

A USER'S GUIDE TO CORPORATE
INTERIOR DESIGN AND
CONSTRUCTION

Meridian Design Associates,
Architects, P.C.

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NEW YORK: 1140 Broadway
6th Floor
New York City, NY 10001
212.431.8643 phone
212.431.8775 fax

MIAMI: 907 SW 79th Avenue
Miami, FL 33144
305.262.7663

GENEVA: Meridian Group8
20, rue Boissonnas
1227 Acacias
Geneva, Switzerland
+4 122 560 88 88

PRINCIPAL: Antonio Argibay, AIA, LEED AP
antonio@meridiandesign.com

PRINCIPAL: Luis Roges, AAIA
luis@meridiandesign.com

PRINCIPAL: Robert H. Milkie, R.A. NCARB
bob@meridiandesign.com

ABSTRACT Tremendous change in the ways that people and businesses work is necessitating the design, construction and/or restacking of many new and existing facilities. Many organizations lack the staff with the in-house experience necessary to lead and manage such undertakings. This document will serve as a primer enabling both staff and management to administer and lead the process of planning, designing and building new facilities with confidence. We will walk through a typical project, describing crucial tools and processes, and highlighting classic pitfalls.

THE CHALLENGE Your company is changing: changing business models, new technologies, doing more with less, or simply doing new things. Maybe the leasehold you've been in doesn't work for the company any more. Maybe it's time to revisit your company's culture and consider adapting new ways of working. Perhaps you need to decide whether to renew your lease or to move.

Whatever the reason, it's time to plan, design and create a new workplace for the business. You're the person with the closest experience to managing a major capital project, and you've been asked to lead the process, while also fulfilling the responsibilities in your job description.

WHERE DO YOU BEGIN? You may be a COO or CFO, a Facilities Manager, Director of HR or a facilities and operations leader. In any case, you are being called upon to take responsibility for a major transformation in the shape of your organization during a period of tremendous change. There is a good possibility that you were never trained in an undertaking such as this, and there is no one in the organization with similar past experience.

This White Paper is for you.

The good news is that there are several proven methodologies and decision-making processes which you can use to assure the most beneficial outcome for the project ahead.

In this paper we will address several areas: how to set up the project, how to look for real estate, how to manage budgets and schedules; and we will offer some insights into the design process.

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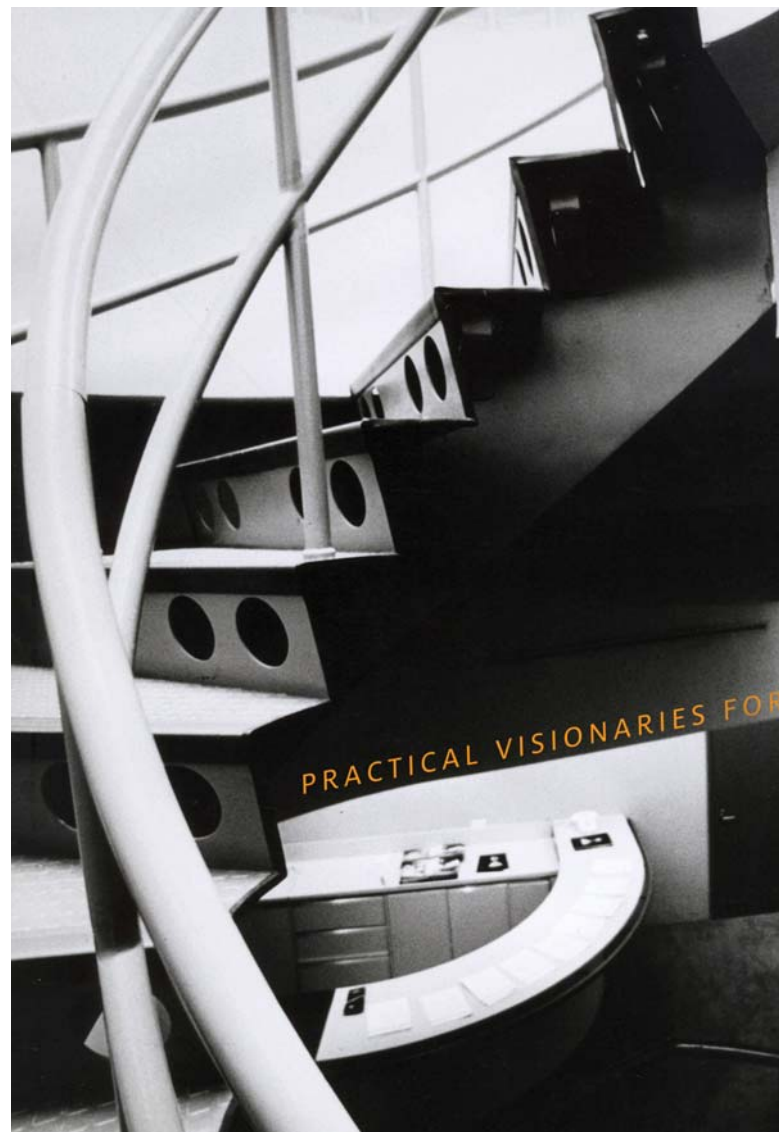
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Setting Up The Project

The Business Plan for Your Project

It might help to see your new capital project as an ephemeral, intrapreneurial new business startup.

- Ephemeral, because this business is intended to last just for the duration of the project.
- Intrapreneurial, because it is an in-house, high-risk undertaking that is substantially different from the core business of your company.
- New Business, because its mission is substantially different from the core business of your company. And at the outset it is very much a start-up.

We call this business "The Construction Enterprise."

The mission of this business will be to plan, design and build your new facility. Your job is to be the leader of this project. You will need to devise a business plan in cooperation with your funders and your board. You'll need to build a team – made up of both in-house staff and outside consultants. Whatever your official title, you are the Chief Operations Officer of this enterprise.

Staffing the Project

When you are tasked with managing the project, it is important to have a clear sense of who in your organization establishes project policy and makes key decisions. We think of this group as the Board of Directors of the Construction Enterprise. The Chairman of that Board will typically be your corporate Chief Executive. The Treasurer will be your Chief Financial Officer. The members will be the key stakeholders in the project.

The operating staff of the Enterprise will typically include a few in-house people representing Facilities and Operations, as well as outside consultants and contractors hired for the project's duration. These consultants are brought on board to leverage your talents and those of the visionaries and decision-makers in your organization. The best product will often result if these consultants have an ongoing "partnering" relationship with your company. In this way it is sometimes possible to outsource the maintenance of an institutional memory.

The key outside Project Team members include your Real Estate Agent, your Architect and Consulting Engineers for Structural, Mechanical/Electrical, Life Safety, Telecommunications, your Real Estate Lawyer, and your Construction Manager or General Contractor. Each of these representatives will speak for the interests of their aspects of the project. One of your most challenging tasks will be to guide and assist your architects in their role of balancing these sometimes divergent interests into one coherent vision for the future.

A team which has successful experience in projects like yours can bring considerable added value to the success of your project. They can offer the benefit of their long-term observations of the pattern of change in your industry and the benefit of their ongoing research into design solutions expressing this change.

Delegate - You Still Have a Full-Time Job

You will most likely continue to have your traditional responsibilities within the company throughout this process. Your success will depend on your ability to articulate your company's needs, and then to manage the efforts of others in bringing them to fruition. One key role you will play is as the liaison between the Project Team and your in-house "Board". It is essential that you keep the senior members of your firm involved and maintain their support and ownership of the evolving product through regular project reviews.

The Business Plan for Your Project

The “business plan” of The Construction Enterprise is what is called your “Architectural Program” or “Space Analysis Study”. The core of your program is based on translating your organization’s business plan into a statement of the physical implications of how your organization does business. Certain technical aspects of this document will be generated by your consultants. By examining your business plan, your architect will establish performance criteria for spatial area and volume, furniture and occupancy standards, the mechanical and electrical systems, project budgets, schedules, and lease criteria, among many other considerations.

Many companies do not have a current business plan in place. In this case, your pre-design process is a great opportunity to question the shape of your business. Your design professional must therefore have the ability to lead you through a policy-making process which will establish the success criteria for the project.

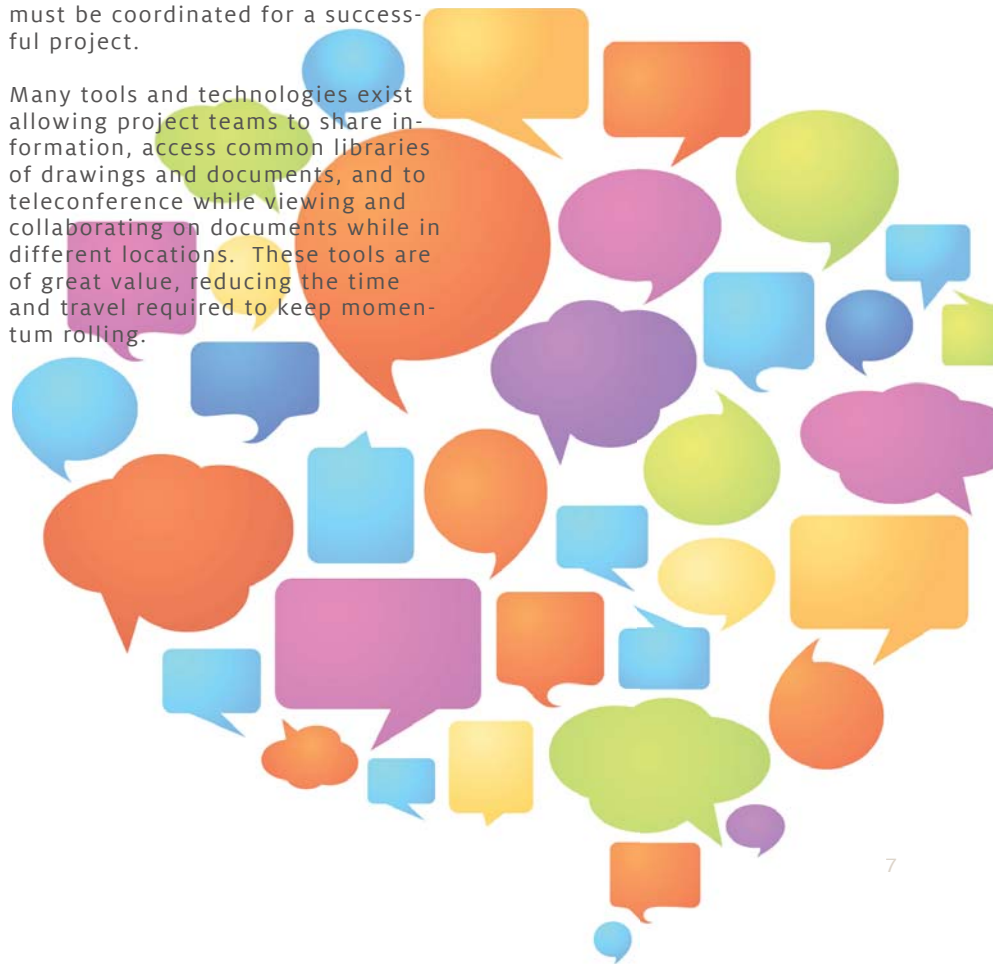
Concepts and Details

One key piece of our project delivery methodology is the knowledge that if you carefully define the concepts which will establish the success criteria for the project, the details will follow. If you fail to build broad consensus on these success criteria, or don’t get participation from the full spectrum of interests at the outset, the odds will be stacked against your project. There’s an old carpenter’s dictum: “Measure Twice, Cut Once.” It is in devising your program that you take the measure of your organization. This work establishes the “genetic code” which will speak to the myriad of decisions required on your project.

Establishing Communications and Decision-Making Protocols

As you begin to understand the complexity of the process you are undertaking, you’ll also begin to appreciate the need for clear lines of responsibility and communication. The Construction Industry has many standard means of communication: Programs, Meeting Minutes, Proposal Requests (RFP’s), Requests for Information (RFI’s), Change Orders, and many more. What is needed is to delegate responsibility for managing the flow of this information. It is also important to document which team member carries each of the many responsibilities which must be coordinated for a successful project.

Many tools and technologies exist allowing project teams to share information, access common libraries of drawings and documents, and to teleconference while viewing and collaborating on documents while in different locations. These tools are of great value, reducing the time and travel required to keep momentum rolling.



The Typical Phases of a Project

A typical construction project has the following phases

- Pre-design
- Schematic Design
- Design Development
- Construction Documents
- Bidding and Negotiation
- Construction Administration
- Commissioning

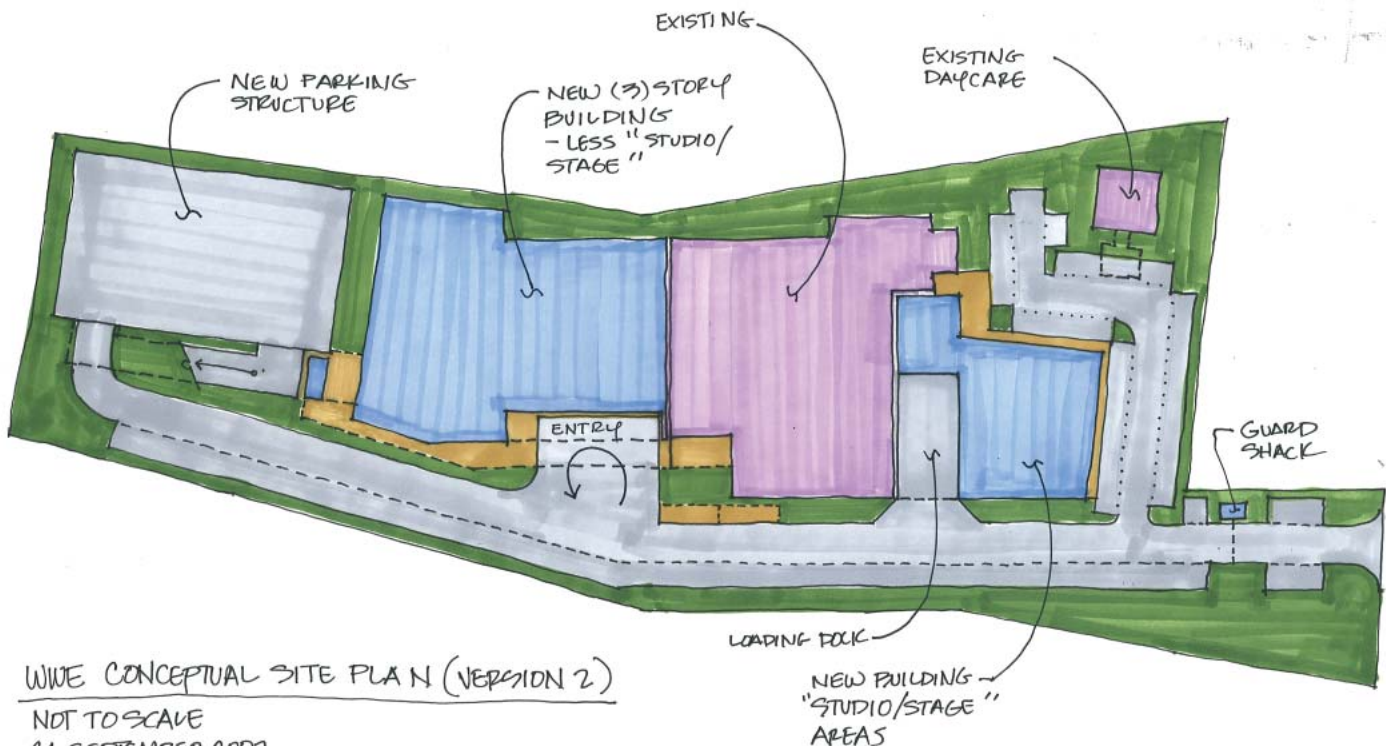
Pre-Design

In the Pre-Design phase, you will assemble your team, articulate the concepts that will guide the project, write your program, establish a preliminary budget and schedule, and undertake the real estate search.

This is the most important part of your project, and involves the most involvement of your corporate leadership. Done correctly, the rest of the project can flow much more smoothly than many people realize.

Architectural Program

Before you even start looking for real estate, it is important to stop and define the success criteria for the project. Why are you changing your workplace? How has your culture and workflow changed since you last undertook a design process? What new staffing models and resource-sharing policies will this new workplace accommodate? What is the project budget? How was that established? What are the time parameters you must work within?



WWE CONCEPTUAL SITE PLAN (VERSION 2)
NOT TO SCALE
24 SEPTEMBER 2007
MERIDIAN DESIGN ASSOCIATES

Types of Square Feet

As you look at spaces, you will hear mention of four types of square feet: Gross, Carpetable, Useable, and Rentable. The real estate industry always speaks in terms of Rentable square feet. Different markets use different means to define these terms, however, in general, the following definitions apply:

- Gross Square Feet are the area of the floor in question measured to the outside of the exterior walls, with no deductions for shafts, corridors, etc.
- Carpetable Square Feet are the actual space in your leasehold that you could put carpet onto. These are likely the square feet you are most interested in, and your Architect can calculate the ratio of carpetable to rentable among various deals to help you understand the relative dollars per square foot among them.
- Useable Square Feet are calculated differently for single-tenant and multi-tenant floors. In a single-tenant floor, useable is merely the gross minus the vertical penetrations such as elevators and mechanical systems. In a multi-tenant floor, each tenant's useable leasehold area also includes a pro-rated share of any spaces shared by the tenants on that floor, such as Elevator Lobbies, Bathrooms and Utility Rooms.
- Rentable Square Feet are useable (whether single or multi-tenant), plus a market driven add-on factor established by the Landlord.

At the end of Pre-Design, you will have a clear set of success criteria for your project, you will have a conceptual layout of the space, updated budgets and schedules, and a real estate deal far enough advanced that it is prudent to invest in a deeper design process. That leads to Schematic Design.

Schematic Design

In this phase, the team will explore schematic design options, resolving a relatively final layout, and selecting various systems at an overview level. You will have collapsed various design options into a specific strategy, with refined budgets, schedules and logistical plans.

Design Development

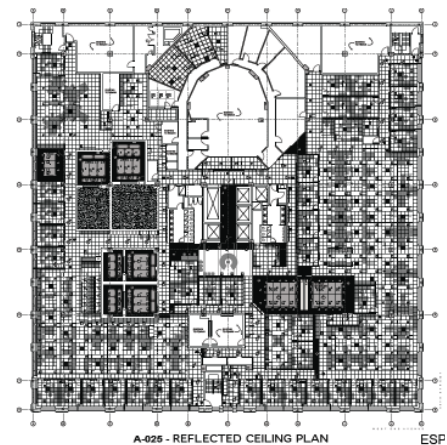
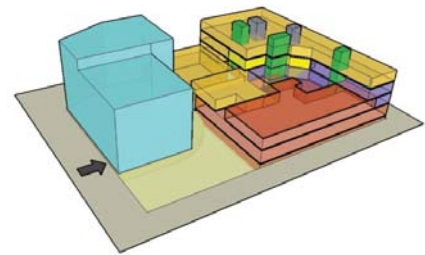
In Design Development the approved schematic design will be fleshed out, exploring the various furniture systems, lighting and finishes in greater detail, maturing the design and tightening up your grasp of a realistic budget and schedule.

Construction Documents

Once the design is matured, you move into the Construction Documents phase. During this period, the team will convey the approved design in an industry-standard format including drawings and specifications. These documents will be used to bid and purchase the project in the marketplace, and will guide the contractor throughout the construction phase.

It is typically in this phase that formal municipal filings will take place. If there are any controversial issues of building law involved with your project, the design team will often have had preliminary meetings with approving officials to be sure that interpretations of law are commonly understood.

During this time, your landlord will also review all your CDs for building conformance.



Bidding and Negotiations

During the Bidding and Negotiations phase, your construction documents will go out into the market-place, and all associated costs will be submitted to you and your team. They will assist you in analyzing and leveling all bids and work with you in the final selection of a Builder.

Construction time may be saved the pre-purchase of long-lead-time items such as HVAC equipment, light fixtures and imported materials.

Commissioning

One often-neglected phase is Commissioning. In this phase, systems are started up and tuned, and the members of your organization are oriented to the new space and its various systems. As-built drawings and operating manuals are archived, and maintenance contracts are initiated for systems requiring them. This period is also an opportunity for debriefing and disbanding the staff of the Construction Enterprise. Much can be learned in this debriefing process which will add to the institutional memory of your company.

Construction Administration

Your Design Team will represent your interests in administering the Construction. They will respond to questions from contractors and vendors, administer any design changes, and process requests for payment. They will assist with municipal approvals as the work progresses.

One important milestone in the Construction Administration Phase is called Substantial Completion. Defined as the moment you have beneficial occupancy of the space, this is when the work is almost done. There will still be corrections and completions of certain work. This is the time when your Design Team will create a "Punch List," an analysis of all the loose ends in various contracts that must be tied up before the project is complete.



A Project’s Many Contracts

A single workplace project typically has multiple sets of contract documents for the various aspects of the work. Each of these has certain appropriate design professionals and contractors. A partial list of typical contracts with their related professionals and contractors is shown below.

Clearly the weaving together of all these disparate contracts is a challenge facing the project team. In the past, this was often the responsibility of an in-house facilities management staff. These days some companies hire outside Project Management firms, or ask their Architect to play this role. Sometimes the General Contractor or Construction Manager is asked to handle this coordination. In any event, it is important to have an entity that has responsibility for the entire undertaking. One metaphor which has traditionally been used for their role is as the conductor of an orchestra, keeping the efforts of the various segments in balance.

CONTRACTS		
CONTRACT	DESIGN PROFESSIONAL	CONTRACTOR
GENERAL CONSTRUCTION	ARCHITECTS AND CONSULTING ENGINEERS	GC or CM
MECH. ELEC. PLUMBING & FIRE PROTECTION	MEP ENGINEER	GC or CM
STRUCTURAL WORK	STRUCTURAL ENGINEER	GC or CM
FURNITURE & FURNISHINGS	ARCHITECT	FURNITURE VENDORS
DATA/TELECOM SYSTEMS	DATA-TELECOM DESIGN CONSULTANT	SPECIALIST CONTRACTOR
AUDIO / VISUAL	AV CONSULTANT	SPECIALIST CONTRACTOR
SOUND CONTROL	ACOUSTICAL ENGINEER	GC or CM
FILING WITH DOB & MUNICIPALITIES	EXPEDITER	EXPEDITER
MOVING	MOVE CONSULTANT	MOVING COMPANY

Managing Your Budget

Budgeting is one of the most stressful aspects of the workplace creation process. With a good program and a little diligence, there is no reason for this mystery.

The first step in generating a realistic budget is to use the square footage numbers generated by your program to project a basic, preliminary budget based on square-foot costs. These are “rule-of-thumb” costs for any given marketplace and are constantly being adjusted based on market criteria. Your design professionals along with general contractors will be able to help you establish realistic costs for your project.

THE STEPS TO A SOLID BUDGET
TAKE THE TIME TO WORK IN-HOUSE AND WITH YOUR CONSULTANTS TO DEFINE A CLEAR SET OF PROJECT SUCCESS CRITERIA
CREATE A COMPREHENSIVE ARCHITECTURAL PROGRAM EXPRESSING THOSE CRITERIA
ESTABLISH COSTS FOR THAT PROGRAM, INDEPENDENT OF LOCATION
COST OUT UNIQUE SITE AND PROJECT SPECIFIC ITEMS
ESTABLISH ALLOWANCES AND CONTINGENCIES TO ABSORB UNKNOWN AND UNDEFINABLE SCOPE
BUDGET COMPREHENSIVELY, LEAVING ROOM FOR SPECIAL ITEMS, FEATURES AND BRANDING
CONSIDER THE BUDGET IN CHOOSING AMONG DESIGN OPTIONS. UPDATE THE BUDGET AS POLICY AND DECISIONS CHANGE, AT LEAST NEAR THE END OF EVERY PHASE OF THE PROJECT, AND SET UP SHARED “LIVING DOCUMENTS” FOR PROJECT MANAGEMENT TASKS

The next piece of your budget-building process is to identify costs unique to your project or the building under consideration. Your professionals will know which of these costs are included in the square-footage costs used for your project. Some typical unique costs might include the items listed in the next table.

POSSIBLE UNIQUE COSTS
UNIQUE ACOUSTICAL REQUIREMENTS
EMERGENCY POWER OR POWER CONDITIONERS
SPECIAL PROGRAM REQUIREMENTS NOT EXPECTED UNDER TYPICAL SQUARE FOOT COSTS
POSSIBLE STRUCTURAL REQUIREMENTS FOR NEW CONSTRUCTION
SPECIAL FINISHES REQUIREMENTS
MOVABLE WALL SYSTEMS

At every stage of project development there will be scope that is hard to define, but likely to occur. There are also certain scope elements that the process cannot even identify until work has begun (hidden conditions, existing construction defects, water in an excavation, etc.). These costs are managed through Allowances, Contingencies, Unit Costs and Alternate Bids.

Allowances always apply to specific expected scope. Contingencies are applied to the overall budget to cover things that cannot be foreseen. Alternate Bids involve the development of alternate designs and the solicitation of pricing for both alternates, allowing you to select between them at your leisure. Unit prices can be requested from each of your trades and establish a fixed basis for pricing additions to and deletions from the project scope. .

The synthesis of your base square-foot-cost-based budget, the site-specific and unique costs, and your allowances and contingencies should provide a reliable preliminary construction cost. Alternate bids and unit costs can give you the flexibility to adjust your scope and budget.

This method will help you to plan responsibly for special design features which are outside typical construction costs – Branding, New Technologies, Special Features, Art, etc. These features, which are often the first victims of a budget crisis, can be monitored and maintained in the budget once you have confidence that it is on target and that you have obtained realistic costs for these special features.

Once your budget is established and approved, it becomes an ongoing tool in the design process. As you proceed with design, each decision must be analyzed in its light. Typically the budget is updated as you move through each phase of the project. If you find yourself discussing any new unique conditions, make sure to add them to your list and establish a cost for them. It is also essential to continually question past budget decisions, looking for any items which may be inconsistent with current thinking and trends.

It is often healthy to begin a budget-pruning process about 80% of your way through the design development phase. At this stage you should have a good sense of where the overall budget is going. Typically, you will have accumulated a few vestigial items which may be considered for removal from your project and could be one of the Value Engineering (VE) issues that will need to be deleted in order to stay within the boundaries of the approved budget.

One strategy which has been very successful over the years is to bring a Cost Estimator, General Contractor or a Construction Manager on board early in the design process and to give them the responsibility to provide ongoing market feedback for the evolving design.

Schedule Management

Schedule Management ranks right behind cost as a major concern. It is amazing how many clients and contractors effectively abandon hope of managing their schedules. The first step is for the team to commit to jointly discussing, creating, managing and maintaining the approved schedule.

Scheduling, like budgeting, should begin the moment you decide to move. Each policy and design decision must be analyzed in light of both schedule and budget. In all venues of the process, many component contracts must be woven together into the milestones and critical paths of the entire project. This is typically the responsibility and collaboration of your in-house project manager, your architect and your general contractor.

ID	Task Name	Duration	Q2	Q3	Q4
1	CNN - MDA Advisory Role - 1st Reg R	17.4 wks	6/2		
2	CNN - CDs - MDA Advisory Role	28 wks	6/2		
3	CNN - CDs (MDA Advisory Role) Client Review and Sign-off	8 wks			
4	CNN - Permit Set (MDA Advisory Role)	6 wks			
5	CNN - Procurement Set (MDA Advisory Role)	6 wks			
6	CNN - Bid Documents (MDA Advisory Role)	12 wks			
7	GC RFP Docs - Bidding and Negotiations	53.6 wks			
8	CNN - Pre-qualif. Of Vendors + Develop RFP Docs + Preferred Vendors Shortlist (MDA Advisory Role)	3 wks			
9	CNN - Issue RFP + Bid Period (MDA Advisory Role)	4 wks			
10	CNN - Bid Levelling and TW Approvals (MDA Advisory Role)	3 wks			
11	CNN - Contract Negotiations (MDA Advisory Role)	5 wks			

The litigious way to manage schedules is to use liquidated damages, which penalize contractors for missing deadlines. This strategy creates a huge amount of hostility and paperwork for all members of the project team. Every delay by every party will be documented by the GC/CM so that when delays happen, responsibility can be apportioned.

Our firm's preferred, Partnering-based way to manage schedules is for the project team to work jointly to establish a base schedule and for them then to monitor any changes at weekly project meetings. Together, they can develop strategies for minimizing negative impacts from problems which arise. The responsibility for leading this effort usually rests with your architect until the bidding and negotiation phase and moves to the general contractor thereafter.

There are two basic components in a project schedule: (1) the critical path of design and construction tasks which must be accomplished, and (2) the planning for long-lead times related to certain items and materials.

An example of the critical path of tasks is the need to create and refine coordination and shop drawings for each of the trades which must go up above the ceilings before any of those trades can be released for fabrication and installation. Another classic limitation on completion of acoustically sensitive spaces is that there are many layers of construction and only so many people who can fit into a given room at one time.

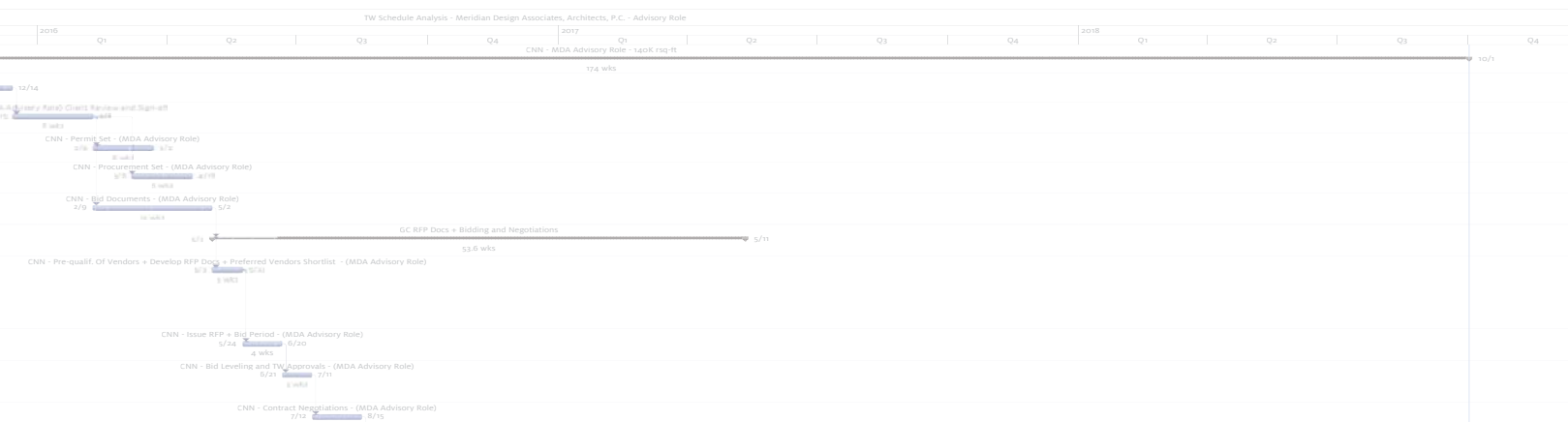
The second component of schedule management is long-lead-time items. At a very early point in the design process it is essential to identify any long-lead-time items and plan ahead for their acquisition. It is common that some of these items are purchased before the bidding phase if a contractor is on board or if your organization has the sophistication to do so. Some typical long-lead items are listed in the Table below.

TYPICAL LONG LEAD ITEMS
HVAC EQUIPMENT
PRE-ACTION FIRE SUPPRESSION SYSTEMS AND FM200
ELECTRICAL SWITCHGEAR AND UPS SYSTEMS
LIGHT FIXTURES
CUSTOM MILLWORK
CUSTOM FINISHES, MARBLE, GRANITE, ETC.
FURNITURE

At the end of the bidding and negotiation phase, it should be the GC/CM's responsibility to establish a project schedule that they are committed to administering. Any changes in that schedule must be accomplished as Change Orders, just as changes in project cost are accomplished by Change Orders. As project scope is changed, it becomes the GC/CM's responsibility to negotiate changes in schedule as well as cost. If this method is diligently followed, the team will have a solid sense of a realistic schedule throughout the project.

One of the classic pitfalls of scheduling is not allowing adequate time for the client's in-house review of various decisions. It is essential that the client commit to limitations on these periods if the schedule is to be adhered to.

It should also be noted that not all weeks are equal. December and August are half months at best. All team members must plan for these lapses.



Balancing Schedule, Quality and Cost

Figure below shows one of the key management challenges in the design process; finding an appropriate balance of time, quality and cost.

It is relatively easy to achieve any two of these three. For example, if you have a fixed budget, you may have to choose whether your next priority is schedule or quality. If time is of the essence, you may have to choose meeting your budget considerations over your quality standards. If quality is crucial, it will, in most cases, cost you either time or money or both.

One of the arts in these undertakings that your architect will greatly assist with, is keeping your project in balance while sacrificing few or none of these desired aspects.



The Design Process

This paper will end with a few observations on the design process.

Some aspects of this process are empirical:

- How many staff members must be accommodated?
- How big is a given piece of equipment?
- What type, size and quantity of meeting/conference rooms, etc.

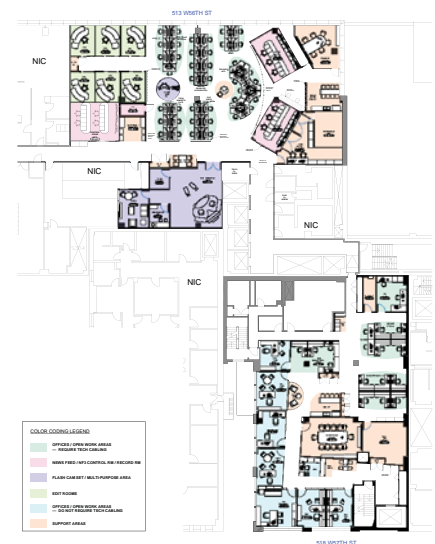
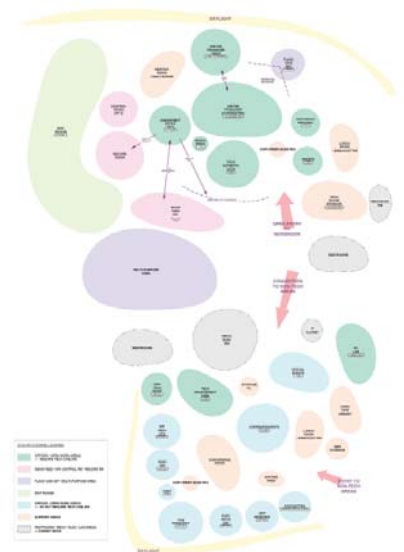
Others are subjective and aesthetic:

- What color scheme will best enhance your business?
- What feeling should your reception area convey?
- What image do you want projected to clientele?

The infrastructure of a design is generated by the empirical form-givers. The empirical then defines the potential for the subjective. If the empirical criteria aren't met, the subjective may have limited value.

That said, it is the subjective, the ideas and ideals expressed in a design, that gives it vitality. There's a biblical saying - "Without vision the people perish." If the design of your facility is to bring the fullest benefit to your organization, it must also transcend the merely empirical needs and express something of the spirit of both the place it occupies and the organization itself.

Lastly, trust in the fact that design is a process. You may not know all the answers until it is over, but with the right project methodology, and the right Project Team, the process will resolve all the seemingly disparate requirements and options into a workplace that serves you and your business well.





SUMMARY

The process of design and construction requires you to question fundamental issues about the shape of your business - even if your only decision is to faithfully replicate exactly what you currently have.

Since you are undertaking a capital project, you have an opportunity to accommodate evolutionary change in what are typically fixed aspects of your business.

So remember:

- **LEVERAGE** your time and abilities by careful selection of the members of your project team.
-
- **ENSURE** that your organization focuses its talent on the creation of a comprehensive program and the definition of success criteria for the project.
-
- **MANAGE** the consensus-building process as policies are established and design solutions are taking shape.
-
- **ASSIST** the project team in making value judgments balancing budget, schedule and quality.

We hope that the insights offered by these guidelines have helped to demystify the process and going forward will enable you to garner benefit for your company for any and all construction projects you manage.

