

# North Clackamas Aquatic Park, Portland Oregon

Heating Systems and Controls



## Energy Savings:

**297,675 kWh**

**37,387 terms**

## Estimated Annual Utility Cost Savings:

**\$56,500**

## Total Utility Incentive Rebate:

**\$121,031**

*Including a special short-term "Kicker" incentive*

## Business Energy Tax Credit (BETC) pass-through dollars:

**\$176,386**

## Project Implementation Costs:

**\$846,000**

## Project Simple Payback:

**6 years**

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## BIG SURF! NETS BIG ENERGY SAVINGS

### Clackamas Aquatic Park Is No Ordinary Indoor Pool

The North Clackamas Aquatic Park is an interactive water play adventure that features a 400,000-gallon wave swimming pool, 3 water slides, a 29-foot rock climbing wall, a toddler splash zone, a six-lane lap pool, and a 13-foot diving well. During Big Surf! recreational hours, divers plunge into 13-foot-deep water as swimmers on rental tubes crest the wave pool's 4-foot surf, competitive swimmers hone their skills, and climbers scale a three-story rock wall. A drop slide sends adventurous aquanauts plunging. The park also includes an adult hot tub, interactive fountains, and a kiddie pool.

The owner of the North Clackamas Aquatic Park turned to Willdan to install multiple energy-saving projects at the park. The scope of work included a lighting upgrade to replace the indoor metal halide light fixture with new fluorescent and LED light fixtures, a new high-energy boiler system and appropriately sized heat exchangers, and optimization of the natatorium ventilation system.

Willdan performed an energy audit of the aquatic park facilities and developed a contract to provide new equipment – while at the same time trimming the park's yearly utility bill by \$56,000 per year. The \$846,000 project is making the park more energy efficient with funds used to replace 35- to 50-year-old boilers, upgrade lighting and renew building controls.

## STRIKING THE RIGHT BALANCE

### Willdan reins in utility costs while increasing comfort

In most natatorium designs, space and water must strike a comfortable balance to minimize evaporation. Willdan modified the supply air and return air systems for improved air distribution, relocated supply fans, and replaced the heat wheel with new media sized for an optimized system. Our staff also provided return air capability, automatically varying the amount of ventilation air (and total airflow), as needed, to maintain comfort and minimize energy use.

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## SUMMARY

### Project Benefits

- Reduced energy costs
- Increased comfort for guests
- More control over air and water temperatures

### Equipment Installed

- Lighting
- Exhaust fan
- Heat exchangers
- Hot water heating pumps
- VAV box controls

### Financial Analysis

- \$846,000 project cost
- \$56,000 estimated annual energy cost savings



During the design review, North Clackamas Aquatic staff requested that several alternates be reviewed and added to the scope of work. These improvements were subsequently approved and integrated into the Willdan scope of work:

- Natatorium Lighting – Add two T5HO high-bay fixtures and two LED flood fixtures to spotlight the wading pool and rock climbing wall
- Recondition Exhaust Fan - Sandblast the wheel and base, two coats of brush-applied, rust-inhibiting paint applied to the base, replacement of bearings, sheave and belts
- Replace Spa Heat Exchanger - Replace 3 spa heat exchangers and associated controls
- Replace Wading Pool Heat Exchanger - Replace the Wading Pool Heat Exchanger and associated controls
- Replace the Hot Water Heating Pumps and Convert to Variable Flow – Replace the existing hot water pumps with new larger pumps and add variable-frequency drives for variable-flow control. The new proposed larger pumps provide redundancy in case of failure.
- Replace Can Lights with LED In Hallway Leading to Board Room - Replace 17 existing can lights with LED lights to better illuminate the hallway leading to the board room.
- Upgrade VAV Box Controls to DDC In Board Room - Upgrade the controls for 2 existing VAV boxes from pneumatic to DDC.
- Upgrade Remaining 9 VAV Box Controls to DDC - Upgrade the remaining 9 existing VAV boxes that serve the office areas and other work rooms from pneumatic to DDC.
- Completely Recondition the Existing Heat Wheel and Replace the Heat Wheel Media with New - Completely replace all major heat wheel components and provide new heat wheel media for a basically brand new heat wheel.

Semco, the heat wheel manufacturer, requires that the replacements and reconditioning be performed and verified by factory personnel. Due to the high cost of this item and the subcontracted nature of work, both our selected mechanical contractor and Willdan provided this alternate at a minimal markup to the owner to cover coordination, carrying costs and bonding.

The upgrades have allowed the owner of North Clackamas Aquatic Park to cut energy and operating costs while improving the quality of its aquatic park and maintenance practices environments. In the first year, the park saved more than \$56,000 in energy-related costs. Annual energy consumption was reduced by approximately 297,675 kilowatt-hours and 37,387 therms, decreasing utility bills by more than 20 percent.