Wiring Maury High School (Part 1)
Jared Gibson

Budget

Item	Price Per Unit	Distance Needed	Units Needed	Total
48-Port Switch	328.99 / switch	N/A	5	1644.95
Ethernet Cables	41.99 / 152.4 m	4867.63	32	1343.68
Outlets	6.99 / unit	N/A	56	391.44
Fiber Optic Cables	38.99 / 50m	143.58	3	116.97
8-Port Switch	26.99 / switch	N/A	1	26.99
48-Port Patch Panel	28.99 / unit	N/A	5	144.95

8-Port Patch Panel	25.99 / unit	N/A	1	25.99
Routers	34.99 / Per Router	N/A	5	174.95
Firewall	285.00	N/A	1	285.00
Total				3931.12

All products are hyperlinked to the Item Title.

Budget will also be provided at the end of the presentation once everything is explained.

DISCLAIMER

The rooms on the floor plan were not very clear, and I could not accurately determine which rooms are meant to have network ports.
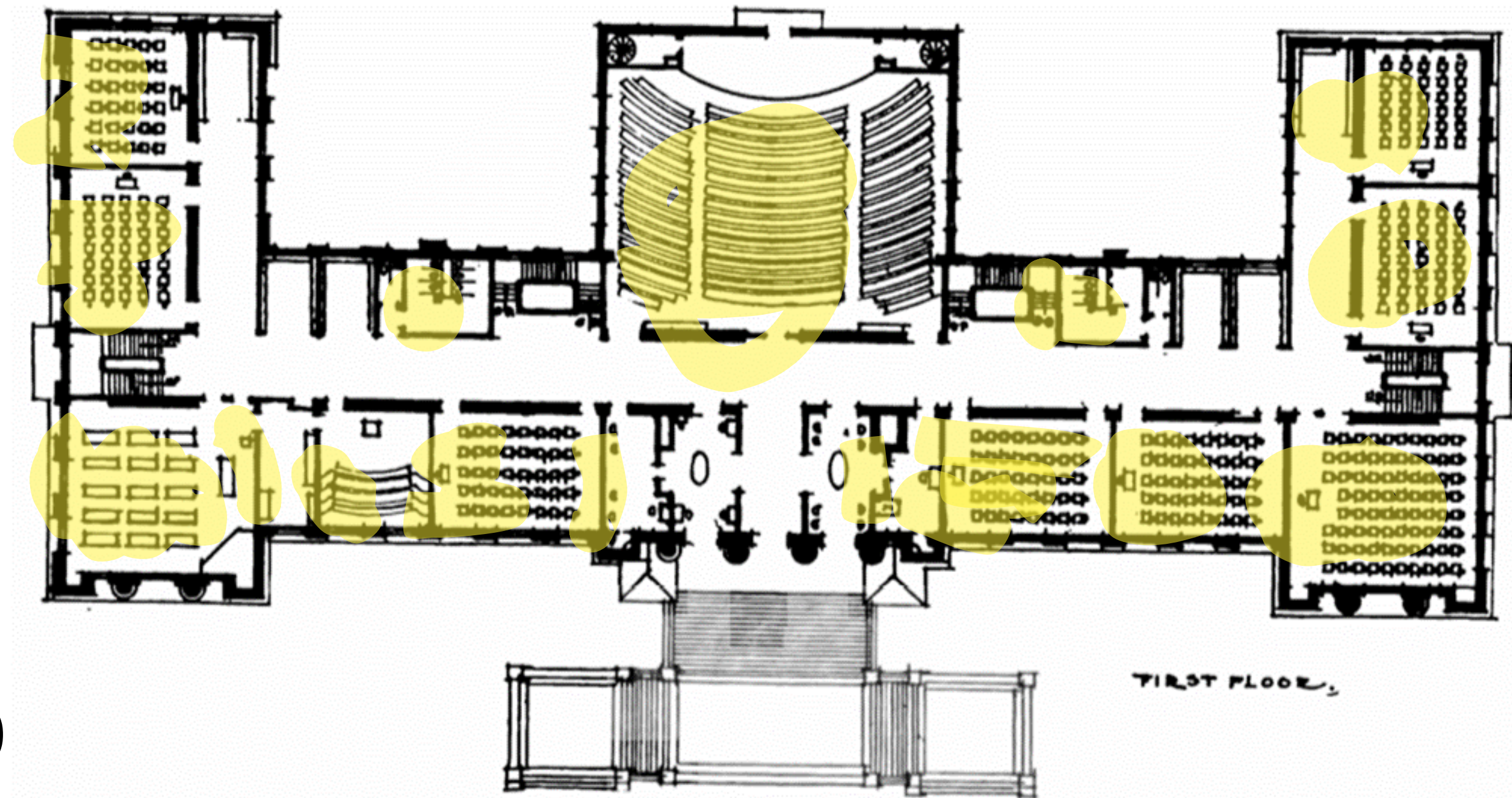
In the next few slides, I highlighted what I believe are rooms that should be designated as network port rooms.

First Floor

14 rooms
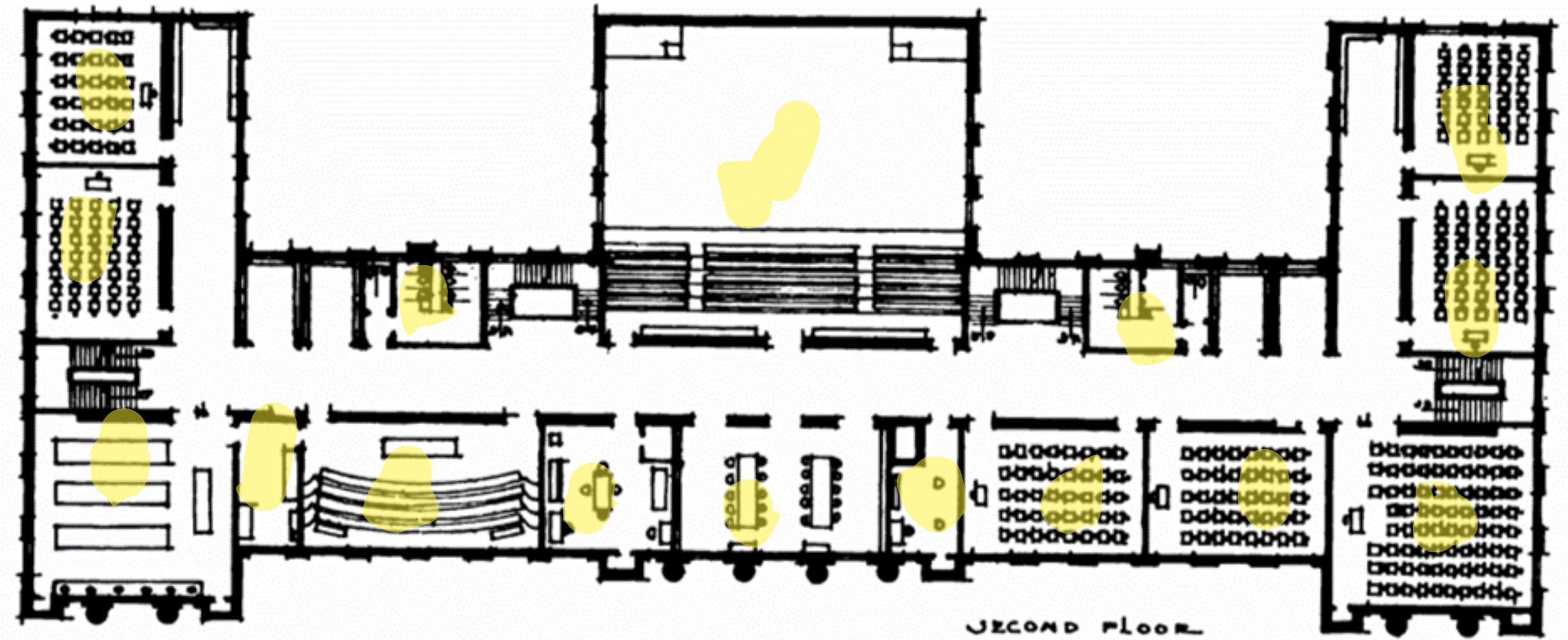
1 telecom closet
(next to the left stairwell)

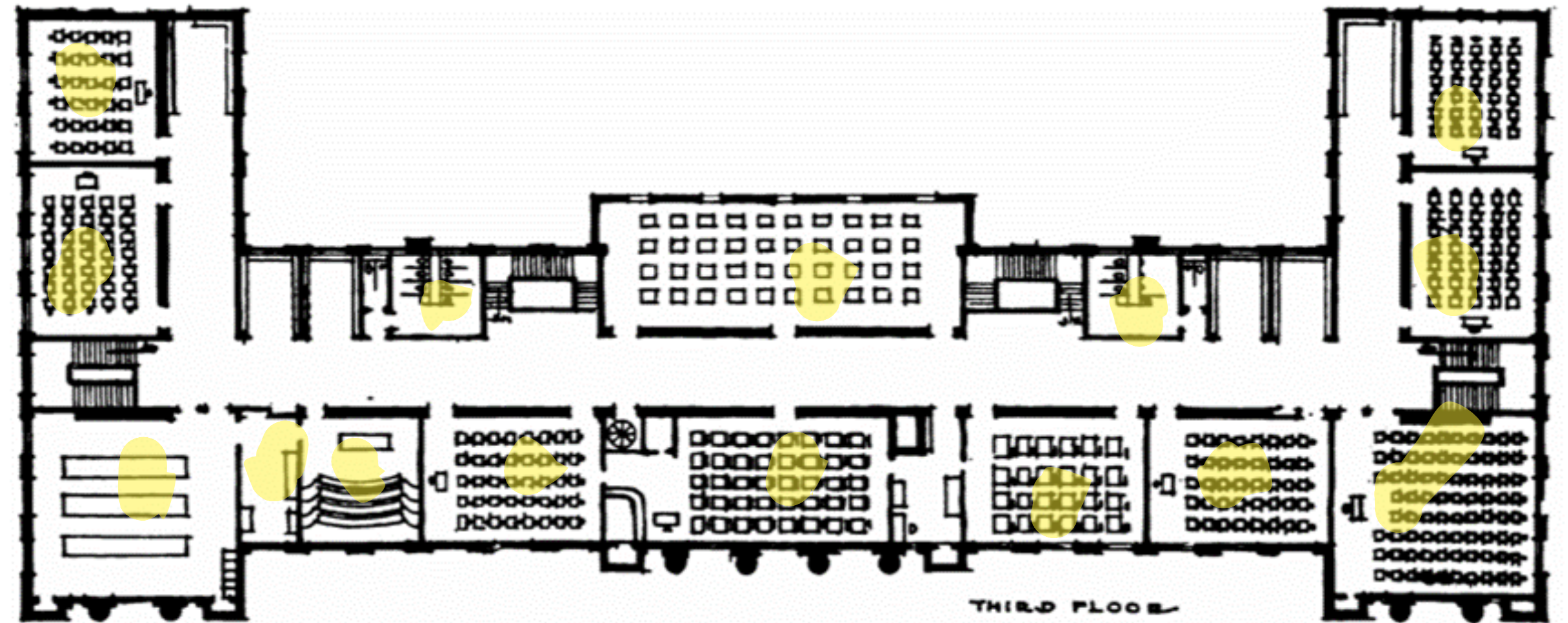1 Equipment Closet
(next to the right stairwell)

FIRST FLOOR.

15 rooms

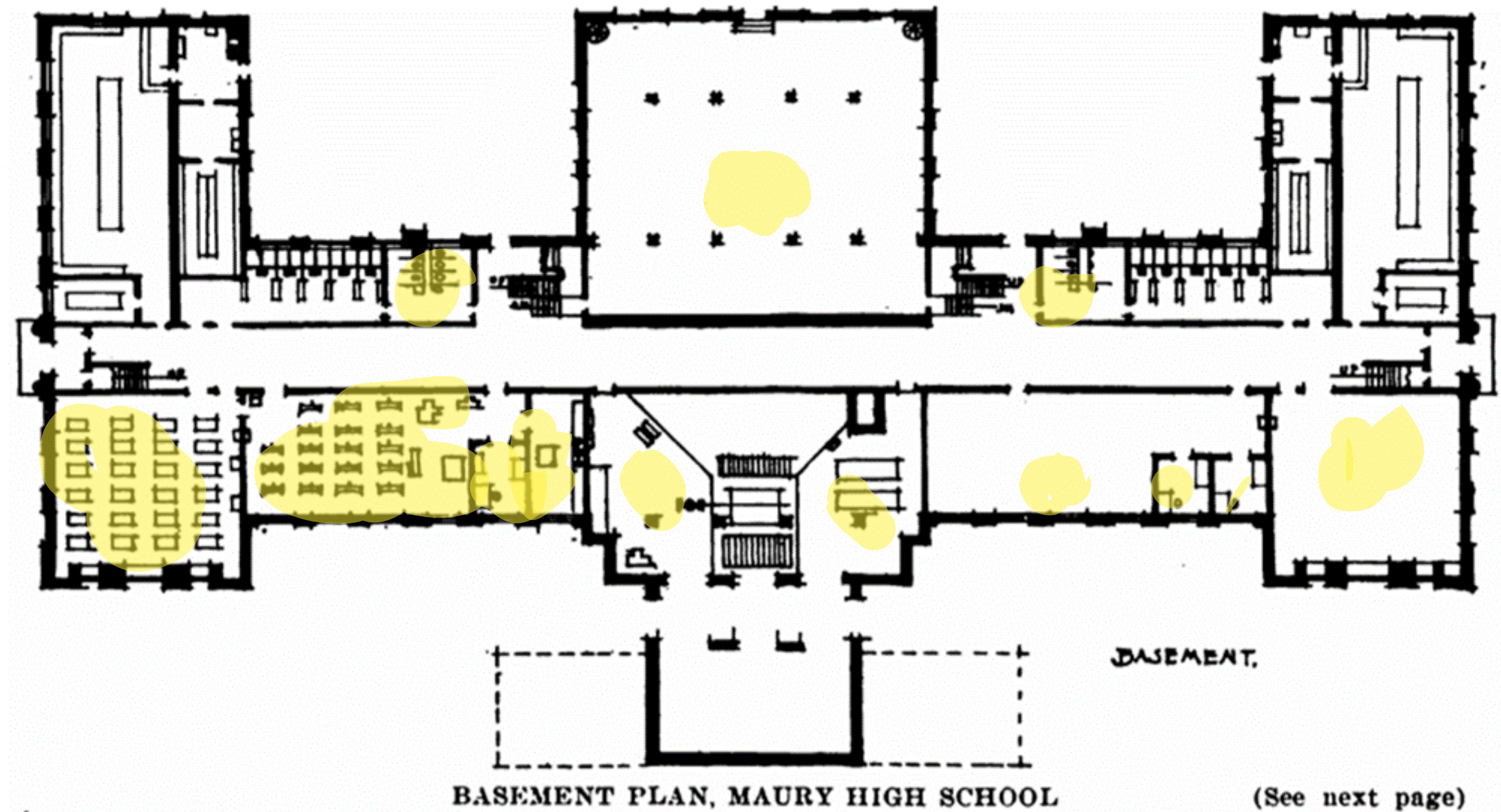1 telecom closet
(next to the right stairwell)

SECOND FLOOR

14 rooms

1 telecom closet
(next to the right stairwell)

THIRD FLOOR

12 rooms

1 telecom closet
(next to the left
stairwell)

BASEMENT PLAN, MAURY HIGH SCHOOL   (See next page)

Math

I used Canva's software to determine the length of the school. The photo itself was 1190.6 pixels. Using the shape tool, I used a rectangle to determine the shortest and longest cable runs to my telecom closets. My shortest run comes out to 110.4 pixels and my longest run comes out to 880.5 pixels. Converting this to meters, my longest average cable run came out to 39.51 meters. I'm sticking to this number to make sure I don't run out of cable.

Since each room needs 2 ports, and I have 56 rooms, I'll need to run 112 cables from my telecom closets. With 39.51m being my average run, this gives me 4425.12 meters of cable to run. An extra 10% will bring that up to 4867.63 minimum cable to order.

Assuming each floor is about 3 meters of space between each other, We'll be running at least 45.51 meters (per floor) of fiber optic cable to the main equipment room on the first floor.

Part 2

In part 1, I settled on needing to cover 112 ethernet connections for 56 rooms.

That is about 28 ethernet connections per floor.

28 * 1.1 (to add 10% more connections) means we must be able to accommodate at least 31 connections.

The closest natural interval of a managed switch would be 48 ports. So we'll designate one switch per floor in each of the telecom closets. Then we'll need to include another switch to connect the internet-facing router to the network.

We'll also need to cover the patch panels for each of these 5 switches.

We're getting 5 48-port managed switches, amounting to 240 ports. We're also connecting all of these to the equipment room with an 8-port managed switch. We'll be getting 248 patch panels to accommodate all of those ports.

Part 3

Each floor in the school is going to have a router, allowing for each floor to be able to take some of the routing load off of the main router.

The traffic will then be separated into two separate VLAN's, one for the teachers, and one for the students. This will allow us to manage the connections differently throughout the network based on the status of the people connecting while also keeping costs down.

ISR4331
Router 0(2)(2)

Switch-PT
Switch4(2)(2)

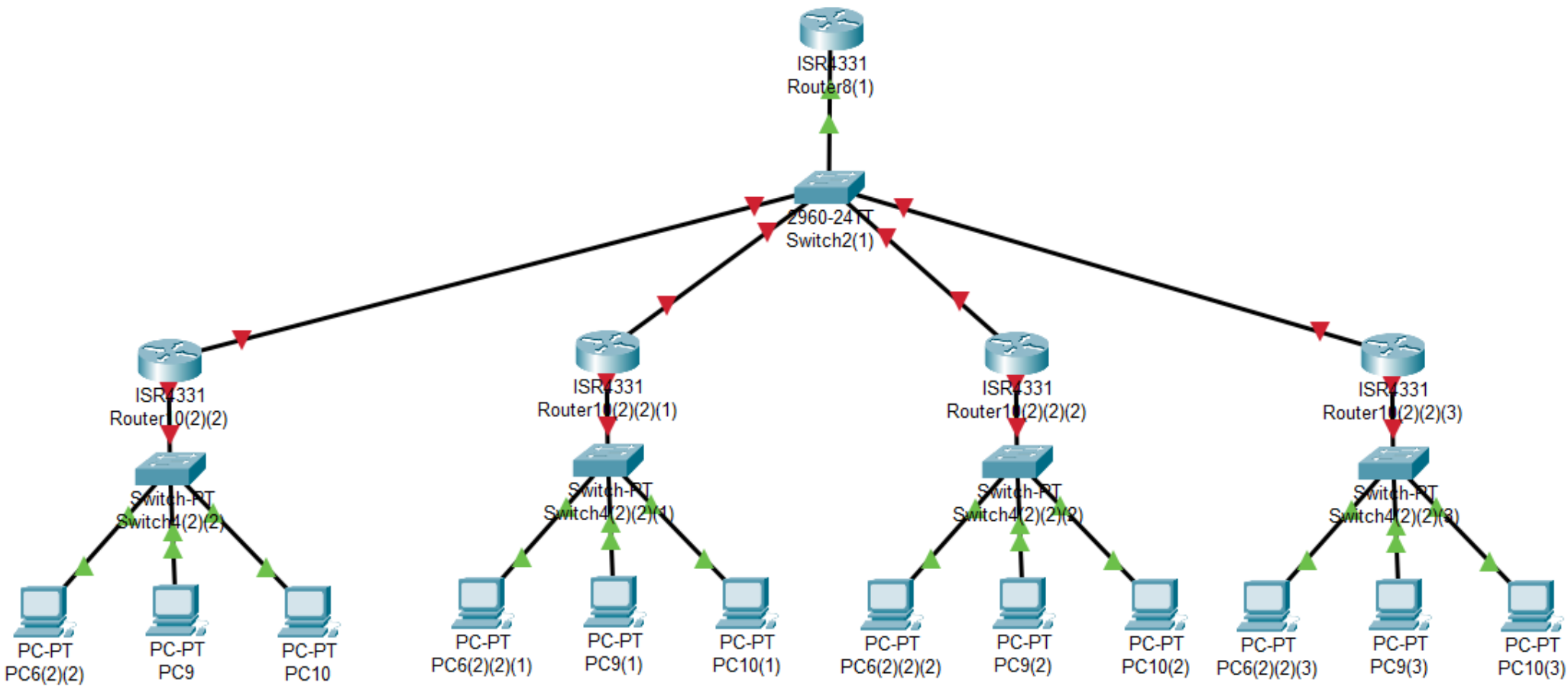PC-PT
PC6(2)(2)

PC-PT
PC9

PC-PT
PC10
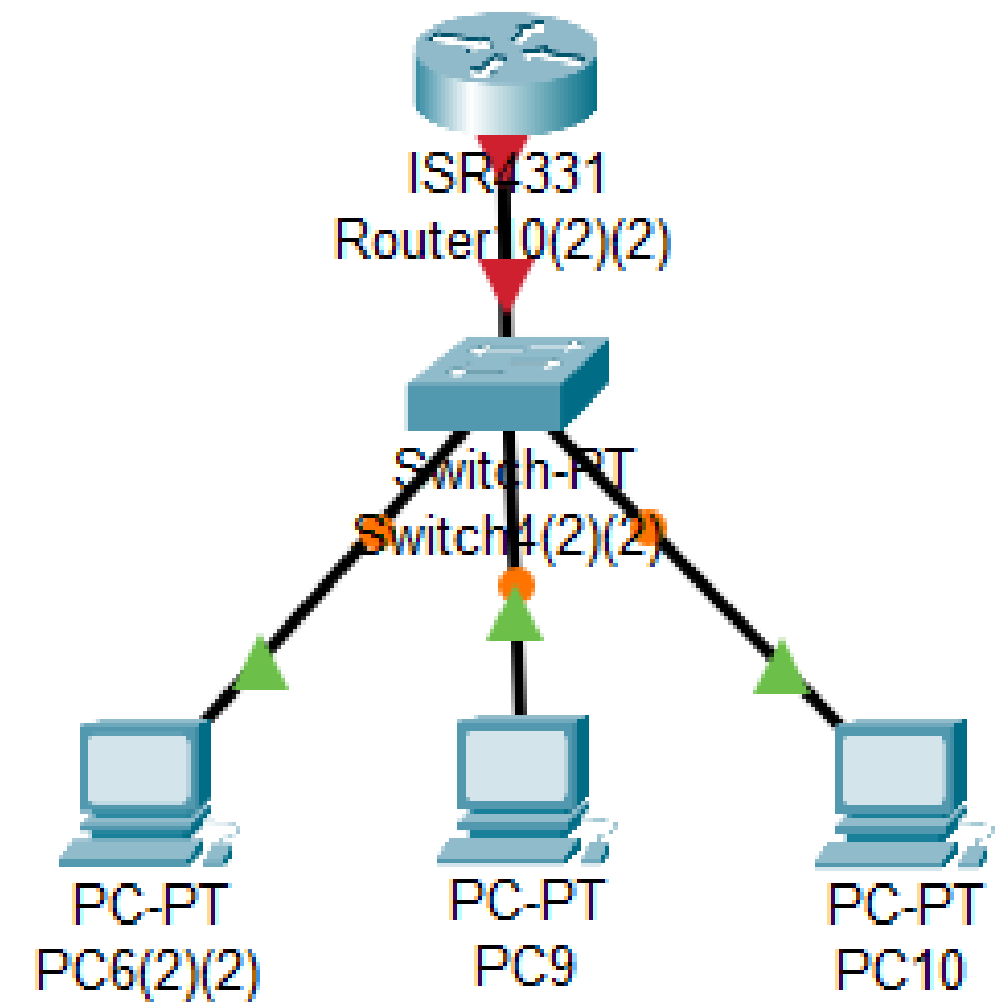
The four floors will be connected to a central switch placed in the Equipment room.

The switch will then be able to send and receive packets to the router facing the internet.

Between the central switch and the router facing the internet is meant to be a firewall, but I haven't yet figured out how to represent a physical firewall in Cisco Packet Tracer.

This topography includes 5 routers, 5 switches, and a physical firewall.

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Total				4154.92

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