

# What it Takes to Build Better Baking and Snack Facilities

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When it comes to building bakeries, there are specific elements to be considered that ensure the most efficient and sanitary facility design and construction – regardless of whether it is a Greenfield or Expansion project. For more than 50 years, The Austin Company has provided innovative planning, design, engineering and construction solutions to support the baking and snack industry’s continuous growth and ever-changing demands. This whitepaper represents some of Austin’s best lessons and practices for consideration in your next facility project.

## Baking and Snack Industry Challenges and Trends

It seems that bakers are facing changes and new challenges nearly every day: regulatory, consumer preference, competition, labor, ingredient costs and industry consolidation, to name just a few. Rapid changes in the equipment and technologies used, including continuous mixing and liquid brew systems, while not entirely new, are becoming a new approach for many bakers. In addition, a new technology involving rapid hydration of flour using very high pressure water is another potential baking “game-changer”. Utilizing different methods to implement projects more quickly are among the tools bakers must use to get ahead of the competition and stay there.

Response to a rapidly changing marketplace with increasingly complex requirements must be fast and efficient. Often, successfully implementing any new initiative or change to ongoing operations requires substantial modifications to existing facilities, including new utilities and/or increased floor space. Regardless of the change, the need for flexible and highly-efficient production facilities that maintain safe operations and products must be a primary focus.

Some of these pressures include:

- **Hiring and Retaining the Right Labor**

Bakeries can be hot, dusty, uncomfortable working environments. High turnover of employees is an issue. In addition, many bakeries are faced with an aging workforce. How can bakery operations adapt to appeal to a younger workforce? And, once the right talent is in the door, how can bakeries work to retain and develop those new employees?

One answer is to make the working environment more attractive through design features, such as HVAC considerations to improve air filtration and circulation, natural lighting, attractive break rooms and ease of operation.

- **Product Margins are Tight – and Getting Tighter**

Increasing raw material and ingredient costs continue to squeeze margins. Many bakeries simply do not have large amounts of capital to invest and as a result, continue to run inefficiently. There is an opportunity and need to reduce waste through process design changes that do not require significant capital investments. To start, identify how to accurately measure waste so you know where to focus improvements.

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- **Environmental Emissions Impact**

This is especially an issue in more densely populated areas. There are approaches that can be adopted to not only reduce emissions, but to recover energy and save money as well. For example, reducing the bakery's impact on the environment through water saving methods will also reduce operating costs.

- **Increasing Energy Costs**

Bakeries can save energy through sustainable design features: capture more natural light, employ best practices to minimize compressed air losses to reduce energy consumption, recover heat from ovens, and design ventilation in production areas to reduce potential contamination and enhance employee comfort, are a just a few of the energy saving opportunities to be considered.

- **Outdated Facilities**

As mentioned above, legacy plants can become less and less efficient. At a minimum, look to improve the layout and install more efficient equipment.

- **Process Controls and Automation**

Investment here can often provide a very quick ROI.

## Approach to Building Better Bakeries

### **Personnel Safety**

Austin's approach to building better bakeries takes into consideration the specific challenges faced by each owner's special operations. Our design and construction methodology strives to mitigate challenges and develop the most efficient baking and snack production facility possible within the company's financial plan.

First and foremost, safety is top priority throughout the entire project. Not only do we consider safety while building the project, we design personal and product safety into the facility itself.

Baking and snack facility workers can be at a high risk of job accidents or injuries, including slips, falls, head injuries and cuts, strain from manually handling heavy items, contact with hazardous substances, burns and scalds from oven components, and flour dust inhalation. Proper equipment layout and facility design, along with material selections and personnel training, can greatly mitigate these risks.

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Some design considerations include:

- Risk of slips and falls are increased with wet floors or spills of sugars, oils, corn meal and other ingredients. Slip-resistant flooring, replacing ladders with stairs, and training on appropriate cleaning procedures can greatly reduce these hazards.
- Head injuries and cuts result from inadequate clearances, lack of maintenance, and inadequate safety guarding and interlocks on or around bakery machinery, blades and conveyors. These are difficult areas to access for maintenance and should be carefully reviewed to ensure worker safety.
- Muscle strain can result from manually handling bulk ingredients and equipment, such as trays and racks. Mechanical aids, automated loaders and unloaders, trolleys and lifts, in addition to training in proper lifting techniques, can prevent strain-based injuries.
- Accidents with hazardous cleaning chemicals can be avoided with proper storage and training.
- Burns and scalds resulting from contact with ovens, trays, syrups and other hot liquids can be avoided by wearing oven gloves and introducing automated systems to handle hot liquids and trays.
- Flour dust inhalation may seem inevitable within a bakery environment, but proper filtration and ventilation can prevent this.

Closely evaluating these high-risk areas and situations and designing safe solutions will significantly reduce worker accidents and injuries.

Specific examples of safety measures implemented by The Austin Company to increase bakery safety include:

- Diamond polished concrete floors that increase slip resistance
- Full staircases for access to roofs and tops of storage tanks in lieu of vertical ladders
- Ingredient tanks located inside the bakery, rather than outside, so employees won't be subject to sun, wind, rain, snow or ice
- Locate overhead utility aisles to provide clear access for maintenance and sanitation
- Eliminate or minimize conveyor crossovers when laying out equipment
- Run electrical conduits below the floor where possible – these are safer to install and never need cleaning

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## **Product Safety**

Product safety is just as important as personnel safety and must also be included throughout the facility's design. Product safety is more than employee training or signage – it must be designed and constructed into the facility itself to minimize or avoid contamination issues altogether.

The design must account for and guard against potential product contamination issues, such as pieces of metal or glass, insects, and bacteria. Design may also accommodate allergen issues, such as the separation of ingredients and production lines to eliminate allergen contamination risk.

Designing for product safety must include sanitation/contamination, allergen and consistency considerations. With regard to sanitation, remember – if you can't see it, you don't know if it's clean; and if you can't get to it, then it won't be cleaned.

Product safety and quality is further defined by the consistency of mixing, machining, baking and packaging, which are impacted by the bakery equipment selected and its layout, as well as the bakery environment. Whether it's a new plant, an expansion, or modifications within an existing plant, many factors must be considered such as:

- **Process Layout**
  - Aim for a goal of straight line flow to minimize turns that may crush products
  - Avoid conveyors that cross each other, or put stainless covers over the lower conveyor
  - Keep overhead utilities clear of open products – establish “safe utility routes”
- **Quality of Facility Construction and the Process Equipment**
  - Both the equipment and building should be made of materials that have durable and smooth, washable surfaces
  - Avoid adding “skins” of cleanable materials. In time, the skin will crack or move, creating a path for moisture and harborage that can't be seen
- **Ease of Sanitation**
  - If something can't be easily reached, it is unlikely it will be cleaned well
  - If surfaces aren't smooth, they are hard to clean
  - Provide 1-1/2” clear between pipes and the surfaces they are mounted on
  - If electrical panels must be mounted close to a wall, mount them as tightly as possible and caulk all around

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## Cost Control Measures

Designing and building the most efficient bakery does not equate to the most expensive bakery. In contrast, bakery design should evaluate how the design affects unit production cost and sustainability opportunities. This will ensure the optimum balance between capital and operating costs.

The unit cost of product includes: ingredients, manufacturing and operating, and labor costs, as well as the cost of the plant and equipment.

The plant design impacts unit cost of production, and consequently the profitability of the bakery, by achieving the optimal balance of capital and operating costs. The most efficient designs will beneficially impact the margins by:

- Capital Cost – Evaluating ways to lower capital costs wherever possible. Lean construction, the highly integrated process of design and construction is one of the surest paths to lower cost.
- Labor Cost – Developing bakery layouts that reduce manning requirements and provide a work environment that reduces turnover.
- Ingredient Waste – Implementing efficient operations that deliver important savings by reducing losses.

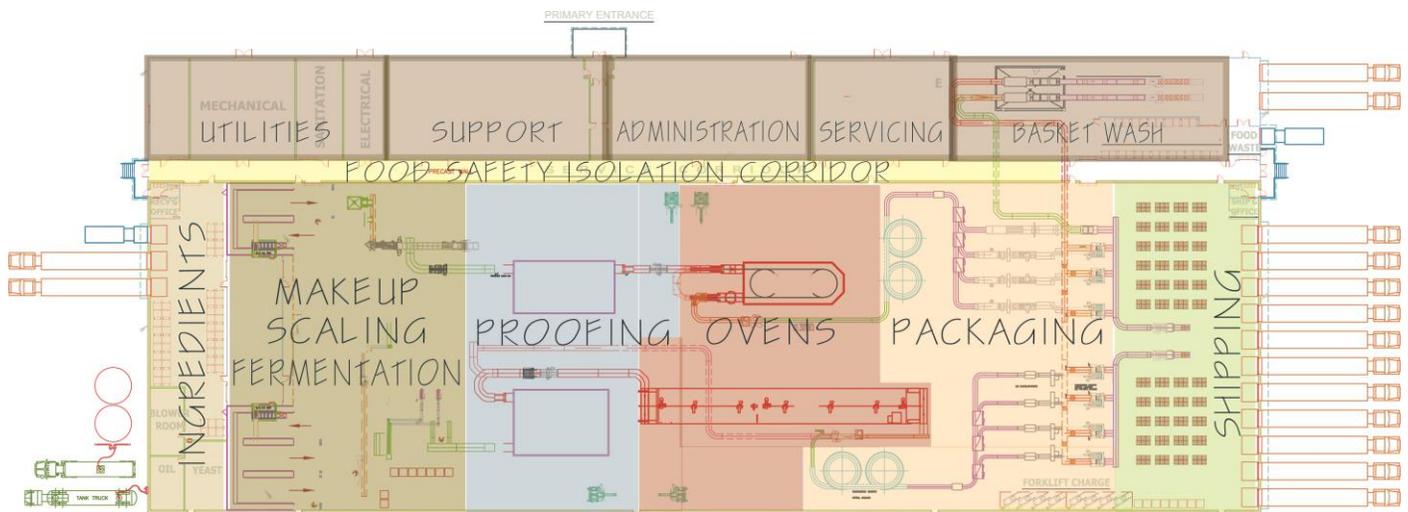
Today, sustainability opportunities abound for bakery facilities. While the initial cost may be greater than more traditional approaches, the long-term return can prove beneficial, both in terms of public goodwill and as a return on investment. Some sustainable features to consider include:



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## The Standard Bakery Concept

With more than 50 years of bakery design-build experience, The Austin Company has developed what is now known as Austin's "Standard Bakery Concept." The Standard Bakery Concept addresses the safety, quality and cost issues discussed above, and has streamlined the bakery facility to its most efficient form. This process reduces project cost and schedule, while providing an optimized layout with high quality. As stated earlier, challenges and rapid change are simply a fact of life. So while the Standard Bakery Concept maintains its foundational structure, the details evolve to ensure the most efficient facility given current considerations.



The Austin Company first introduced the concept of manufacturing building standardization almost 100 years ago. It is a concept that addresses the key elements of all projects for any industry. Standardization is a way to consolidate the best practices within an industry in terms of layout and flows, design details, materials and finishes, and construction techniques.

While the range of available materials and components for a facility increases daily, many bring little advantage to a project, so beware of change for the sake of change. The Standard Bakery Concept relies upon proven equipment, materials and design details that are constantly subject to change, but only after ample research clearly demonstrates the benefits of that change.

Using this approach, the initial planning process begins with a Project Team comprised of the Owner's Team and Austin Bakery Specialists. The Project Team then has the advantage of using a design baseline – The Standard Bakery and Standard Bakery Details, founded on project experience, to initiate the planning, budgeting and scheduling activities for the project.

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During the Standard Bakery Concept design process, the Project Team works closely with the Owner's Team to identify optimum solutions for each area and incorporates them into an optimum design for the specific project. The Project Team is focused on the details from the beginning, rather than spending weeks or months developing a plant layout before getting down to details. Always remember – “The devil is in the details.”

## **Benefits of the Standard Bakery Concept**

|                    |                          |                          |                                   |
|--------------------|--------------------------|--------------------------|-----------------------------------|
| Optimized layout   | Best-of-breed components | Reduced sanitation costs | Speed and cost                    |
| Straight line flow | Central systems          | Improved food safety     | Fastest way to complete a project |
| Reduced manpower   | Proven finishes          | Designed for expansion   | Lowest end cost                   |

## **Austin's baking and snack facility services provide specialized expertise to increase your margin:**

- Logistics studies that increase profits through optimized location or distribution systems.
- Equipment layouts designed to reduce manpower and product losses.
- Production equipment selection assistance.
- Existing equipment evaluation that identifies cost reduction and production increase opportunities.
- Performance specifications for controls and instrumentation.
- Facility layouts that provide product and employee safety and manufacturing efficiency.
- 'Best of Breed' materials of construction and equipment that will ensure energy efficiency and low maintenance.
- *A Standard Bakery Design developed and continuously improved, to answer the need for efficient plants that are economical and fast to build.*
- *An excellent solution to meet the ever-changing demands of today's world.*

## **Contact Austin's baking and snack facility experts:**

Greg Carr at [greg.carr@theaustin.com](mailto:greg.carr@theaustin.com) or 908.295.9185  
Eric Bockmuller at [eric.bockmuller@theaustin.com](mailto:eric.bockmuller@theaustin.com) or 440.544.2663  
Jim Cathcart at [jim.cathcart@theaustin.com](mailto:jim.cathcart@theaustin.com) or 949.451.9021  
Matt Eddleman at [matt.eddleman@theaustin.com](mailto:matt.eddleman@theaustin.com) or 404.564.3962

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[www.theaustin.com/baking-snack](http://www.theaustin.com/baking-snack)