

Southern Nevada Water Authority

A Case Study on The Alfred Merritt Smith Water Treatment Facility



At A Glance

Challenges

- Central Water Authority Data Infrastructure is critical to the ongoing water service of millions of people. All supporting cooling systems associated with the centralization of the water authority data infrastructure needs minimized downtime to protect the IT equipment and maintain continued operation at all times.
- Utilize unique available industrial resources specific to the job site to maximize cooling system reliability and energy savings.
- Electric utility shutdowns for the site were limited to one day a year, making scheduling of electrical installation challenging.
- Routing of new generator feeders through existing building needed to penetrate 14" concrete walls and slab.
- Limit electrical equipment footprint to utilize the existing electrical room. Phased demolition of equipment was planned to accommodate installation of new equipment while maintaining full building operation, but there were challenges with room size and leakage.
- Limited site/outdoor space available to reject heat to the outdoors.
- No existing central supporting infrastructure. Systems engineered would need to be standalone.



Benefits

The integrated MEP approach delivered a resilient, efficient data center infrastructure while minimizing impacts to ongoing operations and maintaining the project schedule.

- Highly efficient reliable cooling with minimal failure points and primary cooling that does not utilize mechanical compressors, which are the most common point of system failure.
- Minimal impact to ongoing building operations. Minimal space required on site outdoors to reject heat.
- Project schedule remained unaffected and on track due to electrical pre-purchase and installation coordination with utility and owner. No additional site shutdowns were required.
- Simple system controls.
- Potential savings substantiation.
- Reliable data center operation.

Objectives

The Southern Nevada Water Authority (SNWA) and its member agencies provide domestic water service to upwards of 2.3 million people. Supporting IT infrastructure to SNWA's operations prior to the renovation was distributed through the building in a variety of small data closets and supported by light commercial ancillary electrical and HVAC systems. Failure of this IT equipment could mean interrupted water service to consumers downstream.

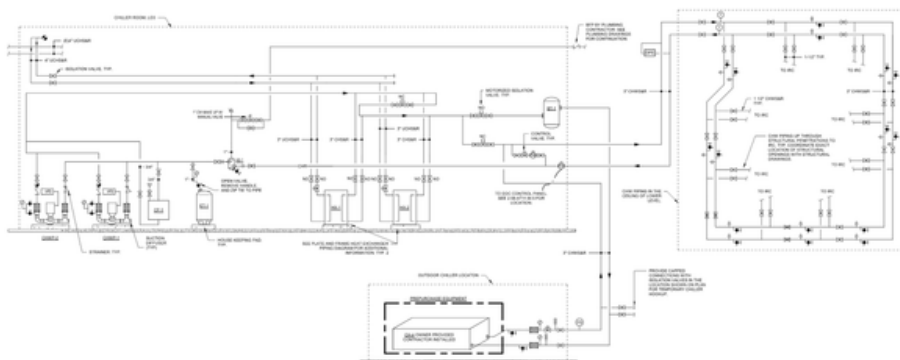
In an effort to centralize, and make the IT infrastructure more resilient, a single white space location was selected to house this future equipment so that future iterations could be supported by more resilient electrical and HVAC systems and to allow for more efficient ongoing IT equipment maintenance and turnover.

The SNWA site is already well developed and houses a variety of industrial scale processes on site. The existing office building construction was recognized early on as having a low structural capacity for added equipment. This meant the options for heat rejection to the outdoors would be limited.

Complete standalone cooling infrastructure and electrical supporting infrastructure dedicated to the data center space with redundancy to mitigate failure wherever possible was needed to support.

Solutions

- Electrical circuit breakers going into existing equipment were sized and ordered as part of a pre-purchase package to ensure installation could occur during the annual 1-day shutdown.
- New generator feeders were routed into the basement and run overhead to just below the new electrical room, allowing for minimal penetrations through the 14" concrete walls/slab.
- An existing storage room was converted into a new electrical room dedicated to the data center electrical equipment to avoid leakage concerns and maintain building operations during construction.



Results

The facility was provided with redundant power while minimizing the downtime and impact on existing electrical equipment.

Strategic use of existing spaces within the facility allowed to expand the capacity of the electrical distribution system with minimal architectural impact.