

# Project Description Statement

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## Hagar Qim and Mnajdra Temples Conservation and Interpretation Project


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- 17\_04\_8 Existing Utilities
- 17\_04\_9 Scheduling

Section

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## Introduction

0.1 Terms of Reference

0.2 The Issue

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## 0.1 Terms of Reference

The Project Description Statement for the Hagar Qim and Mnajdra Temples Conservation and Interpretation Project, located at Hagar Qim and Mnajdra Heritage Park, is a response to a request by Heritage Malta, the National Agency for Museums and Cultural Heritage in Malta, to draft such a report as directed by the Malta Environment and Planning Authority. The aim of Heritage Malta is to develop within Hagar Qim and Mnajdra Heritage Park, in the limits of Qrendi, a visitors centre, protective shelters, parking facilities and other features including footpaths. Outline development application PA 2697/02 was submitted to the Malta Environment and Planning Authority on 13<sup>th</sup> May 2002 (Appendix A1). In terms of current environmental impact assessment regulations, a Project Description Statement was requested by the said authority on 14<sup>th</sup> May 2004 and guidelines for the preparation of same was attached (Appendix A2). This statement was developed in collaboration with Heritage Malta with inputs from the architectural partnership led by Architect Walter Hunziker.

## 0.2 The Issue

The conservation of prehistoric megalithic architecture in Malta has long been an issue. Consecutive governments of Malta have placed this issue on the national agenda. No less than six of these architectural structures have been designated the status of World Heritage Sites by UNESCO, two of which are Hagar Qim and Mnajdra temple complexes.<sup>1</sup> 'The Conservation of Malta's Megalithic Temples' is the title of a Cabinet Discussion Paper presented by the Minister of Education in July 2000. This paper acknowledges that<sup>2</sup>

These cultural elements are under constant pressure from infrastructural development, intensive tourism, material decay and structural destabilisation...When applied to Malta's prehistoric 'temples' such pressures become even more intense and magnified primarily because these imposing buildings have inevitably become one of the archipelago's main tourist attractions.

The Hagar Qim and Mnajdra Heritage Park encompasses a prime archaeological venue of universal importance and should develop as a landmark and point of reference in the

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<sup>1</sup> The value of Hagar Qim and Mnajdra has been recognized by the United Nations Educational, Scientific and Cultural Organization (UNESCO). The 1972 UNESCO World Heritage Convention provides for the inscription of sites of outstanding significance in the World Heritage List. The Ggantija Temples in Gozo were inscribed in this List in 1980. In 1992, this inscription was extended to include Hagar Qim, Mnajdra, and the other principal megalithic sites of the Maltese archipelago, collectively referred to as "The Megalithic Temples of Malta" (Museums Department, *Hagar Qim & Mnajdra Heritage Park: Management Plan*, 2<sup>nd</sup> Draft, September 2002, Section 4).

<sup>2</sup> Cabinet Discussion Paper, 'The Conservation of Malta's Megalithic Temples', July 2000.

management of World Heritage Sites.<sup>3</sup> The principal focus of the Hagar Qim and Mnajdra Heritage Park is the group of prehistoric monuments that are found in this area. These consist of two important clusters of megalithic monuments, namely Hagar Qim and Mnajdra, dating back to the Late Neolithic, approximately between 3,600 BC and 2,500 BC.

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<sup>3</sup> Ministry of Youth and the Arts, International Union of Architects, *Hagar Qim & Mnajdra Heritage Park: International Design Competition*, p.46.



# Background Information

- 1.1 The Applicant
  - 1.2 The Development Proposal
  - 1.3 Scope of the Project Description Statement
  - 1.4 Conceptual Perspectives: A Chronology
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## 1.1 The Applicant

Heritage Malta, the organisation responsible for the operational development of the project site, was set up in 2002 under the provisions of the *Cultural Heritage Act, 2002*. It is the national agency of the Government of Malta in charge with the management of twenty four national museums and heritage sites and their related collections in the Maltese archipelago, including seven UNESCO World Heritage Sites. Heritage Malta is run by a Board of Directors with representatives of the Ministers responsible for Gozo and for Tourism and Culture, the Malta Tourism Authority, non-governmental organisations and experts in heritage management and conservation. The mission of Heritage Malta is to protect those elements of the cultural heritage that are entrusted to it, and to make them accessible to the public.

The functions of Heritage Malta are:

- a. To ensure that museums, collections, sites, buildings and property, movable or immovable, forming part of the cultural heritage, owned and administered by it, are conserved, restored, administered, managed, operated, marketed, studied and presented for exhibition, in the best possible way;
- b. To acquire in property or in trust objects, collection of objects, sites, buildings, for the Museums, collections, sites and buildings;
- c. To perform or commission, in each case under the surveillance of the Superintendent of Cultural Heritage, the restoration or conservation of cultural property owned or otherwise held or administered by it;
- d. To promote public knowledge, education, appreciation and enjoyment of the cultural heritage; and
- e. In co-ordination with the Superintendence of Cultural Heritage to consult with Local Councils in the preservation of cultural heritage in their locality.

## 1.2 The Development Proposal

In line with article 12 of the *Cultural Heritage Act, 2002*, the Ministry of Tourism and Culture is formulating a comprehensive strategy on cultural heritage with the sites at Hagar Qim and Mnajdra taking top priority, because of their cultural and scientific values and their role in promoting Malta's cultural identity.<sup>4</sup>

A project proposal European Structural Funds for the Hagar Qim and Mnajdra Temples Conservation and Interpretation Project has been successfully put forward and developed by the former Museums Department and by Heritage Malta. The selection of the project to

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<sup>4</sup> European Regional Development Fund (ERDF) Malta Objective 1 Programme 2004-2006. Application Form.

receive 3.5 million Euros in European Regional Development Funds (ERDF) was confirmed by Cabinet in August 2004.

The proposal for the Hagar Qim and Mnajdra Temples Conservation and Interpretation Project is aimed at creating an infrastructure for the long-term management, conservation and presentation of the World Heritage resources of Hagar Qim and Mnajdra, within the landscape value and context and comprises the following:<sup>5</sup>

- a. Construction and furnishing of Visitors' Centre and Visitors' Orientation Point;
- b. Construction/installation of accessibility and interpretation measures consisting of routes, tracks and interpretation facilities;
- c. Security measures, including the installation of high-tech surveillance systems; and
- d. Design and construction of temporary protective shelters for the temple structures.

In addition to the actions that are receiving ERDF funding, indicated above, another action that is being undertaken is one year of continuous monitoring of environmental conditions in Hagar Qim and Mnajdra. This action is being completely funded from 200,000 Euros of Pre-Accession Funds that have been allocated for this purpose. The first one-year cycle of intensive monitoring will be completed before the installation of the protective shelters, in order to provide high-quality base-line data that will enable conservators to assess the performance of the shelters against pre-existing conditions.<sup>6</sup>

### 1.3 Scope of the Project Description Statement

The Malta Environment and Planning Authority has requested a Project Description Statement for the Hagar Qim and Mnajdra Temples Conservation and Interpretation Project in order to determine whether an Environmental Impact Assessment is required.<sup>7</sup> Attached to its request were guidelines for the preparation of such a document hereby reproduced as Appendix A2.<sup>8</sup> This Project Description Statement is being prepared in accordance with Regulation 5 of the *Environmental Impact Assessment Regulations, 2001*<sup>9</sup>, since the proposal may fall under Schedule 1 of the said Regulations.

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<sup>5</sup> Ibid.

<sup>6</sup> Ibid.

<sup>7</sup> Electronic mail from the Environment Protection Directorate of the Malta Environment and Planning Authority to Heritage Malta dated 25<sup>th</sup> May 2004.

<sup>8</sup> Letter by the Environment Protection Directorate of the Malta Environment and Planning Authority to the Director of Museums dated 14<sup>th</sup> May 2004.

<sup>9</sup> Legal Notice 204 of 2001.

## 1.4 Conceptual Perspectives: A Chronology

The concept of creating a heritage park at Hagar Qim and Mnajdra dates back to the late 1960s and since then a number of non-governmental organisations had put forward their recommendations for the area.<sup>10</sup> The idea of installing a protective shelter over the temple structures was already conceived in 1935 when a Carnegie Corporation grant was awarded for a shelter over Tarxien temples, which project never materialized due to the outbreak of the Second World War.<sup>11</sup>

### 1.4.1 *Tourism Development Plan, 1989*

The 1989 *Tourism Development Plan* of the then Department of Tourism devotes an entire section to the Hagar Qim and Mnajdra Park. It identifies three initial stages to the project, the first two of which were eventually implemented in collaboration with the then Museums Department:<sup>12</sup>

- a. a boundary wall to delineate the park area for management purposes and to minimise physical access to the area, which wall was constructed in 1991;
- b. parking facilities were constructed in 1993 to relocate the parked vehicles at least 70m away from Hagar Qim temple; and
- c. the construction of an underground visitor centre housing administrative and visitor facilities.

### 1.4.2 *Structure Plan for the Maltese Islands, 1992*

Following the establishment of the Planning Authority in 1992 through the *Development Planning Act* and the coming into force of the *Structure Plan for the Maltese Islands*,<sup>13</sup> a

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<sup>10</sup> Ellul, A., *Hagar Qim/Mnajdra Archaeological Park, Construction of a Visitor Centre, Environmental Planning Statement*, Product Development Section, Department of Tourism, August 1994, Section II. In the late 1960s, Din I-Art Helwa, the Malta Geographical Society and the Natural History Society of Malta had collectively put forward a proposal for the conservation of the entire Maghlaq area incorporating Hagar Qim, Mnajdra, Wied Babu, Wied iz-Zurriq and Wied Hoxt. In 1989, the Zghazagh għall-Ambjent had proposed for a Hagar Qim/Mnajdra Project Fund (Lanfranco, E., *Report on the Natural Communities of the Hagar Qim/Mnajdra Site proposed as a Heritage Park with Recommendations*, Malta University Services Ltd, April 1991, Section 1.3).

<sup>11</sup> Museums Department, *Draft Plan for the Material Conservation of the megalithic structures at Hagar Qim and Mnajdra*, 1<sup>st</sup> Draft, April 2002, p.20.

Museums Department, *Protective Shelter for the Hagar Qim Temples: Design Brief*, 3<sup>rd</sup> Draft, September 2001, Section 2.2. This Brief was integrated in the Museums Department, *Hagar Qim and Mnajdra Heritage Park: Briefs for Visitors' Centre and Protective Shelters for Hagar Qim and Mnajdra Temple Complexes*, October 2001, unpublished document.

Museums Department, *Protective Shelter for the Mnajdra Temple Complex: Design Brief*, 1<sup>st</sup> Draft, October 2001, Section 2.2. This Brief was integrated in the Museums Department, *Hagar Qim and Mnajdra Heritage Park: Briefs for Visitors' Centre and Protective Shelters for Hagar Qim and Mnajdra Temple Complexes*, October 2001, unpublished document.

<sup>12</sup> Ellul, A., *Hagar Qim/Mnajdra Archaeological Park, Construction of a Visitor Centre, Environmental Planning Statement*, Product Development Section, Department of Tourism, August 1994, Section II.

Malta Tourism Authority, Museums Department, S. Cefai, *Visitor's Centre for the Archaeological Park of Hagar Qim and Mnajdra Temples: Architectural Brief*, 1<sup>st</sup> Draft, September 2001, para. III.2.1. This Brief was integrated in the Museums Department, *Hagar Qim and Mnajdra Heritage Park: Briefs for Visitors' Centre and Protective Shelters for Hagar Qim and Mnajdra Temple Complexes*, October 2001, unpublished document.

<sup>13</sup> Ministry for Development of Infrastructure, *Structure Plan for the Maltese Islands*. Planning Services Division. December 1990.

number of policies addressing archaeology in general and Hagar Qim and Mnajdra in particular, were formulated. Policy ARC 4 designated Hagar Qim/Mnajdra area as an archaeological park:

As a matter of priority, the Planning Authority will designate Hagar Qim/Mnajdra and Ggantija as Areas of Archaeological Importance and will collaborate with other agencies to develop them as National Parks.

### 1.4.3 *Environmental Planning Statement, 1994*

A design brief and an environmental planning statement<sup>14</sup> had been prepared for a visitors' centre at Hagar Qim. The design of the centre consisted in an underground building south of Hagar Qim temple complex, within the boundaries of the designated archaeological park on the crest of the hill, in the area of the Hagar Qim Bar & Restaurant.<sup>15</sup> Full development planning consent PA 5390/94 was issued by the Planning Authority on 20<sup>th</sup> October 1995 to the Department of Tourism to construct an underground visitors' centre and ancillary infrastructural facilities (Appendix A4). The Museums Department did not favour the concept of an underground centre due to the irreversibility of the rock-cutting it required.<sup>16</sup>

In the *Environmental Planning Statement*, five main benefits were envisaged for the construction of a visitor facility:

- a. It would rehabilitate an area that was already disturbed by a development;
- b. An underground visitor centre would remove any negative visual impact since the temples would be the main structures above ground;
- c. The centre would manage visitor flow through it and onto the temple site, thus ameliorating the visitor experience. The centre would also serve as a control measure to limit the number of visitors at any one time;
- d. Since the centre would be the entry point into the park, visitors could be controlled and monitored; and
- e. Personnel would have the necessary facilities for a proper management of the Park.

A main disadvantage identified in the Statement was:

...the excavation works that are necessary. The site is very sensitive and any vibration to the temples will cause damage. This is why excavation works will be carried out using the diamond wire rock-cutting. This technique, which will involve a higher cost..., will eliminate any vibration which would cause harm to the temple.

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<sup>14</sup> Ellul, A., *Hagar Qim/Mnajdra Archaeological Park, Construction of a Visitor Centre*, Environmental Planning Statement, Product Development Section, Department of Tourism, August 1994.

<sup>15</sup> *Ibid.*, Section IV.

<sup>16</sup> Museums Department, *Hagar Qim and Mnajdra Heritage Park: Briefs for Visitors' Centre and Protective Shelters for Hagar Qim and Mnajdra Temple Complexes*, October 2001, unpublished document, Section IV.1.

The main premise for siting the visitors' centre underground was to minimise the negative visual impact. However, the design was never implemented because of reservations about the extent of irreversible rock-cutting it required.

#### 1.4.4 *Condition Assessment and Conservation Strategy, 1999*

In May 1999, the Ministry of Education convened an International Experts' Meeting specifically to discuss the conservation of Malta's megalithic temples and to identify suitable response strategies.<sup>17</sup> By December 1999, a condition assessment and a short-term conservation strategy of the megalithic sites was commissioned by the Museums Department and conducted by TBA Periti, a firm of architects and structural engineers.<sup>18</sup> The *Condition Assessment* concluded that:<sup>19</sup>

- a. The condition of Hagar Qim is one of greatest concern and some sections of the temple walls can be defined as precarious. It is liable to flooding with eventual material leaching underneath megaliths and damage due to salt action. There are a number of free-standing megaliths and others exhibit cracking from past restoration efforts; and
- b. The condition of Mnajdra is relatively stable, however, the south temple suffers from leaching of soil infill and from flooding; here, contact stresses are significant. The middle temple suffers from very serious deterioration in south facing walls, due to severe leaching of soil infill, particularly where surface runoff from upslope flows through the structure.

The conservation strategy recommended in the report by TBA Periti is threefold:<sup>20</sup>

- a. Interventions to retard the onset of instability due to leaching or further erosion;<sup>21</sup>

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<sup>17</sup> Participants included the technical advisers of the UNESCO World Heritage Bureau, the International Council on Monuments and Sites (ICOMOS) and the International Centre for the Preservation and Restoration of Cultural Property (ICCROM) (Cabinet Discussion Paper: 'The Conservation of Malta's Megalithic Temples', July 2000).

<sup>18</sup> Museums Department, *Draft Plan for the Material Conservation of the megalithic structures at Hagar Qim and Mnajdra*, 1<sup>st</sup> Draft, April 2002, Section 3.

<sup>19</sup> *Ibid.*, Section 4.  
Museums Department, *Hagar Qim & Mnajdra Heritage Park: Management Plan*, 2<sup>nd</sup> Draft, September 2002, Section 8.2.  
Cabinet Discussion Paper: 'The Conservation of Malta's Megalithic Temples', July 2000.

<sup>20</sup> Museums Department, *Draft Plan for the Material Conservation of the megalithic structures at Hagar Qim and Mnajdra*, 1<sup>st</sup> Draft, April 2002, p.15-18.  
Cabinet Discussion Paper: 'The Conservation of Malta's Megalithic Temples', July 2000.

<sup>21</sup> These are:

- a. Reinstatement of infill material that has been lost by erosion or scouring, by manual filling of voids with an appropriate filler, for example, clay or soil lined with geotextile;
- b. Reinstatement of infill material that has been lost by leaching. This is more difficult because:
  - (i) lining of voids is impossible;
  - (ii) manual infilling is highly difficult; and
  - (iii) although grouting is theoretically possible, defining the appropriate grouting materials and technologies to guarantee success is difficult.

Thus, at certain stages, the only possible intervention is dismantling and rebuilding portions of the walls.

- b. Interventions to enhance stability of free-standing megaliths;<sup>22</sup> and
- c. Interventions to retard weathering.<sup>23</sup>

In the report, it was explained that some of the proposed interventions raise concerns about their reversibility and authenticity, two main premises of modern restoration efforts. For example, reinstatement of soil infill is not reversible or authentic; nor is dismantling and rebuilding of walls. Surface consolidation is irreversible, while falsework propping is not strictly reversible.

#### 1.4.5 *Cabinet Discussion Paper: The Conservation of Malta's Megalithic Temples, July 2000*

In April 2000, the Minister of Education appointed a Scientific Committee on the Conservation of Megalithic Temples, hereafter referred to as the Scientific Committee, as part of a long term conservation strategy for Malta's megalithic temples. The Committee, with expertise in Maltese archaeology, heritage management, stone conservation and structural engineering, was entrusted to advise and make recommendations on a strategic conservation plan for the megalithic temples to the then Museums Department, namely through<sup>24</sup>

- a. research,
- b. the development of appropriate method statements,
- c. monitoring and evaluation, and
- d. long-term compilation of data.

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- c. Temporarily slowing down the leaching process by preventing the ingress of considerable volumes of water by shielding the walls with heavy duty plastic sheets and perforated pipes laid across to drain away water. This is a preventive action and was undertaken at Mnajdra during its reconstruction however, its performance success was not rated and probably it is more feasible to seal the top surfaces of the walls with a synthetic separating layer covered with clay.
  - d. Improve site drainage to minimise flooding.

<sup>22</sup> This involves extensive falsework with serious disadvantages, namely:

- a. aesthetic implications;
- b. its removal implies dismantling and rebuilding the wall it intended to support;
- c. the tendency to displace downwards where falsework is unable to act; and
- d. it does not address the cause of instability.

If falsework is imperative, it is recommended that spring-loaded contact props with displacement indicators are used in the scaffolding.

<sup>23</sup> These are

- a. Strengthen the resistance of the stone surfaces by chemical consolidation which is yet not feasible due to further studies required; or
- b. The use of shelters to protect from direct rainfall and insolation, which is the best reacting measure to the main cause of deterioration. The temporary nature of such a measure implies that concomitant consolidation of the stability of the temples and further studies should be carried out. There are two main impacts in using protective shelters:
  - (i) Visual impact which can be mitigated and
  - (ii) Thermo-hygral imbalance which however may not be the case since enclosure will not be complete.

<sup>24</sup> Scientific Committee on the Conservation of Megalithic Temples, Interim Report, June-November 2000.

Scientific Committee on the Conservation of Megalithic Temples, *Report on Proceedings*, May 2001, Section 1.0.

Museums Department, *Hagar Qim and Mnajdra Heritage Park: Briefs for Visitors' Centre and Protective Shelters for Hagar Qim and Mnajdra Temple Complexes*, October 2001, unpublished document, Part 3, Section 2.1, Part 4, Section 2.1.

Museums Department, *Draft Plan for the Material Conservation of the megalithic structures at Hagar Qim and Mnajdra*, 1<sup>st</sup> Draft, April 2002, Section 3.

The Committee was also asked to evaluate and act upon the recommendations of the *Condition Assessment*.<sup>25</sup>

In July 2000, the Scientific Committee examined and endorsed three method statements on the conservation of megalithic temples:<sup>26</sup>

- a. capping over walls;
- b. sandbagging underneath megaliths; and
- c. improving rainwater drainage from sites.

On 17<sup>th</sup> July 2000, following a recommendation by consultants to the Committee, the Committee brought to the attention of Cabinet the precarious state of Malta's megalithic temples and presented its decision to focus on the problems of the temples, namely that<sup>27</sup>

The immediate deceleration and arresting of deterioration processes on these sites has become an urgent priority of national and international concern. In the considered opinion of the Scientific Committee... the megalithic temple sites are now in such a fragile condition that the laborious task of consolidating and conserving individual megaliths and structures may take so long that serious damage will continue to occur while this work proceeds.

The Scientific committee members have evaluated a wide range of causes that are actively accelerating the rate of deterioration of the temples. The temples have now reached the stage of being structurally unstable as a result of an alarming process of disintegration.

The committee has therefore unanimously resolved to alert and responsabilize Government authorities on the conservation status of the temples, and to persuade the authorities to adopt a concrete strategy so that Government will fulfil its obligations as signatory of the UNESCO World Heritage Convention (1972) and be seen to be doing so.

As an immediate first step the Scientific Committee is recommending the installation of temporary, protective shelters in order to ward off the hostile elements until these sites have been stabilised.

Temporary protective shelters were proposed over four of the megalithic sites that have been prioritized for attention, that is Ggantija, Tarxien, Hagar Qim and Mnajdra, which proposal was approved by Cabinet. This intervention was proposed in conjunction with parallel conservation interventions, an ongoing research and documentation programme, consultation with the UNESCO World Heritage Committee, an environmental monitoring programme to assess the performance of the proposed shelters and a communication programme to inform the public on the conservation issues involved.

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<sup>25</sup> Scientific Committee on the Conservation of Megalithic Temples, *Report on Proceedings*, May 2001, Section 1.0. Museums Department, *Draft Plan for the Material Conservation of the megalithic structures at Hagar Qim and Mnajdra*, 1<sup>st</sup> Draft, April 2002, Section 3.

<sup>26</sup> Scientific Committee on the Conservation of Megalithic Temples, Interim Report, June-November 2000.

<sup>27</sup> Cabinet Discussion Paper: 'The Conservation of Malta's Megalithic Temples', July 2000.



During the Cabinet debate early in July 2000, it was agreed that funds should be voted for the subsequent financial year to design and construct the first of these shelters at Hagar Qim, as a pilot project. On 28<sup>th</sup> August 2000, the Minister for Education and Culture had announced his intention to build shelters over temples, with Cabinet's priority on Hagar Qim.<sup>28</sup> During the Cultural Heritage Interim Board meeting of 26<sup>th</sup> September 2001, it was decided to include a protective shelter at Mnajdra as part of the pilot project. These decisions have been confirmed in Cabinet by the new Legislature on 7<sup>th</sup> July 2003 and the philosophy has been endorsed by Heritage Malta and the Superintendence of Cultural Heritage.<sup>29</sup>

#### 1.4.6 Draft *Architectural Brief for Visitor's Centre*, 2001<sup>30</sup>

An *Architectural Brief* for the Visitors' Centre was drafted during 2001. The facility was recommended to be sited in the vicinity of the existing car park:<sup>31</sup>

This would allow the visitor a dramatic approach to the archaeological park as he will enter along one of the highest contours of the landscape within the archaeological park...the visitor's centre will not be visible from within the archaeological park, yet easily visible as one approaches the park from the street. The first cultural feature to be experienced would be that of Hagar Qim.

The aims and objectives of the Visitors' Centre were:<sup>32</sup>

- a. to help in the interpretation of an area of high cultural importance; thus it should provide an opportunity of a didactic and pleasant experience, even for persons with special needs; the centre should impart enough information in cases that visitor is unable to visit the actual temples;
- b. to house the structure that provides for the management of the archaeological park; and
- c. to provide for any further research and monitoring efforts required.

It was recommended that the Visitors' Centre be divided into three areas – main entrance, display area and administrative area (Table 1.1). The following architectural and technical considerations were recommended:<sup>33</sup>

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<sup>28</sup> Scientific Committee on the Conservation of Megalithic Temples, Interim Report, June-November 2000. Scientific Committee on the Conservation of Megalithic Temples, *Report on Proceedings*, May 2001, Sections 1.0 and 3.1. Museums Department, *Hagar Qim and Mnajdra Heritage Park: Briefs for Visitors' Centre and Protective Shelters for Hagar Qim and Mnajdra Temple Complexes*, October 2001, unpublished document, Part 3, Section 2.2 and Part 4, Section 2.2. Museums Department, *Draft Plan for the Material Conservation of the megalithic structures at Hagar Qim and Mnajdra*, 1<sup>st</sup> Draft, April 2002, p.20.

<sup>29</sup> Ministry of Youth and the Arts, International Union of Architects, *Hagar Qim & Mnajdra Heritage Park: International Design Competition*, p.45.

<sup>30</sup> Museums Department, *Hagar Qim and Mnajdra Heritage Park: Briefs for Visitors' Centre and Protective Shelters for Hagar Qim and Mnajdra Temple Complexes*, October 2001, unpublished document.

<sup>31</sup> *Ibid.*, Part 2, Section 4.3.

<sup>32</sup> *Ibid.*, Part 2, para. 4.2.1.

<sup>33</sup> *Ibid.*, Part 2, Section 4.7.

- a. The Visitors' Centre must be accessible for all;
- b. The main entrance must be spacious enough to accommodate at least the average number of daily visitors and unencumbered so that visitor feels welcome and comfortable;
- c. The exhibition area can be bypassed;
- d. The internal layout must be clear in the direction the visitor must follow for information and guidance and the circulation of the building must be designed such to allow the visitor to choose his/her personal itinerary;
- e. Narrow corridors must be avoided to prevent bottlenecks and sensations of discomfort;
- f. For security reasons, the temporary exhibition hall must be designed such that it could be used independently from the main building;
- g. The design of the building must cater for future flexibility of use and possible need for expansion; and
- h. Design should conform to all norms of safety and security in public places.

The following design guidelines of the building of the Visitors' Centre were formulated:<sup>34</sup>

- a. the building is to be designed as a low lying building so that the skyline is not too obtrusive;
- b. the design is to create the least possible impact on the environment, both physically and visually; and
- c. in order to minimise the visual impact on the landscape, the roof terrace is to be landscaped and included as part of the exhibition space for displaying endemic plants.

#### 1.4.7 Draft *Design Briefs for the Protective Shelters at Hagar Qim and Mnajdra*, 2001

Eight key objectives on the design of the protective shelters were identified in the draft design briefs for both sites:<sup>35</sup>

- a. Effective protection from key external agents of deterioration.  
The span of the shelter should be designed to eliminate damage from direct and wind-driven rain regardless of weather conditions; thus eliminating secondary effects such as ponding. Surface runoff can be eliminated by a thorough water drainage design of the protective shelters and around the site, taking into account runoff patterns and watersheds. The design of the protective shelter must also be designed to provide effective and complete shading for the archaeological structures of Hagar Qim and Mnajdra.

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<sup>34</sup> Ibid., Part 2, Sections 4.4 and 4.6.

<sup>35</sup> Ibid., Part 3, Sections 4 and 5, Part 4, Sections 4 and 5.

Moreover it should reduce on site daily and seasonal thermal fluctuations; avoid trapping heat within it; buffer wetting and drying cycles by warding off rainwater and dew, reduce ponding and condensation, and by providing shade from solar radiation and reducing wind drying effects. Also, they must minimise wind tunnelling effects, thus minimising secondary effects such as salt action and abrasion;

- b. **Approaching Total Reversibility:** After the dismantling of the protective shelters, minimal traces of interference on the landscape should be left. This may be achieved through the use of fully reversible superficial counterweights, complemented by the establishment of anchoring points embedded in the rock. Maximum use of modern rock-cut features to minimise further disturbance, such as the former ticketing office site and an empty circular pit along the southern boundary of Hagar Qim, should be made. There should be no mooring points or other supporting elements within 10m of the temple complex. Moreover, more specifically to the Mnajdra temple complex, no supporting element must interfere with the phenomenon of sunrise alignments and the solstices.
- c. Avoid microclimate changes or other side-effects that may be harmful to the preservation of the site by designing the shelter as an open structure with adequate ventilation, without creating pockets of adverse conditions. The profile of the shelter and the materials to be used must be stated.<sup>36</sup> Another side-effect contemplated is bird nesting which must be discouraged in order to avoid the risk of acidic bird droppings.
- d. Minimise the visual intrusion that may be caused by the shelter on the site itself and in the surrounding landscape: Although the shelters are temporary, the visual impact on the landscape and the site itself could still be of a significant scale. Thus:
  - (i) the design should be such that they are easily seen as alien to the actual archaeological structures;
  - (ii) the shelters must not obstruct key viewpoints and axes of visibility must be respected. Moreover, the general visual impact of the shelter from within the site must also be respected; and
  - (iii) the visual impact of the massing and volume of the structure of the protective shelter on the landscape must be kept to a minimum. Wherever possible, the structure must merge with the apparent horizons from different approaches. The slope of the landscape should

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<sup>36</sup> The brief identifies the following parameters as mandatory statements prior the establishment of protective shelters:

- a. maximum air temperature and stone surface temperature in summer;
- b. minimum air temperature in winter;
- c. maximum light levels; and
- d. maximum and minimum relative humidity levels.

also be exploited creatively to minimise the arc of view taken up by the structure when approached from the outside.

- e. Avoid obstructing access for visitors or further works: The protective shelter must be designed that it does not physically obstruct visitor access and/or access for potential use of heavy machinery for future on site interventions. While the properties of the protective shelters must be determined by the conservation needs of the site, a significant side-effect is the creation of a more comfortable environment for visitors.
- f. Use materials and components that may be maintained and replaced rapidly and cost-effectively: Inert materials must be used so that they are relatively maintenance free, resistant to corrosion and weathering and do not leach chemicals to the environment. Moreover, the design should be as modular as possible to facilitate local repair or replacement of parts of the structure. The design should also be vandal resistant.
- g. Flexibility and monitoring: The design must be flexible due to the uneven terrain of the site. Moreover, this flexibility should be extended in response to results of ongoing monitoring of the site and of the effects of the shelter so that the shelter may be modified or extended. The design must allow for the installation of weather probes for monitoring purposes; and
- h. Safety: the shelter must pose no risk for the site or for the visitor during all phases of its lifetime, that is, during installation, maintenance and during dismantling.

#### 1.4.8 Draft *Hagar Qim & Mnajdra Management Plan, 2002*

A first draft of a management plan for Hagar Qim and Mnajdra, was prepared by the former Museums Department in 2002. The aim of the management plan is to outline the quality, significance, condition, and potential of the various elements within the Park, in order that they will be understood, preserved, and treasured by present and future generations. It aims at providing a clear strategy for managing the site, by which this vision will be advocated and brought to realisation. The Management Plan highlighted a number of key issues and associated actions required for the Heritage Park (Table 1.2).

#### 1.4.9 International Design Competition, 2003

Following the setting up of design specifications for Hagar Qim and Mnajdra Heritage Park and in line with UNESCO and UIA guidelines<sup>37</sup>, an open International Design Competition was launched by the Ministry of Youth and the Arts in November 2003 and was judged in

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<sup>37</sup> European Regional Development Fund (ERDF) Malta Objective 1 Programme 2004-2006. Application Form.

April 2004.<sup>38</sup> The aim of the International Competition was to attract the best expertise available worldwide in the field and to raise the international profile of the site.<sup>39</sup>

The following design philosophy was formulated in the Competition Brief:<sup>40</sup>

- a. Improve accessibility and interpretation;
- b. Design should refer to context and landscape, applying eco-systems thinking throughout;
- c. Sustainable conservation should be addressed;
- d. Interventions should be low impact and reversible. The design should, as far as possible, merge into the landscape without competing with natural features, topography or the monuments; and
- e. Flexible use of contemporary materials is encouraged and the development of sustainable, low-maintenance, modular structures should be a cardinal element.

A number of design principles were presented based on aesthetic qualities, health, safety and security, accessibility, effective use of resources and finally, adaptability and extendibility. As regards the protective shelters, the eight objectives underscored in the respective design brief were again presented in the Competition Brief.<sup>41</sup> The following space requirements for the Visitors' Centre were listed.<sup>42</sup>

- a. Car Park
- b. Reception
- c. First Aid Area
- d. Service Offices for storage space, kitchenette, toilets and bathrooms for staff, and office for service staff
- e. Security and Other Services which include a generator and electrical systems unit, air treatment, toilet facilities, waste separation area, general storage space, archaeological storage, control room, lifts and water reservoir
- f. Commercial Facilities which include ticketing booths, cafeteria and restaurant with a fully equipped kitchen and dining room facilities, and shop
- g. Administration Areas to include management offices, operational offices and security quarters

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<sup>38</sup> Hagar Qim & Mnajdra Heritage Park, International Design Competition, Minutes of the Jury Proceedings, 26<sup>th</sup> – 29<sup>th</sup> April 2004, Valletta.

<sup>39</sup> Ministry of Youth and the Arts, International Union of Architects, *Hagar Qim & Mnajdra Heritage Park: International Design Competition*, p.24.

<sup>40</sup> *Ibid.*, Section 4.

<sup>41</sup> *Ibid.*, p.46-49.

<sup>42</sup> *Ibid.*, p.55-62.

- h. Exhibition and Educational Areas to comprise an exhibition hall, theatre, conference and meeting hall and site interpretation area and observatory

The Visitors' Orientation Point is to contain a reception area, a site interpretation section, a ticketing booth and a security station.<sup>43</sup>

The following assessment guidelines were followed during the adjudicating process:<sup>44</sup>

- a. design principles such as avoiding statements, integration in the landscape and cost effectiveness;
- b. shelter qualities such as weather resistance, minimal visual impact, reversibility and low impact;
- c. effective accessibility like user-friendliness, visitor management and corporate image; and
- d. resources such as material circles, low energy costs, durability and maintenance.

During the Jury Proceedings of the International Competition, the following general recommendations were formulated:<sup>45</sup>

- A marketing investigation is recommended for the future tourist development of the Heritage Park ... in order to avoid unnecessary investment and future costs of maintenance. Agreeable dimensions of all facilities must be determined on such a base to avoid a wrong scale of extensions;
- Considering the protection of landscape and environment at the site the concentration of the service buildings ... at one place seems to be useful and economical...;
- Regarding the unique atmosphere of the "magic" temples and the surrounding landscape facing the sea and the Filfla island, on the rough cliffs with the scanty Mediterranean Flora any presence of "secular" service buildings on the seaside will necessarily destroy the attractive coherence of untouched nature and historic monuments exposed to the western winds;
- All service building, reduced to their necessary minimum, may optimally be situated at the inland-side, not visible from the seaside. The ideal place for all these premises seems to be the existing parking area below the restaurant which also may be transferred in a new building under the top of the hill – not anymore visible from the "sacred grove" at the seaside slope; and
- The Jury recommends for the further planning process a two stages development. The first stage at the present access, a second stage – if necessary according an increasing tourism at this place – integrated sensitively in the quarry (Site A). The Jury is convinced that an access to the temple-side from the quarry is less attractive and also connected with long distances for pedestrians who do arrive at the temples from the rear side missing the breathtaking surprise of the sudden overall view offered by the existing access.

In their concluding remarks, the Jury formulated the following recommendations:<sup>46</sup>

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<sup>43</sup> Ibid., p.63.

<sup>44</sup> Hagar Qim & Mnajdra Heritage Park, International Design Competition, Minutes of the Jury Proceedings, 26<sup>th</sup> – 29<sup>th</sup> April 2004, Valletta, Proceedings, 27<sup>th</sup> April 2004.

<sup>45</sup> Hagar Qim & Mnajdra Heritage Park, International Design Competition, Minutes of the Jury Proceedings, 26<sup>th</sup> – 29<sup>th</sup> April 2004, Valletta, Proceedings, 28<sup>th</sup> April 2004.

- It is suggested that a proper and detailed assessment is carried out of the winning entry to determine the performance of the shelter in relation to structural stability and the degree of protection of the shelter on the temples within. Impact of wind, solar heat gain and possible increase of humidity, as well as other possible factors of deterioration related to the structure, are to be considered;
- A detailed analysis of the climatic conditions of the site over time is required for such an assessment to be complete;
- Site management needs careful consideration prior to any construction on the site. In the first instance, a proper analysis of the visitor numbers is needed, as well as an estimate of the likely numbers of visitors in the foreseeable future, segmented by overseas visitors and Maltese. For conservation purposes, additional studies should be carried out to examine the optimum carrying capacity of the site. The size of the visitor facilities should be based on these estimates. Similarly, the visitor circulation throughout the park and within the monuments, should also be carefully considered;
- To address these various issues, the client will require an inter-disciplinary team of specialists in conservation, structures, heritage management and visitor management. The terms of reference of this team should be in close harmony with the requirements and values of the UNESCO World Heritage Sites of Hagar Qim and Mnajdra; and
- Many of the submissions provided useful insights into the various conservation and management issues which are inherent in the proposed development of the heritage park at such a delicate site. Such insights should be evaluated and seriously considered prior and during the development stages.

These Jury recommendations have been taken into full consideration in the subsequent development of the project design, which has been downscaled and modified accordingly.

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<sup>46</sup> Hagar Qim & Mnajdra Heritage Park, International Design Competition, Minutes of the Jury Proceedings, 26<sup>th</sup> – 29<sup>th</sup> April 2004, Valletta, Proceedings, 29<sup>th</sup> April 2004.

Table 1.1: Main divisions in the Visitors' Centre as recommended in the draft design brief, 2001.

<i>Main Areas</i>	<i>Divisions</i>	<i>Floor Area (m<sup>2</sup>)</i>
Main Entrance	Reception and Information area	100
	Ticket booth	5
	Cloakroom	10
	Sanitary facilities	30
	Shop to sell cultural material, souvenirs and interpretation material	30
	Cafeteria which sells snacks and packed lunches	100
	Cloakroom	10
Exhibition Area	Orientation area with audiovisual facilities	40
	Audiovisual room	80
	Three main exhibition halls for	
	archaeology	100
	architecture	30
	ecology/geology	30
	Interactive area for schoolchildren	40
	Temporary exhibition/conference hall with workshop/store facilities for displaying recent excavation works or on architecture and for conducting seminars/conferences.	70
	Lecture room for public lectures and school visits	40
	Roof of building to be used as an exhibition of endemic plants found in the area	
Administration Area	Curator's office and Assistant Curator's office	30
	Administrative Officer and Secretary	20
	Research Areas, namely laboratory, room to study and record the condition of any new exhibit and room to catalogue any new exhibits that enter the archaeological park	60
	Store for reserve collection	20
	Rest room	15
	Tool room	10
	Security services	10
	Sanitary facilities	10
	Mains room	10

Source: Museums Department, *Hagar Qim and Mnajdra Heritage Park: Briefs for Visitors' Centre and Protective Shelters for Hagar Qim and Mnajdra Temple Complexes*, October 2001, unpublished document, Part 2, Sections 4.6 and 4.8.



Table 1.2: Key issues and associated actions required for the Heritage Park

<i>Issue</i>	<i>Action Required</i>
Legal Protection	Settle all outstanding payments for expropriated land
Conservation	Document cultural resources
	Retard further erosion and leaching
	Improve stability of free-standing, or critical megaliths
	Retard weathering
	Documentation
	Monitoring
	Shelter Hagar Qim and Mnajdra Temples
	Research
Presentation	Risk Management
	Develop visitor-friendly security measures
	Define a time-table for the dismantling of illegal structures
	Create a new visitor centre
	Develop a network of walking routes
	Improve approach roads and signage
	Manage traffic within the park

Source: Museums Department, *Hagar Qim & Mnajdra Heritage Park: Management Plan*, 2<sup>nd</sup> Draft, September 2002, Section 9.

## The Proposed Development: Considerations

- 2.1 Major Causes of Deterioration of Temple Structures
  - 2.2 Protection Strategies: A History
  - 2.3 Current State of Prehistoric Features
  - 2.4 Justification of the Proposal
  - 2.5 Alternative Methods of Protection
  - 2.6 Technical Description of Proposal
  - 2.7 Raw Materials and Wastes Management Plan
  - 2.8 Socio-economic Objectives
  - 2.9 Economic Considerations
-

## 2.1 Major Causes of Deterioration of Temple Structures

The Scientific Committee on the Conservation of Megalithic Temples, in close collaboration with the then Museums Department and other experts, has established that the major internal and external causes of deterioration of temple structures are:<sup>47</sup>

- a. incomplete structures made of vulnerable materials;
- b. direct rainfall and
- c. solar radiation.

Other deteriorating factors include the presence of significant quantities of soluble salts in the stone and in the surrounding air, as well as ground humidity rising into the limestone megaliths by capillary action. Other, less critical sources of decay include wind action and the associated drying effects and the growth of vegetation. In some cases, past restoration interventions, which used iron and cement to repair cracked megaliths, and visitor impact, are particularly significant factors of deterioration. A resume is given in Table 2.1

## 2.2 Protection Strategies: A History

### 2.2.1 Overview

Since their discovery in the early nineteenth century, a number of interventions have been carried out on Hagar Qim and Mnajdra to curb their deterioration. Throughout the nineteenth and early twentieth centuries, the temple complexes were systematically cleared of debris resulting in the renewed exposure of these buildings to the elements. From the late nineteenth century onwards, there was a growing concern with the rapid deterioration of these buildings. During the past century, a number of reconstruction and consolidation interventions have taken place on all the major temple sites.<sup>48</sup> Most of these attempts, however, were sporadic and focused on specific problems, without attempting to deal with the long-term preservation of these sites in a comprehensive manner. Such interventions were highly in line with prevalent restoration philosophies while issues of stone material deterioration and structural failure were never accorded high priority.<sup>49</sup>

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<sup>47</sup> Scientific Committee on the Conservation of Megalithic Temples, Interim Report, June-November 2000. Museums Department, *Hagar Qim and Mnajdra Heritage Park: Briefs for Visitors' Centre and Protective Shelters for Hagar Qim and Mnajdra Temple Complexes*, October 2001, unpublished document, Part 3, Section 2.1, Part 4, Section 2.1. Museums Department, *Draft Plan for the Material Conservation of the megalithic structures at Hagar Qim and Mnajdra*, 1<sup>st</sup> Draft, April 2002, Section 5.

<sup>48</sup> Museums Department, *Hagar Qim and Mnajdra Heritage Park: Briefs for Visitors' Centre and Protective Shelters for Hagar Qim and Mnajdra Temple Complexes*, October 2001, unpublished document, Part 3, Section 2.1, Part 4, Section 2.1. Museums Department, *Draft Plan for the Material Conservation of the megalithic structures at Hagar Qim and Mnajdra*, 1<sup>st</sup> Draft, April 2002, Section 2.

<sup>49</sup> European Regional Development Fund (ERDF) Malta Objective 1 Programme 2004-2006. Application Form.

The Maltese temple complexes are widely recognised as archaeological monuments of outstanding importance. The emergence of these sophisticated buildings during the fourth millennium BC represents an important chapter in the history of architectural development. The temples at Hagar Qim and Mnajdra are amongst a series of megalithic sites which were included in the UNESCO World Heritage List in 1992, giving them an international recognition on their significance. For a site to be included in the World Heritage List, it must fulfil at least one of six criteria defined in the Convention. The inscription of the Maltese megalithic monuments recognizes that they fulfil Criterion Four of the Convention, which requires that a site:

be an outstanding example of a type of building or architectural or technological ensemble or landscape which illustrates (a) significant stage(s) in human history

In nominating these monuments for inclusion in the World Heritage List, the Government of Malta has committed itself to safeguard these sites for the enjoyment of present and future generations on behalf of the international community. World Heritage Sites must have adequate protection and management mechanisms to ensure their conservation. It is the intention of Heritage Malta that the Hagar Qim and Mnajdra Temples Conservation and Interpretation Project moves in line with UNESCO parameters concerning interventions at World Heritage sites.<sup>50</sup>

## 2.2.2 Interventions

### 2.2.2.1 Hagar Qim<sup>51</sup>

Early interventions on Hagar Qim are recorded in the Vance report, issued in 1842. The report notes that a number of modern stone pillars, still present, were used as supports for the flat table structures. During the late nineteenth century, extensive reconstruction work was conducted, particularly along the façade to give it a 'tidy' composition whilst in the early twentieth century, individual blocks were considerably reconstituted with the use of cement mortars. In the 1960s, a protective boundary wall erected in masonry and iron railings was built in close proximity to the temple, significantly divorcing the site from its setting and vehicles could park very close to this wall, thereby increasing pollution damages. In 1998, a new fence, twice as far from the temple complex and visually less intrusive, was installed and the old wall destroyed and a year later, a timber walkway was installed within the

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<sup>50</sup> Ibid.

<sup>51</sup> Museums Department, *Draft Plan for the Material Conservation of the megalithic structures at Hagar Qim and Mnajdra*, 1<sup>st</sup> Draft, April 2002, Section 2.  
Museums Department, *Hagar Qim and Mnajdra Heritage Park: Briefs for Visitors' Centre and Protective Shelters for Hagar Qim and Mnajdra Temple Complexes*, October 2001, unpublished document, Part 2, para. 3.2.2, Part 3, Section 2.1, Part 4, Section 2.1.  
Scientific Committee on the Conservation of Megalithic Temples, *Interim Report*, June-November 2000.  
Scientific Committee on the Conservation of Megalithic Temples, *Report on Proceedings*, May 2001, Section 3.6.  
Museums Department, *Hagar Qim & Mnajdra Heritage Park: Management Plan*, 2<sup>nd</sup> Draft, September 2002, Sections 6 and 7.

temple remains and token barriers established as control measures for visitor flow. In November 1998, a stretch of megalithic masonry collapsed at Hagar Qim. A grant of US\$72,448 was immediately approved by the World Heritage Committee, which consisted of endoscopic equipment for surveying the damage incurred, and a weather station for monitoring purposes. In October 2000, a 3-D survey of Hagar Qim was undertaken in order to assess the damage and TBA Periti were asked to submit a method statement for the reconstruction of the collapse, which reconstruction was effected in July 2001.<sup>52</sup>

In view of the urgency of conservation measures in parts of Hagar Qim, TBA Periti submitted method statements for urgent interventions. The most immediate intervention was the propping up of megaliths where it was considered most critical using steelwork scaffolding structures. Sandbagging was also to be undertaken and a pilot project for water drainage was carried out Tarxien temples, again with the aid of TBA Periti who presented a method statement.<sup>53</sup>

Any other conservation interventions contemplated was engineering and irreversible in nature and included in-filling to recover lost contact between megaliths, replacement of lost material, propping to prevent rotation of megaliths and drainage of flooding. To this effect, three method statements were prepared by TBA Periti which were capping over walls between temple apses, sandbagging underneath megaliths and improving rainwater drainage from site. Consensus was reached in the Scientific Committee that different solutions would have to be applied to each site.<sup>54</sup>

#### 2.2.2.2 Mnajdra<sup>55</sup>

Reconstruction interventions at Mnajdra are believed to have occurred since its discovery in the early nineteenth century well into the twentieth century, but interventions are poorly recorded. From 1948 to 1954, restoration works were carried out, including the reconstitution of some missing parts of the structure using drystone walling. In the 1960s, a boundary wall similar to that built at Hagar Qim was installed. In April 1994, following an intense rainstorm, part of the wall separating the middle temple of Mnajdra from the lower

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<sup>52</sup> It was agreed that reconstruction should include:

- a. lifting and removal of collapsed megaliths;
- b. construction of an easily demountable shelter over the collapsed area; and
- c. temporary propping using steelwork scaffolding structures.

<sup>53</sup> Scientific Committee on the Conservation of Megalithic Temples, *Report on Proceedings*, May 2001, Section 3.2.

<sup>54</sup> *Ibid.*, Section 2.2.

<sup>55</sup> Museums Department, *Draft Plan for the Material Conservation of the megalithic structures at Hagar Qim and Mnajdra*, 1<sup>st</sup> Draft, April 2002, Section 2.

Museums Department, *Hagar Qim and Mnajdra Heritage Park: Briefs for Visitors' Centre and Protective Shelters for Hagar Qim and Mnajdra Temple Complexes*, October 2001, unpublished document, Part 3, Section 2.1, Part 4, Section 2.1.

Museums Department, *Hagar Qim & Mnajdra Heritage Park: Management Plan*, 2<sup>nd</sup> Draft, September 2002, Sections 6 and 7.

temple collapsed, which failure was attributed to the fact that rubble fill forming the floor of the middle temple did not drain rapidly enough resulting in a build-up of pressure which burst the wall. Precautionary measures were installed, mainly rainwater divergence and facilitated drainage, and the collapsed area was restored in 1996. Following the October 1996 vandal attack where graffiti were sprayed on a number of megaliths, a chain-link was installed. In April 2001, another vandal attack at the middle temple resulted in toppling over of the upper tiers of megaliths; some were broken while others were superficially chipped or flakes detached. Restoration and structural works were undertaken as part of the Mnajdra Restoration Project 2001 funded by a grant of US\$50,000 from the World Monuments Fund. In 2002, timber walkways were installed to control visitor impact whilst the chain-link was replaced by a low-visibility security fence, placed twice the distance away from the megalithic structures.

#### 2.2.2.3 Hamrija Watchtower

Extensive restoration works under the supervision of the Restoration Unit of the Works Division have restored and stabilized the structure of the Hamrija Tower, especially the seaward façade which was in a precarious state.<sup>56</sup>

### 2.3 Current State of Prehistoric Features

The *Draft Plan for the Material Conservation of the megalithic structures at Hagar Qim and Mnajdra*<sup>57</sup> states the following general considerations with respect to the present status of prehistoric megalithic architectural structures:

- a. Except for Ggantija, temple sites have been exposed again to the elements since the turn of the twentieth century or even later. Weathering degradation has been observed within twenty to thirty years and significant surface losses have occurred in the last fifty years. In the cases where original megaliths were replaced with replicas in the 1950s, dramatic deterioration could be noticed on the latter compared to prehistoric ones. Although not as dramatic as collapse of a megalith, erosion is a long-term threat to megalith stability and is probably more damaging than a collapse since it is irreversible;
- b. Surface erosion and leaching of bedding material between megaliths are two main contributing factors that degrade the joint contact interface between adjacent megaliths, thereby increasing contact stresses at such interfaces, which in turn weaken the structural stability of the masonry structure. There

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<sup>56</sup> Museums Department, *Hagar Qim & Mnajdra Heritage Park: Management Plan*, 2<sup>nd</sup> Draft, September 2002, Section 6.3.

<sup>57</sup> Museums Department, *Draft Plan for the Material Conservation of the megalithic structures at Hagar Qim and Mnajdra*, 1<sup>st</sup> Draft, April 2002, Section 4.  
Museums Department, *Hagar Qim & Mnajdra Heritage Park: Management Plan*, 2<sup>nd</sup> Draft, September 2002, Section 8.2.  
Cabinet Discussion Paper: 'The Conservation of Malta's Megalithic Temples', July 2000.

are a number of instances where stone spacers or wedgers between megaliths have crushed and megaliths split as a result of undue contact stresses;

- c. There are many instances at the temples that megaliths are precariously balanced on small, cracked stones or that megaliths are held in place at single or double points. Once the inevitable, eventual loss of contact points takes place, loss of equilibrium ensues, often triggering multiple collapses.
- d. The identification of collapse-prone areas is difficult since the temple masonry structure is intrinsically statically redundant, with the possibility of multiple paths of transmission of loads to the ground. The degree of redundancy decreases as the number of contact points between megaliths degrades. Thereafter, the stability of the megalith depends on the ratio between its weight and any incidental horizontal load, such as wind, human pressure and seismic disturbance, and width of its base; in some instances, gradual megalith rotation has thus been observed;
- e. The presence of soil as an infill material between megaliths acts to enhance redundancy and to bind the megaliths. Soil leaching
  - (i) reduces bonding action,
  - (ii) reduces contact area and thus reduces the number of alternative load paths and increases stresses, and
  - (iii) increases abrasion through vertical joints with concomitant reduction in megalith stability.
- f. Since megaliths are subject to degradation processes, the integrity of most of the megaliths is already compromised, with eventual collapse or damage imminent. Exposure to elements, particularly to rain and solar radiation, is a contributing factor to all mechanisms leading to damage or collapse.
- g. The temple ruins cannot be considered as structures anymore since there is minimal structural continuity, “certainly not enough to allow the assessment of global stability using traditional structural analytic tools.” Therefore, most parts of the temple structures could be considered as unstable.

## 2.4 Justification of the Proposal

The philosophy behind the installation of protective shelters at Hagar Qim and Mnajdra is to immediately and significantly retard the main external causes of deterioration, while researching further to consolidate the temple structures and to restore some of their resilience to the elements.<sup>58</sup> There is a general consensus within the Scientific Committee

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<sup>58</sup> Museums Department, *Draft Plan for the Material Conservation of the megalithic structures at Hagar Qim and Mnajdra*, 1<sup>st</sup> Draft, April 2002, p.20.  
Museums Department, *Hagar Qim and Mnajdra Heritage Park: Briefs for Visitors' Centre and Protective Shelters for Hagar Qim and Mnajdra Temple Complexes*, October 2001, unpublished document, Part 3, Section 2.2, Part 4, Section 2.2.

on the Conservation of Megalithic Temples to this effect<sup>59</sup> and Cabinet's decision to install protective shelters at Hagar Qim and Mnajdra was taken for the following three principal reasons:

- a. This is a low-risk intervention. Unlike direct interventions on the prehistoric remains themselves, the installation of protective shelters poses a much reduced risk of causing any irreversible disturbance to the temples.
- b. Speed. This intervention can be implemented much more rapidly than the consolidation of these structures stone by stone, which could take decades to complete, during which time further serious damage will be inevitable
- c. Reversibility. This intervention may easily be removed whenever necessary, if it is considered to be no longer required, or if it emerges that it may be having some harmful side-effects.

The principal disadvantage of a protective shelter is its visual impact. This temporary visual impact in the medium term (25 to 30 years) is considered justified because it will help ensure the long-term preservation of these outstanding archaeological monuments for the enjoyment of present and future generations.

The justification of the expense of the protective shelters has been closely examined in the *Economic and Financial Feasibility Study*<sup>60</sup> (Section 2.9.2). The conclusion of that study is that the expense is justified by the intangible cultural benefits, the positive multiplier effects for the national economy, as well as the savings on costly conservation interventions, particularly where damage caused by collapses has to be reversed, as has been the case on several occasions at Hagar Qim and Mnajdra.

The experience of other protective shelters worldwide has made it clear that the installation of protective shelters alone does not represent an adequate solution. The Scientific Committee has emphasised that this is also the case in Malta. In order to develop a comprehensive strategy for the conservation of the megalithic temples, a number of other actions must be undertaken in parallel with the installation of the shelters, including:

- a. Research and development of suitable and acceptable interventions on the fabric itself
- b. documentation of the megaliths,
- c. databasing of roofed surfaces,
- d. dynamic characterisation of other conservation interventions such as scaffolding, capping and sandbagging,

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<sup>59</sup> Scientific Committee on the Conservation of Megalithic Temples, Interim Report, June-November 2000.  
Scientific Committee on the Conservation of Megalithic Temples, *Report on Proceedings*, May 2001, Section 2.1.

<sup>60</sup> PricewaterhouseCoopers, Economic & financial feasibility review for Hagar Qim & Mnajdra Temples, 30<sup>th</sup> June 2004.



- e. water management and
- f. environmental monitoring.

## 2.5 Alternative Methods of Protection

As outlined in Section 1.4.4 on the *Condition Assessment and Conservation Strategy* report above, there are three types of recommended interventions:

- a. interventions to retard the onset of instability due to leaching or further erosion by the reinstatement of infill material or by preventing the ingress of water;
- b. interventions to enhance stability of free-standing megaliths through falsework; and
- c. interventions to retard weathering either by chemical stone consolidation or through the setting up of protective shelters.

As already outlined in the same section, the reinstatement of infill material and falsework propping are difficult and irreversible processes. The process of chemical consolidation needs further research, which leaves the setting up of protective shelters as a temporary measure against further degradation. The option of stabilizing the megalithic temples by reburying them in inert materials has not been fully explored, because of

- a. the technical complexity and associated risks and
- b. Malta's commitment to make the temples accessible.

## 2.6 Technical Description of Proposal

### 2.6.1 Design Philosophy<sup>61</sup>

The design philosophy of the winning entry of the international design competition for Hagar Qim and Mnajdra led by Architect Walter Hunziker states that

In view of an archaeological site not yet fully discovered, in view of the unique landscape, in view of the secret and magic spirit of the place, we propose a structure of protection and guidance, which remains highly provisional, with minimal impact on environment and antique remains. Our project is adaptable to the demands of future research and, most importantly, develops a clear aesthetic of the transitory in front of a megalithic culture.

The proposed project minimises the use of building materials such as stone and concrete in the structural framework not to compete with the mineral quality of the megalithic ruins and the surrounding landscape. Instead tissues, cables, wood and steel will be used and the foundations will be made of micro piles in steel, materials which were yet unknown to the temple builders.

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<sup>61</sup> Hagar Qim & Mnajdra Heritage Park International Design Competition: Competition submission by Architect Walter Hunziker

Furthermore, the new structures will purposely avoid the use of archaic post-lintel structures. Rather, modular frame units will be used, a system yet unknown to the temple builders. For the protective shelters, tension tents will be used. Both systems are well known for their lightness, adaptability, extendibility and reversibility.

The visitor centre shall be designed to have a working life of at least 150 years. The protective shelters are expected to have a working life of at least 25 years.<sup>62</sup>

## 2.6.2 The Project

The project consists of the following four proposals:<sup>63</sup>

- a. Construction and furnishing of Visitors' Centre
  - (i) a general service area (reception, first aid, service offices);
  - (ii) security and other services such as generator and electrical systems unit, air treatment facilities, toilet facilities, waste separation area, general storage space, archaeological storage, control room, lift;
  - (iii) commercial facilities, namely ticketing desk, cafeteria and shop;
  - (iv) administrative areas, that is management and operational offices and security quarters; and
  - (v) exhibition and educational areas, that is exhibition hall and theatre.
- b. Construction/installation of accessibility and interpretation measures  
Routes, tracks and interpretation facilities. Paths will be:
  - (i) adapted for different levels of accessibility,
  - (ii) make use of existing pathways, and
  - (iii) composed of reversible materials, composed of eco-friendly materials.
- c. Security measures  
The installation of high-tech surveillance systems.
- d. Construction of Temple Shelters  
The eight key objectives identified in the respective design brief (Section 1.4.7) will be adhered to.

Reference is made to the architectural drawings by partnership led by Architect Walter Hunziker, included in this report as Appendix A3. The project that was deemed the winner of the international design competition was developed, in response to the budgetary requirements of the client, into a first preliminary project, and, subsequently, into the definitive project that is being submitted for approval. Both developments of the project remain based on the programme of the competition brief. During the phase of the

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<sup>62</sup> European Regional Development Fund (ERDF) Malta Objective 1 Programme 2004-2006. Application Form, Annex I, Standard Project Document.

<sup>63</sup> *Ibid.*, para 3.4.

preliminary project, the scale of the interventions on the sensitive site was severely reduced, in line with the recommendations of the Jury (Section 1.4.9).

The Visitors' Centre was moved to the site of the existing parking area. The educational, and the commercial, facilities in the Centre, have been drastically reduced, in terms of floor surface and volume, but the Centre still allows an appreciation of the unique site, and its history, at a high educational level. Public facilities meet current international standards with attention given to persons with special needs. The operational and management facilities have been reduced to the necessary minimum, nevertheless, still accommodating archaeological research facilities, adequate space for administrative staff, security personnel and equipment, staff and operational services, as well as storage, and independent delivery access.

#### 2.6.2.1 Visitors' Centre

The Visitors' Centre will be located in the middle level of the existing car park, that is an already developed site and an area which is currently not utilised for its original purpose. The Visitors' Centre will be subdivided into two volumes, and the vertical separation into two levels enables the surface available to be used to its maximum, and the preservation and integration of the topographic elements of the immediate surroundings (Table 2.2). The lower level of the Visitors' Centre will house the main public sanitary facilities, close to the bus parking, where most of the visitor flow is expected. An upper car parking will be at the same level as the interpretative facilities (auditorium and exhibition), as well as the commercial facilities and other amenities (shop, coffee shop and meeting space). Both levels will be easily accessible for persons with special needs by means of direct road level access to both levels, and an elevator connecting the two levels. The plan allows a high degree of flexibility in the use of the different spaces, and permits the adjustment of the desired visitor sequence in accordance with the visitor flow. The lower floor is conceived as a masonry structure, most parts of which are covered by a limestone lining. The large span spaces on the upper floor are supported by steel frames with modular envelope elements.

The Visitors' Centre make use of limestone façade lining with natural wooden window frames and shutter elements at lower floor level whilst the upper level is a steel frame covered by modular façade elements in sandwich construction. The prevailing textures are glass, natural wood and façade panels in an ochre tone. Information panels will be matt-brushed (not shiny) stainless steel frames with natural wooden elements and opaque translucent glass panels for visitor orientation.

The following advantages may be attributed to the proposed building material:

- a. High degree of flexibility;
- b. Reversibility;
- c. Low impact technology; and
- d. Guaranteed aeration.

All the spaces in the Visitors' Centre, except for some technical and storage spaces, have windows, and can therefore be naturally ventilated. The building envelope is insulated against thermal gain and loss (it is envisaged that 8 to 10cm of insulation will be required). Double glazing, with integral sun stop filtering prevents excessive heat transmission in summer and temperature loss in winter. Large ventilation shutters, protected by sun screen grids, allow natural ventilation across the building without the need of opening the windows. The kitchen area of the coffee shop and the toilet facilities will be mechanically vented.

The auditorium, which seats 90 persons, and which will often operate in a non-stop mode, will have a mechanical ventilation installation, in combination with a cooling system. The air conditioning units will be placed in the technical spaces below. Additional and alternative systems of climate control, for example natural cooling by means of guiding the air through cooler basement structures or by evaporation of water, are being studied. Given the natural air flow system proposed, mechanical air conditioning will be minimally restricted to hottest period of year, thus saving energy and reduces shock effect for visitors.

All additional elements in the Heritage Park, such as the interpretative panels and the visitors' orientation points are based on modular units, and are always oriented north-south/east-west, which makes it easier for the visitors to find their way about. This principle also refers to geographic and archaeological mapping. The Orientation cubes are open structures with no need for heating or air conditioning. The Guard's Cubes are naturally shaded and vented, but might require additional electric heating in winter times. Proposed car parking facilities are outlined in Table 2.3.

#### 2.6.2.2 Walkways

The layout of the walkways utilizes, as much as possible, the existing pathways and access routes, and avoids using additional areas of the site. A system of boardwalks will be used for new walkways on uneven ground. For flat and firm areas, simple cart tracks built in the traditional manner will suffice. The light structures require minimal foundation and are easily reversible.

### 2.6.2.3 Security System

#### 2.6.2.3.1 Fencing

Hagar Qim and Mnajdra will retain the present fencing system, which will be serviced and upgraded. All poles will be attached properly and pegs grounded securely to provide proper tensioning of the guy ropes for the fence. The fencing shall be repainted in a neutral matt grey colour.

#### 2.6.2.3.2 Closed Circuit Television (CCTV)

The site will have a number of CCTV cameras in operation. Those at the Visitors' Centre will have about four to six Pan & Tilt cameras to cover all sides and surroundings of the complex. This would ideally be installed in a domed weatherproof housing situated at the corners of the building. The Temples will have four similar cameras each, to cover the area. The location of these is still to be defined to find the optimum location with the least impact possible. All CCTV cameras will be monitored 24/7 from a control room at the Visitors' Centre.

#### 2.6.2.3.3 Lighting

Security lighting will be installed along the perimeter fence of the two temple structures. This will be motion activated so as to limit light pollution as much as possible. The sensor for these will be installed on the fence itself.

#### 2.6.2.4 Protective Shelters

The protective shelters are conceived as surface-active membrane tent structures, each supported by one internal arch. This structural system has been widely tested under similar conditions. The arches shall be made of steel. Before erection, the steel arches will be placed horizontally, on the ground adjacent to the temples, thereby avoiding contact with the monuments. Each arch will then be erected into position by tensioning the steel reinforced tent membrane. The footprint of each protective shelter, as well as the anchor points of the tent structure, are adapted to the topography of the respective sites, as well as to the different equinox, and view axes, of each temple. The main foundations will be placed in carefully selected locations that will be previously archaeologically investigated. It is possible for these foundations to consist of mass foundations so as to avoid any "subtraction" of soil, from the sites. This special erection procedure will minimize vibration on the site.

The significant visible materials used vary from one structure to another. The protective shelters are in natural white textile membrane and matt grey steel support structure and

tensioning elements. Within a couple of weeks, the membrane will undergo a natural bleaching process and will turn into a natural white colour. The proposed membrane fabrics filter the natural daylight penetrating to the interior down to about 10 to 15% of the original intensity. Thus the megalithic sites will still be appreciated under natural light, and will still be also easily photographed. The proposed Teflon-coated membrane textiles require no special cleaning. They will be "washed" during the annual rain period. In both temples, a minimal steel platform is proposed to allow visitors to get an elevated view onto the temple sites. The layout of the megalithic structures is generally structured around key axes that are usually aligned with doorways into the buildings.

It has been proposed that there may be significant alignments between these axes and astronomical bodies. The protective shelters are designed to ensure that at no point do they obstruct any of the axes of the megalithic structures, or any of the astronomical alignments that have been postulated.

The following advantages for tension tents have been identified:<sup>64</sup>

- a. They are easily mounted and factory produced;
- b. The footpoints and anchor points of the tent structures are easily adjusted to the topographic conditions of the ground;
- c. Entrance and ventilation openings can be adjusted according to weather conditions;
- d. Aprons between the tent membrane and the soil will prevent ponding and surface runoff;
- e. Natural aeration is guaranteed for the hot summer season;
- f. They present a minimal degree of use of alien material on such a sensitive site;
- g. They are highly efficient in terms of the relation between covered area and costs;
- h. Their design is an elegant wing figure which blends into the coast line and contrasts with the stone structures of the temples; and
- i. Depending on the type of tissue the thin membrane of the tent provides filtered natural skylight conditions for the interior, reflecting even the position of the sun. Thus, the temples can be appreciated under almost natural lighting conditions and can easily be photographed. An illumination at night, possibly even sound and light effects, could be most spectacular.

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<sup>64</sup> Hagar Qim & Mnajdra Heritage Park International Design Competition: Competition submission by Architect Walter Hunziker.

## 2.7 Raw Materials and Wastes Management Plan

A management plan for raw materials and wastes generated during project implementation has not yet been studied. However, in due course, a detailed Construction Management Plan will be submitted for approval of the Malta Environment and Planning Authority, and will subsequently be attached to the contractual obligations of the eventual Contractor.

During the operational phase of the project, the generation of raw materials and wastes will be limited to 1 skip per day of Municipal Solid Waste in the Visitors' Centre area, which will be disposed of according to the appropriate regulations.

## 2.8 Socio-economic Objectives

### 2.8.1 Visitor Survey<sup>65</sup>

In 2003, the number of visitors to the temples amounted to 111,203. Of these, 44,100 were paying individuals, 49,800 were visitors in groups organised by tour operators, 17,300 were free admissions such as open days and school groups. The busiest months were April and May and the leanest month was January. From the visitor survey, it emerged that

- a. The socio-demographic profile of visitors is mostly German, followed closely by British, predominantly within the middle-aged bracket, and tends to be knowledgeable and educated. The visit to the temples is a social occasion and tourists overwhelmingly visit them accompanied by their spouse/partner or with their family or friends.
- b. Behavioural characteristics: The temples do not have a repeat audience, but is constantly replacing its visitors with a fresh intake of tourists. Most of the visitors visited both temples and the average time spent at the site is 49 minutes: individuals spending more time than group tourists; a quarter of group tourists felt that they did not spend enough time at the site. A third of visitors do so out of specific interest in archaeology: these are often independent visitors, spend more time than others, are aware of the temple's UNESCO world heritage status, visit both temples and are generally satisfied with their visit. The most common means of transport for individual tourists to reach the site is public transport, followed closely by rented cars, in which case about 35% found difficulties in reaching the site due to poor signage. Less than two thirds of visitors first heard about the temples through guide books. Most visitors had already visited other archaeological sites in other countries, mostly Stonehenge in the United Kingdom. Slightly more than half

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<sup>65</sup> Malta Tourism Authority, *Hagar Qim & Mnajdra Temples: A Visitor Survey: Preliminary Report*. Strategic Planning & Research Division, June 2004.

- of the respondents to the visitor survey stated that the visit to Hagar Qim and Mnajdra was the same as other archaeological visits, one fifth stated it was 'better' or 'much better' and another fifth stated it was 'worse' or 'much worse'.
- c. Visitor Experience: Two thirds of the respondents stated that visitor experience to the temples could be improved through more information about the site and another quarter through the use of guiding tools. Slightly less than a third desired a restroom, about a fifth desired a souvenir shop and another 7% would like a coffee shop/restaurant. Tourist satisfaction was rated as very high and practically all of the respondents stated that they would be willing to recommend the site to others.

In its concluding remarks, the Visitor Survey presented the following recommendations:

- a. Better marketing efforts<sup>66</sup>
- b. Product Improvement:
- (i) The major improvement desired by visitors in the temple experience is additional information. Although only about a tenth specifically referred to a visitors' centre, such a facility would actually provide additional information. Other benefits would be in market expansion through the setting up of temporary exhibitions, leading to increased visitor levels and possibly in visitor loyalty which is currently very low;
  - (ii) better accessibility on site through safer walkways and improved interpretation;
  - (iii) better road signage; and
  - (iv) the provision of restrooms. Although a bookshop, souvenir shops and restaurants were not high on the list of desired facilities in the visitor survey, their inclusion in the visitors' centre would increase the visiting time at the temple site.
- c. Site Interventions must not compromise any of its qualities, currently contributing to the high visitor satisfaction levels, namely
- (i) the mystery element of the site;
  - (ii) the importance of the conservation aspect;
  - (iii) the uniqueness of the temple site;
  - (iv) the protection of the surrounding landscape, including the views which can be seen from the temple site; and
  - (v) the age factor of the temples.

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<sup>66</sup> The Visitor Survey concludes that specific promotional efforts should be carried out to target this highly specific market niche in the Maltese tourism sector, that of tourists with archaeological interest. A joint promotional effort with other temple sites in other countries was recommended. Furthermore, it remarked that maximum marketing advantage should be sought from the UNESCO World Heritage Status, which status represents a guarantee to visitors that the site is worth visiting and worth protecting.



## 2.8.2 Carrying Capacity

Current visitor flow is unevenly spread. During peak times on certain days, all the parking bays for coaches are occupied, while on other days, they are nearly all unused. The 'spikes' in this pattern pose a threat to the temples and to their landscape, as it is during these periods that overcrowding, and consequently visitor damage, is most likely to take place.

One of the strategic aims of the project is to spread peaks to a more even flow. It is intended to improve the management of coach groups, which constitute the greater part of the visitor flow at present. One of the objectives is to spread coach groups more evenly through the day and through the week (Table 2.4). The proposed Visitors' Centre is intended to act as a holding area that helps manage and filter the flow of visitors into the park. At any one time, no more than three coach groups will be admitted into the precincts of Hagar Qim. Up to four coach groups may be accommodated at any given moment in the Visitors' Centre area. One of the targets and indicators of the planned visitor flow is never to have more than eight coaches in the car park at any time, in order to ensure that the sustainable carrying capacity of the park is never exceeded.

## 2.8.3 Economic Objectives

The economic objectives of the development proposal are basically twofold:<sup>67</sup>

- a. Sustainable tourism development: In line with the Tourism Development Policies for 2000-2010, that of investing in Malta's key cultural and heritage assets as the principal aspects of Malta's unique value proposition as a tourism destination, the proposal should improve Malta's competitiveness on the international scenario. Given that a quarter of Malta's economy and an equivalent share of its labour market is tourism-related, a strategic investment in what is arguably the most important archaeological attraction in Malta should lead towards the greater achievement of the strategic goals set out by both the Single Programme Document and by Malta Tourism Authority's long-term tourism strategy. Marketing campaigns carried out in Malta's major source markets have consistently emphasised Malta's historical and cultural assets as the country's main selling points. Moreover, the Malta Tourism Authority's Strategic Plan (2002-2004) places particular emphasis on the development of heritage sites in view of the need for their proper conservation and presentation. This will result in benefits to the local economy both in terms of employment and tourism earnings on a national level.

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<sup>67</sup> European Regional Development Fund (ERDF) Malta Objective 1 Programme 2004-2006. Application Form.

- b. Product Improvement: These facilities shall be adding value to the visitor experience and assure sustainable management and enjoyment of the cultural resources in the area. In line with specific archaeological and environmental concerns, the project may be viewed as an investment in cultural heritage.

## 2.8.4 Social Objectives

The following four objectives have been identified:<sup>68</sup>

- a. Education: The proposed Heritage Park represents an invaluable educational resource. The proposed interpretation facilities aim at upgrading the educational value of the site and should ameliorate its appreciation. At strategic points in the Heritage Park, information panels will be set up to further explain what the Park is offering. The educational impact of the proposal is not restricted to students/school children, but has more wide-ranging effects on the general population, with a universal objective of a better appreciation of the national heritage and a concomitant improvement in the tourism sector.
- b. Recreation: The land around Hagar Qim and Mnajdra is a public open space with high recreational value.
- c. Improved accessibility to and within site: The proposed walkways, interpretation facilities and Visitors' Centre will be accessible to all, including persons with special needs.
- d. The proposal will serve as a pilot for six other megalithic sites and thus will serve as an opportunity for the transfer of skills to locally based experts.

## 2.8.5 Cultural Objectives

The following two aspects have been incorporated within the project's design philosophy:<sup>69</sup>

- a. conservation of an important heritage asset; and
- b. The proposal is intended to meet Malta's international obligations in the cultural heritage sector. Malta, as a nation, has the role of custodian of a heritage of universal value.

## 2.9 Economic Considerations

### 2.9.1 Project Timeline

Reference is made to Gantt chart at the end of Section 2.

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<sup>68</sup> Ibid.

<sup>69</sup> Ibid.  
PricewaterhouseCoopers, *Economic & financial feasibility review for Hagar Qim & Mnajdra Temples*, 30<sup>th</sup> June 2004.

## 2.9.2 Economic Feasibility

An economic and financial feasibility exercise for the proposed Hagar Qim and Mnajdra Temples Conservation and Interpretation Project was completed in June 2004 by PricewaterhouseCoopers.<sup>70</sup> Based on a number of operating assumptions, the report identifies the following main economic benefits to be reaped from the project:

- a. Savings on future maintenance of the Temples;
- b. Savings on costs incurred to reverse damage to Temples by vandalism; and
- c. Increase in tourism expenditure by attracting cultural tourism, with a higher spending power, to the islands.

Other benefits which are not factored in the economic model used by PricewaterhouseCoopers include:

- a. Improved cultural formation in education;
- b. Providing suitable setting for a site that is important for Maltese identity;
- c. Transfer of specialised skills to locally based experts;
- d. Learning curve for subsequent cultural heritage projects;
- e. Driving visitor numbers for other historical sites; and
- f. Increased economic wealth from more satisfied tourists.

Whilst the Visitors' Centre and the security system are economically viable, especially from the new sources of revenue from the cafeteria, retail outlets, rental of audio-visual equipment and rental of conference hall for special events, the investments in the protective shelters, if viewed from an accounting perspective, is not financially feasible. The expense of the shelters is justified with respect to the intangible, non-financially quantifiable value of the prehistoric megalithic remains.

## 2.9.3 Employment

The projected employment levels during the operational phase are as follows:<sup>71</sup>

- a. Current staff complement includes three staff members responsible for manning the site during opening hours; their duties also include ticketing and managing visitor flow;
- b. The daytime front-of-house staff is expected to increase to four persons as a result of the projected improvement in services;
- c. Two cleaning staff to service the Visitors' Centre;

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<sup>70</sup> PricewaterhouseCoopers, *Economic & financial feasibility review for Hagar Qim & Mnajdra Temples*, 30<sup>th</sup> June 2004.

<sup>71</sup> Technical clarifications prepared by Heritage Malta and Architectural Partnership led by Architect Walter Hunziker.

- d. The security system will require a complement of eight employees based on 16hrs/day for 7 days a week securing both sites and assuming a 30-hour week; and
- e. The retail outlets will be manned by a complement of four employees.

#### 2.9.4 Funding

The overall cost of the proposal is 3.5 million Euros (Tables 2.5 to 2.7), for which there will be 63% co-financing from the European Union; Heritage Malta has submitted an application to this effect. The proposal falls within the scope of Priority 1 Strategic Investments & Strengthening Competitiveness and specifically Measure 1.4 – Support to the Tourism Sector as set out in The Programme Complement document dated 23<sup>rd</sup> January 2004.<sup>72</sup>

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<sup>72</sup> European Regional Development Fund (ERDF) Malta Objective 1 Programme 2004-2006. Application Form.  
PricewaterhouseCoopers, Economic & financial feasibility review for Hagar Qim & Mnajdra Temples, 30<sup>th</sup> June 2004, p.2.

Table 2.1: Factors of deterioration affecting Hagar Qim and Mnajdra

<i>Factors</i>	<i>Causes</i>
Inherent Factors	The integrity of masonry structures primarily depends on the integrity of the individual limestone units which are inherently susceptible to weathering, albeit to differing degrees depending on the biophysical conditions of their geological deposition. The temples are inherently unstable and vulnerable, since they are no longer complete structures. Hagar Qim temple stands on a plateau outcropped in Globigerina Limestone, which limestone was used in its construction. Globigerina Limestone is a soft stone varying greatly in durability. In some places, this stone has severely deteriorated, leading to further weakening of the structures, as well as the loss of surface features. Due to its exposure to winds high in salt content, the stone has suffered a lot of deterioration. Mnajdra, being constructed of Lower Coralline Limestone has suffered a significantly lower degree of deterioration. <sup>1</sup>
Direct rainfall	Direct rainfall has been identified as a natural agent posing a considerably high threat to the site. Rainfall is in fact responsible for a number of processes that are contributing to the deterioration of the site, mainly the progressive washing out of the fill from within the thickness of the megalithic walls. This process has been observed at a number of points, particularly at Hagar Qim and Mnajdra. It usually starts with the finer fill material, but as the joints between the stonework are worn apart, larger and larger fill material is lost from the structure. The resulting voids within the walls have in many points resulted in a serious loss of structural stability, which may lead to collapse. Direct rainfall may also pose a chemical threat to the stonework in the form of acid rain.
Ponding	Direct rainfall often results in ponding of over 10cm in some parts of the main structure at Hagar Qim and at the Lower Temple at Mnajdra. This in turn contributes to a number of harmful processes such as capillary migrations of water, salt migration and secondary wetting and drying cycles.
Surface Runoff	This is more evident at Mnajdra, it being downslope, where surface runoff percolates through the megalithic complex. Hagar Qim is on the crest of a ridge and hence this problem is less critical.
Direct Insolation	Megalithic elements which are exposed to solar radiation for long periods of times show signs of acute deterioration, compared to those which are more shaded.
Thermal Fluctuations	Past observations indicate that the difference in air temperature between shaded and sunlit parts often exceeds 20°C. Such considerable and repetitive thermal fluctuations often lead to a number of damaging processes such as expansion and contraction cycles, wetting and drying cycles and the consequent migration and crystallization of salts.
Wetting and Drying Cycles	Frequent and repetitive wetting and drying cycles of salt-saturated limestone megaliths induce rapid deterioration of the fabric due to cycles of dissolution and recrystallisation of soluble salts within the stone's pores. Wetting occurs during rainfall, dew, by capillary absorption and condensation, while drying occurs during hours of sunshine, by low relative air humidity and by wind.
Evaporation	Wind accelerates evaporation from the surface of megaliths, in turn contributing to secondary processes such as destabilisation of parts of the structure in extreme weather conditions due to wind tunnelling, and salt action due to wetting and drying cycles.
Abrasion	The abrasive effect caused by wind-blown particles is at present minimal. However, wind tunnelling may increase this to significant levels.
Visitor Impact	The megalithic temples are promoted as the country's main cultural attractions and thereby visitor inflow is considerable. Hagar Qim receives well over 100,000 visitors annually. Until recently visitor flow was poorly controlled and damage to megalith surfaces was considerable.

Source: Museums Department, *Hagar Qim and Mnajdra Heritage Park: Briefs for Visitors' Centre and Protective Shelters for Hagar Qim and Mnajdra Temple Complexes*, October 2001, unpublished document, Part 3, Sections 2.1 and 5.1, Part 4, Sections 2.1 and 5.1.

Museums Department, *Draft Plan for the Material Conservation of the megalithic structures at Hagar Qim and Mnajdra*, 1<sup>st</sup> Draft, April 2002, Section 5.

Museums Department, *Hagar Qim & Mnajdra Heritage Park: Management Plan*, 2<sup>nd</sup> Draft, September 2002, Section 8.2.

Note: 1. Seasonal temperature and wetting and drying cycles induce erosion in the more susceptible rocks. The following types of rocks are the most susceptible to weathering:

- a. all exposed megaliths, especially south facing ones;
- b. at points of contact, that is high stress, between megaliths; and
- c. smaller-sized stones, probably due to lower thermal capacity.

Table 2.2: Space Requirements for the proposed Visitors' Centre

<i>Level</i>	<i>Internal</i>		<i>External</i>	
	<i>Uses</i>	<i>Area (m<sup>2</sup>)</i>	<i>Uses</i>	<i>Area (m<sup>2</sup>)</i>
Upper	Entry hall	38	Covered entry area (except stair)	30
	Coffee shop, kitchen, bar counter	98	Uncovered meeting place	circa 100
	Kitchen and bar counter	22	Outdoor area for coffee shop	circa 50
	Small lecture hall / meeting place	58		
	Tickets / shop counter	13		
	Shop area	54		
	Lecture hall seating 90 persons	93		
	Exhibition area	220		
	Public toilets (ladies, men, disabled)	8		
	Elevator and public circulation	30		
	Internal circulation	8		
Lower	Public toilets (ladies, men, disabled)	38	Vehicle access and delivery court	circa 80
	Technical (ventilation and cooling)	30		
	Technical (back up power supply)	35		
	Storage shop/coffee shop	45		
	Control room (security)	13		
	First aid	6		
	Staff facilities (ladies, men, shower)	7		
	Staff room / lockers	12		
	Operational offices / administration	23		
	Garage / workshop	26		
	Archaeological storage / research	35		
	Technique / ventilation	27		
	Circulation delivery access	46		

Source: Technical clarifications prepared by Heritage Malta and Architectural Partnership led by Architect Walter Hunziker.

Table 2.3: Parking Facilities

<i>Type of Parking</i>	<i>Visitor Capacity</i>	<i>No. of Bays</i>
Coach parking	400 (8 coaches x 50 pass.)	9 bays (existing)
Individual parking	100	60 bays (existing)

Source: Technical clarifications prepared by Heritage Malta and Architectural Partnership led by Architect Walter Hunziker.

Table 2.4: Projected Visitor Numbers (Maximum peaks at any one time)

<i>Type of Visitor</i>	<i>Visitor Centre area</i>	<i>Archaeological Park</i>	<i>Total</i>
Coach groups	250 (peak)	250 (peak)	400 (peak)
Individual visitors	40	60	100
<i>Total</i>	<i>290 (peak)</i>	<i>310 (peak)</i>	<i>500 (peak)</i>

Source: Technical clarifications prepared by Heritage Malta and Architectural Partnership led by Architect Walter Hunziker.

Table 2.5: Estimated Project Costs

<i>Project Item</i>	<i>Estimated Costs (Euros)</i>
Visitors' Centre, furnishings and fittings	1,630,000
Orientation Point	150,000
Accessibility	250,000
Shelters and Conservation	1,020,000
High-tech surveillance system	250,000
Project Studies	100,000
Project Management Fees	100,000
Total Project Costs	3,500,000
VAT	630,000
<i>Total</i>	<i>4,130,000</i>

Source: PricewaterhouseCoopers, *Economic & financial feasibility review for Hagar Qim & Mnajdra Temples*, 30<sup>th</sup> June 2004, p.2.

Table 2.6: Budget Breakdown (Disbursement of Funds) (in Euros)

<i>Item of Expenditure</i>	<i>2004</i>	<i>2005</i>	<i>2006</i>	<i>2007</i>	<i>2008</i>	<i>Total</i>
Management Costs						
Project Management	40,000	15,000	15,000	15,000	15,000	100,000
Consultancy Fees	50,000	50,000	0	0	0	100,000
Infrastructural Costs		1,000,000	1,400,000	700,000	200,000	3,300,000
<i>Overall Costs</i>	<i>90,000</i>	<i>1,065,000</i>	<i>1,415,000</i>	<i>715,000</i>	<i>215,000</i>	<i>3,500,000</i>

Source: European Regional Development Fund (ERDF) Malta Objective 1 Programme 2004-2006. Application Form.

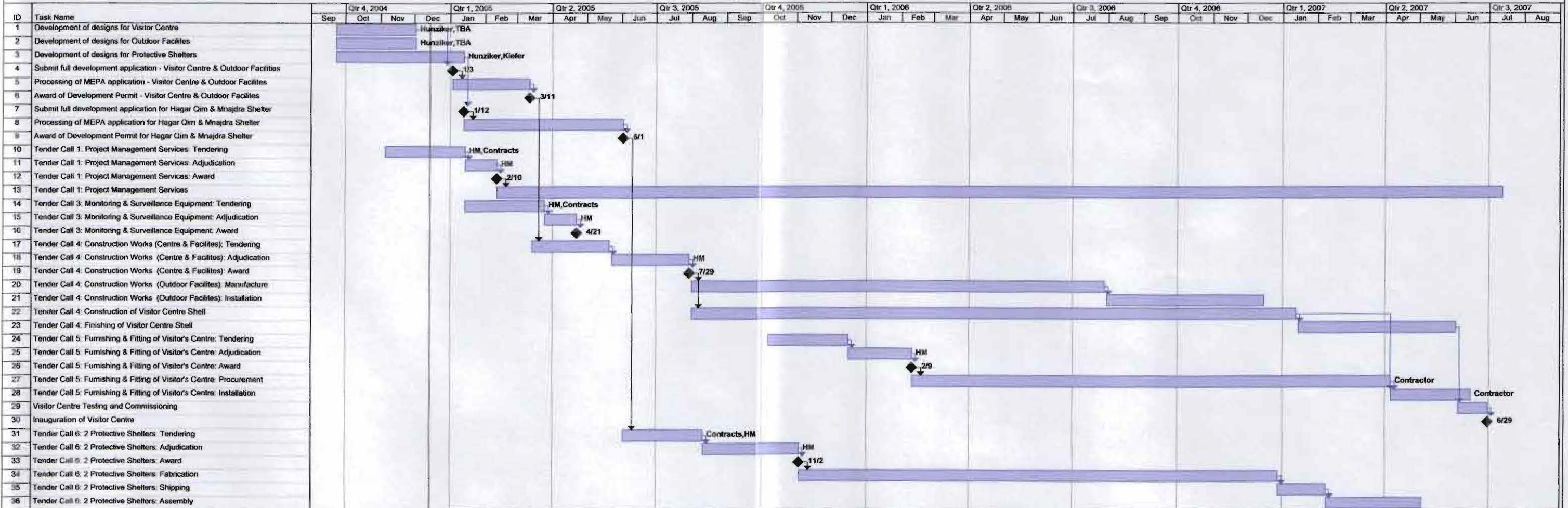
Table 2.7: Public Procurement

<i>Service/Works Contract</i>	<i>Total (Euros)</i>
Project Management	100,000
Project Studies	100,000
Purchase and installation of equipment for environmental monitoring	20,000
Security and accessibility	500,000
Construction of Visitors' Centre and Orientation Point	1,380,000
Furnishings and Fittings of Visitors' Centre and Orientation Point	400,000
Shelters and Conservation	1,000,000
<i>Overall Costs</i>	<i>3,500,000</i>

Source: European Regional Development Fund (ERDF) Malta Objective 1 Programme 2004-2006. Application Form.



## The Hagar Qim and Mnajdra Conservation and Presentation Project European Regional Development Funds



## Environmental Characteristics of the Site

- 3.1 The Study Area
  - 3.2 Topography
  - 3.3 Geocultural Setting
  - 3.4 Landuse
  - 3.5 Scheduling
  - 3.6 Planning Considerations
  - 3.7 Socio-Economic Setting
  - 3.8 Infrastructure
  - 3.9 Visual Links
  - 3.10 Other Considerations
-

### 3.1 The Study Area

The area designated as the Hagar Qim and Mnajdra Heritage Park consists of a stretch of land measuring about forty hectares, situated along the southern coast of Malta (Drawing 17\_04\_1). For the scope of this section, the study area is limited to the extent shown on the Site Location Plan (Drawing 17\_04\_2) from the panoramic road to the south of same. To the south, the area is bounded by the sea, whereas the landward boundary of the park is demarcated by a dry-stone rubble wall (Drawing 17\_04\_1). The area is endowed with

- a. An undisturbed skyline;
- b. One of the best panoramic views in the Mediterranean;
- c. High quality, multi-element visual composition; and
- d. A complex composition of forms, materials, textures and colours.

The groups of megalithic temples at Hagar Qim and at Mnajdra are two of the four most extensive groups that have been preserved, the other two being Ggantija and Tarxien. Each of these buildings has unique characteristics. Mnajdra temples are sited about 400m from Hagar Qim temples, nestled in a hollow at the base of the slope.

### 3.2 Topography

The area identified as Hagar Qim and Mnajdra Heritage Park occupies a clearly defined section of the southern coast. The western boundary is clearly defined by ravine-like cuts in the bedrock, caused by quarries and erosion. The eastern boundary is formed by gentle slopes with typical terraced fields and dry stone walls. The northern boundary is delineated by a relatively high stone wall, separating the open land of the temple sites from the agricultural land further inland. Once in the park, the visitor gets a strong sense of the coherence and authenticity of this section of the landscape. The temples of Mnajdra and Hagar Qim can be easily perceived, as well as the Misqa tanks, the Congreve Monument and the Torri Hamrija, as being part of the landscape. There is also a strong orientation of the site towards the sea and the island of Filfa. Except for certain areas near Hagar Qim, all signs of urban civilisation are hidden by the silhouette of the heights which form the northern boundary of the site. The two megalithic sites of Hagar Qim and Mnajdra, and the plateau of the Misqa tanks, interface each other in a dialogue across space, time and architecture. The relationship between these sites and the surface geology may be easily appreciated. Their relationship with the sea and with the natural coastline is likewise clear.

### 3.3 Geocultural Setting

#### 3.3.1 Geology

Malta is characterised by two main fault systems, which represent the effects of two rifting processes. These are the Great Fault extending south-west to north-east, and the Maghlaq Fault system extending from north-west to south-east; the latter has also been responsible for the downthrow of Filfla to sea level.

Three of the five principal geological formations that make up the archipelago outcrop within the Park. These are the Globigerina Limestone formation (found near Hagar Qim which is built of this material), Lower Coralline Limestone formation (near Mnajdra temple which makes extensive use of this material) and the Upper Coralline Limestone formation (in the Maghlaq region) (Drawing 17\_04\_3). As a result of the Maghlaq Fault system, the Upper and Lower Coralline Limestone formations outcrop at the same level. The Quaternary deposits at Maghlaq are among the most interesting sites remaining from the Pleistocene age in the Maltese Islands. A number of quarries, both ancient and modern, are present in the area. Some of the ancient quarries could have been used to build the temples.<sup>73</sup>

#### 3.3.2 Cultural Assets

Cultural assets within the study area, plotted in Drawing 17\_04\_3, are Hagar Qim Temples, Mnajdra Temples, Misqa Tanks, Hamrija Tower and Congreve monument. A cluster of palaeochristian catacombs dating from Late Antiquity are hewn out of the Lower Globigerina Limestone a short distance north of the boundaries of the Heritage Park, and are known as the Maghlaq Catacombs.

##### 3.3.2.1 Hagar Qim

The cluster of megalithic buildings at Hagar Qim is positioned on the crest of a ridge at the eastern end of the Heritage Park. It consists of a principal building and two subsidiary ones. The main building has the most complex plan of all known Maltese megalithic buildings. This appears to be the result of a succession of building episodes during which more and more accretions were added to the structure. This building also displays a number of unique features, such as the axis that runs through doorways at both ends of the building, the monolithic screens with porthole entrances, and what is believed to be the single largest megalith used in any of the Maltese megalithic sites. One of the two smaller buildings is a four-apsed structure, while the plan of the other is difficult to map. All the

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<sup>73</sup> Museums Department, *Hagar Qim and Mnajdra Heritage Park: Briefs for Visitors' Centre and Protective Shelters for Hagar Qim and Mnajdra Temple Complexes*, October 2001, unpublished document, Part 2, para. 2.2.7.1.

megalithic buildings at Hagar Qim are built of the Globigerina Limestone that forms the ridge they stand on.

#### 3.3.2.2 Mnajdra

The complex of megalithic buildings at Mnajdra is positioned down the slope west of Hagar Qim. It consists in a succession of three adjoining buildings, the facades of which form a single crescent facing the south-east. Some particularly noteworthy characteristics of these buildings include the best-preserved example of corbelled vaulting in any of the Maltese megalithic temples, some fine examples of drilled decoration, a graffito of a façade of a megalithic building, and a possible astronomical alignment. The megalithic buildings at Mnajdra make extensive use of Globigerina Limestone as well as Lower Coralline Limestone, both of which are available in the immediate vicinity.

#### 3.3.2.3 Misqa Tanks

Located on the crest of the hill, 200 metres northwest of Mnajdra temples, Misqa Tanks are a cluster of rock-cut water cisterns. Although difficult to date, especially due to repeated clearings of same, they are considered as part of the archaeological landscape of the area given the hypothesis that they might be contemporary with the temples. Conflicting land uses and minor landscape modifications, namely for agricultural and bird trapping activities, in the vicinity of Misqa Tanks has resulted in progressive degradation of their context.

#### 3.3.2.4 Hamrija Tower

This coastal watch-tower, a dominant feature in the landscape, is one of thirteen towers built by Grandmaster Martin de Redin in the mid-17th century, to improve the security of the coastline.

#### 3.3.2.5 Congreve Memorial

The Congreve Memorial is a granite cenotaph that commemorates Sir Walter Norris Congreve, who was the Governor of the Maltese Islands during the 1920s. Congreve was buried at sea between this point and the islet of Filfla, giving his name to the Congreve Channel, which separates Filfla from the mainland.

### 3.4 Landuse

#### 3.4.1 Overview

Landuse within the Heritage Park is restricted to recreation, bird-trapping and agricultural activity (Drawing 17\_04\_4). The main geomorphological features at Tal-Maghlaq area are the coastal cliffs and Maghlaq valley. The surrounding area is of high cultural and natural

heritage and scenic value. The mineralogical value of the Lower Coralline Limestone outcrops attest to a number of sterilised mineral extraction sites and industrial archaeological sites. The natural landscape is considered to be important given its location between two important valley systems, namely Wied Maghlaq and Wied iz-Zurrieq. The importance of the garigue ecosystem present is highlighted by the number of endemic plant species occurring in the area.

The long history of human activity in this area is attested by the presence of the world's oldest free-standing monuments. Pedological studies indicate strong anthropogenic interventions and past aerial photos and survey sheets show the area to consist largely of agricultural tracts. The agricultural land use assessment of the late 1950s<sup>74</sup> classifies the Maghlaq area to Zurrieq as the Southern Hills and stated that fields are more exposed and field size is smaller than in the Mqabba-Kirkop Plain. Since then, aerial photos indicate no modifications in the agricultural land use, except an increase in mineral extraction activity, which activity was suddenly curbed by the Planning Authority in 1994.

### 3.4.2 Mineral Extraction Potential

The coastal zone around Mnajdra is made up of one of the larger outcrops of Lower Coralline Limestone in Malta. This stone is highly prized as the hardest material that is available in the Maltese Islands. Until recently, two large quarries were in operation immediately beyond the western boundary of the Heritage Park. Rock-cutting has now ceased in this area, after requests for extension of these two quarries were turned down during the 1990s. Some smaller quarrying operations within what is now the boundary of the Park, took place during the 1970s, but were halted after a public outcry. Present Government policy is based on the principle that the mineral value of this area is of less importance than its value as part of the landscape context of the archaeological sites in the area.

### 3.4.3 Agriculture and Soils

Agriculture in the area is largely dryland farming and arable land is generally well kept with well maintained rubble walls. Average field size is about 2 to 5 tumoli, which is considered of medium size by Maltese standards. The general landscape of the study area is in parts terraced arable land, while in other parts it is characterised by coastal karst.

Lang<sup>75</sup> describes the Tal-Maghlaq area with parent material and anthropogenic interference as codominating soil forming factors. Thus where Lower Globigerina outcrops, there is Tal-Barrani series Xerorendzina soil and where Lower Coralline Limestone

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<sup>74</sup> Bowen-Jones, H., J.C. Dewdney and W.B. Fisher, *Malta: Background for Development*, University of Durham, 1960

<sup>75</sup> Lang, D.M., *Soils of Malta and Gozo*. Colonial Research Studies No. 29. Her Majesty's Stationery Office, London, 1960.

outcrops, there is the Xaghra series, a terra soil; where there is strong anthropogenic interference such as strong terracing and cliff sequence, the L-Inglin soil complex was ascribed (Drawing 17\_04\_5).

#### 3.4.4 Ecology

As part of the assessment of natural communities in the proposed Heritage Park, an ecological study was undertaken by Edwin Lanfranco in 1991.<sup>76</sup> The mapping by Lanfranco is reproduced as Drawing 17\_04\_6 whilst the species list is given in Table 3.1. With respect to the flora and fauna within the Heritage Park site, the report states that<sup>77</sup>

The predominant community is a low garigue, in some parts tending to rocky steppe and in others to higher garigue accompanied by cliffside vegetation ... all the communities support a large number of herbaceous species.

... The species of greater ecological significance are the shrubs which dominate the garigues, namely *Thymus capitatus*, *Euphorbia melitensis*, *Erica multiflora*, *Anthyllis hermanniae*, and *Periploca angustifolia*.

... Species of particular floristic importance are those which are endemic to the Maltese islands. These include *Euphorbia melitensis* of which a good population exists here and *Chiladenus bocconei*... Two of the orchids occurring here are likewise endemic. These are ... *Anacamptis urvilleana* and ... *Ophrys* sp.nov. which are still undescribed...Some of the species have a restricted distribution in the Mediterranean. Such a one is *Convolvulus oleifolius* ... The Maltese population of this species require a more intense investigation and comparison with populations from other parts of its geographical range since it is highly likely that our plants may represent yet another endemic entity. *Periploca angustifolia* is another highly significant species... *Triadenia aegypticum* (or *Hypericum aegypticum*) ... *Anthyllis hermanniae* ... *Scilla sicula* has an extremely restricted distribution since outside Malta, it is only known from Sicily and Calabria ... [where] it is extremely rare and the best known populations are those of our islands. It is a rather uncommon species. The whole region is very rich in Orchids. In the Maltese islands twenty-two species of orchids are known to occur (or have occurred) with certainty. Ten of these have been encountered on the site... Also worthy of note is the uncommon annual herb *Hedysarum glomeratum* ... *Minuartia mediterranea* has been recorded from this site but it is possibly extinct.

...Seven species [of land snails] have been noted from the site ... of which two are endemic ... both of which are widespread in garigue habitats. Worth mentioning is *Trochoidea (Xeroclausa) gharlapsi* which, while not found directly on the site occurs almost exclusively in crevices on the cliffside beneath this site and is one the most interesting endemic snails...

### 3.5 Scheduling

In terms of the *Structure Plan for the Maltese Islands* and policies contained therein, the Malta Environment and Planning Authority had scheduled a number of sites within the Park area, for their archaeological or ecological significance. These areas are mapped in Drawing 17\_04\_9. The Authority had scheduled the coastal cliffs from Birzebbuga to

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<sup>76</sup> Lanfranco, E., *Report on the Natural Communities of the Hagar Qim/Mnajdra Site proposed as a Heritage Park with Recommendations*, Malta University Services Ltd, April 1991.

<sup>77</sup> *Ibid.*, Sections 3.1-3.3.

Mellieha as Areas of Ecological Importance in 1996.<sup>78</sup> The coast cliffs south of the study area were scheduled as Level 2 in importance whilst terrain north of same was scheduled as Level 3 Buffer zone. The Hagar Qim and Mnajdra Temples and Misqa Tanks were scheduled in 1997 as Grade A Areas of Archaeological Importance; so is the buffer zone to Mnajdra Temples.<sup>79</sup> The Hamrija watchtower was scheduled in 1995 as Level 1 military architecture tower<sup>80</sup> whilst the Congreve Memorial was scheduled as Level 1 Monument in 1997.<sup>81</sup>

### 3.6 Planning Considerations

The Malta Environment and Planning Authority was set up to integrate the former Planning Authority established by the *Development Planning Act*, 1992 and the Environment Protection Department. Planning applications submitted from 1992 to date and decisions taken by the authority responsible for development planning, is indicative of the interpretation of contemporary planning practice. Planning applications within the study area are plotted in Drawing 17\_04\_7 and the respective location, description of works and decisions taken are tabulated in Appendix A5.

Trends in implementing planning policies are clear: to refuse all development proposals other than those which ensure continuity with the agrarian and visual landscapes. Applications for small scale agrarian developments such as stores, or reconstructions of existing ones, were granted. Applications for larger agrarian developments, or for the sanctioning of existing ones, were generally refused. Furthermore, applications for extensions to operative mineral works, an industry associated with this area since time immemorial, were not granted, bringing the quarrying practice in the area to a halt.

### 3.7 Socio-Economic Setting

A number of socio-economic activities encompass the study area. The most obvious features of the area are the megalithic temples of Hagar Qim and Mnajdra. The megalithic structures are key components of Maltese cultural tourism, a vital focus to promote the Maltese Islands as a distinctive holiday destination; tourism being one of the pillars of Maltese economy.

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<sup>78</sup> Government Notice 400/96 in terms of Structure Plan Policy RCO 10.

<sup>79</sup> Government Notice 271/97. Structure Plan Policy ARC 2 states that protection rating Class A implies:  
Top priority conservation. No development to be allowed which would adversely affect the natural setting of these monuments or sites. A minimum buffer zone of at least 100m around the periphery of the site will be established in which no development will be allowed.

<sup>80</sup> Government Notice 729/95.

<sup>81</sup> Government Notice 241/97.



Secondary activities that characterise the area are dryland farming, bird-trapping and rock-climbing. Traditional bird-trapping is a long-established activity on the more elevated parts of the park. Rock-climbing is practised along the Maghlaq fault, which offers some of the finest climbs in the archipelago. The area is also popular for hiking and picnics for families and school outings. Visitors to the megalithic sites account for most of the pedestrian traffic in this area, which is presently concentrated on the linear path from Hagar Qim to Mnajdra.

## 3.8 Infrastructure

### 3.8.1 Access

At present, most visitors to the Heritage Park limit their visit to the megalithic sites at Hagar Qim, and to a lesser extent Mnajdra. This is due to time constraints, the absence of signage indicating the presence and location of other foci of interest, and the absence of clearly defined pathways connecting these foci of interest. Many of the surfaces which visitors walk over are uneven and inconvenient for wheelchair users.

The area of the existing parking spaces, which is directly linked to the panoramic road, permits a direct view onto the Hagar Qim temple complex, but appears - together with the existing restaurant building - almost outside the temple site.

### 3.8.2 Utilities

Information, dated November 2004, from Water Services Corporation on the existing water, sewage and electricity services to the site, requested by Heritage Malta from the utilities provider, is plotted in Drawing 17\_04\_8. The supply of potable water to the site is through an old 1-inch water mains pipe from Qrendi. No sewers are present in the vicinity of the site. The nearest service point is circa 1.2km east-north-east of the proposed Visitors' Centre. At present, the needs of the site are met through portable toilet units and a cesspit within the Hagar Qim precincts.

The newly-built electrical sub-station has a capacity of 600 Amps. A 400 Amp cable provides electricity supply down to Mnajdra, where up to 100 Amps may be required. Backup is provided by a 250 Amp generator, presently installed within the Hagar Qim precinct. This would be relocated into the Visitors' Centre when completed.

## 3.9 Visual Links

The temple sites of Hagar Qim (Photo 1), Mnajdra (Photo 2) and Misqa Tanks (Photo 3) are intervisible. Hagar Qim is on the promontory north-east of Mnajdra whilst Misqa Tanks are north of same (Drawing 17\_04\_1). With respect to Hagar Qim and Misqa Tanks, Mnajdra is further down the slope (Photo 4). Given the topography of the area, the

predominant view from these prehistoric features is the sea, in particular the Congreve Channel flanked by the island of Filfla and the cliffs (Photo 5). A predominant feature and a significant historical landmark which can be viewed from the Heritage Park is the Hamrija watchtower; one of a number of watchtowers to guard the coast of Malta (Photo 6). A view from Mnajdra precincts showing a visual link between Hagar Qim, Hamrija Tower and the sea, set in a predominantly ecological context is shown in Photo 7. From a distance off the southern coast, these three prehistoric and historical features may be clearly seen.

## 3.10 Other Considerations

### 3.10.1 Pending Legal Issues<sup>82</sup>

Until the late 19<sup>th</sup> century, Mnajdra and the surrounding land belonged to the Roman Catholic Church. In order to preserve the site and to make it more accessible, the Colonial Government acquired Mnajdra and Hagar Qim in perpetual enphytheusis. In order to guarantee access to Mnajdra, a pathway between the two sites was also acquired at the same time. A large proportion of the land which was expropriated in 1991 by Presidential decree, in order to form the Heritage Park, has still not been paid for. This is one of the root causes of friction over conflicting land use within the Park.

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<sup>82</sup> Museums Department, *Hagar Qim & Mnajdra Heritage Park: Management Plan, 2<sup>nd</sup> Draft*, September 2002, Sections 7, 8.

Table 3.1: Species List at Hagar Qim/Mnajdra Area

<i>Type of Vegetation</i>	<i>Species Name<sup>1</sup></i>	<i>RDB Status<sup>2</sup></i>
Trees	<i>Acacia cyanophylla</i>	
	<i>Ceratonia siliqua</i>	
	<i>Ficus carica</i>	
	<i>Olea europea</i>	RDB 27
	<i>Phoenix dactylifera</i>	
	<i>Pinus halepensis</i>	
	<i>Punica granatum</i>	
Shrubs	<i>Opuntia ficus-indica</i>	
	<i>Anthyllis hermanniae</i>	
	<i>Convolvulus oleifolius</i>	RDB 28
	<i>Erica multiflora</i>	
	<i>Euphorbia dendroides</i>	
	<i>Euphorbia melitensis</i>	RDB 21, endemic
	<i>Hypericum aegypticum</i>	RDB 14
	<i>Periploca angustifolia</i>	RDB 27
	<i>Parasium majus</i>	
	<i>Rhamnus oleoides</i>	
	<i>Senecio cineraria</i>	
	<i>Teucrium fruticans</i>	
	<i>Thymus capitatus</i>	RDB 29
	<i>Anthyllis vulneraria</i> subsp. <i>Maura</i>	
	<i>Asparagus aphyllus</i>	
	<i>Chiladenus bocconeii</i>	RDB 34, endemic
	<i>Euphorbia pinea</i>	
	<i>Fumana thymifolia</i>	
	<i>Lotus cytisoides</i>	
	<i>Psoralea bituminosa</i>	
<i>Sedum sedifforme</i>		
Steppic plants	<i>Brachypodium retusum</i>	
	<i>Dactylic hispanica</i>	
	<i>Hyparrhenia hirta</i>	
	<i>Melica arrecta</i>	
	<i>Asphodelus aestivus</i>	
	<i>Narcissus serotinus</i>	
	<i>Scilla sicula</i>	RDB 38, Siculo-Maltese endemic
	<i>Urginea pancracion</i>	RDB 38
	<i>Anacamptis pyramidalis</i>	
	<i>Anacamptis urvilleana</i>	RDB 47, endemic
	<i>Ophrys bombyliflora</i>	
	<i>Ophrys fusca</i>	
	<i>Ophrys lutea</i> subsp. <i>minor</i>	RDB 48
	<i>Ophrys</i> sp.nov. [ <i>O. sphegodes</i> group]	RDB 48, endemic
	<i>Orchis collina</i>	
	<i>Orchis lacteal</i>	
	<i>Serapias parviflora</i>	

Table 3.1 (contd): Species List at Hagar Qim/Mnajdra Area

<i>Type of Vegetation</i>	<i>Species Name<sup>1</sup></i>	<i>RDB Status<sup>2</sup></i>	
Perennial herbs	<i>Atractylis gummifera</i>	RDB 34	
	<i>Carlina involucrate</i>		
	<i>Plantago serraria</i>		
	<i>Umbilicus horizontalis</i>		
	<i>Diplotaxis tenuifolia</i>		
	<i>Daucus carota</i>		
	<i>Dittrichia viscosa</i>		
	<i>Foeniculum vulgare</i>		
	<i>Hedysarum coronarium</i>		
	<i>Oxalis pes-caprae</i>		
	<i>Salvia verbenaca</i>		
Annual herbs	<i>Hedysarum glomeratum</i>		
	<i>Lotus edulis</i>		
	<i>Tetragonolobus purpureus</i>		
	<i>Avena barbata</i>		
	<i>Avena sterilis</i>		
	<i>Bellis annua</i>		
	<i>Borago officinalis</i>		
	<i>Calendula arvensis</i>		
	<i>Diplotaxis erucoides</i>		
	<i>Echium parviflorum</i>		
	<i>Euphorbia helioscopia</i>		
	<i>Fumaria gaillardottii</i>		
	<i>Galactites tomentosa</i>		
	<i>Hordeum leporinum</i>		
	<i>Lotus ormithopodioides</i>		
	<i>Medicago polymorpha</i>		
	<i>Silene colorata</i>		
Lichens	<i>Cladonia convolute</i>		
	<i>Cladonia rangiformis</i>		
Land gastropods	<i>Eobania vermiculata</i>		
	<i>Helix aspersa</i>		
	<i>Lampedusa (Muticaria) macrostoma oscitans</i>		RDB 85, endemic
	<i>Mastus pupa</i>		RDB 82
	<i>Pomatias sulcatus melitensis</i>		
	<i>Rumina decollate</i>		
	<i>Trochoidea calcarata</i>	RDB 86, endemic	

Source: Lanfranco, E., *Report on the Natural Communities of the Hagar Qim/Mnajdra Site proposed as a Heritage Park with Recommendations*, Malta University Services Ltd, April 1991, Appendices A, B.

- Notes: 1. In Lanfranco's report it is stated that species list is not exhaustive and only the commonest and most significant had been listed.  
2. RDB status refers to Schembri, P.J. and J. Sultana, *Red Data Book for the Maltese Islands*. Department of Information, 1989.

## Policy Framework

4.1 Local Legislation

4.2 Structure Plan Policies

4.3 North West Local Plan

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## 4.1 Local Legislation

### 4.1.1 Cultural Heritage Act, 2002

The protection of the cultural heritage is regulated by the *Cultural Heritage Act*.<sup>83</sup> A central concept of this Act is that heritage is protected and managed more effectively through the active participation of individuals, Non Governmental Organisations and other bodies. The Ministry of Tourism and Culture is legally bound through this act to safeguard Malta's national heritage through better management, with an emphasis on accessibility and interpretation.<sup>84</sup> This act set up the Superintendence of Cultural Heritage, which regulates and supports the management of cultural heritage resources delegated to other bodies. The body that is delegated with the responsibility to manage the Hagar Qim and Mnajdra Heritage Park is Heritage Malta, an agency of government which was also set up by the *Cultural Heritage Act* in order to manage government-owned archaeological sites and makes them accessible to the public.<sup>85</sup>

### 4.1.2 Environment Protection Act, 2001

The protection of the environment is regulated by the *Environment Protection Act*.<sup>86</sup> The Authority responsible for the implementation of this Act is the Malta Environment and Planning Authority (MEPA). The act also obliges the Authority to co-operate with other bodies that are able to contribute to the protection of the environment.

This Act makes wide provisions on the duty of the Government and of the public to protect the environment and to manage it in a sustainable way. Other provisions which are relevant to the management of the park are the protection of biodiversity and all natural resources such as land, water, and landscape.

### 4.1.3 Development Planning Act, 1992

Land-use planning and building is regulated by the *Development Planning Act*.<sup>87</sup> The Malta Environment and Planning Authority (MEPA) is also responsible for the implementation of this Act.

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<sup>83</sup> *Laws of Malta*, Chapter 445.

<sup>84</sup> *Cultural Heritage Act*, 2002, Sections 3-6.

<sup>85</sup> *Ibid.*, Section 8.

<sup>86</sup> *Laws of Malta*, Chapter 435.

<sup>87</sup> *Ibid.*, Chapter 356

## 4.2 Structure Plan Policies

One of the key supporting documents of the *Development Planning Act* is the *Structure Plan for the Maltese Islands*.<sup>88</sup> A number of policies in this Plan make specific reference to, or are directly relevant for, the management of the Hagar Qim and Mnajdra Heritage Park. These are reproduced here for ease of reference.

Policy TOU 11: Government will seek the co-operation of relevant public and private sector agencies to ensure that the Islands' many heritage items are made more accessible and interesting to tourists. Heritage trails will be identified in Local Plans.

Policy TOU 15: The Planning Authority in co-operation with the Secretariat for the Environment and other relevant bodies will define a comprehensive policy for the coastal zone. This policy should aim at enabling Government to:

1. Assess the different components of the coastal zone considered as a unique ecosystem
2. Identify permissible uses, development criteria, and standards
3. Promote and enforce policies
4. Include the coastal zone as an area requiring mandatory Environmental Impact Assessment procedures

Policy REC 12: The owners of all illegal constructed property sited on Government or other land will be served with eviction notices requiring that the offending structures be demolished and the site restored within a period of one year from the serving of the notices. Any structure remaining on expiry of the notice will be demolished and the site restored at the occupier's expense. No fines will be imposed on illegal occupiers and no compensation will be payable to them.

Policy ARC 2: Protection rating Class A means Top priority conservation. No development to be allowed which would adversely affect the natural setting of these monuments or sites. A minimum buffer zone of at least 100m around the periphery of the site will be established in which no development will be allowed.

Policy ARC 3: Applications for planning permission for development affecting ancient monuments and important archaeological areas and sites, including areas and sites having such potential, will normally be refused if there is an overriding case for preservation. Where there is no overriding case for preservation, development of such sites will not

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<sup>88</sup> Ministry for Development of Infrastructure, *Structure Plan for the Maltese Islands*. Planning Services Division, December 1990.

normally be permitted until adequate opportunities have been provided for the recording and, where desirable, the excavation of such sites.

Policy ARC 4: As a matter of priority, the Planning Authority will designate Hagar Qim/Mnajdra and Ggantija as Areas of Archaeological Importance and will collaborate with other agencies to develop them as National Parks.

Policy CZM 3: Public access around the coastline immediately adjacent to the sea or at the top of cliffs (including in bays, harbours, and creeks) will be secured. This will include taking shorelands into public ownership, Government acquisition of illegal developments and encroachments, and suitable construction works. In the few cases where this is not practical (for example where security considerations are paramount), nearby detours will be established. All the coastline will be brought into public ownership within a specified period.

Policy RCO 1: Rural Conservation Areas are designated as Illustrated in the Key Diagram. Within such areas the following sub areas will be designated, using World Conservation Union definitions and criteria where relevant:

1. Areas of Agricultural Value: areas comprised of high-grade agricultural land including irrigated and partially irrigated land
2. Areas of Ecological Importance: relatively large areas designated to protect typical and rare habitats
3. Sites of Scientific Importance: sites containing individual species, groups of species, and geological features
4. Areas of Archaeological Importance: concentrations of valuable archaeological sites
5. Sites of Archaeological Importance: Individual and/or Isolated archaeological sites
6. National Parks: relatively large areas of national significance not materially altered by human use, with managed visitor access and amenities
7. Areas of High Landscape Value

Policy RCO 2: Within Rural Conservation Areas and in accordance with Policy SET 11 no form of urban development will be allowed. However, in accordance with Policy BEN 5, applications for permission to develop structures or facilities essential to agricultural, ecological, or scenic interests will be favourably considered as long as the proposed development does not infringe the principles set out in Policy RCO 4 as subsequently detailed in the relevant Local Plan (Policy RCO 3)...With regard to existing buildings and other structures in Rural Conservation Areas, and other rural areas, the overall aim is to improve the rural environment. To this end the rehabilitation and suitable change of use of



some buildings will be permitted, in conjunction with the removal of other buildings and structures which adversely affect the rural environment.

Policy RCO 4: The Planning Authority will not permit the development of any structure or activity which in the view of the Authority would adversely affect scenic value because it would:

1. Break a presently undisturbed skyline
2. Visually dominate or disrupt its surroundings because of its mass or location
3. Obstruct a pleasant and particularly a panoramic view
4. Adversely affect any element of the visual composition - for example, cause the destruction or deterioration of traditional random stone walls
5. Adversely affect existing trees or shrubs
6. Introduce alien forms, materials, textures, or colours

Policy BEN 15: All buildings and facilities used by the general public will be accessible to self-propelled wheelchair users, and adequate provision allowed for convenient access and parking of vehicles for the physically handicapped. Facilities used by the general public include public transport and pedestrian footpaths.

Policy PUT 7: Water storage reservoirs shall either be located underground or be designed so as to blend to the maximum extent with the landscape.

Policy AHF 4: Soil conservation and soil saving measures will continue to be mandatory on all occasions. Soil replenishment measures will be adopted where there are suitable opportunities.

Policy AHF 7: The removal of visual intrusions in the landscape, the reinstatement and maintenance of random stone boundary walls, and the establishment of rights of way will be a condition of development permits.

### 4.3 North West Local Plan<sup>89</sup>

The *North West Local Plan* makes a number of provisions for the future of the Hagar Qim and Mnajdra Heritage Park. Detailed recommendations are made for the safeguarding of the Park, through the prevention of conflicting land uses such as quarrying or building<sup>90</sup>

Hagar Qim and Mnajdra form one of the most important, yet most threatened, cultural landscapes in the plan area. Threatened by quarrying, it is essential that this is not allowed to extend any further in their direction, while the restoration of existing quarried land is needed.

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<sup>89</sup> PMPDU, MEPA, *North West Local Plan*, Public Consultation Draft Revised. September 2004.

<sup>90</sup> *Ibid.*, para. 13.6.19 and 13.6.20.

Additionally there is good reason for a total shooting and trapping exclusion zone in the vicinity of the temples; shooting and trapping create a frequent distraction to visitors together with the unsightly structures and graffiti which accompanies it. The incongruous cafe and boundary fence also detract from the appreciation of their setting and landscape context. The overall objective to be achieved by designation and management is to safeguard the areas and features of cultural value and maintain and enhance landscape character and quality and promote a greater understanding and appreciation of the temples in the community and for the visitors.

The temples require explanation and interpretation for the visitor to appreciate their significance. The present treatment does not do justice to their historical and cultural importance nor to their potential for attracting visitors. Measures needed to improve presentation and interpretation of the temples include:-

- (i) More space around them, so that existing boundary fences can be moved well back from the features themselves, allowing them to be viewed in relation to the surrounding landscape;
- (ii) Well designed footpaths allowing all round viewing of the features with information points on boards; and
- (iii) Indoor interpretation facilities in order to give visitors a picture of what these features, and their surroundings looked like in the past.

Map 2 of the Local Plan designates the area as an Area of High Landscape and Conservation Value and establishes it part of the Country Parkways. This implies that "MEPA will not permit the development of any structure or activity which in the opinion of the authority would adversely affect the scenic value of the landscape or setting of the cliffs."<sup>91</sup> Map 17 establishes the area as a Protected Landscape and establishes the coastal cliffs as Areas of Ecological Importance Level 2 and further inland as Level 3. Map 18 establishes the main cultural features of the area as Class A Archaeological Sites and the entire area as part of Natura 2000 Sites, that is part of the network of Special Areas of Conservation. Map 22 establishes the ecological parts of the Park as garigue. Map 5 indicates that the mineral extraction sites in the vicinity to the Park are now Disused Quarries. Map 23 establishes the coastal cliffs as Marine Conservation Area and the entire area as a Coastal Zone Management Area. Map 72 is the Policy Map specifically on the Hagar Qim and Mnajdra Temples; it delineates the boundaries of the Heritage Park and the Archaeological Park within same.

Policy NWLA 1: Designated areas of scenic, cultural and scientific importance will be protected, maintained and enhanced through the exercise of strict control over development and the introduction of countryside management measures. Emphasis will be given to their appreciation by the community and promotion of their qualities.

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<sup>91</sup> *Ibid.*, para. 15.7.5.

Policy NWLA 2: MEPA will not permit the development of any inappropriate structures or activities which in the opinion of the Authority would adversely affect designated Areas of High Landscape Value at ... Coastal Cliffs...

Policy NWLA 4: The Hagar Qim and Mnajdra Area...are identified as a Landscape of Cultural Value of National Significance...for recognition as Protected Landscape Areas under the I.U.C.N. Protected Area Management Category 5.

MEPA will encourage the Superintendence of Cultural Heritage, Local Councils and other relevant agencies to initiate management plans to identify the measure of protection and enhancement to be adopted with respect to the various uses and activities.

Policy NWCO 4: Areas and sites of Archaeological Importance...are designated to regulate their conservation in accordance with Section 46 of the Development Planning Act (1992), and development will only be permitted where it accords with specific criteria for SSIs Level 1-4 as stated in this policy.

Protection Rating Class A: No development will be permitted which would adversely affect the monument or site or its setting. A minimum buffer zone of at least 100m around the periphery of the site will be established in which no such development will be allowed.

Policy NWCO 13: Wherever possible, MEPA will protect areas of garrigue...from activities that create adverse impact. The illegal deposit of soil, or the use for off-roading on such areas will not be permitted.

Policy NWQD 1: The area from Ghar Lapsi to Wied iz-Zurrieq will be designated as a Heritage Park...in order to protect and enhance Hagar Qim and Mnajdra temples and their setting.

MEPA in conjunction with the Superintendence of Cultural Heritage and other appropriate Government agencies, will encourage the preparation of a Management Plan including a programme for implementation for the Heritage Park. Interested parties will be encouraged to:

- (i) enhance the setting through measures such as clearing illegal structures and restoring degraded land;
- (ii) improve facilities at the Temples and other archaeological, ecological or scientific areas within the Heritage Park by providing sensitively designed and located information boards and a suitably located interpretation centre;
- (iii) identify a Heritage Trail; and
- (iv) undertake restoration work on the watch tower.

Policy NWQD 2: Within the Heritage Park...an area of land...has been allocated for an Archaeological Park in order to protect the isolation and settings of the Temples.

## Assessment of Environmental Impacts

- 5.1 Introduction
  - 5.2 Visual Impact
  - 5.3 Microclimatic Changes
  - 5.4 Hydrological Impacts
  - 5.5 Effects on Flora, Fauna, Soils and Agriculture
  - 5.6 Social Impacts
  - 5.7 Light Pollution
  - 5.8 Other Considerations
  - 5.9 Concluding Remark
-

## 5.1 Introduction

A number of impacts on the existing environs may be identified. Some are short-term, mainly those during construction, and others long term, mainly related once project is completed and in operation. These impacts vary from effects from visitor flow to nuisance caused to same. Major impacts envisaged are visual, hydrological, ecological and on the present building fabric of the temple structures, with possible impacts on the socio-economic fabric of the area. This section is a brief assessment of possible impacts ensuing from the proposal.

## 5.2 Visual Impact

Reference is made to the computer generated views of the proposed developments within the existing landscape (Appendix A3). The silhouette of Hagar Qim can be seen from the coastal road, as well as from the parking area and the upper floor of the Visitors' Centre. Between the Visitors' Centre and the area of Mnajdra and the Misqa Tanks there is no mutual visual communication, as can be proven by 3-D modelling. All sites can be viewed from vessels passing along the coast.

The new Visitors' Centre, as well as the parking areas, are visible from the plateau in front of the Hagar Qim temple, but remain hidden behind the hill of Hagar Qim. From distant views onto the coast, the two storey structure of the Visitors' Centre will be covered by the building and the garden of the existing restaurant. The Visitors' Centre is intended to be seen from the coastal road, but with its low profile it does not enter in competition with the Hagar Qim silhouette. In profile, its roof level is lower than the lower roof level of the existing restaurant. The subdivision into two staggered volumes, the careful terracing up of the outdoor spaces, and the integration of the existing dry stone walls make it appear embedded in the landscape.

The upgrading of the paths and walkways, and fences represents no significant alteration to the existing landscape. In order to fulfil their purpose, the three orientation cubes have to be visible in the landscape, without causing disturbances. The two new guard's cubes, similar in size, replace the existing ones (Drawing 17\_04\_2 and Appendix A3).

The membrane structures will be visible from the site as well as from the coast. The translucent textile structure avoids any type of disturbing reflection of sunlight and adapts, to a certain degree, to the quality of the surrounding daylight. The covered area is minimised to the surface needed for a good sheltering performance, and is carefully shaped in order to leave the important temple axes open. Thus the equinox events, and the very special relationship between temple astronomical configurations and landscape

can still be experienced by the visitor. At night, only the occupied guard's cubes will be lit, the shock lighting at the fence and within the temple shelter will only be activated in case of an intrusion or suspected intrusion. Therefore, at night, the shelter structures will be visible in the moonlight, but there is no further light pollution intended.

### 5.3 Microclimatic Changes

Risks that must be avoided in the microclimate within the sheltered environs are<sup>92</sup>

- a. a significant increase in temperature,
- b. more pronounced heating and cooling cycles,
- c. a significant increase in relative humidity,
- d. wind tunnelling effects,
- e. condensation induction on or within the megaliths or within the structure itself,
- f. rapid drying out of the megaliths and/or the ground, and
- g. an increase in biological growth.

Monitoring of the micro-climate under the protective shelters is essential since the proposed shelters are meant to improve the micro-climate by reducing cycles of change of temperature and wetting and drying cycles, which would lessen the deterioration of the megaliths. There is already a weather station, part of a UNESCO grant, at Hagar Qim temples.<sup>93</sup> This data capture has to be complemented with other forms of data capture at other points of the archaeological remains.<sup>94</sup> The performance of the proposed protective shelter must be monitored through data capture of weather variables such as wind velocity, air temperature and relative humidity.<sup>95</sup> The first complete annual cycle of intensive environmental monitoring will be completed before the installation of the shelters.

### 5.4 Hydrological Impacts

The total roof area of the proposed Visitors' Centre is 690m<sup>2</sup>. Of this area, 390m<sup>2</sup> is presently surfaced with tarmac. The increase in roof area is therefore 300m<sup>2</sup>. The run-off from the car-park is presently directed towards the underground reservoir beneath its eastern end. Surplus surface runoff from the proposed Centre would be managed in the

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<sup>92</sup> Museums Department, *Hagar Qim and Mnajdra Heritage Park: Briefs for Visitors' Centre and Protective Shelters for Hagar Qim and Mnajdra Temple Complexes*, October 2001, unpublished document, Part 3, Section 5.3, Part 4, Section 5.3.

<sup>93</sup> Scientific Committee on the Conservation of Megalithic Temples, Interim Report, June-November 2000. Scientific Committee on the Conservation of Megalithic Temples, *Report on Proceedings*, May 2001, Section 3.4. It should be noted that the weather station at Hagar Qim had installation problems and advice had to be sought from TBA Periti.

<sup>94</sup> Museums Department, *Hagar Qim and Mnajdra Heritage Park: Briefs for Visitors' Centre and Protective Shelters for Hagar Qim and Mnajdra Temple Complexes*, October 2001, unpublished document, Part 3, Section 5.7, Part 4, Section 5.7.

<sup>95</sup> *Ibid.*, Part 3, Section 5.7, Part 4, Section 5.7.

same manner. No direct impacts on the hydrology of the area are envisaged from the construction of the Visitors' Centre.

The Heritage Park does not need a specific surface drainage system, apart from the sloping area, north of the Mnajdra Temple Complex, where special measures against the current gully erosion will be undertaken. However, the membrane structures protecting the temples will act as water collectors. In order to avoid damage resulting from the accumulation of water on either side of the elevated arch construction, and the subsequent ponding of the temple site, rainwater will be guided to the several tension anchorage points of the membrane surface, in appropriate tubes and will be dispersed into areas where it can do minimal damage.

In the case of Hagar Qim temple, with a membrane covering an area of 1,485m<sup>2</sup>, the water from the membrane section facing west will be dispersed and guided to the lower parts of the slope, whilst the water from the membrane section facing east will be collected and guided into the existing underground reservoir in the car park. In the case of the Mnajdra temples, with a membrane covering an area of 2,322m<sup>2</sup>, the water will be guided on both sides to the rocky land towards the sea.

## 5.5 Effects on Flora, Fauna, Soils and Agriculture

### 5.5.1 Impacts due to Surface Runoff

The Visitors' Centre has been sited on land that had already been committed as a parking site. Therefore no negative impacts on living organisms are envisaged; only a limited amount of rainwater from the roof may find its way to adjacent agricultural land. With respect to the protective shelters, surface runoffs generated by the tent structures have to be managed due to the significant surface areas of the latter. Percolation over these areas is eliminated whilst all rainwater will find its way to the sea. Given the significant volumes of surface runoff generated, this will interfere with existing flora and fauna and dramatically increases soil erosion, unless adequate surface water management is practised. Soil erosion due to increased rate of surface runoff from the protective shelters will be most significant at Mnajdra.

### 5.5.2 Visitor Impact

The land around Hagar Qim and Mnajdra is a public open space popular for recreation. Although the promotion of the Heritage Park may attract a greater number of visitors, the site is threshold limited. Unless visitor flow is not adequately managed, visitor impact on

the broader landscape may reach significant levels, resulting in rapid degradation of the steppic vegetation of the area.<sup>96</sup>

## 5.6 Social Impacts

### 5.6.1 Trapping and Hunting Activities

A significant impact on the social use of the area is bird hunting and trapping. The issue of hideouts and other structures used for bird trapping needs to be addressed in the management plan for the area.

### 5.6.2 Tenancy

Around fifty hides with clearings for traditional bird trapping were recorded within the Heritage Park when the expropriation of this area was initiated. The individuals using these hides have often claimed that they were recognised as rent paying tenants by the previous owners of the land. Some individuals may still be paying rent for plots on the part of the property which formerly belonged to the Church, and which was transferred to the Joint Office. Partly as a result of this problem, and partly because of the unresolved land ownership issues noted above, the veracity of these claims still needs to be fully assessed.

## 5.7 Light Pollution<sup>97</sup>

The park represents one of the larger stretches of coastal landscape that is free of roads and buildings. Levels of light pollution have consequently been very low. The installation of lighting around Hagar Qim has become necessary to improve the security of these sites. All possible measures will be taken to mitigate the light pollution that this may cause, such as grilles and hoods over lighting units, as well as motion-sensors which activate lights only when there is the possibility of an intrusion.

## 5.8 Other Considerations

The protective shelters may act as a nesting site for birds. Their acidic droppings may easily become a new conservation threat if they are not prevented from nesting on site. The protective shelter must be designed to discourage bird nesting.<sup>98</sup>

No harmful emissions will ensue from the Visitors' Centre. Although it includes a kitchen and a small catering unit, no food preparation will be undertaken within the Centre. Thus food related odours and emissions will not be an issue.

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<sup>96</sup> Museums Department, *Hagar Qim & Mnajdra Heritage Park: Management Plan, 2<sup>nd</sup> Draft*, September 2002, Section 8.2.

<sup>97</sup> *Ibid.*, Section 8.3.

<sup>98</sup> Museums Department, *Hagar Qim and Mnajdra Heritage Park: Briefs for Visitors' Centre and Protective Shelters for Hagar Qim and Mnajdra Temple Complexes*, October 2001, unpublished document, Part 3, Section 5.3, Part 4, Section 5.3.



Whilst the foundation designs for the Visitors' Centre and Protective Shelters are such to minimise impact on existing terrain, excavation will be required for services such as water, electricity and sewerage disposal, and for the lift shaft. A septic tank and a substation, or upgrading the existing one, if necessary, is mandatory.

## 5.9 Concluding Remark

Any negative impacts on environment are justified by:<sup>99</sup>

- a. the mitigation or elimination of major sources of degradation on the site;
- b. the preservation of the outstanding archaeological monuments for the enjoyment of present and future generations; and
- c. the promotion of cultural and environmental appreciation through proper interpretation facilities, with particular emphasis on tourism and local education sectors.

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<sup>99</sup> European Regional Development Fund (ERDF) Malta Objective 1 Programme 2004-2006. Application Form

Section

6

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## Mitigation and Monitoring Strategy

6.1 Mitigation Strategy

6.2 Monitoring Strategy

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## 6.1 Mitigation Strategy

### 6.1.1 Visual Mitigation

#### 6.1.1.1 Protective Shelters

The visual impact of the protective shelter on the surrounding landscape and on the site itself is an important consideration. For this reason it is imperative that:<sup>100</sup>

- a. all the components of the protective shelters are easily and immediately recognizable as contemporary interventions;
- b. key viewpoints are not obstructed and axes of visibility are respected for an excellent visitor experience;
- c. the general visual impact of the shelter from within the site must also respect the site itself; and
- d. the position of Hagar Qim on a crest and Mnajdra on a hollow at the edge of a cliff are taken into account when designing the profiles of the structure. Thus the massing and volume of the structure on the landscape will be kept to a minimum. The structure must, where possible, merge with the apparent horizons from different approaches. The slope of the landscape will also be exploited creatively to minimise the arc of view taken up by the structure when approached from the outside.

#### 6.1.1.2 Landscaping

In the *Report on the Natural Communities of the Hagar Qim/Mnajdra Site proposed as a Heritage Park with Recommendations*, Lanfranco had brought a number of recommendations if landscaping is meditated. These include the following:<sup>101</sup>

- a. Planting of large trees should be avoid since they detract from the imposing effect of the temples and may induce degradation of the garigue and Cliffside habitats

...A site which is in its natural state cannot be enhanced further and tampering with it will most likely lead to its degradation...

- b. Removal of trapping sites since trapping activity has inherent negative visual, social and ecological impacts; rehabilitation should be carried out in the stead of the trapping ranges using native shrubs such as *Erica multiflora*, *Euphorbia*

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<sup>100</sup> Museums Department, *Hagar Qim and Mnajdra Heritage Park: Briefs for Visitors' Centre and Protective Shelters for Hagar Qim and Mnajdra Temple Complexes*, October 2001, unpublished document, Part 3, Section 5.4, Part 4, Section 5.4.

<sup>101</sup> Lanfranco, E., *Report on the Natural Communities of the Hagar Qim/Mnajdra Site proposed as a Heritage Park with Recommendations*, Malta University Services Ltd, April 1991, Section 4.

*melitensis*, *Periploca angustifolia*, *Euphorbia dendroides*, *Thymus capitatus*, *Anthyllis hermanniae*, *Triadenia aegyptica* and *Convolvulus oleifolius*;

- c. Any soft landscaping should consist of native trees in the area near Hagar Qim and Misqa tanks, where soil is deep; such trees may include *Ceratonia siliqua*, *Olea europea*, *Pinus halepensis*, *Myrtus communis*, *Tetraclinis articulata* and *Quercus ilex*. In more steppic conditions, shrubs should be used such as the species mentioned in (b) above; *Euphorbia dendroides* and *Periploca angustifolia* tend to favour slopes while *Triadenia aegyptica* favours clifftops. Another shrub that should be introduced is *Chamaerops humilis*;
- d. Footpaths should not be wider than 1m made of stone slabs to avoid undue damage to natural habitats; and
- e. A rock garden with labelled species in the area near Hagar Qim should be favourably contemplated.

### 6.1.2 Mitigation of Visitor Impact

The project will mitigate visitor impact through improved management of the visitor flow to the Park (Section 2.8.2). It is intended to improve the management of coach groups, which constitute the greater part of the visitor flow at present (Table 2.4). The proposed Visitors' Centre is intended to act as a holding area that helps manage and filter the flow of visitors into the park.

### 6.1.3 Hydrological Mitigation

A thorough study of the impacts of the surface runoff on the ecological systems of the terrain is recommended. Surface runoff can be eliminated by a thorough water drainage design of the protective shelters and around the site, taking into account runoff patterns and watersheds. The protective shelter will be collecting a considerable body of water on its surface during rainstorms and hence the drainage of this water must be carefully managed, without posing a threat to the main or subsidiary structures at Hagar Qim and Mnajdra, or to the stability of the shelter itself, or to visitor flow.<sup>102</sup>

### 6.1.4 Light Pollution

Security lighting will be installed along the perimeter fence of the two temple structures. This will be motion activated so as to limit light pollution as much as possible.

### 6.1.5 Short Term Social Mitigation Measure

The following conditions should be endorsed in the Construction Plan (Section 2.7):

- a. Car park

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<sup>102</sup> Museums Department, *Hagar Qim and Mnajdra Heritage Park: Briefs for Visitors' Centre and Protective Shelters for Hagar Qim and Mnajdra Temple Complexes*, October 2001, unpublished document, Part 3, Sections 4 and 5, Part 4, Sections 4 and 5.

- (i) The middle level of the car park may be kept closed to visitors indefinitely.
  - (ii) Access for cars to the upper level of the car park and access to the existing restaurant shall be kept open at all times, and restrictions shall be kept to a minimum.
  - (iii) Five of the nine parking bays for coaches in the lower car park shall remain usable at all time.
  - (iv) Access for cars to the area adjacent to coach parking on lower level may be closed.
- b. Visitor flow
- (i) Interruptions to the visitor flow to the temple sites during the construction of the Visitor Centre shall be kept to a minimum.
  - (ii) Safe access routes shall be kept between the parts of the car park that are in use, and Hagar Qim and Mnajdra.
  - (iii) The erection of the Protective Shelters will require the closure of the site, or of parts of the site.

### 6.1.6 Infrastructure

No fresh water and sewer disposal system are needed within the Heritage Park in general and in the protective shelters in particular. However, at the Mnajdra site, a portable toilet will be provided for the staff, and for emergency situations. With respect to the Visitors' Centre, a new water main is required. To avoid disturbance of archaeological deposits, this may be laid in existing trenches. A sewage disposal system<sup>103</sup> will be dimensioned according to the following standards: average consumption of 20 to 40 litres of potable water per visiting person. In addition, water for cleaning purposes and for the landscaping irrigation will also be required. Given that the public sewer lies 1.2km away from the proposed Visitors' Centre, foul water from same will be directed into a septic tank system, at the entrance to the parking area, the lowest point of the site, and which has to be periodically emptied.

## 6.2 Monitoring Strategy

### 6.2.1 Objectives

The aim of monitoring is two-fold:

- a. the need to identify unknown factors in the deterioration of temple structures and
- b. the need to determine the efficacy of the implemented proposal.

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<sup>103</sup> The sewage disposal system has to cater for foul water from 15 No. water closets, 5 No. urinals, 14 No. wash hand basins, 1 No. shower, and the kitchen and bar facilities.

## 6.2.2 Setting up of a Conservation Monitoring Programme

The establishment of a conservation monitoring programme is a high priority. This should make provision for the monitoring of:<sup>104</sup>

- a. the micro-climate at both sites (local wind-speed, wind direction, rainfall intensity, insolation, air temperature and humidity, and surface temperature and humidity at critical locations);
- b. vibration and displacement on critical megaliths, including accelerometers and similar sensors; and
- c. surface deterioration of the megaliths.

## 6.2.3 Infrastructure for Effective Project Monitoring

The project will be monitored on a number of levels. Heritage Malta has the responsibility of Implementing Agency, and is responsible to ensure that the project is delivered to budget and on schedule. The Ministry of Tourism and Culture is also closely supporting and monitoring the project. The Superintendence of Cultural Heritage will monitor and advise on all impacts on the cultural heritage as defined in the *Cultural Heritage Act, 2002*. The Malta Tourism Authority is an active partner that will monitor the effects on visitor perceptions of the experience that is offered.

Progress is also carefully monitored by the Projects and Priorities Co-ordination Directorate (PPCD) in the Office of the Prime Minister. Procurement procedures are monitored by the European Union Unit in the Department of Contracts, while the Ministry of Finance is scrutinising the project in its role as Paying Authority.

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<sup>104</sup> Museums Department, *Hagar Qim & Mnajdra Heritage Park: Management Plan, 2<sup>nd</sup> Draft*, September 2002, Section 9.



← **Photo 1:** View of Hagar Qim Temple Complex



**Photo 2:** Close up of part of elevation of Mnajdra Temple Complex →



← **Photo 3:** Misqa Prehistoric Tanks on the promontory north of Mnajdra Temples



**Photo 4:** Existing pathway from Hagar Qim to Mnajdra (indicated by arrow) →



← **Photo 5:** The island of Filfla from the cliffs off the south of Mnajdra

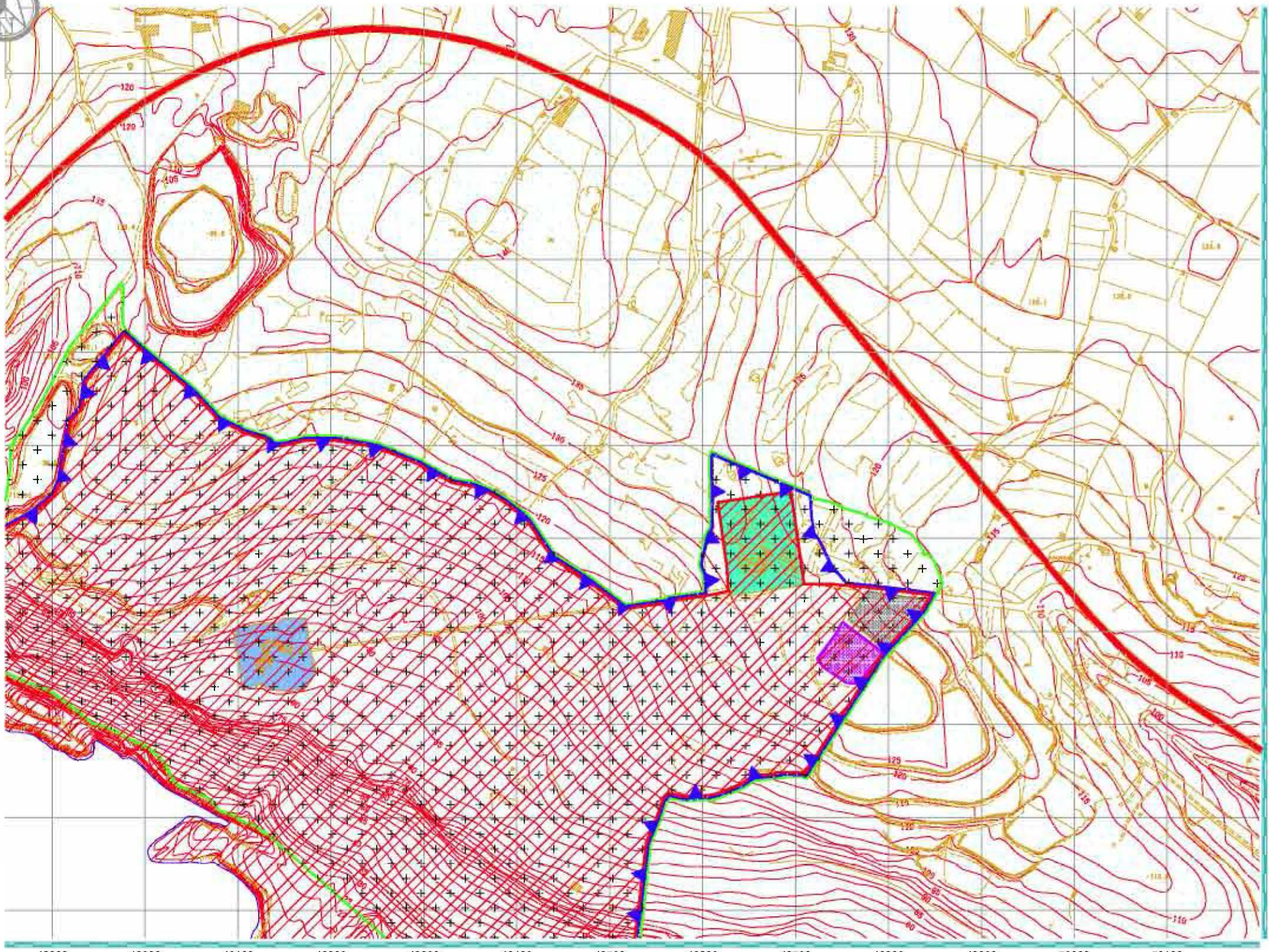


**Photo 6:** The gentle sloping topography towards the coastal cliff. Hamrija watchtower (circled) seen in silhouette →



← **Photo 7:** View from the grounds of Mnajdra (left): Hagar Qim precints at the far centre (indicated by arrow) and Hamrija watchtower on the far right (circled)





GENERAL

-  HAGAR QIM
-  MNAJDRA
-  PANORAMIC ROAD

PLANNING PERMIT PA 5390/94, 1995 <sup>1</sup>

-  LIMITS OF HERITAGE PARK
-  PRESENT CARPARK
-  LOCATION OF VISITOR CENTRE

INTERNATIONAL COMPETITION, 2003 <sup>2</sup>

-  COMPETITION AREA

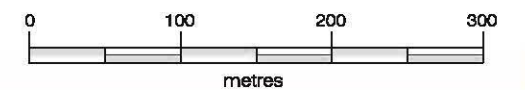
NORTH WEST LOCAL PLAN, 2004 <sup>3</sup>

-  HERITAGE PARK
-  ARCHAEOLOGICAL PARK

1. Planning Authority approved drawing PA 5390/94/1H.
2. Ministry for Youth and the Arts, *Hagar Qim and Mnejdra Heritage Park: International Design Competition*, November 2003, General Area Plan HMP 6.
3. Malta Environment and Planning Authority, *Draft North West Local Plan (Maps)*, August 2004, Map 72.

Map is indicative only, not to be used for measurement or direct interpretation.

Based on 1988 Planning Directorate survey sheets nos 4864, 4865, 5084 and 5085. Scale 1:2500, August 1988 aerial survey.



DRAWING TITLE :  
HERITAGE PARK BOUNDARY

SCALE:  
1:5,000

DATE:  
December '04

DRAWING NO :  
17\_04\_1



**LINO BIANCO & Associates**  
99, Triq Censu Bugeja, Hamrun HMR 10, Malta  
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IN COLLABORATION WITH



**Heritage Malta**

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Tel.: (356) 2295 4000 Fax: (356) 2122 2900

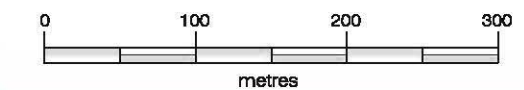
PROJECT TITLE :

**HAGAR QIM AND MNAJDRA TEMPLES  
CONSERVATION AND INTERPRETATION PROJECT**

GENERAL

- HAGAR QIM
- MNAJDRA
- PROPOSED VISITOR CENTRE AND CARPARK
- GUARD'S CONTROL POST
- ORIENTATION CUBE
- ORIENTATION PANEL
- EXISTING PATHWAY
- PANORAMIC ROAD
- PRESENT VEHICULAR ACCESS TO HAGAR QIM FROM PANORAMIC ROAD

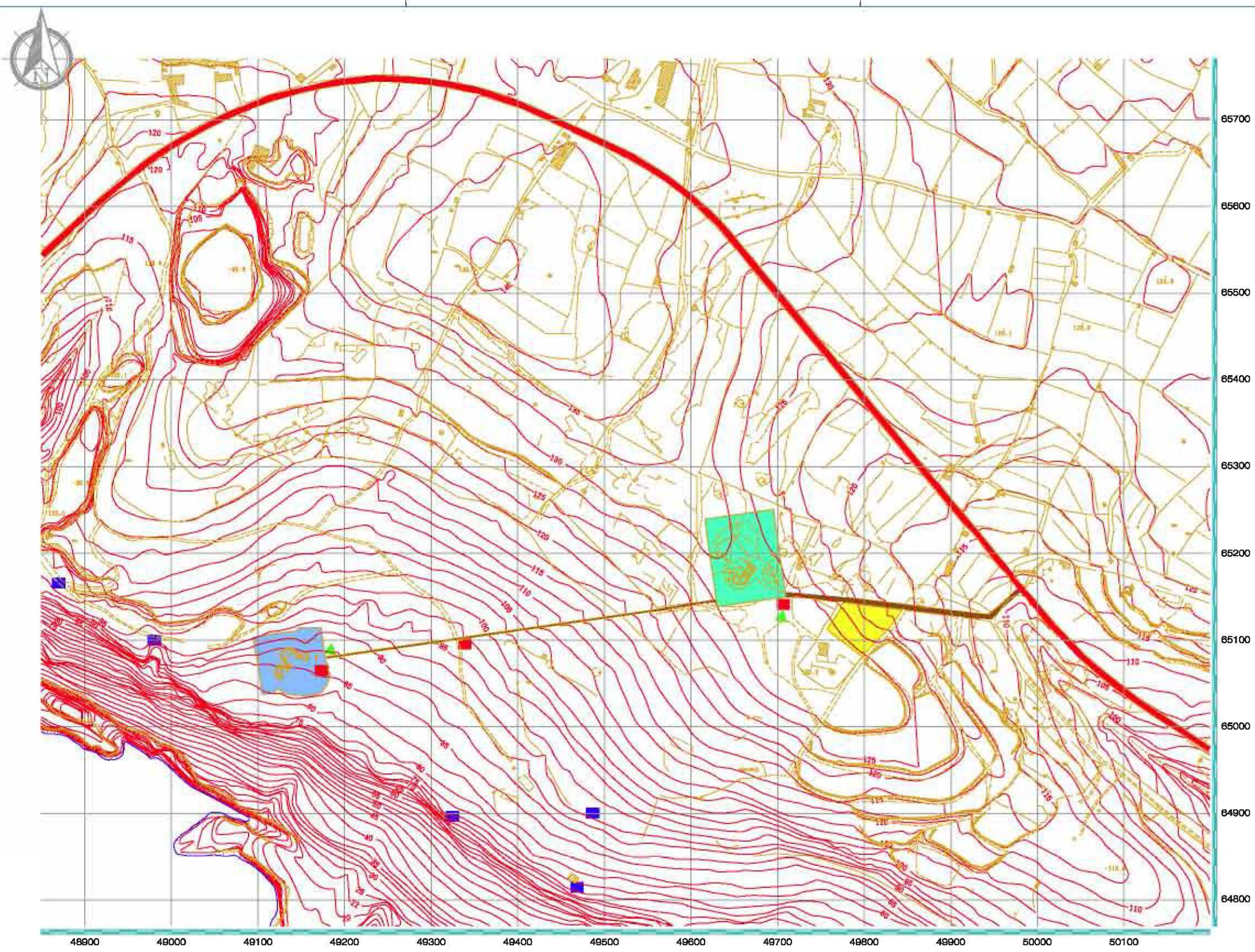
Map is indicative only, not to be used for measurement or direct interpretation.  
 Based on 1988 Planning Directorate survey sheets nos 4864, 4865, 5084 and 5085. Scale 1:2500, August 1988 aerial survey.



DRAWING TITLE :  
 SITE LOCATION PLAN

SCALE: 1:5,000	DATE: December '04
-------------------	-----------------------

DRAWING NO.:  
 17\_04\_2




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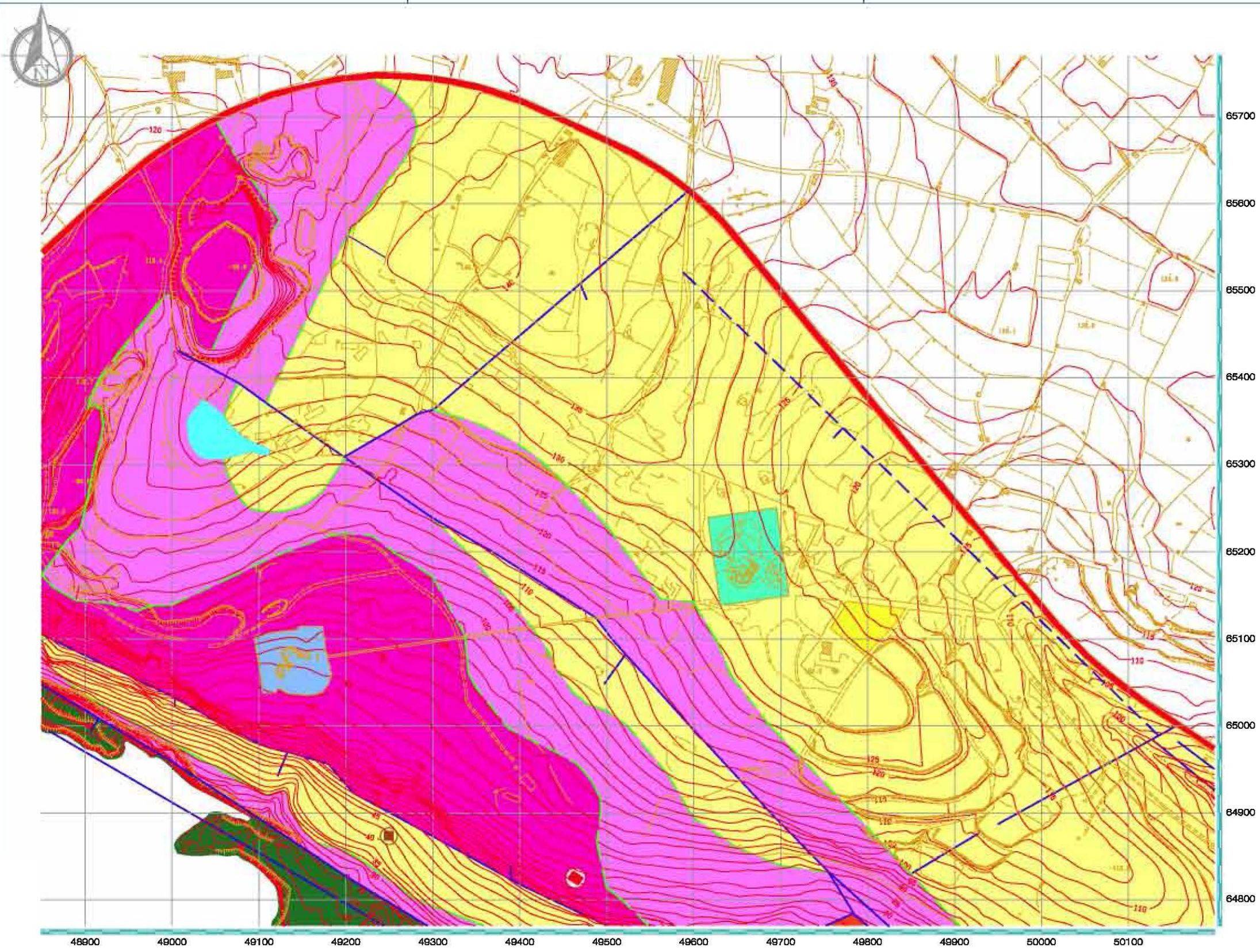
IN COLLABORATION WITH



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 Tel.: (356) 2295 4000 Fax: (356) 2122 2900

PROJECT TITLE :  
**HAGAR QIM AND MNAJDRA TEMPLES  
 CONSERVATION AND INTERPRETATION PROJECT**

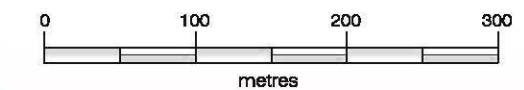


- GENERAL AND CULTURAL**
- HAGAR QIM
  - MNAJDRA
  - PROPOSED VISITOR CENTRE AND CARPARK
  - PANORAMIC ROAD
  - GOVERNER CONGRAVE MEMORIAL (GN No 241/97)
  - MISQA TANKS (GN No 241/97)
  - IT-TORRI TAL-HAMRIJA, TA' HAGAR QIM (GN No 729/95)
- UPPER CORALLINE LIMESTONE FORMATION**
- GEBEL IMBARK MEMBER
- GLOBIGERINA LIMESTONE FORMATION**
- MIDDLE GLOBIGERINA LIMESTONE MEMBER
  - LOWER GLOBIGERINA LIMESTONE MEMBER
- LOWER CORALLINE LIMESTONE FORMATION**
- XLENDI MEMBER
  - ATTARD MEMBER
- STRATIGRAPHICAL BOUNDARIES
  - FAULTS

Based on the *Geological Map of the Maltese Islands*, Office of the Prime Minister, Sheet 1, Scale 1:25,000, 1993.

Map is indicative only; not to be used for measurement or direct interpretation.

Based on 1988 Planning Directorate survey sheets nos 4864, 4865, 5064 and 5065. Scale 1:2500, August 1988 aerial survey.




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PROJECT TITLE :

**HAGAR QIM AND MNAJDRA TEMPLES  
 CONSERVATION AND INTERPRETATION PROJECT**

DRAWING TITLE :

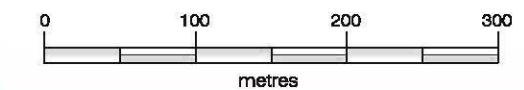
**GEOCULTURE**

SCALE: 1:5,000	DATE: December '04
DRAWING NO.:	
17_04_3	

GENERAL

- HAGAR QIM
- MNAJDRA
- PROPOSED VISITOR CENTRE AND CARPARK
- EXISTING PATHWAY
- PANORAMIC ROAD
- PRESENT VEHICULAR ACCESS TO HAGAR QIM FROM PANORAMIC ROAD
- OTHER SIGNIFICANT CULTURAL FEATURES
- AGRARIAN LAND
- GARIGUE/STEPPE/OLD MINERAL WORKINGS
- RECENT MINERAL WORKINGS
- BIRD TRAPPING SITES
- COMMERCIAL ESTABLISHMENTS
- EXISTING FOOTPATHS

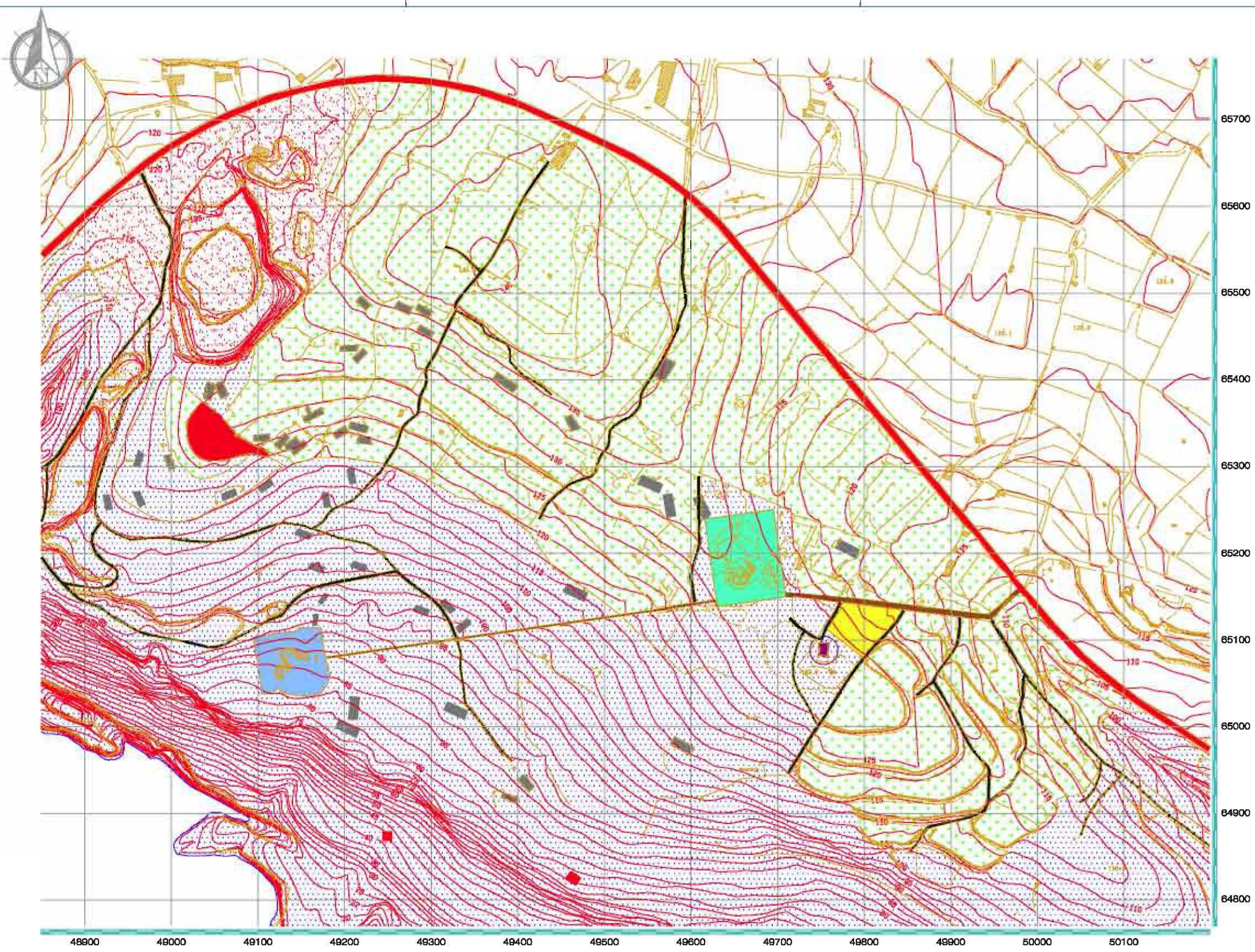
Map is indicative only, not to be used for measurement or direct interpretation.  
 Based on 1988 Planning Directorate survey sheets nos 4864, 4865, 5084 and 5085. Scale 1:2500, August 1988 aerial survey.



DRAWING TITLE :  
 LANDUSE

SCALE: 1:5,000      DATE: December '04

DRAWING NO.:  
 17\_04\_4

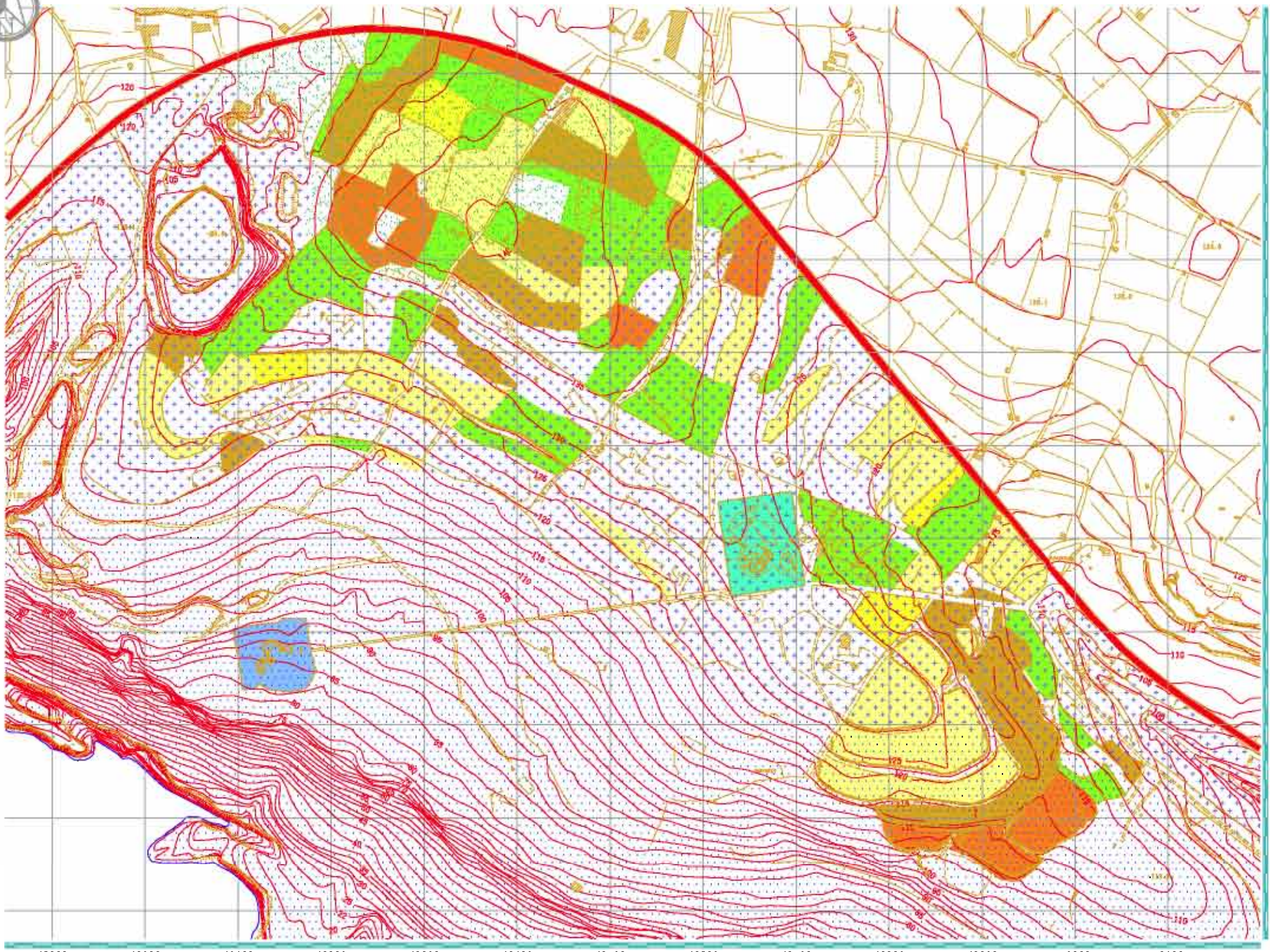


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PROJECT TITLE :  
**HAGAR QIM AND MNAJDRA TEMPLES  
 CONSERVATION AND INTERPRETATION PROJECT**



GENERAL

- HAGAR QIM
- MNAJDRA
- PROPOSED VISITOR CENTRE AND CARPARK
- PANORAMIC ROAD

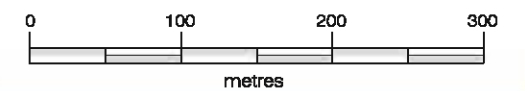
AGRICULTURE

- AGRICULTURE WITH SIGNIFICANT AREAS OF NATURAL VEGETATION
- COMPLEX CULTIVATION PATTERNS
- IRRIGATED LAND
- NON-IRRIGATED ARABLE LAND
- PASTURES

SOILS TYPES

- XERORENDZINAS: TAL-BARRANI SERIES
- TERRA SOILS: XAGHRA SERIES
- SOIL COMPLEX: L-INGLIN COMPLEX

Agricultural mapping based on National Office of Statistics survey for 2000-2001.  
 Soil mapping based on D. M. Lang, *Soils of Malta and Gozo*, HMSO, 1958.  
 Map is indicative only; not to be used for measurement or direct interpretation.  
 Based on 1988 Planning Directorate survey sheets nos 4864, 4865, 5084 and 5085. Scale 1:2500, August 1988 aerial survey.



DRAWING TITLE :  
 AGRICULTURE AND SOILS

SCALE:  
 1:5,000

DATE:  
 December '04

DRAWING NO. :  
 17\_04\_5



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PROJECT TITLE :

**HAGAR QIM AND MNAJDRA TEMPLES  
 CONSERVATION AND INTERPRETATION PROJECT**

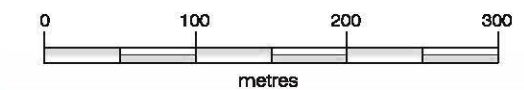
GENERAL

-  HAGAR QIM
-  MNAJDRA
-  PROPOSED VISITOR CENTRE AND CARPARK
-  PANORAMIC ROAD
-  PRESENT VEHICULAR ACCESS TO HAGAR QIM FROM PANORAMIC ROAD
-  STUDY AREA UNDERTAKEN BY LANFRANCO, 1991
-  ARABLE / FALLOW
-  ARCHEOLOGICAL SITES / PATHS
-  CLIFFSIDE VEGETATION
-  DISTURBED GROUND
-  TRAPPING RANGES
-  TREES
-  QUARRIED SITES
-  LOW GARIGUE / STONY STEPPE
-  HIGHER GARIGUE

Mapping undertaken and produced by E. Lanfranco, *Report on the Natural Communities of the Hagar Qim/Mnajdra site proposed as a Heritage Park with recommendations*, Malta University Services Ltd., April 1991.

Map is indicative only; not to be used for measurement or direct interpretation.

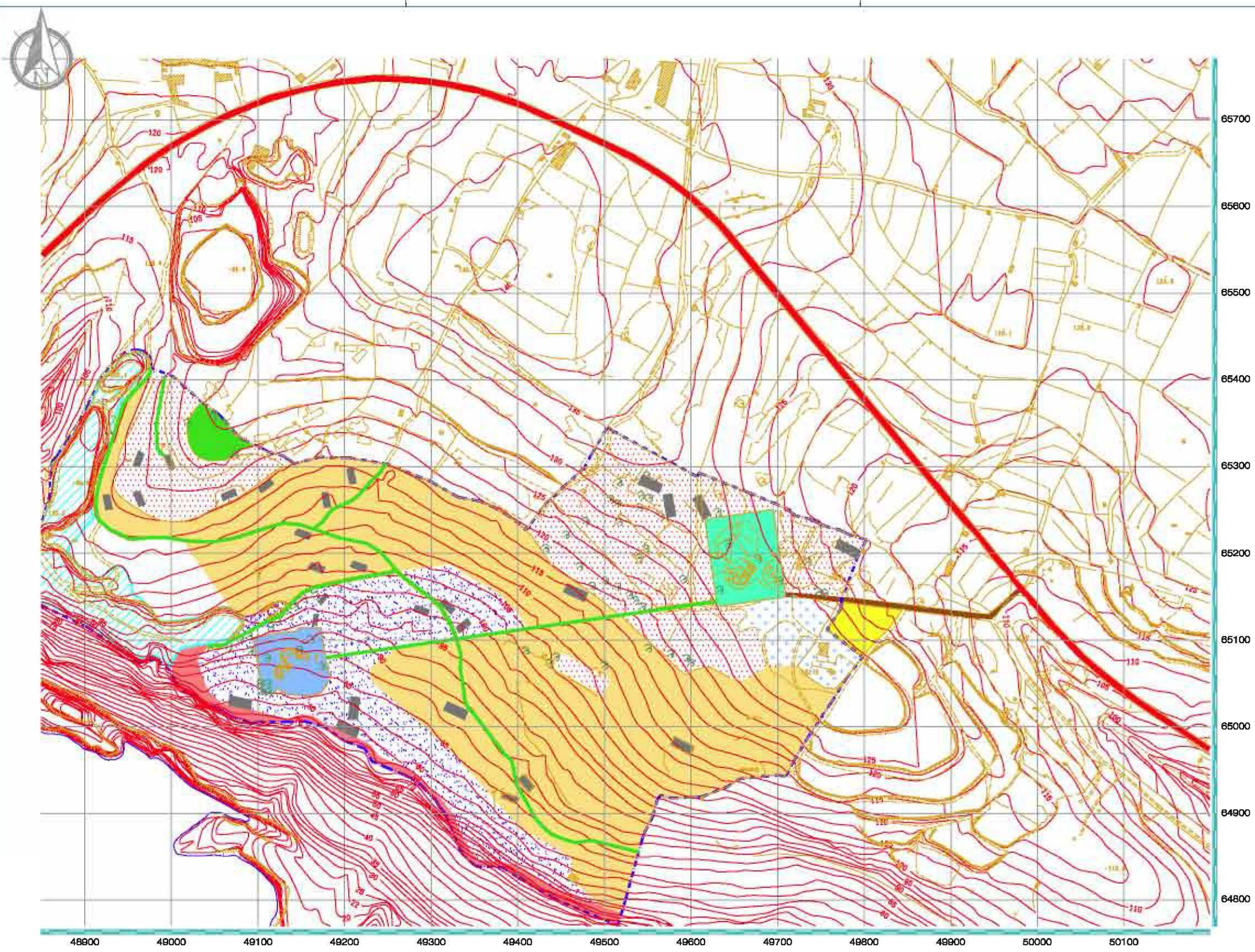
Based on 1988 Planning Directorate survey sheets nos 4864, 4865, 5084 and 5085. Scale 1:2500, August 1988 aerial survey.



DRAWING TITLE :  
ECOLOGY

SCALE: 1:5,000      DATE: December '04

DRAWING NO.:  
17\_04\_6



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Fax: (356) 2122 2900

PROJECT TITLE :  
**HAGAR QIM AND MNAJDRA TEMPLES  
CONSERVATION AND INTERPRETATION PROJECT**

GENERAL

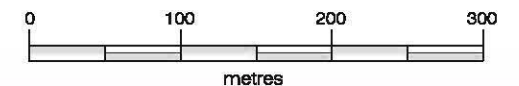
- HAGAR QIM
- MNAJDRA
- PROPOSED VISITOR CENTRE AND CARPARK
- PANORAMIC ROAD
- x REFERENCE NO. OF PLANNING APPLICATIONS AS PER APPENDIX A5

Ref. No.	Application No.
1	PA 02781/00
2	PA 01299/88, PA 02106/00, PA 01317/02
3	PA 04348/98
4	PA 00787/91
5	PA 01317/04
6	PA 03299/02
7	PA 02386/01
8	PA 01667/00
9	PA 02615/99
10	PA 01669/00
11	PA 02633/01
12	PA 05840/98
13	PA 03798/01
14	PA 04794/97
15	PA 01570/95
16	PA 05390/94
17	PA 04497/93, PA 05037/01, PA 06728/01, PA 02773/03
18	PA 04250/03
19	PA 00566/97
20	PA 02697/02
21	PA 01584/98, PA 03150/98
22	PA 03674/02
23	PA 03400/92
24	PA 05257/03
25	PA 03863/93

Data obtained from the official website of the Malta Environment and Planning Authority, as at 8th December 2004.

Map is indicative only, not to be used for measurement or direct interpretation.

Based on 1988 Planning Directorate survey sheets nos 4864, 4865, 5084 and 5085. Scale 1:2500, August 1988 aerial survey.



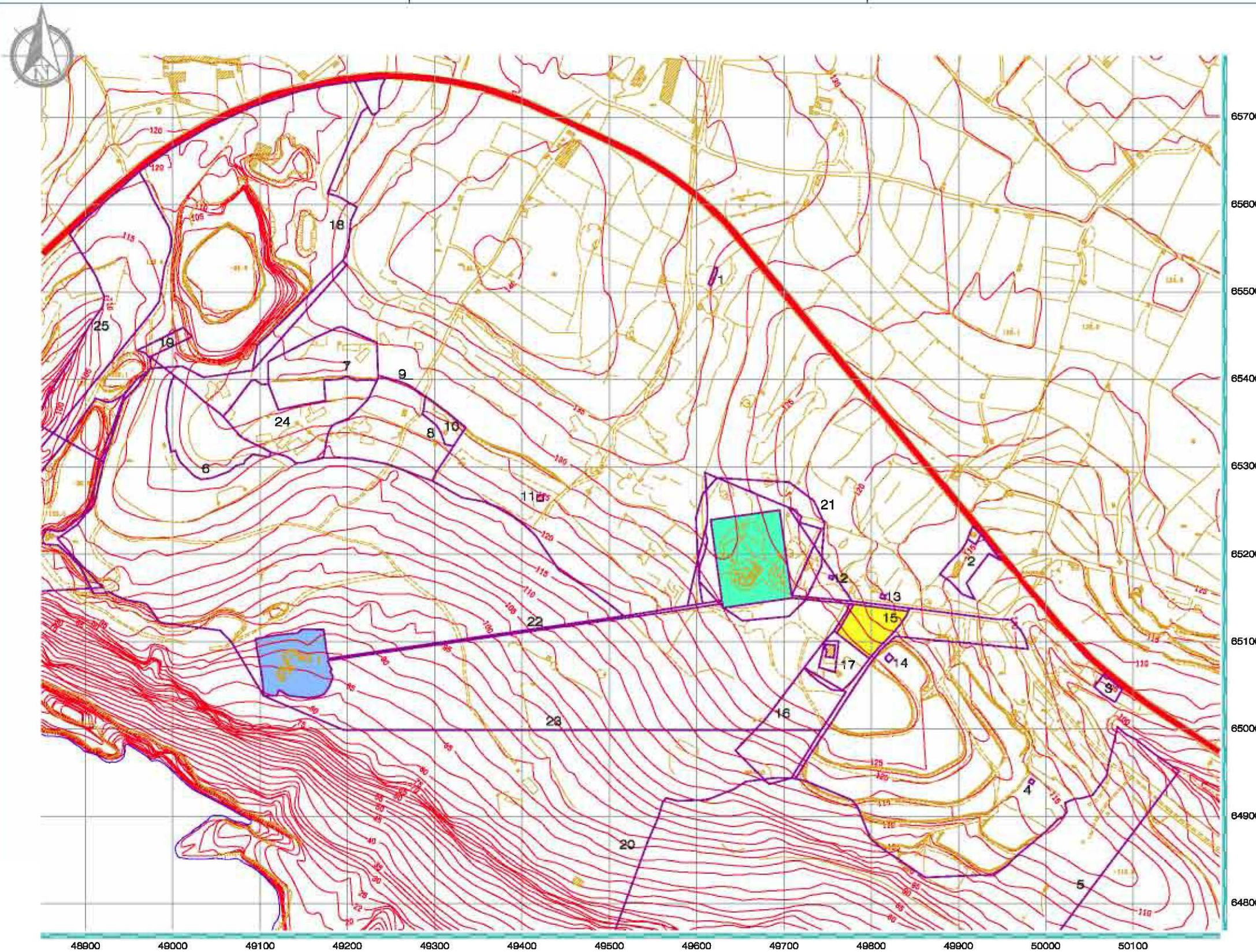
DRAWING TITLE :

RECENT DEVELOPMENT  
PLANNING HISTORY

SCALE:  
1:5,000

DATE:  
December '04

DRAWING NO. :  
17\_04\_7



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Tel.: (356) 2295 4000 Fax: (356) 2122 2900

PROJECT TITLE :  
**HAGAR QIM AND MNAJDRA TEMPLES  
CONSERVATION AND INTERPRETATION PROJECT**

GENERAL

- HAGAR QIM
- MNAJDRA
- PROPOSED VISITOR CENTRE AND CARPARK
- PANORAMIC ROAD

UTILITIES

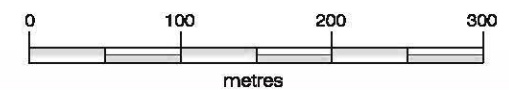
- ELECTRICITY SUPPLY
- WATER SUPPLY

Nearest existing main sewer is circa 1.2 km east-north-east of the proposed Visitor Centre.

Based on information supplied to Heritage Malta by Water Services Corporation, November 2004.

Map is indicative only, not to be used for measurement or direct interpretation.

Based on 1988 Planning Directorate survey sheets nos 4864, 4865, 5084 and 5085. Scale 1:2500, August 1988 aerial survey.



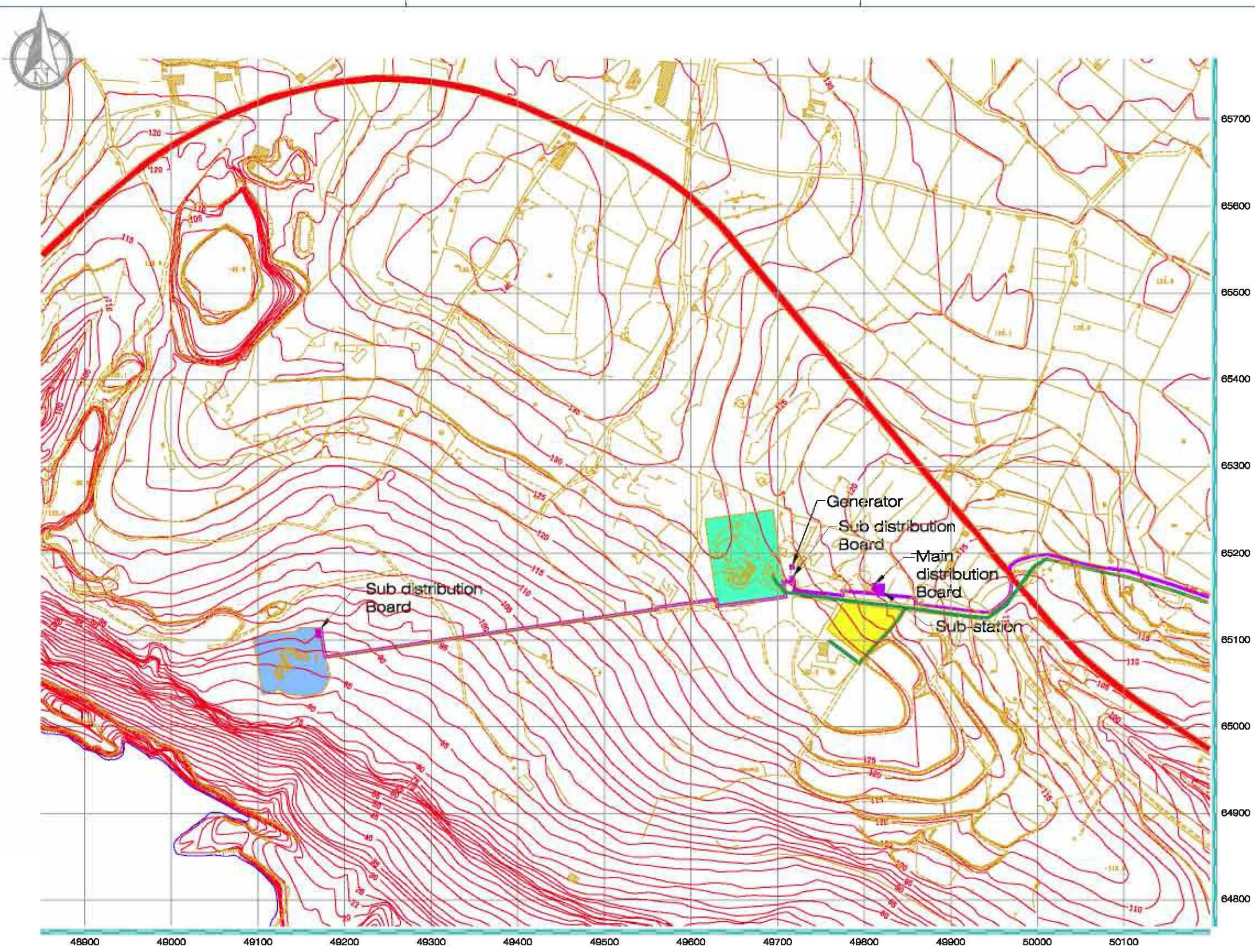
DRAWING TITLE :

EXISTING UTILITIES

SCALE: 1:5,000

DATE: December '04

DRAWING NO.: 17\_04\_8




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PROJECT TITLE :

**HAGAR QIM AND MNAJDRA TEMPLES  
 CONSERVATION AND INTERPRETATION PROJECT**





GENERAL

- PANORAMIC ROAD
- PROPOSED VISITOR CENTRE AND CARPARK

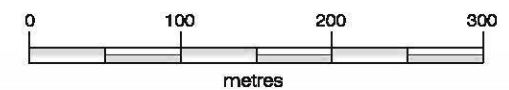
SCHEDULING

- HAGAR QIM TEMPLE (GN No 241/97)
- MNAJDRA TEMPLE (GN No 241/97)
- MISQA TANKS (GN No 241/97)
- IT-TORRI TAL-HAMRIJA, TA' HAGAR QIM (GN No 729/95)
- GOVERNER CONGRAVE MEMORIAL (GN No 241/97)
- BUFFER ZONE FOR AREAS OF ARCHAEOLOGICAL IMPORTANCE (GN No 241/97)
- LEVEL 2 AREAS OF ECOLOGICAL IMPORTANCE (GN No 400/96)
- LEVEL 3 BUFFER ZONE FOR AREAS OF ECOLOGICAL IMPORTANCE (GN No 400/96)

Data obtained from the website of the Malta Environment and Planning Authority, as at 4th December 2004.

Map is indicative only, not to be used for measurement or direct interpretation.

Based on 1988 Planning Directorate survey sheets nos 4864, 4865, 5084 and 5065. Scale 1:2500, August 1988 aerial survey.



DRAWING TITLE :

SCHEDULING

SCALE:

1:5,000

DATE:

December '04

DRAWING NO.:

17\_04\_9



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PROJECT TITLE :

**HAGAR QIM AND MNAJDRA TEMPLES  
CONSERVATION AND INTERPRETATION PROJECT**

Appendix

A1

---

Planning Application PA 2697/02

---

# APPLICATION FOR DEVELOPMENT PERMISSION

In terms of the Development Planning Act 1992

Awtorit<sup>ta</sup> Ippjanar, St. Francis Ravelin, Floriana CMR 02 Tel: 240976 Fax: 224846

This p<sup>art</sup> of the application form will be date-stamped and returned to provide an immediate acknowledgement of receipt.

Office Use only

MALTA ENVIRONMENT & PLANNING AUTHORITY

**RECEIVED**  
13 MAY 2002

ST. FRANCIS RAVELIN - FLORIANA

269704



**1 Applicant** (Please complete in block letters)

X Name DIRECTOR OF MUSEUMS

Address MUSEUMS DEPARTMENT  
138 MELITA STREET  
VALLETTA

Tel. No. 21 230711 Postcode \_\_\_\_\_

Fax No. 21 251140 ID.No. 105762(m)

**3 Architect** (Please complete in block letters)

Name MIREILLE FSADNI

Address Architect and Civil Engineer  
Restoration Unit  
WORKS DIVISION  
FLORIANA

Your ref. for this application \_\_\_\_\_

Tel. No. 21-248894 Postcode \_\_\_\_\_

Fax No. 21-240946 ID.No. 288730(m)

**2 Type of Application. Tick ONE box.**

B1  Full Development Permission

B2  Outline Development Permission

B3  Quarrying (Minerals Extraction) Use separate Form

B4  Internal Alterations Consent

B5  Advertisement Consent

B6  Renewal of Development Permission

B7  Amended Development Permission

B8  Telecommunications Antennae

B9  Householder Development Permission

B10  Approval of details reserved by condition

B11  Scheduled Property Consent

**Attach supplementary forms as required**

B12  Additional information form  
*MUST BE ATTACHED for new shops, offices commercial developments, hotels, industrials, warehousing, leisure and mixed developments.*

C2  Additional information on swimming pools

**4 Location of proposed development** (Please complete in block letters)

Property Name HAGAR QIM AND MNAJDRA HERITAGE PARK Property No. \_\_\_\_\_

Street name(s) \_\_\_\_\_

Locality L/O QRENDI Local Council QRENDI

**5 Description of proposed development**

Describe ALL project components. Indicate both the SCALE and TYPE of development proposed. Include the number of units.

Describe proposed alterations in detail. For extensions, indicate the number of onal storeys.

Construction of Visitors Centre, Protective Shelters on Megalithic Sites, Park Facilities (eg foot paths)

**6 List and plans of drawings**

TICK, if continuation sheet for drawings supplied

Plan/Drawing title	Your Unique Ref.
1) <u>Site Plan 1:2500</u>	
2)	
3)	
4)	
5)	
6)	
7)	

**7 Development Profile**

Site Area (Sq Meters) ≈ 2400m<sup>2</sup>

	Existing		Proposed	
	Floors	Basements	Floors	Basements
Number of floors & basements				
Total floorspace (Sq M)				
Number of dwelling units				

Main use of the site/buildings (See categories in Guidance notes)  
Code \_\_\_\_\_ Category \_\_\_\_\_

Existing Code \_\_\_\_\_ Category \_\_\_\_\_

Proposed Code \_\_\_\_\_ Category \_\_\_\_\_

**8 B2 Outline Development Permission ONLY**

TICK and DESCRIBE those matters that are reserved for further approval

- Siting  *Siting of Visitors Centre; 2 possible locations as marked on plan*
- Design  *Design of Visitors Centre + of Protective Shelters over megalithic site*
- Means of access  *Possible addition of access as marked on plan*
- Landscaping  *Creation or modification of footpaths + park facilities*
- External appearance  *Materials depend on design*
- Other (Specify)  \_\_\_\_\_

**Architect's Declaration (outline Applications only)**

I, the architect and civil engineer, as undersigned, do hereby declare that to the best of my knowledge all the technical content contained in this application and on the submitted plans are correct.

*M. Sadni*  
 Signed \_\_\_\_\_

**MIREILLE FSADNI**  
 Architect and Civil Engineer  
 Restoration Unit

Architect (Official Stamp)

*9/5/02*  
 Date \_\_\_\_\_

**B5 Advertisement Consent ONLY**

- 9** Type of advertisement  Billboard  Projecting Sign   
 Tick ONE box  Fascia sign  Other (Specify)

**10** Illumination required?  No  Yes

Internal	<input type="checkbox"/>	External	<input type="checkbox"/>	Static	<input type="checkbox"/>	Intermittent	<input type="checkbox"/>
Describe the type of illumination							
For how long is the consent required?		Indefinite	<input type="checkbox"/>	If not indefinite, required date of expiry;			

**11** Is the applicant owner of the land or building? Yes  No

If NO, the owner must complete the following declaration:

I, \_\_\_\_\_ of \_\_\_\_\_ as owner of the land or building to which the advertisement(s) are to be fixed, hereby give permission for the display of the advertisement(s).

Signed \_\_\_\_\_ Date \_\_\_\_\_

**B6 (Renewal) and B7 (Amended Permission) ONLY**

**12** Reference number of current permission

**13** Expiry date of current permission \_\_\_\_\_  
 A B1 application is required if the permission has expired

For a B6 application, a letter is required stating that NO amendments are required to the current permission.

**14** Describe in detail the differences between this proposal and the current permission

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**15** List the approved plan numbers which are to be amended

\_\_\_\_\_

If there are any differences between this proposal and the current permit, this will be treated as a B7 application. A B1 application is required if there is a significant change in the form or content of the development.

**B8 Telecommunications antennae ONLY**

**16** Description of apparatus \_\_\_\_\_

*Include technical specifications of the receiver, decoder, low noise block and antenna dish (preferably a manufacturer's brochure)*

<b>17</b> Maximum height above the ground level (m)	
Any other antennae on the site	<input type="checkbox"/> No <input type="checkbox"/> Yes    if YES describe and indicate on plan:

**B10 Approval of details reserved by condition ONLY**

**18** Reference number of related permission

--	--	--	--	--	--

**19** Date of expiry of related permission \_\_\_\_\_  
*A B1 application is required if the related permission has expired*

**20** Conditions to which this application relates

Condition No. on Permit	Summary of Condition

**21** Conditions still outstanding after this application

Condition No. on Permit	Summary of Condition

**ALL APPLICATIONS affecting Scheduled Property or within a Conservation Area**

*SCHEDULED PROPERTY includes areas of natural, ecological and scientific value, as well as listed buildings and trees.*

*CONSERVATION AREAS include Urban, Rural and Marine Conservation Areas as well as existing Village Cores.*

**Tick ALL that apply:**

Type of Scheduled Property	Grade	Scheduled Property Ref.	Name and description of building, area or locality
Urban Conservation Area <input type="checkbox"/>			
Village Core <input type="checkbox"/>			
Rural Conservation Area <input type="checkbox"/>			
Marine Conservation Area <input type="checkbox"/>			
Listed Building <input checked="" type="checkbox"/>			
Archaeological Site <input checked="" type="checkbox"/>			
Area of Natural Beauty <input type="checkbox"/>			
Area of Ecological Value <input checked="" type="checkbox"/>			
Area of Scientific Value <input type="checkbox"/>			
Scheduled tree <input type="checkbox"/>			
Other: Please specify <input type="checkbox"/>			

*as per attached*

**23 Access**

This development includes:

	Yes	No
A new vehicular access	<input checked="" type="checkbox"/>	<input type="checkbox"/>
An altered access	<input type="checkbox"/>	<input checked="" type="checkbox"/>

State name of affected road (s) & indicate proposed changes on plan:

**24 Trees**

This development involves:

	Yes	No
Felling of trees	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Indicate location and species of affected trees on plan number (s)

**25 Water, Sewage and Electricity**

What is the source of water supply?

How will foul sewage to be disposed of?

How will surface water run-off be disposed of?

What is the maximum electrical power requirement for this development (KVA)

**26** Does the development require alignment/levels to be set?  Yes  No

**27 Previous Applications and Permits on this site**

PA/PAB Reference No.	Description	Expiry
PA 01584/98	Installation of New Security Fence at Hajar Qim	
PA 01585/98	Replacement of Security Fence at Mirajdra	
PA 03150/98	Replacement of Sanitary Facilities, etc at Hajar Qim	
PA 03798/01	Construction of Substation, 4/0 Qrendi	

**28 Architect's Declaration (Except for B2 outline Applications)**

I, the architect, and civil engineer, as undersigned, do hereby declare that to the best of my knowledge all the technical content contained in this application and on the submitted plans is correct and that I shall undertake the direction and responsibility for the works referred to in this application according to article 97(o) of the Code of the Police Laws (Chapter 10)

**MIREILLE FSADNI**  
Architect and Civil Engineer  
Restoration Unit

*[Signature]*

Signed \_\_\_\_\_ Architect (Official Stamp)

*9/5/02*  
Date

**Applicant's Declaration (ALL Applications)**

I apply for development permission and declare that, to the best of my knowledge, all the information contained in this application and on the submitted plans is correct

*[Signature]*

Signed \_\_\_\_\_ Applicant (Block Capitals)

**DIRECTOR**  
**MUSEUMS DEPARTMENT**

*[Signature]*  
Date

**29 Certificate of Ownership A (Applicant is the sole owner of the site)**

If Certificate of Ownership B (other, known owners exist) or C (One or more owners unknown) is required, please attach to the application with all relevant documentation.

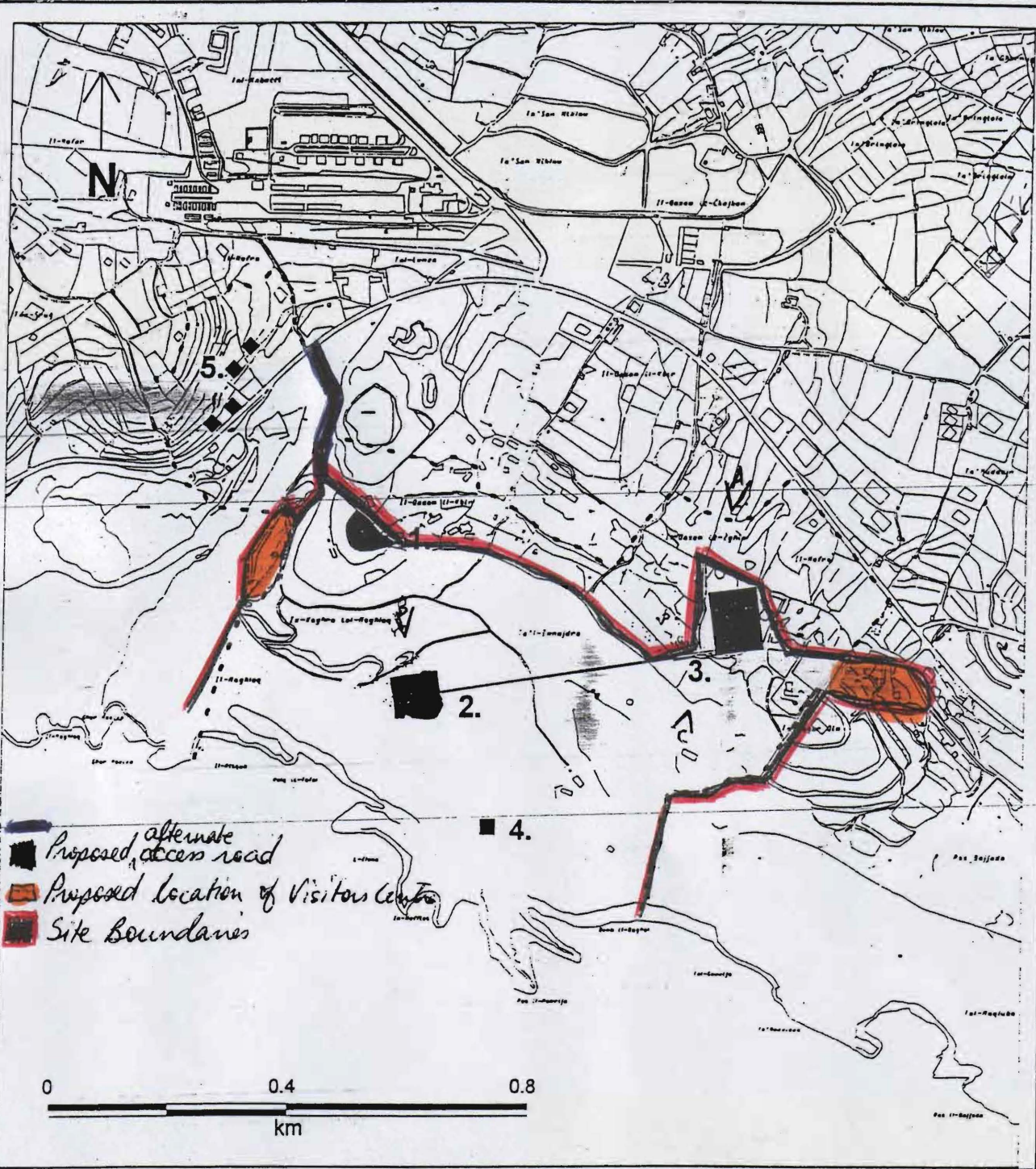
I certify that nobody except the applicant is the owner of any part of the land to which this application relates, as shown in red ink on the accompanying plans.

Signed \_\_\_\_\_ On behalf of/in my own name \_\_\_\_\_ ID Number \_\_\_\_\_ Date \_\_\_\_\_

**30 For Completion by architect: Attachments and drawings Checklist**

- |  |                          |  |                          |
|--|--------------------------|--|--------------------------|
| Building Levy fee receipt attached   | <input type="checkbox"/> | Appropriate Certificate of Ownership completed/attached    | <input type="checkbox"/> |
| All required questions answered  | <input type="checkbox"/> | Full description of proposed development and site location | <input type="checkbox"/> |
| Required copies of the application form and plans                                      | <input type="checkbox"/> | All drawings folded to A4 size and collated into sets      | <input type="checkbox"/> |
| All drawings titled and signed by the architect  | <input type="checkbox"/> | Use of rooms indicated on drawings                         | <input type="checkbox"/> |
| Colour and type of all external materials indicated                                    | <input type="checkbox"/> | For Change of use, area affected, clearly indicated        | <input type="checkbox"/> |
| Three sets of colour photos, on an A4 sheet (Not required for B4 Internal Alterations) | <input type="checkbox"/> | Form B12 attached where required                           | <input type="checkbox"/> |

Provision of all requested information will speed the processing of your application. Your application may be rejected at the front desk if required checklist items are missing.



**PLANNING AUTHORITY**

(c) Copyright Planning Authority

Bounding Co-Ords.of Map:- Min E48450, N64309 Max E501401, N661691

St. Francis Ravelin  
Floriana

PO Box 200, Valletta  
Tel:240976 Fax:224846



Title :-

**Scheduled Property:  
Qrendi/Siggiewi**

Ref No. :- 029/97

Site of Archaeological Importance,  
Class I

- 1. Misqa Water Cistern
- 2. Mnajdra Temples
- 3. Hagar Qim Temples
- 4. Governor Congreve Monument
- 5. Maghlaq Catacombs
- - Buffer Zone

Form No. :- MU003

## Terms of Reference

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Mr. A. Pace  
Director of Museums,  
Museums Dept.,  
138, Melita Street,  
Valletta

Date: 14<sup>th</sup> May 2004  
Our Ref: PA 2697/02

Dear Mr. Pace

Application Number: PA 2697/02  
Location: I/o Qrendi  
Proposal: Construction of visitor's center, protective shelters on megalithic sites,  
park facilities (e.g. footpaths)

### **Environmental Impact Assessment Regulations, 2001**

We refer to your application for development permission, which was validated on 8<sup>th</sup> September 2002.

According to the Environmental Impact Assessment Regulations, 2001 (LN204/2001), this development proposal **may** fall under Schedule I. This means that according to Regulation 5(1), a Project Description Statement (PDS) for the development proposal must be submitted.

A Project Description Statement should contain sufficient information to assess whether an EIA is required and subsequently to prepare the Terms of Reference, if necessary. Guidelines for the preparation of the PDS are enclosed.

Please note that in accordance with the Development Planning Act 1992, Section 36, the Malta Environment & Planning Authority is extending the period stipulated to determine this application in view of this notification. Therefore, the target process date previously quoted is no longer applicable.

We will notify you of the new target process date for this application whenever the abovementioned Project Description Statement has been submitted and approved by the Environment Protection Directorate.

Yours faithfully,

Krista Falzon  
Environment Protection Officer  
f/Director of Environment Protection

c.c. Ms. M. Fsadni, Restoration Unit, Floriana



## **PROJECT DESCRIPTION STATEMENT GUIDELINES**

In order to set out the terms of reference for the EIA, a detailed project description statement is required. This should take the form of a mini report taking into consideration the following issues:

1. Details of the organisation wishing to carry out the development;
2. An explanation of the nature of the opportunities and problems being addressed by the development, and of its general economic, social and environmental objectives;
3. A description of the general strategy employed, and of the production processes and operational methods to be used, and any alternative methods considered, in reaching the social, environmental and economic objectives of the development;
4. An indication of the proposed timing of the project and why this timing was preferred;
5. An indication of whether the project is economically viable;
6. The location of the proposed development with site boundaries clearly shown on a map;
7. A brief indication of alternative strategies considered for the preservation and maintenance of the temples;
8. A description of the physical characteristics including size, scale, design and phasing of the development using models, photographs, diagrams, plans and maps where appropriate;
9. A description of present site management and environmental characteristics of the site;
10. A brief description of surrounding land uses, their nature, their extent and their environmental characteristics;
11. A description of the services, water, foul water sewers, surface water drainage, including storm water drainage, and energy sources available on site, if these utilities are not available on site, a description of what will be required, in particular with respect to the visitor's centre;
12. Estimates of the number of persons to be employed with estimates for each phase of the development;
13. The nature and quantities of raw materials to be used, and wastes generated during construction and operation; the proposed method of storage or handling of materials and wastes, and machinery needed during both the construction and the operational phases;

14. Access arrangements, parking requirements and parking arrangements on and off the site, during both construction and operation;
15. Proposals for mitigating the negative effects of the development.

Appendix

A3

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## Architectural Drawings by Partnership led by Architect Walter Hunziker

Location Plan

Visitor Centre: Lower and Upper Plans (Version 3)

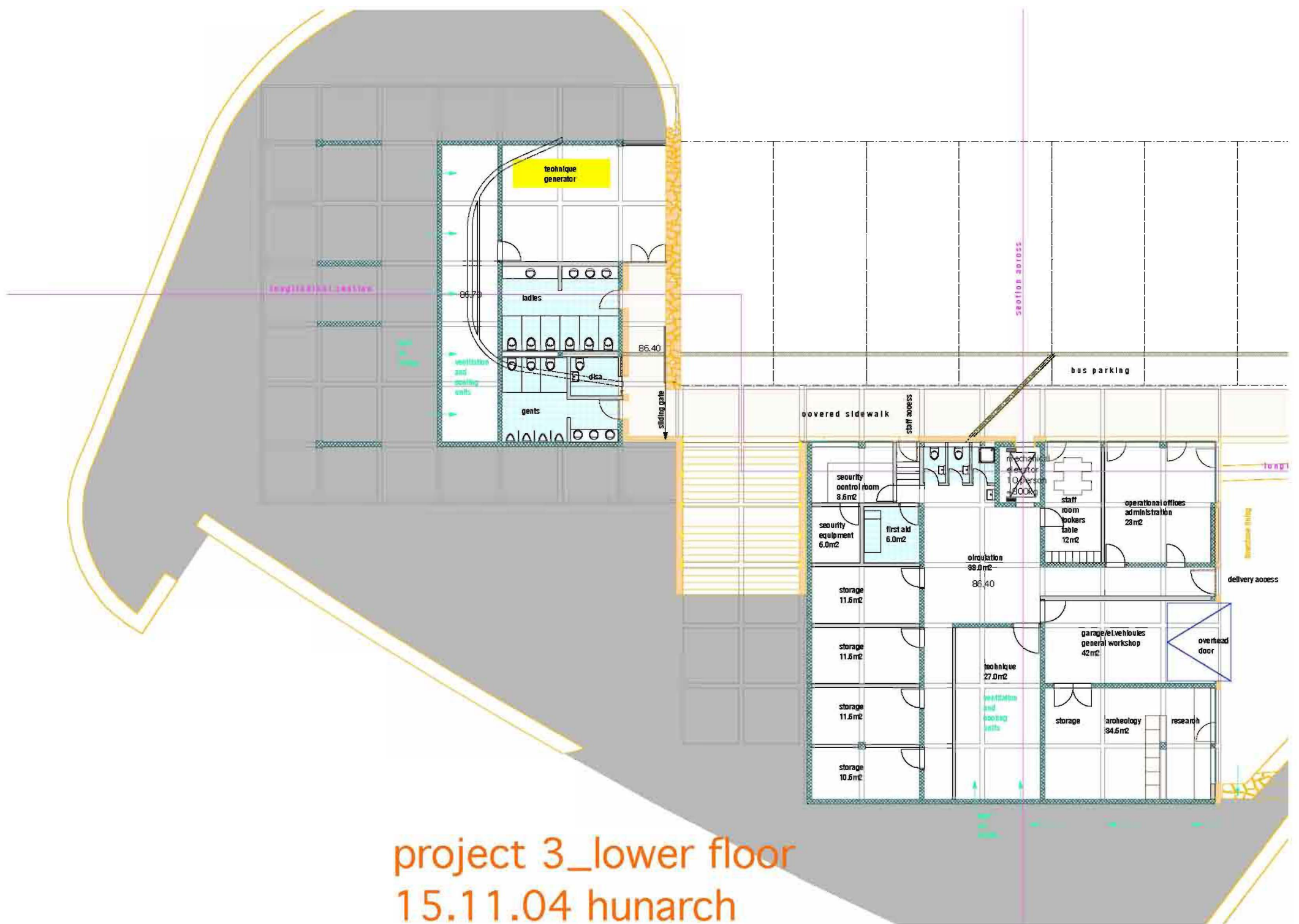
Hagar Qim Shelter (First Draft)

Mnajdra Shelter (First Draft)

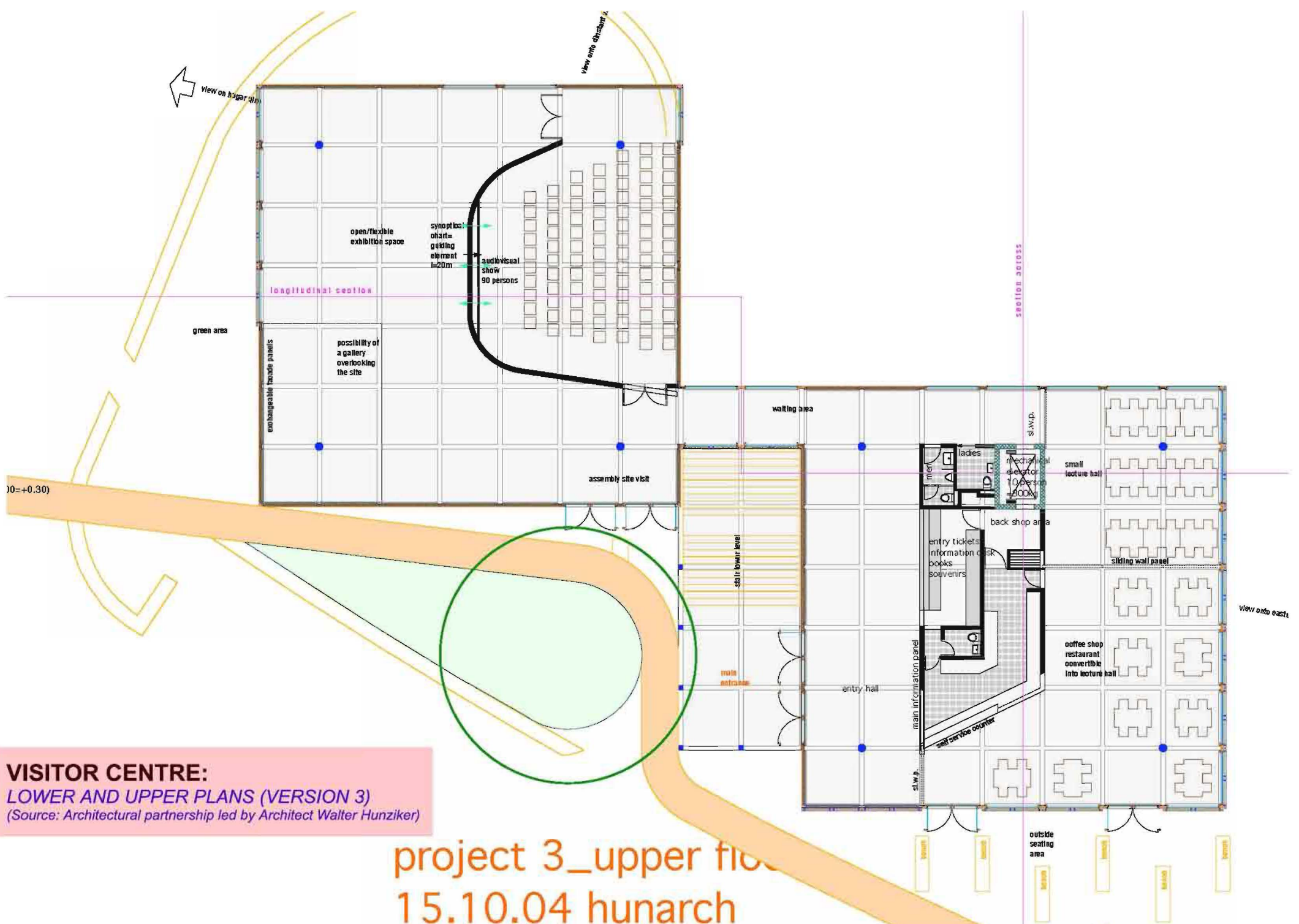
Computer generated views of development proposal in existing landscape

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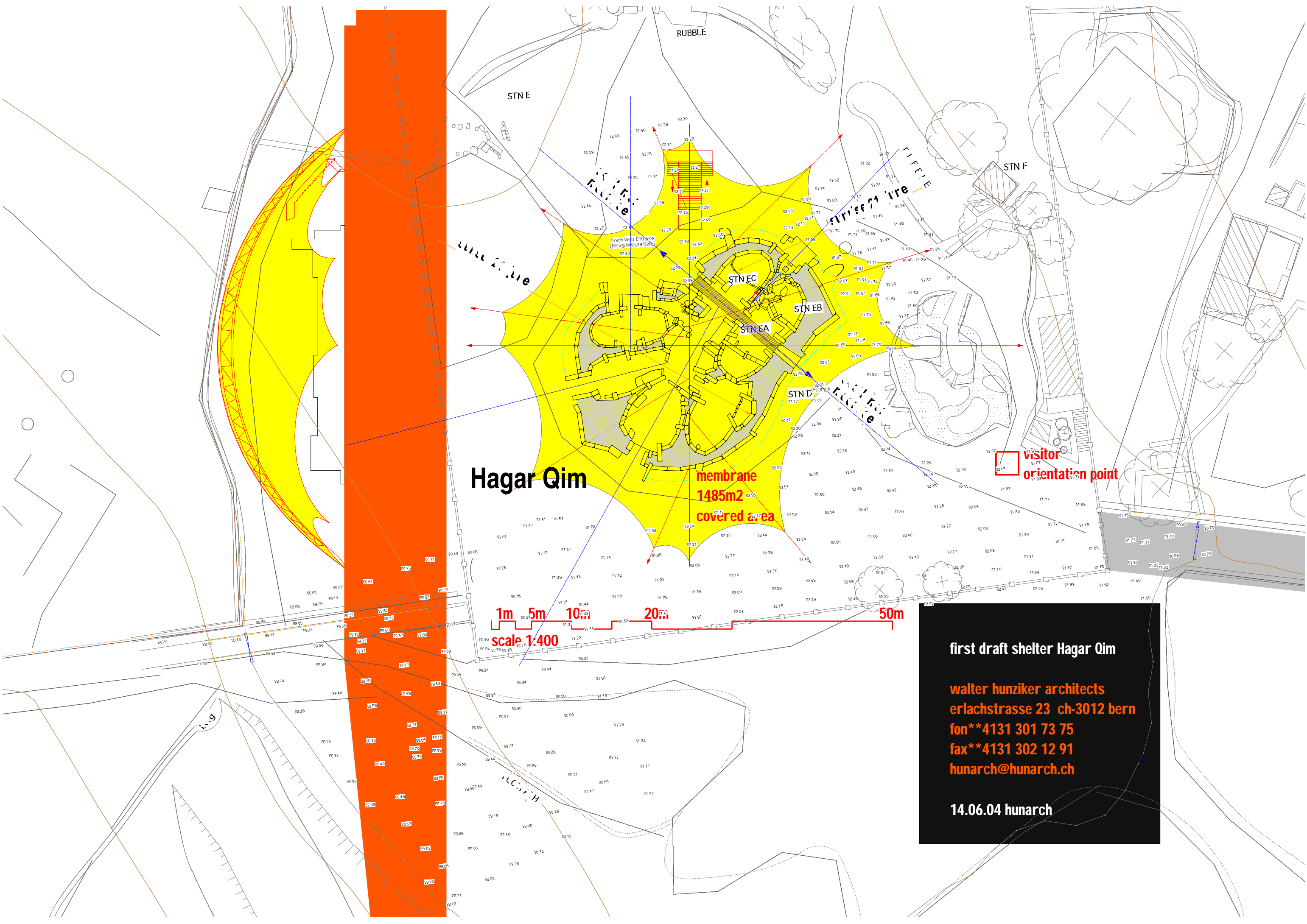


project 3\_lower floor  
15.11.04 hunarch



**VISITOR CENTRE:**  
LOWER AND UPPER PLANS (VERSION 3)  
(Source: Architectural partnership led by Architect Walter Hunziker)

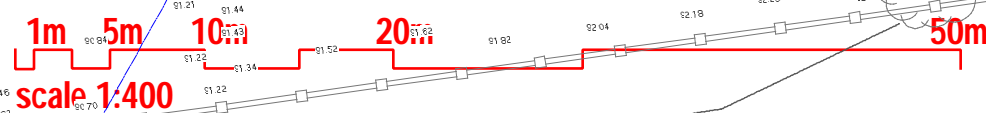
project 3\_upper floor  
15.10.04 hunarch



**Hagar Qim**

membrane  
1485m<sup>2</sup>  
covered area

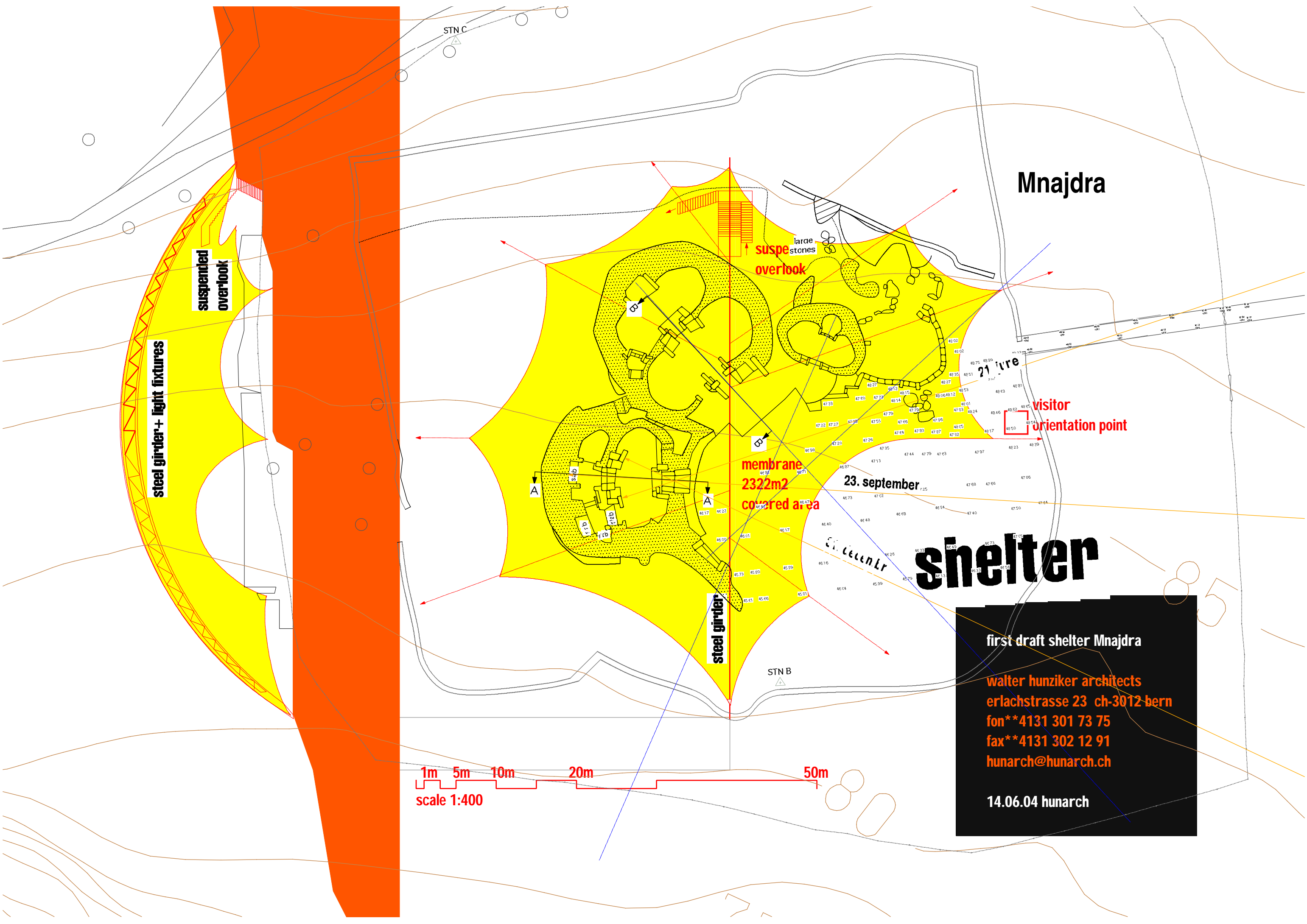
visitor  
orientation point



**first draft shelter Hagar Qim**

walter hunziker architects  
erlachstrasse 23 ch-3012 bern  
fon\*\*4131 301 73 75  
fax\*\*4131 302 12 91  
hunarch@hunarch.ch

14.06.04 hunarch



Mnajdra

suspended overlook

steel girder + light fixtures

suspended overlook

membrane 2322m2 covered area

visitor orientation point

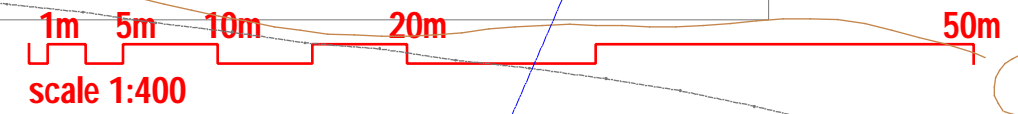
23. september

shelter

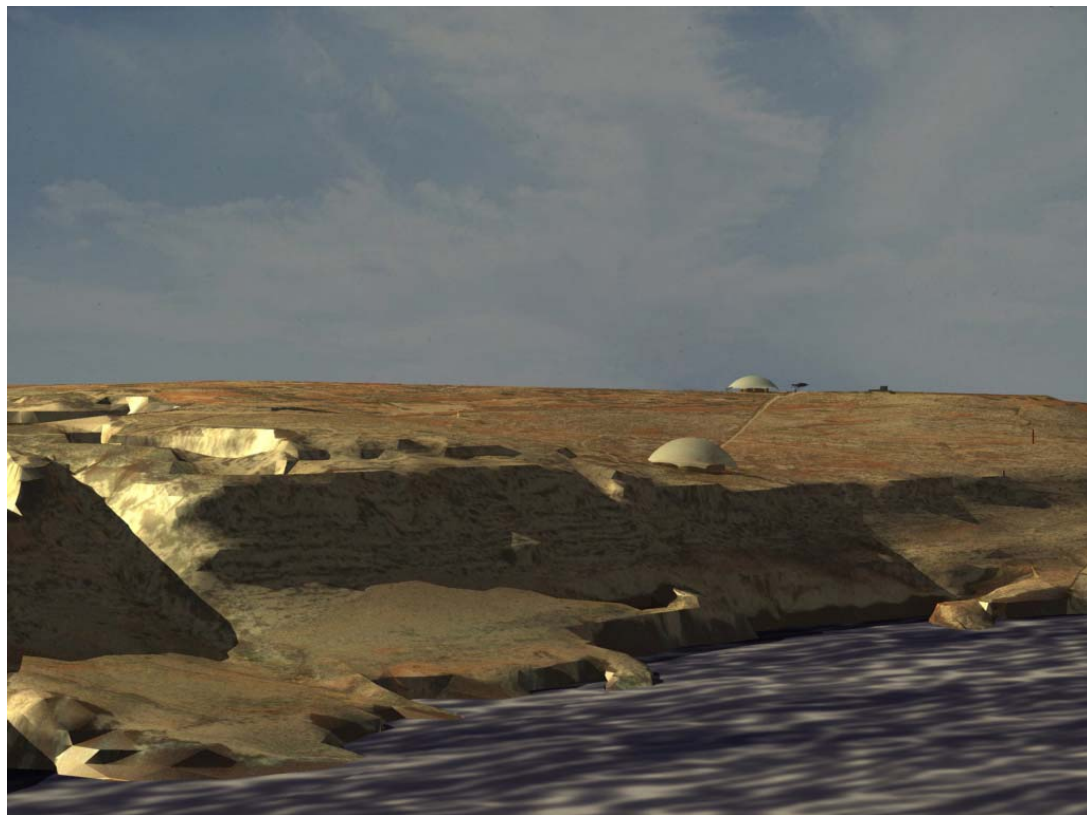
first draft shelter Mnajdra

walter hunziker architects  
erlachstrasse 23 ch-3012 bern  
fon\*\*4131 301 73 75  
fax\*\*4131 302 12 91  
hunarch@hunarch.ch

14.06.04 hunarch



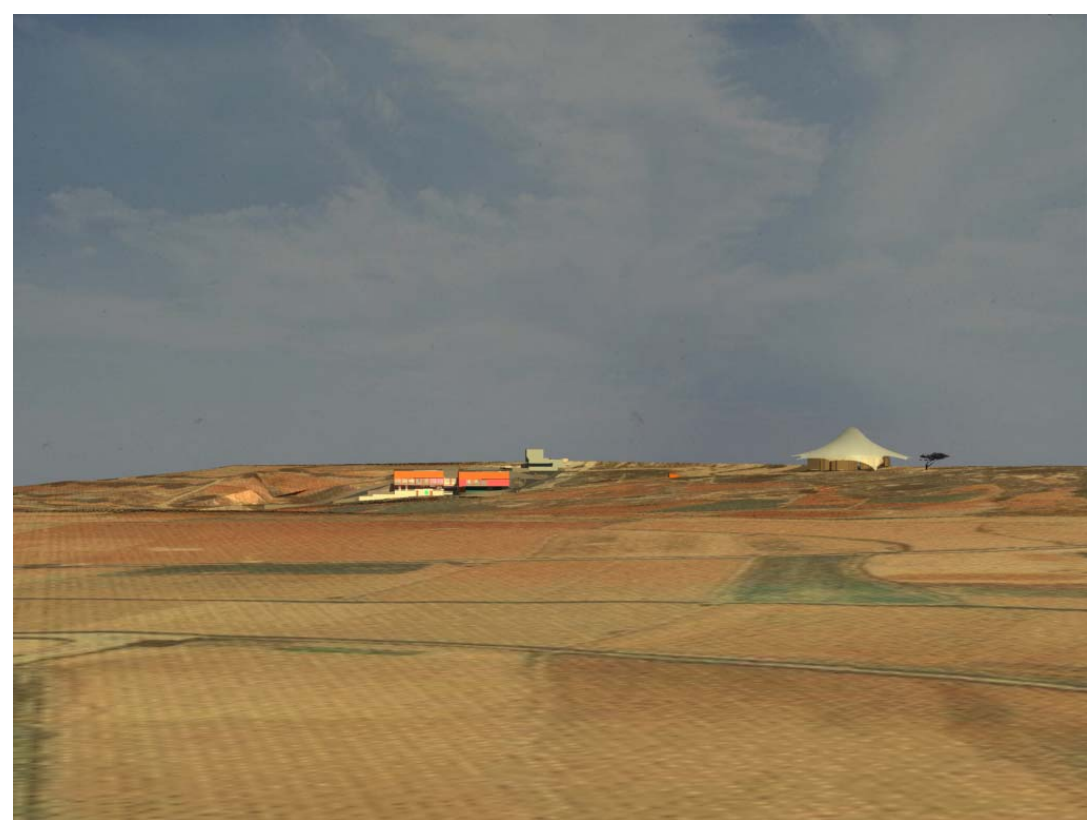




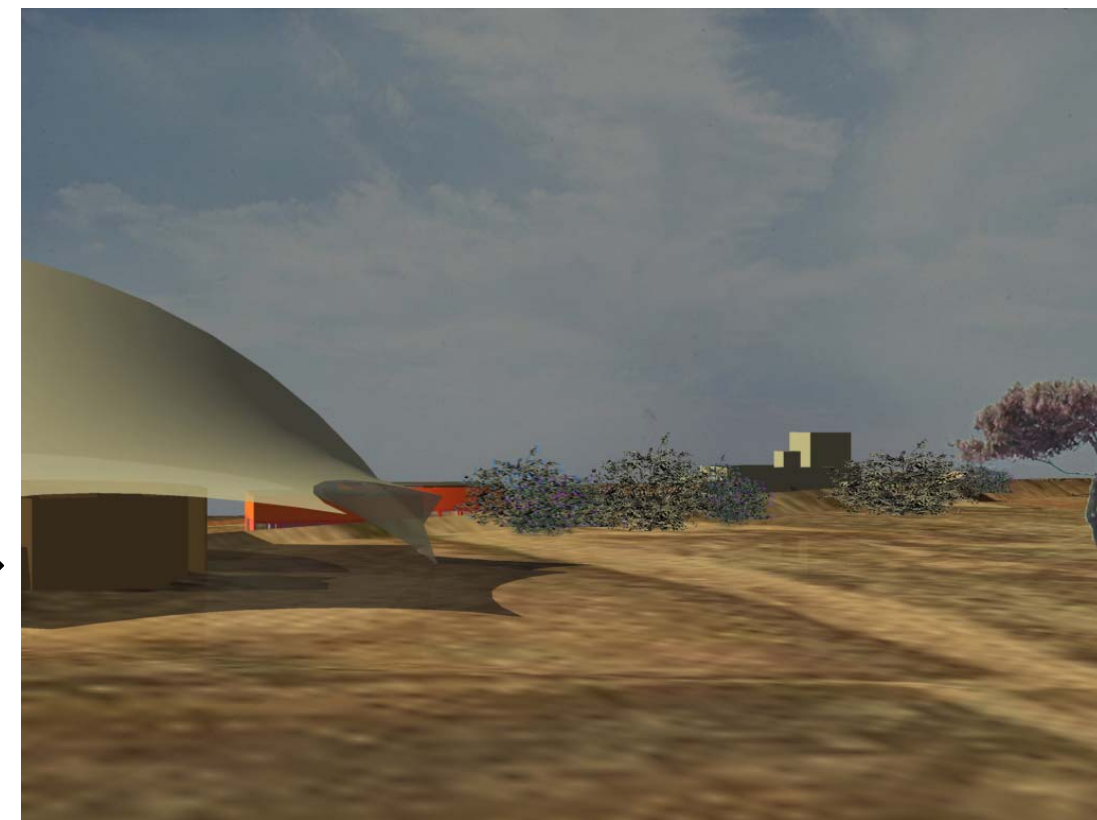
← View from the south-west



Detail view from south-west →



← View of Hagar Qim and Visitor Centre from the panoramic road, northwest of Hagar Qim



View towards proposed Visitor Centre and existing restaurant, standing outside Hagar Qim →

*Computer generated views of development proposal in existing landscaping  
(Source: Architectural partnership led by Architect Walter Hunziker)*

## Planning Permit PA 5390/94



AWTORITA' TA' L-IPPJANAR  
PLANNING AUTHORITY

To: Mr Anthony Ellul  
Department of Tourism  
280, Republic Street  
Valletta CMR 02

Date: 20th October 1995  
Our Ref: PA5390/94/DC11

Application Number: 5390/94  
Application Type: Sch'd prop. (LB)/Conservat'n area consent  
Date Received:  
Approved Plan Numbers: PA 5390/95/1H/1I/1J/1L/1M

Location: Hagar Qim, Limiti Ta', Qrendi  
PROPOSAL: Construction of underground visitors centre to house facilities indicated on drawings in lieu of existing building being used as a restaurant together with sub-station and septic tank.

DEVELOPMENT PLANNING ACT 1992 SECTION 46  
SCHEDULED PROPERTY/CONSERVATION AREA CONSENT

The Planning Authority hereby grants consent in accordance with the application and plans described above, subject to the following conditions:

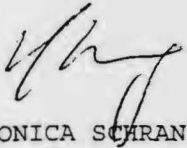
1. Excavations to be carried out must be done by the diamond cutting technique and under the supervision of the Museums Department.
2. Proposed project is to include a septic tank and under the supervision of the Department of Public Health.
3. No cooking is to be allowed in the catering outlet/kitchen area.
4. Any air-conditioning units used should not be visible.
5. Introductory notes and general conditions (A) on form DC 1/88 apply.
6. Before any construction works take place, adequate land shall be reserved both for the parking of vehicles engaged in such works and for vehicle access to the site, to the satisfaction of the Planning Authority. This land shall be kept available for this purpose at all times throughout construction. Lands required for storage or waste dumps shall be identified to the Planning Authority before such sites are used.
7. Before work commences on site, a Construction Management Plan must be submitted showing: all construction access points; storage areas for materials and plant; construction programme; protection measures for retained buildings, structures and landscapes; the location of disposal sites for material from demolition and excavation; and the means

of transport to disposal sites.

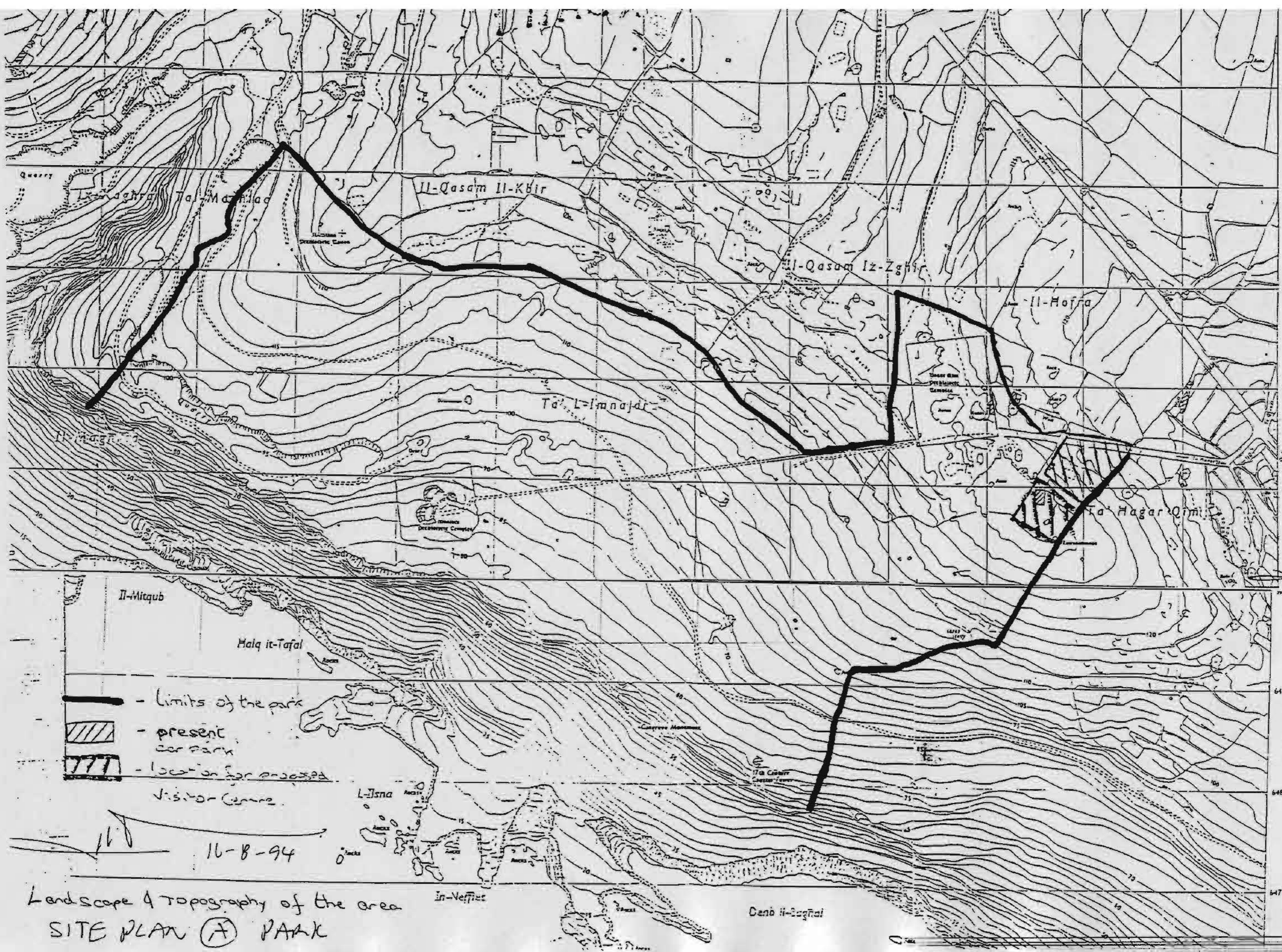
8. All buildings used by the public must have appropriate access, toilet and internal arrangements for the disabled (including self-propelled wheelchair users), the elderly and children in prams or pushchairs. Adequate parking provision must be provided for the physically handicapped.
9. Landscaping of the site shall be implemented in accordance with the details submitted with the application unless the prior approval in writing of the Planning Authority has been obtained to depart from these details.
10. Saving all Third party civil rights.
11. The following group of conditions apply to all development:
  - a) All works shall be carried out strictly in accordance with the approved plans. However, where ambiguities or discrepancies arise between the approved plans and the conditions on this decision notice, the conditions shall take precedence over the approved plans.
  - b) Before work begins, the enclosed A3-size green copy of the Building Permit must be displayed on site. This must be mounted on a notice board, suitably protected from the weather, and easily legible from the street. The permit must be maintained in good condition until works on site are complete.
  - c) No building material, waste, machinery or plant shall be allowed to obstruct the pavement or the smooth flow of traffic in the vicinity of the site.\* Deposit of materials or placing of equipment in the street must be authorised by the Police.
  - d) Copies of all approved plans and elevations must be available for inspection on site by Planning Directorate staff at all reasonable times.
  - e) Where applicable, all building works must be in accordance with the official alignment and proposed/existing finished road levels as set out on site by the Planning Directorate's Land Surveyor. The Land Survey Unit of the Planning Directorate must be informed when the setting out of the alignment and levels is required.
  - f) Before building operations start, where applicable, the street is to be opened up and brought up to its proper and approved formation levels by the applicant.
  - g) The development hereby permitted shall commence within twelve months of the date of this permission and shall be completed within two years of the date of this permission, unless it is renewed.
  - h) The enclosed Commencement Notice shall be returned to the Planning Authority so that it is received at least five days prior to the commencement of the development hereby permitted.

This permit is granted saving third party rights. The applicant is not excused from obtaining any other permission required by law. The applicant should contact the following regarding the location and provision of services prior to commencing development:- Enemalta, Water




Services Corporation, Telemalta, Drainage Department and Melita Cable TV.



MONICA SCHRANZ  
Secretary  
Development Control Commission



CONVERSION TABLE  
 J. FALZON & CE  
 Chairman

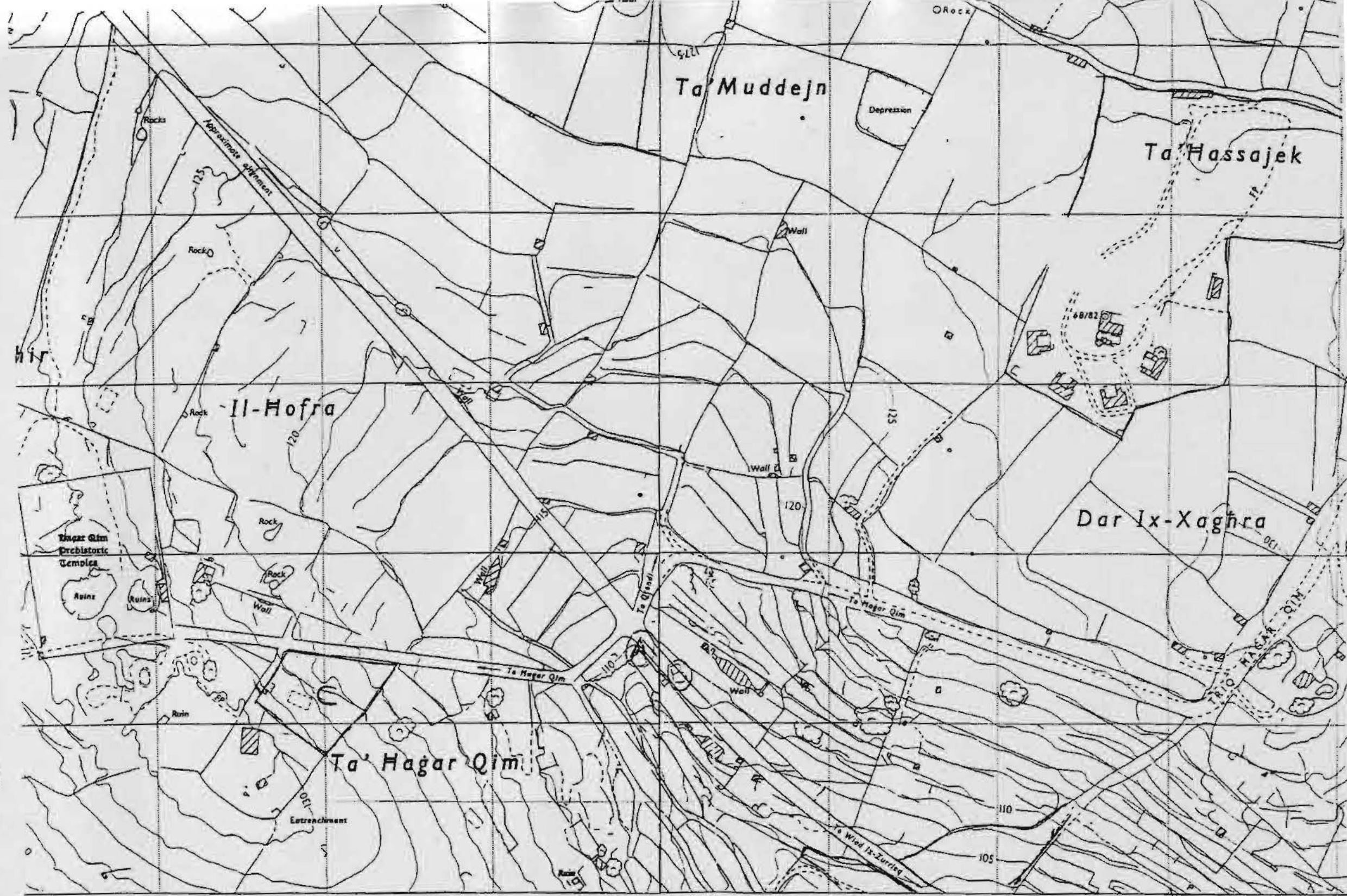
-  - Limits of the park
-  - present car park
-  - location for proposed

Visitor Centre

16-8-94

Landscape & Topography of the area  
 SITE PLAN (A) PARK

J.F.A. No. P.A. 55/94  
 D.C.C. Board No. ....



- Proposed location for Visitor Centre
- A - Location proposed for septic tank
- B - Location proposed for substation
- C - Location of present car park

Contours are shown at 2.5m Vertical Interval.

Buildings are shown according to the roof outline.

The representation on this sheet of a Road or Track is no evidence of the existence of a right of way.

PLAN: No. P.A. 5292/94/1.1  
 D.C.C. Board No. ....

Printed for D.O.S. by the Ordnance Survey. Published for the Maltese Government by the British Government's Overseas Development Administration (Directorate of Overseas Surveys).

Users noting corrections or additions to this sheet are requested to annotate and send it to the Director of Public Works, Malta. The sheet will be replaced.

MALTESE GOVERNMENT 1974

12/74742023 s

**J. FALZON A & CE**  
 Chairman DCC

**SHEET HISTORY**

Edition 1 prepared by the Directorate of Overseas Surveys. Field Survey Data by D.O.S.

Air Photography by Hunting Surveys Ltd., August 1968. Additional information supplied by the Office of Public Works Malta, October 1973. Partial revision by D.O.S. from R.A.F. air photography, May 1970.

*Handwritten signature*

16-8-94

**SITE PLAN (B)**  
**FACILITIES AREA**

## Recent Development Planning History

---



**Table A5.1: Recent development planning proposals. For location of proposed planning applications vide Drawing 17\_04\_7\***

<i>Ref. No.#</i>	<i>Application No.</i>	<i>Location of Development</i>	<i>Description of Works</i>	<i>Status</i>
1	PA 02781/00	Site at il-Qsam iz-Zghir, l/o Qrendi	Construction of farm stores	Granted
2	PA 01299/88 PA 02106/00	Site at Tas-Suldat, Triq il-Guarena, Qrendi	Not found on data base To demolish and reconstruct agricultural store and underground cistern beneath store	Granted
	PA 01317/02	Site at Tas-Suldat, Triq il-Guarena, Qrendi	To sanction agricultural tool store with underground cistern as built	Refused
3	PA 04348/98	Site at Triq Wied iz-Zurrieq, Qrendi	Spread soil over site	Dismissed
4	PA 00787/91		Not found on data base	
5	PA 01317/04	Site at Ras Bajjada, Ta' Hagar Qim, l/o Qrendi	To sanction reconstruction of old damaged room	Refused
6	PA 03299/02	Site at il-Misqa, Qasam il-Kbir, l/o Qrendi	Installation of lightweight security fencing system	Granted
7	PA 02386/01	Site at il-Qsam il-Kbir, l/o Qrendi	1) Erect four courses high rubble wall 2) Sanction the erection of two rooms 3) Spread soil over site (part) 4) Demolish existing rooms	Granted
8	PA 01667/00	Site at il-Qsam il-Kbir, l/o Qrendi	Sanctioning of minor improvement to fields	Granted
9	PA 02615/99	Site at il-Qsam il-Kbir, l/o Qrendi	Sanctioning of minor improvement to fields	Refused
10	PA 01669/00	Site at il-Qsam il-Kbir, l/o Qrendi	Sanctioning of minor improvement to fields at 'Qasam il-Kbir' Qrendi	Granted
11	PA 02633/01	Site at il-Qsam il-Kbir, l/o Qrendi	To sanction agricultural room and proposed rubble cladding	Granted
12	PA 05840/98	Site at Ta' Hagar Qim, limiti ta' Qrendi	Installation of mobile kiosk	Refused
13	PA 03798/01	Site off, Hagar Qim limiiti ta' Qrendi	Construction of substation	Granted
14	PA 04794/97	Site off, Hagar Qim limiiti ta' Qrendi	Erection of reservoir and room for agricultural purposes	Refused

\* The data is obtained from the official website of the Malta Environment and Planning Authority, as at 8<sup>th</sup> December 2004.

**Table A5.1 (cont.): Recent development planning proposals. For location of proposed planning applications vide Drawing 17\_04\_7\***

<i>Ref. No.#</i>	<i>Application No.</i>	<i>Location of Development</i>	<i>Description of Works</i>	<i>Status</i>
15	PA 01570/95	Site off, Hagar Qim limiiti ta' Qrendi	Construction of underground visitors centre to house facilities indicated on drawings in lieu of existing building being used as a restaurant together with sub-station and septic tank	Dismissed/ Withdrawn
16	PA 05390/94	Hagar Qim, Hagar Qim, limiiti ta' Qrendi	Construction of underground visitors centre to house facilities indicated on drawings in lieu of existing building being used as a restaurant together with sub-station and septic tank	Granted
17	PA 04497/93	Site at Hagar Qim limiiti ta' Qrendi	Cleaning of site from boulders and dried vegetation, setting out of same boulder in low walls and floor paving extension construction of a pergola with hasira	Refused
	PA 05037/01	Hagar Qim Bar and Restaurant, Hagar Qim limiiti ta' Qrendi	Installation of telecommunication equipment and antennae over upper roof level	Refused
	PA 06728/01	Hagar Qim Bar and Restaurant, Hagar Qim limiiti ta' Qrendi	To install a satellite dish	Refused
	PA 02773/03	Hagar Qim Bar and Restaurant, Hagar Qim limiiti ta' Qrendi	Sanctioning of temporary shade structure at Hagar Qim Bar and Restaurant	Granted
18	PA 04250/03	Il-Maghlaq Quarries (Panoramic Road), Triq Hagar Qim, Qrendi	Restoration of quarries at ix-Xaghra tal-Maghluq/Qasam il-Kbir by infilling with inert construction and deomolition waste and inert material	Forwarded to a Case officer
19	PA 00566/97	Site at Quarry No 9, Qasam il-Kbir l/o Qrendi	To connect two quarries in order to facilitate and render safe the travelling trucks	Refused
20	PA 02697/02	Site at Hagar Qim and Mnajdra Heritage Park, Hagar Qim, limiiti ta' Qrendi	Constructin of visitors centre, protective shelters on megalithic sites, park facilities (eg footpaths)	Forwarded to a Case officer
21	PA 01584/98	Hagar Qim Temples, limiiti ta' Qrendi	Reinforcing of existing boundary wall and installation of a new galvanized steel security fence	Granted
	PA 03150/98	Hagar Qim Temples, limiiti ta' Qrendi	Replacing of existing unhealthy facilities that is sanitary facilities with a new and improved toilet and rest room facilities and to erect a timber ticketing booth	Granted

\* The data is obtained from the official website of the Malta Environment and Planning Authority, as at 8<sup>th</sup> December 2004.

**Table A5.1 (cont.): Recent development planning proposals. For location of proposed planning applications vide Drawing 17\_04\_7\***

<i>Ref. No.#</i>	<i>Application No.</i>	<i>Location of Development</i>	<i>Description of Works</i>	<i>Status</i>
22	PA 03674/02	Site at Hagar Qim and Mnajdra Heritage Park, Hagar Qim, limiti ta' Qrendi	Surface laying of cables for necessary services	Granted
23	PA 03400/92	Hagar Qim Archeological Park ta' l-Imnajdra Qrendi	To create parking area, erect substation, tool shed and underground water reservoir	Granted
24	PA 05257/03	Site at Qasam il-Kbir l/o Qrendi	Extension of tool shed	Granted
25	PA 03863/93	9 Quarry Qasam il-Kbir, l/o Qrendi	Quarrying operations construction of crushers and boundary wall	Refused

\* The data is obtained from the official website of the Malta Environment and Planning Authority, as at 8<sup>th</sup> December 2004.