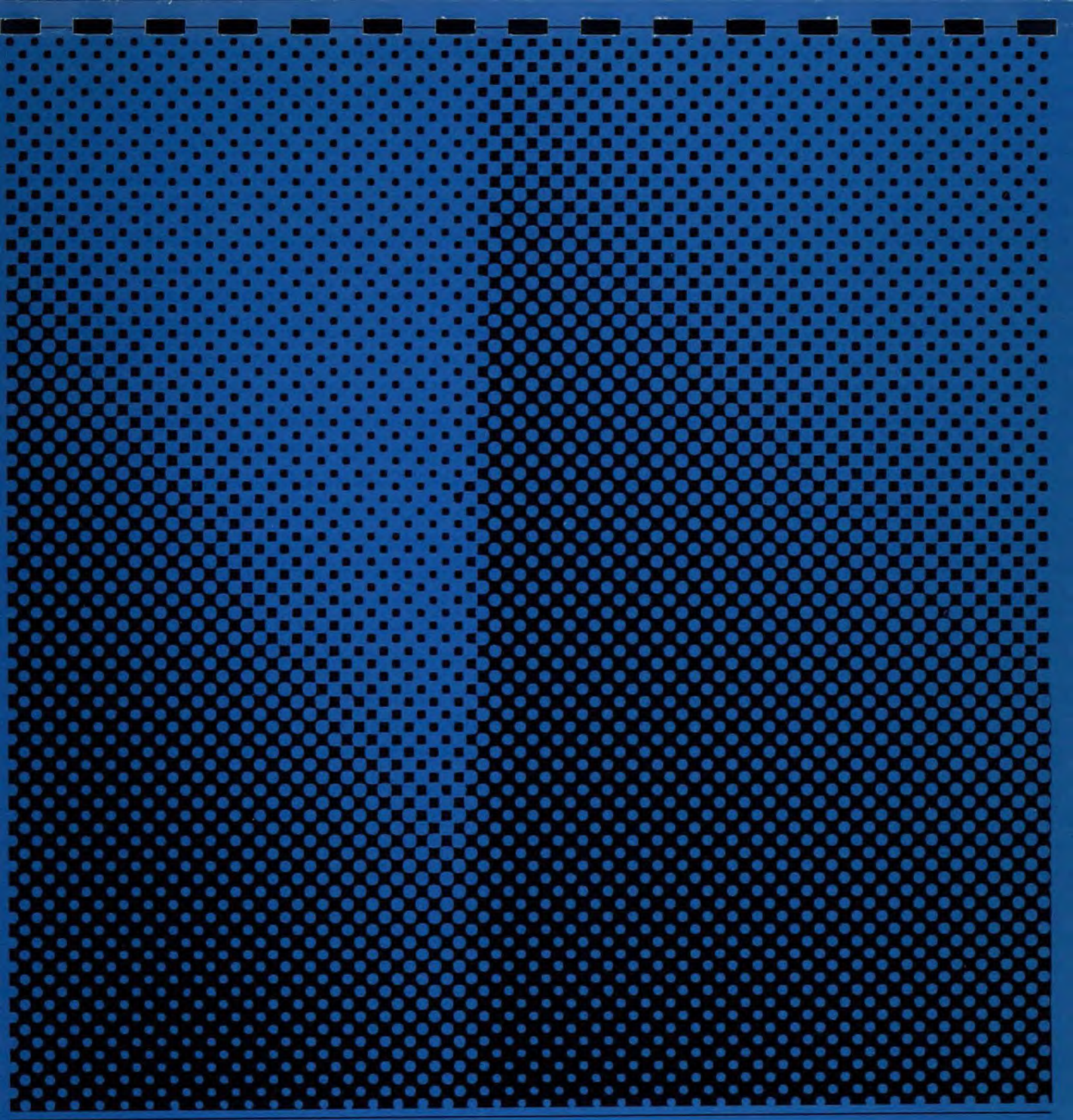


Prototype Program Management Manual

A Study of Management Systems for Department of Regional Economic Expansion

A STUDY OF MANAGEMENT SYSTEMS

related to the acquisition of buildings
and public facilities and the
development of guidelines for the
selection, application and monitoring
of a management system

for

DEPARTMENT OF REGIONAL ECONOMIC EXPANSION

PROTOTYPE PROGRAM MANAGEMENT MANUAL
(An appendix to the Report on Management Systems)

Prepared by:

The Mansfield Consulting Group Ltd.
99 Yorkville Ave.
Toronto, Ont.

27 September 1974

THE PROGRAM MANAGEMENT MANUAL

INTRODUCTION

1. OBJECTIVES OF THE MANUAL

The manual is intended to be used as a guide for program management, to monitor individual projects, from inception to completion, under any jurisdiction. It is developed in a prototypical form to be tested in collaboration with field officers. During the testing, all procedures will be finalized, in order that the manual becomes a fully usable document.

It should be noted that the present format and terminology of the manual is oriented towards building construction. The basic concepts and procedures, however, will be found to be equally valid for civil engineering work.

The manual pursues the following objectives:

a) ease of use by the program representative;

b) comprehensiveness, to include every participant to a project;

c) clarification of the process of monitoring;

d) preparation of feedback information on individual projects;

e) utilization of feedback by program management.

The manual is presented in the form of a guide to assist the representative of the sponsor in the procurement of a facility. The sponsor representative, in the conduct of a project has the responsibility of monitoring the development of a physical facility within budget, time and performance expectations. Developing the monitoring process into three basic phases, the manual provides a general framework for the user to follow the progress of work, and it offers program management a tool to gather valuable information from every single facility it sponsors. The three phases are:

a) the establishment of expectations in terms of quality, budget and schedule at the program level;

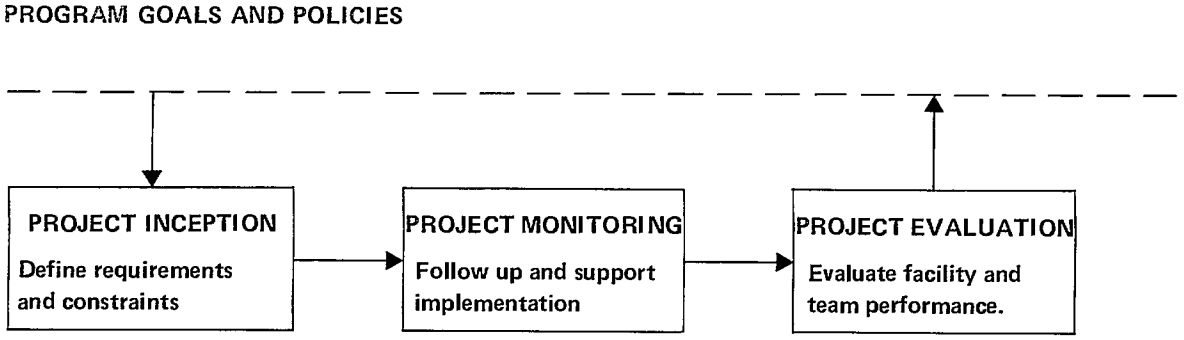
b) the comparison of actual performance with planned progress of work continuously during the development of the facility;

c) the production of feedback information on both the performance of the facility and the organization that conducted the project.

2. SCOPE OF THE MANUAL

The manual assumes that Program Management has set its goals and policies and their fulfilment takes place in the realization of physical facilities subject to overall constraints. The manual is concerned with the monitoring

of single projects and their interactions and interfaces with program management. It ranges therefore from the inception of the project, through the stages of project implementation and terminates with the evaluation of the project to generate feedback information. The boundaries of the manual are illustrated below:



3. DESIGN OF THE MANUAL

The process of the development of a physical facility is first analyzed into stages occurring in their logical sequence. For each stage, the

manual states why it is undertaken as a single step, when it must take place in the process, and who is involved in its implementation.

A second degree of analysis is the activity, a certain number of activities are required under the direction of the Project Coordinator. These activities indicate the respective contributions of the many participants to the development process. They are described in a language that the professionals in the industry can understand as an indication of what must be done and who is responsible for this action.

A final analysis, to be developed during the testing of the manual, is for the user to receive a detailed description of his action as sponsor representative, when his contribution is required in the monitoring role. This description will be made by means of a procedure and a check-list against which he will be able to verify the comprehensiveness of the Project Coordinator's report. (This last analysis will be performed as the manual is tested.)

The framework of the manual follows the logical sequence of the monitoring of the development of a physical facility. It comprises three major sections subdivided in stages from A to H:

I - The establishment of the requirements:

A. Project Inception

B. Project Viability Analysis

II - The monitoring of project implementation:

C. Project Design

D. Project Documentation

E. Project Tendering/Negotiation

F. Project Construction

G. Project Delivery and Operation Planning

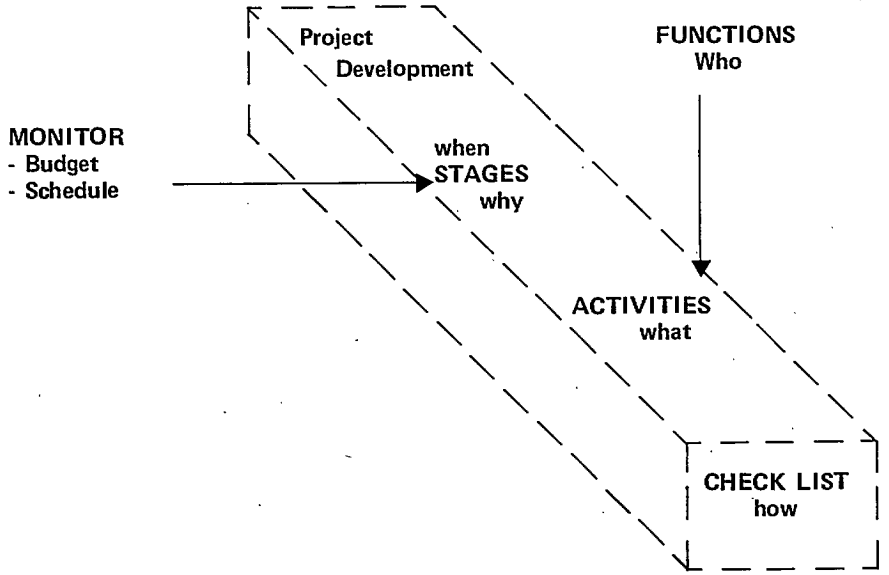
III - The production of feedback information:

H. Project Evaluation

Monitoring is effective on the three criteria of budget, schedule and quality, by means of continuous comparative measurements of the variance between actual and planned performance. The monitoring will run across the five stages (C to G) of the project implementation.

At the stage level, budget and time schedule are monitored. Each project implementation stage ends with a report section indicating the actual performance as compared with planned, and allowing for the user's

comments on variances. The format is standardized throughout the manual in order to produce feedback information at the evaluation stage that can be revised at the inception of future projects.



4. THE USE OF THE MANUAL

By means of this manual, the user is provided with a guide to monitor a single project. He can follow the different activities carried out by the various participants to the project. In stage A, the Program Manager's role is the coordination of the committee members' contributions. The sponsor representative on the project will record the committee's decisions on the forms provided in the manual at the end of that stage.

At the project implementation stages B, C, D, E, F and G, the user of the manual will follow progress of work as directed by the Project Coordinator. His responsibility will be to record time and budget progress on the project in a standard format as indicated at the end of each stage, and add any other comment relevant to the information generated.

At the evaluation stage H, the user of the manual will produce a performance evaluation on the management process, as well as on the technical and functional efficiency of the facility produced. The format is standardized in order to produce feedback directly to the past performance records necessary at the inception stage.

Throughout the manual, an effort is made towards standardization of data recording. The purpose of this is to ensure that information can accumulate and improve as the number of projects monitored under this system increases. However, one cannot expect that every project will evolve in a given sequence of activities, each with a fixed duration; some variations will occur because of particular conditions, or because project management can

be conducted in a different manner. Thus, the manual is provided with the possibility of recording the date of major activities, and with a monitor number system to indicate the sequence of activities applying under the different management approaches.

The date recording and monitor number systems:

MONITOR NUMBER	Record the sequence when		
	S/L or	CM or	TK
DATE	Record date as activities take place		
	PLANNED	ACTUAL	
SPONSOR LIAISON ACTIVITIES	Activities to concur progress of work with sponsor requirements		
PROJECT COORDINATOR ACTIVITIES	Activities as coordinated by the P.C. and reported to the sponsor		

Depending on the type of management system selected by the Project Coordinator, the sponsor liaison will be able to monitor the progress of work by referring to the respective number sequence. Three managerial approaches are considered:

SEQUENTIAL/LINEAR (SL)	:	When the work is carried out in the linear sequence as the manual develops.
CONSTRUCTION MANAGEMENT (CM)	:	When the implementation stages are carried out in a manner to overlap in order to compress the time required to procure the facility.
TURNKEY/DESIGN-BUILD (TK)	:	When implementation is fully contracted after specifications defined by the Project Team.

In order to make the manual operational, a number of procedural forms are proposed to the user. These forms have been designed to assist him in his role of sponsor liaison. They have been developed to give some guidance on complex decision points in the facility acquisition process. The final design of these forms will be closely related to feedback from the testing and implementation phase of the manual.

5. INSTRUCTIONS FOR ADAPTING THE MANUAL TO THE DIFFERENT MANAGEMENT SYSTEMS

This manual develops linearly following the sequential order of activities in the S/L management system. The user follows the sequence of monitor numbers as indicated at the top of each column. This sequence remains the same for

stages A and B under any of the three identified systems of management.

At the end of Stage B, the sequence becomes unique under the CM and TK systems. Special instructions and forms are provided before Stage C to adapt the manual correspondingly.

THE BUDGET MONITORING PAGE

STAGE:
BUDGETING PERIOD:
DATE:

BUDGET						
COST ELEMENTS		EXPENDED	COMMITTED	ESTIMATED FINAL COST	BUDGETED	VARIANCE
1	FINANCING					
2	SITE ACQUISITION					
3	CONSTRUCTION					
4	DESIGN AND MANAGEMENT					
5	LEASING / OCCUPANCY					
6	FURNITURE AND EQUIPMENT					
7	CONTINGENCIES					
TOTAL						
REMARKS:						

THE QUALITY MONITORING PAGE

STAGE:

QUALITY				
CHANGE NO.	DESCRIPTION	RECOMMENDED BY	APPROVED BY	DATE
EFFECT ON QUALITY				
EFFECT ON QUALITY				

NOTE: Add boxes as required by each change to the original plan.

THE TIME MONITORING PAGE

STAGE:

SCHEDULE						
START DATE		STAGE DURATION			COMPLETION DATE	
ACTUAL	CUMULATIVE	PLANNED	ACTUAL	STAGE VARIANCE	ACTUAL	CUMULATIVE VARIANCE
REMARKS:						

project inception

A

STAGE A: PROJECT INCEPTION

THE PURPOSE	:	To program the procurement of a facility that fulfils the need identified, - in accordance with the user's requirements, - within the sponsor constraints of cost, time and performance level.
THE SEQUENTIAL ORDER	:	Inception must necessarily take place before the actual project begins. Thus the sequential order of the required activities remains the same whatever the future project organization will be.
THE PARTICIPANTS AND THEIR RELATIONSHIP	:	Inception stage is carried out in Committee. The Program Manager will constitute the Committee and be responsible for coordinating the respective contributions of the member organizations. The relationship amongst the members is on mutual consultations where everyone is expected to provide his expertise as necessary to develop a global view of the nature and goals of the contemplated project. The decisional capacity belongs to the Committee as a whole. In accordance with the Committee, the Program Manager will ratify the decision, and will take the necessary steps to implement it.

A: PROJECT INCEPTION													
MONITOR NUMBER	1	1	1	2	2	2	3	3	3	4	4	4
DATE	PLAN:		ACT:	PLAN:		ACT:	PLAN:		ACT:	PLAN:		ACT:
PROGRAM MANAGER	Set up the Program Management Committee (PMC). The PMC will be composed of representatives from the sponsor, the user, and the other organizations and agencies concerned in the development of the contemplated project.			Express the program policies to all members of the Committee. Initiate Committee work in first meeting.			Clarify before Committee the respective sponsor and user roles. Indicate the contribution expected from other members.			Set up means of communication and a target date for project definition.		
SPONSOR LIAISON	Help form the PMC by defining the resource requirements necessary to conduct the contemplated development.			Agree on policies.			Agree on role.			Agree with procedures and target date.		
CLIENT/USER	Help form the PMC by clarifying the goal pursued and the contributions necessary to produce a functional facility that will respond to the need.			Agree on policies.			Agree on role.			Agree with procedures and target date.		
OTHER CONCERNED AGENCIES AND ORGANIZATIONS	Contribute to the PMC formation.						Comment on respective contributions.			Agree with procedures.		

5	5	5	6	6	6	7	7	7	8	8	8	
PLAN:		ACT:	PLAN:		ACT:	PLAN:		ACT:	PLAN:		ACT:	
Support individual effort to sustain progress of work with the necessary task forces. Facilitate communication exchange between participant organizations.									Study in Committee the technical program, the performance expectations, the budget and the schedule proposed.			
Express the sponsor's resource requirements in broad terms of performance, with limits on budget and schedule. (1)			Comment on facility's functional requirements.			Comment on technical program.			Contribute to the Committee study.			
Comment on sponsor's requirements taking into account local considerations of resource availability.			Translate the need for the facility into specific functional requirements (2). (Call on professional consultants if necessary).			Prepare the technical program of the contemplated facility. (3)			Contribute to the Committee study.			
Advise sponsor Advise Program Manager.			Assist user organization Advise Program Manager.			Assist user organization Advise Program Manager.			Comment on items brought before the Committee.			

(1)
The budget, schedule and performance requirements are broadly defined in the following form:

Sponsor's Resources Constraints	
Total Budget	Project Duration
$	months
Performance Requirements	

(2)
The functional program is an exhaustive list of the functions required for the facility to perform at the prescribed level of performance.

(3)
The technical program is an exhaustive list of requirements for the facility to fulfil its diverse functions. A form is provided on the last page of Stage A for the recording of the technical program.

A: PROJECT INCEPTION

MONITOR NUMBER	9	9	9	10	10	10				
DATE	PLAN:		ACT:	PLAN:		ACT:				
PROGRAM MANAGER	Make the decision to carry on (reject or modify) the project on Committee's advice.			Appoint the Project Coordinator, and define project objectives.						The Program Manager thus delegates his responsibilities to the Project Coordinator. At the final stage of the project, he will evaluate the performance of the latter.
SPONSOR LIAISON				Agree with the selection of the Project Coordinator.						Criteria for the selection of a P.C.: His past performance as a P.C. on similar projects:_____ On other projects:_____
CLIENT/USER				Propose the selection of the Project Coordinator.						His knowledge of the local environment:_____
OTHER CONCERNED AGENCIES AND ORGANIZATIONS										His other qualifications: Academic:_____ Professional:_____

PROJECT DESCRIPTION

NEED TO BE FULFILLED BY THE FACILITY:

TYPE OF FACILITY:

LOCATION OF THE FACILITY:

FUNCTIONAL PROGRAM DEVELOPED BY:

TECHNICAL PROGRAM DEVELOPED BY:

SIZE OF THE FACILITY:

COMPLEXITY OF THE FACILITY:

STAGE A – INCEPTION: PROJECT PROGRAMMING

PROJECT NAME:

TYPE OF FACILITY:	UNIT BUDGET:
REQUIRED CAPACITY:	TOTAL BUDGET:

FUNCTIONS		SUB-FUNCTIONS		SPATIAL REQUIREMENTS		ENVIRONMENTAL REQ'TS.			
ITEM	NAME OF FUNCTION	TYPE OF SPACE	FUNCT. REQ'TS SQ.FT./ PERS.	SPACE CAPACITY NO. OF PERS.	SPACE AREA SQ. FT.	MECH. ELEC.	ARCH	SOUND CONTR.	OTHER
					s-t.				
					s-t.				
					s-t.				
				TOTAL NET AREA	sq. ft.				

project viability analysis

B

STAGE B: PROJECT VIABILITY ANALYSIS

THE PURPOSE : To ascertain that the program developed at the inception stage is feasible under three aspects:

- a functional facility can be provided to the user's satisfaction
- the necessary resources are within the sponsor's expectations
- there are project management resources available to properly carry out the project.

THE SEQUENTIAL ORDER : The viability analysis requires early estimates that can be performed by a nucleus project organization before full resources are committed. This stage takes place when the program is defined, it will end with the production of initial scheme proposals before design begins.

THE PARTICIPANTS AND THEIR RELATIONSHIP : At this stage, the Program Manager delegates his authority over the project to the Project Coordinator. The latter is fully responsible for forming the project team and has total authority over the team members who will perform the actual project activities as he instructs. When terminating this stage, the Project Coordinator submits the project viability report to the Sponsor Liaison and to the client representative who will review the status of the project against the initial conditions. Their review will lead to actual implementation of the project if no re-evaluation is necessary in total or part.

B. PROJECT VIABILITY ANALYSIS

MONITOR NUMBER	11	11	11	12	12	12	13	13	Go to Section B(1)	14	14	
DATE	PLAN:	ACT:		PLAN:	ACT:		PLAN:	ACT:		PLAN:	ACT:	
SPONSOR LIAISON	Agree with the appointment of the project coordinator.			Assist in the selection of a project organization type.						Comment on proposals.		
CLIENT/USER	Agree with the appointment of the project coordinator.									Comment on functional quality of proposals.		
PROJECT COORDINATOR	Accept appointment to fulfil technical program and project objectives.			Decide on type of project organization. (1)			Obtain preliminary proposals from design organizations.			Evaluate proposals. (2)		
PRIME DESIGN FUNCTION							Respond to invitation.					
COST CONTROL FUNCTION												
STRUCTURAL-CIVIL ENGINEERING												
MECHANICAL & ELECTRICAL ENGINEERING												
CONTRACTOR												

15	15		16	16		17	17		18	18		
PLAN:	ACT:		PLAN:	ACT:		PLAN:	ACT:		PLAN:	ACT:		
Agree with the selection and ratify appointment.			Agree with appointments.			Agree on means of communication and procedures.						(1) A broad procedure for selection of an appropriate organization is suggested at the end of this Section. (2) The evaluation of the proposal will take into account: - the anticipated physical result - the quality of the firm - the proposed staff assignments - the anticipated approximate cost - the timing and scheduling - the consultant-client relationship The evaluation procedure is expanded on the Proposal Evaluation pages at the end of this Section. (3) Means of communication comprise: a) project directory b) meeting schedules c) verbal and written reports d) progress reports.
Agree with the selection. Recommend the design group appointment. Prepare terms of reference.			Recommend the appointment of other consultants.			Agree on means of communication and procedures.						
Select and appoint design consultants. Define scope of work. Appoint cost consultant.			Appoint other consultants as requested by Prime Design function.			Establish means of communication and procedures. (3)			Support studies and research work conducted by consultants.			
Agree on terms and scope of appointment.			Recommend the appointment of specialized consultants (if necessary).			Agree on means of communication and procedures.			Carry out site locational and environmental studies.			
Agree on terms and scope of appointment.						Agree on means of communication and procedures.			Appraise local costs and price trends.			
			Agree with terms and scope of appointment			Agree on means of communication and procedures.			Carry out site study on soil condition.			
			Agree with terms and scope of appointment			Agree on means of communication and procedures.						

B: PROJECT VIABILITY ANALYSIS												
MONITOR NUMBER	19	19		20	20		21	21		22	22	
DATE	PLAN:	ACT:		PLAN:	ACT:		PLAN:	ACT:		PLAN:	ACT:	
SPONSOR LIAISON										Comment on report. Assist with feedback information from previous projects.		
CLIENT/USER										Comment on the functionality of the outline.		
PROJECT COORDINATOR	Request surveyor's report.			Obtain consent from local authorities.			Request an outline of the project for feasibility study.			Ensure functional viability of the outline. Submit report to the sponsor and client.		
PRIME DESIGN FUNCTION	Define site boundaries, levels and services.			Consult local planning authorities on regulations and zoning.			Prepare an architectural and engineering outline of the project taking into account site features.			Revise the architectural program as required.		
COST CONTROL FUNCTION							Survey materials costs, equipment rentals and labor costs.					
STRUCTURAL-CIVIL ENGINEERING							Assist in the preparation of the project outline.			Assist in revision.		
MECHANICAL & ELECTRICAL ENGINEERING	Carry out site studies on services adequacy.						Assist in the preparation of the project outline.			Assist in revision.		
CONTRACTOR												

23	23		24	24		25	25		26	26		
PLAN:	ACT:		PLAN:	ACT:		PLAN:	ACT:		PLAN:	ACT:		
			Comment on cost expectations.			Comment on master schedule.			Comment on budget requirements.			
						Comment on expected completion date.						
Ensure technical feasibility of the project outline.			Ensure observance of costs limits of project.			Establish a master schedule by project stages. (4)			Establish financial plan and budgeting by cost elements. (5)			(4) Dates must be indicated on the project MASTER PLAN page, at the end of this Section.
			Indicate overall quality level of materials.			Comment on master schedule.						(5) A budgeting form is provided at the end of this Section.
			Indicate cost range for project outlined.			Prepare cash flows.			Prepare financial pro-forma statements.			

B: PROJECT VIABILITY ANALYSIS

MONITOR NUMBER	27	27		28	28					
DATE	PLAN:	ACT:		PLAN:	ACT:					
SPONSOR LIAISON	Provide any relevant feedback information from previous projects.			Analyze project viability report. Decide on continuation of project.						
CLIENT/USER	Contribute any further comments on functionality.			Analyze project viability report. Decide on continuation of project.						
PROJECT COORDINATOR	Prepare the project viability report.			Submit report to the sponsor and the client.						
PRIME DESIGN FUNCTION	Provide any documentation requested by P.C.									
COST CONTROL FUNCTION	Provide any further financial study requested by P.C.									
STRUCTURAL-CIVIL ENGINEERING	Assist designer on documentation.									
MECHANICAL & ELECTRICAL ENGINEERING	Assist designer on documentation.									
CONTRACTOR										

STAGE B – VIABILITY: PROJECT MASTER PLAN

PROJECT NAME:
BEGINNING DATE:

PROJECT STAGES		DURATION	SCHEDULE
		MONTHS	DATE
B	VIABILITY		
C	DESIGN DOCUMENTATION		
D	CONSTRUCTION DOCUMENT		
E	TENDERING/NEGOTIATION		
F	CONSTRUCTION		
G	OPERATIONAL PLAN		

PROJECT ORGANIZATION SELECTION (1)

FEATURES	TYPE	LOCATION	SIZE	COMPLEXITY	CONTROL PERFORMANCE (FROM FEEDBACK INFORMATION)								
					SL			CM			TK		
					COST	FACILITY PERFORMANCE	TIME	COST	FACILITY PERFORMANCE	TIME	COST	FACILITY PERFORMANCE	TIME
PROJECT CLASSIFICATION	SIMPLE FUNCTIONS	REMOTE	10M–	M									
				F									
			10M+	M									
				F									
		URBAN	10M–	M									
				F									
			10M+	M									
				F									
	SPECIALIZED FUNCTIONS	REMOTE	10M–	M									
				F									
			10M+	M									
				F									
		URBAN	10M–	M									
				F									
			10M+	M									
				F									

Key – Project Complexity Classification:

F – functional complexity in terms of numerous integrated functions.

M – managerial complexity arising because of special conditions of time

Project Size Classification:

10 million $+/ 10 million $–

At the 10 M mark, the contractor needs a strong managerial and financial background.

SL– Sequential/Linear Project Organization

CM– Construction Management Project Organization

TK– Turnkey Project Organization

NOTE: This matrix must be updated as projects are completed and evaluated by Program Management. The necessary data are generated by filling out Project Description forms at stage A, and Facility forms and Team Evaluation forms at stage H. The matrix is provided to the Project Coordinator in order to assist in the selection of an appropriate project organization.

PROJECT ORGANIZATION SELECTION (2)

	ORGANIZATION TYPE SELECTION								
	SL			CM			TK		
	COST	FACILITY PERFORMANCE	TIME	COST	FACILITY PERFORMANCE	TIME	COST	FACILITY PERFORMANCE	TIME
THEORETICAL PERFORMANCE									
LOCAL RESOURCES AVAILABILITY									
EXPECTED PERFORMANCE									
SPONSOR PRIORITIES									
EFFECTIVE PERFORMANCE									
SCORE									

(FEEDBACK INFORMATION FROM CONTROL PERFORMANCE MATRIX)

(FACTOR ESTIMATED BY THE P.C.)

(THE RESULT OF THE PREVIOUS COMPILATION)

(FACTOR SPECIFIED BY THE SPONSOR ORGANIZATION)

(THE RESULT OF THE PREVIOUS COMPILATION)

(OVERALL MEASUREMENT)

THE BUDGET MONITORING PAGE

STAGE: B
BUDGETING PERIOD:
DATE:

BUDGET						
COST ELEMENTS		EXPENDED	COMMITTED	ESTIMATED FINAL COST	BUDGETED	VARIANCE
1	FINANCING					
2	SITE ACQUISITION					
3	CONSTRUCTION					
4	DESIGN AND MANAGEMENT					
5	LEASING / OCCUPANCY					
6	FURNITURE AND EQUIPMENT					
7	CONTINGENCIES					
TOTAL						
REMARKS:						

THE QUALITY MONITORING PAGE

STAGE: B

QUALITY				
CHANGE NO.	DESCRIPTION	RECOMMENDED BY	APPROVED BY	DATE
EFFECT ON QUALITY				
EFFECT ON QUALITY				

NOTE: Add boxes as required by each change to the original plan.

THE TIME MONITORING PAGE

STAGE: B

SCHEDULE						
START DATE		STAGE DURATION			COMPLETION DATE	
ACTUAL	CUMULATIVE	PLANNED	ACTUAL	STAGE VARIANCE	ACTUAL	CUMULATIVE VARIANCE
REMARKS:						

project
design
development

C

STAGE C: PROJECT DESIGN DEVELOPMENT

THE PURPOSE	:	To develop the outline proposal into sufficient details of design and specifications to decide on materials and to produce cost and time estimates of any part or component of the project.
THE SEQUENTIAL ORDER	:	In the Sequential/Linear type of organization, this stage must be fully completed before steps are taken to contract construction of the facility. With the Construction Management organization, this stage will overlap with contract documentation, tendering/negotiation and early construction. The overlapping compresses time and activities must be carried out in parallel. The Turnkey organization achieves this overlapping within one organization. (1)
THE PARTICIPANTS AND THEIR RELATIONSHIP	:	The Project Coordinator requests from the consultants (and the contractor if appointed) their respective expert contributions to design the facility. He keeps the sponsor and user representatives informed on progress of work and brings to their attention any design considerations which may have a major impact on the initial program. Conversely, he acts for the designers to respond to any new requests in the course of the stage, judged valuable by the client. He submits the final design for comments and approval from the sponsor and the user.

(1) This manual has been developed according to the Sequential/Linear process. Instructions are provided on the next pages for use under a Construction Management approach or a Turnkey approach.

INSTRUCTIONS FOR USE OF THE MANUAL UNDER A CM SYSTEM

Under this system of management, the contractor's role is assumed by the Construction Manager who will determine the sequence of operations through individual contracts. For each contract, the sequence of Stages C, D, E and F is carried out independently. Thus, the user of the manual will monitor each contract individually. In order to do so, each contract must be identified with a specific code number recorded in the CM box.

Example:

Contract No. 03

STAGES: D --- E

Monitor No.: | S/L_{46} | CM_{03} | TK | --- | S/L_{61} | CM_{03} | TK |

Contract No. 07

STAGES: D --- E

Monitor No.: | S/L_{46} | CM_{07} | TK | --- | S/L_{61} | CM_{07} | TK |

A standard coding format for contract numbering is suggested based on the Uniform Construction Index (UCI):

Single Contract	Code Number
General Requirements	01
Siteworks (Building)	02
Concrete	03
Masonry	04
Metals	05
Wood and Plastics	06
Thermal & Moisture Protection	07
Doors and Windows	08
Finishes	09
Specialty Works	10
Equipment	11
Furnishings	12
Special Construction	13
Conveying Systems	14
Mechanical	15
Electrical	16
Site Preparation and Landscaping	17

In order to monitor a project under CM, the user adds as many sections in the C, D, E, F sequence as there are individual contracts on the project.

SECTION B(1)

INSTRUCTIONS FOR USE OF THE MANUAL UNDER A TK SYSTEM

Under this management system, the Stages C, D, E and F are carried out independently by an outside organization. The client retains control over cost, time and quality by means of Performance Specifications and a Contractual Agreement with a Turnkey contractor.

In order to use the manual properly, Sections C, D, E and F should be taken out and replaced by Section B(1) which indicates the sequence of activities required in the preparation of the specifications and the contractual terms. The monitor number must be read in the TK box.

B(1): PERFORMANCE SPECIFICATIONS												
MONITOR NUMBER			13			14			15			16
DATE	PLAN:		ACT:	PLAN:		ACT:	PLAN:		ACT:	PLAN:		ACT:
SPONSOR LIAISON	Concur with P.C. decision.						Concur with cost estimate.					
CLIENT/USER	Concur with P.C. decision.			Detail functional requirements as indicated by the Project Coordinator.			Comment on materials and components.					
PROJECT COORDINATOR	Advise participants on procedures to obtain TK proposals.			Request detailed functional performance specifications in accordance with the program. (1)			Request performance descriptions of construction systems and components; obtain an initial cost estimate.			Invite TK contractors for proposals. Provide descriptive specifications to interested contractors.		
FUNCTIONAL PARTICIPANTS: PRIME DESIGN FUNCTION COST CONTROL FUNCTION STRUCTURAL-CIVIL ENG. MECHANICAL & ELECTRICAL ENG.				Prepare a functional performance specification.			Produce descriptive specifications. Prepare a cost estimate. (2)					
CONTRACTOR (TK)										Respond to invitation. Prepare bidding proposal following descriptive specifications.		

		17			18			19			20	
PLAN:	ACT:		PLAN:	ACT:		PLAN:	ACT:		PLAN:	ACT:		
Comment on proposals.			Comment on contractual terms.						Concur with contractual terms.			(1) This specification is based on the initial list of functional requirements, prepared at the Inception Stage. (2) The descriptive specifications indicate the performance requirements of the materials, components, and the methods of construction. These can be developed by following standard specifications format (UCI) utilized in the industry. (3) The contractual terms may include the site acquisition, related services and amenities.
Comment on bidders' proposals. Finalize functional performance specifications.						Contribute to proposal analysis.						
Evaluate bidders' proposals. Finalize descriptive specifications. Provide feedback to bidders.			Prepare contractual terms.			Analyze and rank each proposal for cost-effectiveness.			Enter into contract negotiation with the selected bidder. Finalize contractual terms. (3)			
			Advise on terms.			Contribute to proposal analysis.						
			Return a final proposal.						Accept contractual terms. Construct and deliver the facility.			

C: DESIGN DEVELOPMENT												
MONITOR NUMBER	29	( )		30	( )		31	( )		32	( )	
DATE	PLAN:		ACT:	PLAN:		ACT:	PLAN:		ACT:	PLAN:		ACT:
SPONSOR LIAISON				Agree with reporting procedures.			Comment on priorities and schedules.					
CLIENT/USER				Agree with reporting procedures.			Comment on priorities and schedules.					
PROJECT COORDINATOR	Define roles and responsibilities of design team members.			Establish methods of communication and reporting. Set a standard reporting procedure on progress of work.			Determine priorities and establish schedule for detail design phase according to master plan.					
PRIME DESIGN FUNCTION				Agree with methods of communication.			Comment on priorities and schedule.			Assemble staff for detail design phase and define roles.		
COST CONTROL FUNCTION							Comment on priorities and schedule.			Assemble staff for detail design phase and define roles.		
STRUCTURAL-CIVIL ENGINEERING							Comment on priorities and schedule.			Assemble staff for detail design phase and define roles.		
MECHANICAL & ELECTRICAL ENGINEERING							Comment on priorities and schedule.			Assemble staff for detail design phase and define roles.		

33	( )		34	( )		35	( )		36	( )		
PLAN:	ACT:		PLAN:	ACT:		PLAN:	ACT:		PLAN:	ACT:		
			Provide required information and decide on queries presented.			Assist as required any studies carried out by design team.						
			Obtain required information and forward to design and engineering function.			Assist as required any studies carried out by design team.						
Evaluate outline scheme and data.			Determine if information necessary for detail design is required from client and obtain same.			Complete any outstanding client/user studies.			Develop detail planning solutions.			
						Prepare any necessary comparative cost studies.			Prepare any necessary comparative cost studies.			
Evaluate outline scheme and data			Determine if information necessary for detail engineering design is required from client and prime design function and obtain same.			Carry out outstanding studies.			Provide sizes of structural elements to allow for detailed layout of project.			
Evaluate outline scheme and data.			Determine if information necessary for detail engineering design is required from client and prime design function and obtain same.			Carry out outstanding studies, i.e. detailed analysis of environmental and functional requirements.			Establish area of service requirements, prepare schematic design based on outline drawings, with preferred routing and locations of major components.			

C: DESIGN DEVELOPMENT												
MONITOR NUMBER	37	( )		38	( )		39	( )		40	( )	
DATE	PLAN:		ACT:	PLAN:		ACT:	PLAN:		ACT:	PLAN:		ACT:
SPONSOR LIAISON												
CLIENT/USER							Provide approval of cost changes (if any) due to authorities' requirements.					
PROJECT COORDINATOR							Advise client/user of progress to date according to accepted procedures.					
PRIME DESIGN FUNCTION	Obtain results of work of other team members.			Consult with authorities to ensure compliance with codes and regulations. Advise project coordinator of results.						Prepare detailed schematic design.		
COST CONTROL FUNCTION	Advise prime designer of results of action.			Advise project coordinator of cost ramifications.						Contribute to schematic design and provide cost advice.		
STRUCTURAL-CIVIL ENGINEERING	Advise prime designer of results of action.			Contribute to authority consultation.						Contribute to schematic design. Confirm scope of major structural elements.		
MECHANICAL & ELECTRICAL ENGINEERING	Advise prime designer of results of action.			Contribute to authority consultation.						Contribute to schematic design. Review services proposals. Confirm design routing, location and overall dimensions of major service elements.		

41	( )		42	( )		43	( )		44	( )		
PLAN:	ACT:		PLAN:	ACT:		PLAN:	ACT:		PLAN:	ACT:		
									Comment on detail design scheme.			
									Comment on detail design scheme.			
Review detail design and provide comments.						Prepare report including detail design scheme, cost estimates and future schedule.			Present detail design scheme and report to client/user and sponsor. Discuss report as required.			
Present detailed schematic designs to cost control and to project coordinator.			Review comments. Amend detail design scheme and prepare presentation.			Provide presentation to project coordinator for report and to cost control. Contribute to report.						
Price detailed schematic design. Should budget be exceeded provide recommendations to bring design into line.			Contribute to revisions of detail design scheme and presentation.			Prepare estimate and give to project coordinator. Contribute to report.						
			Contribute to revisions of detail design scheme and presentation.			Contribute to report.						
			Contribute to revisions of detail design scheme and presentation.			Contribute to report.						

C: DESIGN DEVELOPMENT										
MONITOR NUMBER	45	( )		46	( )					
DATE	PLAN:	ACT:		PLAN:	ACT:					
SPONSOR LIAISON	Give detail design scheme full consideration, make comments and decisions.			Approve scheme.				FREEZE DETAIL DESIGN - CHANGES WILL RESULT IN ABORTIVE WORK		
CLIENT/USER	Give detail design scheme full consideration, make comments and decisions.			Approve scheme and budget.						
PROJECT COORDINATOR	Analyze comments.			Provide copies of approval to design team.						
PRIME DESIGN FUNCTION	Analyze comments.									
COST CONTROL FUNCTION	Analyze comments.									
STRUCTURAL-CIVIL ENGINEERING	Analyze comments.									
MECHANICAL & ELECTRICAL ENGINEERING	Analyze comments.									

THE BUDGET MONITORING PAGE

STAGE: C
BUDGETING PERIOD:
DATE:

BUDGET						
COST ELEMENTS		EXPENDED	COMMITTED	ESTIMATED FINAL COST	BUDGETED	VARIANCE
1	FINANCING					
2	SITE ACQUISITION					
3	CONSTRUCTION					
4	DESIGN AND MANAGEMENT					
5	LEASING / OCCUPANCY					
6	FURNITURE AND EQUIPMENT					
7	CONTINGENCIES					
TOTAL						

REMARKS:

THE QUALITY MONITORING PAGE

STAGE: C

QUALITY				
CHANGE ND.	**DESCRIPTIDN**	**RECDMMENDED BY**	**APPRDVED BY**	**DATE**
EFFECT DN QUALITY				
EFFECT DN QUALITY				

NOTE: Add boxes as required by each change to the original plan.

THE TIME MONITORING PAGE

STAGE: C

SCHEDULE						
START DATE		STAGE DURATION			COMPLETION DATE	
ACTUAL	CUMULATIVE	PLANNED	ACTUAL	STAGE VARIANCE	ACTUAL	CUMULATIVE VARIANCE
REMARKS:						

construction documents

D

STAGE D: PROJECT CONSTRUCTION DOCUMENTATION

THE PURPOSE	:	To produce detailed documents in accordance with the scheduling and the contracting procedures for construction.
THE SEQUENTIAL ORDER	:	In the traditional project organization, the construction documents are developed when the design team has completed the layouts. Contract documents are thus prepared in the light of full scope of contracts. In "phased planning", contracts can be entered into upon partial information with provisions for further agreements when the design is finally documented.
THE PARTICIPANTS AND THEIR RELATIONSHIP	:	The Project Coordinator, in his management capacity, prepares for the client the contractual agreements. He will determine the scope of individual contracts and administer their terms. The professional consultants will assist in providing him with the requested construction documents. It is the professionals' responsibility to produce all the necessary documents, to advise the Project Coordinator on codes and regulations, and to assist him with their relevant expertise.

D: CONSTRUCTION DOCUMENTS												
MONITOR NUMBER	47	( )		48	( )		49	( )		50	( )	
DATE	PLAN:		ACT:	PLAN:		ACT:	PLAN:		ACT:	PLAN:		ACT:
SPONSOR LIAISON												
CLIENT/USER												
PROJECT COORDINATOR	Examine consultants' drawings for preliminary coordination check.						Consult with authorities for compliance with codes and regulations.					
PRIME DESIGN FUNCTION				Finalize working drawings and specifications.			Consult with authorities for compliance with codes and regulations.					
COST CONTROL FUNCTION										Final check for costs and report to project coordinator.		
STRUCTURAL-CIVIL ENGINEERING	Provide working drawings to prime design function for preliminary coordination check.			Finalize working drawings and specifications.			Assist.					
MECHANICAL & ELECTRICAL ENGINEERING	Provide working drawings to prime design function for preliminary coordination check.			Finalize working drawings and specifications.			Assist.					

51	( )		52	( )		53	( )		54	( )		
PLAN:	ACT:		PLAN:	ACT:		PLAN:	ACT:		PLAN:	ACT:		
Concur with sponsor/ client/user agreement												
Comment and approve. Have legal counsel comment.						Advise concerning items to be included in construction contract and items to be provided separately by client/user.						
Pass contract documents to client/user and to sponsor.			Obtain client/user occupancy requirements, and advise construction documentation team.			Clarify items to be included in construction contract and items to be provided separately by client/user. Advise team.						
Submit bid documents, General Conditions, Supplementary General Conditions and Division 1 of Specifications for approval.						Organize documents to reflect items provided by client/user and which do not form part of the contract.			Finalize working drawings including plans, sections and details incorporating results of all above. Prepare specifications concurrently.			
						Advise on costs.						
						Organize documents to reflect items provided by client/user and which do not form part of the contract.			Finalize working drawings including plans, sections and details incorporating results of all above. Prepare specifications concurrently.			
						Organize documents to reflect items provided by client/user and which do not form part of the contract.			Finalize working drawings including plans, sections and details incorporating results of all above. Prepare specifications concurrently.			

D: CONSTRUCTION DOCUMENTS												
MONITOR NUMBER	55	( )		56	( )		57	( )		58	( )	
DATE	PLAN:		ACT:	PLAN:		ACT:	PLAN:		ACT:	PLAN:		ACT:
SPONSOR LIAISON												
CLIENT/USER	Provide special requirements concerning drawing layouts, title blocks, etc.			Make decision concerning use of cash allowances and alternate items.			Provide requirements for insurance and bonds.			Provide contract requirements.		
PROJECT COORDINATOR	Obtain and provide construction document team with client/user requirements concerning drawing title blocks, layouts, etc.			Advise re cash allowances and alternate items, if required.			Obtain client/user requirements for insurance and bonds.			Obtain client/user contract requirements. Provide advice as required.		
PRIME DESIGN FUNCTION	Determine list of required drawings, their content, references and layout.			Ascertain cash allowance items and alternate items, if any required.			Obtain client/user requirements for insurance and bonds.			Obtain client/user requirements for insurance and bonds.		
COST CONTROL FUNCTION				Advise on cost allowances and alternates.						Provide advice as required.		
STRUCTURAL-CIVIL ENGINEERING	Determine list of required drawings, their content, references and layout.			Advise on cost allowances and alternates.								
MECHANICAL & ELECTRICAL ENGINEERING	Determine list of required drawings, their content, references and layout.			Advise on cost allowances and alternates.								

59	( )		60	( )		61	( )		62	( )		
PLAN:		ACT:	PLAN:		ACT:	PLAN:		ACT:	PLAN:		ACT:	
Evaluate approved design development and related data.			Determine if information necessary for production of contract documents is required from client/user and obtain same.			Recheck design development against codes and regulations.			Conduct studies to obtain solutions to technical problems as required.			
									Assist with cost studies.			
Evaluate approved design development and related data.			Determine if information necessary for production of contract documents is required from client/user and obtain same.			Recheck design development against codes and regulations.			Assist with studies.			
Evaluate approved design development and related data.			Determine if information necessary for production of contract documents is required from client/user and obtain same.			Recheck design development against codes and regulations.			Conduct studies to obtain solutions to technical problems as required. Assist prime design function with research.			

D: CONSTRUCTION DOCUMENTS												
MONITOR NUMBER	63	( )		64	( )		65	( )		66	( )	
DATE	PLAN:		ACT:	PLAN:		ACT:	PLAN:		ACT:	PLAN:		ACT:
SPONSOR LIAISON				Agree with procedures.			Comment on priorities and schedules. (1)					
CLIENT/USER				Agree with procedures.			Comment on priorities and schedules. (1)					
PROJECT COORDINATOR	Define roles and responsibilities of team members.			Establish means of communication and reporting.			Determine priorities and establish schedules for this phase. Obtain additional consultants as required.					
PRIME DESIGN FUNCTION				Agree with procedures.			Comment on priorities and schedules.			Assemble staff and define roles.		
COST CONTROL FUNCTION				Agree with procedures.			Comment on priorities and schedules.					
STRUCTURAL-CIVIL ENGINEERING				Agree with procedures.			Comment on priorities and schedules.					
MECHANICAL & ELECTRICAL ENGINEERING				Agree with procedures.			Comment on priorities and schedules.					

67	( )		68	( )		69	( )		70	( )		
PLAN:	ACT:		PLAN:	ACT:		PLAN:	ACT:		PLAN:	ACT:		
						Concur with sponsor/ client/user agreement.			Concur with estimates.			
						Give construction documents full consideration. Make comments and decisions.			Approve documents and estimates.			
			Submit report and construction documents to client/user and sponsor for comment. Discuss as required.			Analyze comments.						
Incorporate revisions required by authorities and cost check.			Assist.			Analyze comments.			Provide copies of approval to construction document team.			
			Assist.			Analyze comments.						
Incorporate revisions required by authorities and cost check.			Assist.			Analyze comments.						
Incorporate revisions required by authorities and cost check.			Assist.			Analyze comments.						

D: CONSTRUCTION DOCUMENTS										
MONITOR NUMBER				71	( )					
DATE				PLAN:	ACT:					
SPONSOR LIAISON		FREEZE CONSTRUCTION DOCUMENTS - CHANGES WILL RESULT IN ABORTIVE WORK								
CLIENT/USER										
PROJECT COORDINATOR				Obtain copies of full documents for bidding.						
PRIME DESIGN FUNCTION				Provide project coordinator with final copies.						
COST CONTROL FUNCTION										
STRUCTURAL-CIVIL ENGINEERING										
MECHANICAL & ELECTRICAL ENGINEERING										

THE BUDGET MONITORING PAGE

STAGE: D
BUDGETING PERIOD:
DATE:

BUDGET						
COST ELEMENTS		EXPENDED	COMMITTED	ESTIMATED FINAL COST	BUDGETED	VARIANCE
1	FINANCING					
2	SITE ACQUISITION					
3	CONSTRUCTION					
4	DESIGN AND MANAGEMENT					
5	LEASING / OCCUPANCY					
6	FURNITURE AND EQUIPMENT					
7	CONTINGENCIES					
TOTAL						
REMARKS:						

THE QUALITY MONITORING PAGE

STAGE: D

QUALITY				
CHANGE NO.	DESCRIPTION	RECOMMENDED BY	APPROVED BY	DATE
EFFECT ON QUALITY				
EFFECT ON QUALITY				

NOTE: Add boxes as required by each change to the original plan.

THE TIME MONITORING PAGE

STAGE: D

SCHEDULE						
START DATE		STAGE DURATION			COMPLETION DATE	
ACTUAL	CUMULATIVE	PLANNED	ACTUAL	STAGE VARIANCE	ACTUAL	CUMULATIVE VARIANCE
REMARKS:						

tendering
negotiation

E

STAGE E: PROJECT TENDERING/NEGOTIATION

THE PURPOSE	:	To obtain an agreement with a contracting organization as to the cost and the delivery of the project.
THE SEQUENTIAL ORDER	:	Tendering and/or negotiation in the traditional approach is based on final documents prepared by the design function. In "phased planning" documentation and tendering will overlap.
THE PARTICIPANTS AND THEIR RELATIONSHIP	:	The Project Coordinator advertises bids, evaluates and prepares the contract with contractor. The consultants advise and comment on bidders. The Sponsor Liaison concurs contractual terms. The user signs the contract and administers the terms of the contract.

E: TENDERING / NEGOTIATION												
MONITOR NUMBER	72	( )		73	( )		74	( )		75	( )	
DATE	PLAN:		ACT:	PLAN:		ACT:	PLAN:		ACT:	PLAN:		ACT:
SPONSOR LIAISON				Agree with procedures.								
CLIENT/USER				Agree with procedures.			Comment on priorities and schedules.					
PROJECT COORDINATOR	Define roles and responsibilities of team members.			Establish means of communication and reporting.			Determine priorities and establish schedules for this phase. (Imperative for design/build approach).					
PRIME DESIGN FUNCTION				Agree with procedures.			Comment on priorities and schedules.			Assemble staff and define roles.		
COST CONTROL FUNCTION				Agree with procedures.			Comment on priorities and schedules.			Assemble staff and define roles.		
STRUCTURAL-CIVIL ENGINEERING				Agree with procedures.			Comment on priorities and schedules.			Assemble staff and define roles.		
MECHANICAL & ELECTRICAL ENGINEERING				Agree with procedures.			Comment on priorities and schedules.			Assemble staff and define roles.		

76	( )		77	( )		78	( )		79	( )		
PLAN:	ACT:		PLAN:	ACT:		PLAN:	ACT:		PLAN:	ACT:		
						Comment.						
			Decisions re tender approach made under "B".			Approve contractor with whom negotiations will be conducted.						
Evaluate approved construction documents and related data.			(Open tendering). Publish advertisement for bids. (Controlled open bidding). Advertise for parties interested in prequalifying for tendering.			(Negotiation). Select contractor (one or more) for negotiations.			(Controlled open bidding). Provide prequalification forms to interested bidders.			
						Assist.						
						Assist.						
						Assist.						
						Assist.						

E: TENDERING / NEGOTIATION												
MONITOR NUMBER	80	( )		81	( )		82	( )		83	( )	
DATE	PLAN:		ACT:	PLAN:		ACT:	PLAN:		ACT:	PLAN:		ACT:
SPONSOR LIAISON	Comment.											
CLIENT/USER	Approve list of bidders.											
PROJECT COORDINATOR	Evaluate prequalification forms. Obtain sponsor and client/user approval.			Distribute construction/ bidding documents to bidders and obtain deposits.			Issue construction/bidding documents to plans room.			Answer bidders' questions. Obtain addenda as necessary from project team.		
PRIME DESIGN FUNCTION	Assist.									Assist.		
COST CONTROL FUNCTION	Assist.									Assist.		
STRUCTURAL-CIVIL ENGINEERING	Assist.									Assist.		
MECHANICAL & ELECTRICAL ENGINEERING	Assist.									Assist.		

84	( )		85	( )		86	( )		87	( )		
PLAN:	ACT:		PLAN:	ACT:		PLAN:	ACT:		PLAN:	ACT:		
						Give approval of alternates, separate prices.			Approve.			
Return drawing and specification security to those who withdraw and return documents.			Receive tenders, tabulate and analyze.			Advise client/user on selections of alternates, separate items, etc.			Make recommendations on which bid should be accepted.			
			Assist with analysis.			Assist.						
			Assist with analysis.			Assist.						
			Assist with analysis.			Assist.						
			Assist with analysis.			Assist.						

E: TENDERING / NEGOTIATION												
MONITOR NUMBER	88	( )		89	( )		90	( )		91	( )	
DATE	PLAN:		ACT:	PLAN:		ACT:	PLAN:		ACT:	PLAN:		ACT:
SPONSOR LIAISON												
CLIENT/USER				Sign letter of intent.			Approve construction contract. Obtain legal opinion.			Act on reminder.		
PROJECT COORDINATOR	Advise successful bidder of award, obtain bonds and insurances.			Issue letter of intent.			Prepare construction contract and give to client/user for approval.			Send client/user written reminder of his obligations, particularly on insurance.		
PRIME DESIGN FUNCTION												
STRUCTURAL-CIVIL ENGINEERING												
MECHANICAL & ELECTRICAL ENGINEERING												

92	( )											
PLAN:	ACT:											
Sign contract with contractor.												
Assist client/user and contractor with contract signing.												

THE BUDGET MONITORING PAGE

STAGE: E
BUDGETING PERIOD:
DATE:

BUDGET						
COST ELEMENTS		EXPENDED	COMMITTED	ESTIMATED FINAL COST	BUDGETED	VARIANCE
1	FINANCING					
2	SITE ACQUISITION					
3	CONSTRUCTION					
4	DESIGN AND MANAGEMENT					
5	LEASING / OCCUPANCY					
6	FURNITURE AND EQUIPMENT					
7	CONTINGENCIES					
TOTAL						
REMARKS:						

THE QUALITY MONITORING PAGE

STAGE: E

QUALITY				
CHANGE NO.	DESCRIPTION	RECOMMENDED BY	APPROVED BY	DATE
EFFECT ON QUALITY				
EFFECT ON QUALITY				

NOTE: Add boxes as required by each change to the original plan.

THE TIME MONITORING PAGE

STAGE: E

SCHEDULE						
START DATE		STAGE DURATION			COMPLETION DATE	
ACTUAL	CUMULATIVE	PLANNED	ACTUAL	STAGE VARIANCE	ACTUAL	CUMULATIVE VARIANCE
REMARKS:						

construction

F

STAGE F: PROJECT CONSTRUCTION

THE PURPOSE	:	To produce a facility as planned within budget, schedule and quality requirements.
THE SEQUENTIAL ORDER	:	In the traditional approach, construction takes place when contractual agreements are signed for the whole of the facility. With "phased planning", construction starts as soon as partial project documentation permits, thus overlapping with the remaining design and the intermediate stages.
THE PARTICIPANTS AND THEIR RELATIONSHIP	:	The Project Coordinator's responsibility becomes control over the project schedule in coordinating the contribution of the consultants to the site operations. The contractor carries out the site operations, acquires the materials, hires the labor, and appoints sub-contractors. The consultants approve materials and work carried out in accordance with specifications. The Sponsor Liaison and user representative follow progress of work from the Project Coordinator's reports. They advise and support when necessary.

F: CONSTRUCTION												
MONITOR NUMBER	93	( )		94	( )		95	( )		96	( )	
DATE	PLAN:	ACT:		PLAN:	ACT:		PLAN:	ACT:		PLAN:	ACT:	
SPONSOR LIAISON				Agree with report and procedures.			Concur with construction schedule.			Approve cost control and financial reporting procedures.		
CLIENT/USER	Contribute to project construction team as indicated by P.C.			Agree with timetable and procedures.			Comment on priorities. Agree on schedule.			Approve cost control and financial reporting procedures.		
PROJECT COORDINATOR	Define roles and responsibilities of construction team members.			Establish project meetings timetable and reporting procedures.			Prepare the schedule for the construction stage. Determine the priorities.			Set up cost control and financial reporting procedures.		
PRIME DESIGN FUNCTION				Agree with timetable and procedures.			Advise on construction schedule and priorities.					
COST CONTROL FUNCTION										Prepare cost control and financial report format and procedures.		
STRUCTURAL-CIVIL ENGINEERING				Agree with timetable and procedures.			Advise on construction schedule and priorities.					
MECHANICAL & ELECTRICAL ENGINEERING				Agree with timetable and procedures.			Advise on construction schedule and priorities.					
CONTRACTOR							Contribute to the preparation of the schedule. Comment on priorities.			Agree on cost control procedures and financial reporting of the construction.		
TIME CONTROL							Prepare construction schedule. Inform P.C. on critical dates and activities.					

97	( )		98	( )		99	( )		100	( )		
PLAN:		ACT:	PLAN:		ACT:	PLAN:		ACT:	PLAN:		ACT:	
									Attend project meetings. Request progress report and comment.			
Approve financing and insurance plans.									Attend project meetings. Request progress report and comment.			
Arrange financing and insurance plans for construction.			Hand over site to contractor. Administer terms and provisions of contract.			Coordinate requests for details and shop drawings.			Conduct project meetings regularly. Prepare progress reports.			
						Produce necessary detail drawings.			Inspect materials and supervise quality of craftmanship.			
Prepare financing and insurance plans.									Produce periodic cost reports and financial statements.			
						Prepare necessary detail drawings for execution. Review and approve shop drawings.						
						Prepare necessary detail drawings for execution. Review and approve shop drawings.						
			Secure temporary access, installations and equipment.			Request any outstanding detail and shop drawings.			Carry out construction work. Coordinate site operations and deliveries. Expedite labor. Sub-contract specialty work.			
									Monitor project schedule. Check against priorities and critical dates.			

F: CONSTRUCTION												
MONITOR NUMBER	101	( )		102	( )		103	( )		104	( )	
DATE	PLAN:		ACT:	PLAN:		ACT:	PLAN:		ACT:	PLAN:		ACT:
SPONSOR LIAISON												
CLIENT/USER							Review reports on quality, cost and time as the project proceeds.			Advise on claims for changes in terms of functional performance.		
PROJECT COORDINATOR							Receive consultants' reports on quality of work and materials. Receive cost and time reports.			Act on claims for changes.		
PRIME DESIGN FUNCTION	Arrange for joint site inspections with other consultants and the contractor.			Request testing laboratories when necessary.			Approve work carried out on site within quality specification. Issue inspection reports.			Advise on claims for changes in terms of technical performance.		
COST CONTROL FUNCTION	Anticipate cost escalation and make projections.			Estimate costs of claims for changes. Issue special reports to P.C.			Produce auditing documents. Advise P.C. on cost and financial situation.					
STRUCTURAL-CIVIL ENGINEERING	Join in site inspection. Notify contractor of deficiencies.			Supervise tests on structural materials and components.			Approve work carried out on site within quality specification. Issue inspection reports.			Advise P.C. on claims for changes in terms of technical performance.		
MECHANICAL & ELECTRICAL ENGINEERING	Join in site inspection. Notify contractor of deficiencies.			Supervise tests on components, fittings and equipment.			Approve work carried out on site within quality specification. Issue inspection reports.			Advise P.C. on claims for changes in terms of technical performance.		
CONTRACTOR	Conduct site inspection.			Request for changes in plans when contingencies occur.								
TIME CONTROL	Advise P.C. on schedule slippage and expedite.			Update schedule when changes are requested. Estimate time and cash flow requirements.			Advise P.C. of expected completion date.					

105	( )		106	( )		107	( )		108	( )		
PLAN:		ACT:	PLAN:		ACT:	PLAN:		ACT:	PLAN:		ACT:	
						Concur.						
			Arrange occupancy insurance plan.			Honor certificate of practical completion.			Inspect facility.			
Instruct contractor on inspection dates.			Inform client of need for insuring facility and contents.			Issue certificate of practical completion.			Inspect facility; list outstanding work.			
			Advise on insurance plan.									
Notify P.C. on practical completion date.												

F: CONSTRUCTION												
MONITOR NUMBER	109	( )		110	( )		111	( )		112	( )	
DATE	PLAN:		ACT:	PLAN:		ACT:	PLAN:		ACT:	PLAN:		ACT:
SPONSOR LIAISON							Participate in final inspection.			Concur.		
CLIENT/USER	Report defects which require immediate attention.						Participate in final inspection.			Honor certificate.		
PROJECT COORDINATOR	Instruct architects and contractors of defects.			Organize pre-final inspection with consultants.			Organize final inspection.			Issue final certificate of completion and release retention fund.		
PRIME DESIGN FUNCTION	Determine necessary action to correct defects.			Carry out pre-final inspection.			Participate in final inspection.					
COST CONTROL FUNCTION										Complete final account. Obtain agreement from contractor.		
STRUCTURAL-CIVIL ENGINEERING				Participate in pre-final inspection.			Participate in final inspection.					
MECHANICAL & ELECTRICAL ENGINEERING				Participate in pre-final inspection.			Participate in final inspection.					
CONTRACTOR	Complete outstanding work. Correct defects.			Collaborate in pre-final inspection.			Collaborate in final inspection.			Agree with final account.		
TIME CONTROL												

113	( )		114	( )									
PLAN:		ACT:	PLAN:		ACT:								
Close budgeting and financial operations.													
Prepare final budget and financial statement.													
			Deliver the facility to the P.C.										

THE BUDGET MONITORING PAGE

STAGE: F
BUDGETING PERIOD:
DATE:

BUDGET						
COST ELEMENTS		EXPENDED	COMMITTED	ESTIMATED FINAL COST	BUDGETED	VARIANCE
1	FINANCING					
2	SITE ACQUISITION					
3	CONSTRUCTION					
4	DESIGN AND MANAGEMENT					
5	LEASING / OCCUPANCY					
6	FURNITURE AND EQUIPMENT					
7	CONTINGENCIES					
TOTAL						
REMARKS:						

THE QUALITY MONITORING PAGE

STAGE: F

QUALITY				
CHANGE NO.	DESCRIPTION	RECOMMENDED BY	APPROVED BY	DATE
EFFECT ON QUALITY				
EFFECT ON QUALITY				

NOTE: Add boxes as required by each change to the original plan.

THE TIME MONITORING PAGE

STAGE: F

SCHEDULE						
START DATE		STAGE DURATION			COMPLETION DATE	
ACTUAL	CUMULATIVE	PLANNED	ACTUAL	STAGE VARIANCE	ACTUAL	CUMULATIVE VARIANCE
REMARKS:						

project delivery & operation planning

G

STAGE G: PROJECT DELIVERY & OPERATION PLANNING

THE PURPOSE	:	To deliver the facility with correct instructions for operation and maintenance.
THE SEQUENTIAL ORDER	:	Delivery and operation planning takes place when the facility is ready for acceptance. Maintenance and operation instructions must be prepared at facility completion.
THE PARTICIPANTS AND THEIR RELATIONSHIP	:	The Project Coordinator requests the necessary documentation on maintenance from the consultant and the contractor before terminating the contractual agreements.

G: PROJECT DELIVERY & OPERATION PLANNING										
MONITOR NUMBER	115	115		116	116		117	117		
DATE	PLAN:	ACT:		PLAN:	ACT:		PLAN:	ACT:		
SPONSOR LIAISON										(1) A facility inspection and maintenance format is provided on next page.
CLIENT/USER										
PROJECT COORDINATOR	Deliver the facility to the user. Organize feedback review for evaluation.			Assemble maintenance documentation.			Prepare a program for inspection and maintenance of the facility. (1)			
PRIME DESIGN FUNCTION				Contribute to maintenance documentation.						
COST CONTROL FUNCTION	Report on cost performance.									
STRUCTURAL-CIVIL ENGINEERING				Contribute to maintenance documentation.						
MECHANICAL & ELECTRICAL ENGINEERING				Contribute to maintenance documentation.						
CONTRACTOR				Contribute to maintenance documentation.						

OPERATION AND FACILITY MAINTENANCE PROGRAM

MAINTENANCE PROGRAM				
EXTERIOR INSPECTION CYCLE: MONTHS		INTERIOR INSPECTION CYCLE: MONTHS		
ELEMENTS	EXPECTED REPLACEMENT	ELEMENTS	EXPECTED REPLACEMENT	OPERATIONAL DEFICIENCIES (IF ANY)
ROOF AND DRAINAGE		FLOORS, WALLS, CEILINGS		
FOUNDATIONS		HVAC, ELECTRICAL		
WALLS		PLUMBING AND SANITARY		
DOORS AND WINDOWS		STRUCTURAL		
TRIMMINGS ETC.		DOORS AND WINDOWS		

THE BUDGET MONITORING PAGE

STAGE: G
BUDGETING PERIOD:
DATE:

BUDGET						
COST ELEMENTS		EXPENDED	COMMITTED	ESTIMATED FINAL COST	BUDGETED	VARIANCE
1	FINANCING					
2	SITE ACQUISITION					
3	CONSTRUCTION					
4	DESIGN AND MANAGEMENT					
5	LEASING / OCCUPANCY					
6	FURNITURE AND EQUIPMENT					
7	CONTINGENCIES					
TOTAL						
REMARKS:						

THE QUALITY MONITORING PAGE

STAGE: G

QUALITY				
CHANGE NO.	DESCRIPTION	RECOMMENDED BY	APPROVED BY	DATE
EFFECT ON QUALITY				
EFFECT ON QUALITY				

NOTE: Add boxes as required by each change to the original plan.

THE TIME MONITORING PAGE

STAGE: G

SCHEDULE						
START DATE		STAGE DURATION			COMPLETION DATE	
ACTUAL	CUMULATIVE	PLANNED	ACTUAL	STAGE VARIANCE	ACTUAL	CUMULATIVE VARIANCE
REMARKS:						

project evaluation

H

STAGE H: PROJECT EVALUATION

THE PURPOSE	:	To provide feedback information to Program Management on the functional value of the facility and the project team's performance.
THE SEQUENTIAL ORDER	:	Project evaluation necessarily takes place after the facility is occupied by the user.
THE PARTICIPANTS AND THEIR RELATIONSHIP	:	The Sponsor Liaison must report to the Program Manager with an evaluation of the project as far as the facility function and the organization are concerned. The Program Manager will record this information and update the program standards if necessary for future project implementation.

H: PROJECT EVALUATION

MONITOR NUMBER	118	118	21	119	119	22	120	120	23	
DATE	PLAN:		ACT:	PLAN:		ACT:	PLAN:		ACT:	
PROGRAM MANAGER							Record feedback information on the project. Review program standards if necessary. (3)			(1) A facility performance evaluation format is provided on next page. (2) A team performance evaluation scheme is provided on next page. (3) Feedback information is recorded for future project viability analysis.
SPONSOR LIAISON				Evaluate the project team's performance on the basis of cost and time variances and facility performance. (2)			Report overall evaluation to program manager.			
CLIENT/USER	Evaluate the performance of the facility with regard to expectations. (1)			Inform the sponsor liaison of facility performance.						

STAGE H EVALUATION: FACILITY PERFORMANCE

PROJECT NAME:

TYPE OF FACILITY / COMPONENTS	RELATIVE COMPONENT IMPORTANCE	USER EVALUATION VIEWPOINTS: SAFETY	FUNCTIONALITY	SERVICEABILITY	NOISE CONTROL	THERMAL COMFORT	ILLUMINATION	AESTHETICS	MATERIALS AND WORKMANSHIP	FLEXIBILITY
FUNCTIONAL	I_1	RELATIVE VIEWPOINT WEIGHTS: W_a	W_b	W_c	W_d	W_e	W_f	W_g	W_h	W_i
FUNCTIONAL SCORE	Σ									
AUXILIARY	I_2	RELATIVE VIEWPOINT WEIGHTS: W_j	W_k	W_l	W_m	W_n	W_o	W_p	W_q	W_r
AUXILIARY SCORE	Σ									
TOTAL SCORE	Σ_Σ									
FACILITY PERFORMANCE		→								

PROJECT TEAM EVALUATION

PROJECT:

TIME CONTROL PERFORMANCE				
PROJECT STAGES		TIME		
		ACTUAL	PLANNED	VARIANCE
A	INCEPTION			
B	VIABILITY			
C	DESIGN			
D	DOCUMENTATION			
E	TENDERING/ NEGOTIATION			
F	CONSTRUCTION			
G	DELIVERY			
TOTAL VARIANCE				

COST CONTROL PERFORMANCE				
COST ELEMENTS		COST		
		ACTUAL	PLANNED	VARIANCE
1	FINANCING			
2	SITE ACQUISITION			
3	CONSTRUCTION			
4	DESIGN AND MANAGEMENT			
5	LEASING / OCCUPANCY			
6	FURNITURE AND EQUIPMENT			
7	CONTINGENCIES			
TOTAL VARIANCE				

REMARKS:

REMARKS:

D.R.E.E.

PROTOTYPE PROGRAM

MANAGEMENT MANUAL