

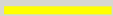
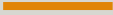





Wiring Maury High School

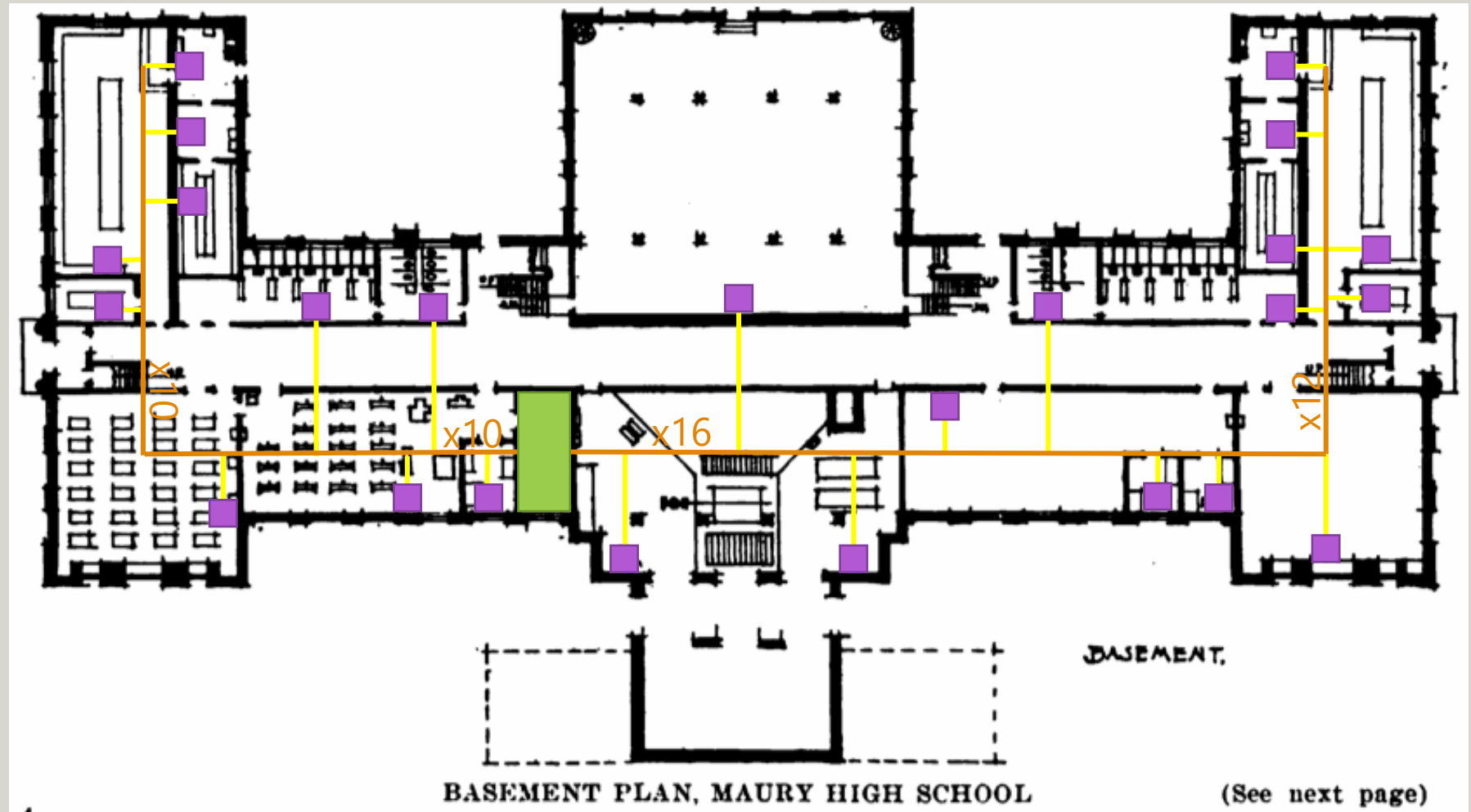
Gavin Williams

12/11/2022

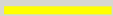
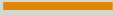



Legend

-  2 Ethernet Cables
-  Multiple Ethernet Cables
-  Telecommunications Closet
-  Ethernet Wall Plate with two data outlets
-  Represents number of cables in the bundle

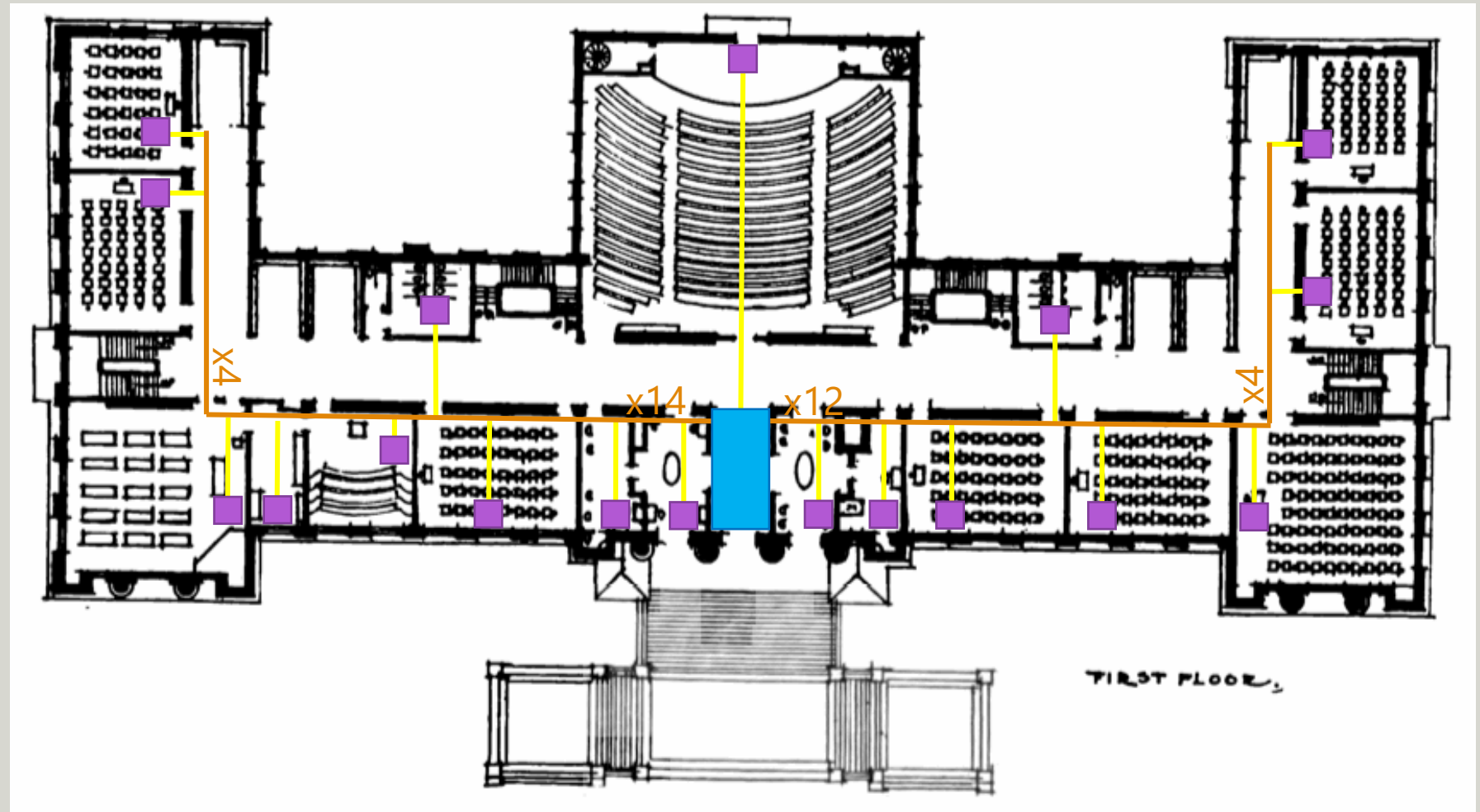
Basement



Legend






-  2 Ethernet Cables
-  Multiple Ethernet Cables
-  Equipment Room
-  Ethernet Wall Plate with two data outlets
-  Represents number of cables in the bundle

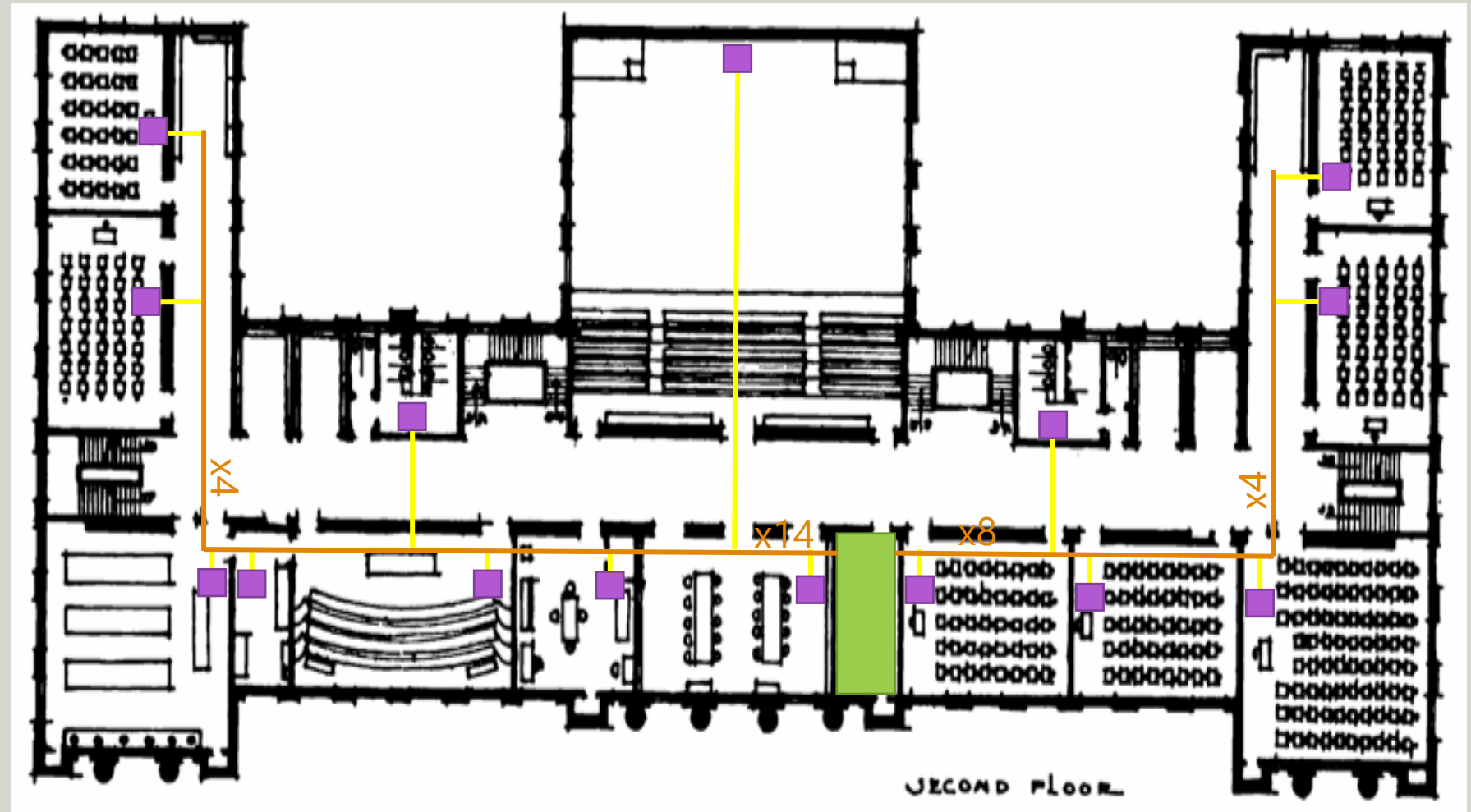
Floor 1



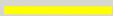
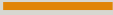



Legend

Floor 2

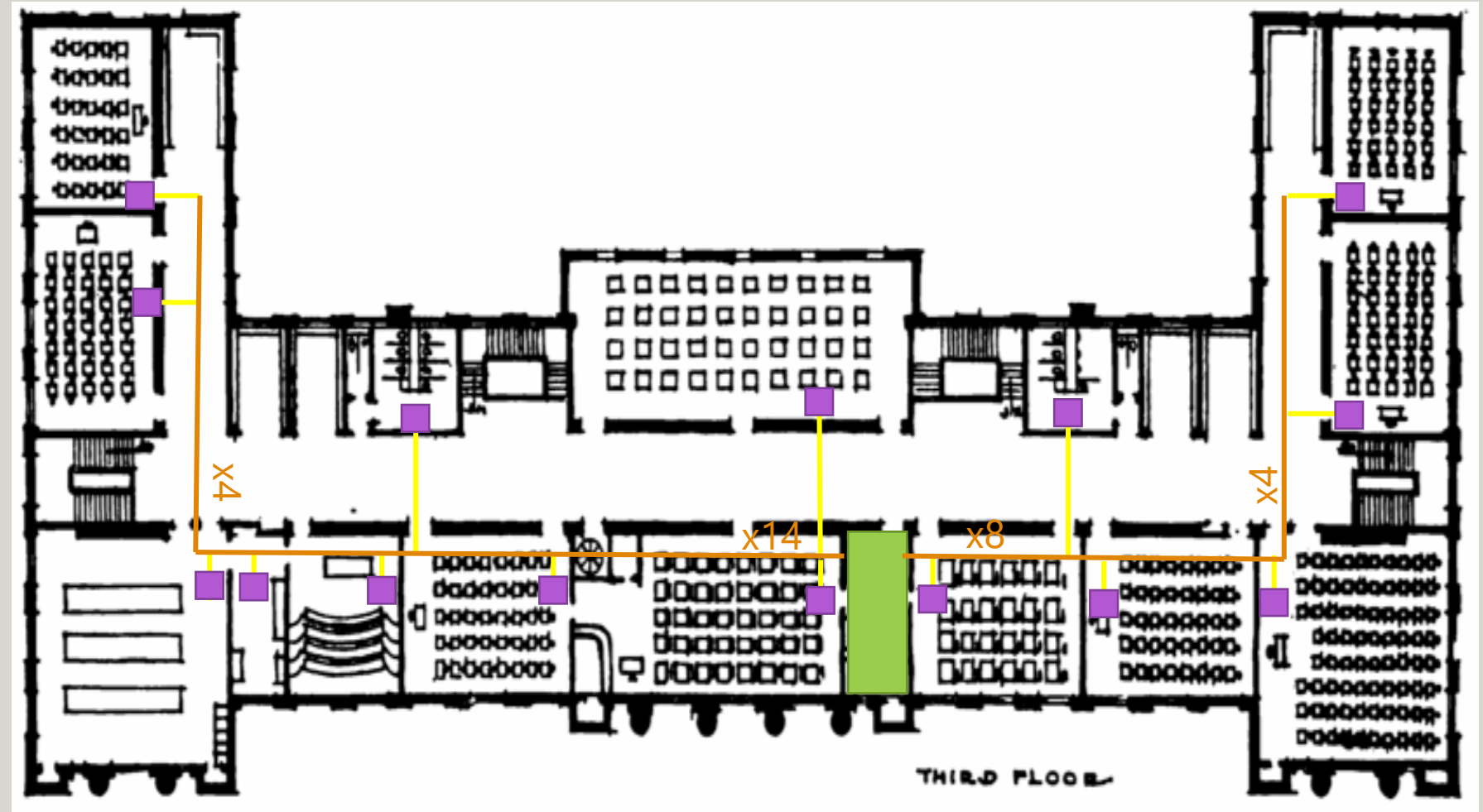
-  2 Ethernet Cables
-  Multiple Ethernet Cables
-  Telecommunications Closet
-  Ethernet Wall Plate with two data outlets
-  Represents number of cables in the bundle



Legend

-  2 Ethernet Cables
-  Multiple Ethernet Cables
-  Telecommunications Closet
-  Ethernet Wall Plate with two data outlets
-  Represents number of cables in the bundle

Floor 3



EQUIPMENT AND COST

Item	Amount	Net Cost
Cat5e ethernet cable	~6,623.43 meters	\$1,470
RJ45 Ends	3 units (3 bundles of 100)	\$30
Outlets/faceplates	18 units (18 bundles of 4)	\$252
Patch panels	8 units	\$392
Patch cables	4 units (4 bundles of 50)	\$220
Total	\$2,364	

RECOMMENDED EQUIPMENT AND COST WITH EXTRA EQUIPMENT FOR EXPANSION

Item	Amount	Net Cost
Cat5e ethernet cable + 20% extra	~7,948.116 meters	\$1,680
RJ45 Ends + 20% extra	4 units (4 bundles of 100)	\$40
Outlets/faceplates + 20% extra	22 units (22 bundles of 4)	\$308
Patch panels + 20% extra	10 units	\$490
Patch cables +20% extra	5 units (5 bundles of 50)	\$275
Total	\$2,793	

Equipment List

- Cat5e Ethernet Cable = VIVO Gray 1,000ft Bulk Cat5e, CCA Ethernet Cable, 24 AWG, UTP Pull Box, Cat-5e Wire, Indoor, Network Installations CABLE-V001 (x50 or x60)
- RJ45 Ends = Cat6 RJ45 Ends 100-PACK Cat6 / Cat5e RJ45 Connector, Pass Through Ethernet Cable Crimp Connectors for Solid Wire and Standard UTP Network Cables (x8 or x9)
- Patch Panel = Patch Panel 24 Port Cat6A with Inline Keystone 10G Support, Rapink Coupler Patch Panel STP Shielded 19-Inch with Removable Back Bar, 1U Network Patch Panel for Cat7, Cat6, Cat6A, Cat5e, Cat5 Cabling (16 or 19)
- Outlets = HuaHengHT Ethernet Wall Plate Outlet 4 Packs 2 cat6 Port RJ45 Network Female to Female Keystone Wall Inline Coupler Jack Plates Blue (x172 to x207)
- Patch cables = GearIT 50-Pack, Cat5e Ethernet Patch Cable 1 Foot - Snagless RJ45 Computer LAN Network Cord, Blue - Compatible with 48 Port Switch POE Rackmount 48port Gigabit (x8 or x9)

Notes

- Nearly every room has ethernet cables running to it regardless of the room's purpose.
- Total cable length is an estimate based on inaccurate measurements.
- Telecommunications closets and equipment rooms were placed in the room located around the middle of each floor regardless of the rooms purpose.
- Cost is calculated before tax
- Cost is calculated without shipping, since everything is bought from amazon an amazon prime subscriptions cancels shipping.

Math

```
*Final project math.txt - Notepad
File Edit Format View Help
Width = 95 meters
*As per diagram* 1" = 10.56 meters
*Add 6 meters per orange cable for wiring to and from ceiling*
*yellow is an average of 7 Meters, unless otherwise specified*

Basement
940.48 (orange 1 right)
388.8 (orange 2 right up)
302.9 (orange 3 left)
324 (orange 4 left up)
196 (yellow right)
140 (yellow left)
rj-45 ends = 96
faceplates = 24
patch panels = 2
Subtotal = 2,292.18m

Floor 1
477.51 (orange 1 right)
108.48 (orange 2 right up)
527.52 (orange 3 left)
108.48 (orange 4 left up)
32.4 (yellow middle)
112 (yellow right)
126 (yellow left)
rj-45 ends = 68
faceplates = 17
patch panels = 2
Subtotal = 1,492.39m

Floor 2
259.2 (orange 1 right)
129.6 (orange 2 right up)
675.36 (orange 3 left)
129.6 (orange 4 left up)
39.79 (yellow middle)
84 (yellow right)
126 (yellow left)
rj-45 ends = 60
faceplates = 15
patch panels = 2
Subtotal = 1,443.55m

Floor 3
250.75 (orange 1 right)
129.6 (orange 2 right up)
675.36 (orange 3 left)
129.6 (orange 4 left up)
84 (yellow right)
126 (yellow left)
rj-45 ends = 60
faceplates = 15
patch panels = 2
Subtotal = 1,395.31m

Total length = 6,623.43 meters

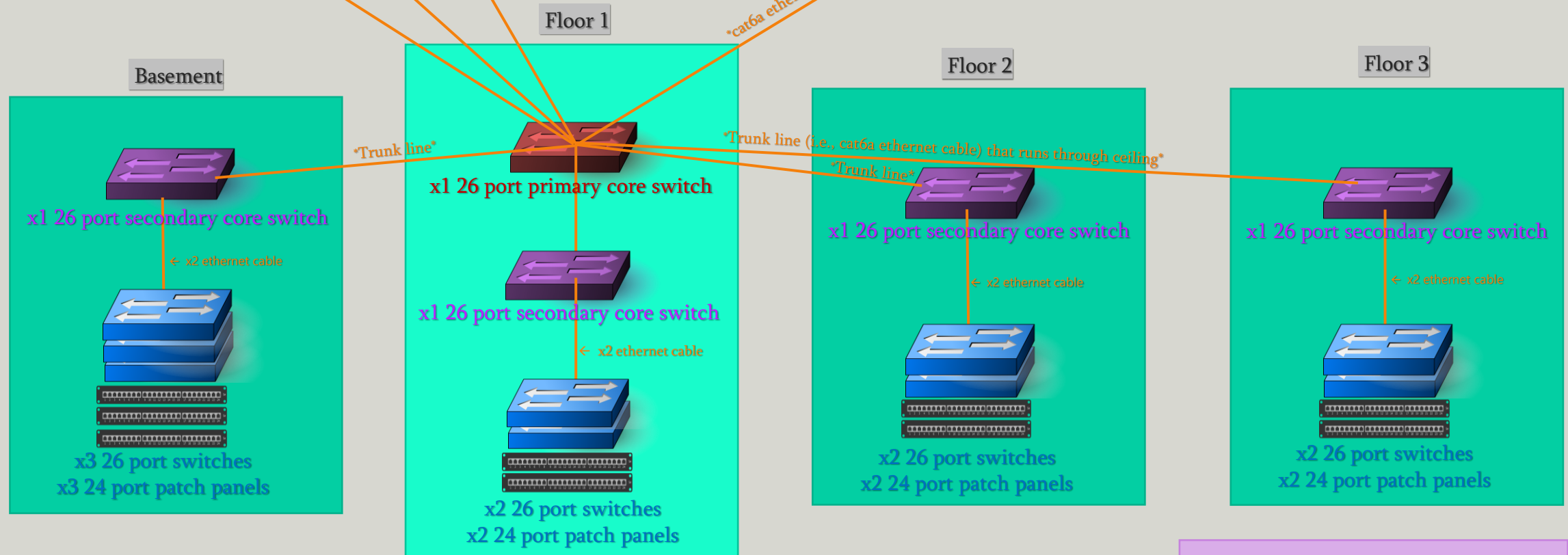
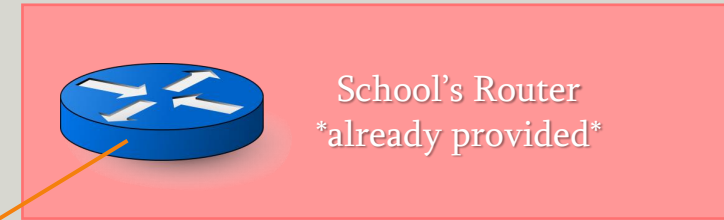
Ln 4, Col 63 100% Windows (CRLF) UTF-8
```


Switch layout +10% equipment

Locate in equipment room if enough space



Locate in equipment room if enough space



← Unlabeled orange line = 1 cat5e ethernet cable

EQUIPMENT AND COST + 10%

Item	Amount	Net Cost
Managed Switches	13 units	\$3,899.87
Cat5e ethernet cable x1 (pack of 20)	40 - 5ft cables	\$36.99
Cat6a ethernet cable x1	500 feet	\$143.99
Patch panels	9 units	\$441
Patch cables	5 units (5 bundles of 50)	\$275
Total	\$4,796.85	

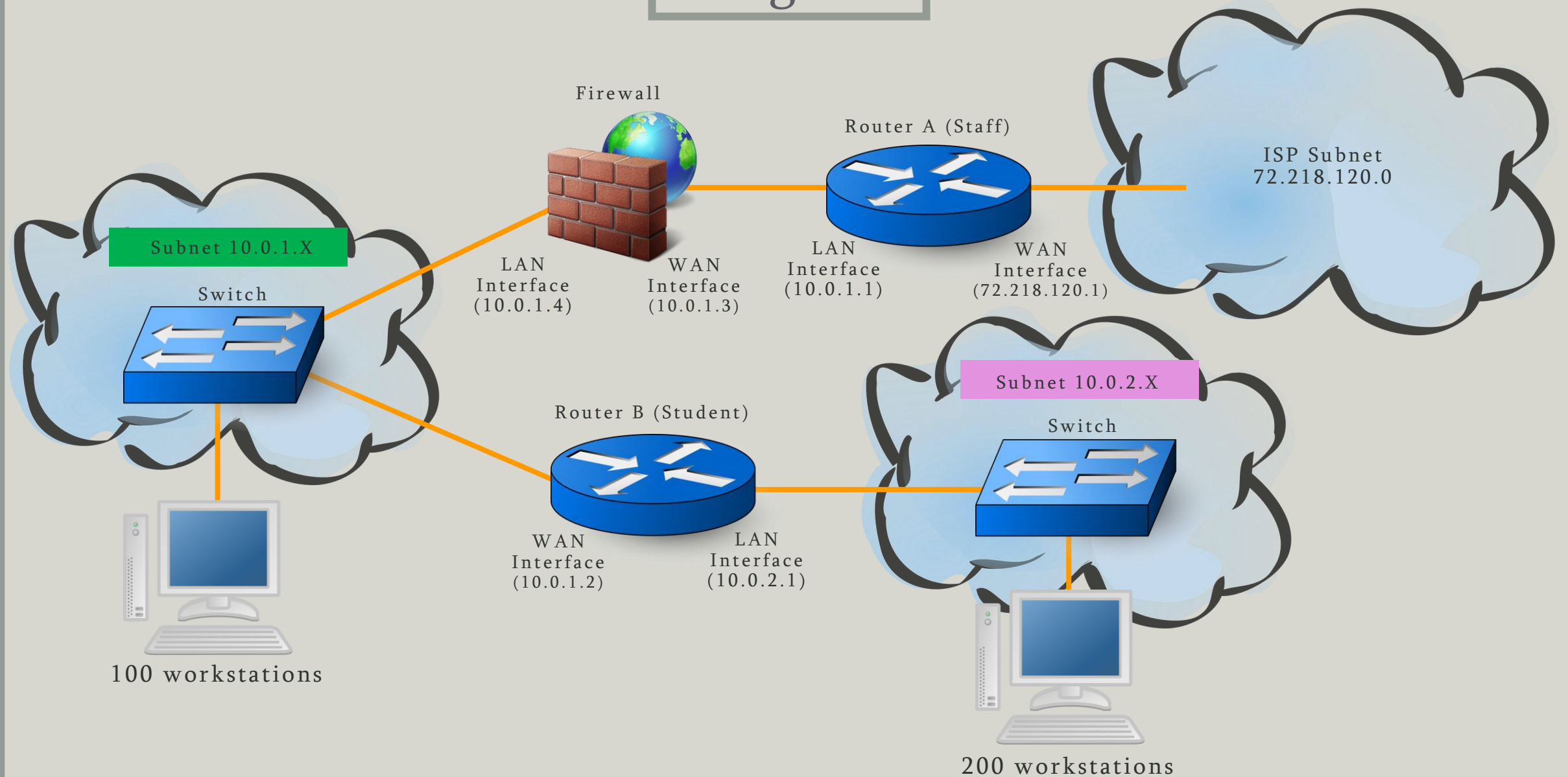
Notes

- Primary core switch is connected to the school's router which in this diagram is already provided
- The diagram shows potential servers that can be added and how to connect them; however, this is just hypothetical, so it isn't calculated into the cost
- Cost is calculated before tax
- Cost is calculated without shipping, since everything is bought from amazon an amazon prime subscriptions cancels shipping.

Equipment List

- Managed Switch = [NETGEAR 26-Port PoE Gigabit Ethernet Smart Switch \(GS324TP\) - Managed, with 24 x PoE+ @ 190W, 2 x 1G SFP, Desktop or Rackmount, S350 series](#)
- Patch Panel = [Patch Panel 24 Port Cat6A with Inline Keystone 10G Support, Rapink Coupler Patch Panel STP Shielded 19-Inch with Removable Back Bar, 1U Network Patch Panel for Cat7, Cat6, Cat6A, Cat5e, Cat5 Cabling \(16 or 19\)](#)
- Patch cables = [GearIT 50-Pack, Cat5e Ethernet Patch Cable 1 Foot - Snagless RJ45 Computer LAN Network Cord, Blue - Compatible with 48 Port Switch POE Rackmount 48port Gigabit \(x8 or x9\)](#)
- Cat5e ethernet Cable = [GearIT 20-Pack, Cat5e Ethernet Patch Cable 5 Feet - Snagless RJ45 Computer LAN Network Cord, Blue](#)
- Cat6a ethernet cable = [celertec CAT6A Ethernet Cable, 500ft, 23AWG Solid Bare Copper, UTP Unshielded Twisted Pair, CMR Riser Rated &ETL Listed, 650Mhz/10 Gigabit Network Speed, Category6 Augmented, Bulk Ethernet Cable- Blue](#)

Diagram



System Routing Table

Router A
(10.0.1.1)

ID	Destination Network	Subnet Mask	Gateway / Next Hop	Interface
1	10.0.1.0	255.255.255.0	10.0.1.3	LAN
2	72.218.120.0	255.255.248.0		WAN
3	10.0.2.0	255.255.255.0	10.0.1.3	LAN
4	0.0.0.0	0.0.0.0	72.218.120.1	WAN

Firewall
(10.0.1.4)

ID	Destination Network	Subnet Mask	Gateway	Interface
1	10.0.1.0	255.255.255.0		LAN
2	10.0.2.0	255.255.255.0	10.0.1.2	LAN
3	72.218.120.0	255.255.248.0	10.0.1.1	WAN
4	0.0.0.0	0.0.0.0	10.0.1.1	WAN

System Routing Table

Router B
(10.0.1.2)

ID	Destination Network	Subnet Mask	Gateway	Interface
1	10.0.2.0	255.255.255.0		LAN
2	10.0.1.0	255.255.255.0		WAN
3	72.218.120.0	255.255.248.0	10.0.1.4	WAN
4	0.0.0.0	0.0.0.0	10.0.1.4	WAN

EQUIPMENT AND COST

Item	Amount	Net Cost
Firewall	1 unit	\$1,699.99
Total	\$1,699.99	

Item	Amount	Net Cost
Firewall	1 unit	\$1,699.99
Routers	2 units	\$598
Total	\$2,297	

Notes

- Routers are expected to be already provided. (however, I add potential routers incase they aren't shown in the blue table)
- Note that most Ip addresses were kept the same from the Hands on #7 this is for simplicity reasons.
- The firewall acts as a router that traffic must flow through to get to the switch, if it is flagged as a potential threat is logged and then dropped.
- The firewall is suitable for 250 users at a time, this is fine since most likely not all 300 users will be generating traffic at the same time. ("also, it's the largest capacity firewall I found on amazon")
- Cost is calculated before tax.
- Cost is calculated without shipping, since everything is bought from amazon an amazon prime subscriptions cancels shipping.

Equipment List

- Firewall = [Zyxel USG Flex 700 \(USG310 v2\), UTM Firewall Bundled with 1 Year Security License, Recommended up to 250 Users \[USGFLEX700BUN\]](#)
- Potential Routers = [Peplink Balance 20 Dual-WAN Router, black \(BPL-021\)](#)

NET TOTAL

NOT INCLUDING THE ROUTERS

CALCULATING WITH +20% SUB-TOTALS

NOT INCLUDING SHIPPING OR TAX

\$9,289.84

