

A PRACTICAL APPROACH TO CALCULATE ACCELERATION COSTS ON CONSTRUCTION PROJECTS IN SOUTH AFRICA

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ABSTRACT

Purpose of this paper – The purpose of the treatise is to set out a simple procedure which can be used for calculating the amount of compensation due to a contractor as a result of acceleration that has occurred on a construction project. The research report will help contractors to choose the right claim procedure. The study will also create a better understanding of the complex nature of acceleration on projects as there is very often a lack of understanding between contractors, client organisations, consultants and lawyers as what could, and could not, be included in an acceleration claim. They will also gain new insights about claim procedures and the substantiation of acceleration costs. Matters of principle that should apply to acceleration claims regardless of the form of contract are examined.

Methodology/Scope - The research is about acquiring information by means of questionnaires from three groups of respondents namely contractors, consultants and employers concerning their opinions and previous experiences on project acceleration. The impacts or delays which have the biggest influence on construction projects are ranked according to how often it occurs. These impacts or delays generally cause acceleration and/or extension of time on projects. Significant differences in opinion are pointed out as it indicates a lack of knowledge and/or understanding of matters concerning acceleration amongst the major stakeholders on construction projects.

Findings - Most acceleration claims are the consequence of significant project scope increase. There are significant differences in opinion regarding various issues relating to acceleration claims. One such issue is a statement that contractors can generally accommodate contract variations and scope increase up to the value of 15% of the contract amount without claiming additional costs for preliminaries or acceleration.

Research limitations – It was not the purpose of the research to recommend either the use of FIDIC, JBCC or NEC. One definition is given to acceleration regardless the form of contract.

Practical implications – The continuous professional development of construction professionals such as engineers and quantity surveyors is essential. The standard and quality of education at tertiary institutions in South Africa must be maintained at all costs. Consultants should refrain from preparing contract documents where the scope of work is not clearly defined. Alternatively a party must be identified to carry the risk associated with an ill defined project scope.

Value – The research report sets out a practical format for claiming damages where acceleration was caused by a significant scope increase. It is foreseen that contractors, consultants, employers and other stakeholders in the construction industry will benefit from the findings and recommendations in this research report.

Keywords: Construction, acceleration, claims, scope increase

1. BACKGROUND

1.1 Acceleration - Defined

The conditions of contract frequently used in South Africa like the NEC, FIDIC, JBCC and GCC all have different definitions for the term “Acceleration”. The meaning of acceleration in terms of the NEC is bringing the completion date forward. This differs from usage in FIDIC and JBCC where acceleration means speeding up the work to ensure that the completion date is achieved. For the purpose of the study acceleration is defined as the execution of outstanding contract works within a shorter time than originally planned to mitigate the extension of time that the contractor would have otherwise been entitled to.

1.2 Increase in the scope of work

It is almost predictable that the original scope of work as at tender stage will not remain unchanged throughout the execution phase of the project. Contractors will most often be required to do more or less work than originally included for in the contract documents. According to McKenzie (1988:122-123) the work done by a contractor on a building project may fall into one of three categories:

- Work expressly or impliedly included in the contract,
- Extras, and
- Work that falls right outside the contract.

Mckenzie (1988:124) also states that an increase in the quantity as measured or estimated does not constitute “extra work”. This is further demonstrated in the case of *Imprefed (Pty) Ltd v National Transport Commission 1993 (3) SA 94 (A)*.

1.3 Contractor’s obligation to execute the whole work

The construction contract is known to the common law as the contract *locatio conductio operis*, the letting and hiring of a work. It is also known and described as an entire contract (Finsen, 1999:16). The contractor firstly has one indivisible obligation to execute the work and secondly an obligation to complete the work. The state of affairs for contractors in South Africa is that they can’t make any claim under common law for payment until they have completed the whole project. However most construction contracts used in South Africa provide for interim payments. If the contractor tries to sue the employer for payment before he has completed the whole project the employer may raise the exceptio (in South African law) or the “ready, willing and able” principle (in English law), and effectively defeat any claim by the contractor indefinitely until the contractor completes the whole of the project.

1.4 Project risk identification

Davison (2003:10-21) points out that the cause of many claims and disputes over additional payments under construction contracts is the failure to place risk plainly on one party or the other and the failure to record and detail the consequences of risks when they do arise. The employer or project sponsor is the best equipped to undertake a comprehensive risk analysis as the contractor’s risk assessment will be limited to consideration of the risks within their own scope of work and contractual arrangements.

Bad planning where limited attention is given to the project scope management processes and unseemingly haste in starting work which has not been properly planned can cause variations, cost overruns, delay and disputes. A poorly defined scope of work must therefore be identified as a project risk in the very early stages of the project lifecycle.

1.5 Delay classification

Sanders and Eagles (2001:3) define a delay as an event that causes extended time to complete all or part of a project. Halvorson (1995:C&C.1.1) points out that the contractor's right to recover increased performance costs, as a result of acceleration, depends on the type of delay that reduces the performance period.

He classifies delays as follows:

- Nonexcusable delay,
- Excusable delay,
- Compensable delay, suspension and disruption,
- Imposed milestone, and
- Concurrent delay.

1.6 Float ownership

Float utilised efficiently by the employer and contractor can reduce the negative impact that acceleration or extension of time (EoT) may have on a project considerably. In the critical path method of scheduling, the time difference between the earliest finish and the latest finish of an activity is called total float. Employers in the construction industry are inclined to believe that all float exclusively belong to the party who is defined as the employer to the particular contract. Contractors on the other hand are normally of the opinion that all float belongs to them as they have prepared the detailed programme and have allowed extra time and/or float for activities where high risks are involved (De Leon, 1986:12).

A possible solution is that float should belong to the project and not a specific party to the contract. Float will then be used on a first come first serve basis. However, this solution is biased towards the employer as he absorbs float that he has not had an influence over and has not earned. Another favourable solution is that all float in the programme should belong to the contractor. Float is therefore seen as a saleable resource belonging to the contractor.

1.7 Constructive acceleration

Constructive acceleration occurs in the absence of owner directed acceleration. The employer's refusal to grant an EoT for excusable delay will result in an acceleration effort by the contractor in order to complete the project on the contractual completion date.

The USA construction industry has become accustomed to the concept of a constructive acceleration order. Davison (2003) points out that the refusal to grant EoT for excusable delay in the USA is normally converted into an implied instruction to accelerate. However, this is not the case in South Africa.

1.8 Claims for acceleration costs under English law

The approach under English law as pointed out by O'Reilly (2007) is that if there is no express authority in the contract to accelerate, then no entitlement arises to claim extra costs for acceleration. The argument adopted by many contractors in South Africa namely that a rejection to an EoT request which the contractor believes is correct amounts to an instruction to accelerate and finish on time is simply incorrect. O'Reilly states that the only exclusion is where the certifier is expressly empowered under the contract to order acceleration on the employer's behalf. Therefore the refusal to grant an EoT can't amount to a "deemed" instruction to accelerate. A claim for constructive acceleration under English law must be based on the ordinary principles for breach of contract and damages.

1.9 Project records required for acceleration claims

There are many different forms of contract that can be adopted by the parties to a construction contract depending upon, among other matters, the nature of the enterprises concerned and the nature and size of the project. Every standard form of contract has its own detailed requirements regarding record keeping, document control, notices, etc. The prime source of information for any claim between the parties is the contract and the specific requirements contained therein.

The process of keeping project records should begin with the tender. Tender documents are often used in litigation to help substantiate the costs that a contractor expects to incur on the project. Other project records such as job cost reports, daily logs and progress reports, daily payroll records, variation orders and related support, minutes of meetings, job correspondence, documentation of design changes, photographs, etc will be vital to substantiate an acceleration claim.

1.10 Methods to calculate acceleration costs

Loots (1995:777) states that there is no hard and fast formula for calculating acceleration costs. He emphasizes that one ought to look at each situation individually and establish what costs were sustained in the attempt of buying back time. Davison (2003) points out that the method or combination of methods which can be used to calculate acceleration costs are:

- The global or total cost approach,
- The modified total cost approach,
- The time impact methodology,
- The measured mile approach, and
- Formula approaches.

1.11 Layout and presentation of acceleration claims

The most effective way to win a dispute is to avoid the dispute. This means that the contractor is rather planning ahead in order to avoid the necessity of claiming, especially if the claim may go to court. Claims are very often the result of the lack of a good control system. If there is no control system that could effectively register every change that occurred during the project execution, a dispute will emerge. Disputes may also emerge if the responsibilities of customers and suppliers are not clearly defined. The contents of a claim can be checked against Sotelo and del Mercado's (1993:G.5.6) content checklist.

The checklist is set out as follows:

- A summary of items and amounts to be claimed,
- Documents that support the claim,
- A detailed analysis of how the amounts were calculated, and
- Legal and contractual support.

2. REASONS FOR THE STUDY

The study attempts to define the views, opinions and understandings of employers, consultants and contractors in the construction industry regarding procedures and methods to calculate and substantiate acceleration costs on projects.

The study is undertaken for the following reasons:

- To point out that most acceleration claims is the consequence of significant project scope increase,
- To set out a procedure or template for the calculation of acceleration costs where a significant scope increase occurred,

- To create a better understanding of the complex nature of acceleration claims, and
- To point out differences in opinion amongst consultants, contractors and employers regarding acceleration claims.

3. RESEARCH METHODOLOGY

The study was fundamentally descriptive quantitative research. Data collection was done by means of questionnaires which were completed by a selected group of 60 individuals. The questionnaires tested respondents' views and knowledge regarding issues relating to acceleration claims on construction projects in South Africa.

3.1 Research population and sampling

The research population consisted of clients, consultants and contractors operating in the building, construction and mining industries in South Africa. The three categories represent the following parties:

- Employers – Clients undertaking and responsible for the funding of projects (party engaging in contract with contractor),
- Consultants – Project specialists such as project managers, engineers and quantity surveyors registered at a governing body in terms of South African legislation and providing specific services to a client as prescribed by the particular contract, and
- Contractors – Building and engineering (mechanical, electrical, civil and mining) contractors.

The research was restricted to individuals who are based at their respective organisation's head offices in Johannesburg, Gauteng. Purposive sampling was used to select a representative group. A group of 60 individuals was selected (20 employers, 20 consultants and 20 contractors) as they represent the diverse opinions on acceleration matters and are typical of all clients, consultants and contractors in the project environment in South Africa. Respondents were requested to answer questions related to projects where the following were applicable:

- Contracts with bills of quantities (BoQ) and detailed programme,
- Contracts based on either NEC, FIDIC or JBCC terms and conditions,
- Work remeasured to determine the final value, and
- A main contractor, main consultant and employer were involved.

3.2 Data collection procedure

A questionnaire containing eight main areas (Section A – H) of questioning was used to collect the primary data. The department of Statistics at the University of Pretoria evaluated the questionnaire to establish whether meaningful conclusions could be derived from it.

Appointments were made with the selected group of participants and the content and purpose of the questionnaire was explained to them. The researcher hand delivered all questionnaires to the relevant participants. The participants were requested to complete the questionnaires before 23 September 2007. A pilot study was conducted where questionnaires were handed out to four respondents in order to establish whether it contained weak spots. This resulted in minor changes to two sections of the questionnaire.

3.3 Validation of method and data selected

The research is about acquiring information from three groups of people (contractor, consultant and employer/developer) concerning their opinions and previous experiences on project acceleration.

Leedy and Ormrod (2005: 183) define survey research as follows:

- The researcher poses a series of questions to willing participants,
- Summarizes the participants responses with percentages, frequency counts or more sophisticated statistical indexes, and
- Draws inferences about a particular population from the responses of the sample.

The purpose of the descriptive research is to solve the research problems through the interpretation of the data that have been gathered. Eventually the hypothesis will be proofed either right or wrong.

The study has sufficient controls to ensure that the conclusions drawn from it are truly warranted by the data. Section A indicates which impacts or delays have the biggest influence on construction projects. These impacts or delays generally cause acceleration and/or extension of time on projects. The impact or delay which occurs most frequently will determine the method to calculate acceleration costs. Section H indicates which method the respondents have opted for when certain impacts or delays have occurred. Six scenarios are illustrated in section H which relate to the impacts and delays described in section A. Section B shows how successful contractor’s acceleration claims are. The results from this section give an indication of how well claims are prepared and substantiated. The results from sections C to G give an indication on the respondent’s knowledge relating to acceleration matters in general. The observations in this study can be applied to acceleration efforts on contractual work of all types of construction projects in South Africa.

4. RESULTS AND RECOMMENDATIONS

The results from the data in the displays, graphs, charts and tables are analysed and interpreted in order to find answers to the research problems. The numbers are summarized and interpreted by using statistics. The statistics provide a means through which numerical data can be made more meaningful. An analysis of the summarized research results is done in order to make meaningful conclusions and recommendations.

Section A – Delays or impacts causing delays on construction projects

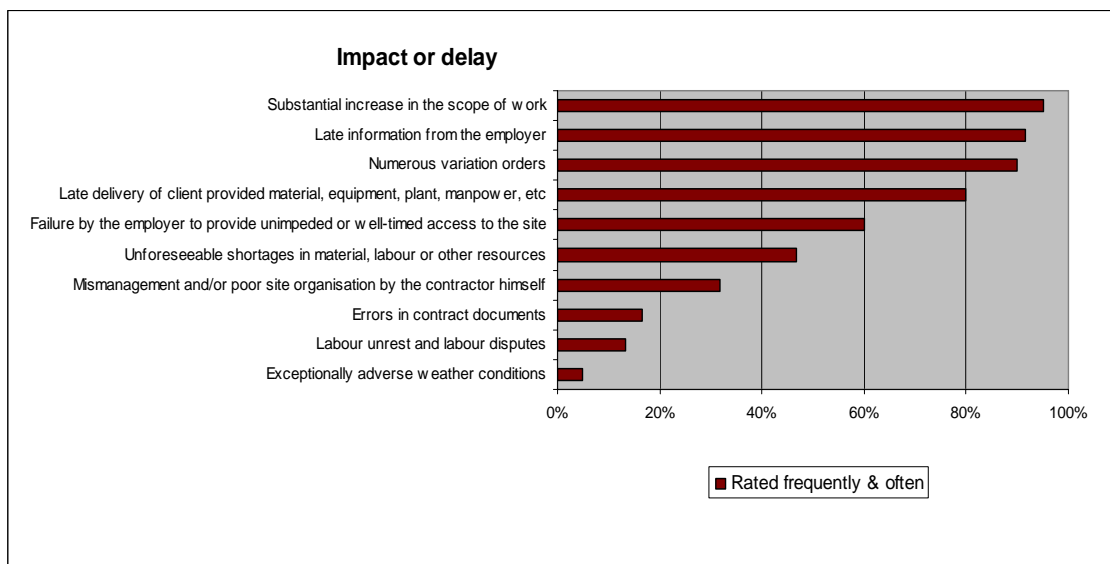


Figure 1: Delays and impacts on construction projects

- The delay or impact which occurs most frequently or often on construction projects is: *A substantial increase in the scope of the work.*

Section B – How often contractors receive certain levels of compensation for claims

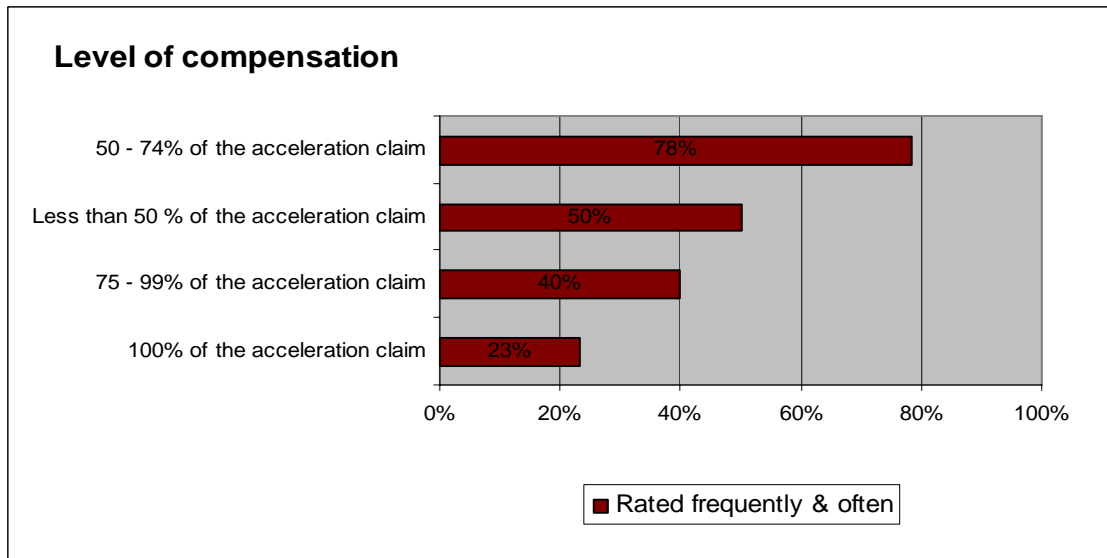


Figure 2: Compensation received by contractors for acceleration claims submitted

Section C – Views regarding the origin of acceleration claims

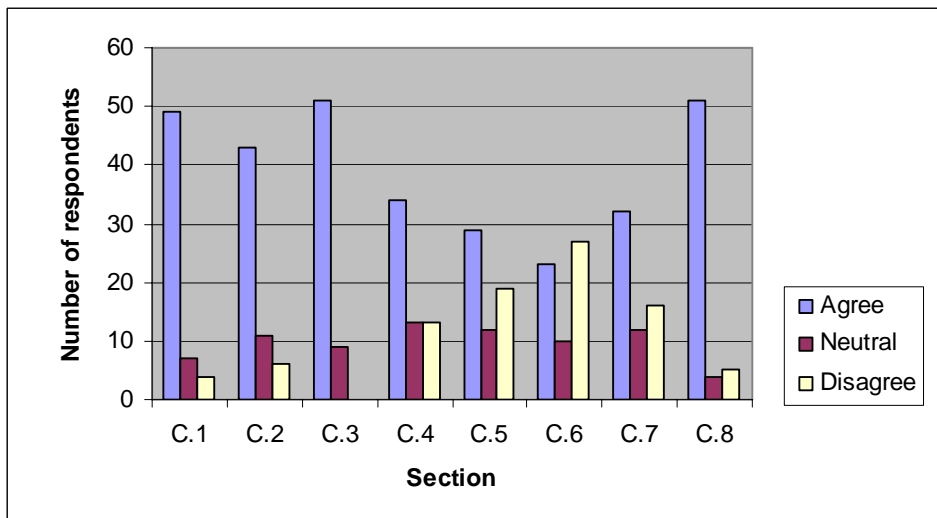


Figure 3: Views regarding the origin of acceleration claims

The following conclusions are drawn from results portrayed in figure 3:

- Respondents agreed that employers should allow more time and funds for the study phases of projects (C.1),
- Most acceleration claims are the result of an increase in the scope of work (C.2),
- A poorly defined project scope is usually the reason for the high number of variation orders and claims on projects (C.3),

- There is a significant difference in opinion amongst contractors, consultants and employers/developers where it is stated that contractors regularly fail to identify and to bring to the attention of the client project risks such as an ill defined scope in the early stages (tender clarification meetings) of a project (C.5)
- There is a significant difference in opinion amongst contractors, consultants and employers/developers where it is stated that contractors can generally accommodate contract variations and scope increase up to the value of 15% of the contract amount without claiming additional costs for preliminaries or acceleration (C.6)
- There is a significant difference in opinion amongst contractors, consultants and employers/developers where it is stated that preliminaries (costs for plant, equipment, etc) can be added to variation orders at any stage even if a contractual clause states that additional preliminaries can only be claimed after variations and scope changes exceed 15% of the contract amount in total (C.7), and
- Scope changes can be identified in the early stages of a project by the contractor's quantity surveyor where he first remeasures work according to the issued construction drawings and specifications and then immediately starts to measure as-built drawings as the work proceed (C.8).

Based on the results from section C the following recommendations can be made:

- The employer must carry the risk where the scope of work is poorly defined,
- It must be pointed out to the parties to the contract that no variation order is required where there is a normal increase in quantities based on a quantity surveyors remeasurements,
- Contractors must not be forced into a situation by employers where they have to accept contract conditions that prescribes an obligation to accommodate contract variations to a value of 15% of the contract amount without claiming additional preliminaries if it is not viable, and
- Scope changes must be identified through the employer's scope management processes.

Section D – Views regarding the impact of delays and float on the programme

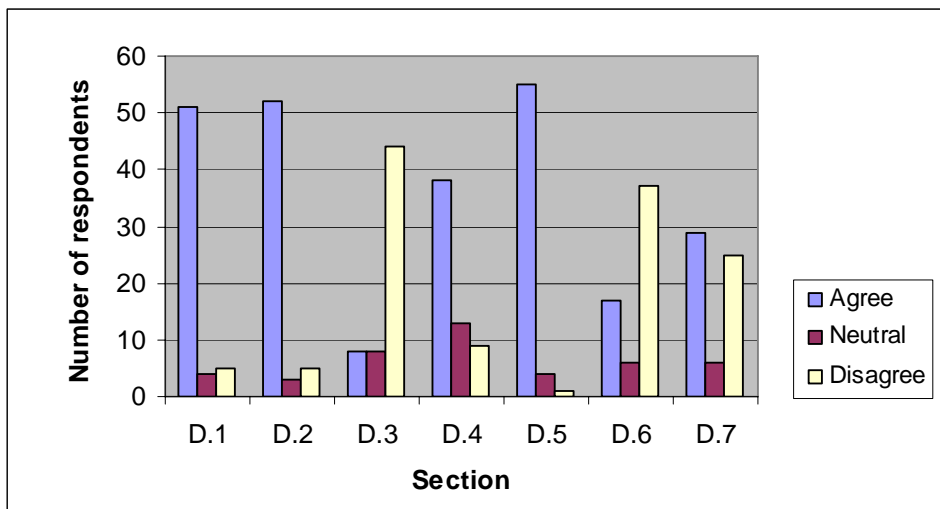


Figure 4: Views regarding the impact of delays and float on the programme

The following conclusions are drawn from results portrayed in figure 4:

- Respondents agreed that delays or impacts which cause extension of time and/or acceleration is a frequent occurrence (D.1),

- Float in the programme (baseline) as submitted by the contractor within the period as required in terms of the particular contract (FIDIC, NEC or JBCC), belongs to the contractor and can be used at his discretion (D.2),
- Float does not belong to the project but to a specific party to the contract. Float can't be used on a first come first serve basis (D.3),
- A possible solution to the dilemma of float ownership is to include a clause in the contract that states the following: "Extension of time shall be based solely upon the effect of delays to the work as a whole...Time extensions shall not be granted for delays to parts of the work, whether or not changed by any variation order, that are not on the critical path of the official schedule. Further, time extensions shall not be granted until all float time available for parts of the work involved is used" (D.4),
- If the employer intends to gain the most advantage from the programme (optimisation), the schedule should be prepared jointly by the contractor and consultant and be accepted as the baseline programme (D.5), and
- There is a significant difference in opinion amongst contractors, consultants and employers/developers where it is stated that the project manager or principal agent in terms of the particular contract (FIDIC, NEC or JBCC) can reduce the time for completion of the contract where work is omitted (D.7).

Based on the results from section D the following recommendations can be made:

- It must be pointed out to the parties to the contract that the project manager or principal agent in terms of the particular contract (FIDIC, NEC or JBCC) can't reduce the time for completion of the contract where work is omitted. Finsen (1999:152) supports this recommendation where he states the following regarding time where work is omitted:
Authorities such as McKenzie, Quail and Malherbe & Lipshitz, relying on the judgement in Kelly and Hingle, conclude that the principal agent does not have the power to reduce time where work is omitted.
- The employer will gain the most advantage from the programme (optimisation) if the schedule is prepared jointly by the contractor and consultant.

Section E – Views regarding constructive and directed acceleration

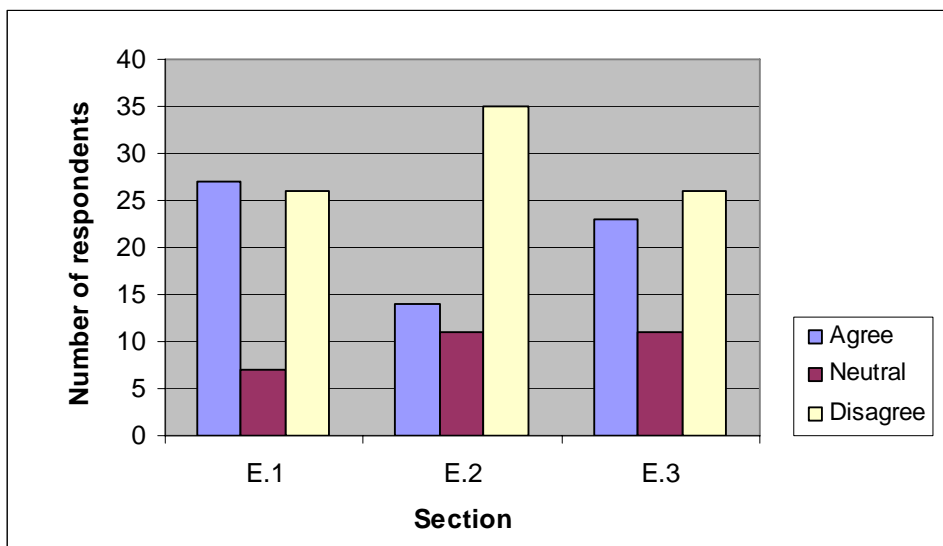


Figure 5: Views regarding constructive and directed acceleration

The following conclusions are drawn from results portrayed in figure 5:

- There is a significant difference in opinion amongst contractors, consultants and employers/developers where it is stated that the refusal of the certifier in terms of the particular contract (FIDIC, NEC or JBCC) to grant extension of time to a contractor for an excusable delay, can be seen as an implied instruction to accelerate (E.1),
- A warning by the project manager or principal agent in terms of the particular contract (FIDIC, NEC or JBCC) which states that a contractor is behind the agreed schedule (due to owner caused delay), can't be seen as an implied instruction to accelerate (E.2), and
- There is a significant difference in opinion amongst contractors, consultants and employers/developers where it is stated that the certifier (consultant) seldom instruct the contractor to accelerate even when its evident that an owner caused delay made acceleration or EoT inevitable (E.3).

Based on the results from section E the following recommendation can be made:

- It must be pointed out to the parties to the contract that the refusal of the certifier in terms of the particular contract (FIDIC, NEC or JBCC) to grant EoT to a contractor for an excusable delay, can't be seen as an implied instruction to accelerate. O'Reilly (2007) supports this recommendation where he states that the refusal to grant an EoT can't amount to a "deemed" instruction to accelerate. A claim for constructive acceleration under English law must be based on the ordinary principles for breach of contract and damages.

Section F – Quality of contractor's acceleration claims

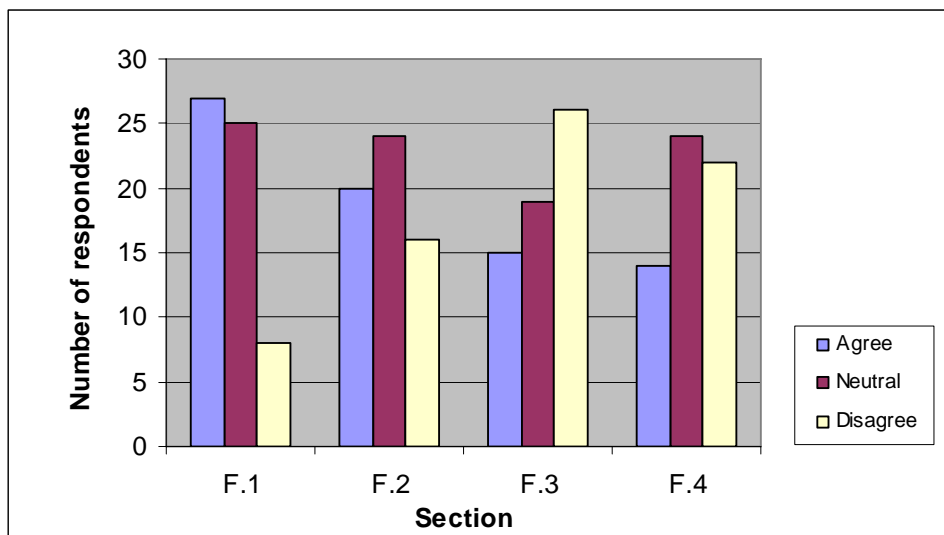


Figure 6: Views regarding the preparation of acceleration claims

The following conclusions are drawn from results portrayed in figure 6:

- Respondents agreed that contractors acceleration claims frequently fail to clearly point out all the instances of contract breach (F.1),
- There is a significant difference in opinion amongst contractors, consultants and employers/developers where it is stated that contractors frequently can't submit proper substantiated acceleration claims due to the bad quality or absence of project records such as job cost reports, daily logs and progress reports, daily payroll records, variation orders, minutes of meetings, job correspondence, etc (F.2),

- There is a significant difference in opinion amongst contractors, consultants and employers/developers where it is stated that contractors are reluctant to include a wide variety of project records in their acceleration claims (F.3), and
- There is a significant difference in opinion amongst contractors, consultants and employers/developers where it is stated that contractors frequently neglect document control on construction sites (F.4).

Based on the results from section F the following recommendations can be made:

- It must be pointed out to the parties to the contract that contractor’s acceleration claims must clearly point out all the instances of contract breach in order to be successful.
- It must be pointed out to the parties to the contract that contractors must adhere to certain quality standards regarding contract administration and document control.

Section G – The most suitable person to prepare an acceleration claim

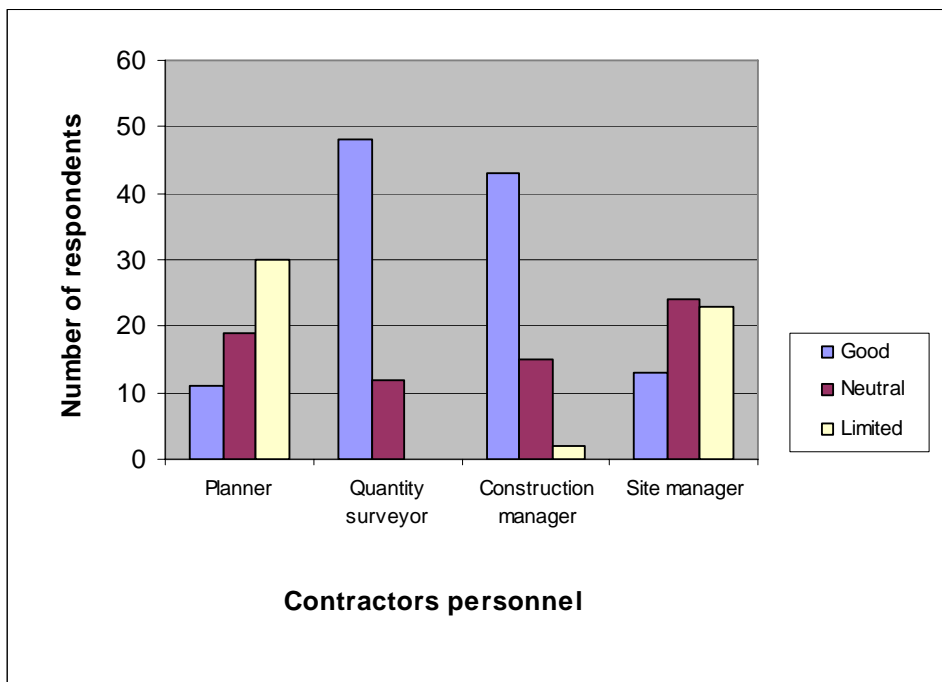


Figure 7: Views regarding the best equipped or skilled person employed by the contractor to prepare an acceleration claim

The following conclusion can be drawn from results portrayed in figure 7:

- The contractor’s quantity surveyor is the best equipped or have the necessary skills to prepare an acceleration claim.

Section H – The best method to use for calculating acceleration costs

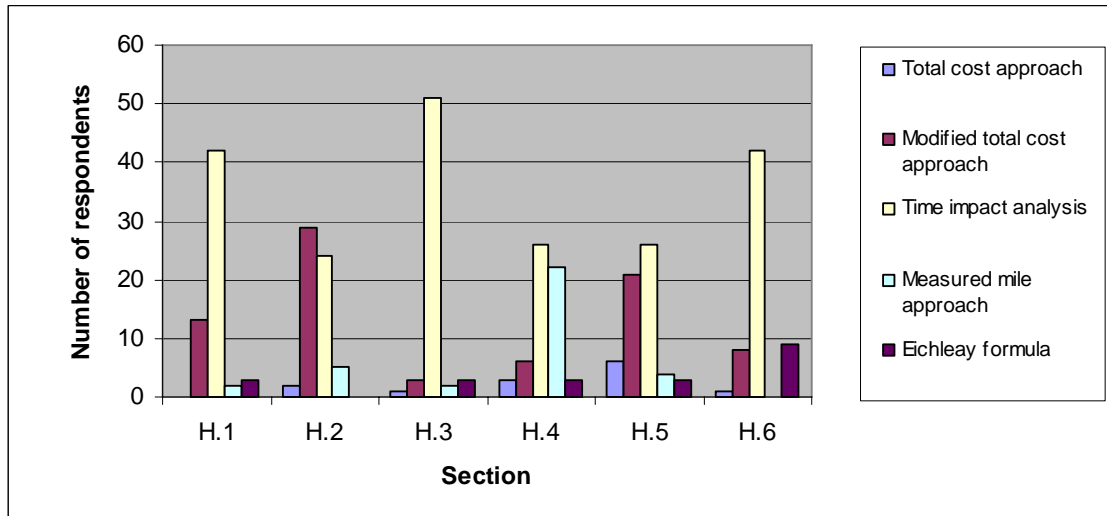


Figure 8: Methods to calculate acceleration costs

The following conclusions are drawn from results portrayed in figure 8:

- Contractors prefer the time impact approach to calculate the acceleration costs on projects (H.1, H.3 – H.6), and
- The modified total cost approach is the preferred method for calculating acceleration costs where the remeasured quantities in all areas of a piping and mechanical installation contract increased with 30% (H.2).

5. A PRACTICAL APPROACH TO CALCULATE ACCELERATION COSTS ON CONSTRUCTION PROJECTS IN SOUTH AFRICA

Based on the results from section H and matters relating to claim methods discussed in the literature study the following conclusions can be made:

- Although the preferred method for calculating acceleration costs by the respondents is the time impact approach, other methods can also be utilized under certain conditions as pointed out under scenario H.2. Results from the research report indicate that a significant increase in quantities is a regular occurrence on construction projects. Therefore the only method suitable to calculate the acceleration costs on a project where there are various matters of claim or complaint, and where it is impractical or impossible to provide a breakdown or sub-division of the sum claimed between those matters, is the modified total cost approach. With this approach the detailed project as-planned and as-built activity schedules are analysed to identify the time frame of specific delays, disruptions, changes, acceleration, etc. The equation for establishing acceleration costs is as follows:

$$\text{Acceleration costs} = \text{Total actual expenditure} - \text{Contract amount} - \text{Contract amendments} - \text{non-compensable cost elements}$$

- Areas relating to acceleration claims where differences in opinion exist amongst contractors, client organisations and consultants can be eliminated by implementing the necessary project management principles and by improving all stakeholders' knowledge on commercial and legal issues on construction projects through continuous professional development.

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