

Constant Hall Structured Cabling Design

Hands-On Assignment #3

Name: Everett Bostwick

Part 1 — Equipment Room & Telecom Closet Locations

Rooms selected (4 total)

All four rooms are interior, windowless service rooms shown on the plan without room numbers

- Equipment Room (E) — 1st floor, center-west interior. Core router, core switches, and patch panels. Serves the 22 rooms
- Telecom Closet TC-1 — 1st floor, center-east interior. Serves the 22
- Telecom Closet TC-2 — 2nd floor, center-west (stacked above E). Serves the 73 rooms
- Telecom Closet TC-3 — 2nd floor, center-east (stacked above TC-1). Serves the 71 rooms

TC-1, TC-2, and TC-3 each uplink to the equipment room (E) via the central vertical riser, completing the extended-star backbone.

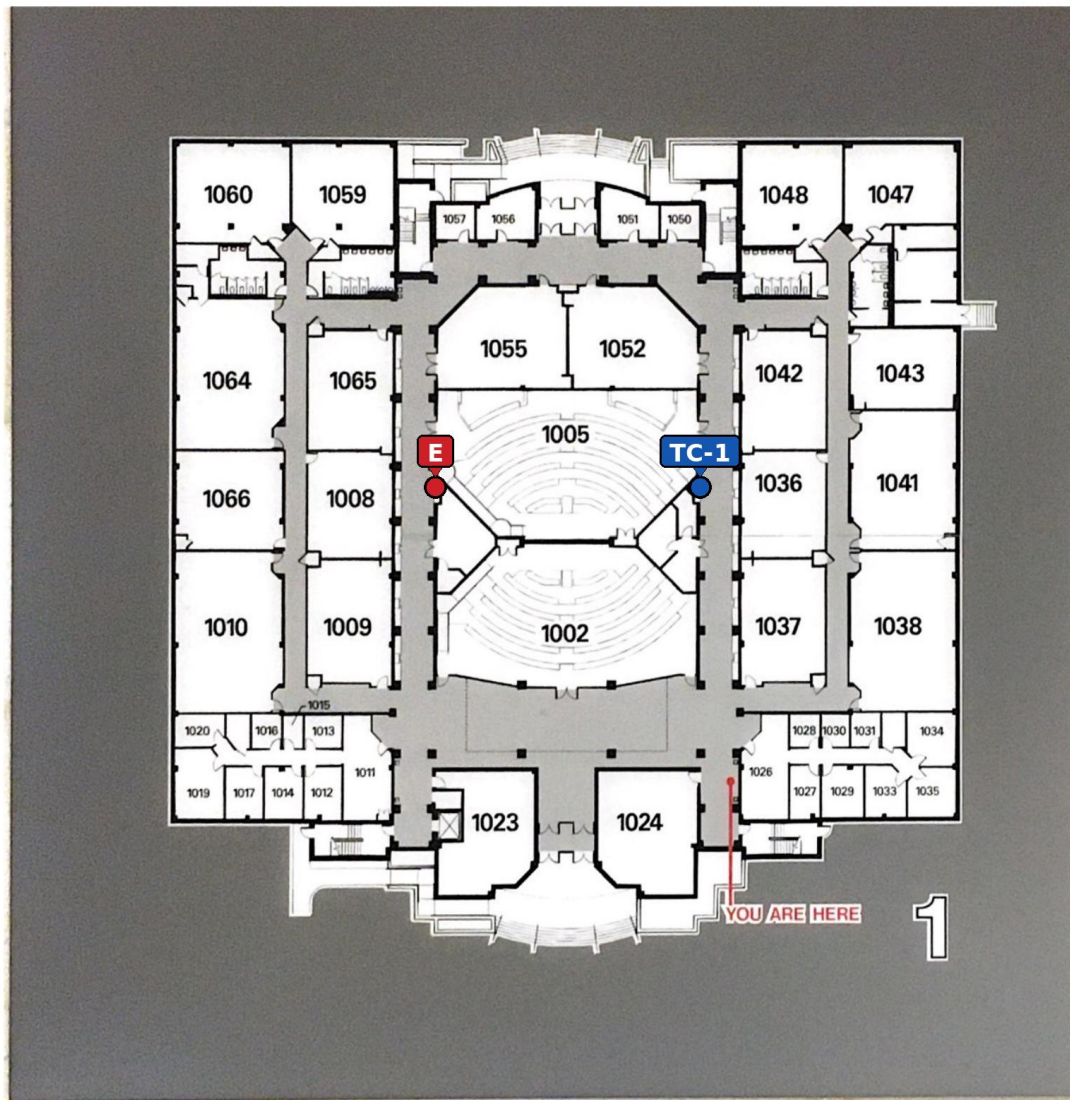
Marked floor plan

First floor — Equipment Room (E, red) and Telecom Closet TC-1 (blue):

CONSTANT HALL — 1st FLOOR

LEGEND

- E = Equipment Room
- TC-1 = Telecom Closet (1st Flr, East half)

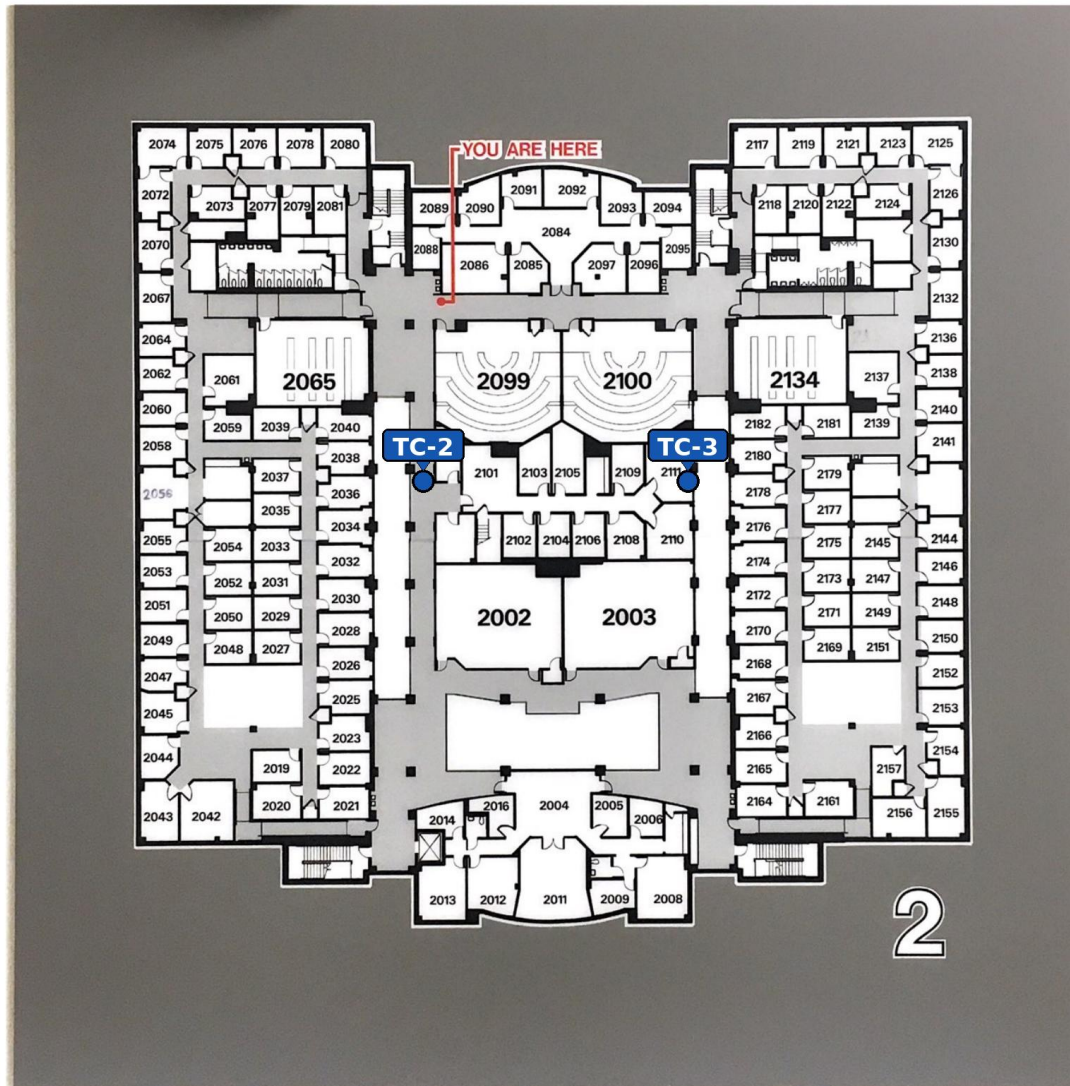


Second floor — Telecom Closets TC-2 and TC-3 (blue):

CONSTANT HALL — 2nd FLOOR

LEGEND

- TC-2 = Telecom Closet (2nd Flr, West half)
- TC-3 = Telecom Closet (2nd Flr, East half)



Part 2 — Total Cable Estimate (incl. 10% wastage)

Scale derivation

The building is given as 215 ft wide. On the floor-plan image the building footprint measures 1,122 pixels across for the image, giving a scale of $215 \div 1,122 \approx 0.192$ ft per pixel (about 5.2 px/ft). Cable run lengths below were scaled from using this factor, measured along corridor routes rather than straight diagonals, since cables follow the trays.

Assumptions

- Each numbered room gets 2 data outlets = 2 cables. Room counts: 1st floor 44 rooms (22 west / 22 east); 2nd floor 144 rooms (73 west / 71 east). Total 188 rooms = 376 horizontal cables.
- The 20 ft vertical allowance covers the drop from the corridor plenum down to the wall outlet (10 ft ceiling) plus the rise into the tray and service slack/terminations at each end.
- Shortest run ≈ 20 ft (nearest adjacent room); longest run is the scaled distance to the farthest room served by that closet along corridor routes.
- Ceilings are 10 ft; cables ride in corridor-plenum cable trays before branching to rooms.

Per-closet calculation

Room	Shortest	Longest	Average	+20 ft vert.	Cables	Subtotal (ft)
E (1st W)	20 ft	140 ft	80 ft	100 ft	44	4,400
TC-1 (1st E)	20 ft	140 ft	80 ft	100 ft	44	4,400
TC-2 (2nd W)	20 ft	145 ft	82.5 ft	102.5 ft	146	14,965
TC-3 (2nd E)	20 ft	150 ft	85 ft	105 ft	142	14,910
Subtotal (sum of runs)	38,675 ft					

Add 10% wastage:

- Subtotal of all runs: 38,675 ft
- Wastage ($10\% \times 38,675$): 3,867.5 ft
- Total cable required: $38,675 + 3,867.5 = 42,542.5$ ft $\approx 42,543$ ft
- In 1,000 ft spools: $42,543 \div 1,000 = 42.5 \rightarrow$ round up to 43 spools

Part 3 — Materials Budget

Item	Description	Qty	Unit price
Cat6A Plenum (CMP) cable	Cat6A Plenum (CMP), 10Gb, 23 AWG, unshielded (U/UTP), solid bare copper, 4-pair, UL Listed — 1,000 ft spool. Vendor: Infinity Cable Products (Elite Cable, SKU TUP2304S03BU).	43 spools	\$448.00
Total project cost (cable only)		\$19,264.00	

Calculation: 43 spools × \$448.00 = \$19,264.00

Vendor link: [Infinity Cable Products — Cat6A Unshielded Plenum 1000ft](#)