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The Qala Creek Project - A Synopsis

Hondoq ir-Rummien quarry and its environs are abandoned and dilapidated even though significant quantities of unexploited hard stone mineral resources still exist. Gozo Prestige Holidays Ltd. has instigated the conceptualization of the Qala Creek Project.

An initial project was presented in 2002. The project was initially presented to the general public and a public meeting was carried out on 10th September 2002.

Following:

- the general public’s comments,
- further detailed studies concerning the environment and activities taking place within Hondoq ir-Rummien and
- a thorough design exercise seeking to:
  - synthesise the general public’s wishes,
  - define the needs of the general public using the area,
  - whilst ensuring the protection of the existing environment,
  - and guaranteeing an economically and environmentally sustainable design solution

a new project was developed. It is this altered project that is being portrayed in this Project Description Statement.

The Qala Creek Project seeks to extract the mineral resources in an accelerated and controlled excavation programme of between 15 to 18
months duration. This will involve excavation at five different faces worked by five separate and independent teams. Boulders and spalls and sand will be stock piled on site for future use or trucked off site at approved bonded storage for release over time as authorised by MRA and MEPA. Hard stone aggregate and sand required for the subsequent works on site will be kept on site and remaining material will be dispatched for stockpiling in existing quarries in Gozo. Sufficient quantities of large hard stone blocks will be sent to industrial facilities for manufacture of hard stone paving slabs with appropriate surface finish for exterior use, and for manufacture of slabs with polished finish for interior use and for external wall cladding on the project. Whilst a number of boulders, blocks and aggregate will be re-used in the actual development of the project.

The developers are proposing to rehabilitate the entire site. The central part of the quarry will be excavated to 4 metres below M.S.L. to create a seawater inlet at the heart of the quarry, with the development of a village in part of the west, east and north quarry faces which will be considerably below the top level of the sheer quarry faces.

The village will be a mixed community containing a hotel, tourist apartments, multi-accommodation units, small commercial outlets, and catering facilities. The village will be designed in a truly Mediterranean context. Architectural style and character will be traditionally Gozitan, and the fundamental design objective will be to achieve a visual perception that the village evolved, almost organically, over the last
century, or more. The inlet will be used as a yacht marina, with a fisherman’s hard standing at the marina entrance. The general architecture of the marina village will reflect the architecture of Qala to achieve the perception that the Qala Marina is part of Qala Village.

All outdoor spaces within the quarry zone, including the rooftops over the steeply terraced buildings, will be soft and hard landscaped, with endemic plants planted throughout.

The whole project will be developed with sustainability in mind, starting off with the fundamentally important concept that the medium size hotel will be an essential part of the village community in the same way as the multi-ownership accommodation units, the holiday apartments, the small commercial units supplying the daily needs of the small community, and the marina, are also essential parts of the community. This will be a unique marketing tool for the hotel and the holiday apartments, ensuring their sustainability.

The project will incorporate a sewage treatment plant to ensure that the development’s secondary water requirements are recycled from soil water generated on the site. Fresh water will be produced from a reverse osmosis plant. The main air conditioning plant will be seawater cooled. Building and Energy Management systems will be incorporated to reduce energy consumption to an absolute minimum.
Preamble

The Qala Creek project is located within the currently non-operational quarry at Hondoq ir-Rummien. Although Gozo Prestige Holidays Ltd. owns 107,597 square meters of land in the area; nevertheless the project’s built-up footprint is limited to the disturbed area of the quarry (which is 56,880 square meters (circa)). In accordance with the Gozo Local Plan the project will initially focus on “…extraction of very good quality hard stone from the site”.

As indicated in the Gozo Local Plan the area “lies in a relatively dilapidated state and there is a dire need for upgrading of the area.” Clause 14.8.4 of the same plan argues that:

“… it is fundamentally important to retain public access to the area since this is one of the few areas accessible for bathing and other marine related activities …”

The Qala Creek proposals seek to enhance public access and improve on the bathing and marine facilities available at Hondoq ir-Rummien. The Qala Creek project will “…rehabilitate the damaged landscape, … provide top-of-the-range beach amenities; … encourage unrestricted access; … compliment the surrounding environment …” by rehabilitating the degraded garigue zone, by the creation of an eco-farming zone, and by the planting of endemic plants throughout the tourist complex. The development is in conformity with Policy GZ-Qala-3 of the draft Gozo Local Plan.

Policy GZ-Qala-4 argues that “Preference shall be given to the exploitation of the existing mineral reserves within the boundaries of the Quarry at Hondoq ir-Rummien (see MAP 14.8-E). After the mineral resource has been exhausted, requests for development permission to rehabilitate the area shall be given favourable consideration. The development permit conditions for this site should take into account the considerable expense needed to rehabilitate the area. However, at least 75% of the site shall be afforested according to the provisions of the Guidance on Planting. The rest of the proposed interventions have to integrate with the surrounding context and be located on the most inconspicuous locations on the site.
This proposal sees to the creation of a yacht marina, which in effect can be considered a viable visual amenity and which can be considered to be visually acceptable, since the whole area would be upgraded. Rather than afforesting the site, most of the site would be taken up by landscaped works, as well as by the creation of vistas by creating the proposed yacht marina. All the interventions integrate with the surrounding context, and definitely offer public open-air recreational facilities.

Accommodation

The Qala Creek project will accommodate:

- A deluxe 5 star 170-bedroom hotel with all facilities.
- 25 Self Catering Villas
- 60 Self Catering Units
- 200 Multi-Ownership Residences
- 731 Underground parking spaces subdivided into:
  - 160 under the hotel
  - 90 reserved for the public along the foreshore
  - 235 south-west village centre
  - 216 east village
  - 40 north east tip
The marina capitanerie.

The village centre comprising a small church/chapel, administration offices, some shops and restaurants.

Other small commercial outlets scattered through the village lanes and alleyways, providing artisans and artists studios, boutiques, local small restaurants, a newspaper shop, and other similar small scale activities, all intended for local use and to provide the character and flavour to the locality. This includes:

- 10 Retail Units
- 5 Dining Facilities

The gross floor area of the commercial area is 3750m².

A marina for between 100 to 150 craft depending on the size of the vessels.

Figure i – Block plan of the Qala Creek Project
**The Public Beach**

The jetty and slipway will be refurbished and improved upon by the reconstruction to provide a stepped access for bathers to the sea and a wider slipway with vehicle access lay-bys (Figure 8.19, p.49). In fact the jetty will be altered in order to make the area more accessible; while ensuring that a diving platform be installed in order to allow the general public to continue experiencing such an opportunity in a safer manner. It is pertinent to point out that the proposed improvements will enable an increased area which would be reserved solely for bathers, by placing the present surface haphazard car-parking area in the underground parking, to be incorporated in the construction of the sea defences (refer to Figures 8.5 and 8.6, p.41, 42), as well as provide improved public beach amenities. From surveys carried out, it is currently the practice that some 80 cars (at peak periods) make use of the rocky area and the garigue area on the south side of the sandy beach. This will be no longer allowed and necessary as all parking amenities will be provided underground.

The promoters agree to develop plans regarding all improvements in consultation with MEPA, Government and the Local Council. An agreement will be reached for a time frame for the compilation of said amenities, which, on completion, would be handed over to Government / Local Council for ongoing management.

**Public Amenities**

It is the developers’ objective that at Hondoq ir-Rummien public amenities will be enhanced ensuring that the general public will be given the opportunity to enjoy the recreational element of the area more intensely. Whilst not directly affecting any of the areas where existing recreational activities take place, the Qala Creek Project will ensure that the area will be accessible to the less impaired and that amenities will be made available to the general public as part of a planning gain package offered as an integral part of the project. This includes:

- The development of a hard surface which will be lowered closer to the sea level therefore making reaching the water easier for users of the area
• Providing improved kiosk facilities therefore enabling the general public to be better serviced
• Creating an underground car-park of around 80 car spaces in order to ensure that the general public will enjoy all necessary facilities of the beach; whilst ensuring a car free environment at and around the beach.
• Ensuring that car parking will not continue to be allowed on garrigue areas close to the sea.
• Provide much improved public shower and toilet facilities.
• Ensuring that all the area is accessible to the less impaired.
• Upgrading of the existing slip-way facilities ensuring the easy launching of boats from the area.
• Provide a terraced soft and hard landscaped area which will enable the general public to make use of bar-b-q facilities and enjoy the beach in a series of more secluded, intimate and private areas all accessible to the less impaired.
• Provide improved facilities for the diving community by enabling improved access to the sea therefore making it easier for diving schools to introduce this sport to the general public.
Figure ii – Upper Level detail of public amenities at Qala Creek

Figure iii – Lower Level detail of public amenities at Qala Creek
Scope

This report, whilst finding its roots in the document presented in 2002 (since the baseline studies carried out then are still valid and offered the basis from which the new project was conceptualized and developed); is a new Project Description Statement providing a detailed description of the new concept of how the area known as Hondoq ir-Rummien could be developed in an economically and environmentally sustainable manner.

Extensive studies have been undertaken throughout the conceptualization and development process of this project. It is through these studies that a new more environmentally friendly design took root and was evolved. Wave studies, novel systems of breakwater and quay design (ensuring that the existing sea bed will not be directly built upon in any way), new energy conservation building designs, and improved public accessibility and public amenities contribute towards the development of this project known as Qala Creek. The study aims to describe the extensive work carried out in order to ensure that the new project respects the environment whilst minimizing impact on the existing environment to a minimum.

This Project Description Statement has been evolving over the last three years, whilst directing the design process; it contemporarily recommends action that will ensure the maximization of the site’s capacity and potential for socio-economic and environmental improvement. The Qala Creek project seeks tangible and practical procedures to upgrade the current dilapidated condition of Hondoq ir-Rummien.

This report is in conformity with the conditions set out by the MEPA and compliant with EIA Regulations 2001 (LN204/2001) brought into force on 11th September 2001. This PDS will act as the basis for the generation of a terms of reference covering a full Environmental Impact Assessment for all the proposed development.
1. The Client

The landowners and developers of the Qala Creek project are Gozo Prestige Holidays Ltd. The company operates for the niche market of villas with pools, and other types of up market accommodation in line with the policies of the Malta Tourism Authority regarding Gozo. Gozo Prestige Holidays Ltd. enjoys a reputation of being the market leader in its sector. This it gained over 12 years of striving to be the best.

The Company specializes in the market segment for high spending tourists seeking self catering luxury accommodation, and who are from a higher spending category of tourists, which bring with them considerable spill over effects to restaurants, shops, and other service providers.

Gozo Prestige Holidays Ltd. efforts to market this project are being bolstered on the international market through a number of world leading companies working in the marketing, management and operation sectors of the leisure industry. Gozo Prestige Holidays Ltd. will synthesise this expertise to ensure that the Qala Creek project comes to fruition – therefore benefiting Gozo.
2. Opportunities and Problems

The Qala Creek Project addresses various opportunities beneficial for the Gozitan community, foremost amongst these are:

- The enhancement of the Maltese Island's objective to act as an international hub for yachting and maritime activities in the Mediterranean Sea;
- The development of the location as a destination port, where yachts and boats can anchor in order to enjoy day/short-stay trips.
- The location and breadth of this project defines the promoters’ objective to create an exceptional tourism accommodation project, which though to be commended for its innovation and boldness for going after new markets, has its own related risks for the developer;
- The opportunity to seek after and cater for new markets, particularly those segments relating to yachting and maritime activity enthusiasts and higher-spend tourists;
- The opportunity to generate economic activity from an unused piece of derelict land with considerable scope for environmental upgrading – this by:
  - Upgrading the natural environment by removing a number of eyesores – in particular:
  - Regenerating the disused quarry located at the picturesque bay of Hondoq ir-Rummien
  - Valorising the built and historical heritage by creating walks and restoring a number of buildings and locations considered to be important in heritage terms within the street environs of Hondoq ir-Rummien – this will include also the provision of information readily available to the general public to learn more about Malta’s built heritage.
Providing a marketing outlet by attracting a significant number of up-market tourists and patrons to the proposed marina and up-market tourism and residential development.

The extension of the swimming zone as shown in Figures i, ii and iii (pgs. xi, xiv), will ensure that the present swimming area versus both conflicts will be considerably increased.

In reaching these objectives, this development will inevitably affect the current users of the area. The promoters of the project have therefore gone to great lengths in order to identify the existing activities currently taking place in the area; whilst ensuring that as part of the project enhancement of all these activities is ensured. Contemporarily, all efforts were made to ensure that the project’s negative impact on the environment would be minimized this through the use of alternative cutting-edge technology which eliminates the need for a break-water, while ensuring that access to the marina will effect the smallest area possible of the sea-bed:

- both through the use of the smallest footprint possible, and
- the effect on the natural sea-bed environment and water-quality will be minimal given sea-current conditions.

The General Economic, Social and Environmental Objectives captured by this Project maybe encapsulated by the following points:

**Economic**

- To generate a positive Net Present Value on the Project indicating financial feasibility and long run prospects.
- To secure an acceptable rate of return on investment for the Project's shareholders over the medium to long term.
- To secure long-term gainful employment for Gozitan indigenous labour in all aspects of the hospitality and catering trades relevant to the Project's array of proposed activities.
To secure and internationalise the know-how and expertise relating to yachting marinas within the Gozitan pool of labour expected to supply the human resources for this project.

To enhance tourism opportunities available in Gozo, which will result as a direct consequence of the approval of this project.

To generate wealth through the creation of built capital, particularly residential development, which will be put on the international market and which therefore will attract direct and indirect foreign investment into the Maltese and more specifically the Gozitan market.

To create a dynamic and growing market for the fast dying artisan trades, the visual arts, and cultural activities in general – therefore ensuring their survival.

Social

To enhance the skills and knowledge base of the indigenous labour force and population generally in terms of hospitality, catering and marina management under the direction of internationally-renowned operators.

To enhance the skills and knowledge base of the indigenous labour force and population generally in terms of the arts, crafts and artesian activities.

To provide new and different work opportunities to the indigenous population.

To enhance Gozo's attractiveness for certain niche segments of higher quality tourism, for example members of the international yachting fraternity, the gaming segments etc.

To enhance the facilities for the bathers who regularly frequent Hondoq ir-Rummien bay in the summer months.

Environmental

To ensure the replacement of what could arguably be termed as an eyesore, (namely an unused/abandoned/derelict quarry) with a carefully sculptured,
aesthetically pleasing complex which will be the first of its kind on the Island.

- To refurbish and upgrade surrounding roads and infrastructure - particularly upgrading the existing road to the north of the site.
- To embellish the present site with acceptable landscaping consisting of lush vegetation, endemic and non-invasive trees mixed together amid boulders and rubble walls and water features, thus creating the perception that the project is the work of nature itself.
- To conserve as much as possible the natural resources employed during the operation of the project, such as the project's water supply necessities.
- To ensure sustainable waste separation in conformity with accepted environmental standards.
- To minimise adverse effects on the seabed through the use of a rubber-dam and/or spillway gate system erected at the land-sea boundary which will provide marina defences which will not impinge on the sea-bed since said defences are developed on the sea-to-land boundary.
- Removal of alien invasive species
- The repristination of the garrigue area and its continued enjoyment by both nature and man.
- The creation of an eco-farm, which will help in the conservation of rare species of tree and plants especially rare fruit tree varieties.
- The conservation of bird life will be ensured over a large area.
- The use of native trees and plants over a wide area.
- Recycling of stones, sand and clay produced and found on site as a landscaping subsoil.
- Valorisation of the existing built-up cultural and historical heritage.

Notwithstanding the great care that is being taken during development of the project in order to ensure that that adverse socio-economic and environmental effects are minimised (thus by adopting state-of-the-art technical solutions), yet the increased
activity within the Qala Creek area will inevitably create adverse effects which must be addressed in order to be mitigated. These include:

- Adverse effects on the sea bed due to increased maritime activity accessing this port area, as well as reclamation for sea defences along part of the coast. In fact, the project will offer anchorage as a destination port within the marina, rather than outside the proposed development, as is envisaged by the Draft Gozo and Comino Local Plan. Furthermore, sea defences have been re-designed completely in such a manner so as to limit development for the creation of a state-of-the-art rubber dam system.

- During construction, it is expected that dust would be generated. This is considered to be the main problem which has to be addressed in detail when preparing the construction and monitoring processes which are to be put in place prior and during said works. In order to mitigate against this problem, a system whereby suspended solids are removed from the stormwater system managing water run-off within the site, as well as a system which ensures that water discharge is done directly to the sea, this after treatment in order that no further changes to the surrounding ecological system are effected through diversion of treated access water run-off. The location of the site office is such so as to ensure that excavation of the basin would be done à-priori of any breaching of the mouth of the excavated port, this in order to ensure that no suspended solids are discharged into the sea.

- Attracting more car activity to the locality of Qala, particularly through the creation of through traffic by residents, patrons, and visitors to the proposed Qala Creek Project.

- Changing an existing relatively undeveloped (even albeit somewhat degraded) sea shore environment, where informal summer recreation takes place, into a more structured and formal recreation space, which inevitably detracts from the current attractiveness of the area.
3. Strategies, Production Processes, Operational Methods & Alternatives

The general strategy employed to attain the above Social, Economic and Environmental Objectives evolve around the concept of creating a Marina-Based Tourist Complex. Such a location will attract new foreign investment into the area as more foreigners will look towards locating within Gozo a first or second home. It is expected that the project will attract tourists who can be rated amongst the higher if not highest spending bracket therefore increasing wealth within the Gozitan economy. To achieve the objectives outlined in the preceding section, the following strategies, amongst others will be implemented.

**Economic**

- The adoption of a professional Marketing Plan designed to create a relevant and consistent Marketing Mix for each of the target client segments of the entire Project, with implementation monitored according the Plan's own schedules.
- The operation of the Hotel and the Apartment clusters to five-star standards by international operators. This is an extremely valuable part of the strategy and is consistent with the other prong, namely the targeted management and operation of the yacht marina by a leading international yacht charter operator.

**Social**

- The running of the project by international operators will ensure the required upgrade of the Gozitan indigenous work force's human resource skills and know-how covering all aspects of the project's operations. The employment opportunities will also include opportunities for: yacht-
chartering personnel, boat skippers, yacht chandlery sales staff, etc. High quality tourist spending will support certain self-employed persons running certain retail outlets such as boutiques, arts & crafts shops etc. Such residents will have a spill over effect on the rest of Gozo’s economy as tourists particularly preferring to have first and second homes will inevitably use services offered and buy their needs within the Maltese Islands. In addition the project will give the opportunity for new jobs within the cultural scene as an integral part of the project is the valorisation of historically important buildings found within the environs of Qala Creek.

**Environmental**

- The landscaping plans, uses of rubble walls etc. are all intended to form part and parcel of the project construction and are intended to attain the project's environmental objectives. As part of the project, it is expected that the required plants to implement and maintain the landscaping plan will be planted and tended to within the grounds of Gozo Prestige Holidays and will predominantly consist of endemic and local flora.

- The entire development will be designed with water conservation in mind. A reverse osmosis plant will furnish the entire requirements of the hotel, the first class holiday apartments, and possibly the village residents. The brine will be returned into the marina to help in the re-circulation of the marina's waters. All roof water rain run off will be collected in abundant underground water reservoirs for use as secondary water. A sewage treatment plant will augment this source considerably. The hotel air-conditioning system will employ seawater cooling, with the seawater returned to the marina basins to help the water circulation in the marina.

- The same applies to the refurbishing of roads, upgrading of the supporting infrastructure and separation of waste that will commence from day one.
**Marine Works – Objectives & Strategies**

The Qala Creek project will involve extensive marine works. The waters around Hondoq ir-Rummien are still very clean. It is extremely important that any interventions will not jeopardize the marine eco-system. Therefore, the environmental objectives set out for the design methodology of the proposed project consist of:

1. The least possible footprint of the sea defence works on the underwater habitat;
2. The minimisation of the amount of dust and other particulate matter entering the water column;
3. The completion of the marine works in the least possible time frame;
4. Maximum re-utilisation of local mineral resources.

The marine works necessary to protect the marina from the south-west and south-east winds can be of various designs, concepts and approaches. Keeping in mind the objectives outlined above two possible structures can really fulfil the requirement while respecting the requirements set above – namely:

- A rubber dam designed to function at the mouth of the marina at the present day sea-to-land boundary.
- Or the creation of a spillway gate designed to function at the same location as the rubber dam.

Various marina layouts have been considered in the course of the planning procedure for the Qala Creek Marina project. The final layout that was selected made use of a gate at the entrance to the basin of the marina. The entrance to the inner basin is 20.0m wide. The top elevation of the sea defence works is El. +3.0m. The marina entrance will be protected either by an inflatable rubber dam or a spillway gate rising from –4.0m below C.D. to +2.0m above mean sea level. The purpose of the gate is to reduce or eliminate wave action in the basin of the marina in order to prevent damage to moored boats during extreme weather events. The gate will be operated in two
positions only; fully deployed or fully retracted. When retracted, the gate will lie flat below El. –4.0m so as to allow boats to pass over the gate unimpeded and without causing damage to the gate.

Adopting this type of wave protection, the impact on the sea-bed has been greatly minimised; since the foot-print on which the wave protection will be constructed is greatly reduced; and generally contained within the disturbed seabed directly giving onto the land-water boundary. The reclaimed part of the sea (with an approximate area of 1,250m²), which will lead to the Marina’s entrance is basically a shore structure. The entire structure would be built from locally existing mineral resources. This structure would consist of a watertight enclosure built from horizontal slicework and filled with concrete. It will be backfilled with quarry waste. Rubble recovered from the quarrying will be used to form a rubble spending bank and spur parallel to the sea shore.

The marina basin is a straightforward excavation of a basin, approximately 200 metres long, 70 metres wide with a draft of 4 metres at low tide in coralline limestone. It is estimated that some 800,000 cu.m. of rock will be excavated. Of this, some 90,000 cu.m. would have to be taken out of the site and backfilled in an appropriate quarry. This should be ideally located close to the site, and as much as possible to follow the same quarry rule adopted to transport the spalls and boulders which are to be stock piled in order to enable gradual use. In addition to this 90,000 cu.m., a further 40,000 cu.m. of clay, which were dumped on site over the years, would have to be used as part of the agricultural land reclamation process. In order to ensure the least possible excavation time, only blasting has been considered as the means of excavation.

Previous experience with other methods of excavation argues against mechanical methods as these invariably breakdown and lead to long time over-runs.
The excavation would be carried out from a deep sump excavated at the northern end of the basin towards the shoreline. All rainwater run-off and ground water infiltration will drain to a sump at the shore end of the basin from where it would be pumped to the sludge processing facility located at the uppermost levels of the quarry from where mechanical set up will filter water from the sludge. The sludge would then be caked and transported to landfill for disposal.

**Land Based Works – Objectives & Strategies**

The Qala Creek project will also involve extensive land-based building works. The building works will only commence once the excavation of phase 1 of the marina basin would be completed. The footprint of the area where building will take place will primarily be limited to the already disturbed land where the disused quarry is in need of regeneration since it obstructs the environment surrounding Hondoq ir-Rummien – particularly when viewed across the waters from the Comino island archipelago and more particularly the hugely popular Blue-lagoon area, as in fact identified in the draft Gozo Local Plan.

The material harvested during the excavation exercise will be partly utilised during the construction project of the Qala Creek project; while the remainder will be stock-piled in other Gozitan quarries in order to be utilised in other works.

It is being considered that the necessary concrete batching plant will be located within the quarry floor and close to the sea-land boundary for the duration of the project and then re-transported to other batching plants within Gozo. This will significantly reduce the number of trips to-and-from the site during the construction period.
4. Project Timing

Following pre-submission consultations with senior MEPA officials, the developers have submitted an outline application to develop a destination port, a marina, a hotel, and a tourist village, under application PA3798/02, registered as valid on the 11th July 2002.

Following meetings with the then EMU of the MEPA, the developers were asked to prepare a PDS which was presented on August 2002, a Public Exhibition which was convened at the Qala Primary School between the 1st and 10th September 2002 and a Public Information Exercise which was held at Qala Primary School on the 10th September 2002 where the general public was given the opportunity to forward its views verbally or in writing on the initial project presented.

Following further discussions with MEPA and the Public meeting the project went back to the drawing board, further studies were conducted and the project was modified in order that its environmental impact be further minimised and the resultant project be more in line with the requirements and needs of the present day users of the area, as well as the needs of the Gozitan economy; while contemporarily ensuring the Qala Creek Project’s economic sustainability. A second updated version of the PDS based on the new project proposals is being presented in order for MEPA to review and further assess the project.

EMDP, led by Architect Mariello Spiteri, have prepared a second PDS in line with the terms of reference submitted by MEPA on 14th September 2005. Reports presented earlier in the first version of the PDS were re-utilised together with new alternative studies to enable the generation of this second updated version. The team of consultants who participated in the compilation of this PDS include:

- Philip Beattie Socio Economic
- Engineering Services Ltd. Infrastructure
- Patrick Schembri Terrestrial/Marine Ecology
In the event of an affirmative decision by MEPA, excavation works will commence immediately, with priority being given to production of boulders if and as required by the Qala Creek project. We are assuming a start to excavation works during 2006.

The developers have meanwhile also sought the advice of local and foreign experts and quarry owners on the methods to be adopted to accelerate the excavation and recovery of the mineral resources existing on the site, and it is generally agreed that the site excavation would be completed in around 15 to 18 months.

This excavation work envelope will enable the project to supply the Maltese market with material that is highly in demand. Although harvested temporarily the material will be placed on the market on a period of time which will ensure that the spalls market is not flooded. The developer is currently finalising arrangements in order to stock-pile the material in quarries located on the eastern Gozitan shore and within easy reach of Hondoq ir-Rummien via secondary roads which will be upgraded, and will not impinge on the national grid and therefore allowing bathers easy access to the beach during and after construction.

Under this preferred scenario, the developers envisage that the rest of the development works will then be completed over a four-year period, ending in 2010.
The landscaping effort of the project would have to start in earnest once the outline development permit is granted by MEPA. In the first year thereafter, the *Euphorbia dendroides* garrigue may be cleared of alien invasives, as will be the case for the other garrigue areas. Destructive activities are to be removed. In the following wet season the garrigue restoration may proceed through appropriate planting. Following this, the garrigue should be left to establish itself naturally.

In the agricultural zone to the East, windbreak planting should also be undertaken at the first wet season after the plans have been approved. The construction of the nursery and rubble wall restoration should progress concurrently but may start before if the permit is issued in the dry season. In the meantime detailed landscaping plans will be made.

Once plant species are approved and quantities known, cultivation and procurement will be made and as the building works progress and finishing is finalised, planting may proceed with utmost haste. It should be kept in mind that landscaping is an ongoing operation that has both the aspect of an investment and that of recurrent affair.
5. Project Viability

The economic / financial concept of Net Present Value is the best way to financially appraise the Qala Creek project as it accounts for the time dimension of the project. The Net Present Value will be needed to be fully dealt with in the Socio-Economic Impact Statement which will form part of the EIA process.

Financial Sustainability of the Proposed Development

The Qala Creek project will be fully completed by the year 2010 and the estimated cost of completion will be in the region of 75 million Euro. It is noteworthy that the quarry which is situated in the development area will be excavated and the proceeds from the sale of aggregate/material will be utilized by the joint venture to finance part of the development costs. The net proceeds from the sale of the remaining 200 shared ownership residences, 25 villas and half of the retail and dining outlets (around 1,500 sq metres) will be utilized to finance part of the development costs of the venture. The hotel, the short/long term leased properties and the berthing occupancy of the marina are dependent on target occupancy rates.

The socio-economic impact study will have to delve in detail into the clear assessment of demand required for the project in its entirety to be considered successful. Nevertheless, it is pertinent to point out that demand for Marina space is overwhelming. More precisely, to date Gozo has suffered from a lack of proper capacity for visiting yachts. Getting the Qala Creek marina operational will provide added spill over revenue not only directly to the operators of the marina and the various businesses located within the proposed village; but rather to the Gozo economy in general.
Long Run Profitability

This project offers various sources of revenue generation, thus reducing project risk and also enhancing the possibilities of long-term success. The diversity of Qala Creek project will increase the chances of this development’s viability in its entirety.

In terms of the hotel aspect of this project, it suffices, at this juncture, to state that long run profitability requires a modest degree of economies of scale based on a minimum size which best facilitates the achievement of the break-even point. There have been some arguments put forward that the propensity of some tourists to switch their destination depends inversely on the availability of space and the remaining natural beauty of the tourist resort itself. The Qala Creek Project has the advantage of offering an aesthetically appealing resort with sufficient supporting facilities to make a clear difference, assuming that the marketing of the development meets accepted standards. In addition the Qala Project will attract a new type of tourist – the sailing fraternity; in addition to enhancing facilities for others like diving, eco and environmental oriented tourism. Evolving around the creation of a new marina located at this unique area within Gozo will ensure popularity with patrons as the Qala Creek project will put Gozo on the international sailing map.

Economic Benefits

The principal benefit for Gozo and hence the Maltese Islands in developing accommodation earmarked for niche tourism such as yachting, gaming and marine activities should theoretically arise from attracting new tourism markets to enjoy the project's facilities within easy reach of the available accommodation, in addition to augmenting Gozo's traditional appeal to the higher quality tourist traveller. The desirable outcome will, in particular, be to enhance tourism in the shoulder months, support other marketing initiatives such as the conference facilities, thus making a contribution to Gozo's and the Maltese Islands' competitiveness relative to other destinations.
The simultaneous rural and coastal location of this development qualifies it as a project which, to a significant extent, will assist the island of Gozo’s tourism appeal, and hence the national tourist industry. The same can be said for the conference market which the project aims to cater for, as well as in terms of the gaming market and yachting market. In terms of yachting clientele, visiting yachtsmen are accompanied by their spouses and families on occasion, thus amplifying the original spend of these persons to a degree.

The residential clientele for the project would also contribute – via the injection of consumption expenditure – to a multiplier effect on the island of Gozo’s GDP.
6. The Site

Qala is the easternmost settlement on the island of Gozo. The settlement has developed around the church, which locally dominates the historic centre. The latter has retained most of its original characteristics. Most of the areas at the periphery of Qala have access to breathtaking long distance views. To the southeast of the development lies the dilapidated Hondoq ir-Rummien Quarry and a bay which is popular with both locals and tourists for bathing purposes.

The Qala Creek project will have a footprint bounded by terraced fields on the East at the place known as Tal-Ghassa, by further terraced fields to the North in the area known as Ta’ Kordina. On the West it partially skirts the public road and then a number of terraced fields. On the same side it follows Hondoq ir-Rummien Gorge. On the South, the land falls sharply to flank the lower Hondoq ir-Rummien Valley and then flanks the coastline till the land at Tal-Ghassa.

The overall site area is 107,597 square metres. It is proposed to extend the development site in the quarry by the stretch of road protruding uneasily into the quarry giving a site area of 66,731 square metres. The garrigue area to the west of the quarry occupies 26,179 square metres. The abandoned agricultural fields to the east have a surface area of 14,687 square metres.

The chapel dedicated to the Madonna tal-Blat situated in the Western zone has been passed on to the Qala Parish as part of the project. In fact the chapel originally was part of the property owned by Gozo Prestige Holidays. This chapel at the moment presents two particular environmental problems. The first is the landscaping associated with its parvis, the other is the dumping of waste originating from church decorations on to the nearby garrigue. The promoters of the project are ready to help intervene and upgrade the area as part of the overall landscaping exercise which is an integral part of the Qala Creek project.
Within the limits of the site one also finds a farm. The state of the farm and the quality and state of the materials used in its construction require restoration and redesign. A traditional farmhouse (Gozitan Razzett) is to be assimilated.

Figure 6.1 – Aerial Shot of existing quarry
Figure 6.2 – Extent of site owned by Gozo Prestige Holidays Ltd.
7. Alternative Uses, Technologies and Sites

The Hondoq quarry is a definite scar on the landscape, and this proposal is addressing the rehabilitation of the landscape damage for this specific site. Different development alternatives have been considered over the years:

- Yacht hard standing. This was identified by the “Yachting Development Subject Study” carried out by the PA and the MMA in 1997, which identified this site as a potential “hard standing site”. The same study recognizes the financial problems that rule out this solution.

- Developing the existing site as a hotel project. Various proposals have been submitted over the years to construct a tourist development in the existing quarry. The Structure Plan requires that mineral resources are fully extracted prior to the “covering” of such quarries for later use. There are over 400,000 C.M. of un-exploited top quality hard stone mineral resources, available for extraction from the site.

- The do-nothing option. The site is already an enormous visual eyesore (refer ASH report.) Do-nothing will inevitably end up with further indiscriminate dumping of debris and waste on the site with obvious consequences.

The Do-Nothing Option

MEPA is well aware that at present Hondoq ir-Rummien is “a scar which is easily visible from nearby Comino and the route taken by the Gozo ferries.” The draft GCLP recognizes that “…the preferred use is to reclaim the area … once the mineral resource is fully exploited.” In fact policy GZ-Qala-4 of the Gozo Local Plan argues that:

“Preference shall be given to the exploitation of the existing mineral reserves within the boundaries of the Quarry at Hondoq ir-Rummien. After the mineral
resource has been exhausted, requests for development permission to rehabilitate the area shall be given favourable consideration. The development permit conditions for this site should take into account the considerable expense needed to rehabilitate the area.”

It is therefore clear that MEPA recognises that the only way Hondoq ir-Rummien can be upgraded is through the development of a project which would enable the potential development of significant economic return, not only to the owners and developers of the project but to the Gozitan economy.

The do-nothing-option environmentally is not acceptable. The area will continue to manifest clear signs of dilapidation and therefore will further degrade itself. If no intervention of any sort were to materialize vis-à-vis the existing vegetation, the situation would not improve but in all probability further degrade. Primarily the quarry scar will remain an eyesore till the artificial cliff faces are colonised by the meagre species that are present on site. The garrigue areas are more than likely to be destroyed, alien species profligate, and refuse dumping continues and the general degradation of the site progress further. With regards to the agricultural areas these too will continue to be bare as the land is not held under title from the owners and hence the present squatters have no interest in its improvement.

It could be argued that natural regeneration may take place. Indeed a small olive grove lies only a few hundred metres away from the site and wild olive trees may one day invade the site, but various unrestricted activities occurring on the site ensure that bird species which act as agents of seed dispersal will be destroyed before they even get a chance to carry out their beneficial function.

Unless the area is not intervened upon, it can potentially impact adversely on the boat-trip activities that visit Comino and circle the islands. This eyesore is located across
the waters from the Blue-Lagoon bay which attracts the highest percentage of boat
day trips on the island.
Un-organized parking, bathing, bar-b-q activities will keep on slowly degrading the
garigue areas and rocky foreshore surrounding the bay. It is necessary that facilities
and amenities are introduced in order to provide the people bathing in the area with a
safer and more appropriate leisure experience related to bathing activities.

It could be concluded that the Qala Creek project will transform the site from one of
dereliction to one where several “natural” habitats are not only being conserved but
also created specifically to promote biodiversity of life for the enjoyment of all.

Why Qala Creek Marina

A sieve analysis has been carried out to compare possible sites where a marina
development could take place. This is based on the proviso that a marina is considered
necessary for the continued development of the Gozitan tourism product and
economic development in general.

A marina, whether it is a new-build or a re-engineered basin, has the power to change
a coastal town’s image and make it attractive for a much longer season than is normal.
The capital investment costs in infrastructure are normally substantial and boat traffic
alone is not normally enough to make a marina development viable. A marina
development may be classified as a waterside tourist development, with the marina
acting as a water feature to enhance the value of an otherwise dull tourist residential
development. Nowadays, marinas also offer a wider range of leisure facilities to suit a
wider customer base.

The site selection process for a waterside tourist residential development requires a
comprehensive analysis of the coastline available for development.
On the technical side, the criteria include the degree of exposure, depth of water, navigational constraints, shoreline topography, existing road access and services. On the environmental side, the criteria include rural and marine conservation areas, sensitive shorelines and other local plan issues.

Using a map based sieving analysis five possible sites were assessed. These include

1. Xlendi Bay,
2. Xatt L-Ahmar below Fort Chambray,
3. Mgarr harbour, east of the existing port,
4. Qala quarry site at Qala,
5. Marsalforn Bay.

Comparing the five sites:

<table>
<thead>
<tr>
<th>Objective criteria</th>
<th>Xlendi</th>
<th>Xatt L-Ahmar</th>
<th>Mgarr</th>
<th>Qala</th>
<th>Marsalforn</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Technical</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shelter from prevailing winds</td>
<td>X</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>X</td>
</tr>
<tr>
<td>Depth -5m</td>
<td>✓</td>
<td>X</td>
<td>✓</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Approach Channels</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Road access</td>
<td>✓</td>
<td>X</td>
<td>X</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Utilise natural shelter</td>
<td>X</td>
<td>✓ from E &amp; W</td>
<td>✓ from E &amp; W</td>
<td>✓ from E &amp; W</td>
<td>X</td>
</tr>
<tr>
<td><strong>Environmental</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breakwater confined footprint</td>
<td>✓</td>
<td>✓</td>
<td>X</td>
<td>N.A.</td>
<td>✓</td>
</tr>
<tr>
<td>Dredging: Confined</td>
<td>N.A.</td>
<td>✓</td>
<td>N.A.</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Reclamation: Confined footprint</td>
<td>N.A.</td>
<td>✓</td>
<td>N.A.</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Beach replenishment possible</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>✓</td>
<td>X</td>
</tr>
<tr>
<td>Direct access from distributor / arterial network</td>
<td>✓</td>
<td>X</td>
<td>X</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Access does not pass through residential or other sensitive land use areas</td>
<td>✓</td>
<td>X</td>
<td>✓</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>
For each of the five candidate sites it can be said that:

**Xlendi Bay**

On environmental grounds it would appear that a marina at Xlendi would be ruled out because the construction of the breakwaters would preclude the use of the beach as a holiday destination. The breakwaters would completely

---

<table>
<thead>
<tr>
<th>Objective criteria</th>
<th>Xlendi</th>
<th>Xatt L-Ahmar</th>
<th>Mgarr</th>
<th>Qala</th>
<th>Marsalforn</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Posidonia</em> beds avoided</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Maintains water quality in Bay</td>
<td>X</td>
<td>✓</td>
<td>X</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Scheduled cliffs to be avoided</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Scheduled trees to be avoided</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Protected Cultural Heritage features to be avoided</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Special Area of Conservation</td>
<td>X</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Social</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Retains bathing areas / enhance / provide new bathing areas</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>✓</td>
<td>X</td>
</tr>
<tr>
<td>Retains small craft moorings</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Public access to the coast retained and / or enhanced</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Important views to be retained / enhanced</td>
<td>✓</td>
<td>✓</td>
<td>X</td>
<td>✓</td>
<td>X</td>
</tr>
<tr>
<td>New noise sources should not impact sensitive uses</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Respects private property rights</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

*Table 7.1 – Comparison of the five sites*
block views towards the horizon and would nullify efforts at beach replenishment.

**Xatt L-Ahmar**

Engineering-wise, a marina would be located entirely on clay which may prove to be problematic, especially in the areas that need to be dredged under water. The loss of the swimming area cannot be easily replaced and is likely to be lost for ever. On the positive side, although the access road would need to be built, the basin would compliment the shore side redevelopment of Fort Chambray.

**Mgarr Harbour**

A marina adjacent to the commercial harbour would enable the commercial port to expand by transposing the marina facilities over in to the new basin. However, the mineral resources to build a breakwater similar to the existing one are unlikely to be available and will always pose a dilemma to future designers. Vertical-sided structures in concrete or rubble mounds armoured with concrete units are unlikely to be readily accepted. The swimming area along this coast would be lost forever.

**Qala**

A marina inside the disused quarry at Hondoq is unlikely to impact the marine environment beyond the area of the disturbed sea bed. The reclamation is confined and practically all dredging is shoreward of the waterline. Areas of concern are related to the impact of noise and traffic on the village of Qala. On the plus side, there is considerably potential synergy between the topography of the quarry and the type of shore side development being proposed.
Marsalforn
A marina dredged in the flat reef is unlikely to be viable unless accompanied by a high density high rise development, requiring a large footprint in the area of the marina.

From this analysis it can be seen immediately discerned that at Xlendi, a marina development would not be viable, given the high environmental cost. Although Mgarr, Marsalforn, and Xatt l-Ahmar can be considered as possible alternatives, yet it seems that Qala is the best location for the development of a marina since:

- the site is already disturbed,
- the high quality rock will be harvested,
- impact on the sea-bed will be minimal, since the development will primarily be made on disturbed and degraded land.

On a more general note, in 1996 the short listed site at the Hondoq Quarry had already been identified as a potential hard standing in the Yachting Development Subject Study, carried out jointly by the Malta Maritime Authority and the then Planning Authority.

Mitigating Environmental Impacts due to the Qala Creek Marina

Looking at the Qala Creek project in more detail, it can be discerned that the biggest environmental impact is on the surrounding marine environment, since the marina and the proposed development will generally take place on the already disturbed land of the quarry site. Various alternatives were researched ranging from different break water designs to solutions which although more costly minimised the footprint of the sea-defences to a minimum.

H. R. Wallingford were commissioned to compare the different sea-defence characteristics of the various solutions. It was determined that rather than going for
various configurations of quay and breakwater designs, the Qala Creek Marina would make use of either a rubber dam or a spillway gate design. The footprint of the development would therefore be reduced to a minimum with only some 1,565 square meters of the seabed being directly reclaimed to construct the sea defences. The area reclaimed has already been disturbed due to rock deposition as part of the quarrying activity taking place over a number of years. As can be seen in the maps appended the footprint of sea-bed lost to the defences is greatly reduced; if not rendered insignificant. More so since the quality of the sea-bed covered by the sea defences is disturbed and lies adjacent to the existing quay.
8. Project Description

The proposed development envisages the excavation of the existing Hondoq quarry to sea water level over the entire site, and the excavation of the marina basin to minus 4.00 metres below msl. The excavation works are programmed to be carried out over a 15 month period, apart from the harbour mouth excavation which will be carried at a later stage when the breakwater arms will have both been constructed.

This harbour mouth will serve as the location for the crushing plant, the batching plant and the aggregate and sand stockpile & storage area. It will also serve as an enclosure to ensure that the large basin retained on the inner part of the site will ensure that all dust and sludge produced by the excavation operation will be secured and dried and subsequently dispatched for dumping in exhausted quarries.

The breach to the sea will be opened shortly before the completion of the hotel, around 30 months after commencement of the project works. By this time dust production will be minimal and the basin will have been totally cleaned and all sludge will have been removed. In addition prior to the opening up of the breach and the construction of the rubber dam and/or spillway gate, the area will be cordoned off by two lines of geo-textile filter.

The hotel will be five star deluxe accommodating 170 double bedrooms. The developers will agree with the operators of the hotel on the bedroom sizes – dividing them into standard bedrooms, junior suites, family suites, executive suites, and the presidential suite. The hotel will be provided with all amenities including an indoor pool and fitness/health centre, an outdoor pool, two tennis courts, two squash courts, the main lobby bar, the marina deck bar, the pool bar, the main restaurant, two speciality restaurants, a marina and scuba-diving club, and other facilities.
The self-catering 1st class apartments will be located close to the mouth of the man-made creek, and the residents will be able to use the hotel facilities, although they will be detached from the hotel. The residents will have their own clubhouse and bar.

The village centre will include a small chapel, some restaurants and shops, and will merge into the cluster of 50 to 60 self-catering apartments.

The marina village below the east quarry face will complete the typical Mediterranean village and will provide accommodation for around 230 multi accommodation units all with abundant terraces with trees plants and shrubs throughout. The village will be broken up by several internal streets and piazzas with local artisans shops, boutiques, artists' studios, and other local shops scattered, as though at random.

Underground parking will be provided at five locations with around 150-car spaces below/behind the hotel, and with around 430 spaces below/behind the apartments. These parking facilities will be primarily used by the patrons of the Qala Creek project. In addition to these parking areas there will be provided some 80 car parking spaces for the general public which will be directly accessed from the sea-shore outside the marina basin.

The entire project will be completed around 48 months after commencement.

**The Scale of the Project**

The quarry and site rehabilitation will produce the areas described below:

- Restored Garrigue area, 26,179 square metres.
- Recovered agricultural/eco-farm 14,687 square metres.
- Yacht marina basin 14,680 square metres.
- Footprint of built structures, including approx 30% of footprint of landscaped roof and terrace gardens, and including approx 400 metres of public lanes and piazzas around the village overlying the lower level apartments with an over footprint of about 19,000 square metres.
- Marina public promenade 7,360 square metres.
- Hotel pool deck and sports facilities 3,100 square metres.
- Hotel access road and surface parking 2,568 square metres.
- Soft landscaping hotel/holiday flats zone 9,011 square metres.
- Soft landscaping village centre zone 1,244 square metres.
- Soft landscaping marina 597 Square metres.
- Public access road and surface parking 5,831 Square metres.

The proposed buildings will therefore occupy 16.7% of the whole site, and 26.9% of the quarry. Landscaping, outdoor spaces and circulation, including the seawater basin but excluding the rooftop and terrace soft landscaping occupy 73.1% of the quarry area. The rooftop and terrace soft landscaping will cover an area of around 5,380 square metres representing 5.0% of the overall site area, and 8.1% of the quarry area. In actual fact therefore landscaping, outdoor spaces and circulation and the seawater basin, including rooftop and terrace soft landscaping occupy 81.2% of the quarry site area.
Figure 8.1 – Layout of the proposed Qala Creek Project

Figure 8.2 – Layout of the proposed Qala Creek Project
Figure 8.3 – Typical units
Figure 8.4 – Upper Level public amenity foreshore and beach

Figure 8.5 – Lower Level public amenity foreshore and beach
Figure 8.6 – Typical cross-sections of public amenity area

Figure 8.7 – Typical cross-sections of public amenity area
The Marina

Various marina layouts have been considered in the course of the planning procedure for the Qala Creek Marina project. Although some 8 layouts were assessed and tested as part of the physical modelling process, three different layouts were preferred – these are described in more detail in Chapter 14 of this document concerning Mitigation Measures. In the last series of physical model tests assessed by HR Wallingford, the use of a gate at the entrance to the basin of the marina is only required in layout 8, the preferred layout.

The marina will consist of a single internal basin approximately 200 metres long, 70 metres wide excavated along a north eastern axis from the current shoreline. The proposed draft of the marina basin will be 4 metres below the lowest astronomical tide level. The single internal basin is further subdivided into two smaller areas through the construction of a smaller wave absorbing finger jetty about 100m away from the entrance to the marina.

The resident fleet will consist of between 100 and 150 vessels depending on the final layout of the internal pontoons.

Marina Entrance Defences

The marina sea defences will evolve around the use of a rubber dam or a spillway gate design. This ensures that the footprint of the sea defences is much reduced and that such defences will generally be constructed along the present day disturbed sea-shore.

The gate is to be installed at the entrance to the basin of the marina. The top elevation of the entrance abutments is El. +3.0m. The 20 metre entrance gap will be protected by an inflatable rubber dam or a spillway gate rising from –4.0m below C.D. to +2.0m above mean sea level. The purpose of the gate is to reduce or eliminate wave action in the marina during severe weather storms. The gate will be operated in two positions...
only; fully deployed or fully retracted. When retracted, the gate will lie flat or below El. –4.0m so as to allow boats to pass over the gate unimpeded and without causing damage to the gate.

**Marina Reclamation**

Reclamation of approximately 1,565 m² to stabilise the shore line slope against excessive overtopping will be constructed from the marina entrance towards the existing beach.

In order to recycle as much of the quarry waste produced by the project as possible, a water-tight containment has been selected to enclose the fill and eliminate dispersion of dust plume.

![Figure 8.16 – Water-tight containment for the reclaimed area](image)

This method of confined reclamation was utilised to limit dispersion at the new Cirkewwa terminal. Along the seaward side, a wave absorbing rubble slope is required to retain the hydraulic characteristics of the existing shore line. This rubble slope will require a limited amount of stone which may be recovered from the quarrying operation of the project. If the recoverable amount is not enough, precast concrete units will be utilised to achieve the desired hydraulic characteristics.
**Vessel Traffic Management**

The centre line of the access fairway is 200 m away from the beach line and is perpendicular to the coastline and this area will be a no-mooring zone.
Mineral Extraction

The site contains considerable amounts of dumped materials as well as scattered hard stone boulders. These will be separated prior to commencement of excavation of the hard stone from the quarry. Estimates of quantities are:

- Clay mounds, previously deposited from other development projects elsewhere in Gozo, to be sent for deposit in quarries estimated at 40,000 c.m.
- Loose debris for placing and sealing in caissons estimated at 15,000 c.m.
- Loose boulders scattered over site to be collected into stockpile on site estimated at 10,000 c.m.
- Estimated volume of unexcavated hard stone below existing quarry footprint down to level +1.00 metre above m.s.l. amounts to 500,000 c.m.
- Estimated volume of rock to be excavated to level –4.00 metres below m.s.l. amounts to 100,000 c.m.
- Estimated volume of rock in the hard stone rock wedge between the existing quarry face and the fault plane amounts to 300,000 c.m.

In total, approximately 900,000 c.m. of hard stone will be extracted from the site, which will be used as follows:

- It is normal for a hard stone quarry to be left with around 10% of unusable waste. This would amount to around 90,000 c.m. This material together with the 40,000 c.m. of clay referred to above will be trucked to the quarry at “Ta’Isopu” near Nadur, which is an approved dump site.
- 60,000 c.m. sand and aggregate will be retained on site for use in the production of concrete required in the project.
- 10,000 c.m. large hard stone blocks will be sent to marble manufacturers to be cut into slabs for paving and facing in the project. They will be returned to the site from time to time as required for the project.
About 740,000 c.m. will be trucked to the nearby ta’ Gafan quarries for stockpiling and future use in Gozo. This will be achieved by 60 daily trips (approx 1 truck per 10 minutes between 7 a.m. and 7 p.m.), 6 days per week, over 18 months, using 30-ton trucks. These trucks will use a yet to be upgraded route which links Qala Creek to the said quarries.

The objective would be to commence excavation works before the end of the year, and a crushing plant will be set up on site at the outset. Trucking of material to the ta’ Gafan quarry will be completed before December 2007. The excavation process will be carried out employing controlled blasting over a 15 month period, during which period all rock excavation will have been completed except for a part of the marina basin at the mouth of the marina.

- Crushing of rock will continue in an internal area of the site for a further six months. Transport of rock to the stockpile will be carried out over an 18 month programme, and will require 12 (30 ton) trucks trips per hour, eight hours per day, 6 days per week, to do the job.

The excavation will be planned and managed in a manner to allow the laden trucks leaving the site for the Gozo quarries to exit onto the road close to the top of the quarry, thus leaving the access road to the beach free of heavy transport.
The site will be managed under different landscape management regimes. Each zone requires its own particular management. The site can be considered to be divided in the following zones:

**The western garigue zone (Figure 8.23)**

This zone requires the least intervention of all. Indeed the *Euphorbia dendroides* garrigue requires no intervention whatsoever save for an environmental cleanup to remove any foreign object such as refuse and invasive plants. Access to this area should not be permitted or indeed encouraged in any way. This will be achieved by
means of leaving it without any trail. It can safely (for it) be enjoyed by anybody looking at it from above.

The upper garrigue zone requires conservation and rehabilitation. This will see the removal of offending structures. The degraded garrigue will be given the opportunity to develop. All invasive plants will be removed. In their stead native shrubs and a very small quantity of *Tetraclinis articulata*, and *Chamaerops humilis* will be planted to complement the garrigue. Current garrigue plants will be strictly protected with the proviso that a small nature trail may be set up along the present informal path. This should be clearly marked with rustic stones so as not to encourage trackers to trample on the garrigue vegetation.

Bird study and observation should also be encouraged on this site and it is proposed that two girna-type hides designated as bird observation hides, be constructed instead of the present haphazard structures.

**The Eastern agricultural zone (Figure 8.23)**

This zone will be retained in it entirety as an agricultural eco-farm. By way of building construction it is recommended that a typical razzett be constructed to house the offices of the Landscaping Section of the Hondoq ir-Rummien Project. This will come together with a tree and plant nursery which will be set up to grow the plants necessary for the whole project, although plants from external sources will also be purchased if the right sizes and species cannot for some reason be grown on site.
The fields of the eco-farm will all have their rubble walls repaired and restored. Footpaths and a number of trails will be clearly laid out to facilitate and indeed encourage access. All fields will have windbreaks planted on their perimeter and this will be considered a priority. Each field will be designated for some use hence the eco-farm will see the planting of Vineyards, Olive groves, Citrus groves, Stone fruit groves, Araar groves.

Each grove or orchard will be touching on some aspect of Malta’s agricultural history. Such rare plants as cotton and cumin will also be grown for demonstration purposes. Moreover an effort will be made to have each type of fruit tree grown in the Maltese Islands growing there. This will help in the conservation of traditional varieties, which currently are under threat from commercially mass-produced and imported varieties.
The Central Quarry zone (Figure 8.23)
This zone will provide the greatest challenge of all. Its habitat restoration effort will differ greatly as will be the plant species that will be used in its landscaping. From a landscaping perspective three features stand out namely,

**Landscaped glacis supporting the marina access road**
This glacis will be formed of various terraces of small width. The vertical sides will be covered by indigenous creepers and native plants. Holes will be drilled and constructed in the cliff face that will, it is hoped, be colonized by local breeding birds.

**A small sand dune garden**
A garden will be created from sand originating on site itself. Plants associated with sand dune ecosystems will be planted. This contrasts significantly with the current condition of the site - a totally derelict location.

**Hotel Reception Area and proposed Woodland**
At the hotel reception area, the area will be planted with riverine tree species planted in the area so that such water as is used for irrigation will also serve for the irrigation and conservation of these species.

The landscaping at the back of the hotel where the car park and tennis courts will be situated will be areas directly and specifically planted to create a forest environment. A number of paths passing through with a number of benches at intervals will be constructed from the onset to provide places of peace and quiet.

**Village Landscaping and Use of Non-natives**
It has also been stated that all terraces of the proposed village will be landscaped. This should be achieved through proper construction methods being employed in the making of the planting areas. These should be capable to take the weight of the
proposed landscaping, soil and water. This concept will ensure much shielding of the terraces once it is operative and will create the aspect of a traditional Mediterranean hillside coastal village.

**Public Gains**

- Rebuilding & upgrading of jetty.
- Organisation of jetty area: sunbathing zone, seating zone, outdoor dining area, fishing zone.
- Organisation & construction of Kiosk and Dining Area.
- Provision of Public Facilities, Changing rooms, Locker Rooms and Sanitary area for bathers.
- Access for all to entire beach and beach-related facilities.
- Extension of Swimming Zone
- Upgrading of Access Road
- Provision of covered Public Parking.
- Upgraded approach to beach.
- Public Promenade along entire Marina Waterfront.
- Heritage Trail to Qala redoubt.
- Nature Trail in rehabilitated Western Garigue Zone.
9. Land Use & Environmental Characteristics

The whole area under review may be divided into three sectors. Each zone of the project site has a number of different land uses. To the West and South the site is dominated by a natural habitat area predominating in garrigue, in the centre by the quarry site itself and to the East by a number of terraced fields. These form the core of agricultural land. The agricultural zone is indeed annually planted to crops under the rain fed agricultural system. The quarry site is derelict and an eyesore, which should be rehabilitated with utmost haste. At present the quarry site is also a magnet for illegal dumping operations. The garrigue area is used primarily as a bird trapping and bird-hunting site. It is also suffering from encroachment, trampling and degradation.

The footprint of the proposed development is primarily concentrated within the quarry site. The garrigue site will be generally restored, while the agricultural zone will be upgraded. For the purpose of this report it is expected that the description of the site and that of its surroundings will be done within this one section. This will facilitate reference to the more detailed reports which are appended to this document and which give a much more detailed description of the land use and environmental characteristics of the area where the development will actually take place and the surrounding land. It is pertinent to note that surrounding areas which are in ownership of Gozo Prestige Holidays will be upgraded.

Agriculture & Ecology

General Description

In general the garrigue in the West is of fair to good quality with the exception of the *Euphorbia dendroides* high garrigue, of which it is a prime example. The central

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1 Note that detailed studies underlying the various sections of this chapter are appended to this document. The reader is invited to inspect these documents if more detailed information is required.
“quarry” zone is what may be easily termed an eyesore. The third zone comprising the agricultural lands is still in a very good state but as is generally the case with such lands, these are under utilised and prone to both wind and water driven soil erosion processes.

The Garrigue Zone

This zone is characterised by two altitudinal levels. The first is that West of the present public road leading to Hondoq ir-Rummien Bay. The second is that cliff face and valley bottom dominated by the *Euphorbia dendroides* garrigue. The upper part of this zone abuts the gorge and in general, is in parts a much degraded garrigue area with elements of good garrigue on the fringes. It is hoped that this garrigue vegetation will be able to colonise the degraded areas once the project gets under way.

Current activities in this area are dry farming, bird trapping, and bird hunting. Indeed this area is littered by the cairns erected for bird trapping which are very unsightly. There is also a determined effort to plant alien species on the garrigue.

The cliff face and valley bottom (located within the western zone) is the best preserved, and presents the least problems from a landscaping point of view.

The Quarry Site

This site is naturally the most degraded of all. In general it presents a very desert-like appearance and requires urgent rehabilitation. Plants offer some greenery to the quarry bottom, but very little mask the quarry faces. The fringes of the quarry are also much degraded by dumping activity and in urgent need of rehabilitation.
The Agricultural Zone

This zone is composed of terraced fields facing southeast and hence Comino. The nature of the underlying rock, being globigerina limestone, makes the soil of a type that is easily cultivated. This resulted in cultivation of the whole area such that field margins touch each other. Due to this intensive cultivation of all the available soil, little room for natural vegetation is left. If the land were to be carefully husbanded, windbreaks would have been erected or planted. In the present case none of these measures are present and thus this zone presents particular problems that will have to be overcome by appropriate landscaping if its full potential is to be reached.

The present surveys were made at the height of the dry season, when most local flora is in a dormant state. A complete picture of the biota present in the study area can only be obtained through a multi-seasonal survey of which the most important period would be ‘spring’. Additionally, although the main habitats and assemblages could be characterised even during the dry season, the presence of wet season indicator species would enable a better delineation of habitat boundaries and may reveal the presence of small-scale assemblages in the study area.

The type of terrain present suggests that the area may offer a suitable habitat for many reptiles as well as some mammals. The majority of species in these two groups are protected by local and international legislation, so special attention should be paid to these groups in any detailed survey of the study area.

Particular attention should also be paid to the wied that runs through the study area, since apart from its intrinsic interest, this supplies sediment to the beach at Hondoq ir-Rummien. Any development within the study area is likely to affect the sediment dynamics and hence the ecology of both beach and the marine environment. Is should be noted that there is evidence that the natural sediment of the beach was augmented
by sediment transported from elsewhere. It is therefore important to know the history of any ‘beach replenishment’ activity, whether official or unofficial, in the area.

**Marine Ecology**

The existing sea area to be directly affected by the proposed development has changed as the project developed. With the use of the rubber dam and/or the spillway gate technologies, impact on the sea bed directly affected by development has been greatly reduced. Whereas the area of direct impact originally covered:

- the shore line from the concrete wharf eastwards to just before the semi-submerged cave at Tal-Ghassa, and extended seawards by some 100m from the present shoreline, where the seawater depth is 10-12m;

The proposed altered development described in this PDS is much reduced and only covers:

- the shore line from the concrete wharf eastwards to just before the semi-submerged cave at Tal-Ghassa, and extended seawards by some 15m from the present shoreline;

Surface currents run parallel to the shore in either a westerly or easterly direction and might be correlated with wind direction.

The Hondoq ir-Rummien area is a high quality site that is well flushed with good mixing and oxygenation throughout the water column. There exist some slight traces of what might be nutrient enrichment present at the very head of the Hondoq ir-Rummien bay and possibly related to the heavy use of the beach and bay by bathers. Apart from the disused desalination plant, several small ‘rooms’, the public convenience, and two kiosks, there is very little development surrounding the bay that could give rise to marine pollution.

The results of the marine benthic survey made in 1993 appear to be still valid in broad detail. Detailed surveys need to be carried out in order to update the 1993 survey and
extend it to a wider area, especially since the limited data on currents indicates that any material released at any eventual construction site at Hondoq ir-Rummien is likely to be transported along the coast both westward and eastwardly. The beach at Hondoq ir-Rummien and the shallow sea area adjacent to this suffers medium to high disturbance due to use by bathers and other sea users. The beach appears to have been ‘replenished’ in the past by using quarried Coralline Limestone gravel/sand. There is also evidence that sediment from the parking areas at the back and to the east of the beach is finding its way into the sea, possibly as a result of erosion due to vehicular parking.

The seabed adjacent to the concrete wharf is also disturbed as a result of mooring of large sea craft alongside this wharf. Offshore in the same area, there is also evidence of anchor or mooring block damage to the sea grass meadows.

The semi-submerged cave at Tal-Ghassa is an interesting geomorphological feature in the local context as well as apparently acting as a refuge for juvenile fish.

No part of the sea area at Hondoq ir-Rummien is scheduled and neither are there any Candidate Marine Conservation Areas (MCA) in the vicinity. However, the whole of the islands of Comino and Cominotto, which lie directly opposite Hondoq ir-Rummien across the Gozo-Comino Channel, is a designated Candidate MCA according to Malta Structure Plan Policy MCO1.

Most of the coast from Zewwieqa to the west of Hondoq ir-Rummien to Ras il-Qala to the east and beyond is designated as an area of ecological importance in the Gozo and Comino Local Plan presently in the public consultation stage.

None of the habitats present in the area under consideration are protected under local legislation; however, ‘Posidonia Beds’ and ‘Semi-submerged caves’ are listed in Annex I of the European Union’s ‘Habitat Directive’, the former as a Priority Habitat.
A number of species of seaweeds of the genus *Cystoseira* are protected locally and internationally. Different species of *Cystoseira* occur in the study area even though it will not be directly impacted upon by the development proposed. Nevertheless it is pertinent to point out that identification to species level is a specialist task that was not attempted in the present exercise.

The habitats present at Hondoq ir-Rummien may potentially support a number of other locally and internationally protected species. Examples include Seahorses (*Hippocampus* spp.) and the Noble Fan Shell (*Pinna nobilis*) that are frequently associated with seagrass meadows, cowries (*Erosaria spurca, Luria lurida*) which live on weed-covered rock, corals (for example, *Astroides calycularis*) common in shady situations on rock, and the Tun shell (*Tonna galea*) common on sand in deeper water.

A detailed marine benthic survey aimed at mapping in detail the habitats present both at the Hondoq ir-Rummien site and in areas adjacent to it has to be affected. The extent of the area to be surveyed will depend on how far from the proposed development is any material suspended in the water likely to be transported. In turn this will depend on the current regime, and therefore more accurate current data than available at present is required.

In particular, the sea grass meadows, particularly those of *Posidonia oceanica*, need to be accurately mapped and characterised such that their status relative to the range of meadow types and conditions present in the Maltese Islands is assessed. Any form of development anywhere along the southern shore of Gozo will impact sea grass meadows, but not all meadows are of equal conservation status.

During the suggested benthic surveys, special attention should be taken to record any locally or internationally protected species present, and if any are found, to assess their population size. Species that are threatened, rare or of scientific and/or conservation interest, even if not protected legally, should also be paid attention.
Although the initially proposed development involved the construction of two breakwater arms that would have affect the present current regime, it is felt that this issue has faded to the background as the new proposal opts for a rubber dam and/or spillway gate construction which has a much smaller footprint and which only effects the disturbed waters directly adjacent to and in line with the existing quay. Nevertheless it is still important that changes in the sedimentation regime be monitored as they may not only affect the present shore by accretion or erosion, but may also affect the deposition of sediment on the bottom, which affects the marine assemblages present, most notably sea grass meadows.

**Marine Toxicology**

In its current status, Hondoq ir-Rummien is quite pristine and its waters are relatively free from most potential marine contaminants. Surface water temperatures and salinities for the area as recorded in July 2002, fall within the normal limits of inshore coastal waters for the area. There were no anomalously low levels of salinity which would have been indicated of some land-based discharges, during the survey.

Water transparencies at Hondoq ir-Rummien were found to be very good. Other data from satellite images confirm that this part of the Gozo coastline has extremely transparent waters, except during or immediately after rainstorms, due to land-runoff from the surrounding agricultural lands.

The levels of chlorophyll-a and of dissolved nitrates and phosphates in the inshore waters of Hondoq ir-Rummien, were found to be very low and indicative of very clean waters completely free of eutrophic conditions (oligotrophic). Again this was confirmed by archived satellite images.

With respect to bacteriological pollution, all stations at Hondoq ir-Rummien were completely safe for bathers and free from pollution by sewage. A review of archived data available since 1996 confirmed that, when taking into consideration the normal
safety threshold of 100 CFU/100ml for FC, the bathing waters of Hondoq ir-Rummien must be one of the safest and cleanest for Gozo.

The report also presents original data to suggest that although the Gozo coastline is at risk from several potential sources of oil pollution, Hondoq ir-Rummien is as yet relatively free from this type of pollution.

**Geology**

The site is made up largely of an outcrop of Lower Coralline Limestone. It was used as a quarry in the sixties for the production of hard stone for use in the construction of the Mgarr breakwater, and in later years for the production of polished stone – locally termed “Malta marble”. This activity has greatly altered the natural geo-environment of the site, disturbing the geology, geomorphology, hydrology and hydrogeology.

**Stratigraphy**

All five formations of the Maltese Islands outcrop within the site and surrounding area. The most relevant formation to the project is the Lower Coralline Limestone as the proposed excavation and re-sculpturing of the site will be in this formation. The following description of the stratigraphy therefore lays more emphasis on this formation. The Greensand is very poorly developed and is not treated.

**Lower Coralline Limestone**

The site is exclusively composed of this formation which reaches a thickness of about 60m. The exposure extends further to the west of the site towards the gorge of Hondoq ir-Rummien while to the east, the exposure is interrupted abruptly by a fault. This formation is subdivided into four members (Pedley, 1978) with Wied Maghlaq at the base, followed by Attard, Xlendi and the Il-Mara Member at the top. The four members are found within the site and the proposed excavations will effect them all.

**Globigerina Limestone Formation**
This formation is largely found outcropping adjacent to the site in the north and east. It is subdivided into three members but at Hondoq ir-Rummien only two are found, the Lower Member and the Upper Member.

**Blue Clay Formation**

This is a medium grey and soft, pelagic marl found outcropping adjacent to the site in the east. It is in contact with the Lower Coralline Limestone across a fault which marks the eastern boundary of the site. Exposing this clay by excavating the coralline limestone could lead to structural instability of the clay and unless protected it will tend to slump down the excavation face. This formation is also protected by legislation and permission to make any intervention on it may not be easy to obtain.

**Upper Coralline Limestone**

In the Hondoq ir-Rummien area, this formation is found outcropping to the north and to the southwest of the site and in a few offshore rocks. None of these outcrops will be influenced by the proposed excavations of the development.

**Structure**

Structurally, the site and immediate surroundings are located on a tilted fault-block which is bounded in the north by the Qala Fault and in the south by the South Gozo Fault. Both faults strike approximately E-W and dip to the south, the former with a throw of about 20 m while the latter has a much greater throw of the order of 100 m and places the Lower Coralline Limestone and Lower Globigerina in juxtaposition with the Upper Coralline Limestone Formation. Two other significant E-W trending faults cut the area and have a throw of the order of 20 m (eg. Hondoq ir-Rummien Fault). Smaller and less significant faults striking WNW-ESE and with a throw of the order of 3 m to 6 m are common, especially east of the study area (eg. Il-Qortin Fault and Tal-Maqjel Fault).
The site itself is located on a tilted horst-block composed of Lower Coralline Limestone in structural contact with Blue Clay and Globigerina Limestone to the north and to the east. To the south this block is in contact with Upper Coralline Limestone, which outcrops below sea level, and is the eastern extension of Gebel Barbaganni, which is composed of Upper Coralline Limestone.

**Geomorphology**

The disused quarry is located in an area where the geomorphology is dominated by highly variable relief produced by structure, weathering and erosion, and karst action. Maximum elevation reaches about 95 m in the north, at Wardija and Il-Qortin – two southern spurs of the Qala Plateau. From here the landform drops steeply southwards over Blue Clay slopes up to near the quarry where the influence of a system of faults combined with the solution action of running water produced a spectacular gorge and a dry valley discharging at Hondoq ir-Rummien Bay – a small but picturesque sandy beach. The N-S trending Tal-Mintuff gorge is formed by karst action on coralline limestone. In contrast, the E-W trending Hondoq ir-Rummien valley at the mouth of the gorge is the product of a major fault that interrupts the discharge of the gorge and re-channels it in a perpendicular direction towards the bay. This discharge provides the sand budget of the beach. Another fault at Ta’Bumbarin gives rise to narrow creek and the gentle promontory of Barbagann Rock. This promontory extends underwater in both directions to produce offshore rocks wherever it emerges - such as Il-Hnejja. To the west of the site is found another dry valley cut in Blue Clay and Upper Globigerina – that of Wied Tal-Maqjel. This valley is also fault controlled, with the watercourse tracing the fault-plane of Tal-Maqjel Fault at the surface.

As the site is a disused quarry, the geomorphological significance of the site has long been destroyed and at present it has no geomorphological value. Nevertheless, the proposed development will have a visual impact on the geomorphology of the surrounding land and it could also influence the sand-budget of the bay. These two impacts on the geomorphology need to be fully assessed.
The proposed development could constitute an environmentally acceptable and better form of rehabilitation provided that it does not extend beyond the boundaries of the site and it does not promote the development of adjacent land. Careful consideration of 3-dimensional visual displays of the development and surroundings is needed to assess the visual impact on the high landform value of the area.

The proposed construction of breakwaters at the entrance to the marina, as well as the marina itself, will have an impact on the distribution of the sand/cobble budget of the beach of Hondoq ir-Rummien Bay. It is likely that the impact of the breakwater will be a positive one as it will tend to reduce the loss of sand and cobbles by wave action.

**Hydrology**

The more important hydro-geological/hydrological features within the site are:

- The disused quarry which serves as a storm water reservoir during the rainy season
- A rainwater culvert which drains storm water runoff into the site for eventual discharge into the sea

The more important hydro-geological/hydrological features in the vicinity of the site are:

- The narrow valley at Tal-Mintuff which borders the site to the west
- The disused sea water distillation facility just up-stream of the sandy beach at Hondoq Ir-Rummien

**Stratigraphy**

The exposed geological formation at the site of the proposed development is the Attard Member of the Lower Coralline Limestone Formation. This formation comprises limestone (wackestones and packstones) which is grey in colour; it is
capped by the Xlendi Member to the north beyond the site of the proposed development.

**Aquifers**

The site overlies the coastal boundary of the Mean Sea Level Aquifer of Gozo to the southeast. This aquifer practically underlies the whole of Gozo and is present at the mean sea level where a fresh water lens ‘floats’ on the denser seawater underneath.

Most of eastern Gozo is capped by the Upper Coralline Limestone formation and the underlying Blue Clay formation. This gives rise to the existence of a number of perched aquifers which are replenished by rainfall during the rainy season. It is believed that most of this spring water is harvested in wells lying outside the northern boundary of the site and consequently does not reach the site.

In the absence of a significant catchment area for the part of the aquifer underlying the site, it is believed that the depth of fresh water lens at this location is insufficient to provide for a sustainable extraction of significant quantities of fresh water from the aquifer, hence the reason why groundwater extraction infrastructure is absent from the site.

**Surface Hydrology**

Storm water runoff generated as far a-field as the location known as Il-Wilga, east of Qala drains towards Hondoq Ir-Rummien.

The catchment area which drains towards Hondoq Ir-Rummien is calculated at 0.875 km$^2$, resulting in an estimated 25,000 cubic metres of water of surface runoff over the span of a year. This figure is a conservative estimate.

This runoff flows along the area known as Ta’ Ruba and thereafter onto Hondoq Ir-Rummien on its way to the coast. Some of the runoff is discharged into the narrow valley at Tal-Mintuff; part of the runoff collects in the quarry depression whilst the remainder is discharged to the sea along Triq Ta’ Hondoq Ir-Rummien. It is
understood that a rainwater culvert transports part of this water into the site of the proposed development.

Runoff generated at the southern part of Qala (Il-Wardija) is believed to discharge into the valley upstream of the unused distillation plant at Hondoq Ir-Rummien. This valley lies outside the hydrological influence of the development and therefore believed to be of no consequence to the proposed development.

**Terrestrial Archaeology**

The area of *Ta’ Hondoq ir-Rummien*, has a particular rural heritage that is characteristic of an area that used to host three important activities – agriculture, fishing and quarrying.

Archaeological/cultural features are mostly clustered into three areas, one on the east and two on the west of the abandoned modern quarry respectively. Some features should be preserved and integrated into the project, and additionally others should be investigated or monitored prior or during the development.

Thus, the quarrying marks and depressions should be investigated further in order to establish their nature. On the Maltese Islands, depressions in the ground with an in growth vegetation normally indicate the presence of rock-hewn tombs. Moreover, the scatter of pottery shreds on the perimeter of the quarry brings the need for a monitoring exercise by a qualified person during the removal of soil from such quarry.

The double room building should be preserved, restored and easily integrated in the project. Since it is located close to the surface quarrying and near the present quarry which will be destroyed by the proposed development, this building would be ideal to host an exhibition area about ancient quarrying techniques and about the various
building projects which the latter quarry has provided raw material for. Likewise, the
cave should also be preserved since it is a unique feature in the area.

The western side of the abandoned modern quarry has a cluster of rural features that,
as mentioned above, are particular to the area. In the Early Modern Period, this area
was intensely utilised as indicated by the number of field-rooms connected to each
other by means of stirs and paths hewn out of the rock, the road identified an the Tal-
Blat chapel.

The buildings of this area, should be restored and integrated in the project as a cluster.
These could be buffered with appropriate vegetation linked to the garigue landscape
and transformed into a natural leisure area. The steps and other pathways could be
preserved to make the area accessible and information panels could be installed along
the way.

Some of these features can provide an educational experience to the visitors. The
visitor should experience the ways our forefathers utilised the landscape. Few foreign
visitors to our islands appreciate and have time to visit rural cultural heritage. This
could be an opportunity to set up an ‘open-air’ museum of Maltese rural cultural
heritage with full-size restored examples.

One should also note that just outside the borders of the proposed development are
other rural features. These have not been studied in detail but have been noticed
during the field survey. On the northwest of the proposed development is a probable
beehive hut, while on the northern side are two corbelled huts (girna). Their
protection during possible blasting and heavy transport vehicles during the building-
phases of the project should also be taken care of.
One should also note that an anchor stock weight about 500lbs has been raised from the coast of Qala in 1961 as recorded in the Museum Annual Report (1961:7). Therefore, the seabed in the vicinity may also be of cultural importance to the area.

**Marine Archaeology**

From this study it would seem that the bay was not conducive to use as a safe anchorage and other places nearby must have been preferred. However, when considering the general area one must keep in mind that this stretch of the Fliegu can be quite treacherous as attested by the numerous ex votos found in and on the chapel overlooking the channel.

One must therefore conclude that archaeological investigations are to be carried out prior to any work carried out in the area. Investigations will be aimed at determining the presence or absence of not only shipwrecks but also loose finds and harbour deposits. Given the much reduced footprint of the sea-defences and the fact that the area of sea-bed directly impacted lies along the coast and has been dumped upon and significantly disturbed during the operation of the quarry; it is suggested that the proposed marine archaeological investigation has now been much reduced in importance.

The proposed archaeological investigations would consist of four main stages:

1) A series of diver searches by qualified and experienced diving archaeologists of the area that will be affected by the development which will include a ‘buffer zone’. These swim-line searches will be used to determine the presence or absence of any submerged cultural heritage proud of the seabed. They will also be used to determine the varying nature of the seabed thus facilitating the planning of subsequent archaeological work.

2) Should the seabed in the area include stretches of posedonia and/or sand and silt it would be necessary to carry out a remote sensing survey using a subbottom profiler as well as a magnetometre. The former will map sand and
other deposits till bedrock whereas the latter will detect any deposits of a ferrous nature.

3) Phase three will largely depend on the results of the remote sensing survey and may include the excavation of test trenches and recovery of archaeological objects.

4) A thorough desk based study which must include unpublished archival and other material that may shed light on any potential archaeology in the site highlighted for development.

10. Infrastructure Services

The Qala Creek Project will require the provision of significant infrastructure services during both its development and operation – this includes electrical power, water and telephone lines during the development stage; whilst during operation, additional services shall be required. At present although electricity, water and sewerage are available to the borders of the site, nevertheless no such infrastructural services are available within the site itself.

Electricity Supply

It is being calculated that during the construction phase some 600 KVA would be required (it is expected that this electricity requirement is already available on site); this would be increased to 6200KVA in instantaneous demand when The Qala Creek project would be operational. During this period, working demand would reach a maximum 3900KVA.

<table>
<thead>
<tr>
<th>Description</th>
<th>Instantaneous Demand</th>
<th>Working Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marina – power supply for marina lighting and provision of power to 150 to 170 crafts and capitane</td>
<td>1180 KVA</td>
<td>700 KVA</td>
</tr>
<tr>
<td>Hotel – 195 bedrooms plus 350 cover restaurant, 300 seat conference area and a number of other facilities</td>
<td>1000 KVA</td>
<td>800 KVA</td>
</tr>
<tr>
<td>3 No 60 first class self-catering units plus clubhouses</td>
<td>1880 KVA</td>
<td>1100 KVA</td>
</tr>
<tr>
<td>250 residencies, terraced, with floor areas 180 – 225 sq m complete with common parts</td>
<td>1740 KVA</td>
<td>1000 KVA</td>
</tr>
<tr>
<td>Allow for the lighting of public roads, plus other general loads for pumping etc, together with individual restaurants, bistros, wine bars, etc.</td>
<td>400 KVA</td>
<td>300 KVA</td>
</tr>
<tr>
<td><strong>Total Requirements:</strong></td>
<td><strong>6200 KVA</strong></td>
<td><strong>3900 KVA</strong></td>
</tr>
</tbody>
</table>

*Table 10.1 – Instantaneous and working demand*
The final demand will therefore be 3.5 to 4.0 MVA. On site, there appears to be a power supply of this size, presently allocated for the Water Services Corporation reverse osmosis plant. However, this is fed from an overhead line which may not be a reliable source of supply.

It is being suggested that a dual (ring) high voltage supply form the Qala DC at 11KV 3ph 50 Hz would be linked to four substations distributed round the site in order to deliver LV power to the various areas. Stand-by power generation will be provided by stand-by generating sets (of the silent type) which will be located close to each substation in appropriately designed soundproof buildings.

**Water Supply**

Mains water service is available at the site in the existing buildings. During the 70s, a large diameter (probably 4 inches) pipe was installed, linking the existing desalination plant located at Hondoq ir-Rummien to the main distribution network at Qala. The present condition of this line cannot be determined at this stage, but upgrading of the mains water supply from Mgarr may be necessary. Further investigation in the matter is required.

During normal operation, the Qala Creek development will be self-sufficient in water supply. The maximum demand is estimated not to exceed 200 cu m daily, of which the private residencies shall require 80 cu m. Underground reservoirs capable of holding a minimum of 3 days’ supply shall be provided. Reverse osmosis plants located on site shall provide the fresh water requirements for the commercial premises. Private residencies may also be connected to this system provided a solution for payment of this service is agreed with the tenants. The total requirement for fresh water shall be further reduced with the provision of second class (grey water) service which shall be used for flushing of toilets and irrigation.
It is expected that fresh water requirement will be supplied by creating reverse osmosis plants which shall process seawater obtained from boreholes on site and shall discharge the concentrate directly back to the sea. The plant shall be located in soundproof enclosures (underground) so that noise pollution will be eliminated. The fresh water produced shall be treated and stored in the underground reservoirs. Distribution to the various areas shall be pumped. A mains connection to the reservoirs shall still be required as a contingency against disruption in the operation of the reverse osmosis plants.

**Sewerage**

There are two main options regarding the treatment of sewerage within the Qala Creek Project.

Recently, a full development permission has been issued for the construction of an urban wastewater treatment plant in Gozo. Thus the possibility of connecting the project to this facility exists. In order to achieve this, a new pipeline would have to be laid connecting the project to the Gozitan main sewerage network.

Alternatively the developers are ready to install a sewage treatment plant. It will be installed underground and supply grey water to the second class water reservoir. This facility will be linked to a standby underground reservoir. This shall have a minimum capacity of at least 36 hours sewage outflow and shall be complete with a pumping system to empty into the main sewer line. The total amount of this water produced, combined with that obtained from surface water run off shall be much more than can be used on site. This extra water can be made available to third parties by pumping up to Qala for use as irrigation water.

If only the sewerage of the hotel is treated, then there will be sufficient grey water to be used on the project. If this option is chosen then sewerage pipeline upgrading within Qala would not be required.
Nevertheless, it is envisaged that a main sewage treatment plant shall be installed in Gozo. This may eliminate the need of a separate plant on site, and all sewage pumped away to the mains. In this case, the main sewer lines would have to be upgraded. No details of this plan are as yet available, however although not the preferred option, this option should be kept in consideration.

Fire-Fighting

Fire-fighting mains shall be provided to the whole area via an underground pipe network. These shall include for fire hydrants in external areas, and hose reels in the hotel, apartments and marina. Mains shall be pressurized and connected to dedicated fire pump sets.

Air-conditioning

Air-conditioning for the hotel and apartments shall be provided by a central plant, comprising seawater cooled chillers. These shall be located in underground plant rooms (to eliminate noise). Cooling water shall be obtained from site boreholes and shall be returned to the sea. Central heating shall be provide by dedicated heating plant (hot water boilers) in the main plant room.

Solar Heating

It is possible to install solar heating for preheating of domestic hot water and heating of pool water. The major problem in this case is the small footprint available for the solar collectors, as well as the high visual impact of such an installation on the surroundings. These restrictions probably eliminate the possibility of large scale installations of this system.
Telephone Services

The area must be fed with telephone services, and the expected demand of ISDN lines will be as follows:

<table>
<thead>
<tr>
<th></th>
<th>Primary Rate ISDN</th>
<th>Basic Rate ISDN</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hotel</td>
<td>1 No</td>
<td></td>
<td>Hotel PABX</td>
</tr>
<tr>
<td>Marina</td>
<td>1 No</td>
<td></td>
<td>Marina PABX</td>
</tr>
<tr>
<td>Self-Catering Units</td>
<td></td>
<td>100 No</td>
<td>Direct to parent exchange</td>
</tr>
<tr>
<td>Terraced Residencies</td>
<td></td>
<td>250 No</td>
<td>Direct to parent exchange</td>
</tr>
<tr>
<td>Others</td>
<td></td>
<td>50 No</td>
<td>Direct to parent exchange</td>
</tr>
</tbody>
</table>

*Table 10.2 – Expected demand of ISDN lines*

It will be the prerogative of the present (and possibly other future) service providers to decide on the methods to feed the area.

This can consist either in the routing of fibre optic cable within the ground, or in the provision of a small wireless link. It is the existing practice for Maltacom plc, that when a considerable number of services are applied for (as is the case here), Maltacom plc will develop the service at their own cost. This may be the case even more as from next year, when Maltacom plc will probably be in competition with other service providers. In such a case, the cost of the provision of telephone services will only be the cost of the individual application fee (normally payable by the tenant).

One or more suitable places may be required to house the antennae for mobile telephony. The connection cable to the point of supply, will obviously have to be routed underground.
Television Distribution

Individual antennae (both terrestrial and satellite) will not be allowed in the areas in order to maintain its aesthetic appearance. The area will house its own television head end area, where a number of dish antennae will be located in the most discreet fashion. Connection for the various hotels and residencies will then be made via cabled distribution. Melita Cable Television, along with future cable television providers will most probably be interested to provide also their service to this development.

Building & Energy Management Systems

There will be various systems installed, among which there will be:

- Building Management System (BMS)
- Lighting Management System (LMS)

These will assist in order that no energy is expanded more than is absolutely necessary. Further, lighting can possibly be controlled at a higher level (during the “evening” portion) and a lower level (during the “night” portion). Consideration will be given to the use of light fittings with own solar-generated power, which will charge batteries during the day to power the lights during the night.

Street Lighting

The existing public thoroughfare from Qala must be upgraded as part of the Qala Creek project. In doing so, care must be taken not only to design and install proper street lighting, but also to provide space for the installation of the new requirements, such as high voltage supply, water, telephone cables and others within the road system.

Street lighting and open air lighting facilities will use as much as possible their own solar generated power. This will cut down on fossil fuel demand.
**Optimum Design - Lighting, Sound, & Emission Pollution**

In order to ensure optimum design conditions, general outside lighting will be designed in accordance with the guidelines given in BS5489:Part 9:1996 (urban centres and public amenity areas). These guidelines give the lighting levels for general traffic considerations and dictate the maximum maintained road surface luminance, the uniformity and the minimum and maximum lighting level. Any lighting which interferes with the vision or the ability to recognize signals of transport, shall be eliminated. This will be done by giving due consideration to:

- Disability glare from luminaries
- Variation in contrast
- Reflecting light
- Identical colour of light to signals

Luminaries will be carefully selected and sited to prevent confusion of visual information. If screening of light sources becomes necessary, this will be achieved by choices of best luminaries and their respective attachments (baffles/screen).

Glare will be designed to be well within limits. The value of the threshold increment (TI) of glare will be designed not to exceed 15% as recommended in BS5484 Part 2 – Limitation of glare.

It is expected that the noise produced will be that from services plant such as standby generating sets, air-conditioning equipment, etc. All these items will have proper sound attenuation canopies if outside and attenuation louvers if located inside. The final sound levels given will be as dictated by the EEC directives. For this reason, equipment sourcing will be properly checked prior to order of the respective equipment. Furthermore, there will be a commitment that any noise level which exceeds that given in the directives, will be alleviated.
All equipment shall be sourced complying with the relevant EC directive in order that it does not cause damaging electromagnetic interference nor is it unduly affected by magnetic interference. Emphasis shall be made that all equipment shall carry the CE marking. It shall be ensured that all equipment shall comply in all respects to EC directive 89/336/EEC, subsequent directive 92/31/EEC and any more recent directives.


11. Employment Opportunities

During the construction phase it is expected that the project would employ up to a maximum of 200 workers. These will be spread amongst the various trades necessary to complete the development. During the operation of the complex it is estimated that some 400 new jobs would be created. These jobs will mainly be in the hospitality industry which would be newly constructed on the site.

It is being proposed that a Landscaping Section be set up within the Qala Creek set-up. This will ensure that the gardeners employed will be committed to the site’s progress and maintenance. All landscaping operations must be kept under professional supervision. Furthermore a technical person will be employed to supervise the daily operation of the project. On-site training will also have to be continually given to reach the planned landscaping goals. Finally it is estimated that up to ten people will be employed in this section with additional part-time labour being employed when and where the need arises.
12. Materials, Wastes & Machinery

The project will use materials and generate wastes both during construction and operation. During construction, the following wastes will be generated:

- Airborne dust during the drilling and blasting operations and handling of the mineral stockpiles;
- Stone dust sludge from the quarrying operations and handling of the mineral stockpiles during rainy periods and in the presence of infiltration during the excavation of the marina basin. Both fresh water and salt water infiltration may influence the amount of sludge produced;
- Sewage wastes.

Construction Wastes

The site of the old quarry will be trimmed sideways to accept the foundations for the proposed buildings and excavated downwards from its current level to make way for the marina basin. The site currently contains the following material resources:

- Minor quantities of excavated clay debris dumped over the preceding years from other excavations around Gozo;
- Considerable quantities of construction waste, mainly of the soft globigerina type;
- Considerable quantities of quarried Coralline stone in various shapes and sizes, both on shore and under water;
- Approximately 1,074,965 m³ of massif Coralline Limestone.

Clay Debris: The clay debris located at all levels of the existing quarry site is not suitable for any of the construction typologies proposed for the new marina facility. This debris will be collected from the site and dumped in an approved landfill/quarry by road for possible agricultural use.
**Construction Waste:** The construction waste consists of both highly mixed waste (upper levels of the quarry) and relatively clean waste.

The highly mixed waste consists of minor building stone fragments mixed with a high proportion of dust and clay fractions. It is highly unlikely that the costs involved in sorting this waste will be justified. It is proposed to convey this waste with the clay fraction to an approved landfill/quarry by road.

On the other hand, the relatively clean waste, consisting mainly of building blocks, concrete slabs and blocks, etc. will be stockpiled on site and utilised as backfill inside the breakwater caissons. Both breakwater structures will be watertight to accept quarry waste.

**Quarried Rubble:** The quarried rubble consists of stone elements of all sizes. On land, the sizes vary from small 1 Kg stones to large 1 000 Kg elements scattered around the site, especially along the second level. Underwater, the sizes vary from 500 Kg to around 5 000 Kg. The underwater deposits extend for approximately 30 metres out to sea and run along the entire frontage. Some of these elements were lost to sea whereas others were dumped as recently as a few years ago during the construction of the car park. All the rubble will be picked up and stockpiled for re-use. The smaller sizes will be used for ballast inside the breakwaters, whereas the larger elements will form part of the wave absorbing spending banks. Washing will not be required as the elements are clean of dust.

**Airborne Wastes**

The airborne dust is expected to be tackled by the use of the proper cyclone filters on the drilling equipment. This will then be disposed of in the appropriate quarries set aside for the purpose. Aerosol dust binders are also under investigation as possible means of limiting airborne particulate matter.
Sludge
The sludge produced by the quarrying operations (dust mixed with rain water run-off, groundwater seepage or sea water seepage) will be pumped to one end of the marina basin set aside as a sludge processing lagoon. The sludge handling lagoon will probably consist of two settling basins separated by a weir from where a mechanical filtering system will dewater the watery sludge to a thicker consistency and from where it will be trucked to a quarry for disposal by the use of a water-tight truck.

The site will be equipped with a wheel washing facility which will also be connected to the sludge handling lagoon.

Sewage
The sewage wastes generated during the construction phase will be handled by a closed system connecting all the site offices to a holding tank. The tank will be emptied as required.

Marine Operations Related Wastes
During operation, the project will generate the following wastes:

- Oily bilge water;
- Particulate-laden run-off;
- Fuel-laden run-off;
- Sewage.

The oily bilge water from the vessels moored inside the marina will be handled by a standard marina bilge water pump-out facility for onward treatment.

All run-off from around the marina basin will be passed through settling tanks and all particulate matter retained for proper disposal.
All areas where fuel is handled will be laid to fall towards a fixed oil-water separator buried underground for treatment via an oil coalescing filter.

Both the resident marina fleet as well as the visiting fleet at the destination port will be provided with proper shore facilities. All shore facilities will handle sewage for onward treatment outside the marina area. Vessels equipped with holding tanks will be handled by a sewage pump-out facility.
13. Traffic

Traffic Generation

The Qala Creek Project consists of the development of a yacht marina, tourist/residential village and a hotel complex. This apart from numerous theme bars, restaurants, open-air cafés, sports facilities, and various leisure activities and attraction spots.

It is estimated that the following traffic be generated by the project:

i) Construction traffic

Vehicular traffic generated by the mining operation has been discussed above.

It is pertinent to point out that the developer seriously studied the possibility of using open barges and/or the “Calypso” Gozo Channel vessel for delivery of all material supplies from Malta. Meetings with Gozo Channel have already taken place. Upon further research it has been decided that the use of the sea-route to transport the material from and/or towards the Qala quarry is not viable and preference to use alternative land-routes which skirt urban conurbations are necessary.

Actual construction works on site, following the excavation of the site to foundation levels, will commence on the hotel around 2006, and it is programmed to complete the entire construction works over a four-year period, by June 2010.

Labour is expected to peak at around 200 workers on site, generating around 50 light car or van arrivals and departures daily. During construction, Truck deliveries will probably peak at around 20 trips daily.

The construction traffic generation estimated above would not really seriously affect access through Qala.
ii) **Operational traffic**

As a rough initial calculation vis-à-vis the amount of traffic generated by the proposed development, TRIPS data sheet calculations pertaining to the UK were assimilated and applied as a rough indicator for the maximum traffic generated to and from the area. It is pertinent to stress that much more accurate calculations would have to be made as part of the Traffic Impact Study.

It is expected that on weekdays the project will generate at peak hour a maximum number of 874 and 1052 incoming trips during the morning and evening periods respectively. Similarly some 1122 (morning) and 1052 (evening) outbound trips will be generated during the peak hour during the week. During weekends, busiest hour traffic generation counts are in the region of 877 inbound trips and 1056 outbound trips.

Such trip generation counts are significant and special attention has to be given in order to ensure that traffic flows do not impact directly onto Qala. It is expected that a route which skirts Qala will be improved and used by development generated traffic. This will be studied in more detail in the Traffic Impact Study being prepared for this project.

Note that the traffic patterns portrayed above do not include for traffic generated by the public area at Hondoq ir-Rummien since it is expected that these traffic patterns already exist and therefore would form part of the background traffic recorded in the area.

Land based traffic generated by the marina are not being included in this preliminary calculation presented in this section since the amount of traffic expected at peak hour is not significant when compared to those extrapolated by
### Weekday Peak Hour Traffic Generation

<table>
<thead>
<tr>
<th>Development</th>
<th>Units</th>
<th>Maximum Daily Trip Rates</th>
<th>Total number of Trips</th>
<th>Peak Hours</th>
<th>Morning</th>
<th>Evening</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Inbound</td>
<td>Outbound</td>
</tr>
<tr>
<td>Hotel</td>
<td>150</td>
<td>Boats 30</td>
<td>2600</td>
<td>6%</td>
<td>20%</td>
<td>7%</td>
</tr>
<tr>
<td>Church Corner</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residential</td>
<td>110</td>
<td>Household 110 per household</td>
<td>1100</td>
<td>5%</td>
<td>55%</td>
<td>13%</td>
</tr>
<tr>
<td>Hotel</td>
<td>250</td>
<td>Shops 250</td>
<td>2700</td>
<td>6%</td>
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<td>10%</td>
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<tr>
<td>Qala Crescent</td>
<td>30</td>
<td>Household 10 per household</td>
<td>300</td>
<td>5%</td>
<td>15%</td>
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</tr>
<tr>
<td>Commercial</td>
<td>750</td>
<td>Shops 750</td>
<td>1125</td>
<td>6%</td>
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<td>Village Plaza</td>
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<td>Household 34 per household</td>
<td>340</td>
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<td>17%</td>
<td>13%</td>
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<tr>
<td>East Point Cove</td>
<td>25</td>
<td>Household 25 per household</td>
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<td>5%</td>
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<td>13%</td>
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<tr>
<td>Residential</td>
<td>25</td>
<td>Household 25 per household</td>
<td>250</td>
<td>5%</td>
<td>13%</td>
<td>13%</td>
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<tr>
<td>Total</td>
<td></td>
<td></td>
<td>874</td>
<td></td>
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<td>Total number of Trips</td>
<td>Busiest Hour</td>
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<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<td>Inbound</td>
<td>Outbound</td>
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</tr>
<tr>
<td>Hotel</td>
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<td>Beds 320 7 per bed</td>
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<td></td>
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<td></td>
<td>10%</td>
<td>224</td>
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<td></td>
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<td>110</td>
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<td>2500</td>
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<td></td>
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<tr>
<td>Qala Crescent</td>
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</tr>
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<td>Residential</td>
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<td>household 30 10 per household</td>
<td>300</td>
<td>9%</td>
<td>27</td>
<td></td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>8%</td>
<td>24</td>
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</tr>
<tr>
<td>Commercial</td>
<td>750</td>
<td>shops 750 150 per 100 sq m</td>
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<td>101</td>
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<tr>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Residential</td>
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<td>household 34 10 per household</td>
<td>340</td>
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<td>31</td>
<td></td>
</tr>
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<td></td>
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<td>8%</td>
<td>27</td>
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<td>Commercial</td>
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<td></td>
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<td>11%</td>
<td>83</td>
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</tr>
<tr>
<td>East Point Cove</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Residential</td>
<td>26</td>
<td>household 26 10 per household</td>
<td>260</td>
<td>9%</td>
<td>23</td>
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<td></td>
<td></td>
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<td></td>
<td>8%</td>
<td>21</td>
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</tr>
<tr>
<td>Villa Zone</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residential</td>
<td>25</td>
<td>household 25 10 per household</td>
<td>250</td>
<td>9%</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8%</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td><strong>877</strong></td>
<td></td>
<td><strong>1056</strong></td>
<td></td>
</tr>
</tbody>
</table>
iii) **Traffic circulation and parking**

The design of the project ensures that traffic generated by the project has been kept well away from accessing the bay. Guests arrive at the Hotel from the top end of the beach access road, with staff and service entering from the main road from Qala.

Residents and visitors to the project enter from the east of the site, from an access road off the main Qala Road. Public parking will also be accessible from the main Qala Road.

Public wishing to park their car at the base of the beach access road will still be able to do so and an underground car park available to the general public is envisaged close to the water.

The marina promenade will be fully pedestrianised, and delivery vehicles will only be allowed limited access at such times determined by the marina management. Access for emergency vehicles will be available at all times.

**The Road Network**

According to the Gozo Local Plan ... *it is recommended that existing arterial roads be downgraded to distributor roads* ... in order to better reflect Structure Plan policy requirements. In accordance with Map 6.2.1 and policy GZ-TRAN-1, the road between Nadur and Qala is to be downgraded from a Distributor to a Local Road; while the road from Ghajnsielem to Nadur which also services Qala and consequently Hondoq ir-Rummien will be downgraded from an Arterial Road to a Distributor Road. The road from Xewkija to Qala will be upgraded form a Local/Access road to a Distributor road. The road network accessing Qala is therefore being considered to be of a Distributor Level. Since a number of these roads are being downgraded, it can be expected that they can withstand the additional loading caused during the development of the project and that generated by its operation. Through the
preparation of a TIS, the impact of the project on the road network of Gozo would be assessed.

The Structure Plan for the Maltese Islands in paragraph 14.6 defines Arterial Roads as roads which will cater for the principal longer distance traffic flows and should carry a high proportion of all the vehicle miles driven on the Islands. … The network will be used for longer distance bus services but will not normally be used for parking or access to property.

Similarly clause 14.7 of the same document defines Distributor Road Network as roads which will give access to the arterial network. … They … will provide for more local traffic movements within a district, will carry the majority of bus services, and will give some access to property. The distributor network will normally be single carriageway and junctions will generally be at grade. … parking restrictions will apply on much of the network. It will be necessary to achieve an appropriate balance between the operational traffic requirements of the system and its use for other purposes.

Local access roads are defined (clause 14.8) by the Structure Plan for the Maltese Islands as streets that “give access to property after receiving traffic travelling along the distributor road network, and their character will vary according to adjacent land uses. They may also be used for parking where suitable.”

The Transportation Planning Unit of the Planning Directorate informed EMDP that no traffic records exist for Qala. Traffic counts have therefore to be taken and the route along which construction and development traffic will opt for would have to be assessed. Critical Junctions would have to be modelled and consequently assessed. The route’s carrying capacity would have to be determined.
The Qala Creek project would have to be specifically designed, prior to traffic generation parameters being agreed. Additional future traffic flow using the existing network has to be identified (using accepted criteria developed in conjunction with the Transportation Planning Unit of the Planning Directorate).

Given that at present traffic reaching Hondoq ir-Rummien would have to pass through the village core, it is necessary that effects on the pedestrians using Qala centre would be assessed and monitored. The study would have to research if new traffic links would be required. These might even require not only the alterations to certain junction points within the Gozo road network; but also the development of new roads which would enable the impact of the Qala Creek project to be mitigated when compared to the present day traffic flows within Qala.

The Gozo Local Plan outlines that in accordance with Policy GZ-TRAN-4, “MEPA will strongly encourage schemes to secure the enhancement of the areas in and around the centre of settlements. The schemes should pay particular attention to: ... reducing traffic speeds and improving conditions for pedestrians and cyclists; ... reducing the visual impact of parking ... provide more space for informal recreation ... provide the space for street cafes ... achieving a ... balance between the requirement for parking and the need for attractive public space.” Map 14.8B outlines the need for the application of Policy GZ-TRAN-4. It would therefore be preferable if the generated traffic attracted to Qala centre because of the Qala Creek project would by-pass the city centre and access the location more directly.
It is being suggested that the following roads and junctions be assessed and monitored in more detail:

- **Junction at Qala between**
  - Triq Hondoq ir-Rummien c.w. Triq il-Kuncizzjoni c.w. Triq il-Kalati Punici

- **Junction at Qala between**
  - Triq il-Kuncizzjoni c.w. Triq in-Nadur
  - Triq il-Kuncizzjoni c.w. Triq San Guzepp cw Triq it-28 Ta’ April 1688

- **Junction at Qala between**
  - Triq l-Imgarr c.w. Triq l-Isqof Buttigieg c.w. Triq it-28 Ta’ April 1688 cw Triq Piju XII

- **Junction at Qala between**
  - Triq il-Qala c.w. Triq David Coco Palmeri c.w. Triq l-Indipendenza c.w. Triq Sihar

- **Junction at Nadur between**
  - Triq il-Kav. Guze Camilleri c.w. Triq it-Tigrija c.w. Triq San Blas c.w. Triq San Gwann

- **Junction at Ghajnsielem/Qala/Nadur between**
  - Triq l-Mgarr c.w. Triq Sant Antnin c.w. Triq Borg Gharib

- **Alternative by-pass designation at Qala (if necessary).**
  - Triq l-Belvedere c.w. Triq iz-Zewwieqa c.w. Triq ta’Hondoq ir-Rummien
  - Triq 28 ta’ April 1688 c.w. Triq il-Belvedere c.w. Triq il-Papa Piju XII c.w. Triq l-Mgarr c.w. Triq l-Isqof Buttigieg
  - Triq il-Wardija c.w. Triq il-Belvedere c.w. Triq Patri G. Portelli
Quarry Related Traffic

The Gozo Local Plan addresses the question of quarry related traffic. Clause 6.2.5 argues that:

“By definition arterial and distributor roads are expected to cater for lorry movements ... whilst it may be possible to remove lorries from some sensitive residential streets, improvements can be made to reduce nuisance and disturbance ... quarrying operations ... will be required to contribute towards the costs associated with the works and measures necessary to establish and maintain the lorry route network.”

In fact policy GZ-Tran-5 of the same plan argues that MEPA will require all applications for new quarries, or extension of existing ones, to contribute toward the cost of introducing and maintaining the lorry route network.

The Qala Creek project involves the re-opening of an existing quarry this in accordance with Policy MIN 1 of the Structure Plan for the Maltese Islands which argues that “proven and potentially workable mineral resources will be safeguarded from development which would lead to their sterilization. Non mineral development will not normally be permitted in areas of known or suspected mineral reserves, unless it can be demonstrated that the deposits beneath the site are not workable.”

The lorry route network identified in Map 6.2.5 fails to include the Hondoq ir-Rummien area. It is therefore necessary that such a lorry route be identified and assessed, in order to ensure minimal adverse effect on the existing road network and the surrounding villages. In fact a route linking the Qala Creek Site to the areas where the bulk of the excavated rock will be stockpiled (i.e. at the quarries at Ras il-Qala) has already been identified. This route will be upgraded in order to allow better movement of traffic through it since toady it is severely degraded in certain areas therefore making it difficult to link the two quarry sites together.
Sea Transport

Sea transport is considered to be the main mean of connection between the two islands. Sea-born transport to date has not proven to be very popular. Sea Transport in fact in the case of Gozo equates to ferry related transport. This service has significantly improved over the last few years – especially through the introduction of a number of new ferryboats. This mode of transport especially evolves around the Mgarr Harbour facility (clause 6.4).

Yachting and Leisure

Nevertheless policy GZ-TRAN-12 of the Gozo Local Plan proposes for the upgrading of existing jetties at ... Hondoq ir-Rummien. ... MEPA will encourage the creation of swimming zones at ... Hondoq ir-Rummien, as well as the zoning of other marine
activities in order to minimise conflicts and increase safety measures in these heavily used bays.

**Unregulated Parking**

The Gozo Local Plan (clause 6.3.2) recognises that Hondoq ir-Rummien manifests clear “… evidence of encroachment and erosion caused by unregulated parking.” The plan recognises the need to prevent and remedy the situation by improving works and introducing a car-parking facility. Clause GZ-TRAN-10 encourages “… the preparation of parking management schemes to upgrade and regularize car parking at … Hondoq ir-Rummien … . The schemes … include measures to stop the encroachment of parking along the coast, strictly define where parking is permitted, and introduce landscaping to screen parking areas.”

**Air Link**

The need for an air-link between Malta and Gozo has been debated for several years. In fact the Gozo Local plan in policy GZ-TRAN-14 land banks a significant tract of land at Xewkija in order to safeguard the area for possible extension of air transport facilities. While the areas immediately outside the safeguarded area shall be developed for informal rural recreation.

**Cycle Routes**

The Gozo Local Plan outlines that MEPA (Policy GZ-TRAN-6) will support the introduction of a network of cycle ways, particularly in the less hilly parts of the island …Initially, this network would provide good cycling conditions for tourists, but in the longer term it could encourage more Gozitans to undertake short trips by bicycle. The local plan argues that efforts are made to produce a high quality cycle network. The Qala Creek project will provide cycling facilities. Such routes will integrate itself within the proposed cycle network.
Public Transport

Qala Creek is expected to be a popular destination for the general public. It is expected that significantly more people will want to visit the area. In order to ensure that the locality is accessible to all, public transport facilities are to be extended from the present day Qala route (which does not reach Hondoq ir-Rummien) in order to incorporate the Qala Creek Development and the fore-shore area. This will be facilitated once the road infrastructure of the area will be upgraded as part of the Qala Creek Project. During the construction phase of Qala Creek, the promoters of the project would commence discussions with ADT and the Local Council in order to ensure that the public transport service will extend to the aforementioned areas. The possibility of introducing a shuttle bus service would also be part of the improved accessibility package.
14. Mitigating Measures

Sea Defences

The original design of the sea defence works for the proposed Qala Creek marina, Option 1 in Figure 14.1, had the dual function of ensuring safe berthing conditions inside the marina and of providing a load-out jetty for the transport of all construction materials by sea.

This option necessitated reclamation adjacent to the existing jetty orientated in such a way to allow a roll-on roll-off ferry to berth alongside during the construction period. All the components of the sea defence works were designed in reinforced concrete caissons constructed elsewhere in Malta and towed to site. The only rubble component was the wave spending beach at the entrance to the fairway.

A public consultation exercise started in September 2002 and terminated in November 2002 to gauge the local reaction to the project returned an unfavourable result on the project’s sea defence works. The major thrust of the public’s criticism centred around the physical and visual intrusion of the sea defence works on the existing beach and picnic amenities, which is Gozo’s only accessible beach amenity when wind conditions are from the western quadrant (the prevailing direction). Also, in light of the vulnerability of the Posidonia oceanica meadows in the area under study (Priority Habitat in Annex I of the EU Habitats Directive – 92/43/EEC), a smaller footprint of the sea defence works was necessary.

As a result of the above, additional modelling studies were carried out for reconfigured layouts of the sea defence works. Two other options were developed:

- In Option 2 (Figure 14.2), all construction work around the existing beach/jetty area was removed and limited to a much smaller main breakwater rooted at the eastern end of the area under study. Under this option, the existing jetty and picnic area were left completely...
untouched, eliminating the intrusion on the current amenities save for the partial visual obstruction of the view from the beach by the smaller breakwater. The fairway was also displaced 10 metres away from the beach line to a total of 130 metres. The resulting footprint was only one third of that in Option 1 and most of it was on disturbed sea bed.

- In Option 3 (Figure 14.3), a further endeavour was made to hide the sea defence works completely from view from the existing beach whilst maintaining the status quo around the picnic area. The resulting layout necessitated the reclamation of an area to the East of the picnic area to ensure against wave overtopping during severe storms. The marine footprint in Option 3 is smaller still and lies entirely on disturbed sea bed.

The potential physical impacts (grouped under three distinct headings) on the marine environment due to the afore mentioned port design options include:

- Construction considerations – like:
  - Visual intrusion on the landscape;
  - The underwater footprint;
  - The impact on the hydrodynamic regime (neighbouring beaches);
  - The materials to be employed in the construction;
  - The cross sectional design of structures;
  - Vessel traffic management.

- Construction considerations – like:
  - The wastes audit;
  - The run-off and infiltration management on site;
  - The operational and programming safeguards;
  - The site supervision and enviro-monitoring;

- The operational element – like:
  - The reception and disposal of toxic solid wastes;
  - The reception and disposal of non-toxic solid wastes;
All three major elements may be mitigated. Modelling will mitigate design considerations; BMP (Best Management Practise) mitigates construction adverse effects; whilst specialist equipment and administrative tools will rectify operational adverse environmental deficiencies.

Option 1 Layout, shown above, consists of a curved breakwater in caissons laid to a radius of 70 metres and a reclamation of approximately 3,000 m². This reclamation is designed to handle a roll-on/roll-off vessel for the transport of all materials in and out of the construction area. The net marine footprint of the sea defence works amounts to 14,600 m², of which, approximately 8,800 m² lie on an area where Posidonia sea grass
is present. The field of view of a person standing on the middle of the existing beach is restricted to $67^\circ$ and is obstructed by both the reclamation and the curved breakwater.

The proposal is also in line with the draft Gozo & Comino Local Plan with reference to the development of Destination Ports in appropriate areas. The main breakwater is designed to support a destination port during the summer months along the outer curve and away from the swimming area.

The breakwater consists entirely of reinforced concrete caissons placed on a concrete foundation. The only rubble in use is for the dissipation of the refracted wave energy at the entrance to the fairway.

The existing beach is a perched beach and does not depend on longshore transport for stability. The presence of the breakwater in close proximity to the beach will not adversely affect the beach.
In **Option 2 Layout**, shown above, the curved breakwater in caissons is now laid to a radius of 30 metres instead of 70 metres and no reclamation envisaged between the root of the breakwater and the existing jetty/picnic area. The net marine footprint of the sea defence works amounts to 4,000 m², of which approximately 1,100 m² lie on an area where Posidonia sea grass is present. The field of view of a person standing on the middle of the existing beach is 84° and is not adversely obstructed by the curved breakwater.

This proposal is also in line with the draft Gozo & Comino Local Plan with reference to the development of Destination Ports in appropriate areas. The main breakwater is still designed to support a destination port during the summer months, albeit a much smaller one, along the outer curve and away from the swimming area.

The breakwater consists entirely of reinforced concrete caissons placed on a concrete foundation and no rubble is envisaged anywhere. The type of dredging envisaged is the removal of under water boulders around the entrance fairway and trimming of the sea bed around the control tower area. The basin entrance gap will be partially excavated in the dry.

The presence of the much smaller breakwater will not affect the beach. In fact, all construction work around the existing beach/jetty area was removed and limited to a much smaller main breakwater rooted at the eastern end of the area under study. Under this option, the existing jetty and picnic area were left completely untouched, eliminating the intrusion on the current amenities save for the partial visual obstruction of the view from the beach by the smaller breakwater. The fairway was also displaced 10 metres away from the beach line to a total of 130 metres. The resulting footprint is only one third of Layout Option 1 and most of it is on disturbed sea bed.
Option 3 Layout, shown above, does away completely with protruding offshore breakwaters thereby eliminating the sea defence works from view from the beach. The sea defence works consist of 2 short stub breakwaters sitting astride a mechanical closure gate 20 metres wide. Two types of closure gates were tested in the laboratory, an inflatable rubber dam and a steel lock gate. Both structures would lie hidden away on the sea floor when not in use. Both systems are actuated by compressed air/water only.

The resulting net marine footprint of the sea defence works amounts to 2,730 m², all of which lie on an area of disturbed sea bed consisting of boulders from the old quarry works. The field of view of a person standing on the middle of the existing beach is totally unobstructed by the reconfigured sea defence works.

Unlike Options 1 and 2, Option 3 does not allow for any destination port to be included in the design for lack of mooring space. Nevertheless, Option 3 further hides...
the sea defence works completely from view from the existing beach whilst maintaining the status quo around the picnic area. The resulting layout, termed as Option 3, necessitated the reclamation of an area to the East of the picnic area to ensure against wave overtopping during severe storms. The marine footprint is smaller still and lies entirely on disturbed seabed.

It is envisaged that the mechanical closure would be constructed in the dry inshore of the current shoreline.

Figure 14.4 – The proposed development area lies on mainly disturbed sea bed

Figures 14.5, 14.6 – Comparison of various developments leading to the current proposal
Figures 14.7, 14.8, 14.9, 14.10 – Comparison of various developments leading to the current proposal
<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>OPTION 1</th>
<th>OPTION 2</th>
<th>OPTION 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field of view from existing beach line.</td>
<td>67° (Partially Obstructed)</td>
<td>84° (Lightly obstructed)</td>
<td>93° (Unobstructed)</td>
</tr>
<tr>
<td>Sea defence works (breakwaters, reclamation) visible from existing beach.</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Distance of centre line of fairway from existing beach.</td>
<td>120 metres</td>
<td>130 metres</td>
<td>200 metres</td>
</tr>
<tr>
<td>Encroachment of sea defence works on existing picnic area.</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Influence of sea defence works on the stability of the existing beach.</td>
<td>Small-to-negligible</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Projected net size of marine footprint.</td>
<td>14,600 m²</td>
<td>4,000 m²</td>
<td>2,730 m²</td>
</tr>
<tr>
<td>Anticipated proportion of marine footprint on Posidonia sea grass.</td>
<td>60%</td>
<td>27%</td>
<td>0%</td>
</tr>
<tr>
<td>Reclamation.</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Size of reclamation</td>
<td>3,000 m³</td>
<td>0</td>
<td>1,100 m³</td>
</tr>
<tr>
<td>Dredging. Boulder clearance + entrance gap</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Summer destination port.</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

*Table 14.1 – Outline comparison of environmental impacts of the 3 options of marina entrance*
Testing the three options for hydrodynamic effects on the sea bottom using bottom dye and tracer tests as part of the physical model suggests that the existing pocket beach should not be adversely affected by the construction of the new structures. Concerns that, under south-westerly wave conditions the new vertical wall in Option 1 may reflect more wave energy into the bay and encourage erosion of the beach were not supported by the test results. Under south-easterly wave conditions, the new structures will afford added shelter to the beach and are therefore unlikely to encourage erosion. When the waves are from this direction, however, they may interrupt the longshore transport process. The general lack of mobility of the bottom sand in the near shore zone, however, suggests that the beach is not reliant on a significant supply of littoral sand. The presence of *Posidonia Oceanica* in such profusion and the fact that the sub-sea cable is still visible (rather than buried) tends to reinforce this conclusion.

The near shore transport studies indicate that the clockwise current pattern set up by both wave conditions tended to move towards the marina entrance. These trends may result in accretion of sediment at the marina entrance.

As the model progressed from Option 1 to Option 3, the impacts, however small, on the coastal regime became insignificant. The coastline in Option 3 is practically free of obstructions jutting out from the coastline.

Summarising the design mitigation measures built in to the design of the Qala Creek Marina – these include:

- Eliminate the visual impact of the sea defence works from the beach area;
- Reduce the size of the marine footprint;
- Satisfy EU Habitats Directive – 92/43/EEC;
- Eliminate all impact on the stability of the existing beach;
- Make the best use of the construction materials available;
- Enhance the safety of the swimming zone during peak summer periods.

**Application History**

Since the submission of the original application under PA 3798/02 on the 4th July 2002, the Developers have discussed various options for the rehabilitation and development of the Hondoq ir-Rummien Quarry with the Planning Directorate.

**Option A** was the original proposal for a marina village and destination port and was discussed with the planning Directorate on the 19th June 2002. It was agreed during the meeting that the promoters were to submit an application for an outline permit for the development.
**Option B**, with a reduced length of the main breakwater arm, was included with the application drawings for PA 3798/02.

*Figure 14.12 – Option B*

*Figure 14.13 – Artistic impression of Option B*
**Option C**, revised marina village concept with a further reduction of the length of the main breakwater arm was submitted following a meeting with EMU, MMA, and the Planning Directorate.

*Figure 14.14 – Option C*
**Option D.** River Valley village proposal based on 25% site coverage with a hotel.
Option E. Option D amended to include a ‘club-village’ type hotel.
**Option F.** Option E amended to include a lido.

*Figure 14.19 – Option F*

*Figure 14.20 – Artistic impression of Option F*
**Option G.** Option F amended with reduced density.
Option H. New marina village concept. The breakwater was completely removed and all incursions on ‘Posedonia’ meadows completely deleted. The density of the marina village reduced considerably by inclusion of ‘villa clusters’ and reduction of heights of buildings.
Option I. Variation of Option H.
Option J, K, L, M. Further variations of Option H.
Figure 14.29 – Option L

Figure 14.30 – Option M
Option N. New concept of marina village in response to MEPA letter of 1st December 2005 which reported on MEPA Board guidance following the Board meeting of the 3rd November 2005.

The MEPA Board guidance included:
- Need to downscale number of commercial units.
- Revision to type, number and size of units to enable proposal to project itself as an up-market distinction.
- Modification and change to the 4 floor podium of Option M.

The letter also advised that the MEPA Board decided on the following issues:

a) The principle of development of a marina/destination port, and a tourist village comprising a Spa Hotel, Self Catering Apartments/Villas and multi-ownership apartments/villas.

b) The primary guidance on the design and density of the development as suggested above.

c) The initiation of the Environmental Impact Assessment (EIA) process without prejudice to the final decision.

The Option N proposals are shown in greater detail in Figures 8.1 - 8.15.

Option N is the preferable option, and is the result of four years of a pro-active consultation process between the developers and the Planning Directorate, and after a series of informal meetings of the Planning Directorate with the MEPA Board, for guidance, culminating in the letter of the 1st December 2005, and the latest proposals as submitted with Option N.
Construction Mitigation

The intensity of the pollution will be a function of both human and natural factors. However, it will broadly depend on the standard of sophistication of the project’s CMP (Construction Management Plan) and the standard of construction supervision and real-time environmental monitoring.

- The CMP for the excavation and marina works will be drawn up following a precautionary and anticipatory rather than a reactive approach with built-in safeguards against potential point source discharges into the marine environment. The CMP will include:

  1. A detailed wastes audit covering all operations at the site and the methods for their re-cycling or safe disposal;
     - Sewage (field offices, hygiene and shower units, workshops) reception and disposal;
       Sewage deriving from on-site activities will be collected in a fibreglass holding tank and pumped automatically from the site to the nearest manhole linked to the town sewerage. The steep gradient on site makes it difficult for the grey waters to be handled correctly by road tanker.
     - Spent oils (engine oil and hydraulic fluids) storage and re-cycling
       Waste or spent oils will be collected on site for onward re-cycling. The site will be equipped with an approved oil storage container, consisting of a double-skinned polyethylene tank with a 300mm square inlet with integral gauze and an 80mm diameter suction outlet. Evacuation will be handled by an authorised sub-contractor.

All hydraulically operated machinery on site will be switched over from a mineral-based hydraulic oil to a vegetable-based product, such as Falcon’s Hawk RS46, an
environmentally friendly hydraulic oil derived from rapeseed. Hawk RS46 is quickly and completely biodegradable (97%) and is safe in human and animal contact.

- **Fuel storage;**
  As the site is rather remote, fuel may be required to be stored on site. All on-site refuelling infrastructure will be of an approved type, similar to the one illustrated in Figure 10.

- **Hazardous wastes (starter batteries, oil rags and contaminated spares) storage;**

- **All hazardous waste and construction debris (masonry, off-cuts and specialised building compounds) will be collected in appropriate skips for onward despatch by authorised sub-contractors.**

- **Construction debris storage and disposal;**

- **Particulate matter (including quarry dust) handling, treatment and disposal.**

Particulate matter in the form of quarry dust, will be produced at a rate of approximately 5% of the daily production volume of excavation. Of this 5%, probably half will be dust and the rest too small to be of any use in construction. The dust fraction poses the largest threat to the air and marine environment, and whereas the relative remoteness of the site will make airborne dust less of a critical problem, its proximity to the coastline means that extra attention is required to prevent accidental discharge into the sea. It is expected that during periods of rain and during excavation of the marina basin below mean sea level, this dust fraction will turn into sludge and must be pumped away from the shoreline for immediate treatment. All vehicles leaving the site will also require cleaning before venturing on to public roads.
Sludge Treatment

There are three types of processes which may be used to treat sludge. These include:

- **Gravity based settling systems**

  Gravity based settling ponds are currently the most used sediment control measures. A weir basin has weirs built into the basin to enhance the sediment settling efficiency. Sediment laden water is pumped into one end of the basin from a collection point. The water travels over and under a series of weirs (baffles) before reaching the outlet at the other end of the tank. The weirs serve to maximise the distance the water must travel inside the tank. They also minimise water turbulence. Both of these factors greatly increase the settling efficiency of the weir basin over a standard pond. The minimised turbulence also allows weir basins to be used for continuous flow operations much more effectively than standard ponds. The outlet flow from the weir basin then passes through a percolating sand filter before discharging back to the environment. Sediment basins need to be cleaned of sediment as the build-up of deposits diminishes the effective volume of the settling basin. The light sludge must then be pumped to caking ponds for approved disposal on land. If the settled sludge is dense enough, it can also be grabbed out and loaded onto special watertight trucks for land disposal. The major weakness of sediment basins is their ineffectiveness in removing very fine sediment (below 10 micron) at high flow rates.

![Figure 14.32 – Traditional gravity weir settling basin](image-url)
• Passive Filtration Systems

The classification of passive filtration systems includes sediment control measures that have physical barriers to remove the sediment from the water. These include gravity or percolating sand filters, pressurised sand filters, bag filters and wound cartridge filters. Typically, each cartridge is 1 metre long with a 60mm diameter. The greater the number of cartridges, the higher the flow capacity and sediment holding capacity. A 4,500 litres per minute system requires less than half a square metre. The small footprint makes them ideal for mobile trailer mounted systems.

• Polymer Treatment Systems

Polymer treatment systems are highly effective in removing colloidal clays. Polymer treatment systems are different than other sediment control measures because they actually fall under the category of a water treatment system. As such, most areas require permits for their use. There are two basic types of polymer treatment systems in use on construction sites: Cationic and Anionic polymer based treatment systems. Cationic polymers carry a positive charge. Anionic polymers carry a negative charge. Each polymer has its uses and benefits. The polymer attracts a large number of particles (sediments) with an opposite charge to create larger particles. The larger particle then settle out at a faster rate. This is called flocculation. Technically, this process incorporates both coagulation and flocculation. Water based polymer treatment systems are water treatment systems. As such, they are more complex and costly than other sediment control measures. Trained personnel are required to design and monitor the system and require continual monitoring during operation.
The Proposed Particulate Treatment Process for the Qala Creek Project

Following from the above review and given that infiltration and rainfall are indeterminate variables, the excavation site at Qala will need a flexible system capable of handling low rates as well as high peak rates of sludge. The proposed system will be a hybrid system consisting of a weir-settling basin connected to a wound cartridge particulate filter.

The weir-settling basin will be able to handle low to very low rates of sludge production, when through-flow rates are low, whereas the wound cartridge system will be able to handle peak flows at the flick of a switch. A weir-settling basin will be constructed at the uppermost level of the quarry. All sludge from the excavation will be pumped to this level for treatment. The outflow from the basin will be pumped to a Clearwater Creek Systems wound cartridge filter unit rated at 1 micron at 4,500 litres per minute.

The discharge from the filter unit will pass through a Claritek turbidity monitor connected to a computer to relay real-time data on turbidity. The discharge will be channelled to the site’s run-off channel discharging through the slipway at the coastline.
The weir-settling basin will be equipped with two parallel primary sludge basins (the first settling tank in the above figure) in order that sludge may be trucked away for disposal without shutting down the entire operation.

2. Appropriate watershed management to ensure that run-off is diverted prior to entering the project site (and increasing the sludge load) and localised geotechnical investigations to identify and grout beforehand, potentially troublesome fissures in the bedrock below mean sea level to limit infiltration;
In order to limit the amount of sludge or polluted water to be treated before re-entering the marine environment, the amount of water entering the excavation will be limited in two ways:

- Rainfall will be limited to that falling on the excavation footprint by diverting the existing Qala run-off away from the excavation as shown in Figure 14. The run-off channel will discharge into the sea via the existing slipway;
- Infiltration through fissures will be limited through a detailed local geotechnical investigation followed-up by injection grouting where and if necessary to limit size of fissures.

The latter exercise will be undertaken when the excavation reaches level +1,20 above sea level and before excavation of the marina basin below sea level commences.
3. Additional operational and programming safeguards to prevent local work practises from jeopardising the integrity of the CPM – these include:

- The sea defence works will be built separately from the marina basin works (in the wet) and the connection between the two will be carried out under carefully flooded conditions to avoid sludge from exfiltrating into the open sea. As an added precaution, the outer gap between the two solid abutments will also be sealed until the programmed breakthrough commences.

- The site offices will be located directly opposite the sea defence works with a narrow strip of connecting access way in base rock. This will ensure a stricter control on the entire process and eliminates the danger of an unauthorised breakthrough to the open sea.

- The excavation of the marina basin below level +1.20 will only commence once the detailed geotechnical survey of fissures is complete and potentially troublesome fissures grouted.

Figure 14.36 – Location plan for the site office setup
The excavated material destined for Malta will be loaded on trucks and exported from the quarry located to the East of Qala. This quarry currently exports aggregate via sea barges. The access road to this quarry already handles quarry trucks and other heavy material.

4. BMP (Best Management Practise) applied to environmental supervision and monitoring.

Recent experiences with marine work in Malta have shown that old school and traditional thinking can no longer be relied upon to ensure compliance with environmental management plans. Nowadays, Best Management Practise dictates that the environment on a marine construction site has to be managed in its own right, utilising trained personnel hired specifically for the job. In order to ensure compliance with the Construction Management Plan, the Environmental Management Plan and any eventual permit conditions, an Operational Management Team (OMT) may be set up on site and run full-time by a representative from the Client, with full executive powers. The OMT may also
include an Environmental Monitoring Team (EMT), possibly from MEPA, made up of persons with relevant environmental expertise required to ensure compliance with the EMP, one of which could be a qualified scientific diver and one having experience in quarry work. To this effect, the Client would reimburse MEPA with the expenses related with the functioning of the EMT team. The composition of the OMT will be drawn up by the applicant and approved by MEPA prior to the tendering process and in time for the setting up of the monitoring programme.

Alternatively, the client could commission consultants approved by MEPA to be part of the EMT Team. The Client will provide an on-site office for use by the EMT as close to the OMT as possible.

The OMT will represent the Client on site on environmental matters, whereas the EMT will represent MEPA on site. The EMT will have the legal right to order changes to work practices and removal of offending machinery so as to ensure compliance with permit conditions.

The Client will, one month prior to the start of the works on site, forward to the EMT a list of all plant to be used on site (including floating plant) in order to achieve the desired quality of work, including all certificates of testing signed by a qualified engineer responsible for the testing. All plant and equipment shall be monitored by the EMT for compliance with Good Management Practice.

- Operational monitoring
- Site Specific monitoring
- Surveillance monitoring

The above monitoring will be carried out by a qualified team of consultants to be approved by MEPA. The results of the monitoring will be submitted to MEPA at the same frequency as the monitoring.
Vegetation

The landscaping of the project site is the most long-term and far reaching mitigation measure being proposed for this project. During the course of its progress, a number of problems may arise. Earlier on the remaining minerals will have to be extracted. This will give rise to dust pollution. Although this would cover large areas in white dust, it is what may be termed a necessary evil. In order to minimise the effect of this nuisance it is proposed that rock blasting be carried out in regular small operations. Once all rock excavation/blasting ceases there would be no further problem associated with quarry dust and it is envisaged that the effect on the present natural vegetation would be negligible, considering that such operations would only last for a few months. Indeed once all building activity would have stopped and a heavy rain arrives, the landscape would be well on the way to recovering its natural green, brown and grey hues.

Visual Impact

The visual impact of the final project will also be mitigated against by a number of measures that are part of the construction process itself. Hence during planning and construction, planters will be provided for in strategic locations to ensure that climbers will have adequate rooting space. The terraces will have appropriate well-drained planters that resemble ground planting rather than large pots. All this entails a large rooting space which guarantees that trees and shrubs on the terraces will grow to sufficient heights that guarantee the breaking up of the feeling of a large built space.

It will be in the choice of species that mitigation will be made. The whole area will be planned to provide maximum green space and shade.

It is expected that the care and expense lavished on the whole development will ensure that one will leave the development site with the perception that this was the work of nature itself; and that the building activity took place amorphously.
On the North side of the site, the existing dumping area which currently features prominently in all views of the site from the North, will be rehabilitated and planted with native scrub and trees as part of the proposal.

**Impact on Garigue**

The area of garigue to the west of the development site is owned by the applicant and is currently degraded by it’s use by bird trappers, resulting in tracks, small huts, stone cairns and rubbish. This area would be restored to its former state by removing all the man-made interventions, and replanting all bare areas. A Nature Trail (as referred to above) would utilise an existing track, with trespass onto adjacent areas prevented by the use of rocks and appropriate thorny plants to delineate the route.

**Relocation/ downsizing of breakwater**

It is proposed that, in order to reduce landscape and visual impacts, the outer breakwater shown in the original application should be reduced in size. The current proposal does away completely with the need that sea defences project out into the bay. Only the disturbed sea-bed along the shore will be affected directly by the proposed sea defences. The visual impact of the sea defences on the bay are minimal and non-obtrusive.

**Sensitive use of faceting and colour on building facades**

In addition to the multi-faceting of the building facades and terracing, pastel earth tones will be used to break-up the outline of the buildings and blend the proposals into their surroundings.

It is anticipated that after mitigation, the only significant post construction landscape impacts are likely to be beneficial. The only slight adverse post-construction landscape impacts are likely to be experienced initially to the East of the site, on account of the removal of the ridge behind the existing quarry cut face and views of
the outer breakwater. However, these impacts are likely to reduce to negligible after mitigation proposals have taken effect and the development “beds into” the surrounding landscape.

**Visual Impacts**

As with the landscape impacts, the substitution of a positive visual element in place of a negative one, is likely to result in generally beneficial effects. The only significant effects are also likely to be beneficial, notably from the existing bathing platform, the road to the beach and viewpoint above the beach, where the despoiled quarry landscape currently dominates foreground views to the north and east. Similarly beneficial effects are likely to be experienced from the sea routes, where the white scar of the quarry face currently features prominently against the more gentle terraced slopes which adjoin the site on either side.

Also, as with the landscape impacts, the only post-construction adverse visual impacts are likely to be slight and experienced initially from viewpoints to the east of the site, on account of the removal of the ridge behind the existing quarry face. However, these slight impacts are likely to be reduced to negligible after mitigation proposals take effect.