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ABOUT US

Vanderweil Engineers is an MEP, power, and technology services consulting engineer, ranked the 135th largest design firm by Engineering News Record.

Vanderweil's Healthcare Specialty Group focuses our extensive experience into a single multidisciplinary engineering team that has completed projects throughout the US and internationally. Our experienced project team understands the importance of responding to each project's unique requirements to develop tailored, cost-effective solutions.

VANDERWEIL HEALTHCARE

Renewability 02

"Preconditioning the minimum OA reduced our incidents of higher than acceptable humidity levels from 60% down to less than 4%."

Director of Engineering, University Healthcare System

VANDERWEIL HEALTHCARE

Renewability of MEP Systems

OVERVIEW

The term “renewable” as we apply it here is not a reference to renewable energy sources like solar and wind. Rather, it refers to the ability to renew (or replace) older equipment. MEP systems will be “renewed” (or replaced) one or more times during the lifespan of a building. MEP systems renewal in a healthcare setting is a complex undertaking because these systems typically run 24/7, and all too frequently, systems have been designed without provisions for their eventual replacement.

THE CHALLENGE

Renewing older systems typically entails the use of temporary “roll-up” equipment at a significant cost and time premium. In response to this situation Vanderweil developed an approach to the design of new hospitals making them “Renewable” as well as “Sustainable” (and improving their maintenance too).

THE SOLUTION - REDUNDANCY

Equipment redundancy is the best strategy to achieve renewability. Often redundant equipment is provided for reliability purposes anyway, but, importantly, when it comes time to replace equipment the redundant unit can be operated while the base-load unit is replaced, and vice-versa. As important as it is for renewability, redundancy can be expensive, so it is frequently deferred due to space and budget constraints, even though the additional costs can often be offset by the significant avoided costs when the system is ultimately replaced. This pamphlet describes the four strategies Vanderweil has used to obtain redundancy and hence renewability.

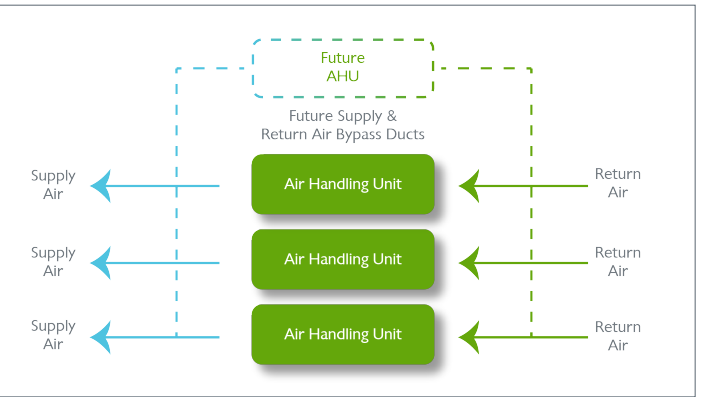
OUTCOME

Buildings that incorporate renewable systems usually experience improved reliability, performance and compliance. There is also the added benefit of significant operating and maintenance cost savings as compared to buildings with systems that are not renewable.

The life expectancy of redundant systems is often extended because of better maintenance that can be accomplished during normal business hours since individual units can be taken off-line. The biggest incentive for renewable systems is the millions of dollars in costs that can be avoided when it comes time to eventually replace the main systems.

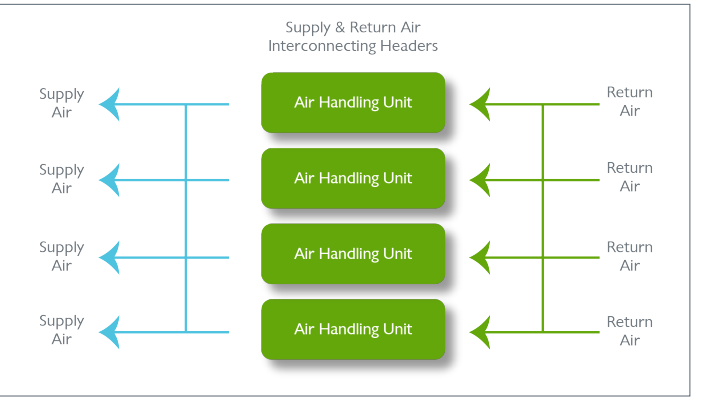
Strategy #1 - Available Space

The most basic - and least expensive - way to provide renewability is to designate space for a future redundant unit. The cost of the unit is therefore postponed until it is needed for phasing of the replacement project.



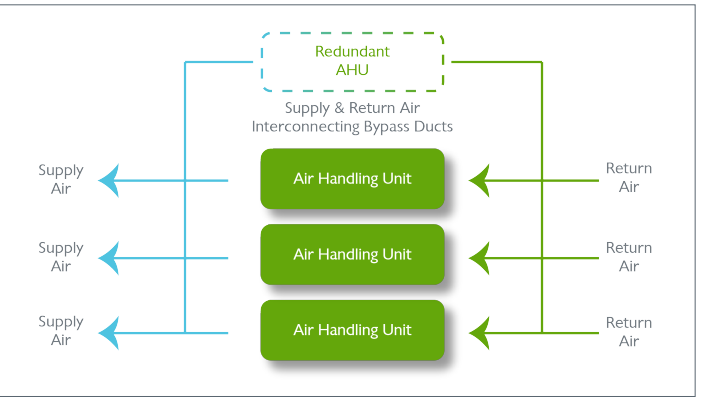
Strategy #3 - Common Header

A further step up is to header together multiple air handling units into common ducts. The AHU’s are each slightly oversized, such that collectively they can provide redundancy for an off-line unit. This can be done at a much lower cost than actually providing a redundant AHU, and it saves space too.



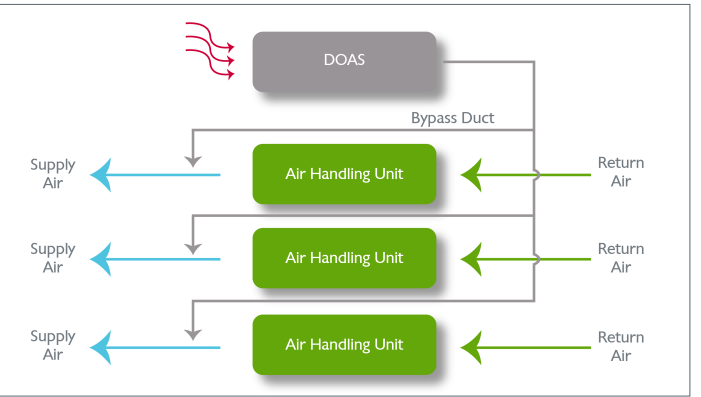
Strategy #2 - Utility Infielder

A step up from just providing space is the utility infielder concept. This is how redundancy is usually accomplished. A redundant unit is provided that can back up other critical units, like a utility infielder in baseball.



Strategy #4 - DOAS

An improvement on the common header concept is to utilize one of the AHU’s as a DOAS (Dedicated Outside Air System). During normal operation the DOAS preconditions the minimum outside air which is then supplied to the other AHU’s. This can result in an approximate 33% reduction in the peak cooling demand as well as significant energy savings by reducing over-cooling of air, which more than pays for the cost of the DOAS unit. In terms of renewability, when the time comes to replace an AHU, the DOAS can be used as a redundant unit.



“Prior to preconditioning the OA, we had to continuously shop-vac the excess condensate that was overflowing the drain pans and spilling out of our air handling units to prevent the water from leaking through the floor onto the Radiology unit below all summer long.”
Building Manager, University Healthcare System