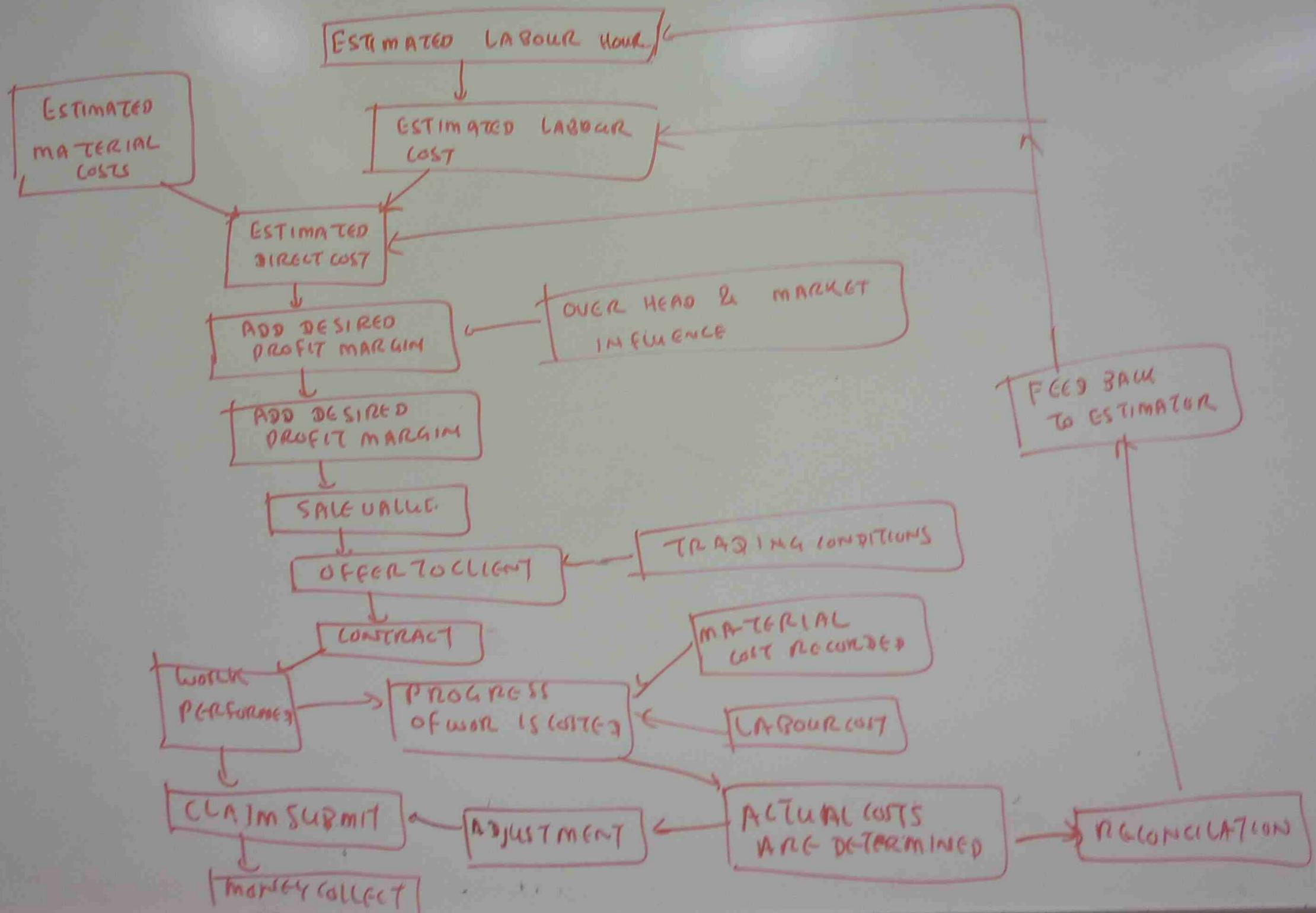


MANAGING THE INSTALLATION PROJECT



ESTIM
 A FOR
 LABOUR
 AND AS
 TO PE
 QUOTE
 THE
 CLIE
 TH
 A
 T

ESTIMATE

A FORECAST OF THE EXPECTED LABOUR & MATERIAL COMPONENTS AND ASSOCIATED COST TO CONTRACTOR TO PERFORM A SPECIFIC PROJECT

QUOTE

THE PRICE OFFERED TO THE CLIENT

THIS MUST INCLUDE ALL APPROPRIATE CONDITIONS OF TRADING.

Q069 + Q070 + E071 + E024 + MEM09004B

$$\text{ADJUSTED HOUR} = \frac{\text{ESTIMATED HOURS FOR STANDARD PRODUCTIVITY}}{\text{ADJUSTMENT FACTORS}}$$

Pb WHERE SITE CONDITIONS WILL CAUSE A REDUCTION IN PRODUCTIVITY TO 90% OF NORMAL AND THE PROJECT HAS AN ESTIMATED LABOUR CONTENT OF 500 HR. THE TOTAL LABOUR HOURS MUST BE ADJUSTED TO REFLECT THE EXPECTED ACTUAL OUTCOME.

$$\text{EXPECTED HOUR} = \frac{500}{\frac{90}{100}} = \frac{500}{0.9} = 556 \text{ HR}$$

$$\text{CREW SIZE} = 0.9$$

$$\text{MULTI STOREY} = 0.85$$

$$\text{HIGH TEMPERATURE} = 0.8$$

$$\begin{aligned} \text{TOTAL ADJUSTMENT} &= 0.9 \times 0.85 \times 0.8 \\ \text{FACTOR} &= 0.612 \end{aligned}$$

MEM 09004B

HOURS FOR STANDARD PRODUCTIVITY
ADJUSTMENT FACTORS.

CAUSE A REDUCTION IN PRODUCTIVITY
PROJECT HAS AN ESTIMATED LABOUR
TOTAL LABOUR HOURS MUST BE ADJUSTED
TOTAL OUTCOME.

$$\frac{500}{0.9} = 556 \text{ HR}$$

$$\text{TOTAL ADJUSTMENT FACTOR} = 0.9 \times 0.85 \times 0.8 = 0.612$$

GRADING POINTS RATING

	RATING
1 SKILLED TRADE PERSON	100
2 FIRST YEAR APPRENTICE WITH 10 MONTHS EXPERIENCE	60
3 4 th YR APPRENTICE	90
4 LEADING HAND, HIGHLY MOTIVATED	120
5 POOR WORK ETHIC	60
6 TRADE ASSISTANT GOOD WORK ETHIC	80

TOTAL 510

$$\text{AVERAGE} = \frac{510}{6} = 85$$
$$0.85$$

THE ESTIMATE MUST PROVIDE FOR THE
PROCESS OF COMPARING ESTIMATED TO
ACTUAL LABOUR AND MATERIAL COSTS.

ESTIMATED
LABOUR HOUR
USED FOR THE
WORK

ESTIMATED LABOUR
COST TO DO THE
WORK

ESTIMATED COST OF
MATERIALS TO DO
THE WORK

RECONCILE
ACCURATE

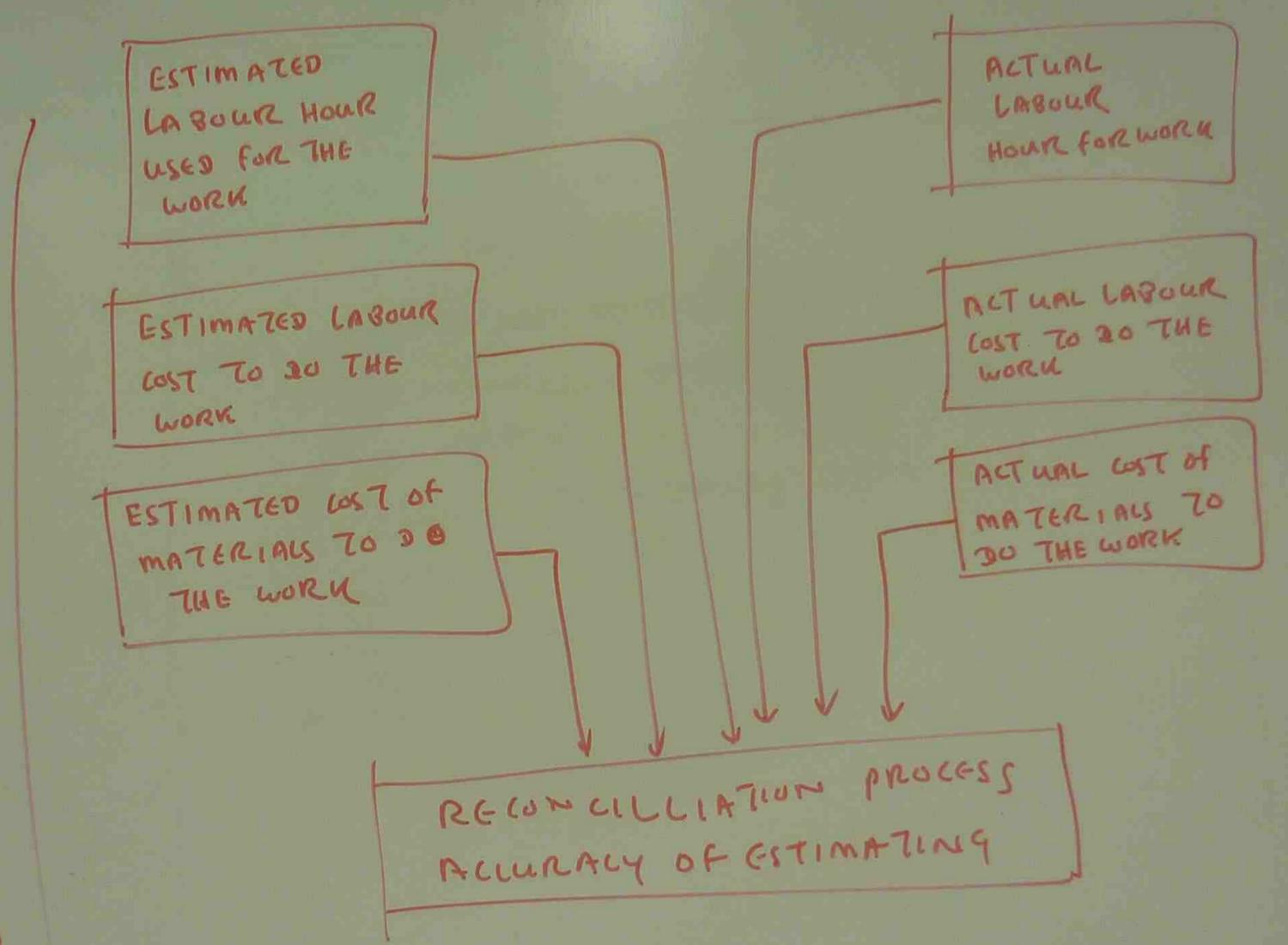
POINTS RATING

	RATING
AGE PER SON	100
APPARENCE	60
MONTHS EXPERIENCE	90
EXPERIENCE	120
EDUCATION, HIGHLY MOTIVATED	60
WORK ETHIC	80
TOTAL	510

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

$$0.85$$

ESTIMATE must provide for the
 comparing ESTIMATED TO
 LABOUR AND MATERIAL COSTS.



TAKE OFF SHEET

JOB NAME _____
 JOB DESCRIPTION _____

DETAIL	QTY	MATERIAL UNIT PRICE

TOTAL LABOUR HOUR _____
 TOTAL LABOUR COST _____

JOB QUOTATION

JOB NAME _____
 JOB DESCRIPTION _____

DETAIL	QTY	MATERIAL UNIT PRICE

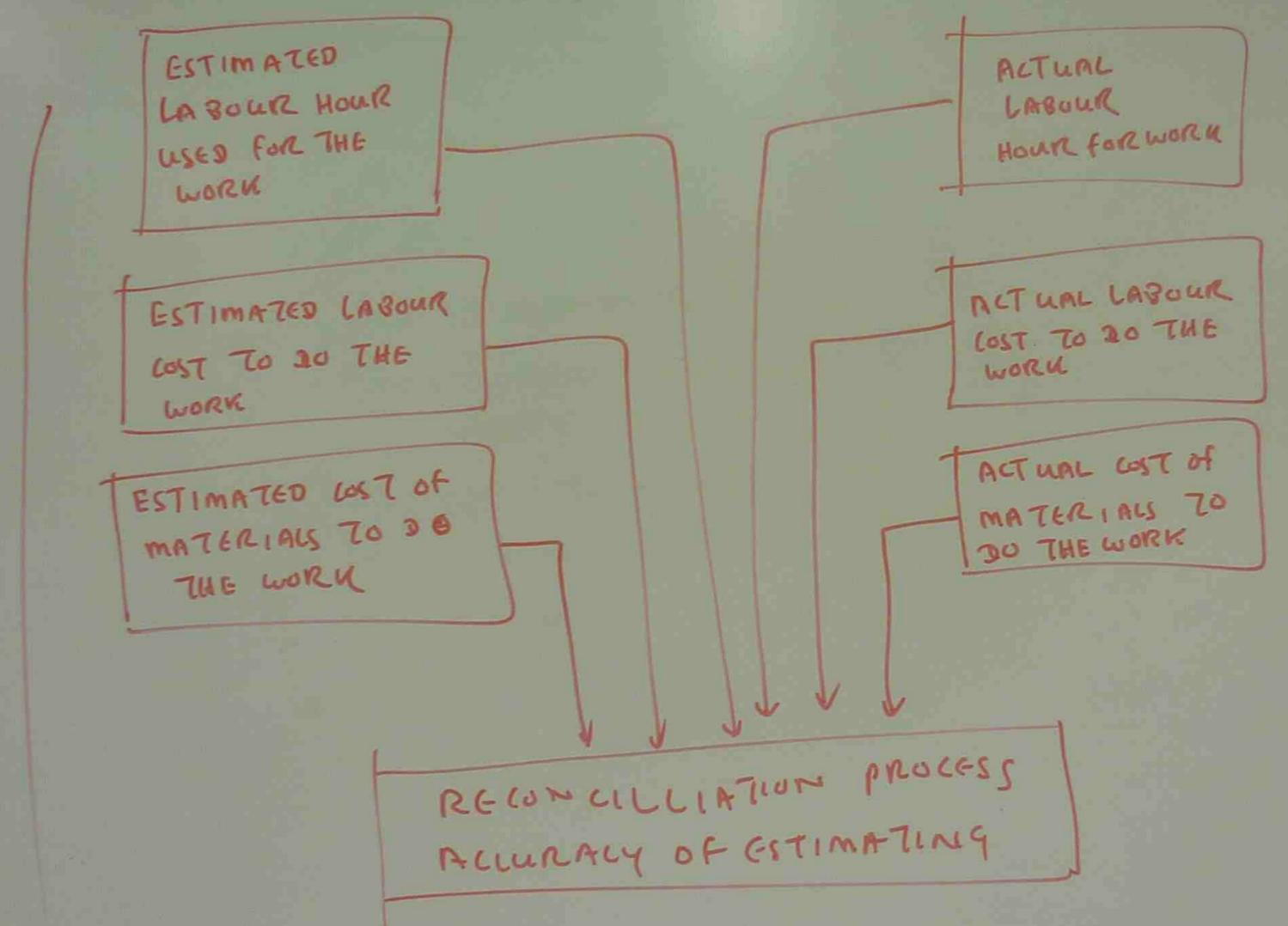
TOTAL HOUR _____
 PLUS MATERIAL COST _____
 JOB DIRECT COST _____

BREAK EVEN = DIRECT COST / (SALES PRICE - VARIABLE COST)
 NET PROFIT = SALES - TOTAL COST

RATING

100
60
90
120
60
80
TOTAL 510
85
0.85

provide for the
 ing estimated to
 and material costs.



TAKE OFF SHEET

JOB NAME _____
 JOB DESCRIPTION _____

DETAIL	QTY	MATERIAL UNIT PRICE	PER	MA EX

TOTAL LABOUR HOUR _____ TOT
 TOTAL LABOUR COST _____ @
 TOTAL COST

JOB QUOTATION TAKE OFF

JOB NAME _____
 JOB DESCRIPTION _____

DETAIL	QTY	MATERIAL UNIT PRICE

TOTAL HOUR _____ + ADJUSTM
 PLUS MATERIAL COST =
 JOB DIRECT COST _____ +
 BREAK EVEN = DIRECT COST _____
 NET PROFIT = SALE - BR

TAKE OFF SHEET

JOB NAME _____

JOB DESCRIPTION _____

DETAIL	QTY	MATERIAL UNIT PRICE	PER	MATERIAL EXTENSION	LABOUR HOUR

TOTAL LABOUR HOUR _____ TOTAL MATERIAL COST _____

TOTAL LABOUR COST _____ @ _____

TOTAL COST

JOB QUOTATION TAKE OFF SHEET

JOB NAME _____

JOB DESCRIPTION _____

DETAIL	QTY	MATERIAL UNIT PRICE	PER	MATERIAL EXTENSION	LABOUR HOUR

TOTAL HOUR _____ + ADJUSTMENT @ P/HR

PLUS MATERIAL COST = _____ + FACTOR

JOB DIRECT COST _____ + MARGIN 20% = SALE PRICE

BREAK EVEN = DIRECT COST _____ + OVERHEAD _____

NET PROFIT = SALE _____ - BREAK EVEN _____

_____ HR @ _____ / HR

ANNUAL HOLIDAY = 4 WK
PAID PUBLIC HOLIDAY - 9 DAYS = 1.3 WK
PAID SICK / FAMILY LEAVE 10 DAYS = 2 WK

TOTAL NON INCOME EARNING = 7.3 WK
WEEKS

INCOME EARNING WEEK = 52 - 7.3 = 44.7 WK

WORKER COMPENSATION INSURANCE FACTOR

8% FOR INSURANCE COVER FOR 52 WK
FOR 44.7 WK

WORKER COMPENSATION ON COST = 8% x $\frac{5}{4}$
= 9.41%

CALCULATING WAGE COSTS

BASE ELECTRICIAN \$32 / HR → \$1

LICENCE ALLOWANCE \$3

TOOL ALLOWANCE \$2

SPECIAL SKILL ALLOWANCE @ \$2.30 / HR

CONSTRUCTION ALLOWANCE

TRAVELLING TIME ALLOWANCE 80%

Hourly RATE = $\frac{1636}{38}$ TOTAL = \$43

TAKE OFF SHEET

JOB NAME _____

JOB DESCRIPTION _____

DETAIL	QTY	MATERIAL UNIT PRICE	PER	MATERIAL EXTENSION	LABOUR HOUR

TOTAL LABOUR HOUR _____ TOTAL MATERIAL COST _____

TOTAL LABOUR COST _____ @ _____

TOTAL COST

JOB QUOTATION TAKE OFF SHEET

JOB NAME _____

JOB DESCRIPTION _____

DETAIL	QTY	MATERIAL UNIT PRICE	PER	MATERIAL EXTENSION	LABOUR HOUR

TOTAL HOUR _____ + ADJUSTMENT @ P/HR

PLUS MATERIAL COST = + FACTOR

JOB DIRECT COST _____ + MARGIN 20% _____ = SALE PRICE

BREAK EVEN = DIRECT COST _____ + OVER HEAD _____

NET PROFIT = SALE _____ - BREAK EVEN _____

_____ / HR @ _____ / HR

ACTUAL LABOUR HOUR FOR WORK

ACTUAL LABOUR COST TO DO THE WORK

ACTUAL COST OF MATERIALS TO DO THE WORK

PROCESSING

ANNUAL HOLIDAY = 4 WK
PAID PUBLIC HOLIDAY - 9 DAYS = 1-8
PAID SICK / FAMILY LEAVE 10 DAYS

TOTAL NON INCOME EARNING WEEKS

INCOME EARNING WEEKS =

WORKER COMPENSATION INSURANCE

8% FOR INSURANCE COST FOR 44.2 WK

WORKER COMPENSATION ON

CALCULATING WAGE COSTS

BASE ELECTRICIAN \$37

LICENCE ALLOWANCE

TOOL ALLOWANCE

SPECIAL SKILL ALLOWANCE

CONSTRUCTION ALLOWANCE

TRAVELLING TIME

Hourly RATE =

OFF SHEET

QTY	MATERIAL UNIT PRICE	PER	MATERIAL EXTENSION	LABOUR HOUR

LABOUR HOUR _____ TOTAL MATERIAL COST _____
 LABOUR COST _____ @ _____
 TOTAL COST _____

QUOTATION TABLE OFF SHEET

DESCRIPTION	QTY	MATERIAL UNIT PRICE	PER	MATERIAL EXTENSION	LABOUR HOUR

LABOUR HOUR _____ + ADJUSTMENT @ P/HR

MATERIAL COST = _____ + FACTOR

DIRECT COST _____ + MARGIN 20% = SALE PRICE

BREAKEVEN = DIRECT COST + OVERHEAD _____
 _____ HR @ _____ / HR

PROFIT = SALE - BREAKEVEN _____

ANNUAL HOLIDAY = 4 WK
 PAID PUBLIC HOLIDAY - 9 DAYS = 1.8 WK
 PAID SICK / FAMILY LEAVE 10 DAYS = 2 WK

TOTAL NON INCOME EARNING = 7.8 WK

INCOME EARNING WEEK = 52 - 7.8 = 44.2 WK

WORKER COMPENSATION INSURANCE FACTOR

8% FOR INSURANCE COVER FOR 52 WK
 FOR 44.2 WK

$$\text{WORKER COMPENSATION ON COST} = 8\% \times \frac{52 \text{ WK}}{44.2 \text{ WK}} = 9.41\% \text{ OF WAGES PAID}$$

CALCULATING WAGE COSTS

- BASE ELECTRICIAN \$32 / HR → \$1216 / WK
- LICENCE ALLOWANCE \$30 / WK
- TOOL ALLOWANCE \$25 / WK
- SPECIAL SKILL ALLOWANCE @ \$2.30 / HR \$87.78 / WK
- CONSTRUCTION ALLOWANCE \$64 / WK
- TRAVELLING TIME ALLOWANCE 80 MIN / 38 HR = \$213.30

Hourly RATE = $\frac{1636}{38} = \$43 / \text{HR}$

TOTAL = \$1636 / WK

F SHEET

MATERIAL UNIT PRICE	PER	MATERIAL EXTENSION	LABOUR HOUR

R HOUR _____ TOTAL MATERIAL COST _____
 R COST _____ @ _____
 TOTAL COST _____

ATION TABLE OFF SHEET

QUANTITY	MATERIAL UNIT PRICE	PER	MATERIAL EXTENSION	LABOUR HOUR

R _____ + ADJUSTMENT @ P / HR
 MATERIAL COST = _____ + FACTOR
 COST _____ + MARGIN 20% _____ = SALE PRICE

N = DIRECT COST _____ + OVER HEAD _____
 = SALE - BREAK EVEN _____ HR @ _____ / HR

ANNUAL HOLIDAY = 4 WK
 PAID PUBLIC HOLIDAY - 9 DAYS = 1.8 WK
 PAID SICK / FAMILY LEAVE 10 DAYS = 2 WK

TOTAL NON INCOME EARNING = 7.8 WK WEEKS

INCOME EARNING WEEK = 52 - 7.8 = 44.2 WK

WORKER COMPENSATION INSURANCE FACTOR

8% FOR INSURANCE COVER FOR 52 WK
 FOR 44.2 WK

$$\begin{aligned}
 \text{WORKER COMPENSATION ON COST} &= 8\% \times \frac{52 \text{ WK}}{44.2 \text{ WK}} \\
 &= 9.41\% \text{ OF WAGES PAID}
 \end{aligned}$$

CALCULATING WAGE COSTS

BASE ELECTRICIAN \$32 / HR → \$1216 / WK
 LICENCE ALLOWANCE \$30 / WK
 TOOL ALLOWANCE \$25 / WK
 SPECIAL SKILL ALLOWANCE @ \$2.30 / HR \$87.78 / WK
 CONSTRUCTION ALLOWANCE \$64 / WK
 TRAVELLING TIME ALLOWANCE 80 MIN / 38 HR = \$213.30

Hourly RATE = $\frac{1636}{38} = \$43 / \text{HR}$

TOTAL = \$1636 / WK

PUBLIC HOLIDAYS

2 WK

44.2 WK → 100%

$2 \text{ WK} \xrightarrow{\quad} = 100 \times \frac{2}{44.2} = 4.52\%$

SICK LEAVE

2 WK

44.2 WK → 100%

$2 \text{ WK} \xrightarrow{\quad} = 100 \times \frac{2}{44.2} = 4.52\%$

SUPER ANNUATION

9% OF WAGE FOR SUPERANNUATION

52 WK → 9%

$44.2 \text{ WK} \xrightarrow{\quad} = \frac{9 \times 52}{44.2} = 10.6\%$

TOTAL OF COST MARGIN

WORKER COMPENSATION	9.41%
LONG SERVICE LEAVE	1.8%
ANNUAL LEAVE	9%
LEAVE LOADING	1.58%
PUBLIC HOLIDAY	4.52%
SICK LEAVE	4.52%
SUPER ANNUATION	10.6%

} = 41-43%

OVER HEADS

- PHONE FAX COSTS
- WAGES FOR SUPERVISORY STAFF
- RENT OF PREMISES
- ACCOUNTANCY COST
- ADVERTISING
- INSURANCE (PUBLIC LIABILITY, FIRE THEFT)

Hourly OVER HEAD BURDEN = $\frac{\text{TOTAL OVER HEAD COSTS}}{\text{ANNUAL PRODUCTIVE HOUR}}$

pb SMALL CONTRACTING OPERATION
TOTAL OVER HEAD \$23000
1150 HR OF PRODUCTION YEAR

Hourly OVER HEAD BURDEN = $\frac{23000}{1150} = \$20/\text{HR}$

SORY STAFF

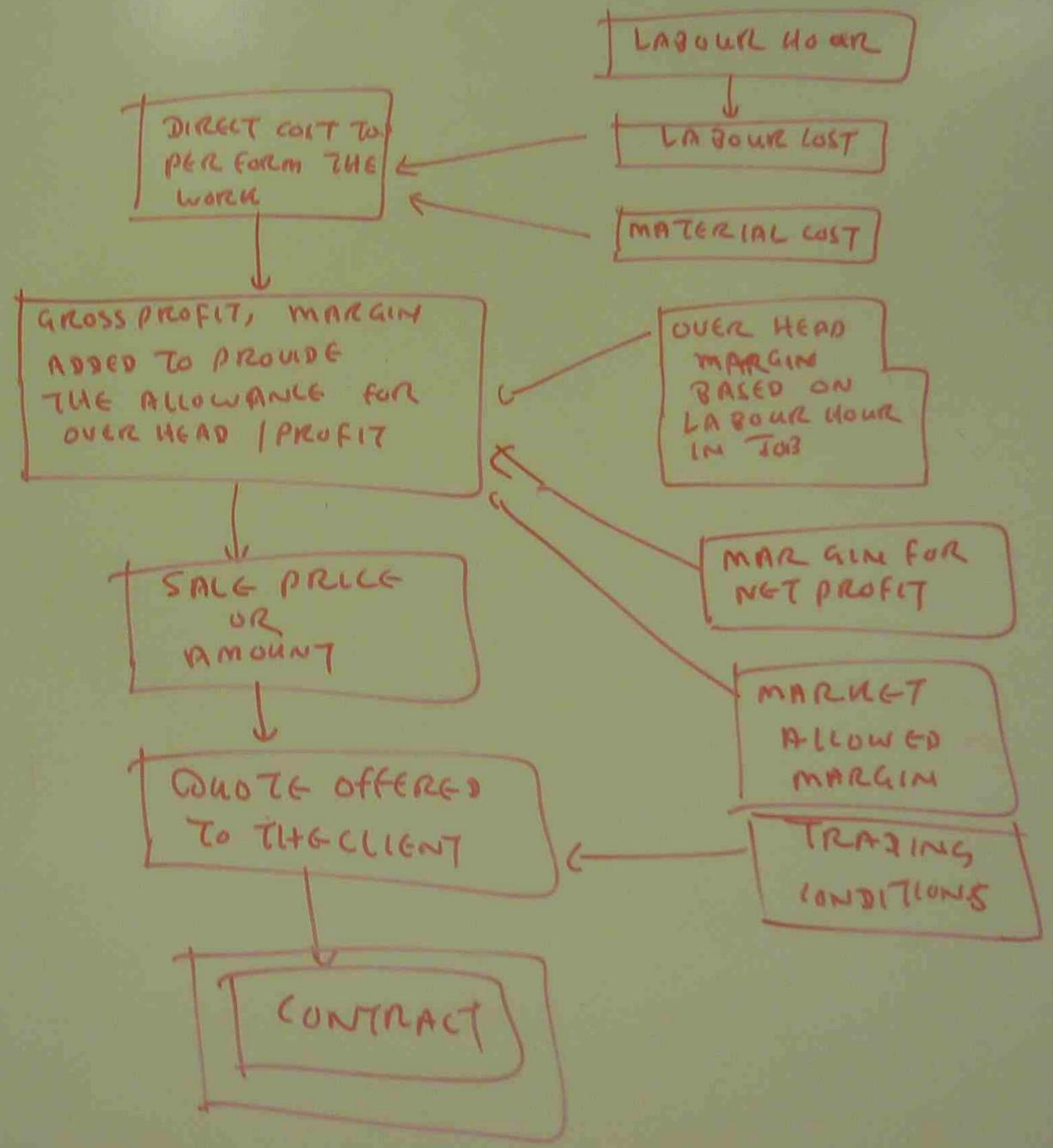
LIABILITY, FIRE
THEFT)

$$P = \frac{\text{TOTAL OVER HEAD COSTS}}{\text{ANNUAL PRODUCTIVE HOUR}}$$

CONTRACTING OPERATION
 OVER HEAD \$23000
 HR OF PRODUCTION 1 YEAR

$$\text{OVER HEAD} = \frac{23000}{1150} = \$20/\text{HR}$$

DETERMINING A MINIMUM SALE VALUE FOR QUOTATION



RECONCILIATION

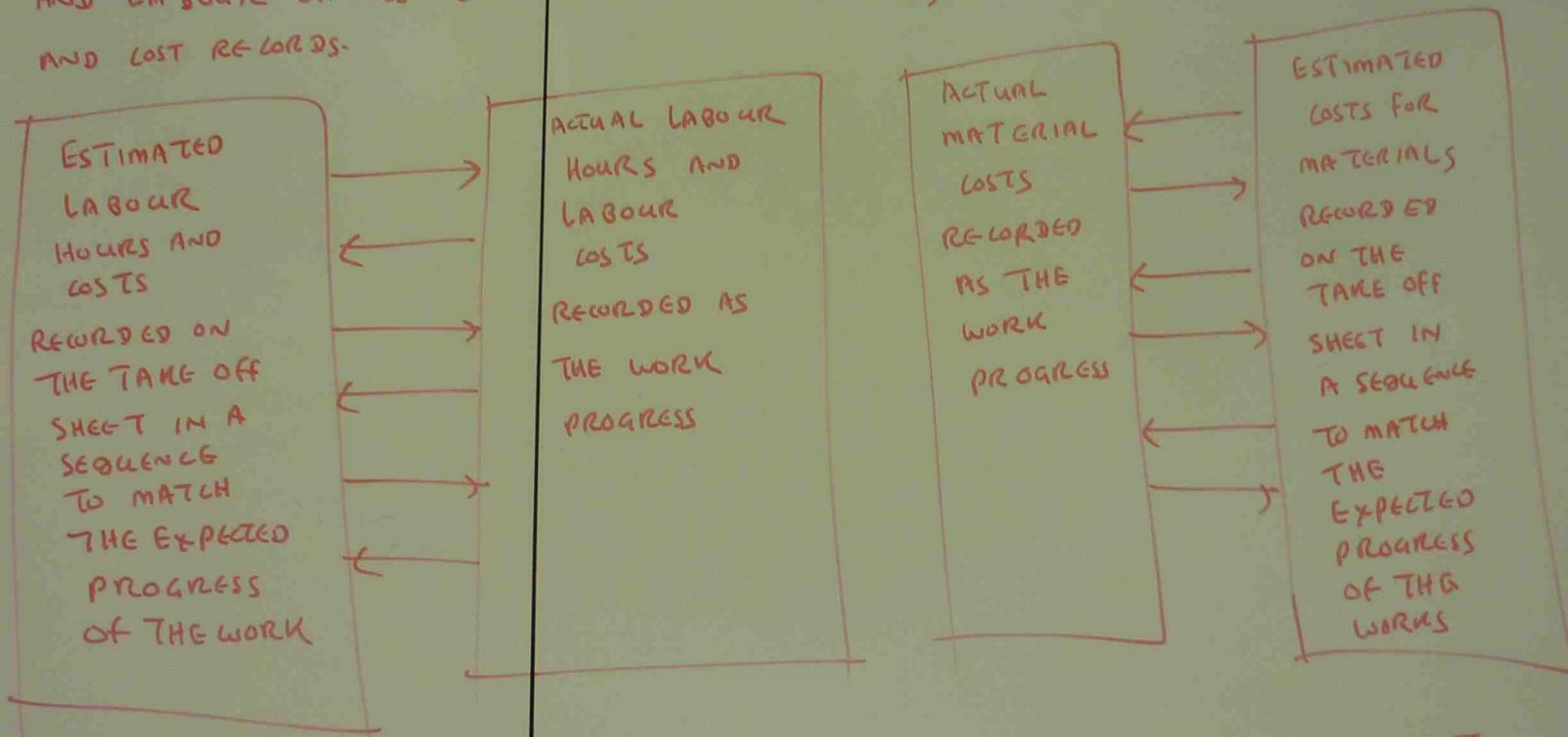
WHERE THE GROSS ESTIMATED VALUE AND LABOUR VALUE AND COST RECORDS.

ESTIMATED LABOUR HOURS AND COSTS RECORDED ON THE TAKE OFF SHEET IN A SEQUENCE TO MATCH THE EXPECTED PROGRESS OF THE WORK

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 SHEETS AND COST RECORDS.



THE RECONCILIATION PROCESS ALLOWS THE ESTIMATOR TO IDENTIFY THE AREAS OF INACCURACY IN THE ESTIMATING PROCESS.

CONTRACT

THE PURPOSE
Two (or) more
PAYMENT

THE CONTENT

- THE NAME
- THE SIGNATURE
- THE DATE
- DETAILS
- VALUE
- ALL

IN ADDITION
CONTRACT

- T

- F

- P

- C

- I

- P

-

-

ME AS THE
MATERIALS
OFF SHEETS

ESTIMATED
COSTS FOR
MATERIALS
RECORDED
ON THE
TAKE OFF
SHEET IN
A SEQUENCE
TO MATCH
THE
EXPECTED
PROGRESS
OF THE
WORKS

ESTIMATOR TO
THE ESTIMATING

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

THE CONTENTS IN THE CONTRACT

- THE NAMES OF ALL PARTIES TO THE CONTRACT
- THE SIGNATURE OF ALL PARTIES TO THE CONTRACT
- THE DATE ON WHICH THE CONTRACT IS FORMED
- DETAILS OF THE SERVICE TO BE PROVIDED
- VALUE OF MONEY TO BE PAID
- ALL CONDITIONS ASSOCIATED WITH THE OFFERS OF ALL PARTIES

IN ADDITION TO THE BASIC COMPONENTS LISTED ABOVE, THE CONTRACT MAY ALSO CONTAIN THE 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 REQUIREMENT
- OHS REQUIREMENT
- WORKING HOURS
- DETAILS OF DOCUMENTS SUCH AS DRAWINGS
- DEFECTS LIABILITY
- LIQUIDATED DAMAGES
- METHOD OF PAYMENT
- PAYMENT SCHEDULE
- METHOD FOR ASSESSING THE WORK

- CONTRACTOR
- COMPLY WITH
- QUALIFIED
- COMPETENT
- BID FIXED PRICE WRITTEN AGREEMENT

MENT BETWEEN
SERVICE FOR

F ALL PARTIES

BOVE, THE

ZKS

PRICE

ED WORK

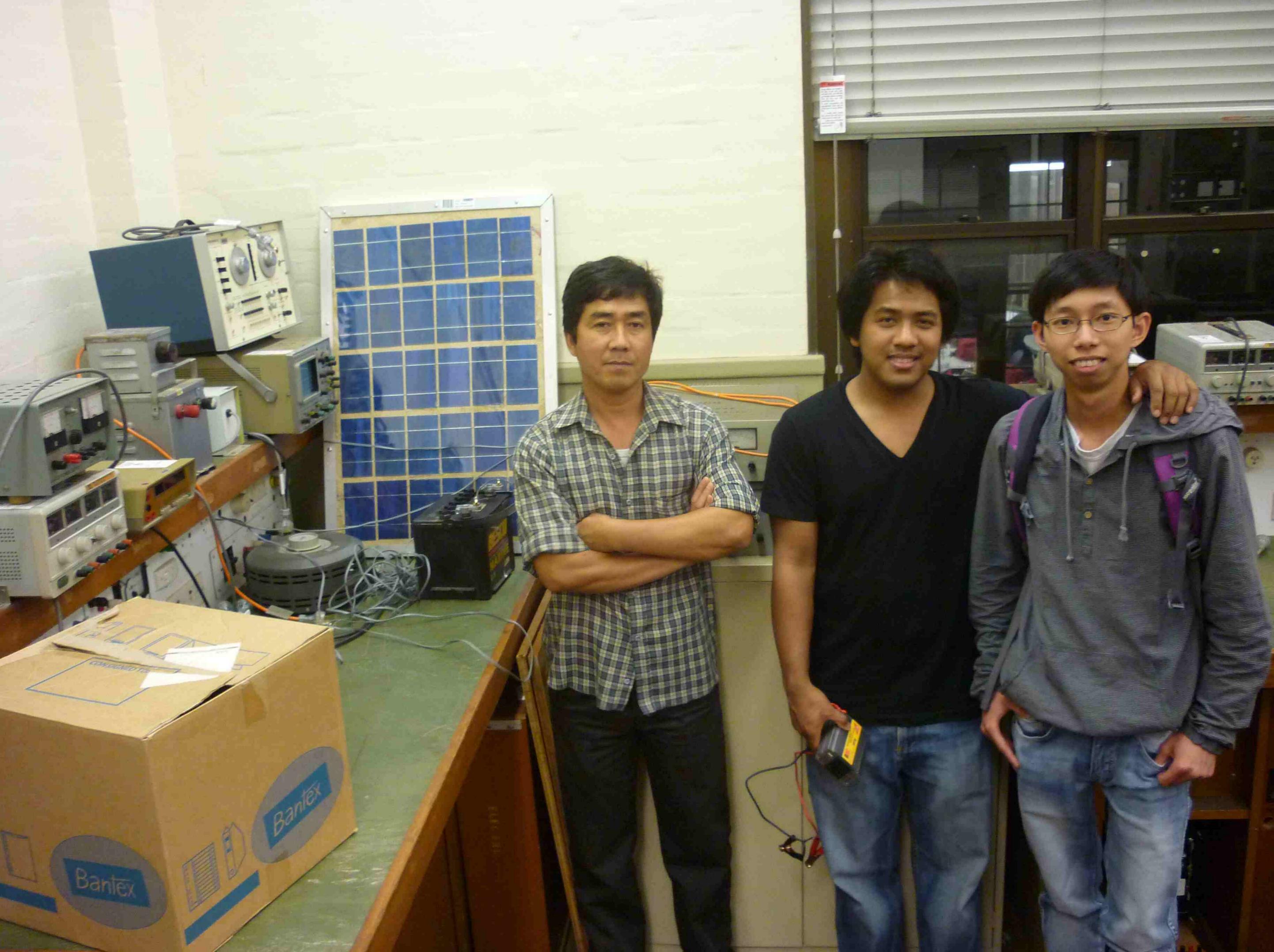
- SITE REQUIREMENT
- OHS REQUIREMENT
- WORKING HOURS
- DETAILS OF DOCUMENTS FORMING THE CONTRACT SUCH AS DRAWING + SPECIFICATIONS
- DEFECTS LIABILITY
- LIQUIDATED DAMAGE
- METHOD OF PROGRESS CLAIMS
- PAYMENT SCHEDULES
- METHOD FOR DISPUTE RESOLUTION
- LIABILITY FOR DAMAGE TO AREA OUTSIDE THE WORK.

- CONTRACTOR - NEAT / ORDERLY WORK
- COMPLY WITH RELEVANT STANDARDS
- QUALIFIED TRADE PERSON
- COMPETENT TRADE PERSON
- B2B FIXED PRICE NO VARIATION WITHOUT WRITTEN AUTHORIZATION

- LIABILITY FOR DAMAGE
- LIABILITY FOR REPAIR
- ITEMS IN SPECIFICATION / TENDER SHALL BE INCLUDED
- SITE STORAGE | MATERIALS
- CO-ORDINATE THE TRADES
- MATERIALS | INSTALLATIONS CONFORM WITH STANDARDS.



Bantex
Bantex
Bantex



Bantex
Bantex
Bantex



6509
ALU ANGLE
30x30x1.5mmx1M





MAINTENANCE
ELECTRONICS

FOR
ELECTRONIC
REPAIR
12V 500mA

100A

DC LOW VOLTAGE

0-50V

COMMON

SUPPLY

PLY

FOR
ELECTRONIC
REPAIR
12V 500mA

ELECTRONICS

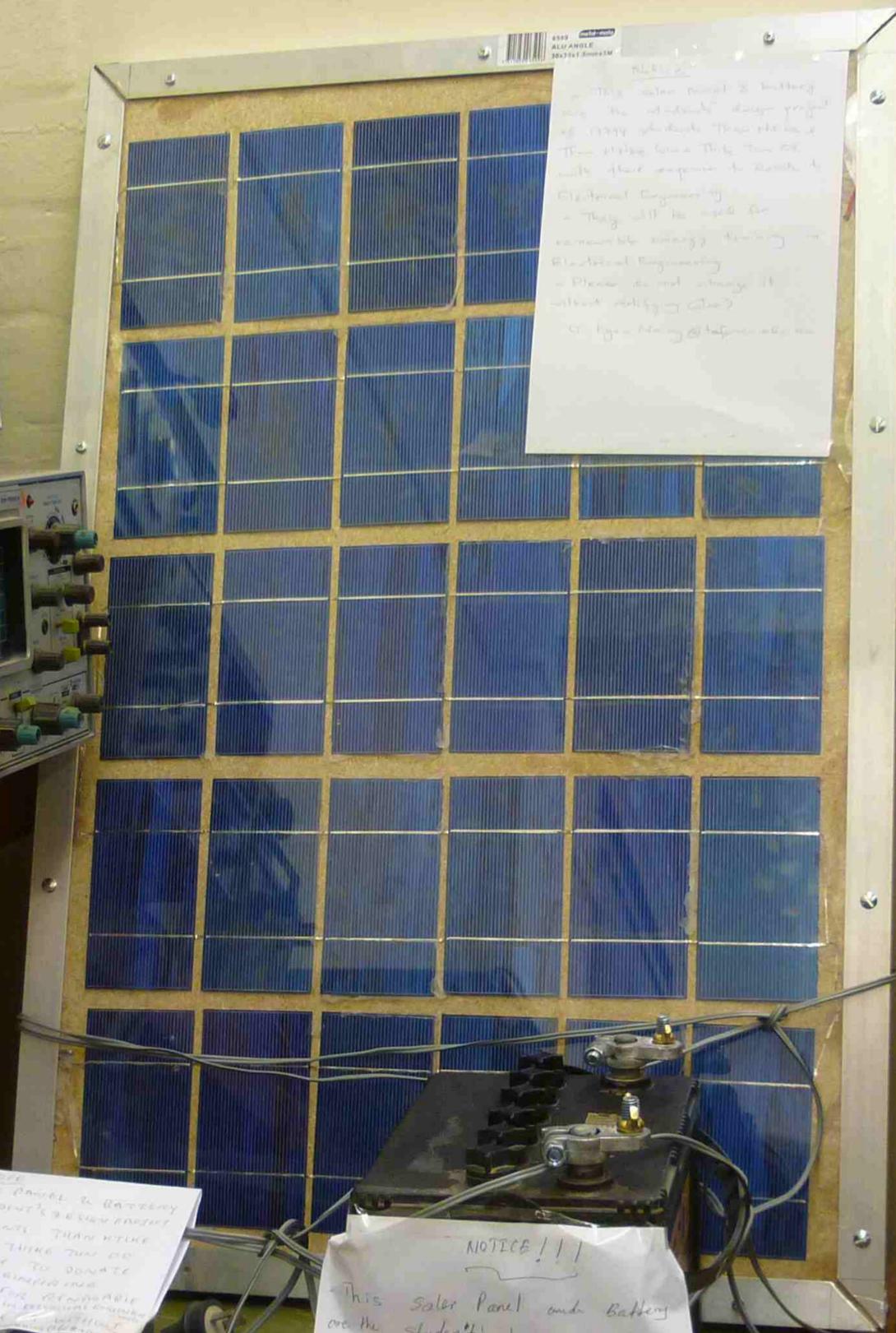
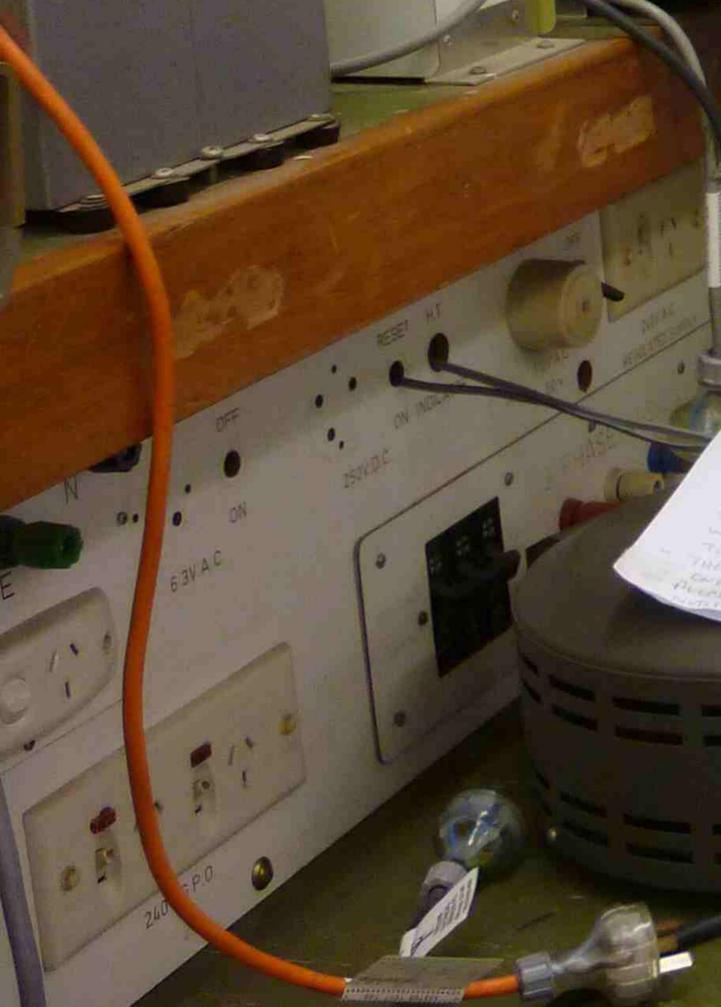




Bantex

GOOD WILL

LECTURE



NOTICE

This solar panel & battery are the student's design project of 17794 students. They have done this project with their expense to donate to Electrical Engineering.

They will be used for renewable energy training in Electrical Engineering.

Please do not change it without notifying staff.

Dr. Nguyen Hai @ lab@unsw.edu.au

NOTICE

This solar panel & battery are the student's design project of 17794 students. They have done this project with their expense to donate to Electrical Engineering.

They will be used for renewable energy training in Electrical Engineering.

Please do not change it without notifying staff.

Dr. Nguyen Hai @ lab@unsw.edu.au

NOTICE!!!

This solar panel and battery are the student's design project of 17794 students: THAN HIEU, THAN HIEU LINH, THIRE TUM OO, with their expense to donate to electrical engineering.

They will be used for renewable energy training in electrical engineering.

Please do not change it without notifying staff.

CTDB @ Nguyen Hai @ lab@unsw.edu.au



Notice

- This solar panel & battery are the students' design project of 17794 students: Than Htike + Than Htike Lin + Thike Tun Oo. with their expense to donate to

Electrical Engineering.

- They will be used for renewable energy training in Electrical Engineering.

- Please do not change it without notifying (Joe)

U: Kyaw Naing@tafemsw.edu.au.

NOTICE

- THIS SOLAR PANEL & BATTERY
ARE THE STUDENT'S DESIGN PROJECT

OF 1994 STUDENTS: THAN HTIKE

+ THAN HTET LIN + THIKE TAN OO

WITH THEIR EXPENSE TO DONATE

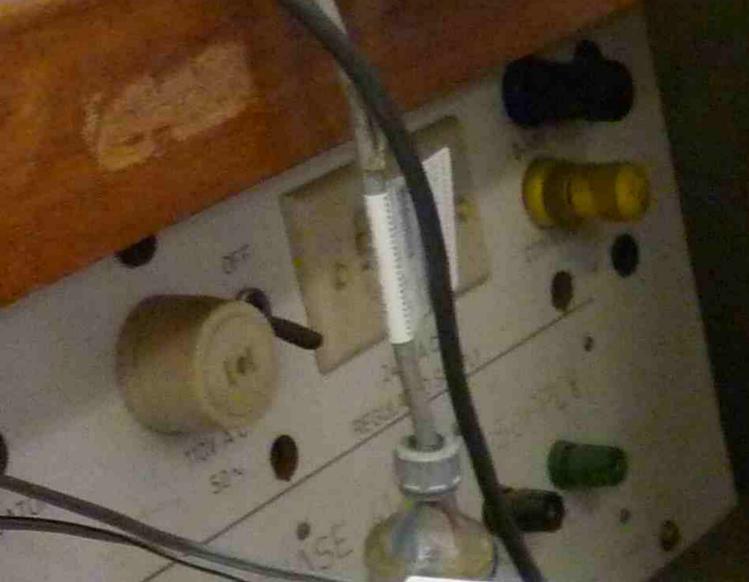
TO ELECTRICAL ENGINEERING

- THEY WILL BE USED FOR RENEWABLE

ENERGY TRAINING IN ELECTRICAL ENGINEER

- PLEASE DO NOT CHANGE IT WITHOUT
NOTIFYING (JOE) u.kyawmaing@tutensw.edu.au

EC



NOTE
 - THIS SOLAR PANEL & BATTERY ARE THE STUDENT'S DESIGN PROJECT OF 1994 STUDENT. THANK YOU + THANK YOU + THANK YOU WITH THEIR EXPENSE TO DONATE TO ELECTRICAL ENGINEERING. THEY WILL BE USED FOR RENEWABLE ENERGY TRAINING IN ELECTRICAL ENGINEERING. PLEASE DO NOT CHANGE IT WITHOUT NOTIFYING (TOE) U. Kapurainig@tut.nsw.edu.au

NOTICE!!!
 - This Solar Panel and Battery are the student's design project of 1994 student. THANK YOU, THANK YOU, THANK YOU, with their expense to donate to electrical engineering.
 - They will be used for renewable energy training in electrical engineering.
 - Please do not change it without notifying (TOE) U. Kapurainig@tut.nsw.edu.au

