ICONEM FUND

FOR ENDANGERED HERITAGE

DOCUMENTATION AND CONSERVATION OF LEBANON'S COASTAL CASTLES

2025

with the support of

In partnership with

BRITISH COUNCIL

Department for Culture, Media & Sport

As of 2025,

ICONEM FUND

FOR ENDANGERED HERITAGE

becomes

HERITAGE WATCH.AI

Our commitment to documenting and raising awareness on endangered heritage sites worldwide remains unwavering. Our mission remains the same: leveraging cutting edge technology to pretect the world's cultural and natural heritage.

SPECIAL THANKS

We would like to extend our deepest gratitude to all those who contributed to the success of the CPF Lebanon Project:

- The **British Council** in the UK and Lebanon, along with the **Culture Protection Fund** team, for their invaluable support.

- **Susan Winter** & **Daniel Head**, with special thanks for her unwavering dedication, continuous follow-up, and belief in our mission.

- The Lebanese **Ministry of Culture** for enabling this project to take place.

- The **Directorate General of Antiquities** (DGA), with heartfelt appreciation to **Sarkis el Khoury, Selim Germanos,** and **Samar Karam** for their collaboration.

- The **Order of Engineers in Tripoli**, with gratitude to its President, **Chawki Fatfat**, for his support.

- **Distruct Solutions**, with special thanks to **Dr. Michel Chalhoub** and **Stephanie Younane** for their expertise and dedication.

- **Biladi**, with deep appreciation to **Joanne Bajjaly,** and **Clara Achkar**, for their invaluable contributions.

- The **trainees and volunteers**, whose commitment and hard work were essential to making this project a reality.

- The **people of Khan el Saboun**, for their warm hospitality and support.

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Ministère de la Culture
المديرية العامة للآثار – لبنان
Direction Générale des Antiquités du Liban

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THE PROJECT IN FIGURES

Figures

Sites scanned: **4**

Buildings assessed: **600**

surface covered: **1.5 km²**

photographs taken: **24 731**

Participants

Professionals: 4

Government personnel: 5

Students: 17

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Partners

- Governmental
- Non-profit
- Academic
- Private

Outcomes

- Updated cadaster of Old Tripoli
- 4 detailed 3D models
- Equipping DGA for nationwide documentation
- Issuance of training certificates
- Assessment of the Old City of Tripoli

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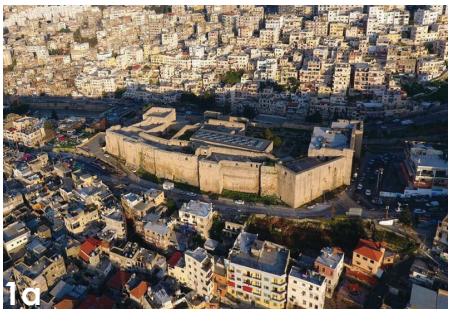
This project focuses on preserving Lebanon's medieval coastal heritage through advanced documentation and restoration initiatives. By leveraging photogrammetry and laser scanning technologies, accurate 3D models of historic sites, including Enfeh, Batroun, and Tripoli have been created. Collaborative efforts with local authorities and experts ensure both the safeguarding of cultural assets and the development of local capacities through training. Despite challenges such as GPS disruptions and coastal winds, the project continues to make substantial progress, laying the groundwork for future restoration and educational endeavors.



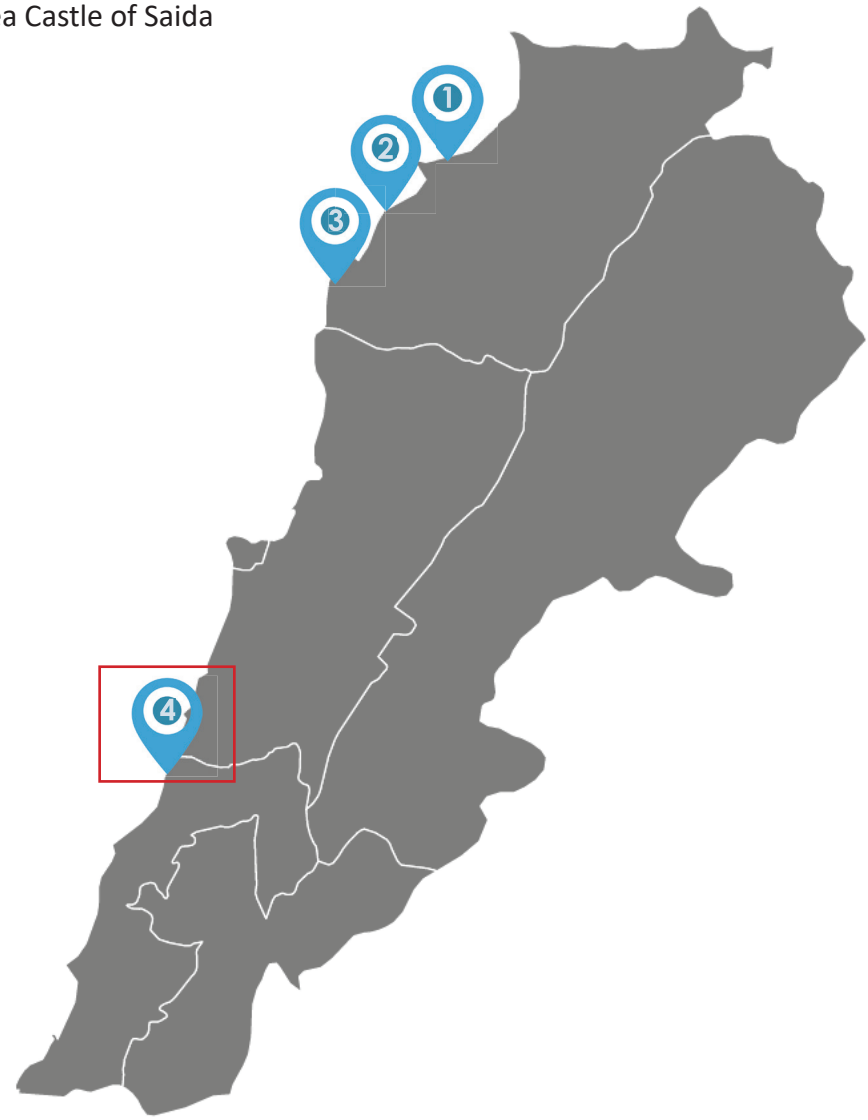
Old city of Tripoli

Sea Castle of Saida

Khan al Saboun

Archeological site of Enfeh

Old city of Batroun



1. **Safeguard and protect the four selected built heritage sites: Batroun, Enfeh, Tripoli and Saida.**

The initial steps taken to ensure safeguarding of the selected heritage sites were:

- Conducting background research, establishing local contacts, and gathering relevant data. This included meetings with experts such as Nadine Panayot (Enfeh), Samar Karam (multiple sites), Selim Germanos (DGA), Jeanine Abdul Massih (Batroun), and Myriam Ziadeh (Saida Sea Castle).

- However, the DGA deemed further interventions in Enfeh and Batroun less of a priority, and as such, conservation efforts were primarily focused on Tripoli.

Originally, a mission was planned for the Sea Castle in Saida in September 2024. However, due to regional conflict, its proximity to the Israeli border, and security concerns for the trainees, the decision was made to reallocate efforts and resources. As a result, the mission moved the workshop to on Khan al Saboun, focused on the citadel of Tripoli instead, ensuring the project's objectives were met in a secure and productive environment.

2. **Improve the capacity of local heritage agencies to monitor and improve the management of the four selected heritage sites.**

The next steps of the mission revolved around the creation of digital twins as a result of an initial in situ workshop, then a urban assessment of Tripoli:

- The 3D photogrammetric digitisation objective was partially met:

- Sites digitised: Enfeh, Batroun, Tripoli.
- The Saida site could not be scanned,
- **Instead, we took the opportunity to highlight the St Gilles Citadel in Tripoli.**

- All digital twins are available on the following platform: app.iconem.com.
- The five-day photogrammetry workshop was successfully conducted in July 2024, and additional training focused on Tripoli's urban assessment in October 2024.
- A second training in October 2024 was conducted and focused on the assessment of the old city of Tripoli:

In collaboration with DISTRUCT Solutions and the Order of Engineers in Tripoli, the DGA conducted a general urban assessment of the old city, building by building. This resulted in a referenced map highlighting the varying degrees of risks to different monuments/buildings.

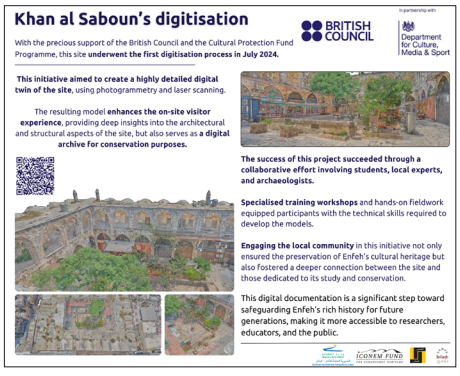
3. Promote and raise awareness on the four heritage sites nationally and internationally.

As an outcome of the mission, promotional content was produced, including:

- A promotional video was produced.
- Banners with QR codes linking to the scanned models will be placed at each site, branded with the project name and British Council CFP logo.
- An awareness raising event is being organised, in collaboration with the DGA, to be held at the Order of Engineers in Tripoli.



Theoretical & practical training sessions in Khan al Saboun & the Order of Engineers building



On site banners

Old Tripoli updated cadaster

- **Unmet Objectives and Challenges**

While the CPF Lebanon Project successfully achieved significant milestones, certain key objectives could not be fully realized due to factors beyond our control.

- **Conservation Works at the Citadel of Tripoli**

Despite thorough assessments and planning, the intended conservation interventions at the **Citadel of Tripoli** could not be implemented. Administrative challenges, including lengthy approval processes and coordination complexities, delayed the necessary authorizations. Additionally, evolving project timelines and resource allocation constraints made it unfeasible to proceed within the current framework.

- **3D Scanning of Saida Sea Castle**

The planned 3D scanning of the **Saida Sea Castle** had to be postponed due to logistical hurdles and unforeseen site access limitations. Factors such as security protocols, administrative clearances, and environmental conditions restricted our ability to conduct the scanning as originally envisioned. As a result, this component remains an area for potential future implementation.

Despite these challenges, the project has laid a strong foundation for continued heritage preservation efforts. The knowledge gained, partnerships established, and groundwork set for these sites will remain valuable for future initiatives.

3.1 PARTNERS

The mission's success has been bolstered by strong partnerships, each contributing vital expertise, logistical support, and local knowledge:

- **DGA (Directorate General of Antiquities)**: Played a key role in facilitating connections with archaeologists and heritage professionals, enabling site access and expert contributions. Key figures included Nadine Panayot (Enfeh), Samar Karam (Batroun, Enfeh, Tripoli), and others who provided invaluable insights into the region's cultural assets.

- **Order of Engineers and Architects of Tripoli**: Provided crucial logistical support, offering access to facilities, including the amphitheater used for theoretical training sessions. Their Head, Chawki Fatat, was instrumental in securing key contacts and ensuring the mission's security through close coordination with the Lebanese Army.

- **BILADI**: Served as our financial and logistical partner, managing all funds transferred from France to Lebanon and overseeing budget allocations for the project. They also played a key role in organising and facilitating the training sessions, ensuring smooth coordination between trainers, trainees, and venue logistics.

- **DISTRUCT SOLUTIONS:** Led the assessment component of the project, conducting in-depth evaluations of the targeted cultural heritage sites. Their expertise in structural analysis, damage assessment, and risk evaluation was essential in identifying vulnerabilities and informing preservation strategies. They also contributed innovative technological solutions, enhancing data collection processes and ensuring precise and accessible records of heritage sites at risk.

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3.2 PARTICIPANTS

The project involved many participants who actively contributed to its execution During the preparation of the mission, we engaged in extensive discussions with the DGA and the Order of Engineers to identify the most suitable participants—those who would benefit most from the training while also contributing to the project's success.

The selected trainees ranged in age from 19 to 45, all with backgrounds in architecture or structural engineering and a foundational knowledge of the heritage sector. To ensure diversity, we included architecture students from the Faculty of Fine Arts at the Lebanese University, alongside renovation architects and structural engineers. This diverse group fostered a valuable exchange of knowledge and expertise, allowing participants to share experiences while engaging with new technologies and innovative methodologies in heritage preservation.

a) PHOTOGRAMMETRY WORKSHOP

- **List of trainees:**

1. Omar DAHABI
2. Yara HANI
3. Mohamad Salim HMOUDA
4. Ali KADDOURA
5. Sally KASSEM
6. Said MAROUN
7. Marlène MOUSSA
8. Mayssa ZAAITER

- **PerDiems**

Per Diem (156.25£ each) was delivered upon the completion of the photogrammetry workshop in Tripoli

A total of 1250£ divided and distrusted by the numbers of trainees (8)

b) URBAN ASSESSMENT PROJECT

- **Team Leaders:**

1. team leader 1: Said MAROUN
2. team leader 2: Bassem ZAWDEH

- **Salary**

The Trainers were compensated 1410 GBP upon completion of their contract.

Key responsibilities of the Team Leader Position for the Contract:

1. Organise the Data Assessment Workshop

- Collaborate with the Order of Engineers of Tripoli and the Directorate General of Antiquities (DGA) to set up and facilitate workshops.
- Ensure the workshops cover essential aspects of the assessment and meet mission objectives.

2. Plan and Coordinate the General Assessment

- Oversee strategic planning and scheduling for the assessment of buildings in the Old City of Tripoli.
- Ensure necessary resources, tools, and team members are prepared for smooth execution.

3. Prepare Trainees for the Mission

- Develop and implement training programs to equip trainees for fieldwork.
- Ensure trainees understand the mission's methodology and goals.

4. Daily Follow-up on Workshop Progress

- Conduct daily follow-ups post-workshop to ensure continuity and address issues.
- Monitor progress and guide team members to maintain quality.

- **List of trainees:**

1. Rachid ABBAS
2. Omar DAHABI
3. Riham JDEIDEH
4. Mohamad Salim HMOUDA
5. Marlène MOUSSA

- **Per Diem**

Per Diems (500£) were delivered upon the completion of the assessment mission in Tripoli A total of 2500£ divided and distrusted by the numbers of trainees (5).

- **List of volunteers:**

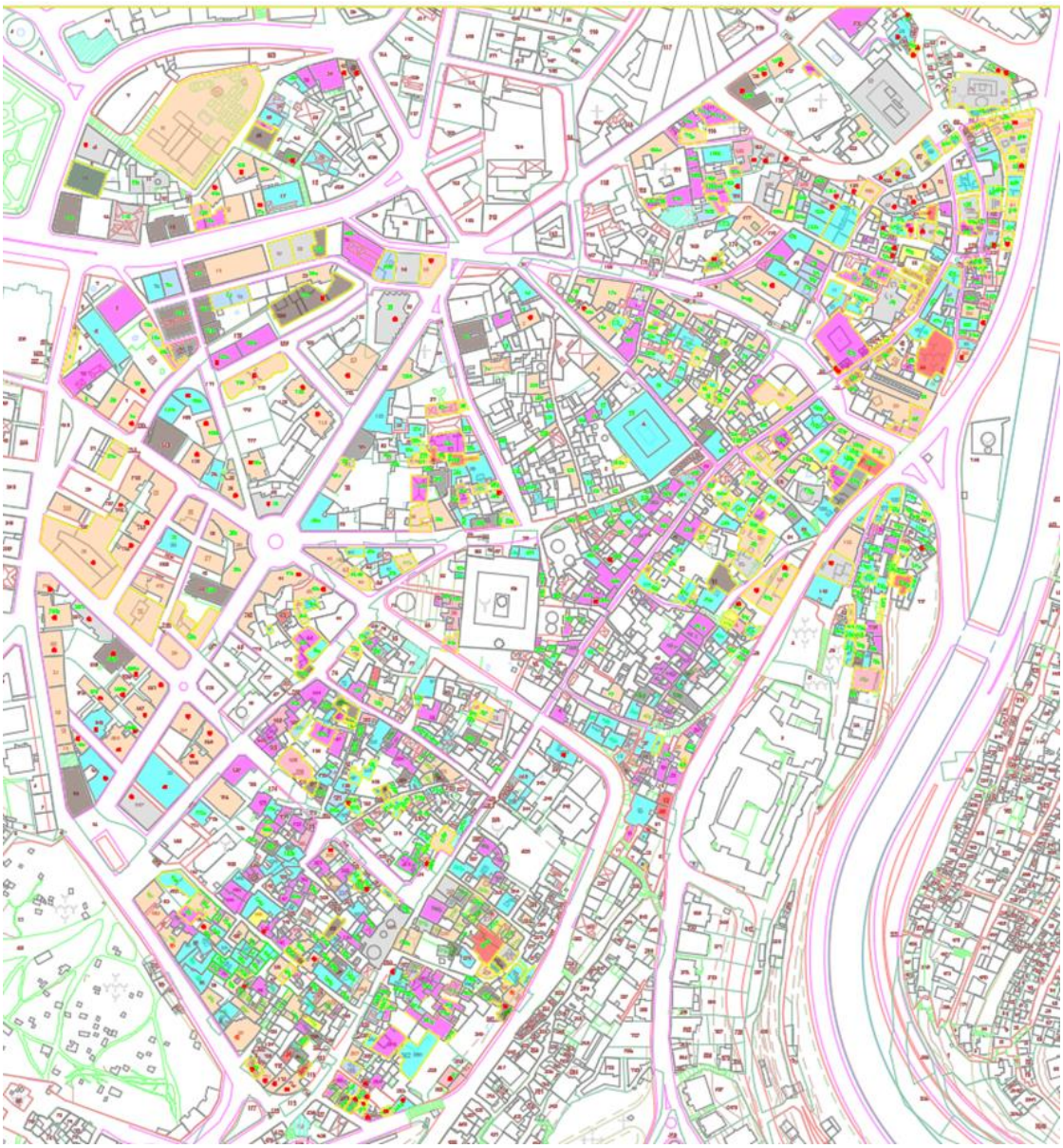
1. Zeina AARBA
2. Salam ABBOUD
3. Layla AL AHDAB
4. Sarah DASSOUKI
5. Sarah HALABI
6. Aya HARMOUCH
7. Fadwa MERHEB
8. Noorhan MOHAMAD
9. Lama NASER EL DIN
10. Hala OSMAN

- **PerDiems**

The PerDiems is delivered upon the completion of the assessment mission in Tripoli. A total of 1500£ divided by the numbers of volunteers (10).

Practical training on the roof of Khan al Saboun

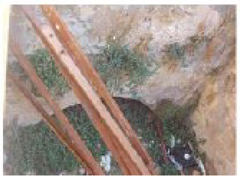
c) URBAN ASSESSMENT SAMPLE



LEGEND:

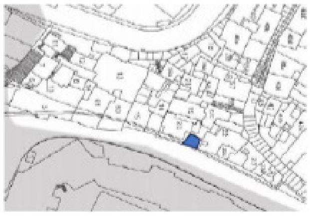
- COLLAPSED
- HIGH DAMAGE
- MEDIUM DAMAGE
- MINOR DAMAGE
- NO DAMAGES
- NEW BUILDING
- NOT ACCESSIBLE AT ALL
- NOT ACCESSIBLE – HIGH DAMAGE
- NOT ACCESSIBLE – MEDIUM DAMAGE
- NOT ACCESSIBLE – MINOR DAMAGE
- NOT ACCESSIBLE – NO DAMAGES

Structural assessment of buildings in the Old city of Tripoli: ILLUSTRATIONS			
Date: 3/10/2024	Field team: Marlene Moussa & Sara al Halabi	Revised by: Marlene Moussa	Checked by: Bassem Zawdeh
1- BUILDING GENERAL INFORMATION			
Area: Castel of Tripoli	Zone: 3	Plot #: 22a	

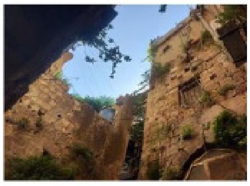


GENERAL KEY PLAN

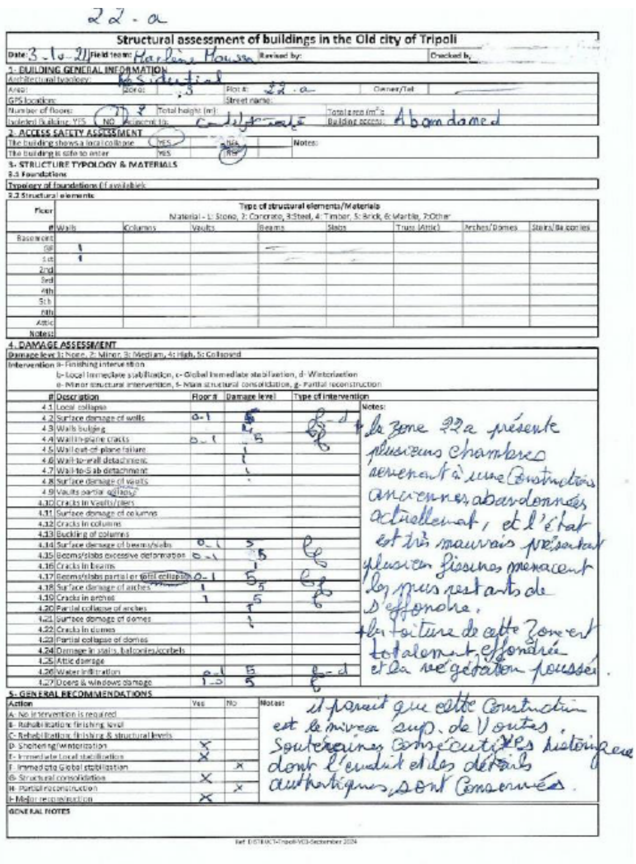
SUB KEY PLAN



PHOTOS OF DAMMAGE IN THE BUILDING



Ref: DISTRUCT-Tripoli-V01-September 2024



22-a

Structural assessment of buildings in the Old city of Tripoli

Date: 3-10-24	Field team: Marlène Moussa	Revised by:	Checked by:

1- BUILDING GENERAL INFORMATION

Architectural typology:	Résidentiel				
Area:	Zone: 3	Plot #: 22-a		Owner/Tel	
GPS location:		Street name:			
Number of floors: 2	Total height (m):		Total area (m²):		
Isolated Building: YES / NO	Adjacent to: citadelle		Building access: Abandoned		

2- ACCESS SAFETY ASSESSMENT

			Notes:
The building shows a local collapse	YES	NO	
The building is safe to enter	YES	NO	

3- STRUCTURE TYPOLOGY & MATERIALS

3.1 Foundations

Typology of foundations (if available):

3.2 Structural elements

Type of structural elements/Materials
Material - 1: Stone, 2: Concrete, 3:Steel, 4: Timber, 5: Brick, 6: Marble, 7:Other

Floor #	Walls	Columns	Vaults	Beams	Slabs	Truss (Attic)	Arches/Domes	Stairs/Balconies
Basement								
GF	1							
1st	1							
2nd								
3rd								
4th								
5th								
6th								
Attic								
Notes:								

4. DAMAGE ASSESSMENT

Damage level 1: None, 2: Minor, 3: Medium, 4: High, 5: Collapsed
Intervention a- Finishing intervention
b- Local immediate stabilization, c- Global immediate stabilization, d- Winterization
e- Minor structural intervention, f- Main structural consolidation, g- Partial reconstruction

#	Description	Floor #	Damage level	Type of intervention
4.1	Local collapse			
4.2	Surface damage of walls	0-1	5	f-d
4.3	Walls bulging		4	f
4.4	Wall in-plane cracks	0-1	5	f
4.5	Wall out-of-plane failure		1	
4.6	Wall-to-wall detachment		1	
4.7	Wall-to-Slab detachment		1	
4.8	Surface damage of vaults			
4.9	Vaults partial collapse			
4.10	Cracks in Vaults/piers			
4.11	Surface damage of columns			
4.12	Cracks in columns			
4.13	Buckling of columns			
4.14	Surface damage of beams/slabs	0-1	5	f
4.15	Beams/slabs excessive deformation	0-1	5	f
4.16	Cracks in beams		1	
4.17	Beams/slabs partial or total collapse	0-1	5	f
4.18	Surface damage of arches	1	5	f
4.19	Cracks in arches	1	5	f
4.20	Partial collapse of arches		1	
4.21	Surface damage of domes		1	
4.22	Cracks in domes			
4.23	Partial collapse of domes			
4.24	Damage in stairs, balconies/corbels			
4.25	Attic damage			
4.26	Water infiltration	0-1	5	f-d
4.27	Doors & windows damage	1-2	5	f

Notes:
+ la zone 22a présente plusieurs chambres revenant à une constructions anciennes abandonnées actuellement, et l'état est très mauvais présentant plusieurs fissures menaçant les murs restants de s'effondre.
+ la toiture de cette zone est totalement effondrée et la végétation poussée.

5- GENERAL RECOMMENDATIONS

Action	Yes	No
A- No intervention is required		
B- Rehabilitation: finishing level		
C- Rehabilitation: finishing & structural levels		
D- Sheltering/winterization	X	
E- Immediate Local stabilization	X	
F- Immediate Global stabilization		X
G- Structural consolidation	X	
H- Partial reconstruction		X
I- Major reconstruction	X	

Notes: il paraît que cette construction est le niveau sup. de voutes souterraines consécutives historiques dont l'enduit et les détails authentiques sont conservés.

GENERAL NOTES

Ref: DISTRUCT-Tripoli-V01-September 2024

4.1 MEETINGS WITH LOCAL ACTORS

From the start of the project, we have been in contact with the DGA, who has facilitated introductions with all the archaeologists and restorers working at each of the sites:

- Nadine Panayot (Enfeh)
- Samar Karam (Batroun - Enfeh – Tripoli)
- Selim Germanos (DGA)
- Jeanine Abdul Massih (Batroun)
- Myriam Ziadeh (Saida Sea Castle)

These meetings have provided us with valuable insights into the history and specific requirements of each site. Consequently, we have been able to establish historical connections between these various sites.

The collaboration with the Order of Engineers and Architects of Tripoli was invaluable for the training. The Head of the Engineers Syndicate, Chawki Fatfat, ensured that all resources of the Order were made available to facilitate the mission, both logistically and practically. The Order also generously offered their amphitheatre for the theoretical training sessions. Additionally, Mr. Fatfat helped secure contacts within the army, who provided security throughout the duration of the mission.

Order of Engineers & Architects building

4.2 TRAINING IN PHOTOGRAMMETRY

Dates: 16 20 July 2024
Number of participants: 8
Actors: Iconem Fund – DGA – Order of Engineers Tripoli - Biladi

The photogrammetry training sessions were a cornerstone of this mission. The first session was held at Khan El Saboun in Tripoli from July 16, 2024. Nine trainees—including architects, engineers, and restoration experts—participated in both theoretical and practical sessions led by Marjorie Coulin, a photogrammetry expert from Iconem, and Bachaar Tarabay, the head of scientific projects at Iconem. Participants included students from the Lebanese University, members of the Order of Engineers and Architects, and representatives from the DGA.

The workshop lasted 5 working days, including mobilisation, data capturing, and data processing.

- The first day was spent on a site visit with the trainer, followed by two days of theoretical sessions.
- Three days were spent on fieldwork (data capturing).
- The final day was dedicated to data processing.

DAY 1	DAY 2	DAY 3	DAY 4	DAY 5
Theoretical Training	On-Site Field Training in Khan al Saboun, Tripoli			Data Processing

4.3 TRAINING IN URBAN ASSESSMENT

Dates: October 2024
Number of participants: 2 team Leaders – 5 Trainees – 10 volunteers
Actors: Iconem Fund – DGA – DISTRUCT - Order of Engineers Tripoli - Biladi

The second phase of training, which took place from mid till the end of October 2024, involved a comprehensive assessment of every building within Tripoli. This 10-day training included 10 trainees and two local supervisors. Additionally, a final seminar will be hosted by the Order of Engineers and Architects in Tripoli in February 2025, featuring the project's achievements and inviting various stakeholders.

- **Photogrammetry & Urban assessment certificates**

After completing both theoretical and practical training in photogrammetry, trainees received certificates of aptitude, recognizing their newly acquired skills. Additionally, a separate certificate was issued for the urban assessment of the city of Tripoli, highlighting the comprehensive scope of the project.

CERTIFICATE

OF INITIATION IN PHOTOGRAMMETRY

This is to certify that **SAID MAROUN** has successfully completed the Training initiation Photogrammetry conducted by **ICONEM FUND** From 16st of June till the 19th of June 2024 in **Tripoli, Lebanon**

PROGRAM DETAILS :

Duration: 4 days

Topics Covered:
Applications of Photogrammetry in the fields of Cultural Heritage Preservation
Theory of Photography & Photogrammetry
Field data collection techniques
Data Analysis & Processing for 3D reconstruction

Trainer	President of Iconem Fund	President of the Order of Engineers and Architects of Tripoli	Director of the DGA
Marjorie COULIN	Yves UBELMANN	Chawki FATFAT	Sarkis KHOURY

Date of Deliverance
20/01/2025

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CERTIFICATE OF PARTICIPATION

This is to certify that

has successfully participated in the

Structural assessment of buildings in the old city of Tripoli

Conducted by DiSTRUCT Solutions with the collaboration of ICONEM FUND
From September 23, 2024, to October 23, 2024

Participants in the mission took part in both theoretical and practical training sessions, along with conducting in-field data collection to rapidly assess the structural damage in the buildings of the old city of Tripoli. This process involved analyzing the types and severity of the damage and classifying the vulnerability risk of the examined buildings.

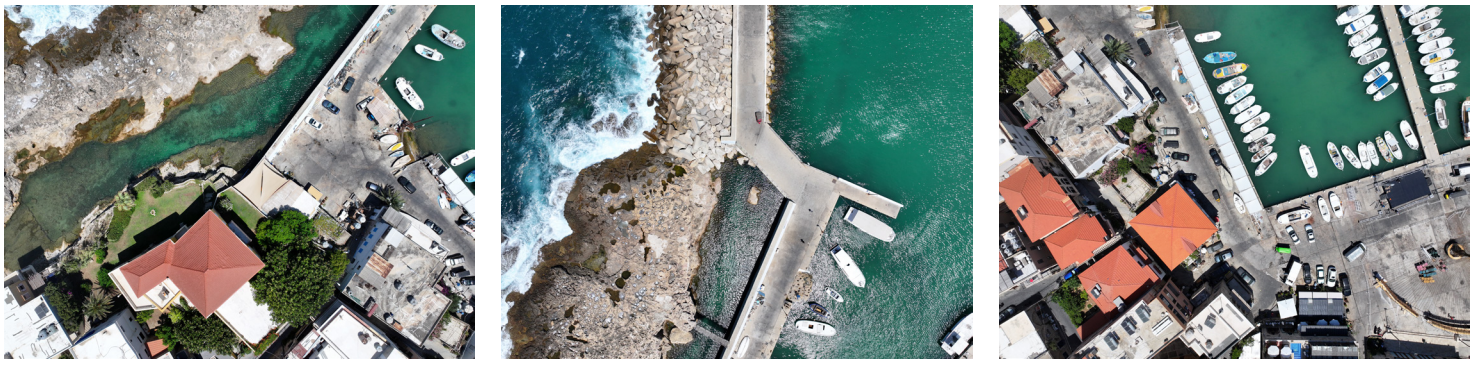
Date: 21 January, 2025

Dr. Michel Chalhoub	Yves Ubelmann	Chawki Fatfat	Sarkis Khoury
DiSTRUCT Solutions, CEO	Iconem Fund, President	Order of Engineers and Architects-Tripoli, Director	Directorate General of Antiquities, Director

4.4 SITE SCANNING

Over the past six months, the following sites have been scanned and digitised using photogrammetry and laser scanning techniques:

- **BATROUN: The Phoenician wall**



Batroun aerial photographs

Scanning the historic old town of Batroun presented significant challenges due to GPS jamming, disruptions in the drone network, and heavy coastal winds. Given the area's dense population and narrow streets, additional precautionary measures are essential to ensure safety and prevent any potential incidents. Enhanced planning and coordination with local authorities were crucial to mitigating risks and ensuring a smooth and secure scanning process.

Batroun
3D model

- **ENFEH:** The archaeological ruins of Enfeh

Enfeh aerial photographs

The archaeological ruins of Enfeh, spanning over three thousand years, reflect the layered history of the region, with structures dating back to the Crusader and Phoenician periods. The site is located on a natural peninsula and features carved-out trenches, ancient walls, and salt basins that hint at its strategic and economic significance.

To document the site, an aerial photogrammetric scan was conducted using drones equipped with high-resolution cameras, capturing detailed images from multiple angles. These images were then processed using a specialised software to create a precise 3D model, ensuring accurate scaling, georeferencing, and comprehensive digital preservation of the site. The data and finished product will serve as valuable tools and resources for conservation efforts.

Enfeh 3D model

- **TIPOLI: Comprehensive Macro Scan of the old city**

The macro surveys of the city of Tripoli play a crucial role in achieving accurate scaling and georeferencing for the 3D models. The collected data is meticulously processed to generate high-resolution orthophotographs and detailed architectural documentation. This information serves as a foundation for preservation efforts, urban planning, and historical analysis, by supporting the creation of an updated cadaster, ensuring that the rich heritage & urban fabric of the old town is accurately recorded and represented.

Tripoli 3D model

St Gilles castle 3D model

- **TIPOLI: Detailed Scan of Khan al Saboun**

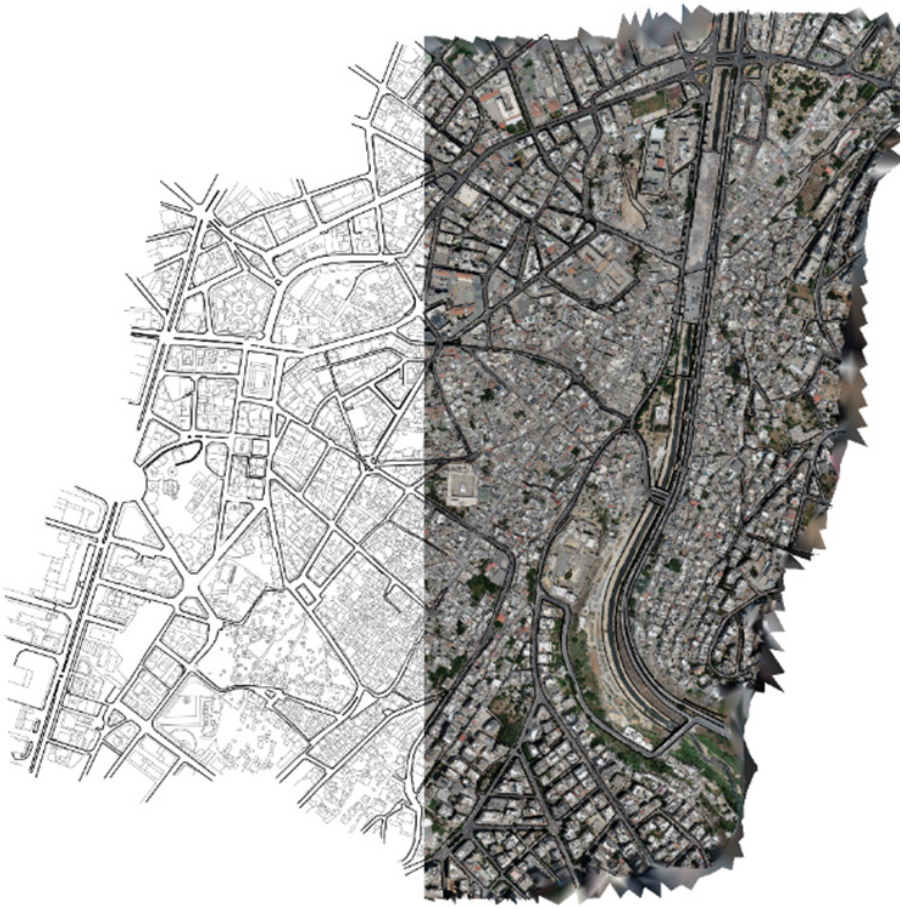
Khan al Saboun is located within the historical town of Tripoli, and hosts traditional soap shops. The building was originally a caravenserail -a marketplace and lodging space for merchants traveling along trade routes- and is characteristic of Ottoman architecture, featuring stone archays, a central courtyard, and vaulted chambers.

The practical training sessions took place in the Khan, providing the trainees with the opportunity to apply their knowledge in a real world setting, and refine their skills in data collection techniques.
We were warmly welcomed by the local merchants who demonstrated remarkable hospitality. They generously granted us access to inaccessible spaces such as the roof, which led to a more comprehensive data aquisition process. This collaboration not only facilitated the trainees' work but also underscored the importance of community involvement in preserving and documenting cultural heritage.

Data aquisition in Khan al Saboun

Khan al Saboun
3D model

4.5 CREATION OF AN UPDATED CADASTRE FOR THE OLD CITY OF TRIPOLI



Tripoli cadaster & 3D model

One of the key objectives of the project was to update and consolidate existing data on Tripoli's Old City. Currently, there is no comprehensive cadastral map of the area—only fragmented surveys conducted at different times by various bodies. The lack of a unified document has made it difficult to develop a holistic understanding of the city's structure, particularly in relation to urban planning and the allocation of future funding for its preservation.

This project laid the groundwork for a systematic assessment of the Old City. The new cadastre was made possible through an extensive photogrammetric survey, which generated a high-accuracy, up-to-scale orthophotograph of the area. The resulting imagery was then meticulously redrawn in vector format using AutoCAD, providing an accurate, precise, and structured representation of the city's layout.
Finally, this cadastral data was integrated with the urban assessment of the Old City, creating a unified and coherent database. This comprehensive resource now links survey data, technical documentation, and analytical reports, constituting a crucial tool for future conservation and planning efforts.

4.6 CREATION OF A VIDEO SHOWCASING THE PROJECT

As part of the project, Iconem's team produced a documentary video to visually capture the mission's key achievements and highlight the importance of heritage documentation. The video serves multiple purposes:

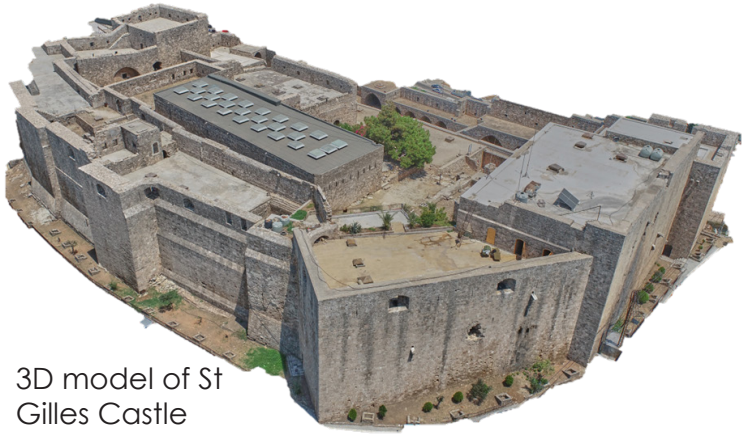
- Showcasing all the heritage sites that were scanned during the mission, offering an inclusive visual record of the surveyed areas.
- Providing a behind-the-scenes look at the photogrammetry training workshop in Tripoli, demonstrating the hands-on learning process and technical methodologies used.
- Presenting visuals of the created documentation, including the cadastral map and orthophoto, which were essential tools for the overall heritage assessment.

Beyond documentation, the video aims to underscore the richness of Lebanon's coastal cultural heritage, the threats it faces, and the critical role of digital preservation in safeguarding these sites for future renovation and conservation efforts. By making this content accessible, the video helps raise awareness among professionals, policymakers, and the general public about the urgency of protecting Lebanon's architectural and historical legacy.

4.7 CONSERVATION WORKS ON THE ST GILLES CITADEL

The initially planned works on the St Gilles site were not undertaken in early fall 2024 due to a combination of security concerns, logistical setbacks, and financial constraints. The need to implement stabilization measures and ensure site protection required additional security protocols, which could not be arranged in time. The DGA's restoration project is included in the appendices for reference. Given the short timeframe, it was decided to delay the work to ensure proper planning and execution for long-term conservation.

Furthermore, the delay in the response from key local stakeholders hindered essential structural assessments and planning. Cash flow limitations, further delayed the realisations of the works. Given these challenges and the limited timeframe, the necessary restoration and preservation interventions will be done in a second phase



3D model of St Gilles Castle

Effective project management was fundamental to ensure the smooth execution of activities across both France and Lebanon. The project required close coordination between multiple stakeholders, including scientific and heritage experts, local authorities, and logistical partners. Responsibilities were divided between the teams in France and Lebanon to optimise efficiency and facilitate seamless collaboration.

In France

The project was managed from Paris by Bachaar Tarabay, Head of Scientific Projects, and Lynn Jabri, Project Manager. Their responsibilities included overseeing the project's overall direction, ensuring alignment with its scientific and heritage preservation goals, and handling administrative tasks. They also coordinated the planning and organisation of the workshops, liaising with partners in Lebanon to ensure smooth execution of the project.

In Lebanon

Close coordination with the DGA (Directorate General of Antiquities) was essential for the project's success. Selim Germanos (Lead System and network Engineer) served as our primary focal point within the DGA, ensuring that all relevant stakeholders were regularly updated and actively involved in key heritage-related aspects of the project.

Biladi played a crucial role in managing the logistical aspects of the workshops in Lebanon, facilitating venue arrangements, accommodations, and local coordination. Additionally, Biladi oversaw the financial management of the project, ensuring the smooth transfer and allocation of funds between France and Lebanon.

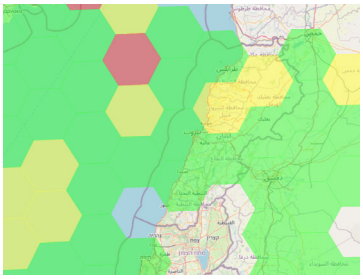
Project-Related Trips

Several trips were organised between Paris and Beirut to conduct on-site assessments, hold follow-up meetings, and oversee the implementation of the workshops. These visits were instrumental in ensuring the project's progress, addressing challenges in real time, and reinforcing collaboration between the French and Lebanese teams.

Challenges

Despite notable progress, we encountered several challenges. We managed to overcome these challenges by proposing multiple alternative for each potential obstacle

- **GPS Jamming**: Led to a drone crash during Batroun scans, mitigated by cross-referencing multiple data sources.
- **Coastal Winds**: Addressed by careful monitoring of weather forecasts to optimise drone flights.
- Managing **cashflow** was challenging due to Lebanon's economic embargo and banking restrictions. In collaboration with the British Council, we partnered with BILADI NGO to oversee and manage the project's financial operations.
- Overall **political instability** in Lebanon and **regional war** leading to general complication in carrying out the project.



Lessons Learnt

Implementing this project from inception to completion provided invaluable insights into both the technical and human aspects of heritage documentation. Witnessing the tangible results of our efforts (high-res 3D models, detailed architectural records, and high-quality orthophotographs) highlighted the importance of meticulous planning and adaptability in overcoming challenges.

The hands-on involvement of participants not only reinforced their technical skills but also fostered a deeper appreciation for cultural heritage preservation. The collaboration with local merchants and community members underscored the social impact of such initiatives, as their enthusiasm and cooperation played a crucial role in the project's success.

Beyond the technical outcomes, this project reaffirmed the importance of the human element. Heritage documentation is not just about capturing data—it is about connecting with the people who live and work in these historic spaces. Their stories, insights, and willingness to participate enriched the process, transforming it from a purely technical exercise into a meaningful cultural exchange. This underscores the need for future projects to integrate both technological innovation and strong community engagement to achieve sustainable and impactful results.

The mission in Tripoli had a significant impact on multiple levels, contributing to the advancement of heritage preservation efforts in Lebanon. The project's outcomes can be categorised into four key areas:

1. Scientific and Technical Advancements

- Updated Documentation: The project successfully produced a comprehensive cadastral map and orthophoto of Tripoli's Old City, providing an essential foundation for future urban planning and conservation efforts.

- Heritage Site Assessments: Through structural analysis, damage assessment, and risk evaluation, the project identified vulnerabilities within the historic fabric of the city, offering valuable data to guide restoration initiatives.

- Photogrammetry and Digital Preservation: The implementation of 3D scanning and photogrammetry improved documentation accuracy and established a new standard for recording heritage at risk.

2. Capacity Building and Knowledge Transfer

- Hands-on Training: The project trained a diverse group of architects, structural engineers, and students, equipping them with advanced skills in digital heritage documentation and risk assessment.

- Interdisciplinary Exchange: By integrating architecture students from the Lebanese University, renovation architects, and structural engineers, the program fostered cross-disciplinary collaboration and knowledge sharing.

- Sustainable Impact: The trainees now have the expertise to apply these methodologies independently, ensuring long-term benefits beyond the duration of the project.

3. Awareness and Public Engagement

- Educational Video Production: A dedicated video was created to document the project, showcasing scanned heritage sites, training sessions, and assessment methodologies. This video serves as a key tool to raise awareness about Tripoli's heritage, the risks it faces, and the importance of digital documentation for future restoration projects.

- Collaboration with Authorities: Close coordination with the DGA and the Order of Engineers and Architects of Tripoli strengthened institutional engagement in heritage preservation efforts.

- Visibility and Advocacy: The project's outcomes contribute to broader discussions on the importance of cultural heritage protection in Lebanon, encouraging future funding and policy support.

4. Future Prospects and Sustainability

- Data for Future Restoration Projects: The collected data provides a reliable and scalable foundation for urban planners, conservationists, and funding organisations to develop targeted interventions.

- Enhanced Institutional Capacity: By integrating modern digital tools into heritage documentation, the project modernised heritage management approaches in Tripoli, setting a precedent for similar initiatives across Lebanon.

- Potential for Expansion: The methodologies developed during this mission can be replicated on other endangered heritage sites across the country, amplifying its impact.

Bloopers


CAN YOU STILL SEE ME UNDERNEATH ALL THE SUNSCREEEN


OUUH FINALLY A DRONE!!


AM I DOING IT RIGHT?!


HAPPY HAPPY HAPPY
ARE WE SURE IT'S ON?!
LET'S TRY TO LOOK SERIOUS


FOOD IS HERE!


FINALLY SOME SHADE

A. Whitebook (Photogrammetry training)

B. Mission preparation documents

C. Conservation works at the St Gilles Castle

D. Certificates for the photogrammetry workshop

E. Certificates for the urban assessment workshop

F. Budget (financial budget including the 4 payment requests)