ARCHITECTURAL CONSERVATION
RED MONASTERY SPRING 2016

Part I: The Church

AMERICAN RESEARCH CENTER IN EGYPT

PRELIMINARY REPORT TO MINISTRY OF ANTIQUITIES

Dr. Nicholas Warner, April 28, 2016

Foreword

The spring season of the architectural conservation project at the Red Monastery commenced on 23 March 2016 and was completed on 28 April 2016. The project was directed by Dr. Nicholas Warner and implemented by Mahmud al-Taiyyib. Inspector Ahmed Mitwalli and Inspector Karam Murad Gad ‘Abd al-Rahim [conservation] from the Sohag Taftish of the Ministry of Antiquities supervised the work. Mr. ‘Ali Zaghloul [Chief Inspector], Mr. Saad Osman [Director of Islamic and Coptic Antiquities, Sohag Inspectorate] and Mr. Nur ed-Din Mustafa Ahmed [Director, Foreign Missions in Sohag] provided monitoring. The work was carried out in accordance with the Permanent Committee approval of January 2016 and included all areas of the complex except for the sanctuary. This is a preliminary report that concerns the works undertaken on the church itself: the tower will be treated in a subsequent report upon conclusion of the clearance and stabilization works in May.

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1 EXTERIOR

1.1 West Wall:

Existing condition (Fig 1.1):

The northwest corner block of the cornice, together with adjacent blocks to the south, was missing. Two minor cracks, running almost the full height of the façade, were present on the south side of the façade. At high level, a brickwork repair had been carried out in the 1990s through the full depth of the wall with inadequate ties on the inner face. At this time, two cornice blocks were removed and laid on their sides above other corner blocks, with no attempt made to reposition them correctly. In 2015, a new treated timber tie beam was installed in the position of a horizontal channel cut for electricity cables at low level.

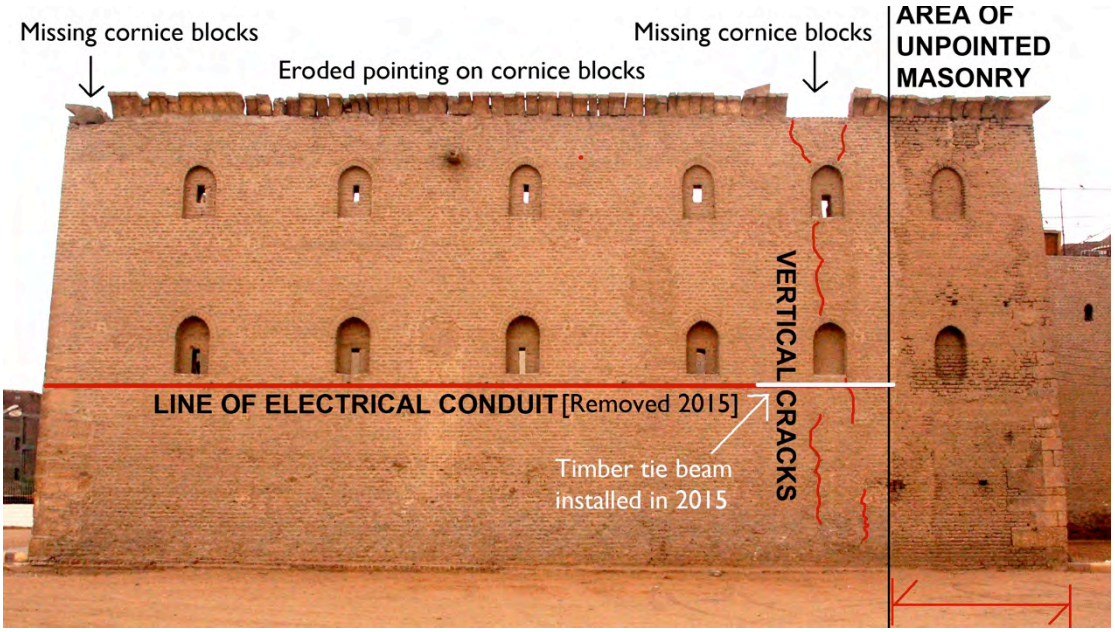

Fig.1.1 Diagnostic of west façade showing condition prior to intervention

Interventions (Figs. 1.2 – 1.4):

A new limestone corner cornice block, matching the profile of the original cornice, was installed on the northwest corner of the façade. This was partly supported on a new limestone base block, cut to match the dimensions of a missing original block. To the south of the corner block, two original cornice blocks were re-installed to complete the area of the missing cornice in this location. Five replacement blocks were also reinstated in the gap in the cornice on the south end of the façade. The entire length of the cornice was repointed with a lime mortar on its upper and outer surfaces [the inner face was repointed in 2015]. Above the line of the existing timber tie beam installed in 2015, the vertical cracks on the south end of the façade were stitched using 1mm thick x 90cm long helical stainless steel ties set 7cm within the masonry following horizontal mortar beds. These ties were bedded in a syringe-applied lime mortar bed that was then pointed. The vertical cracks in the façade were then raked out and repointed with a lime mortar.

Fig.1.2 West façade after intervention

Fig.1.3 Detail of west façade showing indicative locations of stainless steel helical ties (left) and diagonal view from northwest after intervention (right)

Fig. 1.4 A helical stainless steel tie being made (left) and ties being pointed in place on the west wall (right)

1.2 South Wall (Figs. 1.5 – 1.6):

Existing condition: All existing cornice blocks on the south wall had defective pointing. Additionally, a crack was opening up at high level in the brick masonry immediately below the corner cornice block at the west end of the elevation. A number of electrical fittings were also still attached to the wall.

Interventions: All existing cornice blocks were repointed using lime mortar, and a total of 12 original blocks were replaced on the east half of the wall. These were taken from the roof of the tower. The crack at the west end of the elevation was stitched with two stainless steel helical ties. All electrical fixtures were removed from the face of the wall.

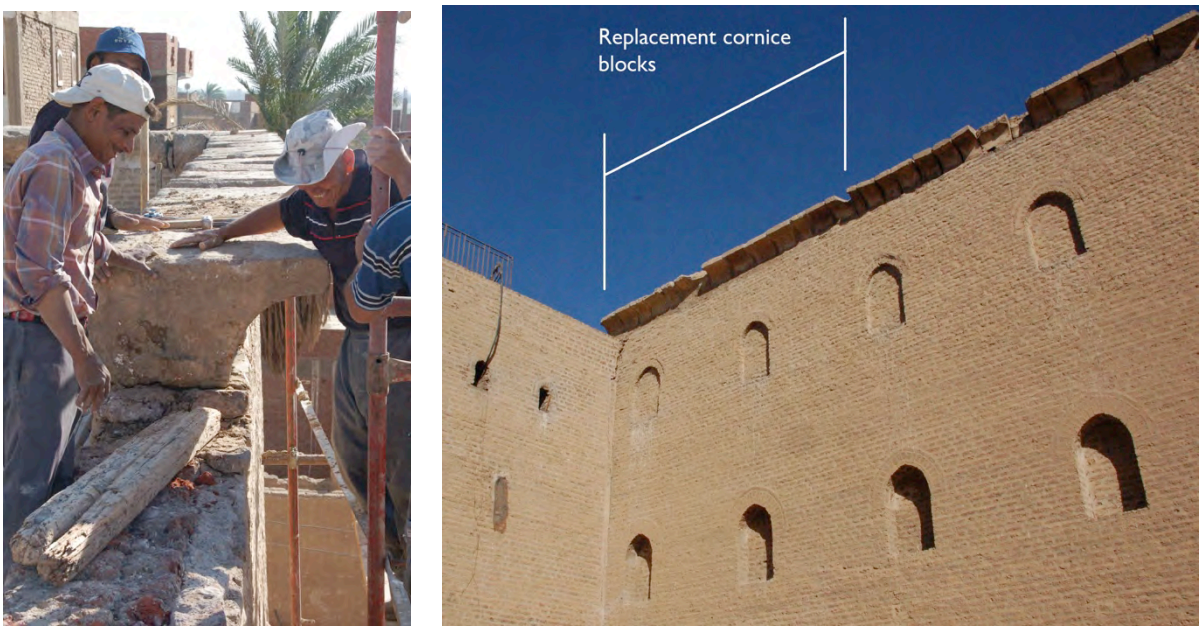

Fig. 1.5 Installation of replacement cornice blocks on south façade in progress (left) and completed line of replacement blocks (right)

In addition to the conservation work on the south wall, a test trench was excavated at its base in the only area where it was possible to make an assessment of the character of the original foundations of the exterior walls of the church. This revealed that the foundation of the

building is on clean sand at a depth of one metre below present grade, and is formed of one or two courses of fired brick followed by one course of limestone blocks 50 cm in height. There is no evidence of a stepped foundation of any kind, and all construction is carried out using a lime mortar. The material removed from the trench was composed of an organically rich soil with remnants of demolished mud brick buildings that had been built against the walls of the church at some period.

Fig. 1.6 Test trench showing foundation of perimeter wall on south face

1.3 North Wall (Figs. 1.7 – 1.15):

Existing condition: Cornice blocks were missing at high level at the eastern end of the north façade, and an arched door on the west side had been crudely blocked at an unknown point prior to 1856 which is the earliest date of the archival imagery for this façade. At high level, the blocking had fallen away, revealing a vertical ceramic pipe emplacement within the wall, centered slightly to the east of the axis of the doorway.

Interventions:

1.3.1 Cornice: Five original cornice block replacements were made at the eastern end of the façade, as well as a new limestone corner block.

Fig. 1.7 The northeast corner of the perimeter wall showing new corner cornice block and replacement blocks on the north and east façades

1.3.2 West door: The blocking masonry of brick and stone laid in a variety of mortars (silt and lime) was removed by hand from the interior of the west door. This revealed that:

1 The pointed arch of the door was partially preserved

2 The limestone pavement was preserved, complete with a door pivot position on the west side of the door

3 The external limestone threshold of the door was raised 20 cm above the level of the internal paving

4 A stone emplacement for an internal timber beam survived on the east side of the door [15 cm high x 20 cm wide x 20cm deep]

5 An emplacement for an internal timber bolt survived on the east side of the door [20 cm high x 12 cm wide x 1.1m deep]

6 The east stone jamb survived to a height of 153 cm.

7 Traces of a rectangular brick frame around a lost recessed panel survived above the door, immediately below the embedded ceramic pipe and centered on this feature rather than the door below. The panel's size could be reconstructed as 127 cm wide x 28 cm high

Fig 1.8. West door in North Wall before (left) and after (right) removal of blocking

Fig.1.9 West door in North Wall after restoration (front and lateral views)

Fig. 1.10. Detail of limestone beam emplacement (left) and door bolt housing (right) in west door

Fig. 1.11 Detail of limestone pavement and door pivot in west door [beside west jamb]

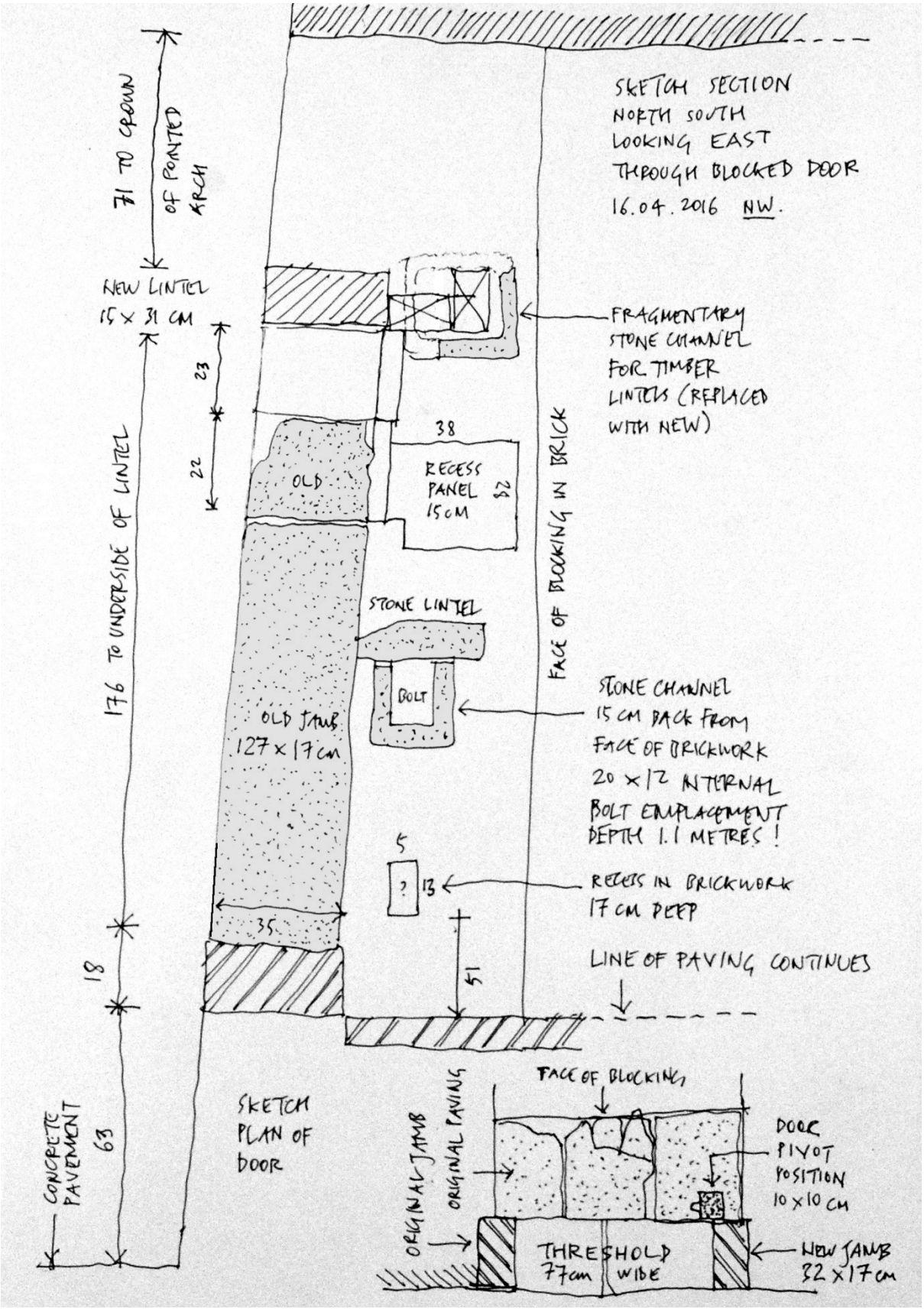

Fig. 1.12 Sketch section and plan through west door looking east showing original features

In addition, three noteworthy masonry elements, deriving from the lost structure of the nave, were recovered from the blocking of the door. These were the lower section of a red granite column shaft [48 cm diameter at base x 1.5 m long], a large carved cornice block [77 cm x 40 cm high x maximum 42 cm deep] and a small carved cornice block [48 cm x 13 cm high x maximum 22 cm deep].

Fig. 1.13 Granite column shaft after removal from west door

Fig. 1.14 Large cornice block with vegetal motifs and slit modillions found in the blocking of the west door

Fig. 1.15 Small cornice block with rosettes and slit modillions found in the blocking of the west door

Interventions: The intervention in the west door itself constituted a full reconstruction using all available evidence for its original appearance. The missing west jamb was replaced as a mirror image of the east jamb with new limestone masonry. The height of the surviving emplacement for the door-pivot beam was used to determine the position of the stone lintel of the door. The missing beam itself was replaced with two treated pitch pine timbers (15 x 20 cm section). Repairs were made to the brickwork of the flanking walls of the doorway re-using old bricks. The profile of the pointed arch seen on the inner face of the door was continued through to the exterior using old bricks. A new blocking wall was built from modern bricks (1.5 bricks thick) directly off the surviving limestone pavement inside the door. On the inner face of the door this wall was set back 10 cm from a section of ancient blocking at the base of the door. The rectangular panel above the exterior of the door was restored, and the inset ceramic pipe was kept visible within this panel. The two cornice blocks discovered in the blocking were incorporated in the lapidarium display inside the chitch (see below). The column shaft fragment will be used in a future anastylosis of the nave.

1.4 East Wall ((Fig. 1.16):

Existing condition: A large number of cornice blocks were missing from this elevation, and there was an accumulation of frass from an inactive wasps' nest under the cavetto of blocks at the north end of the elevation.

Interventions: Wasps' nests were removed manually from the overhangs of the cornice. Forty original cornice block replacements were made, starting from the northern end of the façade, as well as a new limestone corner block. After the completion of work on the cornice, a further three cornice blocks were subsequently discovered in the debris on top of the tower. These will be incorporated into the restored cornice during the next campaign.

Fig 1.16. View of east façade from southeast prior to intervention (top) and view of reinstated cornice blocks at high level on same (bottom)

2 INTERIOR OF CHURCH

2.1 Blocked door in north wall (Fig. 2.1):

Existing condition: The blocked door in the north wall exhibited two phases of blocking: one historical with traces of plaster on its surface and one modern executed with cement mortar and set flush with the original masonry face.

Interventions: The intervention in the blocked door on its exterior has been described above. On its inner face, the modern brick blocking was removed and replaced with a new brick blocking set back 10 cm from the face of the wall in order to delineate the line of the arch of the door, which was also restored at its apex. The new brickwork may be given a coat of limewash in a future campaign to harmonise it with the plaster surfaces of the adjacent wall after cleaning.

Fig. 2.1 The blocked door in the north wall before (left) and after (right) intervention

2.2 South Wall (Fig. 2.2):

Existing condition: With the exception of the south wall, the inner faces of all other walls inside the perimeter were conserved in 2015.

Interventions: The main roosting ledge for birds was given a 45 degree chamfered mortar cap as a deterrent. The cornice blocks on the south wall were also repointed on their inner faces using a lime mortar.

Fig. 2.2 Installing a chamfered mortar cap on a roosting ledge of the south wall

2.3 Wall above the Church of al-Adhra

Existing condition: The Church of al-Adhra is a modern structure, having been substantially rebuilt in the1980s over the foundations of an earlier church in this location. At this time, some of the architectural features of the earlier church were changed: for example, an entirely new dome was created over the sanctuary. The alignment of the north wall of the church, however, respected the original alignment of the south wall of the nave of the main church that once divided the nave from a long hall to its south.

Interventions: A section of the missing south wall of the nave was rebuilt above the Church of al-Adhra to a height in alignment with the top of the column capitals of the colonnade under the former gallery of the nave. This was done to provide future support for the planned shelter in the southwest corner of the nave. Construction of the new wall was carried out using red bricks set in lime mortar, and covered with a lime render. Galvanised metal rainwater spouts were installed in the troughs between the arches of the vaults of the church. A galvanised metal trim was also added above the vaults of the church to clearly distinguish between these vaults and the wall above them. Two 12 cm deep steel channels were inserted into the masonry of the new wall to provide better weight distribution for the planned shelter above and to reduce the loads transmitted to the wall of the church below. The new wall is not of uniform thickness: at its east and west ends it follows the thickness of the original wall, seen in the scarring on the wall at its junction with the west wall of the nave. In the middle, where it is not visible from below, the wall is two bricks thick to reduce its weight. The wall was stepped at its east end to indicate its continuation in an easterly direction.

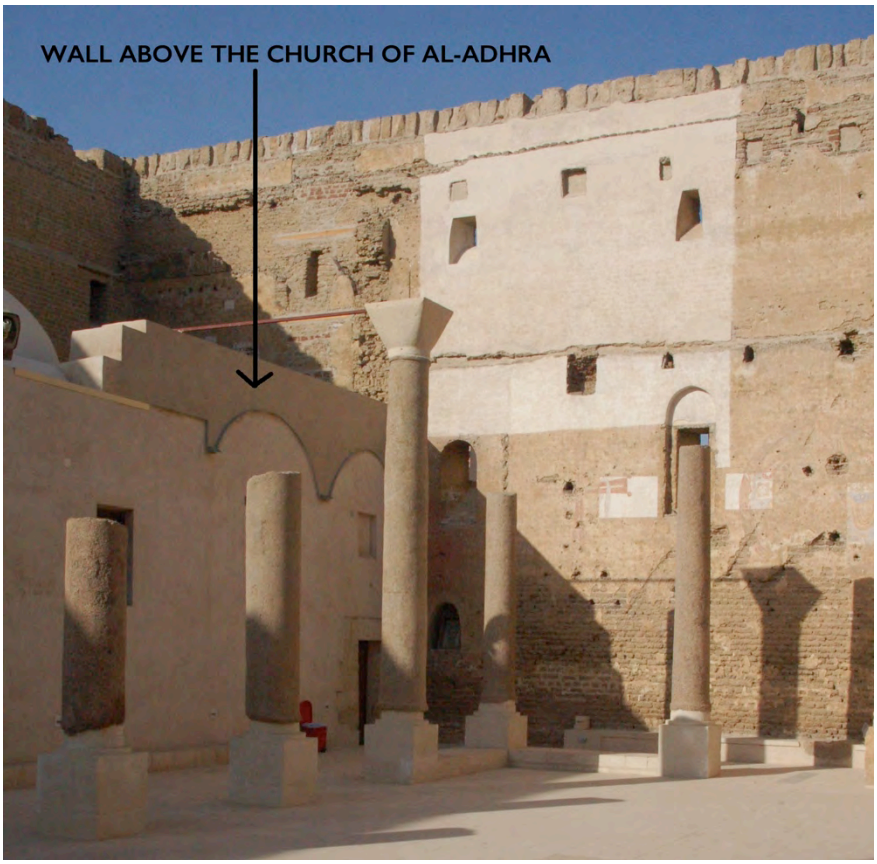

Fig. 2.3 Wall above the church of al-Adhra during construction with steel lintels over vaults (top) and seen from the nave after completion (below)

2.4 Column capitals:

Two new limestone column capitals were installed above the complete shafts erected at the west end of the nave. After erection of the capitals it was decided to install temporary 4 x 4 cm steel box section ties to fixings in the perimeter walls as a safety precaution. These will be removed in the next phase of the work when the shelter is installed.

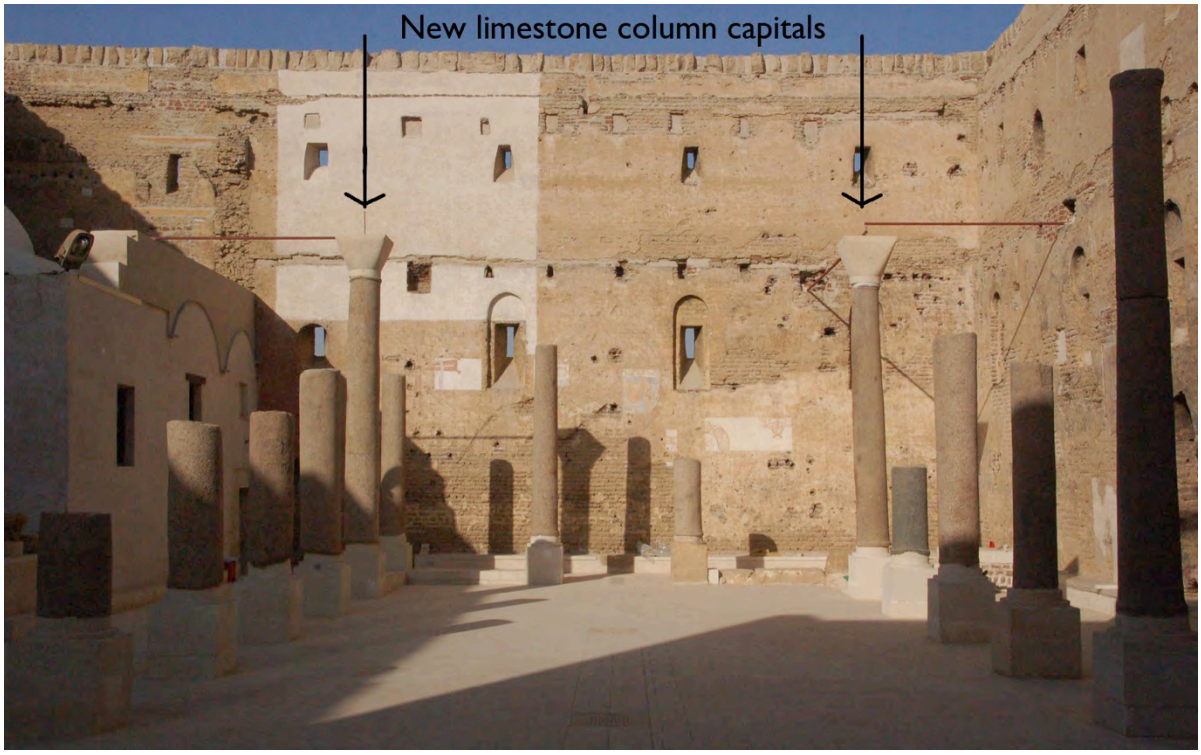

Fig. 2.4 View to west end of nave showing new limestone column capitals

2.5 Minor works (Figs. 2.5 - 2.6):

A perforated stainless steel circular cover was installed in the center of the millstone above the well. Modifications were made to the cover of the electricity cupboard to improve its appearance. A painted steel angle was set over the north wall of the church of al-Adhra to avoid damage to its plaster caused by repeated use of a ladder to access the roof of the church. A stainless steel laser-cut bird spike deterrent was applied over the tie bar connecting the northwestern column of the north colonnade to the inner face of the north wall. This will be removed during the construction of the planned shelter.

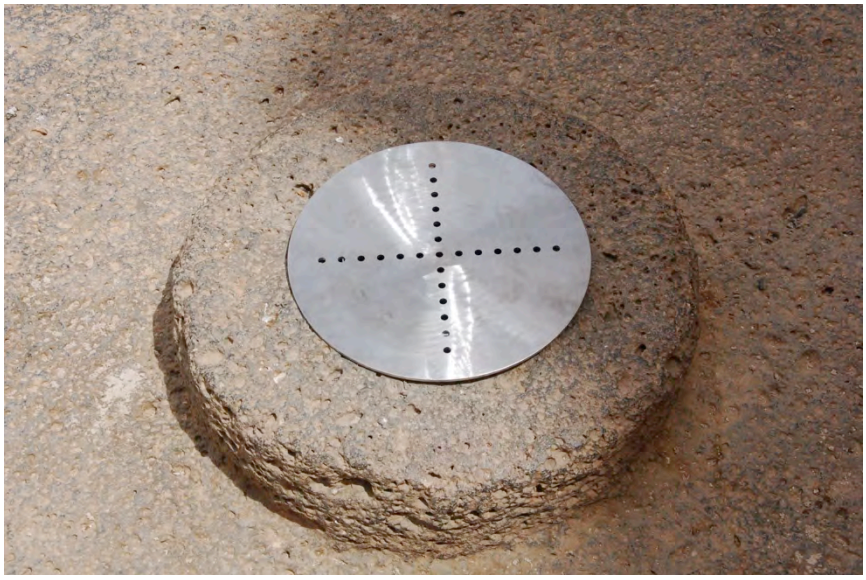

Fig. 2.5 New perforated stainless steel cover for the well inside the church

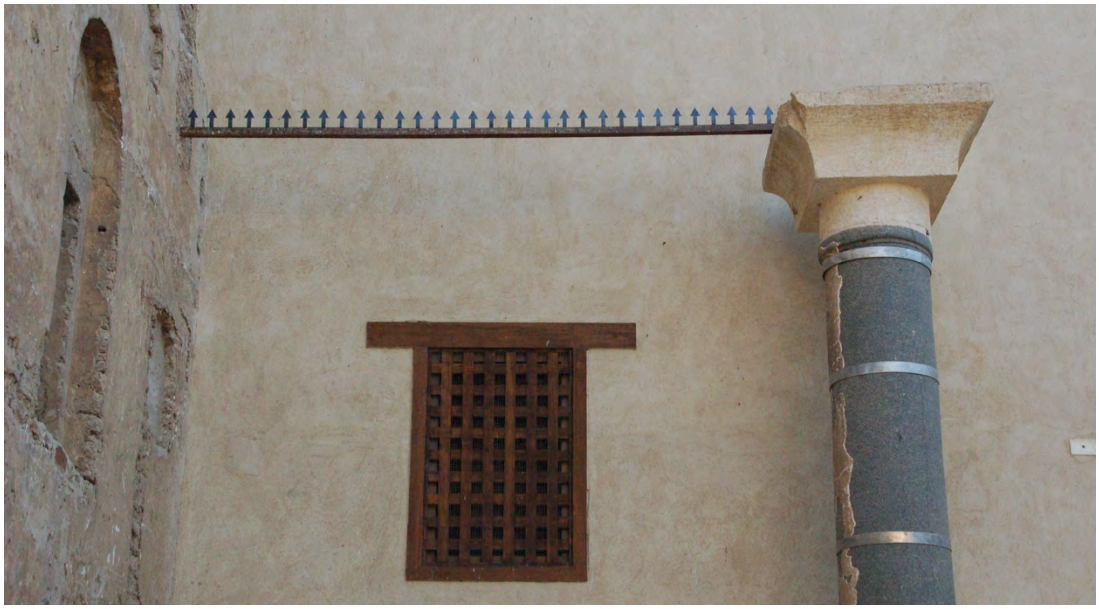

Fig. 2.6 Stainless steel anti-pigeon spikes installed across a tie rod

2.6 Lapidarium (Fig. 2.7):

Two newly discovered carved stone cornice blocks deriving from the blocking of the door on the north wall of the church were cleaned and incorporated into the existing display of the lapidarium. The large cornice block was set on a new steel and limestone shelf at the center of the display, and the small cornice block was set into the masonry on the far left of the display.

Fig. 2.7 Cornice blocks found in the blocked door incorporated into lapidarium display

3 THE SOUTH PORTAL (Figs. 3.1 – 3.5)

Existing condition: The stone lintel of the south portal was restored in 2015. Owing to water damage from rising damp, the west jamb of the south portal had suffered severe deterioration over time in its lower section. This damage had been crudely repaired with random stone blocks set in cement mortar, ignoring the coursing of the original ashlar blocks. On the south face of the portal, other inappropriate stone rubble replacements had been made in place of ashlar elements, also using cement mortar. The final course of the stone masonry on the northern face of the portal contained blocks that had been badly re-set in a silt mortar.

Fig. 3.1 West jamb of the South Portal before intervention (left) and after removal of defective masonry (right)

Interventions: The portal was fully propped, after which the defective stonework was removed and replaced with limestone masonry set in lime mortar. The replacements totalled 12 new blocks in all. Three displaced high-level blocks on the top of the north face of the portal were lifted and reset using a lime mortar. A new limestone threshold, consisting of two blocks 15 cm high was also introduced to determine the level of future paving inside the tower entrance. Finally, a new single leaf pivoting pitch pine door, treated with linseed oil and 'navda rumi', was installed in the original location of the door with a timber bolt on its inner west side. This door had heat-treated steel banding applied to its inner and outer faces using hand made nails: the bands matching the distribution of the carved stone bands on the portal itself.

Note: The limestone masonry of the portal requires further fine conservation treatment including complete cleaning and repointing with lime mortar. This is scheduled to be carried out by the Italian team during their next campaign of work.

Fig. 3.2 Sequence of repair of the west jamb of the South Portal

Fig. 3.3 Re-setting blocks of the upper course on the north face of the South Portal

Fig. 3.4 New timber door of the South Portal seen from the south (left) and north (right)

Fig. 3.5 South Portal elevation and section showing ashlar block replacements

4 THE NORTH PORTAL (Figs. 4.1 – 4.4)

Existing condition: The exterior of the north portal was found to have been patched in its lower areas with limestone rubble randomly set in gypsum. Steel double doors had been inserted on its interior in cement pockets, causing considerable damage to the original stonework.

Interventions: The defective or seriously damaged stonework of the portal was removed and replaced with limestone masonry set in lime mortar. A total of eight block replacements were made. A new double leaf pivoting pitch pine door, treated with linseed oil and 'navda rumi', was installed in the original location of the door with a new timber lintel for its upper pivots. This door had heat-treated steel banding applied to its inner and outer faces using hand made nails: the bands matching the distribution of the carved stone bands on the portal itself. The pivots were made of stainless steel. The door was provided with an exterior bolt and padlock.

Note: The limestone masonry of the portal requires further fine conservation treatment including complete cleaning and repointing with lime mortar. This is scheduled to be carried out by the Italian team during their next campaign of work.

Fig. 4.1 Drilling a fractured block on the west jamb of the North Portal for the insertion of stainless steel threaded rod and epoxy ties

Fig. 4.2 Replacement limestone masonry on east jamb of North Portal (left) and gravity grouting of same (right)

Fig. 4.3 Interior of North Portal showing replacement limestone masonry and new timber double leaf door with steel banding

Fig. 4.4 Exterior of North Portal before (top) and after (bottom) replacement of limestone ashlar blocks

5 RECOMMENDATIONS

It is recommended that during future campaigns of architectural conservation work at the Red Monastery Church, the following interventions should be made:

5.1 Reinstatement of three original cornice blocks on east façade and additional installation of five linear metres of new limestone cornice blocks (to match originals) in the last remaining location where cornice blocks are missing on the façade. This will complete this distinctive architectural feature of the church.

Fig. 5.1 View of the east façade of the church showing the last remaining location of missing cornice blocks

5.2 A capillary break trench should be designed and installed around the entire perimeter wall of the church to prevent any future infiltration of water from the ground into the foundations of the building. This trench, when lined with a synthetic geotextile and filled with coarse sand, will also serve to provide a barrier against the movement of ground-dwelling termites (white ants) into the structure from surrounding areas.

Nicholas Warner

Dr. Nicholas Warner, Supervising Architect.

Sohag 28.04.16