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LANDMARKS OF IDENTITY

BRONZE AGE TOWERS OF THE OMAN PENINSULA

Stephanie Döpper

MINISTRY OF HERITAGE AND TOURISM - SULTANATE OF OMAN
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The Archaeological Heritage of Oman

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Bronze Age Towers of the Oman Peninsula

STEPHANIE DÖPPER

Sultanate of Oman سلطنة عُمان
وزارة التراث والسياحة
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Heidelberg, June 2024.

Stephanie Döpper

Introduction

Research History

The Oman Peninsula is one of the most visually stunning regions in the world. Bounded by deserts and oceans, divided by mountains and plains, its landscape provides an otherworldly backdrop for the richness of the peoples who once lived within and on it. Bronze Age monumental buildings, so-called towers, were evidence of a time of staggering development and change that nevertheless managed to go virtually unnoticed by modern-day (Western) archaeologists until well into the middle of the 20th century. They were first identified in the 1970s as "circular walled enclosures", generally 20–30 m in diameter, that were usually made of either large stone boulders or square stone blocks (de Cardi *et al.* 1976; Hastings *et al.* 1975). Beatrice de Cardi made the first attempt at a typology of these structures using features such as the presence or absence of an adjoining rectilinear platform as distinguishing characteristics (de Cardi 1975: 109–110; see also de Cardi *et al.* 1976: 149). However, without excavating any of the towers, de Cardi's typology relied upon extant remains and surface finds for both classification and dating.

The first of these "walled enclosures" to be excavated was at the site of Hili near Buraimi in the United Arab Emirates, where a 24 m in diameter circular building made of mudbrick was uncovered (Frifelt 1971: 376; 1975: 368–370). Inside this structure researchers found a stone-lined well amongst a complex of internal mudbrick walls that formed "compartments". These compartments were not rooms *per se*, but were filled with compact rubble and sand. The excavator of this structure, Karen Frifelt, referred to the building as a "circular watchtower" (Frifelt 1971: 376), even though only "half a metre's height of wall remain[s] above the surface" (Frifelt 1975: 369). This is the first known usage of the "tower" moniker to describe these structures. In discussing the second tower she excavated—Tower 1145 at Bat—Karen Frifelt provides clues as to the source of this nomenclature. She writes of Tower 1145: "It is tempting to call it a fortification, a watch tower perhaps. […] The same principle is known from much later towers, still preserved in Oman, most famous perhaps the round tower in Nizwa" (Frifelt 1976: 59). The association of these "walled enclosures" with medieval towers has since stuck—although we would argue that this has become a gloss of convenience rather than a helpful guide to understanding these monuments as individual structures. In fact, we would prefer to return to the term first used by the American survey team—i.e., "raised circular platform" (Humphries 1974: 50)—but it seems likely that the established term "tower" will remain in the literature for many years to come.

As is often the case with monuments, many of the towers were used and reused even up through the recent past. Al-Wardi castle, which sits in the centre of the modern village of Bat, was the community's fortress, and in use as the local jail as recently as the 1980s (Young 2019: 80). While this shows the centrality of these towers throughout time it has complicated their study; as each generation used the tower, they modified it to suit their own needs, often sweeping away evidence of previous generations in the process and leaving archaeologists to the painstaking task of untangling 5000 years of remodelling. The elements of the towers that have endured best—that is, their solid stone and mud foundations—are also the parts of the tower that tell us the least about their uses, their ages, and their makers. Counterintuitively, even finding these monuments has proved difficult. For those towers located in wadi valleys or at the foot of mountains the effects of alluviation have sometimes been significant—so much so that they have been entirely covered (as is the case at Salut). Those

towers located in wadis run the opposite risk—of eroding away against the 5000-year onslaught of flooding (as in the case of Al-Qumayra)—while those located on hilltops and precipices have often fallen victim to gravity. The Oman Peninsula has only recently entered the consciousness of archaeologists of the ancient world, and (as is the case in many countries) much of region has yet to be surveyed systematically. Thus, finding and then identifying these monumental structures is often a combination of skill, persistence, and luck. Towers are still being discovered today. When Charlotte Cable and Christopher Thornton conducted a survey in 2009, they collected evidence of 62 Bronze Age towers; now, a decade later, there are close to 100. In 2009 only a handful of publications were dedicated to research on one or more of the towers. Since that time, several whole volumes have been published (e.g., Thornton *et al*. 2016), as well as a number of theses and dissertations (e.g., Botan 2012; Cable 2012; Barker 2018; Kluge 2021; Abar in prep.). The time is ripe for a comprehensive study on tower research on the Oman Peninsula.

The purpose of this volume is thus three-fold. In the first place and for the first time, *Landmarks of Identity* catalogues all the known towers on the Oman Peninsula to-date, thus creating a record for researchers and visitors alike. Secondly, this volume will update discussions of both the antiquities and purposes of these towers, which have varied considerably based on the data sets available. Here, we bring together those data sets along with evaluations of the proposed functions to provide both chronological and functional depth. The final goal of *Landmarks of Identity* is to highlight these Bronze Age monuments for visitors, community members, government representatives, and archaeologists alike. This book seeks to facilitate a scalar shift in understanding from individual research programs and disparate data sets to a broader knowledge of 3rd millennium BCE cultural traditions.

The Bronze Age on the Oman Peninsula

The Early Bronze Age on the Oman Peninsula is one of the richest periods in its history. It is associated with the beginning of large-scale copper processing (Giardino 2017; Döpper and Schmidt 2019; Schmidt and Döpper 2020), long-distance trade along the Arabian Gulf and the Sea of Oman (Potts 1986; Méry and Schneider 1996; Schmidt and Döpper 2020) and monumental architecture in the region. Scholars working in Oman have divided this period into an earlier and later part—the Hafit (3100–2700 BCE) and Umm an-Nar (2700–2000 BCE)—both named after type-sites in the United Arab Emirates. Here, the typical tombs of these two phases have been described for the first time. Besides the monumental towers, stone-built tombs form the bulk of the archaeological remains of this time. Hafit period tombs are circular or almost circular above ground dry-stone structures with external diameters between 4 and 8 m. Their inner burial chamber is much smaller with a diameter of only 1 to 2.5 m. Inhumation in Hafit period graves were few, normally ranging between one and four individuals. Later Umm an-Nar period tombs differ from their earlier counterparts by their larger diameters, their internal divisions into several chambers and the large number of people buried within them. They can reach up to 400 individuals of both sexes and all ages (Cleuziou and Tosi 2018: 220; Méry 2010: 33). The façade of the tombs is built of carefully dressed stones. Domestic architecture, while extremely rare during the Hafit period, becomes a little more common during the Umm an-Nar. Therefore, it is generally assumed that people in the Hafit period mainly pursued a mobile lifestyle, while a more sedentary, agriculturally based lifestyle, at least for parts of the population, is discussed for the Umm an-Nar (Al-Jahwari 2008: 323–324; Magee 2014: 103–107; Charbonnier 2017). Nevertheless, even in the Umm an-Nar period there are fewer domestic sites known than monumental towers (Döpper 2018b). Thus, monumental towers, the focus of this volume, form one of the largest components of the material heritage of the Early Bronze Age on the Oman Peninsula.

Chapter 1

Bronze Age Towers: Catalogue

In an effort to establish baseline information about the Bronze Age towers of the Oman Peninsula, this volume will begin (Chapter 1) with a much-needed overview of every tower on the Oman Peninsula, including those located in present-day United Arab Emirates (Figure 1.1 and Figure 1.2). Moving from northeast to southeast the catalogue of the 98 known towers includes a description and images of each tower (where possible), basic chronological and geospatial information, and a brief history of the research conducted there to date followed by a selection of bibliographic sources for further study. Additionally, several plates will show the ground plans of many of those towers in the same scale to facilitate comparisons.

The distribution pattern of tower sites on a map (Figures 1.1 and 1.2) displays an intriguing pattern. The majority of towers are located along the southern foothills of the Al-Hajar Mountains. It has been suggested that these sites create a line that likely indicates the ancient east–west trade routes that moved copper and other goods between Abu Dhabi and Ras Al-Hadd (Cable and Thornton 2013). Interestingly, most of the known tower sites are spaced between the two large centres Hili and Al-Khashbah, while only a few known towers are located to the east of Al-Khashbah or to the west of Hili. It is also remarkable that, besides Hili, all known towers in the UAE were found along the coast. In the Sultanate of Oman, on the contrary, not a single tower has been reported from lowland coastal contexts. These differences *may* reflect archaeological realities, but lack of systematic surveys in some regions might temper the data.

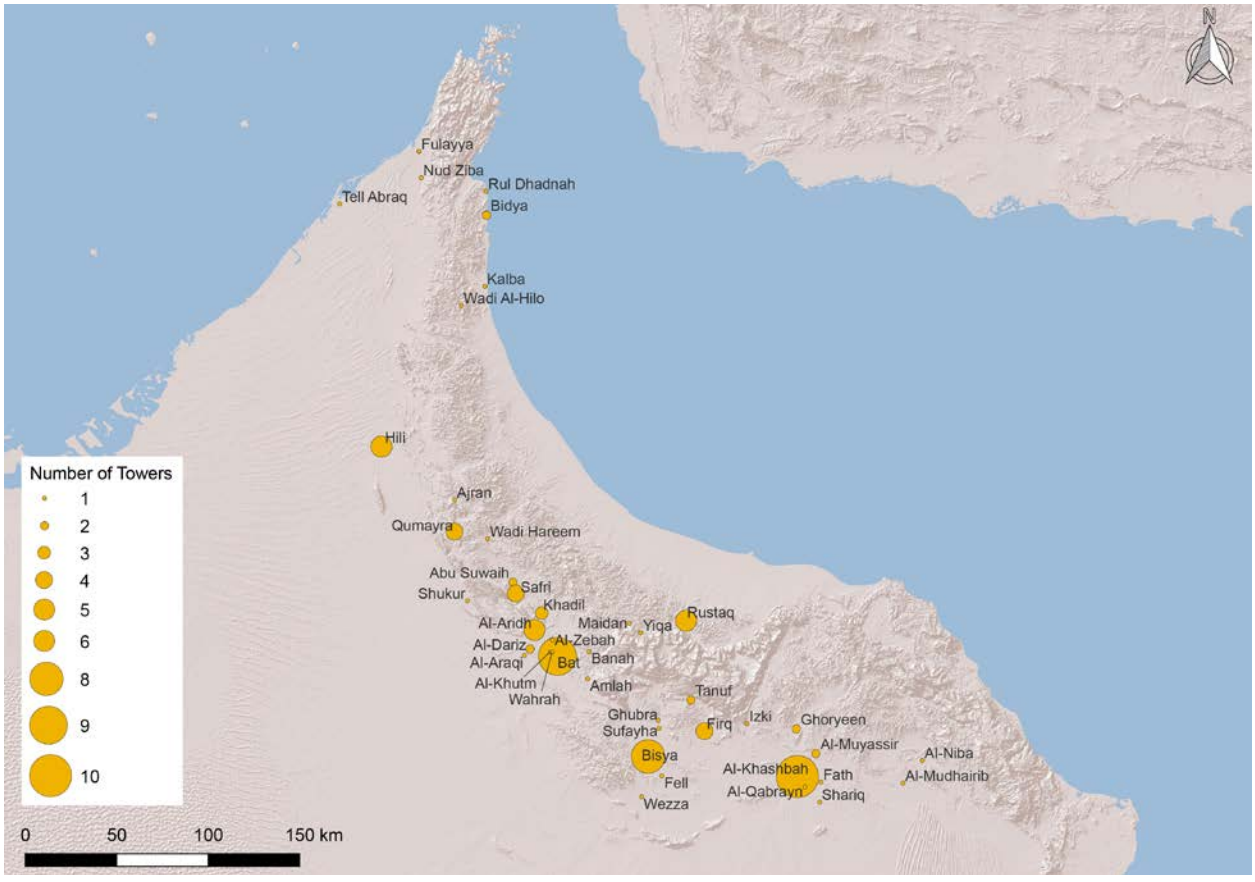


Figure 1.1. Known sites with towers on the Oman Peninsula.

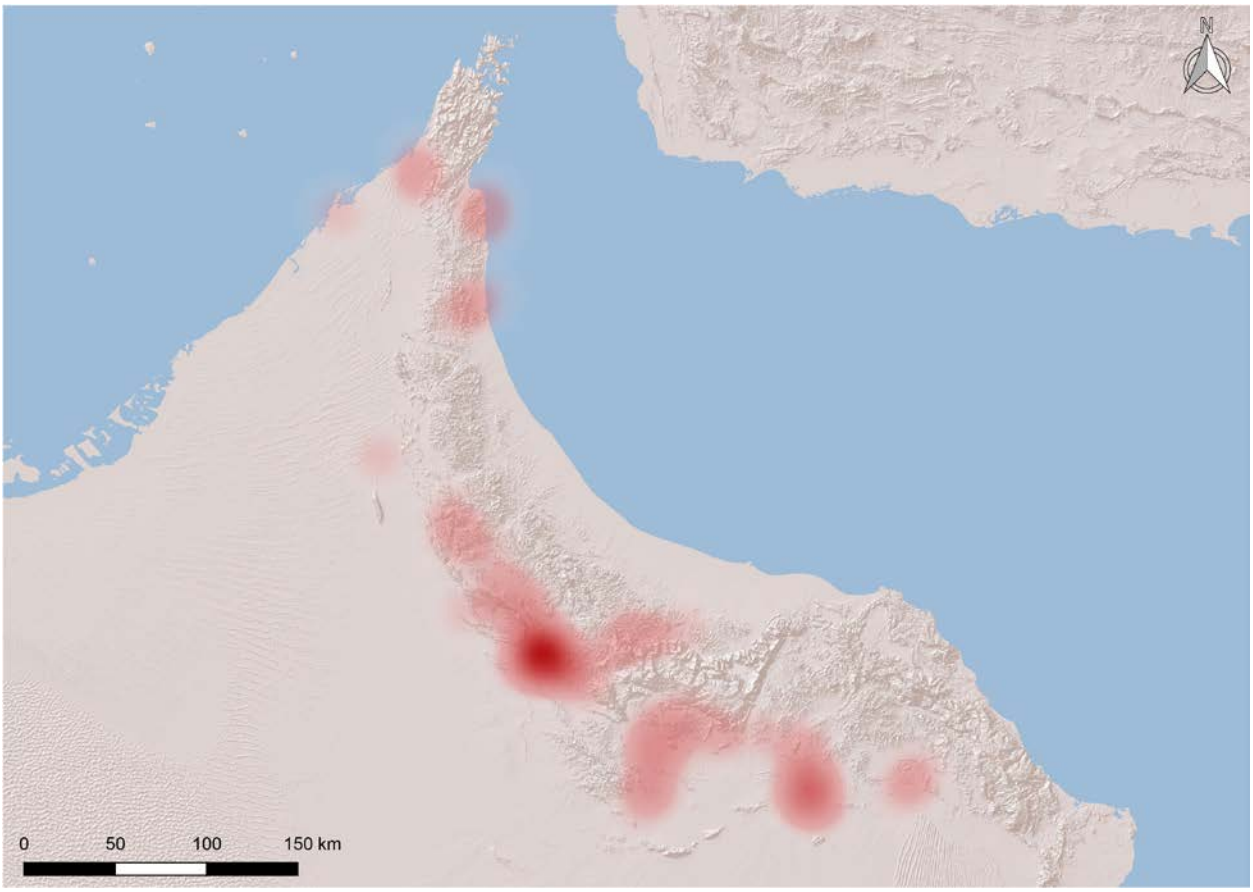


Figure 1.2. Heatmap of tower distribution on the Oman Peninsula.

Tell Abraq
Site: Tell Abraq
Other Names: none
General Location: Sharjah/Umm Al-Qaiwain, UAE
UTM: 354453 E, 2819731 N
Tower Shape: circular
Diameter: 20–40 m
References: Potts 1990c; Potts 1993c: 118–119; Carter 1997b: 91; Potts 2000; Magee *et al*. 2017; Barker 2018

Tell Abraq sits just beyond a major coastal highway through the UAE, straddling the emirates of Ajman and Umm Al-Quwain (Figure 1.3). The site was once situated adjacent to a mangrove swamp, near the coast but sheltered. Today it rises 10 m above the Gulf coastal plain. It is also the most northwesterly of all the known towers belonging to the Early Bronze Age tradition. The tower is surrounded by evidence of domestic activities, including structures that probably resembled *barasti*-style huts (Potts 2000: 23), which primarily date to the 2nd millennium BCE. These extend for at least 30 m around the tower. A single Late Umm an-Nar tomb was built 10 m to the west of the Umm an-Nar period tower (Potts 1990c: 53, figs. 57–58). The site has a long history of research. In 1973 an Iraqi team conducted a brief excavation of the site, but it was not until 1989 that excavations, organized by the Carsten Niebuhr Institute and directed by Daniel Potts (1989–1998), began in earnest. In 2007 excavations continued under the direction of Peter Magee (Bryn Mawr College), and research under his direction is ongoing.

Tell Abraq is unusual in that it remained in use, with little apparent change in function, from the Late Umm an-Nar through to the middle of the 1st millennium BCE. Because of its long period of use it has been more difficult to identify its earlier construction phases, but recent work by Barker (2018) and others (e.g., Magee *et al*. 2017) is doing much to clarify a complicated site. The 3rd millennium BCE tower, which roughly equates with what Potts originally called the first Umm an-Nar Building (Potts 1990c: 22, 29–33, figs. 7–8), consists of a stone exterior wall encasing a mudbrick centre. A well was situated at the centre of the 3rd millennium tower and would have been accessible from inside (on top of) the tower's raised interior platform. Barker has estimated that the Umm an-Nar tower was 20 m in diameter (2018: 195). It was built on a platform defined by what Potts (1990c: 22, 24, figs. 6–8) describes as a "foundation wall" several courses high, possibly intended to create a denser foundation for the structure above. This would have been particularly important for stabilizing the structure as the underlying deposits are sand.

Tell Abraq is one of the few towers in which some of the 3rd millennium BCE interior deposits were relatively intact—in spite of (or perhaps due to) its consistent use. Evidence strongly suggests that people lived inside the tower, which consisted of a raised solid foundation and a later stone perimeter wall—much like a raised fortress (Barker 2018: 181). Ovens, fire pits, and fireplaces complete with food remains, as well as Late Umm an-Nar period and contemporary artifacts (e.g., Harappan cubical stone weights), were found among the remains of mudbrick walls—some of which were preserved up to a height of 1.5 m (Potts 1993c: 2; Barker 2018). Perhaps the most notable of the exterior architecture of Tell Abraq is a simple oval grave, "constructed of *farush* beach rock, built into the lower part of the western face of the Umm an-Nar tower wall" (locus 1059; Barker 2018: 189 and pl. 28). Although its precise date is unknown it appears to have been built into the earliest phases of the tower (Barker 2018: 189)—or, alternatively, the tower was built into it. A single well-preserved flexed individual was interred inside the grave, which was oriented northeast–southwest. The female was roughly 18 years old; her head, which showed blunt force trauma, was facing northwest, and she was lying on her side with her arms bent in front of her.

Outside the tower the 3rd millennium structures are somewhat difficult to tease apart from the far more massive 2nd millennium BCE rebuilding. An angled platform—described by Barker as "a wedge-shaped pisé structure with a horizontal top" (feature 5013; Barker 2018: 204) just southwest of the tower wall—was identified as belonging to the Umm an-Nar phases. Several modestly-sized ditches, pits, moats, and/or glacis were found around the Umm an-Nar structure, some of which were extended during the Wadi Suq period (Barker 2018: 237). Barker (2018: 204) summarizes the potential explanations for these features, some of which she identifies as possible defensive fortifications (Barker 2018: 204–206). By the end of the 2nd millennium BCE, fortifications—including four sets of terraces and retaining walls, surrounded by a ditch—ringed the tower, which itself had increased in size.

The Umm an-Nar construction and occupation of Tell Abraq were quite late compared to many of the other towers. Two radiocarbon dates, obtained from a burnt layer associated with some of the earliest Umm an-Nar construction levels (i.e., locus 23), both suggest that the tower was constructed sometime in the Late Umm an-Nar period (ca. 2300–2000 BCE; Barker 2018: 172–174). On the top interior of the tower, a carbonized date pit found in an oven (D13; locus 27) was similarly dated to the Late Umm an-Nar (Barker 2018: 182, 408).

It is difficult to know whether the Wadi Suq use of the tower—which included the widening of the tower to a 30 m diameter space (marked by a massive, 2 m wide tower wall) and the addition of a huge mudbrick platform (locus 26) over the top of the 3rd millennium tower—should be considered a break in the original use of the Tell Abraq tower or not. A massive structural collapse during the second quarter of

Figure 1.3. Excavations at Tell Abraq (Ziolkowski 2020: fig. 72, used with kind permission).

the 2nd millennium BCE appears not to have halted life on and around the tower for long; the inhabitants appear to have, quite literally, picked up the pieces and used them to buttress the remainder (Magee *et al.* 2017: 217–218). Soon after, another terrace was constructed around the second, and a fourth terrace was added by the late 2nd millennium BCE, along with a massive ditch. There is no evident chronological break (beyond those necessitated by massive construction works), and significant Wadi Suq, Late Bronze Age, and Iron Age deposits have been identified. As described by Barker (Barker 2018: 133–134), "by the end of the 2nd millennium BCE, the settlement consisted of four separate terraces supported by retaining walls that were demarcated (at least to the south) by a massive ditch." The archaeological sequence of the tower continues to the end of the Iron Age, with additional reuse, in the form of some buildings and tombs, dated to the first century CE (Potts 1991: 105–119; Potts 1990b: 2; Barker 2018: 127). At the same time evidence for habitation outside of the tower, in the form of pits, ash lenses, middens and set after set of postholes, continued throughout the 2nd millennium (Magee *et al.* 2017).

Fulayya
Site: Fulayya
Other Names: Bida'a, Bida
General Location: Al-Fulayya, Ras Al-Khaimah, UAE
UTM: 397915 E, 2848431 N
Tower Shape: unknown
Diameter: ca. 20 m
References: Carter 1997a: 70; 1997b: 94; Kennet, personal comm.

Little is known about the site of Fulayya. It was discovered by Derek Kennet in winter 1995/1996 and mentioned thereafter by Carter (1997a; 1997b) in his overview of major Wadi Suq sites in the northern Oman

Figure 1.4. Fulayya (photograph by Derek Kennet, used with kind permission).

Peninsula. Reporting on the discovery made by Derek Kennet, he notes that the site is located near Al-Fulayya on the alluvial plain not far from the town of Ras Al-Khaimah. It is "a small steep-sided mound, some 20 m in diameter ... rising several meters above [the] surrounding ground level" (Carter 1997a: 70; Figure 1.4) and from which considerable amounts of domestic Wadi Suq and Late Wadi Suq/Late Bronze Age pottery were identified (Carter 1997b: 94). This description on its own does not distinguish Fulayya as a tower, however "its elevation above the land surface in a zone of considerable alluvial action … suggests that there is a compact and sizeable structure within it and below ground level" (Carter 1997b: 94). If the Fulayya tower does date solely to the Wadi Suq period, as Carter proposes, it would be unique among the Bronze Age towers. Recently Kennet has revised his initial identification from the Wadi Suq to the Late Bronze Age and away from the tower designation (personal communication, 2020). However, if Fulayya is indeed a tower then the dearth of pottery dating to the Umm an-Nar period is not entirely unexpected, as tower platforms are solid, deliberate construction episodes rather than tells created by the accretion of living surfaces and their associated mess.

Nud Ziba
Site: Nud Ziba
Other Names: Ard Al-Busta (de Cardi and Doe 1971: 252); Khatt 11 (de Card *et al.* 1994); Site 16b (de Cardi and Doe 1971; de Cardi 1985)
General Location: Khatt, UAE
UTM: 399191 E, 2833978 N
Tower Shape: unknown
Diameter: 20+ m
References: de Cardi and Doe 1971: 252; de Cardi 1985: 201–202, site 16b; de Cardi *et al.* 1994: 50–54; Carter 1997a, 1997b; Kennet and Velde 1995

The site of Nud Ziba is located near the modern village of Khatt, just west of the Al-Hajar Mountains in the Emirate of Ras Al-Khaimah. The *nud* (mound) is part of the rich archaeological landscape of Khatt, which was surveyed in 1968 (de Cardi and Doe 1971), 1992 (de Cardi *et al.* 1994), and 1994 (Kennet and Velde 1995) and includes artefact scatters, tombs, and settlements—most of which are not contemporary with the Bronze and Iron Age tower (de Cardi and Doe 1971). Nud Ziba itself is a large two-tiered mound, ca. 6 m tall and 85 m long, rising out from the fertile Jiri plain to the west of the Rus Al-Jabal. The site was first described by de Cardi and Doe (1971) and over the next several decades was visited regularly by various research teams. Unlike the other towers described in this book Nud Ziba is known primarily through its sections. While no team has conducted excavations, partial destruction of the upper tier of Nud Ziba—two parts were bulldozed in 1991 and 1993—have been used to inform the structural and temporal framework of the tower (de Cardi *et al.* 1994: 50; Kennet and Velde 1995). The first of these bulldozing events created a 2+ m tall section (de Cardi *et al.* 1994: fig. XIa), while the second phase of bulldozing created a 4 m tall and 15 m long section along the southern side of the upper tell, and was oriented roughly northeast–southwest (Kennet and Velde 1995: 83, fig. 3). These were documented in the 1990s and the materials housed in the Ras Al-Khaimah museum (e.g., de Cardi 1984: 203, fig. 3; 1985: fig. 12; de Cardi *et al.* 1994; Kennet and Velde 1995).

Little is known about the 85 m wide lower tier of Nud Ziba. The base of the upper tier is a solid deposit, consisting of mudbrick rubble, that Kennet and Velde (1995: 83) suggest is deliberate fill. They describe this deposit, as a whole, as "a large, vertical faced, flat-topped, solid platform made of mudbrick rubble which measures at least 8 metres across, but probably significantly more" (Kennet and Velde 1995: 83). On top of this they documented seven parallel mudbrick walls, each ca. 2 m apart. Visible only in section, the walls are ca. 0.6 m thick and vary in height to a maximum of 1.7 m. Many of the walls have been burned or scorched and were themselves embedded in a loose "destruction layer" and (Kennet and Velde 1995, 84: fig. 5). De Cardi *et al.* (1994) describes these deposits as "mudbrick walls on stone foundations" (1994: 50) but no stone foundations are mentioned in Kennet and Velde (1995).

Atop the mound were the remains of a "mudbrick structure ... with a well and water cistern on the southern side" (de Cardi and Doe 1971: 252). The question of how Bronze and Iron Age people at Nud Ziba had accessed water has proved of interest to archaeologists in the region. Its distance (over 1 km) from the hot springs for which Khatt is well-known has been used as evidence that the aflaj system must have been in use (and the technology employed at Nud Ziba) by the time of Nud Ziba's fluorescence (de Cardi *et al.* 1994: 50). However, the easy access to water via well today (as documented by de Cardi and Doe in 1968) suggests that it might also have been possible to access water via well in prehistory.

Based on her initial visit, de Cardi dated Nud Ziba's primary period of use to "the second half of the 1st millennium BCE and later" (de Cardi 1984: 203). The ceramic assemblage also documents the presence of Late Bronze Age (de Cardi *et al.* 1994: 71) and "Iron Age to the Parthian" (de Cardi *et al.* 1994: 64) periods of habitation at Nud Ziba. Of note are the Iron Age ceramics, which include the applique snake imagery and "incense burners" (de Cardi *et al.* 1994: 52, figure 8/41 and 8/43) indicative of Iron II–III ritual activity (Benoist 2010; Karacic *et al.* 2018; Potts 1990). Thus, it is likely that Nud Ziba was a significant regional centre during the Iron Age (de Cardi 1985: 169).

In addition to the Iron Age use of the tower, the site has earlier roots. Besides ceramics dating stylistically to the Wadi Suq period, radiocarbon dating indicates that the carbonised date seed from the ash deposit in the destruction layer produced a radiocarbon date of 2132 to 1828 cal. BCE (2-sigma, 95% probability;

Figure 1.5. Rul Dhadnah, showing the low mound with Islamic burials and mosque on top (Ziolkowski 2020: fig. 37, used with kind permission).

Kennet and Velde 1995: 85, 93)[1]. Either way, the layer likely dates to the Umm an-Nar–Wadi Suq transition and thus the Nud Ziba tower is all the more important, given the relative scarcity of sites in southeastern Arabia straddling both periods, and Carter (1997b: 89 fig. 2) lists it as one of four substantial non-funerary Wadi Suq sites in the region.

Rul Dhadnah
Site: Rul Dhadnah
Other Names: Site 21
General Location: Rul Dhadnah, Fujairah, UAE
UTM: E 434561, N 2826582 (general location)
Tower Shape: unknown
Diameter: ca. 20 m
References: Ziolkowski 2020: 30–31, fig. 37–39

The site of Rul Dhadnah focuses on a series of abandoned structures between the modern village of Rul Dhadnah and date palm gardens ca. 600 m west of the sea. Just beyond this small, abandoned cluster of buildings are an Islamic cemetery and stone-built mosque on a low mound. On the western edge of the mound is "a curved alignment of large rocks" (Ziolkowski 2020: 30; Figure 1.5). In combination with the Wadi Suq and Iron Age ceramics visible on the surface, Ziolkowski proposes that Rul Dhadnah may have been the location of a Bronze Age tower (2020: 30).

[1] BM2928, recalibrated with IntCal20.

Bidya

Eighty kilometers east of Tell Abraq, north of Khor Fakkan on the Fujairah side, is the modern town of Bidya (also spelled Bidiya(h)). The area, which has a high agricultural potential, is located near the northern end of a long coastal plain, where the mountains and the sea meet. Two towers, less than 250 m apart, sit on opposite sides of Wadi Bidya. On the north side, Bidya 4 is still extant, while Bidya 2, to the south, has fared more poorly. Both were studied in 1988 (Al-Tikriti 1989).

Bidya 2
Site: Bidya 2
Other Names: Site S (Ziolkowski 2020)
General Location: Bidiyah, UAE
UTM: 434852 E, 2813298 N
Tower Shape: circular
Diameter: 26 m
References: Al-Tikriti 1989: 107, pls. 78, 90a; Cleuziou 2002: 215; Barker 2018: 52; Ziolkowski 2020: 44, fig.7

The Bidya 2 tower received the bulk of Al-Tikriti's research efforts, to good effect. The low mound was surrounded by construction (both modern and historic) even during its 1988 excavations, and the tower itself was in poor condition. Built on natural sediments, the tower itself consisted of ca. 40 cm of poorly preserved mud wall foundations encircled by a stone wall 26 m in diameter and preserved to a max height of 1.4 m (Figure 1.6). The stone ringwall had been robbed of much of its materials. However, in plan the ringwall appears to have been sub-circular and shows evidence of 1–2 walls varying in total thickness from less than a meter (on the north side, where only one wall is evident) to over 2 m on the east side. It is unclear whether these two abutting walls are contemporary, but their disappearance–reappearance may account for the sub-circular tower plan; on the other hand, if the extant sections represent individual walls, then as many as four walls may have been present. Internally, the mud walls (which may have been mudbrick) were rectilinear and appear to have been organized on a central east–west axis. The spaces between the walls were filled with sand and gravel. Though Al-Tikriti was unable to identify a well, he noted (1) a collection of stones located slightly off-centre and inside the east–west axis of the tower, which were clearly no longer in place; and (2) just outside the tower, the presence of a well that was "ancient" but still functioning (according to his interlocutors; Al-Tikriti 1989: 109). It seems possible that the collection of stones once amounted to the stone lining of a well.

Outside the tower on its north side and a mere 1.3 m from the ringwall was a 12 m long double-faced stone wall, over 1 m thick, and curving slightly toward the ringwall. The stones of the outer face appear to be slightly larger than those on the inner (tower side) face. According to the published plan the foundation of this outer wall is 10 cm lower than the tower ringwall foundation. Beyond this wall was a ditch ca. 4 m wide and 80 cm deep. Excavations on the south side of the tower indicate the presence of similar structures in a more poorly preserved condition: the foundation of a wall ca. 1.5 m from the face of the tower ringwall, and the edge of a ditch visible 4 m beyond that. Al-Tikriti notes that "the outer circular wall is at a lower level than the main ring wall, and is built on its outer surface of larger stones" (1989: 108), from which he tentatively proposes that it was intended to reinforce the ditch beyond. It is unclear whether the two walls are one and the same, for while the northern section of wall is quite clearly double-faced, the plan of the foundation to the south is more difficult to interpret (Al-Tikriti 1989: pl. 78). In addition, because the wall on the north side is double-faced it is unlikely to be a retaining wall, as these are more likely to be faced only on the exposed side. Walls located quite close to tower ringwalls are quite common as part of a "platform" or

Figure 1.6. Bidya 2 during excavation (image by GCC 2012 Archaeology Exhibition).

"ramp"—but these, too, tend only to be faced on one side. Abutting the tower ringwall on its southern side, another wall, only 2.5 m long and perpendicular to the tower ringwall, appears to run between the ringwall and the second wall; Al-Tikriti suggests that it might have been related to stairs (1989: 108).

The construction of the tower can be firmly dated to the Umm an-Nar period. Inside the tower, Umm an-Nar ceramics were found "below the [Islamic] fireplaces and between the walls" (Al-Tikriti 1989: 108). Umm an-Nar ceramics were also found *in situ* on floor surfaces to the north and south of the tower, between the ringwall and the external wall(s) (what Al-Tikriti calls the "corridor" spaces; 1989: 108). The *in situ* ceramics appear to be domestic (Al-Tikriti 1989: pl. 79) and were found alongside fireplaces, suggesting that this space was used for domestic purposes. Cleuziou (2002: 215) considers the Bidya 2 ceramics to date to Stages 3–4 (2600–2200 BCE). Off the eastern side of the tower, where the ringwall is thickest and along the same axis as the internal mud walls of the tower, are the remnants of what may have been a ramp (Al-Tikriti 1989: pl. 78). The ceramics found in this area (i.e., Al-Tikriti 1989: pl. 80) appear to date to the Iron Age, while a burial on the southern side of the tower is thought to date to the first century CE (Al-Tikriti 1989: 108, pl. 82). The site was also reused in the Late Islamic period (1500–1850 CE), though no further details regarding that period are published. Sometime after 2004 the site appears to have been either covered or completely destroyed by construction.

Bidya 4
Site: Bidya 4
Other Names: Site R (Ziolkowski 2020)
General Location: Bidiyah, UAE
UTM: 434847 E, 2813566 N
Tower Shape: circular
Diameter: 20–22 m
References: Al-Tikriti 1989: 109, pls. 83, 90b; Ziolkowski 2020: 44, 10 fig. 7, 45 fig. 59–61

Figure 1.7. Bidya 4 (Ziolkowski 2020: fig. 59, used with kind permission).

Bidya 4 lies ca. 250 m north of Bidya 2 on the northern bank of a wadi. It is less well-known than Bidya 4 because, in spite of the "notable mound with clearly visible projecting stones" (Al-Tikriti 1989: 109), it lies inside a modern, Islamic cemetery. Its surface remains nevertheless are convincing. Remnants of a stone ringwall, 20–22 m in diameter and 1.2 m thick, encircles a mound of sediment (Figure 1.7). Beyond the ringwall, and clearly visible in satellite imagery, is a terraced area suggestive of a wall encircling the tower at a distance of 5–12 m; this may be what Al-Tikriti calls "evidence of an outer circular wall" (1989: 109). Though no diagnostic materials were found, Al-Tikriti proposes a Late Umm an-Nar date, "continuing perhaps into the early part of the 2nd millennium" (1989: 109). Ziolkowski (2020: 44) identified numerous surface ceramics, but only one (an Iron Age body sherd) dated to the prehistoric period.

Kalba 4
Site: Kalba 4
Other Names: Site J (Ziolkowski 2020)
General Location: Kalba, UAE
UTM: 433963 E, 2774587 N
Tower Shape: circular
Diameter: 20–21 m
References: Carter 1997a, 1997b; Phillips and Mosseri-Marlio 2002; Eddisford and Phillips 2009; Lindauer *et al.* 2017; Barker 2018: 53–55; Schwall *et al.* 2019; Ziolkowski 2020: 39; Schwall and Jasim 2020

Figure 1.8. Kalba 4 (Ziolkowski 2020: fig. 11, used with kind permission).

The tower Kalba 4 is situated in the Emirate of Sharjah on the east coast of the United Arab Emirates, approximately 1.5 km away from the modern shoreline. In 1993, Kalba 4 was discovered by Carl Phillips of University College London and subsequently excavated in the 1990s (Carter 1997a; 1997b; Phillips and Mosseri-Marlio 2002; Eddisford and Phillips 2009). Renewed excavations began in Kalba 4 in 2019 by the Institute for Oriental and European Archaeology (OREA) of the Austrian Academy of Sciences (AAS) and the Sharjah Archaeology Authority (SAA; Schwall *et al.* 2019; Schwall and Jasim 2020) within the extension of an earlier project. As with Tell Abraq, the tower known as Kalba 4 has a long occupation sequence that began in the 3rd millennium and continued almost uninterrupted through to the 1st millennium BCE (Carter 1997a; 1997b; Eddisford and Phillips 2009). Like the Bidya towers it is situated quite near the east coast of the Oman Peninsula, 1.5 km from the Indian Ocean and at the foot of the northeastern extent of the Al-Hajar Range. The site itself is ideally located near the mouth of Wadi Ham in an area used for cultivation, and within easy distance to an area of *sabkha* that was once likely mangrove swamp. Archaeological features abound in this landscape. However, Kalba 4 is surrounded by agricultural land that either obscures adjacent ancient structures or has led to their destruction (most likely both). Regardless, the nearest contemporary archaeological features are two excavated Umm an-Nar tombs and a subterranean Wadi Suq tomb, located less than 2 km to the northwest of the tower just beyond the agricultural fields (Carter 1997a: 29, fig. 5).

The tower is part of a large mound, roughly 60 m in diameter and rising 2.5 m above the modern surface (Figure 1.8). The Umm an-Nar tower appears to have been sub-circular, 20–21 m in diameter and built of mudbrick, with internal rectilinear walls creating a series of small, sand-filled compartments around a central stone-lined well ca. 1.2 m in diameter (Eddisford and Phillips 2009: 115). Outside the tower, a series of tiered

mudbrick or stone retaining walls extend the diameter of the site by an additional 20 m, and the height (from the base of excavations at the outer stone retaining wall to the top of the Umm an-Nar tower deposits) to an overall height of 4 m (Eddisford and Phillips 2009: 103–104, fig. 6b). Between the two retaining walls there is evidence for contemporary ditches (Eddisford and Phillips 2009: 104, fig. 6b). The ceramic assemblage from these associated deposits—incised grey wares, red sandy wares, and imports—date the first known construction and use of Kalba 4 to the Late Umm an-Nar (ca. 2200–2000 BCE). Mesopotamian, Bahraini, Iranian, and Indus imported ceramics (and some other materials) provide weight to the idea that this coastal site was an important node in regional trade. Eddisford and Phillips (2009) suggest that some smelting was conducted and soft-stone vessels were manufactured at Kalba 4, as well. However, a possible gap in the Umm an-Nar ceramic assemblage may indicate a short hiatus near the end of the Umm an-Nar period (Carter 1997a: 265).

Using the Umm an-Nar structure as its centre, Wadi Suq construction works added stone and mudbrick features, including a Late Wadi Suq/Late Bronze Age 4 m thick mudbrick wall encircling the 20–21 m diameter structure and mudbrick used to fill and cap the entire feature. This was followed in the Iron Age I by the construction of yet another ringwall—which Carter (1997b: 93) calls a revetment wall—this time made of stone, and the space between it and the earlier wall filled in to form a gigantic circular platform roughly 40 m in diameter and surrounded by a stone-lined ditch (Eddisford and Phillips 2009: fig. 6a). Unlike the Umm an-Nar tower at their heart, these 2nd millennium constructions lacked the internal structures (walls creating compartments) that marked the earlier tower, though it appears the well itself was still central. A final Iron Age II stone wall, nearly 3 m thick, was constructed over the silted-in Iron Age I ditch deposits (Carter 1997b: 93; Eddisford and Phillips 2009: fig. 6a), which have since been partially robbed out.

Wadi Al-Hilo
Site: Wadi Al-Hilo
Other Names: HLO1
General Location: Wadi Al-Hilo, UAE
UTM: 421115 E, 2764144 N
Tower Shape: circular
Diameter: ca. 7 m
References: Kutterer 2013

The site Wadi Al-Hilo HLO1 is situated in the Jahhar Mountains in the eastern region of the Emirate of Sharjah, approximately 6 km to the north of the town Wadi Al-Hilo and 1 km north of the main motorway connecting Sharjah City with Kalba. It was excavated between 2007 and 2012 by a joint project from Sharjah Archaeology Authority (SAA) and Tübingen University (Kutterer 2013). Besides Neolithic, Iron Age and Islamic remains at the site, there is plenty of evidence for Bronze Age metallurgical activities including a workshop that was used from the 3rd to the beginning of the 2nd millennium. No domestic architecture was identified, other than a small round structure, labelled a "watchtower".

The so-called "Umm an-Nar watchtower" of Wadi Al-Hilo has an outer diameter of 7.7 m and an inner diameter of 5.1 m (Kutterer 2013: 126–134), which is exceptionally small for a 3rd millennium tower and rather fits with Umm an-Nar period graves. Nevertheless, Kutterer interprets the structure as a watchtower,

Figure 1.9. Wadi Al-Hilo before excavation (Kutterer 2013: fig. 5.57/Sharjah Archaeology Authority (SAA), used with kind permission)

Figure 1.10. Wadi Al-Hilo after excavation (Kutterer 2013: fig. 5.58/Sharjah Archaeology Authority (SAA), used with kind permission).

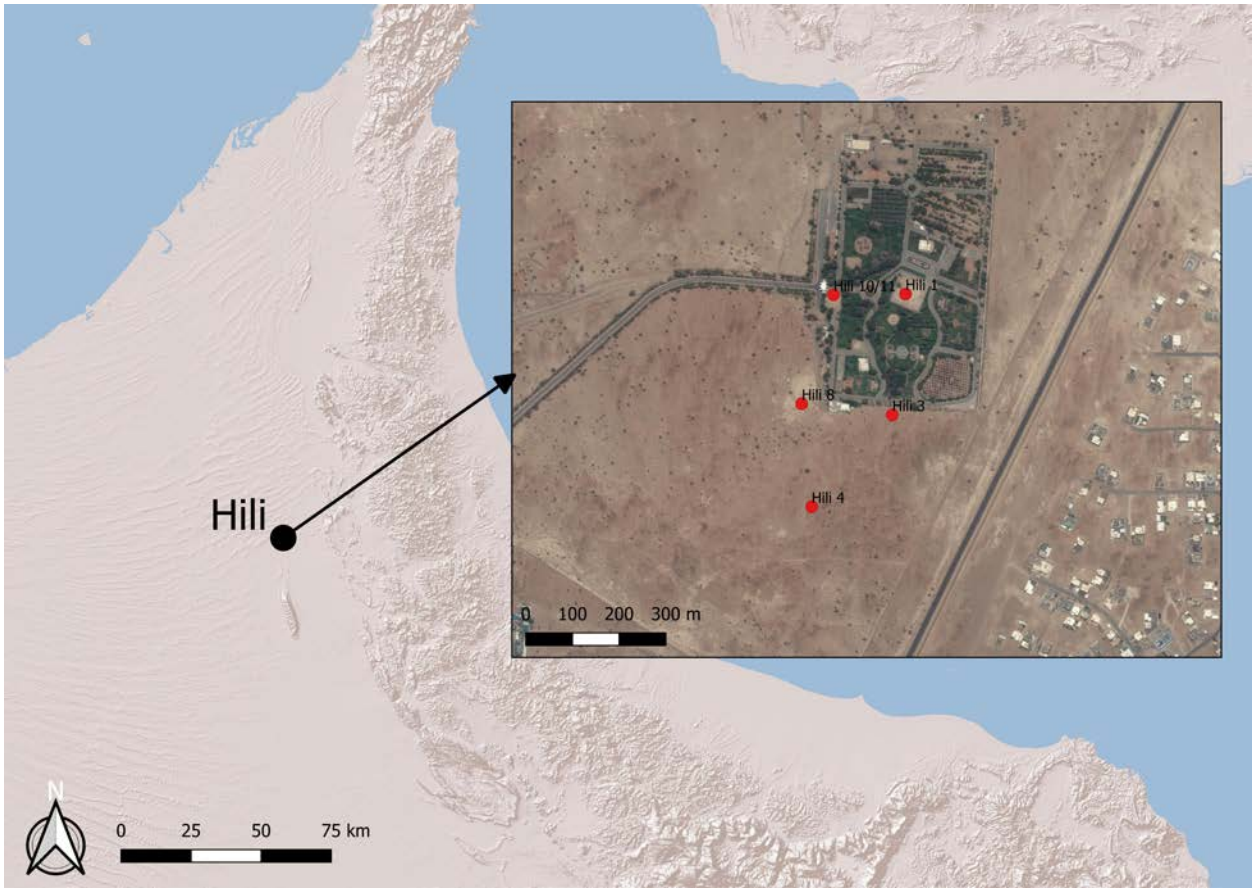


Figure 1.11. Overview map of towers at Hili.

probably outfitted with an elevated and protected platform well above ground level (Kutterer 2013: 127). It was fully excavated in 2007, revealing interior cross walls, which were made as the outer wall of unhewn boulders as well as a fill made of rubble and slag (Figure 1.9 and Figure 1.10). No other finds were made. The cross-walls were built against the inside of the outer wall. Radiocarbon dates from a small fire pit dug against the outer wall of the structure and thus being later provided dates in the early 2nd millennium BCE from 1889 to 1689 cal. BCE (2-sigma, 95% probability; Kutterer 2013: 127).[2] Other than Umm an-Nar tombs, the structure has no entrance at ground level (Kutterer 2013: 134). Nevertheless, its small size and cross-shaped internal division set it apart from all other known towers.

Hili

Hili is an extensive complex of sites focused on an area just northeast of the Buraimi Oasis in the UAE, adjacent to the well-known city of Al-Ain in the Abu Dhabi Emirate. The oasis sits along the western flanks of the Al-Hajar Mountains, at the northern edge of the Jurassic limestone bedrock that makes up the face of the western Al-Hajar Mountains. The area is not only an oasis in its own right, but also an essential node on the trade networks of the Oman Peninsula. From Buraimi are major and most likely ancient routes to Abu Dhabi and Dubai to the northwest and north; through the Al-Hajar Mountains via Wadi Jizzi to Sohar and the coast of Oman; and southwards along the inner piedmont of the mountains to Ibri and beyond.

[2] Hd-26446, recalibrated with IntCal20.

Figure 1.12: Mudbrick compartments within Hili 1 tower (Frifelt 1975: fig. 52).

From the 1960s until well into the 1980s excavations by several teams focused on the Bronze Age sites in and around Hili. The sites are dense and are distinguished by number (e.g., Hili 4). When multiple towers (or buildings) exist at the same site these are noted individually with Roman numerals, such that "Hili 8-III" refers to Tower (or Building) III at the site of Hili 8, while "Hili 3" refers to the site of Hili 3. This clarification quickly becomes crucial, as the towers in these Hili sites have become something of a standard by which both tower characteristics and material chronologies at other sites are compared across the Peninsula. Cleuziou identifies at least five different Hili sites with towers: Hili 1, Hili 3, Hili 4, Hili 8, and Hili 10/11 (Cleuziou 2002: 210), and all located within an area of 30 hectares (Figure 1.11). Thus, while their distinctions are important, it is equally important to consider these structures as part of a major Bronze Age centre.

Hili 1
Site: Hili 1
Other Names: Site 1066
General Location: Buraimi, UAE
UTM: 377630 E, 2687171 N
Tower Shape: circular
Diameter: 24 m
References: Frifelt 1971: 376-377; 1975: 368–369: fig. 3, 52, 53; Cleuziou 1989b: 82; Cleuziou 2002: 210; 2009: 729 fig. 2

Figure 1.13. Ditch surrounding Hili 1 tower (Frifelt 1975: fig. 55).

The site of Hili 1 is located within what is now the Al-Ain Archaeological Park, which also houses the famous Umm an-Nar tomb showing carvings of people and animals (Frifelt 1975: 368). Excavations in 1968 exposed a circular tower made of a series of rectilinear mudbrick and mortar walls arranged symmetrically on a southwest–northeast axis (Frifelt 1969). The spaces between the walls were filled with almost 2 m of cemented gravels, all of which was encircled by another mudbrick wall forming a solid platform ca. 24 m in diameter (Frifelt 1975a: figs. 3, 52, 53; Figure 1.12). Serge Cleuziou, writing in the late 1980s, noted that "a stairway of several steps is still visible on the southwestern part of the Danish excavations at Hili 8" (1989b: 71) and that this stairwell was "also in a smaller construction adjacent to the main round tower" (1989b: 71). Thus, we learn of both a set of stairs and what is likely a platform associated with the Hili 1 tower. Inside the tower, a stone-lined well 7 m deep was easily identified just off-centre (Cleuziou 1976/1977: 21). Encircling the tower at a distance of roughly 3 m was a "rather flimsy" (Frifelt 1975: 369) wall with a dry ditch just beyond (Figure 1.13). The dry ditch is relatively large (4 m wide and 5 m deep), and also encircles the tower. The space between the tower and the ditch appears to have been used domestically; ovens and hearths as well as domestic Umm an-Nar pottery dating to the Late Umm an-Nar were found there (Frifelt 1975: 369). Several radiocarbon dates, taken from hearths in these later domestic deposits, provide a *terminus ante quem* for the tower (see Chapter 2; Frifelt 1970: 383 n20; Frifelt 1971: 377). Cleuziou (1989b: 82) therefore places Hili 1 possibly in use during the same period as the latest of the three towers at Hili 8 (i.e., Building I; see below; Cleuziou 1989b: 71). However, one has to be cautious with this dating, as the old radiocarbon dates span several hundred years (Table 2.1).

Hili 3
Site: Hili 3
Other Names: none
General Location: Buraimi, UAE
UTM: 377592 E, 2686904 N
Tower Shape: unknown
Diameter: unknown
References: Cleuziou 1976/1977: 9; Cleuziou 1989b: 82; Cleuziou 2002: 210 n84; Cleuziou and Tosi 2018: 416; Al-Tikriti 1980: 100–101

In the shadow of its prolific sister sites, Hili 3 is located just outside the Al-Ain Archaeological Park (Figure 1.11). Test excavations conducted in the 1974 by the Al-Ain Department of Antiquities (see Cleuziou 1976/1977: 9; 2002: 210 n84; Al-Tikriti 1980: 101) suggest that Hili 3 is also a tower. The deposits, which included mudbrick walls extending for at least 1.5 m below surface, were capped by two rectilinear stone walls that provide a Wadi Suq *terminus ante quem* for the probable tower beneath, though the rectilinear stone walls may themselves be a reconstruction of the tower (Cleuziou 1989b: 82; Cleuziou and Tosi 2018: 416). Al-Tikriti interprets those walls as Wadi Suq period tombs (1980: 101). Two globular soft-stone vessels with four suspension lugs were found in association with these walls. Pottery sherds found on the surface are of an Umm an-Nar period date (Cleuziou 1976/1977: 9). Other than Hili 1 and Hili 8, the tower Hili 3 was not built on virgin soil, but a layer of sand (Al-Tikriti 1980: 101).

Hili 4
Site: Hili 4
Other Names: none
General Location: Buraimi, UAE
UTM: 377424 E, 2686707 N
Tower Shape: circular
Diameter: 25 m
References: Cleuziou 1976/1977: 9; 1989b: 82; 2002: 210; Al-Tikriti 1980: 100

The furthest south of the Hili towers, Hili 4, has received little attention. Test excavations, undertaken sometime in the 1970s by the Al-Ain Department of Antiquities (Cleuziou 1976/1977: 9), left "the outline of a round building, ca. 25 m in diameter . . . still obvious on the surface" (Cleuziou 1989: 82). Although Cleuziou (1989: 82) indicates that these test excavations were "unproductive", the structure's dimensions hint that it should be considered among the corpus described here. A magnetic prospection carried out by J. J. Orchard and A. J. Clark in 1990 failed to identify any structures (Orchard and Stanger 1994: 70).

Hili 8
Following test excavations by the Al-Ain Department of Antiquities, excavations at Hili 8 began in 1977 as part of a major research programme by the French Archaeological Mission and continued for eight seasons (Cleuziou 1976/1977: 9; 1989b). The site itself is a low mound ca. 40–50 m in diameter and a maximum of 1.5 m high (Cleuziou *et al.* 1978: 19). Hili 8 has one of the best stratified and most-cited chronological sequences in southeast Arabia, with major periods or phases (I–III) or stages (1–5) from earliest to most recent, beginning at the end of the fourth or beginning of the 3rd millennium BCE (Table 2.1). The structures at Hili 8 are called Buildings. The three towers—Buildings III, IV, and I—were built in succession, beginning

Table 1.1. Concordance chart of phases and stages at Hili 8 (after Cleuziou 2002: tab. 1).

Cleuziou 1989	Cleuziou 2002	approx. date BCE	Tower	Well
phases Ia-c	stage 1	late 4th/early 3rd millennium	Building III (Building V/VI)	well 2
phases IIa-c1	stage 2	early 3rd millennium	Building IV (Building II)	well 1
phases IIc2	stage 3	mid 3rd millennium		
phases IId-e	stage 4	late 3rd millennium		
phase IIf	stage 5	late 3rd/early 2nd millennium	Building I	
phase IIg	/	early 2nd millennium		
phase III	/	early 2nd millennium		

with Building III in the Hafit period (Hili 8 period I) and ending sometime in the mid-2nd millennium with Building I (Cleuziou 1989b: 63). Around the towers was intermittent evidence of occupation "in the form of dark, ashy layers, with pieces of mudbrick and some 3rd millennium sherds although, admittedly, such evidence was sparse. The nature of that occupation is unclear, but it may have consisted of smaller houses made of mudbricks or *barasti* structures" (Cleuziou 1989b: 83).

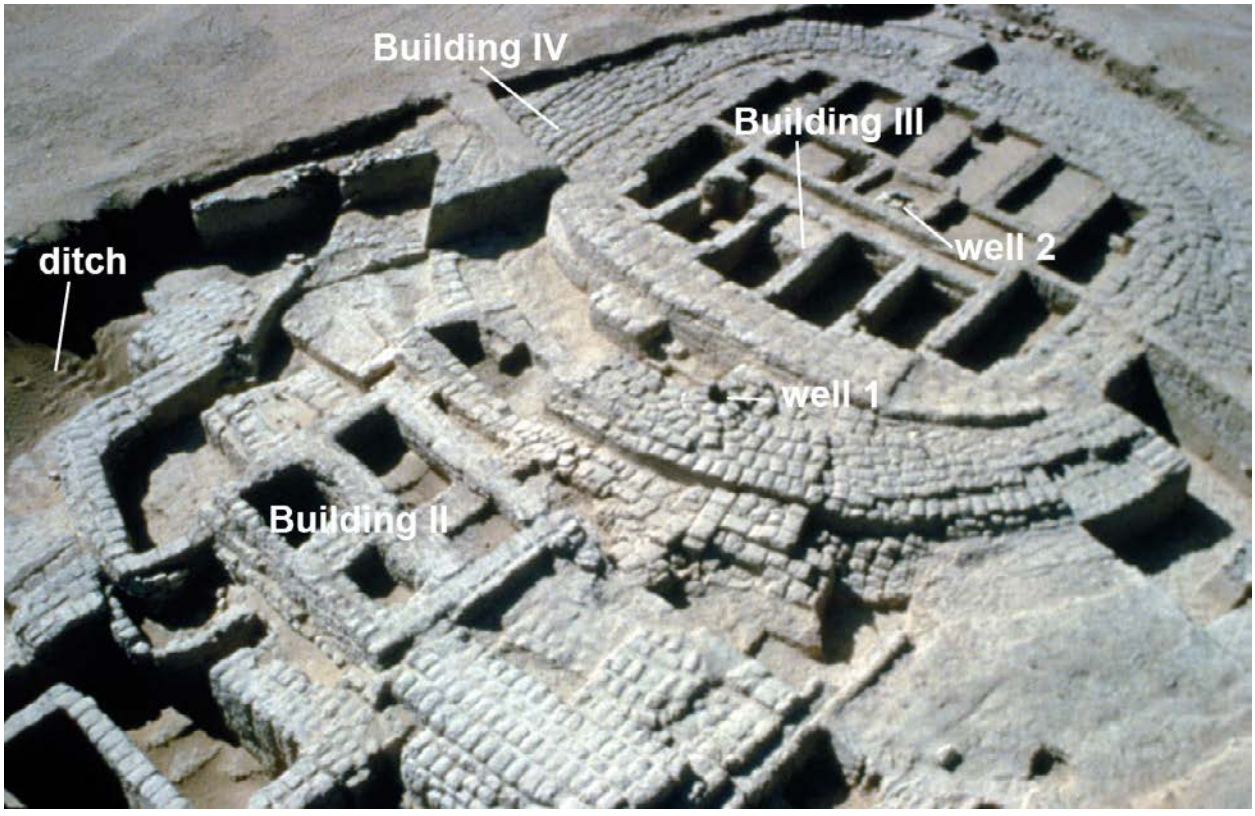


Figure 1.14. Hili 8 (after Méry 2013: fig. 3 with labels by the authors).

Hili 8-III
Site: Hili 8
Other Names: Building III
General Location: Buraimi, UAE
UTM: 377397 E, 2686928 N
Tower Shape: sub-rectangular
Diameter: 16 m
References: Cleuziou 1976/1977; Cleuziou 1989b, 62–64; pl. 11–12, 21; Jorgensen and Al-Tikriti 2002: 40–42; Cleuziou 2009

Of all the Bronze Age towers in Eastern Arabia, Building III at Hili 8 is perhaps the most famous. It is square, measuring 16 m on each side, with rounded corners, built directly on virgin soil. The structure is made up of wide, flat mudbricks laid in headers and stretchers to create rectilinear walls dividing the interior into two roughly symmetrical rows of six compartments and a central space (Figure 1.14; Cleuziou 1989b: 63–64). A stone-lined well lies at the centre of the structure, and the remaining interior spaces created by the rectilinear mudbrick walls were filled with sand and gravel. Around this core was a wall made of two faces of mudbrick. This exterior wall was never connected to the interior rectilinear walls, and is consists of two sets of mudbrick walls set together with thick layers of mortar and more mudbrick fill (Cleuziou 1989b: 63–64). A ditch surrounded this structure and may have been dug prior to the construction of Building III. Soon after the construction of Building III this ditch was filled in with rubbish; a building (Building V) was constructed on top of part of it; and a new ditch was dug that surrounded the slightly expanded complex.

The mudbrick Building V, which abutted Building III against its northeast side, was ca. 5 × 7 m and consisted of only three filled compartments. It was constructed of the same mudbricks as Building III, but the fill was quite different: it "consists of flattened balls of mudbrick mixed with straw . . . sunk into heavy masses of whitish mortar" (Cleuziou 1989b: 65). Though smaller, Building V was clearly intended to be sturdy and likely equates at least in part to the "platform" described at towers elsewhere. Cleuziou and Tosi (2018: 240) propose that Building V was related to storage. At least one ditch or trench, roughly 2.5 m deep, encircled Building III and Building V (Cleuziou 1989b: 65) and is roughly contemporary. Water-borne sediments lined the bottom of the ditch, suggesting that it held water for at least some of the time, and was arguably deep enough to have been a true moat (Jorgensen and Al-Tikriti 2002: 42; but see Cleuziou 2009: 730–731). These three features—the ditch and the two structures—made up the complex. Outside the complex, to the east, the ground surface was lowered 70 cm; Cleuziou and Tosi (2018: 240) suggest that this area was then used as a garden, as lowering the garden level increases the ease of irrigation. A small third building, called Building VI, was constructed adjacent to Building V. All of the floral and faunal samples from this period appear to have come from Building VI (Potts 1990: 80). Either at the same time or soon afterwards the moat was filled in and a wall, joining Building VI with Building V, constructed over it (Cleuziou 1989: 66).

These features—the well, Building III, Building V, Building VI, the ditch—date to what Cleuziou identified as phase I. The well, Buildings III and V, and the ditch were constructed in the earliest phase (phase Ia); Buildings III and V appear to have continued in use as Building VI was constructed (phase Ib); the ditch filled in; and Building VI joined to Building V (phase Ic). A radiocarbon date "taken from below the first layer of the wall and the filling" of Building III, provides a *terminus post quem* of 3371–2891 and 3367–2876 cal. BCE respectively (2-sigma, 95% probability; Cleuziou 1989b: 64; Cleuziou 2002: 195).[3] The

[3] MC2266 and MC2267, recalibrated with IntCal20.

attribution of the tower to these early dates was somewhat disputed, most cogently by Potts (1997; 1998: 46). Potts points out that the two samples from which these earliest dates are derived are both wood charcoal, and suggests that they are examples of the old wood phenomenon (in which wood from long-dead trees is burned in a later fire but retains its earlier radiocarbon signature). Nevertheless, it is still likely that Building III, the earliest of the three Hili 8 towers, dates to the first half of the 3rd millennium BCE, and most scholars consider it a Hafit period tower.

Hili 8-IV
Site: Hili 8-IV
Other Names: Building IV
General Location: Buraimi, UAE
UTM: 377397 E, 2686928 N
Tower Shape: circular
Diameter: 22 m
References: Cleuziou 1989b: 67–68, pl. 13; Cleuziou 2002; Cleuziou 2009

At some point, Building III and the contemporary Building V–VI either fell into disuse or were partially destroyed and the original well abandoned. In the period that followed a second set of features (Building IV, Building II, and another ditch) were constructed to replace them (Figure 1.14). Building IV was constructed from the ruins of Building III (Cleuziou 1989b: 67). It is circular in plan and, with a diameter of 22 m, much larger than Building III. Instead of centring on Building III, Building IV made use of the Building III bulk but shifted further to the northeast, over part of Building V, to incorporate a new well into Building IV. The new well was "dug through the ruins of … Building V. The upper part of this well was included in the construction of the ringwall of Building IV, as can be seen by the crown-like disposition of the bricks around its stone lining" (Cleuziou 1989b: 67). Though it was excavated to increasing depths through the following thousand years, this new well remained in use until 1800 BCE, i.e., the end of phase III (Cleuziou 2009: 730–731).

Just as Building IV replaced Building III, the platform-like Building V/VI was replaced by Building II. Stones were used in the foundation of the platform, and a rectilinear mudbrick structure filled with hard-packed clay built on top. The use of Umm an-Nar tomb stones in the foundation of Building II is particularly notable, as it provides a *terminus ante quem* for the "sugar lump" style of tomb facing stones from which they were taken (Cleuziou 2002: 203; Méry 2013). Altogether, Building II was ca. 5.5 × 6.5 m and preserved to a height of 2.5 m (Cleuziou 1989b: 68). Elsewhere during this period, Tomb M was in use (Cleuziou 2002: 203), while Tombs A and B, 500 m to the south of Hili 8, may have been built and/or come into use during the later years of Building IV (Cleuziou 2002: 205).

A new ditch, 4–5 m wide and 1.75 m deep, surrounded Buildings IV and II and enclosed a 0.3 ha area. Just beyond the ditch were several canals, 0.4 m wide and 0.4 m deep, dug into natural deposit sometime in the first half of Phase II (Cleuziou 1989: 68; Cleuziou 2002: 198; Méry 2013: 5, fig. 4). Cleuziou (2002: 199; 2009: 730, 732 fig. 5) argues that these would have been water runoff channels that led to the ditch or moat. During the years that followed, the subsequent additions to (and decay of) the Building II platform was countered by the addition of craft activities, including copper working and pottery production, both on and around the tower complex (Cleuziou 1989b: 70) as well as within the encircling ditch (Cleuziou 2002: 199).

Radiocarbon dates associated with Building IV and Building II are published in several places—most completely in Potts (1997: table 1) and updated in Barker (2018: 57–58, tab. 3.1). The dates, from the construction of Buildings IV and II (phase IIa) and the "semi-abandonment" period (phase IIe) during

which Building IV decayed prior to the construction of Building I on its ruins (phase IIf), indicate that the Building IV/II tower complex survived for roughly 500 years, from ca. 2700 to 2200 BCE (Chapter 2).

Hili 8-I
Site: Hili 8
Other Names: Building I
General Location: Buraimi, UAE
UTM: 377397 E, 2686928 N
Tower Shape: circular
Diameter: 22–23 m? 25-30 m? 35 m?
References: Cleuziou 1976/1977: 20–21, 22, 23, 24, 49 fig. 19; Cleuziou 1979: 34–35; Frifelt 1979; Cleuziou 1989a; Cleuziou 1989b: 71, pl. 20; Barker 2018: tab. 3.1

The third and final tower at Hili 8, called Building I (as it was found first in the excavations), was excavated in the earliest seasons of research, when the least was known about the tower phenomenon (Cleuziou 1976/1977). Though little of the structure was left, what remained was easy for excavators to identify archaeologically. It is described as "slightly larger" than the 22 m diameter Building IV beneath it (Cleuziou 1989b: 71), but Barker (2018), whose research focuses on the 2nd millennium deposits at Tell Abraq, proposes that it was considerably larger: 25–30 m in diameter (Barker 2018: tab. 3.1). Botan (2012: 14) suggests an even larger tower diameter of 35 m. The tower was built over the remains of Building IV and was separated from the earlier structure by a thin layer of reddish sand. Like the towers that came before, it was constructed of mudbrick, and like Building IV this tower was circular in plan. It also used the second well, which was originally constructed in concert with Building IV. The well remained in use well into the 2nd millennium BCE, through the Wadi Suq (Cleuziou and Tosi 2018: 416).

Meanwhile, Building II, which had formed the platform associated with Building IV, was incorporated into a new structure by additions made to its north side. The walls of this new platform were built to within a few meters of Building I. Cleuziou (1989b: 71) also mentions "a stairway preserved for three steps", associated with this accompanying structure; presumably, these stairs are visible in Cleuziou's published plans as the stones built into the addition against Building II (1989b: pl. 20).

Surrounding this complex was a substantial feature that Cleuziou (1989a: 72) calls an enclosure wall. Its stone foundation was 80 cm wide and constructed in a style considered typical for the Wadi Suq period: stone slabs are set on end and loose stones fill the space between them. The stone foundation was topped by mudbricks. In the eastern portion of the complex, in the enclosed area between the tower and the wall, a series of less substantial rectilinear walls were built against the enclosure wall, and the open space used for craft or domestic activities (Cleuziou 1989b: 71–72; Cleuziou and Tosi 2018: 416–417). Beyond the complex, several tombs (Hili Tombs B and N) were built and in use during this period. As a secondary collective burial, Tomb N in particular demonstrates the characteristics of early Wadi Suq mortuary practices (Cleuziou 2002: 208).

Two radiocarbon dates from phase IIf deposits (MC2261 and MC2262) provide solid late 3rd millennium BCE dates for Building I, and a third radiocarbon date from phase III (MC2259) anchors the enclosure wall and domestic activities to the first quarter of the 2nd millennium (Cleuziou 1989a: 64; Potts 1997: tab. 1; Barker 2018: tab. 3.1; Chapter 2). In total, they demonstrate that Building I was reconstructed and in use during the period transitioning from the Umm an-Nar and into the Wadi Suq period. Hili 8 thus joins several other of the northern towers in providing crucial information about the cultural shifts occurring at the end of the third and beginning of the 2nd millennium BCE.

Hili 10/11
Site: Hili 10 or Hili 11
Other Names: none
General Location: Buraimi, UAE
UTM: 377462 E, 2687166 N
Tower Shape: circular
Diameter: 35 m
References: Cleuziou 1989b: pl. 10; Cleuziou 2002: 210; Jorgensen and Al-Tikriti 2002: 39–40; Cleuziou 2009: 729–730, fig. 2

The tower at Hili 10/11[4] sits just inside the entrance of the Al-Ain Archaeological Park (Figure 1.11). Excavated in ca. 1990 by the Al-Ain Department of Antiquities, it is also made of mudbrick, but at 35 m in diameter is considerably larger than the other Hili towers (Cleuziou 2002: 210)—so large, in fact, that it was not at first recognized as a tower (e.g., Cleuziou 1989b: 83). Today, it is clear even from satellite imagery that this feature should be considered a tower. It had a central well that was ca. 6 m deep (Jorgensen and Al-Tikriti 2002: 39), and appears to have the same rectilinear internal structure, laid out more-or-less symmetrically around an axial "corridor" with the well at its centre, as many other towers are (including 1145 in Bat). Pottery sherds are plentiful on its surface and craft activity at the tower appears to have included pottery making (Al-Tikriti 1980: 101; Cleuziou and Tosi 2018: 335), but little else is known about Hili 10/11.

ʿArja

The site of ʿArja, situated in the eastern foothills of the Al-Hajar Mountains, is known primarily from its significant copper mining and smelting activities, starting from around 1000 BCE, with the main events dating from 800–1000 CE, i.e., the Early Islamic period (Weisgerber 1987: 145). According to Hastings *et al.* (1975: n12) the possible towers were first identified during geological prospection and subsequently visited and described by various scholars.

ʿArja 1
Site: ʿArja 1
Other Names: Aarja; Structure 2; "the ziggurat"
General Location: Arja, Oman
UTM: 441119 E, 2693269 N
Tower Shape: rectilinear
Diameter: ~20 × 20 m
References: Hastings *et al*. 1975: 13, fig. 7, n12; Goettler *et al*. 1976: 48; Costa 1983: 266; Doe 1983: 81–82; Costa and Wilkinson 1987; Weisgerber 1987: 148–149, tab. 14

ʿArja 1 is built of massive, mainly gabbro boulders from local sources. Two platforms are visible, accessible by a long ramp, although no entrance to the building is present at the upper end of the ramp (Costa and Wilkinson 1987: 137–138; Figure 1.15 and Figure 1.16). The lower platform measures 20 m^2 and the total

[4] Confusion between the numbering of 10 and 11 (e.g., Cleuziou 1976/77: 37, fig. 4 and 1989b: pl. 10 compared to Cleuziou 2009: fig. 2 and Cleuziou 2002: 210) have led recent publications (e.g., Mortimer and Thornton 2018) to include both in reference to the tower. The other site, which is slightly to the northeast of the tower at Hili 10/11, has no tower.

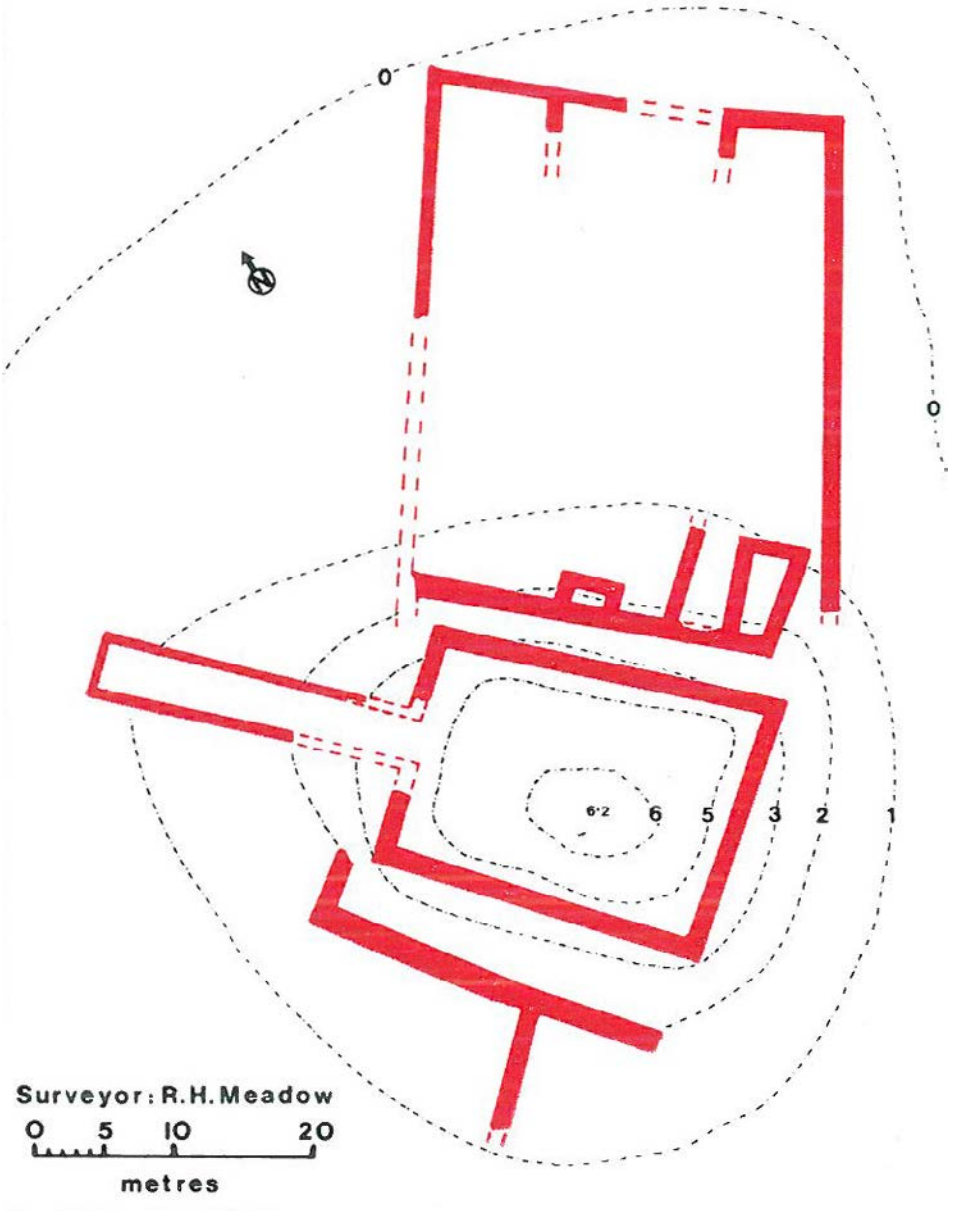


Figure 1.15. Plan of 'Arja 1 (Hastings *et al*. 1975: 21 fig. 7 right).

preserved height of the mound accumulates to approximately 3 m (Goettler *et al.* 1976: 48; Figure 1.17). Its corners are oriented towards the cardinal points (Costa and Wilkinson 1987: 133). Goettler and colleagues (1976: 48) as well as Hastings *et al.* (1975: 13) are remind by this construction of Mesopotamian ziggurats. Therefore, they suggested a date in the 3rd millennium BCE. However, Keall already reported from his visits in December 1973 on blue-green glazed pottery sherds found at 'Arja (Goettler *et al.* 1976: 46). Additionally, there are several radiocarbon samples that tell a different story. Radiocarbon dating on small pieces of charcoal found in slag resulted in 1495 CE (Goettler *et al.* 1976: 46) and a charcoal sample from a roasting pit dates to cal. 259-675 CE (2-sigma, 95% probability)[5], i.e., the Sasanian/Early Islamic period (Weisgerber 1987: 148-149, tab. 14) and therefore clearly putting 'Arja 1 out of the corpus of 3rd millennium BCE towers.

[5] HAM1044, recalibrated with IntCal20.

Figure 1.16. Aerial view of 'Arja 1 (Goettler *et al*. 1976: pl. 2).

Figure 1.17. Corner of the terrace wall of 'Arja 1 (Hastings *et al*. 1975: pl. 6A).

Figure 1.18. Aerial view of ʻArja 2 (Goettler *et al*. 1976: pl. 6).

ʻArja 2
Site: ʻArja 2
Other Names: Structure 3; "round structure"
General Location: Arja, Oman
UTM: 440219 E, 2693534 N
Tower Shape: circular
Diameter: 21 m
References: Costa 1983: 266; Goettler *et al*. 1976: 48

As with ʻArja 1, ʻArja 2 has not been excavated and there is little published about it. Goettler *et al.* (1976) identify it as the "round structure, approximately 20 meters in diameter", located 1–2 km north of Arja itself (Figure 1.18). Its walls are constructed of large boulders cemented together and surrounding a 1–2 m deep depression. Extending 10 m off from the western side of the feature "is an odd-shaped construction, best described as being a double-cross in outline, joined to the main structure by a narrow, shallow trough" (Goettler *et al.* 1976: 48). From this, Goettler *et al.* hypothesize that ʻArja 2 is an open cistern of some sort. Thus, despite contrary suggestions, no 3rd millennium BCE towers seem to be present at Arja.

Figure 1.19. The tower at Ajran, looking northeast into the wadi.

Ajran
Site: Ajran
Other Names: 917-001 (ArWHO)
General Location: Ajran, Oman
UTM: 417391 E, 2657871 N
Tower Shape: circular
Diameter: 21 m
References: Cable and Thornton 2013; Harrower *et al.* 2021

The tower at Ajran is situated not far from the border between Oman and the UAE, near the confluence of two wadis on the northeastern edge of the Jebel Al-Abyad range (Figure 1.19). It sits roughly 100 m from the steeply incised wadi edge on the northeastern slopes of a mountain in an area that lacks much other evidence of human activity. Although there is no evidence of any ancient oasis and the vegetation in the area is sparse it is likely significant that this tower is located at the junction between two different kinds of bedrock. About 40 m from the tower are the remnants of possible Umm an-Nar tombs, while below it, overlooking the wadi, are the possible remains of Hafit tombs. Nearby is a feature consisting of two upright parallel slabs of tabular schist, standing ca. 70 cm apart, set into the ground. There is no other evidence of external features that might be associated with this tower.

The tower itself sits directly on radiolarite chert bedrock and is built of tabular schist-limestone blocks. Two concentric ringwalls form the tower itself. The inner of these two walls is faced on the inside and is visible in plan and elevation on the southwestern side (i.e., the mountain side). This inner wall is ca. 1.4 m thick and built of stones slightly smaller than those of the exterior wall—ca. 40 × 40 × 15 cm as compared to 80 × 55 × 35 cm—and is faced on both the interior and exterior. This interior wall forms a space inside the tower that is ca. 13 m in diameter and 60 cm below the wall's preserved height; however, rubble obscures much of this interior space. The exterior wall, which is also double-faced and made of tabular blocks, is ca. 1.2 m thick (Figure 1.20).

Though a previous 2009 survey by Cable, Thornton and Hatfield identified one small Umm an-Nar sherd. The site overall is nearly bare of artefacts, even if some lithics were found. There is little evidence of re-use or disturbance except for that created by the construction of modern infrastructure (power lines and a tarmac road) immediately to the northeast of the tower; from this, the tower appears to have been saved by the timely intervention of the Ministry of Heritage and Culture (now Ministry of Heritage and Tourism). No excavations or other research has determined the precise age of the Ajran tower, but its technological and stylistic similarities to other towers of the Hafit and Umm an-Nar periods places it well within the 3rd millennium BCE.

Figure 1.20. A view of the exterior ringwall of Ajran, looking north.

Al-Qumayra

The site of Al-Qumayra, also known as Ayn Bani Sa'dah (Costa 2006: 141–146), is situated less than 30 km from the Oman border with the UAE, inside the Al-Hajar Mountains on the eastern edge of the Jebel Al-Abyad Range at the base of Jebel Jumayrah. The four towers are situated at the junction of Wadi Al-Fatah and Wadi Salh, with three towers located on the western and one tower on the eastern bank of Wadi Al-Fatah (Figure 1.21). The site was inhabited at least from the Neolithic onward (Bialowarczuk and Szymczak 2018), with a sizeable Iron Age settlement located south of Al-Qumayra 3. The Bronze Age towers were first discovered by a geological prospection (David-Cuny, personal communication). At that time, the site was referred to as Wadi Al-Fajj. Since 2015 a Polish team from the University of Warsaw has been conducting archaeological research at the site.

Al-Qumayra 1

Site: Al-Qumayra 1
Other Names: T2 (David-Cuny, personal comm.), Site 2 Locus 8 (Costa 2006); QA-5 (Bieliński 2021)
General Location: Al-Ayn/Al-Qumayra, Oman
UTM: 417348 E, 2640591 N
Tower Shape: niched circular
Diameter: 17 m
References: Cable and Thornton 2013; Costa 2006: 141–146

Al-Qumayra 1 sits on the western edge but in the active flooding zone of Wadi Fajj. As a consequence, its entire eastern (wadi-facing) half has been eroded away, leaving its interior partially exposed. No evidence of any exterior structures or features is visible, although this may also be the result of erosion (Figure 1.22). Despite this the tower's western third or half is preserved to a height of seven courses (roughly 4 m). The tower itself is somewhat unusual, as it has the same circular niched plan as Al-Rojoom tower at Bat (Figure 1.23). It is also built of large, roughly shaped tabular limestone or schist blocks, but its construction employs filler stones to support the courses (Figure 1.24). It is unclear whether these stones are original to the structure or attempts to preserve or conserve it at some point in its long history. If structural style can be used to date Al-Qumayra 1, then it dates to the same rough time period as that of Al-Rojoom tower at Bat, i.e., the middle of the Umm an-Nar period.

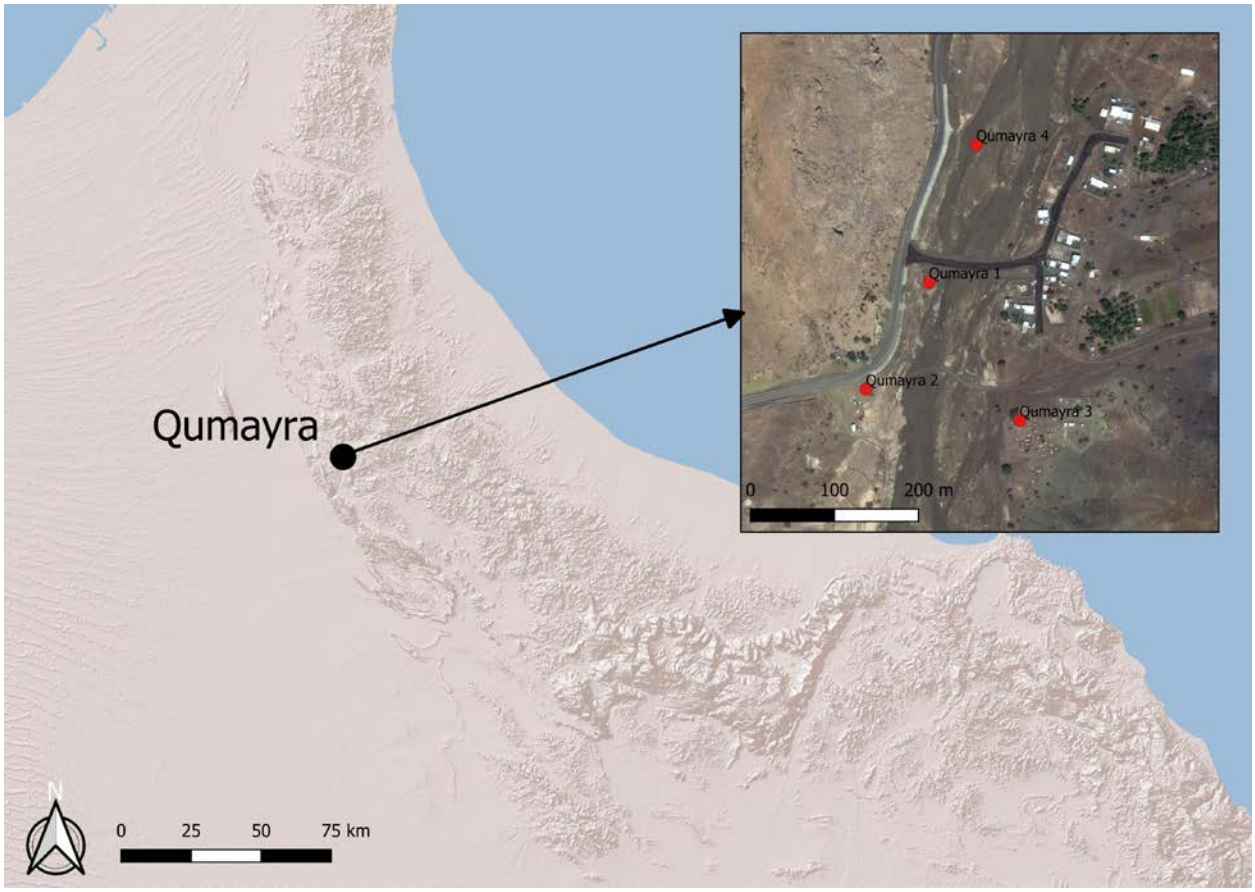


Figure 1.21. Overview map of towers at Al-Qumayra.

Figure 1.22. Al-Qumayra 1 from above. The eastern two-thirds of the tower, facing out to the wadi (at the top of the image) has been completely obliterated by erosion, but the stepped or niched exterior walling is visible in plan.

Figure 1.23. Close-up of the exterior wall elevation showing the "stepped" construction technique.

The exposed interior of Al-Qumayra 1 provides considerable insight into its construction. The base of the structure consists of rectilinear walling constructed of blocks similar to those used in the exterior construction. Inside (or in addition to) those walls are smaller, evenly coursed stones (ca. 20 × 5 × 7 cm), at least four courses high. Above this level is a considerable amount of sediment, which suggests that the tower was also filled with either packed earth, mudbricks, or both. From above, looking down on the top of the tower interior (which is preserved to a height of about 3.5 m) are double-faced rectilinear walls ca. 60 cm thick, apparently also evenly coursed, with a (presumably rubble) fill. The small stones used in the construction of these walls are the same size as those identified at the base of the tower, though no rectilinear walls built of large stones (evident at the base of the tower) were identified in plan at the top of the tower.

Figure 1.24. Detail of the interior of Al-Qumayra 1, exposed to the wadi. Flat stones are visible in sections of the profile. It maybe be that these are the foundations of interior (mudbrick?) walls.

It is unclear whether what is currently exposed at the base of the tower should be considered stone fill that was intended to strengthen the tower foundation, or the base of the same sets of rectilinear walls visible on the tower's interior top in plan. It is also unclear whether there is (or rather was) a well inside the tower, though according to Costa (2006: 145–146) people living nearby affirmed that it did. Atop the tower and built over the tower ringwall are two later features, possibly the remains of disturbed tombs (Figure 1.22).

Al-Qumayra 2
Site: Al-Qumayra 2
Other Names: T1 (David-Cuny, personal comm.), Site 2 Locus 1a (Costa 2006); QM/A/2 (Bieliński 2021)
General Location: Al-Qumayra, Oman
UTM: 417456 E, 2640427 N
Tower Shape: circular
Diameter: 20 m
References: David-Cuny, personal comm.; Cable and Thornton 2013; Costa 2006: 143

Al-Qumayra 2 tower is located 150 m south of Al-Qumayra 1, near the source of a spring (Figure 1.25). The tower's exterior ringwall is built of massive boulders of roughly shaped limestone, 50 to 70 m long (David-Cuny, personal communication; Figure 1.26), and although Costa (2006: 143) mentions the presence of "small sections of concentric walls", these were not identified in the 2009 survey by Cable, Thornton and Hatfield. David-Cuny noted that the lower layer of the tower protruded as it is known from Umm an-Nar tombs. Surface material, including domestic Umm an-Nar pottery and especially fragments of Black Slip Jars, however, favoured their interpretation as a tower. Additionally, large quantities of slag were found on and around the tower, attesting metallurgical activities (David-Cuny, personal communication). The tower is currently under investigation by a University of Warsaw team, whose results will add substantially to our understanding of this tower.

Figure 1.25. Al-Qumayra 2 in 1996 (photograph by Hélène David-Cuny, used with kind permission).

Figure 1.26. Massive boulders of the ringwall of Al-Qumayra 2.

Figure 1.27: Al-Qumayra 3.

Al-Qumayra 3
Site: Al-Qumayra 3
Other Names: Site 2 Locus 7a (Costa 2006); QM/A/2 (Bieliński)
General Location: Al-Qumayra, Oman
UTM: 417273 E, 2640464 N
Tower Shape: circular
Diameter: 18 m
References: Cable and Thornton 2013; Costa 2006: 144

Al-Qumayra Tower 3, which is also under study by the University of Warsaw, is a well-preserved circular tower standing to a current height of 3.5 m above ground level (Figure 1.27). The stones used in its construction are small to medium in size. Costa (2006: 144) notes the difference in stone size compared to Al-Qumayra 2, but stresses that this might have nothing to do with different building techniques or a different chronological range of the structures, but simply with the local availability of raw materials on the two sides of Wadi Al-Fatah.

Al-Qumayra 4
Site: Al-Qumayra 4
Other Names: T3 (David-Cuny, personal comm.)
General Location: Al-Qumayra, Oman
UTM: 417404 E, 2640754 N
Tower Shape: niched circular
Diameter: unknown
References: David-Cuny, personal comm.

Figure 1.28: Al-Qumayra 4 (photograph by Hélène David-Cuny, used with kind permission).

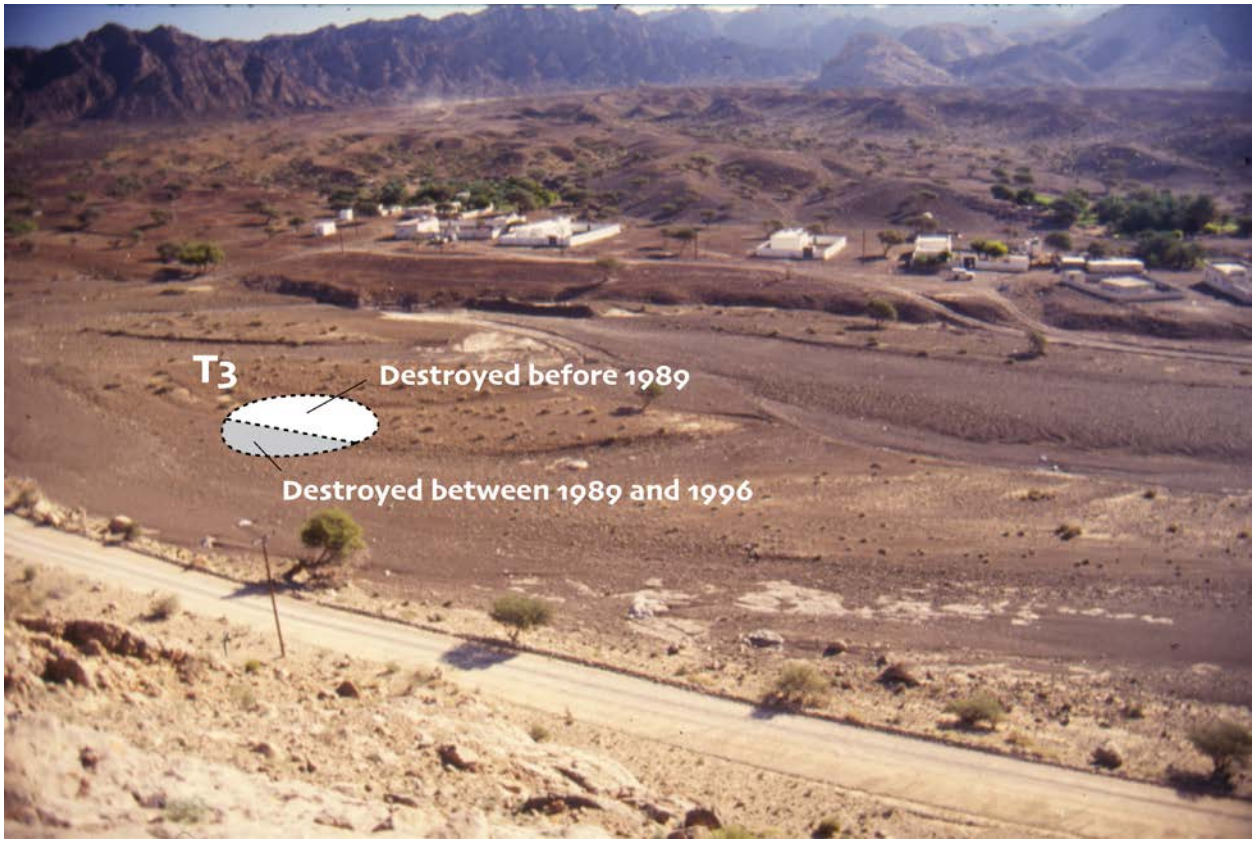


Figure 1.29. Location of Al-Qumayra 4 after its destruction in 1996 (photograph and labels by Hélène David-Cuny, used with kind permission).

When visited for the first time in 1989 by Hélène David-Cuny, Al-Qumayra 4 was half-preserved, cut across its diameter by the wadi (David-Cuny, personal communication). It features a recessed ringwall made of large, unworked stone blocks, preserved to a height of about 2 m. The general layout of Al-Qumayra 4 resembles that of Al-Qumayra 1, albeit being even more massive than the other one (Figure 1.28). In 1996, the remains of the tower were completely washed away by the wadi (Figure 1.29).

Wadi Hareem
Site: Wadi Hareem
Other Names: 973-002 (ArWHO)
General Location: Wadi Hareem, Oman
UTM: 435507 E, 2636548 N
Tower Shape: circular
Diameter: unknown
References: Nathan Staudt 2017: 121 tab. 5.3, 122 fig. 5.5; Harrower *et al.* 2021: 12

This is a single-tower site just to the west off of Wadi Hareem road. It was discovered and documented by the Archaeological Water Histories of Oman (ArWHO) Project (Nathan Staudt 2017: 121 tab. 5.3, 122 fig. 5.5; Harrower *et al.* 2021: 12). It is built from dark, middle-sized boulders and situated today in modern palm gardens (Figure 1.30). A concrete lined irrigation channel encompasses the tower on its northern and western side.

Figure 1.30. Wadi Hareem tower with modern irrigation channel (photograph by ArWHO, used with kind permission).

Al-Shukur
Site: Al-Shukur
Other Names: Safalat Al-Shukur, Shokur
General Location: Dhank, Oman
UTM: 424423 E, 2602587 N
Tower Shape: circular
Diameter: 21 m
References: Cable and Thornton 2013; Williams and Gregoricka 2013

Al-Shukur tower is located on the western flanks of the Jebel Al-Abyad range, on the wide plain of Wadi Dhank south of the city of Dhank (Figure 1.31). The tower itself sits at the edge of the flood zone on a somewhat deflated surface (likely a natural terrace). The site has never been excavated, and little has been published about it (but see Cable and Thornton 2013; Williams and Gregoricka 2013). The tower is likely part of a larger site that included Umm an-Nar tombs and is currently bisected by a modern farm (Williams and Gregoricka 2013). The mound where the towers sits on is roughly 2 m tall and 83 m in diameter, visible as three semi-distinct tiers.

The first (or bottom) tier is irregularly shaped and roughly 83–85 m in diameter. It consists of an irregular stone alignment of boulders that curves 280° clockwise, from an "opening" to the north-northeast until it joins with the wall of the second tier on the northwest side of the tower. Immediately to the north of the tower are the remains of what appear to be an Islamic period cemetery that extends for ca. 50 m.

The outer-most alignment of boulders is filled with ca. 40 cm of fine silty deposit in its western, southwestern, and southern parts (i.e., farthest away from the "opening"). The deposit is likely the result of eroded mudbrick rather than wind-blown accumulation. This first anthropogenic terrace also evidenced the fewest artefacts. On the inside face of this outermost stone wall, which (barring the cemetery to the north) encircles the visible remains of the archaeological site, are remnants of other walls that may have formed rooms reminiscent of those in the Yiqa tower or at Middle and Late Islamic period fortress sites such as Wadi Andam 37 and Qant 3 (Whitcomb 1975: 127–129, figs. 2–3).

Sitting on top of the first terrace is a second, middle terrace. This second terrace, which is situated off-centre from the lowest terrace (on its northwestern side), is roughly 50 m in diameter and rises over 1 m above the first terrace. The small boulders that make up its outer wall are roughly hewn and of similar size.

Figure 1.31. The tower at Al-Shukur, looking northeast.

Figure 1.32. The unevenly shaped boulders that make up the foundation of Terrace 3. Here, the spaces between the boulders are large, and the piles of sandy silt around them suggest that they were once topped or embedded in packed mud or possibly mudbrick.

Only small sections of this wall are visible and its overall shape in plan is indeterminate, but the sharp change in height suggests that stone walling is preserved beneath the rubble and sediment. It appears to be only a single stone wide and it is difficult to determine whether or not the wall is coursed; if so, it is somewhat uneven. Above this, also located slightly off-centre so that its southern wall nearly meets that of the second terrace, is the third terrace. This likely represents the original (possibly Bronze Age) tower wall. It is built of roughly shaped mid-sized limestone boulders ca. 45 × 30 × 30 cm and is visible for up to three courses, arcing for ca. 14 m on the west and southwest side, and encircles an area roughly 21.3 m in diameter (Figure 1.32). This uppermost terrace (Terrace 3) extends a meter or more above the middle terrace. On top of Terrace 3 are remnants of mudbrick walls, evident now as low soil and stone mounds and rectilinear "corners" to the tower that likely represent fort watchtowers. Sub-angular to sub-rounded pebbles, visible on the surface of the terrace deposits, suggest that the sediments captured primarily by the lower two encircling walls are from eroded mudbrick. Pottery is present in relatively large amounts on the two uppermost terraces, and in addition, about a half-dozen broken grinding stones and mortars of different materials. The vast majority of datable materials found on the surface are unglazed Islamic period sherds. The dearth of materials datable to earlier periods may be the result of contemporary mudbrick dissolving over earlier deposits.

Abu Suwaih

Little is known about the towers at Abu Suwaih. The area was surveyed in 2009–2010 by a team of US researchers, during which two towers—identified as Abu Suawaih A and Abu Suwaih B—were first documented (Nathan Staudt 2017: 122 fig. 5.5; Harrower *et al.* 2021). Both towers are located on the northern slope of the Jebel Al-Rawdah, which is part of the Jebel Al-Khatmah range and close to the confluence of Wadi Al-Khubayb and Wadi Al-Shuiyah. They are on the southern bank of the wadi, only 250 m apart from each other.

Abu Suwaih A
Site: Abu Suwaih
Other Names: 997-001 (ArWHO)
General Location: Al-Khuzaymiyah
UTM: 449575 E, 2612657 N
Tower Shape: circular
Diameter: unknown
References: Nathan Staudt 2017: 122 fig. 5.5; Harrower *et al.* 2021: 12

Abu Suwaih A is situated on the foothill of Jebel Al-Rawdah overlooking the wadi. It is built of light-coloured limestone boulders and has been partially affected by a modern electricity line post that has been built on top of it (Figure 1.33).

Abu Suwaih B
Site: Abu Suwaih
Other Names: 997-009 (ArWHO)
General Location: Al-Khuzaymiyah
UTM: 449316 E, 2612720 N
Tower Shape:
Diameter: unknown
References: Nathan Staudt 2017: 122 fig. 5.5; Harrower *et al.* 2021: 12

Figure 1.33. The tower Abu Suwaih A with modern electricity line post (photograph by ArWHO, used with kind permission).

The second tower, Abu Suwaih B, sits directly on the steep slope of the Jebel Al-Rawdah and is only partially preserved (Figure 1.34). It is made of light grey coloured limestone slabs and built directly into the hillside.

Figure 1.34. The tower Abu Suwaih B overlooking the wadi (photograph by ArWHO, used with kind permission).

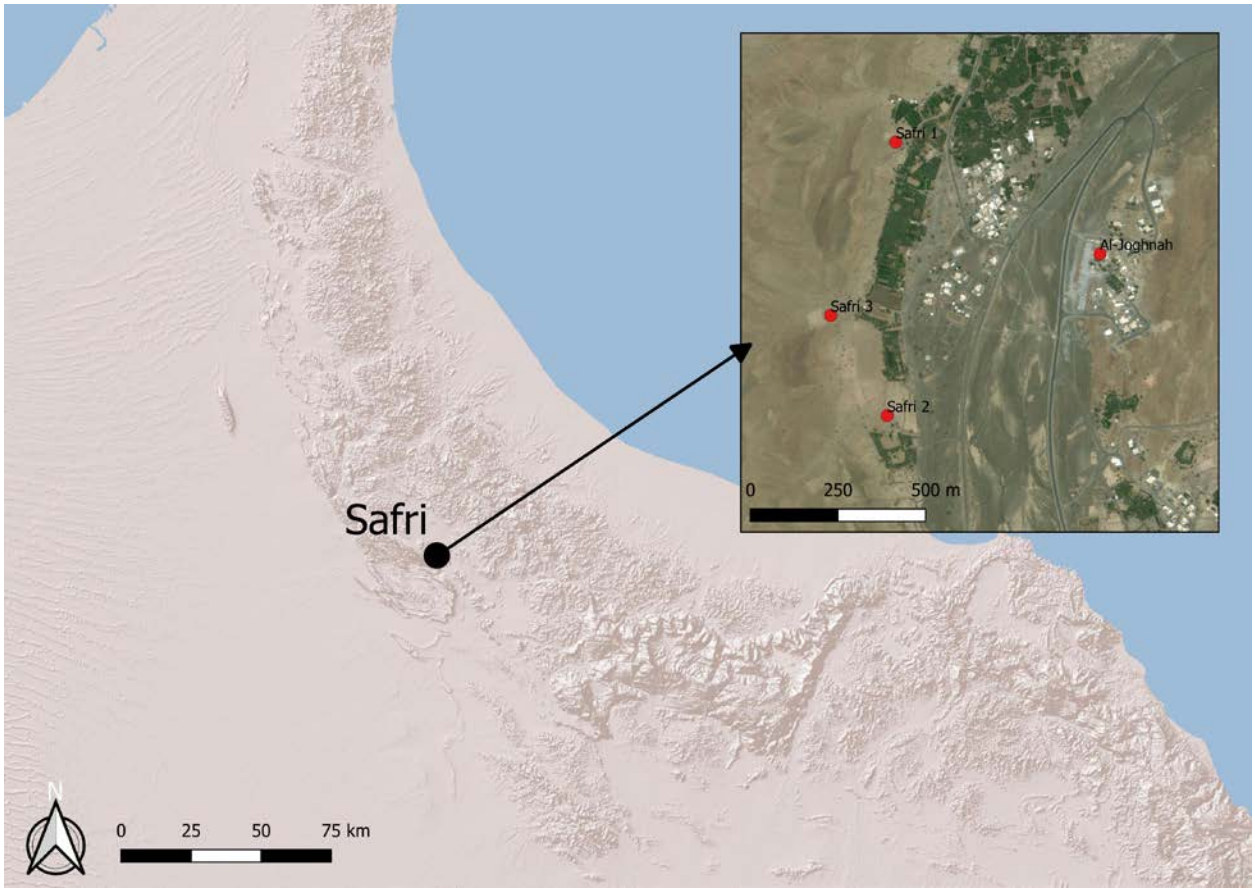


Figure 1.35. Overview map of towers at Al-Safri.

Al-Safri

The towers at Al-Safri are arranged along the edges of the Wadi Al-Fajj, in or just above the date groves and gardens that today cover much of the valley (Figure 1.35). No doubt the sites have been known locally for hundreds (if not thousands) of years, but the archaeological community began reporting on these towers only within the past 25 years (Yule and Weisgerber 1998: 197). No excavations have been conducted at any of the four towers, but publications on digital documentation and GIS research speak to the creative non-destructive strategies of some of the work conducted there (Harrower *et al.* 2014; Nathan Staudt 2017). The first tower-specific survey (Cable and Thornton 2013) identified only three towers at Al-Safri (Al-Safri 1, Al-Safri 2, and Al-Safri 3). The tower called Al-Joghnah was added to the list not long after, during a survey of the Yanqul area by Harrower *et al.* (2014); during those years the identifying numbers for Al-Safri 2 and Al-Safri 3 were also reversed and are now the standard nomenclature used here and elsewhere (but see Mortimer and Thornton 2018).

Al-Safri 1

Site: Al-Safri 1
Other Names: Qasr Hadeeqah, Tower A (Yule and Weisgerber 1998); 989-001 (ArWHO)
General Location: Yanqul, Oman
UTM: 451083 E, 2607107 N
Tower Shape: circular
Diameter: 17.8 m
References: Yule and Weisgerber 1998: 197–200; David-Cuny 2002: 326–327; Harrower *et al.* 2014.

Figure 1.36. Al-Safri 1 with annex in the northwest.

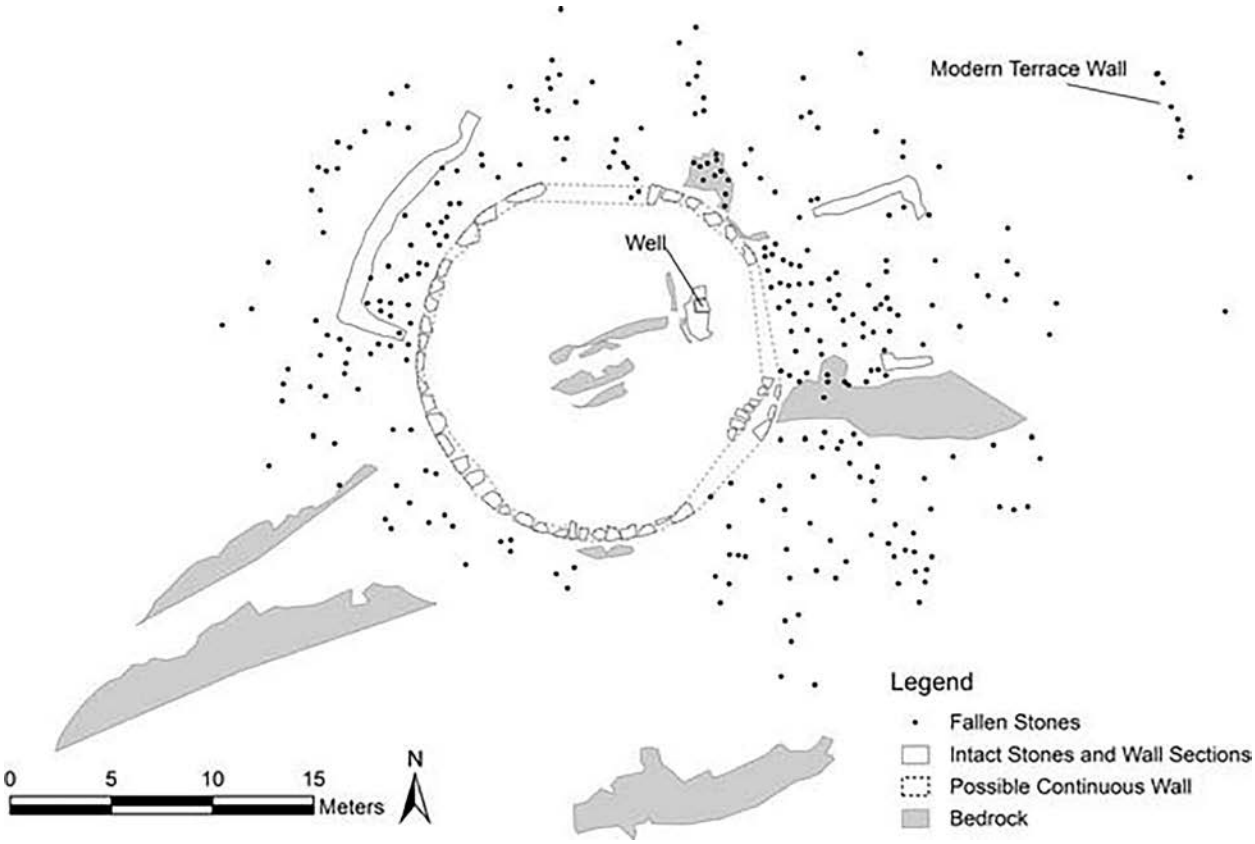


Figure 1.37. Plan map of Al-Safri 1 (Harrower *et al*. 2014: fig. 2).

Al-Safri 1 is one of the most striking towers in Oman. According to Harrower and team, it would have been at least 4.1 m tall in the Bronze Age (Harrower *et al.* 2014: 53). Today, situated as it is on a natural limestone outcrop above the modern palm groves in Hadeeqah, Al-Safri 1 is a sight to behold. The well, which is located in the tower's northeastern quadrant, is square and at least 6.7 m deep (Harrower *et al.* 2014: 53; Figure 1.37). Upright bedded limestone is visible inside the structure and runs southwest–northeast; no other internal "structure" is visible beyond the well podium. The hewn blocks that make up Al-Safri 1's ringwall are highly standardized in size, with an average weight of over 375 kg (Harrower *et al.* 2014: 46).

On the northwestern side of the tower is a gently curving wall roughly 4.5 m from the exterior of. The wall, which is contemporary with (and part of) the tower, is 7.9 m long and is "attached" to the tower on its northeastern end by a short rectilinear "corner" wall to create the "annex" or structure found as several other towers (e.g., Al-Khafaji tower, Al-Sleme tower; Figure 1.36). To the northeast of the tower is another short (ca. 5 m long) wall, this time oriented perpendicular to the tower. It appears contemporary, but its purpose is unclear. The exterior tower surface is the site of numerous petroglyphs. Harrower *et al.* (2014: 54, 55 figs. 8–9) documented 83 petroglyphs on the stones of Al-Safri 1, likely ranging in their date of production ancient to modern times. The ceramic assemblage from on and around Al-Safri 1 dates from the Umm an-Nar period but also the Wadi Suq, Iron Age, and Early Islamic period.

Al-Safri 2
Site: Al-Safri 2
Other Names: Al-Safri 3 (Cable and Thornton 2013; Mortimer and Thornton 2018)
General Location: Yanqul, Oman
UTM: 451058 E, 2606333 N
Tower Shape: circular
Diameter: 21 m
References: Yule and Weisgerber 1998: 197–200, figs 18–20; David-Cuny 2002, 326–327; Harrower *et al.* 2014: 50–51; Nathan Staudt 2017: 121 fig. 5.

Figure 1.38. Al-Safri 2 looking to the southeast in 2009.

Figure 1.39. Today, Al-Safri 2 (in the centre of the image) is safely surrounded by green fields.

On the edge of the wadi amid modern fields is a mound ca. 1.5 m tall, out of which a circle of stones is visible in plan (Figure 1.38 and Figure 1.39). Unlike the other towers at Al-Safri, Al-Safri 2 is located lower in the wadi valley, on a terrace. Its location has also led to a greater degree of reuse such that most of the better-preserved stone blocks have been removed. Though the plan of rectilinear stone walling appears on the surface of the tower and may be original to the structure, other parts suggest that at least sections of the tower were used in later periods. This includes the central stone-lined well, which is circular in plan.

Al-Safri 3
Site: Al-Safri 3
Other Names: Al-Safri 2 (Cable and Thornton 2013, Mortimer and Thornton 2018); 989-003 (ArWHO)
General Location: Yanqul, Oman
UTM: 450904 E, 2606619 N
Tower Shape: circular
Diameter: 20 m
References: Yule and Weisgerber 1998: 197–200; David-Cuny 2002: 326–327; Nathan Staudt 2017: 121

Only a few hundred meters from Al-Safri 2, the tower called Al-Safri 3 resembles Al-Safri 1 in several respects (Figure 1.40). Both are located on the western edge of the valley and several meters above the modern valley floor, situated on a rise at the foot of the hillslope. Al-Safri 3 is equally monumental, if not

Figure 1.40. Al-Safri 3 tower in the lower right of this image is only a few hundred meters from Al-Safri 2, visible in the upper left down amid the fields.

more so: the stones of Al-Safri 3 average 1.6 × 0.5 × 0.5 m each. The height of Al-Safri 3 is roughly 4 m tall from ground level to the top of the well. Unlike Al-Safri 1, however, Al-Safri 3 has considerable sediments preserved in its interior, partially obscuring its top plan so that only a few areas of rectilinear interior walls can be identified unequivocally. The well is small and circular In plan and located in the northeast quadrant of the tower (Figure 1.41). It has a diameter of only 0.5 m and is sediment-filled like the rest of the tower interior. The tower wall is mostly intact for its entire 360-degree circumference, with the exception of a short space in the southeast where the stones are missing. In addition, the distinctive silicified brown banding of the source limestone out of which the tower stones were hewn, adding to the visual appeal of the tower.

However, the entire northeastern quadrant of Al-Safri 3 is buried in rubble and sediment. A sub-rectangular or oval stone structure of indeterminate age is visible sitting both on and in the rubble. The structure straddles the line of the tower circumference and the obscuring rubble, and thus likely post-dates the original tower construction. About 25 m to the northeast of the tower are remnants of a small circular stone feature that is likely the remains of a tomb, while nestled between the tower and the hillside, ca. 100 m to the southwest, is a small Islamic cemetery. No other ancient architectural features were visible. Several diagnostic Umm an-Nar sherds were found on and around Al-Safri 3. The dearth of datable materials from other periods suggests that Al-Safri 3 received relatively little reuse. This is belied by the numerous petroglyphs visible on the surface of the tower wall. Though some are likely relatively recent, others depict mounted riders and are heavily patinaed, suggesting some antiquity.

Figure 1.41. Note the circular well slightly off-centre and the rectangular structure constructed over the top of the tower wall (bottom centre).

Figure 1.42. Al-Joghnah tower (photograph by ArWHO, used with kind permission).

Al-Joghnah
Site: Al-Joghnah
Other Names: 960-001 (ArWHO)
General Location: Al-Safri, Oman
UTM: 451665 E, 2606795 N
Tower Shape: circular
Diameter: 22 m
References: Harrower *et al.* 2014: 50–51; Nathan Staudt 2017: 121, fig. 5.3; Harrower *et al.* 2021: 12

This tower has a much shorter history of research, in part because Al-Joghnah is the only Al-Safri tower located on the eastern side of the valley. In addition, the tower is in the midst of a mudbrick village and has, itself, been incorporated into more recent structures (Figure 1.42). It has been first documented by the Archaeological Water Histories of Oman (ArWHO) project (Harrower *et al.* 2014: 50–51; Nathan Staudt 2017: 121, fig. 5.3; Harrower *et al.* 2021: 12) but no further research has been conducted here thus far. Some petroglyphs have been discovered on its northwestern side.

Khadil

The modern village of Khadil (also transliterated as "Khadal") lies at the junction between the limestone and ophiolite geology just east of the Al-Dareez-Yanqul road. Unlike most oasis sites, which are situated on flat open plains with little evidence of the underlying bedrock, the farms and gardens of Khadil are interspersed between striking orange-red bedrock outcrops of radiolarite.

Khadil 1
Site: Khadil 1
Other Names: 971-001 (ArWHO)
General Location: Khadil, Oman
UTM: 465125 E, 2596178 N
Tower Shape: circular
Diameter: 19 m
References: Cable and Thornton 2013; Harrower *et al.* 2014: 54; Harrower *et al.* 2021: 12

On the northern edge of town in an increasingly built-up area on a gravel terrace, Khadil 1 is constructed of white limestone blocks built around a natural bedrock outcrop of dark red radiolarite and brown limestone (Figure 1.43). The strike of the bedded stone, which is upright and visible both outside and inside the tower walls, runs west-northwest–east-southeast and is primarily visible in the northern half of the tower interior. The stones used to construct the ringwall on this northern side are both slightly irregular in shape and also fitted together carefully; as this is the part of the tower that interdigitates with the bedrock beneath and "behind" the ringwall, it seems that no internal structure was necessary on this half of the tower. The western half of the tower appears primarily to be filled with sediment and reddish rubble from the bedrock. However, visible in plan in the western quadrant is a wall ca. 7 m long running parallel to the bedrock. It is double-faced and built from light-colored reddish blocks that match more closely with the bedrock rather than the white limestone exterior of the tower. A shorter wall of similar construction is visible for a few meters to the southeast and is oriented roughly perpendicular to the first. On its western side the ringwall shows evidence of rebuilding using local stone (poor quality and more reddish in hue). This re-construction likely occurred well after this section of the wall was ruined, or the original stones would have been present for reuse.

Figure 1.43. Looking north towards Khadil 1, with the stone platform sitting on upright banded radiolarite bedrock in the foreground. Note the stone rubble obscuring the slopes.

Figure 1.44. Khadil 1 in plan, showing the platform to the ESE (right) and the banded red radiolarite bedrock beneath and inside the tower.

A separate platform, also constructed from well-fitted white limestone blocks and measuring roughly 4 × 5 m in plan, sits roughly 1.5 m east–southeast of the tower on the same radiolarite bedrock (Figure 1.44). Both the tower ringwall and the platform walls are preserved in places up to five courses high. No other archaeological features are visible around the tower. There is little evidence of any adjacent build-up of sediments that might suggest either buried remains or agricultural purposes, thereby making Khadil 1 relatively unusual. Less unusual (though disappointing) was the lack of artefacts found at the site.

Khadil 2
Site: Khadil 2
Other Names: 971-002 (ArWHO)
General Location: Khadil, Oman
UTM: 465104 E, 2595863 N
Tower Shape: circular
Diameter: 18 m
References: Cable and Thornton 2013; Nathan Staudt 2017: 122 fig. 5.5; Harrower *et al*. 2021: 12

Khadil 2 is also constructed on an outcrop of red bedrock (running roughly east–west) using white limestone boulders and brown limestone slabs, but it is located just south of the now-abandoned mudbrick village in the heart of the oasis (Figure 1.45). This tower has significant Islamic period reuse on top, including stone foundations with mudbrick walls visible as damp rectilinear areas in the mudbrick slump. Bedrock is visible through the top of the tower interior near the centre of the southern half of the tower, suggesting that the bedrock outcrop was once again an important contributor to the siting of the tower (Figure 1.46). Some of the stones feature petroglyphs.

Figure 1.45. Khadil 2 is situated on a bedrock outcrop in the date palm fields. The faint lines of Islamic or modern mudbrick walls are still visible on the surface.

Figure 1.46. Incorporation of the bedrock into the construction of Khadil 2 (photograph by ArWHO, used with kind permission).

Figure 1.47. Tower Khadil 3 (photograph by ArWHO, used with kind permission).

Khadil 3
Site: Khadil 3
Other Names: "Khadil West"; 971-003 (ArWHO)
General Location: Khadil, Oman
UTM: 465405 E, 2595908 N
Tower Shape: circular
Diameter: 22 m
References: Cable and Thornton 2013; Nathan Staudt 2017: 122 fig. 5.5; Harrower *et al*. 2021: 12

Khadil 3, situated 300 m east of Khadil 2, is built from small rose-coloured limestone blocks (Cable and Thornton 2013: 381). It has been listed in Cables and Thornton's 2013 article on towers and additionally documented by Archaeological Water Histories of Oman (ArWHO) project (Nathan Staudt 2017: 121 fig. 5.3; Harrower *et al*. 2021: 12; Figure 1.47), but little else is known about it.

Al-Aridh

The site of Al-Aridh is on the northwestern edge of Wadi Al-Kabir. The site is quite large and in future it may be divided, but at the time of this publication it is 2 km from north to south and 0.8 km wide and includes six towers, numerous Hafit and Umm an-Nar tombs, at least four areas with rectilinear Bronze Age structures, several aqueduct-style aflaj, and a Middle and Late Islamic (Kondo *et al*. 2014: 231) settlement in the midst of mostly-abandoned field systems. Archaeologists first became aware that there were towers in the area in 2011, and the numbers since then have grown such that Al-Aridh is now one of the densest Umm an-Nar tower sites (Figure 1.48). To the north, located on the wadi plain, are the "northern towers": Al-Aridh 1, 2, 3, and 6. These northern towers are situated on the low gravel terraces just beyond the modern flood zone. As described by Kondo *et al.* (2014), the entire area has low levels of Umm an-Nar and Indus Black Slip Jar sherds, providing broad evidence for a Bronze Age settlement area. Though there is little by way of evidence of Umm an-Nar domestic architecture, the poorly preserved remains of Umm an-Nar tombs can be found scattered across the area, while Hafit tombs are visible on the ridges (primarily on the low ridgelines to the south). South of this group of four towers and its settlement, near the mouth of Wadi Al-Khuwaybah, are the two hilltop towers, Al-Aridh 4 and 5, and their settlements. Altogether the site of Al-Aridh warrants considerable further exploration, as is currently underway by a CNRS research team (Castel *et al.* 2020).

Al-Aridh 1
Site: Al-Aridh 1
Other Names: Al-Hasi; ARS01 Tower 1 (Kondo *et al*. 2014)
General Location: Al-Arid, Oman
UTM: 461473 E, 2587260 N
Tower Shape: circular
Diameter: 20 m
References: Kondo *et al.* 2014: 229–231; Castel *et al.* 2020: 76

Al-Aridh 1 sits on a low alluvial terrace on the northwestern edge of Wadi Al-Kabir and makes up one of the four northern towers. Stone cairns, primarily Hafit tombs, occupy the adjacent low ridgetops and several Umm an-Nar tombs are visible on the terrace levels. Wadi Al-Khuwaybah runs southwest roughly

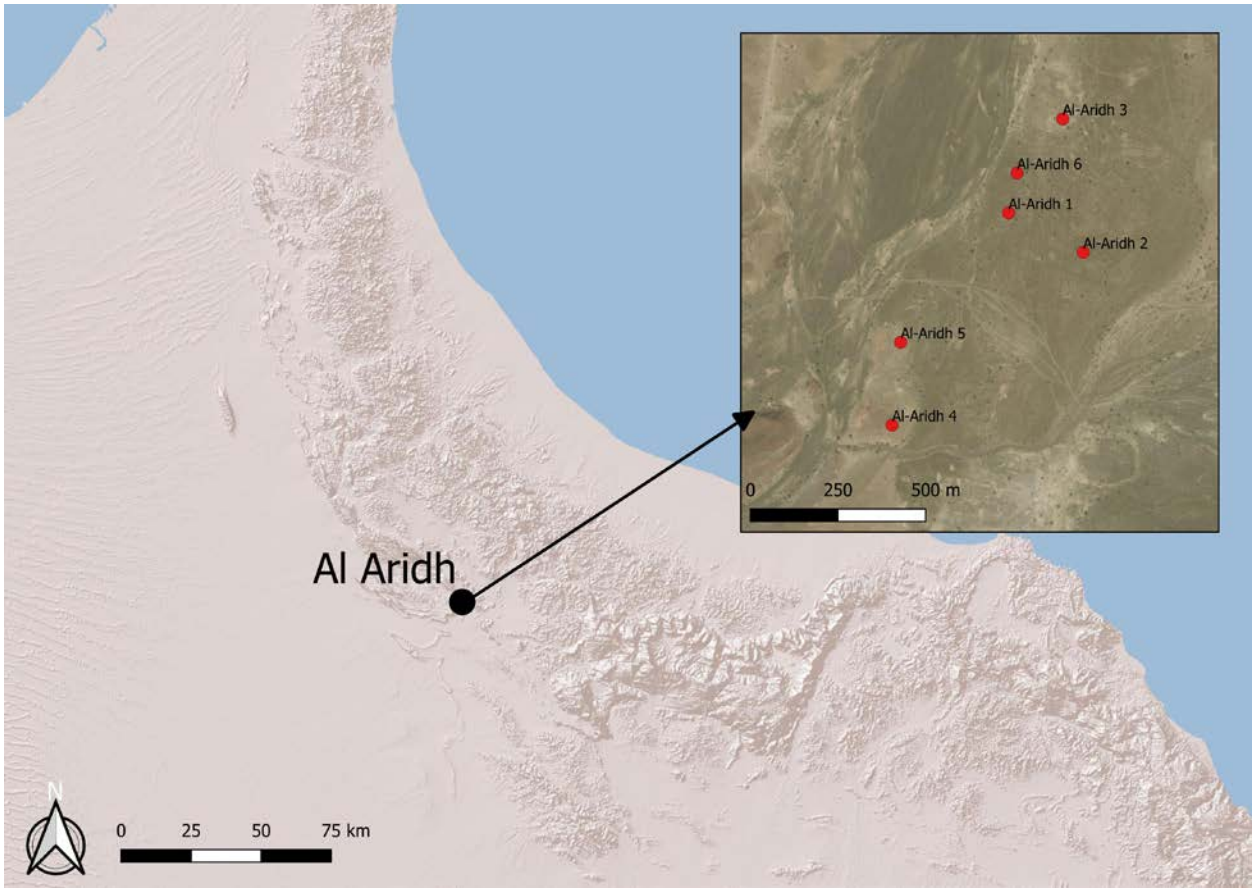


Figure 1.48: Overview map of towers at Al-Aridh.

40 m west of the tower. As with the other towers in this group, Tower 1 and its encircling walls consists of schist boulders that have been hewn into blocks (Figure 1.49). Of the northern tower group Al-Aridh 1's identifying feature is its apparent "spiralling" external retaining walls. This illusion is due to two partial encircling walls—one located roughly 5 m from the tower's west side, the other roughly 9 m from the south and east sides of the tower—and remodelling to the east–northeast to form part of a field terrace (Figure 1.50). From the southwest to the northwest, located ca. 5 m from the tower ringwall, is a double-faced Umm an-Nar style wall partially encircling the tower. Beginning near its southwest end and circa 10 m out from the tower (i.e., another 4–5 m beyond the first encircling wall) is the southwestern end of the second, outermost encircling wall. This wall is less clearly original to the structure: the stones of this outer wall are similar to those of the tower ringwall itself, as if constructed from the tower remnants, and they are not laid to form a double-faced wall. However, this outer wall follows around the tower for the space of the entire southeastern quadrant. Remnants of a possible platform, built of rectilinear stone walling roughly 2.5–3 m wide and 7 m long, are visible off the eastern side of the tower itself, immediately beside the tower; beyond those remnants, the character of the outermost encircling wall changes from a relatively uniform alignment of stones similar to those of the tower (i.e., the character of the wall circling around to the southwest) to an irregular line of smaller and unworked stones that denote remodelled field terracing (evident in part by a concomitant change in elevation by a few centimeters). The outermost ringwall alignment also changes from encircling the tower to veer off to the northeast.

Figure 1.49. Al-Aridh 1 looking south. To the left and right are the two encircling walls that do not meet. On the left of the tower ringwall it is possible to see a short, apparently rectilinear Umm an-Nar wall, while faint lines inside the tower indicate that the tower structure is supported by rectilinear walls.

Figure 1.50. Al-Aridh 1 from above. The wall running along the southeast side of the tower (lower right) appears unconnected to the ringwall.

The tower itself is constructed of rectilinear double-faced walls built of two courses of shaped stone and filled with sediment to a height of ca. 1.5 m above the modern wadi plain. Beyond the remains of a modern hearth, sitting near the centre of the tower, there is little evidence of reuse of the tower itself. The tops of double-faced rectilinear walls are visible inside the tower, which is otherwise filled with sediment. Outside and around the tower were relatively plentiful Islamic, Umm an-Nar, and Indus Black Slip Jar sherds.

Al-Aridh 2
Site: Al-Aridh 2
Other Names: Al-Hasi; ARS01 Tower 2 (Kondo *et al*. 2014)
General Location: Al-Arid, Oman
UTM: 461687 E, 2587149 N
Tower Shape: circular
Diameter: 29 m
References: Kondo *et al.* 2014: 229–231; Castel *et al.* 2020: 76

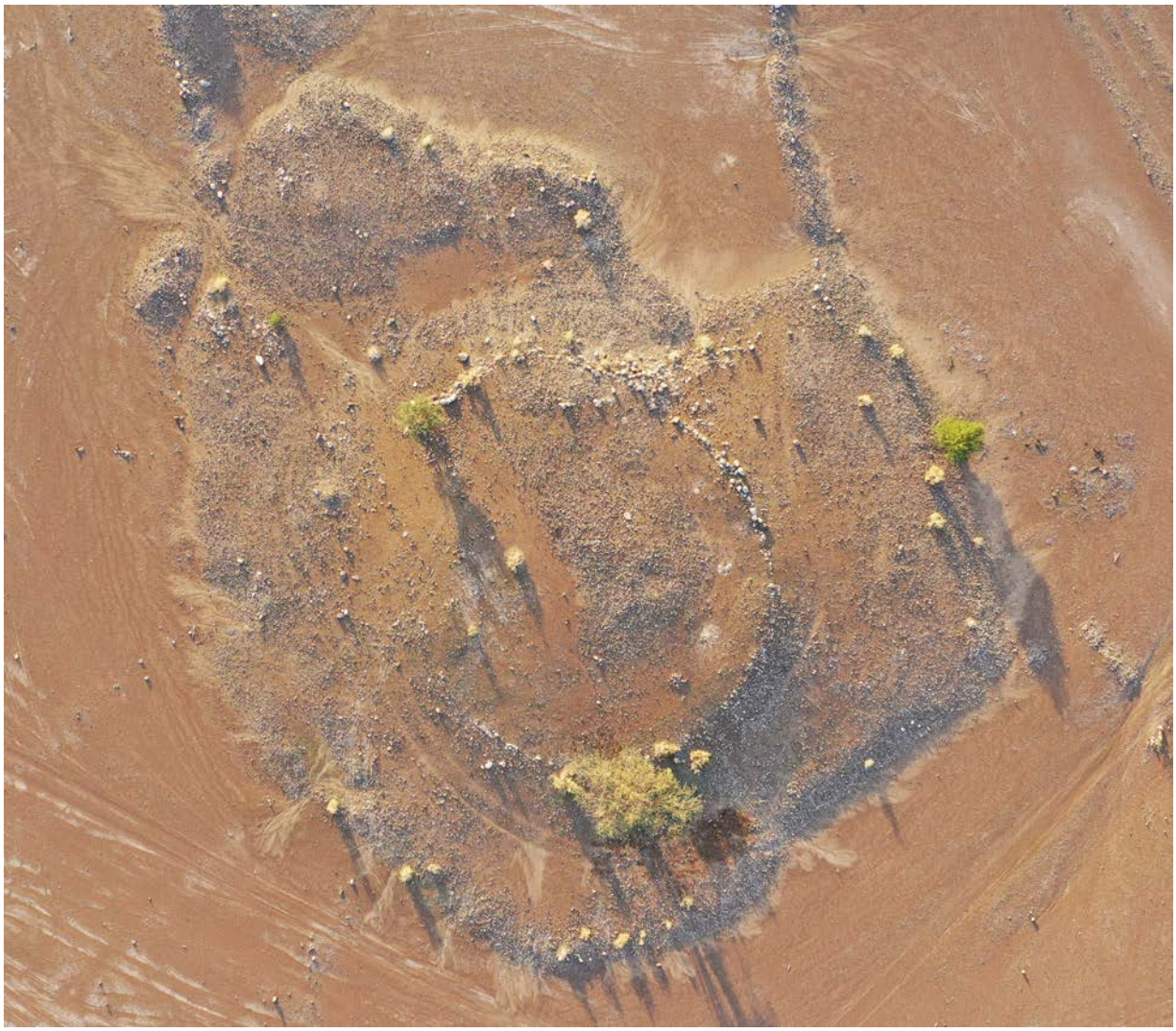


Figure 1.51. Al-Aridh 2 from above. Note the ringwall delimiting the raised 29 m diameter tower with the irregular mound surrounding it. In this image the ringwall "bump" in the southeast quadrant of the tower wall is pointing to the top.

Figure 1.52. Al-Aridh 2, looking northwest.

This tower sits at the centre of a low gravel mound ca. 1.7 m tall and over 50 m in diameter, a few hundred meters to the east of Al-Aridh 1. The tower itself is ca. 29 m in diameter and shows additional evidence of a ringwall encircling it beyond that (Figure 1.51 and Figure 1.52). The stones that make up the tower wall, which is 70 cm thick, are weathered but form a clear Umm an-Nar style wall for much of the perimeter of the tower. In the southeastern quadrant the tower ringwall appears to have been modified to create a slight "bump" (ca. 1.5 m wide and 10 m long) off the original curve of the tower wall (though it is possible that the original tower wall is *in situ* but buried beneath sediments). At either end of the bump are unusually large stone blocks. Off to the south and southeast of the tower the mound appears to be somewhat more rectangular in shape and there is some evidence of stones forming a boundary; among them was a door socket. On the tower and its mound were numerous sherds of Indus Black Slip Jar, Umm an-Nar, and middle Islamic types. On top of the tower and to the south and west were ceramic wasters, suggesting that there had once been a pottery kiln in the area.

Al-Aridh 3
Site: Al-Aridh 3
Other Names: Al-Hasi; ARS01 Tower 3 (Kondo *et al.* 2014)
General Location: Al-Arid, Oman
UTM: 461628 E, 2587529 N
Tower Shape: circular
Diameter: 19 m
References: Kondo *et al.* 2014: 229–231; Castel *et al.* 2020: 76, fig. 5

Figure 1.53. Al-Aridh 3 from above (vehicle for scale). Dark lines indicate the remains of mudbrick walls arranged around a circular core, outlining the Islamic period circular structure that formed the core of the fortified settlement/compound (the corners of which are visible as green areas at the top and bottom of the image).

Because of its reuse during the Islamic period, Al-Aridh 3 is the tallest of the northern towers (Figure 1.53 and Figure 1.54). It sits within the remains of an Islamic period settlement including many outbuildings (the rectilinear stone foundations of which are visible today) and courtyards, all partially bounded by an outer wall. The original Umm an-Nar elements of the tower are difficult to determine beyond the lowest courses of the tower, which are made of roughly hewn boulders ca. 30 × 40 × 50 cm. Though some of these stones are visible higher up in the tower ringwall, it is clear from the heterogeneous sizes of the stones and lack of clear coursing that they are in secondary positions. At least the uppermost 2 m of the tower belong to later periods. The structure today includes an entrance on its east side, complete with stone stairs. The mudbrick superstructure on stone foundations is still visible on top of the tower (Castel *et al.* 2020) as well as on some of the walls still standing in the surrounding compound. Though no well is currently visible, the presence of water can be surmised more generally by nearby canals and an abandoned falaj ca. 100 m to the southwest of the compound (Castel *et al.* 2020: 79 fig. 8). Surprisingly few artefacts were found at Tower 3, though they all appeared to date to the Islamic period.

Figure 1.54. Top view of Al-Aridh 3.

Al-Aridh 4
Site: Al-Aridh 4
Other Names: Al-Hasi; ARS01 Tower 4 (Kondo *et al.* 2014)
General Location: Al-Arid, Oman
UTM: 461140 E, 2586656 N
Tower Shape: oval
Diameter: unknown
References: Kondo *et al.* 2014: 229-231; Castel *et al.* 2020: 76

Al-Aridh 4 is the first of the two hilltop towers, south of the tower grouping on the plains. It (and Al-Aridh 5) sits on limestone conglomerate bedrock deposits near the mouth of Wadi Al-Khuwaybah, which runs southwest to meet Wadi Al-Kabir. Al-Aridh 4 thus has an unobstructed view on all sides except to the south-southwest, along the ridgeline upon which it sits (Figure 1.55). Bedded limestone and radiolarite deposits (likely evidence of the Hawasina nappe) are exposed to the immediate east of the tower. Hafit and Umm an-Nar tombs are visible to the south.

Figure 1.55. A view looking northwest over the top of Al-Aridh 4. Though the tower has collapsed, the southwestern edge of the platform upon which it was built is visible here on the left, as is the western edge of the tower. Settlement remains in the form of rectilinear buildings and walls are located near the base of the ridge on both sides.

Figure 1.56. Al-Aridh 4 looking southwest. The northern, oval end of the tower ringwall sits on a rectilinear platform. A lower, parallel wall is just visible at the bottom of the image.

Perched as it is on a low prominence and at the mercy of time and the elements, Al-Aridh 4 is difficult to see either from the air or from the ground; however, it is undoubtedly a tower. Though the tower itself is ovoid, it sits on what appears to be a rectangular terrace that must be man-made; at least, it does not conform to the ridgeline dimensions. From the terrace, the tower is roughly 2.25 m tall and ovoid; its centre filled with rubble. Below it, on the eastern face of the ridgeline (i.e., facing towards Wadi Al-Kabir) are two additional sections of wall that may have been either revetments—or, more probably, were part of the foundation for the tower above (Figure 1.56). In spite of these attempts to shore up the foundation the entire eastern side of the tower facing out to Wadi Al-Kabir has fallen away. The tower ringwall is constructed of limestone conglomerate boulders and tabular schist blocks roughly hewn to an average size of 50 × 30 × 30 cm to form a wall ca. 1 m wide. The ringwall is visible for sections up to 4 m at a time. No artefacts were found associated with the feature either at the top of the tower or near its base.

Al-Aridh 5
Site: Al-Aridh 5
Other Names: Al-Hasi; ARS01E
General Location: Al-Arid, Oman
UTM: 461165 E, 2586892 N
Tower Shape: circular
Diameter: 18.5 m
References: Kondo *et al.* 2014: 229–231; Castel *et al.* 2020: 76

Like Al-Aridh 4 (located ca. 200 m to the south), Al-Aridh 5 is situated on the furthest north end of a bedrock outcrop overlooking both Wadi Al-Khuwaybah (to the west) and Wadi Al-Kabir (to the north and east). Also, like Al-Aridh 4, it is nearly invisible when viewed today from Wadi Al-Kabir to the west. In addition to the tombs visible to the south of the tower, near the base of the ridge and on both sides to the southwest and southeast are Umm an-Nar-style rectilinear walls and structures. An area filled with fine silt immediately to the west of the tower is suggestive of a water catchment area. The site and area therefore make up an ideal Bronze Age complex.

Al-Aridh 5 seems relatively circular in spite of the narrow bedrock ridge beneath it, but at 18.5 m in diameter is on the smaller side (Figure 1.57). The tower ringwall is best preserved on the ends firmly planted on the ridgetop (i.e., to the north and south), but the lowest courses of the tower ringwall on its eastern side are still *in situ* and visible. Unlike Al-Aridh 4, this tower does not appear to have been constructed on a terrace, but rather the ringwall on the exposed eastern and western sides appear to have been built straight, up like a cylinder, or stepped in slightly. The foundation appears to begin half-way up the side of the ridge and continue from there; if this is correct, the tower is at least 6 m tall today. The boulders that form the base of the ringwall on these eastern and western sides are massive, measuring roughly 100 × 70 × 80 cm, and are likely to be tabular schist blocks rather than unformed boulders (Figure 1.58). Of these lowest courses it is possible to see 15 m of intact ringwall on the eastern side of the tower before it is obscured by rubble. Nearer to the top the stones are considerably smaller, averaging ca. 40 × 40 × 50 cm each, and are built of both hewn bedded limestone and roughly formed and weathered boulders. The ringwall appears to have been one stone thick. The upper sections of the ringwall on the eastern side have fallen away, leaving some of the internal structure of the tower visible on that side. Double-faced rectilinear walls, constructed of irregularly shaped stones 30 × 20 × 20 cm in size, make up the interior structure. Though mostly filled with stone rubble, some fine silt is present inside the tower. No well is visible, but what appears to be bedrock is visible inside the

Figure 1.57. Al-Aridh 5 from above, showing the northwestern line of the tower ringwall above the ridge spine. In the upper right of the image is one of two areas with visible Umm an-Nar settlement. Also note the fine water-borne sediments on the right, indicating a water catchment area at the base of the ridge. Wadi Al-Kabir is to the left (east).

Figure 1.58. A section of wall, half-way up the hill, made from tabular schist blocks.

Figure 1.59. This overhead image of Al-Aridh 6 shows two concentric tiers forming a low mound ca. 50 m in diameter. The line running on the left side of the image is a modern ditch.

tower in its eastern half. Umm an-Nar, Black Slip Jar, and Islamic sherds were all found during a brief survey of the tower itself, along with some lithics. A crucible fragment was found near the settlement as well as more 3rd millennium BCE ceramics.

Al-Aridh 6
Site: Al-Aridh 6
Other Names: Al-Hasi
General Location: Al-Arid, Oman
UTM: 461497 E, 2587375 N
Tower Shape: circular
Diameter: 20 m
References: Castel *et al.* 2020: 71–84

Recent geophysical prospection and archaeological excavations at Al-Aridh by a CNRS team has identified a likely sixth tower (Castel *et al.* 2020) roughly 100 m northeast of Tower 1 and 150 m west of Tower 2. The surface is marked by a low triple-tiered mound ca. 2 m tall, marked by a crust or desert pavement of gravels and pebbles over silty sediment (Figure 1.59). Though little evidence of any stone structure exists, the three

ovoid tiers are 10 m, 21 m, and 55 m in diameter, respectively. This tower, which is completely buried in the alluvium, is encircled by probable ditches or canals.

Al-Dariz

Two towers are located 1–2 km west of the modern town of Al-Dariz, a little less than 2 km southeast of the main Ibri-Rustaq road, in the midst of abandoned Islamic and pre-modern fields on a relic floodplain near the edge of Wadi Al-Kabir. The two towers are less than 400 m apart. These were originally reported by Karen Frifelt as "large [. . .] stone constructions with 3rd millennium pottery interspersed with Iron age potsherds" (Frifelt 1985: 91). It appears that this area was once a large Bronze Age site, as the low ridges nearby are full of tombs dating to the Hafit period, with a few examples of possible Umm an-Nar tombs (Cable and Al-Jabri 2018). Neither tower has been excavated, but the surface remains were documented using photogrammetry in 2009, 2011, and 2012 (Possehl *et al.* 2008; Possehl *et al.* 2009; Kondo and Hopper 2016). A single tomb, located another kilometer to the east up the valley and dating to the 3rd millennium BCE, has been excavated (Gentelle and Frifelt 1989: 123–124).

Al-Dariz South 1
Site: Al-Dariz South 1
Other Names: none
General Location: Al-Dariz, Oman
UTM: 459109 E, 2576032 N
Tower Shape: circular
Diameter: 22 m
References: Frifelt 1985: 91; Gentelle and Frifelt 1989: 123; Hopper and Kondo 2016; Possehl *et al.* 2008: 2

Al-Dariz South 1 is a circular tower with a ringwall built of roughly hewn tabular limestone blocks. Only a few courses are visible and the structure as a whole is less than 2 m tall. No other associated structures are visible, but its location (on the edge of a very low mound in a flood zone) allows for the likelihood that contemporary features are located nearby, buried under water-borne deposits (Figures 1.60 and 1.61). Not far to the northeast of Al-Dariz South 1 is a small Islamic cemetery that likely dates to the modern period (i.e., the past 200 years), but does not appear to be in use today. Few ceramics or other materials have been found at the site, but the construction of the ringwall (in regular courses, of roughly hewn blocks quarried from tabular bedrock) is in keeping with the Umm an-Nar style while the lack of ceramics is in keeping with the findings (or lack thereof) at many Umm an-Nar tower sites. Thus, a 3rd millennium date for the tower is likely.

Al-Dariz South 2
Site: Al-Dariz South 2
Other Names: none
General Location: Al-Dariz, Oman
UTM: 458747 E, 2576137 N
Tower Shape: square
Diameter: 22–23 m
References: Frifelt 1985: 91; Gentelle and Frifelt 1989: 123; Possehl *et al.* 2011: 44–50; Hopper and Kondo 2016; Cable and Al-Jabri 2018

Figure 1.60. Remains of the circular tower Al-Dariz South 1, looking eastward over the flood plain.

Figure 1.61. Top view of Al-Dariz South 1.

As with Al-Dariz South 1, Al-Dariz South 2 was first documented by the Danish team in 1973 (Gentelle and Frifelt 1989). It is roughly 375 m northwest of Al-Dariz South 1 and sits on the eastern part of a low mound ca.115 × 75 m roughly oriented west–east. The tower was surveyed architecturally, topographically, and photogrammetrically (in plan) by the American Team at Bat (Hopper and Kondo 2016; Possehl *et al.* 2011: 44–50), which gave it its current nomenclature. However, as discussed below it is possibly better described as an "enclosure" (Hopper and Kondo 2016).

The tower (or "stone enclosure") is built of large stone blocks, identical to those of Al-Dariz South 1, but arranged in a rectangle, with wall lengths of approximately 20 m and 22 m (Figure 1.62 and Figure 1.63). Inside, several short sections of rectilinear walls are visible, some forming open rooms, as well as a circle of stones that may be a hearth (Hopper and Kondo 2016) or a well (Gentell and Frifelt 1989: 123–124). It is currently unclear whether these interior walls are contemporary with the external tower wall and features.

Outside the structure but also situated on the mound are a considerable number of stone and eroding mudbrick walls, as well as ovoid features (roughly 5 m in diameter) and a 5 m wide pit. Just beyond the enclosure, encircling it on three sides at a distance of 12–17 m, are the traces of a (circular) double-faced stone wall with rubble fill.

Figure 1.62. The rectangular tower at Al-Dariz South 2 showing the rectilinear architecture along the interior of its ringwall as well as outside on the low mound of the site. The new wall partially cuts the easternmost edge of the site.

Figure 1.63. Al-Dariz South 2.

It is possible (if not likely) that Al-Dariz South 2 was constructed of materials robbed from Al-Dariz South 1 sometime during the Islamic period. However, there is an argument to be made for the construction of Al-Dariz South 2 in the Umm an-Nar period. The feature is easily within the normal range of tower sizes and shapes, and Umm an-Nar pottery was also found on the feature during survey. Regardless, Islamic period pottery was found in abundance on the low mound, along with some 1st millennium BCE pottery and glass and metal. The exterior tower wall, though constructed of stone blocks that very likely date to the Umm an-Nar, is poorly built: large gaps between stones are unusual in 3rd millennium tower construction.

An isolated petroglyph was found on a stone in the southeast section of the tower wall. Although currently undated, similar petroglyphs have been discovered at other towers (e.g., at Al-Safri 1 and 3, Sleme and Al-Khashbah IV). There is an excellent argument to be made that these petroglyphs post-date the Umm an-Nar period (Kondo 2016), but for the moment little else can be said regarding the age of the tower petroglyphs in general or this petroglyph in particular.

Al-Araqi
Site: Al-Araqi North
Other Names: Site 62
General Location: Al-Araqi, Oman
UTM: 455569 E, 2572573 N
Tower Shape: circular
Diameter: 17–18 m
References: de Cardi *et al.* 1976: 174–175; Doe 1983: 82–83: fig. 33, pl. 15a

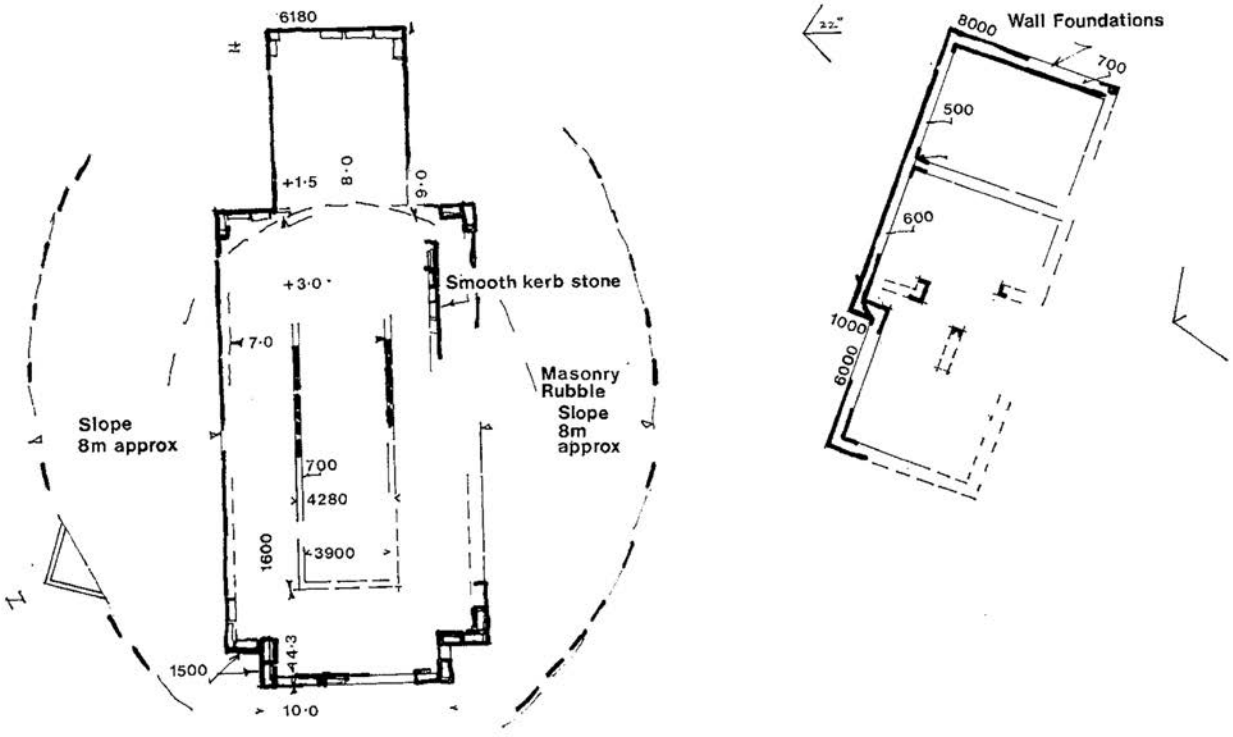


Figure 1.64. Sketch plan of Araqi North (de Cardi *et al*. 1976: fig. 41).

Al-Araqi lies on the north side of Wadi Tayyeb, off Wadi Al-Kabir in the modern town of Al-Araqi to the south of the main highway. It sits at the base of a lone ridge, where numerous Hafit tombs are visible. The site remains unexcavated and its interior obscured, but the feature itself is filled and currently stands several meters tall. The external wall is built of large, roughly hewn stone blocks (ca. 1 × 0.4 × 0.7 m), most likely quarried from the tabular limestone bedrock of the adjacent ridge, and laid in courses. The only adjacent

Figure 1.65. View of Al-Araqi tower.

Figure 1.66. Aerial view of Al-Araqi 1.

external architecture, besides the Hafit tombs and remnants of Umm an-Nar tombs noted by de Cardi *et al.* (1976: 175), is a line of stones that were likely reused from the tower and may have been a much more recent wall foundation. However, low gravel mounds interspersed with fine water-borne sediments suggest that there are other features in the space around the tower.

The tower at Al-Araqi was first published by de Cardi *et al.* (1976) and then by Doe (1983) as Site 62. Though somewhat uncertain, in the end de Cardi and Doe came to the conclusion that the feature is not a tower, but rather "an important public building which appears to follow the classical temple design" (de Cardi *et al.* 1976: 175; Doe 1983: 82–83; Figure 1.64). This classic temple design is also seen at Arja 1. However, in this case, the Bat Archaeological Project (BAP) visited the site numerous times and determined that, whether or not the structure on top was a temple, the base was most certainly a tower (Figure 1.65 and Figure 1.66). Regardless, there is little doubt that this site dates to the 3rd millennium BCE. De Cardi *et al.* 1976, Doe 1983, and Cable and Thornton 2013 all associate their ceramics either with Umm an-Nar and Indus comparanda or have directly identified them as these ware types.[6] However, the site was clearly reused, at least during the Iron Age, as is evidenced by the tomb described by de Cardi *et al.* (1976: 175) and some of the ceramic material. The slope from the centre of the tower mound down to the southeast via the "entrance" is reminiscent of both the entrances to Islamic period towers and the *shadu* slopes leading from wells. The only other material found consists of broken querns and mortars.

[6] Recent research on the Amlah materials and sites (Dollarhide 2019) has verified that the Amlah 3 materials are Umm an-Nar; therefore the Al-Araqi materials that are "similar to the 'Amlah 3 ceramics" (de Cardi *et al.* 1976: 175) are also Umm an-Nar.

Figure 1.67. 3D-model of Al-Qarri castle with three parallel walls on its southern side.

Al-Zebah
Site: Al-Qarri castle
Other Names: none
General Location: Al-Zebah, Oman
UTM: 471024 E, 2581004 N
Tower Shape: unknown
Diameter: unknown
References: Döpper 2018b

Gerd Weisgerber suggested the presence of an Umm an-Nar period tower upon a small hill to the northwest of the Umm an-Nar period domestic site of Al-Zebah. The hill is referred to by the local inhabitants of the area as Al-Qarri castle. The whole has been severely affected by test detonations by mining companies working in the mountains around the ancient site that were conducted in the late 1990s or early 2000s. Al-Qarri castle and the Umm an-Nar period settlement of Al-Zebah are located on a plain surrounded by small mountain ridges, where Wadi Shwoi'ai fans out. In the mountains, evidence for ancient quarries have been found. Other Early Bronze Age remains are mainly Hafit period tombs perched on the ridges of the surrounding mountains and one very well-preserved tomb located 300 m to the north of the settlement on the edge of a small tributary of the main wadi flowing around the site. The closest Umm an-Nar period tombs lie approximately 4 km to the north of Al-Qarri castle.

Figure 1.68. Possible terracing walls of Al-Qarri castle.

At the potential tower itself, Weisgerber identified the remains of three walls still visible on the south side of the hill (Figure 1.67 and Figure 1.68), and one pottery sherd dating to the Umm an-Nar period. This sherd is the only ceramic evidence that was encountered upon the whole hill. The three walls were interpreted as terracing walls, and were constructed of unworked stones, without mortar, from the hill itself. They run parallel to each other with an interval distance of approximately 1.5 m. It seems that the walls were only present in the south, and not on the other sides of the hill, which might be due to the fact that the hill is less steep on its southern flank. Based on these scarce remains, it is not certain whether Al-Qarri castle actually represents an Early Bronze Age tower or not. If it does, it is comparable to Building II at Al-Khashbah and Jebel Juhelat at Bisya. Here, the ringwalls of the tower run around a hill, having the top standing out.

Al-Wahrah
Site: Al-Wahrah fort
Other Names: Al-Wahrah Qala
General Location: Al-Wahrah, Oman
UTM: 469572 E, 2574480 N
Tower Shape: circular
Diameter: 14 m
References: Cable 2016b: 169, 176 fig. 8.10–8.11; Mortimer and Thornton 2018: tab. 2

Figure 1.69. Northern "corner" of Al-Wahrah tower showing the large, evenly sized Bronze Age foundation stones beneath the more irregular reconstruction/reuse.

Al-Wahrah tower is located on the southern edge of the village of Al-Wahrah, overlooking Wadi Al-Hijr. The modern mudbrick structure is currently in use and it was never possible for the authors to visit the interior, so all assessments are based on exterior evaluations and extrapolations. The stone foundation has all of the characteristics of 3rd millennium tower construction: stone size, even coursing, and off-set stretcher stones all combine to form a well-built stone base such as those of Al-Rojoom tower, Al-Khutm tower, Matariya, and all of the others. However, as with Al-Wardi castle, the stone foundation has been altered in places (Figure 1.69). This has disrupted both the general shape of the tower—from circular to sub-circular—and altered the construction style. According to Mortimer and Thornton (2018: tab. 2), Al-Wahrah tower has a well but no other known water-related features.

Figure 1.70. Al-Khutm tower from above at the close of excavations in 2018 (image: Ministry of Heritage and Tourism Oman, used with kind permission).

Al-Khutm
Site: Al-Khutm
Other Names: Site 57, Al-Nabaghiya
General Location: Bat, Oman
UTM: 470803 E, 2574528 N
Tower Shape: circular/oval
Diameter: 18–21m
References: de Cardi *et al.* 1976: 172, pl. 24; Doe 1983: 63–64, fig. 18, pl. 14d; Frifelt 1975: 61, 73; Cocca *et al.* 2019; Bernardini *et al.* 2020

Three kilometers northwest of Bat is another circular stone tower. It sits on a low limestone bedrock outcrop located on the northern side of the wadi plain, and the tower incorporates the upright bedded limestone of its low hilltop into its construction. Hafit tombs are visible to the north and east, and a (primarily) Umm an-Nar settlement is located 300 m to the southeast along the same ridgeline as the tower (Cable and Al-Jabri 2018; Cable and Thornton 2014). The tower at Al-Khutm sits fewer than 10 m from the primary road leading to Bat from Al-Dariz and thus has been documented by survey as Site 57 (de Cardi *et al.* 1976: 172; Doe 1983: 63–64; Frifelt 1975: 61, 73; Gentelle and Frifelt 1989: 123) and Al-Nabaghiya (Orchard and Orchard 2008: pl. 7a).

Joint 2009 excavations by the Ministry of Heritage and Culture (now Ministry of Heritage and Tourism) and the Bat Archaeological Project (BAP) were followed by intensive excavations by the Al-Khutm Project from 2015 to 2018 (Cocca *et al*. 2019). Excavations focused on exposing the plan of the tower interior and—it turns out—the densely used spaces to the immediate north and west (Figure 1.70). Dating from the end of the Umm an-Nar through the Iron Age, the Al-Khutm complex was up to 4 m tall and consisted of a circular tower and an extensive walled area to the southwest. As with Al-Rojoom tower the internal structure of Al-Khutm consisted of a series of parallel stone-walled compartments oriented around a central podium or corridor (running parallel to the ridgeline of the bedrock) and a stone-lined well. Outside the tower, a stone wall partially encircles the tower on its north side; the wall was likely truncated as the main road (situated adjacent) expanded over time.

On top of the tower researchers found evidence that some of the compartments were used as rooms (evidenced by the presence of stone thresholds marking entrances to three compartments), some of which were accessed via the central compartment and the eastern tower edge and others of which were accessed via the tower exterior. From this, we can say several things. First, in order to use the tower compartments as rooms accessible from such a variety of directions, the tower superstructure must have been entirely of mudbrick. This would be unusual: evidence points to other towers having a stone ringwall that was much higher than the level of the platform, and no other towers show evidence of use of the compartments. It is therefore most likely that the use of the tower compartments as living and storage spaces dates to the 2nd millennium BCE use of Al-Khutm.

Outside on the western side of the tower is a walled space measuring ca. 20 × 40 m. Doorways on the western and northern sides provided access to the courtyard and its series of interior spaces. Most, if not all, of these exterior features appear to be of later dates; for example, the wall that encircles the entire space was constructed partially on top of fill that included numerous Iron Age sherds.

Bat

The archaeological site of Bat is one of the best-known prehistoric sites in all of Oman. It sits near the confluence of Wadi Al-Hijr and Wadi Sharsah and is listed as a UNESCO World Heritage Site "of the most complete and well preserved ensembles of settlements and necropolises from the 3rd millennium BCE worldwide" (UNSECO World Heritage List). The majority of the ridgetops surrounding the wadi valley are covered with tombs, with a particularly large and dense 3rd millennium BCE cemetery located on the braided gravel terraces on the northeastern edge of the site. Remains of Bronze Age houses have been identified along the southwestern slopes forming the edges of the valley at Bat, and no fewer than nine towers now appear to dot the landscape (Figure 1.71).

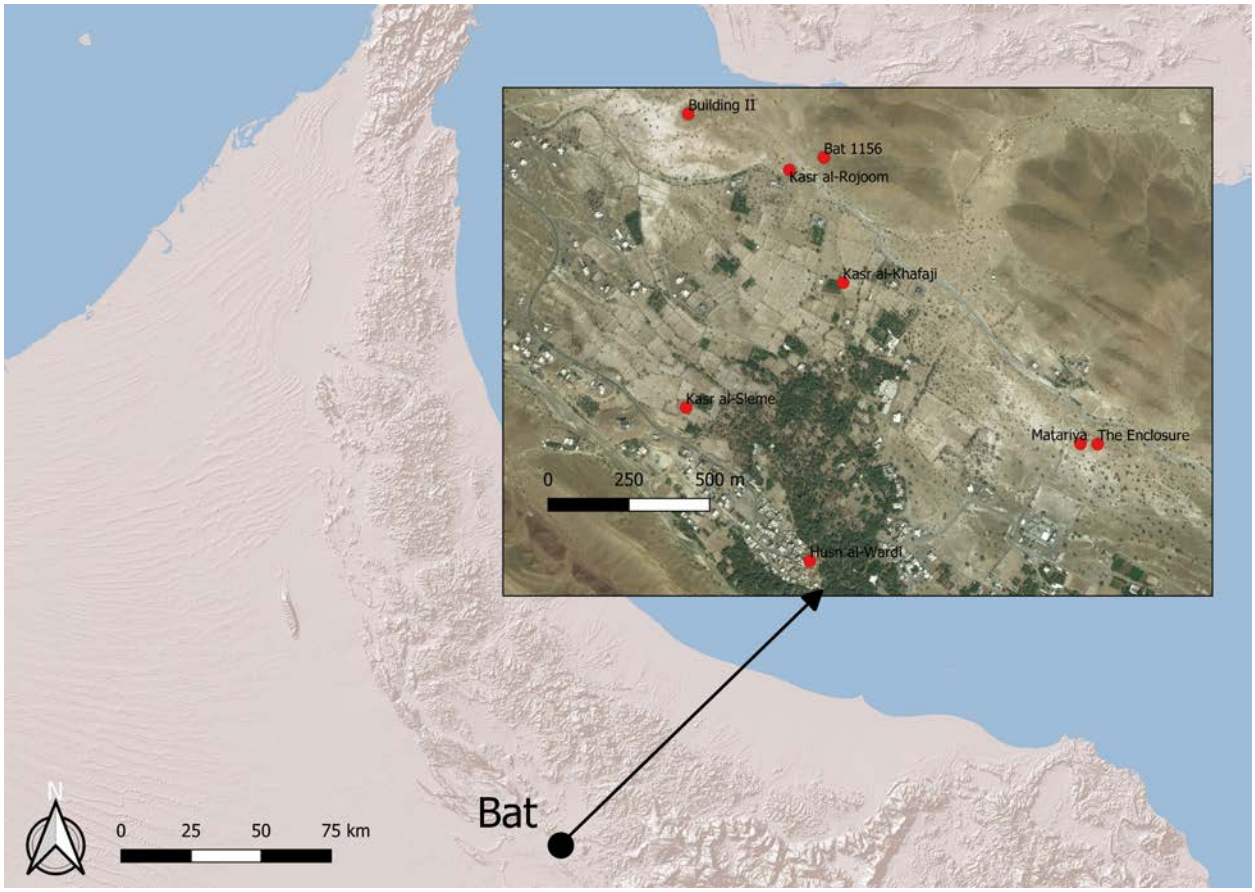


Figure 1.71. Overview map of towers at Bat

As the area was in use from the Late Neolithic (Desruelles *et al.* 2016) all the way through to the modern period; many of the earlier remains were reused, adapted, and/or disassembled during later periods (e.g., Döpper 2021a). In keeping with this long use, the archaeological site of Bat has a long history of research beginning in the 1970s (de Cardi 1975; Frifelt 1976) and continuing up into the present day (e.g., Döpper 2021a; Swerida *et al.* 2020). The result is that the identification of tower structures is ongoing. Many of the towers were originally surveyed by a team of Danish archaeologists, and the structure numbers assigned to them are used interchangeably with the local names, where relevant. In some cases, local names are specific to the tower itself, while in other cases the name of the tower derives from the name of the local area or neighbourhood where the tower sits—for example, Al-Rojoom tower (Tower 1145) is a term reserved for the tower only, but "Matariya" (Tower 1147) is the name of the area where the tower is located. Still other towers have received names after their discovery (e.g., Al-Ahliya tower, the "High Tower").

Al-Rojoom tower
Site: Al-Rojoom tower
Other Names: Tower 1145; Qars Al-Rojoom; Site 60
General Location: Bat, Oman
UTM: 474057 E, 2572925 N
Tower Shape: niched circular
Diameter: 20–22 m
References: Frifelt 1976; Frifelt 1985; de Cardi *et al.* 1976: 173

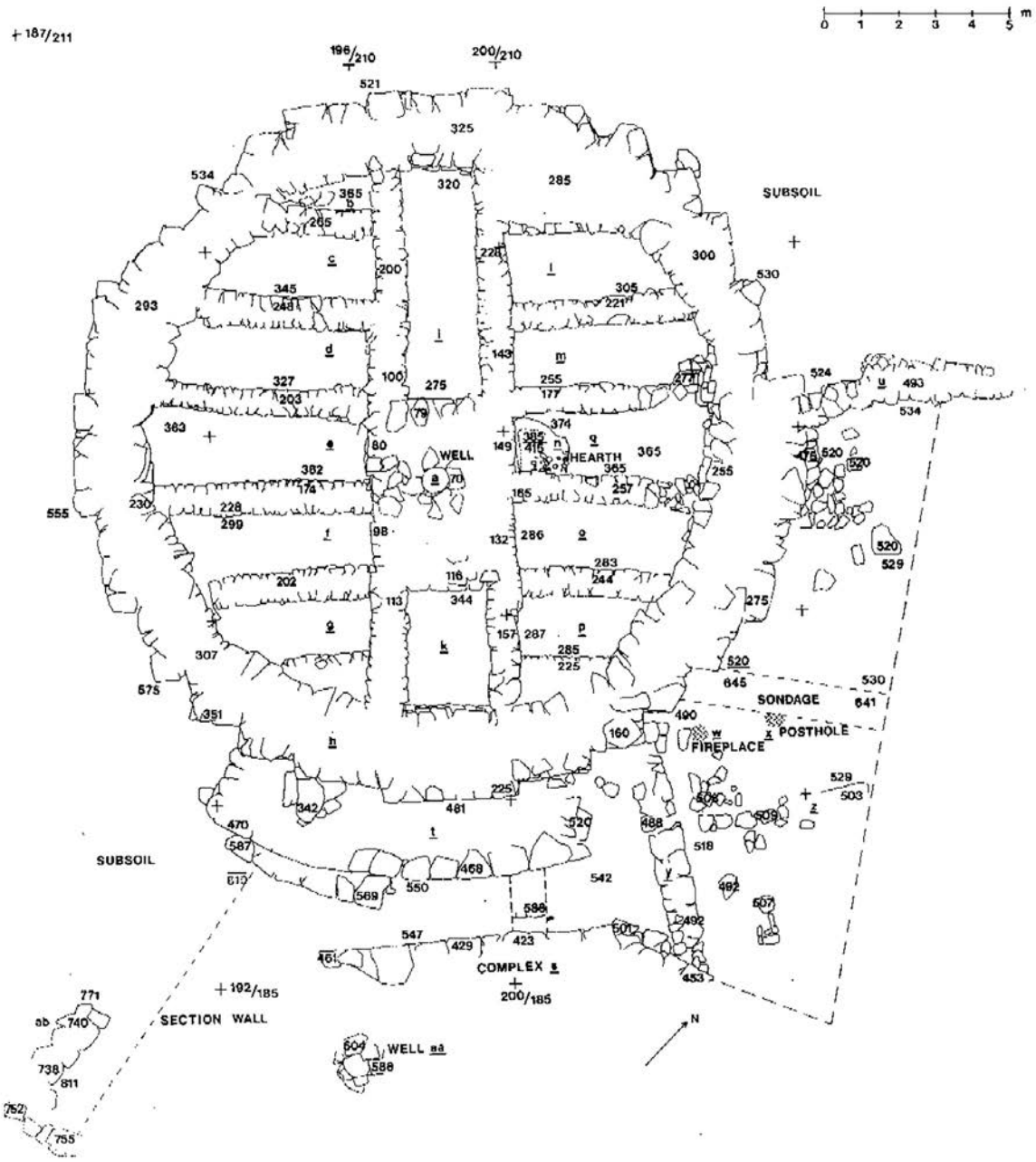


Figure 1.72. Plan of Al-Rojoom tower after excavation (Frifelt 1976: 64 fig. 3).

Al-Rojoom tower sits on the northern edge of an alluvial plain in Wadi Al-Hijr, just north of the modern village oasis of Bat. Nearby, to the northeast, are the remains of the so-called "Settlement Slope", a dense collection of contemporary buildings and houses running along the lower hill slopes (Frifelt 1976: 60–61), while two additional towers, Al-Khafaji tower and 1156, are located a mere 380 m to the south and 150 m to the east, respectively.

Research on Al-Rojoom tower, known also by the structure number 1145 given to it by its excavators (Frifelt 1985), was first published in 1976 (de Cardi *et al.* 1976). Excavations by a Danish team began in the mid-1970s and included study of both the interior of the structure (which, at the time, stood 2.5 m above the surrounding alluvium) and the area around it (Figure 1.72). Since then, the tower has received additional documentation by aerial photography and photogrammetry as well as conservation efforts. Because of the

early attention given to Al-Rojoom tower, it is perhaps the most iconic of the 3rd millennium BCE towers. However, unlike the majority of towers the main encircling wall of Al-Rojoom is not a single smooth circle, but rather is "niched" or stepped, with 18 sets of wall faces at right angles to each other (Figure 1.73 and Figure 1.74). This exterior ringwall is faced on the interior and exterior and filled with stone. Based on the amount of rockfall around it, Frifelt proposed that it had once stood between 5 and 6 m tall (Frifelt 1976; Frifelt 1985).

The interior structure of Al-Rojoom consists of a series of rectilinear stone walls organized symmetrically around a central axis oriented roughly north–south. The stone walls were not bonded to the external encircling wall, but they were also not bonded to the central rectilinear walling (which formed the axis), either. None of the 2.5 m tall interior stone walls contained doors, windows, or any other evidence of human occupation. Instead, the spaces between the walls were filled with packed mud, forming a solid base 21–22 m in diameter and sitting nearly 3 m above the modern ground surface. At the centre of the structure is a circular stone-lined well roughly 65 cm in diameter. A charcoal sample (K-2797), taken from a hearth built during the original construction of the internal walls of the tower, provided a date range of 2700–2220 cal. BCE and thus allows us to suggest a date for the construction of this tower to the middle of the Umm an-Nar period (Frifelt 1985; Frifelt 2002; Swerida *et al*. 2021).

Excavations of the tower's immediate surroundings indicate neither an entrance nor a gate system, but a well-preserved set of features on the southeast side of 1145 may have provided some sort of access. On the southern face of the tower is a gently curving wall ca. 10 m long. It sits ca. 2.5 m from the exterior face of the tower ringwall and is itself faced only on the exterior. At its southwestern end, where it is tallest, it turns sharply to abut the exterior face of the tower ringwall. About 1.7 m beyond this feature (which Frifelt labelled "complex t") is another wall, this time rectilinear, faced only on the side towards the tower, and

Figure 1.73. Al-Rojoom tower looking north, showing the internal stone walls and central well surrounded by a niched ringwall. In the image foreground the exterior walls (including the possible ramp and platform) are visible.

Figure 1.74. Top view of Al-Rojoom tower.

preserved for ca. 6 m. This wall appears to be free-standing, but another (possible revetment) stone wall that runs perpendicular to its northeast end may be related. It seems likely that the rubble "behind" this feature should be considered part of it (Frifelt, who called the entirety "complex s", appears to have thought so). At least two other revetment walls—one on its northeast side, the other on its southwest—radiate out from around the tower, presumably created to stabilize the foundation, which was built on alluvium. In addition, several ditches or trenches had been dug into the deposits on the east side of the tower, roughly 3 and 10 m from the tower ringwall; the outer of these two ditches appears to curve around the tower to the southwest. Two radiocarbon samples (K-3207 and K-3208) from fireplaces in those ditches or trenches surrounding the tower provide date ranges of 2625–1970 and 2600–2130 cal. BCE (2-sigma, 95% probability; Frifelt 1985; Frifelt 2002). Frifelt also found another well, most likely of later date, located about 6 m to the southeast of the tower, just beyond the inward-facing wall.

It is unclear when Tower 1145 fell out of use. Several indicators suggest that this tower was in use and/or occupied from the Middle Umm an-Nar period through at least the end of the Wadi Suq period; several radiocarbon dates obtained and run by Karen Frifelt date to the Wadi Suq period (2000–1300 BCE). While it is unclear whether the well was still accessible, Wadi Suq tombs may have been situated on top of the tower, while fireplaces at its base indicate a Wadi Suq presence.

Al-Khafaji tower
Site: Al-Khafaji tower
Other Names: Tower 1146; Qasr Al-Khafaji
General Location: Bat, Oman
UTM: 474219 E, 2572581 N
Tower Shape: circular
Diameter: 20 m
References: de Cardi 1975; Frifelt 1975: 61, 73; Frifelt 1986; Swerida 2017; Swerida and Thornton 2019; Thornton *et al.* 2013; Thornton 2016a, 2016b

In 1986 Karen Frifelt conducted initial excavations at Tower 1146, known today as Al-Khafaji tower (Frifelt 1989a; Frifelt 2002; Thornton *et al.* 2013). Her initial work uncovered its stone-lined square well and some of the internal stone walls, as well as identifying an Islamic-period reuse of the tower. This was followed by excavations (2008–2015) by the Bat Archaeological Project (BAP). BAP focused on identifying the earliest phases of the tower's construction and uncovering the external structural elements' spaces immediately adjacent to the tower.

This tower is partially buried in the alluvium of the wadi plain just 250 m southwest of the Settlement Slope and about 380 m south-southeast of Al-Rojoom tower. The most recent work on the northeastern and southeastern sides of the tower suggests that it was once on a promontory that has now been infilled by considerable modern water-borne deposits. The promontory itself is at least partially anthropogenic—mudbrick found underneath the tower (in the deep sounding called "Trench A") dates to the Hafit period (Thornton 2016a: 39–46)—but its extent is unclear.

Al-Khafaji tower is approximately 20–22 m in diameter and consists of a series of limestone walls with packed mud fill (Frifelt 2002; Thornton 2016a; Figures 1.75 and 1.76). An internal square well, constructed of large rectangular blocks, is located slightly off-centre along the central axis of the tower (Thornton *et al.* 2013: 255–256). It is possible (though unproven) that this well, along with the exterior tower wall, make up the first phase of construction (and, most likely, use) of the tower, with the interior stone walls and the packed mud fill added slightly later (Thornton *et al.* 2013: 255–256). The tower ringwall itself is massive, measuring roughly 4 m thick and filled with rubble. The stones that make up the interior face of the ringwall are significantly smaller than the stones that make up the exterior. The rectilinear stone walls that form the internal skeleton of the tower are also double-faced and filled with rubble (where necessary), forming cross-walls that less than a meter thick that abut the main "corridor" walls that run northwest–southeast through the centre of the tower.

Outside the tower, 4 m southeast of the tower wall, is a square platform (ca. 5.6 m on each side), built of mudbrick and outwardly faced with several courses of stones (Figure 1.76). The platform angles slightly (ca. 10°) towards the tower, and a sloping stone ramp at its eastern corner could have provided access to the top of the platform. The platform was expanded to the south and west in a later phase, forming a structure that was slightly less than 8 × 8 m and less than 2 m from the tower's ringwall.

Immediately to the east of Al-Khafaji tower, fuller excavations of what Frifelt had proposed was as a "water channel" (1989: fig. 10.5 and fig. 10.9) allowed instead for the identification of domestic spaces: a series of Umm an-Nar spaces demarcated by stone walls (Swerida and Thornton 2019). Structures measured less than 7 × 5.5 m and were arranged at angles around the tower wall. Remnants of mudbricks were identified atop the stone foundations. Both the enclosed buildings and the more open courtyard spaces showed distinctive evidence of domestic use dating to the Umm an-Nar period (Swerida and Thornton 2019).

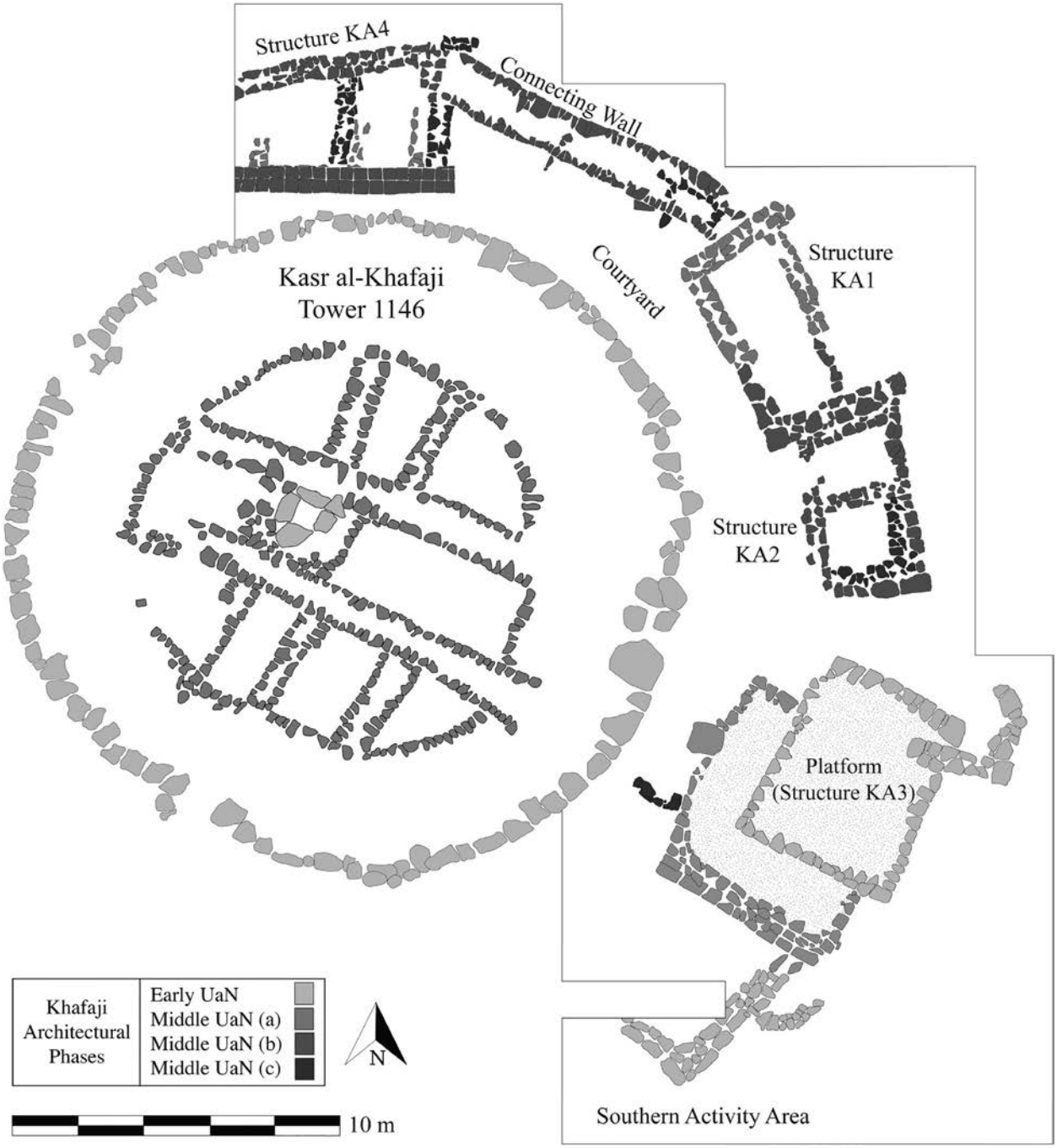


Figure 1.75. Al-Khafaji tower plan with excavated area around the tower.

Radiocarbon samples came from sealed deposits beneath, or adjacent to, Al-Khafaji tower and are published in Thornton 2016a and 2016b. One sample from the deposit beneath the tower wall provides a *terminus post quem* of 2750–2480 cal. BCE (2-sigma, 95% probability), while two dates from the adjacent domestic deposits provide a range of 2450–2250 cal. BCE (2-sigma, 95% probability; Thornton 2016b). The tower was abandoned sometime before the end of the Umm an-Nar period; a ^{14}C date from hard-packed light grey silty-loam directly underneath an interior wall (Beta 260660) provides a *terminus ante quem* of 2250 BCE (2454–2142 cal. BCE (2-sigma, 95% probability)).

Figure 1.76. Al-Khafaji tower from above, 2019. Note the square well just off-centre inside the tower, and the thick stone ringwall that forms its exterior.

Although the tower itself seems to have gone out of use during the Late Umm an-Nar period, it was reused several times: first, sometime between the mid-2nd millennium to the early Islamic period (what Frifelt called the "pre-Islamic period"; Frifelt 1989a: 112); next, during the Middle-Late Islamic period, when a clay-lined oven was built atop the structure; and finally, there was a possible Late Islamic use of the tower's well, as evidenced by the construction of a "ramp" off the southeast side of the structure (Thornton 2016a: 33–34).

Matariya
Site: Matariya
Other Names: Tower 1147
General Location: Bat, Oman
UTM: 474952 E, 2572081 N
Tower Shape: circular
Diameter: 20 m
References: Frifelt 1975: 61, 72; 2002; Cable 2016a

Matariya was first surveyed by de Cardi and colleagues (de Cardi *et al.* 1976: 72 and pl. 15) and, years later, significant test excavations were carried out both inside and outside the tower by Frifelt (2002). She identified the tower by its number—1147—and compared it to several of the other towers at Bat (which she had already excavated). Her work inspired the Bat Archaeological Project's interest in Matariya, with their intensive excavations (2008–2011) published in the 2016 monograph (Cable 2016a). This included extensive excavations within and immediately around Matariya (Figure 1.77).

Like Al-Khafaji tower and Rojoom, Matariya sits on the northern side of the wadi amid deserted fields. Unlike those towers, however, Matariya (or, in Frifelt's nomenclature, 1147) appeared initially only to be a small hill and therefore takes its name from its location and lacks the "tower" prefix "qasr". Matariya is roughly 1 km southeast of Al-Khafaji tower and 200 m northeast of the town's primary school (built in the 1990s), on the eastern edge of the modern village. Only 400 m due north, on a hilltop overlooking the valley, is the remnants of Al-Ahliya tower; the two features are the easternmost towers of Bat, but other features—possible building foundations and tombs among them—extend slightly beyond to the east. Less than 20 m to the southeast is feature 1167a, identified by Karen Frifelt (1989b: 10) as "the enclosure" and discussed separately below as a probable tower. In the fallow land beyond are the remains of several Umm an-Nar tombs, abandoned wells of unknown date, and the remains of an abandoned falaj running west–east. Two large acacia trees grow on either side of the tower, one adjacent on the west and the other on the east. Around the eastern tree, tower wall stones had been rearranged to create a small enclosure. The tower itself sits atop a gently terraced mound that rises about 3 m above the surrounding plain, and is located on the northern side of the wadi, in what is now an open, long-abandoned field system. The area is currently under further study by the Bat Archaeological Project (Cable *et al.* 2019).

The tower underwent several construction phases and is built from a combination of mudbrick and stone. A series of rectilinear mudbrick walls, 3 m tall and situated at roughly 2 m intervals, were laid down on a prepared mud surface and created a niched circular structure roughly 30 m in plan. The spaces between the mudbrick walls were filled in with hard-packed rubbish: a combination of cobblestones, broken querns, and broken or unfinished mudbricks. At some point quite early on, a space was carved out along the outer walls of the mudbrick tower and a circular stone wall was embedded into and around it, with the lower remnants of the original mudbrick structure extending out beneath it in all directions, like a platform. Sometime later (but still in the Umm an-Nar period) a second stone wall, built of larger hewn blocks, was constructed around the first stone wall, forming a stone circular perimeter wall around the remaining mudbrick centre. The head of a stone-lined well, situated slightly off-centre, was also found inside the tower. As the exterior of the stone well was unfaced and deliberately irregular, it appears to have been embedded into mud and mudbrick to the same level as the outer stone walls. Another stone-and-mudbrick feature, located roughly 1 m to the south of the well, appears to have been associated with and contemporary to the well and likely provided some leverage for bringing the water to the top of the tower in a manner similar to a *shaduf*.

A number of features were located adjacent to the tower. Remnants of a ditch were visible primarily on the western side of the tower and appear to pre-date the tower structure. A well-constructed stone wall, located between 3.4 and 8 m from the tower ringwall, was identified on the western, northern, eastern, and southeastern sides of the tower. The wall, which was only one course wide and faced only on the outside, seems to be contemporary with the stone tower walls. In places it was dug into or cut the earlier ditch. It appears to have acted to retain the fill that was packed between the mudbrick tower and the wall. Five meters beyond the retaining wall were the remnants of a second wall. Its construction is considerably poorer in

Figure 1.77. A view of Matariya looking to the north at the end of the 2010 excavations. Note the mudbrick structures (foreground and inside the tower), the stone well podium in the centre, and the retaining wall in the lower right-hand corner of the image.

quality and it is roughly faced on both sides. Since this second wall follows the retaining wall at a consistent distance, it very likely post-dates the retaining wall, but no features were found to clarify this further. A few cross-walls in poor condition, running between the retaining wall and the outer wall, were identified on the northwestern side, where the exterior wall was most evident.

Access to the tower may have been attained on its northeastern side, where the retaining wall doglegs out further from the tower and several stone walls, constructed in the same manner as the tower's outer wall, are located. A stone "pedestal" is the only contemporary feature that abuts the tower wall itself. It consists of a stack of stone blocks, faced, with a paving stone wedged beneath it and extending out in front. Together, this collection of features may have had a similar function as the platforms situated to the southeast of both Al-Rojoom tower and Al-Khafaji tower.

A collection of radiocarbon dates and artifacts were used to identify the dates of the construction and use of Matariya. The mudbrick levelling surface dates to the early 3rd millennium BCE (ca. 2900 BCE), with the first phase of mudbrick construction occurring very soon thereafter (Thornton 2016b). Pottery from three sealed deposits—two inside the stone tower and one outside—resemble Mesopotamian Early Dynastic I–II-style ceramics, which supports the idea that the mudbrick structure dates to the early 3rd millennium BCE.

Although the length of each phase is unknown, these first four phases were begun in the Hafit and completed by the Early Umm an-Nar period. After its early construction in the Hafit period and initial use during the Umm an-Nar—evidenced by the ceramics preserved in its rubble—Matariya appears to have been reused again in the Iron Age. As with its Umm an-Nar use, Iron Age use is documented primarily through ceramics found in poorly preserved mudbrick abutting the tower's stone wall as well as the fill of some pits dug into the tower's mudbrick top. These deposits were then sealed under a "destruction layer" consisting of large limestone blocks (likely originating from the outer stone wall of the tower) embedded heavily into the 1st millennium BCE mudbrick deposits around it.

Sassanian reuse was less easily documented, and is evident in a collection of beads and baubles—most likely taken from tombs—and a double-handled jar, all of which were found in the ruins of an eroded mudbrick structure on top of the tower to the south (Cable 2016a). Elsewhere atop the tower, an area of poorly preserved mudbrick walls near the well identify reuse that, according to a radiocarbon sample from the associated midden, dates to the Middle Islamic period (Beta 260666, 1450–1640 cal. CE (100%)).

Al-Sleme tower
Site: Al-Sleme tower
Other Names: Tower 1148; Qasr Al-Sleme; Site 59
General Location: Bat, Oman
UTM: 473736 E, 2572188 N
Tower Shape: circular
Diameter: 21 m
References: Frifelt 1975: 58, 61, 71–72; de Cardi *et al.* 1976: 173; Kondo 2016

Al-Sleme tower, also called Tower 1148, was surveyed by Frifelt (1976; 1985) and the Bat Archaeological Project (Possehl and Thornton 2007) and was documented photogrammetrically by the Bat Archaeological Project from 2010 to 2012 (Kondo 2016). As it has remained unexcavated little can be said about when in the Umm an-Nar period that the tower was constructed, but studies of its location and exterior point to its significance.

Al-Sleme tower is located near the centre of Bat's alluvial plain and is situated on the western periphery of the modern oasis. It is surrounded by fields, most of which are currently in use. Within the general wadi plain Al-Sleme tower is situated atop a hill of naked limestone conglomerate (Figure 1.78). The tower is built of massive limestone blocks—on average, 78 × 55 × 35 cm—laid down directly onto the bedrock, forming a circular stone ringwall 21 m in diameter. Stones on the north side of the tower are considerably larger, on average, than the stones used on the southern side (84 × 55.8 × 36.7 cm, as compared to 72 × 53.8 × 32 cm); it is unclear why this is so, but it may account for the higher degree of preservation found on the northern side of Sleme. Much of the stones that have collapsed from the structure remain strewn about the slopes of the hill—their size makes them more difficult to transport for reuse—but the northeastern façade of the structure is still nearly 3 m tall, today; the remaining blocks strewn about on that side suggest that it was once even taller. Three meters north of the tower ringwall is a rectilinear stone feature, roughly 5 m long and wide and at least two courses tall. It is built of the same massive stones as the tower ringwall. This feature is comparable (in size and location) to the platform found adjacent to Al-Rojoom tower and likely served a similar purpose. The two other wall features visible on the conglomerate hill with Sleme are clearly of a later date. The first of these, which runs along the walking path a few meters to the southwest of the tower, is constructed from stones taken from the tower and laid somewhat haphazardly in alignment for a distance of about 5 m before turning an uneven corner and ending. The second wall, even younger than the other, sits at the bottom of the conglomerate hill roughly 15 m from the tower. The 20 m long wall, which acts today as a retaining wall for the deposits associated with the northwestern side of Al-Sleme hill, also forms the boundary between the tower and the surrounding farmland. Though some of the smaller tower stones have been incorporated into that wall, they are interspersed at higher levels with cement cinder and breeze blocks along with an assortment of stones of varying sizes. It is possible that the lowest stones, now buried, were part of an original encircling wall similar to the retaining walls surrounding Matariya and other towers.

Figure 1.78. A view of Al-Sleme tower from the northeast, looking over the platform (foreground) towards the best-preserved section of ringwall.

Little is known about the internal structure of Al-Sleme tower. The size of the blocks, coupled with the relatively steep slopes and farmland closing in on all sides, would make excavation difficult and later conservation difficult (Frifelt 1976: 61). A large acacia once grew from the middle of the tower, and it is possible that it marked the location of a well that had been drilled through the conglomerate bedrock. However, that is speculation.

As with its use, much of the tower's reuse is only conjecture. Three dozen petroglyphs, found on the exposed surfaces of the stones fallen from the tower wall, include features such as domesticated horses and camels, and weaponry such as a rifle and bucklers. The domesticates could most certainly date from antiquity onward, while the weaponry may date some of the petroglyphs to the Late Islamic period or later. Whether or not the tower itself was in use at the time, it seems that the location was well-known enough to warrant considerable artistic effort. That the tower is located so close to the modern town of Bat, in and among the gardens tended by local Omanis, means that artefacts found on the surface today can tell us very little about the structure's date and use; unsurprisingly, pottery found there dates to the Bronze Age, Iron Age, and Islamic periods.

Tower 1156
Site: Tower 1156
Other Names: none
General Location: Bat, Oman
UTM: 474163 E, 2572960 N
Tower Shape: circular
Diameter: 20 m
References: Frifelt 1985: 101; Mortimer 2016; Mortimer and Thornton 2018

Figure 1.79. Tower 1156 at the end of excavations in 2013. Note the tombs obscuring the northeast quadrant of the tower wall (upper right), and the rectilinear walls visible in the lower right.

Structure 1156—which later became known as Tower 1156—is located on the western edge of the Settlement Slope, on the northern side of the wadi and built into the short, low terrace at the base of the steeply sloped settlement area (Figure 1.71). As such, numerous rectilinear structures dated primarily to the Umm an-Nar period are located around and even atop the remains of 1156. The tower is also 150 m northeast of Al-Rojoom tower, less than 500 m north of Al-Khafaji tower, and a stone's throw from the remains of several Hafit and Umm an-Nar tombs; it is thus situated near the densest part of Bat's archaeological landscape. Tower 1156 was first described and excavated by Frifelt (1976; 1985) and later by the Bat Archaeological Project (Mortimer 2016; Mortimer and Thornton 2018). The bulk of the excavations took place from 2010 to 2013.

Overall, the tower was poorly preserved and no interior walls or well have been identified (Figure 1.79). Instead, 1156 has three relatively well-preserved stone ringwalls, indicating three instances of tower construction and remodelling; outside the ringwalls are several ditches, a causeway, a stone-lined cistern, and fire pits. Evidence of small-scale metallurgical activity in one of these exterior ditches suggests that the ditch was not intended to be water-filled, at least not year-round, while the stone-lined cistern (which lies at the end of a sloping ditch) seems like it was developed to capture rain runoff.

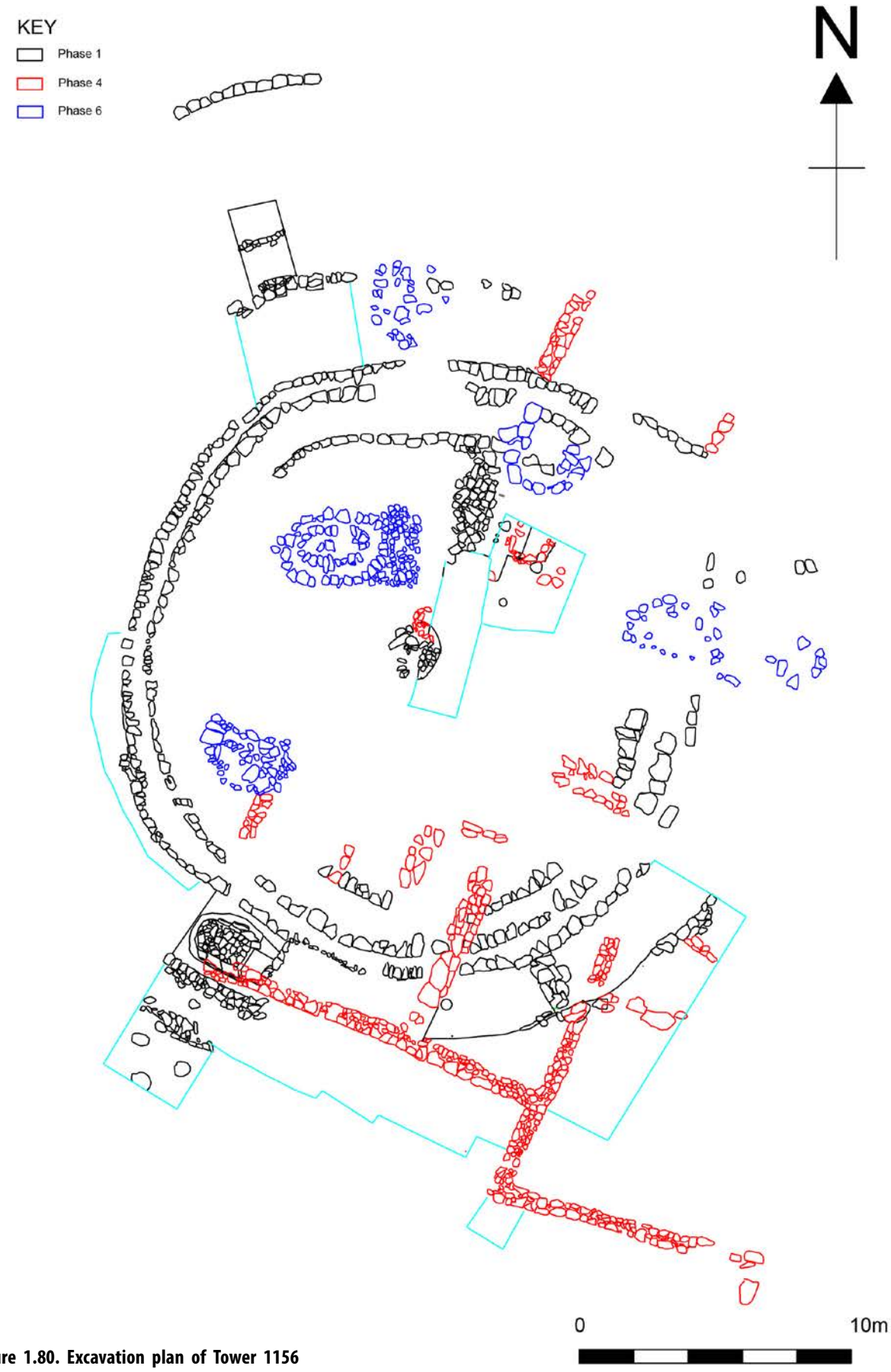


Figure 1.80. Excavation plan of Tower 1156 (after Mortimer and Thornton 2018: fig. 3).

Figure 1.81. Al-Ahliya tower from the northeast, looking towards Bat oasis. Though in ruins, the line of stones forming the tower's ringwall is visible here to the left and centre of the image.

While the numerous modifications to the tower have made understanding the feature itself more difficult, they have also provided opportunities for dates (both relative and chronometric; Figure 1.80). The structure was first built at the end of the Hafit period, during the Hafit to Early Umm an-Nar transition. The ditches were re-worked several times during the first part of the Umm an-Nar period due to water erosion, and it is possible that this is one reason the tower was soon dismantled. Within 250 years of its construction, tower 1156 and its cistern were abandoned. In the mid-3rd millennium the tower was levelled, its ditches filled in, and buildings—most likely domestic—were constructed on its remains. During the early phase of the Wadi Suq period the tower was again partially levelled and tombs constructed on it. While it is unclear whether Wadi Suq people knew of the tower beneath, it is likely: the tombs were situated atop the northern edge of the tower, with the tower ring wall clearly visible. Few artefacts were found in association with the tower itself (as opposed to the buildings above it).

Al-Ahliya
Site: Al-Ahliya
Other Names: Al-Qa'a
General Location: Bat, Oman
UTM: 474894 E, 2572449 N
Tower Shape: circular
Diameter: 22 m
References: Thornton *et al.* 2016

Four hundred meters north of Matariya, on top of a rocky prominence overlooking Bat village, are the remains of another tower (Figure 1.81). The tower is incorporated into the hilltop and is constructed of the same material. That, in addition to the ruined tombs atop the structure, renders the tower only detectable when standing adjacent to or on it. Its visible architecture was documented by the Bat Archaeological Project in 2014, rendering the exterior structure visible at least in plan (Cable and Thornton 2014). Numerous Umm an-Nar tombs are located on the same ridgeline, and several are situated within 15 m of the tower wall. The tower complex appears to include a stone wall, ca. 15 m long, that runs parallel to the main ring wall at a distance of 5–7 m. This wall, which is located on the southeast side of the structure, may have had the same function as similar structures seen at 1145, 1146, 1147, and 1148.

Figure 1.82. A view of Al-Wardi castle and mudbrick ruins in Bat to the southeast. The stone foundation of the tower in the foreground shows a marked change in plan where its original Bronze Age foundation was split open, like segments of an orange, to expand the size of the original structure.

The dating of Al-Ahliya is difficult to pin down, but a *terminus ante quem* is provided by the numerous tombs situated atop the main tower. The remains of a possible Umm an-Nar tomb were identified in 2019 (Swerida *et al.* 2020); numerous Wadi Suq and Iron Age tombs back up the likelihood of a 3rd millennium BCE date (Cable and Al-Jabri 2018; Cable *et al.* 2019). If these tentative tomb dates are correct, then the latest that Al-Ahliya could have been constructed in the early or middle of the 3rd millennium BCE, and only if the Umm an-Nar tomb dated to the end of the 3rd millennium BCE.

Al-Wardi castle
Site: Al-Wardi castle
Other Names: Bat Qala; Husn Al-Wardi; Bat fort
General Location: Bat, Oman
UTM: 474121 E, 2571715 N
Tower Shape: circular
Diameter: 26 m
References: Cable 2016b; Young 2019

The mudbrick fort at the centre of Bat—known locally as Al-Wardi castle—consists of a mudbrick superstructure built atop a stone foundation (Figure 1.82). It lies near the centre of the Bat oasis, and up through living memory was in use as a storeroom, jail and guards' quarters (Young 2019: 80). Like Tower 1148, Al-Wardi castle was built on a conglomerate outcrop and is made of large cut blocks. Over the past

Figure 1.83. Aerial image of Building II at Bat after excavation.

4500 years it has undergone extensive reuse, and although the original stone foundation is still clearly visible along its northern side there is not enough visible to determine the 3rd millennium diameter of the structure. For the same reason the tower's internal structure is also unknown. In 2015 the Bat Archaeological Project was able to conduct limited excavations within the tower, confirming the Bronze Age date intuited from the tower architecture (Young 2019: 103). The work also sparked 2015 efforts by the Ministry of Heritage and Culture (now Ministry of Heritage and Tourism) to conserve the fragile mudbrick superstructure.

Figure 1.84. Ditches surrounding Building II at Bat.

Building II
Site: Building II
Other Names: Area B
General Location: Bat, Oman
UTM: 473745 E, 2573095N
Tower Shape: oval
Diameter: 30 m
References: Döpper 2018a; Döpper 2021b

The first archaeological excavations at Building II were conducted in 2007 by an American team under the direction of Gregory L. Possehl, mainly at the neighbouring hillock Operation A, but also at Building II, the so-called Operation B. In nine 5 × 5 m trenches, part of the external ringwall in the east of the building was exposed. From 2011 to 2015, the German Expedition to Bat from the University of Tübingen under the direction of Conrad Schmidt continued excavations at the site, revealing stretches of the external ringwall in the northeast and south, parts of the interior of the building and a large ditch system surrounding the tower (Döpper 2018a).

The tower structure Building II stands to the south of the necropolis, about 350 m northwest of Tower 1445, on the plain between Wadi Al-Hijr and a tributary to Wadi Sharsah, just north of modern cultivated fields. It forms a shallow hillock. The external ringwall forms an irregular circle of 30 m in diameter (Figure 1.83). In the southeast, no wall could be found in the excavation trenches, which might be due to the state of preservation or that the wall never formed a closed circle, giving access to the interior of the building here.

Figure 1.85. Ringwall of Building II at Bat.

The ringwall is built of undressed brown stones blocks measuring between 30–80 cm in length, 35–70 cm in width, and 10–20 cm in height (Figure 1.85). The gaps in between the stone are up to 9 cm wide and filled with rubble or earth. These stones are considerably smaller than those from most other known 3rd millennium BCE towers on the Oman Peninsula. The wall is preserved to a maximum height of ca. 1.50 m and is on average 0.75 m wide. The ringwall was set into a small foundation trench ca. 80 cm deep, cut into the subsoil. No structures could be identified in the interior of the building, where trenches have been excavated down to ca. 2 m depth.

Outside and to the north of Building II a series of large, intercutting ditches was detected (Figure 1.84). The inner ditch has a maximal depth of 3.35 m and was filled with hard, brown earth showing clear horizontal layering and blocks of extremely hard whitish clay. The original width of this ditch cannot be determined as it was recut after it was completely filled through sedimentation. This recut begins ca. 80 cm to the north of the inner ditch and comes to the same depth of 3.35 m. At the bottom, it is 90 cm wide. It was again cut by the outer ditch. It is about the same depth as the inner ditch and is filled with a slightly darker brown earth than the fill of the inner ditch.

Finds from the excavations include Umm an-Nar period pottery sherds, ground stone tools, seashells and a few beads and chipped stone tools. In total 13 radiocarbon dates were obtained from Building II (Döpper 2018a: tab. 1). They are all from charcoal. One sample originates from the fill of the foundation trench and gives a date of 2887–2677 cal. BCE (2-sigma, 95% probability). The two samples from the first and second ditch date to 2616–2472 and 2872–2625 cal. BCE (2-sigma, 95% probability) and are thus broadly within the same time range as the sample from the foundation trench. This indicates a construction and use of Building II, including its ditches, at the very end of the Hafit or beginning of the Umm an-Nar period. The large majority of the radiocarbon samples were taken from later pits. They provide a wide time range of about 600 years from about 2900 to 2300 cal. BCE (2-sigma, 95% probability).

The Enclosure

Site: The Enclosure
Other Names: 1167 (Frifelt 1989b, 2002)
General Location: Bat, Oman
UTM: 475011 E, 2572075 N
Tower Shape: circular
Diameter: 20 m
References: Frifelt 1989b; 2002: 109, fig. 3; Cable and Swerida 2020

One last possible tower, called 1167 or the "Enclosure", was first studied in the 1980s (Frifelt 1989b; Frifelt 2002). Enclosure 1167 is located less than 50 m east of Matariya tower, but is easily overlooked (Figure 1.86). Although 1167 shares a number of superficial similarities to Bronze Age towers—it is also 20 m in diameter and is ringed by two phases of stone ringwall constructed in an Umm an-Nar style—several significant points of variation marked it as something different. First, unlike other towers, the stone ringwall was only one or two courses high. Second, it lacked any sort of internal structure (Figure 1.87); in its place, Frifelt (who conducted test excavations there in 1989) identified numerous firepits and fireplaces (2002: 109) instead of the solid stone structure she had come to expect from her work at Al-Rojoom tower and Al-Khafaji tower. As a replacement for calling it a tower, Frifelt called it simply "the Enclosure" and dated it to "the last phase of the [Matariya] tower" (2002: 109).

Figure 1.86. Matariya, showing the Enclosure (1167, left) and Tower 1147 (also called Matariya, right). Note the faint, parallel rectilinear lines radiating out from the centre of 1167.

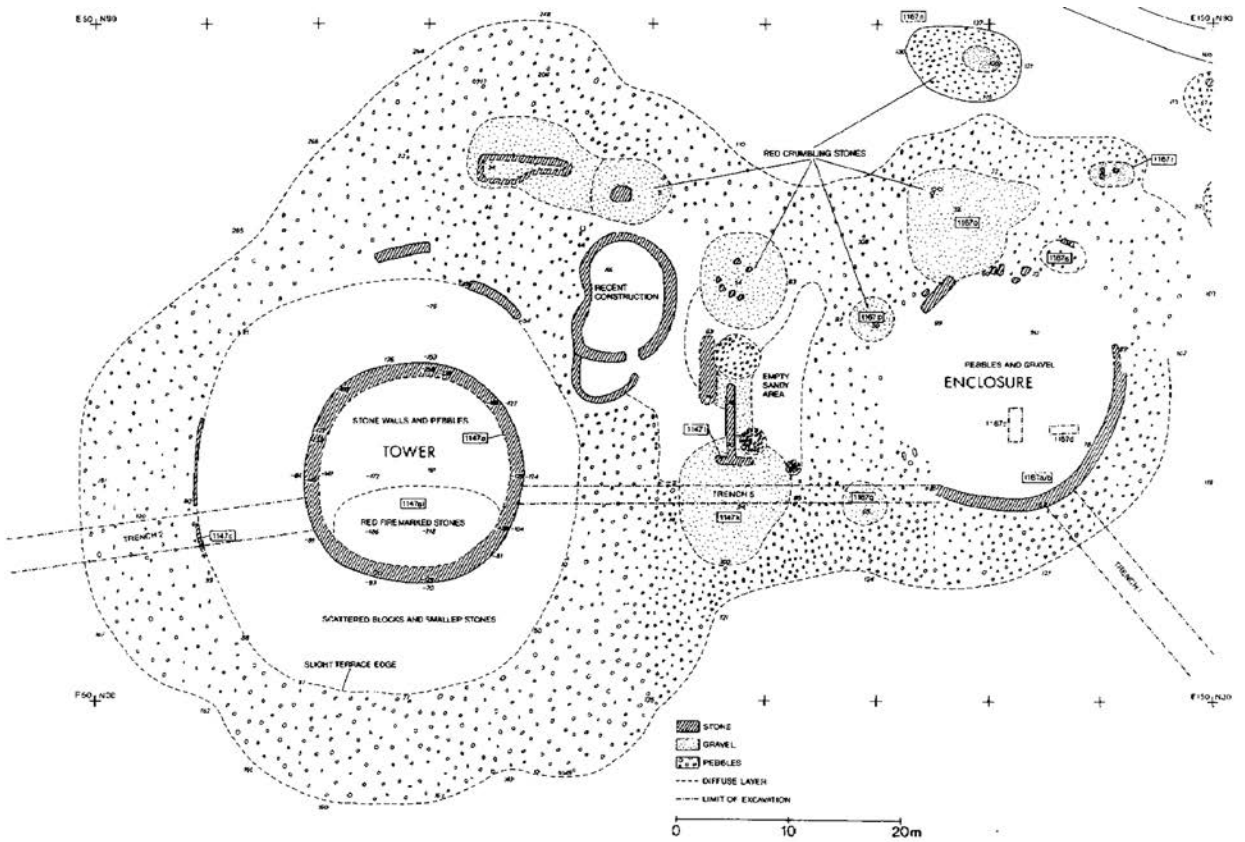


Figure 1.87. Sketch plan of Frifelt's excavations at Tower 1147 and Enclosure 1167 in 1989 (Frifelt 2002: fig. 3).

Amlah
Site: Amlah
Other Names: Site 4
General Location: Amlah, Oman
UTM: 490217 E, 2559938 N
Tower Shape: circular
Diameter: 27–30 m
References: de Cardi *et al.* 1976: 112; Doe 1983: 70, 80-81; Döpper 2018b: 89–90; Dollarhide 2019: 47–53

The site of Amlah was initially reported in the mid-1970s by de Cardi's team (de Cardi *et al.* 1976; Doe 1983). Research—consisting of survey and excavations—was undertaken in 1974 and 2015 (Dollarhide 2019). The tower of Amlah is a large, circular enclosure, measuring 30 m in a north–south direction and 27 m east–west (Figure 1.88 and Figure 1.89). The ringwall is built from large boulders up to 100 cm in length. The ground within the structure is raised approximately 3 m above ground level and was thus much higher than the ringwall. De Cardi *et al.* (1976: 112) compare it to the Tower Firq 25. Excavations were conducted in an 8 × 3 m trench at the eastern side of the tower and revealed nothing in terms of internal structures. No artefacts were discovered during the excavations and only four diagnostic pottery sherds from the surface were found (de Cardi *et al.* 1976: fig. 22.229-234b). To the southeastern side, a small, rectangular stone platform abuts the tower. Southwest of the tower, there are several rectilinear structures, most likely belonging to domestic buildings (Döpper 2018b: 90, fig. 5; Dollarhide 2019: 50).

Figure 1.88. The tower at Amlah. Visible as rubble on the left side of the tower (to the southeast) is the remains of some structure, while rectilinear walling is visible to its southwest (upper right of the image).

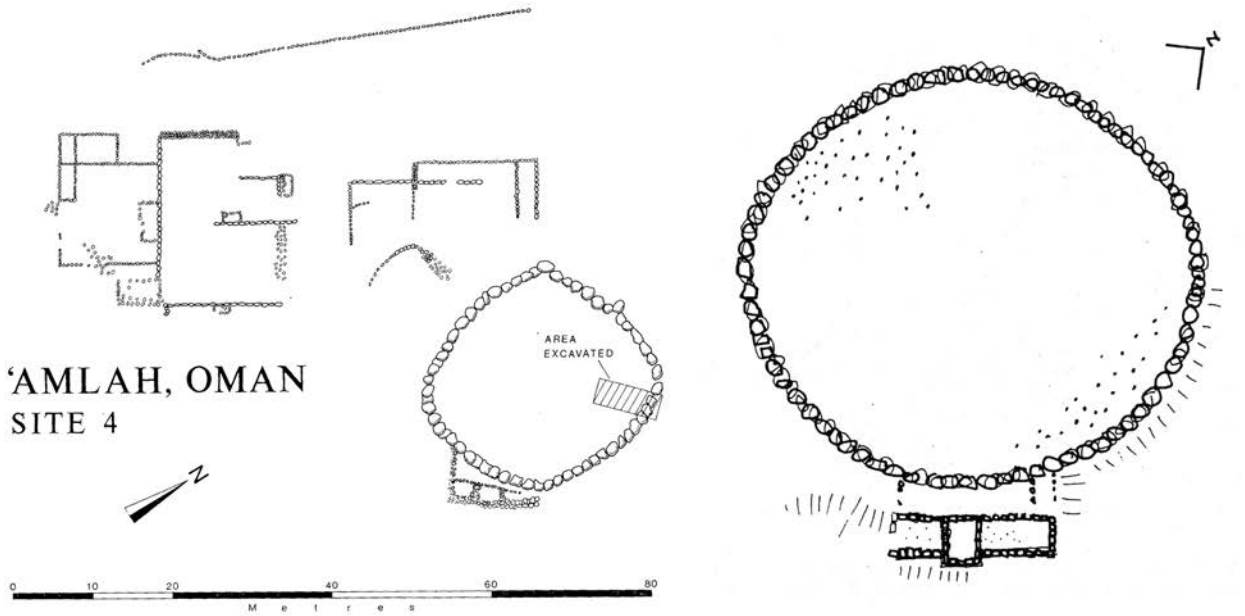


Figure 1.89. Sketch plan of Amlah (left: de Cardi *et al*. 1976: fig. 10; right: Doe 1983: fig. 24).

Al-Maidan
Site: Al-Maidan
Other Names: none
General Location: Al-Maidan, Oman
UTM: 513042 E, 2590231 N
Tower Shape: circular
Diameter: 20.7 m
References: Cable and Thornton 2013

Along the Ibri-Rustaq road leading through the mountain wadis and passes, between the modern towns of Al-Maidan and Sini, is another tower discovered by Sultan Al-Bakri. The construction of the road has impacted the archaeological remains that surround the tower, including a cemetery of what appear to be Umm an-Nar tombs. The location, high above Wadi Sidaq and overlooking the modern villages, may have been along an earlier (ancient) route through the mountains. The tower is perched somewhat precariously on a jutting outcrop of stone where bedded limestone schist and conglomerate meet. It overlooks the wadi valley to west and south, the modern Ibri-Rustaq road to the northeast, and a small but deep gorge to the immediate east. Time has not been particularly kind to the Al-Maidan tower, and much of the blocks that made up the structure have either been removed as debris or are scattered down the steep gorge slope, however sections of ringwall are visible on the southeast, east, and north sides.

The structure itself is made from hewn tabular schist blocks (Figure 1.90). The stones used in its ringwall are blocks up to 1 m long, 70 cm wide, and 1.8 m tall but only one course wide, and faced only to the exterior. At its best-preserved point on the north side, it is only five courses (or 1.6 m) tall. As is typical of Umm an-Nar constructions the blocks are placed horizontally; however, as the section continues counter-clockwise around towards its northwest quadrant the blocks become vertical. As the blocks themselves appear to be original it is unclear whether this is an early reconstruction or simply a variation. Its interior is filled with rubble and some sediment, but appears to have rectilinear walling.

Figure 1.90. The tower near Al-Maidan, overlooking Wadi Sidaq and the road to Sini village.

Beyond the tower, the presence of numerous Iron Age tombs obscures much of the earlier landscape, but little evidence exists of Bronze Age walling. Fifteen meters to the north and northwest of the tower are two rectilinear walls of unknown date, also made of schist blocks.

Yiqa
Site: Yiqa
Other Names: Yika
General Location: Yiqa, Oman
UTM: 519191 E, 2585128 N
Tower Shape: circular
Diameter: 21.6 m
References: Cable and Thornton 2013: 388 tab. 20.1; Kennet *et al.* 2016: 161

The tower at Yiqa, discovered by Sultan Al-Bakri, has received little attention to date. It was briefly mentioned by Cable and Thornton in their 2013 overview and by Kennet *et al.* in 2016 and is known by the Ministry of Heritage and Culture (now Ministry of Heritage and Tourism), but deserves closer interest. The site is located in the Al-Hajar Mountains another 10–15 km beyond the Al-Maidan tower via the Ibri-Rustaq road. Kennet *et al.* (2016: 161) reports at least one Umm an-Nar tomb in the area, and even a passing glance at satellite

Figure 1.91. The Yiqa tower complex is perched on a cliff overlooking date palm gardens in the oasis below. The remains of the adjacent settlement are visible to the north (top).

imagery shows the remains of numerous terraced fields and adjacent compounds. Though no tombs are visible on the neighbouring countryside, this may be in part due to its non-continuous use throughout ancient and pre-modern times. Remains of a settlement (consisting of a half-dozen building foundations and at least one channel) may date to the Iron Age, but the meagre ceramic collection found there was inconclusive. The remains of a few more rectilinear buildings were found several meters west of the tower on the first ledge above the ravine. The tower itself is situated on the edge of a steep cliff overlooking the oasis village of Yiqa, which remains green and relatively lush despite recent nation-wide droughts (Figure 1.91). The tower sits at the juncture between two different bedrocks: directly beneath the tower is conglomerate bedrock, made up of cobble-sized grains (and larger); however, roughly 20 m to the southwest of the tower, it is bedded grey schist.

The Yiqa tower is constructed of large, roughly hewn boulders up to 150 × 80 × 50 cm, made from the conglomerate rather than hewn from the schist. The tower is circular in plan and more than 2 m tall. Sections of the ringwall to the southwest and southeast are well preserved; these sections highlight both the lack of coursing and the careful construction techniques required to ensure structural stability. On top or inside the tower, amid the rubble, rectilinear walls are visible but of indiscernible age. Despite its height there is little fill within the tower rubble; this may have less to do with whether or not a mudbrick superstructure existed than with the inevitable porosity of a structure constructed of boulders sitting above a cliff, as any sediments would have effectively been eroded away. The western edge of the tower ringwall is barely 2 m from the cliff, which effectively defends the southwestern and western sides of the structure. On

Figure 1.92. Pecked divots, organized in loose rows, on the upright face of a fallen stone inside the Yiqa fortification.

its remaining exposed sides, ca. 200°, it is surrounded by a stone wall or rampart preserved to a height of 1.5 m. It is sub-circular in plan and encloses a space roughly 70 m long and 50 m wide. This rampart was built as a single unit, faced on both sides with pebble and cobble fill. The stones that make up its outer face are smaller than those of the tower ringwall, but still quite large, and average roughly 60 × 40 × 30 cm. They are also bigger than the stones used to make the inner face. As the construction style of these walls resembles those of Iron Age and later settlements it is possible that these stones were taken from the tower ringwall.

The entrance to the fortification is located on the northern edge of the rampart, near the cliff. The gateway includes a dog-leg and is situated next to a thickened section of the ramparts; based on the construction style (i.e., arranged upright) it is likely more recent than the rest of the wall. Roughly 10 m from the entrance is a rectilinear structure, 7 m long and 5 m wide, that resembles the platforms seen at some of the other towers. Its northwest corner is preserved to a height of 2 m and is constructed in the same style as the tower ringwall (Figure 1.93); it is possible that the feature

Figure 1.93. Northwestern corner of the Yiqa tower platform.

angles down to the south, towards the tower; however, the side closest to the tower is obscured by rubble and sediment. A section of tower wall is visible behind this feature, but as the walls on either side are absent (either collapsed or removed is unclear) it is difficult to determine how the platform and ringwall relate to the rest of the tower. Against the inner face of the rampart wall (and, in some cases, interdigitating with it) are roughly rectilinear walls forming structures, some of which are agglutinative (i.e., making use of existing walls in the construction of new buildings). These interior walls are made of smaller stones and closer to 30 cm wide, preserved to a height of roughly 50 cm; like the rampart wall they are double-faced and rubble-filled. In the courtyard area on the northeast and southeast sides of the tower are low alignments of cobble-sized stones, faced on one side only and several stones tall; as sediment is sometimes held behind the walls they may indicate raised platforms or walkways, but most likely they are the remains of a channel of some sort.

A surprisingly broad array of ceramics was found within the rampart walls and amid the tower rubble, dating from the Umm an-Nar period (including sherds from Black Slip Jars) up through the Late Islamic period. Petroglyphs include animal and human figures (one holding a spear) as well as Arabic writing and a series of pecked indentations of unknown age (Figure 1.92).

Al-Rustaq

The towers at Al-Rustaq have only recently been discovered (Kennet *et al.* 2016; Pizzimenti and Douglas 2022) and are in the process of publication. They are arrayed along the eastern side of the Rustaq-Barka

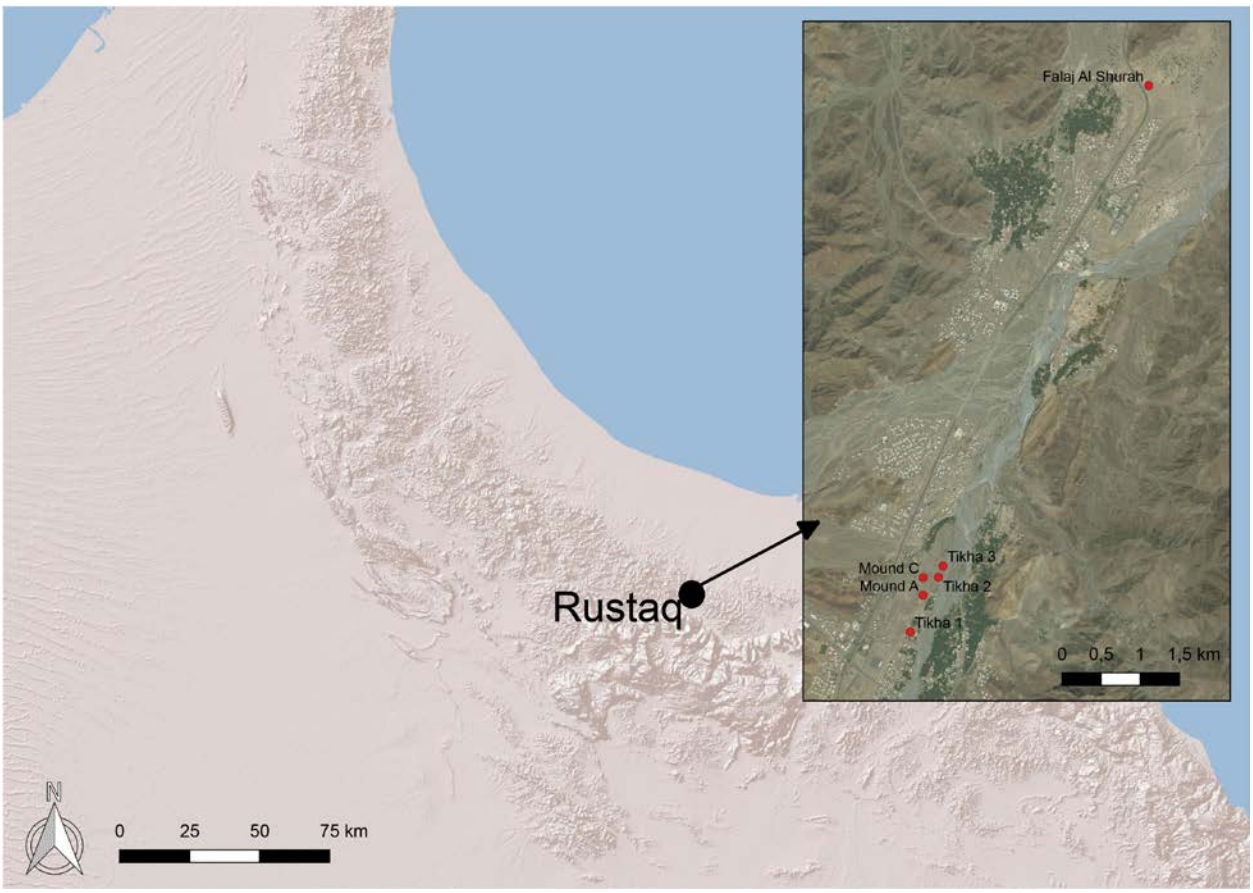


Figure 1.94. Overview map of towers at Al-Rustaq.

route between Al-Araqi and Al-Misfah, near the junction of Wadi Al-Sahtan and Wadi Al-Ghashab (Figure 1.94). Kennet *et al.* (2016: 159) tentatively associate three of the towers and settlement at Al-Tikha (see below for alternate nomenclature) with the Harvard Survey's Wadi Far 1 (Hastings *et al*. 1975: 10, 12: figs. 2, 10). If so, then these towers may be among the first in Oman to be documented by archaeologists, and have only just been rediscovered. An additional fourth and potential fifth tower has been identified by Khaled Douglas and Sara Pizzimenti and is currently under investigation in a joint project by Sultan Qaboos and Pisa universities (Pizzimenti and Douglas 2022). The towers at Al-Tikha are all situated on the even plain that forms the western embankment of Wadi Far, along with remains from an Umm an-Nar settlement and tombs (Kennet *et al.* 2016: 159). A sixth tower at Al-Rustaq, Falaj Al-Shurah, is located 7 km north of Al-Tikha on the same wadi. Additionally, there are two possible towers within the city of Al-Rustaq itself. Kennet *et al.* (2016: 160) suggest a tower close to the Kasfah spring in Al-Rustaq (UTM 547160 E, 2598665 N). Here, they found a scatter of Umm an-Nar pottery as well as a short section of a curved wall. In addition, the southwestern corner of Al-Rustaq fort might also have been built on a 3rd millennium BCE tower (Kennet *et al.* 2016: 160). However, during subsequent visits by Kennet and team, nothing was found to substantiate these claims. Therefore, they are discounted in this publication. Nevertheless, along with the towers at Al-Maidan and Yiqa, the five towers at Al-Rustaq provide excellent evidence for a Bronze Age presence in the Al-Hajar Mountains. It remains to be seen whether they, like the Al-Maidan and Yiqa towers, are located near distinct lithologies or at geologic boundaries.

Al-Tikha 1
Site: Al-Tikha
Other Names: Wadi Far 1 (Hastings *et al*. 1976); L0882 (Rustaq Batinah Archaeological Survey), Harte (Deadman *et al*. 2022), Al-Tikha 2 (Mortimer and Thornton 2018: tab. 2)
General Location: Tikkah, Al-Rustaq
UTM: 544114 E, 2591689 N
Tower Shape: circular
Diameter: 19 m
References: Hastings *et al*. 1975: 10, 12, figs. 2, 10; Kennet *et al.* 2016: 159; Deadman *et al*. 2022

Figure 1.95. Tower Al-Tikha 1 (photograph by Rustaq Batinah Archaeological Survey, used with kind permission)

Figure 1.96. Views of the ringwall of Al-Tikha 1 (photos: Rustaq Batinah Archaeological Survey, used with kind permission).

The southernmost of the towers at Al-Tikha, Al-Tikha 1, is located near the junction of Wadi Al-Ghashab/Wadi Far and Wadi Al-Sahten. This circular tower has a ringwall built of large stone blocks, on average 80 × 50 × 50 cm, one course wide and up to two courses high, encircling an outcrop of bedrock (Deadman *et al.* 2022; Figure 1.95 and Figure 1.96). A 3 × 4 m large stone-lined well is located at its centre. Due to its large size, Deadman *et al.* (2022) suggest that the well is of a later date or has been enlarged at a later date. To the north of the tower, a rectangular annex is attached to the tower, measuring 6.5 × 6 m. Several petroglyphs were identified on the stones of the wall as well as the bedrock itself.

Al-Tikha 2
Site: Al-Tikha
Other Names: Wadi Far 1 (Hastings *et al.* 1976); L0881 (Rustaq Batinah Archaeological Survey); Al-Tikha 1 (Mortimer and Thornton 2018: tab. 2), Mound E (Pizzimenti and Douglas 2022)
General Location: Al-Tikha, Al-Rustaq
UTM: 544474 E, 2592389 N
Tower Shape: circular
Diameter: 18 m
References: Hastings *et al.* 1975: 10, 12, figs. 2, 10; Kennet *et al.* 2016: 159; Deadman *et al.* 2022

Figure 1.97. Tower Al-Tikha 2 (photograph by Rustaq Batinah Archaeological Survey, used with kind permission).

Al-Tikha 2 is the middle tower situated along the western banks of the Wadi Al-Ghashab/Wadi Far, just southwest of the junction with Wadi Al-Sahten (Figure 1.97). It was discovered by the Rustaq Batinah Archaeological Survey (RBAS) in 2013. The eastern-most part of the tower has been eroded away by floodwaters from Wadi Far, exposing an internal core retained by stone casement walls and a double ringwall as well as several interior casement walls. Beyond the tower, also exposed in section by water erosion, is an encircling stone wall and a ditch. To the north of Al-Tikha 2 are a series of stone walls that may be associated with the tower. Surface finds included a small assemblage of Umm an-Nar pottery as well as some later Bronze Age sherds (Deadman *et al.* 2022).

Al-Tikha 3
Site: Al-Tikha
Other Names: Wadi Far 1 (Hastings *et al.* 1976); L1227 (Rustaq Batinah Archaeological Survey), Mound F (Pizzimenti and Douglas 2022)
General Location: Al-Tikha, Al-Rustaq
UTM: 544530 E, 2592531 N
Tower Shape: circular
Diameter: unknown
References: Hastings *et al.* 1975: 10, 12, figs. 2, 10; Kennet *et al.* 2016: 159; Deadman *et al.* 2022

Figure 1.98. Tower Al-Tikha 3 (photograph by Rustaq Batinah Archaeological Survey, used with kind permission).

Al-Tikha 3 has been partially destroyed by Wadi Far. The Rustaq Batinah Archaeological Survey (Deadman *et al*. 2022) were provided with another cross-section showing a double ringwall made from large cobbles surrounding a series of internal casement walls and fill (Figure 1.98). To the north, wall sections hint towards a rectangular annex. The mound measures ca. 30 m in diameter, but it is likely that the tower was smaller.

Mound C
Site: Al-Tikha
Other Names: none
General Location: Al-Tikha, Al-Rustaq
UTM: 544278 E, 2592389 N
Tower Shape: circular
Diameter: unknown
References: Pizzimenti and Douglas 2022

The newest addition to the Al-Tikha towers is Mound C. A GPR survey by a team from the Sultan Qaboos and Pisa universities indicated several walls and in a 10 × 5 m wide trench excavated at the southern side of this shallow mound in 2022 brought to light stone foundations with remaining mudbricks on top (Pizzimenti and Douglas 2022). Finds from the excavations included furnace fragments and hammer stones indicating copper processing but no pottery remains. Radiocarbon dates place the structure around 2700–2600 BCE, i.e., the very late Hafit period (Pizzimenti and Douglas 2022).

Mound A
Site: Al-Tikha
Other Names: none
General Location: Al-Tikha, Al-Rustaq
UTM: 544276 E, 2592158 N
Tower Shape: circular
Diameter: unknown
References: Pizzimenti and Douglas 2022

There is also a possibility of a fifth tower at Al-Rustaq, indicated by GPR survey. Mound A is located approximately 200 m south of Mound C and features an outer wall made of stone, but no internal structures could be revealed (Pizzimenti and Douglas 2022). Radiocarbon dates place it at the end of the Umm an-Nar period around 2200–2000 BCE.

Falaj Al-Shurah
Site: Falaj Al-Shurah
Other Names: none
General Location: Al-Rustaq, Oman
UTM: 547160 E, 2598665 N
Tower Shape: circular
Diameter: 15 m
References: Kennet *et al.* 2016: 159–160; Mortimer and Thornton 2018: tab. 2

7 km further along the road from Tower 3, northeast of the junction of Wadi Al-Seen and Wadi Al-Sahten, is the tower at Falaj Al-Shurah (Figure 1.99). It was discovered by Sultan Al-Bakri, wow Advisor of Research and Studies to the Minister of Heritage and Tourism. From the plan visible on the surface, it seems that the

Figure 1.99. Aerial view of Falaj Al-Shurah (photograph by Mohamad Hesein, used with kind permission).

tower has a rectangular annex to the eastern site (Kennet *et al.* 2016: 159–160). According to Mortimer and Thornton (2018: table 2), Falaj Al-Shurah has an associated ditch but a well has not been found. Little else is known about this tower, but it is clear that the tower phenomenon is not merely to be found on the leeward side of the Al-Hajar Mountains. While by no means coastal, the tower at Falaj Al-Shurah is less than 40 km from the coast. Sherds of Black Slip Jars from the Indus were found on its surface (Douglas, personal communication).

Al-Banah
Site: Al-Banah, Oman
Other Names: Site 51
General Location: Al-Banah, Oman
UTM: 490969 E, 2574898 N (general location)
Tower Shape: circular
Diameter: unknown
References: de Cardi *et al.* 1976: 170; Doe 1983: 68, plate 13c

This site was identified in the early 1970s by de Cardi's initial surveys of the area (de Cardi *et al.* 1976). Doe's *Monuments of South Arabia* (1983) also mentions the tower (he was one of the members of de Cardi's team), which he lists as the most northern of the "boulder circle" style of the tower sites, which he and de Cardi *et al.* both call "walled enclosures" (1983: 68, pl. 13c). The tower is described as located on the east bank of Wadi Al-Hijr, roughly "1.5 kilometres upstream from Al-Banah" (Doe 1983: 68); unfortunately, attempts to find this tower over the past 15 years have not resulted in any positive identification; if the tower still exists, it is successfully hiding from archaeologists. A photograph published in Doe 1983 (pl. 13c) indicates that it was constructed of rough boulders and filled with sediment to a height a little over 1 m (two courses) above the surface (Figure 1.100).

Figure 1.100. Al-Banah tower (Doe 1983: pl. 13c).

Al-Ghubra
Site: Al-Ghubra
Other Names: Wihi Al-Murr, Site 36
General Location: Bahla, Oman
UTM: 528826 E, 2537231 N
Tower Shape: circular
Diameter: 20–21 m
References: de Cardi *et al*. 1976: 163; Doe 1983: 68; Orchard and Stanger 1994: 82–83

The site has been identified during the British Archaeological Survey in winter 1974/75 and labelled as Site 36 in Wihi Al-Murr (de Cardi *et al*. 1976: 163). The tower is located on a very low mount, on the plain about 450 m to the northwest of Wadi Baha. Today, it is surrounded by modern farms. About 20 3rd millennium BCE tombs are known from the wider area (de Cardi *et al*. 1976: 162).

The external ringwall is built of large, multi-coloured stone blocks and measures 20 to 21 m in diameter (de Cardi *et al*. 1976: 163; Figure 1.101, Figure 1.102 and Figure 1.103). Near the centre, a rectangular cistern is cut into the rock. It cannot be said if this was done during the 3rd millennium BCE or is a later addition. Off centre, 4.5 m from the western side and 11 m from the eastern one, a 4 m diameter stone circle is mapped in de Cardi's plan. This possibly indicates the location of a well (Orchard and Stanger 1994: 81). Today, it is covered by modern construction debris.

A magnetometry survey conducted by the Al-Hajar Project revealed at least two ditches encompassing the tower (Orchard and Stanger 1994: 81; Figure 1.104). Ditches are common features for towers located on the plain (Döpper 2018a). Additionally, other structures seem to surround the tower, each associated with an own smaller ditch. According to Jocelyn Orchard, about half of the site is destroyed by road constructors digging for gravel (Orchard and Stanger 1994: 82). Directly at the eastern side of the tower, there is a sub-rectangular feature. No surface finds were made during de Cardi's visit, but Orchard reports on 3rd millennium pottery sherds and occasional quern fragments (Orchard and Stanger 1994: 81).

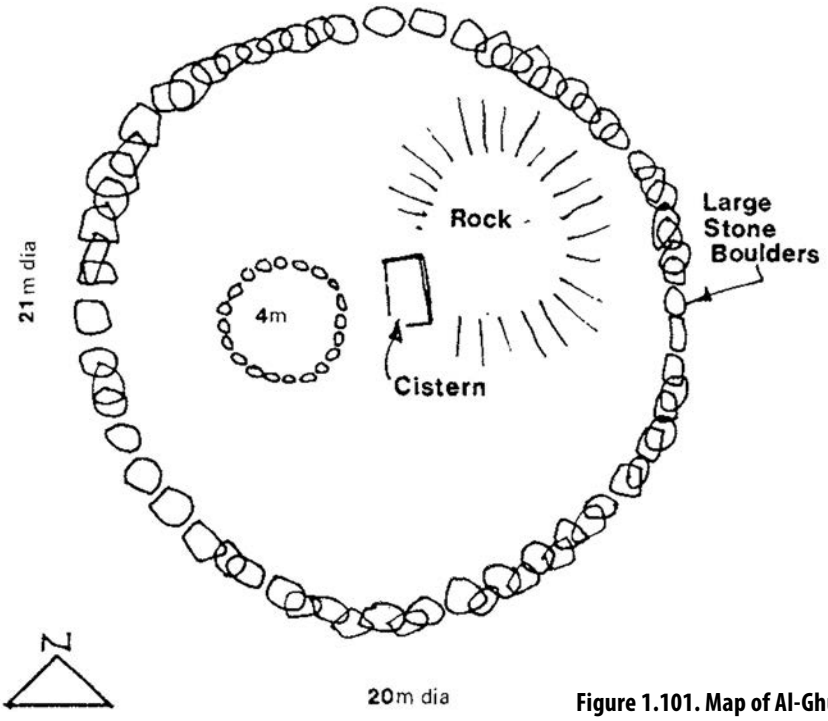


Figure 1.101. Map of Al-Ghubra tower (de Cardi *et al*. 1976: 163 fig. 35).

Figure 1.102. Aerial image of Al-Ghubra tower.

Figure 1.103. Ringwall of Al-Ghubra tower.

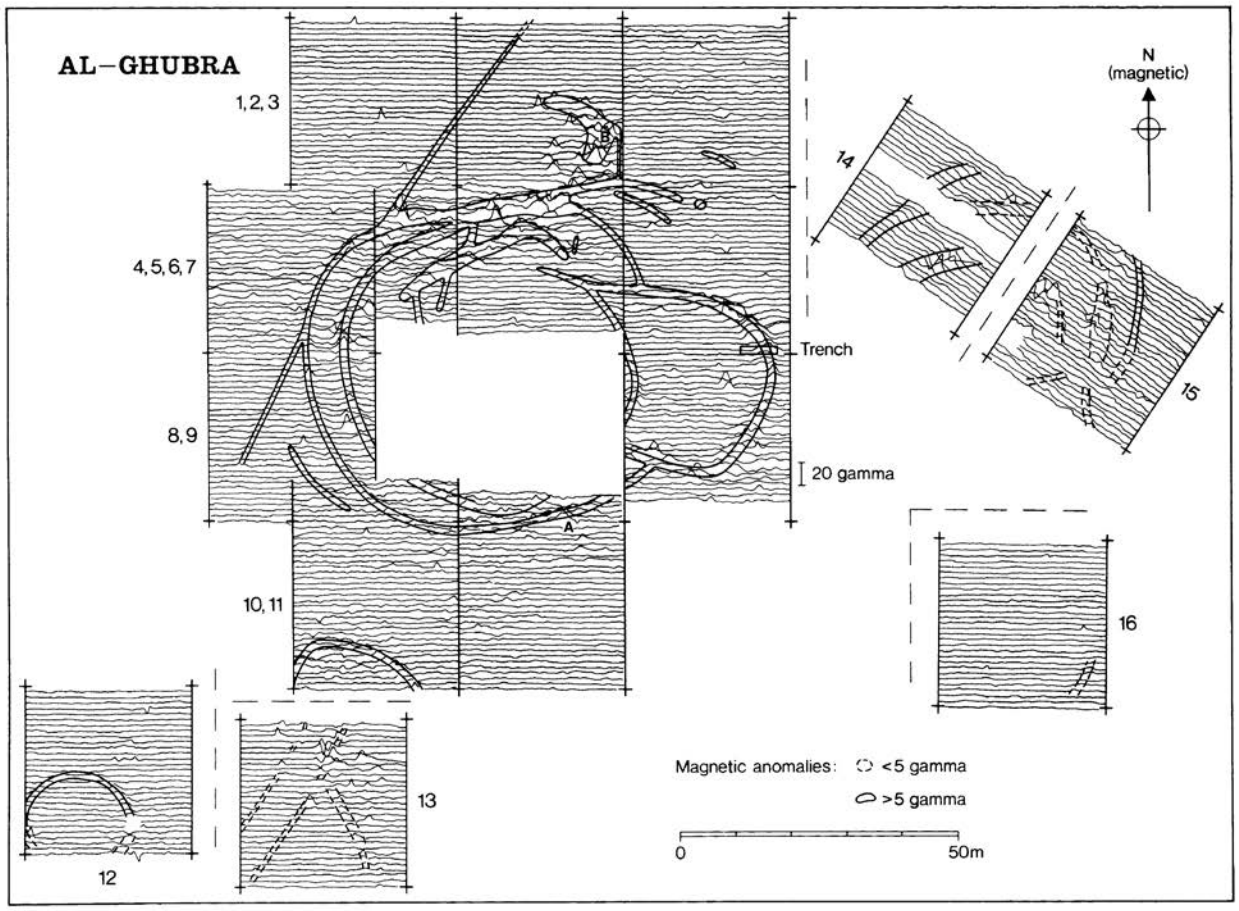


Figure 1.104. Results of the magnetometer prospection of the Al-Hajar Project (Orchard and Stanger 1994: 82 fig. 12).

Sufayha
Site: Sufayha
Other Names: none
General Location: Jabreen, Oman
UTM: 529389 E, 2532689 N
Tower Shape: circular
Diameter: 17 m
References: none

The site, discovered by Sultan Al-Bakri, is located at the eastern edge of Wadi Bahla, at the southern foothills of a small mountain. No other 3rd millennium BCE structures are known from the direct vicinity. Today, it lies immediately next to the highway 15. No archaeological research has been conducted as the site yet.

Sufayha is a rather small, circular tower with an external diameter of only 17 m (Figure 1.105). The external ringwall is made of large, dark-coloured stone boulders (Figure 1.106). Smaller stones fill the spaces in between them. No internal structures are visible on the surface. The space encircled by the external ringwall is completely filled. Attached to the external ringwall in the north-east, there is a smaller circle of stones with a diameter of 2 m. It is unclear whether this belongs to the original construction of the tower or is a later addition. Umm an-Nar period pottery sherds with horizontal and curvy line decoration were present on the surface.

Figure 1.105. Aerial image of Sufayha tower.

Figure 1.106. Detail of external ringwall.

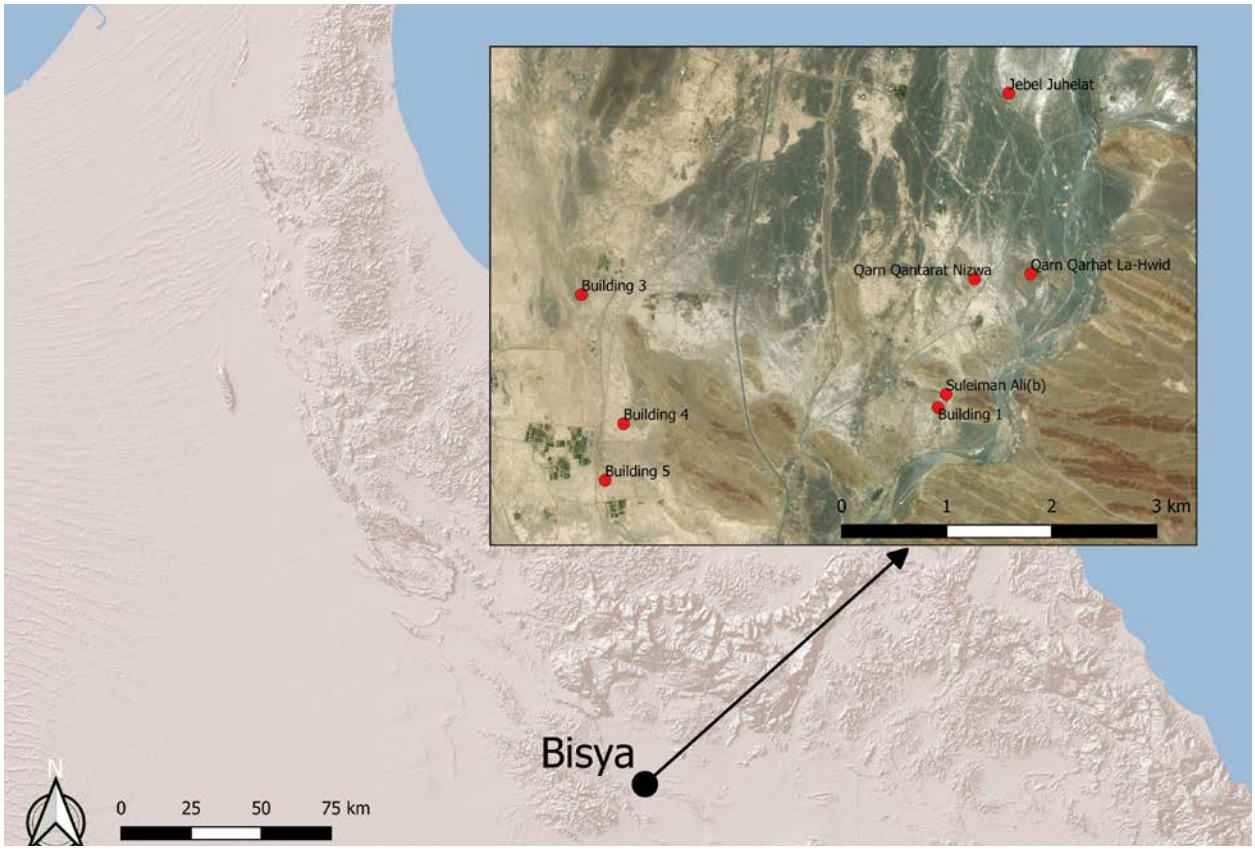


Figure 1.107. Overview map of towers at Bisya.

Bisya

In this dense archaeological landscape of Bisya, eight towers are known to date (Figure 1.107). Five of them are located on the western bank of the large Wadi Bahla north of Al-Dhabi village, the three others in the fertile alluvial plain between Wadi Bahla and Wadi Saifam north of Salut. Besides the towers, a large number of Bronze and Iron Age tombs is present in the region as well as the famous Iron Age fort on Jebel Al-Agma and its surrounding Iron Age settlement. This multiperiod site has a long history of archaeological research, first visited by J. C. Wilkinson in 1973 (Wilkinson 1977: 129) and by the Harvard Archaeological Survey in the same year (Humphries 1974). In winter 1974/75 the British Archaeological Expedition team documented the site (de Cardi *et al.* 1976). In 1980 works of the Al-Hajar Project (formerly the University of Birmingham Archaeological Expedition to the Sultanate of Oman) started in the region lead by Jocelyn and Jeffrey Orchard, conducting excavations at various towers over the next years. These formed the basis of their controversial theories on 3rd millennium BCE oasis towns in Oman (Orchard and Stanger 1994; Orchard 2000a; Orchard 2000b; Orchard and Orchard 2007). A final publication of their extensive research is still pending. In 2004, research by the Italian Mission to Oman (IMTO) began with special focus on the Iron Age fort and settlement as well as the Bronze Age tower ST1 (Degli Esposti 2016; Avanzini and Degli Esposti 2018). Their work provided the starting point for setting up an archaeological park at the site. Most recent addition to this research history are the works of the French Archaeological Mission in Central Oman (FAMCO). Since 2016 research has focused on Building 4 as well as domestic architecture around the tower Suleiman Ali. In 2014, the cultural landscape of Bisya and Salut and its archaeological remains were put on the tentative list by UNESCO world heritage (UNESCO Tentative List).

Building 1

Site: Building 1

Other Names: Site 37-2; BB-21; DT1

General Location: Bisya, Oman

UTM: 526729 E, 2516378 N

Tower Shape: circular

Diameter: 22–27 m

References: Humphries 1974: 50; Hastings *et al.* 1975: 13, 21; de Cardi *et al.* 1976: 163; Doe 1983: 66; Orchard and Stanger 1994: 74

The first reference to Building 1 at Bisya comes from the 1973 Harvard Archaeological Survey, listed as site BB-21 (Humphries 1974: 50). When the Orchards began their work in the region in the 1980s they did not consider the building as a tower without further justification, although it was clearly known to them (Orchard and Orchard 2007: 161 pl. 9; but see Orchard and Stanger 1994: fig. 6).

Building 1 is located at the eastern end of Al-Zabi village, approximately 80 m west of Wadi Bahla on the plain. Only 120 m to its northeast, there is another 3rd millennium BCE tower, Suleiman Ali (Orchard and Orchard 2007: 161 pl. 9). As part of the greater archaeological landscape of Bisya, it is incorporated in an area rich in 3rd millennium BCE tombs and is one of eight towers that were found here in total. The tower consists of a circular wall, 22 to 27 m in diameter, that is preserved today to a height of about 1.5 m (de Cardi *et al*. 1976: 163). The ringwall is built of small limestone blocks (Figure 1.110). On top of the platform, remains of a complex series of rectilinear stone walls are visible (Humphries 1974: 50).

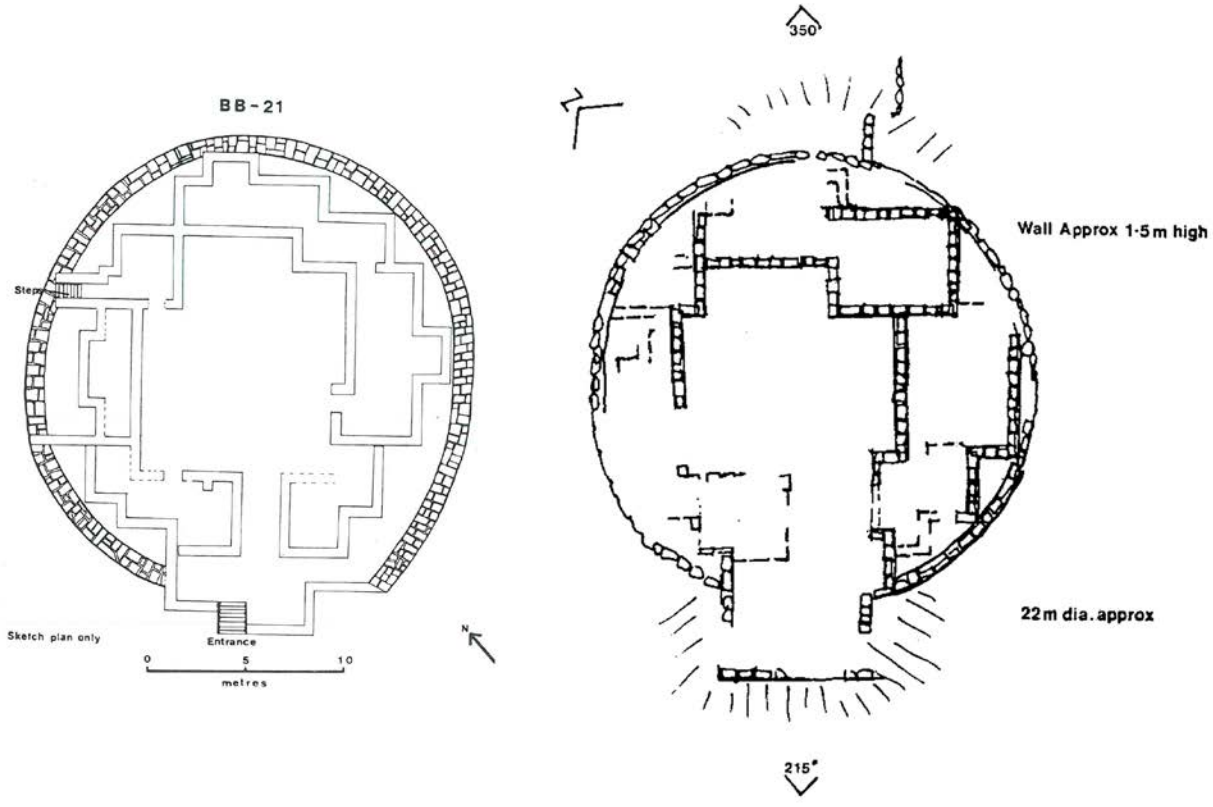


Figure 1.108. Ground plans of Building 1 by the Harvard Archaeological Survey (left) and de Cardi (right) (Hastings *et al*. 1975: 21 fig. 7 left; de Cardi *et al*. 1976: 163 fig. 36).

Figure 1.109. Aerial photograph of Building 1.

Figure 1.110. External ringwall of the tower with protrusion in the southwest.

In the sketch of the tower by the Harvard Archaeological Survey, it presents two more or less concentric stepped stone walls in the interior surrounded by the circular ringwall (Figure 1.108, left). These stepped stone walls are reminiscent of Tower 1145 at Bat and Al-Qumayra 1. Two stairs are reconstructed, one in the northwest and one in the southwest. The latter is identified as the main entrance to the tower. Here, the external ringwall is interrupted and a more or less rectangular protrusion projects towards the southwest. In de Cardi's plan of the tower, the interior walls are far more irregular and from rather several rectangular rooms than stepped walls (Figure 1.108, right). She also identified the protrusion in the southwest but without any stairs and another 'entrance platform' in the northeast (de Cardi *et al.* 1976: 163). Recent aerial photographs give the impression that the ground plan of Building 1 by the Harvard Archaeological Survey is closer to the truth (Figure 1.109). Only a few sherds were reported from the surface of Building 1, discovered by the Harvard Archaeological Survey (Hastings *et al.* 1975: 13), probably being in indicator of the tower dating to the Umm an-Nar period.

Building 3/ST3
Site: Building 3
Other Names: Site 39; ST3
General Location: Bisya, Oman
UTM: 523346 E, 2517426N
Tower Shape: circular
Diameter: 19–24 m
References: de Cardi *et al.* 1976: 164; Orchard and Orchard 2007: 158 pl. 6d

First identified by the British Archaeological Survey in 1974/75, where it was labelled Site 39 (de Cardi *et al.* 1976: 164), the southern part of this tower has been excavated by the Al-Hajar Project of the University of Birmingham, who named it Building 3 (Orchard and Orchard 2007: 158 pl. 6d). The publication of the results is still pending.

Building 3 is the western-most of the seven towers in the Bisya area, approximately 600 m to the north of the tower Building 5/ST1. It lies immediately south of a small hill, where several 3rd millennium BCE tombs are located (Orchard and Orchard 2007: 158 pl. 6d). The tower has two concentric ringwalls, the outer one with a diameter of 24 m and the inner one with a diameter of 19 m (Figure 1.111; de Cardi *et al.* 1976: 164). Thus, the walls are at a distance of approximately 2.5 m of each other. They are built of large stone blocks. Towers with double ringwalls are not uncommon and occur for example at Bat Tower 1147 and 1156. The interior of the tower was not touched by the excavations. To the south, a rectangular structure with a length of 19 m is attached to the external ringwall of the tower. The walls of this annex are built of the same stones as the ringwalls of the tower. The annex borders a several meter wide ditch, which presumably once encompassed the whole tower (Figure 1.112). The southern side of the ditch is lined with a stone wall as well (Figure 1.113). Stone walled ditches are known amongst others from the 3rd millennium BCE towers 1156 at Bat (Mortimer 2016: 133-136) and ST1 at Salut (Degli Esposti 2016). The ditch itself seems to have been several meters deep, although it is not clear whether excavations reached its bottom. Further to the south, the remains of a curved wall are visible. It is not clear whether it is contemporaneous with the tower. Interestingly, no surface pottery was found during de Cardi's visit in the 1970s (de Cardi *et al.* 1976: 164). Whether the excavations by the Orchards yielded pottery is not known. If not, this might be an indicator for a Hafit period date of the tower.

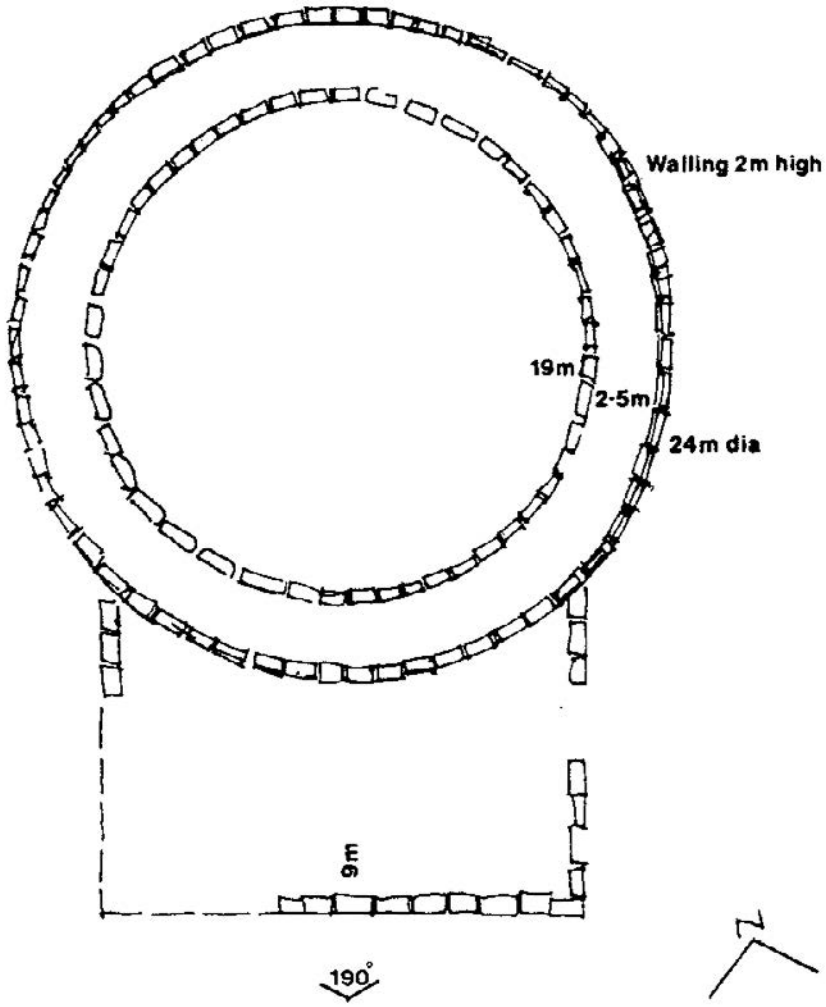


Figure 1.111. Ground plans of Building 3 by de Cardi (de Cardi *et al*. 1976: 164 fig. 37).

Figure 1.112. Aerial photo of Building 3 with annex and stone-lined ditch on the left-hand side.

Figure 1.113. Detail of the stone-lined ditch.

Building 4/ST2
Site: Building 4
Other Names: BB-16, ST2
General Location: Bisya, Oman
UTM: 523751 E, 2516186 N
Tower Shape: oval
Diameter: 33 × 25 m
References: Humphries 1974: 50; Orchard and Orchard 2007: 158 pl. 6d

Building 4 had first been discovered by the Harvard Archaeological Survey in 1973, who labelled it BB-16 in their inventories (Humphries 1974: 50). The Al-Hajar Project conducted further research at the site, giving it its current name, Building 4 (Orchard and Orchard 2007: 158 pl. 6d). The first archaeological investigations began in 2016 by the French Archaeological Mission in Central Oman (FAMCO).

Building 4 is the largest of the eight Bronze Age towers at Bisya and are located 1.3 km to the southeast of Building 3 and 600 m to the north of Building 5. On the hill immediately to the east of Building 4, several 3rd millennium BCE tombs are located as well as evidence for an Iron Age settlement on the slope. The oval structure has a very complex use-history beginning in the Hafit period. By then, a mudbrick tower was surrounded by a ditch system (Figure 1.114). Radiocarbon samples from the bottom of the ditch indicate a date in the 4th millennium BCE. This was followed by adding a stone wall to the outer side of the external mudbrick ringwall. Later on, a third wall of massive stone blocks was attached to this one. For the time around 2300 to 2000 BCE, some repair work as well as internal mudbrick structures have been documented.

Figure 1.114. Building 4 after excavation (photograph by FAMCO, used with kind permission).

By the end of the Umm an-Nar period, the tower seems to have been abandoned. In the Iron Age around 1100 to 500 BCE, the tower was levelled and a new structure was built in its place. This led to a destruction of much of the Early Bronze Age remains. After the Iron Age, occasional use of the site is evidence by pre-Islamic and medieval pits and pottery sherds. What remains from the Bronze Age tower is its oval ringwall and remains of what might have been rather regular, rectangular compartments in its interior. Additionally, there was once a well a bit off the centre of the tower.

Building 5/ST1
Site: Bisya, Building 5
Other Names: ST1
General Location: Bisya, Oman
UTM: 523564 E, 2515686 N
Tower Shape: circular
Diameter: 22 m
References: Orchard and Orchard 2007: 158 pl. 6d; Degli Esposti 2010; 2011a, 2011b, 2012, 2013; 2014a; 2014b; 2014c; 2015a; 2015b; 2016; Frenez *et al*. 2016

First mentioned by the Orchards, they called this tower Building 5 in their reports (Orchard and Orchard 2007: 158 pl. 6d) and conducted some small-scale excavations here, which were, however, not published. A naturally back-filled trench was noted by the Italian Mission to Oman (IMTO), directed by Alessandra Avanzini (Degli Esposti 2010: 1-2), when they began with their large-scale archaeological excavations here in 2010. The excavations, which were made possible by the fundamental logistic support and funding provided by the Officer of the Advisor to his Majesty the Sultan for Cultural Affairs, lasted until 2015. The Italian Mission renamed the site Salut Tower 1, abbreviated as ST1 (Degli Esposti 2016).

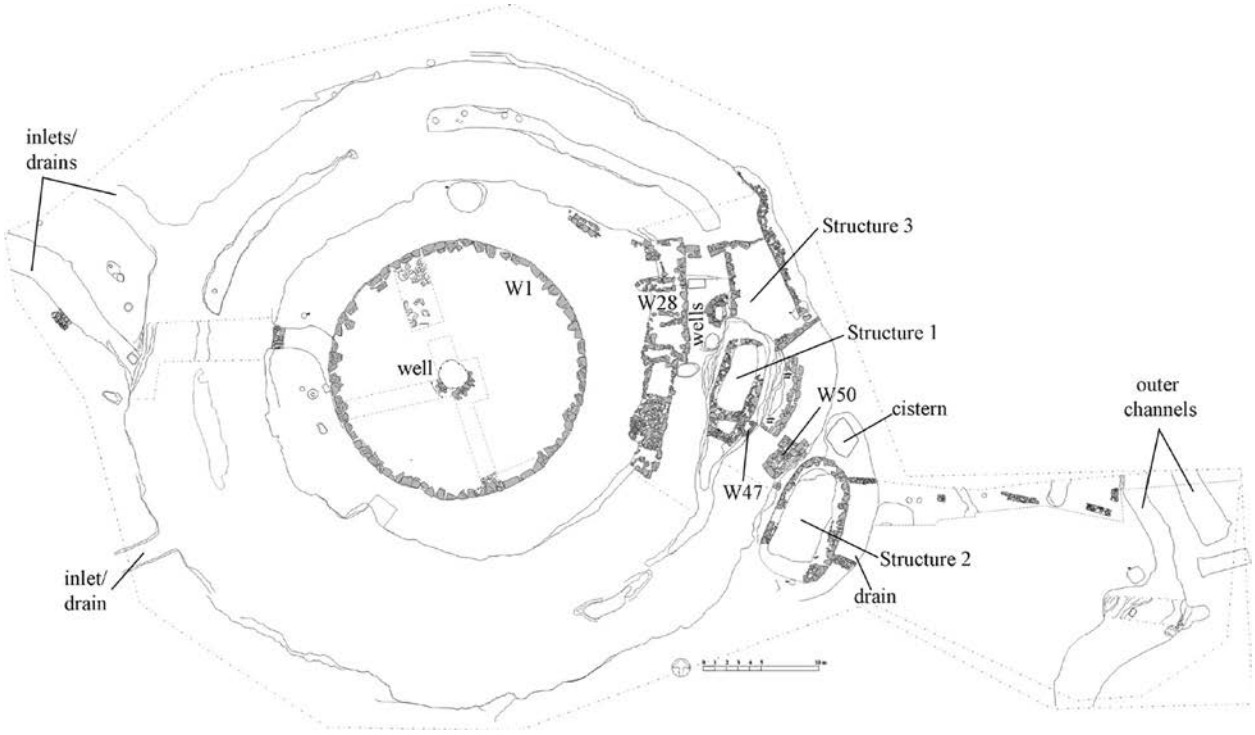


Figure 1.115. Ground plans of ST1 at the end of the excavations (Degli Esposti 2016: 668 fig. 3, used with kind permission).

ST1 is located about 300 m to the northwest of the Iron Age fort of Salut in the surrounding plain. Seven other towers are found in the wider area of Bisya, with Building 4 situated only 600 m to the north of ST1. The ridges of the hills at Salut are dotted with 3rd millennium BCE tombs. The tower itself comprises a circular stone wall (W1) with a diameter of 22 m, built from massive stone boulders (Degli Esposti 2016; Figure 1.115 and Figure 1.116). The lowest course of these boulders was laid into a very shallow foundation trench. The ringwall is preserved to a height of approximately 2.3 m from the ancient surface and takes advantage of a natural shallow mound, which it encircles (Degli Esposti 2010). The interior seems to have been filled with sterile sand and gravel to form a base for whatever existed above. No internal structures are present except for a well located in the centre of the tower. Its shaft has a diameter of 1.75 m; the original dimensions cannot, however, be reconstructed due to Iron Age reuse (Degli Esposti 2016: 669). A possible second well was identified 7 m north of the first one. Degli Esposti speculates that his well came into use after the original one ceased to be operational (Degli Esposti 2010).

The tower is surrounded by a large ditch, 11 to 13 m wide and up to 3.5 m deep (Figure 1.117). In the east, the inner side of the ditch, nearest the tower, was lined with a wall made from large boulders (W28; Figure 1.115). Slightly to the north, the outer side of the ditch was partly lined with another massive stone wall (W41+W51). The stratigraphy of the ditch can be divided into three main phases (Degli Esposti 2011b). The deepest unit is a laminated sedimentation layer, whose morphology and composition indicates that it was deposited over a relatively long period, and originated from the cyclic sedimentation of water-borne material. It represents the actual use of the ditch during the Umm an-Nar period. A few pottery sherds supporting this date were retrieved from this layer. During this phase, the ditch was completely open. Above, several collapsed stones were found and other irregular accumulations. They mark the end of the original use of the ditch in a dramatic event that caused the collapse of large parts of its unlined sides. Degli Esposti (2013) speculates that the dramatic event might have been a heavy flood. Afterwards, the outer part of the

Figure 1.116. ST1 after excavation and restoration (photograph by S. Bizzarri/IMTO, used with kind permission).

Figure 1.117. The ditch system surrounding ST1 (photograph by M. Degli Esposti/IMTO, used with kind permission).

ditch was blocked at least at one point by erecting Structure 3, a sort of terrace, which connected the outer side of the ditch to the strip of caliche (see below). The northern wall of Structure 3 abuts against the ringwall of the tower, thus also blocking the internal channel of the ditch, leaving only an 80 cm wide passage open. Later, all these activities were sealed by massive, thick silty-sandy deposits, which are interpreted by the excavators as relating to one or a few events of loam deposition possibly after heavy rains and flooding and probably a result of a lack of maintenance over a few seasons of heavier rains. Finally, the area of the ditch was used as a dumping ground and remains of fireplaces and traces of burning were abundant (SU 055). After this phase, the Bronze Age occupation of the site came to an end, and the remaining depression of the ditch was completely backfilled. According to the excavators, the ditch was related to water management and storage, possibly associated with intensive agriculture as well as providing water to the people settled around ST1, or was a defence (Degli Esposti 2013; 2016). There is a complex network of channels further east of the tower also dating to the Early Bronze Age (Degli Esposti 2013).

A unique feature is a narrow strip of caliche that was left standing in the centre of the ditch, dividing it into an inner and an outer channel (Degli Esposti 2016: 669). Where the strip widens in the northeast, forming a sort of "island", Structure 1 has been erected. Structure 1 comprises two chambers with an overall trapezoidal shape, made up of medium and large size stone blocks (Degli Esposti 2011b) The walls are single faced, with a quite regular exterior and rubble work filling behind it. In room 2, a thin layer of silty, sandy, whitish-grey loam represents the remains of the original floor, while inside room 1 the top of the caliche layer represents the living surface. Structure 1 rests directly on the caliche. The walls of structure 1 are placed right on the edge of the "island". Structure 2, situated east of the outer channel opposite Structure 1, was built with the same technique and materials and has the same general oval shape as Structure 1, but is larger (Degli Esposti 2012a). The walls are laid in a small foundation trench that cut through a hard silty deposit, which directly tops the caliche and also makes up most of the internal floor of the structure. W47 adjoining Structure 1 and W50 adjoining Structure 1 (Figure 1.115) are rectangular buttresses built against the ditch's outer side. They possibly served as supports for a wooden bridge linking both structures (Degli Esposti 2013).

In the eastern part, three inlet drains (SU 277, SU 293, SU 306) were discovered running into the ditch surrounding the tower (Degli Esposti 2014b; 2015a; Figure 1.115). SU 293 and SU 306 run almost parallel to each other at a distance of 6 m and have a width of 1.7 and 2.5 m respectively. They could divert water from the wadi, whose current bed is however rather far away, or tap water from a closer aquifer, or drain shallow underground water from the site's vicinity. Umm an-Nar period finds come mainly from the ditches. Here, high numbers of Indus related materials, including a stamp seal, were found together with Umm an-Nar period pottery sherds and other objects such as soft-stone artefacts (Frenez *et al*. 2016). From these contexts, there is also a radiocarbon date of a small, charred branch that dates to 2460–2145 cal. BCE (2-sigma, 95% probability). Therefore, the excavators place the construction and use of the tower in the time around 2400–2000 BCE (Frenez *et al*. 2016, 110).

The site of the tower was reused during the Iron Age and the Islamic period. Outside the tower, a large walled compound has been identified, which is of an Iron Age and Islamic date according to the pottery associated with it (Degli Esposti 2010; Degli Esposti 2011a). Furthermore, during the Iron Age occupation, new walls were erected around the tower (W2-5), possibly connected to agriculture, exploiting large boulders removed from the tower ringwall. The well inside the tower was clearly recut during the Iron Age as large quantities of Iron Age material from its fill demonstrate.

Jebel Juhelat
Site: Jebel Juhelat
Other Names: Jebel Jahalah
General Location: Bisya, Oman
UTM: 527402 E, 2519366 N
Tower Shape: oval
Diameter: 30 m
References: Orchard and Stanger 1994: 79, 146; Orchard 2000a: 216; Orchard 2000b: 172–173; Orchard and Orchard 2002: 230, 232; Orchard and Orchard 2007: 146, 162

The Al-Hajar Project discovered the Jebel Juhelat towers in 1985 (Orchard 2000a: 216). It is the most northerly of the towers in Bisya, situated approximately 1.7 km to the north of the towers Qarn Qarhat La-Hwid and Qarn Qantarat Nizwa (Orchard 2000a: 216). The tower sits on an oval, humpbacked outcrop of ferruginous chert of a reddish-brown colour (Orchard and Stanger 1994: 79; Orchard and Orchard 2002: 230). According to the Orchards (Orchard and Stanger 1994: 79), Jebel Juhelat formed the core of an oval, tiered structure that has since been so badly damaged that only three sections of the footings of the ringwall remained between 9 and 6 m below the summit (Figure 1.118, Figure 1.119 and Figure 1.120). Such a structure is comparable to Al-Khashbah Building II and Al-Qarri castle in Al-Zebah. The walls of Jebel Juhelat are built of large stone blocks measuring between 0.65 m and 1.20 m in length, between 0.60 m and 1.10 m in depth, and between 0.50 and 0.55 m in height. They were quarried from an immediately adjacent source (Orchard 2000a: 216). Today, only two short stretches of these walls are visible in the north and south (Orchard 2000a: 216). The excavators interpret a strech of terrace walling, which slopes gradually upwards as helicoidal ascent to the top (Orchard and Orchard 2002: 230; Figure 1.115). No pottery sherds have been found at Jebel Juhelat (Orchard and Stanger 1994: 79). Therefore, a date of the tower in the Hafit period is possible.

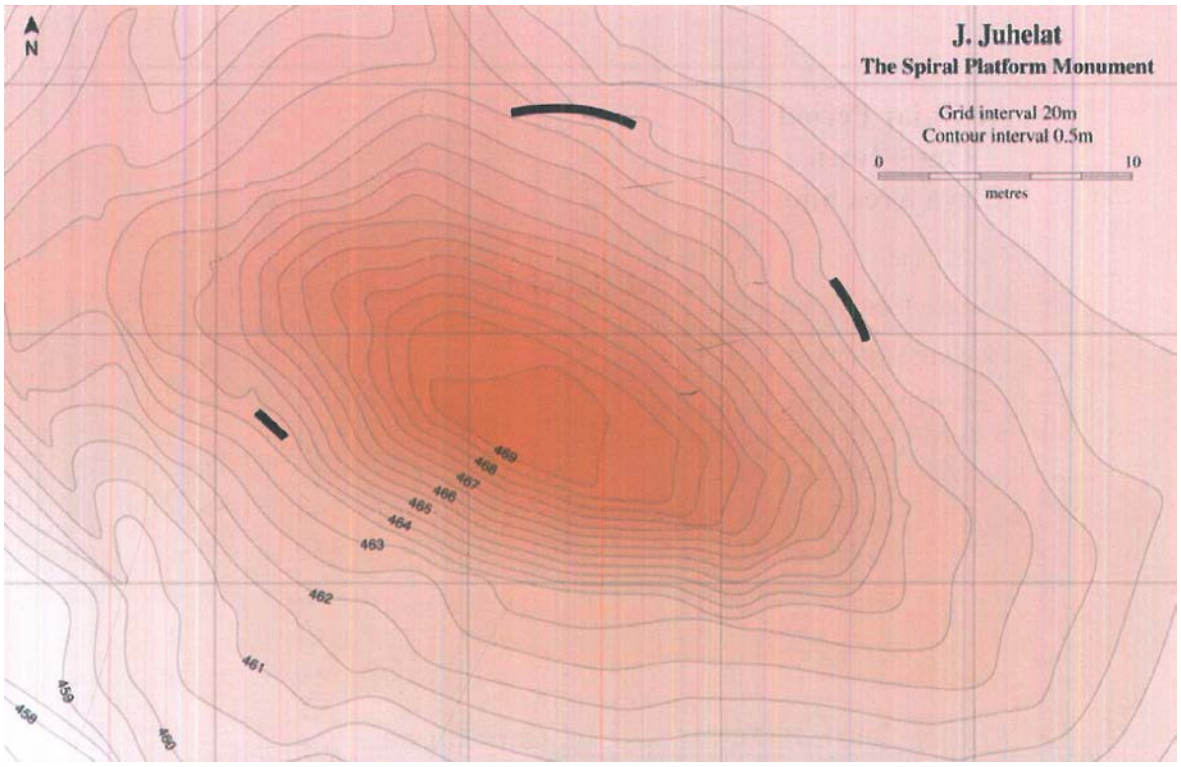


Figure 1.118. Ground plan of Jebel Juhelat (Orchard and Orchard 2007: 162 pl. 10).

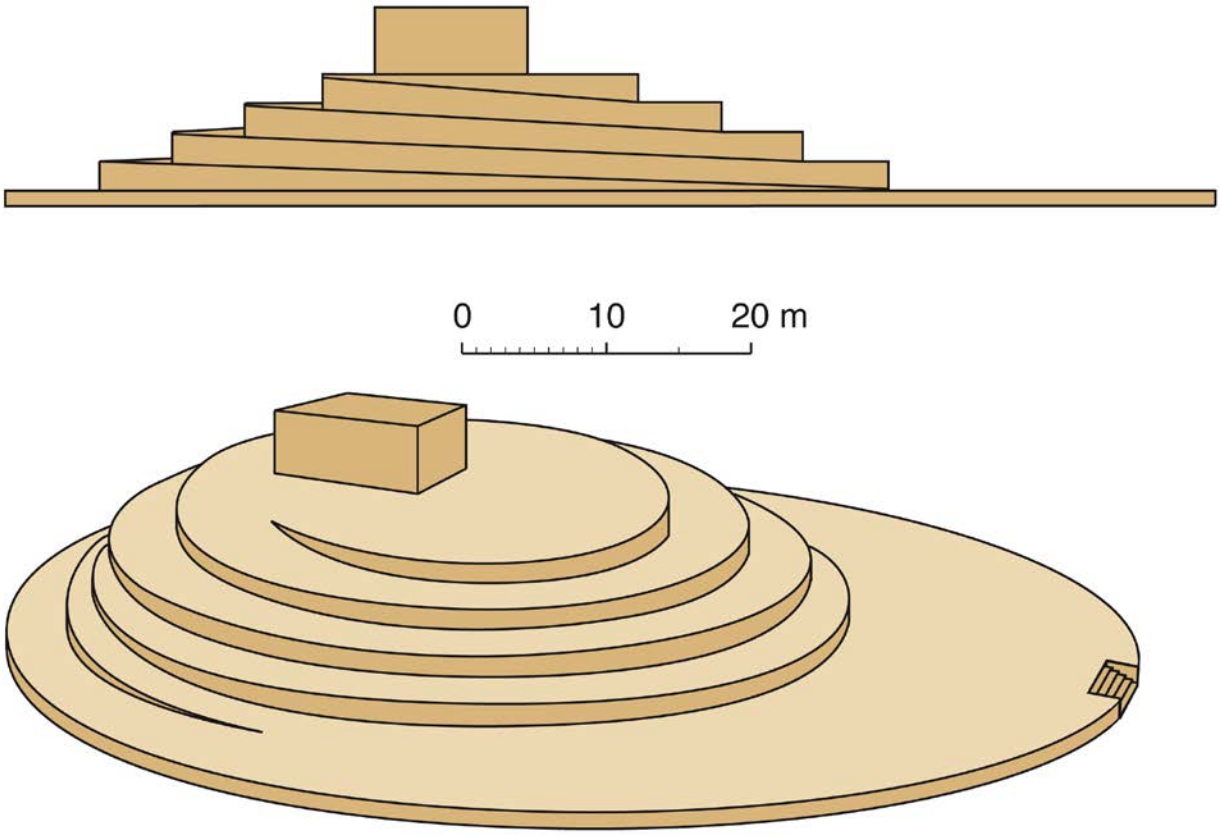


Figure 1.119. Reconstruction of Jebel Juhelat (Orchard and Orchard 2015: 102 fig. 8).

Figure 1.120. Stretches of wall at Jebel Juhelat.

Qarn Qantarat Nizwa

Site: Bisya, Qarn Qantarat Nizwa

Other Names: Site 37-3; BB-22, DF3

General Location: Bisya, Oman

UTM: 527078 E, 2517601 N

Tower Shape: circular

Diameter: 20–25 m

References: de Cardi *et al.* 1976: 163; Hastings *et al.* 1975: 23; Orchard and Stanger 1994: 73–75; Orchard and Orchard 2007: 146, 163; Orchard 2000b: 172; Orchard 2000a: 216

Figure 1.121. Ground plan of Qarn Qantarat Nizwa (Orchard and Stanger 1994: 76 fig. 7).

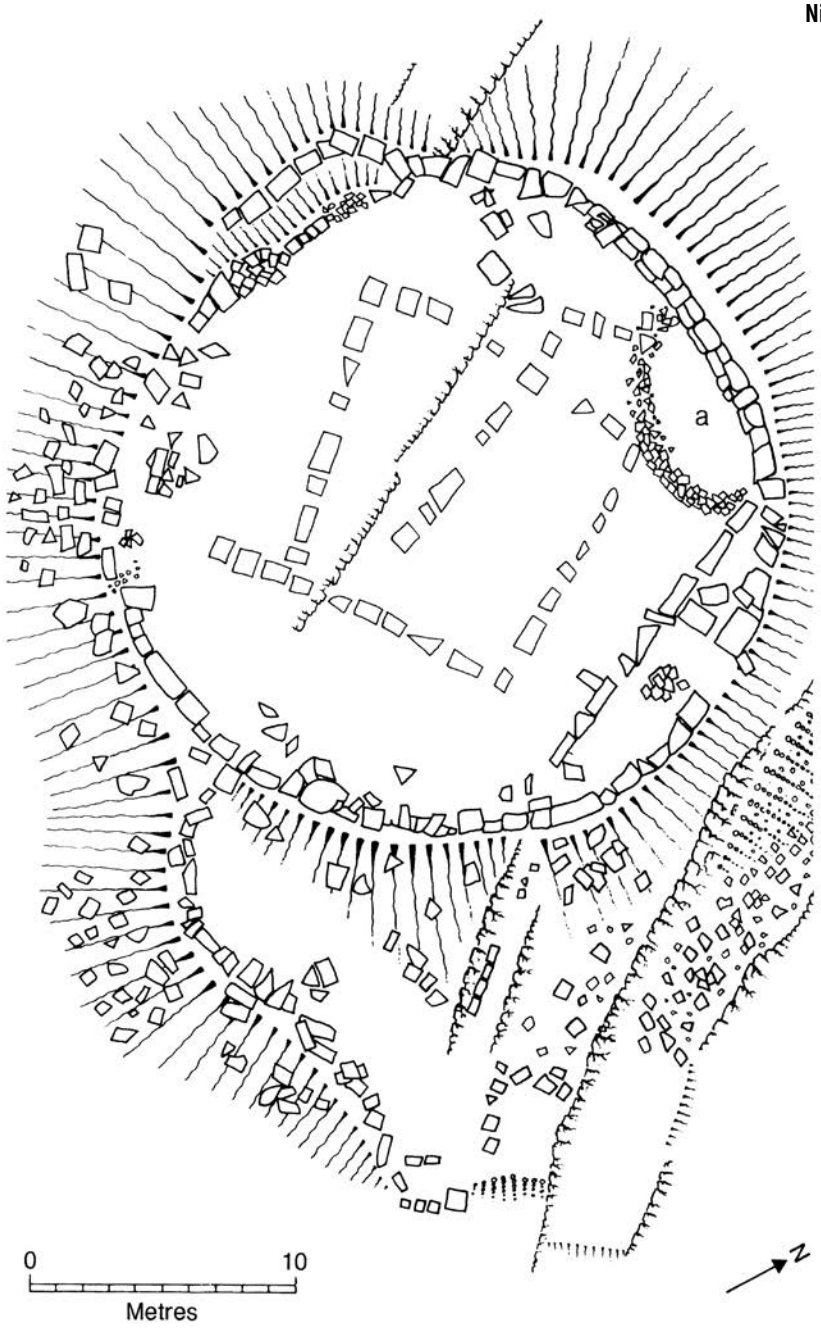


Figure 1.122. Aerial photograph of Qarn Qantarat Nizwa.

Figure 1.123. External ring-wall of Qarn Qantarat Nizwa.

This site had first been identified during the Harvard Survey 1973, who named it BB-22 (Hastings *et al.* 1975: 23). They recorded some Umm an-Nar period pottery sherds, including one with a raised undulating band, interpreted as a snake decoration (Hastings *et al.* 1975: 35 fig. 12). It was again visited by Beatrice de Cardi, Stephen Collier, and D. B. Doe over the course of the British Archaeological Expedition in winter 1974/1975 (de Cardi *et al.* 1976: 163). De Cardi identified the name of the site as Zabi and labelled it Site 37-3. More thorough investigations of the tower were carried Jocelyn and Jeffery Orchard in the scope of the Al-Hajar project, which has worked in the region since 1980/81 (Orchard and Orchard 2007: 146, 163). They refer to the tower with the name Qarn Qantarat Nizwa.

Qarn Qantarat Nizwa is situated at the southeastern end of a small, elongated, double humped outcrop, aligned southeast to northwest (Orchard and Stanger 1994: 73), which is about 6 m higher than the surrounding landscape of the alluvial plain (Figure 1.122). It lies near the confluence of Wadi Bahla and Wadi Sayfam, 500 m to the west of Wadi Bahla (Orchard and Stanger 1994: 73). It is one out of eight known 3rd millennium BCE towers in the region of the modern town of Bisya and only 550 m west of the closest tower, Qarn Qarhat La-Hwid. Third millennium BCE tombs are spread numerously on the hills in the region and also on the rocky outcrop, west of where the tower is located (Orchard 2000a: 216; Orchard and Orchard 2007: 161 pl. 9, 163 pl. 11). The circular tower has an external diameter of 25 m and its external ring wall is preserved to a height of 2.1 m at its northern side, which corresponds to seven courses of stones (Orchard and Orchard 2007: 146; Orchard 2000b: 172; Figure 1.121). The ringwall is made of large limestone blocks, measuring on average 0.8–1.4 m in length, 0.4 m in height, and 0.8 m in width, although some are 2 m in length. (Figure 1.123). The raw material for the stones is available at the site (Orchard and Stanger 1994: 75). According to Orchard and Orchard (2007: 146), the tower was originally completely filled and formed a platform. Today, only the masonry shell is still standing. From the internal reinforcing walls, only the footing survived. Jocelyn Orchard suggests that their alignment fits rooms round a rectangular central court and proposes that they replicate the layout of the rooms of the upper floors they once supported (Orchard and Stanger 1994: 75; Figure 1.121). Two annexes to the external ringwall are reported in the south and the west (Orchard and Stanger 1994, 75), which are no longer visible today. Access to the tower was provided, according to Jocelyn Orchard, by means of a ramp or stairway, which sloped up the eastern side of the hill and round to the southeast (Orchard and Stanger 1994: 75). Umm an-Nar period pottery sherds were found among the collapsed material (Orchard and Stanger 1994: 75).

Qarn Qarhat La-Hwid
Site: Bisya, Qarn Qarhat La-Hwid
Other Names: Site 37-4; BB-19, DF-2
General Location: Al-Dhabi, Oman
UTM: 527614 E, 2517642 N
Tower Shape: circular
Diameter: 45 m
References: Humphries 1974: 50; Hastings *et al.* 1975: 21 fig. 8; de Cardi *et al.* 1976: 163; Doe 1983: 65; Orchard and Stanger 1994: 75–79; Orchard 2000b: 171–172; Orchard 2000a: 215–216; Orchard and Orchard 2007: 146–147; Jean *et al.* 2023

The first mention of this tower comes from the Harvard Survey in 1973. Here, it was labelled at BB-19 (Humphries 1974: 50). In winter 1974/1975 it was revisited by the British Archaeological Expedition, who named it Site 37-4 in their classification system (de Cardi *et al.* 1976: 163). Years later, the Orchards' Al-Hajar

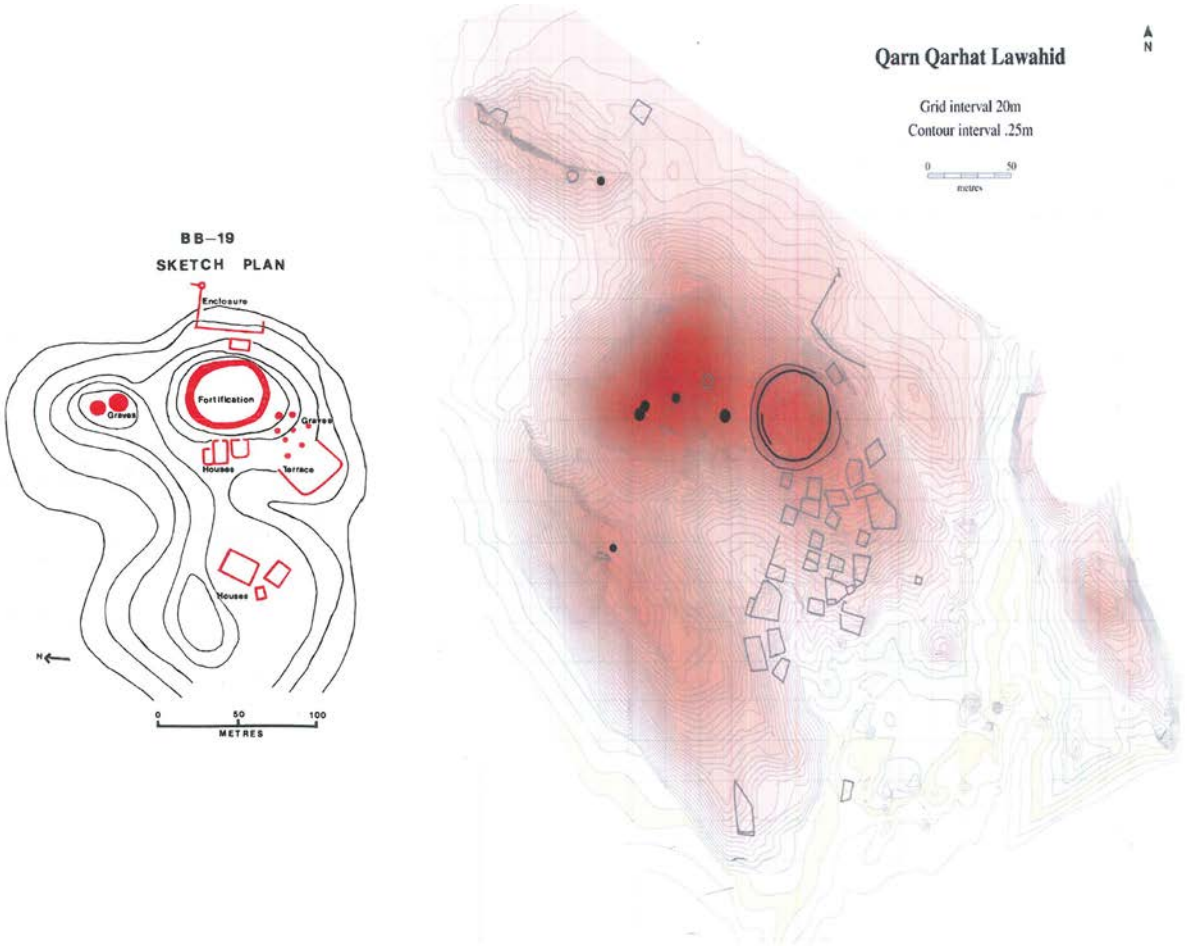


Figure 1.124. Ground plans of Qarn Qarhat La-Hwid and surroundings (left: Hasting *et al*. 1975: 21 fig. 8; right: Orchard and Orchard 2007: pl. 13).

Project conducted intensive mapping at the site, to which they refer to as Qarn Qarhat La-Hwid (Orchard and Stanger 1994: 75–79; Orchard 2000b, Orchard and Orchard 2007: 146–147). Excavations were limited to a small sounding against the southeastern wall footings of a house near the base of the southeastern slope of the tower (Orchard and Stanger 1994: 79). In 2019, the French Archaeological Mission in Central Oman (FAMCO) started excavating at the site focusing on the settlement. All pottery recovered was of a Mid to Late Umm an-Nar period date (Jean *et al*. 2023).

Qarn Qarhat La-Hwid is part of the very rich Early Bronze Age landscape of Bisya region. The site is located north of the confluence of Wadi Bahla and Wadi Sayfam in the region of the modern town of Bisya. Qarn Qarhat La-Hwid lies 550 m to the east of the tower Qarn Qantarat Nizwa, at the centre of a small rocky outcrop, which stands to a height of about 10 m above the surface of the wadi plain (Figure 1.124 and Figure 1.125). In the direct vicinity, some Hafit and Umm an-Nar period tombs are located, further can be found on most hills in the region (Orchard and Orchard 2007: 147, 161 pl. 9, 163 pl. 11).

According to the Orchards, at least two tiers can be reconstructed for the tower (Orchard 2000b: 171–172; Orchard and Orchard 2007: 146–147; Figure 1.126). The first one is an oval structure measuring 55 × 50 m, the second one is circular with 45 m in diameter. On the second one, traces of a third tier are visible on its western side. The first tier is believed to be a solid terrace with some traces of reinforcing walls still visible (Orchard and Stanger 1994: 75). The Orchards suggest access to the tower by a wide stairway on its southeastern side (Orchard and Orchard 2007: 147). The external ring walls of the circular tower have been

Figure 1.125. Aerial image of Qarn Qarhat La-Hwid.

built of massive limestone blocks. The size of the block ranges up to 2 × 0.75 × 0.5 m (Humphries 1974: 50; Figure 1.127). The circular wall itself is 2 m thick and has been preserved to a height of about 2 m on its southeastern end, which corresponds to five courses of stones (Orchard 2000b: 172). In the interior, parts of the bedrock are cropping out, but no other structures are visible. Surrounding the tower, several rectilinear walls are present that were noted by all expeditions (Hastings *et al.* 1975: 21 fig. 8; Orchard 2000b: 172; Orchard and Orchard 2007: pl. 13). They have been identified as several house structures, especially to the southeast, a large enclosure to the north, and a terrace to the southeast. The slope of the hill towards Wadi Bahla in the east seems to be the most densely occupied area. Here, Umm an-Nar pottery, which is generally present all over the site (Hastings *et al.* 1975: fig. 11), is found most frequently (Orchard 2000b: 172). In the northeast, there are the remains of a partially buried rectangular structure (Orchard and Stanger 1994: 79). Orientated approximately north–south, there is a long line of large stones (Orchard and Stanger 1994: 79). Two small circular structures with diameters of 6.2 and 6.5 m situated on the northern slope of the western summit and on the northwestern end of the rocky outcrop have been interpreted by Jocelyn Orchard as protective features (Orchard and Stanger 1994: 78). Possibly, they are the remains of Hafit period tombs. Other funerary monuments are only represented by a small group of Hafit period cairns on the western summit and a single Umm an-Nar period tomb on the northwestern end of the rocky outcrop (Orchard and Stanger 1994: 78).

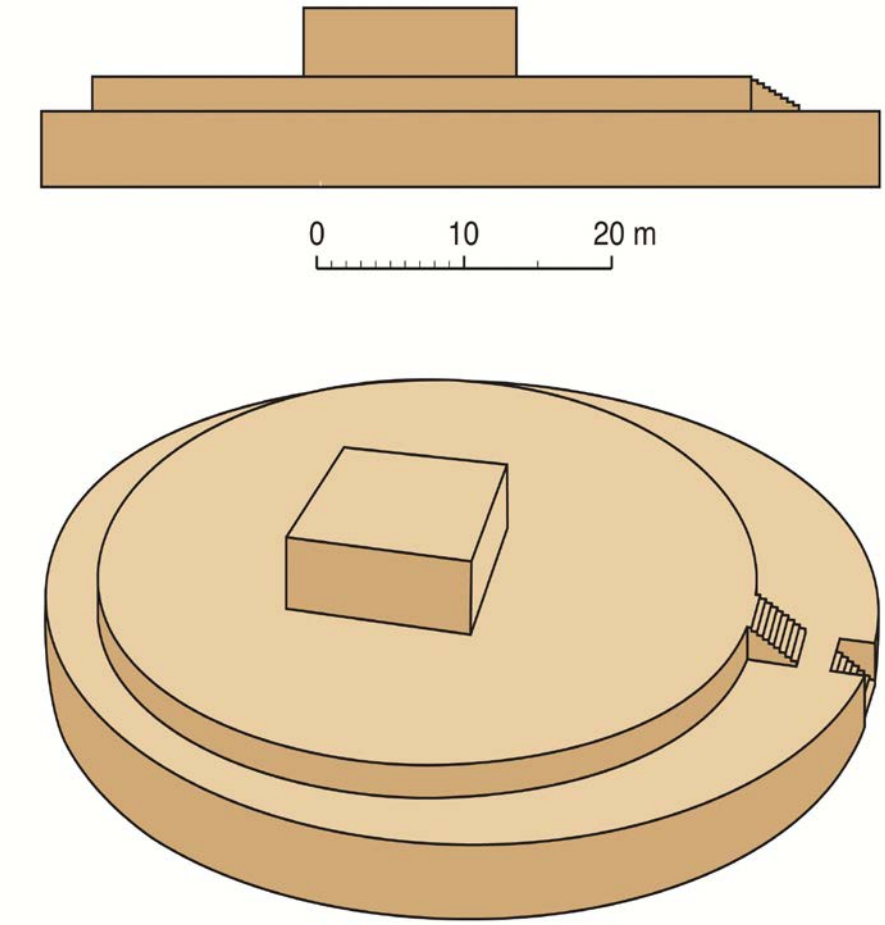


Figure 1.126. Reconstruction of Qarn Qarhat La-Hwid (Orchard and Orchard 2015: 102 fig. 7).

Figure 1.127. Detail of external ringwalls of Qarn Qarhat La-Hwid.

Suleiman Ali

Site: Suleiman Ali (b)

Other Names: Site 37-1, BB-20, DF1

General Location: Bisya, Oman

UTM: 526807 E, 2516504 N

Tower Shape: circular

Diameter: 30–32 m

References: Humphries 1974: 50; de Cardi *et al*. 1976: 163; Orchard and Stanger 1994: 73; Orchard 2000b: 172; Orchard 2000a: 216; Orchard and Orchard 2007: 147, 166

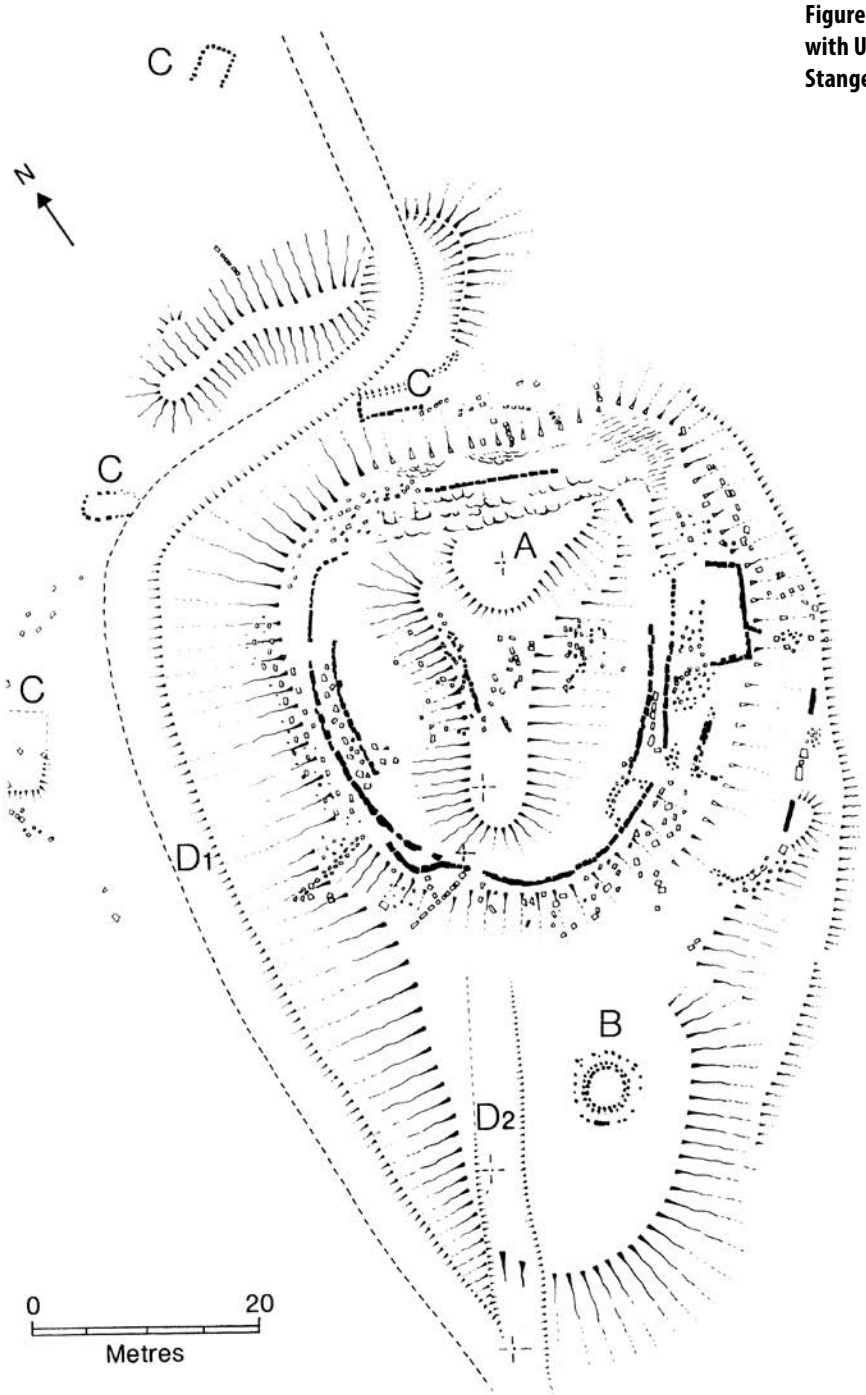


Figure 1.128. Map of Jebel Suleiman Ali (b) with Umm an-Nar tomb (B) (Orchard and Stanger 1994: 66 fig. 2).

Figure 1.129. Aerial image of Jebel Suleiman Ali (b).

Figure 1.130. Annex in the east of Jebel Suleiman Ali (b).

The tower Suleiman Ali (b) has first been mentioned in the publications of the Harvard Survey, which refers to it as BB-20 (Humphries 1974: 50). The British Archaeological Expedition gave it the name Site 37-1 (de Cardi *et al.* 1976: 163), the Al-Hajar Project the name Suleiman Ali (b). Suleiman Ali (a) refers to the nearby hill (Orchard 2000a: 216). Suleiman Ali (b) is located on a small, ovoid hill of thinly laminated ferruginous chert of a reddish-brown colour (Orchard and Stanger 1994: 73). The hill belongs to the western foothills of Jebel Hammah and is situated at the confluence of Wadi Bahla and Wadi Sayfam. The tower is located only 150 m to the north of the tower Building 1 (Figure 1.107). It features a double-skinned, oval, external wall measuring 32 to 35 m northwest to southeast and 30 m from southwest to northeast (Orchard and Stanger 1994: 73; Orchard 2000a: 216; Figure 1.128). The external wall was built of roughly square stone boulders, average 0.4 m (Figure 1.129). The space between the two skins of the wall is less than 0.5 m. As the stone from Jebel Suleiman Ali (b) itself are unsuitable for building blocks, the limestone for the tower had to be quarried from the neighbouring Jebel Suleiman Ali (a) (Orchard 2000a: 216). The external wall encompasses the summit of the hill, comparable to Jebel Juhelat at Bisya, Al-Khashbah Building II, and Al-Qarri castle in Al-Zebah. According to Jocelyn Orchard (Orchard 2000a: 216), rock fragments and reinforcement walls were utilized to form the core of the platform of the tower. Today, an 8.4 m long, straight row of stones is visible in the interior of the tower. At the eastern side of the external wall, there is a rectangular annex, measuring at least 7.7 m in length and 6 m in width, preserved to a height of 1.8 m (Orchard and Stanger 1994: 73; Figure 1.130). It was built of average 0.3 m height and 0.8 m long stone blocks. Jocelyn Orchard (Orchard 2000a: 216) interprets this as a halfway terrace or landing as part of a ramp or ramp-cum-staircase for accessing the tower, although she points out that access would have been easiest from the gentle slopping south-southwestern side (Orchard and Stanger 1994: 73).

No sherds have been found on the surface at Jebal Suleiman Ali (b) (Orchard and Stanger 1994: 73) and an Umm an-Nar tomb sitting on top of the tower debris at the south-southwestern slope (Figure 1.128) are a quite clear indicator for a date of the structure in the Hafit period.

Fell
Site: Fell
Other Names: none
General Location: Fell, Oman
UTM: 530861 E, 2506809 N
Tower Shape: circular
Diameter: unknown
References: none

This tower was discovered by Guillaume Gernez during his works at Bisya and Adam. It is situated approximately 8.5 km southeast of the modern town of Bisya, in the alluvial plain of Wadi Bahla. Its external ringwall is made of carefully placed stone slabs (Figure 1.131). No archaeological investigations have been carried out here to date.

Wezza
Site: Wezza
Other Names: Wedhha

Figure 1.131. Fell tower (photograph by Guillaume Gernez/FAMCO, used with kind permission).

Figure 1.132. Wezza tower (photograph by Guillaume Gernez/FAMCO, used with kind permission).

Figure 1.133. External ringwall of Wezza tower (photograph by Guillaume Gernez/FAMCO, used with kind permission).

General Location: Wezza, Oman
UTM: 519727 E, 2495379 N
Tower Shape: circular
Diameter: 21 m
References: Gernez 2015

This tower was discovered by Anne Mortimer through remote sensing and subsequently reported by Guillaume Gernez in 2015. It is situated near the village of Wezza, between Bisya and Adam. The tower is built of limestone and concrete slabs from the nearby wadi (Figure 1.132). Its external ringwall is preserved to a height of 1.6 m, which corresponds to three layers of stones (Figure 1.133).

Tanuf

The two towers of Tanuf are located 1.5 km southwest of the abandoned mudbrick village of Tanuf and 3 km east of Al-Rawdah in an area known as Tawi Sayf. They sit in a small gap between the up to 1000 m high southern foothills of the Al-Hajar mountain range. Archaeological research at the site has so far been limited to the visit of the British Archaeological Expedition in winter 1974/75 (de Cardi *et al.* 1976).

Tanuf 28
Site: Tanuf
Other Names: Site 28

General Location: Tanuf, Oman
UTM: 546786 E, 2548519 N
Tower Shape: circular
Diameter: 21 m
References: de Cardi *et al*. 1976: 160

Tanuf Site 28 is one of two towers discovered by Beatrice de Cardi near the modern village of Tanuf (de Cardi *et al*. 1976: 160). It is located right at the foot of the first range of the Al-Hajar Mountains, about 1.6 km to the west of Wadi Tanuf at the edge of the alluvial plain. The other tower, Site 29, is found only 30 m south of it. On the ridge of the first range of the Al-Hajar Mountains, there are several Hafit period cairns.

The tower itself is erected from large white boulders, forming a ringwall with a diameter of 21 m around a natural rock outcrop (de Cardi *et al*. 1976: 160; Figure 1.134). Attached to the east of the ringwall, there is a rectangular annex measuring approximately 6.5 m in width and 10 m in length (Figure 1.134 and Figure 1.135) that is reminiscent of the annexes of Bisya Building 1 and Building 3. It is built of the same stones as the ringwall of the tower. In the rocks surrounding the tower, two deep cavities of unknown purpose are present (Figure 1.136). A similar structure is known from Building V at Al-Khashbah. The surface finds collected by de Cardi were made up of Late Islamic and 19th century CE brown glazed pottery (de Cardi *et al*. 1976: 160). A lack of Umm an-Nar period pottery might be an indicator for a Hafit period date of the structure.

Figure 1.134. Aerial photo of Tanuf Site 28 with annex in the east.

Figure 1.135. Detail of the annex wall of Tanuf Site 28.

Figure 1.136. Two cavities in the rock surrounding Tanuf Site 28.

Tanuf 29
Site: Tanuf
Other Names: Site 29
General Location: Tanuf, Oman
UTM: 546705 E, 2548246 N
Tower Shape: circular
Diameter: 27 m
References: de Cardi *et al*. 1976: 161; Doe 1983: 68

Tanuf Site 29 is another tower that the British Archaeological Survey recorded in 1974/75. It is situated about 1.6 km to the west of the main wadi bed of Wadi Tanuf, at the western edge of an alluvial plain, approximately 350 m south of the first range of the Al-Hajar Mountains. Only 300 m to the north, there lies the other Early Bronze Age tower, Site 28. The only other known 3rd millennium BCE remains in the direct vicinity of these two structures are several Hafit period cairns located on the ridges of the Al-Hajar Mountains overlooking the plain. The tower is built on a natural low rock outcrop that is partly visible in its interior (de Cardi *et al*. 1976: 161). It features two concentric walls 3 m apart built of stone boulders, of which the inner one has a diameter of 20 m and the outer one of 27 m (Figure 1.137, Figure 1.138 and Figure 1.139). In total, the tower rises about 2 m above the modern ground level. Towers with two concentric ringwalls are also to be found at Bat Towers 1147 and 1156, and Bisya Building 2. De Cardi noticed two semi-circular stone installations in the interior. Most likely, they date to later than the tower. Other internal divisions are not visible. Two smaller circular stone structures measuring 3 to 4 m in diameter are attached to the external wall of the tower, one in the north and one in the west (de Cardi *et al*. 1976: 161).

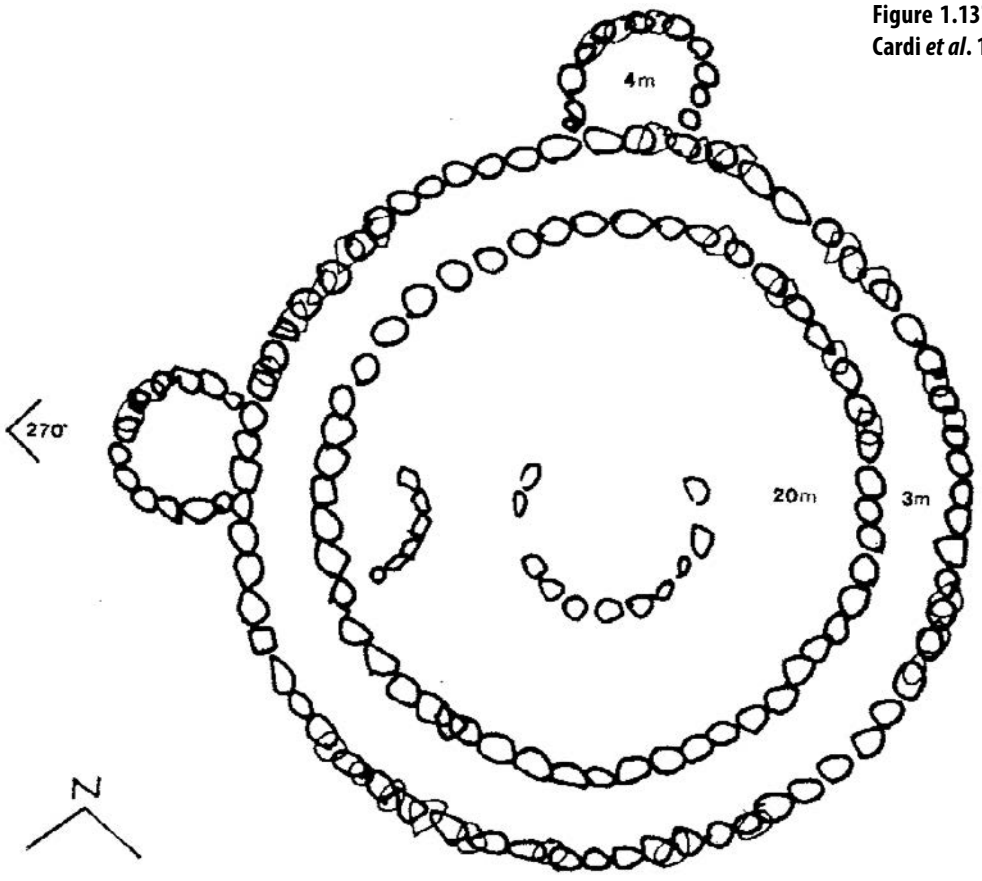


Figure 1.137. Plan of Tanuf Site 29 (de Cardi *et al*. 1976: 161 fig. 34).

Figure 1.138. Aerial photo of Tanuf Site 29.

Figure 1.139. External wall of Tanuf Site 29.

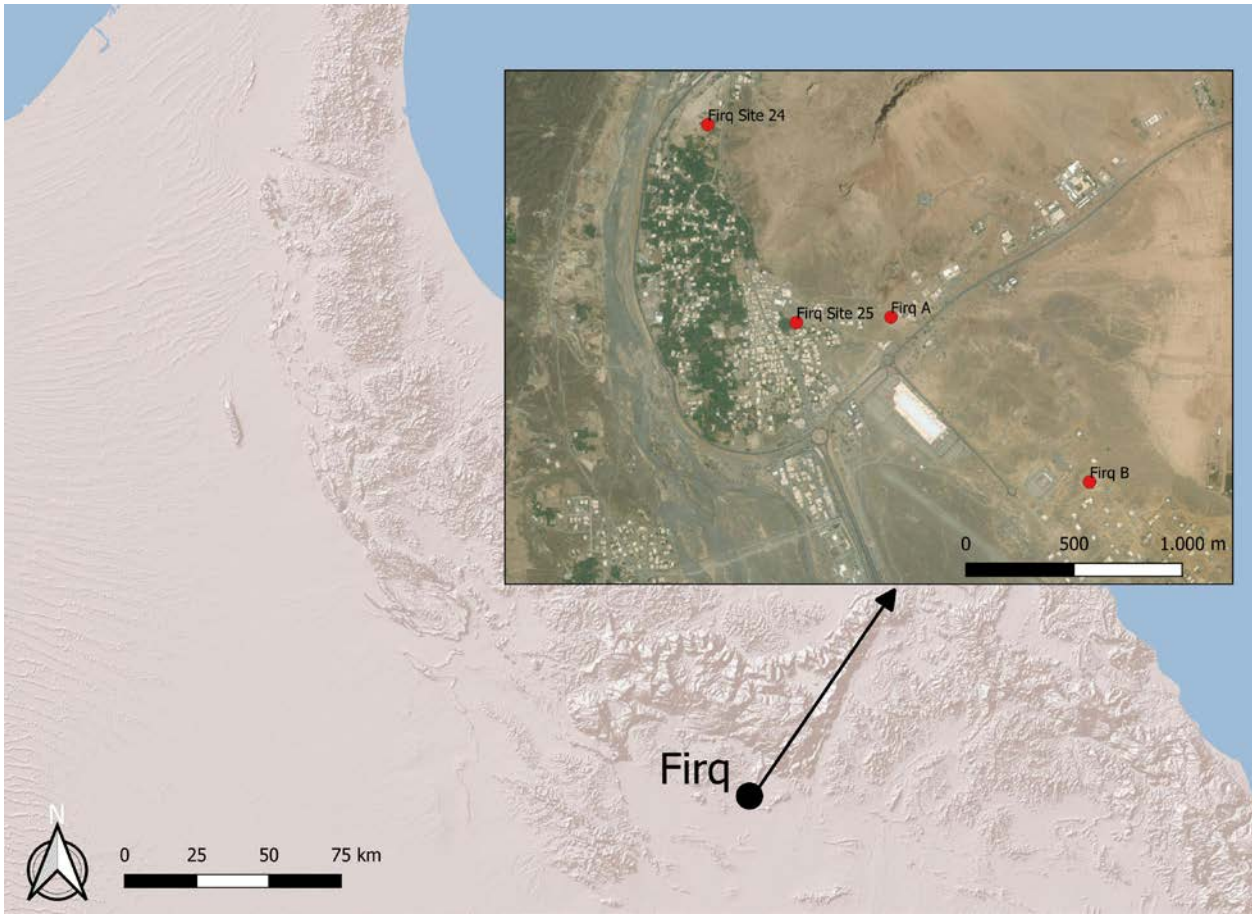


Figure 1.140. Overview map of towers at Firq.

Firq

The three towers of Firq are located just off the plain to the southwestern tip of Jebel Firq, on the eastern bank of Wadi Nizwa/Wadi Kalbu (Figure 1.140). Today they are surrounded by modern houses. They were first reported by the British Archaeological Expedition (de Cardi *et al*. 1976: 159–160) and subsequently visited by Jocelyn and Jeffrey Orchard (Orchard and Stanger 1994: 82; Orchard and Stanger 1999: 91 fn. 2). In their 1999 report, Orchard and Stanger refer to a fourth tower, southeast of the others that was already demolished when their article was published (Figure 1.140). At the initiative of the Ministry of Heritage and Culture (now Ministry of Heritage and Tourism), two of the towers, Firq 25 and Firq A, are fenced in to ensure their protection.

Firq 24
Site: Firq
Other Names: Site 24
General Location: Nizwa, Oman
UTM: 554236 E, 2531277 N
Tower Shape: circular
Diameter: 20 m
References: de Cardi *et al*. 1976: 159–160; Doe 1983: 67; Orchard and Stanger 1994: 82

Figure 1.141. Aerial image of Firq 24 tower.

Figure 1.142. Ringwall and remains of possible second ringwall of Firq 24 tower.

The tower Site 24 at Firq was first described by the British Archaeological Expedition in winter 1974/75 (de Cardi *et al.* 1976: 159). It is situated 150 m to the east of Wadi Nizwa, with the impressive Jebel Al-Nawrah in the background (Figure 1.141). It is the northernmost of the four towers at Firq. The external ringwall of the tower has a diameter of 20 m and is built of large, light-coloured boulders (Figure 1.142). It still reached a height of 2 m when de Cardi visited in in the 1970s (de Cardi *et al.* 1976: 159). Today, only the lowest row of stones is preserved. A second row of stones visible in the west possibly indicates that the tower was built with two concentric walls comparable to towers 1147 and 1156 in Bat, Tanuf 29, and Bisya Building 2. The interior of the tower is filled with mud and pebbles and, according to de Cardi, is raised about 1 m above ground level. No internal structures have been observed. According to de Cardi, surface material included only non-diagnostic fragments of buff and red-slip wares (de Cardi *et al.* 1976: 160).

Firq 25
Site: Firq
Other Names: Site 25
General Location: Nizwa, Oman
UTM: 554644 E, 2530365 N
Tower Shape: circular
Diameter: 28 m
References: de Cardi *et al.* 1976: 159–160, 184; Doe 1983: 67; Orchard and Stanger 1994: 82

Firq 25 is one of two towers situated in the foothills of Jebel Al-Nawrah that was already reported by de Cardi in 1976. She describes several gravel mounds approximately 200 m south of the tower that Jocelyn Orchard (Orchard and Stanger 1994: 82) interprets as house platforms or soil dumps from excavated fields. Today, this area is completely built up.

The tower measures 28 m in diameter (Figure 1.143 and Figure 1.144) and features a ringwall of large, light-coloured stone boulders (Figure 1.145) that is preserved to a height of 2 m (de Cardi *et al.* 1976: 160). At its northern side, some parts of the ringwall have been removed (Figure 1.146). The core stands to a total height of about 7 m above ground, which places the tower into the same structural group as Al-Khashbah Building II, Al-Qarri castle in Al-Zebah, and Jebel Suleiman Ali (b) and Jebel Juhelat at Bisya. No surface material was found by de Cardi (de Cardi *et al.* 1976: 160).

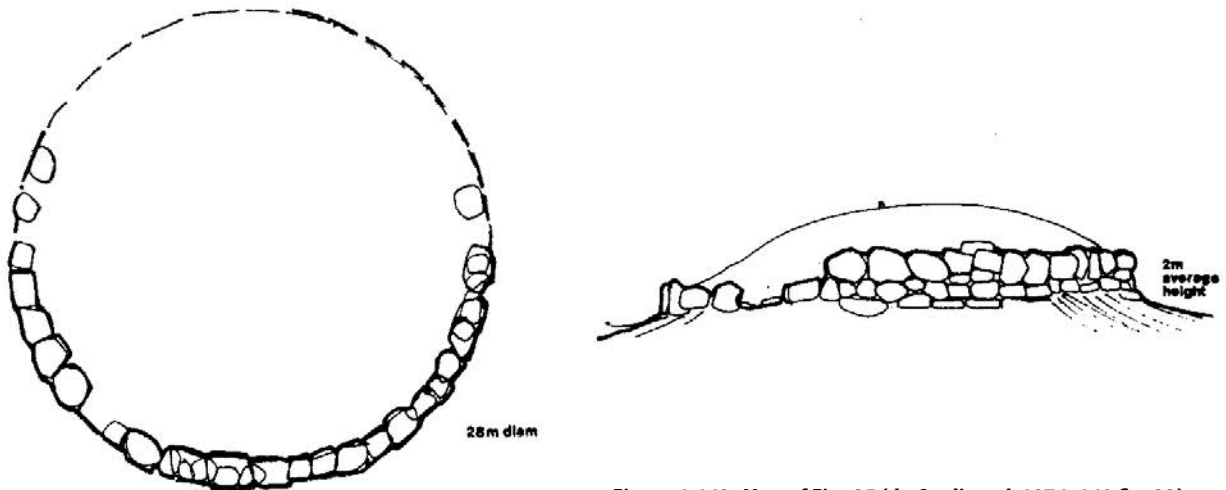


Figure 1.143. Map of Firq 25 (de Cardi *et al.* 1976: 160 fig. 33).

Figure 1.144. Aerial image of Firq 25 that indicated the missing of stones from the ringwall in the north.

Figure 1.145. Ringwall of Firq 25 with core raising up to 7 m above ground level.

Figure 1.146. Aerial image of Firq A tower.

Figure 1.147. Ringwall of Firq A tower.

Firq A
Site: Firq
Other Names: none
General Location: Nizwa, Oman
UTM: 555085 E, 2530383 N
Tower Shape: circular
Diameter: 21
References: Orchard and Stanger 1999: 91 fn. 2, 93 fig. 3; Orchard and Orchard 2007: pl. 7a

The third tower at Firq was reported by the Orchards in 1999 (Orchard and Stanger 1999: 91 fn. 2, 93 fig. 3). It is located only 400 m east of Firq 25. Not to confuse it with the other towers at the site, it is labelled here Firq A. The tower lies at the foothills south of Jebel Al-Nawrah. The circular tower measured 21 m in diameter and is built of large, light coloured stone boulders, very similar to the construction of Firq 24 (Figure 1.146 and Figure 1.147). No internal structures are visible on the surface.

Firq B
Site: Firq
Other Names: none
General Location: Nizwa, Oman
UTM: approx. 555999 E, 2529628 N
Tower Shape: circular
Diameter: unknown
References: Orchard and Stanger 1999: 91 fn. 2, 93 fig. 3; Orchard and Orchard 2007: pl. 7a

The fourth tower at Firq, labelled here Firq B, is only known from reports by Jocelyn and Jeffrey Orchard (Orchard and Stanger 1999: 91 fn. 2, 93 fig. 3; Orchard and Orchard 2007: pl. 7a). It is situated north of a small ridge with several Hafit period tombs, approximately 1 km southeast of Firq A. In 1999, when the Orchards first published details about this tower, it was already demolished. Today, modern houses cover this area.

Izki
Site: Izki
Other Names: Iz0005
General Location: Izki, Oman
UTM: 577478 E, 2535300 N
Tower Shape: circular
Diameter: 20 m
References: Costa 1988: 18; Schreiber 2007: 129-132

The tower Iz0005 was discovered by Paolo Costa (1988: 18) and more thoroughly described during the survey of the "Transformation Processes in Oasis Settlements of Oman" project by the Sultan Qaboos University, the University of Tübingen, the University of Stuttgart, the University of Kassel and the German Archaeological Institute in 2004 (Schreiber 2007). No excavations have taken place. Iz0005 is situated on the western bank of a tributary to Wadi Halfayn, directly opposite the modern oasis of Izki (Schreiber 2007: 129). The structure slopes to the east in the direction of the wadi, which is an odd location choice for a tower (Figure 1.148). It is clearly not the highest point in its surroundings. It is believed that the towers belong

Figure 1.148. Aerial image of Izki tower.

Figure 1.149. Detail of ringwall of Izki tower.

to an Umm an-Nar period settlement that lies approximately 100 m to the south of the tower on the same bank of the wadi. Several foundations and terraces could be identified in an area of 1 ha (Schreiber 2007: 130). The majority of the surface finds date to the Iron Age and only a few non-diagnostic Umm an-Nar period pottery sherds were present. Nevertheless, Schreiber (2007: 131) sees the foundations being made of large wadi pebbles dating to the Umm an-Nar period, while the smaller ones would date to the Iron Age. No Umm an-Nar period tombs are known from Izki. Schreiber (2007: 131–132) believes that, instead, Hafit period tombs were reused during the Umm an-Nar period.

The tower is built of massive stone boulders, which are preserved at its western side to a height of 1.5 m, which corresponds to three layers (Schreiber 2007: 129; Figure 1.149). The diameter of the external ringwall measures 20 m. No internal structures are present. Pottery sherds found in and around the tower suggest a date in the Umm an-Nar period (Schreiber 2007: 129). These are, however, only 24 in total (Schreiber 2007: 148–149), of which only one is a rim sherd. This belonged to a globular jar with black horizontal and wavy lines on its shoulder on a brown clay with red slip. In the interior of the towers, there are the foundations of a small rectangular building (3 × 5 m), which is believed to be later than the tower itself (Schreiber 2007: 129). To the west of the tower, there are five rectangular structures measuring approximately 2.5 × 4 m (Figure 1.148). They are made of the same huge boulders as the tower, but only the lowest course of their walls is preserved. They are tombs of the so-called Izki type, which dates to the Samad period (Schreiber 2007: 142).

Al-Ghoryeen

Ghoryeen is located on the western bank of Wadi Andam near the confluences with smaller wadis coming from the mountains, among them Wadi Mahram. Archaeological work concentrated in the past on the Early Bronze Age site north of the modern village, first discovered and documented during Nasser Al-Jahwari's Wadi Andam survey (Al-Jahwari 2008) and subsequently investigated by a team from Sultan Qaboos University (Al-Jahwari *et al.* 2020). A very recent addition is a second tower, situated a little upstream to a smaller wadi, discovered by the *Missione Archeologica della Sapienza nella Penisola Arabica e nel Golfo* (MASPAG) in 2022.

Al-Ghoryeen
Site: Al-Ghoryeen
Other Names: CS.2.52.1 (Al-Jahwari 2008), GH.S1 (Al-Jahwari *et al.* 2020)
General Location: Al-Ghoryeen, Oman
UTM: 604445 E, 2532407 N
Tower Shape: circular
Diameter: 20 m
References: Al-Jahwari 2008; Al-Jahwari *et al.* 2020; Douglas, personal comm.

First mentioned in Al-Jahwari's Wadi Andam survey (CS.2.52.1), the tower at Al-Ghoryeen was partially excavated in a 5 × 7 m large trench by the Department of Archaeology at Sultan Qaboos University in two field season in 2018 and 2019. It was labelled as GH.S1 (Al-Jahwari *et al.* 2020). It is part of an Umm an-Nar settlement on the western bank of Wadi Mahram, at the point where it meets the larger Wadi Andam. Near Al-Ghoryeen village, there is an Umm an-Nar settlement consisting of the round tower (GH.S1), and several houses and tombs (Al-Jahwari 2008: 515). The tower is situated on a flat area in the central part of the settlement.

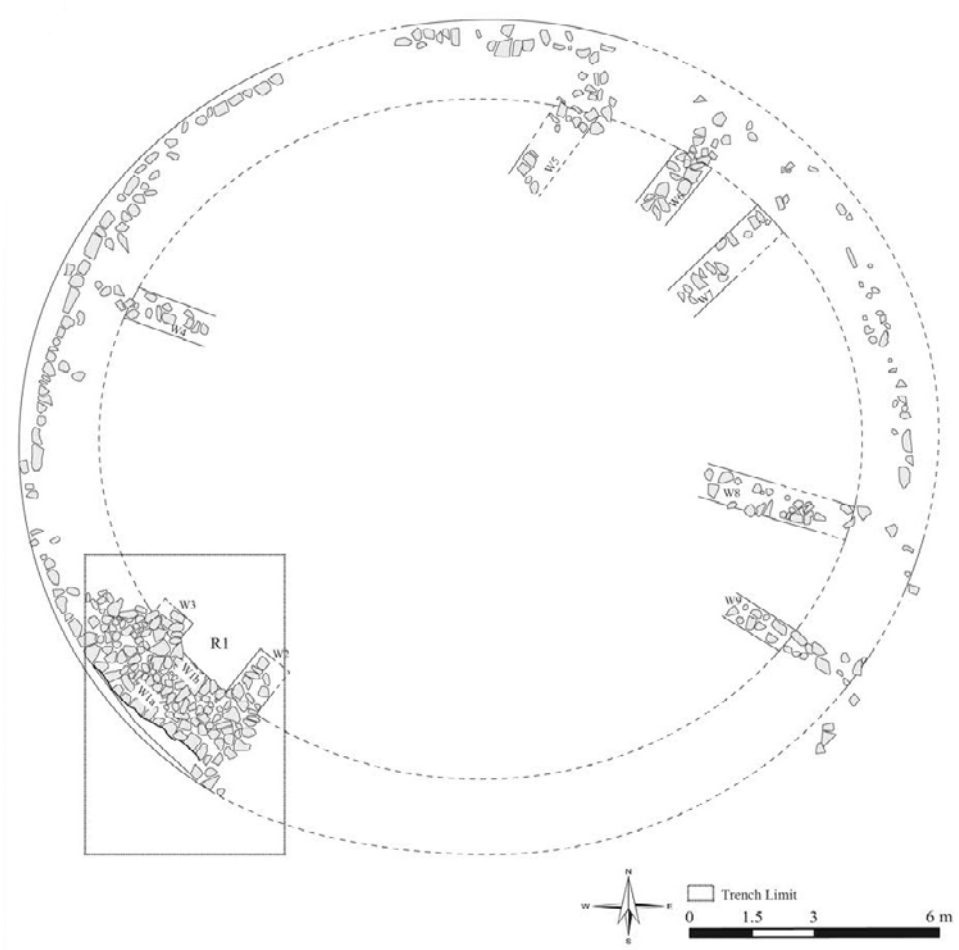


Figure 1.150. Map of GH.S1 (Al-Jahwari *et al*. 2020: fig. 5b, used with kind permission).

The tower has a circular shape with a diameter of 20 m (Douglas, personal communication; Figure 1.150 and Figure 1.151). Today the remains of the tower rise 3 m above the modern surface. Its external ringwall is built double-skinned with the external site made of yellowish limestone blocks and the internal one of fieldstones (Figure 1.152). The space in between is filled with medium sized fieldstones. The preserved height of the wall is 1.5 m, which corresponds to 12 to 14 irregular courses. At least three different phases can be differentiated at the external ringwall. The first phase represents the original façade of the tower from well-cut stone blocks. This is followed by a destruction layer in the second phase, where parts of the external side of the wall were destroyed. In the third phase, the destroyed part was replaced by a new wall that reused old stones and is of a more irregular fashion. At least two floor levels can be associated with these phases.

At least six division walls are visible from the surface in the interior of the tower (Figure 1.150; Al-Jahwari *et al*. 2020: 286). They run radially towards its centre. Most likely, there were originally up to 20. Outside the tower to the north, three heaps of stone seem to indicate some annexes. Finds from the excavations and the surface include sandy Umm an-Nar period pottery, ground stone tools and a particular shaped stone with a deep groove, probably a gutter stone. Two radiocarbon dates from charcoal were obtained. The first comes from the fill of the interior of the tower and dates to 2480–2344 cal. BCE (2-sigma, 95% probability), the second one from the oldest floor outside the tower which dates to 2462–2287 cal. BCE (2-sigma, 95% probability; Al-Jahwari *et al*. 2020: tab. 1). On top of the tower, there is a circular post-3rd millennium BCE burial (Figure 1.151).

Figure 1.151. Aerial image of GH.S1 after excavation with post-3rd millennium BCE burial on top (photograph by Khaled Douglas, used with kind permission).

Figure 1.152. Detail of ringwall of GH.S1 (photograph by Khaled Douglas, used with kind permission).

Figure 1.153. Tower MASPAG-3 (photograph by MASPAG, used with kind permission).

MASPAG-3
Site: MASPAG-3
Other Names: none
General Location: Al-Ghoryeen, Oman
UTM: 602210 E, 2534056 N
Tower Shape: circular
Diameter: unknown
References: Ramazzotti, Antinori and Genchi, personal comm.

Figure 1.154. Close-up of ringwall of tower MASPAG-3 (photograph by MASPAG, used with kind permission)

This site was discovered by the *Missione Archeologica della Sapienza nella Penisola Arabica e nel Golfo* (MASPAG) conducting remote sensing and subsequent ground-truthing in 2022 (Figure 1.153). It is situated on the western bank of a small tributary to Wadi Andam in the outskirts of the eastern Al-Hajar mountain range. The tower is built from large, dark brown boulders (Figure 1.154). No further archaeological work has been conducted here to date, but numerous Hafit period tombs have been noticed by the MASPAG team on the mountain ridges to the east of the tower.

Al-Moyassar

Al-Moyassar is situated only a few kilometers south of Samad Al-Shan, on the western side of Wadi Samad. After the initial discovery of the archaeological site of Al-Moyassar by the Harvard Archaeological Survey in winter 1973/1974, extended archaeological excavations were conducted here between 1979 and 1988 by the German Mining Museum Bochum und the direction of Gerd Weisgerber (Weisgerber 1980; 1981). The aim of this project was to gain insight into the metallurgical history of Oman. With its rich slag concentration on the surface, Al-Moyassar was deemed suitable to carry out such projects. Early Bronze Age remains were mainly uncovered with the settlement Maysar-1, the tower Maysar-25 and several 3rd millennium BCE tombs. As no final publication on the results of the excavations was issued before Weisgerber's death in 2010, Aydin Abar took on the task of processing the material in his doctoral thesis "Beyond the Ecstasy of Copper", which was completed in 2018. During that endeavour, he "discovered" another tower at Al-Moyassar, Structure 3 (Abar in prep.). This tower has been excavated by Weisgerber between 1979 and 1980 (Weisgerber 1980: 77–86), but due to its bad preservation, it was not recognized as a tower at that time.

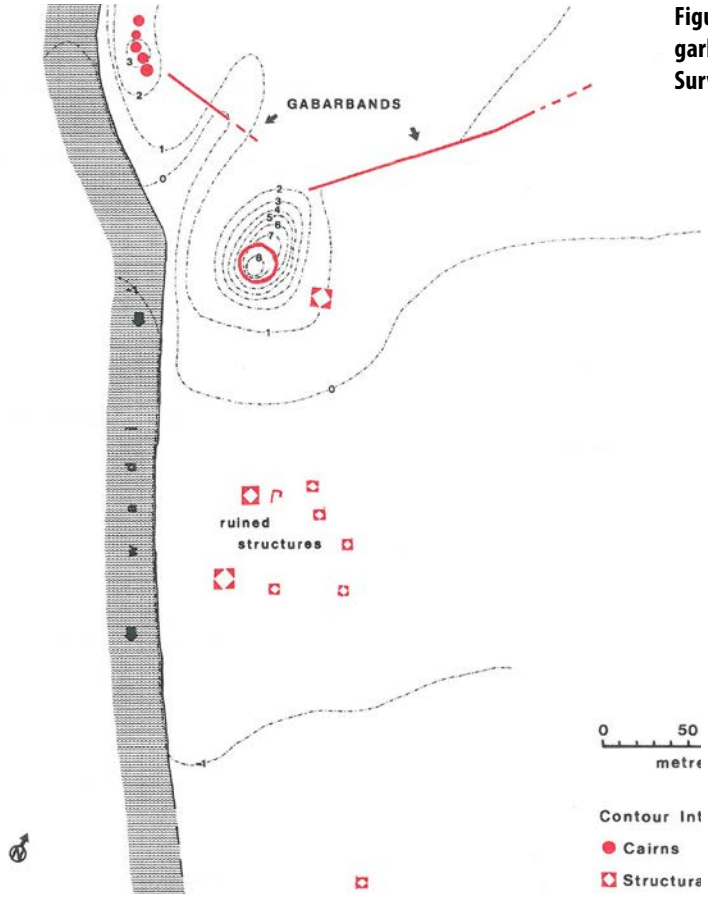


Figure 1.155. Location of tower Maysar-25 with two garbarbands identified by the Harvard Archaeological Survey (Hastings *et al*. 1975: 18 fig. 4).

Figure 1.156. Remains of the eastern garbarband.

Maysar-25
Site: Maysar-25
Other Names: Wadi Samad 4
General Location: Samad, Oman
UTM: 615210 E, 2519018 N
Tower Shape: circular
Diameter: 22 m
References: Hastings *et al*. 1975: 18, 38–39; Weisgerber 1981: 198–204; Abar in preparation

First mentioned in the Harvard Survey in winter 1973/1974 as Wadi Samad 4 (Hastings *et al*. 1975: 18; Figure 1.155), Maysar-25 has been intensively investigated by Gerd Weisgerber from the German Mining Museum Bochum between 1980 and 1981 (Weisgerber 1981: 198–204), who gave it its current name. The tower lies on the eastern bank of a small tributary to Wadi Samad, approximately 2 km to the south of the oasis of the modern village Al-Moyassar. It is a region with a rich archaeological heritage of the 3rd millennium BCE encompassing at least two areas with rectangular domestic architecture and intensive evidence for copper processing and several dozen Hafit and Umm an-Nar period tombs (Weisgerber 1980; 1981). The closest

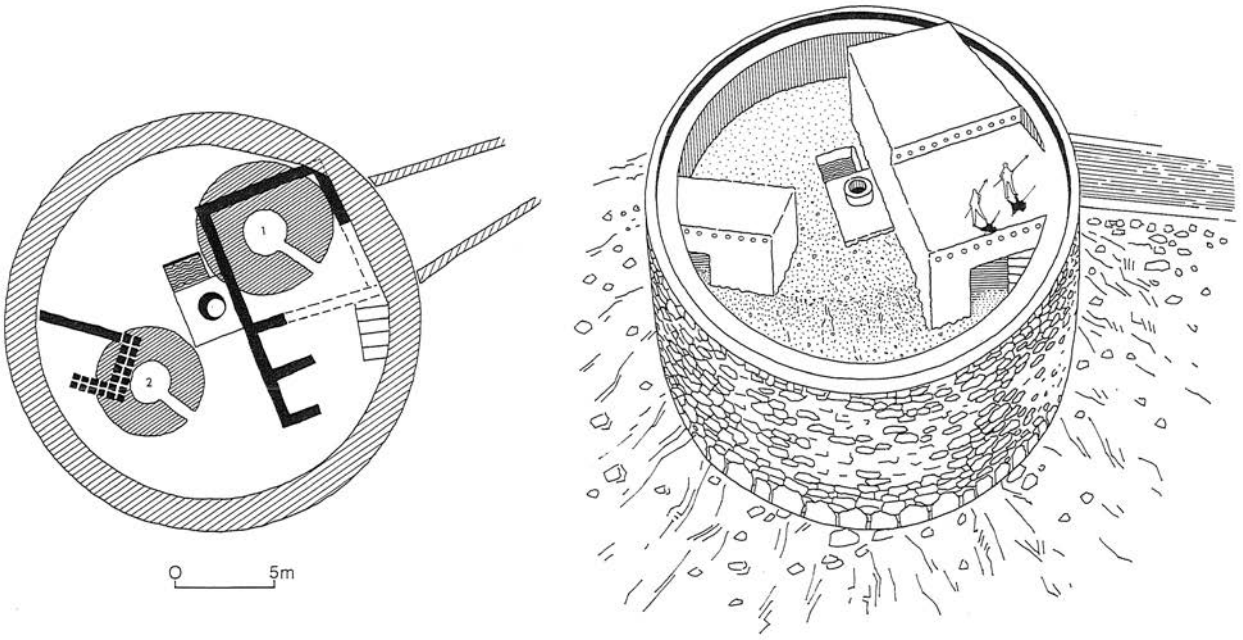


Figure 1.157. Map and reconstruction of tower Maysar-25 (Weisgerber 1981: 199 Abb. 27).

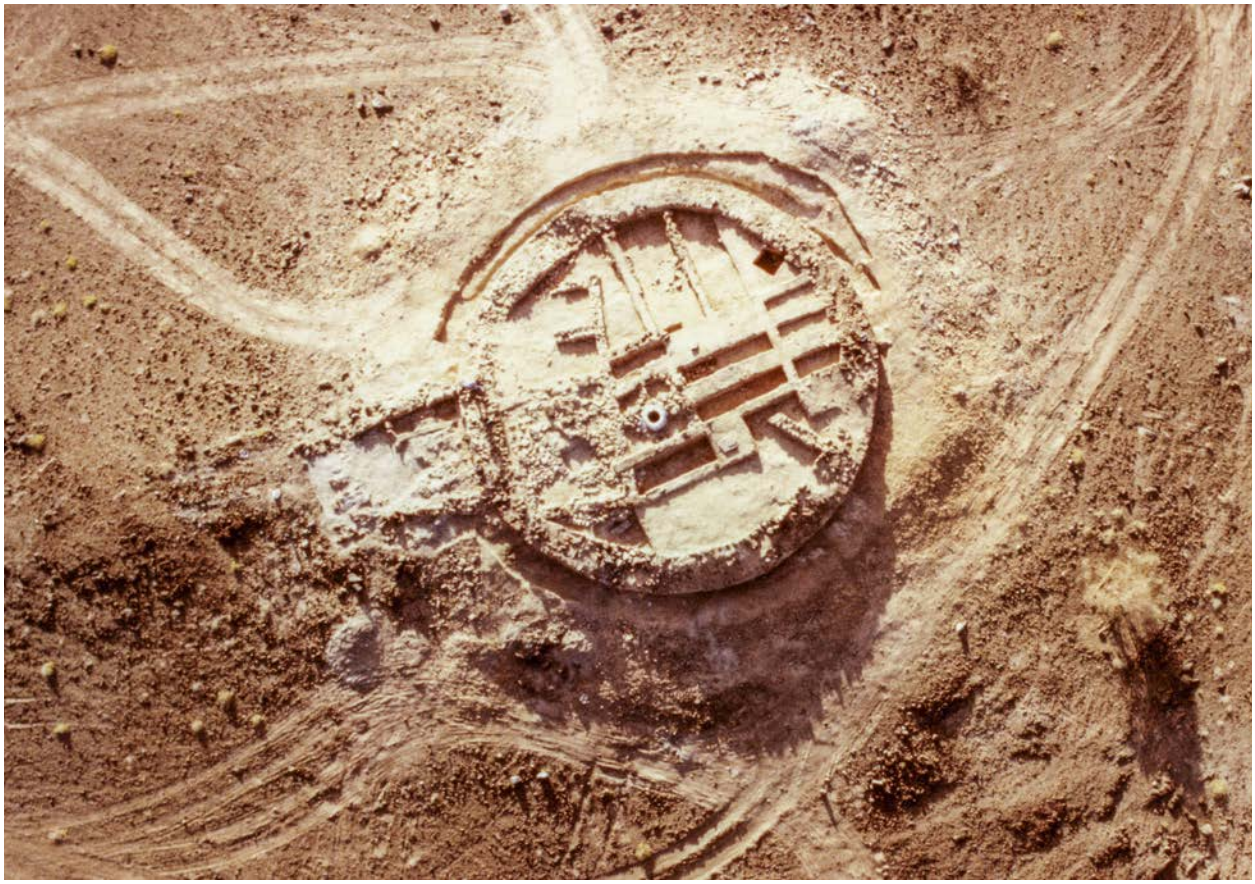


Figure 1.158. Kite image of tower Maysar-25 after excavation (photograph by the German Mining Museum, used with kind permission).

Umm an-Nar period tombs to the tower are located just 100 m to the northwest of Maysar-25. Hafit period tombs are to be found on the crests of the hills surrounding the site in the west and the east. The tower itself stands on a shallow hillock, which rises to a height of 6 m above the terrace and 12 m above the bottom of the wadi tributary (Weisgerber 1981: 198). The Harvard Archaeological Survey identified two garbarbands built of stones or barrages across the drainage (Hastings *et al.* 1975: 11; Figure 1.155 and Figure 1.156). Presumably, these barrages would serve the double purpose of trapping silt, and holding back the run-off sufficiently to encourage it to sink into the ground and create a reserve of water.

The tower Maysar-25 has an external diameter of 21.6 m and an internal one of 17.7 m (Weisgerber 1981: 201). According to Weisgerber (1980: 201), it is preserved to a height of 3 m, but this seems to include the natural hill, on which it stands, as well. The actual preserved height of the ringwall amounts to only 1.4 m (Abar in preparation). The external ringwall is 1.6 m thick and built of large stone blocks (60 × 40 × 40 cm) for the lower parts and smaller ones between 10 and 20 cm thickness on the top (Abar in preparation; Figure 1.159). Those large stone blocks were placed into a foundation trench that was dug into the bedrock (Weisgerber 1981: 201). Clay was used as mortar (Weisgerber 1980: 95). In the interior, two building complexes were differentiated: the northern one with three rectangular rooms, and a smaller southern one with an L-shaped wall (Figure 1.157). The lowest courses of their walls are made of stone, while the upper part was of made mudbrick. There are doorways in the western and eastern walls. In between those two structures, there is a central well with an adjacent clay basin. In the upper 2.8 m, the shaft of the well is built of stones; below, it cuts into the bedrock. It shows signs of deepening over the course of its use,

Figure 1.159. Detail of external ringwall of tower Maysar-25.

which indicates a lowering of the ground water table (Weisgerber 1981: 203). Within the fill of the well, a complete skeleton of a male adult was found together with grinding stones, indicating a deliberate blocking of the structure (Abar in preparation). The remains of a staircase with four steps are present adjoining the ringwall in the northeast. Weisgerber (1981: 200) points out rightly that this is a rather unusual organization of the interior space for towers, as most of them seem to be structured into small compartments that fill the whole of the space. A northern annex to the tower is created by two rather carelessly constructed walls that sit on the bedrock (Figure 1.158). The space between those two walls has been filled with earth and clay. It is interesting to note that the external ringwall of the tower in the space between the two walls of the annex has not been built carefully. For Weisgerber (1981: 201), this is a sign that one knew that it would not be visible. It is interpreted by Abar (in preparation) as part of an earthen ramp. The tower is dated by Weisgerber to the end of the Umm an-Nar period around 2200–1900 BCE (Weisgerber 1981: 198). This is based on radiocarbon dates for the settlement site Maysar-1 (Weisgerber 1981: 251 Tab. 2), which is located about 1 km to the northeast of the tower and believed to be contemporaneous. Third millennium BCE pottery has been found on the surface of the tower (Hastings *et al.* 1975: 38–39). The tower overlies two Hafit period tombs (Figure 1.157), one of which yielded Jemdet Nasr style pottery, a bronze needle and a flint blade. The other tomb is associated with black-on-grey ware imported from Baluchistan. As this pottery only appears in the Umm an-Nar period, the excavators assume that the tomb had been reused during this period (Weisgerber 1981: 199). There is also evidence for a Samad period tomb interred around 200 BCE in the ruins of the tower and a modern stone structure added to the site (Weisgerber 1981: 198).

Structure 3
Site: Structure 3
Other Names: none
General Location: Samad, Oman
UTM: 615876 E, 2519700 N
Tower Shape: circular
Diameter: 17 m (reconstructed)
References: Weisgerber 1980: 77–86; Abar in preparation

Structure 3 was excavated by the German Mining Museum Bochum between 1979 and 1980 (Weisgerber 1980; 1981), but it was only Aydin Abar (in preparation) who recognized it as the remains of the 3rd millennium BCE tower. It lies approximately 1.3 km to the south of the modern village of Al-Moyassar and is situated east of the house Structure 1 in the Umm an-Nar period settlement of Maysar-1, directly on the western bank of Wadi Samad. In fact, large parts of the tower were washed away by the wadi (Abar in preparation). All that remains today of Structure 3 is the southwestern quarter of the tower, although it seems that during the excavations in the 1980s, nearly the full external ringwall was preserved (Figure 1.160). The stone-built ringwall of the tower has a reconstructed external diameter of 17.5 m employing stones in sizes from 12 × 13 up to 50 × 30 cm laid in loamy mortar (Abar in preparation). It shows a rectangular extension towards the south, filled with mudbricks. Abar related this to the stepped layout of Al-Rojoom tower at Bat. In its interior remains of stone walls, rectangular compartments are visible. Additionally, a central well was excavated, whose upper 2.5 m of the shaft was stone-lined, while the lower part was dug directly in the compact marly soil, reaching a total depth of 14 m (Weisgerber 1980: 84–86). Finds from its fill were numerous and consisted amongst other things of several Umm an-Nar period pottery vessels and ground stone tools. A charcoal sample from stone packed below Structure 3 dates to 2565–2146 cal. BCE (Abar in preparation).

Figure 1.160. Structure 3 after excavations in 1980 (detail from Weisgerber 1980: Abb. 32, German Mining Museum, used with kind permission).

Al-Khashbah

Al-Khashbah, nested between the large wadis Andam and Samad in central Oman, was first mentioned in archaeological literature by Gerd Weisgerber (1980: 99–100), when he visited during his research at Al-Moyassar. He reported on four Bronze Age towers (Buildings III, IV, V and VI). In the following years until his death in 2010, he frequently visited the site and discovered four additional towers (Buildings I, II, VIII and IX). Between 2004 and 2006, Al-Khashbah was included in Nasser Al-Jahwari's Wadi Andam survey (Al-Jahwari 2008; Al-Jahwari and Kennet 2010). The rectangular Building IV especially attracted scholarly attention due to its unique shape. From 2015 to 2019 a team from the University of Tübingen conducted the first excavations at the towers of Al-Khashbah, especially at Building I and Building V (Schmidt *et al.* 2021). These excavations proved that both towers were built during the Hafit period, Building V as early as the end of the 4th millennium BCE. In the surveys from the Tübingen team, more towers were discovered, resulting in a total of ten towers at the site (discounting Building III, as upon revision it turned out not to be a 3rd millennium BCE structure).

The towers at Al-Khashbah are mainly found along a small mountain range, running east–west and thus at a right angle to Wadi Samad. Only Buildings X and XII are located further north on the eastern bank of a branch of Wadi Samad, and Building II on an isolated hill on the western bank of another branch of Wadi Samad (Figure 1.161).

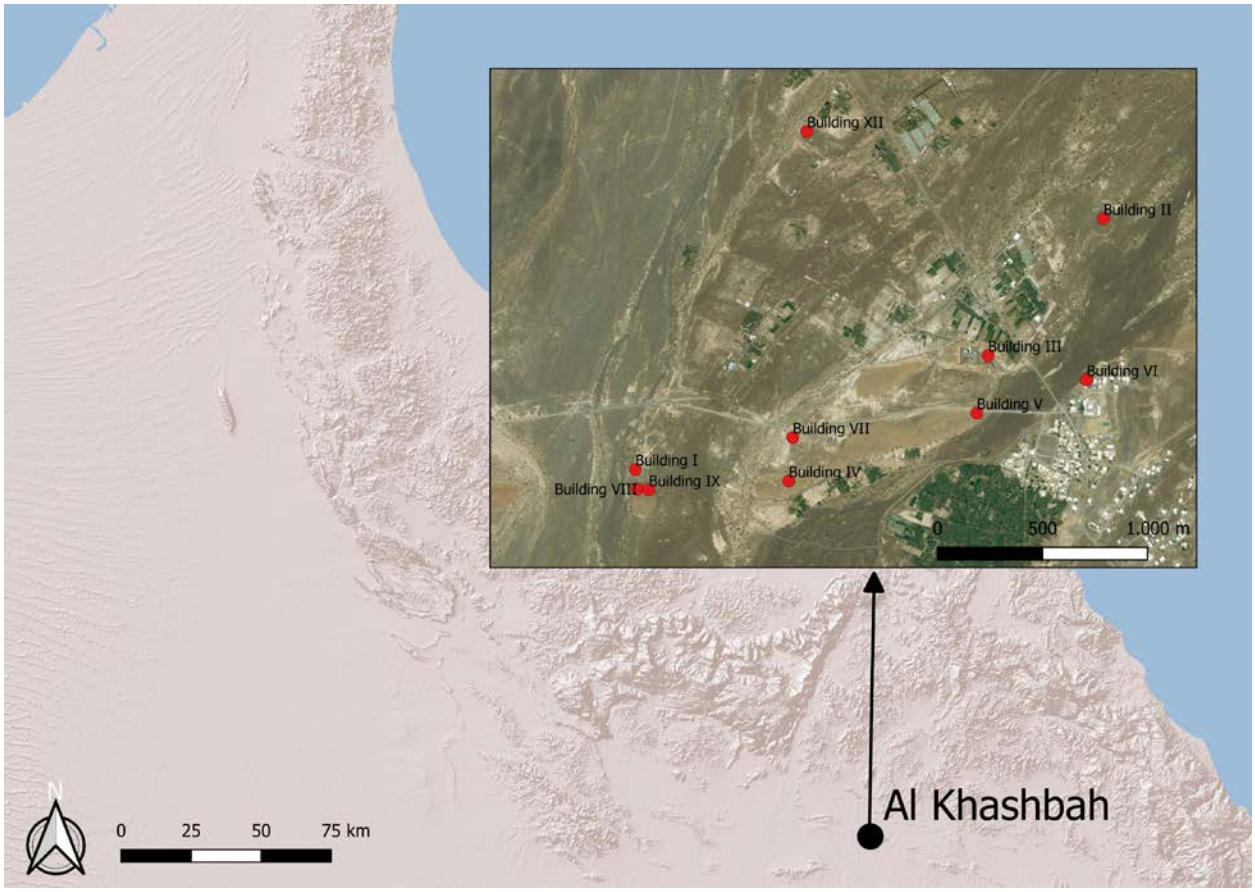


Figure 1.161. Overview map of towers at Al-Khashbah.

Building I

Site: Building I

Other Names: none

General Location: Al-Khashbah, Oman

UTM: 605066 E, 2506416 N

Tower Shape: sub-rectangular

Diameter: 25 m

References: Weisgerber 2005; Schmidt and Döpper 2017a: 146–152; Schmidt and Döpper 2017b: 219–221; Hermann *et al*. 2018; Schmidt and Döpper 2019: 265–270; Kluge 2021: 37–38

The site of Building I at Al-Khashbah was first discovered by Gerd Weisgerber from the German Mining Museum Bochum in 2005. Stone walls were visible on the surface, which he compared to those at Al-Moyassar. Together with the fact that flint and slag, but no sherds, could be encountered on the surface, led him to believe in the identification of a Hafit period village (Weisgerber 2005). In 2015, a new research project from the University of Tübingen started at the site, directed by Conrad Schmidt. Within the scope of the project, excavations at Building I were conducted between 2015 and 2018 (Schmidt and Döpper 2017: 146–152; 2017b: 219–221; 2019: 265–270).

Building I is located immediately on the eastern bank of a branch of Wadi Samad on a small natural elevation approximately 1 m in height (Figure 1.162). It is part of a very rich archaeological landscape

encompassing at least ten 3rd millennium BCE towers, more than 200 tombs and a small area with domestic architecture. Only 75 m to the south, there are the two stone-built towers Building VIII and Building IX, and 120 m to the northeast, there is the tower Building XI (Schmidt and Döpper 2018: 226 fig. 1). On the same hill as Building VIII and Building XI, there are some Hafit period tombs. A magnetic survey conducted in 2015 by Jason Hermann revealed at least three roughly rectangular structures (roughly 20 × 20 m), each surrounded by a large ditch (Hermann *et al*. 2018; Figure 1.163). The area surrounded by the ditches encompassed several mudbrick structures (Figure 1.164). Due to erosion and proximity of the surface, only one structure could be completely exposed, while the others were only partially preserved. Characteristic of these structures are small compartments similar to other towers. Usually, the mudbrick walls consist of a row of rectangular mudbricks edged by two half-sized rows of mudbrick. A variation of this kind of construction is a combination of mudbrick and stone (Figure 1.165). In this case, the two smaller mudbrick rows are replaced by stones. The southern part of Building I consists solely of stone architecture (Figure 1.164). There is a stone-paved corridor, which separates the outer wall from a square platform in the middle of the structure. The western part has been destroyed. The stone architecture exactly follows the edge of its surrounding ditch. In general, Building I offers close similarities to the mudbrick tower of Hili 8, phase I. The ditches surrounding the mudbrick structures are 4 m wide and up to 3 m deep. They were dug into natural, very homogeneous light-coloured soil. A well-constructed stone is situated in the middle of one of the ditches. It was built after sediments had already filled the ditch. Ditches are a common feature for towers located on the plain (Döpper 2018a).

Finds from Building I are, in the majority, chipped stone artefacts, ground-stone tools, beads and other objects of personal adornments including pendants and bracelets. Production debris from the stone tools as well as semi-finished beads (Schmidt and Döpper 2018: 270 fig. 6a) indicate the production of both chipped stone tools and beads at the site. Twenty radiocarbon dates from charcoal date Building I to around 2800 cal. BCE (2-sigma, 95% probability), i.e., the end of the Hafit period (Schmidt and Döpper 2017b: 224 fig. 14; 2018: 269 fig. 5).

Figure 1.162. Building I on the left bank of Wadi Samad with small hillock with Buildings VIII and IX in the background.

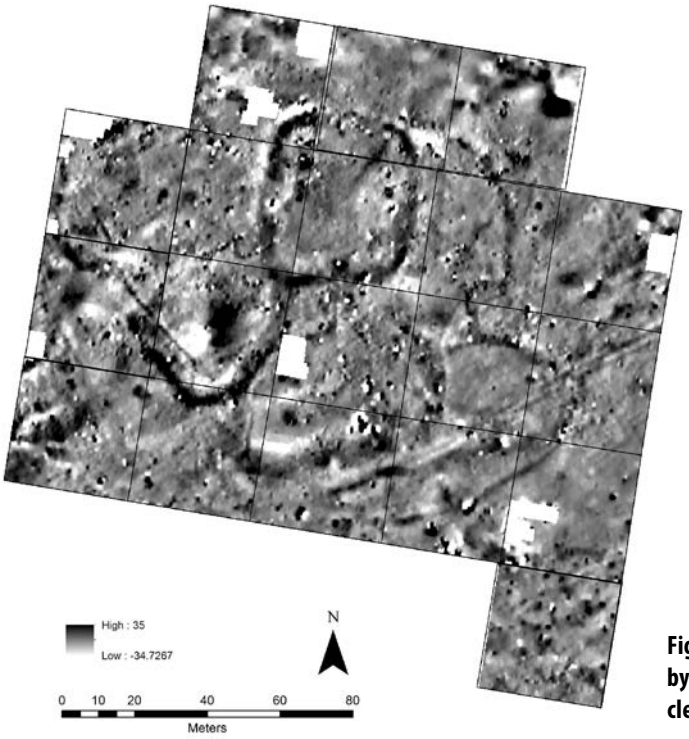


Figure 1.163. Results of the magnetometry survey conducted by Jason Herrmann of Building I. At least three ditches are clearly visible.

Figure 1.164. Map of Building I after excavation.

Figure 1.165. Mudbrick and stone architecture northeast of Building I.

Building II
Site: Building II
Other Names: none
General Location: Al-Khashbah, Oman
UTM: 607302 E, 2507600 N
Tower Shape: circular
Diameter: 28 m
References: Schmidt and Döpper 2017a: 153–155; Kluge 2021: 38–43

Building II was known to Gerd Weisgerber from his visits to Al-Khashbah, although he never published on it. The first small-scale excavations were conducted at Building II in 2015 by the University of Tübingen under the direction of Conrad Schmidt (Schmidt and Döpper 2017a: 153–155).

Building II is situated to the northeast of Al-Khashbah on a conical hill, directly west of Wadi Samad (Figure 1.166). The hill rises 17 m above its surroundings. The tower is one of at least eleven towers in Al-Khashbah, located only 350 m north of the tower Building III. Umm an-Nar period domestic architecture can be found 1.3 km to the east, and Umm an-Nar period tombs 2.5 km to the southwest, while Hafit period tombs are numerous on all surrounding hills. Several stone walls encircle the conical hill (Figure 1.167 and Figure 1.168). The top-most one is best-preserved; all others are widely eroded down the slope. This gives Building II a very similar layout to Jebel Suleiman Ali (b) and Jebel Juhelat at Bisya as well as Al-Qarri castle in Al-Zebah. The ringwall of the tower is a double-skinned wall, whose stones measure 0.4 to 0.6 m in length and approximately 0.3 m in width (Figure 1.169). The wall is preserved to a height of up to six layers. In the northeast, inside the tower, a stone floor was found during the excavations (Schmidt and Döpper 2017a: 153). Here, the ringwall shows two protruding ends, probably marking an entrance. Some Umm an-Nar period pottery sherds were found at the surface of Building II as well as during the excavations (Schmidt and Döpper 2017a: 154 Abb. 33). Five radiocarbon dates from charcoal fall around 2600 cal. BCE (2-sigma, 95% probability), i.e., the Early Umm an-Nar period (Schmidt and Döpper 2017a: 155, Tab. 3).

Figure 1.166. Building II on top of a small hill next to Wadi Samad.

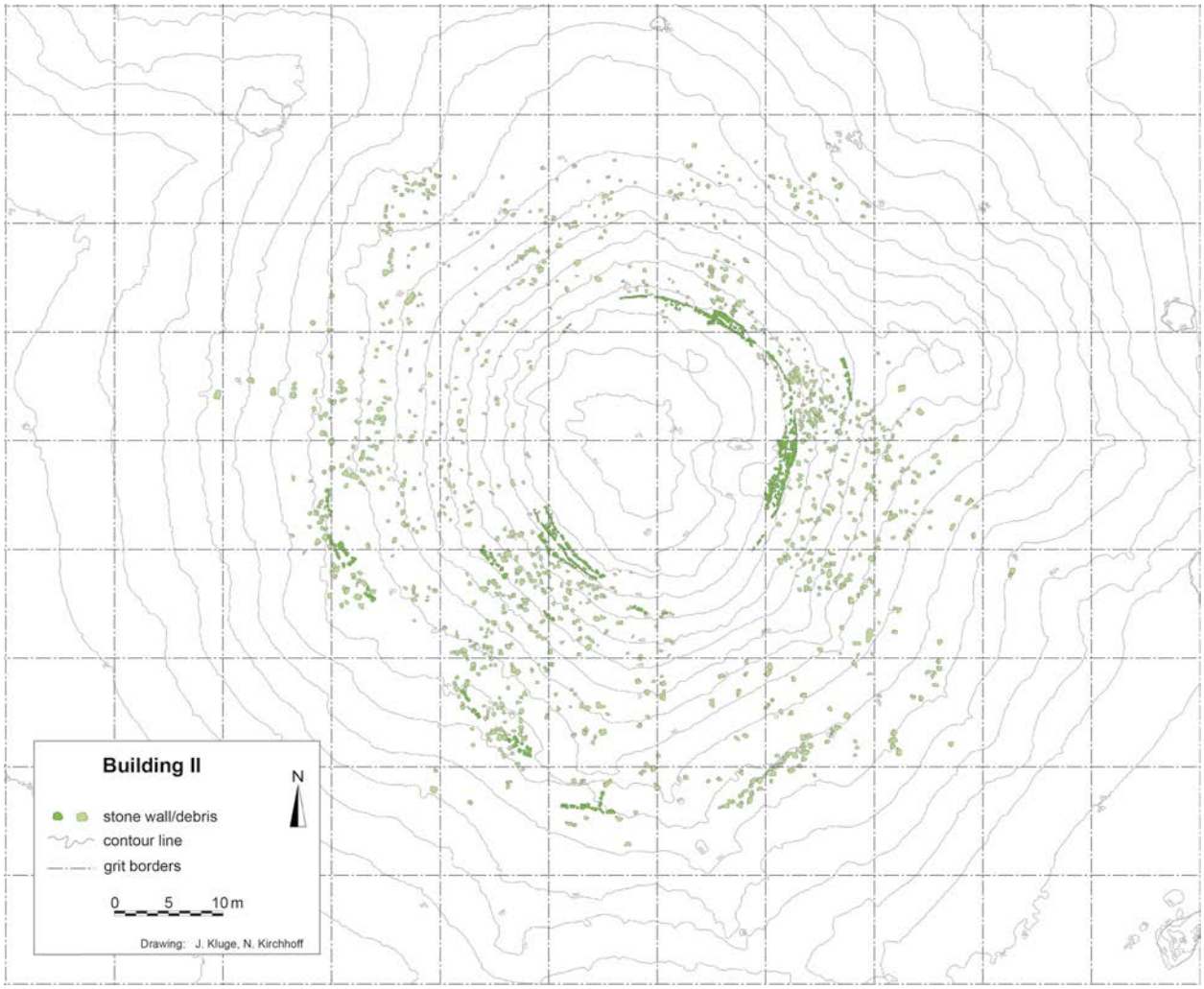


Figure 1.167. Map of Building II.

Figure 1.168. Aerial image of Building II.

Figure 1.169. Detail of external ringwall of Building II.

Building III
Site: Building III
Other Names: Structure 2 (Yule)
General Location: Al-Khashbah, Oman
UTM: approx. 606758 E, 2506950 N
Tower Shape: circular
Diameter: unknown
References: Weisgerber 1980: 100; Yule 2011; Kluge 2021: 43–44

Frist mentioned by Gerd Weisgerber from the German Mining Museum Bochum in his 1980 report (Weisgerber 1980: 100), it is referred in a map by Yule (2011) as Structure 2. Today, the area is completely remodelled as a water tower has been built in its place. Remarkably, aerial photos from 1981 show no structure can be recognized and there are no photos of this alleged tower. Therefore, there are some doubts to its existence at all. Building III is said to be situated on the western bank of Wadi Samad on the eastern end of a small, oval hill. It lies only 300 m to the north of tower Building V and 500 m to the west of the tower Building VI. Hafit period tombs were once present on the hill, but most of them were destroyed during the construction of the modern water tower. No description of this tower has ever been published other than that it is circular, and that the pottery found on the surface looked mediaeval (Weisgerber 1980: 100).

Building IV
Site: Building IV
Other Names: Structure 1 (Al-Jahwari and Kennet), Structure 5 (Yule), Al-Hind
General Location: Al-Khashbah, Oman
UTM: 605780 E, 2506342 N
Tower Shape: rectangular
Diameter: 29.5 × 30 m
References: Weisgerber 1980: 99–100; Yule 2001: 384, Taf. 511; Al-Jahwari and Kennet 2010: 203–205; Yule 2011; Schmidt and Döpper 2017a, 132–133; Schmidt and Döpper 2017b, 217–218; Kluge 2021: 44–49

Figure 1.170. Aerial image of Building IV at Al-Khashbah.

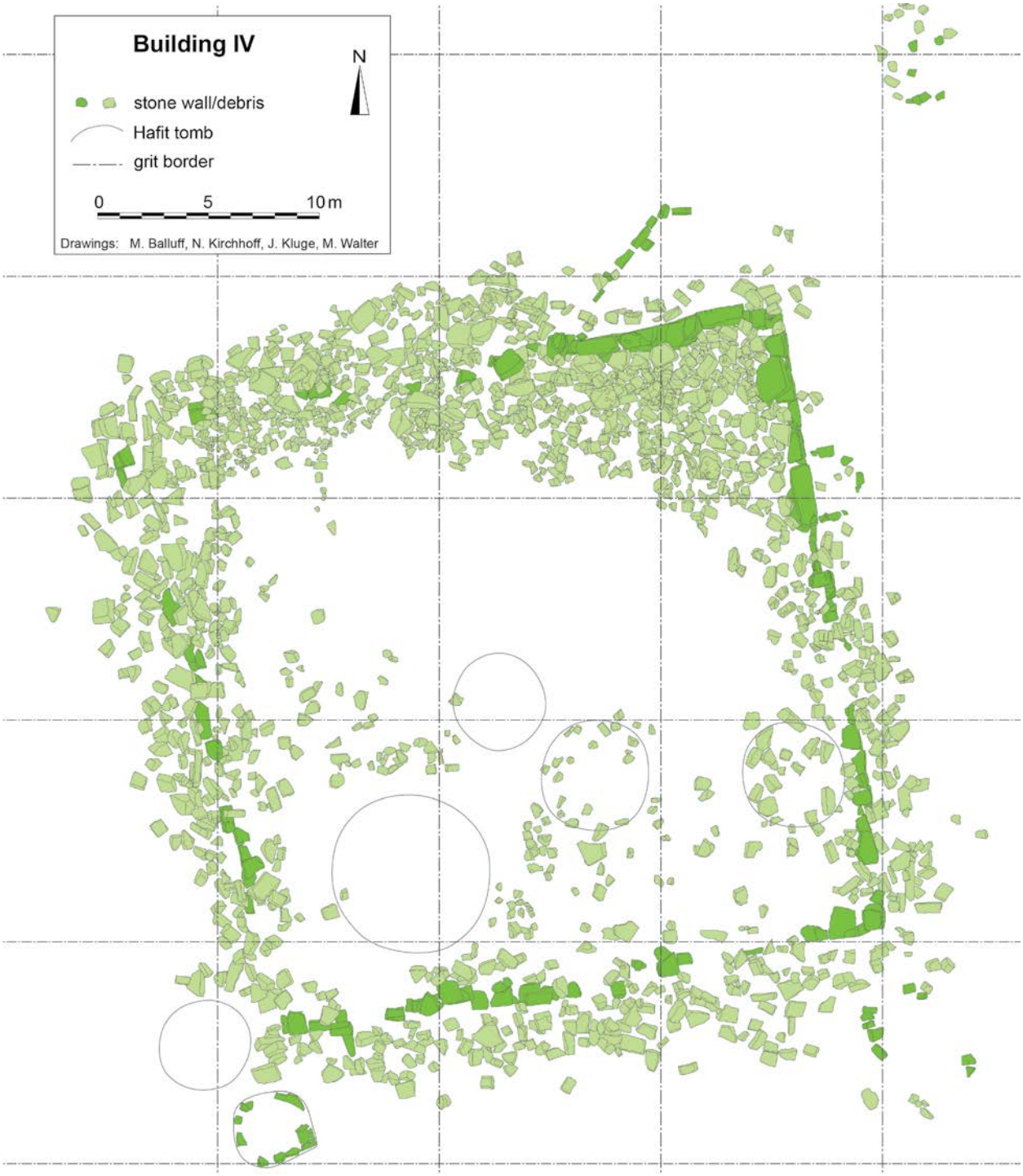


Figure 1.171. Map of Building IV at Al-Khashbah.

Building IV was discovered by Gerd Weisgerber from the German Mining Museum Bochum in the late 1970s (Weisgerber 1980: 99–100) and since then attracted much scholarly attention as it is the only known rectangular tower of the 3rd millennium BCE. Paul Yule as well as Nasser Al-Jahwari and Derek Kennet intensively mapped the tower and its internal structures (Yule 2001: 384; Al-Jahwari and Kennet 2010: 203–205). Between 2015 and 2016, a team from the University of Tübingen headed by Conrad Schmidt documented the site including its nearly 100 petroglyphs (Schmidt and Döpper 2017a: 132; 2017b: 217–218). No excavations have been taken place so far.

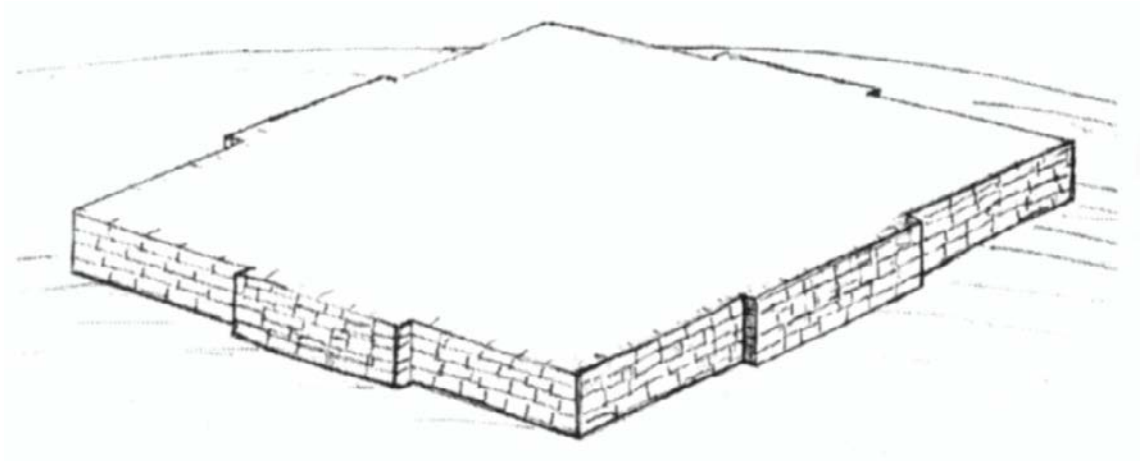


Figure 1.172. Reconstruction of Building IV as massive platform (Al-Jahwari and Kennet 2010: 204 fig. 4).

Building IV is situated approximately 150 m west of Wadi Samad near the western end of an oval, 1 km long hill, on whose eastern end the tower Building V is located. On the ridge of the hill, there are numerous Hafit period tombs. Tower Building VII lies only 170 m to the north of Building IV and the Umm an-Nar period tombs of Al-Khashbah are found 450 m to the southwest. Thus, it is placed centrally in the 3rd millennium archaeological landscape of the site. Building IV is characterized by four sides, almost equal in length from 29.5 to 30 m (Figure 1.170 and Figure 1.171).

Figure 1.173. Detail of external wall of Building IV.

On each side, the wall forms an outward extension or projection (Figure 1.174). Those projections have a length of 10 m and are 0.45 m wide. On the eastern side, the extension does not sit in the middle but is slightly shifted towards the south. The walls are constructed of large stone blocks, measuring up to 2 m in length, 1 m in width and 0.5 m in height (Figure 1.173). In the northeast, where the wall is best preserved, six layers are visible, measuring 2.4 m in height together. The thickness of the walls varies considerably between 0.55 and 1.4 m. This is due to a very uneven appearance of the internal side of the wall. At the eastern side, where the projection is slightly off-centre, there is an exceptionally large stone block, measuring 2.67 × 0.83 × 0.45 m. This possibly marks the entrance of the building. Close to this possible entrance, a displaced stone block was discovered by Weisgerber with a 0.25 m deep depression that showed considerable use (Weisgerber 1980: 100). He interprets it as a door hinge and suggests massive gates. The 2015 survey of the University of Tübingen discovered a stone with depression, which might be the same as mentioned by Weisgerber, but located at the northwestern corner of the building and thus not in the direct vicinity of the possible entrance. Paul Yule reconstructs several straight walls in the interior as well as a small rectangle in its southeastern corner (Yule 2001: Taf. 511). This could not be confirmed in the work of the University of Tübingen (Figure 1.171). Al-Jahwari and Kennet (2010: 204) assume that Building IV was a raised platform (Figure 1.172), but nothing of its supposed fill remained. Building IV superimposes at least four Hafit period tombs, although Al-Jahwari and Kennet (2010: 204), assume that those post-date the structure.

Outside the building, there are several further walls and stone structures. A 6 m long stone wall is present to the north of the building, running southwest–northeast and then turning to the east. It is made

Figure 1.174. Detail of projection of Building IV.

of upright standing stones, which argue for a later date than the Umm an-Nar period. Approximately 20 m south of the southwestern corner of the building, there is another stone wall, measuring 5 m in length. This wall is possibly also later and recycles stones from Building IV. Fifteen meters to the northeast of Building IV, there is a 25 m long double-faced wall that runs down the slope of the hill. It is 1.20 m wide and only one course of stones is preserved. Its construction techniques argue for a date in the Umm an-Nar period. A rectangular structure, 3 m in length and width, is situated to the south of the southwestern corner of Building IV. Its interior is filled with stones and soil. Umm an-Nar pottery found in large quantities on the surface (Schmidt and Döpper 2017a: 133 Abb. 12) give an indication of the date for this structure.

Building V
Site: Building V
Other Names: Structure 3 (Yule; Al-Jahwari and Kennet 2010)
General Location: Al-Khashbah, Oman
UTM: 606690 E, 2506667 N
Tower Shape: circular
Diameter: 25 m
References: Weisgerber 1980: 99–100; Al-Jahwari and Kennet 2010: 205; Schmidt and Döpper 2017a: 141–145; Schmidt and Döpper 2017b: 219; Schmidt and Döpper 2019: 270–273; Döpper and Schmidt 2019; Kluge 2021: 49–52

Building V was discovered by Gerd Weisgerber from the German Mining Museum Bochum in the late 1970s (Weisgerber 1980: 99–100). He describes it at the southern one of two round towers on either side of Wadi Samad, the northern one being Building VI. Excavations of this building were conducted between 2015 and 2019 by a team from the University of Tübingen directed by Conrad Schmidt.

The tower is situated on the easternmost edge of a 1 km long hill, directly on the western bank of Wadi Samad, opposite the modern oasis (Figure 1.175). On the hill, a row of Hafit period tombs stretch up to its western end, where Building IV is located. The distance to Building VI on the other side of the wadi, now destroyed, is 620 m. The ringwall of Building V has a diameter of 25 m and is built of large stone blocks,

Figure 1.175. Aerial image of Building V at Al-Khashbah.

on average 0.8 m long, 0.5 m wide, and 0.4 m high (Figure 1.176). The stone ringwall is preserved to a maximum height of 1.5 m, which corresponds to five courses of stones (Figure 1.177). Interestingly, it is not the oldest phase of Building V, but replaces a former mudbrick wall at the same location, of which only fragmentary sections have survived (Schmidt and Döpper 2019: 270–272). The foundation pit for the stone wall, which cuts approximately 20 cm into the bedrock, was so broad that a massive packing of large stones was necessary to fill the gap. In the interior, at least eleven compartments of mudbrick and stone walls are visible (Figure 1.176 and Figure 1.178). While the eastern part of the excavated area is dominated by stone walls, the western part is solely made up of mudbrick architecture. Occasionally, stone and mudbrick walls are used together. At a later stage, some stone walls were added to the compartments. Unlike most of the other walls, they do not rest on the bedrock but on the accumulation of debris that fills the rooms. None of these compartments showed any indications of doorways.

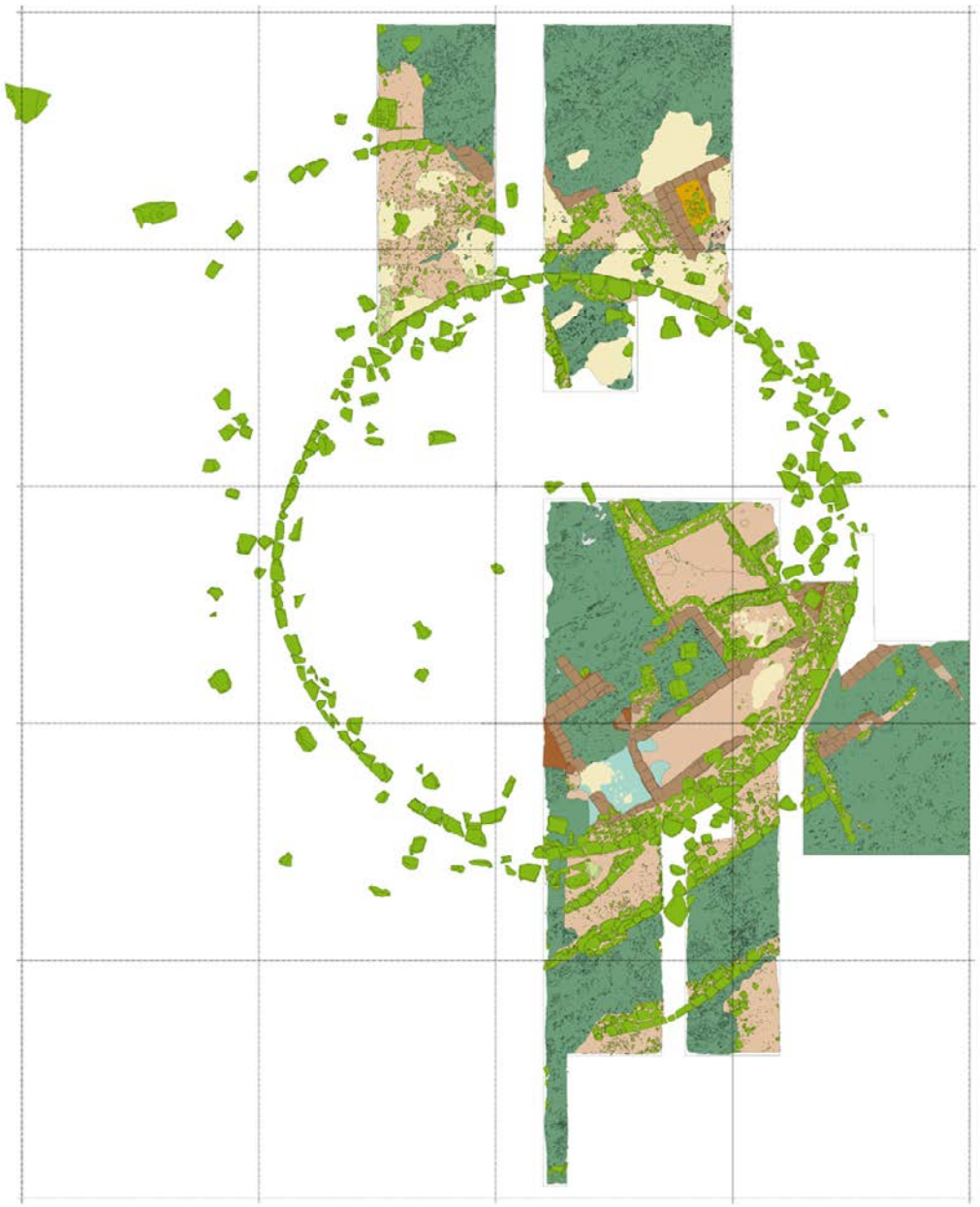


Figure 1.176. Map of Building V at Al-Khashbah.

Figure 1.177. External stone ringwall of Building V at Al-Khashbah.

Figure 1.178. Mudbrick wall of compartment in the interior of Building V Al-Khashbah.

A magnetometer prospection conducted by Jason Herrmann in 2015 provided little information on surrounding structures that were not visible on the surface (Schmidt and Döpper 2017a: 137 Abb. 17 left). This includes a wall to the northwest, which curves at a similar degree to the stone ringwall of the tower. To the west of it, there is a boulder, which features a tapered depression. It has possibly been used as a mortar. Furthermore, excavations to the southeast and to the northeast of the tower revealed a complex arrangement of stone and mudbrick walls, forming various rooms and activity zones. To the south, there are three stone walls that run parallel to neither the outer ringwall of the tower nor to each other. East of these walls, an array of stone and mudbrick walls has been uncovered, forming at least one rectangular room.

Directly above the bedrock inside and outside the tower, thousands of furnace and crucible fragments, prills and copper-rich slag were found indicating that Building V had a specialized function as a copper workshop. Other finds include large ground-stone tools, most likely used to grind copper during processing, as well as hammer stones for crushing the ore or slag. No pottery was found during the excavations. Twelve charcoal samples from the accumulations outside the ringwall, from fire pits on the bedrock on which the tower is founded and from the rooms inside the building, are all associated with substantial copper processing debris, give consistent dates to the early Hafit period, around 3200 cal. BCE (2-sigma, 95% probability; Schmidt and Döpper 2019: 273 fig. 10). A second group of eight charcoal samples dates to the very end of the Hafit period, around 2800 to 2700 cal. BCE (2-sigma, 95% probability). These samples come from a yellowish material close to the surface sealing the 4th millennium remains.

Building VI

Site: Building VI
Other Names: Structure 4 (Al-Jahwari and Kennet), Structure 1 (Yule), Tamr Hansel, Tauer Ḥanthel
General Location: Al-Khashbah, Oman
UTM: approx. 607225 E, 2506819 N
Tower Shape: circular
Diameter: 23–24 m
References: Weisgerber 1980: 99; Yule 2001: 384; 2011; Al-Jahwari and Kennet 2010: 206; Kluge 2021: 52–55

Gerd Weisgerber (1980: 99–100) was the first to report on this tower, which he calls Tamr Hansel. It had been partially destroyed by bulldozing in 1993 (Yule 2001: 384) and only the lowest courses of stones were preserved in 2010, when a modern wall had been built on top of its western part (Al-Jahwari and Kennet 2010: 206). Today, nothing remains of this tower due to modern development. Different scholars gave several (ambiguous) names to this tower. Therefore, when the University of Tübingen started their work in Al-Khashbah in 2015, they went for a new nomenclature for all towers at the site, labelling it Building VI.

Building VI sits on the western bank of Wadi Samad, 650 m northeast of Building V, and 700 m south of Building II. The direct surroundings of Building VI is completely built up with modern houses, but several Hafit period tombs are still present on the small hills in the area. The tower had, according to Weisgerber (1980: 99–100) a diameter of 23 to 24 m, albeit Yule (2001: 384) referred to it as the largest of the round towers at Al-Khashbah. This contradicts a diameter of 23 to 24 m as other towers such as Building V are as large as this one and Building IV is even larger. When visited by Weisgerber in the 1980, the western wall of the tower was preserved to a height of 1.8 m (Weisgerber 1980: 99–100). The tower is built of large stone blocks up to 2 m long (Al-Jahwari and Kennet 2010: 206; Figure 1.180). An aerial image from 1981 reveals a small, approximately 11.5 m long wall to the east of the building, which runs east–west and then turns southwards, where it continues for another 7 m, demarking a small rectangular space (Figure 1.179).

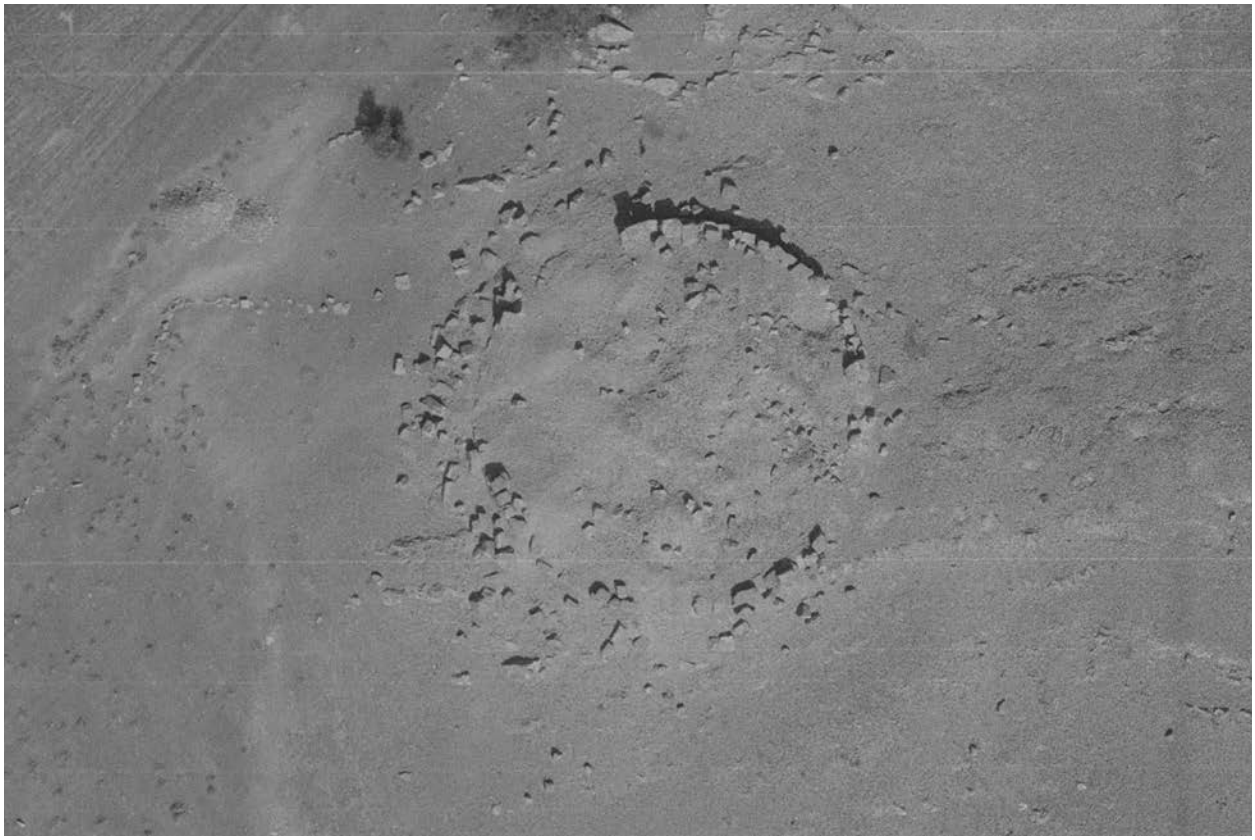


Figure 1.179. Aerial image of 1981 from the National Survey Authority Oman of Building VI before destruction.

Figure 1.180. Building VI before destruction (photograph by Gerd Weisgerber).

No Umm an-Nar period pottery could be found by the various scholars during their visits on the surface, but a few Early Iron Age pottery sherds (Al-Jahwari and Kennet 2010: 206). In the debris that was left after the demolition of the tower, Jonas Kluge could identify several furnace or crucible fragments as well as slag and copper (Kluge 2021: 55). Together, this suggests the tower dates to the Hafit period.

Building VII
Site: Building VII
Other Names: Structure 2 (Al-Jahwari and Kennet), Structure 4 (Yule)
General Location: Al-Khashbah, Oman
UTM: 605844 E, 2506510 N
Tower Shape: circular
Diameter: 32–34 m
References: Weisgerber 1980: 100; Al-Jahwari and Kennet 2010: 205; Yule 2011; Schmidt and Döpper 2017a: 137; Kluge 2021: 55–56

Building VII was first mentioned by Gerd Weisgerber, who compared it to Maysar-25 because of its smaller stones (Weisgerber 1980: 100). Nasser Al-Jahwari then documented it in the scope of his Wadi Andam survey (Al-Jahwari and Kennet 2010: 205) and then in 2015 it was documented by the University of Tübingen, who labelled it Building VII.

Figure 1.181. Aerial image of Building VII at Al-Khashbah.

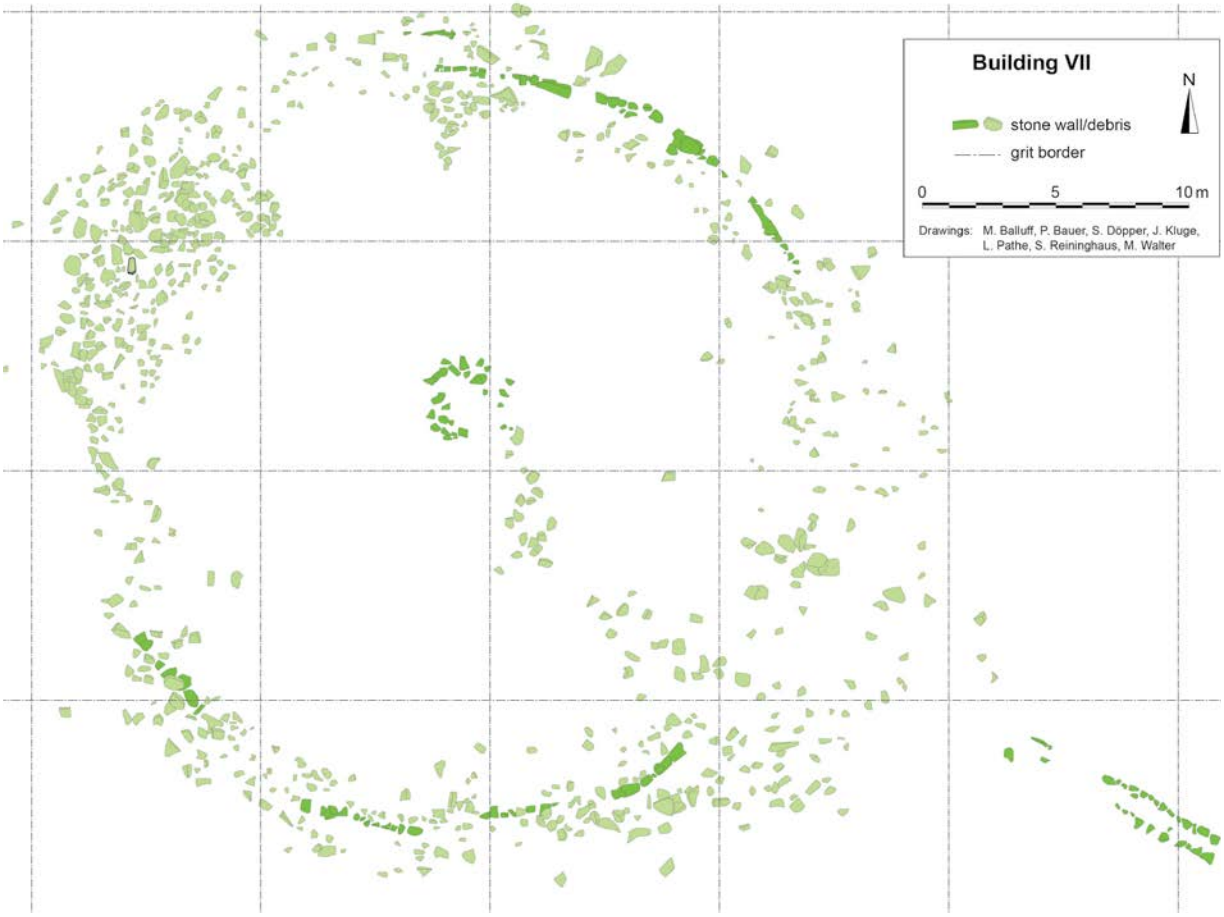


Figure 1.182. Map of Building VII at Al-Khashbah.

The tower itself is situated on a low mound on the flat plain 170 m to the north of Building IV. Several Hafit period tombs are lined up on the ridge of the hill, where Building IV is located; Umm an-Nar period tombs are found to 500 m to the southwest. Four hundred meters to the north, another group of 3rd millennium BCE tombs is present. It is not clear whether they are of a Hafit or Umm an-Nar period date. Building VII is slightly oval in shape with an external wall measuring 34 m north–south and 32 m east–west (Figure 1.181 and Figure 1.182). It was built of small and medium sized stones measuring from 0.3 × 0.2 × 0.1 m up to 1.2 × 0.5 × 0.2 m (Figure 1.183). Thus, they are smaller than the stones of most other towers at Al-Khashbah. The wall is badly preserved and reaches only 0.6 m in height, which corresponds to 2 to 3 courses of stones. The wall sits mid-way on the slope of the small elevation so that it projects up to 1.5 m over the top of the wall. In the interior, a circular stone structure with an external diameter of 3.3 m and an internal diameter of 1.2 m is present. This is possibly a well.

Approximately 1 m north of the ringwall, there are the remains of another stone wall, which is preserved to a length of 1.4 m (Figure 1.181 and Figure 1.182). As this is an area of considerable sedimentation, the actual length of the wall could be more. To the southeast of the tower, there is a double-faced wall made of 0.2 × 0.3–0.5 m large stone blocks, which can be traced over a length of at least 9 m. The wall has a width of 1.2 m. Weisgerber interprets this wall running from Building VII towards Building IV as a dam (Weisgerber 1980: 100). The area between Building VII and Building IV has been subject to a magnetometry survey (Schmidt and Döpper 2017a: 137 Abb. 17 right), but no other structures were visible. Several Umm an-Nar period pottery sherds were found on the surface of this tower, providing a date for the structure.

Figure 1.183. Building VII at Al-Khashbah.

Building VIII
Site: Building VIII
Other Names: Structure 5 (Al-Jahwari and Kennet)
General Location: Al-Khashbah, Oman
UTM: 605087 E, 2506317 N
Tower Shape: circular (?)
Diameter: unknown
References: Al-Jahwari and Kennet 2010: 205; Schmidt and Döpper 2017b: 219–220; Kluge 2021: 56–59

Building VIII was first published by Al-Jahwari and Kennet (2010: 206) as a very badly preserved Umm an-Nar structure. They refer to it, together with Building IX, as Structure 5. In 2015, the structures were revisited by a team from the University of Tübingen and mapped as two separate towers, which were labelled Building VIII and Building IX.

Building VIII is one of two towers on a small hill in the west of Al-Khashbah, directly east of a branch of Wadi Samad. It is situated only 90 m south of Building I and 250 m south of Building XI. The tower is badly preserved and only small sections of the external, most likely circular, ringwall remain in the northeast and southwest (Figure 1.184 and Figure 1.185). The wall is built from large stone blocks measuring from 0.4 × 0.5 × 0.3 up to 1.6 × 0.9 × 0.5 m (Figure 1.186). They were most likely quarried from the same hill where the tower is standing. The maximum preserved height of the ringwall is 0.6 m, which corresponds to two courses of stones. For the largest part, only the lowest course of the wall was present. No internal structures could be observed. East of the tower, there are the remains of an additional wall, measuring at least 2.6 m in length. It was constructed of large stone blocks, which might have followed the outline of the external ringwall. Southwest of the tower, there is another stone wall of medium-sized stone blocks. It runs straight over a length of 8 m from northwest to southeast down the slope. No pottery was found during the survey but the largest concentration of slag and furnace or crucible fragments of the whole survey area was found here (Schmidt and Döpper 2017b: 219). Therefore, a date in the Hafit period is plausible.

Figure 1.184. Aerial image of Building VIII at Al-Khashbah.

Building IX

Site: Building IX
Other Names: Structure 5 (Al-Jahwari and Kennet)
General Location: Al-Khashbah, Oman
UTM: 605134 E, 2506310 N
Tower Shape: oval (?)
Diameter: 25 × 28 m
References: Al-Jahwari and Kennet 2010: 205; Schmidt and Döpper 2017b: 219–220; Kluge 2021: 59

Building IX is the other of the two towers discovered by Al-Jahwari in 2009 and subsumed as Structure 5 (Al-Jahwari and Kennet 2010: 205). In 2015, a team from the University of Tübingen generated a detailed plan of the remaining architecture of the tower (Schmidt and Döpper 2017b: 219–220).

It is the eastern one of the two towers, Building VIII and Building IX, located on a small hill, west of a branch of Wadi Samad (Figure 1.185). Within a radius of 250 m, two more towers are found, i.e., Building I and Building XI. On the same hill as Building IX, a row of Hafit period tombs is located. Comparable to Building VIII, tower Building IX is also in a bad state of preservation. Almost half of the ringwall is visible in the eastern half of the structure, as are further sections of walls in the west, giving it an overall oval layout (Figure 1.187). The maximum extension is east–west and measures 28 m, while the tower has a width of 25 m. The wall does not sit at the highest point of the hill, so the summit projects over the top of the preserved

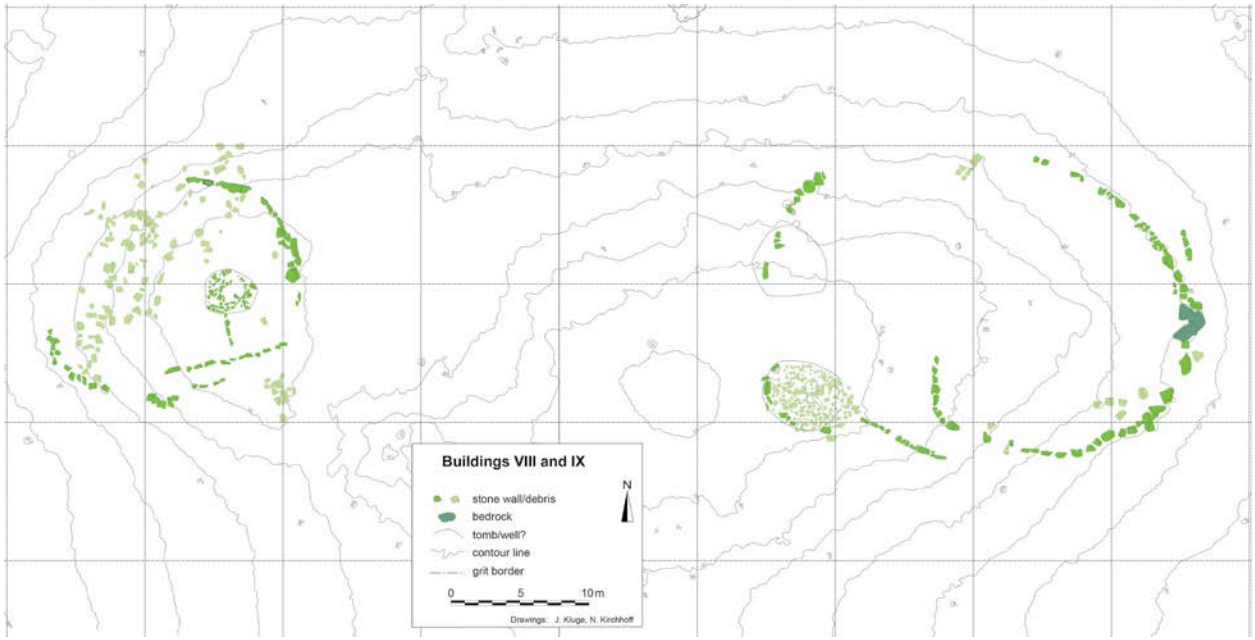


Figure 1.185. Map of Building VIII and Building IX at Al-Khashbah.

Figure 1.186. Wall section of Building VIII at Al-Khashbah.

Figure 1.187. Aerial image Building IX at Al-Khashbah.

wall, which has a maximum height of 0.7 m. This corresponds to four courses of stones. The dimensions of the stone block of which the walls are built reach up to 1 m in length, 0.8 m in width, and 0.25 m in height (Figure 1.188). Most likely, the material originates from the hill itself. Several structures are present in the interior of the tower. Near the centre, there is a round stone, oval stone structure with an external diameter of 2.7 × 2 m. This could possibly be a well or the remains of a Hafit period tomb. There is, however, nothing to substantiate either of these ideas. Immediately south of this structure, there is a straight stone wall, 2.3 m in length. Some of its stones are placed upright, which could be an indicator for a later date. No pottery was found but large amounts of slag as well as furnace or crucible fragments were (Schmidt and Döpper 2017b: 219). This could again argue for a date in the Hafit period.

Figure 1.188. Wall section of Building IX at Al-Khashbah.

Figure 1.189. Aerial image of Building XI at Al-Khashbah.

Building XI
Site: Building XI
Other Names: none
General Location: Al-Khashbah, Oman
UTM: 605158 E, 2506562 N
Tower Shape: circular
Diameter: 30 m
References: Herrmann *et al*. 2018; Kluge 2021: 59–60

Building XI was discovered during a magnetometry survey by a team from the Ludwig Maximilian University of Munich (LMU) in 2017 (Herrmann *et al*. 2018; Figure 1.190). It is located on a small, shallow hill on the eastern bank of a branch of Wadi Samad, 140 m northeast of Building I (Figure 1.189 and Figure 1.84). No walls are visible on the surface, but the magnetometry revealed two to three oval shaped ditches with an external area of 80 × 62 m encompassing a circular structure with a diameter of 30 m. Excavations have not yet taken place.

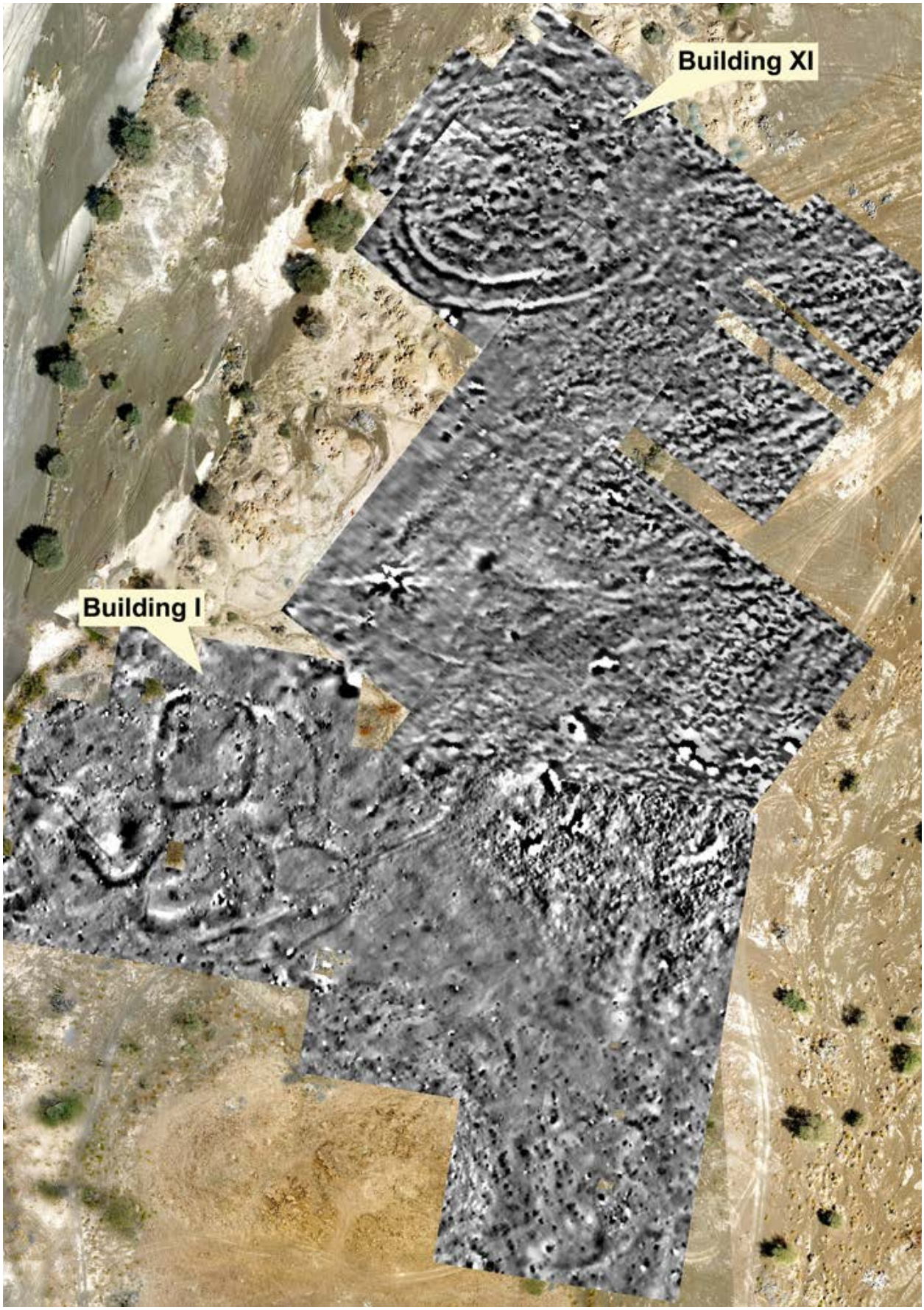


Figure 1.190. Results of the magnetometry survey conducted by Jörg Faßbinder and Marion Scheiblecker with Building XI in the north and Building I in the southwest.

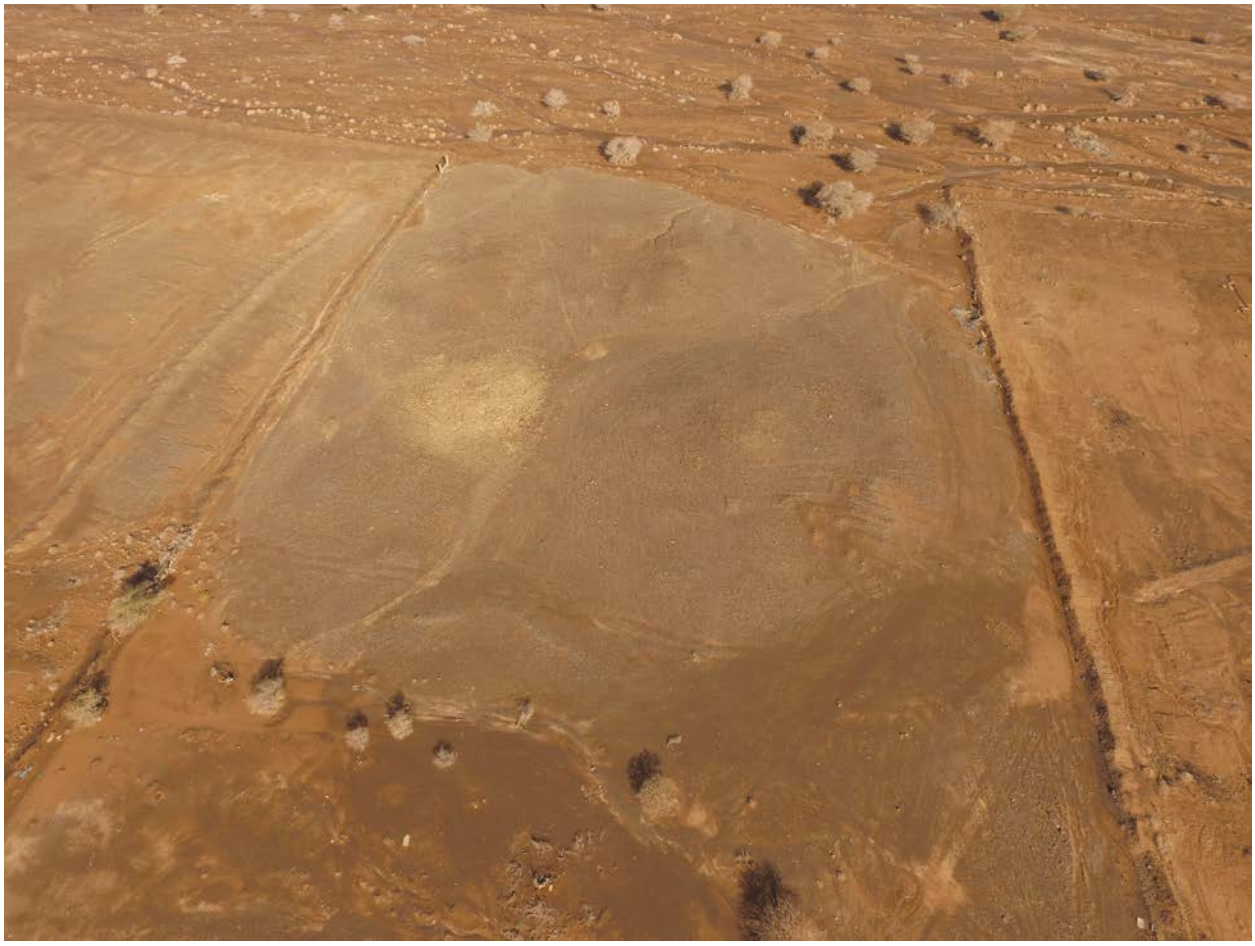


Figure 1.191. Aerial images of Building XII. Bright spot marks Umm an-Nar period tomb.

Building XII
Site: Building XII
Other Names: none
General Location: Al-Khashbah, Oman
UTM: 605920 E, 2508009 N
Tower Shape: circular
Diameter: unknown
References: Kluge 2021: 60–61

This site was discovered during a magnetometry survey conducted by Marion Scheiblecker and Sarah Abandowitz from the Ludwig Maximilian University of Munich (LMU) in 2018. No excavations were carried out at the site. The tower is the northernmost of the towers at Al-Khashbah, situated on the plain, directly east of a branch of Wadi Samad. Less than 100 m to the southeast, there are remains of Umm an-Nar period domestic architecture. Several Hafit or Umm an-Nar period tombs are located in the area southeast of the tower (Figure 1.191). This would have most likely been more in the past, but the area is today widely covered by modern farms. In the magnetometry, a circular tower is visible, surrounded by a ditch with a diameter of approximately 46 m. Ditches are a rather common feature for towers located on the plain. In Al-Khashbah they are also known from Building I and Building XI. Today the site presents itself as a small hillock, but no walls are visible on the surface.

Figure 1.192. Potential Umm an-Nar tower at Al-Qabrayn.

Figure 1.193. Aerial image of potential Umm an-Nar tower at Al-Qabrayn with 2022 excavations of stone wall and mudbrick structure at its eastern side.

Figure 1.194. Stone wall and mudbrick structure at Al-Qabrayn. A stone heap is cut into the upper part of the section.

Al-Qabrayn
Site: Al-Qabrayn
Other Names: MDH-5050
General Location: Al-Qabrayn, Oman
UTM: 609181 E, 2500704 N
Tower Shape: circular
Diameter: 36 m
References: Döpper *et al.* 2023

Figure 1.149. Detail of ringwall University Frankfurt in 2021, a small mound was noted in its extensive field systems (Figure 1.192). It measures 36 m in diameter and displays the remains of a stone wall. The wall is visible at the eastern and western parts of the hill, in the west over a length of 8.9 m. The surface of the hill is covered by several heaps of small stones. In 2022, excavations were carried out that revealed a mudbrick structure in front of the stone wall, both disturbed by the activities from the adjacent Late Islamic field system (Figure 1.193 and Figure 1.194). The stone wall is built from medium sized stones up to 50 × 30 × 15 cm of reddish or grey colour. On the outside, attention was paid to create a smooth façade, while on the inside it is irregular. Stratigraphy is not finally clarified, but it seems that the stone wall rests on the mudbrick structure. The size of its mudbricks is 40 × 35 × 8 cm.

Finds from the excavations include Umm an-Nar pottery sherds, often mixed with Late Islamic ones from the same context, copper scrap as well as grinding and hammer stone fragments. Four radiocarbon dates place the Umm an-Nar occupation of the site between 2800 and 2500 cal. BCE (2-sigma, 95% probability),[7] while one is slightly younger, around 2400–2300 cal. BCE (2-sigma, 95% probability).[8]

[7] MAMS-56344, MAMS-56345, MAMS-56349, MAMS-56350, MAMS-56351.
[8] MAMS-56343.

Figure 1.195. Aerial image of Al-Fatah tower.

Figure 1.196. Ringwall of Al-Fatah tower.

Al-Fatah
Site: Al-Fatah
Other Names: none
General Location: Al-Fatah, Oman
UTM: 617946 E, 2503447 N
Tower Shape: circular
Diameter: 22 m
References: Weisgerber 1981: 177, 180; Döpper and Schmidt 2020

Mapped first by Gerd Weisgerber in 1980 (Weisgerber 1981: 177, 180), the site was studied again by the Al-Mudhaybi Regional Survey in 2019 (Döpper and Schmidt 2020:163). The site of the tower presents itself as having a low elevation on the alluvial plain, immediately east of a small hill with several Hafit period cairns (Figure 1.195).

The circular tower with a diameter of 22 m is built of massive limestone blocks measuring up to 2.5 × 1.5 × 0.4 m (Figure 1.196). Excavations by the University of Frankfurt in 2020 revealed that the external ringwall is preserved to a height of up to 2.5 m. It was set in a foundation trench that cuts into the natural. The intensive surface survey in 2019 (Döpper and Schmidt 2020: 163) as well as the excavations in 2020 yielded no Umm an-Nar period pottery sherds. Thus, a date in the Hafit period for the tower is likely. Weisgerber (1980: 180), however, mentioned Umm an-Nar period pottery sherds found south of the modern oasis of Al-Fatah. In the interior of the tower, a smaller stone wall as well as mudbrick architecture was found. This was associated with Late Islamic pottery as well as three coins dating to the eighteenth century CE. Radiocarbon dates from the lowest levels at the exterior of the tower's ringwall date between 1213 and 1390 cal. CE (2-sigma, 95% probability).[9] Therefore, this has to be considered a later reuse of the tower.

Shariq
Site: Shariq
Other Names: none
General Location: Shariq, Oman
UTM: 617264 E, 2492448 N
Tower Shape: circular
Diameter: unknown
References: Döpper *et al.* 2023

This potential tower was discovered while fieldwalking transects in the Al-Mudhaybi Regional Survey in 2021 (Döpper *et al.* 2023). It is situated in the modern village of Shariq in an extensive area of Iron Age settlement activities. On a small, circular hillock, several large stone boulders were identified that might form part of the tower's external ringwall (Figure 1.197 and Figure 1.198). Most of the surface finds are Iron Age and to a smaller extent Early Islamic pottery sherds, but some of the sherds from the surface might also be of an Umm an-Nar date. No further research has been conducted at the site thus far.

[9] MAMS-46427, MAMS-46428, MAMS-46429.

Figure 1.197. Possible tower at Shariq.

Figure 1.198. Remains of the external ringwall of the Shariq tower.

Figure 1.199. Aerial image of possible tower at Ibra.

Ibra
Site: Ibra
Other Names: I0004
General Location: Ibra, Oman
UTM: 658218 E, 2510684 N
Tower Shape: unknown
Diameter: unknown
References: Häser and Gorsch 2004: 106; Schreiber 2005: 255

The presumed tower at Ibra was discovered in 2003 as part of the "Transformation Processes in Oasis Settlements of Oman" project of Sultan Qaboos University, the University of Tübingen, the University of Stuttgart, the University of Kassel and the German Archaeological Institute (Häser and Gorsch 2004). It lies on a hill near the confluence of Wadi Gharbi and Wadi Ibra. About 200 m to the northeast of the presumed tower, there are remains of two Umm an-Nar period tombs and associated pottery (Schreiber 2005: 255). All that is present today is a collection of large, brown stone blocks (Figure 1.199 and Figure 1.200), that, according to Schreiber (2005: 255), must once have been an Umm an-Nar period tower. This cannot, however, be confirmed with certainty. Other walls visible in the area might belong to later periods (Schreiber 2005: 255). Surface material includes Umm an-Nar pottery but also Early Iron Age as well as Islamic material (Schreiber 2005: 255).

Figure 1.200. Possible tower at Ibra.

Al-Niba
Site: Al-Niba
Other Names: none
General Location: Al-Niba, Oman
UTM: 673432 E, 2515254 N (general location)
Tower Shape: circular?
Diameter: unknown
References: Doe 1983: 65–66, fig. 20

The only reference to this tower is from Doe's 1983 publication on the monuments in south Arabia. Here, he lists it as a "ring wall of coursed masonry", "situated on an isolated small hill dominating the route to an-Niba and the plain of Wadi Aghda" (Doe 1983: 65). No further information is given.

Al-Mudhairib
Site: Al-Mudhairib
Other Names: none
General Location: Al-Mudhairib, Oman
UTM: 662844 E, 2502850 N
Tower Shape: circular
Diameter: 25 m
References: Döpper 2021a

Figure 1.201. Possible Wadi Suq monumental structure near Al-Mudhairib (top) and pottery found on its surface (bottom).

In 2019, Mohammed Rashid Malik Al-Rusiqi, a resident of Al-Naba village, lead a team from Frankfurt and Tübingen universities to a monumental building approximately 7 km southwest of the modern town of Al-Mudhairib. On top of a small hill, a round structure of approximately 25 m in diameter was visible, built of wadi pebbles (Figure 1.201, top). Surface pottery was few, but the diagnostic sherds were all dated to the Wadi Suq period (Figure 1.201, bottom). The hill itself is flown round by two branches of Wadi Al-Izz. Five hundred meters to the northeast of the structure, there is a group of Umm an-Nar period tombs.

Chapter 2

Bronze Age Towers: Chronology

For a long time, the monumental towers of the Oman Peninsula have been perceived as a development of the Umm an-Nar period, despite the knowledge that in 1989, Serge Cleuziou already published two radiocarbon dates from brushwood[1] that date the construction of Building III in Period I at Hili 8 to 3370–2880 cal. BCE, well into the Hafit period (Cleuziou 2009: 729) (Figure 2.1). They originate from two different samples collected in fireplaces in the compartments of Building III and later sealed by fill during the building process (Cleuziou 1989: 51). These dates have subsequently been heavily contested, especially by Dan Potts. He, amongst others, argues that because the samples are wood charcoal, they could be examples of the old wood problem (Potts 1997: 66). Instead, he points out, with the dearth of Hafit period tombs and the presence of Umm an-Nar period tombs in the vicinity of Hili 8, "it makes sense that they [i.e., the towers] do not pre-date the tombs by nearly 500 years" (Potts 1997: 67). Confounding the issue of comparative chronologies, based on her work at Bisya, Jocelyn Orchard has argued for an association between the monumental towers and Hafit period tombs (Orchard 2000b: 174). If accurate, Orchard's proposed chronology would undermine Pott's (1997) argument and support Cleuziou's original chronology—but would prove equally problematic for researchers of the Hafit and Umm an-Nar period mortuary traditions. Lately, more and more radiocarbon dates appear from excavations that emphasize the credibility of Cleuziou's claim. At Bat, a deep sounding at Al-Khafaji tower revealed a Hafit period predecessor building on top of which the Umm an-Nar period tower walls were placed (Figure 2.2). A charcoal sample[2] from the occupation deposits below Al-Khafaji tower dates to 3081–2886 cal. BCE (2-sigma, 95% probability; Thornton 2016a: 39-46). Further radiocarbon dates[3] put the earliest phase of mudbrick construction of Matariya to 3315–2904 cal. BCE and 3025–2787 cal. BCE (2-sigma, 95% probability) respectively (Cable 2016a), while charcoal taken from a pit in sealed ditch deposits[4] from around Tower 1156 provides a use date of 2857–2492 cal. BCE (2-sigma, 95% probability; Thornton 2016b). A third charcoal sample from atop the ditch (and preceding the Middle Umm an-Nar deposits above) provides a *terminus post quem* of 2891–2640 cal. BCE (2-sigma, 95% probability)[5]. At Al-Khashbah a series of 11 radiocarbon dates from charcoal[6] clearly indicate the construction and first use of Building V around 3100 cal. BCE (Schmidt and Döpper 2019: fig. 10) (Figure 2.3). A slightly younger date, but still within the Hafit period, is shown by 22 radiocarbon dates[7] from Building I (Schmidt and Döpper 2019: fig. 5). This clearly demonstrates that towers were part of the material culture of the region from the beginning of the Hafit period onwards.

[1] MC2266 and MC2267, recalibrated with IntCal20.
[2] Beta 260661, recalibrated with IntCal20.
[3] Beta 277516 and Beta 277517, recalibrated with IntCal20.
[4] Beta 316675, recalibrated with IntCal20.
[5] Beta 316679, recalibrated with IntCal20.
[6] MAMS24458, MAMS24459, MAMS27882, MAMS27884, MAMS27885, MAMS27886, MAMS32062, MAMS32063, MAMS32064, MAMS32065 and MAMS32070, recalibrated with IntCal20.
[7] MAMS27867, MAMS27868, MAMS27870, MAMS27871, MAMS27872, MAMS27873, MAMS27874, MAMS27875, MAMS27876, MAMS27877, MAMS32045, MAMS32046, MAMS32047, MAMS32048, MAMS32049, MAMS32050, MAMS32051, MAMS32056, MAMS32058 and MAMS32059, recalibrated with IntCal20.

Figure 2.1. Hili 8 (after Méry 2013: fig. 3).

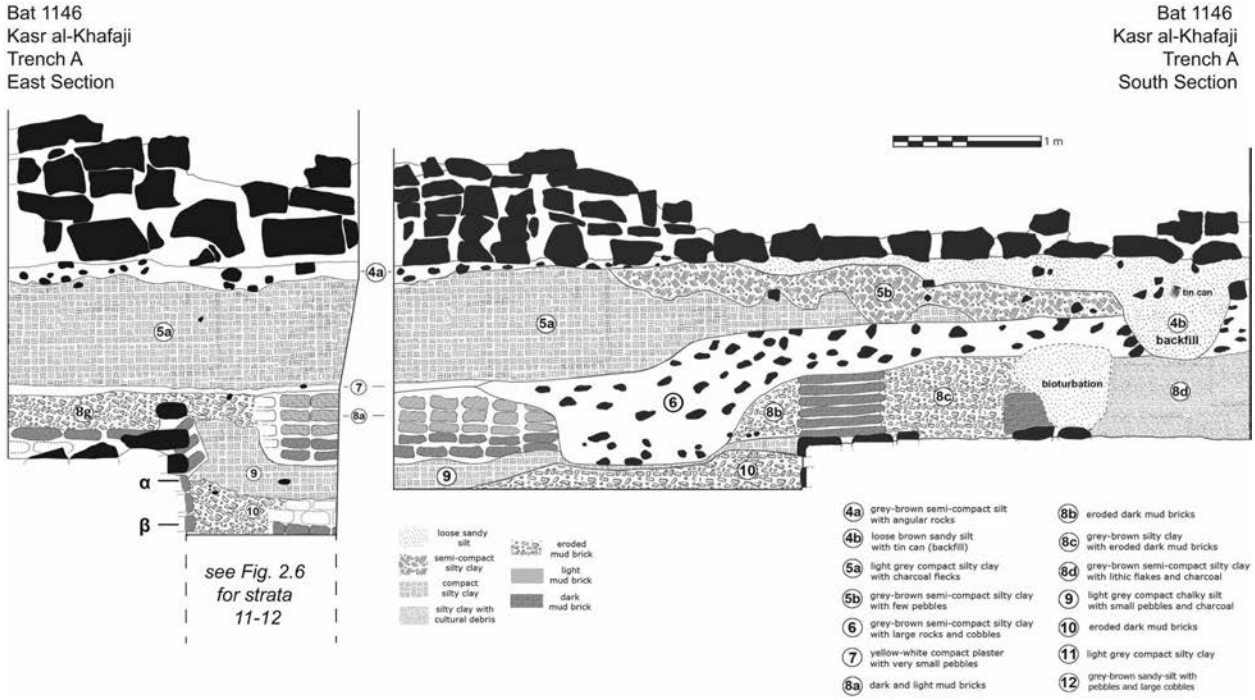


Figure 2.2. South and east sections of Trench A at Al-Khafaji tower showing the complex sequence of events from the Hafit walls at the bottom to the interior tower walls at the top (from Thornton 2016a: 40-41, fig. 3.17).

Figure 2.3. Building V at Al-Khashbah.

At the other end of the spectrum, there are some dates from the very end of the Umm an-Nar and from the following Wadi Suq period. Towers with clear indications of a Wadi Suq period presence include Hili 8, Tell Abraq, Nud Ziba and Kalba 4, all in the United Arab Emirates, as well as Al-Khutm and Al-Rojoom tower at Bat in the Sultanate of Oman. The topmost deposits at Hili 8, which are identified as Hili period III, can be dated to the beginning of the 2nd millennium BCE, by two radiocarbon dates and the associated pottery (Cleuziou 1978/1979: 23–24; Cleuziou 1989: 72–73). One of the radiocarbon dates, from a hearth, gives a range from 2134 to 1616 cal. BCE,[8] and the other originates from an oven and dates from 1954 to 1508 cal. BCE[9]. At Bat, Karen Frifelt published some radiocarbon samples from a hearth and postholes just outside the Tower 1145. They give date ranges of 2016 to 1688 cal. BCE[10] and 1673 to 1419 cal. BCE[11] (Frifelt 1979: 584). A clear reuse of the tower space is visible at Tower 1156, first, in the construction of Middle Umm an-Nar rectilinear walls (Mortimer 2016; Swerida and Thornton 2019b); and second, in a Wadi Suq period burial on top of it (Williams and Gregoricka 2016). While the 2nd millennium remains from the towers at Hili and Bat were rather ephemeral in nature, substantial Wadi Suq occupation of the towers can be identified at Al-Mudhairib, Al-Khutm, Tell Abraq, and Kalba (Figure 2.4). At Kalba 4, a mudbrick platform or capping was added to the 3rd millennium structures during the Wadi Suq period (Carter 1997: 133). The same happened to the tower at Tell Abraq. At the beginning of the 2nd millennium BCE, it was capped by a massive mudbrick platform (Potts 2000: 23), and continued to expand inexorably outwards and upwards

[8] MC2259, recalibrated with IntCal20.
[9] MC2260, recalibrated with IntCal20.
[10] K2795, recalibrated with IntCal20.
[11] K2796, recalibrated with IntCal20.

Figure 2.4. Al-Khutm tower after restoration.

to the end of the Iron Age. Taking all these dates together, they demonstrate that monumental towers are features of the whole 3rd millennium BCE and sometimes even lasting until the 2nd millennium BCE.

The radiocarbon dates from several sites also reveal that there is a chronological component to sites with multiple towers. Most towers at one site do not seem to be contemporaneous but rather follow one after the other, shifting periods of occupation between them. At Bat, there is a succession of towers within the site. Late Hafit period (2900–2800 BCE) and Early Umm an-Nar period (2800–2500 BCE) evidence of tower use comes from Matariya at the southeastern end of the site, and the northeastern-most tower, 1156. Building II, the most northwesterly of the Bat towers, provides a radiocarbon date from its foundation trench at 2889 to 2669 cal. BCE.[12] Charcoal samples from the fill of its ditches indicated that this tower was used until around 2500 BCE. Another monumental tower constructed during the Early Umm an-Nar period at Bat is Tower 1156 at the northwestern end of the Settlement Slope (Mortimer 2016; Mortimer and Thornton 2018; Swerida 2018: 57). Radiocarbon samples associated with the tower use—from a hearth[13] near the base of the inner ditch surrounding the tower (2857–2492 cal. BCE, 2-sigma, 95% probability), a second hearth[14] inside the tower (2871–2581 cal. BCE, 2-sigma, 95% probability); and a sample taken from a (likely smelting) pit in the outer tower ditch[15] (2905–2636 cal. BCE, 2-sigma, 95% probability) provide firm Early Umm an-Nar dates for Tower 1156 (Thornton 2016b: tab. IV.1). Two hundred and fifty meters southwest of the settlement slope lies the third Early Umm an-Nar tower of Bat, Al-Khafaji

[12] MAMS 24445, recalibrated with IntCal20.
[13] Beta 316675, recalibrated with IntCal20.
[14] Beta 316677, recalibrated with IntCal20.
[15] Beta 316680, recalibrated with IntCal20.

tower. A hearth associated with the foundation of this tower provides a radiocarbon date of 2854 to 2501 cal. BCE[16] (Swerida 2018: 67 tab. 1). By the Middle Umm an-Nar period (2500–2200 BCE), Tower 1156 at the Settlement Slope had been abandoned (Swerida 2018: 59–60), while Al-Khafaji tower continued to be occupied and several rectilinear structures had been built around it. Three radiocarbon dates show the Middle Umm an-Nar occupation of this tower. They originate from different fire pits and date to 2474 to 2209 cal. BCE (2-sigma, 95% probability)[17], to 2476 to 2209 cal. BCE (2-sigma, 95% probability)[18] and to 2468–2298 cal. BCE (2-sigma, 95% probability)[19] respectively (Swerida 2018: 67 tab. 1). Al-Rojoom tower was constructed in the Middle Umm an-Nar period (Swerida 2018: 61). Three radiocarbon dates from hearths outside the Rojoom tower provide dates for Rojoom's construction (2856 to 2208 cal. BCE (2-sigma, 95% probability),[20] 2662 to 1961 cal. BCE (2-sigma, 95% probability),[21] and 2623 to 2069 cal. BCE (2-sigma, 95% probability)[22]). Though the date of the tower at Al-Khutm, situated 3 km to the northwest of Al-Khafaji tower, is uncertain, the collection of rectilinear structures 200 m to the east represents a solid Middle Umm an-Nar settlement (Swerida 2018: 63). By the end of the Middle Umm an-Nar period, the towers at Khafaji and Khutm gradually fell (temporarily) out of use, while Al-Rojoom tower was likely still occupied during the Late Umm an-Nar period (Swerida 2018: 65).

A similar situation with building new and abandoning old towers can be observed at Al-Khashbah. Based on a series of radiocarbon samples,[23] Building V dates to the Hafit period around 3100 cal. BCE, making it the oldest known tower of the Oman Peninsula. Building VI is situated on the opposite edge of the wadi and probably dates to the same period, but has not yet been radiocarbon dated. Around 2900 BCE and thus still in the Hafit period a new mudbrick tower complex called Building I was constructed at the western end of the site. A series of 34 radiocarbon dates[24] from different parts of the complex provide substantial data for its chronological setting. Three other towers, Building VIII, Building IX and Building XI, are located in the vicinity of Building I, but their chronological position is uncertain. Surface finds do not include any Umm an-Nar period pottery, which makes a date in the Hafit period likely. Five radiocarbon dates place Building II, the northeastern-most of all towers at Al-Khashbah, firmly in the Early Umm an-Nar period around 2600 to 2500 BCE.[25] The surface material of the rectangular Building IV as well as that of the circular Building VII in the centre of the archaeological site of Al-Khashbah yield large quantities of Umm an-Nar period pottery. A more precise date, however, is currently not possible as excavations have not yet been undertaken. The case studies of Bat and Al-Khashbah demonstrate that only one or two towers are in use at the same time at one site. This contradicts the idea that sites where more towers were found played a more important role in the past than those with only few towers. At a single point in time, all sites seem to have had only one or two towers in operation and were thus more or less all the same size. Some sites simply have a longer history of occupation than others, which results in more towers.

[16] D-AMS 6427, recalibrated with IntCal20.
[17] Beta 316663, recalibrated with IntCal20.
[18] Beta 316664, recalibrated with IntCal20.
[19] D-AMS 6426, recalibrated with IntCal20.
[20] K-2797, recalibrated with IntCal20.
[21] K-3207, recalibrated with IntCal20.
[22] K-3208, recalibrated with IntCal20.
[23] MAMS24458, MAMS24459, MAMS27882, MAMS27884, MAMS27885, MAMS27886, MAMS32062, MAMS32063, MAMS32064, MAMS32065 and MAMS32070, recalibrated with IntCal20.
[24] MAMS 27868, MAMS 27870 to 27877, MAMS 32045 to 32051, MAMS 32054, MAMS 32056, MAMS 32058 to 32059, MAMS 36904 to 36908, MAMS 36912 to 36919, recalibrated with IntCal20.
[25] MAMS 24453 to 24457, recalibrated with IntCal20.

Table 2.1. List of radiocarbon dates from excavated towers. Recalibrated with OxCal IntCal20.

site	tower	lab no.	14C age	±	cal. 2σ BCE	material	reference
Al-Khashbah	Building V older layers	MAMS 36927	4905	73	3938-3535	charcoal	Schmidt and Döpper 2017: fig. 9; Schmidt and Döpper 2020: 273 fig. 10
		MAMS 32063	4554	26	3371-3103	charcoal	
		MAMS 27886	4538	30	3367-3102	charcoal	
		MAMS 36929	4525	26	3361-3102	charcoal	
		MAMS 32065	4520	25	3359-3099	charcoal	
		MAMS 27885	4513	31	3350-3097	charcoal	
		MAMS 27882	4500	28	3350-3097	charcoal	
		MAMS 27884	4498	30	3352-3094	charcoal	
		MAMS 36931	4471	26	3337-3029	charcoal	
		MAMS 36930	4466	26	3336-3026	charcoal	
		MAMS 24458	4464	24	3335-3027	charcoal	
		MAMS 32062	4460	24	3334-3024	charcoal	
		MAMS 36928	4455	26	3334-3018	charcoal	
		MAMS 24459	4446	24	3332-2939	charcoal	
		MAMS 32070	4430	26	3326-2926	charcoal	
		MAMS 41451	4422	30	3323-2922	charcoal	
		MAMS 27880	4326	28	3016-2892	charcoal	
		MAMS 32066	4227	23	2903-2703	charcoal	
Hili	Hili 8	MC2266	4440	100	3371-2891	burned brushwood	Cleuziou 1978/1979: tab. 1
		MC2267	4400	100	3367-2876	burned brushwood	
Bat	Tower 1146	Beta 260661	4330	40	3081-2886	charcoal	Thornton et al. 2016: tab. IV.1; Swerida 2018: tab. 1
		D-AMS6427	4093	24	2854-2501	charcoal	
		Beta 260662	4070	40	2857-2473	charcoal	
		Beta 260660	3820	40	2454-2142	charcoal	
Al-Khashbah	Building I	MAMS 36917	4467	22	3334-3028	charcoal	Schmidt and Döpper 2017: fig. 14; Schmidt - Döpper 2020: 273 fig. 10
		MAMS 32046	4453	24	3332-3019	charcoal	
		MAMS 32051	4421	28	3321-2922	charcoal	
		MAMS 27867	4350	29	3076-2900	charcoal	
		MAMS 36908	4307	25	3011-2883	charcoal	
		MAMS 27871	4304	28	3011-2882	charcoal	
		MAMS 32045	4270	24	2917-2876	charcoal	
		MAMS 36919	4255	21	2911-2886	charcoal	
		MAMS 36916	4246	21	2910-2777	charcoal	
		MAMS 32050	4222	26	2901-2701	charcoal	
		MAMS 36905	4220	24	2900-2701	charcoal	
		MAMS 36918	4218	21	2899-2702	charcoal	
		MAMS 32058	4217	26	2901-2697	charcoal	
		MAMS 36913	4213	21	2896-2701	charcoal	
		MAMS 36906	4207	25	2896-2678	charcoal	
		MAMS 27876	4195	27	2891-2672	charcoal	

site	tower	lab no.	14C age	±	cal. 2σ BCE	material	reference
...	...	MAMS 32049	4195	25	2891-2674	charcoal	...
Al-Khashbah	Building I	MAMS 36904	4192	25	2889-2673	charcoal	Schmidt and Döpper 2017: fig. 14; Schmidt - Döpper 2020: 273 fig. 10
		MAMS 32047	4185	23	2886-2671	charcoal	
		MAMS 27877	4180	26	2886-2639	charcoal	
		MAMS 36915	4175	21	2882-2670	charcoal	
		MAMS 36907	4155	25	2876-2631	charcoal	
		MAMS 32059	4154	25	2876-2631	charcoal	
		MAMS 32048	4152	26	2875-2630	charcoal	
		MAMS 32056	4150	25	2874-2630	charcoal	
		MAMS 27874	4145	27	2875-2625	charcoal	
		MAMS 27872	4141	26	2877-2623	charcoal	
		MAMS 27873	4123	26	2866-2580	charcoal	
		MAMS 27868	4115	27	2866-2576	charcoal	
		MAMS 36912	4109	21	2859-2576	charcoal	
		MAMS 36914	4109	21	2859-2576	charcoal	
		MAMS 27870	4086	33	2861-2494	charcoal	
		MAMS 27875	4057	26	2836-2476	charcoal	
		MAMS 32054	4033	26	2624-2472	charcoal	
Bat	Tower 1147	Beta 277516	4390	40	3315-2904	charcoal	Frifelt 2002: 107; Thornton et al. 2016: tab. IV.1
		Beta 277517	4300	40	3025-2787	charcoal	
		Beta 244213	4260	40	3010-2696	charcoal	
		K5470	4200	60	2910-2584	charcoal	
		Beta 260667	4190	40	2895-2632	charcoal	
		Beta 260665	4140	40	2876-2582	charcoal	
Al-Khashbah	Building V younger layers	MAMS 32064	4498	25	3346-3098	charcoal	Schmidt and Döpper 2017: fig. 9; Schmidt and Döpper 2020: 273 fig. 10
		MAMS 41448	4428	27	3325-2925	charcoal	
		MAMS 41452	4314	26	3011-2887	charcoal	
		MAMS 32061	4234	26	2908-2703	charcoal	
		MAMS 27879	4228	28	2906-2700	charcoal	
		MAMS 32067	4209	24	2896-2696	charcoal	
		MAMS 36933	4206	26	2896-2676	charcoal	
		MAMS 36932	4201	25	2894-2676	charcoal	
		MAMS 36922	4200	23	2893-2677	charcoal	
		MAMS 27878	4191	26	2890-2672	charcoal	
		MAMS 32060	4186	24	2887-2672	charcoal	
		MAMS 36921	4178	22	2884-2670	charcoal	
		MAMS 36920	4174	22	2883-2668	charcoal	
		MAMS 41445	4168	26	2882-2633	charcoal	
		MAMS 41446	4164	27	2880-2632	charcoal	
		MAMS 36925	4146	21	2872-2633	charcoal	
		MAMS 41444	4137	26	2873-2584	charcoal	
		MAMS 41447	4136	26	2873-2584	charcoal	
		MAMS 36923	4134	22	2871-2584	charcoal	
		MAMS 41449	4120	25	2866-2578	charcoal	
		MAMS 32068	4119	25	2866-2578	charcoal	

site	tower	lab no.	14C age	±	cal. 2σ BCE	material	reference
... Al-Khashbah	... Building V younger layers	MAMS 36934	4114	26	2865-2576	charcoal	... Schmidt and Döpper 2017: fig. 9; Schmidt and Döpper 2020: 273 fig. 10
		MAMS 32069	4065	27	2845-2476	charcoal	
		MAMS 41450	4060	26	2840-2476	charcoal	
		MAMS 36924	4046	27	2831-2472	charcoal	
Bat	Building II-7a	MAMS 24445	4188	27	2889-2669	charcoal	Döpper 2021b: tab. 256
Bat	Tower 1156	Beta 316680	4210	40	2905-2636	charcoal	Thornton et al. 2016: tab. IV.1
		Beta 316679	4190	30	2891-2640	charcoal	
		Beta 316677	4130	30	2871-2581	charcoal	
		Beta 316675	4080	30	2857-2492	charcoal	
Bat	Building II-6b	MAMS 24447	4141	27	2875-2587	charcoal	Döpper 2021b: tab. 256
Bat	Building II-6d	MAMS 24446	4017	26	2618-2468	charcoal	Döpper 2021b: tab. 256
Al-Khashbah	Building II	MAMS 24456	4096	29	2861-2499	charcoal	Schmidt and Döpper 2017: fig. 7
		MAMS 24453	4040	29	2663-2469	charcoal	
		MAMS 24454	4037	29	2660-2469	charcoal	
		MAMS 24457	4020	24	2617-2468	charcoal	
		MAMS 24455	4013	30	2620-2466	charcoal	
Tell Abraq	Tower	K5582	4020	85	2872-2299	charcoal	Potts 1997: tab 3; Magee et al. 2017: 213–214
		Beta 228619	3840	40	2458-2152	charcoal	
		K5581	3830	85	2557-2152	charcoal	
		OZA-929U	3830	90	2565-2028	charcoal	
		OZA-924U	3760	100	2468-1925	charcoal	
		OZA-936U	3760	60	2445-1978	charcoal	
		K5575	3750	65	2404-1956	charcoal	
		OZA-923U	3750	60	2402-1972	charcoal	
		K5577	3745	75	2452-1947	charcoal	
		K5578	3730	85	2451-1900	charcoal	
		OZA-930U	3730	60	2338-1949	charcoal	
		K5576	3720	85	2446-1891	charcoal	
		K5574	3685	60	2277-1897	charcoal	
		Beta 228620	3610	40	2132-1828	charcoal	
		OZA-920U	3540	70	2128-1687	charcoal	
		OZA-918U	3480	70	2014-1618	charcoal	
		OZA-921U	3440	60	1919-1546	charcoal	
Hili	Hili 1	SM1239	3940	213	3018-1782	charcoal	Cleuziou 1978: tab. 2; Potts 1997: 67, tab. 2; Frifelt 1970/71: 383,
		SM1237	3715	217	2849-1544	charcoal	
		SM1236	3603	213	2571-1450	charcoal	
		SM1238	3603	213	2571-1450	charcoal	
Bat	Building II	MAMS 24448	4392	30	3098-2913	charcoal	Döpper 2021b: 297 tab. 256
		MAMS 24435	4268	29	2925-2776	charcoal	
		MAMS 24441	4266	28	2921-2780	charcoal	
		MAMS 24436	4241	26	2910-2705	charcoal	
		MAMS 24443	4229	27	2906-2701	charcoal	
		MAMS 24442	4204	27	2896-2675	charcoal	

site	tower	lab no.	14C age	±	cal. 2σ BCE	material	reference
...	...	MAMS 24444	4109	27	2865-2573	charcoal	...
Bat	Building II	MAMS 24438	4098	25	2859-2502	charcoal	Döpper 2021b: 297 tab. 256
		MAMS 24439	3931	25	2557-2303	charcoal	
		MAMS 22620	3914	25	2471-2299	charcoal	
Al-Qabrayn	Tower	MAMS 56344	4099	21	2855-2573	charcoal	
		MAMS 56351	4086	27	2855-2497	charcoal	
		MAMS 56349	4082	21	2847-2498	charcoal	
		MAMS 56345	4077	21	2846-2496	charcoal	
		MAMS 56350	4058	28	2839-2475	charcoal	
		MAMS 56343	3916	26	2471-2298	charcoal	
Al-Ghoryeen	Tower	UGAMS 36626	3930	20	2476-2305	charcoal	Al-Jahwari et al. 2020: tab. 1
		UGAMS 36627	3870	20	2460-2236	charcoal	
Bat	Tower 1146	Beta 316664	3904	40	2476-2209	charcoal	Thornton et al. 2016: tab. IV.1
		A-AMS6426	3904	26	2468-2298	charcoal	
		Beta 260663	3900	40	2474-2209	charcoal	
		Beta 316663	3900	40	2474-2209	charcoal	
		Beta 260664	3850	40	2461-2201	charcoal	
Hili	Hili 8 Period IId-IIe	MC2265	3900	100	2572-1984	charcoal	Cleuziou 1978/1979: tab. 1
		MC2265	3840	100	2835-2039	charcoal	
Hili	Hili 8 Period IIf	MC2263	3950	90	2849-2148	charcoal	Cleuziou 1978/1979: tab. 1
		MC2261	3710	90	2452-1883	charcoal	
		MC2262	3690	90	2402-1778	charcoal	
Nud Ziba	Nud Ziba	BM 2928	3610	40	2132-1828	charcoal	Kennet and Velde 1995: 85
Hili	Hili 8 III	MC2259	3520	90	2134-1616	charcoal	Potts 1997: tab.1
		MC2260	3420	90	1954-1508	charcoal	
Bat	Tower 1145	K2797	3980	80	2856-2208	charcoal	Frifelt 2002: 107
		K3208	3900	85	2623-2069	charcoal	
		K3207	3860	115	2662-1961	charcoal	
		K2795	3510	55	2016-1688	charcoal	
		K2796	3260	55	1673-1419	charcoal	
Wadi Al-Hilo	HLO1	Hd-26446	3470	34	1889-1689	charcoal	Kutterer 2013: 127

Chapter 3

Bronze Age Towers: Function

There is a long-standing debate on the function of the Bronze Age towers (for a recent summary also see Thornton and Mortimer 2018). One of the most common interpretations is that they were defensive structures or keeps. This was suggested by Karen Frifelt (1976: 59) as early as 1976, when she compared the remains of the Bronze Age towers to the round tower of the medieval fort in Nizwa (Figure 3.1). She suggested that the base of the tower was solid for several (above-ground) meters, while the upper parts could have been where rooms for habitation were located (Frifelt 1975: 369). This does fit well with the fact that many towers feature small compartments that may have formed the internal structure for a filled platform. However, there is no evidence that the Bronze Age towers had been much higher that what is preserved today (that is, not more than 5 m above the ground level), which Frifelt (1976: 59) accounts for by the removal of stones for the construction of modern houses. Drawing further analogies with the Nizwa towers, Frifelt (1976: 60) assumes that the Bronze Age towers had a height about half their diameter, which would be at least 10 m. Nowhere in southeast Arabia—even in remote areas with no modern houses or evidence of removal—are towers preserved to that height or yield enough scattered stones in their vicinity to indicate that initial height. Thus, a tower height of 10 m or more seems rather unrealistic.

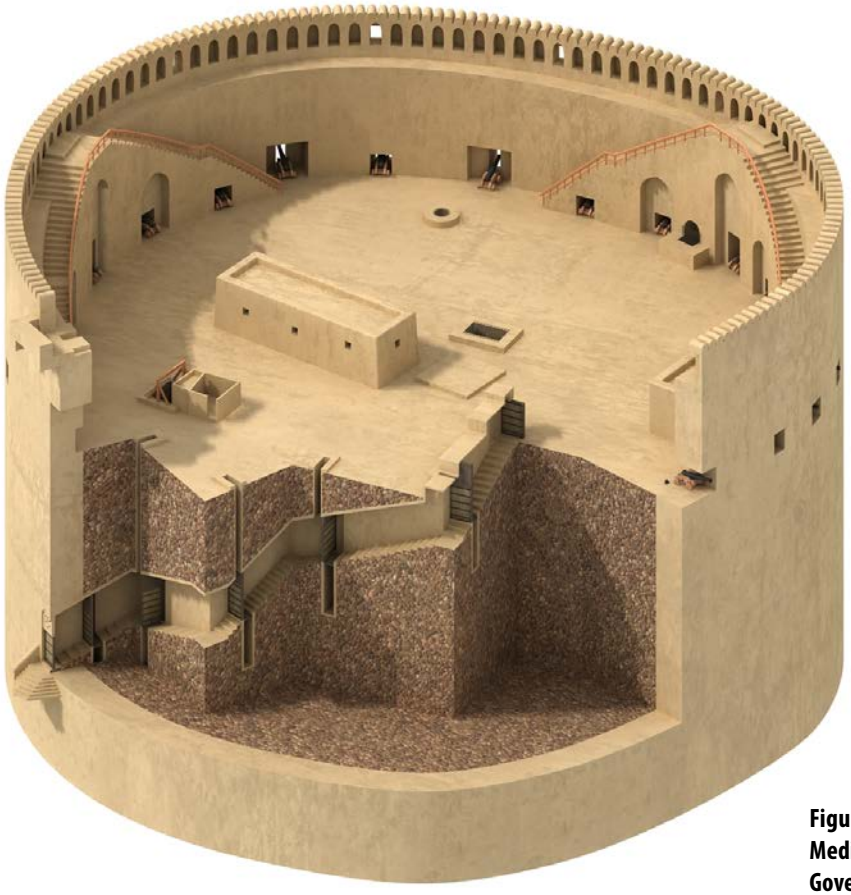


Figure 3.1.
Medieval fort at Nizwa, Al-Dakhiliyah Governorate (image by A. Farach).

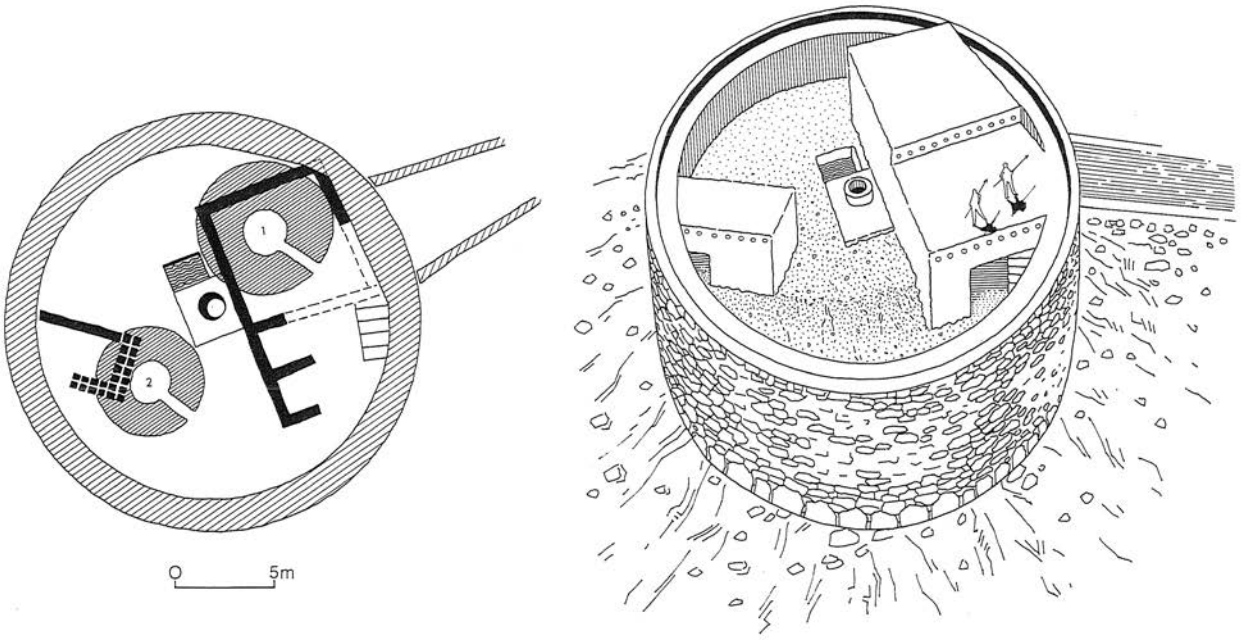


Figure 3.2. Map and reconstruction of tower M-25 at Al-Moyassar (Weisgerber 1981: 199 Abb. 27).

In spite of this, the idea of towers as defensive structures is very popular and repeatedly found in the literature. Besides Frifelt, it has also been voiced by Humphries (1974: 51), Weisgerber (1981: 198–204), Doe (1983: 65), Crawford (1998: 112) as well as Cleuziou and Tosi (2007: 17), just to name a few. The main arguments besides analogies to modern towers are their strong walls, surrounding ditches, and a secured water supply evident in the presence of a central well (Crawford 1998: 112, see also Frifelt 1989a: 113). Crawford suggests that there was a difference between larger towers (with a defensive function) and smaller examples that were only about 6 m in diameter, which she interprets as watchtowers (Crawford 1998: 112). For examples of the latter, Crawford refers to two structures found close to Qarn Qarhat la-Hwid, labelled as "small circular towers" by the Orchards. However, there is no reason to interpret those "small circular towers" as anything other than typical 3rd millennium BCE tombs. Weisgerber (1981: 204) more specifically sees the tower at Al-Moyassar as a refuge, needed in a time of intra-group violence and raids of neighbouring villages (Figure 3.2). To him, the 1.6 m strong walls of Maysar-25 especially provide evidence in favour of this interpretation. The presence of several such towers at sites like Bat is explained by him by the more dispersed nature of the site; that is, Weisgerber considers that each tower at Bat formed the central refuge of a different ancient village. Doe (1983: 67) and later Crawford (1998: 112) further supports this argument with her observation that a number of towers are placed in pairs on either side of a wadi or track "in such a way that it appears that an approaching enemy could be caught in a pincer movement between them". She also suggests that those towers without internal structures could have acted as a corral or compound, in which stock could be protected from raiders (Crawford 1998: 114).

There is, however, no evidence for any type of intra-group violence in the Early Bronze Age of Eastern Arabia, neither in the human remains of this period nor in the material culture. In fact, we know of very few 3rd millennium BCE weapons. Furthermore, the settlement density seems to have been rather low. The closest known site to Al-Moyassar is Al-Khashbah at a linear distance of 15 km. In a radius of 20 km, there are only two other 3rd millennium BCE sites. Assuming that a tower indicates a raiding village, that distance is rather far away for being frequently raided. Serge Cleuziou and Maurizio Tosi (2007: 147) point out that

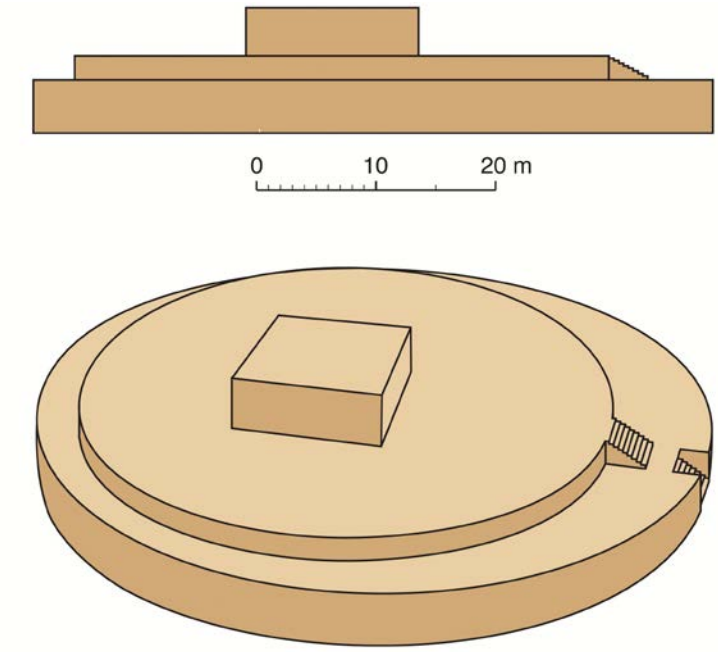


Figure 3.3. Hypothetical reconstruction by Jocelyn and Jeffery Orchard of a tower with stairs access (2015: 102 fig. 7).

conflicts could have been between groups sharing the same settlement. For them, the fact that entrances to the towers are unusual, if found at all, is another argument for the defensive function of the tower. They propose that wooden ladders were pulled up to deny access to any unwelcome outsider (Cleuziou and Tosi 2018: 243). On the other side, Jocelyn and Jeffrey Orchard (2007: 147) presume that every tower was easily accessible via stairways or ramps, most of which have not survived. They explain this (currently hypothetical) ease of access by a ceremonial function for the towers (Figure 3.3). Furthermore, they point out that towers were sometimes overlooked by taller mountains and often had no central well—both of which would prove disadvantageous for the community if the towers were intended for defence. In her later articles, Karen Frifelt (2002: 107) also comes to the conclusion that many towers are situated in flat fields or on the edge of a wadi, both not being a particularly good strategic places for a fortification.

Another widespread interpretation of the function of the towers—one that could have co-existed with other interpretations—is the demarcation of property, and more specifically of the corners of settlements. According to Frifelt (1976: 61), this approach would result in a settlement area at Bat of 40 to 50 ha, based on the five towers known to her in the 1970s. She therefore concludes that, although some of the area incorporated by the towers might have been agricultural land, Bat in the 3rd millennium BCE was a town rather than a village. Similar ideas have been repeatedly brought forward by Jocelyn and Jeffrey Orchard. They see the towers at Bisya as boundary markers of an impressive 300 ha settlement with one tower at either end and two towers in the centre (Orchard 2000a: 214, 2000b: 167, Orchard and Stranger 1994: 80). To them, this is the model for the standard diamond-shaped layout of an "Al-Hajar oasis town" (Orchard and Orchard 2002: 228; 2007: 146; Orchard and Stranger 1994: 83-84): two towers stand opposite one another in the central part, associated with domestic architecture, while the other two mark the outer limits of the settlement. This is accompanied by a necropolis, either on a hill parallel to the oasis town and extending along its full length or, alternatively, on outcrops parallel to the lower part of the settlement or just beyond its lower boundary. The land between the outlying towers and the central area was utilized for growing corps. In their assessment of the site of Bat they also include Al-Khutm, and thus also see that site as encompassing

some 400 ha (Orchard and Stranger 1994: 80). Dan Potts (1997: 65) resolutely argues against this idea by pointing out that there is no evidence that the towers marked the limits of the settlement and that the area within the limits was simultaneously under cultivation. To him, the towers could very well relate to disparate hamlets in the same region; that is, small settlements consisting of a few buildings surrounding or associated with a tower, in much the same way that Weisgerber saw each tower keep as the centre of a village. Jocelyn Orchard (Orchard and Stanger 1992: 92) contradicts the latter by stressing what she sees as the standard layout indicated by the tower locations and the fact that domestic houses are clustered around one individual tower and not associated with all. Nevertheless, Potts raises an important consideration. The theories of the towers demarking the limits of a town only works if all of them are contemporaneous (Potts 1997: 65). At least in the cases of Bat (Thornton *et al.* 2016) and Al-Khashbah (Schmidt and Döpper 2017), we know this is not the case. Thus, this theory is no longer tenable.

The towers have also been taken as residences of elites or other authorities. Frifelt (1976: 61) again uses the analogy of the Nizwa fort and other Islamic period towers, which until recent times were the residence of the *wali* or the paramount sheikhs (see also Crawford 1998: 113). As many towers include wells within their structures, Cleuziou and Tosi see this (in addition to their defensive character) as evidence that the towers should be considered the residences of prominent members of Bronze Age communities (Cleuziou 2003: 144; Cleuziou and Tosi 2018: 243). They imagine that their affiliates, clients, and kin-related groups were housed at the foot or near the tower. It is true that at least at some towers (such as Tower 1146 in Bat), domestic structures have been found close-by. However, inside the towers, little has been found that hints towards domestic activities such as hearths. The Tell Abraq tower is one of the few exceptions. A carbonized date pit found inside an oven on top of the tower was dated to 2350–1910 cal. BCE (2-sigma, 95% probability); in the same levels are a possible pottery kiln and fire pits divided by a "substantial mudbrick structure" (Barker 2018: 183) on the western part of the tower (Barker 2018: 182–184, fig. 7.7). Also on the western side of the tower were several ovens—including one that resembles a *tannur*—near an area with a plastered floor (Barker 2018: 215, fig. 7.30). However, during the 1992 season the excavators "also established that these ovens were in fact built inside the tower, and not on top of it" (Barker 2018: 217). It is unclear whether this simply referred to the preservation of the primary tower wall being higher than these Umm an-Nar period loci; if so, it merely indicates that the activities on top of the tower were at least partially walled off from those outside (and below). However, at Maysar-25, one of the few other towers where the excavators have found remains of actual rooms (Weisgerber 1981: 201), there was no such evidence of domestic use. Beyond the limited evidence from towers themselves, there is little evidence of elites in the archaeological record of the 3rd millennium BCE in southeast Arabia. Neither the burials nor the domestic architecture shows any social stratification or differences in access to resources or wealth distribution.

Another idea is that the towers were connected to irrigation and water supply (Frifelt 1976: 61). For this argument, the ditches encircling a number of the 3rd millennium BCE towers play a prominent role (Döpper 2018a; Mortimer and Thornton 2018). At Bat, the 4 m wide and 2 m deep ditch around Tower 1145 had, according to Frifelt (1989: 113) was probably connected to a wadi stream. Furthermore, the location of the towers in arable land rather than at strategic locations that would make them suitable for defensive purposes is another argument for her idea of the towers being part of an irrigation system. Her main point, however, are the central wells. The objective of the towers would have been to create a gradient for the water in order to irrigate the surrounding fields (Frifelt 1989a: 113). Water could have been brought to the surface from the well with the aid of a draught animal and a pulling device. The ramps located at some towers would also possibly be associated with a pulling device—although it is unclear how this would work.

Figure 3.4. Ditches and remains of stone-foundation bridge at tower ST1 in Salut (photograph by M. Degli Esposti).

Cleuziou (1998; 2004; 2009: 730) is of the opinion that the irrigation necessary for agriculture was done by the means of a simple version of a so-called falaj-system, of which the ditch systems surrounding the towers at Hili would have been a part. However, most archaeologists reject the idea that falaj systems were adopted in the region before the Iron Age as there is no certain earlier evidence for it (Al-Tikriti 2010; Boucharlat 2003: 161–172; Charbonnier 2015; Potts 1990: 131–132; Wilkinson 1983). It is further questionable if those ditches, which were in most cases cut into the ground through the alluvial silt, were generally suitable to hold water at all, which would be the prerequisite for them belonging to an irrigation system. Potentially, the moats were constructed to protect the towers against floodwaters caused by the occasional heavy rains (Döpper 2018a; Frifelt 1985: 98; Jorgensen and Al-Tikiriti 2002: 42). There is a noticeable pattern between towers that are located on plains, and thus at risk of being damaged by floods, and the presence of ditches, including Building II. Towers at higher locations such as on rocky outcrops do not seem to have ditch systems (Cable and Thornton 2013: 384). Occasional flooding of the ditches would also account for the successive recutting of the ditch system surrounding it, which needed to be renewed when it was filled by wadi sedimentation to maintain their functionality. Such recutting is evident at Al-Ghubra (Orchard and Stranger 1994: 82) and flooding events are also observed at Salut ST1 (Degli Esposti 2013; 2014) (Figure 3.4). The revetment of some of the ditch edges with stone walls might also be identified as a strengthening technique against the forces of the floods. The short-lived Tower 1156 at Bat is remarkable for being surrounded by a stepped ditch system, part of which culminated in a cistern (Mortimer and Thornton 2018: 72, fig. 8). This almost certainly indicates that at least some of the ditches were constructed for surface floodwater management; this does not, in and of itself, negate possibilities for further use of the water.

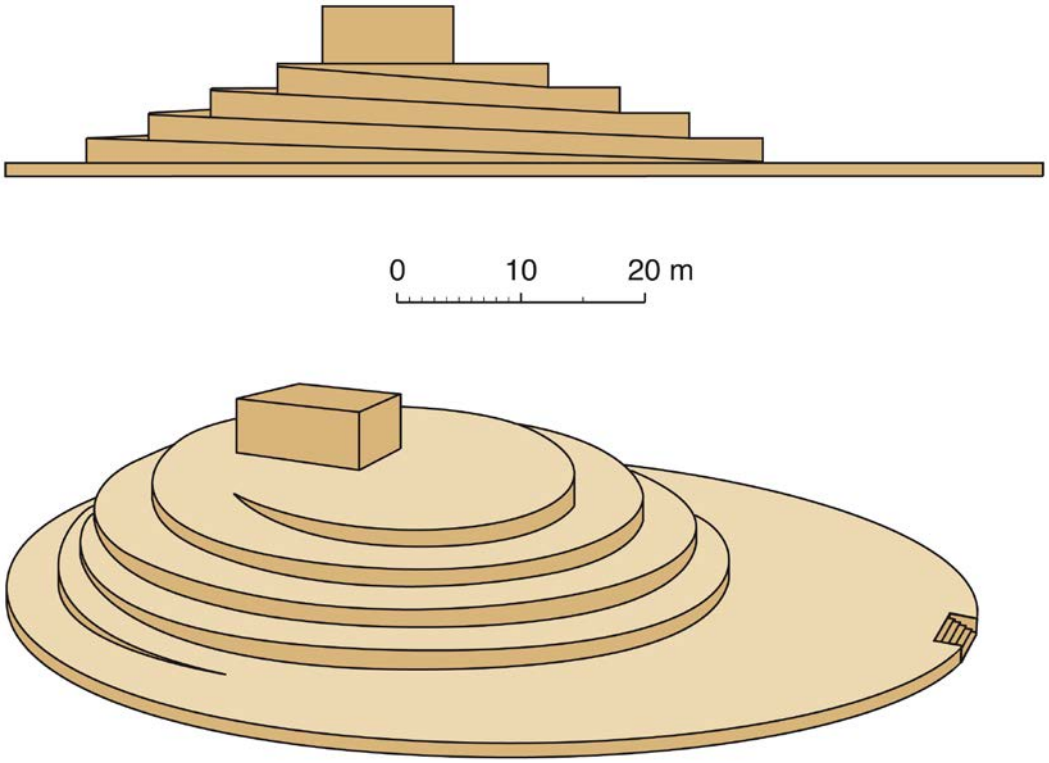


Figure 3.5. Hypothetical reconstruction by Jocelyn and Jeffery Orchard of a tiered platform (2015: 102 fig. 8).

The association of the towers with cultic practices is also very commonly found in the literature. Hasting, Humphries and Meadow were among the first to speculate about the ceremonial usage of the towers (Hastings *et al.* 1976: 13). Jocelyn and Jeffrey Orchard (2002: 231; 2007; 147) argued that a specific type of tower — which they defined as "tiered platforms"—were associated with religious and/or funerary practices, and place it in line with Mesopotamian ziggurats and the Step Pyramid at Saqqara in Egypt (Figure 3.5). To them, these footings suggest the presence of a shrine or sanctuary on the topmost level. Additionally, they interpret the helicoidal ascent to the monuments and the general form of the structures as deliberately constructed to rise upwards towards the sky. The same is true for the beehive tombs located on ridges. All have a 'heaven-directed' position. Therefore, they see a ritual relationship between the devotional and the funerary aspects. They see this further underlined by the find of a small replica of a tiered monument in the midst of a group of tombs at the site of Zahr Sidrah in Wadi Sarin (de Cardi *et al.* 1976: 151). They interpret this as a direct link between the towers and burial rituals (Orchard and Orchard 2007: 147). However, most likely this represents only a normal Hafit period tomb, albeit with three ringwalls. Crawford (1998: 118) suggests that the two graves below Maysar-25 are another indication of ritual activities conducted at the tower. To Reade (2000: 136) the wells located at the centres of some towers can be linked with sacrificial sites used in curing sicknesses. It had to be said, however, that no cult paraphernalia, images of deities or anything of clear ritual function has ever been found at a tower on the Oman Peninsula. Therefore, all these ideas remain speculative. Artefacts were generally rather sparse at the excavated towers and mainly consisted of pottery sherds. Some towers featured evidence for copper processing, most abundantly at Building V in Al-Khashbah (Schmidt and Döpper 2019) and at a smaller scale at several towers at Building II (Leigh 2016) (Figure 3.6). This is one of the few activities that has been conclusively demonstrated at the towers.

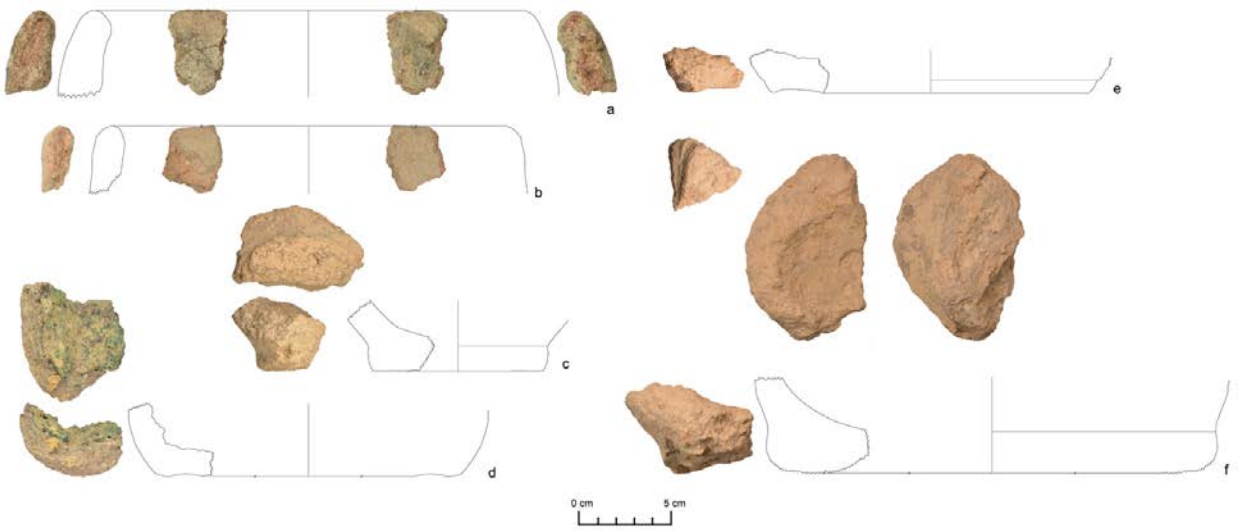


Figure 3.6. Crucible and furnace fragments with slag adhesion from Building V at Al-Khashbah.

Given the distribution of the towers over the region, the presence of hearths and ovens around them, Karen Frifelt, referring to an unpublished thesis by Ron Lenheer, further suggested that they could have been resting places at a distance of a day's ride with donkeys and goats from each other (Frifelt 2002: 109). This goes together with a notion of the towers being marketplaces for groups in the region (Frifelt 2002: 110). Taking all evidence together, a communal gathering place for multiple purposes, including manufacture and exchange of goods and social events, currently seems to be the likeliest explanation. Further, it is likely that different towers had different functions and there is not a one-size-fits-all solution.

Chapter 4

Conclusions

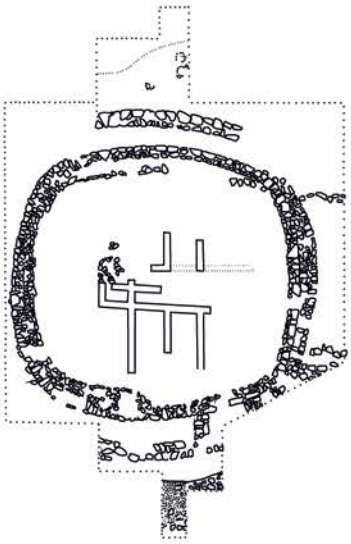
From the beginning of archaeological research on the Oman Peninsula, Early Bronze Age monumental tower structures were at the centre of attention. Most early excavations focused on tower sites and there was a general tendency to judge the importance of sites by the number of their towers. Theories for settlement patterns of this period often assume a three-level settlement hierarchy with central sites with towers and functionally dependent sites in their surrounding areas. Among the first to classify the different types of Umm an-Nar period settlement were Hastings *et al*. (1976: 12). They distinguished three different types of settlement but without positioning them within a hierarchy. The first one is characterised by what they call a central elevated structure, i.e., a tower, surrounded by domestic buildings and tombs. Their second type of settlement consists of domestic architecture and tombs but no towers; their third group mainly features domestic structures, although several tombs might be present as well. Carl Phillips (2007: 5–6) sees at the top of the settlement pyramid sites with substantial architecture and graves, in second place settlements with graves and artifact scatters without substantial architecture, and at the bottom, pure artifact scatters. Nasser Al-Jahwari and Derek Kennet (2010: 168–171) suggested that at the highest level are sites with many monumental towers, sites with only one tower at the second level, and small settlements without towers at the third level. The problem with both theories, however, is that the available data so far suggest exactly the opposite, since in total there are significantly more sites with towers than without that are known (Döpper 2018). This could only reflect the current state of research as new domestic sites are constantly discovered, but also the number of known towers steadily increases. While Doe (1983: map 5) lists 13 tower structures, this number multiplies in Charlotte Cable's and Chris Thornton's tower survey (2012) to 60, and expands over the next ten years to the time of this publication to 98 towers. While newly discovered towers slowly fill some voids in the distribution map such as the Batinah (Figure 21), most new towers add to the picture of a concentration of the towers along the southern foothills of the Al-Hajar mountain range in the Sultanate of Oman and along the coast of the United Arab Emirates. Besides systematic surveys in previously under-researched areas, geophysical prospection has proved to be a major advance in detecting towers buried beneath alluvial deposits, especially those built of mudbricks. These methods enable the discovery of additional towers at sites that have been known for decades such as Al-Khashbah but also at more recently discovered multi-tower sites such as Al-Aridh. At the same time, one has to always be aware of the large number of towers that likely have not survived the passage of time, whether due to modern construction (e.g., at Al-Khashbah) or changes in the physical environment (e.g., at Al-Qumayrah and Firq).

In 2018, Ann Mortimer and Chris Thornton (2018: tab. 3) published an estimate on the percentage of excavated towers from all known towers. At that time, only 24.7 % of all known towers were excavated. To date, this number has slightly increased to 32.7 %, giving testimony to the pace of ongoing excavation activities. Still, the majority of Early Bronze Age towers remains unexplored. One of the most significant discoveries of these excavations was a more defined chronology. It is now beyond doubt that tower building started as early as the beginning of the Hafit period at the end of the fourth millennium BCE (Chapter 2). A Hafit period date for towers has already been suggested by Serge Cleuziou as early as the late 1980s (Cleuziou

1989), but was widely neglected or even actively opposed (e.g., Potts 1997) in the years that followed. Having a better chronological understanding, it becomes apparent that at multi-tower sites most towers were not used simultaneously, but one after another, making precious assumptions on the importance of a site based on the number of towers questionable. We also see that the use and even the construction of towers did not end with the Early Bronze Age but continued will into the Wadi Suq and following periods. This has been established for quite some time for various sites in the UAE (e.g., Tell Abraq, Kalba 4, Hili 8), but is a rather new insight for the Sultanate of Oman (e.g., Al-Khutm, Al-Mudhairib). Despite the significant changes in subsistence strategies, resource exploitation and social complexity that occurred during the Bronze Age on the Oman Peninsula, it thus seems that towers were a stable factor and only gradually went out of use within the second millennium BCE.

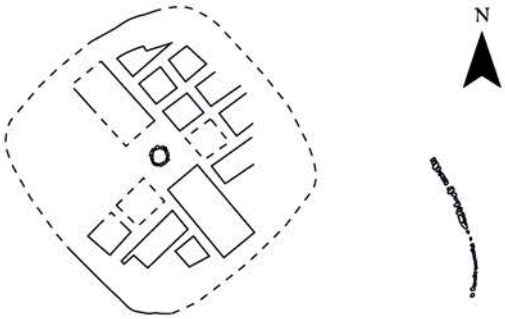
Notwithstanding these advanced in our understanding of Early Bronze Age towers, many questions are still unanswered. In spite of the increasing number of excavated towers, their functions are still largely elusive. Inventories are as good as absent and not conclusive beyond individual activities such as copper processing. We also have to admit that despite some attempts, any typology for the different types of towers (e.g., de Cardi 1975; de Cardi *et al.* 1976; Doe 1983; Orchard and Orchard 2018) did not withstand thus far beyond the presence/absence listing of individual features such as wells, annexes, etc. Further, even if we can identify that towers were built consecutively at a given site, the reason behind building a new tower every few generations is not yet known.

How can we productively move the field forward from this point given that more advanced excavation techniques could not provide answers to some of the most pressing questions regarding towers? Part of the answer could be in moving away from the towers themselves and setting them into a bigger picture. By focussing on regional and landscape studies and incorporating new technologies such as remote sensing and predictive modelling, new insights can be generated that provide new insights into these remarkable and unique landmarks of identity.



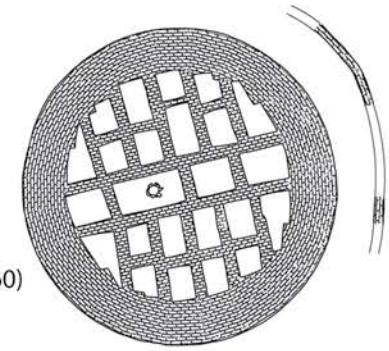
Bidya 2
(based on Al Tikriti 1989: pl. 78)

Bidya 4
(based on Al Tikriti 1989: pl. 83)

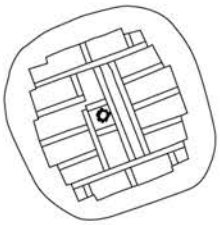


Kalba 4
(based on Eddisford and Phillips 2009: fig. 107)

Wadi Al-Hilo
(based on Kutterer 2013: fig 5.60)



Hili 1
(based on Frifelt 1975: fig. 3)



Hili 8
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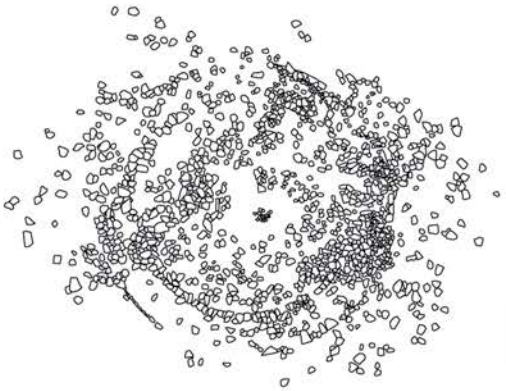
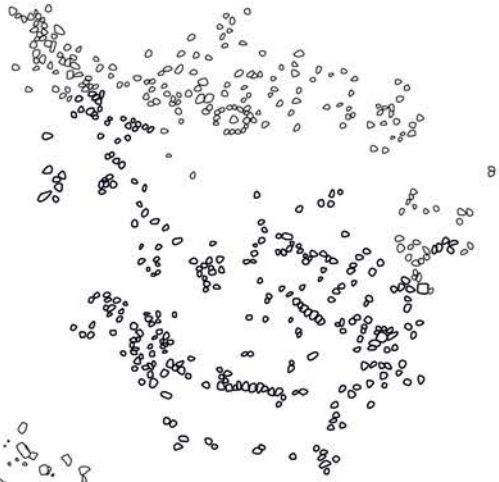


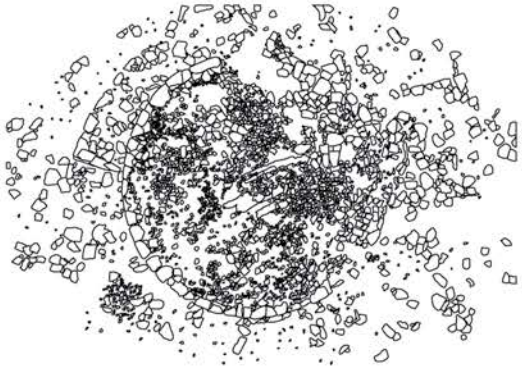
Ajran

Al-Qumayra 1



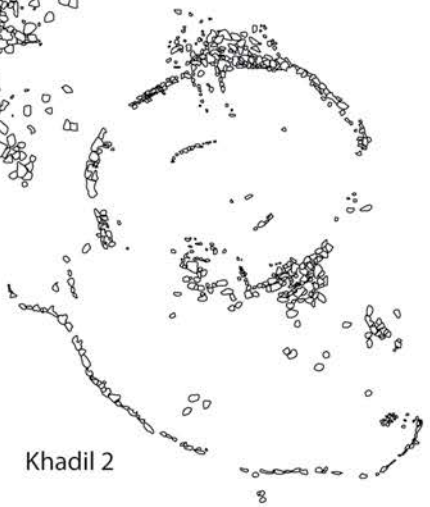
Al-Shukur

Safri 3

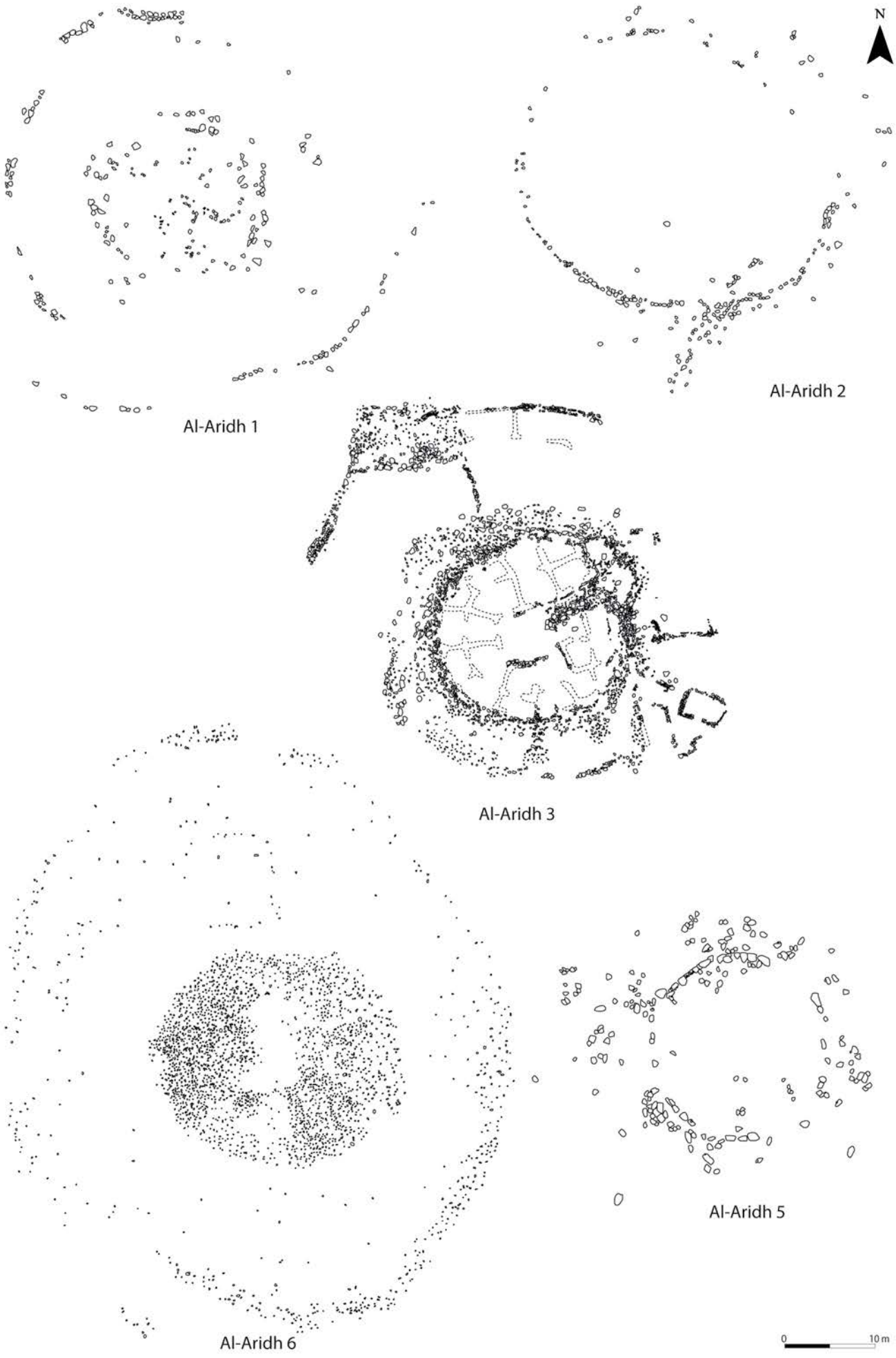


Al-Safri 1

Khadil 1



Khadil 2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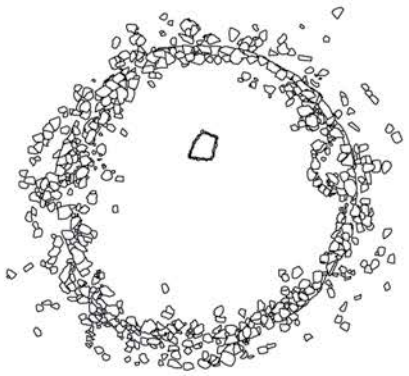
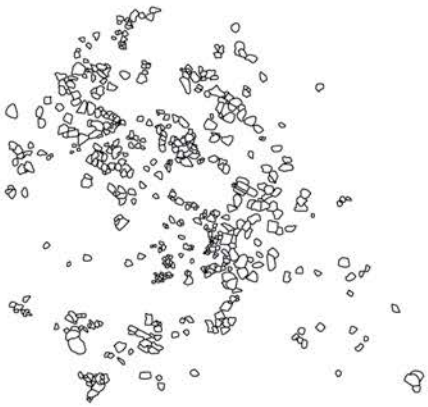
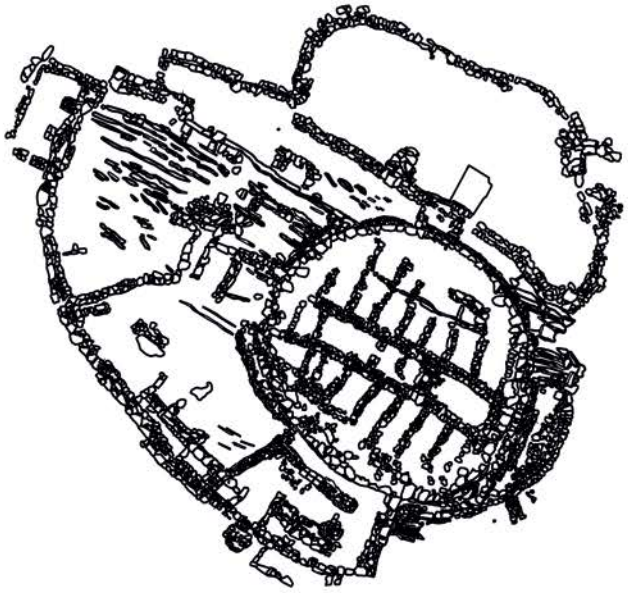


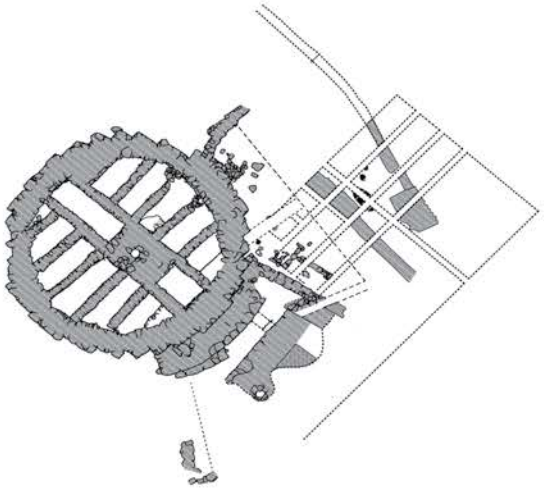
Al-Dariz South 1



Al-Araqi North

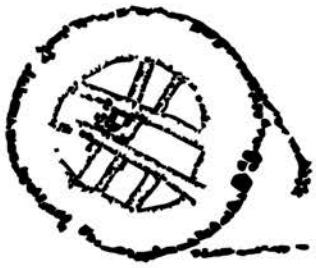


Al-Khutm
(based on Cocca et al. 2019: fig. 4;
approximate scale)

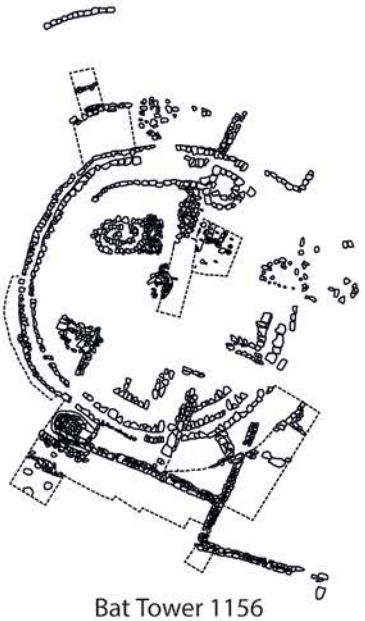


Bat Al-Rojoom Tower
(based on Frifelt 1976: fig. 3.)

Bat Matariya



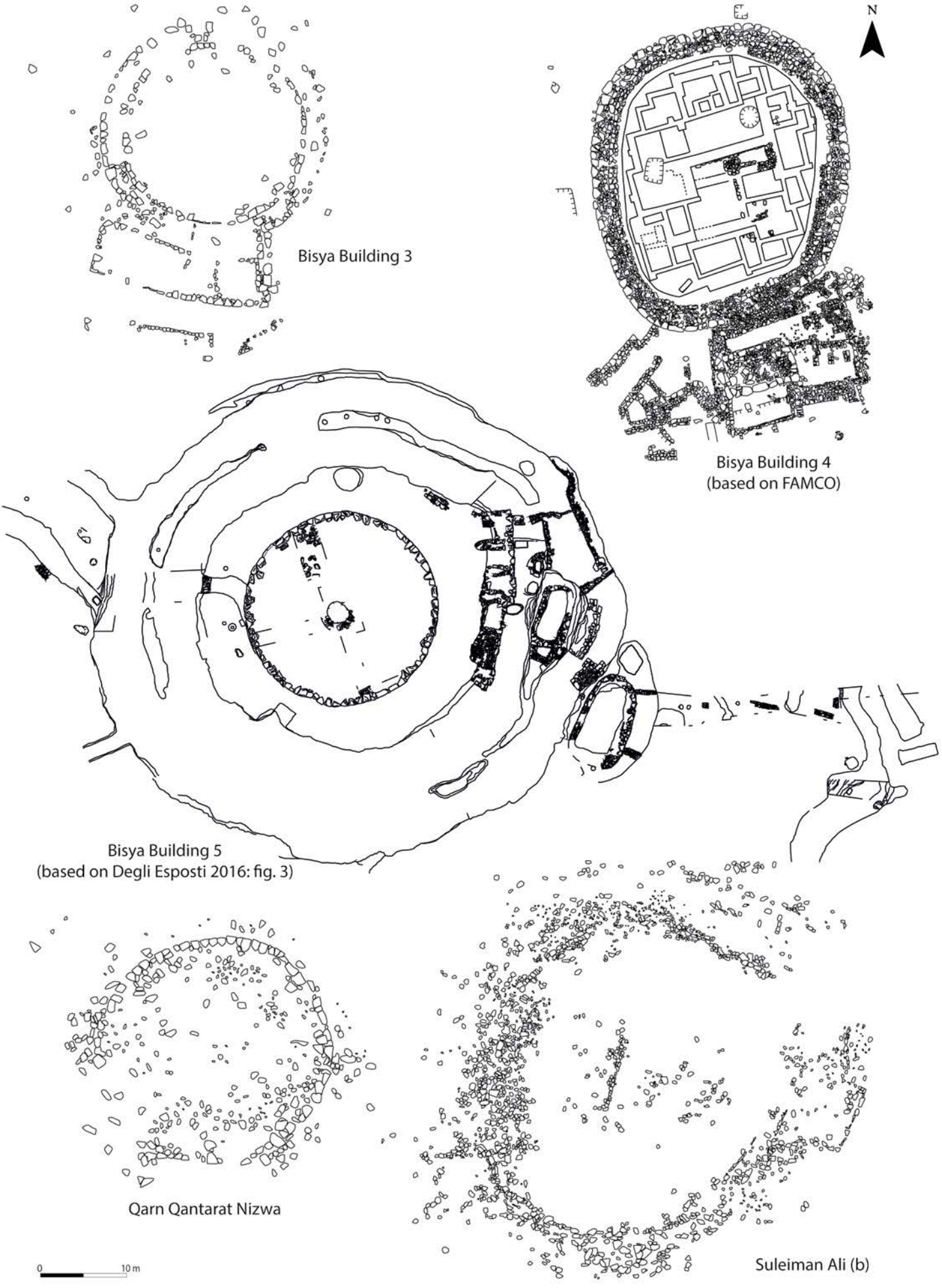
Bat Al-Khafaji Tower

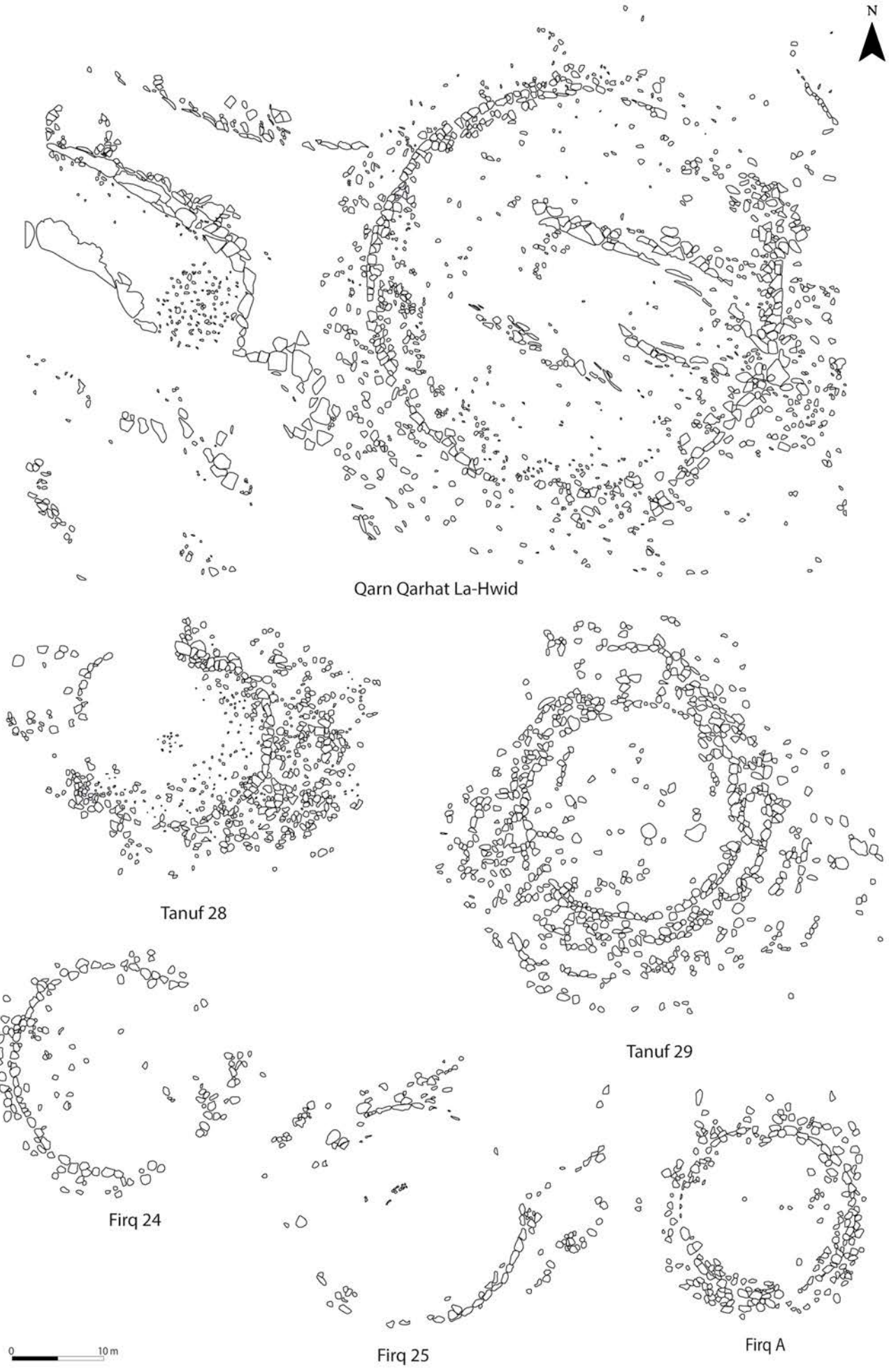


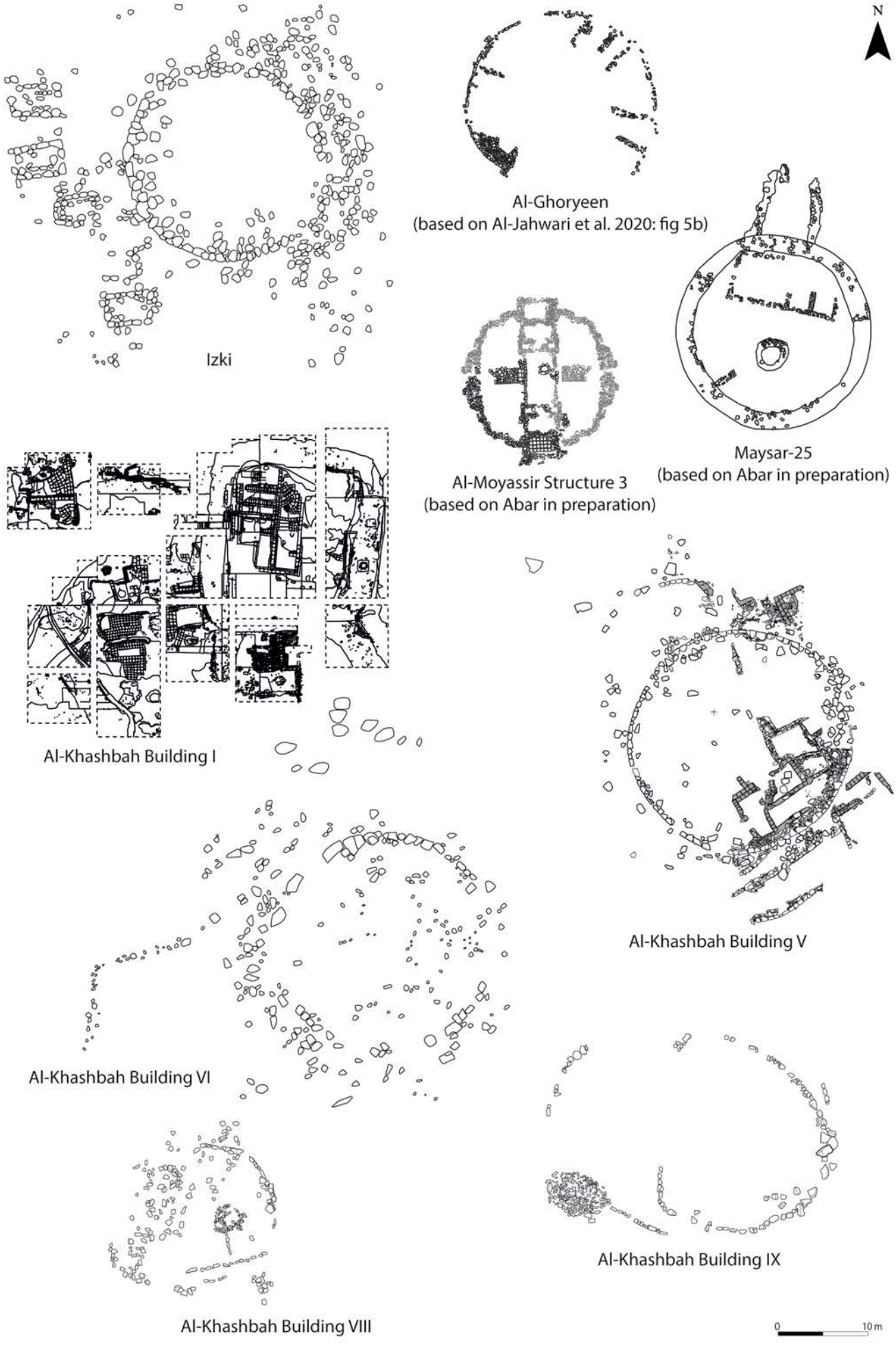
Bat Tower 1156

Bat Building II


N
Amlah
Al-Maidan
Al-Ghurbra
Yiqa
Sufayha
Bisya Building 1
0
10 m


N
Bisya Building 3
Bisya Building 4
(based on FAMCO)
Bisya Building 5
(based on Degli Esposti 2016: fig. 3)
Qarn Qantarat Nizwa
Suleiman Ali (b)
0
10 m


N
Qarn Qarhat La-Hwid
Tanuf 28
Tanuf 29
Firq 24
Firq 25
Firq A
0
10 m


N
Izki
Al-Ghoryeen
(based on Al-Jahwari et al. 2020: fig 5b)
Al-Moyassir Structure 3
(based on Abar in preparation)
Maysar-25
(based on Abar in preparation)
Al-Khashbah Building I
Al-Khashbah Building V
Al-Khashbah Building VI
Al-Khashbah Building VIII
Al-Khashbah Building IX
0
10 m


N
Al-Khashbah Building II
Al-Khashbah Building IV
Al-Khashbah Building VII
0
10 m

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