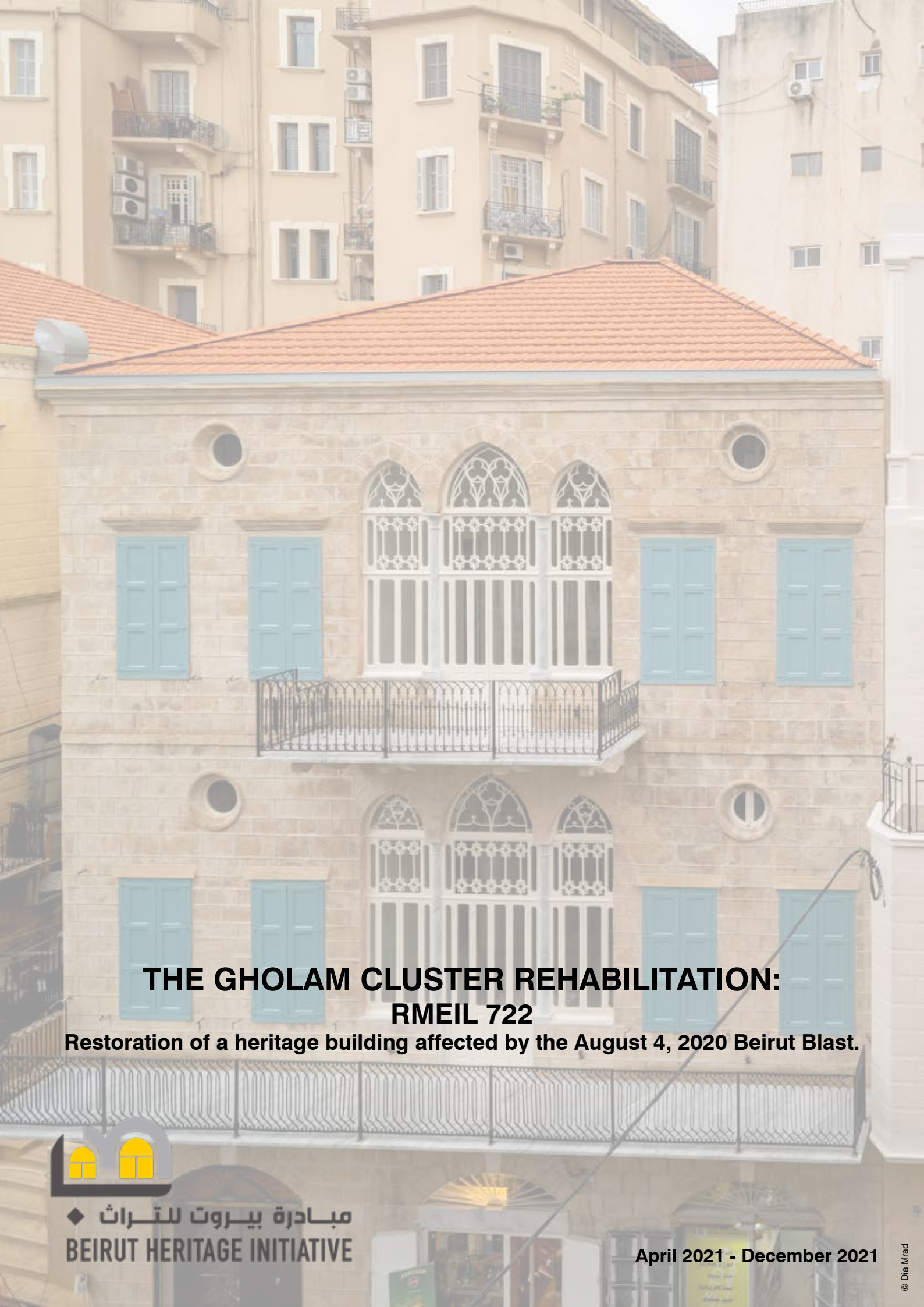


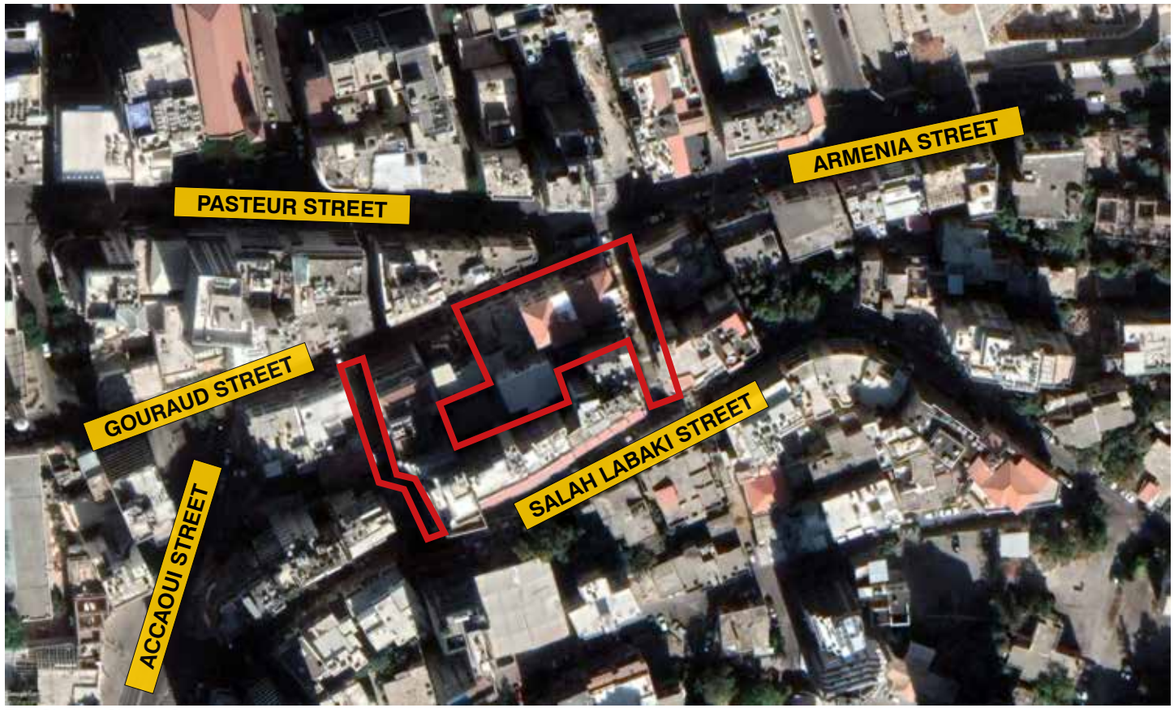
THE GHOLAM CLUSTER REHABILITATION:
RMEIL 722
Restoration of a heritage building affected by the August 4, 2020 Beirut Blast.

مبادرة بيروت للتراث
BEIRUT HERITAGE INITIATIVE

April 2021 - December 2021

OVERVIEW

The extent of damage from the explosion can be witnessed on numerous heritage buildings that are grouped into heritage clusters.
BHI's strategy aims to respond to this urgent need to preserve and protect heritage clusters. Carrying the memories of generations and a unique historical identity, these buildings represent Beirut's rich cultural background. They offer the city and its inhabitants a sense of continuity in our fast changing world.



The Gholam Cluster, *Google Earth*

The Gholam Cluster is composed of **five heritage buildings** dating from the late Ottoman and French Mandate eras (1860 - 1940), in addition to the Gholam public stairs, which were all damaged by the August 4, 2020 Beirut blast. Located in the end of Gouraud Street, the cluster was renovated by *Beirut Heritage Initiative,* in collaboration with *Together Li Beirut* and *The House of Christmas.*

The renovation lasted nine months (April to December 2021), and included structural, envelope and interior repairs, using traditional techniques and materials, under the supervision of Pierre Ghanem and Roland Haddad, specialized architect restorers, and a qualified contractor. This cluster is home to 8 families and 12 small and medium-sized businesses. This project was made possible thanks to the generosity of multiple donors.

Beirut Heritage Initiative had sheltered two of the buildings in this cluster in October 2020, preventing any further damage with the approach of the winter season. Rmeil 722, a typical Beiruti heritage house from the 1880's was then restored within the cluster operation. *BHI* also restored the Gholam Stairs, a pedestrian infrastructure that connects Gemmayzeh and Mar Mikhael to Geitawi and lower Ashrafieh.


Rmeil 722, after the blast, *D. Mrad*

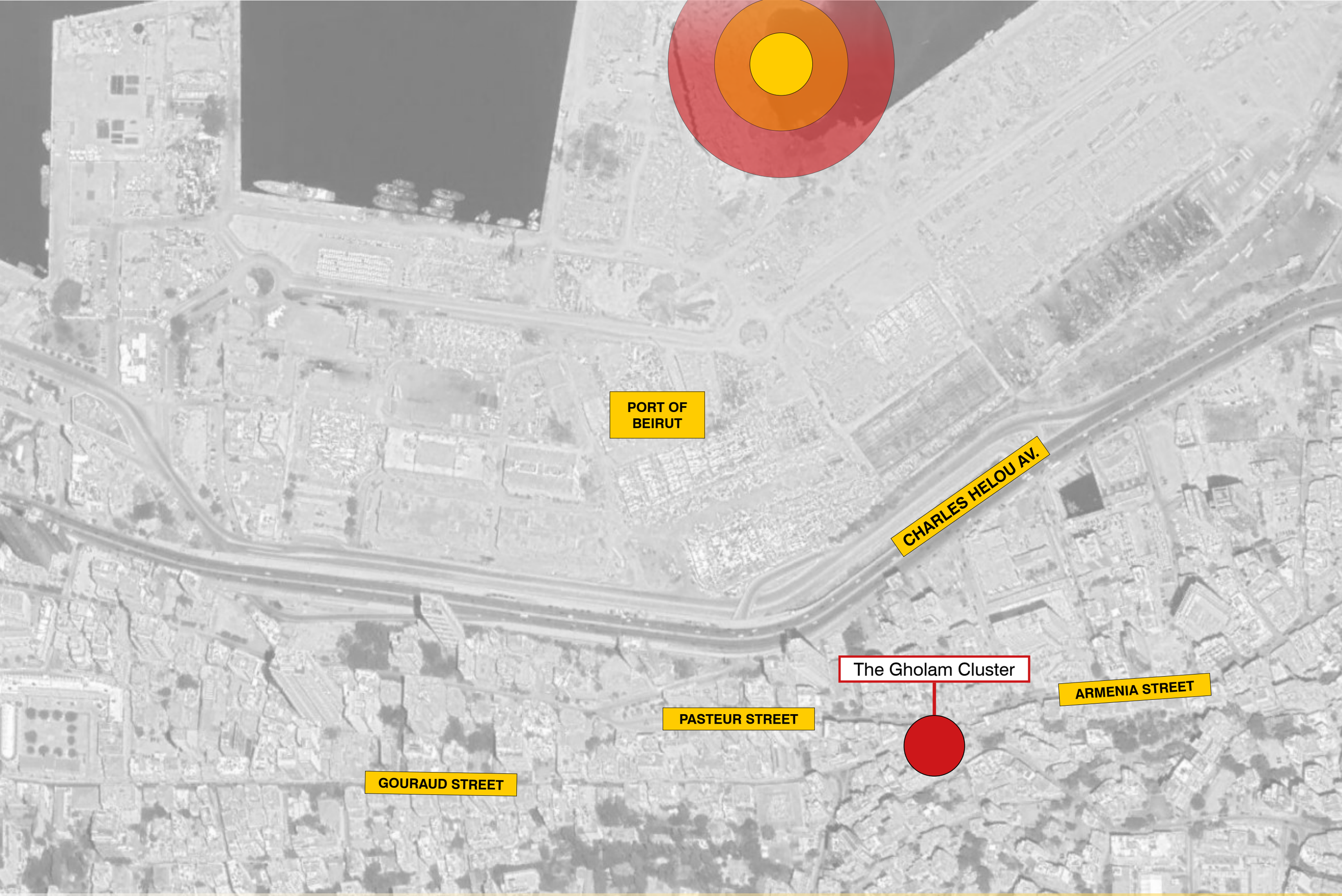

Rmeil 723, after the blast, *D. Mrad*


Rmeil 726, after the blast, *D. Mrad*


Rmeil 727, after the blast, *D. Mrad*


Rmeil 734, *D. Mrad*

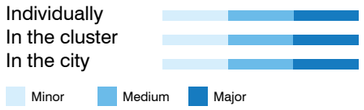

The Gholam Stairs, after the blast, *F. Dagher*



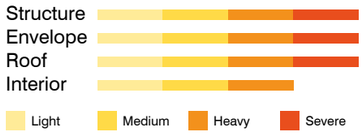
THE GHOLAM CLUSTER

Neighbourhood map, *Beirut Heritage Initiative*

Importance of the building:



Damage Assessment:

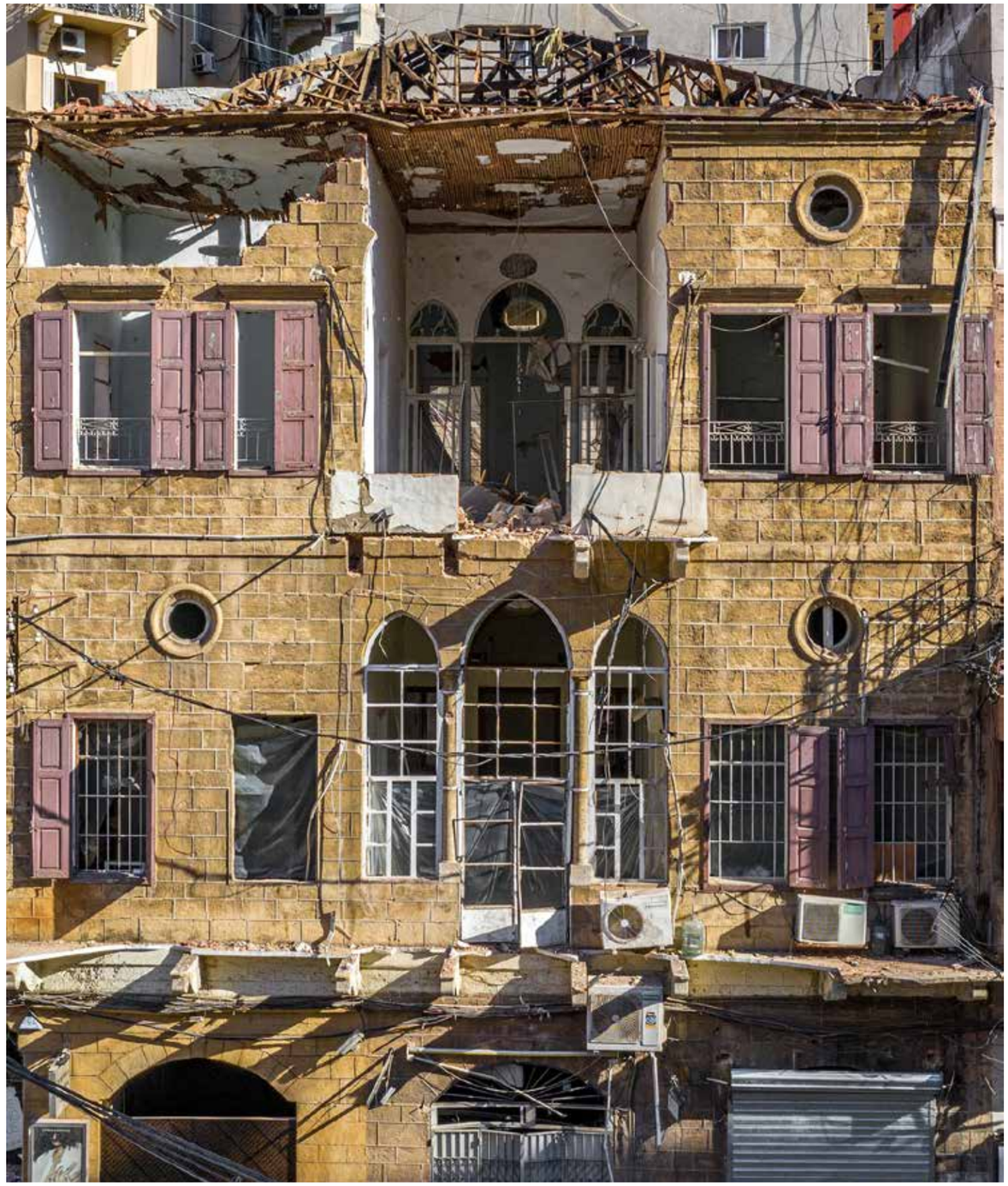


Located at the end of Gouraud street, in Gemmayzeh, Rmeil 722 was severely affected by the explosion that occurred on August 4, 2020 (650m away from the blast). Belonging to the Ottoman era (1880's), this heritage building is composed of a commercial ground floor, and two upper central hall apartments. It belongs to a larger heritage cluster in the "*Al-Hekmeh*" sector.

Before the blast, *F. Dagher*

After the blast, *D. Mrad*

The building sustained heavy damage following the blast, with partial loss of the sandstone on the North Façade and three arches of the upper floor, wall bulging, roof destruction, loss of the *Qotrani* wooden windows, arches, doors, and shutters, interior damage, including the *Baghdadi* light structure.



After the blast, *R. Rizk*

Emergency Propping and Sheltering:

In September 2020, Rmeil 722 was propped by the *Directorate General of Antiquities (DGA)*.
In October 2020, *Beirut Heritage Initiative* sheltered Rmeil 722, as well as Rmeil 723, with a Tarpaulin cover, thanks to the support of *ALIPH Foundation*.

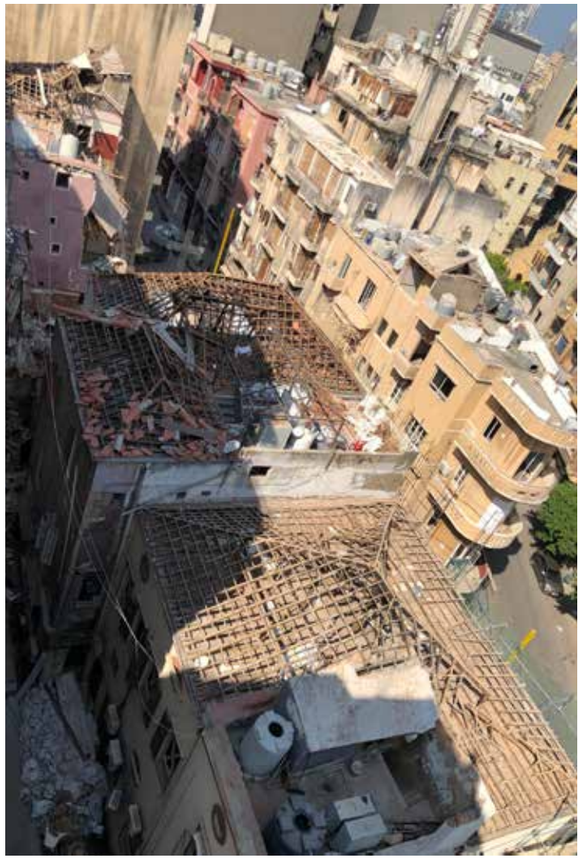
Propping of the north façade, September 2020, *Y. Dagher*

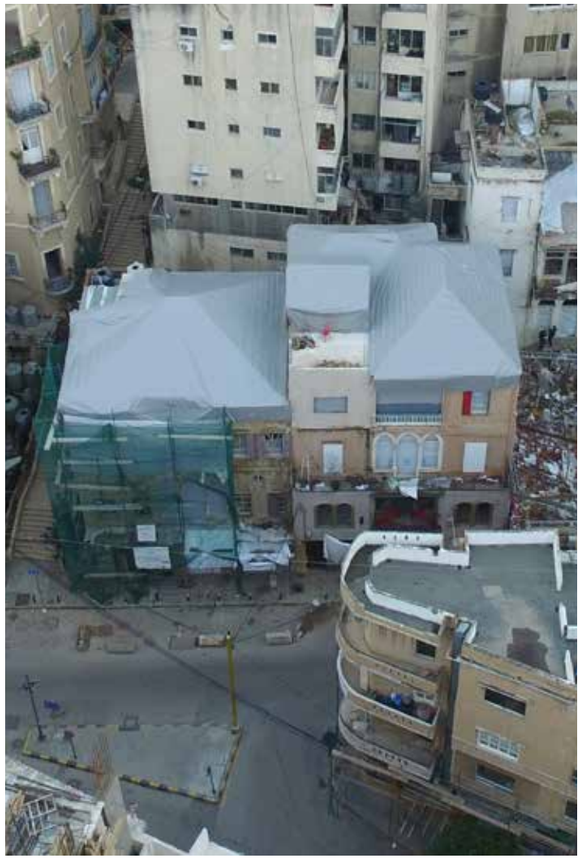

Interior propping and shoring, *D. Mrad*



Propping of the *Baghdadi* ceiling, *D. Mrad*


North façade propped and sheltered, Rmeil 722 (left) and Rmeil 723 (right), *D. Mrad*


R. 722 (bottom) and R. 723 (top) roof's, before sheltering, *D. Mrad*

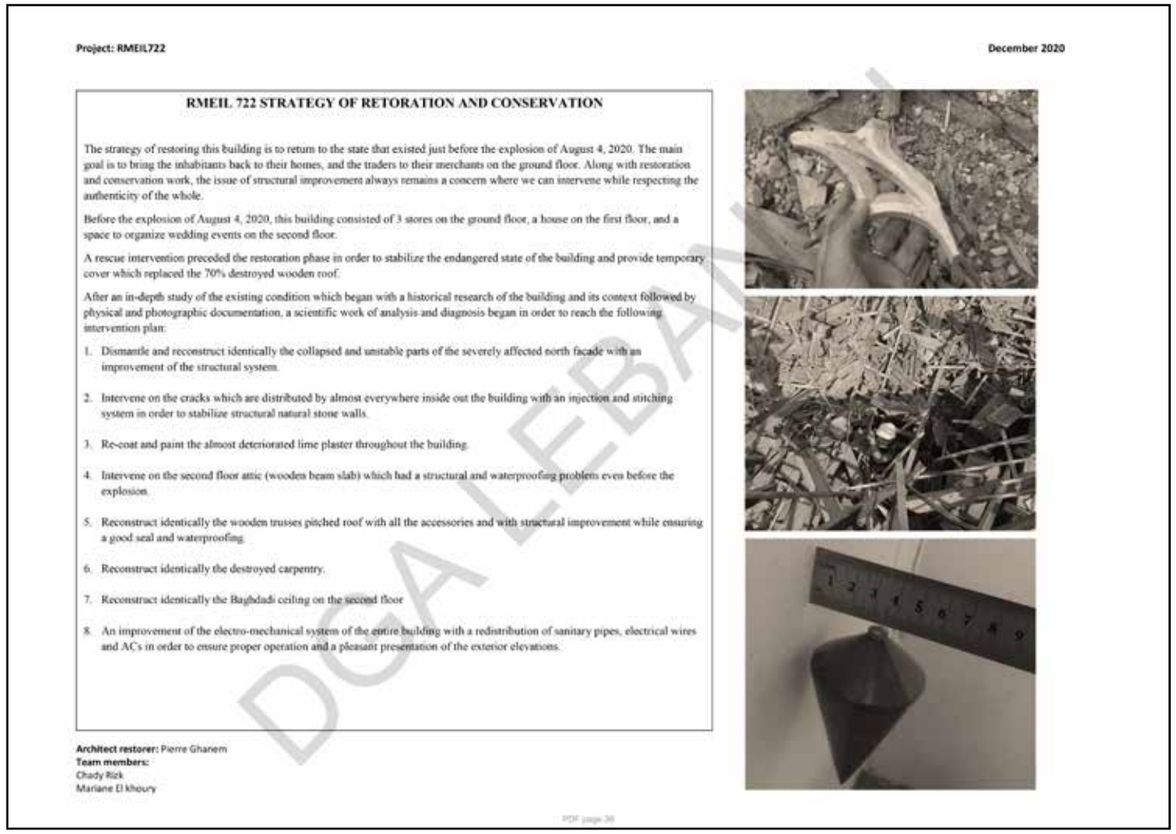

R. 722 (left) and R. 723 (right) after the sheltering, *ACE*

Heritage building study:

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

BBHR2020
BEIRUT BUILT HERITAGE RESCUE 2020
SAUVETAGE DU PATRIMOINE BÂTI DE BEYROUTH 2020

In December 2020, a study was released by the *DGA* and architect-restorer Pierre Ghanem (*BBHR20)*, regarding the strategy for renovation and conservation of Rmeil 722.
The study was funded by the *German Archaeological Institute (DAI)*.



Project: RMEIL722 December 2020

RMEIL 722 STRATEGY OF RETORATION AND CONSERVATION

The strategy of restoring this building is to return to the state that existed just before the explosion of August 4, 2020. The main goal is to bring the inhabitants back to their homes, and the traders to their merchants on the ground floor. Along with restoration and conservation work, the issue of structural improvement always remains a concern where we can intervene while respecting the authenticity of the whole.

Before the explosion of August 4, 2020, this building consisted of 3 stores on the ground floor, a house on the first floor, and a space to organize wedding events on the second floor.

A rescue intervention preceded the restoration phase in order to stabilize the endangered state of the building and provide temporary cover which replaced the 70% destroyed wooden roof.

After an in-depth study of the existing condition which began with a historical research of the building and its context followed by physical and photographic documentation, a scientific work of analysis and diagnosis began in order to reach the following intervention plan:

1. Dismantle and reconstruct identically the collapsed and unstable parts of the severely affected north facade with an improvement of the structural system.
2. Intervene on the cracks which are distributed by almost everywhere inside out the building with an injection and stitching system in order to stabilize structural natural stone walls.
3. Re-coat and paint the almost deteriorated lime plaster throughout the building.
4. Intervene on the second floor attic (wooden beam slab) which had a structural and waterproofing problem even before the explosion.
5. Reconstruct identically the wooden trusses pitched roof with all the accessories and with structural improvement while ensuring a good seal and waterproofing.
6. Reconstruct identically the destroyed carpentry.
7. Reconstruct identically the Baghdadi ceiling on the second floor
8. An improvement of the electro-mechanical system of the entire building with a redistribution of sanitary pipes, electrical wires and ACs in order to ensure proper operation and a pleasant presentation of the exterior elevations.

Architect restorer: Pierre Ghanem
Team members:
Chady Rizk
Mariane El khoury

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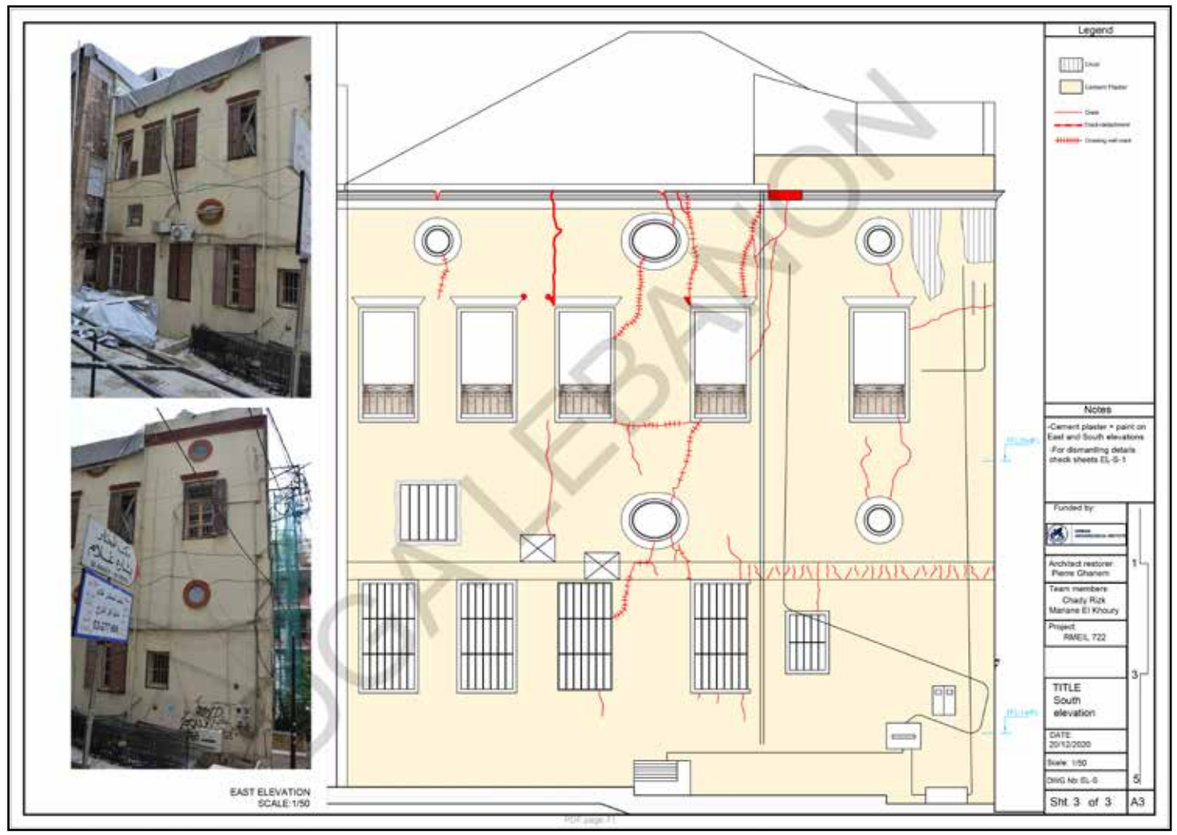
RMEIL 722 STRATEGY OF RESTORATION AND CONSERVATION: METHOD STATEMENT:

An in-depth study of the existing condition was provided, as well as a historical research of the building and its context followed by physical and photographic documentation.
Process of restoration:

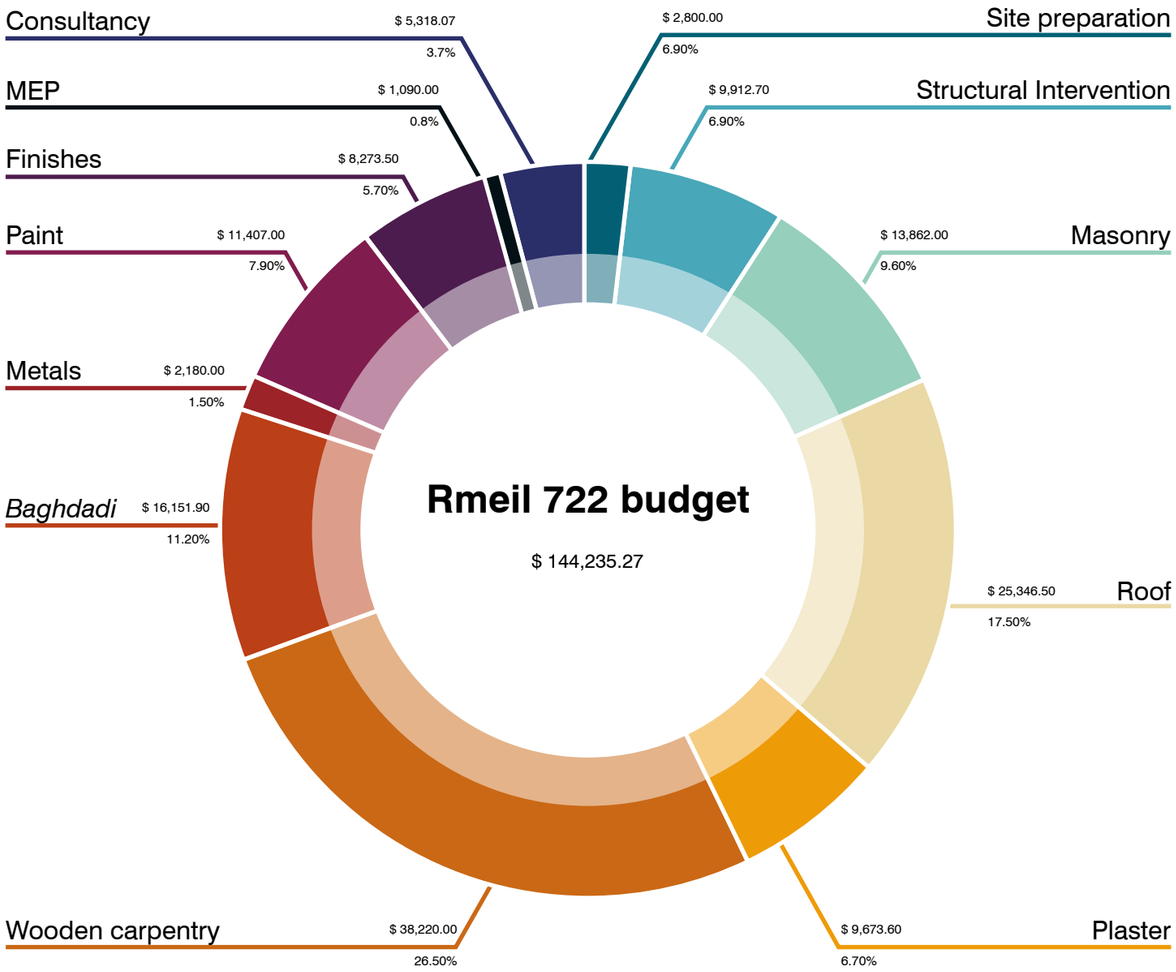
1. Dismantling and reconstruction of the North Façade
2. Cracks repair with an injection and stitching system
3. Re-coat and paint of the deteriorated lime plaster throughout the building
4. Intervention on the second floor attic
5. Reconstruction of the wooden pitched roof
6. Reconstruction and restoration of the destroyed carpentry
7. Reconstruction of the *Baghdadi* ceiling on the second floor
8. An improvement of the electro-mechanical system of the entire building



Pages of the study, *Pierre Ghanem, Chadi Rizk and Marianne El-Khoury (BBHR20), commissioned by the DGA, funded by DAI*

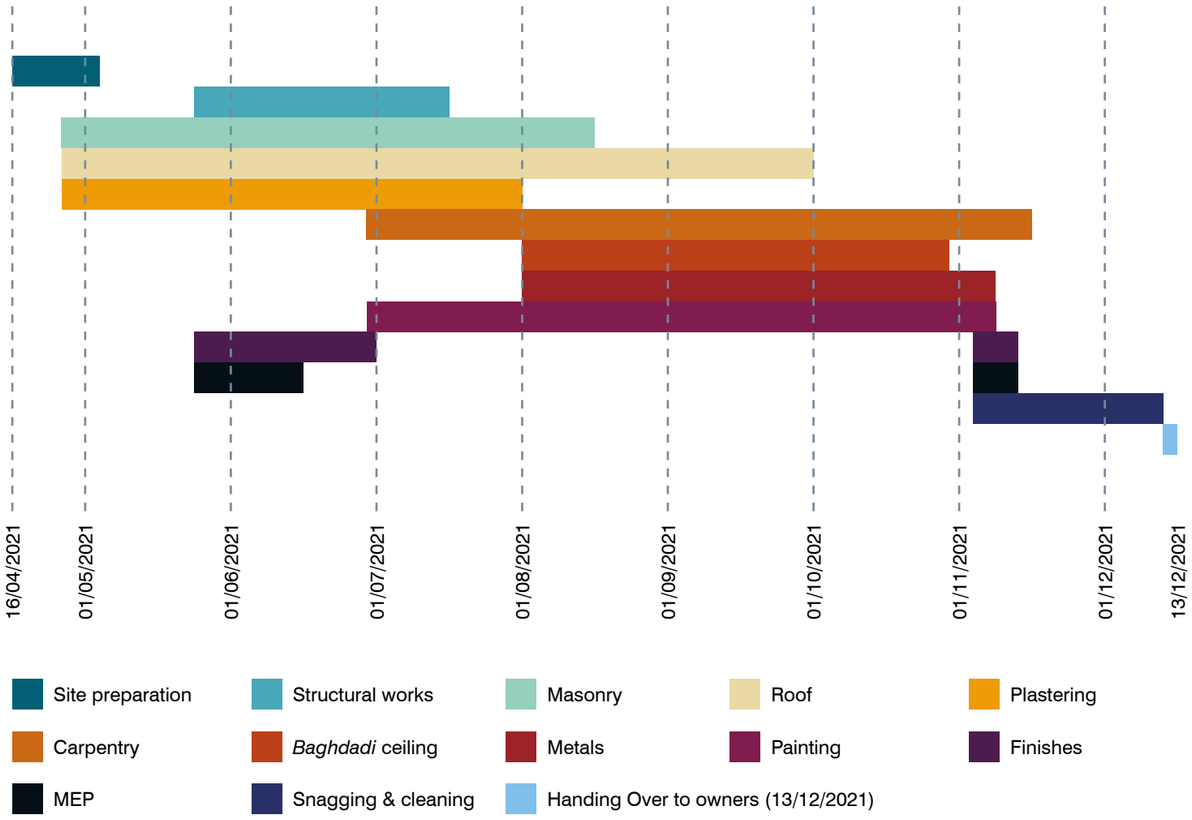
Start of the works:

In December 2020, *Beirut Heritage Initiative* met with *The House of Christmas* and *Together Li Beirut* to **assess and determine the action to be taken on the renovation of the Gholam Cluster**.
BHI undertook the renovation of Rmeil 722, and the Gholam stairs. After a thorough study of the budget and report provided by the *DGA* and *BBHR20* for Rmeil 722, *BHI* started the works in April 2021, with architect-restorer Pierre Ghanem *(BBHR20)* as the consultant, and *Awaida Contracting and Engineering (ACE)* as the contractor.



The *BHI* team followed up the restoration works with daily visits, constant contact with the consultant, contractor, owners and partner NGO on the cluster.
The works started with the contractors' team mobilized on site, to clean the debris and sort salvaged materials such as the sandstones, carpentry, and metal balustrades.
The site perimeter was further secured with scaffolding and a wooden fence on the North facade to allow for the workers' safe mobility and reduce the risk of collateral damages. The budget spent on the renovation of Rmeil 722 amounts to $ 144,235.27.

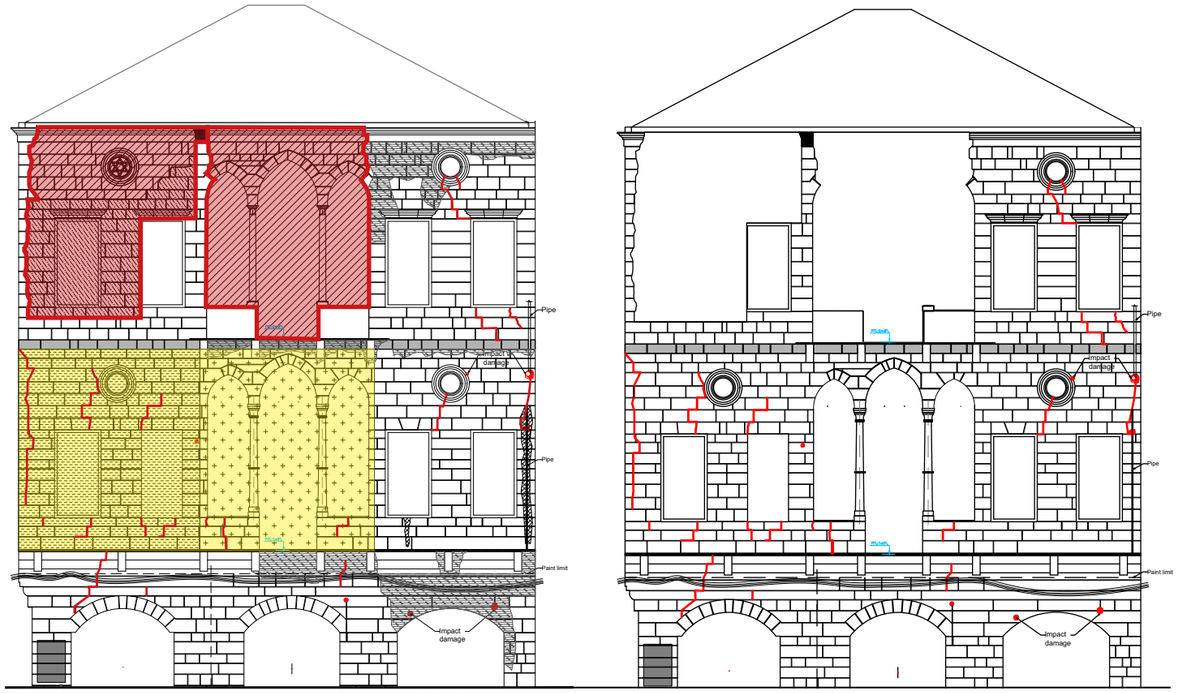
Rmeil 722: Project Timeline



Installation of the wooden fence and scaffolding, *D. Mrad*

North Façade restoration:

The North façade was severely damaged by the blast, which led to its partial collapse on the second floor, and out of plane walls on the first level. To restore it back to its original state, the former had to be completely reconstructed and the latter required dismantling and reconstruction all while using the original sandstones and lime based mortar used in the traditional building techniques.



North façade damage assessment, *P. Ghanem (BBHR20)*

Collapse Bulging Cracks

Start of the dismantling operation on North Façade, *D. Mrad*

Numbering and sorting each dismantled stone with tags, *D. Mrad*

The North façade's restoration process started with the numbering of the salvaged and out of plane walls' stones. Then, **the out of plane walls were manually dismantled starting with the second floor and down to the first.** All the sandstones were later sorted and stored in a safe place until the reconstruction process started.

Laying of the triple arches of the first level, *D. Mrad*

First floor triple arches dismantled, *D. Mrad*

The reconstruction of the North façade started with the reinforcement of the first floor's limestone corbels that held the *Carrara* marble balcony slabs. Then, the dismantled triple arches and wall were rebuild using the previously sorted material. A similar process was followed on the second floor and the final step in the North façade's reconstruction was the rebuilding of the roof's stone cornice. The North façade took 3.5 months to be rebuilt.

Dismantling of the limestone corbels, *D. Mrad*

Cleaning of the limestone corbels, *D. Mrad*

Installation of Carrara Marble slab, First floor, *Y. Kassar*

Rebuilding the sandstone parapet, First floor, *D. Mrad*

Installation of new Carrara Marble columns, First floor, *D. Mrad*

Rebuilding the sandstone arches, First floor, *Y. Kassar*

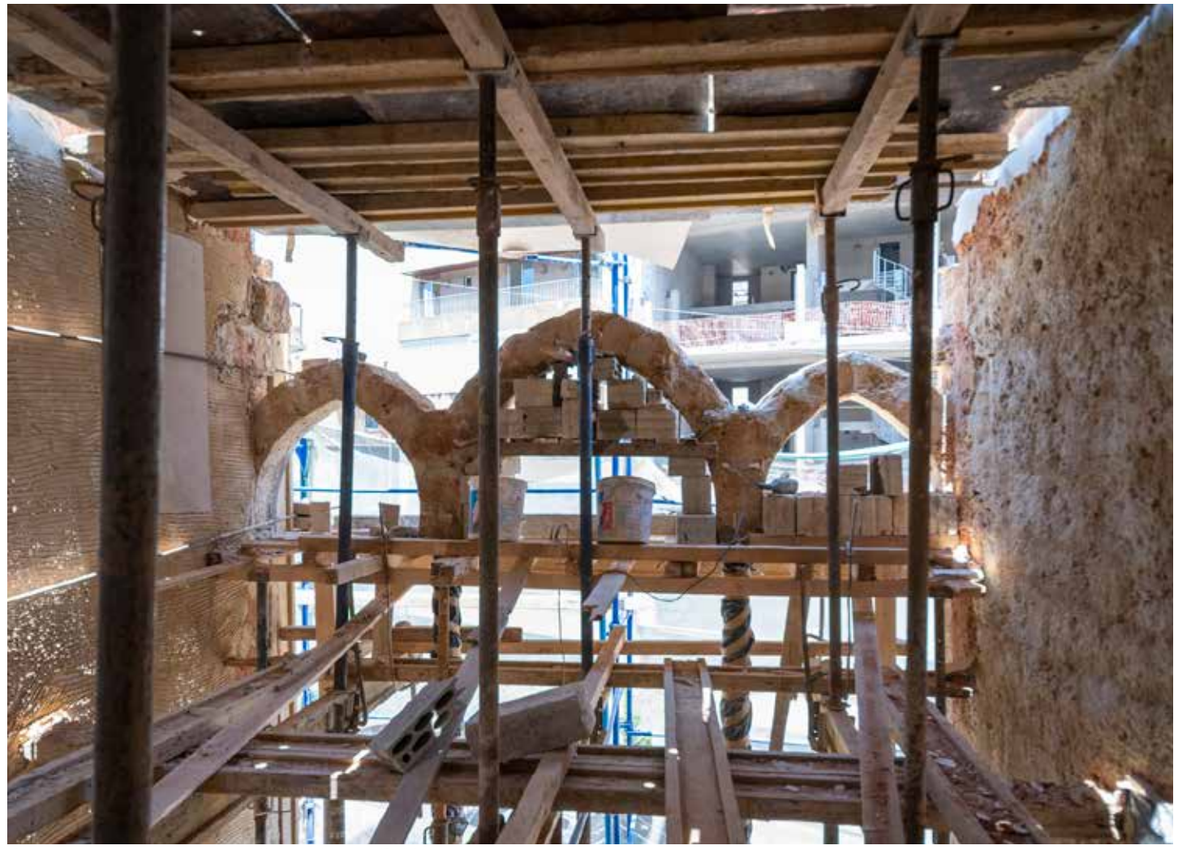
First floor triple arches, *D. Mrad*

Rebuilding the collapsed wall, Second floor, *D. Mrad*

Sandstones awaiting for their placement, Second floor, *D. Mrad*

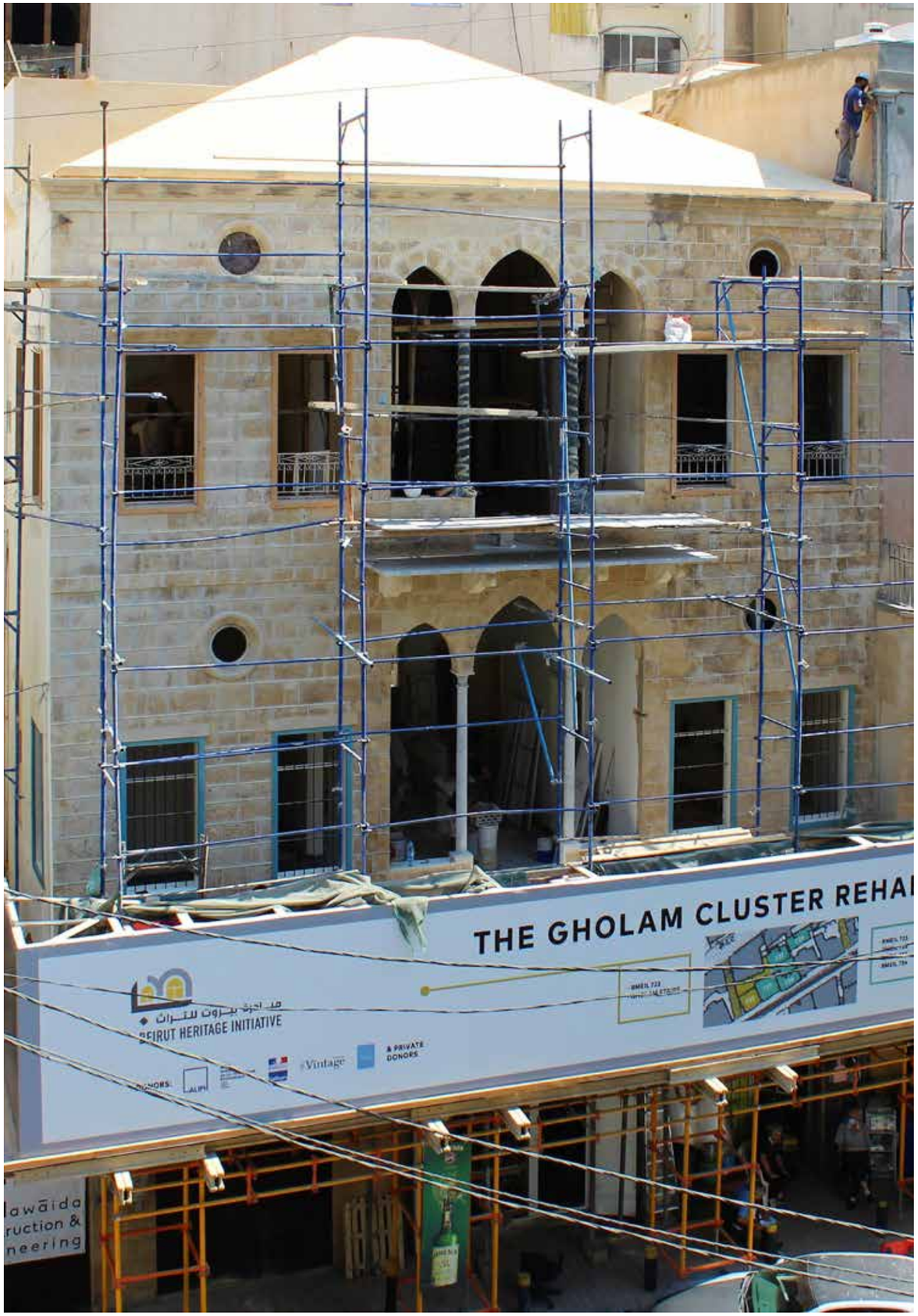
Installation of Carrara Marble columns, Second floor, *D. Mrad*

Rebuilding the three arches, Second floor, *D. Mrad*



Rebuilding the three arches, Second floor, *D. Mrad*

Second floor triple arches, *Y. Kassar*



The North Façade, *J. Chalfoun*

Start of the dismantling, while tagging and sorting the sandstone that will be used later.


© D. Mrad


© D. Mrad

First floor balcony:
Limestone corbels installation, reinforcement and cleaning. Carrara marble slab installation.

First floor:
Reconstruction of the sandstone and Carrara marble triple arches with structural reinforcement at the wall to slab level.


© Y. Majzoub


© D. Mrad

Second floor balcony:
Limestone corbels installation, reinforcement and cleaning. Carrara marble slab installation.

Second floor:
Reconstruction of the sandstone and Carrara marble triple arches, and the collapsed wall with structural reinforcements.


© D. Mrad


© J. Chalfoun

Reconstruction of the sandstone cornice at the top level of the second floor.

North façade cleaning using a water-pressured jet, and re-jointing using lime plaster.


© J. Chalfoun

Pitched roof reconstruction:

In October 2020, *Beirut Heritage Initiative* sheltered Rmeil 722 with a Tarpaulin cover, thanks to the support of *ALIPH Foundation*, and with *Live Love Beirut* as the executer.
The roof of this heritage house consisted of a pyramidal pitched roof made of *Qotrani* wooden structure covered with Marseille red tiles and a small flat concrete terrace.

Rmeil 722, roof condition after the blast, *J. Kallas*

Rmeil 722, after the sheltering, *ACE*

Roof condition after the blast, *R. Rizk*

Damaged roof Damaged *Baghdadi*

During the first month, the existing damaged wooden structure was dismantled, and a recently added concrete room that led to the pitched roof was removed. The second floor's damaged *Baghdadi* ceiling, located under the roof's structure was also dismantled.
The pitched roof's wooden structure was rebuild using *Qotrani* wood, which was traditionally used in the construction of these heritage houses following the conventional building techniques of the time.
For additional protection, a vapour permeable underlay was installed on the wooden structure prior to the installation of the red tiles and caps.
Similarly, the *Baghdadi* ceiling was restored using wooden lathes covered with lime plaster.
The roof reconstruction was funded by *ALIPH Foundation* as part of the "Emergency Roof Covering" project.

Reconstruction of the wooden rafters, July 2021, *M. Khadra*

Installation of wooden planks, *J. Chalfoun*

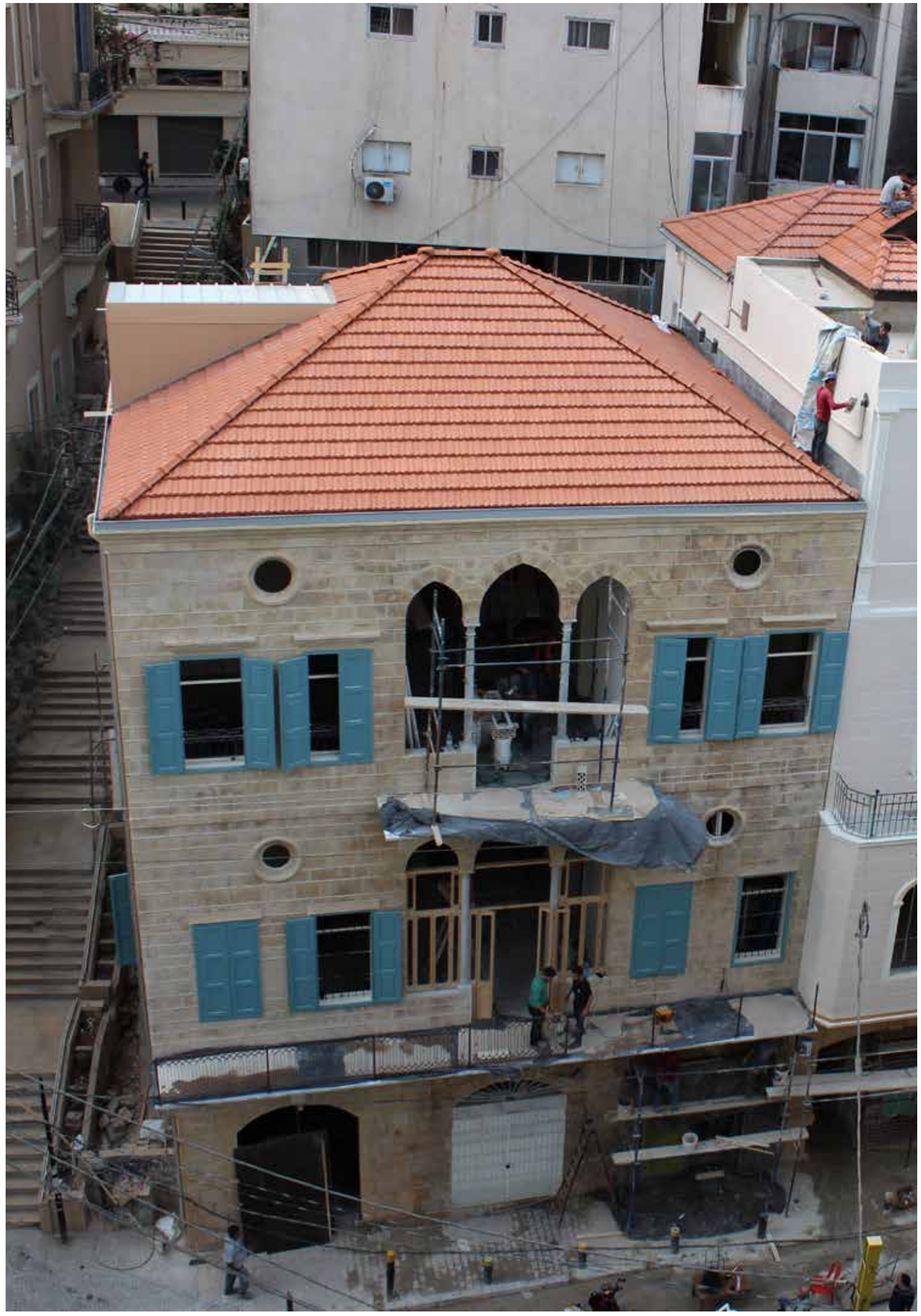
The wooden structure, *Y. Majzoub*

Installation of vapour mesh, *Y. Majzoub*

Installation of vapour mesh, *J. Chalfoun*

Installation of red tiles, *Y. Majzoub*

Installation of red tiles, *J. Chalfoun*



Rmeil 722, *J. Chalfoun*

Plaster & Paint:

Rmeil 722's interior sandstone walls were covered with lime plaster, whereas the exterior walls were largely covered with cement plaster. During damage assessment, a portion of the external cement plaster needed repair and was therefore replaced with lime plaster as the latter is much more compatible with the sandstone's composition, respiration and sustainability.

Manual removal of the lime plaster, *D. Mrad*

Lime plaster mix, *D. Mrad*

<u>The removal and application of lime plaster is as follows:</u>
- Assessment of the damaged and cracked plaster
- Removal of the decayed plaster without altercation of the masonry - manual removal
- Cleaning of the sandstone surface
- Structural consolidation with stitching and injection of cracks in the sandstone wall, using grout and stainless steel plates
- Application of a setting coat for the preparation of the lime plaster
- First rough application of lime plaster - scratched coat
- Second and final layer of lime plaster - smooth surface

Once the plastering process is done, a coat of putty is applied, before the application of the paint.

Cleaning of the north façade, *M. Khadra*

Rejointing north façade, *J. Chalfoun*

The decorative stone jointing of Rmeil 722's North façade was also made of plaster. After the reconstruction of the north façade, the stones were cleaned manually, and in small areas using a low-pressure water jet. Then the decorative jointing was repaired where needed and a light tea-stain was applied on some parts of the stone surfaces to balance out the overall colour of the façade.

1- Assessment of the damaged lime plaster

2- Manual removal of the damaged lime plaster

4- Sandstone preparation for lime plaster application

3- Stitching of the wall where large cracks are found

5- Application of a primary lime plaster coat (rough finishes)

6- Application of a final lime plaster coat (smooth finishes)

8- Application of paint

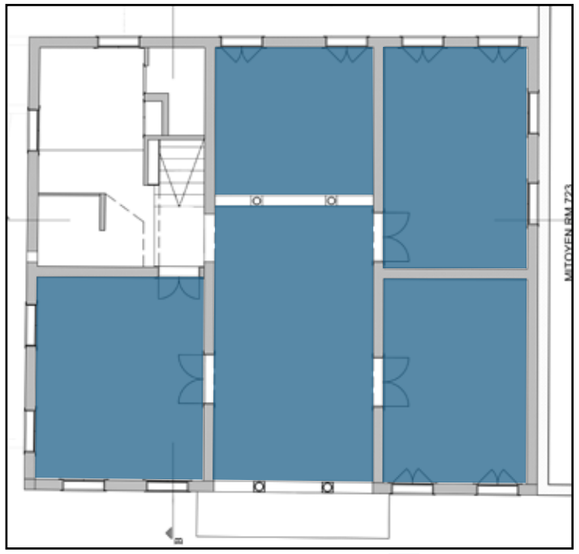
7- Application of wall putty and first layer of paint

Baghdadi Ceiling:

The *Baghdadi* ceiling (in reference to Baghdad) is an architectural element made out of wooden lathes covered in plaster, usually used as wall partitions or ceilings.
Rmeil 722's *Baghdadi* ceiling on the second floor was severely damaged by the August 4, 2020 blast.

Baghdadi structure, *D. Mrad*

The *Baghdadi* structure under the roof, *D. Mrad*



Second floor plan, *P. Ghanem*

Baghdadi ceiling

BHI, the consultant, and the contractor made sure that the *Baghdadi* ceiling was **restored using the original materials and techniques, whereby wooden lathes were installed under the pitched roof's wooden beams and were covered with two layers of lime plaster**: First a rough scratched coat and then a smooth coat. Afterwards, the wooden cornice was installed, the ceiling was painted and finally the central plaster decorative element put in place.

Installation of the *Baghdadi* structure, *J. Chalfoun*

The *Baghdadi* structure under the roof, *J. Chalfoun*

Wooden structure, *Y. Majzoub*

Application of the plaster, *J. Chalfoun*

Prepration for the installation of the wooden cornice, *Y. Majzoub*

Painting of the *Baghdadi* ceiling, *Y. Majzoub*

The *Baghdadi* ceiling in the central hall, *Y. Dagher*

Carpentry:

Damaged carpentry, *D. Mrad*

Loss of carpentry, *D. Mrad*

The *Qotrani* wooden windows, occuli, doors and shutters in Rmeil 722 were severely damaged by the blast and in some cases shattered into bits and pieces.

Damaged arch, *Y. Dagher*

Details of the design, *Y. Majzoub*

Assembling of the pieces using a photo as reference, *D. Mrad*

Fixing the existing window frame, *Y. Majzoub*

The carpentry was restored using salvaged elements and replacing decayed parts with new *Qotrani* wood. As for missing or highly damaged items, they were reproduced by the contractor with the instructions of the consultant to mirror the original design.

During the cleaning process of the original window shutters, old layers of blue paint were revealed, a colour commonly used in the Beiruti Houses. Therefore, it was decided to bring back this vivid colour to the shutters after their full restoration.

Restoration and installation of the carpentry, *J. Chalfoun*

The wooden triple arches, *J. Chalfoun*

Finishes:

The finishes include preserving the old paintings found in Rmeil 722, restoring the metallic balustrades and gratings, and replacing the damaged tiling among other things, using original materials.

Revealing the old paint, *D. Mrad*

Preservation of old paint, *J. Chalfoun*

Broken carrara marble tiling, *J. Chalfoun*

New carrara marble tiling, *J. Chalfoun*

Damaged metallic balustrade, *Y. Majzoub*

Restored and installed metallic balustrade, *J. Chalfoun*

Central hall before the intervention, Second floor, *D. Mrad*

Central hall before the intervention, First floor, *Y. Dagher*

South facade, May 2021, *D. Mrad*

South facade, December 2021, *J. Chalfoun*

THE GHOLAM STAIRS

The Gholam stairs is a pedestrian infrastructure that connects the neighbourhoods of Gemmayzeh and Mar-Mikhael to Geitawi and lower Ashrafieh.

The Gholam stairs, with Rmeil 722 to their side, *D. Mrad*

They were named in the 1920's by Antoine Gholam, "*Mokhtar*" (elected civil officer) of the Rmeil area, and father of the current "*Mokhtar*" of Rmeil, Bechara Gholam, and are located east of the cluster, with Rmeil 722 at its bottom. This pedestrian path that was highly used in the past, being alongside the "Al-Sabil" source, a water source used by the inhabitants of the region. Unfortunately, the source disappeared over time.

Design test, *J. Chalfoun*

Start of the works, *J. Chalfoun*

The renovation of the Gholam Stairs was made possible thanks to the support of the *French Ministry of Culture*, and the F*rench Ministry of Ecological Transition*. The works were carried out by *ACE*, with *URBI* and *Francis Landscapes* as the consultants on this project. The amount spent on the renovation was of $ 20,733.10.

Cleaning of the stairs, *J. Chalfoun*

The new landings, *J. Chalfoun*

During the intervention, tiling installation, *Y. Kassar*

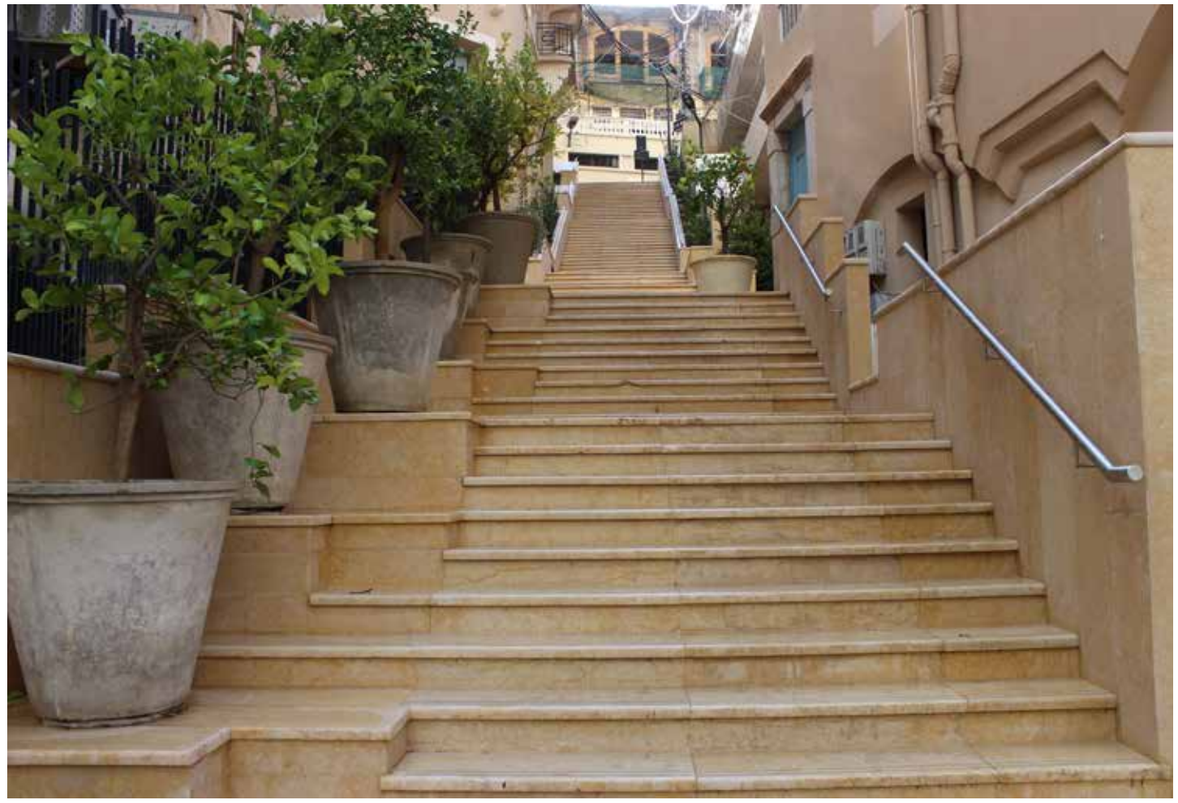
Fixing the top of the stairs, *J. Chalfoun*

Installation of cladding, *J. Chalfoun*

Installation of gutters, *Y. Dagher*

During the intervention, *J. Chalfoun*

After the intervention, *J. Chalfoun*



The Gholam Stairs, *J. Chalfoun*

THE GHOLAM CLUSTER RENOVATION: IMPACT

In December 2021, *Beirut Heritage Initiative* with *Together Li Beirut* and T*he House of Christmas* welcomed back the families into their home, after 9 months of renovation.
On December 17, 2021 the inauguration of the cluster was made in presence of the families and donors, the Governor of Beirut, Judge Marwan Abboud, and the Director General of Antiquities, Dr. Sarkis Khoury, as well as partners and NGO representatives.

The cluster comprises:

5 buildings
2 public spaces

8 households

12 businesses

65 beneficiaries

Inauguration of the cluster on December 17, 2021, *Y. Dagher*

Rmeil 722, after the renovation, *D. Mrad*

Rmeil 723, after the renovation, *D. Mrad*

Rmeil 726, after the renovation, *D. Mrad*

Rmeil 727, after the renovation, *D. Mrad*

Rmeil 734, *D. Mrad*

The Gholam Stairs, after the rehabilitation, *J. Chalfoun*