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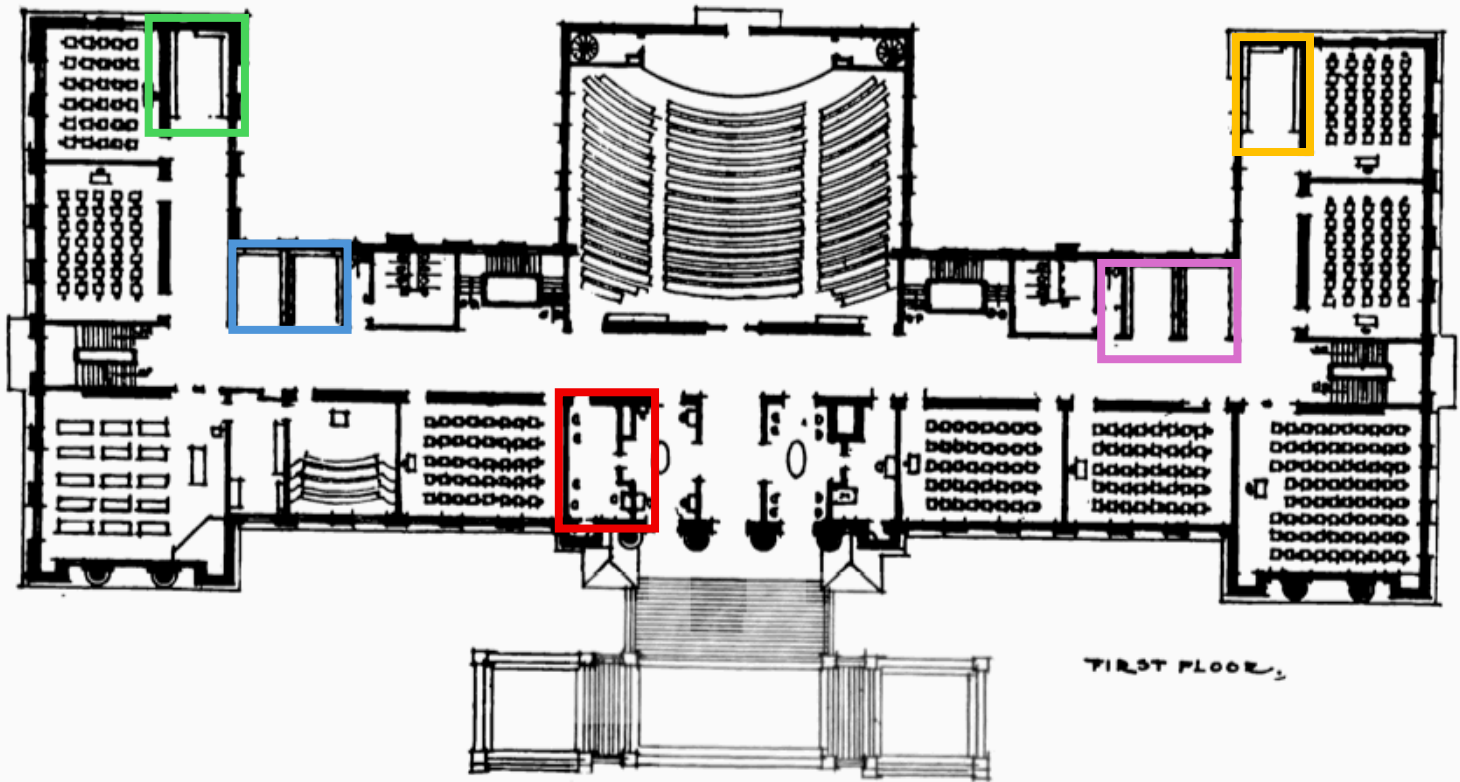
IT 315

Vijay Kalburgi

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Case Analysis

IT 315



Equipment Room: Red Box

Telecom #1: Green Box

Telecom #2: Blue Box

Telecom #3: Purple Box

Telecom#4: Orange Box

Cable Length Breakdown:

Basement: 8 Rooms: 16 drops: 2,112 ft

1st Floor: 24 Rooms: 48 drops: 7,392 ft

2nd Floor: 22 Rooms: 44 drops: 6,292 ft

3rd Floor: 21 Rooms: 42 drops: 6,930 ft

Total: 22,726 ft. Ordered 25,000ft to cover slack.

Item	Quantity	Unit Price	Total Price	Source
Cat6 Plenum Bulk Cable (1,000 ft boxes)	25	\$459.99	\$11,499.75	Monoprice Cat6 CMP 1000 ft
Dual RJ-45 Wall Plates (1-gang, 2-port)	75	\$2.53	\$189.75	Leviton QuickPort 2-port
Cat6 Keystone Jacks	150	\$2.39	\$358.50	Monoprice Cat6 punch-down
48-Port Cat6 Patch Panels	4	\$67.15	\$268.60	CableWholesale / Tripp-Lite
Closet Patch Cords (3–5 ft Cat6)	150	\$1.99	\$298.50	Monoprice Cat6 patch cable
Room Patch Cords (10 ft Cat6)	300	\$4.29	\$1,287.00	Monoprice Cat6 patch cable
OM3 LC–LC Fiber Jumpers (100 m)	4	\$278.99	\$1,115.96	CDW / FS.com
10G SFP+ SR Modules	8	\$16.99	\$135.92	10Gtek Amazon
42U Open-Frame Rack (Equipment Room)	1	\$337.85	\$337.85	StarTech 42U open-frame
12U Wall-Mount Rack (Telecom Rooms)	4	\$157.27	\$629.08	StarTech 12U wall-mount
UPS – 2200 VA (Equipment Room)	1	\$1500	\$1500	APC SMT2200
UPS – 1500 VA (Telecom Rooms)	4	\$575	\$2300	APC SMT1500
			\$18,308.26	

Network Topology:

Cabling:

Total Copper: 22,726 ft, rounded up to 25,000 ft Cat6 to account for waste, re-termination and any longer than average runs.

Backbone Fiber: Four OM3 LC-LC duplex jumpers, 100m each, from equipment room to telecom rooms.

Run Limit Compliance: All copper runs are well below the 100m (328 ft) limit.

Equipment Room:

The Equipment Room houses the core networking infrastructure and is the central point for all connections in the building.

Contents:

Core Layer 3 Switch (48-port, 4x SFP+ Uplinks) – aggregates all fiber uplinks from Telecom Rooms. Handles VLAN Routing between staff, students and management networks.

Next-Generation Firewall (200-300 Users) – Provides internet gateway, VLAN segmentation and access control rules. Positioned between ISP Modem and core switch.

Patch Panels- Fiber uplinks and any copper connections

Fiber Hardware- LC fiber patch panels for OM3 connections to Telecom Rooms

Rack- 42U open frame rack to mount switches, firewall, patch panels, and cable management.

UPS (2200 VA) – provides batter backup in case of power loss.

Cable management: Horizontal/Vertical managers for neat and accessible cabling.

Telecom Rooms (TR1-TR4) – 1st Floor, in separate quadrants.

Each Telecom Room serves one quadrant of the building vertically (1st, 2nd, and 3rd floors) via dedicated risers. These rooms connect classrooms and offices to the core via fiber uplinks.

Contents:

Access Switch - (48 port managed, VLAN-capable, with SFP+ uplink): connects all copper drops in its quadrant to the network

Patch Panels- Cat6 copper runs from classrooms/offices served by Telecom Room

Fiber Termination Panel- LC Panel to connect uplink fiber to the Equipment Room

Rack – 12U wall-mounted enclosure for switches, patch panels, and fiber hardware.

UPS – 1500 VA to maintain network operation for that quadrant during short power outages.

Cable Management – patch cable organizes for clean routing

Vertical Riser Path – Secure conduit to carry fiber and copper between floors for the quadrant level.

Item	Quantity	Unit Price	Total Price	Source
Core Layer 3 Switch (48-port, 4× SFP+ uplinks) – aggregation/routing between VLANs	1	\$1,600	\$1,600	Cisco SG350X
Access Switches (48-port, VLAN-capable, 4× SFP+ uplinks) – one per Telecom Room	4	\$1,295.00	\$5,180.00	Cisco Business 350-48 / Aruba 1960-48
10G SFP+ SR Modules – core↔TR uplinks (2 per link, 4 links)	8	\$16.99	\$135.92	FS.com
OM3 LC–LC Duplex Fiber Jumpers (100 m) – ER↔TR uplinks	4	\$278.99	\$1,115.96	CDW / FS.com
Rack-Mount PDU (Power Distribution Unit) – per room	5	\$89.99	\$449.95	Tripp-Lite / APC
UPS – 2200 VA (Equipment Room)	1	\$1,500.00	\$1,500.00	APC SMT2200 / CyberPower PR2200
UPS – 1500 VA (Telecom Rooms)	4	\$575.00	\$2,300.00	APC SMT1500 / CyberPower PR1500
Cable Management Kits – horizontal/vertical organizers for racks	5	\$45.00	\$225.00	StarTech / Tripp-Lite