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The basics of building a computer room

Denver and the Front Range have been attracting a host of advanced technology companies for years. An ample, educated and youthful workforce, a centralized national location, and high quality of life offer fast-moving operations considerable opportunities to flourish here.

Scores of these companies are information-based, their success dependent upon the smooth and consistent operation of in-house computer systems. In many cases, these systems are controlled and monitored within specially designed and constructed computer rooms.

Coordinating the construction and outfitting of these computer nerve centers is more challenging today than ever before with both tenants and building owners seeking faster and more cost-effective ways of getting it done.

It's in the details

A computer room is an enclosed area of an office space, which acts as the company's main data processing and management system. The room is usually sealed for temperature regulation, carries extra power and communications capacity under a raised floor, and may or may not have beefed up security requirements.

A computer room can be a storage and retrieval base, or it can support a high-output network of terminals in which incoming information is rapidly processed and sent out to another source. State-of-the-art computer room components can run into the millions of dollars depending upon the application and capacity. But the real value is in the information itself. More precisely, ensuring that the flow of information is both uninterrupted and secure is what separates the construction of a computer room from the rest of the facility. For example, an on-line or televised product sales company may have invested \$2 million dollars in its headquarters computer room and equipment, but takes in \$3 million dollars per hour in sales. If that network is down or compromised even for an hour, the fallout could be catastrophic to the company's bottom line.

Finding the infrastructure

The size and complexity of computer rooms can range from the very broad to the highly specialized, and there are dozens of applications, each with different requirements. In general, however, most computer rooms share some basic components, as well as the challenges of completing their timely construction and installation.

The perimeter walls are generally constructed of drywall and whatever aesthetic design elements are called for, like glass, for example, unless extra security is required and concrete and steel are specified. Most computer rooms will have raised flooring tiles supported by pedestals to accommodate data and phone cabling, air movement ducts, and fire suppression equipment among other key components. The surfaces of any particular flooring material must be grounded properly to carry away any static electricity, which could severely damage micro-processing equipment.

Power sources, and heating, ventilation and air conditioning (HVAC) are of special concern here as well. The space in which the computer room is located must be able to handle the new generations of dedicated circuitry in the equipment itself, while HVAC capacity and design must be able to adequately dissipate heat from microelectronics systems without excessively cooling surrounding areas. And these systems must be able to run 24-four hours a day with redundant back up, and the contractors must be available at all hours in case something goes wrong.

Another critical consideration is security. An entertainment operation would probably require less security for physical entrance to the facility, and access to the hardware and software than, say, a defense contractor, and design and construction must follow accordingly.

Minimizing the risk

The key to any computer room construction and installation is overall coordination among the various consultants, and as much front end involvement with

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the general contractor as possible. This is certainly not big news. It could apply to almost any tenant finish project. But when dealing with high technology projects, some of which may even involve the scheduled launching of a satellite in order to bolster operations, delays and mistakes take on an entirely different meaning.

Computer rooms require very specialized, sometimes oversized equipment that must be ordered well in advance of the project's first phase. The construction team needs to be aware of long-lead items like generators, uninterrupted power systems (UPS), power distribution centers, conductive flooring and air handling systems. The team also needs to coordinate where it will go, who will install it, if it even fits through the doors of the space, and what to do if it doesn't. If the equipment lead times are not properly scheduled these avoidable delays can be terribly costly to the client.

Another item which requires close coordination is fire detection equipment. A computer room's detection system must be adequately integrated with the base building's redundant detection systems.

Failure to provide proper integration may result in delays in obtaining building permits and cost the client valuable operating time.

Successful computer room construction hinges on the integrated team approach consisting of the owner, architect, engineers and contractor with thorough collaboration at the earliest stages of the project. This may cost more money up front but small increases in standard construction fees always cost less than fixing problems later, and the benefits apply to both the tenant and building owner.

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