

7. The ultimate advantage to be gained by scheduling is that the construction work can be executed in an efficient manner without wastage of any of the inputs, resulting in maximum possible economy.

A construction project consists of a sequence of various activities like preparation of the site, foundation, substructure, super structure, fittings, finishing, and other activities. Some of the activities may be of critical nature and if the activity is not completed in estimated time, it delays the entire project. The sequence of activities in the construction of a building is given below.

1. Earth work in excavation.	6. BW in super structure	11. Flooring
2. P.C.C bed and BW in foundation	7. Sanitary work	12. Electrical works
3. D.P.C	8. RCC	13. Sanitary works
4. Precasting RCC lintels	9. Door panels	14. White washing
5. Casting RCC columns	10. Plastering	15. Sanitary fittings

SCHEDULING BY BAR CHARTS

The bar chart lists various activities involved in a construction project and the period of time that each activity takes for completion. Indicate in the form of a horizontal bar plotted to a suitable time scale against each activity.

Bar charts are suitable for determining the resources, such as materials, labour, machinery and finance, required for construction work. Bar chart is simple, easily understandable and widely used method of scheduling. However it has certain limitations, firstly it is difficult to depict complicated interdependencies of various items of work. It does not give actual progress of the work. It is not possible to know the peak rate of work necessary for timely completion of a project. The bar chart, therefore, is a static representation and does not respond to the dynamic happening on the construction site of a complex project.

Critical path method of scheduling

Critical Path Method is a network method. In CPM the project is analysed into different activities whose relationships are shown on the network diagram. The limitations of the bar charts can be overcome with the Critical Path Method. CPM is widely used in construction industry by a number of private and public organizations.

The concept of CPM is that only a small number of critical activities take most of the estimated project time. Speeding up the rest of the activities has no effect on the completion of work. Only these critical activities need to be speeded up and the rest of the activities can be allowed to proceed normally. The work can then be completed by the target date.

Basic network construction

A network diagram is a graphical representation of the sequence in which various activities of a project are under taken and the relationship among them.

BUDGET

Budgeting has come to be accepted as an efficient method of short-term planning and control. It is employed, no doubt, in large business houses, but even the small businesses are using it at least in some informal manner. Through the budgets, a business wants to know clearly as to what it proposes to do during an accounting period or a part thereof. The technique of budgeting is an important application of Management Accounting. Probably, the greatest aid to good management that has ever been devised is the use of budgets and budgetary control. It is a versatile tool and has helped managers cope with many problems including inflation.

DEFINITION OF BUDGET

The Chartered Institute of Management Accountants, England, defines a 'budget' as under:

“A financial and/or quantitative statement, prepared and approved prior to define period of time, of the policy to be pursued during that period for the purpose of attaining a given objective.”

According to Brown and Howard of Management Accountant "a budget is a predetermined statement of managerial policy during the given period which provides a standard for comparison with the results actually achieved."

Essentials of a Budget

An analysis of the above said definitions reveal the following essentials of a budget:

- (1) It is prepared for a definite future period.
- (2) It is a statement prepared prior to a defined period of time.

(3) The Budget is monetary and *I* or quantitative statement of policy.

(4) The Budget is a predetermined statement and its purpose is to attain a given objective.

A budget, therefore, be taken as a document which is closely related to both the managerial as well as accounting functions of an organization.

BUDGETARY CONTROL

Budgetary Control is the process of establishment of budgets relating to various activities and comparing the budgeted figures with the actual performance for arriving at deviations, if any. Accordingly, there cannot be budgetary control without budgets. Budgetary Control is a system which uses budgets as a means of planning and controlling.

According to I.C.M.A. England Budgetary control is defined by Terminology as the establishment of budgets relating to the responsibilities of executives to the requirements of a policy and the continuous comparison of actual with the budgeted results, either to secure by individual actions the objectives of that policy or to provide a basis for its revision.

Brown and Howard defines budgetary control is "a system of controlling costs which includes the preparation of budgets, co-ordinating the department and establishing responsibilities, comparing actual performance with the budgeted and acting upon results to achieve maximum profitability."

The above definitions reveal the following essentials of budgetary control:

- (1) Establishment of objectives for each function and section of the organization.
- (2) Comparison of actual performance with budget.
- (3) Ascertainment of the causes for such deviations of actual from the budgeted performance.
- (4) Taking suitable corrective action from different available alternatives to achieve the desired objectives.

Objectives of Budgetary Control

Budgetary Control is planned to assist the management for policy formulation, planning, controlling and co-ordinating the general objectives of budgetary control and can be stated in the following ways:

- (1) *Planning*: A budget is a plan of action. Budgeting ensures a detailed plan of action for a business over a period of time.
- (2) *Coordination*: Budgetary control co-ordinates the various activities of the entity or organization and secure co-operation of all concerned towards the common goal.

(3) *Control*: Control is necessary to ensure that plans and objectives are being achieved. Control follows planning and co-ordination. No control performance is possible without predetermined standards. Thus, budgetary control makes control possible by continuous measures against predetermined targets. If there is any variation between the budgeted performance and the actual performance, the same is subject to analysis and corrective action.

Advantages of Budgetary Control

The advantages of budgetary control may be summarized as follows :

- (1) It facilitates reduction of cost.
- (2) Budgetary control guides the management in planning and formulation of policies.
- (3) Budgetary control facilitates effective co-ordination of activities of the various departments and functions by setting their limits and goals.
- (4) It ensures maximization of profits through cost control and optimum utilization of resources.
- (5) It evaluates for the continuous review of performance of different budget centers.
- (6) It helps to the management efficient and economic production control.
- (7) It facilitates corrective actions, whenever there is inefficiencies and weaknesses comparing actual performance with budget.
- (8) It guides management in research and development.
- (9) It ensures economy in working.
- (10) It helps to adopt the principles of standard costing.

Limitations of Budgetary Control

Budgetary Control is an effective tool for management control. However, it has certain important limitations which are identified below:

- (1) The budget plan is based on estimates and forecasting. Forecasting cannot be considered to be an exact science. If the budget plans are made on the basis of inaccurate forecasts then the budget programme may not be accurate and ineffective.
- (2) For reasons of uncertainty about future, and changing circumstances which may develop later on, budget may prove short or excess of actual requirements.
- (3) Effective implementation of budgetary control depends upon willingness, co-operation and understanding among people reasonable for execution. Lack of co-operation leads to inefficient performance.
- (4) The system does not substitute for management. It is mere like a management tool.

(5) Budgeting may be cumbersome and time consuming process.

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UNIT 4

Introduction

Contract is an undertaking by a person or a firm to do any work under certain terms and conditions, which should invariably be in writing. The work may be for the construction or maintenance and repairs, for the supply of labor or the transport of materials, etc.

Contractor means a person or a firm who undertakes any type of contract. Usually this term is confined to the contractors who are engaged in construction or execution of works or repairs.

The system through which the works are carried out by the contractors, who arrange all the materials, labor and equipment required for proper completion of the works is known as the contract system. The work should satisfy the specifications with expected quality. It should also be completed within the stipulated time.

Types of Contract Agreements

Contract agreements fall into the following two clauses.

1. Piece-work agreements.
2. Contracts.

Piece-work agreements.

- These are agreements for doing the work at agreed rates, without reference to the total quantity of work or time. Small works or piecework up to Rs.5000/- are got done through the contractors by piecework agreement.
- Piecework agreements are of the following types.
 1. Piece-work.
 2. Work Order.

Piece-work: In piece-work, the quantity of work is not mentioned and only the rate is mentioned. This agreement is used

(i) For small works (ii) when it is necessary to start work in anticipation of the formal acceptance of the contract and (iii) for running contract.

Work Order: Work order is used for petty works; work orders may sometimes also mention the time limit within which the work is to be completed. No formal agreement is drawn up with

the contractor as in the case of piece-work when the work is awarded by a work order.

Types of Contracts

Contracts are of the following types.

1. Item rate Contracts.
2. Percentage Rate Contracts.
3. Lump sum contracts.

Tender: A Tender is the contractor's bid in writing offering to execute the specified work of construction, supply of materials etc., at the rates and amounts indicated, within the time limit and under conditions specified and agreed to.

Necessity of Tenders: Works, which are to be awarded to contractors, are publicised to enable a sufficient number of interested parties to bid. The lowest bid is generally accepted, unless there are good reasons for not doing so. The process of inviting bids and accepting them is known as tendering. The bid is usually made on the tender forms specified by the owner. The following tender documents are made available along with the tender forms to enable contractors to bid for the job.

1. Layout plan.
2. Set of drawings, including working drawings.
3. Detailed specifications or reference to standard specifications for each item of work
4. Schedule of stores to be issued by the owner indicating the rates and their place and issue.
5. Schedule of tools and plant and other facilities to be made available by the owner, indicating the conditions, hire charges and the place of delivery.
6. General conditions of the contract including time limits.
7. Special conditions of the contract that may have to be highlighted.
8. Amount of Security deposits to be paid /deducted.

Tender Notice: Whenever works are to be let out on contract, tenders are to be invited from the registered contractors or both registered and unregistered contractors depending on the magnitude and nature of the work by issuing notice in newspapers. The notice that includes various particulars of work is named as Tender Notice.

Contract Agreement

Contract agreements are fall into the following categories:

1. Contracts
2. Piece work agreements

Contracts are classified as:

1. Percentage Rate contracts.
2. Item Rate contracts.
3. Lump sum contracts.

Piece-work agreements are of following types

1. Piece work
2. Work order

Conditions of Contract

The Conditions of contracts includes the following

1. Time of completion of work.
2. Volume of work.
3. Specifications of work.
4. Rates of payment.
5. Penalties for default on the part of the contractor etc.

Payment to Labour- N.M.R. Format

Except for the regular and work charged establishments, all persons engaged departmentally for the execution of works are considered as casual labour. Their wages are drawn on "Muster rolls". Muster rolls are prepared in the prescribed form. The Nominal Muster Roll (N.M.R) form consists of two parts.

Part I of N.M.R. form consists of necessary columns for entering the names of labour, designation, father's name, their attendance particulars, rates of wages and the total amount payable for each labour. N.M.R form has the provision for entering the total amount of the muster, signature or left hand thumb impression of the labour as a receipt. At the bottom of this form, the person preparing such N.M.R form should sign before submitting to A.E / D.E.E who in turn verifies the details entered and makes the payment.

Part II of the muster roll is used for recording the name of work, amount of work done in cases in which the work is susceptible to measurements. Other details like the number of measurement book, pages in which the measurements are recorded will also be entered in this part. If the work is not susceptible to measurement, a remark to that effect is recorded.

Some important instructions regarding the preparation of Muster rolls are:

1. Duplicate copies of muster rolls should not be prepared
2. Separate muster rolls are prepared for each period of payment. Labour may be paid more than once a month depending upon local conditions and practices.
3. The daily record of attendance and times should be recorded in such a way as to leave no possibility of tampering or making unauthorized entries.
4. After the muster roll has been passed, payment should be made as early as possible.
5. A record of wages that remains unpaid must be kept in a register of unpaid wages.
6. Subsequent payment of unpaid wages is recorded in the hand receipt. A note of the same is recorded in the register of unpaid wages as well as in the muster roll.
7. Wages that remain unpaid for three months must be reported to the divisional office.
8. Progress of work done by the labour is recorded and is to be compared with departmental rates.
9. Muster rolls are checked with reference to entries in the measurement book to the extent of 50% in the sub-divisional and 50% in the division office, when the divisional engineer makes payments.

Measurement Books (M-BOOKS)

The measurement book, (common Form No. 298) is a most important record since it is the basis of all accounts and quantities whether the work is done by daily labour, piece work, Schedule contract, lump-sum contract or of materials received.

It is the original record of actual measurements or accounts and forms a reliable record as it may have to be produced as evidence in court of law.

All the books belonging to a division should be numbered serially and the pages of each book should be machine numbered.

A register of M-Books should be maintained in Form PWD VI-20, in the divisional office showing

- (a) The serial number of each book,
- (b) The names of sub-divisions to which issued,
- (c) The date of issue and the date of its return, so that its eventual return to the divisional office may be watched.

A similar register should be maintained in the sub divisional office showing the names of the sub-divisional officer and section officers to whom measurement books are issued.

Books no longer in use would be withdrawn promptly even though not completely written up.

All completed measurement books containing measurements of the works executed by contractors, having running accounts should be sent to the Divisional Office for final record after final bills have been paid to the contractors.

The following instructions should be observed carefully while recording detailed measurements in the M. Book.

1. Topmost lines under columns 1 to 4 on each page of a measurement book should invariably filled in the field.
2. Any lines not required should be carefully scored out in order to prevent additional entries being made later on
3. Only Executive, Deputy Executive or Asst. Executive Engineers should record detailed measurements.

UNIT 5

Types of labour

Construction labour can broadly be divided into two types

1. Casual labour 2. Regular establishment

Casual labour: Casual labour is employed as and when required for the execution of work, payment is made on the basis of the number of days the labour works. There is no provision of leave, except the weekly holidays. This is also known as daily labour.

Regular Establishment: Regular establishment generally includes supervisory personnel that are required for more or less continuous period during construction. They are paid monthly wages and entitled to leave and other benefits. The employees may be temporary or permanent. Permanent employees have great security of service and may be entitled to more service benefits than the temporary employees.

Labour welfare-Human relation

Construction is the largest industry in India and most of the employees who are working in construction industry are labours and skilled workers. As the nature of construction work is temporary the workers are recruited as and when required for the execution of work and are retrenched when no longer needed.

Construction labour is migratory in nature, moving from one site to another site, and the labour attached to big contractors tends to migrate to new work sites taken up by them.

Construction labour has not been able to organize itself to the extent that labour in factories and other organized sectors of trade has. This is mainly because the construction labours do not have a permanent place of work. Consequently construction labour has extremely poor bargaining power and this situation is fully exploited by employers. The construction labour beside low wages, they live in crowded unsanitary temporary huts built at the construction sites in unhygienic surroundings without basic amenities of life.

For the welfare of the labour, the Governments have, from time to time, brought out labour laws.

Labour laws are classified into the following types

- Laws concerning the working conditions of labour.
- Laws concerning wages and other payments to labour.
- Laws concerning the social security of labour.

These laws are proved very much helpful to the labour for improving their living conditions.

Labour Insurance

Insurance laws are applicable only to regular employees.

In construction industry most of the labour is of casual nature and insurance laws are not applicable to them. For the welfare of casual labour, different Acts such as Minimum wages Act, Compensation Act etc. are passed by the Government.

Payment of Wages

The remuneration given to workers for work performed by them is known as wages. Wages are of two types.

1. **Nominal wage:** This is the remuneration paid to the worker in the form of money, but it does not include the value of any other benefit that may be provided.
2. **Real Wage:** Labour is often entitled to different benefits, such as leave, medical care, house rent allowance, bonus etc. If the value of such benefits is added to the nominal wage, it is known as real wage.

Wages are paid to the labour based on two methods:

1. Depending upon time devoted to the work. This method is known as time rate system.
2. Depending upon the quantity of work performed.

This method is known as piece rate system.

Time Rate system

In Time rate system of payment of wages, a suitable rate of payment is fixed per unit of time devoted to work by the labour. The unit of time can be hours, days, weeks or months.

The rate of payment for casual labour is fixed per day and that of regular employees per month in the construction industry.

The advantages of this system are:

1. It is simple and easily understood by labour.
2. The quality of work will be good.
3. The workers do not get overstrained.

There are, however, the following disadvantages in the system

1. Constant supervision is required.
2. Effective cost control cannot be ensured.

Piece Rate System

In this system payment is made on the basis of the output of the workers. The work done by each labour is measured and payment is made at the agreed rate. Thus a worker can make more money by increasing his output. The rate of each item of work is fixed on the basis of the past record of output.

Minimum Wages Act, 1948

The Minimum wages Act of 1948 was passed for the welfare of labour and provided for fixing the minimum rate of wages of labour. The Act aims at making provisions for the statutory fixation for the minimum rate of wages in number of industries where there are extensive chances for the exploitation of labour.

The main provisions of Minimum wages Act are:

1. The setting of advisory committees to collect information on which the minimum wages are based.
2. The wages of a worker in any scheduled employment shall be paid on a working day by:
 - (i) The 7th day after the last day of the wage period if the establishment has less than 1,000 employees.
 - (ii) The 10th day after the last day of the wage period if establishment has more than 1,000 employees.
3. The wages of an employee should be paid without any deductions except those items given below.
 - (i) Fines in respect of acts of omission.
 - (ii) Absence from duty.
 - (iii) Loss of goods directly attributed to the neglect of the employee.
 - (iv) House accommodation provided by the employer.
 - (v) Amenities and services provided by the employer.
 - (vi) Income tax
 - (vii) Subscription to the provident fund.
 - (viii) Recovery of advances.
 - (ix) Deductions ordered by the court.
 - (x) Payments to co-operative societies / Life Insurance Corporation.

Workmen Compensation Act, 1923

The Workmen Compensation Act passed to protect the victims of accidents and their families from hardships out of and in the course of employment. The Act covers workers employed in hazardous occupations as specified in the schedule but excludes those employed in clerical or administrative work. The Act provides for payment of compensation in case of accidents on work sites. The compensation, however, is not payable for injuries due to

- (i) Disobedience or negligence,
- (ii) Non observance of safety measures
- (iii) Consumption of liquor
- (iv) Diseases which are not contracted as a result of the occupation. In the case of the death of a worker, compensation is paid under all circumstances.

ACCIDENTS

Accidents are due to

- (i) Human causes such as poor eye sight, negligence, effect of intoxicants, (ii) Mechanical causes such as inadequate safety devices, live electrical equipment, unreliable scaffolding etc. and
- (iii) Environmental causes. Such as poor lighting, heat, noise etc.

The result of an accident may be:

1. Temporary disablement, which may be total or partial.
2. Permanent total disablement.
3. Permanent partial disablement.
4. Death.

Contract labour act, 1970

The contract labour Act, 1970 was passed to regulate the employment of contract labour in certain establishments. It also provides for improving the service conditions of contract labour.

The Act is of importance to the construction industry where works are executed through contractors or by contract labour.

The Act applies to every establishment and contractor employing twenty or more workmen.

The Act does not apply to

establishments in which only work of an intermittent or casual nature is performed.

The Act provides for the constitution of a Central Advisory Contract Labour Board under the Central Government and of state Advisory contract labour Board under each State Government

to advise the Central and State Governments on matters arising out of the administration of the Act and to carry out the functions assigned to it under the Act.

CLASSIFICATION OF LABOUR LAWS

In India Labour Laws may be classified under the following heads:

I. Laws related to Industrial Relations such as:

1. Trade Unions Act, 1926
2. Industrial Employment Standing Order Act, 1946.
3. Industrial Disputes Act, 1947.

II. Laws related to Wages such as:

4. Payment of Wages Act, 1936
5. Minimum Wages Act, 1948
6. Payment of Bonus Act, 1965.
7. Working Journalists (Fixation of Rates of Wages Act, 1958)

III. Laws related to Working Hours, Conditions of Service and Employment such as:

8. Factories Act, 1948.
9. Plantation Labour Act, 1951.
10. Mines Act, 1952.
11. Working Journalists and other Newspaper Employees' (Conditions of Service and Misc. Provisions) Act, 1955.
12. Merchant Shipping Act, 1958.
13. Motor Transport Workers Act, 1961. 28
14. Beedi & Cigar Workers
15. Contract Labour (Regulation & Abolition) Act, 1970.
16. Sales Promotion Employees Act, 1976.
17. Inter-State Migrant Workmen (Regulation of Employment and Conditions of Service) Act, 1979.
18. Dock Workers (Safety, Health & Welfare) Act, 1986.
19. Building & Other Construction Workers (Regulation of Employment & Conditions of Service) Act, 1996.
20. Building and Other Construction Workers Welfare Cess Act, 1996

21. Cine-Workers and Cinema Theatre Workers (Regulation of Employment) Act, 1981
22. Dangerous Machines (Regulation) Act, 1983
23. Dock Workers (Regulation of Employment) Act, 1948
24. Dock Workers (Regulation of Employment) (Inapplicability to Major Ports) Act, 1997
25. Employment of Manual Scavengers and Construction of Dry Latrines (Prohibition) Act, 1993
26. Industrial Employment (Standing Orders) Act, 1946
27. Mines and Mineral (Development and Regulation Act, 1957
28. Plantation Labour Act, 1951
29. Private Security Agencies (Regulation) Act, 2005

IV. Laws related to Equality and Empowerment of Women such as:

30. Maternity Benefit Act, 1961
31. Equal Remuneration Act, 1976.

V. Laws related to Deprived and Disadvantaged Sections of the Society such as:

32. Bonded Labour System (Abolition) Act, 1976
33. Child Labour (Prohibition & Regulation) Act, 1986
34. Children (Pledging of Labour) Act, 1933

VI. Laws related to Social Security such as:

35. Workmen's Compensation Act, 1923.
36. Employees' State Insurance Act, 1948.
37. Employees' Provident Fund & Miscellaneous Provisions Act, 1952.
38. Payment of Gratuity Act, 1972.
39. Employers' Liability Act, 1938
40. Beedi Workers Welfare Cess Act, 1976
41. Beedi Workers Welfare Fund Act, 1976
42. Cine workers Welfare Cess Act, 1981
43. Cine Workers Welfare Fund Act, 1981
44. Fatal Accidents Act, 1855
45. Iron Ore Mines, Manganese Ore Mines and Chrome Ore Mines Labour Welfare Cess Act, 1976
46. Iron Ore Mines, Manganese Ore Mines and Chrome Ore Mines Labour Welfare Fund Act, 1976

47. Limestone and Dolomite Mines Labour Welfare Fund Act, 1972
48. Mica Mines Labour Welfare Fund Act, 1946
49. Personal Injuries (Compensation Insurance) Act, 1963
50. Personal Injuries (Emergency Provisions) Act, 1962
51. Unorganised Workers' Social Security Act, 2008

CONSTRUCTION INDUSTRY AND SAFETY

Construction is a high hazard industry that comprises a wide range of activities involving construction, alteration, and/or repair. Examples include residential construction, bridge erection, roadway paving, excavations, demolitions, and large scale painting jobs. Construction workers engage in many activities that may expose them to serious hazards, such as falling from rooftops, unguarded machinery, being struck by heavy construction equipment, electrocutions, silica dust, and asbestos.

The information, tools, and resources provided in these Construction Industry web pages are designed to assist those in the industry - whether worker or employer - to identify, reduce, and eliminate construction-related hazards.

Types of hazards on construction sites

- Chemical • Physical • Biological • Ergonomic

Chemicals can exist in the form of

- dusts, fumes, fibers (solids)
- liquids, mists
- gases, vapors

Chemical Hazards

A health hazard can affect the entire body or many organs, or affect only specific tissues, organs, or parts of the body.

Physical Hazards

Physical hazards are different types of energy which may be hazardous to workers.

- Noise
- Vibration
- Temperature extremes
- Radiation

Biological Hazards

Exposure may occur during demolition, renovation, sewer work, work on air handling systems, or other construction work from contact with contaminated or disease-carrying

- soil
- water
- insects (mosquitoes, ticks)
- bird, bat droppings
- animals
- structures

Ergonomic Hazards

Ergonomic hazards can cause painful and disabling injuries till example Musculoskeletal Disorders (MSDs) .

This following situation may causes these injuries:

- heavy, frequent, or awkward lifting
- repetitive tasks
- awkward grips, postures
- using excessive force, overexertion
- using wrong tools for the job or using tools improperly
- using improperly maintained tools
- hand-intensive work

Causes of accidents (HSE, 2003)

• Workers and work-team

– Actions/behavior – Capabilities including knowledge and skills – Communication – Immediate supervision – Workers' health/fatigue

• Workplace – Site conditions (excluding equipment, material & weather) –

Site layout/space – Working environment (light/noise/hot/cold) – Working schedule – Housekeeping

Costs of accidents

- direct costs and
- indirect costs

Direct costs The direct costs are insurance. These include medical costs and others workers' compensation insurance benefits as well as liability and property-damage insurance.

Indirect costs

Below are the lists of indirect costs:

Transportation costs – include the cost of emergency transportation, together with the cost of other personnel that were necessary to get to the injured worker to proper medical facilities

Wages paid to injured worker for time not worked – include all the time in which the worker was not actually doing his or her job and for the wages paid.

Cost incurred because of delays which resulted from accident – other crews affected or delayed; equipment idled; duration of project lengthened; plus all wages, rental fees and indirect supervision costs that occurred as a result of the accident.

Costs of overtime necessitated by accidents – overtime occurred because of the accidents

Loss of efficiency of crew – decrease of crew efficiency due to low morale or reshuffling that might occur to replace an injured worker.

Cost to break in and/or teach replacement worker – hiring new worker would include training and orientation Costs for clean-up, repair or replacement and stand-by costs – normally accidents involves spillage, cave-ins vehicle damage, material wastage or site clean-up.

Extra wage costs, slower returned worker – normally when a worker return to the job site and is partially and/or temporarily disabled, the worker is probably working at a different, less demanding job or less efficient at the former job.

Costs to reschedule work – include time spent to review and reschedule the project due to investigations or project being temporarily suspended by the authorities. Costs of wages for supervision as a result of the accidents – include all time spent on the accident and its results: caring for the worker's medical treatment, investigation, completing forms, disseminating information, visiting the worker, planning to prevent recurrence, appearance in court.

Hazard identification

- Systematic recognition of any aspects of a project which have a potential to be a danger to these persons working on worksite or being around the project.
- Example of hazards present in : working at heights, use of ladders and scaffolds, collapse of temporary structures, use of vehicles, mechanical plant & equipment, etc.

Reasons and benefits to improve health and safety in construction

- Responsibility;
- Economic reasons;
- Impact of safety on overall performance;
- Contractor's performance;
- Control of accident causes Responsibility
- Safety is everyone's responsibility.
- It is a moral and legal obligation of employers to provide a safe working place and of employees to work safely.
- **Employer's duty of care to employees as covering the following areas:**
 - safe system of work; – a safe place of work; – plant and machinery that is safe to use; – competent supervision and/or suitable training; and – care in the selection of fellow employees.