THE NATIONAL LIBRARY AND ARCHIVES OF CAMBODIA

A design proposal for an addition to the existing National Library of Cambodia enabling it to encourage and sustain the continued growth and re-emergence of knowledge and culture in Cambodia.

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April 17, 1975. The Khmer Rouge, led by Pol Pot, took over Phnom Penh. The library was promptly closed; it had no place in a world where knowledge, literature, traditions, art and culture were actively sought out for destruction. As Cambodia moves beyond its traumatic history it is claiming back these things taken from it. The National Library and Archives of Cambodia can assist in this recovery and ensure continued growth into the future.
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Introduction

Research Question:
This project is to investigate what the issues are in developing a design proposal for a modern addition to the French Colonial building of the existing National Library of Cambodia and how it can encourage and sustain the continued growth and re-emergence of knowledge and culture in Cambodia.
Background:
Cambodia’s tragic past underpins the importance and significance of this project. The Khmer Rouge regime, from 1975 to 1979, had a devastating effect on the country including devastating its National Library. Knowledge and culture, important aspects of any country’s identity, were deliberately sought out for destruction and eradication by the Khmer Rouge. The effects of this are still felt today. However, as Cambodia re-emerges economically, Cambodia is also re-emerging in its knowledge and culture. This project, therefore, encourages the rebirth of Cambodia’s knowledge and culture and provides a facility to sustain its ongoing development.

Whilst they take pride in their ancient architectural history, the temples of Ancient Angkor, it is only in recent years that Cambodians have started to recognise their more modern architectural heritage. After independence from France the country’s French Colonial buildings were not considered to be of significant cultural or heritage value, but this attitude appears to be changing and attempts are being made to preserve what buildings are left\(^1\). The importance to Cambodian culture and heritage of the country’s tropical modern architecture from the 1950s and 1960s is still not recognised and many such buildings have already been torn down or altered beyond recognition.\(^2\) Many Cambodian school children are taught that these styles have nothing to do with their heritage,\(^3\) despite their role in shaping current-day Phnom Penh.

The existing National Library building is one such French Colonial building of significant heritage value which needs to be protected against the threat of redevelopment, the fate of many such important buildings in Phnom Penh.\(^4\)

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The National Library building was opened in 1924 during the French Colonial era\(^6\) and largely remains the same as it was when it opened, apart from the general deterioration of the building. The beautiful French gardens it once had have, unfortunately, been replaced by parking.\(^7\)

The library has endured French colonialism, Japanese occupation, the struggle for independence, wars, and traumatic changes of

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\(^7\) Ibid. p.395

government and social structure. It is now showing its age and is in need of updating to bring it back to life. The library’s contents were systematically scattered or destroyed in the brutal years of the Khmer Rouge. The building itself survived the four years of control by the Khmer Rouge, but the collection was largely destroyed and, of its 40 staff, only two returned in 1979. This devastation symbolizes the wider aim of the Khmer Rouge’s plan to “abolish, uproot and disperse the cultural, literary, and artistic remnants of the imperialists, colonialists and all of the other oppressor classes.” The library and archives buildings were used to house pig keepers and later to house Chinese advisers. The books were pushed off the shelves so they could be used to store food and cooking pots. The books remained on the floor where they were used to light fires or as cigarette papers. The grounds were used to keep chickens and pigs for the neighbouring hotel.

The library reopened in 1980 and was soon well patronized again. The collection has begun to grow, but still largely relies on foreign book donations. As well as being the National Library of Cambodia, the library also functions as the only public lending library in the country. Thankfully many people do understand the importance of this institution for rebuilding the cultural and intellectual life of the

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11 Ibid. p. 391.
12 Ibid. p. 392.
13 Ibid. p. 392.

14 Life Magazine, 50607198.jpg, URL Unknown
15 Ibid. p. 404.
16 McVicke, “A Year in Cambodia.”
country. However, the current library is no longer appropriate for the needs of modern day library functions and users. It does not provide suitable conditions for the protection of books; for instance there is no climate control or air-conditioning, which is vital in a country with such humid conditions.

There is a real message of resilience and survival in the history of the National Library of Cambodia. The suffering under the Khmer Rouge was so severe that, as is the case with the entire social fabric of Cambodia, the effects are still being felt today. A national library's role is to preserve the knowledge and culture of a country, the precise ideas the Khmer Rouge were trying to eradicate. The National Library is a vital part of the recovery and growth of Cambodia and can play a significant role in reviving knowledge and culture in Cambodia.

Figure 4

Aims/Objectives:

The purpose of my project, and the main architectural research problem, was to investigate in what way an architectural proposal for the National Library and Archives of Cambodia could encourage and sustain the continued growth and re-emergence of knowledge and culture in Cambodia. I investigated this by developing a design proposal for an addition to the current National Library of Cambodia.

In designing a building to fulfil this purpose, there were other issues and related architectural research problems investigated which had an influence on the design proposal. These issues were: how to appropriately connect the old building with the new addition, merging the functions of a national library and public library, the future direction of libraries and how to make the building suitable and appropriate to Cambodia.

The current National Library is a French colonial building of significant heritage value. It represents part of Cambodia’s history and the proposed addition represents the growth and future of Cambodia. Connecting the aspects of old and new, or past and future, together architecturally was challenging.

As well as being the National Library of Cambodia, the library also functions as Phnom Penh’s only public library. As public and national libraries usually take on different roles, the question of how to architecturally assist in the combining of these roles needed to be addressed. Both national and public libraries serve important roles in promoting learning, but go about it in different ways, catering for different people and different needs.

The future of libraries is a much-debated issue. It is generally agreed that libraries will continue to play an important role in society, but some of the functions and services they provide will change, and already have changed, over time. These changes have accelerated over the last decade due to the development of technology and the digital age. Therefore, the addition to the library needed to not only encourage the current growth and re-emergence of knowledge and culture, but also help sustain this into the future.

The proposal is specifically for the National Library of Cambodia, not for a national library per se, so it is important that this building be appropriate and fitting for Cambodia. I took inspiration from an earlier architectural movement in Cambodia during the 1950s and 60s, led by the Cambodian architect Vann Molyvann. This “New Khmer Architecture” was based on the modernist movement of the time, but what was of particular interest to me was how this style
was then adapted to Cambodia. It addressed the issues of climate, culture and tradition and succeeded in producing buildings that were appropriate to Cambodia. I have tried to produce a design proposal with similar Cambodian influence and appropriateness.

As part of preserving Cambodian culture spaces dedicated to Cambodian arts and culture, such as the exhibition and performance spaces, have also been incorporated. The arts in Cambodia range from traditional *apsara* dancing and shadow puppets to both traditional and modern painting. These are currently being revived in Cambodia and are beginning to flourish and be recognised for their value and importance in society. This is not a new function for the library, as it is already known for supporting the arts, a place where exhibitions are staged in conjunction with the French Cultural Centre and where monthly performances have previously been held by the only surviving group in traditional Khmer shadow theatre.\(^\text{19}\)

Funding is a serious issue for the library. To pay for the upkeep and salaries a large part of the garden is leased out. This is used for parking by the university across the road and by a small restaurant/café which has built shacks and taken over the old garden shed. In my proposal I wish to incorporate similar income generating facilities.

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Define Project

Brief:

The existing library and the archives buildings have run out of space and do not provide conditions suitable for storing books or documents. They both require extensions or new facilities which provide greater room and more appropriate storage conditions. Currently the library and archives buildings are situated on the same block of land, but function separately. The proposed design incorporates both these buildings within the same design, but maintains them as separately functioning entities. After consulting with the library and archives staff, the following brief was produced.
The National Library of Cambodia also functions as a public library. This is something the library staff wish to continue and be further developed. The roles of national and public libraries, however, are considerably different and consist of two different collections. Separate areas for each are required in the design with a defined boundary between the two collections, so there is greater control of the material, ensuring they cannot be accidentally mis-shelved by visitors.

The national library section requires space for:

- Legal deposit collection
- Journal collection
- Cambodiana collection
- Rare/historic books

The public library requires spaces for:

- Fiction collection
- Non-Fiction collection
- Children’s collection
- Reference collection
- Foreign language books
- Issues and return area

Both the national and public library require spaces for:

- General study/reading spaces
- Study or conference rooms
- Circulation workspaces (returning, sorting and organising books)
- Workrooms (providing space for cataloguing, conservation, mending, assigning ISSN/ISBN numbers, and other general offices)
- Digital/IT areas.
- Storage

To calculate the space a collection needs, the general rule is to divide the number of items in the collection by 10. This gives the amount of space needed in square feet. In 2005, the National Library of Cambodia had a collection of 103,635 items. The size needed to accommodate a collection of that size is 10,400sq.ft.

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The library staff did not know the current size of the collection, but it has significantly increased in the past six years. To allow for this, and for future growth of the collection, the amount of space required would be at least 1400m² plus additional space for other functions such as study areas, offices, workrooms, circulation, etc.

The National Archives of Cambodia.

An archive is run differently to a library. Using an archive is essentially a more supervised task. Unlike a library it is not possible to walk in and start browsing. There are two archive buildings, the older and larger is the main building with a newer and smaller building next door, mostly used for storage. The main archives building consists of 3 floors, with the ground floor being where most of the activity happens and the upper floors being where the majority of documents are stored. The ground floor space is made up of study spaces for visitors and staff offices, with more documents filling up the remaining spaces. Documents are retrieved from the upper floors and brought to the ground floor by staff or with staff supervision. This ground floor space acts as a hub and gives the staff control over the archives and visitors. The proposed archive building is also required to function in a similar manner.

The archives could also be broken down into several separate collections:

- Cambodian publications and periodicals
- Photographs, maps and plans
- Official journals of Indochina and Cambodia
- Resident Superior of Cambodia 1863-1954 (French rule)
- Records of the post-colonial governments
- Records of the Pol Pot Regime
- United Nations Transitional Authority of Cambodia (UNTAC) records
- Records of the Genocide Tribunal of 1979

Along with the specific requirements and functions of the library and archives, some other special requirements and functions to be found in the design are:

- Restaurant/café
- Bookshop
- An exhibition space
- Parking
- Performance space
- Spaces to run workshops or classes
- Staffrooms
- Public bathroom

In Phnom Penh electricity is expensive and power cuts are frequent. To reduce reliance on electricity it was advantageous to create a complex that can be negotiated without the need for lifts. Within a library and archives, books are frequently moved around in trolleys. If there were to be no lifts, circulation had to be provided via ramps rather than stairs so trolleys are able to be moved around and wheelchair access provided for.
Figure 5
The site for this project is the current site of the National Library of Cambodia and the National Archives of Cambodia. It was decided not to produce a new national library and archives building on an alternative site in Cambodia, but rather propose an addition to the current buildings. This is because the current French Colonial buildings are of significant heritage value and an important part of both the history of the National Library, National Archives and of Cambodia itself. The location of the current National Library is also prominent as it is adjacent to a well-loved and used park with the main temple, Wat Phnom which the city was named after, situated at one end of this park. There are also many other important buildings, such as university campuses, embassies, bank head-offices, well-known hotels, the old train station and the post office also in the area. The site is also undeveloped compared to a lot of other sites providing plenty of space for a reasonable sized addition.

Currently on the site there are three permanent buildings.
The existing library building is situated in the centre of the site facing South with the main entrance to the site from the South and two smaller entrances on the East and West.

The existing archives building is situated at the North end of the site and also faces South with entrances to the site also being from the East and West. To the West of the archives building is a four storey building which was very recently built and styled to match the existing archives building.
Figure 9 – Boundary walls around the National Library

There are currently walls bordering the site and also running along the back of the library building, separating the library and archives buildings.
The Wider Context
Raffles Hotel le Royal
Christopher Howes park
Ministry of Economics and Finance
Wat Phnom
Sunway Hotel
USA Embassy
National University of Management
Vattanac Bank head office
Literature Survey:

A Library for the Future

The discussion concerning where libraries are heading in the future has been under heated debate for many years now, without having reached much of a conclusion. Some say libraries are a dying breed and others believe they will always exist, with numerous and varied opinions ranging in-between.

Most of this debate is centred around public libraries and the effect our increasingly digital society is having, or will have, on them. A national library is certainly still affected by this, but not to the same extent. Because a National Library’s role is to hold a copy of every book produced within that country, it is unlikely that the physical book will ever disappear completely from its collection. As literature becomes increasingly digitised, the original physical item will be of increasingly higher value and more important for the National Library to retain. Therefore, while the amount of books produced in print may decline in the future, the National Library’s collection will continue to increase (possibly at a lesser rate) but certainly will not decrease in size. A common argument is that people are able to access books, other library items and information in general without having to leave home. Therefore, why would people still want to visit a library? In his Extinction Timeline, Ross Dawson, a future strategist, suggests that libraries will be insignificant beyond the year 2019.22 As Guy Adam Ailion points out in his work Everywhere is Here this might in fact be correct if libraries remain the same as they are today23 and do not try to reinvent themselves. Libraries are recognizing they need to change and are already working on doing so. One of the most common changes is a stronger focus on community and sharing of knowledge. Libraries are becoming more like community centres and a place to gather and socialize - the new town square.24 Libraries need to “emphasize the concept of a library building as a lively social and cultural centre that offers many popular, enticing activities and is quite different from the closed, silent and frigid image of the old-fashioned library.”25

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Just providing access to books and other information is no longer enough. Libraries are becoming a place of learning, not just a place for storage of materials for learning. Libraries are providing community classes and workshops, children’s programs and are having more involvement with other art forms beyond literature. The aim of this project is to support the continued growth and renaissance of knowledge and culture in Cambodia. These additional functions of the library will form a large part of being able to achieve this. Cambodians have traditionally transferred knowledge orally, such as in a class or workshop, and through their arts, such as dance and shadow puppetry.

Libraries wanting to survive in the future have to incorporate new technologies and digital media within their collections. More and more information is being transferred and stored in ways other than printed text. Media such as film, audio and electronic books will become a larger part of the collection and will need to be able to be viewed while at the library or archives. Cambodia is a country with a very young population, the median age being only 23.7 years. As it is the younger generation that connect more with technology, it is appropriate for a Cambodian library to embrace this technology and become a library for the future. This also lends itself well to an oral society with low levels of literacy, as is found in Cambodia. The technology enables a much larger group of people to benefit from the library and do so in a more familiar way.

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Post-colonialism

Designing a Cambodian addition to French Colonial buildings raises issues with regard to Post-colonialism. Firstly, it should be pointed out that the entire concept of a library is a Western idea, so that without having had any Western influence the current national library and archives would not exist. The Western origins of the library cannot be ignored while trying to create a Cambodian version of it. This project is about both trying to apply Cambodian ideas to a Western concept and applying Western ideas to a Cambodian context, then taking the best from each to create a Cambodian version of a library and archives.

Experiences shape people and nations, but they do not change who they are in essence. These experiences are beyond the control of individuals and have to be accepted and moved on from. Experiences cannot be undone so people have to make the most of them, taking the good parts with them. In the case of Cambodia, they have been influenced by the French but they are still, essentially, Cambodian, they have kept the best of the French influences and rejected those they do not wish to retain. Post-colonialism is not about reinstating the way things were before Colonialism but about moving forward, towards a place of mutual respect rather than removing all memories of colonialism.

After independence in 1954 there was an anti-colonial mindset and French influences were rejected. This was illustrated by the move to traditional styles by the artists in South East Asia. “The traditional styles adopted by artists during the middle of the century spawned a debate over the relationship of the East and West. Anything modern was equated with Westernization and Colonialism, while traditional styles symbolized the search for a national identity.” However, Cambodians are now accepting, and even proud, of their French heritage and influences. These same South East Asian artists have also shown the way forward. They eventually became less reluctant to use modern art styles, which has led to the successful creation of works of art that are a “blend of many sources but are still deeply personal and rooted in local concerns.”

The architect Vann Molyvann has shown what can be achieved when there is a blend of styles. Molyvann was the King’s architect during the 50s and 60s and played a significant role in the creation

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28 Ibid.
of a new style in Cambodia called New Khmer Architecture. It was a careful and clever combination, taking elements from Angkorian and traditional Cambodian architecture and combining them with "technical gestures of universal modernism." It became a style which is still uniquely and identifiably Cambodian, but would not be possible without its Modern influences.

Cambodian architecture would not be where it is today without the influence of the French. Cambodians were able to take skills, techniques and stylistic elements they learnt from the French and apply them to their own traditional knowledge. They took the best elements of each culture to further develop Cambodian architecture and this is also the method used in this project.

In the case of the existing National Library and National Archive’s buildings they represent more than just French Colonial buildings. They speak of the survival and resilience of the people of Cambodia during the Khmer Rouge era and the continuation of their survival is ensured within this design proposal. The library building, now used as an entrance space leading on to the additions, symbolizes the fact that Cambodia has had to go through that colonial stage to get to where it is today.

29 Turnbull, “View from Phnom Penh.”
30 Flury and Stehrenberger, “Kosmisch Modern Vann Molyvann - Architekt Des Konigs.”
Precedent Survey:

Hun Sen Library, Royal University of Cambodia, Phnom Penh

In 2011 the Hun Sen Library at the Royal University of Cambodia in Phnom Penh underwent a major addition designed by Pyle Architects. This is the closest contemporary example of a project similar to the addition to the National Library of Cambodia. The existing building is not of historic significance, it was built in the 1990s and it is an academic library rather than either a national or public library. However, the project deals with the climate, attaching a new building to an old building and recognising the needs of a library in the future, all within a Cambodian context.

The Hun Sen Library is a good example of how to deal with Cambodian climatic conditions. Because the building is a library and books need to be stored in a suitable conditions the building could not rely on ventilating outside air throughout the building as is commonly seen in Cambodia, instead it relies on a combination of active and passive climatic control methods.


Passive methods include keeping an existing group of trees which provide shade and cool the surrounding air to create a cool air sink, having solid walls on the East and West sides of the building and having the windows on both the North and South sides shaded from direct sunlight through the use of louvers and overhangs. The building needs to be shaded on both of these sides because, whilst the sun is in the South for the majority of the year, the sun moves over the top of the building to the North for three months a year.

\[32\text{ Pyle Architects, "Concept Design Presentation," (Phnom Penh2008).}\]
Natural light features predominantly throughout the building to reduce electrical lighting requirements\textsuperscript{33} not only to be energy efficient but because power cuts are frequent throughout Phnom Penh and the building still needs to be useable in these situations. Thermal insulation has been built into the solid walls and both roof and building incorporate various vents to allow some controlled natural ventilation.\textsuperscript{34}

Active methods of climatic control are the use of ceiling fans in some areas and a few selected areas have air conditioning. The areas that are provided with air conditioning are the Cambodiana Collection room, Audio-visual room, Archive room, Training room and Seminar/Study group rooms.\textsuperscript{35} These are rooms where either the collection is highly valuable or sensitive to heat or places where there can be a dense group of people.

The building, whilst designed by a British firm with an office in Phnom Penh, incorporates Cambodian features other than purely climatic ones. The control of rain water on the building is mostly dealt with by downpipes which divert the water into the existing pond to the North of the building.\textsuperscript{36} It is foreseen, however, that in very heavy downpours the downpipes will not be able to cope and the design incorporates overflow spouts as an architectural feature, similar to those seen at the State Palace and Olympic Stadium, which were both designed by Vann Molyvann.\textsuperscript{37}

\textsuperscript{33} Ibid.
\textsuperscript{34} Ibid.
\textsuperscript{35} Ibid.
\textsuperscript{36} Ibid.
In the Design Objectives, Pyle Architects state that they should “incorporate walkways, trees and water basins as an integral part of the design”\(^3^8\) as this is a distinct element of many Cambodian buildings and relates to many of the existing buildings on the campus built during the New Khmer Architecture period.

In thinking about the future of the Hun Sen Library it has been assumed that they may need additional storage in the future either due to the expansion of the current library collection or, as some may argue, the lessening use of the library’s collection and existing space of the collection being used for alternative functions such as increased study space. Either way, the design acknowledges that in the longer term, when the seasonal flooding of the local area has been controlled, the under-croft of the new addition, which is currently designed as a place for students to hang out in the shade, could be enclosed and used as additional storage.\(^3^9\) Design provisions have even been made so that it is easy to remove a section of the floor and put in stairs for access to this space internally. With the new addition to the library the amount of space dedicated to study spaces is noticeable. This reflects the existing ideas of where libraries, especially academic libraries, are heading in the future.

\(^{38}\) Pyle Architects, “Concept Design Presentation.”
\(^{39}\) Ibid.
The connections between the existing building and the new addition are provided by a series of bridging ramps. The new addition is, otherwise, a completely separate building to prevent structural complications.\textsuperscript{40} The floor levels of the new addition are offset with the floor levels in the existing building and the bridging ramps zigzag back and forth between the two buildings. Although within the new addition there are stairs provided between the two levels, these ramps mean that trolleys of books and wheelchairs can move between levels without the need to include a lift in either the existing or new building.

\textbf{Figure 13 - Open space underneath library}

\textit{Ibid.}

\textbf{Figure 14 - Diagrammatic section of the existing and new buildings showing the alternating floor levels and ramps connecting the two buildings}

Whilst the building is reasonably successful in dealing with issues of climate, future proofing of the library and its suitability to the Cambodian context, it is understandably designed to fit with the Western idea of what a library should be. There is nothing unique about the library which relates to Cambodian culture and methods of preserving and passing on knowledge.
When one thinks of the future design of libraries, the Seattle Library, 2004, designed by Rem Koolhaas and Joshua Prince-Ramus of OMA/LMN is probably the most well known for its attempt to provide an example of where libraries are heading in the future. While stating that the Seattle Library is a celebration of books and maintaining the position that books are not going to be disappearing from libraries any time soon they have not ignored the fact that the role of the library is changing and serves functions other than just providing access to books.

By providing distinct areas designated for the use of the library’s materials such as the ‘reading room’ and especially the ‘living room’ they are acknowledging the role of the library as becoming a more lively, social, community based civic space as opposed to the more stereotypical view of a library being a silent, restricted and stuffy space. The ‘living room’ in particular is designed to be a “great civic space: a place to sit, read, rest, meet colleagues, search the web, browse the fiction collection, snack, sightsee, and meet for coffee.”

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43 Ibid. p.
This establishes its role as ‘the major (and perhaps the only) free public space in downtown Seattle’ and provides an ‘inspiring and inviting amenity for the entire city.’ It is within these spaces that the changes to the library, as it adapts to future requirements, is set to happen. They have been designed as flexible spaces in the hopes that they can be easily adapted to unforeseen changes in the library’s future.

Whilst steps have been made to ‘update’ the library as we know it, to suit today’s requirements the Seattle Library has not put forth a particularly strong challenge or argument as to where libraries are heading beyond the next ten years. It has addressed this issue, as stated above, by creating flexible spaces (i.e. open, without structural dividing walls) that are perceived to be more easily adapted to future requirements without making an attempt at perceiving what these changes may be. This is a valid design approach to the Seattle Library, but should be seen more as a library designed for today rather than a library designed for the future.

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46 Ibid. p.
The ‘Idea Store’ series of libraries in London, specifically the Whitechapel Idea Store, provide another example of a library design attempting to address the issue of where libraries are heading in the future. The largest and most obvious method they have used to ensure the continued use of the library is to situate it near commonly used amenities such as supermarkets or shopping malls, bringing it to the time deprived society of today and making it as accessible as any other ‘store’ is.\textsuperscript{48}

Not only are the libraries situated in retail environments, the appearance and layout design has taken architectural inspiration from retail also.\textsuperscript{49} The Idea Stores are designed using the “architectural and interior design language of the retail and leisure industries,”\textsuperscript{50} such as “retail style branding and image promotion”\textsuperscript{51} and retail methodology such as placing the café on the top floor to draw people through the library so the various facilities can be advertised.\textsuperscript{52} The libraries are intended to be “attractive to look at

\textsuperscript{49} Ibid.
\textsuperscript{50} Ibid.
\textsuperscript{51} Ibid.
and pleasant to be in, using the best of modern architectural and graphic design."\textsuperscript{53}

These libraries, like the Seattle Library, also acknowledge the trend towards the library becoming a more social and civic space and they are intended to be "a focus for the local community, a place where people can come for a coffee, to meet friends, to take a break from shopping and to enjoy the many facilities."\textsuperscript{54} In the Whitechapel Idea Store this concept is seen in the more socially based facilities such as a café, video wall, healthy living information, art performance/exhibition space, and childcare that are provided.

The Idea Stores are aimed at providing for the needs of the local community not only socially but also educationally. The library is no longer to be seen as just a place for storing books and information which can be taken away and used to educate and entertain, but it sees itself as a lifelong learning facility.\textsuperscript{55} It is a place where education and learning actually happen, not just a place for provision of resources. This, therefore, requires a different accumulation of spaces to most libraries of today. At the Whitechapel Idea Store the design needed to incorporate space for adult further education classrooms, public access IT and Internet terminals, homework clubs, study spaces, and a crèche.\textsuperscript{56}

\textsuperscript{53} Tower Hamlets Council Arts Leisure Sports and Youth and Community Services Committees, "A Library and Lifelong Learning Development Strategy for Tower Hamlets."
\textsuperscript{54} Ibid.
\textsuperscript{55} Ibid.
\textsuperscript{56} Ibid.
Design Stage One: (Pre site visit concepts)

Entrance to site:

Currently, the main entrance to the library is from the South side facing the park. The other three sides of the site face streets which have large, solid boundary walls which feel both intimidating and unfriendly as they are of such a scale that one is unable to see beyond them into the site behind or are topped with barbed wire.

Both the library and archives buildings are oriented towards the South and I have chosen to retain the main access to the site from this direction. While an argument could be made for entering the side from the East or West, between the two existing buildings, the visitor would be faced with the unattractive rear of the library and the mediocre façade of the archives building. It is in fact the library which has the most prominent and distinctive façade and it is the interior of the archives building which lends most of its character. Therefore, it makes logical sense to retain the direction of the original entrance as this maintains the display of the existing library façade to the public. This also provides more opportunities to relate to and connect with the park across the road.
Figure 18 - Boundary wall of site to the east

Figure 20 - Boundary wall of site to the west

Figure 19 – Site Entrance
Changing site boundaries:

Initial investigations into layout and forms revealed a difficulty with the existing site layout. The existing library and archives buildings are situated in the centre of the site. This leaves narrow strips of land down either side of the buildings which proved difficult to work with and provided little opportunity to break away from the symmetry of the site. The current site is surrounded on all four sides by roads. While both the roads on the North and South of the site are essential, it is not necessary to have roads down both sides of the site also. Either one of the roads on the East or West of the site could be removed and become part of the Library’s site. Before visiting the site it was not known which road was less frequently used. The assumption was then made that because the site and the buildings were symmetrical and lay North-South, whichever road was chosen in the meantime could be switched at a later date by mirroring the design. The road to the East of the site was then chosen.
Figure 23 - Raised Buildings in Cambodian Architecture
Lift the building

Another distinctive element of Cambodian architecture, as with much of South East Asian architecture, is that buildings are often raised above the ground on stilts. This is found traditionally in both the ancient Angkorian architecture and vernacular wooden architecture. New Khmer Architecture also utilised this feature, not only because it was one of the elements of the Modern style of the time, but because it referenced those earlier styles. It was also used for practical reasons as Phnom Penh is prone to flooding and, so, elevating buildings above the ground protects the building and contents. It also allows air to flow under the building to cool it. The existing building is built on a 1.5m base, which is presumably for similar flooding reasons, so it would be appropriate to connect the proposed elevated buildings to the existing structure. This also provides an opportunity for using the spaces underneath the buildings for parking, which is required on the site.
Park connection

To strengthen the connection to the park opposite, I considered positioning either a building, sculpture, water feature or some other form related to the proposed architecture, in the park. With the acquisition of the street to the East, the site was now larger, in total area, than was needed. Therefore, part of the South side of the site was taken away and added to the park. This altered the shape of the road and further defined the entrance to the library. It allowed the proposed form positioned in the park to be situated closer to the proposed library buildings and left an unimpeded view from the park towards Wat Phnom.
Layout and Boundaries

Figure 25 - Angkor Wat Temple

One of the first steps taken was to investigate traditional examples of Cambodian architecture and learn what aspects of these are still relevant to Cambodians today and could be applied to the design of the National Library and Archives. The many temples of Ancient Angkor are the most well known of all Cambodian architecture. They are all individual designs but there are features which are common to them all. One of these common features is the way they are laid out in concentric, square ‘rings’ around a central focal point.\textsuperscript{57} The closer to the centre of the temple, the more important and sacred the area and the access more restricted. It is believed that the people who were associated with the temple lived within the boundary walls where there were fewer restrictions on access compared to that of the more central areas of the temple. Each successive layer and boundary of space, leading towards the centre of the temple, had a more restrictive access with only the high priests and/or the King having access to the innermost layer.\textsuperscript{58}

The notion of the boundary is something that appears to be of particular significance in Cambodian culture. As well as the previously mentioned use of distinct boundaries in the Angkorian temples, this tradition has ancient roots in the vernacular architecture also. There was a strong and significant distinction to the Cambodian people between what is ‘within’ and what is ‘without’. In founding a new settlement or “phum”, defining its

\textsuperscript{57} Michael Freeman and Claude Jacques, \textit{Ancient Angkor} (Thailand: Production Printing and Publishing (Public) Co. Ltd, 2003). p. 22
\textsuperscript{58} Dawn Rooney, \textit{Angkor, an Introduction to the Temples} (Chicago: Passport books, 1997). p. 136
boundary was the first, crucial step.\textsuperscript{59} This outlined the territory within which the \textit{phum} could be domesticated and inhabitants protected from the unknown and lawless forest or prey beyond.\textsuperscript{60}

Within these village settlements there were further boundaries to delineate different levels of domestication and order. The domestic house had its \textit{dey phum} which today in Cambodia translates to “home garden”, but can be likened to the Western concept of a yard and within this there were further boundaries.\textsuperscript{61} In the case of the traditional \textit{phteah rông daoł} dwelling, it could be further divided into specific upstairs and downstairs functions. Even within those there were clear divisions of what was public and what was private, such as a wall running North-South dividing the upper space into two main dwelling units, the public \textit{Ivèng chey} (unit of victory) and the private \textit{Ivèng chan} (unit of the moon).\textsuperscript{62} This followed the notion that, as you moved further into the house, the spaces became more private and important.

The monastic complex within the \textit{phum} also can be described as the \textit{mahāsīmā} (the compound boundaries in entirety) within which there are areas defined as the \textit{khandasīmā} or \textit{baddhasmā} where there is the further sacred area of the \textit{vihāra} where monks are ordained.\textsuperscript{63} As the \textit{vihāra} was built, ceremonies were held at significant stages of the construction, but one of the most significant events in the history of the Pagoda was the laying of stones to demarcate the boundaries.\textsuperscript{64} The monastery is called a \textit{wat} which stems from words referring to the location of a building, enclosure or fence.\textsuperscript{65} The physicality of the place is important, as is seen in all of these traditional examples. While in the West we value features such as “indoor-outdoor flow”, in Cambodia there is a strong emphasis placed on distinguishing a place from its surroundings.

The importance of the boundary is not purely an ancient concept; it is still prevalent in Cambodian culture today. The significance of marking the boundary of the site is even evident and emphasised within the \textit{chbap} or Cambodian codes.\textsuperscript{66} In the cities it is common place to build significant boundary walls around the edges of a site.

\textsuperscript{60} Ibid. p. 14
\textsuperscript{61} Ibid. p. 16
\textsuperscript{62} Ibid. p. 14
\textsuperscript{64} Ibid.
\textsuperscript{65} Ibid.
\textsuperscript{66} Ibid. p. 16
This is why, on adjacent sites to the North, East, and South sides of the National Library and Archives site there are such walls. The National Library and Archives site itself, currently follows in this tradition with its own significant boundary walls. In the surrounding areas of Phnom Penh there are extremely large sections of land, which are presumably waiting to be developed, they are completely empty, but have thick, well constructed boundary walls already in existence.

In applying this to the design the first move was to emphasise the existing National Library building as being the centre of the site by arranging the new building forms into a rectangular ring around it. This was only thought of in terms of a formal gesture. Not much emphasis was placed on the functions of the buildings and how these would affect the layout when considered alongside the concept of a space and function being more important the further within the complex a person has gone. This was because, until the site visit was completed, the functional requirements of the building were largely undefined so a formal, rather than functional, approach was taken at this stage of the design development.
Figure 27 - Examples of water management in Cambodian Architecture
Water Management

Another particularly interesting aspect of Cambodian architecture is how water is managed, particularly rain water in the wet season. Water and architecture have always been strongly connected in Cambodian architecture. The temples of Ancient Angkor are well known for their barays (large manmade reservoirs), moats and ponds. Vernacular architecture is raised up on stilts to avoid flood damage during the wet season, often with a pond nearby to where the water drains. In the areas near the Tonle Sap lake, which expands and contracts 4 times its size over a period of a year, floating houses are common in order for a village to move and relocate itself on the edge of the lake.

The rain in Cambodia is often extremely heavy and occurs over a shorter period of time compared to what is experienced here in New Zealand. The volume of water produced during a downpour is often more than the storm water systems of Phnom Penh can handle and this leads to the flooding of streets and buildings. One way to alleviate this problem is to provide storage ponds where the rain water can accumulate during a downpour and drain out at a lesser, more manageable rate or be left to form more permanent ponds or pools. This method operates particularly well at Phnom Penh’s Olympic Stadium, designed by Vann Molyvann. The shallow feature ponds into which water from the roof is drained are one of the key features of the stadium’s design. Also at the Royal University campus, walkways lead the visitor over pools of water which are reminiscent of the barays at Angkor.

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67 Rooney, Angkor, an Introduction to the Temples. p. 86-87
69 Saburo Matsui et al., “Tonle Sap Experience and Lessons Learned Brief,” (Otsu, Japan2006).
70 Turnbull, “View from Phnom Penh.”
Cambodian architecture has always made the most of this close relationship with water and recognises the additional beauty it can bring to architecture. While traditionally it was mostly gathered into large tranquil bodies of water, or ponds, reflecting magnificent temples, the movement of water across a building has become a carefully considered feature. This is due to the functional requirements needed to control the volume of water collected by the building, but instead of hiding drainage it has been turned into a feature. Buildings such as the State Palace, also designed by Vann Molyvann, have features that turn them into giant fountains when it rains.

This connection between architecture and water was something that was investigated within the design. It was first brought into the design with the intention that water collected by the building could be directed across the road to the park where a water feature or pond could be situated.

Figure 28
In a continuation of the idea seen in the temples of Angkor, where there are a series of boundaries forming rectangular rings around a centralised place of importance, it was also noted how all paths lead towards, and line up with, this central point. As an example of this, the plan of Angkor Wat, as seen to the left, is symmetrical along the East-West axis but not along the North-South axis. While the central point of the temple is centred between the North and South extents of the design, it is not between the East and West extents. The pathways leading from the North and South of the site are located according to where they line up with the central point; the symmetry of the design comes secondary to this.

A simplistic version of this was applied to the National Library and Archives design, where connections between the existing and proposed buildings are created so that circulation pathways all lead to the centre of the design, the existing library building.
Open air public space
In the design there was an opportunity to create a public outdoor space in front of the existing library building. In Cambodia the temperature is such that the space would be useable all year round, however, the rainfall would prevent this from being possible. The public space, therefore, needed to be sheltered from the rain to make it useable at all times, but fully enclosing the space defeated the idea of creating an outdoor space. In a tropical climate ventilation and the flow of air are important aspects of cooling. In Phnom Penh, there are examples of large public spaces which, while protected from the rain, allow air to flow within the space and still maintain the feel of being semi outdoor and open spaces. The central market, like a lot of markets, is a large semi enclosed space built with high ceilings. It protects the inhabitants from the rain, but allows air and light into the space. The indoor arena at the Olympic Stadium is another good example. The walls and tiered seating are designed to be as open as possible, allowing light and air into the arena. This gives the enclosing walls a translucent effect creating the feeling of the space and still being semi open to the outdoors.

In the design of the National Library and Archives, the outdoor public space is provided with a roof to shelter from the rain. It was raised above the surrounding buildings so that light and air would still enter the space, helping retain the feeling of an outdoor space. The space would also retain this feeling due to the buildings surrounding the space, being raised off the ground and because of the height of the ceiling over the space.
Figure 33 - Gallery Spaces at Angkor Wat
Gallery Spaces

Continuing with the idea of defining boundaries, a closer look was taken into how these boundaries were defined. In the temples of Ancient Angkor, and especially Angkor Wat, each boundary was created by long gallery spaces. These formed the previously mentioned series of rectangular rings around the central point of the temple. The most notable of these spaces at Angkor Wat is the series of galleries which display long mural carvings, portraying scenes from traditional stories and legends. Other gallery spaces display sculptures, carvings of *apsaras* (female celestial dancers) and other decorative carvings.

The concept of gallery spaces to create boundaries between separate areas of the National Library and Archives was applied to the design. Instead of these spaces being designed as long corridors, as they are in the temples of Ancient Angkor, in the proposed design they are much wider and shorter spaces, more like rooms connecting larger spaces. By doing this, the transition between spaces, is experienced by walking through and along the gallery as opposed to perpendicularly crossing through these gallery spaces as is done in the temple design. This creates transitional spaces rather than thresholds.

These transitional gallery spaces would be where the more artistic and cultural functions of the library and archives could take place. There is the possibility of some, or all, of these spaces being enclosed by brise-soleils, unglazed sun screening walls made up of geometrically interlocked patterns of concrete or brick tiles, as is widely used in Cambodian buildings. This would constitute them as transitional spaces and defining boundaries between areas of the library and archives.

Figure 34
Site Visit.

Once a site visit had been completed the following became apparent:

- The floor area and volume of the design, the size of the proposed addition, was a lot bigger than required and needed to be reduced and scaled back. At the current scale the proposed addition took up the majority of the site. This would have overwhelmed the site and existing buildings. There was also nothing of a similar scale in the area and it would not have been suitable for the context.

- As previously described, the road to the East of the site was proposed to be shut and incorporated into the site. Once at the site it became apparent that the wrong street had been chosen. The road on the East of the site is well used because it is a ‘through-road’ in the area, extending up from the South and continuing to the North of the site. The road on the West of the site however, remains largely unused except for a row of roadside food stalls and parking for large vehicles. This road only exists to the West of the library site; it does not extend beyond this to the North or South and is, therefore, not a commonly travelled route. It was, therefore, decided to merge the street to the West with the site, not the East as previously decided.

- It was also proposed that the road be altered and that a southern portion of the site be ‘donated’ to the park across the road. This, however, would not have been a sensible move. There was the potential for causing accidents and would break the simplistic, but effective, layout of the street and break up the view from the park to Wat Phnom. The proposed design also featured a connection between the library and the park, transferring rainwater across the road to the park. The distance between these would have been too great to join them by any physical element crossing above the road. It would have had to be of an oddly, oversized scale to span the distance and would also block the view towards Wat Phnom. The rainwater collected by the building would have to be managed in a different way.

Figure 35
Design Stage Two

In an attempt to address these issues alterations to the design were needed and the following design series was generated.

Iteration One:

Size reduction in the new library and archives building.

The site is defined with a gallery running around the edges. The enclosure walls of the temples of Ancient Angkor were never intended as fortifications, but to provide psychological barriers between the communities. Similarly these boundary gallery spaces around the library and archives’ buildings are not intended as boundaries to physically prevent people entering the site, but to psychologically define when a person is entering the site. To identify the main point of entrance to the site, part of this gallery roof was raised to create a gopura or gateway. Gopuras were the main architectural features of the walls surrounding the temples of Ancient Angkor and were placed on the principal axes.

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71 Rooney, Angkor, an Introduction to the Temples. p. 99
72 Ibid. p. 97

The front portion of the site was left for public access as a continuation of the park across the road.
Iteration Two:

Veranda gallery spaces were added between the existing and new buildings to create a boundary, emphasising a change of function between the two buildings.

Figure 37
Iteration Three:

A second level was added to part of the addition and a series of ramps created between the existing library building and this second level.

Figure 38

Iteration Four:

A connection between the second level of the new building and the existing library building was created to allow access to the existing library’s roof.

The entrance to the second floor of the new building is via the roof of the first floor on the Western section of the new building.

Figure 39
Iteration Five:

A causeway was introduced leading from the street to the entrance of the existing library building. This feature, originating in the temples of Ancient Angkor, is commonly seen in Cambodian architecture, and was also used more recently at the Royal University of Cambodia. It is often used in conjunction with a water feature.\(^7\)

\(^7\) Ibid. p. 99

![Figure 40](image1.png)

Figure 41 - Causeway at Angkor Wat

![Figure 42](image2.png)

Figure 42 - Causeway at the Royal University of Cambodia
Iteration Six:

At the temple of Angkor Wat (but also at other temples) there are small, stand alone buildings either side of the main causeway. These are seen at three points either side of the main axis leading towards the centre of the temple. These small buildings are referred to as ‘libraries’ although it is likely they were used as shrines rather than repositories for manuscripts. They have been referred to as ‘Jewel-Boxes of Khmer Art.’ It seemed appropriate that the theatre and exhibition spaces or art workshops, requested in the brief, be housed in similar buildings either side of the causeway leading to the entrance of the existing library.

Figure 43

74 Freeman and Jacques, *Ancient Angkor*. p. 50
75 Rooney, *Angkor, an Introduction to the Temples*. p. 133
Iteration Seven:

An outdoor public space was taking form in front of the existing library entrance so, as in the pre site visit concept models, a roof was placed over the space to make it useable year round and a more comfortable place to be. This roof was also extended over the top of the existing library building creating another usable space on the roof.

The second level of the new building was further developed into what would be a book spiral, similar to that of the Seattle Library. This enabled navigation of the building and transportation of book trolleys without the use of lifts.

Iteration Eight:

To strengthen the relationship with the existing buildings, elements of the current library were applied to the new structures. The double columns that feature in the existing library building were applied in the form of double vertical windows. It was also intended to break up the new facade into smaller sections to reflect how the existing building profile is divided by the columns and side wings.
Figure 46

Figure 47 - The National Library’s double columns
Design Stage Three

Existing Archives Building

The existing French Colonial Archives’ building was becoming lost in these proposed designs. The building has a delightful interior quality and needed to be a more dominant feature in the design proposal, not a forgotten element hidden at the rear of the design. The building has an interior brightly lit with diffused light and is set out in a way that lends itself well to becoming an art gallery.

Layers and Boundaries continued

Up until this point the design had mostly been a formal exploration. The next step was to look at the design with a more functional approach. The existing library is the physical centre of the site. But, as it would not be able to house the most important functions of the library and archives, it would not be the functional centre of the design. As previously mentioned, the significance of the centre of an Angkorian temple, was not simply because of its physical location. It was important because of its function and its sacredness.
Similar concepts of layers and boundaries are applicable in the design of the National Library and Archives in terms of the buildings’ functions. As the design incorporates a wide range of functions, there is a variety of accessibility requirements ranging from completely public areas through to completely private. There is, therefore, a need to arrange these functions in a way that develops a logical series of boundaries.

In Western architecture the majority of public buildings are now designed to be inviting, welcoming. To project the appearance of ‘openness’ there are few boundaries impeding public entrance to the site. The National Library and Archives of Cambodia also needs to achieve this sense of being a welcoming building for all, while still meeting the requirement for some form of boundary. This boundary could be either physical like a solid boundary wall or psychological as seen in the use of boundary stones at Wats.  

There needs to be some acknowledgement of where the site boundary is, a distinction between what is inside and what is outside, between the *phum* and the *prey*.

The layout of the National Library and Archive facilities can be arranged in a logical way based on access and availability. The most public and available facilities should be positioned as the first boundary to define the site. From this, a series of boundaries should be set up, leading in towards the most important and restricted facilities and functions of the library and archives situated at the heart of the design.

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The temples of Ancient Angkor arrange these series of boundaries in concentric rectangular rings, so that they are maintained from whichever direction you approach the temple. This, however, need not be the case for the National Library and Archives. Angkorian temples set up their accesses and approaches on a strong series of axes which run along the main cardinal directions. However, temples are buildings of religious significance and the importance of these axes does not apply in the case of the National Library and Archives. Therefore, the boundaries separating different functions in the National Library and Archives are not governed by strict rules of geometry or symmetry, but instead by the directions of circulation within the design. No matter where the site is entered from, or what path is taken, a series of boundaries will need to be crossed before arriving at the most important areas and functions of the design.

In view of this approach to boundaries, and with the intention of featuring the existing archives building more predominantly, the following design was produced.
The new addition was separated into two parts: one for the National Library of Cambodia on the West side of the site and one for the National Archives of Cambodia on the East of the site. This allowed the two additions to be within the same complex, but to function separately as described in the brief.

The buildings now defined the North and East boundaries of the site while the West side of the site is defined by the boundary wall of the neighbouring site. The South boundary and South-East corner of the site continue with the concept of creating a gallery space to define a psychological boundary.

The existing French Colonial Archives’ Building is no longer hidden in the design. It is intended to be used as an art gallery and will also provide an alternative, rear entrance to the complex.

The ‘library’ building to the West side of the causeway was removed. To balance the theatre building to the East of the causeway it was replaced with a pond to assist in the management of water on the site.

The layout is designed so that, no matter which entrance is used, visitors have to pass through a series of boundaries in a set order. They would move through the building from completely public spaces towards the most important and most controlled elements of the design (the new library and archives’ buildings). The diagram below illustrates the pathways a visitor may take to reach the new library and archives’ buildings and the boundaries or areas of successively increasing importance or restriction they would cross to arrive there.

![Diagram](image_url)
Figure 53

With this arrangement of buildings there is a large empty space created between the existing buildings and the new additions. This space is situated in what would be the newly created heart of the site, the most central space and the focal point of the design.

As previously argued, the central point should be where the most important functions of the design be located. Therefore, the most central and important idea of the library and archives needed to be identified. The most important function is not the repository of books or other information, but it is the actual use of these items. The knowledge and learning that the library and archive facilitates and transfers to the people is the fundamental reason it exists. Therefore, this central space in the design should be dedicated to spaces where the library and archives’ materials can be studied and activities related to learning and the transfer of knowledge can take place.

Cambodia has an oral tradition and a high level of illiteracy. Both as a library for the future and as a library for Cambodia, spaces where workshops and classes can be held are an essential part of the design. These spaces should, therefore, also be located within the central space.
This new centre of the site would need to be useable year round. Designing the space as a completely enclosed space was an option, but it is a very large volume to enclose and interior climate control of this volume would be difficult and energy intensive. It made more sense to create this space as a covered outdoor area, as described in previous designs.

Another public space of particular note is Wat Phnom. Wat Phnom is built on a hill with lush, shade providing, trees planted around the base. Many Cambodians gather under these trees to enjoy respite from the heat. The cooling effect of trees is something that can also be utilised in this central area. The roof structure would not need to cover the entire space, allowing uncovered areas to be planted with trees, cooling the surrounding area.
The centre of the site can be viewed as a place of growth, a place where the seeds of knowledge are planted. It is a place where the continued development and re-emergence of knowledge and culture in Cambodia can be encouraged and nurtured. Having gone through such a traumatic period in history, and now with such a young population, the country is starting to blossom. It brings to mind images of budding flowers with all their potential of beauty and future fruitfulness. As inspiration for the roof form over the space, the *rumdul* flower, the national flower of Cambodia, was looked at.

Figure 55 – Cambodians escaping the heat under the shade of the trees at Wat Phnom

![Cambodians escaping the heat under the shade of the trees at Wat Phnom](image)

This led to the following design series:

![Rumdul flower](http://chanthol.files.wordpress.com/2007/06/20061410915854.jpg)

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Figure 58
Another dominant feature in Cambodian architecture is the use of outdoor circulation along covered walkways. The climate ensures there is minimal discomfort in outdoor circulation provided protection from the frequent heavy rain is available. This can be integrated into the building design in two ways: by having exterior corridors running along a series of rooms, or by breaking a building up into its separate rooms, or groupings of rooms, and constructing these as essentially separate buildings connected by covered walkways and courtyard spaces. The advantages of the latter method are the ease of delivering sufficient light into interior spaces and the ready availability of ventilation. This style of construction is less expensive as fewer materials are needed and, in addition, it provides stronger integration with the outdoors.

The new buildings, shown in the diagrams in the figure here, would, if left in this form, be very large scale structures which would dominate and overshadow the existing buildings. The floor area would be much larger than required, especially considering the possibility of multiple interior floors. The building can be broken down into smaller buildings, which are then connected by walkways. While some of these walkways would be open air, others would need to be partially enclosed because of the conditions in which books need to be kept. This also provides an opportunity for the programme of the National Library and the Archives to be broken down and easily separated. This goes some way towards responding to the needs arising from providing both public and national library services within the same facility.
Figure 60 - Zigzag and double roofs in Cambodian architecture
Roofs

In Cambodia, reducing solar heat gain within buildings is essential. One common method is the use of double roofs where the top roof provides shading for the lower roof and allows cooling air to flow between them. This element is found in Cambodian vernacular architecture where the main body of the building has a tiered roof.\textsuperscript{78} Roofs have always been very expressive elements of Cambodian architecture. The pointed roofs found in both vernacular architecture and the temples of Ancient Angkor, combined with the Modern style, have been said to have inspired the VVV shaped roofs so prevalent in New Khmer Architecture.\textsuperscript{79} These roofs were a recurrent motif and became the signature of New Khmer Architecture.\textsuperscript{80} They have since been associated with Cambodian architecture in general and are often used as a double or secondary roof which is detached and floating over the top of a building.\textsuperscript{81}

With the new buildings in the design now being broken down into smaller buildings, a continuous secondary roof was placed over them. This not only acted as a double roof to shade the buildings underneath, but visually grouped the buildings together into a more coherent structure. A variation of the VVV roof shape was used.

\textsuperscript{78}Ibid. p. 20  
\textsuperscript{80}Ibid. p. 109  
\textsuperscript{81}Ibid. p. 85
While it was never the intention to replicate the architecture of the existing building within the new addition, it was important that there was some coherent dialogue between old and new. One of the striking features of the existing library building is its use of double columns and the division of the building facade into a seven metre grid. This double column feature was applied to the facades of the new buildings at seven metre intervals. A seven metre grid was also applied over the buildings, defining where the stilts would be placed and where the bends in the secondary roof would be located.

Both of the existing buildings feature decorative panels which are representative of the decorative carvings found at the temples of Ancient Angkor. These were applied as solid panels to the East and West facades of the new buildings to minimise the solar heat gain from the sun on these walls. Large windows were then placed on the North and South facades of the buildings. These are shaded by the double roof and provide indirect light into the buildings. Direct light is undesirable as it increases solar heat gain and causes deterioration of books and other materials.
The secondary roof is situated too high above the connecting walkways and therefore they will need to be provided with their own roof coverings. They will also need to be enclosed with brise-soleils, unglazed sun screening walls. This provides defence against wind driven rain and direct sunlight but allows air to flow, retaining the concept of exterior connections between the buildings.
Building functions/layout - Library

The existing library building will now be used as an entrance to the library and archives’ buildings. It will house the information desk, café /restaurant, bookshop, bathroom facilities and office space for the archives staff. The main existing archives building will be used as an art gallery space and as a secondary entrance to the complex from the North. This separate access allows the gallery to run its own opening hours including afterhours functions. The theatre building is located within the public space at the main entrance to the site. This also allows for access for afterhours practices, classes and performances.

Both the library and archives are broken up into different collections which need to be housed separately. Dividing the new library and archives’ buildings into a series of smaller buildings allows each collection to be housed within its own building. This prevents the accidental mixing of materials. The concept of boundaries continues to be applied when deciding which collections and functions should be placed within which building. The further into the library or archives buildings a person goes, the more restricted the access or more valuable the collection becomes.

With the National Library layout, the first space is located within the West wing of the existing library building. This is the entrance to
the library and is where books are issued, returned and sorted; it is referred to as the ‘circulation’ area. From here the visitor is connected to the public library collection where there are books which can be freely browsed and borrowed. The building to the South of the public collection is a “staff only” building, containing offices and workrooms. There will be a separate staff entrance to this building opening directly from the parking lot located underneath the library buildings. Continuing North of the public collection is the building housing the legal deposit collection. The legal deposit collection contains a copy of every publication produced in Cambodia and these cannot be borrowed. The most restricted collections are located further to the North. These are rare, valuable and historic books, as well as the Cambodiana collection. They cannot be freely browsed and require staff supervision. To the East of this, the existing additional archives’ building will be used as storage and only be accessible to staff. A study area is accessible from both the public library area and legal deposit collections.

The National Archives is run differently from the library; all of its collections require supervised browsing. The entrance to the archives building is from the east wing of the existing library building. The first building entered is the hub of the archives; everything else extends out from this building. There is a connection to the study area from here as well as North and South connections to buildings holding the majority of the collections. The building further North of these houses the visual collection which appeared to be of particular importance and required more specific methods of storage.
Getting light into the building

The new library and archives buildings have large North and South facing windows which are shaded by the secondary roof. However, because of the solid East and West facades and the depth of the building, additional light would be needed to reduce the reliance on artificial lighting. This lighting can be brought in via skylights, but direct sunlight is undesirable so this light needed to be diffused in some way.

One art form which Cambodians take pride in, and are particularly skilled at, is shadow puppetry. This art form is dedicated to the retelling of traditional stories, another way of passing on knowledge and culture. This art form is relevant for a facility aiming to promote these learning methodologies.

Shadow puppetry uses a large canvas sheet with a single light source directed through it from the rear. Intricately designed puppets, made from leather with cut-outs to allow light transmission, are placed between the light source and the screen causing shadows to be created on the canvas screen. A similar technique could be used to diffuse the sunlight from skylights. A continuous skylight, running down the middle of the secondary roof, could be created from glass imprinted with a light-blocking pattern. Sunlight, shining through this skylight, would cast a patterned shadow onto a semi-translucent section of the underneath building’s roof. The patterned shadow which diffuses the sunlight would be seen on the ceiling from within the buildings.

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Water Management

As previously mentioned, Cambodian architecture has always had a close relationship with water. With this design there was an opportunity to manage rainwater collected by the building in an interesting way, turning the building into a water feature when it rained.

With the new library building the majority of the water would be gathered on the secondary roof and run into the valleys of its zigzagged design. From there it would visibly fall onto the roofs of the buildings underneath, before dropping into large gutters and finally be directed into one of the two ponds located on the site.

For the archives building most of the rain is also collected on the secondary roof and drains to the valleys. From there it runs towards the East boundary of the site and is allowed to drop straight from the secondary roof into another pond located underneath the archives building. This pond is essentially a moat running along the East and North sides of the site. There is to be no entrance to the site from the East and only through the existing main archives’ building from the North. While there are walls blocking this access, they are located further into the site so they do not lessen the effect of the buildings being raised on stilts. The moat provides a buffer between the footpath and this wall and prevents people from inhabiting the space directly underneath the archives buildings.
Central Space Development

Returning to the central area of the design, the study spaces were enclosed with glass. This allows material from the library and archives to be taken to these areas and prevents the transfer of these books from the study areas into the central space. These areas also need to be enclosed to provide more suitable interior climatic conditions for the library and archives’ materials. It also provides visitors with the choice of indoor study spaces if they do not wish to use the covered outdoor space.

The dome’s form was altered so that it related more to the study spaces. Similar aesthetics to the secondary roofs of the library and archives buildings were introduced to create a more cohesive design.
Design Stage Three Critique

At this point, it became apparent that several things in the design needed to be addressed:

The theatre building was located in the wrong place. Cambodian theatre, such as shadow puppets and traditional dance, is not just about providing entertainment. It is designed to tell stories relating to Cambodian culture. These were typically traditional folk stories, but increasingly the theatre is adopting modern themes and providing commentary on current social issues. It is an effective way of communicating and passing on ideas and lessons to the community. This is the sort of transfer of knowledge for which the central space of the design was provided. Therefore, the theatre should have been located in part of this central space, right at the heart of the library and archives, not as an additional building within the outer boundaries of the design.

The form of the dome did not suit the space or the surrounding buildings. The circular form was awkwardly placed within a rectangular space and did not relate to its surrounds, creating uncomfortable intersections between the dome and existing buildings. While the idea of the rumdul flower suited the concept of the space it was not an appropriate form. As previously discussed, feature roofs are a large part of Cambodian architecture but there are other dynamic forms that would have been better suited to the design.

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Ibid. p.13

The existing buildings did not have a dialogue with each other. The main archives building faces into the back of the library building which has its back turned towards the most important space of the design. The existing library building needed to be somehow altered, or opened up, to this space behind it.

The ramp connecting the existing and new library buildings was not working. The level change between the buildings required a long ramp which appeared to be clumsily squashed between the two buildings.
Design Stage Four

Development One

The central space was redesigned to include the theatre building to the West side of the central space and a large multi touch screen was introduced on the East. This screen is at the leading edge of current technology and use points towards the library of the future. The screen, provided instead of a group of public computers, allows visitors to search for digitized content provided by the library and archives. This screen is multi touch, so multiple people can use it at the same time just by walking up to any part of the screen and touching it. As well as allowing access to library material, it provides all other standard computer functions and is large enough for screening of documentaries and films. This screen is in addition to the WiFi zone that would be available for personal computers.

Figure 70 - Theatre Building

Figure 71 - Touch Screen Interface Wall

Instead of providing permanent audience seating for the theatre or screen the space is populated with tables and chairs which are easily
arranged into whatever layout is required. These are also used by patrons of the restaurant/café.

Figure 72 - Roof Details

A new roof form, that has a better relationship with the shape of the central space and surrounding buildings, was created. This was based on the seven metre grid used across the site and a variation of the zigzag styled roof. It is made up of a combination of opaque and glass panels, protected from direct sunlight by louvers. The central point of the space is defined by a pool of water. The roof slopes towards the pond allowing water to drain to this point and fall into the pond below, creating a water feature.

The back wall of the existing library is removed and replaced with a glass façade, opening the back of the library towards the central space and allowing a view of the existing archives building.

Figure 73 - Rear library glass façade, view from library
Development Two

The empty section of the roof, positioned over the pond, allowed too much direct sunlight into the central space. The gap was also filled in with louvers like those already used on the roof, but without the glass which would prevent rain falling through between the louvers.

Figure 74 - Central louvers

Study spaces for the library and archives were introduced above the theatre building and the screen. As in previous designs, they are fully enclosed by glass, but the library study spaces are separated into three separate study spaces to prevent the accidental mixing of materials from the different collections. The archives study space is divided by a level change; this allows a section of the screen below it to be large enough to screen documentaries or movies and to allow part of the space to be separated off for classes or meetings.

Figure 75 - Looking up at the study spaces

The location of the entrance to the new library building was altered to be further away from the existing library building. This provides enough space to accommodate the ramp changing levels between the two buildings. It also provides visitors with the option of visiting either the public library collection or the legal depository without having to go through one to get to the other, a feature of the previous designs. These connections extend from the new buildings...
and push through into the existing library building to emphasise this point of entry.

Figure 76 - Inside the library

Because the theatre building had been moved into the central space it was replaced by a pond to mirror the pond on the other side of the causeway. Public pavilions were placed over these to make the public gardens in front of the existing library a more useable and enjoyable space for relaxing, reading or eating lunch.

To strengthen the cohesiveness between the roof of the central space and the secondary roofs over the library and archives buildings, these secondary roofs were altered to a similarly triangulated aesthetic.

Figure 77
The new library and archives buildings had become quite complicated and aesthetically busy. They were competing against each other for visual dominance, rather than having a dialogue and complimenting each other. The roofs of the new buildings are now flattened in order to relate to the existing architecture and the secondary roofs are simplified and reduced in scale while still maintaining the seven metre grid.

The continuous, shadow-patterned, skylight is now split into smaller versions, positioned on the flattened valleys of the zigzagged roof.

The secondary roof of the archives is connected with the roof of the gallery, creating a boundary on the Southeast corner of the site. This creates one continuous element and further simplifies the design.

Figure 78

Figure 79
Up until this point the East and West facades of the new library and archives buildings were solid panels, textured with a Cambodian pattern. There was no practical reason for this pattern and construction would be difficult, so the pattern is featured on glass elements instead where it can be used to reduce solar gain. The wall panels are now textured plaster instead.

The library study spaces are separated from the theatre building and hover slightly above it. This identifies them as separate elements connected to the library buildings, rather than being part of the theatre building. The exterior connections between the library buildings and the study spaces are now fully enclosed and appear as though they have been pushed out from the facades of the library buildings. This strengthens the idea that these study spaces are a continuation of that particular collection. Also, these connections occur high above the ground and those people who are scared of heights may have had problems accessing these study spaces had they been more open.

The archives’ study space is split into two separate areas to create a similar dialogue with the library study spaces. This enables the two different spaces to be used for different functions without the disruption that may have occurred had they been contained within the same space.
Conclusion

This architectural design proposal for an addition to the current National Library of Cambodia actively encourages and facilitates the growth and re-emergence of knowledge and culture in Cambodia both now and into the future.

The new library and archive buildings are appropriate and fitting for Cambodia. This design proposal successfully preserves the past and provides space for the future. It effectively accommodates both national and public library functions and addressing functional elements of climate appropriate design.

This is not just another western library in Cambodia but a library for all Cambodians. This library is designed around Cambodia's oral society and enables Cambodians, including many who are non literate, the opportunity to access knowledge and make use of their library.

People are the heart of this design, not books. This important aspect of the design pushes the already emerging idea that libraries are no longer quiet, formal, traditional reservoirs of books. Rather, they focus on people - a place where people come together for lifelong learning, a place that builds and sustains communities.

Further possibilities within this design proposal would have been possible had there been more time. This includes greater investigation into the building materials used Cambodia and how they might have applied to this design. More attention to the front part of the design would have strengthened the connection of the buildings to the park and other possible functions for the gallery space could have been explored. And lastly, the concepts of how to connect the existing library building to the new buildings could have been pushed further.

This brings the questions of where to from here? While the National Library of Cambodia would not have the funding for such a design It is apparent that they are seriously considering an addition to the current National Library and key staff at the library are certainly interested in seeing the completed design. Therefore, sending this design proposal to interested parties in Cambodia would be worthwhile as key concepts of this design proposal could be applied on a smaller scale, especially the aspect of the library being a space for different types of knowledge and learning, but more importantly a space for all people - their art, cultural and community.
Bibliography


Appendix
- Wind speed: 4.5 m/s on average.
- During rainy season, wind blows strongly from South West, 37%.
- Wind direction data from 2007: Northeast, 40%; South West, 37%; North, 15%; East, 13%; South, 11%; West, 10%
- Dry season, wind blows from North, 40%.
Rain water increases from 1916 mm to 2310 mm to 936 mm during a year.
Line Graph showing the changes of temperature within one day (24 hours)

- Very hot in April: 35°C
- Average: 33°C
- Average temp at night is 28°C.
- Cool in Dec.

Source: Weather forecast station at Puchong
Date: 01.06.1995