

Austin's Top Ten Master Planning Tips

Proper Master Planning of Facilities Can Improve Your Bottom Line

The Austin Company's Food and Beverage Group has assisted many clients in developing a Master Plan for their facilities. Existing facilities can be evaluated, modified, upgraded, or expanded. New facilities should be planned for growth, advancements in technology, and future requirements.

Here are **our Top Ten Tips for Master Planning** for food & beverage facilities:

1. Base Production Requirements on Market Forecasts

You should have a good idea of your customers' needs and what products will supply this demand. Quantities, product mix, and timing for delivery to the marketplace are key elements of the forecasts that should be developed. Eliminate outdated products and evaluate potential new products for additional production requirements.

Hold meetings with your teams from marketing, sales, engineering, operations, finance, maintenance, HR and management to form a consensus on these items. As necessary, set up interviews or workshops with these groups to help facilitate the process. Assessing your current operations, equipment, staffing, and facilities for the capability to meet these forecasts should form the baseline for the Master Plan.

2. Design Products and Packaging for Efficient Operations

Matching your capabilities to your market involves a detailed review of current vs potential products. Decisions also should be made regarding standardization vs specialty products.

Critically judge the packaging formats you are employing to meet market demand. Are they compatible with rapid changeover during production, allowing for minimal on-site inventory? Or, does the package provide long shelf life so that production may be built for stock inventory? Can your production be broken down into short, rapid runs for specialty products followed or matched with campaigns for higher volume items?

The number of formats you handle will increase the demands on your materials warehouse. Can you simplify or standardize some components across a variety of product formats? What are the minimum replenishment times for critical components? Ultimately, you want to tie the size and complexity of your packaging requirements to the scope of your production demands.

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3. Draft a Production Flow Diagram

If you don't have a current production flow diagram of your operations or it needs updating, consider preparing one or revising your current one. The diagram should be utilized to establish a consensus understanding of your operations.

Review product information and process engineering data. For each product or family of products, summarize a list of ingredients with process parameters, manufacturing procedures, equipment functions and operational steps.

Current production scheduling for the product mix should be studied for quantities, timing/rates, sequences, frequency of change-overs, and batch sizes, as well as for line and individual machinery speeds, loading and utilization.

Examine operator requirements per shift for each functional area. Review utilities usage, support equipment, CIP requirements, and waste handling/treatment.

As a minimum, this diagram should illustrate production requirements and flow based on current operations--from raw ingredients and packaging materials receiving through production to shipping.

After production analysis is completed for future requirements, the production flow diagram should be finalized to serve as the governing document for equipment selection, area equipment layouts and new general arrangement development.

4. Develop a Production Analysis

Calculations should be tabulated for current and future production levels for quantities and types of raw materials, packaging materials and finished products. The results can be used to assist in determining estimated storage levels, dimensions of necessary production and support areas, area adjacencies, and materials flow through the "ideal" new, or reconfigured existing plant layout. Remember to include "peak" or seasonal loadings into your analysis.

Equipment evaluations should be part of this analysis and should be reviewed for possible new equipment or for modifications to existing equipment that could accomplish desired production levels and manufacture potential new products.

Investigate levels of automation for the appropriate application to your production process. Reduction of staff, increased product quality and consistency, traceability of raw materials, operational safety, cleanliness, ergonomics improvements, finished goods/order tracking, integration with a real time production/management information software such as ERP or MES are just some of the benefits that can be gained from automation upgrades.

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Proper Master Planning of Facilities Can Improve Your Bottom Line

5. Determine Your Material Handling Requirements

Review inventory policies for raw materials, packaging materials and finished goods. You should be ready to examine vendor supply contracts. You probably will want to reduce excess amounts stored in-house or off-site. It may be necessary to evaluate new materials required for manufacture or for packaging of new products.

You certainly will want to investigate new methods and equipment or systems for receipt, handling, staging, and transferring materials within the plant during production. This carries all the way through to finished good storage and the handling and loading of final shipments. Look for ways to reduce or eliminate transfers that add to cost but not to value.

Possible alternative distribution strategies should be addressed. Consideration of warehouse reduction, consignment at distributor sites, and the use of 3PL's are possible alternatives to expanding your facility. Converting existing warehouse space to production space in the future may be a possibility.

6. Prepare Facility Layouts

Conceptual equipment layouts in block format should be developed to illustrate alternatives for product processes, staging, area adjacencies, materials flow, operator and maintenance access, and support utilities for use in the re-layout of existing facilities or for a new plant.

As a minimum, plant areas should include receiving, raw materials warehouse, packaging materials storage, production equipment, maintenance/ sanitation, quality assurance, support functions (office, employee amenities), finished product storage warehouse and shipping. If available, equipment outlines electronically developed by you or furnished by equipment vendors should be added in blocks on the layouts.

Develop a site plan to illustrate the main production facility and necessary adjacent buildings, any external product flows, truck traffic patterns, proposed parking, new offices, utilities, and other support requirements for the site.

7. Know Your Staffing Needs

A review of your current or planned staffing should identify any practices that may be improved to reduce operating labor requirements. Where possible, these should be tied into suggested improvements in automation or material-handling practices.

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Products that consume a disproportionate share of labor or the production schedule should be evaluated to see if they can be brought more in-line with standard production rates, either through product redesign or alternate means of production scheduling.

Evaluate staffing needs thoroughly for current requirements and for near-term and long-term production updates to determine if other skill sets are required, additional training is needed or management changes are necessary.

8. Establish Building/ Site Requirements

Review existing building and site drawings. Drawings should be revised to reflect all available updated data and conditions.

Be sure that your existing site is the right location for your business. Should a new or additional location be evaluated? What are the benefits vs disadvantages of your existing location vs potential other locations?

A narrative of the physical building and site requirements should be prepared for the existing conditions, for improvements, or for a new facility. Architectural, civil, structural, mechanical, and electrical design criteria should be documented.

Prepare preliminary plan drawings to illustrate the existing and new equipment, and support area space for the updated existing or the new facility. These will serve as background drawings for the conceptual equipment layout alternatives.

9. Build In Facility Considerations

Examine the proposed renovation plan for an existing building or the concept design of a new building for improvements that can be made to provide for sanitary, practical design per the latest GMP standards to meet or exceed existing plant safety requirements, while also addressing the issue of sustainability. Green design and planning begins with the process of sustainability focused on reduced energy consumption and waste minimization and continues through to building considerations and to the site itself.

Considerations for the building should include the use of energy-efficient roof systems, mechanical systems, electrical equipment, and lighting systems. Recycled construction materials and proper application of materials for sanitation areas should be evaluated for any new facility or expansions.

Investigate LEED certification standards. Site location for existing and/or a new facility should be evaluated for characteristics that would be beneficial for a green design building.

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Proper Master Planning of Facilities Can Improve Your Bottom Line

10. Implement Your Project (budget and schedule)

In order to implement the project, management will require a budget and schedule for evaluation of any appropriations. At this stage of the Master Planning study, a ROM (Rough Order of Magnitude) cost estimate should be prepared that would be in the +/- 25 to 30% level. This can be used for evaluating several alternatives, for financial determination of your return on investment and for preliminary application for outside funding, if required.

A milestone schedule should be developed that will take into account the following items:

- Detailed design engineering
- Modifications to the existing building/site (including consideration for ongoing production needs)
- Construction of the new building with site work improvements
- Equipment selection, purchase, fabrication and delivery
- Equipment installation, testing, start-up and training

Our Capabilities

The Austin Food and Beverage Group provides guidance, expertise and experience in Master Planning which extends well beyond the brief information provided here in our Top Ten list. Should your future plans include upgrading an existing facility or site location and planning for a new facility, please contact us at one of our offices below to find out how we can help you evaluate and improve your bottom- line.

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