

Physical Assets Management

Author: Bill Wright B.Com, MBA
Copyright © 1994

CONTENTS

Section A : Asset Management Overview

UNIT 1: ASSET MANAGEMENT FUNDAMENTALS	3
UNIT 2: INTERFACE WITH BUSINESS PLANNING	9
UNIT 3: INTERFACE WITH PRODUCT DEVELOPMENT	23
UNIT 4: ASSET MANAGEMENT INFORMATION SYSTEM.....	30

Section B : Land & Buildings

UNIT 5: PROPERTY DEVELOPMENT AND MANAGEMENT OVERVIEW .	34
UNIT 6: PROPERTY PERFORMANCE REQUIREMENTS	39
UNIT 7: BUILDING MANAGEMENT PROCESS	42
UNIT 8: BUILDING MAINTENANCE OVERVIEW	50
UNIT 9: BUILDING MAINTENANCE STANDARDS.....	57
UNIT 10: BUILDING MAINTENANCE INSPECTIONS	62

Section C : Plant & Equipment

UNIT 11: EQUIPMENT MAINTENANCE TERMS	68
UNIT 12: EQUIPMENT MAINTENANCE PLANNING	73

Section D : Asset Protection

UNIT 13: QUALITY ASSURANCE.....	77
UNIT 14: SECURITY	81
UNIT 15: SAFETY	89
UNIT 16: FIRE PROTECTION	96
UNIT 17: INSURANCE	99

Section E : Capital Expenditure

UNIT 18: FEASIBILITY ANALYSIS.....	105
UNIT 19: FUNDING	109
UNIT 20: TENDERS & QUOTATIONS	120
UNIT 21: CONTRACTS.....	124
UNIT 22: NEGOTIATIONS	132
UNIT 23: ACCOUNTING PROCEDURES.....	135

UNIT 1: ASSET MANAGEMENT FUNDAMENTALS

This Unit is part of Section A : *Asset Management Overview*

What are “physical assets”?

Physical assets are those items that appear on a balance sheet under the heading of “fixed assets” as separate line items for land & buildings, plant & equipment, furniture & fittings and motor vehicles. Land would include infrastructure improvements (called siteworks) like roads, bridges, landscaping, fencing etc. Fixed assets do not include “current” or “intangible” assets like stock purchased for re-sale, debtors, cash at bank or goodwill etc.

Fixed assets represent long-term investments in tangible, visible, physical resources acquired or developed for income-producing purposes. Because they are held for a long term and are physical in nature they usually require maintenance and possibly eventual replacement.

They are usually “operated” in the sense that they are combined with human resources to facilitate “operations” of the business.

At the micro level, a business may have a large collection of physical assets including well developed land, a modern building with car-parks and business vehicles, landscaping and the interior filled with all kinds of other physical assets including heating and air-conditioning equipment, lifts, computer equipment, furniture and fittings. In many of these businesses, particularly those involved in tourism, these assets are, in fact, a significant part of “product”.

At the macro level, a tourism area (town, city, region , country etc) may have an extensive range of physical assets associated with tourism. A structured tourism inventory analysis would list these including:-

- **attractions** (natural and man-made). Man-made attractions might include resorts, restaurants & hospitality venues, entertainment facilities, convention facilities, sporting and event facilities, parks and gardens, cultural facilities, interpretation centres).
- assets associated with **activities** for seeing, doing and learning.
- **accommodation** (hotel, motels, flats, units, apartments, bed & breakfast, home stay, farm stay, caravan parks & camping sites).
- **access** assets include transportation by air, sea, rail (trains & trams) and road.
- **ancillary** service assets and infrastructure including public works, water , sewer, power, streets, street-scaping, area beautification, signage, area management, conveniences, picnic and camping facilities, public services, information and interpretation, garbage collection, security), human resource/ education assets (eg at schools and training centres).
- **private** assets including site development, retail and commercial facilities, private services, travel agencies and medical/hospital facilities etc.

To reiterate, in tourism the asset (at both the micro and macro levels) is frequently the product or a significant part of the total product. Think about it!

What is “asset management”?

All assets need to be managed. They are a means to an end, the end in most cases being return on investment. This applies whether the assets are short-term in nature (current assets) or long-term (fixed assets). Each asset represents funds invested with a view to producing a benefit, usually measured in profit terms.

Return on investment (ROI) relates profit (return) to the cost or value of the asset employed (investment) to help generate that profit. The profit is the “numerator” in the ROI equation and investment is the “denominator”. The % return can be increased by increasing the numerator (profit) and/or reducing the denominator (value of the investment). Some people refer to ROI as “return on assets managed (ROAM)”.

It follows then that asset management, in the most simple terms, requires a manager (in respect to each asset and to groups of assets) to:-

- manage the denominator (to “size up” the ideal amount and type of both the initial and continuing investment);
- manage the numerator (to plan and monitor use of that asset to ensure that there is an optimal level of usage of the asset and productive harmony between the human, physical and financial resources to produce the maximum financial benefits).

In addition we need to remind ourselves of the essential functions of management (planning, organising, staffing, direction and control) and to see whether these might still apply to asset management of physical assets. Think in terms of a motel. The business scope and direction has to be **planned**, the human, physical and financial resources **organised**, the organisation structure **staffed**, **directions** given for planning and operational activity and **controls** put in place for monitoring progress.

Just as these management functions are applied to the business as a whole they can be applied to the life of each key physical asset. These assets must be planned, organised, staffed, directed and controlled to achieve the maximum ROI.

Each key asset may be looked on as a “mini-business”. Many organisations treat their key assets in this way by referring to them (individually or as part of a group) as profit centres, with their own set of financial statements and performance ratios.

The physical assets management decision making cycle

The main components of the decision making process for physical assets management can be portrayed in a series of sequential steps, namely ... proposals, procurement, acquisition and operation. These steps are detailed below.

The main stages are defined as proposals, procurement, acquisition and operation and can be detailed as follows:-

Proposals

Proposal Definition: Brief, performance requirements/standards, environmental concerns.

Business Planning Justification: Objectives, development strategy, procurement policy (eg make vs buy), budgeting.

Proposal Planning: Programming, feasibility analysis, funding, planning & finance approval

Procurement

Procurement process: Organisation, policies & procedures

Plans & drawings

Specifications (inc. standards)

Contracts: Standard terms & conditions, negotiation, variations, financial documentation

Quotations & tenders: Invitations, expressions of interest, assessment

Quality Management: Planning for Total Quality Management, supplier accreditation

Negotiation

Buying decision-making

Implementation Approval

Acquisition

Purchase or construction

Testing & quality assurance

Commissioning

Asset valuation

Operation

Production &/or service quality control: Materials, partly made goods, finished goods &/or services

Asset Monitoring: Database (inc asset register), review, consultation, reporting

Asset Protection: Insurance, security & safety, unauthorised access, fire, operational safety, internal environment quality & health, health, environment

Repairs & Maintenance: Maintenance standards, diagnosis & planning, cost control, information system, organisation, labour relations & productivity, contract work

Replacement proposals (cycle starts again)

Asset Performance Reviews

It must be stressed that the same rigour that is applied to proposals for new assets should be applied to their ongoing operation. Times, markets and technologies are changing so fast that all assets must be kept functioning properly and healthily for the whole of their life in order to maximise ROI.

If an asset is not performing then new proposals for its modification or disposal should be forthcoming as a matter of routine. A large part of top managements' business is managing assets (physical and human).

Assets should never be taken for granted. They must be made to work hard and effectively for their whole life. We must compare actual utilisation with planned utilisation (eg room occupancy).

Spot inspection of people and assets can be useful as a first step. Regularly walk through an area, look at an asset (or a person) and make a mental note as to whether the “asset” was working or not working. This is a crude measure but often a great indicator of productivity. This is part of an old-fashioned management concept called “MBWA”.....management by walking around.

More sophisticated information systems are of course necessary but too much information can often dull the senses and we often “can’t see the wood for the trees”. To continue the metaphors “a picture is worth a thousand words”.

ACTIVITY QUESTIONS

1. Complete the following sentence:

“Physical assets appear in a balance sheet as.....assets”.

2. What physical assets might be involved in

- a motel
- a bus tour business
- a caravan park
- a holiday farm
- a travel agency
- a manufacturing company making tourist gifts
- a retailer

.....

2. Goodwill qualifies as a physical asset because it refers to physical assets. True or false?

3. What business units (profit centres) might be used for a 5 star hotel?

.....

4. What are the major categories of a tourism inventory asset analysis?

.....

5. What assets could be directly attributable to these business units?

.....

6. What does “ROAM” mean?

.....

7. Could the value of other general purpose assets be apportioned (on paper) to these business units?

.....

8. What is a profit centre?

.....

9. Would it be possible to calculate an ROI for each profit centre?

.....

10. What are the main functions of business and asset management?

.....

11. Would it be reasonable to ask business unit managers to look at the efficiency of asset utilisation eg land area required vs available, floor area, type of equipment etc?

.....

Answers to activity questions are on the next page.

ANSWERS TO ACTIVITY QUESTIONS

- 1.** Fixed.
 - 2.** Think of items under the headings of land & buildings, plant & equipment, furniture & fittings, motor vehicles. Livestock for the holiday farm and tooling for the manufacturer would also be included.
 - 3.** False. Goodwill is an intangible asset and represents the surplus of the market value of a business over the value of the tangible assets, (inc. bank, stock and debtors) after all amounts owing to outsiders have been deducted from the sum of the values for these tangible assets.
 - 4.** Accommodation, restaurants, conference facilities, retail, tour activities, general purposes. The latter item would include land & buildings, plant & equipment, motor vehicles
 - 5.** Attractions, activities, accommodation, access, ancillary, private assets.
 - 6.** Fit-out, furniture and equipment etc.
 - 7.** Return on assets managed. An ROI measure.
 - 8.** The value of the “general purpose” assets can be apportioned on the basis of floor area used by each profit centre eg 5 star hotel (see answer 4 above).
 - 9.** A part of a business that represents a meaningful grouping of assets and activities for determining the contribution of various parts of the business to total performance.
 - 10.** Yes. Net profit for profit centre divided by the sum of directly attributable assets plus apportioned general purpose assets.
 - 11.** Planning, organising, staffing, direction and control.
 - 12.** Yes. eg room occupancy %, restaurant seating utilisation % (seats sold to maximum capacity), equipment usage % (hours used compared with hours available).
-

UNIT 2: INTERFACE WITH BUSINESS PLANNING

This Unit is part of Section A : *Asset Management Overview*

Business Planning Model

There are many business planning models, each having similar fundamental steps. The one set out below is considered to be most useful for our purposes.

Executive Summary

Business Profile (Who are we?)

Business Description, Background, Stakeholders

Situation Analysis (Where are we now?)

Financial Analysis, Planning Analysis, Macro Analysis, Industry Analysis, Organisation Analysis, SWOT Analysis

Vision (Where do we want to go?)

Mission, Objectives, Culture, Policies

Direction (How and when are we going to get there?)

Gap Closing Strategies (including market development, product development and diversification): Programs, schedules and priorities.

Implementation (Who will be responsible?)

Organisation, Delegation, Action Plan

Financial Plan (How much will it cost?)

Resources, Budgets,

Monitoring (How are we going? Are we in control?)

Management Information System; Performance Review; Plan Modification

This kind of a business planning model would suit a wide range of organisations including small, medium and large businesses, government organisations and authorities and also town and regional tourism development agencies, whether they be start-up situations or on-going mature organisations.

The asset management process is dependent on the business planning model. For example, the “proposals” stage of the asset management process requires business planning justification. The remaining asset management stages (procurement, acquisition and operation) are also sympathetic with later phases of the business planning process (implementation, financial plan and monitoring).

Learners are therefore advised to remember the business planning process in both learning and practising asset management.

A more detailed review of the business planning process now follows:

Vision

The question for the whole organisation “Where do we want to go?” must be answered before we consider “Where do we go with physical asset management?”.

The points under this heading would provide a useful checklist to be used when major asset proposals are being considered, to help answer the fundamental question of “why” the proposal should be considered.

A mission statement defines the organisation's role and its basic reason for existence. It should not be too narrow in scope (else opportunities will be missed) or too wide (else resources will be strained).

Corporate objectives include quantitative and qualitative objectives.

- quantitative objectives (by time and extent) which include market share, industry ranking, sales growth, sales (quantity and value), new technology and product introduction, return on investment, liquidity, security etc. Sales can be broken down by products, industries, markets, countries, territories and types.
- qualitative objectives which include statements about environmental and social responsibility, continuity of effective management and image.

When framing corporate objectives considerable care should be taken to see that the final statement of objectives covers the key result areas. These key result areas are as follows:-

- **Customer Satisfaction** :- a prime aim is to find customers and satisfy consumer needs and wants better than the competition. Research and analysis of marketing mix components will help define the key leverage factors in this area
- **Productivity**:- ratio of output to input. eg sales dollars per salesperson, profit per key resource hour (key machine or key executive time), occupancy, direct standard labour hours produced versus paid. If a competitor can out-produce you it can usually out-price you
- **Innovation**:- new and better including product design, facilities, computer applications, human resource management etc
- **Resources**:- creation, conservation and use. eg inventories, debtors, equity, debt, buildings, land, patents, licensing, human resources
- **Management Development and Performance**:- often the biggest bottleneck to improving performance
- **Employee Attitudes and Performance**:- look at staff turnover, absenteeism, morale, time lost through stoppages and accidents, training budgets etc
- **Social Responsibility**

After the objectives have been defined they need to be evaluated in accordance with essential and desirable criteria. The essential key criteria for evaluating objectives are:-

- **Suitability**:- Does the objective relate to purpose and direction (relevance)? Does it fit with other objectives (consistency)? Can it be delegated?
- **Feasibility**:- The objective is theoretically possible? Test the underlying assumptions eg if the sales target requires greater than forecast industry growth ask "who are we going to take business from and how?"
- **Achievability**:- Is the objective practical for those who will be responsible? Can they do it? Do they have the knowledge, skills and motivation even if we give them the required resources?
- **Acceptability**:- Have the resource requirements been estimated? Are we willing to commit resources
- **Value**:- Is securing the objective worth the price (Is it cost-effective)? Is it the best we can get for our money? If we transferred the resources what alternative objective(s) might better satisfy stakeholder expectations?

Desirable criteria for evaluating objectives include:-

- **Measurability:-** Has the objective been quantified? Is it possible to measure progress? Does it allow for a high level of self-control rather than imposed control?
- **Adaptability:-** Can the objective be flexed with changes in assumptions about the external environment?
- **Commitment:-** Has the objective been agreed? Does it inspire commitment?
- **Culture.** Does the objective fit “the way things are done around here” . Culture includes the climate, personality or qualitative standards that characterise human behaviour in an organisation and also refers to the unique ways people unify behind a common purpose to try to deliver superior performance and pass on their skills to others.

Management by objectives (MBO) is a discipline which attempts to define individual responsibilities by setting objectives which have to be achieved within key target areas. The object is to integrate an organisations needs by involving management and subordinates in the process of deciding what to do, how to do it and when to do it. The method provides a rational basis for determining corporate and/or departmental goals and how to achieve them.

The basic elements of the MBO method are:

- planning of corporate objectives relating to every area of performance which affects the organisation, ie. long-term planning.
- planning corporate, departmental and individual objectives which logically derive from the long-term plan, ie. short-term planning.
- aligning other constraints on managerial action with the set objectives, ie. budgets, organisation structure, job descriptions, etc.
- co-ordinating and controlling departmental and individual actions so as to contribute to the achievement of corporate goals.
- devising an information system which will indicate the extent to which objectives are being met.
- periodically reviewing goals and objectives in the light of actual achievement.
- involving staff in setting objectives and defining key target areas. It is important that members of staff concerned should be personally involved in the selection of key target areas and that the targets should be achievable but at the same time present a challenge.

Finally we have to be clear on the difference between objectives and policies. To help clarify this difference we should understand that policies are statements born out of the mission statement and objectives to help keep the organisation on track by defining what actions are permissible and what are to be avoided.

They may be broad in scope and enduring or prescriptive like “rules” eg a policy in the human resource area might be “*our policy on recruitment is to only employ university graduates.*” A policy for a building firm in the strategy area might be “*our policy is never to get involved as a developer.*”

Direction

So we might have “vision” to guide the business planning and physical asset management process, but how do we establish “direction”. How and when are we going to get there?

The answer is provided by “strategy”. Strategies are major courses of action that give significant leverage to the achievement of objectives. As such they are highly useful for providing guidelines for the development and management of physical assets.

The strategy process involves looking at what we **might do**, then at what we **can do**, then at what we **must do**. Very often there is a planning gap between the objectives desired for future performance (usually ROI) and the level that is likely to be reached if the existing momentum of the business is sustained without a major change in direction or resource allocation. Growth strategies are required to fill this gap and include:

- **Fine-tuning** - improving the current momentum by fine-tuning existing products, markets and processes;
- **Re-structuring** - radical internal improvements to achieve greater decentralisation, flatter organisational structures and greater commitment through contractual arrangements;
- **Market penetration** - improving market penetration with existing products into existing segments. Market penetration strategies involve finding new ways for existing products in existing segments and developing new markets to enter new market segments);
- **Market development** - strategies involving finding new ways for existing products in new segments;
- **Diversification** - strategies include vertical and horizontal integration.

Vertical integration...

- forwards towards the customer - eg we could start up or buy a business such as a tour wholesaler, travel agency, restaurant, retail outlet or even a finance company to help facilitate sales;
- backwards towards the supplier - eg we could start up or buy a motor repair workshop, a bus body-building and assembly factory or a fuel distribution outlet.

Horizontal integration

- starting up similar businesses under different brand names or buying competitors eg taking over another bus operator
 - capitalising on existing field strengths. For a business selling products through a strong distribution or sales-force network there is an opportunity to sell other different products using these strengths. eg a bus operator might have strong contacts with tour wholesalers and decide to promote (for a commission) other tourism products through this network with package deals etc
 - capitalising on financial and/or management and/or locational strengths by starting up or buying a completely different business;
 - **Product development**
 - *product enhancements* (known as “facelifts”). These involve aesthetic changes to maintain product image and newness/freshness; new features and activities to encourage re-purchase and repeat visitation from existing segments, extended new features to appeal to new segments eg extra facilities for children to tap the family market
 - *new products*. These are fundamental upgrades to existing products eg a major overhaul of the function and aesthetics of an existing product involving new materials, new components, new packaging; major renovations and re-building programmes; extension of the product line eg new products at the top end and bottom end of the product line to increase sales and protect existing products from competitive threats; land acquisition of adjoining sites for increased accommodation and/or activities;
-

developing new product lines that complement the existing product line;
major new products eg resort, theme park, tourist village

Situation Analysis

The aim of “situation analysis” is to answer the question “Where are we now?” in respect to the effectiveness of business planning and our management of physical assets. The answer(s) would be found by attempting the following analyses, namely financial analysis, planning analysis, macro analysis, industry and market analysis, organisation analysis, SWOT analysis.

Financial analysis

This would assess the profitability and funding effectiveness of physical assets, existing budgets and major funding proposals (including the quality and reliability of supporting information and justification provided by existing business and marketing plans) and would reveal the financial management skills of key executives

Planning analysis

Is there an existing business plan and marketing plan to support the management of existing physical assets and the acquisition of new physical assets? Is there a formal planning system for ongoing management and maintenance? Is it working well or does it need to be enhanced or re-designed?

Macro analysis

This involves a wide range of enquiry, detection of trends and key issues and statements of assumptions for planning purposes. Some factors that might relate specifically to asset management might be GNP, inflation, health and welfare, pressure groups (environmentalists, consumer protectionists, peace movements, local pressure groups), natural resources and energy, climatic, geographic factors, planning constraints and development impact, computing and communications, materials and processes, building, plant and product design, design rules and regulations, pollution, hygiene and safety standards, consumer and environment protection, investment incentives and depreciation allowances, direct and indirect taxation, labour regulation, wages and working conditions

Industry and market analysis

This also involves a wide range of enquiry, detection of trends and key issues and statements of assumptions for planning purposes. It looks at industry demand and supply conditions. Some aspects of specific relevance to physical asset management might be:-

- market size, segmentation, growth and geographic distribution;
 - long-term industry sales to reveal the shape of the underlying product life cycle (market saturation or penetration curves);
 - the underlying determinants (forces) of demand including consumer needs and behaviour;
 - comparable markets overseas;
 - the level of unused capacity (vacancy) and capacity utilisation (eg room occupancy);
 - the availability and risks in supply of raw materials, labour and capital resources;
 - the competition, including assets employed and product design comparison (features and benefits);
 - prospects for industry rationalisation and economies of scale;
-

- determination of the key factors for success (“musts” in terms of knowledge, skills and actions for optimum performance).

Sub-components of this analysis include:-

Market (visitation) analysis. We must gather long-term history about the market and graph industry sales. Ideally the graph should start from when the first product in the industry was released because we are trying to measure product life cycle and to see where we are right now on the cycle. We should not be satisfied with just the last 5 years because 5 years of history is not long for trend analysis to be able to predict the next 5 years

Product life-cycle analysis. Not all long-term sales curves are “S” shaped and even if they are, some might be small or flat while others are large and tall indicating strong market penetration over a long period of time. We must be able to explain the shape of the curve in terms of the underlying determinants of demand and major competitive events like innovation etc. _

Market projections. The next step is to project the market into the future for at least the next 5 years. Will the curve go up, down or sideways? What will the rate of growth be? This can be tried first of all using charting or mathematical techniques but whatever shape is decided it must be explained and justified with assumptions about the underlying determinants of demand.

Consumer (visitor) research. We have to examine the nature, availability and usefulness of recent visitor surveys to find out what kinds of visitors are attracted to the area. We need a quantitative profile of these visitors (demographic, geographic, economic factors etc) and qualitative profiles (needs, motivation, likes and dislikes, behaviour, satisfaction etc). Consumer research results (if any) on the following aspects would be helpful... the strength of consumer acceptance and buying intentions of your own existing product and competitive product offerings; prospective preliminary consumer reactions to prospective changes in product and other marketing mix variables and an understanding of benefits in terms of stated needs and underlying psychological needs.

Past and projected competitor activity. The marketing information system must include surveillance of key competitor marketing mix strategies and cover the traditional four P's of marketing;

- **products** as revealed by brochures, actual product held for analysis, (or inspected), features and benefits analysis and value analysis;
- retail and wholesale **price** information (preferably copies of price lists);
- **promotion** details (sales force deployment, advertising, promotion, public relations etc);
- details concerning **distribution** (key wholesalers, retailers and agents);

The information system must also survey competitors' financial performance by referencing financial reports, including credit information, annual reports, newspaper reviews etc.

Segmentation and target market analysis. Having analysed the total market we then try to do the analysis by segment. It may well be that some segments (ie divisions of the market) are showing strong growth while others are dying. Thus there may be a collection of product life cycles underpinning the one for the total market.

The essence of marketing is to find customers (consumers), understand their needs and tailor the organisations offerings to match those needs, maximising customer satisfaction. Because customers are different we try to divide the market into meaningful groups. This process is called segmentation. Segments may be chosen on the basis of demographic, geographic, psychographic or behavioural attributes.

We know we have an adequate target market profile when we can answer questions like:-

- Who are our customers (or potential customers) and why do they buy?
- What communication objectives and process should we use to reach them?
- What is their decision-making process?

Organisation analysis (management audit)

The aim of this section is to evaluate management capability in the main functional performance areas with a view to determining strengths which can be protected, further developed and capitalised upon and weaknesses which can be overcome. In the physical assets management area this means evaluating people and processes in:-

Products and services._

Do we have any locational advantages and disadvantages? What is our relative product strength compared to competitors and substitute products? How well does our product relate to consumer needs? What opportunities are there for innovation? What strengths and weaknesses have been dominant in the organisation's history (eg design features, quality, reliability, patent protection, branding etc)? How do existing customers, potential customers and distributors regard the organisation's products and services? Can each product line stand on its own feet without support from other product lines?

Production & Development._

How capable are we at product research and development? How competitive, effective and efficient are our production facilities, operations and quality control procedures? Are there any economies of scale? Is our level of non-productive time reasonable and competitive? Can we develop and produce new product on time and in accordance with design brief criteria? Is our buying expertise and access competitive? Are there any potential buying economies of scale?

Financial Management._

What conclusions were drawn from the financial analysis section? What is the quality of our financial management? Is there a sound planning and budgeting programme for improving return on investment and managing short and long term funds? Are returns on investment calculated by product line or for any other segments of the business? In our long-term financial plans and capital expenditure proposals, does management understand the cost of capital in absolute terms and relative to that of our key competitors? Do we understand our break-even point and is this too high to sustain the business through recessions or other downturns?

Human Resource Management._

Are performance appraisal systems producing results? Is the organisational climate conducive to top performance? Is the organisation structure capable of flexing to meet market changes and competitive pressures?

SWOT analysis.

SWOT means strengths, weaknesses, opportunities and strengths. SWOT analysis would be a good way to start a planning process for physical assets management, particularly as

it affords an opportunity for everyone to be involved in an initial brainstorming exercise and/or in detailed analysis.

Opportunities and threats refer to external issues and are derived from the macro and industry analyses referred to above.

Strengths and weaknesses refer to internal issues and are derived from the financial, planning and organisation analyses.

Key issues will emerge during the situation and SWOT analysis stages. An issue is a cue for a problem or opportunity that must be defined and addressed. The issues prompt the problem-solving process. The asset management problem solving or decision making process has five steps.

Step 1 - Research. What are the issues, trace the causes, define the needs, define the problem.

Step 2 - Design Brief. Translate the needs and problems into objectives for the new proposal for acquisition, maintenance or replacement.

Step 3 - System Design. Define and evaluate the costs and benefits of each alternative approach, select best alternative and define implementation requirements.

Step 4 - Approval. Involve all levels of management. Seek firm commitment to the approach, content, digestibility and time-table for implementation process. Top management must be fully committed and willing to commit resources to the project.

Step 5 - Implementation

Try to develop pro-active responses to issues rather than re-active responses. Sometimes threats are opportunities in disguise (eg the can manufacturer threatened with anti-litter deposit legislation that diversified into city waste management). The quality of our response often greatly influences competitiveness. Key issues must be managed like projects.

Implementation

The basic question is “Who will be responsible?”. Implementation involves all areas of management. Every manager must have the ability to get things done through other people.

We have to get the right people in the right place at the right time with the required skills and resources to do the job, better than the competition.

There are several key considerations for designing and managing implementation:-

- Consolidate the key steps from the strategic programmes and schedules
 - Review the responsibility areas in terms of human resource availability
 - Review how these responsibility allocations and work-loads match the existing organisation design and responsibility profile
 - Ensure adequate physical and financial resources are available
 - Define performance requirements for key organisational units and executives
 - Determine personal motivation and incentive systems
 - Analyse key inter-relationships and co-ordination procedures
 - Ensure adequate participation of those responsible for detailed operational implementation
 - Establish appropriate information systems to ensure timely and effective measurement of performance against standards so that corrective action can be taken when required
-

- Adopt relevant training programmes to ensure implementers have the desired level of knowledge and skills before-hand
- Ensure that all leaders understand and are committed to the implementation plan

Principles of organisation structure

Objectivity - productivity will increase when the work performed is directed towards tangible, understood and accepted objectives

Specialisation - performance can be enhanced through specialisation because the division of labour matches human territorial, achievement and recognition needs

Logical Arrangement - logically arranged work tends to produce the greatest accomplishment and highest personal satisfaction for the largest number of people over the longest period of time

Minimum Resources - full loads should be allocated to avoid waste, pretence at being busy, tension and frustration

Maximum Span - the more people each manager can effectively manage the smaller the total numbers required

Minimum Levels - the fewer the levels (the flatter the organisation chart) the greater the potential effectiveness for the people involved

Split Groupings - to be avoided if possible because they encourage duplication and force the supervising manager to spend unnecessary time co-ordinating the split groups activities eg a marketing manager who supervises an advertising manager, a sales manager, a research manager and a product manager

Management Bias - a natural tendency for managers supervising two or more different functions, products or geographic units to favour the most familiar or the closest

Delegation

Delegation is an act and/or a process of assigning responsibility, authority and accountability to others. Getting others to do work effectively is a key part of a manager's job because it conserves resources for more important activities and multiplies key strengths through the work of others.

Sub-objectives in the key result areas need to be defined by those responsible before delegation eg marketing manager identifies the key factors for success in the whole marketing plan to be sales incentives and differential pricing.

Delegation involves job design, management by objectives, selection, training and development.

The main problems in delegation are that responsibility and authority very often are not defined, that authority is not delegated with responsibility and that fear and insecurity produces interference. Often we find it hard to let go. We fear that the job won't be done properly and become concerned over "inputs" rather than "outcomes". Often there is difficulty in accepting that others might work in a different way. Good ideas get lost because of vague responsibilities, particularly with committee work. Participation sometimes wrongly encourages group rather than individual responsibility. Where advice is proffered this does not necessarily mean shared responsibility for decision-making and implementation.

The following steps are recommended for effective delegation:-

- identify existing accountability command points. Accountability is the obligation to do the work with the allocated resources and authority to agreed standards.
 - clarify responsibility (the work assigned to a position). Line responsibility refers to those areas that the manager is directly responsible for, from conception through to final execution. Staff responsibility refers to areas for providing advice (eg suggestions or recommendations) and/or service.
-

- clarify authority (the sum of rights and powers assigned to a position). Command authority is the right to make the final decision. Recommendation authority is the right to offer recommendations and for feed-back on consideration and implementation of those recommendations. Approval authority is the right to approve a decision before it is finalised. Information authority is the right to receive relevant information about plans and decision proposals etc in addition to the routine reporting system
- re-define responsibility, authority and accountability
- ensure the provision of resources in the right quality, quantity, time and place
- ensure the provision of reliable information (intelligence) at the time and place of decision
- agree and establish controls by exception with adequate feed-back mechanisms
- confirm commitment by double-checking that the key components of vision and direction in the business planning process are believed and understood and that there is genuine commitment to what is expected (not just to what might be inspected)
- prepare appropriate job descriptions
- ensure that there is adequate preparation for delegation. Technical and routine work are often prime areas for delegation. Final management decisions, unresolved technical issues and new work are difficult to delegate.
- define and discuss what results are expected in the form of delegation standards (performance criteria)
- define and discuss the major programme steps
- define and discuss the major scheduling requirements (eg due date, interim progress reporting dates)
- define and discuss budget requirements, particularly expenditure limits
- communicate, educate, participate, motivate
- take adequate steps for testing capacity for delegation. Start out easily by encouraging people to answer their own questions eg what do you think?; require solutions not problems eg ask for recommendations; facilitate the persons problem-solving process through discussion; select short assignments, gradually increasing the level of difficulty; extend the gap between monitoring sessions; deal with mistakes patiently; require completed reports that are good enough to sign off yourself

Action plans

A written summary statement of who does what and when? Detailed action plans are completed after delegations have been put in place and milestones and completion dates drafted in major programmes are validated and locked in.

Implementation audit

Leadership

Do superiors have confidence and trust in subordinates?

Do subordinates feel free to discuss major parts of their jobs with superiors?

Do superiors seek and use subordinates opinions?

Motivation

Are high performance motivates used (achievement and recognition)?

Do subordinates feel a high degree of responsibility?

Communication

Have the objectives of the business plan been communicated, understood and accepted?

Have the responsibilities in achieving the plan objectives been clarified and accepted?
 Has the action required of them to discharge their responsibilities been developed in conjunction with those responsible?

Procedures and schedules

Have procedures and schedules been developed to obtain feedback from staff initially and on an on-going regular basis?

Are formal opportunities in place for feedback and dialogue between staff and management?

Priorities

Are staff clear on their priorities and schedules for meeting action plan targets?

Have all the necessary resource and organisational requirements been identified?

Are there any organisational limitations or constraints?

ACTIVITY QUESTIONS

1. What steps in the business planning model, might apply to a proposal to purchase a new tour bus?

2. Would these concepts also apply for
 (a) building a new hotel?
 (b) buying a building to use as a travel agency?

3. What are the four stages in the asset management decision making process?

4. The definition and evaluation process for objectives could be applied to asset management. True/false?

5. What is the management technique that involves the delegation of objectives?

6. What is a planning gap?

7. If a travel agency buys a bus, this is an example of horizontal integration. True/false?

8. Complete the following sentence:

"A physical asset proposal might concern a major development proposals."

9. Complete the following sentence:

"Segmentation refers to various in the market."

10. In your own terms describe what a SWOT analysis is.

11. What is the difference between command authority and approval authority?

The answers to these activity questions are on the next page.

ANSWERS TO ACTIVITY QUESTIONS

1. Situation analysis, vision, direction, implementation, financial plan, monitoring.
 2. Yes.
 3. Proposals, procurement, acquisition, operation.
 4. True
 5. MBO
 6. A gap between (1) the level of ROI that will be achieved in the future (if the business maintains its existing momentum) and (2) the desired ROI objective.
 7. False. The answer is vertical.
 8. Product
 9. Divisions
 10. Strengths, weaknesses, opportunities and threats
 11. Command authority is the right to make the final decision. Approval authority is the right to approve decisions before they are finalised.
-

UNIT 3: INTERFACE WITH PRODUCT DEVELOPMENT

This Unit is part of Section A : *Asset Management Overview*

The new product development process includes the following sequential steps ... idea generation, preliminary screening, design brief, preliminary business analysis, development, final business analysis, market testing and commercialisation.

This process is relevant for the acquisition of physical assets

- where the proposed new asset is purely facilitative (eg an air conditioner)
- but more likely where the asset is a tourism product such as a new attraction, a new hotel, or even a new vehicle as part of a tour product.

For this reason it is important to look at the interface between asset management and the product development process.

Stage 1 - Idea Generation

This stage incorporates many of the activities included in the situation analysis stage of the business planning process. Development ideas and priorities may become apparent from:-

Idea search activity

Involving group brainstorming, literature search, field visits (local and overseas), individual innovation, creativity and invention.

Inventory analysis

The contents of an inventory analysis were referred to in Unit 1 under the heading of “What are physical assets?”. This is appropriate to a study of physical assets for a geographic area eg for a precinct, town, suburb, city or region. Each type of asset can be assessed in terms of key strengths and weaknesses.

Identity / image analysis

Identity analysis seeks to define the existing and desired future character of the area. It ties in with image. Image is the face that is presented. Identity is the real thing. Identity is what helps establish uniqueness and an identity statement for an area or a product is an essential part of the concept definition. It provides great impetus to communication effectiveness in the planning and operational stages and to all development and marketing effort.

Town and regional planning

Economists, land-use planners and other strategists (mining, aboriginal, pastoral, tourism etc) all engage in planning which will impact on tourism product.

At a regional and town level, local government and State authorities have produced a large body of planning principles, zoning plans, design guidelines and constraints etc and tourism planners must understand and consider these as part of product (and asset) planning. Key issues to investigate are objectives and principles of these plans; zoning statements of “desired future character”; permitted, prohibited and consent uses; design restrictions concerning height, site coverage, plot ratio, set backs, landscaping and

materials etc; heritage listings and protection requirements; environmental impact assessment requirements.

At a regional and State level there might be economic development plans. These usually refer to tourism and should also be studied.

More tourism-aware communities are become involved in community based tourism planning, often feeding into local government and regional tourism strategies. Agreement may have already been reached at the community and local tourism operator level on such issues as need for a tourism zone; need for tourism development action projects for specific development sites and types of attractions etc; need for enhancement of unique heritage and conservation areas; need for improved visitation and identity; need to boost the sale of locally made products, income and profitability; need for increased employment increased utilisation and value of community assets; increased awareness and education concerning local history, lifestyle and culture.

All town and regional planning concerns the physical, economic and social environment. It is often extremely helpful to remember these dimensions in all aspects of tourism product (and asset) planning.

Stage 2 - Preliminary Screening

Alternative ideas and concepts need to be screened loosely at first by asking such questions as “Assuming it worked, how big would the market be?”; “What might incremental income be?”; “What might incremental costs be?”; “Would it satisfy our pre-determined minimum return on investment?”; “How great is the risk?”

This phase also might be assisted with a rating form.

Stage 3 - Design Briefs

Design briefs are used when significant development is anticipated. Too many products and projects either start off without a clear brief or at the other extreme start off with a pre-conceived design (sometimes copied) or a far too detailed specification both of which leave little or no room for design creativity

The purpose of the design brief is to set broad parameters to guide the design process and to establish criteria for design evaluation. Product designers, architects, engineers and other professionals should not commence design without an agreed design brief. Furthermore, management should never accept a sketch design or detailed perspective's and site plans etc before the design brief is completed.

Design briefs should be driven primarily by market and finance considerations and should include the following components:-

Strategic guidelines

“Is this a facelift or are we looking for innovation?”; “Is significant innovation desired?”; “What quality and leadership standards might apply?”; “Do we have to use existing tooling?” ; “Is there a concept brief?”

Operational guidelines

“What is the expected sales release or opening date?”; “What is the estimated volume per annum?” (this might influence the process technology and materials used); “What assumptions should we make about market product life?”; “Is the volume associated with other products in the product line relevant?”; “Do we need a cost constraint, eg it should cost no more than....?”; “Is service a critical factor?”; “Who is the product being designed for?”; “What consumer research do we have about the target market (prospective users)?”

Functional guidelines

“What are the prime functions (features providing to user benefits) and secondary functions?”; “What psychological needs are relevant?”; “How important is it to ‘look good’ versus ‘perform well’?”

Competitive guidelines

“Who do we have to be ‘better than’?”; “Can we set competitively based quantified standards in prime functional performance areas?”

The design brief provides the objectives and background for the designer to follow. The designer then considers alternative concepts or design strategies, analysing each before they are discarded, and then presents the recommended design approach to management. The recommendation has to be justified and the designer should also be required to explain alternatives considered but rejected. This is to guard against shallow and/or non-creative design thinking.

Management should assess the design against the criteria contained in the brief and complete a financial appraisal and must not be unduly swayed by high-powered professional presentations and concentrate on content more than style at this stage. They must remain objective and ensure that the design strategy provides the best fit to organisational and consumer requirements.

Stage 4 - Preliminary Business Analysis

Design assessment

Comparison of design proposals and recommendations with the design brief. The analysis may include matrix analysis, including scoring and rating.

Product life-cycle analysis

Not all long-term sales curves are “S” shaped and even if they are, some might small or flat while others are large and tall indicating strong market penetration over a long period of time. We must be able to explain the shape of the curve in terms of the underlying determinants of demand and major competitive events like innovation etc

Marketing Mix

Once we are clear about the shape and direction of the product life cycle and our current position on it we can design strategic responses for new product development and other elements of the marketing mix and corporate strategy

Value analysis

Competitive comparison should be systematic. Each feature offered, whether it be functional or aesthetic, must be assessed in terms of its reason for existence. Each component part of the whole product has to be justified. What is it there for? What value (part of the overall price) might consumers place on this part?

Might there be a better way of providing value by decreasing the contribution some components make to the overall product and shifting the cost saved into other features? Value analysis is a technique that applies the decision-making process to the fundamentals of design

Value for money comparisons

Higher prices must be justified in terms of perceived strengths in distribution, promotion, image, reputation etc. The kinds of research required includes consumer research to measure consumer attitudes to competitive offerings (product, price, promotion and distribution); distributor research of attitudes concerning relative strengths and weaknesses, particularly in terms of perceptions about consumer needs and satisfaction; comparative strengths and weaknesses analysis with own marketing mix variables (preferably with a rating system approach).

Product positioning analysis

Positioning involves a matching process between positions sought in the market place (target markets) and positions in the industry product line. It involves linking rationally thought out positions on the demand side (which is called “consumer positioning”) and on the supply side (which is called “competitive positioning”)

Competitive positioning. The industry product line can be segmented in several ways... by size categories; by price categories; by type of material (or functional approach) categories; by feature categories; by benefits (consumer need categories). The object of this sort of analysis is to determine our competitive position on the supply side to see if there is a prima facie case for changing our product line, by filling gaps and/or adding to the depth and width of our product line. The analysis should show areas where we are competitively strong or weak and areas of competitive opportunities or threats. The final step in competitive positioning is to communicate product benefits to the target market by comparing them with the competition.

Consumer positioning. We have already said that market segmentation and targeting seeks to conserve and optimise resource allocation by directing marketing effort to defined segments. Products must be positioned to match defined target markets by communicating product benefits to meet the already identified needs of these target markets. Consumer positioning associates the product with needs in a specific or general way

- specifically, by seeking to establish direct links between consumer benefits and product features or
- generally, by establishing an appealing image or setting that suggests that benefits sought will be matched by the features offered. Positioning helps build brand identity and “top-of-mind” positions in the consumers mind. These positions can be established on the basis of real benefits offered or by imagery and symbolism.

Decision-making

The design and development process follows the problem-solving process in that we start off with an initial appreciation, then formulate the objectives (define the problem), then evaluate the alternative design approaches, choose the best design strategy and plan the necessary activities and resources, then implement and review performance. Key steps for product planning include listing, weighting and scoring using relevant evaluation criteria; summarising the main advantages and disadvantages of each proposal (option); choosing the best proposal (option); deciding the optimum course of action, staging and timing

Financial assessment

Evaluate income, cost and funds projections; evaluate financial returns and risks; human resource assessment.

Stage 5 - Development

This stage includes project planning, detailed drawing, materials selection, materials specification and costing, process technology, methods engineering, tooling, prototype development and testing, competitive comparisons, definition of resource requirements and final costing.

For a building or property development projects this stage includes developed designs (from the sketch designs in response to the design brief), project planning, detailed drawing, materials selection, materials specification and costing, engineering and construction technology, methods engineering, model development and concept testing, competitive comparisons, definition of resource requirements and final costing

Stage 6 - Final Business Evaluation

This stage follows the approach set for the preliminary business evaluation. A final “evaluation matrix” or “rating profile” might also be completed at this stage, which includes scoring and weighting. This stage assumes all the justification, quotations, agreements, costing, pricing etc has been put in place to such an extent that firm contracts and other arrangements will follow smoothly after approval to the final feasibility study is given, without any surprises.

After approval all planning assumptions, income, costs, funds and time estimates etc should be locked into business plans, marketing plans and most importantly, budgets. The same figures used for approval must be used for performance evaluation. A common error is for projects to be approved with one set of figures and assumptions and different ones are used later on for planning and budgeting.

Stage 7 - Market Testing

In some cases it is possible to test a restricted version of the product (or asset) with the market before sales release involving exposure of the product for consumer and/or trade research. For example with the first production run of a new product, with a mocked-up motel unit off-site for an accommodation project before construction on site commences. In other cases a test market sales release might be held to minimise risk, to resolve unanswered questions or perhaps just to fine-tune the major sales release eg a test market product release in one area or capital city, release of Stage 1 of a development project, preferably with a contingency plan if things don't go according to plan

Stage 8 - Commercialisation.

This is the last stage but there is still plenty of room for failure to occur through unforeseen events and if consumer and trade responses fall below expectations. The implementation plan for marketing and operations must be thorough. The monitoring plan must detect variations to expectations in key pre-determined areas eg competitive responses.

The organisation must be prepared to cut its losses in the event of poor performance. There is an old saying the first loss is the cheapest loss. If you persevere in hope in spite

of commercial realities the losses are usually far greater than those you would have had if you had the courage to get out when the first signs of failure started to show.

Often it is wise to have a contingency plan eg alternative use of all or part of the facilities, a planned, quick sale rather than a “distressed” sale, sale of part of the project to a joint-venture partner who has strengths to overcome the imminent problems, suspend and shelve the project until more favourable conditions occur.

If the product or project is going to plan then it has to be managed through the product life cycle stages. In the **introduction** stage profits may be low or negative, competitors few and promotion should focus on developing market awareness. In the **growth** stage sales will start to climb, new competitors will probably enter, prices should probably be maintained, profit margins will peak and growth should be sustained by manipulating the marketing mix. The **maturity** stage presents the greatest challenge for marketing to be prepared to pursue market modification (find new buyers for the product), pursue product modification (change product characteristics such as quality, features and style to attract new users and/or more usage), pursue marketing mix modification (altering one or more elements of the marketing mix). In the **decline** stage the main tasks are to identify weak products, determine marketing strategies (abandon part or all of the market or devise continuation, concentration or harvesting strategies) and to drop or sell the product.

ACTIVITY QUESTIONS

1. Name five of the eight steps in the product development process.
.....
2. A SWOT analysis could be prepared for an individual physical asset.
True/False?
3. Complete the following sentence:
“*Identity is what helps establish*”
4. Complete the following sentence:
“*The three major concerns for town and regional planning are.....*”
5. When might a rating form be useful?
.....
6. What is the purpose of a design brief?
.....
7. The two main functions in design are performance and aesthetics. True/false?
8. Name the two types of product positioning.
.....

The answers to these activity questions are on the next page.

ANSWERS TO ACTIVITY QUESTIONS

1. Any five of the following ... idea generation, preliminary screening, design brief, preliminary business analysis, development, final business analysis, market testing and commercialisation.
 2. True
 3. Uniqueness
 4. Physical, economic and social environment
 5. Preliminary screening, final business evaluation
 6. To set broad parameters to guide the design process and establish criteria for design evaluation.
 7. True
 8. Competitive positioning, consumer positioning
-

UNIT 4: ASSET MANAGEMENT INFORMATION SYSTEM

This Unit is part of Section A : *Asset Management Overview*

Asset Register

The balance sheet tells us the value of our fixed assets by categories only (land and buildings, plant and equipment, furniture and fittings, motor vehicles, etc.). These line items on the balance sheet need to be supported by asset schedules detailing acquisition date, details, cost, depreciation and written down value, etc. These schedules are composed from an asset register.

Details of each asset and their purpose and location should be recorded in an asset register, preferably using a computerised database approach. Suitable cross-references should be made to source documentation and the location of these source documents (eg plans & specifications etc). Relevant maintenance schedules (preferably for the life of the asset) should be included and details of inspections. Relevant insurance particulars should also be included

It is necessary to have an effective system for registering assets that are acquired and owned to support the line items for fixed assets in the balance sheet, to assist accounting for depreciation and to assist management in the location, care and maintenance of each asset. The system will control their acquisition, provide records of internal transfers and to detail authorisations and records of their disposal.

The database should facilitate the recording of depreciation and the generation of asset value and depreciation summaries for accounting and taxation purposes.

The asset register can be set up to operate as a subsidiary ledger to the general ledger and the details of transfers and disposals can be handled as a matter of routine from appropriate internal accounting documentation.

Asset Monitoring

We need to monitor the condition, location and use of these assets by making regular and systematic reviews to facilitate replacement, purchase, renewal or disposal of assets through a process known as “monitoring”.

Monitoring is also a key element in the business planning process and refers to the control function in management. The plan establishes a course of action and monitoring is essential to see that the organisation stays on course. It is the work a manager does to assess and regulate work in progress and to assess results secured. The monitoring process requires fundamental questioning concerning how are we going and whether we are in control. In physical asset management terms the relevant questions are:-

- How is our asset management process going;
- Is our asset management process under control?

The main benefit of monitoring is to provide better feed-back about performance and recognition of achievement. Effective monitoring uses a management information systems (MIS) approach which:-

- collects, analyses, stores and reports information about the condition and use of assets
- collates and analyses results relevant to plan
- includes data for performance standards which are criteria specified in advance by which work and results can be measured and evaluated. (providing a way of differentiating between good work and poor work and validating evidence of acceptable performance).

Some related managed concepts are:-

Stewardship accounting

Relates costs, income and resource use to accountability areas, cost or profit centres. Stewardship also requires the qualities of promptness and understandability

Performance evaluation

This requires actual data to be compared with the plan. Results must be analysed and interpreted. The analysis usually includes formal performance reviews (say every six or twelve months) and more frequent informal reviews (say weekly or at least once per month). The accountable person explains performance against the plan and the reasons for exceptions. Problems are identified and explored and significant elements for the new plan are discussed, agreed and scheduled. It involves developing and implementing systems and schedules to analyse results relevant to plan, identify tolerable and exceptional deficiencies, evaluate all possible responses to the outcomes and to determine which plan elements should be revised.

Corrective action

Control is effective when managers are prompted to take remedial action themselves. There are two types of corrective action. Firstly operating action - to deal with short term variations as a matter of routine and secondly management action - where an analysis of the basic cause concludes that more fundamental changes are required to the plan.

Plan modification

Procedures must be developed to ensure that any appropriate changes to formal action plans are approved by management, communicated to staff at appropriate levels and continually monitored. It may be necessary for people to take responsibility to change themselves or ultimately (after due process) have their responsibilities changed for them.

Asset Reporting

We are required to formulate clear reporting lines, procedures and frequencies for concise and clear reports which provide authorities with all relevant information and recommendations to amend the plan or correct activities to conform to plan. Records and reports provide the means for measuring performance against standard.

System reports are usually written or computer generated and provide managers with data relating to their accountability.

Individual reports can be written and oral and go to superiors for review and discussion. They are usually related to the business plan, budget or a particular situation.

Acquisition reports are designed to secure senior management approval for the project and should include an executive summary (to be prepared last, say 1 page), rationale for

the project, development stages and time plan, implementation staging and responsibility summary and a budget.

Periodic reports can also be generated from the asset management information system regarding cost, valuation, depreciation, written down value, scheduled replacement, maintenance, training etc.

Communication & consultation

Consultation should be allowed for in the planning and problem-solving process. Furthermore, when the plans are finally prepared they should be communicated to all concerned, seeking endorsement where necessary to ensure effective commitment and accountability. (See also Unit 2)

ACTIVITY QUESTIONS

1. Complete the following sentence:

“A schedule listing the items that make up the balance for a fixed asset line in a balance sheet is derived from an ”

2. Name two kinds of source documentation for an asset register.

.....

3. Define “monitoring” in business planning terms.

.....

4. Define “monitoring” in asset management terms.

.....

5. Name two related management concepts for asset monitoring.

.....

6. How does asset reporting relate to performance evaluation.

.....

.....

The answers to these activity questions are on the next page.

ANSWER TO ACTIVITY QUESTIONS

1. Asset register
 2. Any two of plans, specifications, maintenance schedules, inspection details, insurance details.
 3. A control function to assess work results against a plan.
 4. A systematic review process of the condition, location and use of physical assets.
 5. Any two of stewardship accounting, performance evaluation, corrective action, plan modification.
 6. Performance evaluation compares actual and planning data during an ad hoc or systematic performance review. The results of these reviews can be reported to management by those responsible.
-

UNIT 5: PROPERTY DEVELOPMENT AND MANAGEMENT OVERVIEW

This Unit is part of Section B : *Land & Buildings*

Property development concerns the development of land and buildings and involves site selection, site acquisition, site subdivision, site infrastructure development, building design and building construction. It involves the services of real estate professionals, town planners, architects, engineers, builders and project managers. There is an interface between property development and project management. Some project managers are only responsible for the construction period whilst others assume more of a general management responsibility and manage all steps from concept to the final handover of the site and building to the owner/occupier.

Property management concerns the management of sites and buildings after occupation and involves revenue collection, payment of costs and management of activities associated with occupation and maintenance and advice concerning sale and letting. Property management can be carried out by owners themselves or through agents employed to do the work for them. Property managers should be able to look after minor redevelopment works but major redevelopment should be handled by property development specialists.

For our purposes, in this subject, we shall only concern ourselves with a few selected topics from the wide field of property development and property management. The topics included are:

- Unit 5 - property management accounting, location and site selection criteria, environmental assessment criteria, environmental responsibility,
- Unit 6 - user performance requirements, plans and specifications.

Property Management Accounting

Accounting for property development is associated with feasibility analysis and this will be dealt with further in Unit 18.

Accounting for property management involves establishing procedures, journals and ledgers that will enable the production of financial statements for a property with a view to assessing ROI. The ROI will help measure performance and help determine the value of a building asset using a “capitalisation of profits” method of valuation.

A profit and loss statement for a property will show revenues from all sources (eg actual rentals received) and outgoings for all purposes (eg advertising, depreciation, energy costs, property management fees, holding costs, rates, insurance, etc.). The net profit can then be determined and an ROI percentage calculated in relation to the original cost or market value.

Owners are able to calculate a notional ROI by using a notional rental income based on market rentals for comparable standard buildings.

The net profit can be capitalised using capitalisation factors that are applicable at the time in the real estate industry. For example, a commercial office property might have a capitalisation factor of 10 (meaning that prospective purchasers are looking for an ROI of 10%). If the net profit were \$10,000 p.a., then the value of the property under this method would be \$100,000.

This valuation may be more or less than the original cost or the replacement cost. Many properties in a recession are valued and sold this way for far less than their original or replacement cost.

Location and Site Selection criteria

It is often said that the three most important considerations for property ownership are location, location, location. The subject of location and site selection is critical in tourism development and operations.

Each business should develop its own criteria for assessing existing property (land and building) assets and for new assets of this kind.

The criteria that might be useful are listed below. Some of these criteria relate not only to location and site selection but also to site and building design.

Market criteria

Proximity and access of site to potential markets, transportation facilities and modes, essential support services (eg accommodation, restaurants, shopping centres), other major tourism demand generators, passing vehicular traffic (eg visibility of site) and major competitive facilities.

Physical criteria

Aesthetics of adjoining land and land uses including climate and micro-climate (temperature, precipitation, sunshine and clouds, humidity, winds, seasons, purity of air); water supply (natural springs, waterfalls and cascades, rivers and streams, lakes and seas, drainage patterns, flooding problems); geology and geomorphology (bedrock type, water-table level, well depths, quality, geologic history); soils and topography (soil types, slopes, depths); site aesthetics (scale, views, focal points, variety, feature, form, colour], noise, smells); vegetation (tree types, ground cover type, visual and physical condition, clearing problems); wildlife and fish (species and type, effects of development on these); available infrastructure (sources of energy, water supply, sewer system and waste disposal services, transportation facilities, other needed services); other site characteristics (dimensions and shape, existing rights of way and easements, length of shoreline available, height above sea level, geographical orientation); ability of land to support various types of recreation activities.

Other criteria

Availability of human resources, staff accommodation and suitable quality land for the project. Also the cost of land; zoning principles and regulations; other legal requirements; social and economic characteristics of host area; sources and types of financial assistance in host area; industrial relations.

Environmental assessment criteria

In this section we are not providing details about how to prepare or assess an environmental impact statement. Rather we shall just present some key criteria for dealing with environmental assessment.

The kind of environmental factors that must be considered for tourist developments and existing tourism property assets now follows.

Physical Factors

Location (local and regional); geology and geomorphology (features to be protected, geological hazards); climate and climatic hazards; soils (productivity, hazards for erosion and slippage); visual resources; cultural resources (archaeological, heritage); natural and wilderness resources; water resources (water resource features, water quality, wetlands, ground-water); marine resources; air quality; noise; fire; land use; infrastructure (roads, tracks and trails, electrical distribution, water reticulation, sewerage, solid waste disposal)

Biological Factors

Vegetation (forest, littoral, desert, open range); endangered species (diversity of species, unique species); wildlife (habitat, populations, endangered species, diversity of communities); fish (habitat, populations, endangered species); recreation resources; sensitivity of land/marine systems; biological hazards (poisonous wildlife, disease/quarantine).

Socio-Economic Factors

Economic basis for tourism; employment opportunities; land use requirements; community service requirements; income; tourist population profile (size, composition, mobility, expectations); social implications (economic, political, religious/racial, recreational/leisure); ways of life - defined by subculture variation; leisure and cultural opportunities; stability and change; community identity and values; cohesion and conflict; land tenure and land use; legal considerations

Environmental responsibility

For environmentally sensitive tourism developments we need to be particularly clear about fundamental needs and the various development roles involved.

Needs

There is a fundamental link between tourism demand (involving experiencing, learning, challenge, enjoyment and renewal) and high quality natural and built environments. Tourism activity must be properly managed so that development works with the environment and not against it. Protection of the physical and human environment is not an obstacle to tourism development - it will contribute to ensuring the viability and survival of the tourism industry.

Roles*Tourism authorities*

Should undertake proper strategic planning for tourism - in consultation with other sectors and within the framework of overall tourism and conservation policies; integrate tourism planning policy into the mainstream of planning for economic development, conservation, parks, heritage, land-use and infrastructure; assist those agencies responsible for assets which are potential tourism resources to create tourism opportunities that are consistent with market positioning; establish appropriate performance criteria for developments in sensitive environments; communicate the purposes of management and the methods of protection to other sectors and the general public.

Developers and investors

Should adopt a market driven and environmentally aware planning approach from the first stages of the project planning process; pay particular attention to design detail to create a quality product that works with its environment and not against it; consult with relevant government agencies and community groups at an early stage to identify key issues; monitor environmental performance during the construction and operational phases of a project; provide training for construction and operational employees to understand, equip and motivate themselves to act in an environmentally responsible manner.

Tourism industry operators

Should work together to enhance the product base and image of the State; learn about the heritage, culture and environment of the local area and the State; give a priority to training staff in the need for and means of environmental protection; increase visitors' understanding and appreciation of the natural and built environment in an interesting and informative manner (through appropriate means such as personal conversation, interpretive guides, videos, films, notices, maps, posters and souvenirs).

Special interest groups

Should help establish trust and positive working relationships with other groups in order to integrate environmentally sustainable and economically viable developments; have expressed in specific community cost and benefit terms any concerns held for proposed developments.

ACTIVITY QUESTIONS

1. Name two activities associated with property development.
.....
2. Name two professional roles associated with property development
.....
3. Complete the following sentence:
“*Property management takes over from property development after*”
4. What does the word “capitalisation” mean?
.....
5. What price would relate to a capitalisation of five and a net profit of \$50,000?
.....
6. In a recession, a sale price for a property is usually higher than replacement cost.
True/false?
7. What is the value of having a predetermined checklist of location and site selection criteria to guide the decision making process?
.....
.....
8. Environmental assessment criteria can be grouped under 3 main headings. What are they?
9. Environmental protection is usually an obstacle to tourism development.
True/false?
10. Environmental protection usually lowers net profit? True/false?
11. Name four main players in the field of environmental protection for tourism assets.
.....
.....

ANSWERS TO ACTIVITY QUESTIONS

1. Any two of ... site selection, site acquisition, site infrastructure development, building design, building construction.
 2. Any two of ... real estate professionals, town planners, architects, engineers, builders, project managers.
 3. Occupation or handover.
 4. Capitalisation means determining a market price for a property by multiplying the net profit by a multiple determined by the desired ROI.
 5. \$250,000
 6. False
 7. Allows scoring and rating of alternative sites to help determine the optimum site.
 8. Physical, biological, socio-economic
 9. False
 10. False. Although environmental protection measures can inflate operating and capital expenditure costs it is usually possible to secure benefits from compliance in the form of higher prices and demand, particularly where environmentally sensitive consumers/travellers are involved.
 11. Tourism authorities, developers and investors, tourism industry operators, special interest groups.
-

UNIT 6: PROPERTY PERFORMANCE REQUIREMENTS

This Unit is part of Section B : *Land & Buildings*

User performance requirements

The first source of advice we need for physical asset management is from users and/or consumers. It is fundamental that the asset, whether it is a product (eg a tour bus or a motel) or a facilitative resource (eg an air-conditioning system or a new series of access tracks), must be designed to suit user needs. Whilst consumer and user research is essential to guide the design process, the designer's creativity is still involved.

There are some excellent management tools to help us diagnose and define user needs and performance requirements that are useful for land, buildings and equipment as well as for new product, remembering that in tourism the afore-mentioned items are very often the "product". These tools were detailed in Units 2 and 3 and include consumer research, design briefs and value analysis.

There are many sources of advice relating to performance viz. market researchers, value analysts, designers and architects, engineers, marketing, manufacturing and security consultants, building codes and regulations, performance standards and specifications previously set for comparable projects, published standards for products and components by standards associations (eg the Standards Association of Australia).

Plans and specifications

After the role and functions of the asset are defined, broad specifications can be drawn up to answer the question in broad terms "Well, what do you want?". For a new building project a "schedule of accommodation" is prepared which lists space requirements (with minimum and maximum floor and open space areas) by type of use. For a new tour bus a simple schedule for seating and storage requirements, fuel and engine capacity, communications and entertainment might suffice.

The real challenge is to decide whether something "off-the-shelf" or "off-plans" will do or whether we want something purpose-built or tailor-made to suit our individual needs. Progressive suppliers and builders usually have their "core" construction or building strategies worked out and offer a design service to build in variations for prospective customers at the planning stage.

Whatever the approach we must resist the challenge to follow a "me-too" approach and copy rather than innovate. On the one hand, where the asset is going to be directly seen or experienced by the consumer we must strive for uniqueness to help establish identity. If the asset is in the back-ground (eg an air-conditioning system) this requirement is not so critical. On the other hand, uniqueness usually comes at a higher cost and in some situations it might be wise to opt for a "general purpose" design which allows for easier resale if the asset investment does not work out.

After broad specifications are set and possible alternative approaches screened properly (particularly in budget terms) the next step is to prescribe detailed performance requirements eg minimum size car parking space, minimum ratio of number of cars per

100 sq metres of net useable floor area, temperature and humidity ranges for air conditioning, minimum number of kilometres for tyres, acoustic (noise separation) standards, minimum amount of floor area per patron. Eventually these detailed requirements will be included in contracts as performance standards. As such they are like objectives. They are criteria to be used for assessing performance.

ACTIVITY QUESTIONS

1. The term “user” only refers to an operator of equipment. True/false?
2. Name three management tools to help diagnose and define user needs and performance requirements.
.....
3. What might the letters SAA stand for?
.....
4. Name three possible sources of advice for user performance requirements.
.....
5. What is a schedule of accommodation?
.....
6. Name one advantage and one disadvantage for choosing a unique design?
.....
7. Name two detailed performance requirements.
.....

The answers to these activity questions are on the next page.

ANSWERS TO ACTIVITY QUESTIONS

1. False. It also applies to consumers (eg of a tourism product... a tourist).
 2. Consumer research, design briefs, value analysis.
 3. Standards Association of Australia.
 4. Any three of ... market researchers, value analysts, designers, architects, engineers, marketing personnel, manufacturing personnel, security consultants, advice in building codes and regulations, performance standards and specifications for comparable projects, published standards.
 5. Lists floor area and open space requirements for buildings for each type of use.
 6. Advantage ... helps establish identity.
Disadvantages ... higher cost, more difficult resale.
 7. Any two of ... minimum size car parking space, minimum ratio of number of cars per 100 square metres of net useable floor area, etc., etc. (see text).
-

UNIT 7: BUILDING MANAGEMENT PROCESS

This Unit is part of Section B : *Land & Buildings*

Asset planning for the care and maintenance of buildings requires a systematic approach. The main elements are as follows:-

Property database

A property database may form part of, or be subservient to, an Asset Register. The information should include location, age, function, number of storeys, construction, floor area, element areas, services, space usage, remaining life, occupation costs, replacement value, site value, constraints, eg. listed building, external works.

For new buildings the information may be obtained from 'as built' drawings, bills of quantities suitably amended to allow for variations, or a maintenance manual.

For older buildings in the absence of suitable records the necessary data would have to be compiled from inspection reports or special surveys.

Initial inspection

A condition survey would have to be carried out. This comprises a limited inspection concentrating on those elements at greatest risk and most likely to fail. In order to standardise the approach a check-list of the items to be inspected should be prepared with a simple grading system to record the severity of defects. The object is to give a general picture of the state of the buildings, from which the approximate cost of remedial work can be estimated.

A more detailed account of building inspection procedures is contained in Unit 10.

Utilisation analysis

There is little point in carrying out full-scale maintenance of building spaces which are under-utilised or not utilised at all. If maintenance expenditure is to be justified it must be shown that there is a return of some sort.

The current and possible alternative uses of the building spaces should be considered, taking into account their functional efficiency and the effects of new legislation, new technology and changes in user requirements. In commercial and industrial buildings where requirements are subject to fairly rapid change the regular updating of the premises may be seen as an alternative to maintaining the original facilities.

This approach has been described as 'planned obsolescence' and consists of a continuing programme of refurbishment to keep abreast of market trends. It is particularly appropriate to shopping areas where it is necessary to keep ahead of competitors in meeting changes in the shopping pattern of consumers and in retailing methods.

The aim is to consider not only efficiency in satisfying present demands but also changes that will be needed to satisfy future demands.

Life cycle cost analysis (LCC)

Life cycle costs (LCC) are the total costs of owning and using an asset over its predicted life span. $LCC = \text{capital cost} + \text{operating costs} - \text{expected resale value at end of asset life}$.

Capital costs include the acquisition costs for land and buildings eg:-

- those funds expended to attain a specified performance (developmental costs),
- the purchase cost of the items that comprise the system (production costs),
- the cost of installing the system,
- the initial investment to prepare the system for use (training costs, expenditures for publications, facilities, support equipment, etc.).

The operating cost of a system refers to those funds that are required to maintain the system in a ready or operational condition during its planned life. This includes:-

- maintenance costs (expenditures for contractor services, cost of a sustained training program, funds for spares and labour, etc)
- general operating costs (staffing costs, expenditures for servicing and operating the system).

Operating costs as a percentage of capital costs for an office block might be as follows:- maintenance (1.5%), energy (2%), cleaning (1.5%), overheads and management (5%)...total 10% of capital costs.

The basic concept of LCC is that decisions on the design and acquisition of durable assets should take into account the long-run financial consequences and should not be based solely on initial costs. The full costs (LCC) of a proposal can therefore be realistically compared with other alternatives.

The LCC method can be used at all stages in the life cycle of a building from inception to eventual sale or demolition and allow for changes in the condition and use of the building.

Inception stage

It may be used to determine the most economic way of meeting a need for additional building space. The options to be compared may include re-arrangement of the internal spaces within an existing building, building an extension, gradual redevelopment of the existing site, development of a new site, purchase or lease of another building.

Early design stage

To assist in developing the most economic plan shape, structural form and internal layout of a new building. It should be borne in mind that the earlier the LCC technique is applied, the greater the possible savings and the lower the committed costs. Thus the client's requirements should be stated initially in very broad terms so as not to limit the choice of options.

Detail design stage

To identify the design features, components and finishing's that have the lowest total costs. This stage would culminate in the preparation of Life Cycle Cost Plan which should be incorporated in the maintenance manual for the guidance of the property manager.

Occupation

During the occupation of the building to assist in formulating planned maintenance and renewal policies. It also provides a means of identifying high cost areas and evaluating changes that will reduce these costs.

To start the LCC approach there should be a clear statement of what the proposals are intended to achieve. These proposals may range from the life cycle costs of a new town to the choice of roof coverings for an individual building. For a property manager it could include an evaluation of alterations to an existing building or the financial consequences of renewing rather than repairing a major piece of equipment.

Care should be taken to define alternative ways of achieving the stated objectives. A common time base should be used which is applicable to all the alternatives, then

- identify all the costs and revenues which are directly relevant to the comparison of the alternatives.
- adjust the costs to a common time period by converting to present values or annual equivalents.
- carry out a sensitivity analysis to assess the effect of errors predicting building and component life and different rates of interest.

Cost effectiveness analysis

What is the difference between “effectiveness” and “efficiency”? The latter means to do the chosen things to a high standard. The former means to first of all choose the right things to do at the right time and then do them to the highest standard. What is the value of being the most efficient maker of 360K computer disks when the market is now into 1.4 meg and compact disks. It also means doing the most competitive and consumer-oriented activities with optimal costs given the required resources and extracting from the conversion process the greatest productivity, measured in cost per unit of input and output and by profitability.

We have to look at cost effectiveness over the whole life of an asset. What does “cost-effective” mean? It is a reference to the ratio of costs to benefits (measured by profitability which compares costs with income).

Is effectiveness a measure of actual performance against planned performance? No, this is a measure of efficiency, not effectiveness. Effectiveness is dependent upon the adequacy of the plan. If the plan is in itself defective, then it is difficult to see how fulfilling the plan can be regarded as effective.

The sources of ineffective costs are unnecessary work (including work over and above that required to maintain the building to the specified standards); making good the effects of neglect, improper maintenance and misuse of the building; rectification of design defects and faulty workmanship in the initial construction.

Cost efficiency analysis

This relates to productivity of actual performance compared with planned performance after the asset is installed and the methods of operation are established. Uneconomic work can result from:-

- non-productive time caused by excessive travelling from job to job,
 - waiting for instructions and materials,
 - failure to gain access to premises and inclement weather, etc.
-

- improper work methods resulting in more time being spent on the job than necessary
- waste of materials.

The cause of non-productive time may be attributed to:-

- imprecise instructions or incompetence on the part of the operative;
- lack of motivation on the part of the operatives;
- inappropriate tendering procedures and contract arrangements in relation to the type of work and prevailing market conditions.;
- changes to the nature and scope of the work after commencement;
- lack of an efficient system of recording and controlling costs;
- inadequate work resulting from failure to identify the true cause of the defect and to specify the correct remedial work,
- improper execution of work due to lack of proper supervision, instructions or operative skills,
- lack of adequate safeguards in the contract to ensure that the work is carried out in accordance with instructions and the provision of suitable remedies in the event non-compliance.

Implementation

Once strategies have been identified they have to be documented and quantified. Each proposal needs to involve those responsible for implementation and in its final form circulated to them for comment and commitment.

It is important also to set priorities. There may be many programmes (too many). Each programme must pass feasibility test requirements. These tests will help determine which programs should have priority for funding allocation. Even within a programme there will be priority tasks. After funding allocation, how does the combined program look? It is desirable to establish a rating system for programmes and projects. Techniques for determining priorities within a programme and between programmes include Portfolio Analysis, PERT and Zero Base Planning and Budgeting.

The final action plan might also include (depending on the situation) such matters as standards of upkeep, priorities, criteria for judging levels of maintenance expenditure, the organisation and decision-taking bases for the maintenance function and the degree of control required through the Management Information System.

It is important to ensure that the work considered necessary is carried out with the maximum economy, ie. that the work done satisfies the criteria for effectiveness and efficiency.

Programmes & schedules

A planned approach is better than an ad hoc one.

Each project should have a schedule worked out to show the sequence of activities and timelines. Detailed budgets reflecting these activities should be prepared and signed off. A Gantt chart is a simple graphical method of showing the duration of activities. It is easy to understand and is particularly suitable for communicating short-term site programmes to operatives. However, from a management point of view it suffers from the defect of not showing the relationships between different operations. Critical Path

Method (CPM) is better for the larger and more complex jobs in that the network shows the interdependence of the various operations.

An asset plan should be drawn up providing for the long-term allocation of resources to the related activities of maintenance, refurbishment, new building and replacement, to reflect the changing building requirements.

Normally we try to set out a plan for systematic maintenance, repair, replacement and purchase of physical assets for the next financial year and up to five years. These plans also provide input to budget strategies for purchase of major assets.

In view of the uncertainties, programmes must be formulated at different levels and constantly revised according to the new information which is fed into the system. The levels which can be identified are long-term (5 years or longer), medium-term (annual) and short-term (monthly, weekly, daily).

Long-term programmes

The object of the long-term programming is not so much to lay down the precise dates when work is to be carried out, as to provide a policy framework. The purpose of the long-term programme is to determine the general level of expenditure on maintenance to achieve the desired standards. Inspections will often reveal that there is a backlog of work to bring the buildings up to the specified standard, and this should be recorded separately.

We must avoid large fluctuations in annual expenditure by spreading large items and any backlog over a period. Other considerations include:-

- determining the optimum time for carrying out major repairs and improvements, so as not to interfere with the user of the building;
- determining the structure and staffing of the maintenance organisation and whether it would be advantageous to employ operatives directly to carry out part or the whole of the work;
- gearing the maintenance programme to company policy so that it is compatible with decisions relating to the use of the building, eg. decisions to demolish and rebuild or to move to other premises
- considering the effect of proposed capital works on the maintenance organisation.

Annual programmes

The object of annual programming is to provide a more accurate assessment of the amount of work to be carried out during the forthcoming year and to form a basis for the financial budget.

The major considerations would be:-

- the timing the work in relation to the needs of the organisation so as to avoid interference with the basic user activities and in phase with the overall cash flow pattern;
 - providing a uniform and continuous flow of work for all trades in the direct labour force so as to avoid, on the one hand, slack periods due to insufficiency of work and, on the other hand, the need for men to work overtime at enhanced rates of pay to deal with periods of excessive demand;
 - fixing an appropriate time scale for the preparation of contract documents and tendering procedures where work is let to outside contractors and for the
-

advance purchase of materials where the work is to be carried out by direct labour;

- apportioning the amount included in the budget to specific jobs or areas of work for control purposes.

The annual programme would be built up from:-

- individual items of painting and repairs brought forward from the long-term plan after a check inspection to ensure that the work is in fact necessary
- individual items of work disclosed by the annual inspection as being necessary to carry out within the next year (the possibility that such work would be needed should have been anticipated when drawing up the long-term programme and a contingency sum included based on past experience)
- individual items of work proposed by users at the time of carrying out the inspection. Prior to inspecting premises the user should be asked to state his requirements which, if authorised, would be included in the annual programme
- an allowance for work which it is anticipated will be requested by users during the accounting period, but which is not capable of precise definition at the time of the inspection
- an allowance for routine day-to-day maintenance based on past records.

The next step is to estimate the probable costs of the individual items of work and the bulk items for routine and emergency work; then to decide, according to the nature and timing of the jobs, whether they are better dealt with by direct labour or by contract. If by the former, the costs should be broken down into labour and material and the labour costs subdivided according to trades.

Short-term programmes

So far, only broad estimates of costs have been produced under the following headings:-

- total annual cost subdivided into individual jobs, routine work and emergency work
- cost of work to be let on contract
- cost of work to be carried out by direct labour force, subdivided into labour by trades, direct supervision and materials.

The next stage is to allocate the total workload to the months of the year in which the jobs will be carried out. Where the work is to be let to outside contractors the commencement and completion dates should be entered on a bar chart which should also indicate the dates when the various pre-contract processes should be initiated and completed. The phasing of contract work should take into account not only the convenience of the user and the ability of the maintenance staff to prepare the necessary tender documents, but also any seasonal variations in prices for the type of work to be undertaken.

Programming problems

The main factors which militate against accuracy when programming maintenance work are:

- the small scale and diversity of a large proportion of the total workload. The precise identification of such small jobs in a long-term programme is not possible nor would it be economically worthwhile if it were possible. However, the aggregate amount of these jobs over a period of time shows some constancy and a broad classification according to trade, size and frequency is possible.
-

- the need to determine the best work sequence for a large number of interlocking tasks involving several trades. The position is aggravated if the work in a particular trade is discontinuous, necessitating two or more visits to the site.
- the uncertain work content. In many cases, particularly when dealing with old buildings, work is uncovered which could not have been foreseen.
- The dispersal of sites. The geographical grouping of jobs is desirable and also the provision in the same locality of both indoor and outdoor work for operatives of the same trade groups.
- Interruptions to the normal progress of the work caused by withdrawal of men to deal with emergencies or to carry out a critical task on some other job; inclement weather; non-availability of essential materials or plant; irregularity of user requests and the extremely short lead time for executing emergency repairs.

ACTIVITY QUESTIONS

1. Complete the following sentence:

“A condition survey is a limited”

2. Is full scale maintenance usually justified if space utilisation is low? Yes/No

3. What is planned obsolescence?

.....

4. Name the three components in an LCC analysis.

.....

5. Name the four stages in the lifecycle of a building where LCC analysis might be useful.

.....

6. To reduce each alternative to a common base, we must:

..... all costs and revenues

..... costs to a common time period using present value analysis

Carry out a analysis.

7. Complete the following sentence:

“Being an efficient manufacturer of 360K computer disks when the market is now predominantly 1.4 megabytes is not “cost” .”

8. Name three sources of ineffective costs.

.....

9. Name three causes of non-productive time.

.....

10. Name three management techniques for helping to determine priorities in asset management programming.

.....

11. What is a GANTT chart?

.....

12. Name three factors which make it difficult to be accurate when programming maintenance work.

.....

The answers to these activity questions are on the next page.

ANSWERS TO ACTIVITY QUESTIONS

1. Inspection
2. No.
3. A continuing programme of refurbishment to keep abreast of market trends.
4. Initial capital costs, operating costs, resale value.
5. Inception, early design, detail design, occupation.
6. Identify, adjust, sensitivity.
7. Effective
8. Unnecessary work, making good, rectification.
9. Any three of ... imprecise instructions, operator incompetence, operator lack of motivation, inappropriate tendering, changes, poor recording and cost control, poor defect analysis, poor supervision, weak contract provisions.
10. Portfolio analysis, PERT, zero base planning and budgeting.
11. A simple graphical method showing the duration of activities
12. Any three of ... imprecision with small jobs, work sequencing, uncertain work content, site dispersal, interruptions.

UNIT 8: BUILDING MAINTENANCE OVERVIEW

This Unit is part of Section B : *Land & Buildings*

Definition of maintenance

Maintenance is a combination of any actions carried out to retain an item in, or restore it to an acceptable condition. It may be generated by climatic conditions, user activities and /or changing standards and tastes.

With the passage of time, we might also allow for an element of improvement. Maintenance usually includes a reasonable element of improvement, eg. the replacement of worn-out components with up-to-date versions means that replacements are rarely exactly the same as the original, being superior in some aspects but perhaps inferior in others.

Maintenance for existing buildings includes:-

Maintenance

Work necessary to keep or restore to an acceptable standard including minor associated improvements)

Alterations

Work involved in providing improved facilities to make more suitable for existing use

Conversions

Work involved in rearranging internal spaces and/or providing new facilities to make building suitable for a new functional use

Maintenance can also be classified by the type of work necessary to combat progressive deterioration eg.

Patching

Involving the more or less regular replacement of small parts or areas

Replacement

Of whole elements of components because they are functionally unsatisfactory, incur high maintenance or running costs or are aesthetically unacceptable

Preservation

Of protective coatings either for the purpose of extending the life of the protected material or to maintain appearance.

Cleaning

Which, although often regarded as a separate activity, has important maintenance implications in arresting deterioration and preserving appearance.

In recognising the desirability of including a reasonable element of improvement, the Building Maintenance Committee in the UK recommended the following definition in relation to maintenance work:

‘Work undertaken in order to keep, restore or improve every facility, every part of a building, its services and surrounds, to a currently accepted standard and to sustain the utility and value of the facility’.

This introduces the notion of a ‘currently accepted standard’ which, from the general tenor of the definition, assumed to be higher than the initial standard. There may, of course, be cases where buildings are put to a less demanding use for which lower standards would be acceptable.

The distinction between maintenance and improvement is of greater importance when viewed in the context of feedback to the designer. There is a tendency to believe that the level of expenditure on maintenance would be significantly reduced by better-informed initial design. In order to test the validity of this belief, it is necessary to distinguish between work rendered necessary by technical design faults and that directed to improvements for purposes which could not have been foreseen by the designer and incorporated in the original scheme. The usefulness of the information fed back to the designer will therefore depend upon the extent to which it distinguishes :

- work which may be regarded as normal in relation to the construction materials and conditions of use.
- work resulting from design faults in relation to either technical errors concerning inappropriate construction details or materials or errors of layout in relation to size, arrangement and juxtaposition of working spaces.
- work made necessary by a demand for higher standards or a change in the pattern of use which could not have been foreseen at the time of the initial design.

Although technical design faults attract most attention, it is probable that layout faults prove very much more costly in the long run.

Types of maintenance

Maintenance actions are those associated with initiation, organisation and implementation. There are two processes envisaged: ie. work carried out in anticipation of failure and work carried out after failure. The former is referred to as preventative maintenance and the latter as corrective maintenance.

The essential feature of a planned maintenance system is that failures are anticipated and appropriate procedures devised for their prevention or rectification. It involves having a planned course of action for dealing with the inevitable consequences of deterioration.

Of course, not all jobs can be predicted with sufficient certainty for inclusion in a long-term programme. The object should be to obtain the most economic balance between day-to-day and programmed work.

Maintenance schedule

We are required to determine an appropriate schedule which provides for regular maintenance of physical assets, allows for preventative maintenance of physical assets and avoids unnecessary disruptions to business.

Eventually a decision will have to be made as to whether to demolish the building and replace it with a new one or to improve or adapt it to make it more suitable for either the present use or a new use. In such cases it is helpful to distinguish between physical life, functional life and economic life.

Provided the structure is basically sound it is possible with proper maintenance to extend the physical life of a building almost indefinitely. In the course of time it will tend to become increasingly unsuitable for the functional purpose for which it was originally designed. It may then be possible to adapt it for another use, which will usually involve a change of ownership and perhaps extensive alterations. Thus a building may have a series of different functional lives before it reaches the end of its economic life.

There are two primary sources for maintenance work

- a schedule system, where work is initiated by the maintenance department and consists of larger jobs planned some time in advance. These jobs, while necessary for the long-term preservation of the building, may not have a high degree of urgency.
- a contingency system, where work is requested by the occupier and consists for the most part of small jobs which are regarded, at least by the occupier, as being urgent.

Schedule system

This covers items which tend to deteriorate at a more or less uniform rate and which do not have a high degree of urgency.

- *Scheduling work to be carried out at predetermined times.* This includes planned preventative maintenance and applies where the incidence of failure can be predicted with some accuracy or where the periods are fixed by statute or contract, eg. the terms in a lease requiring painting to be undertaken at fixed intervals.
- *Scheduling inspections to be carried out at predetermined times.* To detect failures or the imminence of failure. In many cases the exact time of failure is not known with certainty and inspections are necessary to determine whether or not the work is actually necessary.
- *Scheduling work and inspections to be carried out at predetermined times.* This applies where it is possible to predict that certain work will be necessary at a particular time, but an inspection is necessary to determine the extent any further work.

Contingency system.

This entails a policy of waiting until a complaint is received from the user before taking action.

Choice of system

The main factors to consider when deciding whether to treat work under the schedule system or the contingency system are:

- the predicability of failure. Components which deteriorate at a known and fairly uniform rate can be scheduled either for inspection or repair before they actually fail. On the other hand components which are susceptible to sudden failure, eg. burst pipes, can only be dealt with under a contingency system.
- the reporting delay time. This is the time which is likely to elapse between the time when the defect would just be noticed by a qualified inspector and the time when the occupier would report the defect to the maintenance department. If the reporting delay time is less than the economic period for carrying out inspections the work must of necessity be dealt with on a contingency basis.
- the rate of deterioration of the component and the corresponding increase in the cost of rectification.
- the extent to which the user can be relied upon to report significant defects. This will depend upon the nature of the occupancy and the attitude of the user to the condition of the building.

Maintenance objectives

Maintenance objectives fall into two distinct categories:

Functional performance objectives

Those which maintain predetermined standards and are repetitive such as:

- Routine maintenance
- Painting externally every five years.

Change objectives

Those that require some distinct cognitive and creative effort and are usually accompanied by some changes in policy, procedures, personnel or investment such as:

- Reducing backlog of work
- Increasing speed of response to tenants' requests
- Improving productivity of labour force by 25 per cent.

The following questions concerning objectives need to be considered:-

- What specific maintenance outcomes are desired?
- What are the benefits? (financial, technical or human)
- How shall we proceed?

Maintenance appraisal

There are a variety of financial appraisal methods for repair/replace decisions methods.

Pay-back period

Net Present Value (NPV)

Annual Equivalent (AE)

Yield method

Break-even analysis

Decision trees

Simulation

To analyse the case for spending money on updating an old building as opposed to replacing it, a DCF analysis should be prepared. Research shows that when the discounted present values of the future costs of the two alternatives are calculated, the longer replacement is deferred the less will be the present value of the future capital and maintenance costs and the less the difference between the costs of the old and the new standards.

The object of this sort of analysis is to help the owner to decide whether the benefits he would receive from a better building and the saving of expenditure on the existing building are together worth the cost of replacement.

Economic life is that period of effective life before replacement. Replacement will take place when it will increase income or reward absolutely, but will not reduce the rate of interest at present enjoyed from the landlord's total investments

Energy management

The maintenance manager is likely to be involved in decisions concerning alternative ways of energy conservation. This will usually start with the preparation of an energy budget or audit giving the energy consumption of the building from all sources for internal environmental control stated in units of energy per unit of floor area.

Comparisons can then be made of the energy usage of different areas and buildings to identify high cost areas.

Is necessary, therefore, to carry out an investigation of the way in which energy is being used and to determine the measures that should be introduced to avoid waste. The measures include good housekeeping, reviewing standards, modifications to existing systems and the provision of new equipment.

Maintenance Manual

A maintenance practice manual is a must and should contain a statement of objectives and policy, staff duties and responsibilities, maintenance categories and priorities, planning and control, approach to planning maintenance, work order system, estimating methods, performance checks, inspections, type of inspection, period, check list and report. Budgetary control procedures should also be included...steps for preparation of the budget around cost centres, variance reports, execution of work, direct labour force, planning and control system, bonus payments, stores, plant and transport, contractors, tendering procedures, types of contracts and documents, supervision and contract administration, claims and payment, information system records, paperwork/computer system, analysis of information, feedback and reports, health and safety measures, staff recruitment and training, tenant / user relations, appendices, standard forms, flow charts and references.

ACTIVITY QUESTIONS

1. Provide a simple definition of maintenance.

.....

2. What is preventative maintenance?

.....

3. What is corrective maintenance?

.....

4. A schedule system of maintenance is determined by the user. True/False?

5. There are three types of maintenance objectives.

.....

6. Research using DCF analysis shows that

.....

7. Complete the following sentence:

“The economic life of a physical asset is that period of life before

The answers to these activity questions are on the next page.



ANSWERS TO ACTIVITY QUESTIONS

1. Work undertaken in order to keep, restore or improve every facility, every part of a building, its services and surrounds, to a currently accepted standard and to sustain the utility and value of the facility.
 2. Work carried out in anticipation of failure.
 3. Work carried out after failure.
 4. False. By the asset/maintenance manager.
 5. Functional performance, change.
 6. False.
 7. Replacement.
-

UNIT 9: BUILDING MAINTENANCE STANDARDS

This Unit is part of Section B : *Land & Buildings*

Definition of standardisation

The purpose of standardisation is to simplify designs, maintain or improve quality and reduce the cost of manufacture/operation and help reach agreement between contracting parties. Standardisation may take several forms:-

Standard terminology - basic definitions, descriptions and symbols which have been agreed to in order to create uniformity (eg drawing symbols)

Basic standards - common data and terms which have been established to form the basis for the continued standardisation of physical objects, such as measured tolerances

Measurement standards- dimensions which for rationalisation or exchange purposes have been established for a product.

Variant limitations-normally a limitation of the number of types or sizes of a product, or rationalisation of a range

Function and quality standard - the properties and performance of a product, established in respect of a normalised quality level

Testing and quality control standards - the established methods by which quality properties and performance can be tested in a uniform manner: possibly by the use of statistical sampling and specified levels of acceptance

Without standardisation, consider the difficulty of trying to define and agree an 'acceptable standard'. Is the work up to an acceptable standard for the person paying for the work, for the person receiving the benefit or for some outside body with responsibility for enforcing minimum standards? Is it acceptable to the public at large or to specific sections of the public?

Standards can change over time. The standards acceptable at the time of undertaking the work may be higher or lower than the initial design standards. With the passing of time, buildings are modified to accommodate new uses and it becomes increasingly unrealistic to think in terms of keeping or restoring the initial standards.

Standardisation in Australia

Australian standards are prepared by committees which are formed on a federal basis with, as far as practical, all interested organisations, regulatory authorities and academic bodies being represented. Committee decisions are reached by consensus rather than majority vote.

The Standards Association of Australia (SAA) is an independent, non-profit organisation incorporated by Royal Charter. It is the Australian member body of the International Organisation for Standardisation (ISO) and the International Electro-technical Commission (IEC). SAA is the owner of a registered trademark known as the "AS" mark. A manufacturer, and in some cases a supplier, can obtain a licence to use the 'AS' mark on a product which indicates that a system of production and quality control is used which gives the purchaser an assurance that the product is manufactured to comply with the relevant standard. The "AS" mark on a product can greatly reduce the inspection costs of a purchaser when compliance with an Australian standard is called for.

There are two points to be examined when a purchaser intends to refer to an Australian standard in procurement documents. The standard should be the latest issue and fully amended. This can be checked by contacting SAA, overseas and international standards Standardisation overseas

Other countries have similar organisations to SAA which prepare standards by consensus agreement in committees. In some countries, the equivalent organisation is a government instrumentality and the standards prepared are always mandatory. The equivalent organisation in the USA is the American National Standards Institute (ANSI).

Building maintenance standards

Where the design requirements are stated in the form of performance specifications these could be used for establishing maintenance standards and incorporated in a maintenance manual together with other relevant detail concerning the construction of the building and its services.

Certain building elements maintain a constant condition over the life of a building, while others are subject to sudden unpredictable failure. In some cases there is only a single criterion, eg whether or not the roof leaks, while in others there is no precise lower limit, eg, decorations do not 'fail' in such a way as to impede user activities but must be judged on the basis of visual acceptance.

Over the long life of a building, users will tend to come to demand higher standards and therefore repairs and renewals will inevitably contain some element of improvement.

The standard may be expressed in the following ways :

In **physical** terms such as the measured condition of the defect or problem in performance terms (compared to the performance specifications used in the initial design). This is sometimes referred to as "condition controlled maintenance". Inspections at appropriate intervals are carried out to determine by visual means or by measurement whether or not the condition of the elements or their performance has deteriorated below that laid down.

In **time** terms, referring to times at which repairs and replacements are to be made. This method is sometimes referred to as 'frequency based maintenance' and it requires certain knowledge of the rate of deterioration and of the point in time when either function failure is imminent or the appearance will become unacceptable. Clearly a proper balance must be achieved between frequency and the risk and consequences of failure.

In **financial** terms. Financial criteria which may take the form of a variable sum related to the cost of some primary activity or replacement value or a fixed sum based on historic costs or an analysis of anticipated benefits.

In most cases, all three methods are used, although there is little doubt that financial expediency often takes precedence over the physical needs of the building.

Determinants of building maintenance standards

User Requirements

The building must provide suitable environmental conditions. At the lowest level the immediate environment should not be directly harmful or uncomfortable. At the middle level the environment should be such as to minimise effort at work or maximise output. At the highest level the environment should promote not only the actual well-being of the users of the building, but also their sensation of well-being.

The building design must show a concern for the external environment (a stable shelter from the weather) and the internal environment. The internal environment includes the visual environment (daylight and artificial lighting, cleaning and decorating room surfaces), the thermal environment (temperature, air movement, humidity) and the acoustic environment (external and internal noise)

Value Considerations

How far does the condition of the building affect the price which would be paid for its services in the open market?

Maintenance interacts with other costs and also with revenue, eg. for shops it is assumed that a higher level of maintenance will draw more customers and induce them to buy more or pay higher prices, while in manufacturing the standard of maintenance may affect the output of the workers and the quality of the product

Statutory Constraints (legislative controls)

There are many statutes governing the design and physical requirements of new construction, additions, alterations and works necessitated by a change of building use. These requirements are largely covered by Planning Acts and Building Regulations.

- In **planning** - the general principle is that a landowner has no right to use his land for any purpose other than its present use unless he first obtains permission for the change of use , the object being to control 'development'. Certain operations are deemed not to involve development and include works of maintenance, improvement or other alterations which affect the interior of the building but do not materially affect the appearance.
- In **building** - the main provisions concern:-
 - securing the health, safety, welfare and convenience of persons in or about buildings and of others who may be affected by buildings,
 - furthering the conservation of fuel and power,
 - preventing waste, undue consumption, misuse and contamination of water,
 - materials, workmanship, structure,
 - site preparation and resistance to moisture and toxic substances,
 - sound, ventilation, hygiene,
 - drainage,
 - heat producing appliances,
 - stairways, ramps and guards,
 - conservation of fuel and power,
 - adequate means of escape and related fire precautions

A more detailed account of health and safety statutory requirements is contained in Unit 14.

ACTIVITY QUESTIONS

1. Name four purposes of standardisation.

.....

.....

2. Name three forms of standardisation.

.....

.....

.....

3. Complete the following sentence:

*“With the passing of time it may become increasingly.....to keep
or restore the initial standards.”*

4. What is the “AS” mark?

.....

.....

5. What does “ANSI” mean?

.....

.....

6. Name three ways a standard may be expressed.

.....

7. Name three determinants of building maintenance standards.

.....

The answers to these activity questions are on the next page.

ANSWERS TO ACTIVITY QUESTIONS

1. Simplify designs, maintain or improve quality, reduce cost, facilitate agreement.
 2. Any three of.... terminology, basic data, measurement, limitation, functions, quality control.
 3. Unrealistic.
 4. A trademark on a product which assures the customer that the product complies with an appropriate standard.
 5. American National Standards Institute.
 6. Physical, time, financial.
 7. User requirements, value considerations, statutory constraints.
-

UNIT 10: BUILDING MAINTENANCE INSPECTIONS

This Unit is part of Section B : *Land & Buildings*

Causes of building defects

A building defect may be defined as an imperfection, deficiency or fault in a building element or component which adversely affects its functional performance or appearance.

Inspections, maintenance operations and defects can all be classified under the following headings:-

- external decoration
- internal decoration
- main structure
- internal construction
- finishes and fittings
- plumbing and sanitary services
- mechanical services including heating and ventilation and gas installations
- electrical services and kitchen equipment (all types)
- external and civil engineering works
- miscellaneous and ancillary works

Some defects are the natural consequence of ageing and normal use. But many premature failures can be traced to a lack of proper skill and care. A British study concluded that over 90 per cent of building defects could be explained partly or wholly as the result of readily identifiable faults in design or construction which could have been foreseen and hence prevented.

Broadly, the causes may be attributed to the following:

Design causes

- *Inadequate brief.* It is often said that defects start on the drawing board but in some cases they can originate at an even earlier stage. For example, the brief may lay down totally unrealistic cost limits or fail to give vital information on the functional requirements of the building. Usually here is no indication of the likely period of use nor of the client's attitude towards maintenance.
- *Faulty design decisions.* The most common faults may be grouped as follows:
 - failure to follow well established design criteria in the choice of structural system
 - selection of materials.

Materials & workmanship causes

- *Ignorance of the basic physical properties of materials.* eg. failing to make allowance for the differing thermal and moisture movements of materials used in combination.
 - *Use of new materials.* Or innovative forms of construction which have not been properly tested in use. This is often the result of uncritical reliance on manufacturers' literature quoting simulated laboratory tests.
 - *Misjudgment* of user and climatic conditions under which the material will have to perform.
-

- **Construction methods.** The conditions under which construction takes place are often far from ideal and, coupled with an emphasis on speedy completion, can result in careless and skimpy work. Whilst the materials may be perfect in leaving the factory they can quite easily be damaged in transit, loading and unloading, unsuitable conditions of storage on site and hoisting and placing in position.

To tackle this problem the construction industry is beginning to introduce the quality assurance techniques developed in other industries such as Quality Assurance (QA) groups and quality circles (QC). Essentially these techniques consist of setting down appropriate inspection procedures and specifying levels of acceptance and rejection together with methods of sampling and testing the performance characteristics.

Management causes

- *Complex details* which have a low probability of successful execution on an open building site.
- *Poor communications* between different members of the design and construction teams.
- *Lack of care* in carrying out repairs and inspections may be the cause of defects the general approach to the diagnosis of defects should be to examine carefully all the symptoms, consider all the probable causes, by a process of elimination identify the true cause and its source, and then decide on appropriate remedial action.
- *Other reasons.* Defects may be caused by unintentional misuse through a lack of information on the correct mode of use, or by deliberate acts of vandalism.

Detection of building defects

In many instances a visual examination will be sufficient for an experienced inspector to determine the cause. Instruments may be used for a more objective diagnosis.

There are many portable instruments on the market for investigating the causes of defects, including:

Moisture meter - to test the comparative moisture content of materials;

Ultrasonic tester - for checking concrete strength;

Depth meter - to enable the cover to reinforced concrete to be ascertained...this instrument can also be used to locate the presence of metal pipes in un-reinforced concrete;

Endoscope - which comprises a slender tube fitted with a magnifier and light that can be inserted through a small hole to give a view of the interior of wall cavities and other voids within a building.

In some cases it may be necessary to monitor the rate of development of a defect over a prolonged period in order to assess the probability of failure. Examples include measuring the width of cracks by means of pins and a micrometer, taking levels at fixed points to determine the rate of settlement and checking vertical alignments with the aid of a theodolite.

Where the surface manifestation of a defect is not sufficient to indicate the true cause, and particularly where there is a reasonable possibility that a structural defect is concealed, an exploratory survey should be undertaken.

Specialist advice may be required in respect of certain defects, eg. structural stability and services and laboratory tests of subsoils or materials to establish their composition and performance characteristics.

Planned inspections

Inspections are undertaken for a variety of purposes:-

- preparing a schedule of the facilities to be maintained and their present condition;
- detecting deviations from predetermined standards and incipient faults which may result in such deviations developing before the next inspection;
- ascertaining the cause of deviations, the extent of remedial work necessary to restore to the required standard and to prevent a recurrence of the defect, and the relative urgency of the work;
- checking that previous work was done in accordance with the instructions and that the work specified was adequate.

The main advantages resulting from planned inspections are:-

- an up-to-date appreciation of the overall condition of the property
- a corresponding improvement in maintenance records;
- more accurate prediction of maintenance requirements and hence better budgetary control;
- a greater proportion of the work can be programmed with less reliance on user requests, so permitting the more economic deployment of direct labour or timing of contract work;
- reduction in the risk of break downs which may interfere with the use of the building and cause financial loss or convenience.

The carrying out of timely repairs will extend the life of certain elements and components and reduce the risk of damage to adjoining parts of the building.

The complexity of buildings and the great variety of possible defects makes it necessary fully to pre-plan the inspections and to provide comprehensive check lists to ensure that no part of the building is missed.

Appropriate criteria should be laid down for each element or component and the type of inspection needed fully defined and documented. This includes details of the form of the inspection, its frequency, the qualifications of the inspector and the feedback procedures.

For greater consistency, special pro-formas should be prepared for each element and sub-element, setting down the essential information required by the inspector, with space for the latter to record the result of the inspection and the recommended remedial work. In addition, it is advantageous to note the cause of any defect and the urgency with which the work should be carried out. Location codes should be given to facilitate the later processing of the information.

Maintenance audits

Every organisation should have some means of checking its management efficiency. There is no single measure that is appropriate and it is necessary to analyse the answers to a series of questions.

The essential feature of a maintenance audit is that it seeks to evaluate the system of internal control and to determine whether or not it is being operated efficiently. It presupposes that there is a definable maintenance management system to audit.

Technical areas to audit:-

- what is the general condition of the building(s) ?
- is the standard of maintenance appropriate?
- have the defects been correctly diagnosed?
- is the remedial work satisfactory?
- are the users satisfied with the quality of the work and the speed of response?

Management areas to audit

- is there a maintenance policy?
- what is the organisational structure?
- are the operating procedures clearly defined?
- what records are kept and are they up-to-date?
- what percentage of the work is planned?
- what is the percentage of emergencies?
- what is the average backlog?
- is there an efficient work order system?
- what controls are exercised over time, cost and quality?
- what is the involvement, if any, of the design of new buildings?

Financial areas to audit

- what is the cost per unit, eg. per dwelling, per job, etc.?
- is the cost within authorised expenditure limits?
- what is the return on capital for direct labour?
- what is the ratio between total costs and administrative costs?
- what are the administrative costs per dwelling, per work order, etc.?

Direct labour audit

- what is the gross output per man?
- what is the value of materials used per trade?
- how many jobs are completed within a given period?
- what are the man-hours per job in each trade?
- how are the operatives motivated? what is the percentage of non-productive time?

Contractors' audit

- how are contractors selected?
- what is the basis of payments?
- what contractual controls are there over time, cost and quality?
- what is the average difference between final account and tender?
- what is the average delay in completion?
- is the quality of the work satisfactory?

It will be apparent that operating such a system of control calls for the full cooperation of all members of the maintenance staff, and to achieve this clear guidelines and procedures should be laid down in a maintenance practice manual.

ACTIVITY QUESTIONS

1. What is a building defect?

.....

2. List three types of building components that might require inspection.

.....

3. Complete the following sentence:

“Defects are the natural consequence of and normal use.”

4. Name three causes of defects.

.....

5. Name one instrument used for diagnosing building defects.

.....

6. Name two purposes for undertaking planned inspections.

.....

7. Name three advantages for undertaking planned inspections.

.....

8. Complete the following sentence:

“The essential feature of a maintenance audit is that it seeks to evaluate the system of and to determine whether or not it is being operated efficiently.”

The answers to these activity questions are on the next page.

ANSWERS TO ACTIVITY QUESTIONS

1. An imperfection, deficiency or fault in a building element or component which adversely affects its functional performance or appearance.
 2. Any three of ... external decoration, internal decoration, structure, internal construction, finishes and fittings, plumbing and sanitary services, mechanical services, electrical services, external and civil engineering works, miscellaneous and ancillary works.
 3. Aging
 4. Design (inadequate brief, faulty design decisions), materials and workmanship (use of new materials, misjudgment, construction methods), management (complex details, poor communications, etc.).
 5. Any one of ... moisture meter, ultrasonic tester, depth meter, endoscope.
 6. Any two of ... help prepare a maintenance schedule, detecting deviations from predetermined standards, ascertaining causes and remedial work required, checking previous work.
 7. Any three of ... up to date appreciation of property condition, improved maintenance records, better prediction of maintenance requirements and budgetary control, facilitate work programming, reduce risk of breakdowns.
 8. Internal control
-

UNIT 11: EQUIPMENT MAINTENANCE TERMS

This Unit is part of Section C : *Plant & Equipment*

Maintainability

Maintainability refers to the capacity of the organisation to carry out maintenance with:-

- ease and economy,
- readily available equipment,
- safety,
- accuracy.

The object of maintainability therefore is to design and develop systems and equipment which can be maintained in the least time, at the least cost, and with a minimum expenditure of support resources, without adversely affecting the item performance or safety characteristics.

Support resources for maintainability include manpower utilisation, spare parts, tools and test equipment, services (contractor support) and support facilities.

The realisation of the objective of maintainability requires involvement in the total design process. This includes participation in advance planning, design development, production, installation, and activation of equipment or a system. Applied maintainability consists of four discrete work stages within each phase of the design process...planning, design application, measurement and evaluation.

In the planning stage, maintainability requirements are defined and translated into design criteria. Next, the criteria are applied to the design to establish the desired inherent functional and physical characteristics of the equipment or system. These design characteristics are then measured to verify quantitative and qualitative goals. And finally, the design and the results of the measurements are evaluated to assess areas for improvement. In this manner the ultimate support requirements of the equipment or system are controlled to meet specific operational needs.

Maintainability tasks

The major tasks are:-

Preparation - gathering tools; obtaining, setting up, and calibrating maintenance aids warming up equipment etc.

Localization - determining the location of a failure to the extent possible without using accessory support equipment

Isolation - determining the location of a failure through use of accessory support equipment.

Disassembly - equipment disassembly to the extent necessary to gain access to the item that is to be replaced.

Interchange - removing the defective item and installing the replacement

Reassembly - closing and reassembly of the equipment after the replacement has been made

Alignment - performing any alignment, minimum tests, and/or adjustment made necessary by the repair action.

Verification checkout - performing the minimum checks or tests required to verify that the equipment has been restored to satisfactory performance,

Maintainability definitions.

Maintenance; All actions necessary for retaining an item in, or restoring it to, a serviceable condition. Maintenance includes servicing, repair, modification, overhaul, inspection and condition verification.

Maintenance, preventative: That maintenance performed to retain an item in a satisfactory operational condition by providing system inspection, detection and prevention of incipient failures, overhaul, lubrication, calibration, etc.

Maintenance, corrective: That maintenance performed to restore an item to satisfactory condition after a malfunction has caused degradation of the item below the specified performance.

Maintenance downtime: That portion of downtime which can be attributed to preventative- and corrective maintenance functions. Maintenance downtime may be expressed in a measure of central tendency arithmetic mean, geometric mean, median, and mode. It may also be expressed in terms of a maximum value relative to a percentile point of distribution of downtime.

Cost effectiveness (C.E.): The measure of a system or equipment in terms of a given level of cost. Cost includes:-

- initial acquisition costs (cost of conceptual studies, design, development, technical data, equipment fabrication and test, installation, and initial support);
- utilisation costs (annual operational costs for personnel, spares, support equipment and tools, facilities, and resources).

Maintenance indices: Primary expressions of quantitative measurements of equipment maintenance characteristics such as:-

- MMH/OH-Maintenance man-hours per equipment or item operating hour
- Cost/OH-Maintenance cost per equipment or item operating hour

Design criteria: Narrative or quantitative statements that define the required functional and physical characteristics of an equipment item or system, (eg “self-test provisions shall be provided to verify the proper function of each plug-in assembly.”)

Design liaison: The monitoring of design progress and the review of engineering data and equipment to assess maintainability characteristics of the design, and the interfacing activity with the design organisation in order to influence the ultimate equipment-support characteristics.

Design review: The evaluation of drawings, sketches, mock-ups, assemblies, and other items which describe the equipment system design. This evaluation is performed to assess potential and existing problems related to the manufacture of the equipment, its functional capability and the support of the equipment or system. The design review is normally conducted in a formal meeting which is attended by representatives from the various areas of interest (eg., human engineering, maintainability, reliability, systems and design engineering, manufacturing engineering, etc.). As a result of this joint meeting, major trade-off decisions are made, and direction is issued which reflects these conclusions.

Design services: Providing design criteria, standards, procedures, policy statements, requirement sheets, and other data which will aid the designer in the definition of the

equipment- or system-design characteristics. This function includes research and special studies to determine the feasibility of a design approach as it relates to maintainability.

Demonstration: The testing of an equipment item or system to prove that specific quantitative and qualitative maintainability characteristics are inherent in the design of the equipment or system.

Maintainability analysis: The sequential development and review of data, concurrent with, or preceding design development, to aid in describing the optimum design characteristics of the equipment or system. The elements considered in the review are quantitative requirements, support resources, cost, operational objectives and safety. The results of the review are translated into criteria which are applied to the design process.

Maintainability engineering: An organisation that is associated with the functions of maintenance engineering, maintainability-design liaison, systems analysis, design services, support documentation, systems planning, safety engineering, and systems integration and test.

Maintenance analysis: The review of engineering drawings and equipment, concurrent with, or following design development, to validate the maintainability-analysis data. This is a formal review with the findings recorded in a prescribed format. The scope of this review is identical to that of the maintainability analysis.

Maintenance concept: A narrative statement or illustration that defines the theoretical means of maintaining an equipment item or system. The statement or illustration relates the tasks that should be performed at each level of maintenance, the test equipment and tools that should be used in maintenance of the items, and the skill levels of the maintenance personnel that perform the identified tasks.

Maintenance engineering. An organisation or function usually associated with the tasks of maintenance analysis, maintenance studies, maintenance-policy generation, support planning, and maintenance-procedures development. These tasks are usually included in the functions performed by the present-day maintainability organisation.

Maintenance level: An organisational level allocated a selection of maintenance tasks. Certain defined tasks are performed at each level consistent with capability.

Maintenance policy - A narrative statement or illustration that defines the practical means of maintaining an equipment item or system. This is an extension of the maintenance concept with due consideration for the inherent characteristics of the equipment design and other constraints or limitations.

Systems analysis: The review of system design and support requirements, the establishment of primary maintainability criteria, an incremental analysis of tasks and functions, association of tasks and functions with support needs, and the progressive review of design/support needs as the design process evolves.

Trade-off - decision-making process. A trade-off is concerned with decisions between desired maintainability characteristics and cost, reliability- and maintainability-design characteristics, automatic-equipment use and manual-equipment use, and other factors associated with maintainability engineering.

ACTIVITY QUESTIONS

1. What is maintainability?

.....

2. There are several tasks involved in establishing and sustaining a level of maintainability. Complete at least four of the following words in the space provided.

Pre..... Loc..... Iso.....

Dis..... Int..... Rea.....

Ali..... Ver.....

3. What does “design review” involve?

.....

The answers to these activity questions are on the next page.

ANSWERS TO ACTIVITY QUESTIONS

1. Maintainability refers to the capacity of the organisation to carry out maintenance with ease and economy, readily available equipment, safety, accuracy.
 2. Preparation, localization, isolation, disassembly, interchange, reassembly, alignment, verification.
 3. An evaluation of drawings, sketches, mock-ups, assemblies and other items which describe the equipment system design with a view to assess potential and existing problems related to the equipment.
-

UNIT 12: EQUIPMENT MAINTENANCE PLANNING

This Unit is part of Section C: *Plant and Equipment*

Maintainability objectives

A statement of maintainability objectives should be generated by management to present milestones for use by the line departments for their planning purposes, and also to establish goals for the designated maintainability organisational unit (or separate organisation).

In Unit 8 we noted that maintenance objectives fall into two distinct categories:

- Functional performance objectives, being those which maintain predetermined standards and are repetitive eg routine maintenance, painting externally every five years.
- Change objectives, being those that require some distinct cognitive and creative effort and are usually accompanied by some changes in policy, procedures, personnel or investment eg reducing backlog of work, increasing speed of response to tenants' requests, improving productivity of labour force by 25 per cent.

In addition, a committee should be designated to review maintainability objectives periodically and to recommend to management changes in program scope.

Maintainability organisation

Delegation

The delegation of functions by management will in itself determine the placement of maintainability within the company structure, the result being that a department manager will be responsible for merging the functions into the existing department sections, or alternatively, establish a separate organisational entity for the sole purpose of performing maintainability tasks.

Whatever approach the department manager takes, company management should review the organisation alignment and pass judgment on whether or not the organisation can function effectively. The end result is that the relevant responsibilities, delegated authority and functional relationships are clearly defined.

Types of Organisations

The types of maintainability organisations frequently appearing on company charts can be classified as line, project, or staff. Each is briefly discussed below

Line Organisation:

This type of organisation has total responsibility for the conduct of maintainability matters affecting the company product lines. It is a self-contained organisation with single authority that provides services for all company design and support activities. Experience indicates that this type is effective since responsibility can be defined and duplication of effort is eliminated. However, if the company has a great number of diversified product lines or is engaged in more than three major projects, then the maintainability organisation size becomes such that control is difficult. If this situation is encountered, the project type organisation is recommended.

Functional organisation:

The key word is specialisation. Grouping is made in terms of the different kinds of work to be performed with each position specialising in one kind of work. It suits small organisations, is economical to administer and flexible. With growth the tendency is to add layers which creates problems with communication and decision-making and also as the organisation expands into new products, markets and areas.

Divisionalised organisation:

The key words are end result accountability. Work is grouped in terms of the end results desired and therefore accountability is for the completed end product, not just for parts of it. Primary kinds of work necessary to achieve overall objectives are to be performed within the same organisational grouping. Usually occurs at the first level (below the CEO) on the basis of products, markets or geographic areas. In large diversified organisations some activities might be centralised eg legal, corporate public relations, personnel management.

Matrix organisation:

The key words are project-orientation. The work to be done is grouped in terms of projects or programmes which have a limited life span. Some activities might centralised. Sometimes project teams are established within a functional or divisionalised structure, requiring a manager to incorporate a project leadership or membership responsibility with their existing responsibility.

Project organisation:

This type of organisation has total responsibility for the conduct of maintainability matters affecting a single company product line or a specific program contracted by the company. This type seems to be preferred by government contracting agencies in that activity and expenditures can be measured directly. The full resources of the organisation are devoted to the program, and the recording and reporting of activity is distinct from other company functions. The disadvantages of this type of organisation are that there is a duplication of services and activity between the various company maintainability organisations and that there is instability in the organisation since phasing of the various programs is most difficult. The transfer of people from one program to another is possible, but they must be experienced in all phases of maintainability work to fully utilise their services. To retain this skill level, the average rate of pay is higher.

Staff Assignment:

Some companies prefer to place a maintainability expert on the staff of the chief design engineer, or to assign him as a consultant to the director of engineering. Experience indicates that this is most ineffectual. A review of the basic principles and concepts of maintainability will reveal that this arrangement cannot possibly work.

Control and reporting procedures

It is important to have regular meetings with participants to discuss progress and possible modifications made necessary by unforeseen difficulties. There should be an annual report giving information on such matters as any revisions to the objectives, reasons for failing to meet objectives and details of the steps taken to ensure that the same problems will not occur again. These evaluations are very useful in the long-range planning process in making the department's future objectives more realistic.

The control and reporting procedures necessary for maintainability program direction should be an integral part of those company directives that define relationships,

responsibilities, and authority. In addition, management should receive periodic progress reports on each program to measure attainment of primary objectives.

The company maintainability committee should also utilise the information in the periodic reports to formulate recommendations to management.

Maintainability training

The purpose of a company maintainability training programme is two- fold.

- to train maintainability engineers in the proper performance of tasks
- to acquaint other company personnel with the purpose and functions of the maintainability organisation.

The main components are a familiarisation course, a design-orientation course, briefing of support personnel and maintainability engineer training

ACTIVITY QUESTIONS

1. Complete the following sentence:

“The maintainability task can be distributed throughout an organisation by a management process called”

2. Complete the following sentence:

“The key word for a functional organisation is “

3. Complete the following sentence:

“The key word for a matrix organisation is “

4. Experience indicates that concentration of the maintenance responsibilities in a staff position is effective. True/False

5. What are the two purposes for maintainability training?

.....

Answers to these activity questions are on the next page.

ANSWERS TO ACTIVITY QUESTIONS

1. Delegation
 2. Specialisation
 3. Project-orientation
 4. False
 5. Training for proper performance, acquaint personnel with the maintainability organisation.
-

UNIT 13: QUALITY ASSURANCE

This Unit is part of Section D : Asset Protection

This unit has been placed in Section D under the section heading “Asset Protection” for two reasons:-

- quality assurance as a continuing process applies to both land and buildings and equipment
- the quality assurance steps (detailed below) are normally taken in three stages ie both during construction/manufacture, after delivery/handover, and while the asset is being used in production/operation/occupation.

Quality Control

Quality controllers measure the physical condition and performance of assets purchased, manufactured or built on delivery or hand-over and at regular stages during the life of the asset, particularly before warranty periods expire and/or retention sums are fully paid out.

When dealing with quality control, the word quality takes on another meaning. The properties of the building, equipment or product are not compared with others but with the requirements and standards specified in drawings, process descriptions, technical specifications or other documents referred to in the purchase agreement.

Quality is a measure of the accuracy of the properties of a building, item or equipment or product to its corresponding specification.

Forms of quality control inspection

There are different form of quality control inspection. The most common forms are inspection of incoming goods, inspection of a construction or production process, final inspection and inspection of measuring tools.

Inspection of incoming goods

Receiving inspection work must be done quickly and efficiently to avoid bottlenecks in the materials flow so as to get the goods to Quality Control. It must, therefore, be performed by skilled and experienced staff, provided with adequate equipment, suitable facilities and equipped with copies of current drawings and quality control instructions.

Inspection of a construction or production process

As a control method this aims at creating the conditions for the process, products or parts to correspond to the established quality specifications. It includes control of the construction or manufacture through all its work operations, analysis of all the reasons for rejects/failures, decisions whether to scrap, sort or rework batches of poor quality and recording of corrective action taken.

Final Inspection

Finished construction or equipment items must be inspected before they are handed over or delivered. The aim of this inspection is to check if the quality of the finished building or equipment corresponds to the established quality specifications.

Inspection of measuring tools

These are referred to below. They need to be regularly checked to ensure effective measurement.

Extent of quality control inspections

In connection with the extent of the inspection work, the following categories exist:-

Trial run inspection

When a machine tool, or any other piece of equipment, has been set up for a production run, the first component that is processed is carefully checked for compliance with drawings etc. If it is out tolerance the machine and the tools are adjusted as necessary and production is then started. For building construction, this might refer to a sample batch of work.

100 % inspection

All aspects of the construction or equipment are inspected in respect of dimensions and important properties. If the inspection is limited to certain dimensions or properties, the term 'limited 100% inspection' may be used.

Partial inspection

Some components in the construction process or equipment are inspected.

Sample inspection

A small number of the materials, work in progress or components are selected for inspection but at random. In statistical sampling the size of the sample and permitted rejection number are statistically pre-calculated. The sample is taken in such a way that each component has a chance of being selected.

Quality compliance

This is where the quality requirements of the purchasing agreement must be met. It implies an evaluation of a certain property of a product or of a material. As a rule one product is evaluated against another product of a similar kind or against a standard that is commonly expected of the product.

The technical complexity of the building or equipment item dictates the inspection method. In certain cases, visual inspection is sufficient. In other cases, comprehensive tests are necessary.

Quality control methods

The following four methods are most common:-

Measuring - the various dimensions of the building or equipment item are measured with special measuring tools adapted to the situation and with a sufficient accuracy.

Use of gauges - whether a measurement is within, or outside, the determined limits, is determined by the use of fixed or adjustable gauges such as calliper gauges and hole gauges.

Testing - function, test, hardness, chemical composition etc. are checked through various laboratory and operational tests

Visual inspection - an object is inspected by normal or magnified viewing.

ACTIVITY QUESTIONS

1. During which stages of the life of an asset does quality assurance occur?

.....
.....

2. What are the four types of quality control inspections?

.....
.....

3. Name three categories of quality control inspections.

.....

4. What are the four most common methods of quality control?

.....
.....

Answers to these activity questions are on the next page.

ANSWERS TO ACTIVITY QUESTIONS

1. During construction or manufacture; after delivery or handover of the asset; during use of the asset in production, operation or occupation of the asset.
 2. Inspection of incoming goods, inspection of a construction/production process, final inspection, inspection of measuring tools.
 3. Any three of ... Trial run inspection, 100% inspection, partial inspection, sample inspection, quality compliance.
 4. Measuring, use of gauges, testing, visual inspection.
-

UNIT 14: SECURITY

This Unit is part of Section D : Asset Protection

We are required in the learning outcomes to be able to set out the environmental and regulatory standards for the security of physical assets. We have already discussed the environmental aspects in Unit 4. We now turn to the common-sense and regulatory aspects of security.

Security needs analysis

When setting up a security system, the best results come from a careful and detailed analysis of needs. We have to define beforehand what needs protection and how important the protection is going to be.

It is relatively easy to define the objects requiring protection and so the most important question concerns value.

The value of security depends upon:-

- the political and economic impact of security failure,
- the level of corporate commitment and concern for asset protection,
- the health and safety of the public
- financial considerations.

The key question is ... “Does the cost of protection outweigh the value of protection?” While this may be a consideration when planning for a security system less than maximum, it is tacitly implied that something calling for maximum security is worth the cost to someone.

After the needs analysis stage is completed, the security analyst will start to come up with some proposals. How do you assess whether a proposal is justified? This question is best answered by a series of questions in relation to each proposal:-

- What is the issue?
- What is wanted in terms of personnel, equipment and policy?
- What are the pros and cons?
- Do the results justify the expense?
- Is there a cheaper way to accomplish the same thing?
- Is it really necessary?
- What happens if it isn't done?
- Is there enough money available to finance it?
- What are the benefit to the company?
- Will it increase profits? (Not likely)
- Will it reduce overhead? (Possibly)
- Will it make the security task easier? (Probably)

Security objectives

The security analyst must first of all list the basic pre-requisites (objectives) of the security system. For example, a maximum security system, in relation to all unauthorised external and internal activity, might be designed to:-

- impede,
 - detect,
-

- assess,
- neutralise

Then under each of these pre-requisite headings, the security analyst would endeavour to list those security options that might accomplish these pre-requisite objectives eg components to impede might include physical barriers, locks and a perimeter fence.

Threat analysis

This process is called “design reference threat” and defines the level of threat with which the facility’s physical protection system could contend with (or is designed to defeat). This is necessary when designing or upgrading a system and is essential for cost-effective planning.

Step 1 - List threats

The security analyst lists all possible threats eg a hospital’s security director might list the following as conditions or situations the system should be able to defeat:-

- disorderly conduct;
- internal theft or diversion;
- assaults on employees or visitors
- armed attack on facility;
- burglary, robbery and car theft from parking areas;
- kidnapping and hostage incidents.

Step 2 - Evaluate threats

The next step is to evaluate these threats in ascending order of credibility based on past experience, loss rates, crime statistics etc.

The hospital in our example could list as follows (going from the most credible to the least):-

- internal theft or diversion,
- car theft from parking areas,
- disorderly conduct,
- assaults on employees or visitors,
- burglary,
- robbery,
- hostage incident,
- armed attack.

Step 3 - Define potential adversaries

Next consider the types of adversaries that would likely be encountered by the security system. There are six generic categories of adversaries:-

- terrorist groups;
- organised sophisticated criminal groups;
- extremist protest groups;
- disoriented persons (psychotic, neurotic);
- disgruntled employees
- miscellaneous criminals.

The security analyst assesses these potential adversary groups in terms of likelihood of encounter, from most likely to least. The hospital’s list would probably be:-

- miscellaneous criminals,
-

- disgruntled employees,
- disoriented persons,
- organised sophisticated criminal groups,
- extremist protest groups,
- terrorist groups.

Step 4 - Match threats to adversaries

Once the likely threats and adversaries have been determined, it becomes necessary to correlate and establish a specific design-reference threat. The process begins by comparing the most credible realistic threats with the most likely adversaries for a particular facility.

For the hospital these might be:-

- internal theft or diversion from miscellaneous criminals, disgruntled employees, organised sophisticated criminals;
- car theft from miscellaneous criminals;
- disorderly conduct from disoriented persons;
- burglary by miscellaneous criminals.

On this basis the hospital's security analyst knows where to channel resources and the degree of protection needed. Since internal theft or diversion has been defined as the most credible threat, the system should be designed to counter this crime as if it would be perpetrated by an organised sophisticated criminal. This is where much of budget money will be spent.

Security strategies

Minimum security

Minimum security can be provided by simple physical barriers and simple locks.

Low level security

Low level security is minimum security plus basic local alarm systems, simple security lighting, basic security physical barriers, high-security locks.

Medium level security

Medium level security is low level security plus advanced remote alarm system, high security physical barriers at perimeter & guard dogs, watchmen with basic communications.

High level security

High level security is medium level security plus closed circuit television (CCTV), perimeter alarm system, highly trained armed guards with advanced communications, access controls, high-security lighting, local law enforcement co-ordination, formal contingency plans.

Maximum security

Maximum security is high level security plus on-site armed response force, sophisticated alarm system.

The security plan

This is frequently contracted out before system implementation. It is a necessary document and after implementation it becomes a necessary reference document. Access

to it should be restricted to those who have a need to know. It should contain at least the following information:-

- a description of the facility and its organisational structure;
- the security organisation of the facility;
- the physical barriers used in the system;
- the alarm system used;
- access controls used to restrict access to or within the facility;
- security lighting at the facility;
- communications capability;
- a description of the CCTV capability and its use;
- a breakdown of the security force and its organisation, training, equipment, capabilities, resources, and procedures;
- outside resources including local law enforcement agencies
- environmental design for maximum security.

Site design and security

This involves physical planning to preventing crime. Its objective is to improve security in residential and commercial areas by limiting criminal opportunity through the use of physical barriers.

It encompasses the consideration of building sites, quality of materials used, architectural design of structures, and the role of trees, shrubbery, lighting, and fencing in preventing crime.

Environmental factors that are also relevant include careful planning of streets, walkways, and other arteries, as well as increased police technology through computerised dispatching and tracking of patrol cars.

Specifically, site design (sometimes called environmental design) approaches used in opportunity minimising strategies, include:-

- making access to the offender's target impossible, too difficult, or too time-consuming;
- making the chances of detection or exposure on the premises too great by eliminating places where the criminal could conceal his presence;
- arrival of the police or armed guards likely while the offender is still on the premises or before he can make a clean getaway;
- making the risk of armed resistance by others, with the possible death or injury to himself, too great;
- successful escape with stolen merchandise improbable because of poor escape routes and probable police interception;
- the likelihood that the offender will be identified through increased observation opportunities.

Building design and security

Since the 1970s Building Security Codes have been developed which require buildings to be constructed with a level of security in mind. These define specific security standards for building components.

An example is from the "Model Residential and Commercial Building Security Ordinance" in the USA, which is a voluntary code. Any builder, contractor or owner desiring to have a decal (a security award denoting compliance) awarded to any single or

multi-family dwelling currently existing, under construction, or to be constructed may voluntarily meet the following specifications dealing with building security. An example of the code as it applies to "Exterior Doors" reads as follows:-

All exterior doors, except sliding glass doors or metal doors, with or without decorative mouldings, shall be either solid core wood doors or stave or solid wood Bake doors and shall be a minimum of one and three-eighths inch (1 3/8") thickness. Hollow Core Doors . A hollow core door or hollow core door fitted with a second composition material, other than mentioned above, will be considered a solid core door. Hinges. All exterior door hinges shall be mounted with the hinge on the interior of the building..... etc

Law enforcement agencies have the knowledge of crime trends and of burglary and therefore should be involved with State and local government planning bodies in the development of these codes.

Security should be designed into buildings and site layout. Designing security into a new complex should begin with interior security and then work out to the exterior and then to the outer perimeter.

Building contractors will experience a theft of stocks or material before completion of the site and should therefore be security-conscious at the beginning of construction before theft gets too costly. Thefts which appear to be of an internal nature should be analysed in relation to previous such thefts at other sites.

Check lists for interior and exterior works are useful planning and design aids. For example, an exterior access checklist might include the following items.....external doors, building line , architectural defects affecting security, building access, windows and glass, locks and their installation, doors Other check lists might include an intrusion alarm systems checklist, a CCTV checklist, a card access control checklist and a storage rooms, safes, and vaults checklist.

Security surveys

The component parts of a security survey are:-

Anticipation

Why is the crime risk important to the security or crime prevention surveyor?

Recognition

Recognition, appreciation and interpretation of the situation.

Appraisal

Suggesting, developing and communicating recommendations.

Assessment of the crime risk

This refers to the opportunities to be gained from crime. The total elimination of opportunity is most difficult, if not most improbable. Thus, the cost of protection is determined by such factors as the depth of protection and delay time desired.

There are basically three types of surveys:

Building Inspection

Involves advising tenants in a large complex of their vulnerability's as they pertain to the physical characteristics of the building

Security Survey

This is a study of the whole complex rather than just a portion of the site for a tenant.

Security Analysis

This is a more in-depth study including risk management, analysing risk factors, environmental and physiological security measures, analysing crime patterns, and fraud and internal theft.

ACTIVITY QUESTIONS

1. Complete the following sentence:

“When setting up a security system, the best results come from a careful and detailed analysis of”

2. Complete the following sentence:

“The key question is does the of protection outweigh the of protection.”

3. Additional security is likely to increase profit?

True/false

4. What are the four objectives for security?

.....
.....

5. Complete the following words in relation to steps in threat analysis.

Stage 1 - threats

Stage 2 - Evaluate

Stage 3 - Define potential

Stage 4 - threats to

6. Define the components of high level security.

.....
.....
.....

7. What would be a useful planning and design aid for security?

.....
.....

8. The four component parts of a security survey are:

.....
.....

9. What are the three types of surveys:

.....

Answers to these activity questions are on the next page.

ANSWERS TO ACTIVITY QUESTIONS

1. Needs
 2. Cost, value
 3. False
 4. Impede, detect, assess, neutralise
 5. List, threats, adversaries, match and adversaries
 6. Includes closed circuit television, advanced remote and perimeter alarm system, highly trained armed guards with advanced communications, access controls, high security lighting, local law enforcement co-ordination, formal contingency plans, high security physical barriers, high security locks, guard dogs.
 7. Checklist
 8. Anticipation, recognition, appraisal, assessment of the crime risk.
 9. Building inspection, security survey, security analysis.
-

UNIT 15: SAFETY

This Unit is part of Section D : *Asset Protection*

Safety requirements

Safety applies primarily to humans but also to physical property eg an accident can cause both human and property damage. Safety consciousness has been raised significantly by legislation governing minimum standards for occupational safety, health and workers compensation. Employers are required to provide a place of employment free from recognised hazards that are likely to cause injury or death. This includes free and accessible means of egress, aisles and working areas free of debris, floors free from hazards, specific requirements for machines, equipment and materials, specified fire protection by fixed or portable systems, clean lunch rooms, environmental health controls adequate sanitation facilities.

The most important provisions are contained in Health and Safety Acts and the regulations made thereunder. These provide a comprehensive and integrated system of law governing the health, safety and welfare of workpeople and the health and safety of members of the public who are affected by work activities. These regulations usually cover the following situations:-

- employers are to ensure, so far as is reasonably practicable, the health, safety and welfare at work of their employees.
- employers and self-employed persons are to conduct their undertakings in such a way as to ensure, so far as is reasonably practicable, that persons not in their employment are not exposed to risks to their health or safety.
- persons in control of non-domestic premises which are used by persons not in their employment either as a place of work or as a place where they may use any plant or substance provided for their use must ensure, so far as is reasonably practicable, that the premises and any plant or substance therein is, when properly used, safe and without risk to health.
- there is a duty on the part of organisations to use the best practicable means available to prevent the emission into the atmosphere of noxious or offensive substances.
- a person who designs, manufactures, imports, installs or supplies any article for use at work must ensure that the article is safe and without risk to health when properly used, and is required to carry out such tests as are necessary and reasonably practicable to ensure that adequate information is available concerning the correct use of the article.
- an employee must take reasonable care for the health and safety of himself and of other persons who may be affected by his actions and shall not interfere intentionally with or misuse anything provided in the interests of health, safety or welfare.

Need for safety management

As a general rule, 85% of all accidents are caused by unsafe acts whilst unsafe conditions cause 15%. All accidents have a cause, they don't just happen. The aim therefore is to identify and control these causes. The field of view should be widened to include all incidents where a loss to production is caused, whether these incidents result in accidents or not. There are far more incidents than accidents. Every incident is a potential accident (a near miss).

It has been estimated that the cost of accidents can be six to fifty times greater than the amount of insurance recoveries because of uninsured building and property damage; wages for lost time; clerical costs; costs of training new workers; supervision and extra time.

In an organisation with a 5% net profit margin every \$1 saved through accident minimisation is worth \$20 worth of sales. If an accident costs \$10,000 it would take \$200,000 of extra sales to offset the cost.

Hazard minimisation

EMERGENCY EXITS

Design: Correct number of exits: location widths: doors opening out: open to street or open space leading to a street.

Identification: Clearly visible day and night

Access and Egress: Clear, safe, unobstructed passage to and from the exit: where security requires doors to be locked, keys should be readily available.

Lighting: Well lit at all times when personnel are in the building.

FIRE EQUIPMENT

Extinguishers

Position: Securely hung: right heights: handy to hazard area: prominently displayed: not a traffic obstruction: correct type of extinguisher for the nature of the expected fire.

Identification: Clearly marked for its use.

Access: Clear, unobstructed: free from foreign material.

Inspection: Correct inspection tag: undamaged: seals unbroken: nozzle hole clear.

Fire Sprinklers: Look for leaks, damaged heads: materials stored correct distance below sprinkler heads: access and identification.

Fire Hoses: Hose Condition: correctly folded in carrier: nozzles attached: dry: unperished: access and identification.

ELECTRICITY

Power Leads: Cables and leads: condition: clear of passageways and floors: joins and connections: lead supports: location.

Switchgear: Guards and operation: condition and fit: contacts: clean and undamaged.

Motors: Connections and covers: cleanliness and maintenance: overheating: smoke: smell: slow running.

Signs and Safety Locks: Provision and use when carrying out maintenance.

AISLEWAYS

Free from Obstruction: Machine obstruction: equipment, stock, tripping hazards.

Surface: Slippery: broken surface.

STAIRWAYS

Design: Width: handrails: tread: (actual and projected): rise: surface: nosing: landings: guard rails.

Maintenance: Worn or slippery section: tripping hazards.

Lighting: Lighting adequate and operating

LANDINGS

Design: Strength: guard rails: openings: toe boards: head height.

Maintenance: Cleanliness: surface: slipping and tripping hazards.

Lighting: Adequate for all shifts.

FLOOR

Cleanliness: Wet or greasy spots: slippery.

Surface: Rough: dips and rises: broken tiles: manholes and pits protected: drains clear: tripping hazards.

Common safety hazards checklist

Floors, aisles, stairs, and walkways

- Oil spills or other slippery substances which might result in an injury-producing fall.
- Litter, obscuring hazards such as electrical floor plugs, projecting material, or material which might contribute to the fuelling of a fire.
- Electrical wire, cable, pipes, or other objects, crossing aisles which are not clearly marked nor properly covered.
- Stairways which are too steep, have no non-skid floor covering, inadequate or non-existent railings, or those which are in a poor state of repair.
- Overhead walkways which have inadequate railings, are not covered with non-skid material, or which are in a poor state of repair.
- Walks and aisles which are exposed to the elements and have not been cleared of snow or ice, which are slippery when wet or which are in a poor state of repair.

Doors and emergency exits

- Doors that are ill-fitting, stick, and which might cause a slow-down during emergency evacuation.
- Panic-type hardware which is inoperative or in a poor state of repair.
- Doors which have been designated for emergency exit but which are locked and not equipped with panic-type hardware.
- Doors which have been designated for emergency exit but which are blocked by equipment or by debris.
- Missing or burned-out emergency exit lights.
- Non-existent or poorly marked routes leading to emergency exit doors.

Flammable and other dangerous material

- Flammable gases and liquids which are uncontrolled, in areas in which they might constitute a serious threat.
- Radio-active material not properly stored or handled.
- Paint or painting areas which are not properly secured or which are in areas that are poorly ventilated.
- Petrol pumping areas located dangerously close to operations which are spark-producing or in which open flame is being used.

Protective equipment or clothing

- Workmen in areas where toxic fumes are present who are not equipped with or who are not using respiratory protective apparatus.
- Workmen involved in welding, drilling, sawing, and other eye-endangering occupations who have not been provided or who are not wearing protective eye covering.
- Workmen in areas requiring the wearing of protective clothing, due to exposure to radiation or toxic chemicals, who are not using such protection.
- Workmen engaged in the movement of heavy equipment or materials who are not wearing protective footwear.
- Workmen who require prescription eyeglasses who are not provided or are not wearing safety lenses.

Vehicle operation and parking

- Forklifts which are not equipped with audible and visual warning devices when backing.
 - Trucks which are not provided with a guide when backing into a dock or which are not properly chocked while parked.
-

- Speed violations by cars, trucks, lifts, and other vehicles being operated within the protected area;
- Vehicles which are operated with broken, insufficient, or non-existent lights during the hours of darkness.
- Vehicles which constitute a hazard due to poor maintenance procedures on brakes and other safety-related equipment.
- Vehicles which are parked in fire lanes, blocking fire lanes, or blocking emergency exits.

Machinery maintenance and operation

- Frayed electrical wiring which might result in a short circuit or malfunction of the equipment.
- Workers who operate presses, work near or on belts, conveyors, and other moving equipment who are wearing loose fitting clothing which might be caught and drag them into the equipment.
- Presses and other dangerous machinery which are not equipped with the required hand guards or with automatic shut-off devices or dead man controls.

Welding and other flame- or spark-producing equipment

- Welding torches and spark-producing equipment being used near flammable liquid or gas storage areas or being used in the vicinity where such products are dispensed or are part of the productive process.
- The use of flame- or spark-producing equipment near wood shavings, oily machinery, or where they might damage electrical wiring.

Miscellaneous hazards

- Medical and first aid supplies not properly stored, marked, or maintained.
- Colour coding of hazardous areas or materials not being accomplished or which is not uniform.
- Broken or unsafe equipment and machinery not being properly tagged with a warning of its condition.
- Electrical boxes and wiring not properly inspected or maintained, permitting them to become a hazard.
- Emergency evacuation routes and staging areas not properly marked or identified.

Safety programmes

How do we start a safety programme?

Step 1 - Survey

Start with an exploratory survey of supervisors and management with questions relating to current safety conditions, need for a safety programme, attitudes about safety management, attitudes to existing or possible safety measures.

Step 2 - Questionnaire

Follow-up with a formal questionnaire with questions like:-

- Who is responsible for safety?;
- Do incidents and accidents affect your job?;
- What improvements would you suggest?;
- How might top management improve the safety record?;
- Have you done everything within your control in the last 6 months to improve safety?;
- How much authority do you have to correct unsafe conditions?;
- What supervisory safety training have you had?

Then analyse the completed questionnaires.

Step 3 - Review

Review all incidents and accidents for say the last 3 years classified by type (eg burns, breaks, bruises etc) and assigning a cause and responsibility to each. Causes can be summarised under the following headings:-

- management responsibility,
- supervisor responsibility,
- employee error,
- mechanical design, mechanical failure

Then assess all those accidents that could have been caused by a lack of protective equipment or unwillingness to use it. Then determine accidents by job title and list accidents under each supervisors name, suggest corrective action eg change job specifications, supervisor education.

Step 4 - Define accident causes

The methods for finding causes are to:-

- observe workers for unsafe acts;
- study each job analysis for areas where safety is an issue;
- regular inspections to detect unsafe working conditions;
- identification and control of hazards.

Occupational health and safety standards abound. Regular inspections are necessary.

Step 5 - Hazardous materials programme

In addition to the safety assessment steps set out above it is necessary to have a hazardous materials programme. As a minimum it is necessary to:-

- identify their existence and location;
- know accident response procedures;
- know how to deal with spills;
- set up safeguards;
- set up appropriate standards and train employees dealing with hazardous materials (note that suppliers of these materials often have safety information sheets with information on chemical composition, health hazard rating, protective gear needed etc).

Step 6 - Leadership

There is also a need for leadership. Management needs to:-

- decide the most appropriate division of line and staff responsibilities for safety;
 - hold subordinates responsible for accident prevention;
 - support regular training;
 - be pro-active (plant tours, employee letters, safety meetings, posters, prompt accident investigations, personal example, safety handbooks)
 - encourage participation.
-

ACTIVITY QUESTIONS

1. Complete the following sentence:

“There are far more Than accidents.”

2. How would you ensure that the following components are clearly identified in the interests of safety?

Emergency exists

Fire equipment

.....

Stairways

Landings

3. Complete the following words in reference to the six steps for designing a safety programme:

S..... Q..... R.....

D..... H..... L.....

Answers to these activity questions are on the next page.

ANSWERS TO ACTIVITY QUESTIONS

1. Incidents
 2. **Emergency Exits** - correct number of exits, wide enough, doors opening out to street or open space leading to a street, clearly visible day and night, unobstructed passage, keys readily available for all locked doors. **Fire Equipment** - hung properly, prominent, correct, clearly marked, evidence of inspection, etc. **Stairways** - appropriate width with tread and handrails/guardrails, adequate lighting. **Landings** - strong with guardrails, openings and clear head height, adequate lighting.
 3. Survey, questionnaire, review, define accident causes, hazardous materials programme, leadership.
-

UNIT 16: FIRE PROTECTION

This Unit is part of Section D : *Asset Protection*

Classes of Fires

Class A Fires

Fires fuelled by ordinary combustibles like wood, paper and cloth. These fires can normally be brought under control with water or water fog. In a Class A fire the water or water fog is used to cool the mass below the ignition point to stop the fire.

Class B Fires

Fires fuelled by petroleum, oil, lubricants and paints. These are volatile fluids that are widely present. Class B fires are usually smothered with carbon dioxide (CO₂) or water fog.

Class C Fires

Fires that concern live electrical equipment, including transformers, generators, and electrical motors. Automatic action to douse such equipment in the event of fire is prudent, and this possibility should be investigated.

Class D Fires

Fires fuelled by combustible metals such as magnesium, sodium, and potassium. The best extinguishing agent in the case of Class D fires is usually a dry powder. In many cases this may be the only method of suppression. This type of fire occurs only when the combustibles are in use

Fire protection fundamentals

Fire protection is a team effort involving those charged with planning and installing the system and those safety and security personnel who are responsible for monitoring and testing the system. Should a fire occur, the company fire brigade, local fire brigade, security staff, and employees are all involved. The building owner bears the ultimate responsibility for the installation and continued effectiveness of the fire system. A building that “meets the codes” is seldom truly adequate.

Fire protection begins in the planning stage. The services of an architect is essential in the fire design of new construction. Consulting engineers must make sure that all systems work in harmony and are mutually supportive. The system design team also should include the building owner, key operational chiefs, and the insurance underwriter.

Fire protection must meet codes and standards set down by legislation. There are a great many codes and standards that determine what equipment can and what equipment cannot be used in connection with fire alarm systems. Construction techniques such as fire walls, fire doors, and ventilation system closures by fire dampers have done much to contain fires to limited areas but they cannot, by themselves, solve the problem.

Fire alarm systems

There are two main approaches for a fire alarm system, both requiring a knowledge of relevant association standards.

Local fire alarm system

In which the operation of an automatic or manual initiating device will cause alarm-indicating devices to alert individuals on the premises to evacuate or investigate. Generally speaking, this type of system provides no record of any activity by the alarm system. The expectation is that someone will hear the bell and call the fire brigade. Local systems offer little peace of mind, since only people present at the time of the alarm are alerted. When the building is unattended, the system is simply an alarm that sounds in the night in hopes that someone will hear and report the signal.

Central station operation

In which a system, or a group fire systems, where the initiation of certain sensors and various devices at a remote location are signalled automatically to an appropriately equipped central alarm-monitoring facility. These signals are supervised, recorded, and maintained through the services of the central station operator.

Fire building fire zoning

The key to rapid fire detection and alarms is finite zoning. Zoning must be specifically designed to provide effective physical compartmentalisation of the building. The smaller the individual zones, the quicker the actual fire location can be determined.

Great care must be taken to ensure that fire zoning takes into consideration the physical construction around and within the zone, the human factor being protected, the cost of material protected, suppression system concerned, and emergency response elements.

ACTIVITY QUESTIONS

1. What is a Class 'A' fire?

.....

2. When does fire protection begin?

.....

3. What are the two main types of fire alarm systems?

.....

4. Complete the following sentence:

"The key to rapid fire detection and alarms is finite"

Answers to these activity questions are on the next page.

ANSWERS TO ACTIVITY QUESTIONS

1. A fire fuelled by ordinary combustibles, like wood, paper and cloth, which can normally be brought under control with water or water fog, which cools the mass below the ignition point to stop the fire.
 2. In the planning stage.
 3. Local fire alarm system, central station operation.
 4. Zoning
-

UNIT 17: INSURANCE

This Unit is part of Section D : *Asset Protection*

Insurance is directly related to the safety and security of buildings, plant and equipment.

Asset valuation

Reinstatement and replacement can only apply if the sum insured is adequate and professional advice should be sought to determine the sum insured.

Replacement

Where property is lost or destroyed it is replaced by similar property to a condition equal to, but not better or more extensive than its condition when new. But what is the replacement value of the property?

Reinstatement

Where property is damaged the repair and/or restoration of the property is to a condition substantially the same, but not better or more extensive than its condition when new.

Valuation can also take other factors into account (covered by an “extra cost conditions” clause in the insurance policy). These include potential inflation factors that occur from the date of the loss until reconstruction is complete, architectural and legal fees, the cost of removing debris, the extra cost of reinstatement for aged buildings, additional costs due to a change in standards.

Risk analysis

What hazards or risks exist, and has the building a history of loss or damage? These factors may include minor fires, damage caused during burglary attempts, frequent malicious damage, flood and vehicle impact damage.

When values are known and risks evaluated, decisions can then be made to insure fully and take action to control risks and exposures.

Excess insurance

Excess insurance is the dollar amount an insured person must pay for each and every claim. This amount must be paid before a claim against the policy can be completed.

A Defined Event Cover Policy offers protection against specific risks or adverse events.

For example, fire, water damage, impact and malicious damage, glass insurance, machinery breakdown and boiler explosion, etc. An Accidental Loss or Damage Policy compared to a Defined Events Cover Policy is normally much broader in scope and covers accidental loss or damage from any cause not otherwise excluded. It is considerably easier to consider because it is easier to focus on policy exclusions rather than thinking through all the possibilities of what may occur.

Liability claims

The most frequent liability claims occur as a result of personal injury and/or damage to premises. A number of parties are normally involved in a claim, including the owner of the property, the occupier, sometimes both the occupier and the owner, the claimant, the mortgagee.

There must be legal liability for a claim to succeed. For legal liability to exist, the claimant (plaintiff) must show that the party causing the injury or loss was negligent and the resulting injury or loss was reasonably foreseeable. In practice, most liability claims are settled out of court by agreement between the parties and insurers.

The potential of legal liability exposure can be limited by constant inspections of property to identify and rectify dangerous areas and/or potentially dangerous situations. For example, potentially slippery floors or surfaces, faulty automatic doors, restrictions to emergency exits etc. The amount of Sum Insured or Limit of Liability must be determined.

The limit of liability is the maximum amount payable in the event of any claim on the policy. When considering the level of protection needed, it is best to envisage the outcome of the worst possible circumstances.

The typical public liability policy is constructed in two sections, firstly a definition of the cover provided by the policy and secondly, specific exclusions (happenings that will not be covered by the policy).

A number of options are available to the property owner when selecting cover, including protection as a result of an accident and happening in connection with the business and protection as a result of an occurrence in connection with the business. The “occurrence” wording is broader in scope, as an “occurrence” can be an event or accident whereas the “accident” wording will cover a happening cause by an accident only. An example of an “occurrence” wording is... *“We will pay to you or on your behalf all sums for which you become legally liable to pay for compensation (excluding punitive or exemplary damages) by reason of liability imposed on you by law, in respect of personal injury and property damage occurring within the territorial limits during the period of insurance of this policy as a result of an occurrence happening in connection with your business.”*

Examples of specific exclusions applying to a Public Liability Policy are:-

- claims caused by the nature, condition, or quality of products;
- claims caused by any mechanically propelled vehicle or machine (including their attachments) where there is a statutory obligation to effect insurance;
- claims arising directly or indirectly out of the erection, demolition, alteration of and/or addition to buildings where such claim exceeds \$5,000
- in respect of damage to any land or fixed property arising directly or indirectly from vibration, the removal of, weakening of or interference with support to land, buildings or any other property.

Insurance Packages

Rather than property owners negotiating a number of separate policies, a package policy (an all-in-one document) can be arranged and the need for duplicated information is removed.

A package policy is usually written in an easy-to-understand format using simple terms of expression.

Lease Provisions

The basic elements of effecting insurance is to cover items in which respective parties have an insurable interest. This insurable interest may be by way of ownership or by way of written obligation for responsibility, eg a landlord owns a total building structure, including plant, equipment, perimeter glass, building structure and fixtures and fittings such as carports, ceilings and tenancy boundary partitions. Tenants would own their own fixtures, fittings and contents of their own tenancy. Each party would have an insurable interest in their respective items directly owned by them.

By way of written agreement, a tenant may be required to insure property owned by the landlord, or may be required to reimburse the landlord for particular insurances specified within the tenancy agreement. There may also be an obligation on the landlord to undertake insurance cover over tenancy fixtures and fittings, although this is not a regular occurrence.

Strata title properties

A Strata Corporation has a legal responsibility to insure buildings, fixtures and fittings and common areas for replacement value. Common areas being any area not contained in a lot (ie stairways, lifts, hallways, roof, etc.). It is not necessary for Individual Unit Owners to be mentioned on the Insurance Policy, nor can the interests of Individual Unit Owners Mortgagees be recovered on this Policy. Public Liability Insurance is also necessary to protect the interest of the Corporation and Workers Compensation Insurance is required if the Corporation employs.

Risk management

Many events which lead to insurance claims can be avoided or the effects of an event limited if risk control is introduced and maintained by management. Insurance premiums are based on many factors including:-

- Claims history. A poor claims history, of a particular property or owner would normally attract higher premiums than a similar risk or the same risk which has a claim free record
- The physical condition of a property
- Housekeeping standards of the occupier

Effective maintenance of property and constant inspections of potentially hazardous areas are recommended (see previous units).

Protection of income

The exposures and risks threatening income have been outlined in “Protection of Assets”. The questions now to be considered are:

- Over what period of time will the physical damage affect income?
 - What level of potential income is to be protected? (from the time of the loss until original income or rent levels are regained).
-

- Could physical damage to adjoining premises affect your business?

The scope of cover provided for income insurance follows that of property insurance. This is because claims for loss of income will only be admitted if the income is reduced as a direct result of an accident for which a claim can be made under the property insurance policy. There are a number of insurance contracts that can protect incomes. They include:

- loss of rent due to the premises becoming wholly or partly unusable to tenants, following an insured loss.
- any increased cost the landlord may incur to get the tenants back, such as electricity connection fees, and accountancy fees to prepare an insurance claim.
- loss of profits : This is usually required by tenants to protect their income and is often a requirement under lease by the landlords. More details are provided in the section of lease provisions. An example of cover is loss destruction or damage to a business property through fire and specified perils resulting in reduction in turnover or increases in cost of working.

The property owner and/or tenant must also nominate the required period of insurance, known as the Indemnity Period. This is the period beginning when the damage is incurred and ending not later than the number of months stated in the policy during which the results of the business are affected by the damage. The monthly period stated in the policy is nominated by the insured person.

ACTIVITY QUESTIONS

1. A “replacement” valuation is one which assumes that property lost or destroyed is replaced by property to a condition to but not better or more extensive than its condition when new.
2. Complete the following sentence:
“Reinstatement does not mean replacement but involves of the property to a condition substantially the same as when new.”
3. If an excess condition exists in a policy, this excess is payable on every claim?
 True/false?
4. Complete the following sentence:
“A public liability claim may arise because of ”
5. What factors help determine the level of insurance premium for a property?

Answers to these activity questions are on the next page.

ANSWERS TO ACTIVITY QUESTIONS

1. Similar, equal
 2. Repair/restoration
 3. True
 4. Personal injury
 5. Claims history, physical condition of the property, housekeeping standards.
-

UNIT 18: FEASIBILITY ANALYSIS

This Unit is part of Section E : *Capital Expenditure*

Types of feasibility analyses

Decisions to purchase or build need to be feasible. Feasibility analysis takes many forms:-

- economic (in terms of income, employment and multiplier effects)
- financial (in terms of market potential, profitability and fundability)
- environmental (in terms physical planning requirements).

Feasibility as far as an organisation is concerned is best measured in financial terms. Meeting environmental and legislative requirements can be costly but with a pro-active approach might also impact favourably on income. Once a proposal is proven acceptable financially it can then be “sold” in economic terms in order to help secure government and community support.

Financial feasibility analysis

This is covered fully in the subject SMTR 4 “Financial Management” and so only a brief summary is provided here to review purposes. The key components of a financial feasibility study are:-

Project Description

Consumer / customer / user needs
Project Definition
Design Brief (or plans & specifications)

Income Analysis

Sales volume/price & value estimates, period of income
Supporting Business Plan logic (eg. Industry trends, strategy)
Supporting Marketing Plan logic (eg target market, positioning strategy etc.)

Cost Analysis

Variable & fixed costs
Basis of cost estimates (logic, standards, targets, equipment & processes, productivity)

Funds Analysis

Working Capital needs (eg. stock & debtors)
Equipment needs (fixed assets)
Sources of funds

Profit Analysis

Contribution
Break-even Point
Net Profit
Pay Back
R.O.I.
D.C.F. (Discounted Cash Flow)

Income and cost analysis produce a Profit & Loss Budget for the proposal. Funds analysis is reflected in the Balance Sheet. Profit analysis is effected by comparing these two financial statements. A DCF analysis however requires a cash flow budget over a long period of time, preferably the life of the asset.

Final feasibility analysis for major projects should also consider issues raised in Units 2 & 3 and conform to business and marketing planning requirements.

Concept screening

Much wasted time, effort and resources can be avoided by the simple process of concept screening. This should follow the steps in the new product development process discussed before in Unit 3. For major projects, particularly those with a significant environmental impact, the concept screening should incorporate:-

- mission
- purpose
- role
- identity statement
- target market criteria
- financial criteria
- strategic criteria (market attractiveness, capability etc)
- economic impact criteria
- environmental impact criteria.

The key point to be made is that most ideas, plans, issues, actions and activities end up being quantified in the financial statements and budgets. It follows therefore that when we are dealing with proposals we should quantify as much as possible as early as possible. Mostly this will involve rough estimates at first and refinement of the figures later as they are confirmed and justified.

Part of the concept screening process should consider alternative supply strategies. Advice might need to be sought on preparing a make/buy analysis. This, in an objective manner, should answer the questions... "Which alternative approach should we follow?", "Which is the most advantageous and gives the highest return on investment?"

- build or make the asset item ourselves or using contractors
- buy something ready-made, even perhaps second-hand

Final finance approval

An estimate of the financial impact on the business in consultation with financial management must be made before asset selection and agreement is finalised.

What are the costs, benefits and resource requirements? Resources are expressed in the capital expenditure budget and the human resource expenditure budget.

These budgets will be expressed in summary form in the:-

- profit & loss budgets (total and by division)
 - cash flow budgets
 - balance sheet budgets
 - funds statement budgets
 - budgeted ratios.
-

Development feasibility studies

New construction proposals require two “stand alone” or “integrated” financial feasibilities

- one for the construction phase, comparing the costs with the value or sale proceeds on completion
- a separate one for the “operating” phase, assuming the asset is constructed and ready for occupation and use

ACTIVITY QUESTIONS

1. What are the three types of feasibility analysis?
.....
2. What sources of financial feasibility advice and information might relate to the purchase, cost-effective funding and performance of
 - (a) a new tour bus;
 - (b) the purchase of a new hotel (already built)
3. Concept screening for major projects would include five levels of criteria. What are they?
.....
.....
4. Financial budgets would include at least two types of financial statements. What are they?
.....

Answers to these activity questions are on the next page.

ANSWERS TO ACTIVITY QUESTIONS

1. Economic, financial, environmental
2. This question refers to the product development process. The advice and information would therefore come under the following headings:

Stage 1 - Idea Generation (Idea search activity, Inventory analysis, Financial analysis, Planning analysis, Macro analysis, Industry and market analysis, Market/visitation analysis, Product life-cycle analysis, Market projections, Consumer/visitor research , quantitative profile, qualitative profiles, Past and projected competitor activity, Segmentation and target market analysis, Organisation analysis/management audit, Products and services, Production & Development, Financial Management, Human Resource Management, SWOT analysis, Identity / image analysis, Town and regional planning, Key issues analysis)

Stage 2 - Preliminary Screening

Stage 3 - Design Briefs (Strategic guidelines, Operational guidelines, Functional guidelines , Competitive guidelines)

Stage 4 - Preliminary Business Analysis (Design assessment, Product life-cycle analysis, Marketing Mix, Value analysis, Value for money comparisons, Product positioning analysis , Competitive positioning, Consumer positioning, Decision-making, Financial assessment, Human resource assessment,)

Stage 5 - Development

Stage 6 - Final Business Evaluation

Stage 7 - Market Testing

Stage 8 - Commercialisation

3. Target markets, financial, strategic, economic impact, environmental impact.
4. Any two of ... profit and loss statement, cash flow, balance sheet, funds statement.

UNIT 19: FUNDING

This Unit is part of Section E : *Capital Expenditure*

Funding Advice

Who should we get the right information and advice for funding from?

Ideally it should come from within because so much of “cost-effectiveness” for a proposal depends on correct feasibility analysis, which in turn depends on appropriate business planning, marketing planning and budgeting.

External advisers can help facilitate the process and provide advice and information when required, including bankers, government agencies, independent consultants, market researchers, funding providers, lawyers, directors, accountants, taxation advisers, engineers etc.

Management should never abdicate responsibility for understanding and assessing feasibility and funding proposals. The key to using external advisers is to be able to ask the right questions and maintain a firm grasp on the key concepts, principles and structures of the decision making process. They have to live with them and are accountable for performance.

Funding analysis

The choice of funding can impact on costs. For example, interest on borrowed funds will show as a cost above the “bottom line” (net profit) whereas dividends on capital do not. This does not mean that we should never borrow because the real bottom line is “return on investment”, a percentage which takes the level of capital into consideration.

In some cases of low gearing it is more advantageous to borrow, providing the gearing level is secure compared to the underlying capital structure of the organisation.

A complete funding analysis is only possible when a full set of financial budgets is prepared, as referred to in Unit 18.

The concepts and techniques for funding analysis have been dealt with in GSM 19 Tourism Accounting, CMTR5 Financial Administration and SMTR4 Financial Management.

Main sources of funds

In financial management the main generic sources are:-

- retained profits
- increase in liabilities (extra credit or borrowing's)
- decrease in fixed assets (sale, depreciation write-offs)
- reduced investments in current assets (stock, debtors etc)
- additional capital
- renting or leasing assets rather than acquiring them

Retained profits are the cheapest sources of internal finance and the means by which many companies finance future growth. The amount of profits retained depends on board

policy with regards to dividends and reserves as well as levels of taxation. As a general rule, at least 30% of profits after tax should be retained for expansion and growth. For organisations with heavy commitments for expansion or replacement the percentage retained should be higher. Inflation places great demands on working capital and in setting the retention rate for profits organisations would be well advised to budget realistically for inflation.

Internal funding

Should the money come from internal or external sources? Key questions that should be asked are:

- Is the organisation trading effectively and efficiently?
- Should it expand along the lines proposed?
- Is it making the best use of its existing resources?
- Has the need for funds been properly defined and evaluated?
- Has the amount been worked out properly?

Improved management of working capital can often free up spare capital for long term development purposes. If a business is able to shorten the length of time it takes to turn its sales into debtors and then into cash (debtors turnover) then such funds can be released. So too with the management of liabilities. In fact, management skill is required for both assets and liabilities. Basically, internal funds have to be generated by obtaining funds from the assets of the business and re-investing them to best effect through profitability, liquidity (including cash flow) and security management skills.

Management of assets

Some of the pitfalls to be avoided are:-

- having too much slow moving stock;
- having too much tied up in debtors because of slow collection;
- an over-commitment in work in progress;
- investment in fixed assets which are vastly in excess of needs;
- having excess funds in bank accounts not earning a satisfactory return.

Management of liabilities

Management skill is required to match the maturities of assets in time to meet the maturities of liabilities so that funds are available to meet them as and when they fall due.

Capital

Lenders do not usually want to have more stake in the business (or asset) than the owners and look to the owners to carry the greater proportion of risk.

Additional capital can come from existing owners/partners/shareholders or by attracting new owners/partners/shareholders into the capital structure. In the case of a company, where the asset to be purchased is of significant size and might even justify the formation of a new company, the following questions need to be asked:-

- How much capital is needed?;
 - Should there be an issue of ordinary shares only or ordinary plus preference shares?;
 - Should the shares be partly paid?;
 - If ordinary shares, should the issue be at par or at a premium?;
-

- Should the issue be offered to existing shareholders or a placement made with a financial institution or with the general public?;
- Is the time advantageous to approach the market?;
- How will the issue affect the company with regard to benefits to existing shareholders, risk and saleability?;
- How will the new capital affect earnings, dividend ratios, asset backing and market prestige?;
- What are the costs involved and do they justify the new issue?

Joint Venture Finance

There are many types of joint ventures. In essence, the joint venture is a partnership between two or more organisations and/or individuals.

In some development projects, a developer will seek to offer a financier an additional ROI than interest on borrowings by also offering a share of the profits. In some cases, this may be last resort finance where a developer experiences a high rate of rejection from traditional sources.

In other cases, the project might be highly worthwhile and because of a “marriage” between the developer and the financier, a greater volume of work might be available than would otherwise be the case. The financier is known as the “finance partner” and the developer, the “management partner”. An additional advantage to the developer is that ready funds might be available to secure sites well in advance of requirements. Given the possibility of long development approval delays, this facility is most advantageous. In some cases, the developer will build up a “bank” of development sites and trade in them as well.

Venture capital

This form of capital is available for new or young companies where the opportunity for considerable expansion is likely and where the expanding business has reached a sensible limit of its borrowing capacity. Business ventures that are most likely to obtain venture capital support will be those that:-

- are managed by people of talent and commitment;
- have rapid growth prospects;
- have something unique in terms of technology, product or market share;
- desire a strong financial partner as a shareholder.

Where grass roots capital is required the entrepreneurs must have a successful track record in previous business ventures and a complete understanding of their new venture business. Companies with a history of successful performance also have access to this form of finance.

Very often this form of investment involves higher than normal risk and will normally be in the form of equity. The venture capitalists are seeking higher than normal returns than would otherwise be available and are prepared to take higher than normal risks.

Often the venture capitalists will provide long term loan finance with debenture security over the whole undertaking, with stringent management performance conditions so that if the business starts to fail the financier will be able to step in and run the business with similar powers to a receiver.

The loan agreement might also provide the right for the financier to exercise an option over ordinary shares for a very favourable price. If the business succeeds, the financier will be able to make a sizeable capital gain representing the difference between the market value of the shares and the discounted price paid for under the option to purchase clauses of the loan agreement.

Bank borrowings

It is most unlikely that organisations would finance asset purchases with short term overdrafts. The old rule is 'never borrow short and invest long.' As a result, most bank finance for asset purchases will be term loans.

Borrowers should realise that trading banks in Australia are basically short to medium term lenders. One reason for this is that banks are short term borrowers themselves.

Trading banks today consider themselves to be cash flow lenders rather than lenders against the security of assets.

The criteria bankers use to assess loan applications include the following.

Management

Bankers like to see sound management in their customers' business. An organisation which has a reputation for saying it can do something and then doing it, will be favoured by a bank in the approval process. A banker is required to make judgments about the capability of management on the basis of:-

- their own experience;
- their own training and procedures;
- the history of the customer in relationships with the bank.

Balance sheet structure

There are two balance sheet relationships critical to the approval process:-

- the ratio of capital to fixed assets
- the ratio of capital to external liabilities.

A banker normally expects capital to be larger than fixed assets and capital to represent a larger investment than the investment made by outsiders. The bank will assess the current situation and the proposed future situation assuming the asset is purchased.

Purpose of loan

The banker will need to be very clear about the details of the proposal and to be satisfied that it is a logical fit with the business plan and economic conditions. It will help if the banker has had some experience before with the type of assets proposed eg land development, tourist resorts.

Where the new asset proposed is of significant size, the bank will want to be satisfied that the applicant has not been carried away with an unreasonable level of facilities and standards, particularly when the funds might be better spent on improving operations and production.

Prospects

It will be very important to demonstrate using budget projections and financial models that the new asset is going to improve the profitability, liquidity and security of the business. The banker will be very interested in the sensitivity analysis and this should

cater for conservative questioning about the main investment variables. A key consideration also is the ability to repay the loan.

Security

Bankers do not like lending money if they think the only way to obtain repayment will be to realise the security. Security makes the loan safe but does not make an unsatisfactory proposal acceptable.

A quick sale value is used for real estate, plant, machinery and equipment and the wholesale market value for motor vehicles. If raw materials, work in progress and stock is offered as security then this may be only valued at half the book value.

Formal security in the form of a legal document might be required and this to be registered with the Titles Office (in the case of property) and with the Corporate Affairs Commission. Where no formal security is required an exchange of letters might suffice setting out the terms and conditions, etc

In some case, where no security is required, (taken by the bank) a “negative pledge” condition might be required. This is where the customer undertakes not to pledge any assets without first offering the security to the bank, or perhaps if security is to be offered to another lender, then the bank will be offered similar security ranking equally with the other party. Some negative pledges require performance conditions, eg to maintain certain balance sheet ratios, particularly current ratios.

Where a formal security is taken against the whole of the assets and undertaking of a company, a debenture document is drawn up and registered with the Corporate Affairs Commission. This will give the bank a first mortgage entitlement over the assets, except where there is an existing first mortgage on an asset, in which case the bank takes a second mortgage.

Long term development projects requiring a start-up situation are required to meet very stringent criteria. As well as the normal approval process the bank would need to be satisfied that all contingencies are covered and that suitable sale or lease arrangements have been entered into on completion of the works.

Bank bills

Where a bank does not wish to make further funds available to a customer, yet still believes the capital expenditure is worthwhile, it may try to organise the funding using bank bills. A bill is a bill of exchange which is drawn by the customer on the bank and states that a certain amount of money is payable on a future date. The period from the drawing of the bill to the maturity is usually not longer than 180 days and is usually drawn for periods of 90, 120, 150 or 180 days at the option of the customer or the bank. The bank usually uses its own stationery and has the bill prepared in its own office. The customer signs the bill (draws the bill) and then the bank accepts the bill and the bill then becomes a negotiable instrument.

The bank is then able to sell the bill on the short term money market. When the bill matures it is sent to the accepting bank for collection and that amount is debited to the customer's account on that day. The customer may be able to continue the bill finance by asking the bank to roll over the bills, with new paperwork required. This process is repeated during the period of the bill facility.

Bank consortia

With very large projects, a single bank may have a limit on their total exposure to any one customer or any one industry. When the amount required is very large the bank will put together a consortium of lenders to provide the accommodation. The lending will be syndicated amongst a number of institutions and the bank will probably manage the syndicate for a suitable fee.

Merchant banks

Merchant banking in Australia grew out of the entrepreneurial operations carried out post World War II by various stockbroking and investment houses. These organisations were strengthened when the government allowed foreign banks to operate in Australia.

Some of their funds are made available from short term deposits from the money market. The term of these deposits is usually about one year but the vast majority would be overnight to thirty days. These deposits represent excess liquid funds that large companies have available from time to time for which no immediate use is required. Through a pattern of building up deposits over a period of years the merchant banks can with safety make firm commitments to lend these funds to their customers. The merchant banks regard themselves as wholesalers of money.

Apart from overseas capital contributions and overseas loans another way in which the funds are raised is by bills of exchange, in the same way as described above.

Merchant banks can make term loans available as well as bills of exchange lines of credit.

Finance company loans

Principal and interest loans

The characteristics of these loans are:-

- a first mortgage is required eg over freehold property;
- loans never exceed 75% to 80% of valuation;
- the sum total of first, second and third mortgages should not exceed 75% to 80% of valuation;
- repayments by equal monthly instalments over the term of the loan;
- the term is often up to ten years but usually five or six years;
- additional security might be required by way of a floating charge (debenture) over the whole business and/or a personal guarantee of directors and/or the main shareholders.

Bridging loans

The characteristics of these loans are:-

- security as described above;
 - term is usually 24 months;
 - the loan could be advanced by way of progress payments in accordance with completion of work verified by architect's, engineer's or valuer's certificates;
 - the lender often requires long term re-finance or sale arrangements to be in place before completion;
 - if such re-finance is not available then the developer would be required to have reliable arrangements for marketing with a good track record for sales of this type and for management capability.
-

Long term loans

The largest providers of long term loan funds are:-

- life assurance companies;
- fire and general assurance companies;
- pension and superannuation funds;
- building societies;
- solicitors' trust funds;
- some charitable trust funds;
- other private funds.

These lenders are usually prepared to lend on the basis of mortgages, debentures, unsecured notes and convertible notes and debentures.

These loans may be facilitated through finance brokers who will charge a procuration fee ranging from half to two percent of the funds raised depending on the amount of the loan. Stock brokers and merchant banks also facilitate funding through debentures and notes.

Where the lending involves a mortgage, the property owner (mortgagor) gives a charge over that property to the lender (mortgagee) to secure the payment of interest and principal. The mortgage document sets out the terms and conditions of the loan and is signed by both parties and registered at the Lands Titles Office. Such registration prevents the owner from dealing with the property until the loan is repaid and the mortgage is discharged.

Lease Finance

One of the first questions a prospective asset owner should ask is "Should we lease or buy?" Leasing provides 100% finance and provides several advantages:-

- frees working capital for more productive use;
- the value of the asset is kept off the balance sheet, helping to improve the ROI percentage;
- lease arrangements are relatively easy to enter into, there being a large range of traditional financiers prepared to write the business;
- it usually leaves other credit lines undisturbed;
- depreciation and investment allowance benefits can be retained;
- the build-in interest rate in the lease rental might be cheaper than alternative interest rates;
- it may allow a better matching of rentals to cash flow.

There may well be some disadvantages:-

- ownership is lost;
 - leasing involves fixed commitments which must be serviced at regular intervals;
 - there is no guarantee that the lessee can retain the equipment after the expiry of the lease unless there is an option to renew (although lease financiers [lessors] are usually prepared to re-write a lease agreement to provide continuity of use);
 - the cost may be higher;
 - there will be penalties if the lessee desires to get out of the lease agreement if the asset is no longer useful. These penalties may be greater than the cost incurred by an owner (assuming there is no lease) selling the unwanted asset;
-

- there is no prestige of ownership.

Detailed financial analyses should be made for the two options, lease or buy. The lease option needs to allow for the built-in interest rate, term of lease, residual value, investment allowance and stamp duty. The lease rental is based on a depreciation factor (determined by the residual value), an interest rate component and an allowance for expected loss on sale. The ownership option allows similar cost components (depreciation and interest).

The main consideration is the “discount rate” which is used in the DCF analysis. In the leasing cash flow analyses the higher the discount factor (opportunity cost) the more favourable the analysis compared to self-funding an asset purchase. Organisations should be aware of two rates:-

- the average cost of funds (of all interest and dividend bearing funds)
- the ROI that might be obtained if those funds were freed up for investment within the firm or at least in some other form of interest or ROI activity.

Lease financiers and brokers will try to window dress their analysis by using a high discount factor which, of course, will erode the payments spread over time. Many finance applicants are “seduced” by this analysis and automatically opt for the “proven” facts provided by these analysts.

At times lease finance might provide a higher degree of “cost-effectiveness” because funds are not invested in assets and this will help drive up ROI.

Leveraged leasing

A leveraged lease is an agreement that calls for the transfer of rights for the use of an asset from one party to another in return for which the using party agrees to pay consideration (rent) sufficient to return to the owning party the initial cost of the asset, the cost of financing the asset and a profit margin

Such agreements have as one of their integral parts a non-recourse loan from a third party to the owner/lessor assisting in financing the acquisition of the asset. The presence of the non-recourse loan from the third party is the distinguishing feature of a leveraged lease.

Leveraged leases are usually only made available to “blue chip” companies with high credit worthiness for high value items of equipment.

Sale and lease back

This type of finance is very similar to lease finance and applies mainly to property.

Many long term lenders are prepared to enter into sale and lease back arrangements for high value property. The owner of the asset sells the asset to the financier and simultaneously enters into a long term lease for continuing use of the asset.

Usually, these deals are related to well located, general purpose properties and the financier expects a fair market price and rental. The amount of the rental should be sufficient to guarantee the financier a reasonable ROI (yield) in accordance with current yields.

The owner (now the tenant) may have an option to buy the property back on the basis of a right of first refusal should the owner decide to sell the property.

Hire purchase finance

This is similar to lease finance in that the asset is “hired” under a chattel mortgage agreement whereby the asset is taken onto the balance sheet as an asset and the amount mortgaged is shown as a liability it applies only to equipment and not to buildings.

There are five aspects of hire purchase finance for companies:-

- the deposit is usually ten to forty percentage of the purchase price (say an average 20%);
- the term is usually four to five years with shorter terms for motor vehicles;
- payment is by equal monthly instalments over the term;
- interest rates are significantly higher than an overdraft rate;
- the financier usually requires the guarantee of directors or even main shareholders;
- stamp duty is to be paid by the hirer.

Government finance

All State governments have investment attraction strategies and development support programmes of one kind or another.

Government lending authorities might provide assistance as a lender of last resort in the form of:-

- loans,
- capital,
- cash grants,
- guarantees to other financiers.

Before providing such assistance the authority satisfies itself that the finance sought is not available elsewhere at reasonable terms and conditions, that there is a reasonable prospect that the proposal for which the assistance is required is economically sound and that the provision of such assistance is in the public interest.

These authorities also have the power to acquire and make available land and equipment for desirable projects on attractive terms and conditions. Buildings may even be purpose built for desirable applicants (offices, factories, houses, etc.).

ACTIVITY QUESTIONS

1. Complete the following sentence:

“When it comes to funding advice management should never responsibility for understanding and assessing feasibility and funding proposals.”

2. Looking at the major classifications on the asset side of a balance sheet, we find that there are two basic sources of funds. What are they?

.....

3. Looking at the major classifications on the liability side of a balance sheet, we find that there are three alternative sources of funds. What are they?

.....

4. Name at least funding pitfalls in asset management.

.....

5. A joint venture is usually a partnership between two types of partners. What are they?

.....

6. Venture capital is usually only provided for ventures that have the following characteristics.

T..... people R.....

Something U.....

7. In venture capital an option to purchase ordinary shares it usually at a price.

8. What criteria would a bank use to assess a loan application?

M..... B..... P.....

P..... S.....

9. What are the two types of finance company loans?

.....

10. What is leveraged leasing?

.....

.....

11. Complete the following sentence:

“In sale and lease back finance the owner of an asset the asset to the financier and then it back.”

12. Complete the following sentence:

“Governments sometimes provide funds but usually only as a”

Answers to these activity questions are on the next page.

ANSWERS TO ACTIVITY QUESTIONS

1. Abdicate
 2. Decrease fixed assets, decrease current assets
 3. Increase current liabilities, increase long term liabilities, increase capital (and profits).
 4. Any three of ... slow moving stock, slow debtors, excess work in progress, over-investment in fixed assets, idle bank funds.
 5. Management partner, finance partner
 6. Talented, rapid growth, unique
 7. Favourable
 8. Management, balance sheet structure, purpose of loan, prospects, security.
 9. Medium term principal and interest loans, bridging loans.
 10. A lease where the owner is able to negotiate a non-recourse loan from a third party to assist in financing the acquisition of the asset.
 11. Sells, rents
 12. Lender of last resort.
-

UNIT 20: TENDERS & QUOTATIONS

This Unit is part of Section E : *Capital Expenditure*

A tender is an offer, in the form of a quotation, provided in response to an invitation to tender.

Invitations to tender

A person or organisation requiring supply of a building or item of equipment (called the client) can advertise seeking offers. These are called tender advertisements. There are several ways of seeking supply offers (quotations) as follows.

Open tendering

This is where a job or supply need is advertised and all contractors/suppliers are free to quote without any prior enquiry as to their competence. The method has been widely used by government in that it fulfils the requirement of public accountability and removes any suspicion of favouritism. However, the method is subject to criticism in that the low prices resulting from indiscriminate tendering are reflected the quality of the work done and that resources are wasted when too many firms tender for the same job.

Selective tendering.

In this method the client invites tenders from a limited number of reputable firms. The list of contractors/suppliers may be drawn up specifically for a particular contract or the client may have a standing list of approved contractors/suppliers from which a short list is drawn up for each contract. Separate lists may be kept according to the type of work or size of jobs which the firms normally undertake. Where a standing list is used it should be reviewed at intervals so that progressive new firms are not excluded , and also so that unsatisfactory firms can be removed from the list.

Negotiated contract

This is where the client invites a tender from a single contractor/supplier who is known to have the necessary qualities, abilities and resources to carry out the work satisfactorily or to supply the equipment. Although there is no competitive element present and as a result the prices may be somewhat higher than with the other methods of tendering it permits a greater involvement of the contractor/supplier during the planning process and perhaps speedier completion and better quality work.

Quotations are offers to construct or supply prepared by a contractor/supplier in response to an invitation to tender. In some cases, a request for quotation form is sent to the prospective contractor/supplier using a request for quotation form. This form can be designed by the tender preparer in such a way that the prospective contractor/supplier (tenderer) can complete it as a quotation. The form usually contains basic information such as:-

- the contractor/supplier's company name and address;
 - the client's representative's name and details;
 - the product specification;
 - the quantity (if applicable);
 - delivery date;
 - the delivery terms (such as ex works or FIS client's store);
 - the latest date;
 - latest date for return of the quotation;
-

- the part number and description of goods required (if applicable),
- the standard conditions pertaining to the tender/bid (usually printed on the reverse).

Evaluation of tenders/quotations

The main factors influencing the purchasing decision are:-

- quality,
- delivery capability,
- price (translated into total cost).

After evaluation of the quotations received, the most competitive ones are selected for a further review. If the sum is significant four additional steps are recommended.

Step 1 - Financial analysis

Analyse each company's annual reports for the preceding two or three years to get an idea of the development of its sales, profitability and liquidity.

Step 2 - Site visit

Visit the tenderer's plant (and previously completed sites and installations), preferably with a team of specialists. During the site visit, it may be advantageous to take a check-list to ensure that the important aspects are examined. Some of the following aspects might be relevant for the check-list. These relate to factory visits for equipment purchases but some may also relate to a construction site.

- the company's organisation;
- impressions of management capability;
- the first impression of the facilities (age, maintenance, capacity, suitability for their purpose);
- plant layouts including transport routes and equipment and quality control checkpoints;
- production equipment (age, state of repair, workload, as well as their suitability for the client's needs);
- storage facilities and equipment;
- raw materials used and its share of the final product's value;
- suppliers of raw materials and raw material prices, if these are of importance;
- quality control;
- is it in evidence on the shop floor and are the finished goods finally checked?;
- technical knowledge, number of years in the trade, number of technical staff in production and in research & development;
- methods of distribution;
- number of employees (ratio of monthly paid to hourly paid employees);
- expansion-willingness, possibilities and plans.

During the negotiation stage, the technical specifications for the purchased products are reviewed along with the construction or manufacturing methods. The prospective supplier is then given an opportunity to present recommendations that may reduce the costs. The client may provide additional information at this stage, eg surface treatment, painting specifications, corrosion protection and packaging.

Step 3 - Price analysis

For quotations to be evaluated, they must first be made comparable. The total cost for each of the quoted items must be established. There may be other costs that must be considered during the evaluation. A client is duty bound to question each quoted price and attempt to achieve more favourable conditions by using all possible fair means, such as requesting new quotations, application of value analysis, negotiations and discount terms.

It is very profitable to utilise settlement discounts, which can be considered as a bonus to clients who pay on time. For suppliers who do not want to extend credit beyond the traditional 30 days period this form of discount is justified and worthwhile the financial benefits are great eg a 2% discount for payment within 30 days represents 24% per annum.

Step 4 - Cost analysis

In many cases the basis for the price quoted should be investigated in an attempt to understand the tenderer's cost structure. Even if it is difficult to determine costs, the client must estimate these in the best possible way when evaluating price. It might be possible to determine the approximate cost for direct material and direct labour.

The next step is to decide whether or not the difference between the sum of these direct costs and the price gives the supplier an excessive sum for overheads and profit.

Some clients claim that it is not a good idea to delve into the supplier's cost structure, as this might prompt price increases, if and when the supplier can prove wage increases or increases in raw material prices. A counter argument may be that close co-operation between client and supplier, with scrutiny of major cost elements, could result in improved value analysis and cost reductions which would benefit both parties.

The use of the "learning curve" as a special cost reduction and negotiation technique complements the use of price analysis. It is based on the fact that complex operations become simple with repetition and construction and/or manufacturing costs should go down as experience increases.

ACTIVITY QUESTIONS

1. Complete the following sentence:

"A tender is an in the form of a"

2. Name three ways of seeking quotations.

.....

3. What are the four steps for evaluating significant tenders/quotations?

F..... S.....

P..... C.....

Answers to these activity questions are on the next page.

ANSWERS TO ACTIVITY QUESTIONS

1. Offer, quotation
 2. Open tendering, selective tendering, negotiated contract
 3. Financial analysis, site visit, price analysis, cost analysis.
-

UNIT 21: CONTRACTS

This Unit is part of Section E : *Capital Expenditure*

Contracts - an introduction

Formation of contract

The offer is usually the contractor's or supplier's tender. Acceptance must be made within a reasonable time and must be unconditional. There is no legal necessity for the building or supply contracts to be in writing, but for purposes of record and to avoid disputes it is highly desirable that they should be so evidenced. For small isolated jobs the contract may be verbal or contained in letters passing between the parties.

Breach of contract

A breach of a fundamental term by one party gives the other party the right to treat the breach as repudiation and sue for damages. For a breach to constitute repudiation it must go to the root of the contract eg for a building item, complete abandonment of the whole works before substantial completion by the contractor or failure by the employer to give the contractor possession of the site (or equipment).

In building work, a client cannot withhold payment on the ground that parts of the work were defective. Where there is substantial compliance to the contract the contract sum should be paid less the cost of remedying the defects. Reasons which a contractor can advance for failure to complete the work include impossibility, illegality, default of other party and waiver.

In addition to the contractual liabilities it is also necessary to consider possible liabilities in tort. A tort is a civil wrong which occurs by reason of a breach of a general duty which is owed to society as a whole. The most common heads of liability in tort include negligence, nuisance and trespass

Implied terms

In the absence of express conditions, the terms implied at common law for building work are that:

- the building owner (client) must:-
 - allow the contractor to enter the building at the necessary time for the purpose of executing the work;
 - give necessary instructions within a reasonable time;
 - not obstruct the contractor in the performance of the work;
 - pay a reasonable price.
- the contractor must:-
 - do the work in a workmanlike manner
 - complete within a reasonable time.
 - where the contractor supplies materials there is an implied warranty that the materials are reasonably fit for the purposes for which they will be used and are of good quality.

Usual contract conditions

Scope of work

There should be a clear understanding by both parties of their respective obligations.

Where the work is stated in broad terms the onus is placed on the contractor to decide the precise extent of the work necessary or equipment to be supplied and the contractor/supplier is contractually liable to do all things necessary to achieve the end result.

The detailed approach removes this discretion and, if the schedule is a contract document, the contractor/supplier is entitled to extra payment for work not specifically included therein.

Where detailed information is given, it takes the form of separate statements about different aspects of the work or equipment which must be taken into account and usually supplemented by a site visit in order to obtain the complete picture. These statements might relate to location, drawings, locational references in the specification, subdivision of the specification or the schedule of items according to location and the work to be performed.

Work detail statements usually include a description of operations and details about the extent of operations, standard of workmanship, restrictions as to method and time, type of materials and tests. Much of this is susceptible to standardisation. In particular it would be advantageous to standardise work descriptions and clauses relating to workmanship and materials.

See also the section below under the heading “Contract Documents”.

Price

This includes:-

- a statement of the lump sum or the formula which is to be set to arrive at the contract sum post-completion or delivery;
- a statement of the documentary evidence that must be produced by the contractor/supplier as a prior condition to payment where work is post-priced, eg. submission of certified time sheets and invoices in respect of materials for cost reimbursement contracts;
- the periods at which interim payments will be made and the method by which they will be valued;
- the procedures for ordering variations in the quality and quantity of the work and, in the case of lump sum contracts, the method of valuing such variations.

In addition, where the contract is of a cost reimbursement type, there should be clear agreement as to what matters may be claimed as prime cost and what are deemed to be included in the percentage addition.

Also it is desirable for building work to give the client organisation greater control over the use of resources than would be appropriate for other types of contract. This control would extend to the method of working and sequence of operations, the number of men employed on the site, the purchase of materials and the plant used on the site.

Time

Failure to complete or deliver by the specified time could result in losses to the client firm. To cover this contingency, it is usual to provide for the contractor/supplier to pay the client an agreed amount for each week of delay beyond the date of completion.

The client may be given a contractual right to determine the contract if progress is not satisfactory (in the client's opinion), but in practice such power should be exercised with caution to avoid a claim for wrongful termination.

Quality

The primary obligation into which the contractor/supplier is normally required is to 'carry out and complete the works or supply the equipment to the reasonable satisfaction of the client.

Conditions which seek to safeguard the client's interests in this respect are of two types:-

- those which attempt to prescribe the circumstances which will favour the production of a reasonable quality, eg. for building work, a requirement to keep a competent foreman on the site at all times;
- those which provide a client with a remedy if the quality is unsatisfactory (the contractor/supplier being required to make good any defects due to non-compliance with the specification for an agreed period following completion of the works or supply of the equipment).

Risk

The execution of building work or installation of the equipment inevitably involves some risk of personal injury or damage to property.

It is essential that such risks should be adequately covered by insurance, preferably by a joint names policy to cover all third-party liability irrespective of who is negligent.

In the case of maintenance, the existing building and contents would normally be insured against damage by fire and other common risks and additional cover could be arranged for the extra risk created by the building operations or installation of equipment.

Disputes

For contracts of significant size it is desirable to lay down procedures for dealing with any disputes that may arise, usually by providing that they should be referred to a named arbitrator or one who is to be elected in an agreed way. This method of settling disputes is generally regarded as quicker and cheaper than the ordinary process of the law.

Contract documents

The contract documents will depend upon the size, nature and complexity of the work and whether payment is to be made on a lump sum, schedule or cost reimbursement basis. They may include a separate form of agreement with attached conditions, drawings, specifications, bills of quantities, schedules of rates.

Agreement and conditions

It is advantageous to use a standard form of agreement wherever possible.

Drawings

The main way of conveying construction/equipment information to the contractor/supplier is by means of annotated drawings drawn to appropriate scales.

In building work, block plans are described as those showing the size and position of the building and its relationship to adjoining buildings. A key plan is one which shows the position of the site when it is not sufficiently identifiable from the block plan. Larger scale details are often necessary to illustrate complex or critical parts of the structure.

Specifications

The presentation of information in a specification may take different forms according to the use of the specification and whether or not it is to be a contract document.

For example, for larger new works a specification may be prepared by the architect with assistance from a quantity surveyor in the preparation of bills of quantities. For smaller building works such as alterations and extensions it is unlikely that there will be a bill of quantities and the contractor will be required to base his tender on the specification and drawings.

For some types of maintenance work drawings may be unnecessary and the specification will be the sole source of information concerning the work to be done.

In building work a specification is normally divided into two main parts - Preliminaries and Materials and Workmanship.

- ***Preliminaries***

This section gives provisions which govern the general conduct of the contract and the overall extent of the contractor's abilities. The clauses will have to be drafted to meet the requirements of the particular job and will include such matters as general description of work; form of contract to be used; provision of plant, scaffolding, etc.; provision of sheds for storing cement, etc.; office for Clerk of Works (if there is one) water, lighting and power; protective measures where work in occupied buildings times of access to site and restrictions on method of carrying out work and other items likely to affect progress.

- ***Materials and workmanship***

This section describes the quality of the materials to be used and the method of construction and standard of workmanship. For new works it is convenient to follow an order like demolition; excavation and earthwork; piling; concrete work, brickwork and block-work; underpinning; rubble walling and masonry; asphalt work and roofing etc.

For works in alterations and repairs it will often be necessary to depart from the sequence of work sections and adopt a sequence which follows the order in which the work will be carried out on site.

Bills of quantities

Normally only used for the larger building jobs and set out in a systematic manner the quantities and full descriptions of all the items of labour, materials and plant required to erect and complete a building.

Schedules of rates

These may be ad hoc schedules prepared for a particular building job or standard printed schedules for use in term contracts. The ad hoc schedules usually follow the same pattern as a bill of quantities but may be either without quantities or with approximate quantities to assist in the evaluation of tenders. A standard schedule is one which has been designed to cover the range of repetitive jobs and may be one which is peculiar to the particular organisation or one which is more broadly based and of general applicability.

The term Schedule of Rates is also used to describe the list rates which have been used by the contractor in building up his tender for a lump sum contract and which he is required to submit for the purpose of valuing any variations might be ordered.

Types of contract

Lump sum contracts

The contractor/supplier agrees to execute the work or supply the equipment for an agreed sum based on information derived from drawings, specifications, bills of quantities or site inspection. Small areas of uncertainty may be left to the discretion of the contractor/supplier to assess the risk and price accordingly or may be covered by the inclusion of a provisional sum. In the latter case, the cost of the work would be ascertained after execution on the basis of day-work, or in accordance with a schedule of rates submitted with the tender or by agreeing a reasonable sum.

Schedule contracts

This applies to building contracts. Schedule contracts are useful where details are too scanty to permit the preparation of a precise specification at the time of commencing the work. The schedule lists all the items of labour and material which are expected to be required and may be an ad hoc schedule for a particular job based on past experience of similar jobs or a standard schedule designed to cover a wide range of jobs.

The schedule may be unpriced, in which case the contractors tender by inserting a rate against each item, or there may be standard rates included in the schedule and the contractors tender by quoting a percentage on or off the standard rates. The work is measured on completion in terms of the schedule items and priced out either at the contractor's rates or at the standard rates plus or minus the quoted percentage.

The cost is, therefore, not known until the work has been completed although the approximate quantities of the various items may be estimated prior to commencement for cost control purposes.

Usually this process is shrouded with uncertainty and it is probable that a contractor would merely identify the pre-dominant trades and base their percentage on the estimated quantities of the major items in these trades.

However, in spite of the above defects, a schedule fulfils a number of useful functions, the two most obvious being that it establishes standard work descriptions and that it lays down a pattern of pricing which, although not corresponding precisely to the pattern of prices normally adopted by the individual contractors/suppliers, is sufficiently close to form an acceptable basis for valuing work executed. The percentage additions also provide a ready means of establishing trends in maintenance prices.

Cost reimbursement contracts

This also applies to building work. A cost reimbursement contract requires the contractor to complete defined work and in return he will be paid the prime cost of labour and material plus either a previously agreed percentage or a fixed fee to cover overhead charges and profit.

The advantage of this type of contract is the absence of any financial incentive to encourage the contractor to carry out the work as economically as possible. Its use should therefore be restricted to small or extremely urgent jobs for which no other method is possible.

There may be occasions on which the nature of the work is so uncertain that, in an effort to provide cover against every eventuality, a firm price might be in excess of that obtained on a cost-plus basis.

This type of contract demands the employment of a reputable contractor and close scrutiny of the contractor's account to ensure that the labour and materials charged are reasonable in relation to the work done.

The main weakness is the difficulty of checking the correctness of the contractor's account, particularly with regard to the number of labour hours. A method that has proved beneficial is known as 'controlled day-work' whereby all jobs are pre-estimated prior to issuing the order. Then if the contractor's account exceeds the estimate by more than a certain percentage, the reasons are investigated. The permitted variation may range from 10 per cent for the larger jobs to 20 per cent for the smaller jobs.

Fixed price contracts

This is an attempt to reduce the considerable amount of paperwork involved in administering the other types of contract, particularly where the paperwork time exceeds the cost of the job. It involves agreeing a lump sum with a contractor for undertaking a range of recurring works of a similar kind to a specified group of buildings over an agreed period.

Term contracts

The contractor is given the opportunity to carry out all work of a certain type or falling within certain limits of cost for an agreed period. The work done is usually priced on either a schedule (measured term) or a cost reimbursement (day-work term) basis, although for the larger jobs it may be more advantageous to negotiate a lump sum.

Suitability of the contractor/supplier

The basic problem of selection is to predict which contractor/supplier of those available is most likely to achieve the client's objectives. It is necessary, therefore, to compare the contractor/supplier's known or assumed abilities with the services required by the client. This process involves competition between those contractors/suppliers who wish to secure the contract. The competition may be formal based on criteria which can be objectively measured, or it may be informal and based on subjective judgment.

Even where a client, such as a building owner, approaches a single contractor/supplier there will be some degree of implied competition in that the mere choosing of a particular contractor/supplier suggests that there are reasons for rejecting all the other contractors/suppliers who are equally capable of undertaking the work or supplying the equipment.

The contractor/supplier's suitability should be considered under three headings.

Resources

Are the potential resources necessary for the performance of the services required available?

Performance

Are these resources likely to be applied adequately to the contract and are there any likely reasons why not?

Proposals

What are the contractor/supplier's specific proposals for the contract and are they reasonable?

To determine the degree to which a contractor/supplier meets the above criteria, it is necessary to consider the following aspects of their organisation:-

- financial stability,
- resources,
- scope of work,
- availability,
- co-operativeness
- price levels .

ACTIVITY QUESTIONS

1. Can a client withhold payment for building work if the work is deficient and only partly complies with the contract requirements?
Yes/No
2. Name some of the usual conditions for a building contract.
S..... P..... T.....
Q..... R..... D.....
3. A specification for a building contract usually has two main parts. What are they?
P..... M.....
4. What types of contracts are there?
L..... S..... C.....R.....
F.....P..... T.....
5. What three criteria might be used for selecting contractors/suppliers?
R..... P..... P.....

Answers to these activity questions are on the next page.

ANSWERS TO ACTIVITY QUESTIONS

1. Yes
 2. Scope of work, price, time, quality, risk, disputes.
 3. Preliminaries, materials and workmanship.
 4. Lump sum, schedule, cost reimbursement, fixed price, term.
 5. Resources, performance, proposals.
-

UNIT 22: NEGOTIATIONS

This Unit is part of Section E : *Capital Expenditure*

Negotiation fundamentals

All asset managers need access to negotiating information and advice. Furthermore, the principles and techniques of negotiation need to be learned and practised. Advice might be sought in this area until they become skilled negotiators through experience.

A successful negotiator needs a good knowledge of the asset to be bought, of cost analysis and about construction techniques and operations management. Some desirable qualities are:-

- to be able to maintain good relations with suppliers;
- to understand their point of view;
- the personality of an effective salesperson;
- the technical inquisitiveness and analytical ability of a good engineer;
- the decisiveness and authority of a successful manager;
- to be able to use judgment, sensitivity and common sense.

A purchasing negotiation aims to reach agreement concerning the contents of a purchasing agreement (such as delivery conditions, quality requirements, price and terms of payment).

For the agreement to be successful both parties should be reasonably satisfied. It is a misconception to believe that a business deal should result in one party being cheated or deprived of reasonable consideration. There are buyers who are never satisfied and always want to haggle, causing suppliers to add a bargaining margin to their quotations.

When to negotiate? Negotiation is recommended:-

- to resolve technical issues;
- if prices are perceived as being too high;
- if the delivery terms are unsatisfactory; if the quality is not acceptable;
- if the purchase represents a very large amount.

Negotiating preparation

There are several important steps recommended before negotiation commences:-

- analyse the situation (factors, facts, conclusions, evaluations);
- establish our price targets. The desired price and compromise price should be determined in advance. What room do we have to move? We have to anticipate the supplier's possible price target range;
- appoint the right negotiators and seek out the right supplier representatives. Is each representative authorised?
- compile the facts about design, manufacturing methods, cost analysis, legal matters, quality control and inspection, warranties, service etc.;
- prepare a plan for the negotiation (sequence of argument, roles etc).

Negotiation techniques

- choose a pleasant environment and a suitable leader,
 - engage company specialists if necessary,
-

- ascertain what can be achieved,
- consider the long term benefits,
- follow a predetermined sequence during the negotiation,
- listen attentively to the supplier's representative,
- put the right questions,
- divert damaging questions,
- be sure of relevant facts and figures,
- justify answers,
- try to visualise the opponent's situation,
- keep emotions under control,
- know when to adjourn,
- avoid premature agreements,
- give the supplier a chance of retreating gracefully,
- consider the supplier's representative as an associate,
- always be honest and fair,
- avoid sharp practices,
- summarise the agreement.

ACTIVITY QUESTIONS

1. Complete the following sentence:

"A purchasing negotiation aims to concerning the contents of a purchasing agreement."

2. When is negotiation recommended?

.....

3. List at least five negotiating techniques.

.....

Answers to these activity questions are on the next page.

ANSWERS TO ACTIVITY QUESTIONS

1. Reach agreement
2. To resolve technical issues, where prices are perceived as being too high, where the delivery terms are unsatisfactory, if the quality is not acceptable, and in all cases where the purchase represents a large amount.
3. See list in text above

UNIT 23: ACCOUNTING PROCEDURES

This Unit is part of Section E : *Capital Expenditure*

Estimating & cost control

The accuracy of an estimate will depend upon the amount of information available on: -

- the nature and extent of the work;
- the conditions under which the work will be executed;
- the mode of execution;
- the costs of employing labour;
- the prices of materials.

An excessively detailed approach can sometimes result in unjustifiable costs and may detract staff from other duties. Sometimes it is better to be less meticulous in estimating and to concentrate the maximum effort on management, supervision and control of expenditure.

Long-term estimates

These are less precise because the precise nature of the individual items of work is not known and the estimate must be based on the average cost of maintenance related to some parameter of the building or equipment in question.

Methods for estimating maintenance costs involve using financial criteria which express maintenance as a percentage of replacement or construction/supply costs and/or production/operating costs. The latter may be determined by a wide range of factors eg:-

- product mix,
- number of shifts,
- efficiency of production equipment,
- occupation costs,
- profitability.

Other expressions of maintenance costs might include costs per unit of accommodation, costs per unit of floor area (square metres), costs per unit of volume (cubic metres), costs per building element (external walls, floors, roof etc.), costs per functional system

Medium and short term estimates

This refers to programming, scheduling and controlling the execution of the work. More accurate estimates are needed based on the actual work which has to be undertaken. Analysis and judgment are required:-

- small jobs can be broken down directly into their labour and material content on the basis of past records of similar jobs;
- large jobs must first be broken down into a series of separate items representing discrete parts of the whole.

The items usually include both labour and materials and may refer to a single trade operation or a self-contained multi-trade operation. The items are then analysed to determine the labour and material content and priced as for small jobs.

In many cases historic cost data are so scanty that estimates are based solely on 'experienced' judgment.

Direct labour estimating

The total estimated labour hours will indicate whether or not the existing labour force has the capacity to do the work and the nature of changes which should be made to its structure and composition.

The estimated job times will form a basis for programming and scheduling labour resources. The job times also provide a yardstick against which to measure actual performance.

The aggregate job times permit an assessment to be made of the backlog of work which exists at any time so that the response time can be adjusted if it is unacceptably long or uneconomically short.

Contract estimating

Information from past contract work is apt to be very much less detailed than that from work executed by direct labour.

Purchase requisition

This form precedes the raising of a purchase order and is an internal document only. It should contain:-

- the name of the originating department;
- the name of the person raising the requisition;
- the date of issue;
- the account number or cost code to be debited;
- the part number or stores code (if applicable);
- the description and drawings, or catalogue numbers, if any;
- the suggested supplier;
- the receiver of goods (originator or other authorised person);
- the required date of delivery;
- the specification for the product to be purchased;
- the quantity to be purchased and unit of measure (if applicable).

Purchase order

Certain purchases such as land and buildings, require agreements in writing. For most other purchases it may not be necessary for agreements to be in writing, but written confirmation in the form of a purchase order from the buyer, and/or an order acknowledgment from the supplier, is desirable.

The purchase order form should include:-

- the specification of the product or service purchased (if applicable);
 - the part number;
 - description;
 - quantity and price;
 - purchase order number and date;
 - supplier's name and address;
 - client's representative's name (the buyer);
 - delivery conditions (F.I.S., F.O.B., C & F etc.);
 - transport method (road, rail, sea or air);
 - delivery date;
 - applicable payment terms (30 days net. 7 days 2% etc.);
-

- provision for sales tax exemption certificate.

Follow-up of the purchase order is important. Make sure that the order reaches the supplier and is acknowledged. Establish if the supplier's acknowledgment, in writing or otherwise, differs from the purchase order.

Receiving inward goods

For identification of incoming shipments, the staff of the goods receiving department usually use the supplier's packing slip and verify details against a copy of the purchase order. Usually a goods received docket is completed.

In its simplest form, the system requires the equipment to be checked against those documents and sent to the user department.

Accounts payable

Accounts Payable must ensure that every payment corresponds with the agreement it refers to and that the supplier has fulfilled all obligations before being paid. Invoices must be matched to orders and approved for payment. Some form of budgetary control is also required to ensure compliance with profit and loss and cash flow budgets.

ACTIVITY QUESTIONS

1. Complete the following sentence:

"Long term estimates are less"

2. Describe the paperwork involved in the acquisition and commissioning of assets.

.....

.....

.....

.....

Answers to these activity questions are on the next page.

ANSWERS TO ACTIVITY QUESTIONS

1. Precise
2. Purchase requisition, purchase order, goods received docket, accounts payable.

STUDENT ASSIGNMENTS

Assignment 1 (2500 words) -refers to learning outcome 1.1

Select a major tourism asset that has recently been built or purchased.

List and describe the past, present and likely future asset management system activities relevant to this asset over its prospective life

Assignment 2 (2500 words) -refers to learning outcome 3.1

For the asset referred to in Assignment 1

- devise an asset inspection sheet for that asset
 - define an optimal scheduling and budgeting programme for the asset for the short, medium and long-term (avoiding unnecessary detail)
-

Each question is related to a unit and to an activity question. The questions in many cases vary from those contained in the activity questions, allowing for a higher degree of difficulty. A short response to each is required. It is expected that learners will develop the degree of understanding necessary to be able to answer more involved questions in an examination with the use of extra detail about the topic and its relationship to other topics in the asset management process as well as some illustrative examples.

Proposals

Unit 2 Q 4

Unit 3 Q 4

Unit 5 Q 7

Unit 5 Q 8

Unit 5 Q 9

Unit 5 Q 10

Unit 5 Q 11

Explain the role of the main players in the field of environmental protection for tourism assets.

Unit 6 Q 1

The term "user" only refers to an operator of equipment. Discuss.

Unit 6 Q 2

What management tools can help diagnose and define user needs and performance requirements?

Unit 6 Q 4

Outline the possible sources of advice for establishing user performance requirements.

Unit 6 Q 5

What is a schedule of accommodation?

Unit 6 Q 6

What are the advantages and disadvantages for choosing a unique design?

Unit 6 Q 7

Give some examples of detailed performance requirements.

Business planning justification

Unit 1 Q 11

What are the main functions of business and asset management?

Unit 2 Q 1

What steps in the business planning model, might apply to a proposal to purchase a new tour bus?

Unit 2 Q 2

What steps in the business planning model, might apply to (a) building a new hotel and (b) buying a building to use as a travel agency?

Unit 2 Q 6

What is a planning gap? Why is it significant for the determination of corporate strategy?

Unit 2 Q 7

Discuss the concept of horizontal integration.

Unit 2 Q 8

Why might the asset management process apply to a major tourism development proposal?

Unit 2 Q 9

Discuss the marketing concept of “segmentation”.

Unit 2 Q 10

Discuss the usefulness of a SWOT analysis in physical assets management.

Unit 3 Q 2

Could a SWOT analysis be prepared for an individual physical asset during the operator/occupation stage of an asset’s life?

Unit 3 Q 3

Discuss the importance of coming to grips with “identity” during the design brief stage.

Unit 3 Q 8

Discuss the concept of “product positioning” in the context of physical assets management.

Proposal planning

Unit 1 Q 1

Discuss how physical assets might appear in a balance sheet and an asset register.

Unit 1 Q 2

What physical assets might be involved in a motel, a bus tour business, a caravan park, a holiday farm, a travel agency, a manufacturing company making tourist gifts, a retailer?

Unit 1 Q 3

How might goodwill be treated in an inventory and a valuation of physical assets?

Unit 1 Q 4

Discuss the usefulness of business units (profit centres) for a 5 star hotel?

Unit 1 Q 5

What are the major categories of a tourism inventory asset analysis? Give examples for each category.

Unit 1 Q 6

How might general purpose assets be attributed to individual business units?

Unit 1 Q 7

What does "ROAM" mean? Discuss this concept in relation to asset monitoring.

Unit 1 Q 8

Can you think of any assets that could not be apportioned to business units?

Unit 1 Q 9

What is a profit centre?

Unit 1 Q 10

Would it be possible to calculate an ROI for each profit centre?

Unit 1 Q 11

Would it be reasonable to ask business unit managers to look at the efficiency of asset utilisation eg land area required vs available, floor area, type of equipment etc?

Unit 2 Q 3

Discuss the four stages in the asset management decision making process and the concept of life-cycle analysis during the operating life of an asset.

Unit 2 Q 5

Discuss how the management technique called MBO might be applied to the organisation of asset management in general and to the maintenance task in particular.

Unit 2 Q 11

Discuss the concept of "authority". In your answer outline how command authority and approval authority might operate in the feasibility and operating stages of an asset's life.

Unit 3 Q 1

Describe the product development process, showing how it relates to the financial feasibility process.

Unit 3 Q 5

Discuss the usefulness of rating forms and indicate where they might be of most use in the asset management process.

Unit 3 Q 6

What is the nature and purpose of a design brief/

Unit 3 Q 7

Discuss the main functions in product/asset design. Illustrate your answer with examples.

Unit 7 Q 10

What management techniques might be useful for helping to determine priorities in asset management programming.

Unit 7 Q 11

What is a GANTT chart? Where could one be used in asset management?

Unit 18 Q 1

What are the three types of feasibility analysis?

Unit 18 Q 2

What sources of financial feasibility advice and information might relate to the purchase, cost-effective funding and performance of (a) a new tour bus and (b) for the purchase of a new hotel (already built)?

Unit 18 Q 3

What criteria would be most useful for “concept screening” major projects?

Unit 18 Q 4

What types of financial statements are used in feasibility analysis?

Unit 19 Q 1

Why should management never abdicate responsibility for understanding and assessing feasibility and funding proposals?

Unit 19 Q 2

Looking at the major classifications on the asset side of a balance sheet, we find that there are two basic **uses** of funds. What are they?

Unit 19 Q 3

Looking at the major classifications on the liability side of a balance sheet, we find that there are three alternative **uses** of funds. What are they?

Unit 19 Q 4

Discuss some common funding pitfalls in asset management.

Unit 19 Q 5

A joint venture is usually a partnership between two types of partners. Discuss.

Unit 19 Q 6

What characteristics are usually desired in an applicant for the supply of venture capital?

Unit 19 Q 7

Outline what an option to purchase is in relation to venture capital.

Unit 19 Q 8

What criteria would a bank use to assess a loan application?

Unit 19 Q 9

Discuss the nature of finance company loans?

Unit 19 Q 10

What is leveraged leasing?

Unit 19 Q 11

Outline how sale and lease back finance works.

Unit 19 Q 12

Under what circumstances might government agencies provide funds?

Unit 23 Q 1

Discuss the application of long term estimating.

Specifications

Unit 6 Q 3

What is the role and value of the Standards Association of Australia?

Unit 9 Q 1

What are the purposes of standardisation?

Unit 9 Q 2

Discuss the various forms of standardisation.

Unit 9 Q 4

What is the "AS" mark?

Unit 9 Q 5

What does "ANSI" mean?

Unit 9 Q 6

How might a standard be normally expressed?

Contracts

Unit 21 Q 1

What safeguards does a client have if building work is deficient?

Unit 21 Q 2

What are the usual conditions in a building contract?

Unit 21 Q 3

What usually appears in specifications in a building contract?

Unit 21 Q 4

What types of contracts are there?

Quotations & tenders

Unit 20 Q 1

Explain what a tender is.

Unit 20 Q 2

What alternative ways of seeking quotations might a prospective asset purchaser have?

Unit 20 Q 3

How would a purchaser evaluate a range of significant tender offers for a major office building?

Unit 21 Q 5

What criteria might be used for selecting contractors or suppliers for the supply of air-conditioning plant?.

Quality management

Unit 13 Q 1

During which stages of the life of an asset does quality assurance occur?

Unit 13 Q 2

What types of quality control inspections are there?

Unit 13 Q 3

Can quality control inspections be categorised?

Unit 13 Q 4

What are the most common methods of quality control?

Negotiation

Unit 22 Q 1

What is the fundamental purpose of negotiation? Illustrate your answer with an hypothetical exchange between a builder and an architect trying to agree a fee for architectural work.

Unit 22 Q 2

When is negotiation recommended?

Unit 22 Q 3

What negotiating techniques might be useful for squeezing a better price out of a selected tenderer?

Implementation approval

Unit 23 Q 2

Describe the paperwork involved in the acquisition and commissioning of assets.

Acquisition

Purchase or construction

Unit 5 Q 1

What activities are associated with property development?

Unit 5 Q 2

What are the various professional roles associated with property development?

Unit 5 Q 3

What is the difference between property management and property development?

Asset valuation

Unit 5 Q 4

What does the word "capitalisation" mean?

Unit 5 Q 5

What price would relate to a capitalisation of 10 and a net profit of \$500,000?

Unit 5 Q 6

In what circumstances might the sale price for a property vary from its replacement cost?

Operation

Asset monitoring

Unit 4 Q 1

How does reporting for an asset in an asset register tie up with that for a balance sheet?

Unit 4 Q 2

Outline the various types of source documentation for an asset register.

Unit 4 Q 3

Define "monitoring" in business planning terms.

Unit 4 Q 4

Define "monitoring" in asset management terms.

Unit 4 Q 5

What management concepts are related to asset monitoring?

Unit 4 Q 6

How does asset reporting relate to performance evaluation.

Unit 7 Q 1

Under what circumstances might a condition survey be carried out?

Unit 7 Q 2

Discuss the relationship between the level or scale of maintenance work and the level of space utilisation for a tourism building asset.

Unit 7 Q 3

What is planned obsolescence?

Unit 7 Q 4

What are the components in an LCC analysis?

Unit 7 Q 5

In what stages in the life-cycle of a building might LCC analysis be useful?

Unit 7 Q 6

How are various alternative approaches for asset maintenance evaluated in LCC analysis?

Unit 7 Q 7

What is the difference between being cost effective and cost efficient?

Unit 7 Q 8

What are the sources of ineffective costs?

Unit 7 Q 9

What are the causes of non-productive time?

Unit 10 Q 1

What is a building defect?

Unit 10 Q 2

What types of building components might require inspection?

Unit 10 Q 3

How are defects caused?

Unit 10 Q 10

Discuss how the problem-solving process might be applied to the diagnosis and resolution of a defect problem.

Unit 10 Q 5

Discuss the use of instruments for diagnosing building defects.

Unit 10 Q 6

Why planned inspections?

Unit 10 Q 7

Discuss one advantage for undertaking a planned inspection on behalf of a prospective purchaser of some tourism real estate.

Asset protection

Unit 14 Q 1

Discuss the nature and purpose of needs analysis before setting up a security system.

Unit 14 Q 2

Explain how cost/benefit analysis might apply to a proposal for a new security system.

Unit 14 Q 3

Discuss whether additional security is likely to increase profit. Give some hypothetical examples?

Unit 14 Q 4

What are the objectives for security?

Unit 14 Q 5

What is threat analysis?

Unit 14 Q 6

Define the components of high level security.

Unit 14 Q 7

What would be a useful planning and design aid for security?

Unit 14 Q 8

What are the major component parts of a security survey?

Unit 14 Q 9

What types of security surveys are there?

Unit 15 Q 1

How might accident analysis benefit from a study of incidents?

Unit 15 Q 2

How would you ensure that the following components reach a high safety standard...emergency exists, fire equipment, stairways and landings?

Unit 15 Q 3

What steps would you follow in drawing up a safety programme?

Unit 16 Q 1

What is a Class 'C' fire?

Unit 16 Q 2

When does fire protection begin?

Unit 16 Q 3

What are the two main types of fire alarm systems?

Unit 16 Q 4

What value is “finite zoning” for fire protection?

Unit 17 Q 1

What is a "replacement" valuation for insurance purposes?

Unit 17 Q 2

What does “reinstatement” mean?

Unit 17 Q 3

If an excess condition exists in a policy, is this excess is payable on every claim?

Unit 17 Q 4

What is a public liability claim?

Unit 17 Q 5

What factors help determine the level of insurance premium for a property?

Repairs & maintenance

Unit 7 Q 12

Why is it difficult to be accurate when programming maintenance work?

Unit 8 Q 1

Provide a simple definition of maintenance.

Unit 8 Q 2

What is preventative maintenance?

Unit 8 Q 3

What is corrective maintenance?

Unit 8 Q 4

Can a user influence a schedule system of maintenance?

Unit 8 Q 5

Name and discuss some types of maintenance objectives.

Unit 8 Q 6

How can research using DCF analysis help the maintenance task?

Unit 8 Q 7

What do you understand by the term “asset life”?

Unit 9 Q 3

How does time affect maintenance to original standards?

Unit 9 Q 7

What are the determinants of building maintenance standards?

Unit 10 Q 8

What is the nature and purpose of a maintenance audit?

Unit 11 Q 1

What is maintainability?

Unit 11 Q 2

What tasks are involved in establishing and sustaining a level of maintainability?

Unit 11 Q 3

What does a "design review" involve for the maintenance function?

Unit 12 Q 1

Discuss how the maintainability task can be distributed throughout an organisation?

Unit 12 Q 2

How might a "functional organisation" approach maintenance?

Unit 12 Q 3

Would a matrix organisation make the maintenance task any easier?

Unit 12 Q 4

What are the advantages and disadvantages of concentrating maintenance responsibilities in a staff position?

Unit 12 Q 5

What are the purposes for maintainability training?

ANSWERS TO REVISION TEST

See comments in previous section.

The revision questions relate to the activity questions, albeit with a higher degree of complexity.

Use the cross-references given to the relevant unit and activity question answer to find the essence of the answer and the main text itself for a more complete answer.