“Site Management at the Red Monastery-Final Report”

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2015-2018

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CONTENT

RED MONASTERY
ARCHITECTURAL CONSERVATION AND PRESENTATION 2015-2018

The following report describes in summary the activities carried out for the CHTE-01 program under USAID co-operative agreement no. AID-263-a-15-00007 "Site Management at the Red Monastery" during the period 2015-1018. The report concludes with a summary of the problems encountered during the project and recommendations regarding unfinished work.

1 SCOPE OF WORK

The agreed goals of the project, as defined in the program description of June 29, 2015, were to:

1. complete the detailed design, planning, and specifications required by the project
2. install specified cabling and lighting and other infrastructure provision
3. complete the anastylosis and conservation and display of architectural fragments in the nave
4. install stone flooring in the nave
5. complete construction of the protective shelter at the west end of the nave
6. conserve portals in the nave and tower entrances
7. complete repairs to the perimeter walls and the tower

Of these goals number 5, related to the construction of a protective shelter at the west end of the nave, was not possible to achieve owing to the absence (despite sustained efforts) of approval from the Ministry of Antiquities. All other goals were achieved.

Further details of individual components of the scope of work are listed below, and are also included in seasonal technical reports submitted by the author.

1.1 Excavation and clearance of nave, south hall and tower

Completed tasks included:

- The lifting of granite columns from under the surface of the nave and subsequently the moving of all architectural fragments to the center of the nave for cleaning prior to re-use or display
- The supervised removal of the wooden structure in the south hall with associated concrete slab and the removal of existing paving outside the small church of al-'Adhra
- Digging all trenches for subsurface electrical and surface water drainage installations, and leveling the surface of the nave prior to paving
- Removal of all water pipes inside the south hall and tower

1.2 Infrastructure provision to nave and south hall

Completed tasks included:

- Design of new infrastructure networks [electricity, CCTV, and drainage]
- Provision of new heavy-duty cable from north side of church to new electrical distribution room at base of tower
- Provision of lighting and power circuits to perimeter of nave and south hall.
- Provision of subsurface rainwater drainage network from nave and south hall to discharge into existing well.

1.3 Anastylosis of granite columns

Completed tasks included:

- Detail design of column assemblies
- Casting new concrete pad foundations for re-erected columns
- Providing new limestone bases and capitals for the re-erected columns with stainless steel dowel connectors set in epoxy resin

Subsequent to the completion of these scheduled works, further fragments of granite column shafts were discovered beside the perimeter wall of the church. These will require future incorporation within the anastylosis carried out in the nave [refer to Sustainable Management Plan].

1.4 Construction of south wall of nave and creation of new display of architectural fragments

The original scope of work for this element was to have included:

- Detailed design of new wall including limestone steps, base blocks and quoins to openings, with integrated lighting
- Digging new foundation trench for wall, respecting archaeological remains of original door opening in wall
- Allowing for a second doorway in the wall on axis between the north and south portals [to facilitate access between the south hall and the nave]
- Plastering the external surfaces of the new brick wall with lime render
- Installation of existing original carved limestone cornice blocks at high level within the built-up wall fixed to a stainless steel internal armature
- Removal of cement plaster from face of church of al-‘Adhra, and replastering with lime render

The Ministry of Antiquities repeatedly refused to approve the construction of a new wall between the south hall and the nave of the church. In Modification No.8 to the original scope of work (October 9, 2018), steel handrails were substituted for the proposed wall. All other tasks were carried out, including the construction of a new lapidarium for the display of carved limestone elements from the church, located at the west end of the south hall.

1.5 Interventions in the perimeter walls

Completed tasks included:

- Replacement of inadequate brick and wood tie-beam repairs on the inner surfaces of the north and west walls with similar timber stitch repairs respecting the integrity and aesthetic of the historic structure and providing more structurally effective repair
- Filling existing beam holes on north and west wall internal faces with new fired brick infills set back 7.5cm from the face of the walls and plaster with lime render [to prevent roosting of birds and allow for a continued reading of the historical evidence of the walls]
- Reinstatement of 50 limestone cornice blocks [40 on ground, 10 on top of tower] in their original location on top of perimeter wall
- Pointing of existing limestone block cornice around entire perimeter of church on inner, top, and cavetto sides with lime mortar
- Installation of two new limestone corner cornice blocks at ends of north wall
- Removal of all existing electrical fixtures from inner surface of walls

1.6 New limestone paving with indications of column locations

Completed tasks included:

- Design of paving layout indicating location of stylobate and column positions
- Installation of new limestone paving incorporating drainage points and stainless steel post holes for erection of temporary tents
- Installation of new plastered brick mastabas with limestone tops to perimeter of nave in order to conceal existing concrete beams

1.7 Conservation of Portals and Tower Entrance

Completed tasks included:

- Limestone block structural replacements on the north and south portals
- Installation of stainless steel angle support to inner face of cracked lintel of south portal
- Design, fabrication and installation of new treated pitch pine doors to north and south portals, including stainless steel pivots and new granite thresholds
- Design, fabrication and installation of two new treated timber doors to the north and south portals with stainless steel pivots and new limestone/granite thresholds as appropriate.
- Installation of new limestone paving in the entrance area and ground floor of the tower.
- Removal of render, repair of cracks, and replastering with lime render of all wall surfaces in and around the covered entrance area

The scope of conservation work in the tower entrance area was significantly increased as a result of the structural and historical discoveries made once work was initiated. Changes to the scope were included in Modification No. 3 and Modification No. 4, described below.

1.8 Avian Deterrents

- Trial installation of selected solutions, monitoring and recommendations for further implementation

A subsonic deterrent was trialed in the entrance area of the church, the worst affected area, with limited success. Eventually, the comprehensive physical interventions that were made to block all roosting points for birds through masonry infill or metal mesh screens provided the best deterrent. The Red Monastery now has a massively reduced problem with regard to fouling by birds, and the resident pigeon population has largely dispersed.

1.9 Construct a wooden shelter at the west end of the nave

Tasks were to have included the following:

• Build up brick wall above small church following the original line of south wall of nave to support south edge of shelter
• Install treated wooden structure including entablature beams, joists, purlins, and tongue in groove sheathing following the distribution of original timber elements
• Install waterproof isolation and cement screed topping with galvanized angle flashings and drips [area: 72 m2]

Of these only the first masonry intervention was executed. The construction of the remaining shelter, and its required extension to the north wall of the nave were consistently refused by the Projects Department of the Ministry of Antiquities. This point will be further addressed in the Sustainable Management Plan for the site.

1.10 Lighting and CCTV cables and outlets

Completed tasks included:

• Design of lighting and choice of luminaires for walls and under shelter
• Procurement, installation and testing
• Installation of CCTV cable runs to replace current installation by Monastery

1.11 Repairs to perimeter wall

Completed tasks included:

• Stitching the crack on the west façade with new treated timber tie beams faced in brickwork to match existing
• Removal of horizontal plastic electricity conduits running around exterior walls and repair with new brickwork to match existing
• Removal of reinforced concrete beams around the tower and previous unsympathetic repairs
• Repair of brickwork at base of tower with new brick facing to match existing

1.12 Repairs to the roof of the tower

Completed tasks included:

• Stripping roof of all accretions, handrails, temporary structures, and concrete covering
• Designing and constructing new covering over stairs to roof with access door
• Repairing damage to two brick vaulted rooms of upper floor as required
• Adjusting levels of roof to fall to perimeter and install new bituminous waterproofing membrane
• Installing a new steel handrail, epoxy painted, to roof perimeter
• Paving the roof of tower with new limestone paving to fall to integral rainwater spouts

The scope of conservation work on the first floor and roof of the tower was significantly increased as a result of the structural and historical discoveries made once work was initiated. Changes to the scope were included in Modification No. 3, described below.

For final reporting on the above project activities see N. Warner, "Architectural Conservation at the Red Monastery Church Technical Report" dated November 8, 2015.

2 MODIFICATIONS TO THE SCOPE OF WORK

As is the case with any conservation project executed on a historic structure, significant additions to the planned scope of work were required by the condition of the building as found. The modifications to the scope, all of which responded to physical and technical problems on site, had impacts on the schedule of work. They are considered in sequence below.

2.1 Modification No. 1, March 24, 2016

No cost extension

2.2 Modification No. 2, April 28, 2016: Additional Tasks in the Tower

a) Increased steelwork component for stability of upper storey of the tower
b) Increased volume of new brickwork required on upper storey of the tower
c) Increased amount of rubble and fill to be removed from the site

The modification was successfully implemented. For details, see N. Warner, "Architectural Conservation at the Red Monastery Church Technical Report" dated May 2016 (Parts I and II).

2.3 Modification No. 3, July 3 2016: Additional Tasks in the Tower

a) Stonework and Flooring
Supply and install hand finished limestone and basalt paving on the ground floor of the tower, and new granite threshold. Allow for 40m2 x 15cm deep lime screed with limestone chips (dakka) under paving inside tower with approved chemical termite treatment [2 litres Fibronil and 6 litres Citronella in dilute solution].

b) Steelwork
Supply and install in specified locations mild steel balustrades, handrails, decks, primed and epoxy painted beige with bolt or flange fixings. Window frames to be primed and epoxy painted black.

c) Joinery
Supply and install 13 doors of various sizes and 11 glazed casemates (30 x 40cm). See drawings for sizes of doors D01 to D13. All doors to be pitch pine fair face braced and ledged pivoting except for D01 (entry doors with baladi steel sheets fixed with handmade nails) and D12 (open grille gates). Supply and install one new pitch pine lintel over D01. All timber to be soaked in wood preservative and painted with navda rumi and linseed oil on completion.
Supply and install vitrine to display archaeological fragments.
d) Brickwork and Related Construction on Roof
Build 5 new brick barrel vaults over staircase area; build 2 new protective shell domes over existing domes; build 1 new protective barrel vault over existing vault; build new brick inner lining walls around perimeter of roof and east edge of new terrace with stone lined rainwater channel on west and south side; install two new galvanized metal rainwater spouts on east side of roof and one on south side

e) Electricity
Supply and install plugs, switches, light fittings, main distribution board, sub-distribution boards (3) as marked on drawings with 35mm thermoplastic cabling in sub-surface conduit

The modification was successfully implemented. For details, see N. Warner, "Architectural Conservation at the Red Monastery Tower Technical Report" dated December 14, 2016.

2.4 Modification No. 4, 28 December 2016: Additional Tasks in the Tower

Items temporarily removed from scope of work and re-instated in Modification No.5 [see below]

a) Removal of cement from tower exterior stonework and repointing with lime
b) Removal of concrete southeast exterior corner of tower, backfill with clean sand
c) Consolidate brickwork south wall low level and remainder of east wall of tower
d) Completion of all unfinished treatment to the interior of the tower

Items added to scope of work

1. Replacement of timber and lighting removed from the site by the monastery
2. Provision of lock and metalwork on door at tower entrance
3. Installation of supporting steel structure for arched vault inside entrance
4. Provision of materials and labor to complete necessary changes in construction and insulation of shell vaults on roof, including steel gate
5. Provision of trapdoor over granite basin in entrance
6. Provision of stainless steel mounts for limestone fragments discovered in the tower

The modification was successfully implemented. For details, see N. Warner, "Architectural Conservation at the Red Monastery Tower Technical Report" dated December 14, 2016.

2.5 Modification No. 5, 12 April 2017: Additional Tasks in the Tower

1 Repointing the external stone quoins at the corners of the tower with lime mortar following removal of existing cement pointing.

2 Removal of 12 cubic metres of reinforced concrete beam at the base of the east wall of the tower and the south wall of the tower.

3 Additional repointing and repairs to the lower sections of the walls where water damage has occurred. 15 linear metres x 1m high. Allow for 1000 'baladi' bricks for new facing.

4 Treatment of movement joint at junction between east wall of tower and south wall of church with full height scaffold

5 New lime plaster finish [as per sample agreed with Sohag Inspectorate] to northeast room on ground floor, staircase including vaults [three rooms on first floor and corridor. Specification: scrape down existing wall surfaces, brush apply coating of dilute Addibond 65, replaster with wooden float using 1 part lime to 2 parts finely sieved sand with dilute Addibond 65. Total area to be treated: 710 m2

6 New lime plaster finish [as per sample agreed with Sohag Inspectorate] to southeast and southwest rooms on ground floor and all corridor spaces. Specification: scrape down existing painted wall surfaces, brush apply coating of dilute Addibond 65, replaster with wooden float using 1 part lime to 2 parts finely sieved sand with dilute Addibond 65. Total area to be treated: 250 m2

7 Door ironmongery additions and replacements to detailed specification. Allow for 5 new doorbolts to improved design.

8 Supply and install two new arched display cabinets in northwest room on ground floor of tower. Sizes to be confirmed. Cases to have steel angle frames and pitch pine glazed fronts with bolt connections. Allow for MDF backing sheets and angle sheets for two low voltage internal spotlights with new wiring in subsurface conduit to main door switch (to be converted to double switch). Make good as required.

The modification was successfully implemented. For details, see N. Warner, "Architectural Conservation at the Red Monastery Church Technical Report" dated May 2017.

2.6 Modification No. 6, 25 April 2018: Additional tasks in the Sanctuary

Carry out termite treatment and control measures inside and outside the sanctuary, including the following:

2.6.1 Void all existing mortar joints in stone paving inside sanctuary and side rooms
2.6.2 Inject chemical termite deterrent comprised of dilute Fibronil and Oil of Citronella into voided mortar joints and leave standing for one month covered with plastic sheeting
2.6.3 Locate termite-damaged wooden elements inside sanctuary and at roof level and treat with approved chemical deterrent to surface after replacement of badly affected sections.
2.6.4 Re-point all mortar joints with a fine lime mortar
2.6.5 Drill 50 no 5cm diameter boreholes around the perimeter of the sanctuary (east side) at 50cm intervals to a depth of 1 metre and install perforated PVC pipes with subsurface screw caps
2.6.6 Apply approved chemical termite deterrent comprised of dilute Fibronil and oil of Citronella
2.6.7 Mark locations of pipes to be incorporated into future paving pattern

The modification was successfully implemented. For details see N. Warner "Red Monastery Church Emergency Termite Control Works, Technical Report" dated July 05, 2018.

2.7 Modification No. 7, 31 May 2018: Additional tasks in the Sanctuary
The replacement of a significant number of termite damaged wooden elements as follows:
Roof beams: 16cm x 7.5cm x 4m [4 pieces to include 1 spare]
Wooden bands: 10cm x 5cm [12 linear metres]
Wooden bands: 13cm x 7.5cm [2 linear metres]
Curved impost blocks for niche: 13cm x 15cm deep with internal diameter of 44cm
Cornices: 10cm x 20cm x 2m [12 pieces]

The modification was successfully implemented. For details see N. Warner "Red Monastery Church Emergency Termite Control Works, Technical Report" dated July 05, 2018.

2.8 Modification No. 8, 9 October 2018: Protection, Maintenance, Outreach

2.8.1. Supply and install new door in Comité wall to suit 90cm wide x 215cm high opening. Steel channel lintels 1.5m long in two separate sections bolted together. Wall thickness 60cm. Lintel no.1: 12cm deep x 22cm wide x 1.5m long; lintel no.2: 12cm deep x 38cm x 1.7m long. Flush azizi door in frame with computer key lock to match existing door on south side of wall. Make good plaster internally and externally.

2.8.2. Supply and install 90 cm high painted steel protective railing railings at the west end of the nave

2.8.3. Supply and install 90 cm high painted steel protective railing railings between the nave and the south hall

2.8.4. Fabricate and install five visitor info panels and one dedication panel (electrostatic paint single face printing on aluminum thickness 1.5mm, 6 holes diameter 8 mm, with graphics in 600 DPI).

2.8.5. Adjust electrical wiring to direct all the internal lighting circuits inside the church to a new stabilizer dedicated exclusively to the lights (and not to multiple fans,

vacuum cleaner, and sound system). This stabilizer was mounted in the corner behind the door on the right side of the Comité wall, next to the sound system.

2.8.6. Supply aluminum ladder and stabilizer with wooden cover according to specifications provided to ARCE and approved budget.

2.8.7. Provision of cheap, locally available LED units for the Phillips cove lights that have failed.

The modification was successfully implemented. For details see N. Warner "Red Monastery architectural Conservation and Site Management Works, Technical Report" dated December, 2018.

3 PROBLEMS ENCOUNTERED DURING THE WORK

Several problems were encountered during the period of implementation of the architectural conservation and site management project:

3.1 Consistent failure to gain the permission of the Ministry of Antiquities to execute key tasks from the outset of the project including the construction of a protective shelter for the conserved wall paintings, and the construction of a masonry separating wall between the nave and the south hall of the church.

3.2 Consistent refusal on the part of the Monastery to accept that its actions – in the form of daily water dispersal around the church and the construction of large new monastic hospitality buildings in adjacency to the church – had serious negative impact on the safety and environment of the historic church.

3.3 The devaluation of the Egyptian Pound in November 2016 resulted in a major drop in the level of funding available for the successful completion of the project.

3.4 The increased scope of work to complete the structural conservation of the Tower, the full extent of which only became apparent after the building was stripped out, meant that there was insufficient funding to carry out certain other components of the conservation and presentation aspects of the project.

4 RECOMMENDATIONS REGARDING UNFINISHED WORK

Unfinished components of the project include the protective shelter for wall paintings, the final anastylosis of the nave, the provision of full visitor information for the site, and the planned preservation of the archaeological areas to the north and west of the church. Certain other parts of the work, critical to the long-term protection of USAID's investment in the preservation of the Red Monastery Church, were also not funded under the CHTE-01 program. The author of this report made two separate personal applications (the last of which was successful) to the Antiquities Endowment Fund administered by ARCE to carry out additional termite protection, landscaping, and drainage works vital to the sustainability of the site. This was carried out in the Fall of 2018.

In addition, ARCE has generously committed to funding the completion of a number of unfinished conservation and presentation tasks at the site. These include:

4.1 Carrying out a sun-shade study to ascertain the best possible location for a shelter to protect the wall paintings on the north and west walls of the church. This study will be presented to the Ministry of Antiquities to try and gain agreement on the design of the shelter prior to implementation. Should agreement be reached on a sensible and sustainable solution, external funding will be sought to complete this task that is essential for the long-term preservation of the paintings.

4.2 Final anastylosis of the nave. This has been approved by the Ministry of Antiquities.

4.3 Provision of complete visitor information for the site. This has been approved by the Ministry of Antiquities.

4.4 Remaining conservation of outstanding 25m2 area of plaster conservation in the south-west corner of the church. This has been approved by the Ministry of Antiquities.

4.5 Remaining conservation of the north and south portals of the church. This has been approved by the Ministry of Antiquities.

4.6 Full documentation by 3D laser scanning of the conservation work carried out from 2015-2019 to complement that undertaken in the sanctuary in 2015. This has been approved by the Ministry of Antiquities.

ARCE has also made an application to the National Endowment for the Humanities for a collaborative research grant to publish the results of the project in all its diverse aspects in both traditional print and digital formats. Without such publication, the project will not receive the attention it deserves.