EXCAVATION AT KHIRBAT AL-MUDAYNA AND SURVEY IN THE WĀDĪ ATH-THAMAD: PRELIMINARY REPORT ON THE 2008, 2010 AND 2011 SEASONS

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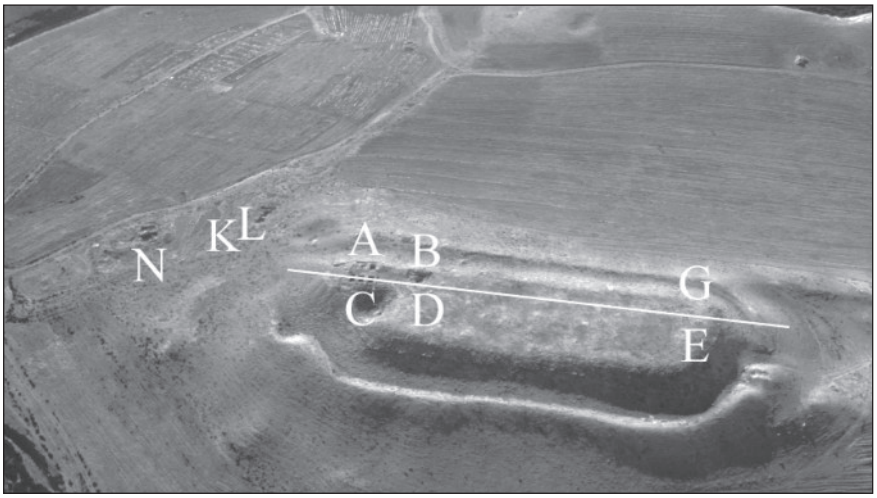
Introduction

Three seasons of archaeological excavation were carried out from 16 June - 25 July 2008, 21 June - 28 July 2010 and 27 June - 3 August 2011 at Khirbat al-Mudayna (Thamad), both in the fortified Iron Age town and the Nabataean-early Roman settlement. Additional documentation and mapping was undertaken in 2010 by the Wādī ath-Thamad Survey team at Khirbat al-Hirī, directed by J. Ferguson[1]. The senior project director was Dr P.M. Michèle Daviau; Dr Robert Chadwick and Dr Michael Weigl were Associate Directors. Team members included scholars, volunteers and students from Canada, the United States, the Netherlands, Denmark, Austria, the United Kingdom, Saudi Arabia and Jordan. Robert Mittelstaedt was camp manager and was assisted with photography in 2010 by John Kantor; Natasha Dilke was the chief photographer in 2011. Local workers also assisted the team each season. This report will present the results of excavation in Fields A + C (north) and Fields B and D on the mound (**Fig. 1**). Also included are the results of excavation in Fields L + K (Reservoir 700) and Field N (House 800), structures dated to the Nabataean-early Roman period. Intensive documentation was carried out at survey site WT-12, a large Nabataean settlement in Wādī Shābik. Additionally, mapping was completed at Khirbat al-Hirī and at sites in the north-western part of the survey region.

Fields A + C (North) (Robert Chadwick)

The first section of this report will discuss work undertaken in Fields A and C, directly north of North Gate 100 during the 2008 season. The second section will discuss the 2010 excavations of the so-called 'moat' in Field B outside



1. View of Khirbat al-Mudayna showing location of excavated Fields.

1. The Wādī ath-Thamad Project is sponsored by Wilfrid Laurier University, Waterloo, ON, Canada, and was funded in part by the Department of Archaeology and Classical Studies. Additional funding was provided by the Deutsche Palästina-Vereins and by friends and colleagues.

2. Plastered north face of Bastion 1000, sealed by Vorplatz fill layers and surface plaster (A14:43).

the walled portion of the Iron Age II town (see below).

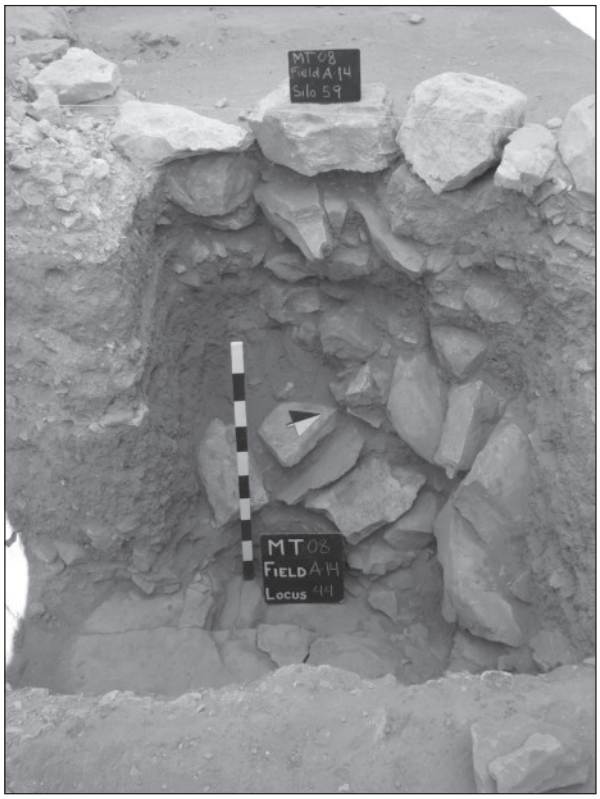
The 2008 excavations focused on understanding the construction phases of gate bastions B1000 and B1500, and their relationship to the in-ground silos and the large *Vorplatz* area immediately to the north. Work in Squares A14 and C94 exposed the exterior faces of bastions B1000 and B1500, whose exterior north wall surfaces were covered with a layer of yellowish-white plaster with straw temper (white [2.5Y 8/2] and yellow [10YR 8/6]; **Fig. 2**). In previous seasons, similar plaster layers have been exposed on a number of exterior wall surfaces in the Gate 100 area and elsewhere on the site.

Directly in front of bastion B1000 were a number of horizontal fill layers approximately 1.25-1.50m deep, consisting of angular white limestone pebbles, layers of reddish soil mixed with river-rolled gravel, and thin lenses of lime powder. All of these fill layers sealed against bastions B1000 and B1500. Of interest was locus A14:43, a reddish plaster surface which runs up to the base of bastion B1000. This layer is different from the plaster on the north face of B1000; it is redder in colour and contains pebble or sand temper instead of the vegetable temper found in plaster used on exterior walls. It is also harder because of what appears to be a small amount of lime powder. Locus A14:43 is situated on top of a layer of soil mixed with pebbles and cobbles between 0.02-0.15m thick, applied directly onto the bedrock to smooth out the natural rock where it is uneven and make a suitable subsurface for the application of plaster locus A14:43. This horizontal plaster layer was exposed over an area measuring 3.00-2.25m, but it no doubt covers a larger area in front of the original gate entrance. Owing to the lack of any artefacts, ash or signs of pedestrian wear, it is uncertain whether plaster layer A14:43 was an artery of pedestrian circulation and whether it was in service for any length of time.

As in previous seasons, excavations revealed that the same kinds of fill material were used throughout the construction of the subterranean surface of the *Vorplatz* area to the north of the gate. Soil, cobble and pebble fill layers such as A13:30 and A13:32 are similar to loci located elsewhere in front of North Gate 100. The 2008 season's excavations exposed the exterior faces of the silo walls and confirmed that three of the in-ground storage installations (Silos 20, 50 and 59) were all sealed by alternating horizontal fill layers.

Silo Support Installations

Cobbles and small boulders that served as silo support installations were exposed in Square



3. Support installation placed against the outer wall of Silo 59.

4. Support installation abutting exterior of Silo 20 (top left); bedrock (lower center).

5. Square C94: Silo 50 wall (right); support installation (center above bedrock); exterior plaster of bastion B1500 (left).

A14, abutting the exterior of Silo 59 **(Fig. 3)**. Comparable silo support installations employing similar construction techniques and consisting of conglomerations of cobbles and small boulders were used to reinforce the outer wall (A13:37) of Silo 20 (**Fig. 4**). While the boulders abut the outer face of the silo wall, fill layers composed of soil, pebbles and cobbles (A13:30, A13:32) seal against the support installation. Excavations in Square C94 exposed a similar support installation which abuts the exterior face of the wall of Silo 50 (**Fig. 5**) and then continues for 0.50m where it also seals against the plaster (C94:34) on the north face of Bastion 1500.

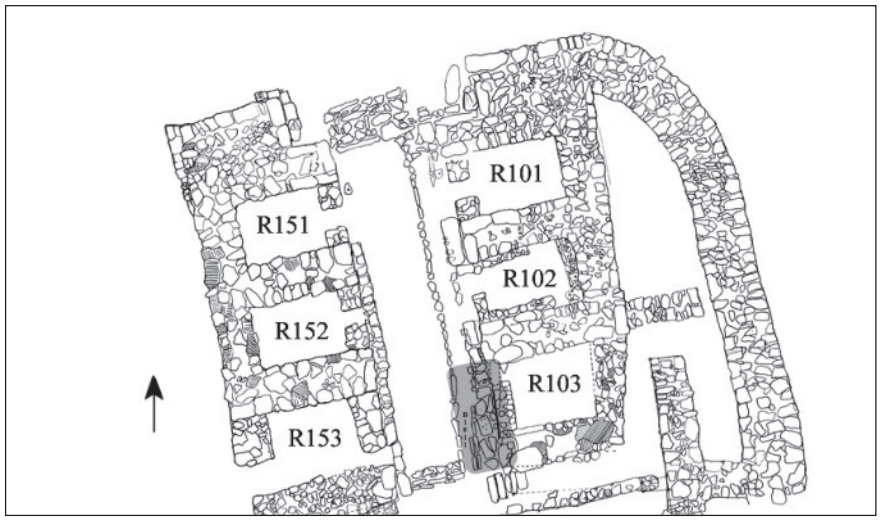
Tower 1013

The second task undertaken during the 2008 season was the excavation to bedrock of the area north of Tower 1013 and west of the cultic standing stone installation. Horizontal fill layers seal against support installation A13:33 outside of Silo 20; they also seal against the northern and western faces of the Tower 1013 making it clear that the tower was built before the fill loci were laid down around it. Excavations exposed the outside corner of a few of the top-most stones of Silo 20, clarifying the relationship between Tower 1013, Silo 20 and the underlying horizontal fill layers consisting of cobble, pebble and soil loci, similar to subterranean loci located elsewhere in the *Vorplatz* area. The similarity between these diverse loci found in various probes under *Vorplatz* S120 indicates that the fill material is the same across the entire area and that all fill material was laid down at the same time against the bastions and around the silos.

Field A (P. M. Michèle Daviau)

Introduction

As excavation progressed in the domestic and industrial building in 2011, it became apparent that certain features of the architecture could be used as indicators of remodelling in the buildings themselves. This realisation led to unanswered questions regarding the third room on the south-east side (R103) of North Gate 100. This room was clearly built after Inner Casemate Wall 2002 had been constructed, since the east wall of Room 103 (W1010) was on an angle to accommodate the position of Wall 2002. In order to answer the many questions concerning the history of the gate architecture, the remaining stones of Bench 1011 (**Fig. 6**) along the east side of Central Road S104 were dismantled to reveal the footings of the south Pier (W1004) of the northern two-room gate unit (Rooms 101+102), the west wall of Room 103 (W1006) and the south Pier (W1005) of the third room (R103).



6. North Gate 100 showing area of excavation of Bench 1011 (in gray) west of R103.

The principal features include:

W1004	A15:22 = A16:7	East - west Pier Wall: north wall of R103
W1005	A16:8	East - west Pier Wall: south wall of R103
W1006	A16:2	North - south secondary wall: west wall of R103
W1010	A16:6	North - south exterior wall: east wall of R103
B1011	A6:19 + 22	Bench on east side of gate road: S104
	A6:50	Threshold in Doorway F into R103

Results

The topography of the site necessitated the creation of deep fills along the east side that extended from the bedrock exposed in the central road (S104) to the footings of the Outer Casemate Wall (W2002), located at a depth of *ca.* 3.94m below the roadway. It was assumed, based on previous excavation in 1996, that the south room (R103) was an addition, built after gate Room 102 to which it is attached. While it is clear that the east wall of R103 abuts the south pier wall (W1004) of the eastern two-roomed unit of Gate 100, the sequence is now better understood with the removal of Bench 1011. The excavation area was located in Square A6 and extended for a length of 5.00m beginning just north of Stairs A7:19, which were built up against the south face of Wall 1005. The bench (**Fig. 7**) had been constructed along the eastern side of Street 104, against the west face of the pier walls (W1003, W1004 and W1005) and, as a result, concealed the west face of wall W1006 and the outer side of Doorway F into Room 103.

7. Bench 1011, upper course with edging stones (A6:46), looking south.

8. Exposure of cobbled construction surface along the west face of Pier Wall 1005 with edging stones A6:46 and drain stones (A6:40) in the foreground, looking east.

9. Doorway F with base stones on same level as base of Pier Wall 1004.

The lowest soil layer (A6:53; **Fig. 8**) consisted of a layer of large angular cobbles and pebbles, most probably just above bedrock (A6:41) given the elevations on bedrock in Drain 105 running along the west side of A6:53. This layer appears to be the principal construction surface for the southern pier (W1004) of the two-chambered eastern portion of the chambered gate, as well as for the threshold of Doorway F (A6:50), the secondary west wall (W1006=A16:2) and the southern pier wall (W1005). All of these walls and the threshold were levelled with small chink stones above the cobble layer, while the southernmost Pier Wall (W1005) was footed on a row of protruding stones (A6:48), of which the northernmost stone also supported the south end of Wall W1006. This discovery is a great significance for understanding the sequence of construction in the gate area, although it raises additional questions that will need serious reflection.

Threshold A6:50 in Doorway F (**Fig. 9**) was also footed on Cobble Layer A6:53, chinked with pebbles, and formed of two courses of small boulders that filled the space between the south face of Pier Wall 1004 and the north end of Wall 1006 (0.74m). The threshold was 0.37-0.40m thick and stood 0.28-0.31m in height; Cobble Layer A6:52 sealed up against it and Pier Wall 1004.

Above the heavy cobble layer was a soil layer (A6:52) with smaller cobbles and pebbles which sealed against the threshold and both the footing stones (A6:48) of Pier W1005 on the east and a single row of stones (A6:46), 3.75m long, that formed the west edging of the area where Bench 1011 was installed. When found, this stone row ran parallel to the eastern row of drain stones (A6:40) which extended 13.18m along the east side of Roadway 104. At the south end, a small curb stone extended east-west linking the bench edging stones to the foot of Staircase A17:19, possibly to channel water away from the footings of the walls of R103.

The cobble layers (A6:52, A6:53) were covered with a hard-packed soil layer (A6:49) which included an ash lens adjacent to the west face of Pier Wall 1005, suggesting that this was a use surface in the space (*ca.* 0.70m wide) between the edging stones and the walls of Room 103. A certain amount of build-up was noted with the presence of another soil layer (A6:47) which contained animal bones, a small number of ceramic sherds, ash pockets and oven fragments. This layer was compressed, probably owing to the weight of the lower course of bench stones and their underlying makeup. The bench stones (A6:45) themselves consisted of large cobbles and small boulders (see **Fig. 10**) which, along the west edge, were roughly hewn in a rectangular shape. These stones were put in place above the edging stones (A6:46) and packed with plaster.

10. Lower Bench stones (A6:19 = A6:43) against Pier W1005 with edging stones in foreground.

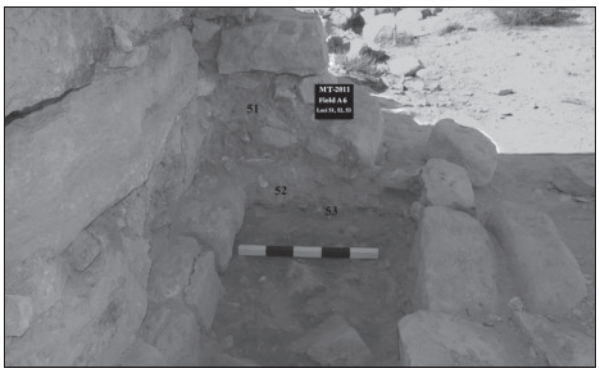
The lower course was comparable to the northern extent of Bench 1011 and included two sub-rectangular stones placed east - west which protruded into Doorway F above Threshold A6:50, forming a step out of Room 103. The soil surrounding the bench stones was packed, becoming looser below them.

When the south end of Bench 1011 was remodelled with the addition of an upper course of large boulders (A6:22 = A6:42) for a length of 2.10m, the west edge was faced with vertical stones and plastered. At this stage, the bench covered the lower step of Staircase A17:19 + A7:40). The bench stones were only partially preserved in 2011 and much of the soft limestone had eroded and was mixed with the wind-blown soil (A6:0.5), forming a crusted surface.

A similar sequence can be seen in the south balk (**Fig. 11**) which reveals the build-up under the steps of Staircase A7:19. Here packed soil with cobbles (A6:51) appear to be superimposed on the two cobble layers (A6:52, A5:53), again supporting the supposition that the third room was built in the same construction event that saw the establishment of the northern gate rooms.

Field B (Robert Chadwick)

Early explorers claimed that the site of Khirbat al-Mudayna was surrounded by what they called a 'moat'. This term is a misnomer and, in this report, trenches or earthworks built for defensive purposes will be referred to as 'ditches', a term which more accurately describes their function. Over a century ago Brünnow and Domaszewski[2] noted the main features at Khirbat al-Mudayna including its 'Graben', for which they include a section drawing (1904 I: fig. 15). Alois Musil took note of what he believed was a ditch (1907: 300, fig. 137) as did Glueck: "about half-way down the slope is a wide ditch or dry moat, which encircles the entire mound" (1934: 13). Glueck also published an aerial picture, in which the site looks flat and rectangular, hinting at the possibility that the top of the mound was shaped by some kind of large podium-fill. However, excavation of structures footed on bedrock inside the town demonstrates that this was not the case.



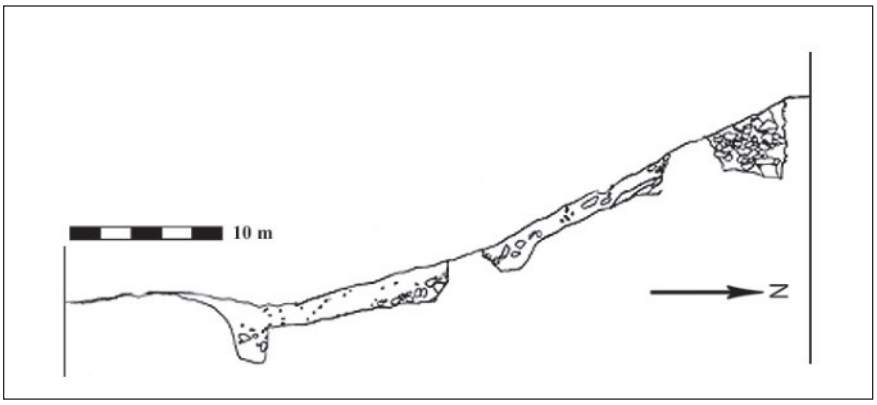
11. Soil layers under steps of Staircase A17:19 with footing stones A6:48 (left) and edging stones A6:46 with the east - west curb stone (right).

The goal of the 2010 season was to determine the nature and function of this exterior 20-25m wide earthwork which surrounds the site on at least three sides, outside of and below the outer casemate wall. Previous excavations undertaken in 2001 at the south end of the site established that although there was a built-up layer of fill which covered some irregularities in the terrain, including a very deep natural hole in the bedrock, there was no evidence for any kind of purpose-dug ditch designed for defensive purposes. There was, however, a natural syncline of the bedrock.

At the opposite end of the site, 150m to the north, extensive excavations in Fields A and C north of Gate 100 have not exposed any kind of ditch, only the natural incline of the geological formation underneath the site. The 'moat' hypothesis, so eagerly embraced by early explorers (none of whom actually excavated at the site) has not been demonstrated.

A line of three squares, B57, B47 and B37 (**Fig. 12**), all running east-west and perpendicular to the outer casemate wall (W2001), were opened during the 2010 season. The horizontal surface of the eastern-most square, B57, was nearly flat with a 2° slope to the west. In B47, the next square to the west, the escarpment increased rapidly from 3° to 17°. The slope continued to increase until it reached square B37, the square closest to the outer casemate wall W2001, where it reached 25° of declination. Beginning a few centimetres below the topsoil surface, all three squares contained clearly de-

2. Brünnow and Domaszewski (1904) provide a description of "Die Römerstraβe von Mâdebâ bis Petra", made on 3 April 1897.

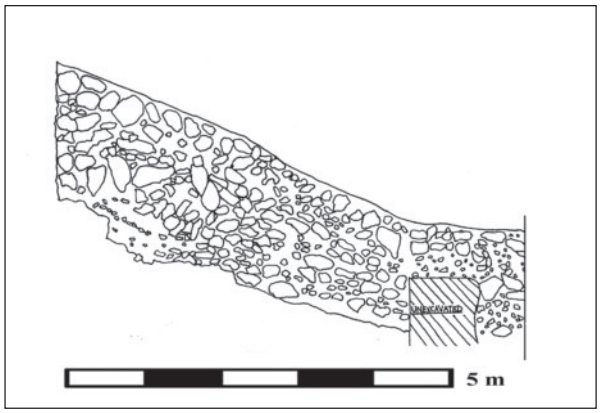


12. Section drawing from 2001 excavations in Field F; south end of Khirbat al-Mudayna showing a naturally occurring geological formation rather than a purpose-built ditch.

finable layers of deliberately laid fill consisting of pebbles, cobbles and soil, with the occasional small boulder. The excavators believe that this material constitutes a glacis.

The deposition exposed in these three squares can be divided into two categories. To the west, beginning on the outside of casemate wall 2001 and sealing against it, was a layer of large cobbles and small boulders, up to 1.61m deep and piled up in a steep 25° angle against the lower portion of the eastern face of the outer casemate wall (W2001; **Fig. 13**). Easily mistaken for wall tumble, on closer inspection the tight and systematic way the stones were positioned suggests that they were placed against the base of W2001 to steepen the slope of the glacis, and were then covered with a layer of soil to protect and preserve them from the elements. Unlike the lower courses of the casemate wall W2001, which consist of very hard chert boulders, the glacis deposition had few hard chert stones; about 50% of it consisted of friable limestone, some of which was badly crumbled and decayed. This seems to argue in favour of the soft limestone being specifically placed at the foot of the casemate to add support to it.

A second type of deposition was exposed farther downslope to the east, starting in Square B47 and continuing eastwards. In this square, directly underneath a locus consisting of pebbles and soil, a subterranean retaining wall (B47:2) of roughly rectangular cobbles was exposed. This retaining wall runs parallel with the outer casemate wall located approximately 10m upslope to the west. Made of the softer, chalky white limestone abundant in the area, this low wall was



13. Deposition against Outer Casemate Wall.

14. Six excavation terraces in Field B: Square B47 (foreground); Square B37 (background).

never meant to be exposed to the elements which would have destroyed it in a matter of decades. Because it runs in two rows parallel to the casemate wall with a low profile of only 2-3 courses, it is doubtful whether this wall could have served as anything other than a parallel support installation to hold the sloping soil layers in place. Elsewhere on the site, similar subterranean support installations consisting of loosely scattered revetment installations – which fan out to the north of the gate entrance – have been exposed in previous seasons. Subterranean supports are likewise seen surrounding the numerous silo wall support installations mentioned above. Since this was a well-known method employed at Khirbat al-Mudayna, we should not be surprised to see it used in the construction of the glacis.

As excavations in the three squares progressed, tip lines where containers of soil and stones had been dumped were clearly visible in the balks. The approximately 1.60 to almost 3.00m deep multiple layers of soil, pebbles, cobbles and small boulders were part of a large flat-lying retaining feature, which constituted a subterranean revetment system of stones that extended under a large part of the eastern glacis and probably continued around most of the site.

Glacis 3001

The glacis at Khirbat al-Mudayna is an ever steepening earthwork (**Fig. 14**) beginning near the foot of the outer casemate wall and continuing eastwards for approximately 25m. The glacis acted as a support to cover the foundations of the casemate circumvallation wall, protecting it from effects of rain and erosion. The lower portion of the glacis is 5-6m higher than the surrounding terrain; its defensive nature becomes apparent when it is approached from the level of the modern cultivated fields. The lower portion of the glacis is nearly flat, even slightly concave towards the centre, which may be one of the reasons why earlier explorers approaching from the east thought it was a 'moat'. It then ascends upwards on the west, reaching a slope of 25° as it seals against Outer Casemate Wall 2001. It is likely that the glacis was constructed to put attackers at a disadvantage, since the slope would have slowed down their progress as they approached the walls, making them easy targets for defenders. By building a sloping, 25m wide

15. Casemate wall W2001 construction footed on bedrock.

open area below the walls, the builders created a 'danger-zone', a kind of no man's land, where attackers had no cover in their final dash to the walls. The glacis offered defenders one additional advantage: it made the use of wheeled siege engines of the type used by the Assyrians during the same period much more difficult.

Casemate Construction

A 2m wide section of Wall W2001, the outer face of the circumvallation wall, was exposed and its foundation excavated to bedrock (B37:12; **Fig. 15**). It was determined that wall W2001 was footed on B37:8, a series of small, flat boulders running perpendicular to the wall. These hard chert stones had been leveled and placed on a top of a 0.30m thick layer of reddish-brown soil mixed with pebbles and small cobbles. This layer was situated between the bedrock and the casemate foundation stones, and resembled closely in texture and material the soil, pebble and small cobble fill material (A13:35) underlying the plaster road surface in front of North Gate 100. Construction of the casemate wall was similar to the thick wall con-

struction methods used in other parts of the site and one may speculate that wall, tower and gate construction were all done at the same time by the same group of builders. Like structures elsewhere on the site, the exterior was covered by a layer of yellow chaff tempered plaster similar to plaster traces found elsewhere in the gate area.

Conclusions

The 2010 season's excavations, reinforced by the work done in Fields E and F at the south end of the site in 2001, confirmed that the site is surrounded by a 25m wide soil, pebble and cobble glacis, but not a defensive ditch. Finally, although there was no clear evidence for a beaten earth surface or paving stones for a paved road, it is possible that the existing pebble and earth surface may have been used as a roadway. Even today, local people still use the lower section of the glacis as a path or roadway to gain access to certain parts of the site. There is no evidence that the glacis ever connected to a gate at the south end of the site, nor is there any evidence that it connected with the six-chambered gate at the north end of the site.

The Street (E. Kate Johnston)

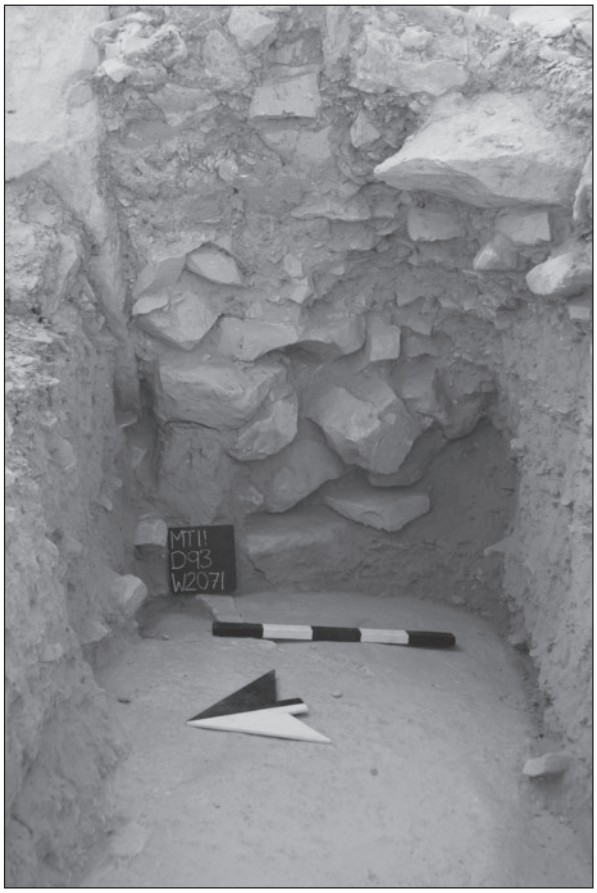
With three seasons of excavation now completed in the street between Fields B and D, it is possible to draw some conclusions about not only the depositional history of the street itself, but also the relationship of the architectural elements in both fields to the street and to each other.

Construction of the Street

The street was built up over an unknown period of time on top of the bedrock outcropping that makes up the foundation of the hill. The varying height of the outcropping means that the thickness of the street and the street levels are not uniform, even across a single square (**Fig. 16**). The southernmost excavated portion of the street is also the thinnest; bedrock level was reached after approximately 1.5m of sediment was removed. However, even within that small area, the variation in bedrock height is nearly 40cm. As the street goes north, the bedrock sinks further.

The street appears to have been built on a peak of the hill. The excavation of Building 210 revealed much lower bedrock heights to the east and west of the highest point of the street. The buildings in Field D have not yet been excavated as far south as those in Field B, but B300 (Daviau *et al.* 2008: fig. 6) also has a floor that is below street level, indicating that the bedrock sinks to the east and west, as well as to the north (**Fig. 17**).

16. South Balk, showing bedrock outcroppings and variation in height.



17. Bedrock sinking towards B210, the southernmost pillared building.

Each street layer was laid down in two discrete parts. First, there was the intentional deposition of clean brown soil, and then a slightly thicker accumulation of refuse that includes bone and ceramic sherds. The topmost level directly below the topsoil is grey wash, thicker towards Field B to the east. This layer is found over the street in all three excavated squares. There are only two street layers above the bedrock in the southernmost square (D93), although this number increases in the squares to the north.

Relationship to the Architectural Elements

The primary goal of the 2011 season was to determine the relationship between the depositional history of the street and the construction of the buildings in Fields B and D. This work was begun in 2010, with the excavation of the doorways into B205 and B210, but the primary objectives were not achieved until 2011.

As **Fig. 18** illustrates, sections were excavated east-west across the street to link the architectural features on each side. In D93, this was exposed to bedrock, revealing that the buildings in Fields D and B were founded on bedrock and that the street then sealed up against them.

While bedrock was not exposed in D92, excavation still showed that the street sealed up against the building elements on both sides. This was most clear in the position of the threshold stones, which are visible in section as having been put on top of older street levels and are sealed against by the more recent ones (**Fig. 19**).

18. Excavated probes in D92 (left) and D93 (right), looking east.

19. Threshold stone in D92 with associated street layers.

Conclusions

It seems clear enough from the excavation that the street was constructed following the primary construction phases of the buildings on either side and that the access ways to said buildings were adapted as the street level became higher, likely to deal with issues of flooding. Furthermore, the street was leveled deliberately, in discrete layers, in order to compensate for differences in the height of the bedrock outcropping.

While fairly simple, the conclusions obtained by excavating the street in the 2011 season are important for the overall interpretation of the site. They also raise some additional questions to be explored in later seasons, such as what the inhabitants of the buildings did before the street was installed, how the bedrock was cleared and how the inhabitants coped with the variation in bedrock outcroppings while constructing the street.

Field B (Michael Weigl)

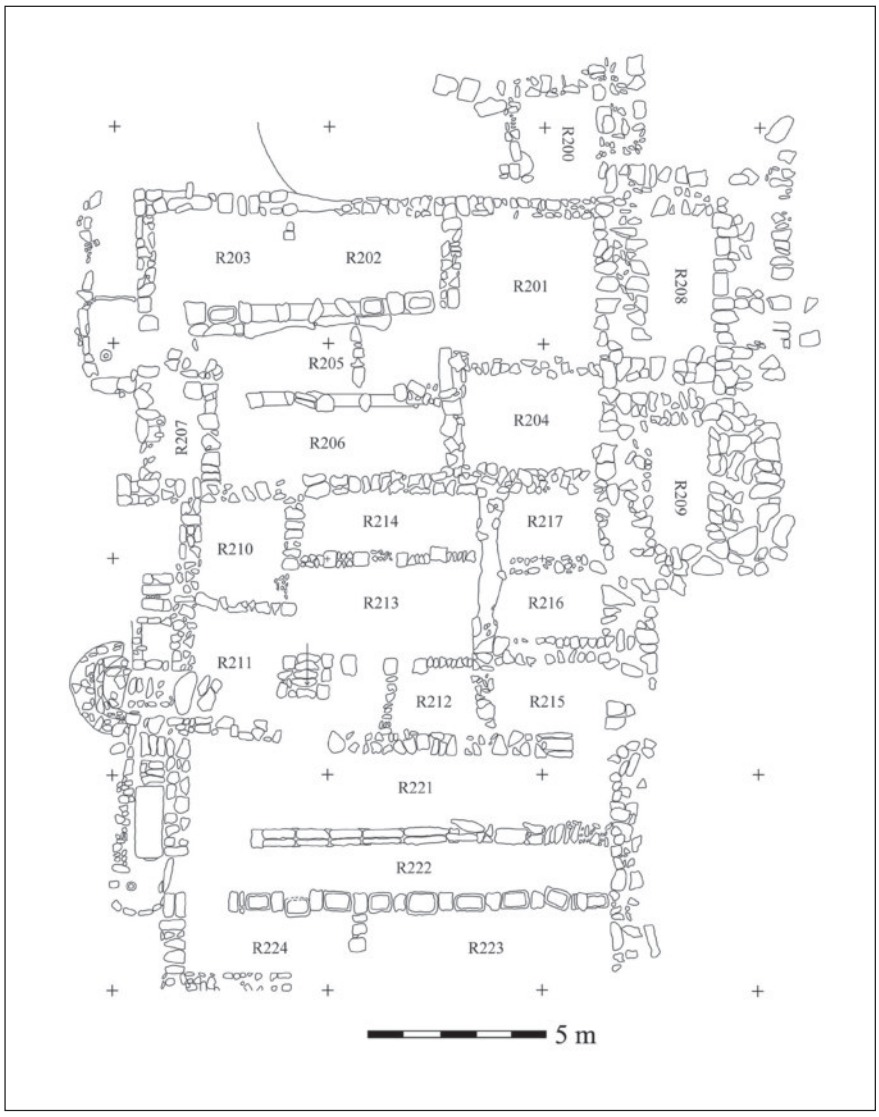
Archaeological work in Field B during the 2008, 2010 and 2011 seasons concentrated on the close investigation of stratigraphical sequences in industrial buildings B205 and B210, which have been excavated continuously since the 2006 season (Daviau *et al*. 2008). In both buildings, the latest occupational layers had already been reached in 2008, yielding yet more evidence of their industrial character, their intense use over an extended period of time (e.g. frequent wall repairs recognized by the insertion of ground-stone tools in a secondary context)[3] and their violent destruction by fire and subsequent collapse. Textile related production

3. This observation was first noted by Steven Edwards, supervisor in Field D.

activities in tripartite B210 were prominent in the north (R221) and south rooms (R223) which were, in their latest phase, both covered by an extensive flagstone pavement built over several constructional and short-lived occupational phases superimposed above bedrock. Several heavy duty grinding implements fallen from above, in particular two large-scale industrial saddle querns, were uncovered in R223, which had at a very late phase been sub-divided by a short secondary wall stub running perpendicular to the building's south wall.

During the past two seasons, the primary research goal was to excavate beyond these latest occupational layers all the way to bedrock in order to obtain a complete understanding of the stratigraphy, phasing, period(s) of use and function of B205 and B210 (**Fig. 20**). These excavations were partially carried out as soundings and partially by full excavation. The central and south rooms of B210 (R222, R223) were also explored to their foundations on bedrock. In the south-eastern room of B205, a sub-floor construction was identified; its secondary relationship is evident in the late addition of a pillared wall (W2025) linking it to B210. In addition, the foundations of the (north - south) Inner Casemate Wall (W2002) and the south wall of B210 were investigated.

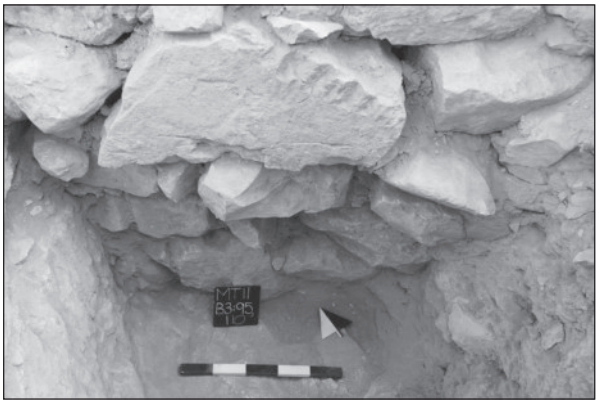
During archaeological investigation it became clear that these two buildings had a much longer and more complex constructional and occupational history than previously assumed. In this regard the occupants had to accommodate



20. Plan of Buildings 200, B205 and B210.

the very peculiar drop of the bedrock's surface from west to east. The entrance porch on the west, lined by a north-south monolithic wall (W2070 and W2071), led down into B210 via three roughly parallel threshold stones and an additional step that fell out of use after the earliest phases of occupation (**Fig. 21**). Here, at the foot of the entrance, the bedrock curves in a very rounded, almost circular shape (**Fig. 22**). This natural feature of the *tall* was used during the earliest phase of occupation for erecting a massive support wall, on which the northern (W2033) and southern pillared (W2034) walls were footed at a considerably later time. This feature was found to extend east, while the bedrock continues to plunge sharply and was covered with layers of boulder and cobble fills to create an even living surface throughout the building. Massive support walls (stylobates) run under the footings of the previously excavated rows of pillars. It became evident that the building must have been used for a purpose other than textile production in its earlier phases, since the basins with their chinkstone support walls were installed above the stylobates (excavated in 2007) and are a late feature of the pillared walls. Thus, tripartite Building 210 originally served a function not yet identified and was then converted to accommodate changing interregional economical needs.

21. Bedrock step supporting the foundation walls for W2033 and W2034.



22. Round bedrock feature with footing of support wall for W2033.

Excavation in 2010 yielded more evidence in support of this theory. Underneath the latest plaster floors that had been reached in the 2008 season, several layers of sub-floor constructions (soil, cobble fill, construction surfaces and very large boulders) were put in place to stabilize the walls of R215, in particular on its west side (W2020) and on the east where all walls abut Inner Casemate Wall 2002. A secondary passageway into the north room of B210 linked R215 in B205 with that building at a much later time, adding a pillared wall and a doorway on its south side (W2025) which was then blocked in the latest stage of construction. It remains undetermined for the time being as to which rooms / buildings R215 was linked initialty. Further research will help determine these issues left unsolved at the end of the 2011 season.

In future field seasons, additional investigation into features of B200, B205 and B210 will be necessary: excavation of the casemate rooms on the east side of B205 and B210; excavation of the storage cellar in B210 (Square B3; Daviau *et al*. 2008: fig. 4) and excavation of the large sink hole / depression at the very north of Field B / south of Field A. The street to the west of these buildings will need to be revisited in future seasons (see Johnston, this article), as architecture will have been exposed to their east, and the western outer walls of B205, B210 and the support walls of the monolithic porch at the entrance to B210 have been consolidated by specialists to avoid destruction of architecture.

Conservation, Consolidation and Preservation

In order to protect the walls of the exposed buildings, extensive backfilling was carried out in Fields B and D. All squares in B210 and in Room 215 of B205 (**Fig. 23**), as well as several probes in D92 and D93 (**Fig. 24;**see also **Fig. 18** above), were carefully backfilled with boulders and fine soil to the height at which excavation had halted in previous seasons. On top of the soft soil fill, cobble stones were placed in

23. Building 210 after backfilling with soil and cobble layers.

24. Square D92 after backfilling and deposition of cobble layer.

patterns to indicate the termination of archaeological activity in these areas, to preserve the stratigraphy and support the walls. Extensive backfilling was also undertaken as a conservational measure in all of the excavation units in the centre of and to the east of Field D. In areas where future excavation is pending, layers of thick plastic were put over the unexcavated soil in order to facilitate the identification of previous seasons' stopping points at the beginning of future ones.

Backfilling is an important step towards future site management, with the aim of indicating completion of excavation in some areas whilst making them visually attractive for visitors to the site. At the same time, re-excavation of these areas will still be possible in the future. In addition, several well-preserved walls in Field B were consolidated by experts from the Mādabā office of the Department of Antiquities at the expense of the Wādī ath-Thamad Project, as a contribution to the protection of Jordan's archaeological heritage (**Fig. 25**).

Also, in compliance with the strategy to maintain the site in a natural and proper condition, a very large dump on the east side of Field B was removed at the end of the 2011 field season. On the very last day of field activities, the large dumps in the Nabataean-Early Roman house (B800) were also removed, clearing the view and preparing for future consolidation of this important feature at the northern foot of the *tall*.

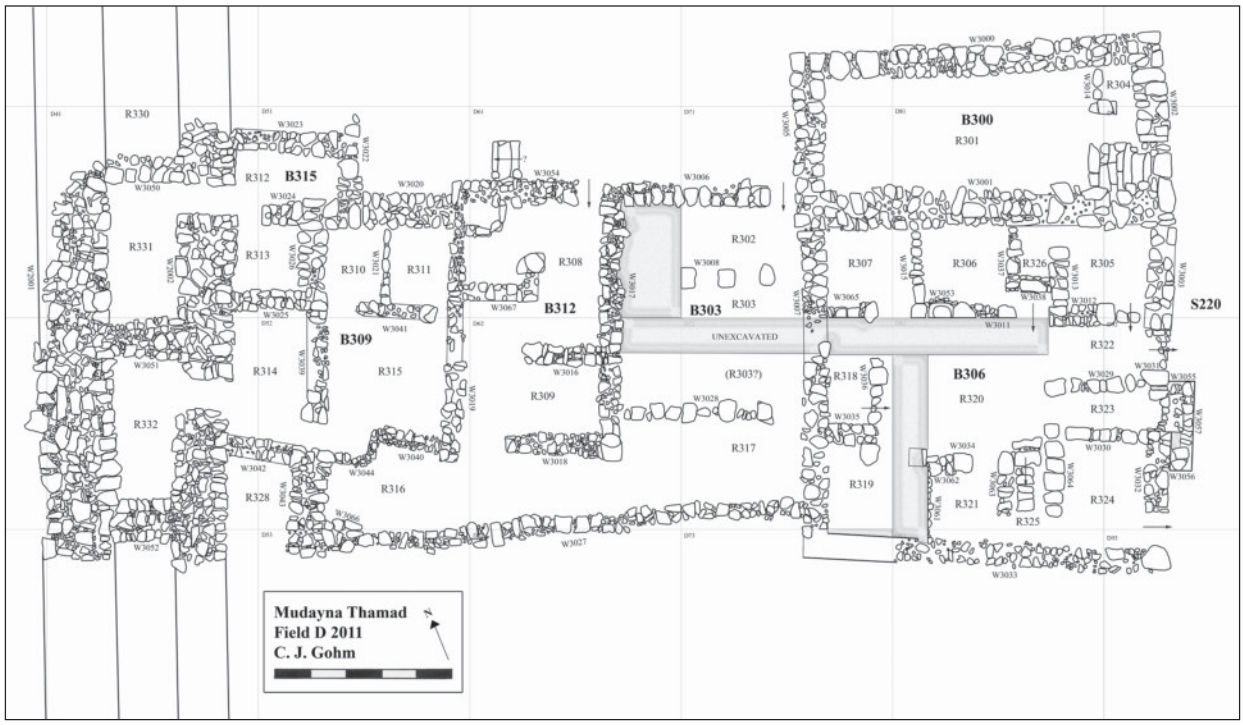
Field D (Christopher J. Gohm and Steven Edwards)

Excavations continued in Field D during the 2008, 2010 and 2011 seasons, and were focused in the area west of Buildings 200, B205 and B210 (the three industrial buildings in Field B). Twelve 6×6m squares were investigated in order to document the layout, stratigraphic history and function of the structures comprising this part of the Iron II settlement (**Fig. 26**)[4]. These excavations resulted in greater exposure within previously-identified buildings B303 and B306 (Daviau *et al.* 2008: 349-350), as well as the recognition of three additional structures (B309, B312 and B315) and the western casemate system (W2001 and W2002).

Although occasional industrial remains were recovered in Field D, the function of this area clearly differed from that of Field B. Specifically, the pottery, installations and artifacts indicated that the buildings served a primarily domestic

25. Consolidated south wall of Building 210, looking east; photo Mr Ali al-Khayyat.

4. Square supervisors were K. Albino, H. Norum and E. Zeran for the 2008 season, V. Cafik, Z. Reilly-Ansons, M. Silver and N. Urosevic for the 2010 season and K. Albino, R. McMullan, Z. Reilly-Ansons and N. Urosevic for the 2011 season.



26. Major wall lines of Field Phase 1 in Field D (in progress).

function. These excavations have yielded one of the largest horizontal exposures of Iron II domestic architecture thus far identified in the region. Based on the layout of the buildings and the nature of the communications between them, these structures appear to constitute several distinct residences. Accordingly, this area has been designated the 'North-West Domestic Quarter'[5]. This residential quarter was separated from the remainder of the Iron II settlement by three walls, the southern wall of B306 (W3033), the long east - west wall south of B309, B312 and B303 (W3027), and the narrow partition wall in B309 (W3042).

Once again, only one occupation phase was documented in this part of the ancient settlement (Daviau *et al*. 2008: 346). Multiple construction and use / modification phases were evident, however, attesting to a relatively long occupational history. The earliest features in the area consist of the western casemate wall, which is abutted by Units B309 and B315, and the previously-excavated B300, which is abutted by B303 and B306. Precise construction phasing in this area is otherwise problematic, as the majority of the walls are footed either on bedrock or discontinuous leveling fills. The following discussion summarizes the key findings associated with each of the five excavated buildings.

Building 303

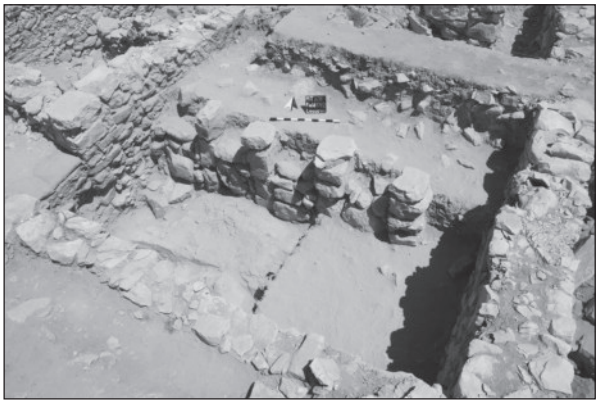
B303 was first explored in 2007 in an effort to better understand the area west and south of the monumental B300 (Daviau *et al*. 2008: 349). Two east-west rooms were investigated (R302 and R303), both of which exhibited evidence of domestic use. During the 2010 and 2011 seasons, excavations were resumed in B303 to gain a better sense of the structure's layout and associated domestic assemblage (Square D72). This work resulted in the identification of the possible southern half of R303 and one additional southern room (R317). These two spaces were divided by an east-west pillared wall; a doorway in the east provided communication between the two rooms. B303 therefore comprised at least three broad rooms (R302, R303 and R317).

The pillared wall in R317 consisted of four

5. It seems likely that second-storey communications existed between several of the buildings in the western part of Field D, as the main floor plans present numerous problems of access (e.g. B309 and B315). Wooden stairs may have been used in these areas.

tall pillars and four low cross-walls. Excavations to the south exposed a boulder pavement (D72:50) and bedrock outcropping beneath a series of collapse layers (**Fig. 27**). Few artifacts were found on this surface, although a restorable krater, two chert pounders, a basalt working surface, several astragali, an industrial hand grinder, a limestone altar fragment, a gaming piece, an anthropomorphic figurine fragment and several other objects were found in the collapse layers above. All of these would likely have been in use on the second floor of B303, further attesting to the structure's domestic function. Prior to the laying of the boulder pavement, the area was prepared for construction. A hard-packed fill (D72:53 / D72:52) was laid to level bedrock depressions in the west; a soil layer (D72:51) was then laid over the fill (**Fig. 28**). The function of R317 is unclear, but it appears as if this area served as a corridor providing access to the southern part of B312. The central part of B303 requires further excavation, as does the possible extension of R317 to the west[6].

27. View of R317 from the west, showing the pillared wall (W3028), boulder pavement (D72:50) and bedrock outcropping used as a surface.



28. View of B303 from the south-east, showing the pillared wall (W3028), southern R317, footings of the westernmost pillar and underlying bedrock.

Building 306

Following the excavation of R305 and the discovery of several high status items in 2007 (Daviau *et al*. 2008:350), a large scale operation was planned for B306 during the 2010 and 2011 seasons. As a result of these excavations, the complete plan of the building has been realized. Measuring 11×10.5m, this structure comprised two eastern hallways (R322 and R323), a western room (R318), four northern rooms (R307, R306, R326 and R305), three southern rooms (R319, R321 and R324) and a staircase to the upper storey (R325), all of which were arranged around a central hall (R320). As mentioned above, all of the northern walls abutted the southern W3001 of B300[7]. This structure was therefore built after B300; based on the fact that W3027 (the southern wall of B303) abuts W3007 (the western wall of B306), it also appears to be earlier than B303.

This building has been subjected to extensive excavation; only three standing balks remained at the close of the 2011 season (**Fig. 29**).

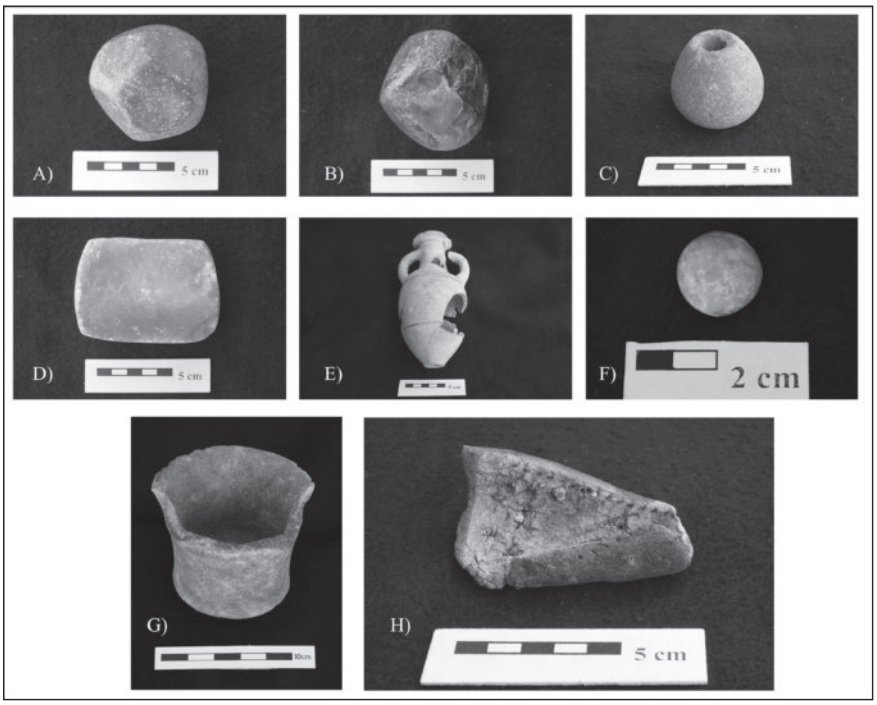
29. View of B306 from the south-west, showing the southern R321, R325 and R325, the eastern R322 and R323, and the central R320.

6. These areas will be explored in a future season of the Wādī ath-Thamad Project (C. Gohm).
7. W3001 and W3003 were previously reported as being "bonded in the lowest courses" (Daviau *et al*. 2008: 350). Upon further examination in 2011, it was realized that W3003 clearly abutted W3001, as only one 'bonded stone' was identified. This stone served as a foundational element for W3001, extruded to the south and was incorporated during the construction of W3003.

The majority of rooms have therefore been fully documented; each exhibited evidence of several use / modification phases following construction. As in B303, bedrock was used as a foundation for the majority of the walls; wherever voids were present, hard-packed fills were used to provide a stable footing. The earliest surfaces consisted of a mixture of exposed bedrock and beaten earth. Later surfaces consisted of soil accumulations that were likewise beaten by foot traffic.

As in other parts of Field D, the ground floor surfaces supported few *in situ* artifacts. The most notable exception was R307, the latest surface of which was littered with a mixture of ground floor remains and upper storey collapse - all of these finds were encased in an extremely hard layer of decaying ceiling plaster that was difficult to excavate. Given the nature of the finds, the western and eastern halves of the room had to be investigated separately to avoid crushing pottery and artifacts underfoot. Several unique stone objects were found just over the floor, including two multi-faceted hand grinders, a socketed mace-head and an unusual alabaster hand grinder (**Fig. 30A-D**). The mace-head is without a contemporary parallel in the region. It has been suggested that it was looted from an earlier (possibly Early Bronze Age) context. Work in R307 also resulted in the recovery of a massive corpus of ceramic sherds (over one thousand), including fragments of multiple pithoi, storage jars, hole-mouth jars, a decorated amphoriskos (**Fig. 30E**), Thamad Painted Ware and several other forms. These sherds were distributed throughout the stratigraphic levels within the room, demonstrating that the upper stories contained the household's storage and serving vessels.

Other areas of concentrated finds included R306 and R324. In a burned collapse layer over the floor in R306 (D81:54), abundant restorable pottery was found, as well a bone textile tool, a nodular grinding surface, an industrial grinder, an industrial upper loaf-shaped millstone, a zoomorphic figurine, a hand grinder, a mortar, a pounder and a miniature tray. Embedded in the latest surface beneath (D81:55), an industrial grinder, a pecking stone, two hand grinders and a stopper were found. These finds suggest that R306 was used for food processing activities, which accords well with the discovery of an *in situ* rectilinear limestone basin in the south-western corner of the room (supported by Partition Wall 3053). In R324, collapse layers (D82:32 and D82:35) over the latest surface contained abundant Iron II pottery, a perforated stone, an altar fragment, a limestone socket, a pestle, a basin fragment, a basalt tray, a hand



30. Notable artifacts from Field D: (A) multi-faceted hand grinder (MT3328), (B) multi-faceted hand grinder (MT3353), (C) socketed mace-head (MT3344), (D) alabaster hand grinder (MT3354), (E) decorated amphoriskos (MT3404), (F) nṣp weight (MT3035), (G) basalt bowl (MT2985) and (H) possible leather furniture fixture (MT3237).

grinder, a chert pounder and an inscribed *nṣp* weight (**Fig. 30F**).

Similar artifacts were found in the remaining rooms (R319, R321, R323, R326), the majority of which appear to have fallen from the second storey. Notable large finds from the collapse layers included two circular limestone basins (one in R320 and one in R321, both 0.83m in diameter) and an up-ended limestone table (in the doorway to R322 from the street). R322 proved to be the principal access hall to B306; a well-preserved threshold was found with its worn door socket *in situ* beneath the collapse layers (**Fig. 31**). Interestingly, part of the threshold consisted of a recycled shaft altar fragment. Work in Street 220 identified a potential ramp leading into B306, in addition to a series of walls blocking the entrance at the east end of R323.

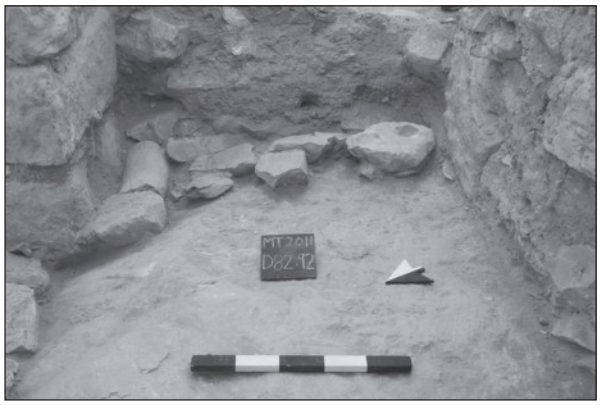
On the whole, B306 appears to have served as a domestic residence, but the presence of numerous high status and unusual goods suggests that it belonged to a wealthy and/or prominent family. Unfortunately, owing to time constraints, the stairwell and unusual blockage outside R323 could not be fully excavated and therefore await further archaeological exploration.

Building 309

B309 is located immediately west of B312, with which it shares W3019. This structure possesses a very unusual design, with two northern rooms (R310 and R311), a large eastern room (R315), a curving hallway to a western room (R314) and a doorway to a casemate room (R332). Excavations in the southern part of Square D52 revealed a small curvilinear wall (W3044), which left B309 with a complete lack of external doorways. This absence suggests that access to the second storey was gained via wooden ladders (perhaps within R316) or a possible stone staircase on the northern exterior of B312 (see below).

Excavations began in R310 and R311 in 2008; a low, single-row partition wall (W3021) was found separating the two areas. The northern W3020 measured 0.94m in thickness and resembles B300 in terms of its monumentality. Unlike the tall eastern wall of B309 (W3019), which was built on a compact beaten earth layer more than 1m above bedrock, W3020 was founded on bedrock and was preserved at a much lower level than the surrounding architecture. It is believed that this wall belonged to an earlier construction phase at the site and was later incorporated into B309.

In 2010, excavations shifted to the southern half of B309. The remains in this area proved to be extremely complex, as upper storey walls and installations were preserved *in situ*, including three narrow walls and two semi-circular bins (**Fig. 32**). Following the documentation and removal of these features, lower storey walls were encountered and the layout of B309 was fully realized (**Fig. 33**). Finds from the collapse layers in R314 include an exquisite stone bowl and an unusual leather object, which likely functioned



31. View of the threshold at the east end of R322 (B306) from the west, showing the worn door socket (upper right), recycled shaft altar (upper left) and bedrock footing.

32. View of upper storey features in B309 from the north, showing bin D52:11 (centre), part of bin D52:22 (lower right), wall D51:5 (upper right) and wall D52:13 (upper centre).

8. A sample of the leather object has been submitted for radiometric dating.

33. View of B309 from the south, showing all ground floor wall lines and the state of excavations at the close of the 2011 season.

as a furniture fixture or – less likely – a bow grip (**Fig. 30G-H**). The leather object was perforated along the edges and pierced by several iron and copper-base metal pins, of which one of the latter had a spiral cross-section (possibly formed by twisted copper wires)[8].

On the whole, the majority of small finds from B309 were utilitarian in nature (e.g. hand grinders, pounders and millstone fragments), suggesting a focus on food processing and storage. Significant quantities of smashed ceramic vessels and animal bones were found in R315, for example, and a rectangular limestone basin was recovered from the upper storey collapse in the northern half of R314 (the leather object was found next to this basin).

Excavations in the south-eastern part of D52 resulted in the identification of another room (R316) which may be associated with the potential east-west corridor running across the southern parts of B312 and B303. Although incomplete, investigations in R316 resulted in the discovery of abundant animal bones and several fragmentary zoomorphic figurines. In the south-western part of D52 a massive north-south wall (W3043) was found, running parallel to the inner casemate wall. This wall appears to continue to the south; R328 to the west has only been partially excavated. In the closing days of the 2011 season, a possible earlier wall with a different orientation (W3066) was recognized beneath W3027. This area will be further explored in the 2012 season.

Casemate R332 was also examined during the 2011 season and contained a number of fragmentary storage vessels and several well-preserved utilitarian tools (including a mortar, a pestle and a variety of millstones). Interestingly, floor level in this casemate room was over 1m below the doorway through the inner casemate wall (**Fig. 34**). Given the lack of communications to the north and south, it seems likely that R332 was functionally incorporated into B309. The dimensions of both the inner casemate wall (W2002) and outer casemate wall (W2001) are consistent with those previously documented in Fields A, B and E. The inner casemate wall measures between 1.50 and 1.60m in thickness, whereas the outer casemate wall measures between 2.10 and 2.40m in thickness. Both walls were constructed of semi-dressed limestone boulders and cobbles in the boulder-and-chink style, as were the three cross walls (W3050, W3051 and W3052) identified during the 2011 season.

Building 312

B312 is located immediately west of B303

34. View of R332 from the north, showing the doorway through the inner casemate wall to (left), bedrock and collapse layers (centre), and outer casemate wall (right).

in the centre of the excavated area; it comprised two rectilinear rooms (R308 and R309). The northern R308 contained a large central pillar (D61:15) and a low partition wall (W3067). A doorway in the south-west provided access to the southern R309. Although incompletely excavated, the potential corridor identified in R317 appears to continue to the south of B312, where a doorway provided secondary access to R309. The primary entrance to B312 was however identified in the north-eastern corner of R308; the structure was accordingly assigned an independent building number. Interestingly, this doorway was flanked by a possible staircase (D61:7) leading to the second storey. This feature was constructed against the northern exterior wall of the building (W3054) and requires further investigation[9].

In the north-west corner of R308, a small curvilinear installation (D61:28) was uncovered. It consisted of a single row of stones arranged in a quarter-circle and the interior was paved with flat-lying cobbles atop a hard-packed beaten earth and plaster layer (**Fig. 35**). The function of this installation remains unclear, although the nature of the paving suggests that it may have been used as a storage area for vessels containing liquids. The majority of the Iron II ceramic sherds collected from the floor in R308 comprised fragments of storage jars and cooking vessels. Small finds included two hand grinders, three chert pounders and an anthropomorphic figurine.

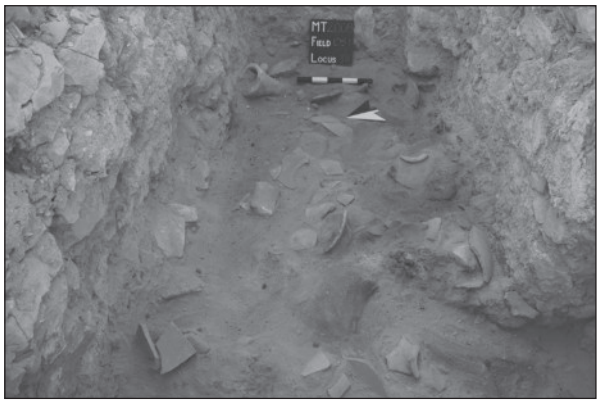
The finds from the southern room (R309) were similarly utilitarian. A circular limestone basin (0.80m in diameter) in the eastern part of the room was in two pieces leaning against W3017. Beneath this basin, and throughout the remainder of R309, several hundred early Iron II and late Iron II sherds were discovered. Other finds included two chert pounders, a large quern, an upper loaf-shaped millstone, a bone spatula and part of a zoomorphic figurine. Overall, the finds from B312 are clearly indicative of a domestic context, with numerous areas involved in food processing activities.

35. View of D51:28 in the north-western corner of R308 from the south, showing the installation and beaten earth surface D61:32.

Building 315

B315 was first excavated in 2008 and was revisited in 2010. Comprising the northern R312 and the southern R313, this building appears to be an architecturally distinct unit - it does not communicate with any other structure in Field D, with the exception of casemate R331 to the west. A single doorway connected R312 to R313. Given the lack of access to these rooms, it must be assumed that wooden ladders were used to descend from the upper storey.

Excavations determined that both R312 and R313 were used as storage areas. Large quantities of storage jars were found in both rooms, along with a number of mortars and millstones (**Fig. 36**). In R313, collapse layer D51:43 contained many ceiling plaster fragments and the remains of several smashed vessels (more than 200 sherds of Iron II and late Iron II date). These vessels, which included at least one large krater and one pithos, likely once rested on the second storey. Beneath this layer, D51:44 contained abundant ash and charcoal, as well as at least three burned



36. View of R312 from the west, showing layer D51:38 and associated finds.

9. A small-scale excavation is planned here for the 2012 season (S. Edwards) in order to determine if this was indeed an external staircase (as opposed to patterned boulder collapse).

ceiling beams (one nearly 1.5m long), restorable ceramics (at least one storage jar), a weight, a polishing stone and an upper loaf-shaped millstone. Multiple use-surfaces were also identified in each of these rooms; these accumulated over the boulder and soil fills that served to provide a stable footing for the Iron II walls.

Although casemate R331 was only partially excavated during the 2011 season, massive quantities of storage vessel fragments were recovered, as well as several complete millstones. There can be no doubt that this part of the Iron II settlement was dedicated to storage and food processing. As a final note, although the ground floor plans of B315 and B309 are distinct, it seems likely that these areas were connected via the upper storey. In essence, these buildings may constitute part of a larger domestic complex, in which R312 and R313 (and potentially casemate R331) served as a dedicated storage area. Given the lack of ground level access to B315 and B309, it is also possible that B312 and B303 also comprised part of this larger complex.

Nabataean-Roman Sites in the Wādī ath-Thamad Region: Site WT-12 / Mughur Shābik, Site WT-139 and Site WT-143 (Mechthild Ladurner)

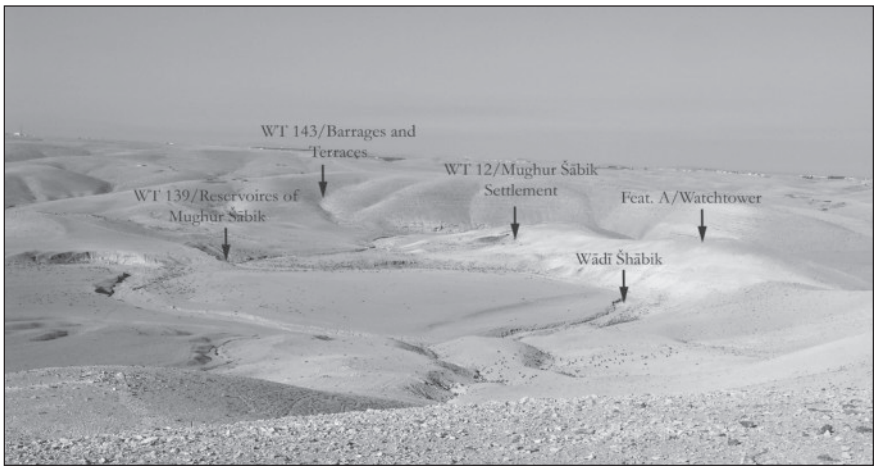
Another focus of research, added in 2007 to the Wādī ath-Thamad Project, consists of the documentation and study of Nabataean-Roman sites in the region, where 'site' is defined as a structure, a group of structures or a concentration of finds (see Silvonen *et al*. 2008: 171). Previous seasons of the Wādī ath-Thamad Regional Survey, as well as data from two years of extensive survey between 2007 and 2008, have revealed more than 30 Nabataean - Roman sites in the area, including architectural structures (domestic structures, watchtowers etc.), water installations (dams, channels, cisterns and reservoirs), agricultural features (field boundaries and terraces), road sections, quarries and burial sites (see Dearman 1996; Foley 1998; Daviau, Mulder-Hymans, Foley *et al*. 2000; Daviau, Steiner, Weigl *et al*. 2006; Daviau and Foley 2007; Lykke and Ladurner 2011; Ladurner 2012)[10].

The main objective of the 2008 field season was the documentation of Mughur Shābik, one of the major Nabataean settlements in the area, as well as its adjacent sites (**Fig. 37**). The site, registered on *MEGA-Jordan* as Site 2696, lies 2.2km south-east of Khirbat al-Mudayna on the bank of Wādī Shābik, a tributary of Wādī ath-Thamad[11]. Its topographical setting resembles several other Nabataean-Roman settlements in the area and is particularly similar to WT-6 / Tāqa (Site 12382 on *Mega-Jordan*). The architectural remains of both sites are aligned along the banks of the *wadis*, which surround vast areas of agricultural land lying in front of the settlements.

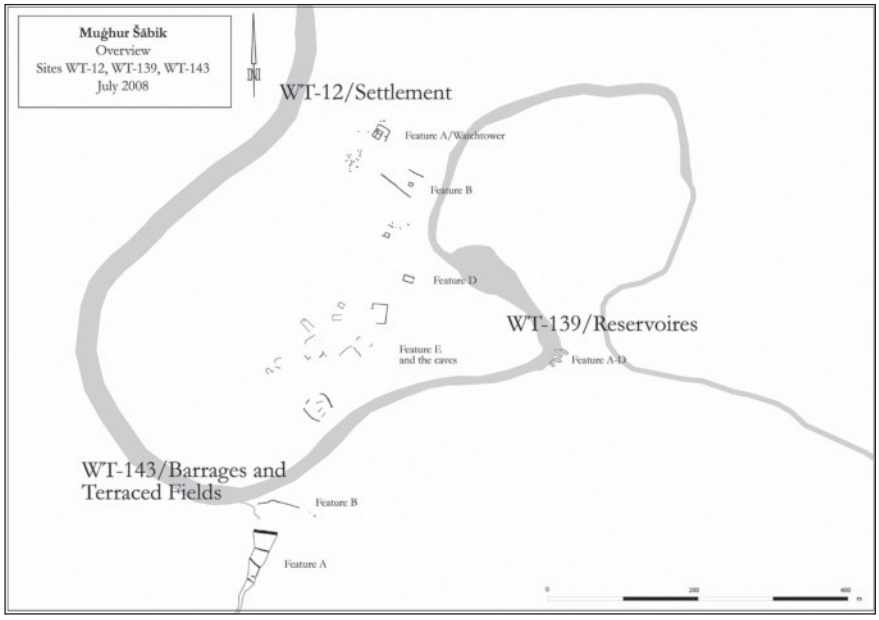
The surface pottery at Mughur Shābik has so far permitted the differentiation of two occupational periods. After an earlier settlement phase in the second half of the 1st century AD, there seems to have been a hiatus that lasted until the re-occupation of the area around the middle of the 3rd century AD.

Our understanding of the layout and organisation of the settlement, as well as its relation to neighbouring sites WT-139 and WT-143, is still fragmentary. The architectural remains at Mughur Shābik are located on the top and at the base of a rocky hill flanking the *wadi* (**Fig. 38**). In the southern part we documented eight semi-natural caves of similar size and layout, each consisting of a single rock-cut chamber (between 45 and 55 m^2), with a courtyard in front delineated by curvilinear or rectilinear walls (**Fig. 39**). Although there is no secure evidence for either the date or the function of these caves, they do have features in common with dwelling-caves at Petra (e.g. Kolb 2007: 146-153). Close to this area is a free-standing, hall-like structure (Feature E), measuring 25×20m with no visible

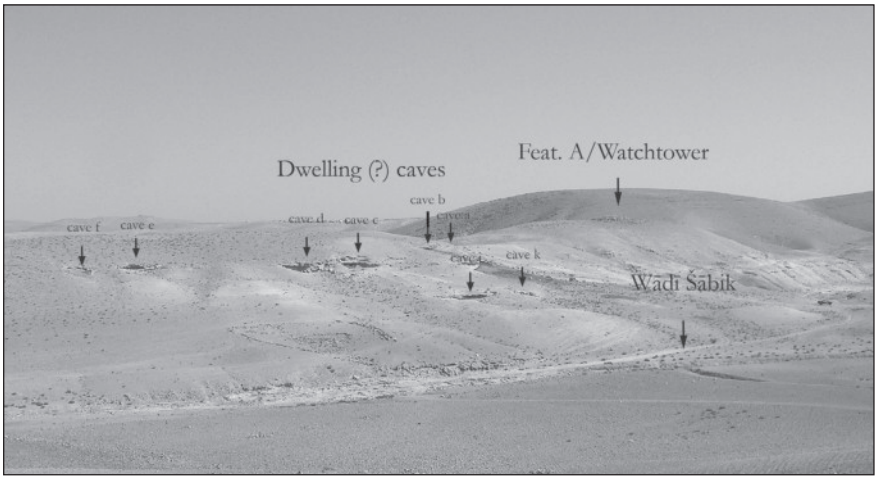
10. The regional survey was directed in the first two seasons (1996 and 1997) by J. Andrew Dearman (Austin Presbyterian Seminary, Austin, Texas, USA), followed from 1998 to 2001 by Christopher M. Foley (University of Saskatchewan, Canada). It is presently carried out under the direction of Jonathan Ferguson (University of Toronto, Canada). The surveys of Nabataean sites were carried out in 2007 and 2008 by Rainer Feldbacher, Mechthild Ladurner and Anne Lykke at the invitation of Project director P. M. Michèle Daviau and in parallel with the research of Jonathan Ferguson.
11. Wādī Shābik was mentioned and mapped by a number of early explorers in Transjordan. See Tristram 1874: 152, 175; Brünnow and Domazewski 1904: 3–5, 26–28, 1905:73–74, 86, 90; Musil 1907: 12–13, 18–21, 108–112, 246–248.



37. *WT-12 / Mughur Shābik and neighbouring Sites WT-143 and WT-139, seen from the north-east.*



38. *Schematic map of WT-12 / Mughur Shābik, WT-143 and WT-139.*



39. *The dwelling (?) caves of Mughur Shābik seen from the south.*

interior divisions. Several trade-related items were found inside, as well as in the immediate vicinity of the building, thereby suggesting an industrial function.

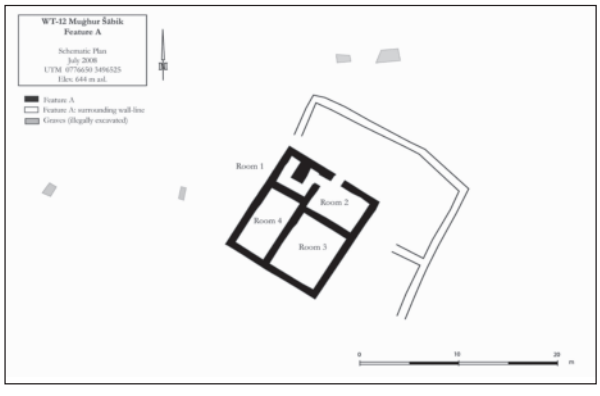
Further to the north we documented a rather poorly preserved, north-west-south-east orient-

ed structure measuring 14×8m (**Fig. 40**).

One course of the limestone blocks is visible above ground level, having an embossed exterior face to the walls (5-8cm wide margin, worked with a dentilated chisel). Projecting boulders on the inner face of the eastern and western walls at regular intervals of approximately 1.20m can most likely be interpreted as supports for arches, a feature common to several Nabataean buildings in the area, i.e. 800 and 802 at Khirbat al-Mudayna (Daviau, Mulder-Hymans, Foley *et al*. 2000). Although Nabataean pottery was found in relatively large quantities in the immediate vicinity, questions on the date and function of this structure remain open.

In the northern part of the settlement, on top of the hill at Shābik, lies Feature A - a nearly square (12×11m), well-built structure with rather thick walls (80-90cm) partly covered by debris (**Fig. 41**). The only entrance to this building lies on its north-eastern side, leading into a rectangular vestibule that gives access to a staircase leading to the roof or an additional floor (**Fig. 42**). The well-chosen position of this structure overlooking the buildings to its south, the surrounding farmland and the rock-cut water reservoirs to its east, in combination with its size and layout, suggests that this feature may have been a watchtower protecting the settlement and surrounding territory.

40. Feature D seen from the north-west.

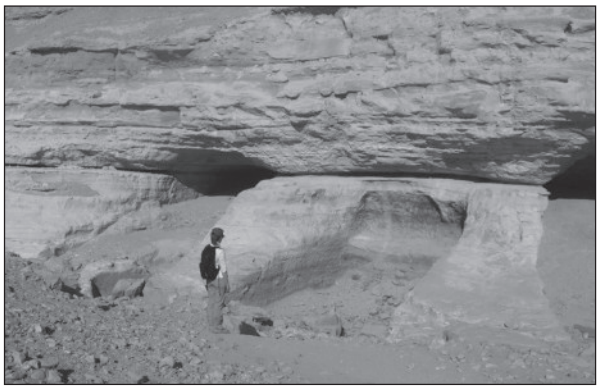


41. Watchtower / Feature A on top of the hill at Shābik.

42. Room 1 of Feature A, with its central pier for a staircase.

Immediately to the north and south of the presumed watchtower we documented a series of looted graves that seem to be placed in a regular manner, insofar as most of them are orientated north-east - south-west. As the looters have destroyed most of the evidence, there is little material with which to date these graves, except for a Late Roman coin ([?] Valerianus on the obverse) found in the immediate vicinity.

Approximately 300m south-east of the so called watchtower, flanking Wādī Shābik, is site WT-139. It comprises four large reservoir basins cut parallel to each other into a rock slope descending towards the *wadi*. The central basin, Feature B, is a nearly rectangular basin of 6.9×4.6m, separated from the three basins to its north and south by bedrock balks (**Fig. 43**). The narrower basins (A, C and D) are equipped



43. The central reservoir basin (Feature B) of WT-139.

with an opening of 0.80-2.00m, flanked on one side by an L-shaped scarp of bedrock, leading the water into a tank of 0.33 – 5.00 m in width. All four basins are protected from the sun by the protuberance of the bedrock vaulting. Almost no pottery was found on or around site WT-139. The proximity of this site to WT-12 / Mughur Shābik suggests that the water stored in these basins was used by the inhabitants of this same settlement, perhaps for agricultural purposes such as irrigation and watering livestock.

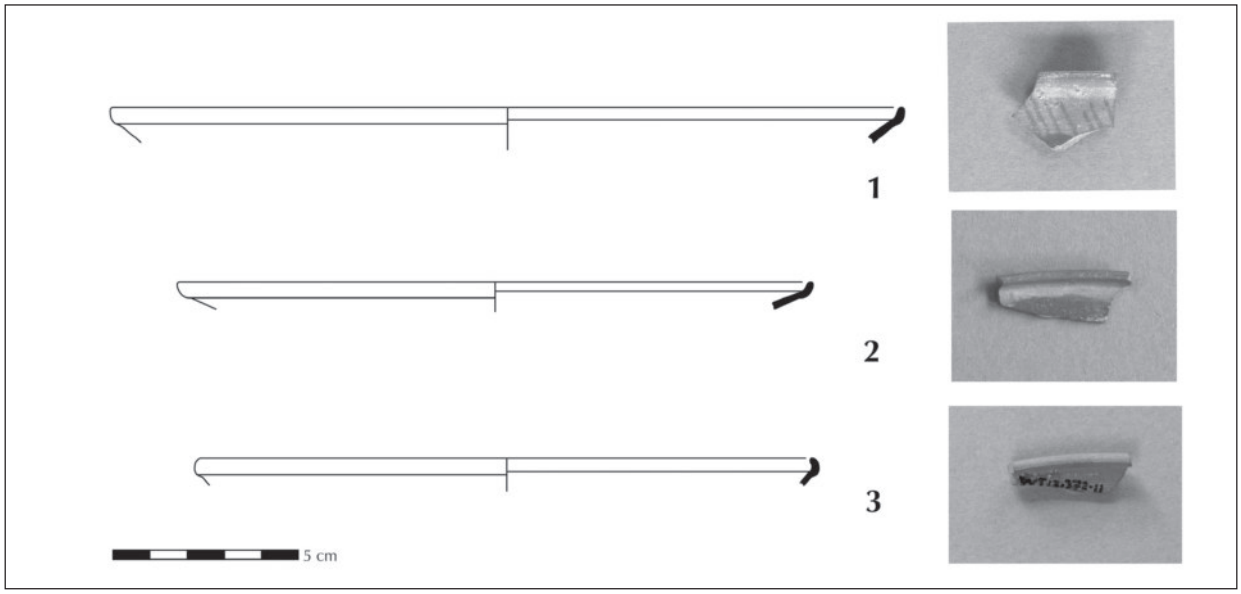
Site WT-143, lying approximately 30m south of the settlement on the opposite site of the *wadi*, is similarly ambiguous regarding its date. Situated in a north - south orientated gully, site WT-143 comprises a system of gully barrages and terraced fields. The upper barrages are built across the gully and consist of uncut blocks.

The lower, broader walls can most plausibly be interpreted as agricultural terrace walls. These could have served to maintain soil on slopes, while the upper barrages slowed down the flow of water. Similar sites are found throughout the Wādī ath-Thamad region (Lykke and Ladurner 2011). Although almost no pottery was found at Site WT-143 or comparable sites in the region, Nabataean parallels from Jabal Hārūn show similar characteristics (Lavento *et al*. 1999; Lavento *et al*. 2007; Silvonen *et al*. 2008).

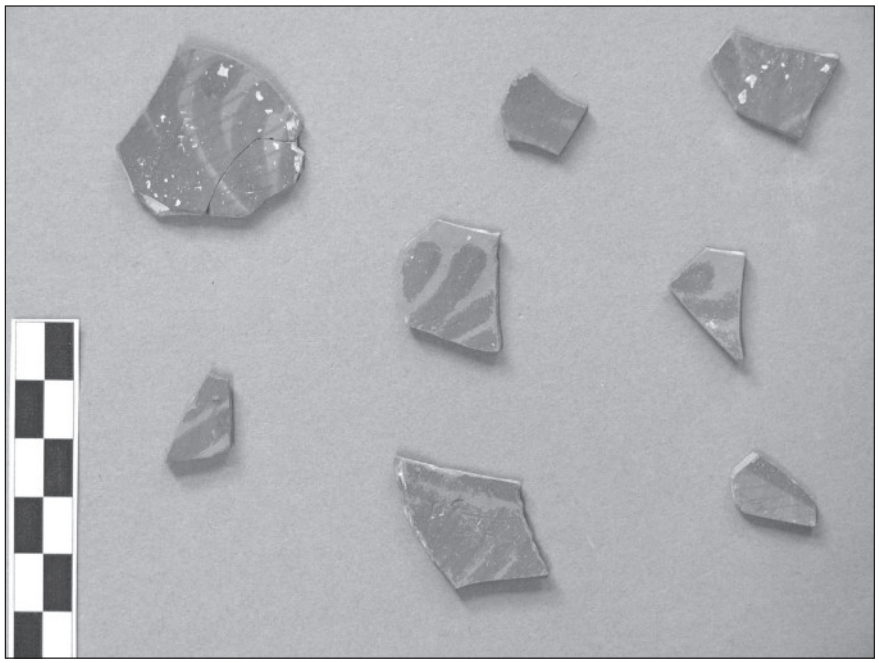
Our first results from Mughur Shābik and neighbouring sites lead us to view this area as a single entity, most likely dedicated to agricultural production. Bearing in mind that the attribution of specific features of this site to a particular period is difficult on the basis of survey data alone, there is some evidence to suggest that a significant proportion of the architectural features and agricultural and hydraulic installations of Mughur Shābik belong to the Nabataean / Early Roman period. This date is suggested by the presence of Painted Nabataean Fine Ware (**Figs. 44-45**) and Unpainted Fine Ware (**Fig. 46**), as well as some fragments of Eastern Sigillata A bowls **(Fig. 47**). The settlement was most likely abandoned by the end this period and was not - according to surface finds - re-occupied prior to the second half of the 3rd century AD.

Field N: The Nabataean House Complex (Noor Mulder-Hymans)

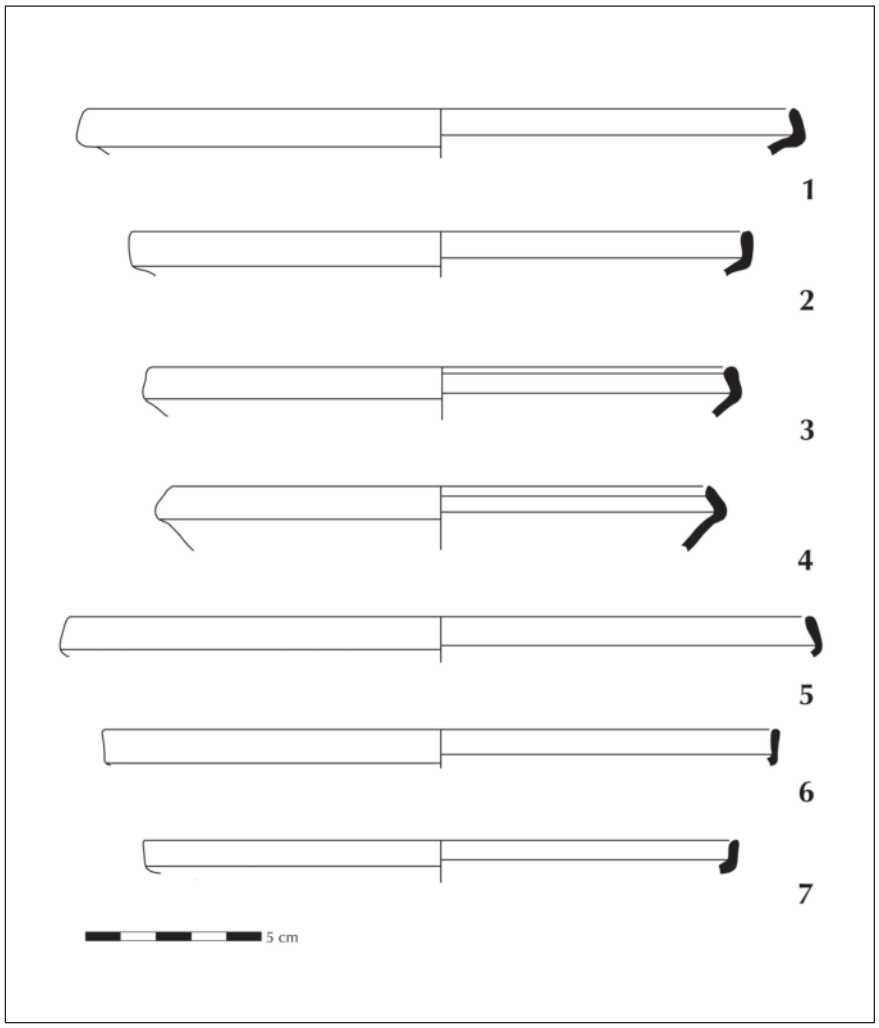
After eight seasons of excavation, the Nabataean house complex in Field N at Khirbat al-Mudayna has been completely exposed (**Fig. 48**). This complex consists of two units, including one in the south-east corner (B800) and a second unit of rooms on the west and north surrounding a central courtyard (B802). This larger unit is surrounded by an enclosure wall that abuts



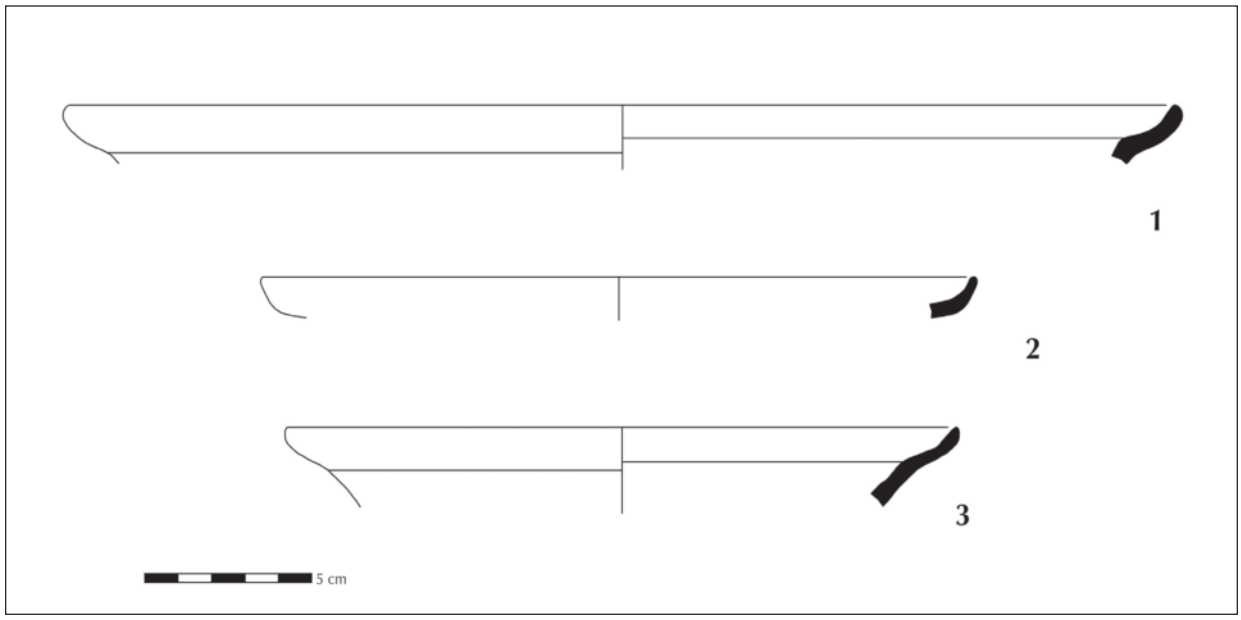
44. Examples of Nabataean Painted Pottery: (1) WTR 12/10.8, painted bowl, diam. 21.2 cm, surface colour 2.5YR 6/6 orange-red, colour of decoration 2.5YR 5/5 reddish brown; (2) WTR 12/370.1, painted bowl, diam. 17 cm, surface colour 2.5YR 6/6 light red-orange, colour of decoration 2.5YR 4/5 pale brownish red; (3) WTR 12/372.11, bowl, diam. 16.4 cm, surface colour 2.5YR 6/6 light red-orange, no traces of paint on the rim.



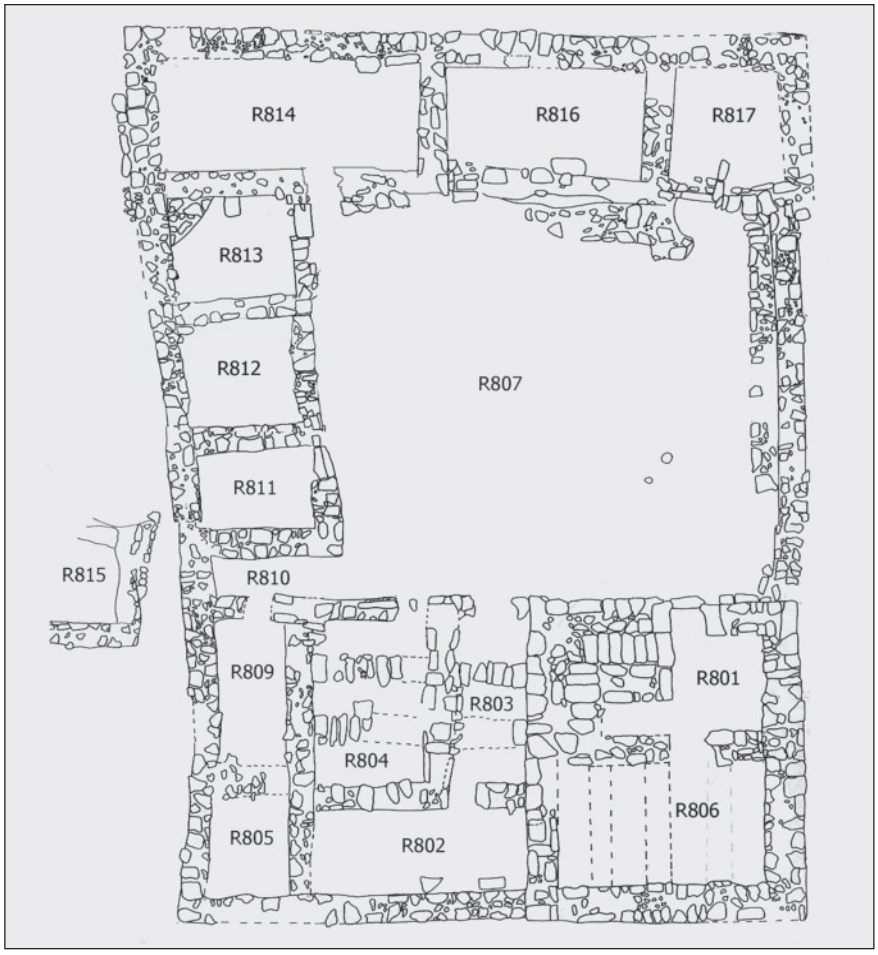
45. *Fragments of Nabataean Painted Pottery; decoration is similar to Dekorphase 3b (70 / 80-100 AD) as defined by Schmidt (1996, 2000).*



46. *Examples of Nabataean Plain Pottery: (1) WTR 12.14.83, bowl, diam. 20 cm, surface colour 5YR 6/5 light reddish brown; (2) WTR 12.367.14, bowl, diam. 16.8 cm, surface colour 5YR 6/5 reddish brown; (3) WTR 12.373.15, bowl, diam. 16.4cm, surface colour 5YR 6/6 light reddish brown; (4) WTR 12.373.13, bowl, diam. 15.2cm, surface colour 2.5YR 6/6 red; (5) WTR 12.19.2, bowl, diam. 21cm, surface colour 2.5YR 6/6 red; (6) WTR 12.19.10, bowl, diam. 18 cm, surface colour 2.5YR 6/6 red; (7) WTR 12.370.3, bowl, diam. 16.8 cm, surface colour 2.5YR 6/6 red.*



47. Examples of Eastern Sigillata A from Mughur Shābik (close to Hayes 54, dated 75 / 80-130 / 150 AD): (1) WTR 12.370.14, plate, diam. over 30cm, colour of fabric 7.5YR 8/4 pale pink, colour of slip 10R 5/8 red; (2) WTR 12.19.33, plate, diam. 21.2cm, colour of fabric 5YR 7/3 pink, colour of slip 10YR4.5/8 red.



48. Plan of building complex 800 + 802 at the end of the 2010 season.

B800. In this report the excavation results of the 2007, 2008 and 2010 seasons within Complex B800 + B802 will be discussed. The excavations of the earlier seasons have been reported previously (Daviau *et al*. 2000: 275–279).

Within this large building complex, two types of pottery were found: Nabataean and early Roman. The Nabataean pottery consisted of daily household coarse wares, well-fired with fine and sharp ribs on cooking pots, jugs and jars. Plain and coarse ware bowls, as well as the eggshell-thin ware, mainly in the form of plates and shallow bowls (with or without floral painted designs) are also present. A research program has been set up to study these wares which have been preliminary dated to the 1st century BC - 1st century AD[12]. The Early Roman pottery shows a variety of types: jugs, casseroles, cooking pots, bowls and jars. It is very well-fired pottery with a variety of ribs on the outside, from shallow to very sharp. Several types of red slip wares, including *terra sigillata,* and some oil lamps dating to the late 1st - early 2nd century AD were also found.

Building Unit 800

Building 800 is located at the south-east side of the complex and consists of Rooms 801 and 806, and a staircase to the upper storey. Altogether this unit measures 9m×7.5m. Along with Rooms 802, 803 and 804 of B802 to the west, these rooms formed the living quarters of this well-constructed part of the complex.

Building 802

Rooms 805 + 809

To the west of Rooms 802 and 804 is a long narrow space (3.5m×9m) consisting of Rooms 805 and 809. When first uncovered, Rooms 805 and Room 809 were divided by a collapse of stones that was only later recognized as an arch dividing a single room. This room is enclosed by W8016 to the west, W8002 to the south, W8015 to the east and two wall stubs to the north, two wall stubs to the north (W8023 and W8024 on the west and east sides respectively of Doorway G). The arch stones are smaller than those used in the arches spanning Rooms 814-817, located along the outer north wall (W8017) of B802, because R805 was a much narrower room. In the south (R805) a hard beaten surface was reached, while at the north end, below the fill in Doorway G, a threshold stone was visible as well as a support stone underneath it. The fill in Doorway G has been left in place as a support for both wall stubs.

In the west, a few cobbles under Wall 8016 served as foundation stones, but most of this wall was built directly on a very hard packed whitish soil, as was the case for most walls in other rooms. Only a few sherds were found on the top of this hard packed soil, which appears to have served as the final surface in this room.

Room 810

To the north of Room 805 + 809 is Room 810, an open area between Walls 8016 to the west, W8021 to the north, and wall stubs 8023 and 8024. This space measures 2.5×4.5m, serving as access to Courtyard 807 and forming a small corridor that leads to Doorway G. All the surrounding walls were built with several irregular lower courses as a footing and were topped with heavier and larger stones. The many patches of wall plaster *in situ*, as well as in the debris, demonstrate that the not-so-regular boulder-and-chink constructed stone walls were smoothed with a layer of plaster. The floor (N45:26) was a surface of very hard packed soil, which also served as the foundation for the walls. Only W8012 and W8024 rested on good foundation stones. Below the floor in Room 810 virgin soil was reached.

Room 812

Along the west side of central courtyard R807 are three nearly square rooms north of Corridor 810 (R811, R812, R813). Central Room 812 measures 4.3×4.5m, opens onto the courtyard to the east and is enclosed by four walls (W8016, W8019, W8020 and N44:24). On the east there is a continuation of the east walls in R811 and R813, although at the north end of this wall a doorstep was found. These walls are also built in boulder-and-chink construction. Room 812 was filled with large boulders, cobbles and pebbles through several loci. The builders of this structure scavenged Khirbat

12. Dr Maria-Louise Sidoroff has undertaken a study of the small Petra-style forms; Alisha Mohamed has completed her MA thesis on the decorative schemes represented at Wādī ath-Thamad sites.

al-Mudayna for many of their building stones. This is shown by chisel marks on at least half of them that are of typical of the Iron Age town on the *tall*, but different to those considered typically Nabataean. Room 812 was fully excavated and several deep probes were made along the walls to determine their construction history below the surface (N44:26). The walls rest partly on foundation stones, but mainly on the very hard packed whitish soil. A small, crudely-worked stone container and part of a ceramic lamp from the 2nd century AD were found in Debris Layer N44:22 above the floor surface.

Room 814

Part of this room was previously excavated in 2006. When completely exposed, the room measured 4.7×8.5m, with walls of the same construction seen throughout. The tumble of an arch, N32:12, was visible as a broken line of big boulders (voussoirs) in front of a heavy friable pier, N32:13, in W8017. The first stone (voussoir) of the arch had shifted, but was built into W8028. Within W8017 two more piers were constructed, N32:14 and N32:15. All piers are in a poor state of preservation (**Fig. 49**). In the upper loci some very nicely tooled architectural fragments were found, one piece measuring 18×11×4cm (**Fig. 50**).

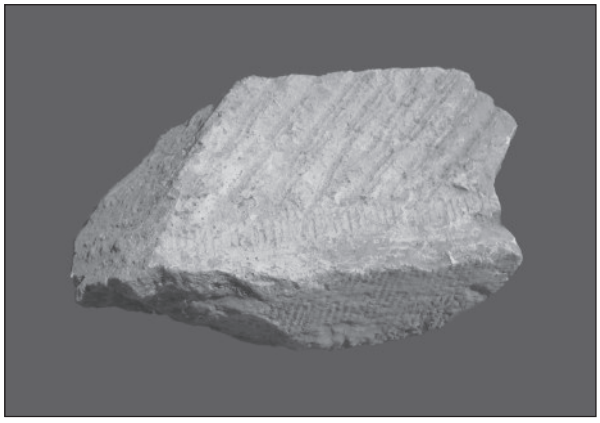
Underneath some layers filled with boulders, cobbles and pebbles, a heavy burned habitation layer *ca* 0.30m deep, N32:25, was associated with the threshold stone in the doorway and the stepping stone in front of it. Part of a 2nd century AD oil lamp and some early Roman pottery was found on the underlying surface. Probes were made along W8017, 8027 and N43:12 through the floor. Foundation stones were discovered mainly under W8017 and Pier 13. The other parts of the walls rested on the natural, very hard packed soil.

Room 817

Room 817 is the north-east corner room of Building 802. The room is smaller than Room 816 to the west and Room 814 in the north-west corner. W8028 along the south side of R816 is abutted by W8029, which is the east wall of room 816 and west wall of room 817. A partly collapsed arch, N52:6, sits on a soil and wall tumble fill, dividing the room into two equal halves: west and east. Most of the arch stones and voussoirs were of friable limestone and fragmented, but in the north part of the arch some solid stones were visible. Rooms 816 and 814 had three arches each; these were resting on piers in W8017 and were built into the walls W8028 and 8018. In Room 817 the arch was built into W8017 and rested on a pier on the south side (N52:32).

Although a threshold stone marks the entrance to R817, no habitation surface was found at this elevation. Once soil locus N52:25 – flush with this stone – was removed, it became clear that the threshold stone was a nice piece of reused limestone that rested on small, round, regularly shaped cobbles. The southern part of the doorjamb rested on this threshold stone, leading to the conclusion that the threshold stone and southern part of the doorjamb were constructed at the same time. The northern part of the doorjamb reached into the foundation of W8029, N52:34, and was built at the same time as this west wall. This part belongs to surface N52:33,

49. Collapsed voussoirs in Room 814.



50. Nabataean tool marks preserved on an architectural fragment.

which is hard packed and had many ashy pockets, bones and pottery. On top of this surface are the foundation stones of the pier that would have supported the arch on the southern side of the room. W8029 itself also seems to have two distinct construction styles; the top wall stones are built over the doorjamb.

The function of this room is still unclear; few objects have been found, except for a small stone fragment, a piece of iron, two fragments of glass, a ceramic fragment, a good deal of pottery (some charred) and a large cache of restorable ribbed pot sherds located in the north-east corner. The later addition of the threshold stone and southern portion of the doorjamb seems to indicate that the room had at least two phases.

Room 815 Outside B800 + 802

Room 815 was partly excavated in a previous season and revealed a plastered floor (N45:8) and the lower courses of a plastered wall, W8022 (N45:6). To gain a better understanding of what the shallow plastered area was used for, three new squares were opened in 2010: N35, N36 and N25. The plaster floor was completely uncovered, along with the four walls that surround it (**Fig. 51**). When fully exposed, this feature measured 9.24×4.25m. The floor plaster runs up to and seals up against the four walls that enclose the floor, which suggests that it may once have held water. It has not been determined if this room was used as a water reservoir, a settling tank or even as a shallow pool. Interestingly, a channel has been found which will need to be investigated further in order for any decisive conclusions to be made, since the channel could have been built prior to the first phase of R815. A similar structure has been found against W8031 near the south-west corner.

51. Plastered area R815 to the west of B800 + 802, looking east.

Between R815 and the west wall (W8016) of B802 is a narrow passageway cluttered with a collapsed construction of very big boulders and a rope stone. It is not clear at this stage of excavation if these boulders are components of a cistern that was related to the plastered room.

Conclusion

The Nabataean house complex in Field N, Building 800 + 802, was built in one stratum with two possible phases close in time. Phase one was the solid boulder-and-chink construction of B800. This unit with a staircase and a second (and possibly third) floor was well-built with a stone-paved floor in Room 806 (Daviau *et al*. 2000: fig. 11). Built up against B800 on its west side is a second unit constructed using the same construction techniques. At the same time the perimeter walls were built. W8005, the south wall of B802 and Room 805, abuts the south wall of B800, W8002. On the east side of the complex, the east wall (W8030) of B802 abuts the east wall (W8003) of B800. The corners of the four perimeter walls are bonded, and all inner house walls abut the four perimeter walls.

The rooms of Building 802 are grouped around the courtyard and were built as an integral unit. The walls were built in boulder-and-chink construction, but with smaller, more irregular stones in two rows with a rubble core. The rooms themselves had arches resting on piers. The surfaces consisted mainly of hard beaten earth or hard packed whitish earth and stone paved floors. In some rooms there were ash pockets on the surfaces. A relatively small quantity of pottery sherds and household objects was found, but their infrequency suggests abandonment and removal of most personal possessions. In R814, a 0.30m thick layer of heavy burned soil with ash and charcoal fragments, some bone and blackened pottery sherds was exposed. Adjacent to Room 814 in Central Courtyard 807, an oven – possibly for communal use – was excavated.

Since the area around Mudayna is known as a rich grain-growing area of Moab, the Nabataean settlement could have functioned as a supply area for the city of Petra. This may explain the occasional pieces of very thin, painted Nabataean pottery imported from Petra.

The ceramic repertoire of the inhabitants of this complex included cooking ware and household utensils, with a variety of ribbed wares represented – especially in jars and jugs. A few pieces of imported *terra sigillata* were also present. In all rooms around the courtyard that were excavated to floor level, this pottery is found together with Herodian-style oil lamp fragments. The oldest pottery present consists of Iron Age potsherds which washed down from the Iron Age settlement on the mound above the Nabataean site. It is not yet clear why the Nabataean settlement was deserted, although it may be related to the Roman conquest of the Nabataean realm in the early 2nd century.

Room 815

Room 815 with its plastered floor has very low walls and is located above floor level in the adjacent house complex. The plaster in Room 815 was very well-laid and runs up the surrounding walls, with extra heavy plaster (a 'curb') where the floor meets the wall. A small part of the plaster floor was removed and a sub-floor with flat cobbles revealed. In the depression (cistern?) next to R815, three plastered layers with stone layers in between are visible in the section. This resembles the high-quality construction of the plastered floor and walls in the reservoir: Building 700 (Daviau *et al*. 2006: fig. 19).

Below these three plaster layers in R815, the earlier surface of heavy plaster was visible. Because Reservoir B700 was very close to the house complex, Room 815 is likely to have had its own special function. So far no parallels are known and further study is needed. In the area to the west of the Nabataean house, more walls are visible on the surface. Further excavation may lead to a better understanding of the function of Room 815 and its possible association with other structures in the settlement.

Wādī ath-Thamad Regional Survey (Jonathan Ferguson)

During the 2010 field season, the Wādī ath-Thamad Regional Survey[13] continued its study of Khirbat al-Mudayna's hinterland. The following sites were visited and documented in 2010, with a focus on sites in the north-western portion of the survey territory:

- WT-1: Khirbat al-Mudayna on Wādī ath-Thamad;
- WT-9: a hilltop stone pile (ruined watch-tower?) north-west of Khirbat al-Mudayna;
- WT-17: Khirbat al-Hirī, an Iron Age fortress north of Khirbat al-Mudayna;
- WT-24: Khirbat az-Zūna, a late Roman *castellum*;
- WT-30 / 100: a ruined tower or farmstead north of Zaynab;
- WT-144: a long field wall in Wādī az-Za'farān east of Khirbat al-Hirī;
- WT-145: a stone circle with standing stones and inscriptions south of Khirbat al-Hirī;
- WT-146: two stone circles and graves east of Khirbat al-Hirī;
- WT-147: three dams at the confluence of two *wadis* north of Khirbat al-Hirī;
- WT-148: graves and abandoned *bedouin* camps north of Khirbat al-Hirī;
- WT-149: a plastered room or installation north of Khirbat al-Mudayna;
- WT-150: a looted cemetery north of Khirbat al-Hirī;
- WT-151: three looted cemeteries north of Khirbat al-Hirī;
- WT-152: a looted cemetery with a megalithic structure north of Khirbat al-Hirī;
- WT-153: a looted grave and cairn north of Khirbat al-Hirī;
- WT-154: a cave and grave on the hill slope north of Umm Ruṣūm;
- WT-155: the early 20th century village of Umm Rusūm, west of Khirbat al-Hirī;
- WT-156: a hilltop lithic scatter north-west of Khirbat al-Hirī;
- WT-157: a looted cemetery east of Khirbat al-Hirī;
- WT-158: caves and a wall line east of Khirbat al-Hirī;
- WT-159: a Byzantine / Early Islamic complex north-west of Khirbat al-Hirī.

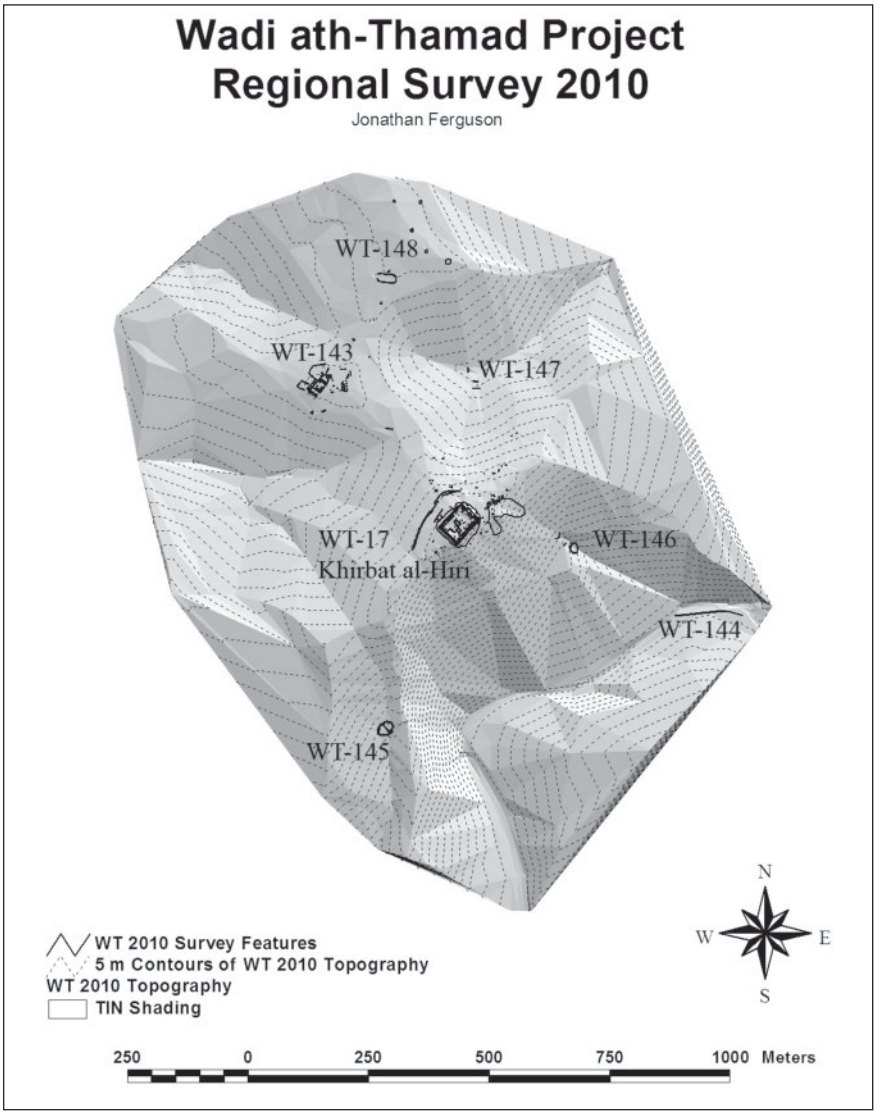
As the aim of the 2010 Wādī ath-Thamad

13. The Regional Survey is conducted under the direction of Dr P. M. Michèle Daviau (Wilfrid Laurier University, Waterloo, Ontario, Canada) as part of the Wādī ath-Thamad Project. Personnel for 2010 included Jonathan Ferguson (Survey Director, University of Toronto, Canada) and undergraduate volunteer Justine Southam. Basem al-Mahamid served as the representative of the Department of Antiquities of Jordan.

Regional Survey was to map and document a part of the survey territory that had not been intensively surveyed before, there were no existing points of reference in the immediate area. A new benchmark was therefore established at Khirbat al-Hirī (WT-17) with a GPS receiver and an orientation backsight to Qaṣr az-Za'farān I (WT-34) with a total station. Sites WT-17, WT-159 and WT-144 - WT-148 were intensively surveyed in relation to one another and their surrounding landscape, which covered an area 1,531m north-south × 1,365 m east-west, extending 145m in height from the top of Khirbat al-Hirī down to the bed of Wādī az-Za'farān (**Fig. 52**).

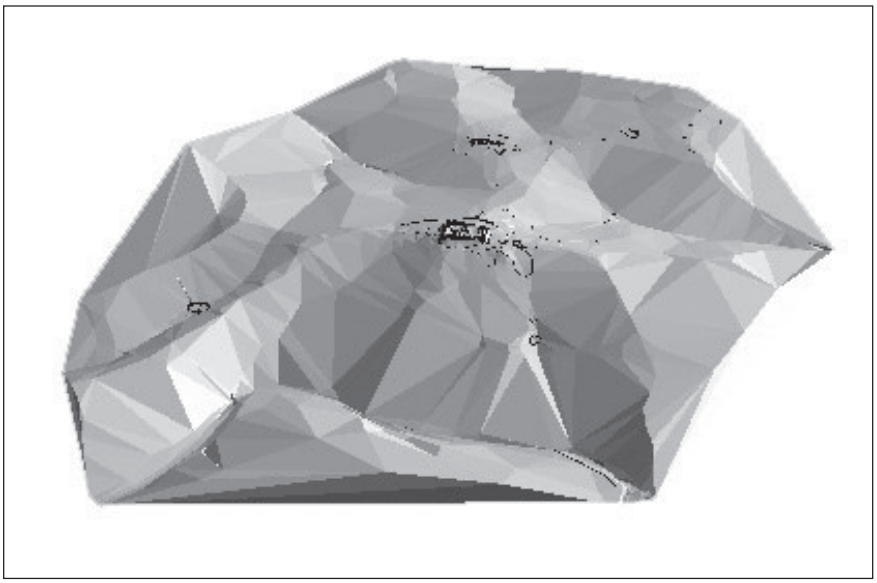
Not only did this exercise build a detailed dataset of the topography around Khirbat al-Hirī, it also led to the discovery of five new sites which would never have been found without crossing this territory on foot. Over the course of the 2010 season, 907 points were surveyed with the total station expressly for topographic modelling. However, since all surveyed points (including architecture, caves, graves etc.) were recorded three-dimensionally, a total of 3,225 points are available for topographic mapping and three-dimensional modelling (**Fig. 53**)[14].

In all, twenty-one sites were visited and documented by the Regional Survey in 2010. Looting and vandalism continue to seriously degrade the archaeological patrimony of this re-



52. Topographic map of the 2010 survey region, with Khirbat al-Hirī (WT-17) at centre and Wādī az-Za'farān at lower right.

14. The archaeological features were drafted using AutoCAD 2006, while topographic modelling was performed with ArcView GIS 3.2a.



53. Three-dimensional model of the 2010 survey region, view to north-west.

gion: eight previously unknown cemeteries were found to have been systematically looted, while the Roman fort of Khirbat az-Zūna suffers from ongoing damage. This report will focus on the fortress of Khirbat al-Hirī, but also touches on four other sites which are representative of the region's archaeological richness and diversity.

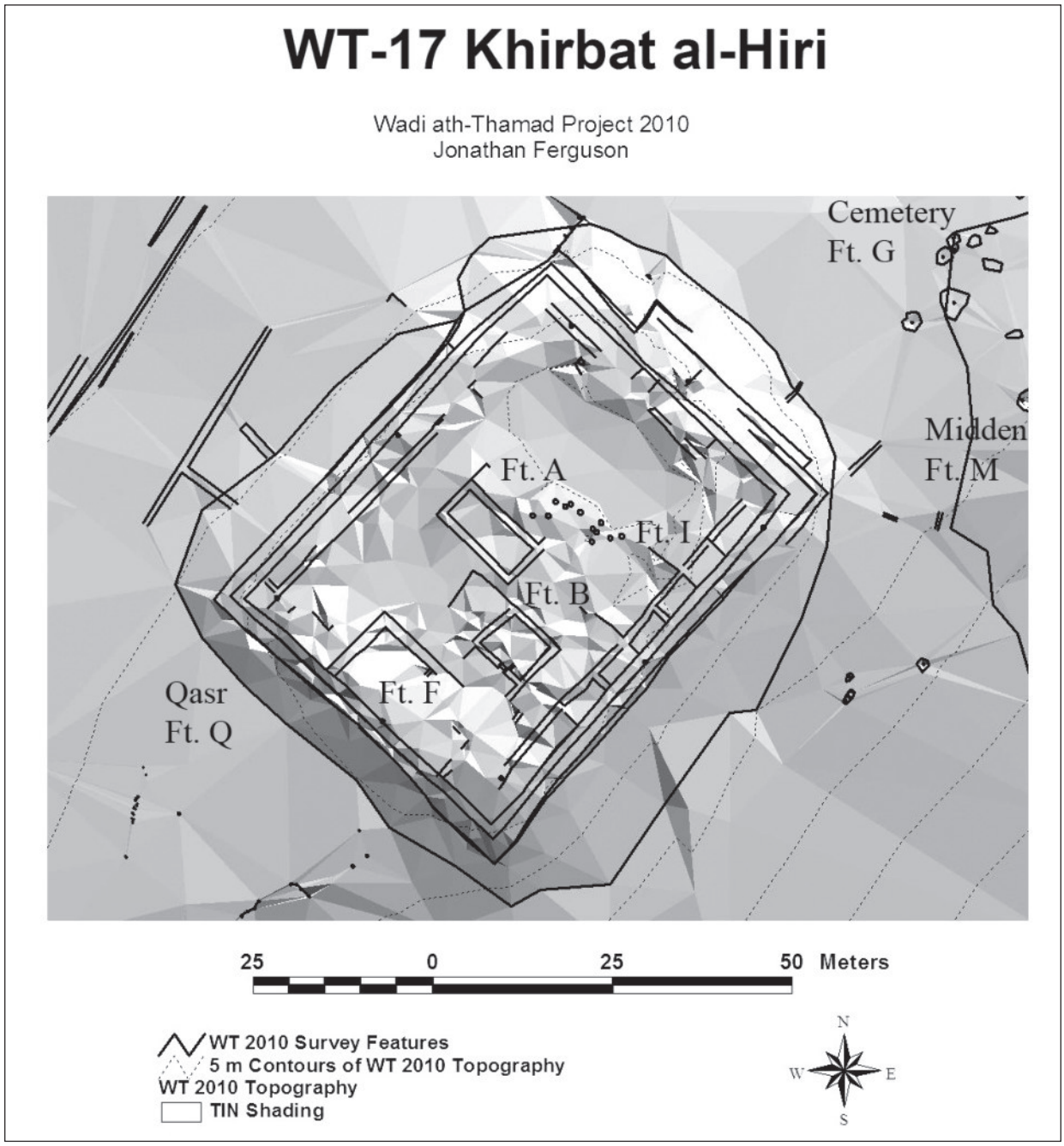
Khirbat al-Hirī (WT-17)
UTM Zone 36: 774421E 3502181N 749 m asl (BM 5369)
Bearings: 5.44 km at 197°T / 193°M to Khirbat ar-Rumayl (WT-18); 1.75 km at 227°T / 221°M to Qaṣr az-Za'farān II (WT-32); 2.16 km at 249°T / 245°M to Qaṣr az-Za'farān I (WT-34)
JADIS: 2311.009 (Palumbo 1994: 2.133)

The site of Khirbat al-Hiri[15] occupies a tall prominence with clear views in all directions (**Fig. 54**). Over a century ago, Khirbat al-Hirī was documented by Tristram[16] (1874: 177-178), Brünnow and von Domaszewski (1905: 86) and Musil (1907: 174). Later, Nelson Glueck visited Khirbat al-Hirī (his Site 66) and described a hilltop fortress, surrounded by cisterns and re-

54. Khirbat al-Hirī (WT-17), view to south from WT-148.

15. Site WT-17 has been known variously as either "Khirbat al-Hirī" or "Rujm al-Hirī" by the Regional Survey staff over the years. However, the former toponym is preferable because Rujm al-Hirī is the name of a different ruin documented by Glueck near Mount Nebo (his Site 237) and he differentiated the two sites in this way (Glueck 1935: 110; Zwickel 1990: 161; Palumbo 1994: 2.59, JADIS 2113.028).
16. Tristram refers to two adjacent sites, "Kasr el Herri" and "Kirbet el Herri" (1874: 177–178). The former (Tristram's "Kasr") is the site referred to in subsequent literature as Khirbat al-Hirī (followed here), while the latter is apparently the village of Zaynab to the east, across Wādī az-Za'farān.

used as a *bedouin* cemetery. Based on surface finds, Glueck determined the site to have been founded in the early Iron Age, with later re-use in the Nabataean period (1934: 12). While the site is well-known to scholars (e.g. Zwickel 1990: 153; Palumbo 1994: 2.133), it had yet to be thoroughly studied or mapped prior to the 2010 field season. The site was identified by the Wādī ath-Thamad Regional Survey in its first year (1996); five looted graves, two caves and three cisterns were identified and photographed in 2005. Khirbat al-Hirī formed the focus of the 2010 season, and detailed documentation and surveying was conducted there of both archaeological features and the surrounding landscape (**Fig. 55**).



55. Khirbat al-Hirī (WT-17), showing the qasr (Ft. Q), interior architecture (Fts A, B, F and I) and portions of the exterior walls, cemetery (Ft. G), midden (Ft. M).

The Qaṣr

The defensive walls of the fortress of Khirbat al-Hirī (the "*qaṣr*") were designated Feature Q**.** The fortress is oriented at 40°T and the outer corners of its walls measure up to 69.41m south-west - north-east and 53.56m north-west - south-east. When referring to directions in general terms, however, directions are given with reference to the *qaṣr*, e.g. the longer walls of the fortress are referred to as the eastern and western walls.

Except on its northern side, the *qaṣr's* defensive walls show a two-layered method of construction. The inner wall averages 1.5m thick and is built in a boulder-and-chink technique. The outer wall consists of a rubble fill with an exterior boulder-and-chink facing, and is also about 1.5m thick where the upper courses of its facing survive. The outer wall is battered, i.e. its base is thicker and its outer faces slants inwards towards the top. It remains unclear whether the inner wall is similarly battered. In some places, particularly on the eastern side, the exterior wall stands to a height of up to 2.13m (**Fig. 56**), but is probably concealed to a considerable depth by the surrounding tumble.

The northern wall of the *qaṣr* is more heavily fortified, with up to four wall layers visible at the north-eastern corner, although all but the inner wall are rubble-filled. The gate has been hypothesized to be in this area, an idea supported by a wall section running perpendicularly to the perimeter and the depressed topography of the centre of the northern side. In this area, the tumbled stone extends outwards for 13.67m and 5.83m below the top of the *qaṣr's* inner wall. It may be, then, that the gate itself remains buried under the considerable overburden of fallen stones here.

56. The battered exterior face of the qaṣr's eastern defensive wall at Khirbat al-Hirī (WT-17 Ft. Q).

Interior Architecture

Feature A is a building west of the *qaṣr's* centre, measuring 13.91 by 9.86m. It takes the form of a rectangle, but with two walls extending northwards from either side. The walls of this building measure about 1m thick, but no northern wall was found. Instead, thirteen round pieces of limestone (each about 60cm across and 15cm thick) were found in that area and may have acted as drums or bases for columns across its front. In other words, this building appears to be a broad-room structure with columns *in antis* across its front, as might be found with a temple. Such a role might be supported by the prominent position of this building, facing the northern plaza and hypothesized gate.

To the south-east of this building is Feature B, measuring at least 16.41 by 10.16m and having two adjacent rooms. The construction of this building is made of somewhat smaller stones than Features A and F, but the walls still measure between 0.85 and 1.00m thick. On the southern side, two perpendicular lintels can be seen, one forming a clear doorway at the present ground level.

Feature F is a building built against the centre of the rear defensive wall of the *qaṣr* (assuming the gate is to be found on the northern side). Its walls are 1.5m across, the same thickness as the inner perimeter wall, suggesting that they were built at the same time and that this was a structure of some importance. While the entrance to this building is obscured, an interior lintel can be seen against its northern wall.

A range of at least seven rooms (each measuring about 2.6 by 5.5m), built against the eastern side of the *qaṣr's* inner defensive wall, was designated Feature I. The inferiority of its construction when compared to the *qaṣr*, i.e. made with smaller stones and thinner walls (about 1 m thick), suggests that this was not a casemate construction in the normal sense. Based on a regular series of depressions and wall stubs on the western side of the *qaṣr*, Feature I was probably mirrored by a similar arrangement of rooms on that side.

In addition to these internal buildings, two areas were notable for their lack of ruined walls

or tumbled stone, and may have served as plazas or courtyards. One extends across much of the width of the northern portion of the *qaṣr's* interior, while a smaller one was identified in its south-western corner.

Exterior Features

A number of walls were mapped outside the *qaṣr*, although their purpose remains unclear. The longest were found on the western side of the fortress; together they extend for 175m, following the contours of the hill. Similar walls were mapped by the Regional Survey at Qaṣr az-Za'farān I (WT-34) and Khirbat az-Zūna (WT-24) in 2005 (Daviau *et al.* 2006: 277, 280; cf. Ferguson 2009: figs 1C, 5D) and Uraynibah West (WT-16) in 2008. The excavation of one such wall at Khirbat az-Zūna showed that it was relatively recent and unrelated to the occupation of the *castellum* (Ferguson 2009: 238). On the other hand, one external wall farther to the north-west of the *qaṣr* appears different from the others, as it is built of larger stones set on edge, forming a megalithic 'alignment' (Scheltema 2008: 19-21).

The site's midden (Feature M) was located north-east of the *qaṣr*, downwind of the prevailing westerly winds and easily accessible from the presumed northern gate. The midden measures up to 82.26m across and extends down two shallow gullies on the eastern slope of the hill. The frequency of sherds is very high here compared to elsewhere on the site, with the pottery dating almost exclusively to the Iron II period. Examination of three 5m^2 sample areas showed that the midden has an average density of 30.9 sherds per square metre. Other types of material, such as bone, were very infrequent.

Eight cisterns have been identified and mapped at Khirbat al-Hirī, all to the north of the *qaṣr*. These cisterns appear in two groups, based on elevation and – presumably – geology. The lower group of five cisterns occurs in a series along a path with elevations between 713 and 720m (Feature E at WT-159 lies along the same contour). One of these cisterns still contained water when visited. The upper three cisterns are closer to the *qaṣr's* north-western corner, between 729 and 732m asl. Feature D has a simple opening and a depth of 3.43m, but still shows plaster adhering to its wall in at least one patch. Feature E, on the other hand, has recently (but prior to 2005) been restored, with a cemented stone superstructure that includes the cistern's mouth and a trough for watering livestock. This cistern descends for 4.29m from the rebuilt mouth. A triangular secondary opening serves to fill the cistern via a small channel.

Like the cisterns, caves at Khirbat al-Hirī appear grouped along similar elevations. One group of three caves is found south of the qaṣr, along the south-eastern face of a bedrock outcrop. Four other caves occur in the bedrock immediately north of the *qaṣr*, including one in the bedrock on which the fortress' north-western corner was built. Another series of five caves is found a little to the north-east, between the elevations of the two groups of cisterns, at about 731m asl. Feature C appears as a sinkhole, from which a cavity extends at least 4.61m to the north-west. The cave Feature H can be accessed directly from its downslope side and has a rough, low stone wall extending across its opening, from which the cave's chamber extends at least 6.13m to the east. This cave has seen some recent use, as shown by an ash pit and goat tracks in the dried mud floor.

Numerous cupholes were found carved into the bedrock south of the *qaṣr*. The 35 cupholes surveyed in this area range from 6 to 29cm in diameter, with the majority tending towards the smaller sizes. The dating and function of these circular depressions remains unresolved (see discussion in Scheltema 2008: 23-25).

In more recent times, Khirbat al-Hirī has served as a *bedouin* cemetery, both within the *qaṣr's* walls and to the north-east of the fortress. It proved impossible to record the graves inside the *qaṣr*, since they were built of the same tumbled stone that covers the interior. Feature G is the cemetery to the north-east and east of the *qaṣr* (overlapping the midden); it includes at least 39 graves, of which 15 have been looted. The remaining 24 graves were identified by the arrangement of stones visible on the surface and are generally aligned east-west.

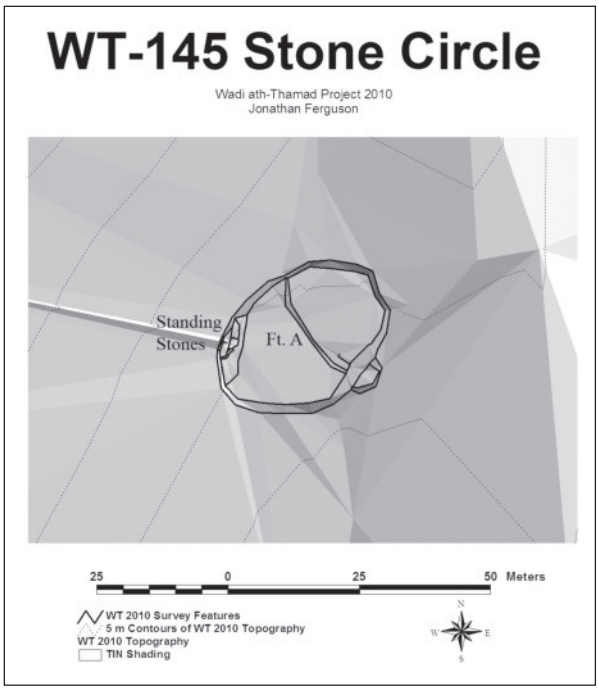
WT-145

UTM Zone 36: 774286E 3501780N 686 m asl
Bearing: 423m at 19°T to Khirbat al-Hirī (WT-17, BM 5369)

While mapping the topography of a ridge to the south of Khirbat al-Hirī, a stone circle was

discovered in a small gully between it and the next ridge to the west. Although site WT-145 has good visibility to the east and south, it is hidden from WT-17 by the intervening ridge.

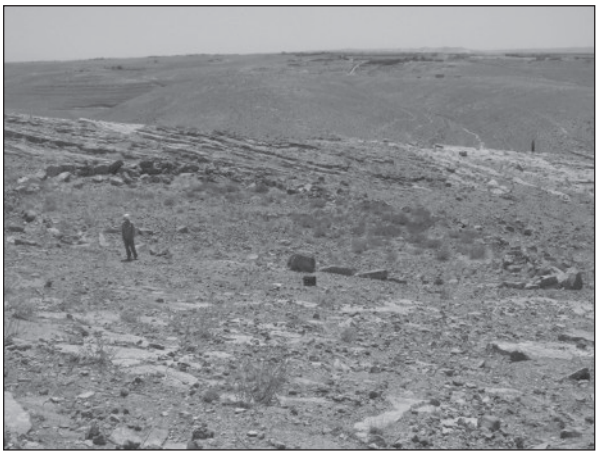
The site is confined to Feature A, a roughly circular wall of boulders (some well over a metre in size) measuring 36.47m south-west – north-east and 25.22m north-west – south-east (**Figs. 57-58**). Although the plan of this wall shows it to be closer to an ellipse than a circle, this is not evident in its setting. The inside of the circle is noticeably level compared to the surrounding landscape, and the southern (downhill) portion of the wall is noticeably thickened (up to 3.13m) and battered, to act as a retaining wall. The circle is bisected along the axis of the gully by a poorly preserved wall of smaller boulders. A parallel internal wall appears present in the south-east, but its course can only be traced for 2.79m. An apsidal projection, measuring 7.75m across, is attached to the circle in this same area.



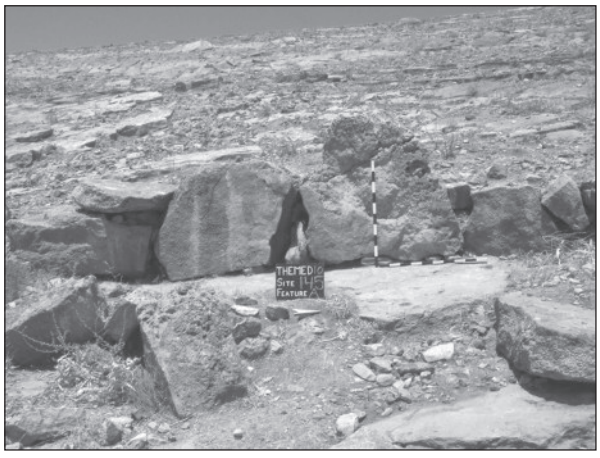
57. The megalithic stone circle (WT-145) south of Khirbat al-Hirī, with the standing stones at its western end.

The western end of the circle is set apart from the rest of the interior by two low, bedrock ledges that are bordered in places by more boulders, although the central axis was left unobstructed. This area focuses on two adjacent standing stones that appear to form a pair, facing east (107°T) (**Fig. 59**). The larger, northern stone (to the right when standing inside the circle) measures 1.60m at its widest point and is 1.54m high. The smaller, southern stone (to the left) is 1.33m wide and 1.21m high. On the upper bedrock ledge, in front of each of the standing stones, are pecked designs, which may be Thamudic inscriptions. Unfortunately, no artifacts were discovered at WT-145, despite an intensive search by the survey team.

Without engaging in untenable speculation, this site and ones like it (such as WT-146 and WT-152, which also have round constructions of large stones) appear to be part of the megalithic tradition of Jordan that peaked in the Chalcolithic or Early Bronze Ages. These simple stone monuments may have played a role in the ritual, communal or astrological lives of their makers, but the dating and interpretation of megalithic stone circles both remain problematic (Scheltema 2008: 21-23).



58. The stone circle at WT-145 with Justine Southam, facing east.



59. The two standing stones at the western end of the stone circle at WT-145 and bedrock ledge with inscriptions.

WT-151
UTM Zone 36: 775011E 3503500N 730m asl (at Ft A on hilltop)
774881E 3503473N 726m ASL (Ft B)
774848E 3503401N 717m ASL (Ft C)
Bearing: 1,445m at 204°T to Khirbat al-Hirī (WT-17, BM 5369)

On a hilltop north of Khirbat al-Hirī, site WT-151 includes three cemeteries, all of which exhibit systematic looting. The largest is Feature A on the summit, measuring about 55m across, where at least 33 looted graves were counted. The graves are all cut into the bedrock and most measure about 2m long by 0.5m wide and reach depths up to 2.5m deep, but even a child's grave barely 1 m long was emptied of its occupant. Most are simple shaft graves, although one has a side chamber and displaced cap stones visible in its bottom (**Fig. 60**). A larger tomb was also found, measuring about 3×2m at the surface and over 1m deep, with a step leading downwards at one corner. Loculi or chambers were seen opening off the tomb's southern and western sides. Nabataean, Early Roman and Byzantine pottery was collected at this cemetery.

Downhill and to the west is Feature B, a cemetery *ca.* 8m wide with at least eight looted graves. These graves are less well-defined than those at Feature A and may have been shallower or not rock-cut. One grave had two pieces of ashlar masonry lying in it, including a bossed stone and another with Nabataean tooling. More Nabataean and Byzantine pottery was collected at this cemetery, including many small sherds of *Dekorphase* 3a - b Nabataean Painted Fine Ware of *ca.* 20-100 AD (Schmid 2000). South-west of Feature B and farther downhill is Feature C, a small cemetery with at least one poorly-defined, looted grave. Other alignments of stone can however be seen; these may represent two or more unlooted graves or, less likely, other wall lines.

60. A looted rock-cut grave in cemetery Ft A at WT-151, showing a side chamber and displaced cap stones (right), facing north.

Umm Ruṣūm (WT-155)
UTM Zone 36: 772817E 3502413N 696m asl
Bearing: 1,622m at 98°T to Khirbat al-Hirī (WT-17, BM 5369)
JADIS: 2311.013 (Palumbo 1994: 2.133)

The village of Umm Ruṣūm was the only site in the JADIS database within the Regional Survey's territory that had yet to be identified, so a concerted effort was made to locate it in the 2010 season. The entry in JADIS lists the site as a modern (1915-1950) village, but further states: "no bibliography; no information" (Palumbo 1994: 2.133). This name appears at least as early as the 1949 topographic map of Kerak (1:250,000), on which it labels a settlement in the *wadi* bed between az-Za'farān and "Rujum *(sic)* el Hirī". Later maps show it in the same location, along what is sometimes labelled Wādī Umm Ruṣūm.

Discussion with local inhabitants clarified matters: the area north of az-Za'farān was generally known as Umm Ruṣūm, but we were directed towards the old village of that name. Site WT-155, the village of Umm Ruṣūm, consists of at least three linear houses, two cave dwellings and a circular structure (**Fig. 61**). However, since much of the settlement lies behind the fence line of a modern farm, only the three features described here were visited.

Feature A is a house with three rooms that all open to the east, with no interconnection between them. Each room has a window on its western side, although the central room also has one facing east. The house is built of stone, which is covered with a straw-tempered mud plaster; it has been painted and, in places, coated with cement. The roof must have originally been made of wood and mud, but has been replaced with metal-reinforced cement. The southern room has benches and recesses built into its walls and a small hole through the wall near the door. Part of the plaster has fallen off the wall in this room,

61. Part of the late Ottoman village of Umm Ruṣūm, showing the entrance to the cave (Ft C) (left) and the three-roomed house (Ft A) (right).

showing the house's construction technique. The central room also has built-in benches and recesses, including one very large shelved recess about 1.4m wide by 1.4m high and 0.5m deep, of uncertain function. The northern room is devoid of such installations. Two similar houses can be seen behind the fence line of the adjoining farm, which appear to be in current use.

To the north of the house is Feature B, a circular stone structure with traces of mud plaster or mortar. Basem al-Mahamid, our Department of Antiquities representative, suggested that it was a bread oven.

Feature C is a cave dwelling to the south of the house. Its eastern end and the entrance are partly built of mud-plastered stone and concrete, while the majority of the structure is carved into the bedrock. A wooden door still hangs on its hinges. A similar entrance to another cave can be seen east of the two houses in the western group, behind the fence. Inside the cave, the first room has a central concrete pillar supporting the roof, which is pierced by a smoke-hole. To the right, a window and door both lead to another room. At the rear of the central room is a third room, which has a central pillar and four holes (two are paired) in its ceiling.

In addition to these features and those behind the fence, Umm Ruṣūm has a number of terrace walls running parallel to the hill's contours, designed to minimize field erosion. Surface finds collected there include Iron Age, Roman, Byzantine, Umayyad, Abbasid (including a green-glazed sherd) and probably Ottoman pottery, as well as a deformed bullet, a basalt millstone, a stone loom weight fragment and lithics (including a blade). This is a site with considerable potential for future study, given its apparently long span of occupation and the light it might shed on the modern settlement of the region.

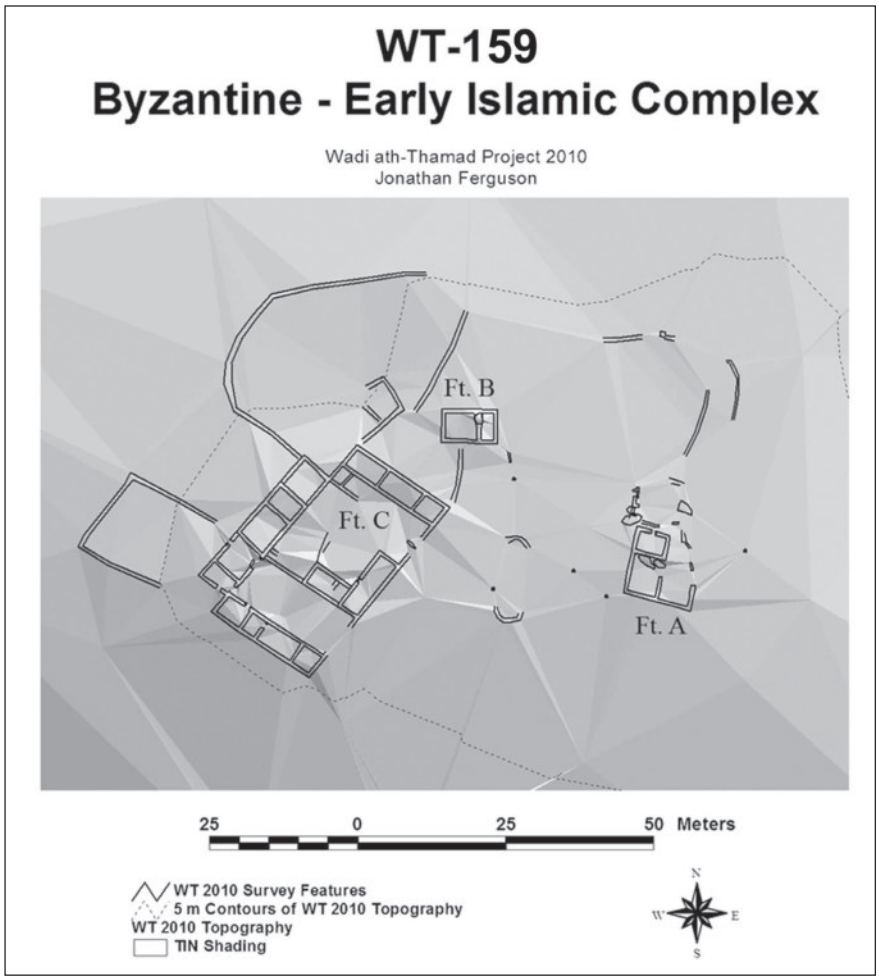
WT-159

UTM Zone 36: 774195E 3502502N 716m asl
Bearing: 394m at 145°T / 156°M to Khirbat al-Hirī (WT-17, BM 5369)

The ruins of four rectilinear buildings are visible on a ridge extending north-west from the hill of Khirbat al-Hirī (**Fig. 62**). With the exception of a few Iron Age body sherds, the pottery collected at this new site (WT-159) dates from the Byzantine and Umayyad periods, when Umm al-Walīd was thriving to the north-east.

Feature A, the building on the east side and closest to the modern dirt road from Umm al-Walīd, is an L-shaped structure (11.74×11.49m) with three rooms. The two southern rooms appear to have been open to the outside, while the northern room had a doorframe in its northern wall. To the north-west is Feature B, a rectangular building 9.52×5.73m, with two rooms divided by a north-south wall closer to its eastern side (this wall is now partially obscured by a *bedouin* grave). Farther to the north is Feature F, a smaller structure measuring 4.30m wide and at least 5.50m long (its western extent is unclear); it may in fact be a grave like the slightly smaller Features B and D at adjacent site WT-148. Measuring 37.29m south-west – north-east by 25.75m south-east – north-west, the largest structure by far is Feature C on the western side of the site, which has sixteen internal rooms arranged around two courtyards. Two rooms in its north-western wing may belong to an earlier phase, since their walls are abutted by later constructions. Although there are some gaps, the arrangement of this building can be reconstructed with some certainty, as door jambs and lintels are visible in many locations. Its function, on the other hand, is less clear, but it may have served as a large farmstead or country estate.

Two cisterns were found at WT-159. One of them, Feature D to the south of Feature C, has been refurbished with a new cemented superstructure in 2005 (the date 2005 can be seen written in the cement); the neighboring *bedouin*



62. The Byzantine and Early Islamic site WT-159, showing the central structures (Fts A, B and C). Another small building (Ft F) and a cistern (Ft E) are located farther to the north-east; another cistern (Ft. D) is located to the south.

family watered their flocks of sheep and goats there daily during our field work. On the north-eastern side of the site is cistern Feature E, which has fallen into disuse and is now the exclusive haunt of wild doves.

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