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- estimating the cost of materials to complete the work
- estimating the labour hours to complete the work
- adjusting estimated labour hours for productivity factors
- calculation of labour costs, including 'on costs'
- calculation of business overhead burdens
- calculation of minimum gross profit margins
- calculation and forecasting of nett profit margins
- the effect of labour/material ratios on quotations for specific projects
- consideration of market forces
- contract law
- standard conditions of tender
- preparation of a written quotation

Part 2 of the book addresses operating the business, covering areas such as managing each job as an individual project, involving

- organising and planning labour
- purchasing and supply of materials
- costing of labour and materials
- management of contracts
- variations and associated claims
- progress and final claims
- management of sub contractors
- management of penalty areas such as liquidated damages
- retention and other deductions
- reconciliation of actual costs to estimated costs
- assessment of estimating accuracy and job productivity
- compliance with sales targets

Other areas covered in this part include developing sales budgets, taxation requirements, business structures, management of overheads, etc.

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Time is the most important of all resources for a contractor. The most difficult of all resources for contracting is time because it is a fixed value that cannot be expanded. Time wasted on duplicating effort or rectifying mistakes is lost forever.

For a contractor, time and money are interconnected.

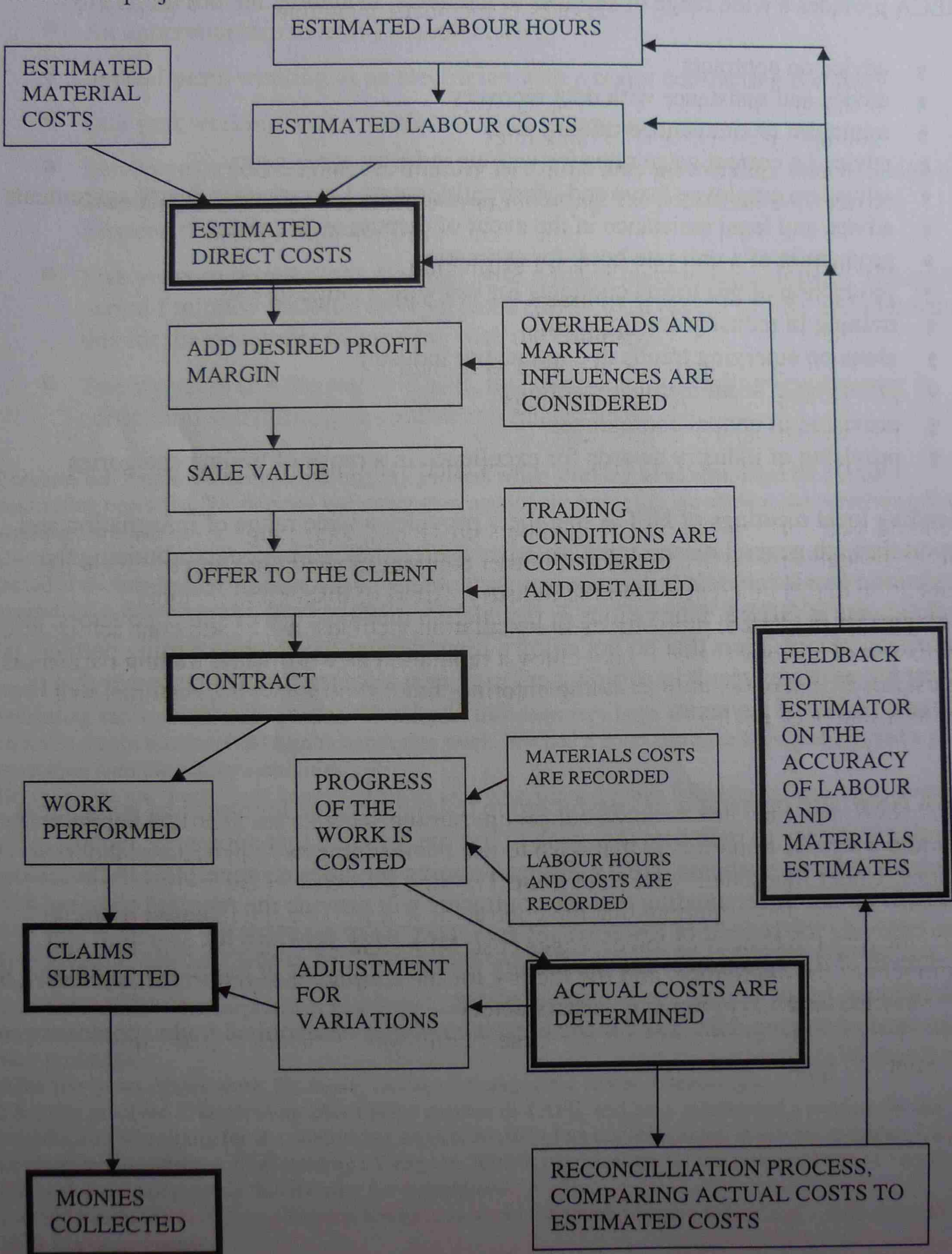
The labour resource of a contracting operation is difficult to expand or shrink without problems. Labour time expended on low profit work is time that could be used on other work where acceptable profit margins are available.

Operating a successful contracting business means using the time resource wisely. This means that you should –

- **avoid low profit work** by operating at rates that are viable. If a sector of the industry will not permit acceptable levels of profit, avoid operating in that sector.
- **know what profit margins are required to allow successful trading.** Profit margins need to cover all costs, including overheads, and return a profit.
- **use the sale of materials** to provide profit. Work involving the sale of materials can be rewarding at lower profit margins than those required for labour intensive work.
- **avoid labour intensive work** as this limits the amount of sales/profit that can be achieved in a given time frame. Alternatively, use a charge rate that compensates for the loss of profit from material sales.
- **use the take off sheet as a tool for planning labour.** When estimating, the time required to perform the various stages of a project has been estimated through careful study of plans etc.. Avoid replanning the labour requirements by studying the job plans - use the estimated values.
- **use the take off sheet as a tool for purchasing materials.** When estimating, the materials required to perform the various stages of a project has been estimated. Avoid replanning the materials requirements by studying the job plans - use the estimated values.
- **use a purpose designed computer program** to operate the contracting business. These programs will automatically keep track of costs, sales and profit margins, plus provide a reconciliation between estimated and actual costs to report on the accuracy of estimates. The use of purpose designed computer programs will ensure correct processes within the contracting business, optimising profit while reducing time used on administrative functions.
- **ensure that a fair contract is used** so that the customer is not placed in a position that can disadvantage the contractor
- **avoid disputes with clients** by following all required contract procedures, and keeping the client informed on all aspects of the contracted works. Disputes consume large amounts of time, robbing time from profitable applications.
- **maintain customer satisfaction**, using this as the primary source of work
- **operate to a planned trading structure**, including the use of a sales budget, planned profit targets, management of overheads, etc.

MANAGING AN INSTALLATION PROJECT

The following flowchart shows the procedure for correct financial management of an individual project.



The primary professional association for persons involved in the electrical contracting industry in New South Wales is NECA (National Electrical Communications Association) which has affiliated organisations throughout Australia and New Zealand.

NECA provides a wide range of services to members, including, but not limited to –

- advice on contracts
- advice and assistance with debt recovery
- minimum recommended trading rates
- advice on correct wage rates for various industry agreements
- advice on employee leave and other entitlements for various industry agreements
- advice and legal assistance in the event of dispute with a client
- production of a unit rate book for estimating
- production of pro forma contracts for use with a range of jobs
- training in industry developments
- alerts on emerging trends in contracts or industry
- provision of local member meetings
- provision of annual conferences
- provision of industry awards for excellence in a range of trading categories

Attending local meetings of NECA members provides a wide range of information and support through general discussion with other contractors, without compromising the competition that is inherent within the industry. Areas of discussion include developments in OH&S, innovations in installation methods, use of sub contractors, etc.

Discussion of customers that do not enjoy a reputation as worthwhile trading partners is also useful, as it may result in avoiding entering into a contract with a customer that is risky as a source of payment.

NECA NSW also operates a successful group training scheme for electrical apprentices, providing a service to members that wish to use the resource that apprentice labour provides. Under this scheme, NECA Group Training provides an apprentice to the contractor on the understanding that the contractor will provide the required training, while enjoying the benefit of lower wages cost. NECAGT provides the selection and recruitment of the apprentice, and the facility for the contractor to return the apprentice if work reduces, or the apprentice is unsatisfactory.

At the time of writing, NECAGT is the largest employer of electrical trade apprentices in New South Wales.

PART 1

ESTIMATING AND QUOTATIONS FOR ELECTRICAL WORK

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PURPOSE

The purpose of this part of the book is to provide information and mechanisms for the preparation of quotations for electrical installation or service work.

An underpinning philosophy of successful contracting is that correctly prepared quotations are the foundation of success.

This part of the book covers preparation of quotations, which involves the following considerations –

- estimating the cost of materials to complete the work
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- consideration of market forces
- contract law
- standard conditions of tender
- preparation of a written quotation

The information is provided to allow development of the skills and knowledge required to achieve competency in the Competency Standard Unit

UEENEEC003 'Prepare quotations for service or installation work'

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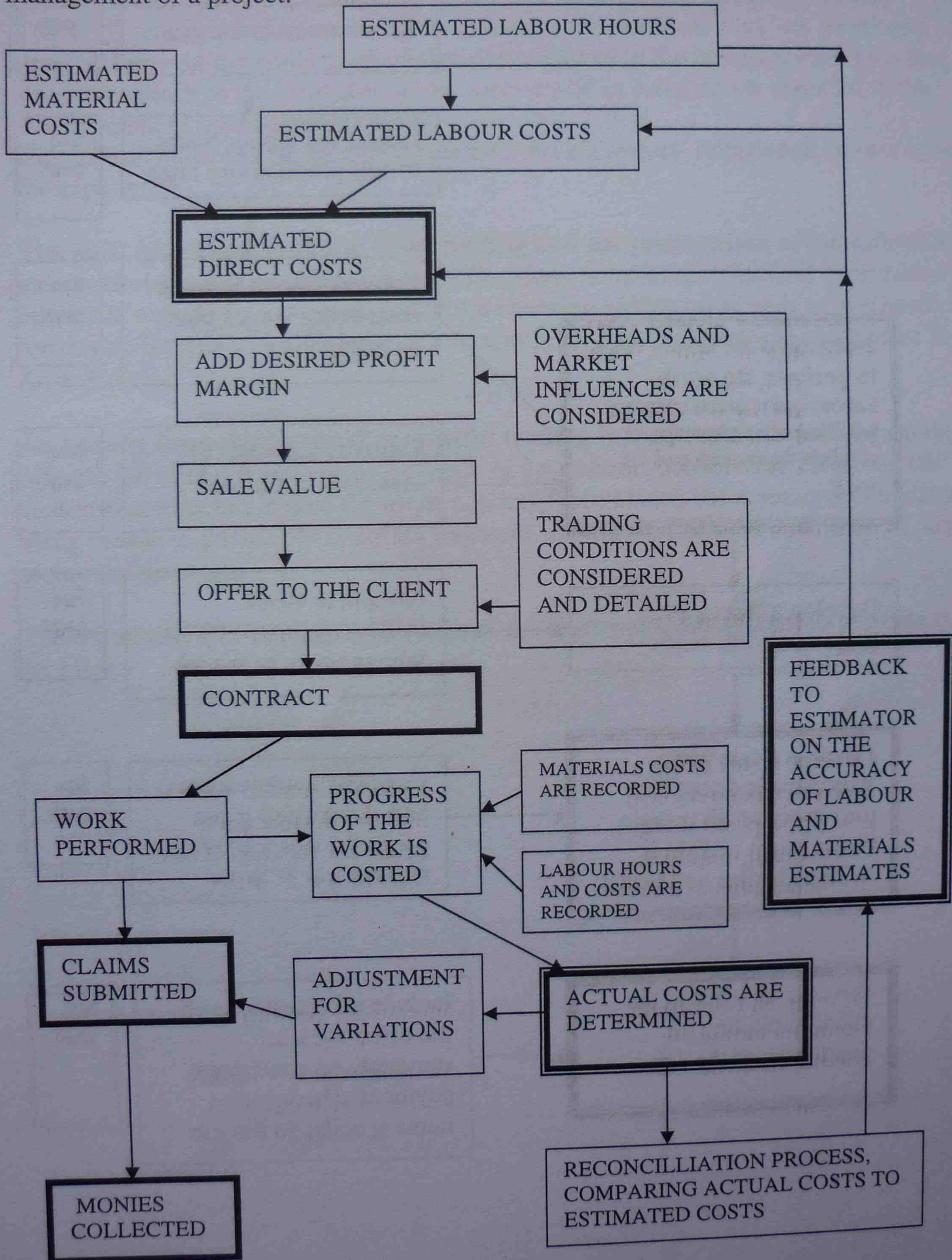
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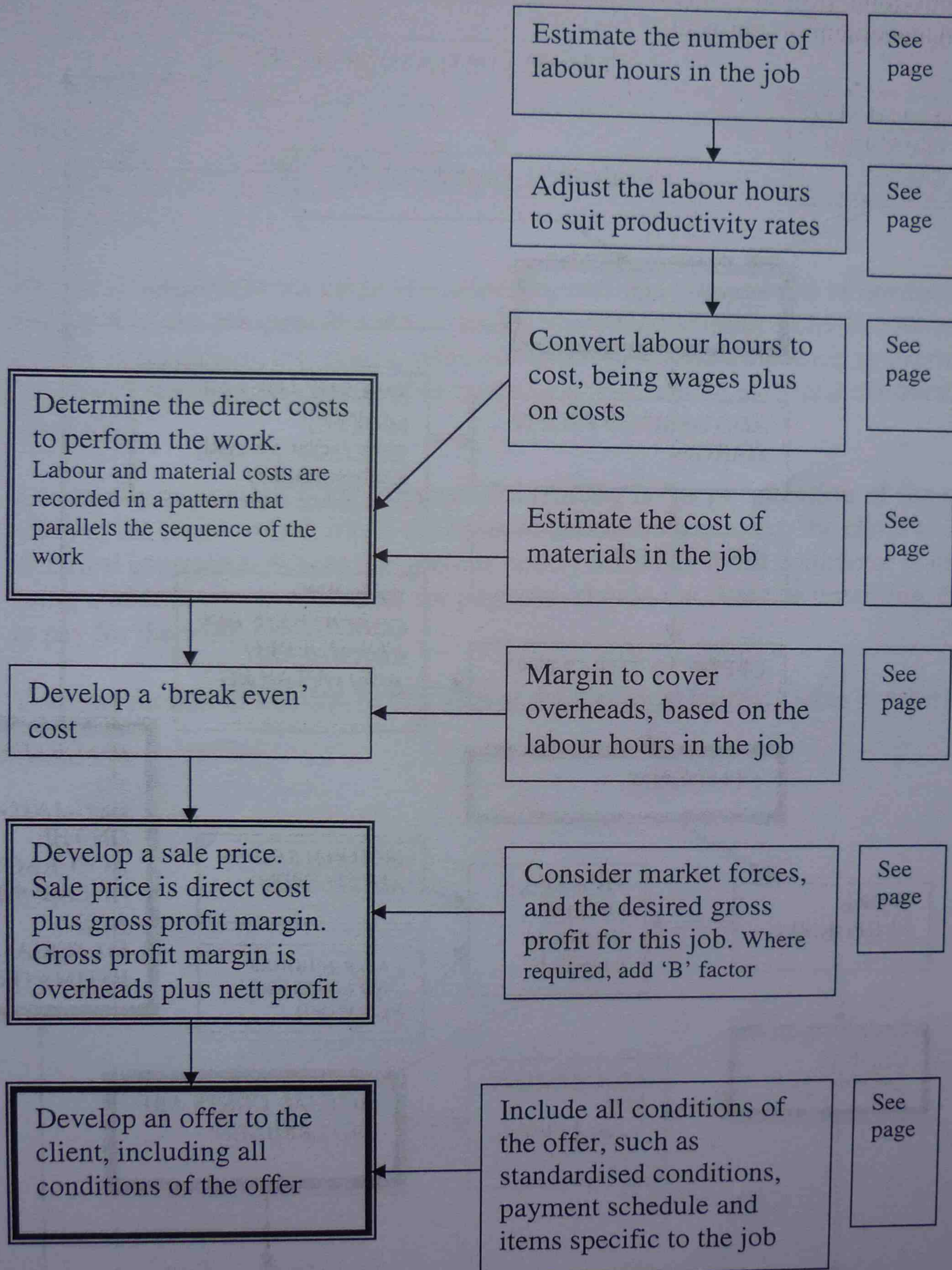
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MANAGING AN INSTALLATION PROJECT

The following flowchart shows the procedure for correct financial management of an individual project. Correct estimating methods are an essential component in the ongoing management of a project.



PROCESS FOR DEVELOPING A QUOTATION FOR INSTALLATION WORK



An estimate is an educated guess of the time and materials required to achieve a desired outcome. Estimating is a part of everyday life, where individuals estimate the time required to perform tasks such as traveling to a destination, doing housework, cooking a meal, performing any of a wide range of work related tasks, etc. etc.

The skills required to perform accurate estimates for electrical work are developed over time, and rely on the application of experience gained in the industry. Processes that supply feedback to the estimator on the accuracy of an estimate are essential in the development of the estimator's skills.

Unit rate manuals can be used to supplement the estimators' experience, or as a substitute for experience

The most important function of estimating and the preparation of quotations is to ensure that the job provides for a profit. Many uninformed electrical contractors operate at unrealistic low prices, often not covering hidden costs such as overheads and 'on costs', leading to a high level of business failure among electrical contractors in Australia.

An equally important area of successful trading is the preparation of the quote, or offer, to the client, which forms the basis of the contract between the client and the electrical contractor. Where the quote is poorly formulated, the contractor is in danger of being unable to pursue the client for payment, should the client be unwilling, or unable, to pay for the work.

The introduction of training in this area of the electrical industry aims to alleviate this problem.

SECTION 1

PROCESSES FOR DEVELOPING A QUOTATION FOR INSTALLATION OR SERVICE WORK

The following pages show the processes involved in the development of a quotation for either installation work or service work.

The process for the development of a quotation for installation work includes the production of an estimate of direct costs, and the ensuing process of developing the estimate into the quote to be offered to the client.

ESTIMATED COST + PROFIT MARGIN = PRICE OFFERED TO THE CLIENT

Some terms to understand are

* **Estimate** – a forecast of the expected labour and material components and the associated costs to the contractor to perform a specific project.

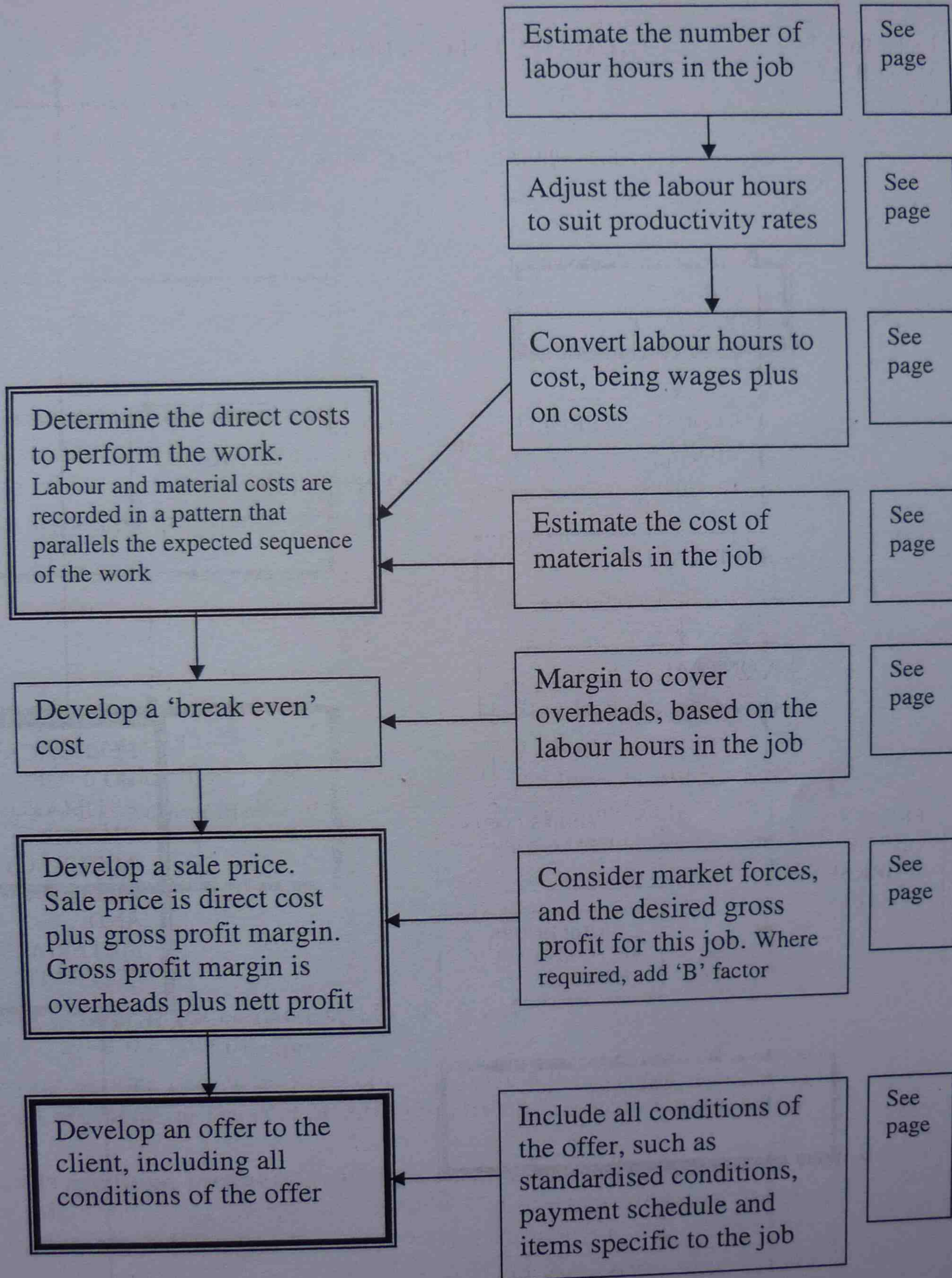
Quote – the price offered to the client, for which the contractor is willing to carry out the works. This must include all appropriate conditions of trading, as it forms the basis of the contract upon which payment will depend.

* 'Estimating' is the process of making a forecast, or educated 'guesstimate' of the amount of labour in a project and the cost of materials and labour, and is a part of the process required in developing a price to be offered to the client.

A quotation for service work, or 'do and charge' work must include provision for all trading costs, such as overheads and nett profit, within the hourly charge out rate. It must also include trading terms.

An important function in all successful contracting operations is to perform a reconciliation of the estimated values of labour and material against the actual values, determined at the conclusion of the work. This process provides essential feedback to the estimator/manager on the accuracy of the estimate, and the productivity of various individuals within the labour force.

PROCESS FOR DEVELOPING A QUOTATION FOR INSTALLATION WORK



SECTION 2

PROCESSES FOR DEVELOPING AN ESTIMATE FOR INSTALLATION WORK

The purpose of an estimate is to determine, or forecast, the costs to the contractor to perform the work.

There are several methods used to estimate, but all should produce a forecast of the expected labour hours required to perform the work, plus the cost of labour and the cost of materials.

Having determined the estimated costs, a separate process is followed to develop a sale price to be offered to the client. This process involves adding a profit margin to the estimated direct costs. (See Section 4)

The following pages contain information on methods of estimating.

projects, but creates difficulties in the reconciliation of actual job costs to estimated costs.

This method relies on the estimate containing all the points in a project, allowing an "average" to occur across the project. Note that it is unsuitable for small projects and "one off" estimates.

- (d) **Historical estimates.** This method uses a broad based average of costs for specific types of work. While it is not commonly used among electrical contractors, it is widely used in the building industry to supply builders with an allowance for electrical work. The costs are based on the average electrical price for a specific type of work, such as new cottage construction, high rise commercial, etc. These costs are usually expressed as a number of dollars per square metre of floor space, or per cubic metre of building space.

Construction reports, such as Cordell's, supply these costs on a regularly updated basis, for the benefit of builders who are developing construction projects not yet tendered for.

While this system is not suitable for electrical contractors preparing competitive tenders, it is useful as a general guide as to the probable price range that may be expected for a specific type of project.

It should be noted that the pricing lists do not represent a method of "Pricing per point". Some contractors are willing to estimate jobs using an average price per point method. For example, a contractor may quote a price of \$70.00 a point for power points, irrespective of the job conditions. They use the philosophy that they will lose on some points, but win on others, and so attain an acceptable average.

In practice, however, when estimating jobs, the tendency will be to win all those jobs which have been quoted too low, and not win those that have been quoted too high. Consequently the operation will be trading at a loss on most of its quoted work.

Further, this practice effectively prevents the contractor from carrying out a thorough cost reconciliation, because it does not supply sufficient details of labour and material costs.

COMPONENTS OF A TAKE OFF SHEET

To suit the optimum use of the take off sheet in the operations activities, there are a minimum number of items of information that need to be included in the design of the take off sheet. Each of these items performs at least one (often more) important functions, and are as follows :

- (a) A title, such as 'TAKE OFF SHEET', OR "QUOTATION FORM" etc., to clearly identify the sheet and its function. This ensures that the sheet will not be confused with other forms, and is readily identifiable to all staff concerned in the operation.
- (b) A general job information section, which will include a number of information items that relate directly to the job. This information would include items such as :

- (1) **JOB NAME** – The job needs to be clearly identified in order to avoid confusing it with other jobs. This is especially so in the case where more than one job is carried out for the same client, often in the same premises.

Where the client has allocated a specific name to the job, the adoption of this job name by the contractor will reduce confusion during the production phase, and especially in the invoicing and payment phase.

- (2) **JOB DESCRIPTION** – Here the estimator notes a brief, but accurately detailed, description of the job to be estimated. This performs several functions, the most important being that it forces the estimator to form an accurate idea of the job, before the estimate is begun. Other functions are to (i) further identify the job, (ii) simplify the entry of the job, once won, into the job book, by supplying a ready made description, and (iii) use the estimator's job description sheet as a site staff instruction, so that the site staff have an understanding of the estimator's concept of the job.

- (3) **QUOTE OR JOB NUMBER** – This allows the contractor to keep a quote record by numbering the quotes in a sequence, not unlike a job book. This allows the client a reference number to identify the quote, and simplifies the method by which the quote is referred to, and included in, any contract documents associated with the job. Should the quote be successful, the job number can also be entered onto the sheet, thereby permanently linking the estimate to the job.

- (4) **DATE OF ESTIMATE** – It is a common occurrence for a client to postpone a job until a later date, and then telephone the contractor, asking for an on the spot adjustment to the price before issuing a work order. This means the contractor needs to be in a position to quickly adjust the overall price, depending on the percentage CPI changes that have occurred since the date of the estimate. The contractor can then offer the immediately revised price as a provisional price,

pending a full check of the estimate. This allows the negotiating process to begin, and often results in the winning of the job.

Another useful facet of dating the estimate is where previous estimates are used as a technical reference when designing another job prior to estimating it. The estimator/designer can gain an approximate idea of the costs, so that a decision on the best way of doing the job can be determined.

- (5) SHEET NUMBER – This is usually detailed as “sheet ... of ...”. As most estimates will involve the use of more than one sheet to detail the costs, it becomes important to number the sheets for totaling the costs of the individual sheets in a summary page.
- (6) THE ESTIMATORS NAME – Provision such as “Costed by ...” allows for the estimator's name or initials to be entered on the sheet. This serves two important functions.
 - (i) Having the estimator permanently identify himself with the product of his work tends to ensure a degree of care that may not always be present if the estimator remains unaccountable
 - (ii) Once a job is won, and production staff are issued with the job instructions, any matters that are unclear can be referred to the easily identified estimator.
- (7) NAMING OF THE PERSON THAT CHECKS THE ESTIMATE – This is usually provided for with an entry such as “checked by ...”. Since even the best estimator can overlook items, or misread specification clauses, it is an important practice in any contracting operation to have a second party check the estimator's work.

This second party should, where possible, be experienced in estimating or production techniques to ensure the best checking of the estimate. In a partnership based operation, all partners share a joint responsibility for any errors or miscalculations in the estimate, thus safeguarding any one partner against recriminations.

Where the operation is very small, and the contractor is also the estimator, and the production staff, then it is still a wise practice to have someone else, such as a wife or other involved person, check through the estimate. An unskilled person can often detect errors or ask questions that prompt the estimator to re-evaluate parts of the estimate.

- (8) COLUMNS FOR TAKING OFF THE JOB QUANTITIES – The take off sheet needs to be arranged in a series of columns in which the various items of the estimate are arranged. While there is perhaps no maximum number of columns,

there is a minimum number to allow the take off sheet to be developed to its full potential.

For the sake of the exercise, and in line with the philosophy of minimising the time used on paperwork, only a minimum number of columns will be developed in the information to follow.

- (a) A DETAILS column in which a brief description of the item of work and its associated materials is entered. Note that this description and materials details may be used for other purposes, such as ordering materials for the job or site instructions for production staff, and so should be detailed enough to provide clear information to people other than the estimator.
- (b) A QUANTITY column in which the quantity of materials measured from the job plans is entered. This column can be used later as a source of information for materials ordering and job instruction for site staff, as an adjunct to the details column. The site staff can be supplied with a photocopy of the take off sheet showing this and the details column, with all other columns (where costs appear) blanked out. This will inform the site staff of quantities and types of materials allowed for on individual parts of the job, without disclosing the materials costs or labour hours allowed.
- (c) UNITS columns – this will involve two columns :
 - (i) A column to detail the units in which the individual items are costed, eg. Cable per metre, switches per each, clips per 100, etc. This column is generally titled “PER” at the top of the column.
 - (ii) A second column to detail THE UNIT COST of the item of material. eg. \$1.80 per metre for cable, \$3.10 for a switch, \$5.60 per packet of 100 clips, etc. These column are used to establish the base price for the material item being costed.
- (d) COST EXTENSION column – in which the information developed in the three previous columns is extended to form a cost (in dollars) for the particular item of the estimate. This column is totalled to provide a final estimated cost for materials to be used in the job.
- (e) A LABOUR HOURS column – in this column the labour, estimated in hours, to carry out the item of work is entered. The labour is always estimated in hours, rather than dollars, for several reasons :
 - (i) The totalled labour hours can be used to carry out project viability considerations, with respect to both the sales budget and the capacity of the workforce to perform the work.

POOR PAPERWORK

= MORE MISTAKES
= NO PROFIT OR A LOSS !!!
= LOTS OF STRESS
= POOR BUSINESS
= EVEN LESS LEISURE TIME

ASK YOURSELF – “If I am not willing and committed to running my business correctly and as efficiently as possible, should I be in business at all?”

HOW EFFECTIVE IS YOUR ESTIMATING METHOD?

Can the take off sheet be used as :

1. An accurate estimate of the cost of all job materials, broken down into each stage of the job?
2. A total of the expected labour hours, broken down into each stage of the job?
3. A total of the cost of labour for the job?
4. A method of planning labour and materials requirements for the job, as each stage of the job approaches? Is the estimate arranged in a sequence that parallels the expected progress of the works? Will the take off sheet allow you the luxury of not needing to remember or re-engineer the job on a continuing basis?
5. A materials list, to facilitate the purchasing of items for the works, as they are required for each stage?
6. A job instruction sheet, for site personnel. (With materials details shown, but costs and labour hours/costs blanked out from the photocopy).
7. An easily compared reference to the job cost record, for the purposes of the job cost reconciliation?
8. A technical reference, for similar jobs priced at a later date?
9. A reference detailing the clients name for the job, and the client contact person (by name) and phone number, etc.?
10. A method to allow you to determine a minimum profit margin, based on the number of labour hours in the job?

In any contracting operation, time is the most valuable asset of the management and production processes.

If the labour capacity of the operation is not used at maximum efficiency, trading capacity is restricted, leading to loss of profit and potential business failure.

If the management processes are not streamlined to minimise the time, resources are not available to take on new business opportunities. Poor management of individual projects leads to confusion and mistakes during the production phase of individual projects.

Use a diary to maximise time management.

Do not rely on memory – write things down in a diary or project file

Use the estimating process as the foundation for efficient financial management of each project

Use a 'gang rate' to adjust labour hours where labour involves larger groups

Use an adjustment rate to adjust labour hours where abnormal installation conditions exist

Use a minimum hourly return rate to determine the minimum sale value for each project

Consider the material to labour ratio when assessing the profit margin for each project

Convert estimated costs to a sale value expressed as a margin (not mark up) to align with the reconciliation process

Obtain feedback on estimating and labour by reconciling final costs to estimated costs for each project

ADJUSTMENT OF ESTIMATED LABOUR HOURS FOR PRODUCTIVITY CONDITIONS

There is a wide range of influences on labour productivity, such as :

- Number of workers on site
- Multi storey work
- Heat and humidity
- General work ethic
- Very large site areas
- Wet weather
- Very low temperatures
- Difficult access

When estimating, an estimator determines labour hours at what is an 'average' or 'benchmark' level of productivity. Where productivity may be influenced by site conditions, the total of estimated labour hours must be adjusted to suit the expected outcome.

$$\text{Adjusted hours} = \frac{\text{estimated hours for standard productivity}}{\text{adjustment factor(s)}}$$

Example 1

Where site conditions will cause a reduction in productivity to 90% of normal, and the project has an estimated labour content of 500 hours, the total labour hours must be adjusted to reflect the expected actual outcome.

$$\text{Expected hours} = \frac{100}{90} \times 500 \text{ hours} = 556 \text{ hours}$$

$$\text{or} = \frac{500}{0.9} = 556 \text{ hours}$$

Example 2

Where more than one productivity influence is anticipated, such as work occurring with large crews on multi storey sites, in hot weather.

If the productivity value adjustments are :

- Crew size – 0.9
- Multi storey – 0.85
- High temperature – 0.8

The adjustment factor is $0.9 \times 0.85 \times 0.8 = 0.612$

Therefore, if the project had 2000 hours of estimated labour, the expected, or adjusted estimate, is :

$$\frac{2000 \text{ hours}}{\text{Adjustment of } 0.612} = 3268 \text{ hours}$$

The above adjustment factors are hypothetical, and should not be used in actual conditions.

To obtain correctly determined adjustment factors for most conditions, reference may be made to the NECA Labour Unit Manual.

'Gang Rate'

An alternative method for smaller contracting operations is to use a 'gang rate' adjustment factor. This involves determining an average productivity for the employees, based against a 'bench mark' employee.

Example – a contracting operation has a workforce of six employees, who are graded against the bench mark employee.

Employee	Description	Grading
Bob	Skilled tradesperson used as bench mark	100
John	First year apprentice 10 month experience	60
Bill	Fourth year apprentice	90
Jack	Leading hand highly motivated	120
Ken	Poor work ethic, tradesperson	60
Bruce	Trades assistant, good work ethic	<u>80</u>
		510

$$\text{Average} = \frac{510}{6} = 85$$

∴ the labour adjustment factor on 'gang rate' for this group of workers is 0.85.

Example – where the labour for a project is estimated at 1000 hours, and a contracting operation has a gang rate of 0.8, the expected hours to complete the project will be :

Labour hours
Adjustment

$$= \frac{1000}{0.8} = 1250 \text{ hours}$$

Always remember that the purpose of estimating is to forecast the cost of performing the work. This must be the cost to the existing structure of the contracting operation. Estimating at rates relevant to other operations leads to inaccuracy and incorrect pricing.

A large company does not have the same labour productivity as a small company, particularly where the owner/operators are not involved in the day to day installation work.

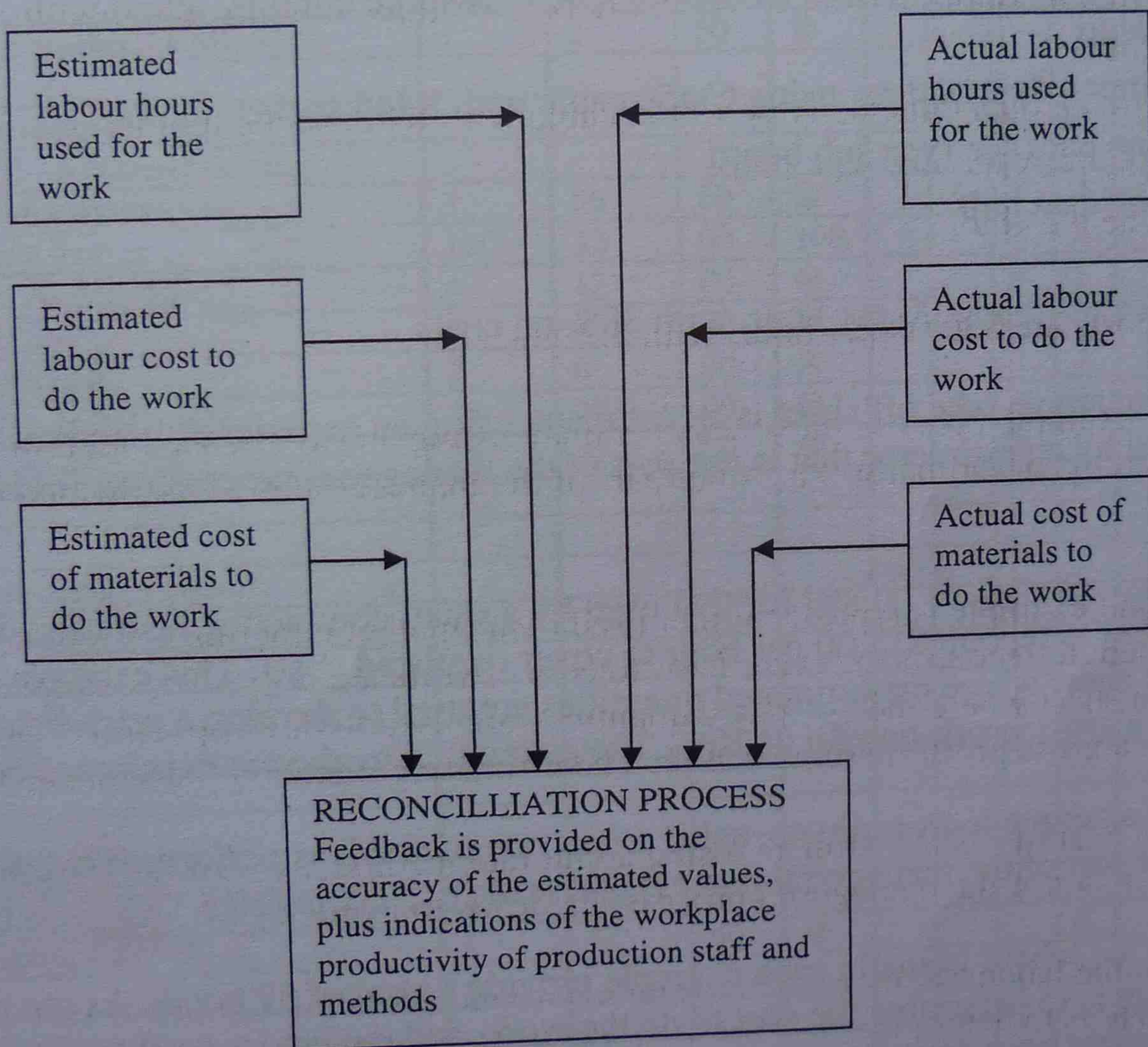
Therefore, if a large company was to attempt to estimate at the productivity rates of a smaller company, each estimate would result in under estimating the labour costs.

Larger companies remain competitive by operating with a relatively low hourly overhead burden, achieved by spreading the overheads across a much larger number of productive hours.

The estimate must provide for the process of comparing estimated to actual labour and material costs

The estimate must be detailed in the time sequence that the job is expected to follow, so that as labour and material costs are incurred during the works, they can be compared to the estimated labour and material costs as an ongoing reconciliation process.

This allows for monitoring the profitability of long term jobs, and provides essential feedback on the accuracy of the estimate.



EXAMPLE OF THE USE OF TAKE OFF SHEETS TO FORM AN ESTIMATE

The following pages contain examples of take off sheets used to complete an estimate for a small commercial fit out job with the following details.

The job involves a small office area that has the following electrical work

- twenty 2x36 watt recessed 'troffer' type fluorescent lights, wired with 1.5mm² TPS cable, controlled by a two gang switch
- one emergency pack, fitted to one of the troffers, for egress lighting
- 15 metres of three channel skirting trunking
- fifteen double 10 amp socket outlets, over three circuits, wired with 2.5mm² TPS cable
- fifteen data outlets, using Cat5e cable with RJ45 socket points
- one package type sub board
- one data hub

Labour costs are \$30.00 per hour, with 38% on costs

The first example take off sheet is an estimate, using an experience based method, as performed by an estimator that is not part of the managerial process that leads to a quote price.

The second example is typical for that used by a small contracting operation that has a requirement to recoup \$15.00 per hour to cover overhead costs. This example is a quotation sheet where the estimated quantities are used to develop a price for the project, based on a gross profit margin of 20%. The estimating method is experience based.

The third example is an estimate, using a unit rate method, as performed by an estimator that is not part of the managerial process that leads to a quote price.

Note that the labour hours in each example provide a total of 39 hours. As the purpose of an estimate is to determine the cost to do the work, and the labour used on the job is based on eight hour days, or two 4 hour half days, 39 hours is an impractical value to base costs upon. Therefore it is converted to 40 hours.

Note that the labour units used in the example of unit rate method are not to be used for actual estimating purposes. They are not a genuine reflection of values shown in unit rate manuals.

TAKE OFF SHEET

JOB NAME . . .Dodgipay Accontancy Services – Office fitout.....DATE ..20/2/2009.....

JOB DESCRIPTION....Wire in 20 2x36watt troffers on two switchgroups, 15 double socket outlets, 15 data points. Package type switchboard and data hub...All outlets on three channel skirting trunking

SHEET1... of2... COSTED BY ...I N Fallible..... CHECKED BY ...D Unno.....

DETAILS	Qty	Materials unit price		Per	Material extension			Labour in hours		
Rough in lights 2 switch groups 1 emerg.										
1.5mm ² twin & earth	130m	110	00	100	1	4	3	1	6	
3 pin sockets with base ACME 413	21	8	20	@	1	7	3			
Cable ties	200	7	00	100		1	4			
switch mounting bracket ACME S14	1	2	50	@			3			
Fit off skirting trunking										
ACME S 3x150 3 channel skirting										
15 metres in 2.4m lengths	7	56	00	@	3	9	2	1	2	
knock in masonry fixings	100	32	00	100		3	2			
internal corners ACME ENC	4	12	00	@		4	8			
joiners ACME ENJ	5	6	00	@		3	0			
end caps ACME ENC	2	6	00	@		1	2			
socket outlet kits ACME SO2	15	12	00	@	1	8	0			
data outlet kits ACME DA 1	15	12	00	@	1	8	0			
Rough in socket outlets 3 circuits									7	
2.5mm ² twin & earth	70m	180	00	100	1	2	6			
Rough in data outlets									6	
Cat 5e 4 pr cable	220m	60	00	100	1	3	2			
Fit off lights										
ACME 2x36 PRDTR	20	72	00	@	1	4	4	0	8	
ACME EMR emerg kit	1	140	50	@	1	4	1			
Plasto light switch LS2	1	7	60	@			8			
Fit off socket outlets										
Plasto 210 outlets	15	12	30	@	1	8	5		3	
Fit off data outlets										
Plasto DRJ45 8	15	11	40	@	1	7	1		4	
TOTALS Front sheet					3	4	1	0	5	6

Total labour hours = ..63.. Total material costs = .\$ 3855.....

Total labour costs =63.....hours @ \$30.00 + 38%.. =\$2608.....

Add 'B ' factor (if required) Total costs = ..\$6463.....

DETAILS	Qty	Materials unit price		Per	Material extension			Labour in hours	
Fit off switch board									
Plasto PAK 15P	1	42	80	@		4	3		3
Plasto Comb RCDCB 20	3	38	60	@	1	1	6		
Plasto Comb RCDCB 15	1	38	60	@		3	9		
Fit off data hub									
Plasto D25 LP	1	246	80	@	2	4	7		4
TOTALS rear sheet					4	4	5		7

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TAKE OFF SHEET

JOB NAME Dodgipay Accountancy Services – Office fitout.....

JOB DESCRIPTION.... Wire in 20 2x36watt troffers on two switchgroups, 15 double socket outlets, 15 data points. Package type switchboard and data hub...All outlets on three channel skirting trunking.....

SHEET ...1... of ...2.... COSTED BY I N Fallible..... CHECKED BY D Unno..... DATE 20/2/2009.....

DETAILS		Qty	Material unit price	Per	Material extension	Labour unit	Qty	Labour extension
Rough in lights 2 switch groups 1 emerg.		130m	1 10 00	100	1 4 3	8 .7	1.3	1 1 .3
1.5mm ² twin & earth		21	8 20	@	1 7 3	.1	21	2 .1
3 pin sockets with base ACME 413		200	7 00	100	1 4 4	1	200	2
Cable ties		1	2 50	@	3	.2	3	.6
switch mounting bracket ACME S14								
Fit off skirting trunking								
ACME S 3x150 3 channel skirting		7	56 00	@	3 9 2	.3	15	4 .5
15 metres in 2.4m lengths		100	32 00	100	3 2 2	.02	100	2
knock in masonry fixings		4	12 00	@	4 8 8	.2	4	.8
internal corners ACME ENC		5	6 00	@	3 0 0	.2	4	.8
joiners ACME ENJ		2	6 00	@	1 2 2	.2	2	.4
end caps ACME ENC		15	12 00	@	1 8 0	.2	15	3
socket outlet kits ACME SO2		15	12 00	@	1 8 0	.2	15	3
data outlet kits ACME DA 1								
TOTALS front sheet					1 2 0 7			3 0 .5

Labour hours = .63..... @ \$.41.4.. Labour cost = \$.2608..... Materials cost = \$.3855..... Total direct costs = \$6463.....
 Add 'B' Factor (if required)

DETAILS	Qty	Material unit price			Per	Material extension				Labour unit		Qty	Labour extension			
Rough in socket outlets 3 circuits 2.5mm ² twin & earth	70m	1	80	00	100		1	2	6		8	.6	70		6	
Rough in data outlets Cat 5e 4 pr cable	220m		60	00	100		1	3	2		2	.7	220		6	
Fit off lights ACME 2x36 PRDTR	20		72	00	@	1	4	4	0			.3	20		6	
ACME EMR emerg kit	1	1	40	50	@		1	4	1		1		1		1	
Plasto light switch LS2	1		7	60	@				8			.2	1			.2
Fit off socket outlets Plasto 210 outlets	15		12	30	@		1	8	5			.2			3	
Fit off data outlets Plasto DRJ45 8	15		11	40	@		1	7	1			.2			3	
Fit off switch board Plasto PAK 15P	1		42	80	@			4	3		2	.5			2	.5
Plasto Comb RCDCB 20	3		38	60	@		1	1	6			.1	3			.3
Plasto Comb RCDCB 15	1		38	60	@			3	9			.1	1			.1
Fit off data hub Plasto D25 LP	1	2	46	80	@		2	4	7		4		1		4	
TOTALS rear sheet						2	6	4	8					3	2	.1

JOB QUOTATION TAKE OFF SHEET

JOB NAME . .Dodgipay Accountancy Services – Office fitout.....**DATE ..20/2/2009.....**

JOB DESCRIPTION....Wire in 20 2x36watt troffers on two switchgroups, 15 double socket outlets, 15 data points. Package type switchboard and data hub...All outlets on three channel skirting trunking

SHEET1... of2... COSTED BY ...I N Fallible..... CHECKED BY ...D Unno.....

DETAILS	Qty	Materials unit price		Per	Material extension			Labour in hours		
Rough in lights 2 switch groups 1 emerg.										
1.5mm ² twin & earth	130m	110	00	100	1	4	3	1	6	
3 pin sockets with base ACME 413	21	8	20	@	1	7	3			
Cable ties	200	7	00	100		1	4			
switch mounting bracket ACME S14	1	2	50	@			3			
Fit off skirting trunking										
ACME S 3x150 3 channel skirting										
15 metres in 2.4m lengths	7	56	00	@	3	9	2	1	2	
knock in masonry fixings	100	32	00	100		3	2			
internal corners ACME ENC	4	12	00	@		4	8			
joiners ACME ENJ	5	6	00	@		3	0			
end caps ACME ENC	2	6	00	@		1	2			
socket outlet kits ACME SO2	15	12	00	@	1	8	0			
data outlet kits ACME DA 1	15	12	00	@	1	8	0			
Rough in socket outlets 3 circuits									7	
2.5mm ² twin & earth	70m	180	00	100	1	2	6			
Rough in data outlets									6	
Cat 5e 4 pr cable	220m	60	00	100	1	3	2			
TOTALS Front sheet					1	4	6	5	4	1

TOTAL HOURS63..... + ADJUSTMENTS = ...64..... @ \$.41.4.....p/hr = \$..2650.....

PLUS MATERIAL COSTS = \$..3855..... PLUS B FACTOR (if required)

JOB DIRECT COST = \$...6505..... + MARGIN ..20.....% = SALE PRICE \$...8132.....

BREAK EVEN = DIRECT COST = \$.6505....+ OVERHEADS 64hr@ . \$15.00.....p/hr = \$7465...

NETT PROFIT = SALE – BREAK EVEN = \$..8132..... - \$.7465..... = \$.667.....

Remember that the most important resource for any contracting operation is labour, and the use of that labour is to produce optimum sales outcomes.

Time spent managing projects is an essential component for any successful contracting operation, but is an overhead cost that diminishes profit.

therefore, time spent managing projects must be kept to a minimum, but be used to provide all necessary management functions.

A correctly formatted take off sheet can be used to reduce the amount of time used to manage a project.

Use the take off sheets provided on the preceding pages to see if the time invested in producing the estimate can also be used to –

- **plan the labour required** for each part of the work, as it arises. Will this avoid the need to study the plans for the job in advance of each part as it occurs in order to determine the labour requirements?
- **purchase the materials** required for each part of the work, as it arises. Will this avoid the need to study the plans for the job in advance of each part as it occurs in order to ensure that the required materials are available on time?
- monitor the labour hours consumed by each stage of the job in order to check the **labour productivity** against the estimated values
- monitor the usage of materials for each stage of the job, checking for **loss or misappropriation of materials**
- use mismatches in the recorded costs to estimated values to check if unauthorised **variations to contracted work** have occurred
- use mismatches in the recorded costs to estimated values to make enquiries with **production staff** as to how the unexpected outcome occurred
- determine **minimum values for progress claims**, submitted as the work progresses

Will the use of a correctly formatted take off sheet result in a reduction of time consumed to manage a project?

SECTION 3

PROCESSES FOR DETERMINING DIRECT COSTS OF LABOUR

THE DIRECT COST OF LABOUR

The direct cost of labour is the cost of employing a person on an hourly basis. This cost must include all 'on costs' such as paid leave, public holidays, workers compensation insurance, superannuation, etc.

The following pages provide information on the method for determining the on cost provision for labour.

As on costs are determined by employment conditions, it is best to develop the on costs margin as a percentage of wages paid so that it remains stable unless there is a change to working conditions. Where a salary increase occurs, without a change in working conditions, the fixed percentage margin is easily applied to the new wage rate to determine the new direct cost of labour.

As wage increases are a regular occurrence, but working conditions rarely change, most contracting operations use the percentage method as a means of avoiding constant recalculation of on costs for labour.

THE DIRECT COST OF MATERIAL

The direct cost of materials for an estimate is that cost born by the contractor to supply the materials to the project. It is not the price or sale value provided to the customer. As the purpose of estimating is to determine the cost to the contractor to perform the work, the direct cost of materials is that cost that includes regular discounts, but also includes expected wastage, such as cable off cuts, short ends from cable drums, etc.

DIRECT COSTS

In any contracting operation utilising labour to perform its normal trading activities, there is an inescapable need to determine the cost to the operation of the labour, on an hourly basis. When an estimator calculates the quantities of materials in a particular job, it is a simple matter to express the cost of materials in dollar terms, based on the cost of purchasing the materials.

However, labour is estimated in units of time, usually hours, and not in dollar terms. Therefore a cost per hour for labour is required. This cost must encompass

- cost of wages
- 'on costs'

Wages costs are those costs that are paid as a component of salary, and can usually be identified with those monies detailed on a pay slip. This must include costs such as hourly wage, travel allowances, tool allowances, license allowances and other wage components that are part of an employment agreement.

On costs are those costs that are directly related to wages, but not specifically detailed as part of salary payments. On costs include provision for sick leave, annual leave, annual leave loadings, workers compensation insurance, superannuation, long service leave, family and community leave and any number of other employment conditions.

On costs are calculated as a percentage of wages, rather than as a dollar value. Since on costs result from employment conditions which do not change regularly (unlike wage rates), determining a percentage value allows for simple adjustment to labour cost.

As a guide, the on cost value for electrical work ranges between 35% to 40% for most Australian employment conditions.

The hourly cost for labour is determined by dividing the wages payment by the number of working hours per week, and adding the on cost percentage to that value.

Note that the on cost margin is covered by the normal working hours. It is not applied to overtime payments. Therefore, where overtime is worked at 1.5 times normal rate it may not be unduly punitive to the costs to perform the work.

DETERMINING AN HOURLY COST OF LABOUR

The first step in arriving at a direct cost figure for labour is to establish the actual dollar figure paid as wages per week to a particular employee.

Calculating wage costs

The following example uses hypothetical values of employment conditions for determining the wage cost for a specific individual.

The calculations are based on a 38 hour working week

(a)	Base electricians wage rate \$32.00 per hour	\$1216.00 per week
(b)	Licence allowance	\$ 30.00 per week
(c)	Tool allowance	\$ 25.00 per week
(d)	Special (skill) allowance \$2.31 per hour	\$ 87.78 per week
(e)	Construction allowance	\$ 64.00 per week
(f)	Travelling time allowance ..80 minutes pay per day, on a 38 hour week	

$$= \frac{5 \times 80}{60} \text{ hours per week @ } \$32.00 \quad \$ 213.33 \text{ per week}$$

Therefore, the normal weekly wage for this employee will be the sum of these items :

$$= \$1636.11 \text{ per week}$$

Dividing the weekly wage by the number of working hours per week, the wage component is

$$\frac{\$1636.11}{38 \text{ hrs}} = \$43.06 \text{ per hour}$$

However, the actual cost is a lot more than \$43.06 per hour, because there remains the 'on cost' component to be added to this figure.

The on cost margin, expressed as a percentage of the employees wage rate, will apply to all employees in the one operation that are employed under the same award.

Calculating 'on costs'

On costs should be calculated as a percentage that can be added to the wage rate for any employee engaged under the local employment agreement.

Each of the on cost components is calculated as a percentage of the wage, and then added to supply a fixed percentage that will allow for all the 'on costs'.

Note that although the employee gets paid 52 weeks a year, income for the yearly salary is produced over less than that period. Those times for holidays, sick leave, etc. are not income earning periods.

As an example, the number of working weeks for most electrical workers is

Annual holidays	= 4.0 weeks
Paid public holidays – 9 days	= 1.8 weeks
Paid sick/family leave – say, 10 days ...	= 2.0 weeks
Total non income earning weeks	= 7.8 weeks

Therefore incoming earning weeks = $52 - 7.8 = 44.2$ weeks

Calculation of on costs must be based on the number of income producing weeks, rather than 52 weeks per year.

The following calculations are provided as an example of determining the on cost percentage required for a hypothetical employee.

1. **Workers Compensation Insurance**

This is usually based on a percentage of the wages paid to an employee. It varies in levy, depending on the competitive rates at which the insurance companies are prepared to operate.

Assuming that suitable cover is obtained for 8% of wages paid.

Therefore the on cost component for workers compensation insurance will be 8%, to be gained over the 44.2 productive weeks.

$$\text{Workers compensation on cost} = 8\% \times \frac{52 \text{ weeks to be paid}}{44.2 \text{ productive weeks}}$$

$$= 9.41\% \text{ of wages paid}$$

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$$\begin{aligned} \text{Workers compensation on cost} &= 8\% \times \frac{52 \text{ weeks to be paid}}{44.2 \text{ productive weeks}} \\ &= 9.41\% \text{ of wages paid} \end{aligned}$$

2. Long Service Leave

This hypothetical example allows for eight weeks long service week after ten years of service.

For each year worked, allow 0.8 weeks pay, spread over the number of productive working weeks in the year.

Converting this to a percentage, $= \frac{0.8 \times 100}{44.2 \text{ wks}} = 1.8\%$

Long Service on cost = 1.8%

(Footnote: In NSW the long service costs for employees engaged in the construction industry are paid by a levy on developers, via the Building Industry Long Service Corporation, and not by the individual contracting industry employers. So, in NSW it is not an on cost component).

3. Annual Leave

This comprises four out of every fifty two weeks.

Converting this to a percentage form for use as an on cost component
 $= \frac{4}{52 \text{ wks}} \times \frac{52}{44.2} \times 100 = 9\%$

Annual Leave on cost = 9%

4. Annual Leave Loading

For this hypothetical employment agreement, employees are granted a 17.5% loading on all annual leave

Converting this to a percentage form for on cost purposes, we can use the 9% already allowed for annual leave, and simply calculate an additional margin for the leave loading.

Additional on cost for leave loading = 17.5% of the 9% on cost
 $= 17.5\% \times 9\% = 1.58\%$

Annual Leave Loading on cost = 1.58%

5. Public Holidays

For this hypothetical employment agreement there are nine paid public holidays, and a paid union picnic day, each year. This is yet another cost that must be carried by the 44.2 working weeks.

Converting this to an on cost percentage, and using the five day working week, 10 paid holidays = 2.0 weeks, which represents an on cost percentage of

$$\frac{2}{52} \times \frac{52}{44.2} \times 100 = 4.52\%$$

Public Holiday on cost = 4.52%

6. Sick Leave

For this hypothetical employment agreement employees have eight days paid sick leave and two family/community days each year. Using the same methods as for public holidays (as above), an on cost component can be derived.

$$10 \text{ days} = 2.0 \text{ weeks} = \frac{2.0}{52 \text{ wks}} \times \frac{52}{44.2} \times 100 = 4.52\%$$

7 Superannuation

This cost is currently set at 9% of wages paid. therefore the on cost component is

$$\frac{9\% \times 52}{44.2} = 10.6\%$$

TOTAL OF ON COST MARGINS

Adding the various on cost percentage margins will give a total on cost margin

Workers Comp	=	9.41%
Long Service	=	1.8%
Annual Leave	=	9.0%
Leave Loading	=	1.58%
Public Holidays	=	4.52%
Sick Leave	=	4.52%
Superannuation		10.6%
TOTAL	=	41.43%

For this hypothetical employment agreement the true cost of employing a tradesperson will be the wages component of \$43.06 per hour, plus an on cost margin of 41.43%.

$$= \$43.06 \text{ plus } 41.43\% = \$60.90 \text{ per hour}$$

Or the cost of employing a foreman, who is entitled to an additional \$100.00 per week, will be :

$$(\$43.06 + \frac{\$100}{38 \text{ hours}}) + 41.43\% = \$64.62 \text{ per hour}$$

The simplicity of using a fixed on cost margin (expressed as a percentage of wages paid) to determine the direct cost of labour, allows for quick calculations of various labour rates and costs.

Changes to wage rates caused through bargaining adjustments will not require a recalculation of the on cost component unless there is a variation in the working conditions, meaning that frequent 'on cost' recalculations are unnecessary.

Note

NECA provides guidance to the on costs applicable to a range of employment conditions as a service to its' membership.

EXERCISES

Below are some exercises in calculating the direct cost of labour for operations trading under differing employment conditions :

EXERCISE ONE

Calculate the direct hourly cost of employing an electrical serviceman, using the following award conditions :

38 hour working week

4 weeks annual leave, with 17.5% leave loading

21 days full pay sick leave

10 weeks long service after ten years service

9% non contributory superannuation

9 paid public holidays per annum

1 paid industry union picnic day

Workers compensation insurance at a rate of 8% of wages paid

Wage rates :

Base award rate	\$ 35.20 per hour
Tool allowance	\$30.00 per week
Special (skill) allowance	\$48.00 per week
Electronics certificate allowance	\$30.00 per week
Serviceman's allowance	\$46.00 per week

EXERCISE TWO

Calculate the direct cost of employing an apprentice under the following award conditions :

- 38 hour working week
- 4 weeks annual leave
- 17.5% annual leave loading
- 8 days full pay sick leave
- 9% non contributory superannuation
- 9 paid public holidays per annum
- 36 paid days per year at college
- Workers compensation at the rate of 10% of wages paid

Wage rates :

Base award rate	\$15.00 per hour
Tool allowance	\$30.00 per week
Construction allowance	\$51.00 per week
Travelling allowance	80 minutes per day

EXERCISE THREE

Calculate the direct cost of employing a leading hand under the following employment conditions :

- 36 hour working week
- 4 weeks annual leave
- 17.5% annual leave loading
- 21 days full pay sick leave per annum
- 9 paid public holidays per annum
- 1 paid union picnic day per year
- 8 weeks long service after ten years service
- Workers compensation insurance at the rate of 9% of wages paid
- 9% non contributory superannuation

Wage rates :

Base award rate	\$30.20 per hour
Leading hand allowance	\$56.00 per week
Tool allowance	\$30.00 per week
Special allowance	\$66.00 per week
Construction allowance	\$55.00 per week

EXERCISE FOUR

Using the data supplied in exercise three (above), determine the new direct labour cost for the leading hand following a national award wage adjustment that grants a flat 5% increase to the hourly base award wage rate. Note that this would not apply to the various allowances, which, in this case, are adjusted in a separate award adjustment.

P.S. If the answer you got in calculating a direct cost for apprentice labour alarmed you, remember that the Federal Government generally supplies a training subsidy to employers that engage apprentices as part of their workforce. In addition to this, apprentices can be profitably utilised to carry out work that would otherwise be done by a tradesman on higher wages.

ANSWERS TO EXERCISES**Exercise 1**

Productive weeks = 41.8

workers comp insurance = $8\% \times \frac{52}{41.8} = 9.95\%$ superannuation = $9\% \times \frac{52}{41.8} = 11.2\%$ annual leave = $\frac{4}{52} \text{ weeks} \times \frac{52}{41.8} = 9.6\%$

leave loading = 17.5% of 9.65% = 1.68%

Public holidays + union picnic = $\frac{2}{52} \text{ weeks} \times \frac{52}{41.8} = 4.8\%$ sick leave = $\frac{4.2}{52} \text{ weeks} \times \frac{52}{41.8} = 10\%$

Total on cost percentage = 47.23%

Hourly wages rate = $\frac{(\$35.20 \times 38 \text{ hrs}) + 30 + 48 + 30 + 46}{38 \text{ hours}} = \39.25 per hour Direct cost for labour = $\$39.25 + 47.23\% = \57.79 per hour **Exercise 2**

Wage rate = \$17.66 per hour On cost percentage = 64.2%

therefore direct cost for labour = \$30.00 per hour

Exercise 3

Wage rate = \$35.95 per hour On cost percentage = 52.87%

therefore direct cost for labour = \$54.96 per hour

Exercise 4

Wage rate = \$37.46 per hour On cost percentage = 52.87%

therefore direct cost for labour = \$57.27 per hour

SECTION 4

PROCESSES FOR DEVELOPING A MARGIN TO COVER OVERHEADS

The following pages provide information on the processes involved in developing a price to be offered to the client.

This price must include provision for all direct costs (labour and materials), an amount to cover overheads for the duration of the job, and an amount for nett profit.

The method for overheads allowance is development of an amount allocated for each working hour of a job, ensuring that each job carries its' share of the overhead burden. The overhead margin, once developed, can be simply applied to each estimated job based on the hours in that job.

Service work rates are developed in a similar manner to estimated work.

FORMULATING A BID PRICE

BID PRICE - The sale value of the offer to the client.

This sum must include -

- (a) the total direct costs for materials and labour
- (b) the gross profit margin, comprised of hourly overhead costs and nett profit

DIRECT COSTS

Material - the expected cost to supply the materials for the project

Labour - the cost of labour - being hourly costs based on wages plus on costs

On costs include those costs, other than wages, that can be directly attributed to the hourly cost of labour. This includes, but is not limited to, sick leave, paid public holidays, annual leave, annual leave loading, workers compensation insurance, redundancy funds, long service, and any other paid non productive events that are directly attributable to employed labour hours.

On costs are calculated as a percentage of the hourly labour rate. By determining a percentage value, the on costs do not need to be recalculated in the event of a change to the hourly wage rate.

Where a change to employment/working conditions occurs, the on cost percentage must be re calculated.

HOURLY OVERHEAD COSTS

The hourly overhead cost for an operation is the annual overhead costs divided by the annual productive working hours.

By calculating an hourly loading for the coverage of the overheads, the overhead cost burden can be allocated to each project, based on the estimated labour hours in the project.

GROSS PROFIT MARGIN

The gross profit margin is expressed as a percentage of the sale value (not as a mark up on the costs). This allows easy comparison to the final result of the job, where actual costs determine the resultant gross profit margin, when compared to the sale value.

Actual gross profit margins are compared to estimated gross profit margins and costs during the job cost reconciliation process that should occur for each project.

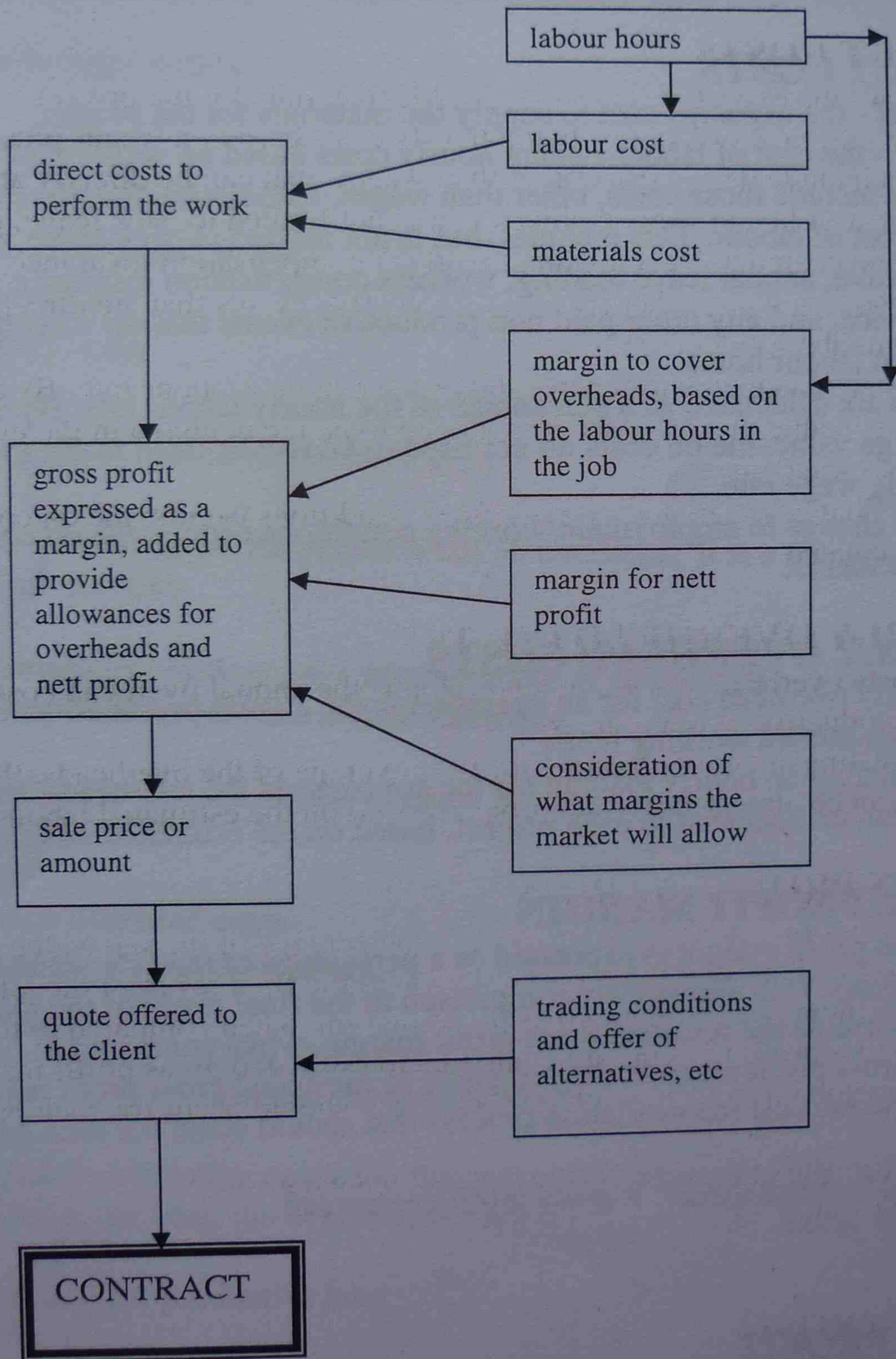
$$\frac{\text{Sale value} - \text{direct costs}}{\text{Sale value}} = \text{gross profit percentage}$$

NETT PROFIT

The nett profit is the final profit, after all direct costs and hourly overhead costs for the project have been deducted from the sale value.

Determining a minimum sale value for a quotation

The value of a quotation must include all direct costs, and a gross profit margin.



OVERHEADS

The overheads are those operating costs of a business that cannot be directly attributed to a specific job, but must be covered by all jobs, over the current financial year.

In order to ensure that the overheads are covered, a portion of the overheads must be covered by each job. The simplest way to achieve this is to determine a set amount, in dollars per productive working hour that is required to cover the total overheads.

Overheads include items such as:

- phone/fax costs
- wages for supervisory staff
- wages for administrative staff
- rent of premises
- accountancy costs
- advertising
- insurance (public liability, fire, theft, etc.)

Note that workers compensation insurance is not an overhead. It is a component of the 'on cost' part of labour costs.

Research has demonstrated that poor management of overheads is a common contributor to failure of small business in Australia.

In order to determine the amount of cost to allow for overheads, on an hourly basis, determine :

- (a) the total annual overhead costs
- (b) The total number of productive hours

$$\text{Hourly overhead burden} = \frac{\text{Total Overhead Costs}}{\text{Annual Productive Hours}}$$

Example – for a small contracting operation that has total overheads of \$23,000, and 1150 productive hours per year, the overhead burden is :

$$\frac{\$23,000}{1150} = \$20 \text{ per productive hour}$$

EXERCISES

Exercise 1

Determine the hourly overhead cost for an electrical contracting business that has the following characteristics -

One full time manager, with an annual salary of \$ 80,000 plus 35% on cost =
\$

One part time clerical person, with an annual salary of \$26,000 plus 35% on cost
= \$

Two vehicles, each with annual operating and lease costs of \$15,000.

Annual telephone costs of \$ 4800

Annual insurance costs (public liability, fire, theft etc) of \$4000

Annual rental costs of \$20,000

All other costs \$ 10000

Total overheads =

Labour resource - seven full time workers, each working 44.6 productive weeks per annum, and 36 hours per week.

Total productive hours =

Hourly overhead cost = $\frac{\text{annual overhead costs}}{\text{annual productive hours}}$

= \$ per hour

Exercise 2

Determine the hourly overhead cost for an electrical contracting business that has the following characteristics -

One owner/operator, with 30% of an annual salary of \$ 75000 plus 35% on cost being connected with non productive work = \$

One vehicle, with annual operating and lease costs of \$15000

Annual telephone costs of \$ 3000

Annual insurance costs (public liability, fire, theft etc) of \$2000.

All other costs \$ 5000

Labour resource - working 44.6 productive weeks per annum, and 26 hours per week.

Hourly overhead cost = _____ = \$ _____ per hour

Exercise 3

Determine the hourly overhead cost for the same contracting business as in Exercise 2, but where the labour hours have been increased by the addition of a full time worker -

One owner/operator, with 30% of an annual salary of \$ plus 35% on cost being connected with non productive work = \$

One vehicle, with annual operating and lease costs of \$.....

Annual telephone costs of \$

Annual insurance costs (public liability, fire, theft etc) of \$.....

All other costs \$

Labour resource - working 44.6 productive weeks per annum, and 26 hours per week for the owner, and 36 hours per week for an employee.

Hourly overhead cost = _____ = \$ _____ per hour

MINIMUM HOURLY RETURN FOR A CONTRACTING BUSINESS

Every contracting business needs to establish a minimum hourly return to cover wages and overhead costs.

Profit from material sales can be used successfully to off set overheads costs, allowing the business to be competitive on the open market. Most successful contracting businesses use profit from materials sales for this purpose.

However, minor domestic work, or most service work, does not provide the required materials sales to allow this practice. Consequently income from labour must be priced to support both wages and overhead costs.

MINIMUM HOURLY RATE FOR A SOLE TRADER

The following sample calculation shows the process required to determine a minimum hourly rate for a sole trader operating in the local area, performing a combination of service work and small installation jobs. The rate is developed to allow for low sales of materials.

For this example, it is assumed that the contractor operates the business from home, and has no unnecessary overhead commitments. It is assumed that the contractor is able to achieve a productivity that allows 30 hours per week as chargeable work, with the remaining 8 hours lost on non chargeable tasks such as traveling, preparing quotes, bookwork, etc. This 8 hour non productive time becomes an overhead.

On costs are assumed to be 38%, which reflects a common value for many contracting operations.

The contractor has chosen to aim for a wage of \$35.00 per hour.

Labour cost per hour = \$35.00 + 38% = \$48.30 per hour

Overheads are as follows

Van = \$15,000.00 per annum (includes all running, insurances and depreciation)

Telephones (mobile and land line) = \$3,000.00 per annum

Insurances (public liability, fire, theft) = \$2,000.00 per annum

Accountancy fees = \$1,500.00 per annum

Advertising, petty cash, entertaining, etc = \$100.00 per week or \$5000.00 per annum

Tool replacement = \$1,500.00 per annum

Non productive hours = 8 hours x 44.2 weeks = 353.6 @ \$48.30 = \$17,078.00

Total overheads = \$28,000.00 + \$17,078.00 = \$45,078.00

Hourly overheads = $\frac{\text{total overheads}}{\text{productive hours}} = \frac{\$45078}{44.2 \times 30\text{hrs}} = \34.00 per hour

Therefore the minimum hourly rate, to achieve a wage (without profit) is
 $\$48.30 + \$34.00 = \$82.30$ per hour

If this is not available in the market, the contractor should not continue to trade, or should change the area of trading.

Exercise 4

For the sole contractor detailed on the previous page, determine the minimum charge out rate that is required if the contractor employs an apprentice. The apprentice contributes 37.4 working weeks (allowing for attendance at TAFE), with 36 hours per week. For simplicity, the charge out rate is based on the contractor's wage rate of \$35.00 per hour, with 38% on costs. Would this adjusted minimum charge out rate make the contractor more viable in the market, assuming that he can produce enough work to keep the apprentice fully occupied?

Exercise 5

What effect on minimum charge rate would occur if the contractor provides a van for the apprentice to use on a full time basis? (Allow \$15000 for annual costs for the van)

NOTES

ANSWER TO EXERCISES

Exercise 1

OVERHEADS	ANNUAL PRODUCTIVE HOURS
Total Overheads = Manager \$80,000 plus 35% = \$108,000 Clerical person \$26000 plus 35% = \$35,100 Two vehicles = \$30,000 Telephones = \$4,800 Insurance = \$4,000 Rent = \$20,000 All other costs = \$10,000	Seven workers @ 44.6 weeks, 36 hours per week = 7 x 44.6 x 36 hours = 11239 productive hours
TOTAL OVERHEADS = \$211,500	TOTAL PRODUCTIVE HOURS = 11239

Hourly overhead costs = $\frac{\$211,500}{11239 \text{ hours}}$ = \$18.82 per hour

Exercise 2 \$47.75 per hour

Exercise 3 \$20.03 per hour

Exercise 4 \$65.16 per hour

Exercise 5 \$70.78 per hour

SECTION 5

PROCESSES FOR DEVELOPING A BID PRICE TO BE OFFERED TO THE CLIENT

Developing the final price to be offered to the client includes allowing for all direct costs, overheads and profit margins.

Sale value = direct costs plus gross profit margin

Gross profit = overheads plus nett profit

Nett profit is the profit remaining after all costs are covered.

SALE = DIRECT COSTS + OVERHEADS + NETT PROFIT

GROSS PROFIT MARGIN

The gross profit margin is expressed as a percentage of the sale value (not as a mark up on the costs). This allows easy comparison to the final result of the job, where actual costs determine the resultant gross profit margin, when compared to the sale value.

Actual gross profit margins are compared to estimated gross profit margins and costs during the job cost reconciliation process that should occur for each project.

$$\frac{\text{Sale value} - \text{direct costs}}{\text{Sale value}} = \text{gross profit percentage}$$

NETT PROFIT

The nett profit is the final profit, after all direct costs and hourly overhead costs for the project have been deducted from the sale value.

GROSS PROFIT EXPRESSED AS A MARGIN FOR THE PURPOSES OF RECONCILIATION OF ESTIMATED VALUES TO ACTUAL OUTCOME VALUES

Definitions :

Margin – an amount expressed as a percentage of the sale value

Mark up – an amount expressed as a percentage of the cost

$$\text{Margin} = \frac{\text{profit (in dollars)}}{\text{sale value}}$$

$$\text{Mark up} = \frac{\text{profit (in dollars)}}{\text{value of costs}}$$

To add a margin to a cost the method is

$$\text{Sale value} = \frac{\text{direct costs}}{100 - \text{margin}\%}$$

Gross profit – a profit margin that must include funds to cover overheads, plus nett profit

Nett profit – the profit realised after all costs, being direct costs and overheads, have been covered

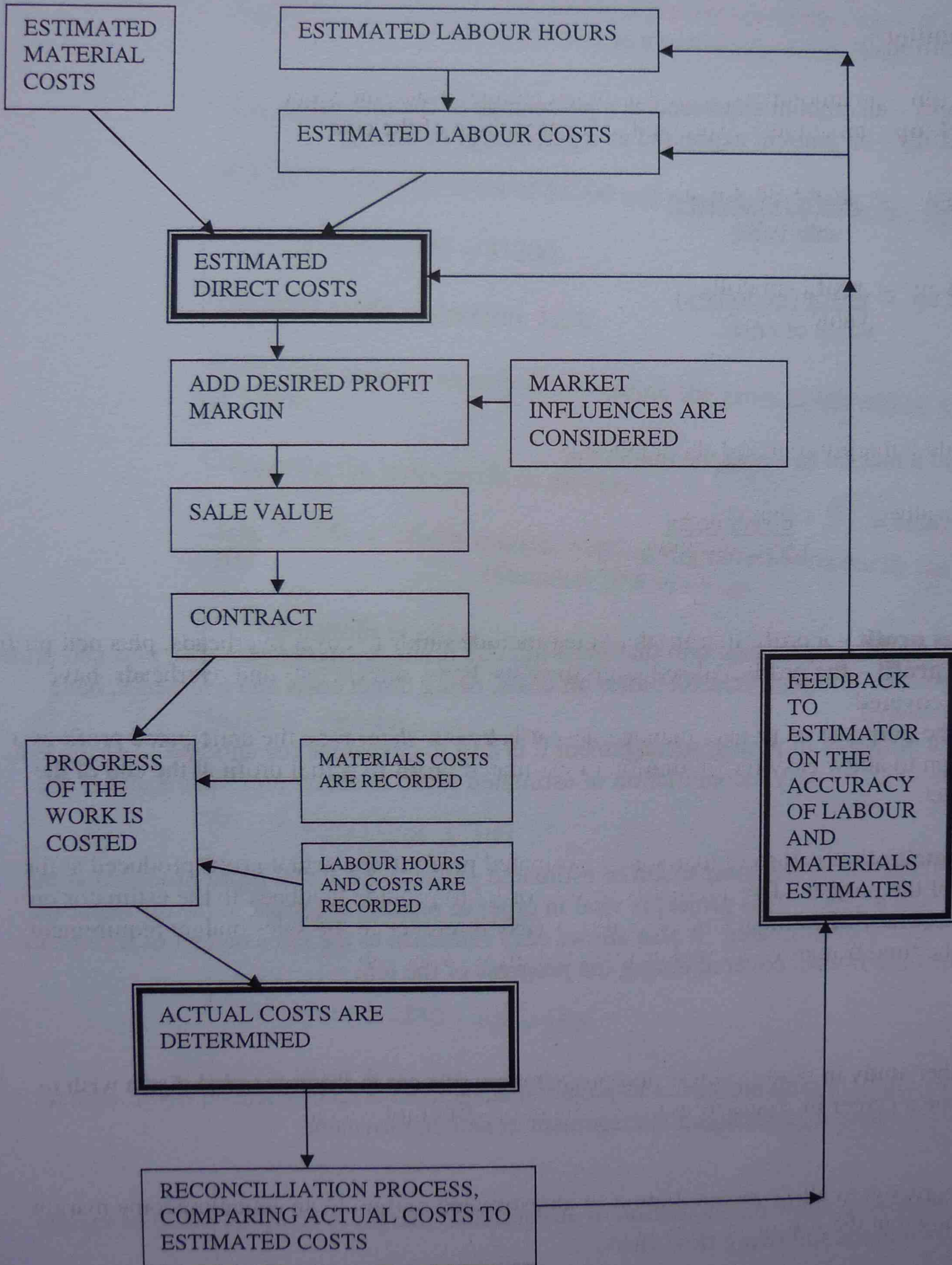
For the purposes of project management it is best to determine the anticipated profit as a margin to allow easy reconciliation of estimated profit to actual profit at the end of the project.

Reconciliation is the comparison of estimated profit to the actual profit produced at the end of the project. This project is vital in order to provide feedback to the estimator on the accuracy of estimates. It also allows easy reference to the sales budget requirements for the time frames covered during the progress of the job.

Further study in both business and project management is recommended if you wish to pursue a career in contracting management or self employment.

The process to allow reconciliation of an estimated margin to an actual outcome margin is shown in the following flow chart.

FLOW CHART SHOWING THE PROCESS THAT LEADS TO RECONCILLIATION BETWEEN ESTIMATED COSTS AND ACTUAL COSTS FOR A PROJECT.



Margin versus mark up

Mark up, where a percentage profit is expressed against the costs is unsuitable for the reconciliation process.

Margin – an amount expressed as a percentage of the sale value

Mark up – an amount expressed as a percentage of the cost

Example 1

If a job is won with costs of \$1000 and a *mark up* of 20%, the sale value is :

$$\text{\$1000} + 20\% = \text{\$1200}$$

The gross profit is therefore \$200.

If the costs came in exactly as estimated, the gross profit will be \$200, for the sale value of \$1200.

Comparing the gross profit to the sale :

$$\frac{200}{1200} \times 100 = 16.6\% \text{ margin, making it difficult to reconcile the outcome to the estimated } 20\% \text{ mark up}$$

Where the profit is added as a *margin*, for the same 20% gross profit, the direct costs will be 80% of the sale. (Sale = Direct Cost + Gross Profit)

$$\text{Therefore, } 1\% \text{ of the sale will be } = \frac{\text{direct cost}}{80}$$

$$\begin{aligned} \text{\$ sale} &= \frac{\text{Direct Cost}}{80} \times 100 \\ &= \frac{1000}{80} \times 100 = \text{\$1250} \end{aligned}$$

The gross profit is $1250 - 1000 = 250$

The gross profit % = $\frac{250}{1250} \times 100 = 20\%$ of sale which is easily reconciled to the estimated gross profit *margin*.

Example 2

A project is estimated with direct costs of \$20,000.

If a mark up of 15% is used, the sale value will be \$23,000 (\$20,000 + 15% = \$23,000).

If the cost come in as estimated the gross profit will be \$23,000 - \$20,000 = \$3000.

Comparing the actual gross profit to the estimated 15%

Actual gross profit % = $\frac{3000}{23000} \times 100 = 13\%$ which is difficult to compare to the estimated 15% mark up

Calculating gross profit as a percentage margin :

GP% = 15% & costs = 85%

Sale = $\frac{\text{Direct Cost}}{85} \times 100$
 = \$23530

& if costs come in at \$20,000, profit = \$3530

Gross profit % = $\frac{3530}{23530} = 15\%$ = estimated margin

Therefore, when determining gross profit, with direct costs as the basis, calculating the gross profit as a margin (rather than a mark up) is preferable for the purposes of reconciliation.

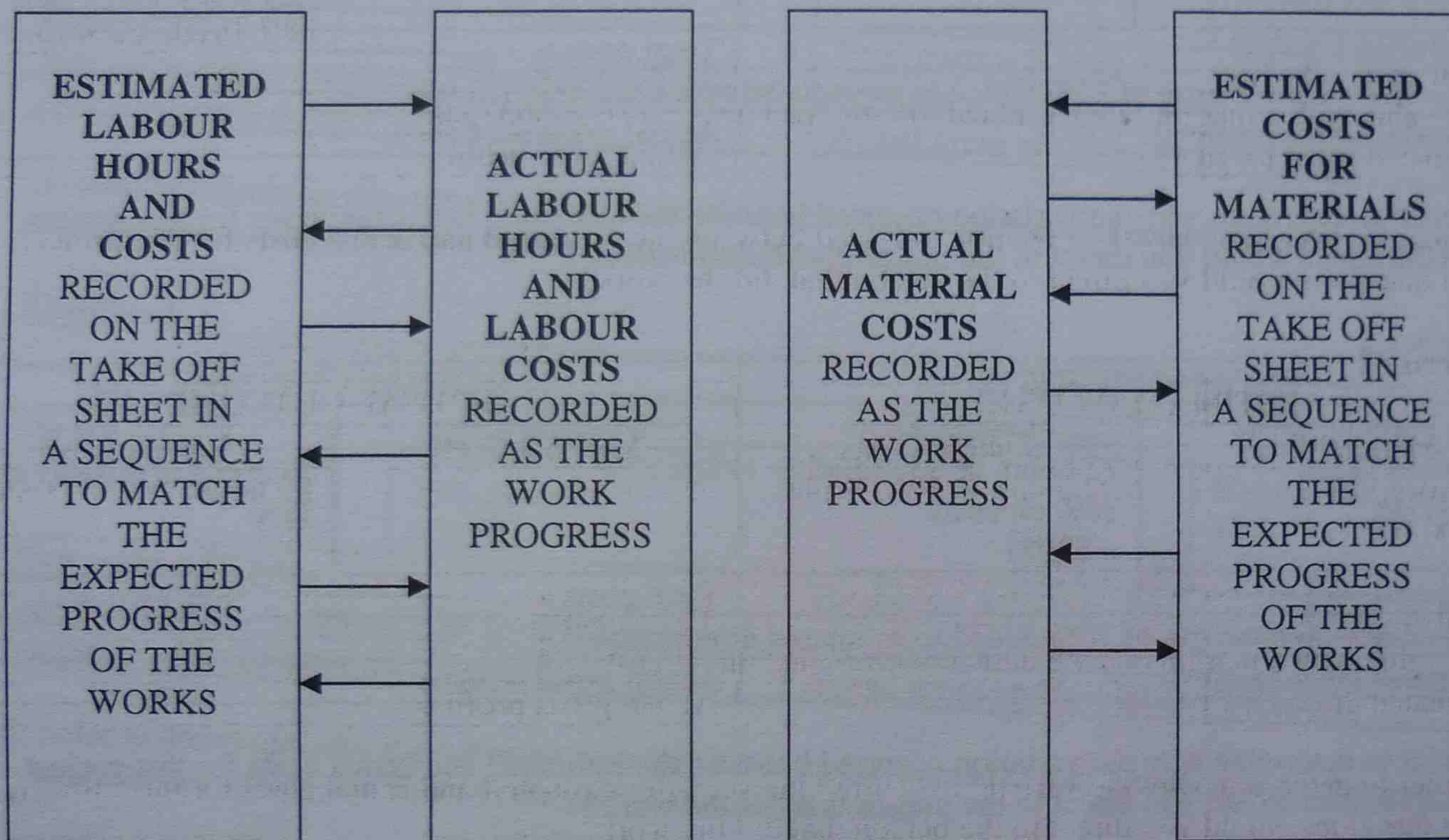
Examples of adding a margin to direct costs

labour estimated values	direct cost of labour	direct cost of materials	desired gross profit margin	sale value
100 hours @ \$30.00 plus 38% on costs	\$4140	\$3400	20%	\$9425
36 hours @ \$32.00 plus 41% on costs	\$1625	\$8560	15%	\$11982
180 hours @ \$32.00 plus 38% on costs	\$7948	\$450	35%	\$12920
32 hours @ \$34.00 plus 40% on costs	\$1523	\$15,500	10%	\$18915

At a later point in this book, you will find that material intensive jobs can be profitable at lower margins than labour intensive jobs (see page)

The Reconciliation Process

Where the gross profit outcome of a project is not the same as the estimated value, the estimator should compare the estimated materials and labour values to the actual values, using the take off sheet and costs records.



The reconciliation process allows the estimator to identify the areas of inaccuracy in the estimating process.

Questions

1. Where the final materials costs exceed the estimated values, what are the likely causes?
2. Where the labour hours and costs exceed the estimated values, what are the likely causes?
3. Where the labour hours come in close to the estimated value, but the labour cost is less than the estimated value, what are the likely causes?

Consider the following reconciliations of estimated costs against actual outcomes.

Exercise 1

ESTIMATED COSTS		ACTUAL OUTCOME	
Material Costs	Labour Costs	Material Costs	Labour Costs
All materials = \$1800.00	72 hours @ \$30.00 plus 38% on costs = \$2981	\$2150.00	32 hours @ 14.00 plus 58% (apprentice) 40 hours @ \$30.00 plus 38% (tradesperson)
Total costs = \$4781		Total costs =	
Sale value with a margin of 25% added to estimated direct costs = \$6375.00			
Estimated gross profit =		Actual gross profit =	

In order to determine why the variation occurred between the estimated and actual costs for this project, what questions would you direct to the person that did the work?

Exercise 2

ESTIMATED COSTS		ACTUAL OUTCOME	
Material Costs	Labour Costs	Material Costs	Labour Costs
All materials = \$3200.00	72 hours @ \$30.00 plus 38% on costs = \$2981	\$3150	80 hours @ \$30.00 plus 38%
Total costs = \$		Total costs =	
Sale value with a margin of 20% added to estimated direct costs = \$			
Estimated gross profit =		Actual gross profit =	

In order to determine why the variation occurred between the estimated and actual costs for this project, what questions would you direct to the person that did the work?

Exercise 3

Where an estimator has a history of accuracy against actual outcomes across a wide range of jobs, with different workers, it is reasonable to suspect unacceptable site outcomes as the reason for imbalances in the reconciliation process.

- If a specific worker consistently exceeds the estimated hours on work that is done, what is the first line of assumption?
- If the above worker is praised by the clients for neatness and punctuality, and requested for further work, what assumptions can be made?
- Where a worker is honest, punctual and reliable, preferred by the clients, but too slow to meet the estimated hour target to allow competition in the market, what would you do?
- If a specific worker consistently exceeds the estimated materials on work that is done, what is the first line of assumption?
- If a worker performed extra work for a client, as variation to the contract work, but forgot to pass this information on to the contractor, what effect would this have on the reconciliation process?

Exercise 3

Where the labour component on estimates is consistently lower than the actual outcomes, across a range of jobs, what is the first line of assumption?

Exercise 4

Where the material component on estimates varies regularly when reconciled to the actual outcomes, across a range of jobs, what is the first line of assumption?

Answers

Exercise 1

ESTIMATED COSTS		ACTUAL OUTCOME	
Material Costs	Labour Costs	Material Costs	Labour Costs
All materials = \$1800.00	72 hours @ \$30.00 plus 38% on costs = \$2981	\$2150.00	32 hours @ 14.00 plus 58% (apprentice) 40 hours @ \$30.00 plus 38% (tradesperson)
Total costs = \$4781		Total costs = \$ 2363.84	
Sale value with a margin of 25% added to estimated direct costs = \$6375.00			
Estimated gross profit = \$1594 (25%)		Actual gross profit = 1861.16 (29%)	

In order to determine why the variation occurred between the estimated and actual costs for this project, what questions would you direct to the person that did the work?

Exercise 2

ESTIMATED COSTS		ACTUAL OUTCOME	
Material Costs	Labour Costs	Material Costs	Labour Costs
All materials = \$3200.00	72 hours @ \$30.00 plus 38% on costs = \$2981	\$3150	80 hours @ \$30.00 plus 38%
Total costs = \$ 6198		Total costs = \$6462	
Sale value with a margin of 20% added to estimated direct costs = \$ 7748			
Estimated gross profit = \$1550 (20%)		Actual gross profit = \$1286 (16.6%)	

In order to determine why the variation occurred between the estimated and actual costs for this project, what questions would you direct to the person that did the work?

Exercise 3

Where an estimator has a history of accuracy against actual outcomes across a wide range of jobs, with different workers, it is reasonable to suspect unacceptable site outcomes as the reason for imbalances in the reconciliation process.

- If a specific worker consistently exceeds the estimated hours on work that is done, what is the first line of assumption? (Poor attendance, slow worker, mistakes, ... or poor estimating)
- If the above worker is praised by the clients for neatness and punctuality, and requested for further work, what assumptions can be made? (works too slow, makes mistakes, or poor estimating)
- Where a worker is honest, punctual and reliable, preferred by the clients, but too slow to meet the estimated hour target to allow competition in the market, what would you do? (allocate the worker to do and charge work, service work, etc)
- If a specific worker consistently exceeds the estimated materials on work that is done, what is the first line of assumption? (misappropriating equipment, or careless with stock)
- If a worker performed extra work for a client, as variation to the contract work, but forgot to pass this information on to the contractor, what effect would this have on the reconciliation process? (excess costs would show up in the reconciliation process – indicating a bad outcome or unpaid work)

Exercise 3

Where the labour component on estimates is consistently lower than the actual outcomes, across a range of jobs, what is the first line of assumption? (the estimator does not have a good understanding of the group work productivity, or the group work productivity must be improved, or both)

Exercise 4

Where the material component on estimates varies regularly when reconciled to the actual outcomes, across a range of jobs, what is the first line of assumption? (poor estimating)

EXERCISES - CONVERTING AN ESTIMATE TO A BID PRICE

The following exercises are designed to demonstrate the importance of developing a quote price for each project, on an individual basis. Each of the following scenarios uses the same overhead burden, and the same gross profit margin, but produces a range of nett profit results. *For the same contracting operation, operating at the same gross profit margin, the nett profit varies with each job, depending on the value of materials and labour.*

Exercise 1

Determine the minimum price (break even) for a commercial fit out project that has been estimated with the following characteristics -

Material costs = \$5,400.00

Labour cost = 150 hours with an hourly cost of \$23.30 + 37% on cost

Hourly overhead cost = \$9.90 per hour

Where the general market rate for this work is a gross profit percentage of 20%, what nett profit would occur if the project is won at market rates?

For this exercise, the ratio of material to labour cost is

Exercise 2

Determine the minimum price (break even) for a commercial fit out project that has been estimated with the following characteristics -

Material costs = \$2100.00

Labour cost = 250 hours with an hourly cost of \$23.30 + 37% on cost

Hourly overhead cost = \$9.90 per hour

Where the general market rate for this work is a gross profit percentage of 20%, what nett profit would occur if the project is won at market rates?

For this exercise, the ratio of material to labour cost is

Exercise 3

Determine the minimum price (break even) for a hazardous location ("flameproof") project that has been estimated with the following characteristics -

Material costs = \$6600.00

Labour cost = 24 hours with an hourly cost of \$23.30 + 37% on cost

Hourly overhead cost = \$9.90 per hour

Where the general market rate for this work is a gross profit percentage of 20%, what nett profit would occur if the project is won at market rates?

For this exercise, the ratio of material to labour cost is

Exercise 4

Determine the minimum price (break even) for a routine maintenance project that has been estimated with the following characteristics -

Material costs = \$250.00

Labour cost = 250 hours with an hourly cost of \$23.30 + 37% on cost

Hourly overhead cost = \$9.90 per hour

Where the general market rate for this work is a gross profit percentage of 20%, what nett profit would occur if the project is won at market rates?

For this exercise, the ratio of material to labour cost is

Enter the outcomes for exercises 1,2,3 and 4 in the table below, to provide an overview of the effect of material/labour ratios on nett profit, where projects are priced at a constant margin.

Exercise No.	Hourly overhead burden	Assumed market rate	Material to labour ratio	Nett profit	Labour hours required Use of fixed resource
1	\$9.90	20%			
2	\$9.90	20%			
3	\$9.90	20%			
4	\$9.90	20%			

The results of this table show the impact on profit of the ratio of material to labour, where a contracting operation submits bids using the same gross profit margin, (20% in this example) for all projects.

CONCLUSION – each project must be evaluated on it's ability to cover the hourly overhead, and an acceptable margin determined to provide a nett profit.

Where the market rate enforces an unrealistically low margin, it is important to maintain an acceptable margin, and avoid losing money.

ie. Pass the job to someone else!

Sitting on the beach is much better than operating a business at a loss!!!

Exercise 5

Determine the minimum gross profit margin that must be applied to labour only work for a contracting operation with the following operating characteristics.

Cost of labour = \$33.00 per hour plus 40% on costs

Hourly burden for overheads = \$27.00 per hour

Exercise 6

Determine the minimum gross profit margin that must be applied to a job with the following estimated values, where a contracting operation has an hourly overhead burden of \$17.00

Estimated labour = 40 hours @ \$32.00 per hour, plus 38% on costs

Materials = \$4,500.00

Exercise 7

Determine the minimum gross profit margin that must be applied to a job with the following estimated values, where a contracting operation has an hourly overhead burden of \$17.00

Estimated labour = 120 hours @ \$32.00 per hour, plus 38% on costs

Materials = \$5,500.00

Exercise 8

Determine the minimum gross profit margin that must be applied to a job with the following estimated values, where a contracting operation has an hourly overhead burden of \$27.00

Estimated labour = 100 hours @ \$32.00 per hour, plus 38% on costs

Materials = \$3,500.00

ANSWERS TO EXERCISES - CONVERTING AN ESTIMATE TO A BID PRICE

Exercise 1

Determine the minimum price (break even) for a commercial fit out project that has been estimated with the following characteristics -

Material costs = \$5,400.00

Labour cost = 150 hours with an hourly cost of \$23.30 + 37% on cost

Hourly overhead cost = \$9.90 per hour

Labour cost = 150 x 23.30 x 1.37	=	\$ 4789
Material cost =	=	\$ 5400
Overhead cost = 150 x 9.90	=	\$ 1485
Total	=	\$ 11674.00

Where the general market rate for this work is a gross profit percentage of 20%, what nett profit would occur if the project is won at market rates?

$$\frac{\text{Direct cost}}{80} \times 100 = \frac{4789 + 5400}{80} \times 100 = \$ 12736$$

$$\text{Nett profit} = 12736 - 11674 = \$ 1062.00$$

For this exercise, the ratio of material to labour cost is

$$5400 : 4789 = 1.13 : 1$$

Exercise 2

Determine the minimum price (break even) for a commercial fit out project that has been estimated with the following characteristics -

Material costs = \$2100.00

Labour cost = 250 hours with an hourly cost of \$23.30 + 37% on cost

Hourly overhead cost = \$9.90 per hour

Labour cost = 250 x 23.3 x 1.37	=	\$ 7981
Material cost	=	\$ 2100
Overhead cost = 250 x 9.90	=	\$ 2475
Total	=	\$ 12556

Where the general market rate for this work is a gross profit percentage of 20%, what nett profit would occur if the project is won at market rates?

$$\frac{\text{Direct cost}}{80} \times 100 = \frac{7981 + 2100}{80} \times 100 = \$12602$$

$$\text{Nett profit} = 12602 - 12556 = \$ 46.00$$

For this exercise, the ratio of material to labour cost is

$$2100 : 7981 = 1 : 3.8$$

Exercise 3

Determine the minimum price (break even) for a hazardous location ("flameproof") project that has been estimated with the following characteristics -

Material costs = \$6600.00

Labour cost = 24 hours with an hourly cost of \$23.30 + 37% on cost

Hourly overhead cost = \$9.90 per hour

Labour cost = $24 \times 23.30 \times 1.37 = \767.00
 Material cost = \$ 6600.00
 Overhead cost = $24 \times 9.90 = \$ 238.00$
 Total = \$ \$7605.00

Where the general market rate for this work is a gross profit percentage of 20%, what nett profit would occur if the project is won at market rates?

$$\frac{\text{Direct cost}}{80} \times 100 = 767 + 6600 = \$9208.00$$

$$\text{Nett profit} = 9208 - 7605 = \$1603$$

For this exercise, the ratio of material to labour cost is

$$6600 : 767 = 8.6 : 1$$

Exercise 4

Determine the minimum price (break even) for a routine maintenance project that has been estimated with the following characteristics -

Material costs = \$250.00

Labour cost = 250 hours with an hourly cost of \$23.30 + 37% on cost

Hourly overhead cost = \$9.90 per hour

Labour cost = $250 \times 23.30 \times 1.37 = \7981
 Material cost = \$250
 Overhead cost = $250 \times 9.90 = \$2475$
 Total = \$10706

Where the general market rate for this work is a gross profit percentage of 20%, what nett profit would occur if the project is won at market rates?

$$\frac{\text{Direct cost}}{80} \times 100 = \$10289$$

$$\text{Nett profit at 20\% margin} = 10289 - 10706 = \text{nett loss of } \$417.00$$

For this exercise, the ratio of material to labour cost is

$$250 : 7981 = 1 : 32$$

Exercise No.	Hourly overhead burden	Assumed market rate	Material to labour ratio	Nett profit	Labour hours required
1	\$9.90	20%	1.13:1	\$1062	150
2	\$9.90	20%	1:3.8	\$46	250
3	\$9.90	20%	8.6:1	\$1603	24
4	\$9.90	20%	1:32	- \$417 LOSS	250

Exercise 5

Hourly cost of labour = \$33.00 plus 40% on costs = \$46.20
Sale value must include overhead loading = \$27.00 per hour.
therefore minimum hourly sale value = \$46.20 + \$27.00 = \$73.20
Minimum margin = $\frac{\$27.00}{\$73.20} = 37\%$

Therefore, any margin above 37% will produce a nett profit. However, as this project ties up labour and does not provide a profit from materials, the margin would need to be substantially above the minimum in order to make it attractive.

Exercise 6

Direct costs Labour = 40 hours @ \$32.00 plus 38% = \$1767.00
Materials = \$4500.00
total estimated direct costs = \$6267.00
overhead allowance = 40 hours @ \$17.00 = \$680.00
Minimum sale value = \$6947.00
Minimum gross profit margin = $\frac{\$680}{\$6947} = 9.8\%$

Therefore, any margin above 9.8% will produce a nett profit

Exercise 7

Direct costs Labour = 120 hours @ \$32.00 plus 38% = \$5299.00
Materials = \$5500.00
total estimated direct costs = \$10,799.00
overhead allowance = 120 hours @ \$17.00 = \$2040.00
Minimum sale value = \$12,839.00
Minimum gross profit margin = $\frac{\$2040}{\$12,839} = 15.89\%$

Therefore, any margin above 15.89% will produce a nett profit

Exercise 8

Direct costs Labour = 100 hours @ \$32.00 plus 38% = \$4416.00
Materials = \$3500.00
total estimated direct costs = \$7,916.00
overhead allowance = 100 hours @ \$27.00 = \$2700.00
Minimum sale value = \$10,616.00
Minimum gross profit margin = $\frac{\$2700}{\$10,616} = 25.5\%$

Therefore, any margin above 26% will produce a nett profit

SECTION 6

PREPARING A QUOTE TO BE OFFERED TO THE CLIENT

The quotation to be offered to the client includes the bid price and all the trading conditions that apply to the contractors' offer.

The following pages provide guidance in the formulation of a quotation to be offered to a client.

The items detailed in these pages do not, and cannot cover the infinite number of variables that occur in day to day contracting. Therefore, it is essential that you develop your own, or use professionally developed quotation forms, such as those available through NECA.

For major jobs purpose designed contacts, such as "AS 2545 Subcontract Conditions" should be used.

Part 2 of this book addresses the use of contacts during the formation of the agreement and the ensuing progress of the work.

By definition, a contact is based on the acceptance of an offer, which means that a poorly constructed offer leads to a weak contract, leaving the contractor vulnerable to non payment.

OFFER + ACCEPTANCE = CONTRACT

While the majority of clients are reputable, and seek a good job for a just payment, there remains a significant number of clients that will avoid payment of claims if the option is available.

In many cases, large clients such as major building companies take the view that non payment, or prolongation of payment, is simply good business practice. The company can make good use of the trading capital that holding sub contractors funds can provide.

As the contracting industry operates on small profit margins, the impact of non payment by any customer has a significant effect, leading to a considerable amount of further trading to recover to the financial position that existed before the job was commenced.

The quote or offer to the client

The following pages contain an example of quotations that may be provided to a client.

The quote should include at least the following items :

- the price in words and numbers
- the clients name, company, title etc.
- the date of the offer
- a description of the works
- details of drawings, plans etc., including plan and revision numbers from which the quotation has been derived
- items specific to the work, especially variations to the plans and specification
- reference to the standard conditions of tender, ensuring that they become an integral part of the contract
- name of the contracting operation, with address, phone, fax etc.
- provision for a signature by the contractor

For smaller projects, where the quotation may be used as the contract, provision must also be made for :

- the clients name and title
- the client company name (if applicable)
- the date of signing
- signatures of all parties to the contract

Note that NECA has a pro forma quotation document, in triplicate pad format, available to members at an economic rate. These are suitable for small to medium jobs, as well as service work. Standard conditions of trading are detailed on the rear of each form.

USING A STANDARD FORM OF QUOTATION

A standard quotation form can be developed, for use with most quotations, thereby reducing the work and time required to formulate the offer to the client.

Since the quotation (or offer) to the client is likely to become the basis of any contract formed between the contractor and the client, the document must include all items designed to provide a safe trading environment for the contractor.

Items that must be included in the offer include at least the following –

- the contractors name and details (address, license number, phone numbers etc)
- the clients name and details
- the date of the offer
- a description of the work to be performed under the contract
- the price, in both words and figures
- reference to trading conditions such as those in a standard conditions statement
- any variations between the offer and plans/specifications belonging to the job
- a date fixing the duration of the works, where the offer is a fixed price
- sales wording, designed to promote the offer to the client

A sample of a standard letter, to be used as a quotation is supplied on the following page. This offer is provided as a quotation for the electrical work associated with the building of a group of town houses, for which the client has provided a set of plans and specification.

The contractor has established that the project is expected to commence in March, and be completed by the end of October of the same year. A fixed price has been requested by the client. As a consequence, the contractor has allowed to cover until the end of the following month, but requires adjustment should the project take longer.

Reference is made to the standard conditions of tender, ensuring that they become a component of any contract based on this quotation.

Details specific to the job are included, such as the use of different light fittings to those specified.

Note that the contractor has not allowed to supply the ranges or water heaters, transferring the responsibility to the client for the supply and delivery of these expensive items. This reduces the on site risks for the contractor in a work area where the items may be stolen or damaged during the work period.

Note that the contractor has used the requirement for RCD protection as a chance to promote the offer to the client.

DESTRUCTION ELECTRICS PTY LTD

1 Bankruptcy Place, Richville 8266

Phone 89666 666

LICENCED ELECTRICAL CONTRACTORS

Lic No. EC 999

To : Amazing Developments
3 Affluence Street
Lootville 8222

Date : 2nd Feb 2010

Attention : The Manager
Re : Town House Development, Crowd Street, Crampedville

Dear Sir,

Please find below our bid price for the electrical installation work to be carried out at the above project. The bid covers that work detailed in the plans and specification supplied, with the following notations :

- (a) The bid is based on the information detailed on plans 1 and 2, no issue number.
- (b) We allow for Alto Cat No. XYZ exterior lights in lieu of the specified Acme Outsider fittings, which appear to be unavailable at the time of tender.
- (c) We allow to use TPS cabling, as per AS/NZS3000 Wiring Rules and standard trade practice, in those areas not requiring conduit for cable installation. Where used, conduit shall be PVC with PVC cabling, as per specification.
- (d) We allow, at no extra cost, to use DIN style safety switches on all light and power circuits. This will allow the residents simple resetting in the event of misuse or overloads, and also allows for a neater, more compact switchboard in the individual units. We remind you that a suitable location will need to be provided for the switchboards within the kitchen cupboards.
- (e) We include for the following items :
 - (i) All light and general power installation
 - (ii) Connection to, but not supply of ranges and water units etc.
 - (iii) Approved telephone block cabling system
 - (iv) Balanced colour television aerial system
 - (v) Overhead mains connection to the installation

Our bid price for this work is FOURTEEN THOUSAND NINE HUNDRED DOLLARS - \$14,900.00.

This price may be considered as a fixed price up until 30/11/2010 after which we reserve the right to claim variation to the price, based on rise and fall as per NICAP building industry indices.

We trust that you find the above to be to your satisfaction, and remain most willing to respond to any further enquires you may have.

Yours faithfully,

I. Madill

Standard conditions of tender

There is a wide range of variables or “what if” conditions that can have a serious impact on the costs to perform contract works. These include, but are not limited to :

- asbestos or other hazardous materials on site
- possible changes to GST or other taxes
- changes to wage rates/labour cost
- changes to employment conditions/labour cost
- non compliance of existing installation wiring, switchboards etc.
- industrial action
- changes to costs related to supply authority requirements

Considerations such as those above, and many others, apply to most contract jobs, and can be addressed by developing a “standard condition of tender” that applies to all quotes issued by the contracting operation. This greatly reduces the time and effort required in developing quotations.

The importance of a well detailed contract cannot be over emphasised.

A fully detailed contract is the first line of defense against non payment by a client.

Unfortunately, there are a significant number of clients that will attempt to avoid payment for work, often by fabricating a dispute as the reason for non payment. In other cases, the client may have insufficient funds to pay all contractors on site, resulting in those with a strong case being paid in preference to others.

Other customers (such as large building contractors) may simply try to keep the sub contractors money for as long as possible, using it as trading capital or investment funds.

Consider this anecdotal story

Kenny, an electrical contractor, observed that his mate Smithy seemed to be in serious financial trouble. Smithy was a great salesman, who had gone into business selling cleaning chemicals to the contract cleaning industry. Unfortunately, Smithy had sold large amounts of stock to cleaning contractors that could not or would not pay their debts, leaving Smithy unable to pay his suppliers.

When Kenny said to Smithy “I guess you mustn’t sleep at night with all these problems” Smithy replied “what problems”? I owe them money and can’t pay it – they are the ones with the problems!

Smithy said – “That’s Murphy’s Golden Rule – whoever has the gold, rules”.

i.e. the person that owes the money is in charge of the situation.

Without a correctly detailed contract, the contractor is at the mercy of the client.

In NSW, the Office of Fair Trading has established a maximum value for work that can be done without a written contract.

This amount is \$ _____
(available from the internet) at

As a contract cannot contain an illegal act, where a contractor does work for a value greater than that above, without a written contract, the customer is under no obligation to pay for the work.

Consider this anecdotal story

Ray, an electrical contractor and air conditioning installer went to the home of a wealthy client to install a window mounted air conditioner. He did the job without a written contract. When he had completed the work the client congratulated him on the job, and said "While you are here, I will get you to do some more work, such as"

This resulted in Ray returning each day for the next week to do more jobs in the premises. Each day Ray provided an update of the costs.

When all the work was completed, Ray presented a carefully detailed invoice for the work, which the client casually tore in half, handed back, and said "Thanks for a good job, pity that I wont pay you for it. You should have got me to sign a written contract."

Another consideration for most work is that materials, once delivered to site, become the property of the client, regardless of payment. i.e. materials cannot be removed from site in the event of non payment.

Obtaining progress payments as the work proceeds is an effective method of minimising the impact of non payment. The contractor has effective bargaining power while the work remains incomplete, but only the power of the contract once the work is complete. Note that it is a breach of law to over claim (claim for work not yet performed). However, contractors are permitted to ask for advance payment for some types of work, but only for a small part of the contract value (see Office of Fair Trading site).

Further study of contracts and related issues it is recommended if you are considering a career in electrical contracting.

The following page contains samples of clauses that may occur in specifications.

Following from that are samples of clauses that be used in the formulation of a "Standard Conditions of Tender"

TYPICAL CLAUSES FROM SPECIFICATIONS, AND THE POTENTIAL IMPACT ON PAYMENT.

Below are some typical clauses that appear in specifications associated with electrical contracting work, and their potential impact.

Note that where the client makes a deduction from the contractors' claim, the deduction(s) often occur from the final claim, after the works have been completed, and the contractor has minimal bargaining power.

TYPICAL CLAUSE FROM A SPECIFICATION OR CONTRACT	IMPACT ON TRADING FOR THE ELECTRICAL CONTRACTOR
1 All work is to be carried out in a neat and orderly manner, to the satisfaction of the architect or his appointed representative. Any work deemed to be of a sub standard nature shall be repaired or replaced to the satisfaction of the architect at no cost to the client	If the customer intends to use a condition of dispute to avoid or prolong payment, this contract condition provides an opportunity. A mechanism for appointing an independent arbitrator is essential, to force resolution of the dispute, and payment.
2 It shall be the contractors responsibility to ensure the works comply with all relevant standards and authority requirements. No claim for additional costs through authority requirements will be allowed.	What if there is an increase or new fees for supply authority work, such as mains connection, inspection fees, etc. What if there is an increase in GST or other taxes and fees.
3 All work shall be carried out by qualified tradespersons, under the employ of the contractor	This excludes the use of apprentice or trades assistant labour resources. It also excludes the use of sub contractors
4 The contractor shall maintain competent tradespersons on site at all times during the progress of the works	This means that tradespersons must be on site, regardless of availability of useful work. The contractor becomes liable for unexpected costs incurred by the client that may have been avoided if the contractor was on site
5 The bid submitted shall be a fixed price not subject to variation without the written authorisation of the architect or his representative	The contractor is unable to claim costs where the project goes on for an unexpected length of time
6 The contractor shall be liable for the repair of any damage to any surfaces for the duration of the project	The client is in a position to deduct money from the contractors' payment for any damage, without proof of the source of the damage
7 This contract shall include all items included in the specification and plans, and all other items deemed obvious, but not necessarily detailed	The contractor is placed in a position of being required to pay for items that have occurred through omissions in the design, etc.
8 The contractor shall provide for all site storage and amenities required in the performance of the works	The client can deduct money for the use of toilets, car parking, lunch rooms, and for the provision of a first aid person or equipment, temporary power supply, scaffolding, hoists etc.
9 The contractor shall co-ordinate with the works of other trades, and will be liable for costs incurred through delays to the works	The contractor will need to be in constant contact with all other trades, relieving the client of the responsibility to co-ordinate and run the job, and become responsible for delays caused by other trades or other circumstances
10 All materials and installation practices shall be in conformity with appropriate standards and regulations, and this specification	Where the specification calls for an item that is not available or impractical, and the contractor provides a similar item without written consent of the client, the contract is incomplete, resulting in a possibility of non payment.

TYPICAL CLAUSES FOR A "STANDARD CONDITIONS OF TENDER"

**DESTRUCTION ELECTRICS PTY LTD
STANDARD CONDITIONS OF TENDER**

Unless specifically stated otherwise, the following standard conditions of tender shall apply to this and all other tenders issued by this firm.

This tender is open for acceptance for a period of 30 days from date of tender. After that period we reserve the right to vary the bid in line with our current trading conditions.

This quotation is based on a 38 hour working week. We reserve the right to claim additional costs for works performed outside normal industry trading hours.

Trading terms are strictly C.O.D or 7 day terms from date of invoice. We reserve the right to suspend works or cancel further works without jeopardising the claims due should payment of claims become overdue.

It shall be the responsibility of the client to provide a safe workplace for the employees of this firm. Where hazards such as toxic materials or unsafe working environments exist, this firm shall be paid additional costs, and reserves the right to suspend the works until such time as the hazards are removed.

Where this bid includes trenching, it shall be for excavation works in soft soil only. Works involving rock or heavy rubble excavation shall constitute a variation to the bid price.

While every attempt to conform to the works schedule will be made, this firm does not accept responsibility for delays caused through suppliers inability to provide required materials, or through the action of parties outside the direct control of this firm.

This bid is subject to variation in conformity with the adjustments to material and labour costs specified under NICAP building industry conditions. The base indices shall be those ruling at the time of tender.

This firm reserves the right to claim variation to the bid in the event of changes to statutory costs such as sales tax, authority fees, etc.

Works will be performed under the supervision of suitably licensed tradespersons, to the standards of normal trade practice, and to the satisfaction of the appropriate supply authority. We reserve the right to use apprentice or other trained labour resources, as per normal trade practices. We allow to maintain staff on site only at those times that suitably productive work is available.

The bid allows for the supply and use of all tools and equipment required under normal electrical trade practices. It does not allow for the supply of site facilities such as toilets, meal rooms, electricity, scaffolding, hoisting, parking and storage. It is reasonably assumed that such items will be supplied by others.

In the event of dispute, this firm reserves the right to claim arbitration through a third party. Unless otherwise agreed, the third party will be a person appointed by NECA. Where resolution of dispute results in costs, those costs will be born by the client.

NOTE THAT THIS LIST IS AN INDICATION OF THE TYPE OF TENDER CONDITIONS THAT MAY BE ADDRESSED USING A STANDARD CONDITIONS OF TENDER. IT IS NOT A COMPLETE LIST AND SHOULD NOT BE USED IN TRADING.

NECA produces a range of pro forma contracts, at a nominal cost for members, with standard conditions on the reverse side.

NECA also provides contract and legal advice to its members, including assistance with debt recovery etc. Members are alerted to difficult clauses that appear in contracts within the industry, and advised of procedures to work with various forms of contract.

An example of trading conditions is available on most delivery dockets from electrical wholesalers (TLE, Turks, L & H etc.). As these are usually available to non managerial staff, such as site personnel, it is recommended that you ask for access to the delivery docket, and read the conditions on the reverse side.

SECTION 7

ADDENDUM

ANCILLIARY INFORMATION FOR STUDENT EXERCISES

This section provides some information to assist in the student work associated with the learning for UEENEEC003 'Prepare quotations for service or installation jobs'

A limited number of labour units for a range of tasks is included, to allow practice with unit rate method estimating.

These rates are for exercises only, and must not be used for actual applications in the marketplace. These rates have not been evaluated against actual work.

Fully detailed rates for unit rate estimating are available from the NECA Manual of Labour Units, available through most NECA offices.

LABOUR UNITS – ADDENDUM

The labour units included below are intended as an addendum to the manual used in the practical part of this course.

The labour units specified are not to be used in actual workplace applications without rigorous assessment.

No responsibility is accepted for the accuracy of these units.

TASK		Unit	Labour hours
1	Fit 2x36 watt troffer fluorescent to T bar ceiling. Lights pre wired with flex and plug	ea	0.20
2	Fit 2x36 watt troffer fluorescent with emergency pack to T bar ceiling.	ea	0.83
3	3 pin surface socket, loom wiring above suspended ceiling	ea	0.25
4			
5	3 channel skirting duct – body (back plate)	m	0.4
6	3 channel skirting duct - cover	m	0.1
7	3 channel skirting duct – internal corner	ea	0.3
8	3 channel skirting duct – external corner	ea	0.3
9	3 channel skirting duct – socket outlet kit	ea	0.2
10			
11			
12	4 pr Cat 5 LAN cable	m	0.04
13	Terminate 4 pr Cat 5 cable	ea	0.17
14	RJ 45 outlet single jack and plate	ea	0.36
15			
16			
17			
18			
19			
20			

To access a range of researched labour units, refer to the NECA sponsored Manual of Labour Units, available through NECA offices in Australia and New Zealand

STUDENT EXERCISES

Select the best of the provided answers for the following questions.

Question 1

The purpose of estimating is to

- (a) determine the profit in a job
- (b) forecast the direct cost of labour and materials for the work
- (c) forecast the number of items of material in a job
- (d) allow for overhead costs in a job

Question 2

Gross profit margins are best expressed as

- (a) a percentage of the direct costs of a project
- (b) the amount of profit, in dollar terms
- (c) the profit after overhead costs have been deducted
- (d) a percentage of the sale value

Question 3

Gross profit is

- (a) the profit available after direct costs have been deducted from the sale value
- (b) the profit available after all costs have been deducted from the sale value
- (c) an exceptionally large profit
- (d) the profit after overhead costs have been deducted

Question 4

The purpose of reconciliation for estimating purposes is to

- (a) provide a quicker estimating method
- (b) compare the labour and material components of a project
- (c) determine a price to offer the client
- (d) provide feedback to the estimator

Question 5

The most commonly used estimating method in small to medium sized contracting operations is

- (a) experience based
- (b) unit rate
- (c) historical
- (d) methodic

Question 6

The method of labour estimating that uses a manual of time allocations to specific tasks is

- (a) experience based
- (b) unit rate
- (c) historical
- (d) manual

Question 7

The most commonly used estimating method in large contracting operations, employing full time estimators on large projects is

- (a) experience based
- (b) unit rate
- (c) historical
- (d) methodic

Question 8

In general, for contracting work in NSW the maximum value of work that can be done without a written contract is

- (a) \$1000.00
- (b) \$100.00
- (c) \$5000.00
- (d) non of the above

Question 9

In general, for contracting in NSW, a written contract

- (a) must be signed by both parties
- (b) need be signed by the client only for domestic work
- (c) is not required for domestic work
- (d) is not required for commercial work

Question 10

A contract is based on

- (a) any payment for services rendered
- (b) acceptance of an offer
- (c) any agreement between two parties
- (d) any agreement between two or more parties

Question 11

Estimating of labour in a project is done in 'hours' for the purpose of

- (a) forecasting the labour cost of the project
- (b) allowing adjustments for productivity influences
- (c) facilitating a reconciliation process
- (d) all of the above

Question 12

'On costs' for labour are calculated as a percentage of wages to

- (a) allow simple use when estimating
- (b) avoid recalculation in the event of a change in wage rates
- (c) avoid recalculation in the event of a change in working conditions
- (d) line up easily with profit, when expressed as a percentage

Question 13

The direct cost of materials is the

- (a) actual price paid by the contractor for the materials
- (b) trade list price for the materials
- (c) retail list price for the materials
- (d) value of materials as sold to the client

Question 14

Where more than one productivity factor applies to the estimated labour hours the

- (a) factors are added numerically
- (b) factors are subtracted from each other
- (c) factors cancel each other
- (d) factors are compounded by multiplying

Question 15

Productivity factors are applied to the estimated hours by

- (a) multiplying the hours by the factor(s)
- (b) dividing the hours by the factor(s)
- (c) adding the hours to the factor(s)
- (d) subtracting the factor(s) from the hours

Question 16

When estimating labour for a project, using experience based methods, labour is based on the productivity of

- (a) the slowest employee in the group
- (b) an employee regarded as 'typical'
- (c) the fastest employee in the group
- (d) an average for the group of employees

Question 17

A factor influencing labour estimating is

- (a) the number of workers on a site
- (b) multi storey construction
- (c) temperature
- (d) all of the above

Question 18

The type of project that requires the highest gross profit margins to be profitable is

- (a) work with a high materials content
- (b) work with a low materials content
- (c) labour only work
- (d) work with a low labour content

Question 19

The purpose of a 'standard conditions of tender' is to

- (a) reduce the amount of effort required when formulating an offer to the client
- (b) allow compliance with Australian Standards
- (c) ensure the tender complies with standard conditions
- (d) detail the clients requirements and specifications

Question 20

The body that regulates electrical contracting in NSW is

- (a) Standards Australia
- (b) NECA
- (c) Consumers Advocacy
- (d) Office of Fair Trading

CALCULATION BASED QUESTIONS

Exercise 1

An installation job has been estimated to have the following components –

Direct costs – materials -\$4200

labour – 40 hours

The trading structure of the company has

labour cost - \$28.00 per hour + 38% on cost

overhead burden of \$14.00 per working hour

Determine the nett profit available from the job if it is won at a gross profit margin of 20%

Exercise 2

An installation job has been estimated to have the following components –

Direct costs – materials -\$1200

labour – 40 hours

The trading structure of the company has

labour cost - \$28.00 per hour + 38% on cost

overhead burden of \$14.00 per working hour

Determine the nett profit available from the job if it is won at a gross profit margin of 20%

Exercise 3

An installation job has been estimated to have the following components –

Direct costs – labour – 60 hours (no materials)

The trading structure of the company has

labour cost - \$28.00 per hour + 38% on cost

overhead burden of \$18.40 per working hour

Determine

(a) the nett profit available from the job if it is won at a gross profit margin of 20%

(b) the margin required if the job is to produce a nett profit of \$600.00

Exercise 4

An installation job has been estimated to have the following components –

Direct costs – materials -\$8600

labour – 48 hours

The trading structure of the company has

labour cost - \$32.00 per hour + 40% on cost

overhead burden of \$9.60 per working hour

Determine the nett profit available from the job if it is won at a gross profit margin of 16%

ESTIMATING EXERCISE

Estimate the cost and develop the direct cost to a bid price for the following project -

A three phase supply, comprising consumers mains and main switch board is to be installed to a factory.

The mains cables are to be installed in Cat A conduit in an underground run of 25 metres (cable length), from a kiosk type substation, with a prospective fault level of 22K amps at the sub station terminals.

The estimated maximum voltage drop in any sub circuit within the installation is – 12 volts in three phase circuits, and 8 volts in single phase circuits.

Maximum demand of the installation is 400 amps per phase. The maximum single phase load on any phase is 80 amps. A significant part of the three phase load involves electric welders and computer controlled (CNC) machines.

The sub circuit arrangements in the factory include -

10 x three phase circuits, with a maximum loading of 60 amps on any circuit

15 x single phase circuits, with a maximum loading of 20 amps on any circuit

The best price for supply of a cubicle type switchboard, from Cataclysm Switchboards, is \$15200.00

The switchboard includes all equipment, including 15 spare pole spaces on the circuit breaker panel, for future expansion.

The switchboard will be located in a main switch board room, with a lockable door.

Direct cost of labour is \$25.00 plus on cost of 38%

The hourly overhead burden of the electrical contracting business is \$16.20 per hour

Determine the projected nett profit for the project, if the project is priced on the following market parameters -

Margin on main switchboard (supply only) = 10%

Margin on all other parts of the project = 20%

Where time permits, profit enhancing alternatives to the specified installation method should be investigated.

ESTIMATING EXERCISE INDUSTRIAL SUB MAINS SUPPLY

An electrical contractor, Destruction Electrics Pty Ltd, has been asked by a prospective client, Dodgipay Pty Ltd, to tender on the installation of a set of 300 amp per phase sub mains.

The cabling is to be installed on a 35 metre run of cable tray, fixed directly to the underside of a concrete slab, at a height of 2.4 metres. The cables, with a total length of 40 metres, are to be fixed to the tray with heavy duty cable ties. Cabling may be multicore or SDI cables, copper conductors, with a maximum three phase voltage drop of 6.0 volts.

The cable tray route involves twelve changes of direction, which can be achieved by the use of sire manufactured bends, or overlapping of the cable tray, butting lengths, etc. The cables are to be lugged and fitted to existing switchboards at each end of the route.

The trading structure of Destruction Electrics is as follows –

Total overheads, including regular time lost by the owner/operator on non productive work of \$60,000.00 per annum

Total annual productive hours of – two tradespersons, each with 44.6 weeks, 36 hours per week

One owner/operator, with 44.6 weeks, 24 hours per week

Direct cost of labour = \$25.00 per hour, plus 36% on costs

Step 1 - determine the cable size and tray size that provides the most economic outcome

Step 2 – Estimate the job, using the experience based method, ensuring that each part of the job is costed in a manner that follows the chronological sequence of the project.

Total the labour hours and material costs on the take off sheet.

Step 3 – Using the same material costs, re estimate the labour component using a labour units book

Step 4 – Check the variations that may occur in the labour hours determined in the above steps.

Step 5 – Determine a 'break even' price for the project, using a minimum hourly return method.

Step 6 – Determine a sale price, to be tendered to the client that has a gross profit margin of 20% (expressed as a percentage of the sale price)

Step 7 – Determine the expected nett profit from the project

PART 2

**CONTRACTS,
PROJECT
MANAGEMENT
AND
FINANCIAL
CONTROL
FOR
ELECTRICAL
WORK**

Part 2 of the book addresses operating the business, covering areas such as managing each job as an individual project, involving

- establishing a contract
- using a written contract to form an agreement
- organising and planning labour
- purchasing and supply of materials
- costing of labour and materials
- management of contracts
- variations and associated claims
- progress and final claims
- management of sub contractors
- management of penalty areas such as liquidated damages
- retention and other deductions
- reconcillation of actual costs to estimated costs
- assessment of estimating accuracy and job productivity
- compliance with sales targets

Other areas covered in this part include developing sales budgets, taxation requirements, business structures, management of overheads, etc.

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SECTION 1

FORMS OF CONTRACT

The purpose of a contract is to formalise the agreement between two or more parties that involves the provision of a service for payment.

For electrical contracting, as with most other contracting trades, the agreement usually involves the creation of a functioning new installation, or the repair of an existing installation.

Contracts may be verbal, involving a spoken agreement between the parties where each party describes the component of the contract that they require, and the agreement to provide the component required by the other party.

In electrical contracting work the agreement involves an understanding of the service required, and the amount to be paid for the service. Where all parties state agreement, a legally binding contract can be formed.

However, because there is no fixed record of the details of the agreement, enforcement of the agreement is rarely practical should one or more parties fail to fulfill the required obligations.

From the electrical contractors perspective, some problems that may arise due to the use of a verbal contract are –

- The client misunderstands or forgets the value of money required.
- The person that makes the agreement with the electrical contractor is not authorised to do so, and payment cannot be obtained from the person in charge of finances. This is a common risk in multi domestic situations when work is required in the communal areas, and also occurs in large commercial and industrial sites.
- The client cannot see value for the service supplied, and disputes the sum required. In many electrical jobs most of the work is concealed in order to produce a neat job, leaving the client with little physical evidence to justify the cost.
- The client rejects the hourly rate as too high. Many clients are unaware of the effects of overheads and on costs on the minimum hourly return required by the contractor.
- The client has no intention to pay, and intends to obtain the contractors work without payment.
- Without the availability of an impartial witness disputes in verbal contracts cannot be resolved through legal channels.
- Once the job is finished, the contractor is wholly reliant on the goodwill of the client to secure payment for the work.

In short, for the purposes of professional trading, verbal contracts should not be used.

Written contracts cover a wide spectrum of size and complexity. For small jobs a simple single sheet contract remains viable and cost effective. For jobs of increasing size the time frame introduces complexities such as multiple progress claims, variations to contracted work, changes in costs, liquidated damages and other penalties, etc. and requires a more complex form of written contract.

Since the purpose of a written contract is to protect each party against failure of the other party to perform the required function, the contract must be suitable for use as a legal document in the event of dispute. It must include at least the following parts –

- The names of all parties to the contract
- The signatures of all parties to the contract
- The date on which the contract is formed
- Details of the service to be provided
- Value of monies to be paid
- All conditions associated with the offers of all parties (refer to Section 6 Part 1)

In addition to the basic components listed above, contracts may also contain items such as –

- Time frames for completion of the works
- Fixed or cost variation adjustable price
- Provision for variation to the contracted work
- Use of sub contractors
- Retention monies
- Public liability insurance
- Provisional sums
- Site requirements
- OHS requirements
- Working hours
- Details of documents forming part of the contracted works (drawings and specifications, etc.)
- Defects liability
- Liquidated damages
- Method of progress claims
- Payment schedules
- Method for dispute resolution
- Liability for damage to areas outside the work.

As a general rule, the complexity of a contract reflects the complexity and time frame of the work.

Small jobs have a lower risk value, and can be usually performed using a simple single page contract. Where the job has a relatively low financial impact, and is to be completed in a relatively short time frame, the added expense and time consumed in the development of a complex written contract may not be justified.

Suitable single page contracts can be developed by an electrical contractor, or as an alternative are available through NECA as a service to their membership.

The contracts developed by NECA are in pad form with duplicate copies, so that copies are provided for both the client and the contractor. These contracts include 'standard conditions' on the reverse side of each copy, and are a product of long term development. Some stationery suppliers sell compact work order books that can be used as simple contracts for small jobs. These are suitable for those contractors that restrict trading to very small jobs where the risk of non payment or dispute is known to be negligible.

Large jobs, which usually cover longer time frames, require more detailed contracts. Many large building companies have engaged legal staff to produce contracts suited to their business. As a sub contractor to these building companies, it is wise to ponder the reasoning behind the (expensive) development of customised contracts, and the fairness that this may imply.

If required to enter into a trading relationship based on this style of contract, it is essential that the contract is thoroughly perused prior to signing. Where possible advice on the usage of these contracts should be obtained. The following section of this book provides some guidance in this matter. As a service to its members NECA provides guidance on contracts developed by large builders, with specific guidance on clauses that may disadvantage the contractor.

An alternative to using contracts developed by building companies is **Australian Standard AS 2545 – Subcontract conditions**. This is a well laid out, thorough contract that protects the interests of both parties equally.

Where a fully detailed contract is deemed desirable, this contract can be used for most electrical contracting jobs.

Time spent in obtaining and carefully reading one of these contracts would be a good investment for any existing or prospective trade related contractor.

SECTION 2

CONTENTS AND USE OF CONTRACTS

PURPOSE

The purpose of this section is to provide details of contract components, and precautions that should be considered when undertaking to use a contract that includes those components.

Due to the myriad complexities of contracting work, and the associated contracts, there will be some items that are not covered in this section.

Why use a written contract?

- To comply with regulations such as those legislated by Office of Fair Trading in NSW
- To reduce the risk of dispute between the parties
- To reduce the risk of non payment by the client
- To provide a structured method for dispute resolution
- To provide a mechanism for the legal recovery of outstanding funds
- To enhance the professionalism of the contractor

Which two of the above items would an electrical contractor rate as most important?

In the event of non payment, the contractor must begin procedures for the recovery of the outstanding funds. Since few contractors are competent in the intricacies of debt recovery and the associated legal requirements, in many cases the contractor is best advised to enlist the services of a mercantile agent (debt collector) to recover the funds. The success of this process depends heavily on the quality of the written contract that has been used. Where the documentation is of sufficient quality the costs for the collection are levied against the contractors client, and interest is claimed for the duration of the non payment period.

There are a number of clients that will avoid payment where possible (termed 'professional debtors') who are aware of legal processes and the penalty cost risks associated with those processes.

Where the contract is suitably professional, the issue of a letter of demand by the contractor or collection agent regularly results in a quick payment of the debt, and avoids court costs for the threatened party.

The following pages cover many, but not all, items included in contracts, with explanatory notes and cautions that apply to each item.

Many of these items can be satisfactorily addressed by inclusion in the offer to the client, as standard conditions of tender.

CLASS NOTES