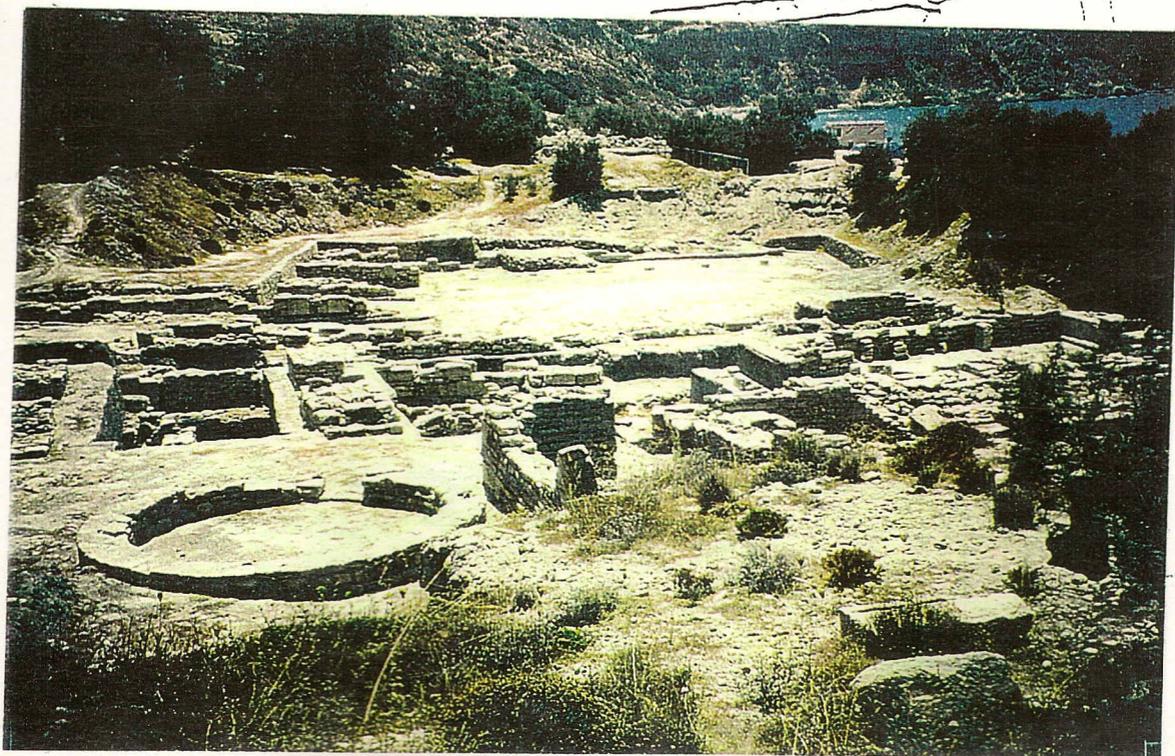
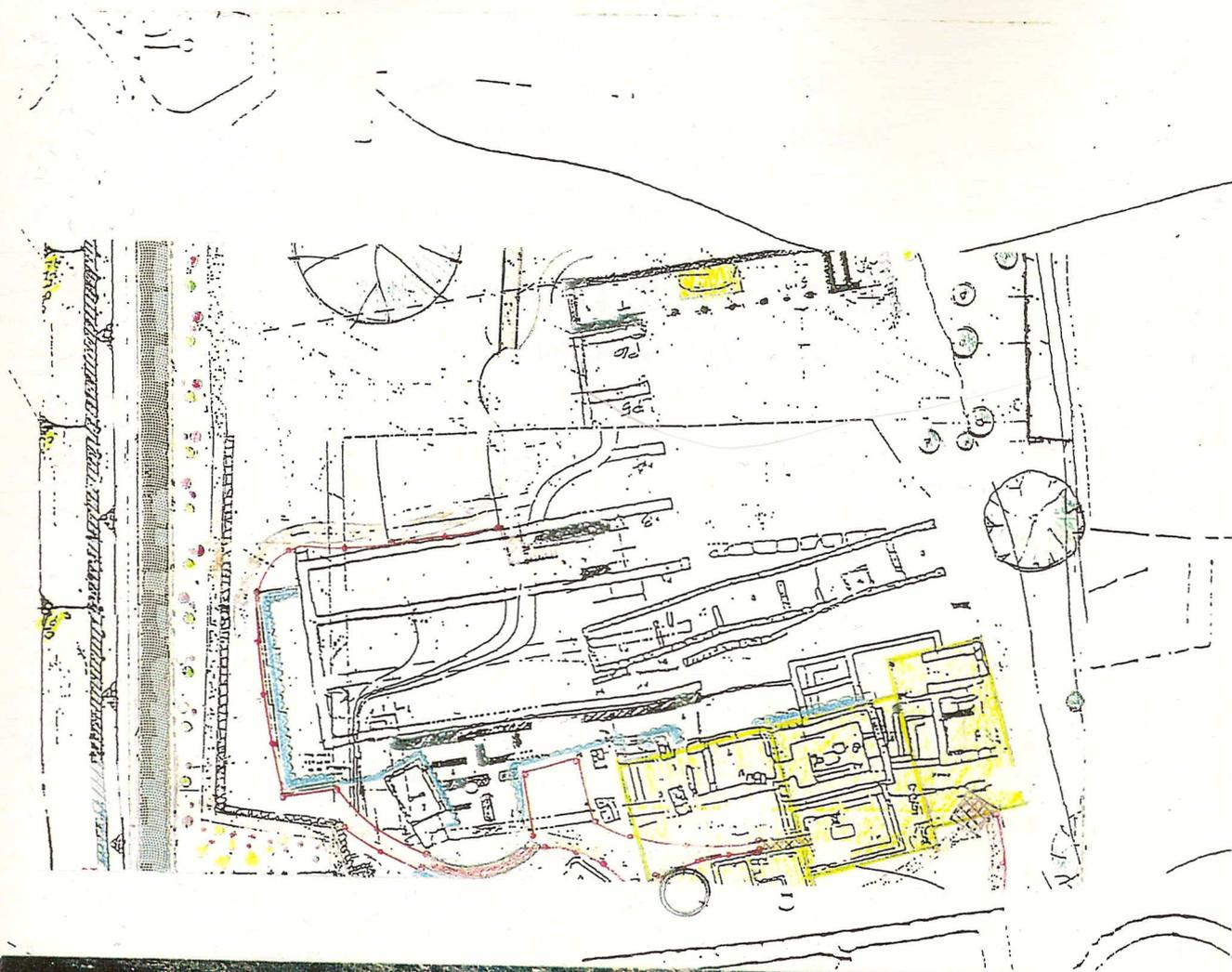


KOMMOS ARCHAEOLOGICAL PARK

ΑΡΧΑΙΟΛΟΓΙΚΟ ΠΑΡΚΟ ΚΟΜΜΟΥ



Foreword

This proposal introduces an overall plan for the development and protection of the Kommos archaeological site in Southcentral Crete. It is largely the work of James Stratis, Restoration Specialist of the Colorado Historical Society. Its genesis owes much to the encouragement of the Ephor of Central Crete, Alexandra Karetsou, with advice of the architects martin Schmid and Clairry Palyvou, as well as others, including Michalis Kotsyfakis, present Mayor of Matala-Pitsidia, whose dream of an archaeological park should come true.

Joseph W. Shaw

Director, Kommos Excavations

KOMMOS ACRHAEOLOGICAL PARK
DEVELOPMENT AND CONSERVATION PLAN

5 March 1998

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Development of the Kommos Archaeological Site

Site History

Kommos, a large Minoan and Greek site, lies on the shore of the Libyan Sea north of Matala in South-central Crete (*Fig. 001*). During the Minoan period (c. 1750 - 1250 B.C.) it featured a town of some 35,000 m², of which a number of excavated houses have now been published in detail (see bibliography at end). The town itself was set on a hillside and higher areas to the north (*Fig.002*). To the south, on the flatter area bordering the shore, there was a succession of three enormous structures, two of which were palatial, with wings and a central court. The third, unique in the archaeological record, may have functioned to house ships of the Cretan fleet during the winter, non-sailing months. Kommos's position on the sea, with its wealth of materials brought from Cyprus, Egypt, Syria and elsewhere, lead one to the conclusion that it was the harbortown or epineion of nearby Minoan Phaistos and Hagia Triada.

During the Greek and Roman period (1025 B.C. - 250 A.D.) the southern area was used for religious rather than commercial purposes. Three successive temples, accompanied by many offerings, were built upon each other, all set upon the ruins of earlier Minoan buildings. Various structures were built around the temples, including four altars from the final period, when Zeus and Athena were worshipped.

Together, the temples and the underlying Minoan palatial walls, represent an architectural assemblage unique on Crete, one that must be preserved intact.

During the Early Roman period sand, drifting in from the shoreline, began to accumulate on the site, which had been abandoned. Eventually the entire site was covered by sand which in some places reached a depth of eight meters,

especially on the south. The area lay deserted until 1976 when the University of Toronto initiated excavations that have continued until the present. Now the effort is being made to deal with environmental problems (e.g. erosion and sand accumulation) and at the same time conserve and protect the complex's well-preserved remains of civic and religious buildings, as well as those of the Minoan town.

General Concept of Area Preservation

In order for excavation to begin at Kommos, an area sufficient to test the site was first expropriated, Later, there were to be three more purchases, all to the south, the present total within the fenced area being some 16,000m². The first purchase obviated the almost mature plans of the landowner, in collaboration with an Italian consortium, to build a large hotel bungalow complex. Next, a large area, from the Pitsidia/Matala highway all the way to the shore, was proclaimed by the Archaeological Service to be a protected zone. Beginning then, but particularly during recent years when a passable road was built by the Pitsidia/Matala community down to the shore, the beach area west of the archaeological site has become an increasingly popular place for tourists and locals alike. Parking is provided (for a fee) by the owner of the land just south of the fenced archaeological area -- he illegally levelled the area with the expectation of building a tourist establishment there: his building materials have been confiscated twice by the Archaeological Service, but he continues in his attempts at private development. Fortunately the decision has now been made to expropriate his property, which will free the entire area for the type of improvements suggested in this proposal.

The Kommos area is a large one, beautiful and open, containing only a few modern structures and, on the west, features a major new archaeological site

bordered by a long stretch of unpolluted, pristine shoreline (*photo 101*). The general concept behind this proposal is that the shoreline area should remain open to the public. Also, that future visitors can inspect the ancient remains which, however, must first be made easily accessible (the area is presently closed to the public). Those wishing to enjoy the beach area should also have minimum sanitary facilities, a peripteron for refreshments should be provided, and there should be an area for parking. (*Figure 004*)

The beach area is presently being cleaned and supervised daily by the local community.

General site issues and problems

Drainage Control / Erosion and Alluvium.

After the Roman period, the entire hillside and civic center areas, as well as the area stretching to the hills east of the site, were gradually covered by wind-borne sand from the shoreline, with accumulations as much as ten meters deep. The sand (and the lower level of earthen fill) has been removed in order to expose the ancient remains. On the east, however, this overburden has only been removed up to the line of the modern road. The result has created the major drainage problem on the site. In a heavy downpour, water flows westward, downhill, over the sand as well as down the modern road. It then accumulates east of the road, overflows it, then flows down the high excavation scarps where it threatens to collapse scarps and retaining walls. If these scarps collapse, the efforts of years of excavation will be covered, obscuring one of the most monumental prehistoric facades known from Crete.

The Minoan town was built upon the bedrock of the hillside and hilltop,

with rainwater accumulation draining off to the south and south-east by way of the roads between houses. When that water reached the bottom of the hill, most of it collected on the main east-west road from where it flowed off westwards toward the sea. Not all of this road has been cleared, however, so water collects within the deeply excavated areas where the road surface has been exposed.

(photo102)

Proposal I

Ia.) WELL AND SUMP PUMP

One of the stretches of the Minoan road (that on the east, shown in *Fig. 005*), should be furnished with a sump pump or be roofed. Integration of a well in a lowered grade adjacent to the Minoan road will require careful design minimising the visual impact to the archaeological context.

Ib.) TRANSLUCENT POLY-CARBONITE SHED ROOF STRUCTURES

The next stretch of road to the west, bordered on the south by the impressive northern facade of Minoan Building T (*Fig. 003 & 005*) should be roofed along with the adjoining area of the Greek Temples (*photo 103*). A survey of various sites on the mainland, in the Aegean and on Crete, was undertaken during the summer of 1997 in order to analyse protective roof structures.

Retaining and partially restoring the natural beauty of the area has remained an integral concern of the archaeologists, designer/planners and the local authorities. While planning provisions for the increased recreational and heritage tourism has defined the architectural program, the natural qualities of the environment must be retained and respected. The solutions proposed herein represent the use of materials, colors and textures compatible with the Kommos - Phaistos area.

Beautiful and graceful protection structures such as those designed by Martin Schmidt of the French School in Athens and recently constructed at Mallia, in north-central Crete were studied, along with several much simpler, utilitarian shelters. These ranged in type from landscape integrated structures such as those proposed by Nikos Fintikakis and Christos Doumas at Akrotiri, Thera, to the curved steel truss structure at Pylos. Ultimately, the Kommos design criteria for all intervention and stabilisation measures are based on materials that are readily available, simple to erect, easily maintained and provide long life cycles. These materials should allow the transmission of natural light and passive ventilation and cooling. Beyond the consideration of appropriate materials, preliminary schematic concepts were developed to:

Determine specific areas where the ruins' exposure, valuable for interpretation, subject them to accelerated deterioration, necessitating a protective covering.

Determine the roof forms and visual characteristics. The shed roofed type structures evident at associated Cretan Minoan archaeological sites such as Knossos, Phaistos and Hagia Triada are recommended for their simplicity, practicality and limited visual intrusion.

The next phase for the architectural plans, Design/Development and the formulation of the next level of budget will need to be carefully assessed through data collection with analysis by structural and geo-technical engineering consultants. Foremost in this focus will be the design of adequate foundation and structural component connections, given the significant wind load factor.

There also exists in the southern area an interesting kiln set within an earlier colonnaded stoa. The kiln was discovered full of pottery which has been removed

for study. The parallel firing chambers have been backfilled with sand for protection (*photo 104*).

Proposal: The sand should be removed after a protective poly-carbonite shed roof structure has been installed; facsimiles of the pottery could be reintroduced and enhanced by labeling.

Ic.) CONCRETE LINED SWALE

The level of the modern road must be raised at least 200 cubic meters (*photo.105*) This is only a *partial*, temporary solution, however. The run-off water should be collected in a large open, concrete-lined swale just east of the road, 203 meters long and sloping down to the south where it turns westwards an additional 48 meters, continually sloping down towards the sea, (*figure 004*). A preliminary survey of indigenous planting materials has been conducted and may be utilised to determine plants, which can be integrated with this construction to soften the effect of the reinforced drainage channel on the landscape.

Id.) REGRADE NON COMPATIBLE STONE LINING

The natural drainage channel has recently been filled in by the owner of the property to the south, through the installation of a *hundred meters of unnatural sharp edged, and oversized boulders, photo 106*). The superseding swale described in Ie above, will allow a more sensitive landscape mitigation. The disruption to the natural qualities of the environment should be remedied, by the relocation of these boulders. Some of these boulders could be buried as ballast in an expansion to the excavation dump to the west, enhancing the protection from wind and sea. Discussion with the local authorities confirmed the mutually beneficial, compatible plan to convert the newly created beach parking area to the

south of the archaeological site into a beach and archaeological park setting. The schematic concept plan (*figure 004*) attempts to illustrate the provision for sensitive re-grading, re-planting of indigenous botanical species, construction of visitor amenities which include shade trees, wind barrier sand berms for use as picnicking and sunbathing areas. These proposed improvements also provide for a handicap accessible beach overlook area with companion bench seating, a beach visitor comfort station for toilets and Changing Rooms (*figure 006*), while accommodating the natural drainage and realignment, including Ic above and Ie below.

Ie.) OUTLET PROTECTION

The outlet of the swale onto the sandy beach should be protected from erosion by the placement of stones, to slow the force of erosion. This would be necessary as a result of the collected, channelled and managed surface water runoff. Future consideration of a small sea wall, which incorporates the ramp to the beach and the swale outlet, is recommended.

II Wind Control / Aeolian Sand Deposition

Since the deep post-Roman sand accumulation was removed from the hillside and civic area over a decade of observation, it has become clear that the sand is blown in from the west, in particular drifting in from the area west of Minoan Palatial Building T (*Fig. 002*). Recent sand accumulation was removed in 1997, after it had covered the western end of the east-west Minoan road and the elaborately paved floor of Building T5 (*photo 107*). If this sand had not been removed, over a twenty-year period it would probably have covered all of T 5 and part of the Greek Temples, and the accumulation would have continued eastward, eventually to recreate the earlier, pre-excavation situation. The accumulation may not be stopped completely but can definitely be slowed.

Proposal II:

IIa) NATURAL WIND FENCE

The protective bank of sand bordering the southwestern part of the site (the excavation dump) should be planted with lines of almiriki (tamarisk) trees which, when established through sufficient watering (a water line still has to be brought down to the site) will not only consolidate the sandbank but will provide a buffer to the wind borne sand (*photo 108,figure 004*).

IIb) REINFORCED SYNTHETIC START-UP SCREEN

At the same time artificial windbreaks should be installed to provide start up shelter for a few years until this indigenous, natural species roots to the watertable and develops sufficient strength against the strong northwest winds. Future removal of accumulated sand from this part of the site can be carried out by a front end-loader accessing the site from the south, utility gate.

III Scarp Reinforcement and Ancient Wall Stabilization

In places on the hilltop and hillside, scarps need consolidation either through the building of new rubble walls or by a covering of cement. The situation is more acute in the southern, civic area on the east where the scarps are sometimes four meters high. In a few cases (near the Greek Temples) scarps have been supported with solid masonry walls. More often, however, a mixture of earth and cement has been used. This is only a temporary solution, however, since when the rains come the upper edges of the scarps are eroded and then the water penetrates behind the cement sheath and sections of the scarp often collapse (*photo 109*). Although rubble walls have been consolidated, the consolidation has been uneven in many areas. Often the cement covering used was not mixed with enough sand and the masons were workmen without sufficient training since the excavators could not call upon trained conservation personnel in the immediate area.

Proposal III:

IIIa) REPLACEMENT REINFORCED CEMENTITIOUS SCARP COVERINGS WITH INTEGRATED INDIGENOUS PLANTINGS

Wire mesh reinforcing with a pressurised, blown cementitious covering will replace deteriorated cement covered soil on certain earthen scarps. Indigenous plants could be established within a grid of pvc sleeves perforating the reinforced trench walls, softening the visual effect of the stabilisation measures and producing increased prominence to the natural landscape and pre-historic remains, (*photo.110*)

Minoan ashlar walls are of two types at Kommos, thick walls faced with enormous orthostate slabs and roughly coursed ashlar masonry. The first characterise the facade of Late Minoan I, Building T, of which some 60 meters have been exposed through excavation. These blocks, averaging about a meter high and as long as 3.50 m., are among the largest uncovered in Crete, (*photo 111*). The second type, also of Late Minoan I date, are most visible in the north-western part of the site. Although deeply worn by weathering during as much as a thousand years of exposure, the orthostats are still fairly well preserved: there is little sign of recent flaking. The coursed masonry, on the other hand, is more worn and must be protected.

Generally, the Greek walls are not as well constructed as the Minoan. Since they are friable (Buildings A1, A2, B, and D in Fig. 002), they must be protected by a roof. Moreover, the mouldings in Temple C are in such a bad state that without protection they will simply disappear.

IIIb.) SUPPLEMENTAL ROCK WALLS

A comprehensive survey and analytical review of existing scarp walls of rubble will determine the adequacy of existing treatment and the area requiring or anticipating treatment. The survey should also determine the existing mortar formula's compatibility with the current reinforcement.

IIIc.) EXTANT ANCIENT WALL STABILIZATION

The analysis indicated in IIIb above will also determine the extent of bracing and other remedial treatments including appropriate tuck pointing mortar for both ancient walls and the modern scarp retaining walls, (*photo 112*). Maintenance requirements should also be determined and be

represented in a periodic and annual maintenance plan with short and long term schedules.

IV Site Access and Visitation

A meeting during the summer of 1997 with Pitsidia Mayor M. Kotsyfakis has confirmed common issues and concerns relative to opening the site. Enhancing the beach recreation amenities of the region with public access and interpretation of the natural and cultural heritage, produces an expanded visitor experience. This expanded tourist offering is beneficial to the business community in Pitsidia and the Mesara region of Crete. The increase in beach use combined with a broadened Pitsidia/Matala access road has produced an unmanaged, increased number of visitors to the area of the archaeological site. More visitors have caused an increase in vehicular traffic, and recently tour bus operators have also contributed to the increased number of people using the beach, (*photo.113*). As mentioned above, parking is provided by the owner of the property to the south of the site and the modern access road. It has been observed, however, that most beach users, not wishing to pay, continue to park in the sand beside the dirt access road that borders the archaeological site to the south and east (*photo.105*)

Proposal IV:

IV-a) ORIENTATION AND ACCESS CONTROL

The preliminary discussions with Mayor Kotsyfakis resulted in a consensus towards extending the bitumen road surface to a new parking area, ideally located above the site to the North-East (*fig. 004*). Here, adequate parking facilities for automobile and buses could be constructed to accommodate passenger drop off and pickup, parking and turn around.

To the south the recently constructed dirt road east and south of the site should be paved in concrete for durability. The improved grading and concrete swale described in Section I above should be integrated with this work to eliminate unnecessary duplication in civil planning/engineering as well as additional contracting and set-up costs.

The exposed archaeological remains will capture the visitors' attention upon their departure from their vehicles in the parking area and as they descend on foot on the walkways to the beach or archaeological park areas. These walkways should be durable and attractive using local stone materials and paving construction techniques. Walkways such as these are presently in use at the Phaistos site. The walkway at Kommos will lead the visitor southwards adjacent to the eastern edge of the existing site. Replacement fencing will not interfere with the spectacular view of the site. At the turn westwards towards the beach, the installation of the primary access gate to the site will be constructed across from the distinctive entry buildings.

IVb SALES, RESTROOMS AND MEDICAL FIRST AID

These buildings will be done in the local vernacular architectural style.

Constructed of steel reinforced concrete super structure they will be clad in local stone and masonry (figures 007,008). Between the twin buildings a wooden roof structure similar to an inverted keel of a Minoan ship will provide a shaded rest area.

Under this roof an alternate texture and color of concrete, easy to keep clean, will reinforce the demarcation of the rest area where simple wooden benches, will reinforce the nautical theme.

A transverse awning will shelter the information and access ticket window from the sun. The structures will be surrounded on a sea of wave patterned, slightly color tinted, concrete. Simple white-grey concrete tables, benches and umbrellas will extend the rest area to the south, connecting to the beach park described in section Id above.

IVc VIEWING AREAS FOR ARCHAEOLOGICAL, GEO-PHYSICAL AND NATURAL HISTORY INTERPRETATION

Archaeological park users will enter the site at the proposed south-east corner gateway north and opposite the entry buildings. They will enter a paved platea surrounded with indigenous plantings. This should be an area large enough to comfortably hold a confluence of entrants descending the primary monumental stairs. There will also be a longer but gentler grade nearby, designed to accommodate access to those with mobility impairments to the site and the departing visitors returning from the central and upper hillside pathways will also reconvene here.

The monumental stairs will descend between two mature almiriki trees where a paved viewing area will converge with the switchback access ramps (*photos. 114 & 115*). The view to the north exposes the triple layered site in its entirety. The visitor will be orientated to the three levels and will be able to determine the choices of the route of travel below and beyond (*photo 116*). The visible routes will be supplemented with pole mounted maps, illustrations and text which further orient and interpret the views. Diagrams of the multi-layered architectural complex will be alternated with other types of information describing archaeological finds, geology, natural history including plants existing on the site today that are represented on the archaeological finds.

From the viewing platform visitors will traverse a long wooden ramp adjacent to an east- west scarp descending to the east and then turning north. The recent construction of wooden ramps designed by architect Clairly Palyvou at Knossos (*photo. 117*) is the model for this solution. The ramp's outer posts and guardrails will provide mounting surface for interpretation materials. The visitor will land on top of the unexcavated portion of Building P6. Ahead to the north there is planned a staircase descending to lowest section of the southern area.

Those with mobility impairments will turn back south along and under the ramp, turning west behind the stoa and kiln on a cement soil stabilised pathway. This type of pathway treatment has been successfully deployed when there is a goal to minimise the visibility of the pathway but provide for the load bearing and traction requirements of wheelchairs. Others could descend the flight of stairs into the only fully excavated ship storage gallery building P3. An existing later cross wall with a modern drainage culvert should be removed.

The modern wooden bridge spanning the gap above the later wall should also be removed (*photo.118*) exposing the full depth of this unique building type. After exploring the lower section of the southern area visitors will return to the landing area at the foot of the wooden ramp. Travelling eastward all visitors will encircle the spectacular monumental walls of Building T. Guard rails should provide visitor safety improvements along steep excavation trenches.

Presently there is a simple wooden plank bridge across the eastern end of the Minoan road. This location covers the view of the roadway from above, (*photo. 102*). A replacement bridge fitted with guard railings will arch towards the Minoan Houses V & X. This reconfiguration of the bridge shape will improve the visibility of these important features. Again, on the new wooden structure interpretation panels can be installed.

The visitor now lands on a broad area between the lower Minoan buildings to the east and the Greek temples to the west. Here are the four altars previous referred to, (*photo. 119*). The two altars to the west will be under an open sided, new triple section roof structure (*fig.005*). Under this roof will be a cantilevered gangway allowing the visitor to walk over the floor and into Building A1 where various distinct features may be seen and interpreted (*photo 120*). Returning east to the area north of the altars a staircase should be constructed adjacent and east of the unusual low round structure (*photo 121*). This will permit the visitor to travel behind buildings B and A1 westward to an area above Building K, (*photo. 122*) where a wooden viewing platform allows a view of the westernmost side of the Minoan Road and the sea, (*photo. 123*). A stabilised pathway will then lead to the Central Hillside which can be viewed from the south and east perimeter.

A stabilised soil viewing area could be installed around the base of a large tree at the south-east corner.

Moving northward the visitor will see the pathway continue to the southern landing for a bridge spring point at the upper hillside section, (*photo. 124*). The bridge will allow visitors to arch over the top of the hill and view the complex arrangement of walls below. Many interesting features will be interpreted on panels attached to the bridge side walls. The view, (*photo. 125*) allows the beach shore line as well as the archaeological site to be inspected.

IVd PERIPTERON (REFRESHMENT STAND)

A western perimeter pathway will return the visitor south along the now descending pathway to an intersecting pathway to the east and the Peripteron where refreshment and an outdoor seating area are available prior to the hillside descent and return to the entry area.

At a point above the Central Hillside section an alternative upper pathway will return the visitor along the eastern edge, (*photo. 126*) of the site providing a stepped back overview of the site.

V) Allowance for future excavation

The Kommos site, especially the Minoan town, extends beyond the fenced-in area for a distance of perhaps 200 meters on the north to as much as a hundred meters on the east. Of the total area of ancient use, less than 3% has been excavated. Therefore, allowance should be made for future excavation even after the site has been opened to the public, a common occurrence on other large sites (e.g. Knossos, Mallia).

Outside the fenced-in area no development should take place on the north and east, where the Minoan town lies below the sandy slopes. Within the fence line, more houses of the Minoan town, east of the general access road, remain unexcavated. Two galleries (Nos. 1 and 2) of LM III Building P remain exposed but still unexplored since publication rather than excavation has been the excavators' recent priority. These can be excavated at the same time as Galleries 5 and 6 to the south (3 has been cleared entirely), once the overburden of sand over 5 and 6 has first been cleared away. Earth and sand removed from the two areas can be dumped to the west or south. Interference with visitor traffic would be minimal.

Bibliography

A general overview of the site is provided in J.W. Shaw and M.C. Shaw, Kommos I, The Kommos Region and Houses of the Minoan Town (two volumes), Princeton 1995 and 1996. There the hilltop and hillside Minoan houses are also discussed. For the Minoan Civic Center and the Greek Sanctuary, see J. W. Shaw and M.C. Shaw, "Excavations at Kommos (Crete) during 1986-1992," Hesperia 62 (1993) 129-190.