Understanding the Process of Planning and Equipping a Commercial Kitchen

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Successful projects depend on an orderly process of development and execution of systems moving forward with adequate time for reflection and revision. A well-executed design flows from broad based thinking. How will various spaces need to be allocated or divided? Where is the entrance? Then, the focus needs to narrow to issues like what kind of equipment, tables and chairs or banquets, then moving into final details like finishes, specific equipment sizes and types, and making sure everything fits within the financial and regulatory limitations.

The first major step in a new project is the programming/ schematic design phase. In some projects this may also include feasibility studies, menu development, and related tasks. Programming allocates or balances the space into core front and back of house functions. It assures adequate space is allocated from the beginning for support functions like mechanical and utility rooms, toilets, office and storage functions. It includes the development of a program statement with a list of core objectives and non-negotiable elements. The list may include a vision of a certain image or style, a budget ceiling, a unique feature or piece of equipment. It should also include a listing of what are not acceptable compromises.

After the space has been divided by areas, the specific locations and inter-relationships between them need to be planned. This effort begins with loose sketches that then become more well defined. During this schematic phase, a good planner will try to develop a number of alternative plans, evaluating the best and worse features of each plan. At this stage the plans don't need to resolve all the issues, but they should reflect realistic solutions that fit the space and budget. The designer should then present these plans to the client for review and comment. Since many clients have difficulty reading and understanding plans, coloring the proposed schematic plan and providing a scrapbook of visual images of similar facilities goes a long way to assure everyone shares the same understanding of what the plan represents. On complex projects or prototype development a simple cardboard and balsa wood model can greatly assist in illustrating 3 dimensional spatial relationships. Budget estimating during schematics is usually done by multiplying square footage by industry standard area costs.

Upon selection and agreement of one promising scheme the planning effort should move forward into a phase commonly called design development, which is a good description of what should occur. The design development drawing refines the earlier assumptions of how spaces are allocated. Building systems like heating, air conditioning, and kitchen ventilation are defined and integrated into the design. Itemized cost estimates and booklets of suggested manufacturer data sheets (cutsheets) food service equipment are prepared for Owner review. The architect or interior designer begins to develop and present the color pallet, fabrics, and finishes. The dining areas are often presented on a color board and may include a basic three-dimensional rendering drawn by hand or computer.

The end of design development should include a formal sign-off by all stakeholders that the design meets the core objectives defined in the programming phase. If there are any lingering doubts or problems with the design, this is the time to resolve them. Later on in the design process making changes will be much more difficult and costly. Never move into construction documents until all the core objectives are met and the project cost estimates are within the budget established.

Construction documents consist of final drawings and specifications used to build the project. The final food service equipment drawings include many different types of drawings: plans (equipment plan, plumbing connection plan, electrical connection plan and mechanical plan), elevations, sections and details. Defining the quality level required on the project is easier to put into words than to communicate in drawing form, so the drawings are accompanied by written specifications to give detailed instructions on the required materials, finishes and workmanship. The documentation prepared during this phase is submitted for review by building and health departments. Allocating adequate time and resources for a 100% complete document package is one of the wisest decisions an Owner can make. Incomplete documents leave many unanswered questions for the bidders and they will respond with higher prices to cover the uncertainty. Otherwise, unresolved issues will result in cost overruns for change orders to awarded contracts.

When all of the drawings, specifications, and details are complete, the project is usually sent to a select group of contractors for bidding purposes. Like the documentation process, providing adequate time for the contractor to prepare bids can reward an Owner with lower prices and fewer misunderstandings. A standard bidding time of 3 or 4 weeks allows the bidder to ask questions, and the designers to issue addendums for clarification and missing information.

Once bids have been received a bid tabulation is prepared and carefully reviewed to make sure each contractor and their subs have addressed the complete scope of work. It's better to request a bid broken down by trade and major components than ask for a single number or "lump sum" as it's called. If you have concerns that the bids will come in over budget, it's a good idea to ask the bidders to include recommendations for cost reduction opportunities with their proposals. This is far more productive than requesting cost savings information 2 or 3 weeks after the bids are received. If there are different options that might satisfy the project, the designers should include them in the bid package as Add or Deduct Alternates. Alternates can range from small details like different flooring materials to major building systems including alternate structural and mechanical systems.

After the bids have been received the Owner and their project team need to negotiate with the most qualified low bidder and award a contract to start construction. The period of time required for negotiating the final price, contract issues and payment terms, etc. almost always takes longer than most Owners expect and needs to be anticipated in the project schedule or time line.

After the contract is awarded and construction starts, the critical and important shop drawing and submittal review phase starts. During the design and specification process hundreds of products, devices, and systems were documented. Now that the project is moving forward, the contractor needs to provide verification that what was in the document is what will be provided. This may include color and material swatches, details of structural beams or columns, or cut books of selected equipment.

The most common shop drawing on almost every project is a dimensioned utility connection plan. The trades will rely on these drawings for purposes of locating utility rough-ins. On small projects a single drawing may be used to document plumbing (water and gas), electric, and ventilation. On larger projects its best to have the requirements for each trade on separate sheets to avoid confusion with too much information on a drawing. Well-developed utility connection plans:

- Show both the dimensioned location of rough-in and the final point of connection to the equipment. While it may be assumed that these are the same, in fact, they represent two different connections. A gas line to service a fryer is installed at a specific point on the wall behind the equipment. The final connection is on the back or bottom of the fryer.

- Provide dimensions from column grids or fixed walls. When locations for utilities like drains or soda/ electrical conduits are set in a new slab, there are no partitions or internal walls- these will be installed after the slab is poured! Dimensions from phantom walls provide no value and create unnecessary work for the contractor who then needs to tie them back to a fixed wall or column, often resulting in dimensional errors.

Another role of the shop drawing process is finalization of details on engineered systems and custom fabrication like stainless and millwork counters and fixtures. In the kitchen, shop drawings typically include the walk-in coolers and freezers, ventilators (hoods), refrigeration racks and systems, and any custom items including custom millwork and stainless steel fabrication. Equipment brand, model, and options are verified through cut book submittals. Good cut book submissions include a lead sheet listing all options and special features matching the original specifications item by item. It's critical to verify all of the purchasing details before the equipment is shipped, since it's often difficult or even impossible to add or change options in the field.

As a project moves into construction, the next major event is verification of field conditions and coordination with other building trades. Unfortunately, construction errors and omissions are a given, even on the most well documented projects using top-notch designers and contractors. Areas requiring careful checking include locations of ventilator hoods, walk-ins, coolers, and floor troughs and drains. The earlier a missing floor depression or a low beam over a hood location, etc. can be detected the least costly it will be to modify either the building or the equipment. Verification and coordination should be a shared responsibility between the general contractor or project manager and the kitchen contractor or dealer.

Assuming all of the utilities are installed and dimensions check out, the next step in the process of building a kitchen is installation of the large pieces like hoods, walk-ins, and built- in equipment like control panels, floor troughs, etc. It is important to balance the installation dates for these items between the time they are needed to allow other trades to connect or finish around them and when they could become damaged.

After the walk-ins and hoods are completed, the kitchen is ready for installation of the custom fabricated and buyout (catalog) equipment like ranges, refrigerators, and dishwashers. As these units are installed they need to be protected from damage from building trades working in the same areas. The kitchen contractor/dealer is responsible for providing information on equipment hook ups to building trades who likely have never even seen such equipment. When all the equipment has been installed and connections made, everything needs to be turned on, adjusted, and thoroughly checked. The process may be called the start-up, commissioning, or burn-in, but the important point is that adequate time needs to be provided to assure the equipment is functioning properly before the Operator needs to start using it. This is also the time the installation or service company should review equipment operation and daily maintenance with those who will operate them. Equipment shakeout and training needs to be done before everyone is busy cooking the first meals and taking care of customers. A well-planned project always leaves adequate time for these activities before the opening.

A last, but very important final step is the inspection or “punch” list. A good kitchen dealer/contractor should be doing their own internal inspection at each major step of the process. This includes their own subcontractor installations of fabrication, refrigeration, etc. Thus, when the final inspection is provided by the designer, specifier, or Owner the items covered should be mostly minor details, like training and startup services, checking for extended warranties, etc. Adequate time needs to be built into any project schedule to make sure the majority of punch list items are satisfied before the facility opens.

With the punch list complete and the Operator start-up tasks fulfilled, the facility is ready to open. As the customers stream in for service its clear that good design and execution are no coincidence. All the steps outlined above contribute to the quality of the finished product. It's hard work and attention to detail from all those involved in the project that contribute to its success.

About the author-

Foster Frable is a founding Principal of Clevenger Frable LaVallee Inc., one 10 largest commercial foodservice facilities planning and design firms in the U.S. *An architectural graduate of Penn State University with a Masters in Hotel & Restaurant Administration, Foster has designed foodservice facilities for over 200 restaurant, hotel, college, and healthcare projects in his 26 years as a professional foodservice consultant. Foster is also the equipment and facilities columnist for two industry trade magazines and has been a keynote or principle speaker on foodservice design and operations at over a dozen major industry conferences and exhibitions including the National Restaurant Show.*

Prior to joining Clevenger Frable LaVallee, Foster was an Instructor in Foodservice Technology and Systems at the School of Hotel & Restaurant Administration at Penn State University. He left teaching in 1979, to serve as Director of Facilities Design for the Marriott Corporation Architecture and Construction Division for 4 years.