

Informatics: Are you ready for the high-speed future?



Area Development Site and Facility Planning

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Technology gurus have been predicting that the telecommunications industry is getting faster, better, cheaper. How will these advances affect your company?

INFORMATION SYSTEMS and technology are taking on larger roles in today's manufacturing environment. That's why it's paramount to expect new site locations to offer advanced telecommunications, fiberoptics, and other leading-edge technologies.

What are some of the basic, often overlooked requirements site selectors should expect - even demand -when searching for a "perfect" existing or custom-built building?

Expert advice from a national telecommunications consultant, plus a visit to a Texas city recognized as a "global data nexus," provides some vital foundational answers.

"Brass Tacks" Techno Questions

Richard Hill is an authority on the changing landscape of communications, especially as it affects site and facility planners. As president of Orlando-based Telecommunications, Inc., his 30-plus years of experience in communications and the electronics industry qualify him as one of central Florida's telephone pioneers.

Hill's firm specializes in the converging telephony, information technology, wireless transmission, and cable TV industries. One of his many career claims to fame was the vital role he played in building the telecommunications systems and department for the Orange County Convention Center, the nation's third-largest convention facility.

Since telecommunications services and technologies are changing and expanding each year, Hill asserts that facilities must have a flexible infrastructure that can

service and adapt to these changes. "In the past, telecommunications needs for the most part were ignored and addressed after the fact," he says. "This trend has been changing because companies are more aware of their need for voice and data communications."

There are a few basic telecommunications concerns site selectors and facility planners should consider when looking at new or existing facilities:

Location of utilities to facility: How far away is your plant from utilities? Is the site at a distance that will require an "excess construction" charge by the utility? If your phone run is on the opposite side of the property, it might be an expensive proposition to run additional conduit for phone lines during a later growth phase.

Also, when the attempt is made to add cable to conduit, "there's a tendency for the cables to wrap around themselves and possibly cause abrasion on the cable," says Hill. "That's why we suggest that when companies put in fiberoptic, they also install interduct a smaller conduit inside a larger conduit. It has a pull string already in it, so you insert the new cable inside the hollow tube."

Location of phone services: Will the services be aerial (on poles) or buried? Try to avoid poles. "Phone companies aren't going to replace that copper hanging in the air on telephone poles unless they have to. Poles have a tendency to break if they're whipped by excessive wind or covered with heavy ice and sleet." Fortunately, 30 to 40 percent of today's industrial parks have buried services, estimates Hill.

Fiberoptic: Does the facility have copper, fiberoptic, or a combination? Buried fiberoptic is always the best, because it is not susceptible to electrical interference or lightning charges, and it doesn't corrode or break. Today it is preferred over copper.

Wireless services: Where wireless services are used, are there any obstructions (tall buildings or mountains) that can interfere with the signal? Will it be necessary to obtain FCC approval to erect a tower to overcome these obstructions? Can you afford the additional expense of a tower?

Restrictions: Are there any restrictions that might increase the cost of installing or increasing internal or external services? When buying an existing manufacturing facility, make sure it has at least a four-inch conduit for the service feed from the phone company. "The site may have a pull box, but it could be under a parking lot you can't get to without spending lots of money," warns Hill.

Phone system check: Has the local telephone company upgraded its telephone system to provide all the communications services required? Find out when the phone

system was last redone from inside. Can it handle your present and future needs? PDS check: When was the building infrastructure, premises distribution system (PDS), installed? Will it need to be replaced? "It's a very large investment," says Hill. "You don't just rip it out and put it back in at a whim. If you have a distributed system with a backbone, you can replace a section at a time without shutting down the plant - but only if they did the distribution correctly."

Significant PDS Concerns Today's rapidly advancing technological environment demands that premises distribution systems employing cable should be state-of-the-art in all facilities, including manufacturing ones, says Hill. "The investment must be made, regardless of structures application, which may change in 10 to 15 years."

Standard telephone services are not really a concern, because they will work with almost any cabling system. Basically, enough jacks must be scattered around for access. "The PDS needs to be developed around data applications and volume of services," Hill explains. "Because of the volume of wire used, it's economically reasonable to install the same wire to all locations. Therefore, if a phone is not needed, a computer may be installed and it eliminates the mistake of installing a computer on telephone wire."

Hill's company always recommends a distributed infrastructure for flexibility reasons. With a distributed system, the local telephone company enters the facility at one location. This should be a communications room large enough to house a telephone switching system, computer and network system, and if possible, a staff of three.

All the cables in the facility begin from this main room and are distributed to smaller rooms throughout the facility, he explains. "From the smaller rooms, service is provided to the offices and workstations. Cabling to the smaller rooms should be large enough to provide service to every wire at every office and workstation, plus 20 percent. That's because things have a tendency to grow!"

In today's world, the backbone cable (main artery to the smaller rooms) would be classed as Category 3, Hill continues, "which means that you can transmit data at 10 megabits (10 million bits per second) over a limited distance, with no signal degradation. For this reason a fiberoptic backbone should also be installed. This ensures the capability of the data network to handle speeds in excess of 1 gigabyte (one billion bits per second)." Cabling to offices and workstations should be classed as Category 5E (or extended/enhanced Category 5), which is capable of data transmissions up to 350 megabits (350 million bits per second) with a distance limitation of approximately 330 feet (100 meters). "We feel that anything above this should be on fiberoptic cable, which can be extended to the workstation." Even

facilities with automated production systems require a data network link to a computer.

Telecommunications Blunders

Over the years, Hill has seen some building planners make costly errors - mistakes he says facility planners and site seekers can avoid.

Stingy with jacks: "Most locations get one phone jack and one data jack. That's not enough! What do you do with the fax machine, network printer, or applications computer not on the local area network (LAN), etc.?" he asks. "Obviously it's more expensive to add voice or data jacks in the offices, copy rooms, and workstations after the fact. In speculative buildings, this could be the determining factor for a potential client."

Forgetting to upgrade PDS: "When adding new construction to an existing facility, the PDS in the existing facility needs to be upgraded to meet the specifications of the new structure," says Hill.

Forgetting to add a critical room: "We are no longer in the era where telephone systems are installed in a broom closet or over the toilet. Too often companies find a site's primary communications room is nonexistent or too small to meet the need."

Dangerous fire-fighting equipment: In the communications room, don't allow water to be the primary fire suppression tool. "Try pouring water on your TV sometime and see what happens!" Hill says.

Going it alone: Most site-searching companies and facility planners do not utilize consultants as much as they should, Hill believes. "Ideally, consultants should be part of the project at the beginning, and if possible, supplement existing staff expertise." Beware of standard recommendations that are void of innovation - "not drifting from the norm with no real consideration for the user who will have to live with the recommendations for the next 10 to 15 years," Hill cautions.

Technical Demands in the "Data Center of the Southwest"

"We are wired in and ready to go!" declares Bill Sproull, president and CEO of McKinney Economic Development Corporation. McKinney, Tex., has what it takes to deliver highly focused corporate telecommunications needs, and Sproull is eager to share its story.

In recent years, McKinney's telephone and electric utility companies have installed

the most advanced fiberoptic and electric links available. Afterwards, the city suddenly, and in an unheralded fashion, was established as the "Data Center of the Southwest," says Sproull. The designation came after three facilities were built: United American Insurance (opened in 1996), Blockbuster (opened in 1997), and Experian Information Solutions, formerly TRW's credit reporting service (opens this year).

"The information collected, stored, and distributed by corporations in McKinney routinely affects hundreds of millions of people worldwide," Sproull explains. "From credit reports to insurance and video-rental records, the influence and importance of the data is tremendous."

What qualifies a facility such as a data center to be deemed high tech? It's more than having a potent power supply and fiberoptic cable, a mainframe computer, and a cadre of programmers, Sproull believes.

"It's a combination of all those things - and more. We've established a niche [in data-center facilities] because of our ability to provide advanced telecommunications services, redundant sources of power supplies, a safe and secure environment, plus the type of technical labor that data centers require; i.e., system analysts and software programmers."

For example, with telecommunications becoming increasingly more complex, central offices have to be digital as opposed to analog. "You have to have wide-band data/voice transmission capabilities along secured and diverse fiberoptic routing," says Sproull. "Diverse means that there are at least two fiberoptic lines so if one suffers a cut, then the other one goes up. They can never go down; you can't afford to lose even one-tenth of a second of downtime or too much information would be lost."

Sproull adds that generally data companies also want their own "dark fiber" (the term refers to idle or spare fiber) for extra security.

Moreover, many of the same telecommunications safeguards are also desired for electric power needs. For example, "companies want redundant sources of electric power from two different substations," says Sproull. "This is insurance against the event of a major catastrophe. If a crisis did occur, typically data centers have two backup generators as well as a battery room chockfull of constantly charged batteries.

"If one of the two [nonworking] generators needs to be charged up," he continues, "these battery systems are designed so that within a millisecond of a discovered problem, another backup system will go up."

In order to test the reliability of electric service coming into their data centers, Sproull says some companies will literally break the system by overloading the main electric line, causing a shutdown. The hope is that these intentional disasters will be immediately mitigated by the center's backup electric systems. If not, it's back to the drawing board.

All this activity is aimed at protecting the enormous information flow that data centers experience daily. "Obviously reliability and security are at the top of the list for information companies," he emphasizes.

Of course, it certainly helps if a location's regional assets augment the plant's whiz-bang technology. For example, McKinney is near a cluster of semiconductor, electronics, software, telecommunications, and defense-related firms; it boasts the second-ranked school district in the Dallas/Ft. Worth metroplex and a attractive quality of life. Moreover, Texas state lawmakers are now proposing legislation to develop R&D tax credits.

The Envelope Please: Predictions for Telecommunications Advances

What exciting things might happen for telecommunications in the future? Happy to make some predictions is Joel Gomer, vice president of Telecommunications, Inc. and a self-described "technical wizard." Gomer's forecasts and trends to watch:

More "cyber buildings," or structures with high-tech infrastructures, will emerge.

The Internet monopoly will break up. (Think AT&T in the 1980s.) Copper will disappear as the primary transmission medium, except for basic telephone services.

There will be continual infiltration into the work environment by Linux, a free public-domain operating-system software offering the robustness of a corporate Unix system without the corporate cost. "Using Linux and other cutting-edge technology can help sustain your business long after the rest of the world swaps out newer equipment for even newer equipment," says Gomer.

Look for direct fiber connections to personal computer workstations, or a completely wireless work environment (except for power).

IP telephony is here, but not quite ready to take on the world. "It enables companies to make phone calls using the Internet instead of a phone network," relates Gomer. It's cheaper, but at a cost: The Internet is subject to delays and dropouts. "Better sit this one out for a while longer," Gomer cautions.

ISDN will continue to be a cost-effective, high-speed Internet access option for many businesses. "An ISDN line may be more appropriate for your company, even if you need to share the line (64 or 128 kilobits, plus \$125 per month and installation). Sharing can provide adequate services without the costs."

Since technology can be used to vastly improve a company's efficiencies and hone its competitive edge, organizations would be smart to methodically explore the technological attributes of all potential sites.

Just because a facility, office complex, industrial complex, or "smart park" claims to be up to speed doesn't make it so. Serious investigation and a little help from telecommunications consultants should pay big dividends not only today, but also in that unforeseen, exciting future where telecommunications is leading us all.

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