>	<p>High risk of collapse if this element is under out of plane and low risk of collapse if this element is under in plane actions.</p>  		<p>Detail 5; The upper part of the masonry wall is collapsed under out of plane action. Second scenario is the same with detail 2; two domes are tend to move to the direction of vault. And the crack and collapsed was occurred. This action occurred in plane that cause a slipping affect of domes and vault of the structure to the right direction according to the section B-B.</p>
Section C-C	Detail 6					
	Symbolic Description of Action Analysis	Symbolic Collapse Mechanism	Description of Collapse Analysis			
	<p>Low risk of collapse if this element is under out of plane actions.</p> 		<p>Detail 6; The "C,D,E" elevation of the structure is partially collapsed. The damage of the front wall separated to the tension ring of the dome. Therefore possible damage mechanism could be under out of plane action shown in symbolic collapse mechanism.</p>			