The trade and distribution of ceramics in the Western Indian Ocean 1250-1550AD An analysis of current available assemblages from Arabia, Iran and East Africa

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ABSTRACT: This thesis is designed to make a generalized study of the ceramics present in the Western Indian Ocean during the period 1250AD- 1550AD, the period of expansion of the Hormuzi trading empire and its associated site of Julfar. The first part presents an analysis of the recently excavated assemblage from Julfar al-Nudud and then sets out to contextualize this within the wider Indian Ocean. Bringing in the available data from important trading sites in Arabia, southern Iran and East Africa, the work demonstrates a series of generalized assemblages based on period and geographical location, along with identifying a 'ceramic trading' assemblage for the study area. This puts forward that certain wares, generally Gulf and Chinese high- quality glazed wares are likely to be found on most sites involved in trade during this time, although not necessarily in great quantities. Other unglazed Iranian and Arabian storage wares, presumably traded for their contents rather than the vessel itself are found in greater quantities but individual wares vary between sites. The study finally identifies the areas where data is currently insufficient and suggests important future research questions for the study area.

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FIGURE 209: TRENCH B JULFARWARES PHASING GRAPH 419
FIGURE 210: TRENCH C JULFARWARES PHASING 420
FIGURE 211: TRENCH C JULFARWARES % ACROSS PHASING 420
FIGURE 212: TRENCH C JULFARWARES PHASING GRAPH 420
FIGURE 213: TRENCH D JULFARWARES PHASING 421
FIGURE 214: TRENCH D JULFARWARES % ACROSS PHASING 421
FIGURE 215: TRENCH D JULFARWARES PHASING 421

ACKNOWLEDGEMENTS:

The main part of this thesis is made up of the ceramic assemblage from Julfar al-Nudud. It is therefore fair to say that this work would not have been possible without the support and help of all involved in the excavation and post-excavation work of that site. The Department of Museums and Antiquities in Ras al-Khaimah financed and supported the project as well as being very accommodating during my stay in Autumn 2010. Christian Velde, the resident archaeologist in RAK, provided useful and constructive feedback on my early work there and was a wonderful host. Dr Kevin Lane, the project and excavation supervisor for al-Nudud did a fantastic job of working out the stratigraphic puzzle of the site, and when combined with Dr Bing Zhao's work on the Far Eastern ceramics, allowed my work to be grounded within a solid phasing. The overall support, advice and feedback of the project director Dr Robert Carter cannot be underestimated. During my time in RAK, the company, smiles and tea provision of Raiz Ahmed, Rakhman Ali, Abid Ali and Aziz Ali made going to the pot shed every day a pleasure. I hope this work proves to them that I am not as lazy as they regularly suggested. I also extend my thanks to the Qalhat excavation team, in particular Dr Axelle Rougeulle and Helen Renel who allowed me to use their ceramics data within this project. Throughout this work Dr Derek Kennet has been forced to read, re-read and occasionally re-re-read sections of this work. I can only apologise for my occasional drifting into a language he has designated as Saunderese and thank him enormously for the patience and help he has given over the last 2 years. A great vote of thanks to my dad who read the whole thing, finding a multitude of spelling and grammar mistakes and sent it back to me with the words "It's very good. I don't understand a word of it, but I'm sure it's very good." Thanks Dad. Thanks to Alex Partridge who kindly sent me articles which I was unable to find. Similarly thanks to all my friends, family and unsuspecting members of the public who have had to endure my ceramics based rants, attempts at explanations and a period of sherdshock when I couldn't look at another piece of pottery without screaming. I'm sorry, and thanks very very much.

CHAPTER ONE: CERAMICS ANALYSIS IN THE WESTERN INDIAN OCEAN:

1.1: INTRODUCTION:

This thesis is primarily concerned with the distribution of ceramics around the Western Indian Ocean and the differences between site assemblages. It discusses the implications of these differences and similarities for the study of trade and exchange in the period of 1250-1550AD, as the high point in the fortunes of the major trading hubs of Julfar and Hormuz (Kennet 2003: 121). These two sites, both located in the Lower Arabian Gulf, appear from both historical documentation and archaeological material to have been important in the importation and exportation of ceramics as well as other goods, with Hormuz almost solely subsisting on inter-regional trade in the Gulf and further afield as discussed in Kennet 2004. Figure 1 and Figure 2 demonstrate the study area with the locations of the sites discussed in this thesis.

Figure 1: Sites in the Indian Ocean relevant to this project:

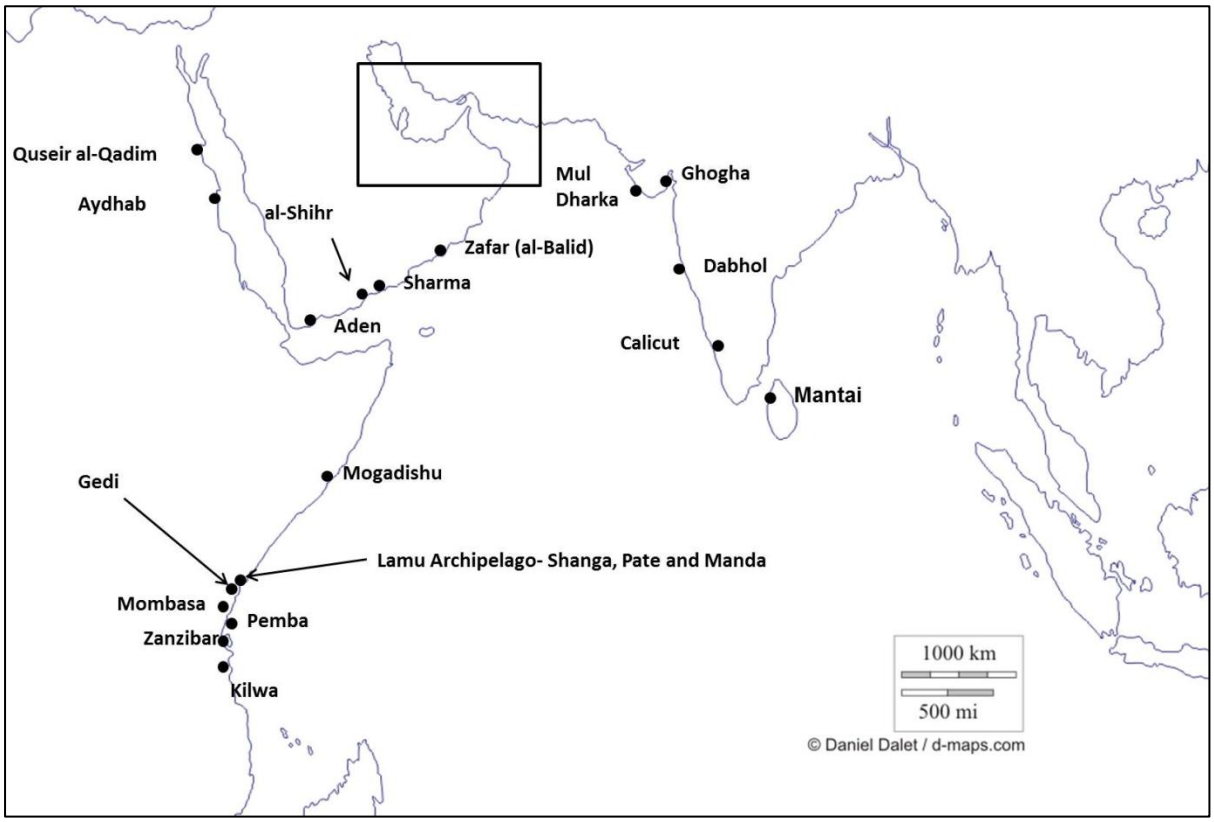
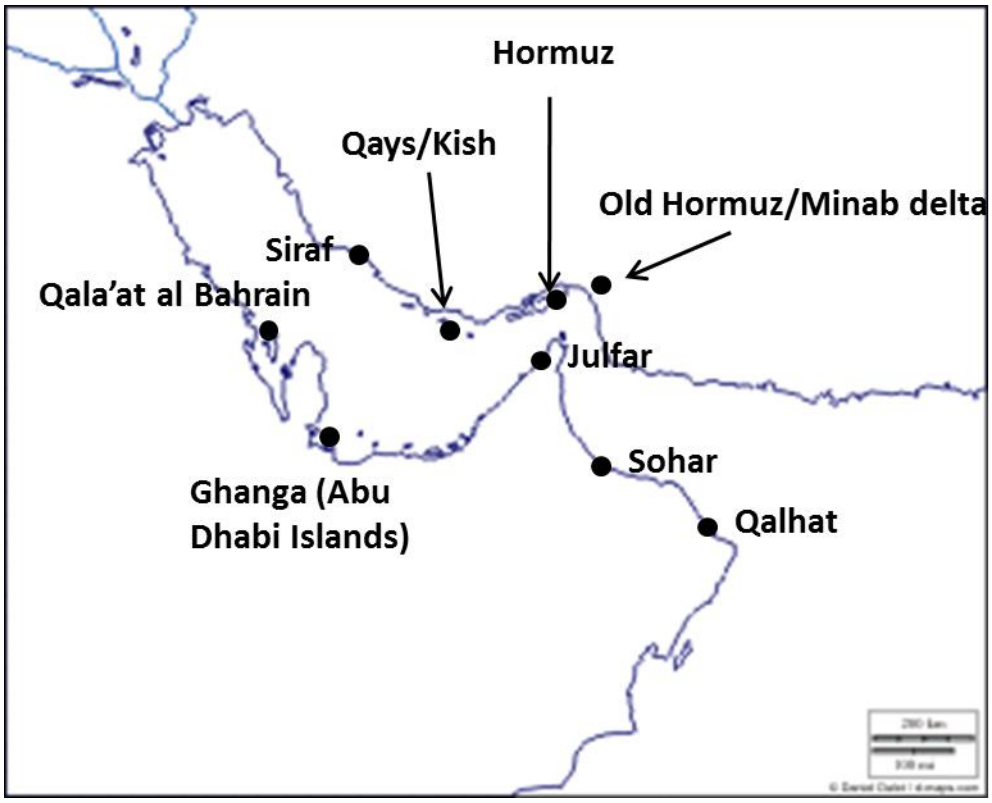


Figure 2: Sites in the Arabian Gulf (close up) relevant to this project:



The historiography of the study area is sadly of mixed quality, both of excavation and publication. A more in depth discussion of the publications for the wider Indian Ocean sites can be found in chapter four, while the Julfar publications are analysed in chapter two. However it is important here to mention the key sites and publications for this study. Three pieces of research form the backbone of this thesis. The first is the ceramics held within the Williamson Collection, originally collected and studied by Andrew Williamson prior to his untimely death in Oman in 1975. Williamson, alongside Martha Prickett, was responsible for an extensive survey including ceramic pick up in Southern Iran (Priestman 2005). He published a limited amount of analysis and discussion on this collection before his death (Williamson 1972). The collection was then revisited, analysed and fully published by Priestman (2005), using a systematic approach developed by Kennet (2003) for his excavations at Kush and the British excavations at Julfar led by King at Julfar (King 1990; 1991; 1992). These provided a general ceramic assemblage for both sides of the Arabian Gulf from the Sasanian to Late Islamic periods and importantly published a full numerical assemblage- in the case of Kush and Julfar, a phased one. Around the same time, other excavations within the study area were similarly publishing phased quantified assemblages- Horton's excavations at the East African trading port of Shanga (Horton 1996) highlighting the large amount of local ceramics compared to imports which earlier nearby studies by Chittick at Kilwa and Manda (Chittick 1974a; 1974b; 1984) had alluded to. Other

excavations from this time are less forthcoming about the exact numbers of ceramic found- the catalogue of the ceramics from the Danish/French excavations at Qala'at al-Bahrain presents a beautiful series of illustrations of the various ceramics found but is strangely silent on quantities (Frifelt 2001). The actual excavation report (Kervran *et al* 2005) despite being published after Frifelt, is equally shy about actual numbers. This lack of any quantified published assemblage from an important trading site is a serious issue that is repeated again and again, although with the exception of Qala'at al-Bahrain, the publications of sites in recent years have included a full or partial quantification of the ceramics- Bilad al-Qadin (Carter 2005); Qalhat (Rouguelle 2010; Sharma (Rouguelle 2005). It must be noted that all of these sites are in the Western Indian Ocean. Currently no Indian or Sri Lankan site has been fully published with quantified reliable ceramic information, although the important trading site of Mantai (Sri Lanka) is in the process of this (Bohingamuwa pers.comm 2012). Further discussion of these publications and sites will be made in chapter four.

The purpose of this study is to bring together the evidence from various individual sites and regional analyses into one over-arching discussion. Previous studies have shown how interlinked the trade systems of the Indian Ocean have been since at least the first Roman expeditions in to the Erythraean Sea (Clark 2006: 388). These studies have generally only looked at individual sites. None have attempted to quantify and analyse the patterns of trade around the whole of the Western Indian Ocean through the ceramic assemblages collected. This study attempts to combine assemblages which have been published to a reasonably high standard and subsequently bring in evidence from those which are more difficult to explicitly quantify. It is based upon the ceramic assemblages from thirteen sites and one survey area. Only seven of these have published quantified data for their ceramic assemblages and only four of these seven have phased quantified assemblages. This study, rather than identifying and comparing a selection of suitable assemblages from a larger corpus, is a study based upon the near entirety of the assemblages available. This is largely due to the current nature of Indian Ocean archaeology, with varying scales of publication of sites coupled with large amounts of data going unpublished completely. Therefore this study contains an eclectic mix: sites with complete published phased assemblages broken down into constituent wares; sites with numerically published assemblages with no ware/phasing data; sites with broadly estimated numerical assemblages; and other published sites that have assemblages with no numerical data published but contain drawn examples and written discussion of the assemblage. This lack of consistency is known to be an issue for the project. To mitigate this, the methodologies used to bring together these differing assemblages allow cross-comparison of disparate data with minimal loss of raw information. The study is an important early step to understanding the

trading patterns within the Indian Ocean, offering thoughts and interim conclusions on the structuring of any trade involving ceramics in the Middle Islamic Period trading boom of Hormuz. It builds upon previous studies by Kennet (2004), Priestman (2005) and Tampoe (1989) which attempted either a regional discussion of trade or related a site's assemblage to the wider trading network, adding in the large assemblage from Julfar al-Nudud as well as other recently excavated and published assemblages.

Ideally this study would be based on a study area including the whole of the Indian Ocean as well as production and trade sites further to the East in South East Asia and China, and would discuss/analyse ceramics trade from the beginning of the Islamic period through to the beginning of European domination. However the constraints of a Masters mean that these parameters must shrink to allow some analysis, rather than just a description and catalogue of trading sites, useful as that would be. Equally there are logistical issues regarding access to information and raw data from many of the assemblages from India and further East, due to either a lack of publication or systematic cataloguing, or indeed in many cases, both. Therefore the research will be based around the Western Indian Ocean which includes an interesting variety of sites within areas of differing raw materials, traded goods and landscapes. It includes the Arabian Gulf, the seaboards of Oman and Yemen and the East African coast. In terms of time period, originally the study included an analysis of assemblages and trading sites from 700AD through to 1250AD alongside the later sites currently presented. However again this proved too much for a project of this size to contain while maintaining an appropriate level of in-depth analysis. Therefore the early cut off of 1250AD (the point at which the trading site of Hormuz- and to a lesser extent- Julfar and Qalhat become known) and a late cut off of 1550AD (the approximate date of European annexation of Hormuz and therefore the end of an independent Hormuzi trading enclave) were decided upon. These dates contain a period of suspected restructuring of trade within the Gulf and further afield (Kennet 2003) and therefore it is hoped that part of this study will provide some detail of this.

To enquire into this large scale inter-regional trade, it is necessary to discuss the wider archaeology of a region rather than just look at an individual site. Important work has been completed on analysing the Gulf assemblage, generally looking at ceramics from one nation, referencing other studies along with other smaller scale work to place a single site assemblage within its regional assemblages. A brief literature review and discussion of ceramics analysis in the Indian Ocean is presented in Chapter four.

1.2: STRUCTURE OF THE PROJECT:

Chapter two will look at the archaeology of the site of Julfar and sum up the history of research at this important trading site. It will include details of all archaeological work known to have been conducted on both sub-sites of Julfar: al-Mataf and al-Nudud. This summing up will include details of the most recent excavations at Julfar al-Nudud by OBAH in 2010 before the ceramic assemblage from these excavations is discussed in more detail.

The third chapter presents the ceramic assemblage from the OBAH excavation during the winter and spring of 2009/2010. This chapter is put forward as a technical example of correct assemblage publication for Indian Ocean sites as it both contains analysis and discussion of the assemblage as presenting the complete phased raw data set for both wares and rim types. It also discusses the assemblage in terms of ware families- groupings of wares with a similar function or provenience- across the phasing and physical extent of the site and then looks at the development of the site through the ceramic assemblage. This chapter, in discussing a large Indian Ocean trade site assemblage, demonstrates what can be achieved through detailed analysis of the individual wares, phases and ware families. It brings in different techniques of analysis, demonstrating those that have been successful in detailing the assemblage, as well as those that have failed to enhance the analysis. It demonstrates that multi-layer assemblage analysis- looking at individual wares and rim types across the site as well as the groupings of families- allows for a more nuanced view of the assemblage, both in terms of the site as a whole and in terms of its relative position in the Indian Ocean trading system.

Having discussed the Julfar al-Nudud assemblage in isolation, Chapter four brings in other trading sites around the whole Indian Ocean, partially to demonstrate the extensive spread of sites involved in the trading network and also to introduce the other sites assemblages which will be discussed in the analysis chapters. This chapter critically assesses these sites, selecting those which can be used for this study and rejecting those which prove unsuitable. This decision will be made on the strength of the quality of publication and the data available, as well as their relevance to the project as a whole. This chapter introduces new geographical locations to the study, with sites not only in the Arabian Gulf but also in Oman, Yemen and along the East African seaboard to Kilwa in southern Tanzania and on the Indian sub-continent in Gujarat and Sri Lanka. This spread of sites gives examples of assemblages from the whole length of the Indian Ocean coastline and will hopefully highlight the issues involved in conducting any widespread comparison of archaeological material from Indian Ocean sites such as incomplete or

completely missing datasets, insufficient publication, mistakes in categorisation and a complete lack of consistency between various reports and publications.

Chapter five then takes an in-depth look at each assemblage from sites without published ceramic raw data. Without this data, these assemblages cannot be used in a like-for-like numerical analysis, as those discussed in chapter six are, but they can be compared to other sites in terms of the wares present. The nature of the various site assemblages in the reports is as varied as the number of sites. Some contain a very loose summation of the site excavation, archaeology and general history, with a small section, or occasionally a couple of paragraphs devoted to the ceramics found. These are usually accompanied by a selection of ceramic drawings of key/interesting ceramic examples. Other reports are based entirely on the ceramic finds but inexplicably do not contain any data for the assemblage in general. They do however provide a detailed collection of ceramic drawings of wares found at that site or general location, along with some dating evidence. The remaining reports have published their data but in a form that makes it incompatible with the rest of the data in this study. This chapter demonstrates that even though the assemblages discussed are incompletely published and often have serious issues with their collection, identification and presentation, they can still be used to make a rough dataset which can supplement the raw data from sites discussed in chapter six to identify key wares and rim forms in the ceramics trade for this period.

The sixth chapter brings in the assemblages that do have complete published assemblages. This chapter predominantly looks at assemblages dating to between 1250-1550AD, bringing in evidence from earlier sites when necessary. The bracketing of this study relates to the period of perceived occupation at Julfar with its foundation around 1250AD. This chapter, as chapter five did for the non-numerical assemblages, looks critically at the presented assemblages, discussing any issues with the assemblages before each assemblage is compared to the Julfar al-Nudud overall assemblage to look for consistencies/differences between assemblages in terms of ware family percentages. Having introduced and completed analysis on the numerical assemblages (including phasing analysis of those with the available data), the assemblages without published raw data will be considered in terms of the data presented in their reports, which is in general, ceramic drawings of important or rare ceramics, as well as the discussion of the assemblage in each report. The second part of this chapter will look for patterns in assemblages from similar geographical locations, in terms of ware family breakdown. It only contains analysis of the full numerical assemblages as it is very difficult to assign quantitative ware family properties to the other assemblages.

Chapter seven discusses the general assemblage around the Indian Ocean, including more sites in greater detail as the analysis is based around individual wares- both their quantity where the data is available, and their presence on a site where numerical detail is lacking. Currently one of the major sites, Qalhat does not have an assemblage split into component wares, and so the majority of the archaeology of the site is excluded from this level of analysis. The season completed by Vosmer has a brief description of the ceramics found in field survey and so some limited detail can be brought in. The numerical assemblages are discussed in terms of the percentages of a ware in the assemblage with three levels distributed depending on the percentage: 'significant', 'important' and 'normal'. After looking at the numerical assemblages the discussion brings in the drawn assemblages to look for significant and important wares across the Indian Ocean, both in terms of geography and period. The final part of this chapter includes a typological table of wares (and their typical rim forms) found in various parts of the Indian Ocean, and across the whole study area.

Finally chapter eight discusses the conclusions drawn from this study, looking at new possibilities for the development and manner of ceramic trade in the Western Indian Ocean. This chapter will also include an evaluation of the overall project, its findings and discuss possibilities for future research in Indian Ocean trade and ceramic analysis.

CHAPTER TWO: THE ARCHAEOLOGY AND HISTORY OF JULFAR:

2.2: JULFAR: ITS ARCHAEOLOGY AND HISTORY:

This research hopes to fit in between the well-studied period of Roman trading systems of the late Antique period and the rise of European mercantile domination started by the Portuguese in the early 16th Century. The base site for this project is the important late Islamic trading and pearling port of Julfar, in Ras al-Khaimah. Numerous mentions of Julfar in both Arab and Western literature demonstrate the importance of the site, although there is some difficulty in differentiating the physical site of Julfar from the toponym which appears to have been applied to multiple areas and sites over the last 1500 years (Hansman 1985: 21). A summary of the site and its excavations prior to the OBAH season has already been published in an article by Kennet in *Arabian Archaeology and Epigraphy* (Kennet 2003). The current study includes the most recent project at Julfar by Oxford Brookes Archaeology and Heritage (OBAH) in 2010, with the ceramic assemblage analysed in chapter three. This most recent excavation will be discussed in chapter three, while all previous work conducted on the site prior to 2010 will be discussed below. The purpose of this section is to show the scale of work that has been conducted on Julfar, and demonstrate why it is being used as the base site for this study.

Site name:

Julfar (al-Mataf and al-Nudud)

Excavations:

Iraqi excavations on al-Nudud- Taha 1973

British excavation on both al-Mataf and al-Nudud- Hansman 1985

British excavations on al-Mataf late 1980s-early 1990s- King 1990; 1991; 1992

Japanese excavations on al-Mataf late 1980s –early 1990s- Sasaki & Sasaki 1992

French excavations on al-Mataf late 1980s- early 1990s- Hardy-Guilbert 1991

German excavations on al-Mataf late 1980s- Vogt 1991; Jansen 1991

British-Emirati excavations 2010- Carter in press

Period/date range:

Julfar is currently suspected to date to between late 13th-early 16th Century AD (Carter in press). Older excavations had a wider date range up to mid-17th Century (Hansman 1985; King 1992; Sasaki & Sasaki 1992). Earlier occupation suggested by de Cardi for northern areas of the site (de Cardi 1971) and Hansman locates several later "Persian camps" to the north and in the Ras al-Khaimah City area which he suggests date to the 17th/18th Century AD (Hansman 1985: 14). Figures 3, 4 and 5 show the phasing from previous excavations at the site prior to ND10.

Figure 3: Hansman's phasing: from Hansman 1985: 6-9

Phase	Date	Description
I	Mid-14th Century	Small scale fishing settlement
II	Late 14th- Mid 15th Century	Mudbrick Settlement
III	Mid-15th-early 16th Century	Large city settlement phase 1
IV	Mid to late 16th Century	Large city settlement phase 2
V	late 16th to early 17th Century	Decline and abandonment

Figure 4: British phasing: Connolly from Kennet 2004: 19-20

Phase	Date	Description
Pre	Early to Mid-14th Century	Post-hole and pit features. Pre-mosque
I	Late 14th Century	Sand brick mosque
II	Early to Mid-15th Century	Larger sand brick mosque with sandbrick dwelling
III	Late 15th and early 16th Century	Expansion of mosque and dwelling (sandbrick)
IV	Early 16th Century	First stone building phase
V	Mid-16th Century	Second stone building phase
VI	Late 16th Century	Abandonment and collapse
REC	17th Century onwards	Post-medieval and modern layers

Figure 5: Japanese phasing: from Sasaki and Sasaki 1992: 119

Phase	Date	Description
I	Early 14th Century	Early fishing community in Arish/baristi huts
II	Mid-14th Century	First phase of large city- mudbrick houses with 1 rebuilding
III	Late 14th- mid 15th Century	Rebuilding of city from phase II- slightly smaller
IV	Late 15th Century	Decrease of population- postholes and clay house
V	Post 15th or 16th Century	Decrease of population- baristi houses

Kennet put together a general chronology for Julfar in 2003 (Figure 6) bringing together all work up to that date. This includes information on architecture and dating of each excavation before the 2010 work at al-Nudud.

Figure 6: from Kennet 2003: 113- table. 3

Periods		British Phase	British Event	Brit. Pot	Brit. Dating	Japanese Phase	Japanese Level	Japanese Event	Jap. Pot	Japanese Dating	Hansman	Vogt
1	Growth	Pre	Earliest settlement.		Early-mid 14th	1	7	Earliest settlement. Post holes & pits.		Early/mid 14th?	I-III	?
		I	First mud-brick mosque.		14th/15th							
		II	Mosque grows.		14th/15th	2C	6 C	First mud brick.	First CBW	Latter half of 14th/ early 15th	IV	II
2	Peak	III	Mosque grows.	First CBW	Early 15th to 16th	2B	6B	Mud-brick structures.				
						2A	6A	Dense urban plan.				
3	Decline	IV	Mosque grows. First mortar mosque. Occupation area out of use.		16th	3	4, 5	Slight population decline?				III
		V	Mosque declines for first time.		16th	4	3	Population decline. Urban decline: post-hole structures begin.				
4	Post-urban	VI	Post-hole phase.		Mid. 16th?	5	1, 2	Post-hole phase.		Mid 16th?	V	IV
5	Abandonment	Rec	Top soil.			Surface		Top soil.				?

These phasings show conformity in the founding of Julfar, with all suggesting a late 13th- early 14th Century AD date for the first phase of occupation on both al-Mataf and al-Nudud. The excavations of Hansman locations shown in Figure 7 and Figure 8) and of King (Figure 9) put the abandonment of Julfar to the late 16th or early 17th Century AD, partly due to the inclusion of areas such as Hansman's Persian Camps and historical references, and of some late features with related ceramics found in the British Mosque area (King 1992: 49). This date is refined during the international work in the 80s and 90s surmised in Kennet 2003 to suggest that the decline at Julfar began around the turn of the 16th Century and at least the main area at al-Mataf continued to be occupied until the middle of that Century (Kennet 2003: 113). The latest excavations at al-Nudud do not demonstrate any occupation after the mid-16th Century. This has led Carter to suggest that the southern sand bank of al-Nudud was heavily depopulated or completely abandoned by the mid-16th Century, with the site contracting to the area of al-Mataf during this period before being finally completely depopulated. However the upper levels of al-Nudud were heavily disturbed by rubbish dumping and plant work during the 1970s – 1980s and so the lack of late dating evidence may be due to his.

Site Map/plan:

Figure 7: from Hansman 1985: 4- fig. 1

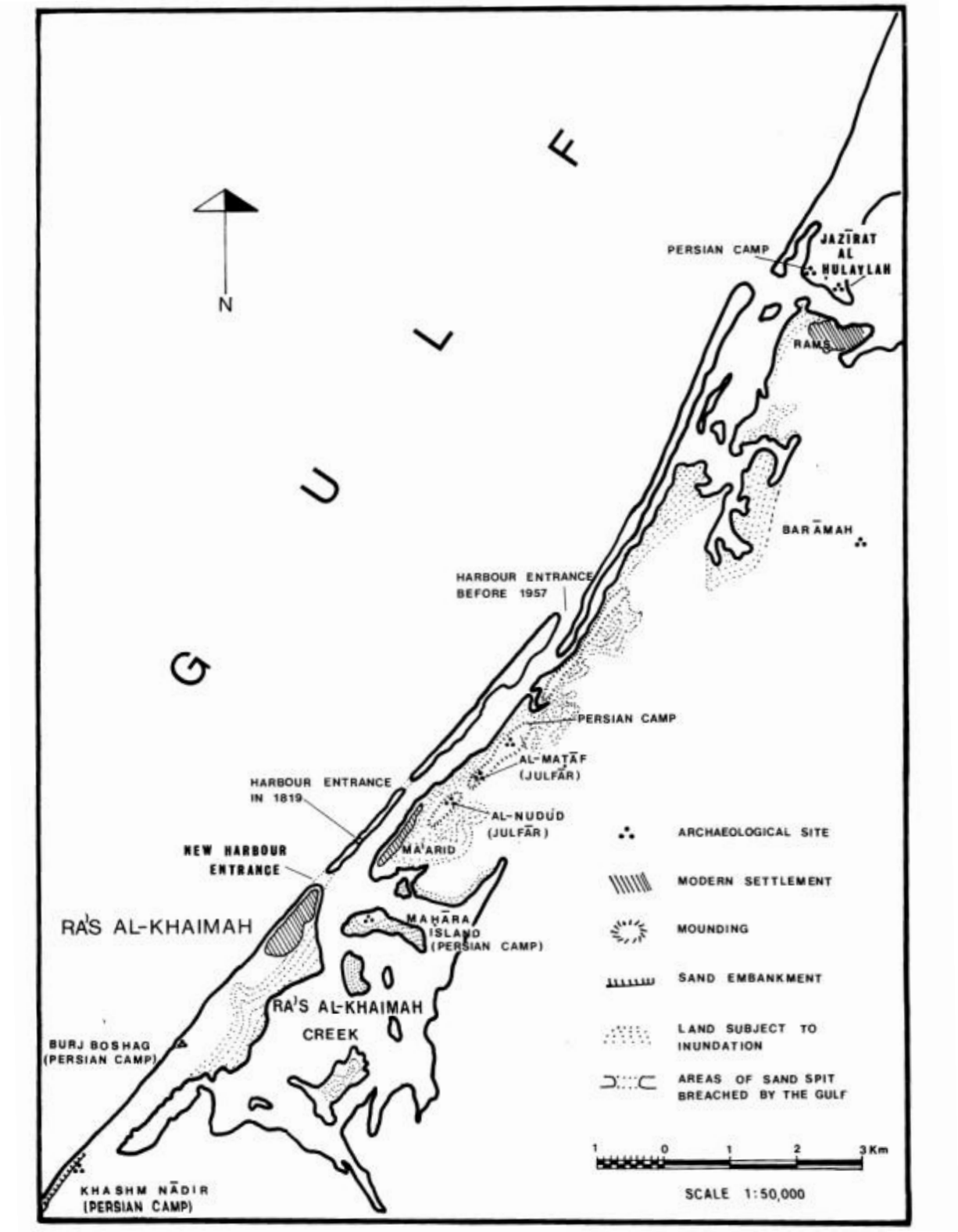


Figure 8: from Hansman 1985: 5- fig. 2

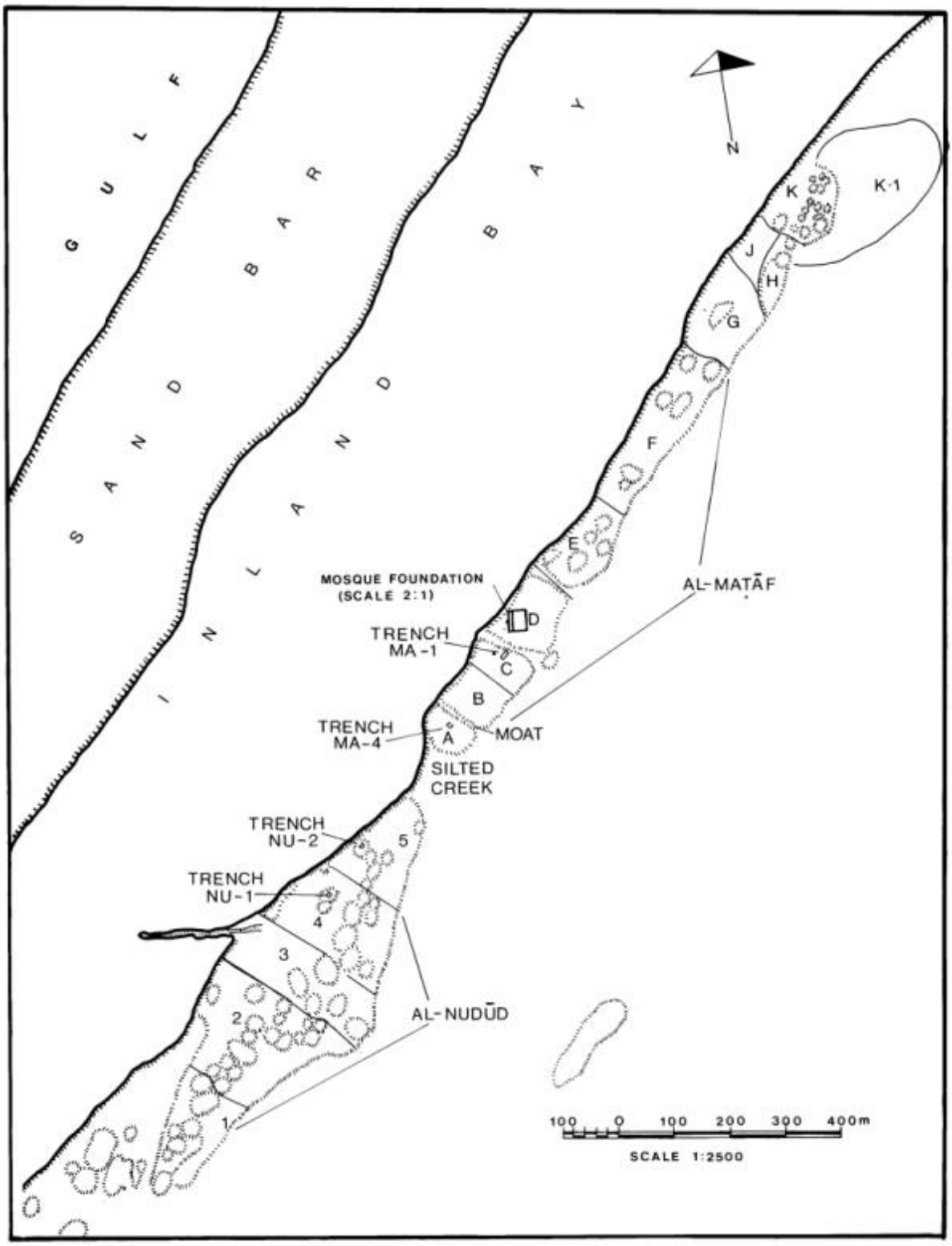


Figure 9: from King 1992: 54- fig. 2

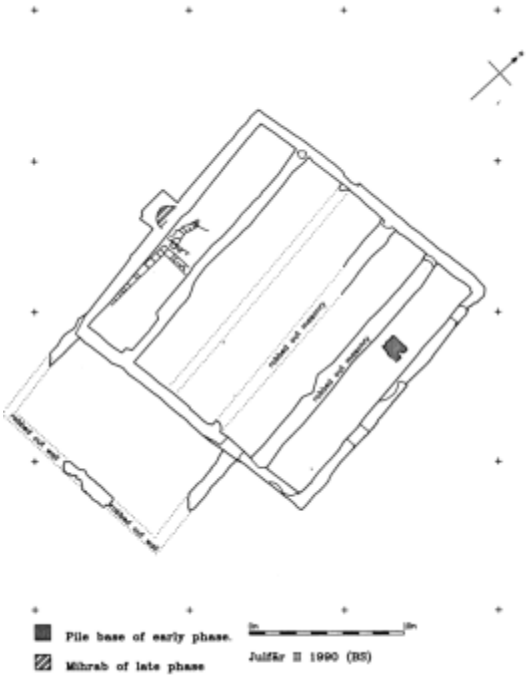


Figure 10: from Sasaki and Sasaki 1992: 106- fig. 1

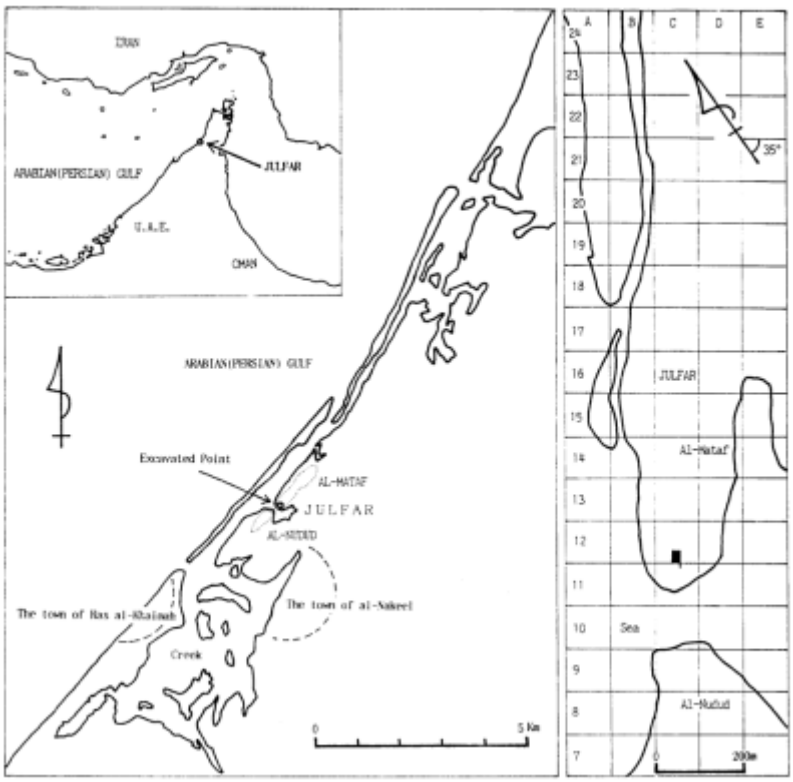
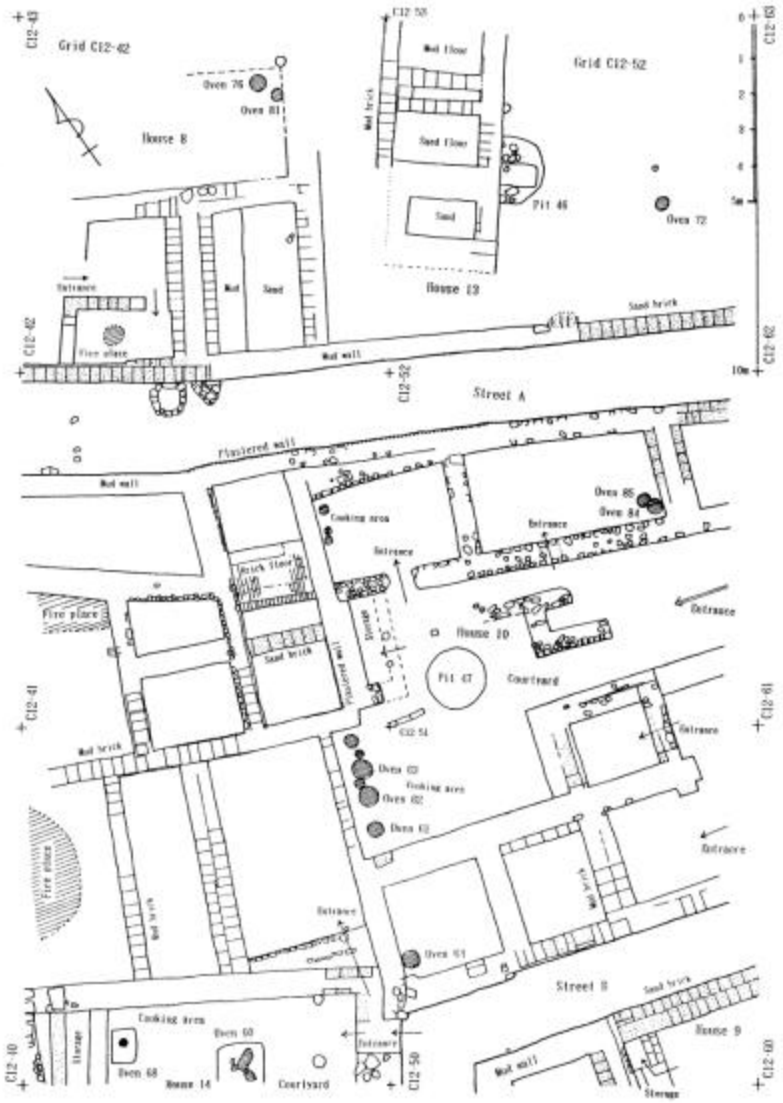


Figure 11: from Sasaki and Sasaki 1992: 113- fig. 5



Topography:

The site is based on two sandbanks on the west coast of Ras al-Khaimah. The northern sand bank of al-Mataf has been protected by the government of Ras al-Khaimah but the southern sandbank of al-Nudud has not been and has therefore been almost completely developed in the last 20 years. These two areas were split by a creek which led to a lagoon to the east of the settlement (Hansman 1985: 3; Kennet 2003: 104). Both of these have now silted up to form *sabkha* salt flats. To the west a new sandbank with a lagoon has developed, which is unlikely to have been in place when the site was functioning (Kennet 2003: 104; 105- fig. 2). The sand banks do not rise above 5 metres from the level of the lagoon to the west, so it is likely that ships would have been run aground on the beaches to unload/load, rather than having any built-up quays, although this is not definite as no excavation has been done on the edges of the

settlement. The area of trench D in the most recent excavations (Carter in press), has been suggested to be a midden relating to the loading/unloading of boats with ceramic cargo (see chapter three, section four).

Dating evidence:

The dating of the original site excavation by Hansman was based on the Far Eastern ceramics, of which there were over 1000 sherds (Hansman 1985: 25). A lot of these came from surface pick-up across the two sites and further to the north, in the area described by Hansman as the Persian Camp (Hansman 1985: 14; Figure 8). It would appear that the majority of 17th and 18th ceramic finds are from these northern areas (K-1 and K). The whole site was seen to date from the 13th to 17th centuries based on this evidence. Hansman backed this dating up with both the numistatic evidence and historical documents from both Arab and Portuguese writers (Hansman 1985: 14).

This was then adapted using similar evidence from the late 1980s/early 1990s multi-national excavations, with no change to the starting date but the approximate date of abandonment being pushed back to the mid-16th Century, again based on the Far Eastern ceramics, which were analysed by Krahl (Kennet 2004: 20-21). The results of this quick dating (it was performed in under a day using exclusively Far Eastern sherds- Kennet 2011: pers. comm.) generally back up the findings from the other late 1980s excavations.

The most recent excavations of OBAH have again re-dated the abandonment of at least the area of al-Nudud to the beginning of the 16th Century through the exact dating of the Far Eastern ceramics and C-14 dating of the site. This does not suggest that the whole site was abandoned, as Hansman suggests that al-Nudud was only occupied for the period of Julfar's commercial peak during the 15th Century.

The current consensus is that therefore, the mosque and fort at Julfar al-Mataf probably did continue to be in use after Julfar had declined as a town, if only as a defensive settlement and its mosque. However King's view that the majority of al-Mataf continued to be occupied during this period is false and the mosque should not be taken to be representative of the whole site. For the purposes of this project the period of occupation at al-Nudud will be approximately 1275-1525AD while al-Mataf is dated using Kennet's finalised dating of the site to 1250-1575AD (Kennet 2002: 156)

Architecture and archaeology:

Kennet tied together the Julfar excavations up to the mid-1990s in 2003 in an article for *Arabian Archaeology and Epigraphy.* The write-up demonstrates a general agreement that the site of Julfar at al-Mataf grew quickly from a small fishing town to a large busy trading town (Kennet 2003: 107; Sasaki and Sasaki 1992: 119), a conclusion which is supported by the excavations at al-Nudud in 2010. The earliest phase of occupation appears to have been of wooden huts or tents made of palm fronds in the traditional fashion followed by a more densely occupied mudbrick town (Sasaki and Sasaki 1992: 119- Figure 10and Figure 11; Kennet 2003: 115). This mudbrick phase appears to be very short, and is followed by a phase of reconstruction of the town in stone. Carter in the phasing for the 2010 excavations suggests two stone phases, based on realignments of walls found at al-Nudud. The stone phase lasts throughout the perceived prosperity of the town and is then abandoned, with low level squatter habitation continuing into later periods.

2.3: JULFAR AL-NUDUD 2010 EXCAVATIONS:

The site of Julfar al-Nudud is across a now dried up creek to the SW of the area of al-Mataf that appears to have been the centre of the urban area (Kennet 2003: 103). It is suggested by the original Iraqi archaeologists in the 1975 excavations that al-Nudud was first occupied slightly later than al-Mataf and declined before its sister area as well (Kennet 2003: 106). Due to a smaller percentage of Far Eastern wares in the early phases (Kennet 2003: 106) it has been suggested that the site was less affluent than al-Mataf, possibly being an area of industry. The 2010 excavations of the site by Oxford Brookes Archaeology and Heritage were organised through the Ras al-Khaimah Department of Museums and Antiquities and were to analyse these conclusions while preparing the site for development. For the rest of this section, unless another reference is mentioned, all statements are referenced to Dr Rob Carter, the project director; Dr Kevin Lane, the site director; Dr Bing Zhao, the Far Eastern ceramics expert; and myself, and are from the forthcoming publication. However any mistakes or inaccuracies are the author's.

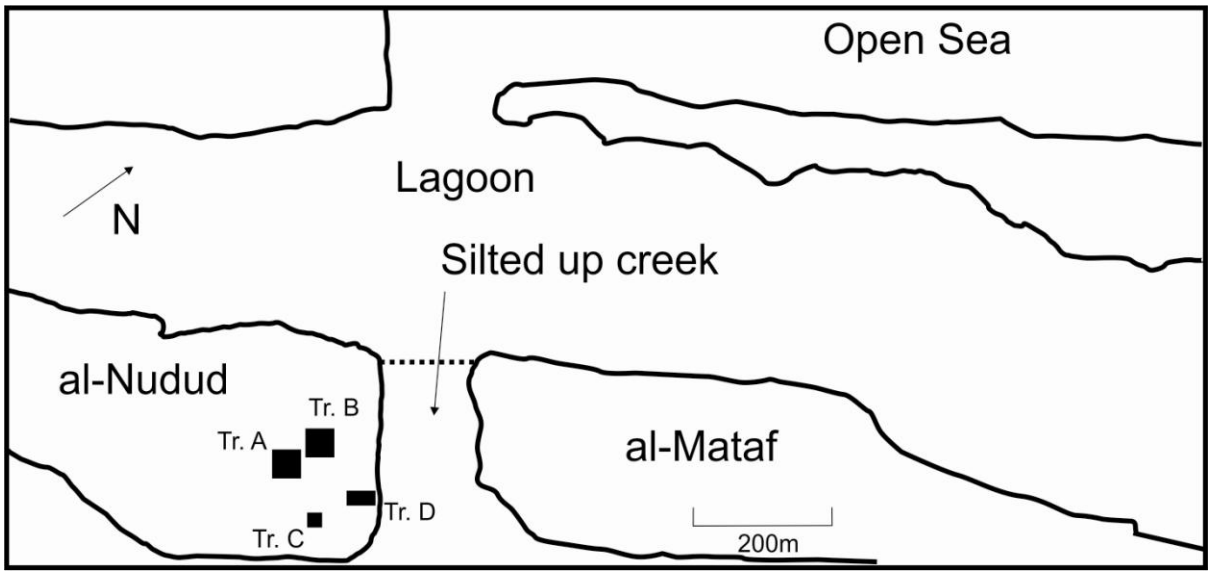
Figure 12: British al-Nudud phasing (Carter in press)

	Description	Date Range	Tr. A		Tr. B	Tr. D	Tr. C	Total Ceramic sherds
Site Period 6	Late disturbance	20th c.	A.VIII		B.VI	D.V	C.III	13428
Site Period 5	Stone Robbing and Postholes	late 15th/early 16th onwards	A.VII		B.V	D.IV	C.II	7322
Site Period 4	Stone Town 2	early 15th to late 15th c.	A.VI		B.IV			4449
	Stone Town 1	late 14th – early 15th c.	A.V			D.III		
Site Period 3	Mudbrick abandonment	14th c. (finish at or before end 14th c.)	A.IV	A.III	B.III	D.II	C.I	2159
Site Period 2	Mudbrick Town			A.II	B.II			46
Site Period 1	Shoreline activity	13th/early 14th c.?	A.I		B.I	D.I		44
Total			6913		10590	782	11325	

The phasing in Figure 12 is based on stratigraphic single context excavation to give a floating chronology which is then tied in using the Far Eastern ceramics studied by Zhao (in press) and C14 dates (Carter in press)

Four trenches were placed around the site: trench A (280m^2) on the highest part of the site; trench B (800m^2) slightly further down the slope towards the inland lagoon; trench C (15m^2) on a small mound thought to be a midden deposit adjacent to the lagoon edge; and trench D (114m^2) on a second mound near to the dried creek edge to the north (Figure 13).

Figure 13: ND10 trench approximate location:



From early clearance, it was clear that the upper layers of the site had been disturbed and in places damaged by heavy machinery when the area was used as a rubbish dump in the late 1970s or 1980s between the major excavation seasons. However below these intrusions, the majority of the archaeology relating to the occupation and subsequent abandonment of the town were intact. The trenches demonstrated a multi-phase site with multiple layers of building construction using various building techniques. Trenches A, B and D all had evidence of stone structures dating to the late phase of the town's occupation which in the case of trench A could be split into two separate phases of building, as some walls were realigned to form the second stone town phase. Trench D contained an area of stone building which had been significantly damaged, probably from stone robbing during the post-abandonment phase of the site while trench C contained no structural remains. Both trenches A and B also contained mudbrick structures below the later stone buildings which relate to the first phase of urban occupation at the site, suggested to be approximately starting towards the beginning of the 14th Century AD and finishing at the end of that Century, while the stone town replaces it and continues until the end of the 15th Century, when it appears to have been abandoned. Between these two phases of differing construction techniques, there is a short phase of abandonment in trenches A and B, which may be contemporary and is presumably to allow the mudbrick buildings to be demolished and the first phase of stone buildings to be erected. Prior to the mudbrick building phase, trenches A and B have evidence for a *baristi* or palm frond hut occupation phase, possibly as the main area of Julfar was growing or prior to this event. This phase is also present in the lower levels of trenches C and D suggesting a site wide similar occupation style. Below this, in all

trenches sterile sand dune was reached, showing that al-Nudud currently is not known to have any preceding occupation at this site.

The archaeology of the features in the trenches was significantly different between the large trenches (A and B) and those trenches further from the centre of the sand bank (C and D). Both A and B contained evidence of courtyard houses during the mudbrick phase. These were made up of elongated rooms approximately 10m x 3.3m (9m x 2.5m internally), subdivided in the case of Trench A. For the stone buildings in trenches A and B, even though there was extensive wall-robbing throughout, both building layout and a general street pattern could be seen along with some areas of domestic industry such as *madbasa* (date presses) and large storage bins. Areas of buried storage jars reused as *tanoor* ovens were found in these trenches as well. The building layout was for at least two, probably three courtyard houses in Trench B, with elongated wings of approximately 12-13m x 4m (10.5m x 3m internally), with each wing divided into three rooms. One of these rooms contained evidence for six square plastered storage bins. At the centre were courtyards, one with a square room in its opposite corner. There appeared to be at least one similar building in trench A.

The conclusion of this latest work at Julfar suggests that al-Nudud developed with or possibly just after al-Mataf, going through similar phases of building and reconstruction in mudbrick and stone as the two areas grew in wealth and stature. However, Carter suggests that around 1475AD, from evidence at both al-Nudud and the Japanese excavations at al-Mataf, that there was a serious contraction of settlement to the area excavated by the British under King. He suggested tentatively that this area remained as an administrative, religious and pearling centre, still clearly with some wealth but that the period of time when Julfar was at its peak had finished after the late 15th Century AD. It is therefore possible that the decline of Julfar was not to do with the Portuguese intervention but to some other currently cause. However the extensive damage to the upper levels of Julfar al-Nudud by rubbish dumping in recent years could have removed evidence for later occupation.

To conclude, the twin sites of al-Mataf and al-Nudud make up the developed trading entity of Julfar, a site which appears to have replaced Kush as the main urban area in the Northern Emirates in the mid 13th Century. A continuity of urbanism in this area has been noted by Kennet as a rare example of occupation in the Lower Gulf during the preceding 11th-13th centuries AD when there was a marked decline in settlement (Kennet 2002: 160). It is suspected that this is due to the agricultural potential of the area, making it the most habitable area on the Arabian side of the Lower Gulf. The area appears to have also provided water, food and other supplies to the city of Hormuz, which controlled Julfar along with large areas of the Lower Gulf

as vassal states. The rise of Hormuz and the rise of Julfar appear to be closely linked (Kennet 2002: 161) and it is clear that while Julfar was an important entity in its own right, without the power and economic influence of Hormuz, it would not have had the scale of international links that both historical records and the finds assemblages demonstrate.

This excavation has not only added information about the occupation of Julfar, but through the artefact analysis, has demonstrated trade patterns in the Gulf and further afield into the Indian Ocean. Through the ceramic analysis (discussed in chapter three) an important numerical assemblage has been added to the published material for Indian Ocean ceramics, which as demonstrated in this thesis, is understood in generalised terms but lacks specific detail for most sites. The next section will discuss the current regional analyses which make up the majority of knowledge about Gulf ceramics, and the interaction with the Indian Ocean trade network.

CHAPTER THREE: THE JULFAR AL-NUDUD ASSEMBLAGE: METHODOLOGY AND ANALYSIS:

This chapter presents and analyses the ceramic assemblage from the 2010 al-Nudud excavations (January to May 2010), conducted to British excavation standards by a team from Oxford Brookes Archaeology and Heritage (OBAH), with employees of the National Museum, Ras al-Khaimah. Section two also contains the methodology behind the analytical techniques used throughout this thesis. These are not particularly complex but require definition before being applied.

3.1.1: BACKGROUND:

Four trenches were opened on the ND10 site, all of which yielded ceramic material, both in situ and in the sieve. At the beginning of the season 2000 context numbers were assigned, with each trench getting 500- trench A: 1-499, trench B: 500-999,trench C: 1000-1499 and trench D 1500-1999 with an unstratified context for trench B called 000 (the majority of finds in 000 are from evaluation trenches in trench B, which were bagged together). 746 contexts were used. Figure 14 shows the breakdown of the contexts used.

Figure 14: ND10 assemblage breakdown

Trench	No. of Contexts	Contexts with ceramics	% contexts with ceramics
A	226	52	23.0
B	317	76	24.0
C	40	14	35.0
D	163	43	26.4
	746	185	24.8

Ceramics were recovered during excavation with no sieving strategy for the general site contexts other than those suspected to be high in palaeo-environmental data. Block lifted contexts were sieved at 5mm following detailed excavation at the site compound. This gave a ceramic assemblage of approximately 500kg and nearly 30000 sherds.

3.1.2 DEFINITION OF TERMS USED:

EVE: An estimation of the number of vessels present in a context or other unit based upon the percentage of complete rim circumference present.

Fabric: The physical make-up of a sherd. Includes the base material- clay; china clay etc- and any inclusions/temper within the base material e.g. organics, grog, grits. This property can vary to an extent within a ware either as an advancement in production techniques or a change in the raw material source. However these changes can only be subtle as any major change e.g. the ceramic becoming glazed; the addition of grog temper- would demonstrate a new ware.

Ware- A term denoting a group of ceramic sherds which are cohesive in terms of fabric, decoration, source (whether a specific site or a region), inclusions and, often, vessel type and function. This grouping may include a variety of fabrics and decorative styles; however these will generally be broadly similar e.g. the ware Chinese Blue and White (CBW) in Priestman 2005 (309-314) was split into 45 sub-categories. This splitting was largely down to variations in the fabric of the sherds and the decorative styles on the surfaces which demonstrate changing manufacturing and styles over the period of manufacture while maintaining the basic general characteristics of the ware CBW.

Ware Family- A broad grouping of wares which share a key characteristic, e.g. presence of glaze, or a similar source region, but are evidently not the same ware. This grouping is effectively creating another level of categorisation within a ceramic assemblage. A sherd is allotted a fabric; a fabric is allotted a ware and a ware is allotted a ware family. Analysis can take place at any and all of these levels, generally looking at different attributes of the assemblage.

Type/rim type- a term for a group of rim sherds which are cohesive in their shape and design, used here only to designate form (i.e. shape) rather than fabric (i.e. the clay and the way it has been treated). The majority of these in the ND10 assemblage are also common to one ware, or at least to one ware family e.g. all J6 rim types are from the JULF.RW ware whereas all G10 rim types will be from several wares but all from the GLAZ (glazed) ware family.

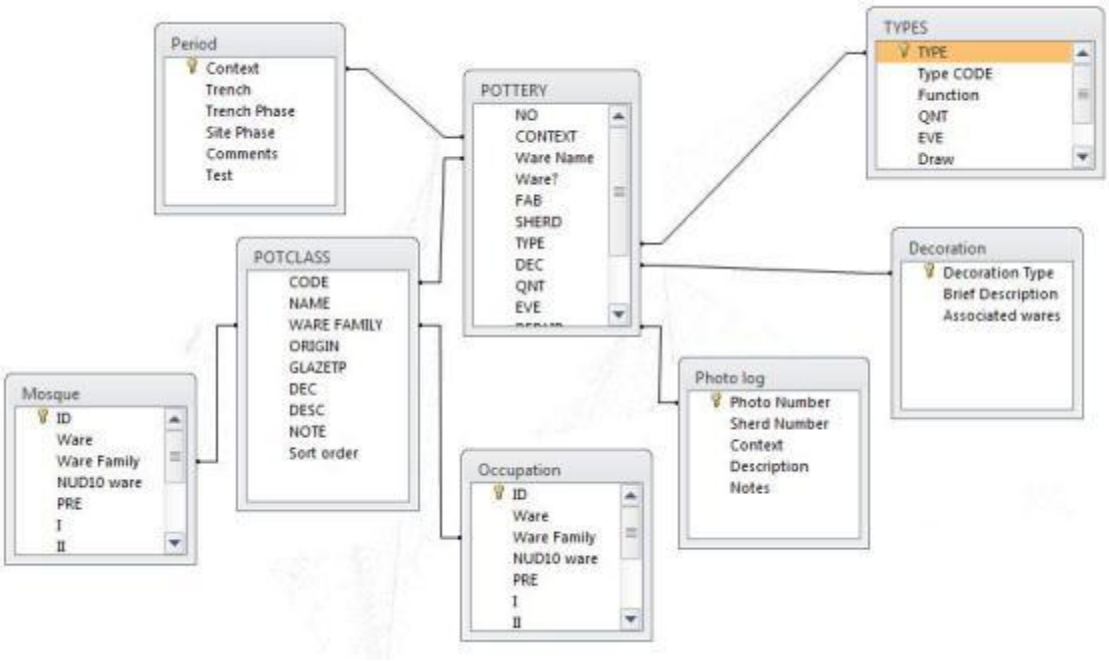
Type family- A grouping of types which are similar in probable function but are obviously different types. A cohesive type family will share similar characteristics which suggest its function e.g. enlarged internal lips for the TRAN (transport) ware family.

3.1.3: ND10 CERAMIC CATALOGUE AND ANALYSIS METHODOLOGY:

The catalogue of the assemblage used a specifically designed Microsoft Access overarching database, containing four individual databases: the assemblage containing individual sherd records grouped to a similar context, ware, sherd type, decoration type and rim type including quantity and EVE information; a database cataloguing individual wares found with their attributes; a database cataloguing rim types and their attributes; and finally a phasing database

containing phase data for each context. These four databases were linked together, allowing designed queries to find sherds with particular attributes across the multiple tables. The database structure is shown in Figure 15.

Figure 15: Access database relationships structure



The design of this database allowed easy data entry, either for individual records in the assemblage cataloguing, or from imported Microsoft Excel spreadsheets. The extra databases included on the structure are either unused in this analysis or relate to the site of al-Mataf, presented in Kennet 2004 and transferred to the database from this publication.

After excavation all ceramic finds were taken back to the compound on al-Mataf, washed and bagged by context. The block-lifted ceramics were left in their excavated condition awaiting conservation work in the Autumn season. The post-excavation season ran between 24/09/2010 and 04/11/2010 during which time the whole assemblage (excluding a small number of unstratified CX000 bags- <15) was catalogued by the author with help from Dr Robert Carter, Dr Derek Kennet, Abid Ali, Riaz Ahmed, Rakhman Ali and Aziz Ali. The ceramic from each context was split into wares. Each ware was then sorted into sherd type - rim (R), body (S), spout (Sp), lid (L), handle (H), small find (SF) and complete (COMP) if these were all present in that context. R/B and R/H relate to the three examples of Julfarware cup (JC types) found on site as they had both sherd types present (Figure 16).

Figure 16: ND10 sherd breakdown

SHER	Quantity
B	67
COMP	1
H	616
L	4
R	4244
R/B	2
R/H	1
S	24509
SF	8
Sp	158

Bases were originally recorded as a separate sherd type from body sherds but after the first few contexts all bases were recorded as body (S) sherds. Bases were recorded for all Far Eastern wares throughout the cataloguing of the assemblage. This does not affect the study as no analysis is being completed on sherd type other than showing the quantities across the site.

From these examples of each rim type, decoration style and unique pieces were drawn by an illustrator, Julia Bastek (Headland Archaeology Ltd.) and by the author, totalling over 200 drawings of the assemblage. These drawings will be compared to those found in other reports from the study area to show both patterns in distribution and to finally give a generalised trade assemblage including drawn examples from this discussion and the more in-depth numerical analysis of site assemblages. This comparison of ware/rim type from drawn examples has been shown to be a significant tool in regional ceramic analysis as many ceramic types have unique or highly specialised rim forms which, when coupled with a strong ware description, demonstrate the high likelihood of the presence of a ware on a site. This can be seen through Tampoe's (1989), Kennet's (2004) and Priestman's (2005) regional catalogues which contain both discussions of other sites and their assemblages and descriptions of the individual identified wares with parallels on other sites. Priestman goes further in providing colour plates of all wares. These two presentation styles mean that the wares described are easily identifiable for other archaeologists working in the area.

The overall site phasing of Julfar al-Nudud 2010 is presented below. It shows the combination of each trench's phasing into a site wide phase in Figure 17. It also details the quantity of ceramics found in each site phase.

Figure 17: ND10 site phasing

	Description	Date Range	Tr. A		Tr. B	Tr. D	Tr. C	Total
Site Period 6	Late disturbance	20th c.	A.VIII		B.VI	D.V	C.III	13428
Site Period 5	Stone Robbing and Postholes	late 15th/early 16th onwards	A.VII		B.V			7322
Site Period 4	Stone Town 2	early 15th to late 15th c.	A.VI			D.IV		4449
	Stone Town 1	late 14th – early 15th c.	A.V		B.IV	D.III	C.II	
Site Period 3	Mudbrick abandonment	14th c. (finish at or before end 14th c.)		A.III	B.III			2159
Site Period 2	Mudbrick Town		A.IV	A.II	B.II	D.II		46
Site Period 1	Shoreline activity	13th/early 14th c.?	A.I		B.I	D.I	C.I	44
Total			6913		10590	782	11325	

There were also 2162 unstratified sherds in the assemblage.

Trench phases which have multiples in this table demonstrate that despite there being a change in phase across the site, the trench and its phase were not affected. Their data has however not been spread across the multiple site phases but has been placed in the earliest one. Similarly it was possible in trench A to split the stone building phase into two and so this is reflected in the site phases. In other trenches this was not done and so the single stone phase in these trenches is put into phase 4 as one unit. Radiocarbon dating on a the stone building in trench D showed it to have been abandoned before the stone buildings in other trenches and so D.III is matched to A.V. However all the data from these phases is only in site phase 4. A seventh phase for unstratifed deposits is present in any tables showing the data. This will not appear on any graphs showing the phasing data as it is not a dateable phase. Similarly it must be argued that the sizes of the assemblages in phases 1 and 2- 44 and 46 sherds respectively are not large enough to be representative of their phase when compared to the later site phases. These represent 0.16% and 0.17% of the total site assemblage each. Therefore while their individual phase assemblages will be analysed to look for important early wares and to identify any

possible early changes within the site, they will not be included on any graph showing site phasing.

Analysis methodology is based around looking at the raw data on as many scales as possible. This includes discussing the assemblage in terms of both the spatial and temporal location of the sherds within the site. The spatial analysis begins at an individual context level, pulling out contexts with interesting distributions of individual wares and rim types and works up through trench by trench analysis to look for a wider distribution pattern before discussing the whole site assemblage in terms of its place in both regional and Indian Ocean wide assemblages. Temporal analysis comes through individual context analysis (this time in terms of its position in the Harris matrix), then into trench phase and finally into site phase analysis. This layered analysis is used to show developments in the assemblage across the site in terms of the wares and rim types used, as style, wealth and trade patterns change. Carter makes good use of this complex analysis in the ceramics report for Bilad al-Qadim in Bahrain (Carter 2005), where he demonstrates both variations in the assemblage across the study area and in the assemblage over the period of occupation. He demonstrates that the site went through several transitions which are evidenced by the ceramic assemblage. The site develops and clearly has strong exterior trade links in the early phase but then is ruled by an introspective power- the Carmathians- who tax trade heavily, and causing the assemblage to become dominated by local wares; a phase it never really recovers from before the site is abandoned in the early 14th Century. Therefore this type of analysis should be the basic level of any discussion of the ceramics, along with presenting the whole assemblage in both raw data and ceramic drawings.

In this analysis a new level of analysis has been introduced which can be used to look at a generalised picture of assemblages based around collective features/characteristics of individual wares. As mentioned in section 3.1.2, the wares and rim types are grouped into families based on a physical origin or purpose in terms of wares and based around a physical purpose for rim types. The allocation of a ware family is generally based on a supposed provenance of a ware, although the majority of the wares within each ware family share general physical attributes as well- FE wares as well as coming from the Far East are nearly all high quality fine stonewares with a high value, while IND wares are unglazed completely or partially burnished wares with a micaceous fabric with varying tempers. Equally the two ware families STOR and GLAZ both originate from the Arabian Gulf/Peninsula (excluding the area around Julfar al-Nudud which has its own ware family) but clearly have a physical difference (one is glazed, the other is not) which splits them. The idea behind this grouping is not to replace the ware by ware analysis used in other studies (Kennet 2004; Priestman 2005) and used later in

this thesis to allocate regional assemblages, but to add an extra layer of analysis. This extra analysis hopes to demonstrate changes within assemblages over time by generalising the provenence and worth of wares into a grouping that can be viewed on a single chart. It would be impossible to view the 66 wares identified in the Julfar al-Nudud assemblage in one chart. Other studies have got round this by picking out important wares and charting their numbers across the assemblage. This study uses this approach as well as using the ware family categorisation to look at the whole assemblage in a small number of charts. From this chart it is possible to infer what shifts in trading (with who/where; for what vague value; during what phase) occurred at Julfar al-Nudud and then extend this study across the Indian Ocean.

There is some variation between the original Julfar al-Nudud analysis presented below and the ware family allocation used across other assemblages; however this is due to some ware families being split due to more detailed information for Julfar al-Nudud. The different groupings for the Julfar al-Nudud data were altered as described in section 6.2.1

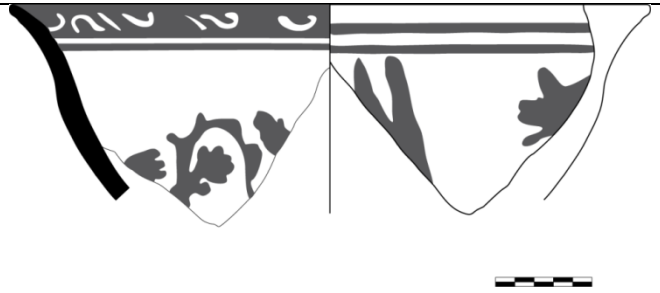
Ware families, rim type families and their use in analysis:

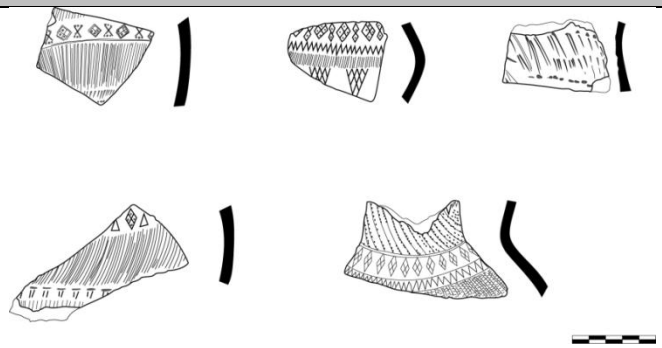
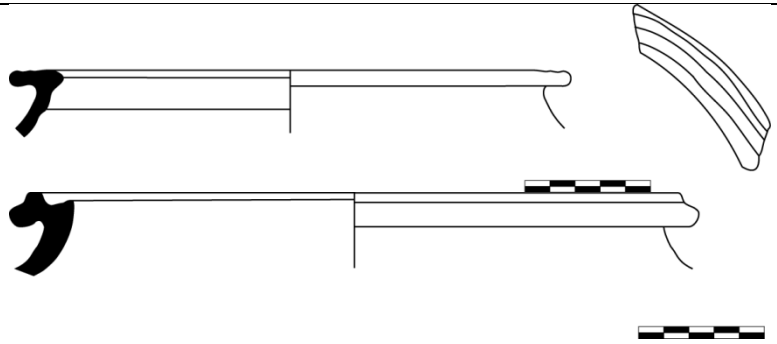
The assemblage was assigned to seven general families names (Figure 18): Far Eastern (FE), Glazed (GLAZ), Julfarwares (JULF), Indian (IND), Incised (INC), Unknown (UNK) and Unglazed Storage (STOR). This generalisation of wares has the potential to show areas or periods at the site where a ware family is found in greater amounts than across the rest of the site, allowing conclusions about trade volumes (particularly with the FE family) and diversity of ceramics.

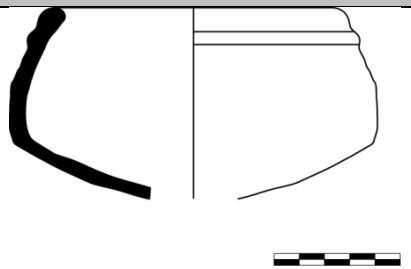
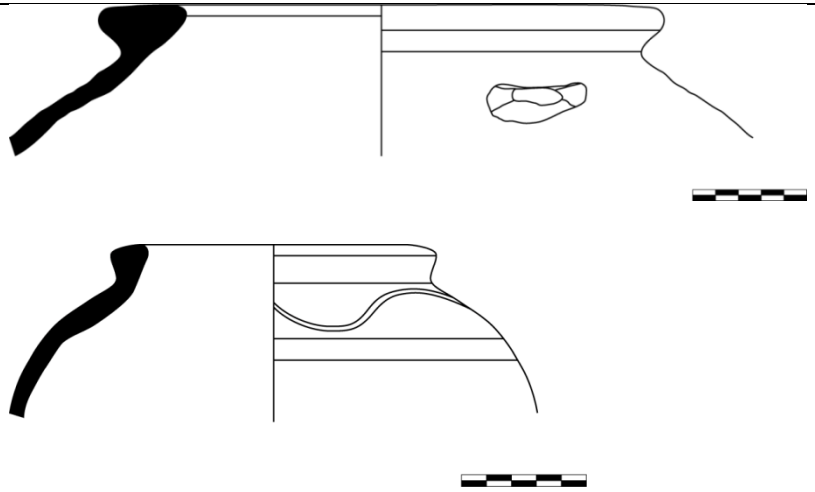
The UNK category is for any wares which could not be reliably assigned to any of the other ware families. This family is mostly made up of the smaller, less understood wares for Julfar al-Nudud and represents a diverse group of ceramics presumably only traded or manufactured on a small scale. The proportion of this ware family could be useful as a demonstration of a site's place within a trading network. A low proportion could show a site that is predominantly trading in/using well-known ceramic wares, while a large number could demonstrate either a site trading with many areas, containing ceramics rarely seen in the area of study; or a badly/only partially understood assemblage.

The overall rim typology has been split into seven different family groups, which reflect their supposed function as a vessel: WATER for water pouring/carrying vessels; UNKN for unknown function; COOK for cooking types; STOR for storage types; TRAN for transport types; BURN for incense burner rims and BOWL for bowl rims (Figure 19).

Figure 18: ND10 ware family breakdown

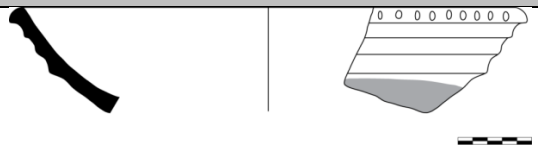
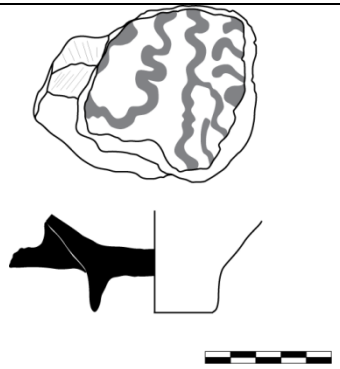
Ware Family Name	Description	Drawn example	Total
FE	Far Eastern wares. Generally stoneware or porcelain fabrics. Imports from South East Asia and China. Seen to be high value prestige items. Almost all examples are glazed or otherwise finely decorated. Relatively high number of repaired sherds. Majority of pieces are bowls or large platters- tableware. In East Africa also used as decoration (Horton 1996)		376
GLAZ	Glazed wares of non-East Asian provenience. Generally suggested to be Iranian for majority of study area but examples of Omani and Yemeni glazed wares also found. Ware traded for its own value rather than value of contents. Generally bowl and platter types for tableware. Some examples of use as wall decoration in East Africa (Horton 1996)		1,970

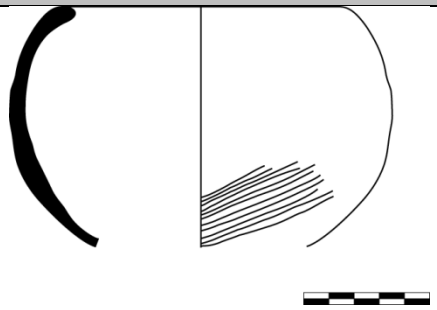
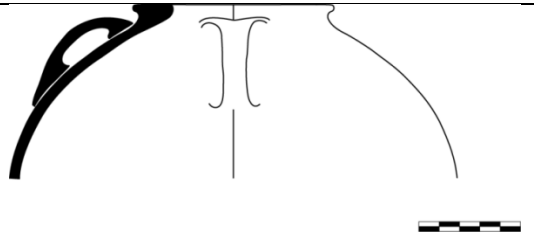
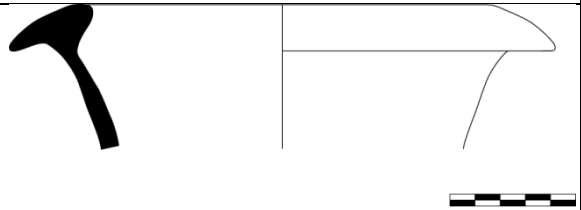
Ware Family Name	Description	Drawn example	Total
INC	Incised decorated wares. Vast majority found on hard buff ware- two specific decorations- ROUL and WAVE- and one catch all- OTHER. Split out from other wares of similar fabric to research possible phasing of decorative styles. Otherwise part of STOR ware family. Thought to be from Hormuzi kilns on Jarun Island. Combined with STOR in inter-site analysis from Chapter five onwards.		1,019
IND	Indian wares. Distinctive due to rim forms (thin indented flat exterior rim) and three to four common fabrics, generally either with large red platelet inclusions or silver/grey sand. Difficult to split into individual wares however as without microscopic analysis many have similar fabrics but different surface characteristics.		640

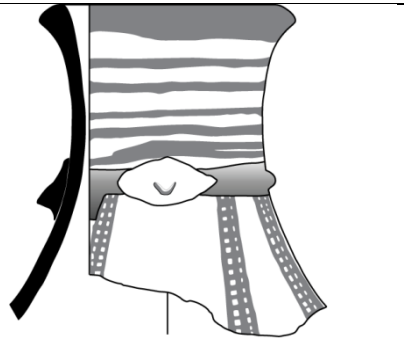
Ware Family Name	Description	Drawn example	Total
JULF	Julfar wares. Local ceramic made in the Wadi Haqil or nearby. Some examples exported around the Gulf and further afield. Limited number of individual wares showing development over production period. Different surface treatment for different wares. Generally storage or cooking vessels, although examples of tableware, bowls and jars as well as water vessels exist.		20,780
STOR	General ware family for unglazed storage vessels of non-Julfarware (or non-local) fabric but still from the Arabian Gulf or Arabian Peninsula (Iraq, Iran, Saudi Arabia, Qatar, Bahrain, Oman and Yemen). Generally larger vessels, often with thick walls and rims designed for certain functions. Contents possibly more valuable than container if also designed to be transported.		3,628

Ware Family Name	Description	Drawn example	Total
UNK	A generalised category for all wares of unknown provenance or of an unknown function. Each ware generally made up of single sherd/<10 sherds.	N/A	1,179

Figure 19: ND10 rim type family breakdown

Rim Type Family Name	Description	Drawn example	Total EVE	Total Quantity
BOWL	Bowl rim types. Contains vast majority of GLAZ ware family rims. No EVE recorded for FE wares but would have been included in this rim type family. Open vessel form used for tableware or serving. JULF ware examples have been placed in this family if their form appears to be similar. Previous studies have identified JULF bowls (Kennet 2004: 75)		7,499	1,173
BURN	Incense burner rim type. Only found in one ware (INCW). Uncommon in assemblage. Suggested local manufacture around Julfar. Could possibly be combined into UNK but due to known function it was kept separate.		218	21

Rim Type Family Name	Description	Drawn example	Total EVE	Total Quantity
COOK	General type family for rims thought to be associated with cooking vessels. Much of the JULF types have been put into this family after Kennet's discussion of Julfarware cooking pots and their development (Kennet 2004: 72-6). Rim types from the IND ware family were classified in this group if charring was in evidence or if the rim/fabric thickness was more delicate. Larger, thicker (and therefore presumably stronger) vessel rims were assigned to the STOR rim type family.		13,580	1,845
STOR	Storage vessel rim types. Generally have thick strong fabric indicative of storage vessels with design features suggesting storage- thick flat outer lip to allow canvas cover to be tied over opening, adaptions for ceramic lid etc.		4,844	403
TRAN	Transportation rim type. Probable sub-family of STOR but kept separate to attempt to identify changes in level of trade. Found in thinner wares with extended inner lip to prevent spillage of contents while in transit. Some examples in STOR could relate to this family.		1,215	93

Rim Type Family Name	Description	Drawn example	Total EVE	Total Quantity
UNK	A generalised category for all rim types of an unknown function. Each rim type generally made up of single sherd/<10 sherds. Most found under UNIQ in rim type breakdown.	N/A	828	68
WATER	Water holding vessel rim type. Similar to TRAN but without extended inner lip. Could be put in STOR family but as function has been identified (Chittick 1974b:) they were split off. Kennet identifies them as jars (Kennet 2004: 76- J2.1 and J2.3) suggesting the differentiation in this project may be unnecessary.		6,038	446

An important point in relation to the ware family classification is that between JULF and STOR. Many of the JULF sherds are from storage vessels and therefore share many of the characteristics of those found in the STOR ware family. However there remains an important difference between the two groupings- STOR vessels were traded in to Julfar from other areas e.g. Bahrain, either for their own value or for that of their contents. JULF vessels were produced and used at/around Julfar. This point will be looked at again in Chapter six when comparison between different site assemblages using ware families is completed.

The typology for the rim families is taken partially from the work of Kennet (2004) and Priestman (2005) on the ceramics of the Gulf. Both of these studies have illustrated rim types with parallels in the ND10 assemblage and give a function for some of the rim types (e.g. Kennet 2004: 72-3- Table 21). Where parallels have not been evident, the type has been either given a family based on morphological similarities with other ND10 types already with parallels or has been placed in the UNKN family. A rim sherd's type family usually matches up with the sherd's ware family as some of those are based on function too. However, particularly in the JULF ware family, while the family is cohesive in terms of wares, the rim types have very different functions to each other. Some are tableware BOWL types (e.g. J14, J4) while others are cooking vessels (e.g. J1, J2) and others are storage vessels (e.g. J5, J15). The differentiation between storage and transport rims (e.g. NG2, NG9) has been made according to the presence of a large internal lip, which, the author hypothesises, has been added to prevent spillage of the contents during transport. It is possible that once these types have been transported they remain with the contents as storage vessels in the place of import. The rim type families will hopefully contribute a similarly general analysis to the ware families, allowing the possibility of different functions occurring in different areas and at different times across the site to be seen.

Previously these family groupings have been used in brief summaries of the ceramic assemblage in interim reports, denoting the presence of a group of ceramics. However, this analysis takes this further, at least with the ware families. The issue with the use of rim type families in inter-site analysis is that none of the sites in the study area have published data for the quantity or EVE statistics of rims according to type which could be placed into a similar frame work. Therefore other than Julfar al-Nudud, all sites assemblage will only be discussed in terms of individual wares, rims and generalised ware families.

3.1.4 ND10 CERAMIC ASSEMBLAGE OVERVIEW:

The assemblage of ceramics from the 2010 al-Nudud excavations were originally attributed to 74 wares (see Appendix I: Original Julfar al-Nudud ND10 Ware Classification:). After some combinations of wares and some deletions of void entries were made in the immediate post-cataloguing analysis to bring the catalogue in line with Kennet 2004 and Priestman 2005, the assemblage consists of 66 wares and a total of 29616 sherds (Figure 20). Some of these are already in use e.g. PERSIA. Other wares were given a new code but upon further research were found to be already known in the archaeological record e.g. ROB is a Syrian painted ware type also found in Bahrain (Frifelt 2001). New wares have been attributed a name and code, generally according to physical properties e.g. fabric, decoration or colour. Some wares were originally classed as separate but further analysis has shown them to be multiples of a more common ware with an element of variation e.g. thin red/buff ware (TRBW) which also includes textile ware (TEX), buff and grey ware (BAG) and probably both deep incised Indian ware buff/black (DIIW.B and DIIW.BL). All of these fall into the Indian ware family along with TBBW and TRW. Where these multiples have been noticed, the main class has been noted in the sub-ware description. Some wares, such as MARS and ROB were formed out of non-ID/ODD sherds which were then examined at the end of the cataloguing. The relative paucity of these wares in a large assemblage such as ND10 suggests that they are either rare non-local wares (e.g. ROB is a Syrian ware) or that they are intrusive/residual from other periods.

Figure 20: ND10 ware breakdown

CODE	NAME	PREVIOUS WARE NAMES	ORIGIN	QNT
BAG	Buff and Grey Ware	Some examples may be GIB in Priestman 2005	IND	14
BAH	Bahrani Storage Ware	Common Ware in Carter 2005	STOR	23
BGSW	Brown Glaze Stoneware	See Far Eastern Chapter for more details	FE	3
BIW	Buff Incised Ware	Some forms of WINC in Priestman 2005	INC	931
BLAB	Black Burnt Ware		STOR	9
BORB	Burnished Orange and Black Ware		IND	6
BRIB	Brown Indian Burnished Ware		IND	24
BRICK	Brick Ware		UNK	6
BUBL	Buff and Black Ware		IND	12
BUFF	Buff Ware	BUFF in Kennet 2004	STOR	2456
CBW	Chinese Blue and White	See Far Eastern Chapter for more details	FE	115

CODE	NAME	PREVIOUS WARE NAMES	ORIGIN	QNT
CHALKY	Chalky Ware		STOR	29
CHIN	Chinese Wares	See Far Eastern Chapter for more details	FE	69
CHOC	Choc-Chip Ware		UNK	2
CORB	Coarse Orange and Black Ware		IND	12
CRWW	Coarse Red and White Ware	Possibly known as WAPO in Kennet 2004	STOR	397
DEPAW	Degraded Painted Ware		GLAZ	119
DIIW.B	Deep Indian Incised Ware. Buff	Some examples may be GIB in Priestman 2005	IND	57
DIIW.BL	Deep Indian Incised Ware. Black	Some examples may be GIB in Priestman 2005	IND	15
TIN	Tin glazed ware (degraded)	TIN.W 1 and 2 from Priestman 2005	GLAZ	666
ERG	Eroded Glaze Ware		UNK	117
FIGB	Fine Grey Burnished Ware		IND	6
FIGW	Fine Grey Ware		IND	29
FINCW	Fine Incense Ware		UNK	4
GFRIT	Green Fritware	Mix of FRIT.BL and FRIT.IT in Priestman 2005	GLAZ	88
GIW	Grey Incised Ware		INC	45
HWW	Hard White Ware		UNK	370
INCW	Incense Ware	CHAM.3 in Priestman 2005	UNK	178
JULF	Julfarware- Plain	JUL in Priestman 2005	JULF	15847
JULF.PB	Julfarware- Purple on Black	JULF.PB in Priestman 2005	JULF	1822
JULF.RW	Julfarware- Red on White	JUL.RW in Priestman 2005	JULF	3104
JULF.RC	Julfarware- recent	JUL.RC in Priestman 2005	JULF	7
KHUNJ	Khunj Ware	KHUNJ in Priestman 2005, Kennet 2004	GLAZ	176
LFRIT	Lustre Frit		GLAZ	6
LIME	Lime Tempered Ware	LIME in Kennet 2004 and Priestman 2005	STOR	516
LQC	Long Quan Cleadon	See Far Eastern Chapter for more details	FE	98
MARS	Mars Ware		UNK	2
MEW	Moulded Ewer Ware	MEW.C or MEW.LG in Priestman 2005	INC	9
MGP	Manganese Painted Ware	MGP.1 in Priestman 2005	GLAZ	230
MLD	Moulded Ware	MEW.C or MEW.LG in Priestman 2005	INC	34
MOD	Modern	N/A	UNK	3
NIDGW	Non-ID Glaze Ware	N/A	GLAZ	74
NIDIW	Non-ID Indian Ware	N/A	IND	3
NONID	Non-ID	N/A	UNK	1
OC	Other Celadon	See Far Eastern Chapter for more details	FE	12
ODD	Odd (Non-ID)	N/A	UNK	182

CODE	NAME	PREVIOUS WARE NAMES	ORIGIN	QNT
PERSIA	Persian Blue Speckled	PERSIA in Kennet 2004 and Priestman 2005	GLAZ	524
PIP	Pink Painted Ware	Possibly SLIP.R in Priestman 2005	UNK	4
PISW	Pink Storage Ware	Possibly Wadi Suq residual fragments	STOR	29
PUM	Pumice Ware		STOR	46
REMIC	Red Micacious Ware		UNK	3
ROB	Red on Buff Ware	PAW.SCC in Priestman 2005	UNK	2
RORG	Red Organic Tempered Ware	ORG types in Priestman 2005	IND	16
IRPW	Red Painted Ware	IRPW in Priestman 2005	IND	43
SAC	South Asian Celadon	See Far Eastern Chapter for more details	FE	78
SHELL	Shell Tempered Ware		STOR	123
SWW	Soft White Ware		UNK	279
TBBW	Thin Black Burnished Ware		IND	167
TEXT	Textile Ware	Some examples may be GIB in Priestman 2005	UNK	2
TRBW	Thin Red/Buff Ware	Some examples may be GIB in Priestman 2005	IND	213
TRW	Thin Red Ware		IND	23
UGC		See Far Eastern Chapter for more details	FE	1
UNIQ	Unique (Non-ID)	N/A	UNK	9
WFRIT	White Fritware		GLAZ	80
WW	White Ware		UNK	17
YEMEN	Yemeni Yellow Glaze Ware	YEMEN in Priestman 2005	GLAZ	7

The assemblage contained 4244 rims from which 85 different rim types were observed and recorded (excluding Far Eastern wares which are looked at in detail in Bing in press). Each rim type has a description, associated class, expected diameter and has been drawn.

Figure 21 shows the rim types with their total EVE and quantity found. Drawn examples of each rim type can be found in Appendix V.II.

Figure 21: ND10 rim type breakdown

TYPE	Function	QNT	EVE
G1	BOWL	60	338
G10	BOWL	5	20
G11	BOWL	22	154
G12	BOWL	26	192
G13	BOWL	1	8
G14	BOWL	2	7
G15	BOWL	1	3
G16	BOWL	2	17
G17	BOWL	8	65
G18	BOWL	10	50
G2	BOWL	215	1259
G3	BOWL	39	229
G4	BOWL	4	20
G5	BOWL	5	44
G6	BOWL	7	36
G7	BOWL	66	403
G8	BOWL	5	65
G9	BOWL	13	73
INC1	BURN	18	192
INC2	BURN	3	26
J1	COOK	362	2517
J1.1	COOK	1	5
J10	WATER	15	
J11	STOR	39	487
J12	BOWL	95	519
J13	BOWL	267	1694
J14	STOR	18	184
J15	BOWL	92	520
J16	STOR	125	1574
J17	BOWL	9	52
J19	BOWL	92	686

TYPE	Function	QNT	EVE
J2	COOK	765	5762
J20	BOWL	21	193
J21	STOR	53	379
J22	STOR	22	230
J23	STOR	9	69
J24	STOR	9	55
J25	BOWL	9	55
J26	STOR	2	47
J27	STOR	14	162
J28	BOWL	11	54
J29	STOR	9	63
J3	COOK	221	1322
J30	WATER	9	165
J31	STOR	5	46
J32	BOWL	3	45
J33	TRAN	3	11
J34	STOR	2	11
J4	BOWL	15	108
J4.1	BOWL	16	127
J4.2	BOWL	2	9
J4.3	BOWL	3	13
J4.4	BOWL	25	173
J4.5	BOWL	9	72
J5	STOR	87	1373
J6	WATER	402	5675
J7	COOK	222	1620
J8	COOK	102	861
J8.1	COOK	6	70
J9	COOK	111	863
NG1	TRAN	40	677
NG10	COOK	3	29

TYPE	Function	QNT	EVE
NG11	COOK	1	14
NG12	COOK	3	31
NG13	COOK	4	25
NG14	COOK	1	10
NG15	COOK	5	46
NG16	COOK	6	8
NG17	COOK	2	18
NG18	COOK	5	48
NG19	COOK	4	20
NG2	TRAN	33	265
NG20	COOK	5	76
NG21	COOK	2	22
NG3	TRAN	8	168
NG4	TRAN	4	45
NG5	WATER	20	198
NG6	TRAN	1	3
NG7	COOK	14	213
NG8	TRAN	2	35
NG9	TRAN	2	11
SJ1	STOR	5	111
SJ2	STOR	1	15
SJ3	STOR	1	14
SJ4	STOR	1	16
UNIQ	UNKN	68	828
W1	BOWL	13	167
W2	BOWL	2	22
W3	BOWL	2	27

3.1.5: REPAIR AT JULFAR:

The ND10 assemblage contains 87 sherds showing signs of repair. Figure 22 demonstrates their wares and the percentage of each ware which has been found to have repairs and Figure 23 demonstrates the percentage of repaired sherds to non-repaired sherds.

Figure 22: Ceramics repair

Ware Name	Repair	Quantity	Repair %
CBW	16	115	13.9130435
LQC	11	98	11.2244898
OC	1	12	8.33333333
DEPAW	6	119	5.04201681
KHUNJ	8	176	4.54545455
PERSIA	23	524	4.38931298
CHIN	1	69	1.44927536
NIDGW	1	74	1.35135135
SAC	1	78	1.28205128
TIN	3	666	0.45045045
MGP	1	230	0.43478261
BIW	3	931	0.32223416
HWW	1	370	0.27027027
CRWW	1	397	0.25188917
BUFF	5	2011	0.24863252
JULF.PB	1	606	0.1650165
JULF	4	15847	0.02524137

Figure 23: Ceramics repair graph

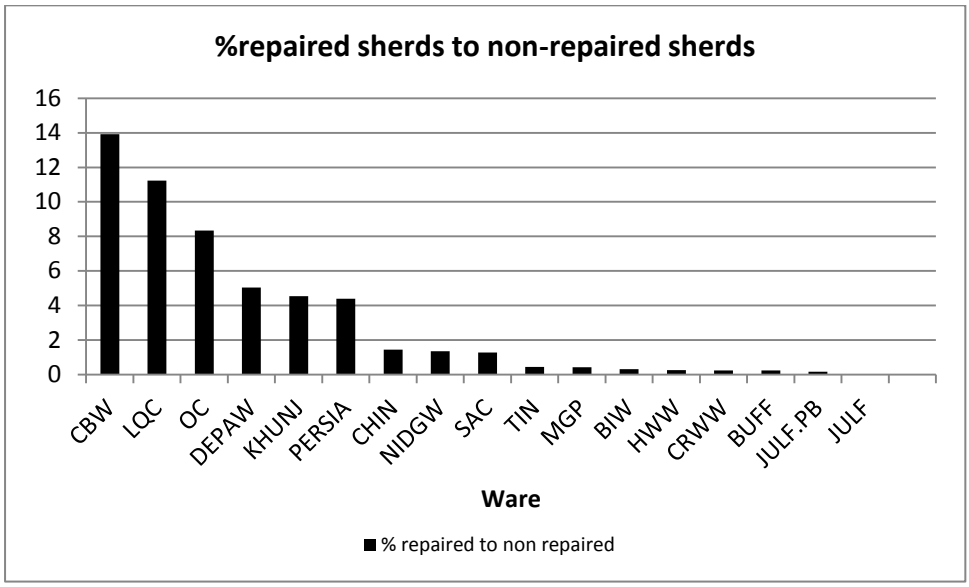


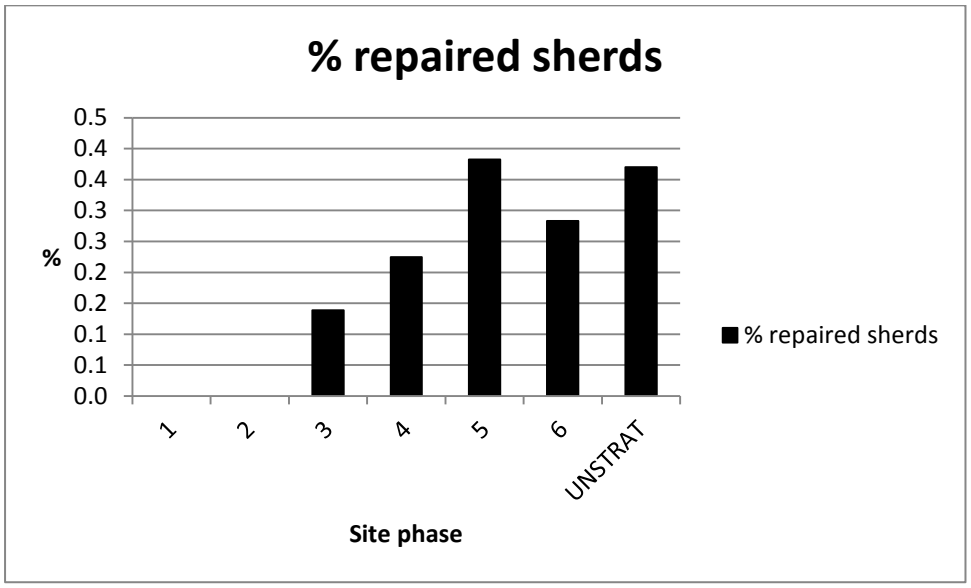
Figure 23 shows that Far Eastern wares have the highest percentage of sherds repaired with nearly 15% of all sherds found for CBW having evidence of repair. Similarly over 10% of LQC sherds show repair characteristics. PERSIA which has the second highest number of repaired sherds, has a relatively low percentage of repaired sherds at just over 4%. KHUNJ and DEPAW both have relatively high percentages of sherds with repairs as does SAC. Repair work tends to be completed on wares that are difficult/more expensive to replace, hence the large numbers of Far Eastern wares. This would suggest that DEPAW, SAC and KHUNJ vessels are more highly valued than PERSIA. As we see that PERSIA is the second most common glazed ware on the site, with only the generic TIN having more sherds, it is likely that PERSIA was regularly traded into Julfar and was comparatively inexpensive compared to the Far Eastern wares or KHUNJ/DEPAW.

Looking at repair across the occupation of the site, Figure 24 shows the frequency and percentage of repaired sherds across site phases which is then demonstrated in Figure 25.

Figure 24: Ceramics repair phasing

REPAIR	1	2	3	4	5	6	N/S
TRUE			3	10	28	38	8
FALSE	44	46	2156	4439	7294	13390	2154
Total	44	46	2159	4449	7322	13428	2162
%	0.0	0.0	0.1	0.2	0.4	0.3	0.4

Figure 25: Ceramics repair phasing graph



There are no repaired sherds found until phase 3. PERSIA is introduced in phase 1 but as shown in graph 2 PERSIA has a relatively low level of repair. LQC and KHUNJ are introduced in phase 3 and SAC in phase 4. The introduction of repairing ceramics in phase 3 could therefore be seen to be down to the prior introduction of these wares and the need to keep complete vessels. The rise in the percentage of repaired sherds over the next three phases shows this practice becoming more common as more wares considered precious are introduced and have time to be broken (CBW and DEPAW are introduced in phase 4 while LQC becomes more common after phase 3).

Conclusions on repaired sherds in the Julfar al-Nudud assemblage:

The above analysis demonstrates that some vessels were considered important/valuable enough to warrant a complex repair. The majority of these were within the CBW group of sherds, or more generally, within the FE ware family. This would back up a reasonably obvious assumption: that FE vessels were highly prized at Julfar al-Nudud. Even when they broke, it was clearly difficult enough to get a replacement that they were repaired. This could also possibly be due to an emotional attachment- these wares often survive longer in circulation due to their high value and so may be passed down as heirlooms. The repair holes present on other FE and some of the GLAZ wares e.g. Khunj may similarly reflect this scarcity although PERSIA is clearly not that difficult to obtain at Julfar. The repair of non-GLAZ/FE ware sherds is so rare (generally no more than 1 or 2% of each ware assemblage) clearly shows that these vessels were easy to replace and so there was no economic reason to repair them. Equally it may demonstrate that these wares excited no emotional attachment, as they were just everyday items.

3.2.1: WARE FAMILY BREAKDOWN:

The purpose of this section is to look at the individual wares within each ware family. It will look at the proportions each ware makes up of its ware family over the site phases discussed above to look for possible changes in the wares being used during different phases at Julfar. The UNK ware family will not be discussed here as it is a catch all grouping for those wares which either have an unknown provenance or an unknown function. The analysis of INC wares will include a discussion on the different decoration styles found on sherds within this ware family.

3.2.2: INCISED WARES IN THE ASSEMBLAGE:

Each incised ware sherd was given an individual sherd number and removed from the general assemblage for all contexts except CX1509 and CX1501. This has helped to identify distinct decorative styles in the incised wares. When sorting CX1509 the amount of incised ware sherds meant it wasn't efficient to mark each one individually and so using the CX1509 assemblage as a test, the sherds were laid out and examined. It became rapidly clear that there were strong cases for three decorative classes and a looser case for three fabric types. When these classes were applied to the separated incised wares, the trend continued to be visible. Three of these wares which were originally separated (WIW, BIW and WIW/BIW) were combined into a single BIW for this analysis as they proved to be very similar.

The decorative classes are ROUL (Figure 26), WAVE (Figure 27) and OTHER (example shown in Figure 32 on page 59).

Figure 26: ROUL decoration:

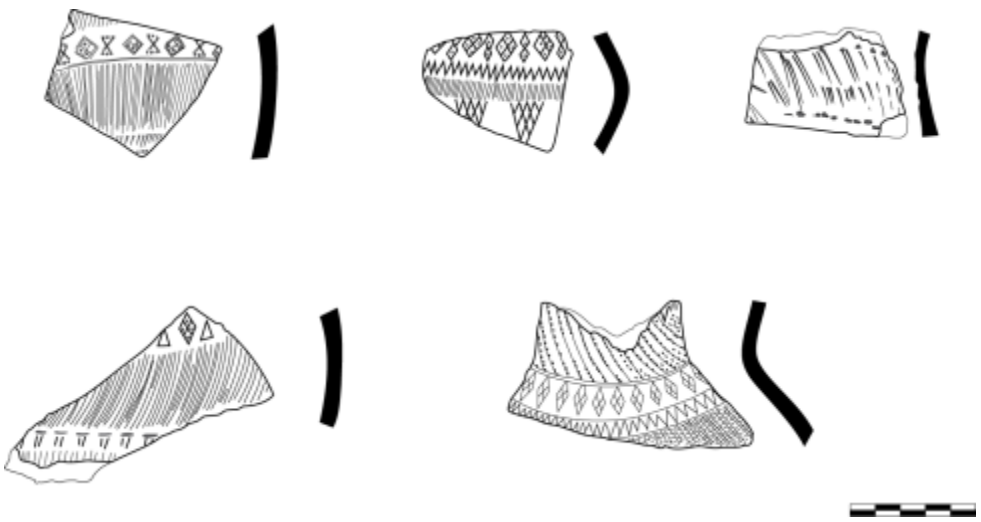
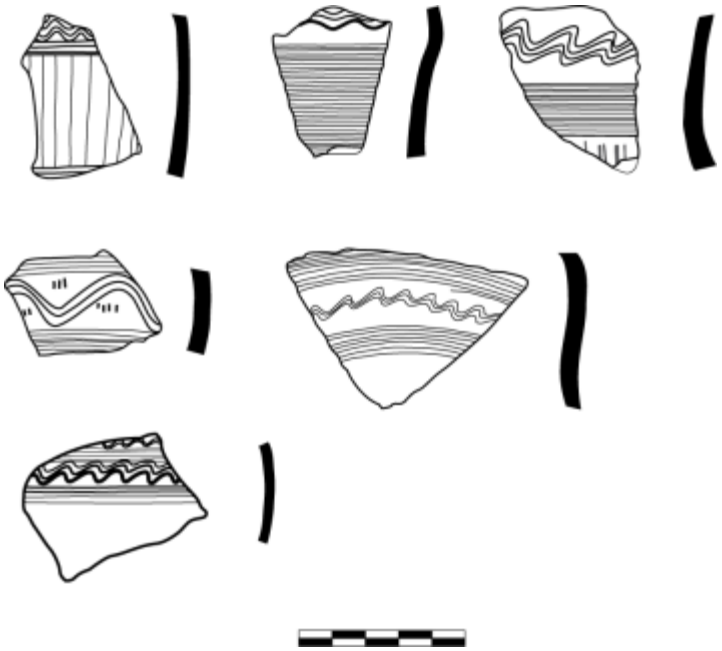


Figure 27: WAVE decoration:

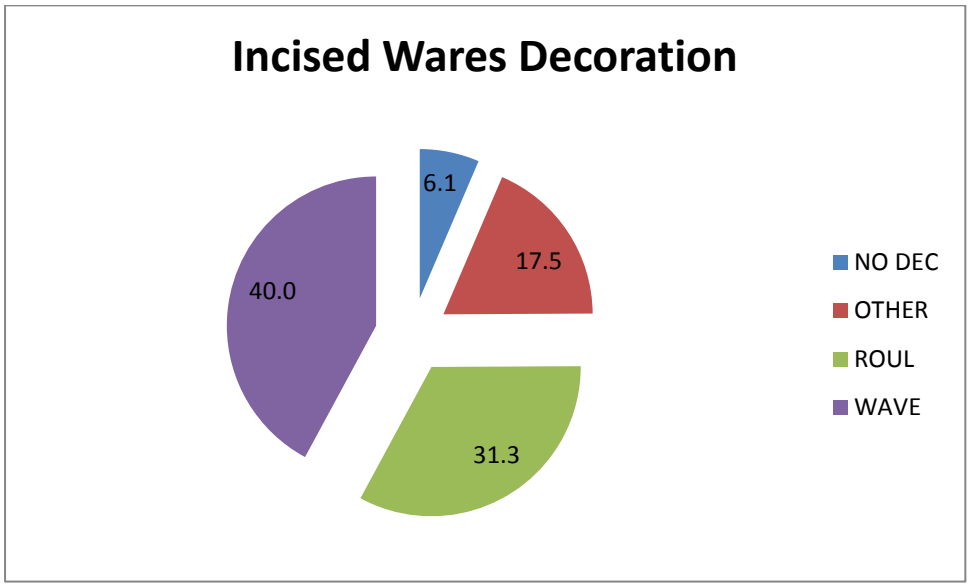


OTHER is a catch all class for the sherds which were not ROUL or WAVE but in general the decoration is naturalistic and made up of incised dots within incised line boundaries. Some sherds which this design type also have Fabric 3 and this combination appears to point to a late 18th Century ceramic type found in Priestman 2005: 402- Plate 81; 202. All examples from this are from surface or disturbed layers. Figure 28 shows the raw and percentage data for the incised wares while Figure 29 presents a pie chart of this information.

Figure 28: Incised wares decoration type breakdown (top row shows raw data, bottom row shows %.)

Ware Name	NO DEC	OTHER	ROUL	WAVE
IWs	60	172	307	392
Ware Name	NO DEC	OTHER	ROUL	WAVE
Iws (%)	6.1	17.5	31.3	40.0

Figure 29: Incised wares decoration breakdown graph



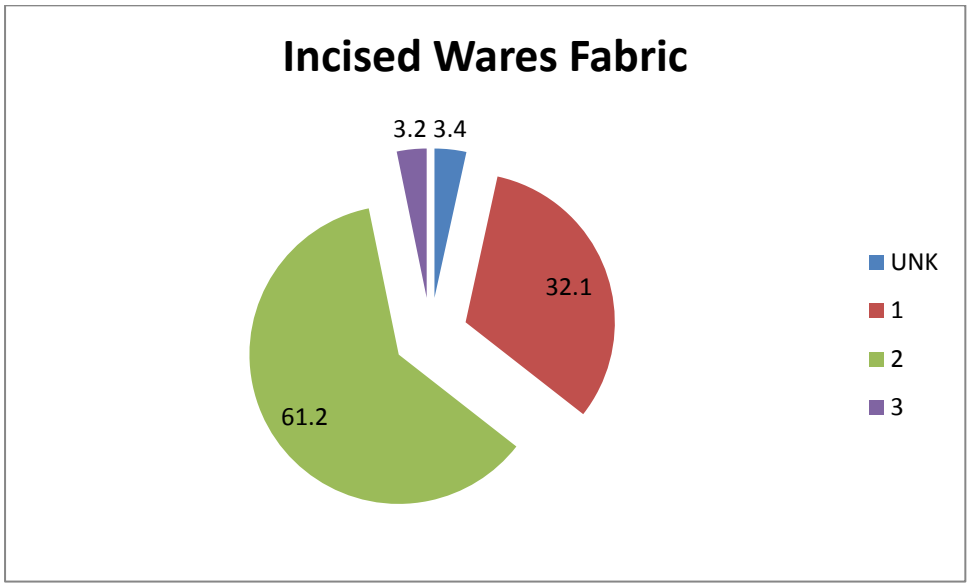
ROUL and WAVE between them make up 70.1% of the incised ware decoration types, showing how dominant the two styles are across the excavated period. Each of these styles appears to have been made using a different set of tools with the ROUL designs being made either with a combination of a single pronged tool and a rouletting tool, or just a single pronged tool. The wave designs have been made using a three pronged tool as the majority have series of three parallel lines either in straight lines or in a wave pattern.

The fabrics of BIW are based on thickness of the sherd for fabrics 1 and 2, and on a completely different fabric make-up for fabric 3. This has been adapted from Kennet 2004: 77 in his discussion on WHITE, EGGSHELL and their subclasses. Fabric 1 is thinner than Fabric 2, generally between 2 and 4mm thick, while fabric 2 is anything more than this. Both these fabrics have been hard fired unlike fabric 3 which is softer and more chalky. UNK shows sherds where the fabric was unrecorded. Figure 30 and Figure 31 present this data.

Figure 30: Incised ware fabric breakdown (top row shows raw data, bottom row shows %.)

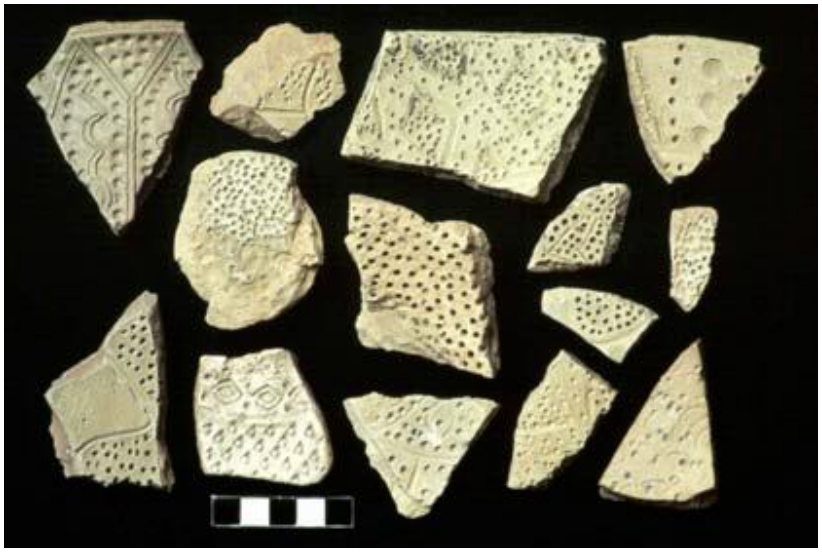
Ware Name	UNK	1	2	3
IWs	32	299	570	30
Ware Name	UNK	1	2	3
IWs	3.4	32.1	61.2	3.2

Figure 31: Incised ware fabric breakdown graph



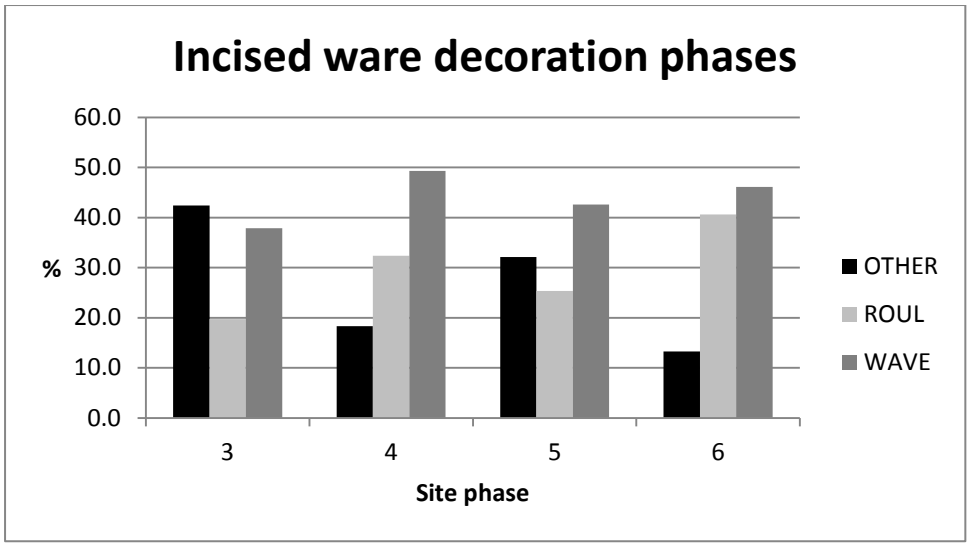
Fabric 3 is only found with OTHER decoration on it, while the other two fabrics tend to be fairly well split between ROUL and WAVE, although there is more WAVE in fabric 1 and more ROUL in fabric 2. From this the ware BIW can be split into four sub-wares based on decoration and fabric. The difference between fabric 1 and 2 does not appear to have any bearing on the decorative styles on the sherd and so these will be combined. The four sub-wares are therefore: WAVE decoration on fabric 1 or 2; ROUL decoration on fabric 1 or 2; OTHER decoration on fabric 1 or 2 and OTHER decoration on fabric 3 (Figure 32). This last sub-ware is known to be of later date than the others, probably around the 18th Century according to similar examples from the Williamson Collection discussed by Priestman 2005: 202; 402- plate 81.

Figure 32: Fabric 3 and OTHER decoration- from Priestman 2005: 402- plate 81:



Frifelt's monograph on Bahrain ceramic finds shows the Hormuzi 'textile ware' used for water jars is found with similar ROUL and WAVE decoration (Frifelt 2001: 96-8) and also shows WAVE decoration on *Gudulia* pilgrim flasks (Frifelt 2001: 81- fig. 124-6) as do drawings from Kilwa and Shanga (Chittick 1984: 94 and Horton 1996: respectively). Therefore the INC wares are likely to be decorated examples of BUFF wares.

Figure 33: % of total incised ware split into decoration type across phasing:



The phasing graph Figure 33 appears to show no clear pattern between a particularly style of decoration being predominant during an individual phase, although there is a smaller proportion of "OTHER" decoration towards the end of the sequence. From this it would appear that the ROUL and WAVE decoration styles were contemporary and possibly interchangeable as they are generally found on the same fabric.

3.2.3: GLAZED WARE ANALYSIS:

The glazed assemblage from ND10 is made up of 1,965 sherds split across ten wares, as shown in Figure 34

Figure 34: Glazed ware breakdown

CODE	WARE FAMILY	QNT	EVE
DEPAW	GLAZ	119	241
TIN	GLAZ	666	915
GFRIT	GLAZ	88	123
KHUNJ	GLAZ	176	333
LFRIT	GLAZ	6	
MGP	GLAZ	230	544
NIDGW	GLAZ	74	129
PERSIA	GLAZ	524	1019
WFRIT	GLAZ	80	48
YEMEN	GLAZ	7	19
Total		1970	3371

The table demonstrates the five major glazed wares found at Julfar-Tin Glazed Ware, Persian Blue Speckled, Manganese Painted Ware, Khunj Ware and Degraded Painted Ware. The in-depth analysis of the glazed assemblage demonstrated that DEPAW was a separate ware to TIN, as prior to this they had been catalogued together. It also showed that DEPAW had a separate set of rim forms- G16 and G18 as well as being found in general glazed ware rim types such as G2 and G9. It also allowed a splitting of the frit ware found on site into the three wares shown in Figure 34 based on the colour of their glaze and decoration. This showed that there were approximately the same number of GFRIT and WFRIT found in the assemblage. The graphs illustrate the differences in glazed ceramic assemblage that can occur not just spatially across the site but all over the period of the sites occupation and abandonment. Figure 35 and Figure 36 show the glazed assemblage across the site phasing, as does Figure 37.

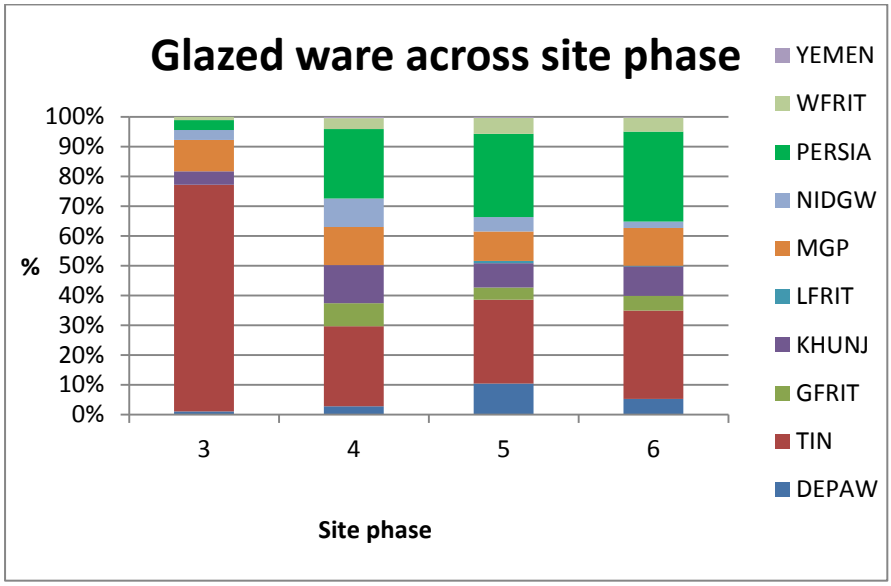
Figure 35: Glazed ware phasing

Ware Name	1	2	3	4	5	6	N/S
DEPAW			2	6	51	46	14
TIN	2	2	137	59	138	258	70
GFRIT				17	20	43	8
KHUNJ			8	28	40	86	14
LFRIT					4	2	
MGP			19	28	48	110	25
NIDGW			6	21	24	19	4
PERSIA	1		6	51	137	263	66
WFRIT			2	8	26	41	3
YEMEN				1	2	2	2
	3	2	180	219	490	870	206

Figure 36: Glazed % glazed assemblage

Ware Name	1	2	3	4	5	6	N/S
DEPAW			1.1	2.7	10.4	5.3	6.8
TIN	66.7	100.0	76.1	26.9	28.2	29.7	34.0
GFRIT				7.8	4.1	4.9	3.9
KHUNJ			4.4	12.8	8.2	9.9	6.8
LFRIT					0.8	0.2	0.0
MGP			10.6	12.8	9.8	12.6	12.1
NIDGW			3.3	9.6	4.9	2.2	1.9
PERSIA	33.3		3.3	23.3	28.0	30.2	32.0
WFRIT			1.1	3.7	5.3	4.7	1.5
YEMEN				0.5	0.4	0.2	1.0

Figure 37: % total GLAZ for individual glazed wares across site phasing:



The site phasing of the glazed ceramic assemblage again shows the introduction of five new glazed wares in phase 3 (MGP, KHUNJ, DEPAW, WFRIT and NIDGW), as well as a contraction in the percentage of PERSIA found in phases 2 and 3, although the phase 1 and 2 assemblages are very small and the single piece of PERSIA in phase 1 could be skewing the results. Phase 3 is therefore the important phase to look at, with 180 sherds of glazed ware and it is clear that TIN dominates in this phase. What is also evident is that after this early phase of dominance TIN becomes one of a number of glazed ceramics in use, suggesting that the site starts to import larger numbers of other glazed wares, with the assemblage becoming more complex and varied. After phase 4 the amount of PERSIA stabilises around 28-31% of the total assemblage. The

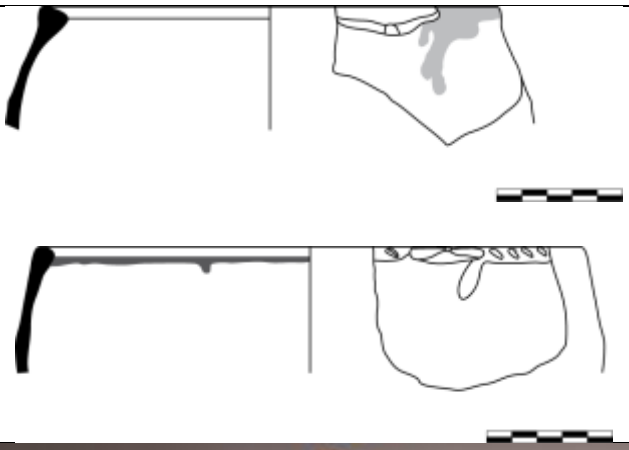
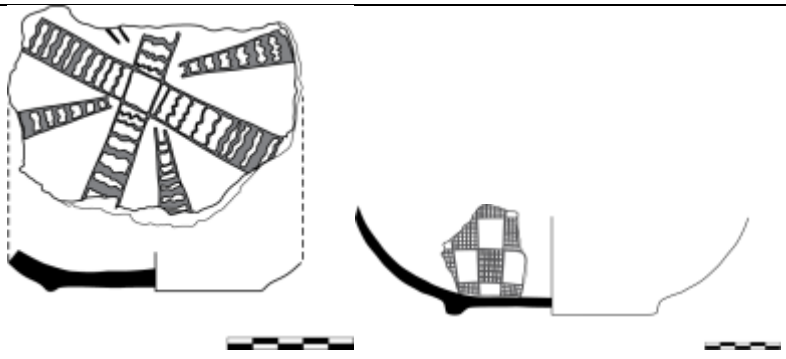
amount of MGP in the assemblage is around 10% for all phases after its introduction in phase 3, while KHUNJ peaks in phase 4 and then slowly becomes less common in later phases. WFRIT and GFRIT become common in phases 4, 5 and 6, while LFRIT is only found in the abandonment phase and modern period. This diversification of the glazed assemblage over the occupation of the site, although some may be residual, suggests an increase in the areas Julfar was trading glazed ware with, particularly with the introduction alongside the common Iranian wares PERSIA and MGP of Yemeni/South Arabian glazed wares such as YEMEN and DEPAW.

3.2.4: JULFARWARE IN THE ASSEMBLAGE:

The local Julfarware types make up just over 70% of the total assemblage. It has previously been split into four wares: Unpainted Julfarware, Red on White Painted Julfarware, Purple on Black Painted Julfarware and Recent Julfarware (i.e. post-occupation of Julfar). During the original cataloguing the Julfarware was originally split into six different wares, three of which have merged as they all fall into the JULFAR.PB ware.

JULFAR, formally JULF1, is the normal unpainted Julfarware, which has a large range of vessel types and can vary in colour, roughness, crudeness of design/manufacture and inclusions. JULFAR.RW, originally JULF3, is red on white painted Julfarware, generally used in bowls, water jars and small storage vessels. It appears to be a development of JULFAR for tablewares and an exportation market- it is found in Bahrain (Frifelt 2001: 93-5) and East Africa (Chittick 1974b: 385). Early on in the Trench A sorting, a number of thin blackened rims were found which were definitely Julfarware but were different to JULFAR. These were given the class JULF2. However for the majority of the cataloguing only the rims were catalogued as a separate class. Sherds with a similar fabric and thickness (much thinner than normal Julfarware which tends to be chunky) have been catalogued as JULF5, described as a thin biscuit Julfarware, often blackened. These two wares have been combined with the original ware JULF4 to form the ware JULFAR.PB. JULFAR.PB is purple on blacked painted Julfarware which appears to come in late in the sequence and is restricted to small cooking vessels, often with cording decoration around the rim. Finally JULFAR.RC is a more post-medieval Julfarware, probably of the 16th or 17th Century AD, with a much smoother surface and well sorted inclusions. It is easily recognisable if a base is present by the base ring that does not exist on earlier Julfarwares. Figure 38 shows the four different Julfarwares.

Figure 38: Julfarware breakdown:

Julfarware	Total	Photo/drawn example
JULF	15847	
JULF.PB	1822	
JULF.RW	3104	
JULF.RC	7	
TOTAL	20780	

The overall total for Julfarware sherds (totalling JULFAR, JULFAR.RW, JULFAR.RB and JULFAR.RC) was 20780. Of these JULFAR sherds were the most common at 15847, with JULFAR.RC being the least common with only 7 examples being found, although on closer inspection of drawn examples, many of these may have been mis-identified as JULFAR.RW in the cataloguing. The Julfarwares across the phases are presented in Figure 39, Figure 40 and Figure 41.

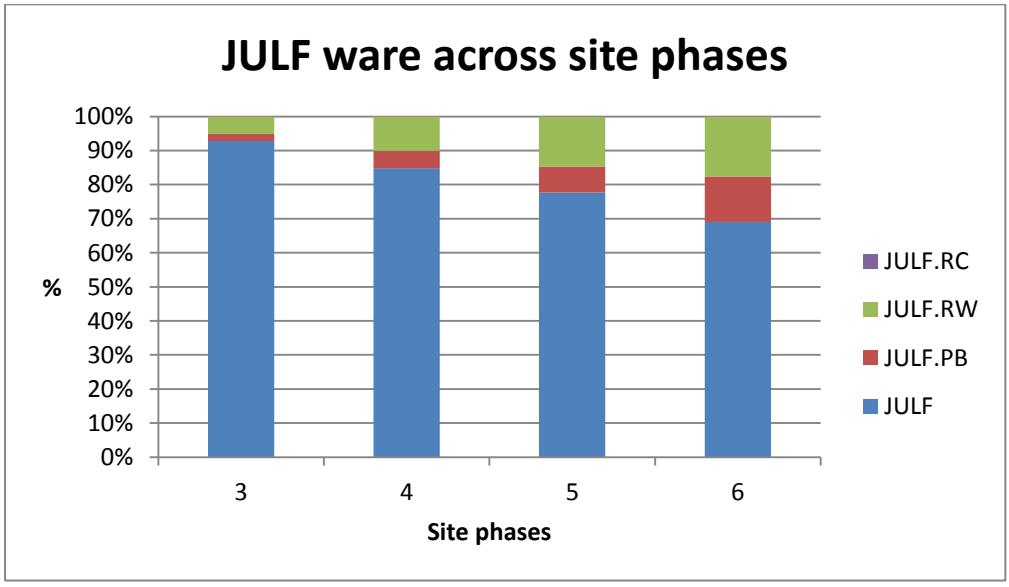
Figure 39: Julfarwares site phasing

Ware Name	1	2	3	4	5	6	N/S
JULF	31	42	1336	2921	4070	6395	1052
JULF.PB			29	176	397	1231	91
JULF.RW			74	348	771	1628	283
JULF.RC					1	3	3
	31	42	1439	3445	5239	9257	1429

Figure 40: Julfarwares % across site phasing

Ware Name	1	2	3	4	5	6	N/S
JULF	100.0	100.0	92.8	84.8	77.7	69.1	73.6
JULF.PB	0.0	0.0	2.0	5.1	7.6	13.3	6.4
JULF.RW	0.0	0.0	5.1	10.1	14.7	17.6	19.8
JULF.RC	0.0	0.0	0.0	0.0	0.0	0.0	0.2

Figure 41: Julfarwares across site phasing



The site phasing graph again shows that the Julfarware assemblage early on is only made up of JULFAR. During phase 3 a small percentage of JULFAR.PB and JULFAR.RW is brought in. With an increase in both JULFAR.RW and JULFAR.PB in phase 4 the proportion of JULFAR is again reduced. This pattern continues through the rest of the phases with the proportion of JULFAR becoming smaller but always being the majority of the assemblage, except for the N/S finds having a smaller percentage of JULFAR.PB.

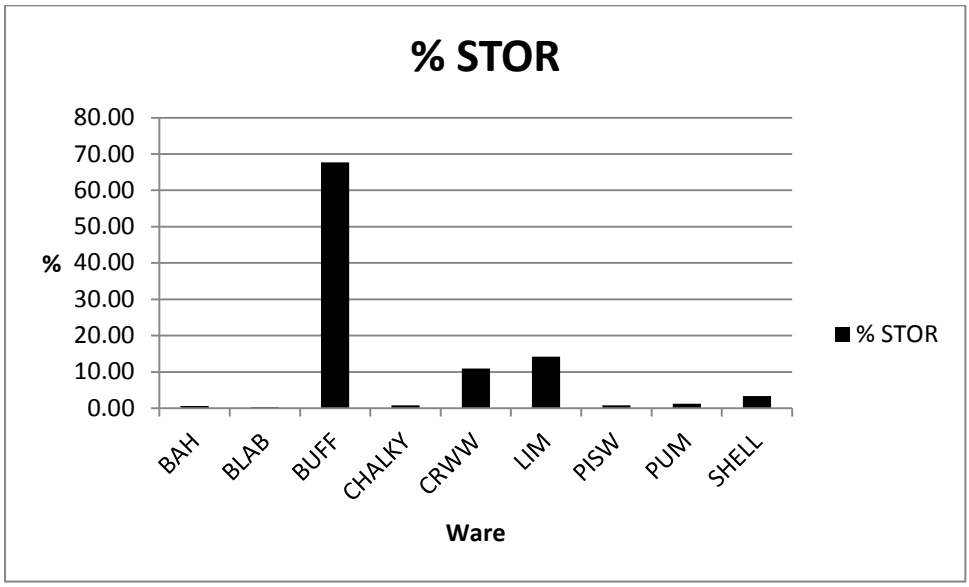
3.2.5: STORAGE WARES IN THE SEQUENCE:

The storage ware family assemblage (STOR) is made up of 3,628 sherds split across nine wares. The ware breakdown for STOR is shown in Figure 42. This ware family is made up of imported wares which appear to have been used for storage of other products. Their value therefore is not necessarily in themselves but in their contents. The wares range from BUFF, used to make hard thin walled brittle water storage/transport vessels to the less common LIM, used to make large thick walled vessels with large handles. Figure 43 shows the proportion of the ware family each ware makes up.

Figure 42: STOR ware family breakdown with % of ware family total:

Ware	QNT	% STOR
BAH	23	0.63
BLAB	9	0.25
BUFF	2456	67.70
CHALKY	29	0.80
CRWW	397	10.94
LIM	516	14.22
PISW	29	0.80
PUM	46	1.27
SHELL	123	3.39
Total	3628	

Figure 43: STOR % breakdown:



When looked at across the site phases, the STOR wares are similarly dominated by BUFF, which makes up just under 70% of the total STOR assemblage. Over the four phases discussed, it is possible to see some slight trends.A breakdown of the wares in the STOR grouping is presented in Figure 44, Figure 45 and Figure 46

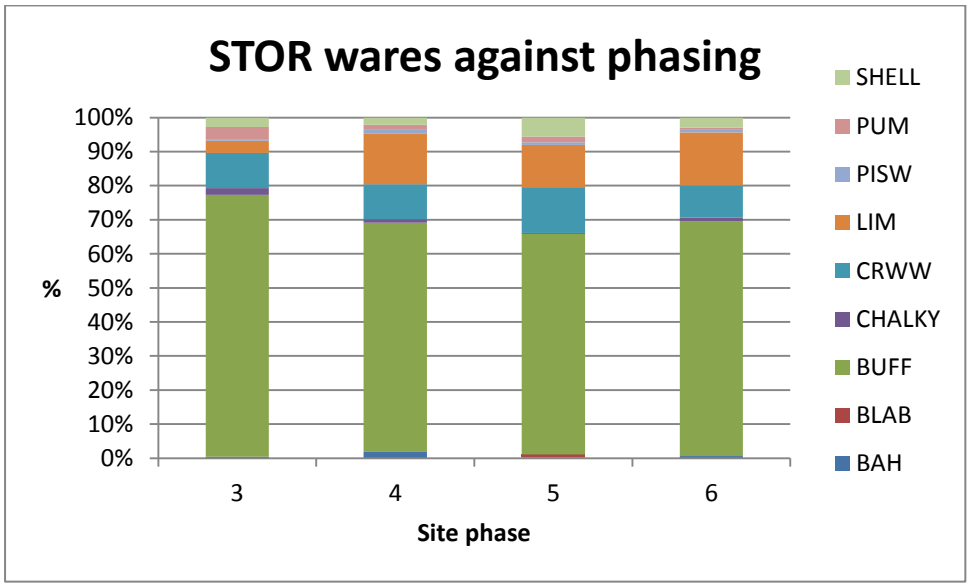
Figure 44: STOR ware family breakdown:

Ware	1	2	3	4	5	6	N/S
BAH			1	7	2	10	3
BLAB					9		
BUFF	2	1	193	262	650	1171	177
CHALKY			5	4	3	17	
CRWW	2		26	40	135	159	35
LIM	1		9	58	124	265	59
PISW			1	4	8	13	3
PUM			9	6	17	11	3
SHELL			7	8	56	50	2
Total	5	1	251	389	1004	1696	282

Figure 45: % STOR ware family wares:

Ware	1	2	3	4	5	6	N/S
BAH			0.4	1.8	0.2	0.6	1.1
BLAB					0.9		
BUFF	40.0	100.0	76.9	67.4	64.7	69.0	62.8
CHALKY			2.0	1.0	0.3	1.0	
CRWW	40.0		10.4	10.3	13.4	9.4	12.4
LIM	20.0		3.6	14.9	12.4	15.6	20.9
PISW			0.4	1.0	0.8	0.8	1.1
PUM			3.6	1.5	1.7	0.6	1.1
SHELL			2.8	2.1	5.6	2.9	0.7

Figure 46: STOR % against phasing:



3.2.6: FAR EASTERN WARES IN THE SEQUENCE:

The assemblage contains 381 Far Eastern sherds, which are discussed in detail in a chapter of the ND10 monograph (Bing, in Carter in press). It is important however to discuss their presence as a general group against the other ceramics in the assemblage and to demonstrate the changes in the general types of ceramics found at al-Nudud.The following is therefore a discussion of the sherds in the generalised wares given to them by the author. Figure 47 shows the breadown of the Far Eastern sherds into their wares.

Figure 47: FE wares breakdown

Class Name	QNT
CBW	115
CHIN	72
LQC	99
OC	14
SAC	78
BGSW	3

These wares are a mix of known wares from other excavations (e.g. CBW- Chinese Blue and White; LQC- Luan Quan Celadon) and general wares which have been split up into more detailed ware descriptions in Bing's work (In press) (SAC- South Asian Celadons). This is particularly true of CHIN and OC (Chinese and Other Celadon) which are so called solely because they didn't fit into the LQC, SAC or CBW categories. Ware descriptions for these wares are not given as the author did not study them beyond a swift early catagorisation.

The trench make up of these can be seen in Figure 48, Figure 49 and then in Figure 50.

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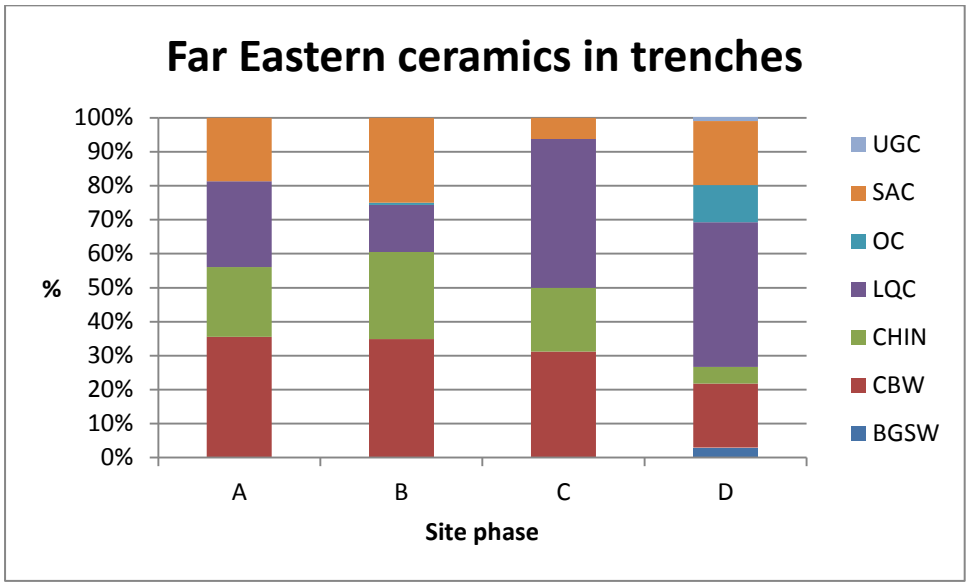
Figure 48: FE ware trench breakdown

Ware Name	A	B	C	D
BGSW				3
CBW	38	53	5	19
CHIN	22	39	3	5
LQC	27	21	7	43
OC		1		11
SAC	20	38	1	19
UGC				1
	107	152	16	101

Figure 49: FE ware trench breakdown %

Ware Name	A	B	C	D
BGSW	0.0	0.0	0.0	3.0
CBW	35.5	34.9	31.3	18.8
CHIN	20.6	25.7	18.8	5.0
LQC	25.2	13.8	43.8	42.6
OC	0.0	0.7	0.0	10.9
SAC	18.7	25.0	6.3	18.8
UGC	0.0	0.0	0.0	1.0

Figure 50: FE wares trench breakdown graph



The graph shows that trench D is the most varied in terms of different general Far Eastern Wares although this may be because sherds listed as CHIN in other trenches were classed as OC in this trench due to the author's inexperience with Far Eastern wares. A more refined breakdown of these ceramics has been made (Bing in press). The graph also shows that while CBW is generally found in similar proportions across the site (although trench D has only half as much as the other trenches) LQC is much more varied with both trenches C and D having more that 40% of their Far Eastern assemblage made up of LQC while Trench B only has 13% and trench A 25%. Trench C also has less SAC proportionally although this could be due to a lack of understanding of the differences between South Asian and Chinese celadons.

Figure 51 and Figure 52 show the data for Far Eastern ceramics across the site phases with the percentages represented in Figure 52 illustrated in Figure 53.

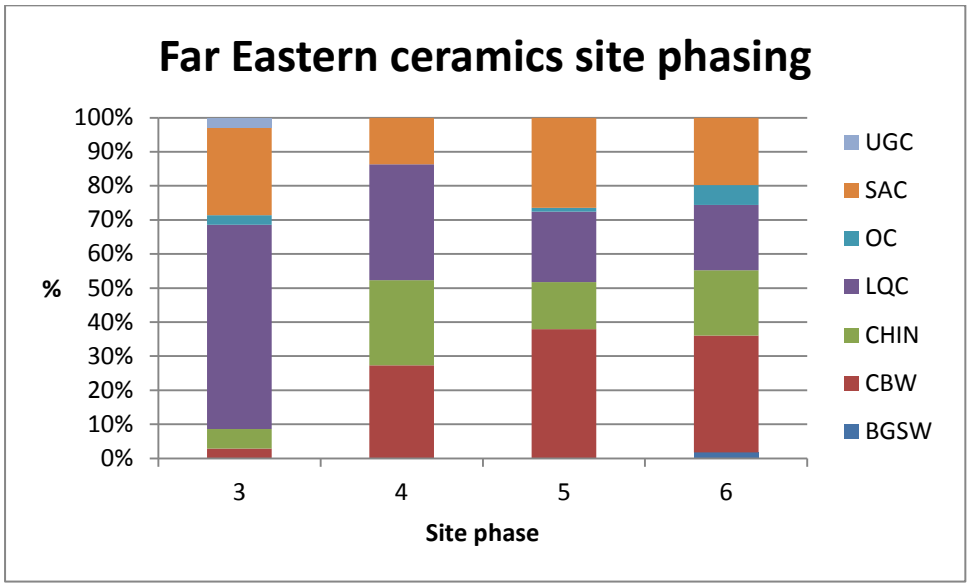
Figure 51: FE wares site phasing

Ware Name	1	2	3	4	5	6	N/S
BGSW						3	
CBW			1	12	33	59	10
CHIN			2	11	12	33	11
LQC			21	15	18	33	11
OC			1		1	10	
SAC			9	6	23	34	6
UGC			1				
	0	0	35	44	87	172	38

Figure 52: FE wares site phasing %

Ware Name	1	2	3	4	5	6	N/S
BGSW						1.7	
CBW			2.9	27.3	37.9	34.3	26.3
CHIN			5.7	25.0	13.8	19.2	28.9
LQC			60.0	34.1	20.7	19.2	28.9
OC			2.9	0.0	1.1	5.8	0.0
SAC			25.7	13.6	26.4	19.8	15.8
UGC			2.9				

Figure 53: FE wares site phasing graph



The graph illustrates that there was no Far Eastern ceramics before phase 3 at al-Nudud. It also shows the introduction of CBW from phases 3 to 6, peaking in phase 5, as well as the fall in LQC which CBW may have replaced as the main Far Eastern ceramic traded in this period.

3.3.1 Context by context analysis:

While the trench overviews give a picture of a general area of the site over all periods, contexts show a difference in a defined locum over a definable period i.e. the start of the context to the end of the context. This analysis was completed using data from a crosstab query asking for context number against ware family, copying into an Excel spreadsheet and then conditionally formatting the cells to change colour when the contents were firstly above 125% of the average across the site for that family, and secondly above 150% (see Appendix II.I and Appendix II.II). This shows the contexts where there was an unusually high concentration of one or more families. Each of these contexts were then studied to look for patterns in use or to demonstrate a particular area of the site which could have been used for a specific purpose. Overall the results of this were inconclusive, largely because of a scarcity of large concentrations of non-Julfarware sherds, particularly Indian and Chinese wares. The study was also held back by the heavily disturbed nature of the upper layers of the site, particularly in trenches A and B. However some conclusions can be made.

3.3.2: WARE FAMILIES ACROSS CONTEXTS:

Through this analysis it was noticed that there were a large number of contexts with small numbers of sherds which were mainly JULF or STOR wares. Looking through the context record, these were all post-hole deposits. This would suggest a conclusion which is not surprising- the possible packing of posts using the cheap, easily available/replaced local wares. The majority of Indian wares came from the upper layers, suggesting that they only became common towards the end of the occupation sequence. One possible storage area was noted in CX1513 which had a high number of storage wares. This context connected to CX1512 which had a slightly smaller percentage of storage wares and so it is possible that one is the storage area for the other. The presence of very large percentages of Julfarware in a context was usually because the context contained a complete vessel or pot oven which dominated the assemblage. These can then be taken as cooking areas with one example in trench A and over 10 in trench B. CX541 had an assemblage of 201 sherds of which 199 were JULF classes (breakdown presented in Figure 54). This context, just above the *madbasa* in Trench B, is described as sealing the *madbasa* layer in the context sheet summary. Whether these sherds are part of a deliberate deposit relating to the *madbasa's* use or destruction is unknown.

Figure 54: CX541 ware breakdown

NO	CONTEXT	Ware Name	SHERD	TYPE	DEC	QNT	EVE
2806	541	JULFAR.RW	R	J6		1	100
4703	541	JULFAR	R	J1		1	32
4744	541	JULFAR	S			174	
4745	541	JULFAR	S		BAND	8	
4746	541	JULFAR	R	J3		10	61
4747	541	JULFAR	R	J16		4	86
4748	541	CRWW	S			1	
4749	541	JULFAR.RW	S			1	
4750	541	CHIN	R			1	25

Figure 54 shows the ceramic assemblage from CX541. From the wares found there is a minimum of four vessels- one JULFAR, one JULFAR.RW, one CRWW and one CHIN When we then bring in the rim types, this is increased to a minimum of six as there are four different Julfarware rim types found. Two of these – sherd numbers 2806 and 4703- are the only examples of that vessel type in the context and so must be individual vessels. The other two Julfarware rim types found have an EVE of less than 100 and so could all be from two vessels, one with a J3 rim and one with a J16 rim. The typical assemblage for a *madbasa* in use is one (or occasionally two) large storage jars (J6 is a water container type and so would fit this

description, J16 is a large storage ware type) into which the date honey is put after processing. J3 and J1 are both cooking vessel/small cooking bowl rim types. The presence of BAND style decoration could relate to either the smaller cooking vessels or to the large storage vessels although CORD decoration is more common in the latter. The presence of the two non-Julfarware sherds does not affect the possible interpretation of the context as relating to the use of the *madbasa* but without detailed knowledge of the position of the sherds in the trench and more information about the minimum number of vessel in sherd numbers 4746 and 4747, it is impossible to reach a valid conclusion.

3.3.3: RIM TYPE FAMILIES ACROSS CONTEXTS:

Analysing the rim families across contexts was done in a similar fashion to the ware family analysis above which conditional formatting highlighting increases in percentages but using the total EVE of each type family rather than the percentage. This analysis showed up that there were three possible contexts that could relate to specific cooking areas in addition to the pot ovens excavated (see Figure 55) - in CX136, CX153 and CX611. This analysis did suggest that the hypothetical storage area in CX1512/CX1513 had a high percentage of water storage/pouring rim types and of transport jar rims. This suggests that the area is not just for storage of local goods but possibly also for the holding of imported materials. CX039 can be identified as a storage pit as 100% of the rim sherds were from storage wares. It could also be a destroyed pot oven as large storage jars were re-used as ovens at al-Nudud and elsewhere in the Gulf (see below). The function of the pit was unknown before this. CX541 contained a mix of COOK, STOR and WATER rim types with higher than average values of WATER and STOR, possibly suggesting that these vessels related to a storage and distribution area for the produce of the *madbasa*.

Figure 55: *Tanoor* oven contexts and assemblages

Context	Site Phase	Ware	Associated Ware	Function	Use
164	2	JULFAR		Unknown	Unknown
509	5	JULFAR		Storage	Oven
536	4	JULFAR	DIIW.BL	Storage	Oven
568	5	JULFAR		Cooking	Pot
577	5	JULFAR		Storage	Oven
590	5	JULFAR		Storage	Oven
621	5	JULFAR.RW		Water	Oven
625	5	JULFAR		Storage	Oven
649	5	BUFF	JULFAR	Storage	Oven
659	6	JULFAR		Storage	Oven
664	4	JULFAR		Cooking	Oven
667	4	JULFAR		Storage	Oven
670	4	JULFAR		Unknown	Unknown
81	4	JULFAR		Storage	Oven

The excavation found fourteen pot ovens- a secondary use for storage jars where they are upended, the base and some of the lower body removed and a small stokehole knocked either in the rim or just above. This allows them to be used as ovens, generally for the baking of flat-breads. All of these were found in trenches A and B, with the majority coming from trench B. The trench A examples are from site phases 2 and 4 while the trench B examples are from phases 4 and 5 with one from phase 6. This shows a consistent technique of cooking over the occupation period of the site. These vessels are generally large storage jars (JULFAR examples are generally J5, J16 or J26 rim types) although there is a single example of a JULFAR.RW J6 water jar and of a BUFF jar which could be for storage or transport of materials. The key factor in the choice of pot does however appear to be their size. Some examples (CX536, CX649) have been re-enforced with other jars (Associated Ware in the table), showing a long period of use or a weakness and repair. The re-enforcement of CX536 was completed using DIIW.BL, a thick Indian probable storage ware. It is probable that the reason behind using these fabrics was due to their easy availability and low cost, as well as their reasonable thermal shock resistance- the large inclusions in Julfarware help to spread the heat through the fabric quickly, although its thickness does count against it. These obviously demonstrate areas of food preparation and cooking, and would suggest that trenches A and B have a different cooking activity in them compared to trenches C and D.

Beyond these examples it was again difficult to show any overall patterns or areas for different functions other than the higher amount of bowl forms already seen across trench C. It may be suggested therefore that the area excavated at al-Nudud was fairly homogeneous in terms of ceramic distribution between individual contexts. The differences noted between trenches and phases are more pronounced, particularly in the rise in Indian wares towards the later periods and in the higher distribution of glazed ware and bowl forms in the midden in trench C.

3.4.1: INTRA-SITE CERAMIC CHANGES:

Different areas of all sites have different functions and therefore it is likely that there will be a variation in ceramic types not only across time periods but also in different areas of the site during a given time period. The ceramic distribution can be used to identify the function of these areas at certain times throughout the site's occupation. There are multiple ways of looking at this, depending on whether the generic families of classes are analysed or whether the generic families of rim types are analysed. Each of these can be analysed in two ways, firstly in a graph looking at the differences between each trench and secondly to look at the attributes of individual contexts. The first can show general functional differences between the areas of excavation while the second can give a specific purpose or function to a context, showing a

specific process was occurring in that context during its period of use. Figure 56 shows the raw data for the ware families and Figure 57 shows the percentage data for ware family which is then placed into Figure 58.

Figure 56: Ware family trench breakdown

WARE FAMILY	A	B	C	D
FE	107	152	16	101
GLAZ	430	701	79	760
INC	205	241	46	527
IND	92	164	6	380
JULF	4992	7731	465	7592
STOR	826	1232	114	1456
UNK	256	363	56	504
	6908	10584	782	11320

Figure 57: Ware family assemblage % trench breakdown

WARE FAMILY	A	B	C	D
FE	1.5	1.4	2.0	0.9
GLAZ	6.2	6.6	10.1	6.7
INC	3.0	2.3	5.9	4.7
IND	1.3	1.5	0.8	3.4
JULF	72.3	73.0	59.5	67.1
STOR	12.0	11.6	14.6	12.9
UNK	3.7	3.4	7.2	4.5

Figure 58: Ware family trench breakdown graph

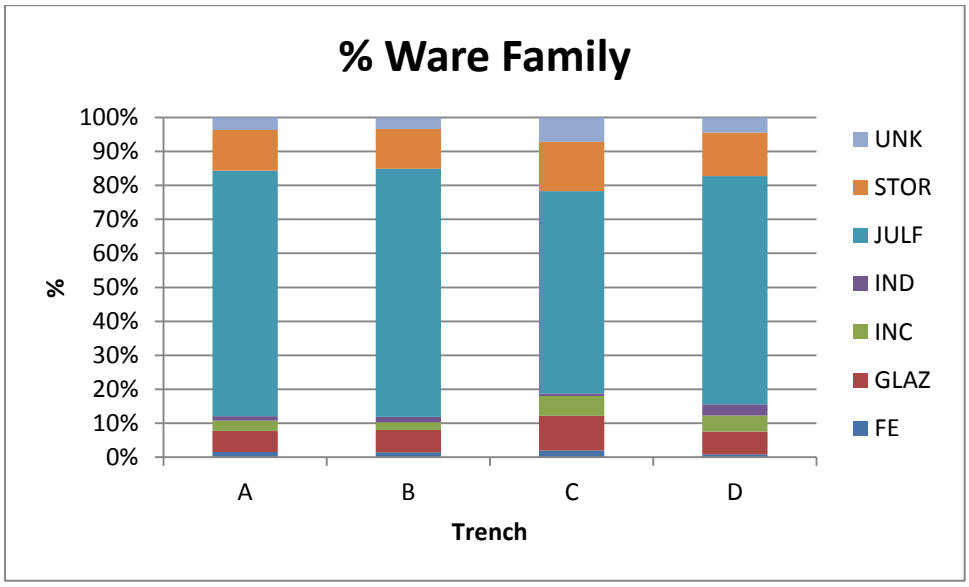


Figure 59 shows raw data for type family while Figure 60 shows the percentage data for type family which is then entered into Figure 61.

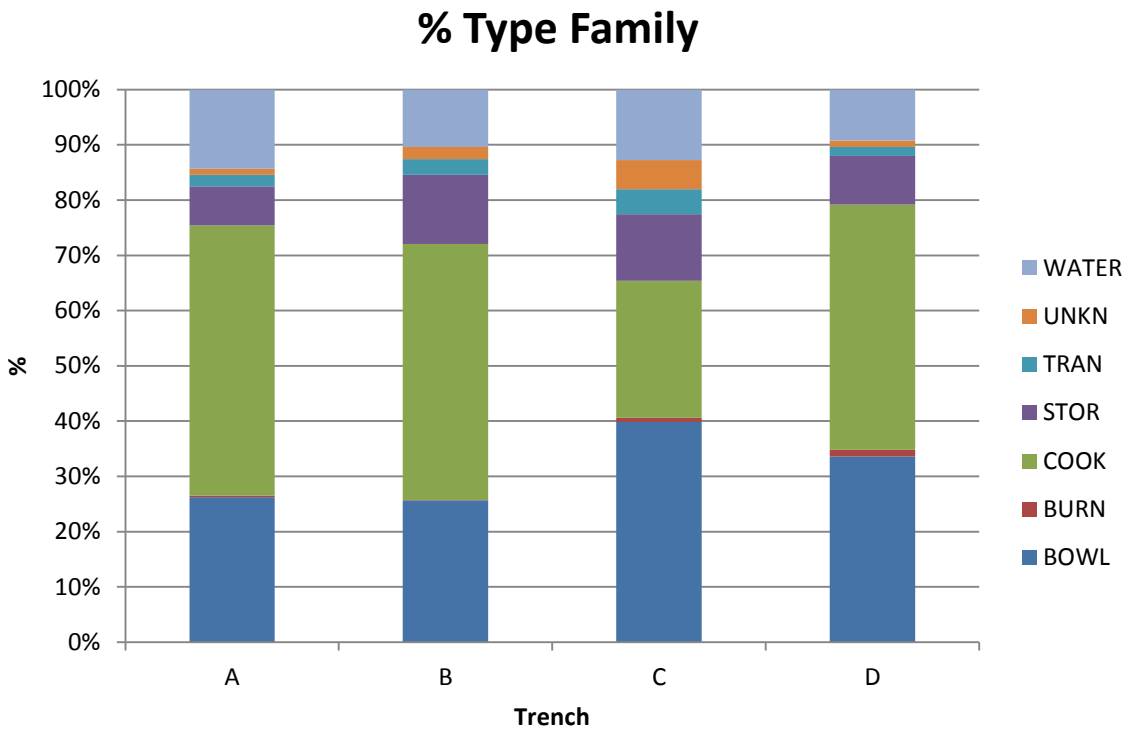
Figure 59: Rim family trench breakdown

Function	A	B	C	D
BOWL	255	402	53	463
BURN	3	1	1	16
COOK	475	726	33	611
STOR	69	196	16	122
TRAN	20	45	6	22
UNKN	11	34	7	16
WATER	139	163	17	127
Total	972	1567	133	1377

Figure 60: Rim family assemblage % trench breakdown

Function	A	B	C	D
BOWL	26.2	25.7	39.8	33.6
BURN	0.3	0.1	0.8	1.2
COOK	48.9	46.3	24.8	44.4
STOR	7.1	12.5	12.0	8.9
TRAN	2.1	2.9	4.5	1.6
UNKN	1.1	2.2	5.3	1.2
WATER	14.3	10.4	12.8	9.2

Figure 61: Rim family trench breakdown graph



The graphs showing general changes across the trenches demonstrate that there is difference in ceramic assemblage across the site with trench C standing out. Both graphs show a higher than normal percentage (taking the average across the site) of glazed and Far Eastern wares (which are generally bowls) and a reduced amount of Julfarware/cooking ware for trench C. There is a higher amount of unknown types in this area and storage wares appear to have a similar distribution to other trenches. It was felt during the excavation that this trench was placed over a midden, which would make the lack of cooking ware and the high amount of glazed ware strange unless there was a bias in collection towards these wares. When taken down to

individual wares (trench breakdown of wares can be seen in Appendix III.I: Ware introductions across trench A phasing:.I-IV) it must be noticed that there is a significant fall in the amount of JULFAR- the generic cooking and storage ware of the site but a spike in the amount of JULFAR.RW- a class which is typified by water-jugs and bowls. This would suggest that there wasn't a bias in collection towards the glazed wares as the Julfarware distribution reflects the strange change. It should be pointed out that there is a bias in the rim types as the bowl types have a lower breakage rate and therefore a higher EVE count. However this bias occurs across all of the trenches and therefore it should not be seen as significant. Excavation at sites in East Africa, such as Manda and Kilwa, has shown that areas on the beachfront, where it is thought that trading ships were unloading, had a higher percentage of Far Eastern and other traded glazed ceramics (Horton 1986: 203). This is thought to be due to vessels broken in transit being dumped in the immediate surroundings of the ship. It is known that the area around trench C was on the edge of the sandspit facing the sheltered lagoon to the east where such boats would be unloading. The smaller proportion of Julfarwares in this area would possibly back this up as it is a local ware. However Julfarwares were also traded from Julfar to sites around the Gulf and further afield e.g. Qala'at al-Bahrain (Frifelt 2001: 93-5). This is particularly true of JULFAR.RW which is also found in higher than average proportions in trench C. The assemblage may therefore suggest that the area around trench C was a dumping area for traded goods which had broken in transit in the case of imported Far Eastern wares or while being stored awaiting loading to be exported in the case of JULFAR.RW.

Trench D has a higher percentage of Indian wares than the other trenches at 3.4% compared to 1.3, 1.5 and 0.8 in trenches A, B and C respectively. This represents 380 sherds, over 50% of the total Indian assemblage. This is not reflected in the rim types graph because these wares have been placed in the COOK class. All four trenches have a similar amount of transport/storage wares in their assemblages, suggesting that as a general rule no one area was used for the storage of these wares, although the amounts in trenches B and C are slightly higher in terms of rim type percentages. The high percentage of unknown sherds and rim types in trench C is significant, possibly backing up the port area theory with rare foreign wares being brought in.

The high percentage of water vessel rim types in trench C is also likely to be significant although trench A has a similarly high percentage compared to trenches B and D. It is recorded that Julfar exported sweet water to Hormuz, which had no indigenous supply (Bakhtiari 1979: 151). This would again hint towards the area around trench C being a dockside area. The distribution of Far Eastern wares across the site appears to be constant, generally around 1-

1.5% of the assemblage. Again trench C is slightly different with a slightly higher percentage of 1.9%.

Trenches A, B and D are reasonably similar in their ceramic assemblage, suggesting that the general functions of the areas covered by A, B and D were similar. The presence of significantly more Indian wares in D could demonstrate an area used by Indian merchants and their crews. Trench C however can be seen to have a different function suggesting either that it was not a part of the town (during excavation it was seen as a midden deposit) or that it had a different function within the city. On balance the former conclusion appears more likely although the presence of so much bowl material confuses the matter.

3.4.2: TRENCH PHASE ANALYSIS:

Prior to allocating general site phases to each context, they were placed in trench phases. The four trenches at ND10 have varying numbers of phases due to the differing nature of the archaeology in different areas of the site, which can in part be seen in the ceramic assemblage analysis discussed above. This trench by trench analysis relies on a consistent function for the area covered by each trench across its occupation. As this is unlikely, the above gives a generalised view of the function of each area. Looking at the trench assemblages split into trench phases allows a more in depth analysis of area function over different periods of occupation, generalising the spatial data but making the temporal data more defined. Figure 62-Figure 65 show the raw data and percentages of the rim type families across trench phasing and Figure 66-Figure 69 show the raw data and percentages for the ware families across trench phasing. The eight graphs below (Figure 70-Figure 73 for rim type families across the four trenches and Figure 74-Figure 77 for ware families across the four trenches) show how varied the ceramic assemblage is between different periods.

Figure 62: Trenches A and B rim family phasing

Function	A_I	A_II	A_III	A_IV	A_V	A_VI	A_VII	A_VIII	Function	B_III	B_IV	B_V	B_VI
BOWL	9		54	108	179	255	539	363	BOWL	11	116	612	1359
BURN								42	BURN			7	
COOK	31	12	171	59	653	920	837	880	COOK	54	462	1655	2885
STOR	15		25	24	285	105	219	216	STOR	27	400	890	1026
TRAN					64	102	59	30	TRAN		3	218	230
UNKN						8	21	72	UNKN		26	214	204
WATER			22	78	168	408	328	402	WATER	48	224	713	1586
	55	12	272	269	1349	1798	2003	2005		140	1231	4309	7290

Figure 63: Trenches C and D rim family phasing

Function	C_I	C_II	C_IIIb	Function	D_IIb	D_IIc	D_III	D_IVa	D_IVc	D_V	None
BOWL	28	49	290	BOWL	18	455	154	154	142	1691	700
BURN		1		BURN						168	
COOK	51	36	177	COOK	44	593	158	292	220	2851	813
STOR	19	52	118	STOR	17	136	142	60	95	625	366
TRAN			93	TRAN		38	113	10		185	117
UNKN	36	12	40	UNKN		27	13	6	7	86	64
WATER		58	207	WATER	20	54	51	79	120	1199	570
	134	208	925		99	1303	631	601	584	6805	2630

Figure 64: Trenches A and B rim family phasing %

Function	A_I	A_II	A_III	A_IV	A_V	A_VI	A_VII	A_VIII	Function	B_III	B_IV	B_V	B_VI
BOWL	16.4	0.0	19.9	40.1	13.3	14.2	26.9	18.1	BOWL	7.9	9.4	14.2	18.6
BURN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	BURN	0.0	0.0	0.2	0.0
COOK	56.4	100.0	62.9	21.9	48.4	51.2	41.8	43.9	COOK	38.6	37.5	38.4	39.6
STOR	27.3	0.0	9.2	8.9	21.1	5.8	10.9	10.8	STOR	19.3	32.5	20.7	14.1
TRAN	0.0	0.0	0.0	0.0	4.7	5.7	2.9	1.5	TRAN	0.0	0.2	5.1	3.2
UNKN	0.0	0.0	0.0	0.0	0.0	0.4	1.0	3.6	UNKN	0.0	2.1	5.0	2.8
WATER	0.0	0.0	8.1	29.0	12.5	22.7	16.4	20.0	WATER	34.3	18.2	16.5	21.8

Figure 65: Trenches C and D rim family phasing %

Function	C_I	C_II	C_IIIb	Function	D_IIb	D_IIc	D_III	D_IVa	D_IVc	D_V	None
BOWL	20.9	23.6	31.4	BOWL	18.2	34.9	24.4	25.6	24.3	24.8	26.6
BURN	0.0	0.5	0.0	BURN	0.0	0.0	0.0	0.0	0.0	2.5	0.0
COOK	38.1	17.3	19.1	COOK	44.4	45.5	25.0	48.6	37.7	41.9	30.9
STOR	14.2	25.0	12.8	STOR	17.2	10.4	22.5	10.0	16.3	9.2	13.9
TRAN	0.0	0.0	10.1	TRAN	0.0	2.9	17.9	1.7	0.0	2.7	4.4
UNKN	26.9	5.8	4.3	UNKN	0.0	2.1	2.1	1.0	1.2	1.3	2.4
WATER	0.0	27.9	22.4	WATER	20.2	4.1	8.1	13.1	20.5	17.6	21.7

Figure 66: Trenches A and B ware family phasing

ORIGIN	A_I	A_II	A_III	A_IV	A_V	A_VI	A_VII	A_VIII	ORIGIN	B_III	B_IV	B_V	B_VI
CHIN			2	4	9	30	32	30	CHIN		10	42	86
GLAZ	3	2	10	16	66	84	143	106	GLAZ	9	54	201	328
INC			5	13	19	41	99	28	INC	2	9	46	152
IND	2		2	3	21	23	33	8	IND	1	61	40	55
JULF	31	42	100	118	885	1122	1389	1305	JULF	74	1212	2512	3046
STOR	5	1	2	12	114	156	324	212	STOR	13	71	410	581
UNK	3	1	5	11	50	65	88	33	UNK	8	17	113	173
	44	46	126	177	1164	1521	2108	1722		107	1434	3364	4421

Figure 67: Trenches C and D ware family phasing

ORIGIN	C_I	C_II	C_IIIb	ORIGIN	D_IIb	D_IIc	D_III	D_IVa	D_IVb	D_IVc	D_V
CHIN	1	1	14	CHIN	2	26	5	5		7	56
GLAZ	6	9	64	GLAZ	7	132	48	54	4	79	436
INC	3	13	30	INC	1	47	17	12		29	421
IND	3	1	2	IND	2	16	26	24		22	290
JULF	55	137	273	JULF	73	1019	495	459	12	628	4906
STOR	8	24	82	STOR	23	193	91	141	2	103	903
UNK	7	15	34	UNK	8	114	49	30	3	32	268
	83	200	499		116	1547	731	725	21	900	7280

Figure 68: Trenches A and B ware family phasing %

ORIGIN	A_I	A_II	A_III	A_IV	A_V	A_VI	A_VII	A_VIII	ORIGIN	B_III	B_IV	B_V	B_VI
FE	0	0.0	1.6	2.3	0.8	2.0	1.5	1.7	FE	0.0	0.7	1.2	1.9
GLAZ	6.8	4.3	7.9	9.0	5.7	5.5	6.8	6.2	GLAZ	8.4	3.8	6.0	7.4
INC	0	0.0	4.0	7.3	1.6	2.7	4.7	1.6	INC	1.9	0.6	1.4	3.4
IND	4.5	0.0	1.6	1.7	1.8	1.5	1.6	0.5	IND	0.9	4.3	1.2	1.2
JULF	70.5	91.3	79.4	66.7	76.0	73.8	65.9	75.8	JULF	69.2	84.5	74.7	68.9
STOR	11.4	2.2	1.6	6.8	9.8	10.3	15.4	12.3	STOR	12.1	5.0	12.2	13.1
UNK	6.8	2.2	4.0	6.2	4.3	4.3	4.2	1.9	UNK	7.5	1.2	3.4	3.9

Figure 69: Trenches C and D ware family phasing %

ORIGIN	C_I	C_II	C_IIIb	ORIGIN	D_IIb	D_IIc	D_III	D_IVa	D_IVb	D_IVc	D_V
FE	1.2	0.5	2.8	FE	1.7	1.7	0.7	0.7	0.0	0.8	0.8
GLAZ	7.2	4.5	12.8	GLAZ	6.0	8.5	6.6	7.4	19.0	8.8	6.0
INC	3.6	6.5	6.0	INC	0.9	3.0	2.3	1.7	0.0	3.2	5.8
IND	3.6	0.5	0.4	IND	1.7	1.0	3.6	3.3	0.0	2.4	4.0
JULF	66.3	68.5	54.7	JULF	62.9	65.9	67.7	63.3	57.1	69.8	67.4
STOR	9.6	12.0	16.4	STOR	19.8	12.5	12.4	19.4	9.5	11.4	12.4
UNK	8.4	7.5	6.8	UNK	6.9	7.4	6.7	4.1	14.3	3.6	3.7

Figure 70: Trench A rim family phasing graph

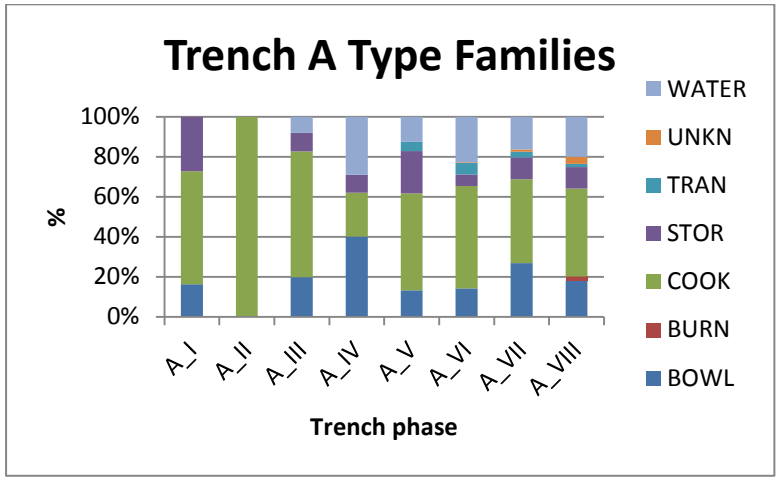


Figure 71: Trench B rim family phasing graph

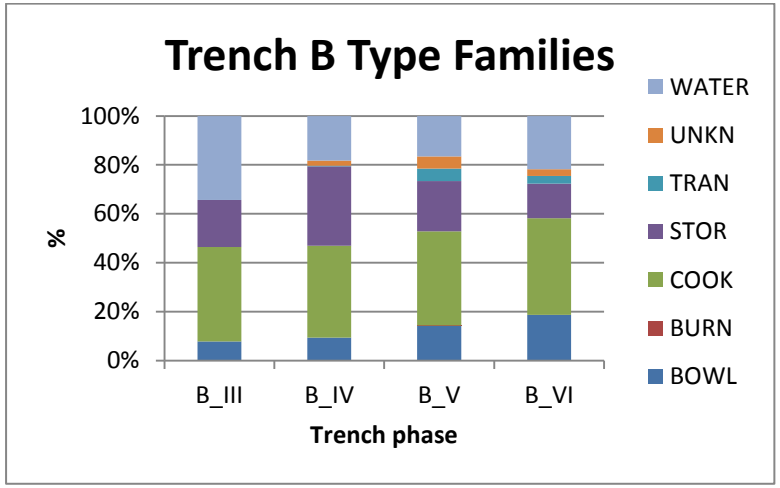


Figure 72: Trench C rim family phasing graph

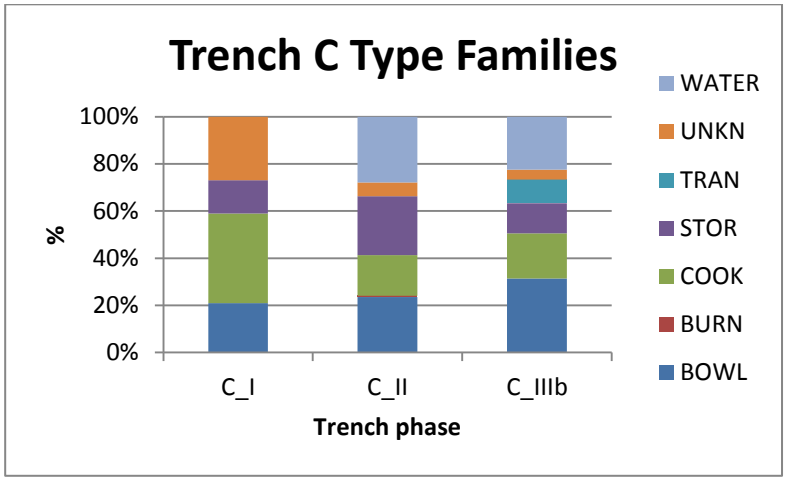


Figure 73: Trench D rim family phasing graph

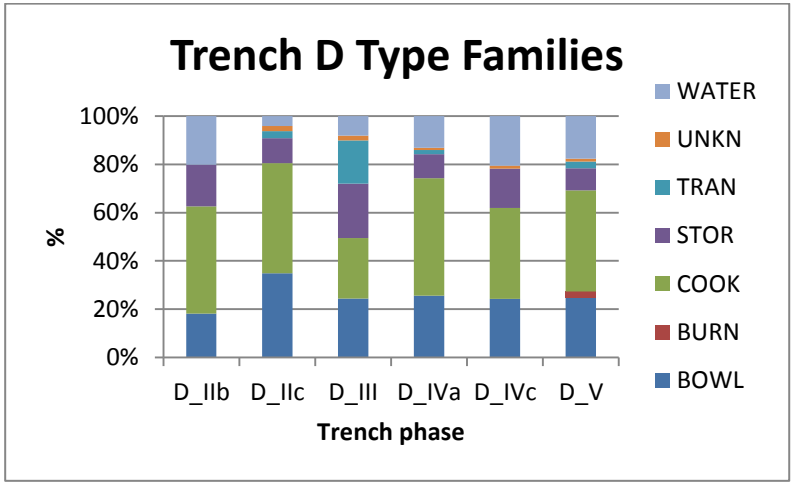


Figure 74: Trench A ware family phasing graph

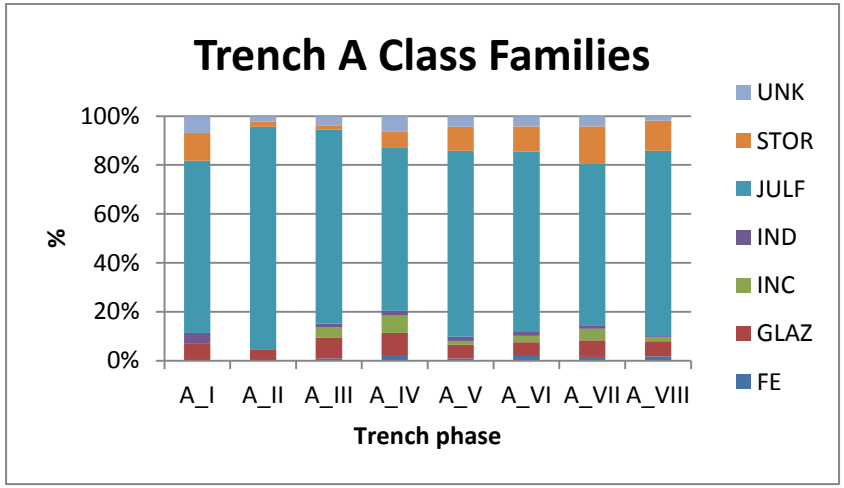


Figure 75: Trench B ware family phasing graph

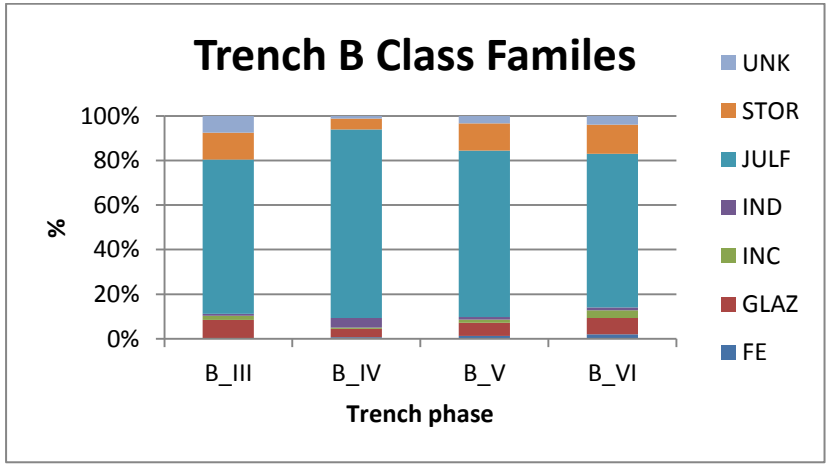


Figure 76: Trench C ware family phasing graph

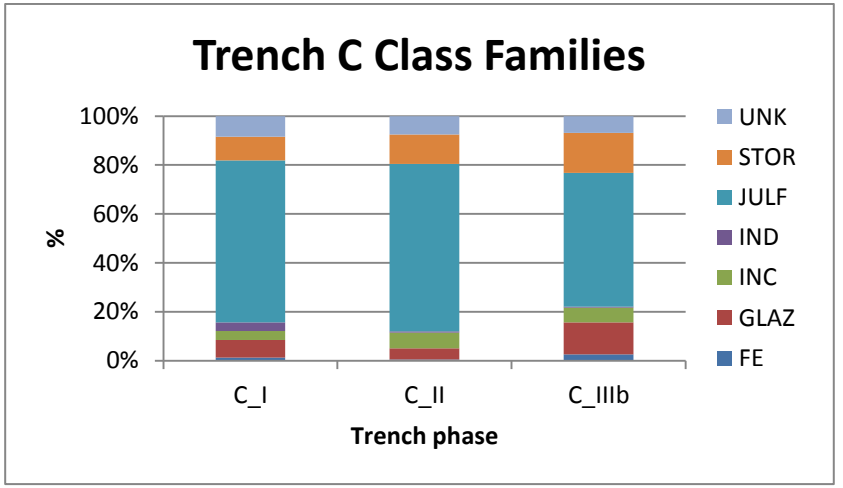
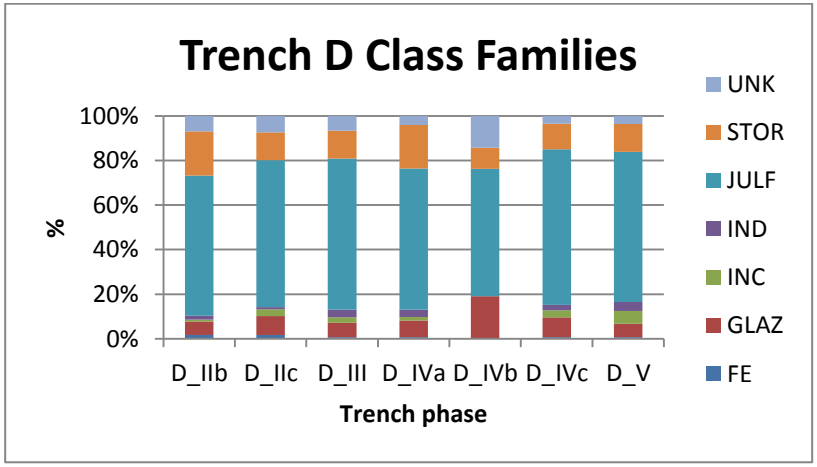


Figure 77: Trench D ware family phasing graph



3.4.3: TYPE FAMILIES ACROSS TRENCH PHASES:

A.I has the three basic type families- BOWL, COOK and STOR. These are the most common across the site. A.II only has COOK rim types but it is a very small assemblage. As discussed above, WATER is a probable adaptation of STOR types for a more specific purpose. Therefore the introduction of WATER types in A.III and a reduction in STOR from A.I could represent a shift in the storage needs of the settlement with water becoming more important, at least in the area covered by trench A. The change in A.IV from COOK to WATER types again could reflect the likely change in occupation style, although in this case, it would reflect a return to a less settled style. This is supported by the assemblage for B.III which is thought to be of a similar period to A.III and A.IV. Similarly D.IIb (and to a lesser extent the combined D.II) shows an increase in WATER types. This does not go against the statement of a change in occupation type between A.I and A.II as it could demonstrate a change to a third, different type of settlement or function, where water storage is a higher priority to food preparation. The later phases of trench A show a general diversification of the types on site with a rise in STOR ware in A.V/A.VI, possibly reflecting the appearance of stone architecture and the need to store materials/food. This is also seen in B.V and D.III from the stone building phase (combined stone 1 and stone 2). The general pattern of a more varied assemblage in the later phases is seen across the site with the modern phases (A.VIII, B.VI, C.III and D.V) having a more varied range of type families (including the BURN type for incense burners which are a late ware). The gradual reduction in cooking types in trench B coupled with the gradual increase of BOWL types could show the site becoming more affluent or a change in eating habits. Trench C could be seen to reflect some of these changes but as it only has three visible phases, patterns are more difficult to see and connections between individual phases from other trenches tenuous.

3.4.4: WARE FAMILIES ACROSS TRENCH PHASES:

The ware families show fewer obvious changes than the type families but it is still possible to infer some. Julfarware dominates the majority of most phases, although less in trench C. Indian ware is present throughout the majority of phases, although as noted in the type family breakdown, there is a reduction in STOR wares in A.II. After the very early phases INC wares become more common as seen in A.II, A.IV, B.III, D.II and D.III. These are then fairly stable throughout the rest of the sequence. Trench A phases A.V and A.VI show an increase in storage ware which again backs up the theory that the beginning of the stone building phases required more storage. Storage wares also go up in the post-abandonment phases of the three main trenches: A.VII, B.V and D.IV. Glazed wares reach their percentage peak in the pre-stone period, which is strange as the stone period is suspected to be more affluent than any previous periods.

Far Eastern wares are also high in A.IV but in general across the site are higher in the stone phases.

3.5.1: SITE PHASE CERAMIC ANALYSIS:

The analysis of the assemblage in this section uses the site phasing shown in Figure 12 which is based on a mixture of stratigraphic evidence, the dating of the Far Eastern ceramics and C14 dates taken across the site. It will look at the development of the site as a whole through the ceramic assemblage, primarily from phase 3 onwards, due to the small size of the phase 1 and 2 assemblages. These two phases will not be shown on the graphs as they distract from any overall patterns while being unreliable due to their small size.

3.5.2: WARE AND TYPE FAMILIES ACROSS SITE PHASES:

Figure 78 and Figure 79 show the raw and percentage data of the ware families across the phasing with Figure 80 presenting this as a graph. Figure 81 and Figure 82 shows the raw and percentage data for the distribution of rim type families (quantity and total EVE) across the site phases. The graph Figure 83 shows the percentages of the rim families for quantity across the phases, while Figure 84 presents the EVE.

Figure 78: Ware families across site phases

WARE FAMILY	1	2	3	4	5	6	N/S
CHIN			35	44	87	172	38
GLAZ	3	2	180	219	490	870	206
INC			71	78	199	601	70
IND	2		27	125	120	353	15
JULF	31	42	1439	3445	5137	9257	1429
STOR	5	1	251	389	1004	1696	282
UNK	3	1	153	147	281	474	120
	44	46	2156	4447	7318	13423	2160

Figure 79: Ware families across site phase

WARE FAMILY	1	2	3	4	5	6	N/S
FE	0.0	0.0	1.6	1.0	1.2	1.3	1.8
GLAZ	6.8	4.3	8.3	4.9	6.7	6.5	9.5
INC	0.0	0.0	3.3	1.8	2.7	4.5	3.2
IND	4.5	0.0	1.3	2.8	1.6	2.6	0.7
JULF	70.5	91.3	66.7	77.5	70.2	69.0	66.2
STOR	11.4	2.2	11.6	8.7	13.7	12.6	13.1
UNK	6.8	2.2	7.1	3.3	3.8	3.5	5.6

Figure 80: Ware family site phasing graph

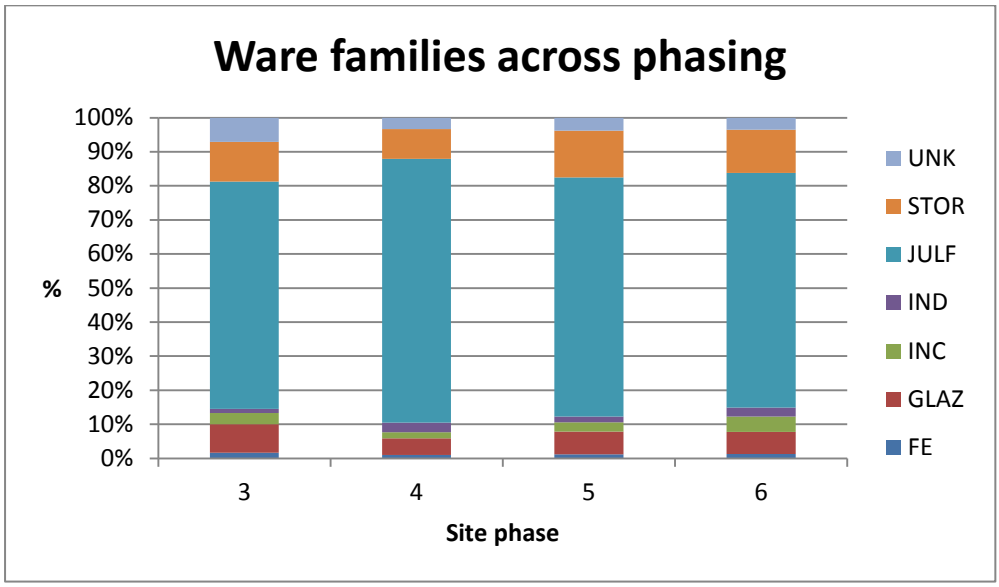


Figure 81: Rim type families (quantity and EVE) across site phases

Function	1		2		3		4		5		6		N/S	
	EVE	QNT	EVE	QNT	EVE	QNT	EVE	QNT	EVE	QNT	EVE	QNT	EVE	QNT
BOWL	9	2			720	112	697	117	1648	275	3650	555	961	135
BURN									8	2	210	19		
COOK	31	4	12	2	972	134	1925	249	3040	422	6616	893	984	141
STOR	15	1			248	26	887	58	1316	87	1867	186	511	45
TRAN		1			38	3	238	14	287	15	445	45	207	15
UNKN					63	7	39	4	260	15	362	35	104	7
WATER					222	20	790	49	1298	106	3187	232	541	39
	55	8	12	2	2263	302	4576	491	7857	922	16337	1965	3308	382

Figure 82: Rim type families (quantity and EVE) across site phases

Function	1		2		3		4		5		6		N/S	
	EVE	QNT	EVE	QNT	EVE	QNT	EVE	QNT	EVE	QNT	EVE	QNT	EVE	QNT
BOWL	16.4	25.0	0.0	0.0	31.8	37.1	15.2	23.8	21.0	29.8	22.3	28.2	29.1	35.3
BURN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	1.3	1.0	0.0	0.0
COOK	56.4	50.0	100.0	100.0	43.0	44.4	42.1	50.7	38.7	45.8	40.5	45.4	29.7	36.9
STOR	27.3	12.5	0.0	0.0	11.0	8.6	19.4	11.8	16.7	9.4	11.4	9.5	15.4	11.8
TRAN	0.0	12.5	0.0	0.0	1.7	1.0	5.2	2.9	3.7	1.6	2.7	2.3	6.3	3.9
UNKN	0.0	0.0	0.0	0.0	2.8	2.3	0.9	0.8	3.3	1.6	2.2	1.8	3.1	1.8
WATER	0.0	0.0	0.0	0.0	9.8	6.6	17.3	10.0	16.5	11.5	19.5	11.8	16.4	10.2

Figure 83: Rim family site phasing graph for % QNT:

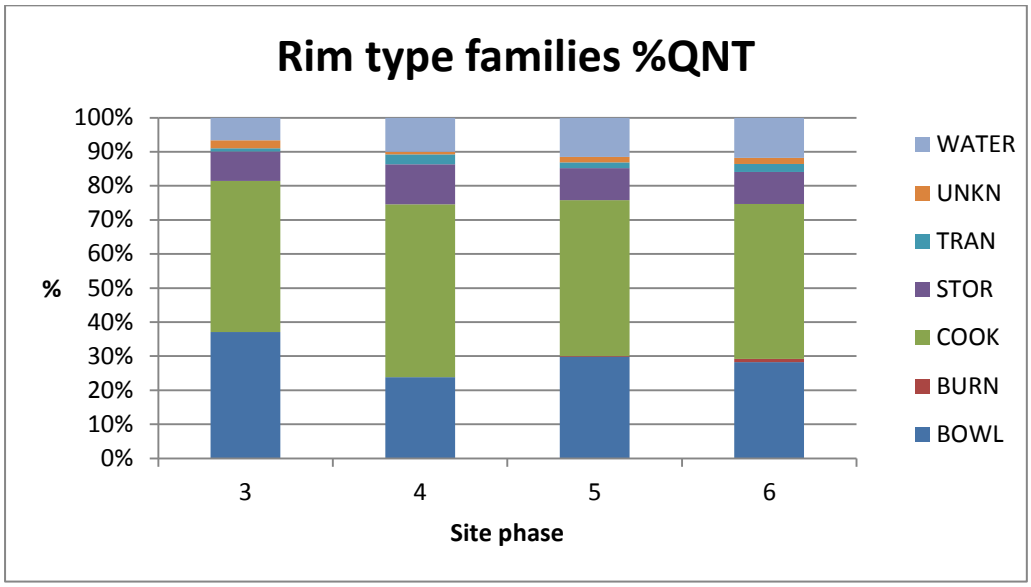
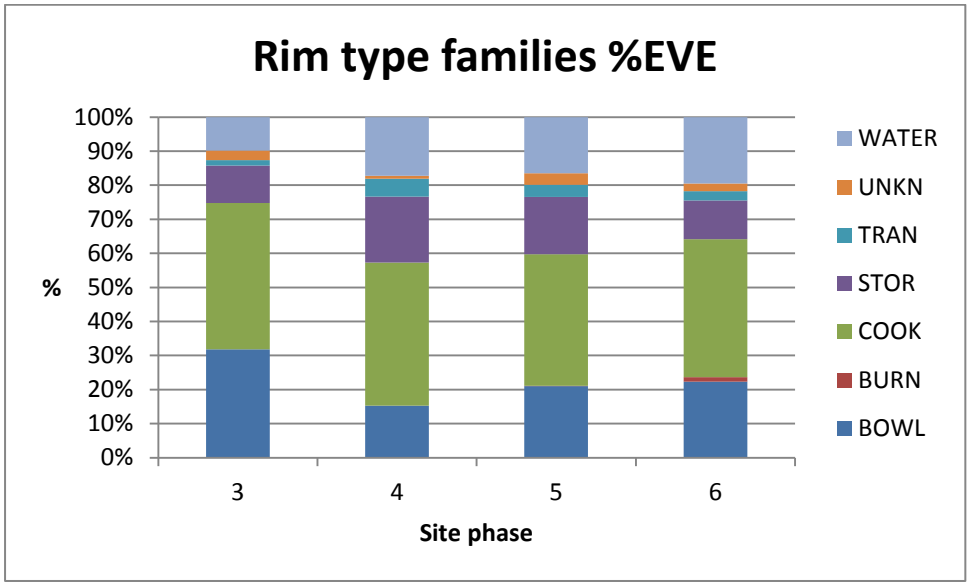


Figure 84: Rim family site phasing graph for % EVE:



The graph demonstrated the development of the rim type families over the major phases of occupation at Julfar. Phase 3 shows the first example of water holding/storage vessels, possibly due to a more settled or permanent occupation of the site. This rise appears to be due to the introduction of the JULFAR.RW ware and its most common rim type, J6. After phase 3 the transport rim types become more evident, possibly demonstrating the town's growing commercial sectors and increased imports/exports. These rims are evident in phase 3, just before the stone building phase but in small numbers. Phase 3 has been identified as a post hole occupation style phase and so could demonstrate the beginnings of Julfar as an international

port. Carter suggests that phases 2 (not shown on graphs due to very small phase assemblage) and 3 may be at least partially contemporary, with phase 3 being the reconstruction of the mudbrick town into stone buildings. Far Eastern ceramics make up 1.3% of the overall site assemblage but make up 1.6% of the ceramics found in phase 3. It is also during phase 3 that the BOWL type rims are at their highest percentage at 31.8% for EVE and 37.1% for quantity. This could suggest either a market style occupation with the increased amount of bowls and Far Eastern ceramics being trade goods, or an increased amount of wealth with these wares being private property or both. During this phase, both cooking wares and storage wares are found in smaller percentages than before (although as the assemblage for each phase tends to be larger than the last, more are found). This would suggest that if the area is a trading market, the emphasis is on ceramics, rather than on the contents of large storage wares. During the stone building phase 4, the percentage of glazed ceramic found falls and the amount of storage and transport rims rises, suggesting a partial reversal of what is being traded from phase 3. The percentages of incised wares and Indian wares also rise during these phases, again suggesting more trading for the contents of the ceramic. This continues the general trend noticed both in the family analysis and in the individual ware and type analysis of a diverisification in the ceramic assemblage as the site itself develops. Phase 5 is similar to phase 4 which as it is the abandonment phase for the stone buildings, other than the example in trench D which was abandoned during phase 4, and therefore presumably contains a large amount of ceramics from them.

3.5.3: WARES AND RIM TYPES ACROSS SITE PHASES:

Figure 85 below shows all wares found in the al-Nudud 2010 excavations, in period order. Tables for the four trench phases can be found in appendix III (III.I-III.IV). The table demonstrates the phasing in of a large number of new classes in phase 3 as the settlement begins to develop from mudbrick structures into stone. The small numbers of each ware present in this phase compared to phase 4 would suggest that either this phase contained ceramics relating to the construction of the structures belonging to phase 4 or is a brief prelude to phase 4 where the majority of the wares first seen in phase 3 become common. The wares present from phase 1 and 2 are mostly unsurprising- JULFAR is the most common Julfarware and as noted by previous studies, has always been shown to be the first ware found in the Julfar period. TIN (Tin Glazed Ware) is again well known from the early periods of Julfar, as is BUFF ware. The appearance of PERSIA and TBBW could possibly be attributed to the sand dune phase 1 being the construction phase for phase 2 (mudbrick). The appearance and subsequent rise in frequency of JULF.RW after phase 2 is also well documented. Originally LQC, PERSIA and KHUNJ sherds were present in phase 2 but having checked the context sheet for context 150, it was

noticed that contamination from contexts from phases 3 or 4 was likely and so this context was moved into phase 3.

Figure 85: Ware breakdown across site phasing

Ware Name	1		2		3		4		5		6		N/S	
	QNT	**%**	**QNT**	**%**	**QNT**	**%**	**QNT**	**%**	**QNT**	**%**	**QNT**	**%**	**QNT**	**%**
JULFAR	31	70.5	42	91.3	1336	62.0	2921	65.7	4070	55.6	6395	47.6	1052	48.7
TIN	2	4.5	2	4.3	137	6.4	59	1.3	138	1.9	258	1.9	70	3.2
BUFF	2	4.5	1	2.2	193	9.0	262	5.9	650	8.9	1171	8.7	177	8.2
CRWW	2	4.5			26	1.2	40	0.9	135	1.8	159	1.2	35	1.6
ODD	2	4.5			24	1.1	29	0.7	54	0.7	53	0.4	20	0.9
TBBW	2	4.5			2	0.1	15	0.3	26	0.4	122	0.9		
LIME	1	2.3			9	0.4	58	1.3	124	1.7	265	2.0	59	2.7
PERSIA	1	2.3			6	0.3	51	1.1	137	1.9	263	2.0	66	3.1
WW	1	2.3					9	0.2	5	0.1			2	0.1
SWW			1	2.2	61	2.8	43	1.0	55	0.8	102	0.8	17	0.8
JULFAR.RW					74	3.4	348	7.8	771	10.5	1628	12.1	283	13.1
BIW					68	3.2	72	1.6	166	2.3	556	4.1	69	3.2
HWW					43	2.0	26	0.6	86	1.2	165	1.2	50	2.3
LQC					21	1.0	15	0.3	18	0.2	33	0.2	11	0.5
MGP					19	0.9	28	0.6	48	0.7	110	0.8	25	1.2
ERG					18	0.8	8	0.2	31	0.4	41	0.3	19	0.9
JULFAR.PB					29	1.3	176	4.0	295	4.0	1231	9.2	91	4.2
TRBW					11	0.5	29	0.7	37	0.5	129	1.0	7	0.3
KHUNJ					8	0.4	28	0.6	40	0.5	86	0.6	14	0.6
SAC					9	0.4	6	0.1	23	0.3	34	0.3	6	0.3
PUM					9	0.4	6	0.1	17	0.2	11	0.1	3	0.1
SHELL					7	0.3	8	0.2	56	0.8	50	0.4	2	0.1
NIDGW					6	0.3	21	0.5	24	0.3	19	0.1	4	0.2
INCW					5	0.2	19	0.4	44	0.6	102	0.8	8	0.4
CHALKY					5	0.2	4	0.1	3	0.0	17	0.1		
RPW					3	0.1	4	0.1	11	0.2	21	0.2	4	0.2
MLD					3	0.1	4	0.1	7	0.1	19	0.1	1	0.0
FIGW					3	0.1	3	0.1	6	0.1	16	0.1	1	0.0
DIIW.B					2	0.1	48	1.1	4	0.1	2	0.0	1	0.0
WFRIT					2	0.1	8	0.2	26	0.4	41	0.3	3	0.1
CORB					2	0.1	7	0.2	2	0.0	1	0.0		
DEPAW					2	0.1	6	0.1	51	0.7	46	0.3	14	0.6
NIDIW					2	0.1					1	0.0		
CBW					1	0.0	12	0.3	33	0.5	59	0.4	10	0.5
CHIN					2	0.1	11	0.2	12	0.2	33	0.2	11	0.5
BAH					1	0.0	7	0.2	2	0.0	10	0.1	3	0.1
PISW					1	0.0	4	0.1	8	0.1	13	0.1	3	0.1

Ware Name	1		2		3		4		5		6		N/S	
BRIB					1	0.0	3	0.1	5	0.1	15	0.1		
PIP					1	0.0	1	0.0	2	0.0				
ROB					1	0.0	1	0.0						
OC					1	0.0			1	0.0	10	0.1		
FIGB					1	0.0					5	0.0		
UGC					1	0.0								
GFRIT							17	0.4	20	0.3	43	0.3	8	0.4
UNIQ							9	0.2						
DIIW.BL							8	0.2			7	0.1		
GIW							2	0.0	25	0.3	18	0.1		
RORG							2	0.0	10	0.1	3	0.0	1	0.0
TRW							2	0.0	8	0.1	13	0.1		
BAG							2	0.0	8	0.1	4	0.0		
BRICK							2	0.0	1	0.0	2	0.0	1	0.0
YEMEN							1	0.0	2	0.0	2	0.0	2	0.1
TEXT							1	0.0	1	0.0				
BORB							1	0.0			4	0.0	1	0.0
BLAB									9	0.1				
LFRIT									4	0.1	2	0.0		
BUBL									2	0.0	10	0.1		
REMIC									2	0.0	1	0.0		
MEW									1	0.0	8	0.1		
FINCW									1	0.0	3	0.0		
JULFAR.RC									1	0.0	3	0.0	3	0.1
BGSW											3	0.0		
CHOC											2	0.0		
MARS											2	0.0		
MOD											1	0.0	2	0.1
NONID													1	0.0
	44		46		2156		4447		7318		13423		2160	

Figure 86 contains the phasing data for rim types in quantity of sherd and Figure 87 contains the phasing data for rim type EVE.

Figure 86: Rim types across site phasing %

TYPE	1		2		3		4		5		6		N/S	
	QNT	**%**	**QNT**	**%**	**QNT**	**%**	**QNT**	**%**	**QNT**	**%**	**QNT**	**%**	**QNT**	**%**
J1	2	25.0			45	14.9	75	15.3	90	9.8	88	4.5	62	16.2
J3	1	12.5	2	100.0	81		38		56		23		20	
J15	1	12.5			24		19		14		30		4	
G2	1	12.5			22		16		52		97		27	
NG15	1	12.5									4			
J33	1	12.5									2			
SJ2	1	12.5												
J13					27	8.9	19	3.9	64	6.9	126	6.4	31	8.1
J6					14	4.6	48	9.8	87	9.4	216	11.0	37	9.7
J19					7	2.3	8	1.6	24	2.6	46	2.3	7	1.8
UNIQ					7	2.3	4	0.8	15	1.6	35	1.8	7	1.8
J2					6	2.0	114	23.2	193	20.9	406	20.7	46	12.0
NG5					6	2.0	1	0.2	4	0.4	8	0.4	1	0.3
J5					5	1.7	16	3.3	23	2.5	33	1.7	10	2.6
G9					5	1.7	2	0.4			4	0.2	2	0.5
G10					5	1.7								
J22					4	1.3	7	1.4	4	0.4	4	0.2	3	0.8
J20					4	1.3	3	0.6	6	0.7	3	0.2	5	1.3
J21					4	1.3	2	0.4	7	0.8	31	1.6	9	2.4
J23					4	1.3	1	0.2			3	0.2	1	0.3
G17					4	1.3					2	0.1	2	0.5
NG1					3	1.0	5	1.0	8	0.9	16	0.8	8	2.1
J4					3	1.0	3	0.6	8	0.9			1	0.3
J24					3	1.0	1	0.2	2	0.2	2	0.1	1	0.3
J16					2	0.7	25	5.1	30	3.3	56	2.8	12	3.1
G1					2	0.7	9	1.8	19	2.1	13	0.7	17	4.5
G3					2	0.7	4	0.8	11	1.2	19	1.0	3	0.8
J4.4					2	0.7	4	0.8	3	0.3	14	0.7	2	0.5
J14					2	0.7	2	0.4	3	0.3	9	0.5	2	0.5
G11					2	0.7			6	0.7	11	0.6	3	0.8
NG13					2	0.7					2	0.1		
J11					1	0.3	4	0.8	8	0.9	22	1.1	4	1.0
J4.1					1	0.3			2	0.2	10	0.5	3	0.8
J31					1	0.3					4	0.2		
J4.2					1	0.3					1	0.1		

TYPE	1		2		3		4		5		6		N/S	
	QNT	**%**	**QNT**	**%**	**QNT**	**%**	**QNT**	**%**	**QNT**	**%**	**QNT**	**%**	**QNT**	**%**
W3					1	0.3					1	0.1		
J12							12	2.4	13	1.4	58	3.0	12	3.1
J7							9	1.8	18	2.0	188	9.6	7	1.8
J9							6	1.2	28	3.0	75	3.8	2	0.5
G7							5	1.0	20	2.2	39	2.0	2	0.5
NG2							4	0.8	5	0.5	21	1.1	3	0.8
G4							4	0.8						
JC2							3	0.6	2	0.2	10	0.5		
NG3							3	0.6	1	0.1	1	0.1	3	0.8
J17							2	0.4	2	0.2	3	0.2	2	0.5
J8							1	0.2	27	2.9	72	3.7	2	0.5
G12							1	0.2	5	0.5	17	0.9	3	0.8
NG18							1	0.2	1	0.1	3	0.2		
JC1							1	0.2	1	0.1	2	0.1		
NG12							1	0.2	1	0.1	1	0.1		
G8							1	0.2			4	0.2		
J32							1	0.2			2	0.1		
NG17							1	0.2			1	0.1		
NG8							1	0.2			1	0.1		
J1.1							1	0.2						
NG11							1	0.2						
NG14							1	0.2						
NG6							1	0.2						
J10									15	1.6				
J27									5	0.5	6	0.3	3	0.8
J28									4	0.4	6	0.3	1	0.3
G6									4	0.4	2	0.1	1	0.3
J25									3	0.3	6	0.3		
G18									3	0.3	4	0.2	3	0.8
G5									3	0.3	2	0.1		
NG20									3	0.3	2	0.1		
J4.5									2	0.2	4	0.2	3	0.8
J8.1									2	0.2	4	0.2		
SJ1									2	0.2	3	0.2		
J26									2	0.2				
INC1									1	0.1	17	0.9		
NG7									1	0.1	13	0.7		
NG16									1	0.1	5	0.3		
INC2									1	0.1	2	0.1		
J4.3									1	0.1	2	0.1		

TYPE	1		2		3		4		5		6		N/S	
	QNT	**%**	**QNT**	**%**	**QNT**	**%**	**QNT**	**%**	**QNT**	**%**	**QNT**	**%**	**QNT**	**%**
NG10									1	0.1	2	0.1		
G14									1	0.1	1	0.1		
G16									1	0.1	1	0.1		
NG9									1	0.1	1	0.1		
G15									1	0.1				
SJ3									1	0.1				
W1											12	0.6	1	0.3
J29											9	0.5		
J30											8	0.4	1	0.3
NG19											3	0.2	1	0.3
NG4											3	0.2	1	0.3
J34											2	0.1		
W2											2	0.1		
NG21											1	0.1	1	0.3
G13											1	0.1		
J35??											1	0.1		
SJ4											1	0.1		
	8		2		302		491		922		1965		382	

Figure 87: Rim types across site phasing (EVE)

TYPE	1		2		3		4		5		6		N/S	
	EVE	**%**	**EVE**	**%**	**EVE**	**%**	**EVE**	**%**	**EVE**	**%**	**EVE**	**%**	**EVE**	**%**
J1	22	40.0			397	17.5	577	12.6	573	7.3	554	3.4	394	11.9
SJ2	15	27.3												
NG15	7	12.7									39	0.2		
G2	5	9.1	1	7.7	113	5.0	87	1.9	272	3.5	613	3.8	169	5.1
J15	4	7.3			120	5.3	119	2.6	59	0.8	179	1.1	39	1.2
J3	2	3.6	12	92.3	516	22.8	218	4.8	343	4.4	126	0.8	105	3.2
J13					210	9.3	103	2.3	377	4.8	786	4.8	218	6.6
J6					171	7.6	777	17.0	1257	16.0	2951	18.1	519	15.7
J19					87	3.8	54	1.2	167	2.1	325	2.0	53	1.6
J5					66	2.9	347	7.6	460	5.9	394	2.4	106	3.2
UNIQ					63	2.8	39	0.9	260	3.3	362	2.2	104	3.1
NG5					51	2.3	13	0.3	41	0.5	91	0.6	2	0.1
J2					47	2.1	906	19.8	1436	18.3	3025	18.5	348	10.5
NG1					38	1.7	95	2.1	211	2.7	229	1.4	104	3.1
J20					38	1.7	29	0.6	41	0.5	25	0.2	60	1.8
J22					35	1.5	44	1.0	66	0.8	40	0.2	45	1.4
J23					31	1.4	11	0.2			21	0.1	6	0.2
J4					30	1.3	17	0.4	50	0.6			11	0.3

TYPE	1		2		3		4		5		6		N/S	
	EVE	**%**	**EVE**	**%**	**EVE**	**%**	**EVE**	**%**	**EVE**	**%**	**EVE**	**%**	**EVE**	**%**
J14					26	1.1	9	0.2	32	0.4	73	0.4	44	1.3
J16					23	1.0	393	8.6	416	5.3	595	3.6	147	4.4
J21					20	0.9	13	0.3	40	0.5	230	1.4	76	2.3
G17					20	0.9					41	0.3	4	0.1
G10					20	0.9								
J24					19	0.8	6	0.1	11	0.1	12	0.1	7	0.2
J4.4					16	0.7	29	0.6	17	0.2	96	0.6	15	0.5
G9					16	0.7	10	0.2			35	0.2	12	0.4
J31					15	0.7					31	0.2		
G3					14	0.6	19	0.4	70	0.9	111	0.7	15	0.5
J11					13	0.6	64	1.4	97	1.2	270	1.7	43	1.3
NG13					12	0.5					13	0.1		
G1					10	0.4	41	0.9	111	1.4	58	0.4	118	3.6
G11					9	0.4			46	0.6	88	0.5	11	0.3
J4.1					8	0.4			19	0.2	71	0.4	29	0.9
J4.2					5	0.2					4	0.0		
W3					4	0.2					23	0.1		
J7							101	2.2	142	1.8	1299	8.0	78	2.4
NG3							76	1.7	12	0.2	27	0.2	53	1.6
J12							65	1.4	93	1.2	271	1.7	90	2.7
NG2							49	1.1	64	0.8	122	0.7	30	0.9
J9							41	0.9	255	3.2	548	3.4	19	0.6
JC2							35	0.8	16	0.2	77	0.5		
NG12							25	0.5			6	0.0		
G8							23	0.5			42	0.3		
G7							20	0.4	99	1.3	278	1.7	6	0.2
G4							20	0.4						
NG8							15	0.3			20	0.1		
J32							14	0.3			31	0.2		
NG11							14	0.3						
J8							12	0.3	190	2.4	641	3.9	18	0.5
NG14							10	0.2						
J17							8	0.2	13	0.2	12	0.1	19	0.6
NG18							8	0.2	4	0.1	36	0.2		
NG17							8	0.2			10	0.1		
J1.1							5	0.1						
G12							4	0.1	38	0.5	121	0.7	29	0.9
NG6							3	0.1						
J27									77	1.0	48	0.3	37	1.1
SJ1									56	0.7	55	0.3		
J26									47	0.6				
NG20									46	0.6	30	0.2		
G5									32	0.4	12	0.1		

TYPE	1		2		3		4		5		6		N/S	
	EVE	**%**	**EVE**	**%**	**EVE**	**%**	**EVE**	**%**	**EVE**	**%**	**EVE**	**%**	**EVE**	**%**
J8.1									29	0.4	41	0.3		
J4.5									26	0.3	28	0.2	18	0.5
J28									22	0.3	26	0.2	6	0.2
JC1									19	0.2	19	0.1		
G6									18	0.2	10	0.1	8	0.2
J25									15	0.2	40	0.2		
SJ3									14	0.2				
G18									11	0.1	24	0.1	15	0.5
NG7									8	0.1	205	1.3		
NG16									8	0.1				
INC2									7	0.1	19	0.1		
NG10									6	0.1	23	0.1		
J4.3									6	0.1	7	0.0		
G16									5	0.1	12	0.1		
G14									3	0.0	4			
G15									3	0.0				
INC1									1	0.0	191	1.2		
W1											151	0.9	16	0.5
J30											145	0.9	20	0.6
J29											63	0.4		
NG4											25	0.2	20	0.6
W2											22	0.1		
SJ4											16	0.1		
NG19											13	0.1	7	0.2
J33											11	0.1		
J34											11	0.1		
NG9											11	0.1		
G13											8	0.0		
J35??											8	0.0		
NG21											7	0.0	15	0.5
J10														
	55		13		2263		4576		7857		16337		3308	

These two tables show the procession and evolution of rim styles over the site's occupation. The development of the site is evident as it changes from a small scale settlement with limited numbers of rims and wares in the early phases (although this could be due to the small assemblage) to a larger trading hub with a diverse range of wares and rims, both imported and developed in the local Julfar wares. The next section will look more closely at these developments within the assemblage.

3.5.4: WARE AND RIM INTRODUCTIONS:

Section 2.5.3 looked at individual rim types and their presence in different phases to look for possible patterns and sequences of rim types. This section will show phases where there are large numbers of new wares and types introduced. This will be done through individual wares and types and then through ware/type families to look for phases where certain families are introduced. Figure 88 and Figure 89 show the introduction phasing for ware families, Figure 90 and Figure 91 show the same for type families and Figure 92 and Figure 93 show these compared across the phasing.

Figure 88: Ware family introduction in phasing

WARE FAMILY	1	2	3	4	5	6	N/S	TOTAL
JULF	1	0	4	0	1	1	0	6
UNK	2	1	5	1	2	3	0	14
FE	0	0	6	0	0	1	0	7
GLAZ	2	0	5	2	1	0	0	10
STOR	3	0	7	0	1	0	0	11
INC	0	0	3	1	1	0	0	5
IND	1	0	8	6	1	0	0	16
TOTAL	9	1	38	10	7	5	0	69

Figure 89: Ware family introduction in phasing graph

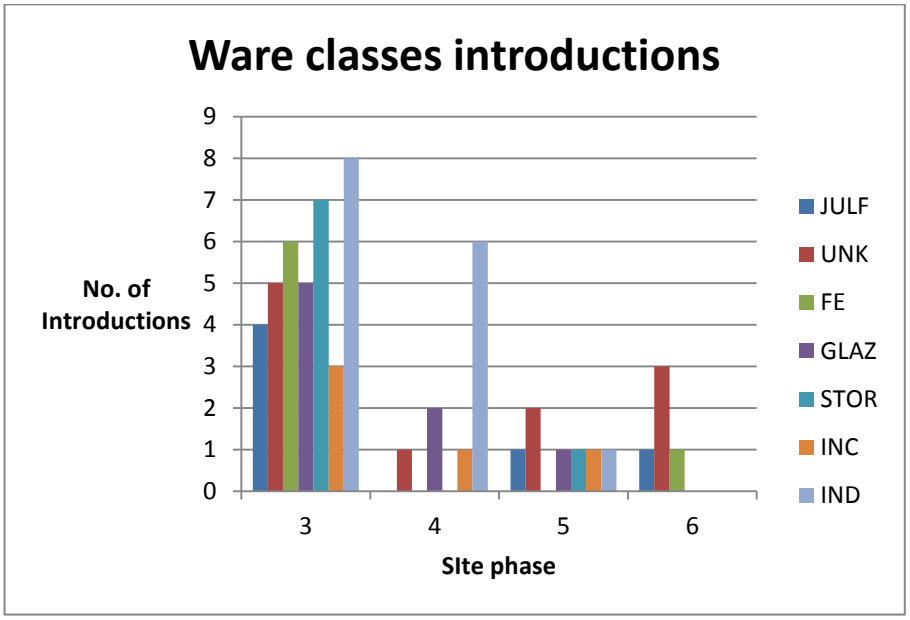


Figure 90: Rim family introduction in phasing

Function	1	2	3	4	5	6	7	TOTAL
WATER	0	0	2	0	1	1	0	4
COOK	3	0	2	9	5	2	0	21
BOWL	2	0	14	9	10	3	0	38
BURN	0	0	0	0	2	0	0	2
TRAN	1	0	1	4	1	1	0	8
STOR	1	0	9	0	4	4	0	18
UNKN	0	0	1	0	0	0	0	1
TOTAL	7	0	29	22	23	11	0	

Figure 91: Rim family introduction in phasing graph

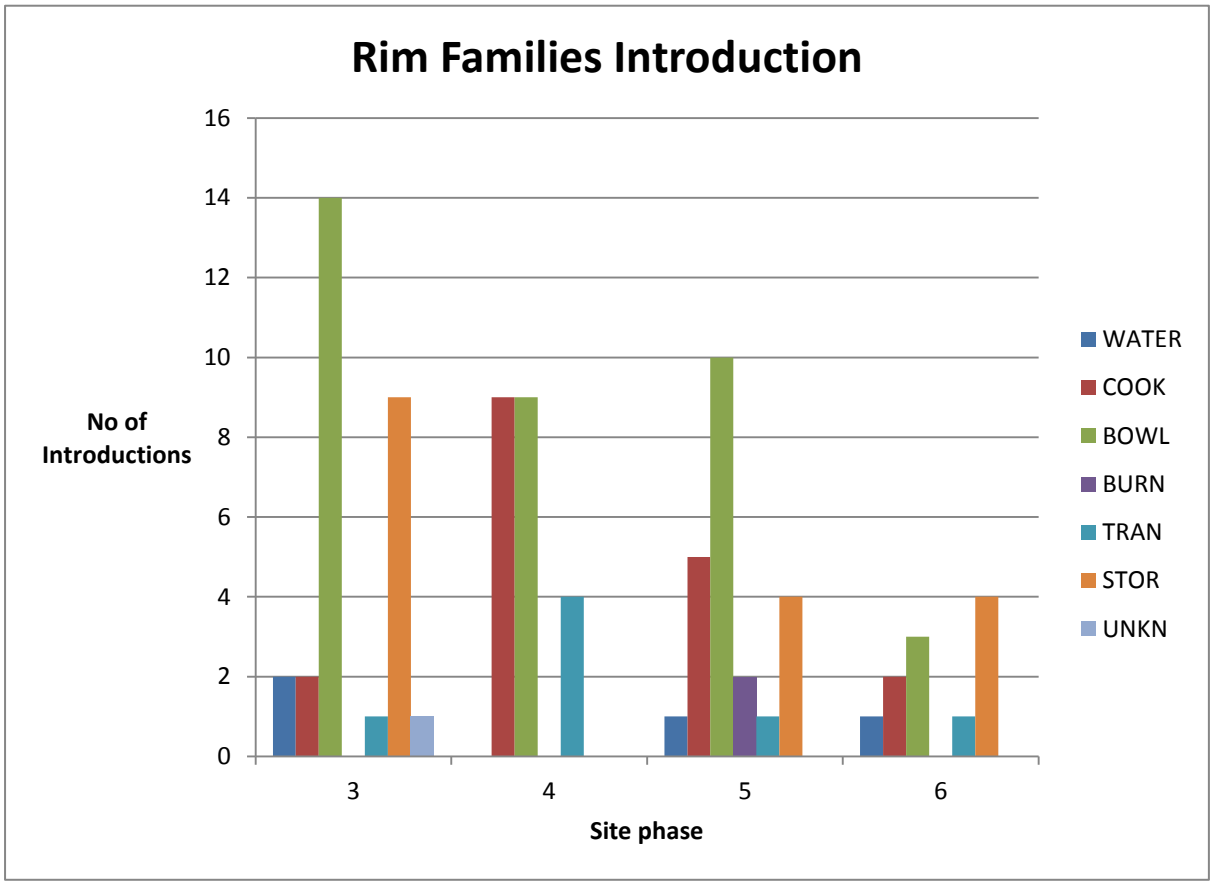
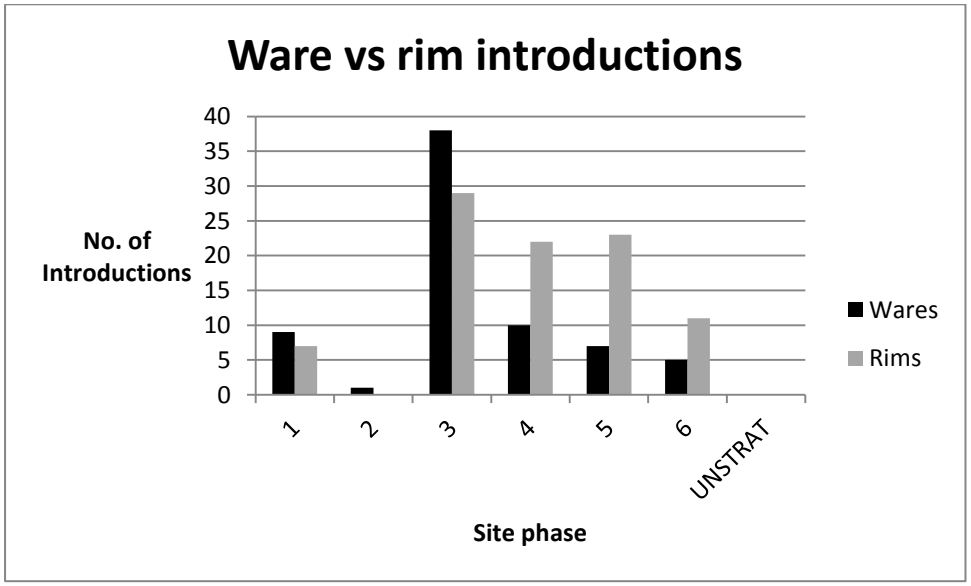


Figure 92: Ware against rim introduction in phasing

Phase	1	2	3	4	5	6	N/S
Wares	9	1	38	10	7	5	0
Rims	7	0	29	22	23	11	0

Figure 93: Ware against rim introduction in phasing graph



The ware family graph shows that the majority of ware introductions occur in phase 3, with the major JULF, FE and STOR wares being introduced during this phase. Early wares in the JULF, STOR and GLAZ families are introduced in phase 1. The majority of IND wares are introduced during phases 3 and 4. The later/modern wares of all families then come through in phases 5 and 6. The clear diversification of wares from a small limited number in phases 3 and 4 demonstrates the possible diversification of the settlement, the people using it and the trade goods passing through. The ceramic assemblage would back up the evidence that this occurred during the stone phase 4 but also had its origins in the earlier phase 3.

Similarly the rim type family introduction table and graph show that the majority of TRAN rim types are introduced in phase 4 and the majority of STOR types come in during phase 3. Phase 1 introduces the early rim types for COOK, BOWL, TRAN and STOR but in small numbers. 23 of 30 BOWL types are introduced during phases 3 and 4, again showing a diversification of ceramics over this period. Phase 4 also sees the introduction of 9 out of 20 COOK types. The later phases again show the introduction of later/modern types in fairly high numbers.

The overall graph therefore shows an original "introduction" of types in phase 1, although this is a false introduction at the start of the sequence. Phase 2 sees only one new ware and no new rim types being brought in and so could be demonstrate a phase with a small or stable ceramic assemblage. The number of wares being introduced peaks dramatically from this low point to 38 in phase 3 before dropping to 10 in phase 4 and 7 in phase 5. This shows that the ceramic assemblage during these phases was in flux with new wares being added but at a slower rate after phase 3. Through these three phases, the number of new rim types introduced also climbs, peaking in phase 3 with 29 new types during that phase. Large numbers of rims are also introduced in phase 4 and then the introduction rate falls as the site decays in phases 5 and 6. This would show that the time when the ceramic phase was most in flux with new types and wares being introduced was the period between the collapse of the mudbrick town, through its rebuilding as a stone town in phase 4 and its eventual abandonment in phase 5, a period of approximately 150 years between circa 1330-1480AD. The number of introductions could also be due to the rise in the size of the assemblage from 44 and 46 sherds in phases 1 and 2 respectively to 2156, 4447 and 7318 in phases 3, 4 and 5 respectively. This 4586% increase in the ceramic assemblage is probably due to an increase in wealth and stability of the settlement as it grows as a port town. The introductions of Indian wares and transportation style rims during phase 3 and 4 suggest that these are the phases when the site is utilised as a trading site. As phase 3 is before (although probably only just before) the stone phase of the site, it would suggest that international trade was occurring in the city prior to stone buildings, continuing into the stone phase, and possibly beyond in to the post-abandonment phase 5, although these may be residual.

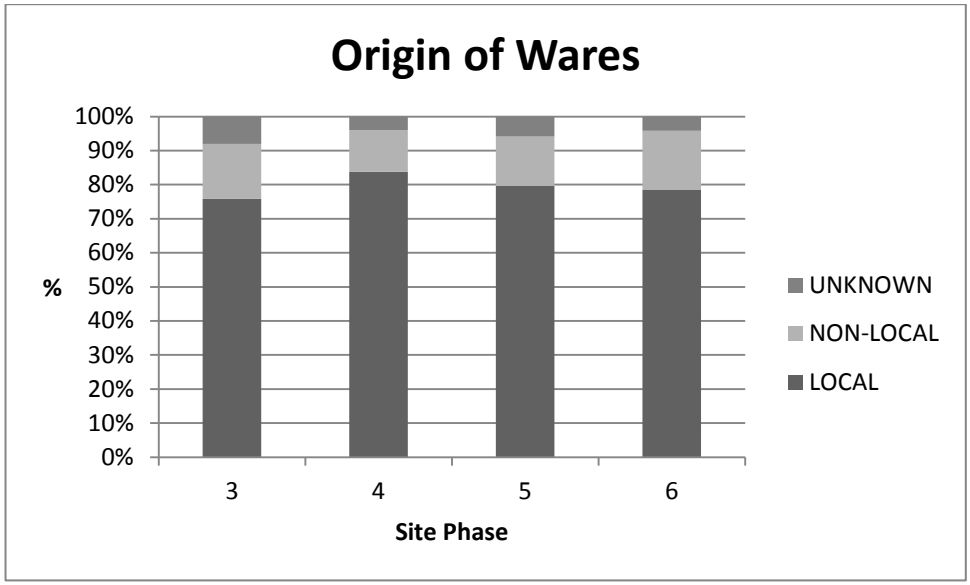
3.5.5: LOCAL AGAINST NON-LOCAL WARES:

So far the results appear to be suggesting that during phases 3 and 4 there was an introduction of more wares from outside the locality of Julfar and that this is diagnostic of an increased international trade being conducted on the site coupled with an increase in the site's wealth and stability shown by the huge increase in the size of the ceramic assemblage between these two periods. To test this, all of the wares have been attributed an origin- local, non local or unknown. This attribute is assigned according to both information already known- previous reports (Kennet 2004, Priestman 2005, Hansman 1986) suggesting a ware found at Julfar is from a certain area e.g. JULFAR is local, PERSIA is not, DEPAW has parallels with wares found at Zabid, Yemen (Ciuk and Keall 1996: 112). Some of the wares were easy to place: all Far Eastern and Indian wares obviously have a non-local origin; other wares were not so clear and so they were put into the unknown category. Figure 94 and Figure 95 show the results.

Figure 94: Local against non-local ceramics

ORIGIN	1	2	3	4	5	6	N/S
LOCAL	33	43	1637	3726	5831	10532	1614
NON-LOCAL	8	2	374	588	1200	2504	448
UNKNOWN	3	1	145	133	287	387	98
	44	46	2156	4447	7318	13423	2160
ORIGIN	1	2	3	4	5	6	N/S
LOCAL	75.0	93.5	75.9	83.8	79.7	78.5	74.7
NON-LOCAL	18.2	4.3	17.3	13.2	16.4	18.7	20.7
UNKNOWN	6.8	2.2	6.7	3.0	3.9	2.9	4.5

Figure 95: Local against non-local ceramics graph



During phase 3 the data backs up the conclusions in 2.5.4, showing a fairly large proportion of foreign wares during this period, suggesting established inter-regional trade. There is a slight contraction in phase 4 although this could be due to a decrease in the number of unknown wares in the assemblage. The amount of foreign wares then continues to gradually increase over the post-abandonment phases and modern phases. This would suggest that either inter-regional trade continued through into these phases, which is likely or that large amounts of the assemblage in the post-abandonment phase is residual from the stone phases. This could be true if the stone phases were fairly short as dating from the Far Eastern ceramics and C14

dating appears to show. This would also tie in with a fall in the wares and types introduced in phase 5 as noted in 2.5.4 as the assemblage would be similar to that of phase 4 with some minor new inclusions.

3.6.1: CONCLUSIONS:

The previous three sections have described and analysed the extensive ceramic assemblage from al-Nudud. Section 3.3 looked at the assemblage context by context using the ware and type families to look for contexts which had an unusually high percentage of any family. This information, when combined with information about the block lifts found in trenches A and B showed up several contexts where cooking was clearly the main function, particularly in trench B which would suggest that trench B and after a lesser fashion, trench A were domestic areas. Similarly areas which had a high percentage of storage wares tended to be in trenches A and B. Trench D had one context (split into two- CX1512/CX1513) which had high numbers of storage ware with WATER or TRAN rims suggesting that this area in trench D had a large proportion of utilitarian wares related to trade. It is possible from the trench assemblage to suggest that trench C was located in an area of unloading/loading of trading vessels.

Section 3.4 looked at the assemblage in a trench by trench analysis, concentrating on trench phases and the difference between each trench assemblage. This demonstrated that the assemblage was not equally spread across the site but instead was concentrated in trenches B and D with very little found in trench C. It did show that the make-up of the assemblage in trenches A, B and D was reasonably similar, apart from more Indian ware in trench D, but that trench C was significantly different. During excavation this area was considered to be a midden and the ceramic assemblage strongly suggests that the function of this area differed to that of the rest of the site. The more mixed nature of the assemblage could demonstrate that rather than having a definite purpose which would mean that one type family- e.g. COOK or one ware family- e.g. JULF dominated, the assemblage reflects the nature of the site assemblage with these biases removed. Equally it could suggest that while other classes were just thrown away, large JULF vessels were recycled as pot ovens as evidenced from trenches A and B. The area around trench D, and that around trench C further to the south east, is thought to have been close to the lagoon edge where ships could beach to load and unload items of trade. The presence of both ceramic wares/rim types that were traded for their value and wares/rim types that were traded for the value of their contents in these areas would back up this theory, while trenches A and B

appear to cover domestic areas of the site where houses, workshops and cooking areas were located.

The analysis of the trench phases showed up changes in the assemblage over the site's use in the four different areas of the site covered by the trenches. As noted above trench C's use doesn't appear to have changed much over the site's occupation. Trench A showed an increase in WATER type rims in phase 3, suggesting that during these phases, there was more need for storage of water in the area covered by trench A if the assumption that they are used solely for water is correct. Trench D had an increase in Indian wares during phases 3 and 4 which suggests either occupants having contact with India or some limited Indian occupancy. Phases D.III and A V/VI all show an increase in TRAN rim types which suggests a pick-up in inter-regional trade, although B.V, a phase in the stone robbing phase 5 also has this rise. The other trenches all showed that the assemblage became more diverse in phases 3 and 4, with a peak in GLAZ ware during phase 3. When combined with the results from the site phasing in section 3.5, this brings up interesting conclusions.

This pulled together the previous information from the trench phases into a more site general analysis. This allowed a more general picture of the assemblage across the site's occupation to be built up. The results from this analysis, looking at ware/type families, introductions of new wares and types and the amount of local to non-local ceramics in the phase assemblages has backed up the preliminary findings already outlined in section 3.4. The site began with a mixed assemblage of basic wares, mainly local but with some examples from across the Gulf. During the mudbrick phase there was a contraction in ceramic variability with the majority being local Julfarware, although this is likely to be due to the small assemblage size of 46 sherds. During phase 3 (post mudbrick abandonment and post-hole occupation) there is then a dramatic opening of the ceramic assemblage to new types and wares from both local and foreign sources as the assemblage gets larger and more varied, suggesting the beginning or increasing of international trade during these phases. This continues through to phase 4 (the stone building phase) but is slightly smaller. However during this phase large numbers of Indian and transport style rims and wares are introduced, suggesting that it is during this phase as well as phase 3 that the site is used as an international trading entrepôt. The assemblage from phase 5 (the post-abandonment phase) continues this trend. As mentioned above, this is likely to be in part because limited trading and sporadic occupation continued after the abandonment of Julfar. However the dating of the Far Eastern wares has shown that the occupation of Julfar during phases 3 and 4 is likely to have been much shorter than previously thought, with the site possibly becoming marginalised either with the arrival of the Portuguese in the very early 16th

Century or before around 1480AD with trade moving south to the area around Ras al-Khaimah City. If the occupation is so short, some of the assemblage in phase 5 is likely to be residual from the period of Julfar as a trading city in phase 4 as ceramic is rarely removed deliberately from sites after their collapse.

Overall therefore, this study has allowed a re-interpretation of the site of Julfar, moving the probable dates it was occupied to a more confined period and showing the effects of the Portuguese on this area of the Gulf. It has also allowed the interpretation and dating of several new wares and rim types and produced a robust, stratified assemblage which can be used alongside the works of Kennet and Priestman to further interpret the ceramics and sites of the Eastern Gulf and further afield.

The next chapter will look at the sites excavated around the Western Indian Ocean which could relate to Julfar and to a wider scale trading system during the period of time which Julfar is occupied for.

CHAPTER FOUR: CONTEXTUALISING JULFAR AL-NUDUD:

4.1: TRADING SITES IN THE WESTERN INDIAN OCEAN:

This chapter is designed to give a general literature review of ceramic studies in the Western Indian Ocean and the sites that the assemblages relate to, followed by an overview of the location and excavation history of the sites that have been identified in the Arabian Gulf and the Western edge of the Indian Ocean, active during the period of occupation at Julfar (late 13th Century-early 16th Century). Some earlier sites will be included in the analysis of the Julfar/Hormuz period in Chapter six due to their similarities with the important sites of the Hormuzi boom period and so they are also presented here. Each site is discussed similarly to the Julfar discussion in chapter two. This will give the base for a more in depth look at each site's ceramic assemblage in reference to the Julfar al-Nudud assemblage.

Figure 97 shows the key trading and associated sites across the wider Indian Ocean high-lighting in red those that will be discussed in detail. The sites in Western India have been excluded as while being important to the trading network, it is very difficult to get solid ceramic data for them and some of the earlier Iranian ports such as Siraf and Kish. This has limited the in-depth study of ceramics trade to the western edge of the Indian Ocean, concentrating on East Africa, the Arabian Peninsula and the Arabian Gulf. Figure 96 shows the sites in the Arabian Gulf.

Figure 96: Trading sites in the Arabian Gulf (red indicates sites discussed within this project):

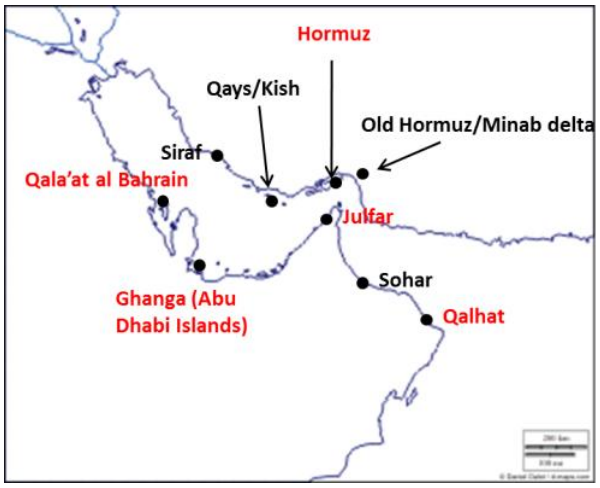
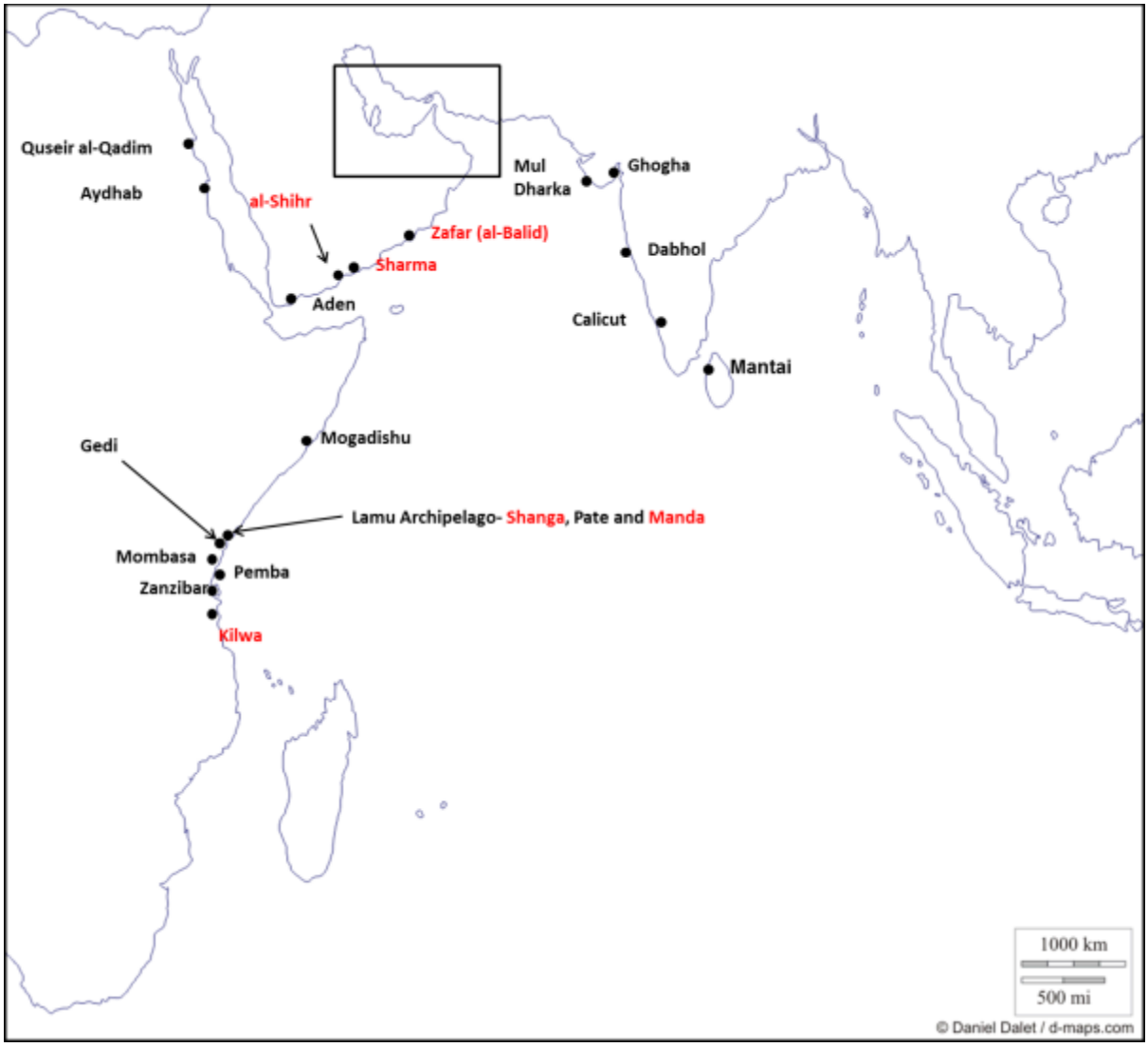


Figure 97: Trading sites in the Western Indian Ocean (red indicates sites discussed within this project):



Currently the study of ceramics in the Indian Ocean is somewhat diverse, both in quality of analysis and in terms of terminology. The discussion of ceramics is generally looked at on a site by site basis, with some assemblages being fully published while others are a small note in an already short interim report for a season of excavation. An example of the first type is the assemblage from Shanga, Kenya, published by Horton in 1996 after over a decade of work at the site. The second type is by far the more numerous in terms of sites, although even in this category of publication, it is clear that there are important differences in standards of report content and presentation. Examples of this wide range of site reports include al-Shihr in Yemen (Hardy-Guilbert 2001), Hormuz in Iran (Bakhtiari 1979: 150-2), Kish/Qays in the middle Arabian Gulf (Whitehouse 1976) and Manda in Kenya (Chittick 1984). The analysis conducted (and published) on these assemblages ranges from a discussion of the site with some ceramic

drawings from al-Shihr in Hardy-Guilbert 1997 to a loose (and inaccurate) sherd count of imported wares (not including Indian wares) from Manda (Chittick 1984: 225). The short interim reports achieve their purpose- they articulate the nature of the archaeology of the site, as well as briefly describing some of the finds, in readiness for a more complete monograph to be published. The ceramic reports which are contained within monographs of the site cannot be said to be fulfilling their function- the East Africa site reports (Gedi- Kirkman 1954; Kilwa- Chittick 1974a and 1974b; and Manda- Chittick 1984) are generally discussing an assemblage that has been either thrown away or heavily tampered with- although in the case of the Manda assemblage Wynne-Jones has conducted recent work on the local ceramic (Wynne-Jones pers. comm 2011) - and so the lack of precise data means it has been completely lost. The presentation of the archaeological features has in general been completed reasonably strongly, particularly at Kilwa which devotes a volume to the features found (Chittick 1974a).

Added to these are a small number of larger scale ceramic studies, based around multiple site analysis, generally covering a regional area, such as southern Iran or the island of Bahrain. The first of these covers all Islamic ceramics found at Qala'at al-Bahrain (Frifelt 2001) and is a strong catalogue of ceramics drawings and descriptions of various wares, their periodization and location on the island. The majority of the finds for this period date to a similar period to the occupation of Julfar and the rise of Hormuz in the mid-12th Century AD until the eventual abandonment of the area in the late 16th Century. The site of Qala'at al-Bahrain is similar to Julfar in many ways. Both are in areas of relative agricultural richness; both were involved in the pearling industry (Frifelt 2001: 60-61; Kennet 2003: 122) ; both were vassal states of Hormuz for much of their occupation before being taken over by the Portuguese and both have a strong local unglazed ceramics industry supplemented by imported wares. Qala'at al-Bahrain is thought to have been the capital of a Bahraini polity from the late 13th to the late 16th Century AD during which time it enjoyed a brief spell of absolute autonomy before becoming a loose vassal state under Hormuz and then a more rigorously controlled one under the Portuguese (Kennet 2003: 121). The report demonstrates the changes and similarities which these changes in overlord brought to the ceramic assemblage through ceramics drawings, with changes in vessel form to suit the needs of the Portuguese (Frifelt 2001: 76; 78- fig. 122). However while all of these ideas are brought out in the descriptions and in the ceramic drawings, there is no raw data published to back these conclusions up. This lack of data, surprising for a recent publication makes it difficult to use for future research. With raw data as part of the analysis, the monograph could have moved from a basic typology of ceramics from Qala'at al-Bahrain to a more complex and more rewarding study of the nature of the assemblage. It would have also

been a useful comparative assemblage for the Julfar al-Nudud and al-Mataf assemblages as the site had similar functions and Hormuzi control.

The al-Mataf assemblage from the British excavations in the late 1980s and early 1990s forms part of a region wide ceramic study completed and published by Kennet in 2004. It uses the assemblages from Julfar and the earlier inland site of Kush, along with other survey areas in Ras al-Khaimah, U.A.E. to create a general assemblage with some phasing components for the Lower Arabian Gulf and in part, the Western Indian Ocean, for the 4th-16th centuries AD. As it is based around the sequence from Julfar and its possible preceding site of Kush, it contains a rim type sequence for the local Julfarwares as well as a general dating for common wares found around the straits of Hormuz from the start of the Islamic period (given by the excavated sequence at Kush, U.A.E. and by fieldwalking surveys across Ras al-Khaimah) to the modern day, although the dating is rougher in the post al-Mataf period until the modern day (approx. 1550AD- now (Kennet 2004: 11)). This work enabled a strong sequence of Julfarware rims and wares to be established up to the end of the site at al-Mataf (approximately 1550AD according to Kennet's dating), as well as demonstrating the presence and frequency of other foreign wares such as 'LIME' and 'BUFF' as well as a reasonably complete corpus of the Far Eastern wares. The report also gives a list of sites around the Gulf where existing ceramic reports contain information relevant to the Julfar assemblage. For the period after the British dating of al-Mataf- i.e. mid-16th Century onwards however, the ceramic assemblage in the Northern Emirates becomes unclear. Due to a lack of stratified sequences relating to this period Kennet was only able to give a broad 'post al-Mataf' general period to later ceramics (Kennet 2004: 28), which has been copied in the recent work on al-Nudud. In the surveys around Khatt in 1994 and the Mountain Village Survey in the Musamdam in 2001, wares which are related to a post-Julfar (post al-Mataf in Kennet's work) period such as 'CHOC' and 'WILLOW' (*Ibid:* 26-7) have been identified. Certain types of morphological changes in the vessels are also noted- i.e. Kennet suggests that lidded Julfarware relates to a post-Julfar period (*Ibid:* 72) and also gives examples showing that Julfarware decoration during the post-Julfar period was very different to that found during the occupation of al-Mataf/al-Nudud (*Ibid:* 74). From these surveys and from that at area 74 (*Ibid:* 28-9) he is also able to establish when wares such as 'PERSIA' (PBS in 2010 al-Nudud work) and rim types such as 'CP1.2' ('J1' or 'J3' in 2010 al-Nudud work) become type fossils relating to an earlier phase- in this case, the occupation of Julfar.

Leading on from this piece of research, Priestman made a complete re-categorisation of the large Williamson Collection assemblage while based at Durham University. This assemblage is from field survey in southern and coastal Iran, an area which shares a large number of wares

and rim types with the Northern Emirates due to bilateral trade (Priestman 2005: 64). The majority of this assemblage came from fieldwalking and ceramic scatter collection by Williamson in the 1960s and early 1970s and as such has a location ID but is generally not stratified. Julfarware appears to have been exported to Iran and glazed wares exported to the Emirates from Iran (*Ibid:* Kennet 2003: 114). Priestman's work has set out a clear research collection for ceramic wares, with colour photo plates of each ware and sub-division of wares. The use of colour plates proved to be invaluable for looking at wares which were unknown to the author but were found elsewhere. Priestman's study is closely linked into the settlement history of the Iranian coast and hinterland, which is likely to bear at least some relation to the settlements on the Arabian side, particularly as he suggests that the northern shore of the Gulf was the driving force for trade and development for much of the Islamic period (Priestman 2005: 151). The main conclusion coming from the study, other than the vast amount of information on the assemblages themselves, is the difference in settlement between the Bushehr and Minab plains, which Priestman suggests echoes the difference between the upper and lower Gulf (*Ibid:* 153). This conclusion comes from both settlement dating and ceramic evidence, showing that the sites in the Upper Gulf (Bushehr) are more numerous in earlier periods with early ceramic assemblages and they then decline while sites in the Lower Gulf (Minab) become more common with ceramic assemblages demonstrating later trade. The study, along with both Priestman's own work on the Siraf collection and Kennet's work in the U.A.E. allow for a strong ceramic chronology for the Gulf for the 7th-16th centuries AD.

Previous work on the Siraf assemblage dating to the Early Islamic period was conducted by Tampoe in 1987. This report forms an early structuring of both the ceramics assemblage of a major southern Iranian trading site as well as discussing trading patterns and methods around the entirety of the Indian Ocean and further afield into China and the Far East. The base for it does however rely on the sample collection held at the Ashmolean Museum, Oxford followed by an analysis of the rest of the assemblage through the pottery data cards (Tampoe 1989: 3). This, while being practical at the time and creating a solid base for later work, is suspected to have brought significant error in to the assemblage analysis, particularly in the glazed assemblage (Kennet 2004: 111). The key ideal behind Tampoe's work was to discuss the Indian Ocean ceramic assemblage as a whole, bringing in discussion of different goods alongside pottery which were traded to look for trading networks. This project takes a very similar line, but due to the amount of excavation that has taken place since the earlier study; and more importantly the availability of recent fully published ceramic assemblages, is able to bring together a stronger set of data than was available to Tampoe.

These three regional studies are all from the Arabian Gulf. They demonstrate a varied ceramic assemblage not just containing ceramics from this region but also a significant number of wares that are in some cases, at some sites, found in significant quantities, such as Far Eastern wares such as Longquan Celadon and Chinese Blue and White. Outside of the Arabian Gulf there have not been similar region-wide studies in ceramic assemblages, with the majority of data being held in site specific assemblage analysis. A good example of this is the ceramic assemblage from Zabid in Yemen, which has been published in a BAR volume by Keall and Cuik (1989). This publication details the various wares and rim forms found during the excavations at Zabid, covering occupation from the 1st millennium BC up to the 16th Century.

The East African seaboard from Somalia in the North to Madagascar in the South has been part of the Indian Ocean trading network since at least the Roman Period with the ports/regions of Malau, Opone and Rhapta (Seland 2010: 39-44). During the Islamic trading boom in the Early Islamic Period and then again in the Late Islamic Period, Gulf merchants and goods could be found at the island trading sites of Kilwa and Mafia in Tanzania and the Lamu Archipelago sites of Manda, Shanga and Pate, along with mainland trading cities at Gedi, Mombasa and Mogadishu (Wynne-Jones 2007: 368/9). These sites currently appear to demonstrate both a strong local identity while maintaining strong cultural and material links with the Arabian littoral, the Gulf and India. The ceramic assemblages from Shanga from trenches 6-10- it is not made clear why the trench 1-5 assemblage is not presented- show these links through the wares present. Similarly the discovery of a bronze lion figurine from Shanga which appears to have been manufactured by Indian techniques using recycled Chinese copper coins and while clearly being an African lion in shape, is posed similarly to Indian representations (Horton 2004: 66). The perceived multi-culturalism of this find by Horton suggests an Indian community of craftsmen living in East Africa.

Current work by Wynne-Jones and earlier work by Horton has expanded the area this project can discuss, allowing the incorporation of the East African seaboard in to the analysis. Wynne-Jones' work re-interpreting the Kilwa assemblage after Chittick's excavations as well as building up a general assemblage for East Africa (Wynne-Jones 2007: 370). The excavations at Shanga are the most modern currently published, although archaeological work is being completed on trading sites in East Africa currently. This monograph, compiled by Horton describes the large scale excavations across both the main town and the limited test-pitting and survey (Horton 1996: 9-10) across the site. Shanga forms the only numerically published phased assemblage currently available for East Africa, split into wares and both phases and periods relating to the construction techniques of the buildings on site (Horton 1996: 273 for ceramics table; 396 for

phasing/periodization). Shanga is also one of the very few sites which were occupied for the majority of the Early to Late Islamic periods (Horton 1996: 394-406) and so the assemblage has the potential to document the changing nature of the ceramic trade between East Africa and the Gulf, looking at the rise and fall of popularity of wares and styles. When combined with the other published assemblages from East Africa, it should provide the backbone to a regional ceramic assemblage for trading sites along the Swahili Coast.

The Julfar al-Nudud assemblage can be added to these regionwide discussions to discuss both Arabian Gulf trading mechanisms and a wider Indian Ocean context. Chapter two presents the al-Nudud assemblage alongside a discussion of the methodology of ceramics classification used throughout the thesis to include assemblages that otherwise would be problematic to discuss. Using this methodology, coupled with a broader discussion of other assemblages around the Western Indian Ocean, the site of Julfar can both be contextualised within a wider framework of trade and exchange, as well as adding evidence to support particular trading patterns and events during the period 1250-1550AD.

The following section looks in more detail at each of these sites, setting out a critical discussion of the location, history and archaeology of each site before chapters five and six go into greater detail about the site ceramic assemblages.

4.2: SITE PUBLICATION DISCUSSIONS:

4.2.1: ABU DHABI ISLANDS ARCHAEOLOGICAL SURVEY- GHAGHA (FIGURE 98 AND FIGURE 99):

Period/date range:

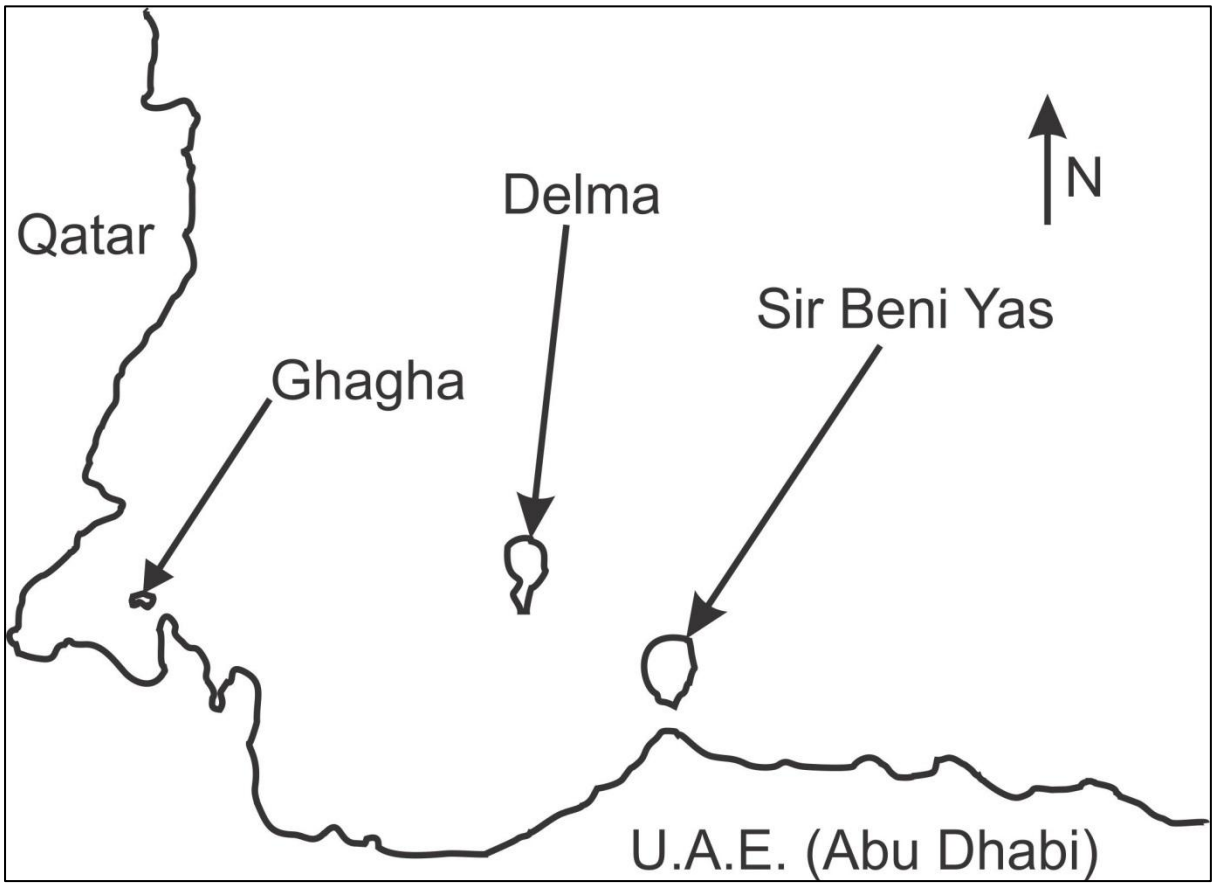
5th- 16th Centuries AD

Also evidence of prehistoric occupation across islands. Ceramic scatter suggests light occasional occupation.

Excavations:

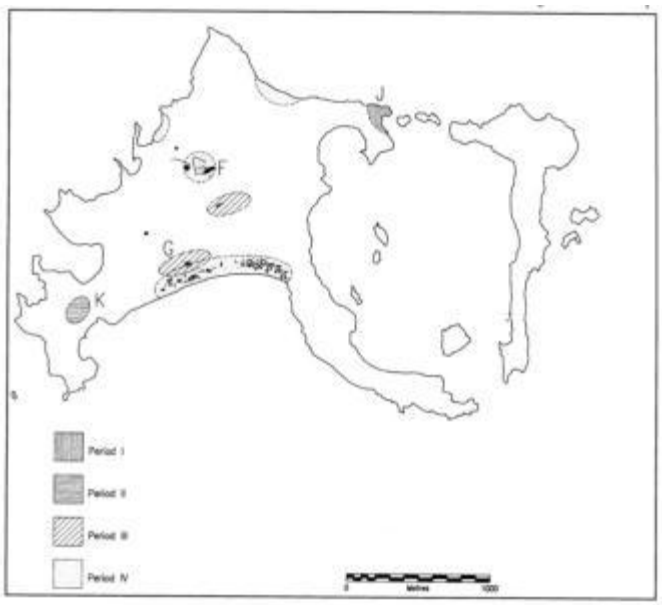
Abu Dhabi Islands Archaeological Survey (ADIAS)- King and Tonghini 1999

Figure 98: The Abu Dhabi Islands



Site Map/plan:

Figure 99: Ghagha Island, from King and Tonghini 1999: 118- fig.2



Topography:

The islands are low mounds in the Arabian Gulf, off the shores of Abu Dhabi Emirate. They have a rocky geology but are covered in layers of guano from the large numbers of nesting cormorants (King and Tonghini 1999: 123). It is likely that it is this that brought people to the islands as the deposit is very fertile. The islands also provided bases for the pearling industry and, due to the fertile soil, date palm groves. One of these on Ghagha has a sophisticated water management system (King and Tonghini 1999: 135)

Dating evidence:

The dating is based entirely on the ceramics and other finds which were all either pre-Islamic or late Islamic- i.e. Julfar period (King and Tongini 1999: 135). Their report, although it gives very wide dating margins (due to the nature of the sites) does show a presence of Julfarwares in period IV (which runs approximately from the 5th- 16th Centuries AD) as well as wares likely to relate to CRWW (site G- cream slipped red ware), BAH (site G- thick dark brown ware with yellow explosions) and BUFF (sites F and G- buff ware).

Architecture:

The buildings and structures on Ghagha are mainly devoted to water management (King and Tonghini 1999: 134). These are stone built and were used to support date palm groves. Minimal architecture was found other than evidence for huts around the island (King and Tonghini 1999: 134).

4.2.2: Qala'at al-Bahrain (QAB):

Period/date range:

Kervran *et al* 2005 suggest a starting date in the mid 13th Century (Figure 100) for the reoccupation and renovation of the Tylos period fort (Kervran *et al* 2005: 283). The report says that no material dating to the period 450/500AD and 1250AD was found at the fort site (*Ibid:* 283). There is then a later occupation of the fort during the Hormuzi-Portuguese Period (XI), along with a 14th-15th Century occupation of a village near to the fort (Kervran *et al* 2005: 329).

The site is then abandoned in the early to mid 17th Century having become obsolete (Kervran *et al* 2005: 350)

Figure 100: Relevant periods from Kervran et al 2005

Phase	Date	Description
X	12th-late 15th Century	Reoccupation of Tylos fort and village with trading
XI	late 15th- 17th Century	Hormuzi-Portuguese invasion and occupation

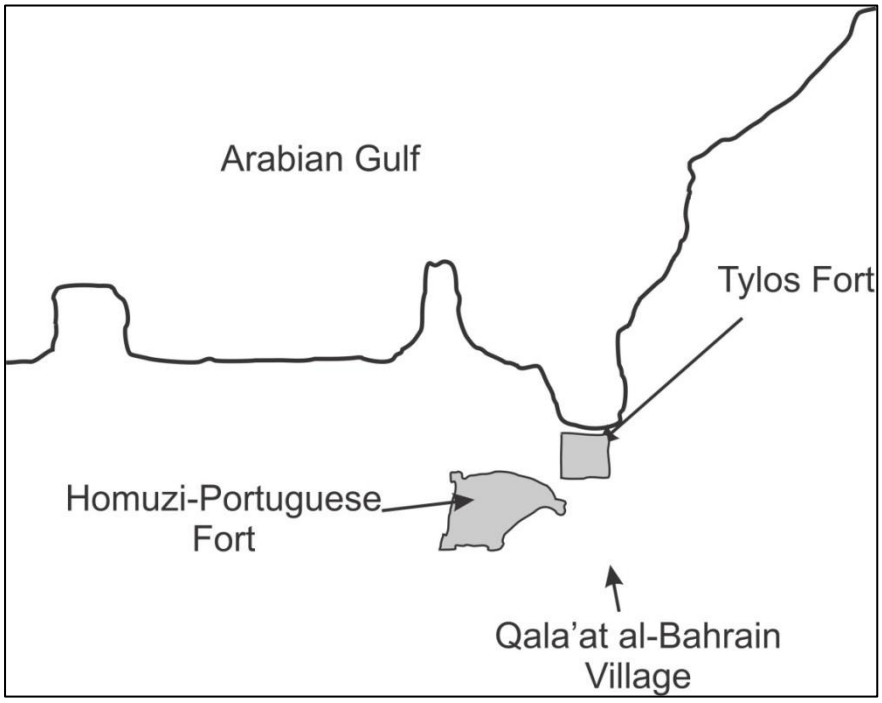
Frifelt 2001: 35 puts the starting date for occupation at QaB slightly earlier in the 12th Century with the majority of ceramics found relating to the 12th and 13th centuries. She suggests that the fort (figure 6) and surrounding settlement with the suq/market area seen in figure 7 are contemporary to the 12th and 13th centuries, with the later village occupation mentioned above being further to the north and west, under the area now covered by the ruined Portuguese fort (Frifelt 2001: 36)- see figure 101).

Excavations:

Danish excavations 1953-70P: Bibby 1957; Hojland and Anderson 1994; Frifelt 2001

French excavations (1980s) Kervran *et al* 2005

Figure 101: Qala'at al-Bahrain site layout:



Site Map/plan: (Figure 102 and Figure 103 are from Frifelt 2001- p39, fig 51b and p49, fig. 67 respectively- and is from Kervran *et al* 2005: 14, fig.2).

Figure 102: Plan of the Tylos period fort

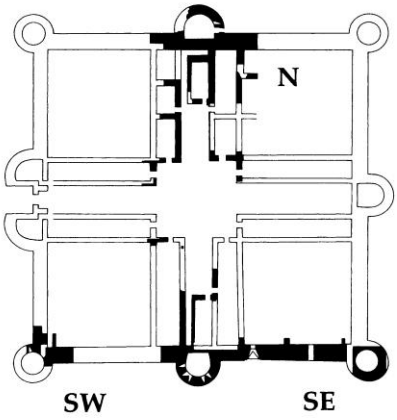


Fig. 51b Plan of the Islamic fortress 1: 1000, the excavated part in heavy type. (After Højlund and Andersen 1994 plan 11).

Figure 103: Plan of the 'souk' area:

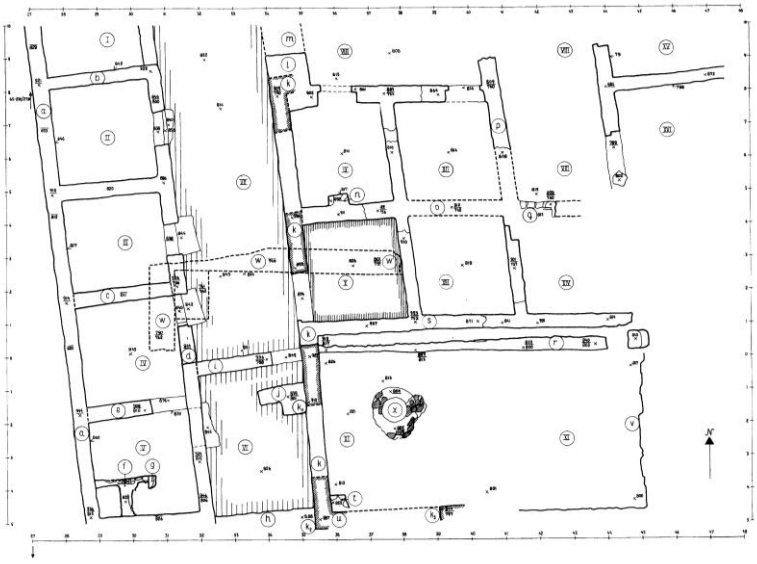


Fig. 67. Plan of the Islamic Town. The small rooms (I-V) facing a street (VII) suggest a suq. (VI) is a building later blocking the street. Area (XI) with well (x) may be an enclosed yard (public bath?), (f),(g),(w) are walls from an earlier Islamic building phase, (k) indicates four piers, and (r) is a secondary wall later than the pier-structure.

Figure 104: The overall site:

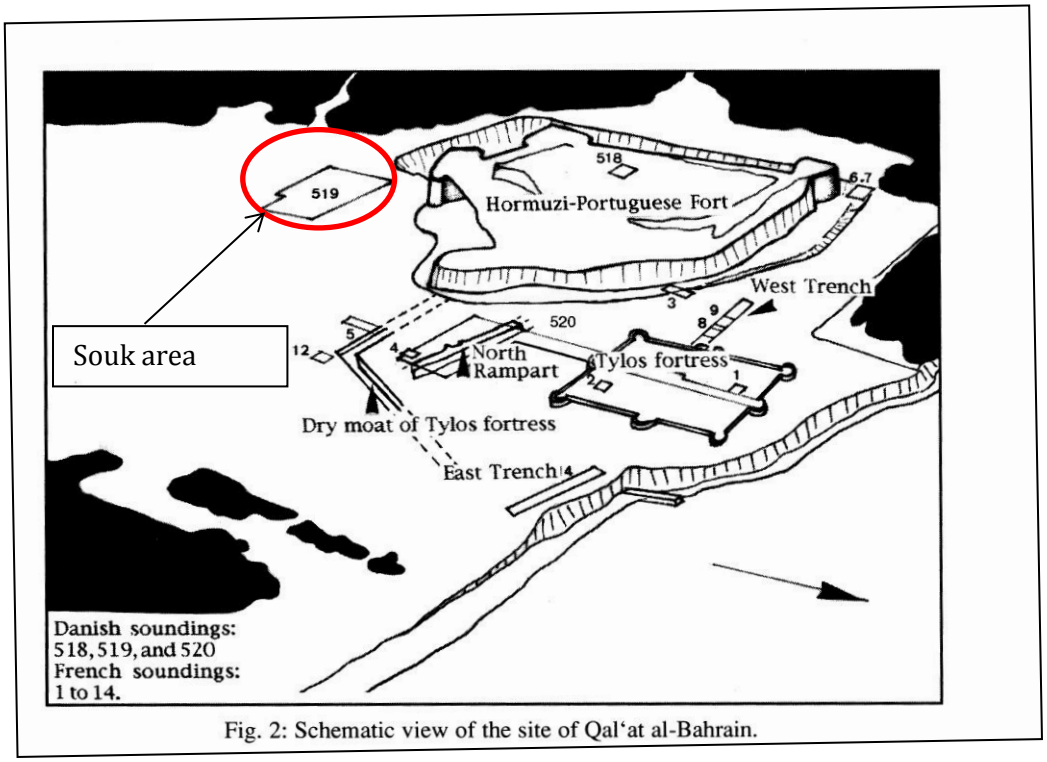


Fig. 2: Schematic view of the site of Qal'at al-Bahrain.

Topography:

The site is close to the shoreline in north Bahrain. The land around the forts is approximately 5-6m above sea level with a steep slope in front of the Tylos fort (Frifelt 2001: 11, fig. 2). The area to the east of the Portuguese fort is gently undulating and generally 5-6m above sea level but the area to the south and west of the Portuguese fort is slightly higher at 10-11m. This is a typical Arabian Gulf tell formation- not very tall but spread over a large area. The Portuguese fort is surrounded by a moat which has filled in over the period of abandonment (Kervran *et al* 2005: 50).

Dating evidence:

Dating evidence for the site is taken in from ceramics, and stratigraphical relationships. The dating of periods between the two excavations is set out in Kervran *et al* 2005: 15-17 and shows a good correlation, with some discrepancies. The most important one of these for this study is

the Danish original dating for the reoccupation in the 12th Century, while the French team suggests a slightly later date in the late 12th/early 13th Century (Kervran *et al* 2005: 16).

Architecture/Archaeology:

The architectural remains on the site show three phases of fortifications, a small concentrated occupation nearby and a later more spread out village. The original phase of fortification is the Tylos fort which is a square fort with round towers at each corner and one half round tower in the middle of each wall, used as gate-ways (figure 6 from Frifelt 2001: 39) dating to between 200BC and 500AD approximately (Kervran *et al* 2005: 16). The re-occupation of it during the 12th/13th Century does not appear to have adapted the fort in any major way- Kervran suggests that the reoccupation was for an Iranian trading outpost (Kervran *et al* 2005: 283). During this phase there is also a settlement associated with the fort, possibly reoccupied slightly later than the fort. The final fort is much larger with more complex defences and developments for cannon warfare. It was built after the Portuguese occupation of Bahrain following the capitulation of Hormuz and its vassal states in the early 16th Century AD.

The plans for the *suq* area show it to be a densely occupied area with a roadway bounded by little square booths with a very regular size (Kervran *et al* 2005: 330-331). Frifelt mentions finds including jewellery and Chinese coins in this area, and suggests that these are evidence of the exchange of items and the wealth that was generated from this (Frifelt 2001: 36)

4.2.3: Bilad al-Qadim (BaQ) (Figure 106 and Figure 107):

Period/date range:

There is some evidence of high-status occupation in early Islamic periods with Insoll suggesting that the early Abbasid capital of Bahrain was at BaQ (Insoll 2005: 54-56). There is then a decline in the number of high-status imported finds during the 11th Century, which Insoll suggests is due to Carmathian rule (Insoll 2005: 54-56). Carmathian power decreases after 1170AD and the site opens up to foreign wares again. However it appears this period of success is short lived, as the settlement at Qala'at al-Bahrain begins to grow as a commercial hub. Insoll suggests that ultimately it is the success of this site which causes BaQ to be abandoned at some point in the 14th Century (Insoll 2005: 56). Only phase 6 will be used in this analysis as it is the only part of

the assemblage dating to the period 1250-1550AD (Figure 105), although the other phases are included to demonstrate the development of the site.

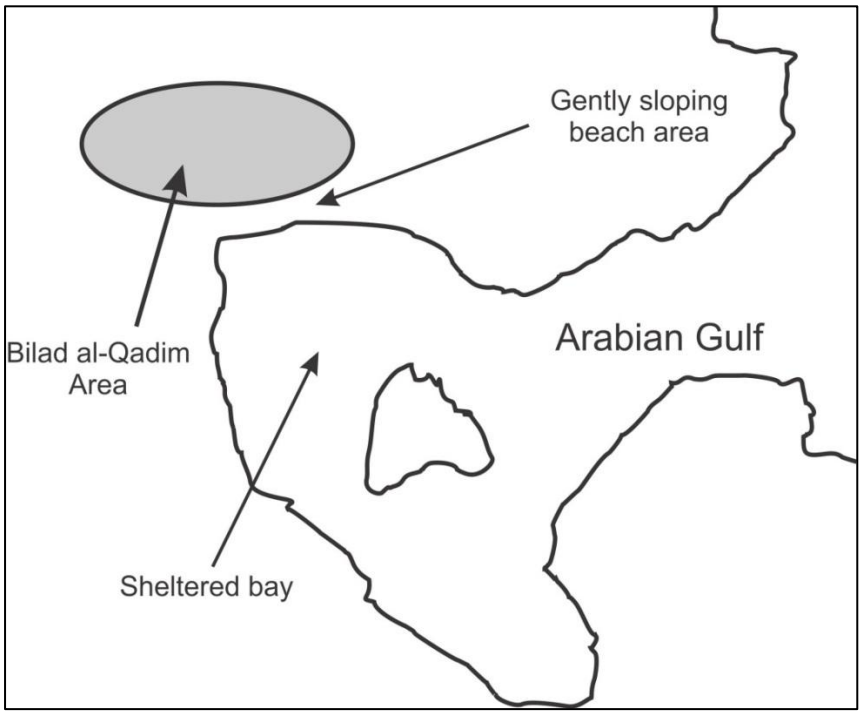
Figure 105: Phasing of Bilad al-Qadim from Insoll 2005

Phase	Date	Description
1	8th to early 9th Century	High status period of early Islamic occupation.
2	9th to early 10th Century	Abbasid period- possible capital at Bilad al-Qadim
3	11th Century	Carmathian control- decline in imports
4	mid-11th to 12th Century	Rise in imports and occupation after fall of Carmathians
5	late 12th to 13th Century	Ceramic production and large scale occupation of site
6	13th to 14th Century	Reduced occupation due to shift of people and trade to Qala'at al-Bahrain

Excavations:

British excavations during 2001: Insoll 2005

Figure 106: Location of Bilad al-Qadim in Bahrain



Site Map/plan:

Figure 107: from Insoll 2005: p399, figs. 3.1b and 3.17

Fig. 3.1b KHA 01C to H - Plan of reconstucted structural phases

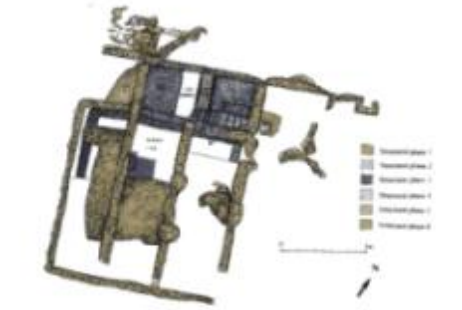


Fig. 3.17 MOS 01A to G - Plan of reconstructed structural phases

The site is based around two main areas of excavation at Khamis mosque (KHA) and at another mosque site with the code MOS, along with a general survey around the area. There is no plan of this survey area.

Topography:

The site is in the north of Bahrain in a small strip of cultivatable land (Insoll 2005: 5) which makes the north of the island agriculturally rich compared to the south. The landscape is open and flat, and appears to have been more marshy in history (Insoll 2005: 44). The site faces the sea to the south, overlooking a sheltered bay, which before modern development, appears to have had gently sloping beaches which would have allowed ships to be put aground to unload/load.

Dating evidence:

A comparison of ceramics from other excavations on Bahrain and with Kennet's assemblage from Kush provides the basis for the site dating (Carter 2005: 107-110). The ceramic

assemblage includes a large amount of local 'Common Ware' vessels, with part of the site being a kiln producing these wares. Some of these are new examples but have been dated using the rest of the assemblage. Carter uses a rough chronology of Far Eastern wares to give a good, if somewhat wide, date range to the phases. This is then backed up by imported glazed wares from Iran, particularly in phases such as Period 2 which has no Far Eastern wares (Carter 2005: 119). This phase does however appear to contain ceramics from the Samarra Horizon (Carter 2005: 123), allowing this phase to be dated to the 9th/10th centuries with a good degree of certainty.

Architecture/Archaeology:

The majority of the excavations were conducted around two mosques but also included small scale excavations around shrines nearby (Insoll 2005: 35-38). Areas of water management systems for date palm gardens were also surveyed and excavated. The majority of the sites (7 out of 8 shrines) are still used or have been incorporated into modern structures of a similar function (Insoll 2005: 39). The site pre-dates occupation at Julfar for the majority of its use, but the final phase is contemporary with the very early phases at Julfar al-Mataf. It appears to have been abandoned in favour of Qala'at al-Bahrain which grew rapidly in the final phases of BaQ as it became deserted.

4.2.4: QALHAT (FIGURE 108 AND FIGURE 109):

Period/date range:

City founded at beginning of 12th Century as 2nd city of the kingdom of Hormuz 13th-15th centuries, then abandoned after Portuguese garrison established in 16th Century (Rougeulle 2010: 303-304).

No published phasing as yet from excavations (Rougeulle 2011 pers. comm.)

Excavations:

Survey and excavation: 1998, 2003- Vosmer 2004.

Excavation: 2008-ongoing- Rougeulle 2010; 2011

Site Map/plan:

Figure 108: from Rougeulle 2010: 306- fig. 2

FIGURE 2. *An aerial photograph of Qalhāt showing the different quarters and main buildings of the medieval city.*

Figure 109: from Rougeulle 2010: 317- fig.10

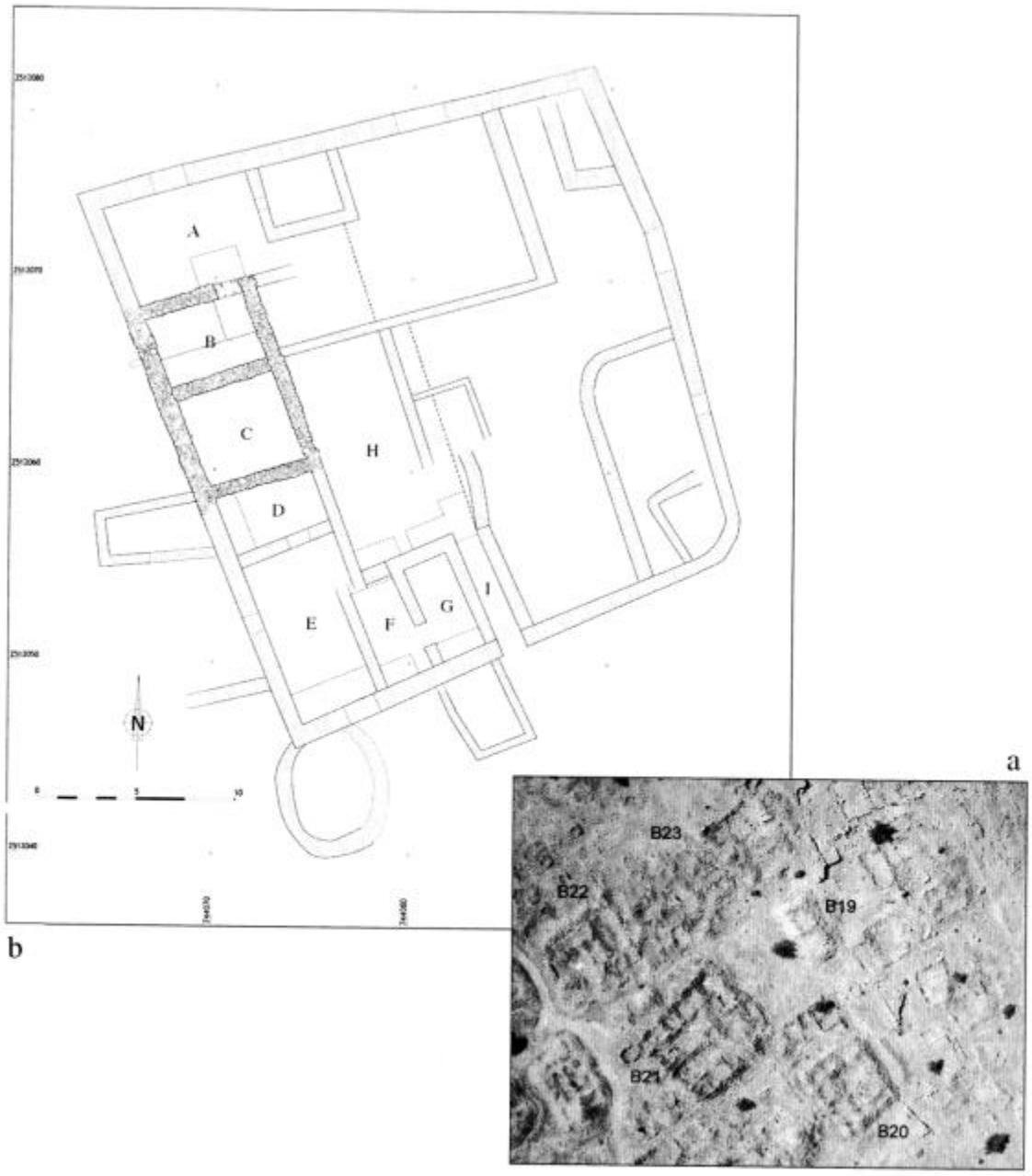


FIGURE 10. *A kite photograph of* **a.** *the north-west 1 quarter;* **b.** *a plan of building B21 (planning and topography B. Hollemaert & A. Rougeulle, geo-referencing E. Régagnon, computer graphics B. Hollemaert).*

Topography:

Qalhat is placed on a coastal plain with a wide shallow bay with the Jabal al-Hajar mountains to the west, preventing easy landward access (Vosmer 2004: 389). To the north the Wadi Hilm flows into the sea, giving a natural defensive barrier with its steep banks (Rougeulle 2010: 305).

Vosmer produced a topographical map of Qalhat and the surrounding bay (Vosmer 2004: 401, fig. 15; figure- in this report) while conducting an underwater survey which showed up the shallower alluvial fan of the wadi as well as some areas of over 50m depth. It is unusual but very useful to have a bathymetric contour survey of the seabed off a port site in this detail in this area, although naval charts come close. The site itself is covered in mounds which can clearly be identified as buildings, along with city walls to the west and south and a possible sea-wall (Rougeulle 2010 (306-307). The location of the city in marine terms is also seen to be important as it lies on the only good safe natural anchorage on this coast and is close to the richest fishing grounds in the Arabian Sea (Cleuziou and Tosi 2000: 19).

Dating evidence:

Dating evidence for the site comes from both historical documents (Ibn al-Mujawir produced a sketch map around 1230AD, Ibn Battuta describes it and de Alberquerque describes the Portuguese attack in 1508- Rougeulle 2010: 307) and from the ceramics although this study is not complete (Rougeulle 2011 pers. comm.) The published report from the 2008 season gives examples of 14th Century Far Eastern and Islamic ceramics e.g. blue speckled ware (PBS) and painted Julfar (JULFAR.RW) (Rougeulle 2010: 310). Bhacker and Bhacker 2004 discuss the general historiography of Qalhat documenting its rise alongside Hormuz and the vital part it played in the trade between the Gulf and the wider Indian Ocean. According to Ahmad bin Majid, writing in 1489-90AD, "the sea is not closed for any time of the year between Qalhat and Gujarat if you take a reliable *Aikar*". It is therefore suggested that up to five voyages a year could be made between these locations (Bhacker and Bhacker 2004: 17) while ports further down the Yemeni seaboard such as Zafar had sailing conditions which only allowed voyages twice a year. Equally the wind conditions around the Musamdam Peninsula are described as stormy (Bhacker and Bhacker 2004: 19), suggesting that at certain times of the year it would be easier to offload goods at Qalhat rather than shipping them through the Straits of Hormuz.

Architecture/Archaeology:

The city is surrounded by walls on 2 sides with gates in the south and west (Rougeulle 2010: 307). The architecture is stone with a large number of square/rectangular buildings around the site, with some degree of town planning in the street grid (Rougeulle 2010: 306). The Friday mosque is placed on the coastline and is known to have been very richly decorated (Rougeulle

2010: 308-310) with tile and stucco. The mausoleum of Bibi Mariyam is one of the few pieces of near complete architecture found on the site (Costa 2002: 55-6).

4.2.5: SOHAR (FIGURE 110):

Period/date range:

6th-11th/12th centuries AD. Declined by the mid 11th.

Excavations:

American Society for the Study of Man excavations 1958 (Cleveland 1959: 11)

Harvard Archaeological Survey 1973 (Williamson 1973)

Farries excavations 1975 (Unpublished)

Excavations by French team 1980-86 (Kervran and Hiebert 1991; Kervran 2004)

Site Map/plan:

Figure 110: Sohar urban areas (from Kervran 2004: 264- fig.2):

Topography:

Sohar, similarly to Siraf on the Iranian coast, is on a wide flat coastal plain with a long mountain and foothill range inland. It does not appear to have a built harbour during the Islamic period, again similarly to Siraf using its long sloping beach as the harbour. Unlike Qalhat further south there are no promontories to form a natural harbour to protect the vessels from the Arabian Sea. The main town itself is bounded by two creeks, both of which have silted up at their seaward ends. The main 13th/14th Century Hormuzi fortress is in the NE corner and the earlier town wall/moat runs along the S side of the urban area between the two creeks (Kervran 2004: 265)

Dating evidence:

Ceramics from the excavations and survey (Williamson 1974) show a present of early-mid Islamic wares as well as some Far Eastern imports. Similarly a coin hoard found in Ras al-Khaimah with 125 silver Dirhams bearing the Uman mint name (widely regarded as Sohar) has been dated to the 11th Century AD, demonstrating the ongoing presence of Sohar as an economic capital (Lowick 1986: 89). The ceramic evidence unearthed by the French excavations show pre-Islamic settlement across much of the site followed by an expansion of the area occupied during the 9th-10th centuries. The presence of Champleve and Sgraffiato bowls is key dating wares to this period (Kervran 2004: 306). Similarly the site contained examples of Bahla ware and early porcelains, both of which date to this period. The site contains Far Eastern, Indian and Iranian ceramics, demonstrating trade and exchange with all these areas (Kervran 2004: 301) with up to 20% of the ceramic assemblage from some sondages being of Indian origin. These ceramics are detailed in Kervran 2004: 315-323. The occupation of the site, other than the later 13th/14th Century Hormuzi fort and its 16th Century Portuguese additions, date to before 1250AD. Therefore the assemblage will not be discussed in detail in this thesis. However Sohar is an important trading site and must be discussed.

Architecture:

10th Century sources discuss the wealth of Sohar alongside its architecture. Williamson (1974) notes the reference of Istakhri: "The capital is Sohar which is on the sea; here reside many sea merchants who trade in ships with other countries. It is the most populous and wealthy town in Onan and it is not possible to find on the shore of the Persian Sea nor in all the land of Islam a city more rich in fine buildings and foreign wares than Sohar." The excavations and site plan suggests a fairly densely settled site bounded by wadis to E and W and the defensive wall/moat to the S. At least some of the houses within the walls were grand with excavations showing a

large complex floor plan and historical description discussing the 'lofty and splendid houses built of burnt brick and teak wood' (Kervran 2004: 335). The Friday mosque was placed next to the sea, as seen at Qalhat and Julfar.

4.2.6: NEW HORMUZ (FIGURE 111):

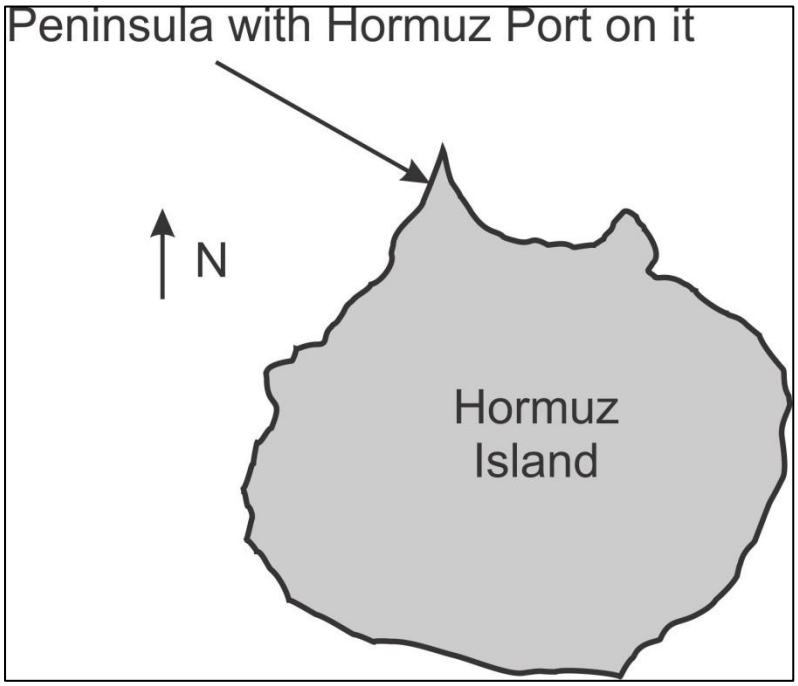
Period/date range:

1200-1600AD

Excavations:

Very limited data from interim report by Bakhtiari 1979 publishing findings of previous season.

Figure 111: Hormuz Island



Site Map/plan:

None available

Topography:

Hormuz is a small island with a large mountain in its centre. The city of Hormuz appears to have been built up around the perimeter of this between the slopes of the mountain and the seashore, with its main centre around the northern edge of the island, although it does appear to have had occupation around its entire circumference. The main site of excavations appears to have been on the eastern and western sides of the island around the city walls and in the northern area in what is assumed to have been an urban area (Bakhtiari 1979: 151). The headland itself tapers to a point at its northern extent and appears to be fairly flat, as can be seen in **Error! Reference ource not found.**.

Dating evidence:

Historical documentation shows the city of Hormuz to have moved from its previous location on the Minab Delta to the island of Jarun in the mid 13th Century, possibly partly in order to avoid attacks from nomadic raiders.

Architecture:

Bakhtiari's report mentions city walls, fortifications, built up areas of dense occupation and large mosques (Bakhtiairi 1979: 151). This would reflect the historical documentation discussing Hormuz as the gem of the world. The surveys in 1979 also showed a large number of water cisterns, reflecting the need to store fresh water brought in from Julfar and elsewhere, as Jarun has no fresh water supplies of its own.

4.2.7: ZAFAR (AL-BALID)(FIGURE 113 AND FIGURE 114:)

Site name:

Zafar (al-Balid)

Period/date range:

1100-1700AD (declining by 1500AD)- see Figure 112.

Figure 112: phasing from Newton & Zarins 2010:

Phase	Date	Description
I	500-1000AD	Early stone walling of Sasanian or later period
II	1100-1350AD	Early heyday of the site- trading at it's peak
III	1250-1500AD	Continued trade and occupation
IV	1500+	Post-occupation deposits

Excavations:

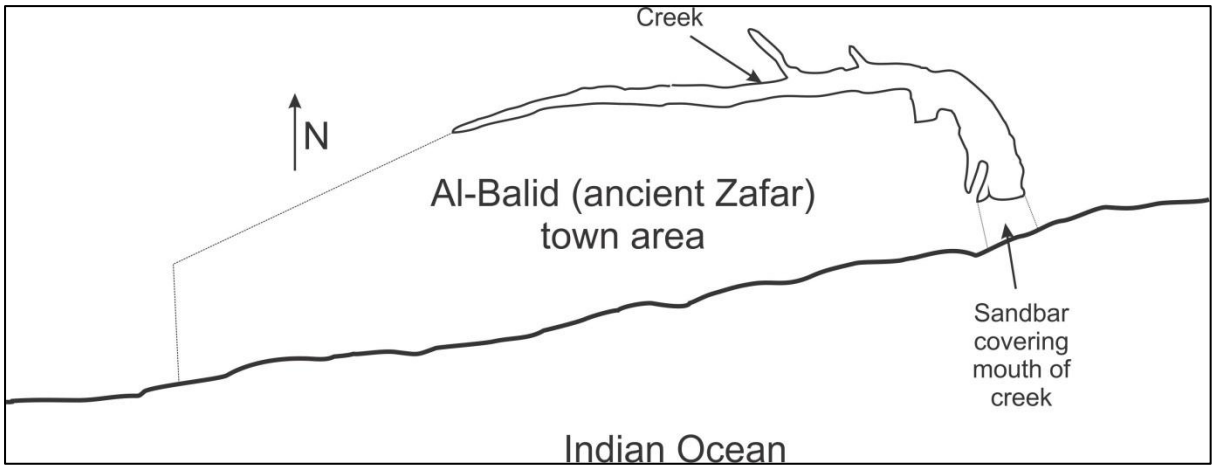
American Foundation for the Study of Man 1952-3 (Phillips 1972; Albright 1982)

Costa 1982

Dutch excavations -Yule 1998; Franke-Vogt 2002; Yule & Mohammed 2005

Zarins 2007; Newton & Zarins 2010

Figure 113: Zafar urban area



Site Map/plan:

Figure 114: from Zarins 2007: 310- fig. 1

Topography:

Zabid is based on a spit of land on the coast joined at the western end to the mainland with a lagoon to the north and a creek to the east. The mouth of this creek has now, like so many on this part of the Omani coast, silted up (Zarins 2007: 310). It is partly due to this that the site was abandoned. The lagoon to the north gave a sheltered harbour to trading vessels.

Dating evidence:

Some of the evidence for the dating of the site has come from the geoarchaeological surveys completed by Reinhardt (2000) and Hoorn & Cremaschi (2004) which analysed the deposits in the lagoon. This is secondary evidence as it only gives dates for major environmental changes which may have caused the site to be abandoned. The formation of the sandbar across Zafar creek mouth is dated to the 14th Century with various other parts of the creek silting up before this, with possible evidence of dredging (Zarins 2007: 310). The dating of the site is based mainly, however on the ceramic assemblage with Far Eastern ceramics providing the dating for the earlier phases and European porcelains and clay pipes dating phase IV (Zarins 2007: 314-315). The Islamic imported ceramics backed up the Far Eastern wares in dating the assemblage

with Iranian fritware being used to date phase III to 1250-1500AD. The site appears to have declined as the Portuguese, Ottoman and Mamluk incursions into the area became more regular, along with bans on trading from the city leaders (Zarins 2007: 321).

Architecture/Archaeology:

The site of Zafar has a large number of mosques in the town area, mostly in the west. Zarins notes that an earlier excavator, Phillips, counted over 24 mosques on the site, while in a more recent survey in 2005 found 55 mosques and probable mosques (Zarins 2007: 312). The majority of large buildings at Zafar are also in the west, with the eastern part of the city made up of open spaces with small walls which have been interpreted as drying areas for sardines and frankincense, although presumably not at the same time. Zarins suggests this area may be the area where articles were loaded onto overland caravans to travel across Arabia to southern Iraq (Zarins 2007: 312).

It would also appear that Zafar did have quays and jetties for the loading and unloading of trading vessels (Zarins 2007: 312), rather than relying on them running themselves aground as at most other trading sites (excepting a few examples such as Manda).

4.2.8: SHARMA (FIGURE 115 AND FIGURE 116):

Period/date range:

10th Century foundation which is abandoned in the 12th Century. Some very small reoccupation in the 13th/14th and 17th/18th centuries (Rougeulle 2003: 287)

Excavations:

French excavations 2001-2005 (Rougeulle 2003)

Site Map/plan:

Figure 115: from Rougeulle 2003: 289- fig.3

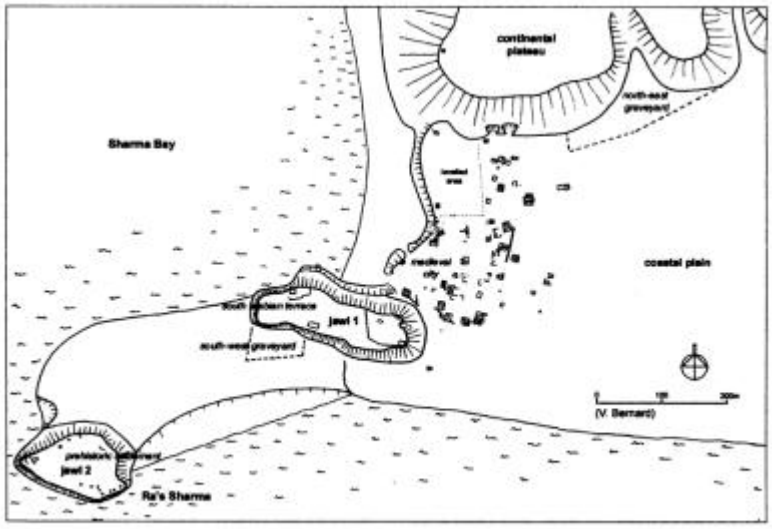


FIGURE 3. *A map of Ra's Sharmah.*

Figure 116: from Rougeulle 2003: 290- fig.4

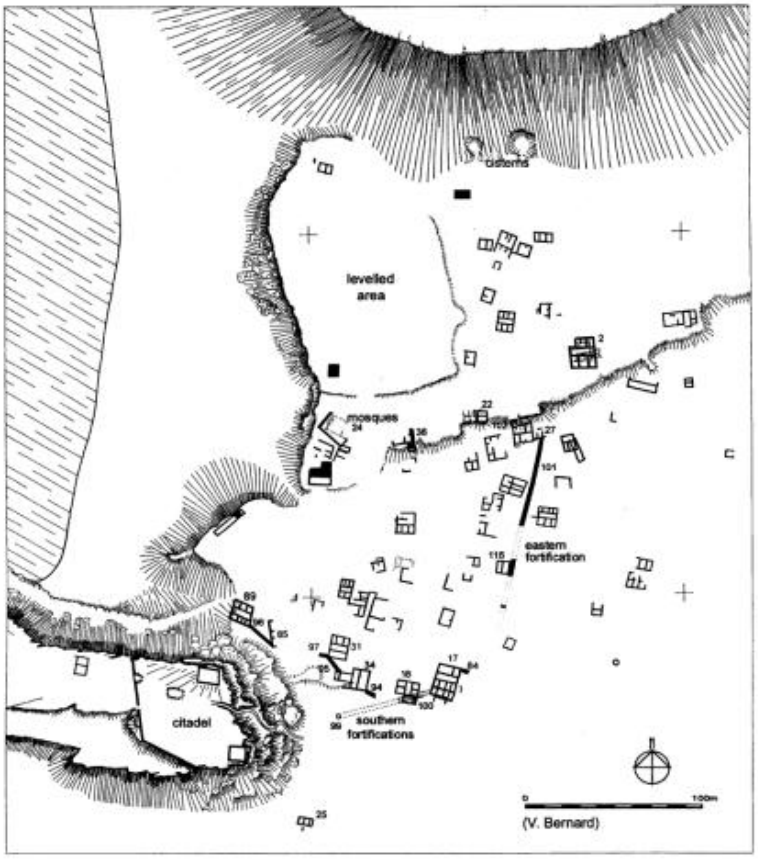


FIGURE 4. *Sharmah. A plan of the early Islamic settlement.*

Topography:

The natural defences of rocky outcrops and deep gullies clearly influenced the location of the site. The citadel to the south of the site is located on a large rock outcrop, considerably higher than the rest of the site, while to the north there is a plateau with other important buildings on it. This, in turn is bounded to the north by another high rock outcrop. To the west and to the south, there are gently shelving beaches where the trading ships would be run aground to load and offload their cargoes. Access from the western beach appears to be through a narrow gully running up onto the raised area of the site.

Dating evidence:

The dating of the site is based on the Far Eastern ceramics found, backed up by the local chronology of the more local ceramics. The majority of glazed wares are sgraffiato types, particularly hatched decoration, dating to the 11th-13th centuries (Rougeulle 2003: 295). The Far Eastern ceramics found make up 4.3% of the assemblage (Rougeulle 2003: 295) and includes the typical 10th/11th Century wares of Yue, Qingbai and Ding porcelains, with the very latest examples dating to the earlier 12th Century (Rougeulle 2003: 295).

Architecture/Archaeology:

The settlement appears to have been a fortified warehouse complex. The fortifications are mainly in the south and east (Rougeulle 2003: 290-291) with large walls running between rocky cliff faces. Inside these walls are multi-roomed buildings, while on the plateau to the north there are mosques and cisterns as well as a large levels area. The citadel to the south on a large outcrop was not investigated during the seasons in the field but does appear to have two large buildings. The warehouses are based on an axial corridor with small rooms to either side, sometimes with basement levels below (Rougeulle 2003: 293-294).

4.2.9: YADHAT KILN SITE (FIGURE 117):

Period/date range:

10th to 12th Century occupation- linked closely to Sharma

Excavations:

French excavations in 2005- Rougeulle 2007

Site Map/plan:

Figure 117: from Rougeulle 2007: 245- fig. 6

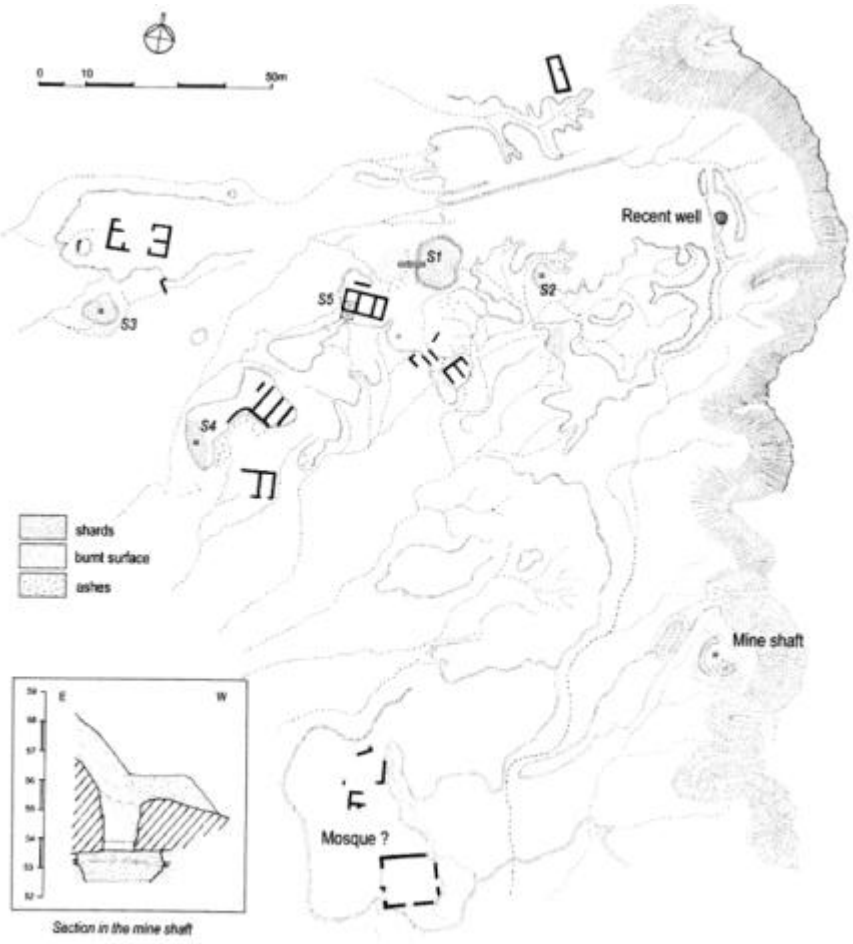


FIGURE 6. *Yadḡat: a plan of the site and the location of the soundings.*

Topography:

The site is found in the Wadi Jerbah at the base of an escarpment to the east (Rougeulle 2007: 244-245). It is approximately 17km north-north-east of Sharma inland and is on a reasonably level plateau between the wadi and the escarpment.

Dating evidence:

The dating of the site is based on the ceramic assemblage. As this is a production site for ceramics, the majority of the assemblage is made up of these local wares. These have been dated in Rougeulle's previous work at Sharma which had a high percentage of these wares alongside imported and easily dateable Far Eastern wares (Rougeulle 2003: 295). The abandonment of the site is given as the same point as at Sharma (mid to late 12th Century- Rougeulle 2007: 251) as there are no diagnostic finds other than one sherd of Mustard Ware found at Yadhat.

Architecture/Archaeology:

The site has a series of buildings of a similar size to the smallest at Sharma (Rougeulle 2007: 246) which are split into 3 or 4 rooms, lacking the axial corridor found in most buildings at Sharma (Rougeulle 2003: 293-294). There is also a possible mosque in the south of the site. Dispersed around these are waste heaps from the ceramic industry. These, Rougeulle suspects are demonstrative of 'bonfire kiln firing'- where the ceramics are piled up in the open and then covered with fuel (Rougeulle 2007: 247) as no kiln structures were found. These heaps have layers of burning throughout.

4.2.10: AL-SHIHR (FIGURE 118):

Period/date range:

Occupied from the 9th Century AD until the modern day. Rasulid city during 13th and 14th centuries AD, continuing to be major city during 15th and 16th centuries AD (Hardy Guilbert 2005: 71).

Excavations:

French-Yemeni excavations - Hardy-Guibert 2001; 2005

Site Map/plan:

Figure 118: from Hardy-Guilbert 2001: 71- fig.2

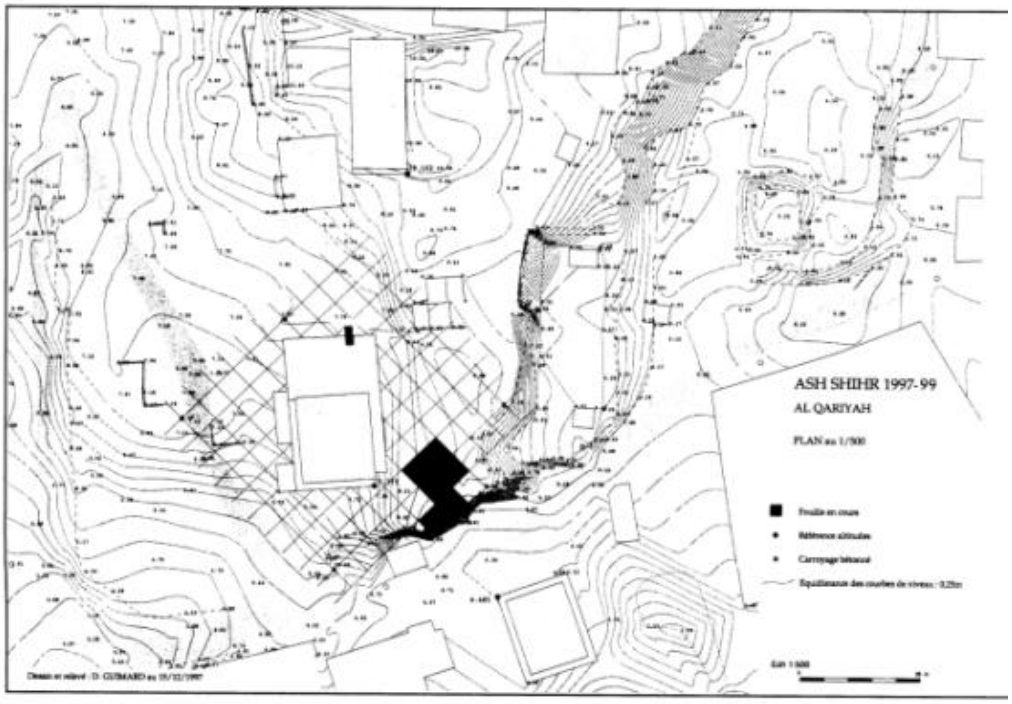


FIGURE 2. *Plan of al-Qaryah tell showing the different excavated sectors.*

Topography:

The site is on a tell above the Wadi Samun in southern Yemen (Hardy-Guilbert 2001: 70). It is on the coast but has no man-made harbour. The article does not describe the topography in high detail but the Google Earth image above shows the site to be close to the coast and to the Wadi Samun, although the mouth of this has now almost completely silted up, with a large sandbar growing from the east. The Arab writers describe it as an area of wild country which produces large amounts of frankincense but little other vegetation. (Hardy-Guilbert 2001: 69).

Dating evidence:

The dating is based originally on Arab histories and geographical writers (Hardy-Guilbert 2001: 69) and then on the ceramics found. The Arab writers discuss the port being an important port in the area from the 10th Century onwards (Ibn Hawqal and Muqaddasi in Hardy-Guilbert 2001: 69). The city submitted to the Rasulid Dynasty in the 13th and 14th centuries and stayed an

important port through into the 15th and 16th centuries (Hardy-Guilbert 2001: 69). The original ceramic dating is from both local wares such as 'mustard ware' and imports in other areas (Hardy-Guilbert 2001: 71). In later reports a Samarran horizon is included (Hardy-Guilbert 2005: 76-77), dating to the 9th and 10th centuries along with extensive examples of different styles of incense burners (Hardy-Guilbert 2005: 78-79).

Archaeology/Architecture:

Hardy-Guilbert describes a large fortification found in the tell as the 'piece de resistance' of the site (Hardy-Guilbert 2001: 71). It appears to date to before the 13th Century AD with a large amount of mustard ware. Half of this structure had been destroyed by development in recent times. The tell is covered in a layer of rubble which is then capped with a layer of a tar like substance which was used apparently as an area for drying fish and goat meat (Hardy-Guilbert 2001: 71; 74). The site assemblage contains many examples of Indian ceramics suggesting a strong contact history with Western India (Hardy-Guilbert 2005: 75). Similarly the presence of East African ceramics in the assemblage suggests contact with this region during the 11th Century AD (Hardy-Guilbert 2005: 83). Hardy-Guilbert also discusses possible traded commodities from the al-Shihr area including fish, frankincense and amber (Hardy-Guilbert 2005: 74). From this list only amber will survive in the archaeological record, so clearly at least some of the trade from al-Shihr will be invisible.

4.2.11: SHANGA (FIGURE 120 AND FIGURE 121):

Period/date range:

Early occupation with trading in the late 8th Century becoming more developed over the 9th-14th Century and then declining into the mid 15th Century (Figure 119).

Figure 119: phasing adapted from Horton 1996

Phase	Trench 6-10 phase	Date	Description
A	1,	C14: 777AD	Primary occupation
B	2, 3	9th/10th Century- C14: 851-924AD	Arrival of Islam- small timber huts
C	4, 5, 6	Mid 10th Century- C14: 939AD	Timber Hall/early Porites building
D	7, 8, 9, 10	late 10th Century- C14: 974AD	Porites Building/kiosks
E	11,	Early 11th Century- C14: 1038AD	Majority Islam- first phase of Friday mosque
F	12,	Early-Mid 11th Century- C14: 1042AD	Robbing and burning of Friday mosque
G	13, 14, 15	Late 11th - early 13th Century	Urban renewal- daub houses, Friday mosque rebuilt
H	16,	Mid to late 13th Century- C14: 1299AD	South Arabian connections
I	17, 18	Early 14th Century	Coral-rag-and-lime houses
J	19, 20	Mid-late 14th Century	Final occupation
K	21,	Late 14th/early 15th Century	abandonment

Excavations: (Dates show seasons, not publications)

Limited survey by Kirkman 1957; 1964

Clearance of overgrowth and building survey by Chittick 1967

2 sondages by Wilding 1973; 1974

Surface ceramic collection by Wilson 1978

British excavations- Horton 1996 (publication)

Site Map/plan:

Figure 120: from Horton 1996: 5- fig.4

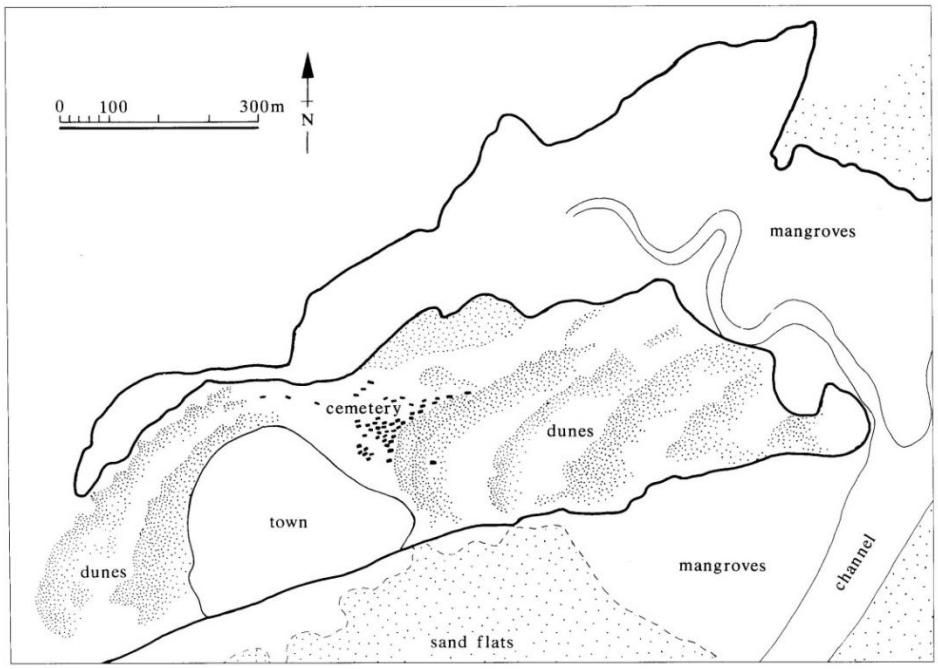
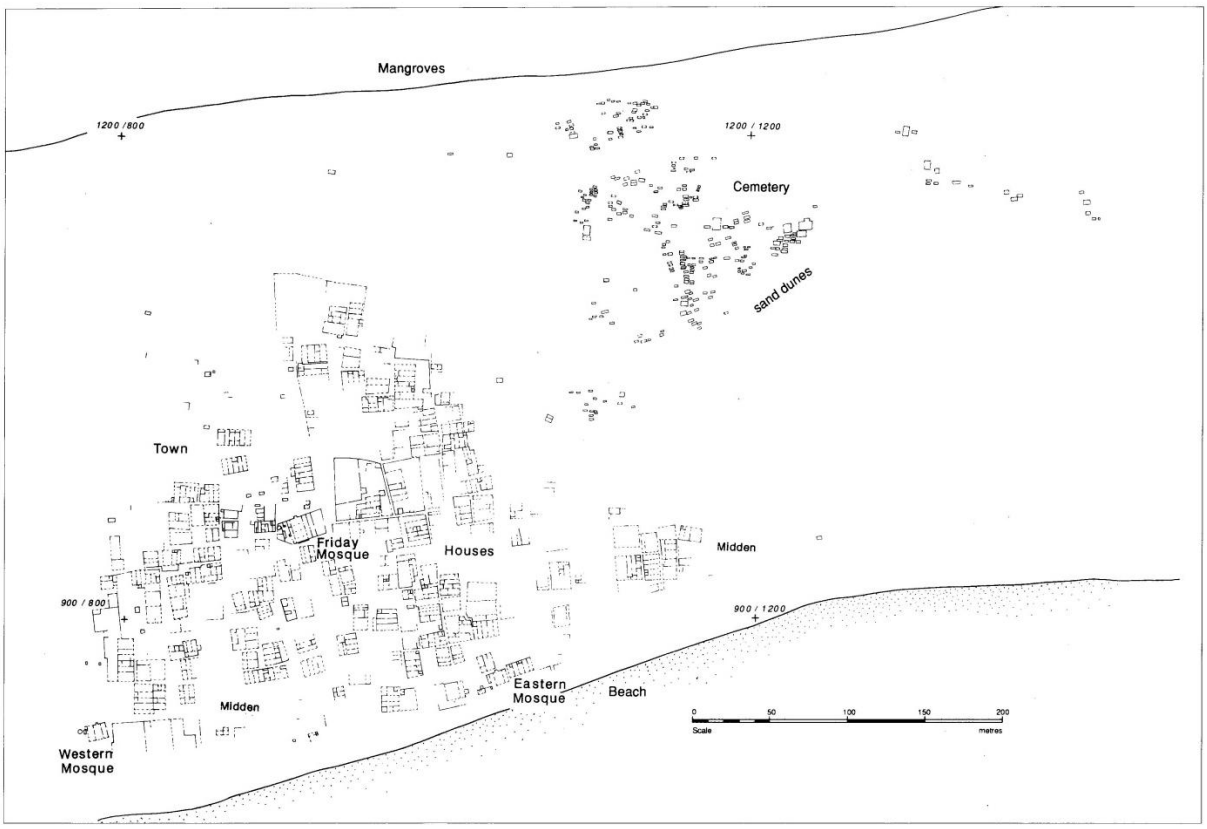


Figure 121: from Horton 1996: 9- fig.5



Topography:

Shanga is located on a coral peninsula, with a creek to the north and east and a gently shelving beach and bay to the south, with a tidal range of 3.4m. The tide retreats to a distance of approximately 2km out from the high tide mark, but on spring tides has a maximum depth of 1.5m (Horton 1996: 26). This would allow ships to come in fairly close to the shore at high tide and then unload at low tide. It is only a few metres above sea level and is covered in white sand, some of which has formed dunefields. Below the sand, and jutting through it in places is the coral bedrock, from which large amounts of the stone town is built (Horton 1996: 26-7).

Dating evidence:

Dating evidence is taken from C14 dates taken throughout the excavation, giving a tied date to most important periods (Horton 1996: 14). Horton points out that these dates are likely to be strong as they avoided mangrove wood which can produce anomalous results (Horton 1996: 14). The rest of the sequence is dated using the Far Eastern ceramic assemblage, as they are well known and dated throughout other East African sites. This assemblage is backed up by the imported Islamic ceramics which will give start/end dates for some of the phases e.g. Sasanian-Islamic ware in the earliest levels (Horton 1996: 15).

Architecture/Archaeology:

The town of Shanga was mainly built out of the two local coral stone types, with the earlier buildings (circa 900-1100AD) being constructed out of *Porites solida*, a soft, easily workable coral stone and the later buildings being built out of the tougher but harder to work coral rag bonded with a lime and sand mix(Horton 1996: 26-27). There is no evidence of in situ brick buildings at Shanga, unlike at Manda (Chittick 1984: 13) although a single yellow brick similar to those found at Manda was discovered. Horton is unsure whether this suggests a hitherto unfound brick building or is an offcast from ship's ballast. Timber was also in use at Shanga as a building material, both as doors and as roof beams. For the smaller houses, the roof beams tended to be made of mangrove trunks. However for the larger buildings, such as the mosques, other larger local woods, along with some imported true teak, were used (Horton 1996: 32).

4.2.12: MANDA (FIGURE 122-FIGURE 125):

Period/date range:

9th Century AD to 17th Century although this may be too late according to modern changes in ceramic chronology.

Excavations:

British Institute in East Africa excavations- Chittick 1984

Site Map/plan:

Figure 122: from Chittick 1984: 6- fig.3

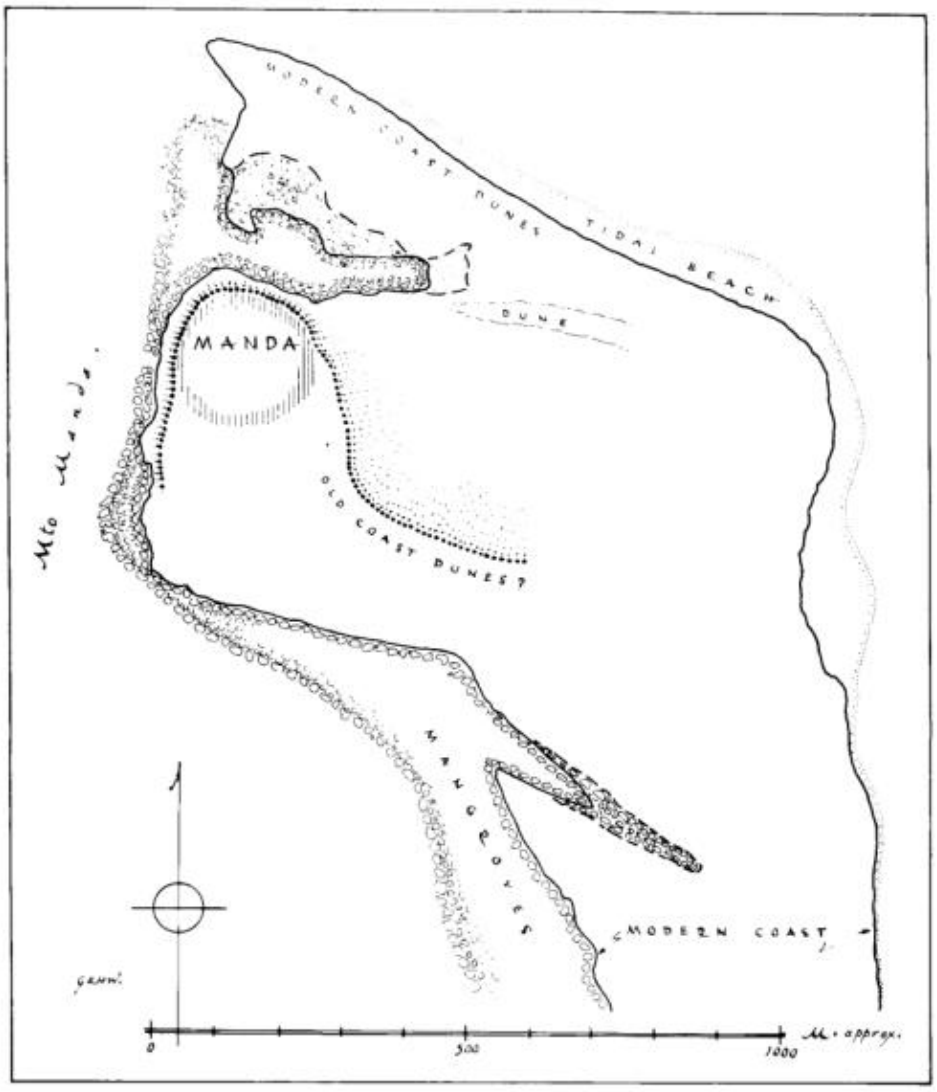


Figure 123: from Chittick 1984: 18- fig.4

Figure 124: from Chittick 1984: 20- fig.5

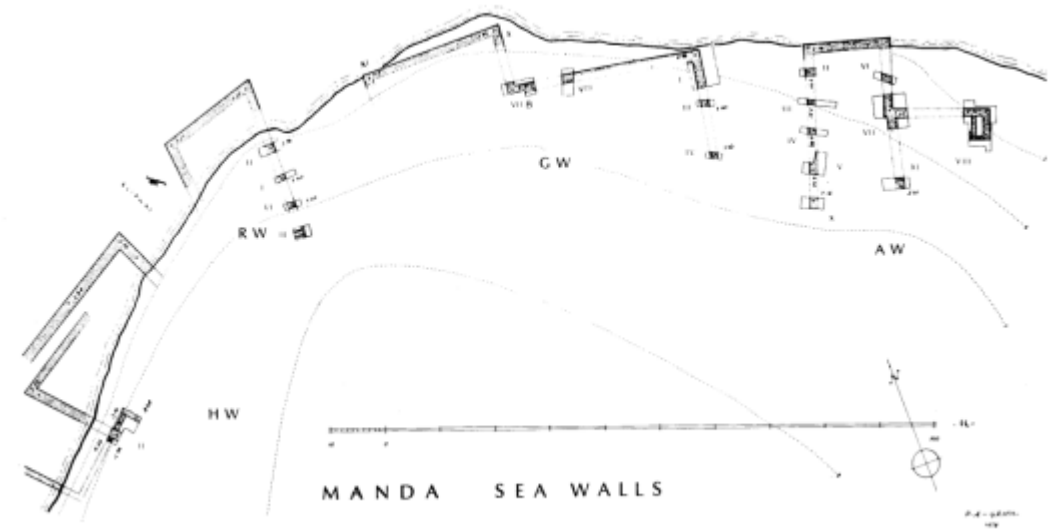


Fig. 5 The sea walls in the north-west region of the site: final stage.

Figure 125: from Chittick 1984: 46- fig.24

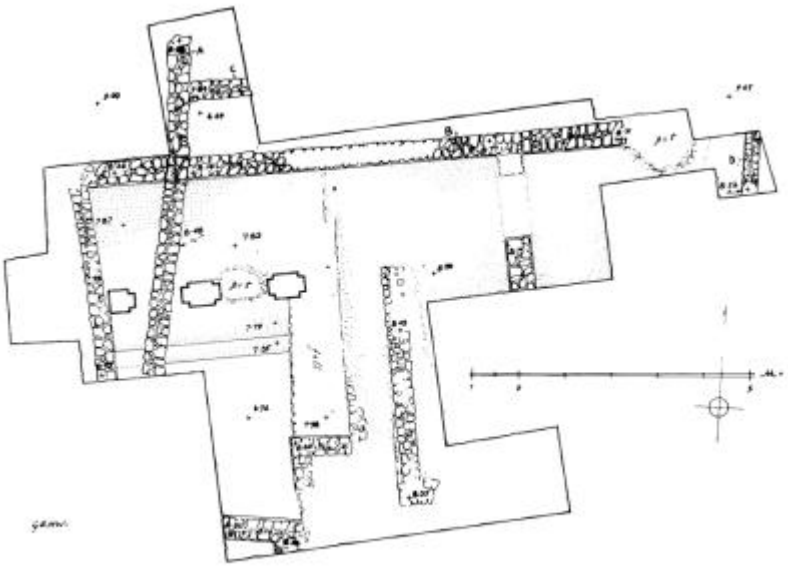


Fig. 24 Detailed plan of the House of the Sunken Courtyard.

Topography:

Manda is located on the northern coast of Manda Island in the Lamu Archipelago. The island is low-lying with mangrove swamps and dune fields (Chittick 1984: 5). The site would have been surrounded by sea on three sides, connected to the rest of the island to the east. The large creek to the west and south, the *Mto Manda,* also splits the headland which Manda is on from the other peninsulas of the island. The area around it has been built up with dunes since the occupation in the medieval period. Chittick suggests that the walls along the sea front are sea-walls for the loading and unloading of cargoes from ships, so they could unload while floating (figure 47/48; Chittick 1984: 19).

Dating evidence:

As with most sites in East Africa, the dating is based on the imported ceramics, particularly the Far Eastern wares. The earliest period is defined by Sasanian-Islamic glazed wares and Dusun jars, which then make way for Sgraffiato and Ch'ing Pai wares in phase 2 (Chittick 1984: 11). The later phases include monochrome wares (PBS/PERSIA) and celadons with some Chinese Blue and White (Chittick 1984: 12).

Architecture/Archaeology:

The buildings at Manda are made from a mix of coral rag stone and brick, which at the time of excavating was unique in East Africa (Chittick 1984: 13). Similarly to Shanga, some of the coral buildings have *Porites* coral stone, which is softer and easy to carve into a clean shape. These buildings are bonded with mortar in the best examples and with red earth in other examples (Chittick 1984:13). The presence of brick architecture led Chittick to suggest this was clear evidence of a dominant Persian merchant class who set up and ran Manda (Chittick 1984: 217). The bricks are suggested to have been brought in as ballast for ships then being loaded with trade goods for their return journey to their port of origin. It looks like this was Siraf for the early years of occupation at Manda as the bricks found at these two sites match perfectly (Chittick 1984: 15). The structures of significant interest at Manda are the sea walls which could be for either quaysides or as part of land reclamation/sea defences (shown in Figure 123 and Figure 124) and two buildings: the house of the cisterns and the house of the sunken courtyard. The house of the cisterns is an early structure, made of coral blocks with two large water cisterns in the centre of the building (Chittick 1984: 43). Chittick sees this building as more evidence of Manda being a Persian outpost as similar house styles are found at Siraf (Chittick 1984: 44). The house of the sunken courtyard (Figure 125) is again an early structure (Chittick 1984: 47), but the style of housing is common at Manda in later periods.

4.2.13: KILWA (FIGURE 127 AND FIGURE 128):

Period/date range:

9th Century to 17th Century AD- see Figure 126.

Figure 126: phasing taken from Chittick 1974a

Phase	Date	Description
Ia	9th Century (?) to c. 1000	Early Islamic period- presence of Sasanian-Islamic ceramics
Ib	c. 1000 to late 12th Century	Late Early Islamic- Introduction of sgraffiato ceramics
II	Late 12th to late 13th Century	Start of stone architecture, introduction of coins
IIIa	late 13th Century to c. 1400	Start of Ahdali dynasty rule- new local ceramic forms and coins
IIIb	c. 1400 to c. 1500	Development of IIIa seen in change to local ceramics
IV	16th to 17th Century	Start of Portuguese rule- decline of stone building quality and quantity
V	18th to 19th Century	New stone buldings relating to French commercial trading- limited knowledge of this period.

Excavations:

British Institute in East Africa excavations- Chittick 1974a; 1974b

Site Map/plan:

Figure 127: from Chittick 1974a: map between p8-9

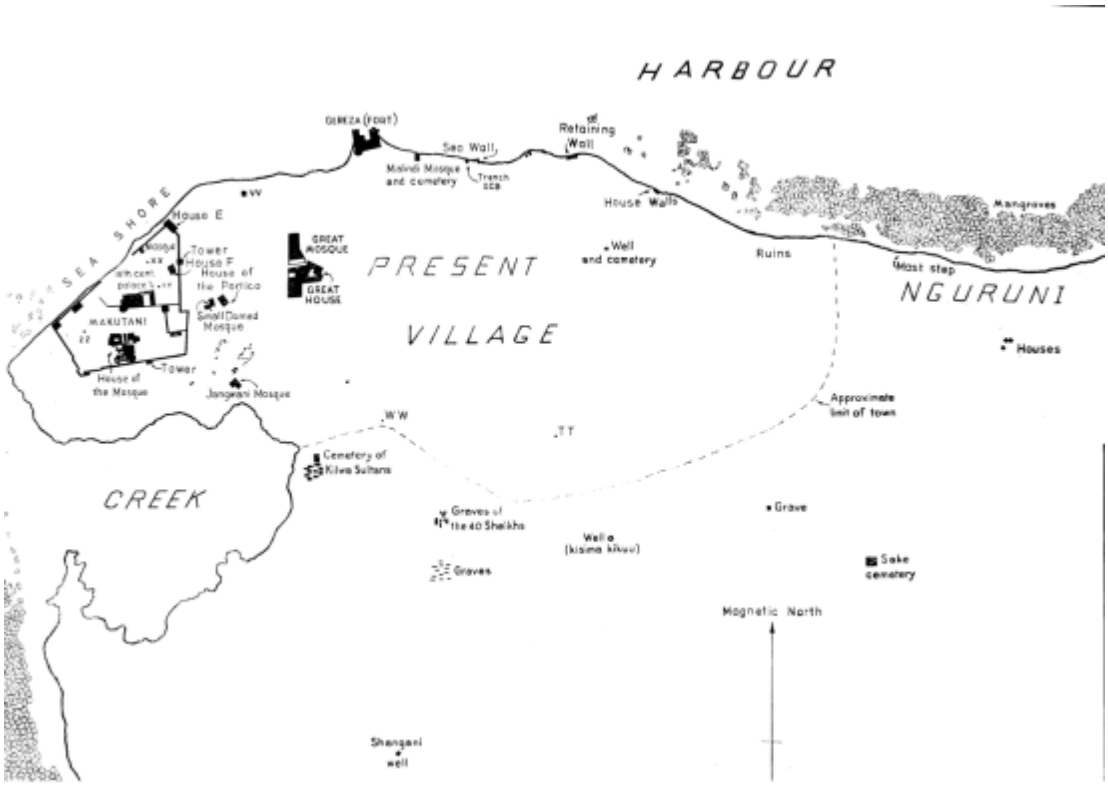
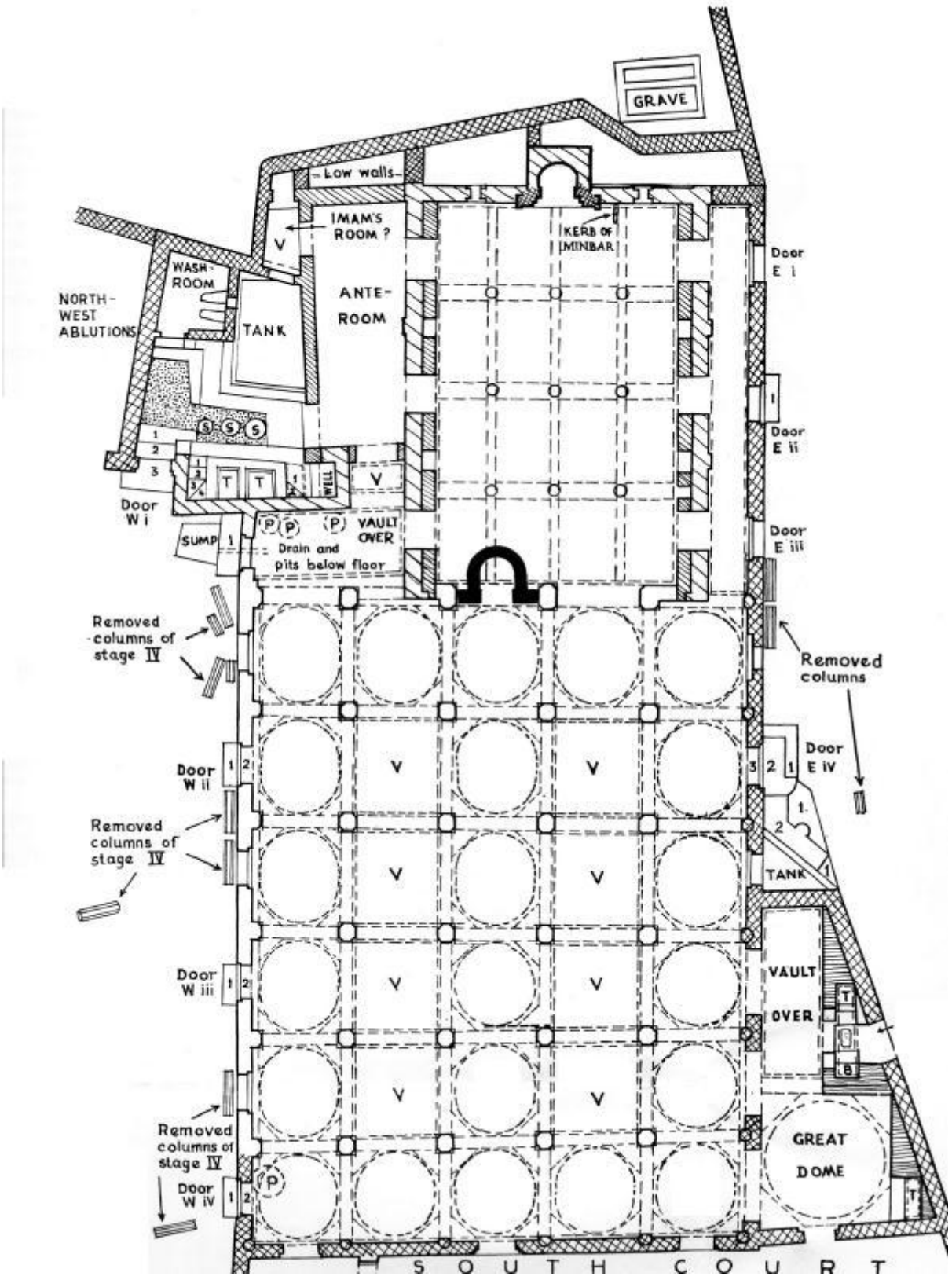


Figure 128: from Chittick 1974a: 64



Topography:

Kilwa Island is approximately one mile off the East African coast. To the north is a deep water channel and to the south and east are sheltered bays, protected from the open ocean by Kilwa and Songo Islands. These are described by Chittick as some of the best deep water harbours on the East African coast (Chittick 1974a: 8). The island itself is low-lying and the area of occupation is around a small bay/creek in the west coast of the island with a gently sloping beach where the trading ships would beach themselves to load/unload cargoes.

Dating evidence:

In comparison to other East African sites, Chittick suggests that the quality of the Far Eastern ceramics is so poor that it is difficult to give precise dating (Chittick 1974a: 19) and so the majority of the dating comes from the architectural changes rather that Far Eastern ceramics and the Islamic glazed wares from the Arabian Gulf. The only phase that is dated by finds alone is the earliest, which contains Sasanian-Islamic ware, gradually being replaced by sgraffiatos into the next phase. The original dating of wares is fairly close to modern chronologies, with the sgraffiatos belonging to 11th/12th Century contexts and the monochrome (PBS/PERSIA) being introduced later in the 14th and 15th centuries. Black and yellow glazed ware is also found, and dating to the early 14th Century. There is a historical document called the Kilwa Chronicles which deal with the town at the point of Portuguese take over in 1502AD (Chittick 1974a: 13). These give a loose dating to the site before this but are more of interest for understanding the commercial dealings of Kilwa. These describe the settling of Kilwa by Shirazi princes and their subjects in a somewhat legendary way- six brothers and their father set sail in seven ships and settle at seven different locations between a site suggested to be Manda in the Lamu Archipelago and the Comoros Islands. Chittick takes this to be a mystification of a genuine movement of Shirazi people to East Africa, but whether they founded new trading ports or took over/integrated into old ones is a subject of discussion (Horton 1986: 419-420).

Architecture/Archaeology:

The site is made up of a large number of stone and coral buildings, with tomb complexes to the south and east of the main occupation. The most impressive building on the site is the Great Mosque, which covers a large area and is built of rough coral stone (Chittick 1974a: 61). It is made up of a large wooden pillared hall with an unroofed ablution area to the west (Chittick

1974a: 63). The southern part of the mosque is different in style to the northern area with octagonal stone columns supporting a roof of mixed domes and vaults (Chittick 1974a: 64) made of lime concrete, while the walls are made of "random rubble". This area is approximately 4 times the size of the northern mosque area and is considered to be a later phase of architecture (Chittick 1974a: 64-67). The rest of the site is made up of similar buildings- some such as the Great House to the south of the Great Mosque have similar architectural features to the mosque. There is no visible evidence of the sea walls which were found at Manda (Chittick 1984: 19)

4.3.1: Sites in the Indian Sub-continent:

The ceramics assemblage for specific sites in Western India is problematic, due again to publication issues. However some evidence is available, although the majority of this for the period 1250-1550AD is through work completed by the National Institute of Oceanography in Goa. The main area of interest is that around the Gulf of Khabhat (formerly Cambay) and the site of Ghogha. This evidence is brought together through both use of the historical records and through underwater/inter-tidal survey around the Khabhat coastline e.g. Gaur *et al* 2009; Gaur and Bhatt 2008; Gaur 2010. These surveys have discovered a large number of stone anchors, the vast majority of which are of a design associated with Indo-Arabian shipping. However one significant example is made from a rock type identified as East Asian and of a design linked to Japan, Eastern China and Korea during this period, demonstrating the presence of a mixture of different regions shipping in this area (Gaur 2010: 151). Associated with these particular anchors, although the assumption that they relate to a similar deposit is not concrete, are 14th Century AD Persian glazed wares and an example of a water transport jar type originating from Hormuz (Gaur 2010: 151-153). This small assemblage makes up the published evidence available for Islamic ceramics in this area, although it is undoubtedly true that there is more around. The evidence of large numbers of Indian ceramics on sites like Qalhat and Julfar al-Nudud, along with the historical documentation discussing trade with the land of Sind shows a regular contact between these two areas. Sadly until a large scale investigation of ceramics from the West Indian coastline is made, it is difficult to bring this area into the study using the same quality of physical evidence to allow close study with other locations.

4.3.2: SITES IN THE RED SEA:

Similarly to sites excavated in the Indian Subcontinent as discussed above, the Red Sea, despite having been a rival to the Arabian Gulf as a link between the Mediterranean and the Indian Ocean and containing some important trading port, has not as yet had a site published with suitably in depth analysis of the ceramics. Sites such as Quseir al-Qadim, Aydhab, el-Tur and Suakin despite being both important trading towns for the Egyptian Caliphs and embarkation ports for those in North Africa going on the *Hajj* pilgrimage (Breen *et al* 2011: 209), have no published ceramic assemblage. Never-the-less it is clear that these ports, and indeed the Red Sea in general, formed a vital arm of Arab trade within the Indian Ocean. A fine demonstration of this are the surviving documentation assemblages from Quseir al-Qadim (Blue and Peacock 2006) and el-Tur (Kawatoko 2005) which demonstrate the international significance of the trade conducted in the Red Sea. The assemblage from el-Tur includes documents dating to the 14th-16th centuries AD discussing the spice trade from South East Asia, something usually invisible in the archaeological record. Alongside this are ceramics from the Arabian Gulf, Turkey, Palestine and South East Asia, demonstrating either a large local market for such goods or the remains of vessels broken on route to other locations- the detritus of the international ceramics trade (Kawatoko 2005: 854-5). Suakin, with its sheltered bay and central island was not only a major trading hub for goods from Egypt, India and the Far East but also controlled much of the movement of pilgrims to Mecca and Medinah (Breen *et al* 2011: 209) In many ways therefore, it is clear that the Red Sea was as important a corridor of international trade as the Arabian Gulf; indeed during some periods of unrest in the Gulf or stability in the Red Sea, it was the prominent route of commerce. The work on non-ceramic artefacts has demonstrated this. However the lack of any published ceramic assemblages from this area makes it difficult to include in this thesis.

4.4: OVERVIEW OF CHAPTER FOUR:

This chapter has brought together a catalogue of important sites around the Western Indian Ocean which are applicable for comparison with Julfar al-Nudud. These cover areas in the Arabian Gulf, the Southern Arabian Peninsula and the East African seaboard as well as identifying sites in the Red Sea and Indian sub-continent which will not be further analysed due to a lack of data. Some of the sites partially pre-date the occupation of Julfar and so give the

project a continuity of trading sites across the Indian Ocean from the 8th Century AD until the collapse of the Hormuzi trading empire in the 16th Century AD. These early sites are still useful for comparison due to their similar function to Julfar of international trade, at least partially in ceramics and their contents. Not all of the sites identified have published assemblages which can be compared to the Julfar al-Nudud ceramics. This is generally due to a lack of complete, or even partial, publication which remains a serious issue for those working in the Middle East, Indian sub-continent and East Africa. Current scholarly interest is pushing more of these sites to either re-examine their assemblages where possible with a view to publication (Priestman's current work on the Siraf ceramic assemblage- Kennet pers. comm.) or conduct new excavations to provide a new dataset which can hopefully be tied into the earlier information as with Wynne-Jones' work in East Africa (Wynne-Jones pers. comm.) or recent work at Mantai (Bohingamuwa pers. comm.). Hopefully this new stress on quantifying assemblages as standard will allow a more extensive analysis in the future, when the whole Indian Ocean area can be analysed. However, on current data it is difficult to make conclusions with full confidence.

This brief gazetteer of sites has identified those with strong data and those which lack it; chapter five will look into the second category of sites while chapter six will analyse the quantified assemblages.

CHAPTER FIVE: THE UNQUANTIFIED ASSEMBLAGES

5.1: TRADE IN THE INDIAN OCEAN- A BASIC COMPARISON OF ASSEMBLAGES BASED ON WARE AND RIM TYPOLOGY:

This chapter will concentrate on the site assemblages noted in chapter four and discuss their similarities with that of Julfar al-Nudud, analysed in chapter three. This chapter represents a basic comparison of similar wares and rim types between the assemblages, not for similar or dissimilar quantities of these wares. This is because the majority of published reports lack numerical data for each ware found, and in most cases do not have any numerical data at all, falling back on phrases such as "a quantity of this type was found". This is a major failing in the majority of the written record for Indian Ocean ceramics. However, it can be partially rectified as the majority of the reports which have a paucity of numerical records do have a good quantity of drawings recording rim types and basic wares. A good example of this is Frifelt's 2001 *Islamic Ceramics from Bahrain* which contains over 250 drawings of different vessel forms (although infuriatingly no actual data for number of vessels found). A second way of presentation is used almost exclusively in Priestman's 2005 work on the Williamson Collection where each ware, including sub-wares is presented as a colour slide. While impractical for most reports, as the price is high for colour plates, it does give an important visual aid to those trying to connect their assemblage in to the wider Indian Ocean context. Figure 129 shows the sites looked at in this chapter. Site reports from Julfar in bold will not be discussed as there is very limited evidence published. They are included to show a complete catalogue of the Julfar excavations to date.

Figure 129: The unquantified published assemblages

Site name	Assemblage size	Author	Notes
Julfar al-Mataf, U.A.E.	Unknown- probably similar size to modern al-Mataf assemblages	Hansman 1984	Some from survey collection. Includes areas to north of main site occupied in 17th Century AD. First modern large scale excavation at Julfar with published drawn assemblage.
Julfar al-Nudud (Iraqi) U.A.E.	**Unknown**	**Taha 1975**	**Short publication in Arabic in *Sumer*. Coin from Mogadishu discussed in Hansman 1985.**
Julfar al-Mataf (French) U.A.E.	**Unknown**	**Hardy-Guilbert 1991**	**Currently unpublished assemblage. Brief discussions in early reports. Full publication is expected soon.**
Julfar al-Mataf (German) U.A.E.	**Unknown**	**Vogt 1991, Franke-Vogt 1996**	**2 short reports in PSAS. Very little detail- no ceramics drawings, no real description of finds- suggestion that little was found.**
Ghagha, U.A.E.	Small- unknown exact numbers	King and Tonghini 1999	Small assemblage from survey and limited excavation. Wares are described and in some cases illustrated.
Qala'at al-Bahrain	Suspected from reports to be similar or larger than Julfar assemblages. Unknown	Frifelt 2001; Kervran *et al* 2005	Both reports have large numbers of ceramics drawings. Frifelt describes different wares. Beyond this little information. Excavated assemblage- mixed between French and Danish expeditions.
Al-Shihr	Unknown	Hardy-Guilbert 2001; Hardy-Guilbert 2005	Both reports show some ceramic drawings but little other information for the assemblage. 1995 report has more information. Excavated assemblage.
Kilwa, Tanzania	Over 1 million sherds reported. Vast majority are East African wares- probably local to	Chittick 1974a; 1974b	Large assemblage- finds published in 1974b. Appears to have large numbers of imported glazed, Far Eastern and Indian wares as well as some Gulf ceramics. Limited knowledge of exact numbers.

Site name	Assemblage size	Author	Notes
	Kilwa but unknown.		Excavated assemblage.
Manda, Kenya	Approximately 250000 sherds	Chittick 1984	Only imported ware assemblage published numerically- most of this is estimates. No phased data and no published numbers for Indian wares although they are present.

Similarly to the previous chapter, this discussion will start with sites in the Arabian Gulf before covering the sites in Oman/Yemen and then the East Africa seaboard. The first site to be considered is Julfar- specifically the first major excavations at the site by Hansman in the 1970s.

5.2: BREAKDOWN OF ASSEMBLAGES

5.2.1: JULFAR (HANSMAN EXCAVATIONS)

Period:

14th-17th Century, with some 18th Century AD sherds.

Approximate size of assemblage:

1000+ Far Eastern sherds, unknown numbers of other ware families although the large number of different rim forms of Julfarware and other earthenwares suggests a large assemblage.

Quality of analysis:

The analysis is mostly based on a discussion of the assemblage, containing very little numerical data for any of the ware families. The majority of the assemblage is illustrated well, with examples of rim forms for all ware types.

Far Eastern ceramics:

The report only gives vague numerical data for the Far Eastern ceramics with over 1000 being found in the excavations and the field survey across both al-Mataf and al-Nudud (Hansman 1985: 25-34). This is a mix of Longquan celadon (LQC) with 111 sherds and Chinese Blue and White (CBW) with over 800 sherds, with some other wares in smaller numbers including the

southeast Asian imitation celadons. The majority of the dating of the sequence was made on the basis of these ceramics, which are mostly from surface pickup (*Ibid:* 3) on both sites. This would explain why much of the site dating is skewed to a later date than is currently suspected with the decline and abandonment being placed in the 17th Century. Hansman also identifies Swatow sherds in the later sequence which he used to demonstrate occupation during or after 1550AD (Hansman 1985: 91). However the few sherds found are unreliable- as Kennet points out (2003: 116-7) the Swatow sherd in Phase III is almost certainly intrusive as it lies in a water eroded gully and the sherds from phase V are very close to the intersection with phase VI which is the phase after the abandonment of the mosque. It is therefore likely that the abandonment of the mosque falls before the introduction of Swatow in the mid to late 16th Century.

Indian ceramics:

Hansman locates some of the deeply incised wares generally seen to be Indian wares from the South-West coast of the sub-continent, as coming from East Africa, based on a site report from Fort Jesus by Kirkman (Hansman 1985: 49). This is possibly true of illustration d (Hansman 1985: 50-51 fig. 11) which has a similar rim termination to East Africa ceramics of the time.

Local unglazed ceramics:

The Julfarware industry appears to have flourished with the rise of Julfar as a trading port (Kennet pers. comm. 2011). Hansman's report details the major sub-wares in this industry as well as a solid typology of rim forms. These include the bowl and jug forms of the red and white painted Julfarware (JULFAR.RW) and the storage and cooking pots of the unpainted Julfarware (JULFAR). However Hansman catalogues the other Julfarwares (purple painted-JULFAR.PB, and the hard thin black (JULF2/5) fabric as imported wares. In the chapter on local ceramics Hansman discusses a possible chronology for the painted wares. The earliest decorative style is found in phase II on everted rimmed bowls with wavy line decoration around the rim and flowing into the centre of the bowl (Hansman 1985: 61). This decoration is also found on some wide-mouthed jars in slightly later phases (III). Hansman then identifies a transition phase of decoration in the later part of phase III which includes both wavy and straight lines on two examples of bowls. Following this in level IV, the decorative style is based entirely on straight lines (Hansman 1985: 61). He also notes the fringe and tassel decoration on the large pouring vessels found exclusively in the red and white painted Julfarware which is illustrated in figure 17 a (Hansman 1985: 74-75). This is also used on the bridge spout jugs although the decoration on these develops over time from the fringe and tassel to a chequered cross hatched design (Hansman 1985: 74-75 fig. 17- c and h).

Foreign unglazed ceramics (Gulf):

There is no mention of imported earthenwares from the rest of the Gulf, other than the "Persian imports" discussed in the glazed ware chapter (Hansman 1985: 54-55)which are almost certainly Julfarwares (JULFAR.RW and 4 vessels) and illustrations of cream ware water tobacco pipes (Hansman 1985: 50-51 fig. 11 g-i).

Glazed ceramics (Islamic):

Hansman splits the glazed assemblage into three sub-catagories: imitation celadons (Hansman 1985: 52); Khunj glazed earthenwares (Hansman 1985: 52-53) and frit wares imitating CBW (Hansman 1985: 53-54). The first clearly includes the blue speckled ware (Monochrome in Chittick 1974b; 1984, PERSIA in Kennet 2004 and Priestman 2005, PBS in Saunders in press) which is illustrated in figure 12- a, d, g and h (Hansman 1985: 56-57) and dates it to the 15th and 16th Century (Hansman 1985: 52). This is one of the few wares to which Hansman gives an exact figure for- 58 fragments were found across the site (Hansman 1985: 52) of which the vast majority (45) were from bowls or basins. There is no exact number for either the Khunj ware or the Persian frit wares found although Hansman does give figures for the amount of Khunj (30 sherds) found at the "Persian Camp" (Hansman 1985: 53) in order to back up his conclusion. He argues against the manufacture of Khunj wares in Oman, suggesting that the kilns at Khunj are the only location of production (Hansman 1985: 53). Hansman concludes that none of the frit ware vessels found date to before the 16th Century and mentions a number of 18th Century examples of tea cups, although these are generally found on neighbouring sites (Hansman 1985: 53-54). The typical ring base of small frit ware bowls can be seen in figure 13- b, c and e (Hansman 1985: 58-59). Hansman includes a selection of earthenware bowls and pots in this section as he suspects they are of Persian origin (Hansman 1985: 54-55). However the drawings (Hansman 1985: 58-59 fig. 13- k-v) clearly demonstrate that they belong to the red and white painted Julfarware (JULFAR.RW) and the purple painted Julfarware (JULFAR.PB) traditions.

General comments:

This report into Julfar provided the first solid typology for the site, and illustrates a wide range of the ceramic vessels found at the site. The lack of any numerical data for the wares is an irritating omission but is typical of the excavation reports from the 1970s and 1980s for this area. Chittick published Manda and Kilwa in a very similar manner (Chittick 1974a; 1974b; 1984). The subsequent excavations at Julfar have brought together Hansman's typology with numerical data for the assemblage and this has allowed some reconstruction of the economy of the site that can be reflected in the ceramics.

Unsurprisingly the Hansman assemblage contains very similar wares to the ND10 assemblage, although the amount of Far Eastern ceramics is probably representative of the collection strategy, rather than a large FE assemblage at al-Mataf. This is backed up by the Julfar al-Mataf British excavations and their assemblage, which will be discussed in chapter six.

5.2.2: GHAGHA, ABU DHABI ISLANDS ARCHAEOLOGICAL SURVEY

Period:

5th-16th centuries AD, Some evidence of later occupation

Approximate size of assemblage:

Unknown size but descriptions suggest low numbers of earthenware ceramics and almost no glazed sherds.

Quality of analysis:

No numerical data is published, and the report is more concerned with the architecture and general history of the sites than in the ceramic assemblage. The brief descriptions of the main wares allow an informed guess at the wares found but no more, which when coupled with some of the ceramic drawings published (e.g. King and Tonghini 1998: 133- fig. 4 (d)) suggest known wares, such as CRWW.

Far Eastern ceramics:

Only isolated sherds found (King and Tonghini 1998: 136). This would back up the suggestion that the site is a low-key pearling and farming site connected to but not within wealthy areas of the Gulf.

Indian ceramics:

None found. This would suggest a lack of contact with the Indian subcontinent or with those who have contact with the subcontinent, or a lack of Indian sailors/merchants occupying the island.

Local unglazed ceramics:

There does not appear to have been a ceramic industry on Ghagha. All ceramics are therefore imported.

Foreign unglazed ceramics:

The assemblage is made up of four main wares which can be identified as wares found in other studies (Kennet 2004; Priestman 2005; Saunders in press). There are examples of Julfarwares in period IV (which runs approximately from the 5th- 16th Centuries AD) as well as wares likely to relate to CRWW (site G- cream slipped red ware), BAH (site G- thick dark brown ware with yellow explosions) and BUFF (sites F and G- buff ware) (King and Tonghini 1998: 132-133). This would suggest that the islands were linked in to a local trading system

Glazed ceramics:

None described.

General comments:

The site appears to have a utilitarian assemblage of imported earthenwares, probably dating to the 14th and 15th centuries, all from the Gulf. This would back up the idea that the nature of the sites found relates to limited occupations for industries such as pearling and guano extraction which would have their main bases on land. High quality ceramics and traded items from further parts of the globe would diffuse down from the large ports, such as Julfar, which imported them, and these glazed wares would be unlikely to make their way to small industrial communities. The presence of both Bahraini and Julfar unglazed ceramics could demonstrate that the island was used by fleets from both areas, but as these wares appear to be common through the whole southern Gulf, this is difficult to prove.

5.2.3: Qala'at al-Bahrain (Danish and French missions)

Period:

12th-16th Century AD (main occupation of fort 12th-14th Century, occupation of village 14th-16th Century AD)

Approximate size of assemblage:

Unknown but is from over 30 years of excavations in a ceramic rich site (Frifelt 2001 shows this with extensive ceramics drawings). Extensive examples of various wares and rim types would suggest that the assemblage covers all wares and the majority of rim forms existent during the historical occupation of the site.

Quality of analysis:

There has been no published numerical data for the assemblage, in either the French literature for their excavations (Kervran *et al* 2005) or the earlier compendium by Frifelt (2001). This latter report describes in detail the finds from Bahrain. The ceramic section of this work is extensive in terms of the drawn examples of wares and rims, allowing some comparision with other sites in terms of wares/rims present. However the complete lack of quantifiable data holds both of the studies back.

Far Eastern ceramics:

The Chinese imports from all of the periods covered, however could not be produced locally to the same quality, and so there are a wide range of wares and vessel forms, with approximately 50% being celadons, 20% Chinese blue and white and 22% green glazed and brown glazed stonewares making up the majority of the assemblage. All of the CBW dates to the 16th Century occupation (Kervran *et* al 2005: 307) and all of the celadon is suspected to have come from the Longquan kilns dating to between the 14th and 16th centuries. This small but important assemblage is seen to reflect the increase in trade with China and the Far East over the 12th to 16th centuries, with the majority of the sherds dating to the 13th and 14th centuries, at which point Qala'at al-Bahrain appears to have lost its frequent trade with the east, until the Hormuzi-Portuguese reoccupation in the 16th Century.

Indian ceramics:

The majority of cooking pot rim types illustrated are Indian wares from Gujarat or elsewhere on the west coast of India (Kervran et al 2005: 322-323 Fig. 135: 3-8). The Indian wares have similar rims to some of the Indian vessels found at Julfar and suggest a connection with north-west India. The presence of these wares may be due to the presence of Indian merchants and seaman, as personal items, or if they are more numerous, may show trade in ceramics or their contents (as these are cooking vessels, the former would be more likely). As no numerical

information is published for this, it is impossible to form any conclusion beyond contact with Gujarat.

Local unglazed ceramics:

The site at Qala'at al-Bahrain has a large number of vessel types which appear to only be found on Bahrain. This is particularly true of the basin forms (Kervran et al 2005: 318-321) which are made from local Common Ware. These vessels are suggested to have been made by coiling and are meant to be tableware or food preparation. The Common Ware is also found in other forms, some of which are found at Julfar, although these are the storage and transport rim types (NG4 in Saunders- see chapter three), which are thought to have contained date honey (or dibs) for trade. Not all versions found at Qala'at al-Bahrain are found at Julfar- indeed from the rim types found, only one out of over ten different vessel forms illustrated (Kervran et al 2005: 324-327). The Common Ware industry in Bahrain appears to be of a similar function to the Julfarware industry in Ras al-Khaimah, with table wares and storage wares all being found. In terms of cooking ware, however, very little appears to be made out of Common Ware. Only two cooking pot forms of local vessels are illustrated (Kervran et al 2005: 322-323 Fig. 135: 1-2). The QaB assemblage discussed in Frifelt 2001 also contains large quantities Common Ware water or storage jars which are also common in the al-Nudud assemblage (LIME). With similar rim forms (NG2 and 4), it is clear that this type of vessel, local to Bahrain, was exported to Julfar, although whether it had any traded contents or was just taken as a vessel is unknown. These vessels are often found with 'flat covers of the same ware', which has been taken (Frifelt 2005: 63; 65) to make them water containers with a lid to stop the loss of water through evaporation. They are a late ware at QaB, making them date to the 14th Century, a date which ties in well with their presence at al-Nudud. BAH ware, found at al-Nudud and named as a Bahraini transport/storage jar ware is found at QaB with examples showing the distinctive 'two cord handles' which attach high on the neck of the vessel.

Foreign unglazed ceramics:

There is also clearly contact with south-western Iran, with a varied assemblage of forms of Common Buff Ware (BUFF in Saunders, WHITE in Kennet 2004, Hormuzi/Minab ware in Frifelt 2001) which are described as local in the report (Kervran *et* al 2005: 314-317) but probably are the same as the Hormuzi ware vessels mentioned in Kervran et al 2005: as well as some moulded pieces which are probably fragments of pilgrim jars which are found throughout the Indian Ocean (Chittick 1974: 383; Horton 1996: 299). Frifelt illustrates a number of Julfarware 1 vessels (Frifelt 2005: 87-89 Figs. 147 and 148) and Julfarware 4 rim types (*Ibid:* 89-91 Figs.

149, 150 and 153) assigning them a local or Indian origin, but does suggest a link to Ras al-Khaimah. The examples shown make it evident that the majority of this ware and the rim types illustrated are Julfarwares 1, 2 or 4. This would suggest, as mentioned above, that ordinary cooking wares in Qala'at al-Bahrain were generally imported from Julfar. JULFAR.RW vessels are catalogued as a separate 'Omani' ware with illustrations demonstrating the characteristic red painted stripes on cream slip (Frifelt 2001: 94-95). Other painted examples found at al-Nudud in very small amounts but in larger numbers at Qala'at al-Bahrain (QaB) are the geometrically painted 'Syrian' wares (Frifelt 2001: 92). These include a rectangular incense burner similar to the one example found at al-Nudud (FINCW) and have similar designs and fabric to the ROB class which only had two examples at al-Nudud. This would back up the claim by Frifelt (Frifelt 2001: 92) that Bahrain was part of both trading spheres for these ceramics but Syrian ware was rarer the further east from Bahrain. Frifelt's report also discusses Hormuz/Minab storage jars which are bulbous spherical jars with a distinctive rim feature (Frifelt 2001: 96-98). These appear to correspond directly to BUFF ware and to rim types NG1, 3 and 9, which given the large percentage of the assemblage made up by this ware (and its sub-wares MICA and STWW) points to a close link with Hormuz- well known in historical texts and now evident in the ceramic assemblage. Hormuz 'textile' pottery (Frifelt 2001: 96-98) shows the same decorative techniques and patterns found in the WIW/BIW ROUL decorated sherds found at al-Nudud and gives a locality to their production on the North coast of the Straits of Hormuz where Stein found the kilns for this ware (Stein 1937). This would again suggest a 14th Century AD onwards dating for this ware. Examples of the WIW/BIW WAVE decorated sherd found at al-Nudud are also present at QaB, where they are known as fine cream ware. Frifelt proposes that they are sherds from Mosul jugs (Frifelt 2001: 79-83). The decorative style OTHER when found on Fabric 3 sherds of WIW/BIW at al-Nudud is also evident in the QaB assemblage, and appears to be restricted to Mosul jug types with strainers, known as Hama jugs. Similarly Frifelt mentions a sand tempered red ware with cream slip and occasional wavy decoration which corresponds to the CRWW found at Julfar (Frifelt 2001 71-72). The original rim types found (SJ1 and 2) are found in the pre-Portuguese period at QaB and date to the 14th Century. The later large storage amphora which have large long handles similar to those found at al-Nudud are dated to the Portuguese period at QaB with certainty (Frifelt 2001: 77-78), which corresponds to the 15th and 16th Century at Julfar. The excavations also looked at the Portuguese period at QaB and showed that some wares continued but changed their vessel types and styles- the most obvious being the cream slipped red ware (CRWW in the Julfar al-Nudud report) which before the Portuguese takeover was used for bulbous short necked storage vessels (*Ibid:* 71) but then afterwards morphed into a high-necked three handled amphorae style of vessel (*Ibid:* 78). This

is possibly due to the Portuguese need for vessels more suited to long-distance seaborne transport in the rougher high seas around the Cape of Good Hope- their only route back to Lisbon (Boxer 1991: 47), rather than the relatively calm seas of the Gulf and, in good weather, of the Northern Indian Ocean. The Hormuzi-Portuguese re-occupation ceramics assemblage mostly post-dates the abandonment of Julfar but includes an example of Julfarware 1 rim type J1 (Kervran *et al* 2005: 380 Fig. 172: 4).

Glazed ceramics:

The glazed assemblage contains a large number of forms which are not found, or are not common at Julfar, with a large number of carinated under-glazed painted bowl forms and no examples of Persian Blue Speckled vessels (Kervran *et al* 2005: 312-314). The number of local glazed wares and vessel forms does outweigh the number of Iranian glazed examples, again suggesting that the ceramics trade at Qala'at al-Bahrain was limited, or that the site simply did not require such a wide range of imports. The QaB assemblage also has similar rim types for the glazed wares found at Julfar with 'soup bowl' types being reasonably common. This would suggest that both areas were trading in Iranian glazed ceramics but on different scales.

General comments:

The assemblage at Qala'at al-Bahrain is large but again lacking in numerical data. It allows a good comparison with the Julfar assemblage as, while it does begin 200 years beforehand, it runs through to the end of Julfar, and slightly beyond. The high quantity of illustrations allows comparison of rim forms and the text contains enough description of wares to give a reasonable understanding of the fabric of the important wares found and demonstrate differences and similarities between the Bahrain and Julfar assemblages.

5.2.4: KILWA (CHITTICK)

Period:

9th to 17th Century occupation

Approximate size of assemblage:

Over one million local sherds were found. There was also a large quantity of imported sherds but no exact number is published.

Quality of analysis:

Chittick presents the finds from Kilwa in a separate volume. Both the local and imported ceramics are discussed at length with a large number of ceramic illustrations detailing the wares and their rim types. However there is no numerical data for any of these wares or rims, partly because of the vast size of the assemblage. The excavation was conducted in the late 1960s and so may not have been as vigorous as modern work. However the sheer quantity of the assemblage would suggest that at least a good sample of the ceramic tradition at Kilwa was found.

Far Eastern ceramics:

The majority of the imports are glazed types, probably filling a gap in the local market as East Africa produces very little glazed ceramic (Horton 1996: 414). This glazed assemblage contains both Far Eastern and Islamic glazed wares. Far Eastern wares are present in the assemblage from phase II onwards and are more common than Islamic glazed wares from phase IIIa onwards. The assemblage is made up of celadons (mostly Longquan and South Asian examples- Chittick 1974b: 309), Chinese Blue and White wares- rare examples of Swatow and Amman ceramics come from this group, White and grey wares, Stoneware jars and imitation Stoneware (Chittick 1974b: 310). The earliest phase containing Far Eastern ceramics is II which has occasional examples of celadon and White and Grey wares. Phase IIIa's assemblage is dominated by Longquan celadon, with the first examples of CBW bowls being found in very small numbers (Chittick 1974b: 311). During phase IIIb in the 15th Century the percentage of CBW increases greatly and effectively equal the proportion of celadons by the end of the period (Chittick 1974b: 311). Period IV sees CBW become the predominant Far Eastern Ware (Chittick 1974b: 312), although by this point the majority of occupation at the site has finished.

Indian ceramics:

Chittick identifies a limited number of sherds from Indian wares (Chittick 1974b: 383- fig. 141 a and b) from Gujarat from the 14th/15th Centuries. Beyond this, there is little discussion of any Indian ceramics.

Local unglazed ceramics:

Over one million sherds of local ceramic were found during the excavation. These have been put into a local ceramic typology which clearly shows the distinctive local decoration style (incised triangles around the shoulder or lip of the vessel) but are rarely found outside of East Africa. This decoration style is widely variable within this ceramic tradition (Chittick 1974b: 319). The

vast majority of the local assemblage came in three vessel forms: necked pots for cooking; open bowls for eating; and large jars for storage. This ceramic type is not found at Julfar al-Nudud or al-Mataf unless it is in very small numbers as non-identified ceramics.

Foreign unglazed ceramics:

Examples of BUFF ware rim types (the most common storage ware at Julfar, identified as an Iranian ware by Frifelt 2001: 96-98) were found in areas round the Great Mosque and Great House (Chittick 1974b: 330; 382- fig. 140). These are very rare examples at Kilwa, suggesting that BUFF vessels, while common in the Gulf only made the journey south in limited numbers. This could be due to the nature of their tradable contents or because local equivalents are available. Chittick illustrates examples of pilgrim flasks (Chittick 1974b: 330; 382- fig. 141 c and d) and a near complete example of a JULF.RW water jug with the distinctive spout joined to the body at top and bottom (Chittick 1974b: 385- fig. 143a). The pilgrim flasks are slightly more common than the JULF.RW jug which is very rare, suggesting that the majority of ceramic imports were glazed wares from the Gulf and Far East. This would suggest that there is not trade in any substances contained by the TRAN/STOR wares found at Julfar to at least the southern most of the east African trading towns.

Glazed ceramics:

Kilwa has Islamic glazed ceramics present in the 9th and 10th Century layers (Chittick 1974b: 302). Similarly to Manda, these wares appear to have been imported through contact with Siraf in Iran (Chittick 1974b: 303). They are very rare early in the assemblage, forming only 0.2% of the phase Ia assemblage. After this phase they become more common but are outnumbered by Far Eastern sherds by phase IIIa (Chittick 1974b: 302). The early assemblage is based on white tin glaze, blue glaze and splashed tin glaze wares, along with Sasanian-Islamic ware. By the 11th/12th Century (phases Ib and II) the majority of imported glazed ware were sgraffiatos of some type (hatched, simple and Champleve) with late Green sgraffiato introduced in phase II. The 14th Century assemblage contains both Black on Yellow ware and Islamic Monochrome (PBS) glazed wares, the first of which probably comes from Yemen and the latter from Iran. Chittick notes that the colouring of the glaze appears to become more variable over time, with early examples being mainly light green with a buff paste (Chittick 1974b: 304). The later Standard Monochrome ware is generally a dark blue or green on red paste, while the Late Monochrome is of variable colours (blue, green, purple, lavender) and generally of buff paste.

General comments:

The assemblage is very large but contains an important percentage of imported wares showing interaction with the Indian Ocean trading network. The lack of examples of local ceramic outside East Africa suggests that the commodities trading for the imported ceramic were not ceramic, but rather wood, ivory or people. The assemblage is broadly contemporary to that of Julfar, with some earlier phases but it appears to show a continuity of the locations of trading sites in East Africa that is not found in the Gulf. Kilwa clearly traded with a large number of partners across the centuries of its occupation and Julfar was just one of these.

5.2.5: MANDA (CHITTICK)

Period:

9th- 17th Century AD with most occupation occurring before 14th Century AD

Approximate size of assemblage:

250 000+ sherds found at Manda during Chittick's excavations (Chittick 1984: 65). The imported assemblage is numerically published, and totals c12616 sherds (although Indian wares are excluded from this analysis (Chittick 1984: 225). There is also a rough estimate of number of vessels in the imported assemblage, based on the number of base fragments (Chittick 1984: 225). This is estimated at 1,676 imported vessels. Both of these figures are wrong when the individual numbers in the table are looked at- sherds count is at c. 13,750 and vessel number is at c. 1,688. This could however be due to the use of approximate figures for the four major imported wares- Sasanian-Islamic glazed wares, Sgraffiato glazed wares, red/pink unglazed wares and buff/greenish buff unglazed wares.

Issues in assemblage:

This report does not have a complete set of numerical data for the assemblage but does split the assemblage into imported and local wares, and notes that the proportion of imported ware varies hugely both spatially across the site (28% of sherds in the lower beach edge are imported compared to 19% further up the beach and even fewer elsewhere (Chittick 1984: 65)) as well as temporally across the phasing of the site with the percentage of imported sherds dropping from an undefined peak in phase I to less than 1% in the final phases (*Ibid:* 65). Only the imported

wares are published in numerical form, and the table has numerous issues including excluding Indian wares and the use of approximate numbers for any counts above 1500 sherds. The table of imported wares (Appendix II of Chittick's report) is reproduced below in Figure 130:

Figure 130: The Manda published imported assemblage

Ware	Sherds	% imported sherds	Estimated no of vessels	% of vessels
Chinese Wares				
Early (Dusun) stoneware jars (I:7%)	288	2.08	40	2.4
Yueh stoneware bowls (I:3%)	57	0.41	19	1.1
Painted stoneware (I:1.5%)	20	0.14	9	0.5
White porcelain/porcellaneous				
stoneware (I: 2.5%, II: 1.5%)	215	1.55	22	1.3
Ching Pai	51	0.36	16	0.9
Te Hua (II)	9	0.06	9	0.5
Later Stoneware jars (II-IV)	94	0.67		
Celadon	244	1.76	57	3.4
Blue and White (III, IV, mostly V)	40	0.28	13	0.7
Islamic glazed wares				
Sasanian-Islamic (I:26%)	c.3200	23	145	8.6
White glazed (I:30%)	467	3.37	171	10.2
White glazed + colour (I:18%)	319	2.3	102	6
Lustre (I:2%)	57	0.41	12	0.7
Mottled splashed (I:6%)	104	0.75	32	1.9
Green and White (I:1%)	5	0.03	5	0.3
Piped icing (I:1%)	6	0.03	5	0.3
Sgraffiato (II/III at say 3:2)	c.2000	15	576	34.3
E. Persian (II)	68	0.49	28	1.6
Black on Yellow (III)	375	2.79	90	5.3
Islamic Monochrome (IV-V)	350	2.52	50	2.9
Manganese Purple (V)	37	0.26	5	0.3
Misc. earlier Islamic (see p. 81)	12	0.1	12	0.7
Misc. later Islamic (see p. 81)	14	0.1	14	0.8
Unidentified Islamic glazed	196	1.41	20	1.2
Islamic unglazed				
Red/pink wares	c.2200	16	32	1.9
Buff/greenish buff cream jars	c.2200	16	80	4.7
Fine cream wares (incl. '*gudulia*' ware)	1122	8.1	124	7.3
Total in Chittick 1984: 225	c.12616		c.1676	

From this table and Chittick's description of the assemblage as being approximately 250000 sherds a very rough breakdown of the ceramic assemblage from Manda has been made, which can be compared to that from Julfar. This is missing any data on any Indian wares, which were clearly present. Chittick alludes to a possible phasing of Indian wares where he describes 30 out of 50 sherds found as being from period I with 15 of the remainder being from period II and 5 from later periods (Chittick 1984: 101). However it is unclear from the text whether this is discussing only the major ware (the so-called Purple ware also found at Kilwa- Chittick 1974b: 330- type 39 and 41) or the whole Indian ware family assemblage. If we assume that it is discussing the whole assemblage then Indian wares make up 0.02% of the Manda assemblage- hardly a statistically important figure.

Another problem with the later assemblage is that none of the Period III finds are from stratified deposits, making strong analysis impossible (Chittick 1984: 83).

Finally only a few samples from Period I were sieved. All other excavated material was not sieved, which would suggest smaller finds, particularly local ceramic sherds, would be lost (Chittick 1984: 107)

The Assemblage:

The assemblage cannot be discussed in terms of numerical phasing as it is not divided into these periodisations. Therefore for the purpose of this study, a brief overview of the wares present in each ware family will be given.

Far Eastern wares:

Far Eastern wares appear early in the sequence (Chittick 1984: 65). Chittick split the early wares into five main wares: Dusun, Painted, Grey-green ware (Yue ware), White porcelains and White Stonewares (Chittick 1984: 66-67), although the Painted Ware sherds are possibly Islamic, as considerably more are found at Siraf than in the Far East (Chittick 1984: 66). Chittick uses these wares to date the buried beach suspected to be the main landing area from imports to the late 9th Century. The later wares from the Far East are much rarer, suggesting that contact and trade are more limited in this period, with very little CBW or Longquan celadons found (Chittick 1984: 70-71). The total number of Far Eastern ceramics found at Manda is 1018. This is a larger number than at the nearby site of Shanga. Chittick used the number of base sherds found to give an estimate of the number of vessels found in the excavations at 185, and from this extrapolated the number of Far Eastern vessels on the site to be approximately 20000 (as the excavated area represents approximately 0.1% of the site).

Indian ceramics:

The Manda assemblage includes Indian ware pots and bowls, although Chittick describes them as water bowls (similar to modern chatties for water- Chittick 1984: 101). Two do have evidence of burning but Chittick describes them as too thinly potted to be suited for cooking (Chittick 1984: 101). Their presence shows that rim styles and ceramic wares for Indian wares do not appear to change much over the study period, partly because they are so variable to begin with. These have no numerical data for them and so have been counted as 0 in the analysis of the assemblage. Estimates reconstructed from the text suggest they made up only 0.2% of the assemblage.

Local unglazed ceramics:

It is likely that the local ceramic found at Manda was manufactured on the mainland rather than on the island itself due to a lack of suitable clay (Chittick 1984: 107). Chittick splits the local assemblage into five fabrics: soft, crumbly, hard, refractory and pink. The latter is only found in the local painted ware bowls, which Chittick suggests are imported from further south (Chittick 1984: 109). The majority of vessels have the typical local hatching decoration around the shoulder and are slightly closed in form. Some have a shoulder below the rim, making their form more closed (e.g. Chittick 1984: 113 fig. 61 and 61). There are also small open bowls (Chittick 1984: 124 fig. 84) and jars/pots (Chittick 1984: 126 fig. 88). A small ceramic lamp industry is also in evidence at or around Manda (Chittick 1984: 140-141 fig.115)

Foreign unglazed ceramics:

Chittick discusses the unglazed imports briefly. The majority are large jars and basins, with a minority being of the *gudulia* (pilgrim flask) vessel type, in a distinct ware (probably similar to BUFF or WIW). The large storage jars (Chittick 1984: 84-85) appear to be similar to examples from Siraf, suggesting a 8th or 9th Century dates (Chittick 1984: 84). Other storage jar types appear to have been rarer (Chittick 1984: 86-89) but also from the Gulf. The buff fabric jars appear similar to those found at Julfar but it's unclear whether the dating correlates- in Chittick's report they are dated to the 7th/8th Century which is far too early to relate to Julfar (Chittick 1984: 94). There are therefore no examples of Julfarwares found at Manda. The table shown above shows that 5522 sherds out of the 13750 sherd imported assemblage was made up of these unglazed imports suggesting that they were an important part of the imported assemblage. However the majority of this (4400 sherds) is only approximate data (Chittick 1984: 225)

Glazed ceramics:

The relationship between Manda and the trading ports of the Gulf, principally Siraf, can be seen in the large amount of Islamic glazed ware that is present in the imported assemblage. The majority of the early Islamic glazed ware is Sasanian-Islamic ware, which is mainly formed in to jars, although basins are also found. Other wares found include white-glazed ware, lustre ware, green and white ware, piped-icing ware and splashed ware (Chittick 1984: 76-79). All of these only occur in period I and are replaced by sgraffiatos in later phases (Chittick 1984: 76). Chittick suggests these were introduced to the site in the 11th Century (Chittick 1984: 79) and come in three sub-wares: hatched, simple and Champleve. All of these come from the southern Iranian kilns (Chittick 1984: 79). By the 13th Century the sgraffiato has become poorer in quality. These decline in period III and are replaced on a much smaller scale by Black on Yellow ware, Islamic Monochrome (PBS), Manganese Purple ware and very small numbers of Blue and White ware (Chittick 1984: 82.) The Islamic glazed assemblage makes up 2.88% of the whole assemblage, a percentage considerably smaller than all other sites with numerical data for their assemblage e.g. Sharma where GLAZ made up 6.6% of the total assemblage. This would suggest that Manda had either less contact with Gulf traders, or was importing items other than ceramics from there.

5.3: CHAPTER FIVE OVERVIEW:

This chapter has described Western Indian Ocean assemblages which have been published but do not have any/complete quantified data for the assemblage. It has shown that there are a large number of trading sites with known assemblages around the Western Indian Ocean during the study period and, while few of these are fully published, the data within the reports is enough to give a vague idea of which wares were present at which sites. The purpose behind this discussion is to identify which wares were present at which sites and during which rough time periods. It has demonstrated that the key Far Eastern imports of Chinese Blue and White (CBW) and Longquan Celadon (LQC) are found on all of the trading sites which date to post 1250AD. Similarly all have Iranian glazed wares, whether imported just across the Gulf to Julfar and Bahrain, or down the East African seaboard to Kilwa and Manda. PERSIA and some frit wares appear to be an important part of any imported assemblage on all of the sites dating to the study period. The evidence also shows that while 'local' unglazed wares from the Gulf and Southern Arabia are found in East Africa, very few East African ceramic sherds are found in the Gulf, while some do make it to Southern Arabia. This would suggest a trade in Gulf ceramics and their contents for East African aceramic goods. This information will complement the data from Chapter six which will compare the quantified assemblage from Julfar al-Nudud with the few

other fully published assemblages. These two analyses will be brought together in Chapter seven to attempt to form a generalised view of the ceramics assemblage around the Western Indian Ocean during the study period.

CHAPTER SIX: THE QUANTIFIED ASSEMBLAGES AROUND THE INDIAN OCEAN:

This chapter will look in detail at the assemblages which have been published in full across the study area, split into ware families in a similar manner to the Julfar al-Nudud assemblage discussed in Chapter three. The majority of these either date in their entirety to the period 1250-1550AD or have phased data relating to this period, as shown in Figure 131. The only exemptions to this dating are the site of Sharma in Oman; which dated to approximately 900-1000AD but has an interesting assemblage with a high quantity of imported wares which demonstrate the continual trading systems that have existed since antiquity; and Manda which has parts of its assemblage dating to phases earlier than this period. However as no phased assemblage has been published for Manda, it is impossible to remove the ceramics from these early phases from the overall assemblage. Due to this the Manda assemblage will be not be discussed in the phased assemblage discussion below (sections 6.1-6.3) but will feature in the later analysis in section 6.7 which will look at the total assemblages in relation to each other.

6.1: 1250-1550AD ASSEMBLAGES:

The original analysis will discuss only those sites which date to the period 1250-1550AD or that have ceramic assemblages for individual phases dating to this period (see Figure 131). The analysis of Qalhat and Sharma will be included in section 6.5, due to a lack of published phased assemblages for these sites.

Figure 131: The numerically published assemblages

Site name	Assemblage size	Author	Notes
Julfar al-Nudud, U.A.E.	29592 sherds	Saunders (in press)- see Chapter three	Possible issues with ware identification- however ware families likely to be strong. Phased assemblage. Split into individual wares.
Julfar al-Mataf (British) U.A.E.	46862 sherds	Kennet 2004	Cataloguing done rapidly- possible mis-identification of Indian wares. Published with phase data. Split into individual wares.
Julfar al-Mataf (Japanese) U.A.E.	617 sherds	Sasaki and Sasaki 1992	Very small published assemblage, only representative of one phase in one trench. Split into ware families.
Bilad al-Qadim, Bahrain- **Only phase 6**	6508 sherds	Carter 2005	Only last phase contemporary with Julfar phasing. See table – for details of earlier phases. Large amounts of residuality. Published with phase data. Split into individual wares. Occasional miscalculation in published data but less than 1%.
Qalhat, Oman	31728 sherds	Unpublished- preliminary data from Renel and Rougeulle pers. comm. 2011	Preliminary data- no phasing and high percentage of 'unknown' as not identified at time of study. No split into individual wares.
Old Hormuz (Survey data) Iran	676 sherds	Priestman 2005- exact site data from pers. comm. 2011	Surface collection assemblage- probable bias in collection. Split into individual wares.
Shanga, Kenya. **Only phase H, I, J and K.**	135836 sherds	Horton 1996	Only later phases contemporary with Julfar.

Julfar al-Nudud has already been discussed in terms of its assemblage in Chapter three.

Therefore the first site assemblage to be discussed is Julfar al-Mataf (British excavations).

6.2: THE ASSEMBLAGES:

6.2.1: JULFAR AL-MATAF (BRITISH EXCAVATIONS):

Size of assemblage:

46862 sherds (split into 33392 for mosque area and 12873 for occupation area)

Issues in assemblage:

A first caveat for the al-Mataf assemblage is that a large percentage of the assemblage from al-Mataf comes from the mosque, which during its various rebuildings, was filled with spoil taken from the surroundings (Velde pers. comm. 2011; Kennet 2003: 19). It is possible therefore that a large amount of the finds are somewhat residual and may not reflect the chronological development of the site. However for the purposes of this study it is assumed that this is not the case.

In order to establish similarities and differences in the ceramic assemblages between the two excavated areas of Julfar, the two assemblages (al-Mataf taken from Kennet 2004, al-Nudud from the assemblage detailed in Chapter three) were brought together. The use of ware families to categorise the ceramics at al-Nudud is not a proven way to look at them but does allow at least some of the subtleties of the assemblage to be understood. As explained in Chapter three the al-Nudud assemblage was split into seven ware families based along the function and origin of the different wares: Far Eastern ceramics (FE); Indian ceramics (IND); Glazed wares (GLAZ), Incised wares (INC); Julfarwares (JULF); Storage wares (STOR) and finally unknown wares (UNK). The al-Mataf assemblage having not been split into these groupings, it was necessary to assign ware families to the different wares. This was done through analysing the ware descriptions in Kennet 2004 and matching similar wares to their al-Nudud counterparts where applicable.

For this analysis, the ware families INC and STOR will be combined into a single ware family (see Figure 132). Firstly as none of the other sites split these two groups, it appears pointless to continue to do so for this analysis. Secondly, other reports demonstrate that the unincised BUFF ware (part of STOR) is the same as the incised WIW/BIW. It is evident that vessels had limited areas of incised decoration on a plain jar as shown by Frifelt's Hormuzi/Minab Delta Textile ware (Frifelt 2001: 96-7).

Figure 132: Conversion of ware family names

Ware Family name (al-Nudud)	Ware family name (Western Indian Ocean analysis)	Description
FE	FE	Far Eastern ceramics
GLAZ	GLAZ	Islamic glazed wares
JULF	LOCAL	Local unglazed ceramics
IND	IND	Indian ceramics
INC	STOR	Incised wares become part of storage wares
STOR	STOR	
(No JaN ware family)	LOCAL GLAZ	Local glazed ceramics
UNK	UNK	Unknown ceramics

An important differentiation must be made between STOR and LOCAL wares, as local unglazed wares can also have a storage function. The basic difference is in the provenance of the ware- if it is made locally to the site it is classed as LOCAL, if it is imported from another polity or area while having a storage function, it is classed as STOR. This differentiation is simplified in the Arabian Gulf and Peninsula where the ware assemblage is comparatively well understood. When looking at East Africa the term LOCAL is applied to any ceramics appearing to be of any African provenience. This is largely because little work has been completed specifying the exact origin of wares in the East African assemblage. Therefore LOCAL ceramic found at Shanga could well be local but they share vessel shapes with ceramics found much further north and south- Fort Jesus to the north (Kirkman 1974) and Kilwa to the south (Chittick 1974b: 317-394). The area covered by this area of ceramic origin uncertainty is larger than the Arabian Gulf itself and so an obvious bias in the analysis of the ceramics is created. Therefore all the ceramics could be from the local area, or all imported from much further afield still within East Africa or both. However the rethinking of the nature and movement of East African ceramics is worthy of a much longer thesis in its own right and so cannot be considered at length here. All ceramics appearing to be Sub-Saharan African found at East African sites will be considered LOCAL.

With these boundaries in place it was then possible to look at the ware descriptions published with the assemblage to assign each al-Mataf ware an appropriate ware family. Figure 133 shows the different wares from the mosque excavation and their newly assigned ware families. Figure 134 shows the same for the occupation excavation.

Figure 133: Julfar al-Mataf mosque assemblage (from Kennet 2004: 23)

Ware	Ware Family	NUD10 ware	PRE	I	II	III	IV	V	VI	REC	Total	%
JULFAR	LOCAL	JULFAR	7	54	929	1618	4539	4892	5207	6554	23800	71.27
WHITE	STOR	WIW/BUFF	7	114	186	519	909	900	830	715	4180	12.52
UNDERGL	GLAZ	MGP/TIN	2	7	72	125	279	148	119	104	856	2.56
WPINK	STOR	CRWW		3	16	73	71	83	67	38	351	1.05
LQC	FE	LQC		2	13	29	29	21	22	58	174	0.52
LSANDY	STOR			2	1	27	15	11	27	17	100	0.30
SCHINA	FE			1	5	9	17	8	12	20	72	0.22
GRITTY	UNK			1			6	3	3	10	23	0.07
MUSTARD	GLAZ	YELL		1			1	1	4	2	9	0.03
TURQ	GLAZ			2	2	2					6	0.02
MGPAINT	GLAZ	MGP		1							1	0.00
JULFAR.1	LOCAL	JULFAR.RW			30	167	752	432	462	422	2265	6.78
LIME	STOR	LIME			7	26	96	36	93	63	321	0.96
PERSIA	GLAZ	PBS			3	18	51	33	60	58	223	0.67
JULFAR.2	LOCAL	JULFAR.PB			3	9	35	22	40	23	132	0.40
JULFAR.4	LOCAL	JULFAR.PB			1	11	13	25	72	3	125	0.37
MTB	FE	CHIN/OC			2	2	10	4	17	31	66	0.20
FRIT.BW	GLAZ	WFRIT			2	7	18	12	11	14	64	0.19
LEATH	UNK				1	1	5	8	14	15	44	0.13
BLGREY	UNK				1	9	1	2	3	3	19	0.06
BLACK	GLAZ				2	2		1	1	5	11	0.03
BSTONE	FE	BGSW			1	1				3	5	0.01
BURN	UNK				2	1	1				4	0.01
CBW	FE	CBW				11	22	19	45	78	175	0.52
KHUNJ	GLAZ	KHUNJ				10	44	34	36	32	156	0.47
FRIT.DEG	GLAZ	WFRIT				5	4	18	8	11	46	0.14
GMONO.2	GLAZ	TIN				1	12	2	3	5	23	0.07
EASTIN	FE	CHIN?				1	7		5	2	15	0.04
YELWHIT	UNK					2	2	4	2	3	13	0.04
RSLIP	IND	IRBW?				3	1	2	3		9	0.03
WPORC	FE	CHIN?				2		2	4		8	0.02
SWATOW	FE					1		1	1	4	7	0.02
GBSTONE	FE					2		3			5	0.01
BWEARTH	GLAZ	NIDGW				2					2	0.01
FRIT.CEL	GLAZ					2					2	0.01
THIN	LOCAL	JULFAR.PB?					2	3	3	19	27	0.08
FRIT.TB	GLAZ	GFRIT					4	1		1	6	0.02
ENAM	FE	CHIN?					1			1	2	0.01
DKHUNJ	GLAZ	KHUNJ						1	3		4	0.01
VIET	FE	SAC						2		2	4	0.01
NONCHIN	FE	CHIN?						1			1	0.00
IMITCEL	GLAZ								1	3	4	0.01

Ware	Ware Family	NUD10 ware	PRE	I	II	III	IV	V	VI	REC	Total	%
MOD	FE								1		1	0.00
LGREEN	GLAZ									1	1	0.00
DHM	FE									1	1	0.00
DHP	FE									1	1	0.00
UNCLASS	UNK						16	1	5	6	28	0.08
			16	188	1279	2698	6963	6736	7184	8328	33392	

Figure 134: Julfar al-Mataf occupation assemblage (from Kennet 2004: 24)

Ware	Ware Family	NUD10 ware	PRE	I	II	III	IV	V	VI	REC	Total	%
JULFAR	LOCAL	JULFAR	2	199	290	2873	534	442	3751	969	9060	70.38
WHITE	STOR	WIW/BUFF	2	31	62	492	152	63	637	110	1549	12.03
JULFAR.1	LOCAL	JULFAR.RW	1	1	4	134	27	43	590	74	874	6.79
UNDERGL	GLAZ	MGP/TIN		10	24	242	27	26	155	8	492	3.82
WPINK	STOR	CRWW		4	12	34	35	6	52	11	154	1.20
LQC	FE	LQC		2	11	22	1	2	14	3	55	0.43
FRIT.BW	GLAZ	WFRIT		1	3	8		3	8	1	24	0.19
SCHINA	FE	SAC			1	5		2	17	2	27	0.21
LIME	STOR	LIME				8		2	144	20	174	1.35
PERSIA	GLAZ	PBS				8	4	4	76	20	112	0.87
KHUNJ	GLAZ	KHUNJ				1		1	45	7	54	0.42
CBW	FE	CBW				3			25	18	46	0.36
FRIT.DEG	GLAZ	WFRIT				16	1	3	20		40	0.31
LSANDY	STOR					5	1		26	4	36	0.28
BLGREY	UNK					1		24	8		33	0.26
JULFAR.2	LOCAL	JULFAR.PB				4		1	23	4	32	0.25
LEATH	UNK					3		1	15		19	0.15
MTB	FE					2		1	9	3	15	0.12
JULFAR.4	LOCAL	JULFAR.PB				2		7	1		10	0.08
YELWHIT	UNK					1	4		4		9	0.07
BURN	UNK					7					7	0.05
RSLIP	IND	IRBW?				4					4	0.03
BSTONE	GLAZ					2					2	0.02
FINPAINT	UNK					1			1	1	3	0.02
BWEARTH	GLAZ					1					1	0.01
DHP	FE					1					1	0.01
GBSTONE	GLAZ	BGSW						1			1	0.01
EASTIN	FE	CHIN/OC							4	1	5	0.04
GMONO.2	GLAZ	TIN							5		5	0.04
MUSTARD	GLAZ	YELL							2		2	0.02
FRIT.TB	GLAZ	GFRIT							1		1	0.01
POLY	GLAZ								1		1	0.01
VIET	FE	SAC							1		1	0.01

Ware	Ware Family	NUD10 ware	PRE	I	II	III	IV	V	VI	REC	Total	%
GRITTY	UNK									11	11	0.09
IMITCEL	GLAZ									3	3	0.02
THIN	LOCAL	JULFAR.PB								1	1	0.01
BLACK	GLAZ									1	1	0.01
UNCLASS	UNK			2		4			2		8	0.06
			5	250	407	3884	786	632	5637	1272	12873	

Assemblage in phasing:

The British al-Mataf phasing, excluding VI and REC phases, dates to the study period 1250-1550AD. Figure 135 and Figure 136 show ware family raw data and percentage across the occupation area, with Figure 137 presenting it graphically, while Figure 138 and Figure 139 show the raw data and percentage across the mosque area with Figure 140 illustrates these figures.

Figure 135: Occupation phasing (summised from Kennet 2004: 24)

Ware Family	PRE	I	II	III	IV	V	VI	REC
FE	0	2	12	33	1	5	70	27
GLAZ	0	11	27	278	32	38	313	40
LOCAL	3	200	294	3013	561	493	4365	1048
IND	0	0	0	4	0	0	0	0
STOR	2	35	74	539	188	71	859	145
UNK	0	2	0	17	4	25	30	12
	5	250	407	3884	786	632	5637	1272

Figure 136: Occupation phasing %

Ware Family	PRE	I	II	III	IV	V	VI	REC
FE	0.00	0.80	2.95	0.85	0.13	0.79	1.24	2.20
GLAZ	0.00	4.40	6.63	7.16	4.07	6.01	5.55	3.14
LOCAL	60.00	80.00	72.24	77.57	71.37	78.01	77.43	82.31
IND	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00
STOR	40.00	14.00	18.18	13.88	23.92	11.23	15.24	11.40
UNK	0.00	0.80	0.00	0.44	0.51	3.96	0.53	0.94

Figure 137: Occupation phasing graph

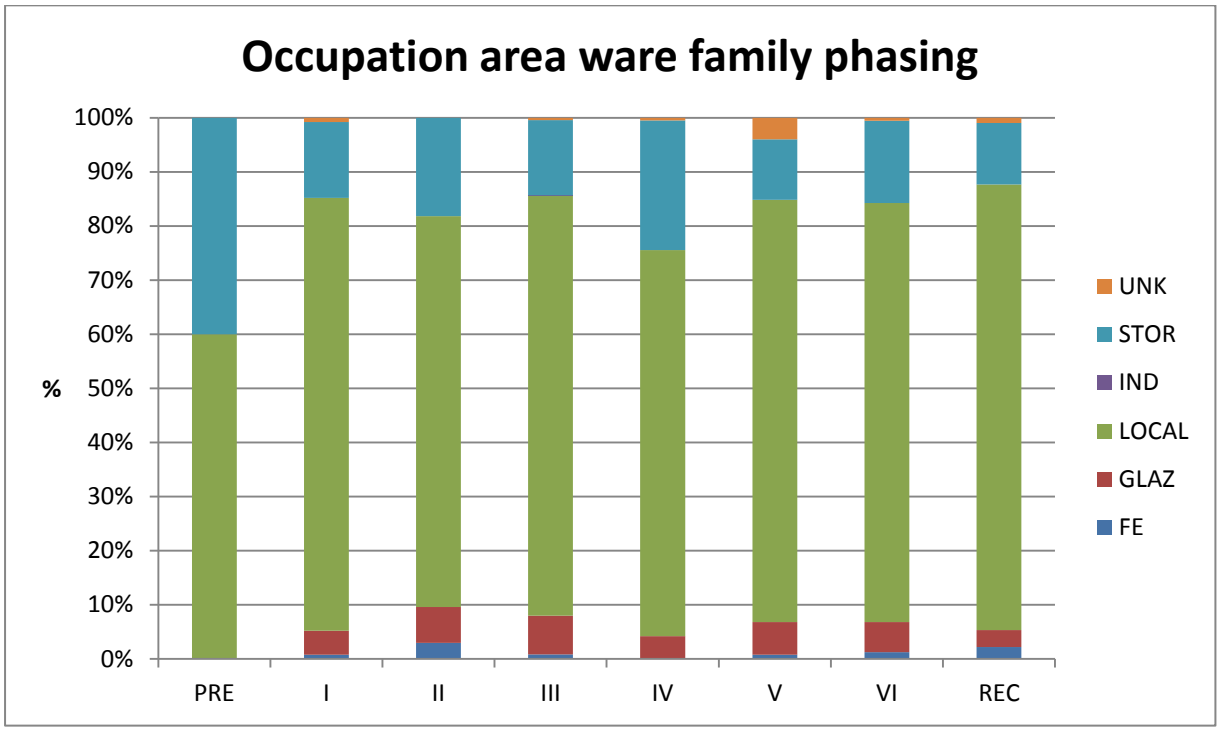


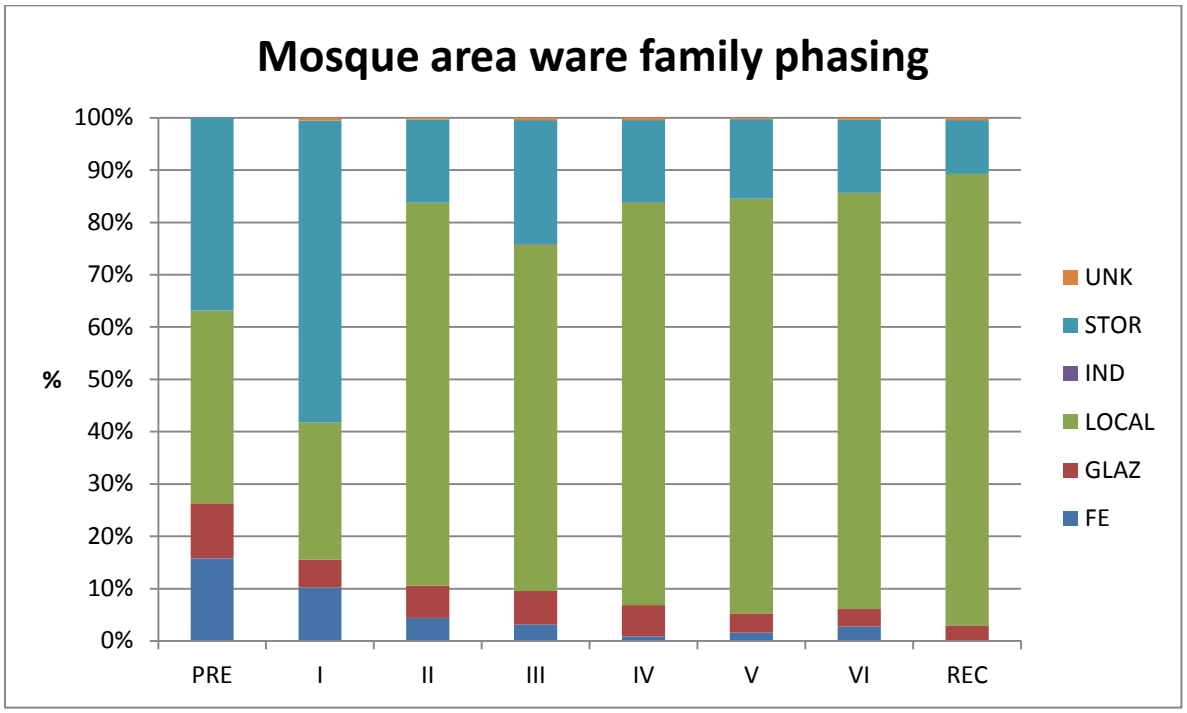
Figure 138: Mosque phasing (summised from Kennet 2004: 23)

Ware Family	PRE	I	II	III	IV	V	VI	REC
FE	3	21	58	86	61	107	201	0
GLAZ	2	11	81	174	413	251	246	236
LOCAL	7	54	963	1805	5341	5374	5784	7021
IND	0	0	0	3	1	2	3	0
STOR	7	119	210	645	1091	1030	1017	833
UNK	0	1	4	13	31	18	27	37
	19	206	1316	2726	6938	6782	7278	8127

Figure 139: Mosque phasing %

Ware Family	PRE	I	II	III	IV	V	VI	REC
FE	15.79	10.19	4.41	3.15	0.88	1.58	2.76	0.00
GLAZ	10.53	5.34	6.16	6.38	5.95	3.70	3.38	2.90
LOCAL	36.84	26.21	73.18	66.21	76.98	79.24	79.47	86.39
IND	0.00	0.00	0.00	0.11	0.01	0.03	0.04	0.00
STOR	36.84	57.77	15.96	23.66	15.72	15.19	13.97	10.25
UNK	0.00	0.49	0.30	0.48	0.45	0.27	0.37	0.46

Figure 140: Mosque phasing graph



These graphs show how different the assemblage is in the early phases, with the mosque area having a large percentage of its first two phases made up of storage ware (i.e. non-Julfarware storage vessels) as well as a high percentage of Far Eastern wares in its earliest phase. However it is probably best to disregard both PRE phases as the mosque PRE phase only has 19 sherds and the occupation PRE has 5. Similarly the mosque phase I only contains 205 sherds compared to all other phases which number in the thousands. These are not high enough to give reliable results, particularly compared to the rest of the assemblage. Therefore the important phases to look at are II- VI in the mosque assemblage and I- VI in the occupation assemblage. Both graphs show a fluctuating amount of Far Eastern wares throughout the occupation of the site, with the majority being in the mosque area. Percentage wise the Far Eastern ceramics become less common later in the sequence in the mosque area, although their actual number increases. Similarly the percentage of the assemblage made up of Julfarware increases over the phasing, unlike al-Nudud where we see a general gentle decrease in Julfarware assemblage proportion. This goes hand in hand with a reduction in the percentage of non-Julfarware storage wares across both al-Mataf sequences, while glazed wares peak in the middle phases (II, III, IV and V) in the occupation area and at a similarly early phase but with an earlier drop off (II, III and IV) in the mosque area.

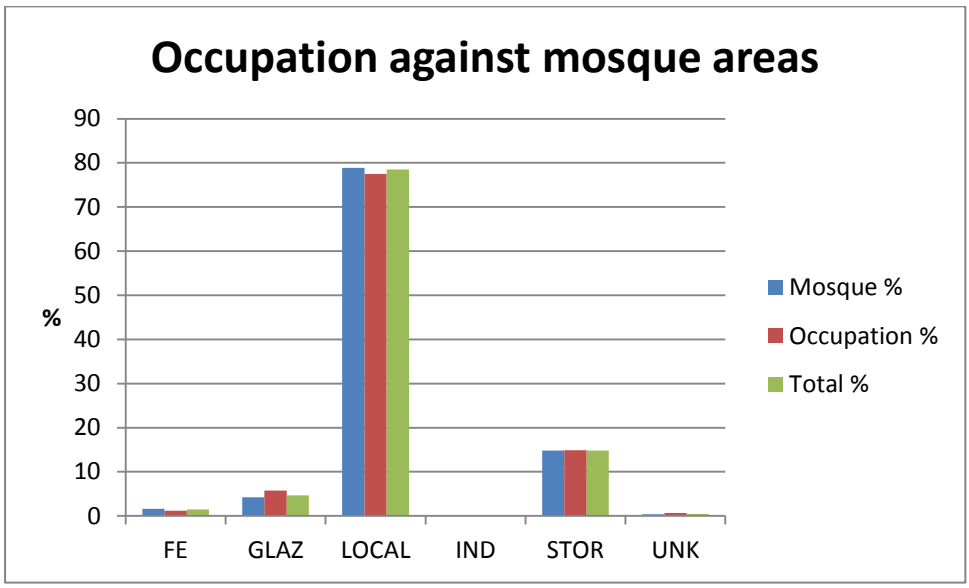
Mosque vs occupation areas:

When the two areas are compared to each other, it is possible to see a slight difference between them (Figure 141 and Figure 142). There is a difference between the make up of the two areas in phases III and IV with the proportion of Julfarware between these two phases going down in the occupation area but rising in the mosque area. After phase IV the two assembalges become more homogenous. When looked at as a whole, rather than phased assemblage, the differences in proportions of ware families are so small (generally not bigger than 1.5%) that they are not significant.

Figure 141: Occupation against mosque assemblage

Ware Family	al-Mataf total	Mosque	Occupation	Mosque %	Occupation %	Total %
FE	688	537	150	1.61	1.17	1.49
GLAZ	2153	1414	739	4.23	5.74	4.65
LOCAL	36325	26349	9977	78.91	77.50	78.52
IND	13	9	4	0.03	0.03	0.03
STOR	6865	4952	1913	14.83	14.86	14.84
UNK	221	131	90	0.39	0.70	0.48
	46265	33392	12873			

Figure 142: Occupation against mosque graph



The graph demonstrates the two areas' similarity in assemblages. This would back up the statement that the possible residuality of the sherds in the mosque sequence is not too large an

issue. The graph either demonstrates that there was little difference between the ceremonial/religious assemblage of the mosque and the domestic assemblage of the occupation area or that the use of material from elsewhere in the site to flatten the mosque area between each phase of building has swamped the distinct ceremonial/religious mosque assemblage with a more generalised domestic assemblage similar to that found in the occupation area. It is not clear which of these statements is closest to the truth. To conclude, on present evidence, the Julfar al-Mataf assemblage (at least in the British excavation area) is fairly homogeneous.

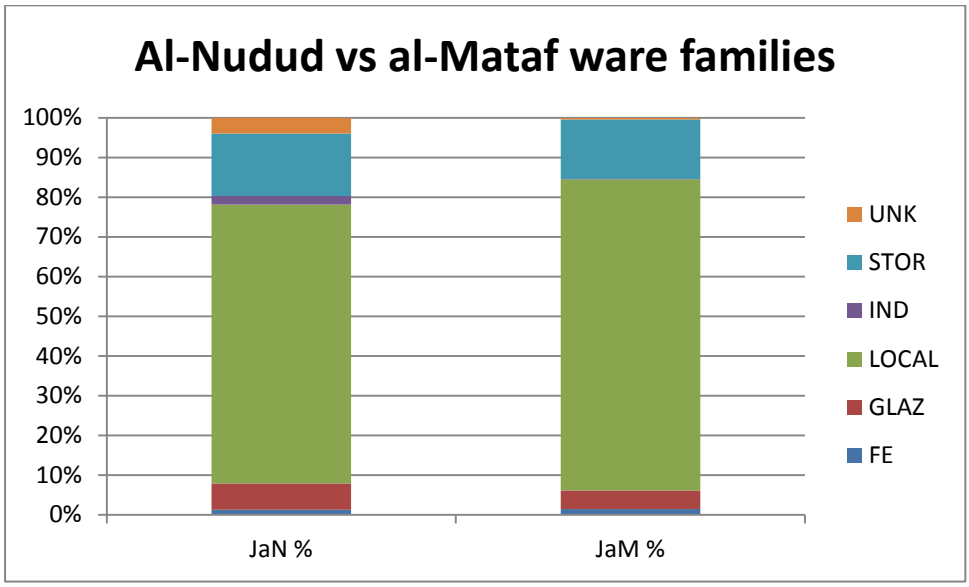
Assemblage against Julfar al-Nudud:

The Julfar al-Mataf assemblage is slightly larger than the al-Nudud assemblage and was catalogued in less time and with no time to check over after original cataloguing (Kennet 2011: pers. comm.). Therefore it is possible that some mistakes were made throughout the assemblage. One of these may be the mis-assigning of Indian wares to other wares, particularly Julfarwares (Kennet 2011: pers. comm.). As seen below, the low Indian ware percentage is the main difference between the two assemblages. The other small difference is that the al-Mataf assemblage contained few UNKN sherds. However this is likely to reflect the difference in experience between the ceramic specialists working on the assemblages. The comparison between the two assemblages is presented in Figure 143 and Figure 144.

Figure 143: al-Mataf against al-Nudud

Ware Family	JaN Total	JaM Total	JaN %	JaM %
FE	376	679	1.27	1.45
GLAZ	1970	2197	6.66	4.69
LOCAL	20780	36736	70.22	78.39
IND	640	18	2.16	0.04
STOR	4647	7011	15.70	14.96
UNK	1179	221	3.98	0.47
	29592	46862		

Figure 144: al-Mataf against al-Nudud graph



The graph demonstrates that the assemblage at al-Mataf is slightly more dominated by Julfarwares than that at al-Nudud which has a higher percentage of glazed, Indian and storage wares as well as more unknown wares. As mentioned above these differences are unlikely to be due to a genuine difference in the assemblage but rather to time and experience limitations during the cataloguing of each assemblage. It is tempting to suggest that the Indian wares at al-Nudud are due to a small quarter for Indian merchants (as discussed in Chapter three, trench D at al-Nudud had a high percentage of Indian wares at 3.36% of total trench assemblage) but it is difficult to back this conclusion up satisfactorily with the above caveats acknowledged.

Conclusions:

It would therefore appear that there is minimal divergence in the ceramics assemblages of al-Nudud and al-Mataf, although al-Mataf does appear to have been occupied for a slightly longer period than al-Nudud. This could back up the views of all who have excavated at al-Mataf (Hansman 1985; King 1992; Sasaki and Sasaki 1992; Kennet 2004) that it is the central area of the town with al-Nudud being an expansion of the town soon after it became affluent. Al-Nudud was not too far behind al-Mataf in terms of development, as the archaeology demonstrates that an original phase of mudbrick building developed into two phases of stone building. Equally the quality of the Far Eastern ceramics and glass from al-Nudud is undoubtedly fine. It would however appear than al-Mataf was the centre of Julfar when it was a trading port.

The next assemblage to be considered is the Japanese assemblage from the late 1980s excavations at Julfar al-Mataf. This assemblage will be compared to both al-Nudud and British al-Mataf to potentially add to a general Julfar assemblage across the site.

6.2.2: JULFAR AL-MATAF (JAPANESE EXCAVATIONS):

Size of assemblage:

617- Assemblage from pit 3. Rest of assemblage unpublished.

Issues in assemblage:

This assemblage is very limited as it only relates to the pottery found in one pit, albeit quite a large one- Pit three (Sasaki 1992: 118).

Assemblage in phasing:

Pit 3 dates to the very end of level 2 of the Japanese excavations (Sasaki 1992: 117). This phase appears to date to the final phase of occupation of Julfar, when the settlement has returned with *barasti* style housing after the collapse of the site (Sasaki 1992: 108-9). It therefore is likely to be contemporary with JaN phase 6 and JaM (B) phase VI.

Assemblage against British al-Mataf and Julfar al-Nudud assemblages:

When looked at compared to the phase VI British al-Mataf mosque and occupation assemblages, it suggests that the overall Japanese ceramic finds were similar to those in and around the mosque, and therefore had some differences when compared to the al-Nudud phase 6 assemblage. Figure 145 and Figure 146 show the overall data for this comparison which is presented as a graph in Figure 147.

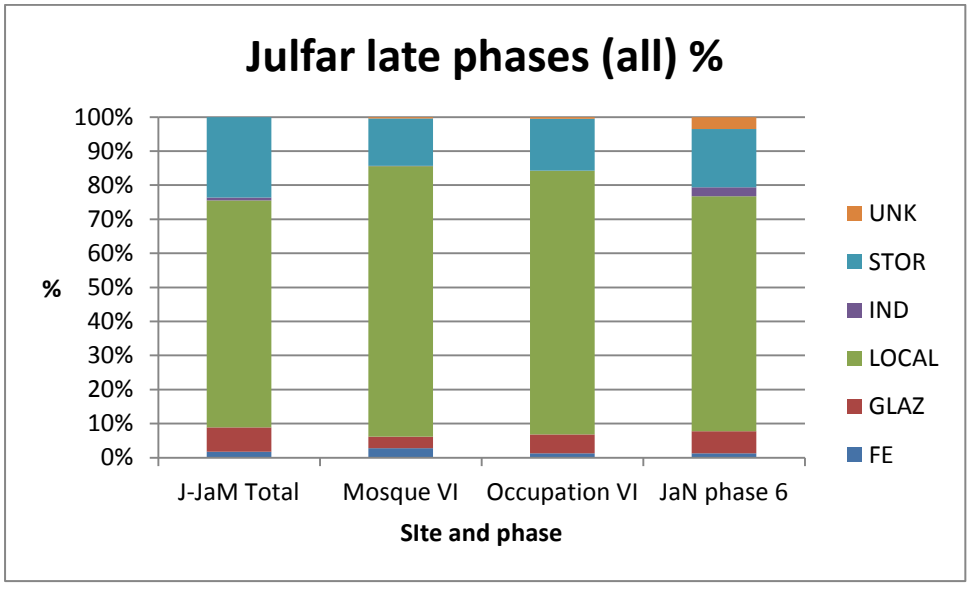
Figure 145: Japanese assemblage against British al-Mataf phase VI and al-Nudud phase 6:

Ware Family	J-JaM Total	Mosque VI	Occupation VI	JaN phase 6
FE	11	201	70	172
GLAZ	44	246	313	870
LOCAL	411	5784	4365	9257
IND	5	3	0	353
STOR	146	1017	859	2297
UNK	0	27	30	474
	617	7278	5637	13423

Figure 146: Japanese assemblage against British al-Mataf phase VI and al-Nudud phase 6 % ware families:

Ware Family	J-JaM Total	Mosque VI	Occupation VI	JaN phase 6
FE	1.8	2.8	1.2	1.3
GLAZ	7.1	3.4	5.6	6.5
LOCAL	66.6	79.5	77.4	69.0
IND	0.8	0.0	0.0	2.6
STOR	23.7	14.0	15.2	17.1
UNK	0.0	0.4	0.5	3.5

Figure 147: Japanese assemblage against British al-Mataf phase VI and al-Nudud phase 6 % ware families graph:



The graph and table show that there are some small differences between the Japanese assemblage and the British al-Mataf assemblages with slightly more glazed and Indian wares, as well as a much higher percentage of storage wares in the Japanese and more local Julfarware in the British- nearly a 10% difference between the two assemblages. The Japanese assemblage is similar is proportions of ware families to the 2010 al-Nudud assemblage with the main difference being the larger number of UNK wares in the al-Nudud assemblage. This may be down to the different levels of experience of the ceramicists. The Indian wares found in the Japanese assemblage are of slightly questionable nature; in the report they are listed as two wares of unknown origin but considered likely to be Indian (Sasaki 1992: 118). A final difference between the Japanese assemblage and the others in the increased amount of storage wares. The nature of the Japanese assemblage could point to a reason for this- the assemblage is for one pit (pit 3) in one area of the Japanese trench. It is not representative of the whole trench therefore, although the pit is clearly quite large.

When looked at in comparison to the al-Nudud assemblage it is clear that the assemblage contains similar components- a high percentage of local wares followed by a similar collection of imported earthenware storage vessels (LIME/LIME, BUFF/WHITE, WAPO/CRWW) and Far Eastern porcelains/celadons and the quantities of these are not particularly varied between the two sites. There is slightly more STOR wares in the Japanese al-Mataf pit assemblage but overall the assemblages are remarkably similar. Different areas of the site would obviously have different functions and therefore slightly different ceramic assemblages, which would account for the slight differences in the ware family percentages.

Conclusions:

Including the Japanese excavations at al-Mataf, it is clear that a strong assemblage for the twin sites of Julfar al-Mataf and al-Nudud can be put forward. The make-up of this assemblage varies slightly across the site and as noted in both the al-Nudud and al-Mataf discussions, across the occupation periods of the sites. However these changes are likely to be representative of differences in function of one context or area with another, as discussed for al-Nudud in Chapter three. Therefore the general Julfar assemblage appears to be reliably defined.

6.3: The wider Arabian Gulf and Western Indian Ocean:

To compare the Julfar assemblage with the next available around the rest of the Gulf and Western Indian Ocean, the three assemblages will be joined as follows- the joint Japanese and

British al-Mataf assemblage alongside that of al-Nudud. Both can then compared to each site in turn. Nudud and Mataf are kept separate due to the years separating the excavations. It is felt that while the Japanese and British assemblages can be reasonably combined, it is a step too far at this point to combine them with the al-Nudud assemblage.

6.3.1: BILAD AL-QADIM (PHASE 6):

Size of assemblage:

6508 sherds.

Issues in assemblage:

The Bilad al-Qadim assemblage has been published fully with numerical data for all wares in the individual site phases in Insoll's excavation report (Insoll 2005) and is analysed by Carter as a separate chapter (Carter 2005). The data is presented only as percentages of the assemblage in each phase. The totals for these phases are then found on a graph in the report. It was therefore necessary to complete basic calculations to get the raw data of the numbers of each ware, and then convert into ware families for the analysis. However during this it was noticed that none of the phases percentages added up to 100%. This part of the analysis of the BaQ assemblage is only looking at phase 6, which was one of the least affected by this statistical issue. Figure 148 shows the difference between the actual and calculated total for this phase. As the difference is only 0.4% (3 sherds), this issue is seen to be statistically insignificant.

Figure 148: Bilad al-Qadim phase 6 assemblage

	Phase 6
% total	100.04
Actual total	6505
Total from %	6508

The first task, having noted the percentage discrepancy was to convert the different wares in the assemblage over the phases of occupation into the ware families used at Julfar al-Nudud.

This was done using the published ware descriptions (Carter 2005: 401-425) which gave enough evidence for the majority of wares to be assigned to one of the major groupings, and the remainder put into the Unknown (UNK) group. This can be seen in Figure 149.

Figure 149: Bilad al-Qadim assemblage breakdown

Ware	Code	Ware Family	Phase 6
Grey Abrasive Ware	GAW	UNK	0
Brown Sandy Ware	BSW	STOR	1
Turquoise Glaze with Black	TURQ.BL	GLAZ	0
Cream Ware	CREAM	UNK	1
Hard Red Sandwich Ware	HARS	UNK	0
Chinese White Ware	CHIN.W	FE	4
Lower Gulf Dark Ware	LOWDAR	STOR	17
Lower Gulf Red Ware	LOWRED	STOR	118
Lower Gulf Pale Ware	LOWPAL	STOR	67
Turquoise Glaze with Applique	TURQ.AP	GLAZ	19
Plain Turquoise Glaze	TURQ	GLAZ	42
White and Black glaze	WAB	GLAZ	0
Early Sgraffiato	GRAF.E	GLAZ	0
Limy Ware	LIME	LOCAL	2
Dark Blue and White Glaze	DBLUE	GLAZ	0
Proto Julfar	JULF.PR	STOR	0
Burnished Indian	BURIND	IND	0
Black Glaze	BLACK	GLAZ	0
Splashed Ware	SPLASH	GLAZ	0
Incised Turquoise Glaze	TURQ.INC	GLAZ	3
Cobalt with Black	COB.BL	GLAZ	0
Lustre Ware	LUSTRE	GLAZ	0
Opaque White Glaze	WHITE	GLAZ	4
Cobalt Decorated White Glaze	COB.WH	GLAZ	1
Fine Ware	FINE	LOCAL	49
Red and Green Over-glaze	RAGO	GLAZ	0
Green Glaze with Yellow Streaks	GREYEL	GLAZ	0
White or Indeterminate Frit	FRIT.WH	GLAZ	5
Gritty Ware	GRITTY	STOR	5
Brown Sgraffiato	GRAF.BR	GLAZ	1
Non-Specific Celadon	CEL	FE	3
Blue Frit	FRIT.BL	GLAZ	9
Hatched Sgraffiato	GRAF.HAT	GLAZ	14
Monochrome Green Sgraffiato	GRAF.GR	GLAZ	7
Fine Red with Black Underglaze	FIREB	GLAZ	6

Ware	Code	Ware Family	Phase 6
Misc Underglaze	MISC.G	GLAZ	2
Sgraffiato (General)	GRAF	GLAZ	115
Frit Lustre Ware	FRIT.L	GLAZ	0
Blue Glaze with Vertical Ribs	BLURIB	GLAZ	0
Blue and White Frit	FRIT.BW	GLAZ	0
Longquan Celadon	LQC	FE	4
Manganese Purple Underglaze	MGP	GLAZ	4
Julfar	JULF	STOR	42
Chinese Blue and White	CBW	FE	18
Carved Glazed Red Ware	CARRED	GLAZ	4
Khunj/Bahla	KHUNJ	GLAZ	1
Common Ware	COMM	LOCAL	5533
White Earthenware (eggshell)	EGG	STOR	269
Unclassified Glazed	UNKN.G	GLAZ	96
Unclassified Unglazed	UNKN.U	STOR	29
Indetermiate Far Eastern	UNKN.FE	FE	8
Barbar	BARB	UNK	1

The class LOCAL at Bilad al-Qadim relates to wares likely or known to have been made in Bahrain- the most common being Common Ware which equates to Saunders (in press, see Chapter three) LIME/BAH and Kennet 2004: 79-80/Priestman 2005: 210 LIME. The STOR ware family is defined as storage function earthenwares not produced in the local area; therefore in Bahrain it does not include storage vessels made of Common Ware and at Julfar it does not contain storage vessels made of Julfarware. The full Bilad al-Qadim assemblage is briefly demonstrated below in Figure 150, Figure 151 and Figure 152 to contextualise the phase 6 assemblage that is used for comparison with Julfar al-Nudud.

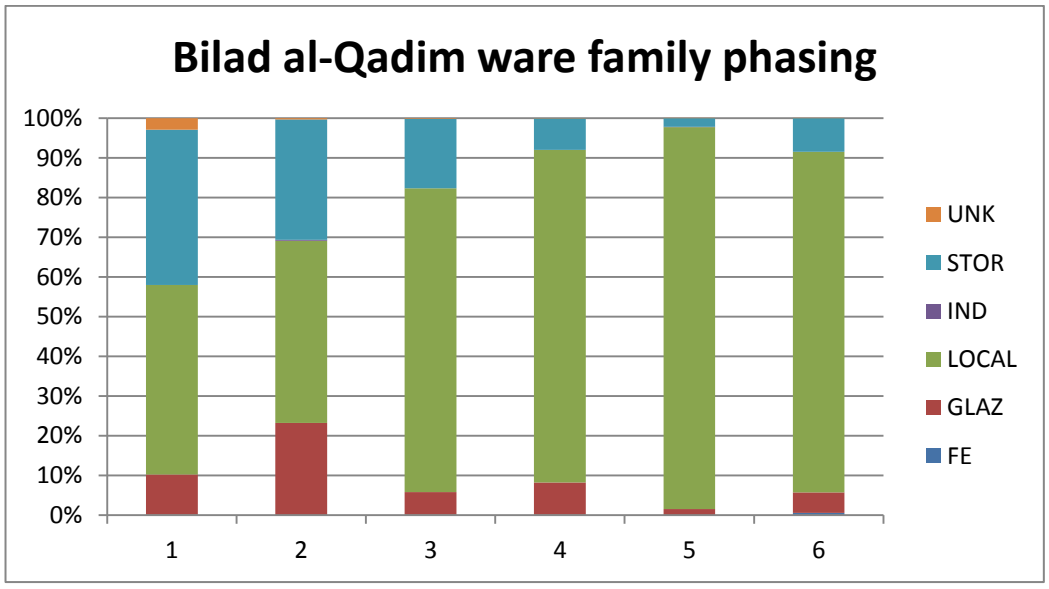
Figure 150: Bilad al-Qadim ware family full phased assemblage

Ware Family	1	2	3	4	5	6	TOTAL
FE	1	0	2	4	3	37	48
GLAZ	89	264	164	436	231	335	1518
BAH	419	522	2176	4493	14153	5584	27347
IND	0	2	0	0	6	0	8
STOR	343	345	497	428	327	549	2489
UNK	26	4	6	4	1	3	44
	878	1137	2845	5364	14721	6508	

Figure 151: Bilad al-Qadim ware family full phased assemblage %

Ware Family	1	2	3	4	5	6
FE	0.11	0.00	0.08	0.08	0.02	0.57
GLAZ	10.14	23.20	5.75	8.12	1.57	5.15
LOCAL	47.72	45.92	76.48	83.76	96.14	85.81
IND	0.00	0.18	0.00	0.00	0.04	0.00
STOR	39.08	30.34	17.47	7.97	2.22	8.44
UNK	2.95	0.36	0.22	0.07	0.01	0.04

Figure 152: Bilad al-Qadim phased assemblage ware family graph



Assemblage in phasing:

The site of Bilad al-Qadim dates to between the 8th and 14th Century. Within this are six periods of occupation. Only phase 6 applies to the current study period 1250-1550AD. The Phase 6 assemblage appears to reflect a period of reduced occupation when the majority of the population moves to Qala'at al-Bahrain but this is not strongly backed up by the stratigraphy, similarly to the British Julfar al-Mataf excavations, with the continued use of the mosque in both cases (Insoll 2005: 55-56; King 1992: 49).

Assemblage against Julfar al-Nudud:

When the BaQ phase 6 assemblage is compared to those from al-Nudud and al-Mataf it is clear that the assemblages are very different. The data in Figure 153 has been presented in Figure 154.

Figure 153: BaQ phase 6 against JaN and JaM

Ware Family	BaQ 6 TOTAL	JaN TOTAL	JaM TOTAL	BaQ 6 %	JaN %	JaM %
FE	37	376	679	0.57	1.27	1.45
GLAZ	335	1970	2197	5.15	6.66	4.69
LOCAL	5584	20780	36736	85.81	70.22	78.39
IND	0	640	18	0.00	2.16	0.04
STOR	549	4647	7011	8.44	15.70	14.96
UNK	3	1179	221	0.04	3.98	0.47
	6508	29592	46862			

Figure 154: BaQ vs Julfar assemblages graph

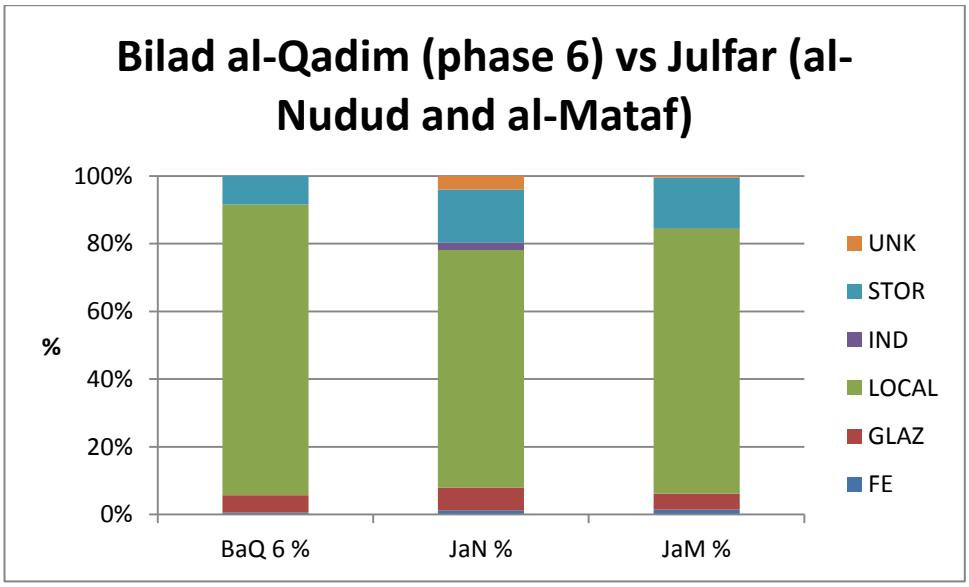


Figure 154 shows that the late BaQ assemblage is different to the assemblages at al-Nudud and al-Mataf, as it is dominated by local ceramics, with fewer Far Eastern, storage, Indian or Unknown ceramics in the assemblage. It also has a reduced percentage of glazed wares compared to al-Nudud. The final phase at BaQ has more similarities with al-Mataf than al-Nudud, but still has 7% more local ware in the assemblage than the increased amount at al-Mataf. The BaQ assemblage contains only 0.5% Far Eastern wares which suggests contact between BaQ and this area was limited. The higher percentage of Iranian glazed wares suggests that BaQ had the majority of its trade with the Iranian side of the Arabian Gulf, while Julfar traded further afield as well. The assemblage lacks the non-local storage wares that are present in a comparatively high percentage at al-Mataf. This is possibly due to the large numbers of BUFF sherds at Julfar due to its supplying of water to Hormuz in this Hormuzi ware (Frifelt

2001: 96) known in Saunders as BUFF/BIW/WIW and in Kennet 2004: 77 as WHITE, while BaQ was not. This would suggest that during the pre-Hormuzi period in the Gulf, the main settlement on Bahrain was not particularly heavily connected to exterior trade routes in its final phase of occupation

Conclusions:

Bilad al-Qadim appears to be the precursor site to Qala'at al-Bahrain, the site which is occupied during the same period as Julfar. It can therefore be used to give an idea of ceramic trade in Bahrain both before and during the early occupation of Julfar. It suggests lower levels of ceramic trade which in turn may suggest a relative isolation of the area from international trade, with only limited amounts of Persian glazed wares being brought in. 85% of the assemblage is local in the final phase of occupation, giving an idea of a strong local industry that could have meant that more imports were unnecessary. However there was a strong local industry at both Julfar and at Qalhat while both of these sites have a larger proportion of imports. It is equally possible that the lack of large numbers of imports as seen throughout the various Julfar assemblages is indicative of a polity which was somewhat inward looking politically as well as having a location further inland than other sites discussed in this survey. A final possible reason is that inter-regional trade at Bilad al-Qadim was in aceramics goods and materials such as textiles, pearls and wood, all of which were important for various Gulf economies and would leave no trace in the ceramic assemblage.

6.3.2: SHANGA (POST 1250AD PHASES H-K):

Size of assemblage:

40669 sherds

Issues in assemblage:

Currently Horton's excavations at Shanga (Horton 1996) is the only example of a quantified published assemblage from the Swahili coast relating to the period in question, although only the data from trenches 6-10 was published in full. The imported assemblage data from trench 1 is also published but there are no details of the local assemblage. Trenches 6-10 are based

around an area of housing to the west of the Great Mosque. The site predates Julfar but does continue to be occupied for at least part of the occupation of Julfar as a trading port. The assemblage at Shanga was dealt with in a similar way to that of Bilad al-Qadim although it was presented as raw quantities rather than percentages of the assemblage. The phases H-K assemblage for trenches 6-10 is reproduced in Figure 155 with new ware codes and assigned ware families.

Figure 155: Shanga H-K assemblage

Ware Name	Ware Code	Ware Family	H	I	J	K
Tana East African Ware	TANA	LOCAL	9659	14077	14234	6395
Sasanian-Islamic (a)	SASa	GLAZ	5	0	0	1
Sasanian-Islamic (b)	SASb	GLAZ	7	2	1	0
Sasanian-Islamic (c)	SASc	GLAZ	5	8	4	0
Sasanian-Islamic (d)	SASd	GLAZ	6	6	1	1
Sasanian-Islamic (e)	SASe	GLAZ	2	1	1	1
White Glaze (a)	WGa	GLAZ	0	1	3	1
White Glaze (b)	WGb	GLAZ	1	1	1	1
White Glaze (c)	WGc	GLAZ	0	0	0	0
White Glaze (d)	WGd	GLAZ	0	0	0	0
Samarra Lustre	SAM	GLAZ	1	1	0	0
Pb glaze polychrome (a)	PBa	GLAZ	0	0	0	2
Pb glaze polychrome (b)	PBb	GLAZ	7	9	7	0
Pb glaze polychrome (c)	PBc	GLAZ	0	0	0	0
Pb glaze polychrome (d)	PBd	GLAZ	0	0	0	0
Late Scraffiato (a)	SCRAFa	GLAZ	37	32	11	2
Late Scraffiato (b)	SCRAFb	GLAZ	67	41	6	3
Late Scraffiato (c)	SCRAFc	GLAZ	53	35	15	3
Late Scraffiato (d)	SCRAFd	GLAZ	13	4	1	0
Late Scraffiato (e)	SCRAFe	GLAZ	15	20	2	1
Late Scraffiato (f)	SCRAFf	GLAZ	20	6	2	0
Late Scraffiato (g)	SCRAFg	GLAZ	26	46	24	6
Late Scraffiato (h)	SCRAFh	GLAZ	57	86	41	5
Late Scraffiato (i)	SCRAFi	GLAZ	15	19	4	2
Late Scraffiato (j)	SCRAFj	GLAZ	17	21	11	4
Late Scraffiato (k)	SCRAFk	GLAZ	13	7	6	0
Late Scraffiato (l)	SCRAFl	GLAZ	13	19	4	1
Late Scraffiato (m)	SCRAFm	GLAZ	33	40	13	4
Late Scraffiato (n)	SCRAFn	GLAZ	0	0	0	0
Late Scraffiato (o)	SCRAFo	GLAZ	11	9	7	1
Late Scraffiato (p)	SCRAFp	GLAZ	2	2	0	0
Late Scraffiato (q)	SCRAFq	GLAZ	0	1	0	0

Ware Name	Ware Code	Ware Family	H	I	J	K
Late Scraffiato (r)	SCRAFr	GLAZ	1	2	0	0
Late Scraffiato (undiag.)	SCRAFunk	GLAZ	42	67	28	2
Green glaze inc.	GG	GLAZ	5	0	13	2
Black on Yellow (i)	BOY1	GLAZ	7	7	10	2
Black on Yellow (ii)	BOY2	GLAZ	7	39	34	8
Black on Yellow (sherds)	BOYs	GLAZ	29	107	111	44
Dark/light blue polychrome	DPOLY	GLAZ	5	5	22	17
Green/brown polychrome	GPOLY	GLAZ	2	1	1	0
Green monochrome (a)	GMONOa	GLAZ	8	35	164	149
Green monochrome (b)	GMONOb	GLAZ	0	2	4	9
Blue monochrome	BMONO	GLAZ	0	4	38	40
Islamic Fritwares	FRIT	GLAZ	0	0	0	0
Pale Green earthenware	PGEW	STOR	1	6	10	4
Pink earthenware	PEW	STOR	2	3	3	3
Fine pink earthenware	FPEW	STOR	0	0	0	0
Brittle ware	BRIT	STOR	0	0	0	0
Red Slipped earthenware	RSEW	STOR	0	0	0	0
Fine creamware	CREAM	STOR	2	0	0	1
Gudulia	GUD	STOR	2	9	11	7
Misc. earthenware	MISCEW	STOR	1	3	3	1
Grass Greyware	GRASS	IND	1	2	3	1
Grog Maroonware	GROG	IND	2	8	11	8
Red-slip orangeware	ROW	IND	0	0	0	0
Decorated redware	RED	IND	33	48	26	10
Changsha	CHANG	FE	0	0	0	0
Olive-green jar	OLIVE	FE	0	1	0	1
Martaban	MART	FE	2	10	24	14
Yue	YUE	FE	0	0	0	0
Sage greenware	SAGE	FE	0	0	0	0
Longquan	LQC	FE	4	38	77	41
Brown greenware	BROWN	FE	1	11	16	4
Ding	DING	FE	0	0	0	0
Qingbai	QING	FE	1	2	3	1
Moulded whiteware	MOULD	FE	1	1	1	0
Porcelain	PORC	FE	0	0	0	0

Assemblage in phasing:

The phasing of Shanga (for trenches 6-10) is split into 21 trench phases then attributed to 11 site phases A-K. This section deals with the final four phases H-K which represent the

occupation of the site between approximately 1250AD and 1450AD, shown in Figure 156, Figure 157 and Figure 158.

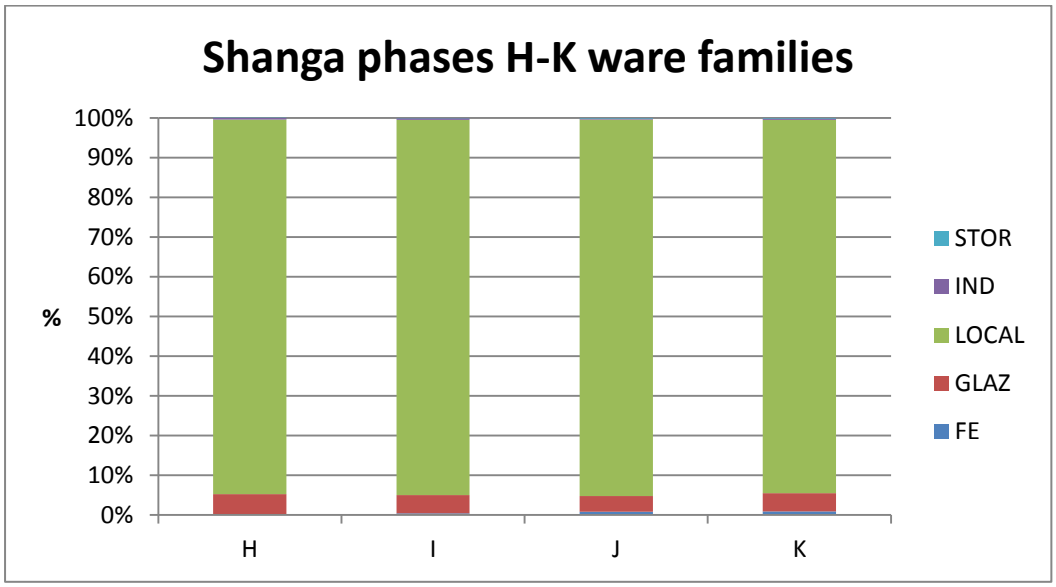
Figure 156: Shanga ware family phased breakdown

Ware Family	H	I	J	K
FE	9	63	121	61
GLAZ	532	686	590	312
LOCAL	9659	14077	14234	6395
IND	36	58	40	19
STOR	7	18	24	15
	10243	14902	15009	6802

Figure 157: Shanga ware family phased breakdown %

Ware Family	H	I	J	K
FE	0.088	0.423	0.806	0.9
GLAZ	5.194	4.603	3.931	4.59
LOCAL	94.3	94.46	94.84	94
IND	0.351	0.389	0.267	0.28
STOR	0.068	0.121	0.16	0.22

Figure 158: Shanga ware family phasing graph



The graph shows the dominance of the local assemblage at Shanga across the whole occupation of the site. There is not much change through the four phases during the period 1250-1550AD with only a small rise in the amount of Far Eastern ceramics in phases J and K combined with a slight drop in glazed wares. This would suggest that the ceramic trade at Shanga was did not change much during these phases. The near complete lack of STOR wares found at Shanga would suggest that these wares, and more importantly their contents, were not being extensively (or indeed occasionally) exchanged at Shanga.

Assemblage against Julfar al-Nudud:

The assemblage was therefore split into the ware families used to look at the Julfar al-Nudud assemblage, in a similar fashion to the assemblage from Bilad al-Qadim. Figure 159 shows the Shanga assemblage in raw data and percentages against the two Julfar assemblages, which is then shown in Figure 160.

Figure 159: Shanga against Julfar assemblages

Ware Family	Shanga H-K Total	JaN Total	JaM Total	Shanga H-K %	JaN %	JaM %
FE	254	376	679	0.54	1.27	1.45
GLAZ	2120	1970	2197	4.51	6.66	4.69
LOCAL	44365	20780	36736	94.48	70.22	78.39
IND	153	640	18	0.33	2.16	0.04
STOR	64	4647	7011	0.14	15.70	14.96
UNK	0	1179	221	0.00	3.98	0.47
TOTAL	46956	29592	46862			

Figure 160: Shanga against Julfar assemblages graph

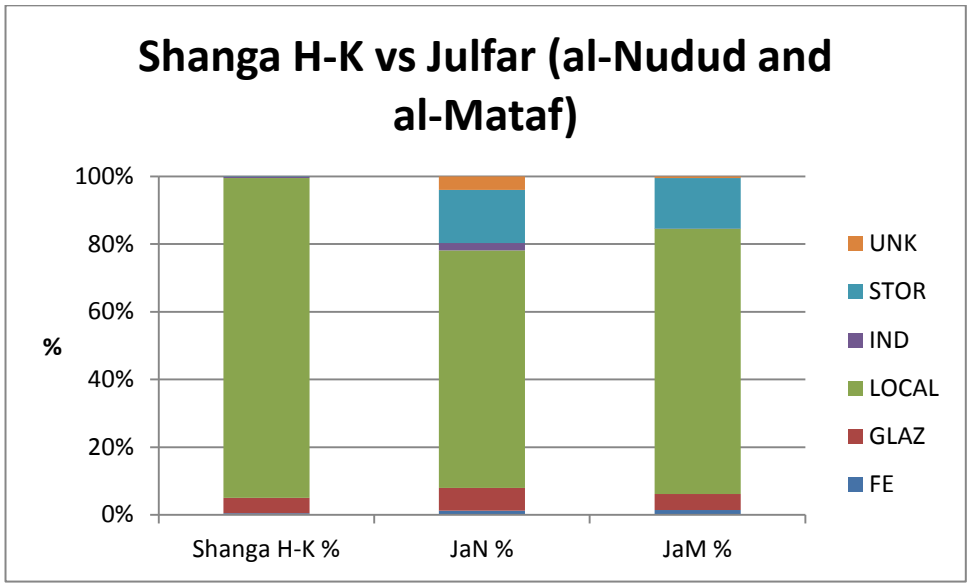


Figure 160 shows how different the late phase Shanga assemblage is compared to contemporary phases at Julfar, with 90% local wares compared to 70% and 78% at al-Nudud and al-Mataf respectively. There are also very low proportions of Indian, Far Eastern and storage wares, suggesting that these were only traded in small numbers to Shanga. In the later phases of Shanga, the proportion of Far Eastern wares does increase to nearly 1% of the assemblage. However this is still lower than other sites in Southern Arabia and the Gulf. In the case of the storage wares, these are in general used as containers for traded goods, and a low percentage of these would suggest that Shanga was not importing or exporting goods which could be held in these vessels. The percentage of glazed wares, mostly of Gulf provenience, is reasonably high however, suggesting a stronger contact with Arabia and the Gulf. There is a debate on the provenance of Horton/Chittick's Standard Monochrome ware-Saunders/Kennet/Priestman PERSIA with Horton suggesting it is from southern Arabia (Horton 1996: 293) and Kennet, Priestman and Saunders suggesting a Persian provenance (Saunders in print; Kennet 2004: 54; Priestman and Kennet 2002; Priestman 2005: 271). This ware becomes the dominant glazed ware in the assemblage in the final phases of Shanga. Horton identifies the change in glazed ceramics between phases I-J from Black on Yellow (definitely of Yemeni or southern Arabian provenance) to Standard Monochrome which depending on the provenance of the ceramic would either show a shift of trade routes or a continuation. (Horton 1996: 291-6)

Conclusions:

If Shanga had been a Gulf site during this period, it would be tempting to suggest that it was not an important trading site, but had limited contact with long distance trade, in a similar manner

to BaQ. This argument is limited- Shanga is not in the Gulf and therefore should not be expected to have a mirror image of the assemblages found at the large Gulf trading sites. However the assemblage is so different that it cannot be argued that the site was as reliant on inter-regional trade as the large Gulf trading sites, due to the lack of imported wares other than Islamic glazed wares. These are still important as the proportions of these in the 12th Century at Shanga are similar to those from the later phases of Kush (phases V, VI, and VII which date to the 12th Century AD have GLAZ proportions of 5.1, 4.5 and 6.9% of total phase assemblage respectively) which is the precursor site to Julfar in the U.A.E. (extrapolated from Kennet 2004: 17). This would suggest that Shanga had a similarly strong relationship with those conducting the trade in Iranian glazed wares to a Gulf site such as Kush. It may well have exported and imported goods which were neither ceramic or contained within ceramic vessels- it is well documented that much of the African trade was in exporting slaves, wood and ivory and importing cloth, none of which require a ceramic vessel to hold them, but from the above evidence it must be suggested that the site was not on the same scale of ceramic trading as those in the Gulf.

6.4: 1250-1550AD ASSEMBLAGE PHASE DATA:

If we now look at the phased assemblages from all of these sites for this period, some patterns may become evident. It must be pointed out that the very small numbers of sherds present in phases I and II at al-Nudud and phases PRE and I at al-Mataf make their use statistically problematic in terms of analysis with other phases. They are included to give the full range of phasing. The group of sites have, on first inspection, few similarities, although clearly all are involved in some level of maritime trade. The first similarity, and the reason for their inclusion, is that they have a numerical phased assemblage dating to 1250-1550AD. Secondly they all contain some element of imported ceramic. Beyond this, it is difficult to show that the sites have enough similarities to be able to identify a key difference which may relate to the difference in assemblage. The following two tables Figure 161 and Figure 162 demonstrate the raw and percentage data for the ware families across the phased assemblages of these sites while Figure 163 shows the % data graphically.

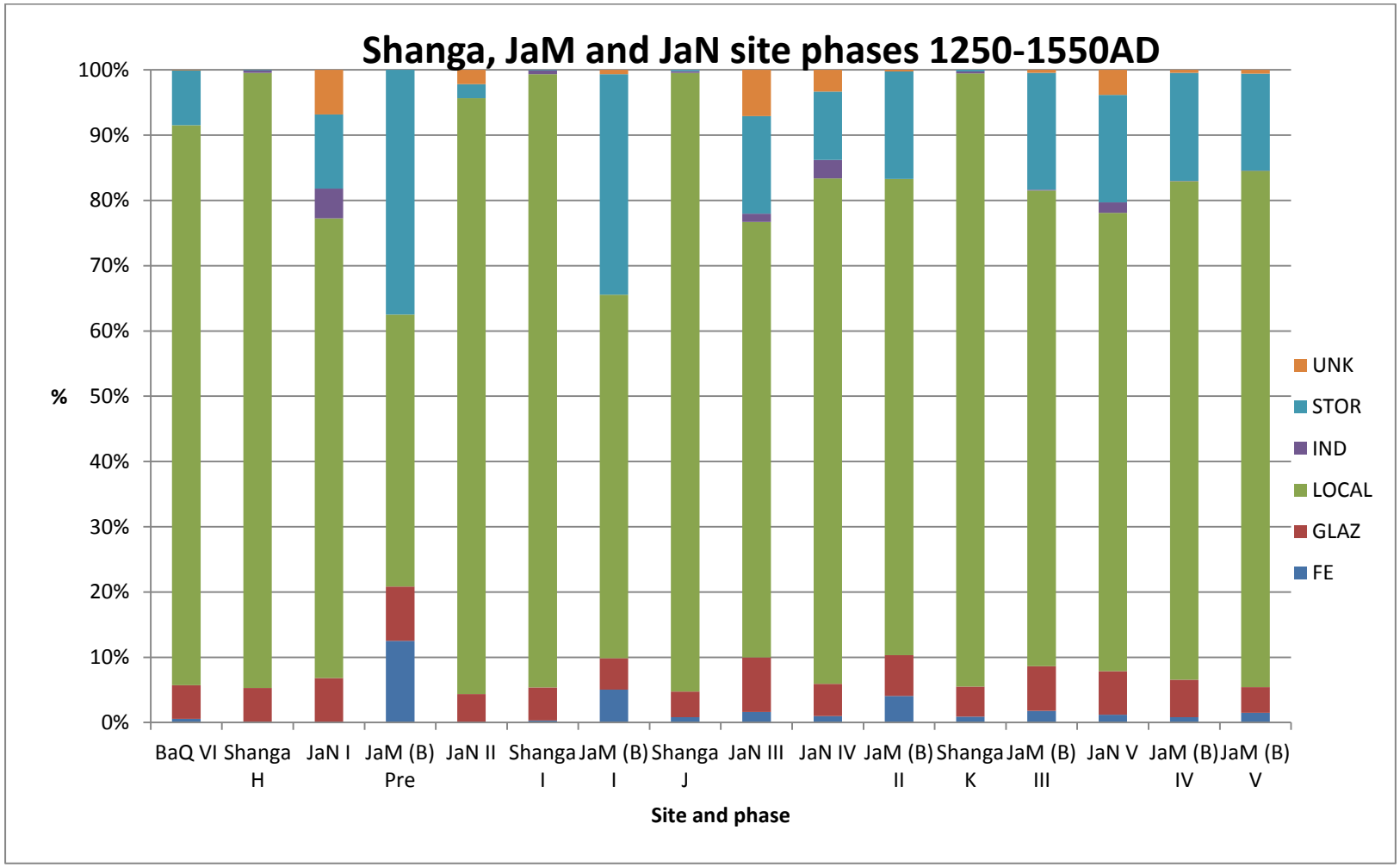
Figure 161: All sites phased ware families

Ware Family	BaQ VI	Shanga H	JaN I	JaM (B) Pre	JaN II	Shanga I	JaM (B) I	Shanga J	JaN III	JaN IV	JaM (B) II	Shanga K	JaM (B) III	JaN V	JaM (B) IV	JaM (B) V
FE	37	9	0	3	0	25	23	121	35	44	70	61	119	87	62	112
GLAZ	335	532	3	2	2	437	22	590	180	219	108	312	452	490	445	289
LOCAL	5584	9659	31	10	42	8093	254	14234	1439	3445	1257	6395	4818	5137	5902	5867
IND	0	36	2	0	0	49	0	40	27	125	0	19	7	120	1	2
STOR	549	8	5	9	1	7	154	26	322	467	284	16	1184	1203	1279	1101
UNK	3	0	3	0	1	0	3	0	153	147	4	0	30	281	35	43
Total	6508	10244	44	24	46	8611	456	15011	2156	4447	1723	6803	6610	7318	7724	7414

Figure 162: All sites phased ware families %

Ware Family	BaQ VI	Shanga H	JaN I	JaM (B) Pre	JaN II	Shanga I	JaM (B) I	Shanga J	JaN III	JaN IV	JaM (B) II	Shanga K	JaM (B) III	JaN V	JaM (B) IV	JaM (B) V
FE	0.6	0.1	0.0	12.5	0.0	0.3	5.0	0.8	1.6	1.0	4.1	0.9	1.8	1.2	0.8	1.5
GLAZ	5.1	5.2	6.8	8.3	4.3	5.1	4.8	3.9	8.3	4.9	6.3	4.6	6.8	6.7	5.8	3.9
LOCAL	85.8	94.3	70.5	41.7	91.3	94.0	55.7	94.8	66.7	77.5	73.0	94.0	72.9	70.2	76.4	79.1
IND	0.0	0.4	4.5	0.0	0.0	0.6	0.0	0.3	1.3	2.8	0.0	0.3	0.1	1.6	0.0	0.0
STOR	8.4	0.1	11.4	37.5	2.2	0.1	33.8	0.2	14.9	10.5	16.5	0.2	17.9	16.4	16.6	14.9
UNK	0.0	0.0	6.8	0.0	2.2	0.0	0.7	0.0	7.1	3.3	0.2	0.0	0.5	3.8	0.5	0.6

Figure 163: All sites ware family graph



The analysis does show that there are some trends across the sites which are interesting. The Shanga assemblage across the phasing contains a similar Islamic glazed ware percentage to both Julfar and Bilad al-Qadim. This would suggest that the trading of this type of ceramic was established across the whole area of the Western Indian Ocean covered by this study, with it being as common in East Africa as in the Arabian Peninsula. The twin sites of Julfar, sparing the first two phases of both which each contain fewer than 50 sherds, can be seen to be similar during the middle and late phases of each site (JaM (B) II, III, IV and V along with JaN III, IV and V). The graph clearly demonstrates as well that Julfar (beyond the early JaN phases I and II which again can be discounted) had a larger percentage of Far Eastern and Indian wares than Shanga, suggesting larger scale trade routes between Julfar and the Far East than between Shanga and the Far East. Interestingly when Far Eastern ceramics at Shanga do become slightly more commonin the later phases of occupation, Islamic glazed wares decrease as a percentage of the assemblage. This would suggest that there was a level of international trade at Shanga that remained at a fairly constant level but that the type and place of origin of ceramic traded changed during this period. It is possible that, given that Far Eastern wares were more valuable than Islamic glazed wares in general, the value of the commodities exchanged at Shanga rose as the quantity of Far Eastern wares increased and the Islamic ware decreased. However the differences in the quantity of these two ware families is minimal- FE wares do increase from approximately 0.3% in the earliest phase of this analysis to 0.9% in the final phase while GLAZ wares start at just over 5% and dip to 3.8% in the penultimate phase of Shanga before rising again to 4.6% in the final phase. This would therefore suggest that actually the level of interregional trade in East Africa (certainly at Shanga) was fairly constant, only rising a small amount in the final phase.

6.5: NON-PHASED 1250-1550AD ASSEMBLAGES:

Having looked at the sites which have published phasing data for the period 1250-1550AD, it is now necessary to discuss those sites which do not have discreet phasing information but are known to date from the period in question for the whole of their occupation. The first of these is the important site of Qalhat, in Oman. This site is currently undergoing excavation by a French team led by Dr. Axelle Rougeulle and the preliminary data that follows has been kindly provided by the team.

6.5.1: QALHAT:

Size of assemblage:

31,728

Issues in assemblage:

The site of Qalhat, currently under investigation by a French team under Rougeulle is thought to be the twin city of Hormuz, which then had Julfar as a subsidiary city (Rougeulle 2010: 303). The differences and similarities between the Qalhat and Julfar assemblages could therefore be very interesting. The data from Qalhat is preliminary and currently unphased as only a very brief analysis has so far taken place. However, an overview of the site can be made, and a comparison with Julfar al-Nudud and al-Mataf is possible. Unlike both of these areas, Qalhat appears to have had a local glazed ceramic industry as well as an unglazed tradition (Rougeulle 2010: 312-313). This has led to a slight change in the graphs, with an extra category LOC GLAZ included.

The sherds come from excavation and survey work completed during the last three years at the site. Exact collection methods and sieving/sampling strategies are unknown.

Assemblage against Julfar al-Nudud:

As there is no phasing to discuss, the analysis between ware family proportions at the three sites is the only analysis of the Qalhat assemblage to be completed in this study. Figure 164 shows the quantities and percentages for the sites and this is then represented in Figure 165.

Figure 164: Qalhat against Julfar assemblages

Ware Family	Qalhat	JaN Total	JaM Total	Qalhat %	JaN %	JaM %
FE	1619	376	679	5.1	1.3	1.4
IND	8309	640	18	26.2	2.2	0.0
GLAZ	1658	1970	2197	5.2	6.7	4.7
LOCAL	6896	20780	36736	21.7	70.2	78.4
LOC GLAZ	1590	0	0	5.0	0.0	0.0
UNK	9163	1179	221	28.9	4.0	0.5
STOR	2493	4647	7011	7.9	15.7	15.0
	31728	29592	46862			

Figure 165: Qalhat against Julfar assemblages graph

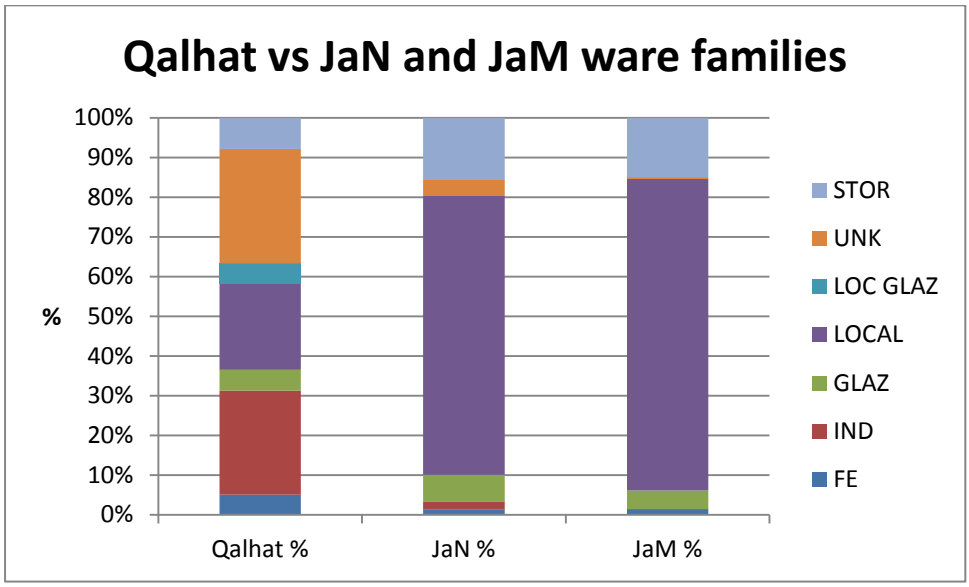


Figure 165 demonstrate how different the Julfar sites are to Qalhat. The Julfar sites are clearly dominated by the local unglazed wares, while the Qalhat assemblage is more evenly split between the different ware families, with a large percentage of Indian sherds and a higher number of Far Eastern ceramics compared to Julfar. The combined total of definite local wares is only 26.7% while both Julfar sites have over 70% of the assemblage made up of local wares. This discrepancy could be due to the high proportion of ceramics of unknown derivation which may come from the local area. However, as kilns were discovered at Qalhat (Rougeulle 2010: 312-313), it is unlikely that these wares are from the city itself. They could be imports of an unknown provenance somewhere around the Indian Ocean, showing interaction either with a new group or on a previously invisible scale that the growth of Qalhat has allowed to blossom.

Conclusions:

The percentage of imported wares is, unlike any other site in this review, higher than the local wares. This would suggest either a community using imported wares rather than their own local ceramic from an early stage (and therefore the wealth which would be associated with that), or a site made up of foreign traders with a small local presence. The historical documents would suggest that the site was occupied by Qalhati merchants, a local populace and various diaspora communities from around the Indian Ocean.

6.5.2: EARLIER ASSEMBLAGES: SHARMA:

Having considered the sites which have published discreet phasing for the period 1250-1550AD, it is now possible to add in the assemblage from Sharma in Yemen to the analysis. This site dates to an earlier period of trade between Siraf and Oman, Yemen and the East African seaboard during the 10th and 11th centuries, and is suspected to be part of the Sirafi mercantile system (Rougeulle 2003: 296).

Site:

Sharma/Yadhat

Size of assemblage:

35,515 sherds excavated. Only published as percentages in Rougeulle 2005 and later Yadhat report (Rougeulle 2007: 239). For comparison with Julfar assemblages see Figure 166.

Issues in assemblage:

The assemblage is published as part of a general article discussing the excavation and survey of the site of Yadhat, which is the production centre for the local ceramics found at Sharma (in a similar way to the kilns in the Wadi Haqil are the production centre for the Julfarwares found at Julfar). The original report was published before a complete and exhaustive study of the unglazed ceramic had been completed (Rougeulle 2003: 295) and so there are no exact figures for imported/local wares in this report. However in the later report on the Yadhat kilns (Rougeulle 2007) which supplied the local wares found at Sharma, the percentages are published.

The assemblage:

Far Eastern ceramics:

The Far Eastern ceramics found at Sharma show it was occupied between the 10th and 12th centuries AD, with examples of Qingbai porcelains in the later periods preceded by Yue and Ding porcelains in the 10th and early 11th centuries. Some black glazed stoneware is also present. This varied assemblage makes up 4.3% of the total (Rougeulle 2003: 295).

Indian ceramics:

Rougeulle illustrates several examples of Indian ceramics in figures 9 (no. 6) and 10 (nos. 1-4) which appear to be cooking vessel types (Rougeulle 2003: 302-303 and 304-305 respectively). These could demonstrate a similar purpose to those found at other Arabian sites- the personal items of Indian merchants or sailors or could show trade in Indian ceramics. The first explanation would seem the most likely as Sharma has its own industry for cooking pots (Rougeulle 2007).

Local unglazed ceramics:

Rougeulle discusses the unglazed ceramics as a general group as at the point of publication they had not been split into local and imported wares. She suggests that some have been brought from Zabid (Rougeulle 2003: 294). The examples shown in Rougeulle 2003: 302-303 fig. 9- nos. 4 and 5 are likely to be local. They are very similar to the ceramics found later by Rougeulle at Yadhat (Rougeulle 2007). A lot of the other wares illustrated are unclear.

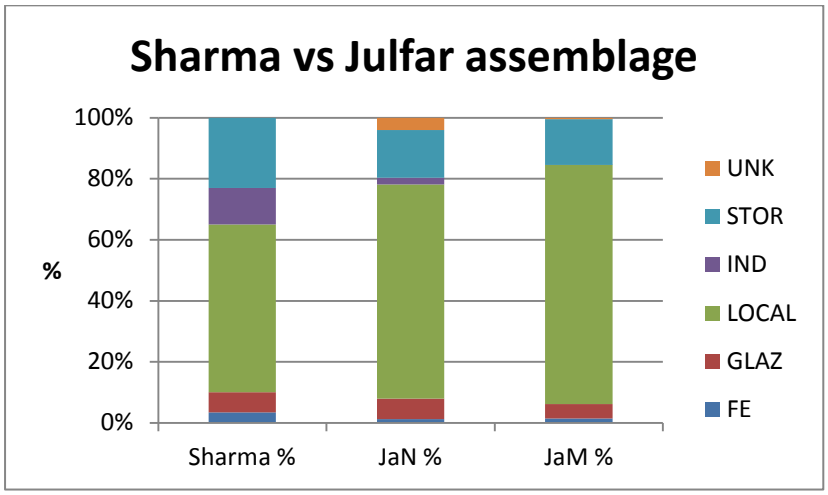
Foreign unglazed ceramics:

The report does contain illustrations of vessels that are clearly imported. East African ceramics are present as shown by Rougeulle 2003: 304-305 fig. 10- nos. 17-20. These bear the characteristic rim forms and hatched triangular decoration seen at Kilwa (Chittick 1974b: 342). The presence of East African ware is interesting as it does not occur further north at sites in Oman or in the Gulf. A number of Arabian Gulf unglazed sherds were found, although the proportions are unclear (Rougeulle 2003: 296)

Glazed ceramics:

The glazed ceramics found at Sharma are typical of a 10th-12th Century AD assemblage of exported glazed ware from Iran and the Gulf. Sgraffiatos (hatched, incised or Champleve) are in evidence and show probable trade with Siraf just before its decline in the late 10th/11th Century AD. Other glazed sherds such as white glazed wares and Iranian lustre ware are very rare, with only 10 sherds of Persian Fritware being found (Rougeulle 2003: 295). The glazed ware assemblage makes up 5% of the total assemblage, a number very close to the percentage made up of Far Eastern ceramics. This would suggest that the Far Eastern trade was as numerous as the trade in Islamic ceramics at Sharma.

Figure 166: Sharma against Julfar assemblages graph



Conclusions:

The site is interesting as it has a large percentage of imported wares, which Rougeulle has used to interpret it as a fortified trading warehouse (Rougeulle 2003: 295). The small percentage of local wares from the Yadhat site (Rougeulle 2007: 239) shows a need for cheap local ceramics at the site, presumably for food and cooking. However the large percentage of Indian wares would suggest a large Indian merchant population or a need for cooking/water storage vessels in the area due to a lack of indigenous vessels of these types. It is clearly a site of importance for the Indian Ocean trade in this area and demonstrates an important and rare case study- a site devoted entirely to trade with the East, with little local industry or population.

6.6: Conclusions of 1250-1550AD ware family assemblages:

The above analysis has demonstrated the lack of any general ware family assemblage over the sites occupied during the period 1250-1550AD. The amount of variability between the ware family assemblages in this time period shows that while some sites have an assemblage made up of approximately 50% non-local, and therefore imported, ceramics at Qalhat while another site, Shanga, is occupied during the same period and has approximately 95% of its 1250-1550AD assemblage being locally produced despite phases H-J being the phases of apparent increased international contact (Horton 1996: 403-6). This does not suggest that there was not an ocean wide trading network involving all or some of these sites, but that during this period it did not cause the sites assemblages to become homogeneous in their ware family make-up. It

must be noted that two of the ware families do change identity at each site- LOCAL relating to local unglazed wares, while STOR relates to imported unglazed wares. This would mean that if the analysis had shown that the proportions of two assemblages were similar, the actual ware make-up of the assemblages would not have been, as the local ware at each site is different. The majority of the sites have a strong local ceramic element supplemented with differing proportions of imported wares. This proportion does not appear to alter across time for all sites, with some seeing a decline in the percentage of non-local wares while others experience a rise. Sites clearly do have differences in their assemblage make-up, with some containing a larger imported segment while others have a much more limited one.

The period 1250-1550AD clearly demonstrates a period of complex changes in the different ware family assemblages, but these appear to be mainly site specific. The graphs do show that the assemblages do generally become more complex and have a larger proportion of imported wares, thereby demonstrating a possibly Indian Ocean wide rise in trade during the later stages of the study period. What is clear from the analysis is that there are important similarities in the assemblages of sites in a similar geographical area e.g. the Oman/Yemen seaboard where the two sites discussed have a larger imported part of the assemblage compared to all other sites. This would suggest a possible geographical factor within the assemblage make up, which will be discussed below.

6.7: GEOGRAPHICAL ANALYSIS OF ASSEMBLAGES:

The previous sections related the sites which had published numerical data for their ceramic assemblages to the assemblage from Julfar al-Nudud (Saunders in Carter in press) and the combined British and Japanese published assemblages from Julfar al-Mataf (Kennet 2003; Sasaki & Sasaki 1992), and demonstrated that there were not groupings of similar assemblages depending on the period of occupation.

6.7.1: THE ASSEMBLAGES:

This section will look at the different geographical groupings of these assemblages to discover whether the same can be said for geographical location or whether different regions have

similar ware family proportions. This chapter will include the numerical data from Manda which was not included in the period analysis as no phase data is available for the assemblage and the occupation of the site covers both periods discussed. Figure 167 shows the raw data for six of these assemblages while Figure 168 shows the percentage data for all seven as no raw data for Sharma is currently available. This is then presented in Figure 169.

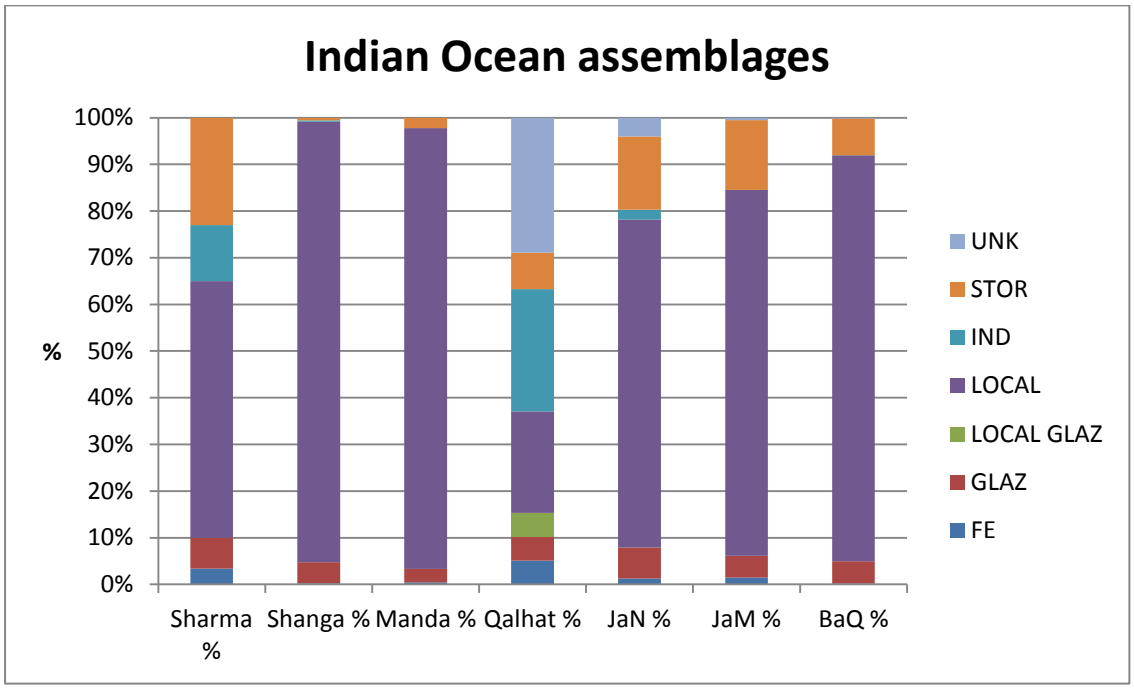
Figure 167: All sites ware family assemblage

Ware Family	Shanga Total	Qalhat Total	JaN Total	JaM Total	BaQ Total	Manda Total
FE	346	1619	376	679	48	1018
GLAZ	6128	1658	1970	2197	1518	7210
LOCAL GLAZ	0	1590	0	0	0	0
LOCAL	128252	6896	20780	36736	27347	236250
IND	299	8309	640	18	8	0
STOR	811	2493	4647	7011	2489	5522
UNK	0	9163	1179	221	44	0
	135836	31728	29592	46862	31454	250000

Figure 168: All sites ware family assemblage %

Ware Family	Sharma %	Shanga %	Qalhat %	JaN %	JaM %	BaQ %	Manda %
FE	3.4	0.3	5.1	1.3	1.4	0.2	0.41
GLAZ	6.6	4.5	5.2	6.7	4.7	4.8	2.88
LOCAL GLAZ	0.0	0.0	5.0	0.0	0.0	0.0	0
LOCAL	55	94.4	21.7	70.2	78.4	86.9	94.5
IND	12	0.2	26.2	2.2	0.0	0.0	0
STOR	23	0.6	7.9	15.7	15.0	7.9	2.21
UNK	0	0.0	28.9	4.0	0.5	0.1	0

Figure 169: All sites ware family assemblages graph



The differences between the assemblages are evident. The closest to each other are those of Manda and Shanga, the two East African sites. Equally the two Julfar sites are similar, while Bilad al-Qadim has proportions between the Julfar sites and the East African sites. Similarities can be seen between Sharma and Qalhat, due to the smaller proportion of local wares compared to all the other sites. Sharma has the second highest percentage of Indian ware and Qalhat the highest. Qalhat also has the most varied assemblage of all the sites, as the only example of a site with local glazed ceramic and a high percentage of currently unknown ceramic. This could be due to Qalhat's location as the first landfall point for vessels sailing from India and the Far East as well as being an important port on the transit of commodities between the Arabian Gulf, Oman, Yemen and the East African Seaboard.

These assemblages can then be looked at in terms of local and non-local ceramics. This will demonstrate areas with a strong local ceramic tradition and areas which import the majority of their ceramics. What these results signify will be discussed later. Figure 170 shows the raw data for each site, while Figure 171 shows the percentages. These are then illustrated in Figure 172.

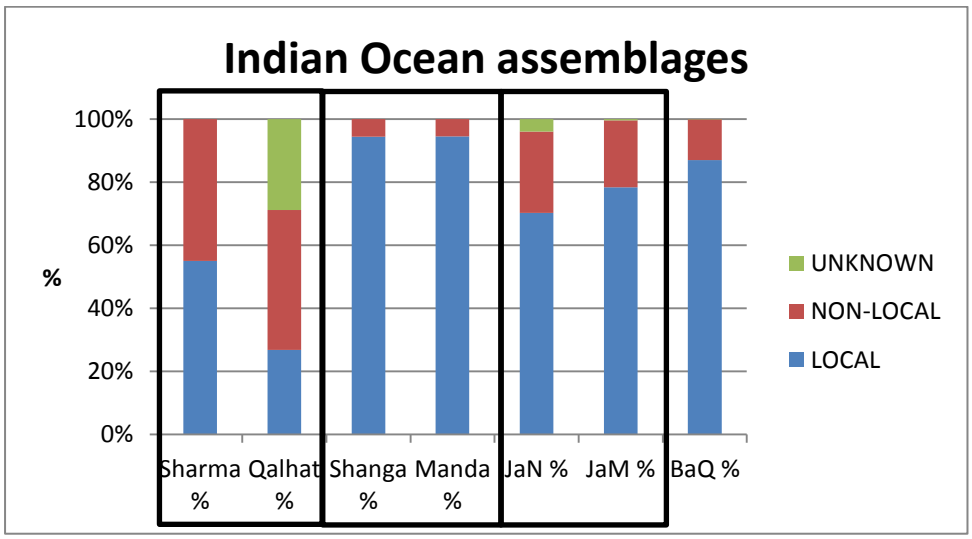
Figure 170: All sites Local against non-local ceramics

Origin	Shanga Total	Qalhat Total	JaN Total	JaM Total	BaQ Total	Manda Total
LOCAL	128252	8486	20780	36736	27347	236250
NON-LOCAL	7584	14079	7633	9905	4063	13750
UNKNOWN	0	9163	1179	221	44	0
	135836	31728	29592	46862	31454	250000

Figure 171: All sites Local against non-local ceramics %

Origin	Sharma %	Shanga %	Qalhat %	JaN %	JaM %	BaQ %	Manda %
LOCAL	55.0	94.4	26.7	70.2	78.4	86.9	94.5
NON-LOCAL	45.0	5.6	44.4	25.8	21.1	12.9	5.5
UNKNOWN	0.0	0.0	28.9	4.0	0.5	0.1	0.0

Figure 172: All sites local against non-local ceramics graph



These graphs show the immense variability there is between the assemblages across the study areas. The only similarities are between the two sites at Julfar which have reasonably similar % of foreign wares (JaN- 25.8 to JaM 21.1%) and more strikingly the similarity between Shanga and Manda with both having just over 5% foreign wares. Even though previous graphs have shown that the two sites may have had slightly different imported ceramic assemblages

according to the ware family data, the numbers involved show that a similar level of overall ceramic trade was being conducted. The purpose built trading site of Sharma is nearly 50/50 on imports to local wares and Qalhat, which appears to have the most varied multi-national assemblage of all sites.

6.7.2: GEOGRAPHICAL ANALYSIS CONCLUSION:

It is therefore possible to break up the seven assemblages into groupings which also reflect their geographical location: Julfar al-Mataf and al-Nudud could be seen to represent an Arabian Gulf type ware family assemblage, while the two East African sites, Shanga and Manda make a coherent group. This does expose Bilad al-Qadim as a possible exception, as it appears to fit somewhere between the Gulf and East African groupings. However as discussed above, the purpose of the site at Bilad al-Qadim is probably dissimilar to all other sites in this discussion due to its political affiliations, inland location and probable decline. This could therefore lead it to have different proportions to its nearby sites, such as Julfar. A more useful comparison site in the Gulf is Qala'at al-Bahrain, which sadly has not had numerical data for its assemblage published. The next chapter will add to this conclusion of geographical limitations being placed on assemblages by looking at the individual wares present in each assemblage including those discussed above as well as QaB, Kilwa, Zabid, Zafar and the Williamson Collection. This should allow a less generalised discussion of the different assemblages, as well as putting forward individual wares as part of regional trading systems as well as those that are part of the large scale, inter-regional system.

CHAPTER SEVEN: INDIVIDUAL WARE ANALYSIS IN THE WESTERN INDIAN OCEAN:

7.1: INDIVIDUAL WARE ANALYSIS- INTRODUCTION:

Analysis of the Indian Ocean assemblages has so far concentrated on the breakdown of each assemblage into ware families, giving a generalised view of any trade and exchange patterns. To make the analysis more specific to a trading event/process it is necessary to also look at the individual wares present in each assemblage. The results of this may point to specific trading acts between the site where the ceramics are found and the location at which they were produced or to a certain ware being used to trade between sites.

This analysis is only possible for some of the assemblages discussed, as Qalhat does not currently have any information about the individual wares within its assemblage. The analysis will first look at the individual assemblages from each site, using percentage boundaries to split out wares making up a significant portion of the assemblage, as well as identifying those wares which are present in smaller but still important numbers. Once significant and important wares for individual sites have been identified, the ceramics drawings of wares from other assemblages which have been published without numerical data will be discussed in terms of their presence in those assemblages. Two separate hypotheses will be tested, similarly to the ware family analysis in chapter six, looking at ties between the assemblages and their geographical locations/period of occupation.

7.1.1: METHODOLOGY AND ANALYSIS:

The definitions of the terms 'significant ware' and 'important ware' are a key part of this analysis, in terms of finding appropriate percentage levels for these terms. Too high a percentage boundary would lead to a lack of any significant wares, while too low a bracket would make a ceramic mountain out of a sherd molehill. After a period of experimentation with the Julfar al-Nudud assemblage, a set of boundaries was decided upon. Significant wares are identified as wares which make up more than 0.5% of an assemblage, and therefore represent a relatively large segment of the ceramic found at each site. Important wares however are identified as wares that make up between 0.25% and 0.5% of an assemblage, and represent a second tier of wares which are slightly rarer at sites, due either to their increased value compared to more common wares or to lesser importance as part of the trade assemblage.

The first stage is to look for individual wares that are important in different periods of trade and exchange. This has been completed using those assemblages with phased data, using the definition of significant and important wares described above to look at variations for each phase. This analysis will hopefully demonstrate sites which have an assemblage that changes over time depending on which wares are most common, as well as possibly showing sites which are more static in terms of their assemblages. The first site to be discussed is the base site of Julfar al-Nudud.

7.1.2: JULFAR AL-NUDUD SIGNIFICANT AND IMPORTANT WARES:

The Julfar al-Nudud assemblage has already been discussed at length in chapter three. This original analysis only looked in detail at the presence of wares, rather than the significance of each ware. Figure 173 below shows the phased ware assemblage and high-lights the significant wares in red and the important wares in green. Phases 1 and 2 are excluded due to their small size (42 and 46 sherds respectively) and as Plain Julfarware is the only ware with more than 2 sherds in both these phases, it is the only ware that could be considered significant.

Figure 173: Julfar al-Nudud significant and important ware analysis (red for 'significant' ware, green for 'important' ware):

Ware Name	Ware Family	1	2	3	4	5	6	N/S	Total
JULFAR	LOCAL	31	42	1336	2921	4070	6395	1052	15847
DLGW	GLAZ	2	2	137	59	138	258	70	666
BUFF	STOR	2	1	194	269	652	1181	180	2479
CRWW	STOR	2		26	40	135	159	35	397
ODD	UNK	2		24	29	54	53	20	182
TBBW	IND	2		2	15	26	122		167
LIME	STOR	1		9	58	124	265	59	516
PERSIA	GLAZ	1		6	51	137	263	66	524
WW	UNK	1			9	5		2	17
SWW	UNK		1	61	43	55	102	17	279
JULFAR.RW	LOCAL			74	348	771	1628	283	3104
WIW	STOR			68	72	166	556	69	931
HWW	UNK			43	26	86	165	50	370
LQC	FE			21	15	18	33	11	98
MGP	GLAZ			19	28	48	110	25	230
ERG	UNK			18	8	31	41	19	117
JULFAR.PB	LOCAL			29	176	295	1231	91	1822
TRBW	IND			11	29	37	129	7	213

Ware Name	Ware Family	1	2	3	4	5	6	N/S	Total
KHUNJ	GLAZ			8	28	40	86	14	176
SAC	FE			9	6	23	34	6	78
PUM	STOR			9	6	17	11	3	46
SHELL	STOR			7	8	56	50	2	123
NIDGW	GLAZ			6	21	24	19	4	74
INCW	UNK			5	19	44	102	8	178
CHALKY	STOR			5	4	3	17		29
RPW	IND			3	4	11	21	4	43
MLD	STOR			3	4	7	19	1	34
FIGW	UNK			3	3	6	16	1	29
DIIW.B	IND			2	48	4	2	1	57
WFRIT	GLAZ			2	8	26	41	3	80
CORB	IND			2	7	2	1		12
DEPAW	GLAZ			2	6	51	46	14	119
NIDIW	IND			2			1		3
CBW	FE			1	12	33	59	10	115
CHIN	FE			2	11	12	33	11	69
PISW	STOR			1	4	8	13	3	29
BRIB	STOR			1	3	5	15		24
PIP	UNK			1	1	2			4
ROB	UNK			1	1				2
OC	FE			1		1	10		12
FIGB	UNK			1			5		6
UGC	FE			1					1
GFRIT	GLAZ				17	20	43	8	88
UNIQ	UNK				9				9
DIIW.BL	IND				8		7		15
GIW	STOR				2	25	18		45
RORG	UNK				2	10	3	1	16
TRW	IND				2	8	13		23
BAG	IND				2	8	4		14
BRICK	UNK				2	1	2	1	6
YELL	GLAZ				1	2	2	2	7
TEXT	IND				1	1			2
BORB	UNK				1		4	1	6
BLAB	UNK					9			9
LFRIT	GLAZ					4	2		6
BUBL	UNK					2	10		12
REMIC	UNK					2	1		3
MEW	STOR					1	8		9
FINCW	UNK					1	3		4
JULFAR.RC	LOCAL					1	3	3	7

Ware Name	Ware Family	1	2	3	4	5	6	N/S	Total
BGSW	FE						3		3
CHOC	UNK						2		2
MARS	UNK						2		2
MOD	UNK						1	2	3
NONID	UNK							1	1
		44	46	2156	4447	7319	13424	2161	29594
0.25%		0.11	0.12	5.39	11.12	18.30	33.56	5.40	73.99
0.50%		0.22	0.23	10.78	22.24	36.60	67.12	10.81	147.97

The table demonstrates that the Julfar al-Nudud assemblage contains a large number of significant wares both across individual phases and in the total assemblage. The majority of these are significant in the assemblage from at least phase 3 with JULFAR being the only significant ware for the whole phasing. The significant wares are split between all ware families fairly equally with the exception of Far Eastern wares which, for the total assemblage, are only found in percentages between 0.0025 and 0.005% of the assemblage and are therefore the next level down- important wares. There is only one phase where FE wares become significant in the assemblage- phase 3 for LQC (as well as both LQC and CHIN being significant in the unstratified assemblage). However in general they are mostly in the important ware bracket, suggesting that while they are not common they are at least at a constant level in the assemblage across the phases. The table also shows wares which have brief periods of significance in the phasing before becoming less common e.g. DIIW.B in phase 4 and DEPAW in phase 5. Overall, however the significance of a ware does not appear to change too much over the phasing, with the majority of these which are significant or important at the point of their introduction remaining so. This suggests that the assemblage overall is fairly stable, with only occasional introductions, particularly in phases 3 and 4. This backs up the suggestion in chapter three that wares were introduced during these phases and then remained in the assemblage, with the rim types of vessels changing, rather than the ware they are made from.

7.1.3: JULFAR AL-MATAF SIGNIFICANT/IMPORTANT WARES IN PHASING:

In terms of immediate contrast, the next assemblage to be discussed will be the British assemblage from al-Mataf. It will be interesting to demonstrate whether these two assemblages are similar, both in terms of their significant/important wares and in terms of their changes

over their phasing. The British assemblage will be split into the two excavation areas- the mosque and the occupation area- for this analysis. Figure 174 shows the mosque data while Figure 175 shows the occupation data.

Figure 174: Julfar al-Mataf mosque assemblage significant and important ware analysis (red for 'significant' ware, green for 'important' ware):

Ware	Ware Family	NUD10 ware	PRE	I	II	III	IV	V	VI	REC	Total	%
JULFAR	LOCAL	JULFAR	7	54	929	1618	4539	4892	5207	6554	23800	71.27
WHITE	STOR		7	114	186	519	909	900	830	715	4180	12.52
UNDERGL	GLAZ	MGP/TIN	2	7	72	125	279	148	119	104	856	2.56
WPINK	STOR	CRWW		3	16	73	71	83	67	38	351	1.05
LQC	FE	LQC		2	13	29	29	21	22	58	174	0.52
LSANDY	STOR			2	1	27	15	11	27	17	100	0.30
SCHINA	FE	CHIN		1	5	9	17	8	12	20	72	0.22
GRITTY	UNK			1			6	3	3	10	23	0.07
MUSTARD	GLAZ	YELL		1			1	1	4	2	9	0.03
TURQ	GLAZ			2	2	2					6	0.02
MGPAINT	GLAZ	MGP		1							1	0.00
JULFAR.1	LOCAL	JULFAR.RW			30	167	752	432	462	422	2265	6.78
LIME	STOR	LIME			7	26	96	36	93	63	321	0.96
PERSIA	GLAZ	PERSIA			3	18	51	33	60	58	223	0.67
JULFAR.2	LOCAL	JULFAR.PB			3	9	35	22	40	23	132	0.40
JULFAR.4	LOCAL	JULFAR.PB			1	11	13	25	72	3	125	0.37
MTB	FE	CHIN/OC			2	2	10	4	17	31	66	0.20
FRIT.BW	GLAZ	WFRIT			2	7	18	12	11	14	64	0.19
LEATH	UNK				1	1	5	8	14	15	44	0.13
BLGREY	UNK				1	9	1	2	3	3	19	0.06
BLACK	GLAZ				2	2		1	1	5	11	0.03
BSTONE	FE	BGSW			1	1				3	5	0.01
BURN	UNK				2	1	1				4	0.01
CBW	FE	CBW				11	22	19	45	78	175	0.52
KHUNJ	GLAZ	KHUNJ				10	44	34	36	32	156	0.47
FRIT.DEG	GLAZ	WFRIT				5	4	18	8	11	46	0.14
GMONO.2	GLAZ	TIN				1	12	2	3	5	23	0.07
EASTIN	FE					1	7		5	2	15	0.04
YELWHIT	UNK					2	2	4	2	3	13	0.04
RSLIP	IND					3	1	2	3		9	0.03
WPORC	FE					2		2	4		8	0.02
SWATOW	FE					1		1	1	4	7	0.02
GBSTONE	FE					2		3			5	0.01
BWEARTH	GLAZ	NIDGW				2					2	0.01

Ware	Ware Family	NUD10 ware	PRE	I	II	III	IV	V	VI	REC	Total	%
FRIT.CEL	GLAZ					2					2	0.01
THIN	LOCAL						2	3	3	19	27	0.08
FRIT.TB	GLAZ	GFRIT					4	1		1	6	0.02
ENAM	FE						1			1	2	0.01
DKHUNJ	GLAZ	KHUNJ						1	3		4	0.01
VIET	FE	SAC						2		2	4	0.01
NONCHIN	FE							1			1	0.00
IMITCEL	GLAZ								1	3	4	0.01
MOD	FE								1		1	0.00
LGREEN	GLAZ									1	1	0.00
DHM	FE									1	1	0.00
DHP	FE									1	1	0.00
UNCLASS	UNK						16	1	5	6	28	0.08
Total			16	188	1279	2698	6963	6736	7184	8328	33392	

0.0025%	0	0.5	3.2	6.75	17.4	16.8	18	20.8	83.48
0.0050%	0.1	0.9	6.4	13.5	34.8	33.7	35.9	41.6	166.96

Figure 175: Julfar al-Mataf occupation assemblage significant and important wares analysis (red for 'significant' ware, green for 'important' ware):

Ware	Ware Family	NUD10 ware	PRE	I	II	III	IV	V	VI	REC	Total	%
JULFAR	LOCAL	JULFAR	2	199	290	2873	534	442	3751	969	9060	70.38
WHITE	STOR	WIW/BUFF	2	31	62	492	152	63	637	110	1549	12.03
JULFAR.1	LOCAL	JULFAR.RW	1	1	4	134	27	43	590	74	874	6.79
UNDERGL	GLAZ	MGP/TIN		10	24	242	27	26	155	8	492	3.82
WPINK	STOR	CRWW		4	12	34	35	6	52	11	154	1.20
LQC	FE	LQC		2	11	22	1	2	14	3	55	0.43
FRIT.BW	GLAZ	WFRIT		1	3	8		3	8	1	24	0.19
SCHINA	FE	SAC			1	5		2	17	2	27	0.21
LIME	STOR	LIME				8		2	144	20	174	1.35
PERSIA	GLAZ	PERSIA				8	4	4	76	20	112	0.87
KHUNJ	GLAZ	KHUNJ				1		1	45	7	54	0.42
CBW	FE	CBW				3			25	18	46	0.36
FRIT.DEG	GLAZ	WFRIT				16	1	3	20		40	0.31
LSANDY	STOR					5	1		26	4	36	0.28
BLGREY	UNK					1		24	8		33	0.26
JULFAR.2	LOCAL	JULFAR.PB				4		1	23	4	32	0.25
LEATH	UNK					3		1	15		19	0.15
MTB	FE					2		1	9	3	15	0.12

Ware	Ware Family	NUD10 ware	PRE	I	II	III	IV	V	VI	REC	Total	%
JULFAR.4	LOCAL	JULFAR.PB				2		7	1		10	0.08
YELWHIT	UNK					1	4		4		9	0.07
BURN	UNK					7					7	0.05
RSLIP	IND					4					4	0.03
BSTONE	GLAZ					2					2	0.02
FINPAINT	UNK					1			1	1	3	0.02
BWEARTH	GLAZ					1					1	0.01
DHP	FE					1					1	0.01
GBSTONE	GLAZ	BGSW						1			1	0.01
EASTIN	FE	CHIN/OC							4	1	5	0.04
GMONO.2	GLAZ	TIN							5		5	0.04
MUSTARD	GLAZ								2		2	0.02
FRIT.TB	GLAZ	GFRIT							1		1	0.01
POLY	GLAZ								1		1	0.01
VIET	FE	SAC							1		1	0.01
GRITTY	UNK									11	11	0.09
IMITCEL	GLAZ									3	3	0.02
THIN	FE	CHIN/OC								1	1	0.01
BLACK	GLAZ									1	1	0.01
UNCLASS	UNK			2		4			2		8	0.06
Total			5	250	407	3884	786	632	5637	1272	12873	

0.0025%	0	0.6	1	9.71	2	1.6	14.1	3.18	32.1825	
0.0050%	0	1.3	2	19.4	3.9	3.2	28.2	6.36	64.365	

The table shows that the al-Mataf assemblage is more concentrated into a smaller number of significant wares with nine in the mosque assemblage and seven in the occupation assemblage. These are a mix of the ware families, including FE wares such as LQC and CBW, unlike at al-Nudud. Most of these are found in the mosque area of the site, suggesting that this was a richer area with finer wares present in larger numbers. Similarly to al-Nudud there are not many examples of individual wares becoming important for one phases, except for GRITTY in the REC phase, and BLGREY in phase V, both from the occupation area, showing that the general assemblage is quite homogenous through the occupation of the site, even though new wares are added in at various points. The analysis shows that the al-Mataf assemblage does differ from the al-Nudud ceramics- the number of significant/important wares is smaller than at al-Nudud and there are more FE and GLAZ wares as a percentage in the al-Mataf assemblage. This would suggest that the assemblage is based around a few core wares, some of which are imports. The

dominant ceramic ware is still the local unpainted Plain Julfarware. A very similar pattern can be observed in the Bilad al-Qadim assemblage discussed below.

7.1.4: BILAD AL-QADIM SIGNIFICANT/IMPORTANT WARE IN PHASING:

The assemblage from Bilad al-Qadim pre-dates the occupation of Julfar for all but the final phase of occupation. Therefore the majority of the wares are not common to both sites. However the local Common ware present in the BaQ assemblage continues to be produced and is present at Julfar. Similarly during the final phase of BaQ, some imported Julfarware is found. Figure 176 shows the phased BaQ assemblage.

Figure 176: Bilad al-Qadim significant and important wares analysis (red for 'significant' ware, green for 'important' ware):

Ware	Code	Ware Family	1	2	3	4	5	6	Total
Common Ware	COMM	BAH	419	516	2156	4426	14132	5533	27182
Lower Gulf Red Ware	LOWRED	STOR	181	172	154	126	80	118	831
White Earthenware (eggshell)	EGG	STOR	108	105	245	203	112	269	1042
Plain Turquoise Glaze	TURQ	GLAZ	43	106	41	39	13	42	285
Unclassified Glazed	UNKN.G	GLAZ	39	80	73	159	138	96	585
Lower Gulf Pale Ware	LOWPAL	STOR	36	34	53	61	22	67	273
Grey Abrasive Ware	GAW	UNK	23	1	0	0	0	0	24
Unclassified Unglazed	UNKN.U	STOR	11	5	13	16	46	29	121
Turquoise Glaze with Applique	TURQ.AP	GLAZ	5	18	7	1	1	19	51
Lower Gulf Dark Ware	LOWDAR	STOR	5	6	11	10	1	17	51
Turquoise Glaze with Black	TURQ.BL	GLAZ	2	3	0	1	0	0	6
Brown Sandy Ware	BSW	STOR	2	2	5	0	0	1	10
Cream Ware	CREAM	UNK	1	2	1	0	1	1	7
Hard Red Sandwich Ware	HARS	UNK	1	1	5	4	0	0	11
Chinese White Ware	CHIN.W	FE	1	0	1	1	1	4	9
Barbar	BARB	UNK	1	0	0	0	0	1	2
Cobalt Decorated White Glaze	COB.WH	GLAZ	0	25	1	27	10	1	65
Proto Julfar	JULF.PR	STOR	0	21	4	0	3	0	28
Cobalt with Black	COB.BL	GLAZ	0	7	25	1	0	0	33
Fine Ware	FINE	BAH	0	5	19	67	21	49	161
Dark Blue and White Glaze	DBLUE	GLAZ	0	5	2	0	0	0	7
Lustre Ware	LUSTRE	GLAZ	0	4	1	2	1	0	9
Splashed Ware	SPLASH	GLAZ	0	4	0	10	0	0	14

Ware	Code	Ware Family	1	2	3	4	5	6	Total
Early Sgraffiato	GRAF.E	GLAZ	0	4	0	0	0	0	4
Opaque White Glaze	WHITE	GLAZ	0	3	7	12	1	4	27
Incised Turquoise Glaze	TURQ.INC	GLAZ	0	2	1	1	0	3	8
Burnished Indian	BURIND	IND	0	2	0	0	6	0	8
White and Black glaze	WAB	GLAZ	0	2	0	0	0	0	2
Limy Ware	LIME	BAH	0	1	1	0	0	2	4
Black Glaze	BLACK	GLAZ	0	1	0	4	1	0	6
Gritty Ware	GRITTY	STOR	0	0	12	11	62	5	91
White or Indeterminate Frit	FRIT.WH	GLAZ	0	0	2	3	7	5	18
Red and Green Over-glaze	RAGO	GLAZ	0	0	2	1	0	0	3
Green Glaze with Yellow Streaks	GREYEL	GLAZ	0	0	1	2	0	0	3
Indetermiate Far Eastern	UNKN.FE	FE	0	0	1	1	0	8	10
Sgraffiato (General)	GRAF	GLAZ	0	0	0	106	13	115	235
Hatched Sgraffiato	GRAF.HAT	GLAZ	0	0	0	30	9	14	53
Brown Sgraffiato	GRAF.BR	GLAZ	0	0	0	12	0	1	13
Blue Frit	FRIT.BL	GLAZ	0	0	0	8	7	9	25
Monochrome Green Sgraffiato	GRAF.GR	GLAZ	0	0	0	7	4	7	19
Fine Red with Black Underglaze	FIREB	GLAZ	0	0	0	6	10	6	22
Misc Underglaze	MISC.G	GLAZ	0	0	0	3	3	2	8
Non-Specific Celadon	CEL	FE	0	0	0	2	0	3	5
Blue Glaze with Vertical Ribs	BLURIB	GLAZ	0	0	0	0	3	0	3
Longquan Celadon	LQC	FE	0	0	0	0	1	4	5
Manganese Purple Underglaze	MGP	GLAZ	0	0	0	0	1	4	5
Frit Lustre Ware	FRIT.L	GLAZ	0	0	0	0	1	0	1
Blue and White Frit	FRIT.BW	GLAZ	0	0	0	0	1	0	1
Julfar	JULFAR	STOR	0	0	0	0	0	42	42
Chinese Blue and White	CBW	FE	0	0	0	0	0	18	18
Carved Glazed Red Ware	CARRED	GLAZ	0	0	0	0	0	4	4
Khunj/Bahla	KHUNJ	GLAZ	0	0	0	0	0	1	1
			878	1136	2842	5365	14871	6505	31597

Total	878	1137	2845	5364	14721	6508	31453
0.0025%	2	3	7	13	37	16	79
0.0050%	4	6	14	27	74	33	157

For the Bilad al-Qadim assemblage there are more significant and important wares present in the early, pre-Julfar phases 1-4, showing a more varied assemblage less dominated by the local Common Ware. However in phase 5 there are only 4 significant wares and two important wares, suggesting a serious contraction with Common Ware then making up 95% of the assemblage- a number much closer to that of the East African sites than the previous phases or the overall site assemblage. Unlike both Julfar site assemblages, the assemblage does have wares which briefly

peak with more variants of glazed wares being common in phases 2-4 (2 cobalt glazed wares and 2 sgraffiato wares become significant during these periods). Similarly we see that in phase 6 Julfar ceramics are first imported in a significant number, and the first sherds of CBW are found. The assemblage has already been discussed as a middle ground between the Julfar assemblages with around 25% imports and the East African site of Shanga which has around 5%, shown in the next table.

7.1.5: SHANGA SIGNIFICANT/IMPORTANT WARES IN PHASING:

Figure 177: Shanga significant and important wares analysis (red for 'significant' ware, green for 'important' ware):

Ware Name	Ware Family	A	B	C	D	E	F	G	H	I	J	K	Total
Tana East African Ware	LOCAL	1371	5515	7503	8181	8225	14976	38116	9659	14077	14234	6395	128252
Sasanian-Islamic (a)	GLAZ	0	8	2	6	10	18	27	5	0	0	1	77
Sasanian-Islamic (b)	GLAZ	4	16	25	18	5	9	13	7	2	1	0	100
Sasanian-Islamic (c)	GLAZ	9	20	66	27	19	10	32	5	8	4	0	200
Sasanian-Islamic (d)	GLAZ	6	22	36	30	16	13	21	6	6	1	1	158
Sasanian-Islamic (e)	GLAZ	5	2	9	5	4	9	44	2	1	1	1	83
White Glaze (a)	GLAZ	0	27	35	20	23	30	13	0	1	3	1	153
White Glaze (b)	GLAZ	0	12	7	18	5	14	9	1	1	1	1	69
White Glaze (c)	GLAZ	0	0	0	5	0	1	0	0	0	0	0	6
White Glaze (d)	GLAZ	0	2	0	0	0	0	0	0	0	0	0	2
Samarra Lustre	GLAZ	0	4	7	7	3	2	3	1	1	0	0	28
Pb glaze polychrome (a)	GLAZ	0	0	0	0	0	1	2	0	0	0	2	5
Pb glaze polychrome (b)	GLAZ	0	0	0	2	2	10	21	7	9	7	0	58
Pb glaze polychrome (c)	GLAZ	0	0	1	0	0	0	0	0	0	0	0	1
Pb glaze polychrome (d)	GLAZ	0	0	0	0	0	0	1	0	0	0	0	1
Late Scraffiato	GLAZ	0	0	0	3	137	255	501	37	32	11	2	978

Ware Name	Ware Family	A	B	C	D	E	F	G	H	I	J	K	Total
(a)													
Late Scraffiato (b)	GLAZ	0	0	0	0	14	44	184	67	41	6	3	359
Late Scraffiato (c)	GLAZ	0	0	0	3	41	74	190	53	35	15	3	414
Late Scraffiato (d)	GLAZ	0	0	0	0	2	7	54	13	4	1	0	81
Late Scraffiato (e)	GLAZ	0	0	0	1	7	53	104	15	20	2	1	203
Late Scraffiato (f)	GLAZ	0	0	0	1	26	30	84	20	6	2	0	169
Late Scraffiato (g)	GLAZ	0	0	0	1	2	3	55	26	46	24	6	163
Late Scraffiato (h)	GLAZ	0	0	0	0	14	47	238	57	86	41	5	488
Late Scraffiato (i)	GLAZ	0	0	0	0	9	24	74	15	19	4	2	147
Late Scraffiato (j)	GLAZ	0	0	0	1	11	11	74	17	21	11	4	150
Late Scraffiato (k)	GLAZ	0	0	0	4	13	20	51	13	7	6	0	114
Late Scraffiato (l)	GLAZ	0	0	0	1	10	16	43	13	19	4	1	107
Late Scraffiato (m)	GLAZ	0	0	0	0	24	50	199	33	40	13	4	363
Late Scraffiato (n)	GLAZ	0	0	0	1	6	1	1	0	0	0	0	9
Late Scraffiato (o)	GLAZ	0	0	0	0	2	12	44	11	9	7	1	86
Late Scraffiato (p)	GLAZ	0	0	0	0	2	0	8	2	2	0	0	14
Late Scraffiato (q)	GLAZ	0	0	0	0	0	0	5	0	1	0	0	6
Late Scraffiato (r)	GLAZ	0	0	0	0	0	1	12	1	2	0	0	16
Late Scraffiato (undiag.)	GLAZ	0	0	0	12	40	35	147	42	67	28	2	373
Green glaze inc.	GLAZ	0	0	0	0	0	0	4	5	0	13	2	24
Black on Yellow (i)	GLAZ	0	0	0	0	0	0	1	7	7	10	2	27
Black on Yellow (ii)	GLAZ	0	0	0	0	0	0	1	7	39	34	8	89
Black on Yellow	GLAZ	0	0	0	0	0	0	8	29	107	111	44	299

Ware Name	Ware Family	A	B	C	D	E	F	G	H	I	J	K	Total
(sherds)													
Dark/light blue polychrome	GLAZ	0	0	0	0	0	0	0	5	5	22	17	49
Green/brown polychrome	GLAZ	0	0	0	0	0	0	0	2	1	1	0	4
Green monochrome (a)	GLAZ	0	0	0	0	0	0	1	8	35	164	149	357
Green monochrome (b)	GLAZ	0	0	0	0	0	0	0	0	2	4	9	15
Blue monochrome	GLAZ	0	0	0	0	0	0	0	0	4	38	40	82
Islamic Fritwares	GLAZ	0	0	0	1	0	0	0	0	0	0	0	1
Pale Green earthenware	STOR	5	51	79	70	37	21	32	1	6	10	4	316
Pink earthenware	STOR	0	2	5	13	20	12	22	2	3	3	3	85
Fine pink earthenware	STOR	1	5	1	1	5	0	0	0	0	0	0	13
Brittle ware	STOR	0	1	6	4	3	0	2	0	0	0	0	16
Red Slipped earthenware	STOR	0	0	0	2	7	1	0	0	0	0	0	10
Fine creamware	STOR	21	31	58	17	13	7	1	2	0	0	1	151
Gudulia	STOR	0	0	0	0	5	116	37	2	9	11	7	187
Misc. earthenware	STOR	0	0	0	0	5	5	16	1	3	3	1	34
Grass Greyware	IND	0	0	0	0	0	1	4	1	2	3	1	12
Grog Maroonware	IND	0	0	0	0	1	0	11	2	8	11	8	41
Red-slip orangeware	IND	0	0	0	2	2	1	4	0	0	0	0	9
Decorated redware	IND	0	0	0	0	0	6	114	33	48	26	10	237
Changsha	FE	2	4	8	0	0	0	0	0	0	0	0	14
Olive-green jar	FE	0	0	1	2	1	0	2	0	1	0	1	8
Martaban	FE	0	0	0	0	2	4	13	2	10	24	14	69
Yue	FE	0	0	4	3	2	7	15	0	0	0	0	31
Sage greenware	FE	0	0	0	0	1	0	1	0	0	0	0	2
Longquan	FE	0	0	0	0	1	1	0	4	38	77	41	162
Brown greenware	FE	0	0	0	0	0	1	0	1	11	16	4	33

Ware Name	Ware Family	A	B	C	D	E	F	G	H	I	J	K	Total
Ding	FE	0	0	0	1	0	1	2	0	0	0	0	4
Qingbai	FE	0	0	0	0	1	3	18	1	2	3	1	29
Moulded whiteware	FE	0	0	0	0	0	0	1	1	1	1	0	4
Porcelain	FE	0	0	0	0	4	0	0	0	0	0	0	4

Total	1424	5722	7853	8463	8782	15963	40680	10244	14905	15012	6803	135851
0.0025%	3.56	14.31	19.6	21.2	22	39.91	101.7	25.61	37.3	37.53	17	339.63
0.0050%	7.12	28.61	39.3	42.3	43.9	79.82	203.4	51.22	74.5	75.06	34	679.26

The Shanga assemblage table in Figure 177 shows the differences present in an assemblage across the periods of a site's occupation. Only the local ceramic (generally between 90 and 95% of the assemblage remains significant throughout the site's occupation while, as the table shows, there is a progression of different glazed wares becoming popular then declining. The first of these is the Sasanian-Islamic group which are found in significant numbers in phases A-D and then are only found as residual sherds. These are joined by some earthenwares- fine creamware and Pale Green earthenware which similarly are found in significant numbers in the early phases and then decline. Sgraffiatos of various descriptions are the next group of glazed wares found in reasonably large quantities during phases E-I (if these were combined into one general sgraffiato ware the results are even clearer) before these too decline as Black on Yellow and the green/blue monochrome (PBS) glazed wares become more common in phases I-K. These are accompanied by LQC, the only FE ware to be found in significant numbers in the assemblage, and only in phases I-K. Indian wares are less common, with only Decorated Redware present in numbers enough to make it important, and then only during phases G-I. Similarly *Gudulia* sherds- a ware used for pilgrim flasks and for water storage vessels- are only really present in one phase-F- and then become much less common. This could suggest that either a whole vessel was found in a context from this phase, or that there was a limited period when these vessels were very popular at Shanga. The change from Sgraffiato to Black on Yellow could demonstrate a change in trading patterns towards ceramics from Yemen rather than the Arabian Gulf. This then changes again as more monochrome (PERSIA) is imported form the Gulf in the final phases.

7.1.6: MANDA SIGNIFICANT/IMPORTANT WARES IN PHASING:

The final assemblage that is split into wares with numerical data is from Manda, although as already noted, there are issues with the accuracy of the figures. Figure 178 shows the ware breakdown for the site.

Figure 178: Manda significant and important wares analysis (red for 'significant' ware, green for 'important' ware):

Ware	Ware Family	Sherds
East African ceramics	LOCAL	236250
Sasanian-Islamic (I:26%)	GLAZ	3200
Red/pink wares	STOR	2200
Buff/greenish buff cream jars	STOR	2200
Sgraffiato (II/III at say 3:2)	GLAZ	2000
Fine cream wares (incl. '*gudulia*' ware)	STOR	1122
White glazed (I:30%)	GLAZ	467
Black on Yellow (III)	GLAZ	375
Islamic Monochrome (IV-V)	GLAZ	350
White glazed + colour (I:18%)	GLAZ	319
Early (Dusun) stoneware jars (I:7%)	FE	288
Celadon	FE	244
stoneware (I: 2.5%, II: 1.5%)	FE	215
Unidentified Islamic glazed	GLAZ	196
Mottled splashed (I:6%)	GLAZ	104
Later Stoneware jars (II-IV)	FE	94
E. Persian (II)	GLAZ	68
Yueh stoneware bowls (I:3%)	FE	57
Lustre (I:2%)	GLAZ	57
Ching Pai	FE	51
Blue and White (III, IV, mostly V)	FE	40
Manganese Purple (V)	GLAZ	37
Painted stoneware (I:1.5%)	FE	20
Misc. later Islamic (see p. 81)	GLAZ	14
Misc. earlier Islamic (see p. 81)	GLAZ	12
Te Hua (II)	FE	9
Piped icing (I:1%)	GLAZ	6
Green and White (I:1%)	GLAZ	5
Total		250000
0.0025%		625
0.0050%		1250

This shows that similarly to Shanga, there are a very limited number of significant/important wares, as the assemblage is 95% local East African ceramics. The other four significant wares are split between imported glazed and storage wares with the only important ware being the *gudulia* water storage vessels. The representation of some glazed wares as significant is similar to the Shanga assemblage. However Shanga did not have any significant STOR wares in the totalled assemblage, only during individual phases. This would suggest that more storage ware was being imported into Manda than Shanga.

7.2: SIGNIFICANT WARES ACROSS THE INDIAN OCEAN:

From this analysis we can see that there are a number of significant/important wares at each site and that they vary between sites. However, there are clearly some wares which are found throughout the Indian Ocean in significant or important quantities. Figure 179 below shows the 'significant' wares from each site discussed above while Figure 180 shows the 'important' wares.

Figure 179: Indian Ocean 'significant' wares

NAME	ORIGIN	QNT	Site
Plain Julfarware	LOCAL	15847	Julfar al-Nudud
Red on White painted Julfarware	LOCAL	3104	
Buff Ware	STOR	2456	
Purple on Black painted Julfarware	LOCAL	1822	
White Incised Ware	STOR	931	
Tin Glazed Ware	GLAZ	666	
Persian Blue Speckled	GLAZ	524	
Lime Tempered Ware	STOR	516	
Coarse Red and White Ware	STOR	397	
Hard White Ware	UNK	370	
Soft White Ware	UNK	279	
Manganese Painted Ware	GLAZ	230	
Thin Red/Buff Ware	IND	213	
Odd (Non-ID)	UNK	182	
Incense Ware	UNK	178	
Khunj Ware	GLAZ	176	
Thin Black Burnished Ware	IND	167	

Ware	Ware Family	Total	Site
Julfarware	LOCAL	23800	Julfar al-Mataf (Mosque)
White ware	STOR	4180	
Underglaze painted ware	GLAZ	856	
White and Pink ware	STOR	351	
Long Quan Celadon	FE	174	
Julfarware- R/W painted	LOCAL	2265	
Lime ware	STOR	321	
Persian Blue Speckled	GLAZ	223	
Chinese Blue and White	FE	175	
Ware	Ware Family	Total	Site
Plain Julfarware	LOCAL	9060	Julfar al-Mataf (Occupation)
White ware	STOR	1549	
Red on White painted Julfarware	LOCAL	874	
Underglaze painted ware	GLAZ	492	
White and Pink ware	STOR	154	
Lime ware	STOR	174	
Persian Blue Speckled	GLAZ	112	
Ware	Ware Family	Total	Site
Common Ware	LOCAL	27182	Bilad al-Qadim
White Earthenware (eggshell)	STOR	1041	
Lower Gulf Red Ware	STOR	831	
Sgraffiato (General)	GLAZ	235	
Unclassified Glazed	GLAZ	585	
Lower Gulf Pale Ware	STOR	273	
Fine Ware	LOCAL	161	
Plain Turquoise Glaze	GLAZ	284	
Ware Name	Ware Family	Total	Site
Tana East African Ware	LOCAL	128252	Shanga
Late Scraffiato (a)	GLAZ	978	
Ware	Ware Family	Sherds	Site
East African ceramics	LOCAL	236250	Manda
Sasanian-Islamic (I:26%)	GLAZ	3200	
Red/pink wares	STOR	2200	
Buff/greenish buff cream jars	STOR	2200	
Sgraffiato (II/III at say 3:2)	GLAZ	2000	

Figure 180: Indian Ocean important wares

NAME	Ware family	QNT	Site
Shell Tempered Ware	STOR	123	Julfar al-Nudud
Degraded Painted Ware	GLAZ	119	
Eroded Glaze Ware	UNK	117	
Chinese Blue and White	FE	115	
Long Quan Cleadon	FE	98	
Green Fritware	GLAZ	88	
White Fritware	GLAZ	80	
South Asian Celadon	FE	78	
Ware	Ware Family	Total	Site
Large Sandy storage ware	STOR	100	Julfar al-Mataf (Mosque)
Red on White painted Julfarware	JULF	132	
Purple on Black painted Julfarware	JULF	125	
Khunj glazed ware	GLAZ	156	
Ware	Ware Family	Total	Site
Long Quan Celadon	FE	55	Julfar al-Mataf (Occupation)
Khunj glazed ware	GLAZ	54	
Chinese Blue and White	FE	46	
Degraded Fritware	GLAZ	40	
Large Sandy storage ware	STOR	36	
Unknown ware type	UNK	33	
Ware	Ware Family	Total	Site
Unclassified Unglazed	STOR	121	Bilad al-Qadim
Gritty Ware	STOR	86	
Ware Name	Ware Family	Total	Site
Late Scraffiato (h)	GLAZ	488	Shanga
Late Scraffiato (c)	GLAZ	414	
Late Scraffiato (undiag.)	GLAZ	373	
Late Scraffiato (m)	GLAZ	363	
Late Scraffiato (b)	GLAZ	359	
Green monochrome (a)	GLAZ	357	
Ware	Ware Family	Sherds	Site
Fine cream wares (incl. '*gudulia*' ware)	STOR	1122	Manda

There is a noteworthy amount of cross over between the significant and important wares around these sites. The wares do show both temporal and spatial patterns in their distribution- temporal due to the period of their manufacture and spatial due to their movement through trade and exchange. In general the significant wares are firstly the local ceramic ware, following by imported glazed wares and storage wares, with a wider range of wares being significant in the Arabian Gulf, although this may be due to a lack of close provenancing of the East African ceramic. The only FE ware to be rated as 'significant' in this analysis is the Longqaun celadon from the mosque excavation at al-Mataf, possibly due to the buildings status and use. The range of glazed wares also show trade in multiple styles and wares around the Gulf and down into East Africa.

Far Eastern wares are more common within the 'important' wares identified. This is possibly due to their value as a commodity which made them ubiquitous at trading sites but kept the numbers of vessels actually present at lower proportions compared to cheaper GLAZ imports and local earthenwares. . The East African Far Eastern assemblage is much smaller than other areas but the presence of approximately 185 vessels at Manda (based on estimates by Chittick 1984: 224-226) and the range of different wares from different periods shows some level of constant trade to the East African seaboard, and the reasons behind this trade may vary from those of the Arabian Gulf.

The geographical differences show that the Indian Ocean can be theoretically split into three general regions based on the ceramics assemblages discussed.

The Arabian Gulf grouping is based around the twin sites of Julfar al-Mataf and Julfar al-Nudud, along with the major trading site at Qala'at al-Bahrain. These sites both have links to the pearling industry in the Gulf, although the evidence from Julfar is only from historical sources as no concrete archaeological evidence of the pearling industry has been found.

The second grouping, of Oman/Yemen is based around the sites of Qalhat and Sharma. Sharma is from a different time period to Qalhat (Sharma occupied in the 10th and 11th Century while Qalhat was occupied in the 13th-early 16th Century) but both appear to have had a similar function- that of a way station or maritime caravanserai for the Indian Ocean trade routes that existed in both periods. This has meant their assemblages are more diverse in terms of general wares found as well as a different ware family makeup.

The third group of sites in East Africa includes Shanga, Manda, Kilwa and Gedi, with the first two having numerically published assemblages. These sites appear to be the main trading sites of their area but do not have the same level of imported wares as found in the Arabian Gulf and the

Arabian Littoral. However this may be because the exact provenance of African ceramics is not as well understood as in the Gulf (which still requires a lot of work itself).

7.3: ARABIAN GULF ASSEMBLAGES:

The basis for the Arabian Gulf assemblages appears to be that they have a strong local unglazed ware ceramic industry, alongside both a large scale importation of glazed/Far Eastern wares and a second industry- pearling. This may be because both major assemblages looked at for the period 1250-1550AD in the Arabian Gulf are known pearling ports and so it is a fair assumption even before looking at the assemblages that they might be similar. Large non-pearling ports and their assemblages have not been looked at, mainly because very few of these have been excavated and fully published for this area. It is important to note that even in the Arabian Gulf the catalogue of sites in small even though in recent years it has seen so much archaeological work completed and is by far the most investigated of the three regions discussed. This study would be reinforced if more datasets from Kish/Qays, Hormuz, Old Hormuz (although some surface collection was completed by Williamson at the suggested site of Old Hormuz) and other trading sites in Iran that are only published in Iranian journals.

The evidence for a general numerical assemblage is sadly limited to only the various assemblages from excavations at Julfar, as discussed in Chapter six. However this has given a strong general site assemblage for this site, showing that while there are slight variations across the site, over all the assemblage is fairly homogeneous, with approximately 75% of the assemblage being local Julfarware ceramics with the rest being dominated by imported STOR and GLAZ wares with approximately 1.3% FE sherds and a similar percentage of Indian imports. From these figures it is clear that the assemblage, while having a strong local ceramic tradition covering multiple vessel forms and therefore multiple vessel functions- see Chapter three on rim form families- the importation of ceramics either for their own value or for the value of the contents, and the exportation of ceramics for the same reasons is clearly important to the site. Similarly, at the only other excavated site of a similar size from the period of occupation at Julfar, Qala'at al-Bahrain appears to have a very similar assemblage, even without numerical data to prove this similarity.

The assemblage from Qala'at al-Bahrain dates mostly to between the late 13th and 16th centuries AD. Overall it is roughly similar to that of Julfar, having a large percentage of the major wares

found at Julfar al-Nudud 2010. A major ware is classified as a ware with more than 100 sherds as this removes the majority of the small wares of unknown provenience. There are two exceptions to this- South Asian Celadon (SAC) and Long Qaun Celadon sherds total less than 100 sherds. However as both are Far Eastern ceramics and therefore of high value, they have been included. Julfarwares 2 and 5 can be combined as they are very similar. Figure 181 shows a list of the significant wares and whether they are present at Qala'at al-Bahrain.

Figure 181: Gulf wares

NAME	Ware Family	QNT	Sig/imp at JaM	Sig/Imp at BaQ	Present at Qala'at
Plain Julfarware	LOCAL	15847	Sig	Imp	Y
Red on White painted Julfarware	LOCAL	3104	Sig		Y
Buff Ware	STOR	2456	Sig	Sig	Y
Purple on Black painted Julfarware	LOCAL	1822	Imp		N
White Incised Ware	STOR	931	N/A		Y
Tin Glazed Ware	GLAZ	666	Sig	Sig	Y
Persian Blue Speckled	GLAZ	524	Sig		Y
Lime Tempered Ware	STOR	516	Sig	Sig	Y
Coarse Red and White Ware	STOR	397	Sig		Y
Hard White Ware	UNK	370		Sig	N
Soft White Ware	UNK	279			N
Manganese Painted Ware	GLAZ	230	Sig		Y
Thin Red/Buff Ware	IND	213			Y
Odd (Non-ID)	UNK	182			N/A
Incense Ware	UNK	178			N
Khunj Ware	GLAZ	176	Imp		Y
Thin Black Burnished Ware	IND	167			Y
NAME	Ware Family	QNT			Present at Qala'at
Shell Tempered Ware	STOR	123			N
Degraded Painted Ware	GLAZ	119			N
Eroded Glaze Ware	UNK	117			Y
Chinese Blue and White	FE	115	S/Imp	Imp	Y
Long Quan Cleadon	FE	98	S/Imp		Y
Julfarware 2	LOCAL	97	Imp		N
Green Fritware	GLAZ	88			Y
White Fritware	GLAZ	80			Y
South Asian Celadon	FE	78			Y

The similarities between the two assemblages are clear as demonstrated in Chapter six when discussing a general 13th-16th Century assemblage. However as Chapter six also shows, there is

less evidence for this tight general assemblage across the whole Indian Ocean for this period, with sites such as Qalhat and Shanga being very different. What can be demonstrated is that there is a clear assemblage for Gulf ports which have multiple functions, rather than just the ceramics trade. Both Qala'at al-Bahrain and Julfar are port cities with a hinterland of good agricultural land, enabling them to support pearling fleets and the people who operated them alongside other trading functions. Other large port cities such as Qalhat and Hormuz do not appear to have this dual function, relying on trade only for their support.

7.4: ARABIAN SEA ASSEMBLAGES:

The two main assemblages in this area are those of Sharma and Qalhat. These are both clearly trading sites, although occupied at different times. Sharma appears to have been a Sirafi way station on the Gulf-East Africa trade route between the 10th and 12th centuries AD while Qalhat is the second city of the Hormuzi trading empire occupied between the mid/late 13th-16th centuries. Possibly due to these two areas use as trading centres, or due to their location in the area where the East African, Gulf and Indian trading systems meet, these are the most varied sites in terms of their traded assemblage, as well as the number of individual wares found. However, it is not possible to put forward an individual ware analysis between these sites as no individual ware assemblage is available for Qalhat. The discussion of Sharma is also complicated as a full assemblage has not been published as yet. However a small amount of analysis can be completed based on Rougeulle's preliminary reports from Sharma (Rougeulle 2003; 2005) and Qalhat (Rougeulle 2010) and Vosmer's discussion of his work at Qalhat (Vosmer 2004).

7.5: EAST AFRICAN ASSEMBLAGES:

The East African assemblage from the three sites Shanga, Manda and Kilwa shows a ceramic assemblage based almost entirely on local unglazed cooking pot wares making up a larger proportion of the assemblage than in the Gulf and Arabian Sea sites (see Figure 182). A small part of the assemblage is made up of imported wares, generally glazed wares which dominate the imported assemblage for a period of time before being phased out in favour of a new glazed ware. This can be seen in the progression from Islamic-Sasanian to Sgraffiatos to Green/Blue Monochrome (Persian Blue Speckled) in the Shanga assemblage. This would suggest that the

imports form an important part of the assemblage but are sensitive to changes in style and fashion. However the fact that only one glazed ware is predominant at any one time, unlike the Gulf assemblages such as Julfar which has three or more, is interesting and suggests that either the site is only interested in importing certain wares, or that only certain wares are being offered for exchange.

Figure 182: East African wares

Ware Name	Ware Family	Total	Sig/Imp at Manda	Present at Kilwa?
Tana East African Ware	LOCAL	128252	Sig	Y
Late Scraffiato (a)	GLAZ	978	Sig	Y
Ware Name	Ware Family	Total		
Late Scraffiato (h)	GLAZ	488	Y	
Late Scraffiato (c)	GLAZ	414	Y	
Late Scraffiato (undiag.)	GLAZ	373	Y	
Late Scraffiato (m)	GLAZ	363	Y	
Late Scraffiato (b)	GLAZ	359	Y	
Green monochrome (a)	GLAZ	357		Y

However this table does not tell the whole story. The FE imports into East Africa, present in small numbers on all of these sites, and according to all authors, an important part of the assemblage, do not figure. This is probably due to their use as both a prestige item and as decorative items within buildings, making them rare but sort after. Glass vessels are much more common at these sites, particularly at Shanga and may, together with some of the finer Gulf glazed wares, fill the gap in the material culture assemblage left by the FE ceramics. Despite their small numbers, they are clearly part of the trading assemblage of the Western Indian Ocean and are the best evidence for dating different phases, as the ware being traded changed over the occupation of these sites. Therefore they will be included as part of the East African trading ceramic assemblage. Equally the local Tana ceramic while making up the vast majority of the assemblages at each site, also have limited but important trading patterns up into the Arabian Sea, as discussed above. Therefore it is also included in the trading assemblage.

7.6: CERAMIC WARE DISTRIBUTIONS:

The above work has demonstrated that there are regional differences between the assemblages known around the Western Indian Ocean. There is however a general ceramic assemblage linked to the trade and exchange of items around this area. The wares from this assemblage are found in varying quantities on the sites in the study period. Some are not found at all sites, and some are regionally distinct. Therefore below are four tables. The first, Figure 183, shows a list of the wares which are found throughout the whole study area and therefore can be considered components of a pan-Indian Ocean trading assemblage. The second, Figure 184 shows wares that are specifically found in the area of the Arabian Gulf while the third, Figure 185 deals with wares relating solely to the Oman/Yemen area and the East African Seaboard. There is some cross over between these two areas, particularly with the 'local' East African ware which could have been manufactured anywhere from Somalia to Mozambique and is found as far north as Oman. However these tables are not intended to be the last word in Western Indian Ocean ceramics- this would be impossible with the limited data set available. They are more intended as a building block to allow further research.

Figure 183: Generalised Western Indian Ocean assemblage

CODE	NAME	PREVIOUS WARE NAMES	ORIGIN
BIW	Buff Incised Ware/ White Incised Ware	Some forms of WINC in Priestman 2005, Hormuzi Textile Ware in Frifelt 2001	HORMUZ
BUFF	Buff Ware	BUFF in Kennet 2004	HORMUZ
CBW	Chinese Blue and White	Known as this in most publications	FE
CRWW	Coarse Red and White Ware	Possibly known as WAPO in Kennet 2004, Red Ware with White Slip in Frifelt 2001	BAHRAIN
TIN	Tin Glazed Ware	TIN.W 1 and 2 from Priestman 2005	GLAZ
FRIT	Fritware	Mix of FRIT.BL and FRIT.IT in Priestman 2005	GLAZ
JULF	Plain Julfarware	JUL in Priestman 2005, JULFAR in Kennet 2004	JULFAR
JULF.RW	Red on White painted Julfarware	JUL.RW in Priestman 2005, Omani painted ware in Frifelt 2001	JULFAR
KHUNJ	Khunj Ware	KHUNJ in Priestman 2005, Kennet 2004	GLAZ
LIME	Lime Tempered Ware	LIME in Kennet 2004 and Priestman 2005, Common Ware in Carter 2005	BAHRAIN
LQC	Long Quan Cleadon	Known as this (varying spellings) in most publications	FE
MGP	Manganese Painted Ware	MGP.1 in Priestman 2005	GLAZ
PBS	Persian Blue Speckled	PERSIA in Kennet 2004 and Priestman 2005, Monochrome in Chittick 1974b; 1984; Horton 1996	GLAZ
SAC	South Asian Celadon	Variety of names but generally called Burmese/Vietnamese/Thai Stoneware	FE
TBBW	Thin Black Burnished Ware	Generic Indian ware in most other publications	INDIAN
TRBW	Thin Red/Buff Ware	Some examples may be GIB in Priestman 2005, otherwise generic Indian ware in most other publications	INDIAN

The table demonstrates that the assemblage is made up of wares from different geographical origins and made for different purposes. Some of the wares are more concentrated in the areas of their origin with only limited examples occurring in other areas. It must be stated that the only wares which are ubiquitous and found in similar numbers throughout the Western Indian Ocean at nearly all sites are the glazed wares- both of Iranian and Far Eastern origin. This is probably because these vessels were not only status symbols of high value but also difficult to manufacture and therefore hard to copy to the required standard away from the original production site. Most of the sites discussed have Indian wares of some kind present. However the wares are so difficult to correctly differentiate that it is unclear which exact ware is found where. Without a more detailed knowledge of Indian ceramics during this period, the spread of different wares from the subcontinent will remain unknown.

The Gulf origins HORMUZ, BAHRAIN and JULFAR are all found throughout the Indian Ocean but are found in their highest quantities firstly near to their production sites and secondly in the area of the Arabian Gulf. Other wares do not make it out of the Gulf and are restricted to this area.

Figure 184: Generalised Arabian Gulf wares

CODE	NAME	PREVIOUS WARE NAMES	ORIGIN
BIW	Buff Incised Ware/ White Incised Ware	Some forms of WINC in Priestman 2005, Hormuzi Textile Ware in Frifelt 2001	HORMUZ
BUFF	Buff Ware	BUFF in Kennet 2004	HORMUZ
CRWW	Coarse Red and White Ware	Possibly known as WAPO in Kennet 2004, Red Ware with White Slip in Frifelt 2001	BAHRAIN
INCW	Incense Ware	CHAM.3 in Priestman 2005	JULFAR
JULF	Plain Julfarware	JUL in Priestman 2005, JULFAR in Kennet 2004	JULFAR
JULF.RW	Red on White painted Julfarware	JUL.RW in Priestman 2005, Omani painted ware in Frifelt 2001	JULFAR
JULF.PB	Purple on Black painted Julfarware	JULF.PB in Priestman 2005	JULFAR
KHUNJ	Khunj Ware	KHUNJ in Priestman 2005, Kennet 2004	OMAN
LIME	Lime Tempered Ware	LIME in Kennet 2004 and Priestman 2005, Common Ware in Carter 2005	BAHRAIN

Figure 185: Generalised Arabian Sea and East African wares

CODE	NAME	PREVIOUS WARE NAMES	ORIGIN
DEPAW	Degraded Painted Ware	Present at Julfar al-Nudud but not elsewhere in the Gulf	ZABID
BLAYEL	Black and Yellow Glazed Ware	Black and Yellow, Black on Yellow	YEMEN
YELL	Yemeni Yellow Ware	YEMEN in Kennet 2004; Priestman 2005. Mustard ware in Rougeulle 2003	YEMEN
EASTAF	East African wares	Local ceramics in Chittick 1974b; 1984; Horton 1996. East African ceramics in most other publications	EAST AFRICA

The generalized Indian Ocean assemblage table is presented as a selection of ceramics drawings showing the common rim types for each ware presented above in Appendix VI.I: Indian Ocean General Ceramic Assemblage, Appendix V.II: Arabian Gulf Ceramics Assemblage and Appendix V.III: Arabian Sea and East Africa ceramics assemblage:. There does appear to be a bias towards the Gulf in terms of ceramic trade with the vast majority of wares originating or being extensively traded in that area. This in part suggests a two or three tier system, with a large scale well established ceramic trading system in the Gulf while a trading system that is not

reliant on ceramics operating out of East Africa while the Oman/Yemen Seaboard acts as a transit area for both of these systems and the Far East and Indian goods, both ceramic and aceramic.

7.7: POSSIBLE MECHANICS OF IDENTIFIED TRADE:

Having identified the trade routes and zones within the Indian Ocean, it is important to consider the reasons why these may exist. What physical constraints exist within the Indian Ocean? The most important natural phenomenon must be the monsoon winds which allow trading vessels to sail easily in certain directions at certain times of year. However it meant that trying to travel in the opposite direction was almost impossible. While, as Kervran (2004: 298) points out, sailing to Northern India was possible all year, sailing further south was not. The outward journey was only possible during February-April with the return during October-February. Therefore trips had to be carefully planned on a yearly cycle with a leg from Arabia to Southern India taken during the spring NE monsoon and the return during the winter SW monsoon (Williamson 1974: 81-2; Chaudhuri 1985). If a trading journey to the Far East was planned then it also had to confront the monsoons around Thailand and Malaysia and therefore would involve a two-three year journey. This demonstrates the considerable outlay, both in terms of time and expense which any long distance trade in the Indian Ocean would have involved. The NE monsoon made sailing to India and the sub-continent relatively easy but as many scholars note, the risks of piracy, shipwreck and other misfortune always made the voyage a treacherous one. As Williamson notes, the probable reason for a succession of large wealthy trading cities along the Omani seaboard is due to the Arabian Sea being a perfect staging post for ships and traders both on their outward journey, as they wait for the monsoonal winds and for their return journey into the Gulf to sell their commodities in Baghdad, Samarra, Hormuz or Basra, depending on the period in time (Williamson 1974: 81-2). Therefore the presence of these intermediary ports of Sohar, Qalhat and Muscat on that coastline, with both Qalhat and Muscat providing protected anchoring and their wealth from the trade is not a surprise. Qalhat in particular sits in a position where ships naturally make landfall due to the currents and general wind patterns (Cleuziou and Tosi 2000: 19). These settlements are both trading entities in their own right as well as being vital and lucrative stop offs for traders from the even more wealthy entrepots of the Gulf.

A similar story can be seen for the North-South trade between the Gulf and East Africa, where merchants appear to have had stop off locations along the Indian Ocean seaboard of Oman and

Yemen at al-Shihr, Sharma and Zabid as they waited for the NE monsoon to carry them down to their trading partners at Shanga, Kilwa, Manda and other sites.

The monsoonal winds were clearly vital to the maritime trade around the Indian Ocean, and appear to have had an effect not only on this but also on the location of some of the important port cities.

CHAPTER EIGHT: CONCLUSION:

This thesis has looked at the nature and development of the ceramics trade in the Western Indian Ocean during the Mid and Late Islamic period, concentrating on the 13th-16th centuries AD. The original vision was to analyse the new Julfar al-Nudud ceramic assemblage and, having made some conclusions about the nature of this site during its occupation, to compare the assemblage with a selection of assemblages from a similar period and of a similar nature from around the whole Indian Ocean. However early research made it clear that there were serious problems with this approach. As discussed in earlier chapters, this area has an incomplete and inconsistent archaeological record, particularly in terms of reports which align numerical and drawn evidence of finds and archaeological stratigraphy into a complete published report. Therefore these conclusions are presented as a demonstration of the possibilities of multiple layers of analysis. These can be used both on a single site assemblage, as demonstrated in Chapter three, or as a comparison tool between multiple sites, even with different standards of publication, as Chapters five, six and seven show. The use of both individual wares where available for inter-site comparison is an important part of any ceramic assemblage analysis. Ware family analysis creates a secondary theoretical attribute for each ware, allowing a more generalised analysis of the assemblage as well as presenting an easily understandable description of the ceramics: e.g. the assemblage developed from 3% glazed wares in phase 2 to 17% in phase 5.

The first conclusion has come out of the analysis of the Julfar al-Nudud assemblage, discussed in Chapter three. This original analysis demonstrated that the assemblage was based around the strong Julfarware ceramic industry (at around 70% of the assemblage across the site) but with important foreign imports of ceramics. These took the form of Iranian glazed wares (Julfar had no local glazed ceramic industry, possibly because the Iranian imports were easily available), storage vessel wares from other areas of the Arabian Gulf, Indian vessels and Far Eastern high quality glazed porcelains and stonewares. The site therefore clearly had connections with both the wider Gulf and either directly or indirectly the Indian Ocean and Far East. The amount of each ware family present (1.3% for Far Eastern, 6.7% for Iranian glazed, 2.2% for Indian wares and 15.7% for other Gulf storage wares) also shows that this contact was strong for all these areas, although possibly weakest with the Indian sub-continent due to the low percentage of their wares coupled with the low value of each vessel and/or its contents. The low percentage of the Far Eastern ware is offset by the high value of each vessel. Comparison of this assemblage with the assemblages excavated at al-Mataf, its twin site to the north has demonstrated some

differences, as would be expected across any large site with varied functions, but in general shows a consistency in the percentages of wares and ware families. Both areas appear to show similar developments in the local ceramic industry, as suggested by Kennet 2004 when looking at the original assemblage, with the majority of it being made up of the plain coarse Julfarware before increasing numbers of decorated Julfarwares (purple on black and red on white) enter the assemblage around the middle of the 14th Century. Similarly the development of the glazed assemblages with the introduction of first Persian Blue Speckled and then frit wares can be seen in similar phases for the two sites. The Far Eastern assemblages from both sites catalogue the switch from Longquan celadons to South Asian celadons to Chinese Blue and White, with the phasing once again matching up. These parallels can be made through both the ware family analysis and through the individual ware analysis. Even though the al-Nudud assemblage does appear to have a broader range of wares, this is possibly due to a general improvement in understanding of the Gulf assemblage in the years between the analyses of the two sites.

Secondly a general note about the development of the traded assemblage around the Western Indian Ocean over the period 800-1550AD can be made, although much of this has already been stated. Although the evidence from the ware family analysis of this development proved to be inconclusive, suggesting that there is no linear change in the inter-regional assemblage over this period, as site assemblages change due to site specific conditions. When looked at in terms of individual wares, the introduction, exchange and eventual decline in a selection of traded wares is clear. The Shanga assemblage demonstrates this best, as it covers the whole period of Arab trading up to 1550AD. It shows the original trade in Sasanian-Islamic glazed wares that began in the 8th Century before the development of Samarra horizon ceramics such as sgraffiatos which begin to be traded in the early 9th Century. Sgraffiatos and the developments in style on them take up the majority of the glazed trading assemblage for the whole of the Western Indian Ocean during the 9th – 12th centuries. As these decline in the East African and Yemeni seaboard, a Yemeni local ware (Black on Yellow ware) rarely found in the Gulf becomes the predominant glazed ware that is traded into East Africa. This would suggest a decline in contact between the Gulf and East Africa during this period while trading with Yemen increased. This may well reflect the shifting of power in these areas, with the rise of the Rasulids in Yemen (Vallet 2006: 293-4) and the decline of urbanism in the Lower Gulf (Kennet 2002: 160). The rise of the Rasulids brought in a new mercantile power (Vallet 2006: 290) which, the ceramic assemblages suggest, began to expand its operations into East Africa either at the expense of, or as a replacement to, the decline in Gulf origin trade. The decline in urbanism in the lower Gulf, if it is as extensive as Kennet suggests with only Kush, U.A.E., remaining as a major centre, would have affected the trading networks which operated out from the area. It is possible that the start of

this decline is the destruction of Siraf by an earthquake in 977AD which according to Muqaddasi writing in the late 10th Century caused large numbers of the merchants to leave (Whitehouse 1968: 3).

This ability of merchants to move on and set up trading links in other ports is a key one to the rise and fall of many of the entrepôts and port cities that have been discussed in this paper. If a city is struck by environmental issues, such as the earthquake at Siraf or the silting up of creeks and lagoons as at Zafar (Zarins 2007: 312), the merchants appear to move their entire business to a location elsewhere. The regular change in location of trading hubs could be seen to demonstrate this power of movement, particularly in the Gulf where the only long standing urban site is at Kush, lasting between the 4th and 13th centuries, before it is replaced by the nearby site of Julfar. All other trading ports around the Gulf appear to last approximately two hundred years, rarely longer. This is possibly partly to do with the ever-changing political nature of the Persian land-mass but as discussed by Risso (1995: 35-6), the various ruling classes of Persia rarely made attempts to control the maritime trade, preferring to run the less profitable but still extensive land based trade routes.

Therefore the discussion of the assemblages in this thesis, and the sites they are from, has allowed a generalised analysis of the trading systems found in the Indian Ocean during the study period. The study shows that ceramics were an important part of the Arabian Gulf trade economy both in terms of intra-regional ceramics and those from the wider Indian Ocean. The ports along the Arabian Sea can be seen to have a larger percentage of imported ceramics from outside this region, suggesting long-distance ceramic trade being channelled through this area, while the East African port assemblages show a limited imported ceramic assemblage against a highly dominant local ceramic assemblage. This would suggest that, as it is known that these ports were still heavily involved in the Indian Ocean trading system, the majority of their trade was not in ceramics, with only high value ceramics being traded in quantity.

Finally this research suggests a possible grouping of similar assemblages around locations with those in Yemen and Oman having a high proportion of imported ceramics, particularly from the Far East and India, while the East African seaboard has a near completely local unglazed assemblage with only a small proportion of imported wares, mostly Islamic glazed wares. The Gulf assemblage is in between these two extremes with large local assemblages alongside varied imported wares, although there is a complete lack of East African ceramic imports in this area, unlike sites in Yemen. It would therefore appear from the assemblages that the centres benefitting from the Indian Ocean trade are in the Gulf; at Hormuz, Julfar and Qala'at al-Bahrain; but, given the more varied assemblages, the original entry and transit ports are in Yemen and

eastern Oman,. The transit of ceramics from the Far East, India, the Gulf and East Africa all meet around this area. This conclusion is backed up by the historical records of Arab geographers and merchants such as Ahmad bin Majid who suggest that this area had the best sailing conditions for regular safe crossings to India and the Far East. This is particularly true of the site of Qalhat, which appears to have been settled partially because of the proximity of extremely advantageous monsoonal wind patterns (Bhacker and Bhacker 2004: 17). This meant that it became the main port of call for trade conducted between the Gulf and India, as well as the vessels coming north from Zafar, Aden and East Africa. Sharma appears to have had a similar role as a transitory trading port between the Gulf and East Africa in the period of Siraf's dominance in the 9th/10th Century AD. It would therefore appear that the ports of the Omani and northern Yemeni coast were important to the trade networks operating across the Indian Ocean and between the Gulf and East Africa.

Overall the research project has catalogued and analysed the Julfar al-Nudud assemblage before placing it with the Western Indian Ocean ceramics trading network. It has also demonstrated how varied and difficult to use the analytical methods and presentation of data for ceramic assemblages are. As noted in the body of this report, the techniques of statistical analysis applied in this research require a ceramic database which satisfies a number of rigorous criteria. By pointing to the structural and numerical limitations of ceramic assemblages presented from earlier work on sites in the region, this project puts forwards an argument for the adoption of a standard model of ceramic database in future work in the region.

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APPENDIX I: ORIGINAL JULFAR AL-NUDUD ND10 WARE CLASSIFICATION:

CODE	NAME	PREVIOUS WARE NAMES	ORIGIN	QNT
BAG	Buff and Grey Ware	Some examples may be GIB in Priestman 2005	IND	14
BAH	Bahrani Storage Ware	Common Ware in Carter 2005	STOR	23
BGSW	Brown Glaze Stoneware		FE	3
BIT	Bitumen	N/A	DEP	1
BIW	Buff Incised Ware	Some forms of WINC in Priestman 2005	INC	147
BIW/WIW	Buff Incised Ware/White Incised Ware	Some forms of WINC in Priestman 2005	INC	364
BLAB	Black Burnt Ware		STOR	9
BORB	Burnished Orange and Black Ware		IND	6
BRIB	Brown Indian Burnished Ware		IND	24
BRICK	Brick Ware		UNK	6
BUBL	Buff and Black Ware		IND	12
BUFF	Buff Ware	BUFF in Kennet 2004	STOR	2011
CBW	Chinese Blue and White	See Chinese ceramics chapter for more details	FE	115
CHALKY	Chalky Ware		STOR	29
CHIN	Chinese Wares	See Chinese ceramics chapter for more details	FE	69
CHOC	Choc-Chip Ware		UNK	2
CORB	Coarse Orange and Black Ware		IND	12
CRWW	Coarse Red and White Ware	Possibly known as WAPO in Kennet 2004	STOR	397
DEPAW	Degraded Painted Ware		GLAZ	119
DIIW.B	Deep Indian Incised Ware. Buff	Some examples may be GIB in Priestman 2005	IND	57
DIIW.BL	Deep Indian Incised Ware. Black	Some examples may be GIB in Priestman 2005	IND	15
TIN	Tin Glazed Ware	TIN.W 1 and 2 from Priestman 2005	GLAZ	666
ERG	Eroded Glaze Ware		UNK	117
FIGB	Fine Grey Burnished Ware		IND	6
FIGW	Fine Grey Ware		IND	29
FINCW	Fine Incense Ware		UNK	4
GFRIT	Green Fritware	Mix of FRIT.BL and FRIT.IT in Priestman 2005	GLAZ	88
GIW	Grey Incised Ware		INC	45
HWW	Hard White Ware		UNK	370
INCW	Incense Ware	CHAM.3 in Priestman 2005	UNK	178
JULF1	Julfarware 1	JUL in Priestman 2005	JULF	15847

CODE	NAME	PREVIOUS WARE NAMES	ORIGIN	QNT
JULF2	Julfarware 2	JULF.PB in Priestman 2005	JULF	97
JULF3	Julfarware 3	JUL.RW in Priestman 2005	JULF	3104
JULF4	Julfarware 4	JULF.PB in Priestman 2005	JULF	606
JULF5	Julfarware 5	JULF.PB in Priestman 2005	JULF	1119
JULF6	Julfarware 6	JUL.RC in Priestman 2005	JULF	6
KHUNJ	Khunj Ware	KHUNJ in Priestman 2005, Kennet 2004	GLAZ	176
KILN	Kiln Debris	N/A	DEP	10
LFRIT	Lustre Frit		GLAZ	6
LIM	Lime Tempered Ware	LIME in Kennet 2004 and Priestman 2005	STOR	516
LQC	Long Quan Cleadon	See Chinese/Far Eastern ceramics chapter for more details	FE	98
MARS	Mars Ware		UNK	2
MEW	Moulded Ewer Ware	MEW.C or MEW.LG in Priestman 2005	INC	9
MGP	Manganese Painted Ware	MGP.1 in Priestman 2005	GLAZ	230
MICA	Mica Tempered Ware	BUFF in Kennet 2004	STOR	137
MLD	Moulded Ware	MEW.C or MEW.LG in Priestman 2005	INC	34
MOD	Modern	N/A	UNK	3
MODJULF	Modern Julfarware	JUL.RC in Priestman 2005	JULF	1
NIDGW	Non-ID Glaze Ware	N/A	GLAZ	74
NIDIW	Non-ID Indian Ware	N/A	IND	3
NONID	Non-ID	N/A	UNK	1
OC	Other Celadon	See Chinese/Far Eastern ceramics chapter for more details	FE	12
ODD	Odd (Non-ID)	N/A	UNK	182
PBS	Persian Blue Speckled	PERSIA in Kennet 2004 and Priestman 2005	GLAZ	524
PIP	Pink Painted Ware	Possibly SLIP.R in Priestman 2005	UNK	4
PISW	Pink Storage Ware	Possibly Wadi Suq residual fragments	STOR	29
PUM	Pumice Ware		STOR	46
REMIC	Red Micacious Ware		UNK	3
ROB	Red on Buff Ware	PAW.SCC in Priestman 2005	UNK	2
RORG	Red Organic Tempered Ware	ORG types in Priestman 2005	IND	16
RPW	Red Painted Ware	IRPW in Priestman 2005	IND	43
SAC	South Asian Celadon	See Chinese/Far Eastern ceramics chapter for more details	FE	78
SHELL	Shell Tempered Ware		STOR	123
STONE	Stone	N/A	DEP	3
STWW	Sand Tempered White Ware	BUFF in Kennet 2004	STOR	308
SWW	Soft White Ware		UNK	279
TBBW	Thin Black Burnished Ware		IND	167
TEXT	Textile Ware	Some examples may be GIB in Priestman 2005	UNK	2

CODE	NAME	PREVIOUS WARE NAMES	ORIGIN	QNT
TRBW	Thin Red/Buff Ware	Some examples may be GIB in Priestman 2005	IND	213
TRW	Thin Red Ware		IND	23
UGC			FE	1
UNIQ	Unique (Non-ID)	N/A	UNK	9
VOID	Void	VOID	N/A	2
WFRIT	White Fritware		GLAZ	80
WIW	White Incised Ware	Some forms of WINC in Priestman 2005	INC	420
WW	White Ware		UNK	17
YELL	Yellow Glaze Ware	YEMEN in Priestman 2005	GLAZ	7

APPENDIX II.I: CONDITIONAL FORMATTING OF WARE FAMILIES IN CONTEXTS (GREEN IS 50% ABOVE THE AVERAGE, YELLOW IS 25% ABOVE):

CONTEXT	FE	GLAZ	INC	IND	JULF	STOR	UNK
000	1.0	8.4	2.4	0.6	72.3	11.1	4.2
10	0.0	0.0	0.0	0.0	100.0	0.0	0.0
1001	3.2	12.4	6.9	0.5	55.2	17.8	4.0
1026	6.7	13.3	13.3	0.0	46.7	6.7	13.3
1027	0.0	0.0	0.0	0.0	66.7	0.0	33.3
1028	0.0	12.5	0.0	0.0	75.0	0.0	12.5
1029	0.0	2.4	2.4	0.0	80.5	12.2	2.4
1032	0.0	4.2	10.4	1.0	64.6	14.6	5.2
1033	0.0	2.7	0.0	0.0	73.0	10.8	13.5
1034	0.0	3.2	6.5	9.7	61.3	9.7	9.7
1035	0.0	15.8	2.1	0.0	52.6	10.5	18.9
1036	0.0	0.0	25.0	0.0	25.0	50.0	0.0
1037	0.0	25.0	0.0	0.0	75.0	0.0	0.0
1038	2.5	7.5	0.0	0.0	72.5	7.5	10.0
1039	0.0	100.0	0.0	0.0	0.0	0.0	0.0
1040	0.0	0.0	0.0	0.0	100.0	0.0	0.0
106	0.0	8.3	0.0	0.0	64.6	18.8	8.3
109	0.0	6.8	2.7	0.0	82.2	1.4	6.8
110	1.0	5.1	3.1	1.0	71.4	8.2	10.2
116	0.0	0.0	0.0	0.0	100.0	0.0	0.0
117	0.0	100.0	0.0	0.0	0.0	0.0	0.0
119	0.0	0.0	0.0	5.9	76.5	5.9	11.8
120	2.1	7.4	3.2	2.1	60.6	13.3	11.2
126	0.0	6.1	0.0	6.1	69.7	9.1	9.1
127	0.0	0.0	0.7	0.0	99.3	0.0	0.0
129	2.3	9.3	0.9	0.9	72.1	8.4	6.0
132	3.4	3.4	3.4	1.7	71.2	16.9	0.0
134	0.8	8.5	6.2	0.0	62.3	13.8	8.5
136	0.0	0.0	2.4	0.0	95.2	2.4	0.0
138	0.0	6.7	6.7	20.0	20.0	33.3	13.3
140	0.0	0.0	20.0	0.0	80.0	0.0	0.0
142	0.0	0.0	0.0	0.0	60.0	40.0	0.0
144	0.0	0.0	0.0	0.0	40.0	60.0	0.0
146	1.6	6.3	1.9	3.5	66.5	16.3	3.8
147	0.9	8.3	0.0	1.8	82.6	4.6	1.8
149	2.6	5.3	4.2	0.5	74.2	7.4	5.8
150	0.8	8.7	4.0	1.6	79.4	1.6	4.0
1501	0.4	5.5	4.7	5.3	69.2	12.7	2.3
1502	100.0	0.0	0.0	0.0	0.0	0.0	0.0
1503	0.7	8.6	3.7	2.6	69.5	10.7	4.1
1504	0.0	10.5	10.5	5.3	68.4	0.0	5.3
1505	0.0	0.0	0.0	0.0	0.0	100.0	0.0
1507	0.0	5.3	0.0	10.5	68.4	10.5	5.3
1509	1.0	6.8	8.1	1.6	65.2	11.7	5.7
151	5.9	0.0	0.0	5.9	58.8	23.5	5.9
1511	0.3	6.8	3.7	3.7	63.6	15.7	6.2
1512	2.0	10.7	2.0	0.4	66.2	12.1	6.6
1513	2.2	7.6	1.1	1.1	65.2	19.6	3.3

CONTEXT	FE	GLAZ	INC	IND	JULF	STOR	UNK
1514	0.9	8.9	2.6	1.7	71.3	12.0	2.6
1515	1.2	7.9	5.5	2.4	57.1	14.6	11.4
1524	0.0	0.0	0.0	0.0	50.0	0.0	50.0
1526	0.0	28.6	0.0	0.0	50.0	14.3	7.1
153	2.1	11.5	0.0	2.1	65.6	9.4	9.4
1532	0.0	0.0	0.0	0.0	0.0	100.0	0.0
1543	1.4	5.9	2.9	1.0	69.9	12.3	6.7
1544	1.4	4.8	1.4	2.4	63.8	21.9	4.3
1545	0.3	8.0	1.8	4.7	60.1	21.5	3.6
1549	0.0	0.0	0.0	0.0	75.0	0.0	25.0
1551	0.0	4.2	0.0	4.9	72.7	11.2	7.0
1553	0.0	0.0	0.0	0.0	100.0	0.0	0.0
156	0.0	6.9	4.6	0.0	72.4	11.5	4.6
1560	0.0	0.0	0.0	0.0	91.7	8.3	0.0
1562	100.0	0.0	0.0	0.0	0.0	0.0	0.0
157	0.0	0.0	6.7	0.0	66.7	13.3	13.3
1572	0.0	0.0	0.0	0.0	66.7	11.1	22.2
1573	0.0	13.3	0.0	13.3	46.7	20.0	6.7
1574	50.0	0.0	0.0	0.0	50.0	0.0	0.0
1575	0.0	0.0	25.0	0.0	75.0	0.0	0.0
1576	0.0	0.0	6.7	13.3	73.3	6.7	0.0
1578	1.1	5.4	1.1	5.4	64.1	15.2	7.6
1579	0.6	9.1	5.1	2.3	59.1	13.6	10.2
1581	0.0	0.0	0.0	0.0	0.0	0.0	100.0
1583	0.0	100.0	0.0	0.0	0.0	0.0	0.0
1585	0.0	0.0	100.0	0.0	0.0	0.0	0.0
1588	0.0	0.0	0.0	0.0	50.0	0.0	50.0
1589	1.0	9.7	1.9	1.0	73.8	9.7	2.9
1590	1.6	6.3	3.2	0.0	66.7	14.3	7.9
1594	0.0	0.0	0.0	0.0	100.0	0.0	0.0
1597	0.0	33.3	0.0	0.0	66.7	0.0	0.0
1600	0.4	7.0	2.1	4.1	72.0	10.7	3.7
1602	0.0	0.0	0.0	0.0	36.4	27.3	36.4
1607	0.0	18.2	0.0	0.0	63.6	9.1	9.1
161	2.3	9.0	7.3	1.7	66.7	6.8	6.2
1610	0.0	0.0	0.0	0.0	100.0	0.0	0.0
1612	0.0	0.0	0.0	8.3	66.7	16.7	8.3
164	0.0	4.3	0.0	0.0	91.3	2.2	2.2
166	0.0	9.1	0.0	0.0	72.7	18.2	0.0
18	0.0	0.0	0.0	0.0	37.5	0.0	62.5
2	1.8	6.2	1.6	0.5	75.9	12.4	1.6
21	0.0	0.0	0.0	0.0	100.0	0.0	0.0
32	1.8	4.0	2.5	1.5	79.6	9.6	0.9
33	1.7	7.1	4.2	1.9	63.9	16.9	4.2
39	2.5	2.5	17.7	0.0	63.3	10.1	3.8
40	0.9	6.1	3.5	0.9	66.7	16.7	5.3
43	0.8	4.5	2.3	0.0	81.8	6.8	3.8
44	0.0	22.6	3.2	0.0	54.8	19.4	0.0
46	0.0	0.0	0.0	0.0	100.0	0.0	0.0
501	100.0	0.0	0.0	0.0	0.0	0.0	0.0
502	1.0	3.1	0.5	0.0	79.1	11.7	4.6
503	1.7	7.3	1.3	0.9	81.0	6.0	1.7
504	2.3	0.0	0.0	0.0	86.4	6.8	4.5
505	1.2	4.7	2.4	0.4	80.8	7.1	3.5
509	0.0	0.0	0.0	0.0	100.0	0.0	0.0
51	0.0	5.9	5.9	17.6	58.8	5.9	5.9
510	0.0	7.1	0.0	0.0	89.3	0.0	3.6
513	1.5	5.4	3.0	0.5	71.9	15.3	2.5
514	2.6	9.8	3.9	0.0	57.5	22.2	3.9

CONTEXT	FE	GLAZ	INC	IND	JULF	STOR	UNK
516	0.0	4.8	0.0	0.0	76.2	4.8	14.3
518	0.7	4.1	1.4	0.0	68.9	18.9	6.1
519	2.6	5.6	3.0	4.5	63.9	15.2	5.2
520	1.4	6.5	3.8	1.9	69.9	12.5	4.0
521	2.9	8.8	2.1	0.3	64.0	17.1	4.7
523	2.6	7.4	3.2	0.0	71.1	10.3	5.5
526	0.0	0.0	0.0	0.0	100.0	0.0	0.0
527	0.0	0.0	0.0	0.0	75.0	25.0	0.0
528	1.9	7.4	0.0	0.0	87.0	1.9	1.9
536	0.0	0.4	0.4	17.6	80.7	0.8	0.0
537	0.5	7.4	0.5	0.5	74.1	15.3	1.6
541	0.5	0.0	0.0	0.0	99.0	0.5	0.0
544	0.0	6.7	2.2	4.4	71.1	15.6	0.0
546	0.0	12.4	1.8	0.9	69.9	12.4	2.7
547	1.4	4.9	0.0	0.7	85.2	4.9	2.8
548	3.3	10.3	3.7	0.8	62.0	15.5	4.3
549	2.1	6.6	4.7	1.0	66.2	15.4	4.0
55	0.0	6.7	0.0	0.0	73.3	13.3	6.7
550	3.2	3.2	3.8	1.9	65.2	18.4	4.4
551	2.3	18.2	0.0	0.0	70.5	2.3	6.8
553	1.0	2.0	1.0	2.0	66.0	22.0	6.0
554	2.6	14.1	1.3	1.3	67.9	11.5	1.3
555	2.8	6.7	2.5	0.0	77.9	7.7	2.5
556	0.0	6.3	12.5	6.3	56.3	12.5	6.3
558	5.4	8.9	0.0	0.0	67.9	14.3	3.6
559	1.3	7.3	1.3	2.6	74.8	9.3	3.3
561	1.9	16.8	3.4	3.4	58.4	13.4	2.7
562	0.0	9.5	0.0	7.1	73.8	4.8	4.8
563	4.3	4.3	2.1	4.3	70.2	8.5	6.4
564	2.2	13.0	0.0	2.2	67.4	8.7	6.5
568	0.0	0.0	0.0	0.0	100.0	0.0	0.0
570	0.0	14.3	0.0	0.0	71.4	14.3	0.0
574	0.0	0.0	11.1	0.0	77.8	0.0	11.1
576	0.0	0.0	0.0	0.0	96.6	3.4	0.0
577	0.0	0.0	0.0	0.0	100.0	0.0	0.0
578	0.0	33.3	0.0	0.0	66.7	0.0	0.0
580	0.0	10.0	0.0	0.0	90.0	0.0	0.0
582	0.0	0.0	0.0	0.0	100.0	0.0	0.0
589	0.0	5.1	0.0	2.5	57.0	30.4	5.1
590	0.0	0.0	0.0	0.0	100.0	0.0	0.0
591	0.0	0.0	0.0	0.0	100.0	0.0	0.0
593	3.9	14.1	2.3	0.8	57.0	15.6	6.3
596	0.0	9.1	0.0	0.0	90.9	0.0	0.0
600	0.0	0.0	0.0	3.6	75.0	14.3	7.1
604	2.0	26.5	2.0	0.0	51.0	14.3	4.1
605	0.0	20.9	0.0	4.7	55.8	16.3	2.3
606	4.3	6.5	0.0	6.5	65.2	15.2	2.2
608	0.0	15.4	0.0	0.0	69.2	0.0	15.4
610	2.7	10.0	2.7	6.4	57.3	12.7	8.2
611	1.2	9.6	3.6	0.0	71.1	10.8	3.6
613	0.0	0.0	0.0	0.0	80.0	20.0	0.0
616	0.0	7.1	0.0	0.0	50.0	21.4	21.4
618	0.0	47.4	0.0	0.0	52.6	0.0	0.0
621	0.0	1.9	0.6	2.6	85.2	7.7	1.9
622	0.0	20.0	0.0	0.0	26.7	13.3	40.0
625	0.0	0.4	0.0	0.4	99.2	0.0	0.0
649	0.0	1.1	0.7	0.4	72.2	25.6	0.0
651	0.0	10.9	1.8	0.0	63.6	14.5	9.1
652	0.0	5.8	1.9	1.9	75.0	9.6	5.8

CONTEXT	FE	GLAZ	INC	IND	JULF	STOR	UNK
656	0.0	11.8	5.9	0.0	58.8	23.5	0.0
657	0.0	0.0	4.3	2.9	87.0	5.8	0.0
659	0.0	0.0	0.0	0.0	100.0	0.0	0.0
663	0.0	0.0	0.0	0.0	91.7	4.2	4.2
664	0.0	0.0	0.0	0.0	97.0	3.0	0.0
667	0.0	0.6	0.0	1.1	93.9	4.5	0.0
669	0.0	0.0	0.0	0.0	100.0	0.0	0.0
670	0.0	1.3	0.0	3.3	88.1	6.0	1.3
69	0.0	7.1	0.0	0.0	71.4	21.4	0.0
73	0.0	3.7	5.6	0.0	79.6	11.1	0.0
74	1.5	10.3	2.9	2.2	54.4	19.9	8.8
77	0.0	0.0	3.3	0.0	73.3	20.0	3.3
80	0.0	9.1	9.1	0.0	81.8	0.0	0.0
81	0.0	1.4	0.0	0.0	98.6	0.0	0.0
82	0.0	0.0	0.0	0.0	87.5	12.5	0.0
88	0.0	0.0	100.0	0.0	0.0	0.0	0.0
90	0.0	0.0	16.7	0.0	83.3	0.0	0.0
92	0.0	0.0	0.0	0.0	100.0	0.0	0.0
96	0.0	0.0	0.0	0.0	100.0	0.0	0.0

APPENDIX II.II CONDITIONAL FORMATTING OF RIM TYPE FAMILIES IN CONTEXTS (GREEN IS 50% ABOVE THE AVERAGE, YELLOW IS 25% ABOVE):

CONTEXT	BOWL	BURN	COOK	STOR	TRAN	UNKN	WATER
000	28.1	0.0	30.6	17.7	4.4	3.6	15.5
1001	27.7	0.0	20.7	14.1	11.2	4.8	21.5
1026							
1028	100.0	0.0	0.0	0.0	0.0	0.0	0.0
1029	27.6	0.0	34.5	0.0	0.0	0.0	37.9
1032	14.8	0.0	19.3	22.2	0.0	8.9	34.8
1033	36.1	2.8	0.0	61.1	0.0	0.0	0.0
1034	0.0	0.0	54.0	0.0	0.0	46.0	0.0
1035	64.8	0.0	4.4	0.0	0.0	0.0	30.8
1036	0.0	0.0	100.0	0.0	0.0	0.0	0.0
1037	0.0	0.0	0.0	0.0	0.0	100.0	0.0
1038	47.5	0.0	20.3	32.2	0.0	0.0	0.0
106	64.6	0.0	35.4	0.0	0.0	0.0	0.0
109	57.1	0.0	42.9	0.0	0.0	0.0	0.0
110	17.2	0.0	33.9	4.4	8.3	0.0	36.1
116	0.0	0.0	0.0	100.0	0.0	0.0	0.0
119	0.0	0.0	100.0	0.0	0.0	0.0	0.0
120	15.4	0.0	35.1	10.1	12.7	0.0	26.8
126	0.0	0.0	100.0	0.0	0.0	0.0	0.0
127							
129	23.9	0.0	61.4	7.2	4.9	2.6	0.0
132	0.0	0.0	46.0	36.0	0.0	0.0	18.0
134	22.4	0.0	39.7	12.1	0.0	0.0	25.9
136	0.0	0.0	100.0	0.0	0.0	0.0	0.0

CONTEXT	BOWL	BURN	COOK	STOR	TRAN	UNKN	WATER
140	0.0	0.0	0.0	0.0	0.0	0.0	100.0
142							
146	19.2	0.0	61.3	13.1	2.0	0.0	4.4
147	2.4	0.0	57.1	21.4	19.0	0.0	0.0
149	14.0	0.0	60.2	15.7	0.0	0.0	10.0
150	19.9	0.0	62.9	9.2	0.0	0.0	8.1
1501	24.8	2.3	47.1	7.7	1.8	0.2	16.1
1503	27.0	0.0	33.6	13.1	0.0	1.9	24.3
1504	53.3	0.0	0.0	0.0	0.0	46.7	0.0
1507	0.0	0.0	0.0	18.5	0.0	0.0	81.5
1509	27.5	3.2	33.6	11.4	4.2	2.8	17.3
151	63.6	0.0	36.4	0.0	0.0	0.0	0.0
1511	12.0	0.0	52.0	4.4	2.6	0.0	29.0
1512	44.2	0.0	40.8	3.4	5.2	0.0	6.3
1513	22.0	0.0	53.7	0.0	0.0	0.0	24.4
1514	16.4	0.0	43.6	24.1	0.0	0.0	15.9
1515	27.7	0.0	48.4	12.7	0.0	11.3	0.0
153	14.5	0.0	85.5	0.0	0.0	0.0	0.0
1543	23.6	0.0	53.0	21.8	0.8	0.8	0.0
1544	30.6	0.0	63.3	0.0	0.0	0.0	6.1
1545	28.6	0.0	37.0	15.9	3.6	0.0	14.9
1551	9.8	0.0	37.7	21.3	0.0	9.8	21.3
156	17.0	0.0	83.0	0.0	0.0	0.0	0.0
1560	0.0	0.0	0.0	48.4	51.6	0.0	0.0
157	0.0	0.0	100.0	0.0	0.0	0.0	0.0
1572	0.0	0.0	100.0	0.0	0.0	0.0	0.0
1573	47.8	0.0	52.2	0.0	0.0	0.0	0.0
1576	46.7	0.0	53.3	0.0	0.0	0.0	0.0
1578	4.7	0.0	62.8	32.6	0.0	0.0	0.0
1579	66.7	0.0	21.7	6.2	0.0	5.4	0.0
1585	0.0	0.0	0.0	0.0	0.0	0.0	100.0
1589	12.0	0.0	48.8	12.8	0.0	4.8	21.6
1590	0.0	0.0	17.6	82.4	0.0	0.0	0.0
1600	17.1	0.0	22.0	22.3	27.7	0.0	10.9
1602	0.0	0.0	0.0	100.0	0.0	0.0	0.0
1607	50.0	0.0	50.0	0.0	0.0	0.0	0.0
161	40.1	0.0	21.9	8.9	0.0	0.0	29.0
164	0.0	0.0	100.0	0.0	0.0	0.0	0.0
166	34.6	0.0	7.7	57.7	0.0	0.0	0.0
18	0.0	0.0	0.0	0.0	0.0	0.0	100.0
2	18.2	2.1	44.2	10.8	1.5	3.6	19.6
32	11.1	0.0	43.8	1.8	8.1	0.0	35.2
33	28.6	0.0	42.4	8.6	3.9	0.4	16.1
39	10.5	0.0	9.3	72.1	0.0	0.0	8.1
40	100.0	0.0	0.0	0.0	0.0	0.0	0.0
43	26.0	0.0	42.8	0.0	0.0	0.0	31.2
44	100.0	0.0	0.0	0.0	0.0	0.0	0.0
502	5.6	0.0	65.9	4.5	3.4	1.1	19.6
503	13.2	0.0	36.7	33.8	2.1	11.0	3.2
504	28.1	0.0	50.0	21.9	0.0	0.0	0.0
505	18.1	0.0	43.2	7.7	13.6	2.1	15.2
509	0.0	0.0	4.4	95.6	0.0	0.0	0.0
51	31.8	0.0	0.0	0.0	0.0	68.2	0.0
510	0.0	0.0	0.0	0.0	0.0	0.0	100.0
513	31.5	0.0	25.0	18.8	9.4	1.2	14.1
514	30.8	0.0	25.3	31.2	0.0	0.0	12.7
516	3.1	0.0	81.4	0.0	0.0	0.0	15.5
518	19.3	0.0	41.2	4.4	2.2	0.0	32.8
519	19.1	0.0	54.9	13.6	0.0	0.0	12.3

CONTEXT	BOWL	BURN	COOK	STOR	TRAN	UNKN	WATER
520	15.9	0.0	34.2	10.9	2.9	4.0	32.1
521	16.3	0.0	48.6	7.8	8.8	2.7	15.8
523	17.6	0.0	67.2	10.0	0.0	0.0	5.2
526	0.0	0.0	0.0	100.0	0.0	0.0	0.0
527	0.0	0.0	100.0	0.0	0.0	0.0	0.0
528	12.3	0.0	58.9	0.0	0.0	0.0	28.8
536	18.6	0.0	26.7	45.2	0.0	9.5	0.0
537	20.5	0.0	46.0	13.7	3.7	0.0	16.1
541	0.0	0.0	33.3	30.8	0.0	0.0	35.8
544	24.1	0.0	75.9	0.0	0.0	0.0	0.0
546	23.7	0.0	48.2	4.4	0.0	0.0	23.7
547	23.4	0.0	54.3	22.3	0.0	0.0	0.0
548	19.8	0.0	46.9	13.6	5.7	0.5	13.5
549	19.7	0.0	36.9	16.5	0.3	3.6	23.0
55	0.0	0.0	100.0	0.0	0.0	0.0	0.0
550	8.8	0.0	22.6	33.2	0.0	3.2	32.3
551	21.4	0.0	21.4	57.1	0.0	0.0	0.0
553	10.3	6.5	83.2	0.0	0.0	0.0	0.0
554	19.3	0.0	45.0	26.6	0.0	0.0	9.2
555	17.2	0.0	43.2	15.6	10.9	0.0	13.0
556	14.3	0.0	23.8	0.0	0.0	61.9	0.0
558	15.9	0.0	5.7	47.7	3.4	0.0	27.3
559	6.1	0.0	29.7	3.7	0.0	40.7	19.9
561	19.4	0.0	30.3	2.4	6.4	1.1	40.4
562	0.0	0.0	78.9	21.1	0.0	0.0	0.0
563	12.5	0.0	10.0	8.8	0.0	6.3	62.5
564	17.0	0.0	48.9	4.3	0.0	0.0	29.8
568	0.0	0.0	100.0	0.0	0.0	0.0	0.0
570	0.0	0.0	100.0	0.0	0.0	0.0	0.0
574	100.0	0.0	0.0	0.0	0.0	0.0	0.0
576	0.0	0.0	100.0	0.0	0.0	0.0	0.0
577	0.0	0.0	0.0	100.0	0.0	0.0	0.0
578	100.0	0.0	0.0	0.0	0.0	0.0	0.0
582	0.0	0.0	0.0	0.0	0.0	0.0	100.0
589	5.9	0.0	28.3	8.4	0.0	19.6	37.9
590	0.0	0.0	0.0	100.0	0.0	0.0	0.0
591	0.0	0.0	89.3	10.7	0.0	0.0	0.0
593	27.2	0.0	40.6	17.1	0.0	0.0	15.2
596	0.0	0.0	100.0	0.0	0.0	0.0	0.0
600	29.0	0.0	22.6	48.4	0.0	0.0	0.0
604	37.7	0.0	13.0	49.3	0.0	0.0	0.0
605	47.4	0.0	52.6	0.0	0.0	0.0	0.0
606	25.0	0.0	56.8	0.0	0.0	18.2	0.0
608	0.0	0.0	0.0	100.0	0.0	0.0	0.0
610	15.4	0.0	50.0	14.2	9.3	11.1	0.0
611	16.0	0.0	76.6	7.4	0.0	0.0	0.0
613	0.0	0.0	100.0	0.0	0.0	0.0	0.0
616	7.1	0.0	92.9	0.0	0.0	0.0	0.0
621	10.1	0.0	5.9	0.0	0.0	0.0	84.0
622	100.0	0.0	0.0	0.0	0.0	0.0	0.0
625	0.0	0.0	0.0	100.0	0.0	0.0	0.0
649	0.0	0.0	23.0	7.0	43.5	3.0	23.5
651	16.3	0.0	44.9	24.5	0.0	0.0	14.3
652	3.3	0.0	35.2	16.5	0.0	0.0	45.1
656	28.6	0.0	47.6	0.0	0.0	0.0	23.8
657	0.0	0.0	89.7	10.3	0.0	0.0	0.0
659	0.0	0.0	0.0	100.0	0.0	0.0	0.0
664	0.0	0.0	100.0	0.0	0.0	0.0	0.0
667	0.0	0.0	5.8	94.2	0.0	0.0	0.0

CONTEXT	BOWL	BURN	COOK	STOR	TRAN	UNKN	WATER
670	0.0	0.0	100.0	0.0	0.0	0.0	0.0
69	0.0	0.0	100.0	0.0	0.0	0.0	0.0
73	13.2	0.0	81.6	5.3	0.0	0.0	0.0
74	7.6	0.0	46.8	0.0	15.2	0.0	30.4
77	21.1	0.0	0.0	0.0	0.0	0.0	78.9
80	0.0	0.0	100.0	0.0	0.0	0.0	0.0
81	0.0	0.0	35.4	47.8	0.0	0.0	16.7

APPENDIX III.I: WARE INTRODUCTIONS ACROSS TRENCH A

PHASING:

Ware Name	A_I	A_II	A_III	A_IV	A_V	A_VI	A_VII	A_VIII
JULFAR	31	42	93	66	747	806	951	902
TIN	2	2	7	8	11	27	27	36
BUFF	2	1		7	52	97	186	108
ODD	2		2	3	3	6	13	8
TBBW	2		2		5	3	5	2
CRWW	2				13	7	43	35
PBS	1		2	1	12	24	56	20
LIME	1			2	23	22	68	43
WW	1					11	1	
SWW		1	1		15	22	27	2
JULFAR.RW			6	44	98	198	354	254
BIW/WIW			5	13	18	37	79	26
ERG			2	1	2	2	5	4
KHUNJ			1	3	7	13	14	16
MGP			1	2	11	9	18	23
JULF2			1	2	10	4	11	8
LQC			1	1	3	10	5	7
PUM			1	1	1	2	6	
MICA			1			6		3
JULF5				5	15	106	17	75
INCW				4	15	5	11	4
HWW				3	12	12	30	12
SAC				3	2	4	11	
JULFAR.PB				1	15	8	55	65
STWW				1	12	20	17	9
NIDGW				1	7	4	11	4
DEPAW				1	3	1	8	3
RPW				1	1	2	1	
DIIW.B				1	1	1	2	1
SHELL				1		1	3	10
FIGW				1		1	1	
GFRIT					11	7	5	2
BAH					6		1	
TRBW					5	12	11	4
PISW					4			4
UNIQ					3	6		
CHIN					3	4		13
CHALKY					3	1		

Ware Name	A_I	A_II	A_III	A_IV	A_V	A_VI	A_VII	A_VIII
DIIW.BL					3			
CBW					2	11	15	10
RORG					2	1	4	
BRIB					2		3	
WFRIT					2		3	
MLD					1	2	3	2
BORB					1	1		
YELL					1		2	
TEXT					1		1	
GIW						2	17	
TRW						2		
BRICK						1	1	1
BAG							5	
JULF6							1	1
LFRIT								2
MARS								2
BUBL								1

APPENDIX III.II: WARE INTRODUCTIONS ACROSS TRENCH B PHASING:

Ware Name	B_III	B_IV	B_V	B_VI
JULFAR	60	1123	2064	1992
JULFAR.RW	9	66	304	688
BUFF	6	24	178	184
TIN	6	12	54	98
JULF5	5	13	56	190
CRWW	4	16	69	93
SWW	3	3	12	40
HWW	3	2	41	78
LIME	2	10	51	170
BIW/WIW	2	9	41	145
MGP	2	3	23	57
ERG	2	2	12	4
PBS	1	18	42	88
STWW	1	13	35	65
FIGB	1			1
DIIW.B		47	2	
NIDGW		10	8	13
ODD		8	15	15
JULFAR.PB		7	80	159
TBBW		6	10	7
FE		5	11	22
SHELL		4	47	34
KHUNJ		4	21	32
DIIW.BL		4		3
TRBW		3	10	14
JULF2		3	8	15
WFRIT		3	7	8
DEPAW		2	35	16
INCW		2	28	30
CBW		2	16	33
GFRIT		2	6	9
PUM		2	5	5
LQC		2	3	14
SAC		1	12	22
MICA		1	7	19
BRIB		1	1	2
BAH		1		2
BLAB			9	
TRW			8	13
PISW			8	7
LFRIT			4	
MLD			3	3
FIGW			2	6
RPW			2	3
GIW			2	2
BUBL			2	1
REMIC			2	1
PIP			2	
RORG			2	
CHALKY			1	2
FINCW			1	1
CORB			1	
OC			1	
BAG				3
BORB				2
CHOC				2
JULF6				2
MEW				2
YELL				2
BRICK				1
MOD				1

APPENDIX III.III: WARE INTRODUCTIONS ACROSS TRENCH C PHASING:

Ware Name	C_I	C_II	C_III
JULFAR	50	95	153
ODD	5	4	14
JULFAR.RW	4	33	98
BUFF	4	19	63
BIW/WIW	3	10	29
TIN	3	4	15
CRWW	2	3	5
HWW	2	2	18
SHELL	2	1	2
TRBW	2	1	
JULFAR.PB	1	4	6
LQC	1	1	5
DEPAW	1		8

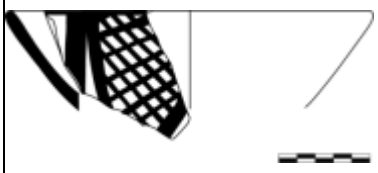
Ware Name	C_I	C_II	C_III
MGP	1		5
KHUNJ	1		4
DIIW.B	1		
JULF5		5	16
INCW		4	2
WFRIT		4	
WW		4	
GIW		2	
PBS		1	30
MLD		1	1
ERG		1	
STWW		1	
LIME			9
CBW			5
PISW			3
FE			2
RPW			2
YELL			2
NIDGW			1
SAC			1

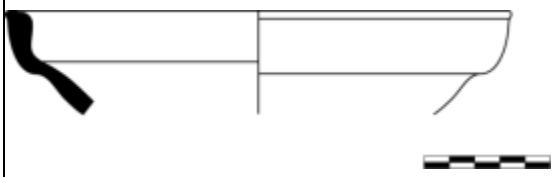
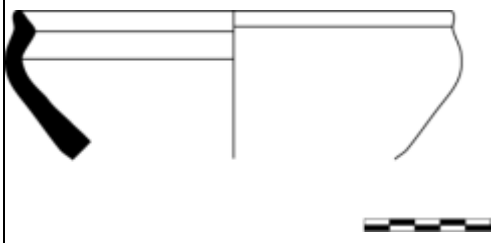
APPENDIX III.IV: WARE INTRODUCTIONS ACROSS TRENCH D PHASING:

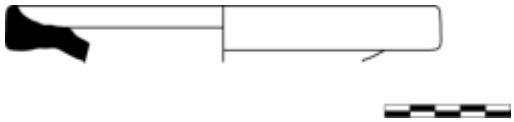
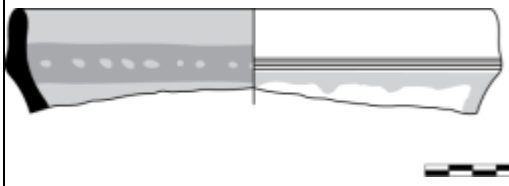
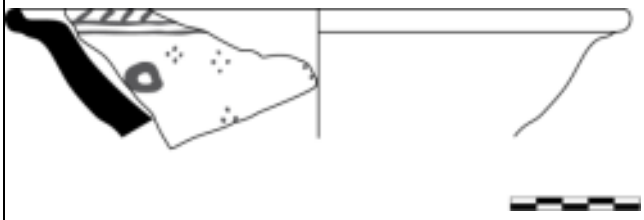
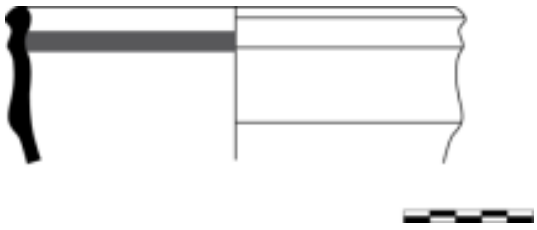
Ware Name	D_II	D_III	D_IV	D_V
JULFAR	1067	465	960	3501
TIN	113	21	53	124
BUFF	111	61	179	691
SWW	57	20	16	60
BIW/WIW	45	16	36	385
MICA	38	2	5	38
HWW	35	10	13	75
STWW	24	13	23	54
CRWW	20	6	20	31
LQC	18	4	9	12
ODD	14	12	22	30
JULFAR.PB	13	8	14	161
MGP	13	6	7	30
ERG	13	2	13	33
JULFAR.RW	11	21	80	686
TRBW	9	10	15	111
PUM	7	3	6	6
SAC	6	1		12
NIDGW	5	3	6	2
LIME	5	3	5	52
CHALKY	5		2	15
KHUNJ	4	6	4	32
SHELL	4	3	5	6
MLD	3	1		14
PBS	2	7	37	155
CORB	2	7	1	1

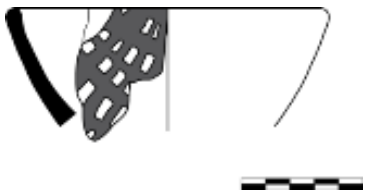
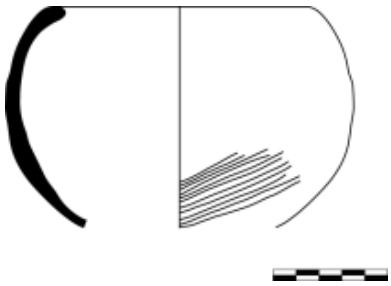
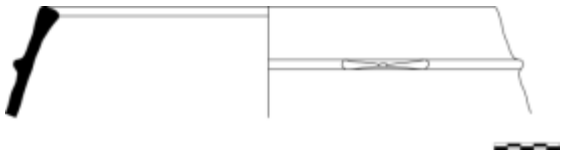
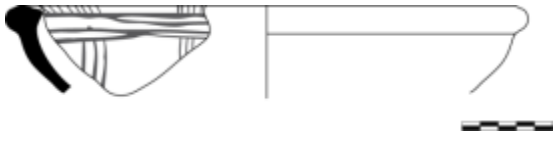
Ware Name	D_II	D_III	D_IV	D_V
WFRIT	2	3	12	33
FIGW	2	3	3	10
RPW	2	2	8	18
NIDIW	2			1
INCW	1	1	1	68
PIP	1	1		
ROB	1	1		
JULF2	1		2	30
CBW	1		2	16
BRIB	1		1	13
BAH	1		1	8
CHIN	1		1	3
OC	1			11
PISW	1			2
UGC	1			
GFRIT		2	9	32
BAG		2	3	1
BRICK		2		
JULF5		1	33	528
TBBW		1	11	113
DIIW.BL		1		4
DEPAW			8	27
GIW			4	16
RORG			4	3
MEW			1	6
BUBL				8
FIGB				4
BGSW				3
BORB				2
FINCW				2
DIIW.B				1

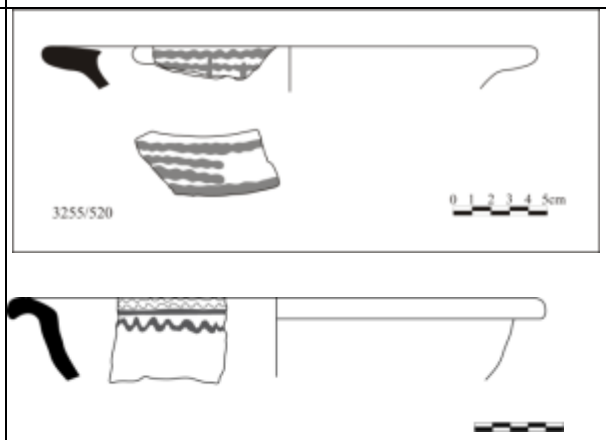
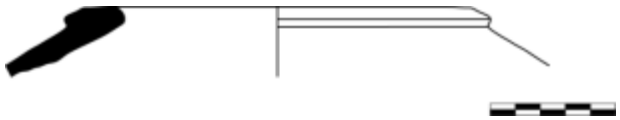
APPENDIX IV: JULFAR AL-NUDUD ND10 RIM TYPOLOGY:

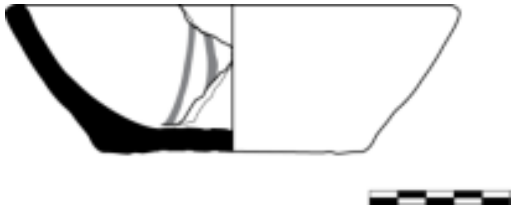
Type	Drawing	Function	Description	Page
G1		BOWL	Deep bowl rim type. The majority of examples of these are PBS rim sherds.	
G2		BOWL	Deep bowl rim type. Similar to G8 but lacks raised band on inside surface below rim	
G3		BOWL	Deep bowl rim type. Large serving dishes/bowls usually of PBS ware.	
G4		BOWL	Deep bowl rim type. Small serving bowl? TIN and MGP ware type.	
G5		BOWL	Deep bowl rim type. Large serving bowl.	
G6		BOWL	Deep bowl rim type, Small serving bowl?	
G7		BOWL	Bowl rim type. Similar to G2 as form is fairly simple. Steep vessel body sloping outwards from base.	

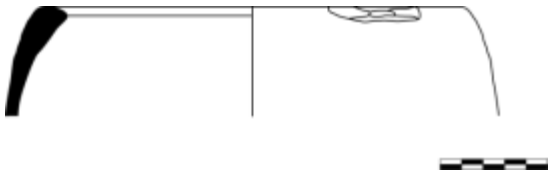
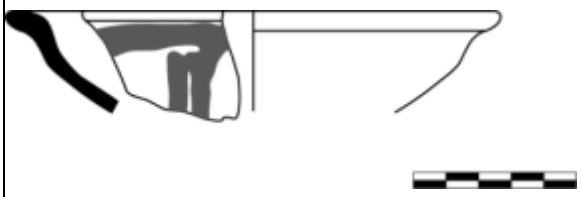
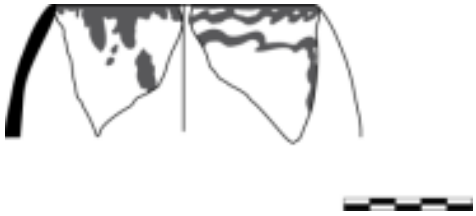
Type	Drawing	Function	Description	Page
G8		BOWL	Bowl rim type. Similar to G2 as form is fairly simple. Steep vessel body sloping outwards from base. Below rim one raised band runs around the internal surface 15mm below the rim termination.	
G9		BOWL	Bowl rim type. Deeper body than G10 or G11	
G10		BOWL	Deep bowl rim type. Similar to G9 but with slight variations.	
G11		BOWL	Very shallow bowl rim type. Could be a short lived fashion type or a ceramics industry only occasionally traded with.	
G12		BOWL	General glazed ware rim type. Vessel body is a shallow bowl with upward curving sides.	
G13		BOWL	Tin Glazed Ware rim type. Small bowl type. Dating is unknown but it could be a late type.	

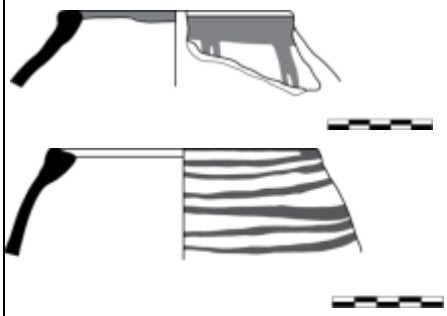
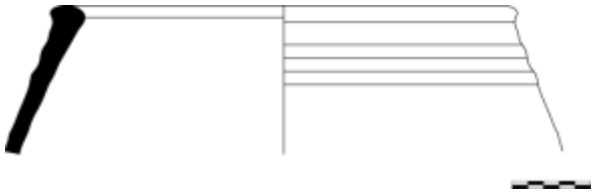
Type	Drawing	Function	Description	Page
G14		BOWL	Shallow bowl with horizontal out-turned rim, similar to G12 but with a thicker outside part. Possible in between type between the flat G12 and the G17 with the small upward lip	
G15		BOWL	TIN rim type. Straight sided bowl type	
G16		BOWL	Late rim type only found in post stone phases. Complex rim type, possibly for function, possibly for decoration.	
G17		BOWL	Glazed ware rim type. Possible development of G12. Open bowl type.	
G18		BOWL	DEPAW glazed ware rim type. Only found in DEPAW vertically sided bowls. Vessel side is vertical with thickened bands running around the exterior surface.	
INC1		BURN	cense burner ware rim type. Appears to be bowl type made of same fabric as incense burners. rounded crenulations around the rim edge	

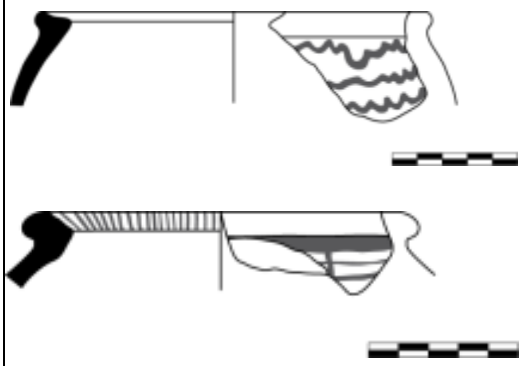
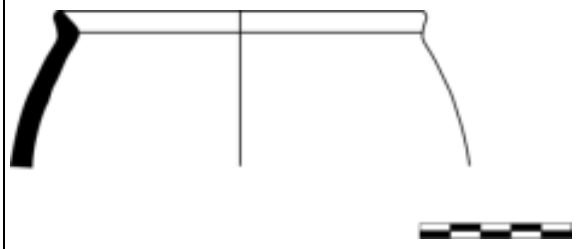
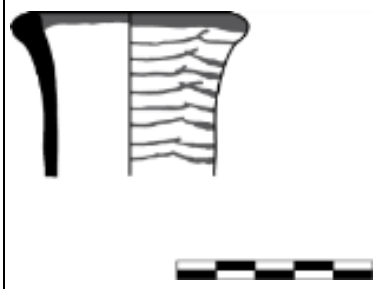
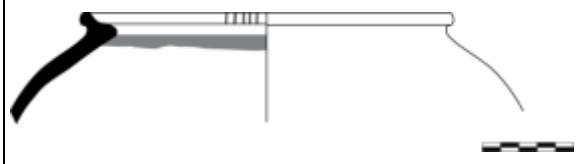
Type	Drawing	Function	Description	Page
INC2		BURN	Incense burner ware rim type. Probably cup rim type for handles and bases regularly found in this assemblage. Very simple rim termination with no deviations or decoration on rim	
J1		COOK	This rim type is seen to be the earliest Julfarware rim type found in the Julfar area. It is equivalent to Kennet 2004: CP1.2.	
J1.1	No drawn example	COOK	Similar to J1 but with steeper walls. Combined in to J1 data after first trench completed.	
J2		COOK	A possible development of J1 with a more curve, spherical body form on some examples	
J3		COOK	Similar to J1. However profile is slightly more angular with sides pushing further out as they go down the vessel. The type is also much thicker than the J1 type.	
J4.1		BOWL	J4.1 is a bowl rim with horizontal protrusions to both the inside and the outside of the rim, with the outer one rising and the inner one dipping in towards the centre.	
J4.2	No drawn example	BOWL	J4.2 is the opposite to J4.1, with the inner rising up and the outer protrusion dipping down	

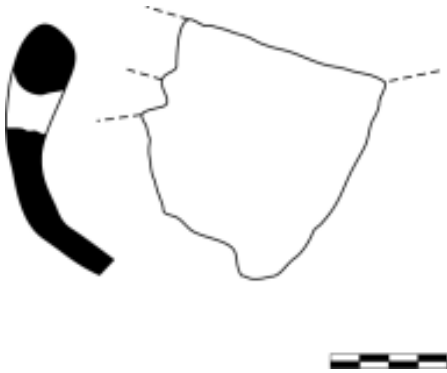
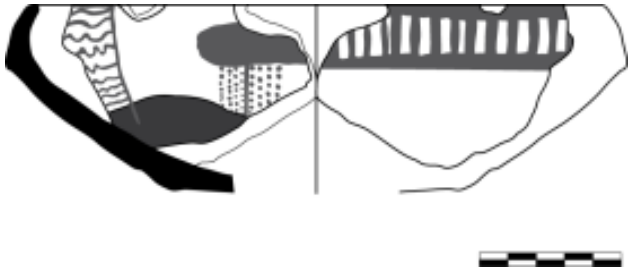
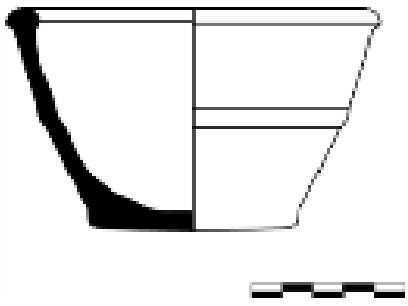
Type	Drawing	Function	Description	Page
J4.3	No drawn example	BOWL	J4.3 is a bowl rim with only an exterior protrusion which rises, forming a kink in the exterior surface	
J4.4		BOWL	J4.4 is similar but the protrusion of the rim becomes more horizontal in a similar fashion to type G1. The J4.4 type has four bands of decoration around the rim on the top and inside. This rim type is problematic as during cataloguing various rim types were assigned to this type incorrectly, as the two images show.	
J4.5		BOWL	J4.5 is fairly straight sided with a rim that thickens equally internally and externally with a flat top.	
J5		STOR	Large jar or storage rim. Similar but has important differences with J11 and J16, both of which are also from storage jars.	
J6		WATER	Jar or jug type with the majority of examples found in Julfarware 3. It is the most common JULFAR.RW type	
J7		COOK	Rim is very similar to J2. However this type is exclusive to Julfarware 4 and has a triangular sharp lug on some examples which is extended out from the lip of the pot	

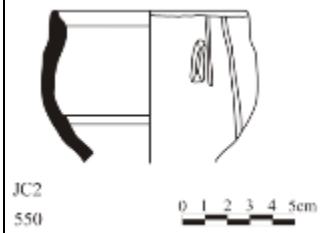
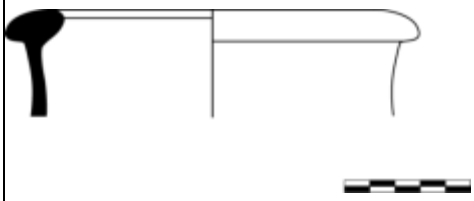
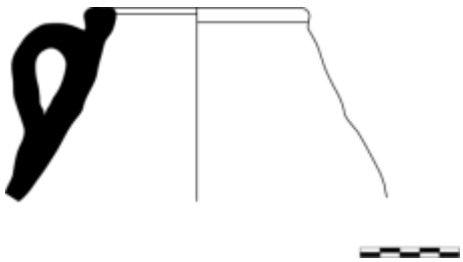
Type	Drawing	Function	Description	Page
J8		COOK	Body shape of vessel is similar to J2. Rim turned out by approx 100 degrees from body, possibly to enable a cloth cover to be used. Only found on Julfarware 4 examples, sometimes with JULFAR.PB cording decoration approx 50mm below the rim	
J8.1		COOK	Rim extends further than J8(30mm) at a less acute angle, approx at right angles or less (J8.1)	
J9		COOK	A development of Kennet 2004 CP4.4. However rim does not extend as far as J8 examples and is completely turned over to the exterior. Corded decoration is present on exterior surface of rim.	
J11		STOR	A rim similar to J5 with but with a smaller exterior protrusion at the rim. Slightly flattened on exterior surface. Similar to Kennet 2004: CP2.2 but more likely to have been a storage vessel type.	
J12		BOWL	Julfarware carinated bowl type found only in JULFAR.RW ware. One of the most common JULFAR.RW bowl types,	
J13		BOWL	Small bowl type introduced in large numbers in the stone phase 4.	

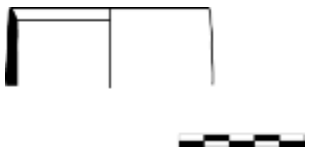
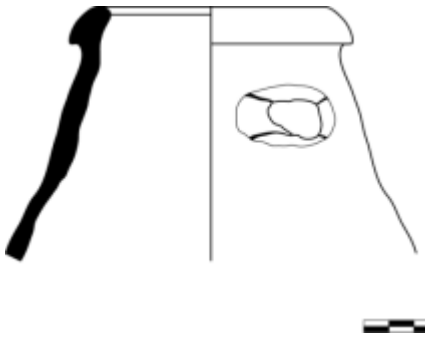
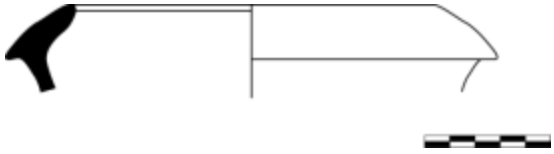
Type	Drawing	Function	Description	Page
J14		STOR	Small storage vessel in JULFAR.RW fabric. Less common small storage rim type	
J15		BOWL	An open rim type with a flattened rim. Similar to J12 but with a less thickened rim. Large platter type.	
J16		STOR	A probable development of J5 rim types with the rim becoming more prominent. late Julfar storage type which appears to coincide with the expansion of the city into international trade.	
J17		BOWL	A bowl type with thinner fabric than J4 and with a more extended exterior protruding lip at slightly less than 90 degrees to the interior vessel shape.	
J19		BOWL	Rim type similar to J6 but with vessel body which widens out just below rim. Similar to J14 but larger.	
J20		BOWL	Possibly a mid point between J13 bowls and JC1 cup types. Small and thin, showing a possible refining of the local Julfarware.	

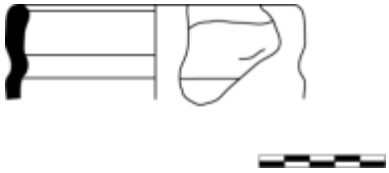
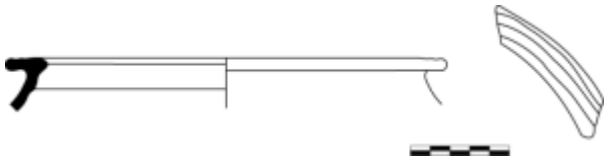
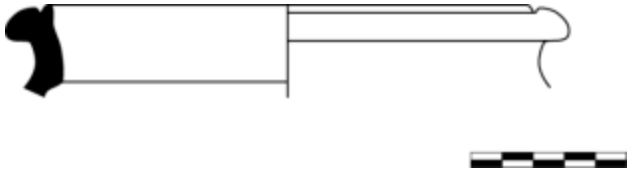
Type	Drawing	Function	Description	Page
J21		STOR	Storage vessel rim type. Slightly similar to J19 and to J14 but rim top is different. Similar function is likely however.	
J22		STOR	Very similar to J14 but small changes show it to be separate. Similar storage function to J14, 19 and 21.	
J23		STOR	Lidded type similar in function to J24. Appears to be part of a short lidded Julfarware ceramic tradition during the period directly before the stone building phase.	
J24		STOR	Lidded type similar in function to J23. Appears to be part of a short lidded Julfarware ceramic tradition during the period directly before the stone building phase.	
J25		BOWL	Similar to J12 and J13 in the large platter tradition. Possibly a more modern Julfarware type.	
J26		STOR	Large Julfarware 1 storage jar. Similar function to J5, 11 and 16 but different style, being much wider at the mouth.	

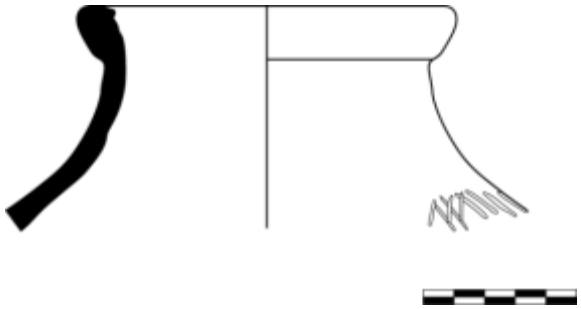
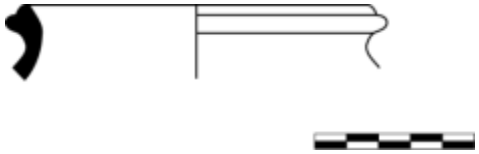
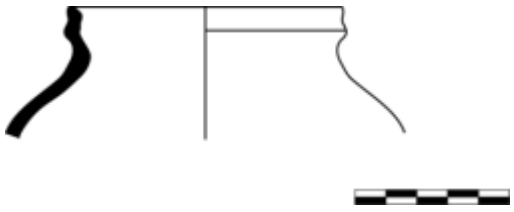
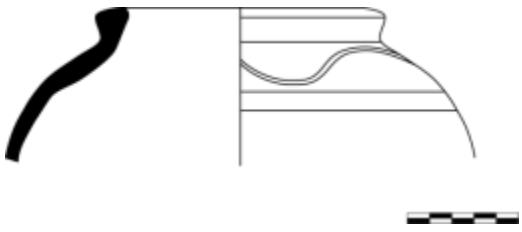
Type	Drawing	Function	Description	Page
J27		STOR	Julfarware 3 storage jar type. Possibly an overlapping type combining examples of J22 and J14 but will be considered as a separate type for this analysis.	
J28		BOWL	Julfarware bowl type. Slight similarities with J13 rim types. Shows possible continuation of large platter wares post-stone.	
J29		STOR	Julfarware bowl type. Similar to J8 types but found in JULFAR fabric. Body shape of vessel is similar to J2.	
J30		WATER	Julfarware 3 narrow necked jar, possibly for water storage. Similar in shape to J6 types but much smaller.	
J31		STOR	Lidded rim type similar to J23 and J24 in function but part of the JULFAR.RW ware assemblage	

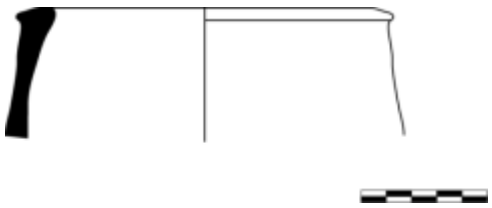
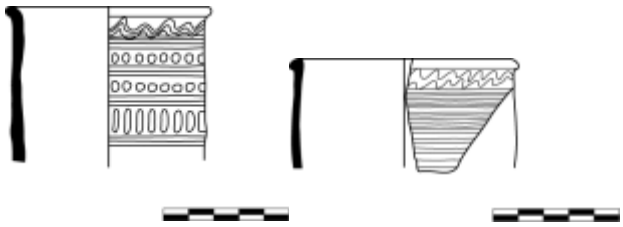
Type	Drawing	Function	Description	Page
J32		BOWL	Julfarware 4 bowl rim type. Similar to J28 in shape with heavily turned internal rim. Possibly a small version of the large platter types seen during the stone phase.	
J33		TRAN	No parallels from Julfar. A basket type pot with two or more similar handles around the rim to enable easy transport.	
J34		STOR	JULFAR.RW painted bowl type. Slightly similar to J12 carinated bowls but smaller and thinner.	
J35	No drawn example. Only 1 sherd known- possibly down as a JULF unique sherd	STOR	Unknown	
JC1		BOWL	A rough cup type. JC2 has some similarities in style and function. Other small cup types include J32 and J20.	

Type	Drawing	Function	Description	Page
JC2		BOWL	A cup type which is slightly closed. JC1 has some similarities in style and function. Other small cup types include J32 and J20	
NG1		TRAN	Transport/Storage vessel rim type, with the majority found on BUFF ware. Has large internal lip.	
NG2		TRAN	Transport/storage rim type exclusive to LIME class. to NG4 rims which are probably just damaged examples of NG2.	
NG3		TRAN	Similar in form to NG1 but does not have large internal lip so could be plain storage version.	
NG4		TRAN	Very similar to NG2 type. Also only found in LIME classes. It is possible that this type is NG2 with the inner lip broken off	

Type	Drawing	Function	Description	Page
NG5		WATER	A simple termination rim found in both hard and soft white ware types and white incised ware types	
NG6		TRAN	LIME class rim type. Near vertical vessel sides from deep bowl thicken on the interior side before round into a slight overhang	
NG7		COOK	Small cooking pot or gourd rim type from Indian wares TRBW and TBBW. : A smaller version of other NG rim types from the Indian sub-continent.	
NG8		TRAN	Bahraini storage ware rim. Slightly similar rim development to NG1 and NG3. Does not have large internal lip that typifies NG2.	
NG9		TRAN	Transport/storage vessel rim type found in BUFF. Possibly either a larger version of NG1 or a development of it.	

Type	Drawing	Function	Description	Page
NG10		STOR	Storage vessel rim type found in CRWW vessels. Vertical vessel sides (the example found is possibly from the neck of a larger closed storage vessel as CRWW class is a storage vessel ware) with a simple rim termination.	
NG11		COOK	Complex Indian cooking or storage pot. Only example found in phase 5 suggesting that it is part of the Indian assemblage brought in by increased international trade.	
NG12		COOK	: Larger more complex version of NG7, presumably for food cooking and storage	
NG13		COOK	Storage/cooking vessel with large rim. One of the first Indian rim types for be introduced at Julfar	
NG14		COOK	Flat topped storage vessel found in stone phase 6 (one example) suggesting it dates to early to mid 15th Century AD. Similar to NG11 but larger rim.	
NG15		COOK	Smaller mouthed storage vessel compared to other similar examples (NG12, NG13, NG14). Exterior rim in similar to NG13 but larger and slightly thinner.	
NG16		COOK	Indian ware rim type. Diameter and size varies a lot. Can be found in large, medium and some small storage jars/cooking vessels.	

Type	Drawing	Function	Description	Page
NG17		STOR	TBBW rim type, probably for a storage vessel. No similar types known from al-Nudud excavations.	
NG18		COOK	Indian burnished ware rim type. Similar to NG16 but the angle of the rim is higher. Uncommon rim type.	
NG19		STOR	Non-ID and Indian ware rim type for storage vessels and possibly cooking jars. Similar to transport rims found in BUFF ware	
NG20		COOK	FIGW and Non-Id rim type for either small cooking pot or small jar. Both closed vessels. Possible similar function to NG7	
NG21	No drawn example can be found. Appears as only 1 sherd from FIGW-could be down as a unique rim type. Possibly similar to NG20.	COOK	Unknown	
SJ1		STOR	Similar form to SJ2 but no large outer lip and to some Julfarware rim types such as J14 but has wave decoration below rim.	

Type	Drawing	Function	Description	Page
SJ2		STOR	Rim type found on CRWW vessels. Similar form to rim part of SJ1 with slight lip on exterior of rim and slightly slope upwards from exterior to interior rim edges.	
SJ3	No drawn example. Only one sherd of this rim type found.	STOR	Fabric for this type is CRWW. A possible development on either NG1 or 3.	
SJ4		STOR	CRWW and Non-ID rim type for storage jars. Vessel body slopes inwards toward narrowest point which is the rim	
W1		BOWL	White ware rim type generally only found in white incised ware fabric 1 (WIW1). Exterior surface is heavily decorated, usually with the distinctive wave style of decoration just below the rim	
W2		BOWL	HWW rim type. For small white ware bowls with straight slightly outward and upward sloping vessel shapes.	
W3		BOWL	HWW rim type. For small white ware bowls with shallow sloping sides.	

APPENDIX V.I: JULFAR AL-NUDUD WARE DESCRIPTIONS:

BUFF AND GREY WARE

Code: BAG

Distinguishing Features: Buff surfaces with black/dark greyish brown fabric centre. Red grit temper occasionally evident on surface or in fracture. On second inspection is badly eroded TRBW.

Surface Treatment: None. Occasionally has organic fabric imprint on surfaces.

Decoration: None

Manufacture: Handmade.

Firing: Hard-medium firing. Fabric is difficult to break but fragments once broken.

Colour (Munsell): Surfaces are 7.5YR 7/3 pink/buff and inner body is Grey 1 2.5/N black.

Fracture: Erratic fracture which is generally coarse. Some fractures are perpendicular but most are lateral fractures into one or both surfaces, suggesting that the fabric is inconsistent.

Inclusions: Frequent very small mica fragments throughout body and surface, although less frequent on surfaces, medium well sorted quartz grains (1mm) and occasional red sand grains (0.8mm) in body

Thickness: 5-8mm

General Description: A handmade coarse ware with a grey/black centre sandwiched between buff surfaces. The ware is tough to break but then fractures easily around the break.

BAHRAIN LIME SPECKLED WARE

Code: BAH

Distinguishing Features: Pinky red fabric with heavy yellow lime spalling throughout.

Surface Treatment: None

Decoration: None

Manufacture: Wheel manufacture marks internally with handmade handles.

Firing: Medium firing as breaks reasonably easy with minimal sound.

Colour (Munsell): Original fabric is 2.5YR 6/4, heavy lime spalling on surfaces is 10YR 8/3

Fracture: Course fracture perpendicular to surfaces. Angular edges.

Inclusions: Very dense lime fragments (0.5mm-1mm) with lime spalling throughout. Badly sorted white/grey/black sand grains (0.5-1mm) are also present.

Thickness: 5mm-10mm thick.

General Description: Bahrain wheel manufactured dense lime tempered storage ware. Shapes suggest import was for contents, not for ceramics themselves. Heavy lime spalling disguises original pinky red colour but makes this type very easy to identify.

BUFF INCISED WARE (SEE ALSO WHITE INCISED WARE)

Code: BIW (see also WIW)

Distinguishing Features: Incised decoration on exterior surface of wheel made buff pottery. Most forms appear to be either water jugs or water pipes (sheisha). Can be combined with WIW (for contexts 1509 and 1501, these types were combined into BIW/WIW)

Surface Treatment: Surfaces are flattened and smoothed. No slip/glaze.

Decoration: Incised decoration on exterior surface. Most examples are geometric designs or varying designs made with a 3 pronged tool e.g. waves, lines and hatching in bands down body of pot. Some have bands of more complex designs involving shapes and dot patterns. These have been characterised into three general decoration classes- WAVE, ROUL and OTHER.

Manufacture: Most examples of this are thin with wheel turning marks on the interior suggesting wheel manufacture. The design has been incised with evidently specifically made decoration tools such as a three pronged tool to make parallel lines of a set distance apart. All BIW/WIW sherds have been classified into three fabrics: thin, thick and soapy. Thin and thick fabrics are very similar with the only difference being the thickness. The soapy fabric is completely different and appears to relate to a different style of pottery from the 18th Century AD (Priestman 2005).

Firing: The ware is medium hard fired, breaking with a dull snap. Fabric is quite tough.

Colour (Munsell): Body colour is 7.5YR 7/6 red. Outer and sometimes inner surface are 10YR 8/2 very pale brown which is uniform across the whole surface. Some examples are slightly redder in the body colour.

Fracture: Clean fracture

Inclusions: Clay has clearly been levigated to remove impurities. Inclusions are occasional sub-angular red sand grains 0.1mm, occasional unspalled lime 0.3mm and occasional very small mica fragments 0.01mm.

Thickness: Majority of ware is 4mm thick.

General Description: A well codified fabric and ware. Wheel made very clean clay fabric with a white/cream slip on exterior surface. Incised linear and geometric decoration is a clear feature of this ware.

BLACK BURNT WARE

Code: BLAB

Distinguishing Features: Heavily burnt thick storage ware. Possibly a heavily overfired type of another class, however inclusions and other features are very difficult to make out. Only found in one context. Large grit inclusions and some evidence of organic temper.

Surface Treatment: None

Decoration: None

Manufacture: Handmade is likely as the type is very rough. No wheel turning marks

Firing: Medium soft as fabric is easy to break and is quite brittle around a new fracture.

Colour (Munsell): Black.

Fracture: very angular. Not perpendicular to surfaces with frequent deviations due to inclusions and inconsistencies.

Inclusions: Some organic temper is likely as the scars are left on the interior surface. Small charcoal pieces can be seen in fractures (1-2mm). Large sub-rounded badly sorted grit pieces (3-7mm) are throughout fabric.

Thickness: 13mm

General Description: A single context class for a type not found anywhere else. Could just be an overfired type of another class. Heavily burnt/overfired type with large grit inclusions and organic temper. Soft medium fired and is quite crumbly once broken.

Burnished Orange and Black Ware

Code: BORB

Distinguishing Features: Bowl type vessel with slightly burnished orange/buff exterior surface and heavily burnished (sometimes degraded) interior surface. Fabric starts orangy buff on exterior surface but becomes more grey/black as it moves through the body to the interior surface.

Surface Treatment: Surfaces have been heavily smoothed and the exterior lightly burnished. The interior black surface has been heavily burnished to a dull sheen.

Decoration: None

Manufacture: No real wheel marks but consistency and shape suggest a wheel made bowl type.

Firing: Hard medium firing as surfaces are very hard. Inner fabric is also hard but not as tough as surfaces. Degraded example (3899) is softer.

Colour (Munsell): Outer fabric is 10YR 6/4 light yellowish brown with inner fabric being 10Y 5/1 greenish grey. Interior surface is black.

Fracture: Smooth with very few deviations or bumps. Edges are angular. Penpendicular to surfaces so fabric is uniform throughout.

Inclusions: Very small mica fragments. No other inclusions other than some occasional small voids in the fabric. Clay is well levigated.

Thickness: 10mm approximately.

General Description: Small class for previously Non-ID sherds from different contexts. Appears coherent, although different conditions have degraded one of the sherds. Class has a heavily burnished black interior surface with a lightly burnished buff/orange exterior surface. When degraded surfaces are rougher. Appears to be bowl type vessels.

BROWN INDIAN BURNISHED WARE

Code: BRIB

Distinguishing Features: Sandwich fabric of chocolate brown exterior and interior surfaces with dark grey/black centre of body. Generally a thin ware with burnishing on exterior edge. Organic temper marks. Appears to mainly be used for cooking pot types.

Surface Treatment: Burnishing on exterior surface and flattening on interior.

Decoration: None

Manufacture: There appears to be minor wheel turning marks around the rim. However ridges on the inside of the pot could point to hand manufacture. Likely to be wheel made in most cases however.

Firing: Fabric breaks easily with minimal sound suggesting a medium to soft firing. However surfaces of fabric are reasonably hard, pushing it more into the medium firing bracket.

Colour (Munsell): Surfaces are 10YR 5/3 brown while body centre is 10YR 3/1 very dark grey.Burnishing is slightly darker than surfaces.

Fracture: Break is rough, possibly due to inclusions and voids in fabric. It is perpendicular to the surfaces however suggesting there is consistency in fabric across the two colours of the body.

Inclusions: Large amount of organic temper throughout body. Suggest blackened body centre is due to burning of these as some slight charcoally inclusions are possible. Badly sorted sub rounded white sand grains (0.5-1mm) are also throughout the fabric.

Thickness: 5mm thick.

General Description: An organically tempered thin brown burnished ware often with a blackened centre to the fabric. Burnishing is only evident on the exterior edge. Dense organic temper is visible on surfaces and on breaks. Shapes show probable cooking vessel use.

BRICKY RED EARTHENWARE

Code: BRICK

Distinguishing Features: Flaky inner fabric with small pieces of yellow/white lime and occasional white grit fragments (5mm). Some mica pieces. Looks like modern brick fabric.

Surface Treatment: None

Decoration: None

Manufacture: Hand made as no wheel turning marks

Firing: Medium hard as surfaces are tough but inner fabric is slightly flaky. Some small amount of delamination.

Colour (Munsell): Fabric is 2.5YR 4/6 dark red.

Fracture: Rough if delaminated but smooth if normal break. Break is perpendicular to surfaces so fabric is uniform throughout.

Inclusions: Small occasionally spalled lime fragments (1-2mm), very occasional white grits (4-7mm) and frequent mica pieces throughout fabric.

Thickness: 8mm

General Description: A class made from Non-ID sherds from different contexts. However fabric appears coherent across the sherds. Bricky appearance with mica, lime and white grit inclusions. Occasionally flaky in inner fabric. Tough other fabric.

BUFF AND BLACK WARE

Code: BUBL

Distinguishing Features: Striking two tone fabric with buff layer (if over fired, buff becomes light greyish buff) on exterior surface between 4 and 9mm thick then clear change to dark grey/black fabric which is between 8 and 13mm thick. Some evidence of organic temper on surfaces. Some examples have a similar texture in the dark grey layer to heavily charcoaled wood.

Surface Treatment: None. Some smoothing of surfaces

Decoration: None

Manufacture: Probably hand made as no wheel marks are obvious.

Firing: Overfired pieces are much harder than the type with the buff surface. The overfired ones are hard to break and do not crumble in the hand, suggesting that they have been medium to hard fired. The buff example has a tough exterior surface but the black fabric is very soft and crumbly, suggesting soft to medium firing.

Colour (Munsell): Outer fabric is 10YR 7/2 for buff, 10YR 6/2 for overfired. Inner fabric is 2.5YR 3/1 very dark grey

Fracture: Angular and usually not perpendicular with surfaces. The fabrics are not of the same strength, therefore. The inner fabric on the underfired type is very soft and so has some delaminations.

Inclusions: Infrequent white shell fragments throughout both fabrics (1-4mm in length). Frequent well sorted small sand grains (0.2mm) also throughout fabric. Mica pieces are visible in dark grey/black fabric.

Thickness: 12-23mm thick

General Description: A small class from Non-ID pieces from different contexts. However the fabrics appear to be similar and so they have been grouped. A two tone class with a buff ouer fabric which becomes grey when overfired and a dark grey/black inner fabric. Thickness and size of sherds suggests storage ware but no diagnostic sherds have been found.

BUFF WARE

Code: BUFF

Distinguishing Features: Undecorated buff pottery with white/cream coloured exterior and interior surfaces. Fractures longtitudially.

Surface Treatment: Possible white/cream slip but more likely firing conditions. External surface is heavily pitted.

Decoration: Some examples have incised decoration. These have been catalogued under BIW (buff incised ware).

Manufacture: This ware appears to be handmade with no wheel marks. However the clay has probably been levigated.

Firing: The ware is hard fired, being difficult to break, breaking with a harsh snap. Very solid fabric.

Colour (Munsell): Body colour can be 2.5YR 6/6 red but majority is 10YR 7/3 pale brown. Outer and inner surface are mottled 10YR 7/4 very pale brown with the body colour showing through in places. Some examples are slightly redder in the body colour.

Fracture: Medium course. Ware delaminates and breaks apart. Some examples of these delaminates have none of the mottled pale brown surface but were identified by fabric similarities.

Inclusions: Very dense well sorted small sub angular white, pink and brown sand 0.1mm. Linear voids run through the pottery- possibly beginnings of delaminations.

Thickness: Majority of ware is 5mm thick but some is up to 15mm thick.

General Description: A well codified fabric and ware. The delamination effect appears to unique to this ware, probably due to the linear voids in the fabric. The two colours of the body and surfaces make this ware reasonably easy to identify.

CHALKY CREAM AND PINK WARE.

Code: CHALKY

Distinguishing Features: Cream coloured exterior surface with sand temper showing through with pinky coloured body. Surface can feel slightly chalky. Interior surface commonly has horizontal ridges running around the vessel.

Surface Treatment: Possible very thin cream coloured slip. Exterior surface is also flattened/smoother.

Decoration: None

Manufacture: Hand manufacture is suggested due to the uneven ridges on the interior surface of the vessels.

Firing: Appears to be medium soft fired as while fabric breaks with a muffled snap, exterior surface feels chalky. This could be due to the possible slip covering it, however.

Colour (Munsell): Exterior surface is 10YR 8/2 very pale brown. Interior surface and fabric body is 5YR 8/4 pink.

Fracture: Break is rough, possibly due to inclusions in fabric. It is perpendicular to the surfaces however suggesting there is consistency in fabric in the body.

Inclusions: Frequent medium sorted yellow, cream and grey well rounded sand grains (1mm) are present throughout. Occasional sub-angular pieces of orange/red clay or grog temper are present, possibly giving the fabric its pinky colour. Both of these show up on both exterior and interior surfaces.

Thickness: 10-14mm thick.

General Description: A pink bodied fabric with a cream exterior surface. Sand and clay temper shows through on surfaces. Ridges on interior could show hand manufacture. Storage jar type is likely. Possibly related but different to CRWW class. Handle types are similar to those in LIM class.

CHOC-CHIP STORAGE WARE

Code: CHOC

Distinguishing Features: Thick body with traces or complete red/pinky slip on exterior surface. Large angular black and red grit inclusions. Platelets of grit tend to be parallel to surfaces. Consistent colouring throughout body.

Surface Treatment: Both exterior and interior surfaces are smoothed. The exterior surface has been painted with a thick pinky/red slip which is degraded in places.

Decoration: None

Manufacture: Handmade but only suggested by a lack of wheel marks and slightly rough hand made marks on the interior surface.

Firing: Medium hard firing as breaks with a muffled snap. Surfaces are hard but ware is not extremely brittle as it would be if it was extremely hard fired.

Colour (Munsell): The body fabric is fairly uniform throughout with a colour of 2.5Y 7/4 pale yellow with the slip on the exterior surface being 10R 5/4 weak red.

Fracture: Fracture is rough. It is slightly concave, which suggests that the slipped surface is slightly tougher. Roughness of break is probably due to dense grit temper and voids

Inclusions: Dense angular black and red grit temper, some larger (1-5mm) and some are very small (0.1mm). Smaller ones are black. Angular voids in fabric, again badly sorted.

Thickness: 9-13mm thick

General Description: Course late storage ware. It is identified to the Post-Mataf phase by Kennet 2004. Red/pink slip on exterior surface. Grit temper is the defining characteristic of this ware.

COARSE ORANGE AND BLACK WARE

Code: CORB

Distinguishing Features: Thin coarse ware with black centre of fabric and orange surfaces. Shell tempered.

Surface Treatment: None. The surfaces may have been smooth during manufacture but ware in general is coarse

Decoration: None

Manufacture: Handmade as no wheel marks on either interior or exterior faces.

Firing: medium hard firing as breaks reasonably easily but surfaces are hard. Quiet snap when broken.

Colour (Munsell): Exterior surface is 7.5YR 6/6 reddish yellow, interior surface is 7.5YR 6/3 light brown and centre body is black.

Fracture: Reasonably smooth fracture with only deviations being around larger inclusions of shell temper.

Inclusions: Very frequent badly sorted sub angular white shell fragments 0.1mm to 2mm. Some baldy sorted grey sand grains (0.5mm to 2mm) and occasional charcoal fragments (0.5mm) all visible on surface, sand and shell easily visible in body.

Thickness: 3mm approx.

General Description: Very obvious thin coarse ware due to sandwiching of black fabric between the orange exterior and interior surfaces of the ware. Shell temper (usually white) can be seen both on fractures and on both surfaces. Inner surface is smoother than exterior surface which has temper protruding, making it more uneven.

COURSE RED/WHITE WARE

Code: CRWW

Distinguishing Features: A course red body fabric covered on either exterior only or both interior and exterior with a white/very pale yellow slip. Some have incised designs on the exterior. Particular among these is a wave design made with either a two or three pronged tool.

Surface Treatment: The exterior and occasionally the interior of this ware are covered with a rough white/very pale yellow slip approx. 1mm thick. Some examples have become heavily pitted, possibly due to degradation. Some examples have bitumen coating on the interior.

Decoration: Some examples of this class have incised decoration, generally in the upper quarter of the pot near but not on the rim. This consists of two lateral lines running round the pot approx 10mm apart (some examples double up these lines with two close together 10mm below two others close together) and then a wave of incised lines running round the pot close to the rim. This wave is regularly made of 2 or 3 lines close to each other, suggesting the use of a 2 or 3 pronged instrument in the manufacture.

Manufacture: Obvious wheel turning marks on the interior of this ware heavily suggest wheel manufacture.

Firing: The body of the fabric does not appear to have been heavily degraded. However when snapping the fabric breaks diagonally away from the exterior point, suggesting that the slip is harder than the body fabric. It is suggested that the fabric is medium fired.

Colour (Munsell): The body fabric is fairly uniform throughout, with a 5YR 5/6 yellowish red colour, with the interior appearing slightly more washed out- 5YR 6/6 yellowish red. The exterior slip is a 5Y 8/3 pale yellow colour although the surface is slightly lighter than areas of degradation. Some overfired examples become greenish yellow in fabric through the body (5Y 7/6)

Fracture: Fractures on this ware are smooth with angular egdes. As noted above forced fracture causes a diagonal face sloping towards the interior suggesting more cohesion and toughness at the exterior surface.

Inclusions: The fabric of this ware has medium density sub-angular sand grains of varying colours (mostly beige and white) between 0.05mm and 0.5mm in size. In addition to this, one

example found had a complete shell in its fabric which was approx. 10mm long and 4mm thick. There is also evidence of some very small pieces of mica as an inclusion (0.01mm)

Thickness: The ware varies between approx 4mm and 14mm with most examples being approximately 10mm thick

General Description: This is a courseware, with a rough pale yellow/white exterior slip and a red body, generally 10mm thick. Inclusions are mica, sand grains and some shell. It is easily recognisable due to its two colours and incised decoration type.

DEGRADED LEAD GLAZE WARE.

Code: DLGW

Distinguishing Features: Hard yellow/buff fabric (some have pinkish hue) with degraded white, blue and/or green glaze on usually one surface. Glaze surface is abraded and rough with patches of no glaze where it has worn off.

Surface Treatment: Surfaces have been flattened and then glazed with a white, blue or green glaze which has then become degraded and rough over the period in the ground.

Decoration: Rare sherds have some painted decoration under the glaze but the majority of these were classes as MGP. All other examples do not have any other decoration than the glaze.

Manufacture: Most examples appear wheel-turned due to the regular nature of the forms and the turning marks on bases and unglazed areas.

Firing: Medium hard firing which is hard to break and not soft/soapy to the touch. Fabric is slightly porous and rough but not to the same extent as FRIT wares.

Colour: Fabric is mottled 10YR 7/4 very pale brown although some examples are more yellowy and some more pinkish. Glazes are white, green and/or blue.

Fracture: Most fractures are smooth with smooth edges to the surfaces. Breaks are perpendicular to the surfaces showing a consistent fabric.

Inclusions: Small mica fragments occasionally visible on fractures. Very few other inclusions- some small occasional voids- 0.5mm

Thickness: 6mm-9mm

General Description: A general class for degraded glaze wares found at Julfar al-Nudud. Name is slightly mis-leading- studies by Sasaki and Sasaki show the glaze is not whitened/opacified by lead but by white quartz grains, which would explain the rough nature of the glaze once it has been weathered. Rim forms show this ware is generally used in BOWL types, suggesting it is generally a table ware. It is the most common glazed ware at Julfar al-Nudud and is probably an import from an area in Southern Iran.

DEGRADED PAINTED WARE

Code: DEPAW

Distinguishing Features: Hard red fabric with few inclusions and painted decoration similar to MGP types underneath either a yellowy degraded glaze of a slightly smoother blue/turquoise glaze. The defining feature is that the glaze looks multi-coloured if it is not wet. Most examples need to be wet to allow the painted decoration to show through.

Surface Treatment: Surfaces have been flattened and smoothed. They then have been painted with decorative designs (see below) and then glazed with either a turquoise or yellow glaze.

Decoration: Painted decoration underneath the glaze which takes the form of swirls and curved geometric designs. Some designs are more blobbly, with small dots of a glazed colour in a band of another running approximately 20mm below the inner rim edge.

Manufacture: Wheel manufacture marks throughout pieces.

Firing: Medium hard firing which is difficult to break and is not soft to the touch. Fabric is slightly porous and feels slightly like frit ware

Colour (Munsell): Fabric is generally 2.5YR 4/6. Glaze ranged from a dark turquoisy blue to a lighter yellowy brown. Some decoration may be other colours but they are usually similar to these.

Fracture: Most fractures are smooth with smooth edges to the surfaces. Breaks are perpendicular to the surfaces showing a consistent fabric.

Inclusions: Small mica fragments occasionally visible on fractures. Very few other inclusions- appears to be a stone paste or a frit paste.

Thickness: 6mm-9mm thick.

General Description: A class originally not distinct from DLGW but became evident that it was a different class because of the fabric differences. The fabric is more like a frit/stone paste, unlike the soft fabric of DLGW. Similarly the red colour of the fabric was not coherent with the DLGW cream colour. The glaze and decoration could have placed the class with MGP but again the fabric colour and type was completely different. It is easy to differentiate because of the fabric and the glaze colour. When the glaze degrades it becomes either slightly yellowy on the surface (even if it is a yellow colour below this is apparent) or in the case of the blue/turquoise glaze, it becomes multi-coloured when held at an angle to the light.

DEEP INCISED INDIAN WARE (BUFF)

Code: DIIW.B

Distinguishing Features: Red/orange exterior surface with deep incised ridging across whole exterior surface. Ridging is not always parallel/horizontal. Similar fabric to TRBW with buff body fabric and small red sand inclusions. Large storage jar fabric compared to the thinner TRBW.

Surface Treatment: both interior and exterior surfaces are slightly flattened. Exterior surface has red/orange/black slip across surface.

Decoration: Exterior surface has incised ridges running both horizontally and at other angles (most at about 45 degrees to horizontal. These are very rough and have not been smoother or worn down.

Manufacture: Hand manufacture is likely as no wheel turning marks.

Firing: Soft medium fired material which crumbles under pressure from pliers. Surfaces are still however reasonably hard.

Colour (Munsell): The body fabric is 7.5YR 7/3 pink with the red slip on the exterior surface reading 2.5YR 6/6 red. The darker blackish slip also on some areas of the exterior surface is 2.5YR 3/2 dusky red.

Fracture: Fracture is rough and sub-angular. It is generally perpendicular to surfaces showing that the fabric is uniform in strength.

Inclusions: Frequent well sorted ferrous oxide grains (0.2-1mm) with very frequent sub-angular white quartz sand grains throughout fabric (0.3-1mm)

Thickness: 7-11mm thick

General Description: Deep incised Indian storage vessel ware with similar fabric to TRBW. Slips cover the exterior surface which is also covered in small ridges. The purpose of these if there is one is unknown. Related to DIIW.BL which has similar surface treatment and thickness but has a black fabric. This would suggest that, as is obvious from the majority of the Indian wares, there are multiple production areas using slightly different clays to make similar vessels.

DEEP INCISED INDIAN WARE (BLACK)

Code: DIIW.BL

Distinguishing Features: Red/orange exterior surface with deep incised ridging across whole exterior surface. Ridging is not always parallel/horizontal. Similar fabric to TRBW with red/buff outer body fabric and small red sand inclusions. Differs to DIIW.B as has dark grey/black inner fabric and is generally slightly thicker. Large storage jar fabric compared to the thinner TRBW.

Surface Treatment: both interior and exterior surfaces are slightly flattened. Exterior surface has red/orange/black slip across surface.

Decoration: Exterior surface has incised ridges running both horizontally and at other angles (most at about 45 degrees to horizontal. These are very rough and have not been smoothed or worn down.

Manufacture: Hand manufacture is likely as no wheel turning marks.

Firing: Soft medium fired material which crumbles under pressure from pliers. Surfaces are still however reasonably hard. Possibly slightly more oxidised version of DIIW.B so could have been fired for longer.

Colour (Munsell): The body fabric is 7.5YR 7/3 pink with the red slip on the exterior surface reading 2.5YR 6/6 red. The darker blackish slip also on some areas of the exterior surface is 2.5YR 3/2 dusky red.

Fracture: Fracture is rough and sub-angular. It is generally perpendicular to surfaces showing that the fabric is uniform in strength.

Inclusions: Frequent well sorted ferrous oxide grains (0.2-1mm) with very frequent sub-angular white quartz sand grains throughout fabric (0.3-1mm)

Thickness: 7-11mm thick

General Description: Deep incised Indian storage vessel ware with similar fabric to TRBW. Slips cover the exterior surface which is also covered in small ridges. The purpose of these if there is one is unknown. Related to DIIW.B which has similar surface treatment and thickness (DIIW.B is possibly slightly thinner) but doesn't have a black inner fabric. This would suggest that, as is obvious from the majority of the Indian wares, there are multiple production areas using slightly different clays to make similar vessels.

Eroded Glaze Ware

Code: ERG

Distinguishing Features: Slightly glossy/burnished surfaces. Yellow hard fired fine clay fabric with a slight chalky feel. Very few inclusions

Surface Treatment: It is likely that this fabric is the same as that described as degraded lead glazed ware (DLGW) when found with glaze still intact. As seen on examples of DLGW with some glaze missing the glaze can be removed through weathering and erosion and if all glaze is removed in this way, the fabric may not be considered evidence enough to place into the DLGW class. The surfaces have been flattened during manufacture presumably to have glaze painted on them. It is likely that ERG sherds were glazed at some point but the glaze has been removed.

Decoration: None visible but probably originally similar to that found on some DLGW sherds.

Manufacture: Bases show wheel turning marks, making this ware almost certainly from this method of manufacture. The very fine nature of the clay in the fabric suggests at least some levigation.

Firing: Hard fired fabric which snaps with a clean sound

Colour (Munsell): Body and clean surfaces are 5Y 8/4 pale yellow. Some parts of surface are discoloured with black/dark brown staining.

Fracture: Reasonably smooth with only a few raised areas running along the break which is perpendicular to the surfaces.

Inclusions: Medium sorted assorted sand grains approx 0.5-1.2mm (mainly red and greyish white) are occasional inclusions through the body. They are not visible on the surfaces of the ware.

Thickness: Generally between 6 and 9mm. Some examples (probably from near base are up to 16mm thick.

General Description: Ware is the same as DLGW but with all glaze removed. Some discolouration, possibly due to glazing, can be seen on some surfaces, usually brown or black.

FINE GREY BURNISHED WARE

Code: FIGB

Distinguishing Features: Very smooth burnished black/dark grey surfaces with a sandwich body of light grey surface fabric and dark grey inner fabric. Stonepaste fabric.

Surface Treatment: Heavily burnished on both exterior and interior surfaces.

Decoration: None

Manufacture: Although no marks, vessel form heavily suggests wheel manufacture and vessel thickness is constant.

Firing: Hard but quick firing as surface is very tough but inner fabrics very brittle and prone to delaminating along the change in fabric.

Colour (Munsell): 5PB 4/1 for exterior and interior surfaces, 10Y 6/1 for light grey outer fabric and 5PB 4/1 for inner fabric.

Fracture: Fracture is very angular with delamination along the fabric borders. Breaks like slate. Fabric is of inconsistence strength.

Inclusions: None, very pure stone paste.

Thickness: 6mm although slightly thicker towards rim development.

General Description: A very fine stone paste black/grey ware with a sandwich of fabrics- dark grey burnished surfaces with a light grey outer fabric below and a dark grey inner fabric in the middle. Bowl type.

FINE GREY WARE

Code: FIGW

Distinguishing Features: Very thin hard fired grey to greyish buff fabric. Surfaces show mica temper. Thin finely levigated fabric. with only occasional sand grain temper. Wheel turned.

Surface Treatment: None

Decoration: None

Manufacture: Very obvious wheel turning marks are found on the interior of the ware. Bases are very flat, supporting the wheel manufacture. Some evidence of thin necks being attached in secondary manufacturing process.

Firing: Fabric is very brittle when pressure is applied suggesting a hard but quick firing, breaking into many pieces rather than snapping off as one.

Colour (Munsell): Body and surfaces are 5YR 5/1 grey.

Fracture: Break is not always perpendicular with surfaces suggesting inconsistencies in the strength of the fabric. Break is generally quit smooth due to the fine temper.

Inclusions: Mica fragments are visible in surfaces and breaks. Occasional small white sand grains and small angular pieces of ferrous oxide. Some small orange sand grains also visible. All appear well sorted.

Thickness: 3mm-5mm

General Description: A fine grey clay war which is hard fired and does not appear to have degraded at all. The sherds show wheel manufacture marks and secondary manufacture is evident in the attached necks. The ware is likely to be for small jars or water jugs as it has flat bases and appears to have a bulbous body narrowing to a thin neck.

FINE INCENSE BURNER WARE

Code: FINCW

Distinguishing Features: Very fine buff surface fabric with thick red linear decoration. Inner fabric is more rough and is grey in colour. Used to make oblong and circular incense burners. The fabric is much finer than the crude INCW type.

Surface Treatment: Surfaces have been heavily smoothed and lightly burnished

Decoration: Thick red painted linear decoration. Hatched areas corresponding to the shape of the vessel.

Manufacture: Handmade is likely as the shapes made are highly complex and would not be producible on a wheel

Firing: Hard medium firing as surfaces are very hard. Inner fabric is also hard but not as tough as surfaces.

Colour (Munsell): Inner fabric is 10YR 5/1 or 4/1 grey. Exterior fabric is 2.5YR 7/3 pale yellow.

Fracture: Sub angular with lots of bumps and hollows but edges are quite smooth. Fracture shows surface fabric to be harder than interior fabric.

Inclusions: Small angular grits in inner fabric (1mm) but none in surface fabrics. Small voids (0.5-1mm) throughout fabrics.

Thickness: 6-9mm although due to vessel types this is widely variable.

General Description: Class for fine incense burner ware which could be a development of the more crude INCW although there is no reason why they could be unrelated. Painted designs have some similarities but forms are very different. FINCW appears to be made into oblong incense burners, although a round example has been found. Strong fine surface fabric with a rougher inner fabric.

FRIT WARES

Code: GFRIT, WFRIT, LFRIT

Distinguishing Features: A rough abrasive paste, generally pure white in colour with hard glazed surfaces. Usually thin sherds. Glaze can be transparent, turquoise/green or with a slight lustre. Some pieces have painted designs in blue or black under the glaze. Seen as an attempt to copy Chinese Blue and White ware.

Surface Treatment: Surfaces have been flattened and smoothed. They then have been painted with decorative designs (see below) and then glazed with either a turquoise, transparent or lustre glaze.

Decoration: Painted designs in blue or black underneath eh glaze. There are generally geometric designs, with a higher concentration on the interior surface. Most pieces only have two narrow painted bands as exterior decoration, just below the rim. Some pieces do have a more natural decoration style but these are rare.

Manufacture: Wheel manufacture is suggested due to regularity of vessels. Wheel turning marks only visible on bases.

Firing: Hard surfaces but brittle fabric. Breaks easily if already broken. Suggest hard quick firing.

Colour (Munsell): Fabric is white. Surfaces can be turquoise green (GFRIT), white (WFRIT) or have a slight golden lustre to them (LFRIT). Some pieces have slight yellow staining under the glaze, probably a result of degradation and natural processes. Painted decoration is black or blue. Most GFRIT pieces have a 'halo' around the edge which is white where the colour has been leeched out of the glaze around the breaks.

Fracture: Fractures are very rough and abrasive due to the frit paste. The edges are angular and some breaks are concave as the paste is softer than the surface glazes.

Inclusions: Small mica fragments occasionally visible on fractures. Some angular badly sorted occasional pink, brown and yellow sand grains (0.5-1mm).

Thickness: 4-5mm thick.

General Description: A well known class found throughout the Gulf area. The frit paste fabric is soft with hard surface glaze, some examples of which, generally in the GFRIT and WFRIT sub-classes have painted designs in blue or black underneath the glaze. GFRIT has a turquoise glaze over the top of the painted designs which is bleached towards the fractures. WFRIT has a transparent glaze. LFRIT has a slightly golden tinged glaze. All of these can become degrade- in general WFRIT and LFRIT gain areas of yellow degradation, while GFRIT gains the halo described above. A coherent class with three sub-classes put forward on the basis of the glaze colours.

GREY INCISED WARE

Code: GIW

Distinguishing Features: Very thin hard fired incised grey fabric. Incised decoration is of both geometric and natural designs.

Surface Treatment: None

Decoration: Incised decoration forming both geometric and natural designs around exterior body of ware. Geometric design made up of repeated chevrons in one band with regular diamond shapes incised in other bands. Natural designs are in the middle of these, with wavy lines running through the diamonds. Other examples just have incised lines running around the body of the pot.

Manufacture: Very obvious wheel turning marks are found on the interior of the ware, and the base interior shows signs of tension from when it was removed from the wheel.

Firing: The fabric snaps with a harsh sound, showing the hard firing that made it. The fabric is also very tough

Colour (Munsell):10YR 6/2 colour for both body and surfaces

Fracture: Clean, sub-smooth fracture- still a few sub-angular lumps along break. Perpendicular to surfaces.

Inclusions: Occasional sub-rounded sand grains (1mm) with occasional mica fragments (very small).

Thickness: 3mm-5mm

General Description: A fine grey clay ware, with geometric and natural incised decoration. It is hard fired and does not appear to have degraded at all. Source is probably from Iran. The sherds show wheel manufacture marks.

HARD WHITE WARES

Code: HWW

Distinguishing Features: White fabric with a tough feel to its surfaces and fractures. Wheel turning marks on most examples. Some examples correspond to some white incised wares. A catch all ware class for a large number of hard white wares.

Surface Treatment: Most examples have smoothed exterior surfaces but the interior surfaces still have wheel turning marks on them. Occasional imperfections on interior.

Decoration: None. See White incised ware description

Manufacture: Most examples are wheel made although it is possible that some have been well handmade. Some sherds show manufacture of complex necks and pot bodies in separate pieces then assembled.

Firing: Medium Hard. Surface is tough and the fabric breaks with a clear snap.

Colour (Munsell): 5Y 8/4 very pale yellow for majority although some are white.

Fracture: Fracture is smooth and usually perpendicular to surfaces. Crisp edges to fracture.

Inclusions: frequent very small (0.1mm) well sorted dark sand grains throughout body of fabric. Frequent very small voids in fabric (0.1mm).

Thickness: Wide range of thicknesses from 4mm to 16mm

General Description: A general class for medium to hard fired white wares. Fabric is variable but in general has only small inclusions of sand. Shell and organic temper has not been identified. These appear to be good quality wares. Most have wheel turning marks but not all.

INCENSE BURNER WARE

Code: INCW

Distinguishing Features: Two tone orange surface and grey body ware with similar characteristics to Wadi Suq ceramics. Often found as fabric for incense burners.

Surface Treatment: Surface is sometimes flattened on both exterior and interior surfaces.

Decoration: Some examples have red slip decoration on them. This appears to take the form of either a general application or a red slip circle in the centre of the interior base with red slip lines radiating out from it.

Manufacture: Handmade. Appears to be of rough manufacture.

Firing: Medium hard as surfaces feel slightly soft but fabric appears quite hard to break.

Colour (Munsell): Surfaces are 7.5YR 7/6 reddish yellow which slowly blends into the fabric body colour 7.5YR 4/1 dark grey.

Fracture: Ware breaks non perpendicular to surfaces forming a concave depression into the dark grey body with ledges of the surface fabric surrounding it. Break is however quite smooth and clean other than this difference in fabric strengths.

Inclusions:

Thickness:

General Description: A two tone rough hand made ware, generally used for incense burner with rough surfaces. Decoration is only found on some pieces and consists of red slip lines radiating out from a central red circle in the interior base. Some evidence of burning can be found on some examples.

JULFARWARE 1

Code: JULF1

Distinguishing Features: Undecorated plain Julfarware

Surface Treatment: Not glazed or slipped. Some examples have evidence of washing on exterior surface giving a translucent, irregular greyish white colour to the surface.

Decoration: Some examples have a simple raised band running around the pot, usually between 20 and 70mm below the rim, which is often also raised out from the profile of the body.

Manufacture: Unclear manufacture- no wheel turning marks and appearance of sherds suggests inconsistent manufacturing with thickness, shape and design all heavily variable. Suggests either handmade or very slow wheel

Firing: Appears to have been fired to medium hard. Breaks with a crumbly snap. Some examples are very brittle.

Colour (Munsell): Heavily variable. Most examples have a core and surface of 10R 5 or 6/8 red. Surfaces which have been washed after firing are slightly whitened by this process. Some examples are heavily blackened, probably during firing due to inconsistent temperature.

Fracture: The ware fractures very coarsely with angular lumps along the break.

Inclusions: The most common inclusion is bad sorted sub-angular red and grey platelets, usually lining up with the shape of the pot, between 0.25 and 1mm. Small fragments of white lime, sometimes spalled also occur.

Thickness: Very varied 5mm to 20mm (some thicker when decorative band occurs).

General Description: Utilitarian course local Julfarware. Very variable in colour, thickness and style suggests either multiple uses, multiple production sites or both.

JULFARWARE 2

Code: JULF2

Distinguishing Features: Similar to Julfarware 1 class but thinner, most consistant fabric, often blackened either during firing or through use.

Surface Treatment: Usually blackened on exterior face but not on interior. The colouring is consistent across the whole surface suggesting that the colour is due to firing rather than use. Some examples have heavy sooting on base and lower sides, probably due to use.

Decoration: No banding, painting or incision decoration. Some examples have a very small lug of 30mm length raised 3mm from the surface near the rim.

Manufacture: No wheel turning marks so probably handmade or slow wheel. Less variability than JULF1 would suggest possibly slow wheel manufacture.

Firing: Medium firing- break is relatively easy but body is not soft to the touch.

Colour (Munsell): Fabric is more uniform than JULF1 with a body colour of 5YR 6/6 and an exterior colouring of 5YR 4/1.

Fracture: The fracture is less course than JULF1 but still has angular edges.

Inclusions: The fabric has some medium sorted sub angular red platelets (0.5-1mm) and a higher level of sub-rounded lime (minimal spalling) than JULF1 of between 0.5 and 1.5mm in size.

Thickness: The thickness of this ware is consistently around 3mm.

General Description: A thin, more consistent Julfarware which is still probably hand made. Firing appears to affect the exterior more consistently and regularly than with JULF1.

JULFARWARE 3

Code: JULF3

Distinguishing Features: Similar fabric with inconsistencies as JULF1. Exterior and sometimes interior is now painted with red on white designs, mostly of a linear form but with some possible "natural" designs- hanging dates etc.

Surface Treatment: The exterior and occasionally the interior surfaces (type dependent) have been prepared with a white slip, which has sometimes degraded or washed off.

Decoration: Linear red line designs have been painted on to the white slip. These vary depending on their position on the ware and on the type of vessel. On jugs and small vessels the lines are generally horizontal running round the ware in the top quarter of the ware. They then become vertical as they go down the body of the ware. Around handles, the lines become more complex, with some deviating around the handle join and some travelling up the handle. The possible stylistic depiction of dates could be a later design which appears in the middle of the exterior surface, usually surrounded by a triange. Larger vessels may have one or two horizontal lines near the rim (and some travelling round the top of the rim) with the vertical lines starting higher up the pot.

Manufacture: Unclear manufacture- no wheel turning marks and appearance of sherds suggests inconsistent manufacturing with shape and design all heavily variable. Suggests either handmade or very slow wheel.

Firing: Appears to have been fired to medium hard. Breaks with a crumbly snap. Some examples are very brittle.

Colour (Munsell): Body of pot is more consistent in colour than JULF1. Most examples are 5YR 5/6. The white slip is 10YR 8/2 very pale brown and the red paint is 2.5YR 4/4 dusky red.

Fracture: The ware fractures very coarsely with angular lumps along the break.

Inclusions: The most common inclusion is bad sorted sub-angular red and grey platelets, usually lining up with the shape of the pot, between 0.25 and 1mm. Small fragments of white lime, sometimes spalled also occur.

Thickness: The thickness of the ware is variable but most examples are around 8mm thick, with only a few being any thicker.

General Description: Painted Julfarware. Generally slightly more consistent than JULF1. Very easy to recognise due to red on white painted designs. These do sometimes degrade, becoming difficult to tell apart from some of the grey washed surface JULF1 sherds if the red paint has degraded faster than the white.

JULFARWARE 4

Code: JULF4

Distinguishing Features: Painted version of Julfarware 2 with more advanced decoration and lugs. Paint is purple/dark red on rim with corded decoration either on rim or approximately 60mm below it.

Surface Treatment: Exterior face can blackened uniformly, probably due to firing conditions. Some sherds are not blackened on the exterior. Interior surface has not been treated.

Decoration: Purple/dark red paint has been applied to the rims of all JULF4 examples. This shows a difference from JULF3 with no white slip being applied first. The lugs are also constructed off the rim, rather than further down the body as in previous Julfarware types.

Most examples have a corded design (not raised off the surface as in some JULF1 by a band by incised in to the surface). These cords can appear on the rim or further down the body.

Manufacture: Unclear manufacture- no wheel turning marks suggests either handmade or very slow wheel.

Firing: Appears to have been fired to medium hard. Breaks with a crumbly snap. Some examples are very brittle. Slightly harder to break than JULF1 and 3.

Colour (Munsell): Variable. Majority have body and interior colouring of 2.5YR 4/6 to 6/6. Some then have a blackened exterior of 5YR 4/1 and others have a lighter exterior colour of around 10YR 6/2.

Fracture: The ware fractures medium coarsely with angular lumps along the break.

Inclusions: The most common inclusion is bad sorted sub-angular red and grey platelets, usually lining up with the shape of the pot, between 0.25 and 1mm. Small fragments of white lime, sometimes spalled also occur.

Thickness: Majority of examples are approximately 3mm thick.

General Description: A possible advancement of Julfarware from JULF2 with more advanced lugs and decoration. Wide range of types and designs show varied uses.

JULFARWARE 5

Code: JULF5

Distinguishing Features: Very thin undecorated 'biscuity' Julfarware. Generally dark grey/dark blackish red in colour.

Surface Treatment: Possible slight burnishing to exterior. Not complete. Exterior looks very rough in part snot slightly burnished. Has look of vegetable temper without actually having vegetable temper.

Decoration: None

Manufacture: Very thin fabric with possible slight wheel marks on the interior. Suggest due to thickness slow wheel made.

Firing: Medium hard firing. When broken, dull snap is heard.

Colour (Munsell): Quite varied form with colours of body ranging from grey 10YR 4/1 to dark red 5YR 4/6. Exterior face is darker (5YR 3/1) although can be more grey.

Fracture: Fracture is less course than JULF1 and 3 but with angular edges.

Inclusions: Occasional bad sorted angular red/grey platelets (0.25-1mm) with some lime (minimal spalling) 0.5-1mm.

Thickness: Most examples are between 2 and 3mm thick.

General Description: A very thin biscuity Julfarware with a very rough outer surface, with possible burnishing on some of the raised areas. Easy to differentiate from JULF1 and 3.

JULFARWARE 6

Code: JULF6

Distinguishing Features: Possible modern Julfar ware. Distinguished from other Julfar wares by ring base type and heavily smoothed surfaces. Retains distinguishing features of other Julfarware classes.

Surface Treatment: External surface has been either washed to create a slight white surface colour or a very thin white/cream slip has been applied. Surfaces have been heavily flattened, with very slight pitting, possibly caused during the smoothing. Temper is visible on surfaces.

Decoration: None visible.

Manufacture: Unclear manufacture- no wheel turning marks. Probable hand manufacture with smoothing of surfaces on slow wheel. Ring base attached before surface smoothing.

Firing: Hard fired. Very difficult to break, although this may be due to the thickness. Fabric is certainly harder fired than most other Julfarware classes.

Colour (Munsell): Inner surface and breaks are 2.5YR 5/6 with exterior surfaces have been coated with a thin slip or washed to 5YR 7/2.

Fracture: The ware fractures very coarsely with angular lumps along the break. Fractures are perpendicular to the surfaces.

Inclusions: The most common inclusion is bad sorted sub-angular red and grey platelets, usually lining up with the shape of the pot, between 0.25 and 1mm. Small fragments of white lime, sometimes spalled also occur. Very small white sand is also present (0.1mm) throughout fabric.

Thickness: Body is approx. 11mm thick, but widens at ring base to 24mm.

General Description: Developed late Julfar ware (16th or 17th Century?) with a heavily flattened surface and ring bases. The shape of the vessels appear to show either bowls or platters. Only found in upper disturbed contexts.

KHUNJ/BAHLA WARE

Code: KHUNJ

Distinguishing Features: Hard stone paste with brown glaze on either one or both surfaces. Small jar or high-sided bowl types. Some pieces have a sandwich fabric of 2 colours, usually orange on surfaces and grey inner fabric.

Surface Treatment: Smoothed flat surfaces with a brown glaze of varying hues. Some glazes retain sheen but others have become degraded, possibly by salt action.

Decoration: None

Manufacture: Wheel manufacture marks throughout pieces.

Firing: Medium hard firing which is difficult to break and is not soft to the touch.

Colour (Munsell): Fabric varies between 2.5YR 6/8 red to 7.5YR 7/2 pinkish grey with some dark grey fabrics and some buff coloured ones. Glaze varies continuously between 7.5YR 2.4/2 very dark brown and 7.5YR 6/6 reddish yellow. There is little apparently correlation between fabric colour and glaze colour, suggesting multiple production sites.

Fracture: Most fractures are smooth as there are very few inclusions, Angular edges with surfaces and break is usually perpendicular to surfaces.

Inclusions: Very few inclusions in some, others have dense very small (0.3mm) well sorted rounded black sand grain inclusions.

Thickness: 7mm-13mm thick.

General Description: This is a large class containing all pieces with a brown glaze and a stone paste. It has been well described before. However the amount of variation suggests that while it may be a general ware, there are multiple centres of production which are producing ceramics of a similar nature. Petrographic samples have been collected from the ware, both double and single sided glaze, and will hopefully show some variation. The ware was split firstly into fabric colour, then into glaze colour and finally into single or double sided glaze sherds. The first two showed a wide variation in the new categories and so they were abandoned. The single/double glaze had slightly more cohesion with the double sided glaze types generally having darker glaze and darker bodies. However, it is not known whether this is a chronological change and so this has been catalogued but the Khunj has not been split into 2 distinct wares.

LIME WARE

Code: LIM

Distinguishing Features: pinky or yellowy colour, roughly made, interior and exterior surfaces are both rough to the touch, interior more than exterior. Frequent lime pieces (0.1-1.5mm) in fabric. Rim form NG2 is particular to this ware.

Surface Treatment: None

Decoration: None

Manufacture: No wheel marks on either exterior or interior surfaces so likely to be handwritten.

Firing: medium firing- when breaks, sounds is dull.

Colour (Munsell): Body colour is Munsell 7.5YR 7/4

Fracture: Coarse fracture but generally perpendicular to surface.

Inclusions: Frequent badly sorted sub angular lime pieces (0.1mm-1.5mm) and occasional mica fragments. Very occasional pieces of grey sub- rounded shell temper (1mm) and sub-angular white sand (1mm)

Thickness: Ware varies between 7mm and 12mm

General Description: Course lime-tempered ware, generally pink in colour, with some examples in yellow. Medium fired. Most examples are of large sherds (70mm across+).

HARD RED WARE

Code: MARS

Distinguishing Features: Heavily pitted surface which looks like the surface of Mars. Thin ware which gives a high pitched ring when hit. Hard fired. Dense mica inclusions.

Surface Treatment: Exterior surface is heavily pitted which could either be due to post-depositional environmental effects or a deliberate decorative design. Interior surface is flattened slightly.

Decoration: None

Manufacture: Hand made is likely as no wheel marks.

Firing: Very hard as ware is tough and breaks with a loud snap.

Colour (Munsell): 2.5YR 5/8 red

Fracture: Smooth but with very angular edges to surfaces. Generally perpendicular to surfaces showing consistency of fabric. However some are slightly concave suggesting that the surfaces are slightly tougher than the inner fabric.

Inclusions: Dense mica fragments throughout fabric. Frequent small circular voids throughout fabric (1mm). Mica is visible on interior surface and breaks.

Thickness: 9-10mm

General Description: A hard red fabric with a heavily pitted exterior surface and dense mica inclusions. Has a high pitched ring when hit.

MOULDED EWER WARE

Code: MEW

Distinguishing Features: Grey fabric with moulded decoration on exterior surface. Most pieces between 7 and 10mm thick.

Surface Treatment: Exterior surface has been flattened and smoothed slightly, interior has not.

Decoration: Moulded decoration on exterior surface. Both geometric and more natural designs.

Manufacture: Moulded ware.

Firing: Hard firing making the fabric very tough and hard to break.

Colour (Munsell): Fabric is 2.5YR 6/2 light brownish grey.

Fracture: Sub-angular with very angular edges. Generally perpendicular to the surfaces.

Inclusions: Frequent mica fragments throughout fabric. Some larger pieces of quartz sand occasionally occur (1mm)

Thickness: 6-12mm thick.

General Description: A grey fabric moulded ewer ware as seen in Priestman's work on the Wilkinson collection. Decoration is only on exterior surface.

MANGANESE PAINTED WARE

Code: MGP

A generally buff coloured thick body with degraded, bleached blue or red paint which would have been covered with a clear or tinted glaze. Designs are often linear with both thick and thin lines.

Surface Treatment: The interior surface is coated with manganese paint in linear designs and then covered with a clear glaze, which is usually degraded or completely missing. It is possible that some DLGW is in fact heavily degraded MGP where the paint has become invisible.

Decoration: Linear painted thick and thin linear designs, often radiating from a block colour centre on the interior. Colours of design are blue and red (regularly bleached/degraded) for linear design with a yellow or white background, although some have no background colour.

Manufacture: Some but not all examples have wheel turning marks on exterior, suggesting either slow wheel manufacture or a good standard of hand manufacture.

Firing: The body of the fabric is hard, suggesting a medium to hard firing with the surface often being slightly softer and more spongy.

Colour (Munsell): The body and unpainted surfaces of the ware are reasonably uniform is colour, 10YR 7/4 very pale brown. The interior paint ranges from a reddish brown 5YR 4/4 to a degraded worn blue (no Munsell number). Glazes are either white, clear or translucent yellow.

Fracture: The ware fractures with a dull snap, leaving a smooth break with occasional rough edges.

Inclusions: The clay used for the ware is almost free of inclusions visible through an 8x magnification hand lens. There are very occasional rounded red sand grains, approx 0.1mm in size. Fresh breaks show there are also occasional lime spalling cavities. These are very small (0.1mm) which would suggest even smaller pieces of lime as now degraded inclusions. Small linear cavities running horizontally through the body are also visible, possibly showing hand manufacture as more layers of clay are introduced during the shaping of the ware.

Thickness: Most examples are between 8mm and 1.2mm in thickness. Some may be slightly thicker than this.

General Description: This is a painted ware with a relatively pure clay buff coloured body of average 10mm thickness. Defining features of this ware are the linear designs painted onto the

interior. When heavily degraded these designs may not be visible and some of the examples may be classified as DLGW.

MICA TEMPERED BUFF WARE

Code: MICA

Distinguishing Features: Smooth surfaced, buff coloured ware with dense mica temper.

Surface Treatment: Both interior and exterior surfaces have been flattened and made smooth. Possible evidence of washing on exterior although may just be discoloration from exposure to sunlight.

Decoration: None

Manufacture: No evidence of wheel marks but consistency of thickness and form would suggest wheel manufacture. Marks could have been removed due to the flattening/smoothing of the surfaces.

Firing: Hard fired material with tough surfaces and fabric.

Colour (Munsell): Body is 7.5YR 6/4 light brown with interior and exterior faces being slightly lighter in colour at 7.5YR 7/3 pink either due to surface treatment of to sun bleaching.

Fracture: Smooth fracture perpendicular to surfaces but with some lateral fractures running into the exterior surface.

Inclusions: Dense mica (less than 0.1mm) and small sand grain (0.1-0.5mm) inclusions which are very well sorted and spread throughout the fabric. Sand grains are mainly brown, grey and red in colour.

Thickness: 7mm

General Description: A hard pinky buff ware with a slightly discoloured exterior surface and dense mica and sand temper. Slight pitting on both surfaces has removed some of the smoothness from the surface.

PERSIAN BLUE SPECKLED WARE

Code: PBS

Distinguishing Features: Thick, rarely degraded blue/green glaze with speckling obvious. Speckling takes form of small black or dark spots in glaze. All examples are bowl types. Glaze can vary in colour to pink, purple, near black and pale green. However it is suspected that these variations are due to firing problems/slight changes in glaze make up.

Surface Treatment: Surfaces are flattened and interior surface only is then glazed. Some examples have exterior glaze as well but this is limited to just below the rim.

Decoration: Some examples have small incision patterns around the exterior rim edge.

Manufacture: Wheel turning marks are obvious on the exterior surface and forms would point towards wheel manufacture even with out these.

Firing: Hard medium fired as not brittle but still tough fabric.

Colour (Munsell): fabric can vary from 2.5Y 6/3 light yellowish brown to 5YR 6/4 light reddish brown. Some examples are a darker red than this. Glaze, as noted above ranges from turquoise to blue to purple to light green.

Fracture: Smooth with angular edges. Tends to break along weaknesses/cracks in glaze and glaze is thick and tough.

Inclusions: Stoneware paste so very few inclusions. Frequent small quartz grains which are well sorted and rounded.

Thickness: 7-10mm although often thicker at rim.

General Description: Considered to be an Iranian attempt to copy celadon types, the class is well established. Thick glaze with impurities causing the speckling that is seen in all examples. Fabric is stoneware paste which varies in colour, suggesting multiple production sites for a coherent ware. Rim forms are all for bowls with only 7 different types of rims, most of these developments/ changes to G1 or G2 types.

PINK PAINTED WARE

Code: PIP

Distinguishing Features: White/cream fabric similar to CHALKY with possible thin white slip in interior surface. Exterior surface has been covers in pink/light red slip which has been bleached by the sun. Looks like Roman painted plaster.

Surface Treatment: Thin white/cream slip on interior surface, thicker red/pink slip on exterior surface.

Decoration: None

Manufacture: Handmade coil pot. Coil bumps are obvious on interior surface.

Firing: Medium soft firing as surfaces feel soft and chalky and fabric is easy to break..

Colour (Munsell): body is 2.5YR 8/3 pale yellow and red slip is 2.5YR 6/4 weak red.

Fracture: Smooth but with occasional angular bumps. Generally perpendicular to surfaces.

Inclusions: Frequent well sorted small sand grains (1-2mm) visible on breaks and interior surface, showing through the thin cream slip.

Thickness: 5mm

General Description: A small class from Non-ID pieces from different contexts. However the fabrics and slips appear to be similar and so they have been grouped. A chalky cream fabric class with thin cream slip on the interior surface and thicker red/pink slip on exterior. Sand inclusions show through inner slip. Manufacture is likely to be coil method.

PINK SANDY WARE.

Code: PISW

Distinguishing Features: Pinky red fabric. Thick body with rough surfaces. Both inner and outer surfaces are heavily corroded, with large amounts of concreted sediment on them. Flat bases and outward turned rims with rounded tops. Outer surfaces are pitted slightly. Most examples has a sandwich fabric with pinky buff colour on the surfaces and light greyish pink in the centre.

Surface Treatment: None

Decoration: None

Manufacture: Hand made. Base shows joining marks with body walls underneath. Surfaces are rough and slightly crude.

Firing: Medium hard firing as fabric is difficult to break and snaps with a muffled crack.

Colour (Munsell): Surface colour is 2.5YR 7/6 light red and centre of body is 2.5YR 7/1. Some examples do not have differing colours through body.

Fracture: Medium smooth fracture perpendicular to surfaces showing consistent strength of fabric through body. Edges are angular but on old breaks are heavily rounded.

Inclusions: Medium sorted small yellow and grey rounded sand grains (1-2mm) are common throughout fabric. Occasional rust coloured larger angular inclusions. Possibly some small pieces of grog temper.

Thickness: 10-15mm thick.

General Description: A pinky coloured rough handmade storage ware. Vessel forms appear large with flat bases. Very rough surfaces with concreted substances on both internal and external surfaces for unknown reason. Temper of small sand grains and possible occasional small angular grog temper.

PUMICE WARE

Code: PUM

Distinguishing Features: Very lightweight fabric with a pumice-like feel. Pale yellow colour with usually approx. 12mm thickness.

Surface Treatment: None

Decoration: None

Manufacture: Very rough surfaces with no wheel turning marks suggest handmade. Sherds suggest mostly used for large vessels. No levigation of the clay.

Firing: Soft fabric would suggest a medium soft firing. No snap when broken. Fabric is crumbly.

Colour (Munsell): Approx. 2.5Y 8/4 pale yellow. Occasional pinky discolouration around pitting on surfaces.

Fracture: Coarse facture at slight angle from the perpendicular to the surfaces.

Inclusions: Voids (both linear parallel to surfaces and random) frequently visible in fabric. Badly sorted frequent to dense white sub rounded quartz grains between 0.4mm and 1.2mm. Infrequent red and pink sub rounded sand grains (0.5mm). Very occasional black/grey large pieces of shell (3-4mm in length, 0.2mm in width, running with fabric of pot)

Thickness: Approx. 10mm

General Description: A lightweight ware made of yellow clay with quartz inclusions. It is not fired at a high temperature and is handmade. Sherds suggest large vessels. Fabric is very rough and abrasive. Surface is pitted, either by erosion or due to badly sorted inclusions making the surfaces uneven.

RED MICACIOUS WARE

Code: REMIC

Distinguishing Features: Hard red fabric which appears to delaminate easily. Mica pieces are obvious on surfaces and breaks. Some evidence of mild burnishing on exterior surface.

Surface Treatment: Possible burnishing on exterior surface.

Decoration: None

Manufacture: Probably hand made as no wheel marks are obvious.

Firing: Hard firing is likely as pieces are very tough but appear brittle, particularly laterally as they appear to delaminate frequently.

Colour (Munsell): 2.5YR 6/6 red.

Fracture: Angular and usually not perpendicular with surfaces. Delamination appears to be frequent. Breaks and delaminations are heavily pitted.

Inclusions: Mica fragments (very small) are visible on all surfaces and breaks. Small shell fragments (2mm) are also present in fabric.

Thickness: 5mm

General Description: A small class from Non-ID pieces from different contexts. However the fabrics appear to be similar and so they have been grouped. A red fabric with dense mica inclusions which appears to delaminate easily. Hard fired and appears quite brittle.

RED PAINT ON BUFF WARE

Code: ROB

Distinguishing Features: Small white shell temper which is slightly rounded and shows through on breaks and all surfaces. No other inclusions on a pinky/buff fabric. Some examples have linear thin red painted decoration on exterior surface.

Surface Treatment: Surfaces are flattened and smoothed.

Decoration: Some pieces show thin linear/geometric designs in red paint. Triangles inside triangles is a recurring design.

Manufacture: Base has a wheel turning mark on the underside and there are faint ones on the interior surface.

Firing: Medium hard as ware is not soft and doesn't break easily. Breaks with a muffled snap.

Colour (Munsell): Fabric is 2.5YR 6/4. Exterior can be a little more buff coloured.

Fracture: Smooth with very angular edges. Generally perpendicular to the surfaces.

Inclusions: Very frequent well sorted sub-rounded small white shell pieces (1mm) throughout fabric. Occasional rounded small sand grains (1mm).

Thickness: 4-7mm thick.

General Description: A pinky/buff shell tempered ware with occasional geometric designs on the exterior surface in red paint. Handmade bowl or jar type.

RED ORGANIC TEMPERED WARE

Code: RORG

Distinguishing Features: Red earthernware with organic temper scars on interior surface and linear ridging (small- 1mm thick ridges with 1-2mm between each one) on exterior surface. Two tone fabric (exterior and interior)

Surface Treatment: both interior and exterior surfaces are slightly flattened. Exterior surface has white deposits in the hollows between ridges suggesting either a heavily degraded thin slip or washing before firing.

Decoration: Exterior surface has incised ridges running horizontally around vessel. These have been worn and smoothed slightly but are still pronounced in patches.

Manufacture: Hand manufacture is likely as interior surface is irregular and uneven.

Firing: Hard and well fired material.

Colour (Munsell): The body fabric is 10R 5/4 weak red. This is consistent across the interior surface and halfway through the body. The second tone of the two tone fabric is a 10R 5/8 red. The exterior surface is bleached to a slightly paler red 10R 5/3or 6/3

Fracture: Fracture is rough and shows a difference in strength of fabric between the two colour tones with the outer fabric being stronger, fracturing diagonally inwards. The inner fabric is weaker and snaps vertically

Inclusions: Small sand grains (0.1mm) well sorted throughout fabric. Frequent mica inclusions visible on surfaces and breaks. Evidence of organic temper in interior surface and in breaks.

Thickness: 9-11mm thick

General Description: Red organic tempered earthernware with two tone fabric, organic temper scars on internal surface and ridging on exterior surface. Appears to be storage jar but could also be cooking pot.

RED PAINTED WARE

Code: RPW

Distinguishing Features: Orange fabric with remnants of red slip on surfaces. Generally thin ware.

Surface Treatment: Both interior and exterior surfaces are usually treated with red slip. This has become eroded and is rarely continuous over the entire sherd. Salt has been deposited in some of the small depressions in the surface, so most sherds have small areas of white on their surfaces.

Decoration: None

Manufacture: Wheel marks on both exterior and interior surfaces point to wheel manufacture. Clay may have been levigated to remove impurities and there are very few inclusions.

Firing: Medium hard firing as ware has hard fabric surfaces but is quite easy to break with a clear snap sound.

Colour (Munsell): Body fabric is 7.5YR 6/4 light brown while red slip paint is 2.5YR 4/6 dark red. Occasional salt deposit is white.

Fracture: The ware, when broken, gives a clean fracture perpendicular to the surfaces, showing that the fabric is similar throughout the sherd. Occasional rough areas on fracture due to inclusions.

Inclusions: Very frequent very small mica fragments visible on surfaces where there is no slip and throughout body. Very occasional white sand grains (0.5-1mm) in body.

Thickness: 3-5mm

General Description: A medium hard fired ware with an orange fabric of fine clay. It has been wheel made with levigated clay and then painted with red slip. This slip has now become faded and patchy but presumably covered the whole surface of the pot.interior and much of the exterior.

SHELL TEMPERED LARGE VESSELS

Code: SHELL

Distinguishing Features: Thick body sherds with heavily pitted surfaces and shell/sand temper. Abrasive to the touch.

Surface Treatment: Surfaces have possibly been slightly smoother. No other treatment.

Decoration: None.

Manufacture: No wheel turning marks and roughness suggests hand manufacture.

Firing: Very hard fired fabric which is very difficult to break. However minimal noise when broken. No discolouration of fabric from firing.

Colour (Munsell): Fabric is 10YR 7/4 very pale brown in body and on interior surface. Exterior surface is slightly bleached from this colour

Fracture: sub smooth fracture perpendicular to surfaces with some sub coarse areas of fracture.

Inclusions: Occasional angular shell temper in body of fabric and on surfaces. Frequent badly sorted variable sized sand grain temper (0.5-2mm) throughout body and surfaces.

Thickness: 10mm to 15mm

General Description: A tough, sand/shell tempered large vessel ware. Appears to have been handmade, possibly storage or transport ware.

SAND TEMPERED WHITE WARE

Code: STWW

Distinguishing Features: Tough consistent thickness white/beige colour with heavy pitting on surfaces. Dense sand temper.

Surface Treatment: Possible evidence of either washing, very thin slip or bleaching on surfaces, exterior more that interior. Heavy pitting on both surfaces.

Decoration: None

Manufacture: Handmade. Consistent thickness shows advanced hand manufacture.

Firing: Hard firing is likely as surfaces and fabric are very tough.

Colour (Munsell): 5Y 8/2 pale yellow for exterior and interior surfaces. Body is slightly darker. Some light brown discolouration on exterior.

Fracture: Sub-coarse fracture generally perpendicular to surfaces. Linear raised areas in fracture run through body of pot laterally.

Inclusions: Occasional grey large sand grains (1mm) only visible in fractures. Very dense very small well sorted sub rounded sand grains are throughout fabric. Linear voids run through some areas.

Thickness: 6-8mm

General Description: A very hard dense sand tempered ware. Well hand made with consistent thickness and consistent fabric with some linear voids running through. Linear ridges appear to run along fractures. Heavy pitting on both exterior and interior surfaces possibly due to erosion and some evidence of sun bleaching on exterior surface.

SOFT WHITE WARES

Code: SWW

Distinguishing Features: White fabric with a soft feel to its surfaces and fractures. Wheel turning marks on some examples. Some examples correspond to some white incised wares. A catch all ware class for a large number of soft white wares.

Surface Treatment: Most examples have smoothed exterior surfaces but the interior surfaces still have wheel turning marks on them.

Decoration: None. See White incised ware description

Manufacture: Most examples are wheel made although it is possible that some have been well handmade. Some sherds show manufacture of complex necks and pot bodies in separate pieces then assembled.

Firing: Medium soft as fabric feels soft on the surfaces. However main body is generally quite hard.

Colour (Munsell): 2.5Y 7/3 very pale yellow for majority although some are white.

Fracture: Fracture is smooth and usually perpendicular to surfaces. Some diagonal fractures do occur however. Fractures are not necessarily straight, some have complex angles and deviations in them.

Inclusions: frequent very small (0.1mm) well sorted dark sand grains throughout body of fabric. Some evidence of small (0.2mm) lime temper also.

Thickness: Wide range of thicknesses from 4mm to 16mm

General Description: A general class for medium to soft fired white wares. Represents those with soft surfaces. Some may be “chalky”. Most have wheel turning marks but not all.

THIN BLACK BURNISHED WARE

Code: TBBW

Distinguishing Features: Thin black fabric, burnished exterior surface and some limited organic temper marks on interior surface.

Surface Treatment: Exterior surface has been burnished to at least a dull sheen on raised areas. Most examples are completely burnished on exterior surfaces. Interior has been slightly smoothed.

Decoration: None

Manufacture: Nature of pottery suggests hand manufacture but of a high quality.

Firing: Ware is hard fired as surfaces are tough and it is reasonably difficult to break. Breaks with a dull snap.

Colour (Munsell): 10YR 2/2 very dark brown for exterior surface. Body and interior surface are black or very dark brown.

Fracture: Clean fracture perpendicular to the surfaces with occasional voids and lumps caused by temper.

Inclusions: Occasional brown sand grain temper (1mm) only visible on fractures. Inner surface shows evidence of some organic temper and occasional mica fragments are visible.

Thickness: 3mm

General Description: Very thin, hard dark burnished ware. Handmade with minimal temper. Occasional sand grains visible in breaks.

TEXTILE IMPRINTED WARE

Code: TEXT

Distinguishing Features: Similar fabric to TRBW and DIIW.B but rather than incised ridges across the exterior surface, a hatched design has been imprinted on the surface, leaving little inverted pyramid indentations. Fabric has frequent small, medium and large ferrous oxide inclusions. Priestman 2005 shows example in same category as DIIW.B.

Surface Treatment: The exterior surface has been imprinted with a hatched design, probably by a stamp similar to those used to print textile patterns. It has left a trellis design of little inverted pyramids into the surface of the vessel. The interior surface has not been worked.

Decoration: None

Manufacture: Hand made and hand decorated

Firing: Hard medium but fast as fabric is very hard and brittle. Can be snapped with the fingers.

Colour (Munsell): Fabric is 2.5YR 8/3 pale yellow. Inner fabric is N 7/1 light grey.

Fracture: very angular, starts to delaminate when snapped. Breaks very easily

Inclusions: badly sorted small, large and medium angular ferrous oxide fragments throughout ware (0.2-5mm). Medium sorted small white sand grains (1mm) throughout ware.

Thickness: 9-10mm

General Description: An imprinted design ware with a similar fabric to TRBW but with different decoration. Coherent class but could possibly be included in TRBW if decoration is not seen to be defining.

THIN RED/BUFF WARE

Code: TRBW

Distinguishing Features: Fabric of varying colour between red and buffish grey but all examples have dense sub-angular red grit inclusions throughout, often with scrap marks running diagonally across/down pot body surface.

Surface Treatment: Surface has been flattened on interior and exterior. The interior has then sometimes been burnished.

Decoration: None on interior. Exterior face has been covered in diagonal scrape marks running across/down the body of the pot. Some of these have been flattened slightly. Diagonal marks are

not present at sharp changes of angle on the ware. Most scraped lines go in one diagonal direction. However there are some less frequent lines at right angles to these.

Manufacture: Material does not show tell tale signs of wheel manufacture. However fabric is very thin and of a consistent thickness. It is likely that the interior burnishing and the exterior decoration have removed the wheel marks of manufacture.

Firing: Very hard fired fabric which is difficult to break.

Colour (Munsell): Body and surfaces are 5YR 6/6 reddish yellow with consistent colouring throughout fabric.

Fracture: The ware breaks with a reasonably smooth fracture due to very few inclusions. The fracture is perpendicular to the surfaces showing a consistency in hardness through the section.

Inclusions: Frequent very small mica fragments can be seen in the body and on the interior surface. They are less obvious on the exterior facing. There are dense very badly sorted yellow, grey and red sand grains/grit ranging in size from 0.5mm to 3mm. Majority are red. These are highly visible on breaks in the fabric and less visible on the surfaces.

Thickness: 3-5mm

General Description: A hard fired, thin red ware with a burnished interior and scraped exterior. Possibly a general ware for Indian ceramics, including the wares TEXT, DIIW.B, DIIW.BL and BAG. Most examples have 1mmred grit inclusions in the fabric, which in the more buff coloured ones is very easy to pick out. Paddle marks occur on some examples, others have a reddish brown degraded coating. Some have both.

WHITE INCISED WARE (SEE ALSO BUFF INCISED WARE)

Code: WIW (see also BIW)

Distinguishing Features: Incised decoration on exterior surface of wheel made white pottery. Most forms appear to be either water jugs or water pipes (sheisha). Can be combined with BIW (for contexts 1509 and 1501, these types were combined into BIW/WIW)

Surface Treatment: Surfaces are flattened and smoothed. No slip/glaze.

Decoration: Incised decoration on exterior surface. Most examples are geometric designs or varying designs made with a 3 pronged tool e.g. waves, lines and hatching in bands down body

of pot. Some have bands of more complex designs involving shapes and dot patterns. These have been characterised into three general decoration classes- WAVE, ROUL and OTHER.

Manufacture: Most examples of this are thin with wheel turning marks on the interior suggesting wheel manufacture. The design has been incised with evidently specifically made decoration tools such as a three pronged tool to make parallel lines of a set distance apart. All BIW/WIW sherds have been classified into three fabrics: thin, thick and soapy. Thin and thick fabrics are very similar with the only difference being the thickness. The soapy fabric is completely different and appears to relate to a different style of pottery from the 18th Century AD (Priestman 2005)

Firing: The ware is medium hard fired, breaking with a dull snap. Fabric is quite tough.

Colour (Munsell): Body and surface colour is cream/white.

Fracture: Clean fracture

Inclusions: Clay has clearly been levigated to remove impurities. Inclusions are occasional sub-angular red sand grains 0.1mm, occasional unspalled lime 0.3mm and occasional very small mica fragments 0.01mm.

Thickness: Majority of ware is 4mm thick.

General Description: A well codified fabric and ware. Wheel made very clean clay fabric with a white/cream slip on exterior surface. Incised linear and geometric decoration is a clear feature of this ware.

YELLOW SLIP WARE

Code: YELL

Distinguishing Features: Slightly degraded yellow slip on interior. Red fabric

Surface Treatment: Exterior surface has been smoothed but still have wheel turning marks. Interior has been smoothed and then treated with a yellow slip.

Decoration: None

Manufacture: Wheel turning marks on exterior show wheel manufacture.

Firing: Hard fired (presumably double fired for slip). Breaks with a dull snap.

Colour (Munsell): Exterior surface is 5Y 8/3 pale yellow. This becomes 7.5YR 6/6 in the main body and interior surface below the slip. The slip is a bright yellow colour not in the Munsell chart.

Fracture: Clean, smooth fracture perpendicular to surfaces.

Inclusions: Frequent very small (0.1mm) well sorted dark sand grains throughout body of fabric. Frequent very small voids in fabric (0.1mm).

Thickness: 10-12mm

General Description: A wheel manufactured yellow degraded slip ware with yellow slip on the interior surface. The fabric is two tone with a pale yellow exterior becoming a reddish yellow in the body.

APPENDIX V.II JULFAR AL-NUDUD RIM TYPE DESCRIPTIONS:

GLAZED WARE RIM TYPES

RIM CODE: G1

General Description: Deep bowl rim type. Bowl body slopes upwards towards rim at just over 50 degrees to horizontal. Approx. 24mm before rim termination, the exterior surface turns to a shallower angle and then runs straight until it is rounded at the rim edge. The interior surface has a 2mm thick raised band that runs around the inside of the vessel approx. 17mm below the rim edge, rising sharply from the vessel body and then sloping gently upwards to the rim. The majority of examples of these are PBS rim sherds.

Open / Closed: Unknown

Diameter- 320mm outer, 280mm inner

Bowl

Thickness: Body is approx. 7mm, rim at thickest is 11mm.

Ware: PBS

Associations: Similar to G3 type. Large serving dishes/bowls usually of PBS ware. Introduced in site phase 3 and becomes common in stone phases 5 and 6 with largest number of examples in post-abandonment phase. Demonstration of increased wealth at Julfar.

RIM CODE: G2

General Description: Deep bowl rim type. Bowl has steep slope from base to rim. Very simple rim with either no deviations or protrusions from surfaces or with a small indentation on the inner surface 15mm below the rim termination. Surfaces curve equally into rim from exterior and interior.

Diameter - 180mm outer, 170mm inner

Bowl

Thickness: Body is approx. 8mm thick.

Ware: MGP, DLGW, PBS

Associations: Similar to G8 but lacks raised band on inside surface below rim. First found in site phase 1 and continues throughout site occupation. Most examples found in post-abandonment of stone phase but phase 4 also has large numbers. Most common glazed bowl type. Small serving bowl?

RIM CODE: G3

General Description: Deep bowl rim type. Very similar to G1 rim which only one difference. The raised band along the inner edge has sharp edges on both sides rather than on just the side which goes into the base. In other aspects type is identical to G1.

Diameter- 300mm outer, 250mm inner

Bowl

Thickness: Body is approx. 8mm thick. Rim at thickest is 10mm.

Ware: MGP, DLGW, PBS

Associations: Similar to G1. Large serving dishes/bowls usually of PBS ware. Introduced in site phase 3 and becomes common in post-abandonment phase although these examples could relate to the previous phase of stone buildings. Demonstration of increased wealth at Julfar?

RIM CODE: G5

General Description: Deep bowl rim type. Interior surface runs simply to rim which has a slightly flattened top and is rounded and turned to an exterior protrusion. Below this on the exterior surface there are 3 further raised bands running around the vessel with the tops of the bands being 10mm further down the body than the last. After the 4th band, the ware is no longer glazed. The rim protrusion has evidence of oval shaped cording decoration on its exterior edge although much of this has been worn away.

Diameter

Bowl

Thickness: Body is approx. 10mm thick. Thickest band is the lowest; 13mm. Other bands are 11mm.

Ware: PBS

Associations: No similar types. Large serving bowl. Only found in post-abandonment phase of stone buildings so a late rim type. Could relate to stone building phase. Could be a development on G1 and G3 types, again showing increased wealth at Julfar.

RIM CODE: G7

General Description: Bowl rim type. Similar to G2 as form is fairly simple. Steep vessel body sloping outwards from base. Approaching rim both interior and exterior faces turn to a slightly shallower angle, still both sloping outwards from base. Rim is either then rounded or interior surface slopes diagonally to meet exterior rim edge.

Diameter- 160mm-280mm outer, 150mm-260mm inner

Bowl

Thickness: Body is approx. 7mm thick. Rim then can narrow to 5mm.

Ware: DLGW, NIDGW.

Associations: G2 and G8 are similar is basic form. Small serving bowl. Only found in stone phases 5 and 6 and later so late rim type- relating to increased wealth of Julfar or new fashion in style at production base.

RIM CODE: G8

General Description: Bowl rim type. Similar to G2 as form is fairly simple. Steep vessel body sloping outwards from base. Below rim one raised band runs around the internal surface 15mm below the rim termination. It is only a very slight raise and is 1mm thick. There is a similar band running round the exterior at the same point below the rim

Diameter- 180mm outer, 170mm inner

Bowl

Thickness: Body is approx. 7mm thick. Rim then can narrow to 6mm.

Ware: DLGW

Associations: G2 as has very similar form. Only one example is found before the stone abandonment phase 7 suggesting that it is a very late ware relating to the post-decline occupation of the settlement- starting early 16th Century?

RIM CODE: G9

General Description: Bowl rim type. Body comes vertically down off rim which is rounded and turned slightly to form a small exterior protrusion. 20mm from rim termination, body turns inwards and runs at 45 degrees to horizontal. This would suggest a deeper body than G10 or G11, although this is uncertain due to no complete vessels of this type.

Diameter- 160mm outer, 140mm inner

Bowl

Thickness: Body is approx. 7mm thick. Rim then thickens to 8mm.

Ware: DLGW

Associations: G10 as has similar form other than rim. Introduced in phase 4 along with other glazed rim types such as G10, G11. Rare after stone phases so short lived rim type at Julfar. Dating approx. late 14th Century to mid 15th Century?

RIM CODE: G10

General Description: Deep bowl rim type. Bowl body runs at approximately 45 degrees to horizontal until it takes a sharp upward and inward turn 30mm below the rim termination. The body continues on this new angle for 25mm and then develops into the rim where the interior surface stops and slopes diagonally up to the exterior rim edge which is rounded and protruding from the exterior surface by 3mm. This type has been found in DLGW class sherds.

Open

Diameter- 175mm outer, 165mm inner

Bowl

Thickness: Body is approx. 7mm, rim thins to 3mm before terminating.

Ware: DLGW

Associations: Similar to G9 but with slight variations. Introduced in site phase 4 as Julfar is seen to expand and diversify in the late 14th Century. Possible demonstration of growth in wealth of the site. Only found in phase 4 so possibly a short lived fashion or trading partner.

RIM CODE: G11

General Description: Very shallow bowl rim type. Body of vessel appears to have flat base running out towards edge of vessel. Body then takes a sharp upwards turn approximately 30mm from rim edge to running almost vertically upwards towards rim. 6mm below rim termination, interior surface runs diagonally to exterior surface, forming a pointy rim edge at the exterior edge. Very slight protrusion of rim out of exterior surface at rim edge. The type is found in DLGW class rims.

Open

Diameter- 110mm-210mm outer, 90mm-200mm inner

Bowl

Thickness: Body is approx. 6mm, rim thins to 3mm

Ware: DLGW

Associations: First introduced in site phase 4 but is not found in stone phases 5 or 6. Re-appears in post abandonment phase 7 and modern phase 8. Could be a short lived fashion type or a ceramics industry only occasionally traded with. No precise date available.

RIM CODE: G12

General Description: General glazed ware rim type. Vessel body is a shallow bowl with upward curving sides. Body then turns to a shallower angle between 15 and 25mm from the rim edge and runs flat or in a slight upwards concave curve to the rim. The rim is a simple termination rim with no deviation or protrusions. This type has been found in GFRIT fabric.

Open

Diameter- 340mm outer, 290mm inner

Bowl

Thickness: Body is approx. 5mm, rim thins to 3mm

Ware: GFRIT

Associations: Single example found in stone phase 5 but majority of examples found in post-abandonment and modern phases suggesting it is a late rim type at Julfar.

RIM CODE: G13

General Description: Degraded lead glazed ware rim type. Small bowl type. Exterior surface has a small rounded ridge approx.20mm below the rim top. The surface dips inwards slightly after the peak of this ridge and then turns outwards to form a thick rounded rim. The rim top is slightly curved with a slight overhang with a rounded curve on the interior surface.

Open / Closed: Open

Diameter: 200mm outer, 170mm inner

Bowl

Thickness: Body is approx. 7mm, rim thickens to 12mm

Ware: DLGW

Associations: Only example found is from modern/disturbed layers. As it is the only example in the assemblage it is clearly an uncommon rim type in this area. Dating is unknown but it could be a late type.

RIM CODE: G14

General Description: Glazed ware rim type. Shallow bowl with horizontal out-turned rim, similar to G12 but with a thicker outside part. Possible in between type between the flat G12 and the G17 with the small upward lip. G14 has a large upward protrusion at the outside edge of the rim, but rather than being thin and going straight back down to the inner surface of the horizontal rim, the G14 type slopes in a gentle concave curve to the small lip caused by the horizontal turning of the rim. Its internal profile is like that of type G3.

Open / Closed: Open

Diameter: 170mm outer, 160mm inner

Bowl

Thickness: Body is approx. 7mm, rim thickens to 14mm

Ware: DLGW, MGP

Associations: G12 is similar but has a different rim termination. Only examples are from post-stone abandonment and modern/disturbed layers and so is probably a late type. Similarly to G13 as only two examples were found in the assemblage it is an uncommon rim type in this area.

RIM CODE: G15

General Description: DLGW rim type. Straight sided bowl type, although sides could slope gently into centre beyond 30mm below the rim top as examples show no more than this. As body approaches rim vertically interior surface curves inwards, thickening the rim and creating a slight overhang. The inner edge of this is rounded to the flat rim top. The exterior surface turns horizontally outwards only 3mm below rim top, and forms a thin exterior protrusion which is also rounded to the rim top.

Open / Closed: Sub-Closed

Diameter: 250mm outer, 210mm inner

Flat bottomed bowl?

Thickness: Body is 5mm thick, rim at thickest is 15mm.

Ware: DLGW

Associations: Single example from post-abandonment phase. Presumably a late, uncommon rim type in the area. Demonstrates the diversification of ceramic types in the later periods at Julfar.

RIM CODE: G16

General Description: Glazed ware rim type. Vertical rim type of bowl which goes down 30mm then internal surface turns towards centre of bowl. Exterior surface has a ridge at 30mm and

then turns in at same angle as interior surfaces. Base type is not known, but it is likely to for a wide flat base or a small concave base.

Open / Closed: Unknown

Diameter: 225mm outer, 190mm inner

Bowl

Thickness: Body is approx. 10mm, rim thins to 8mm

Ware: DLGW, MGP

Associations: Late rim type only found in post stone phases. Complex rim type, possibly for function, possibly for decoration.

RIM CODE: G17

General Description: Glazed ware rim type. Possible development of G12. Open bowl type. Vessel body is a shallow bowl with upward curving sides. Body then turns to a shallower angle between 15 and 25mm from the rim edge and runs flat or in a slight upwards concave curve to the rim. The lip then turns vertically upwards from the rim.

Open / Closed: Unknown

Diameter: 240mm outer, 190mm inner

Bowl

Thickness: Body is approx. 5mm, rim thins to 3mm

Ware: DLGW, MGP

Associations: Development of G12 with more complex rim form. Serving bowl. Small numbers found in phases 3 and 4 suggesting it is an early uncommon rim type as Julfar is becoming slightly more wealthy.

RIM CODE: G18

General Description: DEPAW glazed ware rim type. Only found in DEPAW vertically sided bowls. Vessel side is vertical with thickened bands running around the exterior surface. There is

between 2 and 4 of these including the final top rim band. The rim has a similar protruding band around its exterior edge, which is well rounded to the internal rim edge. This has a slight rounded overhang above the internal surface which then drops away vertically.

Open / Closed: Open

Diameter: 180mm-320mm outer, 160mm-300mm inner

Bowl type. Unknown use.

Thickness: Body is 9mm thick, rim at thickest is 9mm.

Ware: DEPAW

Associations: A late rim type probably relating to the stone phase 5/6 where large amounts of DEPAW are found but only found in post-abandonment and modern/disturbed layers. Dateable to 15th Century AD.

INCENSE BURNER RIM TYPES:

RIM CODE: INC1

General Description: Incense burner ware rim type. Appears to be bowl type made of same fabric as incense burners rather than an incense burner rim or a cup which have also been found in this fabric. Simple rim termination approach, however rim has been indented with a finger to create rounded crenulations around the rim edge. These are indented from the internal surface and from above. There are no indentations from the exterior edge. Internal surface has criss-crossed red slip painted lines in common with most incense burner sherds. No decoration on external face.

Open / Closed: Open

Diameter: 120mm outer, 110mm inner

Storage vessel

Thickness: Body and rim are 5mm thick

Ware: INCW

Associations: Relates to all incense burner wares- late introduction in phase 5 stone buildings but with majority in modern/disturbed layers. Probably a local type.

RIM CODE: INC2

General Description: Incense burner ware rim type. Probably cup rim type for handles and bases regularly found in this assemblage. Very simple rim termination with no deviations or decoration on rim. Internal face has criss-crossed red slip lines in common with rest of INCW class. Body slopes diagonally inwards from rim to base. Rim is rounded from both internal and external edges.

Open / Closed: Open

Diameter: 130mm outer, 120mm inner

Cup/incense burner

Thickness: Body and rim are 5mm thick

Ware: INCW

Associations: Relates to all incense burner wares- late introduction in modern/disturbed layers. Not as common as INC1. Similar to INC1 but without the indented rim. Probably a local type.

JULFAR WARE RIM TYPES:

RIM CODE: J1

General Description: This rim type is seen to be the earliest Julfarware rim type found in the Julfar area. It is equivalent to Kennet 2004: CP1.2. It is on the verge between open and closed with a near vertical side running off the rim. The rim is usually P shaped with the bulb going into the interior of the vessel. Below this rim on the exterior is a band running horizontally around the vessel usually approximately 30-50mm below the rim. The sides of the vessel slope out slightly as they go down and then turn at an acute angle inwards to the base. This ware is considered to be a cooking vessel.

Open / Closed

Diameter: 120mm-190mm outer, 100mm-170mm inner

Cooking pot.

Thickness: 5-8mm thick body, rim only thickened slightly.

Ware: JULF1

Associations: Possibly develops into J3, a larger cooking vesse,l and J2 which is more spherical in shape. One of the earliest rim types found on site, along with J3. It continues in use throughout the occupation of the site and is found in every phase other than phase 2. Small vessels, possibly for one/two person cooking.

RIM CODE: J2

General Description: This rim type is of a closed vessel. It appears in JULF1, JULF2 and JULF4 types. The Julfarware 1 types do not generally have an overturned lip on the inside of the rim, while the Julfarware 2 and 4 types generally do. Examples with lugs on show a difference between the 3 wares in lug design. The JULF1 type has lugs very similar to those found on J1 and J3 rim types while the JULF2 have a proto-lug. This is not large enough to pick the vessel up on its own, particularly if the vessel is full and so could only have been an aid, rather than a means of picking the vessel up. JULF4 wares have a more developed type of lug modelled on those seen on J7 types, with red/purple paint running around the rim. Most examples of this type, particularly the JULF2 examples are heavily sooted, promoting the idea that this is a cooking vessel type.

Open / Closed: Closed

Diameter: 120mm-280mm outer, 100mm-260mm inner

Cooking pot.

Thickness: 5mm- 10mm, JULF2 and 4 types thinner than JULF1.

Ware: JULF1, 2 and 4.

Associations: A possible development of J1 with a more curve, spherical body form on some examples. Introduced in phases and 4 in small numbers, then becomes more common in the stone phases 5 and 6, continuing through into phase 7. It is a common cooking vessel type.

RIM CODE: J3

General Description: Similar to J1. However profile is slightly more angular with sides pushing further out as they go down the vessel. The type is also much thicker than the J1 type. The band around the vessel is slightly thicker than that found around J1 as welland is slightly more pronounced. The lugs on this ware are developed out of the band. It is equivalent to Kennet 2004: CP1.2. It is only found in JULF1 wares, similarly to J1. It is possible that it is an advancement on the J1 type or possibly a different production site with more skill or slightly better raw materials.

Open / Closed: Closed

Diameter: 350mm outer, 320mm inner

Cooking pot.

Thickness: 7-10mm thick body, rim thickened to 10-12mm

Ware: JULF1

Associations: Possible development or larger example of J1 found in every phase on site. Most common in phase 4 before decreasing in amount through the stone phase, possibly being replaced by J2 and J1. Much larger size of cooking vessel than J1 or J2- possibly family cooking vessel while others are for fewer people.

RIM CODE: J4

General Description: J4 is a bowl type equivalent to Kennet 2004: B14 which has been split into 5 different sub types for this work. J4.1 is a bowl rim with horizontal protrusions to both the inside and the outside of the rim, with the outer one rising and the inner one dipping in towards the centre. J4.2 is the opposite, with the inner rising up and the outer protrusion dipping down. J4.3 is a bowl rim with only an exterior protrusion which rises, forming a kink in the exterior surface. J4.4 is similar but the protrusion of the rim becomes more horizontal in a similar fashion to type G1. The J4.4 type has four bands of decoration around the rim on the top and inside. J4.5 is fairly straight sided with a rim that thickens equally internally and externally with a flat top. This type is exclusive to JULF3 ware with most examples having painted red on white decoration.

Open / Closed: Open

Diameter: J4.1- 290mm outer, 250mm inner, J4.4- 300mm outer, 240mm inner, J4.5- 320mm outer, 280mm inner

Bowl types.

Thickness: Generally between 10mm and 15mm thick

Ware: JULF3

Associations: J4.1 has early examples found in phase 3, as does 4.2. J4.4 is first introduced in phase 4. These types are the early forms of J4 bowls, introduced as Julfar grows. J4.3 and J4.5 are much later forms, found in the post-stone abandonment phases. These bowls are likely to be serving bowls. J4.1, 4.2 and 4.4 are among the first JULF3 rim types found at Julfar.

RIM CODE: J5

General Description: Large jar or storage rim. Thickens as reaches rim and raked over to exterior. Similar but has important differences with J11 and J16, both of which are also from storage jars. Possible development from J2 or J11 with lip to allow cloth cover to be used. No Kennet example. Likely to have similar body shape to J2 and J11.

Open / Closed: Closed

Diameter: 175mm outer, 110mm inner

Storage Jar

Thickness: 15-20mm thick walls of vessel. Rim can be up to 30mm thick.

Ware: JULF1

Associations: Similar to J11 and J16. All three are large storage jar types for grain or similar foodstuffs. Small numbers are found in phases 3 and 4 before the building of stone buildings. During the occupation of these buildings more examples of J5 are found than before. There is then the highest number of this type in phase 7, the post-abandonment phase which probably is residual from the stone phases beforehand.

RIM CODE: J6

General Description: Jar or jug type with the majority of examples found in Julfarware 3. Some limited examples in Julfarware 1 although this may be due to weathering of the paint. They were thin necked vessels which move into a wider body for water storage. The rim follows the same basic shape but with slight changes, as shown in Kennet 2004: type J2.1. The majority of pieces found at Nudud thicken and turn outwards at the rim with the flat surface of the rim being at a downward angle. The Julfarware 3 examples all have either lateral rings of red paint going around the neck or linears which go down the body of the vessel. Most examples have a thicker ring of red paint around the rim.

Open / Closed: Closed

Diameter: 130mm outer, 100mm inner

Jugs and water storage vessels

Thickness: 5-8mm thick body, rim is thickened to 10-12mm, sometimes as much as 16mm.

Ware: JULF3. Very occasional, JULF1 as well.

Associations: J30 is possibly a smaller version of this type. It is the most common JULF3 type, introduced in phase 3, becoming more common during the stone occupation phase. Large numbers also exist in the post-abandonment and modern phases. This type continues through to at least the 18th Century according to other examples (Kennet 2004). It is indicative of water storage vessels.

RIM CODE: J7

General Description: Rim is very similar to J2. However this type is exclusive to Julfarware 4 and has a triangular sharp lug on some examples which is extended out from the lip of the pot, rather than lower down the body as with J2 examples. Most examples have red paint on rim, but no white paint. Lug is usually upturned at distal end. Rim itself is thickened and slightly more protrusive on exterior side.

Open / Closed: Closed

Diameter: 180mm outer, 160mm inner

Cooking vessel.

Thickness: Body is 5mm thick, rim is slightly thickened.

Ware: JULF4.

Associations: Development of J2 type into JULF4 fabric with more pointy lugs. Introduced in phase 5 and is one of the first examples of JULF4 rim types. Shows development of Julfarware ceramics at Julfar, becoming more diverse and deisgned for certain functions.

RIM CODE: J8

General Description: Body shape of vessel is similar to J2. Rim turned out by approx 100 degrees from body, possibly to enable a cloth cover to be used. Only found on Julfarware 4 examples, sometimes with JULF4 cording decoration approx 50mm below the rim on the exterior surface. Often out-turned area of rim is covered in red paint, similarly to J7. This type is similar to Kennet 2004 CP4.4. Rim tends to extend approx 20mm out from surface. However some examples have a rim which extends further (30mm) at a less acute angle, approx at right angles or less (J8.1). These were only recorded haphazardly throughout the assemblage with the majority put down as J8.

Open / Closed: Closed

Diameter: 215mm outer, 190mm inner. J8.1 examples have an outer diameter of approx. 220mm

Storage vessel?

Thickness: 5mm body, rim thickened slightly.

Ware: JULF4.

Associations: Similarly to J7, probably a development or divergent from J2 in JULF4 fabric. Cooking vessel with possibly some use as a storage vessel as well. Introduced in phase 5 but only one examples. Majority found in post-stone abandonment phase 7 and 8, although these could be residual from stone phases. However the lack of them in phases 5and 6 would suggest that this type is a later one, possibly 16th Century.

RIM CODE: J9

General Description: A development of Kennet 2004 CP4.4. However rim does not extend as far as J8 examples and is completely turned over to the exterior. Corded decoration is present on exterior surface of rim. Some examples have sharp triangular lugs extending from the rim, in a similar fashion to J7. Only found in Julfarware 4.

Open / Closed: Closed

Diameter: 215mm outer, 200mm inner

Storage vessel?

Thickness: 5mm-10mm. Rim slightly thicker.

Ware: JULF4.

Associations: Similarly to J7 and 8 it is a development or divergent of J2 types into JULF4 fabric. This shows the development and diversification of the Julfar ceramics assemblage as Julfar becomes more developed itself. J9 is introduced in phase 5- the first stone phase, similarly to J7. The majority of its examples are found in the post-abandonment phase 7 although these could be residual. It is therefore a type only found from the late 14th to early 15th Century onwards at Julfar. It could become more common in the late 15th and early 16th Century.

RIM CODE: J11

General Description: A rim similar to J5 with but with a smaller exterior protrusion at the rim. Slightly flattened on exterior surface. Similar to Kennet 2004: CP2.2 but more likely to have been a storage vessel type. Found in Julfarware 1 examples only. Appears to be a basic storage vessel rim, with additions to the rim making J5 and J16 types, both of which have accommodation for some form of cover to keep out pests etc. Rim is rounded and body of pot is closed.

Open / Closed: Closed

Diameter: 150mm outer, 110mm inner

Storage vessel?

Thickness: Body is 6-10mm thick, rim is only slightly thickened to 12mm.

Ware: JULF1.

Associations: Similar to both J5 and J16 types but lacks the exterior lips to allow cloth covers to be affixed to the rim. Introduced in phase 4 with more examples in phase 5. Largest amount of sherds found in the post-abandonment phase but these could be residual. Probably dateably to early 15th to early 16th centuries AD.

RIM CODE: J12

General Description: Julfarware 3 bowl type. Vertical exterior surface comes off rim, then sometimes curves outwards before curing in again to go to base. Top of rim is horizontal and flat. Interior faces is vertical and then curves towards exterior approx. 30mm from rim, giving a thickened rectangle below the rim with the thinner vessel body running out of the exterior bottom corner. These bowls are always found with red on white paint on both surfaces. The rim is painted red, with horizontal red rings going around the bowl on both the interior and exterior faces. These types are called carinated bowls by Kennet and are equitable with his 2004 type B1.1

Open / Closed: Closed

Diameter: 350mm outer, 330mm inner

Bowl

Thickness: 7mm- 10mm. Rim is 12-14mm thick.

Ware: JULF3.

Associations: Julfarware bowl type found only in JULF3 ware. One of the most common JULF3 bowl types, introduced to the assemblage during the stone phases 5 and 6 and continues through to post abandonment and modern phases although some of this could be residual. Large patter style. Dateable to early 15th to early 16th Century AD possibly continuing later.

RIM CODE: J13

General Description: Julfarware 3 bowl type. Flattened top to rim with small thickening on interior face. Sides are either vertical then curving in towards base or slightly curved inward. Exterior has been rounded onto rim while, due to thickening, the change from rim to interior surface is more angular. A solely Julfarware 3 type with the usual red on white painted designs

on exterior and interior surfaces. Most examples have a solid red painted rim with approx 10mm block painted red on both surfaces from the rim.

Open / Closed: Closed

Diameter: 200mm-215mm outer, 180mm-195mm inner

Bowl

Thickness: 5mm thick body, rim slightly thicker.

Ware: JULF3.

Associations: Small bowl type introduced in large numbers in the stone phases 5 and 6. Some examples also in later post-abandonment and modern phases. Good cohesive rim type. Majority of examples are quite small suggesting small bowls/large cups. All examples are in JULF3 ware.

RIM CODE: J14

General Description: Storage jar rim form with a thickened rim which has a protrusion on the exterior face. This has a rounded outside edge which then goes to the interior rim edge on a flat horizontal surface. The inside edge is also rounded. Decoration on the Julfarware 3 examples consists of horizontal banding in red paint on the white background broken by occasional vertical red lines running down the body of the pot. The rim is painted as a solid red band. Some examples are found in Julfarware 1 fabrics.

Open / Closed: Closed

Diameter: 210mm outer, 170mm inner

Storage vessel

Thickness: 8-10mm. Rim is thickened to 12mm.

Ware: JULF1 and 3

Associations: Small storage vessel in JULF3 fabric. Introduced in phase 4 but not as common as other JULF3 types. Continues to be found during stone phases and some also present in later phases of the site. Appears therefore to be a less common small storage rim type in use at Julfar between the late 14th to the early 16th Century.

RIM CODE: J15

General Description: An open rim type with a flattened rim. Exterior side runs vertically downwards from rim before slowly curving into the base. Rim is triangular in form with rim being short side and interior surface being the hypotenuse, the body of the vessel running out of the bottom corner of the triangular. Body of vessel thickens out as approaches rim towards the interior. Occasional lugs are in evidence. These are gentle triangles protruding from just below the rim.

Open / Closed: Open

Diameter: 250mm outer, 210mm inner

Large bowl or similar open vessel

Thickness: 7-10mm

Ware: JULF3 and 1

Associations: Similar to J12 but with a less thickened rim. Large platter type. Introduced during phase 1 although this could be a mistaken identification. Majority of sherds found are in phases 4 and 5 with almost as many found in phases 7 and 8- post-abandonment and modern. Some of these are likely to be residual. It shows there was possibly an introduction of platter style bowls in phases 4 and 5.

RIM CODE: J16

General Description: A probable development of J5 rim types with the rim becoming more prominent. Rim is flattened with exterior and interior edges being rounded. Large exterior lip has been formed around entire circumference. It is likely that the larger cord decoration is mainly found on vessels of this type. The size and thickness of the type should that it belongs to very large storage vessels, probably for water or grain. The presence of the lip suggests a need to attach a cover to the rim. This also presumably pre-dates this type to the development of the lidded types J23 and 24 although this is only conjecture. The type has small fully formed handles on the vessel sides approximately 30mm from the base of the lip. It is likely that these are for movement when the vessel is empty as when fully the size of the vessel would make it very heavy.

Open / Closed: Closed

Diameter: 220mm-350mm outer, 100mm-300mm inner

Very large storage vessels

Thickness: 8-16mm body with rims of up to 25mm thickness

Ware: JULF1

Associations: Similar function to J5 and J11, with similar form to J5 but with large lip to rim. Introduced during phase 4 in small numbers with considerably more being found in stone phase 5 and the post-stone phase 7. This is therefore a late Julfar storage type which appears to coincide with the expansion of the city into international trade.

RIM CODE: J17

General Description: A bowl type with thinner fabric than J4 and with a more extended exterior protruding lip at slightly less than 90 degrees to the interior vessel shape. Rim is medium flattened on top. Some examples have a slight indentation (approx. 10mm thick by 1mm deep) running the whole circumference on the exterior of the vessel just below the bottom of the lip. This type is also found with red paint decoration on the interior, with a red band at the exterior edge of the lip and a second one on the interior face just before it turns into the lip. The lip edges are rounded.

Open / Closed: Open

Diameter: 150mm outer, 130mm inner

Bowl

Thickness: 5-7mm

Ware: JULF1, 3 and 4.

Associations: J4 types are thicker and larger. This ware is more delicate. Introduced in the stone phases 5 and 6 with only 1 example in each, there are a few more examples in the post stone phases, suggesting that this is an uncommon late type, demonstrating the diversification of the ceramics after phase 4 of the site. Dates to early 15th Century AD onwards.

RIM CODE: J19

General Description: Rim type very similar to J6 but with vessel body which widens out just below rim. The majority of pieces found at Nudud thicken as they develop into the rim and turn outwards at the rim. Unlike J6 the majority of examples have a flat horizontal rim top which is then rounded on the exterior edge. The Julfarware 3 examples all have either lateral rings of red paint going around the neck or linears which go down the body of the vessel. Most examples have a thicker ring of red paint around the rim. Not exclusive to Julfarware 3, some Julfarware 1 examples are found. Some examples have a slightly more rounded rim profile than J6, with the slope of the rim top running slightly downwards from exterior to interior.

Open / Closed: Open

Diameter: 355mm outer, 310mm inner

Bowl

Thickness: 7-9mm. Rim can be up to 15mm thick.

Ware: JULF1 and 3

Associations: Similar to J14 but larger. Rim is also similar to J6. One of the few JULF3 large storage vessel types. Introduced in phase 3 of the site with one example and then becomes more common through phases 4 and 5 as Julfar grows. Again most common after the abandonment of the site, although some of these sherds could be residual from the stone phases 5 and 6.

RIM CODE: J20

General Description: A bowl type with thin fabric similar to J13 but rather than the flattened lip and slight internal protrusion noted for that type, the rim curves slightly to the exterior and is rounded. The rim does not thicken at all, infact becoming slightly narrower as it curves. Both internal and external faces are vertical when the rim becomes developed and as they go down the vessel, they curve inwards to the base. No evidence of feet or a base ring has been found suggesting a flat base for this type. This type appears to be a small bowl or large cup. All examples of this type are from Julfarware 3 fabric. The rim is usually block coloured as a red painted band with either a white band below it on the interior surface or red lines travelling perpendicularly to it coming off and heading towards the centre of the bowl.

Open / Closed: Open

Diameter: 115mm outer, 100mm inner

Bowl or large cup

Thickness: 4-7mm

Ware: JULF3

Associations: Possibly a mid point between J13 bowls and JC1 cup types. Small and thin, showing a possible refining of the local Julfarware. Known from phase 4 onwards and found in small numbers during the stone phases. Most examples are from the post-stone phases 7 and 8. Late Julfar ceramic type probably dating from the late 14th Century to late 15th or later.

RIM CODE: J21

General Description: A storage vessel rim type with a closed body. The rim comes off the slanted vessel body which is curving outward to form the bulbous body of the vessel as it goes down. The rim is slightly turned back on itself creating a slight lip with no flattening of the rim top. This leaves a rounded interior edge to the rim and a sharp exterior edge. The body of the vessel thickens slightly as the rim is turned and then becomes much thinner in the developed rim. Some examples in Julfarware 1 and 3. Julfarware 3 examples have vertical linear decoration running down the vessel sides from a solid red band which covers the rim.

Open / Closed: Closed

Diameter: 240mm outer, 230mm inner

Storage vessel

Thickness: 7mm-10mm. Rim can be 15-20mm thick.

Ware: JULF1 and 3

Associations: Slightly similar to J19 and to J14 but rim top is different. Similar function is likely however. First found in phase 4 of the site and becomes more common in later post-stone phases, although some of this could be residual. Probably dates from the late 14th to the late 15th Century, possibly later.

RIM CODE: J22

General Description: Storage jar rim form with a thickened rim which has a protrusion on the exterior face but unlike J14, there is no thickening on the interior surface, just the rounded exterior protrusion. This has a rounded outside edge which then goes to the interior rim edge on a flat horizontal surface. The inside edge is also rounded. Decoration on the Julfarware 3 examples consists of horizontal banding in red paint on the white background broken by occasional vertical red lines running down the body of the pot. The rim is painted as a solid red band. Some examples are found in Julfarware 1 fabrics.

Open / Closed: Closed

Diameter: 110mm-160mm outer, 90mm-130mm inner

Storage vessel

Thickness Body is 7mm, rim thickens to 12mm

Ware: JULF1 and 3

Associations: Very similar to J14 but small changes show it to be separate. Similar storage function to J14, 19 and 21. Introduced during phase 4 and becomes more common during stone phase 5. Also found in post stone phases 7 and 8 in smaller numbers. Late 14th to late 15th/early 16th Century date is likely.

RIM CODE: J23

General Description: Storage jar rim with indentation around top for lid. Vessel body curves outwards below rim to form a round body. Vessel walls become thicker as they develop into the rim on both the interior and exterior surfaces. The interior surface protrudes in towards the centre of the vessel and then is rounded. The exterior surface is rounded away from the vessel centre with a rounded exterior rim edge. The rim top is flattened and then dips down to form the flange holding the lid. Some examples have slightly less rounded edges. This is the first type with evidence of a non-cloth lid which needs an internal flange to hold it. Kennet 2004 describes types with this internal lip as post al-Mataf Julfar ware,

Open / Closed: Closed

Diameter: 205mm outer, 170mm inner

Storage vessel

Thickness: Body is approx. 5mm, rim at thickest is 15mm.

Ware: JULF1

Associations: Lidded type similar in function to J24. Introduced during phase 4 with some examples found in later phases. Appears to be part of a short lidded Julfarware ceramic tradition during the period directly before the stone building phase. Late 14th to mid 15th Century AD?

RIM CODE: J24

General Description: Similar rim form to J23 with developed thin rim and internal flange to hold lid. J24 examples however do not show a body curving out greatly to form a more rounded vessel. The vessel still fills out below the rim. However this is made from a gradual outward slope rather than a curve. This type has a second defining feature from J23 with the addition of a raised band running horizontally around the vessel approximately 34mm below the top of the rim on the exterior surface. This could show it to be a development of the J1 and J3 type of vessels. The internal flange for a solid material lid again pushes this type into the post-Mataf phase in Kennet 2004. Some examples have small triangular lugs which are extended out of this band.

Open / Closed: Closed

Diameter: 180mm-280mm outer, 150mm-260mm inner.

Storage vessel

Thickness: Body is approx. 6mm, rim at thickest is 15mm.

Ware: JULF1

Associations: Lidded type of JULF1 similar to J23 but with different exterior protrusions. Introduced during phase 4 and also found in small numbers in post-stone phases. Appears to be part of a short lidded Julfarware ceramic tradition during the period directly before the stone building phase. Late 14th to mid 15th Century AD?

RIM CODE: J25

General Description: Julfarware 3 bowl type. Extended version of J13 with a larger internal protrusion. The exterior surface reaches the exterior rim edge with a slight exterior lip which is tend rounded to the rim top. This is flattened and extends 10mm until it is rounded back on to

the interior surface. This surface undercuts the rim top for 5mm until it turns and runs parallel to the exterior surface.

Open / Closed: Slightly closed

Diameter: 290mm outer, 270mm inner

Storage vessel

Thickness: Body is 5mm thick, rim at thickest is 10mm.

Ware: JULF3

Associations: Similar to J12 and J13 in the large platter tradition. However is introduced much later, during the post-stone phase 7 and modern/disturbed layer in phase 8. Possibly a more modern Julfarware type. Early 16th Century onwards date.

RIM CODE: J26

General Description: Large Julfarware 1 storage jar. High steep sides which are near vertical sloping inwards as they go upwards. Fabric is very thick with thickened band 50mm down from rim top. Rim is also thickened in to a band with rounded protrusions both internally and externally. Type is likely to be for storage but could be very large cooking vessel as well. It has the appearance of a very large form of J3, however the slightly rougher fabric compared to the majority of J3 suggests a different purpose.

Open / Closed: Slightly closed

Diameter: 295mm outer, 250mm inner

Storage vessel

Thickness: Body is 10mm thick, rim at thickest is 20mm.

Ware: JULF1

Associations: Similar function to J5, 11 and 16 but different style, being much wider at the mouth. Only found during the post stone abandonment phase and so could be seen to be a limited example of different storage needs. Early 16th Century?

RIM CODE: J27

General Description: Julfarware 3 storage jar type. Closed body with exterior D shaped rounded rim. The rim then slopes down to the internal lip which is slightly rounded before turning back into the internal surface. Some overlap between J22 and J27 is possible. However J22 has an internal widening of the body as it reaches the rim whereas the J27 type has the exterior rim. Most J27 types are Julfarware 3 although it is likely that any Julfarware 1 types found are infact just eroded Julfarware 3 types.

Open / Closed: Closed

Diameter: 135mm outer, 100mm inner

Storage vessel

Thickness: Body is 9mm thick, rim at thickest is 20mm.

Ware: JULF3

Associations: Possibly an overlapping type combining examples of J22 and J14 but will be considered as a separate type for this analysis. Introduced late in the sequence during the post abandonment phase and so is probably a late, uncommon storage ware. Early 16th Century date?

RIM CODE: J28

General Description: Julfarware bowl type. Slight similarities with J13 rim types. However J13 rim types are generally smaller in diameter and deeper. J28 have the same inward turned rims with rounded tops. The bowls are shallow, like platters. Some examples have triangular lugs on the rim. The type is slightly closed as the rim has been turned in.

Open / Closed: Closed

Diameter: 270mm-305mm outer, 250mm-290mm inner

Bowl

Thickness: Body and rim are 7mm thick.

Ware: JULF1

Associations: Similar to rest of platter tradition types such as J13. Only found in post-stone phases 7 and 8 showing a possible continuation of large platter wares beyond the stone phases unless the few examples are all residual. Early 16th Century date is possible.

RIM CODE: J29

General Description: Julfarware bowl type. Similar to J8 types but found in JULF1 fabric. Body shape of vessel is similar to J2. Rim turned out by approx 100 degrees from body, possibly to enable a cloth cover to be used. This type is similar to Kennet 2004 CP4.4. Rim tends to extend approx 10mm out from surface. Smaller rim protrusion that J8.

Open / Closed: Closed

Diameter: 125mm-195mm outer, 110mm-180mm inner

Bowl

Thickness: Body and rim are 7mm thick.

Ware: JULF1

Associations: Could be JULF1 version of J8 rims which are found only in JULF4 ware. Only found in modern/disturbed layers so could relate to the more modern refined Julfarware rim types e.g. J17. Probably dates 16th Century or later.

RIM CODE: J30

General Description: Julfarware 3 narrow necked jar, possibly for water storage. Diameter at rim is same or only slightly larger than diameter of vertical sided neck. Some examples have a slight rolling of the rim to the exterior edge. Most examples are Julfarware 3 and those in Julfarware 1 are likely to be eroded Julfarware 3 sherds. Possible comparison with Kennet 2004: J2.3 jugs. Connection therefore with J10 spouts. J6 rim type could be considered to be larger version of this.

Open / Closed: Slightly closed

Diameter: 60mm-75mm outer, 40mm-60mm inner

Storage vessel

Thickness: Body and rim are 5mm thick.

Ware: JULF3

Associations: Small water storage/pouring vessel similar in shape to J6 types but much smaller. Only found in modern/disturbed layers so possible date of post 16th Century is likely.

RIM CODE: J31

General Description: Julfarware 3 storage jar type. It has an internal flange on the rim to allow a ceramic lid to be put on top. The basic rim form is that of J27 on the outside with an exterior protrusion which is rounded and then slopes diagonally down to the internal lip. The flange is halfway down this slope and is indented about 2mm into the surface. The type is only found in JULF3. The slope with the flange on it is painted with red/white vertical linears running from the outside lip to the outside lip. Below the internal lip, there is a layer of red paint which goes approximately 10mm down the internal surface.

Open / Closed: Closed

Diameter: 200mm outer, 160mm inner

Storage vessel

Thickness: Body is 9mm thick, rim at thickest is 20mm.

Ware: JULF3

Associations: Lidded rim type similar to J23 and J24 in function. 1 example in phase 3 and 4 in modern/disturbed layers suggests either incorrect cataloguing of the early sherd or residuality of the later sherds. If it is part of the lidded rim tradition already seen, the sherd from phase 3 would be correct. If not, it could be part of a more modern Julfarware assemblage from post 1550AD

RIM CODE: J32

General Description: Julfarware 4 bowl rim type. Similar to J28 in shape with heavily turned internal rim. However diameter is much smaller than Julfarware 1 J28 examples (between 90

and 155mm for J32) and rim top is slightly flattened. Rim type only found in Julfarware 4 fabric. Both examples found have small triangular lugs coming off the top. Fabric is very thin and biscuty like Julfarware 5. Probably small bowl or cup.

Open / Closed: Slightly closed

Diameter: 90mm-155mm outer, 80mm-140mm inner

Storage vessel

Thickness: Body and rim are 4mm thick.

Ware: JULF4/5

Associations: J28 is similar but made of a different fabric and much larger. Possibly a small version of the large platter types seen during the stone phases. J32 is first found as a single example during the stone phase 5 with two more examples in found in modern/disturbed layers. This would suggest an uncommon rim type of 15th Century AD date, possibly later.

RIM CODE: J33

General Description: Julfarware 1 rim and handle combination. Very rough fabric with white/cream slip covering internal and external surfaces. Simple rim termination with rounding on both internal and external edges. Hand comes off the rim top and appears to be D-shaped although no examples have been found. This would suggest a basket type pot with two or more similar handles around the rim to enable easy transport. Function unknown but clearly intended to be moved around a lot. Future research into these should involve X-rays of the structure.

Open / Closed: Slightly closed

Diameter: 230mm outer, 200mm inner- estimate- examples were very uneven

Storage vessel

Thickness: Body and rim are 12mm thick

Ware: JULF1

Associations: No parallels from Julfar. 1 example is from the earliest occupation of the site in the early 14th Century AD but the other examples are from the modern/disturbed layers (early 16th Century) suggesting either two very similar ceramic traditions split by 200 years or residuality.

RIM CODE: J34

General Description: JULF3 painted bowl type. Shallow sub-closed bowl with a small flat base with a diameter of 100mm. The vessel sides then slope gently upwards and outwards until they turn vertically upwards, then start sloping inwards again. The exterior surface has a slight indent before turning vertically. The rim top has an overhang over the internal surface and is rounded. A painted ladder like design runs around the exterior of the bowl above the point where it turns vertically on some examples.

Open / Closed: Sub-Closed

Diameter: 210mm outer, 200mm inner

Flat bottomed bowl

Thickness: Body is 7mm thick, rim at thickest is 11mm.

Ware: JULF3

Associations: Slightly similar to J12 carinated bowls but smaller and thinner. As found only in modern/disturbed layers, it is likely to be a more modern Julfarware type dateable to post 16th Century, similarly to J30.

JULFAR WARE CUP RIM TYPES:

RIM CODE: JC1

General Description: A rough cup type. The examples found are at largest 750mm deep and at smallest 590mm deep. The body slopes outwards from the flat base (although the base does thicken towards the side walls) to the rim at a steep angle The rim is then either plain and rounded or has a small protrusion on the exterior face suggesting it has been rolled slightly to the outside. One example has a handle which stretches from the rim to the base in a classic D

shape. Examples all come from Julfarware 3 fabrics with red painted decoration on the inside consisting on lines running from rim to base.

Open / Closed: Open

Diameter: 120mm outer, 100mm inner

Cup

Thickness: 6mm

Ware: JULF3

Associations: JC2 has some similarities in style and function. Other small cup types include J32 and J20. One example in phase 5 but rest (3) in post stone phases 7 and 8. These could be residual or it could be a late type. Earliest date would be early 15th Century AD but could date to end of 15th/early 16th Century.

RIM CODE: JC2

General Description: A cup type which is slightly closed by the sides turning in approximately 30mm below the rim. Of unknown depth and base style. The rim are thinner than JC1 with the rim being thinner after it is turned slightly to the exterior of the vessel. Examples do not have handles but do have small triangular lugs affixed vertically to the sides of the vessel (rather than horizontally as with cooking ware types). These are either just below the rim or 15mm below. The type is only found for Julfarware 3 fabric with the rim being painted with a red band which runs the whole circumference of the vessel and with some examples having red lines running rim to base on the exterior of the vessel.

Open / Closed: Closed

Diameter: 90mm outer, 70mm inner

Cup

Thickness: 6mm for body, rim is 4-5mm thick

Ware: JULF3

Associations: JC1 has some similarities in style and function. Other small cup types include J32 and J20. One example in phase 5 but rest in post stone phases 7 and 8. These could be residual

or it could be a late type. Earliest date would be early 15th Century AD but could date to end of 15th/early 16th Century.

NON-GLAZED WARE RIM TYPES:

RIM CODE: NG1

General Description: Transport/Storage vessel rim type, with the majority found on BUFF ware although some examples have been found on Non-ID types and one examples from MICA, which is similar to BUFF. The rim is developed out of a vertical vessel body immediately below it. It is substantically thicker than the body with large protrusions to both the interior and exterior faces. The exterior protrusion terminates lower than the interior one, meaning the rim top slopes upwards from exterior to interior. The exterior rim edge is not particularly smoothed unlike the interior edge which has been rounded. The rim therefore has a large lip running for the circumference of the vessel, probably used to allow a cloth cover to be attached to the vessel.

Open / Closed: Examples are open but probable use suggested complete vessel would be closed.

Diameter: 150mm-165mm outer, 110mm-120mm inner

Thickness: Body is 5mm thick, rim at thickest is 18mm thick.

Ware: BUFF, MICA, ODD

Associations: Similar in form to NG3 but has large internal lip- transport reasons. First found in phase 4 and becomes slightly more common during the stone phase. More examples are found during the post-stone phase although these could be residual. Probably dates from late 14th Century to late 15th/early 16th Century.

RIM CODE: NG2

General Description: Transport/storage rim type exclusive to LIM class. Gently inwards vessel sides to rim which is inwardly turned to make a horizontal protrusion which then starts to dip downwards. Some examples have raised banding at exterior of lip and approximately 15mm below the rim on the exterior. The vessel body becomes slightly thicker as it approaches the

rim. The interior rim edge is rounded but the exterior rim edge is unrounded. This internal protrusion could be an attempt to ensure the contents do not spill out of the vessel during transport, suggesting the contents may be loose or liquid.

Open / Closed: Closed.

Diameter: 160mm outer, 90mm inner

Thickness: Body is 8mm thick, rim at thickest is 32mm thick.

Ware: LIM

Associations: Similar to NG4 rims which are probably just damaged examples of NG2. Found in stone phases 5 and 6 in small numbers with some examples also found in post-stone layers. Probably dates to the 15th Century.

RIM CODE: NG3

General Description: Similar rim type to NG1. However this type has no interior protrusion. The interior surface continues upwards until the external lip meets it, with a steep slope from the interior surface down to the lip edge. Similarly the exterior lip is not rounded and is turned quite sharply. This is probably again due to a need to attach a cloth cover to the open vessel mouth.

Open / Closed: Closed.

Diameter: 130mm outer, 100mm inner

Thickness: Body is 6mm thick, rim at thickest is 14mm thick.

Ware: BUFF

Associations: Similar in form to NG1 but does not have large internal lip so could be plain storage version. First found in phase 5 although only three examples. Two individuals found in the two post-stone phases although these could be residual. Probably dates from late 14th Century to late 15th/early 16th Century.

RIM CODE: NG4

General Description: Very similar to NG2 type. Also only found in LIM classes. It is possible that this type is NG2 with the inner lip broken off as it is difficult to tell whether there is a break with the LIM fabric. The example does show the handle type for LIM vessels which is a D shaped handle starting 20mm below the rim and reconnecting 70mm below the rim. It rises to 21mm above the vessel exterior surface at its furthest away.]

Open / Closed: Closed.

Diameter: 110mm outer, 80mm inner

Thickness: Body is 14mm thick, rim at thickest is 14mm thick.

Ware: LIM

Associations: Similar to NG2 rims as examples are probably just damaged examples of NG2. Only found in modern/disturbed layers which suggests that if they are an individual rim type separate to NG2, they are a late type used for transport around the Gulf- 16th Century AD or later.

RIM CODE: NG5

General Description: A simple termination rim found in both hard and soft white ware types and white incised ware types. The rim is merely a rounded end of the vessel body which is in general vertical in the sherds which have demonstrable rims. The vessel body may become larger or smaller below this but there are no complete vessels to demonstrate which it is. The rim is thinner that the vessel body as the internal surface slopes out from the centre of the vessel.

Open / Closed: Unknown

Diameter: 85mm outer, 75mm-80mm inner

Storage vessel

Thickness: Body is approx. 4mm, rim thins to 3mm

Ware: HWW, SWW, WIW

Associations: Some examples of this rim type found with WAVE type decoration around the rim. Early introduction in phase 3 in small numbers then found in slightly larger numbers in phase 4. Stone phase only has one example of this type with more coming through in the post stone

phases, possibly with some residuality. Appears to date to mid-late 14th Century, possibly with continuations into the mid 15th Century.

RIM CODE: NG6

General Description: LIM class rim type. Near vertical vessel sides from deep bowl thicken on the interior side before round into a slight overhang. Exterior surface rounds on to rim top which has a small dip in the middle between the two edges.

Open / Closed: Open

Diameter: 165mm outer, 140mm inner

LIM bowl type. Odd.

Thickness: Body is approx. 8mm, rim thickens to 12mm

Ware: LIM

Associations: Unclear if this type has any associations with any other rim types. Only examples found in phase 5 (stone building). Possibly should not be considered as a rim type as only one example found. However the phasing of the type suggests an early 15th Century date.

RIM CODE: NG7

General Description: Small cooking pot or gourd rim type from Indian wares TRBW and TBBW. Bulbous round body and base which then narrows at a neck approximately 20-30mm below rim top. Rim is then turned outwards and rounded, staying the same thickness until its termination.

Open / Closed: Closed

Diameter: 75mm-120mm outer, 60mm-90mm inner

Thickness: Body is 6mm thick, rim at thickest is 6mm thick.

Ware: TRBW, TBBW

Associations: A smaller version of other NG rim types from the Indian sub-continent. This type appears to be a small goard type possibly for holding small amounts of foodstuffs e.g. spices.

Found only in post-stone phases, suggesting a late type if it is not residual. As there is little evidence it is residual the type probably dates from the 16th Century.

RIM CODE: NG8

General Description: Bahraini storage ware rim. Slightly similar rim development to NG1 and NG3 with a long fair horizontal vessel neck developing into the rim by first curving outwards and then being turned inwards at a high angle to create a rounded internal lip. Large handles are positions, probably 2, with one on either side, just below the exterior rim edge. This design could also be to stop the contents spilling during transit.

Open / Closed: Closed

Diameter: 115mm outer, 80mmm-90mm inner

Storage vessel

Thickness: Body is 9mm thick, rim at thickest is 11mm.

Ware: BAH

Associations: Similar form to NG2 and NG4 but different ware. Does not have large internal lip that typifies NG2. Only two examples found; one in the stone phase 5 and one in the modern/disturbed phase 8. This suggests a 15th Century date with a residual piece in the modern layers.

RIM CODE: NG9

General Description: Transport/storage vessel rim type found in BUFF. Possibly either a larger version of NG1 or a development of it. The rim is developed out of a vertical vessel body immediately below it. It is substantially thicker than the body with large protrusions to both the interior and exterior faces. The exterior protrusion terminates lower than the interior one, meaning the rim top slopes upwards from exterior to interior. The exterior rim edge is not particularly smoothed unlike the interior edge which has been rounded. The rim therefore has a large lip running for the circumference of the vessel, probably used to allow a cloth cover to be attached to the vessel. The interior protrusion is larger than that of NG1 and slightly thinner. This could be due to a difference in goods being transported in the vessel or just due to different manufacturers.

Open / Closed: Examples are open but probable use suggested complete vessel would be closed. Complete rim and some of body from block lift context 649 show body is wide, so vessel type is indeed closed.

Diameter: 190mm outer, 140mm inner

Thickness: Body is 5mm thick, rim at thickest is 14mm thick.

Ware: BUFF.

Associations: Similar to NG1 and NG3 but with much more pronounced internal rim. Only found in later post-stone phases 7 and 8 suggesting it is a later transport rim type from the end of Julfar dating to the 16th Century or later.

RIM CODE: NG10

General Description: Storage vessel rim type found in CRWW vessels. Vertical vessel sides (the example found is possibly from the neck of a larger closed storage vessel as CRWW class is a storage vessel ware) with a simple rim termination. There is some undulation on both the interior and exterior surfaces with a 10mm wide protruding band on the interior surface being mirrored by a 10mm dip in the exterior surface. The rim curves very slightly inwards.

Open / Closed: Example found is open but ware type is a storage vessel ware so likely to be closed

Diameter: 115mm outer, 100mm inner

Thickness: Body is 6mm thick, rim at thickest is 8mm thick.

Ware: CRWW.

Associations: Ware is generally found in SJ1 and Sj3 rim types but NG10 is very different in form to these. Examples found in post- stone phases which could be residual from previous phases but also could be genuine in date. Probably dates to 16th Century or later.

RIM CODE: NG11

General Description: Indian ware storage or large cooking pot. Vessel body is curving upwards and slightly inwards then thickens at the interior surface. The exterior surface is curved through

90 degrees + and is then rounded. From this there is an upwards protrusion with a flat top which is separated from the angular inner rim edge by a 4mm deep, 10mm wide dip. Could be seen to be a more complex version of NG15.

Open / Closed: Closed

Diameter: 270mm outer, 220mm inner

Thickness: Body is 7mm thick, rim at thickest is 25mm thick.

Ware: Indian wares

Associations: Complex Indian cooking or storage pot. Only example found in phase 5 suggesting that it is part of the Indian assemblage brought in by increased international trade. Dates to 15th Century. Possibly a more complex version of NG15.

RIM CODE: NG12

General Description: Indian ware storage or large cooking pot. Similar beginning to rim to N7. After it turns outwards and upward again, the exterior rim turns horizontally outwards then nearly vertically upwards until it reaches the rim top which slopes gently up to the inner rim edge. Some pieces have an extra exterior band just underneath the larger protrusion.

Open / Closed: Closed

Diameter: 240mm outer, 200mm inner

Thickness: Body is 6mm thick, rim at thickest is 15mm thick.

Ware: Indian wares

Associations: Larger more complex version of NG7, presumably for food cooking and storage. First found in phase 5 with one example in both phase 7 and phase 8. Rare import type dating to 15th Century, possibly later.

RIM CODE: NG13

General Description: Indian ware rim type. Rim turns vertical from the vessel body which has sloped in as it came upwards. Exterior surface turns at a near 90 degree angle and runs for

25mm outwards until it is rounded. The interior surface has a slight inward protruding band which is rounded and then slopes gently downwards to the exterior edge.

Open / Closed: Closed.

Diameter: 270mm outer, 230mm inner

Storage Vessel

Thickness: Body is approx. 5mm, rim thickens to 20mm

Ware: Indian wares.

Associations: Storage/cooking vessel with large rim. Found first in phase 4 as one of the first Indian rim types for be introduced at Julfar- either a cooking vessel brought by crews from India or a storage ware bringing goods from that area. Also found in modern/disturbed layers which could be residual. Probably dates to late 14th Century/early 15th Century AD.

RIM CODE: NG14

General Description: Indian ware rim type. Vessel body curves inward to the rim which is the narrowest point of the upper vessel, there is a slight thickening shown on the interior surface 25mm below the rim top. The inner rim edge has an overhang over the interior surface which is rounded into the rim top which runs horizontally to the outer rim edge (with 3 incised rings running around the rim top on some examples). The outer rim edge is also round and the exterior surface runs off the rim edge perpendicular to the rim top before curving down and outwards to meet the rest of the body.

Open / Closed: Closed.

Diameter: 220mm outer, 180mm inner

Storage Vessel

Thickness: Body is approx. 5mm, rim thickens to 7mm

Ware: Indian wares.

Associations: Flat topped storage vessel found in stone phase 6 (one example) suggesting it dates to early to mid 15th Century AD. Similar to NG11 but larger rim.

RIM CODE: NG15

General Description: Indian ware rim type. Rim develops vertically from narrowest point of upper vessel. Interior surface is vertical before rounding into a small narrow upwards protrusion which forms the rim top. There is the a small dip on the exterior side of this and then the surface is rounded into an exterior protrusion approximately 9mm out from the exterior surface. This is then rounded into the vertical exterior surface.

Open / Closed: Closed.

Diameter: 180mm outer, 150mm inner

Storage Vessel

Thickness: Body is approx. 6mm, rim thickens to 15mm

Ware: Indian wares.

Associations: Smaller mouthed storage vessel compared to other similar examples (NG12, NG13, NG14). Exterior rim in similar to NG13 but larger and slightly thinner. One example found in phase 1- the first Indian ware rim found at al-Nudud. All other examples found in post stone phases 7 and 8. Could be two different similar rim types or an infrequent contact with a ceramics industry in India. Date unknown.

RIM CODE: NG16

General Description: Indian ware rim type. Diameter and size varies a lot. Can be found in large, medium and some small storage jars/cooking vessels. Rim appears to develop out of a narrowing in the vessel body at the thinnest point, after which the body presumably widens out further down the vessel. No complete examples of this survive. Above this narrow point, the body curves out slightly again then turns horizontal on the rim top. The bottom/external rim surface is half oval shaped with a convex curve facing straight down. This is then turned upwards and angularly joins the rim top.

Open / Closed: Closed

Diameter: 210mm-300mm outer, 180mm-250mm inner

Cooking vessel

Thickness: Body is 5-10mm thick, rim at thickest is 7-12mm.

Ware: Indian wares.

Associations: Similar to NG18 but rim is turned down to horizontal. More rounded and thicker than NG14. Only found in post stone phases 7 and 8 so likely to be a rare late Indian rim type dating to the 16th Century.

RIM CODE: NG17

General Description: TBBW rim type, probably for a storage vessel. Vertical sides turn inwards at a nearly 90 degree angle for approx. 20mm then turns vertically. Rim then develops out into an exterior protrusion which is well rounded. The rim top has a small upward protrusion at the inner rim edge from which the surface first goes straight down for 2-3mm then slopes to the external rim edge. Some examples have incised cording around the external rim edge.

Open / Closed: Closed

Diameter: 220mm outer, 200mm inner

Cooking vessel

Thickness: Body is 3mm thick, rim at thickest is 10mm.

Ware: TBBW

Associations: No similar types known at Julfar. Two examples; one found in stone phase 5 and one in modern/disturbed layers. This would suggest that it dates to the early/mid 15th Century with some residuality.

RIM CODE: NG18

General Description: Indian burnished ware rim type. Similar to NG16 but the angle of the rim is higher. The shape of the rim is however very similar with the exterior surface of the rim being the shape of a half oval, with the curved side outwards. The rim top has a very slight overhang over the inner surface and then the surface goes down vertically before curving outwards to make the bulbous vessel body.

Open / Closed: Closed

Diameter: 125mm outer, 100mm inner

Storage vessel

Thickness: Body is 5mm thick, rim at thickest is 12mm.

Ware: Indian wares.

Associations: Similar to NG16. Examples found in both stone phase 5 and later post-stone phases so probably dates to the early 15th Century. Uncommon rim type.

RIM CODE: NG19

General Description: Non-ID and Indian ware rim type for storage vessels and possibly cooking jars. Appears to develop from narrowing of bulbous vessel body. At narrowest point rim then curves upwards and outwards, then forming an exterior protrusion which is rounded. There is then an upward protrusion from the rim top which has a rounded outer edges and an angular inner edge. This design could be to allow a cloth top to be put on the vessel and to stop the contents escaping during transit.

Open / Closed: Closed

Diameter: 120mm-140mm outer, 100mm inner

Storage vessel

Thickness: Body is 5mm thick, rim at thickest is 21mm.

Ware: ODD, Indian wares.

Associations: Similar to transport rims found in BUFF ware- could be for similar function. Only found in modern layers so likely to be a late uncommon Indian rim type dating to after the 16th Century AD.

RIM CODE: NG20

General Description: FIGW and Non-Id rim type for either small cooking pot or small jar. Both closed vessels. Vessel body narrows then curves outwards slightly. There is a small exterior

protrusive band approx. 10mm below the rim top. The inner rim edges slopes slightly up from vertical toward the rim top. Could also be storage vessel for smaller quantity materials.

Open / Closed: Closed

Diameter: 90mm outer, 70mm inner

Cooking vessel

Thickness: Body is 5mm thick, rim at thickest is 5mm.

Ware: FIGW, ODD.

Associations: Possible similar function to NG7 rim types but different rim form and wares. Late rim type as only found in post stone phases 7 and 8. Uncommon type at Julfar.

STORAGE JAR RIM TYPES:

RIM CODE: SJ1

General Description: Rim type found on CRWW vessels. Rim is formed from a heavily closed body vertically from exterior surface with a slight thickening and a slight outward curve 10mm from start of rim formation. The exterior rim edge is rounded and the rim top then slopes slightly to the interior rim edge which is also rounded. The interior of the rim formation is also slightly thickened with a slight interior overhang. These types have incised wavy decoration running around the vessel between 7mm and 34 mm below the start of the rim formation. Below this decoration are incised bands again running around the vessel.

Open / Closed: Closed.

Diameter: 130mm outer, 100mm inner

Thickness: Body is 6mm thick, rim at thickest is 14mm

Ware: CRWW

Associations: Similar form to SJ2 but no large outer lip and to some Julfarware rim types such as J14 but has wave decoration below rim. Only found in post-stone layers so probably an uncommon late storage ware dating to the early 16th Century or later.

RIM CODE: SJ2

General Description: Rim type found on CRWW vessels. Similar form to rim part of SJ1 with slight lip on exterior of rim and slightly slope upwards from exterior to interior rim edges. However body of vessel does not appear to expand outwards. Vessel form appears to be open, however this may be due to a lack of larger sherds of this form. Sides of vessel on sherd are vertical. Slight lip could show evidence of a cloth cover for vessel mouth.

Open / Closed: Closed.

Diameter: 150mm outer, 120mm inner

Thickness: Body is 7mm thick, rim at thickest is 15mm

Ware: CRWW

Associations: Similar to SJ1 and to other Julfarware storage wares such as J14 but has the larger exterior lip. Only found in phase 1 so early storage ware rim (early 14th Century or before). Very uncommon.

RIM CODE: SJ3

General Description: Fabric for this type is CRWW. A possible development on either NG1 or 3. The rim is developed from vertical interior and exterior vessel sides with no deviation or protrusion on the internal edge. The external rim protrusion follows a similar out-turned profile to NG3 with the edge being rounded. From this edge however the rim rises steeply to form a flat rim top which then runs horizontally to the internal rim edge. The exterior surface has wavy incised decoration, with the wave peaks being closer together than NG1 and 3 approximately 45mm from the bottom of the rim protrusion.

Open / Closed: Closed.

Diameter: 130mm outer, 110mm inner

Thickness: Body is 6mm thick while rim at thickest is 17mm.

Ware: CRWW

Associations: Similar to NG1, NG3 and NG9 but in different ware. Only example is found in post abandonment phase so likely to be a rare late rim type from the early 16th Century AD.

RIM CODE: SJ4

General Description: CRWW and Non-ID rim type for storage jars. Vessel body slopes inwards toward narrowest point which is the rim. Interior surface has one slight protrusion 20mm below the rim, then a slight depression 15mm below the rim before inwardly protruding again for the inner rim edge which is rounded to the rim top. The exterior surface turns outwards to form a sub-rounded exterior protrusion 15mm below the rim top then slopes upwards to the rim top.

Open / Closed: Closed

Diameter: 120mm outer, 100mm inner

Storage jar type.

Thickness: Body is 7mm thick, rim at thickest is 11mm.

Ware: CRWW, ODD.

Associations: No parallel to this rim type in the Julfar assemblage. Only example found in modern phases. Late rare storage rim (post 16th Century).

WHITE WARE RIM TYPES:

RIM CODE: W1

General Description: White ware rim type generally only found in white incised ware fabric 1 (WIW1). Exterior surface is heavily decorated, usually with the distinctive wave style of decoration just below the rim and then regular incised horizontal lines running around the whole vessel. These are sometimes broken up by vertical softened incisions which run round the vessel. The interior surface is undecorated and vertical. The rim develops into an external lip 5mm below the top which is slightly rounded. These vertical sided types suggest a narrow necked form (diameter is between 80 and 110mm) with possibly a large body below as can be seen in other water jars. Priestman has suggested that these are decorated water cooling jars.

Open / Closed: Open in examples found but no complete vessels. Likely to be narrow necked with bulbous body.

Diameter: 80mm outer, 70mm inner

Storage vessel

Thickness: Body is 3mm thick, rim is 5mm thick.

Ware: WIW, BIW

Associations: Similar to NG5. Examples have WAVE decoration around rim. All examples found in modern phases however so likely to be a late development in the incised ware assemblage- post 16th Century AD?

RIM CODE: W2

General Description: HWW rim type. For small white ware bowls with straight slightly outward and upward sloping vessel shapes. Rim develops at a near right angle from these to be horizontal and then at outer edge turns vertically to form a small lip. This is rounded. Some examples are missing this lip, possibly due to ware.

Open / Closed: Open

Diameter: 140mm outer, 110mm inner

Bowl type. Unknown use.

Thickness: Body is 5mm thick, rim at thickest is 3mm.

Ware: HWW

Associations: Small bowl type with no similar types. Only found in modern layers so late uncommon rim type in HWW (post- 16th Century AD?)

RIM CODE: W3

General Description: HWW rim type. For small white ware bowls with shallow sloping sides. As vessel sides near the rim, they thicken and the exterior surface is rounded up to vertical when a small lip is formed where the rounded exterior surface and the slightly rounded interior surface meet.

Open / Closed: Open

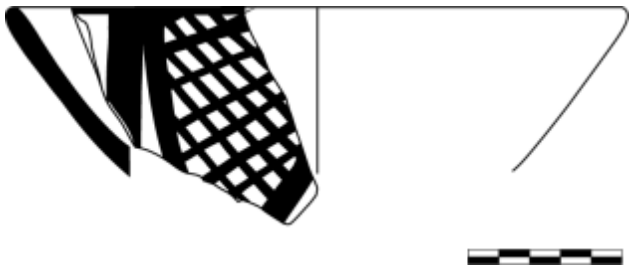
Diameter: 180mm outer, 170mm inner

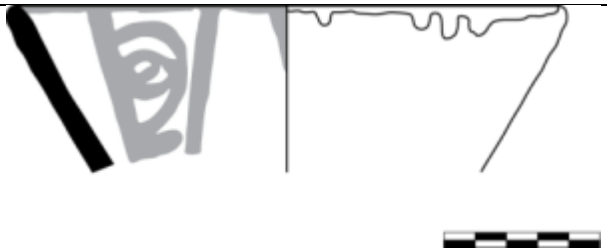
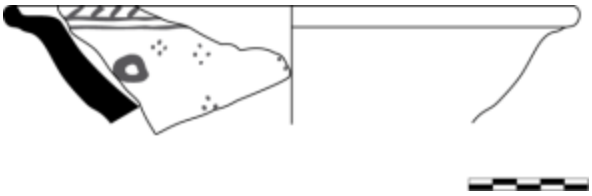
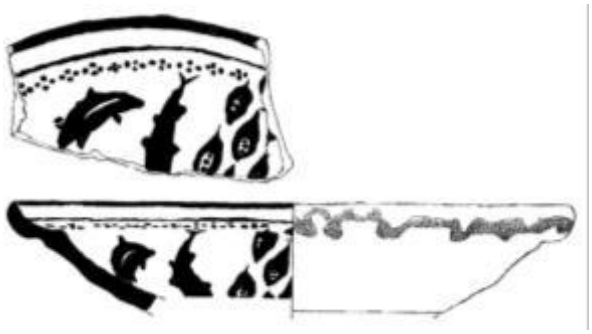
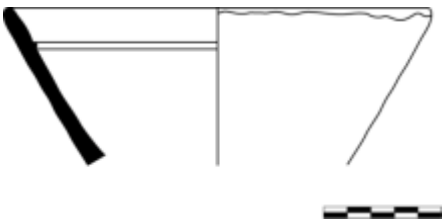
Bowl type. Unknown use.

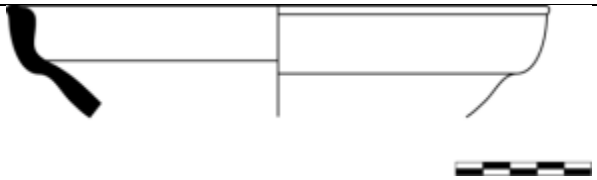
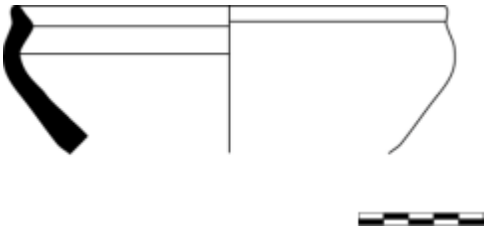
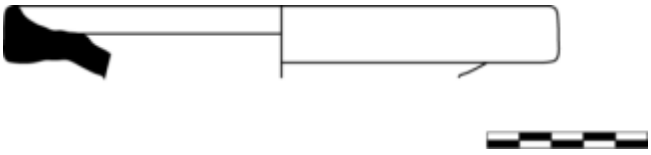
Thickness: Body is 5mm thick, rim at thickest is 9mm.

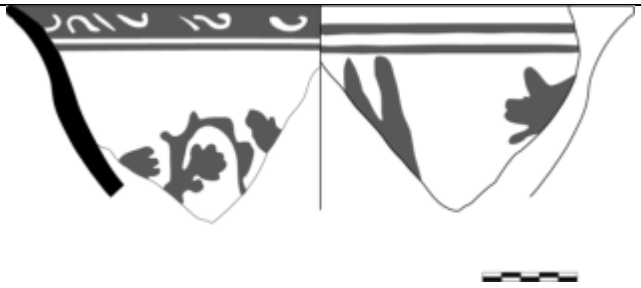
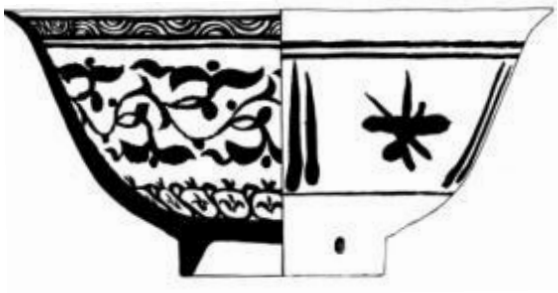
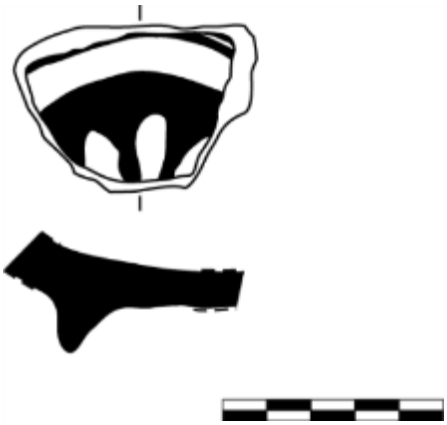
Ware: HWW

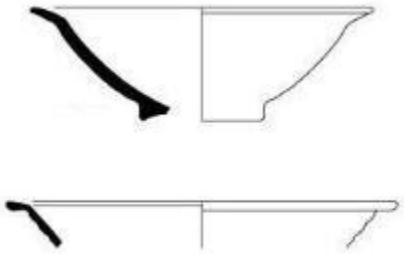
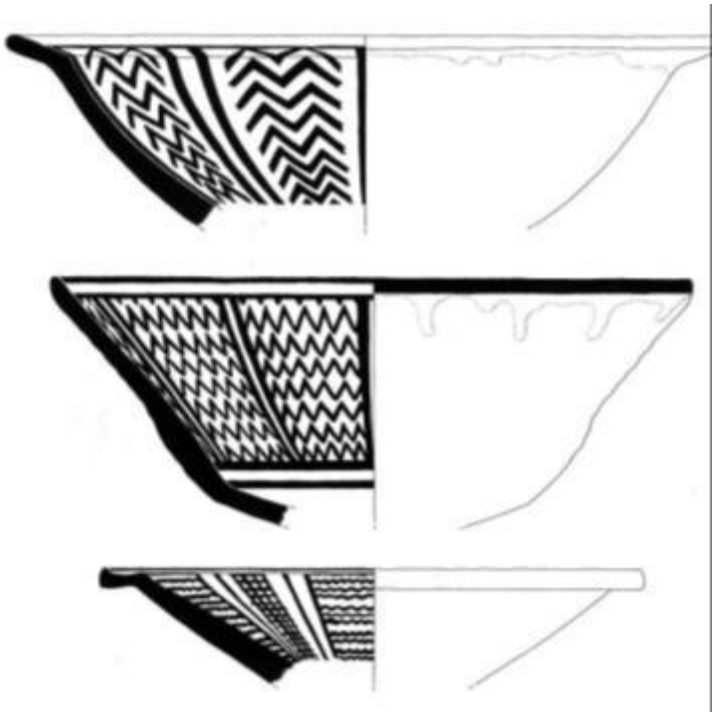
Associations: No similar examples. Small bowl type. One example in phase 4 and one example in phase 8. Either a mistake in cataloguing or residuality. Could be a late 14th Century AD type or post 16th Century AD. Other W rim types are all post 16th Century.

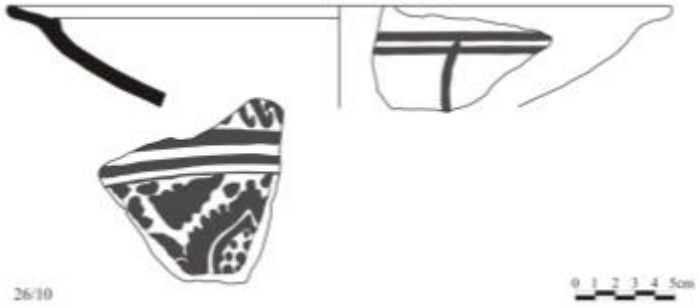
	# APPENDIX VI.I: INDIAN OCEAN GENERAL CERAMIC ASSEMBLAGE	
Ware name	Drawings	Notes
	ISLAMIC GLAZED WARES	
Persian Blue Speckled Ware- also called PBS, PERSIA, Standard Monochrome. Drawings 1, 2 and 3 all from Julfar al-Nudud 2010 excavations	Drawing 1:  Drawing 2:  Drawing 3: 	Common to both sites- described as soup plates in Frifelt 2001: 107-109. This ware appears to be a common part of the Iranian glazed ware export assemblage.
Manganese Painted Ware- also called MGP, MGPAINT. Drawings 5-7 are from the Julfar al-Nudud 2010 excavations	Drawing 4:  Drawing 5:	Common glazed ware at both sites. Possibly part of an Iranian glazed export assemblage which is common to this period and area.

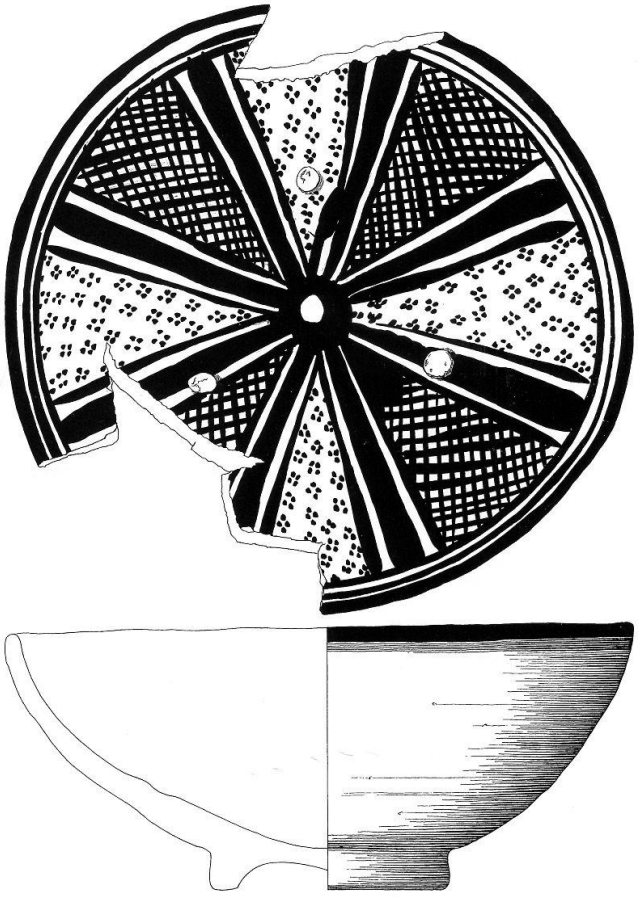
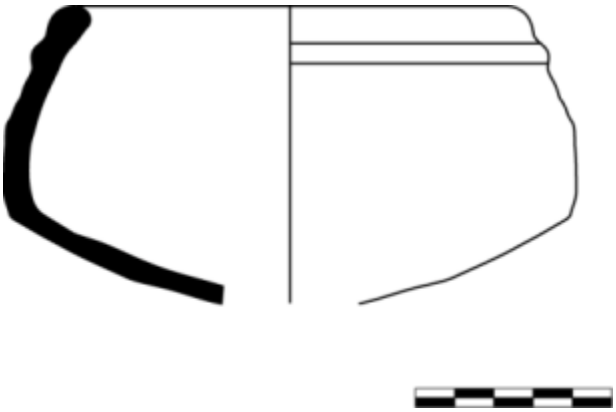
Drawing 8 is from the Danish excavations at Qala'at al-Bahrain (Frifelt 2001: 122- fig. 232)	 Drawing 6:  Drawing 7: 	
Tin Glazed Ware. Also known as Islamic glazed ware (white and green), Islamic White Ware All drawings are from Julfar al-Nudud 2010 excavations	Drawing 8:  Drawing 9:  Drawing 10:	This general class is common on both sites with similar vessel forms found. Could be part of a general Iranian export assemblage for this period and area.

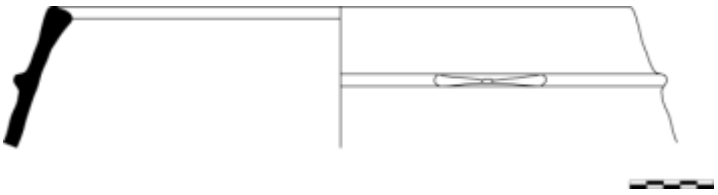
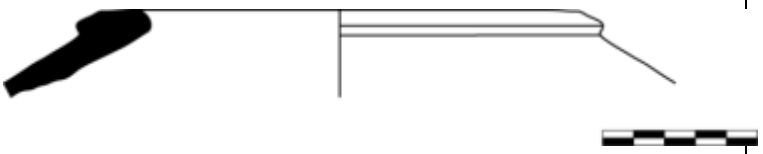
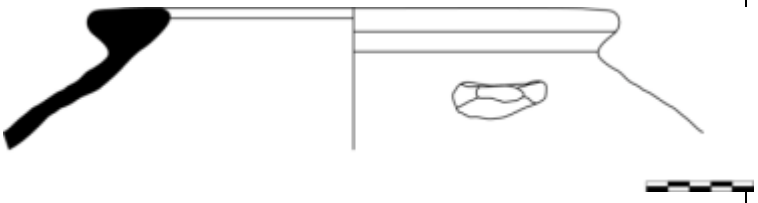
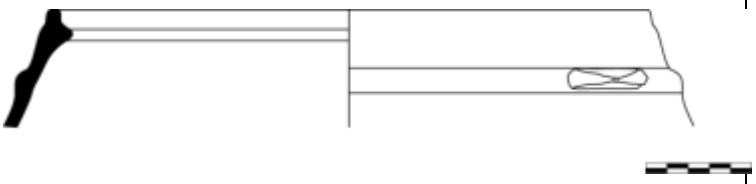
	 Drawing 11:  Drawing 12:  Drawing 13:  Drawing 14:  Drawing 15: 	
Frit wares (FRIT of	Drawing 16:	Common ware and rim forms found on both sites- possibly

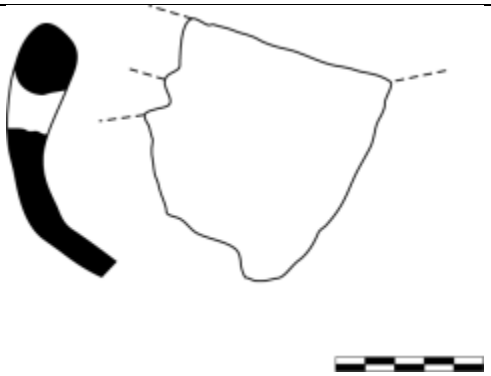
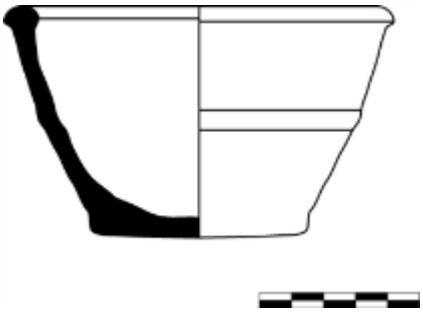
various colours Drawings 16, and 18-20 are from the 2010 Julfar al-Nudud excavations Drawing 17 is from the Danish excavations at Qala'at al-Bahrain (Frifelt 2001: 134- fig. 258.	 Drawing 17:  Drawing 18:  Drawing 19:  Drawing 20:	similar decorative styles as well. Part of this period's Iranian glazed ware export assemblage, common to this region.

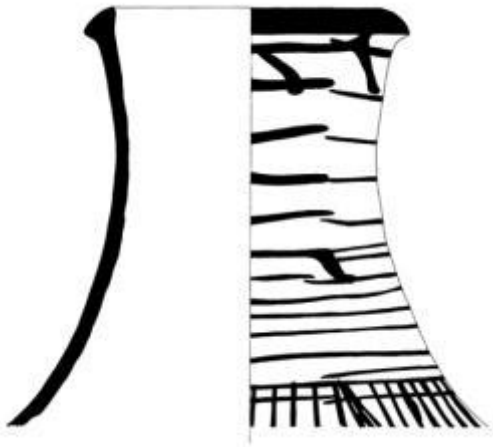
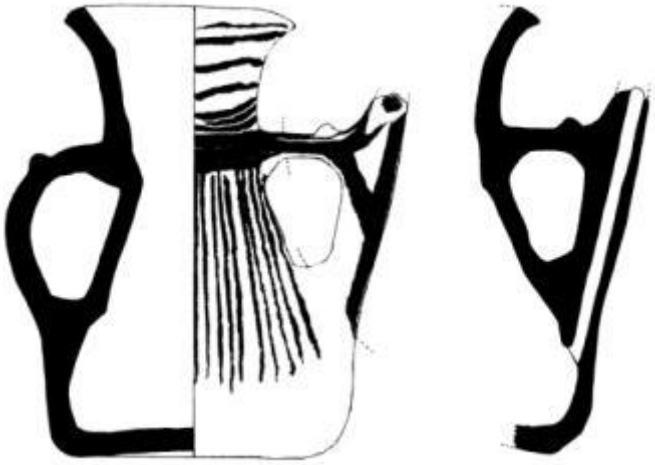
		
Yemeni Yellow. Also called YEMEN, YELL Drawing 21 is from the 2010 Julfar al-Nudud excavations Drawing 22 is from Kennet 2004: 140- fig. 13	Drawing 21:  Drawing 22: 	Ware probably traded in from Yemen area. Found at both sites but in very small quantities.
Green and Black glazed wares: also called Turquoise and Black, some NIDGW sherds from al-Nudud Drawing 23 is from Qala'at al-Bahrain: Frifelt 2001: 124- fig. 236 (a), (b) and (c). Drawing 24 is from the 2010 Julfar al-Nudud	Drawing 23:  Drawing 24:	Rare ware at Julfar al-Nudud but appears more common at Qala'at al-Bahrain, possibly as settlement there is for an extended period into the mid and late 16th Century.

excavations Drawing 25 is from Qala'at al-Bahrain: Frifelt 2001: 127- fig. 243	 Drawing 25:	

		
	ARABIAN GULF UNGLAZED WARES	
Julfar wares: Plain unpainted Julfarware. Also called JULFAR, JULFAR All drawings are from the 2010 Julfar al-Nudud	Drawing 26: 	Most common ceramic at Julfar as local ceramic tradition. Unglazed Julfarware is not found in large amounts at Qala'at al-Bahrain, probably due to a strong local tradition there.

excavations.	Drawing 27:  Drawing 28:  Drawing 29:  Drawing 30:  Drawing 31:  Drawing 32:	

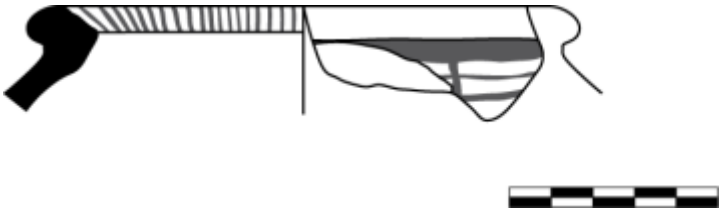
	 Drawing 33:  Drawing 34:  Drawing 35: 	
Red on White painted Julfar ware: Also called JULFAR.RW, JULFAR.RW,	Drawing 36:  Drawing 37:	Common to both sites. Exported from Julfar to Qala'at al-Bahrain as no similar wares known as part of Bahrain local

painted Omani ware. All drawings other than drawing 38 are from the 2010 Julfar al-Nudud excavations. Drawing 38 is from Bahrain (Frifelt 2001: 94- fig. 160)	 Drawing 38:  Drawing 39:  Drawing 40: 	assemblage. Fewer rim forms found in Bahrain suggesting specific vessel types exported.

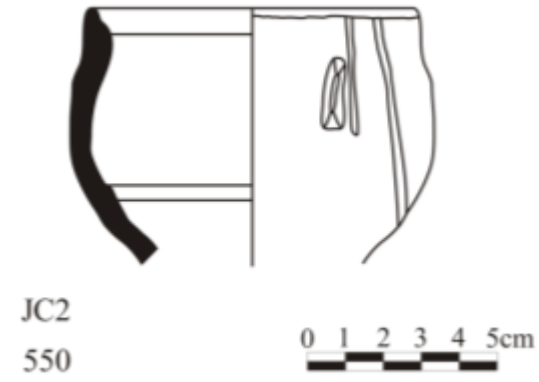
Drawing 41:

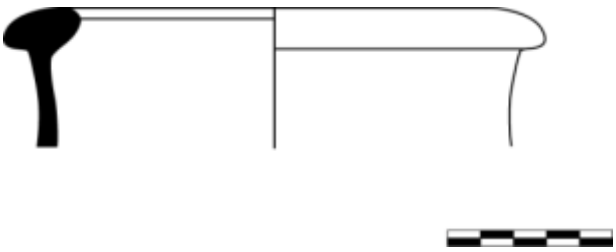
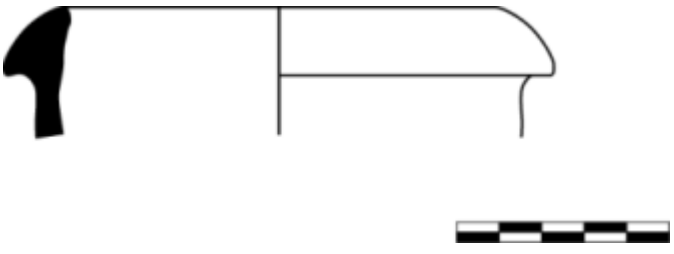
Drawing 42:

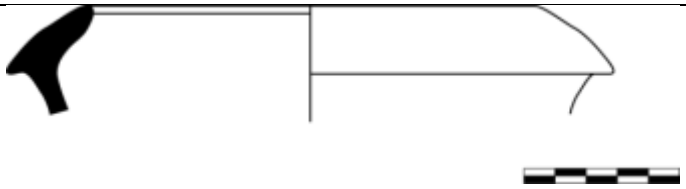
Drawing 43:



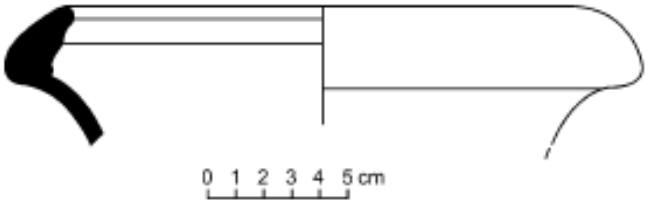
Drawing 44:



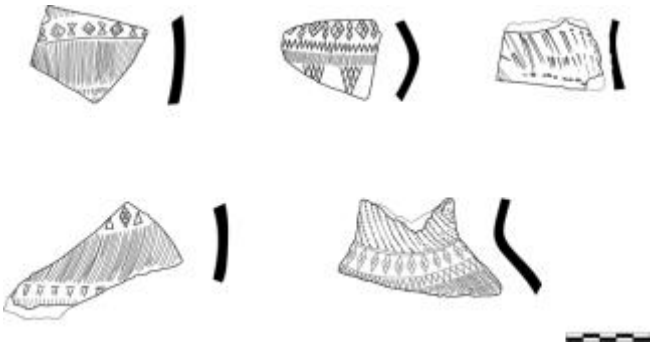
	HORMUZI BUFF FABRIC WATER JARS	
Hormuzi buff wares- also called BUFF, STWW, MICA, WIW, BIW, Buff, Hormuzi textile ware Drawing 45 is from Bahrain-Frifelt 2001: 98- fig. 170 All other drawings are from the 2010 Julfar al-Nudud excavations.	Drawing 45:  Drawing 46:  Drawing 47:  Drawing 48:	Found in large numbers at both sites- most common imported storage ware at Julfar al-Nudud and probably at Qala'at al-Bahrain as well. Described as Hormuzi/Minab delta textile ware in Frifelt 2001: 96-97. Probably similar function for either storing water or for exporting sweet water to Hormuz as both sites were known to be vassal/client cities.



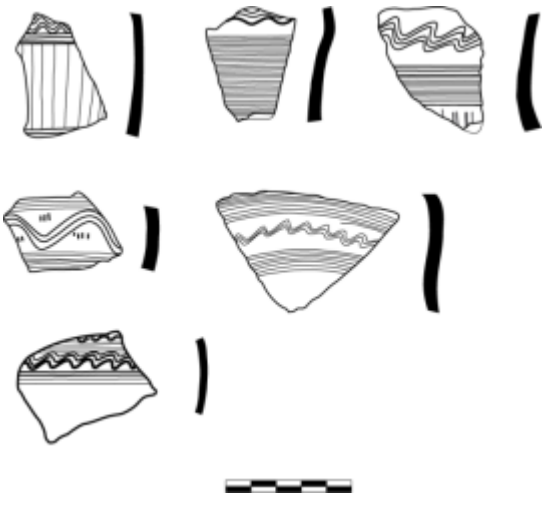
Drawing 49:



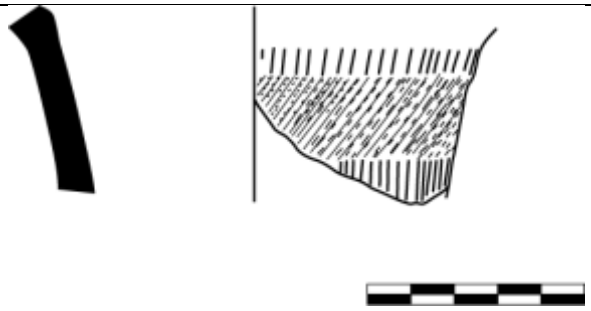
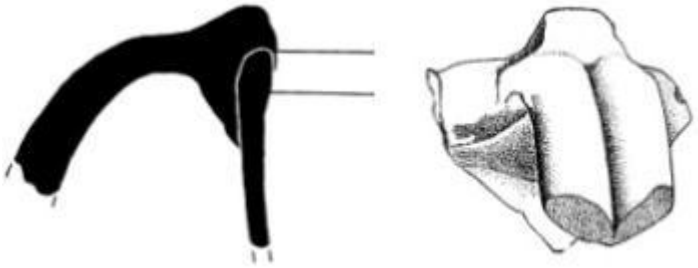
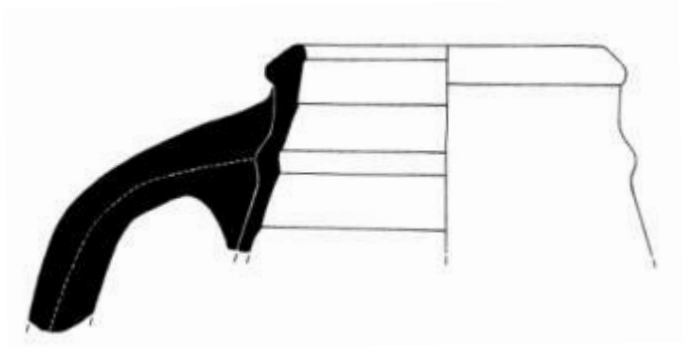
Drawing 50:

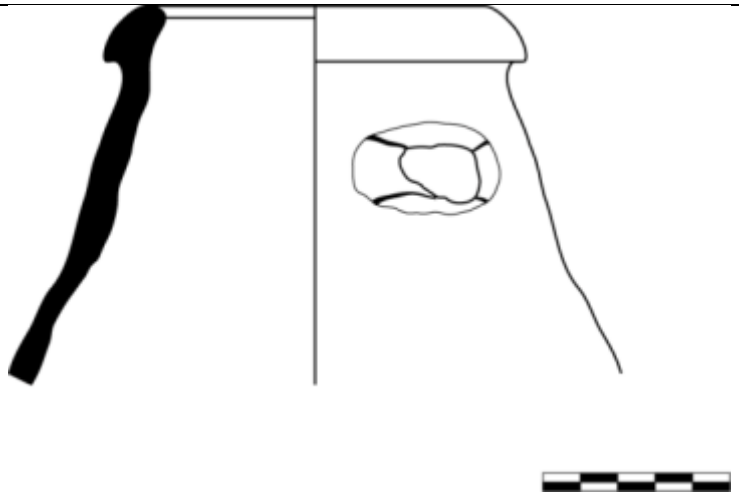
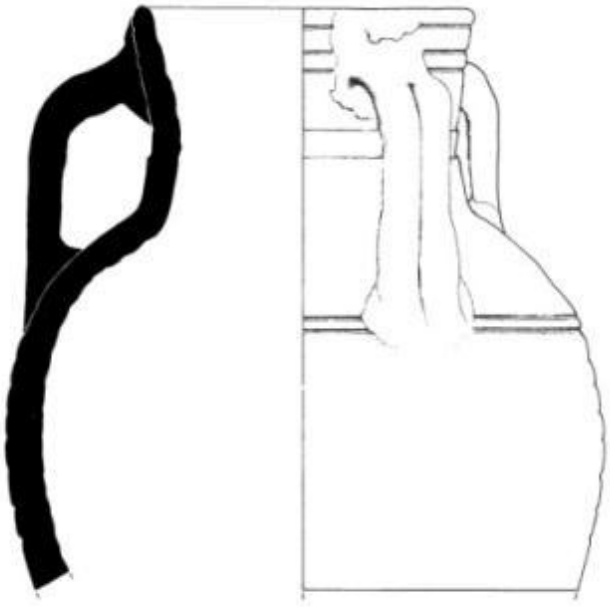


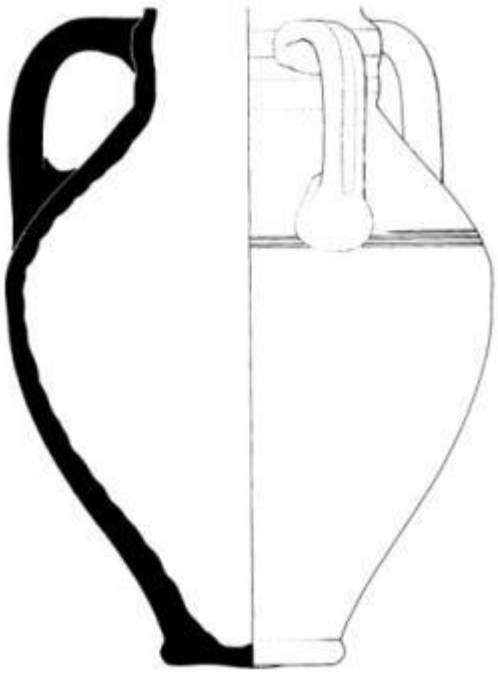
Drawing 51:

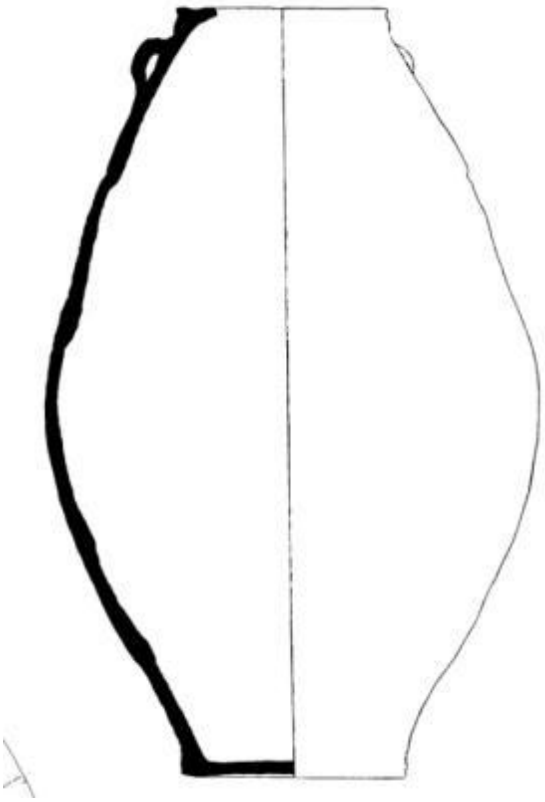


Drawing 52:

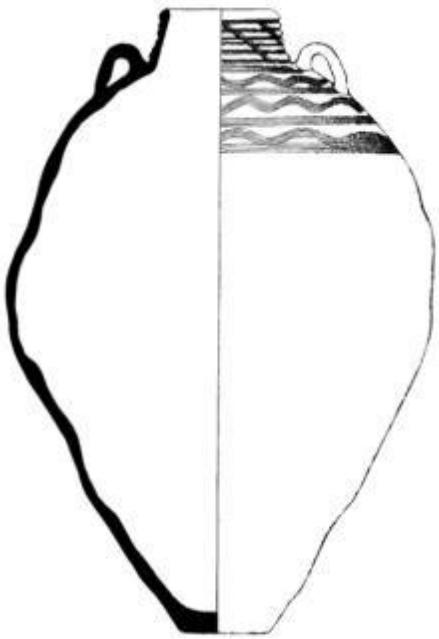
		
Bahraini Common Ware- also called LIME, LIME, BAH, greenish pink ware. (BAH and LIME are seen to be different wares in the al-Nudud report but probably have a similar source in Bahrain). Drawings 55, 60 and 61 are from the 2010 Julfar al-Nudud excavations. All other drawings are from Bahrain. Drawing 53: Frifelt 2001:	Drawing 53:  Drawing 54:  Drawing 55:	Local ceramic industry at Qala'at al-Bahrain so most common ware at that site. Some rim forms exported to Julfar al-Nudud- obvious selection of vessel types for export to other areas of Arabian Gulf for contents rather than the ceramic vessel.

67- fig. 95 Drawing 54: Frifelt 2001: 72- fig. 110 Drawing 56: Frifelt 2001: 66- fig. 93 Drawing 57: Frifelt 2001: 66- fig. 92 Drawing 58: Frifelt 2001: 65- fig. 90 Drawing 59: Frifelt 2001: 64- fig. 87 Drawing 62: Frifelt 2001: 85- fig. 139 Drawing 63: Frifelt 2001: 76- fig. 116 Drawing 64: Frifelt 2001: 76- fig. 115 Drawing 65: Frifelt 2001: 64- fig. 88	 Drawing 56:  Drawing 57:	

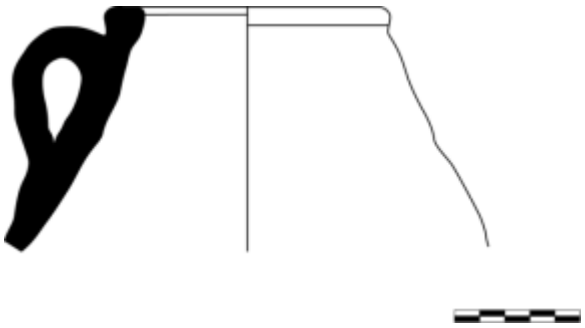
	 Drawing 58:	



Drawing 59:



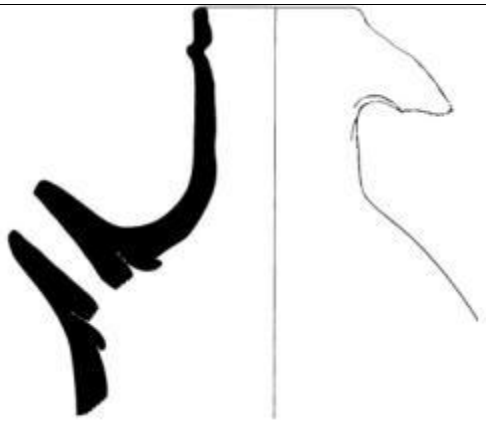
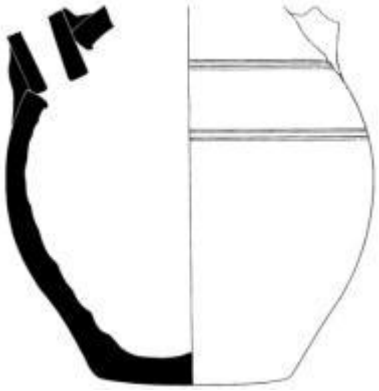
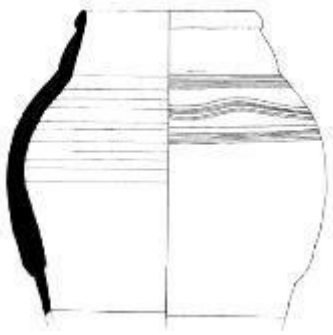
Drawing 60:

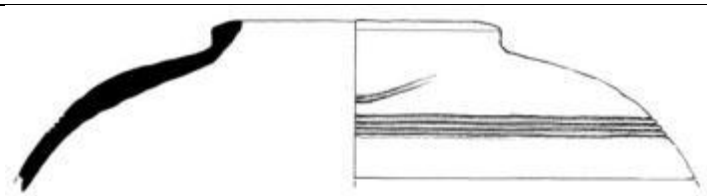
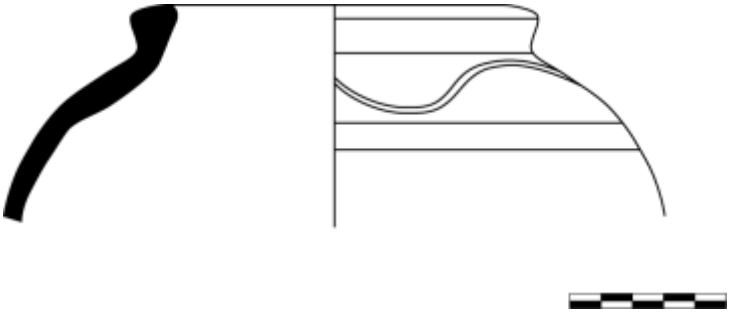
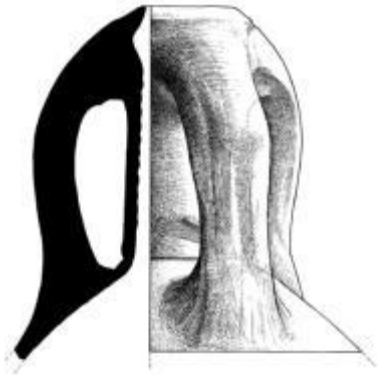
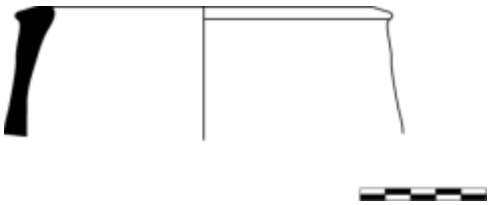


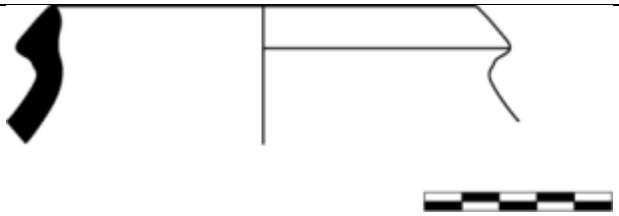
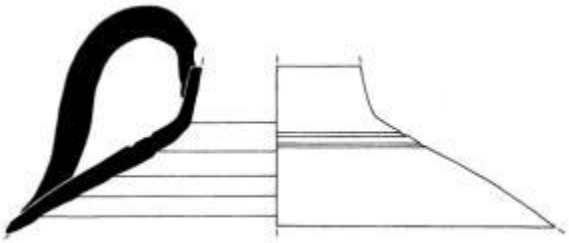
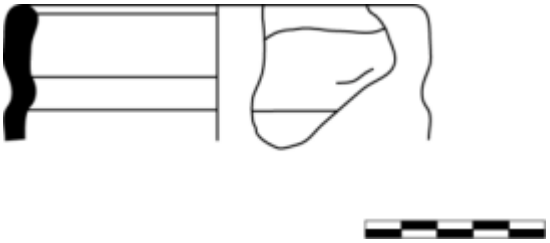
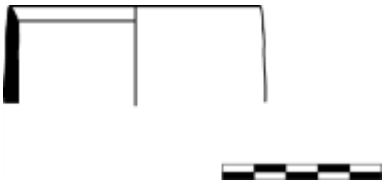
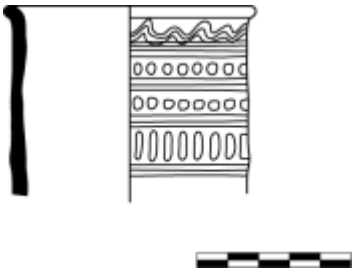
Drawing 61:

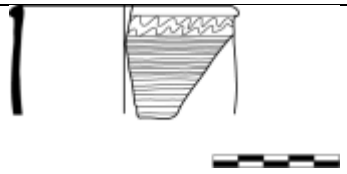
Drawing 62:

Drawing 63:

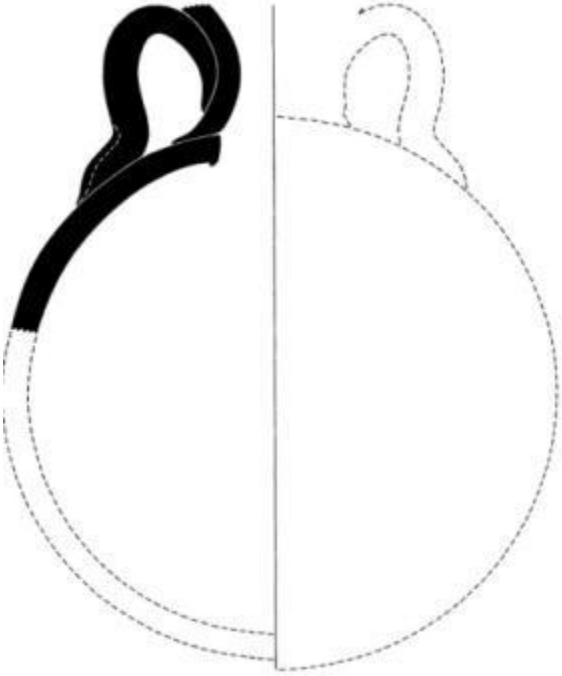
	 Drawing 64:  Drawing 65: 	
Cream slipped red ware- also called CRWW, cream slipped	Drawing 66:	Unknown origin but quantity found at Qala'at al-Bahrain suggests local Bahraini industry.

ware. Drawings 67, 69, 70 and 72 are from the Julfar al-Nudud 2010 report. Drawing 66: Frifelt 2001: 71- fig. 107. Drawing 68: Frifelt 2001: 78- fig. 122 Drawing 71: Frifelt 2001: 69- fig. 103.	 Drawing 67:  Drawing 68:  Drawing 69:  Drawing 70:	Common at Qala'at al-Bahrain and clear selection of vessel forms for export- 3 predominant vessel types found at Julfar al-Nudud as shown in drawings. Later adaptions after Portuguese annexation of Bahrain. Not found in southern Iran as represented in the Williamson Collection (Priestman 2005).

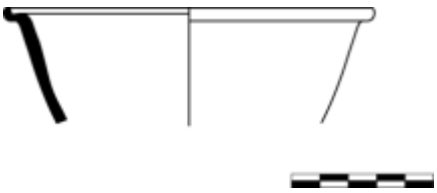
	 Drawing 71:  Drawing 72: 	
White wares- also called HWW, SWW, white wares. Drawing 76: Frifelt 2001: 81- fig. 124. All other drawings from Julfar al-Nudud 2010 report	Drawing 73:  Drawing 74:  Drawing 75:	Found throughout Gulf and East African seaboard, generally as *Gudulia* pilgrim flasks. Unknown production sites- Searight suggests multiple areas of production. Hard white fabric



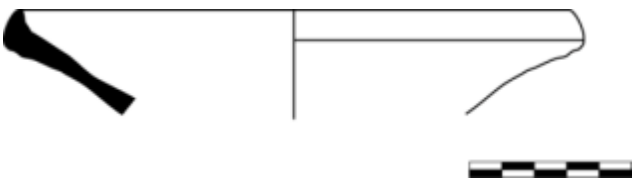
Drawing 76:



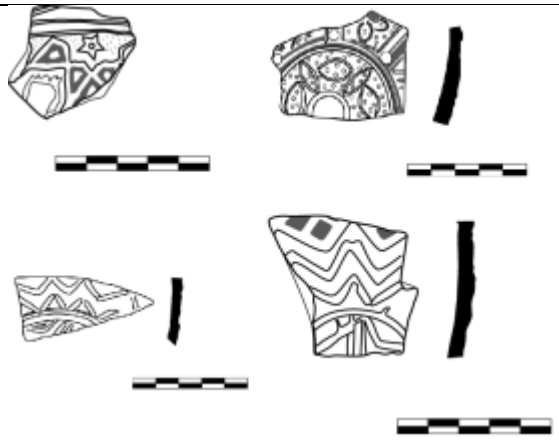
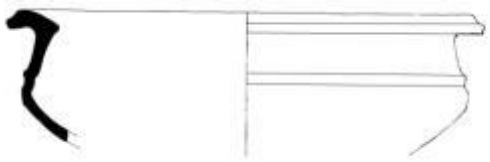
Drawing 77:

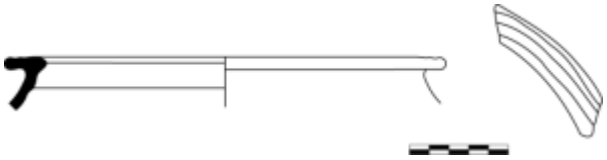
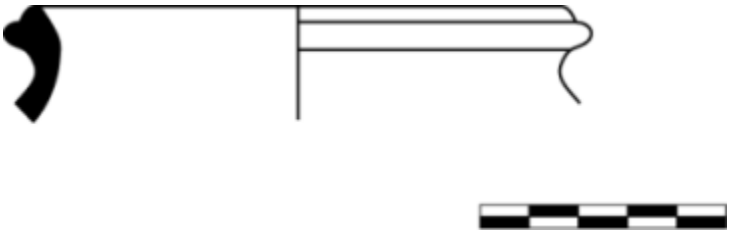
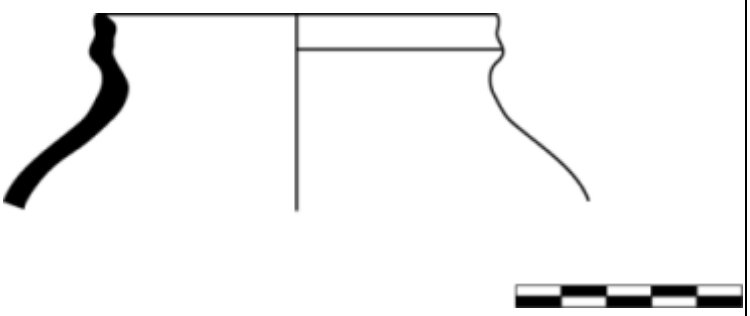


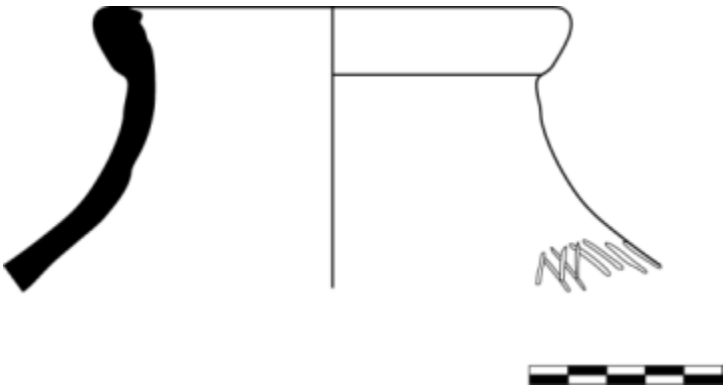
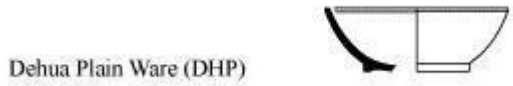
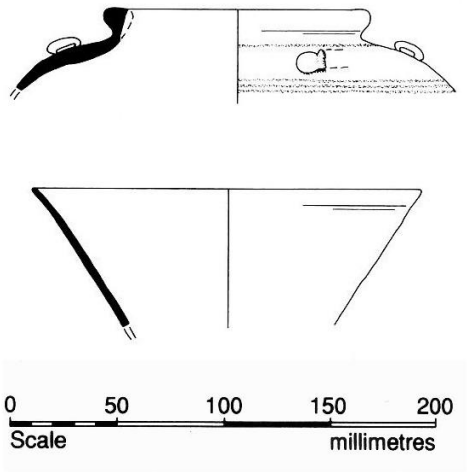
Drawing 78:

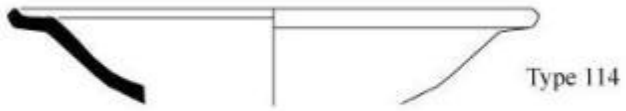
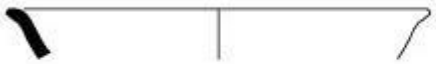
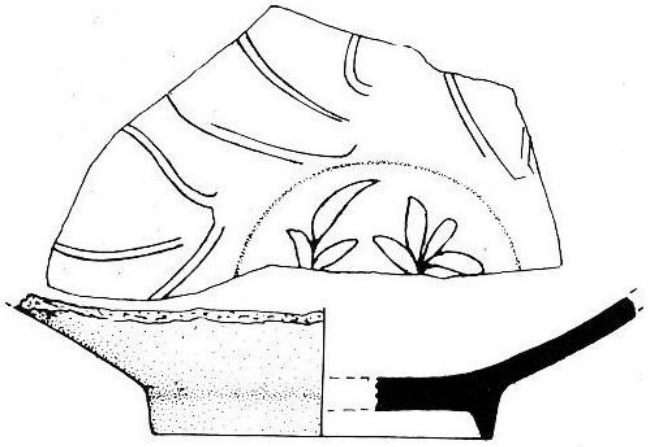


Drawing 79:

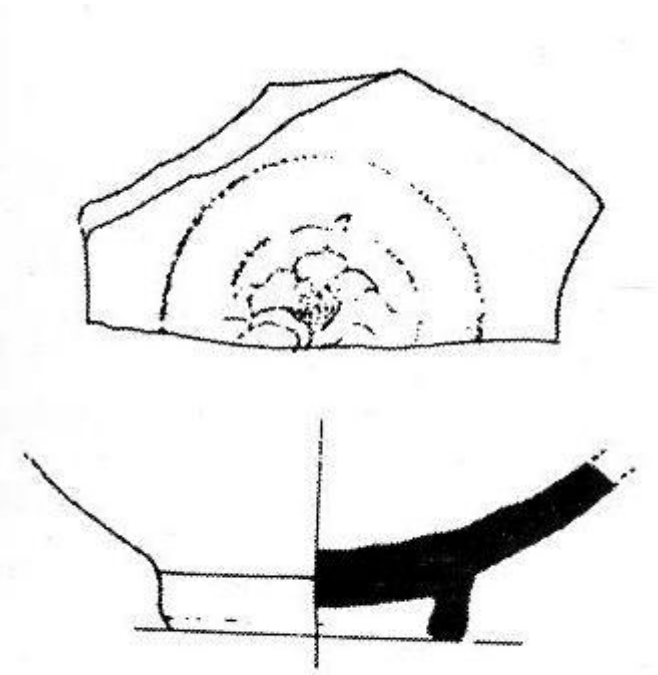
		
	INDIAN WARES- WESTERN COAST AND SRI LANKA	
Various wares: Indian Red Burnished Wares (IRBW), Indian Black Burnished Ware (IBBW), Coarse Orange and Black ware (CORB), Deep Incised Indian Ware (DIIW. BL and DIIW.B) and TEXT. Drawing 80 is from Bahrain- Frifelt 2001: 90- fig. 151 All other drawings are form the 2010 Julfar al-Nudud	Drawing 80:  Drawing 81:  Drawing 82:  Drawing 83: 	Indian wares are found generally around the Indian Ocean. Difficult to make clear distinctions between wares and to provenance to a particular area. Both Julfar al-Nudud and Qala'at al-Bahrain have a number of Indian wares and a selection of different rim forms in their assemblages.

excavations	Drawing 84:  Drawing 85:  Drawing 86:  Drawing 87:  Drawing 88:  Drawing 89: 	

	Drawing 90: 	
	FAR EASTERN WARES	
Dehua Ware. Also called DEH Drawing from Kennet 2004: 143- fig. 16	Drawing 91:  	12th-13th Century. Earliest Far Eastern ware included in this table
Qingbai Ware. Also called QING Drawing is from Shanga-Horton 1996: 308- fig. 231 (b) and (d)	Drawing 92:  	12th-14th Century. Assemblage can be split into two phases 12th-13th Century examples and 14th Century examples
Longquan Celadon. Also called LQC. Many variants	Drawing 93:	First made in the late 13th Century. First examples in the Western Indian

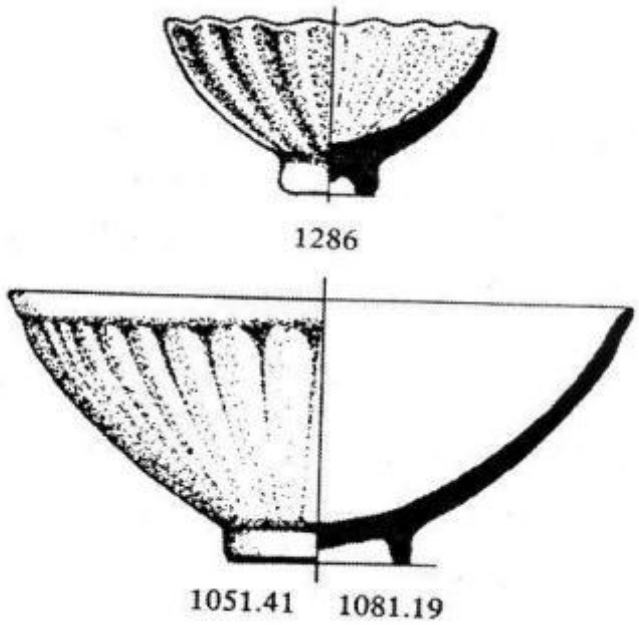
allowing for close dating. Drawings 93-95 are from Julfar al-Mataf: Kennet 2004: 145- fig. 18 Drawings 96, 104 and 105 are from Manda: Chittick 1984: 70- fig. 33 (c) – (e) Drawings 97 and 98 are from Bahrain: Kervran *et al* 2005: 305- fig. 127 Drawings 99-103 are from Shanga: Horton 1996: 306- fig. 230 (e), (f), (g), (h), (i), (k) and (l).	 Type 114 Drawing 94:  Type 111 Drawing 95:  Type 107 Drawing 96: 	Ocean are from mid 14th Century. Becomes less common in late 15th after introduction of CBW

Drawing 97:



1082.1

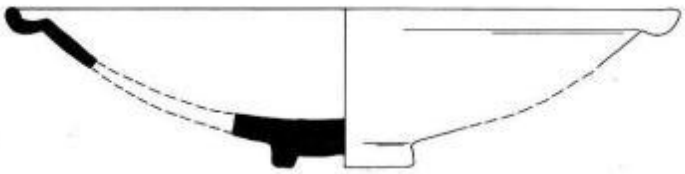
Drawing 98:



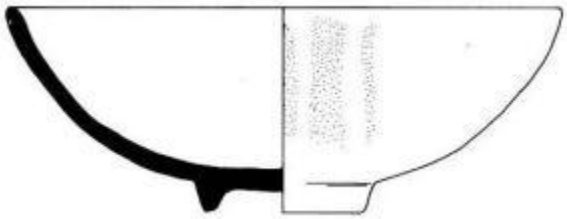
1286

1051.41 1081.19

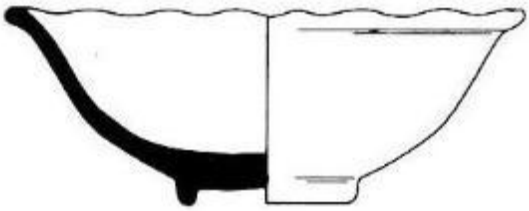
Drawing 99:



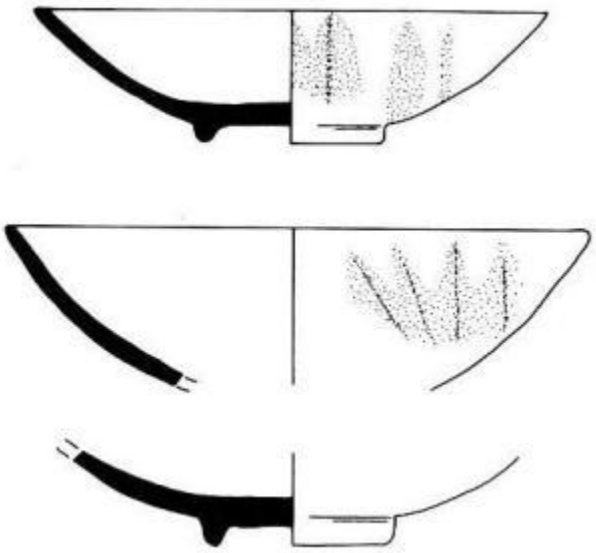
Drawing 100:



Drawing 101:

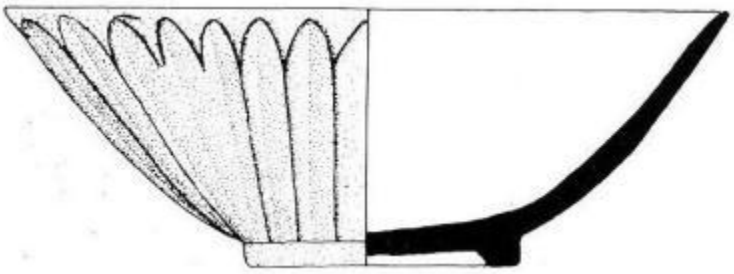


Drawing 102:

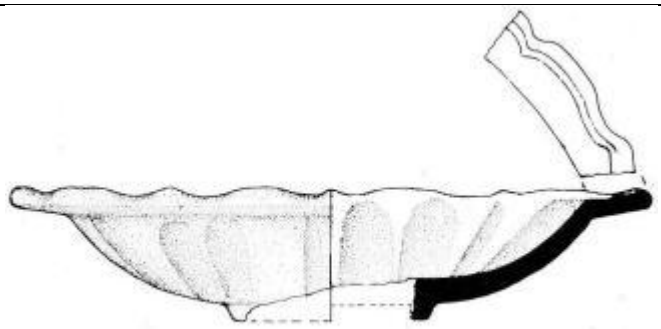
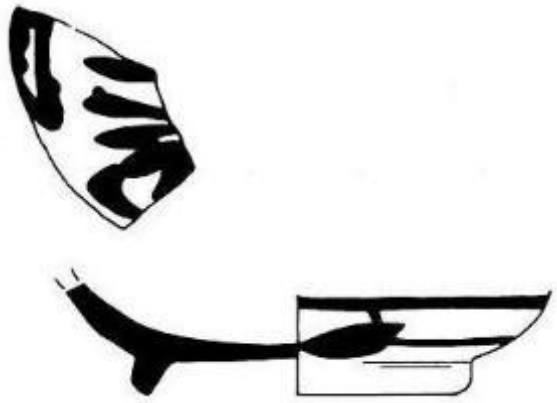
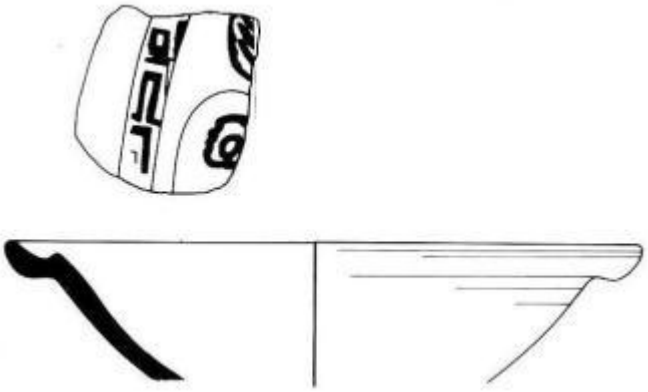


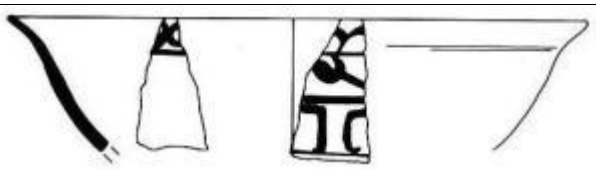
Drawing 103:

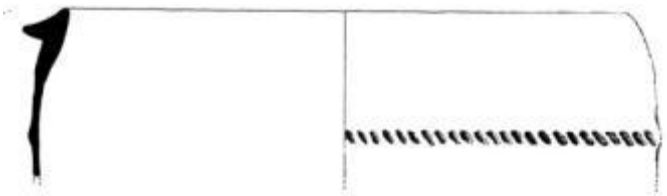
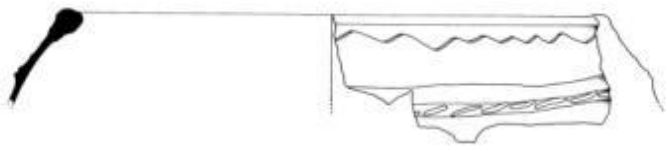
Drawing 104:

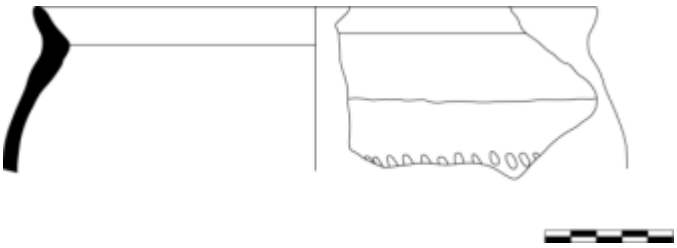
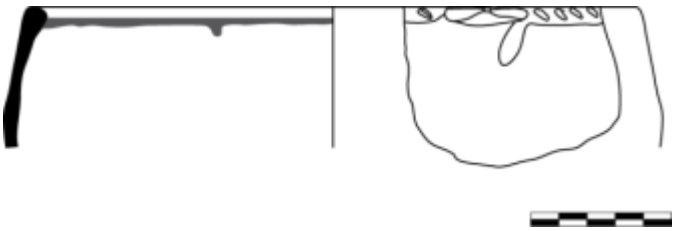
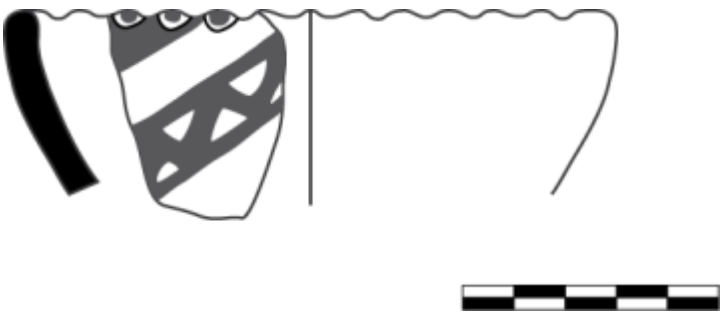


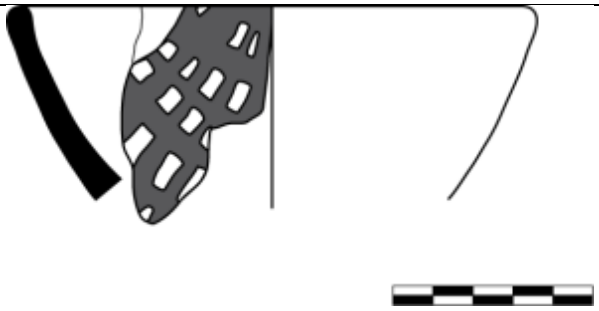
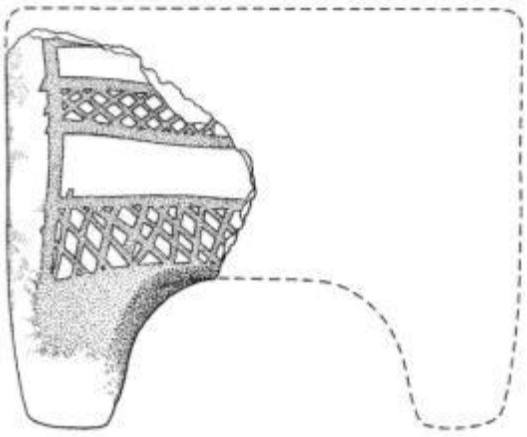
Drawing 105:

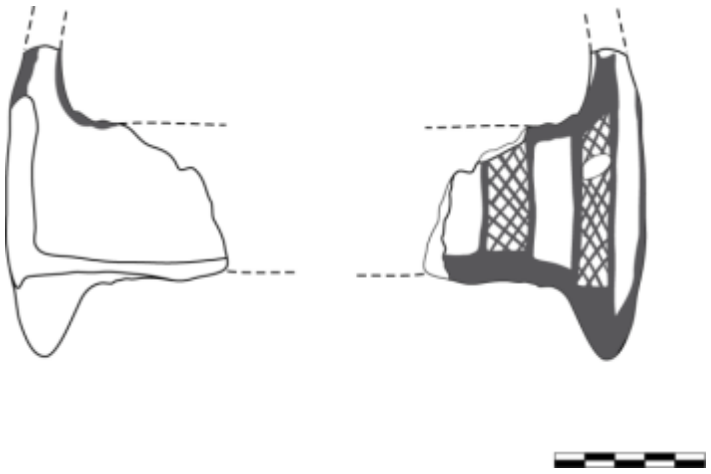
		
Chinese Blue and White. Also called CBW. All drawings from Shanga: Horton 1996: 308-309- fig. 231 (g), (h) and (i).	Drawing 106:  Drawing 107:  Drawing 108:	First produced in late 14th Century. Introduced into Western Indian Ocean in early/mid 15th Century. Continues in use through to modern Era. Designs are closely dated.

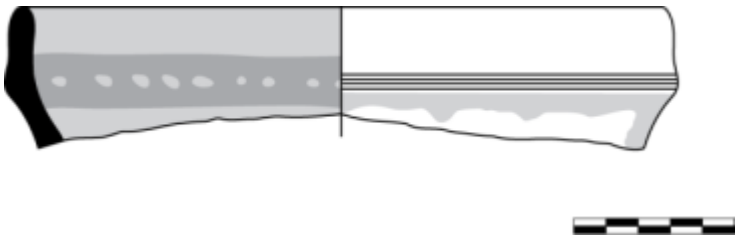
		

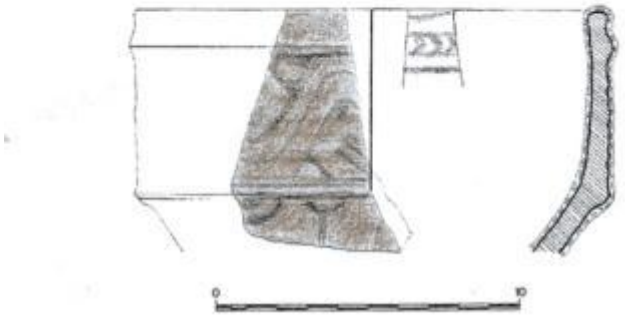
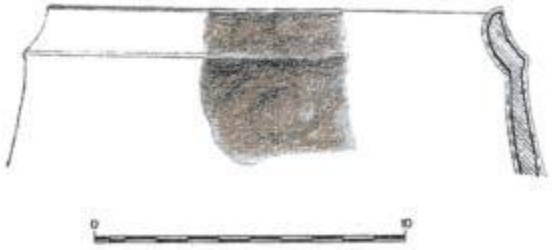
	# APPENDIX V.II: ARABIAN GULF CERAMICS ASSEMBLAGE	
Ware name	**Drawings**	**Notes**
	JULFARWARES (PURPLE AND BLACK)	
Purple and black painted Julfarware: JULFAR.PB Drawings 110, 112-114 are from the 2010 Julfar al-Nudud excavations Drawing 109 is from Bahrain-Frifelt 2001: 89- fig. 149. Drawing 111 is from Bahrain-Frifelt 2001: 90- fig. 150a	Drawing 109:  Drawing 110:  Drawing 111:  Drawing 112:	Produced late in the Julfar sequence, probably coming in after red and white painted Julfarware (JULFAR.RW). Occasional examples at Qala'at al-Bahrain but probably not as common as JULFAR.RW examples.

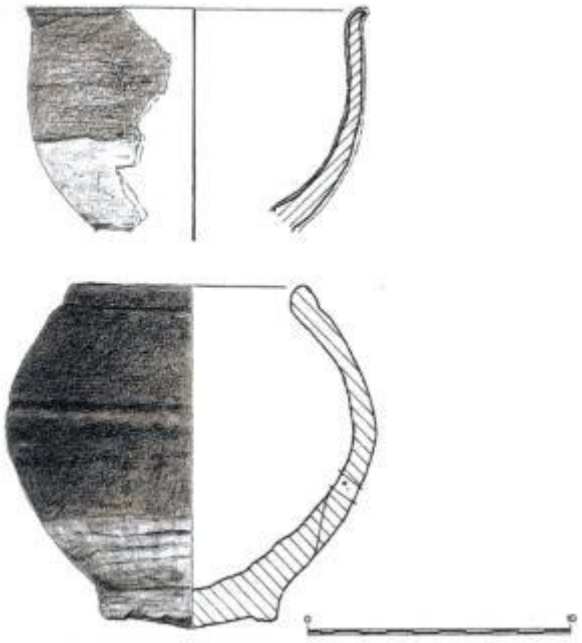
	 Drawing 113:  Drawing 114: 	
	JULFAR INCENSE BURNERS	
Incense burner ware- INCW, CHAMP.3 All drawings are from the 2010 Julfar al-Nudud excavation.	Drawing 115:  Drawing 116:	Only found at Julfar. Possibly only produced for local use as badly fired and crude. Also found in southern Iran (Priestman 2005- CHAM.3 ware)

		
	SYRIAN PAINTED WARES	
Syrian painted wares- also called ROB. Drawing 117 from Bahrain- Frifelt 2001: 92- fig. 156	Drawing 117:  	More common at Qala'at al-Bahrain. Isolated examples from Julfar al-Nudud and Mataf suggesting limited connections to Julfar.
Syrian painted incense burners- also called FINCW Drawing 118 from Bahrain- Frifelt 2001: 92- fig. 154 Drawing 119 is from the 2010 Julfar al-Nudud	Drawing 118: 	More common at Qala'at al-Bahrain than at Julfar. Only isolated examples discovered at al-Nudud.

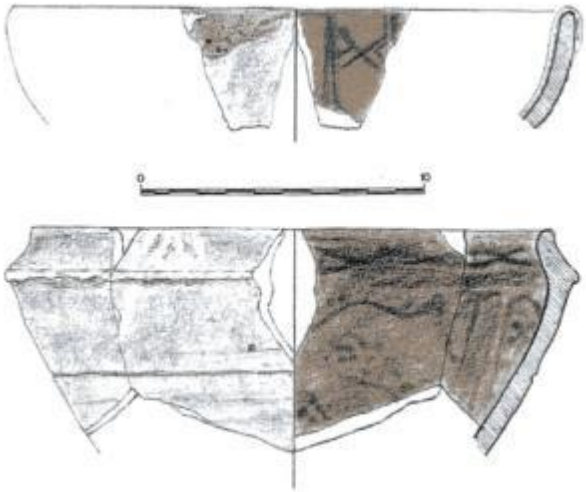
excavations.	Drawing 119: 	

	# APPENDIX V.III: ARABIAN SEA AND EAST AFRICA CERAMICS ASSEMBLAGE:	
Ware Name	**Drawings**	**Notes**
	YEMENI GLAZED WARES: DEPAW	
Degraded Painted Ware. Appears in both Julfar al-Nudud assemblage and Zabid, Yemen. Large variation in rim type found at Zabid. Drawings 120, 121 and 126 from the Julfar al-Nudud 2010 excavations Drawing 122: Ciuk and Keall 1996: 112-3-Plate 95/47 (c), (e) Drawing 123: Ciuk and Keall 1996: 112-3-Plate 95/47	Drawing 120:  Drawing 121:  Drawing 122:	Originally catalogued with TIN sherds. Possibly also present in other Gulf assembalges and in Arabian Sea but currently unknown.

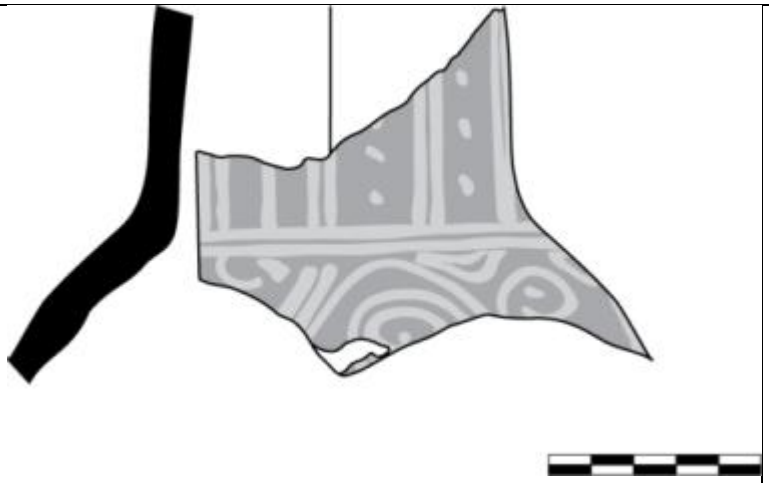
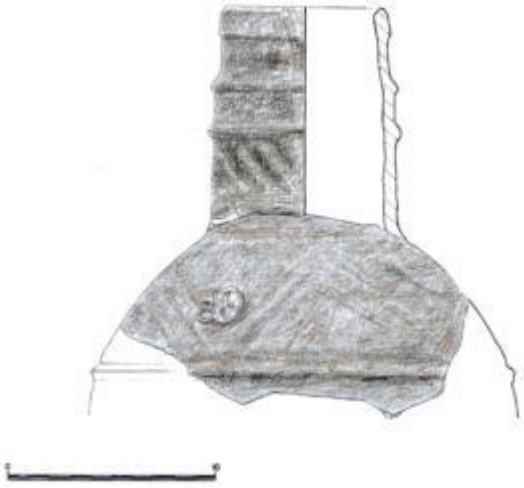
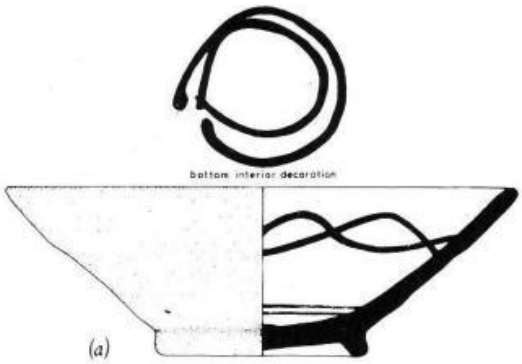
(d) Drawing 124: Ciuk and Keall 1996: 112-3- Plate 95/47 (j) Drawing 125: Ciuk and Keall 1996: 112-3- Plate 95/47 (f), (i) Drawing 127: Ciuk and Keall 1996: 52-3- Plate 95/17 (e)	  Drawing 123:  Drawing 124:	

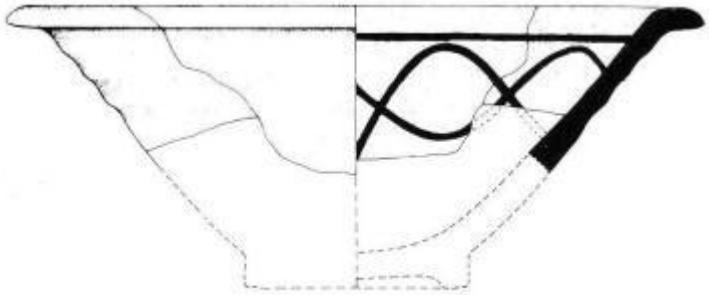
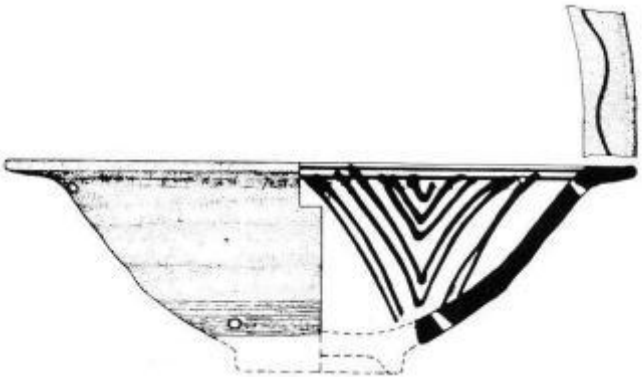
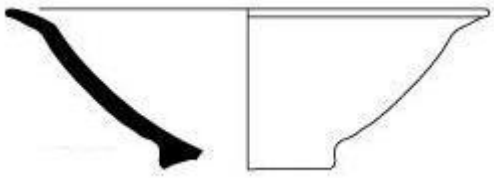
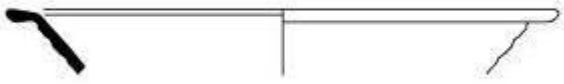


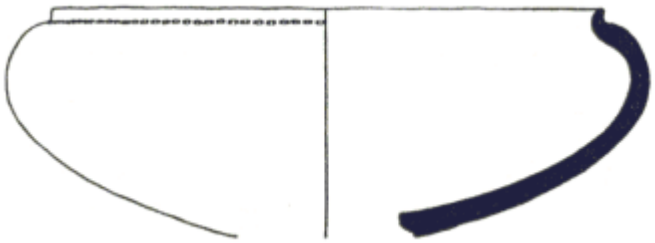
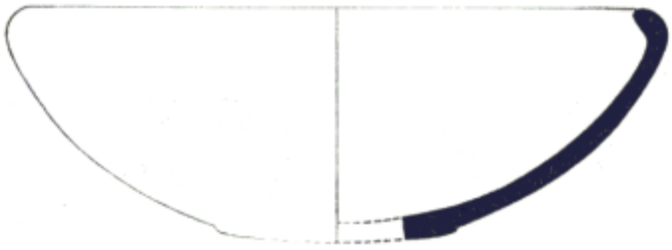
Drawing 125:

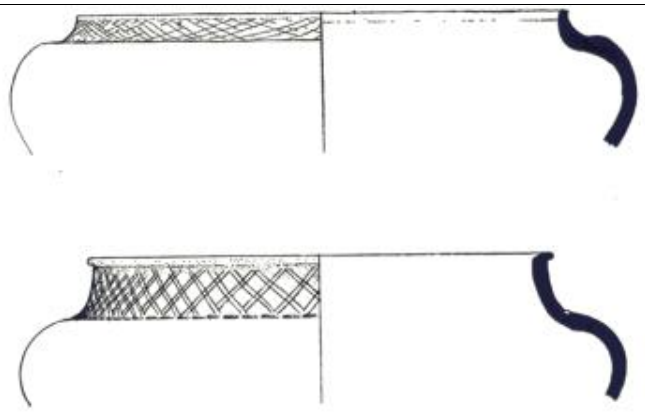
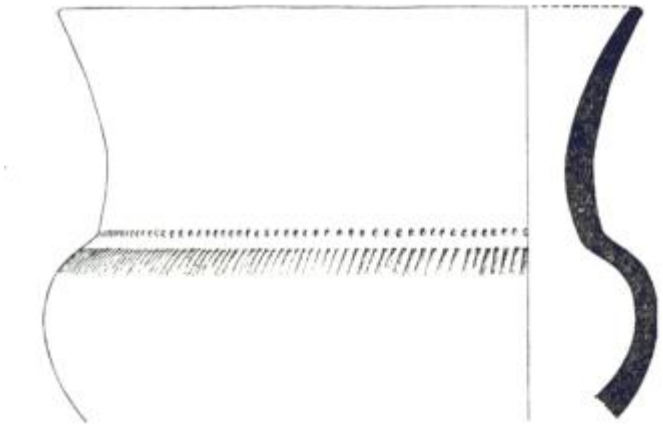
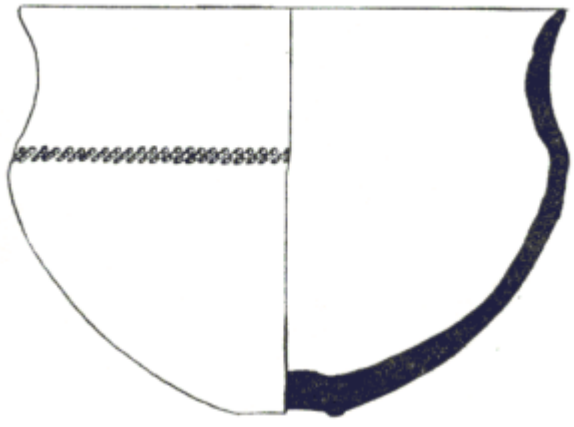


Drawing 126:

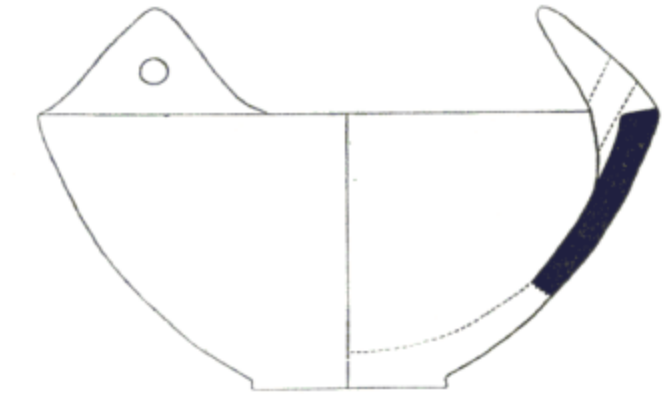
	 Drawing 127: 	
	BLACK AND YELLOW GLAZED WARE.	
Manda ceramics- Chittick 1984: 82- Fig. 39 (a), (c) and (d)	Drawing 128: 	

	Drawing 129:  Drawing 130: 	
	YEMENI YELLOW GLAZED WARE	
Drawing 131: Kennet 2004: 140- fig. 13. Type 42. Drawing 132: Julfar al-Nudud report	Drawing 131:  	

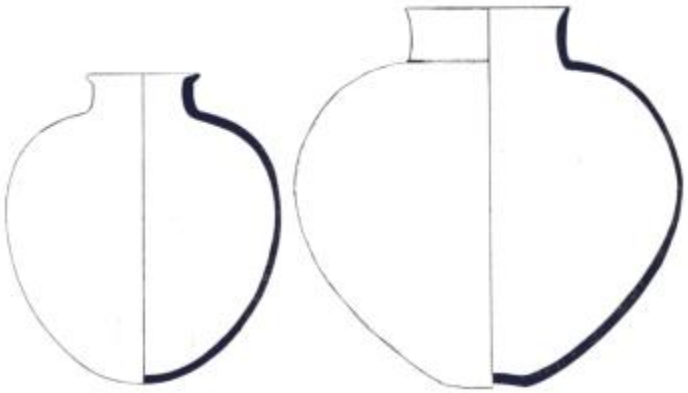
	Drawing 132: 	
	EAST AFRICAN 'TANA' WARES	
East African Tana Wares, found throughout East Africa, although local variations likely. All drawings from Chittick 1974b. 133: Chittick 1974b: 354-fig. 103 (f) 134: Chittick 1974b: 348-fig. 106 (f) 135: Chittick 1974b: 343-fig. 101 (d) and (e) 136: Chittick	Drawing 133:  Drawing 134:  Drawing 135:	A generalised grouping of wares found along the East African Seaboard. Despite varitations in the fabric of the wares, the general shapes of the vessels appear similar throughout this area.

1974b: 340- fig. 98 (a) 137: Chittick 1974b: 339- fig. 97 (b) 138: Chittick 1974b: 384- fig. 142 (a) and (c) 139: Chittick 1974b: 378- fig. 136 (c) and (d).	 Drawing 136:  Drawing 137: 	

Drawing 138:



Drawing 139:

APPENDIX VI: OTHER ANALYSIS OF JULFAR AL-NUDUD 2010 ASSEMBLAGE:

GLAZED WARE TRENCH AND TRENCH PHASE ANALYSIS:

Figure 186 shows the glazed ware assemblage across the trenches with Figure 187 showing the same in percentages, represented graphically in Figure 188.

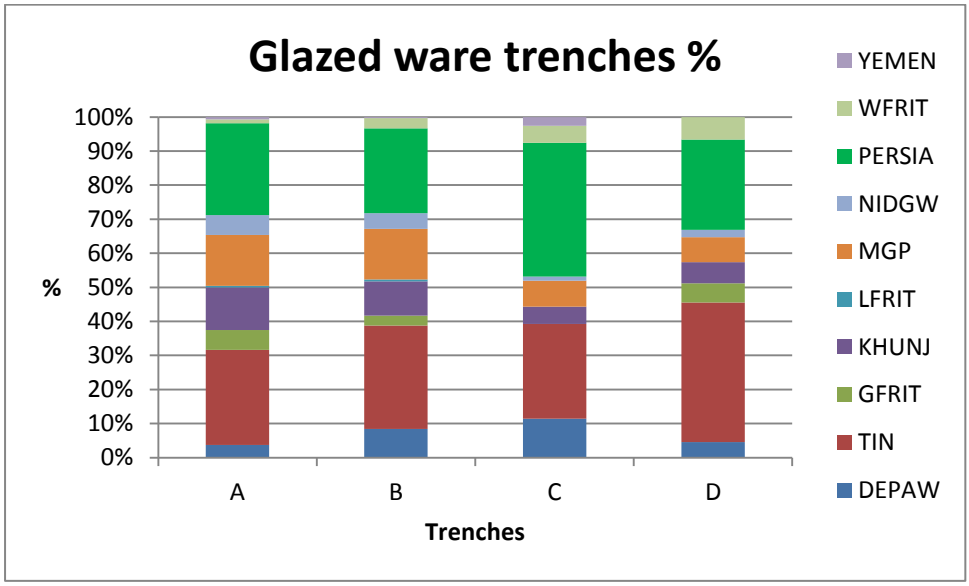
Figure 186: Glazed wares trench breakdown

Ware Name	A	B	C	D
DEPAW	16	59	9	35
TIN	120	213	22	311
GFRIT	25	20		43
KHUNJ	54	71	4	47
LFRIT	2	4		
MGP	64	104	6	56
NIDGW	25	32	1	16
PERSIA	116	175	31	202
WFRIT	5	21	4	50
YEMEN	3	2	2	
	430	701	79	760

Figure 187: Glazed wares trench breakdown % glazed assemblage

Ware Name	A	B	C	D
DEPAW	3.7	8.4	11.4	4.6
TIN	27.9	30.4	27.8	40.9
GFRIT	5.8	2.9		5.7
KHUNJ	12.6	10.1	5.1	6.2
LFRIT	0.5	0.6		
MGP	14.9	14.8	7.6	7.4
NIDGW	5.8	4.6	1.3	2.1
PERSIA	27.0	25.0	39.2	26.6
WFRIT	1.2	3.0	5.1	6.6
YEMEN	0.7	0.3	2.5	

Figure 188: Glazed wares across trenches



The level of TIN is fairly constant across trenches A, B and C but increases to 41% of the glazed assemblage in trench D. Similarly PERSIA is approximately 26% for trenches A, B and D but rises to 38% of the assemblage in trench C. Levels of MGP are similar in A and B but are at lower levels in C and D, while Khunj ware is found in its largest percentage in trench A. Trench C has no GFRIT but has the largest percentage of DEPAW at 11%.

Figure 189: Trench A glazed ware phasing

Ware Name	A_I	A_II	A_III	A_IV	A_V	A_VI	A_VII	A_VIII
DEPAW				1	3	1	8	3
TIN	2	2	7	8	11	27	27	36
GFRIT					11	7	5	2
KHUNJ				3	8	13	14	16
LFRIT								2
MGP			1	2	11	9	18	23
NIDGW				1	7	3	10	4
PERSIA	1		2	1	12	24	56	20
WFRIT					2		3	
YEMEN					1		2	
	3	2	10	16	66	84	143	106

Figure 190: Trench A glazed ware phasing % glazed assemblage

Ware Name	A_I	A_II	A_III	A_IV	A_V	A_VI	A_VII	A_VIII
TIN	66.7	100.0	70.0	50.0	16.7	32.1	18.9	34.0
PERSIA	33.3		20.0	6.3	18.2	28.6	39.2	18.9
DEPAW				6.3	4.5	1.2	5.6	2.8
GFRIT					16.7	8.3	3.5	1.9
KHUNJ				18.8	12.1	15.5	9.8	15.1
LFRIT								1.9
MGP			10.0	12.5	16.7	10.7	12.6	21.7
NIDGW				6.3	10.6	3.6	7.0	3.8
WFRIT					3.0		2.1	
YEMEN					1.5		1.4	

Figure 191: Trench A % total GLAZ for individual glazed wares across phasing:

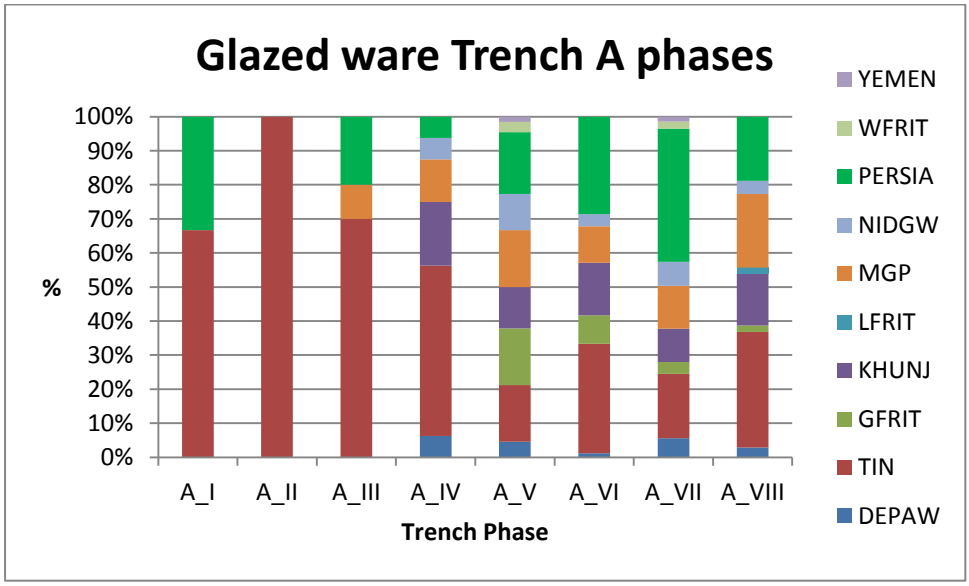


Figure 192: Trench B glazed ware phasing

Ware Name	B_III	B_IV	B_V	B_VI
DEPAW		2	35	16
TIN	6	12	54	98
GFRIT		2	6	9
KHUNJ		4	22	37
LFRIT			4	
MGP	2	3	23	57
NIDGW		10	8	13
PERSIA	1	18	42	88
WFRIT		3	7	8
YEMEN				2
	9	54	201	328

Figure 193: Trench B glazed ware phasing % glazed assemblage

Ware Name	B_III	B_IV	B_V	B_VI
DEPAW		3.7	17.4	4.9
TIN	66.7	22.2	26.9	29.9
GFRIT		3.7	3.0	2.7
KHUNJ		7.4	10.9	11.3
LFRIT			2.0	
MGP	22.2	5.6	11.4	17.4
NIDGW		18.5	4.0	4.0
PERSIA	11.1	33.3	20.9	26.8
WFRIT		5.6	3.5	2.4
YEMEN				0.6

Figure 194: Trench B total GLAZ for individual glazed wares across phasing:

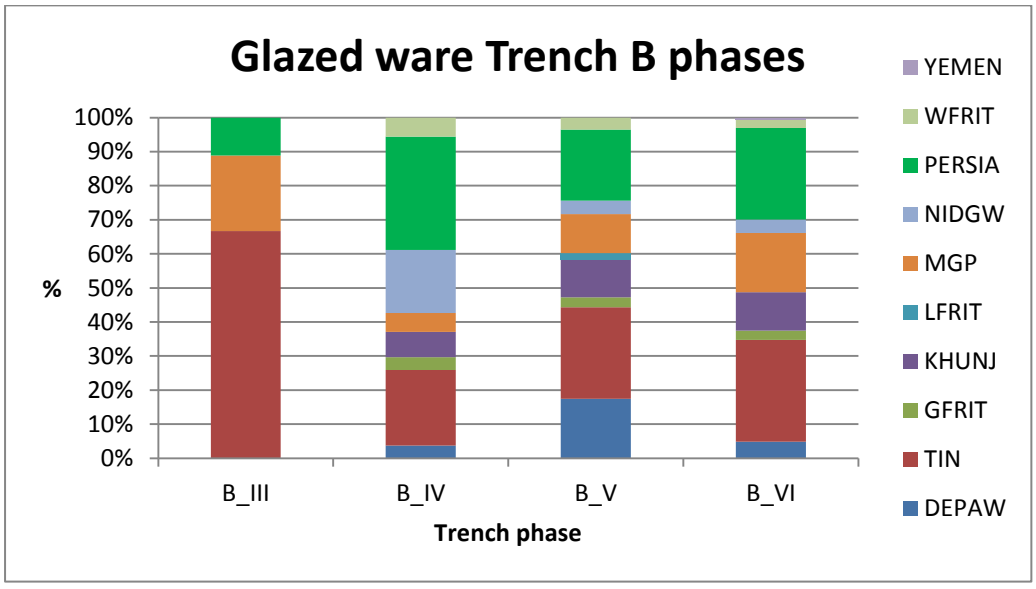


Figure 195: Trench C glazed ware phasing

Ware Name	C_I	C_II	C_IIIb
DEPAW	1		8
TIN	3	4	15
GFRIT			
KHUNJ	1		3
LFRIT			
MGP	1		5
NIDGW			1
PERSIA		1	30
WFRIT		4	
YEMEN			2
	6	9	64

Figure 196: Trench C glazed ware phasing % glazed assemblage

Ware Name	C_I	C_II	C_IIIb
DEPAW	16.7	0.0	12.5
TIN	50.0	44.4	23.4
GFRIT			
KHUNJ	16.7	0.0	4.7
LFRIT			
MGP	16.7	0.0	7.8
NIDGW	0.0	0.0	1.6
PERSIA	0.0	11.1	46.9
WFRIT	0.0	44.4	0.0
YEMEN	0.0	0.0	3.1

Figure 197: Trench C total GLAZ for individual glazed wares across phasing:

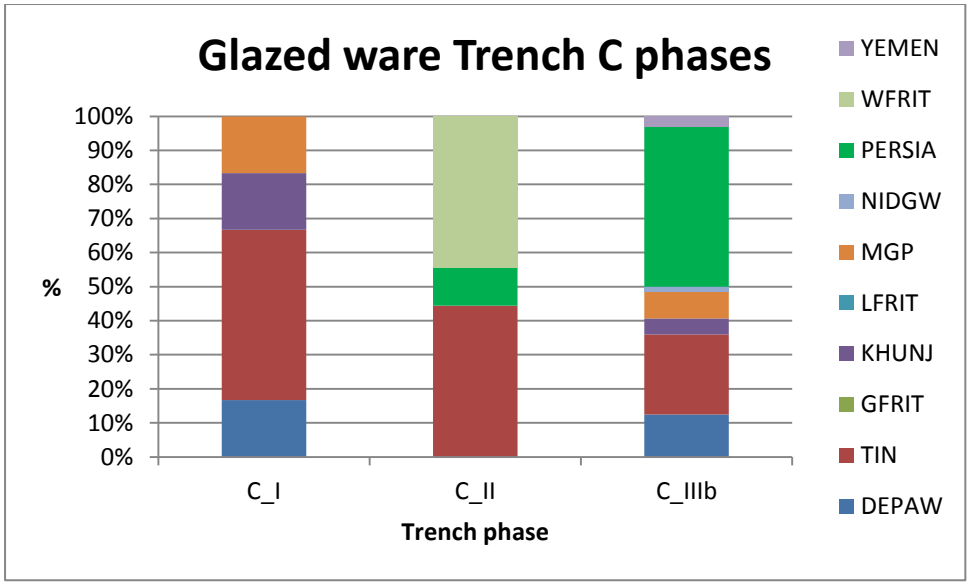


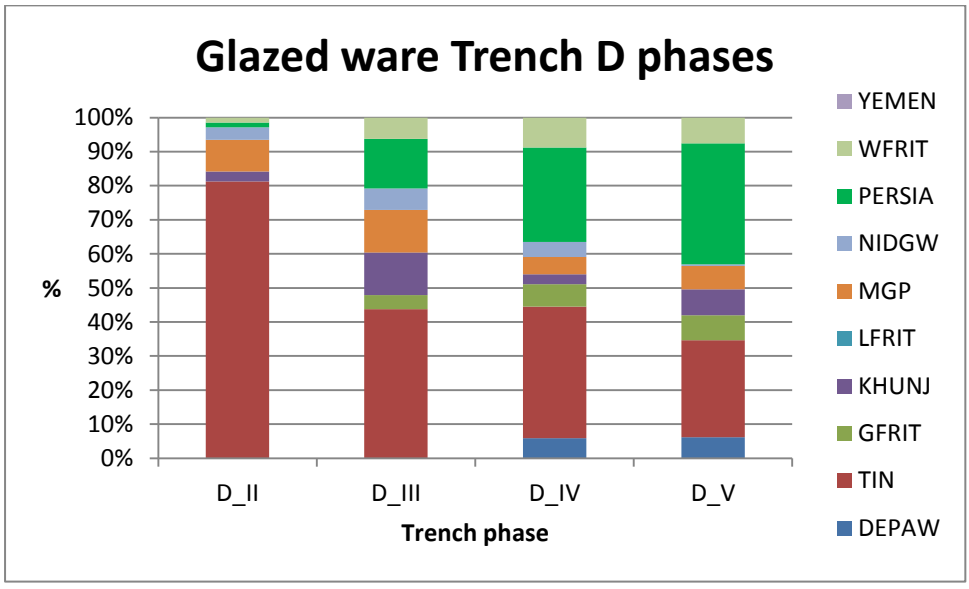
Figure 198: Trench D glazed ware phasing

Ware Name	D_II	D_III	D_IV	D_V
DEPAW			8	27
TIN	113	21	53	124
GFRIT		2	9	32
KHUNJ	4	6	4	33
LFRIT				
MGP	13	6	7	30
NIDGW	5	3	6	2
PERSIA	2	7	38	155
WFRIT	2	3	12	33
YEMEN				
	139	48	137	436

Figure 199: Trench D glazed ware phasing % glazed assemblage

Ware Name	D_II	D_III	D_IV	D_V
DEPAW	0.0	0.0	5.8	6.2
TIN	81.3	43.8	38.7	28.4
GFRIT	0.0	4.2	6.6	7.3
KHUNJ	2.9	12.5	2.9	7.6
LFRIT				
MGP	9.4	12.5	5.1	6.9
NIDGW	3.6	6.3	4.4	0.5
PERSIA	1.4	14.6	27.7	35.6
WFRIT	1.4	6.3	8.8	7.6
YEMEN				

Figure 200: Trench D total GLAZ for individual glazed wares across phasing:



These four graphs show the introduction periods of the glazed wares as well as showing each trench phase's assemblage make up. The early phases in each trench (but particularly trench A which has ceramics in all phases) have less than five wares- A_I has PERSIA and TIN, B_III has PERSIA, TIN and MGP, C-I which covers a longer period than the other phases has these three wares as well as KHUNJ and D_II, which is though to be slightly later than A_I has all of these as well as some white Fritware. The longer sequences of A,B and D show the introduction of ware: A_III has the first KHUNJ and MGP in trench A; phase B_IV has the first KHUNJ, MGP, GFRIT and

WFRIT in trench B and phase D_III has the first GFRIT in trench D. The trench D graph also shows the reduction in the percentage of the glazed assemblage made up of TIN across the development of the site, falling from over 80% in D_II to less than 30% in D_V.

JULFAR WARE TRENCH AND TRENCH PHASE ANALYSIS:

Figure 201 and Figure 202 show the count and percentages of the different Julfarwares in each trench which is then illustrated in Figure 203.

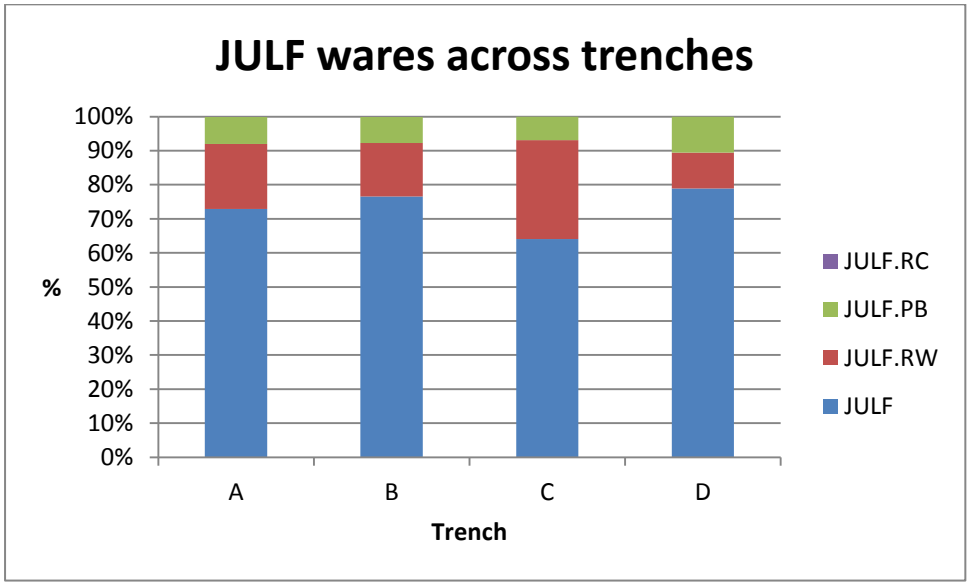
Figure 201: Julfarware trench breakdown

Ware Name	A	B	C	D
JULF	3638	5918	298	5993
JULF.RW	954	1217	135	798
JULF.PB	398	592	32	801
JULF.RC	2	5		
	4992	7732	465	7592

Figure 202: Julfarware % across trench breakdown

Ware Name	A	B	C	D
JULF	72.9	76.5	64.1	78.9
JULF.RW	19.1	15.7	29.0	10.5
JULF.PB	8.0	7.7	6.9	10.6
JULF.RC	0.0	0.1	0.0	0.0

Figure 203: Julfarware across trenches



The data and graph show that JULFAR is by far the dominant ware with JULFAR.RW as the second largest. JULFAR.PB is fairly constant across the whole site at between 7 and 8% of the Julfarware assemblage in all trenches other than trench D which has an increased amount at

10.6%, at the expense of JULFAR.RW. The red on white painted Julfarware JULFAR.RW is present in trench C at a higher level than in the other trenches, although the reasons for this are unclear. It could reflect the higher than average amount of glazed and Far Eastern ceramics also present in trench C, as these were imports while JULFAR.RW was an export from Julfar to Southern Iran (Priestman 2005: 229) and Bahrain (Frifelt 2001: 94-95)

Figure 204: Trench A Julfarware phasing

Ware Name	A_I	A_II	A_III	A_IV	A_V	A_VI	A_VII	A_VIII
JULF	31	42	93	66	747	806	951	902
JULF.PB			1	8	40	118	83	148
JULF.RW			6	44	98	198	354	254
JULF.RC							1	1
	31	42	100	118	885	1122	1389	1305

Figure 205: Trench A Julfarwares % across phasing

Ware Name	A_I	A_II	A_III	A_IV	A_V	A_VI	A_VII	A_VIII
JULF	100.0	100.0	93.0	55.9	84.4	71.8	68.5	69.1
JULF.PB	0.0	0.0	1.0	6.8	4.5	10.5	6.0	11.3
JULF.RW	0.0	0.0	6.0	37.3	11.1	17.6	25.5	19.5
JULF.RC	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1

Figure 206: Trench A Julfarware phasing graph

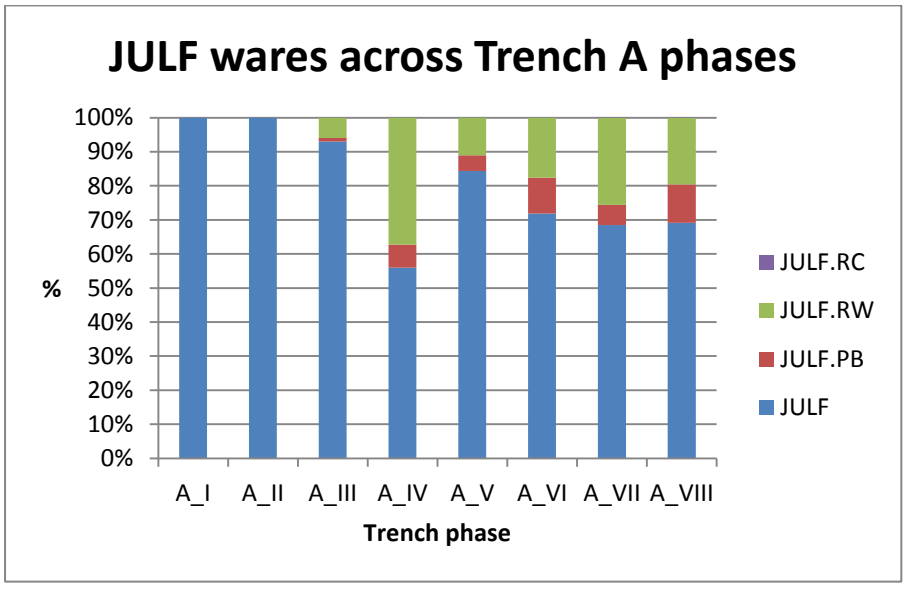


Figure 207: Trench B Julfarware phasing

Ware Name	B_III	B_IV	B_V	B_VI
JULF	60	1123	2064	1992
JULF.PB	5	16	144	364
JULF.RW	9	66	304	688
JULF.RC				2
	74	1205	2512	3046

Figure 208: Trench B Julfarware % across phasing

Ware Name	B_III	B_IV	B_V	B_VI
JULF	81.1	93.2	82.2	65.4
JULF.PB	6.8	1.3	5.7	12.0
JULF.RW	12.2	5.5	12.1	22.6
JULF.RC	0.0	0.0	0.0	0.1

Figure 209: Trench B Julfarwares phasing graph

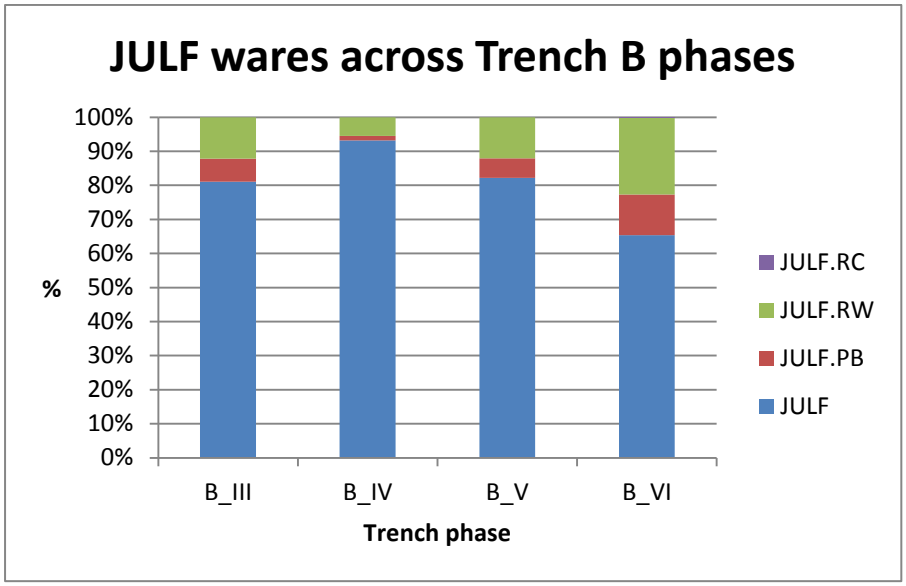


Figure 210: Trench C Julfarwares phasing

Ware Name	C_I	C_II	C_IIIb
JULF	50	95	153
JULF.PB	1	9	22
JULF.RW	4	33	98
JULF.RC			
	55	137	273

Figure 211: Trench C Julfarwares % across phasing

Ware Name	C_I	C_II	C_IIIb
JULFAR	90.9	69.3	56.0
JULF2	1.8	6.6	8.1
JULFAR.RW	7.3	24.1	35.9
JULF.RC	0.0	0.0	0.0

Figure 212: Trench C Julfarwares phasing graph

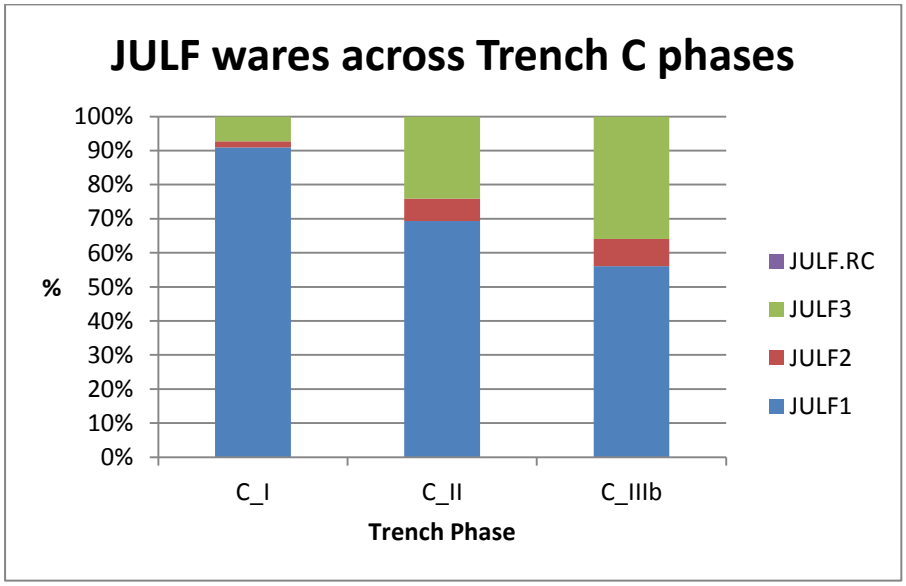


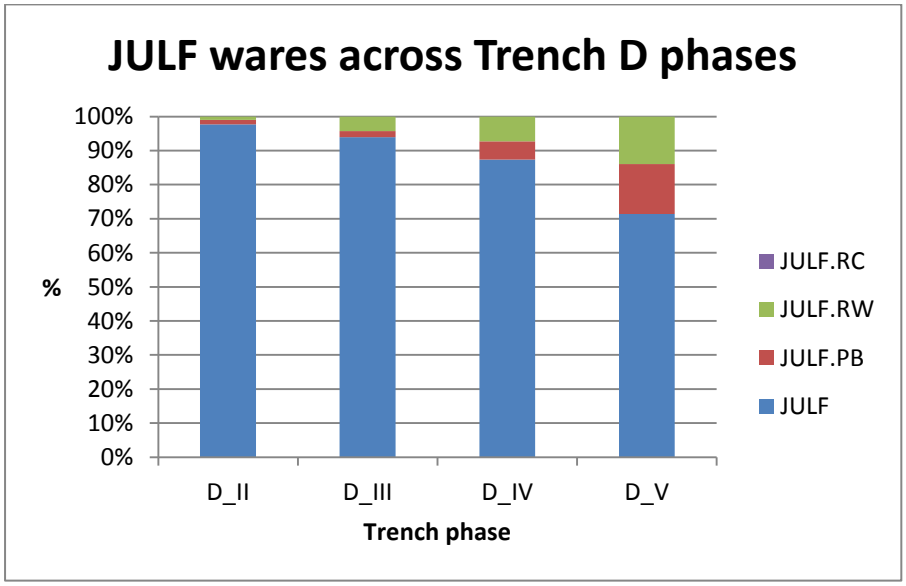
Figure 213: Trench D Julfarwares phasing

Ware Name	D_II	D_III	D_IV	D_V
JULF	1067	465	960	3501
JULF.PB	14	9	59	719
JULF.RW	11	21	80	686
JULF.RC				
	1092	495	1099	4906

Figure 214: Trench D Julfarwares % across phasing

Ware Name	D_II	D_III	D_IV	D_V
JULF	97.7	93.9	87.4	71.4
JULF.PB	1.3	1.8	5.4	14.7
JULF.RW	1.0	4.2	7.3	14.0
JULF.RC	0.0	0.0	0.0	0.0

Figure 215: Trench D Julfarwares phasing



The graphs and data show the nearly complete dominance of JULFAR in the early phases of each trench, with other JULF wares being introduced in later phases, with JULFAR.RW and JULFAR.PB becoming common in later phases. Trench A has a peak of JULFAR.RW in phase A_IV from where the percentage falls in later phases but remains higher than 15% beyond phase A_V. Trench B begins with a spread of Julfarwares between JULFAR, JULFAR.RW and JULFAR.PB in phase B_III but then the percentages of JULFAR.RW and JULFAR.PB contract in B_IV. The reason for this is unclear but it could show a decline in the numbers of different local wares used during this phase in trench B. Trenches C and D follow a simple trajectory of large proportions of JULFAR in early phases, steadily becoming smaller but always the majority of the assemblage as JULFAR.RW and JULFAR.PB become more common.