

Preservation Survey and Situation Assessment

Acre's El-Jazzar Mosque

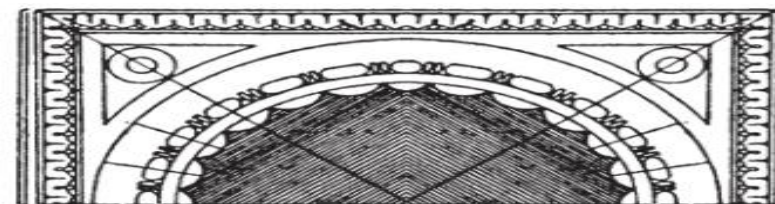
Engineering-Construction failures and risks in The Minaret (Al-Madhana) (summary)

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The Islamic Waqf Board of Trustees - Acre



ATIQ عتيق
FOR ANTIQUITIES AND HERITAGE

The Minaret (Al-Madhana)

The mosque has a minaret (Al-Madhana), located in the northwestern corner of the prayer hall. The minaret is reached via a staircase that emerges from the prayer hall. The minaret reaches a height of 23 meters above the prayer hall, and is topped with a 1-meter high metal crescent. The minaret was apparently damaged several times. In 1812, the main minaret was damaged and developed cracks after being hit by a bolt of lightning. The minaret was rebuilt in 1816, and when it was restored, the minaret's original shape was preserved.

The parts of the minaret: The base of the minaret is attached to the elephant leg pillar in the corner of the prayer hall, a barrel-shaped element (diameter: 2 meters, height: 14 meters) with a rounded, recessed base attached to the corner of the prayer hall, within which is a spiral staircase. The parapet is comprised of a cylindrical *jawsak*, or neck (height: 4 meters) resembling the shaft of the minaret, rising over a small elliptical balcony (diameter: 3 meters, height: 1 meter) with a balustrade (the height of the balustrade is 1 meter). Above the *jawsak* is a conical canopy (*el-Burnus*, Height: 3 meters), capped with a crescent.

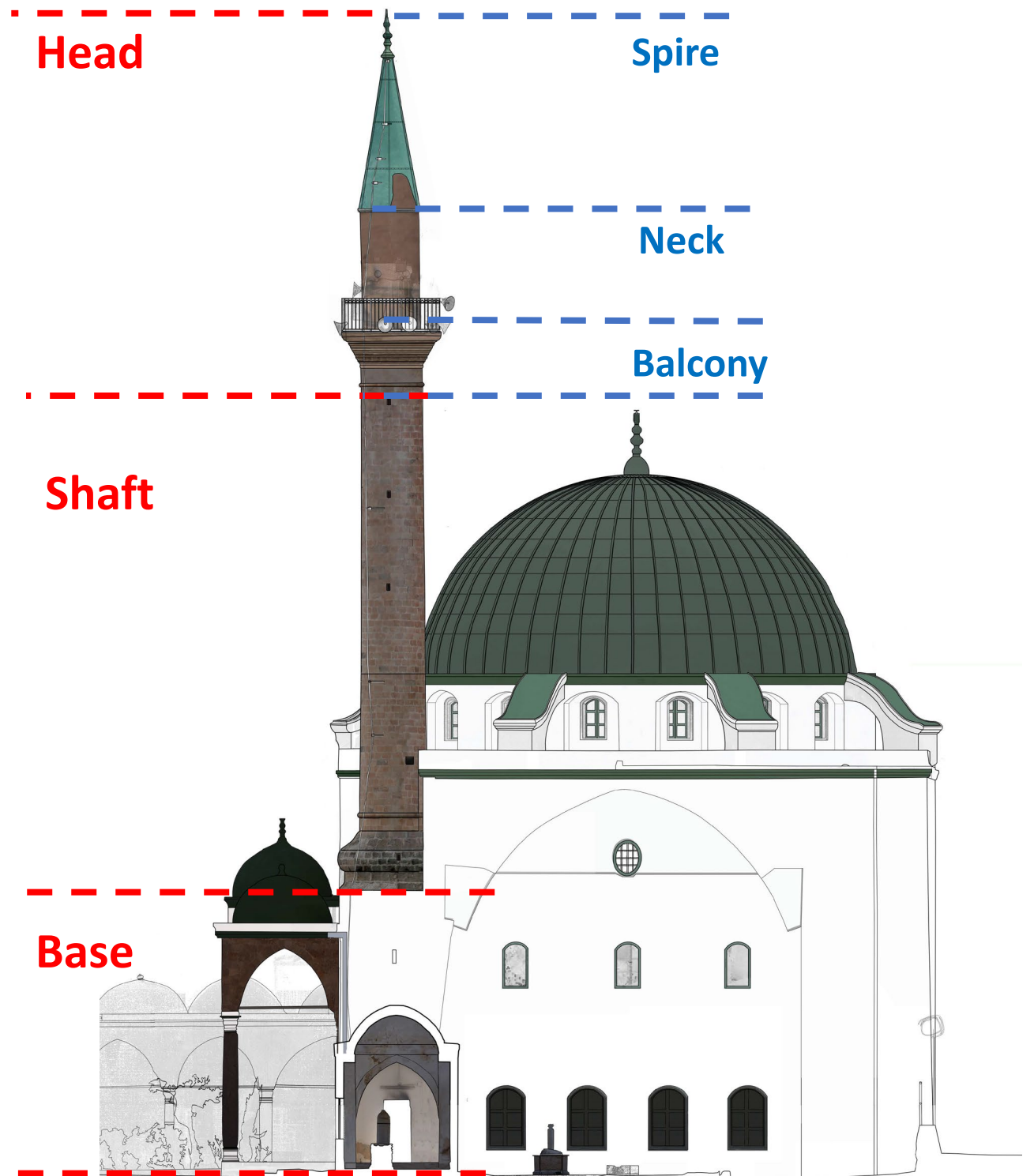


Figure 21: The minaret, viewed from the east

Architectural Documentation & 3D laser scanner survey of el-Jazzar mosque in Acre

Preserving and restoring the minaret

The El-Jazaar Mosque's minaret is shaped like a thin pencil. These types of minarets are less earthquake-resistant, and more vulnerable to bolts of lightning, due to their height.

In 1812, the main minaret was damaged and developed cracks after being hit by a bolt of lightning. The minaret was rebuilt in 1816, and when it was restored, the minaret's original shape was preserved (*Mheibesh*, 1999: 74).

This photograph, taken in 1870, shows that the mosque did not have a minaret at the time. The minaret had probably fallen off earlier. As of yet, no information on this incident has been obtained, and the exact time it occurred is unknown.

The minaret may have fallen off during the tremendous, severe earthquake that occurred in the Holy Land in 1837, causing great damage to the north of the country, and to entire cities, like Tiberias and Safed (Matani 2020: 293).

- A photograph from 1880, showing that a minaret had been built for the mosque. The new minaret was probably built between 1870 and 1880.

- As of yet, despite having searched the archives extensively and consulted many of the city's dignitaries and elders, no information was found on the 1927 earthquake and the extent of the damage it caused to the minaret. Nonetheless, the survey of the *acsadra* (the portico at the entrance to the prayer hall) revealed that the domes at the front of the structure are made of concrete (cement-based). In any interview with the previous chair of the board of trustees, Mr. Hassan al-Sarwan (November 11, 2022), who was familiar with the history of the mosque, from the 1950s, al-Sarwan stated that he had no precise information on the renovation of the *acsadra* or the restoration of the minaret. In my view, given that the *acsadra* was built with cement, it had probably collapsed during the 1927 earthquakes, and it was probably rebuilt during the 1940s.

- The current minaret was considerably damaged and had many safety hazards. According to the testimony of Mr. al-Sarwan, the former chair of the board of trustees, approximately 30 years ago, an iron mesh was installed, and a 25-mm concrete-cement slab was poured along the interior walls of the minaret, in order to reinforce the structure.

- **Currently, the minaret is in disrepair and at a very high risk of collapse.**

These risks necessitate professional and rapid intervention.



The El-Jazaar Mosque, 1870



The El-Jazaar Mosque, 1880

ATIK survey, 2023

As mentioned earlier, the ATIK survey was a general survey of the entire compound, during which we addressed the various elements of the mosque, particularly the minaret. The survey addressed all elements of the minaret – the base, the shaft, and the head – as well as how the minaret is attached to the foundations and to the prayer hall.

A few points should be emphasized here:

- The minaret is currently in a delapidated state. It's at a very high risk of collapse and poses a danger to the rest of the compound, particularly if events such as earthquakes were to occur.
- If the minaret collapses, that would also endanger worshippers and visitors in the area, and it may cause other damage to the structure of the mosque itself, particularly the prayer hall.
- The minaret is an inseparable part of the prayer hall. It is built on top of a pier (elephant leg), in the southwest corner of the prayer hall, which also supports the arches and the main dome.
- The pier forms the base of the minaret and is an inseparable part of the structure of the minaret. We can't address the damage in the minaret without addressing the damages to the base of the minaret, and the intervention must address all elements of the minaret.

In previous surveys, millimetric measurement of the cracks in the shaft of the minaret was not performed. These measurements could help us monitor the deterioration of the spire, especially after the damage and fallout of earthquakes, which could be at a very small scale, and thus, difficult to notice with the naked eye.

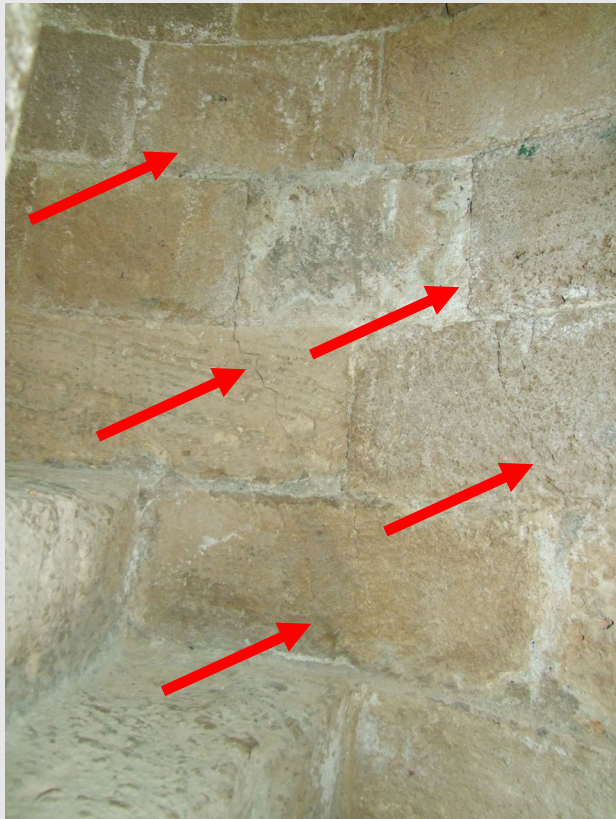
The deadly earthquake that occurred in Turkey in February of 2023, which was also felt in Israel, precipitated fears of damage to the mosque's minaret. In the absence of previous millimetric measurements of the cracks, which could serve as a basis of comparison, there is no way of ascertaining whether these earthquakes had a direct effect on the structure. After the earthquakes, another survey was conducted, on March 23, 2023, and millimetric measurements of previous cracks were taken in order to monitor their deterioration.

In light of the minaret's high risk level and delapidated state, it is imperative that the damage be urgently repaired. The minaret's uniqueness and complexity necessitates particularly prudent and professional handling. We recommend forming a team of experts, so that a joint decision can be made on the level and nature of the best possible intervention, to preserve the minaret.

Team members would include experts in the following fields:

Archaeology – late Islamic/Ottoman, Ancient architecture, Ancient construction, Seismology, Geology.

Survey and Situation Assessment El-Jazaar Mosque	The Islamic Waqf Board of Trustees – Acre masjed-aljazzar.org	ATIQ For Antiquities and Heritage atiqh.com	Dr. Abd al-Razek Matani abedrazeq.atiq@gmail.com	4
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Stairs 9-13

Cracks and a fracture in the eastern wall, opposite the stair

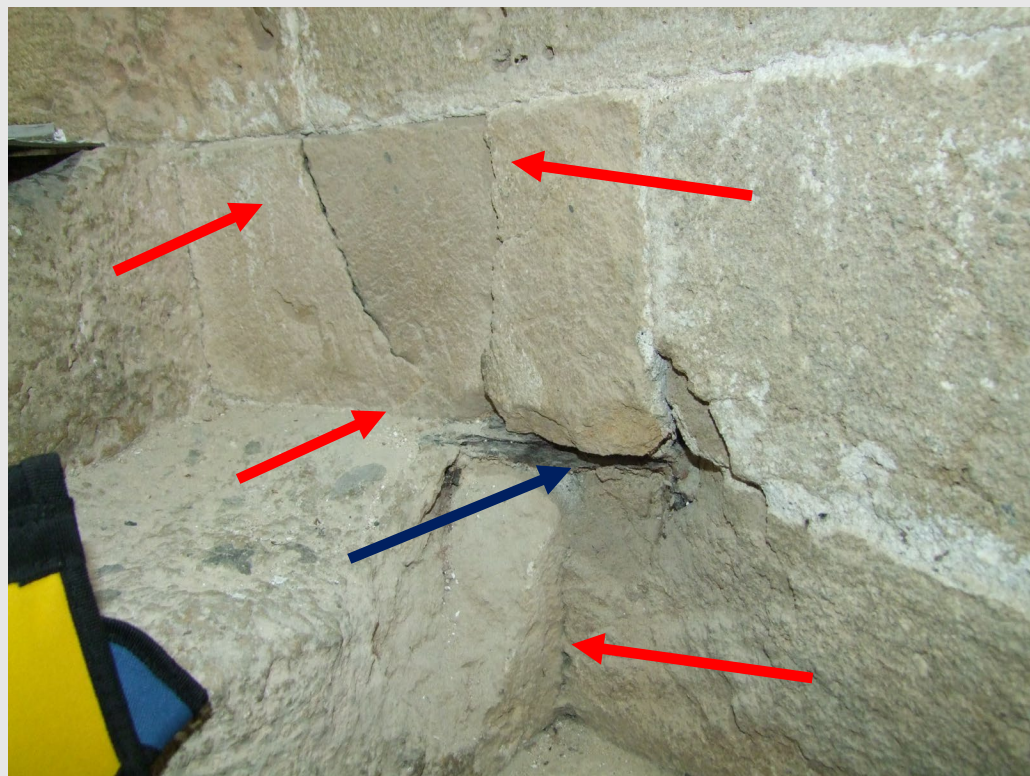
Stairs 11-13

Cracks running down the length of the stairs (0.3-0.6 cm)



Cracks and a fracture in the southern wall, opposite Stair

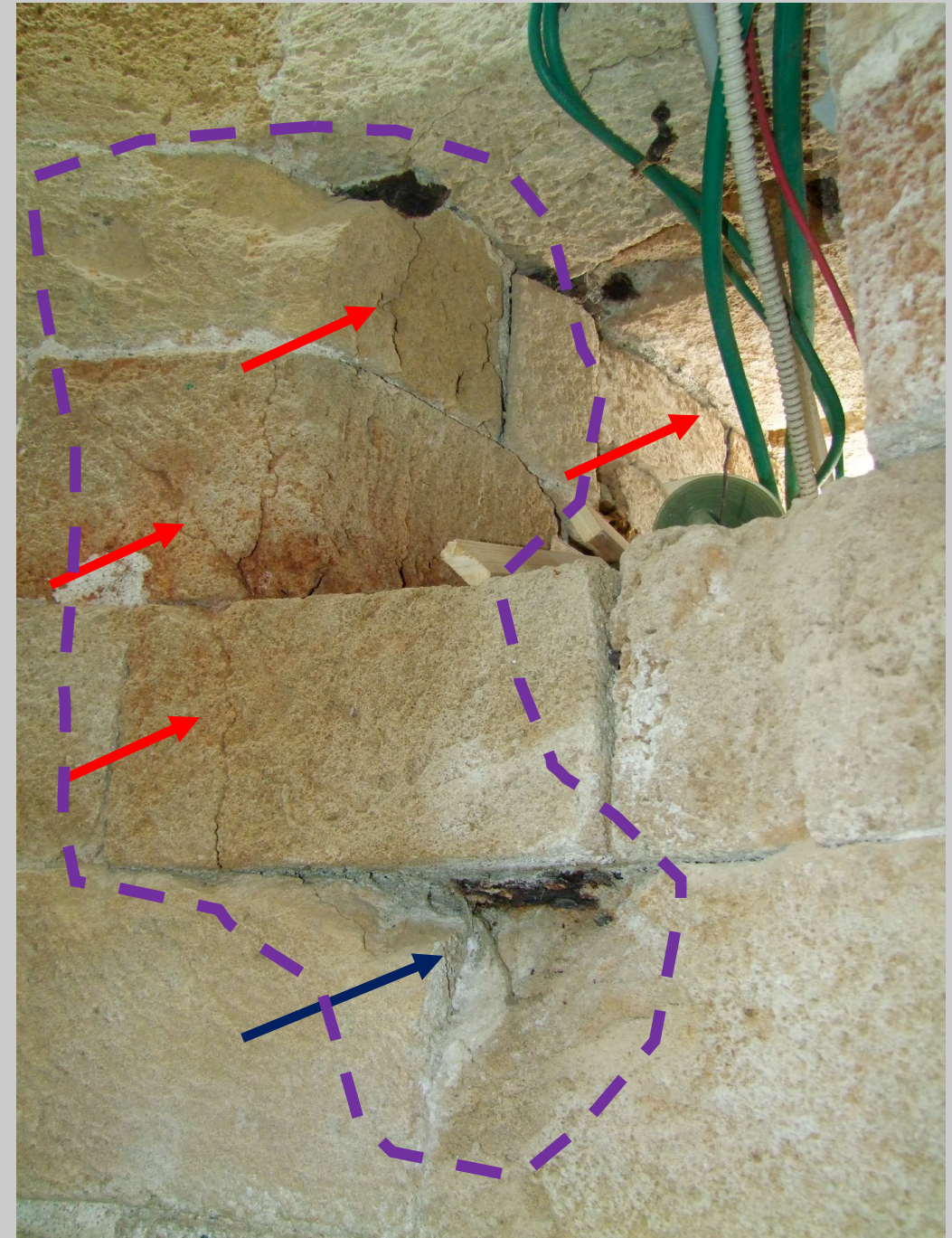
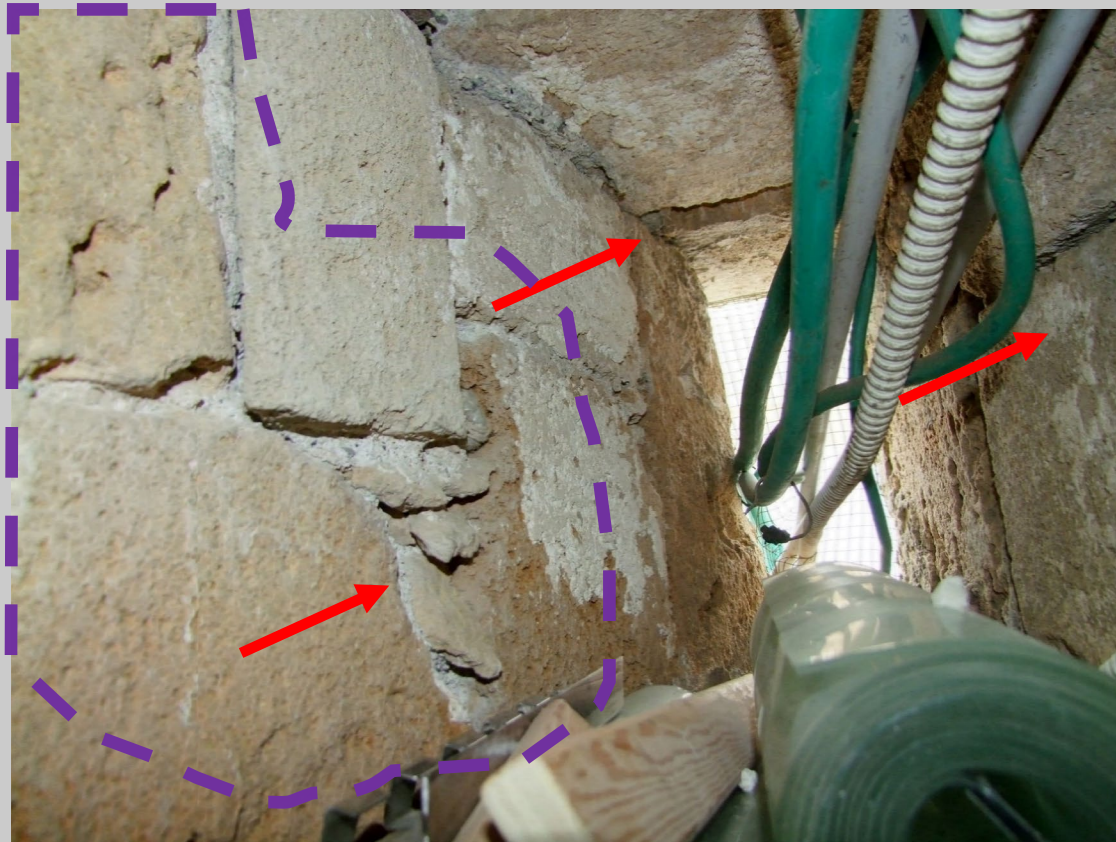
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Interior view of the window

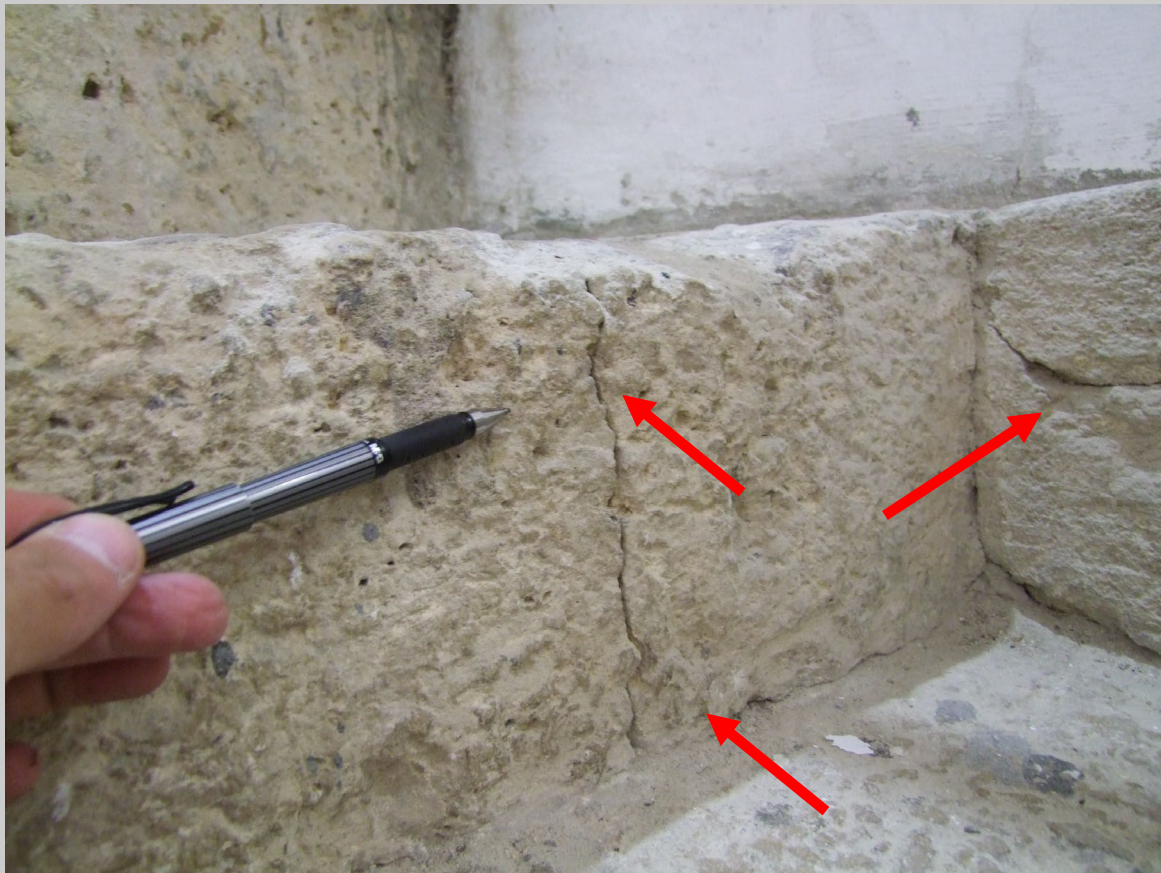
The first window

Cracks and weathering in the window stones
Rust and expansion of the steel nails under the window

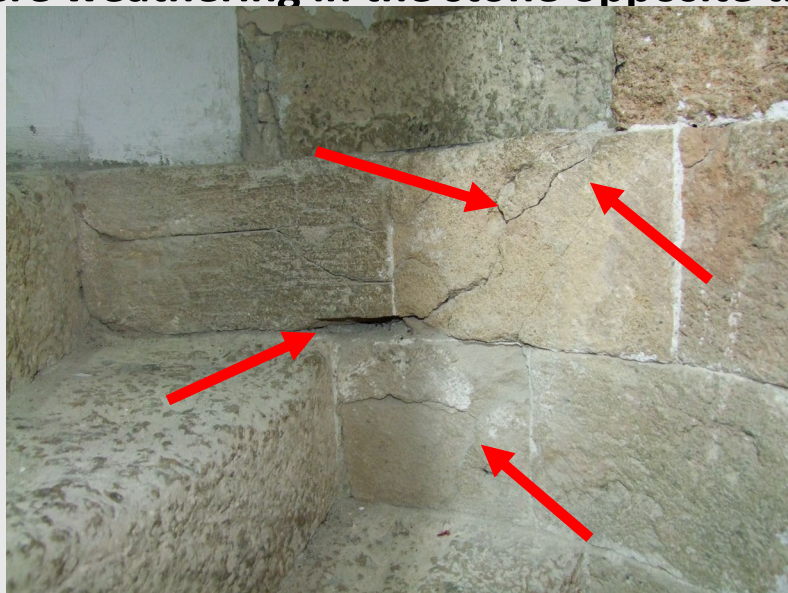


Stair 15

Crack at the center of the stair, which continues to the stairs above

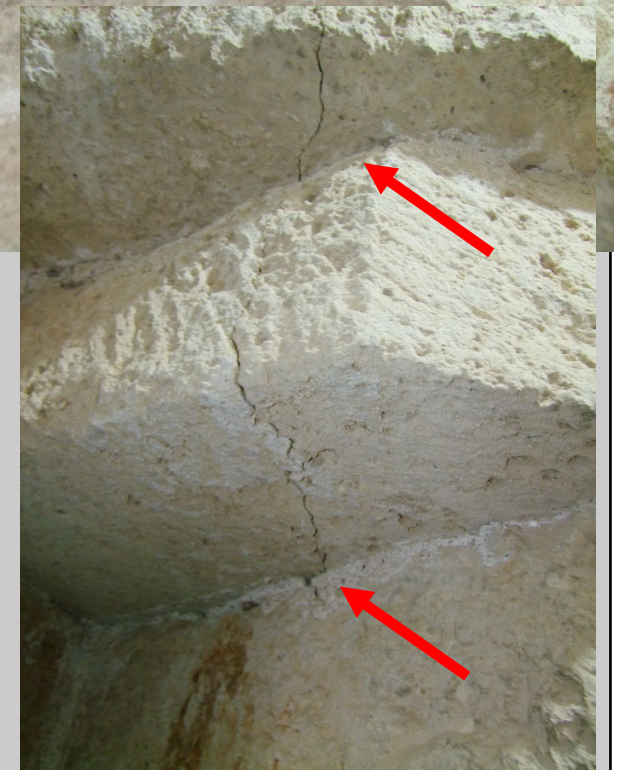
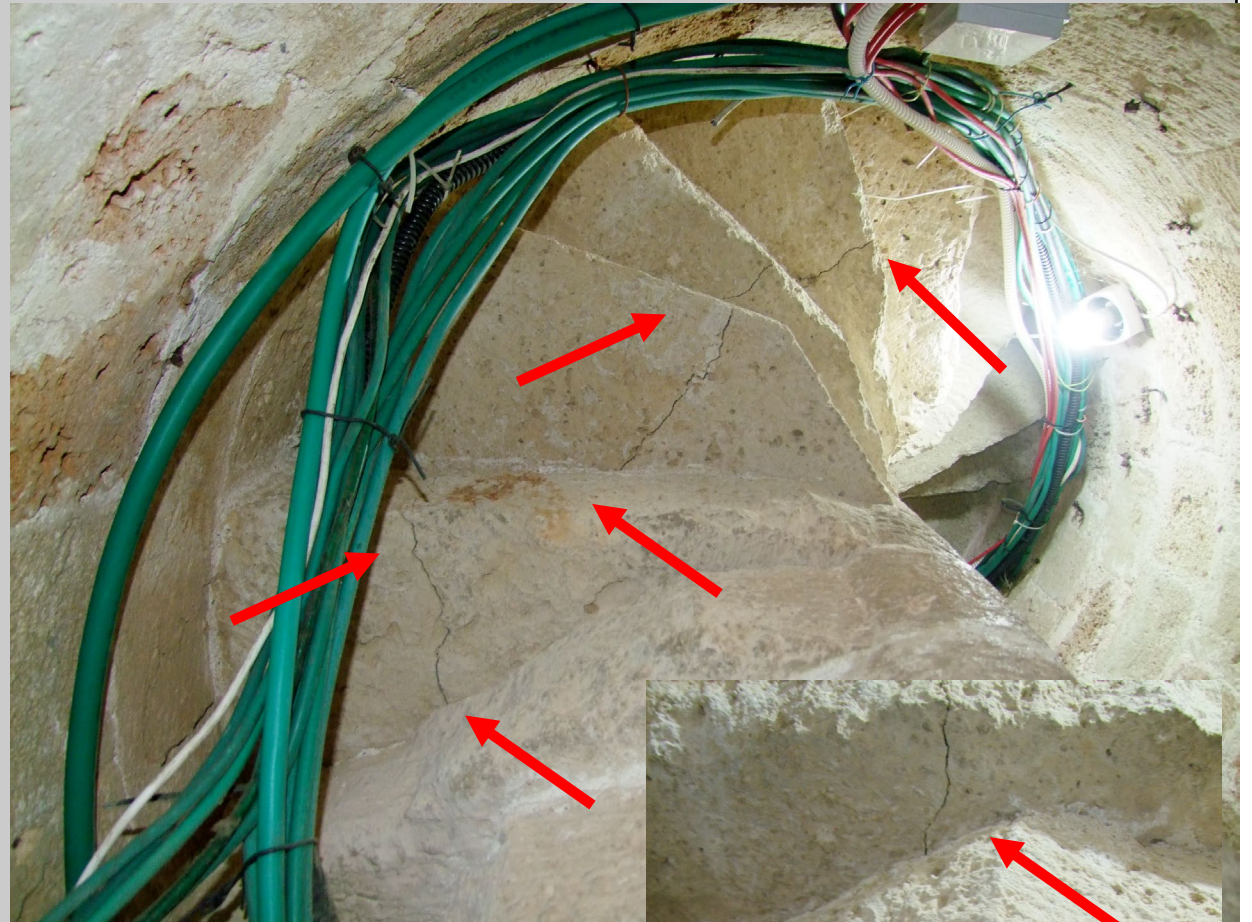


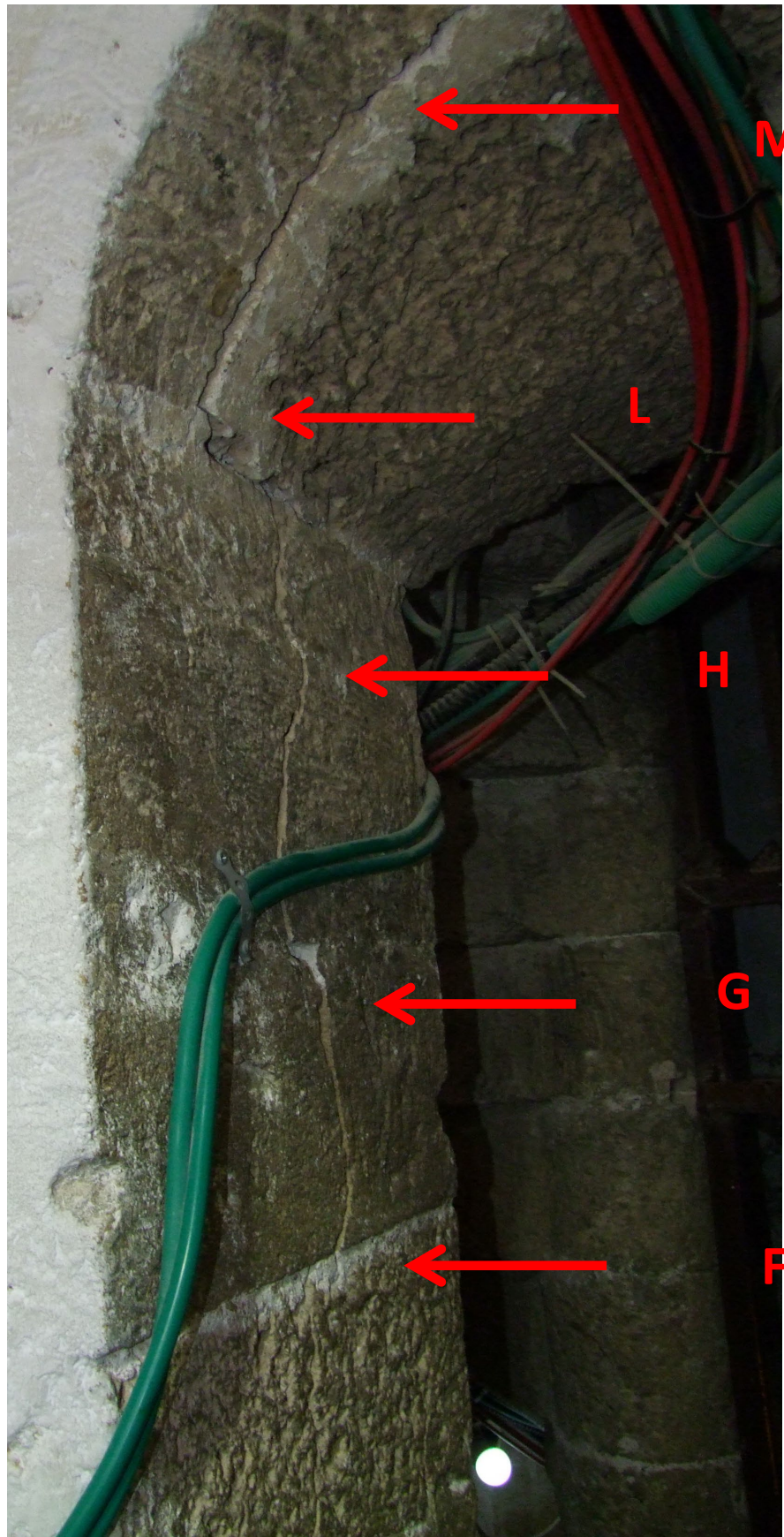
Cracks and severe weathering in the stone opposite the stair



Stairs 15-22

Cracks along the stairs (0.5-0.7 cm)



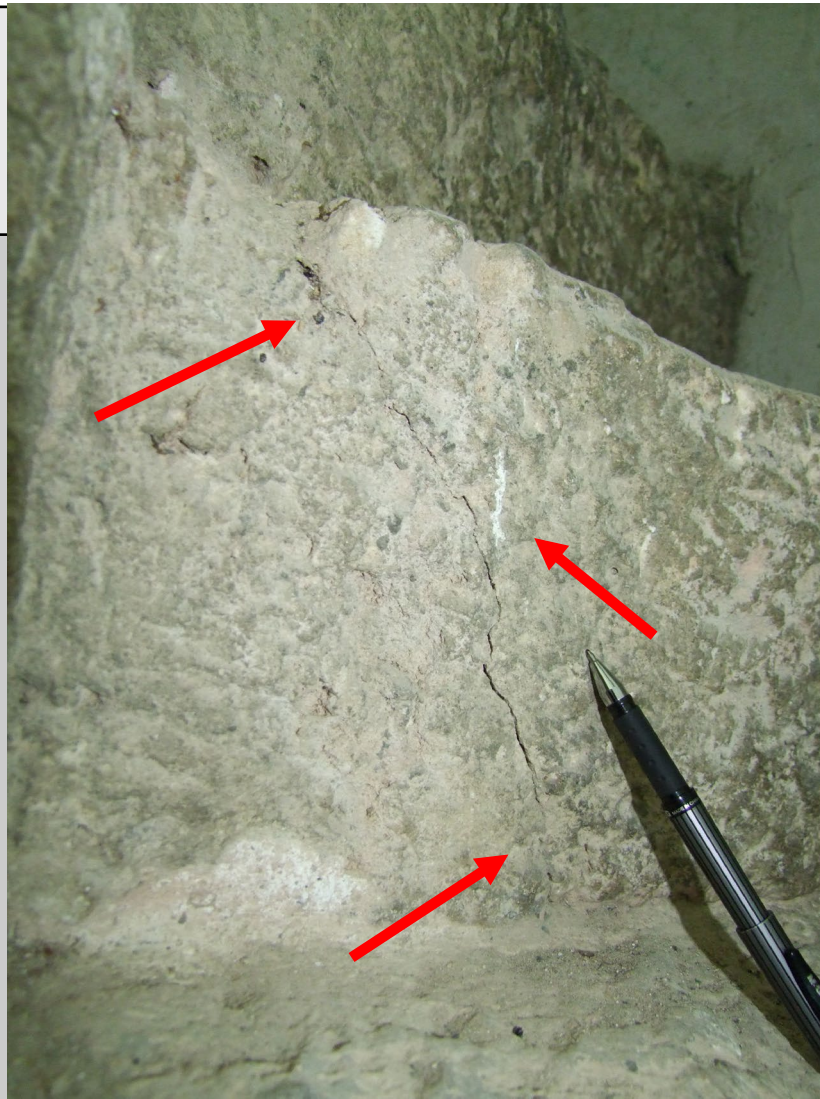


Measuring the width of the cracks in various places	
F	0.5 cm
G	0.4-1 cm, 2.5 cm deep
H	0.7 cm
L	0.6-1 cm
M	0.6 cm
N	0.7 cm
O	1.3 cm

The cracks in the vault at the entrance to the stairwell.

Stair 25

Crack in the stair



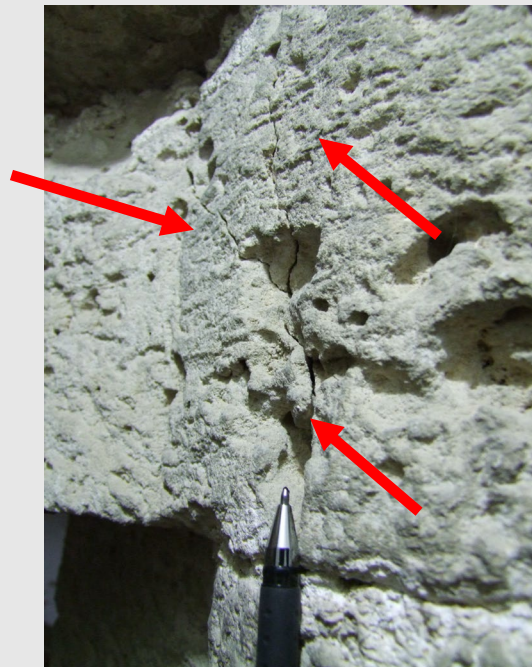
Stair 24

Crack in the stair



Stair 25

Crack in the column

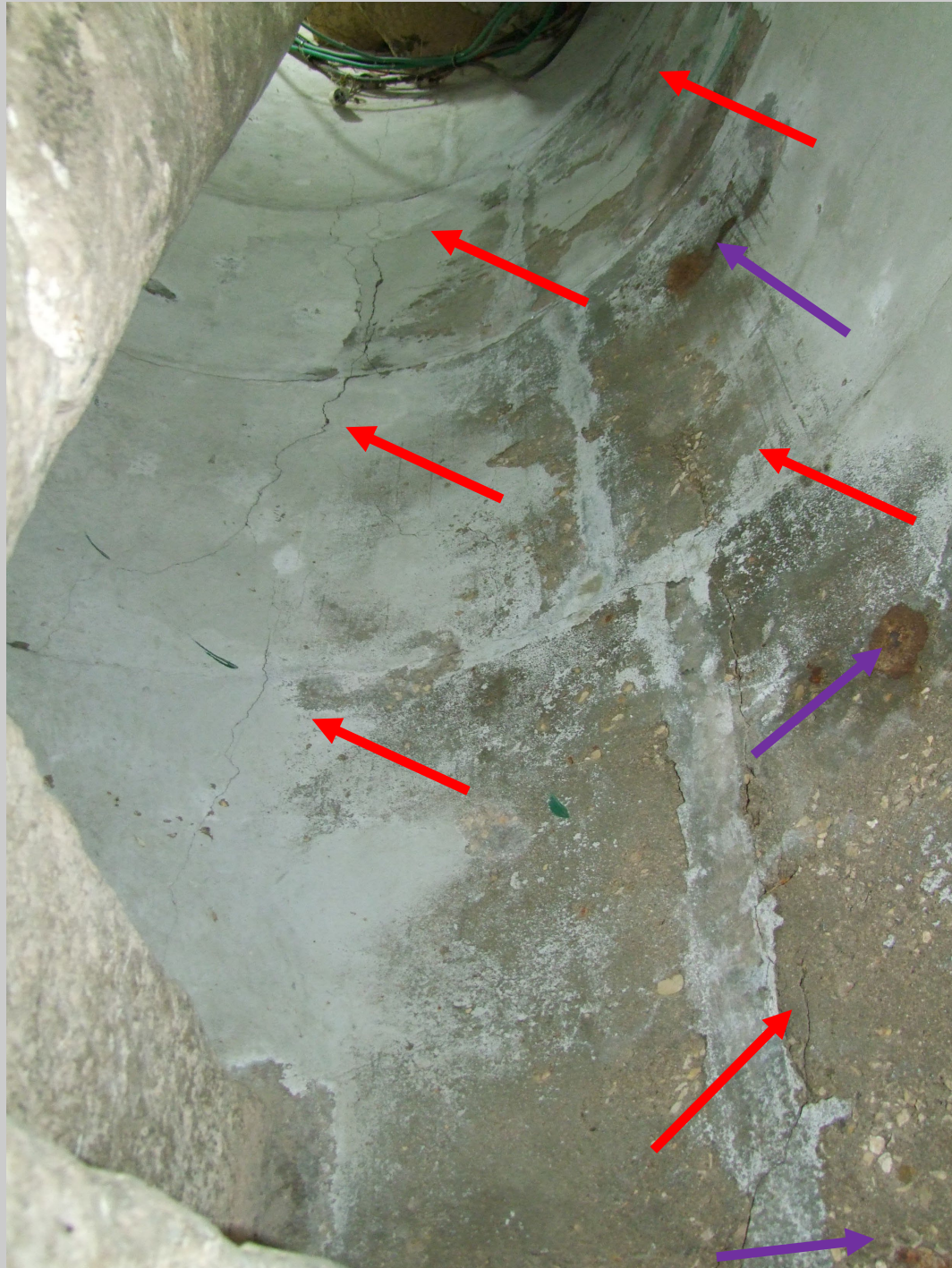


The exterior wall

From Stair 96 and above

Severe weathering of the concrete reinforcement layer: horizontal, vertical and circumferential cracks in the shaft of the minaret

Severe rusting in the metal



Stair 101

Circumferential crack in the column, above stair 101



Stair 100

Very severe crack along the length of the stair/ column



Stairs 114-117

Very severe damage in the column

Severe weathering and crumbling of the stone in the stair



Survey findings:

The minaret is deteriorating, and necessitates immediate intervention. In addition to the damages that were documented in previous survey, the types of damage to the minaret and the main cracks were analyzed:

The head of the minaret and the upper levels

- The stones in the minaret, beginning at level (stair) 96, differ from the rest of the minaret. This section is probably a later renovation, which is of a low quality. The exact time this renovation occurred is unclear. It probably dates back to the early 20th century, and it might have been done after the 1927 earthquake.
- **Chalkstone was used for the repairs. These stones are very heavy and rigid, and this had probably increased the stress on the central column and caused cracks running down the length of the column, which is made up of the stair segments (stairs 92-95).**

The slant of the minaret

- The slant of the minaret is mainly in the upper section. In comparison to other minarets commonly found in the Holy Land, the slant of this minaret is normative. These slants were sometimes created in order to boost the minaret's ability to withstand wind pressure. In other cases, this tilt is a result of an engineering failure. It is difficult to definitively determine what caused the slant, in this case. The substandard work in the upper section of the minaret leads me to believe that here, the tilt is an engineering tilt,

created during construction and renovation.

- The interior layer of concrete along the wall and the mesh added to the minaret are rusty and have cracks, mainly in the upper section, and less so in the center of the shaft of the minaret.



The foundations of the minaret

The base of the minaret is extremely delapidated. Cracks in the minaret's central column and in the wall stones were documented. Some of these damages were probably due to dampness that seeped into the shaft of the minaret, making the metallic nails that attached the stones to each other rust and expand.

Many years ago, a fire had broken out at the base area. This fire and the heat it produced caused damage to the stones and cracking.

- At the entrance to the minaret, there are cracks running along the ceiling of the vault. **These cracks are very dangerous and they affect the minaret, particularly since this section is used as a support and is part of the base of the minaret and the pier in the northwestern corner (elephant leg pier).**
- Other cracks were found in the levels opposite the prayer hall's rear balcony (steps 16-24).
- We note that the base isn't merely a support for the minaret. It is also an important corner base for the prayer hall. The cracks in the base, combined with the cracks in the central column, put the minaret and the prayer hall at a great risk, and necessitate immediate and comprehensive intervention.

