



How PCX Used a **Modular Data Center** to Overcome Challenging Environmental Conditions in the South Pacific



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# Introduction


One of the world's leading brands of bottled water planned to double its production, which necessitated increasing its data center capacity.

However, because its production facility is located on a remote South Pacific island, upgrading the data center operations presented a number of challenges. Local resources and IT expertise were limited, so The Wonderful Company needed to find a creative solution for data center expansion.

That was the challenge presented to PCX Corporation. The logical solution was to go modular.

Modular data center design has improved dramatically in recent years. It is possible to specify exactly the type of equipment and environmental infrastructure required, while having it packaged and delivered in a self-contained, plug-and-play unit. By going modular, the entire system can be built off-site to exact specifications and delivered to the location, ready to go.



A white modular data center unit is being lifted by a yellow crane at a construction site. The unit is rectangular and has a door on the side. It is being hoisted by several cables attached to a yellow crane arm. The background shows a white building and a concrete ground. A blue text box is overlaid on the top left of the image.

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# The Location is Key

Sourcing water from a pristine rainforest ensures product purity, and the isolated location is what makes this bottled water unique, giving the product its cachet. At the same time, maintaining a state-of-the-art manufacturing facility in the jungle presents a unique business challenge.

The Wonderful company recognized that it had to prioritize preserving the rainforest, but not just because it was the source of the product. The water producer had a vested interest and a responsibility to minimize the environmental impact of production on the region, so when it decided to expand its operation, it committed to do so with minimal environmental impact. This included adding a new data center as part of the expansion plan.

Once the company decided it was time to build a new data center, it was clear that it needed a solution that was not only energy-efficient with a small carbon footprint, but also was easy to install, easy to use, and easy to maintain.

# A Unique Data Center Dilemma


In order to support the upgraded facility, it was clear that the company needed more computing capacity and IT personnel.

The existing data center was housed in an office within the production facility, which was already crowded and not designed to accommodate computer equipment. In addition to limitations in floor space and electrical capacity, the environment posed a unique weather challenge for data center installation, as the constant rain and high temperatures meant there was ever-present humidity. Any new data center would have to be set up in a separate structure that was able to deal with these harsher climate conditions, as well as being able to withstand severe weather conditions, such as hurricane-force winds and seasonal flooding.

Even though expansion plans called for substantially increasing data center capacity, the company did not want to have to double its IT staff, so it needed a data center that was easy to operate and maintain. Management also realized they would need a turnkey solution that required little or no expertise to get up and running, because local computer engineering expertise was scarce.

Once the scope of the problem became clear, the company contacted [Critical Infrastructure Group \(CI Group\)](#), specialists in data center infrastructure equipment. After carefully assessing the problem and the company's data center needs, the CI Group team contacted their partner, [PCX Corporation](#), specialists in prefabricated, module electrical and data center solutions.



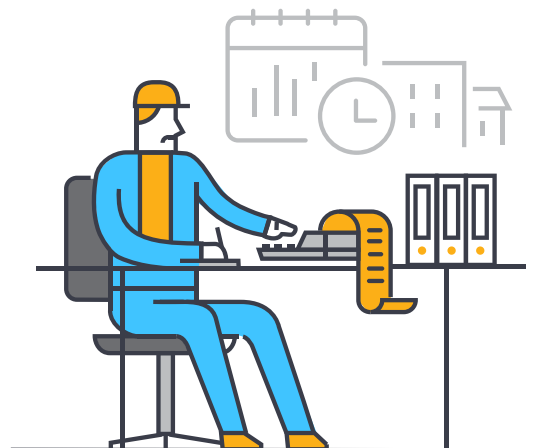


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# Overcoming Challenges

The CI Group team and the PCX engineers met to review the parameters and challenges presented by this unique data center project. There were a number of specific requirements for the project that would make the design more challenging:

- The specification was for a relatively small data center with only 10 kW capacity, which is much smaller than conventional data centers operating at 45-90 kW capacity.
- Specific parts of the project, such as the hardware racks, an in-rack UPS system and fire suppression system, had to meet exacting specifications.
- The completed systems had to be easy to ship, easy to install, and able to deliver trouble-free service in a harsh environment.
- Fast installation was needed to coincide with a scheduled plant shutdown as part of the operations upgrade.





The PCX design team suggested a variety of options, and after some discussion, it became clear that a self-contained modular data center housed in an ISO container would be the best option. Although PCX engineers seldom recommend using ISO containers to house modular data centers, for this application, it made perfect sense to simplify both design and delivery:

- A modular data center could be preconfigured to specifications, tested and delivered as a turnkey solution.
- An ISO container could be used as a self-contained, standalone structure that would be large enough for a 10 kW data center.
- Using an ISO container also would simplify shipping, which would help cut overall costs.
- The design could be documented in detail to simplify remote support for maintenance and make it easier, and it could be cloned for use at other locations, as part of future expansion.



# The PCX Solution



## Company Background

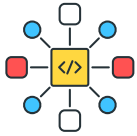
PCX has been designing, building and providing solutions for modular electrical systems, including data centers, for over 25 years. PCX has developed a proven methodology driven to ensure a quality product that could be produced on time and within budget. Every design, training and prefabrication process is continually improved using ISO 9001:2015 quality management systems, so processes become more efficient and reliable over time. An essential part of PCX's mission is to design and build reliable, customized, prefabricated electrical systems that are best-in-class and ideally suited to meet the customer's needs. To deliver on that commitment, PCX uses a step-by-step approach for preconstruction, construction and post-construction.

Customers come to PCX looking for beneficial solutions, as well as engineering innovation and fabrication capabilities. Customers don't arrive, schematics in hand, asking PCX to build something. They want guidance to understand what options are available and what would be the best approach to meet short-term goals and long-term objectives, while still remaining within budget. In the case of this bottled water company, it was looking for the best approach, including specific criteria for the best price.

**PCX has developed a proven methodology driven to ensure a quality product that could be produced on time and within budget.**







## Bidding and Development

As with most projects of this type, the bidding and development stage took some time. Discussions began during the summer of 2019, when preliminary design concepts and rough estimates were presented. After the company fielded competitive bids, it came back to CI Group and PCX in October to finalize a contract calling for February delivery, including shipping by cargo ship. Due to the initial design having already been discussed and reviewed, 12 weeks was a reasonable turnaround time. With the contract finalized, PCX immediately began data center fabrication.

One of the things that made PCX such a great partner for The Wonderful Company was its vendor-agnostic approach. This allowed the bottled water company to accommodate special equipment requirements at a low cost, including a specific type of insulation and fire suppression system as part of the design. The company's IT department also needed to use equipment racks from a specific manufacturer, and the design had to include a rack-mounted UPS backup power system. These requirements added cost to the project, but because PCX could specify any vendor's components, the company was able to choose the right HVAC system, electrical distribution systems and other components to implement and control costs.

The shipping container design also proved to be the ideal size for the necessary server size and HVAC demands. By creating a ready-to-run data center in an ISO container, delivery costs were substantially reduced because the finished data center didn't need special handling or shipping equipment.



## Installation and Maintenance

Data center installation and maintenance was also a concern, because the customer's IT team would have to handle both. To ensure smooth installation and support, PCX hosted members of the IT team during fabrication to witness factory acceptance testing (FAT). The IT staff was also trained in the various components in hardware and provided with detailed instructions regarding installation and operations.

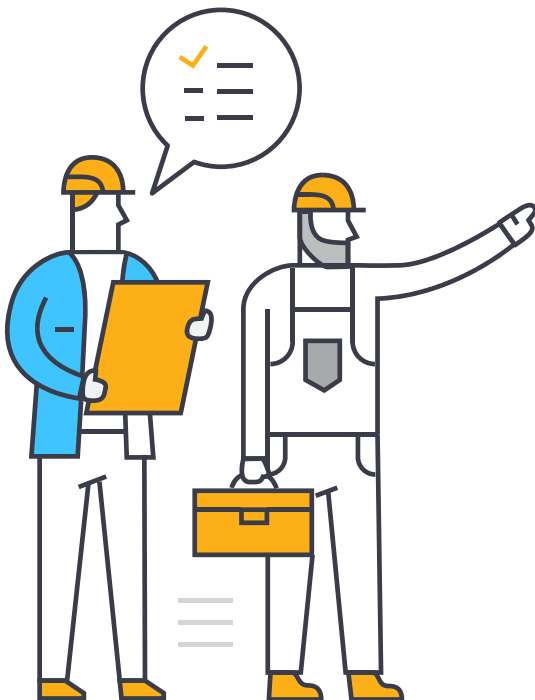
PCX had to ensure it had all the repair parts it would need, as replacement parts would be difficult to acquire, once the data center was commissioned. As a result, these were included as part of the initial package. Additionally, all PCX data centers are shipped with a full warranty, so any necessary system repairs can be handled by local contractors, or remotely by PCX engineers working with the company's IT staff.



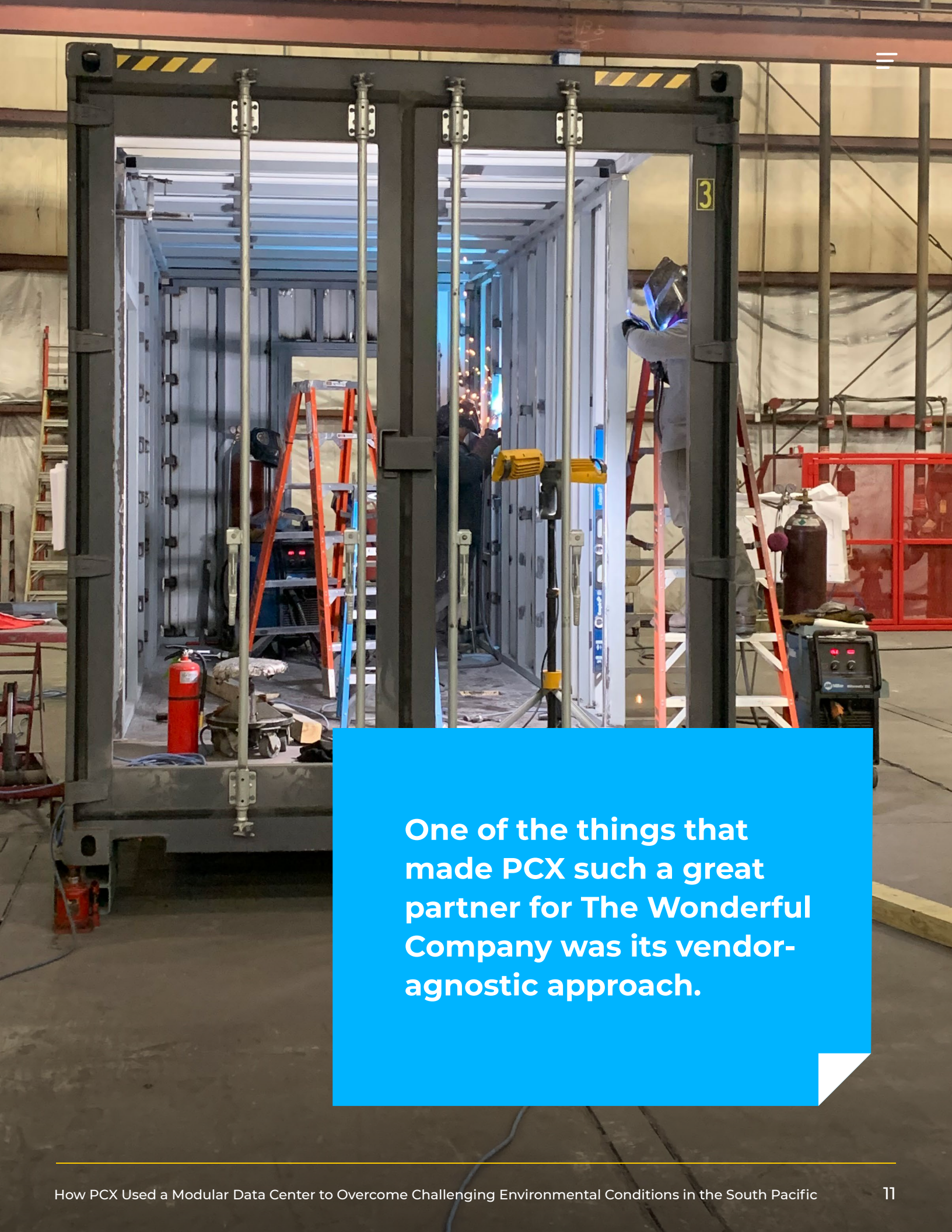
## Future Outlook

Following the successful installation of this flagship data center, the bottled water company is considering leveraging PCX's expertise for other data center projects in similar locations.

This project also enabled PCX to create a new patent-pending data center design, for applications in which a smaller capacity, self-contained data center might be needed. This solution is ideal for manufacturers, distributors, retailers and businesses similar to the leading bottled water company.







**One of the things that made PCX such a great partner for The Wonderful Company was its vendor-agnostic approach.**

# Finding Success in Your Data Center Expansion Projects

The successful completion of this project highlights why it's important to choose the right partner for your own data center expansion projects.

**When looking for a partner, consider the following:**

- **Work toward the same goals.** Ensure your prefabrication partner takes the time to understand your business objectives, as well as immediate deliverables, and presents innovative solutions that meet immediate and long-term needs.
- **One size does not fit all.** You need an expert partner who can offer creative data center design alternatives to address the problem.
- **Experience is key.** Find a modular system provider that can show you how to get it done, provides guidance throughout the process and leads from experience.

If you have unique data center or construction requirements, we can help you configure a plan that works within those constraints, to provide you with a beneficial solution for your company. To learn more about our solutions or to speak to a modular construction expert, [contact us](#).





As we enter a new decade, you can expect to see the construction industry transformed by new technologies and methodologies designed to shorten construction timelines, reduce overhead and promote sustainability. However, the construction industry has always been slow to embrace change, and innovations will take time to have any real impact. Therefore, builders will continue to rely on proven tools and techniques, like prefabrication, to help them stay competitive in the decade ahead.





**Contact Us**



33 Pony Farm Road  
Clayton, NC 27520

919.550.2800



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