



PSF People - John Welch

John's experience includes over twenty years in the mechanical industry. Prior to becoming PSF's Shop Superintendent, John worked in the field, often traveling out of state on Nordstrom projects.

John insures that our ductwork and specialty fabrication is completed to a high quality standard, and that when shipments leave for a job site delivery they are complete and on time.

John's conscientious management of the shop has been responsible for the shop having no time-loss accidents since he was promoted to Shop Superintendent in the spring of 1989.

When not at work, John enjoys fishing, camping, hunting, and water-skiing with his wife Kathy, and their three children; Patrick, Justin, and Jessica. He resides in Everett, Washington.

PSF Goes to Jail



Photo courtesy of NBBJ Architects

PSF Mechanical, Inc. recently completed work on the Tulalip Casino project for M.A. Mortenson and WA Botting. Now they're sending us to jail! Fortunately, we will not be tenants. Ground was broken for the new Snohomish County Jail recently. Immediately upon award of the HVAC portion of the contract, PSF began assembling detailed 'superplot' inter-trade coordination documents in an HVAC add-on program for AutoCAD called CadDuct. PSF recently implemented the use of this 3-D software for coordination purposes.

The Snohomish County Jail is approximately 275,000 ft² (251,000ft² of new construction and 24,000ft² of remodel). It will be completed by May 2005. The project team consists of NBBJ (project architect), M.A. Mortenson (general contractor), WA Botting (prime mechanical contractor),

PSF Mechanical (HVAC contractor), DW Close (electrical contractor), and Fire Systems West (fire/life safety).

General Contractor: M.A. Mortenson

PSF Team:

Project Manager
Greg McKinney



Field Foreman
Randy Nau



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Dedicated Outside Air Systems

“Dedicated Outside Air Systems” which condition ventilated air (100% outside air) provide cooling and/or heating to the spaces they serve. These systems have been around for many years, but because of higher cost and additional space requirements above the ceiling they are not widely utilized. The two primary benefits of utilizing these systems are the ability to separate the outside air latent cooling loads from the interior sensible cooling loads and the ability to provide the required ventilation air prescribed by Code directly to each space.

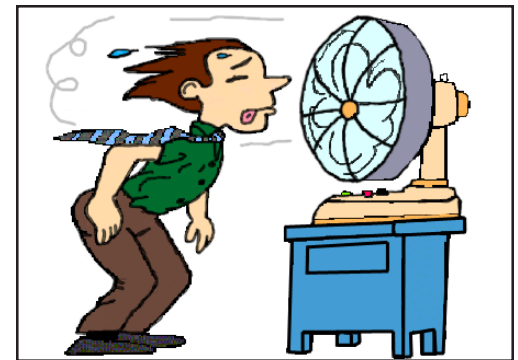
Regions that have high humidity levels make these systems very attractive as a viable solution for space comfort. The conditioning of outside air becomes a major factor in the design and selecting the AC system. Separating the latent cooling load of outside air and conditioning it with a dedicated AC unit provides better control of the humidity level in the space. In the Pacific Northwest, humidity is usually not a concern and the outside air is not a major factor

in indoor air latent and sensible cooling loads. Operational and comfort problems occur when high humidity conditions exist, yet ambient temperatures remain below “design” conditions. With conventional controls the HVAC systems will not run in the cooling mode long enough to dehumidify, creating “muggy” indoor conditions. If dehumidification controls are used to run the equipment, some form of reheat will be needed - raising operating costs and complexity. Isolating outside air loads with a dedicated system eliminates these problems.

The benefit of providing ventilation air directly to each space simplifies code compliance. It is also energy efficient, since each space is ventilated to the exact amount without excess. In comparison, it is more difficult to quantify the necessary ventilation air supplied by a typical AC system, with the exception of constant volume systems. A typical HVAC system mixes ventilation air with return air before supplying it to each space. Variable

air volume systems utilize larger quantities of ventilation air than the “Dedicated Outside Air System” for code compliance, resulting in more energy usage. With a VAV system, it is also more complicated to calculate required ventilation air settings due to the fluctuation of mixed air supplied to each space throughout the day as the cooling load fluctuates.

The benefit of “Dedicated Outside Air Systems” for projects located in high humidity regions can be realized over the additional cost and space impact. For all other regions further evaluation is required to verify the potential energy savings verses construction costs.



We Travel (II)

As part of our normal workload, PSF often has crews in any number of states simultaneously. Currently we are licensed in 33 states. This number fluctuates slightly as we add new states, or occasionally let a license lapse.

What does it take to obtain licensing to work out of state? Since PSF is a design/build firm, we must obtain a minimum of two licenses; a State Professional Engineers license, and a State Contractor’s license.

Obtaining a State PE license entails filling out an application through NCEES (National Council of Examiners for Engineers and Surveyors) to certify the applicant is a Professional Engineer of proper standing for the field applied for, then making applications to the

individual states of interest. Often, a test is required by the individual states to demonstrate competency. Some states, such as Alaska, have special requirements due to extreme design conditions and/or extraordinary engineering skills requirements.

The second license obtained is the State Contractors license. Obtaining this license entails a direct application to the state, usually requiring the demonstration that the individual applicant is qualified via a combination of training and experience. The exam(s) for state contractors licenses are often two-part tests: one part being “administrative”, the other “trade” related. The administrative test typically covers business knowledge such as state regulations, business ac-

counting, OSHA regulations, state licensing rules, risk management, state and federal labor laws, workers comp rules, AIA documents and project management. The trade portion of the test covers fundamental trade related skills, in our case HVAC, refrigeration, psychrometrics, weather data, trade skills, troubleshooting and construction standards. An officer of the company usually takes these tests.

Occasionally, an additional “tradesmen’s” test is required - usually taken by a superintendent or foreman who will be on-site or will conduct frequent site inspections. Also, individual cities may require an additional license, though these usually involve the payment of a fee without the requirement for an additional test.

PSF Teams with BMWC on Fast-Track GMP Clean Room



PSF Mechanical recently completed the fast-track design and construction of a new Class 10,000 (ISO Class 7) clean room and the retrofit of an existing clean room for the Dendreon Corporation. Established in 1992, Dendreon is a biotechnology company developing targeted therapies for cancer. The project is located in Dendreon's existing 3005 1st Ave, Seattle facility. The project team included BMWC - Prime Contractor, Stock & Associates - Architect, Process Solutions - controls and critical systems monitoring,

plus Technical Safety Systems (TSS) - Validation.

The HVAC systems were designed, fabricated and installed to meet the stringent criteria of the International Organization for Standards, ISO 14644 - Design, Construction and Start-up of Cleanrooms and Associated Controlled Environments. As such, PSF developed and implemented project specific design issues such as air change rates, filtering efficiencies, pressure relationships and control, duct cleanliness and protection, and specific start-up and test procedures.

The project team was also presented with and successfully overcame logistical, schedule, and budget challenges: The HVAC systems needed to fit into the extremely limited available ceiling space (the building was originally constructed as an office and offered only 15" of clearance above ceilings); The project needed to be built in thirty-five calendar days from start of demolition to commencement of owner validation;

And the project needed to be completed with the strict budget parameters established by the owner. As PSF Project Manager Walt Clear stated, "This was an extremely challenging project and I'm proud of what we have been able to accomplish here. The whole team really rose to the challenge."

This project serves as an example of the effectiveness of the design/build delivery system in a team oriented environment. Owner occupancy of the new clean room occurred on schedule in August.

Owner: Dendreon

Scope: GMP Clean Room

Prime Contractor: BMWC

PSF Team:

Project Manager
Walt Clear



Field Foreman
Joe Marshall



A Different Perspective

The events of 9/11 and the subsequent Anthrax attacks on several government buildings caused many people to question the integrity and safety of modern buildings. Protecting our buildings and their occupants from terrorist attacks is an imperfect science at best. As Americans, we value our freedom to be "unencumbered" by annoying security procedures and systems.

From an HVAC perspective, buildings are very vulnerable - as was demonstrated in Washington DC when first the news media, then government offices were the intended victims of a coordinated Anthrax attack. The postal services became unintended victims as well, as postal equipment and handling spread Anthrax within some mail handling facilities. In all of these

cases, the 'attackers' count on the building's occupants and HVAC systems to spread contamination. 'Weaponized'



Anthrax spores are designed specifically to behave like a gas, spreading almost by osmosis to surrounding areas. HVAC systems, by design, make excellent air transportation vehicles. At any given time conventional HVAC systems may be recirculating up to 80% of their total air flow. In addition, fan-powered VAV systems pick up and recirculate variable amounts of ceiling plenum air as well. This makes the job of protecting a conventional building very difficult. Cleaning up a contaminated building becomes a daunting task - with spores literally in every nook and cranny of the affected building.

Some of you may recall a recent event in Russia, where several hostages were unintentionally gassed to death, when a seda-

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Summer Projects

The following are projects that PSF will be working on this summer:

Dendreon

- Scope: GMP Clean Room
- PC: BMW
- PSF PM: Walt Clear

QSR Lot 3A NW District Council TI

- Scope: 14,000 Ft.² Build-Out
- GC: Pennon Construction
- PSF PM: Will Thompson

Simplex Grinell TI

- Scope: 6000 Ft.² Build-Out
- GC: Sellen Construction Co.
- PSF PM: John King

YMCA- Auburn Branch

- Scope: New Full Service Facility
- GC: GLY Construction
- PSF PM: John King

Perspective *-Cont...d-*

tive gas was introduced via the building's HVAC system by Russian special forces (to maintain an element of surprise). In Japan, there are several buildings that use the HVAC systems to spread scents throughout the building. It has been demonstrated that certain scents affect peoples level of alertness, mental acuity and moods - all directly affecting productivity (try that in the US!). These examples demonstrate the vulnerability of a building (for 'good' or bad) via the HVAC systems.

One HVAC system proposal studied for 'secure' buildings uses a dedicated 100% outside air system combined with chilled water radiant cooling. What makes this system unique is the use of radiant cooling panels to handle the interior and skin loads of the building for cooling purposes. Outside air cooling, dehumidification and/or humidification loads, plus filtration, are handled by the dedicated outside air sys-

tem. In the case of a secure building, the filtration (and detection) systems may be very rigorous, including HEPA and UV (ultraviolet) treatment of the airstream. Recirculation of building air is completely eliminated. In theory, a building using this type of HVAC system would be much less vulnerable to attack from outside, and in the event of an 'internal' attack (via the mail, courier-delivered material, etc...), much less vulnerable to the spread of contamination within the building.

Like to get on our mailing list? Send your name and address or email address to: sales@psfmech.com

Or, simply write:

*PSF Mechanical, Inc.
9322 14th Avenue South
Seattle, WA, 98108*

For more information about our company, visit our web site at www.psfmech.com



PSF Mechanical, Inc.
9322 14th Avenue S.
Seattle, WA 98108

