

Antonio Shields
IT 315
Case Analysis
April 23, 2023

1.

Scale used:

Maury High School = 91.44 meters (m) = 300 feet wide (ft) = 6.45 inches (in)

1 in = 14.18 m

Ceiling height = 3 m = 9.84 ft

One equipment room and Three telecommunication closets are used throughout the high school with the equipment room being on the first floor and one telecomm closet on the basement level, second, and third floors respectively. All four rooms are located in the same location on all four floors so cable distances will be the same on every floor.

Furthest connection from Equipment Room and Telecomm closets = 6.50 in = 92.17 m + 6 m ceiling run (up to the ceiling and down through the ceiling) = 98.17 m

Closet connection to Equipment Room and Telecomm closets = 0.375 in = 5.32 m + 6 m ceiling run = 11.32 m

Average cable length = 54.75 m

One equipment room and Three telecomm closets service 74 rooms (17 rooms on the basement level, 21 rooms on the first floor, 19 rooms on the second floor, and 17 rooms on the third floor) x 2 cables per room = 148 cables needed minimum

Total Cable Length = 54.75 m x 148 cables = 8103 m

8103 m = 26,584.6 ft

Cable purchased from: <https://www.truecable.com/products/cat6-plenum-ethernet-cable-unshielded-1000ft>

Sold as 1000 ft bundles and would need how many to cover total cable length: 27 bundles

Price of Bulk order of 25-49: Plenum \$284.04/1000 ft bundle

Total amount needed for cabling: Plenum: 27 cable bundles x \$284.04 = **\$7669.08** + tax

The cables are Pure Solid Bare Copper Conductors that comply with UL, ANSI/TIA, and U.S. product safety standards, are superior conductor material for data transmission and PoE use and are said to be the only industry and governmental-approved type of conductor for use in Ethernet networks.

74 rooms x 2 ports per room = 148 RJ45 keystone jack connectors needed @ \$63.83 for a 25-pack = 6 packs x \$63.83 = **\$382.98**

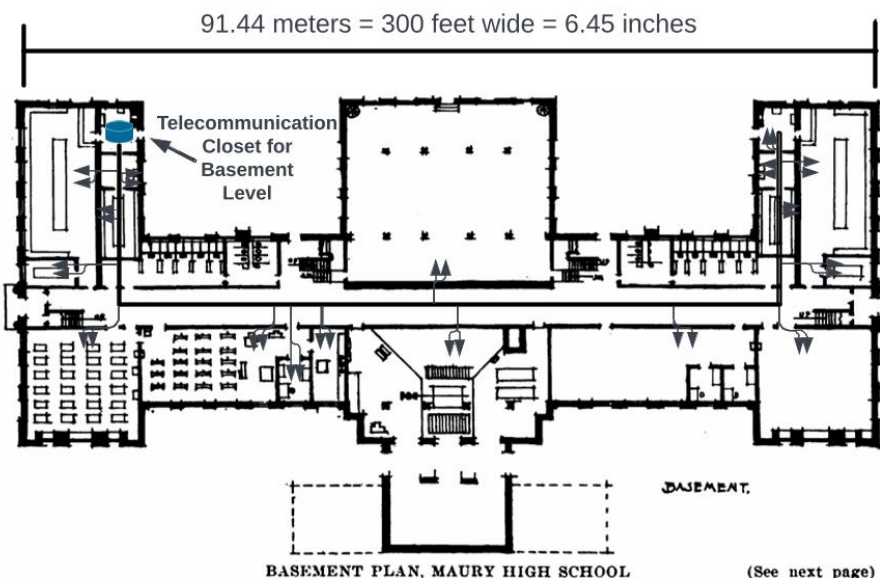
RJ45 keystone jack connectors purchased from: https://www.amazon.com/Leviton-5G108-BL5-GigaMax-QuickPort-Connector/dp/B000U3G114/ref=asc_df_B000U3G114/?tag=hyprod-20&linkCode=df0&hvadid=167151358503&hvpos=&hvnetw=g&hvrnd=2292428448373914409&hvpon e=&hvptwo=&hvqmt=&hvdev=c&hvdvcm dl=&hvlocint=&hvlocphy=9008565&hvtargid=pla-314819632965&psc=1

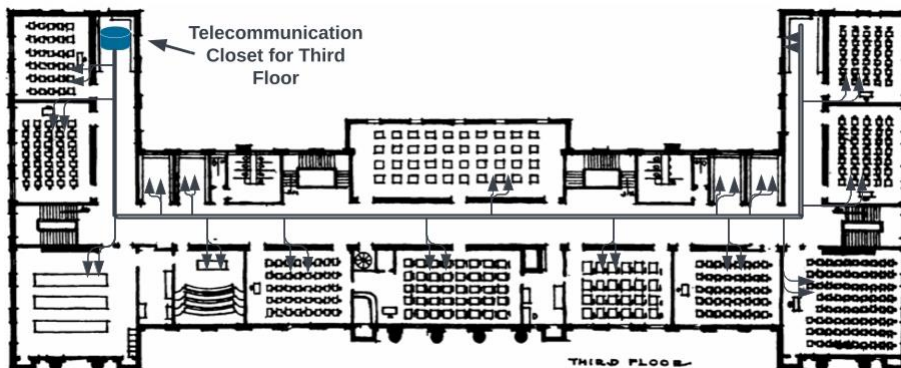
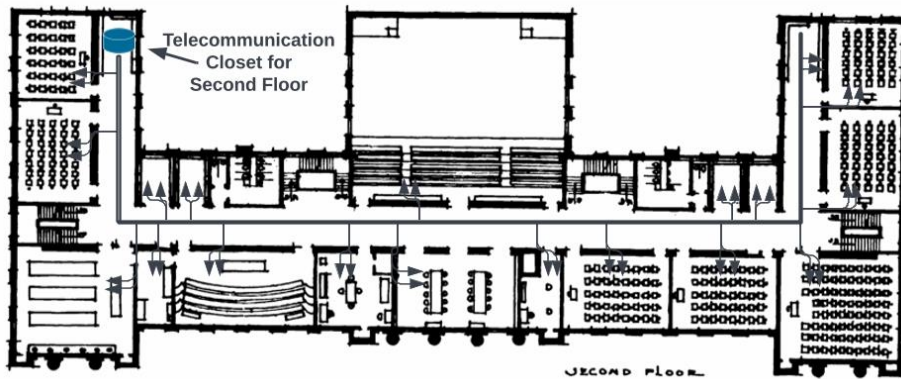
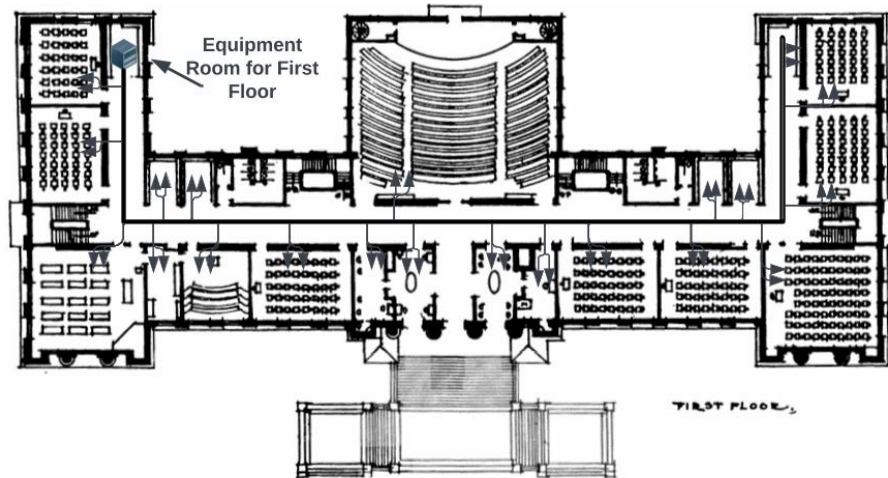
74 keystone jack faceplates would be needed to fit every room. 74 two-port RJ45 keystone jack faceplates @ 2.99 ea = 74 faceplates x \$2.99 = **\$221.26**

RJ45 keystone jack faceplates purchased from: <https://www.cdw.com/product/tripp-lite-2-port-dual-outlet-rj45-universal-keystone-jack-face-plate-taa/1759413>

Four 48-port patch panels are needed, one for the telecomm closet on the basement level to support the 34 ports on this floor, one for the equipment room on the first floor to support the 42 ports on this floor, one for the telecomm closet on the second floor to support the 38 ports on this floor, and one for the telecomm closet on the third floor to support the 34 ports on this floor. I will be utilizing the Tripp Lite 48-port Cat5e Cat5 2U Rackmount 110 Patch Panel Ethernet TAA. Four 48-port patch panels @ \$101.99 ea = (4) 48-port patch panels x \$101.99 = **\$407.96**

48-port patch panels purchased from: https://www.cdw.com/product/tripp-lite-48-port-cat5e-cat5-2u-rackmount-110-patch-panel-ethernet-taa/475461?gclid=EAlaIQobChMik7K_4Lvy_QIVJhCzAB2gaw55EAQYCSABEgIKDPD_BwE&cm_ven=acquir gy&cm_cat=google&cm_pla=NA-NA-Tripp%20Lite_PT&cm_ite=475461&ef_id=EAlaIQobChMik7K_4Lvy_QIVJhCzAB2gaw55EAQYCSABEgIKDPD_BwE:G:s&s_kwcid=AL!4223!3!47988697099!!!g!305383660999





2.

For the workgroup switches, I will be using the same amount as the port patch panels, so four total, one on each floor. For the workgroup switches, I will be using the S3900-48T4S, 48-Port Gigabit Ethernet L2+ Switch @ \$529.00 ea. = (4) S3900-48T4S, 48-Port Gigabit Ethernet L2+ Switches x \$529.00 = **\$2116.00**

<https://www.fs.com/products/72946.html>

For the core switches, I will be using one core switch on the first floor to combine all four workgroup switches, attach the two servers on the first floor, and connect to an access point for wireless connections. I will be utilizing the S5860-20SQ, 24-Port Ethernet L3 Switch, 20 x 10Gb SFP+, with 4 x 25Gb SFP28 and 2 x 40Gb QSFP+, Support Stacking, Broadcom Chip @ \$1599.00 ea = (1) S5860-20SQ, 24 Port Ethernet L3 Switches x \$1599.00 = **\$1599.00**

<https://www.fs.com/products/108710.html>

I will purchase 10 10-ft patch cables for the four workgroup switches and the core switch to connect all the switches to the core switch. (10) 10-ft patch cables x \$3.95 = **\$39.50**

https://www.cables.com/10ft-cat5e-ethernet-patch-cable-blue-color-snagless-boot-stranded-rj45-350mhz-24awg.html?gad=1&gclid=Cj0KCQjwi46iBhDyARIsAE3nVrZgfXaC8HppeHbrvGRA8Bz3Q38miRXVraY2lZhrXAMnTuDi8W9sqCoaAmAGEALw_wcB

3.

The firewall that will be used to support 200-300 users will be the WatchGuard M470 with 3-yr Basic Security Suite WGM47033. This firewall is ideal for up to 450 users and can support up to 300 VLANs. One WatchGuard M470 with 3-yr Basic Security Suite WGM47033 = **\$5,877.30**

<https://www.guardsite.com/Firebox-M470.asp>

Total overall cost: \$7669.08 + \$382.98 + \$221.26 + \$407.96 + \$2116.00 + \$1599.00 + \$39.50 + \$5877.30 = **\$18,313.08**

