REACTIVE MONITORING MISSION TO

LUMBINI, BIRTHPLACE OF LORD BUDDHA

16 - 24 April 2000

Report and Recommendations of an UNESCO mission undertaken by

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EXECUTIVE BRIEF

A. MISSION BRIEF

Following a request from the Bureau of the World Heritage Committee at its 23rd extraordinary session in Marrakesh, Morrocco (29 November - 4 December 1999), the two consultants were requested to:

- undertake a reactive monitoring mission to Lumbini, birthplace of Lord Buddha;
- hold consultations with the authorities concerned;
- examine management and conservation needs of the site;
- discuss the most appropriate conservation and presentation methodology;
- provide advice to the Nepalese authorities concerning the draft conceptual design for the Maya Devi Temple conservation work;
- make recommendations to the UNESCO World Heritage Centre and the Bureau for examination at it 24th session (June 2000);
- assist the Nepalese authorities in elaborating a technical co-operation request for the organisation of an international technical meeting to discuss the proposed project for the conservation, restoration, and presentation of the Maya Devi Temple, which would be submitted to the Bureau at its 24th session.

B. MAYA DEVI TEMPLE RECOMMENDATIONS

It is recommended that the 4 draft conceptual designs for the Maya Devi Temple submitted to the mission are rejected. This recommendation is based on factors in which the construction of a short-term temple (with an estimated lifespan of 100 years) will result in significant long-term damage to a unique site over 2000 years old:

- chemical, physical and biological damage to 'in situ' archaeological deposits close to foundations;
- over 500m^3 of 'in situ' archaeological deposits will be destroyed in the digging of foundations;
- air conditioning will be unable to stabilise the environment of the enclosed archaeological remains;
- Tange's concept of a Sacred Garden will be contradicted with the presence of a new construction;
- none of the proposals are reversible without further disturbance to the property;
- use of non-local materials (steel, marble or concrete) will result in a loss of authenticity:
- use of the new designs will not replicate the 1930s Temple and will result in a loss of authenticity.

Alternative designs for the Temple, based on concepts of non-intrusion, reversibility, shelter, visibility, focus, access, worship, authentic materials and integration with the Tange master plan were investigated and discussed during the duration of the mission, these included:

- light tensile structures supported by non-intrusive timber supports;
- light non-intrusive timber frame structures with ceramic tiling or thatch.

C. MANAGEMENT AND CONSERVATION RECOMMENDATIONS

The mission noted the absence of a strategic plan for the ongoing management and conservation of the property. Itt is recommended that a 'minor plan' be created for the sacred garden in order to enhance its preservation and presentation. With regard to the contents of the minor plan, the mission noted the following areas:

- as the site is not fully delineated, a geophysical survey should be conducted;
- as archaeological structures are deteriorating, a systematic conservation strategy must be followed;
- as recent landscaping efforts have created an incoherent collage, a unified approach must be taken in order to connect the site to its surrounding to ensure that authentic materials are used with reference to the site's historical and archaeological nature;
- as visitor numbers are uncertain, it is recommended that numbers be proactively logged;
- as damage has occurred through ritual practices, it is recommended that a principle archaeological circuit and a principle ritual circuit are created with zones for the above practices;
- as the Tange plan is still incomplete, it is proposed that visitor services are regrouped behind a distinct entry zone, screened from the core of the property by plantings;
- improved drainage systems must be investigated.

D. IMMEDIATE RECOMMENDATIONS

In light of the sensitive religious, archaeological and political nature of the property, the mission has made three recommendations for immediate implementation:

- that an international technical meeting is held to discuss the conservation, restoration, and presentation of the Maya Devi Temple in order to initiate alternative draft conceptual designs based on the following criteria:

    1. Non-intrusive
    2. reversibility
    3. shelter
    4. visibility
    5. focus
    6. access
    7. worship
    8. authentic materials

- and that the meeting initiate a new dynamic for the management of the property with the proposal of a minor plan for the sacred garden. It is recommended that the individuals with the following expertise are included:

    1. Architectural heritage practitioner
    2. Artefact conservator for the Marker Stone
    3. Archaeological brick conservator
    4. Archaeological chemist/physicist
    5. Landscape architect
    6. South Asian archaeologist

- That the following activities may be immediately commenced by the DoA and LDT in advance of the above international technical meeting by initiating conservation having first the removed the modern brick coverings:

    1. photographic recording;
    2. EMD recording;
    3. planning;
    4. load-bearing capacities;
    5. recording of daily temperature;
    6. recording of daily rainfall;
    7. recording of daily humidity;
    8. recording of daily visitor numbers;
    9. recording of water table;
    10. recording of soil chemistry and profile.

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1. Objectives of the 2000 mission to Lumbini, Nepal

Following a request from the **Bureau of the World Heritage Committee** at its 23rd extraordinary session in Marrakesh, Morrocco (29 November - 4 December 1999), the two consultants were requested to:

1.1 undertake a reactive monitoring mission to Lumbini, birthplace of Lord Buddha;

1.2 hold consultations with the authorities concerned;

1.3 examine management and conservation needs of the site;

1.4 discuss the most appropriate conservation and presentation methodology;

1.5 provide advice to the Nepalese authorities concerning the draft conceptual design for the Mayadevi temple conservation work;

1.6 make recommendations to the UNESCO World Heritage Centre and the Bureau for examination at it 24th session (June 2000);

1.7 assist the Nepalese authorities in elaborating a technical co-operation request for the organisation of an international technical meeting to discuss the proposed project for the conservation, restoration, and presentation of the Maya Devi Temple, which would be submitted to the Bureau at its 24th session;

1.8 submit a report concerning the findings and the recommendations of the mission to the UNESCO World Heritage Centre upon completion of the mission, before 20 May 2000, in 3 hard copies and in digital form (diskette PC Word 95 or CD.ROM, with relevant photographs and plan.

2. Lumbini UNESCO World Heritage Site

2.1 The site of Lumbini was inscribed on the UNESCO World Heritage list as number 666 in 1997, on the basis of Cultural *criteria (iii) and (vi)*:

> "As the birthplace of the Lord Buddha, the sacred area of Lumbini is one of the holiest places of one of the world's great religions, and its remains contain important evidence about the very nature of Buddhist pilgrimage centres from a very early period." (ICOMOS 1997)

2.2 The archaeological remains proposed for inscription on UNESCO's World Heritage list by His Majesty's Government of Nepal in 1996 included the following monuments:

a) The **Shakya Tank**.

b) The **Mayadevi temple.** It contains brick structures of different periods dating from the 3rd century BC to the modern contribution of 1939 AD. The present excavation in this temple discovered the holiest of the holy spot where Lord Buddha for the first time stepped on earth.

c) The inscribed **Asokan pillar** of 249 BC that testifies to the authenticity of the site Lumbini where Lord Buddha was born.

d) The **monasteries** dating from 3rd century BC to 5th century AD.

e) The **votive stupas** built in different periods dating from 3rd century BC to 15th century AD.

2.3 It should be noted that the metal sheet and scaffolding shelter currently protecting the Mayadevi temple is only a temporary measure and, under certain climatic conditions, constitutes a danger to both the archaeological remains and visitors. Interior and exterior views of this temporary structure are attached (Figure 1, Figure 2, Figure 3, Figure 4 & Figure 5).

View of monks approaching temple

Close up of temporary structure

Interior view of temporary temple

View of birthplace of Buddha

Marker stone

3. Draft conceptual designs submitted to the mission

The mission inspected 4 designs for the restoration of the Mayadevi temple. One draft was submitted by a team from the Institute of Engineering, Pulchowk Campus, Tribhuvan University, Nepal (LDT, 1999). This team was led by Professor Sudarshan Raj Tiwari, Professor of Architecture and former Dean of the Institute. Three additional drafts were submitted to the mission in Lumbini by Mr Yoshinobu Kumagai of the SD Planning Institute of Yokohama, Japan (Kumagai, 2000). Mr Kumagai submitted a further draft on the mission's last day; but as it failed to address the weaknesses identified in the earlier variants, it has not been considered.

3.1 Institute of Engineering team design (Figure 6)

This design is two-tiered and completely encloses the archaeological foundations. A small gallery above those foundations within the first story offers accessibility and visibility. A substantial prayer platform is offered on the roof, whilst visibility of the marker stone is offered through the second tier - a small temple pavilion. It is designed with 22 steel pillars at a distance of between 4 and 4.5 metres and carries a steel truss. Standing a total of 8 metres high, it will be supported by 4.05 metre deep foundations, which will be 1.8 metres in diameter. Two staircases will provide access to the prayer platform, one on the west and another on the north.

3.2 Kumagai design A.1.2 (Figure 7)

This design is non-intrusive and simply seals the exposed archaeological foundations under a flat, rectangular prayer platform. A small single-tiered central temple, facing east, covers the marker stone in situ as well as providing a shelter from the nativity sculpture. Access to the platform is from the east and west, and access to the temple is from the east.

3.3 Kumagai design A.2.2 (Figure 8)

This 28 by 23.5 metre design is based upon that of Tribhuvan University's Institute of Engineering team, but "with an aim to realize a building having superior durability and resistance to earthquakes." (Kumagai, 2000, 1). Eight supports on the northern side and eight on the southern side support the superstructure. As a result of its substantial 4 metre deep spread foundations, an area of up to 4 metres from the outer walls of the archaeological monument will be disturbed. The temple is two-tiered and completely encloses the archaeological foundations. A small gallery above the foundations within the first story offers accessibility and visibility. A prayer platform is offered on the roof, whilst visibility of the marker stone is through the second tier - a small temple pavilion.

3.4 Kumagai design A.2.3 (Figure 9)

With a span of 28 metres by 24 metres and two tiers, this variant of A.2 has eight concrete piles cast in place and steel columns. As a result of its substantial foundations, 4 metres deep, an area of up to 3.5 metres from the outer walls of the archaeological monument will be disturbed. The temple is two-tiered and completely encloses the archaeological foundations. A small gallery above those foundations within the first story offers accessibility and visibility. A substantial prayer platform is offered on the roof, whilst visibility of the marker stone is offered by the second tier - a small temple pavilion

Institute of Engineering design

Kumagai design A.1.2

Kumagai design A.2.2

Kumagai design A.2.3

4. Report on the Mayadevi temple draft conceptual designs

The mission recommends that the 4 draft conceptual designs for the Mayadevi temple submitted to the mission be rejected, as they will endanger the property's listing as a UNESCO World Heritage site. This recommendation is based on the following factors in which the construction of a short-term temple building, with an estimated lifespan of 100 years, will result in significant long-term damage to a unique archaeological and religious site.

4.1 Chemical, physical and biological change adjacent to intrusive pillars

As noted in 2.1, the archaeological remains at the site of Lumbini are protected as a UNESCO World Heritage site because they represent the birthplace of the Buddha and because they contain important evidence concerning the nature of Buddhist pilgrimage from a very early period. When the 1939 temple was removed, a series of superimposed brick temple structures were identified and excavated in the levels below, the lowest of which has been dated to the third century BC. Whilst the lowest brick structure only dates to the third century BC, there is evidence of earlier occupation at the temple site in the form of 'in situ' archaeological deposits below. Indeed, although the final report of the joint excavations of the Lumbini Development Trust, the Department of archaeology, His Majesty's Government of Nepal and the Japanese Buddhist Federation is still keenly awaited, the excavators have stated that there are pre-Mauryan posthole structures in the vicinity of the temple (Rijal, 1996, 9). It may be thus be proposed that there is an underlying pre-Mauryan sequence in the vicinity of the Mayadevi temple - a sequence that represents the use of less permanent structures at the site, and a sequence which may date back to the time of the Lord Buddha, himself. Thus it may be proposed that the 'in situ' deposits under and surrounding the Mayadevi temple at Lumbini are of the highest importance, both in terms of archaeology and in terms of Buddhist pilgrimage.

Whilst a stable state of preservation never fully exists, after centuries of burial archaeological materials reach a state of relative stability. It is now understood that changes to that stability will occur if its environment is altered by foundations of an intrusive nature, which will change the chemical, physical and biological nature of the deposits. Indeed, such changes will greatly accelerate the degradation and destruction of archaeological materials and objects. During the last century redevelopment affected a number of large British cities, such as London and York and as older buildings were demolished, new structures were erected in their places. As these new structures were often larger, they utilised new technologies within their foundations and, in particular, adopted the use of piles and deeper foundations. Frequently, more modern structures would be demolished and cut back to reveal deposits of archaeological significance. Following British cultural heritage legislation, as contained within PPG16, no more than 5% of the building footprint was damaged (Tilly, 1998), and thus the new structure would sit on top of these deposits but rely on a number of intrusive pile foundations. In this way developers, archaeologists and legislators hoped to preserve the majority of the 'in situ' archaeological deposits intact for the future. During the 1990s, however, many of these modern structures were demolished for redevelopment, offering an opportunity to examine the underlying archaeological deposits again. Archaeologists were surprised to find that substantial changes had

occurred to the underlying deposits as a result of the pile foundations. In York, for example, a 30 year old building was removed to reveal that "upper 2m of the archaeological deposits had undergone recent decay and that they had shrunk by 200mm" (Oxley, 1996, 53). In London, 'in situ' deposits containing timber were found to have decayed, due to their proximity to intrusive foundations (Nixon, 1996, 43). Intrusive foundations have been found to facilitate changes within their vicinity, an effect that has been termed "wicking" (ibid.). This appears to result in the introduction of oxygen into anoxic deposits, the introduction of bacteria and fungi, the introduction of chemical contaminants as well as altering the level of the water table (Oxley, 1996, 53). These changes have been found to damage the 'in situ' deposits by greatly accelerating the degradation of both organic and inorganic archaeological objects ranging from wood and bone to metal (Edwards, 1996; Hopkins, 1996; Millard, 1996; Pollard, 1996; Simpson, 1996). Although much of this data is new and trial experiments incomplete, it is highly recommended that the design submitted by Institute of Engineering and Kumagai designs A.2.2 and A.2.3 are not implemented as their intrusive nature threatens the unique and valuable 'in situ' archaeological deposits at Lumbini.

4.2 Excavation of 'in situ' archaeological deposits for piers

As mentioned in 4.1, the 'in situ' archaeological deposits under and surrounding the Mayadevi brick foundations are extremely fragile and important. It is very possible that an earlier series of wooden post and mud structures lie under the exposed brick structure. Until the pre-brick structural sequence at Lumbini is more fully understood, it is recommended that these deposits are not damaged in any way. The Institute of Engineering temple design will necessitate the cutting of 22 foundation pits for the steel pillars, which will support the superstructure. As each pillar will sit on foundations 4.05 metres deep and 1.8 metres wide, it is estimated that each foundation pit will measure 4.05 metres by 3.8 metres by 3.8 metres (allowing 1 metre either side of the foundations for labourer access). A volume of 58.48m^3 of 'in situ' deposits will thus be removed for each pit, generating a total of 1286.6 m^3 for 22 pits. As the temple design has a span of 22.76 by 26.56 metres (604.5m^2), its foundations will destroy over 50% (317.68m^2) of the structure's footprint. British cultural heritage legislation, as contained within PPG16, recommends that no more than 5% of the footprint should be damaged (Tilly, 1998). Kumagai design A.2.2 is also highly intrusive with 16 pillars; each placed in a pit measuring 4 metres deep and with foundations 5 metres wide (allowing 1 metre either side of the foundations for labourer access). As a result some 1600m^3 of 'in situ' deposits will be destroyed. The temple's footprint measures 28 by 23.5 metres (658m^2) and the destruction will represent some 60% of the footprint. Kumagai design A.2.3 is less intrusive with 8 pillars, each placed in a pit measuring 4 metres deep and some 4 metres wide. As a result some 512m^3 of 'in situ' deposits will be destroyed. The temple's footprint measures 28 by 24 metres (672m^2) and the destruction will represent some 20% of the footprint. It should also be noted that this design would also cause damage to adjacent brick structures. In conclusion, it is recommended that none of the above designs be implemented, as they will result in the wholesale destruction of important 'in situ' archaeological deposits. Additionally, the level of archaeological information recovered from the sections of a number of small foundation pits will extremely poor. It should also be noted that until the full

excavation report is published and accompanied by a sequence of radiocarbon dates, the nature of this proposed damaged cannot be fully ascertained.

4.3 Air conditioning

The design proposed by Institute of Engineering and Kumagai designs A.1.2, A.2.2 and A.2.3 all propose the use of air conditioning to stabilise the environment of the encased archaeological remains. Such a system would be necessary as the exposed brick walls, the marker stone and nativity statue would be subject to temperature and humidity extremes by being encased within the four temple designs. Such extremes might promote biological growth, already notable on bricks covered by the temporary shelter, or of exfoliation; it should also be noted that the marker stone is a conglomerate and thus is fairly fragile. Whilst the concept of air conditioning thus removes the above dangers, there are a number of weaknesses in its recommendation. Firstly, the electrical supply at the site is not constant, resulting in possible damage from power cuts. Secondly, an air conditioning unit will be noisy and thus may interfere with the ritual needs of visitors to the complex. Finally, as it is proposed that large numbers of paying visitors will pass through the inner gallery, visitors' breath as well as the entrance and exit doors opening and shutting will create a continually altered environment. In view of these weaknesses, it is recommended that designs relying on air conditioning are not implemented.

4.4 Kenzo Tange Master Plan

In 1978 Professor Kenzo Tange, funded by the UNDP, prepared a master plan for Lumbini. Tange's plan proposed to transform three square miles of paddy land into 'a sculpted landscape to make the teachings of the Lord Buddha accessible to all humanity' and is divided into three linear zones on a north-south access. The first, and most northerly, is to be a residential village, cultural centre and accommodation for visitors and tourists. The second, or monastic zone is divided into 41 plots for places of worship; it is also possess a library, museum and research centre. The final zone is the sacred garden, protected by the circular levee with the Asokan pillar and Mayadevi temple at the centre. In 1988 the Lumbini Development Trust stated that the Sacred Garden is "to be tranquil and undisturbed, the beauty of its plant life restored to create a reverent atmosphere in which to experience Buddha's universal message." (LDT, 1988,9). Indeed, Tange's plan for this area is that it should resemble a garden and advocates the demolition of the adjacent buildings to allow focus on the ancient monuments. The construction of a new temple at the centre of the Sacred Garden will seriously contradict this concept.

4.5 Non-reversibility

Although the design submitted by the Institute of Engineering is termed 'reversible', it is irreversible without further damage occurring to the 'in situ' archaeological deposits. Indeed, following its safe life span of 100 years, large trenches and pits would have excavated into 'in situ' deposits again in order to remove its foundations. Only Kumagi's design A.1.2 is reversible as it is non-intrusive.

4.6 Use of non-local materials

Whilst the 1999 Japanese Buddhist Federation's restoration recommendations, suggested that the project "should basically use traditional construction method and materials" (JBF, 1997, 17), none of the designs appear to meet this concept as they utilise steel, concrete and other unauthentic materials. Indeed, the Japanese Buddhist Federation advocates the use of marble or cement for flooring, the foundation border and the foundation ledge (ibid., 18). Such materials are inappropriate and will result in the loss of material authenticity. Surely, the Asokan pillar, nativity sculpture and marker stone should be all the more notable by being the only objects of stone at the site.

4.7 Use of modern designs

Despite the indication that the temple "should be restored to its original shape, size and appearance" (LDT, 1999, 3), the term restoration is not appropriate as all 4 designs submitted to the mission will not restore the 1939 Mayadevi temple. The new designs, ranging from a single platform to a two-tier structure, will thus result in a loss of authenticity at the very centre of Lumbini.

5. Recommendations concerning the Mayadevi Temple draft conceptual designs

In light of the above comments, rejecting the 4 submitted designs, as they will endanger the property's listing as a UNESCO World Heritage site, it is recommended that alternative draft conceptual designs are considered for the Mayadevi temple site. The alternative designs should be in response to a detailed architectural brief. The brief has to be developed incorporating the following points:

5.1 Conservation aspects

5.1.1 Non-intrusive quality

In view of the comments made in *4.1 Chemical, physical and biological change adjacent to intrusive pillars* and *4.2 Excavation of 'in situ' archaeological deposits for piers*, it is recommended that the foundations are 100% non-intrusive. Such foundations could utilise sleepers lying on the exposed brick foundations if the latter are capable of load bearing.

5.1.2 *Reversibility*

In view of the comments made in *4.2 Excavation of 'in situ' archaeological deposits for piers*, it is recommended that the Mayadevi designs are 100% reversible. That is, the construction, and eventual removal, of the structure will not cause any damage to the archaeological site and its structures and deposits. The intended lifespan of the structure should also be made explicit and the designs should be accompanied by clear descriptions of how the structure is to be fully reversed.

5.2 Architectural aspects

5.2.1 Shelter

As Lumbini is of such archaeological and religious importance, it is recommended that more protection is offered to the Mayadevi temple foundations than normally advocated by SAARCH conservation norms. Rather than simply conserving the brickwork and exposing the structure to the elements, it is recommended that a shelter is provided. The aim of this shelter is to protect the exposed brick foundations from temperature extremes and rainfall as well as protecting the marker stone and nativity sculpture. It will also provide shelter to visitors.

5.2.2 Visibility

In view of the archaeological and religious importance of the structure exposed, it is recommended that the exposed brick foundations remain visible to visitors. The nativity sculpture should be reinstated in the monument, perhaps on a consolidated section of the upstanding brick section of phase IV. Furthermore, the marker stone can be made visible to visitors through the use of overhead mirrors.

5.2.3 Focus

In light of the failure to fully implement the Kenzo Tange master plan for the Sacred Garden and the demolition of adjacent modern buildings, it is proposed to use the Mayadevi temple design as a focus for visitors. The reinstatement of the

nativity sculpture and the visibility of the marker stone will offer the complex's central focus.

5.2.4 Access

Access onto the archaeological monument is not recommended, indeed, it is proposed that the current scheme of restricting access is continued. The remains will be quite visible from the circumabulatory path and the use of mirrors will enable visitors to see the marker stone. Restricted access will very necessary following the exposure in order to prevent possible damage or vandalism to these two objects.

5.2.5 Worship

Lumbini is clearly a living monument, and worship by both Buddhists and Hindus must form an integral element of the design (Figure 10 & Figure 11). Whilst access to the fragile temple must be restricted in order to protect it, the visibility of the marker stone and the nativity sculpture and the provision of adjacent prayer platforms and the circumabulatory path will offer a focus for worship.

5.2.6 Authentic materials

In view of the comments made in *4.6 Use of non-local materials*, it is recommended that traditional and authentic methods and materials are utilised.

5.3 Urban planning aspects

5.3.1 Integration with the Kenzo Tange master plan

Kenzo Tange's general plan indicates the way in which the archaeological site and temple should relate to its surrounding landscape and how it should develop. However, solutions to the current developmental problems do not lie within the master plan alone. Contextually, it is of the utmost urgency that a minor plan is created which will address the archaeological zone within the framework of the master plan *(See 7. Recommendations concerning management and conservation issues).*

5.4 Alternative architectural options

A few alternative architectural options were investigated and discussed during the duration of the mission, these included:

5.2.1 Tensile Structures (Figure 12)

The use of light tensile structures supported by non-intrusive timber supports resting on the brick foundations, and inspired by traditional tent models.

5.2.2 Timber framed structures (Figure 13)

light timber framed non-intrusive structures with ceramic tiling or thatch inspired by traditional Terai buildings. Again, foundations are to rest on the brick foundations.

Alternative designs for the temple, based upon the above brief, could be developed either through an open workshop or an architectural competition.

Buddhist monks

Hindu puja

Tensile structure

Timber framed structure

6. Report on management and conservation issues

The mission noted the absence of a strategic plan for the ongoing management and conservation of the property. Indeed, there are plans for major hydraulic intervention at the site in order to lower and regulate the water table, but the time scale and articulation of this intervention with other activities at the site are unclear. In particular, the mission noted the following areas of concern:

6.1 Delineation of the archaeological site

Although a modern wire fence surrounds the exposed archaeological complex at the centre of the Sacred Garden, the full extent of the archaeological remains has not been defined (Figure 14). Indeed, the fencing ignores other areas of potential significance such as the settlement mound under the Police Station. As a result the archaeological site is not fully delineated.

6.2 Conservation state of monuments

Conservation at the site is 'as and when' necessary, but during the mission it became apparent that a number of the brick-built archaeological structures are deteriorating and are need of immediate conservation (Figure 15 & Figure 16). The mission noted salination within the temple (Figure 17) as well as organic growth on bricks. It is unclear whether the former is only restricted to new bricks. The absence of a regular, systematic conservation strategy at the site is noted.

6.3 Use of inappropriate landscaping materials

Recent landscaping efforts within the Temple's vicinity have created an incoherent collage of concrete paving, stone paved areas, flower beds, fences, trees and bushes (Figure 18). The use of octagonal concrete slabs is inappropriate as is a modern material; moreover, they are already badly deteriorating (Figure 19). The paths are also too narrow for visitor numbers, causing wear to adjacent areas (Figure 20). The use of stone slabs for prayer platforms and the circumambulatory path is also inappropriate (Figure 21). The use of stone should be restricted in order to enhance the impact of the historical use of stone for only special cult objects such as the stone marker, the Asokan pillar and the nativity sculpture (Figure 22). The planting of trees and bushes and hedges is also not recommended at such a sensitive archaeological site where sub-surface deposits might be damaged by root action. Finally, the use of a metal wire fence is inappropriate (Figure 23).

6.4 Lack of monitoring systems

There is little understanding about the numbers of visitors to the site and their daily and season fluctuations. As a result there is no knowledge of peak flow times when the monument may be at greatest risk from excess visitor traffic and visitor numbers. There must be an optimum or threshold number of visitors for the fenced enclosure, over which damage can be anticipated.

6.5 Damage from ritual practice

During the mission's visit to Lumbini, it became clear that damage to elements of the property is occurring through a number of ritual practices. These practices range from the use of oil lamps to the smearing of tilakas and the application of

gold foil to brick stupas (Figure 24 & Figure 25) and even to parts of the Asokan pillar (Figure 26).

6.6 Site interpretation

There is little visitor information available at the site, few information signs and no recommended route around the fenced enclosure. As a result the visitor experience is limited and confusion is added with the presence of two large mounds, one to the north and one to the south. Far from representing archaeological monuments or stupas, they represent the spoil and rubble removed from the site during its earlier excavations (Figure 27).

6.7 The realisation of the Kenzo Tange master plan

In 1978 the Kenzo Tange master plan proposed to demolish the present modern structures within the Sacred Garden in order to ensure that it will be "tranquil and undisturbed, the beauty of its plant life restored to create a reverent atmosphere" (LDT, 1988,8) (Figure 28). Some 22 years later the modern buildings have still not been demolished and they have been, in anything, consolidated (Figure 29). Furthermore, the proposed entrance from the north is still not realised with the majority of visitors coming from the east. As a result, it must be debated whether the Tange plan will ever be realised; indeed, the UNDP has already initiated a general re-evaluation of the master plan. Certainly, the recent removal of the shops and car parks from the vicinity of the temples to an area in the northeast is to be supported as it lessens the worldly impact on the archaeological core.

Fencing

conservation

conservation

salination

flowerbeds and paths

concrete slabs

narrow stone paths

stone prayer platforms

Asokan pillar and stone paving

Metal fence

Gold leaf and oil on stupa

Oil and wax on stupa

Tilaka and oil on Asokan capital

Earth spoil heap

Sacred garden

14. Modern buildings

7. Recommendations concerning management and conservation issues

In response to the above points, it is recommended that the following are quickly implemented in order to enhance the management and conservation of the site.

7.1 Geophysical survey

It is recommended that a geophysical non-destructive survey is undertaken within the Sacred Garden in order to fully delineate and define the archaeological site. It is thus proposed that the buried areas of archaeological significance within the Sacred Garden may be identified for greater protection, investigation and interpretation.

7.2 Conservation strategy

It is recommended that a regular, systematic conservation strategy is adopted in order to monitor the conservation status of the property's monuments. It must be made explicit whether the LDT's archaeology cell or the DoA is responsible for the conservation and also the monitoring of the inscribed monuments.

7.3 Use of authentic materials

It is recommended that the current collage of inappropriate materials is removed from the Sacred Garden and that a unified approach is taken in order to connect the site to its surrounding. It is crucial that authentic materials are used with reference to the site's historical and archaeological nature. The use of stone and concrete should be heavily restricted and other materials such as sand and gravel considered as an alternative for use in the prayer platforms areas and circumambulatory pathways.

7.4 Monitoring systems

It is recommended that the monitoring and logging of visitor numbers, and their daily and seasonal fluctuations is immediately instigated. It is recommended that hourly visitor numbers are proactively logged in order to identify peak flow times at which the property may be at risk. Furthermore, the threshold number of visitors at one time within the property must be calculated in order to ensure the site's enhanced management and protection. The provision of an entry pavilion to the Sacred Garden's core would provide such an opportunity for monitoring. The average time of a visit should also be recorded as well as the number of monuments visited.

7.5 Management of ritual practice

The ritual needs of visitors should be monitored and it is proposed that this data is used in order to create a principle ritual circuit or route for ritual practices in areas of non-sensitive archaeology. The current, successful, identification of prayer platforms is to be continued but with the use of other materials. Additional areas can be identified through non-destructive geophysical survey and tested by trial trench. Circumabulatory paths are to be wide enough to support the numbers of visitors to the site.

7.6 Site interpretation

It is recommended that visitor information and information signs is enhanced and increased, and that a principle circuit or route be identified around the fenced enclosure with a clear entrance and exit. Conserved monuments should be labelled, dated and interpreted in order to enhance the visitor understanding of the site and its many monuments. Information leaflets and plans should be available for sale and guides should also be recruited and trained in order to greater facilitate visitor understanding. The two spoil mounds or heaps should be removed in order to limit confusion, however, they should be carefully sieved as much valuable archaeological material may still be included within them.

7.7 Re-evaluation of the Kenzo Tange master plan

It is recommended that the management of the property is enhanced with the proposal of a 'minor' plan for the sacred garden, in the light of the failure to realise the Tange plan. At present entry to the site, car parks, monasteries, administrative buildings and shops are located in the eastern half of the sacred garden. The location of these services could be regrouped behind a distinct entry zone, screened from the core of the property by plantings to enhance the concept of a Sacred Garden shielded from the secular world. Areas of non-sensitive archaeology can be selected for planting through their identification during non-destructive geophysical survey and tested by trial trench.

7.8 Publication of the Mayadevi temple excavation report

It should be noted that the final excavation report and chronometric dating of the Mayadevi temple excavations is still not published despite the lapse of a number of years. It is of the highest priority that radiocarbon dates for the sequence are generated and that the full report is published as soon as possible. Indeed, until it is fully published, there should be no major interventions of any nature at the temple site as the nature of the 'in situ' or archaeological material is still unclear.

7.9 Improved drainage

It should be noted that at present the only drainage at the Mayadevi temple site is natural run-off. As a result there are substantial areas of standing water during the monsoon period. Any form of temple design at the site will necessitate the designing of improved drainage systems. Such systems should be non-intrusive and, if possible, with low visibility. Areas of non-sensitive archaeology, suitable for drains, can be selected during non-destructive geophysical survey and tested by trial trench.

8. Recommendations for immediate action

In light of the sensitive religious, archaeological and political nature of the property, the mission has made three recommendations for immediate implementation. The immediate nature of these needs is underlined by the extremely temporary nature of the present iron scaffolding and corrugated iron roof, parts of which are dangerous to both visitors and the archaeological remains in high winds.

8.1 International technical meeting

It is recommended that an international technical meeting is held at Lumbini to discuss the conservation, restoration, and presentation of the Maya Devi Temple. This meeting will initiate alternative draft conceptual designs based on the following criteria already detailed in *6. Recommendations concerning the Mayadevi temple draft conceptual designs*:

8.1.1 Non-intrusive
8.1.2 Reversibility
8.1.3 Shelter
8.1.4 Visibility
8.1.5 Focus
8.1.6 Access
8.1.7 Worship
8.1.8 Authentic materials

8.2 Initiation of minor plan for the Sacred Garden

It is also intended that the meeting will initiate a new dynamic for the management and conservation of the property with the proposal of a minor plan for the Sacred Garden. It is recommended that individuals with the following expertise are included:

Architectural heritage practitioner
Artefact conservator for the Marker Stone
Archaeological brick conservator
Archaeological chemist/physicist
Landscape architect
South Asian archaeologist

8.3 Monitoring the Mayadevi temple environment

It is recommended that the following activities may be immediately commenced by the DoA and LDT in advance of the above international technical meeting by initiating conservation, having first the removed the modern brick protective coverings. This data will form the basis of discussion concerning the nature of the alternative designs.

8.3.1 Photographic recording

It is recommended that detailed photographic recording is conducted so that the surface condition of the exposed brick structures at the Mayadevi temple site can monitored over time and compared with the original photographs. In

this way the rate of erosion can be monitored and conservation needs identified. The DoA has trained staff and suitable instrumentation for this activity.

8.3.2 Planning

It is recommended that detailed scale drawn plans are prepared so that the surface condition of the exposed brick structures at the Mayadevi temple site can monitored over time and compared with the original drawings. In this way the rate of erosion can be monitored and conservation needs identified. The DoA has trained staff and suitable instrumentation for this activity.

8.3.3 EDM recording

It is recommended that the levels of the surfaces of the exposed brick surfaces at the Mayadevi temple site are recorded with the use of an Electronic Distance Meter and related to a known benchmark. The DoA has trained staff and suitable instrumentation for this activity. This activity will enable the stability of the brick structures to be regularly monitored in order to gauge subsidence.

8.3.4 Load-bearing capacities

It is recommended that the load-bearing capacities of the brick surfaces at the Mayadevi temple site are recorded. The Institute of Engineering has trained staff and suitable instrumentation for this activity. This activity will provide necessary data in order to ascertain the loads and stresses that the archaeological structure will be able to bear without damage being caused - thus informing the alternative temple designs.

8.3.5 Recording of daily temperatures

It is recommended that the daily temperature of the Mayadevi site is recorded in order to monitor daily and monthly fluctuations. An understanding of these fluctuations and the maximums and minimums will assist the briefs for the alternative temple designs.

8.3.6 Recording of daily rainfall

It is recommended that the daily rainfall at the Mayadevi site is recorded in order to monitor daily and monthly fluctuations. An understanding of these fluctuations and the maximums and minimums will assist the briefs for the alternative temple designs as well as the design of new drains for the site.

8.3.7 Recording of daily humidity

It is recommended that the daily humidity of the Mayadevi site is recorded in order to monitor daily and monthly fluctuations. An understanding of these fluctuations and the maximums and minimums will assist the briefs for the alternative temple designs as well as inform the conservation needs of the marker stone, brick surfaces and nativity scene.

8.3.8 Recording of daily visitor numbers

It is recommended that the number of visitors to the site, and their daily and seasonal fluctuations, are recorded. It is recommended that hourly visitor numbers be proactively logged hour in order to identify peak flow times at

which the property may be at risk. This data will assist the formulation of recommended or principle routes and enhance the general management at the site.

8.3.9 Recording of the water table

It is recommended that the daily water table at the Mayadevi site is recorded in order to monitor daily and monthly fluctuations. An understanding of these fluctuations and the maximums and minimums will inform the conservation needs of the marker stone and brick foundations.

8.3.10 Recording of soil chemistry and profile

It is recommended that nature of the local subsoil is investigated and that the basic soil chemistry is recorded in order to best formulate conservation needs as well as informing the design briefs.

9. Mission Itinerary

16th April 2000	Travel to Delhi
17th April 2000	Travel to Kathmandu
18th April 2000	Meeting at UNESCO, Kathmandu Meeting at Department of Archaeology, His Majesty's Government of Nepal Travel to Bhairahawa Travel to Lumbini
19th April 2000	Meetings at Lumbini Development Trust Office, Lumbini Site tour of Lumbini
20th April 2000	Meetings at Lumbini Development Trust Office, Lumbini Site tour of Lumbini Site tour of Tilaurakot/Kapilavastu Site tour of Ramagrama excavations
21st April 2000	Travel to Bhairahawa Travel to Kathmandu Meeting at UNESCO, Kathmandu Meeting at UNDP, Kathmandu Meeting at Department of Archaeology, His Majesty's Government of Nepal Meeting at Lumbini Development Trust Office, Kathmandu
22nd April 2000	Travel to Delhi
23rd April 2000	
24th April 2000	Travel to London
25th April 2000	Travel to Paris

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Mr Deep Kumar Upadhyaya, Kapilavastu

Venerable Vimalananda, Abbot, Lumbini Buddha Bihar

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13. List of illustrations