PRELIMINARY EXAMINATION OF THE MURALS AT

LA SUFRICAYA, HOLMUL

PETEN, GUATEMALA

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SUMMARY
The following is a report on a two-day site visit to the archaeological site of Holmul. The objective of the site visit was specifically to examine two murals in a group of structures known as La Sufricaya, carry out a summary condition survey, and provide recommendations for conservation of the murals. Angelyn Bass Rivera and Leslie Rainer carried out the survey on March 7-8, 2003. Project archaeologist Francisco Estrada-Belli led the visit. Nora Lopez, Director of Cultural Patrimony (IDAEH) and William Saturno, archaeologist, were also present. The murals were examined visually, and then documented graphically, photographically, and in written form. Conditions were mapped on acetate sheets overlaid on printed digital images of the murals to give an overall map of the condition of the murals, and a general idea of the conservation problems and patterns of deterioration.

The murals are located in two separate areas of Structure 1, Group 1 of La Sufricaya, hereinafter called Mural Room 1 and Mural Room 2. They date to 400-500 A.D. (Early Classic Period). Mural Room 2 is later phase of construction than Mural Room 1, but still within 400-500 A.D. Both murals were originally located on building exteriors. The murals display both figurative and geometric designs. The paintings are faint and fairly fragmentary, and show damage from roots, water, and other environmental factors. Generally, the murals are in relatively poor condition due to impact from extreme environmental conditions and disruption from roots of the Brosinum alicastrum or Ramon (Breadnut) tree.

DESCRIPTION OF SITE AND MURALS
Holmul is located in the Petén region of Guatemala, approximately 45 km from Melchor, and 40 km east of Tikal. The site is composed of numerous groups of structures. The murals are located in Structure 1 of Group 1 in the area known as La Sufricaya.

Mural Room 1

Description-Mural Room 1
Mural 1 is painted on three walls (north, east, and south) under the rubble of Structure 1. It depicts figures in a grid, and is arranged in horizontal registers outlined in red. The description from the 2001 field report follows:

"*The composition is divided into two parts, with small 10 x 20cm red-lined frames on the left, and 5 stacked 20 cm-high registers, each with five figures, on the right. All 25 individuals are seated and face left (west); each holds spear-thrower darts, some with trilobe-shaped points. Most wear a drum-shaped headdress, while some have eye-goggles and feathers; the outfit also includes knee-pads, thigh bands and belts with feather tails. The body proportions are unusual for Classic Maya art, showing traits more common in coeval central Mexico. On the left, one standing figure wears a jaguar-skin loincloth and tail, another a ball-game yoke around the waist. Both are in recognizably Maya style*."[1]

The figures are very faint and are fairly illegible due to color loss and surface deterioration. The south wall is painted red and does not appear to have any figures. The north wall is approximately 190cm high and 350cm long. The east wall is 186cm long and 180cm high. The south wall is approximately 160cm high and 53cm wide.
Structural Description-Mural Room 1

[1] *Estrada Belli, Francisco. Personal correspondence, April 2003.*

The wall supporting the mural is constructed of shaped limestone blocks set in a lime and rubble mortar. Average limestone block size is 15x30cm, and the wall is one block or wythe thick. Some of the limestone blocks have impurities of mud in pockets and veins. Rubble fills the space between early construction and later phases. Prior to excavation, the room was filled with dry-laid limestone masonry as a foundation for the overlying structure. The room and murals were excavated in 2001. Unexcavated rubble forms a ceiling above the room and is still in place in the south end of the room. An original plaster floor abuts the mural.

Structural Condition-Mural Room 1

The condition of the wall is good and it is structurally stable. A vertical crack extends the height of the north wall, however this does not appear to pose an urgent structural threat. This crack is narrow at the bottom and opens at the top. There are voids in the fill behind the wall and between the stone units. There are two large holes from looters trenches on the north and east walls.

The condition of the rubble ceiling is poor. The loosely packed fill is unstable. A network of roots, most from the Brosinum alicastrum, is growing through the rubble roof of the space. In one way the roots serve to stabilize the ceiling by keeping rocks and soil in place; however they also may endanger the mural in the future by growing down into the walls and through the plaster layers.

The floor is covered by debris from excavation and its condition could not be determined.

Plaster Description-Mural Room 1

The plaster stratigraphy appears to be two plaster layers with paint on each layer. The layer closest to the wall is approximately 1cm thick and the overlying layer is approximately 1mm thick. The plaster on the north wall extends around the northwest corner. The plaster on the south wall continues around the southwest corner. Both plaster layers have a smooth texture. The composition of the paint and plaster should be confirmed through instrumental analysis. Samples are being sent to Diano Magaloni, a consrvation scientiist sepcialized in the type of work in Mexico.

Plaster Condition-Mural Room 1

Generally the plaster is in good condition and is well adhered to the wall. Locations of these conditions were mapped on the graphic condition survey. Problems occur in discrete areas and include:

- deep losses of plaster to the stone support;
- surface plaster loss of the upper plaster layer;
- deformation and bulging of the plaster in association with losses;
- loose plaster along the top edges and associated with cracks;
- cracks through the plaster layers on the north and east walls;
- minor interlayer delamination between plaster layers.

Paint Description-Mural Room 1

There appear to be three paint layers on the north and east walls. A light pink layer can be seen in areas of loss on the first plaster layer. The principal design layer is painted on the second, thinner plaster layer. The design consists of a grid with figures in individual squares and in

horizontal registers. The colors are red black and yellow on a pinkish-gray background. The final layer appears to be a limewash with a decorative orange band that can be seen along the edges of the walls. The paint appears to have been applied thinly. This stratigraphy would indicate that the wall, or parts of the wall, was painted in at least three campaigns, with the last layer applied directly over the design layer. Microscopic analysis can confirm the stratigraphy and thickness of each layer.

Paint Condition-Mural Room 1

The paint of the mural is worn and abraded with numerous losses. The limewash has been removed in certain areas. Some of the limewash that remains on the wall obscures the grid design. The paint is powdering and flaking in areas on the north and east walls. The south wall has drips where water has washed down the surface. Roots have grown into the structure and infiltrate the plaster and paint of the murals, especially on the south wall, in the southeast corner of the east wall, and in patches of plaster loss on the north wall. Most roots coming through the mural are less than 1mm in diameter.

***Sample Collection-Mural Room** 1*

Two samples, less than 1 cm^2 in size, were taken from the murals and were give to Fransisco Estrada-Belli. *Suf 1* is a sample of plaster and at least two paint layers, and exhibits orange paint and limewash over red and possibly one underlayer. The sample can be used for cross section analysis of the paint and plaster stratigraphy, as well as for pigment and binder identification. *Suf 2* shows a whitish powdery deterioration product seen on the surface in areas of disrupted plaster. This sample should be used to identify the substance, which may be salts. Characterization and identification of the original paint and plaster materials, as well as deterioration products will provide information on building technology and will help to guide future conservation treatment of the murals.

Immediate and Long-term Treatment Recommendations-Mural Room 1

The recommendations that follow are based on first-hand, preliminary observation by specialists in wall paintings and architectural conservation. The recommendations form the basis of a conservation treatment strategy for the murals, but do not in themselves constitute a comprehensive conservation plan for the murals, the rooms or the site. Development of a conservation plan that is most appropriate for the resource must be made based on a thorough assessment of the values, physical condition of the resource, and the management of the site in context. An advisory group composed of the principal stakeholders (local, national, and international) of the site should be actively involved in making these longer-term planning decisions.

Different long-term conservation strategies for the murals exist and include:

1. in situ preservation and protection for presentation to visitors;
2. lifting and relocating to a protected environment; and
3. complete reburial.

To preserve the murals in situ, and to allow them to be viewed by the public or studied directly, is an option that is selected for many archaeological sites. This option would entail stabilization of the room, shelter / protection from water, animals, plant growth and vandalism, permanent security measures, conservation treatment of the murals, and regular maintenance of the surrounding area. The murals at La Sufricaya, which are located in a remote area that is often inaccessible during the rainy season and therefore difficult to monitor and maintain, may be incompatible with a policy of public presentation. In addition, protecting such sites with just a shelter is rarely an adequate solution and may cause inadvertent damage to the murals.

Removal of the murals is an alternative means of preserving them while allowing for additional study, however removal is incompatible with conservation principles that seek to preserve the original context and integrity of the site. Furthermore, removing the murals may be difficult at Holmul due to its remote location, which would present tremendous logistical problems. Detachment, considered as only a last resort for murals that are in imminent danger of damage, involves stabilizing the murals *insitu*, removing the wall in whole or in part from the site, and then conserving and displaying the murals in a suitable location. There is great risk of damage or loss to the mural during and after removal, and the costs of relocation may be high. After detachment a proper conservation space is needed to complete treatments and fabricate a physical support, and then a climate controlled storage or exhibition space is needed to display the mural and conduct regular maintenance. If these conditions cannot be met, damage will result over the long term.

The third option that exists for the preservation of the murals at Holmul is to conserve and document the murals and re-bury them using the best methods possible to control damaging vegetation and prevent further deterioration of the site. This option though, is not without risk. The proximity of the murals to the ground level where large trees with invasive roots grow, and the fragile condition of the murals makes them extremely susceptible to deterioration from chemical, biological and mechanical actions. Long-term reburial will require a specialized design to mitigate deterioration, and a strict site monitoring and maintenance plan is needed to control growth of harmful vegetation and minimize soil erosion.

In the interim, until decisions about future conservation and use of the murals are made, we recommend that the murals not remain exposed in their current environment. Due to the fragile condition and faded appearance of the murals, and since protection from the harsh climate, light, and roots is paramount, we suggest the room be temporarily reburied or similarly protected. Prior to any further action, the mural and the room must be stabilized. This should be done as soon as possible. Stabilization will help preserve the murals and allow for future study. An interdisciplinary conservation team should be formed to address the specific issues of structural stability, protection of the mural, and reburial methods and materials. All treatment on the murals should be performed by qualified conservators with experience in the conservation of architectural surfaces on archaeological sites. The following actions are necessary:

1. fully document the condition of murals prior to treatment;
2. replace wood posts supporting the rubble ceiling with another support that will not be subject to biogrowth, or build a stable ceiling to protect the room from root and water infiltration (the roof must be strong enough to support the weight of the overburden);
3. remove debris on the floor and cover with fine-grained fill ;

4. fill large vertical crack at the NE corner with compatible fill material;
5. edge loose plaster fragments and ends of walls with compatible fill material;
6. fill voids and rubble behind north wall with compatible fill material;
7. grout / fill voids in plaster and interlayer delamination with compatible grout material;
8. brush surface with a soft bristle brush to remove dust and spider webs;
9. reattach flaking paint with appropriate adhesive;
10. consolidate powdering paint with appropriate consolidant;
11. remove drips on south wall;
12. clip roots protruding from plaster;
13. remove surface accretions and wasp nests; and
14. document treatment procedures and current condition of the murals in graphic, photographic, and written form following treatment and prior to reburial. Include list of conservation materials used and locations of treatment.

Reburial Design

A reburial strategy must be carefully designed for both temporary and long-term protection. The design must be such that it will not promote further damage and will preserve the mural. A reburial strategy will need to address certain technical considerations and constraints imposed by the remote location and extreme environment of the site, as well as the fragile condition of the murals. The following should be considered in the reburial design:

- the room and the walls should be documented in detail to compensate for removing the resource from direct examination;
- documentation should meet research as well as display and exhibition needs;
- research and testing (archaeological and conservation) should be completed prior to reburial;
- a set of reference samples should be taken and archived for future study;
- duration of the reburial must be established and materials and methods chosen to meet (and exceed) that time period;
- since there is the certainty of continual growth of vegetation at the site and associative damage to the walls and mural, reburial materials must be selected to prevent root growth into the fill;
- vegetation in the immediate area of the murals should be identified and removed if needed (keeping in mind that some vegetation is needed to maintain soil stability);
- close proximity of the walls to the ground surface makes them susceptible to root and moisture penetration, therefore the depth of reburial should be as high as possible to create a stable (not fluctuating) thermal and hygral environment;
- specialized fill materials may be needed in proximity to the mural as both a marker layer and for protection from root penetration or other damage;
- the surface of the reburial mound must be designed to control soil erosion and to promote drainage of surface water runoff;
- the site must be routinely monitored and maintained to control vegetation and provide site security.

Mural Room 2

Description-Mural Room 2

The mural is located on the north wall of a narrow excavated passageway. In total, the mural measures approximately 12 meters long and 2 meters high. A large looter's tunnel divides the wall in two sections, east and west. The room and murals were excavated in 2002, and is dated to 400-500 AD. During this site visit, approximately 5 meters on the east end were exposed and visible. The west end had been backfilled and was not accessible. The exposed portion of the mural depicts a complex iconography. According to the 2002 field report:

"*The composition is centered on a seated individual, whose body is painted in yellow. His arms are tied by large bows to vertical posts of what appears to be a scaffold placed on a bench. He wears a simple loincloth and a belt with a serpent or turtle head at the right end. A white cape seems to be draped over his shoulders. In front of this figure is what appears to be a lip-to-lip pottery cache or a bundle. To the right is a kneeling [figure], also painted in yellow, with hand stretched out to the central figure. The hands seem to support an offering of sorts (in black, possibly a headdress). Further to the right is a standing frontal figure wearing a red and black beaded pectoral with long black fringes draped on his chest. On the opposite side, to the left of the central figure, is another kneeling figure, poorly preserved and possibly a mirror image of the first one, also bearing an offering to the main character. Further outward, to the left, is a standing figure in profile. The face of this personage is painted in red and black and a shell disk or mirror is visible in the chest area.*"[2]

The figures are nearly life-sized, extending from the excavated ground level to the ceiling. The paint colors are red, yellow, and black on a buff-colored ground.

Structural Description-Mural Room 2

The wall supporting the mural is constructed of shaped limestone blocks set in a lime and rubble mortar. The average limestone block size in 15x30cm, and the wall is one block or wythe thick. Rubble forms a ceiling above the room. There appears to be a plaster floor under the floor fill.

Structural Condition-Mural Room 2

In general, the wall is structurally sound. There are some voids in the masonry wall where mortar rubble is loose and missing [with snakes in some of the voids]. A looter's trench cut the wall and mural in two sections, however, the trench does appear to have compromised the wall's stability.

Plaster Description-Mural Room 2

The plaster stratigraphy appears to be three thin lime plaster layers, each approximately 0.5-1.0cm thick, with at least one layer of paint on each. This would indicate that the wall, or parts of the wall, was redecorated in at least three campaigns. The composition of the paint and plaster should be confirmed through instrumental analysis.

[2] *Estrada Belli, Francisco. 2002. Archaeological Investigations at Holmul, Peten, Guatemala. Preliminary Results of the Third Season, 2002.*

Plaster Condition-Mural Room 2

The plaster is in poor condition. It has been infiltrated by roots that penetrate all of the plaster layers. This likely has caused some of the loss of plaster to the masonry substrate, separation of layers from each other, and bulges or deformations with associated voids. There are loose plaster fragments around areas of detachment and loss. There are also numerous cracks in the surface and through plaster layers. The plaster is fragmentary at the base of the wall near the floor. The poor condition of the plaster is likely due to post-deposition alteration while buried, and also possibly its original setting as the exterior wall of a building.

Paint Description-Mural Room 2

There is paint on each of the plaster layers. The first two paint layers can be seen in areas of loss. These appear to be pinkish-red in color. The surface paint layer shows the mural design. The colors are black, yellow, orange and red. Incisions can also been seen that outline details of the figures.

Paint Condition-Mural Room 2

The image is fragmentary due to losses in the paint layer. The paint that remains is fairly stable. It is well adhered to the wall and is not powdering. There are accretions (possibly calcareous) and root impressions on the surface. The accretions obscure some of the design and would be difficult to remove without damaging the underlying paint and plaster. The composition of the accretions should be analyzed to help design cleaning solutions, should the decision be made in the future to remove the accretions from the mural. It is doubtful that cleaning or other such treatments would reveal significantly more detail than what is already visible in the painted parts of the mural.

Sample Collection-Mural Room 2

Two samples were taken and given to Fransisco Estrada-Belli. *Suf 3* is from the cache of detached plaster fragments that were temporarily stored in the looters trench (these plaster fragments had fallen from the wall and were wrapped in aluminum foil and labeled). *Suf 3* shows plaster with red, yellow and black paint. This sample has an intact stratigraphy of paint and plaster that can be used for cross-section analysis, and for pigment and binder identification. *Suf 4*, is less than 1 cm^2 in size, and was taken directly from the mural. *Suf 4* shows the whitish encrustations on the wall, with some red pigment included. It should be used to determine the composition of the accretion on the surface of the mural. Characterization and identification of the original paint and plaster materials and deterioration products will provide information on building technology and will help guide future conservation treatment of the murals.

Immediate and Long-term Treatment Recommendations-Mural Room 2

Both immediate and long-term treatment recommendations for Mural Room 2 are similar to Mural Room 1 (see above). The long-term conservation strategies for the murals are:

1. in situ preservation and protection for presentation to visitors;
2. lifting and relocating to a protected environment; and
3. complete reburial.

Until a decision about how to preserve the murals for the long-term is made, we recommend the room be temporarily reburied or similarly protected. Considerations for reburial design are also outlined in the Treatment Recommendations section for Mural Room 1.

Prior to any further action, the mural and the room must be stabilized. This should be done as soon as possible. Stabilization will help preserve the murals and allow for future study. An interdisciplinary conservation team should be formed to address the specific issues of structural stability, protection of the mural, and reburial methods and materials. All treatment on the murals should be performed by qualified conservators with experience in the conservation of architectural surfaces on archaeological sites.

The following actions are necessary:

1. document the condition of the entire mural prior to treatment;
2. remove debris on the floor and cover with fine-grained fill;
3. fill unstable losses and edges with appropriate fill material;
4. grout / fill voids in plaster and interlayer delamination using a compatible grout material;
5. clip roots protruding from plaster;
6. remove surface accretions where possible with wood hand tools; and
7. document treatment procedures and condition of mural in graphic, photographic, and written form following treatment prior to reburial. Include a list of conservation materials used and locations of treatment.

CONCLUSIONS

Both murals in Mural Room 1 and Mural Room 2 have tremendous significance and should be conserved. They are important for understanding the evolution and use of the buildings, they are iconographically unique, and they provide rare information about Mayan painting and building technology. The general condition of the murals is poor; the paints have faded or been lost, and/or the plaster is unstable. The principal threats to their preservation are root damage, moisture infiltration, and in the case of Mural Room 1, collapse of the rubble ceiling. *Insitu* conservation treatments are necessary, and the murals must be protected from environmental impacts. Protection may be accomplished through a carefully designed temporary reburial or other form of physical protection. Due to the great significance of the murals, an advisory group composed of the site's principal stakeholders should convene to make critical long-term decisions about future use and conservation of the murals and the site. Select *insitu* stabilization treatments should be implemented by conservators as soon as possible.

SAMPLE LIST

Samples of paint and plaster from Mural Room 1 and Mural Room 2 at La Sufricaya were collected by Leslie Rainer and Angelyn Bass Rivera on March 8, 2003. The samples were given to Fransisco Estrada-Belli for analysis.

Sample I.D #	Sample Location	Sample Description	Sample Date	Reason for sampling
Suf-1	Mural Room 1, North wall 190 cm from ground 40 cm from N.E corner	Sample shows plaster and at least two paint layers – Orange paint and whitewash over red band (?) and possibly one underlayer	08 March 2003	Stratigraphy of paint and plaster layers for x-section Pigment and binder identification.
Suf-2	Mural Room 1, North wall 104 cm from ground 93 cm from N.E. corner	White crystalline powder in disrupted area of plaster	08 March 2003	Deterioration product – identify possible salts
Suf-3	Mural Room 2, North wall, east side Fragment from floor	Paint and plaster – red, yellow and black paint on plaster layer	08 March 2003	Stratigraphy of paint and plaster for x-section Pigment and binder identification
Suf-4	Mural Room 2, North wall, east side 120 cm from ground 151 cm from west entrance	White encrustations on wall, some red pigment included	08 March 2003	Deterioration product / accretion on surface of mural – id and composition