# Internal report of an archaeological rescue operation at al-Khod, Hor al-Dab` (al-Hawd, Hūr Ad-Dab '), Muscat Governorate, 12.01. to 26.01.2023 for the Ministry of Heritage and Tourism, version 1 

Marcel Juhas, Luisa von Schlammersdorff, Fanny Weber, Paul A. Yule

Internal report of an archaeological rescue operation at al-Khod, Hor al-Dabc (al-Hawḍ, Ḥūr Ad-Dab'), Muscat Governorate, 12.01. to 26.01 .2023 for the Ministry of Heritage and Tourism, version 1

## A rescue excavation and mapping of hut tombs and niche tombs


#### Abstract

In September 2018 the population of the capital area reached 1.4 million. Places such as alKhod need room for growth. The development of this area during the past 20 years includes the building of the Nizwa road, highway 15, to its north-east Lulu al-Bandar super market and flanking to its west a large housing settlement. Tombs are scattered over the three mountains ( $600 \mathrm{~m} \times 300 \mathrm{~m}$ area). The Ministry of Defence plan to develop the mountains (Fig. 1) as a recreational facility - the 'Heritage Hill' project.

This document reports first on the excavation and documents 140 burial structures, the excavated finds, the clearance of stone from the tomb cluster on the southern mountain, figures of the 3D and drawings of the tomb floors as well as thumbnails of the tombs ordered sequentially in ascending order.


Introduction
On the southern side of the property of the Ministry of Defence, 200 m south-west of the Lulu al-Bandar parking lot lies a concentration of prehistoric hut tomb on the backs of the three east-west mountain chains and prehistoric niche graves in the piedmont zones. The Lulu parking lot is separated from the archaeological site by a cobbled masonry trench 1 m in depth. To the west highway 15 closes it off. But to the west and south the site is still not built on. Further local building plans, while not yet announced, are certain to follow in coming years generated by population increase. The entire archaeological site has been damaged by road building and construction. This is visible most recently in the bulldozing of the north-eastern and eastern flanks.

In 2018 Ali Khamis al-Rasibi of the then Ministry of Heritage and Culture (today Ministry of Heritage and Tourism) began planning this facility to protect and turn them to good use. He posted ministry antiquities signs to show that the site stood under protection of the ministry. In October 2018, May 2019 and October 2021 Michela Gaudiello, Stephan Blum, Fausto Mauro and Paul Yule of the Heidelberg University team surveyed this site as a service for the ministry. It was necessary to change the numbers which the team wrote on the architectural features, which often do not correspond with those used here. Owing to electronic defensive disturbance, the hand-held GPS did not work in this military area and yielded bizarre results for our site mapping. With the help of the Differential GNSS receiver of the GUtech this team already submitted a first hut tomb plan of Hūr al-Dab to the Ministry which was published in 2021 (Yule et al. 2021, 301 Fig. 24). This season it was possible to complete the mapping of the niche tombs optically.


Fig. 1. This Google Earth satellite image from April 2013 shows the Ḥūr al-Dab' site and its archaeological features. The site lies between Lulu al-Bandar, above and road no. 15 to the left. The blue flags signify niche tombs and the red huts hut tombs. The blue 'safires'signify completely ruined tombs while the 5-point stars designate sangars (Fig. 5).


Fig. 2. Photogrammetric orthographic view of hut tomb HDh7, seen from four sides and from above.


Fig. 3. Orthographic view of the niche tomb, HDh84.

80 hut tombs, 56 niche tombs, 6 recent sangars (temporary fortified defensive position with a breastwork constructed of stone) as well as 10 destroyed structures comprise the main features. The two kinds of tombs (Fig. $2 \& 3$ ) on site need not be contemporary sensu stricto with each other. Some tombs comprise merely a few remaining stones. In most cases the tomb roof has collapsed. The hut tombs typically use a sandwich wall construction (Fig. 4). They spread on three parallel ESE-WNW oriented mountains. Between them lies a 50 m wide empty valley. Some 30 tombs lie on the northern mountain nearer to Lulu. But more lie on the ridge of the third mountain 150 m to the south. The preservation of the tombs is heterogeneous; a few still are roofed. They are built of broken stone 20 to 100 cm in size. Hut tombs consists of the local limestone, but those on the south mountain show a mixture of light-coloured limestone and dark mafic rock. Hut tombs are understood to date to the Early Iron Age (Yule - Gaudiello 2017), but this dating has been seriously challenged (Düring - Olijdam 2015). In the Batina and Wadi al-Jizzi, recent surveys show destroyed tombs, only rarely well-preserved ones. The hut tombs and niche tombs as at Ḥūr al-Dab' have been little studied and give us significant information with regard to local demography, burial customs and social structure of the local population. They reveal building methods which have not yet been documented in the different parts of the Sultanate. In their form the hut tombs are more closely related to those of north-eastern and eastern Oman. The entrance is from the top, not from the end.

Investigating tombs with caved in roofs without damaging them is difficult and collapse is irreversible. They easily may collapse just to gain access, which we avoided (e.g. tomb HDh8). We completely excavated tombs HDh6 and HDh7. Experimentally we re-constructed HDh7 with six workmen. This took four hours, but the roof was not completely re-closed. We avoided excavating niche tombs, because these lay outside the possible site of the Heritage Hill building. No site plan was available to us of the planning or the topography, which would have improved or speeded up our mapping. We focussed on the northern mountain which seemed the likely site of the new building.

The shape of the niche tombs varies according to the shape of the natural geological niche which forms one side of the structure. Given the wide variation, this is not a tomb type, but rather only a simple way to build tombs. This is not specific to a place or a time, but is wider. It also occurs in Zafar (al-Shaḥrî 1991, 187 fig. 8). Examples from al-Buḥayṣ (Sharja emirate), contained EIA finds (Jasim 2012, tombs BHS16, BHS17, BHS22, BHS23, BHS26BHS33, BHS35, BHS36).

Some of the niche tombs show skeletal remains in situ but could not be recorded for time reasons. Fortunately, Halima al-Shehhi was available to study the human remains.

In 2018 in his project estimate to the ministry Yule proposed excavating and documenting Hor al-Dab' during a period of 60 or of 30 days. However, funds enabled survey and excavation for only 14 days in the field ( 6 days/week). Our fieldwork is thus only a pilot project. Compared to other salvage operations in the Batina we had a critically low relation of documenters (de facto 4) and labourers (6) in relation to the number of tombs. On the third day it was decided that the well-preserved Hūr al-Dab' tombs were not be destroyed, as opposed to those of the Baṭina salvage operations.

In the available time, first we recorded 24 tombs by means of 'Structure from Motion' (SfM) software. The graphic documentation of the tombs and writing requires more time than does actual excavation. The 140 archaeological features appear on the site map and in a gazetteer of the site (pp. 10-37).


Fig. 4. Sangar perhaps less than 30 years old to judge from the kind of ammunition found in them.

| feature no. | SfM | excavated | plan sketch | final photo |
| :--- | :--- | :--- | :--- | :--- |
| Hdh001 | x | x | x | x |
| Hdh002 | x | x | x | x |
| Hdh003 sangar | x | x | x | x |
| Hdh004 | x | x | x |  |
| Hdh005 | x | x | x |  |
| Hdh006 | x | x | x | x |
| Hdh007 | x | x | x | x |
| Hdh008 | x | x | x |  |
| Hdh009 | x | x | x | x |
| Hdh010 | x | x | x | x |
| Hdh011 | x | x | x | x |
| Hdh012 | x | x |  |  |
| Hdh013 | x | x |  |  |
| Hdh014 | x | x | x | x |
| Hdh015 | x | x |  |  |
| Hdh016 | x |  |  |  |
| Hdh017 | x |  |  |  |
| Hdh018 | x |  |  |  |
| Hdh038 | x |  |  |  |


| Hdh039 | x |  |  |  |
| :--- | :--- | :--- | :--- | :--- |
| Hdh078 | x |  |  |  |
| Hdh079 | x |  |  |  |
| Hdh080 | x |  |  |  |
| Hdh081 | x |  |  |  |
| Hdh082 | x |  |  |  |
| Heg. |  |  |  |  |

Fig. 5. Work accomplished 12.01. to 26.01.2023 at Ḥūr al-Dhab. The work consisted of the fashioning of 'Structure from Motion' 3D images, excavation, plan drawing and a final photo of each structure.

On the southern mountain we also cleared the large cluster of tombs of stone fallen from the upper tomb courses, in order that visitors can freely move through it (pp. 38-41).

The finds
Surface finds were rare and included a few sherds of medieval TURQ pottery. The tombs contained few finds, all were disturbed. Most common finds were disturbed skeletons. Tomb HGh04 contained Pinctada beads (Fig. 6). Three broken late Sasanian glass aryballoi also occurred in the same tomb - the first of its kind in this part of Oman (Fig. 7). They find parallels from burials on Bahrain (Andersen 2007, 86 fig. 352). No diagnostic Early Iron Age finds came to light.


Fig. 6. Pinctada beads from tomb HDh04.


Fig. 7. At least two late Sasanian glass aryballoi from tomb HDh10.

| find no. | type of find | level | date | tomb no. | gramme |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 23.01. | bone | debris | 18.01.2023 | 6 | 3 |
| 23.02. | bone | debris | 18.01.2023 | 7 | 10 |
| 23.03. | charcoal | debris | 19.01.2023 | 12 | 3 |
| 23.04. | glass | debris | 18.01.2023 | 7 | 2 |
| 23.05. | pottery sherd | debris | 19.01.2023 | 7 | 0,5 |
| 23.06. | white substance | debris | 18.01.2023 | 10 | 3 |
| 23.07. | bone | debris | 19.01.2023 | 11 | 493 |
| 23.08. | cartridge frag. | debris | 19.01.2023 | 11 | 0,5 |
| 23.09. | bone | debris | 18.01.2023 | 12 | 0,5 |
| 23.10. | bone | debris | 22.01.2023 | 12 | 186 |
| 23.11. | glass | debris | 19.01.2023 | 12 | 0,5 |
| 23.12. | mollusc shell | debris | 22.01.2023 | 12 | 0,5 |
| 23.13. | seed | debris | 19.01.2023 | 13 | 0,5 |
| 23.14. | bone | debris | 22.01.2023 | 10 | 1512 |
| 23.15. | tooth | debris | 22.01.2023 | 10 | 2 |
| 23.16. | tooth | debris | 22.01.2023 | 11 | 0,5 |
| 23.17. | shell | debris | 22.01.2023 | 10 | 8 |
| 23.18. | bone | debris | 22.01.2023 | 4 | 30 |
| 23.19. | bone | debris | 22.01.2023 | 5 | 45 |
| 23.20 | bone | debris | 23.01.2023 | 9 | 127 |
| 23.21 | lithic | debris | 23.01.2023 | 4 | 5 |
| 23.22 | glass vessel frags | debris | 23.01.2023 | 10 | 37 |
| 23.23 | bead | debris | 23.01.2023 | 4 | 4 |
| 23.24 | bone | debris | 25.01.2023 | 4 | 417 |
| 23.25 | bone | debris | 26.01.2023 | 5 | 636 |
| 23.26 | bone | debris | 24.01.2023 | 2 | 103 |
| 23.27 | charcoal | debris | 24.01.2023 | 10 | 7 |
| 23.28 | bone | debris | 24.01.2023 | 1 | 201 |
| $\begin{array}{\|l} \hline 23.29 \mathrm{see} \\ 23.22 \end{array}$ | glass | debris | 25.01.2023 | 10 |  |
| 23.30 | bone | debris | 26.01.2023 | 14 | 57 |

Fig. 8. The finds from the Ḥūr al-Dab' excavation of January 2023.

## Archaeological Insights

The excavation gives a more concrete idea of the hut tomb means of construction in this part of Oman. Such hut tombs are not documented outside of the Batina. Their form is partly conditioned by the locally available stone - whether rolled or broken. The frontal entrance, as known at hut tomb sites in eastern Oman are not present at Ḥūr al-Dab' which belongs to the Batina EIA tomb tradition. Nor is the common small type 2 cell tomb (Yule et al. 2021, 296 Fig. 20). The EIA chronology question for these tombs can best be resolved by OSL dating. The only datable finds are late Sasanian glass vessels which are taken to be from reuse. Hִū al-Dab' is important as part of the typological scaffolding for the EIA chronology to be further developed. The authors still hold to a provisional dating of hut tombs in the EIA.

The team of 2023 at Ḥūr al-Dab' consisted of:
1 Prof. Dr. Paul A. Yule coordinator
2 Jabar al-Shiriani archaeologist
3 Hanan al-Harthi
4 Halima al-Shehhi
5 Hilal al-Qasimi
archaeologist
student anthropologist
6 Marcel Juhas
7 Luisa von Schlammersdorff
8 Fanny Weber
9 Walid al-Gahfri
10 Ali al-Mahruqi
archaeologist
student archaeologist
student archaeologist
student archaeologist
advisor
11 Sultan al-Bakri
advisor ex officio
Director General of Archaeology
Six labourers excavated except for the fine work, six day per week, 07:30-13:00.
Team of 2018: Michela Gaudiello, P. Yule
Team of 2019: Fausto Mauro, P. Yule
Team of 2021: Michela Gaudiello, Stephan Blum, Ahmed Hadidi, P. Yule
Special Arabic vocabulary:


Hur al-Dhab حور الذبع Ḥūr adِ-dِab`

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| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | 3,30 | 1,90 | 1,30 | E-W | x | NW | oval in plan, roof broken in |  |
| 2 | 2,90 | 2,20 | 1,40 | E-W | x | NW | chamber wall intact, roof entirely missing |  |
| 3 | 1,80 | 2,00 | 0,75 | SE-S | / | NW | sangar, open to SE-S |  |
| 4 | 2,90 | 2,30 | 1,20 | NW-SE | x | NW | upper portion of both ends demolished, roof $25 \%$ extant |  |



| 9 | 3,30 | 2,30 | 1,25 | E-W | x | NW | 9-11 together, E end is demolished, roof collapsed |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 10 | 3,50 | 2,30 | 1,70 | E-W | x | NW | end demolished, roof $50 \%$ intact |  |
| 11 | 4,00 | 1,80 | 1,65 | E-W | X | NW | E end demolished |  |
| 12 | 3,60 | 2,70 | 1,55 | E-W | x | NW | upper courses of E wall and SE end of roof destroyed |  |


| 13 | 3,90 | 2,60 | 1,70 | NE/E- <br> SW/W | X | NW | upper courses of E wall and roof demolished, otherwise basically intact |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 14 | 2,90 | 2,20 | 1,20 | E-W | X | NW | built together 14-17, most of roof \& uppermost N side demolished |  |
| 15 | 3,20 | 2,20 | 1,65 | E-W | X | NW | roof caved in |  |
| 16 | 3,80 | 2,40 | 1,40 | E-W | X | NW | roof mostly collapsed |  |


| 17 | 3,10 | 2,50 | 1,25 | E-W | x | NW | roof collapsed |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 18 | 2,00 | 2,10 | 0,65 | $\mathrm{N} / \mathrm{NE}$ | / | NW | small sangar |  |
| 19 | 3,10 | 2,10 | 1,45 | E-W | x | mid E | NE corner \& roof collapsed, black stones mixed in |  |
| 20 | 3,20 | 2,20 | 1,65 | E-W | x | mid E | black stones mixed in, roof collapsed |  |


| 21 | 3,10 | 2,20 | 1,40 | NE-SW | x | mid E | 21-4 built together, dishevelled, roof largely intact |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 22 | 3,00 | 1,50 | 1,40 | NE-SW | x | $\operatorname{mid} E$ | roof \& presumed entrance largely collapsed |  |
| 23 | 3,10 | 2,00 | 1,60 | SE-NW | x | $\operatorname{mid} E$ | upper courses of NE corner damaged |  |


| 24 | 3,00 | 2,20 | 1,20 | SE-NW | X | mid E | SE part of the roof is demolished |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 25 | 2,60 | 2,60 | 0,40 | $\sim$ E-W | \# | mid E | square in plan, not a hut tomb |  |
| 26 | 3,10 | 3,00 | 1,40 | SE-NW | x | $\operatorname{mid} \mathrm{E}$ | N-NW end upper courses missing, unclear where entrance is, white and black stones |  |
| 27 | 3,00 | 2,60 | 1,10 | E-W | x | mid E | NE corner upper courses are destroyed, roof collapsed |  |


| 28 | 2,20 | 2,60 | 1,40 | NE-SW | x | mid E | roof collapsed, black stones mixed in |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 29 | 3,00 | 2,40 | 1,20 | SW-NE | x | mid E | oval plan, roof collapsed |  |
| 30 | 2,70 | 2,00 | 0,80 | E-W | 1 | mid E | points to the W, ca. 5 courses of stone/ in front is a large monolith |  |
| 31 | 3,00 | 2,70 | 0,50 | NW-SE | / | SE | oval sangar |  |


| 32 | 3,00 | 2,40 | 2,00 | E/SE- <br> W/NW | x | SE | roof collapsed |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 33 | 3,50 | 2,70 | 1,65 | NW-SE | X | SE | part of SE wall and roof collapsed |  |
| 34 | 3,90 | 2,20 | 1,60 | ~E-W | X | SE | roof collapsed, thick entrance at SW end |  |
| 35 | 3,50 | 2,15 | 1,50 | $\sim$ E-W | x | SW | roof largely intact, NE wall damaged |  |


| 36 | 3,30 | 1,90 | 1,10 | E-W | X | SW | 36-7 built together, white \& black stones, roof collapsed |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 37 | 3,50 | 2,40 | 1,70 | E-W | x | SW | SE upper courses damaged, roof collapsed |  |
| 38 | 3,60 | 2,00 | 1,60 | SE-NW | x | SW | perforation in the roof, NE side damaged |  |
| 39 | 3,30 | 2,20 | 1,45 | E-W | x | SW | NE end and roof collapsed |  |


| 40 | 3,20 | 1,90 | 1,55 | E-W | x | SW | 40-1 built together, upper courses esp. in NW dishevelled, roof collapsed |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 41 | 3,20 | 2,30 | 1,30 | E-W | X | SW | NNE end collapsed, roof partly intact |  |
| 42 | 3,50 | 2,25 | 1,55 | E-W | x | SW | 42-4 built together, W end demolished, roof collapsed |  |
| 43 | 4,20 | 2,50 | 1,80 | E-W | x | SW | NNE corner \& roof collapsed, this built 1st |  |


| 44 | 3,60 | 2,50 | 1,70 | E-W | x | SW | upper courses of SSW side damaged, roof collapsed |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 45 | 3,20 | 2,40 | 1,45 | E-W | x | SW | S upper courses missing, roof collapsed |  |
| 46 | 3,00 | 2,20 | 1,60 | E/SE- <br> W/NW | x | SW | 45-7 together, large hole in roof |  |
| 47 | 2,60 | 1,65 | 0,90 | E-W | x | SW | just to N of 46, roof perforated, |  |


| 48 | 3,60 | 1,90 | 1,70 | E-W | x | SW | E upper courses damaged, roof partly intact, black and white stones |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 49 | 4,20 | 1,50 | 1,60 | E-W | X | SW | lies between 48 \& 50, roof indented |  |
| 50 | 3,60 | 2,30 | 1,30 | NE-SW | x | SW | NE wall and roof demolished |  |


| 51 | 3,40 | 2,40 | 1,60 | NE/E- <br> SW/W | x | SW | upper walls badly damaged, roof demolished |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 52 | 3,70 | 1,80 | 1,55 | N-S | x | SW | N end upper courses and roof damaged, |  |
| 53 | 3,80 | 2,10 | 1,70 | N/NW- <br> S/SE | x | SW | lies between 52 \& 54 , BW mixed stones, roof collapsed |  |
| 54 | 3,80 | 2,10 | 1,40 | N-W | x | SW | roof collapsed |  |


| 55 | 3,70 | 1,90 | 1,60 | E-W | x | SW | 55-6 twin tombs, 55 at NNW end, roof collapsed |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 56 | 3,30 | 1,80 | 1,60 | E-W | x | SW | at SSE end roof collapsed |  |
| 57 | 3,00 | 1,80 | 1,40 | NE-SW | x | SW | roof collapsed |  |


| 58 | 3,30 | 2,10 | 1,00 | E/NE- <br> W/SW | x | SW | ENE end \& upper courses demolished, roof intact |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 59 | 3,45 | 1,90 | 1,35 | E/NE- <br> w/sw | x | SW | 59-61 SSW end and roof destroyed |  |
| 60 | 3,30 | 2,50 | 1,80 | NE-SW | x | SW | stones mostly dark |  |


| 61 | 4,60 | 2,20 | 1,70 | E-W | X | SW | E upper courses and roof missing |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 62 | 4,50 | 2,10 | 1,70 | E-W | x | SW | E courses and roof missing, 20\% of roof preserved |  |
| 63 | 3,80 | 2,20 | 1,60 | E-W | X | SW | W end of chamber intact, NE wall missing |  |
| 64 | 3,50 | 2,80 | 0,60 | E-W | x | SW | completely demolished hut tomb |  |


| 65 | - | - | 0,75 | Not determi nable | x | SW | stone scatter, once a hut tomb |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 66 | 3,80 | 3,20 | 1,20 | E-W | \# | SW | semi-circular, roof collapsed, not a hut tomb, standing rock defines one wall |  |
| 67 | 2,50 | 2,40 | 0,85 | NE-SW | 1 | SW | located on a peak, sangar, breastwork to the SW |  |
| 68 | - | - | - | E-W | \# | SW | 68-71 converted into a defensive emplacement, 68 northernmost |  |


| 69 | - | - | - | Not determi nable | \# | SW | yellow rectangle signifies position of grave 69 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 70 | - | - | - | N-S | \# | SW | most westerly, floor recognisable |  |
| 71 | - | - | - | E-W | \# | SW | floor recognisable |  |
| 72 | 3,30 | 1,90 | 1,15 | NW-SE | x | SW | 72 built with 73 , roof perforated |  |


| 73 | - | - | - | $\begin{aligned} & \text { E/SE- } \\ & \text { W/NW } \end{aligned}$ | \# | SW | collapsed |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 74 | 3,40 | 2,10 | 1,10 | E-W | x | SW | collapsed chamber, roof dismantled |  |
| 75 | 4,90 | 3,40 | 1,50 | NW-SE | \# | S of S | ESE-WNW secondary use of stones, floor excavated, recent |  |
| 76 | 1,80 | 1,50 | 0,70 | NW-SE | x | mid W | built on a steep slope leaning against bedrock, S side walled in, in plan pear-shaped |  |





| 85 | 2,30 | 1,60 | 0,60 | $\begin{aligned} & \text { NNW- } \\ & \text { SSE } \end{aligned}$ | + | mid E | few stones in situ |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 86 | 2,10 | 1,50 | 0,90 | E-W | + | $\operatorname{mid} E$ | chamber build of rough stones |  |
| 87 | 2,00 | 1,70 | 1,10 | N-S | + | mid E | grave build into north cliff face |  |
| 88 | 1,50 | 1,70 | 0,80 | $\begin{aligned} & \text { NNW- } \\ & \text { SSE } \end{aligned}$ | + | mid E | chamber wall in situ, roof destroyed, eastern cliff face |  |


| 89 | 1,30 | 2,00 | 0,80 | N-S | + | mid W | build into south-west cliff face, chamber wall preserved |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 90 | 2,80 | 1,80 | 1,00 | ENEWSW | + | mid W | build into wester cliff face, chamber extant |  |
| 91 | 3,00 | 2,10 | 1,20 | NW- SE | + | SW | chamber wall opposite eastern cliff face |  |
| 92 | 3,00 | 2,00 | 1,40 | E-W | + | mid W | roof missing, chamber stones are only at W end |  |


| 93 | 3,60 | 2,50 | 1,70 | E-W | + | mid W | W part of roof damaged, otherwise intact |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 94 | 3,30 | 1,80 | 1,20 | E-W | + | mid W | roof preserved at W end, E end missing |  |
| 95 | 3,10 | 1,90 | 1,30 | E-W | + | mid W | roof and wall destroyed, stones at E \& W end still extant |  |
| 96 | 3,30 | 1,90 | 0,60 | E-W | + | mid W | roof missing, wall largely destroyed, chamber roof very low |  |


| 97 | 2,40 | 1,40 | 0,60 | E-W | + | mid W | grave destroyed, stones in situ at E end |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 98 | 3,80 | 2,00 | 0,60 | E-W | + | mid W | largely destroyed, stones in situ E end |  |
| 99 | 3,60 | 2,10 | 1,80 | NE-SW | + | mid W | stones in situ in E end |  |
| 100 | 3,00 | 1,70 | 1,20 | E-W | + | NW | stones piled up against N cliff |  |


| 101 | 3,00 | 1,40 | 0,80 | NW- SE | + | NE | anthropogenic pile of stones resembling a grave |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 102 | 3,20 | 1,70 | 1,10 | E-W | + | NE | roof and S chamber wall largely missing |  |
| 103 | 2,10 | 1,90 | 0,50 | WNW | + | NE | irregular stone walling against cliff |  |
| 104 | 2,70 | 1,50 | 0,90 | SE-NW | + | NE | irregularly walled chamber |  |


| 105 | 2,10 | 1,60 | 0,80 | SE-NW | + | NE | roof built build of stone slab, $S$ end missing |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 106 | 3,50 | 2,50 | 1,00 | E-W | + | NE | irregular stone walling against slope |  |
| 107 | 2,50 | 1,60 | 0,80 | NESW | + | NE | few stones W chamber wall intact |  |
| 108 | 1,80 | 0,70 | 1,20 | E-W | + | SE | N face, chamber formed of rough stones, roof not intact |  |






| 117 | 2,20 | 1,70 | 0,70 | $\begin{aligned} & \text { NNW- } \\ & \text { SSE } \\ & \hline \end{aligned}$ | + | SW | cut into wadi, stones piled on W face |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 118 | 3,30 | 2,00 | 1,00 | NE-SW | + | SW | roof missing, 7 stone courses extant |  |
| 119 | 1,80 | 1,50 | 1,20 | E-W | + | SW | roof missing, 7 stone courses extant |  |
| 120 | 3,00 | 1,60 | 1,20 | NW-SE | + | SW | chamber intact, leans against northern cliff face |  |



| 125 | 3,00 | 2,20 | 1,00 | NE-SW | + | SE | rough chamber wall, leans against north-eastern cliff face |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 126 | 3,00 | 2,60 | 0,80 | E-W | + | SE | chamber recognizable, leans against northern cliff face |  |
| 127 | 2,80 | 1,70 | 1,00 | E-W | + | SE | chamber recognizable, leans against northern cliff face |  |


| 128 | 3,60 | 2,20 | 0,90 | E-W | + | SE | chamber well recognizable, at the foot of the mountain |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 129 | 3,60 | 2,00 | 0,70 | not determ | + | SE | chamber recognizable, leans against northern cliff face |  |
| 130 | 3,20 | 1,60 | 0,80 | E-W | + | SE | chamber well recognizable, perched against northern cliff face |  |
| 131 | 3,40 | 1,80 | 0,60 | NW-SE | + | SE | destroyed chamber, leans against western cliff face |  |



| 136 | 2,60 | 1,40 | 1,00 | E-W | + | SE | recognizable chamber wall, leans against northern cliff face |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 137 | 2,40 | 1,50 | 0,90 | E-W | + | SE | badly damaged chamber wall against northern cliff face |  |
| 138 | 2,70 | 1,30 | 0,70 | E-W | + | SE | badly damaged chamber wall against northern cliff face |  |
| 139 | 2,50 | 1,30 | 0,80 | NE-SW | + | SE | badly damaged chamber wall against northwestern cliff face |  |


| 140 | 3,20 | 3,00 | 0,80 | N-S | / | mid W | dug into the conglomerate entrance in the south |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |




Fig. 1. Ḥūr al-Dab tombs HDh01-02.


Figs. 2-3. Ḥūr al-Dab‘ tombs HDh01-02.


Fig. 4. Ḥūr al-Dab‘ sangar HDh03.


Fig. 5. Ḥūr al-Dab‘ tombs HDh04-05.


Fig. 6-7. Ḥūr al-Dab‘ tomb plans HDh04-05.


Fig. 8-9. Ḥūr al-Dab' tomb HDh006 SfM and plan.


Fig. 10. Ḥūr al-Dab' tomb HDh007.


Fig. 11. Ḥūr al-Dab'. The lowest course of stones of the hut tombs shows in plan a sandwich wall construction.


Fig. 12. Ḥūr al-Dab' tomb HDh008 SfM.


Fig. 13-15. Ḥūr al-Dab tombs HDh009-011 SfM.


Fig. 16-17. Ḥūr al-Dab' tombs HDh010 \& 011 plan drawings.


Fig. 18. Ḥūr al-Dab' tomb HDh012 SfM.


Fig. 18. Ḥūr al-Dab' tomb HDh014 SfM.


Fig. 19. Ḥūr al-Dab‘ tomb HDh014-016 SfM.


Fig. 20. Ḥūr al-Dab tomb HDh014 SfM.


Fig. 21. Ḥūr al-Dab‘ sangar HDh018 SfM.


Fig. 22. Ḥūr al-Dab tomb HDh038-039 SfM.


Fig. 23. Ḥūr al-Dab' niche grave HDh084 SfM.


Fig. 24. Ḥūr al-Dab' niche grave HDh084 drawing.


Fig. 25. Ḥūr al-Dab' hut tombs HDh038-039 SfM.


Fig. 26. Ḥūr al-Dab‘ destroyed hut tomb HDh088 SfM.


Fig. 27. Hor al-Dhab‘ niche grave HDh123 SfM.



| Tomb | File name | image | Author |
| :---: | :---: | :---: | :---: |
| 01 | grabsohle dwg.jpg |  | Juhas |
| 01 | P1240001.JPG |  | Juhas |
| 01 | P1240002.JPG |  | Juhas |
| 01 | P1240003.JPG |  | Juhas |
| 01 | P1240012.JPG |  | Juhas |
| 01 | P1240013.JPG |  | Juhas |
| 01 | P1240014.JPG |  | Juhas |
| 01 | P1240015.JPG |  | Juhas |


| 01 | P1240016.JPG | Juhas |  |  |
| :--- | :--- | :--- | :--- | :--- |
|  |  |  |  |  |


| 02 | 002 grabsohle dwg |  | Juhas, von <br> Schlammersdorff |
| :--- | :--- | :--- | :--- | :--- |
| 02 | 002 P1240004 |  |  |


| 02 | 002 P1250008 |  | Juhas |
| :---: | :---: | :---: | :---: |
| 04 | 004 grabsohle dwg |  | Yule |
| 04 | 004 P1230042 |  | Yule |
| 04 | 004 P1230043 |  | Yule |
| 04 | 004 P1230044 |  | Yule |
| 04 | 004 P1280006 |  | Yule |
| 05 | 005 grabsohle dwg | 포느․ | Al-Harthi\&Yule |
| 05 | 005 P1230038 |  | von <br> Schlammersdorff |
| 05 | 005 P1250011 |  | von <br> Schlammersdorff |
| 05 | 005 P1250015 |  | von Schlammersdorff |
| 06 | 006 grabsohle dwg | $\begin{array}{r} 28 \\ 28 \\ \hline \end{array}$ | von <br> Schlammersdorff |


| 06 | 006 P1180001 |  | von Schlammersdorff |
| :---: | :---: | :---: | :---: |
| 06 | 006 P1180003 |  | von Schlammersdorff |
| 06 | 006 P1180004 |  | von Schlammersdorff |
| 06 | 006 P1180005 |  | von Schlammersdorff |
| 06 | 006 P1180007 |  | von Schlammersdorff |
| 06 | 006 P1180008 |  | von <br> Schlammersdorff |
| 06 <br>  <br> 06 | 006 P1180009 |  | von <br> Schlammersdorff |
| 06 | 006 P1180010 |  | von Schlammersdorff |
| 06 | 006 P1180015 |  | von <br> Schlammersdorff |
| 06 | 006 P1180016 |  | von <br> Schlammersdorff |


| 06 | 006 P1180017 |  | von <br> Schlammersdorff |
| :---: | :---: | :---: | :---: |
| 06 | 006 P1180018 |  | von <br> Schlammersdorff |
| 06 | 006 P1180021 |  | von <br> Schlammersdorff |
| 06 | 006 P1180023 |  | von <br> Schlammersdorff |
| 06 | 006 P1180025 |  | von <br> Schlammersdorff |
| 06 | 006 P1180149 |  | von <br> Schlammersdorff |
| 07 | 007 tomb floor dwg |  | Yule |
| 07 | 007 P1180027 |  | Juhas |
| 07 | 007 P1190001 |  | Juhas |
| 07 | 007 P1190002 |  | Juhas |


| 07 | 007 P1190003 |  | Juhas |
| :---: | :---: | :---: | :---: |
| 07 | 007 P1190005 |  | Juhas |
| 09 | 009 dwg |  | Yule |
| 09 | 009 P1220028 |  | al-Shiriani |
| 09 | 009 P1220029 |  | al-Shiriani |
| 09 | 009 P1230006 |  | al-Shiriani |
| 09 | 009 P1230007 |  | al-Shiriani |
| 09 | 009 P1230008 |  | al-Shiriani |
| 09 | 009 P1240007 |  | al-Shiriani |



| 10 | 010 P1230036 |  | Weber |
| :---: | :---: | :---: | :---: |
| 10 | 010 P1250027 |  | Weber |
| 10 | 010 P1250028 |  | Weber |
| 10 | 010 P1250029 |  | Weber |
| 10 | 010 P1280003 Kopie |  | Yule |
| 11 | 011 dwg |  | von <br> Schlammersdorff |
| 11 | 011 P1190006 |  | von <br> Schlammersdorff |
| 11 | 011 P1190007 |  | von <br> Schlammersdorff |
| 11 | 011 P1190008 |  | von <br> Schlammersdorff |



| 12 | 012 P1220038 |  | al-Shehhi |
| :---: | :---: | :---: | :---: |
| 12 | 012 P1220039 |  | al-Shehhi |
| 12 | 012 P1220041 |  | al-Shehhi |
| 12 | 012 P1220043 |  | al-Shehhi |
| 12 | 012 P1220045 |  | al-Shehhi |
| 12 | 012 P1220046 |  | al-Shehhi |
| 12 | 012 P1220053 |  | al-Shehhi |
| 12 | 012 P1220054 |  | al-Shehhi |
| 14 | 014 dwg |  | von <br> Schlammersdorff |
| 14 | 014 IMG_1484 |  | von <br> Schlammersdorff |


| 14 | 014 IMG_1488 |  | von <br> Schlammersdorff |
| :---: | :---: | :---: | :---: |
| 14 | 014 IMG_1492 |  | von <br> Schlammersdorff |
| view <br> south | gen view to south P1180026 |  | Yule |

