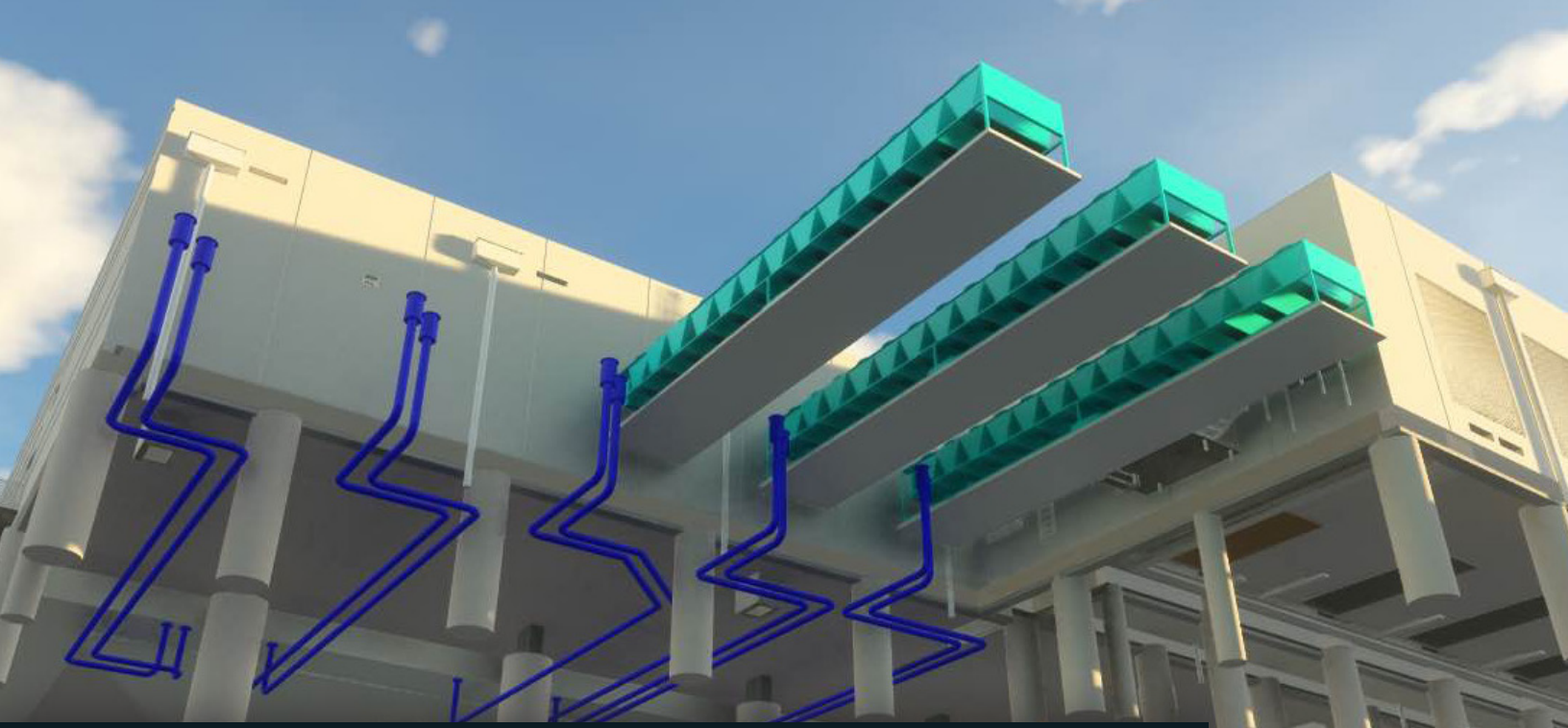

Evaluating a Data Center Begins with a Peek Underground

DATA FOUNDRY

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Evaluating a Data Center Begins with a Peek Underground

Some data centers are built in three to six months from groundbreaking to commissioning, and sometimes existing facilities are retrofitted to be data centers on an even quicker schedule. There are advantages to these types of data center construction projects—they're fast and cheap, and companies that need data center space ASAP can move in quickly. However, as you can imagine, much is sacrificed in the way of security, resiliency and redundancy when data centers are put together in a hurry.

When speed isn't a company's top priority, and security and availability take precedence, stakeholders should do their due diligence when it comes to choosing a new home for their IT infrastructure. This process should begin with finding out how potential data center providers built the facilities in question. Stakeholders should tour facilities that make the final cut, and take a look into the underground infrastructure with an engineer's eye.

Here we will outline some of these critical infrastructure features, giving your company an idea of what to look for when choosing your next data center.

Designing the Site

Data center construction project teams have the ability to design a facility and all its utility infrastructure using 3D Building Information Modeling (BIM) technology. BIM software allows for greater coordination across design, construction and operations silos and minimizes errors. BIM software also allows construction and design teams to visualize the development of underground infrastructure from any angle. An example of these visualizations is as shown in the image below.

Careful data center operators will be involved in this design process from the very beginning of the project, ensuring that their standards are met. They will have their own in-house construction team review every aspect of a design project before groundbreaking begins, and as the site develops, the construction team takes over and works with the comprehensive BIM model to ensure everything falls into place. To understand how a facility was developed, it may be helpful to ask a data center operator if your company can see some of the renderings from their BIM model. This will help your team to evaluate a data center's resiliency and ability to provide redundant utilities.

Another factor to note in a data center's design is its scalability. Some data center providers will purchase more land than is initially required for a data center and ensure infrastructure is designed to be scalable. They will also have a master plan for the site. This careful planning ensures there is enough space and power capacity when customer needs warrant expansion. If scalability is a concern for your company, ask about a colocation provider's expansion plans and ensure there is enough power capacity and land available for more data halls or another data center.

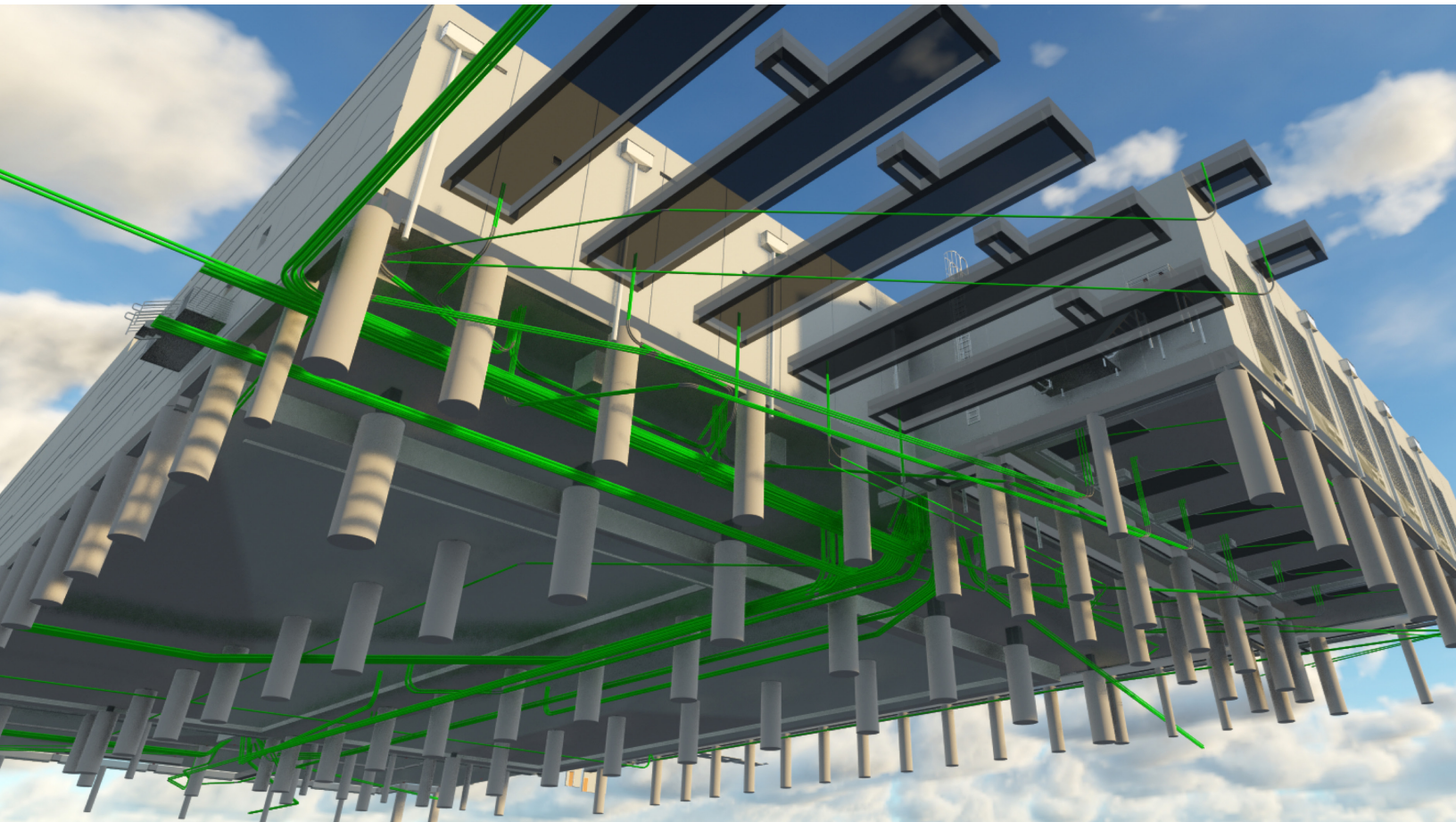
TAKEAWAY QUESTIONS:

Are there renderings available that show the facility's infrastructure?

Is there enough land acquired by the owner/operator for expansion?

What is the power capacity on site? It it enough for your future needs?

Does the site have a master plan?



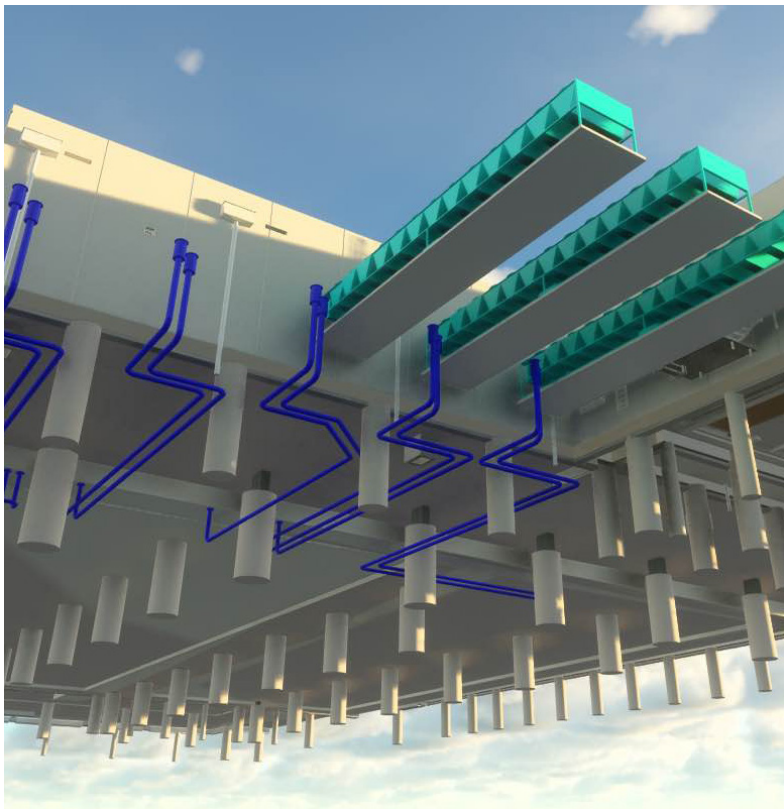
Electrical Duct Banks & Conduits

Power feeds are some of a facility's most critical infrastructure components. This is the facility's core source of power, and the more redundant and reliable the feeds, the more reliable the power the facility can provide. For this reason, it is ideal for a data center to have dual, diverse power feeds. If one feed is down, the facility can continue to operate normally. Another factor to consider is whether these feeds are underground or above ground, and If they are encased in concrete. Underground, concrete-encased feeds protect a data center from power failure caused by storms, car accidents and squirrely squirrels. Power outages caused by squirrels on power lines happen more often than most people think. Basically, these underground duct banks minimize the possibility of downtime from unexpected incidents. Additionally, the duct banks' concrete fill allows for more efficient dissipation of heat from the power cables and increases ampacity. To ensure a data center's reliability, ask the operator to show you how many power feeds there are and how they come into the property.

TAKEAWAY QUESTIONS:

Does the facility have dual, diverse power feeds?

Is at least one of these feeds underground and encased in concrete from end to end?



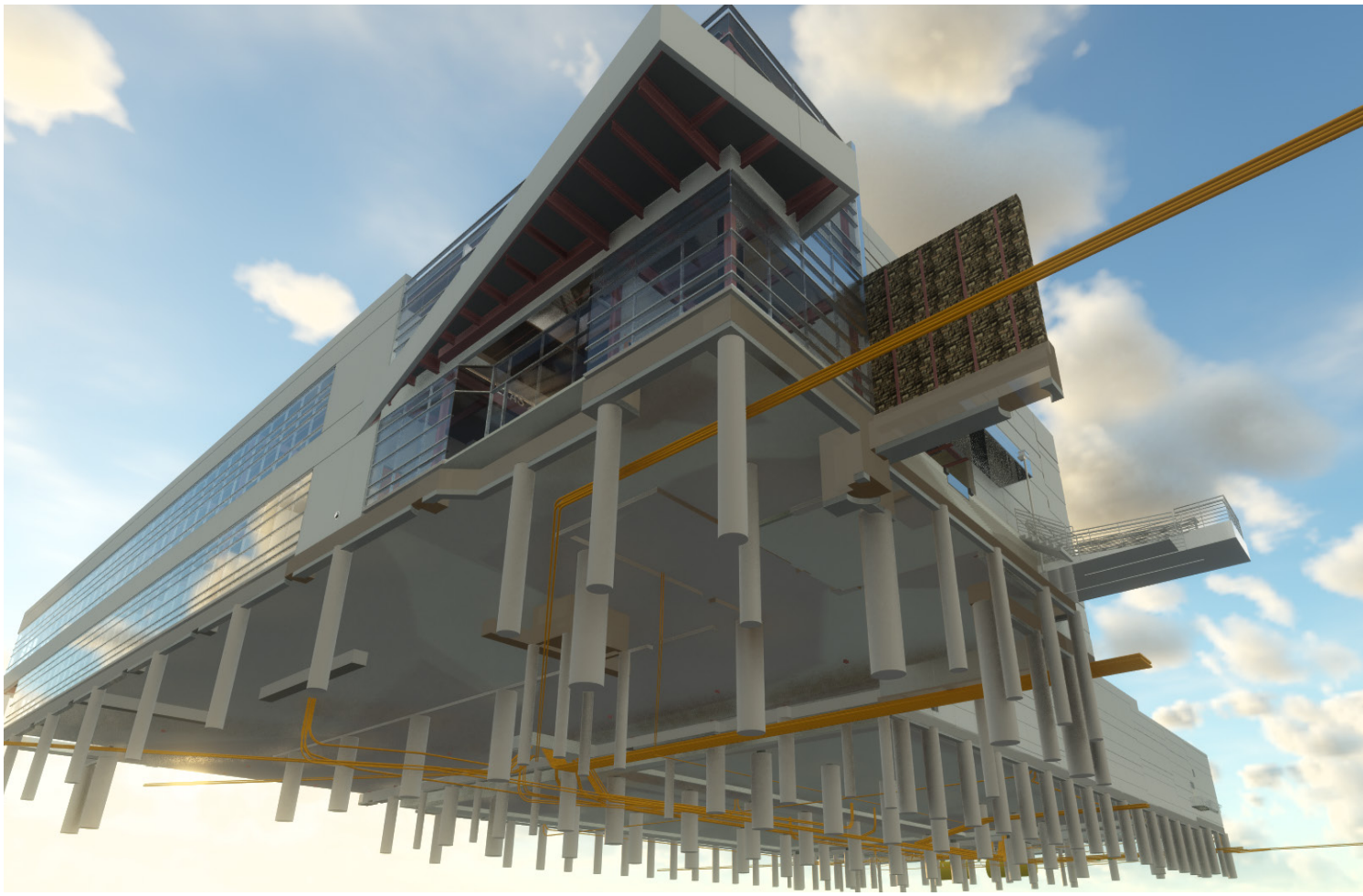
Chilled Water Piping

In addition to hot and cold aisle separation and deep subfloor space (around 36 inches), chillers provide efficient cooling to support High Performance Computing (HPC) environments. Underground piping is the safest way to transport water to and from the building. The blue piping in the BIM image above provides an example of the transportation of cool water underground from the chillers and back up into the data halls. Having these pipes underground not only gives the facility a clean look, but it's safer than having the pipes run overhead in the data center, should the pipes ever leak. When evaluating a data center with chilled water cooling, ask about the paths of water pipes into the facility.

TAKEAWAY QUESTIONS:

Where do water pipes run through the data center?

How is equipment protected from leaks?



Telecom Duct Bank & Conduits

Just like power feeds, diverse underground network feeds provide greater reliability. Purpose-built data centers can be designed with diverse, concrete-encased telecom duct banks that run from the data center to the edge of the property. These diverse paths ensure customers stay online if something happens to one of the feeds. Another advantage to pre-building conduits for network feeds is that it is enticing to network carriers. With the infrastructure already in place, they will endure minimal cost and effort to set up service at the facility, since the underground work is already done for them. Installation of underground feeds not only makes the facility more reliable, it attracts network providers, which ultimately benefits users with a healthy marketplace of carriers to choose from. If your company is considering a recently built colocation facility, it is especially important to find out what infrastructure is already in place for carriers.

TAKEAWAY QUESTIONS:

Do network feeds have diverse entry points?

Are these feeds located underground?

How many carriers are available to customers?

Generators & Underground Fuel System

Generators are a data center's power source when all power utilities fail. They are a critical feature of a data center's infrastructure when disasters occur – natural or manmade. For this reason, generators should be protected, whether they are located indoors or outdoors, and there should be a fuel supply on site at all times. In premier facilities, generators are fed by fuel pipes from underground fuel storage tanks to provide a convenient and secure secondary power source. Underground fuel systems contribute to a facility's availability. With fuel on site, data center operators do not have to wait for fuel trucks to arrive in the event of a disaster. Road closures may prevent fuel trucks from arriving and replenishing fuel supply. Additionally, underground fuel tanks are safer and less likely to be damaged or tampered with. Underground fuel tanks allow data center operators to store enough fuel on site to operate for days without electrical power. In the event electrical power is lost, tap boxes, fuel tanks and generators keep the facilities running without interruption.

TAKEAWAY QUESTIONS:

Where are the facility's generator's located?

Are they protected?

Are they fed by underground fuel tanks that provide at least 48 hours of fuel at full load?

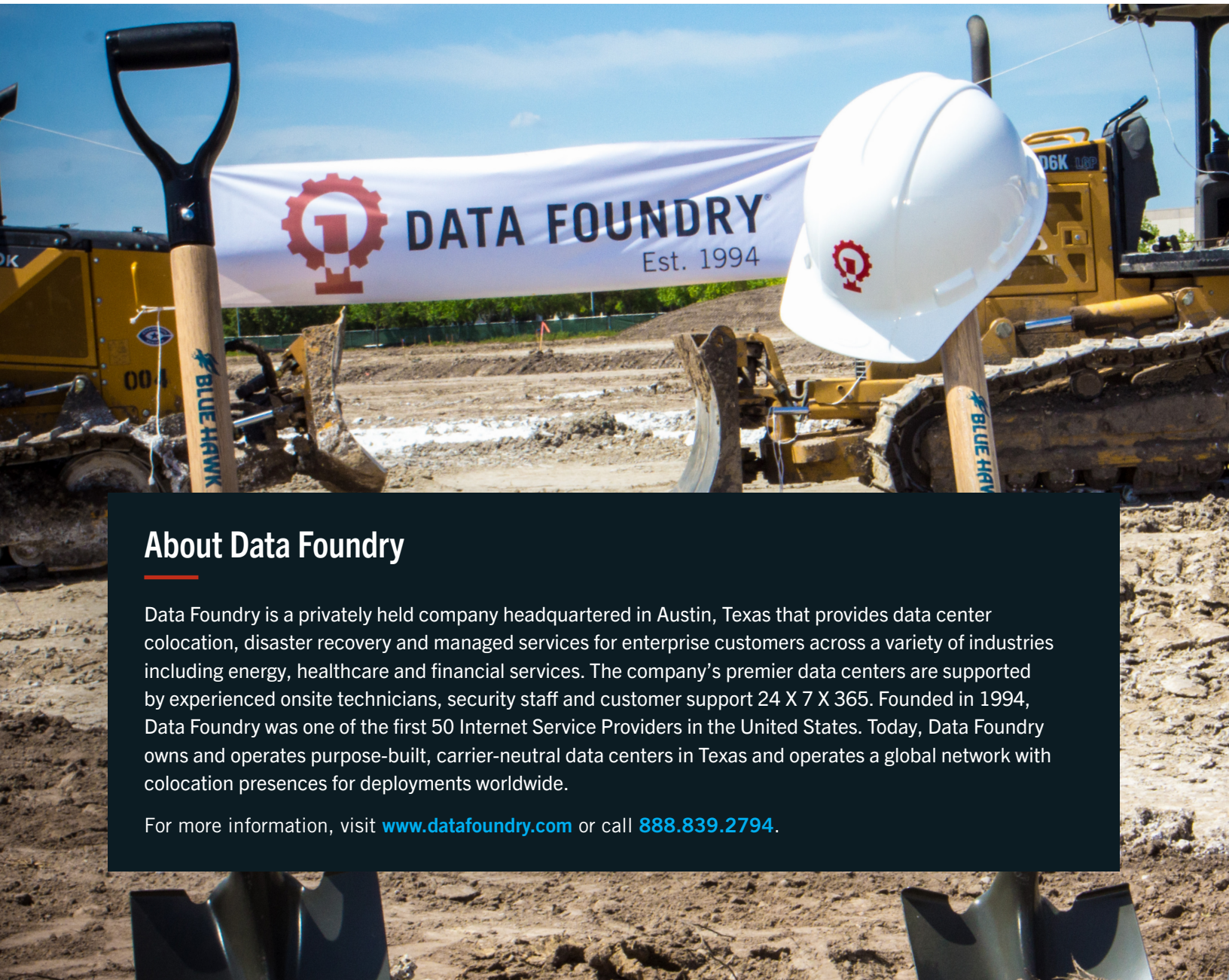
Final Words

When quick build-outs are mandated, construction teams perform minimal work underground. Underground infrastructure and how it is designed plays a critical role in maximizing uptime and providing a safe and secure operating environment. If business continuity is a top priority when it comes to what you want from a data center provider, ask about the construction process. How well are the utilities protected? How were network, power and water feeds installed? A provider that gives precedence to providing maximum availability will have thoroughly planned not only the building structure itself, but will have invested in redundant and protected utilities that keep your business online in the event of a disaster. By looking underground, you'll get a better idea of the resiliency, security and redundancy a facility can provide.

Our Construction Process

Data Foundry devotes a large portion of its data center construction timeline to what goes in the ground, months before the slab is even poured. Part of the reason we devote so much time to underground work is because we are and have always been data center operators, not realtors. Designing and building data centers from an operator's point of view results in a hyper-focus on protecting and securing IT infrastructure. Designing a resilient and secure mission critical environment is our top priority. Our team is so meticulous about underground infrastructure that we spend approximately three months drilling 25-30 feet into the earth to install massive foundation piers, laying piping, and creating duct banks for power and network feeds before building construction begins.

Data Foundry's internal team reviews every aspect of a design project before groundbreaking begins, and as the site develops, the construction team takes over and works with the comprehensive BIM model to ensure everything falls into place. A data center company who is experienced and serious about their design and construction process will be excited to walk you through it and give your company the documentation it needs to make the best decision for your business.



About Data Foundry

Data Foundry is a privately held company headquartered in Austin, Texas that provides data center colocation, disaster recovery and managed services for enterprise customers across a variety of industries including energy, healthcare and financial services. The company's premier data centers are supported by experienced onsite technicians, security staff and customer support 24 X 7 X 365. Founded in 1994, Data Foundry was one of the first 50 Internet Service Providers in the United States. Today, Data Foundry owns and operates purpose-built, carrier-neutral data centers in Texas and operates a global network with colocation presences for deployments worldwide.

For more information, visit **www.datafoundry.com** or call **888.839.2794**.