Cabling & Wiring Guide

Introduction

Professional cabling and wiring installers can create a neat and reliable network infrastructure for your voice and data connections. By creating a wire management system, you can best prepare for shifts in technology and user requirements.

A typical cabling and wiring project runs voice and data cables through the walls or ceilings of your facility. The cables connect to individual workstations at one end and terminate at patch panels in your server room and telephone closet. Vendors create pathways that neatly store and label cables so you can easily identify problems if they emerge. When a project is complete, the vendor carefully tests the wiring and components to ensure that each location has a fast and clear connection to your network.

Whether you're moving into a new office, gutting and rewiring an existing office, or expanding to accommodate growth, a full-service cabling vendor can ensure that your network is up and running from day one. This Cabling and Wiring Guide will help you find the right vendor and learn what to look for to ensure a clean installation.

One helpful tip before you read on: many people assume they can install wiring themselves because they've done "similar work" at home. Unless you have experienced wiring professionals on staff, avoid this mind-set. Professional voice and data networks are far more complex than any home networking project, and the ongoing headaches will likely outweigh your initial savings. Certified installers have the proper training to ensure a long-lasting, that's worth the initial investment.

Pricing guidelines

Actual costs for cabling and wiring projects will vary tremendously depending on the number of connections (or "drops"), type of cabling, and additional equipment needed. Here are some very rough estimates – we'll go into more detail in Cabling and wiring pricing.

Type of cabling work	Sample prices
Per drop pricing	$100 to $500 per drop
Project-based pricing	$15,000 to $25,000 for full project (about 75 to 100 drops included)

Assessing your cabling needs

Before you can talk to potential cabling vendors, you'll have to gather some crucial information about your facilities and technology needs. For example:

• Age of your building (newer construction is easier to wire and test without causing interruptions)

• Whether this will be an upgrade to existing wiring or a completely new project

• The blueprints and building floor plans showing exact locations for each workstation and office

•Total number of locations or "drops" you need

• Whether you need voice or data connections (or both)

• If you use voice over IP (VoIP) systems (which require high-quality data cable)

 Once you have general answers to all these topics, it's time to start comparing different cabling and wiring providers. Submit a request for cabling and wiring quotes, and you'll be connected with several qualified providers based on your project needs.

Scheduling a vendor site visit

 After you narrow down your choices to a few potential providers, you should schedule physical site visits with the providers you choose. This is an opportunity for the providers to determine:

•Where drops need to be

 • How the cables will be laid out and where they'll be run — above a drop ceiling, through cubicle wiring systems, or along walls

•Where the wiring will terminate — a server room, a telephone closet, or both

• Whether existing wiring has problems such as pinched, unlabeled, or disorganized cables

 The provider will assess your existing wiring, run some quick tests, and map out all requirements for an updated or new installation in a specifications document (read more about the specifications document in choosing a cabling and wiring provider.) If your existing wiring is substandard, they'll let you know they have to run new wires from scratch. They'll also plan the installation around your schedule to reduce downtime and will provide you with a price quote for the project.

 Depending on the provider, you may also get a complete ROI assessment that details how a structured cabling and delivery solution can reduce future material and labor costs, and save you money in the long run.

Meeting standards

 Each provider will also inspect the building to determine if it can accommodate a safe installation. Your wiring project must adhere to industry standards set by multiple governing bodies such as:

• ANS (American National Standards Institute) – Ensures compatibility between data devices

• EIA (Electronic Industries Association) – Sets standards for electrical equipment and functionality

• TIA (Telecommunications Industries Association) – Sets minimum requirements for business-grade telecommunications cabling

Of course, any significant renovation also must comply with local fire and building codes. Your installers should demonstrate thorough familiarity with all the appropriate regulations.

Plenum space vs. non-plenum space

If your cables are run above a drop ceiling that is also used as plenum for an air-conditioning system, you'll have to use plenum-rated cable that doesn't emit toxic fumes in the event of a fire. Plenum cabling costs slightly more than non-plenum wiring, but it's necessary to maintain code compliance.

Any other location for your cables is a non-plenum space. In these cases, installers can use less-expensive plastic-coated PVC cables but may have to charge you more if local building and fire codes require conduits or other fireproof enclosures.

Network cabling services basics

Project work usually starts at the telecom or termination closet. Experienced installers will run voice and data wiring from the closet to every workstation, cubicle, office, and conference room in your facility. If necessary, the network cabling services vendor will install hardware such as patch panels and conduits, or complete rack systems for streamlined wire management.

The installer clearly labels each wire and data port in the telecom closet and server room. This makes it much easier to locate the appropriate components if you need to make changes or fix problems.

Once the wiring is in place, the installer thoroughly tests it to make sure everything works properly and adheres to national and local codes. Using special equipment approved by the EIA or TIA, the installers test for point-to-point connectivity and signaling speeds, certify all new and existing data ports, and correct any problems they find. The process is similar in new installations and upgrades of existing cabling.

Types of cabling

There are three common types of "cat" (cable and telephone) cables, twisted copper wires for voice and data transmission:

• Cat 5 – This structured cabling is found in older wiring setups, and manufacturers still support them but no longer make them. It's upward compatible with Cat 5e and acceptable for low-bandwidth applications if you're not rewiring, but future projects will require Cat 5e or higher.

• Cat 5e – Capable of 100 MHz transmissions, Cat 5e is the most common and cost-effective cabling solution for most businesses. It fulfills most cabling needs and is compliant with most local building and installation codes.

• Cat 6 – This offers twice the performance of Cat 5e but carries twice the price tag. Cat 6 is better suited for complex applications like VoIP system connectivity and offers higher data rates than its predecessors. It's backward compatible with Cat 5e and provides more bandwidth, which helps set you up for future needs. While there currently is no industry-approved "Cat 7", you can get 10 Gig Ethernet, which is the highest-rated cable available. It's typically reserved for businesses like hospitals that need the most bandwidth to regularly transmit large amounts of data. While it offers the best performance, it can cost twice as much as Cat 6 and isn't recommended for most businesses.

Cabling and wiring professionals can also install specialty cabling such as fiber optics or coaxial wire for maximum performance, but those projects can cost twice as much as a traditional setup using copper cabling.

Choosing a cabling and wiring provider

Cabling and wiring installers are usually either low-voltage electricians who do commercial wiring exclusively or phone systems professionals who install wiring as an additional service. Either choice is fine as long as the installer is a certified RCDD (Registered Communications Distribution Designer). This certification ensures that the installer is proficient in telecommunications wiring and understands all national and local codes.

Look for installers who are both licensed and insured. Your cabling and wiring project must adhere to local safety standards set by the National Electronics Code and EIA/TIA. Installers who are certified by standards organizations such as BICSI or AECS learn how to comply with all regulations to ensure that you get a safe and compliant installation.

A great way to learn how a cabling company does business is to see them in action. Ask if you can observe while the vendor installs cabling for another company in your area. Watch how the installers interact with the client and the level of detail they put into the project, and how they communicate with each other while on the job. This should give you a clear idea of how they work and show you what you can expect in your office.

Project specifications document

All cabling and wiring companies should provide a detailed specifications document of your network architecture. This document will explain the project overview, scope of services, labeling and testing details, turnaround time, and necessary equipment.

The spec document also puts a cap on your total costs. Since it details all the required work and associated costs, you're responsible to pay for what's listed and nothing more — unless your requirements change during installation.

The spec document should provide a clear estimate of how long the project will take to complete as well as any downtime you should expect. The document may specify compensation you're entitled to if the vendor doesn't get the job done in time.

Working with a spec document helps you avoid exorbitant fees for making late project changes. This is work you need done beyond what's listed in the document and can add significantly to your costs. A quality vendor will clearly review everything with you so there are no surprises. When you get a copy of the document, share it with your IT and facilities staff to get their input and make sure everything is in order.

Finally, the spec doc should describe the customer support you're entitled to. What happens when problems emerge? Will the vendor respond to your service call and diagnose and correct the problem? What guarantees can the vendor provide for response time? The specifications document should explain the level of service you get, but don't depend only on those written guarantees. Ask plenty of questions about each vendor's customer support policies, so you feel comfortable with a potential partnership.

Get quality references

Make sure to get references before you work with any installer. This is an opportunity to get information the vendor may not have shared. Installers will likely provide you with contact details from their best customers, but you can still elicit honest responses if you ask direct questions about an installer's performance, such as:

• Overall, how happy were you with the installation?

• What challenges did your company face before the project started? Did the installer solve them?

• Were there any delays or problems during the installation?

• Did you receive a detailed specifications document for the work provided?

• Did the installer communicate well with your other service providers (phone systems, internet access, etc.)?

• How much downtime did you experience?

• Would you use this installer again?

• Was there anything about the installation process that could have been improved?

Cabling and wiring pricing

Installing structured cabling requires a large up-front investment. Quality cabling and wiring systems can last three times as long as typical computing equipment for just a fraction of your IT budget.

Most cabling and wiring vendors charge for each location (or "drop" or "end point") where you need voice and data connections. The costs can vary greatly, from $100 to $500 per drop, depending on the number of connections you need, the type of cabling you choose, and any additional installed equipment.

Other vendors may provide a total project cost. For example, a vendor installing 75 drops for a small business may charge $15,000 to $22,500 for the entire project. If the company needs additional drops beyond that, they could pay a per-drop rate as long as it's added to the spec document before the work begins.

Your current wiring status will also have a big impact on your costs. Work done in new construction or existing construction with reliable outlets carries a lower total cost. Installations that need to completely gut and rewire a messy setup will be at the higher end of the pricing spectrum. Regardless of the complexity of the job, you can expect per-drop costs to dip as the total number of drops increases.

Your rates can also differ depending on how easy it is for vendors to install the wiring. If your installers can easily access conduits or ceiling plenums, you'll pay considerably less per drop than projects that require pulling cables through attics or tight crawl spaces.

The vendor should stand behind all the work and installed equipment with a warranty. A typical cabling and wiring warranty guarantees your infrastructure for five to 10 years. The specifications document should detail what the warranty will cover, including response times, additional materials, testing and labeling, and travel costs.

Review pricing details in the spec document

One benefit to a cabling and wiring project is that the spec document details everything you'll need. When you receive a quote, it should include itemized pricing and material quantities as well as information about installation, labeling, and testing of all components. The document will explain the scope of the work and if any labor or materials aren't included in the costs — typically such nominal extras as conduits, sleeves, or paint, or special wiring like fiber optics or coaxial cables.

As mentioned in choosing a vendor, it's crucial to carefully review the spec document before the vendor begins work. The document details the manpower and labor hours necessary to complete a job for the price quoted. If you request add-ons or changes, the vendor can charge as much as double the original estimates. One helpful tip is to plan ahead — have the vendor pull additional lines or add more connections now to plan for future growth and avoid these hefty costs.

Most cabling projects also require you to pay in advance for supplies and equipment that are delivered to your worksite prior to installation. After installation and testing, you pay the balance of the project costs.

7000 Central Parkway, Suite 1700

Atlanta, GA 30328

Contact: Mike Allen / Principal

 (770) 294-1049

mallen@cablingtoday.com

www.cablingtoday.com