

THE ARCHITECTURAL OF ANCIENT PORT IN SIXTH CENTURY BCE EARLY WORLD CIVILIZATION

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Abstract. Archaeological research of early civilizations has proven that trade activities using the sea route took place much earlier than the first century AD. The evidence was obtained through archaeological research of the ancient port which is still dated to be used since the 31st Century BCE in Niuserre (Abu Gurab), West Asia, the 26th Century BCE in Dholavira, India, 18th Century BCE at Phalasarna in Europe and the 16th Century BCE in Honduras, Mesoamerica. However, this discussion only discusses the evidence of the ancient port dated at least since the sixth Century BCE for the early civilizations that have a contemporary dating with the discovery of the SB2D port structure in the Sungai Batu Complex, Lembah Bujang, Kedah.

Keywords: *architecture, reconstruction, oldest in Southeast Asia, ancient port*

Introduction

Recent archaeological research related to the architectural of the ancient port of early civilizations clearly show evidence of the used of sea routes has occurred over than 3,000 years ago. This is suggested based on evidence of ancient port recorded through archaeological studies that revealed it was used since the 31st century BCE in Niuserre (Abu Gurab), West Asia (Sichan, 2011), 26th century BCE in Dholavira, India (Gaur et al., 2019), 18th century BCE Phalasarna in Europe (Hadjidaki, 2001; 1988) and 16th century BCE in Honduras, Mesoamerica (McKillop, 2005; 2004a; 2004b; McKillop et al., 2004). However, archaeological research in that area is not accompanied by a proper plan of the architectural of the ancient port.

Archaeological research at the Southeast Asian until 2021 (*Figure 1*) show that only the Sungai Batu Archaeological Complex reveals evidence of the oldest and most complete port architecture in the region. These because other port sites in Southeast Asia are proposed as part of the trade area based on the findings of block ruins, wooden pillars, city fortifications, shipwrecks and trade artifacts such as ceramics, beads, glass, pottery and so on. So far the archaeological research at the Sungai Batu Archaeological Complex has revealed the most complete architectural evidence, the architectural structures of the port has clearly been able to fill the gaps related to the architecture of the port for early world civilization in particular.

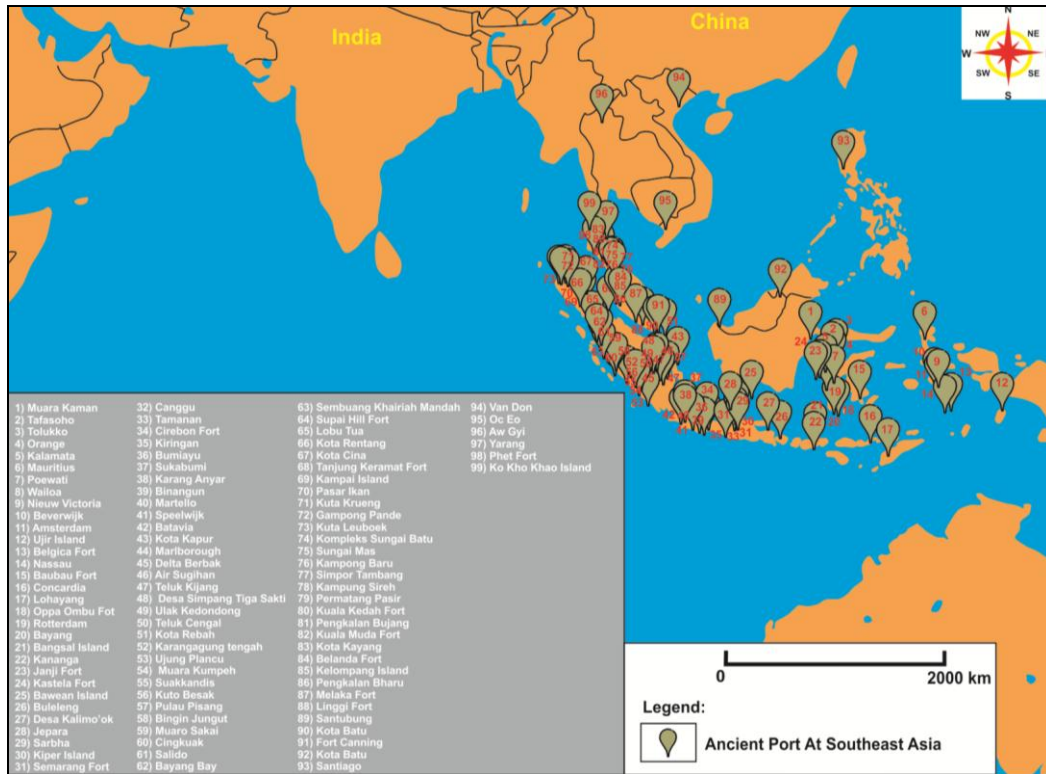


Figure 1. Location of the ancient Southeast Asian port site.

Materials and Methods

Archaeological research of the ancient port sites of the Sungai Batu archeological complex

Archaeological studies at the Sungai Batu Archaeological Complex especially at the SB2D site (Figure 2) (05°41.64' North and 100°27.08.35' East) have been found evidence of the shape of the port was built since 582 BCE (Table 1) (Saidin et al., 2011). The dating was obtained through in-situ brick samples at the site using Optically Stimulated Luminescence (OSL) technique. The brick samples were sent to Korea Basic Science Lab to obtain the dating data.

Table 1. Dating result of ancient port of SB2D.

Site	Trench	Spit	Sample classification	Dating
SB2D	f19	5	Floor structure	582 BCE

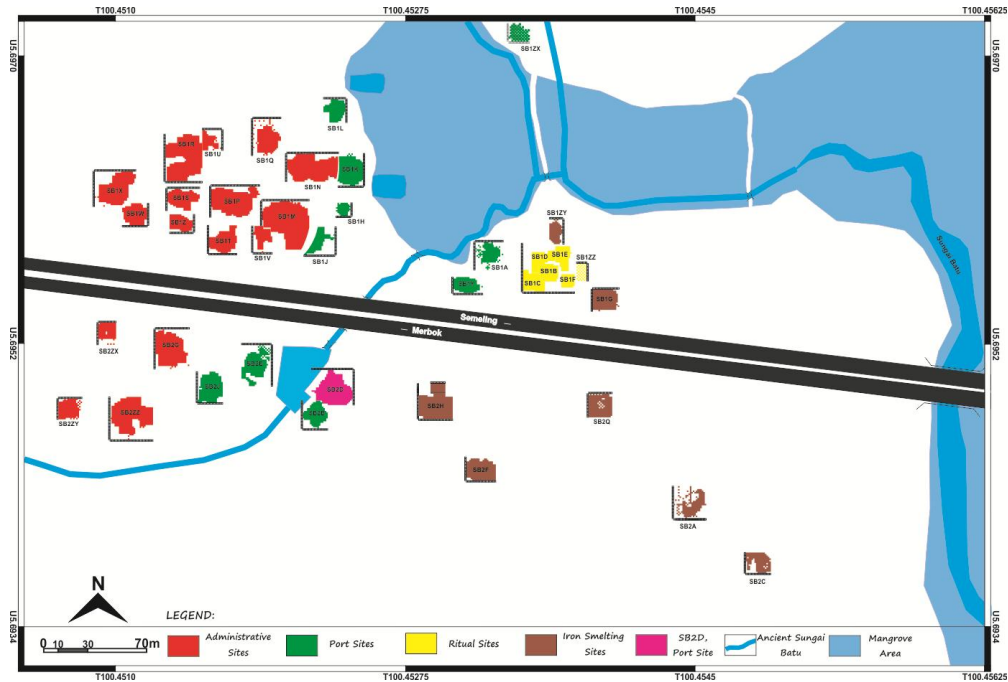


Figure 2. Location of the SB2D port site within the Sungai Batu archeological complex which reveals the sixth BCE dating.

Figure 3, Figure 4(a), and Figure 4(b) are sketches of the architectural structure of the SB2D ancient port and its suggestion of roof structure base on scattered of fragment of roof tile and pillar base. The site reveals its main structure measuring 19 meters x 5 meters and a support structure (Zakaria, 2014). The monumental structure of the ancient port of the SB2D site is characterized by the discovery of floor structures, walls, corridors, supporting buildings and roof tile that prove that the site as a roofed structure. In fact, the site was also built, directed and sloping towards the ancient river which further strengthens its interpretation as an ancient port in this area.

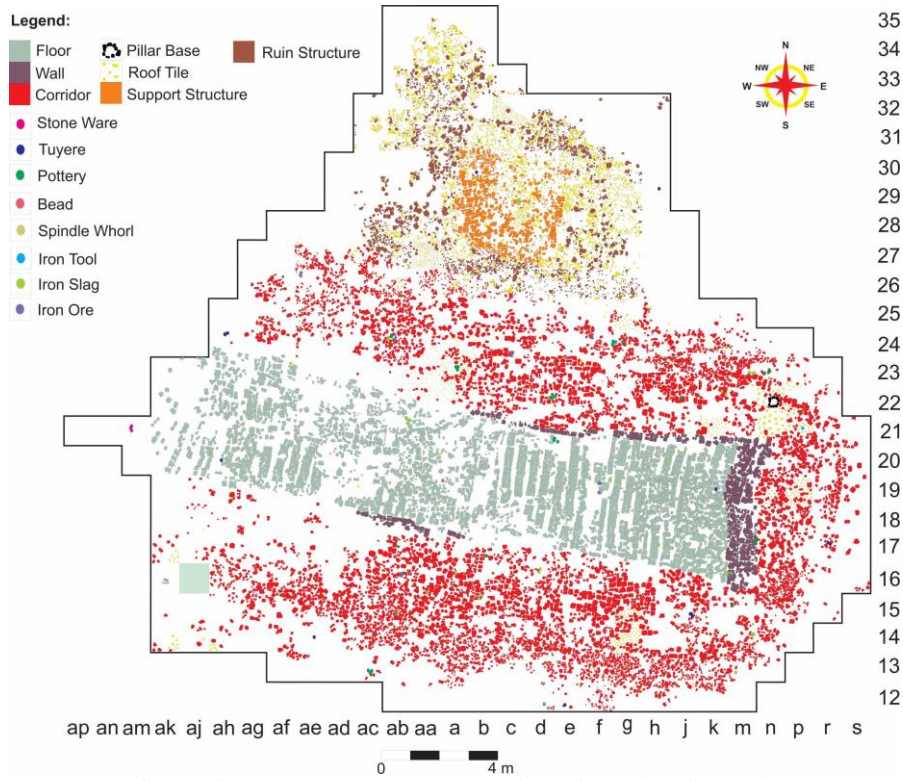


Figure 3. SB2D ancient port site based on sketch results.

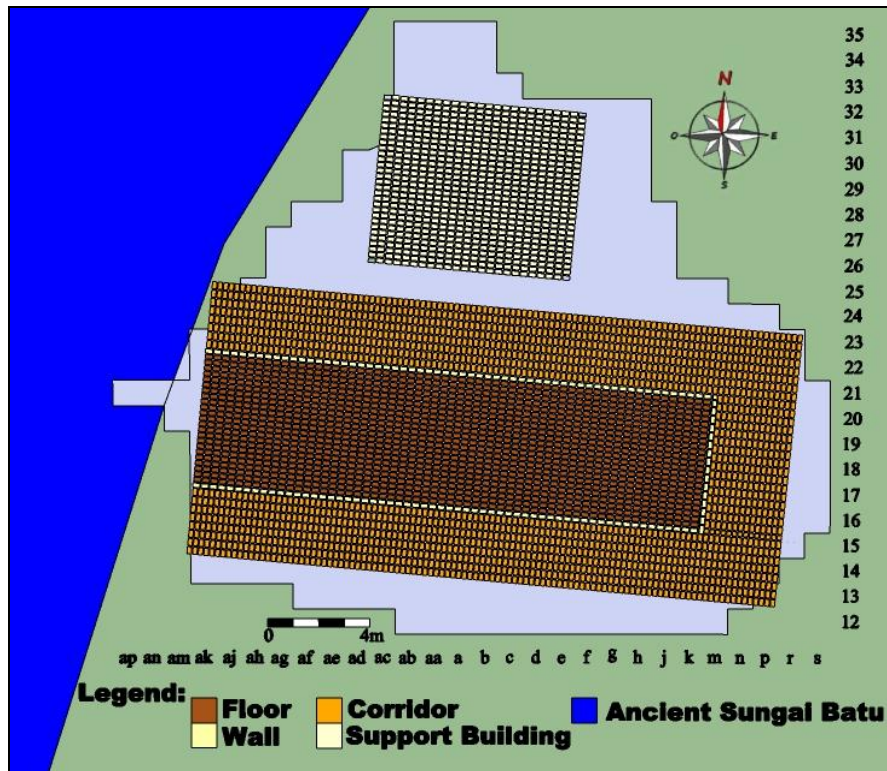


Figure 4(a). Architectural design of SB2D port site.

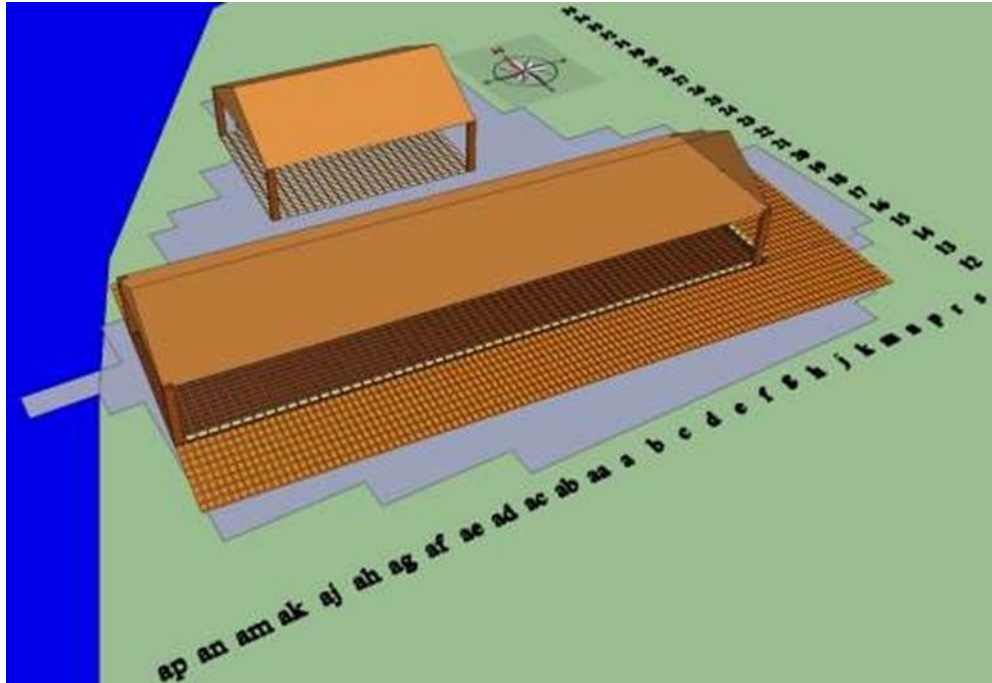


Figure 4(b). Architectural design of SB2D for proposed roof design.

The main floor of the SB2D port structure is characterized by a brick arrangement extending north-south. A total of 42 in-situ floor bricks were arranged to the main floor structure of the port which is 19 meters long. The corridor structure that found on the side of the main structure is characterized by a non-uniform arrangement of bricks. The corridor is estimated to be about 19 x 3 meters (Zakaria, 2014) and 3 meters wide. The orientation of the corridor at SB2D site was built arranged east-west oriented and also slope into the ancient river same with main monument. The wall structure at the SB2D site is on the east side of the site separating the main building from the corridor structure. The wall consists 12 in-situ layers of bricks and extends 5x1 metres were stacked forming a wall structure on this site which is oriented in a north-south direction (Zakaria, 2014).

The northern part of the SB2D site has been recorded a rectangular structure measuring between 3.5 meters x 2.9 meters which is proposed to serve as a support building to the SB2D port site (Zakaria, 2014). The two architectural structures are proposed to be built separately due to the empty space between the two architectural of the monument. The structure is also proposed to have a roof as many of the roof tile distributions are scattered over this rectangular structure. Excavations at the SB2D site also found a log proposed as anchors pole for merchant ship masts as they anchored in the port area (*Figure 5*). The anchors pole were found at the last floor structure on the river banks of the ancient Sungai Batu, at trenches namely am21, an21 and ap21 at a depth of about 50 cm (Zakaria, 2014). The findings are further reinforced by the discovery of trade artifacts at the SB2D site such as ceramics, stone ware, beads and spindle whorl that clearly illustrate the SB2D site was once involved in early trading activities.



Figure 5. A log possible as an anchor pole found at the last floor structure on the river bank of Sungai Batu at the SB2D port site.
Source: Zakaria (2014).

Results and Discussion

Analysis the evidence of the ancient port site of early civilizations

The chronometric dating of the SB2D port site gives data it has been built since the sixth century BCE (Mohd Hasfarisham, 2019) then the discussion in this paper will focus on evidence of ancient port architecture was built around the sixth century BCE to enable a comparative study was conducted. Therefore, *Table 2* is a classification of ancient port structure data for South Asian, European and African civilizations dated to be used since the sixth century BCE while *Figure 6* is the location of the ancient port sites which has been dated since the sixth century BCE in this area.

Table 2. Data classification of ancient world civilization of port sites.

Country	Site	Coordinate	Classification	Location	Source
India	Dantavaktrunikota	18°27'3.64" North and 83°54'53.91" East	The ruins of brick monument structure and trade artifacts such as pottery	Benggala Bay	Tripati (2009)
	Pithunda (Pithapuram)	16°17'0" North and 81°13'0" East	The ruins of brick monument structure and trade artifacts such as pottery	Maisolos River	Tripati (2009); Tripati et al. (2015)
	Naukratis	30°54'04" North and 30°35'33" East	Wall structure, wood and trade artifacts such as pottery	Nil River	Thomas et al. (2014)
Greece	Corinth	37.56° North and 22.56° East	Wall structure and trade artifact such as ceramic	Corinth Bay	Repousis et al. (2015)
	Apollonia	40.43° North and 19.28° East	Monument structure from stone block embedded in the seabed	Mediterranean Sea	D'Urso et al. (2015)
	Pythagoreion (Samos Island)	37°42' North and	A breakwater structure	Aegean Sea	Graauw (2017)

		26° 57' East	measuring 480 m long		
France	Marseille	43°17'47" North and 05°22'12" East	Wooden pole, wall from stone blocks, anchors and shipwrecks The ruins of brick monument	Mediterranean Sea	Morhange (2014)
Itali	Gravisca	42°12'46" North and 11°42'37" East	structure, breakwater and trade artifact such as pottery	Mediterranean Sea	Shuey (1981; 1978)
Libya	Ptolemais	32°42' North and 20°57' East	Wall structure measuring 300x5m	Mediterranean Sea	York (2017)
Tunisia	Salakta	35°24' North and 11°03' East	Ruin of fort and breakwater measuring 350m long	Mediterranean Sea	Garnsey et al. (1983)



Figure 6. Location of the ancient port sites of early world civilization.

Based on the data of the study, the evidence of the architectural of the world's ancient port since the sixth century BCE also does not reveal the complete architecture. Much of the evidence of the ancient port site of world civilization until now recorded the discovery of stone block ruins on the seabed (*Figure 7*) (D'Urso et al., 2015), wooden pillar structures (*Figure 8*) (Morhange, 2014), port cities (*Figure 9*), breakwaters (*Figure 10*) (Garnsey et al., 1983), wall structures (*Figure 11*) (York, 2017) and reede (*Figure 12*) (Bahar and Amri, 2009) built close to the sea, gulf and rivers. Furthermore, the presence of evidence of shipwrecks, anchors and trade artifacts strengthens the interpretation of the site's function as a ancient port. Based on the archaeological research, it revealed that the port site is not complete in the architectural of the port to enable a comparative study of the architecture to be carried out.



Figure 7. Ancient stone block structure of a port on the seabed.
Source: Graauw (2019a).



Figure 8. Ancient port reveals a pillar structure.
Source: Dogu et al. (2011).



Figure 9. One of the port city structures that was mapped during the archeological study.
Sources: Seshan (2019).



Figure 10. Ancient breakwater structure.
Source: Graauw (2019b).



Figure 11. Ancient ruin of port wall structure.
Source: Olesen (2017).



Figure 12. A reede structure that also represents part of the ancient port architecture.
Source: Bahar and Amri (2009).

Therefore, until now, only archaeological research at the Sungai Batu Archaeological Complex have been able to reveal the most complete ancient port architecture since the sixth century BCE and can be used as a reference related to the ancient port architecture in the world. To date, the discovery of 11 port structures on the left and right river banks of the Sungai Batu has been recorded (Halim, 2019; 2014) which is also the only area for early world civilization to reveal so many port structures in a river environment.

Conclusion

Archaeological research in the area of the Sungai Batu Archaeological Complex in a systematic and scientific manner have been able to study and examine the architectural of the most complete ancient port for Southeast Asia in particular and the world in general. It is built on the river banks of a Sungai Batu and its architecture slopes towards it to fit the basic interpretation of the shape of the port. Therefore, the evidence of archaeological studies in the Sungai Batu Archaeological Complex until now is a strong support regarding the architectural structure of the port was built using bricks since the sixth century BCE to represent the architectural of the ancient port of world civilization.

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Conflict of interest

The authors confirm that there are no conflict of interest involve with any parties in this research.

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