

Energy Savings & Green Design Features

South Hill Data Center is pursuing LEED-Gold Certification through a variety of sustainable measures.

- Highly efficient cooling system is complemented by enhanced commissioning to ensure system will function at maximum efficiency.
- Extensive sub metering and building automation will allow ongoing measurement and verification of energy use.
- Stringent construction practices protect indoor air quality by controlling dust and particulates to prevent contamination of building materials, ductwork and equipment.
- Low VOC materials and finishes are used throughout the facility. Wherever possible, building materials contain recycled content and are sourced within 500 miles.
- Regularly occupied areas enjoy natural daylight and views, separate comfort controls, and low water use fixtures.

South Hill's Benefits vs. a "typical" New Data Center

- Significant re-use of mechanical/electrical infrastructure leveraging existing top quality, like-new equipment
- Speed to market and reduced construction risk
- Long term scalability to high density (230w/sf) of critical power with the required cooling. This high density eliminates the risk of functional obsolescence
- The innovative cooling system in this facility represents the "Next Generation Data Center". The extremely low PUE and low power rates will provide significantly lower operating costs when compared to a "typical" data center. With these innovations South Hill will be awarded LEED certification.



South Hill Business + Technology Center

Next Generation Data Center

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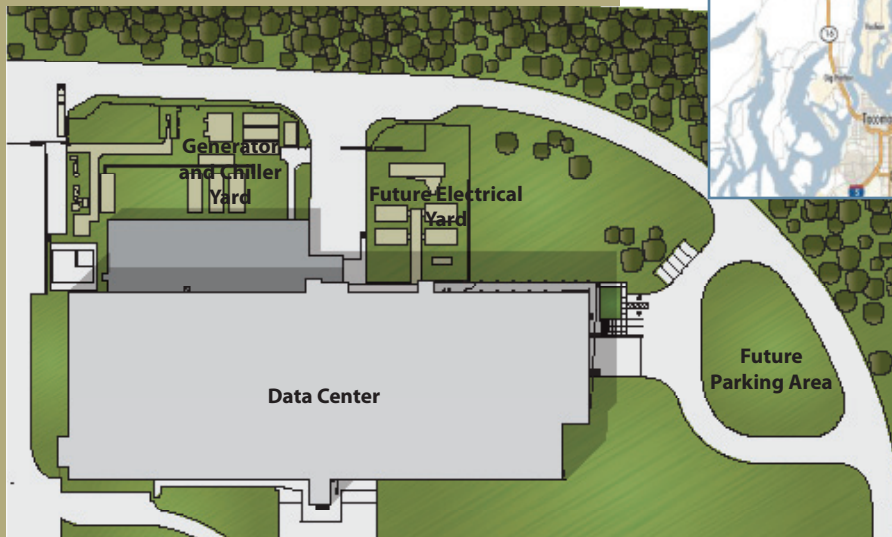
FOR LEASE/SALE

www.benaroya.com/datacenter



Vicinity Map

South Hill Business & Technology Center
1111 39th Ave SE
Puyallup, WA 98374



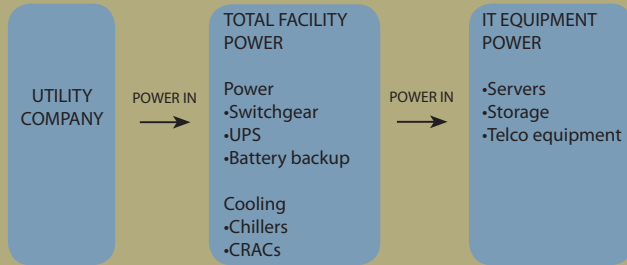
Site Plan



PUE - power usage effectiveness

WHAT IS PUE - Power usage effectiveness (PUE) is a metric used to determine the energy efficiency of a data center. PUE is determined by dividing the total amount of power used at the data center by the power used to run the computer infrastructure within it.

POWER USAGE EFFECTIVENESS



$PUE = \text{Total facility power} / \text{IT equipment power}$

3.0 MW - Conventional Data Center PUE = 1.9 Power Cost - \$0.09/kWh
 3,000 kW @ 1.9 PUE = 5,700 kW @ .95 Load Factor x 24 x 365 =
 47,435,400 kWh @ \$0.09 kWh = \$4,269,186

3.0 MW - South Hill Data Center PUE = 1.4 Power Cost - \$0.058/kWh
 3,000 kW @ 1.4 PUE = 4,200kW @ .95 Load Factor x 24 x 365 =
 34,952,400 kWh @ \$0.058 kWh = \$2,027,239

Annual Cost Savings \$2,241,946



Electrical Room



Air Handling Units

Facility Overview

High Capacity Reliability

- 37.5 MW of existing capacity at substation (18.75 MW N+1)
- Supplied by 115kV transmission lines
- Dual fed from separate 230kV sources utility substations
- Complete, redundant system – extremely high power reliability
- 15MVA of transformation in facility (12.47kV/480V)
- Eight 1100kVA Liebert UPS modules in facility

Cooling

- 55 highest quality AHU's (PACE) create ~3 million CFM
- Significant free cooling with air side economizers and evaporative cooling

Connectivity

- Carrier Neutral – Qwest, Level 3, 360 Networks, Integra and Above Net
- Short distance to Seattle Internet Exchange (SIX) and Pacific Northwest Gigapop (PNWGP)
- All capable of redundant pathways

LEED Designed

- Efficiently designed to take advantage of the Pacific Northwest's mild air temperature. LEED gold Certification targeted.

Low Cost Power

- Lowest industrial rates in Western Washington
- \$.01 per kWh discount from Puget Sound Energy's standard electrical rates
- For a 3MW data center with an average PUE of 1.4 and a load factor of .95, that \$.01 differential equates to savings of \$349,524 /year
- Ultra-effective air side economizers

Water

- Dual fed water supply from the City of Tacoma & the City of Puyallup which together can provide up to 2 million gallons per day
- On-site capability to store more than 1.5 million gallons of water

Security

- Stand alone building on secluded 94 acre campus

Data Center Critical Environment Operations

- Scalable on-site critical environment management – aligned with the needs of the user
- On or off-site BMS (building management system) monitoring
- Scalable on-site security staffing

Expansion Potential

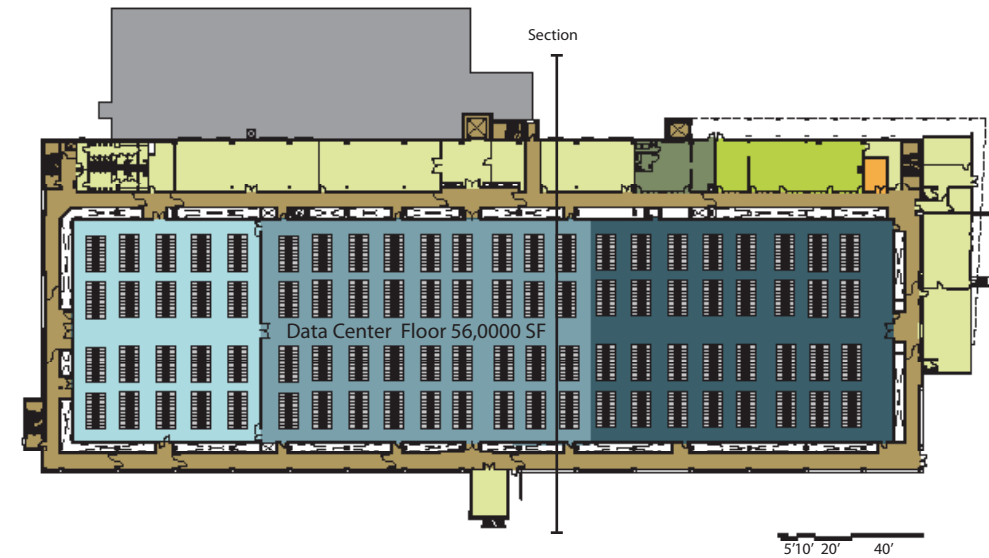
- Yes

Other Benefits

- The City of Puyallup's proactive permitting climate
- Proven data center and real estate team
- Available sites for Data Center Container Deployments as well

Second Floor Plan

- Controls
- Office
- IDF Room
- Data Center Phase I
- Data Center Phase II
- Data Center phase III
- Support
- Circulation
- Return Air



Mechanical System Overview

The mechanical base scope and design will serve up to 56,000 SF of raised floor critical loads. The design and installation will be scalable up to 230W/SF of rack loading and is based upon a fully segregated hot aisle / cold aisle arrangement. The cold aisle is to be maintained at 78° F (max) between 20% and 80% RH (the low and high relative humidity limits are intended to prevent static discharge and condensation respectively). The hot-aisle is designed for a 20-degree F rise across the servers.

The hot-aisle / cold-aisle segregation will optimize the performance of the outdoor-air economizers. This segregation allows the use of an elevated supply air temperature and as such, direct evaporative cooling and humidification addresses all of the cooling needs of the raised floor area. This design differs from the conventional method of delivering 50° to 55° F supply-air that mixes with the heat rejected from the server racks. Our design will provide considerable energy savings (up to 75%) compared to traditional chilled water system cooling while eliminating the risks of chiller restart failure.

The AHUs are equipped with a fan section featuring air-foil wheels, evaporative-cooling / humidification, face and by-pass dampers, and a filter section consisting of MERV 8 & MERV 13 filters. The evaporative cooling section will provide the primary cooling and humidification, served by a centralized pumping system (N+1) with evaporative water distribution to the AHUs and drain piping back to a centralized fiberglass tank. A pulsed water treatment (non-chemical) system with conductivity controller and blow-down valve will treat the water.

Facility Cross-Section

