

PROFIT TAKING IN ENGINEERING, PROCUREMENT AND CONSTRUCTION (EPC) PROJECTS

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ABSTRACT

Profit Taking in Engineering, Procurement and Construction (EPC) Projects is reported. Five formula for calculating "Profit Taken" have been identified and demonstrated by use of a hypothetical EPC Contract no.015. The interface of Notional profit, Earned profit, Profit suspense and Work-in-progress (WIP) have been demonstrated. "Earned profit" taking can now be done within due limits of certainty without derailing the project.

Key Words: EPC Projects, Notional Profit, Earned Profit, Work-in-progress.

1. INTRODUCTION

1.1 What is 'Profit'

Profit is a financial benefit that is realized when the amount of revenue gained from a business activity exceeds the expenses, costs and taxes needed to sustain the activity. Any profit that is gained goes to the business's owners, who may or may not decide to spend it on the business and it is calculated as:

$$\text{Profit} = \text{Total Revenue} - \text{Total Expenses} \quad [1] \quad (1)$$

In other words, Profit is the money a business makes after accounting for all the expenses. Regardless of whether the business is a couple of kids running a lemonade stand or a publicly traded multinational company, consistently earning profit is every company's goal. The path toward profitability can be long. For example, online bookseller Amazon.com was founded in 1994 and did not produce its first annual profit until 2003. Many start ups and new businesses fail when the owners run out of capital to sustain the business.[1] Also, profit can be seen as the difference between the revenue received from the sale of an output and the opportunity cost of the inputs used. This can be used as another name for "**economic** value added" (EVA). This definition of profit is referred to as Economic Profit (or Loss). [2] In calculating economic profit, opportunity costs are deducted from revenues earned. Opportunity costs are the alternative returns foregone by using the chosen inputs. As a result, you can have a significant accounting profit with little to no economic profit. [3] Furthermore, Profit has several meanings in economics. At its most basic level, profit is the reward gained by risk taking entrepreneurs when the **revenue** earned from selling a given amount of output exceeds the total **costs** of producing that output. This simple statement is often expressed as the *profit identity*, which states that:

$$\text{Total profits} = \text{total revenue (TR)} - \text{total costs (TC)} \quad (2)$$

However, the concept of profit needs clarification because there is no standard definition of what counts as a cost.[4] Profit can be qualified as Normal profit, super-normal (economic) profit and

marginal profits. In markets which are perfectly competitive, the profit available to a single firm in the long run is called normal profit. This exists when total revenue, TR, equals total **cost**, TC. Normal profit is defined as the minimum reward that is just sufficient to keep the entrepreneur supplying their enterprise. In other words, the reward is just covering opportunity cost - that is, just better than the next best alternative. The accounting definition of profits is rather different because the calculation of profits is based on a straightforward numerical calculation of past monetary costs and revenues, and makes no reference to the concept of opportunity cost. Accounting profit occurs when revenues are greater than costs, and not equal, as in the case of normal profit. To the economist, normal profit is a cost and is included in total costs of production. [4] On the other hand, if a firm makes more than normal profit it is called super-normal profit. Supernormal profit is also called economic profit, and abnormal profit, and is earned when total revenue is greater than the total costs. Total costs include a reward to all the factors, including normal profit. This means that, when total revenue equals total cost, the entrepreneur is earning normal profit, which is the minimum reward that keeps the entrepreneur providing their skill, and taking risks. The level of super-normal profits available to a firm is largely determined by the level of competition in a market – the more competition the less chance there is to earn super-normal profits. Super-normal profit can be derived in three general cases: i) By firms in **perfectly competitive** markets in the short run, before new entrants have eroded their profits down to a normal level. ii) By firms in less than competitive markets, like firms operating under **monopolistic competition** and **competitive oligopolies**, by innovating or reducing costs, and earning *head start profits*. These will eventually be eroded away, providing further incentive to innovate and become more and iii) By firms in highly uncompetitive markets, like **collusive oligopolies** and **monopolies**, who can erect **barriers to entry** protect themselves from competition in the long run and earn persistent above normal profits.[4] In a similar vein, Marginal profit is the additional profit from selling one extra unit. A profit per unit will be achieved when marginal revenue (MR) is greater than marginal cost (MC). At profit maximisation, marginal profit is zero because $MC = MR$. Firms achieve maximum profits when marginal revenue (MR) is equal to marginal cost (MC), that is when the cost of producing one more unit of a good or service is exactly equal to the revenue derived from selling one extra unit.[4]

Economic profit is the difference between the total revenue received by a business and the total implicit and explicit costs of a firm. It's often the extra profit left over after considering the next best alternative investment, and can be either positive or negative in value.

Economic profit differs from accounting profit because it also includes **implicit costs**, which are the opportunity costs equal to what a business or individual gave up in order to do something else. These costs are deducted from revenues and are the alternative returns you decided not to pursue. Adding implicit costs to your profit calculation gives you another way to compare financial alternatives. Mathematically,

$$\text{Accounting Profit} = \text{Total Revenues} - \text{Explicit Costs} \quad (3)$$

$$\text{Economic Profit} = \text{Accounting Profit} - \text{Implicit Costs} \quad (4)$$

$$\text{Economic Profit} = \text{Total Revenues} - (\text{Explicit Costs} + \text{Implicit Costs}) \quad [5] \quad (5)$$

In another language, Economic Profit is the amount remaining after subtracting from the total income of a company the total monetary cost of all business activities, as well as the opportunity cost of profits that could have been made by investing resources in alternative business activities. The economic profit measures both the financial status of the firm, and the effectiveness of the firm's decision-making strategies.[6]

1.2 PROJECT MANAGEMENT

Project management is the application of processes, methods, knowledge, skills and experience to achieve the **project** objectives. While a **project** is a unique, transient endeavour, undertaken to achieve planned objectives, which could be **defined** in terms of outputs, outcomes or benefits. A project is usually deemed to be a success if it achieves the objectives according to their acceptance criteria, within an agreed timescale and budget [7] The core components of project management are: **i)** defining the reason why a project is necessary; **ii)** capturing project requirements, specifying quality of the deliverables, estimating resources and timescales; **iii)** preparing a business case to justify the investment; **iv)** securing corporate agreement and funding; **v)** developing and implementing a management plan for the project; **vi)** leading and motivating the project delivery team; **vii)** managing the risks, issues and changes on the project; **viii)** monitoring progress against plan; **ix)** managing the project budget; **x)** maintaining communications with stakeholders and the project organisation; **xi)** provider management and **xii)** closing the project in a controlled fashion when appropriate. [7]

A Project is a temporary endeavour undertaken to create a unique product, service or result and **Project management**, is the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements. Project management *processes* fall into five groups: **i)** Initiating; **ii)** Planning; **iii)** Executing; **iv)** Monitoring and Control and **v)** Closing. Also, Project management knowledge is drawn from ten core areas, namely: **i)** integration; **ii)** scope; **iii)** Time; **iv)** Cost; **v)** Quality; **vi)** Procurement; **vii)** Human Resources; **viii)** communication; **ix)** Risk Management and Stakeholder Management.[8]

In similar vein, Project management is seen as the discipline of initiating, planning, executing, controlling, and closing the work of a team to achieve specific goals and meet specific success criteria. A project is a temporary endeavour designed to produce a unique product, service or result with a defined beginning and end (usually time-constrained, and often constrained by funding or deliverables) undertaken to meet unique goals and objectives, typically to bring about beneficial change or added value.^{[1][2]} The temporary nature of projects stands in contrast with business as usual (or operations),^[3] which are repetitive, permanent, or semi-permanent functional activities to produce products or services. In practice, the management of these two systems is often quite different, and as such requires the development of distinct technical skills and management strategies. [9].

Furthermore, Project management is seen as a methodical approach to planning and guiding project processes from start to finish. According to the Project Management Institute, the processes are guided through five stages: initiation, planning, executing, controlling, and closing. Project management can be applied to almost any type of project and is widely used to control the complex processes of software development projects. [10]

1.3 PROJECT MANAGEMENT FOR PROFIT

Armed with accurate financial data, a project manager can always be sure that profitability is an integral part of the equation for every project decision. It stands to reason: When you can quickly

track the effectiveness of every dollar spent on a project, you tend to be able to keep a lot more of those dollars at the end of the project. Hence mathematically:

$$\text{Maximized Profits} = \text{Real-time financial Scorekeeping} + \text{Financially Influenced Decisions} + \text{Profit-Focused Team Actions} \quad [11] \quad (6)$$

One of the most important roles of any project manager is to be the "great exalted broker of time". Most busy project managers buy, sell, barter, lose and give away time virtually every day.....often times without even knowing it. And it goes without saying.....time is one of the most valuable commodities every project manager has. With the PM4Profit system, time is literally given a dollar value. Every hour spent on the effort and every hour expected to be spent to finish the effort has definitive value. Man-hours, calendar timelines, and dollar figures are linked together in such a manner that everyone can easily and precisely measure and understand the financial impacts of schedule slip, as well as the often underestimated expenses of recovering from negative schedule impacts. By monitoring and reporting these costs regularly, the PM4Profit system tends to drive schedule from the financial perspective. The financial transparency of project decisions tends to discourage the old heroic cry of "get it done on time, no matter what the cost..." With that in mind from day one, schedules tend to be kept more precisely on a day-to-day basis. [11] The PM4Profit system creates a strong environment of collaborative effort within the project team. Every member knows the game plan and the profit score at any given point in time throughout the life of the project. Everyone's performance can be measured financially, creating levels of accountability previously unattainable. If people can see a tangible metric to define their performance, almost invariably they'll strive to continually improve that performance.[11] Factors militating against projects for profit among others include: i) been over budget on a project; ii) exceeded a timeline on project; iii) worked on a project that completely stalled as you neared the finish line; iv) lost money on a sure-thing project and has no idea why; v) noticed that scope and feature creep held you back; vi) watched a project take three times as long as planned and vii) felt embarrassed to perform a review of your successes and failures. [11]

In a similar vein, profit based projects demand: i) the need to maximize profits on each project; ii) detecting early warning signs; iii) the completion of every project on time and iv) the usage of project collaboration dashboard. [12].

Profit margins are huge issues at the executive level – especially if your project is big...and by that I mean very important to the organization's bottom line. Stay on top of these eight areas and you are likely to get those most profit out of your project for those executives who are hoping for it and expecting it from you. Namely: i) Let your project managers act as engagement managers; ii) Reuse successful project plans from the end of projects; iii) Teach scope management; iv) Educate staff on gold plating; v) Get the CEO involved; vi) Educate the project team on sales behaviour; vii) Reforecast the project budget all the time and viii) Check the resource forecast weekly. From the executive level standpoint, it's all about profit margin. And profit margin is as difficult to realize as is project success. Stay on top of these eight areas before and during the project and you are likely to maintain and, hopefully increase, the target profit margin for your project. [13].

Deltek TrafficLive hosted an interesting debate at SXSW called Cocktails, Conversation, and Creative Leaders where members from the creative agency and digital project management world participated in a panel to address ways to minimize profit-eating operational challenges. A salient part of the debate focussed around managing scope creep and how to avoid the hidden costs of over-servicing our clients. It's a perennial challenge; how to service clients in such a way that we foster and secure a long-term relationship – while still delivering profitable projects and not undervaluing work by giving it away for free. Knowledge of boundaries, education, communication and tracking can help in making our projects profitable. [14]

1.3.1 CALCULATING COST ON ENGINEERING OR ARCHITECTURE PROJECTS

Profit and how it is calculated is the most elusive of all moving targets. What some in the Architecture and Engineering industry seem not to know is that it is feasible to produce breathtaking work that your clients will sing from the mountain tops about and still obtain a quality monetary return on that investment. To derive profit from projects, one must first understand the variables that are in play in the profit equation. The baseline in this equation is always cost, but what cost looks like depends on one's method of thinking.[15]

$$\text{Cost} = \text{DPE (direct personal expense)} + \text{overhead} \quad (7)$$

DPE (Direct Personal Expense), also known as payroll burden, is personnel-related overhead costs (such as vacation, sick leave, insurance, payroll taxes, pension expenses, and other benefits) that you add to labour cost for project reporting purposes.

On the other hand, Overhead, which is not part of DPE, includes any operating expenses not directly related to employees. For example, these expenses can include rent, office expenses, utilities, business taxes, insurance, and so on.

DPE and overhead can be calculated in a variety of ways, with the most commonly used being: **i) Based on fixed percentages with Direct labour plus DPE as the base**: this method is used when DPE is calculated separately from overhead. This method is commonly used by architectural and engineering firms.

ii) Based on fixed percentages with Direct labour as the base:

this method is used when DPE and overhead are considered as a single calculation.

DPE and overhead based on fixed percentages can be calculated as follows:

$$\text{DPE \%} = (\text{Annual staff-related benefit cost total}) / (\text{direct salary cost}) \quad (8)$$

And DPE (cost value to project, using DPE % calculated in (9) above) gives:

$$\text{Project DPE} = \text{Direct labour cost} \times \text{DPE percent} \quad (9)$$

Calculating Overhead – Separately From DPE

(using direct labour + DPE as the base):

$$\text{Overhead percent} = [C_T - (C_L + C_P + C_D)] / (C_L + C_P) \quad (10)$$

Where, C_T = Firm's total operating cost (*not including taxes or discretionary bonuses*)

C_L = Direct labour cost; **C_P** = DPE (Direct personnel cost) and **C_D** = Direct expenses.[15]

Overhead (cost value to project, using % calculated in (11) above) – Overhead that is added to project labour cost is given as:

$$\text{Overhead Amount} = (\text{Cost amount} + \text{DPE}) \times \text{overhead percent} \quad (11)$$

Hence, Total "burdened" project cost =

$$\text{Cost amount} + \text{DPE amount} + \text{overhead amount} \quad (12)$$

Calculating overhead with DPE (using direct labour as the base)

This method is used when it is not necessary to track DPE separately from general

overhead expense when viewing project cost.

$$\text{Overhead percent} = [C_T - (C_L + C_D)] / (C_L) \quad (13)$$

Where, C_T , C_L and C_D have same meaning as in Equation (11) above.

Overhead (cost value to project, using % calculated in equation (14) above) gives:

$$\text{Overhead cost} = \text{Cost amount} \times \text{overhead percent} \quad (14)$$

$$\text{Hence Total "burdened" project cost} = \text{Cost amount} + \text{overhead amount.} [15] \quad (15)$$

1.3.2 CALCULATING PROFIT ON TIME AND EXPENSE BILLING PROJECTS

In calculating profit on time and expense billing projects, three approaches are considered, namely, Spent, Billed and Billed + WIP.

For Spent approach:

$$\text{Profit} = [\text{Spent amount}] - [\text{Burdened cost}] \quad (16)$$

For Billed approach:

$$\text{Profit} = [\text{Billed amount}] - [\text{Burdened Cost}] \quad (17)$$

For Billed + WIP approach:

$$\text{Profit} = [\text{Billed amount}] + [\text{WIP amount}] - [\text{Burdened Cost}] \quad (18)$$

The **project spent amount** is used in profit calculation on T&E jobs when one wants to look at the potential profit, assuming all labour, expense and consultant charges will be billed. Spent is calculated at time entry and does not require billing to be completed in order to calculate.

The **Billed approach** allows calculation on T&E jobs to get the true letter-of-the-law profit. This is the standard cash basis financials definition of what a project is – what was billed minus what the costs were. This takes the mentality that what haven't been billed cannot be included as profit because it is not known at this time if it will be able to be billed. This profit calculation waits for the billing cycle before new project profitability can be calculated. So, most often this calculation can only be done monthly. Best Practice is to use the **billed amount** for calculating project profit on T&E jobs when the project is completed and closed. This is your true profit. In the same vein, Best Practice is to use the **billed + WIP amount** for calculating project profit on T&E jobs when the project is still being worked on and is not yet closed..[16]

1.4 PROFIT TAKING IN CONTRACTING

There are two basic issues in contract costing: i) the determination of profit to be taken in a long term contract performed each year and ii) valuation of the work-in-progress (WIP). It can be recommended that profit to be recognized will be that part of the profit which is correctly estimated to arise over the duration of the contract and which fairly reflects the profit attributable to that part of the work performed as at the balance sheet date so that the profit to be recognized are given by the following formula:

i) Profit on Work = Value of work approved (certified) less cost of work certified or

$$\text{Total cost input less cost of work not yet approved} \quad (19)$$

$$\text{ii) Profit} = [(\text{Value certified})/(\text{contract price})] \times (\text{Total expected profit}) \quad (20)$$

$$\text{iii) Profit} = [((2/3 \text{ or } 3/4)(\text{cash received})) / (\text{value of work certified})] \times (\text{Notional or expected profit}) \quad (21)$$

$$\text{iv) Rule of the Thumb: take 25\% of profit earned as the profit.} \quad (22)$$

2. MATERIALS AND METHODS

2.1 MATERIALS

Formula for profit taking as identified from literature review. A hypothetical data from an Engineering, Procurement and Construction (EPC) Project: Contract No. 015. A software on Project Manager (optional).

2.2 METHODS

Through a thorough and rigorous literature review, billing and computational formula are identified for computation of notional profit, earned profit, profit suspense and work in progress. All the equations identified in the literature review are narrowed to equations (19), (20), (21) and (22). The data from EPC Project (Contract No. 015) are keyed into the cost balance sheet in order to obtain the total cost of the work done by the Contractor. The notional profit is then computed. Equations (19) to (22) which represent formula 1 to 4 are now used to compute the earned profits and by default the profit suspense. The WIP for each formula is also computed and the balance sheet is obtained as Table 1 under Results (see Computation Details in Appendix).

3. RESULTS AND DISCUSSIONS

3.1 RESULTS

S/NO	PROFIT CALCULATION FORMULA	NOTIONAL PROFIT (N)	EARNED PROFIT (N)	PROFIT SUSPENSE (N)	VALUE OF WIP (N)
1	Value of work approved (certified) less cost of work certified = Total cost of input less cost of work not yet approved	67,500	67,500	-	50,000
2	[(Value certified)/(Contract price)] x (total expected profit)	67,500	54,000	13,500	36,500
3a	[(2/3 of cash received)/(value of work certified)] x (Notional or expected profit)	67,500	40,500	27,000	23,000
3b	[(3/4 of cash received)/(value of work certified)] x (Notional or expected profit)	67,500	45,562.50	21,937.50	28,062.50
4	Rule of the Thumb: 25% of profit	67,500	16,875	50,625	-625

	earned as profit				
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SOURCE: From the computations of data of the Hypothetical Engineering, Procurement and Construction(EPC) Project 015 as shown in Appendix.

3.2 DISCUSSIONS

Profit calculation formula 1 from Table1 reveals that earned profit is equal to the notional profit and profit suspense is zero. Thus the maximum profit accruing from certified work has been taken without a profit suspense. Also the WIP associated with formula1 is N50,000. This value of WIP represent the cost of work done but not yet certified plus the difference between agreed contract price and value of certificate for the stage of the work. Hence for formula 1 at this stage of work, profit suspense plus WIP is equal to N50,000.

In similar vein, profit calculation formula 2, from Table 1 shows notional profit of N67,500 and earned profit of N54,000with a corresponding profit suspense of N13,500. The WIP associated with formula 2 is N36,500. This value of WIP represent the cost of work done but not yet certified plus the difference between agreed contract price and value of certificate for the stage of the work less the profit suspense. Hence for formula 2, at this stage of work, profit suspense plus WIP is equal to N50,000.

Also, profit calculation formula 3a from Table 1 shows notional profit of N67,500 and earned profit of N40,500 with a corresponding profit suspense of N27,000. The WIP associated with formula 3a is N23,000. This value of WIP represent the cost of work done but not yet certified plus the difference between agreed contract price and value of certificate for the stage of the work less the profit suspense. Hence for formula 3a, at this stage of work, profit suspense plus WIP is equal to N50,000.

Furthermore, profit calculation formula 3b, from Table 1 shows notional profit of N67,500 and earned profit of N45562.50 with corresponding profit suspense of N21,937.50. The WIP associated with formula 3b is N28,062.50. This value of WIP represent the cost of work done but not yet certified plus the difference between agreed contract price and value of certificate for the stage of the work less the profit suspense. Hence for formula 3b, at this stage of work, profit suspense plus WIP is equal to N50,000.

With reference to profit calculation formula 4, from Table 1, the notional profit is N67,500 and earned profit is N16,875 with corresponding profit suspense of N50,625. The WIP associated with formula 3b is - N625. This value of WIP represent the cost of work done but not yet certified plus the difference between agreed contract price and value of certificate for the stage of the work less the profit suspense. Hence for formula 4, at this stage of work, profit suspense plus WIP is equal to N50,000.

From these formula for calculating profit, in Table 1, it can be seen that formula 1 gives the highest earned profit and corresponding highest value of work in progress (WIP). Formula 4 gives the lowest earned profit and corresponding lowest work in progress (WIP).The import of this is that at the stage of work, formula 1 places more money in terms Of profit earned in the pocket of the contractor than formula 4,and hence the contractor will find it easier to meet up with its obligations to personnel, subcontractors and shareholders. Should the contractor engage in

frivolous spending, there is higher tendency of default in project completion since the WIP associated with this formula is highest. On the other hand, the low value of earned profit in formula 4 of Table 1, could militate against the contractor's ability to meet up with its obligations to personnel, subcontractors and share holders. Since the WIP value here in formula 4 is lowest, the tendency of default in project delivery appears to be minimum.

It might therefore be necessary to find a compromise value for the profit earned between the two extreme levels represented by formula 1 and 4. Formula 3a might be useful in this regard. However, the profit suspense plus WIP adds up to N50,000 for all the formula. Hence any of the five formula for calculating profit is within acceptable window; but the particular formula applied will depend on the local and environmental scenario prevailing at the time and location of the project.

4. CONCLUSION

Five Formula for "earned profit" taking have been identified, demonstrated and tested. The extreme of "earned profit" to be taken is represented by formula 1 and 4. A middle of the road "earned profit" for taking is represented by Formula 3a. The interplay between Notional profit, Earned profit, Profit suspense and Work-in-progress (WIP) has been highlighted. Formula 1 to 4 clearly draw a concrete wall as partition between capital and profit. Hence the chances of erroneous drawing of capital as part of "earned profit" is non-existence. Hence there is high likelihood of project delivery on budget.

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6. APPENDIX

CONTRACT NO. 015: ENGINEERING, PROCUREMENT AND CONSTRUCTION (EPC) PROJECT.

Materials sent to site: N180,000. Labour engaged at the site: N140,000. Plant installed at the site (cost): N30,000. Direct expenses: N6,000. Materials returned to store: N1,000. Value of certificate for the stage of the work: N400,000. Cost of work not yet approved (or certified): N10,000. Materials on hand at site at the end of the period: N4,000. Wages of labour not yet paid at the end of the period: N5,000. Similarly, direct expenditure not yet paid (accrued): N500. Administration overhead:

N8,000. At the end of the period, the plant value was: N22,000. The contract price was agreed at N500,000. In respect of the certificate, a cash of N360,000 has been received. determine the profit to be taken and the stage of the work. (Explaining the rationale for the margin of the profit you have shown).

SOLUTION TO CONTRACT NO. 015

TABLE 2 - COST BALANCE SHEET

ITEM	DESCRIPTION	VALUE (N)	TOTAL COST (N)
MATERIALS			
	Materials sent to site	180,000	
	Less material returned to store	<u>1000</u>	
		179,000	
	Less material at site	<u>4000</u>	
			175,000
LABOUR			
	Accrued	140,000	
	Unpaid	<u>5000</u>	
			145,000
OTHER EXPENSES			
	Direct expenses	6000	
	Accrued	<u>500</u>	
			6,500
OVERHEAD	Plant depreciation	30,000	
	Less balance	<u>22,000</u>	
			8,000
ADMIN EXPENSE			8,000
TOTAL			342,500

Total cost of work done by contractor = N342,500.

Worth of work not yet approved = N10,000

Hence cost of work approved = N342,500 - N10,000 = N332,500.

Therefore Notional profit = N400,000 - N332,500 =N 67,500.

CALCULATION OF PROFIT TO BE TAKEN

FORMULA 1

Value of work approved (certified) less cost of work certified = Total cost of input less cost of work not yet approved = N400,000 - N332,500 = N67,500.

Hence, Notional profit = earned profit = N67,500; and profit suspense =N0.00.

FORMULA 2

$[(\text{Value certified})/(\text{Contract price})] \times (\text{Total expected profit}) = (\text{N}400,000/\text{N}500,000) \times (\text{N}67,500) = \text{N}54,000.$

Hence, Notional profit = N67,500; earned profit = N54,000 and profit suspense = N13,500.

FORMULA 3a

$[2/3(\text{cash received})/(\text{value of work certified})] \times (\text{Notional or expected profit}) = [2/3(\text{N}360,000)/\text{N}400,000] \times (\text{N}67,500) = \text{N}40,500.$

Hence, Notional profit = N67,500; earned profit = N40,500 and profit suspense = N27,000.

FORMULA 3b

$[3/4(\text{cash received})/(\text{value of work certified})] \times (\text{Notional or expected profit}) = [3/4(\text{N}360,000)/\text{N}400,000] \times (\text{N}67,500) = \text{N}45,562.50.$

Hence, Notional profit = N67,500; earned profit = N45,562.50 and profit suspense = N21,937.50.

FORMULA 4 (RULE OF THE THUMB)

25% of profit earned as profit = 25% of N67,500 = 16,875.

Hence, Notional profit = N67,500; earned profit = N16,875 and profit suspense = N50,625.

CALCULATION OF WORK IN PROGRESS (WIP)

Cost of work not yet approved = N10,000

Balance on Contractee = N40,000

Total N50,000

For Formula 1, profit suspense = N0.00. Hence, WIP = N50,000 - N0.00 = N50,000.

For Formula 2, profit suspense = 13,500. Hence, WIP = N50,000 - N13,500 = N36,500.

For Formula 3a, profit suspense = N27,000. Hence, WIP = N50,000 - N27,000= N23,000.

For Formula 3b, profit suspense = N21,937.50. Hence, WIP = N50,000 - N21,937.50 = N28,062.50.

For Formula 4, profit suspense = N50,625. Hence, WIP = N50,000 - N50,625 = -N625.

The Notional Profit, earned profit, profit suspense and WIP computed here based on Formula 1 to 4 are summarized in Result Table 1 above under the sub-heading RESULTS.