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Strategies for Managing Retail or Other Short Cycle Design Programs

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STRATEGIES FOR MANAGING RETAIL OR OTHER SHORT CYCLE DESIGN PROGRAMS

INTRODUCTION

Of the numerous types of architecture/engineering design that are commonly practiced, successful retail and other short-cycle design programs require specific strategies. The nature of these programs favors timeliness with minimal design cost, typically sacrificing individual project creativity to satisfy owner desires for speed and efficiency. Many owners facilitate this type of design through a number of methods not commonly associated with commercial or other more customized design: development of standardized criteria drawing sets, establishment of expected fee structures, provision of standard construction specifications, establishment of national accounts for specialized design or equipment and providing varying levels of owner-employed staff to oversee institution and quality control of such standards. For new or seasoned design firms, producing designs that meet owner expectations of these standards can be challenging. Added to these challenges are the nuances that arise when a single design firm strives to please multiple owners whose final constructed facilities are very similar, but whose standardized design and construction procedures differ. This lesson covers a number of topics and strategies to help the design professional achieve success in this quick-moving market segment.

FAST, GOOD, CHEAP – PICK ANY TWO BUT STRIVE FOR ALL THREE

The realities of owner expectations can be summarized by three key elements: fast, good and cheap. All too often, the nature of design work allows for production of contract documents that satisfy any two elements at the expense of the others. Definitions of each from the owner's point of view prove valuable:

Fast – Most retail or other short cycle design program schedules see construction documents move from zero percent to city/owner review levels of completion in a matter of weeks. In some instances, owners may feel that their design standardization allows for such "cookie cutter" production that timelines may be shortened to a matter of days. In comparison, large-scale commercial designs may take months or years to fully design. Ensuring fees accurately reflect design timelines and having staff available to produce quality products is essential.

Good – Accuracy of design directly translates to the owner's costs of permitting, bidding and construction. Rarely can standardized owner criteria be directly applied without job and site specific adaptation. The quality and usefulness of owner criteria leads directly to the production of "good" designs. Owners expect designs that are biddable and build-able. This means a design must be code compliant to achieve a building permit, clearly portrayed to achieve reasonable contractor bids and accurately coordinated to achieve successful construction. Each of these phases (local administrative authority review, bidding and construction) must be accomplished with minimal confusion or re-work or else the relatively low fees associated with retail or short-cycle design work will be negated by hours spent fixing designs that aren't inherently good.

Cheap – Total design fees for retail or other short cycle design rarely exceed six figures. This means that the allowable fees by each design discipline (architectural, mechanical, structural, electrical, civil, etc) may not exceed four figures. Owner expectations are for the lowest fees possible to produce a predictable and quality set of plans. Translating fees to hours of effort, it is not unusual for many design disciplines to budget 100 hours or less of total time (to include design, drafting, quality control, professional review/stamping, coordination and construction administration) to a typically sized retail project.

Considering these three elements, let's review how each may appear mutually exclusive:

Good and Fast – To be guaranteed of speedy production of a quality set of construction documents, an architecture/engineering firm must employ experienced people in sufficient numbers who can quickly assess, site adapt, coordinate, and produce sets that require minimal rework. Training and retaining such staff costs money, which is often reflected in the design fees. Typically, design firms can't competitively staff retail or other short cycle design teams with senior architects/engineers and production personnel. Instead, a balance must be achieved where the right mix of experienced and junior drafters, designers and licensed professionals are teamed to produce quality designs that are reasonably priced and meet short design timelines.

Fast and Cheap – The ideal method to achieve this combination is to directly apply owner-provided criteria to a specific job with minimal site customization. This could be as simple as changing the title block from the criteria to be job specific and sending the set out the door. Minimal design effort is expended and, if criteria is sufficiently well designed, the appearances of a reasonably complete and accurate set of construction documents may be achieved. However, consider the scenarios that are possible from the lack of a truly site-adapted, coordinated and "good" set. What if the local jurisdiction doesn't allow the type of construction or engineering sub-systems represented on the criteria set? What if the building orientation or siting doesn't allow for utilities and elevations as represented in the criteria set? What if the criteria is so general that bidders can't accurately estimate the project costs? What if the local conditions are such that the criteria facility simply doesn't operate properly once constructed? Personally observed examples of this abound: installation of year-round cooling towers in the northern plains that freeze solid every winter, slab on grade floors of fast-food restaurants that heave and crack because of locally expansive soil conditions, use of heat pumps in frigid locations…all because plans were directly applied from a criteria design that was not site engineered.

Good and Cheap – Likely the most difficult to achieve of the three combinations, but not mutually exclusive of "fast". Because time is money in the design world, meeting the "cheap" goal implies "fast". The challenge is having the procedures, resources and experience in place to ensure the product is good. To these ends, the following topics are discussed.

WHAT ARE CRITERIA?

The lesson up to this point continually mentions the term criteria. Criteria may take many forms based upon owner desires and expectations. The successful design firm must

understand what a specific owner's criteria represents, how the owner will react to deviations from criteria and how the criteria can be effectively integrated into the firm's own design process. Much of this boils down to a mutual understanding between the owner and designer of "What is criteria?"

Many retail or other short cycle design owners improve their odds in the battle of good-fast-cheap by establishing standardized design principles. These principles may take a number of forms:

- Written guidance describing generic to specific goals. Examples of generic goals might be "masonry building with minimal fenestration and total internal area ranging from 20,000 to 50,000 square feet." A design firm that receives such open-ended owner guidance may immediately refer the project over to their commercial/customized designers since there is plenty of room for creativity. However, the owner would not be facilitating fast or cheap design since such generic guidance requires stages of schematic design and design development precede production of any useful construction documents. More often than not, retail and short cycle design criteria is much more specific. For example, "provide 53,500 square foot slab-on-grade facility with split-face concrete masonry exterior finish, R-11 wall insulation and 5 percent dual-pane fenestration area." This guidance would be accompanied by many more such statements, effectively establishing the schematic design and design development end results and allowing designers to move directly to construction documents.

- Many retail/short cycle design owners take written guidance a step further by issuing example construction documents that illustrate not only their philosophy of the facility but detailed design and drafting standards as well. When issued in electronic format, this type of criteria provides designers a head start in producing final construction documents.

- Standard specifications often expedite the design process. These also guarantee standardized construction across a large number of similar facilities.

- In recent years, many owners established national accounts for everything from refrigerated cases to structural steel elements. To the maximum extent possible, these items will be pre-engineered so designers can directly apply equipment selections from a limited number of choices. Once again, this method provides standardization for the owner. It also provides construction cost savings through buying items in bulk and reducing construction timelines.

- To facilitate development, implementation and quality control of criteria standards, many owners employ dedicated facility management departments. The extent of expertise available from these departments to the designer is a key consideration when establishing fees and design timelines. For example, designers can expect specific and timely guidance from owners who employ large and experienced facility departments. The opposite extreme is also common, where owners may have one architect or engineer covering many simultaneous projects and design firm contracts. In this case, responses to individual design questions will likely be less direct or timely.

Successful retail/short cycle design firms understand each of these elements of criteria. Most importantly, they understand where the lines of responsibility are drawn and have effectively merged each criteria element into their own unique mix of personnel and resources so they can provide the owner quality and timely construction documents at reasonable cost.

BUILDING A TEAM OF QUALITY-ORIENTED PEOPLE

Successful retail or short-cycle design requires fast, accurate, experienced and motivated individuals. Each of these qualities then translates into a quality-oriented team structure that optimizes the likelihood of achieving the owner's good/fast/cheap goals.

Having team members that are fast implies several important skill sets. Experience and speed in CAD programs is a must in the current design world. This requires familiarity with owner preferences for layering, graphical symbols, sheet layout, plotting and system design philosophy. Successful firms feed this need for speed with CAD tools that include cell libraries for repetitive graphics, layering schemes that allow quick referencing of key coordination items by other disciplines (such as ceiling grids, roof plans, ductwork and lighting) and methods of copying aspects from similar jobs for site-specific modification. Beyond speed enhancing CAD systems, firms also require communication methods that are quick and accurate. Ideas, information and plans must be able to move from discipline to discipline with a speed that allows for profitable short cycle design. This typically involves a strong information technology foundation that integrates e-mail, scheduling, CAD and accounting software with networked servers in which the many gigabytes of information can peacefully coexist. Finally, a need for relatively quick and accurate decision making prevails. There is typically not time budgeted for extensive research, outside consultation or analysis of various options. Where clients present detailed criteria, it is often assumed that levels of creative judgement were accomplished during criteria design so that individual project design become site application of criteria elements.

Accuracy is a key element to profitable design, and ultimately to effective bidding and on-budget construction. Retail and short-cycle design leaves much less time for extensive back-checking than large commercial projects or customized creative endeavors. A single back-check effort by the designer and CAD staff augmented by a big picture back-check by the licensed professional is all that such designs typically budget for. Where construction administration is included in retail or short cycle design fees, this post-bid work is typically budgeted as only a fraction of the entire scope. Competitive fee schemes force an even stronger need for accurate design. There is little doubt that accuracy is enhanced through sound, established design and drafting techniques along with experienced people whose judgement allows for minimal consultation with senior staff licensed professionals.

It is not unusual for experience levels of those performing retail and short-cycle design work to be less than those performing commercial or customized work. The repetitive nature of retail allows for younger people to get their feet wet while working within bounds established by owner criteria. Less experienced people also have lower wages and operating costs, which allows for more competitive fee structures. However, the need to be fast and accurate requires a level of experience that doesn't come with the typical recent technical schooling or college graduate. Successful firms balance these demands by integrating their less experienced people into teams where they can quickly learn from more experienced peers and co-workers.

Final among team member attributes, there is a certain motivation that sets successful retail and short cycle designers apart from others. In its most basic sense, this motivation is a

sense of satisfaction in meeting schedule, budget and quality deadlines in lieu of achieving creative or ground-breaking designs. Firms must recognize and cultivate those who fit this mold. They must also instill promotion and job-growth possibilities that allow retail/short cycle teams to retain experienced personnel rather than foster an atmosphere where all team members aspire to "graduate" to commercial or more creative design teams.

Having established key qualities of retail/short cycle team members, what is a model of an ideal team? Following the levels of personnel typically found in design firms, recommended skill sets are presented:

- CAD Technicians – Familiar in all CAD programs utilized by their clients, well versed in their firm's layering and CAD standards, experienced enough to recognized obvious oversights or errors in design markups provided by designers or engineers, quickly asking questions when something isn't clear in place of muddling through hours of obscure design markups, cognizant of the interrelation of billable hours and fees

- Designers – Strongly versed in specialized areas of design but able to cover other areas with reasonable competence, having strong CAD capabilities is a real plus since it allows for simultaneous design and CAD production, able to effectively select and schedule equipment and materials, cognizant of the interrelation between billable hours and fees

- Junior architects/engineers – Well versed in owner philosophies of systems and layouts, able communicators and coordinators amongst disciplines, good schedulers, able to recognize areas outside their scope of knowledge and learn by teaming with senior professionals to work a solution, capable construction cost estimators, able to formulate and implement fee schedules, effective at client and contractor interactions

- Senior professionals – Well versed in site-specific code requirements, adept in manpower management and team leadership, effectively implement concepts of responsible charge, experienced enough at owner specific CAD and design technicalities to effectively budget fees and recognize shortcomings in design, effective at client and contractor relationships, effective and available teachers and mentors

While these qualities of individuals and teams may be idealized, they offer insight into a firm's current level of development and a road map for future growth.

TECHNICAL DESIGN TOOLS

There are many technical design tools that assist in successful production of retail or short cycle designs. This section highlights only a few basic tools that should be considered among the myriad of resources that are commonly in use.

Design Guides/Checklists – While there is no doubt that the art of design can not be reduced to a rote checklist, there are several advantages to capturing owner goals and design/production methods in standardized guides. Two cases are especially worth considering: 1) where a particular firm engages in retail/short cycle design for a number of clients whose ultimate facility products are relatively similar and 2) where a firm expects employees to seamlessly and quickly move from one type of design to another (for example electrical lighting layout to power distribution or HVAC design to fuel systems). In the first case, having design guidance that specifically highlights the nuances of one client's interests in comparison to the other is valuable…a situation which is touched on in further detail below. In the second case,

established design guidance allows an employee to quickly get back up to speed on a particular type of design after being "out of the loop" while working on another type of design. In comparison to the familiarization benefits of design guides, checklists effectively enhance stages of design where standardization is key. For example, a standard set of information may need to be gathered during pre-design site visits or construction site observations. Also, plan checkers may use checklists to ensure that final construction documents achieve levels of quality control. Design guides and checklists lend themselves well to word processing formats, a set of software generally well understood by today's designers. Each also requires a level of dedicated maintenance, receiving continual updates as owner desires change and technology evolves.

Spreadsheets – All forms of design, and especially retail/short cycle design, have repetitive calculation or information gathering stages that benefit from spreadsheets. Every discipline of design can relate, from civil storm water runoff calculations to mechanical air conditioning duct pressure losses to electrical panel schedules. Spreadsheets allow for efficiencies, common understanding of design principles and accurate standardized results. For example, senior licensed professionals can establish spreadsheet calculations and provide them to more junior designers in a format where calculations are easy to understand and visualize. The designers then apply them to a number of similar retail or short cycle designs. The results are a standardized set of calculations that the senior professionals know are accurate and are in a recognized format when presented for final plan check. Adding to their value in the CAD world, many equipment schedules and design calculations are generated in spreadsheet format and converted in real time using commercially available software directly to CAD files. In this arrangement, data updates are made in the more user-friendly and editable spreadsheet software that can then make automatic calculations and utilize the CAD program simply as the graphics output device. Finally, modern spreadsheet programs include a number of features such as inter-related tabbed sheets where multiple calculations can be executed and carried over to other calculations as well as graphing interfaces that allow for better visualization of results.

CAD – There is little doubt that skilled CAD operators can make or break design firms when it comes to competitive fee structures. The time required for an inexperienced operator to perform the same task as a seasoned pro can be an order of magnitude longer. To this end, many design firms employ standardized CAD tests during the hiring of CAD technicians to determine whether their accuracy and time performance is up to snuff. What may be less obvious than the speed of the operator though is the efficiency and usefulness of a firm's CAD standards. Standards come in two forms: inter-departmental standards that allow for efficient and predictable sharing of CAD information between disciplines (such as architectural, structural, mechanical, etc) and intra-departmental which allows for use of standard graphic symbols and layering within a discipline (such as mechanical symbols for ductwork, valves, piping, etc). If such standards are not in place or well understood, a retail or short-cycle design effort may turn into primarily a low profit exercise in CAD production as opposed to a profitable effort in architectural/engineering design and criteria site adaptation. While a separate lesson in CAD standardization could easily stand on its own, several questions must be answered before a firm takes on retail or short cycle design efforts:

- What CAD program are we using and in what version? Does everyone have this program and version available and are they trained in its use to a level appropriate for their role in design?

- How will inter-departmental information be shared? Will base files be e-mailed to consulting disciplines with the understanding that they are responsible for keeping bases updated or will a networked system of file sharing be implemented where consulting disciplines continuously reference in the most up to date information?

- How will critical coordination elements of each discipline be managed? For example, structural members, walls, roof penetrations, lighting, ductwork, doors, floors and a host of other items must be shared amongst design disciplines to ensure conflict is minimized. Effective standardized layering techniques allow each discipline to know where to look for and how to reference another discipline's elements for coordination.

- What level of intra-departmental design is required? Will schematic level design and detailing be sufficient for owner purposes or will the drawings have to be fully scaled and graphically represented?

Field Survey Efficiency Enhancement

Field surveys are an important aspect of many designs. They are also a prime consumer of design budgets and a convenient scapegoat for inadequate design results. Efficiency enhancements made to field surveys pay great dividends, especially in the world of tight-budget retail and short cycle design efforts. It is not unusual for architecture/engineer teams to have only a day or two during a pre-design survey of a retail establishment. During this time, personnel frantically strive to gather as much data as possible so their designs can be reasonably accurate and lead to the minimum number of bidding and construction questions possible. Use of speed enhancing tools such as standardized survey checklists, digital photography, automatic measuring devices and personnel augmentation from local equipment experts is often required. Even more challenging are situations where designers are offered no opportunity to perform a pre-design field survey. Designers and licensed personnel must be very cognizant of what pre-design information is a must for safe and effective design and be willing to fight for this information when necessary. Finally, efficiencies in field surveys may be achieved through intelligent scheduling and staffing. Where feasible, firms should consider taking on multiple surveys that optimize travel time…for example two back-to-back surveys in the same geographic area. Also, firms may consider retaining specialists whose construction background allows them to effectively cover surveys or site observations for multiple disciplines rather than having to send less experienced individuals from each discipline to the field.

Digital Imaging and Geographic Integration

Briefly mentioned in the last subsection was the important role of digital imaging to design. Not only is digital imaging an important tool for field surveys, it is also an emerging area of design production. Whether involving large-scale mapping, multi-view portrayal of exterior elevations or integration of Geographic Information System (GIS) type design

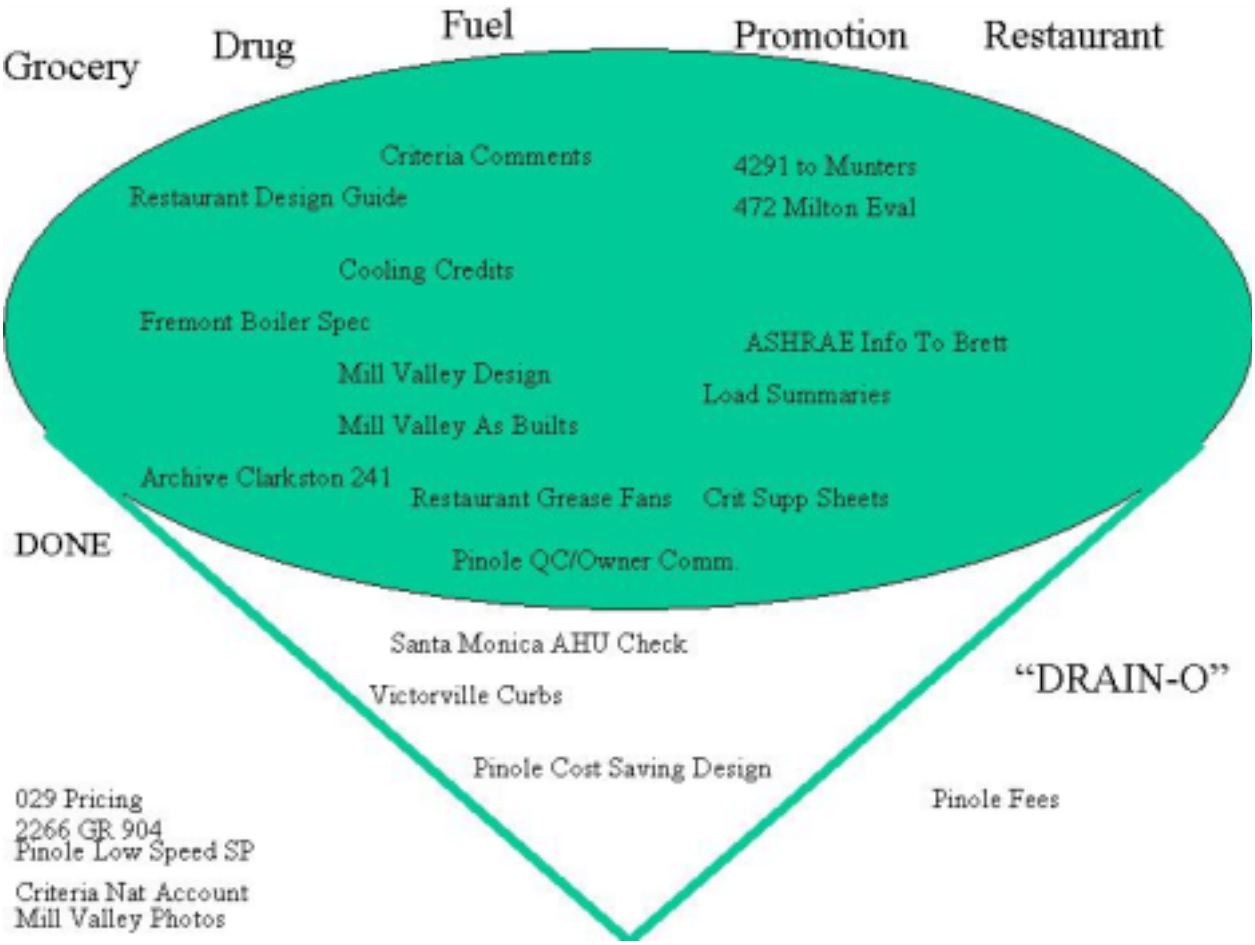
file/spreadsheet information, effective use of digital imaging as a design enhancement is becoming an important marketing multiplier.

MANAGEMENT TOOLS

As alluded to earlier, retail and short cycle design contrasts with commercial or more customized design in levels of creative effort required and timelines allowed for final construction documents. Production of such design greatly benefits from specifically developed management tools that enhance a firm's ability to handle fees, scheduling and information.

The first item considered for each new project, and the final assessment of how successful a retail or short cycle design project was, involves fees. Typically, fees are presented to owners via written contracts and are authorized under fixed or time and materials bases. Successful contracts must include several elements: expectations by the designer as to what is provided by the owner (such as criteria guidelines, scope of construction management and base files), description of what the architect/engineer provides under the basic fee, description of what the architect/engineer may provide under an additional service basis, terms and conditions of the work and an itemized breakout of proposed costs. Determination of fees is a difficult and necessarily secretive task. Background data regarding typical construction costs, ranges of competitor fees, historical performance of similar projects and consideration for a given firm's overhead costs must be considered. It is also valuable for firms to maintain schedules of values from bid results so they can assemble actual field-tested data to back up their fee proposals. Management tools must also be in place to effectively track hours and materials expended on a project and relate these costs to the established fee…without such tools there is no way to accurately determine how close a project is to being "spent out". A subset of these tools may also break down expended hours into specific tasks so firms can analyze what stages of production require what percentage of the project costs to complete. For example, an analysis of similar projects may show that CAD development of base files is requiring a disproportionate amount of time…managers can then determine how to best address this to make projects more profitable.

The nature of retail and short-cycle design means that schedules are often tight. Tools that strengthen the ability of individuals and teams to manage their time are a must. One specific tool that has proven beneficial to individual time management and coordination with other designers is shown below and described as the "Retail Funnel".



This tool was originally produced in Power Point software to track active and accomplished tasks in a way that graphically shows the user and their co-workers the interrelation of task prioritization. No matter the type of work, an individual can only actively engage one thing at a given moment. This one item of active work is shown at the neck of the funnel and, upon completion, moves to the "Done" pile. A number of other items just above the neck may be in various stages of completion and are on their way to being actively worked on, completed and discharged from the funnel. Any number of tasks may be directed towards the individual to be accomplished and, if they are worth accomplishing, are inserted into the open throat of the funnel where they will eventually become active tasks and be accomplished. How tasks are accomplished can be jointly determined by the individual and their coworkers…a first-in/first-out approach may be appropriate or new tasks may take higher priority over older tasks. The funnel allows an individual to show a coworker, supervisor or project manager their ongoing active and inactive tasks. If a new task is agreed upon by all to be of supreme importance when related to other tasks, it can take the "Drain-O" option by flushing other tasks out of the way to be accomplished first. The real power of the funnel is displayed when unrelated project managers present a designer with multiple "most important" tasks that must be done ASAP. The designer can graphically show the project managers all tasks currently in their funnel leading to an informed decision as to what really is the most critical and worthy of being at the active end of the funnel. A funnel active can be kept on a computer desktop and be updated several times per day. Beyond conveying task prioritization, it also becomes a tool for tracking what is

accomplished on a weekly basis, reinforcing the positive notion that progress is always being made even if it's in the form of finishing a minor active task.

Especially effective at scheduling team efforts are calendars that show critical project milestones. Such calendars are invaluable tools for tracking manpower allocation, when a senior professional needs to be available for plan check and stamping, and where bottlenecks may arise. For example, tracking calendars may show several projects reaching 100% completion on the same day…a situation that requires scheduling of plan checks and allotment of time for plotting final design sheets.

As important as fee and scheduling tools are to retail and short cycle design, the most critical are tools that enhance the sharing, understanding and organization of information. The amount of information flowing during a busy retail design period can easily overwhelm. Store numbers, site locations, owner preferences, specific code jurisdiction requirements and project schedules can become muddled into a pool of confusion unless the proper tools are in place to manage such information. A good starting point is establishment of standard filing systems for design information as a project moves to completion. For example, a project binder system may be beneficial so that critical correspondence, code research, calculations and equipment selections can be logically organized and tracked. If a question comes up on a particular project, anyone who understands the binder system can quickly and accurately assess how a design decision was determined. For larger projects where multiple individuals require constant updates and communication, periodic meetings and shared project logs should be considered. For example, a running spreadsheet or document on a networked computer system could keep all pertinent project information in a format where any interested party can review or update the information. Maintaining logs of phone conversations, e-mail correspondence and meeting notes are also good ways to organize diverse information.

Management tools mentioned above are only a small number of those that are worthwhile. However, firms must have at least basic tools in place to handle fee structures, scheduling and information sharing if they hope to survive in the retail/short cycle design arenas.

ELEMENTS FOR QUALITY DESIGN

Up to this point, a number of topics and tools have been addressed that enhance a firm's ability to generally manage and produce quality designs for retail or short cycle owners. To be truly useful though, it is important to address what elements must be in place to ensure a specific design is the best quality possible.

Accurate Bases

Similar to a facility where the foundation is poorly constructed, a design with poor base files and information will be shaky from the start. To optimize design efficiency, base files and information should be firmly established before the bulk of design takes place. Such base files and information include building dimensions, floor plans, structural grids, site plans, fixtures and elevations. However, as many retail and short cycle designers can attest, owners often change their layouts during design to capitalize on emerging market opportunities or to integrate updated systems. Such layout changes inherently change bases. Depending on how far into design the set is, base changes may cascade into large-scale changes that affect design cost and accuracy. Bases must be accurate not only in what the eye can see, but also what the CAD program can

see. For example, bases in which all the right graphics plot to paper but aren't properly arranged with respect to layers, cells or line types are deceptively complete and cause others who use the bases many CAD challenges. For this reason, successful firms ensure all drafters and designers are versed in client-specific CAD standards. Most importantly, successful firms have an in-depth understanding of what constitutes complete bases, methods of managing base information and arrangements with their owners to effectively minimize and handle any base changes.

Understanding Owner Preferences for Systems and Philosophies

The competitive retail marketplace means that retail clients must develop unique attributes that translate into specific owner preferences for systems and philosophies. Retailers, by definition, are engaged in selling products to the general public that are manufactured by independent makers of materials, foodstuffs or other items. Many retailers sell the same products, and therefore must attract customers to their retail outlets based upon factors other than the actual goods for sale. Any number of elements may be employed by retailers to set them apart from other retailers. Lower prices, cleaner stores, more selection, more convenience by combining many services into one store and catering to individual customer desires are a few examples of retail delineators. Successful architect/engineering design firms specialize in translating these specific retail delineators into facility designs that meet client goals.

Examples of how facilities may support such delineators are instructive.

- Low price leaders. Facilities may adopt a warehouse atmosphere where facility finishes are minimized so customers don't feel an aura of high-priced overhead expenditures. Facilities may also favor first costs of construction over annualized operating costs. Client expectations may revolve around facilities that last ten years or less and are discarded rather than long term facilities that are remodeled or upgraded.

- Cleaner stores may require a combination of finish work, fixtures and sanitation design. For example, stores may include bright finishes and damage-resistant flooring to provide an appearance of cleanliness. Fixtures may be designed and arranged to facilitate cleaning and minimize trapping of dust and debris. Lighting levels are customized to highlight products and brighten stores. Sanitation features may be desired such as wash stations, departmental drainage or multiple janitor areas.

- More selection may require larger merchandising and storage spaces or enhanced supply delivery capabilities. This may translate into designs of larger spaces or site planning considerations that maximize delivery throughput. This also equates to more elaborate computer-based inventory control systems that must be incorporated into design documents.

- Combining multiple conveniences into one store may require designers to incorporate unusual and diverse systems into retail stores. What once may have been a simple grocery store or dry goods sales facility may now be part grocery store, part clothing store, part pharmacy, part auto repair shop, part restaurant, part eye clinic, part pet store, part financial institution, part dry goods and part hair salon. Each of these areas require specific designs in accordance with applicable building, mechanical, plumbing, electrical and fire codes. They also require combined design

expertise that may stretch the limits of designers who specialize in any one area of these combined facilities.

- Catering to individual customer desires may involve a unique approach to facility designs. Clients may want to localize their facilities through elaborate exterior elevations that reflect the character of specific regions. Facilities may be internally divided into more intimate spaces that foster less of a warehouse feel and more of a small shop aura. Interior trim and finishes may also reflect localized enhancements. Clients may use such facility design to help customers feel more like they're receiving personalized services and cater to customers who prefer this atmosphere even at the risk of higher prices caused by such facilities. Such clients may also desire long term facilities that will have lower annualized operating costs and be able to serve the same location for 30 or more years.

While these are but a few examples of retail delineators found in competitive markets, they indicate a very important requirement for successful retail or other short cycle design management…understanding specific client goals, philosophies and systems. An in-depth understanding of these items by design firms may be difficult enough for one retail client but is made even more challenging when several similar clients are serviced who have different approaches to achieving similar facility designs. Examples of key differences between similar clients are highlighted below:

- What equipment items are owner-furnished, contractor-furnished, owner-installed or contractor-installed? Clients often use national accounts to capitalize on volume purchasing. Clients may also have fixture or trim production facilities under their direct control and preferences for equipment suppliers. Clearly understanding owner expectations in this area is critical to please the client and foster accurate bids and successful construction. For example, design errors regarding owner versus contractor supplied equipment leads to construction cost variances, unhappy owners/contractors and potential construction schedule snafus.

- How are updates to owner philosophies, systems and criteria distributed and applied by designers? Retail and short cycle clients are continuously evolving their design expectations to capitalize on emerging market forces. Owners disseminate this information through a number of means such as standardized criteria updates, owner comments to design sets, periodic meetings of design consultants or web-based update postings. Design firms must be able to accurately acquire, digest and implement such updates in a manner that continues to foster good, fast and cheap design. Organization and information sharing are keys in this area. Multiple designers must be able to access, understand and apply such updates with a minimum of re-work or confusion.

- What are owner expectations for fee structures? Clients who offer similar services may expect vastly different fee structures to construct similar facilities. Are site visits expected? If so, is the owner or designer paying for reimbursable expenses such as airfare and lodging? What is the extent of construction administration services? If construction administration is not included, is there a clear break of responsibility after a building permit is obtained? How will additional services be billed? Successful firms have methods in place to accurately propose fees for such diverse clients and track expenses to ensure profitable work.

Code Review and Coordination

Retail and short cycle design timelines typically revolve around a single pass through local administrative authority review. Projects that are not code compliant or fail to meet local jurisdiction requirements will not be permitted, may require multiple re-submittals and ultimately upset owner construction timelines. Also important to note are clients who engage in negotiated bid contracts or solicit bidders prior to local administrative authority approval. Such contracting arrangements assume that designs are standard enough and local jurisdiction comments will be of a minor nature so that bidders can accurately present construction costs simultaneously to building department review, thereby accelerating construction timelines. All of these factors point to the importance of accurate local code review and coordination by design firms. Successful firms have orderly methods of investigating and finalizing code issues at project kick-off. In this age of internet proliferation, one powerful tool is review of web-based codes. For example, many municipalities post standard codes and local amendments on their web sites. Successful firms employ methods of disseminating such information to all design disciplines and back-checking to ensure these items are incorporated prior to submittal to building departments.

Levels of Calculation

All facility designs require some level of customized calculation. Such calculations may be code driven, required for equipment or system sizing or mandated by the client. Many calculations involve levels of assumption and levels of accuracy that must be assessed by design firms. The more definite the input data and detailed the calculation method, the more "correct" the final results may be. However, what level of "correct" is the client willing to pay for, since more definite input data and detailed calculation usually costs more. Are rules of thumb appropriate? Is rote application of owner criteria sufficient? Is direct re-use of previous designs appropriate? Can quick hand calcs with safety factors suffice or will detailed computer-aided calcs be required? Is code driving a specific level of calculation to be compliant? Does the owner provide specific calculation guidance or sizing forms that must be used by the designer? All of these questions must be answered to effectively gage the time, and hence fee, required to complete a design.

A Heating-Ventilating-Air Conditioning (HVAC) design example may help describe such a calculation quagmire. Most commercial and retail facilities include some form of HVAC system to maintain interior conditions. The methods of sizing HVAC equipment to meet interior conditions vary greatly in levels of detail of input data, calculation accuracy and owner preferences. For example, some owners may stipulate certain cooling capacities, heating capacities or airflow values per square foot. These may lead to quick equipment selections but often over or under size equipment due to regional variances in climate, wind, sun exposure and building orientation. Designers also have the option of using computer based load calculation programs that require detailed data input and result in highly accurate sizing predictions. Designers could instead opt for rule of thumb calculations or direct application of HVAC sizing from previous similar designs that cost less to apply but may not serve the specific store location as well. Equipment suppliers may provide custom-built HVAC equipment that is exactly sized to design requirements, but involve higher production costs and longer construction lead times. On the other end of the spectrum, designers may choose from packaged sizes that reduce detailed

calculations into less precise choices from only a few models (that ironically might have been the same model chosen through a less detailed rule of thumb sizing methodology). Local energy codes may require a level of calculation accuracy that right-sizes equipment in lieu of less accurate methods that conservatively oversize equipment. When it's all said and done, the client's employee or customer at the check stand may still be uncomfortable due to personal preferences or the owner's maintenance program may be so shoddy that many of the carefully designed systems fail to operate properly after a short time in operation. Taking all of these what-ifs into account, the designer must still be able to prepare a competitive fee that reflects the time spent to size the HVAC equipment and ultimately satisfy the owner. Determining such levels of calculation is not a trivial exercise…it may mean the difference between a competitive fee and losing a job due to overpriced design services.

Levels of Detailing

Combining the fact that most architectural and engineering construction documents contain details with the old adage "the devil is in the details" yields another important consideration for retail and short cycle design…what level of detailing is expected, adequate and profitable? Also important are methods of developing and applying standard details as well as methods of avoiding problems when details have to be customized to a particular job.

Details are an important part of construction documents, as they describe methods of assembly or system construction when other parts of the plans aren't explicit enough. The possible variety and number of details are voluminous. They include such items as roof penetrations, weather flashing, interior décor, plumbing installation, HVAC equipment, structural anchoring, catch basins and a plethora of other assemblies. Logically, the more details included in a design set the more accurately a contractor can bid and construct the project since the designer's intent is more precisely described. However, detailing involves hours for research, drafting, cross-referencing and back-checking and hence can be a costly addition to retail or short-cycle design fees.

To counter costs of detailing, many owners and design firms have established libraries of standard details. A number of factors must be considered to make standard detailing efficient and accurate.

- Detail organization. Typically, standard detail libraries start with one detail for each type of assembly and grow as new versions of the assemblies are used for designs. Through this growth, one detail may differ from another in subtle ways such as mirror-imaging a component, changing a text note to meet a local administrative authority plan check comment or updating a model number. Without precise organization, the sheer numbers of details may prove burdensome and the minute changes from one detail to another may prove disastrous if the wrong detail is applied. Typical detail organization schemes may include descriptive text titling, electronic or paper filing in a folder-subfolder file system and methods of highlighting differences to clarify exactly what one detail depicts when compared to another.

- CAD considerations. Standard details are most effective when they can be quickly inserted into CAD files such that all cross-referencing is already accounted for. It is not unusual for a single detail to be cross-referenced many times between schedules, plan-view designs and even the designs of other disciplines. Accounting for these cross-references can be time-consuming and the effort is best spent once with the goal of instituting a system that minimizes new cross-referencing on future similar jobs. One method used by successful firms is to include

similar variants of a detail always in the same location with the same detail numbering scheme. For example, all lavatories may be Detail Number 1 on a plumbing detail sheet. Designers can then insert as Detail Number 1 customized lavatories, be they different in mounting, model number or fixtures, by the job. With this method, lavatories must only be cross-referenced once in developing the standard sheet layout with the assumption that all lavatories, no matter the specific type, will always be Detail Number 1. Along these lines of reasoning, retail and short cycle design construction documents often have a number of details marked as "not used" when a specific detail does not apply to a particular job. By marking as "not used" but retaining as a placeholder, detail cross-referencing does not have to be re-accomplished on every job since the name and number of each type of detail remains unchanged. On occasion, a local administrative authority may require "not used" details to be removed, in which case a design firm must be able to budget for or recoup time spent in re-referencing their sheets.

- Customizing to the job. The most critical aspect of detailing is to ensure that each detail on a final set of construction documents is code compliant and truly reflects what the designer wants accomplished on that job. To achieve the first item, many details are general enough to meet all possible governing codes and then modified through additional notes or graphics to customize to a particular jurisdiction. On occasion, a specific building department may require a specialized detail be created, filed and named so that it can be re-used for future work in that locale. To meet the second item, designers must budget time to accurately review each detail to make sure it applies to the particular job and that it effectively compliments what is represented on schedules, notes, elevations, sections or plan-view designs. Details should not be purely repetitive of what is on another part of the design, but should logically gel with the rest of the set. For example, a standard roofing detail that shows a built-up roof over wood trusses that is not replaced or customized to a job that depicts on the schedules standing seam metal roofing over steel web joists will lead to much confusion in the bidding and building processes.

Owner's Intent to Bid

From the big picture perspective, having a solid knowledge of the owner's intent to bid is crucial for a successful design. This intent may well determine the answers to other questions posed in this section such as levels of detailing, levels of calculation and levels of coordination. Types of bid arrangements vary considerably in levels of contract and technical detail. Even more importantly, types of bid arrangements differ in levels of common understanding between owners and designers. Several of the more popular bidding methods are summarized below. Successful firms are intimately familiar with each of these methods and arrive at a common understanding of what is expected with their clients.

- Design-Bid-Build. The most common and traditional form of design involves distinct periods of construction document design, formalized review by local administrative authorities and/or owner, competitive bidding, award and construction. In terms of retail and short cycle design efforts, this entire process is typically budgeted on the order of months. However, the fastest example I've personally been involved in was measured in days as it benefited from a large-scale dedicated design effort, hand-walking construction documents through various building and health departments, bidding to a pre-selected group of acceptable contractors and flexible construction hours that enhanced contractor capabilities. Firms must budget design fees to accomplish all of these tasks. Typically, design firms include fees that will address one

complete set of building department/owner comments and result in an authorized building permit. As described below, construction administration efforts are typically budgeted as separate line items.

- Negotiated Bid. An emerging method of bidding in the world of retail and short cycle design involves owners working directly with one or a limited number of pre-qualified general contractors in a negotiated bid environment. Such efforts may include provisions in which the contractor(s) have already agreed to line item construction prices. For example, the owner and contractor may agree to price facility construction according to a standard table of allowances such as the R.S. Means publications. In other cases, negotiated bids may have no such pre-agreed line item costs but may have established construction timelines. As seen in practice, negotiated bidding is often used to accelerate the standard design-bid-build process by handing sets of construction documents over to the contractor(s) for bidding prior to local administrative authority approval. This effectively cuts the advertising and award phases out of the overall schedule, and assuming that building department comments are minimal, starts construction weeks or months earlier. For the designer, it is important to know if the owner intends to use negotiated bid methods. Important considerations include whether there are specific pre-negotiated line item costs that must be adhered to in the design (such as roof types, construction methods, finish materials, etc). Also to be considered is the level of completeness achieved on a design set prior to building department review. For example, equipment schedules that are not 100% complete may not adversely affect administrative authority review, but will certainly affect accurate pricing in a negotiated bid arrangement.

- Design Build. Likely the least commonly understood method between owner and designer is design-build. In one type of design-build, specific contractors and designers are pre-selected and teamed in an arrangement where schematic design and equipment selection is performed to achieve a construction document completion of approximately 30%. These design sets are then reviewed and approved by owners and administrative authorities. Construction may then proceed while more detailed design is finalized and much of the fine-tuned design achieved in the first two methods is replaced by shop drawing preparation by the contractor. Typically, the burden of design liability is shifted from architectural/engineering firms to the contractors and design fees so reflect this shift. However, the opposite extreme of this method was once summarized in a quote heard by a contractor supposedly teamed with us in such a bidding arrangement, “Sure this is a design build, you the engineer design it and we the contractor build it.” Obviously, a well-drafted contract is a must that clearly defines the roles of designers, contractors and owners to make this method of bidding successful. Such a contract must include milestones with specific roles and responsibilities, descriptions of who retains liability for design decisions, how building department review will be handled, and what the engineer/architect’s role is once a building permit is obtained. Most critical from the designer’s standpoint are that this type of arrangement typically excludes open competition amongst general contractors and the general contractor typically holds the primary agreement with the owner and then subcontracts design services.

Owner's Intent for Construction Administration

In most retail and short cycle design efforts, it is common for design firms to include fees for varying levels of construction administration. Such work typically includes answering building department and contractor questions after the issuance of a building permit, review of shop drawings and equipment submittals, producing revised design documents, and review of pricing for construction changes. These efforts may also include incorporating field changes into a final set of as-built drawings. The term "construction administration" is differentiated from "construction management", which implies more active control of field construction as well as the ability to direct contractor work on behalf of the owner (i.e. spend the owner's money). Most retail and short-cycle design clients maintain their own construction management expertise, often in the form of in-house personnel who make frequent visits to the construction site and have strong relationships with a number of regional general contractors. Design firms must effectively budget for construction administration efforts. Typical construction administration labor allowances may be 15% of the time it took to prepare construction documents and achieve a building permit. If significant contractor "hand holding" is required, 15% may be too little as requests for information mount up on items that more experienced contractors (or contractors who had more padding in their bid) never question. Firms also approach construction administration staffing in different ways. For example, some firms retain dedicated personnel to handle all construction administration, effectively passing on the package from the original designers upon award of a building permit so they can focus on more new work. Other firms ensure the same designers carry projects from cradle to grave, intimately involving them in construction administration as a method of training so that future designs improve. Individual firms must assess their own manpower situations and fee structures to determine how to best implement and manage construction administration activities.

MILESTONES AND SCHEDULING

By their very nature, successful retail and short cycle designs require closely coordinated milestones and well thought-out schedules. Schedules and milestones must be well understood by all disciplines involved in the design, and must allow for unforeseen circumstances that may impact project delivery. Design professionals and owners must commonly approach project schedules and both must appreciate how design changes affect schedules. Ultimately, the most significant challenge in retail and short cycle design involves project schedules as opposed to challenges of creative or technical design efforts.

First and foremost in scheduling retail or short cycle designs is development of design timelines that meet client needs, individual designer capabilities and expected fee structures. Faltering in any one of these three areas will lead to an unsuccessful project. Designers must put forward their best effort to meet client schedules, realizing that owners rely on timely completion to capitalize on specific market factors. Similarly, clients must have reasonable schedule expectations, especially allowing sufficient time for a good design that is well coordinated, code compliant, bid-able and build-able. Capabilities of individual designers or departments play a key role in project scheduling. Is a department already operating at maximum output capacity? If so, additional work may not be accomplished in the same time as is usually expected or may be of lesser quality due to time constraints. Do designers have the tools and people in place to meet the design schedule? Especially important, do the individual designers have the time

continuously through the project schedule to deliver items required for coordination? Being unavailable for the first 75% of the schedule but totally free to complete design in the last 25% won't help much if critical coordination items are required during earlier stages of the project. Finally, schedules must gel with expected fee structures. The client expects to get their money's worth. Presenting a high fee but not dedicating the corresponding time and effort will likely lead to unhappy customers. Conversely, having plenty of time available to accomplish a project that has low fees can easily lead to designers busting their profitability by spending too much time on the project.

A key aspect to effective scheduling is good project management. Having single persons in each department ultimately responsible for creating quality designs in the time allotted is a must. As mentioned earlier, many retail or short cycle design efforts budget 100 hours or less total project time. Without a single capable belly-button to track project schedules, 100 hours can quickly evaporate without accomplishing much. Especially deleterious to such projects are the effects of having too many hands in the stew. Projects that start with one person and are shifted to others often have so much re-familiarization time that they fail to be profitable. 100 hours isn't much for one or two designers to utilize…if five or six designers are involved the time will be charged so quickly that only extremely effective big picture management will ensure success.

Hand in hand with having good overall project schedules is effective establishment and adherence to critical milestones. Milestones include such items as inter-departmental coordination dates, periodic owner review dates, architectural coordination dates, specification production dates, printing dates and building department review timelines. While many retail and short cycle design efforts fare well at setting overall milestones such as project kick off, owner review dates and city submittal dates, far fewer succeed at communicating and meeting internal coordination milestones. Failure to meet these milestones then leads to challenges in meeting the overall project goal.

It is critical for all design disciplines to understand what others need and at what times they need information to accomplish their portion of the design. Good examples of such items include finalized electronic base files, structural framing plans and lighting layouts, provision of equipment load data and ductwork layout from mechanical to electrical and fire protection designers, provision of specialty designs such as refrigeration or product conveying systems for coordination and civil site plans showing utility tie in points. My experience has been that project managers put too little time into developing master milestone schedules that are agreed upon by all disciplines. If the effort is not put in up front, results often include frustration during design and lack of overall coordination.

BUDGETING TIME FOR CONTINUOUS IMPROVEMENT

No design is perfect and no project management program is perfect either. Successful firms budget time for continuous improvement of their processes so that overall quality, efficiency and profitability improve. Several methods of continuous improvement are described below that should be considered when developing retail or short cycle design programs.

- Tracking design deficiencies and not making the same mistake twice. Nothing frustrates a client more than seeing mistakes repeated. Successful firms have methods of tracking design deficiencies and ensuring that they are not repeated. This may involve keeping a master set of

owner criteria documents and marking lessons learned on them so that all future designs can reference and avoid these mistakes. Many firms also track contractor requests for information, thereby keying on repeated items that are confusing in their designs. It is also important for individual designers to share problems encountered in their designs. Problems may take the form of an error or omission made by a single designer that is not common to other designers. In this case, an errant designer should understand the lesson learned and ensure it is not repeated. This case is usually avoided by experienced professional design reviews before sets are released for construction, thereby catching issues early and instructing designers on problems in their designs. More typical are problems common to all designers in a department. When these types of problems arise, department leadership must digest the problem, develop a solution and make sure all in the department understand how to avoid the problem in the future.

- Improving design tools and practices. Methods of design continuously evolve and design firms must keep up with the times to stay profitable. This means time must be dedicated to researching better methods of design, determining which ones are worth adopting and instituting them within the department. One such area that almost always can be improved is computer aided drafting. Very few designers fully understand all features of today's extremely sophisticated CAD software. As projects develop, designers learn better methods of producing CAD drawings. CAD improvements are also effective means of filling any down time that may result from light design workloads.

- Professional development. Not only is professional development a good method of continuous improvement, it is also becoming more and more commonly mandated for registered professionals. Establishing well-designed professional development programs that target specific areas of improvement and are set up to meet professional licensing requirements pays dividends. Many design firms leave the scheduling and accomplishment of professional development totally up to their individuals. However, if a company has a need to focus in specific areas (such as cold weather design to exploit emerging markets or team leadership skills to build more effective departments) then it benefits from involving itself in professional development scheduling. It is also increasingly important for firms to assist their professionals in developing workable schedules to accomplish professional development mandated by licensing boards. For example, many retail or short cycle design firms employ single professionals registered in many states. If each state requires 30 professional development hours every two years and the individual has license expiration dates every month or two, ensuring professional development is accomplished for each state can be a scheduling nightmare. Tracking spreadsheets and scheduling smaller credit professional development efforts on a recurring cycle help ensure state licensing requirements are met.

FEEDERS AND EATERS

Throughout this discussion, the focus has been on successfully accomplishing retail or short cycle design once a client is retained. The marketing and business methods required to woo and retain clients is well outside the scope of this lesson. However, it is important to touch on the roles that retail and short cycle design firms have as feeders and eaters.

Successful design firms ensure that their feeders, those who interact with existing or new clients to bring in new work, are representative of those who actually do the design work (the

eaters). Slick marketing pitches that present unrealistic qualifications or project timelines often lead to unsuccessful projects and unhappy clients. Many times I've heard of higher-level company representatives who promise product delivery without consulting with all the elements required to meet their promise. Often the reaction is "I can't meet that schedule" or "It's not my problem that you promised that, you should have asked for my input first." Rarely is the client re-approached and informed that the project can't be delivered as promised. Instead, a best effort is made and hopefully all turns out well. If the project doesn't turn out well, a rash of finger pointing may break out that becomes internally divisive within the firm. Ensuring adequate eater representation when the feeding frenzy is underway is a must.

Countering this problem requires that firms dedicate time and effort to developing some of their eaters into part or full time feeders. This may factor into continuous improvement efforts discussed above. This also provides good career ladder rungs for hands-on designers to climb up in the company. While not all designers desire to directly interact with clients as marketers, successful firms ensure that their clients interact with employees who actually perform design work, showing off their knowledge and dedication to fulfilling the client's design goals.

SUMMARY AND STRATEGY FOR SUCCESS

This goal of this lesson is to present a number of different topics that should be considered by firms involved in retail or short cycle design. As opposed to a how-to manual, it instead attempts to be a thought-provoking endeavor. It is most effective when each subsection is approached with the attitude of "Have we considered that…if already implemented are there ways of making it better?" With this in mind, the following summary/question list is provided as a means of assessing where a firm stands in its retail/short cycle design program and where it may focus its improvement efforts.

1. How do we rate for each owner goal of fast/good/cheap on a scale of 1 to 10? How do my principle competitors rate? Brainstorm ideas of how to improve weaknesses.

2. List your primary retail/short cycle design clients. Beside each, succinctly describe how their criteria is conveyed to your company, how updates are provided, how your firm applies this information and rate how capable your client is in working with you on criteria questions. Highlight differences between clients on your list. How do those differences affect you? How can items be standardized to improve efficiencies?

3. Repeat item 2) for client design service expectations instead of criteria.

4. Rate your team's performance with regards to speed, accuracy, experience and retail-project motivation on a scale of 1 to 10. Dig further into weak areas. How can weaknesses be improved?

5. Review ideal trails for your CAD technicians, designers, junior professionals and senior professionals. How can you overcome any shortfalls?

6. List technical design tools used throughout your team. Rate on a scale of 1 to 10 how well understood each tool is by each team member, how consistent the results are from each tool, how

critical the tool is for overall project success and how cost effective it would be to standardize or improve the tool. What possible benefits of each tool have yet to be explored?

7. Review and answer the specific CAD questions in the lesson. For each client you serve, where can items be standardized?

8. Review your last week of work and organize how tasks were accomplished through a retail funnel. How could a tool similar to the funnel have helped organize, prioritize and communicate your tasks?

9. Draft a fee proposal from scratch for a client you don't currently service but wish you did. Compare this proposal with your standard proposals. Did starting from scratch identify flaws in your current client proposals? How can you turn your "wish" proposal into a marketing tool for the dream client?

10. List your best horror stories for each element of quality design. What practices are in place to avoid repeat mistakes?

11. List continuous improvement efforts each of your team members accomplished in the past 12 months.

12. List areas where your team needs to improve. How can continuous improvement be structured to achieve development goals?

13. Name your feeders and eaters. What are each person's strengths and weaknesses in each area. Can focused improvements be made?