

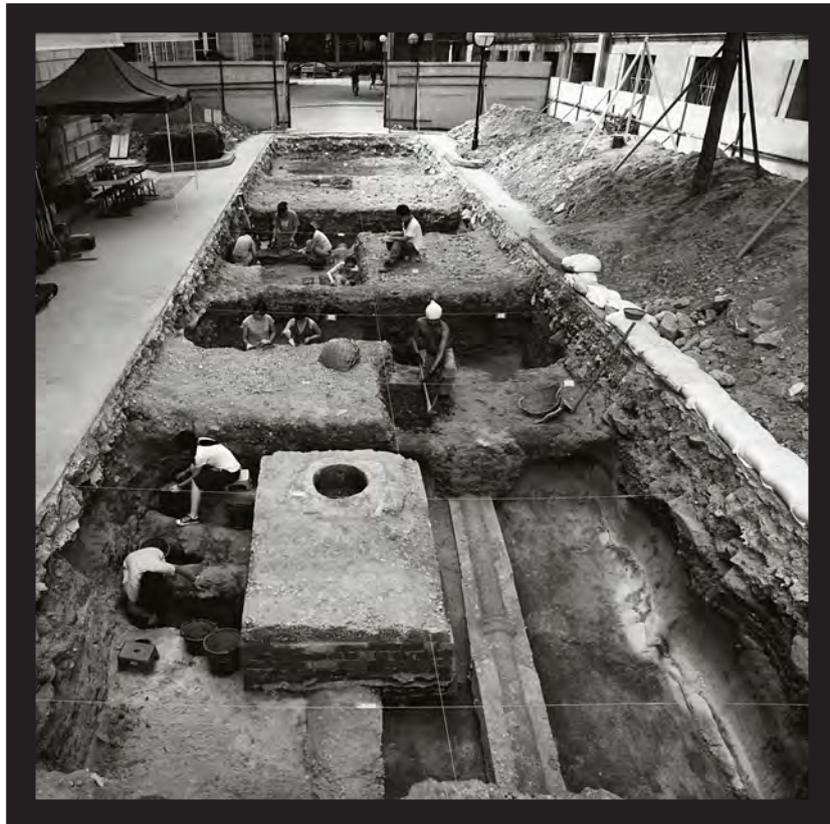
#5

NALANDA-SRIWIJAYA CENTRE

ARCHAEOLOGY UNIT

ARCHAEOLOGY

REPORT SERIES



Preliminary Report on the
Archaeological Investigations at
the National Gallery Singapore

LIM CHEN SIAN



Archaeology Unit
Nalanda–Sriwijaya Centre
ISEAS – Yusof Ishak Institute
30 Heng Mui Keng Terrace,
Singapore 119614



6870 4548



6775 6264



facebook.com/nalandasriwijayacentre



<http://nsc.iseas.edu.sg>



nsc@iseas.edu.sg

LIM CHEN SIAN

Lim Chen Sian was the Project Archaeologist for the archaeological investigations at the National Gallery Singapore. Since 2006, he has led all the major archaeological excavations in Singapore. He read finance and archaeology at Boston University, and received his MA in Southeast Asian Studies from the National University of Singapore. He is Associate Fellow with the Archaeology Unit, Nalanda–Sriwijaya Centre, ISEAS - Yusof Ishak Institute.

The Nalanda–Sriwijaya Centre Archaeology Unit (NSC AU) Archaeology Report Series has been established to provide an avenue for publishing and disseminating archaeological and related research conducted or presented within the Centre. This also includes research conducted in partnership with the Centre as well as outside submissions from fields of enquiry relevant to the Centre's goals. The overall intent is to benefit communities of interest and augment ongoing and future research.

The NSC AU Archaeology Report Series is published electronically by the Nalanda–Sriwijaya Centre of ISEAS – Yusof Ishak Institute.

© Copyright is held by the author/s of each report.

ISEAS – Yusof Ishak Institute accepts no responsibility for facts presented and views expressed. Responsibility rests exclusively with the individual author or authors. Authors have agreed that permission has been obtained from appropriate sources to include any content in the publication such as texts, images, maps, tables, charts, graphs, illustrations, and photos that are not exclusively owned or copyrighted by the authors. Authors have also agreed that proper referencing, acknowledgement and accreditation has been exercised according to professional standards.

The NSC AU Archaeology Report Series cannot be republished, reprinted, or reproduced in any format without the permission of the paper's author/s.

Citations of this publication should be made in the following manner:

Lim Chen Sian, Preliminary Report on the Archaeological Investigations at the National Gallery Singapore Nalanda–Sriwijaya Centre Archaeology Unit Archaeology Report Series No 5 (January 2017).

Senior Guest Editor: Terence Chong
Senior Editor : Kyle Latinis
Editor : Nicholas Chan
Cover Art Template : Aaron Kao
Layout & Typesetting : Kyle Latinis & Nicholas Chan

For any submissions or inquiries, please refer to the website or contact nsc@iseas.edu.sg.

FOREWORD

The Nalanda-Sriwijaya Centre is pleased to present our first report on archaeological rescue operations conducted in Singapore. Despite Singapore being a comparatively small island in the region, the archaeological assemblages are quite substantial, densely packed, and critically important vis-à-vis numerous applied and academic concerns. They not only add considerable depth to local and regional history, but also provide a wealth of data useful for global theories and models.

Although many readers are often drawn to the prominent 14th century CE component of several Singaporean sites since their discovery in the 1980s and 1990s through the pioneering research conducted by Professor John Miksic and others, Singapore offers a rich historical archaeology potential from the 14th century onwards, particularly from the colonial period through the 20th century. It is quite intriguing to consider the different manifestations of Singapore's "port city" history (ancient, colonial, and modern) through the unique narratives provided by the archaeological record; a record that yields complementary, sometimes contradictory, and often missing narratives to historical studies. Furthermore, all periods are heavily characterised by complex inter-regional and inter-cultural interaction, commerce, and networks. On the other hand, inter-site and intra-site variability and dynamics are evident. These give ancient Temasek and historic Singapore a unique verve and personality. Moreover, the intra-site variability hints at different vocational, political, social class and perhaps cultural variability that adds considerable richness and dynamism to ancient urban studies.

Archaeological mitigation efforts have increased since the early 2000s. The National Gallery Singapore project is only one of several initiatives conducted over the last three decades. However, as Mr. Lim intimates in the following report, archaeological efforts face support difficulties and remain a primarily volunteer and financially constrained undertaking despite growing public interest and appreciation. The archaeological record is a non-renewable resource and quickly vanishing in the wake of continual development. Furthermore, there is a need for more skilled professionals to process the existing material and properly address future demands. We sincerely hope that this report as well as future reports will minimally contribute to one form of cultural preservation (i.e., documentation, reporting, analysis, knowledge creation and dissemination) and stimulate further awareness, growth and support.

David Kyle Latinis
Visiting Fellow
Nalanda-Sriwijaya Centre
ISEAS – Yusof Ishak Institute
Singapore, January 2017

Preliminary Report on the Archaeological Investigations at the National Gallery Singapore

ABSTRACT

The former Supreme Court and Municipal Building (City Hall) underwent extensive redevelopment and was remodeled as a new art museum dedicated to Southeast Asian art. An archaeological evaluation conducted in December 2009 revealed pockets of pre-colonial deposits, which led to a month-long large-scale rescue excavation in November 2010. While the rescue excavation only covered a small part of the construction impact zone, about 375 kg of materials were successfully recovered. This preliminary site report details the excavation sequences conducted at the site.

Keywords: National Art Gallery; National Gallery Singapore; Pre-colonial Singapore; Pre-modern Singapore; Rescue Archaeology; Temasek.

CONTENTS

FOREWORD	1
ABSTRACT	2
LIST OF FIGURES	5
LIST OF TABLES	8
1: INTRODUCTION	9
1.1: Archaeology in Singapore.....	9
1.2: Circumstances of the Investigations.....	9
1.3: Nomenclature and Nature of the Report.....	10
2: ARCHAEOLOGICAL BACKGROUND	10
3: THE SITE.....	12
4: ARCHAEOLOGICAL OBJECTIVES AND METHODS	19
4.1: Project Objectives	19
4.2: Areas of Investigations	19
4.3: Methods.....	20
4.4: Site Datum	20
5: GEOLOGY, SITE STRATIGRAPHY AND ARCHAEOLOGICAL SEQUENCE ...	22
5.1: Geology.....	22
5.2: Site Stratigraphy	23
5.3: Archaeological Sequence.....	24
6: REMOTE SENSING	24
7: EVALUATION TEST EXCAVATION.....	26
7.1: NAG 001 (Car Park Lot No.17)	28
7.2: NAG 002 (Car Park Lot No.16)	30
7.3: NAG 003 (Car Park Lot No.15)	31
7.4: NAG 004 (Padang).	32
7.5: NAG 005 (Padang)	35
7.6: NAG 006 (Car Park Lot No.13)	37
7.7: NAG 007 (Car Park Lot No.12)	38
7.8: NAG 008 (Car Park Lot No.11)	39
7.9: NAG 009 (Car Park Lot No.7)	40
7.10: NAG 010 (Car Park Lot No.6)	41
7.11: NAG 011 (Car Park Lot No.5)	42
8: RESCUE EXCAVATION.....	42
8.1: Modern Services Intrusions.....	45
8.2: NAG 012 to NAG 015 (4 Units)	46

8.3: NAG 016 to NAG 019 (4 Units)	47
8.4: NAG 020 to 025 (6 Units).....	48
8.5: NAG 026 to NAG 029 (4 Units)	51
8.6: NAG 030 to NAG 035 (6 Units)	51
8.7: Rescue Excavation Stratigraphic Record	52
9: WATCHING BRIEF	54
10: THE FINDS AND ARTIFACTS	54
10.1: Post-Excavation Processing and Analysis	54
10.2: Evaluation Yield.....	54
10.3: Rescue Excavation Yield	55
10.4: Artifact Survivability	56
10.5: Chinese Ceramics.....	57
10.6: Southeast Asian and Local Ceramics	60
10.7: European Ceramics.....	61
10.8: Colonial Period Bricks	61
10.9: Metals	61
10.10: Gold	63
10.11: Medieval Glass.....	63
10.12: Shell and Coral	64
10.13: World War II Midden.....	65
10.14: Other Materials	65
11: DISCUSSION.....	66
12: CONCLUSION.....	67
REFERENCES CITED	69
ACKNOWLEDGEMENTS	71
ARCHAEOLOGY PROJECT TEAM	72

LIST OF FIGURES

Fig. 1: Location map of National Gallery Singapore site (Aaron Kao).	13
Fig. 2: Plan of Singapore Harbour February 1819 by Daniel Ross (Author's collection).	14
Fig. 3: Enlargement of plan showing 'Old Walls of the City' (Author's collection).....	14
Fig. 4: June 1823 sketch attributed to Philip Jackson (Pearson 1953).....	15
Fig. 5: Enlargement of sketch depicting Farquhar's Residency with tall pitch roof (Pearson 1953).	15
Fig. 6: G. R. Lambert postcard c. late-19th century showing residences and hotels along the Padang esplanade (Author's collection).....	16
Fig. 7: Hotel de L'Europe in a series of bungalow houses along the esplanade (Author's collection).	16
Fig. 8: Grand Hotel de L'Europe after redevelopment in 1907 (Author's collection).	17
Fig. 9: 1934 master plan for the civic district (National Archives United Kingdom)..	18
Fig. 10: 1934 master plan showing the three proposed government buildings; Legislative Council, Supreme Court, and Municipal Building (National Archives United Kingdom).	18
Fig. 11: Plan depicting areas for investigations.	20
Figs. 12a and b: SLA Precise Level Benchmark No. 80181 within St. Andrew's Cathedral compound.	21
Fig. 13: Alluvial deposits highlighted in yellow. Geological Map of Singapore (Public Works Department 1976).....	22
Fig. 14: Enlargement of geological map showing alluvial deposit underlying the National Gallery Singapore site (denoted in map as Supreme Court) and general vicinity (Public Works Department 1976).....	23
Figs. 15a and b: GPR trial with 900 MHz antenna in the courtyard of the Municipal Building (Benjamin Vining).	25
Fig. 16: Car park area between the buildings for evaluation.	27
Fig. 17a and b: Removal of the precast perforated concrete slab provided the opportunity to excavate without damaging the existing roadway.....	27
Fig. 18: Evaluation excavation units NAG 001, NAG 002 and NAG 003.....	28
Fig. 19: Site plan for evaluation units NAG 001 – NAG 011 (highlighted in red).	28
Fig. 20: NAG 001 West Profile.....	29
Fig. 21: NAG 002 West Profile.....	30
Fig. 22: NAG 003 West Profile.....	31
Fig. 23: NAG 003 North Profile.....	32
Fig. 24: NAG 004 and 005 North Profile.....	33
Fig. 25: Plan view of World War II midden in NAG 004.	34

Fig. 26: Detailed plotting of World War II midden in NAG 004.....	34
Fig. 27: NAG 004 and 005 South Profile.	36
Fig. 28: Asbestos sheets in NAG 005 (rear) and NAG 004 World War II midden (foreground).....	36
Fig. 29: NAG 006 West Profile.....	37
Fig. 30: NAG 007 West Profile.....	38
Fig. 31: NAG 008 North Profile.....	39
Fig. 32: NAG 009 East Profile.	41
Fig. 33: NAG 009 East Profile. The labels read (left to right): roadway fill; pipe trench; colonial period bricks; Temasek cultural layer, and watertable.	41
Fig. 34: NAG 010 West Profile.....	42
Fig. 35: Site plan for rescue excavation units NAG 012–NAG 035 (highlighted in red).	43
Fig. 36: Rescue excavation zone; measuring 26 x 5m.	44
Fig. 37: Three 20th century trench intrusions clearly visible, cast iron sewage pipe (left), terracotta ceramic sewage pipe (here clad in concrete–centre), and Portland cement, gravel, and sand trench (right). These three intrusions run the entire length of the excavation site.....	45
Fig. 38: Extent of cast iron and terracotta ceramic sewage pipes.....	45
Fig. 39: NAG 012 and NAG 013, live cast iron sewage pipe (foreground) and disused brick sewage inspection chamber (centre).....	46
Fig. 40: NAG 018 showing disused ceramic terracotta pipeline (foreground) and defunct corroded gas main running on a north-south axis between the former Supreme Court and Municipal buildings.....	47
Fig. 41: NAG 24 East Profile.	49
Fig. 42: NAG 024 where the significant torso of a Buddhist figurine was found buried amongst a cache of rocks (lower left).....	49
Fig. 43: Buddhist figurine amongst rocks.....	50
Fig. 44: Buddhist iconography from NAG 022 (right) and NAG 024 (left).....	50
Fig. 45: NAG 028 (left) and NAG 029 (right). PVC pipe housing electrical cables for lighting on unexcavated bulkhead (left rear).....	51
Fig. 46: NAG 030 to 035 on the extreme western end of the excavation zone, furthest away from the Padang.....	52
Fig. 47: Typical east profile of the rescue excavation zone (NAG 030 and NAG 031). 52	
Figs. 48a and b: North profile of rescue excavation zone.....	53
Fig. 49: <i>Xiao kou ping</i> (Chinese: bottle with small mouth).....	58
Fig. 50: Greenware globular jarlet.	58
Fig. 51: Whiteware porcelain with intricate motifs.....	59

Fig. 52: Unidentified figurine of an elderly gentleman. 59

Fig. 53: Decorated earthenware sherds..... 60

Fig. 54: Chinese copper cash. 62

Fig. 55: Fishing hooks (highly oxidized). 62

Fig. 56: Gold foil..... 63

Fig. 57: Decorated glass shards. 64

Fig. 58: Shell remains. 64

Fig. 59: Flint as ballast. 65

LIST OF TABLES

Table 1: Brief Historical Chronology Of The Site..... 12

Table 2: Typical Stratigraphy Of The Excavated Units 23

Table 3: Unit Excavation Schedule..... 26

Table 4: Total Mass Per Material And Sub-Category—Evaluation Excavation. 55

Table 5: Percentage Mass Per Temporal Period – Evaluation Excavation. 55

Table 6: Total Mass Per Material And Sub-Category—Rescue Excavation. 56

Table 7: Percentage Mass Per Temporal Period – Rescue Excavation..... 56

1: INTRODUCTION

1.1: Archaeology in Singapore

Archaeology provides the means to understand the past, especially where records and documents are scarce or do not exist. This is particularly relevant to researching the origins of Singapore's port and urban trading complex from its 14th century CE zenith as a prominent straits port to the early colonial period. Additionally, the archaeological record offers a unique and complementary historic narrative from the colonial to modern periods often absent in most history books.

Archaeology is the study of the past through material remains. Through the recovery of artifacts, ecofacts, features or structures, the study of a site's usage in the past and also relationships between socio-political-religious lifeways may be discerned. Archaeology involves controlled excavation and the systematic recovery of data, and does not limit itself to the study of artifacts. For example, analysis of sediments and stratigraphy can all provide clues for the archaeologist to interpret the past.

Modern Singapore rests upon a rich foundation of colonial and pre-colonial archaeological remains spanning a period of seven centuries. The earliest artifacts date to the 14th century.¹ Excavations since 1984 have revealed vast amounts of artifacts dating to the Temasek or Singapura period (c.1300-1600s) (Miksic 2013). These discoveries expanded the urban history of Singapore from the previously accepted conventional date of Singapore's widely portrayed origin when the English East India Company established a trading factory in 1819 (Kwa *et al.*, 2009). Over the last 32 years, 10 major sites have been excavated and identified as belonging to the Temasek period: Fort Canning, Empress Place riverside, Colombo Court, Parliament House Complex, Old Parliament House, Padang, St. Andrew's Cathedral, the National Gallery Singapore, Victoria Concert Hall, and the Empress Place lawn. These sites fall within the estimated urban core of the ancient port city and likely belong to a large contiguous settlement area, although internal settlement variation perhaps represented by socio-economic, vocational, ethnic, religious and other factors likely occurred.

1.2: Circumstances of the Investigations

The site for a new Southeast Asian art museum rests within the historically and archaeologically important civic district. This new art gallery entailed the conversion and redevelopment of two colonial period buildings, the former Supreme Court (built 1939) and Municipal Building (built 1929). Any further development will continue to impact archaeological materials remaining beneath the compounds of the buildings and surrounding roadways.

Currently, archaeological impact assessments are not required as part of developmental planning policies in Singapore; nor for sites that are gazetted with conservation or preservation status. Nevertheless, the historical significance of the two

¹ Chinese coins from the Tang Dynasty (618-906 CE) were recovered within the 14th century context. These are the 'oldest' artifacts from an archaeological provenance in Singapore. In the 1930s, the Raffles Museum acquired Neolithic tools from the western coast of Singapore, but no archaeological investigations on the prehistoric period were carried out. The tools are cursorily estimated to be

buildings was recognised. They were designated National Monuments under the Preservation of Monuments Act in 1992, albeit the protection of the sites are limited to above ground built heritage (architectural) and does not pertain to archaeological remains (Lee, 2013). However, recognising the heritage importance, the archaeology team was able to negotiate with the developing agency to conduct an archaeological evaluation of the site when news of the development was publicised (Ministry of Information, Communications and the Arts 2007).

Subsequently, a four-week archaeological investigation funded in part by the developing agency, the National Gallery Singapore, was conducted in Dec 2009 to evaluate the archaeological potential of the site. The successful recovery of 71 kg of artifacts ascertained that there remained a sizable assemblage of subsurface archaeological remains. This led to a one-month large-scale archaeological rescue excavation in late 2010.²

1.3: Nomenclature and Nature of the Report

The site was known as the National Art Gallery (NAG) during the course of the archaeological evaluation in 2009 and rescue excavation in 2010. Since then, the gallery has undergone a series of rebranding and name-changes, finally settling with National Gallery Singapore. The NAG prefix was adopted for all archaeological records of the site, excavation units, illustrations, finds, and artifacts. When referring to the archaeological data, the NAG designation will be employed for this report and any future publications. References to the current name of the site, National Gallery Singapore, will be used in conjunction with the former.

This report serves as a record of the archaeological investigations held on site between 2008 and 2012. The on-site fieldwork comprises of a ground penetrating radar (GPR) survey in Apr 2008; evaluation trenches in Dec 2009; large-scale rescue excavations in Nov 2010, and a limited watching brief during the initial stages of construction in 2012.³ This report is based on two unpublished reports submitted to the National Heritage Board detailing the evaluation and rescue excavation phases (Lim 2010a; 2010b). Post-excavation processing and analyses of the finds from the excavations are still underway and are not included in this site report.

2: ARCHAEOLOGICAL BACKGROUND

Archaeological investigations in the colonial and civic district demonstrated that Temasek period sites are located along the north bank of the Singapore River. Past excavations in the 1990s and 2000s have revealed the vicinity to be the heart of the 14th century settlement (Miksic 2013: 240–263). Many of the sites in the vicinity consist of colonial period architecture from the mid-19th century to pre-Second World War. The building foundations are typically shallow, hence large pockets of archaeological artifacts from the pre-colonial Temasek period remain intact. Temasek

² The author was previously a Visiting Affiliate with the Southeast Asian Studies Programme, National University of Singapore (NUS) and the excavation was undertaken under the auspices of NUS.

³ A watching brief essentially involves an archaeologist being on-site to observe and if necessary recover and document any material cultural remains during construction.

period deposits are characteristically found in a single dark sandy layer approximately 1.0-2.0 m beneath the present modern surface.

Early archaeological interest in the north bank of the Singapore River began in 1989 when construction workers uncovered some antiquarian remains.⁴ Further opportunities to conduct limited archaeological excavations presented itself during the construction of the new Parliament House Complex in 1994. A few years later, the redevelopment of the defunct Empress Place Museum as the Asian Civilisations Museum, permitted an excavation along the Empress Place riverbank in 1998. More redevelopment work enabled additional excavations at Colombo Court during the construction of the new Supreme Court that took place in 2000; the conversion of the Old Parliament House into the Arts House in 2002; the returfing of the lawn of the Singapore Cricket Club Padang in 2003; and the St. Andrew's Cathedral in 2003. American expatriate archaeologist John Miksic led these early excavations as part of a research agenda to shed light on Singapore's ancient port and urban landscape. While no individual official archaeological site reports were published, a brief overview of these excavations is summarised in Miksic's book, *Singapore and the Silk Road of the Sea 1300-1800* (Miksic 2013).

Past excavations and surveys within the immediate locality of the National Gallery Singapore revealed an abundance of archaeological remains despite development in the 19th and 20th centuries. From the adjacent St. Andrew's Cathedral excavations, one metric tonne of artifacts were salvaged (Miksic and Lim 2004). A test trench probe at the Singapore Cricket Club attested to more archaeological remains lying in-situ beneath the Padang. These sites yielded substantial evidence supporting the existence of a pre-modern settlement covering an area of minimally 80 ha (Miksic 2004).

More recently, following the excavations at the National Gallery Singapore, redevelopment at neighbouring Victoria Concert Hall and Theatre and Empress Place lawn brought about the need for archaeological intervention and mitigation. The Victoria Concert Hall and Theatre complex underwent a major construction. The theatre was demolished in its entirety and rebuilt except for the original facade. An archaeological evaluation conducted in Jun 2010 in the north garden of the concert hall and inspection of construction services along the west compound provided sufficient evidence of archaeological remains to warrant mounting a limited rescue excavation. An area measuring 29.0 x 4.0 m situated within the impact zone was excavated in Sept 2011. The rescue excavation yielded 700 kg of artifacts predominantly from the Temasek period (Lim 2013).

Landscaping works for the transplanting of trees on the Empress Place lawn in 2015 resulted in the largest archaeological excavation in Singapore. The principal area for investigation covered 70.0 m x 15.0 m and the site yielded the largest quantity of materials in the history of Singapore archaeology. Approximately three metric tonnes of artifacts were recovered (Lim 2016).

⁴ *The Straits Times*, November 18, 1989

3: THE SITE

The National Gallery Singapore site consists of the compounds of the former Supreme Court and Municipal Building of Singapore (Figure 1). A cursory history of the two buildings can also be found in the Preservation Monument Boards Preservation Guidelines produced by the Urban Redevelopment Authority (1993; 1994).

Table 1: Brief historical chronology of the site.

1951	Municipal Building renamed as 'City Hall'
1939	Supreme Court building opens
1936	Demolition of Grand Hotel de L'Europe, and construction of Supreme Court
1929	Municipal Building opens
1926	Construction of Municipal Building
1907	Remodeled and enlarged as the Grand Hotel de L'Europe
1865	Hotel de L'Europe established in one of the bungalows
1828	George Coleman (and possible other architects or engineers) built a series of bungalow houses for European merchants
1823	Philip Jackson, Assistant Engineer purchased plot from William Farquhar
1819–1823	William Farquhar built his house and official residence of the Resident and Commandant of Singapore
1300s–1600s	Settlement of Temasek, ancient Singapura

Several 19th century maps depict the ancient city walls of Temasek and suggest the extent of its urbanised core (Figures 2–3). The second East India Company Resident of Singapore, John Crawfurd, observed in Feb 1822 that the remnants of the walls were still visible and made up the northern boundary of the ancient town (Crawfurd 1828). Archaeological research since the 1980s has determined that the remains of the pre-modern settlement of Temasek were bounded by Fort Canning Hill to the west, the Singapore River in the south, Stamford Road to the north, and the shoreline on the east. The National Gallery Singapore lies within the urbanised boundary of the ancient settlement.

Besides the pre-colonial Temasek period, historical records and archaeological data are equally scarce for the early years of modern Singapore under the East India Company. Colonial period archaeology is still in its infancy in Singapore. Only a few sites have been probed to date (Lim 2006).

The National Gallery Singapore sits atop the official Residency of Lieutenant-Colonel William Farquhar, the first Resident and Military Commandant of Singapore (Figures 4-5). The Residency was the earliest predecessor of the Government House, which later evolved into the Governor's Residence and finally the present-day Istana. The Residency was recorded to have consisted of several single-storey structures that were used as Farquhar's residence, office, treasury, courthouse, and church (Leong 2004).

After Colonel Farquhar's departure in 1823, part of the compound was sold to another prominent official of early Singapore, the Assistant Engineer of the settlement, Lieutenant Philip Jackson. It is also believed that the Second Resident of Singapore, Dr. John Crawfurd lived in one of the bungalows within Farquhar's Residency prior moving to Government Hill (today's Fort Canning). From historical records, it is known that the entire compound measured some 32,680 sq ft (Leong 2004).

Fig. 1: Location map of National Gallery Singapore site (Aaron Kao).

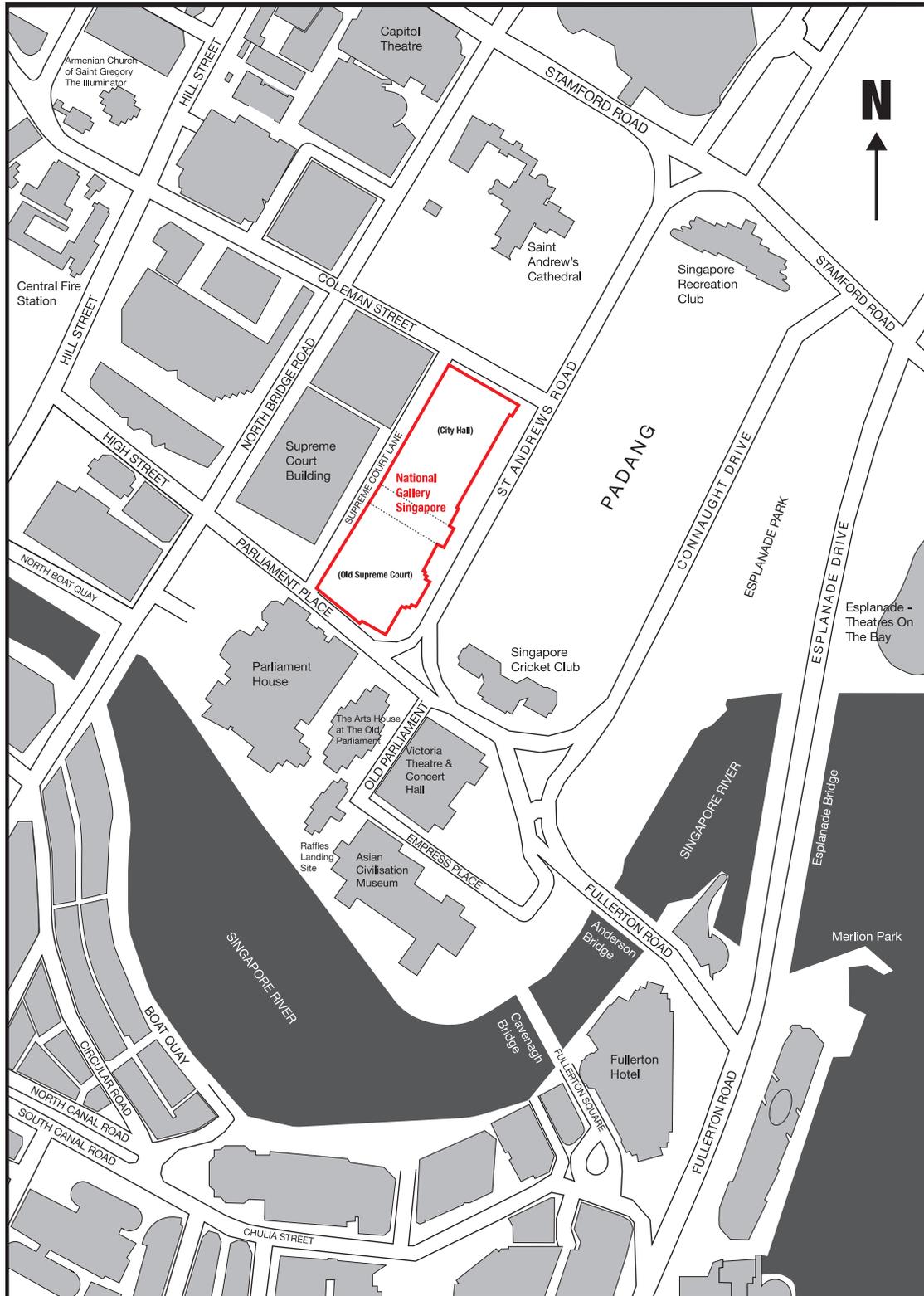


Fig. 2: Plan of Singapore Harbour February 1819 by Daniel Ross (Author's collection).

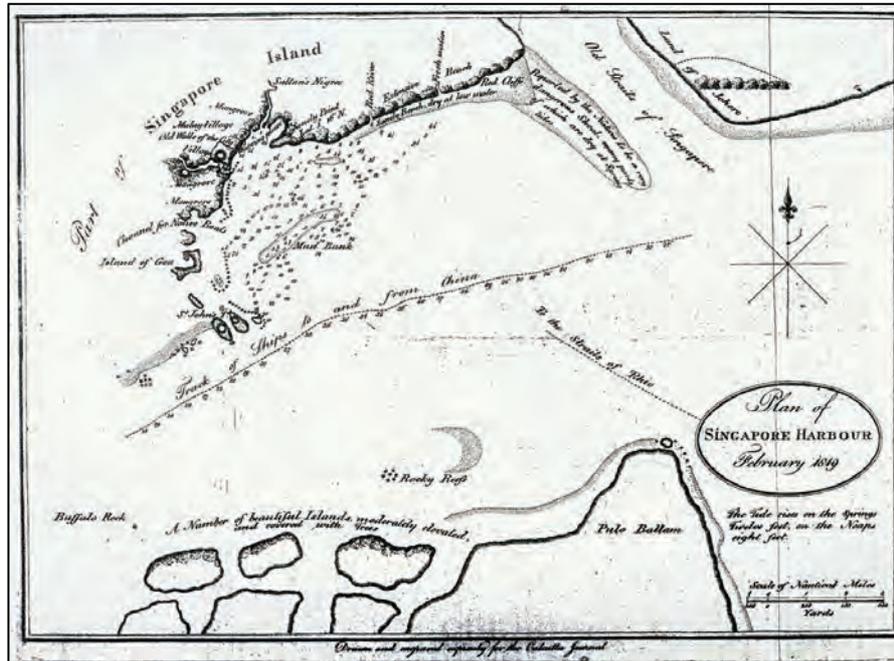


Fig. 3: Enlargement of plan showing 'Old Walls of the City' (Author's collection).



Fig. 4: June 1823 sketch attributed to Philip Jackson (Pearson 1953).

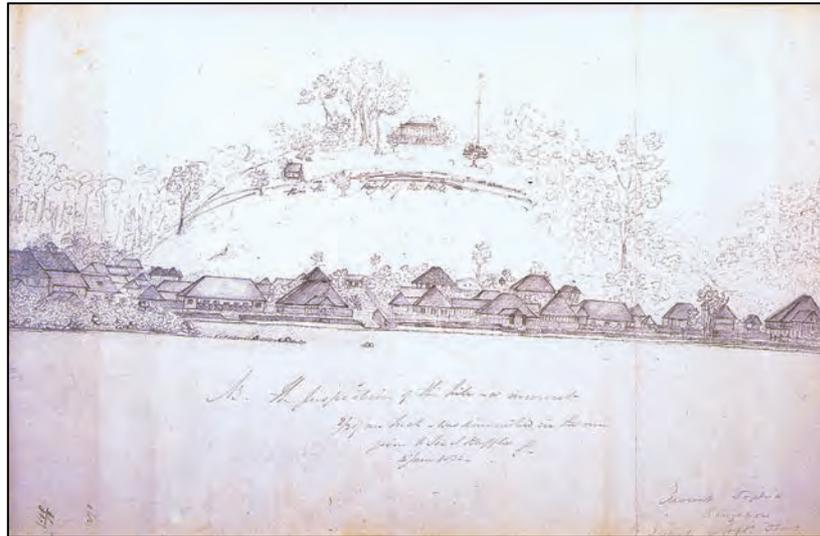
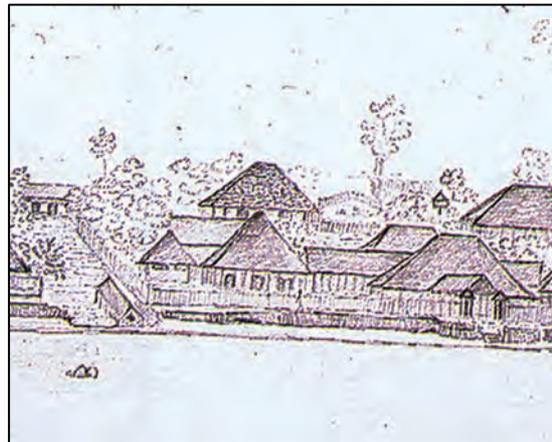


Fig. 5: Enlargement of sketch depicting Farquhar's Residency with tall pitch roof (Pearson 1953).



Early housing in Singapore was typically constructed of timber and thatch. Over the course of the 19th century organic materials slowly gave way to masonry and brick as the future of the factory and colony became politically and economically certain. Affluent European merchants soon erected comfortable bungalows around the Padang. By the mid-19th century, some of the houses were converted into hotels (Figure 6). In 1867, Hotel de L'Europe, originally located on Hill Street, took over the management of another hotel at the esplanade (Figure 7)⁵. The hotel grew in prominence and the string of bungalows and private residence that made up the

⁵ *The Straits Times*, October 1, 1897.

compound was replaced with a modern building with a rooftop garden and opened for business in 1907 (Figure 8).⁶

Fig. 6: G. R. Lambert postcard c. late-19th century showing residences and hotels along the Padang esplanade (Author's collection).



Fig. 7: Hotel de L'Europe in a series of bungalow houses along the esplanade (Author's collection).



⁶ *The Straits Times*, October 30, 1932.

Fig. 8: Grand Hotel de L'Europe after redevelopment in 1907 (Author's collection).



In the interwar years between the First and Second World War, the colonial government embarked upon a grand redevelopment plan for the civic district to include a new courthouse, legislative council, and municipal hall (Figures 9-10). The land on which the hotel sat was acquired for the building of the courthouse. However, due to the economic effects of the Great Depression, only the Supreme Court and Municipal Building were constructed prior to the outbreak of the Second World War.⁷

With the erection of the Municipal Building in 1929 and the Supreme Court in 1939, little else has changed for the site apart from the occasional disturbance emplacing utility services. This want of disruption to the site presents significant potential for pockets of archaeological remains from the Temasek and early colonial periods lying undisturbed within the compound. Consequently, the National Gallery Singapore's redevelopment plans, which entailed extensive demolition and construction of multiple subterranean levels beneath the two buildings, would destroy any archaeological deposits.

⁷ National Archives of the United Kingdom, CO 273 599-1, 1934.

Fig. 9: 1934 master plan for the civic district (National Archives United Kingdom).

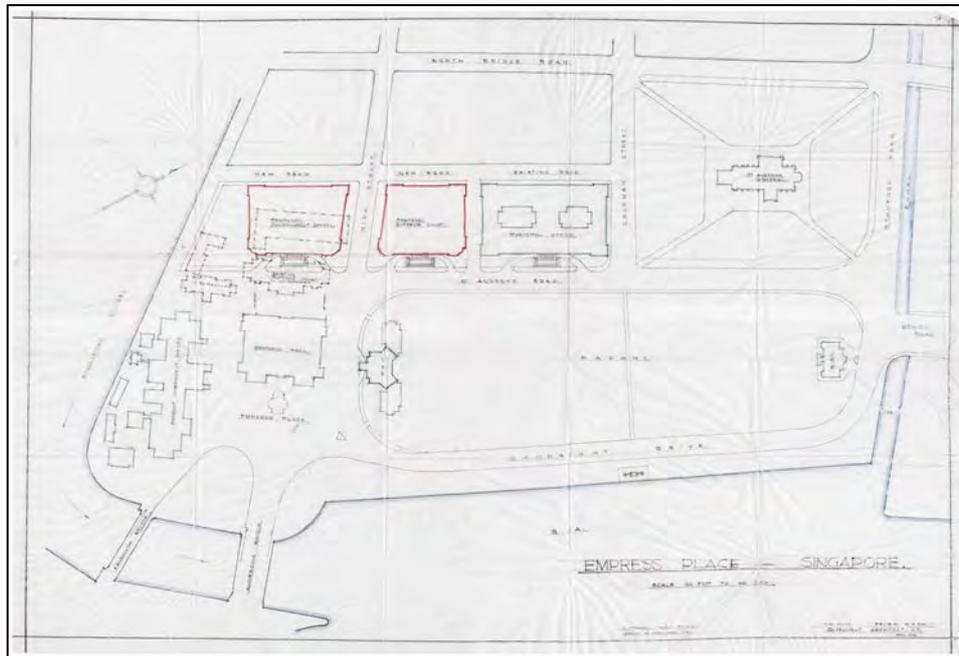
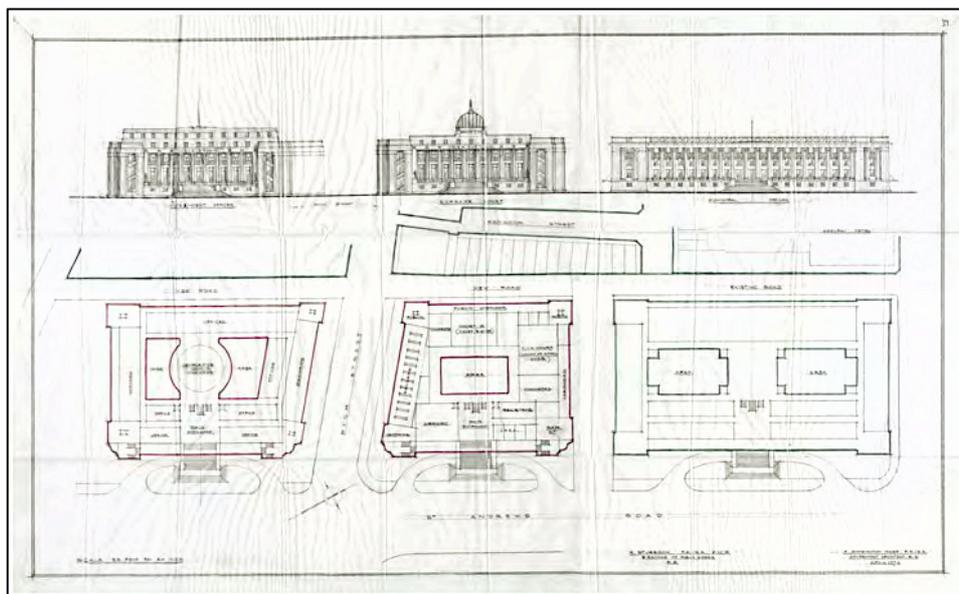


Fig. 10: 1934 master plan showing the three proposed government buildings; Legislative Council, Supreme Court, and Municipal Building (National Archives United Kingdom).



4: ARCHAEOLOGICAL OBJECTIVES AND METHODS

Initial exploration for the archaeological potential of the National Gallery Singapore site began in September 2007. Over the following two years, sporadic site assessments were carried out. Soil investigations by civil engineers were undertaken within the compound between December 2008 and February 2009. The soil investigations required the removal of approximately 50 cm of surface material and earth to facilitate the employment of a gasoline powered machine piston bore. The engineering studies provided the opportunity to conduct sub-surface inspections for archaeological remains.

The engineering bores took place within the car park between the Supreme Court and Municipal Building, as well as the interior courtyard of the Municipal Building. The soil test trenches revealed similar archaeological stratigraphy to other Temasek period sites (e.g., St. Andrew's Cathedral and the Padang). A small quantity of ceramic sherds recovered were identified as typical of the pre-colonial period.

4.1: Project Objectives

Evidence from inspection of the engineering bore trenches determined the site warranted archaeological intervention prior to the redevelopment. A project proposal was devised to determine the potential and extent of any archaeological reservoirs. The primary foci of the project were to:

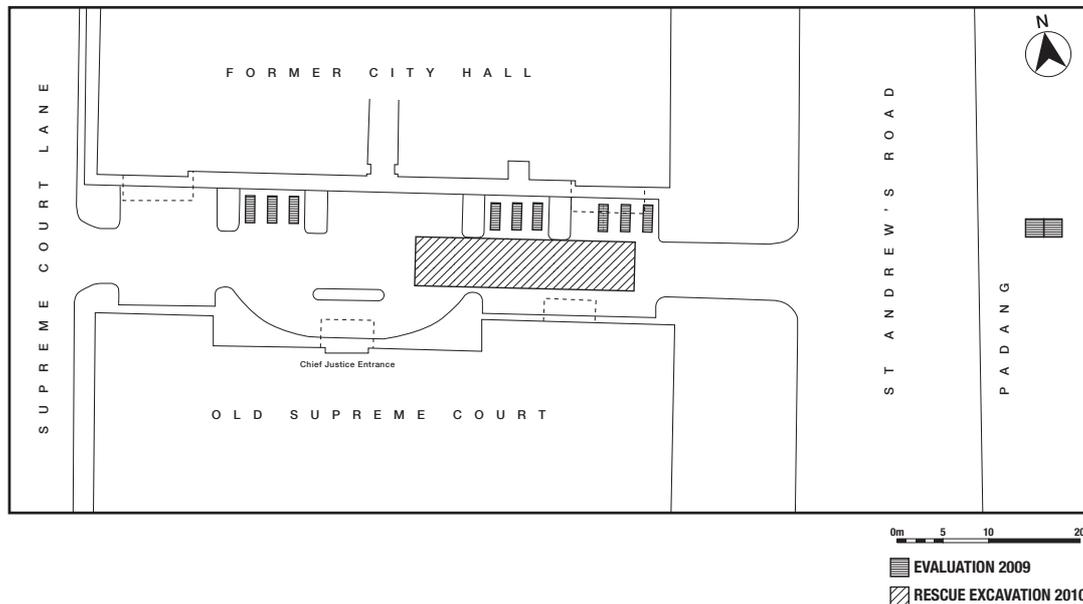
- (i) Identify any existing remains from the pre-modern settlement of Temasek/Singapura.
- (ii) Identify any existing remains from the early East India Company factory (1819–1824) and the colonial period (1824–1959).
- (iii) Systematically recover and document all movable artifacts.

4.2: Areas of Investigations

Several areas within the compound were identified for investigations. The primary area for study was the car park between the Supreme Court and Municipal Building as it possessed the highest likelihood of intact deposits with archaeological remains as no construction had been undertaken on this parcel of land since 1939 (Figure 11). Additionally, the redevelopment plans for this particular plot indicated it would be one of the most critically impacted by construction. The location constituted the principal entrance for the gallery where a sweeping grand stairway would lead downwards to the main lobby and reception. The construction of the stairway and basement would eradicate any archaeological remains.

Secondary test areas included the grass edge along the Padang across from St. Andrew's Road. This was to determine the relationship and extent of the archaeological deposits between the National Gallery Singapore site and the open field opposite. Originally the proposal also called for other secondary areas of investigation to include the interior courtyard of the Municipal Building. However, lack of funding and a restricted window for archaeological fieldwork prevented the initiative.

Fig. 11: Plan depicting areas for investigations.



4.3: Methods

The archaeological investigation at National Gallery Singapore encompassed the following components and methodology:

- (i) Remote sensing: a ground penetrating radar trial to explore non-intrusive geophysical techniques for detecting below ground archaeological features.
- (ii) Evaluation excavation: test pit excavations to evaluate any significant archaeological deposits and determine the need for large-scale rescue mitigation.
- (iii) Rescue excavation: large-scale excavation to maximise recovery of archaeological materials and data; to rescue the archaeological record prior to imminent destruction by construction development.
- (iv) Watching brief: monitoring of the site during the construction process to identify additional archaeological deposits and remains.

4.4: Site Datum

Measured recording was referenced to the Singapore Land Authority (SLA) Precise Level Benchmark No. 80181. Located just within the southeast corner of the St. Andrew's Cathedral compound, it served as the general locality datum (Figure 12). An intermittent transit point in the Padang linked the east-west excavation transect to the datum. Individual excavation unit datum was located at the southeast corner of each pit and was arbitrarily set at 10 cm above surface level. Unit depth measurements are recorded in metric as centimeters below datum (cmbd). The site locality and individual unit datums enabled points for mapping and plotting of artifacts and the excavations.

Figs. 12a and b: SLA Precise Level Benchmark No. 80181 within St. Andrew's Cathedral compound.

12a



12b



5: GEOLOGY, SITE STRATIGRAPHY AND ARCHAEOLOGICAL SEQUENCE

5.1: Geology

The general geology of the north bank of the Singapore River consists of alluvial member found as valley fills throughout Singapore, typical of riverine association. The alluvium is a variable terrestrial sediment ranging from pebble beds through sand, muddy sand, and clay to peat. The member is usually unconsolidated, but lightly consolidated beds may be found (Defense Science and Technology Agency Singapore 2009; see Figures 13 and 14). The riverine alluvium was not exposed during the investigation and lies beyond the extent of the excavation at depths greater than 200 cmbd (centimeters below datum). The site's proximity to the shoreline and the Singapore River, however, produced sandy strata as characteristic overlays for alluvium.

Fig. 13: Alluvial deposits highlighted in yellow. Geological Map of Singapore (Public Works Department 1976).

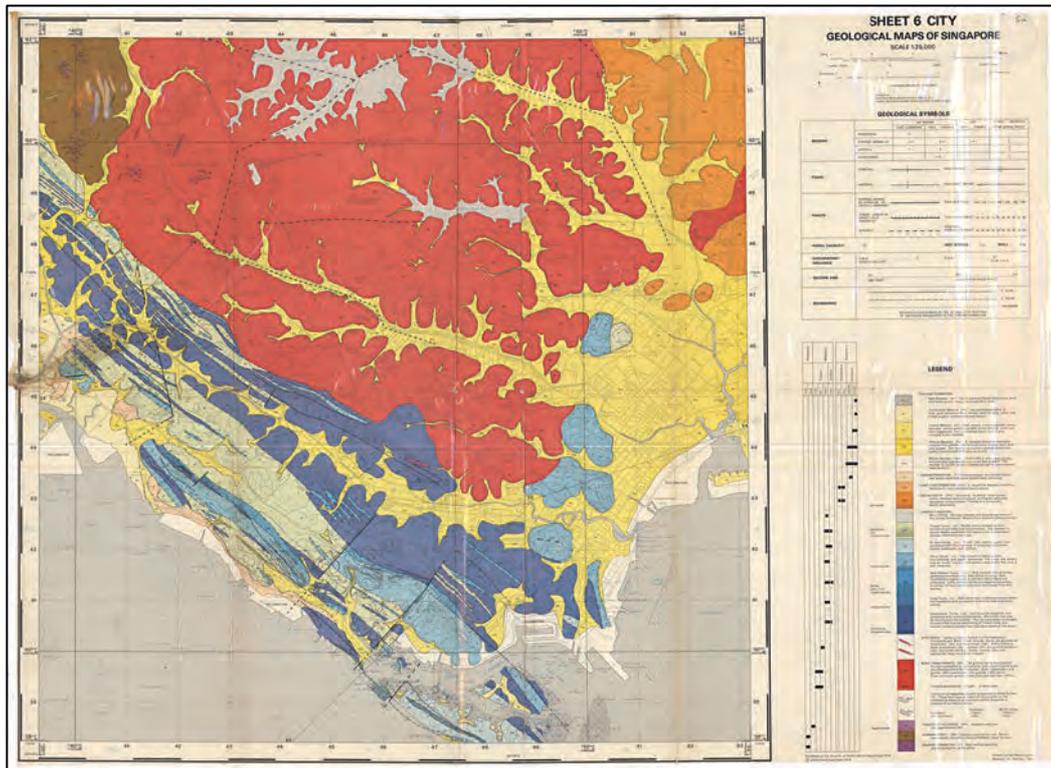
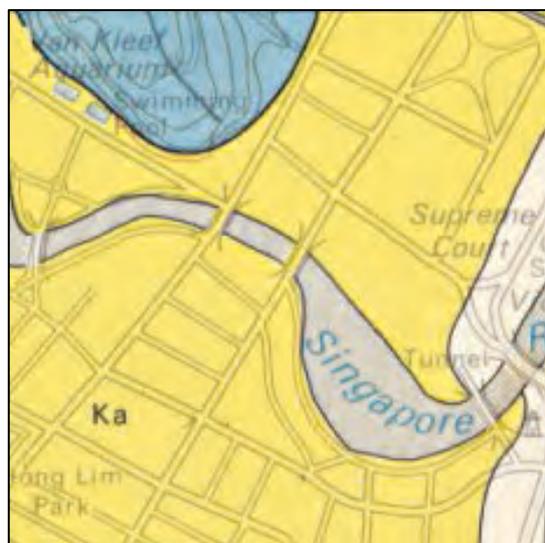


Fig. 14: Enlargement of geological map showing alluvial deposit underlying the National Gallery Singapore site (denoted in map as Supreme Court) and general vicinity (Public Works Department 1976).



5.2: Site Stratigraphy

The general stratigraphy of the site was considerably uniform and clearly discernable. From the surface, it consisted of the tiled roadway laid upon granite block foundations and fill, which occurs uniformly throughout the site for the first 60 cm. A transitional layer between 60 cmbd and 100 cmbd, comprising of clayey-sand and remnant gravel fill from the above roadway, forms the next layer. Consistent deposits of beach sand occur beneath this stratum until the end of the excavation depths at approximately 200 cmbd. The Temasek cultural layer occurs as a darker deposit with dense artifact remains in the beach sand deposits generally between 120 cmbd to 160 cmbd. The water table for the site fluctuated between 180 cmbd and 200 cmbd. With the exception of three modern 20th century trench intrusions for the laying of services (described below) and other localised pockets of anomalies, the stratigraphy was consistent throughout the excavated area.

Table 2: Typical Stratigraphy of the excavated units.

Stratigraphy	Depth (centimetres below datum)
Modern Roadway	0–10 cmbd
Roadway Fill	10–70 cmbd
Construction Fill	70–80 cmbd
Clayey-sand (transitional layer)	80–100 cmbd
Sandy-clay (start: Temasek cultural layer)	100–110 cmbd
Sand (Temasek cultural layer)	120–160 cmbd
Sterile Sand (end: Temasek cultural layer)	160–200 cmbd
Water Table	180–200 cmbd

5.3: Archaeological Sequence

Three principal periods of occupation were recorded for the site. The site was continuously occupied for the last two hundred years since the 19th century. Earlier in the pre-modern period, the site was likely to be occupied permanently for about a hundred years during the 14th century, and sporadically into the 17th century before its final abandonment.

(i) *Post-Colonial and Contemporary Period (1959–Present)*

The last 50 years since independence in 1965 and the formation of the Republic of Singapore was marked by major development and redevelopment. While no new building was erected within the National Gallery Singapore site, cosmetic changes to its surroundings and landscaping were prevalent. Chief of these was the periodic re-laying of asphalt and the re-tiling of the roadway. Construction of utilities and services also affected the site. Apart from these modern intrusions, no archaeological deposits of major historical significance were uncovered from this period.

(ii) *Colonial Period (1819–1959)*

The site as a whole produced very little evidence of in-situ colonial period activities. The most extensive colonial signature was a terracotta drainage that was replaced at a later date with a cast iron sewage system. A World War II midden was uncovered in the Padang trial unit. Other colonial period materials were recovered but largely from the disturbed construction fill deposits. No remains from the early East India Company factory period or William Farquhar's Residency were discovered.

(iii) *Temasek Period (c.1300–1600s)*

Despite repeated development on the site since 1819, dense reservoirs of archaeological remains could still be found undisturbed beneath the present day roadway. The majority of the archaeological remains are attributed to the Temasek period. This period accounts for about half of the yield of artifacts by weight.

6: REMOTE SENSING

A ground penetrating radar (GPR) and magnetometer trial was conducted within the grounds of the Municipal Building in April 2008 (Figure 15a and b). A GSSI SIR 2000 GRP system with a 900 MHz antenna was employed along with Geometrics G-858 cesium-vapor gradiometer for magnetometry. The trials were conducted with the assistance of Benjamin Vining from the Department of Archaeology and International Centre of East Asian Archaeology and Cultural History at Boston University, Massachusetts, United States of America. The following segment is an extract of Vining's report and reviews the complexities of remote sensing in a highly urbanised context:

Singapore is a busy urban environment that unfortunately introduces multiple varieties of noise that can interfere with geophysical surveys, and both magnetic and

radar sensors will be sensitive to electromagnetic interference. Electronic devices such as cell phones emit signals fall within the 400 MHz frequency range and can induce noise into otherwise clean data. Electric lines, motors and other powered appliances generate electromagnetic fields that can interfere locally with GPR.

Cars and other ferrous metal objects (electrical junction boxes, light posts, iron fences, and individuals with metal components on their clothing) within or adjacent to the survey area were particularly problematic for the magnetometer survey. They introduced magnetic anomalies creating the illusion that an object was buried, or were so strong that it overpowered and ‘wash-out’ lower magnitude magnetic anomalies from actual buried objects” (Vining 2008).

These trials within the National Gallery Singapore site and others in Singapore (St. Andrew’s Cathedral, Adam Park, and Ulu Pandan) suggest that remote sensing technology may not be the most suitable methodology to employ in a highly urbanised setting where large amounts of construction and domestic debris abound. Too much interference and ‘noise’ were detected, and the data obtained typically offers only a narrow band in identifying below-ground anomalies and potential archaeological remains.

In addition, while GPR technology is readily available for hire in Singapore, the lack of trained personnel to interpret archaeological data poses another challenge. Typically, GPR is employed to address engineering concerns in the country and archaeological applications are rare. Hence, additional expense is incurred to engage an archaeological remote sensing specialist to conduct the surveys and analyse the data. At this juncture, it is more economically effective to conduct ground truthing in the form of physical excavation and trial trenching rather than utilising remote sensing methodologies.

Figs. 15a and b: GPR trial with 900 MHz antenna in the courtyard of the Municipal Building (Benjamin Vining).



15a (left); 15b (above)

7: EVALUATION TEST EXCAVATION

Potential areas for the evaluation test excavation were primarily limited to grounds immediate to open spaces with the least amount of past development. The test pit excavations were restricted to the parking lots between the two buildings (Figures 16–19). During the evaluation only three test units were conducted at any one time to permit the continued usage of the car park. Apart from the temporary removal of the precast concrete slabs within the individual car park units, none of the asphalt, tarmac, or road tiling was affected. At the completion of the evaluation the soil and the concrete slabs were reinstated.

On-site excavation works were conducted between 7 December 2009 and 12 Jan 2010 (Table 3). Excavations were carried out over 32 days with work hours between 0830hrs to 1900hrs. A core team of three archaeological personnel and a total of 35 volunteers carried out the fieldwork. On average between five to eight volunteers were on site each day.

Eleven test units were excavated for the duration of the archaeological investigation, of which nine units were within the National Gallery Singapore compound and two units located across the road in the Padang. The nine units (NAG 001, 002, 003, 006, 007, 008, 009, 010, and 011) were restricted to the precast concrete slab parking lots in the car park roadway between the former Municipal Building and Supreme Court buildings. Each unit measured 300 x 90 cm. The Padang units (NAG 004 and 005) each measured 200 x 200 cm. Permission was granted to conduct the trial units in the Padang by the Singapore Cricket Club, the present tenant of the field.

The first evidence of an in-situ Temasek period pocket on the site was discovered on 11 Dec 2009 within units NAG 003 and NAG 002. The following is the general schedule of units excavated during the evaluation:

Table 3: Unit excavation schedule.

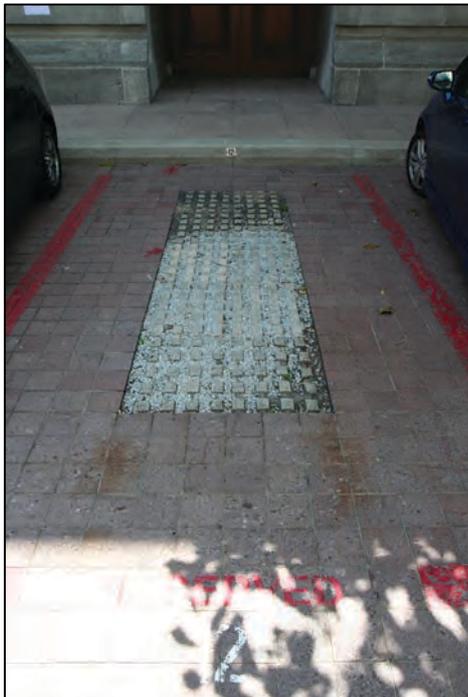
Excavation Unit	Commencement	Closure
NAG 001	07 Dec 2009	19 Dec 2009
NAG 002	07 Dec 2009	19 Dec 2009
NAG 003	08 Dec 2009	19 Dec 2009
NAG 004	17 Dec 2009	12 Jan 2010
NAG 005	19 Dec 2009	12 Jan 2010
NAG 006	19 Dec 2009	31 Dec 2009
NAG 007	19 Dec 2009	31 Dec 2009
NAG 008	20 Dec 2009	04 Jan 2010
NAG 009	31 Dec 2009	12 Jan 2010
NAG 010	31 Dec 2009	12 Jan 2010
NAG 011	04 Jan 2010	12 Jan 2010

Fig. 16: Car park area between the buildings for evaluation.



Fig. 17a and b: Removal of the precast perforated concrete slab provided the opportunity to excavate without damaging the existing roadway.

17a



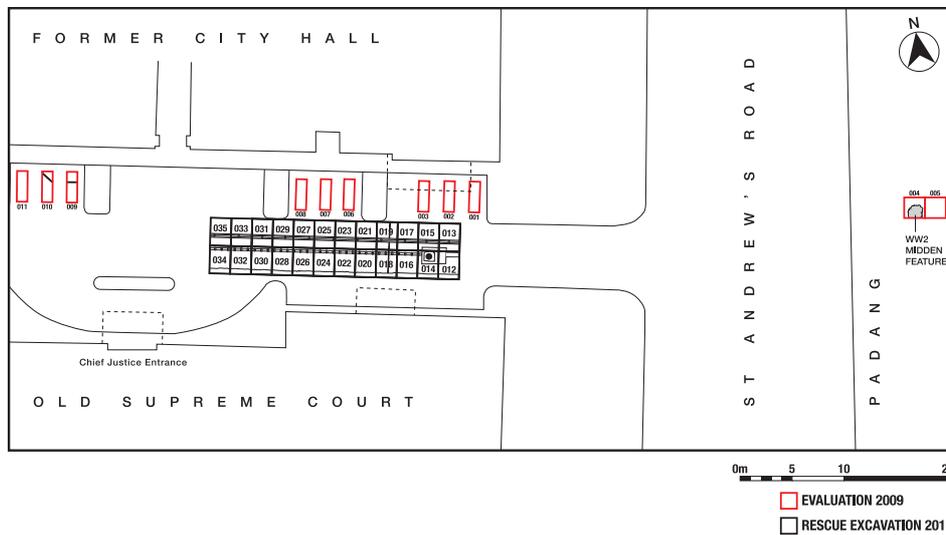
17b



Fig. 18: Evaluation excavation units NAG 001, NAG 002 and NAG 003.



Fig. 19: Site plan for evaluation units NAG 001 – NAG 011 (highlighted in red).



7.1: NAG 001 (Car Park Lot No.17)

Excavation for NAG 001 was carried out systematically and manually with handheld tools. The precast concrete slabs were removed with the aid of crowbars. Careful and measured excavation of the initial test unit was necessary to ascertain the general stratigraphy of the site prior to employing either a mechanical excavator or contract labourers.

The surface consisted of modern tiled masonry roadway. The unit was restricted to the confines of the precast perforated concrete slab that sat in the center of a car-park lot. The perforated concrete slab was leveled with sand to allow drainage of engine oil from parked vehicles.

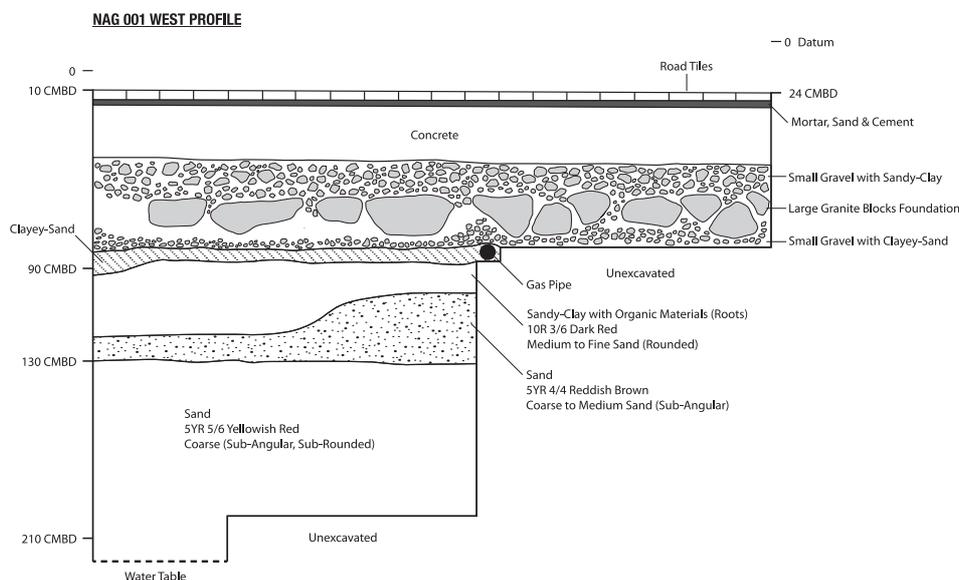
The roadway consisted of the aforementioned brick tiles and precast perforated concrete slab set upon a thin layer of gravel, and bitumen/asphalt (approximately 5 cm), followed by a bed of concrete approximately 30 cm thick. The concrete rested on granite gravel, sandy-clay, and large granite foundation blocks of varying sizes between 15–75 cm in diameter, and 5–20 kg in weight. Beneath the granite foundation blocks lay clayey-sand with gravel and cement. The entire roadway and its construction fill were approximately 90 cm in depth (0–90 cmbd).

Underneath the roadway fill was a layer of medium to fine sand (rounded dark red: 10R 3/6) with organic inclusions (e.g., roots) between 90–120 cmbd. The next layer of sand was reddish brown (5YR 4/4), coarse-medium and sub-angular, from 120–160 cmbd. The final layer where excavation ceased at the water table consisted of coarse yellowish-red (5YR 5/6) sub-angular to sub-rounded, sand. The water table was reached at 215 cmbd.

Artifacts recovered from this unit were predominantly deposited during the construction of the roadway and mainly comprised of ceramic building materials (CBM – terracotta tile sherds, brick fragments, and mortar), glass, modern metal in varying states of oxidation, stoneware ceramics, porcelain and some timber splinters. Although pre-colonial material from the Temasek period was recovered in small quantities from this unit, particularly within the southern sector from the sediment deposition, it was not possible to determine whether these were from a culturally intact context or a disturbed feature.

This unit’s stratigraphy (Figure 20) was disturbed by a single gas pipe running along a northwest by southeast axis in the northern sector. Because of this feature, the northern half of the unit was excavated only to the depth of the pipeline at 90 cmbd. The artifacts were possibly mixed in from an earlier fill during the excavation of the trench for the gas main and hence the context probably disturbed.

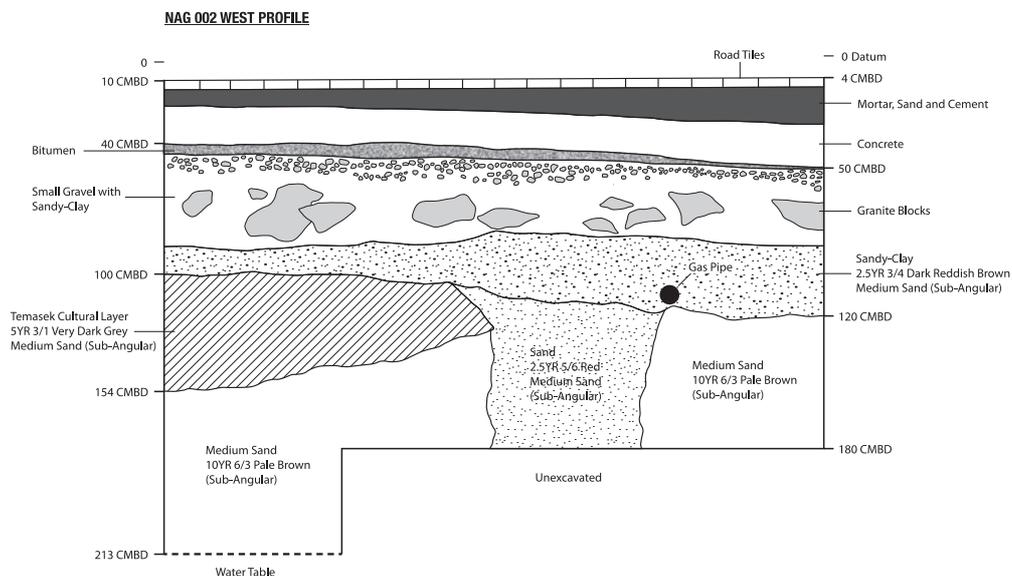
Fig. 20: NAG 001 West Profile.



7.2: NAG 002 (Car Park Lot No.16)

NAG 002 was opened concurrently on 7 December 2009 with NAG 001. The upper stratigraphy of this unit was similar to NAG 001 and differs only beyond the roadway fill, where a pocket of undisturbed and in-situ stratum from the Temasek period was uncovered (Figure 21). 100% sieving for Temasek period cultural layer and the transitional layer beneath was conducted with a ¼ inch wire mesh screen. As with the previous unit, excavation was careful and deliberate in order to discern the general stratigraphic layout prior to engaging contract labourers for the other units.

Fig. 21: NAG 002 West Profile.



The gas main continued from the adjoining NAG 001 in a northwest by southeast orientation, but unlike NAG 001 it did not prevent the excavation of the strata beneath the pipeline. The unit was sectioned in the center by a column of red (2.5YR 5/6) sub-angular medium sand where Temasek period materials were also recovered. The primary pocket of Temasek period deposits was found in the southern half of the test unit between 100-160 cmbd. This layer can be described as a typical Temasek period deposit found close to the former shoreline within the colonial and modern civic district. It consists of very dark grey sand (5YR 3/1, medium sand, sub-angular). The Temasek cultural layer then transitioned to pale brown (10YR 6/3) sub-angular medium grade sand which was sterile and devoid of any cultural remains. The unit was excavated to the water table at 213 cmbd in the southern corner.

The density of the artifacts from the Temasek cultural layer exceeded those from the colonial period and the roadway construction. Artifacts from the Temasek period comprised of large amounts of Chinese stoneware sherds, locally or regionally produced earthenware pottery, high-fired Chinese glazed porcelain, metal (including Chinese copper coins, and fishing hooks), shell, charcoal, a single shard of medieval period glass, and gold foil.

7.3: NAG 003 (Car Park Lot No.15)

The upper stratigraphy of the roadway and methodology for excavation were similar to the above previous two test units. The gas pipe extended from NAG 001 and NAG 002 into NAG 003 at its extreme north corner, and its disturbance was hence limited. Underneath the roadway fill was a layer of sandy-clay with colonial period brick remains from 80–104 cmbd. The brick remains were not part of an in-situ feature but had been deposited as part of the fill. The Temasek period cultural layer located in the southern half of the unit was particularly dense in the southwest corner. The Temasek stratum was typical black (10YR 2/1) medium sand between 104–148 cmbd. Beneath the Temasek layer was sterile coarse light grey sand (10YR 7/2). The water table was encountered at 213 cmbd.

NAG 003 was the first unit to yield an intact in-situ deposit from the Temasek period during the excavations. 100% screening was conducted for the Temasek layer and the stratum beneath (Figures 22 and 23). Chinese stoneware sherds formed the largest component of ceramic artifacts. Local or Southeast Asian earthenware and Chinese porcelain were also recovered along with metal coins and fishing hooks, medieval period glass shards, organic remains (shell and charcoal), and possibly worked stone or fossilised remains. A number of unworked flints were also recovered from the colonial period layer.

Fig. 22: NAG 003 West Profile.

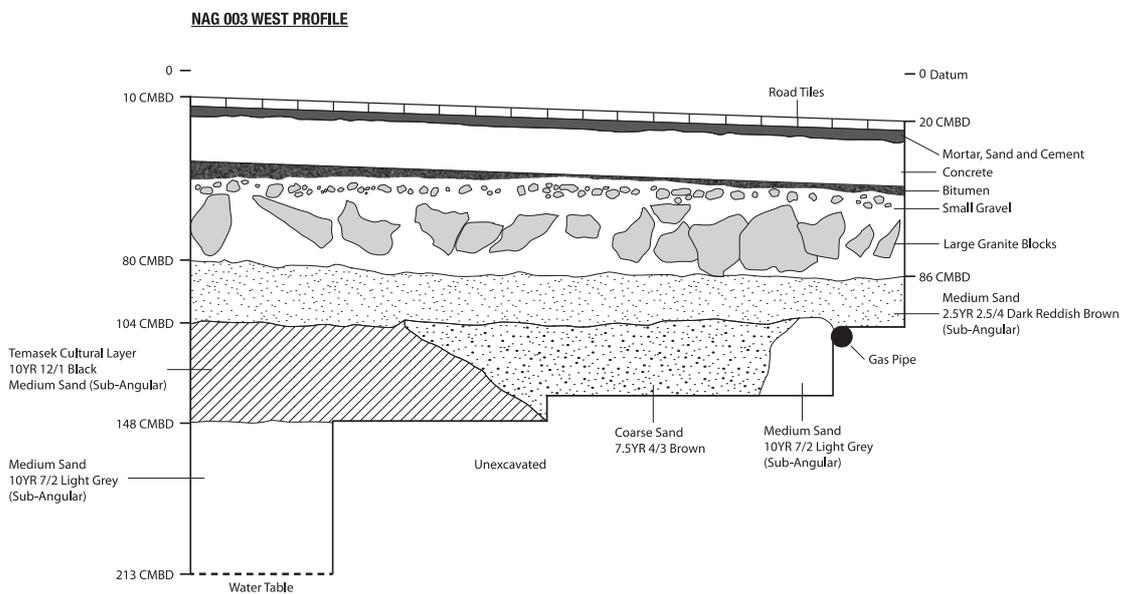
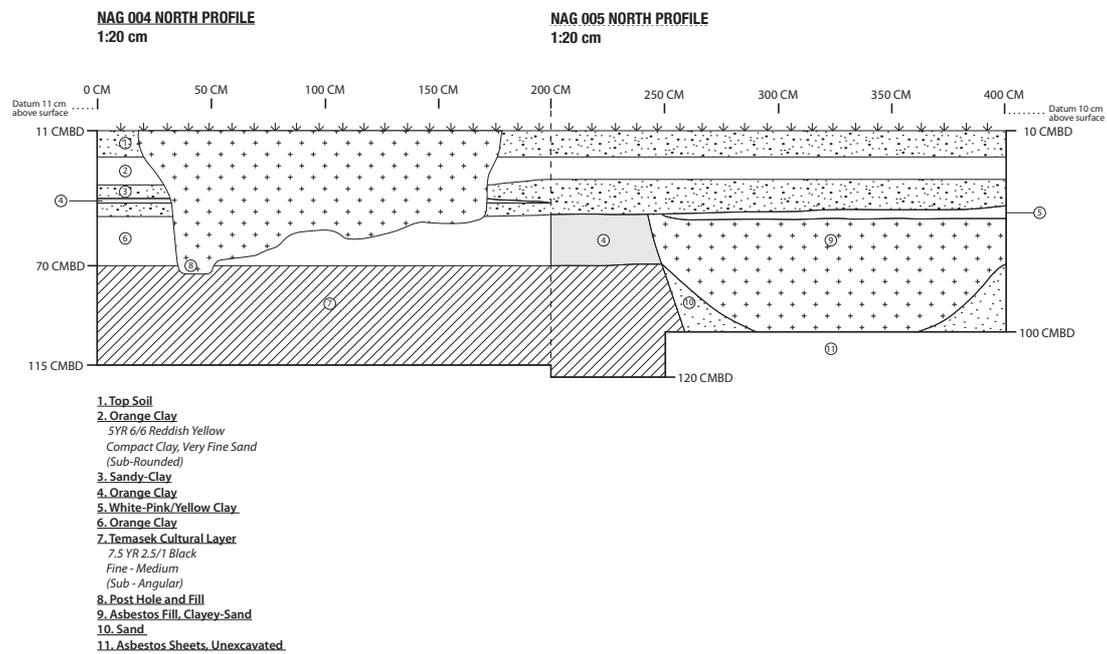


Fig. 23: NAG 003 North Profile.

7.4: NAG 004 (Padang).

In an attempt to explore the ancient boundaries of the site, the east-west excavation transect (aligning the excavation units within the National Gallery car park) was extended across the road to the Padang where a 200 x 200 cm unit was opened. The Padang unit's stratigraphy (Figure 24) differs greatly from those within the gallery's immediate compound, resulting largely from the absence of any major construction development on the field for the past two centuries. The top 40 cm of the soil has been deposited post-1965 as a result of returfing activities on the field after the annual or biennial National Day Parade celebrations, and sports events. The post-1965 to present day deposits were essentially made up of sod and clay with large amounts of organic intrusions and bioturbation (roots, invertebrate/worm holes).

Fig. 24: NAG 004 and 005 North Profile.



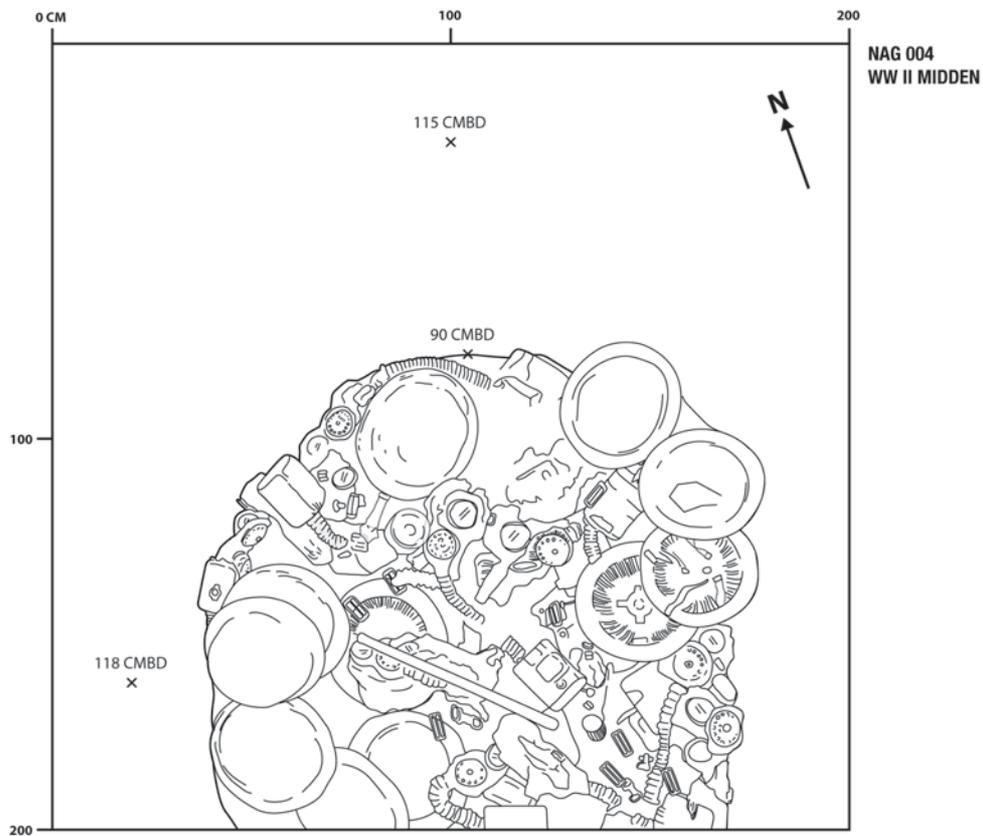
The next stratum between approximately 40–65 cmbd consisted of dense reddish yellow (5YR 6/6) clay—probably deposited during varying phases of the colonial period (1819–1959) to grade and level the Padang. Underlying the clay deposit was the Temasek period cultural layer of black (7.5YR 2.5/1) fine-medium sand from approximately 60–105 cmbd where the excavation ceased as Temasek period material began to thin out, but also due to the large amount of Second World War materials found within the test unit. 100% screening was conducted for the Temasek period stratum.

Within NAG 004 was a World War II midden (rubbish pit) filled with artifacts dating back to Singapore’s capitulation in February 1942. The midden was extremely well defined and it was probably an existing air raid slit trench or shelter dug sometime between the months of December 1941 and February 1942 (Figures 25 and 26). The trench later became a convenient receptacle for abandoned military equipment during the battle or after the surrender of Singapore to the Japanese.

Fig. 25: Plan view of World War II midden in NAG 004.



Fig. 26: Detailed plotting of World War II midden in NAG 004.



The World War II midden measured approximately 130 x 120 cm, was between the depth of approximately 70 cmbd to minimally 105 cmbd (at the stop of the excavation) and intersected the Temasek Period cultural layer, demarcating the unit in the centre.

NAG 004 proved to be a rich reservoir of artifacts ranging from post-independence materials to large amounts of exceptionally high quality and variety of Temasek period material culture, as well as the significant and well-preserved World War II midden. Artifacts from ancient Temasek included medieval period glass shards and beads, coins, high-fired Chinese ceramics and an array of regionally produced earthenware. The World War II midden yielded steel helmets, rubber gas masks, charcoal filters, webbing equipment, glass bottles, a boot, and assorted military related paraphernalia.

Due to the delicate and fragile nature of the artifacts from the World War II midden, and the lack of funds for proper conservation, these finds were largely left in-situ and carefully reburied. The midden was recorded in detail and excavation for the unit ceased at 105 cmbd. Several courses of sandbags (with clean fine sand) were emplaced around the midden, and a fine mesh fabric screen laid over the midden prior to packing over with fine sand and backfilling the unit.

7.5: NAG 005 (Padang)

NAG 005 was an extension of NAG 004 adjoining the latter unit to the east. The unit was similarly 200 x 200 cm in size and the general stratigraphy was comparable to NAG 004 (Figure 27). NAG 005 was predominantly another man-made trench from the Second World War period, with large amounts of asbestos corrugated sheets uncovered between approximately 55–78 cmbd (Figure 28). The Temasek period stratum was limited to a section measuring 200 cm in length (north-south) x 50 cm wide (east-west) contiguous with the neighbouring unit, NAG 004.

It is presently unclear if this unit was an air raid trench lined with asbestos for fire retardation or it was deliberately dug as a dump for the asbestos sheets. Interspersed with the asbestos were artifacts from the Temasek period which might suggest the latter. Temasek materials were comparable to those in NAG 004. As with the previous unit the asbestos were carefully re-buried, and excavation for this unit ceased at 78 cmbd for the asbestos layer and at 105 cmbd for the Temasek cultural layer.

Fig. 27: NAG 004 and 005 South Profile.

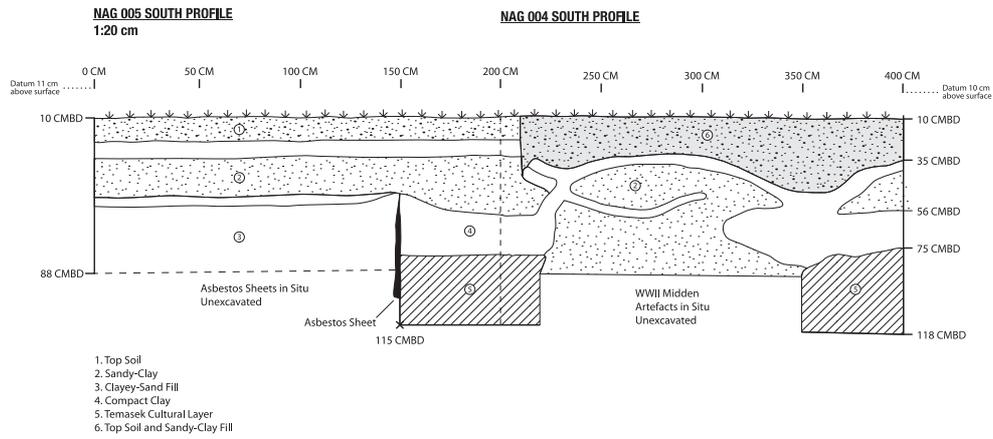


Fig. 28: Asbestos sheets in NAG 005 (rear) and NAG 004 World War II midden (foreground).



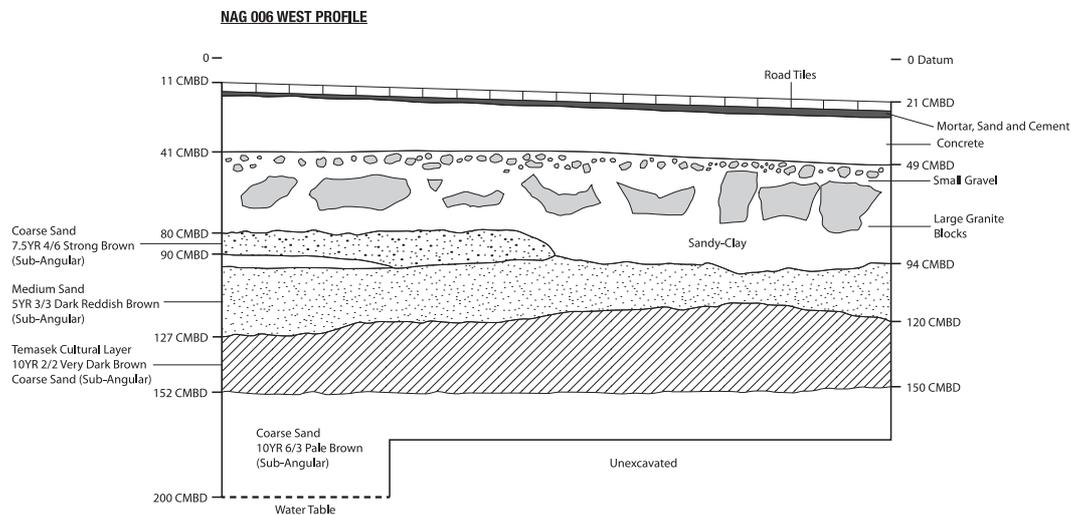
7.6: NAG 006 (Car Park Lot No.13)

This unit's upper strata, as with previous test units within the NAG car park, comprised of the roadway and its construction fill (Figure 29). The unit was the first of the subsequent units to be excavated by contract labourers. As the roadway and fill were modern and of no archaeological significance, these strata were removed by hired labourers to an arbitrary depth of 60 cmbd, and the remaining deposits were then excavated systematically by the archaeological team. Excavation by the contracted labourers was conducted manually with handheld tools.

The Temasek period cultural layer was extensive, and covering the entire area of the 300 x 90 cm unit. Very dark brown (10YR 2/2) sand was found between approximately 120–152 cmbd. Beneath was sterile pale brown (10YR 6/3) coarse sand devoid of artifacts. The water table occurred at 200 cmbd. The Temasek period stratum and the layer beneath were subjected to 100% sieving.

Colonial period artifacts were largely CBM and mortar, with the usual assortment of ceramics (stoneware, porcelain, earthenware) and other materials. Temasek period finds were consistent with the previous car park zone units. Some of the significant finds recovered were a medieval period glass bead, and an almost complete (less the shoulder and crown) 'mercury-type' Chinese stoneware jar (*xiao kou ping*—bottle with small mouth).

Fig. 29: NAG 006 West Profile.



7.7: NAG 007 (Car Park Lot No.12)

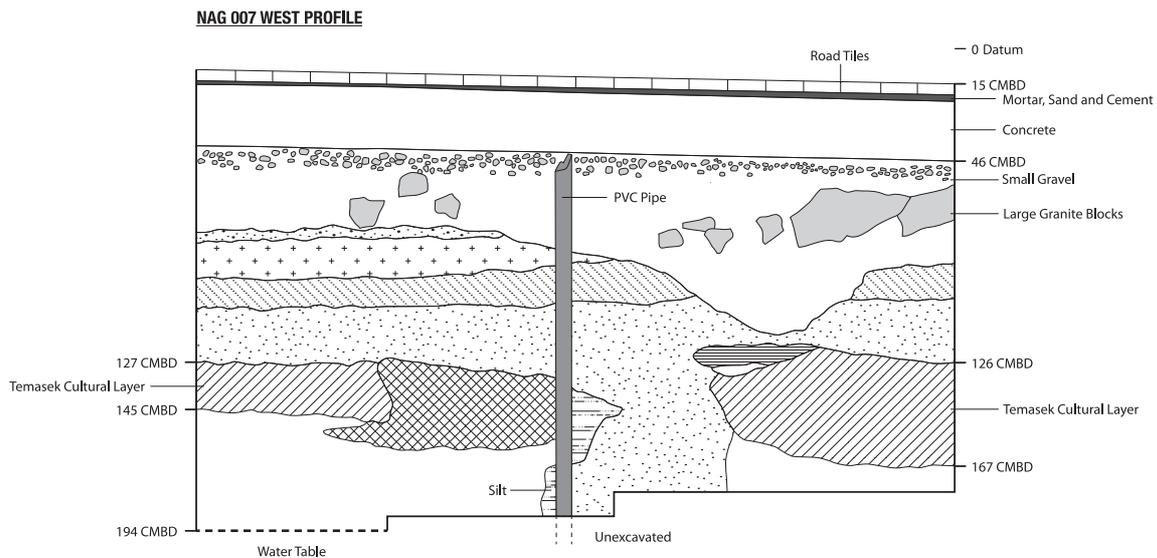
NAG 007 upper roadway stratigraphy corresponded with the rest of the car park units, and was excavated manually by contract labourers to the arbitrary depth of 60 cmbd. Systematic archaeological excavation resumed after the roadway foundations and fill were exposed and removed.

The unit was dissected in the centre by a vertical polyvinyl chloride (PVC) standpipe from the recent geophysical soil coring by the civil engineers for the development. The embedding of the PVC core effectively demarcated the unit into three separate sectors of different deposits.

The northern end of the unit displayed the usual characteristics of the low shoreline plains, with a dark grey sand pocket with its relevant associated Temasek period artifacts. The centre sector was the soil engineering core measuring approximately 40 cm across and was backfilled with sediments of greenish-grey (Gley 1 5/5G) silty-clay from deep marine deposits some 10–30 m beneath. Artifacts found within this centre sector are from a recent disturbance and hence had lost its original cultural context.

The southern sector of the unit yielded Temasek period deposits from between 120–140 cmbd and also had a sizable pocket of shell mollusc, comprising tiny shell and coral remains that required fine sieving and picking by tweezers. This shell feature was located above the Temasek cultural layer within a transitional stratum of sandy-clay and sand 110–120 cmbd. Temasek period artifacts were also located within this transition. The unit was excavated to 200 cmbd where the water table was met. All the sediments from the Temasek layer and the stratum beneath were sieved (Figure 30).

Fig. 30: NAG 007 West Profile.

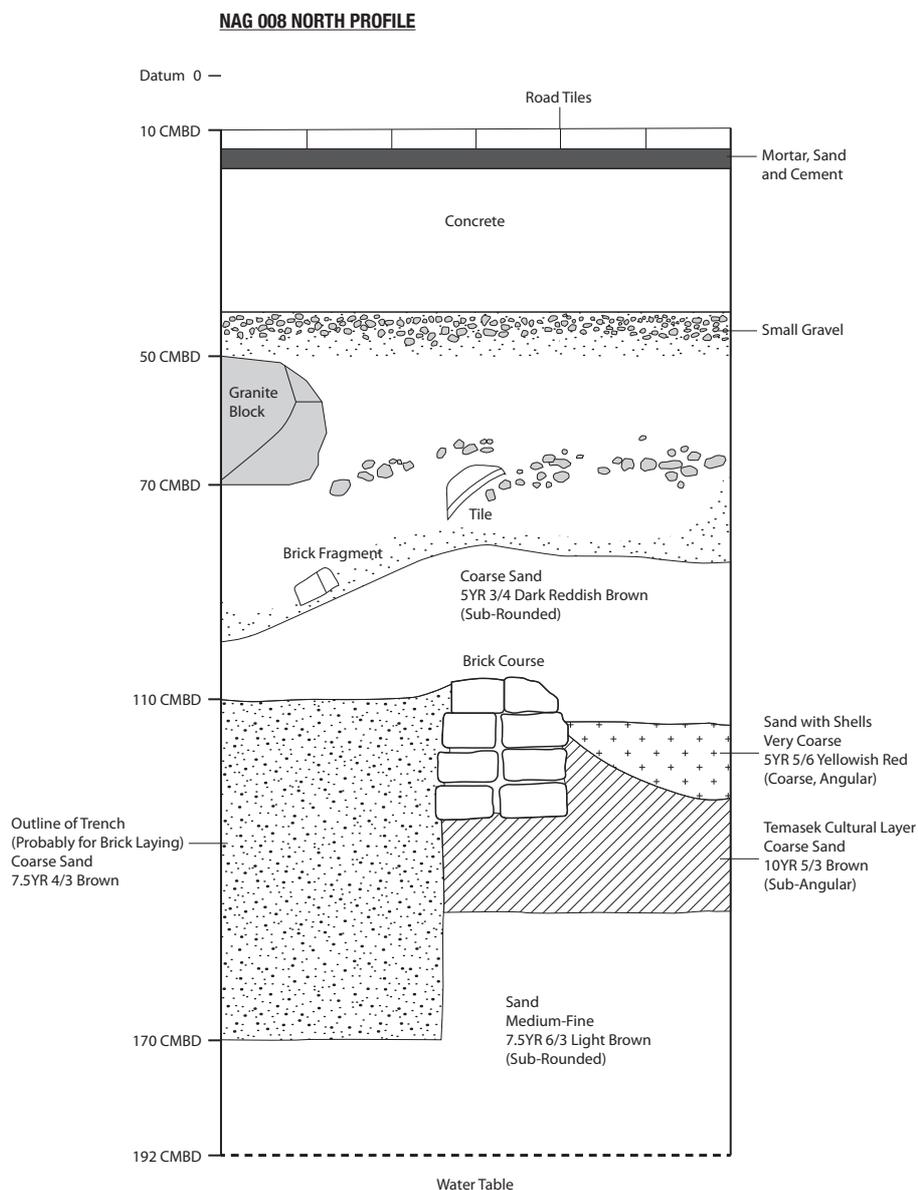


Despite the recent soil engineering disturbance, large amounts of CBM from the colonial and more recent periods were recovered. Temasek material culture consists of Chinese stoneware sherds from storage vessels, greenware (celadon) and the other assorted pottery mix. Charcoal, shell, coral, metal, and pebbles were also uncovered.

7.8: NAG 008 (Car Park Lot No.11)

The upper roadway and associated construction fill were excavated manually by contract labourers up to the arbitrary depth of 60 cmbd, from which point systematic archaeological excavations resumed. NAG 008 yielded some architectural features from the colonial period (Figure 31).

Fig. 31: NAG 008 North Profile.



This unit revealed brick features comprising of four courses in depth and two courses wide between 110–135 cmbd. This brick feature appeared to have been originally laid out on a longitudinal north-south axis through the centre of the present test unit. To the west of the brick courses an outline of a trench between approximately 110–175 cmbd in depth was evident, having been excavated possibly for the purpose of bricklaying for a past building construction. Sediment from this pre-existing trench consisted of coarse sub-angular brown (7.5YR 4/3) sand. The brick typology appears to be from the first quarter of the 20th century, possibly remains from the Hotel de L'Europe (c.1906–1932).

It is not surprising that finds from NAG 008 are largely from the colonial period. A significant amount of CBM and intact hand-moulded bricks were collected, along with nails, and European ceramic sherds. The Temasek cultural layer, brown (10YR 5/3) coarse sand, was restricted to several small pockets along the eastern edge of the unit, although Temasek materials were also found mixed with the sediments of the 'bricklaying trench'. All sediments from the Temasek cultural layer were screened. The water table for this unit occurred at 193 cmbd.

7.9: NAG 009 (Car Park Lot No.7)

Contract labourers manually excavated the unit to an arbitrary depth of 80 cmbs to remove the bulk of roadway fill. Exceptionally large boulder sized granite blocks were uncovered. A modern cast iron pipe (probably water main) was also revealed in the northern half of the unit running east-west. Two separate courses of bricks ran parallel to the cast iron pipe in the southern half of the pit. Despite these construction disturbances, the modern (post-1965), colonial period, and Temasek period strata were remarkably well defined and the Temasek pocket survived virtually undisturbed.

The stratigraphy for NAG 009, albeit complex, was extremely distinct, enabling the identification of a total of sixteen layers and deposits (Figures 32–33). The trench for the cast iron pipe intersected through the mid-section of the unit was the latest disturbance comprising finely crushed gravel, sand, and cement. The laying of the cast iron pipe had destroyed the colonial and Temasek period strata in the northern half of the unit. The brick features were found between 85–110 cmbd in a bed of dark reddish brown (2.5YR 3/4) medium angular sand. These bricks are likely the remnants of the old hotel as the typology and context is consistent with the bricks from NAG 008.

Temasek remains were approximately 110 - 145 cmbd in depth. The stratum was of medium very dark grayish brown sand (10YR 3/2). Apart from the aforementioned bricks, artifacts are entirely from the Temasek era, with stoneware storage jar sherds, porcelain, an intact earthenware lid, metal fishing hooks, and organic materials (shell, bone, and charcoal). 100% sieving of the Temasek cultural layer and the stratum beneath were conducted. The water table for this unit occurred at 180 cmbd.

Fig. 32: NAG 009 East Profile.

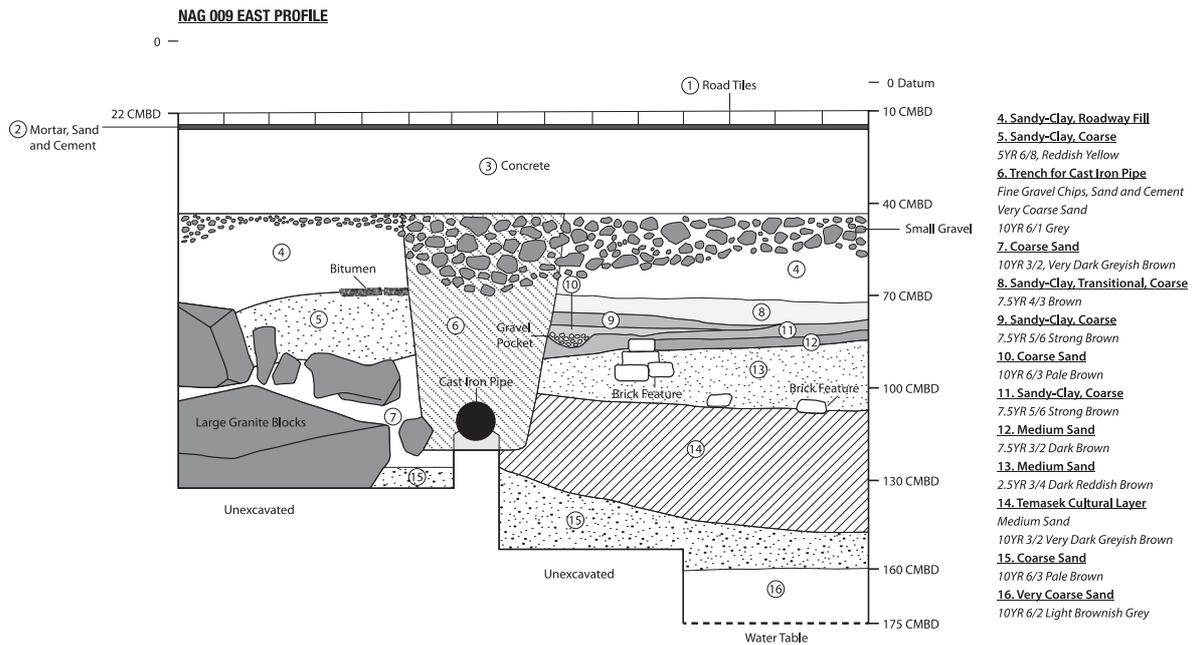


Fig. 33: NAG 009 East Profile. The labels read (left to right): roadway fill; pipe trench; colonial period bricks; Temasek cultural layer, and watertable.



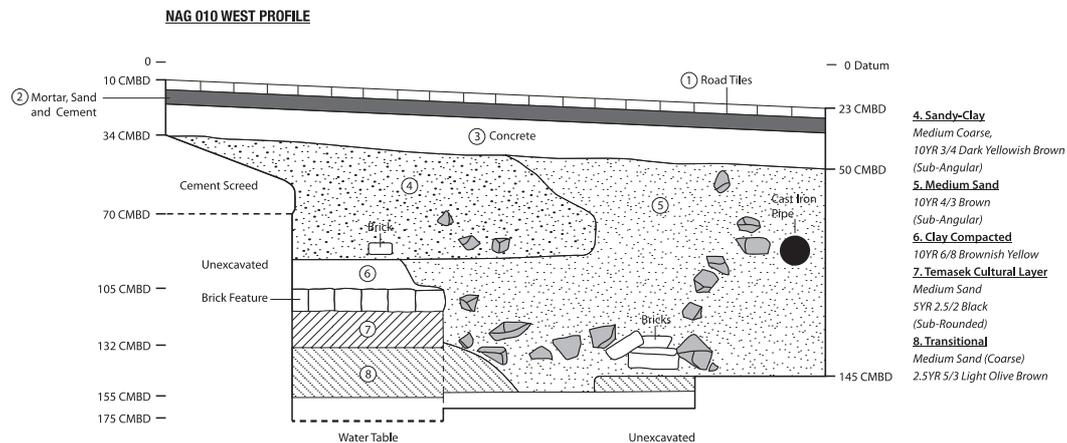
7.10: NAG 010 (Car Park Lot No.6)

As with the previous units, contract labourers manually excavated NAG 010 to the depths of approximately 80 cmbs. The cast iron pipe from NAG 009 extended into the unit on an east-west axis but angled 45 degrees and continued through the northwest corner of the pit. Contextual artifacts associated with the cast iron pipe indicate that it was probably emplaced within the past two decades. This unit was also characterised by the large (75–100 cm in diameter) granite blocks for the roadway fill.

An inclined concrete screed was revealed from 34–70 cmbd at the southern end of the unit, and was left unexcavated. More bricks from the early 20th century colonial period were uncovered, mainly as loose deposits or fragments. However, a single course of bricks was found in-situ at 105 cmbd in the southwest corner of the unit. This brick feature again corresponds with the typology and context of the previous units NAG 009 and 008, hence probably were remains from Hotel de L'Europe (Figure 34).

The Temasek layer was limited to a pocket beneath the brick feature between 115–132 cmbd consisting of black (5Y 2.5/2) medium sand. It was typical of the artifact assemblage from the NAG site encompassing mainly stoneware and earthenware, with a larger concentration of the 'mercury-type' bottle sherds. As with the previous units, the Temasek stratum and the layer beneath was 100% screened. The water table was reached at 175 cmbd.

Fig. 34: NAG 010 West Profile.



7.11: NAG 011 (Car Park Lot No.5)

This unit was the final test pit excavated within the NAG compound for the evaluation phase of the project. NAG 011 was opened manually by contract labourers to a depth of 40 cmbs where a bed of concrete was uncovered. The concrete was likely casing for modern cabling works that extend through the entire unit and hence work on this trench was abandoned and the unit reinstated. No artifacts were recovered from NAG 011.

8: RESCUE EXCAVATION

The evaluation excavation revealed a sizeable volume of artifacts to necessitate a rescue excavation. Ideally, full-scale systematic archaeological rescue excavations to encompass the totality of the construction impact zones should be implemented prior to development. This, however, proved to be impractical due to the scheduling of

construction works, time, resources, and more importantly funding that were available for an excavation of such magnitude. Thus, only a limited rescue excavation was possible.

A larger scale pre-development rescue operation was undertaken from 1 November through 3 Dec 2010. This duration was the time window permitted by the developer National Gallery Singapore, National Heritage Board. Apart from the archaeology team, a total of 243 volunteers worked 6 ½ day-week over a period of 4 weeks to complete the excavation.

The rescue excavation was limited and directed at the car park roadway between the two buildings as this area was most affected by the construction of the grand entrance and reception complex in the basement. The primary focus was to ensure maximum recovery of archaeological materials and data prior to the imminent destruction by construction development.

The archaeology team’s appointed contractor began preliminary site preparation works on 21 October 2010 and conducted a subsurface survey for buried utilities (cables and pipes) by a licensed cable detecting worker (LCDW), as well as undertook trial trenching with 50 x 50 cm units to ascertain the location of detected services by the LCDW.

Based on the findings from the subsurface survey for services, a 26 x 5 m area (130 square metres) was demarcated for excavation (Figures 35–36). This area was barricaded and hoarding emplaced to restrict public access and entry was permitted for authorised archaeology personnel only. The excavation zone was subdivided into 24 units, each measuring 250 x 200 cm.

Fig. 35: Site plan for rescue excavation units NAG 012–NAG 035 (highlighted in red).

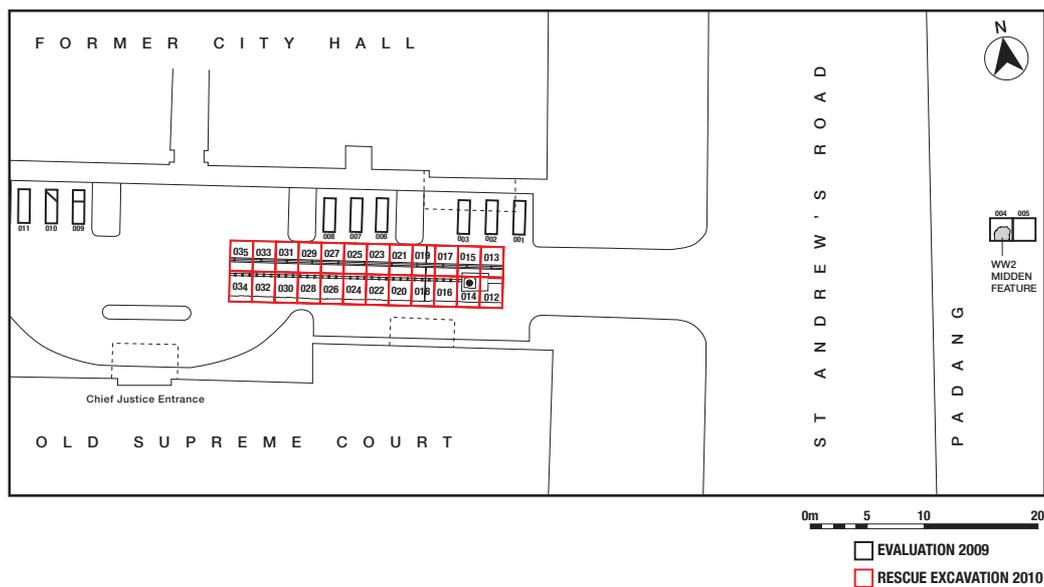


Fig. 36: Rescue excavation zone; measuring 26 x 5m.

Previously in the 2009 archaeological evaluations, a total of 11 units (NAG 001 to NAG 011) were excavated (9 units measuring 300 x 100 cm, and 2 units measuring 200 x 200 cm). These units were outside of the 2010 excavation zone and there was no overlap. The allocation of the unit numbers followed the prefix and nomenclature from the 2009 season. The 24 units were labeled sequentially from NAG 012 to NAG 035. 100% of the excavated zone was successfully dug with 260 cubic metres of earth removed.

The 2009 evaluation provided the opportunity to determine the site's general stratigraphy and enabled the archaeology team to adopt appropriate strategies for the 2010 excavation. With the modern roadway depth established previously in 2009, the top 60 cm of tiled roadway, its foundation and fill were mechanically removed by a backhoe and the spoil stockpiled on site for backfilling after the excavation. The mechanical removal of the roadway layers started on 27 October and was completed on 30 October. The team began systematic archaeological investigations on 1 November 2010.

The rest of the site (between 60–200 cmbd) was excavated manually with hand tools by the archaeology team, volunteers, and for the final week of the project, assisted by additional hired field labour. All of the manually excavated sediments were sieved through ¼ inch wire mesh screens to ensure the highest possibility of recovering any archaeological materials. However, due to the dependence on volunteers and untrained hired labour, the ability to identify artifacts and vigilance of the individual volunteer may result in some variances in the recovery rate.

8.1: Modern Services Intrusions

There were three intrusion trenches for services found within the site (Figures 37–38). These were laid on a linear axis running consistently through the entire site. Two sewage pipe systems run beneath the entire length of the roadway along an east-west orientation. Both pipes were laid parallel to each other, one of which was made of terracotta ceramic (now defunct), while the other was made of cast iron construction, was more recent (possibly laid within the last 50 years) and at the point of excavation was still in operation. Both pipes were laid upon a layer of gravel and cement foundation. The ceramic pipeline leads into a brick inspection chamber complete with manhole shaft. This brick structure's usage was also discontinued.

Fig. 37: Three 20th century trench intrusions clearly visible, cast iron sewage pipe (left), terracotta ceramic sewage pipe (here clad in concrete—centre), and Portland cement, gravel, and sand trench (right). These three intrusions run the entire length of the excavation site.



Fig. 38: Extent of cast iron and terracotta ceramic sewage pipes.



The third major intrusion was along the entire southern profile of the excavation area. It was a modern trench laid similarly on an east-west axis, consisting of Portland cement, gravel, and sand mix on a bed of concrete and gravel screed. The purpose of this intrusion trench is not known, but it is likely to be infill from the laying of modern services just beyond and south of the excavated zone.

8.2: NAG 012 to NAG 015 (4 Units)

The most prominent feature uncovered within units NAG 012, NAG 013, NAG 014, and NAG 015 was a brick sewage inspection chamber with manhole (Figure 39). The structure is defunct and filled with debris. It was the juncture point for the ceramic sewage pipeline. From the brick typology, this brick chamber is likely to have been constructed sometime in the post-1950s period.

Fig. 39: NAG 012 and NAG 013, live cast iron sewage pipe (foreground) and disused brick sewage inspection chamber (centre).



In NAG 013 and NAG 015, a significantly large number of Chinese coins were recovered. The identity of the Chinese coins are generally too corroded to be discerned prior to conservation treatment, but are likely to be those from the Southern Song (c.1127–1279) and Yuan (c.1279–1368) periods.

Within NAG 013, a very distinct and dense pocket of the Temasek period cultural layer was uncovered in the northeast corner of the unit. This Temasek period pocket extended into and along the northern profile of NAG 015. The active cast iron sewage pipe, described in the modern services intrusions above, runs through NAG 013 and NAG 015. The stratigraphy and deposits of NAG 014 are essentially disturbed by the construction of the brick inspection chamber. Apart from this sewage system, no other discernable colonial period cultural layer was evident. The outline of a trench made up of Portland cement, gravel, and sand ran through contagiously along the southern end of NAG 012 and NAG 014.

8.3: NAG 016 to NAG 019 (4 Units)

Part of the brick sewage inspection chamber extended into NAG 016 along with the disused terracotta ceramic pipeline, which continued into neighbouring unit NAG 018 (Figure 40). On the southern end of NAG 016 and NAG 018 ran the cement, gravel and sand trench. NAG 016 and NAG 018 were largely disturbed from the laying of the pipes. In NAG 018 an additional corroded pipe, probably an old and now disused gas line intersected the unit in the centre and was laid along a north-south orientation. Despite these disturbances, within NAG 018 there were two small intact pockets from the Temasek period. They yielded the typical stoneware, greenware celadon, and earthenware.

The cast iron sewage pipe bisected NAG 017 and NAG 019. These two units were largely disturbed from the construction and laying of the pipeline. Within NAG 019 the same corroded gas pipe found in NAG 018 was uncovered. A small Temasek period pocket was located in the southern end of NAG 019 bordering NAG 018.

Fig. 40: NAG 018 showing disused ceramic terracotta pipeline (foreground) and defunct corroded gas main running on a north-south axis between the former Supreme Court and Municipal buildings.



8.4: NAG 020 to 025 (6 Units)

These six units featured the most spectacular discoveries from the entire excavation. A large assemblage of undisturbed Temasek period remains was recovered. The usual intrusions were evident through these units, with the cement, gravel and sand trench running parallel to the south end, and the terracotta sewage pipe through NAG 020, NAG 024 and NAG 026. The cast iron sewage pipes ran through NAG 021, NAG 023 and NAG 025.

NAG 020 yielded an interesting array of Temasek period artifacts, particularly stoneware. Also, significant amounts of small charcoal remains were recovered from the screens. Amongst the artifacts of interest, was an iron oxide black underglazed porcelain sherd. However, the artifact density was lower than neighbouring unit NAG 022.

NAG 022 was one of the units yielding the densest amount of artifacts from the Temasek period. An intact pale greenware celadon jarlet decorated with floral motifs was recovered from this unit. In addition, a single Qingbai headless seated Buddhist figurine was amongst the large quantity of artifacts uncovered. Other interesting materials included a stoneware knob, Chinese copper cash, a glazed stoneware sherd with painted dragon scales, a small metal tack, and possibly a needle.

The transitional stratum above the Temasek cultural layer also yielded some interesting materials. Within the modern construction fill and contemporary artifacts was a ceramic sherd depicting the face of Chinese warrior deity Guangong, and another ceramic sherd with the facial portrait of an unidentified elderly gentleman.

Some of the most prominent artifacts recovered from the project was from NAG 024. This unit yielded the largest amount of materials from the Temasek period cultural layer for the entire excavation. A large amount of rocks and stones from the Temasek period, weighing approximately 25 kg in total were found in this unit. The rocks were not native to the site—having been transported from elsewhere. Within these rock pockets were numerous ceramic sherds, the most important being a sizable fragment of porcelain statuary depicting a Buddhist torso (Figures 41–44). This appears to be a variant of the Bodhisattva Avalokitesvara.

In NAG 021 a pocket of the Temasek cultural layer extended into the southern end of this unit from NAG 020. Within this pocket a small number of coin fragments and beads were retrieved at the screening stations. The Temasek period cultural layer was divided into two pockets by the cast iron sewage pipe in NAG 023. NAG 025 appeared to be on the tapered end of the rich Temasek period reservoir of its southern NAG 024 neighbour.

Fig. 41: NAG 24 East Profile.

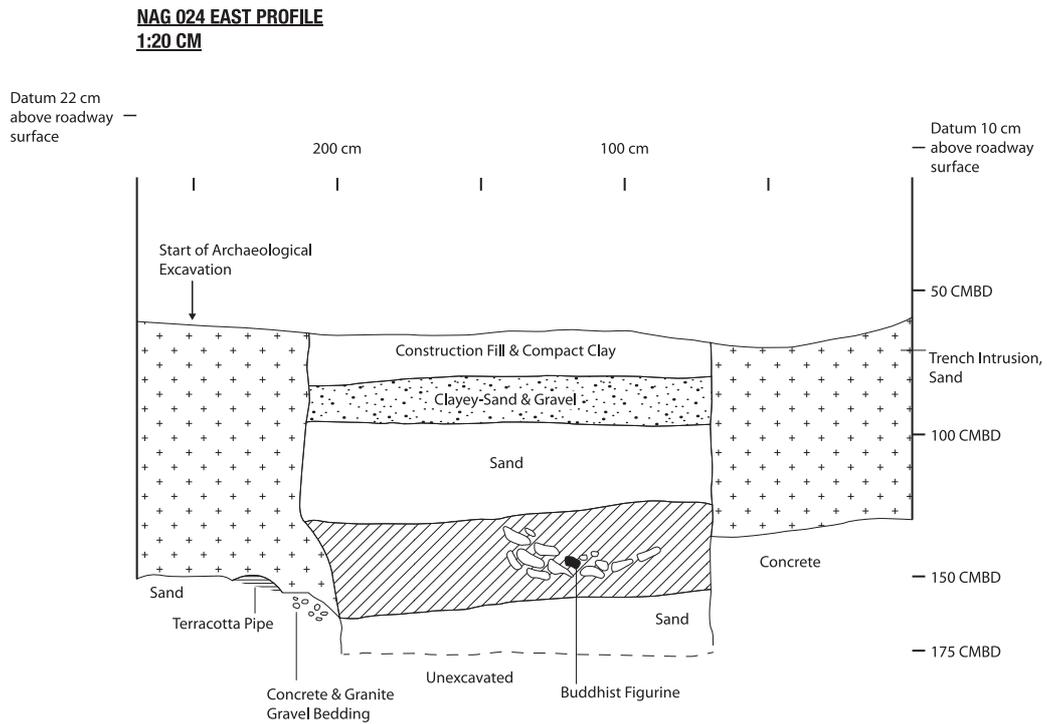


Fig. 42: NAG 024 where the significant torso of a Buddhist figurine was found buried amongst a cache of rocks (lower left).



Fig. 43: Buddhist figurine amongst rocks.



Fig. 44: Buddhist iconography from NAG 022 (right) and NAG 024 (left).



8.5: NAG 026 to NAG 029 (4 Units)

Unit NAG 026 was the western extreme of the Temasek pocket extending from NAG 022 and NAG 024, the dense artifact bearing deposits ending within this unit. NAG 026, NAG 027, NAG 028, and NAG 029 all yielded marginal amounts of artifacts from the Temasek period. NAG 028 produced a large amount of 20th-century ceramic building material, terracotta roof and floor tiles, brick fragments etc.

The cement, gravel, and sand trench intrusion continued along the southern end of NAG 026 and NAG 028. In the centre of these two units ran the disused terracotta sewage pipe (Figure 45). NAG 027 and NAG 029 were largely disturbed by the cast iron sewage pipeline. Another modern disturbance was a PVC pipe casing for electrical wiring of the street lamps. This plastic electrical piping ran north-south between the Supreme Court and Municipal Building dissecting through the western profile of NAG 028 and NAG 029.

Fig. 45: NAG 028 (left) and NAG 029 (right). PVC pipe housing electrical cables for lighting on unexcavated bulkhead (left rear).



8.6: NAG 030 to NAG 035 (6 Units)

The same three modern intrusions extended into these six units (Figure 46). The Temasek period cultural layer artifact yields for NAG 030 to NAG 035 were relatively sparse. Units NAG 031 and NAG 032 provided the most with approximately 3 kg of artifacts each, with NAG 033 containing only 1.5 kg. Negligible amounts were recovered in the remaining units.

Fig. 46: NAG 030 to 035 on the extreme western end of the excavation zone, furthest away from the Padang.



8.7: Rescue Excavation Stratigraphic Record

Despite a number of intrusions for the laying of utilities and services over the past century, the stratigraphy of the excavated units was relatively uniform (Figure 47). While modern and historic disturbances truncated earlier deposits, pockets of archaeological materials still lay intact and in situ. The site’s typical east and west stratigraphy and the profile for the entire northern extent of the zone are recorded and reproduced below (Figures 48a and b).

Fig. 47: Typical east profile of the rescue excavation zone (NAG 030 and NAG 031).

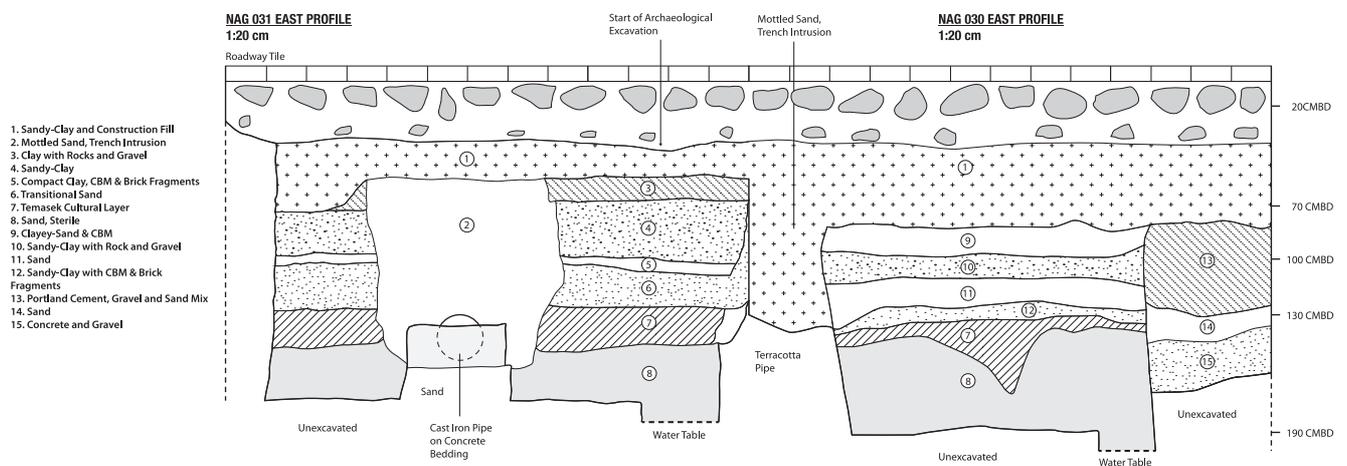
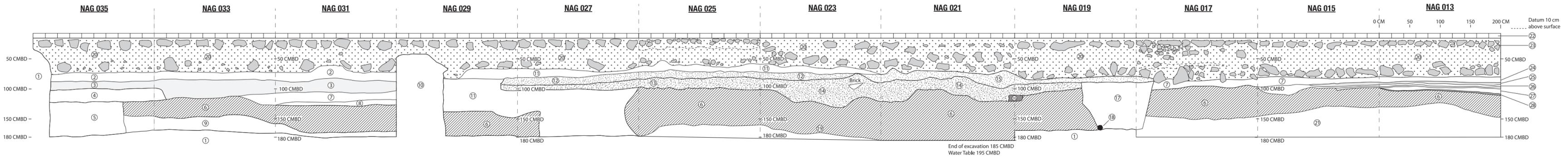


Fig. 48: North profile of rescue excavation zone.



- | | |
|--|---|
| 1. Unexcavated | 16. Reddish Sandy-Clay |
| 2. Compact Clay with Coral and Rocks | 17. Trench Intrusion, Sandy-Clay |
| 3. Clayey-Sand | 18. Corroded Pipe |
| 4. Compact Clay | 19. White Sand |
| 5. Clay | 20. Roadway Fill |
| 6. Temasek Cultural Layer (7.5YR 3/2 Dark Brown) | 21. Sterile Sand (7.5YR 7/2 Pinkish Gray) |
| 7. Sandy-Clay | 22. Roadway Tile |
| 8. Compact Clay | 23. Granite Blocks, Concrete/Cement with Reinforced Steel Bars and Sand (5YR 4/6 Yellowish Red) |
| 9. Sand | 24. Sandy Clay Striation/Layers: 5YR 4/6 Yellowish Red |
| 10. Unexcavated - PVC Pipe in Concrete Housing | 25. Sandy Clay Striation/Layers: 2.5 YR 3/6 Dark Red |
| 11. Clayey-Sand | 26. Sandy Clay Striation/Layers: 7.5 YR 4/8 Reddish Yellow |
| 12. Compact Orange Clay | 27. Sandy Clay Striation/Layers: 2.5 YR 4/8 Red |
| 13. Sandy-Clay, with Organic Material (roots) | 28. Thin Layer of Marine Sand, Very Coarse with Large Amounts of Quartzite, Shells, Corals and Molluscs |
| 14. Reddish Sandy-Clay | |
| 15. Orange Clay Layer | |

9: WATCHING BRIEF

Beyond the excavations, a periodic watching brief was maintained by the author to monitor on-site construction works for any potential archaeological remains exposed elsewhere during the development. A watching brief was conducted during the initial construction phases. However, access to the site was curtailed from 2012 and no further watching briefs were conducted. The areas monitored by the author were limited to the Supreme Court Prisoner Loading Bay.

10: THE FINDS AND ARTIFACTS

10.1: Post-Excavation Processing and Analysis

Presently, processing and analysis of the artifacts, soil samples, and data recovered from the site, as well as archival research, are underway. Cleaning and sorting of the finds are ongoing at the Archaeology Unit, ISEAS-Yusof Ishak Institute. In general, post-excavation work consumes more resources than the excavation itself. Depending on the expertise and number of the people working on the materials, several months or years may be needed before a rudimentary dataset can be established. The completion of the processing will provide the basis for analysing and interpreting the findings. Despite the ongoing nature of the processing and analysis, it is possible to provide a preliminary descriptive overview of the findings and their significance.

A total of 375 kg of artifacts were recovered over the two excavations. The following is a summary of the artifacts recovered. The data below excludes soil samples, the large number of bricks from the colonial period features, and the deposits from the World War II midden.⁸

10.2: Evaluation Yield

A total of 71 kg of artifacts were recovered from the evaluation units. Close to 70% of the finds can be attributed to pre-colonial Temasek period (Tables 4–5).

⁸ This data is based on preliminary sorting of the artifacts on site and not systematically processed and catalogued. This rudimentary dataset has been compiled prior to having the artifacts washed and removal of dirt. Variations in the weights and categorisation are to be expected when processing work is completed.

Table 4: Total mass per material and its sub-category – evaluation excavation.

Evaluation Excavation		
S/No.	Artifact Type	Mass (g)
1.	Ceramic Building Material	10,320
2.	Ceramic Stoneware	27,493
3.	Ceramic Earthenware	7,818
4.	Ceramic Porcelain	6,030
5.	Metal	3,864
6.	Glass	2,198
7.	Plastic	216
8.	Timber	49
9.	Bone	178
10.	Shell/Coral	1,019
11.	Charcoal	493
12.	Geological	8,792
13.	Other	2,931
	Total	71,401

Table 5: Percentage mass per temporal period – evaluation excavation.

Evaluation Excavation			
Layers	Chronology	Mass (g)	Percentage
Temasek period	c.1300 – 1600	49,917	69.91%
Colonial period	1819 – 1959	20,471	28.67%
Modern	1959 and Post 1965	1,013	1.42%
	Total	71,401	100.00%

10.3: Rescue Excavation Yield

The 2010 rescue excavations at the National Gallery Singapore site yielded in total approximately 303 kg of artifacts, of which some 40% can be attributed with a high level of confidence to the Temasek period. The following is the breakdown of the artifacts by categories and broad chronological range (Tables 6-7).

Table 6: Total mass per material and sub-category – rescue excavation.

Rescue Excavation		
S/No.	Artifact Type	Mass (g)
1.	Ceramic Building Material (excluding bricks)	73,803
2.	Ceramic Stoneware	100,863
3.	Ceramic Earthenware	24,243
4.	Ceramic Porcelain	18,808
5.	Metal	9,996
6.	Glass	11,361
7.	Plastic	93
8.	Bone/Shell/Coral	5,252
9.	Charcoal	938
10.	Geological	45,360
11.	Other	12,924
	Total	303,641

Table 7: Percentage mass per temporal period – rescue excavation.

Rescue Excavation			
Layers	Chronology	Mass (g)	Percentage
Temasek period	c.1300 – 1600	120,198	39.58%
Non-Temasek *	1819 – Present	171,389	56.45%
Other - no context	N/A	12,054	3.97%
	Total	303,641	100.00%

* Includes materials from the transitional layers where artifacts dating to Temasek period were found but in a disturbed or undistinguishable context with modern construction fill.

10.4: Artifact Survivability

From the emergence of pottery technology approximately 10,000 years ago, ceramics have become the most frequent archaeological material encountered from sites across the world. This is primarily because ceramics are made from fired clay, which is virtually indestructible. When fired to a temperature of 900 degrees; the process crystallises internal structure and transforms it into the hard unmalleable material ubiquitous in everyday life.

Ceramics can of course break or shatter. However, once the broken sherd is discarded and buried in the ground, it is almost impervious to rapid decomposition and takes thousands, if not hundreds of thousands of years, to revert to its natural state. Higher fired ceramics such as stoneware and porcelain have even higher resistance to natural deterioration. It is because of its high survivability that archaeologists recover more ceramics than any other type of artifact. Artifacts of organic nature like fabric, timber, paper, bone, and botanical remains deteriorate far more quickly.

10.5: Chinese Ceramics

Based on total mass, ceramic artifacts recovered in all the excavated units are predominantly Chinese in origin. Visual analysis of these ceramics displays a spectrum of Chinese material, design and technologies. It is possible to identify provincial origins, kiln manufacturing sites, typology, and intended function in several cases. The Chinese ceramics are generally high-fired stoneware and porcelain. The most abundant are stoneware vessels. These include brown glazed storage jars from Guangdong, the so-called 'mercury-type' bottles from Cizhao kiln complex in Fujian (Chinese: *xiao kou ping* - bottle with small mouth), 'Ding-type' tea pots, and other utilitarian glazed and unglazed storage vessels (Figure 49).

Porcelain sherds including a small sample of greenware (celadon) were identified as produced in both Zhejiang and Fujian provinces. The former are extremely well made with a rich glaze and paste and are indubitably from the Longquan kiln complex. The Fujian materials are generally of lower quality with varying shades of green. An example of the Fujian production uncovered in NAG 022 is the almost-complete globular greenware jarlet decorated with what appears to be lotus leaf sprays (Figure 50).

An array of whiteware was also recovered from the site. A few pieces feature relief decorations of lotus leaf and animal motifs (Figure 51). Porcelain decorated with cobalt blue designs were also recovered. These include Yuan dynasty (AD 1271–1368) blue and white as well as blue and white wares produced during the colonial period. Examples of the latter include sherds from bowls with the 'double happiness' motif that were in circulation no later than the first half of the 20th century.

Several porcelain figurines were recovered including what appears to be the torso of the Bodhisattva Avalokitesvara or the Chinese deity Guanyin (NAG 024). Also religious in nature, is an accompanying devotee seated figure, and possibly the head of the Chinese warrior deity Guanggong. Other figurine parts found depict the head of a dog or mammal, and an unidentified elderly gentleman (Figure 52).

There were also ceramic building materials (CBM) such as roofing and flooring tiles, commonly referred to as terracotta, which may be of Chinese origin. Specialised study on their chemical composition and mineralogical analysis may be able to shed some light on this subject.

Fig. 49: *Xiao kou ping* (Chinese: bottle with small mouth).



Fig. 50: Greenware globular jarlet.



Fig. 51: Whiteware porcelain with intricate motifs.



Fig. 52: Unidentified figurine of an elderly gentleman.



10.6: Southeast Asian and Local Ceramics

The ceramic assemblage also includes earthenware. Much of the earthenware pottery may have been locally produced (e.g., proximate areas in Singapore, Malaysia or Indonesia). Earthenware is defined as clay fired between 400 and 900 degrees Centigrade. The earliest earthenware is estimated to have appeared in insular Southeast Asia about 4,500 years ago and in the Malay Peninsula around 4,000 years ago during the Neolithic period. Earthenware makes up the second largest category of ceramic finds from the National Gallery Singapore site. The earthenware recovered is contemporaneous with the Temasek period, and are mostly 'Malay-type' produced in the Straits of Melaka area, as well as some consisting of fine paste (possibly Javanese), and an unidentified variety of cruder fabric with large quartzite intrusions.

Decorations often include cord-bound and carved wooden paddle impressions, woven mat impressions, shells incised and combed designs. These impressed and incised patterns may have also served a utilitarian function; such as, preventing slippage. Other earthenware sherds are incised with very ornate, complex and intricate patterns (Figure 53). Various decorations recovered included chevrons, geometric shapes, and, linear and curved lines. Some sherds show signs of burnishing which forms a smooth surface.

Earthenware remains often permit the study of the evolution of indigenous technologies and stylistic trends over a given chronological span and/or geographic space—allowing spatial and temporal seriations to be created. Additionally, the functional use of earthenware evolved into an important requisite in the social, economic, and religious life from the earliest prehistoric communities to the present. The earthenware from the National Gallery Singapore site are likely fragments of crockery, kendis, bowls, and various storage receptacles.

Fig. 53: Decorated earthenware sherds.



10.7: European Ceramics

A modest amount of European ceramics was recovered. Most of these sherds date from the last quarter of the 19th century to early 20th century. They were probably churned up and re-deposited during the construction of the roadway. They include English transfer-printed white-earthenware sherds from dinner services, buff-orange glazed inkbottle fragments, Dutch sponged printed white-earthenware, and either Dutch or German mineral water bottle sherds.

10.8: Colonial Period Bricks

Several excavation units during the evaluation phase (NAG 008, 009, and 010) revealed brick features still in-situ. These are likely part of the Hotel de L'Europe and may provide a unique glimpse into the construction technology of the early 20th century. The bricks were hand-moulded to a general standard set of dimensions measuring 21 x 11 x 5 cm.

With the establishment of an East India Company factory in Singapore in 1819, one of the earliest industries to be founded on the island were brick manufactories. By the mid-19th century, the demand for bricks and ceramic building materials began outstripping supply. Subsequently, the government set up its own brick kilns in the late-19th century that provided for practically all the construction activities within the civic district. No archaeological study into these early industries of Singapore has yet been attempted, but these finds provide useful data for future research into these pioneer enterprises.

10.9: Metals

Historical and modern metal objects recovered included scraps of corroded iron, steel and alloys, crown bottle caps, and nails from the modern roadway fill, and the odd Straits Settlement coin from the colonial period.

The metals from the Temasek period revealed important clues to the socio-economic practices of the inhabitants of the ancient settlement. 14th-century metals are a rarity due to the nature of corrosion and the reversion of the metals back to their original base form, hence they are only preserved in limited quantities.

A total of nine Chinese copper cash coins including fragmentary examples were recovered from the evaluation phase (NAG 002, 003, 004, 005, and 008). Dozens of coins were recovered from the rescue excavation phase with a large concentration in NAG 013 and NAG 015. They display varying degrees of corrosion. However, preliminary inspection suggests that many date from the Southern Song Dynasty (AD 1127-1279) (Figure 54). These coins continued to remain in circulation in 14th century Temasek and throughout Southeast Asia for some time.

Albeit in small quantities, metal fishing hooks (Figure 55) were also recovered from the site. Excavations in 1994 at the Parliament House Complex (today the Parliament building) suggest that the site by the river was part of a smithy for metalworking, and it is possible that these fishing hooks from National Gallery Singapore were locally produced (M. Zaini 1997).

Fig. 54: Chinese copper cash.



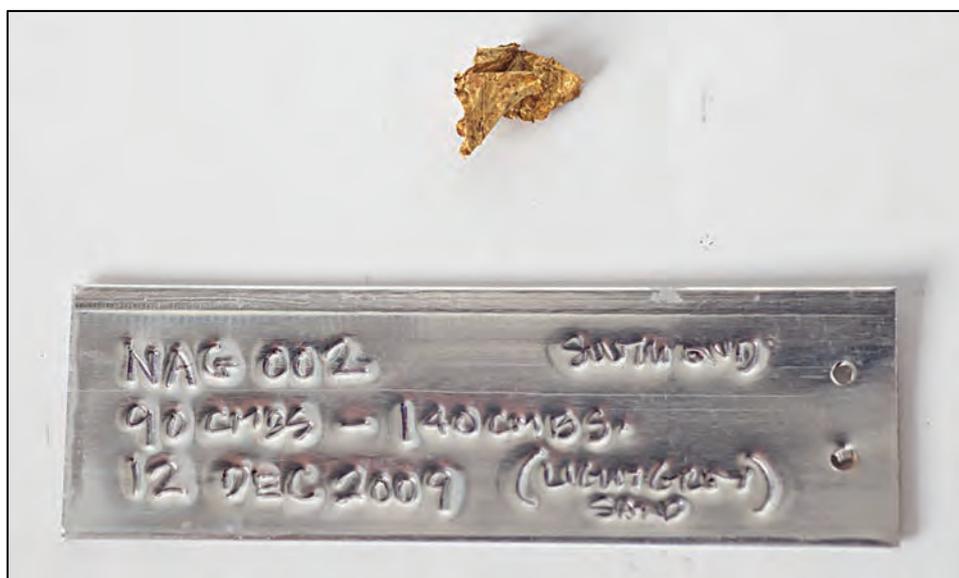
Fig. 55: Fishing hooks (highly oxidized).



10.10: Gold

A single fragment of crumpled gold foil (Figure 56) was found within the National Gallery Singapore compound (NAG 002). Pending detailed analysis, the foil may be inscribed with some form of religious mantra or *dharani*. Such pieces of deliberately crumpled inscribed gold foil uncovered in Java appear to be either employed for some form of ritual dedication or incantation. This may be the first of such discovery in Singapore.

Fig. 56: Gold foil.



10.11: Medieval Glass

Glass fragments from the medieval period are perhaps some of the most uncommon artifacts recovered (Figure 57). Glassware was generally a luxury commodity during the mid-second millennium and a relatively unknown technology except in a few major production localities in Asia. Glass beads, bangles, and fragments from vessels have been recovered from Temasek layers in various Singapore sites. However, Singapore's Fort Canning Site suggests a glass-recycling workshop existed during the Temasek period. Evidence indicates local craftsmen were remelting, reshaping and remoulding imported glass (possibly from China and other Asian manufactories). The various glass shards and beads (NAG 004, 006, and 007) recovered from the National Gallery Singapore site are of a different style from those found at Fort Canning (Miksic 1995).

Fig. 57: Decorated glass shards.



10.12: Shell and Coral

Mollusc shells and coral were recovered from most of the excavation units (Figure 58). These remains were probably obtained from mangrove swamps, the Singapore river estuary, coral reefs, and intertidal rocks not far from the original shorelines. The most prominent deposit was a sizable pocket of shells and coral within NAG 007. This feature contained numerous Mollusc shells and was located between 110–120 cmbd, just above the Temasek cultural layer. It is possible that this cache was gathered to extract calcium carbonate for lime working, or perhaps for some culinary broth.

Fig. 58: Shell remains.



10.13: World War II Midden

British military steel helmets, rubber gas masks, and associated paraphernalia were uncovered in a shallow pit in NAG 004. These items were extremely well preserved and were probably dumped and abandoned into an existing air raid slit trench in the Padang within days after the capitulation of Singapore to the Japanese on 15 February 1942. The model numbers on the gas mask respirators enable them to be identified as having been manufactured and issued in 1940 and 1941. No items from a later date after Singapore's fall were identified in this deposit. Other materials found within the midden were charcoal filter canisters for the masks, fabric and parts from knapsacks, shoulder bags and webbing, a boot, and broken bottles once containing alcohol.

In NAG 005 large amounts of asbestos sheets were found, probably the remains of an air raid shelter or trench. The asbestos would have lined the walls of the shelter as protection against incendiary charges or fire.

10.14: Other Materials

There is always an assortment of miscellaneous artifacts recovered from an archaeological site. From the National Gallery excavations, these range from modern plastic ball point pen caps and ink tubes, disposable plastic drinking straws, fibre stocking hosiery, to a roll of medical tape, and rubber gasket. One of the highlights were nodules of raw flint (Figure 59) shipped out from the British Isle in the 19th century. Flint was a variety of chert that produces sparks when struck with another object and was the predominant form of a fire igniter for the past two millennia. The flint was shipped out in its unworked pebbled form as ballast onboard an East Indiamen heading to the factories and colonies.

Fig. 59: Flint as ballast.



11: DISCUSSION

Over the past thirty-three years, archaeological investigations in Singapore have been sporadic and intermittent—particularly within the civic district where the heart of colonial activities and the ancient port settlement of Temasek were located. What archaeologists have gathered over the last few decades proves that there existed a concentration of distinct economic or social activities on each individual site. For instance, Fort Canning Hill was likely to be the ceremonial centre and residence of the elite in ancient Temasek, while Empress Place was riverfront habitation and commercial grounds; the Old Parliament House site a densely inhabited and possible extension of the riverfront commercial area; Parliament House Complex a metallurgy workshop; and St. Andrew's Cathedral an inter-tidal mangrove with low-density habitation.

However, there still remains a want of understanding of the National Gallery Singapore site vis-à-vis other Temasek period sites within the district. Until the processing of the finds is complete and a structured analysis of the artifacts is undertaken, it remains difficult to test hypotheses regarding specific site activities, duration of occupation, estimation of population size, and reconstruction of the past environment. Also lacking is sufficient statistical data from other Temasek period sites to serve inter-site comparison and analysis in Singapore and Southeast Asia.

The limited excavations carried out in December 2009 and November 2010 within the National Gallery Singapore compound was a modest sample of the entire construction site and only a tiny sample of the overall Temasek settlement and colonial historic civic district sites. Apart from the partial car park zone between the former Supreme Court and Municipal Building, the archaeological investigations did not address other areas within the large National Gallery compound. The 2009 archaeological evaluation only sampled 27 m² of the car park site, which measured approximately 15 x 84 m (1,260 m²). This translates to only 2.14% of the construction impact area within the present car park. The 2010 rescue excavation area of 26 x 5 m (130 m²) represents only 10.32% of the same impact zone. Altogether, the 2009 and 2010 excavations only totaled 12.36% of the car park site.

The nature of the two archaeological investigations differs significantly. The 2010 excavations operated on a tight schedule to rescue as many archaeological remains and data as possible prior to the destruction of the site from construction development. Although the project achieved its aim of excavating 100% within the selected excavation zone, the pace of the excavation and its overwhelming dependence on large numbers of volunteer labour - and towards the final seven days, hired contractor labour - indubitably resulted in less than 100% recovery rate for artifacts and data.

Approximately 4% of the artifacts have no detailed context. This is generally caused by human error, or the result from heavy rainfall washing out the artifacts and destroying unit walls and stratigraphic profiles. The large number of volunteers with irregular schedules also hindered careful monitoring of horizontal stratigraphic controls. Furthermore, different individuals often excavated a single unit; hence, consistency could not be maintained. Nevertheless, the excavation work was sufficiently successful to provide a broad understanding of the site.

No sizable colonial deposits are evident with the exception of the sewage pipe systems and the associated trenches dug to lay services. Some brick remains were

uncovered in NAG 008, NAG 009 and NAG 010 may possibly be remnants from the Hotel de L'Europe. The principal colonial era deposit was the Second World War midden in NAG 004 outside of the present National Gallery compound. It is highly likely that traces from the 19th century and early 20th century architectural remains have since been destroyed during the construction of the tiled roadway. The artifacts recovered from the colonial period largely constitute ceramic building materials and pottery sherds from disturbed contexts.

Although there is an almost complete lack of a colonial period occupation layer within the rescue excavation zone, there exist undisturbed provenances for the Temasek period. Two major concentrations of Temasek period materials can be discerned from the excavation. The first is from NAG 013 and NAG 015 in the northeastern corner of the excavated area closest to the Padang. This concentration yielded approximately 11 kg of artifacts. Interestingly, this area also revealed the densest concentration of Chinese copper cash. The 2009 excavated material from units NAG 002 and NAG 003 correspond closest to this concentration, then yielding 10 kg of Temasek remains.

The second and most prominent concentration for the entire project is within the area of NAG 020, NAG 022, and NAG 024. These three units together provided 62 kg of Temasek artifacts, with 37 kg for NAG 024 alone. This concentration accounts for about half of the entire Temasek period yield from the rescue excavation. It is within these few units that some of the most spectacular artifacts have been recovered. The most impressive is the torso of the porcelain Bodhisattva, likely to be that of Avalokitesvara or Water Guanyin in a 'royal ease' pose uncovered in NAG 024. A smaller porcelain seated figurine was also revealed in the neighbouring unit, NAG 022. Stylistic inspection suggests this figurine may have been an accompanying devotee figure to the larger Avalokitesvara. Several other ceramic sherds featuring fragments of figurines including a Guangong deity, a yet to be identified elderly gentleman, and a mammal or dog come from the same concentration. Another artifact worthy of mention is a dull celadon jarlet with mould-decorated floral motifs. Apart from a few minor cracks, this vessel is almost completely intact.

Throughout the rest of the excavated area, lesser concentration of artifacts occurred and are generally scattered. The two major concentrations suggest that there were specific activities areas possibly demarcating the compounds of either a household or institutional unit. Past excavations at the Padang and recoveries of artifacts from further inland towards Fort Canning Hill postulate that the beach and plains closest to the present-day National Gallery Singapore site were the most densely occupied or trafficked during the Temasek period. The excavation at the National Gallery Singapore, however, suggests that this area may have been a lower density zone, perhaps consisting of small residences, immediately beyond the boundaries of the beach.

12: CONCLUSION

The National Gallery Singapore excavation is one of the largest archaeological investigations in Singapore. The excavations achieved the project's primary objectives to: (i) identify any existing remains from the pre-modern settlement of Temasek/Singapura; (ii) identify any existing remains from the early East India Company factory and the colonial period; (iii) and systematically recover and

document all movable artifacts. The investigations have revealed that despite extensive construction development over the past two centuries, significant and large pockets of the Temasek archaeological reservoirs remained intact beneath the National Gallery Singapore compound.

Notwithstanding the small sampling area of the archaeological investigations and the incomplete analysis of the finds, unique artifacts were recovered—some for the very first time in Singapore. These include the fragment of crumpled gold foil, religious iconography of a Bodhisattva, and medieval period etched glass. The excavation also revealed an extensive Second World War midden. These provide an exceptional glimpse into the pre-colonial and colonial past for which there is little or no record in historical texts.

Post-excavation processing of the finds is still underway. Since the completion of the rescue excavation in 2010, the archaeology team has made significant progress in sorting and cataloging the artifacts. Should adequate resources become available, the team has in place an ambitious programme to develop an inventory database to promote and enable future research. Recently, some headway has been made on starting detailed analysis of the assemblage. Several research projects have been initiated including studying the decorative motifs, the *chaîne opératoire* of local earthenware pottery production, comparative inter-site activities and functions, and long distance ceramic trade and exchange. NSC Archaeology Unit researchers recently presented related results at the 2016 SEAMEO SPAFA conference in Bangkok, Thailand with papers submitted for future publication.

While the potential of the archaeological assemblage from the National Gallery Singapore site to reveal new insights into past lifeways of pre-modern Singapore remains very much untapped, it also underscores that archaeology is the best approach currently available to understand Singapore's unwritten past.

REFERENCES CITED

- Crawford, J. (1828). *Journal of an Embassy from the Governor General of India to the Courts of Siam and Cochin China*. London: H. Colburn and R. Bentley.
- Defense Science and Technology Agency Singapore (2009). *Geology of Singapore 2nd Edition*. Singapore: Defense Science and Technology Agency Singapore.
- Kwa, C.G., Heng, D., and Tan, T.Y. (2009). *A 700-Year History: From Early Emporium to World City*. Singapore: National Archives of Singapore.
- Lee, J.T. (2013). 'A Presence of the Past: The Legal Protection of Singapore's Archaeological Heritage', *International Journal of Cultural Property*, 20.3, 257–288.
- Leong, F.M. (2004). 'Early Land Transactions in Singapore: The Real Estates of William Farquhar (1774-1839), John Crawford (1783-1868), and Their Families', *Journal of the Malaysian Branch of the Royal Asiatic Society*, 77.1, 23-42.
- Lim, C.S. (2006) 'Archaeology as a Critical Source of Examining the Past: The Archaeological Potential of Singapore' in D. Heng (ed.) *New Insights to Singapore History: Perspectives of Emerging Scholars*. Singapore: National Library Singapore.
- Lim, C.S. (2010a). *Preliminary Report on the Archaeological Investigations at the National Art Gallery*. Report submitted to the National Heritage Board Singapore.
- Lim, C.S. (2010b). *Report on the Archaeological Investigations at the National Art Gallery November-December 2010*. Report submitted to the National Heritage Board Singapore.
- Lim, C.S. (2013). *Report on the Archaeological Excavations Victoria Concert Hall and Theatre*. Report submitted to the National Heritage Board Singapore.
- Lim, C.S. (2016). *Empress Place Rescue Archaeology Excavation Project Preliminary Report, 2016*. Report submitted to the National Heritage Board Singapore.
- M. Zaini, S.A. (1997). *Metal Finds and Metal-Working at the Parliament House Complex, Singapore*. Unpublished MA Thesis, University of Michigan.
- Miksic, J. (1995). '14th Century Chinese Glass Found in Singapore and the Riau Archipelago'. In R. Scott and J. Guy (eds.) *South East Asia and China: Art, Interaction & Commerce* (252–273). London: School of African and Oriental Studies.
- Miksic, J. (2004). '14th Century Singapore: A Port of Trade'. In J.Miksic and C.M.G. Low (eds.) *Early Singapore 1300s - 1819: Evidence in Maps, Text and Artefacts* (41–54). Singapore: Singapore History Museum.
- Miksic, J. (2013). *Singapore and the Silk Road of the Sea 1300-1800*. Singapore: NUS Press.

Miksic, J. and Lim, C.S. (2004). 'Archaeological Research on the Padang and in the St. Andrew's Cathedral Churchyard: St Andrew's Cathedral Archaeological Research Project Progress Report Summary September 2003 – June 2004', *ARI Working Paper*, National University of Singapore.

Ministry of Information, Communications and the Arts (2007). 'Singapore launches architectural design competition for a new national art gallery', media release, February 22, 2007.

National Archives of the United Kingdom (1934). 'Empress Place Singapore', CO273 599-1, 1934.

Pearson, H.F. (1953). 'Singapore from the Sea, June 1823. Notes on a Recently Discovered Sketch attributed to Lt. Phillip Jackson', *Journal of the Malaysian Branch of the Royal Asiatic Society*, 26.1, 43–55.

Public Works Department (1976). *Geology of Singapore*. Singapore: Public Works Department.

The Straits Times (1897). 'Picturesque Singapore', October 1, 1897.

The Straits Times (1932). 'The Europe Hotel Closes', October 30, 1932.

The Straits Times (1989). 'Workmen stumble on a piece of Singapore history', November 18, 1989.

Urban Redevelopment Authority for Preservation of Monuments Board (1993). *Supreme Court Preservation Guidelines (PPG) Vol. I*.

Urban Redevelopment Authority for Preservation of Monuments Board (1994). *City Hall Preservation Guidelines (PPG) Vol. I*.

ACKNOWLEDGEMENTS

The production of this report was assisted by Wee Sheau Theng and Margaret Wong who computed the preliminary dataset of artifacts. The profile illustrations were executed by the author and Lim Tse Siang and digitised by Aaron Kao. Unless otherwise indicated, all photographs in this report are by the author and Ung Ruey Loon.

We are extremely indebted to all our volunteer team members who unfailingly showed up for work despite the rain and heat. Special mention needs to be accorded to the teachers of Humanities Branch, Curriculum Planning and Development Division Ministry of Education, Dunman High School, and the School of the Arts for their relentless enthusiasm and labour. Special thanks to Benjamin Vining of the Department of Archaeology, Boston University for conducting the remote sensing trials.

We thank the Singapore Cricket Club for granting permission to excavate upon their grounds, specifically Alan Jones and Owen Monaghan for speedily approving our request. Previously with the Preservation of Monuments Board, we thank Yeo Kang Shua for his careful explanation on the demarcation of National Monument boundaries. We are most appreciative of Rosli and his security and janitorial team from PREMAS, who were most helpful and accommodating throughout the duration of our project. A note of gratitude to our contractor Wei Eng Hardware and Engineering Pte Ltd for providing much gratis materials and work on site.

Our sincere thanks to the National Art Gallery Project Team headed by Sushma Goh, consisting of Mark Chee, Lim Shu Juan, Kenny Ng, and Pamela Tham. We also wish to record our appreciation to other colleagues at the National Heritage Board for their support.

The initial evaluation phase was partially funded by the National Gallery Singapore and an anonymous private donor. This project, and more importantly Singapore's heritage and archaeology, is eternally grateful to the Lee Foundation for its timely funding of the rescue excavation. Kwa Chong Guan must be thanked for his relentless support and lobbying. We are also indebted to the Institute of Southeast Asian Studies, particularly to Geoff Wade and Ambassador Kesavapany, for providing emergency funding. This project is also partly funded by the National Volunteer and Philanthropic Centre.

ARCHAEOLOGY PROJECT TEAM

Project Archaeologist: Lim Chen Sian

Field Crew Leads: Aaron Kao, Lim Tse Siang, Wee Sheau Theng and Margaret Wong

Photographers: Sam He, Lim Shao Bin and Ung Ruey Loon

Field Crew and Volunteers: Raymond Ang, James Chan, Chan Oi Khum Karen, Cheah Fang Leah, Omar Chen, Chestnut Secondary School, Chiang Ky, Daniel Chin, Eugenia Chin, Daphne Chui, John Chong, Samuel Chong, Chong Yuan Jian and Family, Choo Ai Loon, Joyce Chng, Dunman High School, Edison, Goh Chye Kim, Goh Geok Yian, Gracia, Hardi Zein, Sam He, Kanako Iida, Institute of Southeast Asian Studies, Mabel Kam Eng Yee, Christabel Khoo, Jeremy Lee Boon Haw, Kevin Lee, Eileen Lim, Shirlene Lim, Lim Shujuan, Lim Shuxian, John Miksic, Nanyang Technological University, Ng Ching Huei, Inas Ng, Michael Ng, Ryoko Aoki, Eunice Sim, Geraldine Sim, Singapore Heritage Society, Singapore Polytechnic Guild, School of the Arts, Timothy Soh, SP Jain Institute, Alex Tan, Amnah Tan, Tan Rui Qing, Elizabeth Tay Ai Lyn, Lena Teo Hui Lin, Samantha Toh, Tong Ziming, Cherylyn Wong, Kim Wong, Xing Guan Can, Atsuko Yamamoto, Angeline Jude Yeo, and Yeo Kang Shua, and Martina Yeo.

