FACULTY OF COMPUTING
UTM Johor Bahru

SEMESTER 1/20242025

SECR1213-07 NETWORK COMMUNICATIONS

PROJECT : PHASE 4

GROUP : Darksystem

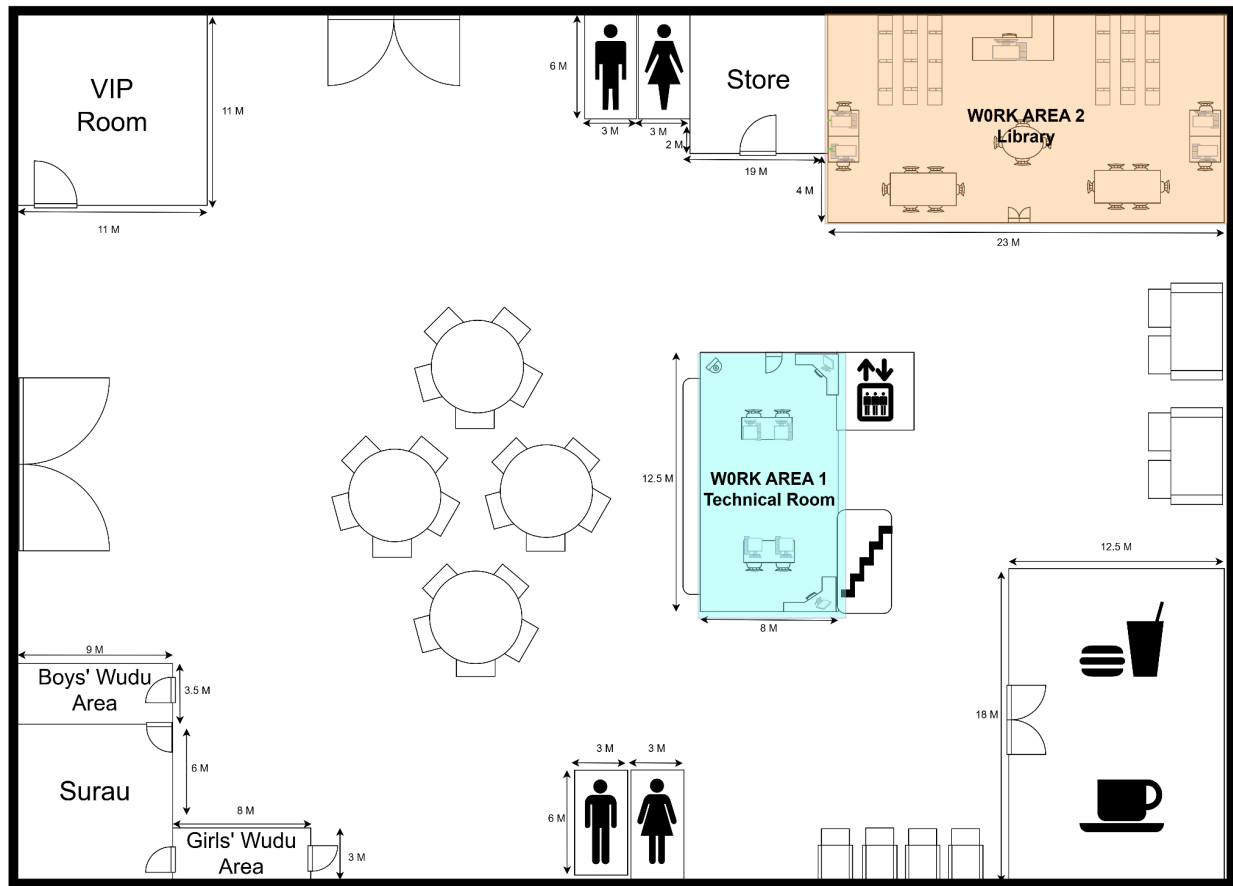LECTURER: Dr. Nurfazrina binti Mohd Zamry

NAME	MATRIC NO
IZZAT FAKHRULLAH BIN KARIM	A23CS0089
MOHAMMAD IRFAN DANIAL BIN KEFLI	A23CS0113
THAYAALLAN NAIDU A/L GANESAN	A23CS0281

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1.0 Work areas on the floor plan

For the ground floor, the Library and Technical room will be a work area. The Technical Room will have 6 workstations for the technician in case there was any technical problem regarding failure of connection. For the Library, there will be workstations for students to study in the library in case their laptop is not working.
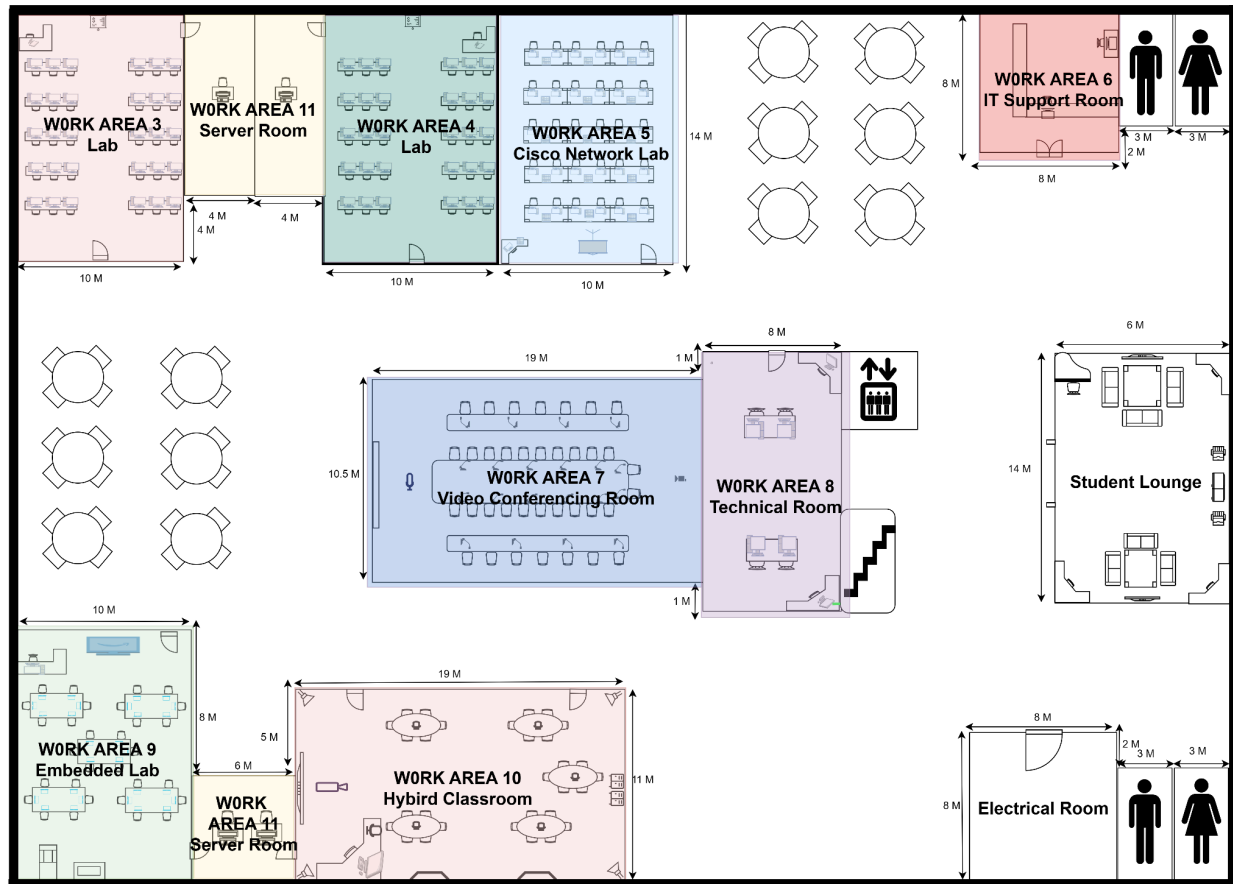
For the first floor, there will be 10 work areas. Work area 3 and 4 are general labs , where students will use during classes, each lab is equipped with a total of 62 workstations including 2 workstations for lecturers in the labs.

Next, for Work area 5, Cisco network lab, The space is thoughtfully designed to support collaboration and hands-on learning between students and lecturers. It features 30 workstations for students, a workstation with a projector for lecturers to share and manage their teaching materials.
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For work area 6 which is IT support room, there will be 2 workstations in there, since it was intended to help both the students and lecturers who are having the device problem such as software problem, hardware problem, and much more.

Then, work area 7, which is Video conferencing room, is designed with a streamlined approach, featuring a central high-quality projector and a screen. This setup ensures the room is fully ready to give effective presentations, virtual meetings, and collaborative work.

Next, work area 8, which is the technical room again, it is the same as work area 1. It will have 6 workstations for the technician in case any failure of connection happens.

Furthermore, Work area 9, which is an embedded lab, or well known as IOT Lab. This lab consists of 31 workstations and will be connected to the switches connected to the router respectively.

For work area 10, which is a hybrid classroom, it consists of 31 workstations. This room is equipped with advanced technology like smart TV to support both in-person and virtual learning. It also provides the laptop and tablet storage to keep the devices secure and organized.

For the last one, Work area 11, which is Server room. It consists of 1 to 2 workstations for each room. It was designed to provide a dedicated space for the storage and protection of crucial data, as well as implementation of necessary monitoring and security measures.

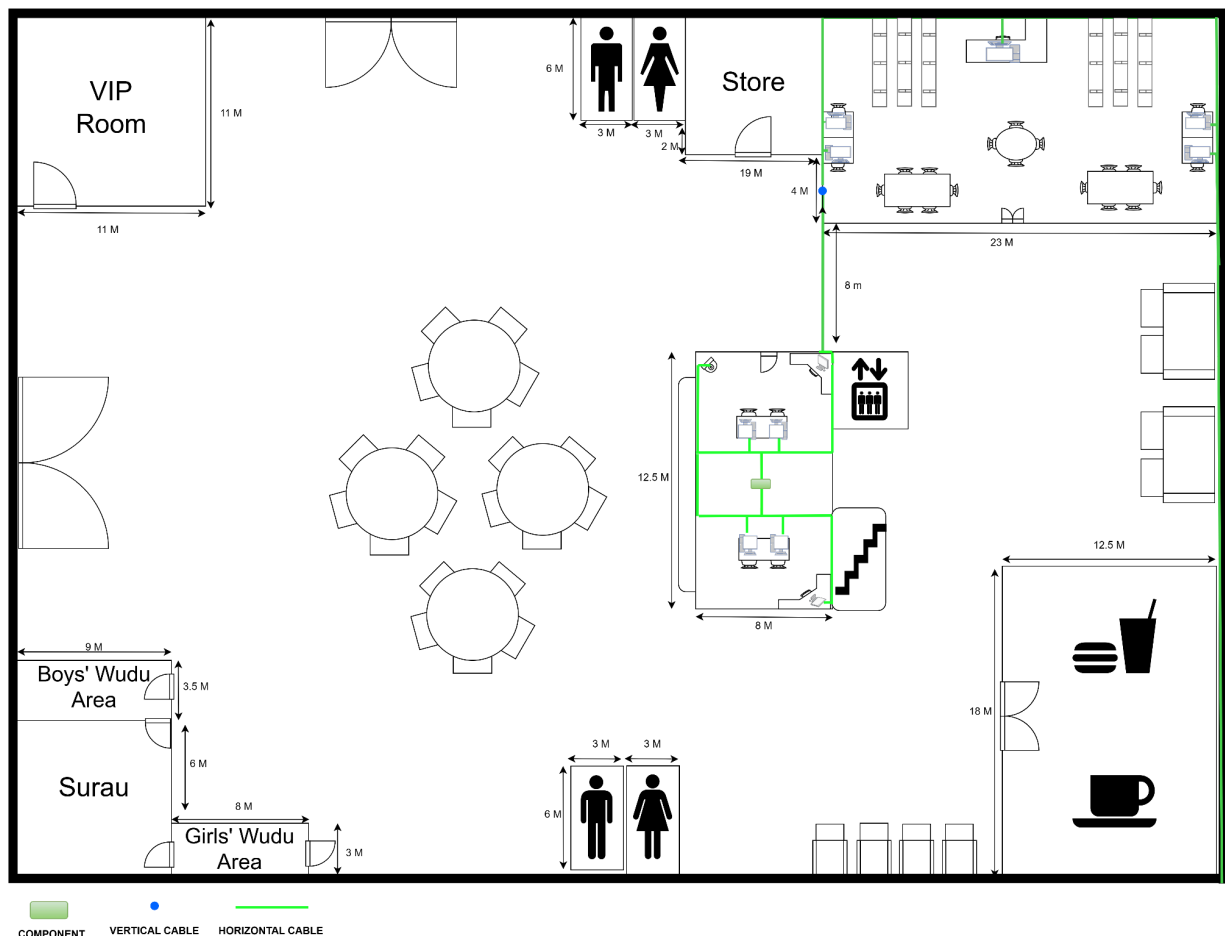# 2.0 Distribution and connection of devices

Figure 2.1 Cable Distribution of Ground Floor
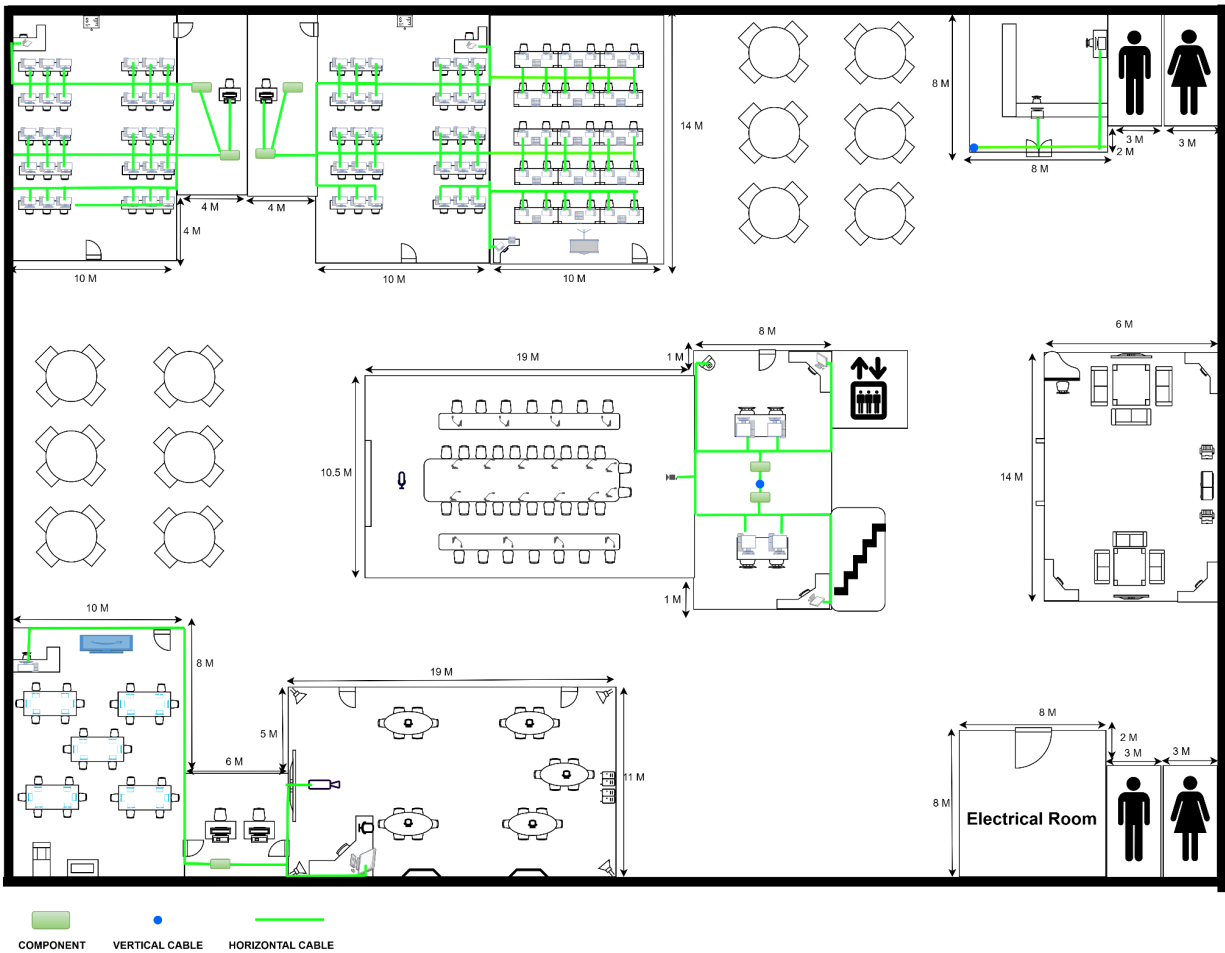
Figure 2.2 Cable Distribution of First Floor

Figure 2.3 Library

0.625 m

0.375 m

6.625 m

6.5 m

1.125m

8 m

3.875 m

4.125m

1.5 m

1.5 m

1.25 m

0.625m

0.875 m

1 m

4.125m

6.75 m

0.375
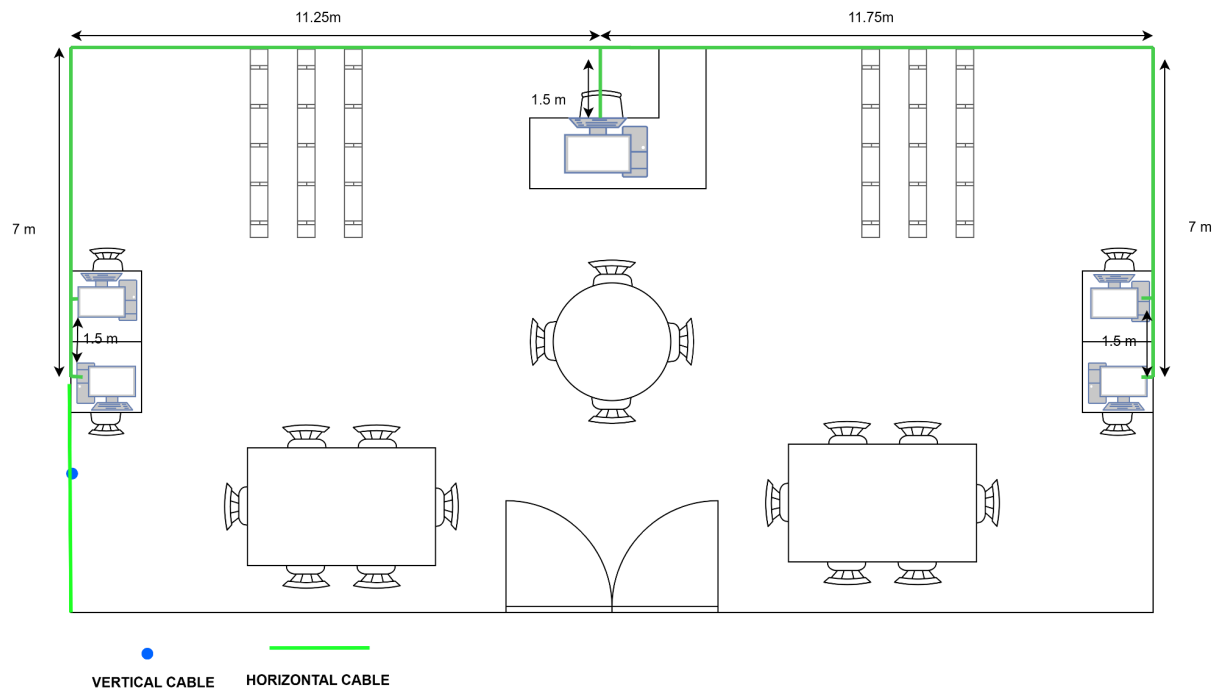
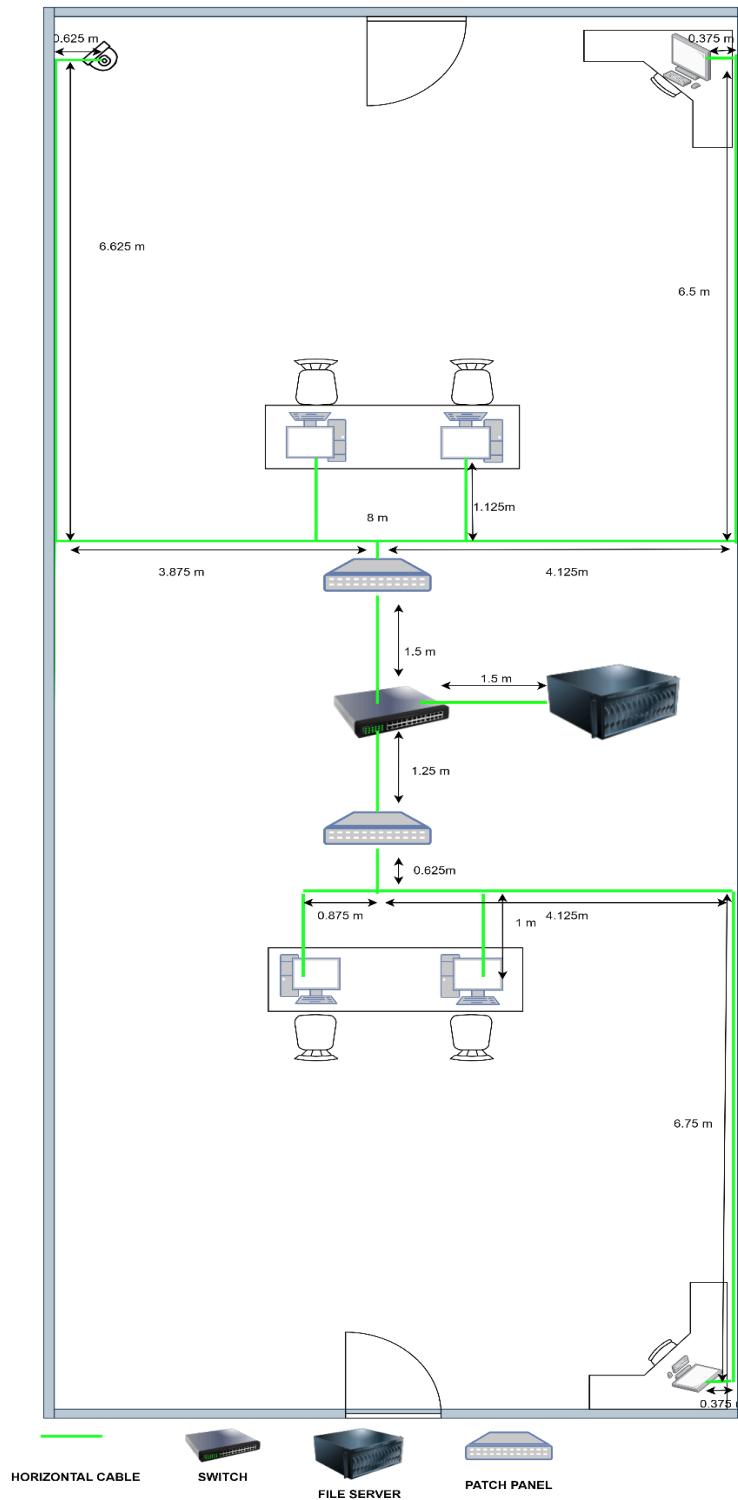HORIZONTAL CABLE   SWITCH   FILE SERVER   PATCH PANEL

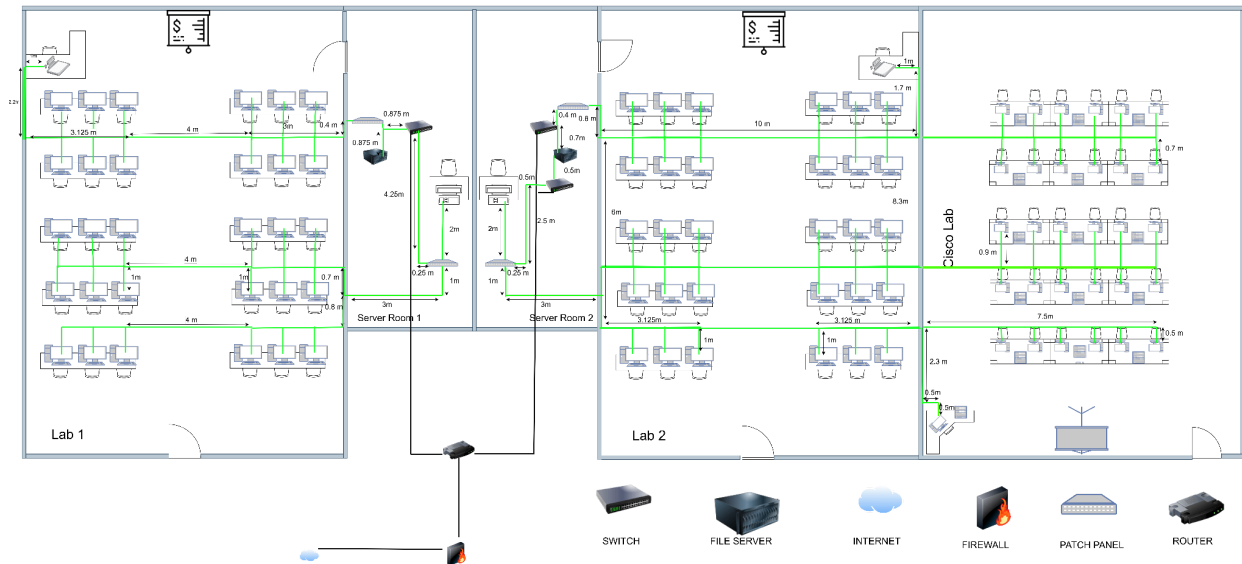Figure 2.4 Technical Room (Ground Floor)

8

Figure 2.5 General Lab 1, Server Room, General Lab 2, and Cisco Lab

The diagram represents the network setup of a computer faculty, consisting of General Lab 1, the Server Room, General Lab 2, and a Cisco Lab. At the core of the network is the Server Room, which houses critical components such as the router, firewall, patch panel, file server, and a central switch. The internet connection enters the network via the router, which is directly linked to a firewall to provide secure and filtered access to the internal network. From the firewall, the connection flows to the central switch, which acts as the main distribution hub. The file server, also connected to the central switch, allows shared storage and access to all PCs across the labs.

General Lab 1, General Lab 2, and the Cisco Lab has its own dedicated network switch, connected to the central switch in the Server Room via the patch panel, which organizes and manages all the cabling. PCs in each lab connect to their respective switches, ensuring a high-speed and stable network connection. The hierarchical setup ensures that all PCs can access shared resources like the file server and the internet while maintaining efficient and organized cable management. The Cisco Lab likely includes additional networking equipment for specialized training. This setup creates a secure, reliable, and scalable network infrastructure suitable for academic and research purposes.
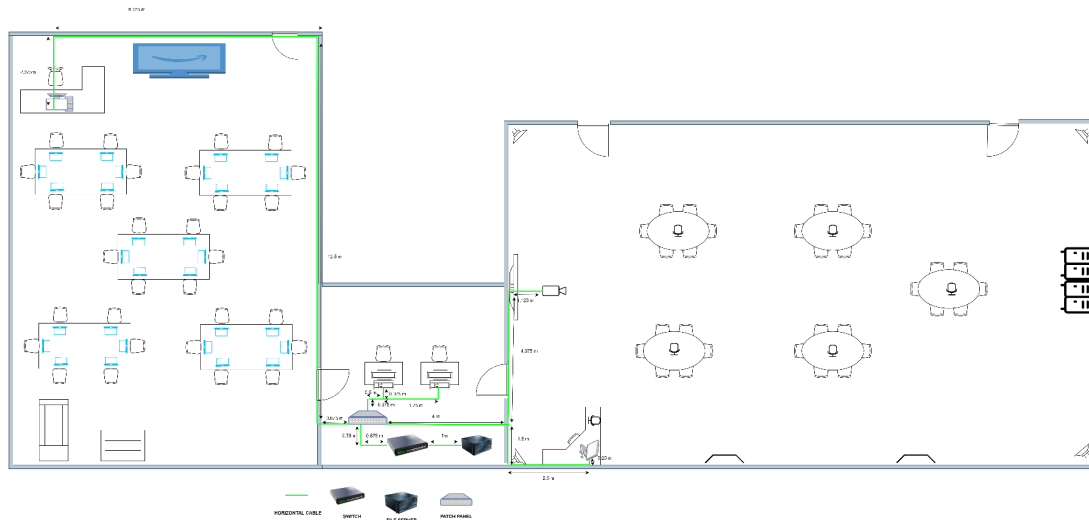
Figure 2.6 Embedded Lab, Server room, and Hybrid Classroom
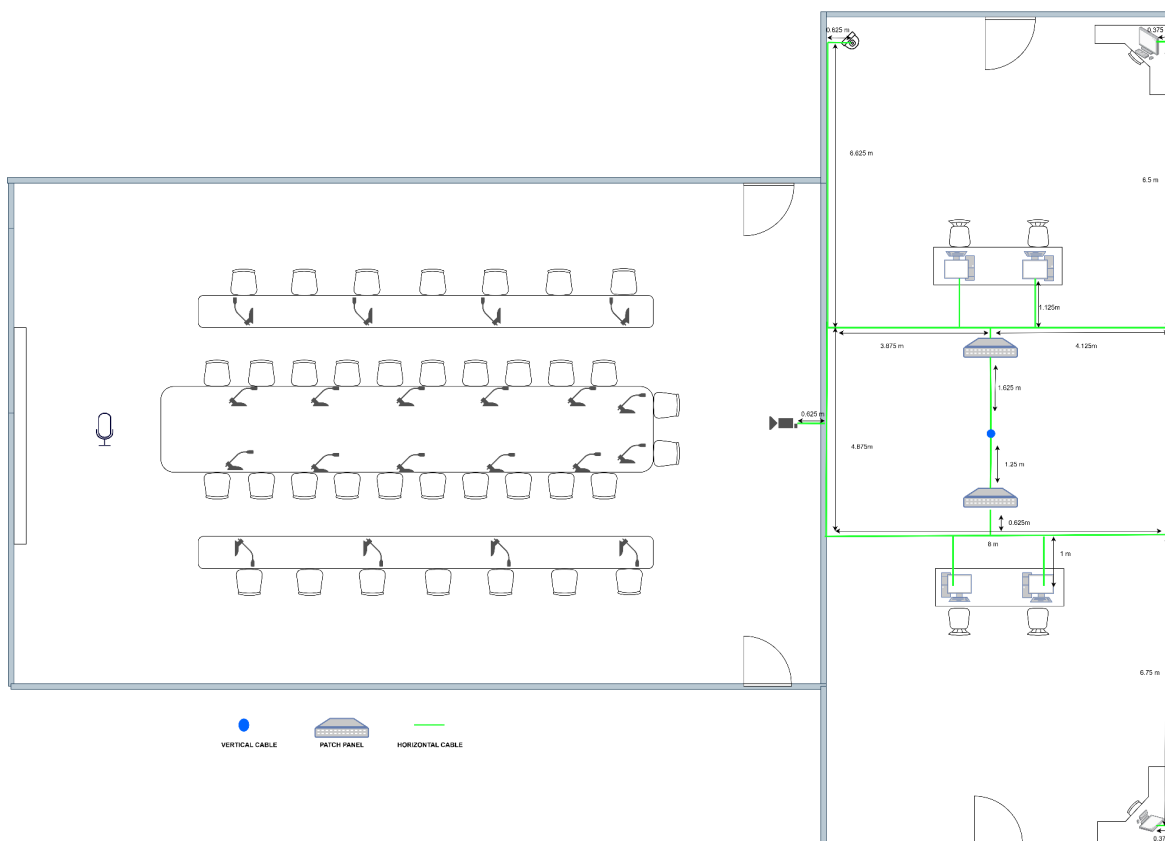
Figure 2.7 Video Conferencing Room and Technical Room(First Floor)

6 M

2.25 M

7.5 M

HORIZONTAL CABLE
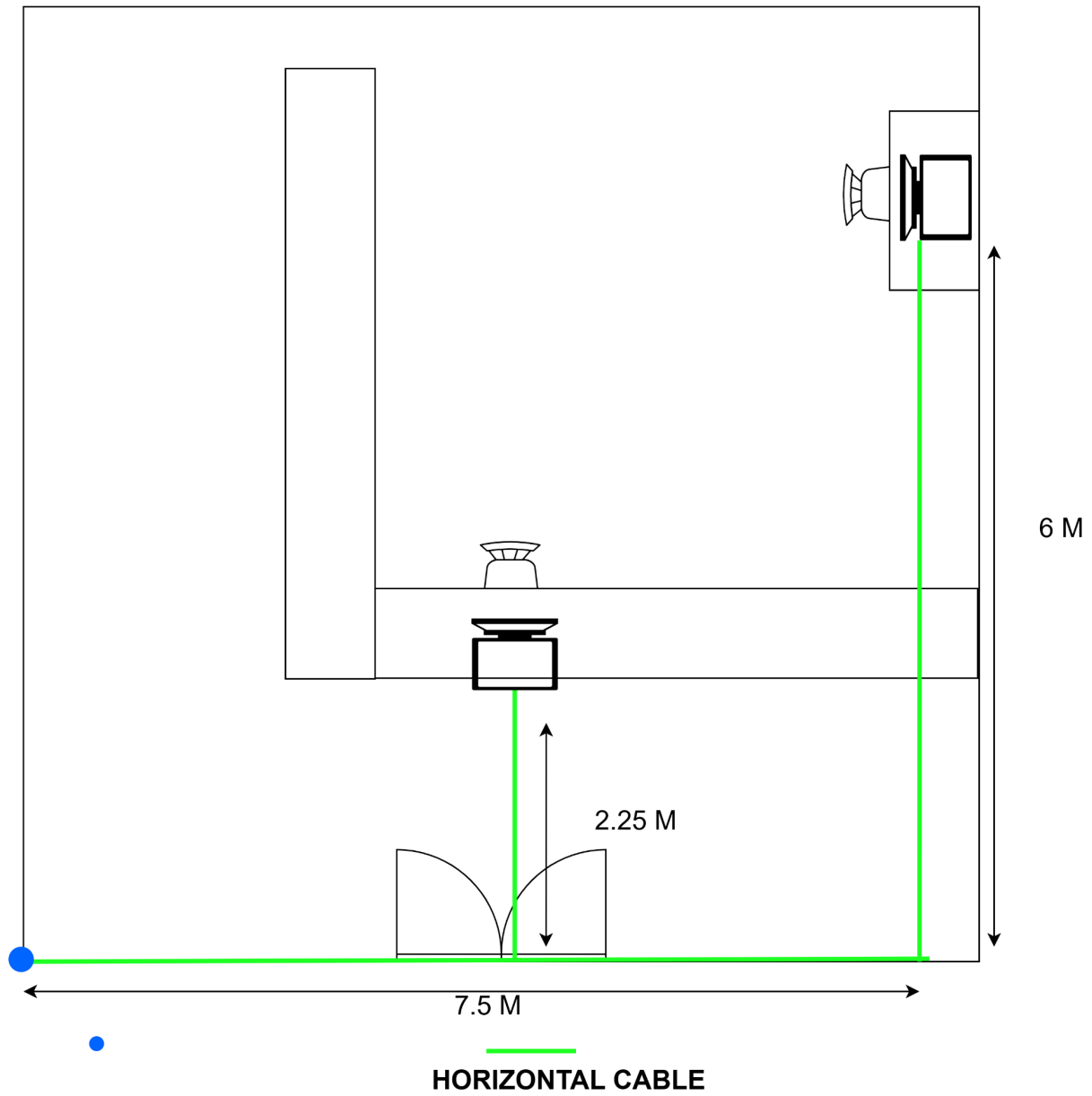
Figure 2.8 IT Support Room

3.0 Number of connections, patch cords and switch ports needed

Area	Number of switch port needed
General Lab 1	31
General Lab 2	31
Cisco Lab	31
Embedded Lab (IOT Lab)	32
Hybrid Classroom	12
Video Conferencing Room	22
Technical room (Ground Floor)	7
Technical room (First Floor)	7
IT Support Room	2
Server Room	12
Library	5
Total	192

Area	Number of patch cords needed
General Lab 1	31
General Lab 2	31
Cisco Lab	31
Embedded Lab (IOT Lab)	32
Hybrid Classroom	12
Video Conferencing Room	22
Technical room (Ground Floor)	7
Technical room (First Floor)	7
IT Support Room	2

Server Room	12
Library	5
Total	192

Area	Number of connector needed
General Lab 1	62
General Lab 2	62
Cisco Lab	62
Embedded Lab (IOT Lab)	64
Hybrid Classroom	24
Video Conferencing Room	44
Technical room (Ground Floor)	14
Technical room (First Floor)	14
IT Support Room	4
Server Room	24
Library	10
Total	384

Switch Ports :

Switch ports are the physical interfaces on a network switch where devices such as computers and servers connect to the network.The total switch ports needed is 192, which indicates the total number of network devices requiring connectivity.

Patch Cords :

Patch cords are cables used to connect devices to switches or other networking hardware. Each switch port corresponds to a patch cord. The total number of patch cords needed is also 192, ensuring connectivity for all devices in the facility.

Connectors :

Connectors are the terminations at the ends of patch cords or cables that plug into ports for example the RJ45 connectors for Ethernet cables. Since each patch cord has two ends, the number of connectors is twice the number of patch cords. The total number of connectors across all areas is 384, ensuring every patch cord has proper terminations for secure connections.

4.0 Cable types and length

To connect PCs and other network devices we used the **Fiber Optic Pigtail Single Mode 0.9mm SC/UPC and SC/APC cables** due to their higher performance and dependability. These pigtails are used to provide high-speed data transport. It is characterized with low insertion loss and high return loss proving good signal quality. The G. 657A bend-insensitive fibers offer durability and signal quality assurance on tight installations and structures. Third, fiber optics are not affected by electromagnetic signals which means that connections they provide will be very stable in areas that have so many electrical devices. As endorsed with RoHS and ISO9001 standards, fiber optic pigtails are a high quality environment friendly product that computer faculty can utilize to enhance and perpetually reliable IT framework.

Area	Length (m)		Total Length (m)	Total Price of Cable Used (RM)
	Horizontal	Vertical		
Ground Floor				
Library	72.5	-	72.5	87
Technical Room (Ground Floor)	65.375	-	65.375	78.45
Ground Floor Room Total			137.88	165.45
First Floor				
General Lab 1	233.15	-	233.15	279.79
General Lab 2	334.2	-	334.2	401.04
Cisco Network Lab	625.83	-	625.83	751
IT Support Room	70.375	14	84.375	101.25
Video Conferencing Room	16.875	-	16.875	20.25
Embedded Lab	26.5	-	26.5	31.80
Hybrid Classroom	23	-	23	27.60
Technical Room (First Floor)	65.375	49	114.375	137.25
Server Room	23.5	-	23.5	28.20
First Floor Room Total			1481.81	1778.18

5.0 Minute meeting

5.1 First meeting

DATE/TIME	27/12/2024, 8 PM
LOCATION	Google Meet (Online)
AGENDA	-Read the details of task 4 -Discuss the task 4
MEETING MC	MOHAMMAD IRFAN DANIAL BIN KEFLI

ATTENDANCE		
NAME	**TIME**	**REASON FOR ABSENCE**
IZZAT FAKHRULLAH BIN KARIM	7.55 PM	-
MOHAMMAD IRFAN DANIAL BIN KEFLI	7.50 PM	-
THAYAALLAN NAIDU A/L GANESAN	7.57 PM	-

MINUTES			
NO.	**ITEM DISCUSSED**	**IDEAS/SUGGESTIONS AND PERSON GIVING IT**	**PERSON IN CHARGE**
1.	Discussion for task 4	- Izzat shared the information about task 4 and its rubric - All members read and try to understand the task - All members discussed what needs to be done in task 4	Izzat
2.	Suggestion for network devices distribution	-All members suggested the network distribution in the floor plan -All members gave their opinions regarding the details that need to be standardized	All members

3.	Task distribution	-Izzat distributed the task to all members equally -Izzat was assigned to plan for the network distribution of the general labs, library, and server rooms -Thayaallan was assigned to plan for the network distribution of the Cisco Lab, Embedded lab, Electrical room, and IT Support room -Danial was assigned to plan for the network distribution of the Video conferencing room, Technical rooms, and Hybrid Classroom	All members
4.	Meeting ended	-at 9:21 pm, the meeting ended after all discussion were done	All members

5.2 Second meeting

DATE/TIME	29/12/2024, 8 PM
LOCATION	Google Meet (Online)
AGENDA	-IUpdate each other status -Finalize network distribution diagram -Do a calculation of the cable length
MEETING MC	THAYAALLAN NAIDU A/L GANESAN

ATTENDANCE		
NAME	**TIME**	**REASON FOR ABSENCE**
IZZAT FAKHRULLAH BIN KARIM	8.00 PM	-
MOHAMMAD IRFAN DANIAL BIN KEFLI	8.00 PM	-
THAYAALLAN NAIDU A/L GANESAN	7.55 PM	-

MINUTES			
NO.	**ITEM DISCUSSED**	**IDEAS/SUGGESTIONS AND PERSON GIVING IT**	**PERSON IN CHARGE**
1.	Update progress	- All members shared their part	Izzat
2.	Suggestion on the task	-All members give their opinion and suggestion on each member part	All members
3.	Calculation of the cable length	-Each member was assigned to calculate the length of the cable based on their assigned rooms.	All members
4.	Meeting ended	-at 9 pm, the meeting ended after all discussion were done	All members