

# the evolution of manufacturing design

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When looking to build a new facility or renovate an existing one, manufacturing leaders need to consider several factors for the best return on investment. In the past, operational efficiency was often the most prominent, if not the only consideration.

But today, the physical characteristics of a manufacturing facility must now deliver beyond operational excellence. The building or campus' presence must now also serve as a recruiting tool, a reinforcement of brand, a testament to the company's mission and values. Not to mention, contributing to the overall aesthetic of the community to ensure government and neighborhood support.

## attracting new talent

Manufacturing talent today is becoming as demanding of their workplace as they are of their compensation.

- 21% of employees would take a 10% pay cut to work in a nicer environment. (Staples Annual Workplace Survey)
- 69% of employees said they would be willing to give up other benefits to work in a well-designed space. (CBRE Study)
- 54% of employees agree that when it comes to considering a new job, office design is equally or more important than office location. That number increases to 64% among mid-level employees (Capital One Study)

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To attract and retain top workers, companies in big cities as well as rural communities need to offer environments attractive to the new generations of workers. High tech, collaborative spaces are now standard. A mix of indoor and outdoor work environments is highly sought after. And, creating an engaging workplace is critical at self-contained sites, where people may remain on campus for an entire day.

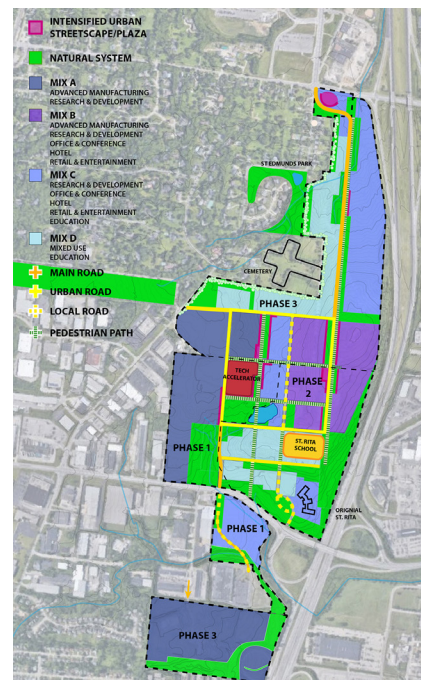
For example, when creating the master plan for AeroHub, an advanced manufacturing innovation district in Cincinnati, Ohio, use and activation of the campus was identified as a critical planning principle. Providing a denser physical setting for productive, informal, and social relationships that foster ideas and problem solving is key to success. Exceptional shared places can foster identity and provide the kind of dynamic environment necessary to attract the most critical component of innovation – talent.

This newer generation of workers also wants to align with companies that share their values. According to a recent Glassdoor study, alignment with culture and values is the #1 factor for employee satisfaction.

Fostering innovation, wellness, and sustainability are often cited as key values of companies the new generation of workers connect to. The representation of, or lack of these values is often interpreted through the workplace design. A well-lit interior with both collaborative and private spaces, along with exterior amenities such as greenways, walking trails, and water features offer benefits to the employees as well as improved aesthetics for neighboring properties. Architects can also introduce WELL building standards for improving health and human experience. LEED®, a building rating system from the U.S. Green Building Council, provides guidance for sustainable buildings.

emersion's \$23 million brownfield rehabilitation of a 1930's aircraft hangar into a state-of-the-art Advanced Power and Thermal Laboratory and Test Facility was completed with a primary emphasis on sustainability and energy conservation. The project preserved an important historical structure with a conversion that accomplished LEED Gold Certification and was the recipient of a Federal Energy & Water Management Award.

The success of this project demonstrates that renovation and new construction offer opportunities to design and construct facilities that meet programmatic needs while also creating an environment suited to attract the best talent.



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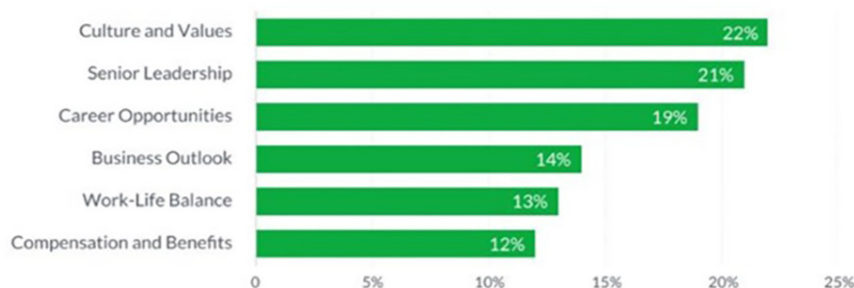


## functional facility design

While manufacturing leaders want to incorporate innovative facility design to attract and retain young, technical talent, they also need to build a template for their operations and facilities that deliver operational efficiency and can adapt to ongoing change. Flexibility of the facility is imperative in a rapidly advancing manufacturing world.

Facilities should be designed so they can be easily expanded or adjusted to meet changing production needs. Flexible manufacturing systems are most often highly automated facilities so accommodation of current and future technology support should be considered. The facility should also be designed to accommodate smooth process flow. This doesn't necessarily have to consist of straight rows in a rectangular shaped building. An architect working with the manufacturing team can provide potential design options to support different process flows, materials storage and handling, product output, and worker safety. Some of the goals in designing the facility should be to ensure a minimum amount of materials handling, to avoid bottlenecks, to minimize machine interference, to ensure high employee morale and safety, and to ensure flexibility. Facility design must be considered very carefully to avoid redesign and renovations.

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Critical items to consider when designing to achieve these goals include:

- Space utilization – width of traffic lanes and vertical space for storage are core considerations.
- Shipping and receiving – there always seems to be a shortage in this area so allot ample room.
- Ease of communication and support – facilities should be laid out so that internal communication and interactions with vendors and customers is easily done, either in designated floor areas or easily accessible conversation rooms.
- Safety – the facility layout should support Occupational Safety and Health Administration guidelines.

Layout requirements can also differ dramatically. Essentially, there are two distinct types of layout. Product layout addresses the assembly line and is oriented toward the products that are being made. Process layout is oriented around the processes that are used to make the products. Generally, product layout is applicable for high-volume repetitive operations, while process layout is applicable for low-volume custom-made goods. Manufacturers will still have significantly different facility layouts, depending on their unique needs. For example, the production challenges associated with chemical manufacturing will vary greatly from those involved in basic tooling processes.

By combining design aesthetics to attract talent with functionality for operational effectiveness, manufacturers can expect a notable impact. Countless studies have indicated that employee wellness is impacted by workplace design and has a major impact on loyalty and productivity.





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A study by the World Green Building Council recorded an 11% increase in productivity as a result of increased fresh air to the workstation and a reduction in pollutants. While another study by CABI/British Council for Offices showed even greater improvements. A well-lit and well-ventilated work space were found to decrease the number of absences and increase satisfaction by 24%. In turn, productivity went up by 16%. Truly being comfortable while working decreases absences and boosts satisfaction, which, in turn, increases productivity.

This approach to more comprehensive design thinking can also support and reinforce the company brand. If the facility is aesthetically pleasing, it can reinforce the brand's reputation as well as the inclination to protect it by maintaining a clean and attractive workplace.

Campus-like environments, distinctive architectural elements, and collaborative workplaces ultimately distinguish new and renovated facilities that attract top talent, improve job satisfaction, and deliver optimum productivity. Manufacturers who understand this evolution in facility design will enjoy a rapid return on their investment and distinguish themselves from trailing competitors who are slow to embrace.

"I have worked with  
emersion multiple  
occasions...

Their efforts on designs,  
design-build,  
and design-bid-build  
projects often include  
innovative approaches,  
helpful solutions,  
and quick problem  
resolution with expert  
recommendations and  
advice when needed.....

I look forward to working  
with them again  
in the future."

- Rob Lesko, Senior  
CM Project Engineer





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### steve kimball

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Steve has over 40 years' of business leadership and project management experience. Prior to co-founding emersion DESIGN, he was the President and CEO for a 100-person architectural/engineering firm with offices in Ohio and Florida. He has expertise with projects such as campus master plans, computer centers, research and testing facilities, healthcare facilities, labs, university academic buildings, and engineering centers. Steve has managed over \$1 Billion in construction projects.

*emersion DESIGN, located in Cincinnati, Ohio is a collaborative architecture, interior design, planning, structural engineering and sustainable design firm driven by a passion for exceptional designs that advance clients and society.*

### References:

1. CBRE Study  
<https://static1.squarespace.com/static/564655a7e4b0bc08c0869886/t/582e602b414fb5594a0e44c9/1479434408226/CBRE+Global+Millennials+Live+Work+Play+Report.pdf>
2. Staples Workplace Survey  
<https://marketingassets.staples.com/m/11f5d2887db343cb/original/2017-Staples-Workplace-Survey.pdf>
3. Glassdoor Economic Research  
<https://www.glassdoor.com/research/studies/employee-satisfaction-drivers/>
4. 2019 Work Environment Survey, Capital One  
<https://www.capitalone.com/about/newsroom/wps-survey/>
5. CBE, British Council for Offices  
<https://webarchive.nationalarchives.gov.uk/20110118111511/http://www.cabe.org.uk/files/impact-office-design-full-research.pdf>
6. World Green Building Council  
[https://www.worldgbc.org/sites/default/files/compressed\\_WorldGBC\\_Health\\_Wellbeing\\_\\_Productivity\\_Full\\_Report\\_Dbl\\_Med\\_Res\\_Feb\\_2015.pdf](https://www.worldgbc.org/sites/default/files/compressed_WorldGBC_Health_Wellbeing__Productivity_Full_Report_Dbl_Med_Res_Feb_2015.pdf)