The Harappan cities were divided into different parts like citadel and lower town. They were also divided into sub-sections. The houses of different types were constructed in all the blocks. In the citadel area residences or palaces were constructed for rulers. In the lower town the houses for common people were constructed. Some commercial houses or industrial complexes like warehouses; Dockyard, Bead factory, etc. were constructed at different sites.

(a) GENERAL HOUSE PLAN

The Harappan people were master in civil engineering. The plan of city was based on modern style. They constructed their house on the both sides of the lanes and streets. Generally the doorways of the houses did not open in main streets. Their gateways open in the lanes. The houses in the harappan settlements had two to five rooms, kitchen, bathroom, verandah and courtyard. A few houses had latrine or privy at some sites.

The common houses in the Harappan cities were constructed with mud and mud-bricks. In some houses baked bricks and stones were used by the people. The large sized houses were occupied by the rich people while people of some poor background lived in dwelling pits.

A well protected house was found in DK area at
Mohenjodaro. It has four rooms and a courtyard. Its doorway was 4ft. 10ins wide and opens in a lane. A stair case, 3ft. 9ins, was also found which indicates that it was a double storied house. A large room was divided into two rooms by a wall. This wall has a communication door between the two but the dividing wall was not interlocked with the main walls of the rooms. Two rooms of this house were set on their longer edges.\(^1\) On the floor of a room five basin-like depressions were found, which indicate that they were the depressions of large jars. These were constructed with wedge shaped bricks set slantwise in a circle. It is considered that it might be a place of refreshment or a large family house. A hearth was found in south-east corner of the courtyard which indicates that the food was cooked in open area.

One house in the First Street has doorway of 3ft. 6ins wide. The doorway opens in a paved floor which was well laid that protected by a wainscot on three sides. Near the doorway there was an aperture soak pit in the main street. A room of this house was 16ft. 9ins long and 15ft. 2ins wide. In the centre of the floor there was a circular depression which was lined with wedge-shaped bricks placed slantwise. An open pit was found near the north-east corner of this room. This pit was connected with a small covered drain.\(^2\)

Another house was found in DK Area which has a very considerable height and the building was again used by the

\(^2\) Ibid, p. 63.
people. There was a pavement of burnt bricks (11.65×5.65 ×2.9ins, in size). There was no direct communication in the rooms of the houses which indicates that the building was not used for dwelling.\textsuperscript{3} It is considered that the building might be used by the dwellers as store room.

A well preserved room was situated in the south-west corner of the large court. The measurement of this room is 11ft. 10ins long by 7ft. 9ins wide. This room was entered from the other room of the building through short doorway of 3ft. wide.\textsuperscript{4} The doorway in the building indicates that the well was constructed by the dwellers of the building but the doorway in the lane suggests that the well was for the public use also.

At Diamabad the houses were constructed with mud walls, so they were not in preserved condition. One house measures 4m long and 2.6 m broad. The width of the walls of the room was 30cm. In this house a circular hearth of 50cm in diameter was found which indicates a kitchen in this house. To the south of the room there was an open space. The floor of the room was plaster with mud of reddish brown colour.\textsuperscript{5} The mud bricks, 32×16×8ins, were used in the construction of this house. The room was used for sleeping by the dwellers.

One another house, measuring 6.3m north-south and 6 m east-west was, found at Diamabad. It was a plan of a simple

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\textsuperscript{3} John Mashal (1931), \textit{Mohenjodaro and Indus civilization}, p. 77
\textsuperscript{4} Ibid, p. 55
house. It was also constructed with mud bricks (32×16×8ins).\(^6\) The waste water of the house came out through an aperture and a private drain took it into large jar placed in the street along the wall. The poor type of construction of the house indicated that the dwellers were belonging to the artisan community.

A house was found at Chanhudaro which has lanes in two sides, one in eastern and other in southern side. The entrance from the lane on the south was 3ft. 7.5ins wide. The measurement of a room of the house was 7ft. 11ins long by 5ft. 6ins wide. The eastern wall of the room made up of mud bricks in English Bond technique and still stood 4ft. 4ins. high. This room was separated from the other room with a wall, which was not interlocked with the main walls of the room. One doorway in the northern side of this room was 3ft. 2ins. wide.\(^7\) The average height of the walls was 3ft. and all they were well preserved. One smaller room to the south of the verandah was used as kitchen.

One house was found at Chanhudaro it was entered from the west. The measurement of a room of this house was 6ft. 10ins long by 5ft. 5ins wide. The mud-bricks of various sizes were used in the construction of this room. The house also had a courtyard.\(^8\) It was an ordinary room and was used for sleeping.

A mud brick house near the street 1 was found at Lothal. It has a large verandah, two rooms and a large hall. The fire altars of burnt bricks indicate that the room was used for fire-worship.

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\(^6\) Ibid, p. 89  
\(^7\) E.J.H. Mackay (1976), *Excavation at Chanhudaro*, p. 42  
\(^8\) Ibid, p. 44
Another room was used for dwelling.⁹ The evidences of kitchen were not found. A bathing platform was found near the street wall, it was paved with mud brick and connected with pubic drain in street through an aperture.

A plan of mud brick structure was found on the south of lane 3 at Lothal. It was constructed on the 2 ft. 6 ins high mud brick platform, which acts as the plinth of this house. The walls of this house were 1 ft. 10 ins wide. The measurement of the house was 12 ft. × 8 ft. internally. In the succeeding period the northern room was partitioned and one room was added on the eastern side. A circular mud enclosure, 1 ft. 6 ins, was found in the southern room of the house. It was plastered internally to serve as a base for a storage jar. In this house two rooms were added during later phase. In one room fire altar indicates the evidence of fire-worship. In another room a rectangular fire alter and jars were found. The jars were used to keep holy water for worship. So it is considered that two rooms of this house were used for worship by the common people and the other rooms were used by the priest (Purohita) for dwelling.

A mud-Brick house was found in block E. it was oriented north-west and south-east directions. It has three rooms and a verandah. The overall measurement of the house was 28 × 48 ft. The average size of the room was 8 × 8 ft.¹⁰ and the walls were 2 ft. 3 ins thick this house was simple and occupied by a common

¹⁰ Ibid, p. 116
people for dwelling.

At Lothal a mud brick house was also occupied by an ordinary family. It has three rooms which were constructed on 2ft. 6 ins high platform. A very interesting feature of this house was that the floor of a room was made of ovoid terracotta balls and cakes which were well rammed and plastered with mud. Sometimes a layer of potsherds and broken terracotta balls were also spread over the sill to serve the purpose of dry concrete. A post-hole noticed in the floor of the house suggests that the roof was supported by wooden ports besides the mud brick walls. In two rooms the storage jars were found which shows that the occupants of the house store food grains in the jars. It seems that it was a farmer's house, who produced surplus food grains.

A large mud-brick house was found in block E at Lothal. Its overall measurement was 56 ft. from east to west and 42 ft. from north to south. It was bounded by street 8 on the north, street 5 on the east and street 7 on the south. The largest room measures 36×26 ft. and it was entered from street 8 through a doorway (5 ft. wide). A storage jar was found on the mud-brick floor of the house. The brick pavement adjoining with the northern wall seems to be a bath, a soakage jars was embedded in street 8. The soakage jar was used to collect the waste water of the house. The ovoid mud brick enclosure was built on the raised floor of the house. Its longer axis was 6ft. 6 ins and shorter was 4 ft. The dwarf of this enclosure wall was made of mud brick which have

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turned red owing due to constant firing. It appears to be a fire-altars used for ritualistic worship of fire. The house was occupied by a large family and the members performed fire worship. The house had five rooms which indicated that the size of the family was large.

A big house with several rooms was found at Balu. One room in the corner of the house was measuring 4.12×2.70 meters. It has five courses of mud bricks, which measures 72×36×12cm. The walls of this house were 80 cm wide. The house had open courtyard and entrance in one of the room located in the north-west. The house had a pucca drain.  

At Kunal the Early Harappan people lived in round pits but during Harappan Phase they started to live in the houses which were constructed on ground. The people lived in square and rectangular houses. One or two rooms, kitchen, bathing platforms were there in most of the houses. The mud bricks, 13×26×39; 11×22×33; 9×18×36; 11×22×44 cms, were used in the construction of their houses. The bricks of two ratios, 1:2:3 and 1:2:4 were found and both types of bricks were used in the same house. The bricks were laid in English bond with mud mortar.

Some two or three rooms houses were found at Balu. In one house the walls were running north-west to east-west. The floor of this house was made of mud-lumps or broken mud-bricks. The

12 S.P. Shukla (1997), *Form of the Harappan civilization as Revealed from the Excavation at Balu*, Haryana, p. 10
13 M. Acharya (2008), *Kunal Excavations (New Light on the origin of Harappan Civilization)*, p. 10
mud bricks, 36×18×9cms, were used in the construction of this house.\textsuperscript{14} Carbonized wheat and barley were collected near the wall which indicate that its a farmer's house who grow these food grains.

Another house with two walls was also found at Balu. Its floor was paved with stone with stone quern. The surface of this house was reddish in colours which indicates some sort of burning activity.\textsuperscript{15} It is estimated that some oven (Tandoor) were placed at that reddish place. The mud bricks, 36×18×9cm, were used in the construction of this house.

In one of the houses some evidences of fire-places were found. One fire place was elliptical in shape and measuring 169 cm long and 96cm wide. Some baked or unbaked clay was used to set the form of fire place. Carbonized wheat, barley and charred bones were found scattered around this fire place, indicating some sort of ritual activity. The floor of this house was paved with stone quern and broken mud-bricks. The mud-bricks, 36×18×9cms in size, were used in its construction.\textsuperscript{16} Total six courses of mud-brick walls were found.

Two rooms of a house, made of mud-bricks, were found at Farmana, district Rohtak in Haryana one room of the house measured 4.35m from north to south by 4.35m from east to west. The average width of the wall was 62cm. The floor of the house was paved with mud-bricks. An another small room was also

\textsuperscript{14} Arun Kesarwani (2002). \textit{Excavation At Balu}, p. 18
\textsuperscript{15} Ibid, p. 23
\textsuperscript{16} S.P. Shukla (1997), \textit{op. cit}, p. 9
found, it measured 1m wide and 2.35m long.\textsuperscript{17} This small room might be used as store room. The occupants cooked their food in the courtyard. The mud-brick, $30 \times 15 \times 7.5$cm, were used in the construction.

An important house complex was also found at Farmana. It contained a culture of rooms. The measurement of rooms varied from 2.55m long by 1.35m wide to 13.60m long by 7.40m wide. The total number of structures in this house complex was 21.\textsuperscript{18} The width of walls also varied from 34cm to 80cm. The mud-bricks, $40 \times 20 \times 10$cm and $34 \times 17 \times 8.5$cm, were used by the people. The floor of some rooms had dwelling pit in centre of floor. The floor of some houses were paved with mud-bricks. Some rooms had some evidences of hearth that indicated the cooking place. This house complex had some similarities with the house found at Bhagwanpura district Kurukshetra Haryana.

A well preserved House was found in Mound F at Harappa. It measures 55ft. 4ins. from north to south and 29ft. 3ins. from east to west. The inner lengths of the large room were 13ft. 3ins. and 11ft. 3ins. respectively and the width is about 7ft. It was entered from a small doorway 3ft. 3ins. wide. In the north side of this room there was a courtyard, measuring 22ft. 9ins by 20ft. 6ins., and it was entered from lane 3 through a passage 4ft. wide. The wall of the room was 1ft. 10 ins wide. At the northern end of the house there was an another large room measuring 23ft. 2ins.

\textsuperscript{17} Vasant Shinde, T. Osada, A Uesugi and Manmohan Kumar (2008), \textit{Linguistic, Archaeology and the Human Past}, occasional Paper 6, p. 29
\textsuperscript{18} Ibid, p. 35
by 16ft. 4ins.\textsuperscript{19} House 1 is consisted of 2 rooms and a courtyard. The burnt bricks, $11 \times 5.2 \times 2.5$ to 3ins., were laid with mud mortar in the construction of this house.\textsuperscript{20} It is considered that the house I was occupied by the workmen.

House I of mound f is an ordinary upper class house. Its plan is carefully designed so as to separate the female apartments from the rest of the house. In the south east corner of the house there was a well 2ft. 9ins. in diameter which is conveniently situated for both inmates and neighbors. Room No. 9 and 11 were used as guest room and room no. 10 and others were used by the inmates themselves. One room in this house was used by the women of the house. The two rooms of this were constructed for female inmate’s measures 16ft. 8ins. by 12ft. and 12ft. by 8ft. 8ins. respectively. The length of the courtyard in the house is 43ft. 9ins.\textsuperscript{21}

At Kunal different types of house plans were found during the excavation by J.S. Khatri and M. Acharya. During Early Harappan Period people were living in circular pits, which were lined with finely moulded mud-bricks. The three such pits, had its 2.92m, 2.75m and 2.64m outer diameter respectively. The mud bricks used in the houses varying in size (11×24×39, 10×22×37, 11×23×39cm). The depth of the structure was 1.12m with mud floor. These structures were belonging to pre-harappan period.\textsuperscript{22}

\textsuperscript{19} M.S.Vats (1974), \textit{Excavations at Harappa}, p. 63
\textsuperscript{20} Ibid, p. 21
\textsuperscript{21} Ibid, p. 131
\textsuperscript{22} M.Acharya (2008). \textit{Kunal Excavation}, p. 8
The mason used 'English Bond' technique and mud mortar in the laying of bricks.\textsuperscript{23}

During mature Harappan Period the dwelling changed from the semi-subterranean pits to regular square and rectangular houses including rooms, kitchen and bathing platform, built of standardized bricks and bricks on the ground level which was further raised at various points to provide height and stability to living quarters. The brick size was found to be standardized in two ratios of 1:2:3 and 1:2:4 measuring 12×26×39, 11×22×33cm and 9×18×36, 11×22×44cm, etc. Both sizes of bricks were used by the Sothi, Kot Diji people of Early Harappan Period. The houses of this period were extremely modest in dimension and elaboration when compared to these of the Mature Harappan period. They also developed drain of houses outside.\textsuperscript{24}

At Banawali the evidences of planned house were found. The mud-brick houses had several rooms, a kitchen, a bathroom, a courtyard, etc.\textsuperscript{25} The house were built on the either side of the roads and lanes. One room had a wash basin at a higher level in a corner near the drain, which carried the waste water into the drain. Alcoves in the thickness of walls of the rooms are a new feature in rooms of the houses at Banawali.\textsuperscript{26} Some of the houses had fire-altars, which indicates the fire worship. In the construction of the houses sun-dried bricks of various sizes were

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\textsuperscript{23} D.P. Agrawal (2007), \textit{The Indus Civilization an Interdisciplinary Perspective}, p. 88
\textsuperscript{24} M. Acharya (2008), \textit{op. cit}, p. 10
\textsuperscript{25} R.S. Bisht (1987), Further Excavation at Banawali 1983-84 in B.M. Pandey and B.D. Chattopadhaya (eds), \textit{Archaeology of History} p.146
\textsuperscript{26} J.P. Joshi (2008), \textit{op. cit}, p.106
\end{flushright}
used. These bricks may be grouped into two sets. The smaller set ranging in sizes from 24×12×6cm. to 32×16×8cm., it was used in the construction of houses. the larger size bricks, 40×20×10cm, 44×22×11cm and 50×25×12.5cm, were used for defense purposes.

One house is a fine example of perfect planning and architecture. It measures 52m×46m. It has eleven units of rooms. The largest space in the house is occupied by an open courtyard. It contained a courtyard, a sitting room, some bedrooms, a toilet, a kitchen and worship room.²⁷

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At Kalibangan the houses were flanked either side of the streets and lanes in both the mounds. (Fig.27) An average house consisted of a courtyard and three to four rooms. All the rooms opened in the courtyard. The main entrance of the house was quite large, so that a bullock-cart can get in. In the courtyard, there were rectangular troughs and big half jars for feeding the cattle. Wooden rafters, bamboos and reeds were used in the making of roof. Tiles of intersecting circles were used in the paving of floor in a room.28 A fire-altar was also found in a few houses, which was used in house construction as in the fortification wall. The mason used 'English Bond' and mud-mortar with alternate courses in the construction of drains. The underground drains were not found in the streets at Kalibangan.29

One house complex was exposed to the western side of the citadel at Surkotada. Its room was abutting the main rampart. The house complex opens to the last and has a lane in front of it. On the northern and southern sides of the house no other structures were attached to it. It has three to four courses of dressed-stone masonry having an average width of 60-70cm in the walls of the room. The measurements of the rooms of this house were.

Group 2,1,IC, iii: 4.30×3.60m (Font room with an entrance)
Group 2,2,IC, iii: Size 3×3.40m
Group 2,3,IC, iii: Size 4.20×3m
Group 2,4,IC, iii: Size 3.80×3.50m

28 J.P. Joshi (2008) op. cit, p.105
Group 2,5,IC, iii: Size 3.20×3m

Group 2,6,IC, iii: Size 2.20×4.40m

Group 2,7,IC, iii: Size 3.40×4.0m

Group 2,8,IC, iii: Size 3×3.80m

Group 2,9,IC, iii: Size 1.80×4m\(^{30}\)

There were total 9 rooms in this house. Dressed stones and mud-bricks were laid in mud mortar. This is an example of a big house, perhaps it was used by some special authority. The houses in the citadel area were built over the platform and they were bigger in size than the houses in the residential area.\(^{31}\)

(b) COMMERCIAL COMPLEX:-

Geographical conditions in the Indus Valley were much favorable for agriculture. Agriculture in sindh depended exclusively on the silt deposited by the monsoonal overflow of the Indus. Mohenjodaro, A Harappan site in Sindh, is in a traditional rice bowl region. In the region of modern Haryana, Punjab and Rajasthan the irrigation facilities were provided by the Saraswati River and her tributaries. So the Harappan Civilization flourished in this region of bread basket. The Harappans grow rice, wheat, barley and cotton.\(^{32}\) The evidences of agriculture were found during excavation at Harappa Mohenjodaro, Lothal, Chanhdaro, Daburkort, Dholavira, Banwali, Kalibangan, etc.

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\(^{30}\) J.P. Joshi (1990), *Excavation At Surkotada 1971-72 And Exploration in Kutch*, p. 54

\(^{31}\) J.P. Joshi (2008), *op. cit*, p. 107

\(^{32}\) B.B. Lal (1997) *op. cit*, p.46
Some evidences of warehouses were found at Harappa, Mohenjodaro and Lothal. The evidence of granary was found at Harappa in Mound F. It was near the bank of the old course of the Ravi. The granary was divided into two blocks; the western Block and eastern Block. Each Block consists of six halls or units and each unit, measuring 51ft. 9in. long by 17ft. 6in. wide. Every unit had adequate passages for circulation of air. The corridor between each unit was 51ft. 9ins and 5ft. 6in. width. All the walls are running parallel with narrow intervals of distance. Between the eastern and western blocks there was 24ft. wide passage, the passage was used for vehicular activity to store grains in the warehouse. About 270 m south to the granary, eighteen pounding platforms were brought to light which had average diameter 3 meters each. Platforms were made of circular rings of bricks laid on edge. In the centre there was a hollow into which a wooden mortar was fitted for pounding grains.

At Mohenjodaro the granary was situated in the western area of the citadel mound. It covered an area measuring 45m east-west and 22.5m north-south and stood at a height of 1.5meter. It was divided into twenty-seven rectangular or square blocks arranged in three rows of nine each. All the blocks in the different rows were not in same size but they were in the same size in same row. There was passage between the blocks for the circulation of air.

33 M.S. Vats (1974), Excavation at Harappa, p. 19
34 J.P. Joshi (2008), Harappan Architecture and Civil Engineering, p. 109
35 B.B. Lal (1997), op. cit, p.114
36 Ibid, p.108
This type of arrangement ensured that the cereals stored in the wooden superstructure were duly saved from humidity. To the north of the granary there was a loading platform which make easy to load and unload the bullock cart with grains.\(^{37}\)

A warehouse or granary was constructed in Block C at Lothal. The high platform, on which the bases of ware house were constructed, was measuring 160×135ft. The bases measuring 12ft square and 3ft. high stood in three rows of four each. The mud-bricks were used in the construction of the platform. The peripheral platforms on the south and east were deliberately kept low so as to provide an earthen ramp for an approach to the warehouse from the dock on the east and the fields on the south. The intersecting passages between the bases were 4ft. wide and originally paved with burnt bricks. These passages were constructed for the ventilation of air and for the movement of labour. The warehouse was very near to west of Dockyard, it provided accessibility of trading activity. The food grains from the granaries were exported by sea route.

The evidences of Harappan civilization revealed their trading activities with its contemporary civilization. They developed their trade via land and sea route. The Dock at lothal and Goha revealed the sea route trade of the Harappan people. The ancient dock at Lothal was connected with sea by an ancient Nullah. In the later phase the river channel changed its course due to silting and the dock lost its link with sea. The government

\(^{37}\) J.P. Joshi (2008), \textit{op. cit}, p.108
authority and the guild of traders financed to dug a canal, Bhogavo to maintain the link of the dock with sea. So in commercial purpose dock had its great importance. It was constructed to the east of the city. The builders of the dock took care to provide a mud brick platform 800ft. long and 64 to 72ft. wide, 38 adjoining the western bank for easy hauling of the cargo. The warehouse in Block B was also constructed to the west of the dock. The surplus grains were stored in the warehouse for export purpose. During early stage of the dock the inlet was constructed in the northern wall but in later phase the dock was linked by an eastern inlet with the canal. The trade was restarted after a short time gap. The Lothal folk had a sound knowledge of constructing boats. The terracotta-models of boats found in the habitation area give its clues. 39

In Lower Town at Lothal a merchant's house was found. It has a verandah and 3 rooms in the western wing and another verandah and 2 rooms were added to form its eastern wing. The measurement of this house was 47ft. long by 23.5ft wide. To the back side of the verandah of the house two large and two medium size rooms were available. Four rooms in small size were at the rear of the building. The large room of this house measures 8ft.×9ft., the medium 10ft.×5ft and the smaller one was 6ft. square. The verandah was 40ft. long. A soakage jar was placed in the street. The rim of this jar was skirted with burnt bricks. A

38 S.R. Rao (1979), op. cit, p. 126
39 Ibid, p. 132
rectangular projection of mud-bricks was used as a step to reach the house from the street. The house was constructed on the platform to prevent from the flood. Due to the availability of foreign origin ceramic and other evidences, it is considered that the occupant of this house must have been a merchant or trader.40

A mud brick house was found at Lothal it had a verandah and rooms. The house comprises of more than two rooms. There was passage between these two houses. One house has some evidences of broken pot, two stone grinders and a large shell. It seems that it was used as a place of worship. The walls of this house were 43cm. wide.41 The different walls of the house were separate and they were not inter-connected with tootthing.

A house of medium size measuring 17 ft. × 20 ft. with four rooms was found at Lothal. It was constructed on a 2 ft. high mud-brick platform. The main wall of this house was 3ft. thick. The rooms were also vary in size from 10ft. × 8 ft. 6 ins to 11ft. × 4ft. A dump of shells found in one of the front room of the houses.42 The shells were collected by the occupants for making necklace of beads. The unfinished bangles and rejected cores of chank-shells found in the house suggest that the structure was a shell worker’s shop.

In the acropolis area an important structure of a house was found. It has three rooms one of which had dye-Vat with two jars

40 Rao S.R. (1979), op. cit, p. 91
41 Ibid, p. 94
42 S.R. Rao (1973), op. cit, p. 96
which were placed on a small burnt brick pavement (2×2ft.) at different levels and the overflowing water from large jar was collected into small jar through a covered drain. The small jar was placed at lower level which was also skirted with burnt bricks. This house was used for dyeing by the lapidaries. The overall measurement of this dye-house was 19 ft. 6 ins × 21 ft. The Burnt-bricks and mud-brick were used in the construction of this house.  

Another house having same purpose was also found in acropolis area. It has a room measuring 10×7.5 ft and a verandah 16×6 ft. A saddle quern of sandstone and small bulbous jar were found in the varandah of the house. A large jar of red ware was embedded in burnt brick pavement and covered with stone. it might have been dyeing vat. Two jars containing fragments of an elephant's tusk were also found in this house. The available evidences in the house indicated the occupants of the house were artisans.  

A mud-bricks house was found in the acropolis area. It has a verandah 26 ft. × 5 ft. 3 ins. along the wall of the street. The room on the west is 24 × 15 ft. and the central room is 12 ft. 6 ins × 14 ft. A fire altar of mud brick was found in the central room suggested that the room was used for fire worship. The rooms were paved with mud bricks. The house was entered from a

43 Ibid, p. 98
44 S.R. Rao (1973), op. cit, p. 108
narrow passage which was connected with street 2 and street 3.\textsuperscript{45} Two dye-vat jars were also found in a room which show that the room of this house were used by the dyer. One remarkable feature of this house was a provision of privy by embedding a jar in a burnt brick pavement. The jar of the privy was closed with stone. The bricks used in the construction of dye-vat were plastered with lime.

\textbf{(c) INDUSTRIAL COMPLEX:-}

A large structure was found in Block f at Lothal. It consists of a central courtyard with a mud-brick platform entered by a covered passage on the north-west and surrounded by a double row of rooms on the north and east. All the rooms, eleven in number, and courtyard were enclosed by a mud-brick wall. The central courtyard was measuring 38.5×23.5ft. externally. Two jars were embedded in the mud-brick platform in the courtyard. One jar was containing 600 finished carnelian beads and the other containing some unfinished beads. The internal measurement of some rooms were 20×13ft, 10×6ft, 15×9ft.\textsuperscript{46} The workers lived in the rooms built around the working platform in the central courtyard. The arrangement of rooms, courtyard, covered passages, stores, etc., revealed a high degree of planning in establishing factory. On the basis of the evidences found during excavation, the structure can be considered as a bead factory. It contained pebbles of agate, carnelian finished beads, rejected

\textsuperscript{45} S.R. Rao (1979), \textit{op. cit}, p. 111

\textsuperscript{46} S.R. Rao (1973), \textit{op. cit}, p. 118.
cores and flakes and a jar of finished beads. A kiln for cooking agate pabbles and a flanged drill was also found in this bead factory. The large numbers of beads were produced at Lothal which were exported to other Harappan centres.

A bead kiln was also found near the bead factory. Its internal diameter was 4ft. 2in and the axis running across the stokehole of the kiln was measuring 8ft. 8ins. All the flues in the upper chamber were interconnected among themselves and with the mouth of the kiln in the lower chamber through which fuel was supplied.

In the kiln the pebbles could be softened for easy chipping by heating them. The importance of kiln was associated with bead factory.47

A mud brick house was found in street 1 at Lothal. It consists of two rooms measuring 10ft.×12ft. and 12ft.×8ft. internally. The overall measurement of the house was 17ft.×24ft. A furnace, 2ft. 6ins×2ft., was found and it was skirted by burnt-bricks placed vertically on edge.48 Some copper tools were found in these houses indicate that it was a workshop of a coppersmith. A unique feature of this workshop was that the cross wall providing entrances to the furnace-room were not built in one straight line. There was a provision of niche in the outer face of the western wall in street 1. It was used to keep an oil lamp. Copper was imported from the Khetari mines in Rajasthan

47 S.R. Rao (1979), op. cit, p. 120
48 Ibid, p. 95
and the produced goods with copper were exported to the different region.

Some evidences of a Bead factory were found at Chanhudaro in which a small and very carefully built room 9ft 2ins long by 7ft. wide was found near the street. It was entered from the east by a doorway (3ft. 3ins). Another doorway, 4ft 7ins wide, was also in the opposite side but it was blocked up. An aperture 2ins was made under the blocked doorway which take the waste water of the house in a jar placed in the street.

In the north-western side of the room there was a series of well-built flues, averaging 5.5ins wide by 8ins high. These flues were covered by a single course of bricks and on this pavement there were three compartments of varying size with wall only half a brick thick and standing some 18ins high. The thickness of the walls of the compartments above the flues indicates the possibility of this building having been a hammam. The absence of any signs of a great temperature in the flues is strong evidence that the heat used in them was very moderate. There were no evidence of ash and there was no trace of furnace. The availability of finished and unfinished beads indicates that the building was a bead factory. Chanhujodaro was the centre of bead making and the beads were exported to the other regions.

One another room 8ft. 9ins long and 7ft. 3ins wide in a simple house, was found at Chanhudaro. It has 4ft. wide doorway

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49 E.J.H. Mackay (1976), op. cit, p. 42
in the street and another doorway, 4ft 2ins wide open in the courtyard of the house. This room was near to the bead factory perhaps it was owned by the owner of factory.

(d) WORKERS QUARTER:-

A series of rooms was found at Mohenjodaro. The features of these rooms indicate that they were either storerooms or servants quarters. The thickness of the walls and the carefulness of their construction were strongly indicated that they were built for government use. The average width of the doorways of the rooms was 2ft, 11ins to 3ft. 5ins. Mud-bricks of different sizes, 11.75×5.9×2.75 ins and 12×5.9×2.75ins, were used in the construction. In one room evidences of a little bin was found. The size of the bin was 2ft. 7ins long by 1ft. 11ins wide and 13ins deep. Perhaps it was used to throw garbage of the rooms. It was cleaned by some appointed person regularly. In one room a flight of steps was built. The measurement of treads of this stairway measures 10.75 ins broad and 7.25 ins high. The base of the staircase was filled with coarse debris. The presence of stair case indicates that the house was double storey. The set of rooms was near the palace or a large building, was on same style like today. In the modern time in India the front room near the gate is for the guards and the rooms at the back are used by the servants for sleeping.

The workmen's quarter were also found at Harappa. These

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50 Ibid, p. 42
51 E.J.H.Mackay (1998), op. cit, p. 69
quarters were built to the north of citadel. The quarters were laid in two east-west rows with a lane in between. Each unit was separated by a narrow gap. One unit of quarter measures 17 m north-south and about 7m east-west. Every unit has a courtyard in the front and a room at the back. The entrance was not straight but oblique, it was to maintain privacy. The complexes of these quarters were enclosed by a compound wall, made of mud-bricks.

At Harappa the houses were constructed on the mud-platforms. Each house was consisted of two rooms and a courtyard. A house measuring 18×8 m, having two rooms and a courtyard. The doorway of the house was simple and opens in the lane. Mud-bricks were used in the construction of the house. It was a plan of the simple house which was occupied by the common people.

(e) EXCLUSIVE BUILDINGS:-

The Harappan settlement had similarities in many ways like in streets, drains, houses, etc. But some cities had some exclusive features like warehouse, Pillard hall, Dockyard Great Bath, etc. These exclusive features were constructed for different purposes. There were symbols of progress.

(i) Mart:-

The marts were the market place which was used to sell the commodities. The artisan produced some surplus goods like bangles, potteries, Jewellery, tools, surplus foodgrains, etc. and

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52 B.B. Lal (1997), *The Earliest civilization of South Asia*, p. 112
sold in the market place. Some evidences of such marts were found at Mohenjodaro Banawali and Lothal. Some evidences of platform, an average width 4ft.6ins, were found in First Street at Mohenjodaro.\textsuperscript{54} The outer faces of these structures were only one brick thick. These benches were used to decorate the market goods.

The street 1 in lower town at Lothal was also used to decorate the market goods. This street was flanked by commercial house in both sides.\textsuperscript{55} Some platforms were found in the main street at Banawali these platforms were also used to decorate the market with goods.

\textbf{(ii) House of Pilgrims}

A remarkable building was found in G. section at Mohejodaro. This large rectangular building was 76ft. long and 216ft. wide. This building was entered from a doorway 14ft. 11ins wide. The doorway opened in the low lane. This was not an ordinary dwelling building. Mackay said "It might be a temple but there is complete absence of any object of religious significance within the building or a shrine for a statue."\textsuperscript{56} A. Khan named this building as some kind of hostel for pilgrims or travelers. It may be used by some priest and their pupils. Some special type of education may be imparted in this building.

\textsuperscript{54} E.J.H. Macky (1998), \textit{op. cit}, p. 28
\textsuperscript{55} S.R. Rao (1979), \textit{op. cit}, p. 55
\textsuperscript{56} E.J.H. Mackay (1998), \textit{op. cit}, p. 93