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Examen des architectes du Canada
Examination for Architects in Canada

Extracts from:

# Mastering the Business of Architecture (2004)

Stone, D., Ontario Association of Architects, Toronto.
*(English version)*

Volume 2 section 2
Volume 3A sections 1 to 4

## Vol 2 - Sec 2 - Detailed Task Checklist

### *The Scope of Services*

This section is comprised almost solely of a master list of services which an architect might typically offer his or her clients. The master task list is to be used in conjunction with the Work Breakdown Structure which was detailed in Volume 1, Section 5 and Volume 2, Section 2. In fact, the task list is an integral part of the WBS, since the individual tasks form the detail at the lower levels of the breakdown structure.

Together, the WBS, which organizes the work, and the task list, which details precisely what will be done, form the Scope of Services which you will provide to your client. This Scope of Services is a specific listing of what the client can expect to receive in exchange for their money. It will be the basis of your discussions regarding fees and the terms of your contract. It will also be your guideline and checklist throughout the project to ensure you are completing the necessary work while not succumbing to the insidious "scope creep." Lastly, it will form the basis of your project management system accounting and tracking system.

Without a detailed Task List you are planning and executing in the dark. Don't scrimp on the amount of time you spend developing the task list. When you are preparing a task list:

1. Start from scratch with a new WBS each time. Don't depend on a pre-printed list or modified list from a previous project.

2. Keep it simple. Remember the "six year-old" and don't exceed seven to ten items at any level in the WBS.

3. List everything that impacts your schedule whether it falls under your contract or not. You will identify "what's included" and "who does what" during negotiations and discussions.

4. Always include project management because no project can be effectively completed without being managed.

### *No assumptions*

The checklists in this section are intended to help you prepare for any project as you define and specify:

1. What services are included.
2. What services are not included.
3. What services might be optionally available.
4. What services will be provided at "no charge."
5. What deliverables the client can expect.
6. What services are to be provided by others.



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While some of these items may seem questionable, each of the five are equally important because the most common mistake in preparing a scope of work is to omit assumptions. Invariably, at some point in the project, the discussion becomes, "I assumed that would be included in the price." Or, "I assumed you knew we would have to charge you for that."

By defining these items, you save yourself and your client the embarrassment of assumption and you save both of you considerable legal fees.

**A valuable lesson or an affront to professionalism?**

You will notice that Item 3 refers to services which are "optionally available." For decades architects have been offering their clients "Basic Services" and "Additional Services" or "extras." While perhaps accurate, the semantics of these categories have been hurting the profession's marketing for a long time. It's time to learn a lesson from another industry.

When you go out to purchase an automobile, the dealer offers you a car which includes "standard equipment." Notice they don't refer to it as "basic" equipment. This is because no one wants just plain "basic." In fact, the "base model" has come to be seen as something less than desirable.

The dealer also will offer you equipment that is "optionally available." This includes things like a more powerful engine, special handling packages, a higher quality stereo, etc. Never will the dealer refer to these as "additional" or "extra." Why? Because he or she knows you don't want to pay for "additional" or "extra." You do, however, like the idea of some of this "optionally available equipment."

This is pure semantics and pure human psychology. And it hurts our professional pride to think we can learn something from the car dealers. However, when it comes to selling your services, human psychology still applies! Your clients would much rather pay for "options" than "extras" or "additions."

**Organization of the Detailed Task Checklist**

Finally, as you go through the checklist, do not think of these tasks as connected with pre-defined phases of work. While there are obviously some that most often apply to one or another phase, you will get into trouble by immediately assuming or assigning them to traditional phase breakdowns. For example, the use of CAD on a project means that, even while you are preparing schematic designs, you are already contributing to the development of the contract documents.



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In the example of the fast-track shopping center project given in the last chapter, drawings and specifications occur in many phases of the work.

Instead, think in terms of components of the work. For example:

- To help the client obtain funding, what tasks need to be completed?
- To fully document your research findings, what tasks will be necessary?
- To apply for a rezoning, what steps must you go through?
- To prepare a schematic design, what needs to be done?

The list has been organized into general categories of architectural work which resemble the traditional phase breakdowns. But don't hesitate to mix and match!



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## 1. Tasks Generally Associated with Planning and Evaluation

These tasks most often precede the design of a project for construction. They establish the parameters, objectives and expectations of the project and prepare the background information and conditions in which a project may be designed and built.

In these tasks the consultant provides services which analyze the owner's information, requirements and budget. This establishes the criteria necessary for a design project.

These tasks are not always associated with a construction project, however. It's frequent that a client may engage an architect to study or survey conditions, analyze and/or make recommendations regarding actions the client might take with regard to facilities or real estate without then moving on to design and construction.

Project initiation
- Discuss and refine client requirements
  - Project brief
  - Schedule
  - Budget
- Confirm client's space needs and other program requirements
- Provide advice and options on how to proceed
- Establish scope of work
  - Scope of work of prime consultant
  - Other subconsultants that may be required

Obtain client-supplied information
- Site ownership and status
- Site occupancy
- Existing conditions
- Surveys
- Legal: easements, encroachments, rights-of-way, etc.

Existing facilities surveys
- Site visit and initial appraisal
- Utilities: off- and on-site
- Measured drawings
- Photography
- Adjacent building and/or property condition survey
- Environmental studies and reports
- Soils investigation and report
- Mapping



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Analyze client requirements
- Functional
- Budget
- Schedule

Feasibility studies
- Economic
- Functional
- Regulatory
- Alternatives
- Construction
- Life-cycle analysis
    - Public meetings
    - User meetings
    - Research
    - Report preparation
    - Report presentation

Energy studies and reports
- Data collection
- Research
- Analysis
- Report preparation
- Report presentation

Site analysis and selection
- Site visits
- Data collection
- Research
- Analysis
- Report preparation
- Report presentation

Programming
- Research
- User surveys and meetings
- Data collection
- Analysis of space and volume requirements
- Specific fit programming
- Prepare facility program report
- Report presentation
- Review and coordinate with client's budget and brief

Site development planning
- Master planning



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- Detailed site utilization studies
- Geotechnical investigations
    - Research
    - Data collection
    - User surveys and meetings
    - Analysis
    - Report preparation
    - Report presentation

Schematics
- Space plans
- Flow diagrams
- Client review and feedback

Client budget review
- Data collection
- Research
- Quantity take-offs
    - Title search
    - Site acquisition
    - Real estate fees
    - Legal fees
    - Survey
    - Environmental audit
    - Environmental remediation
    - Financing
    - Property taxes, levies, etc.
    - Demolition
    - Renovation
    - Construction
    - Marketing
    - Operation and maintenance
- Consultant coordination
- Report preparation including associated implications
- Report presentation

Marketing studies
- Data collection
- Research
- User surveys and meetings
- Analysis
- Report preparation
- Report presentation

Project financing



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- Research
- Grant applications
- Documentation
- Meetings
- Negotiations

Zoning and permitting
- Research
- Documentation
- Applications and submittals
- Reviews
- Meetings
- Negotiations
  - Official Plan amendment
  - Zoning
  - Committee of Adjustment
  - Site plan control agreement
  - Demolition permit
  - Construction permit(s)
  - Municipal fees
  - Department/Ministry of Labour

## 2. Tasks Generally Associated with Preliminary Design

Tasks in this category take the criteria and information established in the planning and evaluation process and begins the preliminary designs of the facility to be built. The consultant and the owner should establish, before the work begins, the number of design alternatives to be prepared.

Schematic design documents illustrate the general scope, scale and massing of the project elements in conceptual format. They should show the proposed site layout, building plan form and appearance of the project with respect to the topography, adjacent use and utility connections. They should also illustrate the general approach to structural, mechanical, electrical and other major systems to be used.

The schematic design phase should also establish a preliminary construction budget and schedule. Owners should understand, however, that designs at this stage are preliminary and the accuracy of estimates cannot be guaranteed.

Prepare schematic design documents
- Site plan
- Principal floor plans
- Vertical sections
- Elevations
- General descriptive views

Visualizations
- Physical study models
- Artist renderings
- Computer visualizations

Permitting
- Research applicable regulations, codes and by-laws
- Meet with, and present designs to appropriate user or community groups who have influence with permitting agencies
- Meet with appropriate permitting authorities to review schematic designs
- Incorporate comments into design revisions

Calculations
- Calculate areas and volumes
- Analyze plan efficiency
- Determine applicable net-to-gross ratios

Costing
- Perform preliminary cost estimate



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Obtain cost estimates from each consultant
Prepare written preliminary cost estimate including contingency
Compare with client budget

Review

Submit schematic design documents to client including drawings, visualizations, project brief, calculations and cost estimates
Incorporate client revisions
Obtain client's written approval to proceed to design development

## 3. Tasks Generally Associated with Design Development

Based on the schematic design option which the client has selected, the consultant now moves forward to refine and further develop the design by determining more precise aspects of planning, materials and construction.

Design development documents illustrate planning, appearance and construction in more precise format. Siting, planning, materials and dimensions are defined and building systems such as structural, mechanical, electrical and other major systems are developed in detail.

The design development phase should also establish a more detailed construction budget and schedule. Owners should understand, however, that designs at this stage are still subject to change and the accuracy of estimates cannot be guaranteed.

Detailed design

- Review program to ensure compliance through this stage
- Continue development of conceptual design documents
- Provide consultants with pertinent program data and functional space requirements
- Confer with consultants to determine major systems to be used
- Analysis and recommendation of comparative systems
- Determine building system space and location requirements
- Update project brief to include system and equipment descriptions
- Research and identify potential architectural materials, finishes, equipment and furnishings to be used

Prepare design development documents

- Prepare site plan indicating building location and site improvements
- Principal floor plans
- Typical floor plans
- All elevations
- Critical sections
- Typical construction details
- Schedules
- Equipment layouts

Visualizations

- Physical study models
- Artist renderings
- Computer visualizations
- Design, construction and testing of prototypes

Develop preliminary specifications

- Establish criteria and quality standards for materials, systems and equipment

Identify potential materials, systems and equipment
Investigate availability of preferred materials, systems and equipment
Identify and investigate availability of alternate materials, systems and equipment
Prepare preliminary specification
Architectural
Structural
Mechanical
Electrical
Civil

Permitting
Review schematic design documents against all applicable codes and regulations
Meet with appropriate permitting authorities to review designs
Make and/or negotiate where required, applications for approvals under building acts, regulations or other statutory requirements
Incorporate comments into design revisions
Planning Dept.
Building Dept.
Fire Marshal
Ministry of Labour
Health
Public Utilities
Traffic
Airport Authority
Conservation Authority
Regional Authorities
Environment
Other

Consultants
Prepare layouts and drawings as required to illustrate and describe respective aspect
of work
Structural
Investigate and confirm a review of applicable legislation
Continued development of specific structural system
Final structural design criteria
Foundation design criteria
Preliminary sizing of major structural components
Critical coordination and clearances
Outline specification or materials list
Mechanical
Continued development of specific mechanical systems
Develop outline specifications and material lists
Select fuel source for mechanical systems

Contact utility companies and public authorities on all services and obtain written approval for all service connections
Establish approximate equipment sizes and capacities
Preliminary equipment layouts and space allocations
Required chases and clearances
Acoustical and vibration control
Visual impact of equipment
Energy conservation requirements

Electrical

Continued development of specific electrical systems
Develop outline specifications and material lists
Contact utility companies and public authorities on all services and obtain written approval for all service connections
Establish criteria for lighting, electrical and communication systems
Establish approximate component sizes and capacities
Preliminary equipment layouts and space allocations
Required chases and clearances
Energy conservation requirements

Continue development and expansion of schematic design documents and development of outline specifications and materials lists to establish final scope and preliminary details for on- and off-site work of:

Civil engineering
Landscape design
Interior design
Other specialty consultants

Coordinate the work of consultants providing designs for major building systems
Where specialty consultants have significant input over the construction value, coordinate the provision of preliminary designs for these systems or components
Develop and forward to consultants, or alternatively obtain from consultants list of specialized systems and requirements such as

Cable TV
Clock
Closed circuit TV
Compressed air
Electronic systems
Communication systems
Energy management systems
Gas and medical gas
Intercom
Lighting
Lightning protection
Oxygen



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Pneumatic tube
Remote control operations
Security
Steam
Telephone
Vacuum
Voice communication
Other

Investigate all applicable public and utility regulations
Review architectural and structural schematic drawings to establish adequate provision for conventional and specialized systems
Prepare estimates of facility operating costs with recommendations

Calculations

Define actual occupancy loads for each area
Area calculations (gross and net)
Volume calculations

Costing

Perform detailed cost estimates
Architectural
Structural
Mechanical
Electrical
Civil

Confer with contractor for review of cost estimates
Compare cost estimates with client budget
Have client confirm type of construction contract required

Review

Submit design development documents to client including drawings, visualizations,
specifications, calculations and cost estimates
Incorporate client revisions
Obtain client's written approval to proceed to contract documents
Verify, where applicable, that other approval-giving or funding agencies have given
authorization to proceed



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## 4. Tasks Generally Associated with Contract Documentation

During contract or construction documentation, the architect and consultants prepare the details working drawings and specifications which are used to obtain the appropriate permits, prepare final cost estimates and construction bids and construct the facility. The drawings consist of site plans, building plans, elevations, sections and construction details. Written specifications detail the requirements of manufacture, installation, design, performance criteria and workmanship of materials and equipment.

On traditional design, bid, build projects, the contract documents are prepared in their entirety prior to letting them out for construction bids. On fast-track and design-build projects, the construction documents are most often prepared in stages, allowing the contractor to begin site work and foundations prior to the completion of the final contract documents.

Of course, contract documentation activities only occur on projects which lead to construction.

Working drawings
- Develop drawing plan and sheet index
- Establish information to appear on each drawing sheet
- Set up CADD layers
- Establish drawing scales
- Establish drawing format
  - Metric
  - Imperial
- Establish drawing check set review schedule with client, consultants and authorities
- to mandatory and/or office policy
- Prepare final working drawings for architectural and all consulting disciplines
  - Site plan
  - Foundation plan
  - Principal floor plans
  - Typical floor plans
  - Elevations
  - Sections
  - Construction details
  - Equipment layouts
    - Structural grid
    - Base building
    - Dimensions
    - Notations
    - Material hatching
    - Addenda



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Specifications

Prepare and assemble specifications concurrently with preparation of drawings

- Notice to bidders
- Advertisement or invitation to bid
- Instructions to bidders
- Bid form
- Construction contract
- General Conditions
- Divisions 1-17
- Supplementary Conditions
- Cash allowances
- Other

Submit to, and assist client with review of General and Supplementary Conditions and specific contract requirements

Determine acceptable alternatives to specified materials, equipment or systems

Prepare testing and quality control program and budgets

Schedules

Prepare written and tabular schedules for construction elements including

- Hardware
- Room finish
- Equipment
- Furniture
- Other

Quality Control

Check completed documents for coordination, compliance with program, accuracy and cross-coordination with consultants work.

- Architectural
- Structural
- Mechanical
- Electrical
- Other

Have consultants carry out required coordination

Revise documents as required after check and have consultants do same

Verify all revisions

Affix Architect's seal and signature on documents

Ensure consultants seal and sign documents

Calculations

Prepare final calculations of net and gross area and volume

Contracting

Assist client in selection of testing agencies



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Determine if testing costs are to be included in construction contract
Obtain client's instructions on insurance and bonding
Obtain client's instructions regarding construction agreements and bidding procedures
Obtain client's requirements for phased occupancy or other special requirements
Determine items or work to be furnished by the client, or not to be included in the construction contract
Review with client schedule for delivery and installation of client-furnished materials and equipment
Determine bidding procedures including time, date and place of bid delivery
Review list of potential contractors with client
Obtain and review qualification statements, if required, from interested bidders
Obtain assistance from consultants if separate prime contracts are to be awarded
Annotate issuance of documents for intended purposes, e.g. bid, building permit, construction, etc.

Permitting

Review design development documents for compliance with all applicable codes and regulations
Meet with appropriate permitting authorities to review detailed design
Obtain client's instruction on application and payment of necessary permits including:

- Building Department
- Ministry of Labour
- Health
- Public Utilities
- Traffic
- Airport Authority
- Conservation Authority
- Regional Authorities
- Environment
- Other

Assist client in filing documents for approvals and permits

Costing

Perform detailed cost estimates for construction
Obtain from each consultant further update of estimated construction cost
Confer with contractor for review of cost estimates
Compare cost estimates with client budget
Review and confirm project construction budget with client

Review

Submit drawings, specifications, estimate of construction cost and area calculations
to client for review



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Revise where required
Verify all revisions
Obtain client's written approval
Obtain client's written authorization to proceed to bidding or negotiation

## 5. Tasks Generally Associated with Construction Procurement

After the construction documents are complete and approved by the owner, the consultant can then assist and advise the owner in obtaining competitive bids or negotiated proposals and in awarding the construction contract.

Identify bidders
- Publish advertisements for open bidding
  - Publish separate advertisements if separate prime bids are to be awarded
- Research bidders for invited bidding
- Obtain and review qualification statements from interested bidders
- Notify selected invited bidders

Direct selection
- Assist client in direct selection of contractor(s)
- Assist client in contract negotiation

Distribution of bidding and proposal documents
- Determine number of sets of bid documents required
- Arrange for printing/reproduction of bid documents
- Prepare bid packages
- Distribute documents to bidders and obtain deposits
- Issue documents to local construction association plan rooms
- Obtain satisfactory return of documents from bidders who withdraw
- Obtain satisfactory return of documents from disqualified bidders
- Return deposit to bidders who satisfactorily return documents
- Repair and reassemble returned documents for use during construction

Bid inquiries and addenda
- Hold pre-bid conference
- Arrange and conduct site tour
- Record all bid document inquiries
- Receive and respond to questions from bidders
- Clarify or interpret bidding documents
- Review and advise on alternates or substitutions proposed by bidders
- Prepare and issue supplementary information or addenda as necessary
  - Drawings
  - Specifications
  - Instructions
  - Change in bidding schedule or procedure
- Ensure bidders have sufficient time to review addenda prior to bid closing

Bidding
- Organize and run bid opening
- Receive all bid packages submitted up to bid deadline

Return all bid packages submitted following bid deadline

Bid and proposal evaluation

- Open and tabulate all legitimate bids as per procedures established with client
- Analyze all bids including alternates and substitutions
- Obtain assistance of consultants as necessary
- Prepare report of bidding results and analysis
- Analyze alternates or substitutions proposed by bidders
- Advise client on selection of alternatives and separate prices
- Review bids and analysis with client
- Assist client with selection of successful bidder
- Notify unsuccessful bidders and obtain return of bid documents
- Return deposit to unsuccessful bidders who satisfactorily return documents

Contract negotiation and award

- Notify successful bidder of acceptance and basis of acceptance
- Assist client to issue letter of intent
- Assist client with contract negotiation with successful bidder or pre-selected contractor
- Request and receive submission of post bid information
    - Performance bond
    - Labour and material bond
    - Insurance certificates
    - Worker's Compensation
    - Other
- Assist client in preparation of construction contract
- Assist client with preparation and coordination of separate prime contracts
- Provide client written reminder of client's obligations under Contract
    - Insurance
    - Permit(s)
    - Occupancy
    - Access
- Assist client and contractor in execution of construction contract



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## 6. Tasks Generally Associated with Contract Administration

As the project is under construction, the consultant can administer the construction contract between the owner and the contractor. In this capacity the consultant is the owner's professional advisor in interpreting the contract documents and advises the owner on contractor performance. While the consultant is not responsible for the contractor's performance, he or she will generally review the progress and quality of construction.

Document management

Obtain all bonds and insurance policies required by contract documents from contractor
Forward bonds and insurance policies to owner
Advise client to file copies of property insurance policies with contractor
Have client purchase special hazard insurance as part of property insurance policy at
contractor's written request and expense
Provide contractor with required copies of contract documents

Permits

Remind contractor to obtain and pay for all permits required by contract documents
Assist client with applications for gas, water, electricity, telephone and other services as required

Schedules

Obtain and review contractor's construction schedule
Obtain and review contractor's schedule of shop drawings and samples
Obtain and review contractor's schedule of values
Obtain and review contractor's updated progress schedule
Advise client of potential revisions to date of substantial performance (if required)
Prepare colour selections and schedules
Obtain client approval for colour schedules
Issue colour schedules to contractor

Project procedures

Establish and advise regarding basic lines of communication between all parties including contractors, client and consultants
Establish with contractor requirements for testing and inspection of specific materials and work by inspection and testing companies
Arrange for distribution of reports through proper channels for action if necessary
Advise on interpretation of contract documents
Issue supplementary details and instructions as required



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Respond to requests for information and issue written site instructions to contractor
when applicable
Advise contractor on Contemplated Changes to the contract
Prepare and process requests for quotation regarding Contemplated Changes to the
contract
Process and coordinate changes to contract after consultation with client
Review contractor's submissions for changes in contract time and amount in conjunction with consultants
Advise client on validity of claims
Issue Change Orders as required
Obtain client approval and signature on Change Orders
Notify appropriate authorities of changes when appropriate

Site visitation and review
Attend site meetings
Make periodic visits to site to determine if construction is in general conformity with contract documents
Evaluate work performed and materials supplied in relation to contractor's progress
application
Make site visits to observe specific events as conditions warrant
Prepare and submit to client, contractor and building officials site visit reports including those of professional engineering consultants
Issue appropriate certificate for payment covering contractor's request

Shop drawings and samples
Review requested shop drawings when submitted
Instruct consultants to review shop drawings as appropriate
Review submitted samples where applicable and comment accordingly
Instruct consultants to review submitted samples as appropriate
Maintain shop drawing and sample record

Consultants
Coordinate general review and other services of other consultants
Direct findings of other consultants for appropriate action

Administration of changes in the work
Prepare proposal requests
Receive and review proposals responses
Prepare and issue change orders

Project close-out
Review prescribed procedures for project close-out e.g. specifications and/or



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OAA/OGCA Document 100

Arrange for appropriate representatives to attend demonstration(s) of systems

Obtain appropriate records of demonstration(s)

Arrange for turnover of applicable operating instructions

Substantial performance

Receive from contractor application for Certificate of Substantial Performance

Receive from contractor list of items to be completed or corrected

Perform site review for substantial performance

Review site review findings in relation to contract and lien legislation

Notify contractor if substantial performance not certified and provide reason

Certify substantial performance

Obtain and review required documents for release of basic holdback moneys

Issue certificate for payment for release of holdback

Assist client in obtaining occupancy permit if required or requested

Obtain from contractor:

Warranties

Certificates of inspection

Equipment manuals

Workers compensation certificate

Operating instructions

Statutory declaration documents

Keying schedules

Maintenance stock

As-built drawings

Other specified items

Completion

Receive from contractor application for statement of completion

Carry out site visit for completion

Review findings in relation to contract and lien legislation

Notify contractor if project not found to be complete and reasons

Issue statement of completion

Receive contractor's written notice of total completion

Issue certificate for payment for holdback for finishing work

Perform final site visit

Issue final site visit report

Receive from contractor final application for payment

Issue final certificate for payment to contractor

Prepare record drawings if required

Advise professional liability insurer of project completion date



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## 7. Tasks Generally Associated with Post-Construction and Facility Operation

Following completion of construction, the consultant may provide the owner with services necessary in the occupation, use and maintenance of the facility.

The contract documents usually require a 12 month warranty on all labour and materials. During this period the consultant may continue to advise the client and communicate with the contractor regarding defects or deficiencies which may be observed.

After occupancy of the building the consultant may also continue to assist the owner by providing ongoing facility management services such as maintenance advice, changing occupancies and tenant issues.

Warranty
- Review reported defects during one year warranty period
  - Notify contractor of items requiring attention
- Carry out review of reported defects or deficiencies prior to expiration of one year warranty period
  - Notify contractor of items requiring attention
- Assist client in administering corrective action by contractor where defects or deficiencies occur within extended warranty period

Start-up assistance
Move management

Maintenance
- Maintenance programming
- Compile maintenance manuals
- Arrange maintenance contracts

Operational
- Programming
- Compile maintenance manuals
- Review operational procedures
- Facility operations meetings
- Facility performance meetings

Tenant-related services

Project promotion

Leasing services



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## 8. Tasks Generally Associated with Project Management and Administration

- Project management
  - Planning
    - Prepare project plan including man-hours and timelines
    - Set up project tracking and accounting system
    - Establish project filing system
  - Scheduling
    - Prepare initial schedule
    - Modify schedule as needed
    - Inform owner of schedule details and implications
    - Track schedule performance
  - Internal budgeting
    - Prepare internal project budget
    - Modify budget as needed
    - Track internal project costs
    - Track budget performance
  - Billings
    - Prepare periodic billings report
    - Prepare periodic fee invoices
    - Prepare reimbursable expense invoices
  - Staffing
    - Set up project team
      - Architects
      - Designers
      - Technical staff
      - Other
    - Communicate project requirements
    - Assign and monitor individual tasks
    - Monitor staffing needs
    - Prepare and distribute project directory

- Interaction with owner
  - Identify client's authorized representative
  - Obtain client's standards and requirements for drawings and other submissions
  - Maintain regular communication
    - Correspondence
    - Meetings
  - Reviews and approvals
  - Changes

- Consultant management
  - Consultant selection
  - Negotiate, prepare and execute consultant agreements
    - Planning



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- Civil engineering
- Survey
- Geotechnical
- Architecture
- Structural
- Mechanical
- Electrical
- Landscape architecture
- Interior design
- Furniture/equipment

Specialty consultants

- Environmental
- Acoustical
- Food service
- Traffic
- Signage/graphics
- Building code
- Special lighting
- Energy
- Seismic
- Cost
- Hardware
- Roofing
- Building envelope
- Security
- Marketing
- Other

Consultant and Owner's consultant coordination

- Insurance
- Licensing
- Scheduling
- Estimates
- Building systems
- General ongoing communication

Prepare and distribute project directory

Obtain consultants' requirements for investigation and testing as needed

Inspection and testing

Needs determination

Consultant selection

Specifications

- Soil
- Concrete
- Steel
- Roofing



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- Asphalt
- Building audit
- Other

Insurance
- Excess professional liability
- Property damage
- Builder's risk
- Personal liability
- Other

Meetings
- Owner
- Consultants
- Permitting and approval agencies
- Contractor
- Staff
- Public
- Other
  - Specify number of meetings

Project presentations
- Client progress meetings
- Public meetings
- Marketing presentations
- Special presentations

Cost estimating
- Data collection
- Research
- Quantity take-offs
- Consultant coordination
- Preliminary estimates
- Detailed estimates
  - Utilities: on and off site
  - Demolition
  - Site development
  - Base building construction
  - Tenant improvements
  - Furniture and equipment
  - Landscape
  - Allowances
  - Maintenance
  - Life-cycle costing
- Cash flow analysis



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Analysis of alternates
Report preparation
Report presentation

Value engineering
Design review
Building systems review
Research of alternates
Cost estimating
Evaluation analysis
Report preparation
Report presentation

Quality control/Quality assurance
Establish QC/QA procedures
Monitor QC/QA procedures
Design concept review
Technical review
Consultant coordination
Dimension check
Specification coordination



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## Volume 3A Section 1- The Entrepreneurial Project Manager

### Introduction

You have invested a great deal of time, effort and expense to win the project. When the client announced that you had been awarded the job, you felt that rush of satisfaction that comes when a goal is realized. Now it's time to settle down and get the job done.

There are many components to a successfully completed project. Obviously the technical competence of you and your team count heavily in the outcome. Fortunately, technical competence (although not necessarily brilliance) is fairly easy to come by. Most projects don't fail in their ability to meet technical goals. Many do, however, fall short of the financial, schedule, client satisfaction and general management goals which are established or assumed.

The burden of this effort falls on the project manager. Project managers take many forms. On small projects, the PM is often lead designer, technician, draftsperson and sometimes clerical staff. On the largest projects, the project manager is a senior staffer or Principal overseeing a large team which extends throughout the firm's office and beyond. In every case, and regardless of that person's seniority status in the firm, the project manager is the individual responsible for ensuring that all the project goals are met.

There is no shortage of books and seminars which teach Project Management technique. Even this manual has numerous Sections devoted to the step-by-step tactics of scheduling, budgeting and tracking projects. These fundamental skills are vital to success in Project Management. Without these most basic skills, your career as a project manager will be, or ought to be short-lived.

### Raising the bar of performance

All project managers worth their salt knows how to design, schedule and budget projects and steer them to successful completion. That's entry level stuff.

So what separates you from the amateurs? What does it take to move beyond the "kid's stuff" in project management?

The best project managers have long since realized that success in project management has to equal success in business. And successful project managers do far more than simply drag their projects across the finish line. They understand that schedule and budget compliance are the minimum requirement of project management success. They realize they need to build a much deeper set of skills and operate with a much broader outlook if they are to be successful.

One model which many successful project managers have adopted is that of the entrepreneur.

An entrepreneur is a self-directed person who operates a business which takes advantage of diverse talents and resources in order to service customers* and return profits. The key difference between an entrepreneur and a manager in a corporation is that the entrepreneur usually has, but in any case behaves as if he or she has a personal stake in the success or failure of the business. This attitude of personal ownership sets a high standard of performance in every aspect of their work. Entrepreneurs realize that, while they work together with a team to accomplish the goal, they, personally, are the driving force behind that team. While entrepreneurs may not, and often don't, actually perform the work, they are personally responsible for the quality of the work, the satisfaction of the customer and the financial return to the shareholders.

This attitude sets the performance bar high. Without an entrepreneurial attitude, it's easy to find countless reasons why the project will or did fail. The owner didn't supply the right information. The technical staff were incompetent. The permitting agency was too slow. The budget was inadequate. An entrepreneur, on the other hand, knows that failure is not an option. If the project fails, the company fails and they stand to lose everything. In a similar way, the entrepreneurial project manager knows that if the job is to be done, it's up to them. They accept no excuses and find ways to mitigate or remove the barriers to successful project completion.

What does it take to become an entrepreneurial project manager?

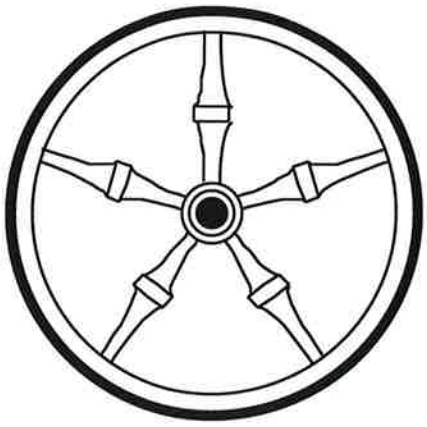
* Throughout this manual the word "client" has often been replaced with the word "customer." While "client" has been used forever in this industry, "customer" has a more personal implication. This is especially pertinent for the project manager with an entrepreneurial attitude. You have been a "customer" of many businesses and know the type of treatment which inspires you to return again and again. By thinking of your clients as "customers" the importance of high quality "customer service" gains a higher priority and helps to add even more value to your services.

## The Entrepreneurial Wheel

The entrepreneur's world is like a wheel with five spokes. Each spoke carries an equal weight and demands equal attention. Should any of the spokes break, the entire wheel will collapse.



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Each spoke represents an aspect of the entrepreneur's business which must be established, tracked and proactively managed in order to achieve success. The spokes represent, in order:

- Vision
- Marketing
- Finance
- Human Resources
- Delivery Systems

**Spoke # 1 Vision**

As we discussed in Volume 1, Section 1, no business can thrive without a compelling reason for being and a strong drive to contribute in a meaningful way. This is often called "vision." In the earlier section we discussed the vision which a design firm must have in order to distinguish itself from competitors and provide a compelling reason for clients to select it. For the entrepreneurial project manager, "vision" is equally important but in a slightly different manner.

There are two types of vision which are important to the project manager and both must be clearly understood and articulated.

The first type of vision is that which we've already discussed and defines and drives the firm and the team. What sets your firm apart from the competition? Why should a client select your firm over someone else? What is it, besides price, which makes your firm the one to beat?

**A vision for yourself**

These same questions should also apply to you as a project manager. There are many project managers out there. Most are good at what they do. Some are exceptional. What do you offer a firm and a client that they can't find elsewhere?

An entrepreneurial project manager will think of themselves as, "Me Incorporated." They understand that both the practice and the client are looking for the best. They make it their personal responsibility to continually upgrade their skills and increase their value to the marketplace. By working diligently to stay at the front of the pack, these project managers establish a reputation for themselves and are constantly in demand. Clients ask for these project managers to be assigned to their projects. Firms make offers of ownership.

All these results come from the project manager who has a strong vision of their unique contribution to the profession. Without this strong, overriding vision, you are just another adequate project manager.

**A vision for your project**

The second type of vision which the entrepreneurial project manager must cultivate is a vision about the project at hand. Every project is a unique undertaking. Each has its own origin and "hot buttons." No two projects are ever the same. Even if the scope is identical, the personalities of the participants, the culture of the organizations and the circumstances which establish the need are always changing.

To be successful, every project must also have a strong vision. The vision statement of a project will let everyone involved know what the team is attempting to accomplish with this work. If most of your projects seem too mundane to require or deserve a mission statement, perhaps you have become too jaded and would benefit from a higher purpose to your work!

Think about the following story which was related by the Principal of a Mechanical/Electrical consulting firm in New Mexico.

**Building Better Chips**

Several years ago, the silicone chip giant Intel, built an enormous manufacturing facility near Albuquerque, NM. Of course, every consultant and contractor for miles around wanted a piece of the action and competition was very tight. For its part, Intel insisted on making all A/E selections based on low price.

This practice was most frustrating and one consultant decided to do something about it. He made an appointment with the Director of Facilities and made an impassioned appeal for Intel to select on value, rather than price.



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The Director listened attentively and then said, "Every consultant has told me how well they can help me build my facility. They have related their experience and showed me countless pictures of other facilities they have built. But so far no one has talked to me about making computer chips. I am in business to make chips, not build facilities. The first consultant who comes in my office and shows me how they can help me make chips better will get all the work here and I won't even ask the price."

The purpose of that project was not to build a factory, it was to make chips better. What is the vision for the project on which you are currently working?

You can distill this vision by asking yourself:

- Why is your customer going ahead with this project?
- What are they trying to accomplish that is larger than the simple built stuff which you will provide?
- How can you show that you understand those goals?
- How can you help them achieve those larger goals?

By understanding and working from the larger goals of the project, you develop a vision which will let you bring more value to the customer than they ever could have expected. By bringing your client and your entire team into this shared vision, you stand out in the client's mind in ways which few of your competitors can mach.

Don't head into another project without first establishing a powerful vision for the project. Let there be an overriding goal of accomplishment beyond the mere technical requirements of the job. With this "double vision" that includes yourself as a project manager and the project itself, you will be in demand like no other.

## Spoke # 2: Marketing

### The Project Manager and the Store Clerk

Every one of us has had the experience of shopping at a store where the clerks were too busy chatting to realize we were there; where their body language spoke clearly that they weren't interested in serving us; where they made it clear we were just too much trouble. It's rare that we go back to those stores.

We have also shopped at stores where we were made to feel as if we were the most important person on earth. Where nothing was too much trouble and the clerk had all the time in the world for us. We shop at these stores repeatedly.

A large store chain may spend millions on advertising. They carefully ensure the stores are stocked with the right inventory. They continually rework the look of the store so it



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appeals to potential customers. They do relentless market surveys to ensure their pricing is in line with their competition. All this work will be successful in bringing a new customer in the door.

Then it's up to the store clerk.

In many ways, a project manager is like that store clerk. Your firm may work tirelessly to attract new clients. You may spend thousands chasing and winning a particular project. But it is only when the client has the chance to experience the service available from the project delivery team, will they decide whether or not to "shop at your store" again.

**Your Personal Marketing Plan**

Most firms obtain between 70% and 90% of their work from repeat clients. These are clients who have worked with the firm before and are pleased and motivated to come back to have you do additional projects.

Knowing their role as the crucial connection between the client and the repeat work they represent, the entrepreneurial project manager has a keen sense of their marketing responsibilities. They understand that their attitudes and actions in "customer service" will be as important in bringing the client back as their ability to complete the technical aspects of the project.

As an entrepreneurial project manager you know that:

**You** and your team have the single, most important role in the marketing effort.
**You** are the point where all the marketing hype is validated or disproved.
**You** alone have the power to bring a customer back, or send them away forever.
**You** are the person on whom the client depends to get the job done.
**You** have direct, personal responsibility for the level of service and quality throughout the project.
**You** have a direct responsibility to ensure a continuing supply of work.

With this understanding, you and your team will establish "Personal Marketing Plans" which are implemented every day, in every situation.

Most project teams, when asked to participate in "Marketing," immediately envision making those dreaded cold calls which most design professionals will do anything in their power to avoid. You can assure your team this is not their highest and best use and, while they will be asked to interact with clients, they will not be required to do telemarketing.

Establish your entrepreneurial and personal marketing plan by reviewing these questions with your team:



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1. How aware are you and your team of your role in turning customers away or bringing them back?

2. What can you do to make that "shopping" experience memorable for your customer during:

- Meetings
- Phone calls
- Project updates
- Regular communications

3. Are you always on the lookout for opportunities for:

- Extras
- Additional services
- Other projects
- Client maintenance opportunities
- Other likely clients
- Network building opportunities
- Networking opportunities
- Ways to make your client look good
- Public relations opportunities
- Good client references and testimonials
- Post project communications opportunities

By recognizing yourselves as that vital, personal link between the customer and your firm, you can easily identify the simple, everyday actions that will inspire your customers to come back project after project.

**Spoke # 3: Finance**

There is no escaping the fact that one of the project manager's primary responsibilities is to manage the project finances and ensure the job returns a profit to the firm. The entrepreneurial project manager will take this responsibility very seriously and will educate him or herself on the subtleties of project and firm finances.

Other sections of this manual have dwelt extensively on financial performance. Pay special attention to:

| | |
|---|---|
| Volume 2, Section 3 | Hourly rates |
| Volume 2, Section 5 & 6 | Calculating and compiling fees |
| Volume 3B, Section 1 | Profit: what it is, what it isn't, why you need it. |
| Volume 3B, Section 4 | Learning to calculate your overhead rate |
| Volume 3B, Section 5 | Using key indicators to "manage by the numbers" |



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These sections will give you the knowledge necessary to budget your projects and set adequate fees. They will also show you how project finances merge into overall firm finances and contribute or detract from the health of your company.

When focusing on the finances of the project itself, the entrepreneurial project manager will learn how to work with, monitor and manage project finances to steer the job to successful and profitable completion.

Many firms have some type of computer-based job-costing and tracking system in place. In fact, the most popular software programs are far more powerful and sophisticated than is necessary. It is certainly the case that most project managers and many firm Principals don't understand how the system works, what the various reports mean and how to interpret and act on the data provided. As a result, few firms are actually using the capability they possess.

The entrepreneurial project manager, on the other hand:

- Learns how to plan a project so it can be tracked carefully.
- Forecasts project expenditures before the job begins
- Tracks expenditures and determines schedule and budget status on a weekly basis
- Accurately assesses actual percentage completion
- Regularly compares actual completion to budget and schedule consumed
- Knows exactly where his or her project stands at every step along the way.
- Treats project management as a continual series of minor course corrections
- Takes early corrective action to keep projects ahead of schedule and under budget

Other sections of this Volume focus on techniques you can use to forecast, monitor and manage project finances to successful completion. Pay special attention to:

| | |
|---|---|
| Volume 3A, Section 2 | Project planning |
| Volume 3A, Section 3 | Tracking project progress using the Earned-Value Method |
| Volume 3A, Section 4 | Keeping your project on track |

In the discussion of Profit in Volume 3B, Section 1, the point is made that it is the project manager's job to deliver a profit on every project. The fact that your project is profitable should not be a remarkable accomplishment, it should be the normal course of events. While there are occasions when you may anticipate, for marketing or other purposes, to have a project which does not make a profit, these situations are rare and always pre-planned. The entrepreneurial project manager assumes responsibility for always delivering a profit and satisfying the customer's needs.

**Spoke #4 - Human Resources**

In many places throughout this manual, we have made the point that design professionals do not deal in inventory or machinery, they deal in ideas which are generated and implemented by trained and talented people. The resources which project managers use to accomplish their work are human.

As an entrepreneurial project manager, you must learn to understand and deal with those human resources on two levels:

1. You must first learn to understand and manage yourself
2. Then you can move forward to understanding and managing your team

**Understanding and managing your own personal human resource**

One of the characteristics of project managers in the design professions is that virtually every one has begun their career as a design professional -- an architect, an engineer, a planner, an interior designer, etc. They went to school and worked hard to achieve that goal and were motivated to work hard at improving those skills. In most cases, these dedicated professionals distinguished themselves in their profession and were rewarded with a promotion to the role of project manager.

While this common scenario makes perfect sense, there is a flaw in the logic. It is rare to find the architect or engineer who went through five or six years of university education looking forward to the day they could schedule and budget projects. The subject matter was probably never mentioned in school and few, if any, pressured the faculty for courses in project management.

Once into the working world, practitioners quickly discovered the vital need for project management, but it was seen, like laundry, as something that had to be done, not something you would choose to do.

Among the many people involved in this profession, some seem to have been born with a natural talent for project management. They are easily recognizable and respected for their abilities. When other design professionals are asked to list the characteristics of the best project managers they have ever known or worked with, characteristics similar to the following are invariably mentioned:

- Good communicator
- Well organized
- Good listener
- Understands the "big picture"
- Inspiring leader
- Team player
- Motivates others
- Manages time well
- Delegates work effectively



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- Technically competent
- Rarely gets flustered

In workshop after workshop, where participants are asked to characterize their favourite project managers, these traits are listed. Significantly, out of ten characteristics listed, the characteristic of "Technical Competence" is usually mentioned near the end.

What do we learn from this simple exercise?

The important lesson here is that the important skills necessary for success in project management are not those in which most design professionals have been formally trained. A quick look at the list confirms that few engineering or architectural schools offer courses in, "being a good listener," or "delegating work effectively." If a project manager has these skills, they were either born with them or they have learned them somewhere other than in their formal education.

Rising out of this question is the reasonable notion that you might not want to be a project manager. When a person is promoted to project manager status, it often means you get to do less of the technical and design work that you like to do. It can even be argued that the thinking process which takes those who have demonstrated excellence in their technical capabilities and moves them into a position in which these skills are much less important than the "people" skills in which they have little or no training is somewhat twisted.

Since you invested all that time and money pursuing your career dreams, and you have not necessarily sought to acquire the "softer" skills that are important in project management, you may decide you don't want to be a project manager.

Ask yourself if you have or want to acquire the personal skills it takes to be a successful, entrepreneurial project manager?

- Are you content to let others do much of the technical or design work on a project?
- Do you prefer the atmosphere of a team or do you work best as a loner?
- When things go wrong, do you mind taking the heat?
- Would you rather be the coach or the star player?
- Can you work well under stressful conditions?

This self-inspection is vital if you want to move forward to being a successful project manager. If you determine that this career path is for you, it's time to start investing in your own "human resource management" by upgrading your skills in:

- Interpersonal communications
- Time management
- Supervision and delegation



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- Leadership skills
- Written and oral communications
- Stress management
- Negotiating

**Understanding and managing your team**

If the resources a project manager must use to accomplish his or her work are human, they must learn how to manage those resources. Unlike managing equipment, machinery or inventory, human resources pose a particular challenge.

Perhaps making the project manager's job even more challenging is the fact that the human resources in the design professions are highly trained, highly intelligent and self-directed individuals. Each has his or her own, strong opinions of how things ought to be and often resist being told what to do. The management of groups like this has often been referred to as "herding cats."

Your job is to build a team and then nurture that team so it sets and then exceeds its own high standards of performance.

**Recruiting and Motivating**

While we all know how hard it is to find good talent, the best people are always attracted to work with the best project managers. Your job is to set your project standards high enough to attract the best talent that's out there. A really fine firm and its best project managers never have trouble finding good talent.

As an entrepreneurial project manager, you have an ongoing need to attract, recruit and train top talent. The best way to do this is to make your team a "talent magnet" by:

- Setting your standards high and sticking to them.
- Understanding that individual team members have differing levels of interest in a project.
- Acquainting yourself with your team members and learning what drives them.
- Recognizing individual achievements, contributions and quality work, with open praise.
- Writing a memorandum of praise and placing a copy in their personnel record.
- Knowing that reward or recognition should be immediate or the value to the recipient diminishes.
- Keeping any corrections or reproofs that are necessary prompt and directly related to the event which triggered them.
- Keeping your admonitions for mistakes or poor performance completely private.
- Knowing that an employee's time is their most valuable commodity and recognizing and rewarding their contributions.



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**Delegating**

Always remember that your title is project manager, not Project Doer. As a manager, your task is to leverage the efforts of others towards the completion of the work.

Always

- Begin with preparation and systematically plan what to delegate and what to do yourself.
- Think through the activities the team member will need to do to complete an assignment
- Specifically outline that individual's or team's responsibilities

- Ask for feedback to ensure the assignment has been fully understood. One of the most frequent mistakes made by project managers is assuming that other people understand what's going on and know what they are doing.

- Challenge the time estimate to complete any task. Given the option, everyone will ask for more time to complete a task than may be necessary. However, you must always work with the staff and team to get their "buy-in" to your schedule. If they don't believe from the outset that it can be accomplished, the schedule will fail.

- Grant the team member enough authority to complete the assignment.
- Be certain the individual has the resources to do the job
- Check periodically to determine if you've given too much or too little authority and adjust appropriately
- Ask the team member if you've provided enough information
- Focus on what needs to be done, not how to do it
- Take time to review completed assignments
- Thank a team member and show that you notice high-quality work

Never

- Let two or more individuals be responsible for the same task
- Overly structure the assignment so the individual has no latitude to make decisions
- Demand that the individual work in exactly the same manner as you would. This removes authority, responsibility and creativity. Instead, focus on the end result, not the step-by-step means of getting there.
- Re-do the assignment yourself. Nothing undermines trust greater.
- Avoid confronting a team member about substandard performance



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Red Flags

You know you need to improve your delegation skills if:

- You're just too busy. You are under constant pressure, usually miss personal deadlines or spend a great deal of time on activities that you would not personally pay your charge-out rate for.
- You're often surprised by team members doing things other than what you expected or intended, and job quality is below the standards you expect.
- Productivity is low or dropping and team members seem less efficient and unmotivated.

**Spoke # 5: Delivery Systems**

**Process vs. Project**

Most businesses which breed successful entrepreneurs are "process" driven. This means they establish a successful process for accomplishing work or producing a product and then manage that process. Projects and products come and go, but the process by which they are developed and completed gives the company its strength and competitive advantage. Over time, continuous fine tuning and adjustment of the process makes it better and more profitable.

Design professionals, on the other hand, are "project" driven. They work from one project to the next with little regard for a standardized process which would make the production of work faster, easier, more accurate, and more profitable. With an intense focus on maximizing billable time, the incremental improvements which are made in the "process" are developed in rare moments of "stolen" time. Compounding this problem is the strong belief that every project is different and should be approached with a "clean slate" in order to give the client maximum value. Making a standardized process even more challenging is the "herd of cats," each of whom has and vigorously defends, what they believe to be the best process.

The entrepreneurial project manager recognizes this dilemma and works to balance the need for standardized processes against the value of a unique approach.

The entrepreneurial project manager will find the best processes and systems which will allow him or her to accomplish projects faster, more accurately, and at lower cost. Once they have found these processes, they are very intolerant of individuals who take it upon themselves to use a different set of standards or procedures and undermine the strength of the team. If adjustments or changes are to be made in the process, they will be reviewed, tested and adopted by the team, not by individuals at their own discretion.



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## Standard Procedures

Why do you need standards? In general the most significant advantage offered by any standard procedure is the ability to re-use and leverage previous efforts. In order to do this effectively any standard must be:

- Easy to find, understand and use
- Consistently formatted
- Usefully organized
- Accessible to everyone

Standards should never exist for their own sake. As we've repeated numerous times in this manual, your firm lives and grows on knowledge and information which is the foundation of the value you bring to your clients. The use of standard procedures allows that information to be:

- Easy to find, understand and use
- Consistently formatted
- Usefully organized
- Accessible to everyone

and makes it available for effective reuse. It's not coincidental that the standards and the information are judged by the same criteria. In addition, standards will:

- Improve the way you communicate and coordinate information
- Allow you to re-use and benefit from your highest quality work
- Increase productivity by reducing repetitive effort

However, unless everyone adheres to your standards, your office and especially your computer capability will only experience dramatically increased overhead costs. Standards must be universally accepted and adhered to within your team. There are plenty of firms who claim to have developed standards and who can dust off the manual to prove it. But when you look at the computer terminals, the filing cabinets, the correspondence going out of the office and the schedules and budgets being prepared, it's everyone for themselves!

## Types of Standards

Standards fall into three categories and each is equally important to be addressed.

1. Standards of organization



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For example:
- Computer and paper filing and storage systems
- Consistent file and document naming
- CAD layering organization

2. Standards of communication
   For example:
   - Graphic standards
   - Symbol and detail libraries
   - Standard forms and templates
   - Letter and memo writing
   - Meetings and their minutes

3. Standards of procedure
   For example:
   - Scheduling techniques
   - Task delegation
   - Preparation and documentation of calculations
   - Review and quality control
   - Project monitoring and reporting practices

As you work to develop a set of office and team standards, keep these principles in mind:

1. The standards should be kept as simple and straightforward as possible. Complexity for its own sake only adds to confusion and resistance to the use of the standards

2. Stay away from committees. Assign only one or two people who can focus on the work, not the committee.

3. Give those assigned to develop the standards a strict and short deadline and then allow them time to get it done. Do not expect this type of work to be done as an extra curricular activity.

4. Assume that the standards which are developed will continuously evolve. This will be an ongoing process as you work with the standards and discover weaknesses or better alternatives.

5. Prepare a printed manual and distribute it to everyone. Hold a meeting to present and discuss the standards. Make sure everyone is aware of them and the importance of adhering to them.

6. Enforce the standards by refusing to accept work which is not in conformance. Unless they know you are serious, the entire effort is a waste of time.



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7. Establish a regular schedule for the review and revision of each section. Focus on a different section every 3 months. Encourage your team to submit their ideas and experiences with the standards and include those comments in the review process.

8. Keep the manual revised and updated regularly. Develop the habit of issuing the next update on a regular basis. Don't allow the manual to collect dust.

9. Hold regular gatherings to discuss and review the standards and educate your team about new developments.

**How does a PM become an Entrepreneur?**

The model of the entrepreneurial project manager is one which can drive your project success rate to new heights. It does, however, call for a change of thinking on your part. The world of the entrepreneur is not familiar to most design professionals and you need to make an active decision to adjust your thought process. Do this by:

1. Exposing yourself to the entrepreneurial world.

- Join a business roundtable or a weekly breakfast meeting of local business people through your Chamber of Commerce. Get the outside perspective they can provide on the world of business in general and their specific buying needs and habits.

- Determine to learn something new from an industry other than yours. What can you learn from retail, from banking, from manufacturing that could be useful to your operation? While it's unlikely you will learn methods which can be directly translated into your practice, be open-minded about how you could adapt their strategies to your advantage.

- Subscribe to and read business journals. While you must continue to keep abreast of professional issues reported in the architectural and engineering journals, add a monthly small business magazine to your reading list. Pick up a copy of "Inc.," "Success," "Fortune," "Entrepreneur" or other general business publication. Again, keep your mind open to what you can learn from other entrepreneurs who face many of the same struggles as you.

- Establish an Advisory Board made up of individuals who are not from your firm or even your profession. Let this Board meet quarterly or twice yearly to review your progress, help you set goals and provide their detached, outside-perspective views on the world-at-large and your place in it.

2. Setting specific entrepreneurial performance goals.

- At the beginning of each year, or even twice per year, sit down alone or with your team and establish a set of profit goals for your projects. By working together to set these targets, you will have a high level of commitment from everyone to achieve your goals.

- Establish a defined set of Customer Satisfaction ratings which can be measured by a simple survey. Take an initial survey of your existing clients to establish a base line, then conduct yearly or twice yearly surveys to monitor your continuously improving performance in each category.

- Invite formal or informal peer review of your project management techniques on a regular basis. Keep a scorecard of your performance in each important category and set new goals for achievement each year.

3. Measuring entrepreneurial performance.

- Get competitive! Monitor the various professional surveys and business reports to see how your growth and performance ranks against that of your peers and your competitors. Establish the key indicators which are most important to you and set annual goals for improved performance.

- Chart your progress regularly. Keep your entire team informed of your entrepreneurial performance in regular meetings and by a chart on the wall. Only when these performance issues are kept front and center will they become important in the day-to-day decision-making and thought process of your team.

4. Rewarding entrepreneurial performance.

- Celebrate success. Take time to recognize both individual and team accomplishments when goals are met. If you fail to reinforce this mode of thinking, it will quickly fade and your high-performance team will return to the standard methods of doing business in the design professions.

- If you and your team are going to think like entrepreneurs, you should be rewarded like entrepreneurs as well. Be sure, though, that you are not providing exceptional rewards for merely adequate performance. Remember, a project manager's job is to deliver a profit on every project. Only when the budgeted profit, or some other predetermined standard is exceeded, should rewards which are above and beyond normal compensation be shared.



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## Volume 3A Section 2 - Project Planning

### The Importance of Planning

Imagine this situation: A client of yours, say a developer in the commercial office business, decides they are going to put up another project. They've done this many times before and they know the process, so they decide they don't need an architect. After all, putting up a simple office building isn't that tough. It's just a matter of following a few simple steps.

Step one: Dig a hole.

Step two: Start pouring concrete for foundations.

Step three: Start pouring concrete for the walls or core of the building.

Step four: Realize you've poured the foundations in the wrong place so tear them out and start again.

The idea of starting a project as large and complex as a building, even a relatively simple on, without first planning the project, is so foolish it's laughable. The entire reason the profession of architecture exists is to plan projects on paper or the computer first, before committing to the expense of actual bricks and mortar. Tearing out a foundation on paper is a lot less expensive than taking them out with a jackhammer.

By planning the entire project ahead of time, we learn where the problems are likely to occur. We identify conflicts and solve them while the cost is still relatively low. Architects love to tell prospective clients that the design fee is but a tiny fraction of the total cost of the facility. The investment in pre-planning assures a project that will run more smoothly and the finished product will meet their objectives and expectations.

Question: If we're so good at planning other people's work, why do design professionals do such a poor job of planning their own?

There is no good answer to this question. Simply an excuse that architects, once handed a project, love to dive in and start working on the job. Since surrounding ourselves with the design and the technical challenges is far more entertaining and satisfying than preparing schedules and budgets, architects like to put off or altogether avoid the planning work which should go on before a project begins.



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The results are just as predictable as they are for the client who starts building without a blueprint. We start working on a project only to discover that we have missed an important piece of information or failed to coordinate with another vital discipline. So we undo the work we've done and start over. Or we redo work which has been done before because we neglected to plan the proper sequence of the work.

On project after project, design professionals spend more time, more money and more effort than they ever need to because they fail to plan their work. Although it's almost impossible to measure accurately, it has been estimated that the average project spends between 25% and 50% of the project budget on:

- Tasks which have already been done once, but must be done over
- Work which is not within the scope
- Re-doing work which has not been properly coordinated between the disciplines
- Exploring even more design options when the budget only allows for limited design work

These and many other "un-planned" activities eat away at a project's budget, schedule, profitability and ability to meet client expectations. All of these activities can be minimized or avoided altogether by good, upfront planning.

**Why do you need to plan your projects?**

Architects must plan their projects for the same reason that their clients' projects must be planned. The undertakings are just too complex to simply walk into and start working. If unplanned, something is bound to go wrong.

Architects also plan because the planning process provides a means of measuring the progress of the project once it is underway. Without the ability to measure progress, it is impossible to know where a job stands and whether or not it needs special attention.

The overriding objective of the planning process is to break any project into small, manageable parts that can be delegated or undertaken in a logical, progressive manner. Then, as each part of the project is completed, the project manager can measure progress, quality and client satisfaction along the way. If, at any time, the measurement system indicates the project is heading off track, the project manager can take preemptive action instead of waiting until the end of the job to discover it ran over schedule and budget.

Before a project begins, the project manager, along with the extended team including any in-house staff, the client, any other consultants and, if possible, the permitting agencies, the contractor and any others who have significant input, will work together to assemble a Project work plan.

**The project work plan**



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Some of the elements of a good work plan have been discussed at length in other parts of this manual. Others have received only passing mention. Depending on the size and complexity of the project at hand, you should put the appropriate level of time and effort into preparing your work plan.

For some projects, preparation of the work plan will take you less than an hour. It will take the form of a few notes on a page. For others, project planning could take days or weeks and require the input of many people. You must be the judge of the appropriate level of effort necessary to plan your project.

In total, there are eight elements in a good work plan. These are:

**1. Project Definition.**
(Why you are doing the work)

**2. Work Breakdown Structure**
(How you're organizing to do the work)

**3. Task List**
(The details of what needs to be done)

**4. Schedule**
(When things are going to get done)

**5. Organization Chart**
(Who is responsible for getting it done)

**6. Budget**
(What it will cost to get it done)

**7. Quality Management Plan**
(How you'll make sure it's done right)

**8. Client Management Plan**
(How you'll keep the client happy as it's getting done)

We will examine each of these elements separately.

**Work plan element #1: Project definition.**

In the previous Section (Volume 3A, Section 1) you read about the need for a "vision" for the project - an understanding of the larger goals which the job is to accomplish. The story was told of the silicon chip factory in which the goal of the project was not to construct a factory, but to build chips better.

This concept was also discussed in Volume 1A, Section 5 where you learned to define the scope and establish a clear understanding of the larger goals of the project by asking questions such as:

- Why is the client doing this project?
- What problem will it solve?
- What opportunities will it create?

Obviously the approach you take to a temporary "fix-it" job that will be replaced in two years will be different from the approach you take to the design of a new facility.

So the first element of your work plan is a clear "vision" for the project at hand.

Without a clear definition it's just too easy for the project to go off track as you and your team explore alternatives which do not relate to the client's overall goals. However, by understanding and working from the larger goals of the project, you develop a vision that will let you bring far more value to the customer than they could ever have expected.

Once this vision and definition have been distilled, communicate it so the entire project team shares in this understanding.

**Work plan element # 2: The Work Breakdown Structure (WBS)**

The concept of a WBS has been discussed at length in both Volume 1A, Section 5 and Volume 2, Section 1. It has also been mentioned in numerous other places throughout this manual. The WBS is such a common theme because it forms the foundation of your entire work plan. It is the common framework from which all planning is done.

By breaking the work down into small elements, the WBS increases the likelihood you will account for everything. This has two major advantages. First, you will complete all the work expected by the client. Second, you will be able to easily identify work which is outside the scope and for which you are receiving no fee. The first is vital for client satisfaction. The second is vital for financial success.

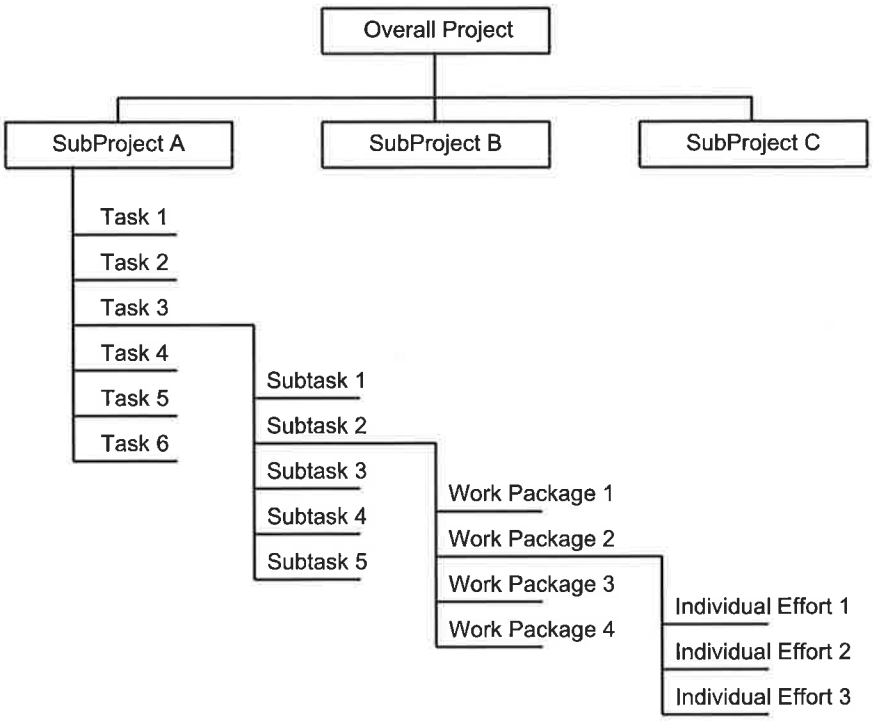
Since design and construction projects are most often large, complex undertakings lasting months and sometimes years, there isn't a project manager who can successfully keep the countless individual tasks organized in their head. They must have some means of orderly arrangement which allows them to comprehend the project at a glance and know, at any time, the status of the overall job and each of its elements. The only way to do this is to break the project into component parts organized in a WBS.

The two sections cited above provide extensive discussion and step-by-step instructions on the development of a WBS. This is likely the most important element in your work plan and the one on which you should spend the most time.



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Once it has been complete, provide a diagram of your WBS to all team members so you are all working from the same organizational perspective.




**Work plan element # 3. Detailed task list**

If the WBS is the framework of the project, the task list is the in-fill and detail of how you and your team members will be spending your days in the coming weeks or months.

These two work plan elements are integrally related and could even be seen as one and the same thing since the detailed task list fills in the blanks of the WBS. The process of preparing the detailed task list can be daunting and it is tempting to simply adopt the task list from a previous project. The danger of this practice is the risk of including or excluding an important item which sets this project apart.

Volume 2, Section 2 provides an extensive checklist which you can use as a prompt to see if your list is complete. It also provides detailed instructions and advice regarding the preparation of your task list.

Like the WBS, you should put a priority emphasis on the development of your task list. If you hurry this process, you are likely to miss important items which will come back later to haunt you either as mistakes on the project or errors and omissions claims by the client.

When preparing your detailed task list:

1. Start from scratch with a new list each time. Don't depend on a pre-printed list or modified list from a previous project. Use the list provided in Volume 2, Section 2 as a guideline and a thinking prompt only.

2. Keep it simple. Never exceed seven to ten items at any level in the WBS.

3. List everything that impacts your schedule whether it falls under your contract or not. You will identify "what's included" and "who does what" during negotiations and discussions.

4. Include project management as a task on your list because no project can be completed without being managed.

**Work plan element # 4: Schedule**

There are numerous scheduling techniques and systems available to today's project manager using automated and manual methods as well as combinations of the two. In the spirit of keeping things simple, though, there are only three techniques which most project managers need to master and use on a regular basis. These techniques are:

- Milestone Scheduling
- Bar Chart Scheduling
- Critical Path Scheduling

This listing shows the techniques in ascending order of complexity, detail and level of effort in preparation. Each method has its merits and drawbacks and your job is to select the best method for the project at hand. The method you choose will be influenced by the complexity and length of the job and the makeup of the project team. Projects which are large, complicated and using extended teams will require a more complex scheduling approach. Those that are small and require only a few team members can use a simpler method.

Keep in mind that larger projects are made up of many smaller projects. While you may schedule the entire job using Critical Path Scheduling, you might find that small groups, working on isolated aspects of the project, will find a Milestone Chart very beneficial for their work.

**Milestone Scheduling**

A Milestone Chart is a very simple scheduling method. In its most basic form, the chart shows the list of tasks to be completed and the due date for each task. The chart is



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distributed to team members or, if you are working alone on a project, pinned up in front of your desk, to focus the effort on the deadline.

Referring back to the case study project which was outlined in Volume 2, Section 1, here is how a Milestone Schedule might look for the portion of the project in which the existing building must be studied and documented.

| **Task:** | Study the Building | **Deadline** |
|---|---|---|
| 1 | Conduct historical research | 26-Mar |
| 2 | Obtain existing old drawings and photographs | 9-Apr |
| 3 | Prepare structural evaluation | 2-Apr |
| 4 | Determine construction materials and methods | 2-Apr |
| 5 | Identify and evaluate major and minor defects | 16-Apr |
| 6 | Prepare measured drawings | 7-May |
| 7 | Prepare photographic documentation | 14-May |
| 8 | Conduct adjacent building and property condition survey | 23-Apr |
| 9 | Assess utilities both on- and off-site | 30-Apr |

Milestone schedules are best used on smaller projects of short duration with a small project staff. Obviously, this includes smaller sub-projects within a large, complex one. They offer a number of advantages to the project manager including:

- The simplicity of preparation
- The low cost of preparation and revision
- A focus on deadlines

These advantages must be weighed against their shortcomings which include:

- No indication as to when tasks should begin in order to achieve the deadline
- No capability for reporting project status
- No reflection of the interrelationships between tasks

Even with these disadvantages, Milestone Schedules can and should be used by all project managers on small projects or for isolated sub-projects within larger jobs.

**Bar Chart Scheduling**

The bar chart is also simple to prepare and use and is probably the most popular scheduling method. It consists simply of a gridded sheet with the tasks listed down the left side against a time scale along the horizontal axis. Horizontal bars indicate the planned start and finish dates of each task. The length of the bar is proportional to the duration of the task.



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| | week ending | March | | April | | | | | May | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Task:** | Study the Building | 19 | 26 | 2 | 9 | 16 | 23 | 30 | 7 | 14 |
| 1 | Conduct historical research | | | | | | | | | |
| 2 | Obtain existing old drawings and photographs | | | | | | | | | |
| 3 | Prepare structural evaluation | | | | | | | | | |
| 4 | Determine construction materials and methods | | | | | | | | | |
| 5 | Identify and evaluate major and minor defects | | | | | | | | | |
| 6 | Prepare measured drawings | | | | | | | | | |
| 7 | Prepare photographic documentation | | | | | | | | | |
| 8 | Conduct adjacent building and property condition survey | | | | | | | | | |
| 9 | Assess utilities both on- and off-site | | | | | | | | | |

Bar Charts are used on every size and shape of project imaginable. Bar Chart Scheduling is, by far, the most commonly used method of preparing and documenting schedules that exists. This is for good reason since Bar Charts offer a number of significant advantages:

- An easily and commonly understood graphic representation
- Ease and low cost of preparation and change
- The display of both starting and completion dates for tasks
- Appropriate for all but the largest and most complex projects
- The availability of many computer-based programs to prepare Bar Chart schedules
- The ability to prepare them manually on simple graph paper if necessary

Despite these many advantages and their obvious popularity, Bar Charts don't do everything. Bar Charts fail to:

- Show the interrelationships between tasks
- Prioritize the tasks in any way
- Assist the project manager by identifying which tasks are critical to reaching the end date

Because of their distinct advantages, you should plan on using Bar Chart Scheduling to plan and document the majority of your projects.

**Critical Path Scheduling**

Large, complex projects on which many people are working over a long period of time call for a more sophisticated method of scheduling. Since these projects are made up of so many smaller tasks, all of which contribute to the overall completion of the job, it's vital that the project manager know how the various tasks are dependent upon one another and which tasks have top priority for completion.

Critical Path scheduling identifies those tasks within a project which have a direct effect on the final deadline. Stated another way, the critical path is the shortest possible "path" through the project. If any of the tasks on the critical path go over their allotted time, the



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deadline for the project will be missed. With this knowledge the project manager can exercise a level of control and judgment over a project which is simply unavailable with other scheduling methods.

Critical Path Method (CPM) allows in-depth project schedule analysis for managing large, complex projects. It has the graphic clarity of the Bar Chart method plus the additional benefit of defining and showing task interdependencies and priorities.

While CPM is the most thorough and accurate scheduling system, it's also complex to understand and prepare. Even with computer-based scheduling software, a project manager must have a thorough understanding of the method to make the best use of it.

CPM offers the advantages of:

- Clearly identifying the relationships between tasks
- Identifying those tasks which influence project deadlines
- Providing a high level of project control for the sophisticated project manager

The disadvantages of using CPM are:

- The high cost and effort of preparation
- The need for regular schedule maintenance and updating to be of continuing use
- The difficulty in understanding the charts and communicating to the rest of the team

**Preparing a CPM Schedule**

The first step in the preparation of a Critical Path Schedule is perhaps the most difficult. It is to establish the relationship that exists between each of the tasks. Fortunately, there are only three possible types of relationships between the tasks on any project. The three possible relationships between any two tasks are:

1. Task A must be completed before Task B can begin.

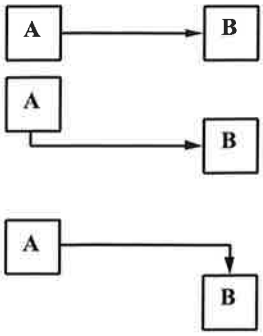
2. Task A must be at least partially completed before Task B can begin.

3. Task A must be entirely completed before Task B can be completed.

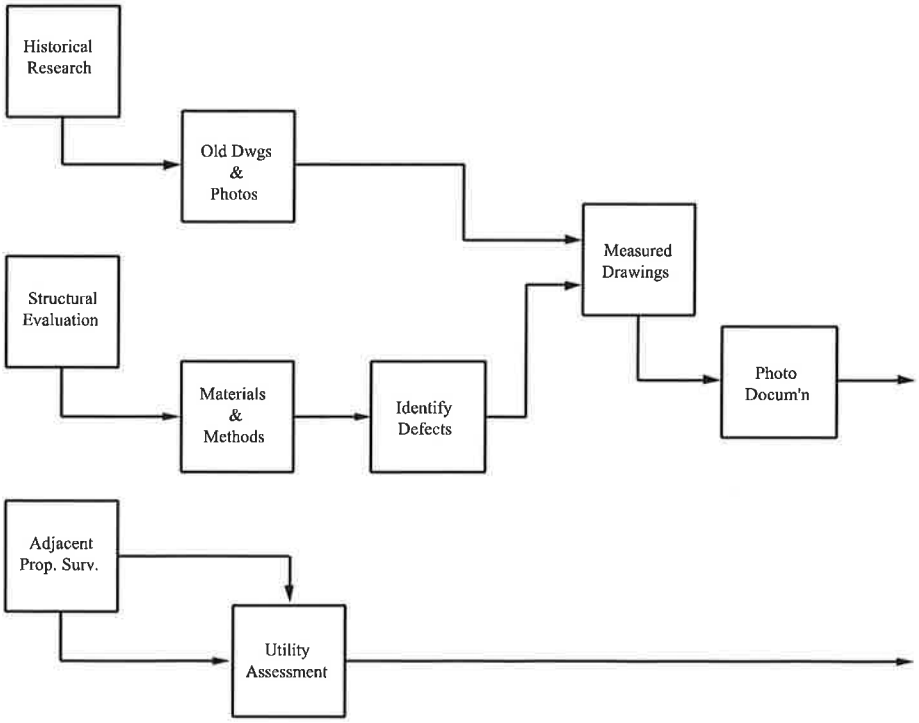
These relationships are graphically represented like this:



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When all the relationships between each pair of tasks on the project have been determined, a "task interface diagram" graphically illustrates these various task relationships.




Notice how, in at least one case, two tasks have both the Type 1 and Type 2 relationships. This is not uncommon. A high-profile example would be the traditional tasks of Design Development and Working Drawings. In this case, Working Drawings can't begin until Design Development is at least partly underway. Nor can Working Drawings be complete until Design Development is 100% finished.

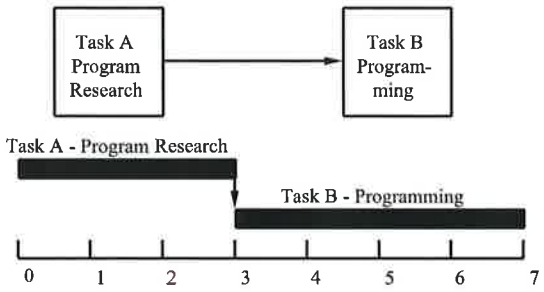


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When you have determined how each is task is related to all the other, the next step in the process is to determine the duration of each task. In the budgeting process discussed in Volume 2, Section 4, you learned to develop a duration chart that identified the number of hours required to complete a task. It's unlikely those hours would be put in all at once. It's more likely they would be spread out over a period of time. When preparing a Bar Chart or Critical Path Schedule, you must estimate the length of time over which those hours will be expended.

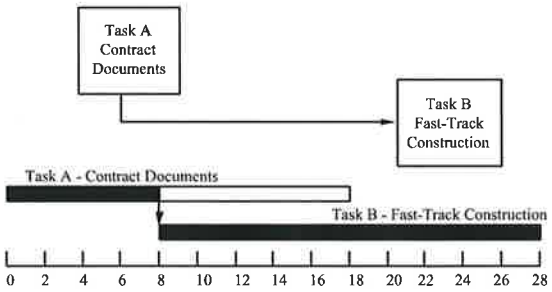
Type 1 Relationship

Task A = Programming Research (3 calendar days)
Task B = Programming (4 calendar days)




Type 2 Relationship

Task A = Contract Documents (8 weeks)
Task B = Fast-Track Construction (20 weeks)

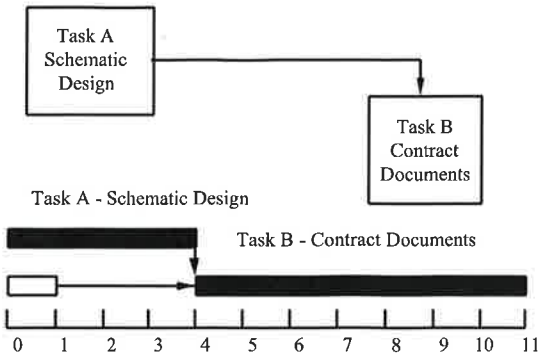



Type 3 Relationship

Task A = Schematic Design (4 weeks)
Task B = Contract Documents (7 weeks)

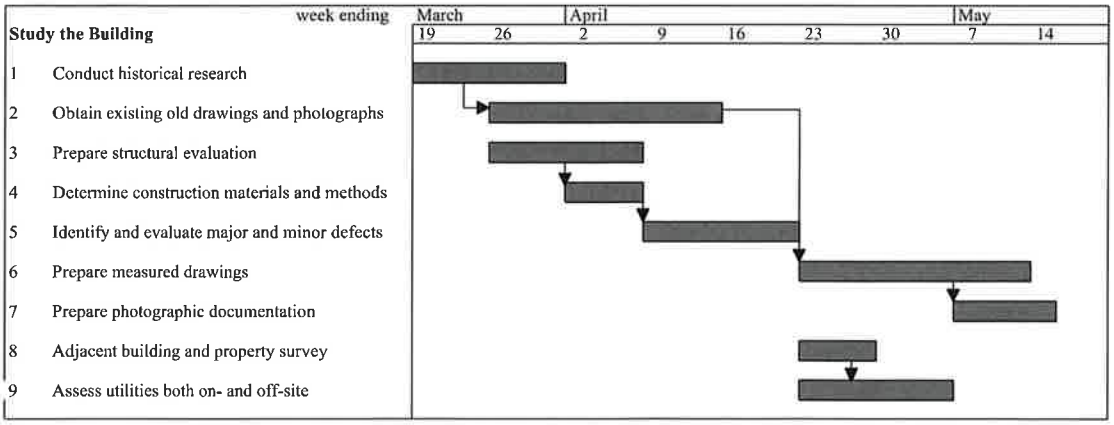


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Notice how, in the Type 2 and Type 3 examples, there is more time in the first and last tasks respectively, that can be completed either before or after the second task comes onto the critical path. This is known as "float" and represents the areas where a project manager has flexibility to shift his or her own time or that of the staff members working on the project. As is evident from the diagrams, these "non-critical" tasks which are off the critical path can only be delayed for so long before they would affect the deadline.

Step three is to combine the task-based precedence diagram with the time-based duration chart. This results in a bar chart-looking diagram, on which are superimposed the relationship arrows of the precedence diagram.

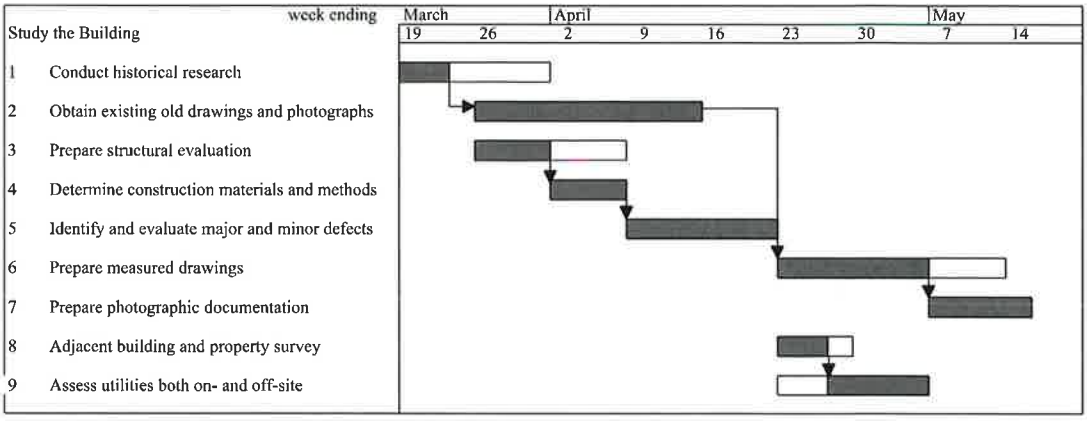



The final step is to determine those tasks which are "critical". Critical tasks are those which will affect the duration of the overall project if there is any delay in their completion.

For smaller projects, this task can be done visually from the time-based precedence diagram. For larger, more complex projects it will be necessary to tabulate each task, detailing its start date, duration, finish date and float time. For very large projects, the manual determination of critical path becomes almost impossible manually and demands the use of a computer-based scheduling system.



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## Common Mistakes in Project Scheduling

There are many pits into which project managers can fall as they assemble project schedules. Here's how to avoid the most common ones:

- Don't forget to schedule time for the corrections and changes which always follow any review
- Be sure to let the client know about their role in maintaining the schedule.
- Confirm that all the necessary ground-work has been completed before you schedule tasks to begin.
- Never assume that all the staff you will need will always be available when you need them
- Build in enough time for the not-so-obvious tasks like phone calls and meetings
- Assume that none of your deadlines will be met and develop contingency action plans for the day your assumption comes true

## Traits of a Good Schedule

A schedule is far more than just a chart pinned to a wall or submitted in a proposal. It's a working tool, necessary for the successful completion of your project. The best schedules will always:

1. Simplify the process and allow everyone on your team to understand what's going on. The simple schedule will also be easy to change and update.



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2. Unite and motivate the team because it has been developed in cooperation and with the commitment of everyone.

3. Help you understand how the tasks are interrelated.

4. Anticipate the worst by building in slippage, forcing early deadlines, and including time for non-technical tasks like Project Management.

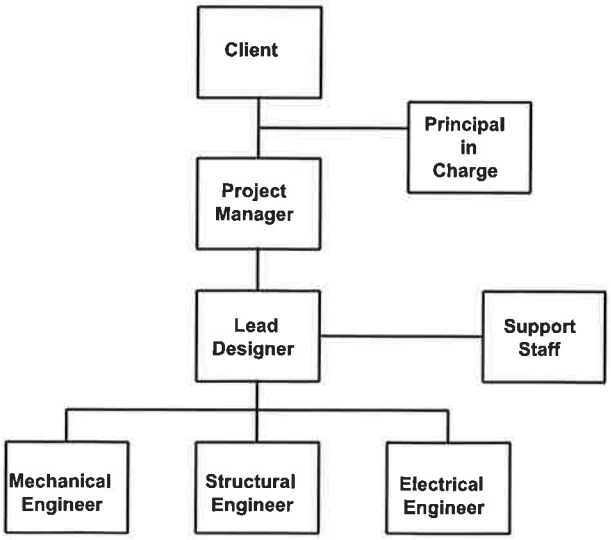
**Work plan element # 5. Organization chart**

Any time your project is to be accomplished by more than one person you need to determine how the effort is to be divided up amongst the team members. Of course, there is never a time when a project is done by a single individual since every project involves at least one design professional and one client.

The organization chart must address two major questions:

1. Who is responsible for each area of work to be accomplished
2. How will communication take place between the various team components

The traditional organization chart is a mainstay of the profession. It has been seen in virtually every proposal that has ever been submitted and might look similar to this:




Characteristic of this type of organization chart is the boxes with names and titles and the "chain of command" which runs up to top. While the names in the boxes might change, the chart remains virtually identical from project to project.



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Unfortunately, while charts like this may show who is responsible for a certain part of the work, they do little or nothing to explain how you intend to "organize" to get the work done. While the example chart is generic, it is not unlike many that appear in projects all the time. Taken at face value, this chart says the engineers only ever speak and report to the lead designer, who passes their information on to the project manager who speaks to the client. The engineers never have an opportunity to meet with the client. Of course, this doesn't ever (or, at least, should never) happen. Communications and meetings take place between every level of the project.

Nor does this organization chart reflect any unique aspects of the project. For example, there is a great deal of difference between how a firm should organize to accomplish a traditional design-bid-build project versus a fast-track or design/build project. Yet the organization charts for each of these jobs more often than not looks the same.

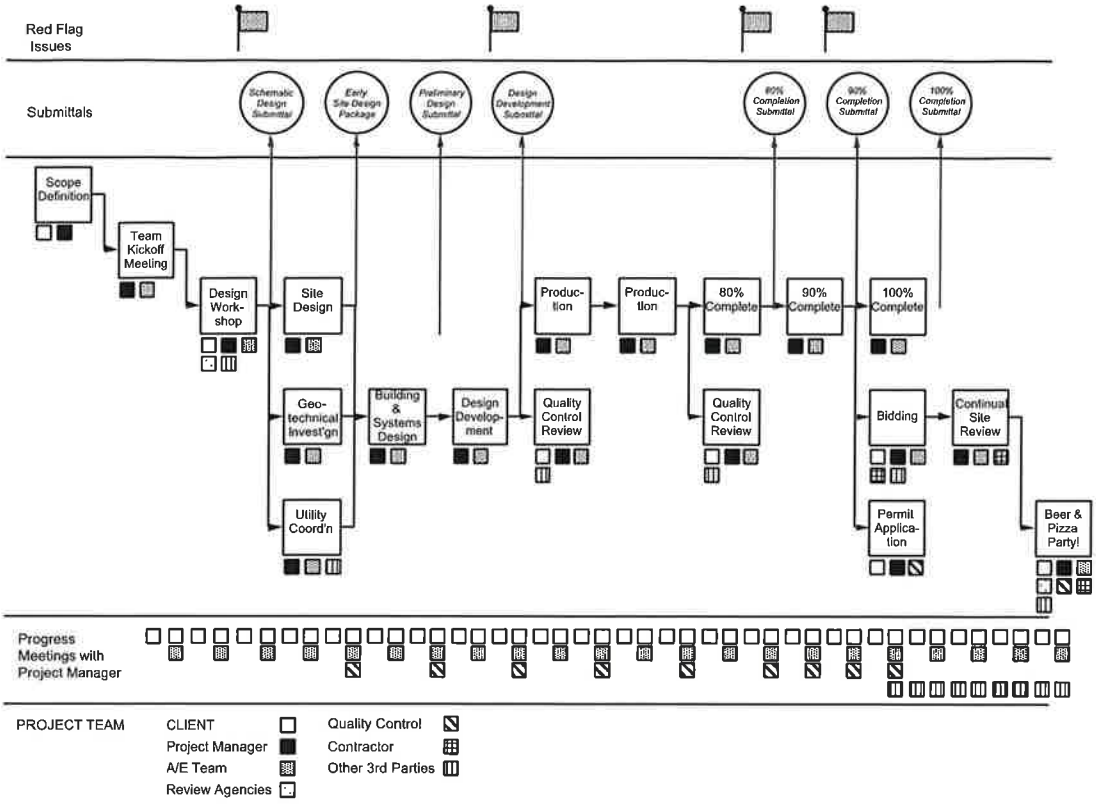
When preparing your work plan, augment the traditional organization chart with annotations that refer to how communications will take place. If the project warrants, include some notes regarding how special circumstances will be dealt with. The traditional organization chart should perhaps more correctly be called a Responsibility Chart. To that you should add some notes about how those who are responsible will actually organize and communicate amongst themselves to get the work done.

One firm, working on a very large project, decided to prepare a "Management Organization Chart" which identified not only the various responsible parties, but how their tasks would evolve through the life of the project. This chart illustrates the flow of activities through the course of the project and identifies the team player or players who carry responsibility for each activity. Key submittal points are also shown as well as "red flag" points, where projects can often become bogged down.

By identifying key tasks and the team members who had key responsibility for each of those tasks, the chart, while complex, painted a clear picture of how the project would be completed.



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## Work plan element # 6. Budget

Volume 2 of this Manual is almost entirely focused on preparing your project budget. Obviously this is a vital component of your work plan. The budget identifies the costs associated with each task of the project and develops a total cost and fee to be charged to the client.

In your work plan, the budget must recognize and allocate for each of the budget components which are:

1. Direct labour
2. Overheads
3. Other direct costs
4. Contingency
5. Profit

It is never enough to simply calculate a total fee which you will charge to the client for the work. It is vitally important that your budgeting process identify the breakdown of costs for all the tasks and responsibilities throughout the project. Only then can you properly manage the job once it's underway.

Throughout Volume 2, and particularly in Sections 5 & 6, you are encouraged to use as many budgeting methods as possible to determine both the project costs and your overall fee. Using a single budgeting method will give you a budget number. But only when your number has been confirmed by numerous other methods can you feel comfortable in quoting that fee to the client and working to ensure your profit on the job.

In the end, your work plan must break the project budget down into its various components in the Bottom-Up Budgeting format shown in Volume 2, Section 5. This will then be used as the basis of your project progress tracking which is discussed in Volume 3A, Section 3.

**Work plan element # 7. Quality management plan**

Every client has a different set of project expectations. Likewise, every project calls for a particular level of quality and attention to detail. While design professionals seem genetically programmed to be perfectionists, not all clients are willing to pay for absolute top quality. Because many project managers fail to address the issue of quality at the earliest stages of the project, many jobs either fail to meet client expectations or, more commonly, "over-shoot the runway" and provide quality standards which are far in excess of what the client needed, wanted or was willing to pay for.

Your quality management plan is simply an opportunity, before the project begins, to clearly define with the client and the entire team, the standards of quality which are expected on the project. Obviously these are tied directly to the construction budget when dealing with the selection of materials and methods.

Perhaps less obvious are the implications for your process. Do the quality standards on this project call for two design alternatives from which the client may choose or should you just keep working until the design is "perfect?" Do the quality standards demand that every detail be designed from scratch, or does the budget only allow for the reuse of standard details?

Questions like these show clearly that "less-than-perfect" quality does not equate with shoddy work on your part. It simply relates to the process you will use and the amount your client is willing to invest in the design component of the project.

Your quality management plan should document the client expectations and the process you plan to use to achieve them. This will let the entire team and the client work from the same understanding so mistakes of "too little" or "too much" aren't made during the project.

**Work plan element # 8. Client management plan**



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Consider this list of potential clients:

- A building committee at a church
- An individual home owner
- The Public Utility Director in a small community
- The Board of Directors of a large Corporation
- A big Department within the Federal Government.

Every client and every client organization, large or small, is unique. As individuals, each has his or her own personality, preferences and pet peeves. As organizations, they all have ways in which "things get done around here."

In order to have a successful project and, perhaps more importantly, a successful ongoing relationship with that client, you must understand and accommodate these personal preferences.

A true story:

An architect once had a small medical practice as a client. The doctor who was the architect's main contact was a person who was very detail-oriented. He never seemed to have enough data from which he could make a decision. Meetings with this client would last for hours and cover excruciating detail on every aspect of the project. However, decisions were very difficult to come by.

For his part, the architect was a very flamboyant character who would make decisions on the least amount of evidence and rush off to make progress on the project. He would return to his office after a meeting with the client and dive into the work and push it into fast-forward. Then, a week later, the client would call wanting to discuss the detail a little more because, in his mind, no decisions had been made.

The two managed to tolerate each other for a period of time, but eventually the relationship was ended. The architect lost the client because he failed to learn how to properly "manage" that person.

Your client management plan must address the particular needs and preferences of both the individuals with whom you will be dealing and the organization within which they work. If it is a public agency, it probably has a very specific process for review and approval. If you don't understand that process, your project and your relationship will run into trouble. If the client is a particular personality type, recognize it and address how you plan to deal with it.

Your client management plan must document these issues and, if you are working with an extended team, make the needs clear to them as well. It needn't be long and involved, simply enough to identify key preferences, processes and "taboos."



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**Your work plan**

While it may seem that preparation of the work plan takes more effort than the project, this is decidedly not the case. As discussed at the beginning of this section, the time and effort you put into it should be proportional to the size and complexity of the project. A small project may call only for a simple schedule, a budget and a few notes on a page addressing the other issues. A large, lengthy job will certainly call for you to spend a few days and even several weeks assembling your work plan.

Your clients have learned that it's worthwhile to invest in your planning services before beginning their jobs. Learn from them and invest in your own planning effort before you start the next project.



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## Volume 3A Section 3 - Tracking projects

### The Challenge of Project Tracking

You've now invested a tremendous effort in selling your client on the project and convincing them to retain your firm instead of someone else. You spent hours calculating a fair fee which also promised to provide you with a decent profit. Then you worked especially hard to convince the client to accept the fee you had calculated. Once the deal was signed, you prepared a thorough work plan that included all the essential elements. Now it's finally time to get on with the work.

All this planning and preparation won't be of much use if you have no means of tracking the progress and status of the job along the way. In the same way that you want a road map to check your progress on a trip, you will need a means of monitoring the progression of the project.

Many, but by no means all firms make use of automated accounting and job tracking software. These systems tend to be powerful and sophisticated and can be enormously useful. The problem with many of the systems in place is two-fold. First, for many firms, they are too powerful and too sophisticated. The variety of reports that are available and the countless ways in which data can be manipulated bring confusion rather than simplicity. Second, the firms, and particularly the project managers who use them rarely take the time to learn the systems well enough to understand the options they offer.

There is another, perhaps even more damaging flaw in the overall system used by many firms which has nothing to do with the software. The weak link lies in the project manager's ability to accurately report percentage completion. In most firms, project managers simply don't bother to report the estimated percentage completion of their projects on a regular basis. Without this vital number, the reports produced by your expensive system are meaningless. While they will certainly tell you how many hours and dollars you may have spent on the project, without the percentage completion estimate, they have no way of telling you whether you are ahead, behind or right where you should be.

This is an enormous problem in project management practice. It's rather like having a bank book that tells you how much money you've spent, but doesn't tell you how much is left in the bank. The one piece of information is useless without the other.

The reason many project managers don't report percentage completion is they don't know how. When they try, most use one of two methods:

1. They will try the "throw-the-dart-at-the-wall" method which simply involves guessing. This usually works until the project nears completion. Then it runs into the



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"95% and hanging there forever" syndrome. The project manager reports 95% completion, then spends another two weeks working on the project only to report again that the job is 95% complete.

2. The second method might be called the "How much have I spent?" method. In this case, the project manager knows he or she has spent, for instance, $5,500 from a $10,000 budget and therefore assumes the job is 55% complete. This method usually has a rude awakening when the budget is entirely consumed but there is still a lot of work to be done.

There is no doubt that estimating percentage completion on an entire project is difficult. There are many tasks being worked on simultaneously and the overall progress of the job can be more of a gut feel than an accurate calculation.

There are, however, methods of accurately assessing percentage complete which, when combined with a simple but accurate accounting system, will provide you with all the data and information you require to accurately track the status of both the schedule and the budget of your job from start to finish. One of these methods is known as the Earned-Value Methods of project monitoring.

**Earned-Value Monitoring Method**

As the name implies, this method applies a value to the work you are doing and then monitors the amount of the value you have "earned" as you complete the work. This system was originally developed by the U.S. military for tracking their projects and is now used by construction companies and design professionals throughout the profession.

Don't let the fact that it was developed by the military and is used by contractors make you think it is a complicated system. It probably requires less time and provides more accurate results than any other method available. It's only requirement is good project planning, nearly all of which you will have done by now.

The primary requirements of the Earned Value Method are:

1. A good Work Breakdown Structure and Task List
   (Volume 1A, Section 5 & Volume 2, Sections 1 & 2)
2. A Bar Chart schedule (Volume 3A, Section 2)
3. A project budget expressed in Bottom-Up format (Volume 2, Section 5)

With these in hand the effort involves five easy steps:

1. Prepare an Expenditure Forecast
2. Estimate the progress for each task and compute overall progress
3. Check the actual project costs to date
4. Determine the status of the schedule

5. Determine the status of the budget

Using the example project which has illustrated many of the concepts in this manual so far, see how the tracking is prepared and accomplished.

NOTE: In the example shown here, the budget figures include the cost of labour only and do not include overhead or profit. If your firm allows project managers to know raw labour rates and costs, this method is preferable since there is a direct correlation between the time sheets and the work completed. However, many firms consider labour rates to be confidential and do not share them with project managers. If this is your case, the Earned Value method works just as well using gross Billing Rates.

If you are using labour amounts for your calculations, you are actually tracking project costs. If you are using billing amounts, you will be tracking earnings. Either system works, just make sure you are consistent.

## Step 1:Preparing an Expenditure Forecast

### Task list and task budgets

In the project planning effort, you prepared a Work Breakdown Structure, a Task List, Schedule and a Budget. These items are now brought together for your tracking effort.

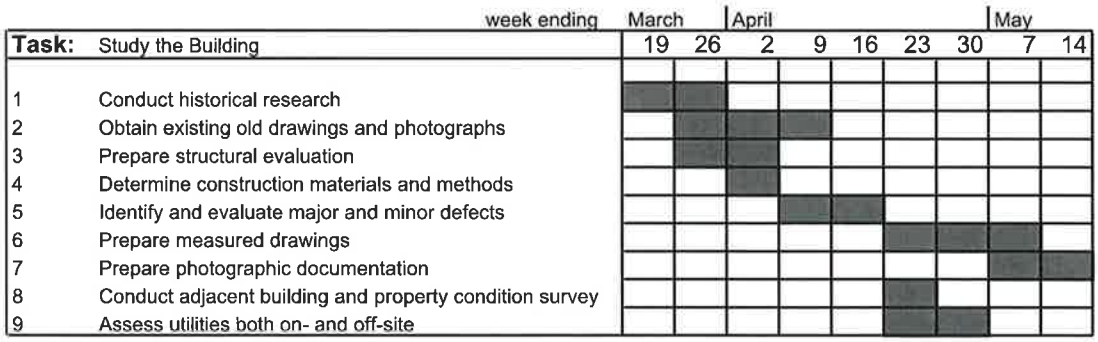
The Work Breakdown Structure and Task List developed the following list of project items to be completed. (Volume 2, Section 1)

| **Task: Study the building** |
|---|
| *Subtasks* |
| Conduct historical research |
| Obtain existing old drawings and photographs |
| Prepare structural evaluation |
| Determine construction materials and methods |
| Identify and evaluate major and minor defects |
| Prepare measured drawings |
| Prepare photographic documentation |
| Conduct adjacent building and property condition survey |
| Assess utilities both on- and off-site |

For each task on the list, a budget of both hours and dollars was prepared. (Volume 2, Sections 4 &5)

| Task: Study the building | Who | Hours | Rate | Who | Hours | Rate | Extend |
|---|---|---|---|---|---|---|---|
| *Subtasks* | | | | | | | |
| Conduct historical research | DTM | 8.5 | $ 45 | | | | $ 383 |
| Obtain existing old drawings and photographs | DTM | 5.5 | $ 45 | | | | $ 248 |
| Prepare structural evaluation | TON | 8 | $ 75 | REV | 4 | $ 35 | $ 740 |
| Determine construction materials and methods | TON | 5 | $ 75 | REV | 4 | $ 35 | $ 515 |
| Identify and evaluate major and minor defects | TDN | 4 | $ 75 | | | | $ 300 |
| Prepare measured drawings | LMW | 16 | $ 65 | BNG | 24 | $ 45 | $ 2,120 |
| Prepare photographic documentation | LMW | 10 | $ 65 | | | | $ 650 |
| Conduct adjacent building and property condition survey | TON | 4.5 | $ 75 | | | | $ 338 |
| Assess utilities both on- and off-site | LMW | 6 | $ 65 | REV | 3.5 | $ 35 | $ 513 |
| **TOTAL** | | | | | | | **$ 5,805** |

The Bar Chart Schedule for these tasks looked like this: (Volume 3A, Section 2)




It's important to note that the budget for the project identified the number of hours to be spent on each task. The schedule, on the other hand, indicates the period of time over which these hours will be expended. Just because a task is budgeted to take eight hours, does not mean it will be accomplished in one day. More often than not, that time will be spread out over a longer duration

From the schedule, the duration for each of the tasks is as follows:

Study the Building

| | |
|---|---|
| Conduct historical research | 2 weeks |
| Obtain existing old drawings and photographs | 3 weeks |
| Prepare structural evaluation | 2 weeks |
| Determine construction materials and methods | 1 week |
| Identify and evaluate major and minor defects | 2 weeks |
| Prepare measured drawings | 3 weeks |
| Prepare photographic documentation | 2 weeks |
| Conduct adjacent building and property condition survey | 1 week |
| Assess utilities both on- and off-site | 2 weeks |

This allows you to bring all three elements of your plan -- scope, schedule and budget -- together in one chart.

| Task Name | Task Budget | Task Duration |
|---|---|---|
| Conduct historical research | $ 383 | 2 weeks |
| Old drawings and photographs | $ 248 | 3 weeks |
| Prepare structural evaluation | $ 740 | 2 weeks |
| Materials and methods | $ 515 | 1 week |
| Major and minor defects | $ 300 | 2 weeks |
| Prepare measured drawings | $ 2,120 | 3 weeks |
| Photographic documentation | $ 650 | 2 weeks |
| Adjacent building & property survey | $ 338 | 1 week |
| Assess utilities both on- and off-site | $ 513 | 2 weeks |
| | **$ 5,805** | |

As stated above, the "Earned Value" concept is based on the fact that each task is assigned a "value" equivalent to the budget of that task. When the task is complete, the firm will have "earned" the amount which is the budget of the task. Each task is predicted to be completed over a period of time and the value of the task will be earned over the duration of the task.

For example, the task of "Identify and evaluate major and minor defects" has a value of $300 and is scheduled for a duration of two weeks. Therefore, you can assume the budget will be used up at a rate of $150 per week. Each of the other tasks, budgets and durations can be combined in the same manner. In fact, the "bars" of the Bar Chart can be replaced with the amounts that ought to be "earned" in each time period like this:

| week ending | March | | April | | | | | May | |
|---|---|---|---|---|---|---|---|---|---|
| Study the Building | 19 | 26 | 2 | 9 | 16 | 23 | 30 | 7 | 14 |
| Conduct historical research | $192 | $192 | | | | | | | |
| Old drawings and photographs | | $83 | $83 | $83 | | | | | |
| Prepare structural evaluation | | $370 | $370 | | | | | | |
| Materials and methods | | | $515 | | | | | | |
| Major and minor defects | | | | $150 | $150 | | | | |
| Prepare measured drawings | | | | | | $707 | $707 | $707 | |
| Photographic documentation | | | | | | | | $325 | $325 |
| Adjacent building & property survey | | | | | | $338 | | | |
| Assess utilities both on- and off-site | | | | | | $257 | $257 | | |

From this chart, it's easy to see that certain weeks will have a high level of activity while others will be fairly slow on this project. Likewise, the amounts scheduled to be "earned" vary by week.

Using the same chart, you can easily determine the amount to be "earned" each week like this:

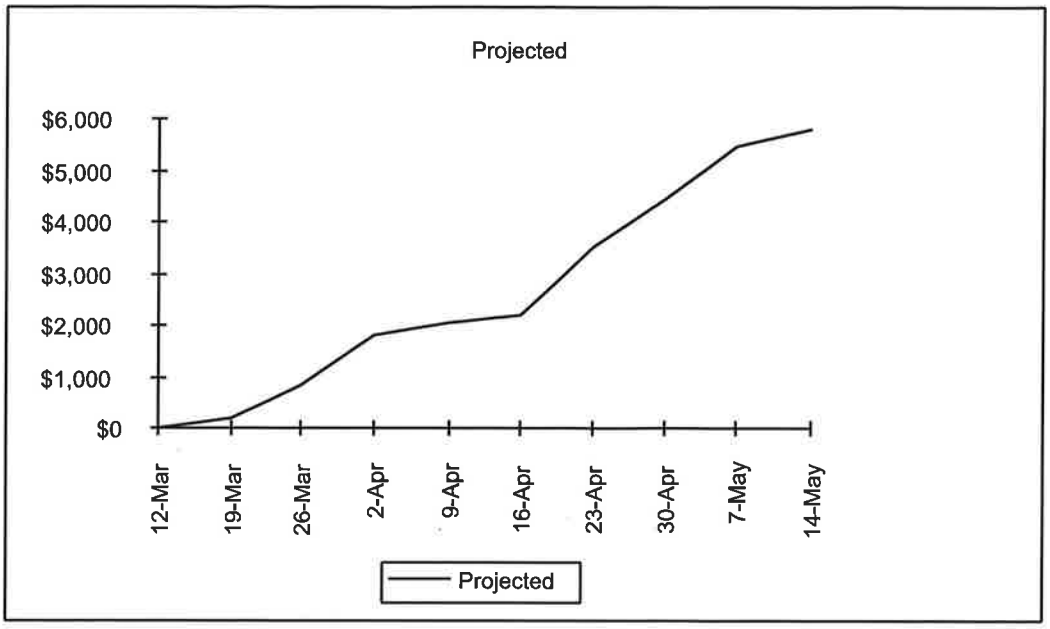
| week ending | March | | April | | | | | May | |
|---|---|---|---|---|---|---|---|---|---|
| Study the Building | 19 | 26 | 2 | 9 | 16 | 23 | 30 | 7 | 14 |
| Conduct historical research | $192 | $192 | | | | | | | |
| Old drawings and photographs | | $83 | $83 | $83 | | | | | |
| Prepare structural evaluation | | $370 | $370 | | | | | | |
| Materials and methods | | | $515 | | | | | | |
| Major and minor defects | | | | $150 | $150 | | | | |
| Prepare measured drawings | | | | | | $707 | $707 | $707 | |
| Photographic documentation | | | | | | | | $325 | $325 |
| Adjacent building & property survey | | | | | | $338 | | | |
| Assess utilities both on- and off-site | | | | | | $257 | $257 | | |
| Total Weekly Value Earned | $192 | $645 | $968 | $233 | $150 | $1,302 | $964 | $1,032 | $325 |

Finally, you can calculate the cumulative amounts predicted to be "earned" as the project is scheduled to progress.

| week ending | March | | April | | | | | May | |
|---|---|---|---|---|---|---|---|---|---|
| Study the Building | 19 | 26 | 2 | 9 | 16 | 23 | 30 | 7 | 14 |
| Conduct historical research | $192 | $192 | | | | | | | |
| Old drawings and photographs | | $83 | $83 | $83 | | | | | |
| Prepare structural evaluation | | $370 | $370 | | | | | | |
| Materials and methods | | | $515 | | | | | | |
| Major and minor defects | | | | $150 | $150 | | | | |
| Prepare measured drawings | | | | | | $707 | $707 | $707 | |
| Photographic documentation | | | | | | | | $325 | $325 |
| Adjacent building & property survey | | | | | | $338 | | | |
| Assess utilities both on- and off-site | | | | | | $257 | $257 | | |
| Total Weekly Value Earned | $192 | $645 | $968 | $233 | $150 | $1,302 | $964 | $1,032 | $325 |
| Cummulative Earnings | $192 | $837 | $1,805 | $2,038 | $2,188 | $3,490 | $4,454 | $5,486 | $5,811 |

## Projected Expenditure Curve

Using this projected cumulative "earnings" or "cost" data depending on whether you are tracking labour or billing amounts, you will then prepare a graph which plots the cumulative earned amount over the life of the project. This curve plots the course of your "earnings" or "expenditures" (depending on whether you are using billing rates or labour rates) if everything on the project goes according to plan.






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## Step 2:Determining Project Status

### Schedule Status

After all this planning and preparation, your work on the project has actually begun. By yourself, or with your team you work through the first time period of the project. You fill out and submit your timesheets and the data is entered into the system. Now it's time to check on the status of the project.

The key to any method of project tracking is to compare the work which has actually been accomplished against the length of time and amount of money it has taken to accomplish it. Most systems, however, ask the project manager to estimate the percentage completion of the overall project. Even on relatively small projects, this is a challenge. With so many individual tasks, many of which are ongoing simultaneously, it is almost impossible to look at the overall project and accurately determine the percentage complete.

The Earned Value Method asks you only to estimate the percentage completion of individual tasks. For example, the case study project -- which itself is only a small portion of a larger project -- is made up of nine tasks. While the overall project of "Study the Building" is fairly straightforward, there are still many components which have to be considered in an estimate of completion. Any estimate would be, at best, a good guess. You need a higher level of accuracy than that.

It is far easier to estimate the level of completion of each task. For example, the first task of "Conduct historical research" is estimated to take two weeks. If you were the one doing the work, any point during that period you could make a reasonably accurate estimate of your progress without too much effort. The task is simply small enough and sufficiently contained that an accurate estimate is readily prepared. The same is true for any of the other eight tasks which make up the project.

Study the Building
- Conduct historical research
- Obtain existing old drawings and photographs
- Prepare structural evaluation
- Determine construction materials and method
- Identify and evaluate major and minor defects
- Prepare measured drawings
- Prepare photographic documentation
- Conduct adjacent building and property condition survey
- Assess utilities both on- and off-site

If the project manager is working with a larger team, he or she, along with the person delegated to do the task will prepare the estimate. If, as is often the case, the project manager <u>is</u> the team, he or she prepares the estimates alone.



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Your estimate will have nothing to do with the amount of money that has been spent or the number of hours that have been logged. It will be solely based on looking at the task to be done and assessing:

- The work which has actually been accomplished to date
- The quality of that work
- Any revisions which may have to be done due to poor quality or mistakes
- The amount of work left to be accomplished in the task
- The progress of deliverables toward a milestone

Your estimate need not be any more accurate than within plus or minus ten percent. In fact, you should not try to be accurate within one or even five percent. If the tasks have been sufficiently divided to be small enough, the effect of plus or minus ten percent will have very little effect on the accuracy of your estimate for the overall project.

At the end of the first week of work, the project manager reviews the work and discovers that:

- Task 1 got a late start because a staff member was ill. Although it was scheduled to be 50% complete at this time, only about 30% of the work was done.
- Tasks 2 and 3, although not scheduled to begin until the second week, actually made some progress
- Task 9 had some work done because a staff member happened to be at the Public Works office on another matter and was able to collect utility drawings for the site.
- No other tasks were started.

The estimate of completion might look like this:

**Status of work actually completed at the end of Week 1**

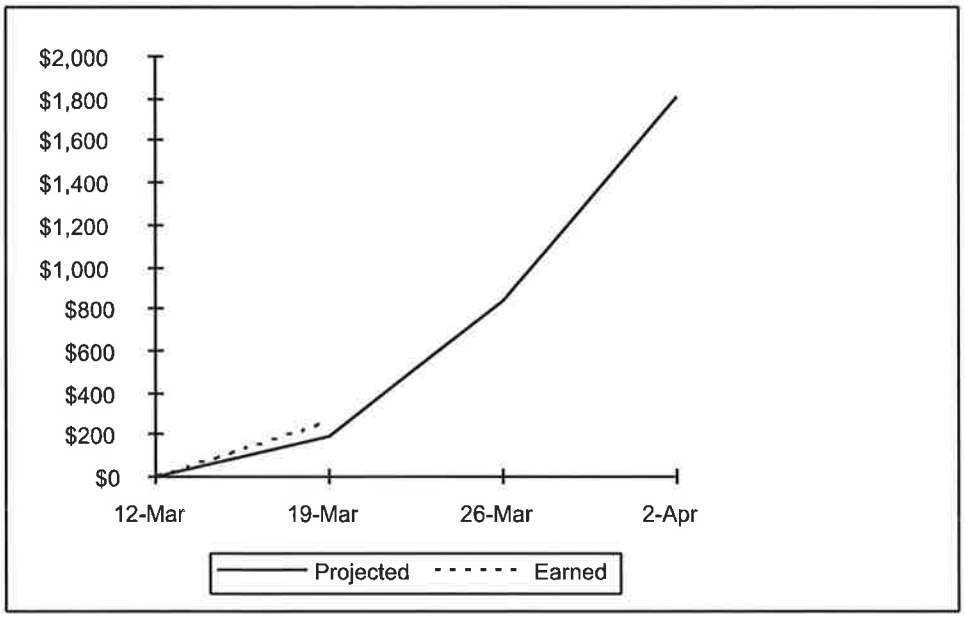
| Study the Building | Task Budget | % Complete | Value Earned |
|---|---|---|---|
| Conduct historical research | $384 | 30% | $115 |
| Old drawings and photographs | $249 | 10% | $25 |
| Prepare structural evaluation | $740 | 10% | $74 |
| Materials and methods | $515 | 0% | $0 |
| Major and minor defects | $300 | 0% | $0 |
| Prepare measured drawings | $2,121 | 0% | $0 |
| Photographic documentation | $650 | 0% | $0 |
| Adjacent building & property survey | $338 | 0% | $0 |
| Assess utilities both on- and off-site | $514 | 10% | $51 |
| Total Value Earned | $5,811 | | $266 |

By multiplying the task budget by the % Complete for that task, you determine the amount you have "earned" to date on the task. By totaling the earned value of the tasks, you can determine the total value you have earned on the entire project.

Interestingly, the total value earned, divided by the total project budget determines overall percentage complete of the entire project. At this point, the project is:

$266 ÷ $5,811 = 5% complete

If you plot the value of the work you have actually completed against the Projected Expenditure Curve, the result looks like this:

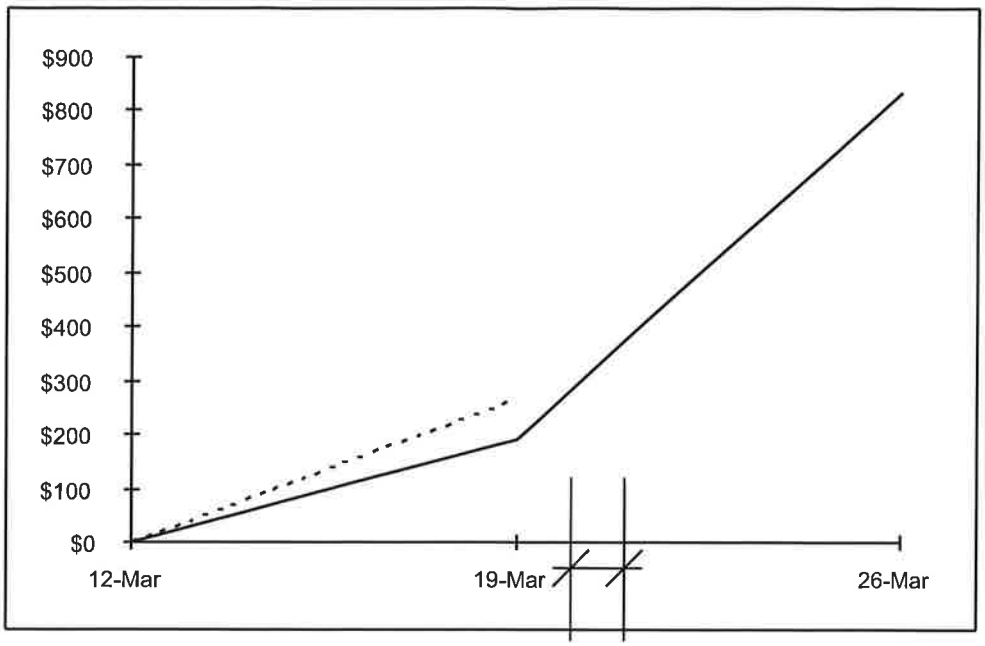



Notice how, as of the 19th of March, the actual value earned is higher than the projected.

What does this indicate?

At this point in the project, you and your team have done work which is worth $266. You weren't projected to have completed that value of work until some time into the next week. So, as of the 19th of March, your project is about a half a day ahead of schedule.

A closer look at the graph shows that the horizontal distance (the time scale) between the value of the actual work done and the projected curve, is the amount of time you are ahead of or behind schedule.




**Budget Status**

Although any project manager will take delight in being ahead of schedule, it's no good being ahead of schedule if the budget is out of control. The next step is to look at the status of the budget.

Although the estimate of percentage completion said the actual work completed at this time is worth $266, you must determine how much it actually cost the firm to produce this work.

In most firms, the frequency of time sheet submittal is every two weeks. More progressive firms submit timesheets weekly and some have initiated daily submittals. Obviously, the more lag there is between spending the time and receiving the report of the time, the greater is the chance of error and overspending.

On larger projects lasting many months, there is probably little need to update the status of your project any more than every two weeks. On small projects, which are started and completed in a few days or weeks, the entire budget can be spent twice over before the first financial report is available.

On small jobs, project managers must take responsibility for monitoring the expenditures on a frequent enough basis to accurately track spending. Some ask their team members to submit their timesheets to the project manager daily. This way, they can keep a simple chart or spreadsheet of the expenditures on the project. Whatever system you need to put in place or modify to provide accurate and timely information, is worth the effort for the success of your project.

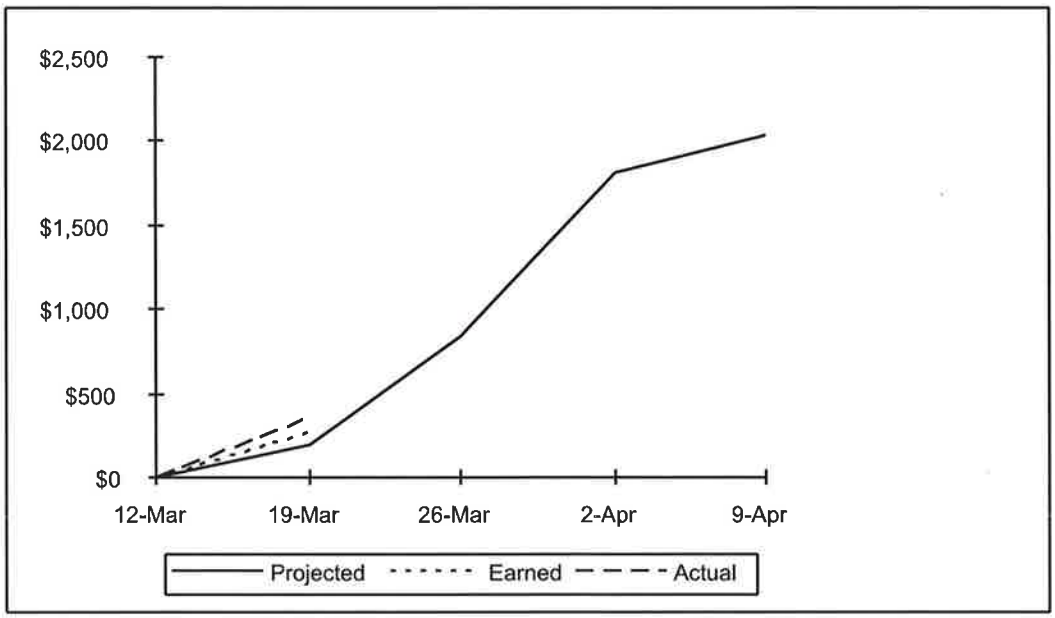


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In the case study project here, the project manager, or the Accounting Department must determine the total amount spent on the project to date. The amount does not have to be broken down into phases and it does not matter on which task the money was spent. All that is required is the total amount spent to date. Remember, however, to remain consistent. If you are tracking labour, determine the total labour cost to date. If you are tracking earnings, determine the total billing rate amount to date.

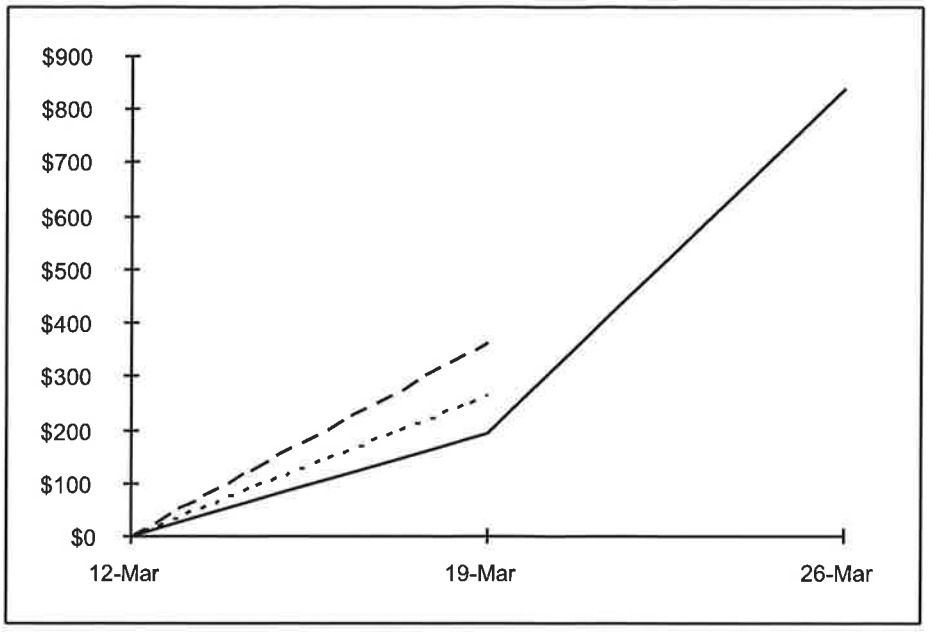
Let's say the project manager determines the total spent to date on the project is $365.

When added to the graph, the result would look like:




A simple glance at this graph shows that, as of the 19th of March, the value of work actually completed is $266, but it has cost the firm $365 to do that work. This indicates the project is $99 over budget.

A closer look at the graph reveals that the vertical distance (the dollar scale) between the value of the actual work done and the actual cost to do that work is the amount by which the project is currently over or under budget.




**So What?**

A project which is a half day ahead of schedule and $99 over budget will hardly make headlines.

But managing a project is much like driving a car. As you drive down the road you are always looking ahead, watching for problems and making tiny corrections through the steering wheel, the gas pedal or the brakes. These tiny corrections, constantly made, keep you from finding yourself in a terrible skid, sliding sideways down the road at 60 miles per hour. Once you are in the skid, there is very little that anyone can do to help you.

Knowing that the project is $100 over budget one week into the job, any project manager worth their corner office can make a tiny correction which will bring the budget back in line. But, a project manager who discovers the job is thousands of dollars over budget and weeks behind schedule with only a few days left to finish is like the driver who looks up and sees a tree or bridge abutment 10 feet in front of the car. There is nothing anyone can do to help you.

Using the Earned Value Method, you can easily monitor the status of both your schedule and your budget. With this information you can then make frequent, minor course corrections to keep your project on track.

Let's look at the case study project after four weeks have gone by.

At the end of the fourth week of work, the project manager reviews the work and discovers that:

- Task 1 is still dragging. Although much initial work has been completed, the key staff member has been tied up with another project.
- Tasks 2 and 3 are completely finished and the material is in the file.
- Task 4 has not yet been started.
- Task 5 was late starting, but is well underway now.
- Task 6 has been started using available information and is progressing well.
- The photographer had a cancellation and was able to get on to Task 7 early.
- Task 8 has not been started.
- Task 9 has progressed no further than before.

The estimate of completion might look like this:

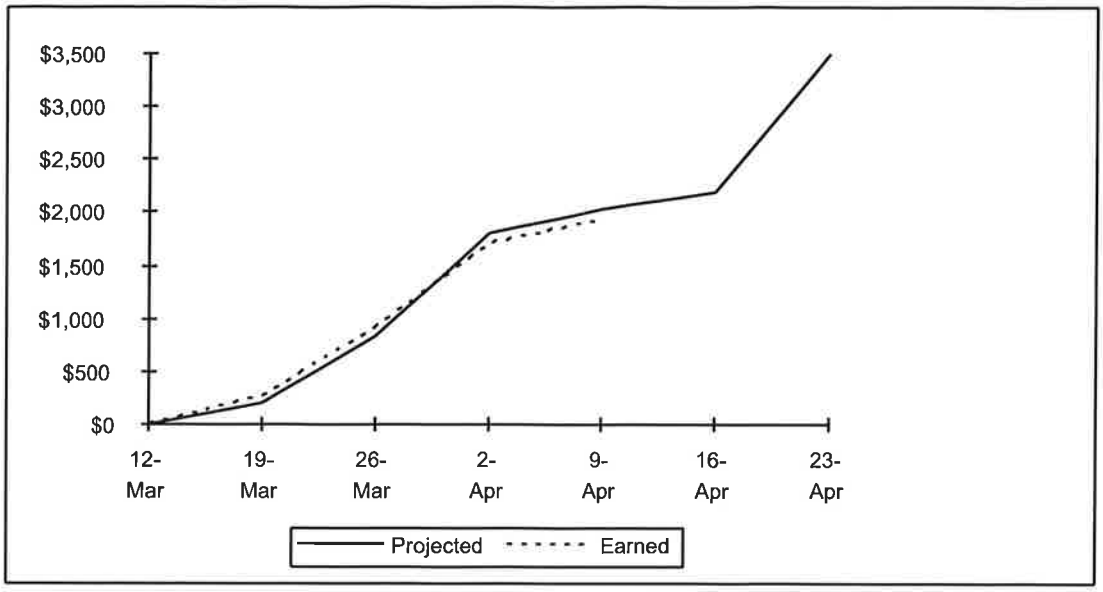
**Status of work actually completed at the end of Week 4**

| Study the Building | Task Budget | % Complete | Value Earned |
|---|---|---|---|
| Conduct historical research | $384 | 75% | $288 |
| Old drawings and photographs | $249 | 100% | $249 |
| Prepare structural evaluation | $740 | 100% | $740 |
| Materials and methods | $515 | 100% | $0 |
| Major and minor defects | $300 | 40% | $120 |
| Prepare measured drawings | $2,121 | 20% | $424 |
| Photographic documentation | $650 | 10% | $65 |
| Adjacent building & property survey | $338 | 0% | $0 |
| Assess utilities both on- and off-site | $514 | 10% | $51 |
| Total Value Earned | $5,811 | | $1,938 |

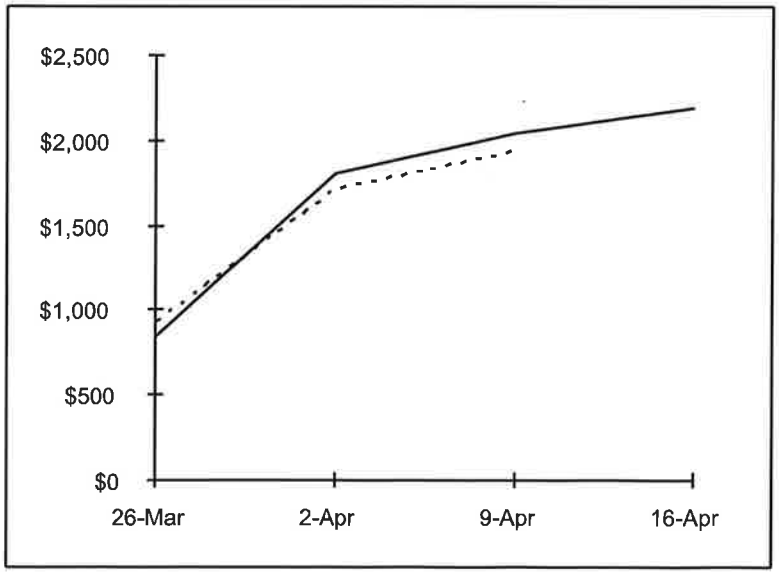
Comparing the total value earned to the total project value, the overall percentage complete can be seen to be:

$1,938 ÷ $5,811 = 33%

Plotting the value of the work you have actually completed against the Projected Expenditure Curve, the result looks like this:



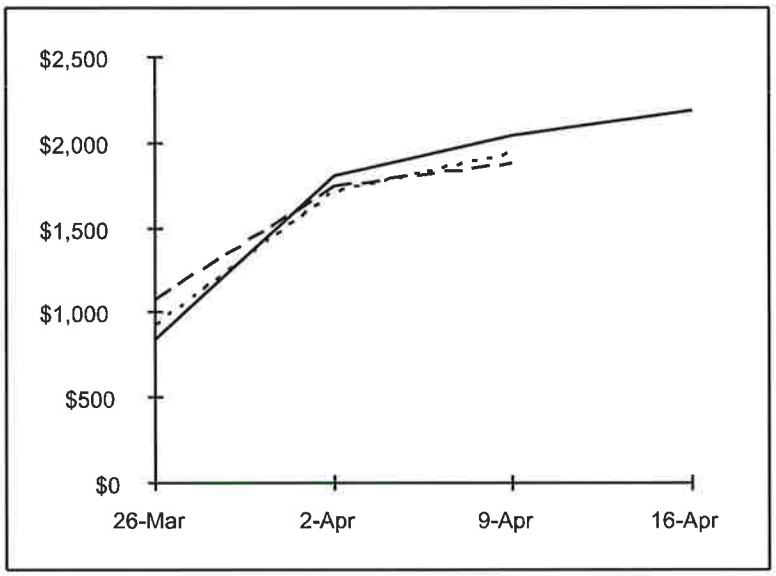

In contrast to the schedule status after the first report, the project has now fallen behind. Where the actual value of work completed to date is $1,938, the plan called for $2,038 worth of work completed by now. A quick check of the horizontal distance between the two lines indicates the project is behind by two or three days.




Again, a good project manager should be able to correct a situation like this without breaking a sweat. And it's much better to know you are two days behind schedule at the half-way point of the project than to discover it with only a few days left to go.

Checking the status of the budget, while work completed by the end of Week 4 is worth $1,938, a quick check with the Accounting Department or the project manager's own notes determines that this work actually cost the firm $1,875.

Even without plotting the graph, it's easy to see the project is a little under budget.




Using this simple system, a project manager can keep close tabs on the schedule and budget status of any project. It is not time consuming and provides accurate updates upon which he or she can act.

As the job moves along, regular percentage completion estimates keep the project manager informed of the schedule status. A close watch on the expenditures of the project allow you to determine the budget status of the work. In its simplest form, the project manager's job is to keep the three lines of the graph as close together as possible until the project is complete. Should the schedule or budget line start to wander at all, your job is to find out what is causing the deviation and take action to bring it back in line.

It's highly unlikely that you will ever have a status update in which your project's progress is exactly on the projected path. It will always be a little ahead or a little behind. You can easily control these variations with the minor "course corrections" discussed above. Only if your project suffers a major deviation from the projected curve will it be necessary for you to take drastic corrective action.

In the following Section you will learn how to recognize an out-of-control project and the corrective actions that are available for you to take.

**Dollars, Not Hours**

Many firms and project managers track their jobs in terms of the hours spent on a project. They will budget 100 hours for a particular task and then monitor the time spent to see if they are over or under budget.

In contrast, you will by now have noticed that there has been no mention of the number of hours spent in the entire discussion of the Earned Value Method.

One of the realities of Project Management is the fact that, unless you are a one-person operation, you can never be sure from day to day, who is going to be available to work on your job. Sometimes you get the staff member you want, other times you get any warm body that might be available. In any firm with more than two people, there are wide variations in the labour cost, billing rates and productivity of staff members.

When you budget one hour for a particular task, you assume a consistent productivity no matter who does the job. While Mr. Jones might be able to get the job done properly, Ms. Smith, who charges out at $20 per hour more, may be able to do it in half the time. Comparing the hours spent by these people on the same task is useless because one person's hour is almost never equal to another person's hour.

A dollar, on the other hand, will always be equal to another dollar regardless of who spends it. Since the hours are all eventually converted to dollars, why not take advantage of the dependable accuracy and track schedule and budget in relation to dollars?

Your client pays you in dollars. You and your staff prefer paychecks made out in dollars. This is a reliable, consistent method of measuring value and progress and it doesn't lie about productivity.



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## Volume 3A Section 4 - Keeping Your Project on Track

### Recognizing an out-of-control project

A project is a living, breathing thing whose state of health is constantly changing. As a project manager, your job is to monitor the health of this beast until it is completed and out of your hands. Like a good nurse, you must learn to recognize the symptoms of an ailing project and be adept at the therapy which will bring your patient back to good health.

In the previous section, you learned how to use the Earned Value Method of project tracking. You will use this method to monitor the schedule and budget status of your project. In this Section you will learn more about that system and how to watch for signs of trouble.

Your schedule and budget, however, aren't the only vital signs you must monitor. A good project manager has an instinctive "gut feel" for the status of a project including the mood of the client and the extended team as well as a keen eye for the threats which can derail your project from out of the blue.

The most dangerous condition for a project manager is to be paralyzed in a state of inaction when a project is going out of control. Signs that a project is or is heading out of control include:

- When you feel powerless to control the project. Has the project taken on a life of its own? Are things happening (either positive or negative) without or in spite of your input?

- When you have a feeling of "who knows where this is going to end?" Has the project schedule become a mere dream? Are scope items being added at rate faster than you can even write them down?

- When cost overruns are large and/or unexpected. Were you surprised by the budget status of the project? Were there expenditures or significant time inputs about which you didn't know?

- When deadlines are constantly being missed. Does it seem like you just can't get caught up no matter how much overtime you put in? Are other people establishing deadlines which you don't feel are realistic?

- When you feel the original plan was unrealistic and a new plan has not been formulated. Are you so busy fighting fires that you don't have time to fall back and plan your strategy?

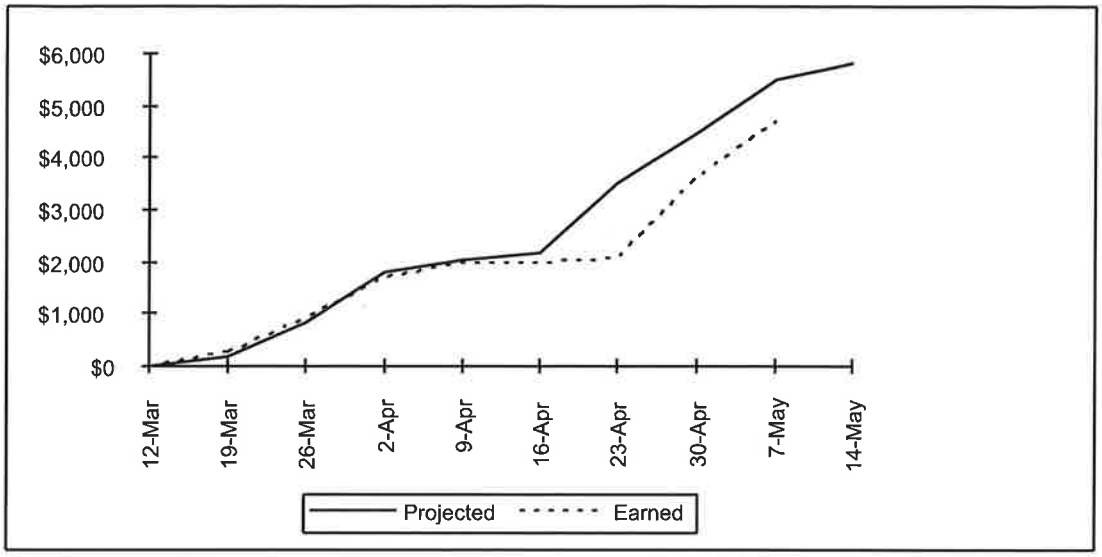


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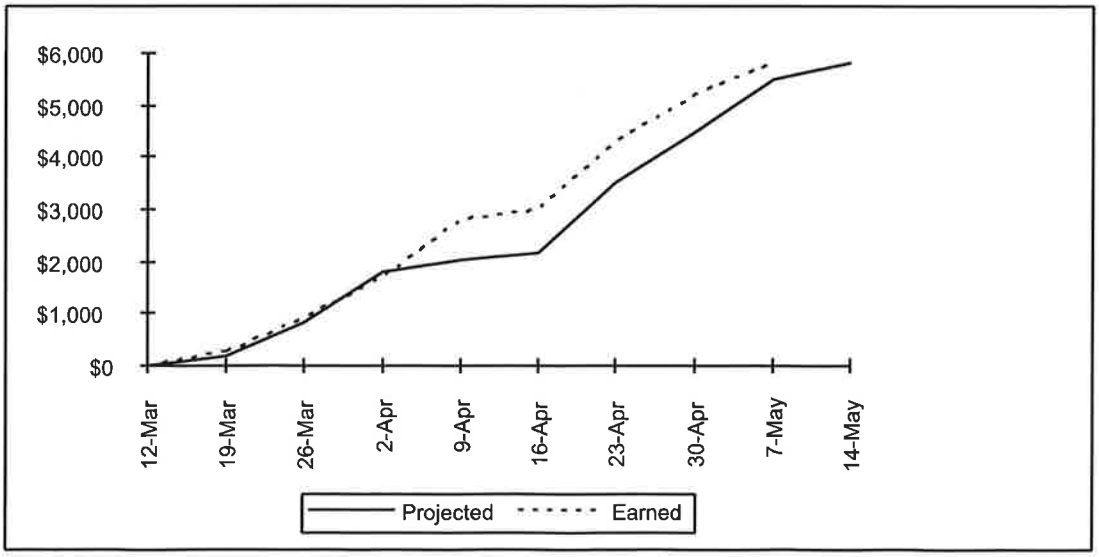
• When the client or other team members are informing you of problems on the project of which you were unaware. Do you feel like "project manager" means "last one to know anything?"

If you are suffering any of these symptoms, it's likely your project is out of control.

The graphs you generate in the Earned Value Method can also indicate trouble.



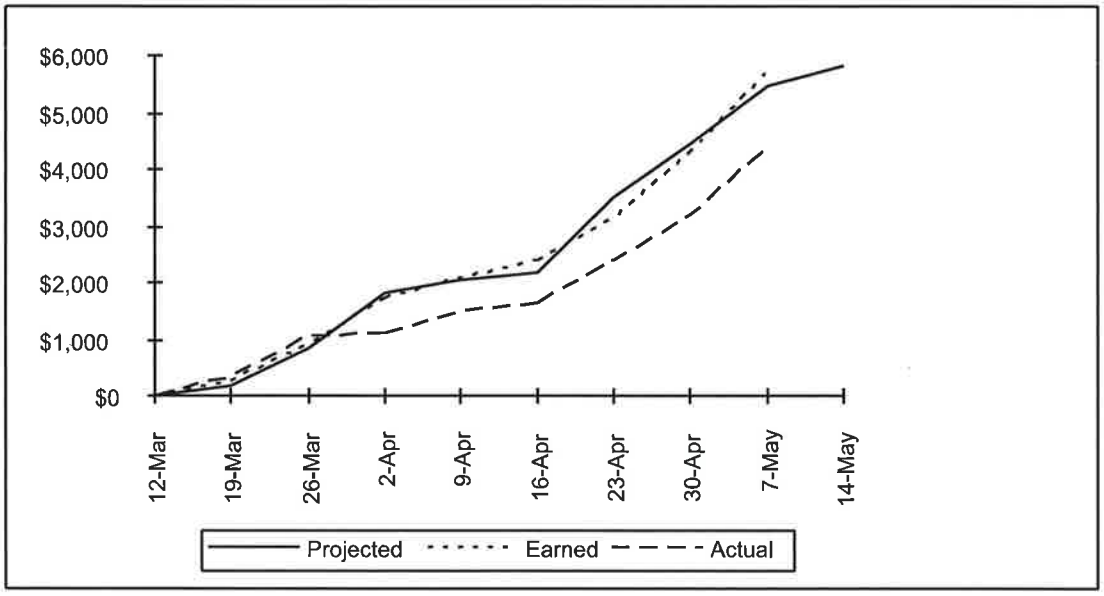

This is a classic example of a project to which a scope item has been added without any adjustment to the schedule or budget. The project was progressing smoothly until it suddenly fell behind by almost a week. After that, it resumed regular and steady progress, but never managed to get caught up.






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This project manager, on the other hand, has completely forgotten about an important scope item worth about $800. The project will finish up ahead of schedule, only to discover the mistake after the budget has been consumed. Notice how the initial gain is gradually being diminished by an over-confident team.




The project manager on this job is very happy about his job being right on schedule and yet significantly under budget. Unfortunately, the sudden budget drop followed by a consistent difference between the lines probably indicates someone is simply charging their time to the wrong project.

A project or individual task which comes in below budget or ahead of time is not always good news. It may indicate time has been charged to the wrong job, or a large portion of the scope has been missed. Avoid the temptation of looking at under-expenditure as a resource to fund creeping scope on other tasks.

**Working With Contingency**

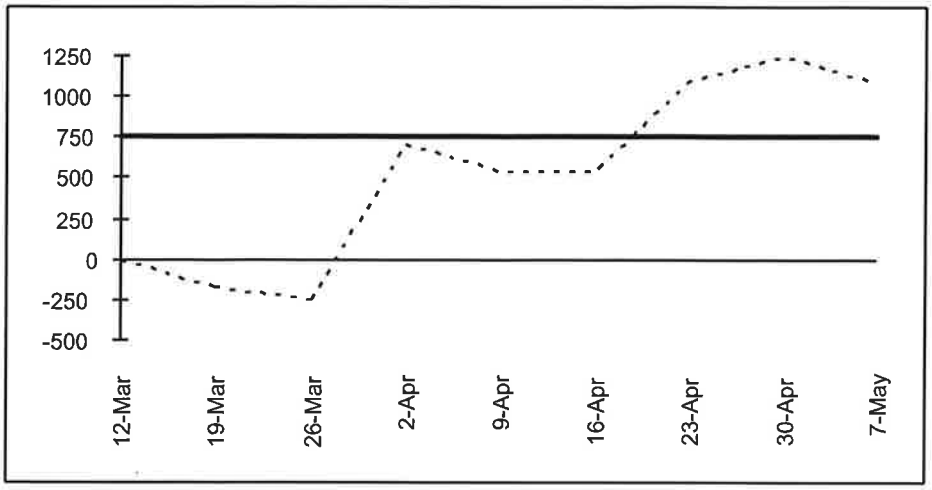
Some project managers are shrewd budgeters and know how to build a contingency factor into their projects. With this "cushion" in place, they have a greater flexibility to let the project get slightly behind schedule or over budget. There are times when you may want to provide the client with an additional scope item "at no charge." You can only do this if you know it won't threaten the overall success of the project.

If you have a contingency in price or schedule on the project, you can make use of a Variance Curve to track your budget status. On this project, the project manager has a



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budget contingency of $750. The dotted line indicates the amount the project is over or under budget at any point. As long as the budget overrun does not exceed the $750 contingency, the project manager knows she can still make the projected profit. However, when the overrun threatens to or exceeds the contingency, action is required.




**Keeping Your Project Out Of Trouble**

Everyone knows the best way to get out of trouble is not to get into trouble in the first place. For project managers, this translates into careful planning and vigilant anticipation. Here are a few Project Management Rules to keep you out of trouble before it happens.

1. Careful planning helps you avoid trouble in the first place.
Take the time to build a thorough Work Plan. (Volume 3A, Section 2) Make sure all eight elements have been considered and the entire project team (even if you are a one-person operation, you work with others outside your firm) is informed of the plan.

2. Be skeptical.
Brainstorm with your team to anticipate as many potential problem areas as possible. List the "David Letterman Top Ten Things That Are Likely To Go Wrong On This Job." Too many project managers have short memories and are surprised when a particular problem "blindsides" them (for the fifth time). Many project problems are easy to anticipate: the client will not get their answers to you on time; the permitting agency will take two weeks longer than they estimated; the new-in-town subcontractor will not have the quality of work you expected. These and many other problems are so common that you should never enter a project without having planned for their inevitable occurrence.

3. Have contingency plans ready if any of your fears come true.



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There's no sense in anticipating a problem without having an action plan for when the problem arrives. If, for example, you think it possible that the permitting agency will be late in approving your application you could plan to:

- Approach them prior to your submission to inquire about the fastest possible way through the permitting process.
- Work with the permitting staff to provide the information in a format which makes their work as easy and fast as possible.
- Split the permitting into packages which can be submitted in sequence so the work can still progress even if the entire project has not been permitted.
- Schedule your work so you have other, non-permit related tasks to complete while waiting for permit approval.

4. Rework your budget and schedule when you are awarded the project.
It's likely you put together a budget and a schedule as part of your proposal process. It's also likely that aspects of the project changed during the negotiation and contract signing. If you don't rework the plan before you get started, you are working from an out-dated plan and are headed for trouble.

5. Revisit and revise your project plan regularly.
As the job moves along, particularly if the project is large and lengthy, you should periodically review the work plan and determine if it must be updated. Projects inevitably have scope items added, suffer schedule setbacks or have initial assumptions proved wrong. If you don't update your plan to recognize these changes, the plan cannot accomplish the goal of completing the project.

6. Conduct "post-mortems" on every project and incorporate the lessons in future jobs.

Too many firms and project managers move from job to job without ever taking the time to reflect on what did and what did not work on the previous one. Without that pause, the same mistakes are made again and again. In addition, the other members of your firm miss the opportunity to share in the lessons-learned from your previous projects. Don't make the mistake of the tree-cutter who was too busy chopping down trees to take a moment to sharpen his axe.

7. Plan to make a profit on all phases of the job.
It's always a mistake to rationalize a losing project by assuming you will make it up later. It almost never happens. Likewise, if you make additional profit or get ahead in an early part of the job, don't use that as an excuse to fall behind down the road. Profits are hard enough to come by without giving away those you do win.

8. Stay close to the client and your design team with constant and thorough communication.



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There has never been a problem which has arisen on a project which could not have been solved by or at least been lessened by improved communication. As projects sink deeper and deeper into trouble, project managers are more and more reluctant to speak with clients. Although it's human nature to want to avoid confrontation, when trouble is brewing is the time when you need to be communicating the most. Understand that you and the client are on the same team, working toward the same goals. They don't want the project to go sour and they would rather spend time and energy helping get things back on track than chewing you out.

**And If Things Do Go Sour...**

Sooner or later (and probably sooner) you will be working on a project that goes bad. When that happens, it's your responsibility to pull that project back out of the hole and turn it into a winner. The project manager is not a neutral bystander who watches and reports as the building goes up in flames. You are the key, action-oriented person who will take charge to save it.

Here are some time-tested ideas for pulling your sinking project out of the hole.

1. Settle on a solution quickly and go with it.

Design professionals are notorious for wanting to explore just one more option. Your struggling project is not the place for this. Pick one solution -- the first solution you proposed was probably 97% right anyway -- and run with it. Yes, there may be small ways you can improve the project, but you don't have time or money for it now. Exploration of alternatives can wait for the next project.

Projects are like buses: There's always another one coming along and you can try your great idea on it.

2. Review the scope of work carefully and don't stray outside of it.

A struggling project is not the place to be practicing your good client relations by giving away free services. Sit down with your team or review the current task list and compare it to the contract you signed. If you find you or any of your team are working on tasks which aren't in the contract, put an immediate stop to it. Get the essential elements of the project complete, then determine whether you have time to give away the odd "freebie."

3. Use overtime judiciously.

Overtime is a great solution to many projects that have fallen behind. But don't get carried away. First, unless all your staff are salaried, you will have to pay for that overtime and it's more costly than regular time. Second, and perhaps more important, after a point, the quality of work falls off dramatically because you and your team are just too tired and overworked to produce a good project.



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4. Try to use staff with as much experience as possible.
A struggling project is not the place to be training interns or junior staff members. Although their labour rates are the lowest, they are unable to make fast decisions, the quality of their work is low and they make more mistakes which have to be corrected. When a project is in trouble, clear the decks and bring in the veterans. They're better and faster decision makers and they know all the shortcuts to getting a project done and out quickly.

5. Sit down to talk with the client.
It may be the hardest thing you ever do, but sitting down and letting the client know the project is falling behind just might reveal some resources you weren't aware of. The client is interested, first and foremost, in getting the project done. They don't want to delay the project any further by initiating a conflict with you. By being up-front with your client, they may be able to help you prioritize tasks or take over certain tasks which they could do in-house. Remember, you are both on the same team, working toward the same goals.

6. Check with Accounting to see if you actually are over budget or behind schedule.
All that anxiety and the problem was simply someone charging time to the wrong job. Before you push the panic button, make sure the problem is for real. It may just be a timesheet error.

7. Shout "Stop!"
The most under-used word in the project manager's vocabulary is, "Stop!" Left to their own devices, your team would likely keep working and "tweaking" the project forever. Think back to exam time when you were in school. At the end of the test, the professor would state, "pencils down!" and the exam was over. There will always be something more you can add to the project, the drawings, the specs, the bid package, and on, and on. Shout, "Stop!" and let the project be finished.

**The Kick-Finish**

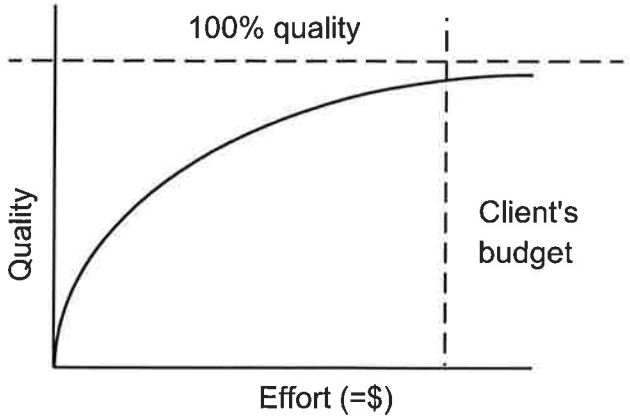
One of the hardest things a project team can do is finish a project. Many jobs easily reach 95% completion and then hang there for what seems like forever. There is always just one more thing which "really should be added." Unfortunately, while you are adding to the design and documentation, you are also subtracting from your profit and your client's pleasure that you finished on time!

Everyone has heard of the "Kick Start" in which you give an energetic shove to an endeavor in order to get up and running quickly. The "Kick Finish" has the opposite effect and allows you to bring a job to a quick and satisfactory conclusion.



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The Quality Management gurus are very familiar with Paretto's Principle which is the Law of Diminishing Returns. It states that your continuing efforts will contribute less and less to the overall quality of the job. If you were to graph "effort expended" (which, in this industry is equal to money) against "quality achieved," the result would look like this:




You would achieve a reasonable level of quality very quickly, but, after that, the return on your effort would diminish until it would be necessary to give an infinite effort to achieve 100% quality. Unfortunately, most client's budgets fall well short of infinity.

If all projects follow an Effort-Quality curve of this sort, you can take advantage of this phenomenon to achieve a quick and quality finish to your job. Here's how it works:

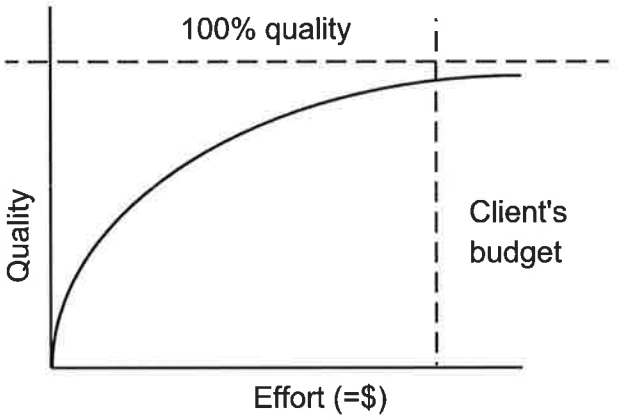
When the project reaches 95% completion, shout, "Stop!" Wrap up the project right then and there and don't allow any more time to be charged to the project. No, the job is not finished yet, but you are about to "Kick Finish" it.

When the work has stopped, sit down by yourself or with a skeleton team and put together a work plan for a brand new project. The work plan will have a new project definition, scope, WBS, task list, schedule, budget, quality management plan and client management plan. It will be a very short project, and it's primary task is to finish the old one.

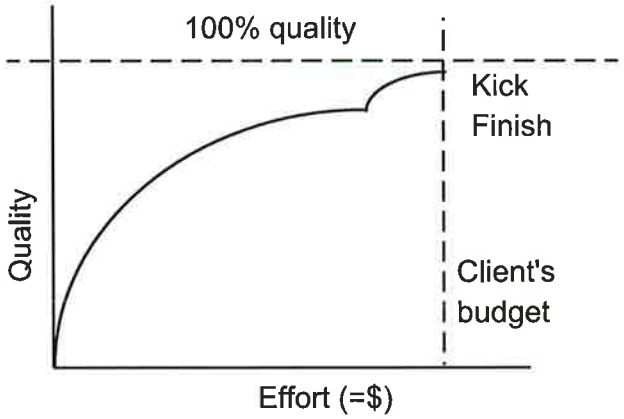
By bringing a fresh start to the old project and treating the last five percent as a brand new project, one in which your "SWAT Team" will come in and clean up, you bring new energy, enthusiasm and commitment to the old tired job. It often pays to bring a new face onto the project team who brings a fresh look at the job and can see opportunities or challenges you have missed.

With a new schedule, budget and scope in hand, you will set out to complete this "new project. Now, as was pointed out above, every project is subject to the Law of

Diminishing Returns, but you can use this to your advantage. If the first 95% of the project looks like this:




and the last 5% of the project looks the same, they will combine to look like this:




With the Kick Finish, you can dramatically increase your return on the last 5% of the effort and achieve a much higher level of quality for the effort you invest.