

INGENUITY TUTORIAL



Choosing Between Using Own Or Subcontract Labour



Choosing between using Own or Subcontract Labour

In progressing jobs it is always **more cost-effective to use the company's own fully trained labourers that are available.**

However, if there **is an overall labour shortfall** that the Construction Manager needs to address, two options are available :-

- Take-on **new recruits**, adding to the company's own labour
- Use **subcontractors**

But which option is now the most cost effective ?



Choosing between using Own or Subcontract Labour

Industry parameters Navigate to "Main menu/Industry information/Industry parameters"

FINANCE **OVERHEADS** **PROCUREMENT** **JOB PROGRESSION**

PROJECT MANAGERS Recruiting costs: 10 % annual salary
 Paying off costs: 20 % annual salary
 Relocating costs: 6 % annual salary

OVERMANNING LIMITS

Sector	Effective labour limit above the planned level
Industrial	35 %
Building & Commercial	35 %
Transport	45 %
Energy	18 %
Water & Sewage	25 %

OWN LABOUR New recruits limited to: 70 this period
 Training cost for each new recruit: 2,500 per person
 Labour payoff rate: 75 per person
 Each idle labourer costs: 6,000 per annum

SUBCONTRACT LABOUR Additional cost for each subcontractor each

ALL LABOUR Each ineffective labourer costs: 22,500 pe

NEW RECRUITS

Each new recruit that is taken on into the company's own workforce has to be trained in their first period with the company. This is a one-off cost allocated to the job they are placed on.

The training is assumed to take place where the company is based, and does not vary between countries. Hence, no matter which job a new recruit is allocated to the training cost is the same.

The training cost for each new recruit is shown in the **Industry parameters**, and is 2,500.



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OVERMANNING LIMITS

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Industrial	35 %
Building & Commercial	35 %
Transport	45 %
Energy	18 %
Water & Sewage	25 %

OWN LABOUR New recruits limited to: 70 this period
 Training cost for each new recruit: 2,500 per person
 Labour payoff rate: 750 per person
 Each idle labourer costs: 6,000 per annum

SUBCONTRACT LABOUR Additional cost for each subcontractor each period:

ALL LABOUR Each ineffective labourer costs: 22,500 per annum

JOB COMPLETION Retention, late completion penalty and early completion bonus

SUBCONTRACTORS

Subcontractors **do not need to be trained**, and are fully effective from day one.

However, they do incur an **additional subcontract premium each period** for each subcontractor used, shown in the **Industry parameters**, which varies between countries.



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Country information

Navigate to "Main menu/Industry information/Country information"

Id	Name	Subcontract cost
AUS	Australia	1,500
CAN	Canada	1,500
CHI	China	1,000
FRA	France	1,200
IND	India	500
IRQ	Iraq	500
JAP	Japan	1,000
LEB	Lebanon	500
NZ	New Zealand	1,500
QAT	Qatar	1,000
SA	South Africa	750
SIN	Singapore	1,000
SYR	Syria	500
UAE	United Arab Emirates	1,000
UK	United Kingdom	1,200
US	United States	1,500

Australia is a country in the Southern Hemisphere comprising the mainland of the Australian continent, the island of Tasmania and numerous smaller islands in the Indian and Pacific Oceans.

The population is approximately 22.6 million, with approximately 60 per cent concentrated in and around the mainland state capitals of Sydney, Melbourne, Brisbane, Perth and Adelaide. The nation's capital city is Canberra.

A developed country, Australia is the world's thirteenth largest economy, and ranks highly in many international comparisons of national performance such as human development, quality of life, health care, life expectancy, public education, economic freedom and the protection of civil liberties and political rights. Australia is a member of the United Nations, G20, Commonwealth of Nations, ANZUS, OECD, APEC, Pacific Islands Forum and the World Trade Organization.

Australia has a market economy with high GDP per capita and low rate of poverty. The Australian dollar is the currency for the nation. After the 2006 merger of the Australian Stock Exchange and the Sydney Futures Exchange, the Australian Securities Exchange is now the ninth largest in the world.

...ector of the economy, including tourism, education, and financial services, ... 70 percent of GDP. Risk is natural resources. Australia is a major supplier



Since subcontractor costs vary between countries, the decision as to where to use them can have a significant affect upon company costs.

Consider the following different scenarios.

SCENARIO 1

If additional labour is needed on a 3-period job in the United States, **it is more cost effective to use 'new recruits'** (own labour) since the training cost of a new recruit is 2,500 as opposed to the potential cost of 4,500 (1,500 x 3) of using subcontractors for the planned duration of the job.

SCENARIO 2

If additional labour is needed on a 3-period job in Iraq, **it is more cost effective to use subcontractors** since the cost over 3 periods would be 1,500 (3 x 500) as opposed to 2,500 for a new recruit.

KEY POINTS

The above scenarios can change each period as labour surpluses or shortfalls arise e.g., in scenario 2 if own labour became available when another job finishes, this would be the cost effective option compared to using subcontractors.



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MAKING Job progression decisions (Labour) for period 6 in the Early Years

Change period Key information Help

IDLE LABOUR POOL

START OF THE PERIOD
 Number in the idle pool: 22
 Number to layoff: 0
 Number available for jobs in progress: 22

AFTER DECISIONS
 Net transfers: -22
 Number left in the idle pool: 0

JOBS IN PROGRESS

Job	Country	Sector	Plan Dur	Remaining planned periods	Progress so far	Status	Plan lab	Own Labour					Subcontract Labour				Total		
								This period		To site		From site		On site	End last	Take on		Lay off	On site
								Last per	From ILP	New	To ILP	Paid off							
29	UK	Transport	2	OVERRUN by 1 periods	Behind schedule	3rd period	Over	15	0	0	13	0	2	0	0	0	0	0	2
34	UK	Energy	3	FINAL planned period	Ahead of schedule	3rd period	19	57	0	0	49	0	8	0	0	0	0	0	8
49	UK	Water & Sewage	2	FINAL planned period	Ahead of schedule	2nd period	17	14	0	0	0	0	14	0	0	0	0	0	14
52	UK	Transport	3	2 planned periods remaining	Ahead of schedule	2nd period	158	138	0	0	0	0	138	0	24	0	24	0	162
67	SYR	Energy	3	2 planned periods remaining	Ahead of schedule	2nd period	15	11	4	0	0	0	15	0	0	0	0	0	15
74	MEX	Transport	4	4 planned periods remaining		1st period	84	0	24	61	0	0	85	0	0	0	0	0	85
82	IRQ	Building & Commercial	3	3 planned periods remaining		1st period	55	0	56	0	0	0	0	0	0	0	0	0	56

Consider another example where there is an overall labour shortfall, and 24 subcontractors have been taken onto job 52 in the UK to cover the shortfall.

However, job 82 in Iraq is using 56 of all the company's own full trained labour from the Idle Labour Pool, and no subcontractors.

Are these wise decisions ?



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82	IRQ	Building & Commercial	3	3 planned periods remaining		1st period	55	0	56	0	0	0	56	0	0	0	0	0	56

Id	Name	Subcontract cost each period
AUS	Australia	1,500
CAN	Canada	1,500
CHI	China	1,000
FRA	France	1,200
IND	India	500
IRQ	Iraq	500
JAP	Japan	1,000
LEB	Lebanon	500
MEX	Mexico	1,000
NZ	New Zealand	1,500
QAT	Qatar	500
SA	South Africa	750
SIN	Singapore	1,000
SYR	Syria	500
UAE	United Arab Emirates	750
UK	United Kingdom	1,200
US	United States	1,500

Subcontractors cost far less in Iraq than the UK (500 each period in Iraq compared to 1,200 in the UK), so it is **far more cost effective** to move labour around as follows :-

- Use 24 subcontract labourers on the job in Iraq, rather than labour from the Idle Labour Pool.
- Do not use any subcontractors on job 52 in the UK, but transfer 24 labourers from the Idle Labour Pool instead.



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 Net transfers: -22
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Job	Country	Sector	Plan Dur	Remaining planned periods	Progress so far	Status	Plan lab	Own Labour					Subcontract Labour				Total		
								This period	To site		From site		End last	Take on	Lay off	On site			
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Display details for job 82

The labour movements are made, and more cost effective decisions will reduce job costs, improving job and company profits.



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OWN LABOUR New recruits limited to: 70 this period
 Training cost for each new recruit: 2,500 per person
 Labour payoff rate: 10 per person
 Each idle labourer costs: 6,000 per annum

SUBCONTRACT LABOUR Additional cost for each subcontractor each period

ALL LABOUR Each ineffective labourer costs: 22,500 p

JOB COMPLETION Retention, late completion penalty and early completion

Legend: Fixed for all periods Can vary each period

Where there is an overall labour shortfall in the period, the decision as to whether to employ new recruits or use subcontractors is further complicated by the **limit on the number of new recruits** that can be taken on in a period, as defined in the **Industry parameters**. The limit can vary each period.



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Comparing the training cost of new recruits versus subcontractor premium in a period, it would appear that subcontractors are the cheaper option. **However, it must be remembered that the new recruit training cost is a one-off cost, whereas subcontractor premiums have to be paid every period.**

The decision as to whether to employ new recruits or use subcontractors may come down to the jobs where they may be needed, and there are other **factors** that may also affect the company's strategy :-

- The limit on the number of new recruits that can be employed.
- The anticipated duration of a contract, which can affect how many periods subcontractors need to be employed for.
- The affect of using subcontractors on the morale of the company's own labour, which is covered in another demo.
- Eventually own labour may need to be paid off when work dries up, incurring additional labour payoff charges. The laying off of own labour may then impact on labour relations, affecting the morale and productivity of the workforce across the company.

It is certainly worth taking the time to determine the most cost-effective approach, as this can have a significant bearing on the **profitability** of the company.