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**The Qalhât Project - Preliminary report on the second
season of excavations of the French mission
(1/11-16/12/2009)**

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The Qalhât Project

Ministry of Heritage and Culture
Department of Excavations and Archaeological Studies
Sultanate of Oman

Preliminary report on the second season of excavations
of the French mission
(1/11-16/12/2009)



Sultanate of Oman
Ministry of Heritage & Culture



مِنَاظِمَةُ عُومَانِ
وَقَادَةُ الْبِنَاءِ وَالثَّقَافَةِ



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Introduction

The second season of excavations of the Qalhât French Project took place from November 1st to December 16th 2009. The expedition was held under the authority of the Ministry of Heritage and Culture of the Sultanate of Oman, with the joint financial support of the MHC on the Omani side and of the Ministry of Foreign Affairs and National Centre for Scientific Research (Cnrs) on the French side.

Members of the team were:

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Dr Thomas Creissen (Eveha, Limoges), archaeologist, responsible of the mosque excavations
Mr Aurélien Hamel, archaeologist, mosque excavations
Mrs Anne Joyard (AKTC, Paris), archaeologist, B16, B38 and B91 excavations
Mr Vincent Bernard, draughtsman archaeologist, in charge of the architectural plans and the drawings and analyse of the mosque decoration
Mrs H  l  ne Morel-Renel (Cnrs, Paris), ceramologist, in charge of the registration and study of the archaeological material
Mrs Emmanuelle Regagnon (Geofil, Lyon), topographer, head of the topographical project
Mr Olivier Barge (Cnrs, Umr 5133, Lyon), topographer, topographical project

Special thanks are due to the Department of Excavations and Archaeological Studies of the Ministry of Heritage and Culture of the Sultanate of Oman, to its Director Mrs Biubwa Ali al-Sabri and all the staff, for their very kind and efficient help and support all along the expedition, and especially to Mr Kham  s N  ser al-  mr  . As in 2008, the mission could not have been so successful without the collaboration of the French National Centre for Scientific Studies, which sent Mrs H  l  ne Morel-Renel as a specialist for the registration and study of the Qalh  t material, and of Eveha, a French archaeological consulting agency specialized in contract archaeology and heritage development, which put at the disposal of the mission one of its members. Furthermore, the second phase of the topographical project of planning of the ancient city was realized thanks to a special sponsorship of the Total Group in Paris.

The main objects of the 2009 season were as follows:

- continuation of the excavations at the Friday Mosque (B12) started during the first season, mainly soundings and limited clearing to check the general plan and chronology of the two successive mosques identified in 2008. Based on this information the general clearing of the buildings will be possible when the restoration project will be ready, to avoid further destruction
- soundings in the large building B13 nearby to check its identification, plan and dating
- excavations in one of the large buildings (B16, B17 or B38) in the north-eastern quarter (QNE) to check its identification (rich houses or stores ?) and dating.
- achievement of the study of the local productions from the 2008 excavations at the ceramic kiln B41, and study of the 2009 archaeological material
- second phase of the topographical GIS project sponsored by the Total Group Paris: detailed planning of the ruins visible on the surface in order to draw the plan of the medieval city
- in connection with this topographical project, continuation of the surface survey, identification of the streets of the city, checking of the fortifications (gates, towers ...), main buildings, w  d  s ...

1. The Great Mosque area (B12 & B13 complex)

During the preliminary visit at the site made in January 2007 at the invitation of the MHC, glazed tiles were found on the surface of B12, a large building on the sea-shore in the middle of the ancient quarter of the city which was therefore interpreted as the possible location of the Friday Mosque of Qalhât (see 2007 Report). Limited excavations in this area during the 2008 expedition have brought to light a *mihrab* and a *minbar*, and B12 could therefore be assumed as being the Great Mosque of the city (see 2008 Report). A deep stratigraphical sounding (S1) dug against the outer façade of the *qibla* wall reached the bedrock more than 5.5m under the surface, and 6 successive chronological phases were identified, going back to the 11/12th centuries. The last mosque visible on the surface (phase VI), probably the one destroyed by the Portuguese in 1508, was built on top of the walls of an earlier building which was therefore interpreted as an older mosque, maybe the one built by Bibi Maryam around 1300 according to Ibn Battuta (see 2008 Report). It is made of small coral blocks in a rather soft white mortar, and the extensive clearing of the ruins must be made paralleled with a restoration project. For that reason, soundings only were opened in this area, to check the general plan, evolution, and dating of the successive mosques.

The mosque is located at the southeast corner of a wide architectural complex, measuring about 60m east-west and 80m north-south along the beach, very different from the densely built urbanism of the ancient quarter of the city all around. This complex is made of two units enclosed by surrounding walls, seemingly separated by a narrow east-west street leading from the beach to the top of the natural ridge which dominates the complex on its western side. To the south, the B12 unit includes the mosque itself in the southeast corner, an access courtyard in the northeast corner, and a large courtyard or garden in the western half of the unit, together with secondary buildings. The northern unit includes a large building to the west, and a courtyard to the east, also with secondary buildings. Some soundings were therefore also dug in these areas, in B13, to check its dating, as on the peripheral walls of the complex.



Oblique kite photograph of the B12-B13 complex

1-1. The Great Mosque (B12)

On the ground, the mosque appears as a nearly square structure, with no line of walls visible and no heaps of stones as is usually the case at Qalhât, and especially in building B13 nearby. On the contrary, it shows a rather even surface, with scattered small coral blocks and plastered fragments, strongly sloping from its western limit, at about level $\Delta 17.00$, to the eastern sea side, at level $\Delta 11.00$, and therefore seemingly greatly eroded.

Several wide soundings were dug this year in this area. Four were located in the northwest (S3), southwest (S4), southeast (S5) and northeast (S6) corners, to check the general dimensions and plan of the building, the levels of the floors inside, and the surroundings. Another one was made under the floor of the mosque, near the 2008 stratigraphical excavation on the other side of the *qibla* wall, to complete the study of the foundations (S2). And a long west-east trench, 1.5m large and 25m long, was opened across the mosque from the *mihrab* down to the sea (S7-12), to check the inside plan and the chronological evolution of the building.



Vertical kite photograph of the mosque (B12) unit, with the location of the main soundings

These excavations showed that the Great Mosque of Qalhât was an impressive edifice, 27m large north-south and 25m deep east-west, which was erected on a high basement about 5m high on the sea-side. The total height of the eastern façade on the sea was therefore around ten to twelve meters. The basement was mostly empty and, when its eastern wall on the beach felt down, the complete mosque collapsed inside and was thereafter washed by erosion down to the sea, which explains the slope of the ruins eastwards. The superstructures of the mosque proper are now nearly completely destroyed, except for the rear nave up to about 1m at maximum, but fragments of the superstructures were found collapsed inside the basement, which allows a tentative reconstruction of the plan and elevation of the structure.

1-1-1. The basement

The basement was built with surrounding walls 1.25m thick, in limestone blocks. It was founded directly on the bedrock on the eastern seaside, on top of the beach at around level $\Delta 11.00$ (S5-6). The southern wall was also founded on the bedrock, along a street climbing the slope of the substratum and leading from the beach, at level $\Delta 11.00$ (S5), to the inside of the city, with the southwest corner of the basement at level *c.* $\Delta 13.50$ (S4). In the stratigraphical sounding opened in 2008 against the outside face of the western (*qibla*) wall (S1), this basement was built from the existing surface of earlier occupation layers, at level $\Delta 14.10$, with a foundation trench about 1m deep down to level *c.* $\Delta 13.00$. In the deep sounding opened this year against the inner face (S2), the wall goes down to $\Delta 13.50$ at least. The northern side is badly known, but the base of the northwest angle was lower than level $\Delta 13.70$ (S3) and the northeast angle was based on the bedrock up the beach (S6), at around level $\Delta 11.00$ as the façade on the sea. This angle is very peculiar: a rectangular structure with thick walls, 4m wide and more than 14m long, is attached to the corner of the



The eroded sw corner of the basement seen from the south street, with the inside white floor up.



The angle of the eastern facade of the basement, on the sea, with the corner structure

basement, protruding on about 9m beyond the façade on the seaside. First a low massif was built to the east on the seaside, to level the surface of the bedrock of the beach, at about $\Delta 11.10$. On this foundation was erected a structure with a floor at around $\Delta 11.30$, accessible from the south, near the corner with the facade wall of the mosque, through a wide door 1.80m large. After some time of occupation this structure was levelled and the door blocked, to build a terrace with an earth floor based on a layer of pebbles, at level $\Delta 12.30$. In the same time a rectangular structure 3m large and more than 6m long was built against the corner of the basement. The inside was completely filled with collapsed fragments of walls and the floor could not be reached. This room had two openings, a door 1.4m wide giving access to the inside of the basement on the southern side, and a gate 2.30m wide opening northwards onto the exterior. West of this passage, a cubic masonry fills the western part of the room, maybe the base for a staircase.

The interior of the basement was divided into six compartments 3.10m large by five long walls parallel to the sea, 80cm thick, which were built in connexion with the surrounding walls. Perpendicular partition walls were cleared in the southern section of the long trench, one every two compartments, and it is probable that these long spaces were partitioned in smaller rooms, regularly arranged.

The basement was built up to level *c.* $\Delta 16.00$, thus 5m high on the seaside, and about 2/2.5m high on the inland side. Then the two western rear compartments (S7-8), which were probably too low, were filled with a backfill of good earth, when the four front ones were left empty and used as cellar rooms, most probably connected by small inside doors although none was found in the trench.



The trench, seen from the sea side



The third compartment (S9), with the collapse from the superstructures of the mosque inside the basement



The fourth compartment (S10)

The walls were coated with a strong mortar. The floors were at different levels according to the altitude of the bedrock in the compartment. The third compartment was not excavated down to the floor due to the huge amount of collapse masonry inside (S9). In the fourth compartment the floor was in strong pinkish mortar similar to the coating of the wall, at level $\Delta 13.00$ (S10). No clear floors were found in the fifth and sixth compartments where traces of an earlier occupation were discovered on the bedrock, a level of small pebbles with two post-holes and traces of an ancient wall, at level $\Delta 12.00$ in the fifth compartment (S11), at $\Delta 11.50$ in the last one (S12).

Two doors allowing access to the cellar rooms from the outside of the basement were found in the excavated areas. One was located in the middle of the façade on the sea; it was found at the extremity of the trench (S12) and its width is not known. The second was located near the northeast angle, inside the corner structure (S6).

1-1-2. The mosque

The mosque itself was erected on top of the basement, starting from around level $\Delta 16.00$, with the walls of the *musalla* based on the surrounding walls. They are 85cm thick, 1.25m in the area of the *mihrab*, built in small coral blocks embedded in a thick whitish mortar and covered with a strong pinkish coating. Five lines of four square pillars were based on the top of the inside long walls, thus making six bays 3m deep and five naves 4.10m large.

The floors of the mosque were of two different kinds. On the *qibla* side, the two rear compartments filled with an earth backfill (S7-8) were sealed by a very compacted floor, a thick white plaster level lying on a preparation layer of coral slabs and pebbles embedded in strong grey cement.

As the backfill subside, this strong floor sank 20cm down where it was not supported by the underlying partition walls, sometimes as a soft depression, in other places broken straight on the edge of the walls. A new floor was therefore built. Further east, the cellar rooms in the five other compartments were very probably covered with a wooden ceiling lying on the partition walls. Traces of this ceiling, including parts of wood planks, were found down the collapse layer on the floors of the cellar rooms.

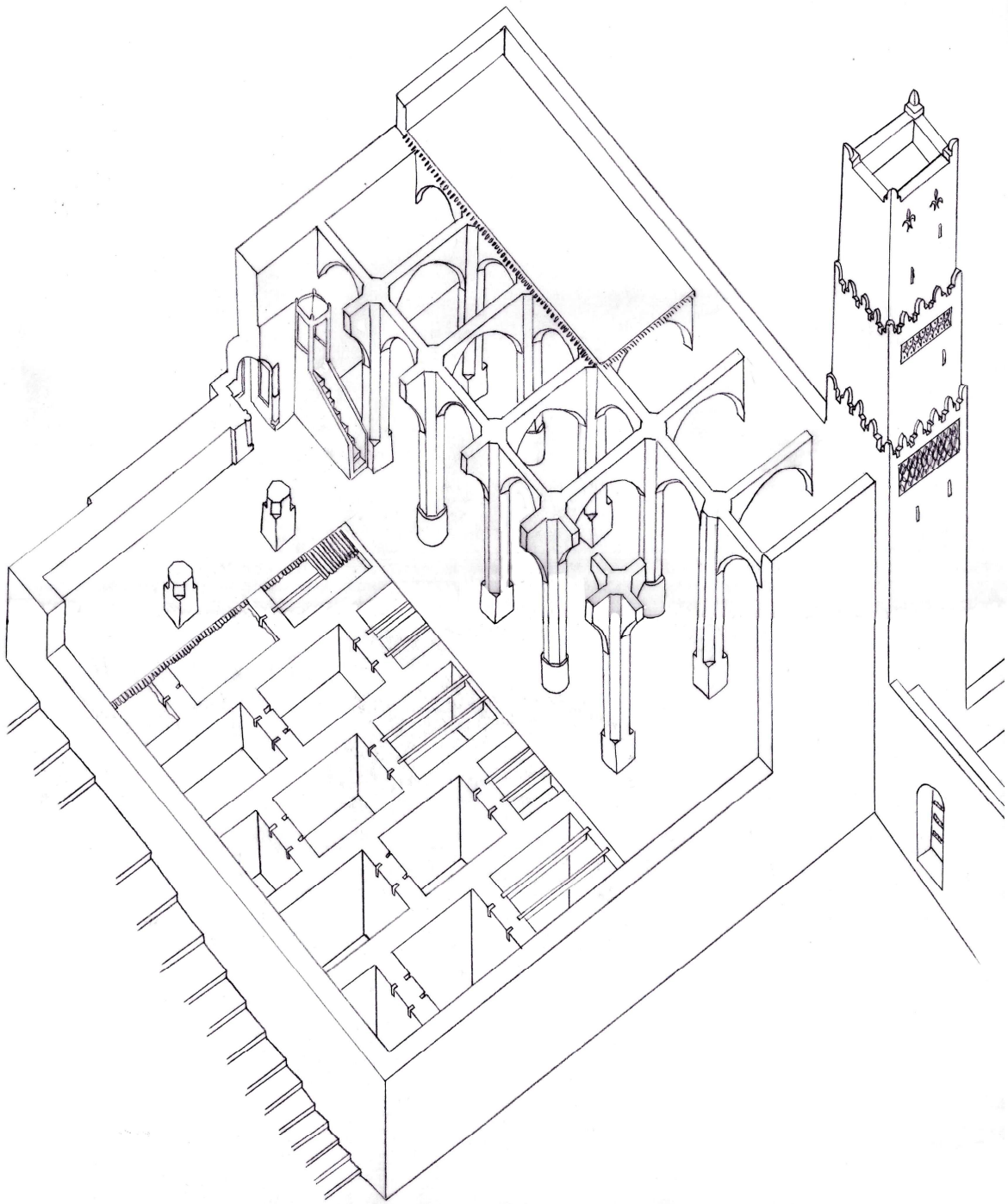


General view of the preserved part of the mosque, with the *qibla* wall and *mihrab* in the background, the *minbar* and pillar in the foreground.

The only superstructures of the mosque now preserved are the lower part of the *qibla* wall, *mihrab* and *minbar*, and the base of the pillars of the last nave, up to about 1m at maximum. The *mihrab* was located in the axis of the central nave, a niche 1.5 x 1.5m with several phases of decoration, the last one in stucco with small pilasters and recesses. A *minbar* 1.20m large and 3.8m long was at some time erected to the right of the *mihrab*, leaning against the last pillar of the central nave. This *minbar* is associated with the second floor of the mosque (S2) and the last phase of decoration in the *mihrab*, later than the original floor and the coating of the *qibla* wall, and it could have replaced an earlier structure. Four stairs are now preserved, which were protected by parapets and covered with wood planks now vanished. It probably had originally eight stairs, thus leading to a platform about 2m high.

The preserved lower part of the pillars, in the last bay, is square, 90cm on each side. It is built with square and rectangular cut limestone blocks with a vertical band in recess in its eastern front side, originally the place for a decorated panel. At the base was a deep recess surrounding the pillar and small wood beams were still preserved inside, maybe some kind of hooping to avoid destruction in case of earthquake. Fragments of octagonal and circular columns were also found in the trench and it is therefore possible that the pillars were of different shapes in each bay, or of different shape at their base and upper part.

The total height of the ceiling of the mosque is unknown, probably 5m at least. It was supported with arcades which seem to have been running in both directions, perpendicular and parallel to



Preliminary proposition for a hypothesis of reconstitution of the Great Mosque

the *qibla* wall, according to the study of some fragments found in the collapse. Given that the bays and naves have different widths, it is probable that the mosque was covered with a flat roof, rather than with cupolas which are difficult to build on a rectangular basis.

The rectangular structure attached to the northeast corner of the basement was probably a minaret, with a staircase based on the massive masonry found in the western part of the entrance. Five crenellations were found collapsed at its foot, which were crowning the lower part of the tower, encircling the base of an upper and narrower storey. Another minaret was possibly located at the northwest corner where a square structure $???$ x $???$ m was at some time built against the northern façade of the basement. Traces of stairs were discernable inside, around a central square pillar.



The northeast corner structure on the beach

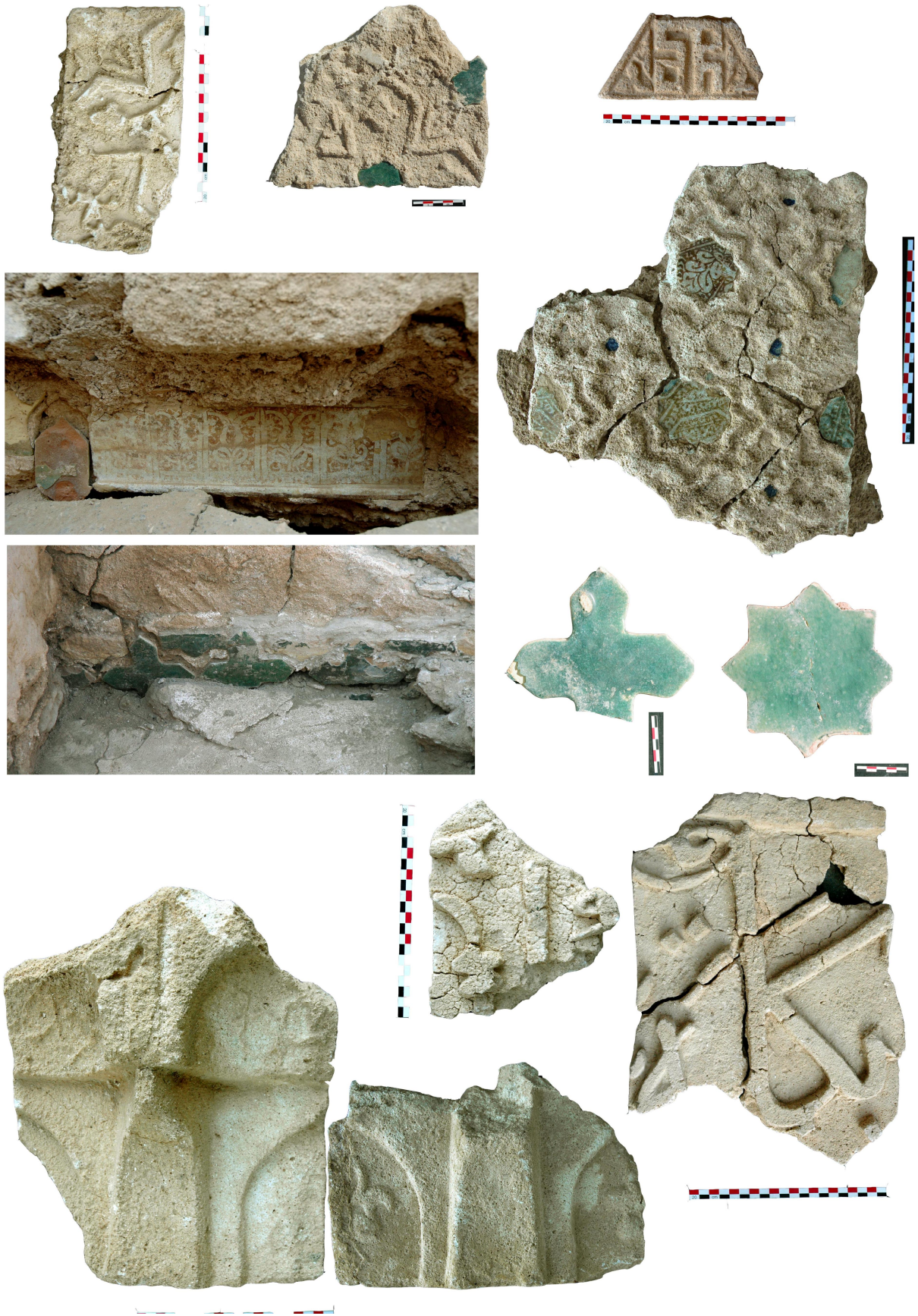
No gate to the mosque was found until now. Clearing on the sea-side delivered no trace of a ramp or a staircase which could have given access to an axial gate in front of the *mihrab*, five meters above the level of the beach. Such a structure could certainly have been completely washed out by the sea but the presence of a door leading into the basement exactly at that place indicates that there was no structure built against the centre of the façade. No main entrance was of course located in the *qibla* wall, and nothing is visible in the southern side along the small street. The main entrance to the mosque was therefore probably located in the northern wall where a declivity in the surface could indicate a passage in the masonry. This side of the mosque is badly known and deserves further researches. It is facing a courtyard associated with the shrine, with ruins seemingly indicating the presence of an outbuilding, maybe for ablutions (see *infra*). An access ramp or staircase could therefore have been logically located there, between the possible two minarets.

1-1-3. The decoration

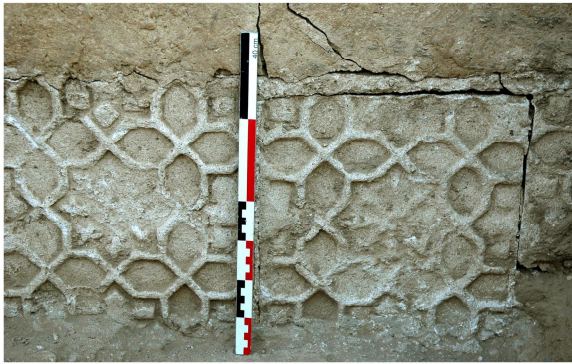
The last Great Mosque of Qalhât was richly adorned. Many fragments of decoration were found in the collapse layer and the accurate study of their location allows to some extent the reconstruction of the ornamentation of the building. Also very varied in the techniques employed and the material used (glazed tiles, stucco, stone), this decoration is mainly constructed on the base of a single motif, an interlacing of stars and crosses.

In its last phase, the niche of the *mihrab* was covered with a thick plaster with shallow recesses, which were decorated with stucco panels inlaid with broken fragments of Kashan golden lustre tiles and sherds of bowls in a cobalt blue fritware with black lustre decoration. These were reused from a former *mihrab* which is partly visible underneath, with a Kashan golden freeze. Triangular elements with a schematic MHMD inscription were possibly located at the base of the half-cupola covering the niche and two carved stucco pillars were located at the entrance corners. The façade of the *mihrab* on the *qibla* wall seems to have been crowned by a kufic stucco inscription, unfortunately illegible as some fragments only were found. A freeze of limestone blocks carved in the shape of small niches decorated with a lis flower and covered with half cupolas ornamented with carved stars, probably as a symbol of *mihrab*, were also located up the niche, down or up the inscription, in fact probably just under the ceiling.

The base of the *qibla* wall was ornamented with a freeze of green glazed tiles in the shape of



Elements of decoration from the *mihrab* and the *qibla* wall



Elements of decoration from the *minbar*, the pillars and the arches



Elements of decoration from the minaret area, and varied

eight points stars and crosses arranged as a mosaic, which goes back to the first stage of the wall, associated with the first *mihrab*. The wall itself was maybe decorated with regular niches, c. 80cm large, as the fragment of a such a niche was found in the collapse layer in front of the wall. The base of the *minbar*, on the *mihrab* side, was also decorated, with a line of identical stucco panels moulded with a mosaic of eight points stars and crosses, similar to the *qibla* freeze but with no glazed tiles.

The pillars were all decorated, at least on their eastern face fronting the praying community. As for the arches, they seem to have been also highly ornamented, on all their faces. These are mostly panels with fragments of broken green star or cross tiles, inlaid in plaster and covered with thick stucco lines geometrically arranged to produce the motif of stars, with five, eight or even ten points on the corner pieces; moulds for the production of these stucco lines were even found. Or a coating of plain plaster, inlaid with complete stars and/or crosses tiles, regularly arranged on the intrados. Limestone bilobed or quadrilobed carved blocks were also found which were used in association with stars tiles. We can also mention several fragments of a large plate in Chinese blue and white porcelain inlaid in a plastered panel as decoration; they were found in the cellar room of the fourth bay.

Massive elements of decoration were found in the sounding of the northeast corner of the mosque. Beside the crenellations already mentioned, these are two fragments of a large inscription, and several fragments of a large stucco freeze made of interlacing circles. Given the size of these motifs, they were probably located rather high, which confirms the presence of a minaret in this area.

1-1-4. The surroundings

As already stated, the mosque is part of an architectural unit including an open area to the west and a courtyard to the northeast, with several secondary buildings.

The western open area includes all the western part of the unit, ??? x ???m. It could have been a garden, maybe created during phase IV when a thick backfill was deposited against the *qibla* wall of the basement of the first mosque. It was limited to the south, west and north by surrounding walls followed by three perpendicular streets, and was mainly accessible through a wide passage sloping down from the western street, which was located up the natural ridge dominating the area. A smaller access from the southern street was also possibly located at the corner of the basement, as no trace of a wall was found in the sounding excavated there (S??). The northern street, running between the B12 and B13 units, is not very clear and the possibility of another access on that side is not certain.

The northeast courtyard is located along the beach, between the mosque and the northern street. It is limited on the sea side by a wall parallel to the sea, built in continuity with the extremity of the rectangular structure/terrace at the foot of the minaret, 9m ahead of the façade of the mosque. Twenty meters north of the angle, a wide gate in this wall, c.3m large, was leading to the street between B12 and B13, a gate which was probably closed by a wooden door as shown by a deep square hole at the base of the jamb where a beam could have been inserted, acting as a threshold to the door. An entrance to the courtyard was most probably located immediately after this gate in the southern wall of the street, but it is now destroyed by an erosion *wâdî*. The layout of the courtyard is nearly square, around 17m on each side and three successive surface layers were found, the last one at level $\Delta 11.50$. Small structures 4m deep seem to have been aligned all along the eastern sea wall and an important secondary building was located to the west, at the limit with the western open area. Finally, a ramp or large staircase was most probably located against the centre of the northern facade of the mosque between the two possible minarets, leading to the main entrance. This part of the B12 unit is therefore very important for the understanding of the mosque and deserves further studies.

1-1-5. Dating

In the stratigraphical sounding opened in 2008 against the outer façade of the *qibla* wall, the two first phases (phase I, layers 1-9, $\Delta 11.90 > 12.90$ and phase II, layers 10-27, $\Delta 12.90 > 14.10$) delivered only occupation layers, dated by the ceramic assemblage of about 1100-1250 for phase I (Iranian sgraffiatos), and post-1250 for phase II (Yemeni Mustard ware). No trace of structure was found in the sounding but it is most probable that a small mosque was already standing at that place, which was later destroyed by the construction of the excavated building (see 2008 report).

The construction of the basement is dated to phase III. A foundation trench was at that time dug from the existing surface, at level $\Delta 14.10$, down to about level $\Delta 13.00$ (phase IIIa, layers 28-31), which was then sealed by the construction layer of the basement ($\Delta 14.10-14.50$). The mortar coating of the basement wall was starting from this level, associated with an outer floor. Five layers of occupation (phase IVa, layers 33-37, $\Delta 14.50-14.90 / 15.20$), plus three layers of backfill (IVb, 38-40, $\Delta 14.90 / 15.20-16.05$), subsequently accumulated on this floor, leaning against the wall of the basement. The associated ceramic assemblage, and especially the Chinese imports, is dated to the 14th century, probably to the first half given the presence of some Mustard pieces. All these layers were then cut by a very large pit nearly 2m deep (phase V, layers 41-45) which delivered a rather different ceramic assemblage, probably dated to the end of the 14th or the 15th century.

In this sounding, the outside coating of the *qibla* wall proper is clearly contemporary or later than the pit of phase V, and therefore certainly later than the basement of phases III/IV. As a matter of fact, its base is associated with a layer sealing the pit (phase VI, layer 46, $\Delta 16.05-16.20$). The associated Chinese imports are dated to the 14th or early 15th century.

It is therefore certain that the mosque underwent two successive architectural phases, a fact which is confirmed by the reusing of broken fragments of decoration during phase VI. Given the date of the associated material, the first phase is probably the one built by Bîbî Maryam around 1300 according to Ibn Battuta, and the last one the mosque destroyed by the Portuguese in 1508, although the description of Bras de Albuquerque does not fit exactly with the plan of the excavated building. But, contrary to the hypothesis given last year, the phase IV mosque was not completely destroyed, with the base of its *qibla* wall only preserved under the floors of phase VI. The mosque of Bibi Maryam was in fact also built on top of the basement, and was restored only during phase VI, with the refectation of the floor, of the *mihrab* and *minbar*, the modification of the minaret area, and probably the reinforcement of the walls, at least on the *qibla* and sea sides. It is even possible that some parts of these walls were completely rebuilt.

Traces of this former shrine are now mainly visible in the architectural evolution of the minarets, but further excavations and clearing of the basement will certainly bring more data on this building. Another evolution between the two phases was on the western *qibla* side of the basement, which was completely hidden behind a thick backfill during the occupation of the Bibi Maryam's mosque in the 14th century, maybe to create a garden. The last *qibla* wall was therefore erected from about the level of the surrounding surface on that side, although it still dominated the beach of 5m on the sea-side.

1-2. The large building (B13)

The B13 unit is located north of B12 unit, and includes a large building to the west and a courtyard with secondary structures to the east. The building measures about 25 x 35m and is now covered with huge heaps of stones, especially at the southwest corner where the ruins reach nearly 4m above the surrounding surface (Δ ???). The layout is not perfectly orthogonal, the northwest corner smaller than 90°, maybe to fit with the topography of the ground which shows several natural

ridges in this area. A semi-circular structure is visible against the western façade, possibly a tower. The plan seems to include several rooms around a central courtyard, but nearly not a single line of wall appears on the surface, except on the southern façade facing the mosque where some aligned stones were clearly visible on top of a long heap (Δ ???).



The southern wall of B13

A sounding 1.5m large was open this year against this wall to get preliminary information on the function and dating of the building, as excavations are planned there for the 2010 season. The wall is built with large limestone blocks, and preserved up to about 3m (base at Δ ???). It was certainly a very impressive construction, most probably with an official function.



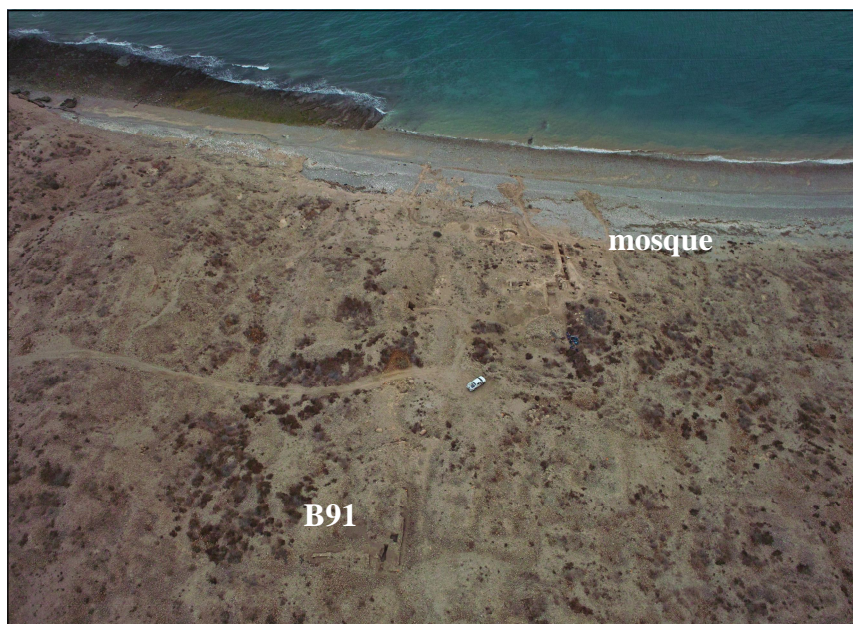
The deep sounding against the southern facade, showing the layers under the base of the wall

The base of the wall lies on a thick layer of compacted light brown clay with small gravels, with some intermediary lens of ashes, 35cm thick. Under is an occupation layer with ashes, some charcoal, and gravels, 15cm thick. Then is another layer of compacted clay, associated with a small pit with a filling of small pebbles near the northern section of the sounding. This in turn lies on a thick level of medium pebbles, which becomes more and more compacted as excavation goes down, with no human traces. Although this is probably not the bedrock proper, it is a natural deposit, prior to the foundation of the city, maybe the bed of a small wâdî. Excavations were therefore stopped at level Δ ???.

Ceramics found in this sounding is rather specific when compared with the archaeological material found in most of the excavated areas. As a matter of fact the levels down the wall yielded an early assemblage, with Iranians sgraffiati of the 11-13th centuries and no local production of the 14-15th or even no Mustard Ware of about 1250-1350. These layers can therefore probably be dated to around the 12th and/or early 13th century. Even the levels leaning against the base of the wall are rather ancient, around the 13th or early 14th century. Building B13 could therefore bring interesting information on to the development of the city, and further researches will be held there during the next season.

2. Soundings in the city centre, building B91

To complete information about the urbanism and evolution of Qalhât, some researches were conducted this year in the southeast quarter (QSE), the central area of the city around the Friday Mosque, which was supposed to be the most ancient part of the settlement.



Limited excavations were made in building B91. This construction is located up the natural ridge in the bedrock overlooking the B12-B13 complex, at the corner of two streets, one east-west street coming from the complex, and one street north-south. Several lines of walls were visible on the surface and the building seemed to be a square construction, c. 15 x 19m. Two soundings were opened and four different layers and three occupation phases were identified in the area excavated.

The earlier construction was built directly on the bedrock, which is sloping east-west from about D24.30 to about 24.60, with a floor in compacted clay, associated with the façade wall along the southern street, 90cm thick, and an inside partition wall, c. 65cm thick, both preserved up to about 1m high (D25.20/40). In the room east of this partition wall the floor was covered with a layer of pure grey ashes with big charcoals in the southeast side. West of this wall, in the southwest room of the building, the base of the wall is associated with a compact yellow clay level and an occupation layer made of exploded stones, pebbles, fired bones, dark earth, charcoals and ceramic sherds, about 20cm thick altogether. Up this layer, a second phase of occupation of the building is made of a structure in compacted hard clay, associated with a layer of occupation with a lot of ceramic sherds, organic material and various remains of domestic activity.

This two occupation phases of the original building were then covered with a thick layer of destruction, up to one meter thick in the eastern room, 60cm thick in the western room. On top of this layer was then built a light construction, small walls with one good face only, which are therefore probably the surrounding walls of a terrace. They seem to support a rough filling and extend from south to north with a very short part oriented east-west.

The preliminary study of the ceramic from B91 indicates that this building is rather late, dated to around the 14th-15th centuries. No trace was found of an early occupation in this area, as the one dating back to the 12th century discovered in 2008 at the bottom of the stratigraphical sounding against the *qibla* wall of the mosque, less than 100m far.

3. The north-eastern quarter, buildings B16 and B38

The north-eastern quarter of the city (QNE) is located between a steep ridge about 5m high in the topography of the ground and the sea-shore, here an abrupt cliff also c. 8m high. It is therefore a rather distinct area in the urbanism of the city, which is further characterized by the presence of some of the largest buildings of the site, up to 1000m². The function of these constructions was not clear, whether houses of rich people and/or warehouses for merchandises traded in the harbour. As a matter of fact, this quarter is connected to the beach and landing area south by a street running rather straight on more than 420m from the Friday Mosque area until a gate in the northern fortification wall (see 2008 report). This quarter was therefore directly connected to the coastal plain north of Qal-hât through the mouth of the Wâdî Hilm.

3-1. Building B16

Building B16 is located west of the street at a place where this street widens to make a rectangular square c. 16m large and 55m long. From kite photos it looked as a nearly square construction, about 1000m², divided in what seemed to be four different quadrants, and connected to building B17 to the north by a structure alongside the street (see 2008 report).

The surface study and the clearing of the lines of walls visible on the ground show that the building actually extends on 31m north-south along the street in front of the square, and on 36m east-west from the street to the foot of the ridge, an overall surface of more than 1110m². Although the outside walls are rather clear, with a thickness of about 1m, the inside walls are hardly visible, showing only as elongated heaps of fallen stones, sometimes peaking at more than 3.50m above the surrounding surface. The general plan is therefore difficult to interpret, the southeast quadrant seemingly a built area, the southwest quadrant maybe a courtyard with peripheral rooms, and the northwest and northeast quadrants possibly two courtyards.



Kite photograph of the area of B16 and B38

Six soundings were opened this year following an east-west line across the southeast and southwest quadrants and two main architectural phases were identified.



General view of B16 from the square

3-1-1. The street sounding

Along the street, the eastern facade of the southeast quadrant of building B16 was clearly visible, with a door 2m wide located slightly north of the axis of this quarter, the threshold at level D10.80. A small trench 1.50m large and 2.50m wide was opened perpendicular to this wall, including half of the doorway.



The street sounding, phase II



The street sounding, phase I

Under the surface collapse, a large parallelepipedic grey stone was found in front of the door (D10.67), used as a step to connect the threshold to the level of the street outside (D10.40), a very compact circulation level, beige in colour. Under it, several layers of powdering earth from grey to beige with some ashes and few charcoals are superposed on a height of about 50cm. Under is a great brown earthy level about 1m thick, which contains numerous organic remains, degraded greenish and sticking to the surface of the ceramic material. All these layers lean against the façade of an earlier wall, phase I, located just under the upper one with nearly no difference in the façade except that it is here covered with a strong coating showing finger prints. This wall was built directly on the bed-rock, here a very strong pudding of medium pebbles in a strong mortar, the base of the wall coating leaking on the earlier layer of the street just above it, at level D9.10.

3-1-2. The entrance sounding

The street sounding was extended inside the building on the other side of the wall which is about 1m thick, in an area which was therefore the entrance to B16 (sounding 1,50 x 1,50m). The top level is a loose layer of demolition with a lot of stones in a soft powdery earth. It lies on a homogeneous layer of earth, rather compact with few charcoals and ash remains, at to the level of the threshold of the door. No built mortar floor was found in this area, which could therefore be a small courtyard rather than a room.

Under this later occupation phase, another layer of fallen stones was found, many coral blocks and few pebbles in a loose earth, about 60cm thick. Below is a meter thick layer of occupation/accumulation, with powdering earth, gravels, pebbles, bones and other few organic elements and remains. It lies on a floor located at level D 9.07 which is connected with the base of the wall of phase I, here also with a strong coating. To the contrary of phase II, no doorway was found in this early wall. Just under the floor, about level D9.00, the bedrock is similar than in the street sounding.



The entrance sounding, phases I-II

3-1-3. The main room sounding

Beside the outside walls, the only clear traces of construction appearing on the surface of B16 were several lines of thick strong plaster forming niches and recesses, slightly to the southwest of the entrance. A sounding and surface clearing eventually indicate that the centre of the southeast quadrant was occupied, during the later occupation phase, by a large rectangular room, 12.5m long east-west and 3.7m large north-south. This room is entirely decorated with niches 1.1m wide and 0.4m deep with concave corners, creating a regular plan with one niche in the middle of each extremity of the room and probably four niches in the lateral walls. Around the middle of the room, a deep depression in the layer of collapse was surrounded by large fragments of fallen masonry, partly curving, which are probably part of arches. It is therefore possible that the central part of the room was covered with special roofing, maybe a *qubba*.



The main room, with its plastered floor and niches, phase II

The sounding (2.20x2.20m) was open in the northeast corner of the room, where the plaster was well preserved up to the surface. The top layer is a level of collapse about 1.20m thick (D12.70 > D11.45) made of many stones, coral blocks, mortar and numerous fragments of plaster coating, with few ceramic sherds, in a powdering earth; the base of the niches appear at layer c. D11.95, about 75cm under surface. Under this collapse a rather homogeneous layer of earth was found, with some charcoal and plaster fragments, c. 50cm thick. It rests on the floor of the room, located at level D11.00, an altitude similar to the one of the threshold of the doorway to B16 and the floors of phase II in the street and entrance soundings. Here this floor is an extremely strong white plaster, ca 5cm thick, lying on a preparation layer of small gravels and mortar, altogether ca 20cm thick. These floor layers are leaning against the base of the coating of the walls which were therefore entirely plastered and completed before starting the construction of the floor, the best technique to build a beautiful clean and even surface. The lower part of the walls, under the plaster and floor, is only covered with mortar coating and no niches are visible; it is associated with a 30cm thick layer of earth with stones, few pebbles and coral blocks and a lot of ceramic sherds, bones and fish remains, dating back to the period of construction of the room. This layer lies on a very compacted construction level with pebbles in a dumped earth, which is associated with the base of the walls, at D10.45.

Because of the danger of collapsing of the upper destruction layer, the sounding under the floor of the room was reduced to 2.20x1.00m. Both walls of the northeast corner of the room of phase II are based on earlier walls of strong masonry, with seven courses of rather large limestone blocks, without any coating. The lower part is in pebbles, based on the bedrock at D9.15, an altitude similar to the one in the street and entrance soundings. The levels associated with this building of phase I are, first, a layer of blackish and compacted homogeneous earth on the bedrock, ca 20cm thick, then a heterogeneous layer, 1.10m thick, of soft powdery earth with pebbles, stones, organic remains, probably the collapse of phase I before the reconstruction of B16 during phase II.

3-1-4. The north and north-west soundings

The main room was bordered on its northern side by what seems to be an east-west corridor connecting the entrance of the house to the southwest quadrant, seemingly a courtyard surrounded by rooms; a door in the middle of the south wall of the corridor was most probably leading to the centre of the main room.

The northwest sounding (3 x 1m) was opened on about the same axis as the street and entrance soundings, perpendicular to what seemed to be the line of a north-south wall between the southeast and southwest quarters, peaking at D12.80. Excavations eventually showed that this elevation was in fact made of a thick earth layer with many stones, ceramics and organic remains, leaning against a small east-west wall, 1.40m long and 60cm thick, which is built on a layer of white plaster at level D11.98; it could therefore be a later reoccupation, phase III.

This wall is based on an earlier wall, which was only cleaned on 1.50m length, with no extremity or corner found. It is associated with a meter thick level with many organic remains of food, bones, fish, shells, with many ceramic sherds and charcoals. This occupation layer rests on a solid floor located at level D10.77, therefore probably dated to phase II. Under this floor, excavation was held in a small sounding only, more than 2.50m deep and rather dangerous due to the possible collapsing of stones. The wall still goes down, associated with a layer of powdery earth with stones. The base of the wall was tentatively identified at D10.30, lying on a sandy layer with many pebbles, probably the top level of the bedrock in this area.

A limited sounding (1 x 1.50m) to the north allowed the clearing of an east-west wall, of similar dating than the upper construction in sounding north-west, with the same thickness of 60cm. The top level is a layer of demolition, then a lot of earth with stones, pebbles, coating fragments with no ceramic. Excavation was stopped. at D12.30.

3-1-5. The south-west sounding

A last sounding (2.20 x 2.0m) was opened in the southwest quarter of B16 near the corner of the building, to check the presence of rooms around the large depression which can probably be interpreted as a courtyard. The other aim of this sounding was to search evidence for a possible secondary gate allowing direct access to this courtyard from the west, near the southwest corner where a depression was visible on the surface, without passing by the main door on the street, the entrance room and the corridor. As a matter of fact, the presence of such a secondary gate could suggest that the courtyard was used as a store for merchandises rather than as a domestic area.

From the surface there, around level D12.40, the sounding was dug in a thick layer of collapse, with many stones in a powdery earth, covering the remains of the corner of two walls. The east-west wall is 1m thick and preserved up to level D12.40. It is abutting against a south-north wall, 80cm thick, preserved up to level D11.54. Due to the limited space left on every sides of the walls, the sounding was stopped around D10.60. No floor was identified and the dating of these walls, either from phase I or II, is therefore difficult to ascertain.

The position of these walls demonstrates that the southwest corner of the courtyard was occupied by a rectangular room 4.30m deep and probably 7.10m long, and that no gate was located in this area. The western wall of the courtyard was seemingly entirely bordered by a line of rooms 4.30m deep, and the middle part had probably two storeys given the height of the ruins in this area, which are peaking at D14.30, 3.50m above the actual surface of the courtyard. Two rooms 3.30m deep were located against the southern wall of the courtyard.

3-1-6. Conclusions to B16

Two successive phases of occupation were therefore discovered in B16 area. The first building was erected straight on the bedrock which was apparent in all the areas excavated, sloping from around level D9.00 in the street to about 10.30 in the courtyard. Not a single trace was found of an earlier occupation and it is possible that most of the northeast quarter was uninhabited until that time although the preliminary study of the pottery indicates that this first phase is rather late, not earlier than the 14th century. Walls of this period were found only in deep soundings and the plan of the phase I house is therefore not well known but seems to be similar to the plan of phase II, except that the entrance was located in another place and that the central room was probably not decorated with plaster and niches.

During this phase I, the level of the street against the façade of the building, and probably of the complete square, raised up of nearly 1.5m, up to level D10.40 This certainly means that all the quarter was at that time built up and that quite a lot of persons were living there. For an unknown reason, maybe an earthquake, the building was thereafter destroyed and levelled inside with a mass of debris.

Another construction was then erected on the levelled top of the previous walls, around D11.00, following more or less the same plan as the former building. The southwest quarter was a living and reception area, with a beautiful large central room decorated with niches and coated with strong white plaster, probably a *majlis*. The location of the doorway was changed, now accessible from the street by a step. The southwest quarter included rooms around a central courtyard, maybe a living area or possibly stores although no direct access from outside was found until now. Given the elevation of the ruins, it is probable that some areas of B16 had an upper storey. From the preliminary study of the pottery, this phase may be tentatively dated to around the 15th century.

3-2. Building B38

Building B38 is located opposite B16, on the eastern side of the square, between the square and the cliff overlooking the sea. It is a rather large construction, ca 25 x 25m, with what seems to be four quadrants as in B16. The northwest and southeast quadrants are courtyards and the northeast and southwest quadrants are built areas. The southwest quadrant had several rooms and probably two storeys given that its ruins are preserved very high, at level D12.91, more than 2.5m above the present surface of the outside square and street. The northeast quadrant had two rooms and only one storey. During the excavation season held at the site in 2003 under the direction of T. Vosmer, a stratigraphical sounding had been excavated by T. Creissen in the northwest courtyard and the bedrock was reached about 2m under the surface.

Excavations were held this year east of the 2003 sounding, in one of the two rooms visible in the northeast quadrant. The sounding, 1.5 x 1.5m, was opened against the southern wall of the room which was clearly visible on the surface, with a thickness of 80cm and its preserved top sloping from D11.05 at the western limit of the sounding to D10.32 at the eastern limit. Three layers and one occupation phase only were identified in the area excavated.

The top layer is the usual layer of collapse, with stones and coral blocks in a powdery earth, about 1m thick down to level D9.19. It lies directly on a square or rectangular structure limited by a small border of low walls, 30cm high and 34cm thick, abutting against the wall of the room. All these walls are contemporary and were coated with two identical successive mortars, the earlier one associated with the base of the walls, around level D8.90, the later one at level D9.00. The western and northern limits of the structure were found exactly under the sections of the sounding but the eastern wall was outside the excavated area. The structure is therefore 1.40m wide and more than 1.50m long. Strangely enough, no floor in plaster or mortar was found inside this structure, which cannot therefore be interpreted as a *birkat* or a basin. The coating of the walls end abruptly on the underlying level, a layer a small pebbles (3-4cm) in a powdery earth, ca 55cm thick, with some human traces as ceramics and charcoals in the upper part of the layer. Downwards it becomes more sandy, with bigger pebbles and fragments of marine limestone and without traces of human occupation, ending on the compacted puddingstone bedrock around level D8.35.

A very peculiar occupation layer was associated with the structure. It is a thin (ca 15cm) clay level with few charcoals and very small pebbles (1cm Ø), with micro-ashes and yellow powder coming probably from organic remains. The ceramic are too fragmentary to be identified, except for several sherds of a pot with a red fabric, a moulded decoration and an outside surface covered with shining mica, a typical production of the Indus delta. Also of probable Indian origin is a fragment of grey stone with a carved decoration looking like a lotus flower. The summit of this layer and of the structure, just under the collapse, was covered with a large amount of pearl oysters, most of them complete and some others with a hole in the middle of the shell, and it therefore seems possible that this area was devoted to some kind of activity connected with the pearl production and/or trading.

4. The topographic survey of the ancient city (E. Régagnon & O. Barge)

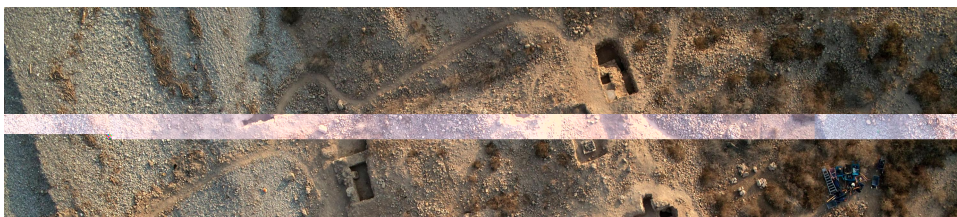
The topographic survey of the ruins of Qalhât is a main part of the Qalhât French Project, which must lead to reconstruct the map of the medieval town, and allow the building of a 3D model. This kind of representation is an interesting way to give a meaningful illustration of the historical heritage of Oman to the public. The survey was realized thanks to a two years sponsorship of the Total Group, Paris, by an agency specialized in topography and aerial photographs in the field of archaeology (geofil.fr@gmail.com)

Last year, a digital elevation model (DEM) of the ancient city of Qalhât and its surroundings has been built from topographic points acquired with a DGPS (see 2008 report). The aim of the 2009 mission (25 November to 10 December) was to achieve the map of the city itself: districts, streets, squares and when possible, buildings. The main problem we had to resolve, is that some districts are quite simple to understand – it is possible to delineate buildings, even sometimes rooms in the buildings – as others are far more complex – only streets and blocs of buildings can be identified. Therefore, we had to be pragmatic: use all the information of all types we have, and adapt the method of recording to the field complexity. We so use a DGPS to record the archaeological remains when it was possible, in the South district or in the North-East district for example; in other areas, we first identify main streets and buildings (or blocs of buildings) on aerial photography, we digitized it with GIS software, then transfer it to the GPS receiver, and finally control the photointerpretation on the field.



DGPS recording in a complex zone

We also use a kite with a camera and a remote video control to make our own aerial photography, both vertical and oblique. We previously recorded some painted ground control points with DGPS in order to georeference the vertical shots. This layer in the GIS, completed with oblique views, will be a great help to distinguish afterwards, with a better accuracy, the buildings in complex zones.



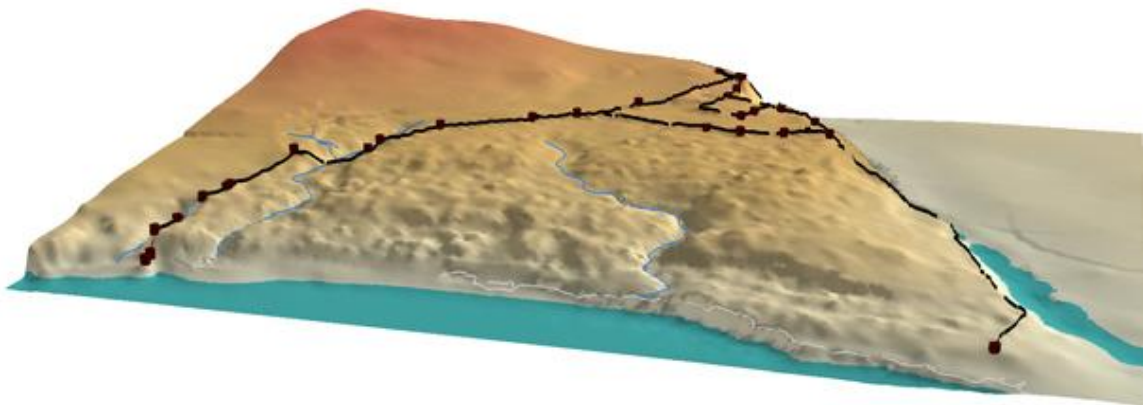
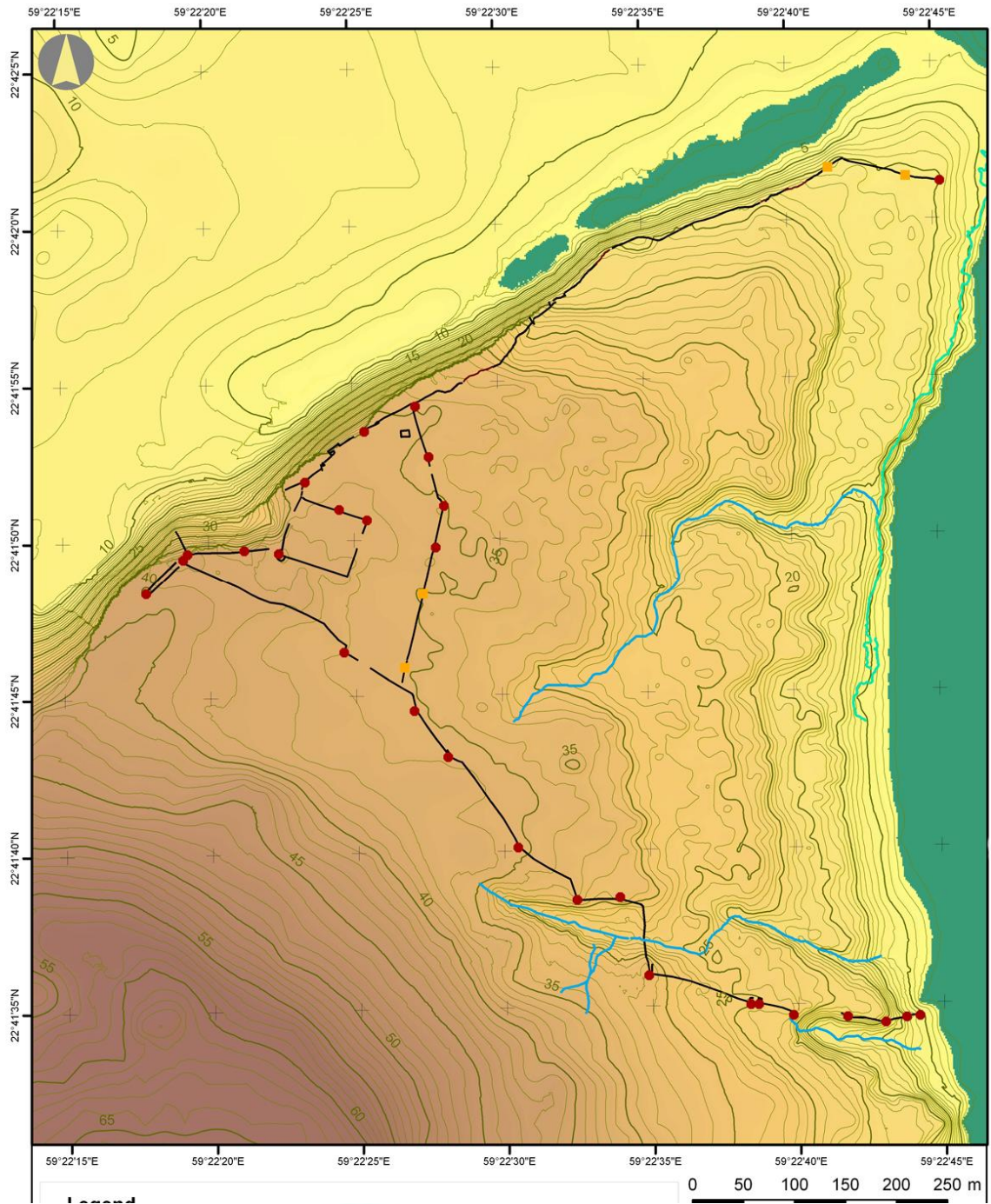
Vertical kite view of the mosque



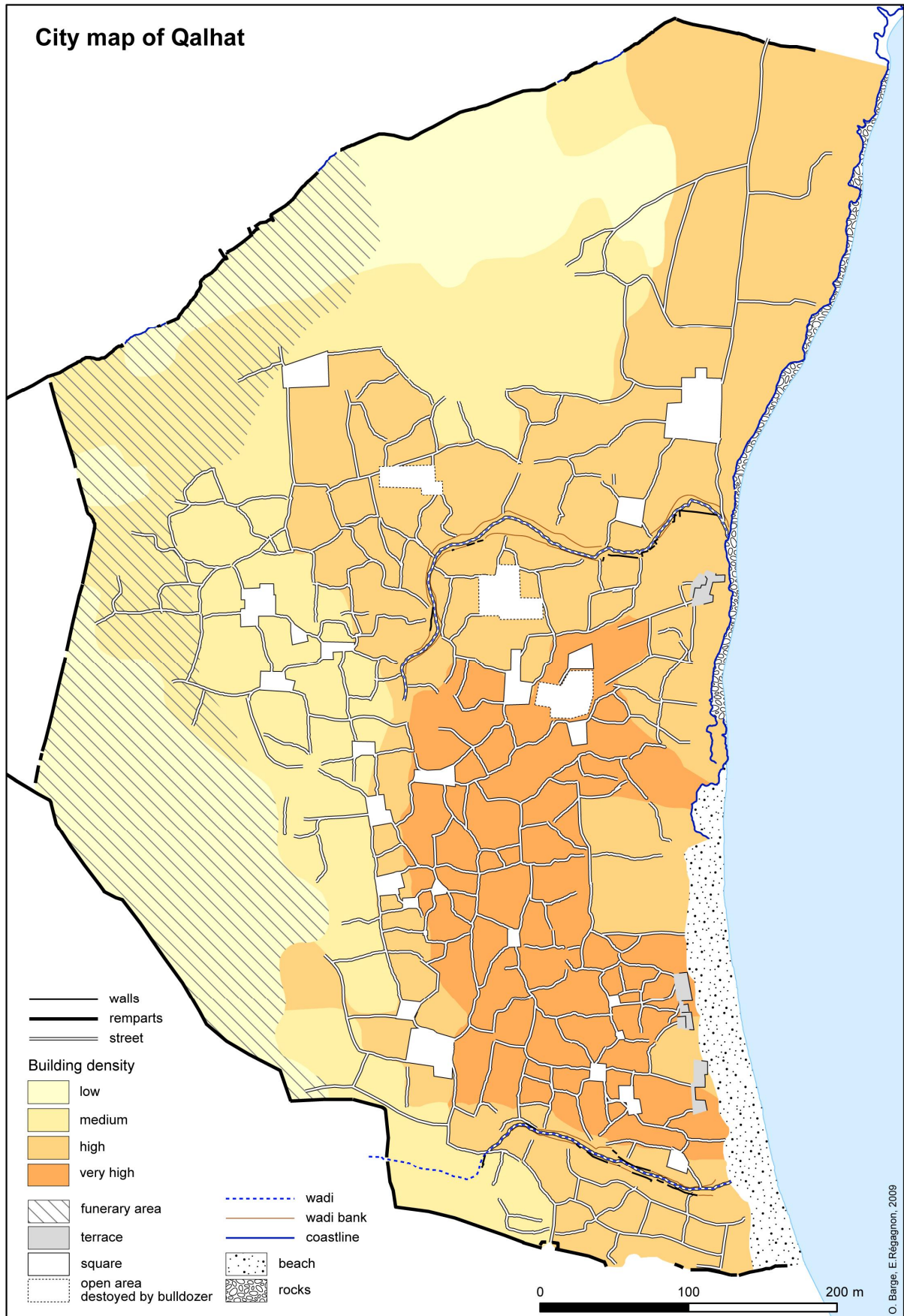
Oblique view of the northern part of the site. In the background, the 2008 French excavations in the northwest quarter of the city (B19 and B21)

Subsequently we record all the information we can, in order to achieve the work in post-treatment. At the moment, it is possible to introduce a preliminary map showing the street network, the squares, the funerary areas and the main districts, with an estimation of the building density. We also draw the main terraces on the front beach. Actually, we often managed to understand the open spaces (as squares) which are usually built with a system of terraces allowing the control of the natural declivity of the ground.

A more detailed map, with all the buildings (and terraces) we record would be available after the pos-treatment work. The recording of the relative elevation of the buildings must lead to a 3D representation superimposed on the DEM collected last year. Unfortunately, the most complex zones will only be described as a general level. After 16 days of field work, we can estimate that 8 extra days would permit to have more detailed information in these areas. A new mission next year would be most useful to finish this work : it can be completed with the recording of the funeral structures and the *extra-muros* buildings. A survey of the surroundings can also allow understanding the defensive system (towers and walls to the South) and the possible system of water supply of the city.



Contour line plan and Digital Elevation Model of the site of Qalhât



Preliminary map of the medieval city of Qalhât, showing the streets and squares, and the building density

Conclusions

The second season of excavation of the Qalhât French Project therefore brought unique pieces of information on the history, development and urbanism of the harbour city. First, researches in the northeast quarter, at B16 and B38, confirm the data yielded last year from excavations in the northwest and central quarters that most of the peripheral districts of the town were inhabited rather late, not earlier than the end of the 13th century. This was really the period of main expansion of Qalhât, when it became the second capital of the Hormuzi kingdom, and probably mainly from the time it was ruled by Ayâz and his wife Bîbî Maryam, around 1290-1320. In the 12th and early 13th centuries the city was much smaller, limited to the area in front of the beach, around the mosque.

As a matter of fact, the presence of an ancient mosque in the B12 area is rather certain, although the construction of the building ordered by Bîbî Maryam, around 1300 probably, destroyed nearly all vestiges of this former shrine. Traces of this early period were found in 2008 in the stratigraphical sounding against the *qibla* wall and further evidence will have to be searched in the nearby area of B13, maybe the residence of the governor of the city, which also delivered early ceramic wares this year.

The topographical project sponsored by the Total Group was achieved this season, although a final mission next year should be useful to complete the survey of the surroundings of the city. Most of the streets, squares, terraces and buildings or blocks of buildings were registered and the general urbanism of the city studied. A general plan of the city will be produced after the treatment of the field data on Arcgis software, and the production of a schematic 3D computerized model will probably be possible.

Further reflexions and studies must now be done on all these data before being able to give a detailed research programme for the next mission, which will be held in the same period, from around the 1st of November to around the 15th of December 2010. Given the results of this season, the preliminary planning is to start excavations in the large building B13, to complete the work in the northeast courtyard between B13 and the mosque B12, and if possible to study one private house in the ancient quarter of the city.