CONSTANT HALL WIRING

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INSTRUCTIONS

- You have been assigned by Old Dominion University to rewire Constant Hall with category 5e cable, outlets, and patch panels. The floor plan of the building, which you can assume is to scale, is linked. Each office and classroom (these are the rooms that are numbered on the floor plan) will need two data outlets. That means that **two cables** will need to run to each room. Use a **star or extended star topology** for the wiring, which is what we've been working within all of our examples. Pick one "**equipment room**" that will house the core switches and router for the building as well as access cables from nearby classrooms and offices. You will also need "**telecom closets**" if the building is so large that an access cable will be more than 90 meters long. Ensure that the cable run from each of your chosen rooms to the office or classroom that is furthest away is **not further than the Cat 5 spec Links to an external site.** allows (90 meters). The building is 65 meters wide. The ceilings are 3 meters tall. Use a ruler to determine the scale of the diagram and use that scale to estimate the total amount of cable that you will need.

- Submit:

1. A diagram of Constant Hall indicating where the equipment room and telecommunication closet(s) should be located. You may use up to 4 small rooms total for these purposes. Because people like windowed offices, the rooms you use **must be windowles**s (not on the outside of the building). Your equipment room must be at least 4 square meters, but telecommunication closets can be as small as 1.5 square meters.

2. An estimate of the **total amount of cable** that will be needed. The simplest way to estimate is to average the shortest and longest cable runs to the equipment room or telecom closet, then multiply that by the number of cables running to that room. Show the assumptions that you used about the horizontal and vertical cable runs that led you to that number (i.e., show your work).

3. Based on the total amount of wire and **number of outlets** you need, **create a materials budget** that includes wiring, outlets/faceplates, and patch panels (Constant Hall already has equipment racks). Indicate the sources of your information.

1 inch = 10 meters

Equipment Room
Telecom Closet
Outlets
Upstairs Connection
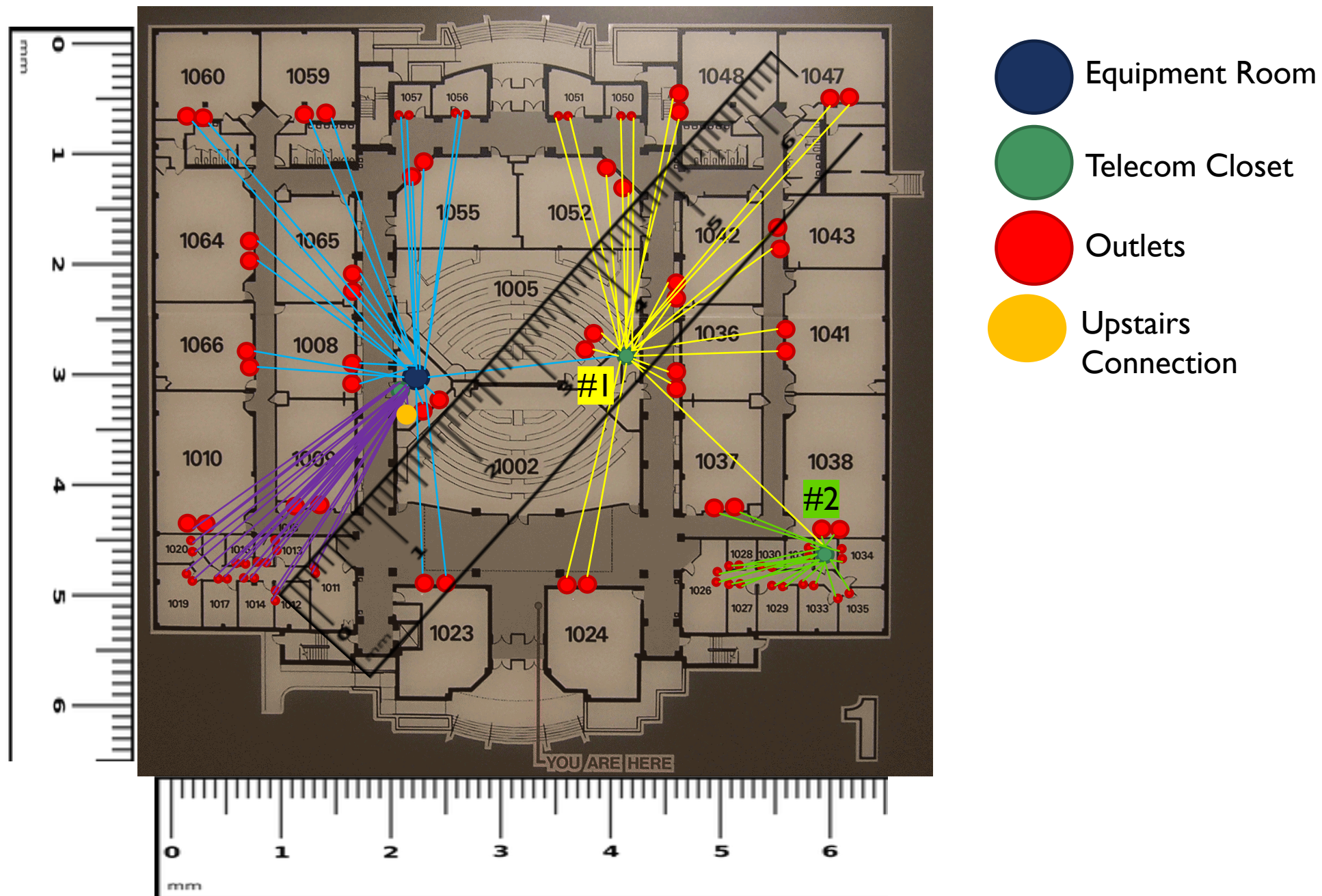
FLOOR 1 MATH

- Equipment room:
  - Longest Wire = 30m
  - Shortest Wire = 1m
  - Total Wires = 46
  - Required switches = 2 (24 slot switches)
  - $((30 + 1)/2) \times 46 = 713m$

- #1 Wires:
  - Longest Wire = 29 meters
  - Shortest Wire = 4 meters
  - Required switches = 1 (24 slot switches)
  - Total Wires = 21 cables.
  - $((29 + 4)/2) \times 21 = 347m$

- #2 Wires
  - Longest Wire = 9
  - Shortest Wire =1
  - Total Wires = 22
  - Required switches = 1 (24 slot switches)
  - $((9 + 1)/2) \times 22 = 110$

- Total Floor 1 Wires
  - $713m + 347m + 110m + 3m \text{ (height)} = 1173m$
  - Total cables = 46 + 21+ 22 = 89
  - Required Switches = 2 + 1 + 1 =4
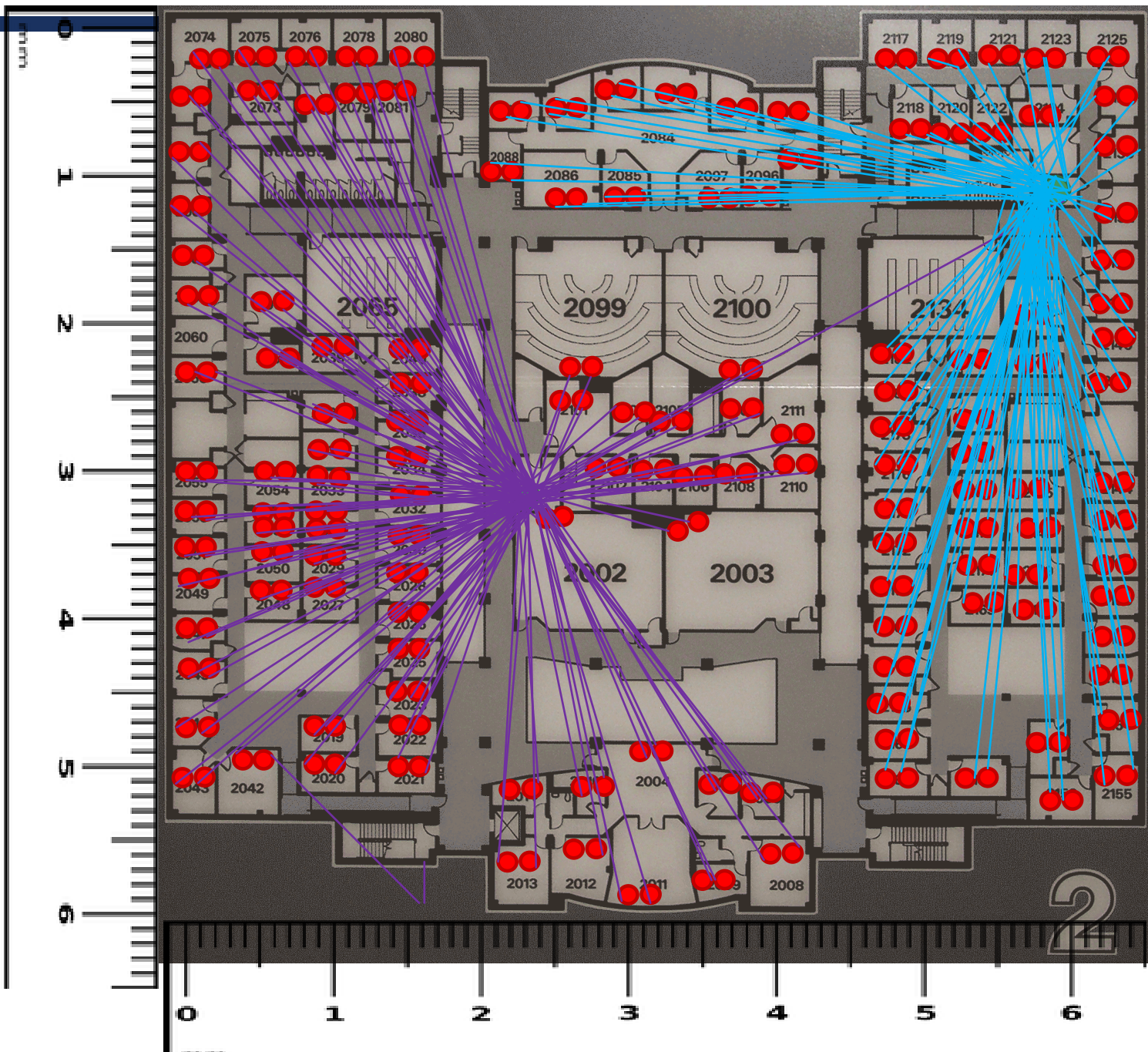
FLOOR 2 MATH

- Purple Wires
    - Longest Wire = 40m
    - Shortest Wire = 2m
    - Total Wires = 156
    - Required switches = 17 (24 slot switches)
    - $((40 + 2)/2) \times 156 = 3276m$

- Blue Wires
    - Longest Wire = 40 meters
    - Shortest Wire = 1 meters
    - Total Wires = 126 cables
    - Required switches = 6 (24 slot switches)
    - $((40 + 1)/2) \times 126 = 2583m$

- Total Floor 2 Wires
    - 3276m + 2583m = 5859m
    - Amount = 156 + 126 = 282

- Total Wires
    - Length = 1173m + 5859m = 7032m
    - Amount = 89 + 282 = 371
    - Required Switches = 4 + 7 + 6 = 17

BUDGET

Product	Price	Amount	Total Price	Amazon Link
Cat5e cable (1000ft)	$68	8	$544	Amazon.com
Wall plate (4 pack)	$12	93	$1116	Amazon.com
Patch Panel (24 Port)	$42	17	$714	Amazon.com
		Total	$2374	