

## **The History of Efforts to save the New Gurna for Hassan Fathy towards the Restoration Project 2021**

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### **Abstract:**

The project of the New Gurna by Hassan Fathy in Egypt (1946-1952) considered as an outstanding example of sustainable human settlement and appropriate use of technology in architecture and planning, it also inspired a new generation of architects and planners worldwide through an integration of vernacular technology with modern architectural principles. But through decades of lack of maintenance and neglect, the New Gurna faced severe structural problems and demolishes.

This paper focused on the series of efforts that had been done to reach the real project of Safeguard Hassan Fathy architectural legacy in New Gurna 2021, with the proposed work plan of conservation and reuse the heritage public buildings of New Gurna, with a comprehensive sustainable solution to the main problem that threatens the project which is the underground water.

The study suggested that a maintenance plan must be established for the new system of the underground water, to avoid any leaking or plugging of the connecting pipes that could affect the level of water under the foundations.

The restored buildings also must have a regular maintenance plan, and also must be reused and engaged with the community needs to encourage them to safeguard the heritage buildings and stop sabotaging them.

**Key words:** vernacular architecture, New Gurna, heritage buildings, restoration, safeguard project.

## 1. The historical background:

New Gourna village is located in Luxor on the West Bank of the Nile River, within the World Heritage property of Ancient Thebes in Egypt. The village was designed and built between 1946 and 1952 by the famous Egyptian architect Hassan Fathy (1900-1989). It was created to shelter the community of Old Gourna (Fig: 1) who had lived above the tombs in the ancient cemetery of Thebes and whose relocation was considered as a solution to reduce the damages to the Tombs of the Pharaonic period. It is claimed that the Gourniis for generations had made their livelihood by tunneling into the tombs,

**Fig 1:** The Old Gourna- above the tombs of Thebes



**Source:** The author

plundering the contents and selling the artifacts on the black market. Therefore, they built their houses in front of the tunnels to accord a certain degree of security to their operations[1]. Determined to stop the tomb robbing, the Department of Antiquities engaged Fathy in 1946 to design and construct a new village for the relocation of the Gourniis. But his project didn't have the appropriate appreciation from the Original Gourmiis and remained without habitants for long time.

The main characteristics of New Gourna village consist of Daniele Pini, 'Safeguarding Project of Hassan Fathy's New Gourna Village'[2]: its reinterpretation of a traditional urban and architectural setting, its appropriate use of local materials and techniques, as well as its extraordinary sensitivity to climatic problems. It demonstrated, within the era of "modern movement" that sustainability and social cohesion could also be met with vernacular architectures, local materials and techniques. For this reason, it is an outstanding example of sustainable human settlement and appropriate use of technology in architecture and planning. Exposed in one of the major architecture and

planning references, Architecture for the Poor[3]: An Experiment in Rural Egypt by Hassan Fathy, published in 1973, these ideas inspired a new generation of architects and planners worldwide through an integration of vernacular technology with modern architectural principles.

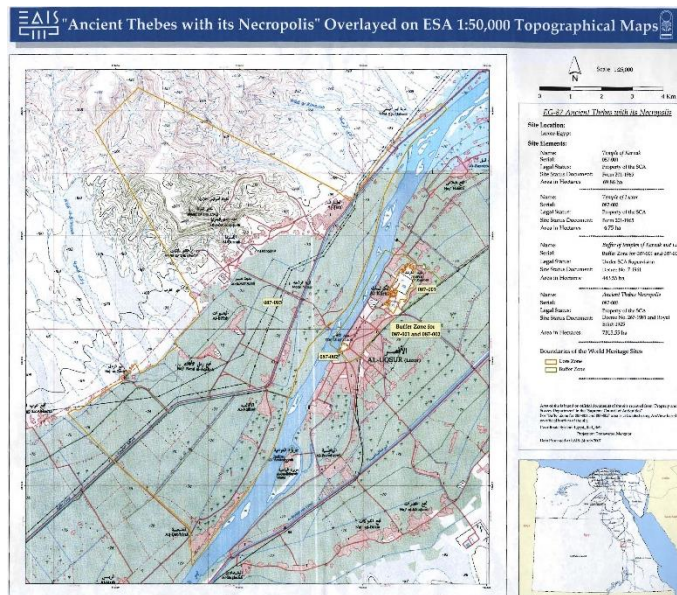
Although New Gournia is situated inside the boundary of the World Heritage Property of Ancient Thebes with its Necropolis (inscribed in 1979 on the World Heritage List) Fig 2[4], its outstanding value was not recognised in the nomination dossier at the moment of its preparation[5].

James Steele epitomized the New Gournia project thusly: “The social experiment that Fathy had been mentally piecing together for so long was thus to finally become a reality. He saw this opportunity not as an end in itself, but as a testing ground for all his ideas and a prototype for other, larger villages to come.”[6]

The new site for the New Gournia [7](Fig 3) was about fifty acres and was located away from ancient remains but close to the road and railway line[8]. Fathy selected the site to position the village close to the tourist traffic to ensure activity and avoid isolation. Aside from the historical and technical concepts directing the project, considerations influencing the design of New Gournia ranged from specific social concerns to purely theoretical ideas.

The main entry to the site was through one of those buildings, the market, located at the southeast corner of New Gournia, which was divided into two sides by the railway. Traditionally a trade and a social space in rural Egypt, the market acted as a filter, a kind of funnel that directed the movement along an orchard to a large winding main street. The main route led to the rectangular-shaped public square where most of the

**Fig 2:** The location of Gournia and New Gournia in the World Heritage site of Ancient Thebes Necropolis



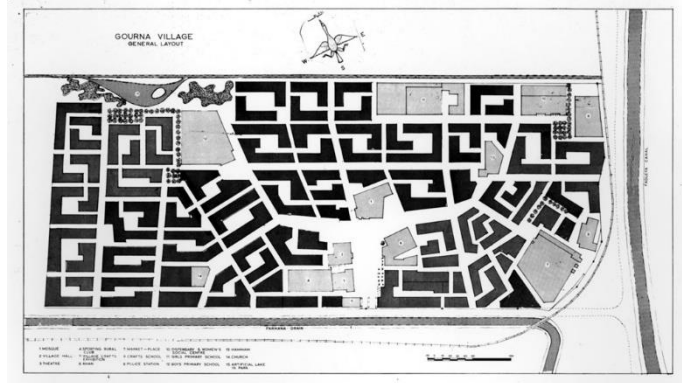
Source: <https://whc.unesco.org/en>

community functions were grouped. Next to the mosque were the village hall, the theater, the sporting rural club, the crafts exhibition hall, and the khan.

The mosque still serves today as the main focal point of the village. Well maintained by the inhabitants, its horizontal and vertical massing was based on Upper Egyptian tradition[9] (Fig 4).

The bold, straight outside staircase to the minaret and the arrangement of passages on the main street added to its Nubian character and helped to make one forget the presence of the road[8].

**Fig 3:** Gournia Village General Layout, locations of principal public buildings identified



**Source:** MIT Libraries, Aga Khan Visual Archive, USA  
<https://dome.mit.edu/handle/1721.3/73753>

**Fig 4:** The Mosque of the New Gournia, in the baste and after 2021 restoration



**Source:** AUC, rare books, Hassan Fathy's collection



**Source:** the author, 2021

## 2. The previous reports the studies of the new Gournia:

This small, experimental village remains a focus of global interest. New Gournia was nominated to the World Monuments Watch in 2010, just as UNESCO spearheaded an initiative to safeguard the village.

Following concerns about the serious state of village degradation, by The Egyptian ministry of culture, the World Heritage Committee in UNESCO and the World Academy of Experts in Hassan's Fathy Architectural Work, the UNESCO Cairo office in cooperation with the Egyptian Ministry of Culture represented by the National

Organization for Urban Harmony (NOUH) made a lot of actions started from 2009 till now, which produce the currently project: **Safeguarding Hassan Fathy's Architectural Legacy in New Gurna in 2021.**

Aspects of cooperation and what has been implemented can be summarized by:

**In 2008:** The World Heritage Committee has invited the Government of Egypt "to strengthen efforts to restore Hassan Fathy's New Gurna village". In addition to, several threats facing New Gurna pointed out by the "Save the Heritage of Hassan Fathy" association at Mediterra also alerted the World Monuments Fund, which inscribed the village on the 2010 World Monuments Watch List for the 100 most endangered sites in the world[2].

**In 2009:** UNISCO initiated a project for safeguarding Hassan Fathy's architecture work because of the importance of the site. After that, a Prime Ministry's Decree declared Hassan Fathy's Village as a Heritage Protectorate and created a Committee with members from the Ministry of Culture, Supreme Council for Antiquities, the National Organization for Urban Harmony and Luxor Governorate to identify the perimeters of the village and the legal measures for the protection of the area.

**In 2010:** Four missions of UNESCO Experts were done, the first one was on March, and aimed to discuss with the local authorities the implementation modalities for the project initiative 'Safeguarding project of Hassan Fathy's New Gurna village' under the programme "Management of World Heritage sites in Egypt". The second mission was on April, and aimed to undertake initial observations to identify concepts and priority actions required for the preparation of a conservation, rehabilitation and development plan[2].

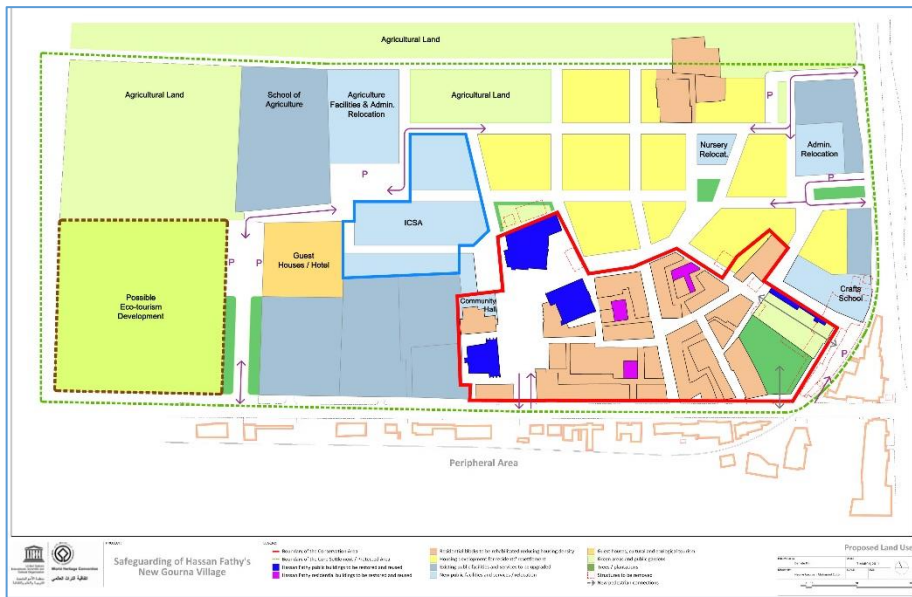
The third mission was on May, and planned to follow up the first mission's result, and during the discussion with the Egyptian authorities, it was agreed that an outlined proposal should be prepared to launch the first tangible interventions during autumn. An official agreement on a defined plan of operations will be established between UNESCO and the Governorate specifying the obligations of both parties in the implementation of the activities prior to the launch of the activities.

The fourth mission was on July, and aimed to facilitate the physical survey of the village of New Gurna launched by a UNESCO team and to start the preparation of the draft of the Master Plan. The physical survey is aimed at identifying the survey area, creating

a reliable base map, carrying out a plot-by-plot survey, producing a set of GIS maps and providing a summary report containing a preliminary analysis of the data. The Governor of Luxor offered logistical support for the survey.

Following the recommendations and suggestions of several missions and petitions, the outcomes of the missions and the Scientific Committee meeting in 2010, as well as the concerns of the local authorities was the following Master Plan[2] Fig (5).

Fig 5: The proposed Master of Gournia Plan 2010



Source: Daniele Pini, 'Safeguarding Project of Hassan Fathy's New Gournia Village' (UNESCO, 2011)

**In 2011:** The World Monuments Fund in cooperation with the UNESCO send a group of experts to visit the New Gourna to understand the relationship between the people and place of New Gourna, to identify the needs of the community, and to engage residents in conservation efforts. The report named “**New Gourna Village: Conservation and Community**[10]” and in my point of view, the Key findings of the study include that:

- The community of the New Gourna have strong social bonds and these are reinforced by familial connections to Old Gourna.
- The community is a stable, but need to be enhanced in employment and economic development opportunities.
- Improved housing conditions are a primary concern of the community. Public services are well provided, with the exception of sewage management, which is also a priority. (this is still an urgent request in the Safeguarding project 2021)
- Changes in groundwater conditions have contributed to the deterioration of the built fabric of New Gourna. These must be addressed before pursuing any conservation efforts. (and this the most important point that have been solved in the Safeguarding project 2021).
- Many modifications have been made by residents to the original fabric, these have been borne out of necessity with the best of intentions, and with limited financial and information resources. While the residents feel proud of the community and its association with Hassan Fathy.

**In 2013:** UNESCO conducted a condition assessment mission for the current situation of the village, which resulted in a report to monitor the condition of the village, to draw a list of priorities, to propose adapted solution for treatment and to prepare of intervention with more focus on urgent activities that could be implemented.[11]

**In 2015:** a response was issued from UNESCO approving the use of part of the funding of projects for the development of heritage sites in Egypt, and to open a special account for the Safeguarding and rehabilitation project. In August, UNESCO conducted a one-day mission to New Gourna, together with the Ministry of Culture, to visit the site and discuss the next steps, including the detailed action plan, to re-activate the project to “Safeguard Hassan Fathy architectural legacy in New Gourna”, the Pre-Assessment Mission Report mansions that new collapses and cracks had been accrued and the

deteriorated conditions need to be closely monitored[12]. And the recommendations were that structural reinforcement is needed for the main facade wall (East wall of the theater) and

the parallel wall behind the stage of the Theater, also the cracks need to be closely monitored like (arch in the Northern aisle of the Mosque).

**In 2016:**

The main objectives of this mission are to re-activate the project for safeguarding Hassan Fathy's architectural legacy and to design and to start installing the propping/shoring/stabilization system for the damaged dome in Hassan Fathy's House, the consolidation of the Khan, the Market vaults, and to prepare the initial plan for the stabilization of the façade wall in the theater; also to conduct on-site training and demonstration works for each preventive conservation techniques to be implemented during the mission; in addition to clean, remove vegetation and evacuation of debris from the site work; and Finally to define the detailed Action Plan of the subsequent phases of the project, as per the set Tentative Plan of the project[13].

In the same year an addition mission report [14] finished by general recommendations like:

- Urgent relocation and transfer of all activities taking place in the Market to allow the installation and starting of the mud brick production unit.
- Temporary reuse of the market vaults as a Site Unit with offices and training workshops.
- Soil identification and analyses to be able to validate or not the use of the local soil.
- The high concentration of soil humidity is a result of a combination of high water table level, excess water coming from the failure of the sewerage system and the poor soil absorption capacity. As long as the problem of drainage and sewerage system of the village is not treated, the instability of buildings even after their restoration will always be critical.

Later in May 2016, the remained Buildings of the original planning for Hassan Fathy had been registered, accordance with Resolution 767 of 2016, under the Egyptian Law No. 144/ 2006 for significant buildings of heritage value, issued by the National Organization for Urban Harmony and declared by the Supreme Council of Urban



Planning and Development, which is protect the rest of the building from demolished as shown in Fig 6[15].

**Fig 6:** The heritage listed buildings in Gourn



**Source:** National Organization for Urban Harmony, 2017

**In 2017:**

Many meetings had been done to set up the work plan to start the safeguard project of New Gourn including the reuse plan, then the UNESCO commissioned a consultant to put the working plan and to make photo documentation for the main building in the Gourn. The report of the UNESCO consultant divided the phases of the project for three phases, the first one: The Khan and the Mosque, the Second and the Third phases: the rest of the building in the center and the main square[16], The expected time for the rehabilitation project was 27 months, and the estimated budget was 23.5 million pounds.

The vision of rehabilitating valuable sites in the consultant’s report has two main objectives[16]:

**Ensuring cultural continuity:** by revealing the historical value of these sites, the development of their architecture, their relationship to the surrounding urban area. In addition to the disclosure of cultural messages, provided by those sites in the past, to understand what could be possible for present and future.

**Ensuring physical continuity:** by adopting means of restoring the original physical presence, taking the necessary measures to remove any threatening factors and prevent any future threats.

Finally, the report included the evaluation of the current status of the village center and the most important problems that can be observed ostensibly in the buildings and the recommendations for the rehabilitation.

**In December 2017:** there were some efforts of quick intervention with the Khan to stop the demolishing. Unfortunately, that intervention was agonist the main idea of Hassan Fathy when he was built the Gourna, which caused changing in the dimensions of the norther main façade of the Khan, used the cement with the red bricks, in addition to hide the original elements from the façade and add an addition wall to the main façade of the khan, see fig (7).

Because the unapproved intervention, the NOUH took the decision to stop the work and asked the UNESCO to made the structural assessment in advance.

**Fig (7):** The Phases of intervention of the Khan wall from 2017-2021







D: During and after applying the clay plaster to the northern facade wall.

Shows the deference of the width of the wall



E: After remove the added exterior wall 2021.



F: After the final restoration of the Khan 2021.

Reference: the author.

**In 2018:** after the addition to the Khan which is caused changing in the original design for Hassan Fathy, The National Organization for Urban Harmony NOUH (Ministry of Culture) formed a technical advisory committee to provide technical support for the project of revitalizing the Gournia village in Luxor. So the decision was taken to cost consultancy offices to conduct construction case studies, ground water and soil tests and structural analysis for the buildings under restoration and preservation in the village of Gournia and to develop structural restoration solutions. In May 2018, the Housing and Building National Research Center HBRC, had been chosen to do those studies.

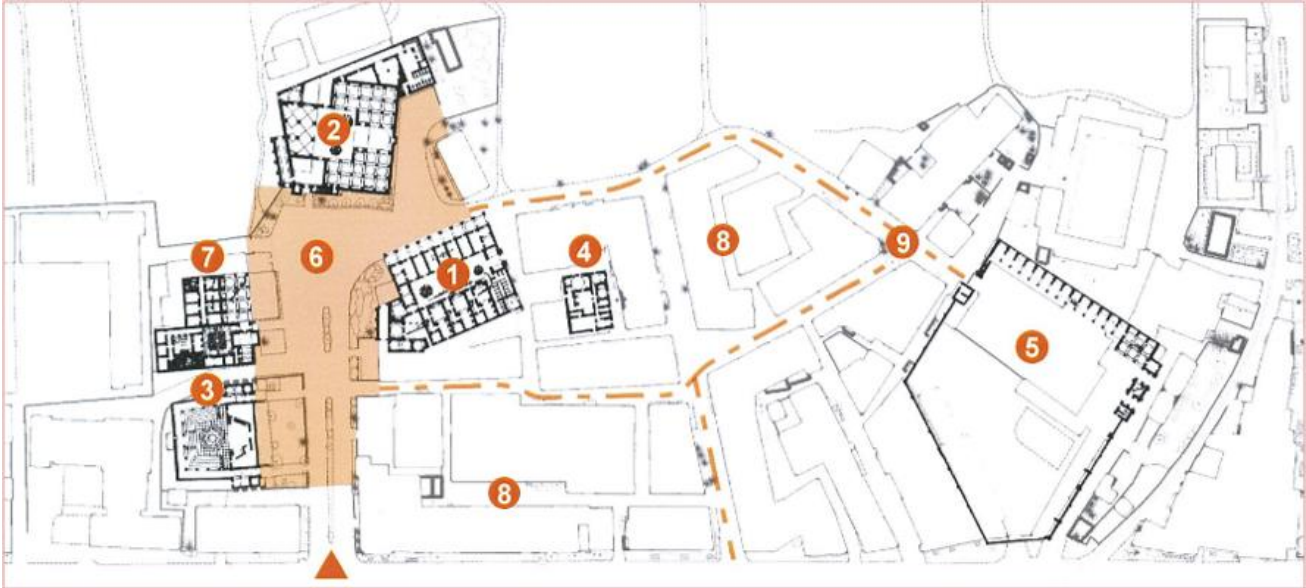
The Structural analysis report[17] included:

1. The Architecture description for the buildings in Center of Gournia.
2. The detailed documentation for the buildings.
3. The Structural analysis for the Khan and the House including the materials and the methods of construction.
4. The foundation observation.
5. The documentation of the cracks and collapses on the structural elements.
6. The entail testes for the building material which was the lime stone, the mud bricks, the red burned breaks, the testes were: the pressures test, the absorption test, the prism test, the tension test, the chemical analysis and structural analysis.
7. The summary and recommendations.

**In 2019:** The Ministry of Culture presented in NOUH in cooperation with the UNESCO, started the call for the project “Safeguard Hassan Fathy architectural legacy in New Gournia site”, and offered all the previous studies and tests. There were only 4 companies which Specialized in the environmental projects, so an international committee from expertise were evaluated the technical offers for the companies, then the financial offers. Finally, Environmental Quality International (EQI) has been chosen to take the project. All the previous steps had been done under the observation of NOUH as a national representative.

**In 2020:** in February the contract has been signed with EQI, the project divided to three steps as shown in fig (8), and the first phase costs 520000 \$

Fig (8): The Phases of the project “Safeguard Hassan Fathy architectural legacy in New Gouna site”



First phase: 1. The Khan      2. The Mosque      3. The theater

Second phase: 4. Hassan Fathy's House      5. The Market      6. The main square

The Third phase: 7. The city hall      8. The current buildings facades      9. The upgrade of roads

**In 2021:**

The first phase of the rehabilitation project is done by the EQI, and because of the covid-19, the time frame expanded about more 4 months, to finish officially in October 2021. The project mainly intervention in phase 1 with: the three buildings the Khan, the mosque and the theater. And the others phases will be completed when financing is available.

### **3. Safeguard Hassan Fathy architectural legacy in New Gournia site 2021:**

The scope of works in the project focus on the urgent reconstruction and restoration works to prevent further deterioration of five unique buildings of the master pieces built by the Architecture legend Hassan Fathy and restore them to their original standing. These buildings were built in the New Gournia village in Luxor, in the mid of the twentieth century using traditional earthen architecture (mud bricks). This includes the provision of adequate basic services required to complete restoration work of those buildings to their original state, using the same architectural methodology, methods, and techniques of Hassan Fathy, and equip them with appropriate and adequate facilities (electricity, water facilities and public toilets) that can allow the proper functioning of the buildings reuse plan[18].

The restoration project was a turn-key reconstruction and restoration project, and upheld in accordance with the precept and guidelines of the UNESCO 1972 Convention concerning the Protection of the World Cultural and Natural Heritage, and the national Law 144/2006 and the NOUH regulations. And the intervention methodology should stand for the preservation of Fathy's vision, mission, project objectives, in addition to his authentic Architectural, Urban Design, and Planning products and outcomes.

In the packages of the project, While the existing structures require restoration work on the areas that are structurally fragile and prone to collapse, the missing parts would require almost total reconstruction of the original architectural structure that Hassan Fathy created.

Aiming to halt the continuous deterioration of the existing five structures, the rehabilitation and restoration works, as well as the total reconstruction of the missing parts will include the following[18]:

- Repair and restore the walls, arches, ceilings, flooring and foundations of the buildings, surface and underground water drainage, collection and storage systems to protect structural elements from decay, by preventing water infiltration; dismantling and replacement of seriously degraded masonry and timber structural elements; reconstruction of collapsed structures, etc.
- Installation of basic and appropriate infrastructural services, utilities, and facilities foreseeing expansion for future functions and re-use: basic electrical power supply system and lighting, fire alarm, basic water supply and sewage treatment systems and visitors' toilets, etc.

- Propose a strategy for the execution of the restoration works involving available competencies within the local community to a maximum extent will be an advantage in the technical evaluation.
- Installation of a comprehensive sustainable solution or system to control the groundwater level and prevent any harmful conditions to the building in addition to the surface water drainage system within the building domain and its adjacent context. All relevant works should be approved by UNESCO and endorsed by NOUH, before detailing and submitting as part of the construction method of statement.

### **3.1. The underground water as a major threat to the Gournia buildings:**

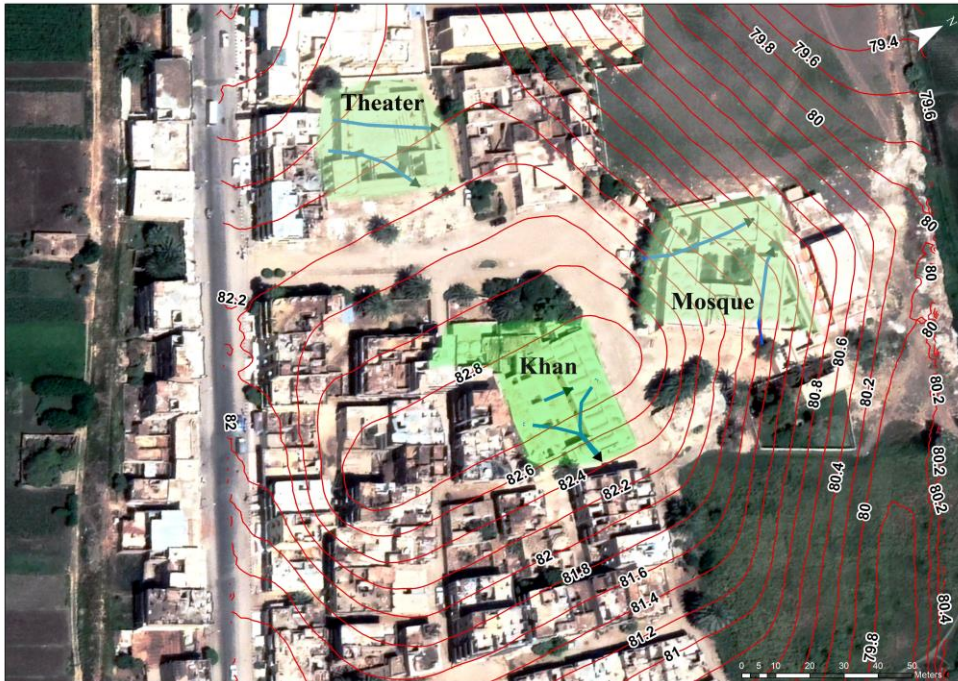
The most severe threats for the Gournia buildings is the movement of the ground water, that is because of the soil under foundations is clay which is affected by ground water movement causing settlement under foundation resulting in cracks in the buildings and bad connection of walls. In addition to there was poor site drainage due to the raised levels of the pathway around the buildings and non- presence of effective drainage system. Also, the Inefficiency of the roof waterproofing system and lack of rainfall water drainage[19].

Due to solve this problem, a series of meetings have been done between the stockholders and the consultants to put the best system that will be efficient and sustain, based on the previous technical reports provided by HBRC in 2018.

The next Fig (9), Shows the contour line around the buildings and the direction of the underground water in relation with the buildings.



**Fig (9):** The Phases of the project “Safeguard Hassan Fathy architectural legacy in New Gournia site”



Source: the author

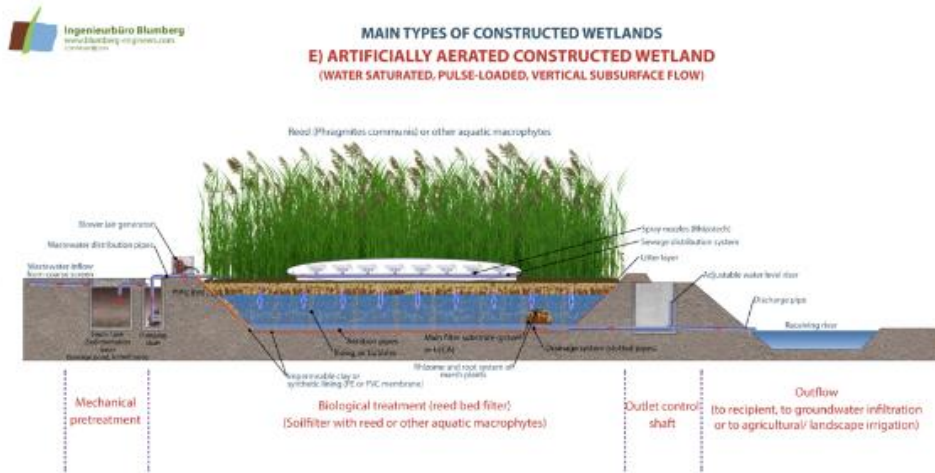
### 3.2. The system to control the underground water:

To control the ground water level, a comprehensive system consists of 2 constructed wetlands with 8 trench places have been chosen based on the HCRC recommendations, and the EQI experience in Siwa to implement the constructed wetland. The main aim of this works is to protect the foundation walls of the buildings and control the underground water level.

And briefly, the constructed wetland is (according to the Centre for Science and Environment in India): an organic wastewater treatment system that mimics and improves the effectiveness of the processes that help to purify water similar to naturally occurring wetlands. The system uses water, aquatic plants (i.e.: reeds, duckweed), naturally occurring microorganisms and a filter bed (usually of sand, soils and/or gravel). Constructed wetlands can be used for either secondary or tertiary wastewater treatment<sup>1</sup>. The Fig. (10)[20] Shows the idea of filtering the wastewater to reuse it.

<sup>1</sup> <https://www.cseindia.org/constructed-wetlands-wastewater-treatment-systems-6215>

**Fig (10):** the section of the wetland system



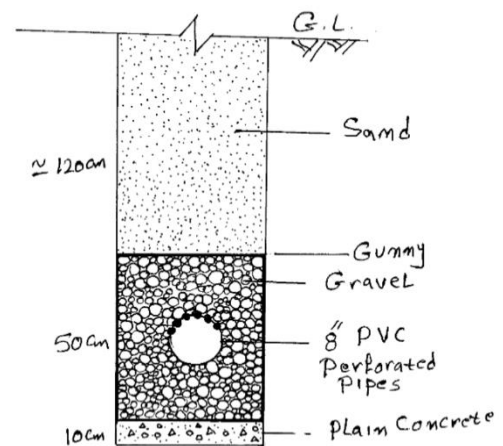
Source: <https://www.blumberg-engineers.com/en/ecotechnologies/constructed-wetlands>

The Second component of the system are the eight underground wastewater cisterns. they are buried at a depth of 2.5 m, and together required 480 m of perforated pipes in total. Of those 8 cisterns, 1 was installed in place of a previous leaking tank that had been put by the community near to the Mosque[21].

the underground cisterns were executed as follows[22] Fig. (11) :

- Excavation of soil around the three buildings at least 2m from front walls of buildings around 1.8 m depth and 1m width.
- 10 cm plain concrete.
- A layer of gravel 10 cm.
- Laying perforated PVC pipes 8inches with a minimum slope 1% (the holes in the upper third of the pipe, with a fiber glass layer on it).
- Complete the 40 cm gravel.
- A layer of gunny between the gravel layer and sand layer.
- Sand layer around 120 cm to back fill the excavation.
- At the selected positions, the collections chambers to be executed.

**Fig (11):** the section of the cistern



Source: 'Project Methodology & Method Statment', Cairo, Egypt, 2020.

The following diagram[21] Fig. (12) shows the location of the cisterns for wastewater collections, as well as the artificial wetlands at the Hassan Fathy site in New Gouna:

**Fig (12):** the underground water control system



**Source:** *Drainage Works Explanatian* (Cairo, Egypt, 2020)

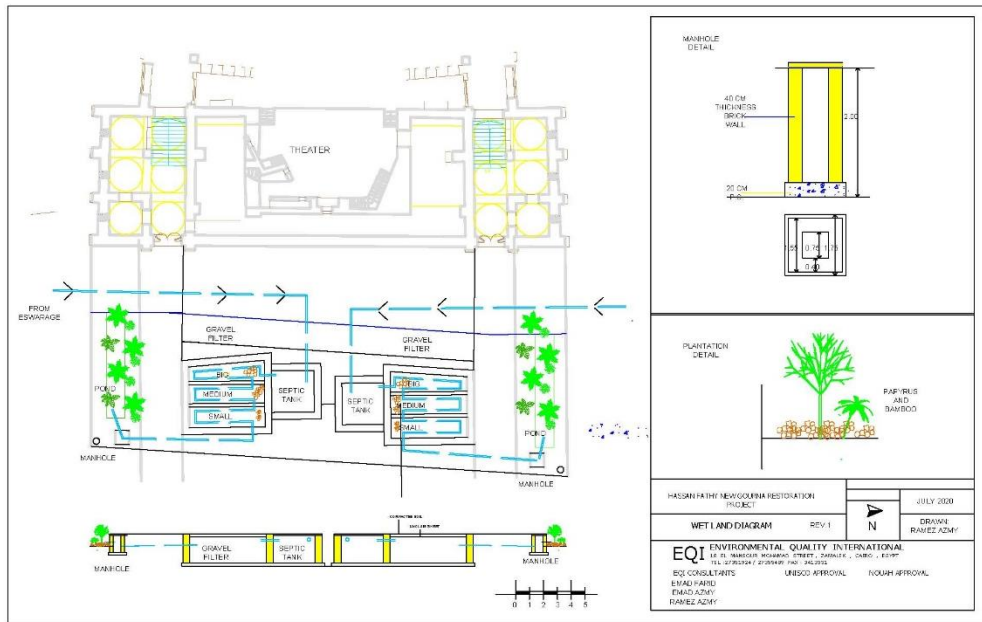
The volume of effluent produced by the surrounding community is about 20 tons per week. Wastewater holding tanks were periodically emptied by vacuum trucks that would drive very close to the Hassan Fathy buildings, causing vibration damage to the walls and foundations. In order to avoid paying for this service too frequently, community members would also pump wastewater into the ground, to a depth of about 10 mm which causes more unsuitability to the ground under the foundations.

With the new drainage system and wetlands that have been installed under the project, the total volume of effluent has been reduced by almost half, to about 12 tons per week, after treatment in the artificial wetlands. Another advantage is that although this effluent will still have to be removed by vacuum trucks, it will at least be stored as surface water in impermeable basins, rather than in leaking underground tanks. Moreover, the effluent will have been partially treated, and will contain less contaminants.

Finally, after installing its own drainage system, the EQI team discovered 4 piezometers around the Khan, with one more piezometer near Hassan Fathy's house, all in boreholes reaching to depth of 25 m. It is unknown who installed these, however, these

caused water to collect below ground. EQI therefore installed drainage pipes at a depth of 6 m to collect water rising by capillary force as a result of the boreholes[21]. And the following Fig (13), shows the detailed plan of the first wetland that located next to the theater façade.

**Fig (13):** the details of the wetland 1, next to the Theater



**Source:** wetland Digram, by: EQI (Cairo, Egypt, 2020)

#### 4. Conclusion:

The New Gurna has been designed primarily by uses the locally available materials and techniques. This fact not only imparts a vernacular character to the place's architecture but also promotes its sustainability, resistance to climatic extremities and economy.

The long sires of studies and reports from 2008 are recognize the main threats of the buildings because of the ground water movement under the foundations, so the project of "Safeguard Hassan Fathy architectural legacy in New Gurna site 2021" focuses to solve this problem before any intervention with the buildings.

This project funded by UNESCO, with cooperation with the national organization for urban harmony, ministry of Culture and done by EQI.

The new system to collect the underground water and control the level of water under the foundations must have a maintenance plan to avoid any leaking or plugging of the connecting pipes.

The restored buildings also must have a regular maintenance plan, and also must be reused and engaged with the community needs to encourage them to safeguard the heritage buildings and stop sabotaging them.

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