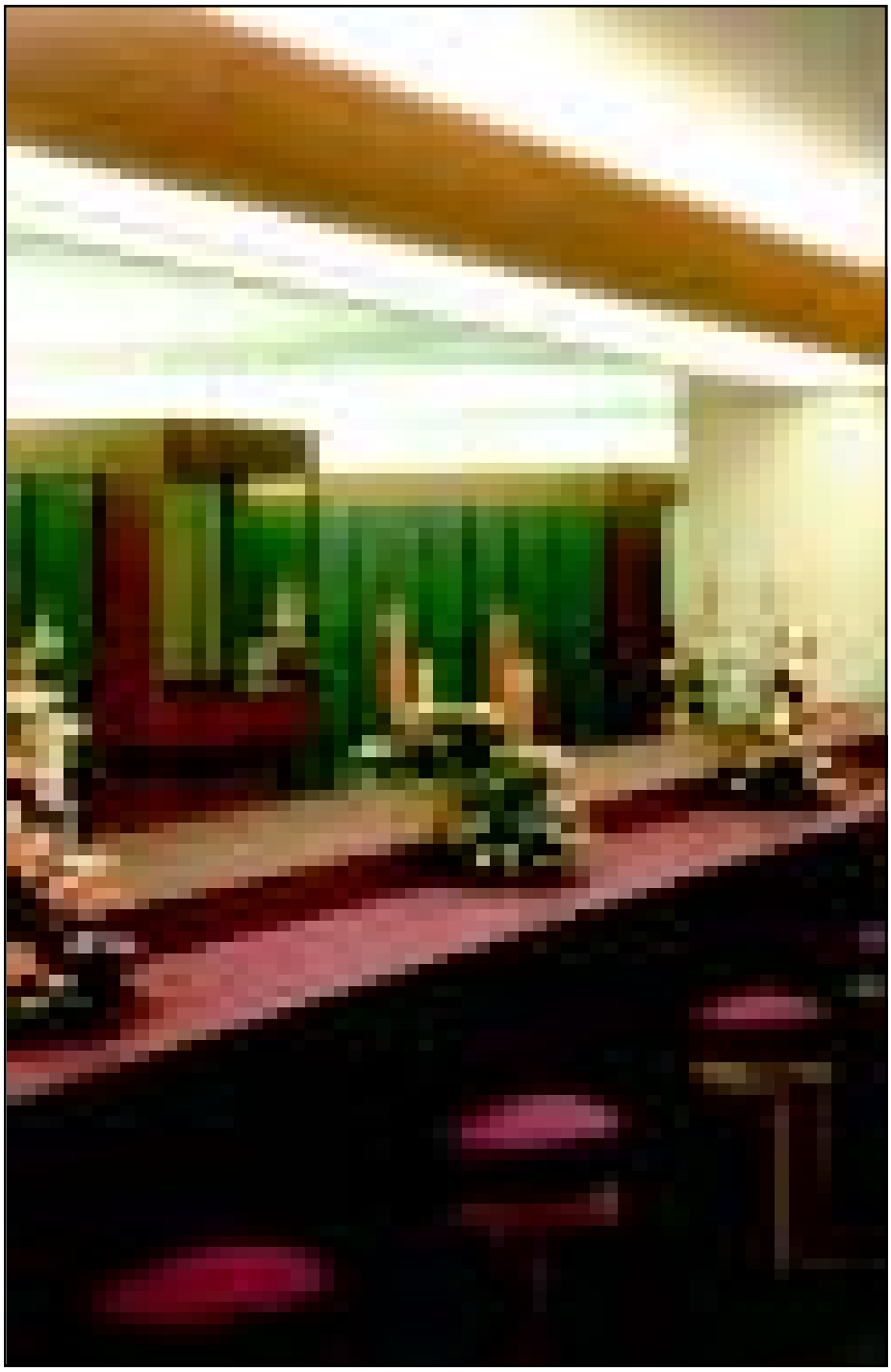
LOCKER ROOM ENGINEERING FROM THE INSIDE OUT

Working closely with an engineering consultant will help club owners acquire locker rooms with cost-effective HVAC, power, plumbing and lighting systems.



By HERVEY R. LAVOIE, AIA

By far the most common complaint among locker room users steams from an immutable law of nature, which states that, upon entering a locker room, your assigned locker will always be sandwiched between the only other two lockers being used in the room.

The second most common complaint about locker rooms is that they smell funny.

While this first law of nature continues its timeless rule, the age of poorly ventilated locker rooms is coming to an end for those owners and designers who are willing to subscribe to the highest standards of modern engineering design.

That odors are a problem in locker rooms should not be a surprise to anyone familiar with the elements of organic decay. The presence of moisture, warmth and organic material guarantees that odor-producing processes will thrive just as they do in a stagnant, subtropical swamp.

The following article is presented not as a technical dissertation for engineers, but as a primer for owners and designers who must work with engineers in setting objectives, weighing alternatives and designing cost-effective systems. It outlines an approach to securing reliably engineered results in the design of HVAC, power, plumbing and lighting systems.

ENGINEERING GUIDELINES

♦ *Earning credibility the old fashioned way.* An engineer should be utilized;

however, don't employ one who is inexperienced in designing an effective locker room HVAC system. Don't give this individual your faith until you have taken the time to visit an example of his or her previous work.

You'll be entrusting a great deal to this person's ability to harness the forces of modern technology and use them to control the basic elements of the universe. The engineer must be a person who respects the powers of nature—part philosopher and part scientist. Very few of these people have chosen to make a living designing HVAC system, so keep looking until you've found the right person.

With modern engineering, the age of poorly ventilated locker rooms is coming to an end.

♦ *The law of supply and return.* One approach to controlling locker room odors and humidity is to continuously exhaust all locker room air and replace it with freshly heated or cooled outside air. Most HVAC systems for other types of buildings will only exhaust a small percentage of building air, saving most of it to be heated or cooled again and recirculated through the building.

When this type of system is employed for a locker room, the results are often unsatisfactory, unless special filtering and dehumidifying equipment is utilized. However, the recirculating systems are popular because both the initial cost and operating costs are less expensive than utilizing 100-percent exhaust systems.

The 100-percent exhaust systems continuously throw away treated (heated or cooled) inside air, which must be replaced by outside air, which must be treated (heated or cooled). This results in high energy costs on those occasions when the outside air is either too warm or too cold to be introduced untreated to the building's interior.

This loss of energy can be averted by installation of heat exchangers known as run-around coils, heat wheels or energy recovery units. These devices capture the heating or cooling effect from outgoing treated air and transfer it to the incoming outside air. Thus, without sacrificing energy efficiency, it is possible to maintain a continuous flow of fresh, outside air into and through the locker rooms.

This rate of flow is often defined in air changes per hour and can be set at an adequate level to dilute ambient humidity and odor. You can expect to pay more for the design and installation of such a system, but if effective locker room heating, ventilating and air conditioning systems were cheap and easy to design, everybody would be installing them.

♦ *To be or not to be dehumidified.* This question should be asked whenever a recirculating air system is employed. While excess humidity in locker room dry areas can be a source of discomfort and corrosion, excess dryness in the locker room wet areas can create chilly conditions for wet bodies. Anyone who has climbed out of a swimming pool in the dry heat of Arizona knows firsthand how cold one can feel under the evaporative cooling effect of low humidify, even at air temperatures of 90°F or more.

Although some wet-area humidity contributes to the comfort of users, efforts to control the damaging effects of excessive humidity levels should be undertaken with full engineering knowledge of the consequences. A psychometric chart can be used by environmental engineers to approximate the limits of the human comfort zone under varying levels of humidity.

Several varieties of dehumidifying equipment are available, many of which feature energy recovery capabilities that allow otherwise wasted heat to be used to preheat pool makeup water. Dehumidifiers should be used in climates where outside air is often too humid to create comfortable dry interior conditions.

In all cases, it is clearly desirable to treat locker room wet and dry areas as separate zones. This means that different temperatures and humidity conditions should be simultaneously maintained in each area.

- *A theory of relativity.* In the effort to control humidity and odor, it is desirable to manage the general flow of air through a space so that odors and humidity are contained at the source. Fans, ductwork are balanced to produce a negative relative pressure in dressing, lounge and circulation areas. This approach will work against the migration of odor and humidity throughout the entire facility.

An example of containing odors at their source can be found where extensive use is made of storage lockers for damp, sweat-soaked workout gear. These storage lockers can be placed over return air plenums so that all or part of the locker room exhaust system is designed to draw air through the lockers, directly removing odor and moisture. In a service-oriented facility, the same benefit can be gained by offering an automatic laundry service to members who rent storage lockers.

ENGINEERING FOR AMENITIES

♦ *Tanning beds.* In clubs where tanning beds are located in private, enclosed rooms, it is imperative that each room be individually controlled and provided with additional cooling and ventilating capacity. A further refinement will discharge the supply air at a level and location that provides a direct cooling effect on the tanning bed user.

This can usually be accomplished by placing the supply diffuser low on one wall of the room and the return grille on the ceiling adjacent to the opposite wall. The use of an adjustable diffuser is recommended so that air flow can be directed as desired.

♦ *Whirlpools.* Many whirlpools have air-injection blowers to enhance the turbulence of the water. This means that massive quantities of air are being forced out beneath the surface of the water, bubbling to the top and released into the atmosphere of the room.

You probably couldn't design a better humidity generator. News of this large-scale humidifier is frequently a surprise to the engineer, who would otherwise be anticipating only a modest vapor contribution from normal evaporation of a warm body of water and no addition of air volume.

If not adequately exhausted, the whirlpool area becomes an atmospherically positive space, pushing warm, damp, odor-laden air into adjoining spaces. Make sure the engineer is advised of the capacity and operating patters of all whirlpool equipment.

♦*Steam and sauna.* Neither of these spaces require any connection—supply or return—with the central HVAC system. The steam room must be a water- and vapor-proof enclosure with a user access door and steam injection pipes.

The sauna need not be water- and vapor-proof. For electrically powered heaters, a small transfer grille is recommended immediately below and behind the unit. Provide the engineer with manufacturer literature on the specific steam and sauna units that are used.

FINISHING TOUCHES

The bulk of the HVAC system is generally concealed in equipment rooms, chases and ceiling spaces. However, some components will be a very visible part of the interior decor and deserve special attention from both the engineer and designer.

Air supply diffusers are often located on a ceiling or high on a wall, where staining and dirt streaking from inadequate filtered air handling systems will be readily apparent. Such staining is virtually impossible to remove from some acoustical panel ceilings and can only be prevented by an engineer who is experienced enough to acknowledge the potential problem, and take the appropriate measures to prevent this condition from occurring.

Wall-mounted diffusers and grilles have more visual impact on the interior design than ceiling types and should be carefully composed. Consider concealing such grillwork behind decorative screens or valances.

Other components of an HVAC system, which are often visible and therefore deserving of planned rather than haphazard placement, includethermostats, ductwork, baseboard heaters, unit heaters, radiators and access panels.

All too often, the engineer is given the mission statement, "Make it work and make it economical."

POWER, PLUMBING, LIGHTING SYSTEMS

♦*Power supply.* Electrical engineering plays a less critical role in the locker room experience than the heating, cooling and ventilating. However, careful attention to this area will contribute to a smoothly functioning space.

An adequate and compatible power supply must be provided for many locker room functions, including hair dryers, vacuum cleaners, shavers, swimsuit dryers, electronic scales, sauna heaters, steam generators, suntan beds, vending machines, shoe shine machines, water coolers, hair curlers and televisions.

♦*Plumbing design.* The adequacy of a plumbing system reveals itself in several critical ways: Is there sufficient water pressure to produce a satisfactory shower? Will there be an adequate supply of hot water? Will the temperature of any given shower remain constant under such variables as flushing toilets, and adjacent showers and lavatories being turned on or off? Will the fittings and valves endure the intensity of use and the likelihood of abuse? Will the system be accessible for repair and lend itself to alteration or expansion?

♦*Lighting design*. From an interior design standpoint, lighting design is a deep subject and deserving of more detailed discussion than is possible in this article. From an engineering standpoint, several simple guidelines should be considered:

- Varying light levels will help create a more inviting space. Provide an ambient light level of 15 to 30 foot-candles and supplement that as appropriate with task lighting of 75 to 100 foot-candles in specific areas such as vanities, water closets and whirlpools.
- While incandescent lighting offers the best enhancement of the skin tones common to locker rooms, fluorescent lighting can efficiently deliver higher light levels and longer amp life. When used as indirect source, incandescent lighting can produce the warm tones desirable in a locker room.

The work of engineering the modern locker room is too important to be delegated to any single design entity. It is vital that a continuing dialogue about design issues be maintained between owner, designer and engineer.

All too often, the engineer is given the mission statement, "Make it work and make it economical." With this attitude, the engineer is sent away to complete the work without the benefit of continuing participation in the development of objectives and solutions.

To get the best results from an engineering consultant, insist that he or she listen to your goals and aspirations for the facility, and find out what design alternatives the engineer is pursuing. This approach, referred to as process-oriented design, will yield superior, long-term results.

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