BATU GAJAH

COURTHOUSE

Modern Architecture Studies in Southeast Asia Research Unit

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SABD

Declaration

The Courthouse Museum

The Courthouse Museum, Jalan Changkat, Batu Gajah, Perak.

This report is submitted for the subject ARC 1215 / ARC 60305 Methods of Documentation and Measured Drawings to School of Architecture, Building, Design of Taylor's University to obtain 5 credits for Practicum 1.

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January 2015

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Acknowledgement

We would like to express our greatest gratitude to the curator and the accommodating staff from the Courthouse Museum, Batu Gajah for their assistance during the days of our site visit as well as Mr. Mohd Adib bin Ramli as our group mentor, for his patience, guidance and useful critiques on our research and measurement works. Our grateful appreciation also goes out to the lecturers who have evaluated us during the interim and presentation sessions. Their comments have been helpful in further improving our quality of work. We truly thank the staff of the National Archives (Arkib Negara) and the Tun Razak Library,Ipoh for their kind assistance while we were conducting our research. Furthermore, we would like to extend our thanks to the Taylor's University staff whom have been accommodating in providing us a venue to work on our project and also transportation to and from our site. Lastly, we would like to express our utmost gratitude to our fellow team members who have sacrificed a lot of time and invested a whole lot of effort into making this measurement exercise a successful and memorable project.

Sketch by Chia Yi Ling

Introduction to Research

This research documents the importance of The Courthouse Museum on various aspects such as the architecture, history and culture of the building. This report is also a supporting document to the set of measured drawings of The Courthouse Museum. In this report, we also highlight the relationship in between the architecture of the courthouse and the history of the building, and how these two aspects affect the inhabitation of the building.

Figure 1.0

List of Figures, Diagrams and Tables

Figures

Figure 1.0 The Courthouse Museum

Figure 1.1 Raffia String

Figure 1.2 Bosch laser measuring device

Figure 1.3 Measuring tape

Figure 1.4 Team members measuring the reliefs on the wall

Figure 1.5 Team members measuring the roof

Figure 2.1 Tin mining being carried out in Batu Gajah

Figure 2.2 Shop lots located in Batu Gajah

Figure 2.3 An old photo of Batu Gajah Town

Figure 2.4 The previous look of the Courthouse Museum

Figure 3.1 The Courthouse Museum exterior

Figure 3.2 Names of Perak Sultan, Frank Swettenham and Caulfield were displayed on the front elevation of the building.

Figure 3.3 Front of the Courthouse Museum before renovation

Figure 3.4 Plaque placed in front of the building.

Figure 3.5 List of District Officers of Batu Gajah

Figure 3.6 District Officer's House

Figure 3.7 Batu Gajah Police Station

Figure 4.1 The Courthouse Museum showing influence of the British colonial architecture

Figure 4.2 The Courthouse Museum before renovation

Figure 4.3 Pediment that is in the shape of a triangle

Figure 4.4 Pediment is also seen above the plaque on the front elevation of the building

Figure 4.5 Dentils seen in the bed mould of the cornice

Figure 4.6 Pediments decorated by dentils

Figure 4.7 Rectangular shaped columns seen along the corridor

Figure 4.8 Circular shaped columns seen on the front façade of the building

Figure 4.9 Pilasters decorate the front façade of the building

Figure 4.10 Pilasters acting as a decorative element to the walls

Figure 4.11 Windows arranged at a constant distance

Figure 4.12 The side elevation of the building

Figure 4.13 Courthouse Museum with pediments and columns highlighted

Figure 4.14 Vilnius Cathedral with pediments and columns highlighted

Figure 4.15 Courthouse Museum with its pediments highlighted

Figure 4.16 Madison County with its pediments highlighted

Figure 4.17 Courthouse Museum with its pediments, dentils and columns highlighted

Figure 4.18 Maison Carree with its pediments and columns highlighted

Figure 4.19 The Sultan Abdul Samad Building

Figure 4.20 The Municipal Council Building

Figure 5.1 Idris Ibni Iskander Shah (Sultan of Perak)

Figure 5.2 Frank A. Swettenham (British Resident of Perak)

Figure 5.3 Map showing location of Batu Gajah in Perak

Figure 5.4 Thousands of Chinese labourers from China flooded in the area as miners in Kinta Valley

Figure 5.5 Railway map from Perak to Selangor

Figure 5.6 The Courtroom

Figure 5.7 Meeting Room

Figure 5/8 Courthouse Museum viewed from the side

Figure 5.9 Courthouse Museum rear elevation

Figure 5.10 Symmetrical façade

Figure 5.11 Repetition of windows

Figure 5.12 Repetition of spindles

Figure 5.13 Pitch roof of courthouse museum

Figure 6.1 Windows located on top of the door

Figure 6.2 Door has prominent panels and is painted in a dark color

Figure 6.3 Fixed window with stained glass located at the second floor

Figure 6.4 Double casement windows and round fixed window

Figure 6.5 Weathered brick

Figure 6.6 Plaster attacked by fungi

Figure 6.7 Rusted Marseille Terracotta Roof Tile

Figure 6.8 Corroded granite tile

Figure 6.9 Stained Gypsum Partition Board

Figure 6.10 Decayed timber window

Figure 6.11 Stained glass with accumulated dirt

Figure 7.1 The partition board in the office

Figure 7.2 Partition boards used to divide the space

Figure 7.3 Granite steps leading to the courtroom

Figure 7.4 Granite steps at the entrance of the façade

Figure 7.5 Timber flooring on the first floor (Courtroom)

Figure 7.6 Timber flooring on the second floor (Attic)

Figure 7.7 Top view of the roof

Figure 7.8 Pattern of the roof tiles as seen from side view

Figure 7.9 Rose window on the second floor

Figure 7.10 Decorated tall window on the first floor

Figure 7.11 Front façade of the Court House finished with plaster

Figure 7.12 Elevation of the Court House finished with plaster

Figure 7.13 Plaster bas relief formed by lime plaster

Figure 7.14 Table in the courthouse made of wood

Figure 7.15 The woven elements seen in the seats of the chairs.

Diagrams

Diagram 4.1 Building structure shows symmetrical design

Diagram 4.2 Diagram showing the ornamentation of the building from front elevation.

Diagram 4.3 Diagram showing the ornamentation of the building from side elevation

Diagram 5.1 Ground Floor Plan with meeting room highlighted

Diagram 5.2 First Floor Plan with the courtroom highlighted

Diagram 5.3 Ground floor plan showing linear organization

Diagram 5.4 Left elevation showing repetition of columns

Diagram 5.5 Ground floor plan showing types of spaces

Diagram 5.6 First floor plan showing types of spaces

Diagram 5.7 Diagram shows access and circulation of ground floor plan

Diagram 5.8 Diagram shows access and circulation of first floor plan

Diagram 5.9 Diagram shows advantages of pitch roof

Diagram 6.1 Ground floor plan with doors labelled

Diagram 6.2 First floor plan with doors labelled

Diagram 6.3 Second floor plan with doors labelled

Diagram 6.4 Axonometric of Door 1

Diagram 6.5 Elevation and plan view of Door 1

Diagram 6.6 Axonometric of Door 2

Diagram 6.7 Elevation and plan view of Door 2

Diagram 6.8 Axonometric of Door 3

Diagram 6.9 Elevation and plan view of Door 3

Diagram 6.10 Axonometric of Door 4

Diagram 6.11 Elevation and plan view of Door 4

Diagram 6.12 Axonometric of Door 5

Diagram 6.13 Elevation and plan view of Door 5

Diagram 6.14 Axonometric of Door 6

Diagram 6.15 Elevation and plan view of Door 6

Diagram 6.16 Axonometric of Door 7

Diagram 6.17 Elevation and plan view of Door 7

Diagram 6.18 Axonometric of Door 8

Diagram 6.19 Elevation and plan view of Door 8

Diagram 6.20 Axonometric of Door 9

Diagram 6.21 Elevation and plan view of Door 9

Diagram 6.22 Axonometric of Door 10

Diagram 6.23 Elevation and plan view of Door 10

Diagram 6.24 Axonometric of Door 11

Diagram 6.25 Elevation and plan view of Door 11

Diagram 6.26 Front elevation of metal gril

Diagram 6.27 Front and side elevation, plan view of glass door

Diagram 6.28 Ground floor plan with windows labelled

Diagram 6.29 First floor plan with windows labelled

Diagram 6.30 Second floor plan with windows labelled

Diagram 6.31 Axonometric of Window 1

Diagram 6.32 Elevation and plan view of Window 1

Diagram 6.33 Axonometric of Window 2

Diagram 6.34 Elevation and plan view of Window 2

Diagram 6.35 Axonometric of Window 3

Diagram 6.36 Elevation and plan view of Window 3

Diagram 6.37 Axonometric of Window 4

Diagram 6.38 Elevation and plan view of Window 4

Diagram 6.39 Axonometric of Window 5

Diagram 6.40 Elevation and plan view of Window 5

Diagram 6.41 Axonometric of Window 6

Diagram 6.42 Elevation and plan view of Window 6

Diagram 6.43 Axonometric of Window 7

Diagram 6.44 Elevation of Window 7

Diagram 6.45 Section showing timber floor joists

Diagram 6.46 Ground floor plan showing granite straight stairs

Diagram 6.47 Ground floor plan showing granite half-landing stairs

Diagram 6.48 First floor plan showing timber half-landing stairs

Diagram 6.49 Plan View of Staircase 1

Diagram 6.50 Elevation of Staitcase 1

Diagram 6.51 Section of Staircase 1

Diagram 6.52 Axonometric of Staircase 1

Diagram 6.53 Plan view of Staircase 2

Diagram 6.54 Elevation and section of Staircase 2

Diagram 6.55 Axonometric of Staircase 2

Diagram 6.56 Plan view of Staircase 3

Diagram 6.57 Elevation of Staircase 3

Diagram 6.58 Section of Staircase 3

Diagram 6.59 Axonometric of Staircase3

Diagram 6.60 Plan view of Staircase 4

Diagram 6.61 Elevation and section of Staircase 4

Diagram 6.62 Axonometric of Staircase 4

Diagram 7.1 Ground Floor Plan with brick masonry walls highlighted

Diagram 7.2 First Floor Plan with brick masonry walls highlighted

Diagram 7.3 Ground Floor Plan with gypsum partition boards highlighted

Diagram 7.4 First Floor Plan with gypsum and timber partition boards highlighted

Diagram 7.5 Ground floor plan showing granite tiles

Diagram 7.6 First floor plan showing timber flooring and Marseille Terracotta roof tiles

Diagram 7.7 Second floor plan showing timber flooring and Marseille Terracotta roof tiles

Tables

Table 7.1 Table showing the materials used in the building's construction

Table 7.2 Table showing the advantages and disadvantages of lime plaster

Table of Content

Declaration

Acknowledgement

Introduction to Research

List of Figures, Diagrams and Tables

Chapter 1: Introduction
- 1.1 Objectives
- 1.2 Measuring Tool
- 1.3 Methodology
- 1.4 Limitations

Chapter 2: History of Batu Gajah
- 2.1 Introduction to Batu Gajah
- 2.2 Origin of the Name
- 2.3 Timeline of Batu Gajah

Chapter 3: History of The Courthouse Museum
- 3.1 Introduction to Courthouse in Batu Gajah
- 3.2 Historical Background of the Courthouse Musuem
- 3.2 Ownership of the Building
- 3.3 Timeline of Courthouse
- 3.4 Site Context of the Building

Chapter 4: Architectural Style
- 4.1 Introduction to Architectural Style
- 4.2 Design Concept
- 4.3 Features and Characteristics
- 4.4 Comparison and Influence
- 4.5 Application

Chapter 5: Architectural Analysis
- 5.1 Site Selection
- 5.2 Spatial Organization
- 5.3 Architectural Spatial Organizational Schemes
- 5.4 Form and Hierarchy
- 5.5 Public, Semi-Private and Private Spaces
- 5.6Access and Circulation
- 5.7 Climate-conscious Design

Chapter 6: Construction Method and Details
- 6.1 Door
- 6.2 Window
- 6.3 Flooring System
- 6.4 Staircase
- 6.5 Building Conservation

Chapter 7: Building Materials
- 7.1 Climatic Conditions
- 7.2 Structural Materials
- 7.3 Finishing Materials

7.4 Furnishing Materials
7.5 Furniture

Chapter 8: Conclusion
8.1 Reflections
8.2 Limitations of Current Usage
8.3 Summary

Chapter 9: References

Chapter 10: Glossary

Chapter 11: Appendix

Chapter 12: Scaled Drawings

C H A P T E R 1

Introduction

1.1 Objectives
1.2 Measuring Tool
1.3 Methodology
1.4 Limitations

1.1 Objective

The objective of this project is to obtain accurate and detailed record of the Courthouse Museum located in Batu Gajah, Perak. The report will contain an in-depth study and analysis of the significance of the building and also the historical information behind this building which complements the measured drawings. The main focus of this report is towards two core aspects: the architectural influences and also the historical background, highlighting information on how the two support the inhabitation of the building and its relation to architecture.

Sketch by Chia Yi Ling

1.2 Measuring Tool

There are several equipments that we have used to obtain measurements that are required to produce the detailed architectural drawings. Raffia strings are used to measure curved surfaces. Marks are made on the string to mark a start and an end point for the curved surface. A measuring tape or ruler is then used to measure the distance in between the two points. The digital measuring device is utilized to measure heights as well as spaces of vast distances. The use of these laser devices help in maximizing accuracy as well as reducing measuring time. Ladders were also used to measure building structures at unreachable heights.

Figure 1.1 (Ruslan and complet)

Figure 1.2 (Bosch Power Tools for Professionals)

Figure 1.3 (Length)

1.3 Methodology

In terms of documentation, acquiring information regarding the Courthouse Museum proved to be difficult since the building has undergone various occupancies. Even so, the National Archives are good sources for historical findings. By incorporating the relevance of the neighboring buildings around the museum, we are able to extrapolate the important events that occurred within the vicinity and thus, understand the significance of the building. During the period in between 18th to 23rd January 2015, a group of 25 students are involved in a field work consisting on-site measuring and documentation of the The Courthouse Museum, Batu Gajah, Ipoh. We are required to understand the principles of building preservation and the method of recording it in four documentation methods: on-site sketching, measured drawings, written documentation and photographic documentation. The group of students was delegated into 6 subgroups according to different tasks leading by a subgroup leader. In terms of measured drawings, several methods were used to collect measurement data. Measuring instruments such as measuring tapes and digital laser devices are the main devices that were used to measure the lengths of both interior and exterior spaces of the building. Digital laser devices proved to be beneficial in situations where measuring lengths would be an issue such as when one is measuring the height of a particular space. These laser devices also proved to cut down measuring times and reduce inaccuracies in measurements unlike measuring tapes which prove to be inaccurate at times due to parallax errors when reading off values. During the field work, time management and teamwork among all was vital in completion of tasks.

1.4 Limitations

1.4.1 Human error

The incorrect or improper use of a measuring instrument in measuring the structure of the building. Parallax error may occur or team members use an incorrect way of positioning the measuring instrument against the structure of the building, thus causing the documentation of incorrect measurements.

Figure 1.4

1.4.2 Lack of information

All information about the building was kept private and confidential. JKR Perak did not disclose any information about the building and the National Archive only had minimal information about the building, mostly general.

1.4.3 Transportation

The only means of transportation was by the bus provided by the university and also by the cars of students. It was very inconvenient to acquire additional information as students have to travel a distance to go back to the building.

Figure 1.5

C H A P T E R 2

History of Batu Gajah

2.1 Introduction to Batu Gajah
2.2 Origin of Name
2.3 Timeline of Batu Gajah

2.1 Introduction to Batu Gajah

Batu Gajah was one of the centers of tin mining, with hundreds of Chinese working their open-cast mines, easily exploiting the rich alluvial deposits of tin. Before the arrival of the British, Batu Gajah was already a busy river trading station. Tongkangs regularly berthed at its huge stone jetty, where the goods were transferred to smaller boats for the journey upriver, and where tin ore, coconuts and jungle products were loaded for the fifty-mile return journey to the coast. There were rows of Malay huts on both banks of the river.

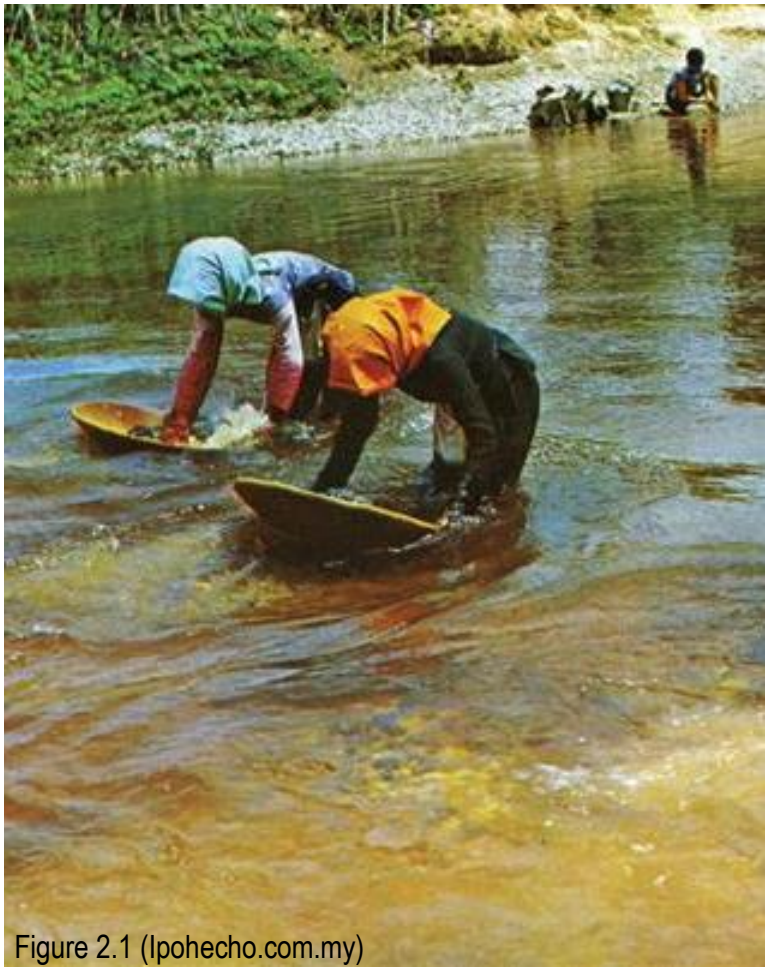


Figure 2.1 (Ipohecho.com.my)

2.2 Origin of the name

The name “Batu Gajah” came from a stone that resembled an elephant. Many versions of this tale have been passed on for generations.

The first version holds that when tin was discovered in the vicinity, many immigrants came from Sumatra to trade in the ore. Some of them were Buddhists, and they carved two elephants in place of worship.

Another version holds that a very long time ago, as two wild elephants were crossing the river, a deity called Sang Kelembai called out., and they were immediately transformed into stones. These elephant-shaped stones are believed to be located near Kampung Pisang but no one has seen them.

Despite the origins of its name, Batu Gajah owed a lot to elephants for the development of its early mines. They transported the heavy tin ore from the mines to the boats and the necessities back for the miners.

Figure 2.2

2.3 Historical Timeline of Batu Gajah

Figure 2.3

Figure 2.4

1870 — Batu Gajah is actually a sub-district of Sungai Terap, which is also one of the sub-district under the Kinta Colony. The oldest part of Batu Gajah town was established along River Road, beside the Kinta River.

1875 — After the debacle of the Birch murder, the Assistant Colonial Secretary, Frank Swettenham, realized in order to legitimize the colonial administration in the eyes of the Malays, he had to make use of officials. Penghulus were given duties.

1879 — Hugh Low promulgated land regulations, which fixed tenure and registration, laying the foundation for land revenue. Land applications, both for mining and agriculture, were handled by the Land Office.

1880 — The town had been surveyed and 127 lots had been built, Quite a number of Malays opened up shops in Old Town.

1884 — Batu Gajah was chosen as the capital of the Kinta district and government offices were located here.

2015 — The Government constructed a complex of three substantial brick buildings, the first of the kind in Kinta, to house the Kinta Land Office, the High Court and the Survey Department.

C H A P T E R 3

History of The Courthouse Museum

3.1 Introduction to Courthouse in Batu Gajah

3.2 Historical Background of the Courthouse Museum

3.3 Ownership of the Building

3.4 Timeline of Courthouse Museum

3.5 Site Context of the Building

3.1 Introduction to Courthouse in Batu Gajah

The Courthouse, also known as District Court Complex was built in 1892 and owned by the British Resident of Perak, Frank Swettenham. It is located in Batu Gajah, Perak, Malaysia and is the oldest courthouse that is built in this small town. It is structured in the form of three linked building blocks connected together by a covered walkway. This three-block complex was originally occupied by several government departments such as the District Office and Public Works Department for the blocks on the sides and by the Batu Gajah Court, which is the hall of Courthouse for the center block of the complex. The court had a historical plaque placed on its front that was inscribed Idris Ibni Iskander Shah as Sultan of Perak, Frank A. Swettenham as British Resident and Francis St. G. Caulfield as State Engineer. The Courthouse is a solid plaster-and-brick structure built of cruciform floor plans that was based on the Christian church cultures in the west back then. The building was designed to symbolize justice using the Christianity culture principles typified in colonial architecture during the Imperial era.

Figure 3.1

3.2 Historical Background of the Courthouse Museum

1892

The Courthouse was built and owned by the British Resident of Perak, Frank Swettenham. The complex was originally occupied by several government departments including the District Office and the Public Works Department as well as by Batu Gajah Court, which functioned as a High Court.

Figure 3.2

1903

Many administrative functions were transferred to Ipoh. The High Court moved to Ipoh and status of the Batu Gajah was changed to District Court. The complex was later occupied by the Batu Gajah Magistrates' Court, although only the upper storey-the ground floor was occupied by the Land Office.

1994

The Magistrates' Court vacated the complex and transferred to a new courthouse also located in Batu Gajah.

1998

The complex and other buildings in Batu Gajah was given control to the Sultan of Perak which led to repainting the buildings to white in the Sultan's favour. This was due a professional perception of simplicity to the area.

Figure 3.3

2007

The complex was refurbished. The Courthouse was then developed as Kinta District Administrative Complex (Kompleks Pentadbiran Daerah Kinta) in Batu Gajah. The construction of the Kinta District Administrative Complex put Batu Gajah on the map.

2015

Today, the complex is also opened as Kinta Museum for the local and foreign tourists to experience the historical environment in the court while the administrative goes on with their work.

Figure 3.4

3.3 Ownership of the Building

The complex was originally owned by the very first British Resident of Perak named Frank Swettenham along with the Sultan of Perak, Idris Ibni Iskandar Shah. It was then passed on to the later generation of the British colonial administrative to lead the court and other governmental departments in the building. The list of building owners were taken down and passed on to the local government and it was then framed in the meeting room of the courthouse, though most of the history background of the British and local owners of the building had gone lost on track.

Figure 3.5

3.4 Site context of the building

These are the very old buildings found at the Heritage Trail that were used for political and commercial purposes back in the olden days. The route is located from the city Ipoh to the small town area of Batu Gajah where the courthouse is located between both areas. Some of the buildings that were previously owned by the British are now under our local government and are occupied with offices for registration use while some of them are abandoned. The courthouse is located near to the podium, District Officer's House, the Batu Gajah police station, Batu Gajah hospital, the JKR office and St. George church.

Figure 3.6

Figure 3.7

C H A P T E R 4

Architectural Style

4.1 Introduction to Architectural Style

4.2 Design Concept

4.3 Features and Characteristics

4.4 Comparisons and Influence

4.5 Application

4.1 Introduction to the Architectural Style

Aesthetically, British colonial architecture in Malaysia is essentially a hybrid. Under Western influence, the buildings shows different architectural styles that are modified to a greater or lesser degree by the use of local building materials and architectural traditions.The administrative building during the British era, reflects western designs and technology in construction with a mix and match kind of outlook, adopting certain aspects of local design such as the façade, form, as well as materials even when these buildings had unique characteristics that were foreign to the local culture. In the 19th century, the British had adopted an architectural style, originating from the British building style, a mixture of the British and Mughal Architectural style (Indian Muslim) in India; and is commonly used in administrative buildings.

Figure 4.1

4.2 Design Concept

British Colonial style compromises different classical design concepts from the Western architecture with the original influences of the Indian Mughal architectural style. The openings such as doors and windows, the frames, the columns, the materials and other structures were all designed to portray the British's ideology towards their dominacy and to introduce the classical modernism in Malaya. The courthouse had a mixture of different styles but the building plan was mainly European-style. Heritage of Malaysia Trust (1990) pointed out that this type of building was easily found during the 1880s, with some Baroque influence and Palladian style during Renaissance revivalism. The Renaissance and Palladian buildings have a special feature, which is a symmetrical design. However, the slight curve on the portico, ornateness of the gate and grand central stairs are of Baroque influence.

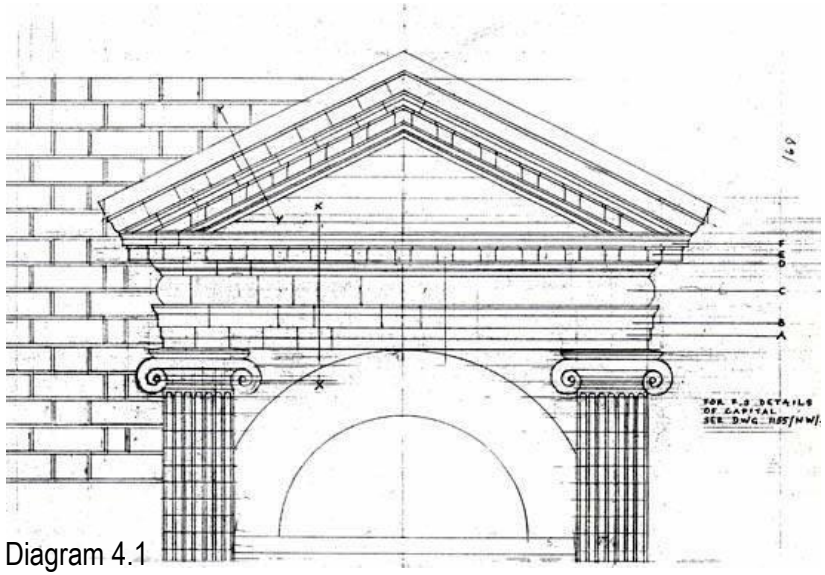


Diagram 4.1

4.3 Features and Characteristics

The Courthouse is one of the historical building that was influenced by the European architecture style in terms of the tropical climate in our country Malaysia. This European-influenced structure may be applied just has how it is from the West, but our long term humid weather was mainly in concern during the structural design and construction process. The Courthouse Museum building itself has a Palladian style façade, which is painted in striking black and white, featuring plaster bas-reliefs of strange eye-like shapes, decorated gables and covered walkways. The building complex was designed by Francis Caulfield, one of the State Engineer in the early Perak Administrative office. Despite of having a Palladian style façade, the courthouse building in overall is a British Colonial architectural style building.The court has a floor plan with the shape of a cruciform that is influenced by the cultural design of a Christian church. The choice of the columns are based on the historical fact that the column was the object through which the concept of 'kind' was delivered within the Classical architecture that was developed both logically and morphologically. The ionic columns are arranged in such a way that they are individuated in the building floor plan.

Figure 4.2

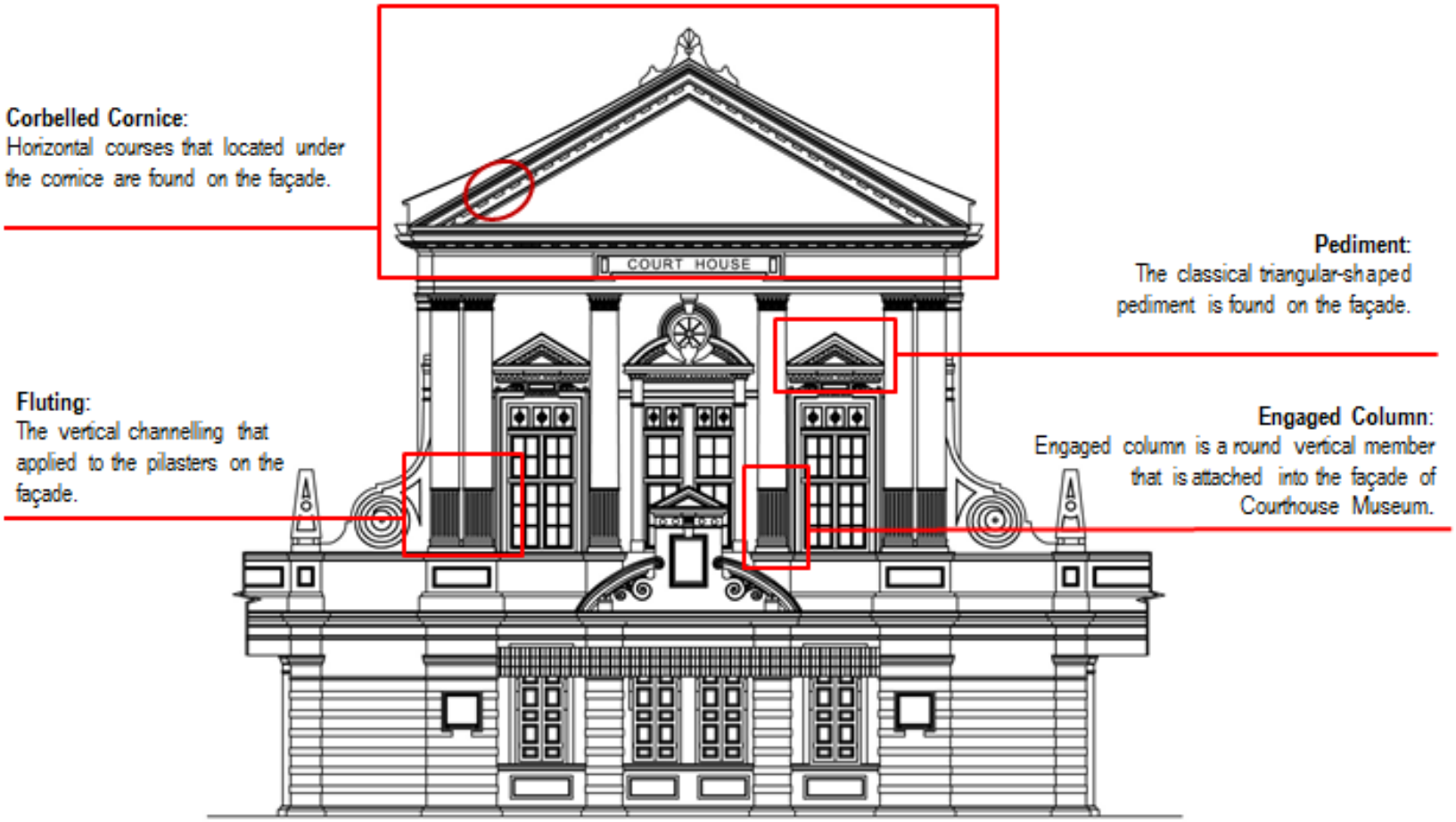

Corbelled Cornice:
Horizontal courses that located under the cornice are found on the façade.
COURT HOUSE
Pediment:
The classical triangular-shaped pediment is found on the façade.
Fluting:
The vertical channelling that applied to the pilasters on the façade.
Engaged Column:
Engaged column is a round vertical member that is attached into the façade of Courthouse Museum.

Diagram 4.2

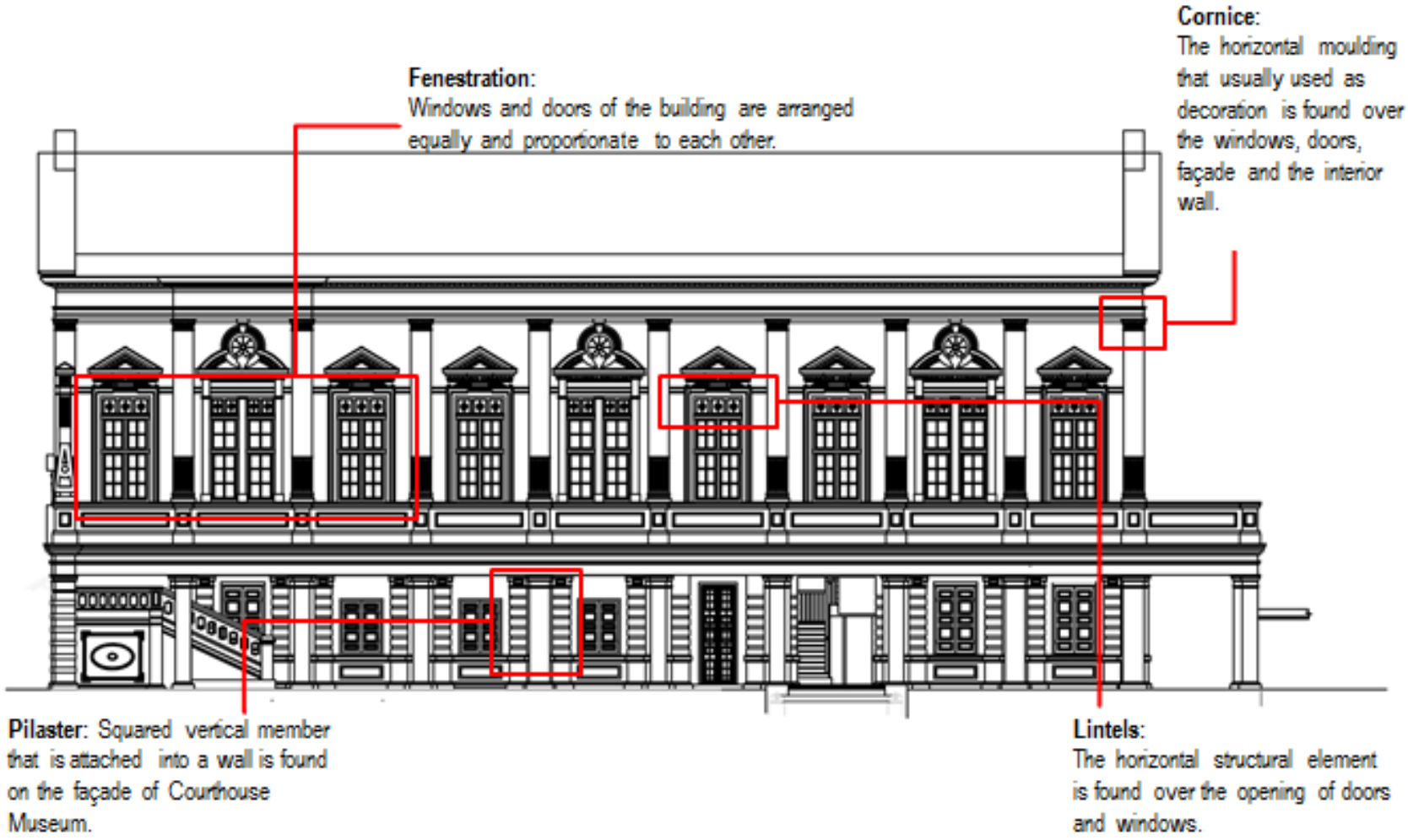

Cornice:
The horizontal moulding that usually used as decoration is found over the windows, doors, façade and the interior wall.
Fenestration:
Windows and doors of the building are arranged equally and proportionate to each other.
Pilaster: Squared vertical member that is attached into a wall is found on the façade of Courthouse Museum.
Lintels:
The horizontal structural element is found over the opening of doors and windows.

Diagram 4.3

4.3.1 Pediment

One of the main features of the Courthouse that is designed in a triangular gable is called a pediment. The pediment is a structure element influenced by the classical, neoclassical and baroque architecture. As mentioned, it has a shape of a triangle designed with cornice and dentils. It is placed above the Courthouse towards the end of the roof slope. It also being applied on the openings such as doors and windows, and above the plague as decorative elements and a symbol for the architectural style of the Courthouse.

Figure 4.3

Figure 4.4

4.3.2 Dentil

Another main feature of the Courthouse that was influenced by the classical architecture is the dentils. The dentils are rows of small rectangular tooth-like blocks that is repetitively placed in the bedmould of the cornice. It is commonly used as ornaments for the colonial buildings in our country. The similar mouldings of the dentils are also applied within the pediments of the doors and windows as decorative ornaments.

Figure 4.5

Figure 4.6

4.3.3 Column

Another main feature that holds the Courthouse is the columns. The columns are designed as both supporting structures and decorative elements around the Courthouse. This feature comes in long rectangular and circular shape. The circular column used is of the classical Tuscan order that has a simple outlook of the capital and base with flutings. This column is placed at the front top of the Courthouse. The rectangular columns has the same outlook as the Tuscan style only that it has no flutings. This type of column is placed along the walkways around the building at ground floor.

Figure 4.7

Figure 4.8

4.3.4 Pilaster

The feature of the classical element that has an outlook of flat-faced vertical projections attached agaisnt the façade of the Courthouse are called pilasters. It acts as decorative ornaments around the building.There two types of pilaster design. One has a similar design as the Tuscan column that are placed at the first floor, while the other type has horizontal stripes wrapped around it at ground floor.

Figure 4.9

Figure 4.10

4.3.5 Fenestration

This feature gives an outlook for the whole building consistency. This design is called the fenestration. The opening such as doors and windows are all arranged in such as way that is constant in distance to one another agaisnt the wall. This applies on the first level exterior wall and also the ground floor for the wooden windows.

Figure 4.11

Figure 4.12

4.4 Comparison and Influence

4.4.1 Comparing with Neo-classical architecture and its influence

The Courthouse has the similar column design as Vilnius Cathedral of Neo-classical style, only that there is no fluting on the base shaft of the Cathedral's columns at the entrance. The columns are both arranged at the same position which is the entrance. These two buildings have the same pediment design concept applied on the end of the roof and for the ornaments on the exterior wall. Same goes for the dentils.

What differs the two similar building is the usage of the a few structures such as the arrangement of the columns, the size of the dentils, the amount of carved ornaments and the placing of domes. There is no domes used on the Courthouse while the domes are placed towards the end of the Cathedral building. There may be the use of pilaster design, but stripe pattern is applied to the pilaster of the Courthouse unlike the cathedral.

Figure 4.13

Figure 4.14 (Wikipedia)

4.4.2 Comparing with Renaissance architecture and its influence

The Courthouse has the same pediment concept as Madison County Court House of Renaissance style, only that it doesn't apply for the openings for the Madison court.

The Courthouse is not much of a Renaissance influenced structure. The columns are of two different designs. The Madison Court has significantly capital designs compared to the Courthouse as it doesn't apply on its simple columns. The Courthouse does not have a dome, the openings ornament and design are not as minimal as Madison's, the balconies are not ad exposed with the use of metal grills as Madison's.

Figure 4.15

Figure 4.16 (Commons w kimed a. rg

4.4.3 Comparing with Roman architecture and its influence

The Courthouse is also influenced by Roman architecture. The same pendiments concept, and it goes on with the other common classical elements such as the columns, cornice and dentils.

The Maison Carree holds a much more simpler arrangement and the amount of ornament and decorative structures are minimal. Though the building may be kept to its minimal, the columns are more outstanding compared to the Courthouse's column designs. The shafts have more flutings and the capital is completely different. The concept of an open spatial design does not apply on The Courthouse, as much as it stresses on the Roman architecture culture. Lastly, Roman architecture holds culture beliefs, while the Courthouse design built to symbolises modernism.

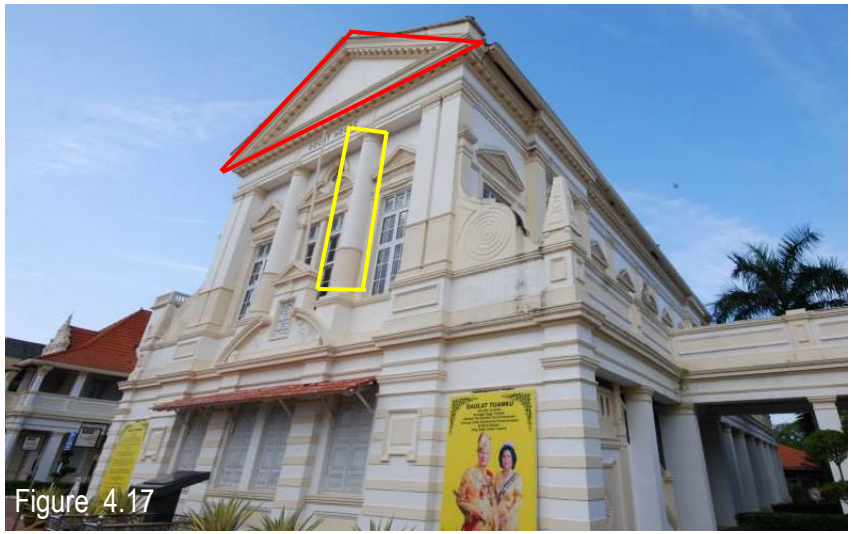


Figure 4.17

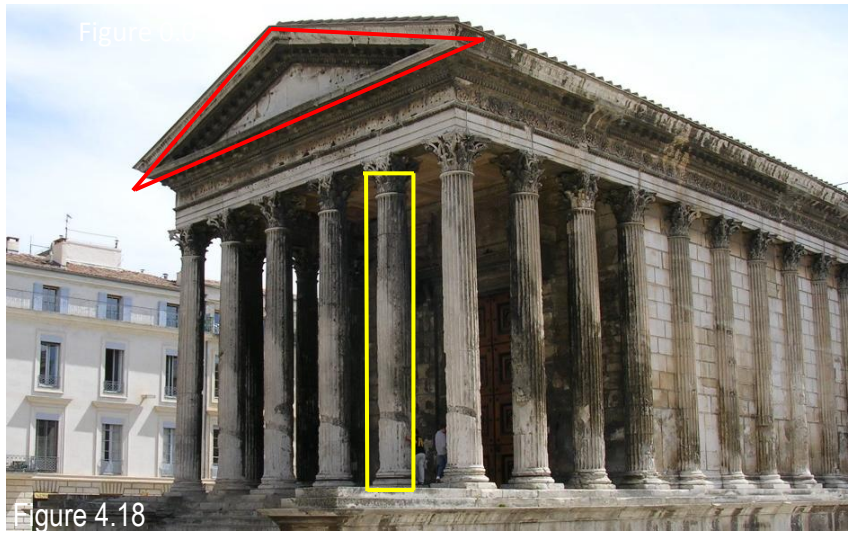


Figure 4.18

4.5 Application

British Colonial style was widely applied not only on the Courthouse, but also on the local administrative buildings throughout our country Malaysia and worldwide as the British government had dominated many countries back then. The original local culturally designed buildings were then evoluted and combined with the Europian structure designs, resulting in these aesthetical historical monuments that are now used as musuems and offices. These local buildings hold the same architectural style as the Courthouse that can be seen from the building structures such as the columns, the dentils, the arches and many more. They hold the same design concept with the same dominancy intention and idealogy. The architecture has become one of the main attractions in our countries that led to the attraction of many visitors and tourists such as the Old General Post Office and Sultan Abdul Samad building in Kuala Lumpur, Municipal Council Building in Georgetown, Penang, Former Police Contigent Building in Klang and Former State Secretariat Building in Seremban.

Figure 4.19 (Flickr)

Figure 4.20 (Malaysia, Malaysia and profile)

C H A P T E R 5

Architectural Analysis

5.1 Site Selection

5.2 Spatial Organization

5.3 Architectural Spatial Organizational Schemes

5.4 Form and Hierarchy

5.5 Public, Semi Private and Private Spaces

5.6 Circulation

5.7 Climate-conscious Design

5.1 Site Selection

5.1.1 Geography and Climate:

Batu Gajah is located in Perak, 20km away from Ipoh. Batu Gajah is a large and fine village which is located near the left bank of the Kinta River. The land was surrounded by century-old tropical trees and hills. The good soil condition which was suitable for construction had become one of the attractions towards the British. The warm and stable climate whole year round has also attracted the British.

Figure 5.1 (Selangor)

Figure 5.2 (Malaysia and profile)

Figure 5.3 Ipoh World's World

5.1.2 POPULATION:

In 18th century, Batu Gajah was chosen to be the administrative capital for the Kinta district of Perak. Kinta valley was at the epicentre of a "tin rush". It had tens of thousands of Chinese labourers flooded in the area as miners. The Chinese population in the Kinta valley rose from 8,900 in 1879 to 58,587 in 1891. Due to the expansion of population, the British colonial were attracted to the area.

5.1.3 ECONOMY:

During the British colonial period, Perak had become one of the wealthiest states due to the expansion of the tin mining industry. It was the largest producer of tin mining. Batu Gajah was enjoying the Kinta Valley's Tin Rush period during that time. It became the second most important town in Perak after Taiping. It was then chosen as the capital of the Kinta district and government offices were located here in year 1884. The economic boom has made it notable and caught the attention of the British Officers. Besides, the railway service had eased the transportation of tin from Batu Gajah to Teluk Anson port which brought a major change to the town, further expanding the economy.

Figure 5.4 (Ipoh World's World)

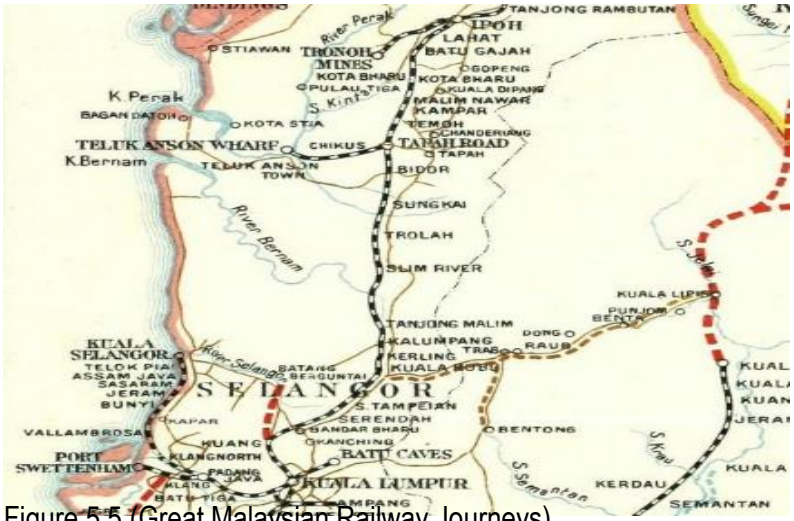


Figure 5.5 (Great Malaysian Railway Journeys)

5.2 Spatial Organization

The spaces in the Courthouse Museum are directly related to one another. The repetition of form, size and function of the spaces in the building are linked through a separate and distinct space and form a series of spaces. Each side of the spaces has an exterior exposure. There are a few organizations that can be showed through the spaces of the Courthouse Museum.

As seen from Figure 0.0, the organisation of the structure greatly emphasizes on two major areas, the courtroom and the meeting room by being larger in size as well as having good circulation with easy access throughout the whole space.

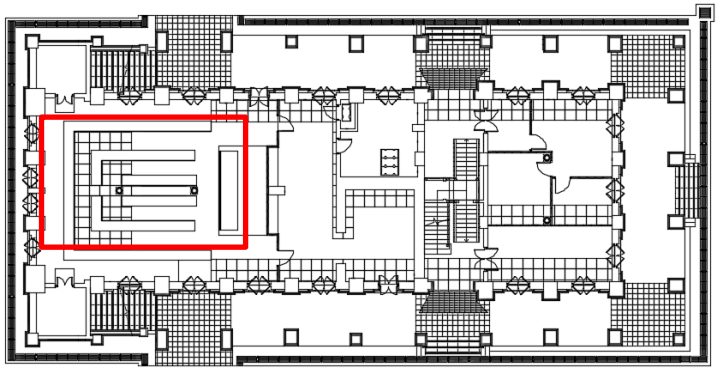


Diagram 5.1

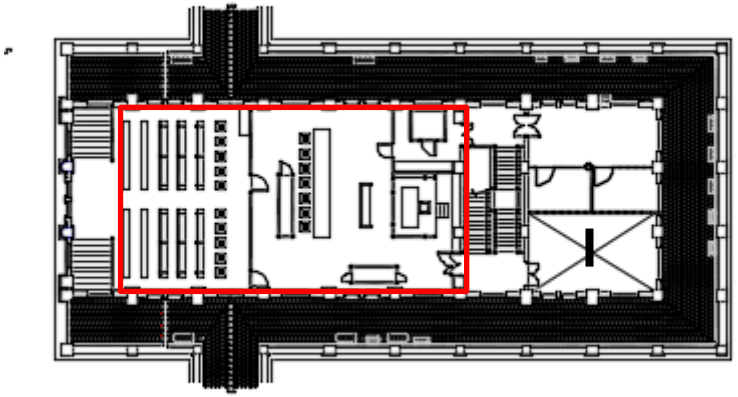


Diagram 5.2

5.2.1 Spaces

The Courtroom is the main function of the structure. It was where the British used to bring justice on those who had committed crimes. As the main room, it has a larger area and heavy ornamentations in the interior. The focal point of the room would be the judge's table, having higher ground, better seating and a special entrance which helps in focusing the attention towards the judge. The courthouse was later converted into a museum when it was not in use anymore.

The meeting room was also an important space. It is located right below the courtroom with equal area but different height of ceiling and lesser ornamentation. Even now, it is still in use, with new technology installed and renovation taken place.

The office, which is another function of the building was not included in the original plan but was renovated with plaster ceilings and partitions when the courthouse is converted into a museum. They occupy the unused rooms after the building no longer served as a courthouse.

Figure 5.6

Figure 5.7

5.3 Architectural Spatial Organizational Schemes

5.3.1 Architectural Order

There exists a natural diversity and complexity in architectural works and requirements for buildings. Many architects and designers have focused on the concept of order, and how concepts of order can produce a sense of beauty, discipline, and meaning in buildings.

5.3.2 Organizational Schemes

The following spatial organizational scheme can be seen as compositional 'constructs' where diverse forms and spaces can be arranged into an inter-related 'whole' via systematic and disciplined forethought. The vast majority of buildings are composed of a number of rooms or spaces related to one another by function, proximity, or a circulation path. It is important to remember that organizational schemes are inherently 'value-neutral' organization schemes. They become more or less valuable depending on the intentions of the design.

Figure 5.8

Figure 5.9

5.3.2.1 LINEAR ORGANIZATION

A linear organization consists essentially of a series of spaces or objects. These spaces can be directly related to one another or linked through a separate and distinct space. Spaces that are functionally or symbolically important to the organization can occur anywhere along the linear sequence and their importance articulated by size and form.

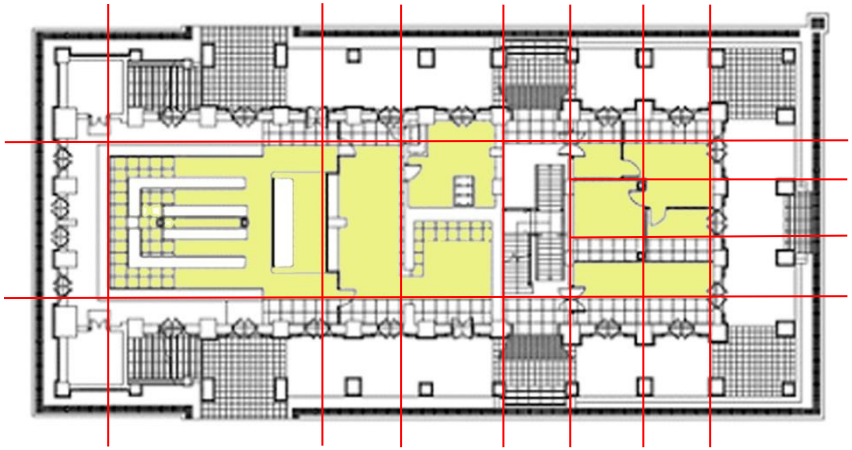


Diagram 5.3

5.4 Form and Hierarchy

5.4.1 Symmetry

With the reference to the front rise, when a line is drawn through the core of the pediment of the exterior in front, it demonstrates a reasonable characteristic of symmetrical face. The reflected and symmetrical structure demonstrates the dependability between the both sides.

In addition, by alluding to the ground floor arrangement, a symmetrical floor arrangement has been demonstrated. It can be seen that both wings are symmetrical to one another, exemplifying a feeling of balance to the building. The segments along the hall at both sides of the building are situated and organized just as to one another.

Figure 5.10

5.4.2 Repetition

Repetition is the simplest method in designing. The columns and windows in architecture, the legs of a piece of furniture, the pattern on fabrics, tiles on the floor are obvious examples of repetition. Repetition of unit usually conveys an immediate sense of harmony. Each repetitive unit form is like the beat of some kind of rhythm, repeating art elements in regular or cyclical fashion to create interest, movement, and harmony.

Repeated use of a shape, color, or other art elements in a building structure can help unify different parts into a whole. The repetition might be limited to only an instance or two: not enough to create a pattern or rhythm, but enough to cause a visual echo and reinforce or accent certain aspects of the building.

Figure 5.11

Figure 5.12

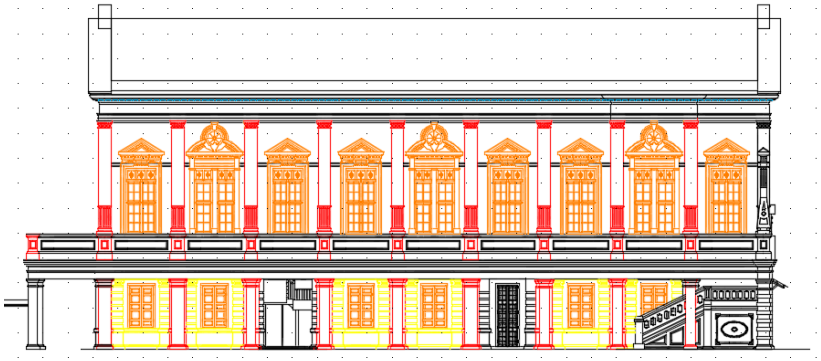


Diagram 5.4

5.5 Public, Semi-Private and Private Spaces

A public space is a social space that is generally open and accessible to people while private space is a self-governing enclave whose restricted areas are owned by the residents and whose services are provided by the private sector.

With the reference to the ground floor plan, the spaces marked in red colour is considered as private spaces. Washrooms are considered as private spaces. It is located behind the building to provide more space for access to the public. From the floor plan, it is noticeable that most of the spaces in the building are opened to public such as the courtroom for visitor and offices for administration work to be done . Meeting room is considered as a semi private space which permits pertinent powers and staff to enter this confined range to discuss on private and confidential matters.

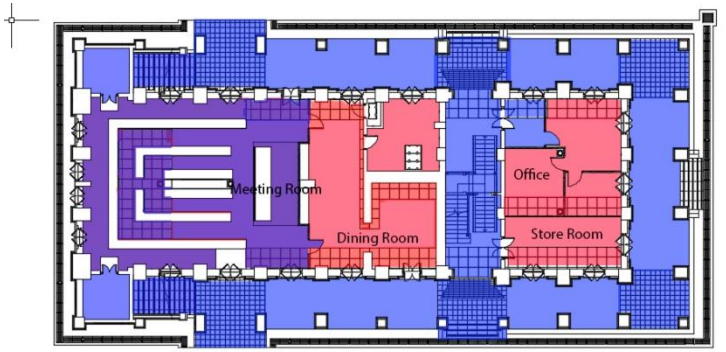


Diagram 5.5

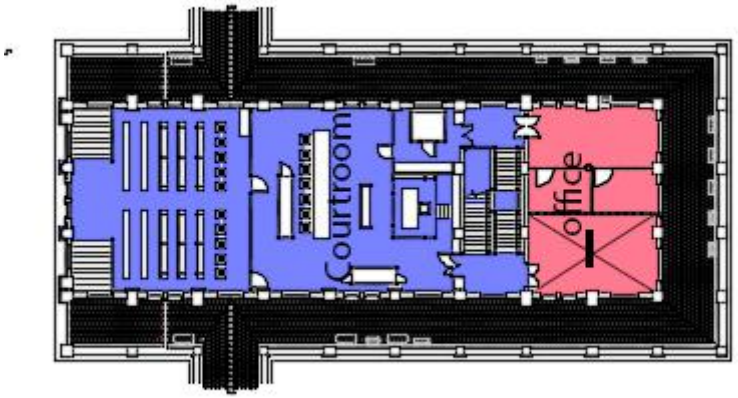


Diagram 5.6

Public spaces

Private spaces

Semi-private spaces

5.6 Access and Circulation

The structure was primarily designed as a courthouse, so the circulation is greatly influenced by the position of the courtroom and also the meeting room which is also a major function of this structure. As per the ground carpet arrangement of Courthouse Museum, we can see that there are three passages to enter the building. There are two stairways built oppositely which go about as the primary way to lead the guests to the first floor and second floor. On the ground floor, there is a meeting room and offices possess the spaces on both sides of the staircase. On the first floor, there is a courtroom and offices spotted on both sides of the staircase which is similar to the ground floor plan. The courtroom has turned into a historical center for visitors. On the second floor, there is a store room that keeps the old reports and data papers. It is no longer utilized as an office just as it is in the pass. The courtroom, being the main function of the building has 4 entrances in which 2 are located on the ground floor and another 2 are located on the first floor.

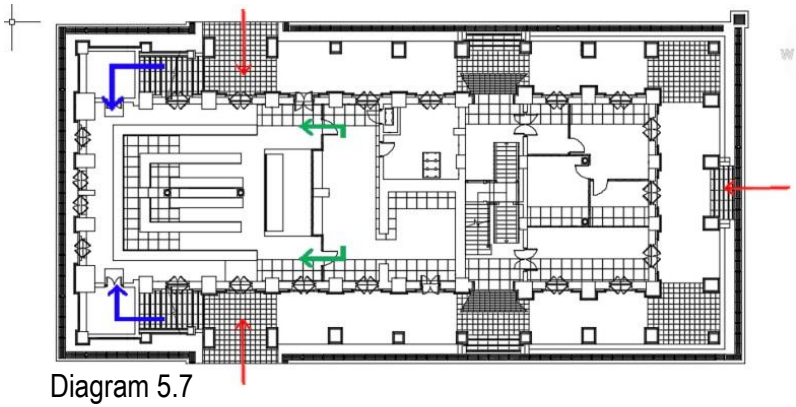


Diagram 5.7

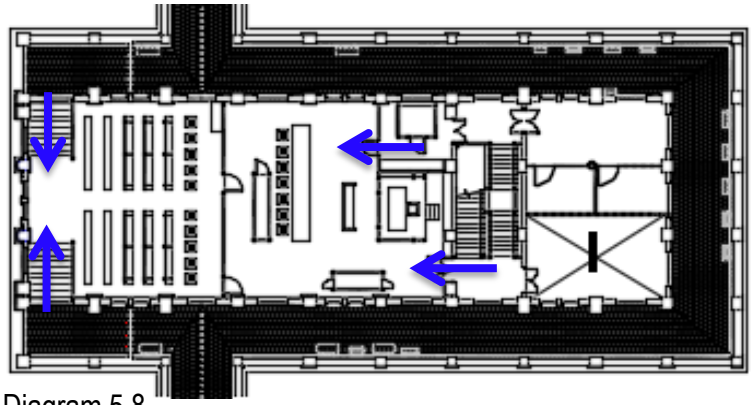


Diagram 5.8

As seen in Figure 0.0 and Figure 0.0,the red arrows show the entrance to the building, the blue arrows represent the entrance to the courtroom while green arrows as the entrances to the meeting room.

5.7 Climate Conscious Design

Given Malaysia's hot and moist atmosphere accompanied by rainstorm seasons, measures must be taken when embracing configuration impacts from calm nations. Pitch roof help lessen the measure of territory that is present to diminish direct daylight introduction. This will along these lines help diminish the measure of hotness inside the building.

The roof is designed based on the measure of temperature, humidity, atmospheric pressure, wind, rainfall and other elements that determine the weather in Malaysia. Monitor roof provides good air ventilation because of the high ceiling. The amount of heat that is absorbed into the building can be reduced with the design of monitor roof. Natural light can penetrate into the building with the design of large windows and high ceilings.

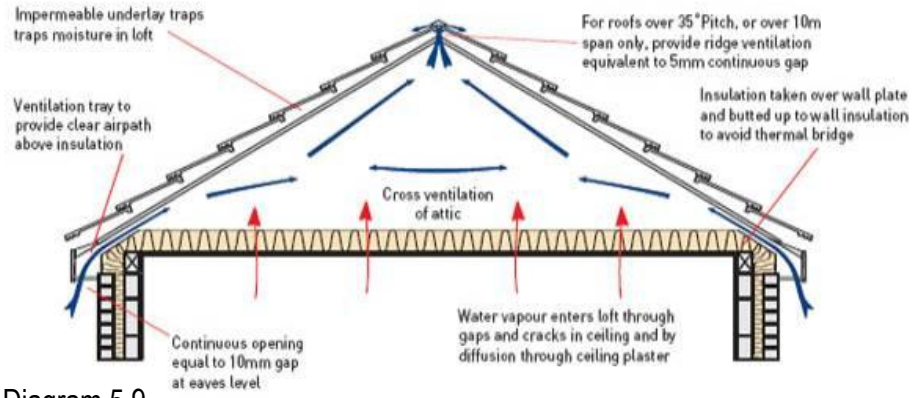


Diagram 5.9

Figure 5.13

C H A P T E R 6

Construction Method and Details

6.1 Door

6.2 Window

6.3 Flooring System

6.4 Staircase

6.5 Building Conservation

6.1 Door

6.1.1 Entrance Door

There are prominent panels, usually placed in two columns and painted in a dark color. There is commonly a row of windows either on the top of the door or in a transom above. The orientation of the surface material is vertical with raised panels of varying sizes. There are layered trim boards with decorative molding.

Figure 6.1


Figure 6.2

6.1.2 Location of Door

Figure 0.0

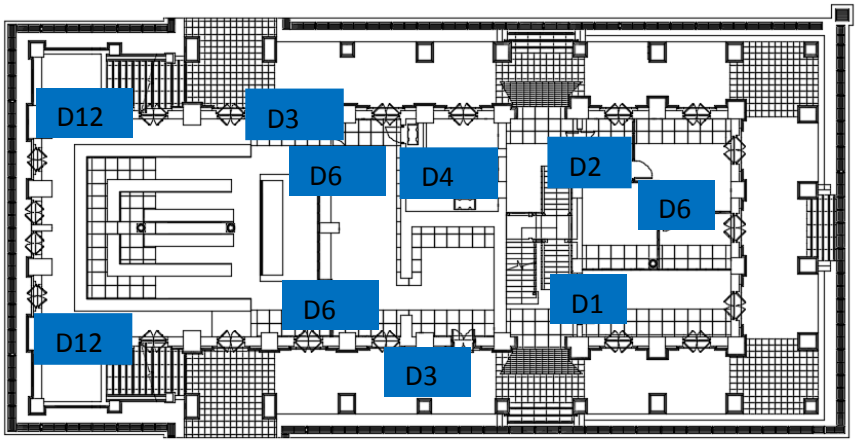


Diagram 6.1

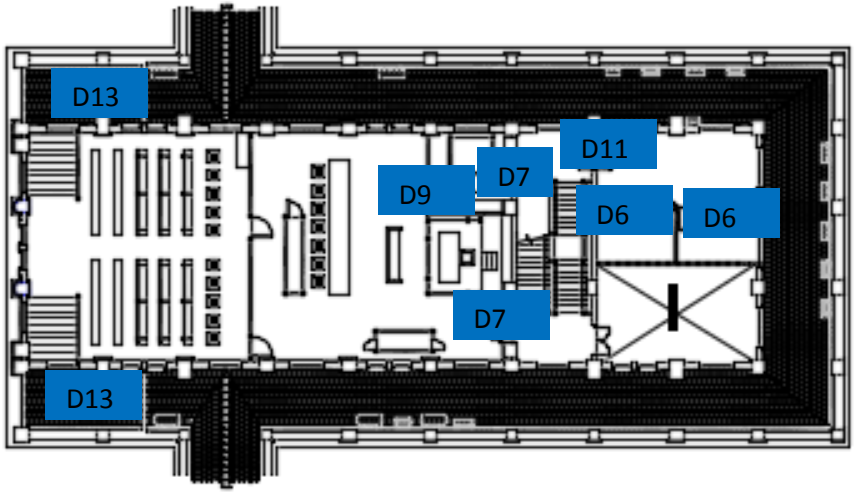


Diagram 6.2

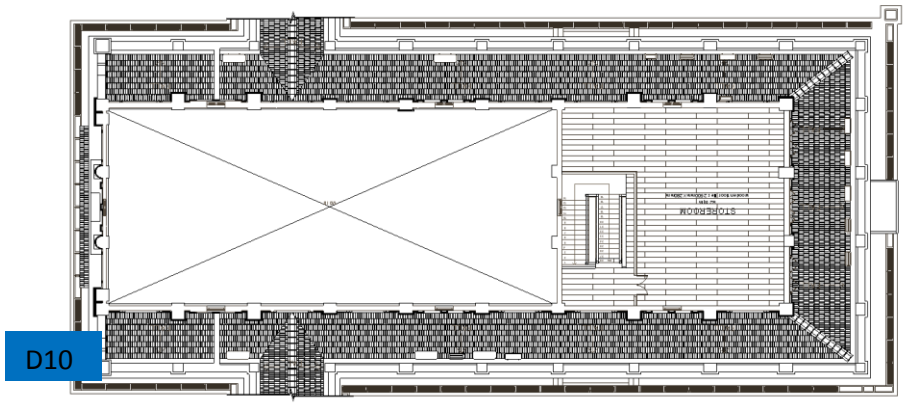


Diagram 6.3

6.1.3 Door details

D1: Door 1

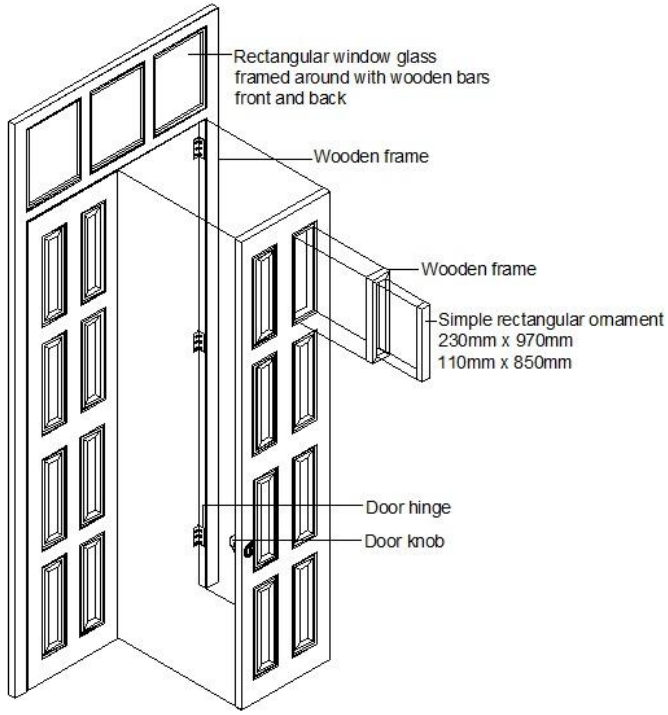


Diagram 6.4 Wooden door for the locked storeroom opposite the staircase located at ground floor.

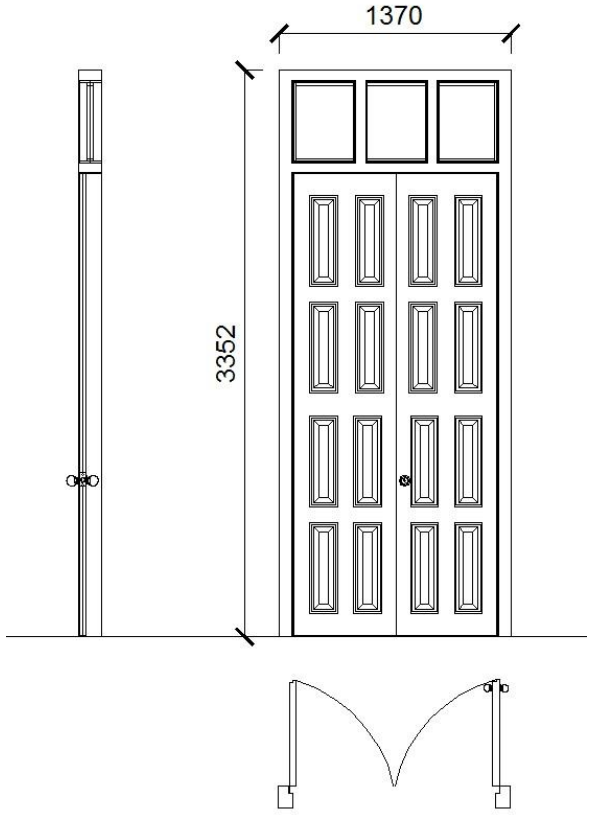


Diagram 6.5 Elevation and Plan view of Door 1

D2: Door 2

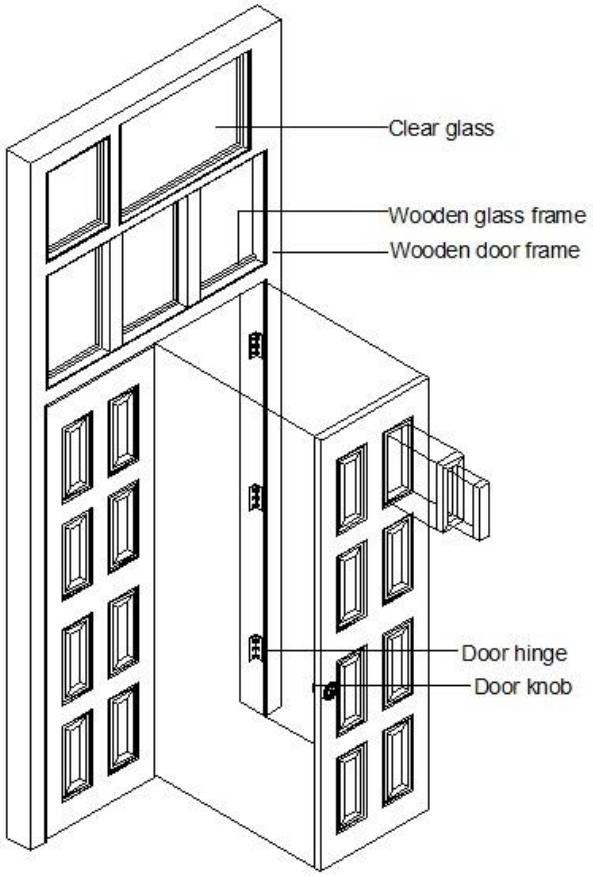


Diagram 6.6 Wooden door for the registration office beside the storeroom located at ground floor.

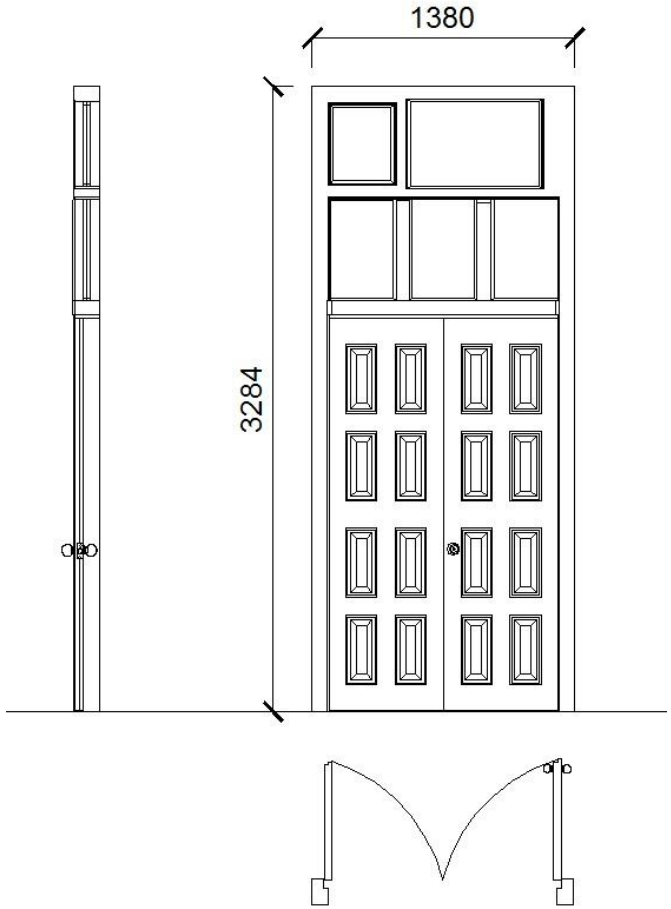


Diagram 6.7 Elevation and plan view of Door 2.

D3: Door 3

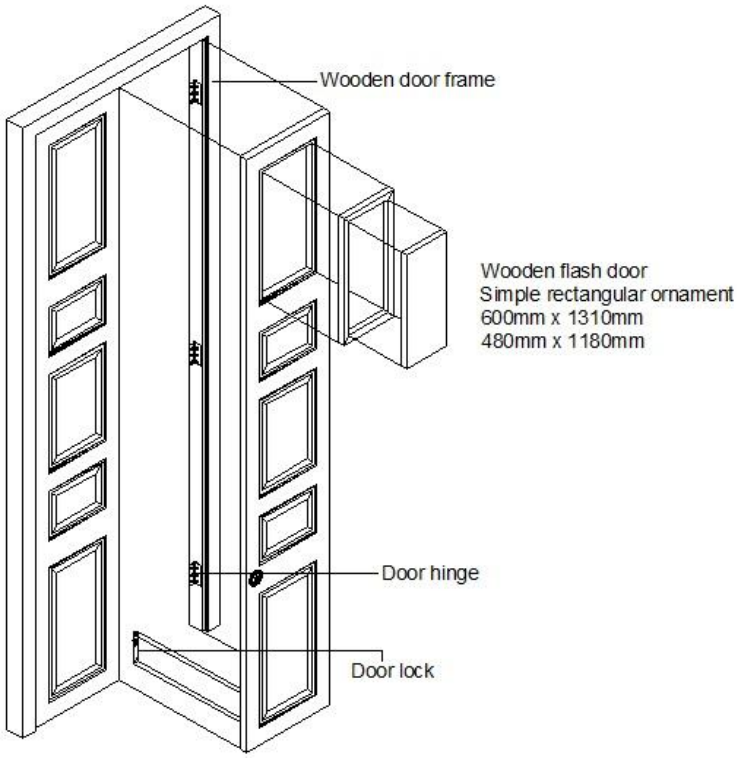


Diagram 6.8 Wooden door located outside the meeting room at the ground floor.

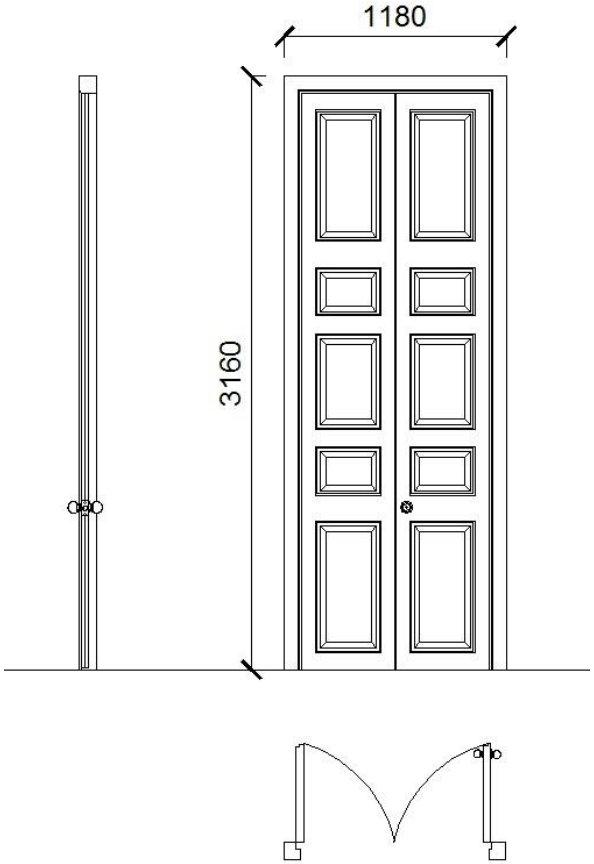


Diagram 6.9 Elevation and Plan view of Door 3.

D 4: Door 4

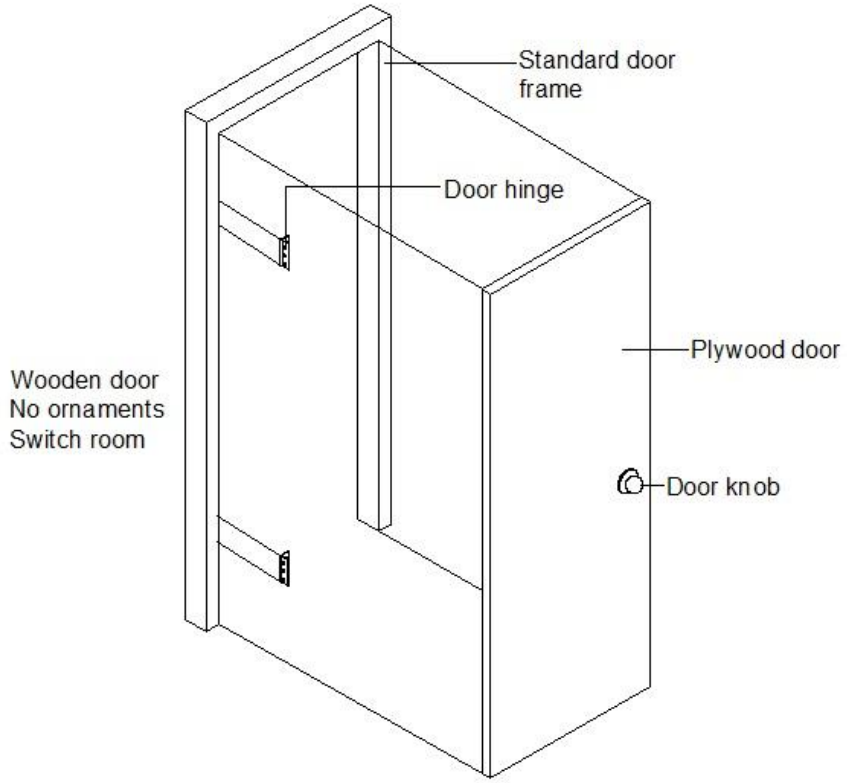


Diagram 6.10 A plain door used for the switch room and the storeroom in the meeting room.

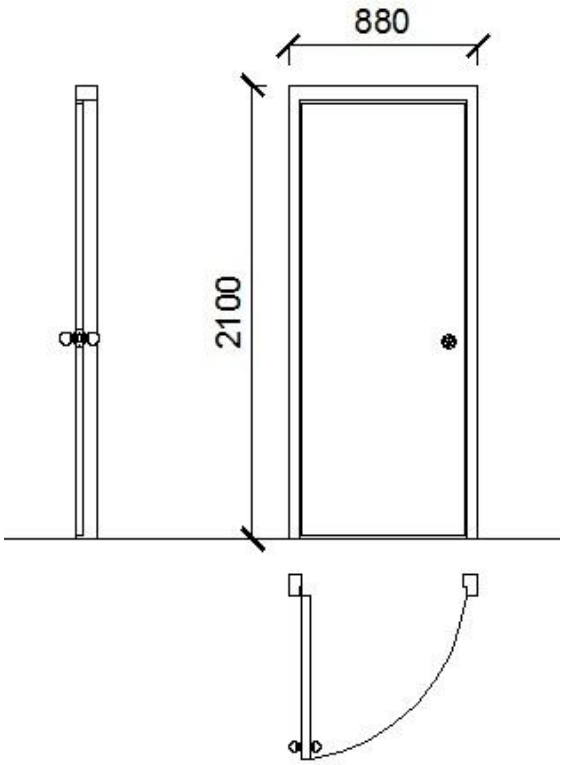


Diagram 6.11 Elevation and plan view of Door 4.

D5: Door 5

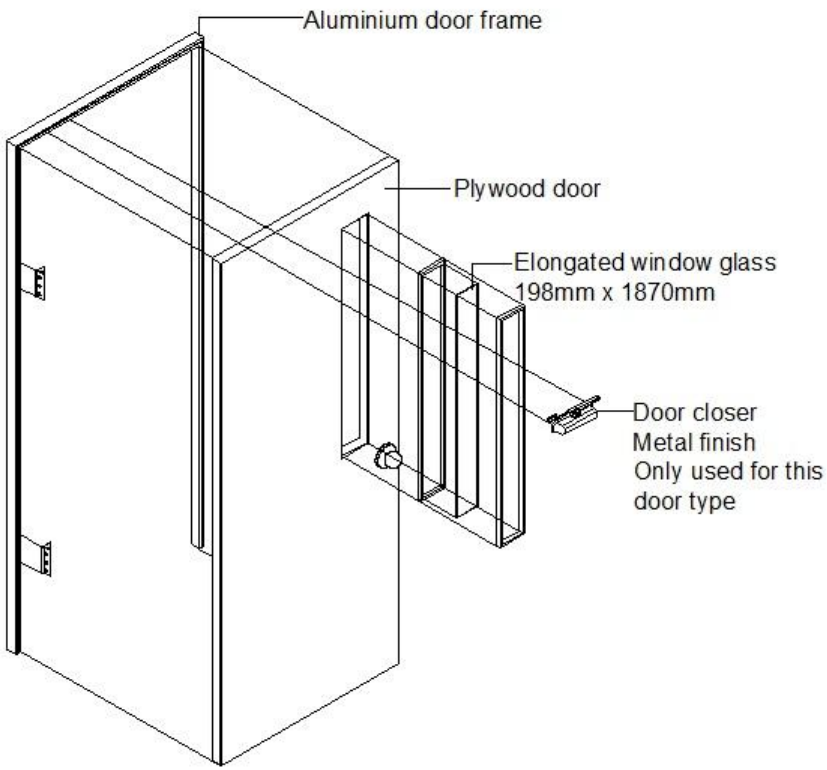


Diagram 6.12 Partition door used for the meeting room.

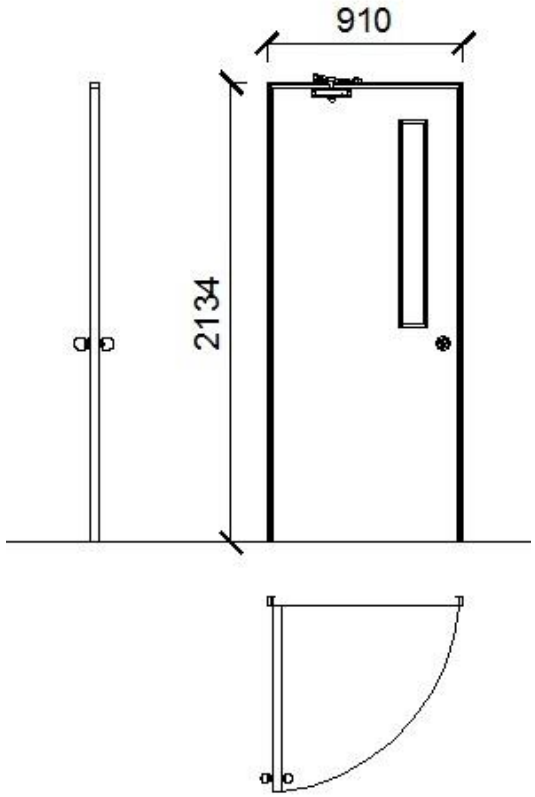


Diagram 6.13 Elevation and plan view of Door 5.

D6: Door 6

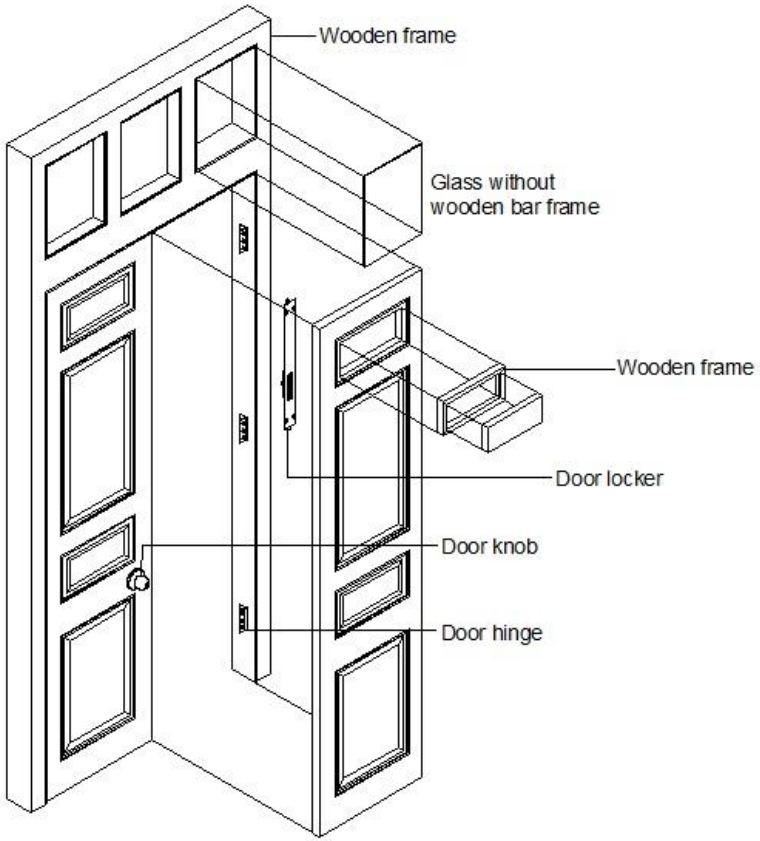


Diagram 6.14 Wooden door with different ornaments located outside the court room located at first floor.

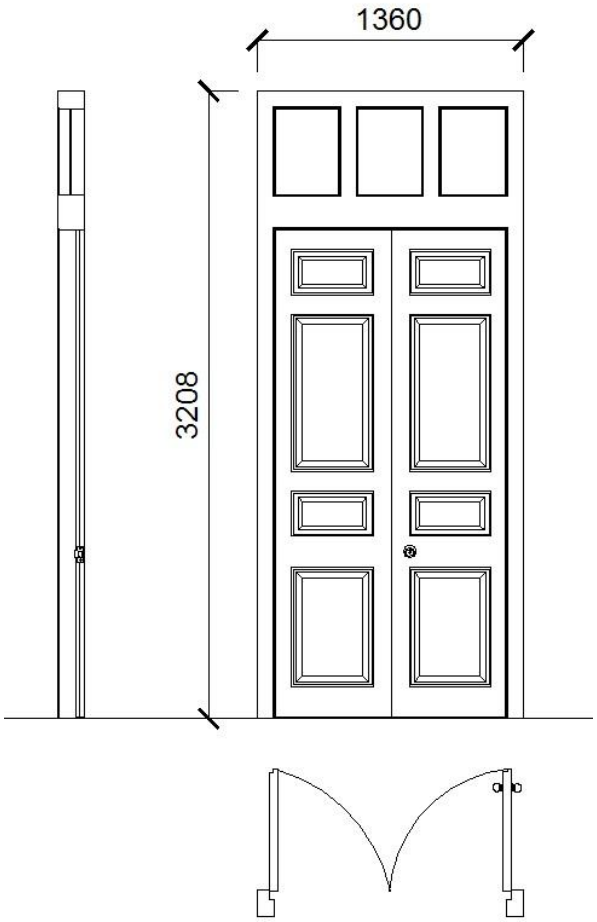


Diagram 6.15 Elevation and plan view of Door 6.

D7: Door 7

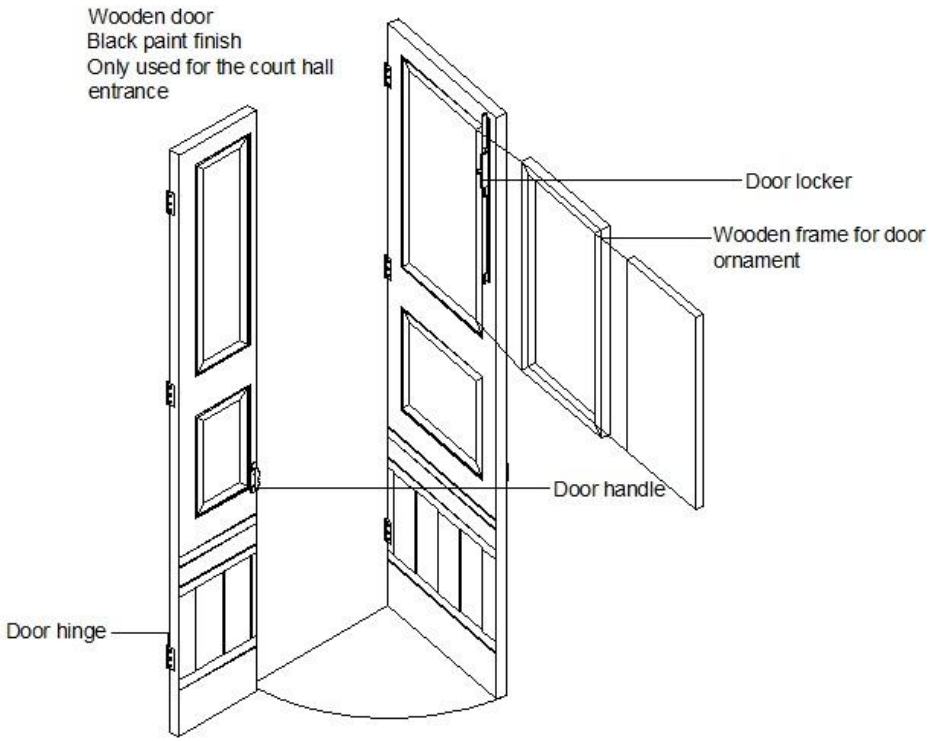


Diagram 6.16 Black wooden door used in the court room located at first floor.

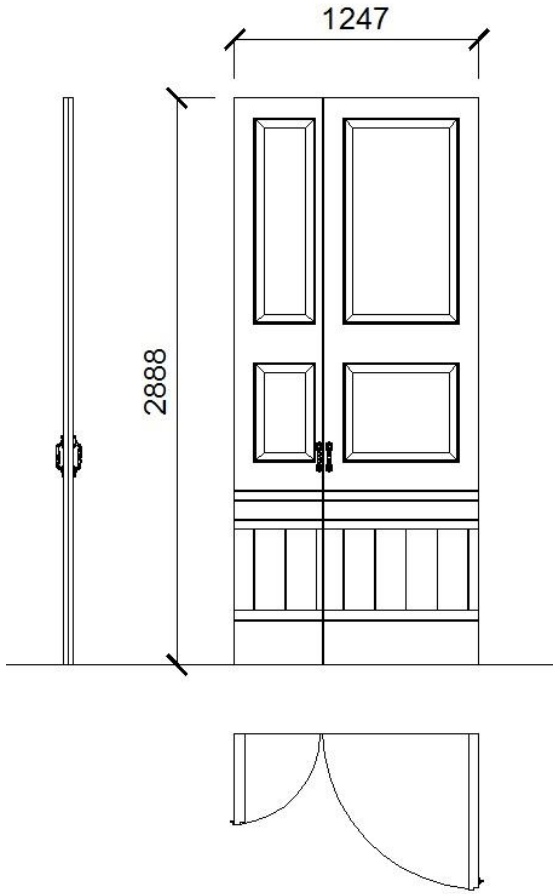


Diagram 6.17 Plan and elevation view of Door .7

D8: Door 8

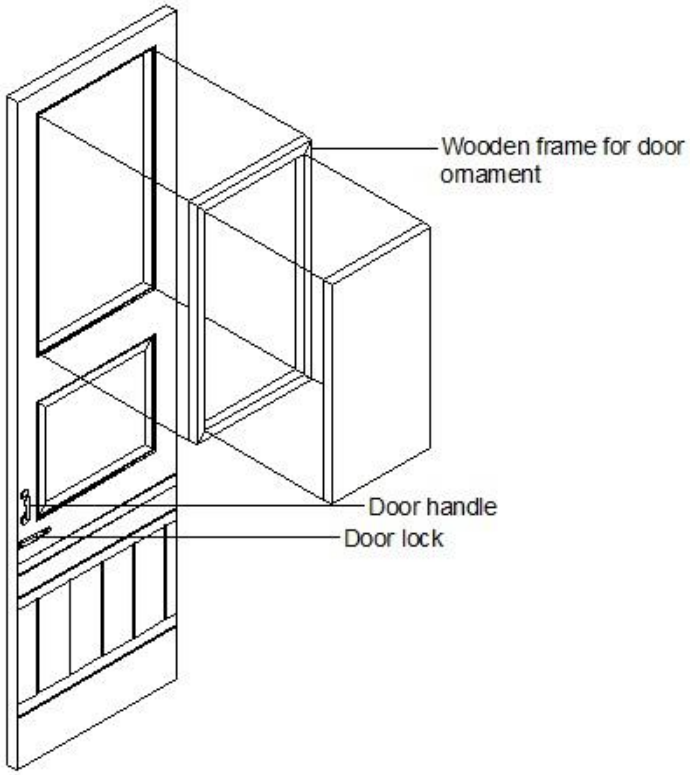


Diagram 6.18 Another black wooden door located in the court room on the first floor.

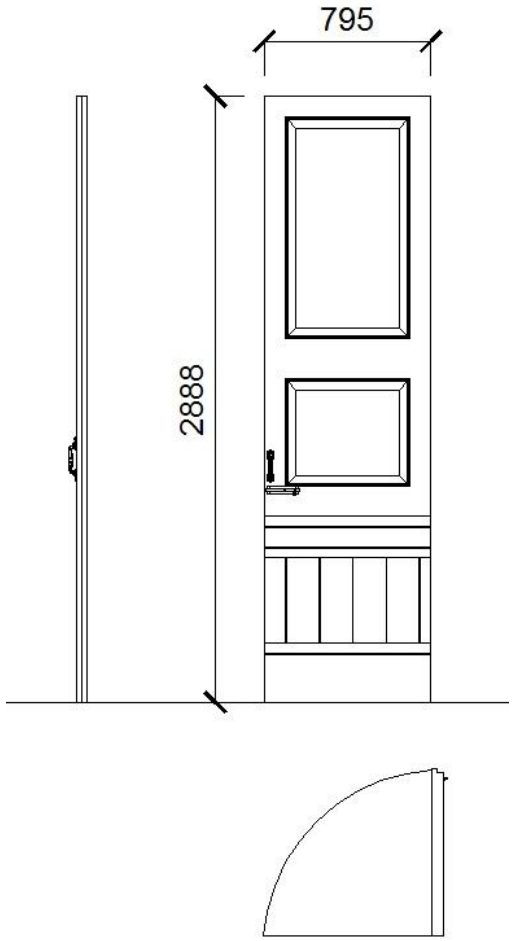


Diagram 6.19 Elevation and plan view of Door 8.

D9: Door 9

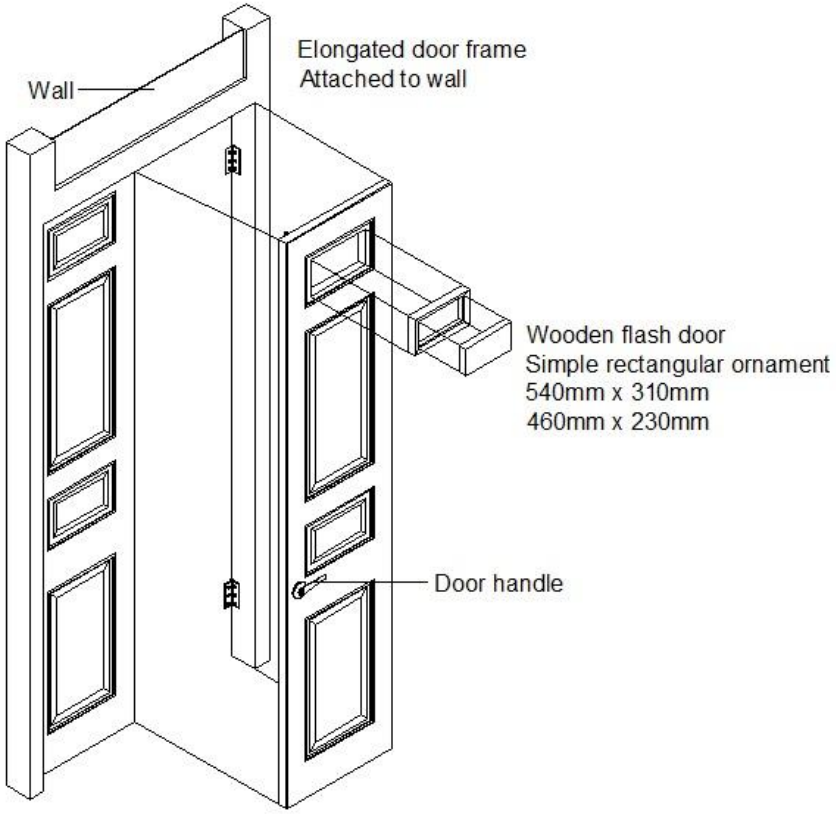


Diagram 6.20 A similar wooden door without glass frames that is used for the attic at second floor.

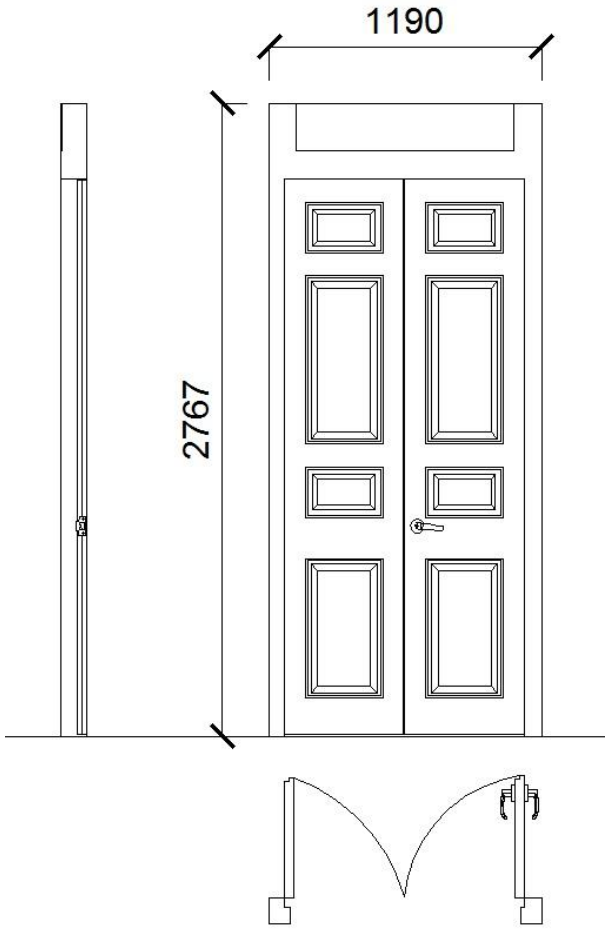


Diagram 6.21 Elevation and plan view of Door 9.

D10: Door 10

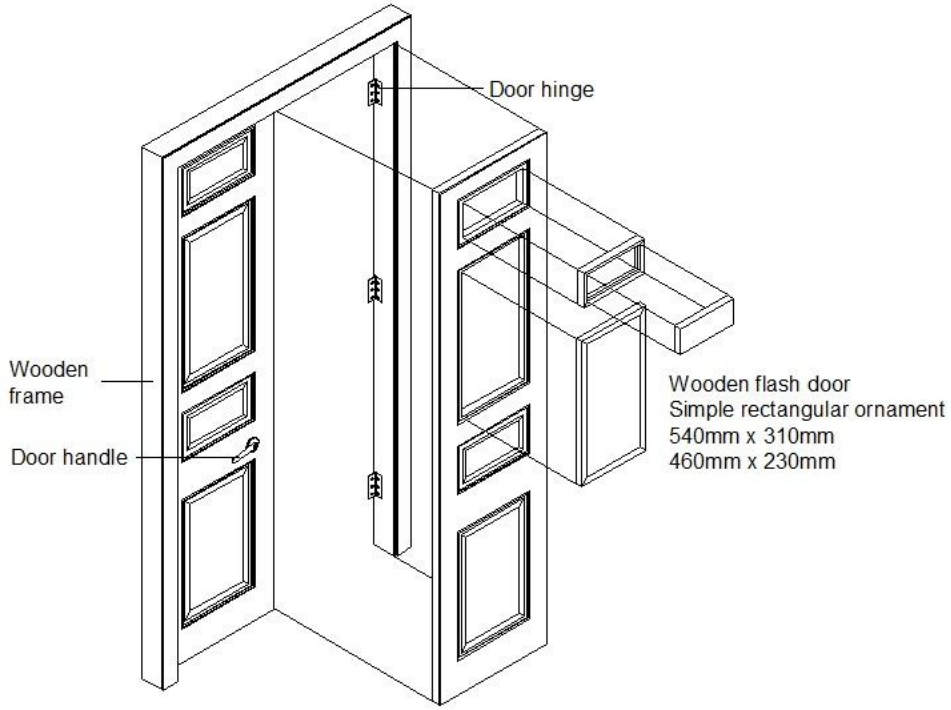


Diagram 6.22 wooden door used for the office located opposite the court hall at first floor.

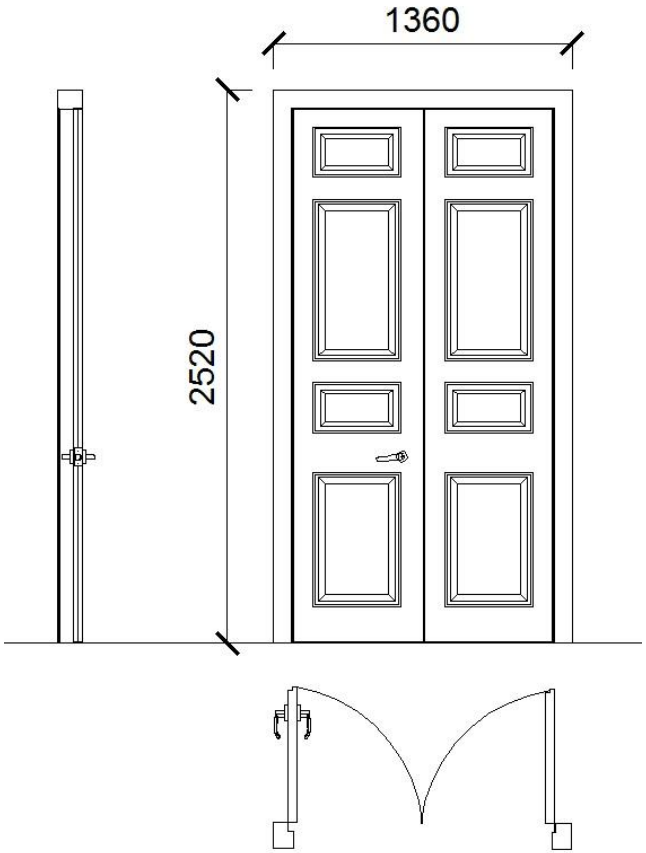


Diagram 6.23 Elevation and plan view of Door 10.

D11: Door 11

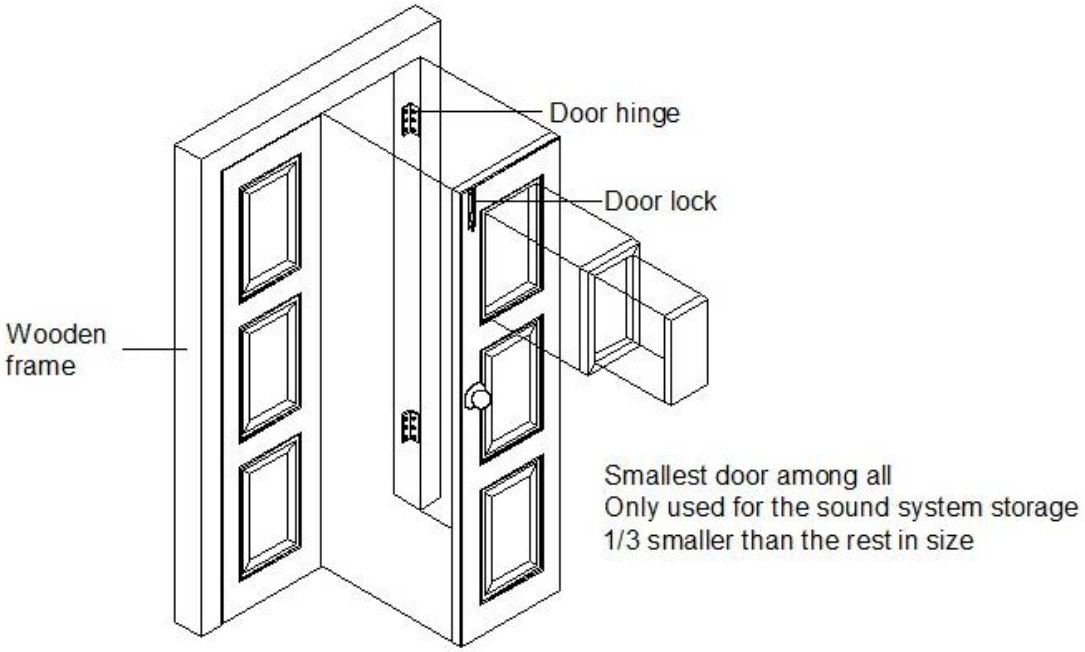


Diagram 6.24 Small wooden door that is used to hide the sound system in the meeting room at the ground floor.

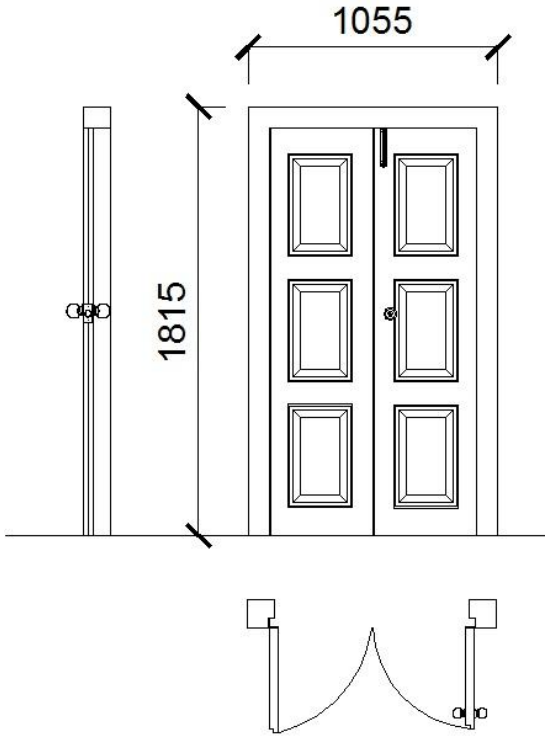


Diagram 6.25 Elevation and plan view of Door 11.

D12: Door metal Grill and Glass Door

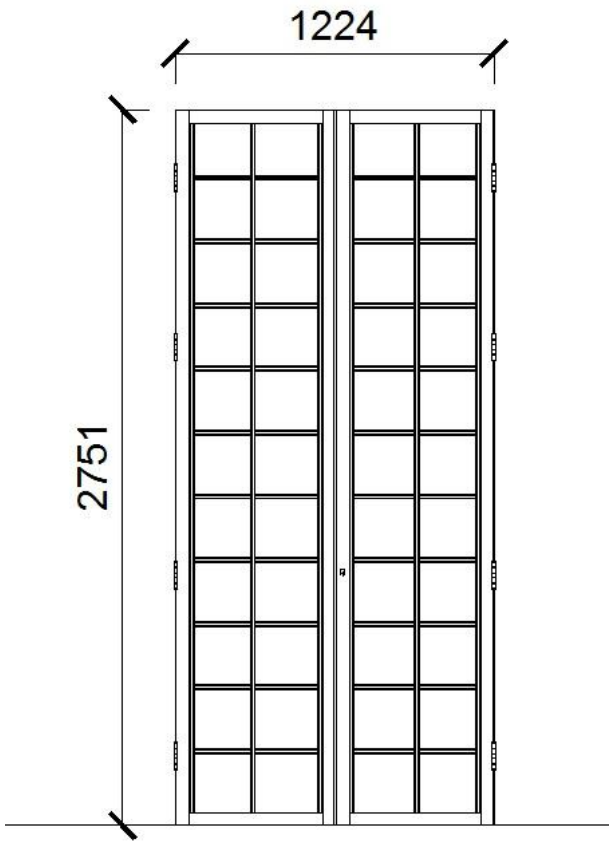


Diagram 6.26 Metal grill used for the exterior wooden doors at the ground floor

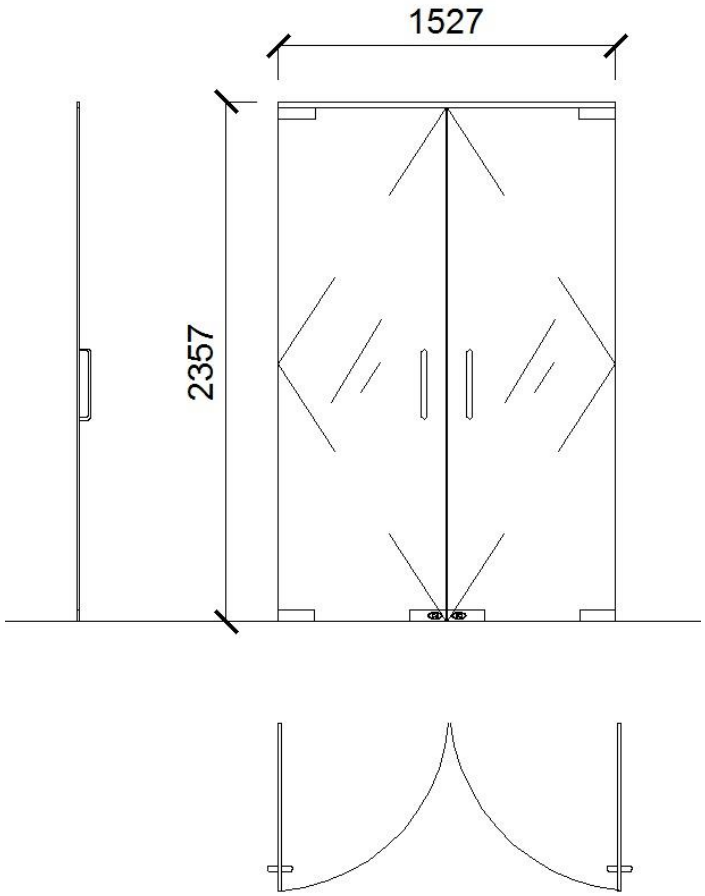


Diagram 6.27 Glass door located at end of both sides of the courtroom

6.2 Window

6.2.1 Double casement window

Most of the windows that are used in the building are double casement windows of Georgian Colonial style . Double casement windows are windows that swing outwards like doors, to give maximum ventilation and sunlight to the interior. Colonial style windows are normally divided into equally numbered panes and can be commonly seen in sets of 9,6, or 4. The window panes are constructed of aluminum.

Figure 6.3

6.2.2 Fixed window

A fixed window is a window that cannot be opened, in which its function is only limited to allowing light to enter. In the attic room on the second floor, there is an arch-half round colonial window decorated with stained glass. Along the courtroom above the double casement windows, there are also round colonial style windows. These windows are all fixed windows.

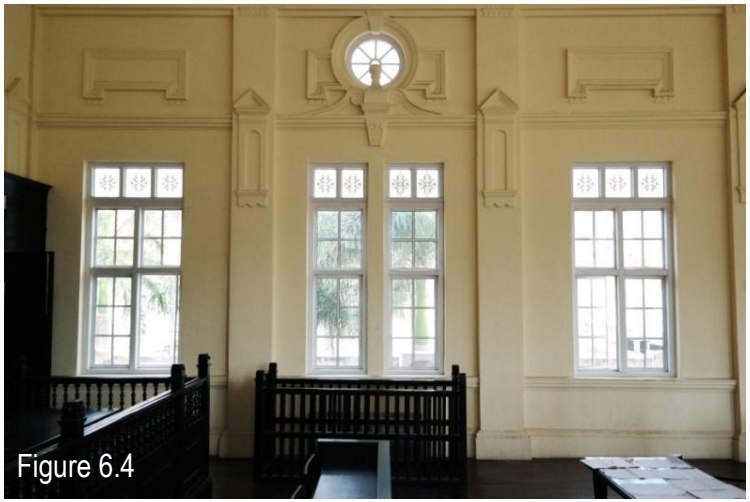


Figure 6.4

6.2.3 Location of windows

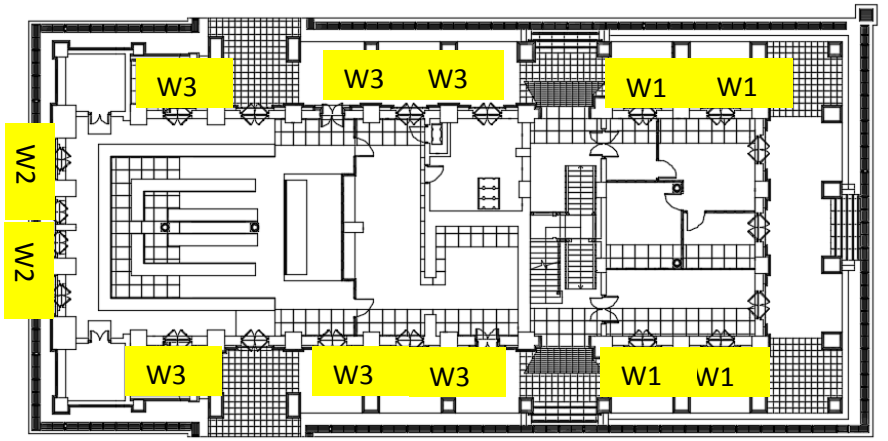


Diagram 6.28

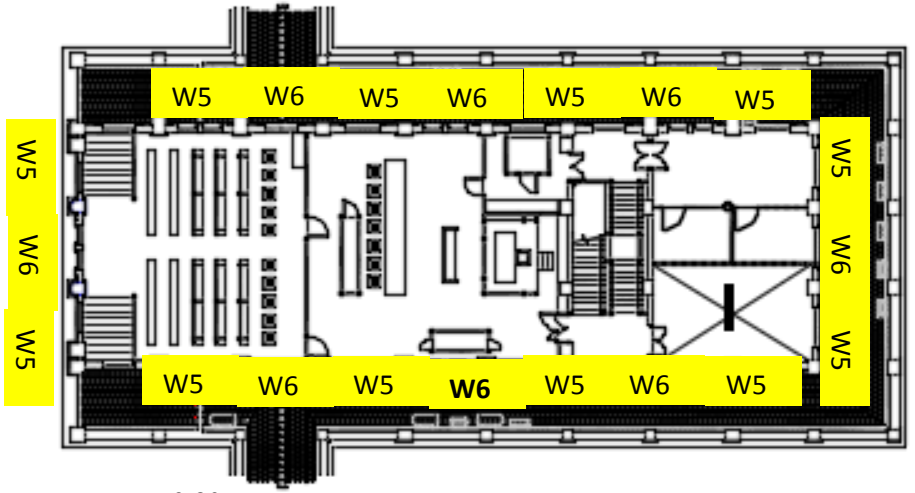


Diagram 6.29

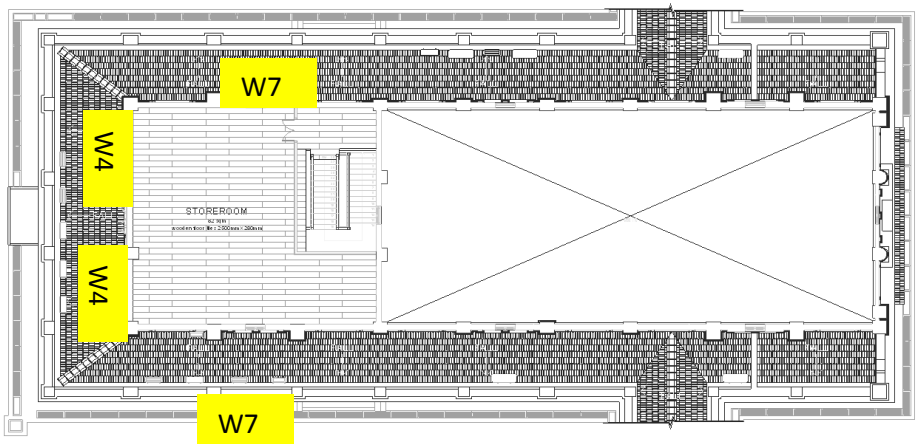


Diagram 6.30

6.2.4 Window Details

W1: Window 1

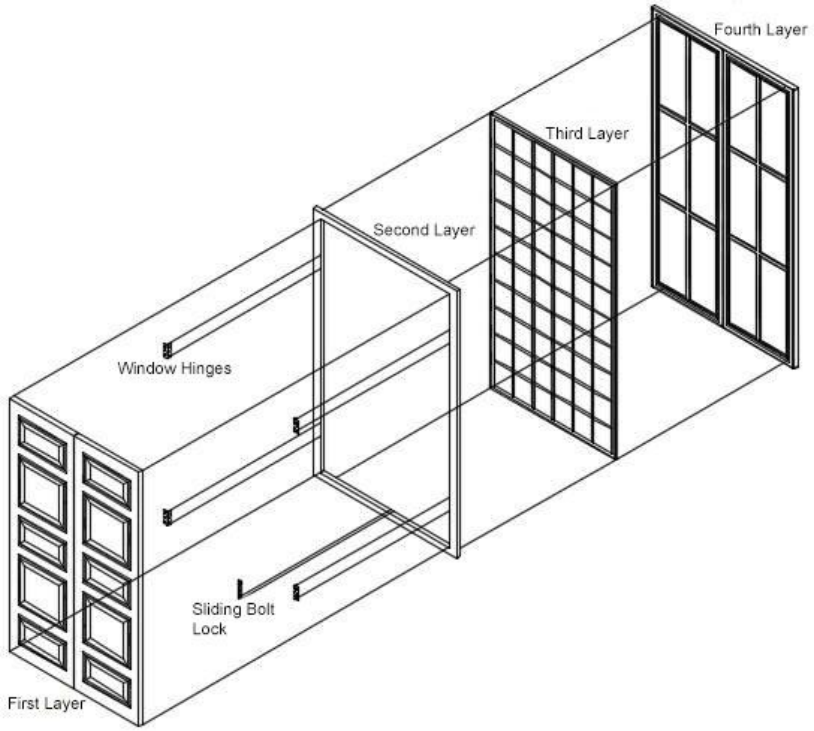


Diagram 6.31 Double casement aluminum window located at ground floor office.

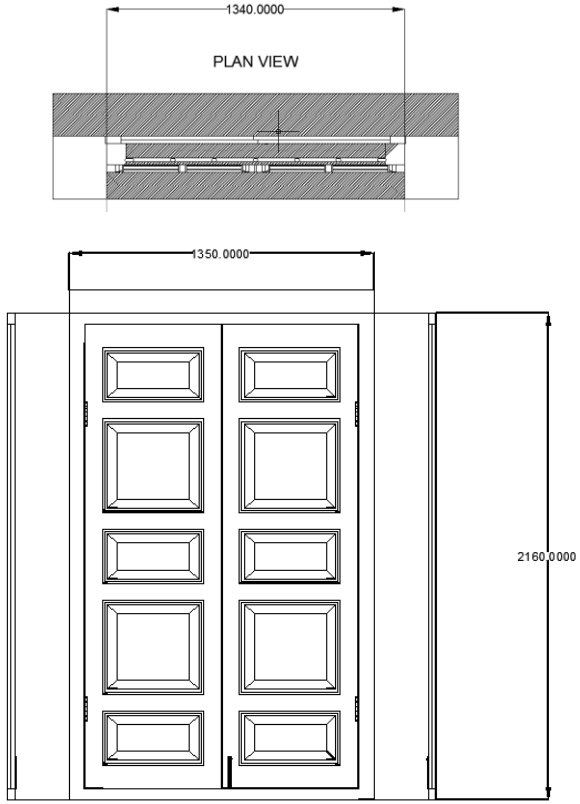


Diagram 6.32

W2: Window 2

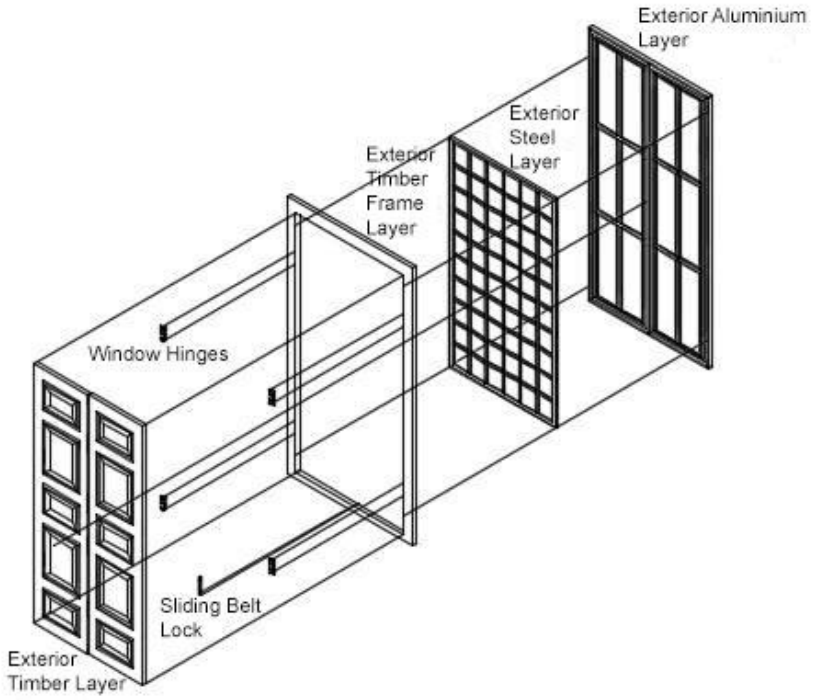


Diagram 6.33 Double casement aluminum window located in the meeting room at the front elevation.

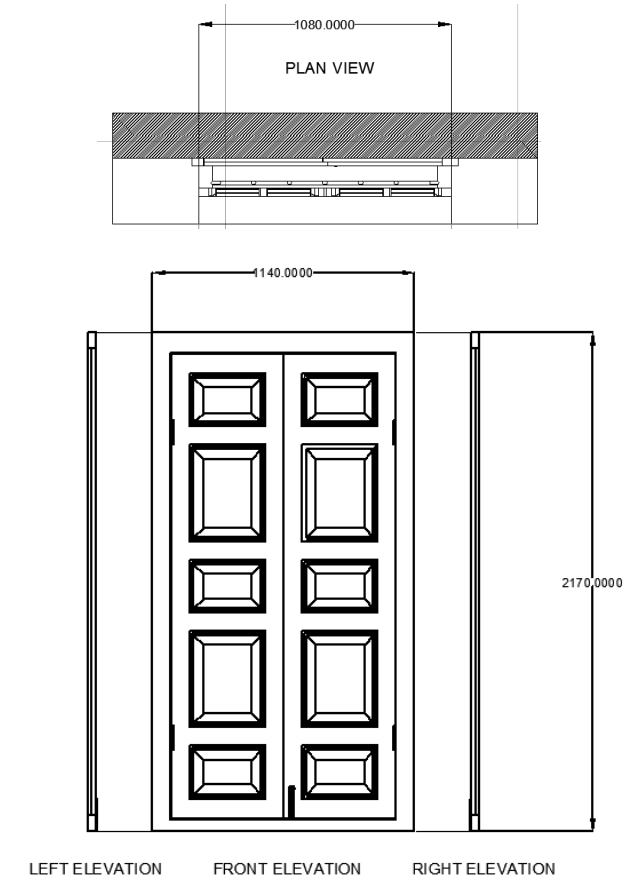


Diagram 6.34

W3: Window 3

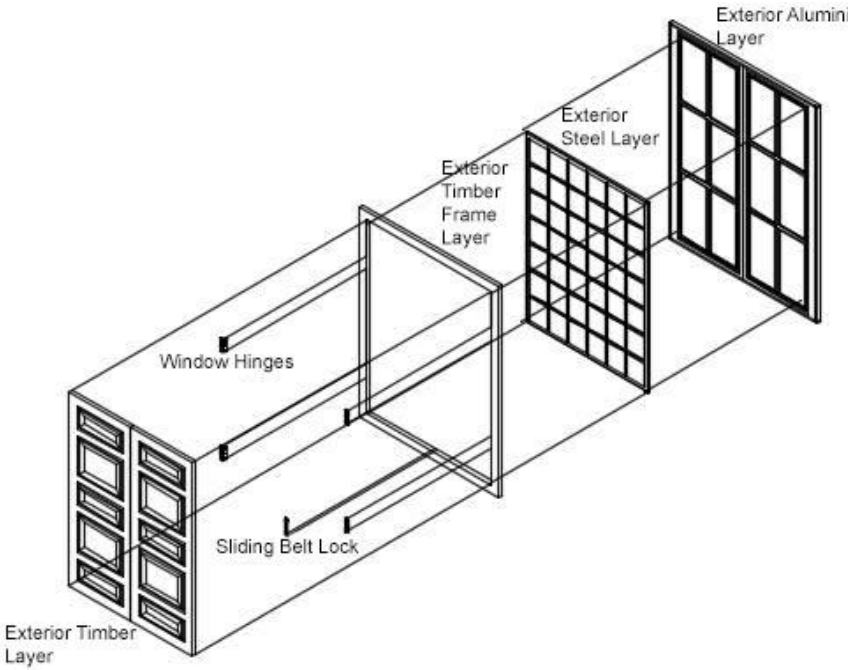


Diagram 6.35 Double casement aluminum window located at the right and left elevation of the meeting room.

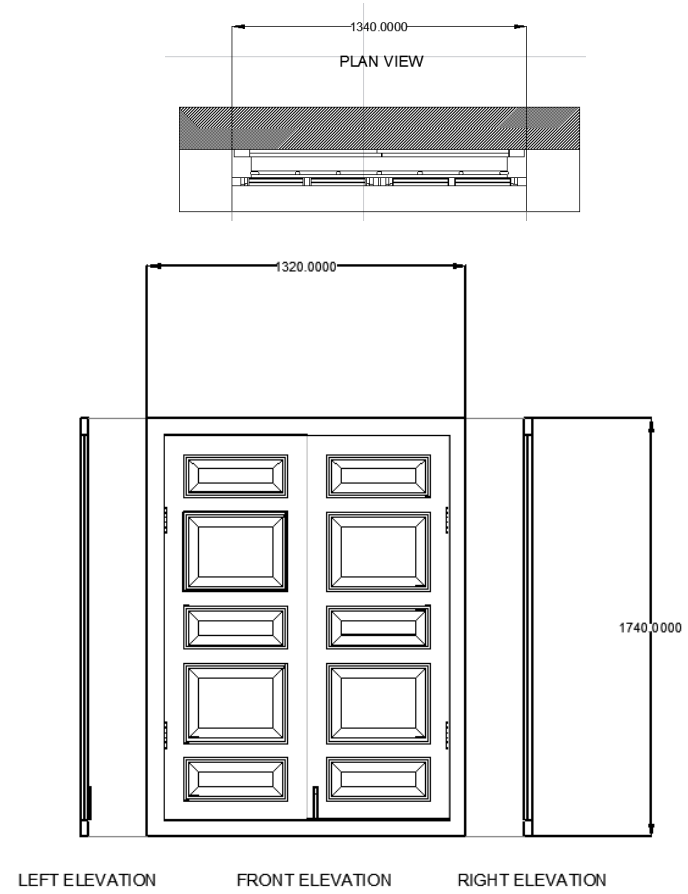


Diagram 6.36

W4: Window 4

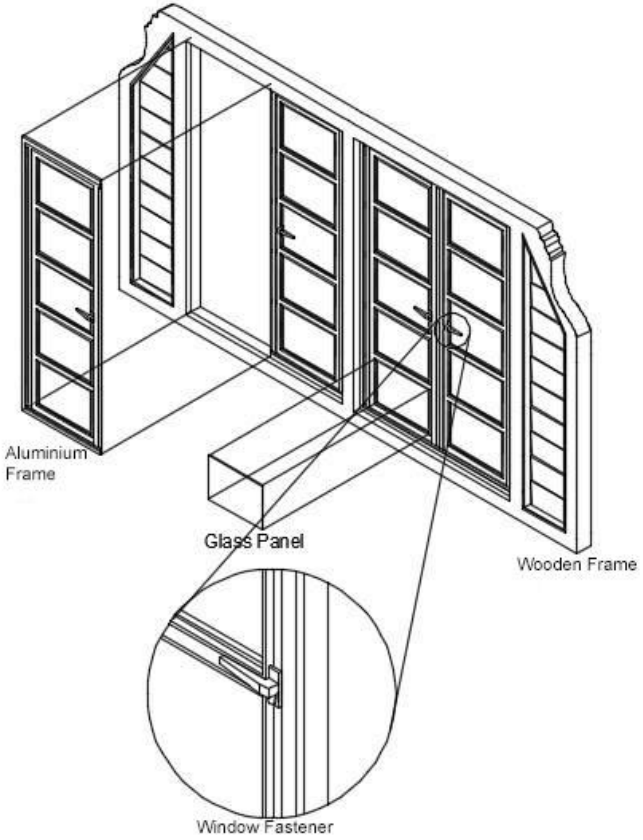


Diagram 6.37 Double casement timber window located on the second floor.

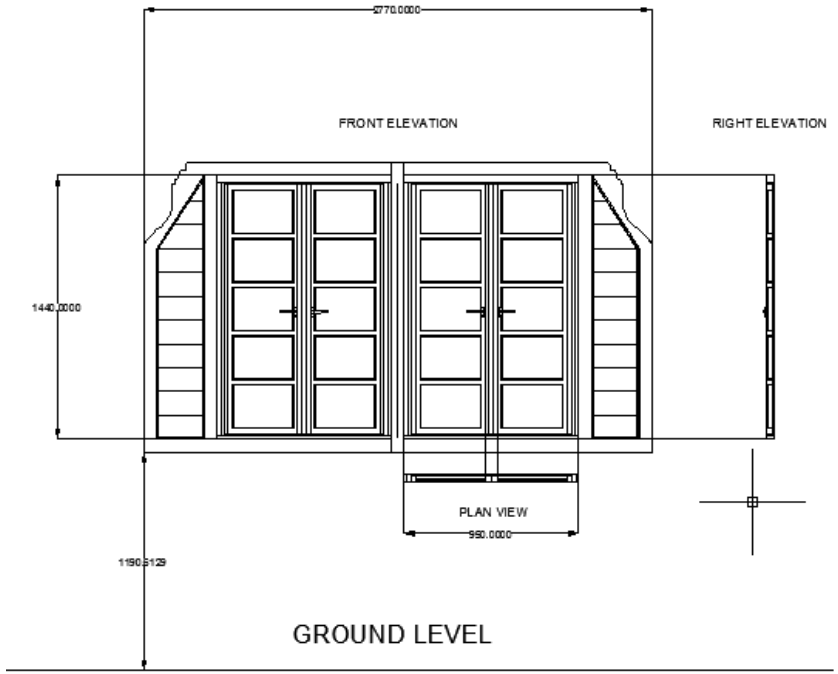


Diagram 6.38

W5: Window 5

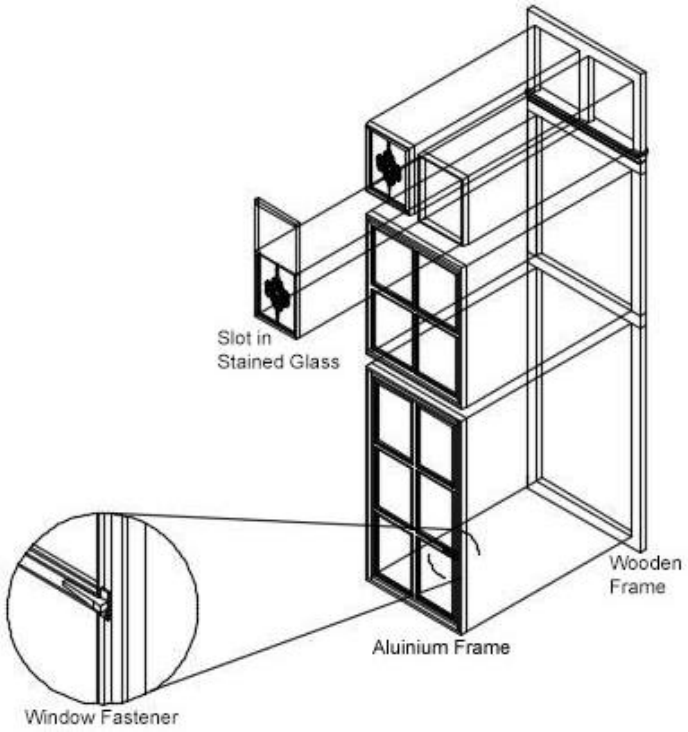


Diagram 6.39 Double casement aluminum window located at the first floor courtroom.

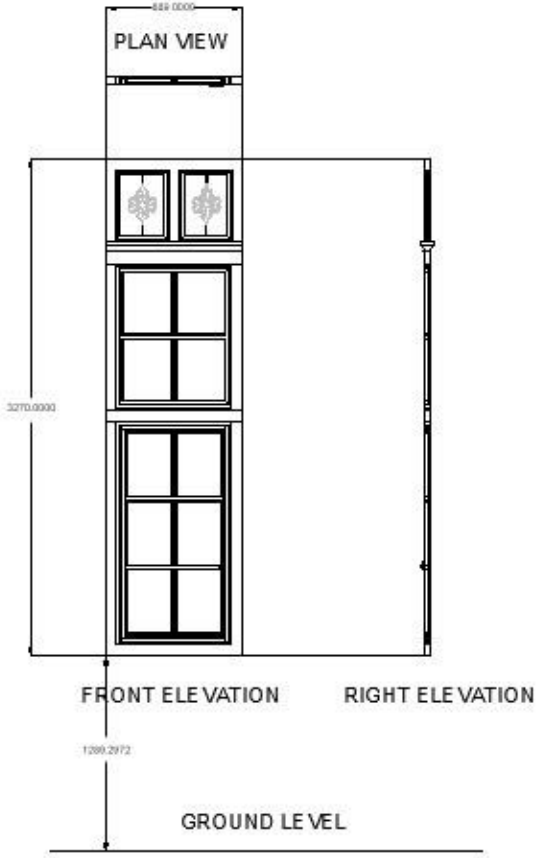


Diagram 6.40

W6: Window 6

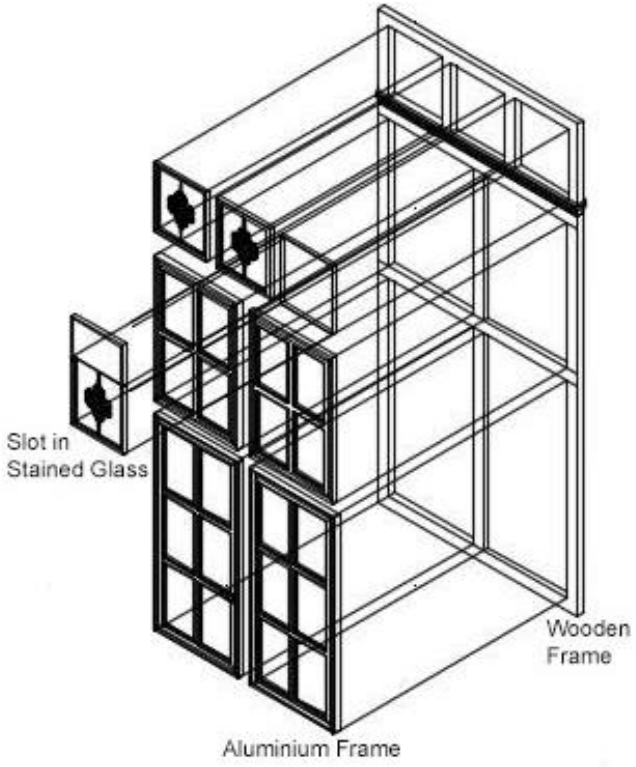


Diagram 6.41 Double casement aluminum window located at the first floor courtroom

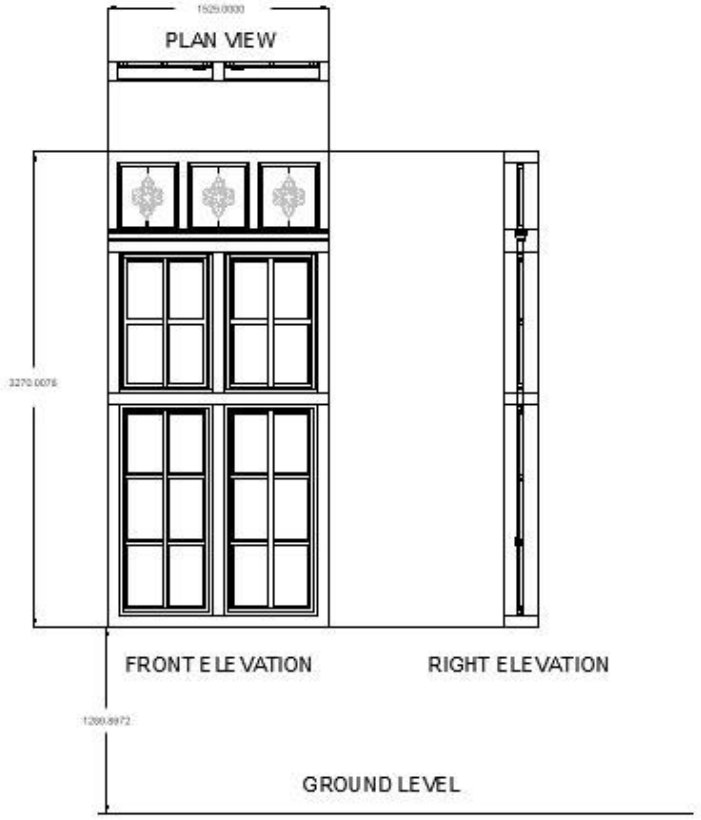


Diagram 6.42

W7: Window 7

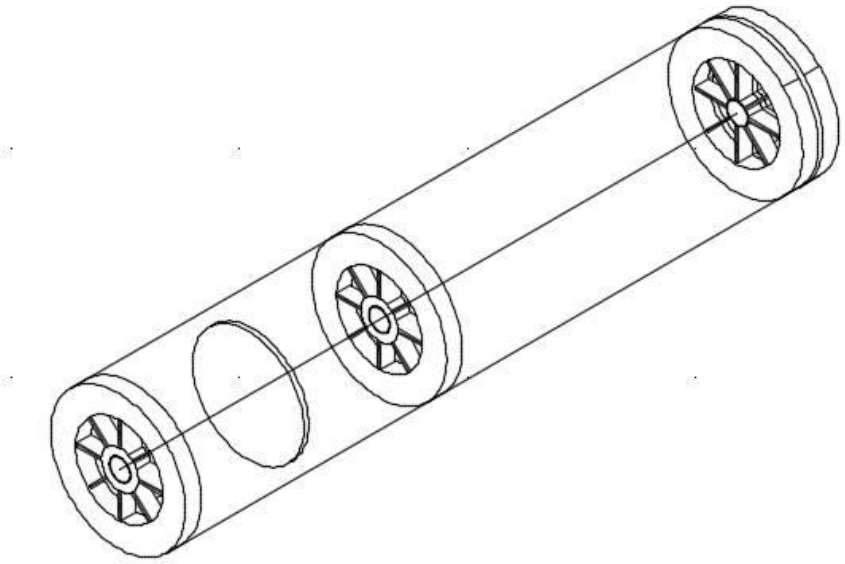


Diagram 6.43 Fixed timber window located on the second floor.

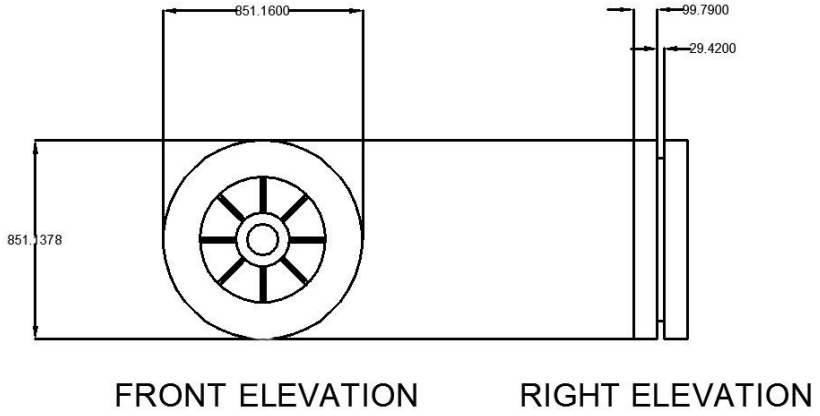


Diagram 6.44

6.3 Flooring system

The floor joist system of the first floor of the building is a one-way timber joist slab. It is constructed of timber framing in which it carries both a floor and the ceiling with just a set of timber joists.

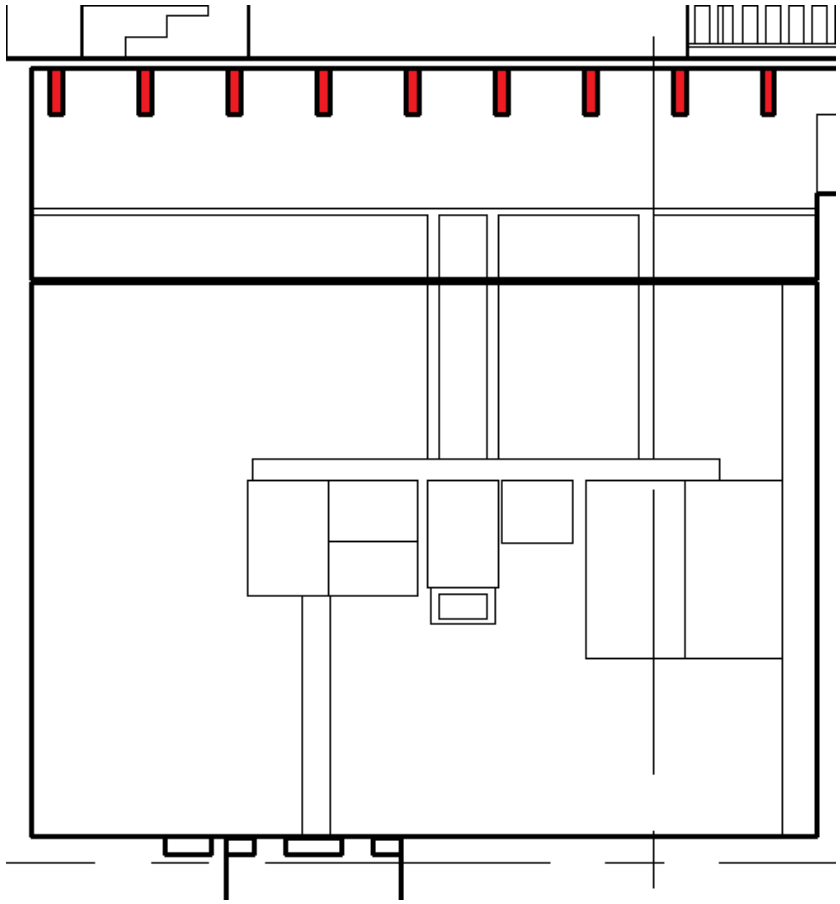


Diagram 6.45 Timber floor joist highlighted, which makes up the the first floor floor joist.

6.4 Staircase

6.4.1 Straight staircase

The straight staircase in this building is made of granite. These staircases lead from the exterior to the corridor of the building and also from the corridor to the toilet located at the back of the building.

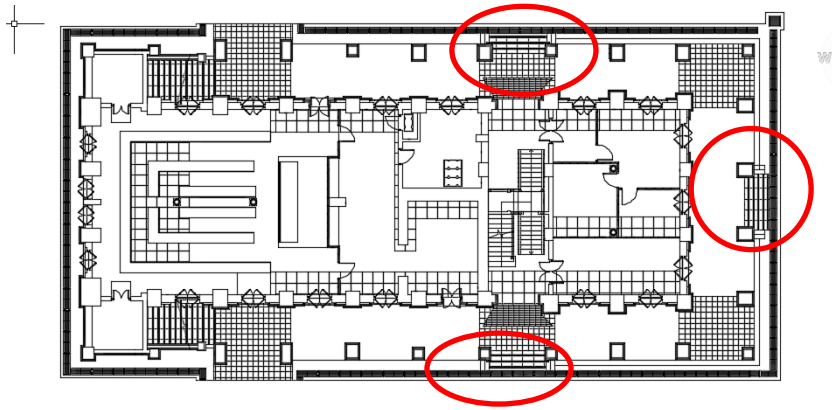


Diagram 6.46

6.4.2 Half-landing Staircase

There are two types of half-landing staircases in this building: Timber half-landing staircase and granite half-landing staircase. The first half-landing staircase consists of granite staircase and timber staircase, as highlighted in green in the diagrams on the right. They connect the corridors on the ground floor to the courtroom on the first floor. Another timber half-landing staircase is the main staircase located at the middle of the building, connecting the ground floor to the second floor, which is highlighted in red in the diagram on the right.

Diagram 6.47

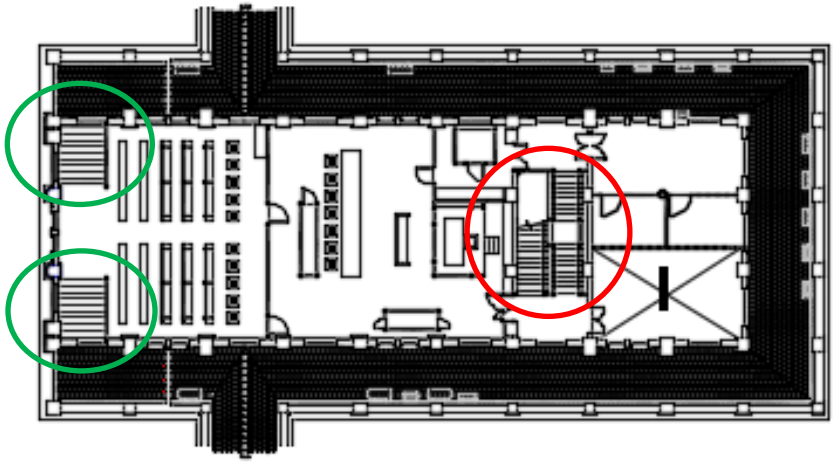


Diagram 6.48

6.4.3 Staircase Details

Staircase 1

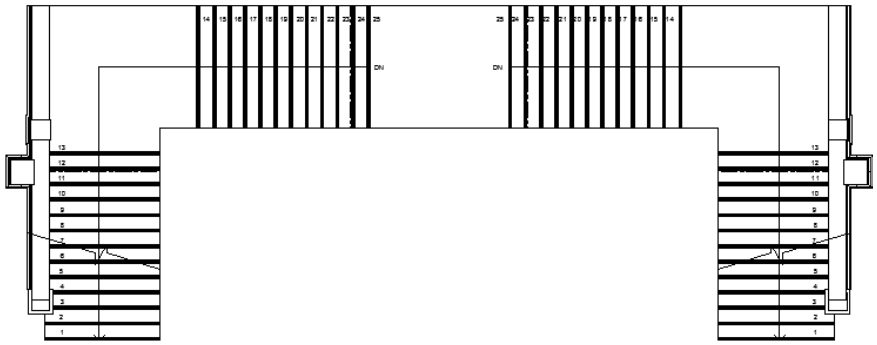


Diagram 6.49 Plan View of Staircase 1.

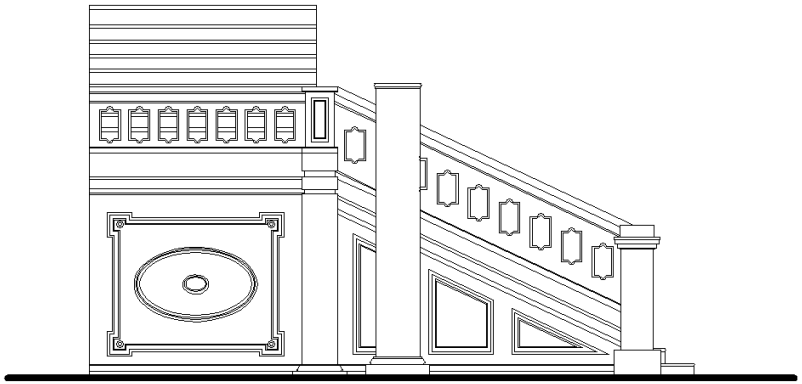


Diagram 6.50 Elevation of Staircase 1.

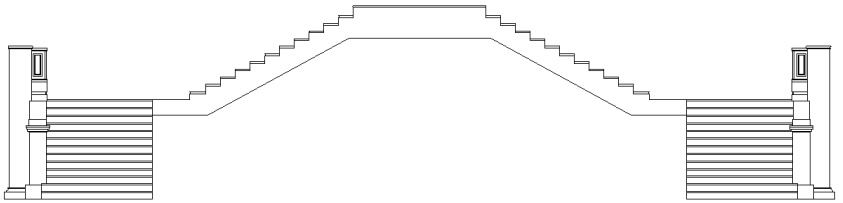


Diagram 6.51 Section of Staircase 1.

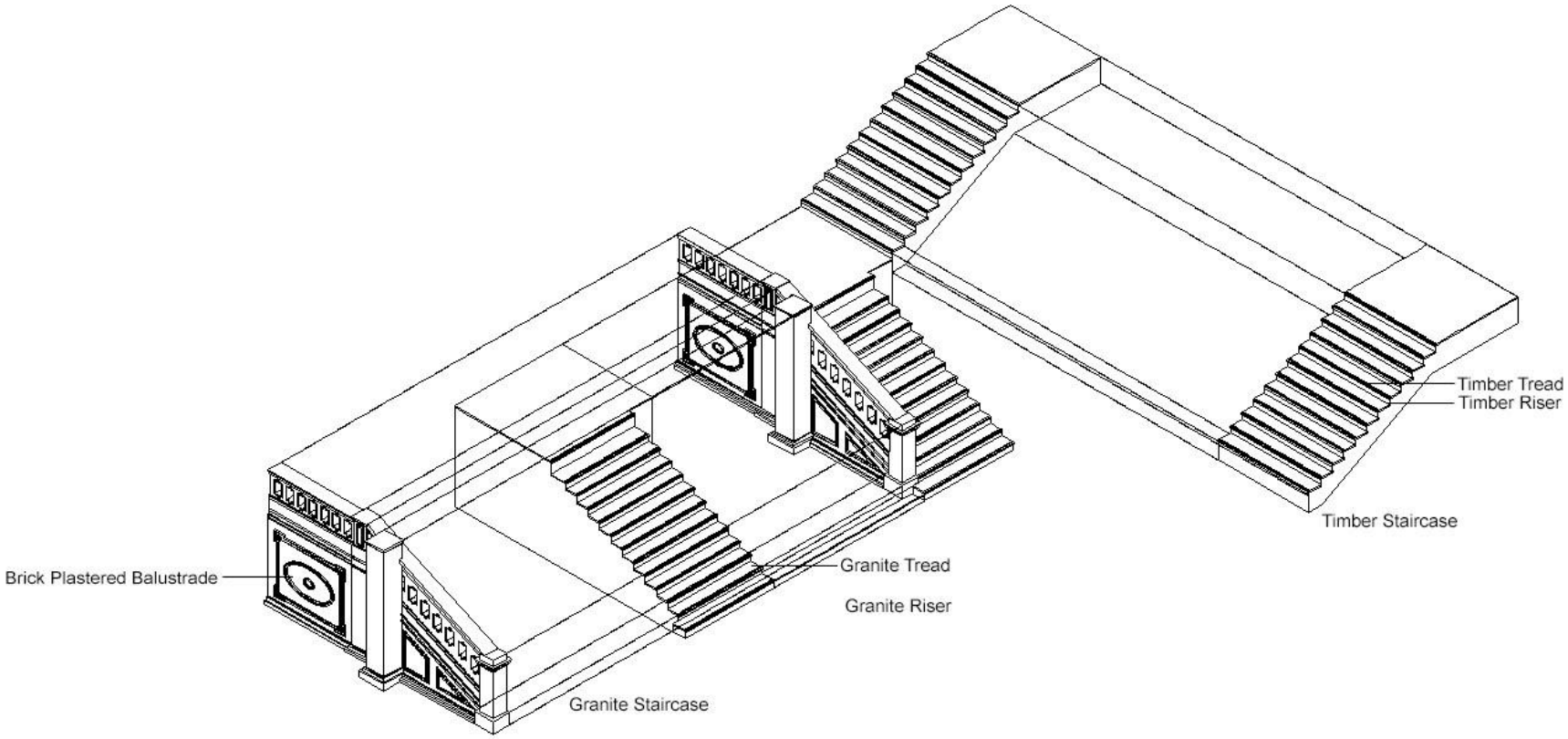
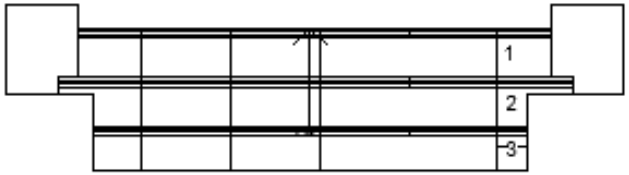


Diagram 6.52 Granite half-landing Staircase 1 and Timber Staircase 1 that leads to the courtroom on the first floor.

Staircase 2



PLAN VIEW

Diagram 6.53

Diagram 6.54 Front elevation and section of Staircase 2.

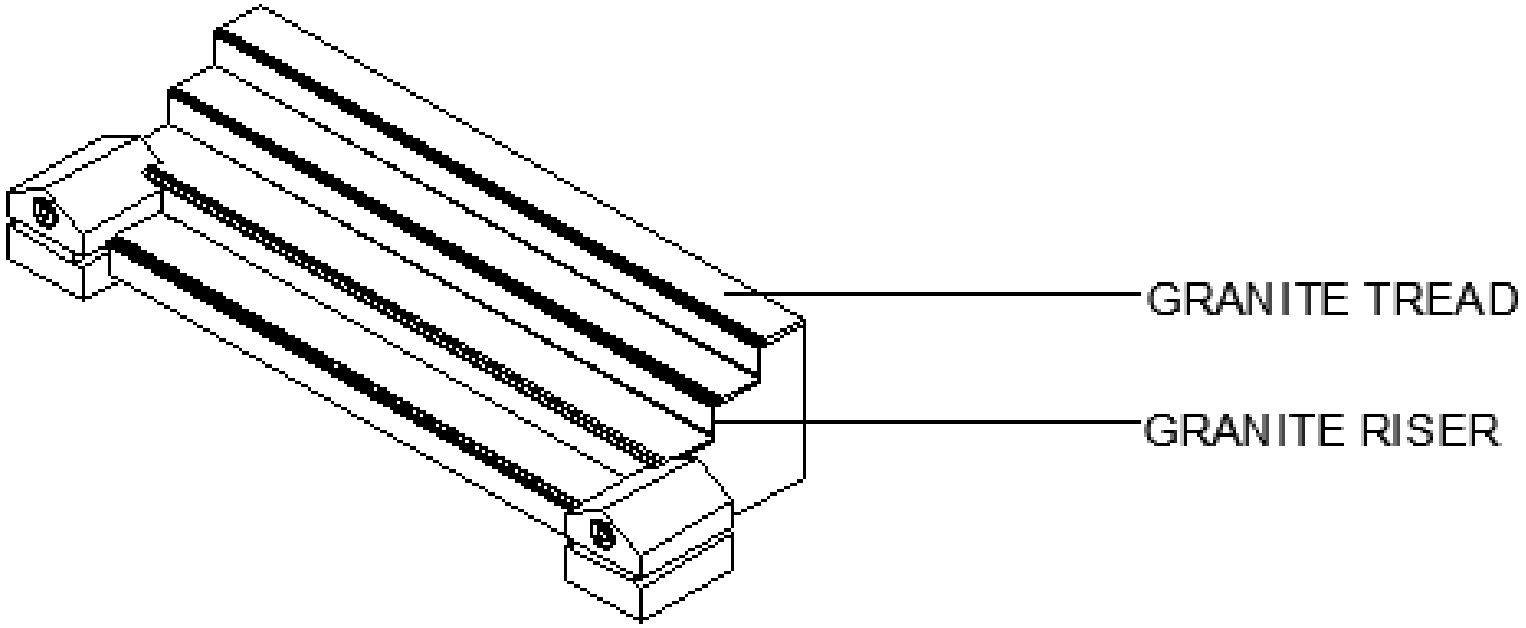


Diagram 6.55 Granite straight Staircase 2 leading from the exterior to the corridor of the building

Staircase 3

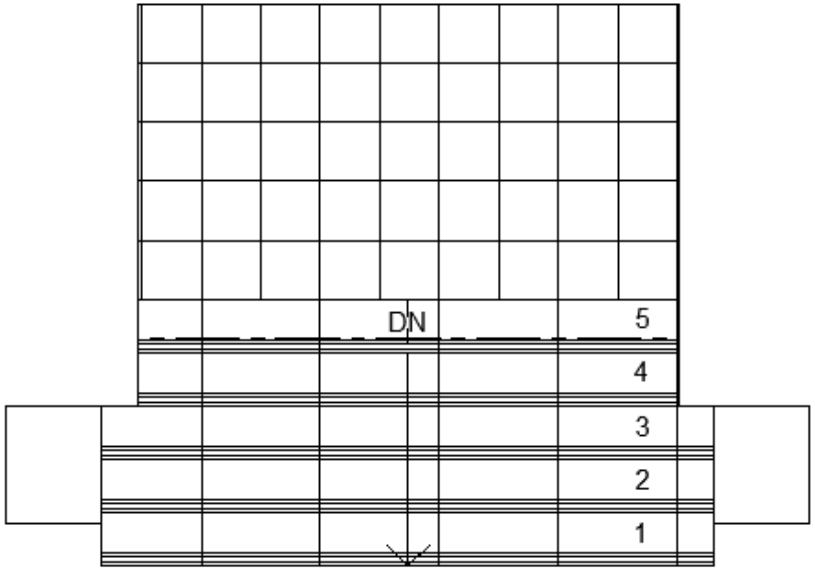


Diagram 6.56 Plan view of Staircase 3

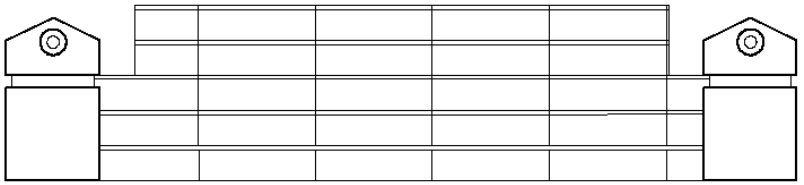


Diagram 6.57 Front elevation of Staircase 3

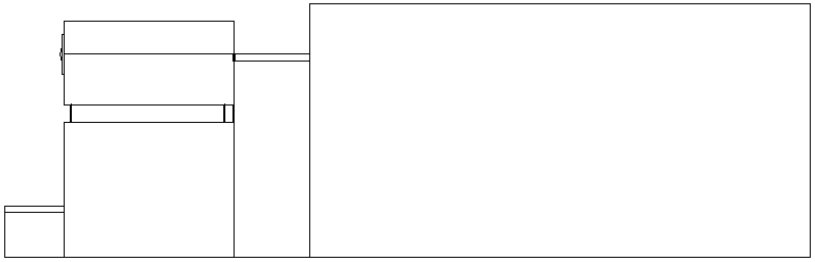


Diagram6.58 Section of Staircase 3

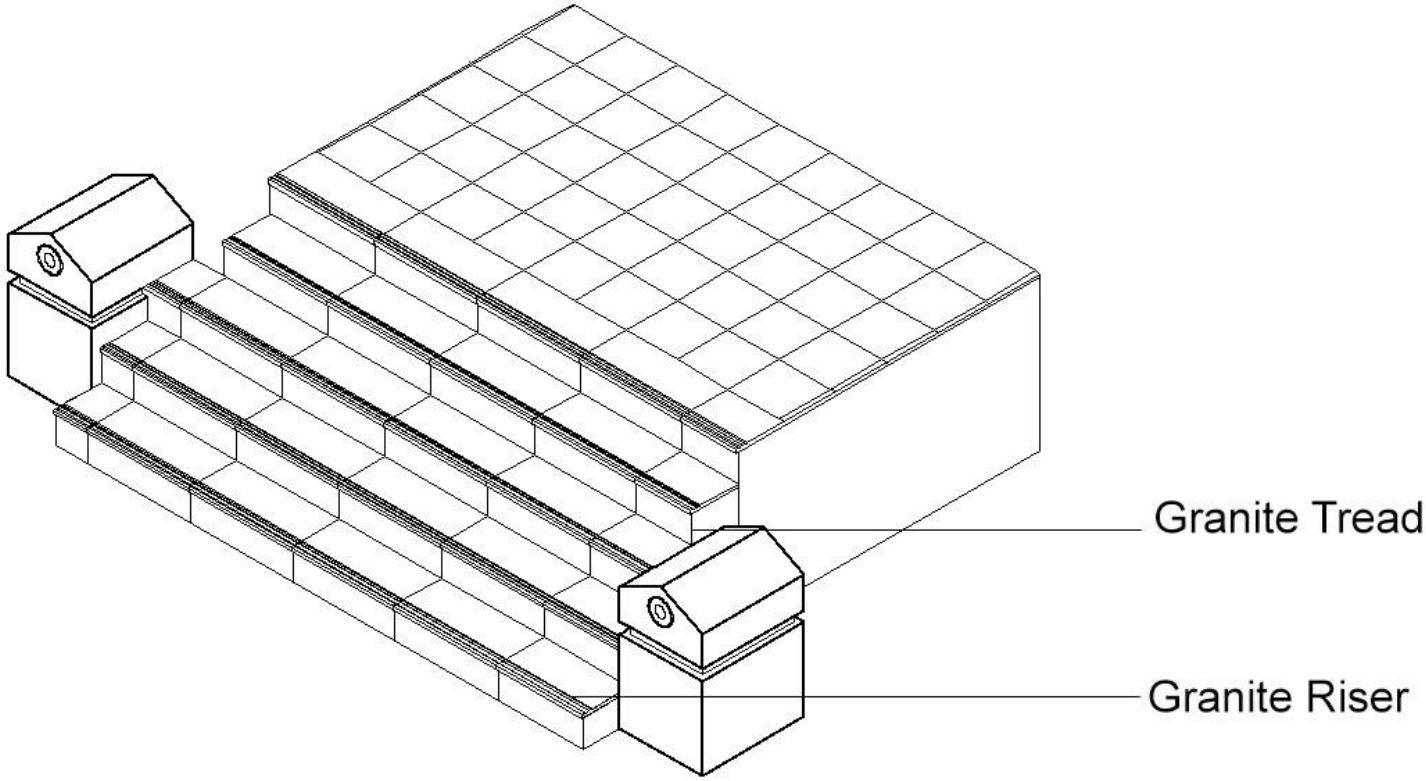


Diagram 6.59 Granite straight Staircase 3 leading from corridor to the toilet located at the back of the building.

Staircase 4

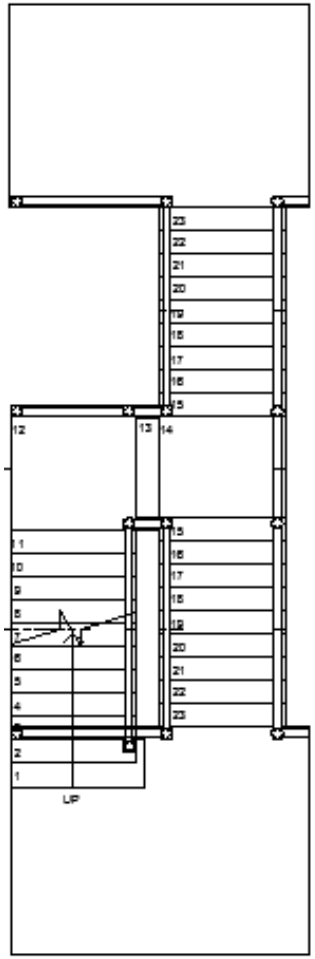
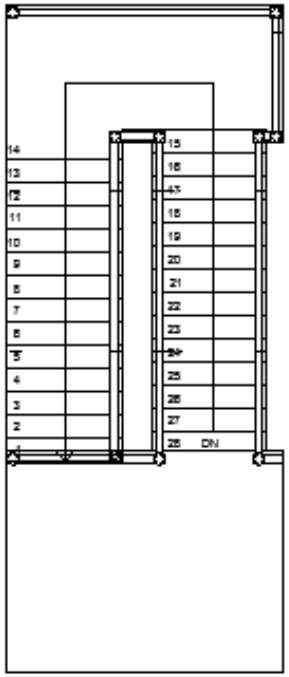


Diagram 6.60 Plan view of Staircase 4.



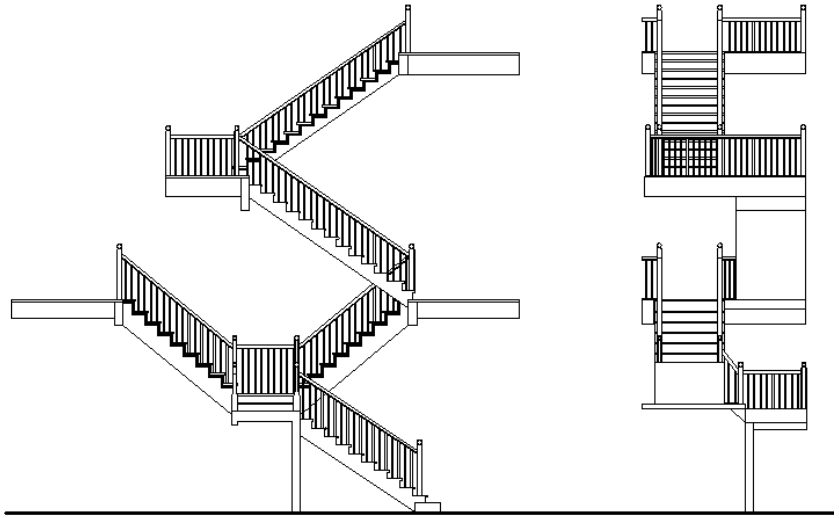


Diagram 6.61 Section and rear elevation of Staircase 4.

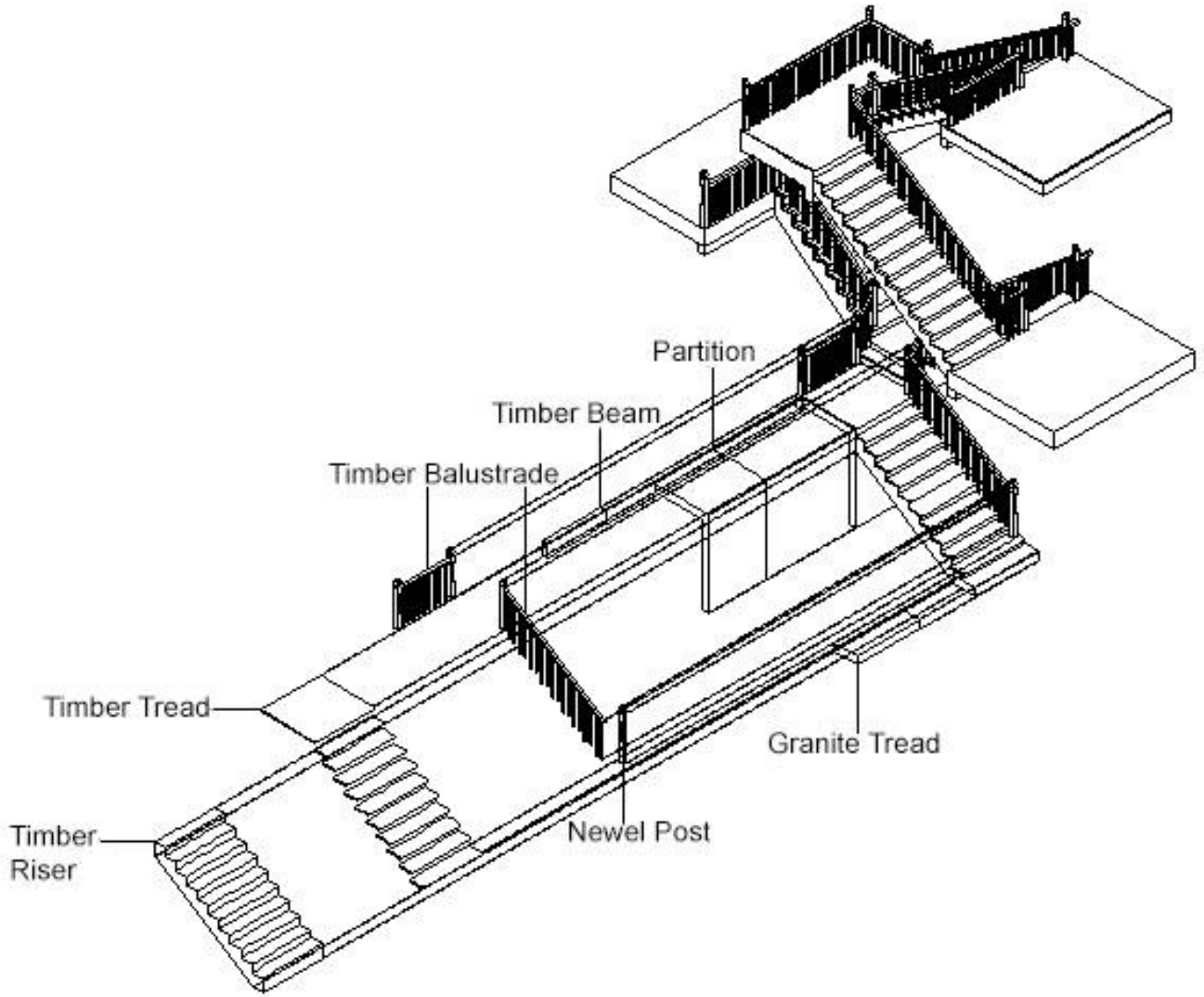


Diagram 6.62 Timber half-landing Staircase 4 leading from first to second floor.

6.5 Building Conservation

There are many causes of decay in the building structure.

6.5.1 Climatic cause

Wind, rain, temperature changes, solar radiation, humidity & moisture, particulate, smoke, dust or sand particles are the main climatic cause of decaying.

6.5.2 Biological and botanical causes

Fungus, incects, birds, moss and vermin are living things that inhabit parts of the building, causing the decay of building structures.

6.5.3 Poor building management

Vandalisme by visitors is also one of the main cause of decaying.

6.6 Causes of decay on the building materials

6.6.1 Brick

Rainwater that percolates down through the open texture of the brick accumulates on the ledges, decaying it overtime. Expansion of the brickwork panels caused by sulphate attack on the bonding mortar lead to the formation of vertical cracks.

Figure 6.5

6.6.2 Plaster

Cracking and failure are often caused by absorption of moisture or by cyclical expansion and contraction of the clay. Moisture increases the susceptibility to fungal rot and beetle attack. Mechanical damage is also caused by contractors or window cleaners leaning against it.

Figure 6.6

6.6.3 Marseille Terracotta Roof Tile

Rust and corrosion of fixings may shatter terracotta. Failure of mortar joints and the different movement patterns between terracotta and its substructure can cause cracking.

Figure 6.7

6.6.4 Ceramic Tile

The corrosive actions of various substances (solid, liquid or gas) that come into contact with the tile surface causes deterioration. Persistent efflorescence arise from rising moisture where inadequate damp resisting construction had been carried out.

Figure 6.8

6.6.5 Gypsum Partition Board

Gypsum Partition Boards can be damaged when it remains exposed to water for an extended period of time. Moreover, the paper backing found on most gypsum boards may be supportive to the growth of mold.

Figure 6.9

6.6.6 Timber

Most timber decay if it is damp, and the rapidity depends upon its durability. If the moisture content of wood exceeds 20%, fungal rots, insect infestation and termite attack will take place.

Figure 6.10

6.6.7 Stained Glass

UV light from sunlight, indoor and outdoor man-made pollution, and biological damage often causes panels to become encrusted with a thick layer of dirt. The breakdown of the skeletal structure that holds the glass in place often poses the greatest and imminent risk to stained glass work.

Figure 6.11

C H A P T E R 7

Building Materials

7.1 Climate Conditions

7.2 Structural Materials

7.3 Finishing Materials

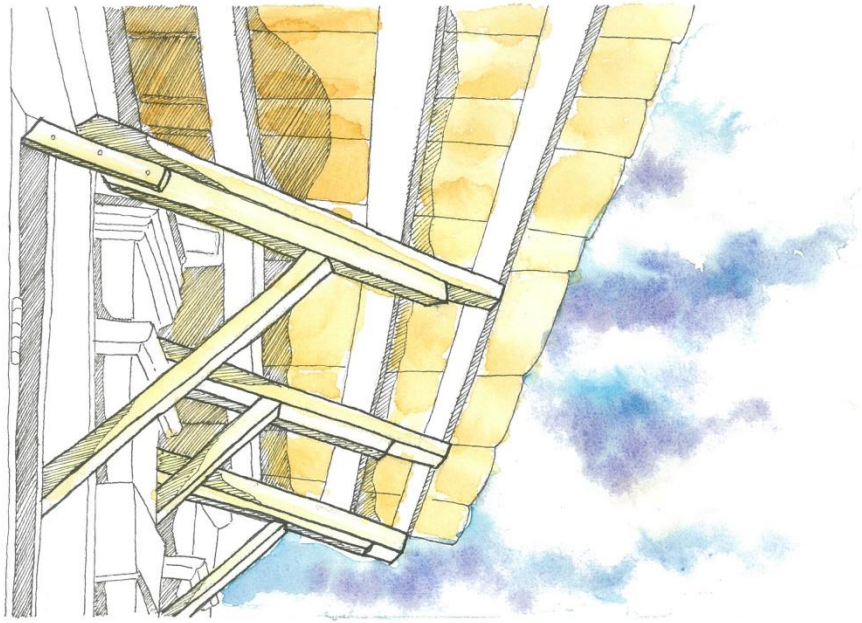
7.4 Furnishing Materials

7.5 Furniture

7.1 Climatic Conditions

It is important to consider the climatic conditions of Malaysia and its effect on building materials. Like many other tropical countries, Malaysia has heavy rainfall and warm sunshine all year round. This implies that buildings in the country tend to weather rapidly, particularly in respect to external building materials which are exposed to external causes such as rain, wind, solar radiation including ultra-violet light; and atmospheric pollution. Fungal stain, harmful growth, peeling paint, erosion of mortar joints and defective plastered rendering are a few examples associated with this factor.

Most of the historical buildings in Malaysia use building materials which are easily available locally. Such building materials include timber, stone, brick and plaster. In the care and conservation of historical buildings, understanding the nature of the building materials and accurate diagnosis of defects is most important. This is because historic buildings are, like older people, vulnerable to all sorts of diseases.



Sketch by Edwin Ho

The construction of a building is a complex procedure and requires many steps and precautions. Choosing appropriate building materials, as well as taking into consideration the local climate conditions, are important factors in the making of a quality building.

Batu Gajah is located in a tropical climate with high temperature and humidity. Several materials can be found within the construction of the courthouse as shown in Table 0.0.

	Before renovation	After renovation
Materials	Timber Plaster Brick Masonry Walls	Ceramic tiles Partition board Glass

Table 7.1

7.2 Structural Materials

7.2.1 Brick Masonry Walls

During the colonial period, people chose to use bricks because it can form a permanent structure that can stand for a long period. Laying the bricks perpendicular to the building can help to reinforce the structure, keeping it stable and strong. Most of the walls at the Court House are made of red brick masonry walls which have been plastered over and painted with light coloured reflective paint. Furthermore, bricks can provide amazing soundproofing qualities that result in a quieter environment. Brick walls are generally maintenance free except for the occasional painting over. It is a fire resistant material and is also termite resistant *("Benefits", 2007).* In relation to the Court House, the reason for the use of bricks is due to its ability to resist harsh weather and UV degradation; since the building is located in a tropical climate.

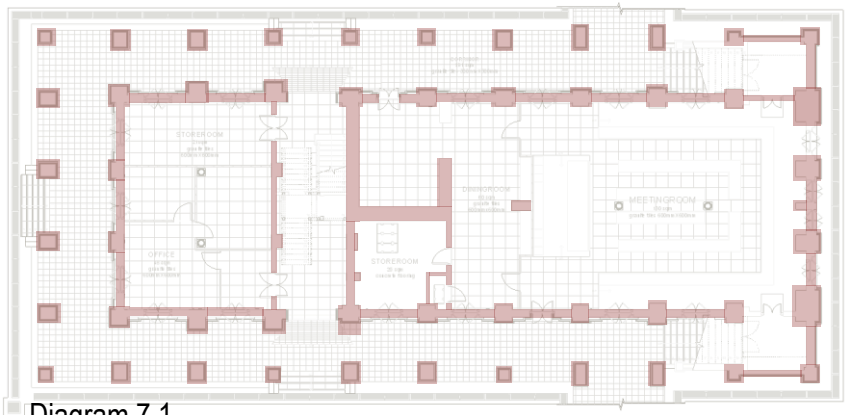


Diagram 7.1

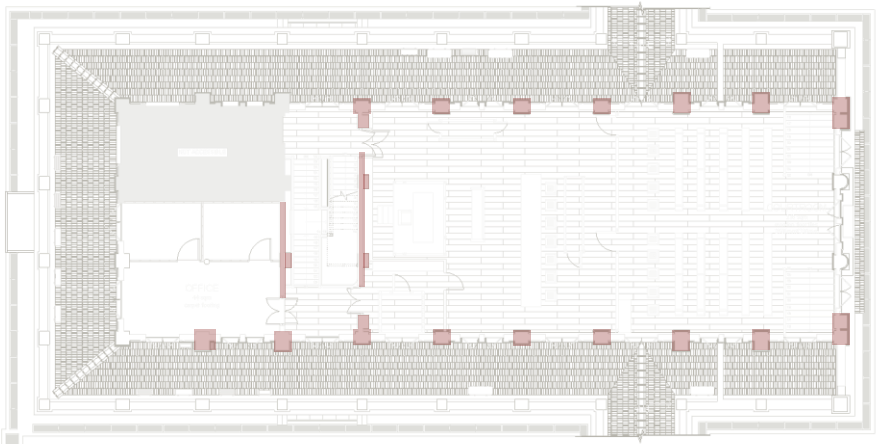


Diagram 7.2

Brick masonry wall

7.2.2 Partition Boards

7.2.2.1 Timber Partition Boards

This type of partition walls consists of a wooden framework either supported on the floor below or by side walls. The framework consists of a rigid arrangement of timber members which may be plastered or covered with boarding from both sides. Such partitions are not fire-resistant and the timber forming the partition is likely to decay or be eaten away by termites. With the introduction of new building materials, the use of timber partitions is gradually reducing these days.

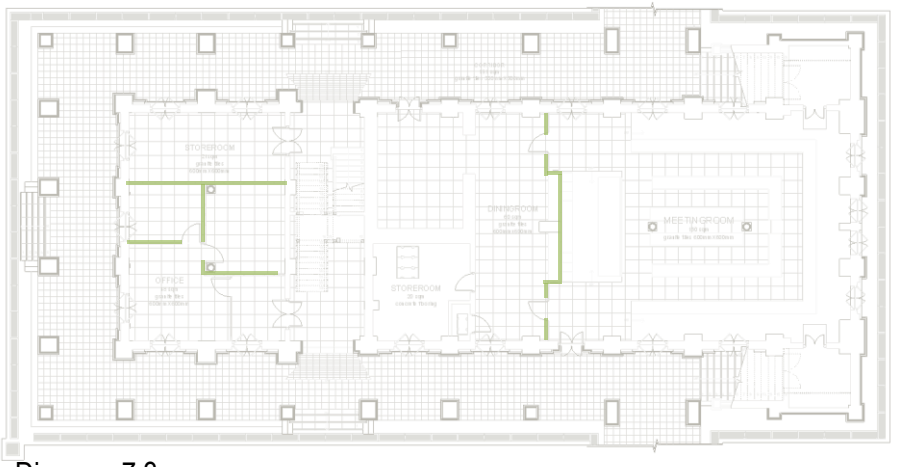


Diagram 7.3

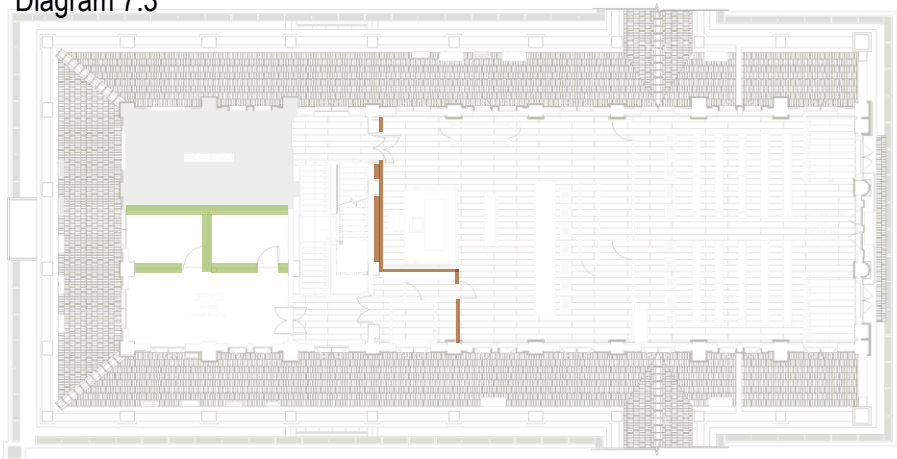


Diagram 7.4

Timber partition board

Gypsum Partition Boards

7.2.2.2 Gypsum Partition Boards

Gypsum partition boards were installed to divide the floor area of the building. They are located in the office at the ground floor, where it separates the counter from the private office for the privacy purposes of the building's inhabitants. It also separates the meeting hall and dining hall. It is a non-load bearing wall. Partition boards are easy to install and disassemble if needed to. These walls are light in weight (Advantages & Disadvantages of Partition Walls ,n.d.). As their cross section is thin, they occupy less area of the floor.

Besides, gypsum partition boards are constructed with metal stud being covered by two pieces of board on either side. Electrical and networking cables and wiring are concealed in between the boards. In this way, the work of wiring is made much easier and faster without the hacking on the wall.

Figure 7.1


Figure 7.2

7.3 Finishing materials

7.3.1 Floor Finishes

Granite tiles flooring

Timber flooring

Marseille double Terracotta roof tiles

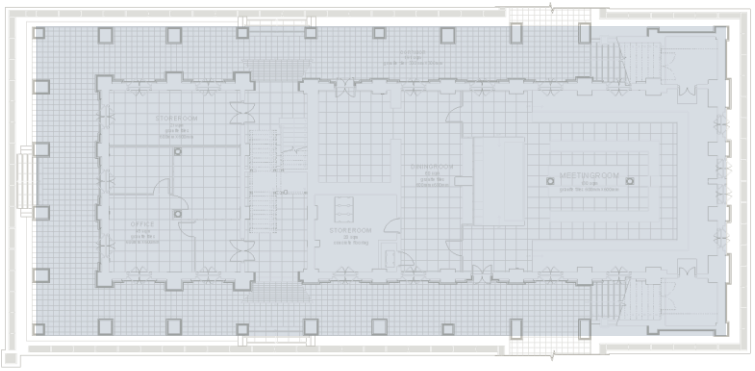


Diagram 7.5

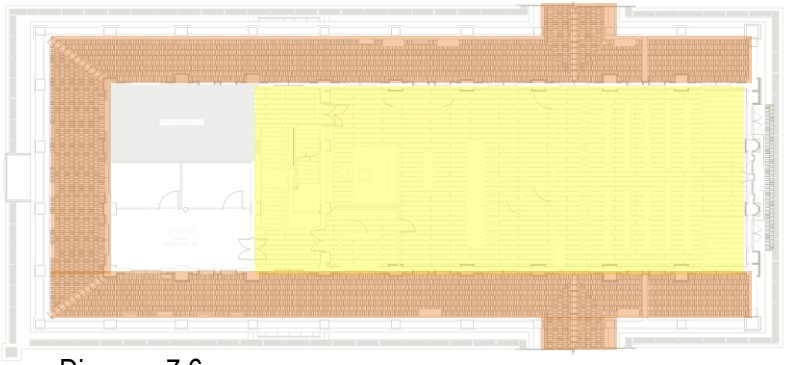


Diagram 7.6

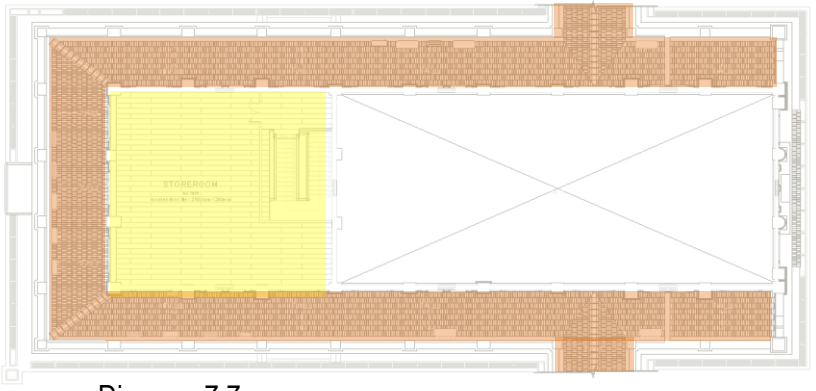


Diagram 7.7

7.3.1.1 Granite Tile Finish

Granite tiles are known for their superior strength, majestic appearance, versatility and many other distinctive characteristics. They have many special durable properties which makes them the most popular natural stone tile. As they are formed from volcanic residues and are igneous forms of rock, they are highly enduring and strong. Due to the properties of being highly advantageous and easily maintained, they are suitable to be used as the building's flooring. The usage of tiles can be seen mainly on the ground floor of the Court House. Being one of the renovated materials, their sturdiness and long-lasting nature make them the perfect option to compensate for the high foot traffic on the ground floor.

Figure 7.3

Figure 7.4

7.3.1.2 Timber Flooring

They designed timber as flooring for the first floor of the Court house to adapt to the hot tropical climate. It is mainly made up of Cengal hardwood. Cengal is a popular form of timber because of it's termite resistivity and durabilty .Timber has outstanding thermal and sound insulation properties which results in a more comfortable environment and is a naturally cooling material. It can hold little heat and cools adequately at night. They are easily contructed,simple to maintain and the local materials are cheap during that period. The performance of timber can be easily enhanced with preservative treatments, flame retardants and surface coatings.

Both the first and second floor utilize timber flooring, as opposed to the ground floor, which uses tiles. Timber has aesthetic value. More over, timber construction do not require heavy lifting equipment, making building sites safer work places.

Figure 7.5

Figure 7.6

7.3.2 Marseille Double Terracotta Roof Tiles

Instead of the traditional cement and mortar, roof tiles on the Court House were installed using the dry fixing method, resulting in better roof ventilation and energy saving. Marseille double terracotta roof tiles are interlocked at the head and side for protection against harsh weather. The tiles were laid staggered from the right to the left. Terracotta tiles has the benefits of high colour retention and negligible maintenance requirements. Unlike other materials, Terracotta roofing substantially retains its appearance with age, maintaining the aesthetic appearance of the courthouse over time.

Figure 7.7

Figure 7.8

7.3.3 Stained Glass

The term ‘stained glass’ refers to coloured glass as a material or to works created from it. Throughout its thousand-year history, the term has been applied almost exclusively to the windows of churches and other significant buildings. Classic transom lights are an important feature of the Georgian window.The installation of stained glass in the building creates aesthetic value. These windows are used throughout the building in windows in the courtroom and also in the attic.

Figure 7.9

Figure 7.10

7.4 Furnishing Materials

7.4.1 Plaster

Like timber, stone or brick; plaster tend to deteriorate over a period of time. Plaster normally contains lime, sand and water. Plaster is used to cover or sheath the brick surface, used as a finishing for the exterior walls. It is durable and can protect the walls from wear and tear . Besides, It is used widely in decorative panels, ceiling renderings, cornices and internal walls. The main reason why they plaster the surface of the building is to further fireproof a building. Plaster may crack which usually occurs early in the life of the building but substrata movement is often the reason for failure in historical situations. Most of the ornamentations such as the decorative elements that can be found within the building is also made of plaster.

Figure 7.11

Figure 7.12

7.4.2 Lime plaster

The plaster used in most lath and plaster construction is mainly lime plaster, with a cure time of about a month. A modern form of this method uses expanded metal mesh over wood or metal structures, which allows a great freedom of design as it is adaptable to both simple and compound curves.

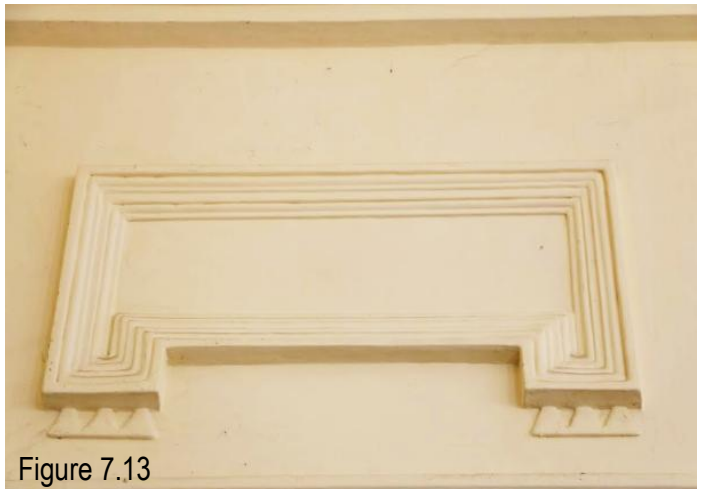


Figure 7.13

Advantages	Disadvantages
Decorative appeal (ornamentation)	Repairing difficulties
Sound insulation	
Fire resistance	
Moisture control	

Table 7.2

7.5 Furniture

The furniture construction of The Courthouse Museum built in the British colonial period was simple, medieval, and based on a few tools. The resulting shapes were massive, boxy, and mostly without ornament, except for an occasional turning to emphasize leg, rungs, stretchers, and backs. In all the colonies, chairs with straight backs and rush seats were common, and new decorative elements found wide acceptance.

Sketch by Yii Hong Gin

7.5.1 Dark wood furniture and floors

Ebony, teak, and mahogany are often used, along with other native woods, to build furniture and houses. The furniture found in British Colonial rooms are frequently of British style.


Figure 7.14

Chair Leg

Elaborate Turning - Turned leg with multiple types of turnings.

(Windsor chair leg)

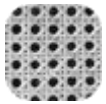
Straight - Straight leg, vertical to chair seat.

Chair back seat

Ladderback or Slatback - Equally spaced horizontal flat slats, either straight or curved.

Ornamentation

Spindle - Turned pieces split vertically, often affixed to the front of case furniture.



Woven Elements

In the 19th century, caned furniture became associated mainly with Dutch and English colonial furniture, because these countries had colonies in places like Indonesia and India where rattan was easily accessed and where the technique may had a long history. This colonial aesthetic spread across the globe to other European colonies as well; caned furniture made sense in tropical climes because, unlike solid woods, it would not warp or crack from heat or humidity.

Figure 7.15

C H A P T E R 8

Conclusion

8.1 Reflections

8.2 Limitations of Current Usage

8.3 Summary

8.1 Reflections

Unlike any other projects in our pass semesters, this short and intensive practicum has been a huge challenge to us in terms of time-management and also teamwork. With just a team of 25 students, we were given only a week's time to measure a large scale building like The Courthouse Museum. We were overwhelmed by the size of it and was also worried about the time range given to us to complete our measuring tasks. During the starting of the week of our site visit, everything went well as planned but at the end of the week, many problems started to surface as some of the team members discovered mistakes in the measurements provided for the Autocad drawing due to inconsistencies in the structures of the building. Team members had to double check the measurements again which took up a significant amount of time. We realized that accuracy in measurements was much needed to ensure efficiency in our work. After the site visit, we had to juggle our manpower in the autocad works, model-making and also the completion of this report. As each of these tasks are linked together, each sub group depends largely on each other. Thus, efficiency in work was required and the stress in facing the dead lines was never ending. However, our determination and cooperation was the fuel to fight the sleepless nights and drive us to complete this project. All in all, this practicum has been a memorable and enriching experience that we will never forget.

8.2 Limitations of Current Usage

To measure an occupied building was a challenging task to us as some of the rooms were locked and were not accessible. The ceilings and walls were also plastered and sealed up, which made it impossible for us to understand the construction details of the building. Moreover, false ceilings that were set up also covered the true measurement of the floor to ceiling height, making it difficult for us to obtain accurate measurements. Furthermore, the alignment of the columns were also inconsistent, which was also one of the difficulties that we faced in producing our measured drawing. Having explored most of the spaces in the building, we discovered that the spaces in the building were not fully used. Empty spaces under the stairs can be fully utilized as storage spaces. There is also an abandoned attic on the highest floor which could be utilized as an office instead of leaving it as a storage space for old documents. Also, some parts of the building was poorly managed and are left in a dirty condition. As a historical building and also a tourist attraction, the condition of the building should be constantly well-kept to maintain its reputation.

8.3 Summary

The Courthouse Museum went through many changes along the way, changing occupancies as well as its overall outlook. Looking through the history of this building and how it changed its function from a District office to a tourist attraction, we can see its development from being an important government building to a place where eople understand Malaysia's cultural heritage. As one of the buildings in the Heritage Trail, it should be given more attention and also proper management so that it remains as an important heritage of the Perak State.

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10.0 Glossary

Balustrades

A railing at the side of a staircase or balcony to prevent people from falling.

Colonial
Characteristic of a colony.

Columns
A structural element that transmits, through compression, the weight of the structure above to other structural elements below.

Cornice
A horizontal decorative molding that crowns a building or furniture element.

Cruciform
The shape of a cross or a Christian cross.

Dentils
A small block used as a repeating ornament in the bedmould of a cornice.

Efflorescence
The loss of water of crystallization from a hydrated or solvated salt to the atmosphere on exposure to air.

Façade
One exterior side of the building.

Fluting
The shallow grooves running vertically along a surface.

Gables
A generally triangular portion of a wall between the edges of a dual-pitched roof.

Jalan
Road.

JKR
Jabatan Kerja Raya or also known as Public Works Department.

Kampung
Village.

Ledges
A narrow, flat surface that sticks out of the wall.

Ornate
Covered with decorations.

Parallax Error
A change in the apparent position of an object relative to more distant objects, caused by a change in the observer's line of sight towards the object.

Pediment
An architectural element consisting of a gable, originally of a triangular shape, placed above the horizontal structure of the entablature, typically supported by columns.

Plaque
A flat, thin piece of metal with writing on it that is used as a reminder of a historical event.

Portico
A porch leading to the entrance of a building, or extended as a colonnade with a roof structure over a walkway, supported by columns or enclosed by walls.

Proximity
Nearness in space.

Stretcher
A horizontal support element of a furniture.

Substrata
A layer of earth beneath the surface soil.

Tongkang
A heavy sailing barge.

Transom
A crosspiece separating a door from a window above it.

Verandah
A roofed opened gallery or porch.

11.0 Appendix

KERAJAAN MALAYSIA
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ASAL

(Kew.38E)
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			Jumlah		**50.00**

Ringgit Malaysia: Lima Puluh Sahaja

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1 SAL. DNMM8101 (PK.7) - BATU GAJAH @ RM20.00 SATU

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PTJ : JABATAN UKUR PERAK
Pusat Terimaan : JABATAN UKUR DAN PEMETAAN PERAK

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No Kebenaran : BNPK(8.15)248-10(SK.6)JD29(52)

By Yii Hong Gin


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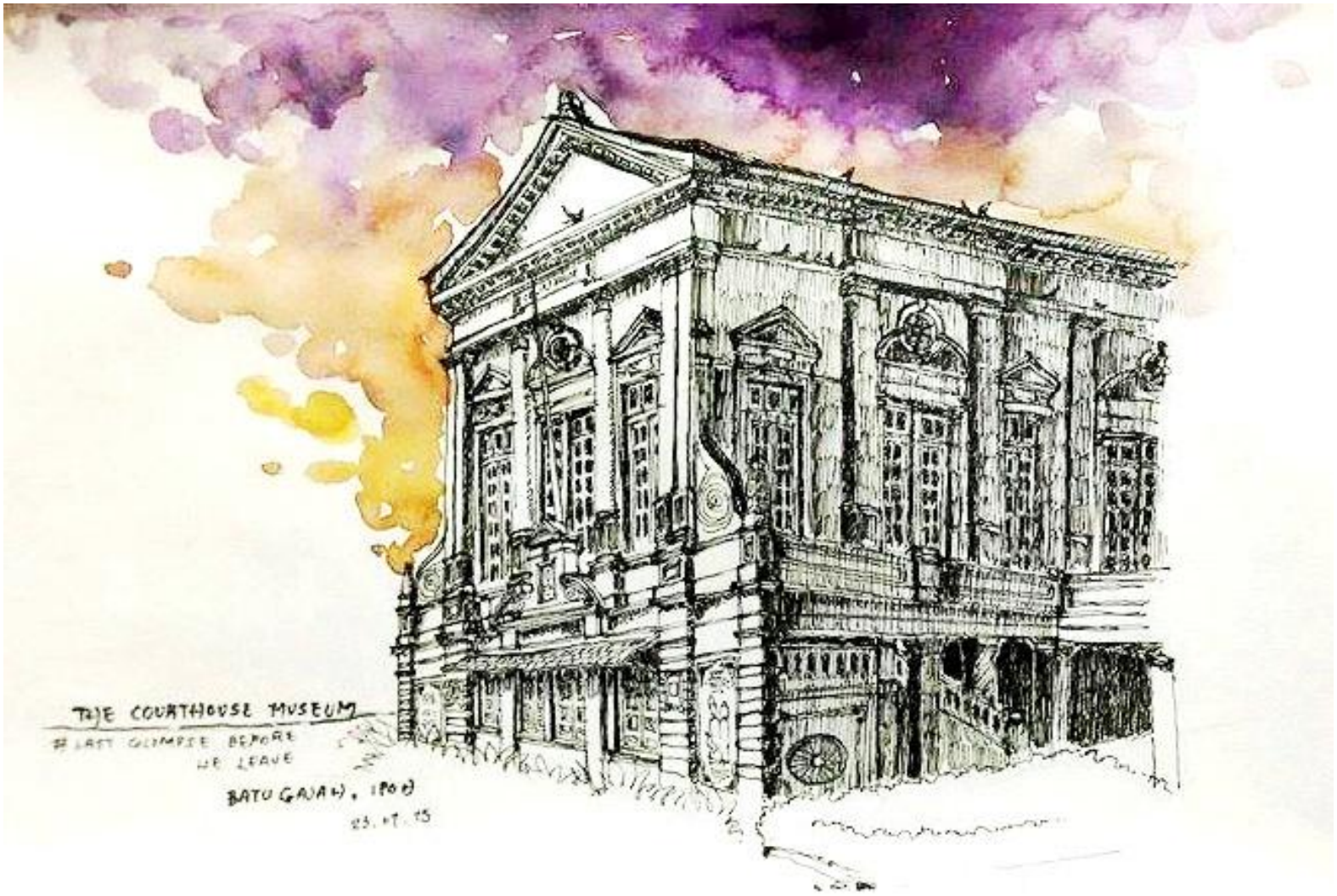

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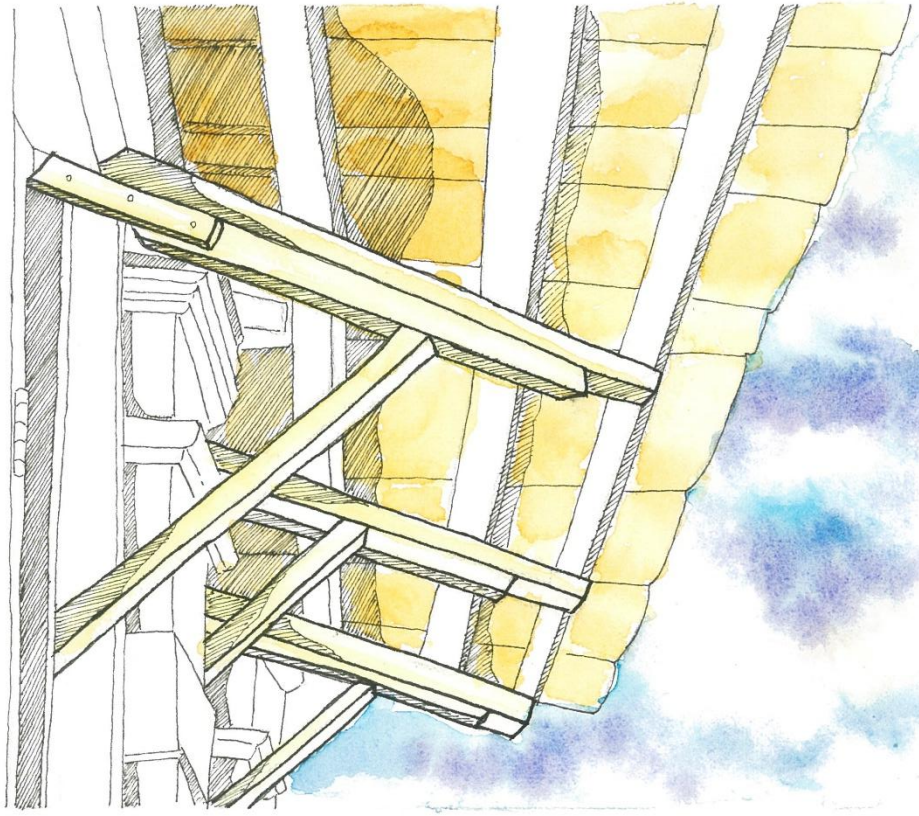

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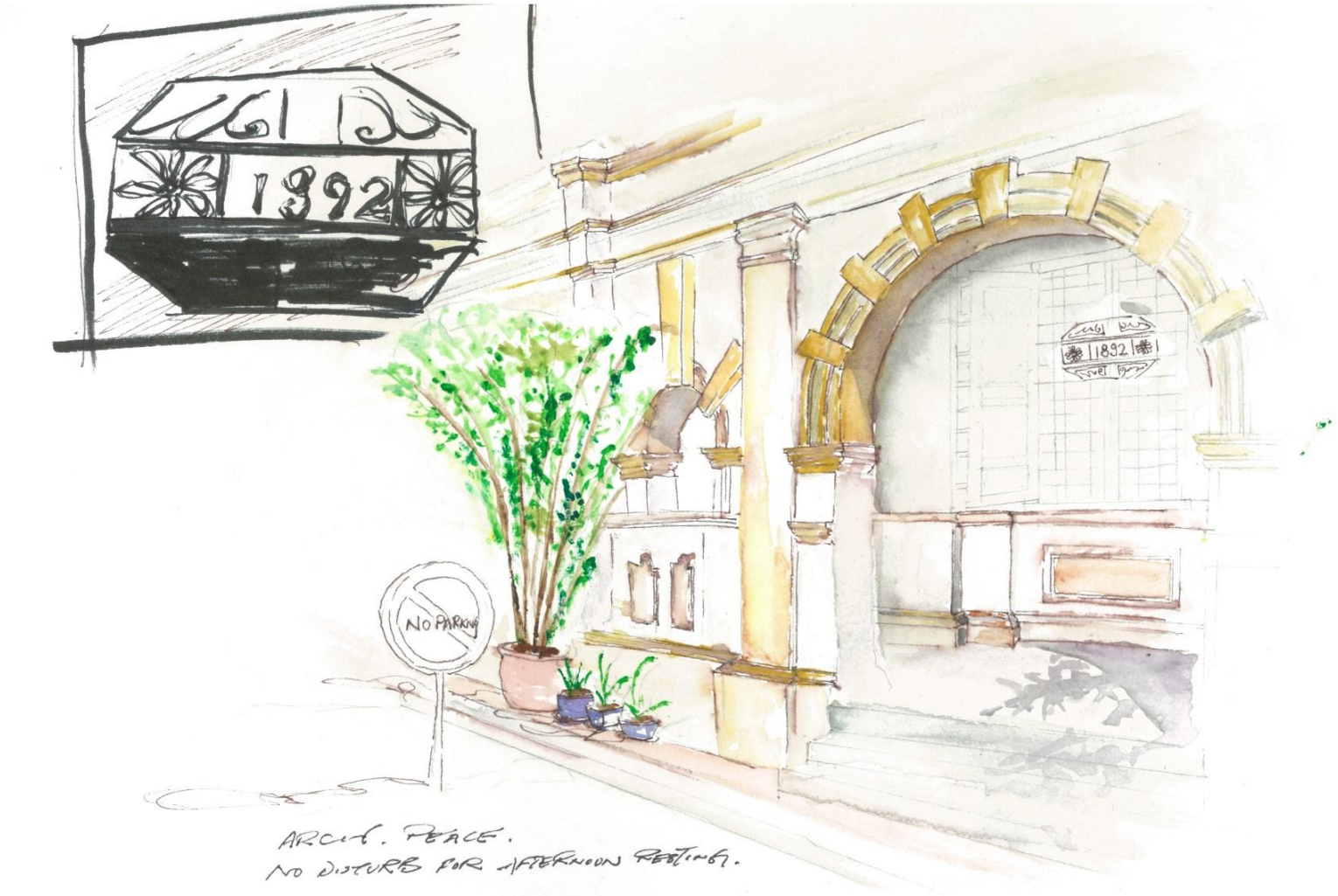

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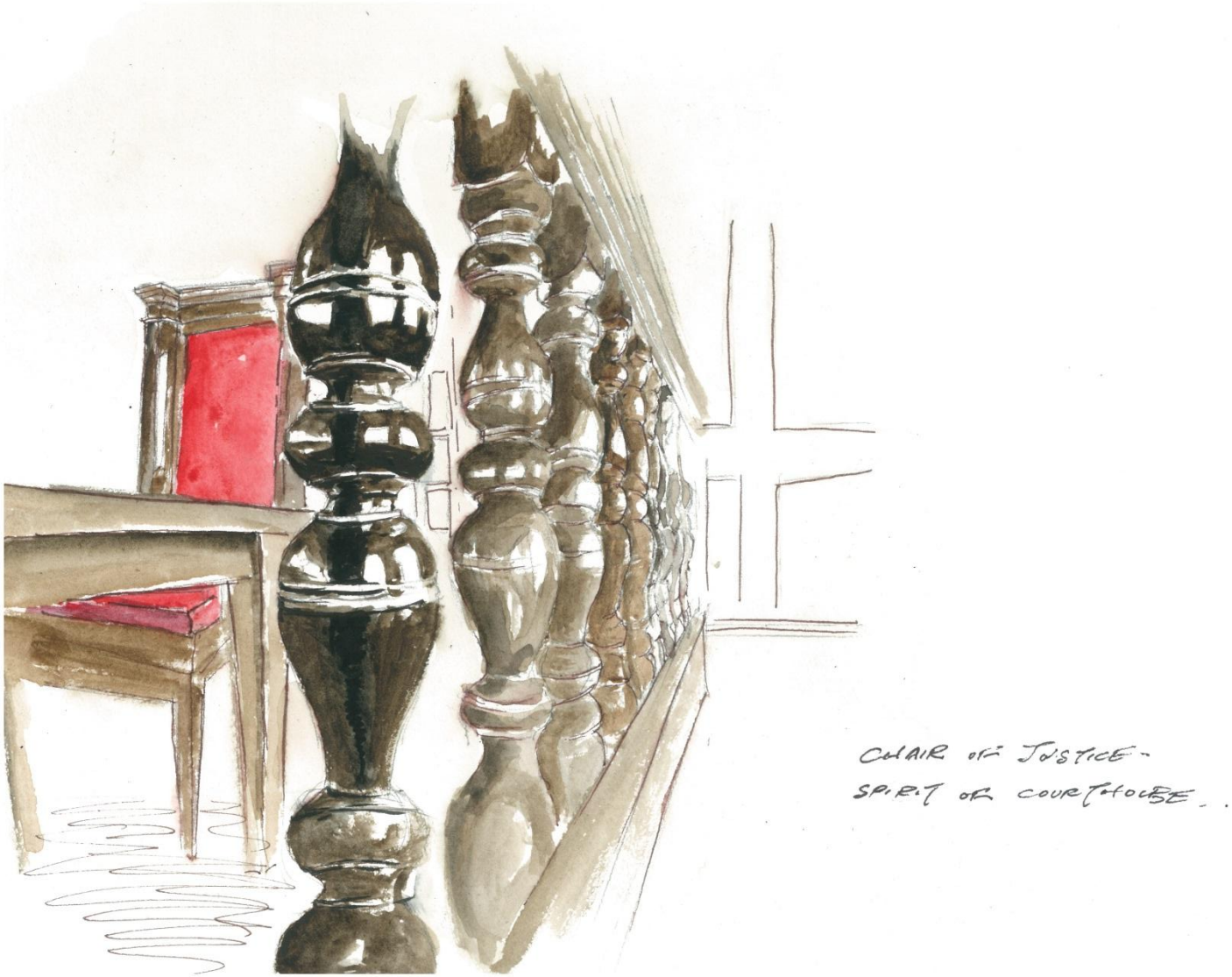

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