FINANCIAL PLANNING AND PROJECT COST CONTROL TECHNIQUES APPLIED TO BUILDING MANAGEMENT

A Thesis for the Degree

of

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by

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Summary.

The study first examined the extent of the use of financial planning techniques by a representative group of building companies. While general support for such procedures in principle was found, evidence of their application seemed restricted to the larger firms. Guided by such results the means of introducing a system of financial planning into a modest sized building company was devised.

The system was limited initially, to the forecasting of turnover, developed from an extension of existing control procedures. Following an evaluation of the system in this embryo form recommendations were made for its extension in order to take account of inflation, taxation and the importance of maintaining an adequate level of liquidity. Due regard was also given to achieving an appropriate measure of profitability relative to turnover achievement and investment during trading activities.

In formulating such recommendations, consideration was given to the value of Cash Flow Analysis and the computation of Internal Rate of Return, and the manner in which variations in performance, as indicated by these criteria, may influence company policy.

An examination was made of the existing conditions in a larger company (at present capable of undertaking such procedures) to see whether they were conducive to staff readily undertaking the additional processes of Cash Flow Analysis and the evaluation of Internal Rate of Return at the tender stage; and whether the opportunities were available to assess and compare individual projects on the basis of their working capital requirements and internal rate of return prior to tender submission. Such findings support proposals concerning the adoption of financial planning procedures by the first mentioned company.

Financial Planning - Building Management.

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INTRODUCTION

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Introduction.

1.1 The main objective of this research was to establish a practical means of introducing a system of financial planning and control procedures into a building company. Further to this, to evaluate the system initially devised, and to assess the validity of added techniques which provide criteria to examine the variations in performance which may influence company policy. It was hoped that the exercise would help management develop a sounder basis for considering those factors essential for the success of the company (profitability etc.) as well as to motivate them to take a wider view of the variables affecting performance (including inflation, taxation etc.).

1.2 To this end the following sequence of work was undertaken;

i) A review of significant literature and research within the area of Management Accounting and Control Procedures (of which "financial planning is regarded as an essential part" (Sizer (102))).

ii) Enquiries with a representative group of building companies, carried out by means of a questionnaire and supplemented by

interviews with Senior Management, to ascertain the extent to which financial planning techniques were being practised. This study contrasts with previous research, whose enquiries have been broadly based on Management Accounting and Control Systems.

iii) A system of financial planning was introduced and evaluated in stages by:

a) The appraisal of turnover achievement on current contracts.

b) The production of turnover forecasts based upon the value of work outstanding.

c) The monitoring of turnover results, the evaluation of performance and the implementation of corrective action.

iv) The consideration of factors essential to the success of the company and the implications of inflation and taxation upon performance.

v) The validity and possible inclusion of further financial planning techniques was examined, (Cash Flow Analysis and Internal Rate of Return), and their effect upon the policy to be adopted by the particular company considered.

vi) Supplementary to (v), two studies were included to establish:-

a) Whether the 'estimating environment' existing in a typical building company

was conducive to staff readily undertaking the additional procedures implicit in the application of cash flow analysis and internal rate of return at the tender stage, and

b) the opportunities available to evaluate and compare individual projects on the above basis prior to tender submissions.

1.3 The purpose of these studies (1.2 vi), although based upon statistical evidence, was to convey no more than an impression of existing situations, adding perhaps a little more substance to the intuitions of management concerning the application of the more sophisticated financial planning techniques.

The overall intention of the study, therefore, was to promote a progressive approach to the installation of financial planning into a company in order to provide more effective financial control by means of a system tailored to meet its particular developing needs.

2.0 Discussion

2.1 Financial control is accepted as an essential ingredient to the success of any company. Murphy (75) in his study suggests that the "lack of such control is one of the main causes of business failure". His further findings concur with the opinions of Coventry (18), Goodlad (35), Jackson and Townsend (54), May (69), Sizer (102), Sugden (109) and Wren (126), among others, that the performance of companies could be improved by a wider application of financial control techniques. Many works refer to the value of financial accounting in providing information for control purposes. In seeking to extend the function of financial accounting beyond that of mere stewardship, May (69) suggests the term "Management Control Accounting" and Sizer (102) the expression "Management Accounting". Both refer to the use of "information emanating from the Accounting function which has the applicability to managerial decision making as well as the control of centres for which individual managers are held responsible". Coventry (18), in his work refers to control as the checking of performance against pre-determined standards" whilst Jackson and Townsend (54) extend this to "the initiation of

corrective action where results deviate from requirements". Sizer (102) further qualifies such definitions by indicating that, "the essential nature of control involves not so much the correcting of past mistakes but the directing of current and future activities in such a manner as to ensure the realisation of management plans".

2.2 It is from such definitions that planning and the creation of standards by which performance is measured are recognised as processes synonimous with that of control. This premise is supported by Wren (126) in his statement that "one cannot control without planning and planning is meaningless without control" and amplified by Coventry (18) who suggests that Planning and Control are complementary processes, stating that, "control standards, of course, arise from plans, which must be consistent with objectives, translated into convenient stages for measurement and resultant, perhaps corrective, action".

2.3 Although financial planning may first be concerned with long range projections into the future, it will equally play a role in the short term, by directing and controlling individual operations towards the fulfilment of their

desired contribution to the corporate objectives of the company. A failure to plan leads to a lack of direction and control, and while it is accepted that every company must and does plan, it is the extent to which a disciplined approach is applied to the process, and the degree to which plans are formalised. which may often be open to question.

2.4 The extent to which financial planning is practised by individual companies is influenced by the size and nature of the business, the environment in which it operates, and the general attitude of the management concerned. Some may enjoy almost complete autonomy with respect to the selection, design and production of their product, and be little influenced by external factors and authority. They may have the means and the receptive environment to take full advantage of both corporate planning and market research techniques, and be supported by adequate financial resources and the ability to readily adjust productive capacity to meet changing situations.

2.5 Few companies, however, would agree that they enjoyed a predominance of these virtues, and many in the Building Industry, although accepting the desirability of formalised

financial planning procedures, would claim that the extent of the difficulties associated with their use (due to the unique character of the industry and the general problems as indicated by Banwell (5), Emmerson (27) and Lea (64)) detract from their adoption.

2.6 In order to fully appreciate this aspect with regard to building it is first necessary to recognise the peculiar nature of the construction industry and the manner in which work is obtained. A building contracting company operates principally by providing a service to erect a building in accordance with a client's requirements, relying upon invitations to tender, and the acceptance of the tender value submitted within a competitive situation for the procurement of work. The company is rarely responsible for the design of its product. ("In no other important industry is the responsibility of design so far removed from the responsibility of production". (see Emmerson (27)). This is in contrast to manufacturing companies, who are able to design, manufacture, and store products in readiness to meet a demand which may even be created by intensive marketing techniques.

2.7 It is perhaps in this context, that the

difficulties associated with the identification of the future demand upon the services of the individual building company create the first element of uncertainty in establishing future financial plans. A probable inducement for companies to practise these procedures would be the removal of some of the uncertainties associated with the future of the industry. The tendency for successive governments to use the industry as an economic regulator has without doubt contributed to the cyclical nature of the demand for building work, (see Eleanor Lea (64)), and has led to the appeal of Sir Frederick Catherwood (12), (echoed by many prominent leaders in the industry) for a "more balanced view of future economic prospects". Obviously, the large company with its recognised role at National or Regional level, enjoying established connections, and possible support from financial groups connected with building development, may well identify its future role more readily than the small contracting company. Nevertheless, to effectively determine financial objectives and plans, every company irrespective of size, would need to examine the potential demand for its services, having, in the first instance, determined the type and value of building projects most appropriate to its organisation.

2.8 The general impressions conveyed by authoritative works on the subject however (see Argenti (3), Brech (9), Goodlad (35)) suggest that few companies determine objectives in a formalised manner, and seem to confirm the comment of Coventry (18): "Although it might be thought that every firm would know where it was going, there are in fact too many firms with a rough idea of direction and a vague sense of purpose". A further view often expressed within the industry is that the exercise of such formal planning procedures are the prerogative of the large companies; and it is when the Building Industry with its predominance of small firms (i.e. 99% of the firms in the industry employ less than 300 men and undertaking 57% of the work load (see D.O.E. Stats (23)) is viewed in this light, that the potential for a wider acceptance by individual firms to determine objectives and apply financial planning in a more formalised manner may be appreciated.

2.9 In addition to the extensive number of publications available on the subject (Horngreen (49), Jackson & Townsend (54), Sizer (102) and May (69) among others), many research studies on Management Accounting have have been undertaken within the last decade

or so. Some associated themselves with its broad application by business in general (Thornton (112)) and others such as Groombridge (41) directed its use of particular levels of management. A number associated its application within small firms in particular, (Murphy (75) and Wren (126)), whilst Goodlad (35) was concerned with its relevance to the Construction Industry. Additional studies were directed to the utilisation of specific techniques and their problems of application in general business management. These included the works of Adams (1), Flannery (31), Gordon (38), Irving (53), Sugden (109), Turner (120) and Williams (124); whilst the works of Cooke (16), Denton (21), Mannering (68) and Pilcher (92), (among others), confined their studies to the utilisation of certain techniques within the Construction Industry in general, and in some instances, to small firms in particular, (Nicholson (83) and Wren (126)).

2.10 These works provide evidence of general agreement that many of the techniques within financial management are not practised extensively other than by the larger companies. Murphy (75) for example states that "there has been a growing criticism over the past few years that not only has there been a laxity in the

use of financial control procedures, but that this laxity, together with the inability to initiate new technology and implement new techniques, is sufficiently widespread as to have an adverse effect on the country's economic growth". A comparison between the studies of Duck, Goodlad, The Irish Management Institute and Hart and Prusman, produced by Murphy (75), revealed a wide disparity within industry in the use of financial control techniques, and a generally low utilisation of long range planning and capital appraisal techniques. Goodlad (35) in his work presents a similar situation with regard to the Construction Industry. "In the case of the large contractor the full range of techniques is used and there is also some degree of development, in the case of the medium contractor there is not the same degree of penetration. Indications are that this type of firm is not accounting orientated and as a result there is far from general use of all these techniques. Very limited use seems to be the case in the small firms".

2.11 In contrast to Goodlad's broad appraisal of management accounting within the Construction Industry, the enquiry within this study concentrates upon the application of financial

planning techniques within a representative group of building contracting companies. In particular its efforts were directed to ascertaining the extent to which these companies forecasted turnover, cash flow and profitability. The findings concerning the utilisation of these techniques proved similar to those of management accounting in general. "In the main, companies placed a greater emphasis on basic financial control techniques required for day to day control than techniques concerned with the long term". (Murphy (75)).

2.12 Following this result interest was centered on how best such techniques could be accepted and undertaken by the management of a modest sized building company. Many previous studies, whilst recognising the problems of application, have tended to neglect to examine the means of effecting their introduction in any real practical form. Adam's work, (1) although concerned with industry in general lends support to this view stating, "The literature on forecasting has done little to aid managers of medium sized companies.....many papers lack the basic concept of forecasting being a management tool which should be suited to practical situations.... to gain acceptance by management, a forecasting system must be easy to apply and

have a certain intuitive appeal". The importance of application is underlined by Bestwick (7) who suggests that "perhaps the most important consideration in the assessment of forecasting methods and monitoring is that of implementation".

2.13 A prime requirement for the effective introduction and implementation of a new system is to define its intended role as accepted or conceived by top management, "whose enthusiasm for, and involvement in, the formal strategic planning" is regarded by Grinyer (40) as essential. Their encouragement, and the promotion of a sense of participation, between those involved at the various levels of management activity in connection with the new procedures, is vital. Sugden (109) suggests that "only by allowing all managers to participate fully, to the common good in the achievement of company objectives can be the fullest use be made of business resources." It was shown in Murphy's work (75) that "where management were aware of the need for financial control and were given the necessary expertise to install the necessary procedures, then such controls could be maintained with a minimum of effort and a low cost with effective results". These findings would seem to support those of

this study which demonstrated that many aspects of the system as introduced, were implemented by a modest extension of existing procedures (Chapter 3.).

2.14 The importance of cost considerations prior to the installation of a system is shown by Adams (1) who advises that "before embarking on any forecasting technique the manager must try and equate the cost of application to the value of the resulting forecast" and there remains the basic need noted by Groombridge (41) for "each system of control to be in keeping with the needs of the firm and for the sytem to cost less to operate than the savings it represents in production and servicing departments". Although the extent to which the services and advantages to be obtained from a system is difficult to quantify, as Horngreen (49) expounds "the contribution is not always easily identifiable", the quality of its design will, in itself, reflect ultimately upon the benefits to be gained from its adoption. In this respect Sugden (109) emphasises "that a particular problem to solve is one of reconciling the information produced with the information received". Groombridge (41) qualifies his requirements by stating that the management control system "should meet the decision needs

of the manager", and the "need for a financial control system to be flexible", is stressed by Cleaver (14).

2.15 The provision of effective feedback should be implicit in the design of any system of control. Pilcher (92) proposes that "a system of regular significant reporting in appropriate detail must be implemented at all levels in order that management may be made aware of progress towards objectives". Other works, (Breck (9), Goodlad (35)) refer to the need for information to be provided at a time appropriate for action to be taken. Groombridge (41) suggests "speed rather than accuracy is essential", holding it "more desirable to designate responsibility for action now than assessment of blame later". He further expresses the need for the process to identify trends in performance in whatever field of activity under review. Grinyer (40) in his paper recommends flexibility and the ability to respond to change, and on this aspect Mills (72) points out that "feedback is designed not only to tell how far we are keeping to our targets, but to evaluate targets themselves in relation to both constraints in the external environment and changes in performance and circumstances".

Having taken account of the above factors in the design of the proposed system, consideration is given to the means of its introduction and implementation.

2.16 Referring to the introduction of financial control techniques, Murphy's work (75) suggested that "it was possible to introduce a number of techniques into even the smallest company with subsequent benefits by way of improved control information". A similar hypothosis is expounded within this study with regard to financial planning, based primarily upon the impressions gained from the enquiry conducted (Chapter 2). In devising the system proposed, the poignant characterisation of many building companies as displayed by Bradburn's (8) exposition remained under constant review...

> "There appears to be an occupational obsession with growth, pushing up turnover, securing contracts and getting work done rather than selecting the right work and ensuring payment for it is received in the right amount at the right time".

In proposing the means of introducing a new system, both Murphy (75) and Wren (126) seem to be in general agreement in suggesting, "It would seem that a dynamic approach is needed in small business management and a requirement to

use techniques and systems as they become appropriate to the size of operations" Enquiries within this study confirmed that a similar approach in the introduction of Financial Planning within this modest sized company was more likely to be accepted and successfully implemented by the management concerned.

2.17 Consequently the system was designed to be introduced in progressive stages and an evaluation undertaken at each stage. The initial approach on the basis of the consideration of turnover, would seem to concur with the proposals of M.E. Murphy (76) who expounds that "the first aid to a small company could come from a analysis of the income statement to show sales by products". Proposals are made for the extension of the system by the use of additional techniques, having first given consideration to those factors upon performance. The value of these additional techniques in providing the means of influencing policy was also examined. Para 1.1 to 1.3 provide a detailed sequence of the means by which the system was introduced and proposals for its extension hypothesised.

2.18 Certain indirect benefits were hoped to be obtained from the system. The endorsement of

Coventry's (18) statement that "financial controls are interwoven with functional controls", promoted endeavours to ensure that the system would indirectly provide, as Hofstede (47) suggested in the context of budgetary control, "sound co-operation between financial and technical people." It was also hoped that the system would also act as "a further communication device" as advocated by Goodlad (36) in his discussion concerning the 'contract budget'.

2.19 The nature of the study precluded the actual implementation of certain of the financial planning techniques proposed. It was accepted at the outset that the company concerned may well never expand sufficiently to warrant the formalisation of the more sophisticated techniques. ("It would seem that the more sophisticated techniques have little place in the small company" (Murphy (75)). Nevertheless the consideration of these techniques are presented with the intention of providing management with an awareness of their benefits; with the suggestion that every attempt should be made to absorb their principles into both existing and such financial planning procedures as may be adopted.

CHAPTER 2

QUESTIONNAIRE ENQUIRY

Chapter 2.

Questionnaire Enquiry

1.0 Introduction

1.1 This enquiry was undertaken to ascertain the extent to which financial planning techniques were being practised by a representative group of building companies.

It was first hoped to obtain an indication of the extent to which financial forecasts were produced, and if such forecasts were translated in terms of annual turnover values related to long term objectives, or restricted to the currently secured work load of the individual company.

1.2 It was intended that enquiries would establish the time intervals used for the monitoring of turnover achievement by the responding companies, and the standards against which these achievements were being measured. The study also aimed to evaluate the extent to which the respondent companies produced valuation forecasts for individual contracts, both as a basis for supporting overall turnover targets, and in the provision of standards for performance appraisal.

1.3 The regular monitoring of income and expenditure is fundamental to the effective financial control of any company. Enquiries were therefore concerned with finding whether the respondent companies practised the forecasting and monitoring of cash flow in relation to both their overall trading activities and with regard to individual contracts.

1.4 Further enquiries were made to ascertain whether any of the respondent companies practised the assessment of the potential profitability of projects at the tender stage, in addition to the more traditional criteria used in the determination of tender values prior to their submission.

2.0 Method and Design of Questionnaire (See Appendex A)

2.1 The study was commenced by the circulation of a questionnaire to twenty-five firms in the Merseyside area, from which eighteen replies were received. Fourteen companies expressed their willingness to co-operate further. To this end interviews were conducted to obtain a more detailed appraisal concerned with the forecasting techniques being practised by these firms.

2.2 It was recognised that the size of sample would not be sufficiently large to produce comprehensive conclusions; however it was hoped that the questionnaire would provide a useful contribution

to the complementary studies to follow.

2.3 The questionnaire was designed so that the majority of questions could result in either a negative or affirmative answer, while at the same time providing opportunity to evaluate the extent of the application of forecasting procedures in construction practice. Provision was made for the individual participants to qualify their replies during the interviews subsequently arranged, and the limits of confidentiality expressed by the respective companies were consistently respected.

2.4 The first series of questions (1 to 8) were designed to establish whether the type of company and the breadth of its activities were indicative of the extent to which forecasting techniques were being practised.

2.5 Question 1 was selected in an attempt to discover any marked difference between the privately owned and public company in the adoption of corporate planning procedures and the formal production of long term financial plans.

It was considered that a public company might be more likely to practise these procedures because of the recognised obligations of the directors to inform the shareholders of the long term objectives

that had been resolved and the plans formulated for their achievement. Conversely, it might be reasonable to propose that there is less inducement for the directors of a private company to present plans in such a formalised manner, being answerable only to themselves for their actions and ultimate success.

2.6 Questions 2 and 3 were incorporated to investigate whether the geographical range of the current activities of a company, and its size in terms of annual turnover, could be considered factors influential in the adoption of long range planning.

2.7 Question 4 specifically enquired as to the existence or otherwise of a formalised long range financial plan, with the emphasis placed on the term 'formalised' for two reasons:

Firstly, to establish the extent to which long range plans were formalised in practice; and secondly, it was thought that to simply enquire if any long range financial plan existed, regardless of detail, might be too provocative a question, inviting the obvious affirmative answer.

It was felt that the extent to which any long range plan was formalised in any conscious degree could be discreetly assessed from the result of any

interview which might follow. The inclusion of Question 5 was intended as a follow up to an affirmative answer to the previous question, in order to ascertain the period chosen for the long range plan. A range of up to five years was offered for selection within the questionnaire, the latter being regarded as the maximum period considered viable because of the recognised nature and structure of the construction industry.

"Five years is likely to be considered a realistic period" (Pilcher (93).)

2.8 The purpose of the three questions which followed (i.e. 6,7 and 8) was to establish the extent to which annual turnover forecasts were produced by companies, and whether such forecasts were broken down into shorter periods. As a consequence, Question 9 was included in an attempt to find the extent to which valuation forecasts for individual building projects were being carried out and at whose instigation.

2.9 Question 10 attempted to find the degree of confidence placed upon forecasts in terms of the benefits to both the client and building company, while the following Question asked whether there was an increasing demand from clients for forecast valuations, as it was felt that such demands

could provide the impetus for contractors to establish these forecasts as a regular routine.

2.10 The suggestion to use forecast valuations as the basis for interim payments has often been the subject of consideration by both Industry and the Professions as a means of reducing the cost of producing numerous interim valuations during the execution of contracts (Cooke 17). Question 12 attempted to obtain some indication of the measure of support likely to be provided by the contracting companies for the adoption of forecasts for this purpose.

2.11 Although Question 12 qualified the use of forecast valuations as a basis for the interim payments by the provision for adjustment during the course of the contract, it was felt that many of the contributions to the enquiry may still favour the traditional practice of assessment and payment by the submission of interim valuations. The opportunity to state their preference in this respect was therefore included in Question 13.

2.12 A review of the value of building work completed at a particular stage, reflected by the size of the interim valuation, has always been accepted as a measure of the general progress attained during the execution of a building contract. The purpose of

Question 14 was to confirm its continued practice or otherwise, by the companies contributing to the study. Provision was made in the question for each company to indicate from a selection of three criteria those used to assess the result of an interim valuation. A comparison of the interim valuation with the actual costs incurred to date was offered for selection (part a). This would provide an indication of the financial state of the contract, the difference between the two results representing the apparent profit or loss achievements to date. A comparison of this nature can be a useful measure of achievement, providing both statements (ie. value and cost) have been carefully reconciled with each other.

Part b, of the question allowed respondents to indicate if they made use of forecast valuations as a standard with which to compare the actual results of an interim valuation. Of the three criteria, this would be the only effective means of monitoring at regular intervals turnover achievement for comparison with a pre-determined target. The aggregated results of the individual contracts representing the overall turnover achievement in relation to the time period under review.

Part c, was intended to ascertain if companies attempted to relate the results of actual

valuation achievements with site production records. This may be of value to management in that an additional check is thus provided, so long as the measure of completion reached in monetary terms can be readily correlated with that expressed in physical terms. By dividing the question thus, the use of more than one method by companies, who might wish to base their conclusions upon the impressions gained from more than one source, could be accounted for.

2.13 The next portion of the questionnaire, Question 15, was included with a view to evaluating, in the first instance, the extent to which income and expenditure were forecasted by the contributing companies. It was noted that the methods used to produce such forecasts would range from an approximate assessment of overall value, related to the forecasting period, to an aggregate of detailed cash flow statements produced for each contract. The need to differentiate between a time projected system and a procedure limited to a review of commitments at pre-determined intervals was recognised.

The second half of this question was designed to find whether cash flow forecasts for individual contracts were being produced at the tender stage,

or only when contracts were secured. It was hoped that such answers would reflect the value placed upon these forecasts by the contributing companies, when finalising tender prices.

2.14 The last question was to test which of three particular factors were considered by the contributing companies when tendering for a contract. The first two factors, ie. profit in relation to contract value, and the required contribution of the contract to the recovery of overheads, are generally regarded as traditionally acceptable, and most commonly used (I.O.B. Code (see 51)) The third factor constitutes an assessment of the rate of return to be derived in relation to the amount of required working capital investment. An affirmative answer to this latter portion was expected to be correlated by the confirmation of the production of cash flow statements in answer to part ii of Question 15.

2.15 Directly the completed questionnaires were received, an analysis of the replies was prepared (see Table (Ai and A(ii) Appendix A.).

During the same period a series of visits were conducted to those companies which had kindly offered further assistance, in accordance with the

opportunity provided in the final portion of the questionnaire. Interviews were conducted at Senior Management level, and consequently, the views expressed and recorded carried the appropriate authority of the persons concerned.

3.0 Discussion and Conclusion to the Enquiry

3.1 Only a small minority of the eighteen contributory companies provided evidence of corporate policy and long range financial plans documented in a formalised manner, and it appeared that the size of annual turnover was the major factor in their adoption. The management in all instances asserted that they considered and applied as normal business practice those factors regarded as synonymous with corporate planning procedures. However, these policies were often informal in nature, and tended to be implied, rather than positively communicated. There, therefore, appeared a need for a more conscious and deliberate effort to be made to communicate policy more effectively and to produce plans in a more formalised manner.

Annual turnover forecasts were widely practised, though they were inclined to be a mere reflection of the currently secured work load unrelated to long range plans. All respondents recorded actual valuation achievements on a monthly basis, though only a minority (in the larger turnover group) could be said to operate a monitoring system which enabled monthly achievements to be compared immediately with a forecast of the same time scale, projected within an annual turnover forecast.

The sample firms were prepared to produce forecast valuations for contracts upon the request of clients, though often these were only undertaken on a selective basis. However, the opportunity to test the accuracy of the forecasts and to examine the feasibility of their adoption for internal use seemed to have been generally neglected.

A large majority of the respondents confirmed that forecast valuations provided a reasonable assessment of future income and of the clients impending rate of expenditure, although it was noted that only a minority produced them for their own internal benefit, and that the slight increase in the demand perceived stemmed from the clients of the smaller companies. A minority of respondents were also prepared to accept forecast valuations as a basis for interim payment. The support for such procedures seemed to be reflected by the adequacy or otherwise of the Quantity Surveying staff within individual companies, although the majority of the comments in this respect tended to reflect opinion rather than actual experience. Nevertheless, having been assured of the continuing acceptance of the established role of interim valuations, more respondents were prepared to accept their secondary role as a means of correction when using forecasts as a basis for interim payment, suggesting that a wider adoption of such techniques might ensue from

a greater dissemination of information regarding their application. The use of interim valuations as a means of performance appraisal was unanimously accepted by the contributory companies, although the ability of most to use them for this purpose was largely restricted to cost appraisal exercises. Only the few companies which produced monthly valuation forecasts had the appropriate standards against which actual achievements could be directly compared with that planned.

A substantial majority of respondents forecasted the flow of income and expenditure at either quarterly or monthly intervals. Though quarterly forecasts tended to be based upon arbitrary assessments, rather than the aggregation of cash flow forecasts from individual contracts, they never-the-less were thought to provide a reasonable indication of liquidity, and allowed appropriate action to be taken. On the other hand, the monthly forecasts were revealed as little better than periodic reviews, limiting their users to a 'fait accompli' position with minimum opportunity for corrective action. In most cases, however, there was little evidence of any deliberate correlation between the forecasts so produced, and the turnover forecasts previously described. A minority of the sample produced evidence that

they had ascertained the working capital demand from cash flow forecasts in relation to secured contracts of higher than average annual turnover value. These were undertaken primarily to ensure the availability of capital to finance such projects.

In general though, management relied upon quarterly or monthly reviews of income and expenditure to indicate future working capital demand in terms of their respective companies as a whole, rather than individual contracts. The arbitrary nature of such provisions for working capital demands, and particularly for individual contracts, were seen to provide a poor substitute for the deliberate exercises available. The receipt of income derived from individual contracts was monitored by all contributory firms. There was no evidence of similar monitoring of the timing of expenditure: payments were made on the basis of total indebtedness to individual suppliers, and consequently the actual timing of expenditure in relation to individual contracts was not readily available. The absence of motivation to re-orientate their accounts to remedy this deficiency appeared to stem from the selective nature of the production of such forecasts in the first instance.

Enquiries left no doubt that the principal element

used in finalising a tender submission was the profit margin in relation to estimated cost including the provision within the tender of a contribution towards overhead costs. No company confirmed the practise at the tender stage of calculating the internal rate of return for the working capital anticipated to be required for a project. Reliance was placed upon the skill of the individual estimators to make adequate provision for the cost of working capital, and its effective recovery within the contract value. The scant encouragement given to the adoption of cash flow forecasting in this respect by the Code of Estimating Practice (Institute of Building 3rd edition) was also noted (see 51).

It is suggested that the Code be extended from merely recommending the formulation of an opinion of the profitability of the proposed project, to advising the undertaking of a deliberate exercise in determining working capital demand, and the adjudication of its rate of return based upon a cash flow forecast. Such exercises must inevitably be beneficial to management by providing a greater awareness of the extent and areas of employment of working capital, and assisting in the resolvement of tender values.

CHAPTER 3

INTRODUCTORY SYSTEM OF FINANCIAL PLANNING

CHAPTER 3

Introductory System of Financial Planning

1.0 Introduction.

1.1 The aim of this section is to demonstrate the introduction of financial planning within the existing financial control procedures of a building company and to evaluate the system installed.

1.2 This Company, operating with an annual turnover of £450,000, had been established for some thirty years. The work currently undertaken at the time of the study ranged in size from a civil engineering contract of £30,000 in value to a housing contract of £400,000. Since its formation the Company had been predominantly engaged in civil engineering, and it was only in recent years that market conditions had influenced the diversification of its activities into the field of general contracting, of which housing contracts constituted the major portion of this work.

1.3 Discussions with the Directors of the Company confirmed that, (common to many of the smaller companies responding to the questionnaire), there had never been any deliberate effort in previous

years to establish target values for turnover. Any review of future prospects tended to be restricted to an appraisal of the value of the contracts secured, and an assessment of the average prospective monthly turnover value. There was clearly no established provision for growth, the Directors regarding as satisfactory a level of turnover comparable in real terms with that of previous years. The estimating procedures adopted were mainly orientated towards the production of a competitive price, while little consideration was given to the demands on capital or potential profitability,

1.4 As the existing organisation structure did not contain a planning department, there was little evidence of any formal planning and monitoring procedures in operation, other than that displayed by the initiative of the individual Site Agent. Management relied upon these Agents to exercise effective control of the work, and to provide details of actual progress in a somewhat informal manner during the visits of the Contracts Manager to the sites.

1.5 The only detailed information available to Management, which gave some indication of progress on current contracts was that produced by the Quantity Surveyors responsible for the financial

control of the individual projects, who valued at pre-determined intervals the work completed, as a basis of claims for interim payment.

1.6 Actual turnover achievement was measured by recording interim certificates as received within the demands of the book-keeping procedures currently operating, and the production of financial results at half-yearly intervals.

1.7 It had become evident to the Directors during recent years that the present procedures were becoming less capable of coping with the stress and pace of modern practice. There was a genuine desire on the part of all concerned to improve upon the existing system, provided that the cost of implementation was not excessive, and that the change could be effected without undue disturbance to the existing organisation.

1.8 The absence of a planning department (see para. 1.4) and the method of estimating adopted (see para 1.3) meant that there was little capability or foundation data available to enable the immediate installation of a comprehensive system of financial planning techniques.

1.9 It was therefore resolved to introduce the system in progressive stages, with as little

disturbance to current activities as possible, by the extraction of recorded information already available (although somewhat dispersed) within the company.

2.0 First Stage in Introduction of System.

2.1 The initial procedure was concerned with an appraisal of turnover achievement from contracts currently being undertaken, with the objective of;

i) Presenting turnover achievement on current contracts, correlated to an appropriate period.

ii) Comparing the results attained with a pre-determined turnover target.

2.2 Method.

The appraisal of past turnover achievement was commenced by the collection of valuations recorded for each of the contracts operated by the company during the previous ten months. These results were abstracted as per appendix B. diagram I, and the turnover achievement for each month ascertained by totalling the respective monthly columns. The ten month period was chosen quite arbitrarily, and the valuation recordings for contracts in progress prior to the first month of this period were commenced with their cumulative totals.

2.3 The presentation of the results in this form highlighted immediately the frequency of valuation claims made with respect to each contract. Certain contracts showed a regular series of recordings, in marked contrast to others whose entries were of

an intermittent nature.

2.4 The valuations recorded were those for which claims had actually been agreed with the respective Professional Surveyors, and were based on the value of work completed, excluding un-fixed materials, but embracing sums to be deducted as retention by the client. In effect they were indicative of the value of the work completed, and not of the actual payment received from the Client. This was to ensure that the results as recorded would provide an acceptable basis for the production of forecast valuations at a future stage in the system.

2.5 The individual monthly values as calculated were then produced in graphical form (see appendix B, diag. 2) to provide a visual pattern of the turnover obtained from contracts during this ten month period. The total turnover achieved amounted to £340,035 resulting in an average monthly turnover value of £34,000, with a range extending from £24,092 to £40,170. Of the twenty seven contracts involved eight were still in progress at the end of the review period.

2.6 The next stage was to establish a criterian for the appraisal of the turnover results recorded. Management revealed the practice, when estimating,

of adding 7½% to the nett forecast costs for the recovery of overheads expenditure, (any margin for profit being additional to this percentage).

It was therefore decided, for the purpose of this initial exercise, that the percentage quoted was to be used to calculate the minimum amount of annual turnover required to recover an assumed value of overhead costs. This would provide management with at least a basic aim with regard to turnover, against which actual turnover achievements could then be measured. It was agreed that this value would be based upon the previous year's trading result in which a sum of approximately £30,000 was attributed to overhead costs. Using the values quoted the minimum annual turnover was calculated as follows:

$$\text{Minimum turnover required for recovery of overheads} = £30{,}000 \times \frac{100}{7\frac{1}{2}}$$

$$= £400{,}000 \text{ per year}$$

$$= £33{,}333 \text{ av. per month}$$

This was done with the knowledge that the resulting percentage recovery value would actually be equivalent to 8.06% of assumed nett costs, slightly more than the minimum requirement previously stated.

e.g. Nett Costs = 100%

Turnover = (Nett Cost ± % provision) = 107½%

$$\text{Recovery Value} = \frac{107\frac{1}{2}}{100} = 8.06\% \text{ of nett costs.}$$

2.7 Having established the average desirable monthly turnover, diagram 2 was completed by the insertion of a horizontal line representing that value. The actual turnover achievements for each of the ten months previously plotted could now be compared visually with this target. The results were also recorded in tabular form, and the variations with the desired average monthly turnover indicated (Appendix Diagram 3).

3.0 Evaluation of the System at the First Stage of Operation.

General Observations.

In establishing criteria for the evaluation of the system, it was considered appropriate to use as a base line the original objectives and to first measure performance on these terms. The evaluation would later be extended by additional criteria from which the relative merits and disadvantages of the system could be more fully demonstrated.

3.1 In the fulfilment of objective 2.1(i), the presentation of results as described indicated the irregularity of the receipt of interim valuations (see paragraph 2.3). Thus the need was established in the future development of the system for the production of interim valuations on a regular time basis, to ensure their effective

correlation and the production of a more accurate monthly turnover result.

3.2 The necessity to use past interim valuation results when launching the system was accepted with a cautionary note that any impressions gained would need to be tempered by:

i) An awareness of inaccuracies which may be associated with the production of interim valuations in practice and,

ii) The omission of the value of work subject to ultimate agreement between the Professional and Company Quantity Surveyors concerned with the individual contracts. It is noted at this stage that future monitoring procedures in the later development of the system would endeavour to alleviate the above problems.

3.3 The presentation of the monthly turnover results in visual form (Appendix B, Diagrams 1 to 3) correlated the valuation results of individual contracts and provided an overall pattern of turnover achievement which hitherto had not been readily available. This could then be compared with the average monthly turnover target based upon the recovery of overhead expenditure and the variations noted, thus satisfying objective 2.1(ii). As the use of the

the percentage recovery rate will again be applied in the second stage of the system, an evaluation of its application will therefore be more appropriately dealt with at that stage.

4.0 Second Stage of Introduction of System.

4.1 Having established a record of turnover achievement from the contracts currently being undertaken, the next step was to produce forecast valuations for each contract completion, from which a forecast of overall turnover could be compiled. In this way the following objectives could be achieved:

i) An indication of the task remaining (in monetary terms) with reference to the completion of each contract.

ii) The means by which future valuation achievements on each contract could be evaluated.

iii) The extent of turnover to be derived from currently secured contracts.

iv) A comparison of the forecast of overall turnover with the established target.

v) An indication of the periods most appropriate for the introduction of new contracts.

vi) A promotion of the review of the percentage rate of recovery of overhead costs in

relation to changes in volume of turnover as forecasted.

4.2 Having clarified the proposed date of completion and value for each contract, graphs were prepared using these two values as parameters in each case. The actual valuations recorded to date were then plotted on each graph, enabling the extent of these achievements to be compared with the parameters indicated (see appendix B, diagrams 4 to 6 provided as typical examples for each of the contracts).

4.3 Consultations were subsequently undertaken with the Company Quantity Surveyors responsible for each contract to ascertain the value and nature of the work still to be completed. It was agreed that this would be obtained by deducting the measured quantity and value of work included in the interim valuations to date from the original amounts contained in the Bills of Quantities for each contract. The accuracy of the quantities relating to the principal items within the Bills was verified by reference to the working drawings and site works re-measured where appropriate. Consideration at this stage was restricted to a broad review of the situations with regard to each contract; incidental items in each of the Bills being grouped within clearly

recognised major sections of work.

4.4 These reviews were then extended to include the Contracts Manager and Site Agent responsible for each contract under consideration. Agreement was reached in principle as to the phasing of major sections of work to be completed, the intention being to apportion their value over the periods in which the work was anticipated to take place. During this review it was essential to correlate the information provided by the individual Quantity Surveyors as to the state of progress on contracts and the assessments made by Site Agents.

Reports produced by the Quantity Surveyors naturally followed the Trade format of the traditional Bill of Quantities, and often did not relate directly to the actual production activities on site, the latter forming the basis of any serious review of progress by site Supervisory Staff.

4.5 It is necessary to ensure that all concerned kept the objectives of such reviews in perspective, recognising that the intention was to provide guidance as to the extent of future valuations needed to be achieved, within the permissible time limit, for the completion of each contract. Every endeavour was made to ensure that these

forecasts would be as realistic as possible, without resorting to detailed production planning procedures at this stage.

4.6 Graphs for each contract were completed by plotting the forecast cumulative valuations as assessed, extending each curve beyond the position of the last valuation recorded through the assessed forecast valuation positions, and terminating at the parameters described in para. 4.2. As far as possible, attempts were made to produce forecast valuation assessments on a one monthly basis, but in cases where this proved difficult they were made at longer intervals, their positions plotted and the curve drawn. Monthly cumulative values were recorded directly from the appropriate positions on the curve, thus produced.

4.7 Individual monthly forecast valuations were calculated by subtracting in each case the cumulative value of the previous month from that assessed for the month under consideration. Both cumulative and individual forecast values were then produced in tabular form and these, together with the graphs as drafted, were presented to the Management for approval. (see diagrams 5 and 6, as examples)

4.8 Upon approval, these forecasts were collated and a statement produced indicating the overall turnover anticipated each month. A further statement underlining the variations between these forecasts and the average monthly turnover target was drafted in accordance with appendix B, diagrams 7 and 8. The form of presentation is similar to the statements produced in connection with the actual turnover achievements as illustrated in Appendix B, diagrams 1 and 3.

4.9 The forecast monthly turnover values were then produced in graphical form as shown in Diagram 9. By combining this graph with Diagram 2 (which related to actual turnover achievements), it was possible to provide Management with a pattern of turnover extending over two years. (see diag 10).

4.10 Thus diagram 10 provided the means of comparing the combined patterns of actual and forecast tunover with the desirable monthly turnover target. It is followed that in any comparisions made, incidents of over-recovery of turnover would be offset by those of under-recovery. This presupposed that on balance these variations would have a compensating effect, and sufficient turnover would be achieved for the recovery of the appropriate portion of overhead costs.

4.11 However, an appraisal exercise of the form described only provided a resulting balance at the end of the particular period under review; the balance as calculated representing the total amount of over or under recovery achieved up to that date. It was therefore considered an advantage to produce these over and under recovery values in cumulative form, so that the Management would see the changing balances occurring at the end of each month, rather than to await a particular review period.

4.12 To this end the cumulative balances of these over and under recovery values were calculated for the complete two year period, as per Appendix B, Diagram 8, and these values plotted to produce the graph as illustrated in Diagram 11. The values illustrated in this form highlighted occasions when the resulting cumulative balances equated to the desirable turnover value, and the periods (in months) over which parity occurred.

Some interesting comparisons could now be made between the information provided by Diagram 10 and that of 11.

4.13 A review of the actual valuations as per Diagram 10 revealed two periods during which the monthly valuations achieved did exceed the

desirable target (April to July and September to November). These excesses were shown to be counteracted by the contributions of August, December and January, whose values were below target.

On balance over the period the desired turnover was achieved, a result which was immediately apparent by reference to Diagram 11. A similar exercise was extended to the forecast of turnover which commenced with a period of under-recovery in February followed by a period of over-recovery from March to August, and terminating by a total run down of valuations beyond this date attributable to the phasing out of current contracts. Again the result in cumulative balance form directly indicated that parity of turnover value as forecast with that desired, would most likely be achieved between November and December.

4.14 Inspection of the turnover as forecasted and illustrated in Diagram 15 showed the monthly values of turnover falling below the average desirable value in August, reducing progressively each month, and terminating upon the completion of the current work load of the following year. A study of Diagram 11, however, revealed that the incidence of the cumulative balance falling

below the desirable was not likely to occur until November because of the over-recoveries anticipated to be gained in the previous months.

Apart from the possible need to secure additional contracts to replace those terminating, and to ensure continuity of employment of both operative and management resources, it therefore appeared essential to introduce new work some time before August in order to maintain a level of turnover at least equal to the desirable average monthly value. Management could perhaps obtain some limited comfort from the fact that if the forecasts related to the current work load were attained, the recovery of overhead costs could be maintained until November (see Diagram 11) without the addition of new contracts.

4.15 The timing of new work may be further assisted by the presentation of an overall picture showing the winding down of contracts, using the same control information as that used to forecast turnover. An example of this is shown in Appendix B, where the information (Diagram 12) is plotted for each of the contracts concerned (see Diagram 13). Thus the information is illustrated in two different forms; Example Diagrams 5 and 6, demonstrating future commitments in terms of 'valuations required to be achieved' and

Diagram 13, placing the emphasis upon the 'rate of winding down' of the contracts, on the basis of the fulfilment of original contractual commitments.

5.0 Evaluation of System at Second Stage of Operation.

5.1 The review of valuation achievements and the production of forecast valuations for each of the current contracts (as described in paragraphs 4.1 to 4.7) fulfilled the first two objectives (i.e. 4.1(i) and (ii)). However, certain deficiencies in these forecasts were recognised:

i) As they were based upon committed contract periods conceived in a climate little influenced by deliberate planning procedures, they could be subject to some initial inaccuracy.

ii) Because the contracts were in progress at the introduction of the system, the forecasts were, therefore, based upon the measure of work outstanding, the accuracy of which being subject to...

a) Discrepancies in the valuations recorded, as described in paragraph 3.2.

b) The need to reconcile the information provided by the Quantity Surveyors and reports of Site Agents (see paragraph 4.4).

Despite these limitations, however, the forecasts were accepted as providing a reasonable basis for the establishment of the overall turnover forecast to follow, and as indicating the extent of commitments with the respective clients.

Nevertheless further consideration of aspects (a) and (b) will need to be made during the evaluation of the third stage of the system, in which the monitoring of progress and the feasibility of the forecasts for individual contracts is considered in greater detail.

5.2 The overall turnover forecast produced from the aggregation of the forecast valuations of current contracts (see paragraph 4.8) indicated to Management the extent of secured work load and its gradual reduction as contracts were anticipated to be completed. The graphical illustration of these values (see paragraph 4.9) demonstrated the periods most appropriate for the introduction of new work, and the extent to which the overall turnover as forecasted was meeting the average monthly turnover target. Thus objectives 4.1(iii), (iv) and (v) were achieved. The provision for monitoring the changing balances of over or under recoveryof overhead costs attributable to the variation in the forecasted turnover values, satisfied objective

4.1(v). It also confirmed that the percentage recovery rate was influenced by the changes in magnitude of future turnover.

5.3 The periods over which the forecasted rate of turnover would achieve parity with the desirable turnover target (see Diagram 11) was seen to be indicitive of the periods over which the percentage rate for the recovery of overheads would be expected to operate with confidence. Consequently it could encourage the reconsideration of the size of the percentage recovery rate when used in the build up of estimates for future contracts and discourage the use of the same percentage, irrespective of the likely magnitude of future turnover (achieving objective 4.1(vi)).

5.4 The percentage rate used for the recovery of overhead costs was based upon the performance in previous years. Although this was accepted in order to commence the system, additional consideration will be given to this aspect at a later stage.

6.0 Third Stage of Introduction of System.

6.1 Concern in the third stage of implementation was with introducing a procedure for the monitoring of results and their comparison with those

forecast.

The principal objectives were as follows;

i) To monitor valuation achievements in relation to individual contracts on a regular time basis.

ii) The correlation of the above results to provide a record of overall turnover.

iii) To relate results as recorded in i) and ii) to appropriate forecasts and to indicate variancies.

iv) The review of performance on individual contracts.

v) To initiate corrective action on individual contracts.

vi) The revision of financial forecasts for individual contracts, and to effect similar revisions to overall turnover forecasts as necessary.

vii) To extend the system (see stage 4.1(vi)) by the continual review of the percentage rate of overhead recovery, in the light of actual turnover achievement.

viii) The production of financial forecasts for new contracts as received, and their absorption into the overall turnover forecast.

ix) To use the overall turnover forecast in providing guidance, and to stimulate

selection processes when tendering.

Proposed Monitoring Procedures.

6.2 No forecasting system would be complete without some method of control in which the actual results of the activities under consideration could be measured and recorded to a time scale related to that of the forecast. Accordingly, Appendix B, Diagram 14 was designed to meet this purpose. The forecast values from Appendix B. Diagram 7. were transferred to the 'forecast' column in the new table, in readiness for the recording of the actual valuations.

Columns were provided for the recording of the individual monthly valuations as they occurred, together with the turnover culminating at the end of each month. Provision was made for the recording of the variations between the actual results achieved and those forecast, and the resulting balances at the end of each month were highlighted for the attention of management.

6.3 Recordings for the first two months of the operation of the system are shown in Diagram 14. It was noted that during this period irregularities in the frequency of the receipt of valuation achievements again occurred as previously mentioned

in paragraph 2.3. This resulted in the failure to record the value of work completed on Contracts No.3381 and No.3423 in February, and Contracts No.3369 and No.3370 in March. The omissions in each of these cases were attributable to the inability to carry out the valuations with the Professional Quantity Surveyors on the dates due.

It is perhaps opportune at this stage to mention the possibility of having contracts in which the frequency of the valuations could, by agreement, extend beyond the normal one monthly period. Such contracts would also result in similar omissions. Clearly it was necessary to accept the occurrence of such anomilies, as in the majority of cases the cause lay beyond the control of the company Quantity Surveyor, and could not be readily eliminated.

6.4 However, the suggested method of dealing with the problem was to record the valuations as received, and to indicate the absence of a valuation by a negative variation equivalent to the forecast made for the particular contract under consideration. (see Diagram 14).

It was further proposed that such action should be supported by a supplementary statement from the company Quantity Surveyor responsible for

the particular contract. This would indicate the value of work which in his opinion had been completed, for inclusion as a contingency amount in any overall appraisal of turnover at the month end.

6.5 The cumulative values recorded in Appendix B, Diagram 14, were calculated from the commencement of the forecasting period, with the intention of providing a ready indication of the amount to which the actual turnover achievements were meeting the forecasts set out in Diagram 8. It was also considered that there could be some merit in the provision of similar records with the cumulative totals calculated from the beginning of each individual contract. This would enable an assessment to be made of the performance achieved in terms of the total value of work on the contract, a performance criterion perhaps more appropriate for use by the Contract's Manager.

Appendix B, Diagram 15 was designed to be used for this purpose, with the intention of completing the recordings at the same time as those for Appendix B, Diagram 14. The resulting variations between forecast and actual should be the same in both cases.

6.6 It was proposed that the information concerning actual valuations agreed on contracts should be received no later than five working days after the month end. Records in accordance with Diagrams 14 and 15, when completed, to be submitted to management for review, and appropriate reference made to any supplementary statement produced in the case of contracts on which the value of work had not been agreed. The necessity for corrective action would stem from the size of the variation, and the information provided to management arising from initial enquiries made to ascertain the cause. However, decisions concerning corrective action, particularly when related to individual contracts, would be very inadequate if based solely upon the information related to valuation achievements. Reports concerning physical progress on site, records of costs to date, price loading, and any factors considered to have influenced the results would need to be obtained, and used collectively, in order to ensure that management was provided with a sound basis for making effective decisions.

The main intention of the system at this juncture was to provide management with the means to monitor turnover achievements for comparison with pre-determined turnover targets, and to motivate the initiation of enquiries concerning the

current production achievements on the various contracts.

6.7 As proposed in the above paragraph, arrangements were made for the submission of the actual variation results to the Senior Quantity Surveyor within five working days following the end of each month. He would be responsible for the completion of forms as per diagrams 14 and 15 and to submit the results to management within a further three days. Appropriate reference would be expected to be made to any supplementary statement produced concerning those contracts in which the value of work assessed had not been agreed, (see para 6.6). Senior Management's consideration of these particular results was also established as a regular monthly practice.

6.8 During the review of the results as recorded management would be expected to consider the extent of the variation between the total turn-over forecast for the month and that actually achieved. Diagrams 14 and 15 highlighted this overall result for their immediate attention. The size of the variation occurring on each of the contracts concerned, would naturally be considered at the same time.

6.9 To assist management to consider the above

variations, it was suggested the form as illustrated in Appendix B, Diagram 16 could also be used. Using Contract 3381 as an example, the results of the actual valuations were recorded, compared with the forecasts, and the variations highlighted. The cumulative totals were calculated from the commencement of the contract, and conforming to the collective recordings made in Appendix B Diagram 12, the value of work outstanding each month was shown.

It was further proposed that the actual valuation results be plotted upon the original forecast graphs for each contract, and appropriate comparisons made. For the purpose of illustration the forecast graph for Contract No. 3381 was reproduced and the valuation achievements duly recorded (see Appendix B Diagram 17).

6.10 Whilst accepting that every variation, if possible, should be investigated to ascertain the cause and to consider the application of corrective action if necessary, it was agreed that Management, (having satisfied themselves with regard to the reasons for the respective variations), would need to establish some order of priority in the application of corrective action between those contracts selected for further consideration.

6.11 In the exercise of the selection procedure, it would be necessary to identify those contracts in which it was likely that prompt corrective action would arrest a serious adverse trend, and effect the greatest improvement in future production performance. A significant factor in this respect would be an examination of the opportunity available within the remaining period of each contract for the exercise of corrective action, or if serious consideration would need to be given to the extension of the contract period.

6.12 The absence of any formalised planning and progress procedures on site, suggested the need to set up on a regular time basis deliberate enquiry procedures to examine the general progress on each contract selected for review. It was argued that such enquiries would be assisted by an analysis of the interim valuation statements produced for each of the contracts. In this respect, the Quantity Surveyors responsible for their production, were requested to generate as a regular practice as accurate and as detailed a statement as possible of the work completed, even to an extent beyond that normally regarded as necessary for the establishment of claims for interim payment. It was also suggested that these statements should be supplemented by information concerning the value and nature of

work still to be completed.

6.13 An example of the form of presentation of results showing the amount of work outstanding on each of the contracts is illustrated below using the results of Contract No. 3381. Statements of the value of work outstanding on the contract were related to the Main and Sub Contractors' responsibility, with a further sub-division into elements which could be readily associated with particular sections of the Main Contractors labour force, and those of the individual sub-contractors.

CONTRACT 3381

VALUE OF WORK OUTSTANDING

Main Contractor.	£	
Sub Structure	1620	
Concreter	1001	
Bricklayer	5555	
Pavior	1322	
Carpenter	6412	
Painter	1568	
Garage	1601	
Sub Station	355	
Ext. Work	1698	
		21,132
Sub Contractors.		
Roofer	1081	
Plumber	4867	
Metalworker	1328	
Glazier	290	
Plasterer	4042	
Electrician	1266	
Pre-cast Concrete	2556	
		15,430
		£36,562

6.14 These details could, if desired, provide the basis of further enquiries to ascertain the extent of the task required in physical terms for the completion of each contract. For example in considering each of those items to be finished by the main contractor's operative force, a deduction of the value attributable to the cost of materials, overhead charges and profit, would leave a balance outstanding, representing the 'sum allowable' for expenditure on labour and plant for the completion of the work. In conducting such exercises, consideration would need to be given to the 'loading' of individual bill items which may have been undertaken in the build up of the original tender.

The 'sum allowable' when expressed in terms of 'man hours' or 'machine hours' could then be examined in more practical terms by the staff responsible for resolving the necessary corrective action and the determination of production targets. Using the total man or machine hours allowable as a basis, the appropriate period for the execution of the outstanding work may be calculated in relation to the optimum sized labour force required for its execution. The question as to whether the this period would be acceptable, within the context of the total period available for the completion of the

contract, and in relation to other operations, may be a matter for further consideration. Similarly, such an exercise could reveal that the 'sum allowable' was insufficient to meet the cost of the resources considered necessary to execute the work. In fulfilling the commitment, management would need to accept that a loss was likely to occur, but would at least have the advantage of being warned of such a consequence.

6.15 Having described the procedure for the monitoring of actual valuations, it was thought appropriate to conclude with a mention of the information available to management when reviewing progress on individual contracts at each monthly recording stage.

Using contract 3381 as an example, Appendix B Diagram 18 was produced to show in the first instance the original forecast graph with points A. B.C.D.E. and F, representing the cumulative values desired. This was followed by the recording of actual achievements as they occurred (G.H.J.K.). For example, the February achievement of £5,238 (G) indicated a deficiency of £3,262 when compared with the forecast of £8,500 (B). The increased rate of production in monetary terms required to meet the subsequent forecast (March £13,000) is shown by the insertion of the line G to C.

Similarly lines H. D., J. E., and K. F., were added at each monthly review stage, thus showing the continued increase in the rate of production required on each occasion due to the repeated failure to meet the original forecasts. The last entry in this particular example shows an actual valuation achievement in May of £22,827, leaving £18,973 as the value of work outstanding instead of £13,800 as originally forecast. In this case, management would need to consider the feasibility of increasing production to the extent required, by the revised target in the months remaining for the completion of the contract.

Bearing in mind the previous comments in paragraph 6.6 any impressions gained of the task remaining, would need to be supplemented by additional information concerning the physical nature of the task involved.

A study of the illustration should however provide a significant pointer to management, indicating the acceleration of the penalties resulting from the continual failure to meet the required forecast at the appropriate time.

7.0 An Example of the Review of the Valuation Forecasts for Contracts within the Third Stage of the Introduction of the System, and Adjustment where Necessary.

7.1 For the purpose of this review, the monitoring of the actual valuation achievement for the individual contracts was extended to April and May, a further two months beyond the period originally described in paragraph 6.3. These additional results were recorded and the variations highlighted in a similar manner to that previously described. (Appendix B Diag 19 and 20).

The variations for all four months were reproduced as follows:

	February	March	April	May
Monthly variations	-£4177	-£5241	-£3371	-£5762
Cumulative "	-£4177	-£9418	-£12789	-£18551

They indicated negative variations for each of the months concerned, and a cumulative balance of under recovery with respect to the desired turnover target. This suggested the need to undertake a detailed analysis of the current position with respect to each contract, and the probable adjustment of the overall turnover forecast.

7.2 In accordance with the recommendations made in the previous text, the forecasts for each of the relevant

contracts were examined, and the prospects of their completion by the agreed dates reviewed. The size of the task remaining in each case was considered in the light of the results achieved, together with such information as provided by financial reports similar to those described in paragraph 6.13. The first contract was No.2911, a local authority housing contract, in which the valuations recorded up to May amounted to £325,673 leaving the value of work outstanding as £54,294. In contrast, the forecast for May was, £330,000, which would have left a balance of £49,967. It was clear from the negative variation of £4,327, that if the present trend continued, valuations of the magnitude forecast for the remaining months of the contract would be unlikely to be achieved. This contract, consisting of houses and maisonettes of some seventy-two units in total, was originally agreed to be completed within a two year period, and six months of the original contract period still remained. Up to the date of the May valuation, thirty-five units had been handed over to the local authority, leaving a balance of thirty-seven units to be finished.

7.3 A review of the progress indicated that there was a general state of unbalance in the gang sizes, and the stages of completion of the individual blocks. The majority of the work outstanding related to the

first fixing and finishing operations of the plumbing, electrical and plastering trades, of whom only the last two mentioned were employed directly by the company.

As a consequence of the inevitable concentration of work load within the stages described, and the dependency between the trades involved, it was noted that the extent to which future production performance could be increased by additional manning was severely limited. The problem was further aggrevated by a lack of co-operation from both the plumbing and plastering sub-contractors; their failure to keep to agreed time schedules and their inability to maintain optimum size labour forces during the course of the contract. Other contributory factors were those which provided the basis for claims for extension of time upon the contract. These included delays in the receipt of Architects' instructions and components from nominated suppliers, these, in addition to a two week strike by bricklayers in the early part of the contract, brought the total claim for an extension of time to three months. Management agreed that there was a valid case for a revision of the forecast to the contract, and accordingly, an extension of time submitted.

A revision of the valuation forecast was carried out by re-apportioning the value of work

outstanding in each section over the revised period allotted for its execution. The revised monthly forecast for the contract arising from the above, was produced and illustrated in graphical form, as per Diagram 21.

7.4 The next contract for consideration was No. 3364. Again this was a housing contract, of some 28 units, the value of work completed up to the month of May was £54,243, leaving a balance of £69,757, compared with the original forecast in which it was hoped to reach a cumulative value of £60,000, with a balance of £64,000 remaining. A review of this contract indicated that the work was progressing reasonably well, although the speed of production was dictated by the need to demolish existing property on the site before certain of the new work could proceed. Considerable delay was being experienced in the demolition process due to the inability of the local authority to effect the re-housing of the existing tenants. Therefore it was agreed to continue the execution of the contract with a smaller labour force than that originally contemplated, and accept the inevitability of reduced valuations. There was obviously a clear case for an extension of time on the contract, and a delay of four months was considered likely.
A revision of the forecast in a similar manner to that described for the previous contract was produced.

7.5 Contract No. 3381 was another housing contract whose record of valuation achievements was that used to illustrate an example of the "statement of the value of work outstanding", suggested to be provided by the quantity surveyor responsible for each contract, (see paragraph 6.13). The cumulative valuation achievement up to the month of May was £22,827, resulting in a negative variation of £5,173 when compared with the original forecast of £28,000. The failure of build up to the optimum labour force on the contract, particularly in relation to the carpenters and domestic sub-contractors, was found to be the main factor leading to this adverse situation. There was, however, some evidence of delays of an acceptable nature which could be referred to in order to substantiate a claim for an extension of time. These amounted to a total of three weeks, but considering the amount of work still outstanding on the contract, it was agreed that a more realistic date for completion would be October, two months beyond that agreed within the original terms of the contract. A revised forecast was prepared accordingly, with management bearing in mind the need to approach the client some time in the future in order to resolve the difficulty of a revised completion date as amicably as possible.

Of the four current contracts remaining, Contract No. 3365 and No. 3423, were both completed in May. The

actual valuations achieved on Contract No. 3365 amounted to £900 in excess of the original contract sum, and similarly in respect of Contract No. 3423 a £500 excess was recorded. There was still a small balance of work remaining on Contract No.3319 which had been scheduled for completion in May; provision for this was made by an extension into the following month of the outstanding balance amounting to £1,707.

Finally, with regard to Contract No.3370, the actual valuation achievements up to May were reviewed, and found to be satisfactory when compared with those forecasted. No further amendments were considered necessary, other than the substitution of the actual results achieved between February and May with those in the original forecast.

7.6 Having examined the current position in relation to each of the contracts, and the revisions to the forecasts carried out as necessary, a new forecast valuations summary in the form of Appendix B Diagram 22 was produced. The actual valuations achieved up to May, together with the revised forecast valuations beyond this date were duly recorded, and the table was completed by the calculation of the individual monthly and cumulative forecast totals as illustrated. The production of this revised forecast valuations summary replacing that oringinally

produced in Appendix B Diagram 7.

The next aim was to compare the revised monthly valuations as forecast, with the average monthly turnover desired, which involved the replacement of Appendix B Diagram 8 by Appendix B Diagram 23. The cumulative balances were then ascertained, as in the now redundent Diagram 8. The results recorded in Diagram 22 were produced in graphical form Diagram 24, to demonstrate the revised monthly turnover forecast, replacing the original forecast illustrated in Diagram 9. Similarly the revised cumulative balances compiled in Diagram 23 were illustrated in Diagram 25, providing a replacement of the original forecast, (cf. Diagram 11).

7.7 An interesting conclusion to this exercise is shown by Diagrams 26 and 27. In the former, the revised monthly turnover forecast is combined with an illustration of the original forecast.

The result of extending the periods of certain contracts, and the consequent reduction in the forecasted monthly turnover values, is clearly demonstrated. The adverse effect upon the anticipated turnover of the company is further illustrated by the slump in production value represented by the shaded area A, and its gravitation

to position B in the lower portion of the graph. The problems associated with a reduction in the rate of turnover on currently secured contracts, and the need to introduce new contracts to make good these deficiencies, will be discussed later. (see paras. 9.7 and 9.8).

Diagram 27 indicates this effect even more forcibly when related to the cumulative balances between the revised turnover forecast, and the monthly turnover desired. The valuation achievements recorded during the four months between the first review period in February, and the second in May, showed that the anticipated over-recovery of turnover beyond the desired rate, did not materialise.

As a result, the over-recovery balance forecasted in Diagram 8 for May of £23,150 was reduced to £4,599, a total fall of £18,551: a little over half the value of the desirable monthly turnover of £33,333.

A further fact revealed by diagram 27 was that the period over which the favourable cumulative balance for the recovery of overheads could be regarded as operative was reduced from mid-November to August by the revision of the turnover forecast. The significant date for the necessary introduction of additional contracts was consequently moved forward three and a half months. Conversely, the

period of activity on those contracts making up the current work load was now likely to be protracted from January to about April. (see Diagram 26). The revised forecast indicated the likely need to retain management and operative resources over a longer period, leading to the difficulties to be discussed in the ensuing text. (see paragraph 9.8.)

8.0 Procedure Involved in the Adjustment of the Turnover Forecast in the Event of the Introduction of a New Contract.

8.1 During the course of this review a modest size contract was secured for the laying of a sewer pipe to convey waste chemical effluent from a factory. The date of its commencement was sufficiently late to prevent its introduction interfering with the forecast revision exercise previously described. Its timing also provided an opportunity to conveniently show the method of extending the forecasting period to cater for the introduction of a new contract whose proposed completion was scheduled beyond this period.

8.2 The tender price amounted to £27,271 with an agreed contract period of five months. A programme for the contract was drafted in bar chart form, and the value of each programme item apportioned over the period allotted in the programme for its execution.

The value of work anticipated to be completed during each week of the programme was then assessed from the sum of the values recorded in each week of the programme. Subsequently, the forecast for each month was drawn up from these weekly totals, and the cumulative monthly values compiled.

8.3 The next stage was to add the forecast valuations thus calculated for the new contract to the revised turnover forecast produced in Diagram 22. For convenience, a portion of this table was reproduced as Diagram 28 to include the last few months of the turnover review January to April. As the newly acquired contract extended two months beyond the turnover forecast, Diagram 28, was extended accordingly to cover May and June. The revised forecast was obtained by the addition of the forecast monthly contributions of the newly acquired contract, to the previously recorded monthly totals. The cumulative totals were then calculated to complete Diagram 28. A portion of Diagram 23 was reproduced in a similar manner to generate Diagram 29. The revised monthly totals were transferred from Diagram 28 and compared with the desired monthly turnover, and the results expressed as either under or over recovery values in terms of desired turnover. Finally the revised cumulative balances were ascertained accordingly.

8.4. The effect of the anticipated contribution of the new contract can be seen in the revised forecast as a reduction in the value of the negative cumulative balance previously recorded. The resulting balance in June represented the additonal turnover needed to be introduced during the extent of the period. In order to avoid the production of redundant diagrams, the effect of the monthly contributions attributable to the new contract is illustrated in both Diagrams 24 and 25.

9.0 Evaluation of System at Third Stage of Introduction

9.1 The system at this stage effectively monitored valuations for current contracts and their aggregation to provide a record of overall turnover achievement on a regular monthly basis (as per objectives 6(i) and 6(ii)). These results were registered on standard control forms (Appendix B, Diagrams 14,15 and 16) to enable comparisons with the forecasts previously established, so that variations would be brought to the attention of the management as a deliberate control policy (objective 6(iii)). The previous tendency was for management to examine the results of individual contracts in isolation to each other and in the absence of any clearly defined criteria.

Satisfactory provision was also made at this stage

to overcome the difficulty created by the omission of an interim valuation at a recording stage (see paragraph 6.4).

9.2 Additional to the monitoring of turnover performances, a further aim of the study (6.1 iv) was to supply (in the absence of formalised site planning and progress recording procedures) the means by which management could obtain an indication of production performance on each contract as reflected by the variation between actual and forecasted monetary values. Certain difficulties associated with such assessments are recognised and will be discussed in the following paragraph, and it is accepted that such assessments are no real substitute to formal site progressing procedures. However, it is suggested that sufficient indication of the state of progress may be provided to warrant management to initiate further enquiry with regard to production achievement (as per objective 6.1 v), rather than to rely upon the informal information stemming directly from the sites. The former enquiries would then be conducted in accordance with the review procedures outlined (see paragraphs 6.13 to 6.16) enabling management to identify the extent of the task remaining for the completion of the contracts under review, and to

formulate policy for the guidance and future action of the site administrative staff concerned.

Examples of these procedures when applied to specific contracts are contained in Section 7 of the previous text.

9.3 In the conduct of such enquiries, the management were advised of the need to temper the impressions gained during the evaluation of progress, by an awareness of the following anomalies which may often be associated with the usual form of interim valuation.

(i) In general, interim valuations are only as accurate as they need to be to fulfil their prime function of establishing claims for an interim payment; as such, they do not necessarily provide a sufficiently accurate picture for management to control detailed production activities. It is accepted that there are difficulties associated with the production of precise and accurate valuations. The complexity of the production processes involved, or the inability to measure accurately certain sections of the work on occasions, may operate against such efforts. No doubt the Quantity Surveyors concerned, in the exercise of correct professional conduct in such matters, make every endeavour to produce valuations as accurate as possible. In

certain circumstances, however, they may well be forced to bow to expediency and produce a compromise result, influenced by an awareness that any approximations within the interim valuation would be subject to ultimate correction at the final account stage. The suggestions made in paragraph 6.12, encouraging the production of valuations as accurately as possible by Company Quantity Surveyors, are worthy of note in this respect.

(ii) During the execution of a contract, the recognition and valuation of certain items of work carried out, may be a source of contention, and the subject of further enquiry by respective Quantity Surveyors. As a result, the inclusion of the value of such work in full or part, within an interim valuation, could be postponed, and become the subject of adjustment to the contract sum at a later date. An awareness of such incidents would need to be provided at a time appropriate to the evaluation of production achievement within the system.

(iii) The format of an iterim valuation relating so directly to the items contained in the Bill of Quantities, and often expressed in terms different to production activities as defined on site, may not always provide management with facts in sufficiently appropriate a form to enable them to effectively appraise current progress, unless

further correlation exercises are undertaken.

(iv) The inherent danger of accepting the result of an interim valuation on its face value needs to be continuously guarded against, particularly if such results are to be used to measure production performance. Whilst the size of the valuation may appear to be satisfactory in comparison to the 'value expected', an investigation may reveal, for example, the installation of costly components, disguising the effect of low productivity achievements in other sections of the contract.

(v) When investigating the amount of work still outstanding on any contract, due regard needs to be given to the possibility of error arising from the acceptance of the quantities of work as stated in the Original Bill of Quantities. Assuming that variations would duly be taken into consideration as they arose, care should be exercised during the course of the contract to recognise those sections of each Bill which may have been under or over-measured in the first instance. An under measure in the Bill would under rate the amount of work outstanding at the time of a review, while conversely an over measure would result in there being less work remaining

than that presumed. (Although either aspect would result in subsequent adjustment, a distorted impression may be presented at the time of the review). The management fully accepted the validity of the comments expressed, and general agreement was reached that, although production achievements on site could well be reflected by the magnitude of interim valuations presented, their use for reasons other than prime purpose, should be adopted subject to the recognition of the limitations described.

9.4 The procedure for monitoring actual valuation achievements, and their comparison with the values as forecast, provided management with an assessment in monetary terms of the task remaining to meet the demands of each contract. However, it is considered that full advantage of the system would be best achieved by the application of the following aspects during each review by management.

9.5 For instance, there would be those contracts whose results to date indicated that future valuations as forecast were within attainable limits. These could be left to continue without interference. Other contracts whose deficiencies in valuation achievements to date made it evident that there was little hope in the future of attaining the size of valuations, as forecasted,

without some form of corrective action, would need to be the subject of further consideration. Corrective action in the form of an increase in the rate of future production and measured in terms of a desired increase in future valuations, could either be achieved by the introduction of additional resources to the project, or by an increase in the productivity of the current operative force.

The ability to introduce additional resources would depend upon the nature of the work outstanding and the current stage of competion of the contract. The extent to which an increase in productivity could be relied upon to have speedy or marked effect upon future production would, however, be generally somewhat limited.

Further examination may suggest that certain of these contacts could respond to an increase in resource allocation. Management would then need to be satisfied that such resources would be available at the time needed, and could be absorbed effectively into the contract without causing undue disturbance to the existing resources and control structure. The need to contain these resources within the permissible economic limits of the contract would be an additional factor for the consideration of management in reaching any

decision concerning corrective action. This latter point is particularly relevant when increased resources take the form of extended working hours by the same labour force, additional wage payments being implicit in such action. A review of each contract in this manner would assist management to decide objectively upon a policy for future action for communication to the Site Staff concerned.

9.6 In the case of those contracts in which it was evident that it was not possible to apply sufficient corrective action of the form described to obtain a satisfacotry solution, serious consideration would need to be given to the necessity of extending the period of the contract.

An extension of the contract period, permitting the contractor to fulfil his obligations in terms of the agreed date for completion, can only be that granted at the discretion of the client upon the recommendation of the Architect.

Furthermore, the granting of such an extension would only be made if the reasons for the delay were those acceptable within the terms of the particular form of Building Contract, and subject to the compliance by the contractor of the requirement to inform the Architect immediately of the occurrence of an event likely to lead to a delay.

This would necessitate a careful record to be kept by the contractor of the report of such an occurrence so that in the event of an extension of time becoming necessary, any claim could be substantiated.

Failure to obtain the required extension of time would place the management in a difficult position, faced with the inevitable prolongation of the contract and the consequent dissatisfaction of the Client.

9.7. The need for management to ascertain as soon as possible the extent of the period for which a contract is likely to be prolonged is essential, irrespective as to whether or not an extension of time will ultimately be granted.

The prolongation of the work beyond the original agreed date will of necessity call for a review of the valuation forecast for the particular contract concerned. Obviously an extension of time, measured in terms of a few weeks, would hardly warrant the production of a new financial forecast; but a prolongation in terms of months would demand serious reassessment of the original forecast.

A revised forecast, based upon an extension of the date of completion for the contract, will result

in values more likely to be attained than those in the original forecast, though it must be accepted as a negative approach to the solution, despite the inevitability of the situation in this respect. The prolongation of the contract will of course have an adverse effect upon the overall turnover forecast for the company, leading to a reduction in profitability and the probable failure to meet the required contribution to the recovery of overheads and profit. (see Lea 62). Such a prospect, however distasteful,must be faced and the extent of the revisions upon the overall turnover forecast measured as soon as possible, to enable Management to consider the possible courses of action available which may lessen their detrimental effect.

9.8 A revised overall turnover forecast will indiciate the occasions most appropriate for the introduction of additonal contracts. Some of these could be expected to replace the reduction in earnings of those contracts whose durations had been extended. The contributions of new contracts in making good these deficiencies would be of immeasurable assistance to management in their constant endeavour to maintain the desirable rate of turnover, although assistance of this nature may never eradicate entirely the defects caused by the prolongation of a contract period.

Despite the fact that the additional cost may be recoverable under certain conditions within the terms of the contract (ie extension of time), the inability to release staff and resources because of the continued demand on their services may inhibit the ability of management to introduce new contracts at the times considered most appropriate.

9.9 Although reference has only been made to contracts with valuation deficiencies, there could well be those whose results are greatly in excess of the valuations forecasted. If the variances were of sufficient size, by the same token, they should lead to revisions in the forecast valuations, and a consequent adjustment in the turnover forecast; an exercise which no doubt would be gladly carried out by all concerned.

9.10 Within the application of the system to date, management had been provided with two opportunities to review the situation with regard to turnover and the recovery of overhead costs (as per objectives 6.1 (vi) and (vii). The first was in February, upon the initial compilation of the actual valuation achievements from the current contracts to date. This provided the foundation for the initial overall turnover forecast produced the same month, based upon the agreed completion dates

of the contracts concerned. The second opportunity occurred upon the appraisal of the results of the actual valuation achievement monitored during the three months that followed. This led to the production of a revised overall turnover forecast, resulting from the adjustment of the forecasts for certain individual contracts (found necessary by the extent of the variances recorded to date, and the adjustments made to their proposed dates of completion). The evaluation of the foregoing demonstrated the advantages to be gained from the adoption of such reviews at quarterly intervals.

10.0 Addition of New Contract

10.1 The gaining of a new contract provided the first opportunity of producing a complete valuation forecast at the outset. (see paras 8.1 to 8.4). The work was undertaken by the company Quantity Surveyor from the programme produced with the assistance of the Site Agent. The experience gained from this exercise suggested that the staff concerned were able to cope with the production of the forecast, although reservations were expressed by them as to their ability to manage in the future without additional assistance in the event of larger size contracts, or a greater concentration of new contracts during a

particular period. The forecast so produced was very readily absorbed into the overall turnover forecast in compliance with objective 6.1 (viii).

11.0 The Relevance of the Turnover Forecast to Tendering Procedures, and some consideration for Future Policy.

11.1 Once the forecasting was established and the procedure for recording the actual valuation achievement set in motion, management was able to reflect upon the turnover forecast produced, and to examine its value in the area of tendering procedure and the procurement of future work. (objective 6.1 (xi). A review of the turnover as forecast (Diagrams 7 to 11), and the extent to which the desirable contribution to the overhead costs could be achieved, has already been described (paragraphs 4.10 to 4.15).

Further examination of this information showed that although the individual monthly forecast turnover values began to drop below that desirable from August onwards, a study of Diagram 11 indicated a favourable cumulative balance forecasted to extend up to mid-November. This had been made possible by the extent of over recovery attributable to the turnover values forecasted for the previous months, and implied that the turnover as forecasted was sufficient to meet the desired average monthly

turnover target up to the month of November, ten months beyond the establishment of the forecast. The significance of this aspect suggested that the percentage overhead recovery value used for the estimate of current tenders, and in the establishment of the desirable turnover value, was compatible with the work load that the company had found possible to secure to date.

11.2 Whilst the resulting cumulative balance as forecasted could be regarded as satisfactory up to November, the necessity to secure additional contracts of sufficient value to eliminate the negative cumulative balance occurring in the following forecasting period was indicated. The introduction of new contracts would of course result in the continued revision of the turnover forecast, and such revisions as effected are described in paras 8.1 to 8.4. The principal aim would be to obtain those contracts which by their very nature, and the timing of their proposed execution, would be most conducive to the production of the desired level of turnover, when added to the total monthly values remaining from the currently secured contracts.

11.3 The desirability of timing the introduction of additional contracts for the occasion when the fall below the desired level of monthly turnover was

anticipated, (in this case August), is evident from a study of Diagrams 9,10 and 11. The conclusion is further substantiated by reference to Diagram 13, which shows the winding down of current contracts based upon their anticipated dates of completion, leading to the inevitable reduction in the monthly turnover as forecasted.

The proposed completion by August of four of the eight contracts currently in operation is shown with the consequent release of the resources involved. From this aspect, the most appropriate occasions for the introduction of new contracts would be those which would ensure the gradual absorption of resources as and when released from the contracts nearing completion.

11.4 A balance between obtaining contracts of the right value and income rate, and those most likely to make the most effective use of redundant resources, due to the expiration of current contracts, would need to be continually borne in mind by management in their consideration of future turnover needs.

11.5 The obvious difficulties associated with obtaining those contracts considered to be most appropriate, and with arranging their timely introduction, is regarded as one of the most difficult aspects of building contracting. The opportunities for

selection open to the contractor must inevitably be limited to the number of invitations to tender received at any one time. Selective techniques, if applied, would need to be influenced by such considerations as; the type and value of the project, the nature of the work involved, resource usuage, and anticipated period of execution. The ability to identify in a positive form those contracts more appropriate than others, and to measure more effectively their potential benefits, would no doubt be greatly enhanced by the determination of management to apply financial forecasting techniques at the tender stage, coupled with the demand for the pre-tender planning procedures implicit in their use. In making such a selection not only would the probability of the project readily co-ordinated into the current work load need to be assessed, but the effect of its introduction in relation to the gaining of other contracts in the future would also merit some degree of consideration, however remote the possibility, or indeterminate the factors involved.

11.6 A further consideration must be the evidence provided by various research studies which seem to suggest the obvious advantage to be gained from some degree of specialisation by a contracting company in undertaking contracts of a particular type, or size.

For example, as Barnes (see (6)) has pointed out "We did observe however, that the majority of companies showed their highest gross profit in the contract size bracket which dominated their turnover", and- "We also looked at those companies which did specialise, defining specialisation as meaning that more than 40% of their turnover was in one of the building types we have defined as institutional, private housing, commercial office buildings and other categories mentioned earlier. Four out of five companies which appeared to specialise by that criterion showed a higher profit margin in their specialisation than their own average". Such evidence serves to reinforce the suggestion that in the application of any selective process, serious consideration should be given to those invitations to tender relating to contracts whose size and type identify them as being within the recognised areas of specialisation exercised by the company.

11.7 The success rate of tendering must also have a bearing upon the attitude of management to the application of selection procedures at the tender stage. In the situation of a low success rate, coupled with a reduced number of available tenders, the contractor may be forced into the unenviable position of tendering for almost all contracts,

despite the recognition that some contracts would be less attractive than others, and could present difficulties if secured. The temptation to waive the opportunity to be selective in such circumstances is understandable, but not without its inherent dangers.

11.8 The requirement of management to tender for contracts in sufficient number, relative to the success rate, in order to meet the desired future turnover forecast may best be met by seeking every opportunity to widen and extend the sources of tender invitations. This should provide a greater opportunity to be more selective in the choice of tenders undertaken, and to encourage management to price more competitively when tendering for those contracts which appear to show the greater potential in meeting the turnover needs of the company, providing due regard was paid to the provision of an adequate level of profitability. An aspect to be dealt with more fully in the evaluation of proposed further developments of the system.

11.9 Mention has been made of these tender considerations and selective processes in order to underline their importance and to recognise the need to think in terms beyond 'monetary value' when conducting any exercise concerned with the review of future turn-

over needs. In this respect, the advantage of diagram 11 in providing a basis for the review of future turnover needs, by showing the effect of the expiration of current contracts, and the extent of the recovery needed to restore the monthly turnover to within reasonable bounds of the desirable, was clearly demonstrated.

With regard to the particular study under review, (from an assessment of the information provided), it was suggested that management should endeavour to obtain and introduce from August onwards new contracts. Their collective turnover rate would at least absorb the negative cumulative balances forecasted to occur from November and effect possible employment of redundent resources.

12.0 Final Evaluation and the Conclusion in setting up and operating the System.

12.1 The importance of obtaining the active co-operation of the staff concerned in the running of the system was fully recognised by Senior Management. Discussions were undertaken at every level in which it was emphasised that the regular recording of actual achievement was vital to its sucess. The occasional revision of the forecasts (as a result of corrective action or introduction of new contracts) needed to be accepted by staff

as an integral part of the system. "The fact that a plan needed to be reviewed does not render the plan useless". (EFL Brech(9)).

12.2 The major proportion of the clerical work required to set up the system was largely absorbed in the collection of the initial data, and the production of the various statements and illustrations of turnover forecasts as indicated from Diagram 1 to 13.

The time involved in this preparatory work amounted to eighty clerical man hours, so that the system was ready for use within the first fortnight of February.

12.3 In the operation of the system, the support of the Quantity Surveying Staff, (Chief Surveyor and three staff) was of particular importance to the success of the procedures reccommended. A list of proposed duties with respect to the system was therefore compiled:-

<u>For each Quantity Surveyor</u>:

i) Submission each month end of interim valuation for each contract under his control, indicating whether such valuations have been agreed or not with the Professional Surveyor. (see paras 6.3 to 6.5)

ii) Submission of records for each contract showing a comparison between the actual valuations achieved and those forecast, together with the value of work still to be completed. (Diag. 16 & 17) such records being supplemented by graphical illustrations.

iii) Particularly with regard to contracts subject to a more detailed review, a breakdown of work outstanding and the submission of "allowable man or machine hours" for its completion. (Paras 6.13 6.14).

iv) Adjustment of forecast valuations as necessary.

v) Production of forecasts for newly secured contracts (Diag 28)

Chief Quantity Surveyor to be Responsible for:-

i) Correlation of results from individual contracts.

ii) Presentation of overall monthly turnover results. (Diag 14 & 15).

iii) Corrective Action and Revision of forecasts for individual contracts. (Diag 21)

iv) Quarterly review of turnover, and revision of forecast summaries and graphs. (Diag 19.20.and

22 to 27).

v) The revision of turnover upon the introduction of new contracts. (Diag 28 and 29).

The usual financial statement concerning monies outstanding, retention sums, and interim costs to date would be the subject of separate submissions in the normal discharge of staff responsibilities within the Quantity Surveying Department.

12.4 The operation of the system over the four month period was sufficient to convince the management and staff of its value. They were particularly pleased to recognise that the clerical demands of the system, once in operation were not heavy, and in many instances only required a modest extension of existing procedures. It was accepted that the majority of the facts were readily available: it simply required the establishment of a system which would ensure their regular collection and correlation. Indeed, it was agreed that certain of the tasks were already carried out at the discretion of the respective Quantity Surveyors, purely for their own benefit in exercising financial control over the contracts. The implementation of the system in many instances, simply formalised those discretionary procedures within a regularised time frequency, with the addition of forecasts against which the actual recorded

achievements could be compared.

Although such achievements could only initially be compared with forecasts based upon agreed contractual commitments, and the desire to provide an appropriate level of recovery of overhead costs, it was hoped that its success would motivate management to consider the value of implementing future planning procedures based on more comprehensive and clearly determined objectives.

12.5 The examination of the feasibility of forecasts within the system and their revision as appropriate, demonstrated the folly of establishing completion dates for contracts without making an accurate forecast of their duration at the outset.

The use of graphs provided management with a visual impression of the pattern of turnover activity. Those related to turnover indicated the appropriate timing of new contracts and assisted the selection at the tender stage those projects with the greater potential in meeting the future turnover needs of the company.

12.6 The system motivated management to quantify objectives in terms of the value of work required to be completed in each of the ensuing months. (based upon the financial forecast related to each

contract and the overall turnover target). This was far removed from the previous situation, which tended to produce historical results of individual contracts without any recognised means by which their separate performances could be evaluated and correlated into an overall result.

Finally, although the prime objective of the system was to forecast and monitor turnover achievement, it was agreed that it could be utilised, (to a limited extent), to measure production performance of individual contracts in monetary terms providing management with a basis to initiate further enquiries and coordinating the work of project management and quantity surveying staff.

12.7 Summary of the Information Provided by the System

i) Forecast valuations for individual currently secured contracts based upon the commitments undertaken with clients in relation to the value of the contracts, and the agree periods for their execution.

ii) A forecast of turnover, based upon the forecast valuations compiled for currently secured contracts.

iii) The establishment of a desirable average monthly rate of turnover, based upon an agreed percentage allowance, used to assess the required contribution of each contract towards the recovery of overhead costs.

iv) The means by which the turnover as forecast could be compared with that desirable.

v) The monitoring of the actual monthly valuation achievements on individual contracts, the comparison with those forecast, and the highlighting of variations.

vi) The monitoring of actual turnover achievements at monthly intervals, the comparison with those forecast, and the highlighting of variations.

vii) The illustration of the above items i) to vi) in graphical form for the ready assimilation by management.

viii) Provision of statements of value of work outstanding in relation to individual contracts, and overall turnover.

ix) Facility for the adjustment of valuation forecasts for individual contracts in the light of results, or changing circumstances.

x) Means by which turnover forecasts could be revised, arising from the adjustment of valuation forecasts for individual contracts and the introduction of new contracts.

12.8 The assistance provided by the system to various levels of management is summarised as follows:

Senior management - Forecasting and monitoring of turnover.

Monitoring of recovery of overhead costs.

Future guidance in tendering and timing of incoming work.

Projects Management - Setting of future valuation targets for contracts.

Monitoring of progress in monetary terms of individual contracts.

Promotion of enquiry with regard to production performance.

Establishment of policy statements with regard to future action on individual contracts.

Site Management - Receipt of guidance from project management with regard to progress and future action.

Guidance concerning allowable expenditure of resources on future operations or tasks.

CHAPTER 4

FURTHER EVALUATION OF THE SYSTEM

CHAPTER 4.

1.0 Further evaluation of the system

1.1 The evaluation has so far been concerned with the system in its present form. Briefly, it provided turnover objectives and the means by which achievement could be measured and corrective action undertaken, although it was acknowledged from the beginning that a system orientated solely to the achievement of turnover would have limited application. Nevertheless, its implementation was seen to supply, as intended, an indication of the failings of previous procedures , and a springboard for the encouragement and development of future financial planning by the company.

1.2 It therefore followed that the principal aims of any extension of the system would need to ensure-

(i) That the application of financial planning in the generation of future activities of the company would be established on a more comprehensive basis, taking into account those objectives, in addition to turnover, which are essential for the survival and future success of the company.

(ii) That the forecasting and monitoring of turnover achievement would be supplemented by procedures concerned with the adequate supply of finance the maintenance of liquidity and the

attainment of an appropriate level of profitability.

1.3 As the prime aim of any business is to produce a surplus of income over total expenditure (i.e. profit), and as there is an accepted relationship between profit and turnover, it follows that the turnover forecast, in association with a profit plan, may be recognised as a useful medium for the generation of future company activity. It is essential, however, in the production of such a plan that the factors necessary for the achievement of the above objectives be given adequate consideration. Accordingly the following dissertation is presented.

1.4 It may be argued that the aims to be established for directing the activities of the company more effectively should be synonymous with the criteria applied to measure the results of its trading activities. In this regard Pilcher (93) suggests that "the ratio of rate return to capital employed must be at a satisfactory level for success". This is supported by Sizer (103) who states that "the characteristics of the successful business is the ability of the company to be able to produce an adequate surplus of income over all expenditure including taxation, in relation to the investment needed to support the activities from which such a surplus may be generated".

Sizer further proposes that such results should be sufficient to:-

1) Give a fair return to shareholders in relation to the risk and uncertainty attached to their investments.

2) Provide for the normal expansion of the business.

3) Provide adequate reserves in times of inflation. to maintain the real capital of the business intact.

4) Attract new external capital when required.

5) Satisfy creditors and employees of the likelihood of the continued existence and/or growth of the business.

Such criteria are also given emphasis by Parsons (88) in his paper 'Setting the Scene' in which he outlines the causes of business failure-

"For many years now business has failed for a variety of reasons to make an adequate return to provide:-

a) Adequate cover for interest on borrowings,
b) Funds for fixed asset replacement,
c) Funds for research and development,
d) Funds to finance the increase in working capital

requirements caused by expansion and inflation.

e) A proper return for equity or risk capital to ensure the attraction of new capital when required.

f) A surplus over and above all the items mentioned."

Sizer's essentials for success and Parson's reasons for business failure are worthy of correlation when considering the factors for establishing a profit target, and in this respect Falk's (28) comment provides a useful summary:-

"A business requires profit to buttress it against the normal risks that have to be undertaken, to underwrite the cost of expansion and to meet its obligations to its shareholders".

1.5 The aggregation of profit achievement from individual contracts is represented by the amount by which payments received exceed the total expenditure incurred in carrying out these contracts.

1.6 The profit thus derived is required to support those costs incurred by the company as a whole, and which cannot be directly related to any particular contract (i.e. head office administration charges or overhead costs) Any surplus is then expected to be sufficient to meet the criteria for success outlined in the previous paragraph (1.4)

1.7 Farrow (29) in his paper proposes the need to be clear with respect to the definition of overhead costs, being careful to distinguish between "those costs not directly arising from site operations but essential and necessary to the running of the business as a whole", and those which, in addition to the direct cost of production, "may be attributable to the operations of individual contracts" (i.e. Site oncosts).

Brech (9) also argues that further analysis could determine differences in demand for Head Office Services according to the nature and complexity of individual contracts. Contributions to overhead costs being then assessed on the use of these services by each contract. However the difficulties which may be associated with this procedure would appear to encourage companies to continue the practice of relating the recovery of overhead costs to a given level of expenditure. The continuance of such procedures therefore makes it essential to allocate site oncosts to contracts as accurately as possible in order to keep overhead costs to a minimum. As Brech (9) suggests "the smaller the overhead can be made the less must be the impact of uncertainty".

1.8 The assessment of overhead costs in the system was based for expediency upon the trading results of previous years, and consequently took no account of

changes in expenditure, or the volume of turnover upon which the future recovery of these costs would depend. Future assessments should therefore ensure that a careful examination is made of the items categorised as overhead costs, and to relate them to a predetermined level of expenditure. .

It follows that in this latter connection some contingency should be made to take into account future inflationary influences. Both Winkler (125) and Brech (9) concur that "each item should be be scutinised carefully ----- and a schedule built up of the items to be included next year to show how much they will cost".

1.9 Management having satisfied themselves in defining the items to be included as overhead costs, together with their values, apportionment and means of recovery, may proceed with confidence to consider the amount of surplus desired to meet the criteria set down in paragraph 1.4 and to produce a profit plan within the following headings.

1.10 'Adequate cover for interest on borrowing'.

The profit desired would need to provide for the above; in this respect Pilcher (93) suggests that "on the whole, however, the minimum level of return required should be that of the weighted average of the company's cost of the whole of its capital, since

monies for projects are allocated as a rule from a central fund wherein each source of money is not readily identifiable".

1.11 'Funds for the fixed asset replacement'

To cater for this contingency, provision should be made in any assessment of profit for the creation of funds to offset the reduction in the value of company assets, and to provide for their replacement (i.e. depreciation allowances).

There are a number of accounting approaches which may be used in the assessment of depreciation; these need to appreciate the distinction between the allowances specified for taxation purposes. Only the latter are permitted to be set against profits before the assessment of tax payable.

Coventry (18) also points out that "the quantitative aspects are magnified considerably when inflationary trends are brought into the picture " and this aspect will be further amplified in the text, concerned with general implications of inflation. (see para 1.14 to 1.16)

1.12 'Funds for research development'

The findings of Ward (122) suggest that consideration of this aspect seems only to be included in the profit planning of the more enlightened building company ----

"We spend about £3.5m (1969.70) on R and D which as a percentage of the £4700m of work completed in 1969 is about 0.001 per cent."

In providing the foregoing data he states that "there is no well defined criteria for the evaluation of Research and Development expenditure, so that one cannot argue for spending more or less on construction research."

Similar difficulties are also indicated in measuring the benefits of education and training. However, despite the difficulties outlined, a sound argument can be offered for the industry in general and the individual company in particular, to make provision for expenditure on research, development and training in its profit plan. For instance, Goodlad (35) in his findings indicates the need for more firms to become more orientated to market research, and suggests that the significance of the site manager should be re-appraised and more attention be given to his training and development. In this connection Hofstede (47) gives support by stating the need for training people". These being but two, of many other worthy considerations available to prudent management when formulating their profit plan.

1.13 'Funds to finance the increase in working capital'

A further factor to be noted in the profit plan, is the need to generate sufficient funds to finance the increase in working capital requirements caused by expansion and inflation. Falk (28) comments that "a business required profit to underwrite the cost of expansion", and is further supported by Wren (126) in his statement that "the restricted availability of working capital may limit the progress which a firm can make in expanding business and taking on new work". Sizer (102) suggests that some companies "follow a deliberate policy of limiting growth to the extent it can be financed from internally generated funds, and where there is a forecasting deficiency of internally generated and retained funds, this may be covered from external sources in the form of a bank overdraft (if unsubstantial and short term in nature) or where substantial, by the raising of long term finance". Other works confirm the wide acceptance of this practice by business management.

The advice of Parsons (88) on the whole aspect of funding however is worthy of note" I believe it important for one to be able to see that investment has been achieved without adversely effecting the gearing of the company and that future cash flow from such things as trading profits investment without a large dependence on loaned funds".

Therefore, if Packard's (86) statement that "growth is a measure of strength and a requirement for survival" is to be accepted, it follows that sufficient profit will need to be achieved to provide an adequate return for any additional capital required to support each expansion. Sizer (102) and Wren (126) both confirm this need in similar statements that" the company that is merely expanding sales at a declining rate of return on capital employed will eventually be unable to attract expansion capital", and further weight is added to this in Pilcher's (94) warning that "too much emphasis must not be placed on increased sales volume as an indication of growth".

1.14 The need for a company to make adequate provision within the profit plan to counteract the effects of inflation is of importance to its future success, particularly in view of the rate of increase in inflation which has occurred in recent years. The significance of this aspect will be appreciated by the realisation that the annual rate of increase was around 5% in 1965 compared with a figure of 26% in the year to June 1975. Parsons (88) confirms the view of many authoritative bodies in suggesting that "inflation has had a dramatic effect upon company profitability and probably has had a greater direct effect upon the ability of companies to survive than any other factor".

Careful consideration therefore needs to be given to the inclusion of an inflationary allowance when establishing targets for future profits and turnover.

Such targets should reflect the extent of the activity needed to be generated by the company compared with past achievements to sustain expansion in real terms and provide an adequate return to satisfy the future demands of shareholders in an inflationary climate. Increase in the amount of capital employed will be synonymous with an increased value of turnover, and if part of this capital employed is supported by loan capital, the question of the higher interest rates associated with an inflationary climate needs to be taken into account within the profit plan. In times of inflation 'Loans become expensive and difficult to obtain' (Winkler (125). This aspect is reinforced by Parsons (88) who recalls " a bank rate of 5% in June 1964 and 7% in June 1970 an increase of 40% compare this with today's 11¼% minimum lending rate (December 1975) "

1.15 Profit targets may be eroded by a failure to recognise the extent of changes in future price levels within an inflationary climate when tendering for fixed price contracts. It is also necessary to recognise the distortion which may occur from profits arising merely from a change in money value.

Apart from providing an unrealistic base for the establishment of future profit targets, according to Sizer (103) "if such gains are taxed as if they were real income to the business then the ability of the company to maintain the capital of the business intact and sustain real growth is diminished"; he further amplifies this aspect by suggesting that "if as a result of inflation profit is seriously overstated the burden of taxation on the business will be greater than that implied by the nominal rate of tax."

It has been previously stated that due allowance should be made within the profit target to keep the capital of the business intact.
The need to make provision additional to any depreciation allowance based upon the original cost of an asset, as described in paragraph 1.11, is therefore advised in an inflationary climate.
Trimble (118) indicates that this provision is not tax deductable until the new plant is purchased, and furthermore that, what is less obvious is "that this can have the effect of subjecting the company to taxation even when in real terms the company is making a loss". Coventry (18) calls for a re-thinking of orthodox historical accounting, pointing out the most important effect of continued inflation is that by allowing fixed assets to remain on the books as cost less depreciation, the key rates

of return on capital employed show " profits at face value being proportionately better than they really are."

1.16 In any further examination of the implications of inflation upon any future profit forecast, it is suggested that serious consideration be given to the 'Proposed statement of Accounting Practice E 18, prepared under the Chairmanship of Douglas Morpeth (73) included among its many recommendations are the revaluation of assets and stocks, and the establishment of provisions for the effects of depreciation profit and taxation.

The draft proposals claim to offer a practical and realistic system of current cost accounting within an inflationary climate, but accepts that amendments to the proposals may be made as a result of comments invited from the various authoritative bodies concerned.

1.17 Proper return on equity capital

It is essential to include in the profit plan for the provision of a proper return for equity or risk capital when required. In the consideration of this aspect, it is important to recognise the full extent of the shareholder's investment in the company. Brech (9) defines equity capital as "the owners own money invested in the business" and in a company takes the form of paid up capital on ordinary shares

plus accrued profits which have been retained in the company but not paid out in dividend, and many regard the return of equity capital as the vital test. This is supported by Sizer (102) who states that "The ability to earn a satisfactory rate of return on equity shareholders investment is the most important characteristic of the successful business". Notwithstanding this statement however, he then argues "that real growth comes from the ability to successfully employ additional capital at a satisfactory return". This takes into account the importance of the support to equity capital, which may be given by loan or debt capital in providing the capital required to generate the desired level of business activity. In this respect a reasonable relationship must be maintained between risk capital and borrowings. (see para 1.13).

1.18 Provision for Taxation

Provision will need to be made within the profit plan for the taxes to be eventually paid by both the company and shareholders from the profits earned.

"Taxation is one of the largest costs facing a company today"-- Argenti (3) Under the 1972 Act companies are liable for the payment of Corporation Tax based upon the percentage rate of the profit. The percentage is charged for a financial year at a rate incorporated in the Finance Act as announced in the

Budget each year. Delays in payment may occur because of the difference in timing of the company accounting period and the tax year, and due provision needs to be made in the financial plan for the timing of these payments, and in the production of any subsequent cash flow statements.

Certain allowances may be set against tax, enabling the government to determine the rate of write-off of assets and to stimulate investment by capital allowances when desired.

In conclusion of this brief note on the complex subject of taxation, shareholders in receipt of dividend would be credited with tax at the basic rate by the Inland Revenue, and one would therefore hope that sufficient provision for this had been made in the plans of prudent management to ensure that the nett return received by shareholders would satisfy their requirements.

1.19 Surplus over all previous items

Parson's (88) final reason for company failure refers to the inability to provide a surplus over and above all the items previously mentioned (see paragraph 1.4).

Other works refer to the need for a surplus to offset losses caused by production inefficiencies and faulty estimating.

They refer to the advisability of providing for contingencies over which they have little control but which may well have an adverse effect upon profit forecasts, Argenti (3) notes the salient fact that 'profits of most existing businesses are being eroded by the profit squeeze' (costs rising due to inflation while selling prices remain constant or even fall due to competition) if the company's profits are to grow, action has to be taken that is powerful enough to counteract this squeeze and to add new profits.

Such policies are supported by Winkler (125) as a means of counteracting the effects of inflation, advocating that "Profit improvement programmes are good, cost reduction programmes are bad".

Some surplus is necessary to cushion the adverse effect of changes in interest rates on debt capital and the related effect of delays in payments by clients. These are just a few of the many factors which would cause a depletion of the profit target.

1.20 Consideration in this chapter has essentially been devoted to the financial implications of producing the profit plan and turnover forecast for

the company. However, it will be recognised that for these to be really effective their resolvement should also stem from the more wider and corporate aspects of the company's activities. These would concern the determination of future objectives, based upon an appraisal of its own performance in comparison with others, and the indentification of its future role within the environment it intends to operate. The strategy which would evolve from this examination would require an awareness of future trends, and the development by the company of the ability to respond to change, and to apply such constraints and moral influences as may be chosen to influence the means by which future objectives may be achieved.

1.21 The production of the financial plan on the basis described would provide the means of generating future trading activity upon a sounder basis than that initially established. Whilst the plan would be principally projected in terms of profit and turnover objectives these would now be formally based upon criteria defined in accordance with the recommendations set out in the previous text, so essential for the future success of the company.

CHAPTER 5.

Proposals for the introduction of further financial procedures.

Chapter 5.

1.0 Proposals for the introduction of further financial planning procedures

1.1 Having installed the system in its initial form and satisfied management with regard to its continued operation (and the benefits to be derived from its further development), the next stage sets out proposals for the formulation of a long range financial plan, which would provide the framework for the guidance and control of the company's future operations. It is suggested that discussion with management would be pursued on the following lines.

1.2 The production of the plan should be commenced by the establishment of a suitable period for its projection and the translation of the desired objectives into financial terms. The extent of the period selected would be very much influenced by the confidence placed in the forecasting information available, reflected no doubt by uncertainties concerning the future work demand associated not only with the individual company but also with the industry in general. Established works in this respect seem generally agreed that such plans should not be projected beyond a five year period. "Normally long term forecasting and planning relates to a period two to five years ahead" (see Goodlad (35)).

Enquiries conducted within the study (see chapter 2, para 2.7) revealed that in the opinion of the respondents who practised such procedures, a period of three years was considered most appropriate.

1.3 It was proposed that the plan should begin with an introductory section defining the purpose and extent of the company business, with a brief reference to previous achievement and possible future development. This should be followed by an appraisal of the environment in which the company expects to operate, and from which future opportunities and difficulties may be recognised. The objectives of the plan and the strategy for its achievement may then be presented in monetary terms (as outlined in Chapter 4.). Having determined the amount of profit needed to satisfy the above requirements, management should relate this value to the size of turnover necessary for its achievement, bearing in mind the influence of current and future market trends. The anticipated value of future turnover of existing and future activities, and the diversification into other areas (if evisaged), would also need to be indicated, and values for the provision of growth and inflationary aspects included at this stage.

1.4 The financial plan should then be summarised in tabular form with values allocated to every element, for each of the years concerned. Such statements may in turn be supplemented by detailed proposals for each product division or geographical area of activity, together with observations concerning future trends in both market and product development (see Turner (121)).
The influence of the plan upon future production requirements, and the financial implications inherent in any consequent change in related expenditure and in the demand upon basic production and management resources, would be a matter of detailed study, and the object of further presentation within the plan.

1.5 The plan would not be complete without detailed reference to the current financial structure of the company, and future liquidity positions extended to include the generation of additional financial resources (if required), and the cost of their provision. Further proposals would account for the disposition of any anticipated trading surplus or deficiencies by the provision for the payment of taxation and dividends or the adjustment of reserves.

The presentation of this information may best be

achieved by the production of proforma financial statements, profit and loss accounts and balance sheets. Such statements would readily indicate the essential correlation between the various financial elements, and provide a useful basis for the control of future financial activities within any proposed framework of budgetary control. This indeed, may constitute the means of monitoring achievement and applying corrective action during the implementation of the plan, thus introducing "the element of flexibility essential for its ultimate success. (See Argenti (3)).

1.6 Turnover forecasts within the long range financial plan.

Following the establishment of the long range financial plan, its aims and proposals for their achievement would need to be communicated to those responsible for its implementation. The planning process would thus be continued by the consideration of the short term requirements, initiating, directing and controlling those individual activities whose combined contributions (it is hoped) would lead to the attainment of the defined objectives. Foremost in this respect, would be the study of the financial objectives for each of the years within the long range plan, expressed in terms of annual turnover.

1.7 Forecasts for individual contracts

As the annual turnover achievement will be derived from the aggregate of the turnover achievements on individual contracts, the natural extension of the planning process would be to forecast the turnover of contracts already secured, so that their combined turnovers as forecast could be compared with the annual turnover target. Any deficiency would then represent the amount of additional work needed to be introduced during the future years in order to meet the annual turnover targets within the overall plan, thus providing stimulus and guidance to those responsible for its procurement. The production of turnover forecasts for the existing individual contracts had been implemented in the system introduced within the company and described in previous text. The opportunities of applying more realistic planning and financial forecast techniques in the production of financial forecasts for new contracts as they were introduced would now be available. This avoids the pitfalls of the past, when forecasts were of necessity based upon rather arbitrary commitments.

1.8 Monitoring of turnover achievement.

The establishment of annual turnover objectives

within the long range plan, supported by the monthly turnover forecasts related to individual contracts, forms a basis of future control and performance appraisal. Actual valuation achievements on site may be produced in accordance with the system previously described, and compared at regular monthly intervals with the forecasts so produced. By extending the forecasting of turnover so that the retention of monies and the timing of payments are considered, a measure of the prospective receipt of income from contracts would be obtained, which may, conversely, be related to the rate of expenditure likely to be incurred by clients. Such forecasts would also assist clients to arrange the availability of finance in good time to meet the demands for interim payment during the execution of their respective contracts.

1.9 Forecasting of expenditure

Having considered the forecasting of turnover and the receipt of income, it follows that in order to complete the financial planning and control process, similar considerations will need to be given to the forecasting and monitoring of expenditure by the company.

The rate of expenditure for individual contracts

may be forecast using similar methods to those described in the forecasting of turnover and income. The process, however, is made more complex by the need to take into consideration the delays incurred between consumption of the elements of expenditure involved (in accordance with the production programme), and the timing of their payment. The phasing of these payments will vary with the elements concerned; expenditure upon wages occurring weekly, whilst payments for material, plant and subcontracting work are generally made monthly, but depend upon the periods for payment stipulated within the terms of individual contracts. The aggregate of the forecasts for the individual contracts provide a forecast of the total direct expenditure for comparison with any overall provisions made within the annual forecasts contained in the long range financial plan.

1.10 It will be appreciated that any initial forecast of working capital requirements made at the commencement of the financial plan, would, in the absence of cash flow forecasts from individual contracts, need to be based upon an assessment of the overall working capital demands anticipated at pre-determined intervals during the period of the plan.

These would be mainly based upon monies likely to be outstanding from clients, in addition to the value of work in progress and stock, but less monies due to be paid out to creditors. Due consideration is given to any pre-payments less the value of any accruals.

Many standard works including Murphy (76) and Horngreen (49) describe suitable methods of making such arbitrary assessments. These are based principally upon monetary values proportional to turnover and related to average periods of credit and the time awaited between the valuation of work completed and payment.

1.11 The forecast of the receipt of income and the incident of expenditure, together with a comparison of their respective values, may then be presented in the form of statements, based on the assessment methods described in the previous paragraph and ultimately upon cash flow forecasts of the individual contracts when compiled.

It is desirable that these forecast cash flow statements be produced at regular intervals, to supplement any overall forecast of liquidity which may have been produced within the long range plan. Such statements would provide

more positive indication of the changing demand upon working capital, and assist in balancing future requirements. They can also be the foundation from which the acceptability of future commitments in terms of working capital demand may be measured, as well as facilitating the procurement in good time of additional capital at an economic cost. (see Gordon (38)). Practical considerations dictate that cash flow forecasts be projected over quarterly intervals at least, in order to provide management with a reasonable opportunity to initiate appropriate action.

1.12 Failure to project such forecasts must restrict management to the very limited preview of income and expenditure provided by the monitoring procedures previously conducted within their existing accounting system.

Such previews by their very nature were limited to the agreed periods for the settlement of accounts (usually on a monthly basis) and, based upon commitments actually incurred, gave little opportunity for manoeuvre with regard to the liquidity position revealed. The acceptance of such a situation by any company must expose its management to valid criticism. Though the most generous view might accept that the overall

demand for working capital may not vary sufficiently to warrant the undertaking of cash flow forecasts, ("the swing in capital is frequently more marked in individual projects than in the case of the firm as a whole" (see Brech (9)). The question as to whether the balance of demand is achieved by 'design', or by the 'manipulation' of credit facilities available, must however be a matter of conjecture. The enquiry conducted with contracting companies (see chapter 2) provided evidence of the extent to which respondents practised the forecasting and monitoring of cash flow in this respect.

1.13 The consideration of the need to maintain an adequate level of liquidity is perhaps a fitting conclusion to this aspect of financial planning and control.

Management were therefore advised to continually bear in mind the direct relationship between an expansion of turnover and an increase in working capital as previously mentioned (Chapter 4 para 13). In a climate of rapid growth they should make every endeavour to forecast any increase in demand on working capital and avoid a situation of overtrading. Bradburn (8) suggests that profits are not the sole criterian stating "The availability of cash is of vital importance

in construction and many a firm large or small has found itself in severe difficulties with liquidity, when on paper the business looks good."

1.14 On the other hand, where a situation existed in which the availability of working capital appeared to be in excess of future requirements, consideration would need to be given to the investment of any surplus on projects, either within the company, or externally during this period to ensure that such cash resources would be used to their fullest extent and to obtain maximum profitability.

2.0 Working Capital and Profitability at Project Level.

2.1 The use of cash flow analysis in determining the pattern of working capital demand in relation to individual contracts, and the company as a whole, has been referred to in previous text. (Paragraph 1.10).

Particular emphasis has also been placed in previous text (Chapter 4), upon the desirability for a company to achieve an adequate rate of return in relation to the capital employed. This rate of making profit, in relation to a company's investment, is defined as the measure of its profitability, and is described by Denton

(21) as, "the amount of profit expressed as a percentage of the assets needed to enable its being earned". This outline however, fails to indicate the significance of the time period involved, and Hartley's (43) definition is perhaps more explicit in this respect, stating that "the return must take account of time".

2.2 This measure of company profitability will stem from the aggregation of the achievements in this respect attributable to the individual contracts. The assessment of the latter, according to Pilcher (93) is dependant upon three factors, "the amount of profit, the duration of the contract and the company's investment required". If it is accepted that the prospect of achieving profitability in the first instance will be influenced by the provisions made within the tender price, it follows that any further development of the system installed should make provision for the assessment of profitability for a project at the tender stage, so that each contract may perhaps assist more effectively in the achievement of company objectives.

2.3 The work of Denton (21) supports the consideration of this aspect by selecting as one of its principal aims an examination of a method of, "producing a tender figure which is in accordance with a

company's objectives, as opposed to adopting a bidding strategy which seeks only to determine the lowest tender figure of any competing contractor".

2.4 Traditional estimating practice is very much influenced by the relationship established between the amount of profit desired by a company and the size of turnover cost considered necessary for its achievement.

The resulting ratio between profit and turnover is then "reflected by the percentage addition to the total prime cost and overhead provisions assessed in the compilation of the tender sum for a project". (see Mannering (68)). The application of the percentage addition in the manner described places an undue emphasis on the value of the contract under consideration, and loses sight of the important need to consider the amount of capital likely to be employed during the execution of the project, and the influence of the desired rate of its return, upon the profit margin selected. This inaccuracy may be further aggravated by any crude adjustment of the percentage additon made at the adjudication stage, in the light of current market conditions and the desire to obtain the contract. (see Nicholson (83)).

2.5 At this stage it may be appropriate to distinguish between the amount of profit a business or project earns and the measure of its profitability. The profit earned can be expressed as the amount by which the income exceeds expenditure, and it is this value when related to the actual amount of capital employed that determines the level of profitability. To do this, it is necessary to produce a cash flow exercise for each project, from which the amount of capital to be employed during its execution may be evaluated. This value may subsequently be related to the amount of profit anticipated to indicate the likely return for the required capital investment.

2.6 Although the amount of return for the capital investment is important, the actual rate at which the return is made has an even greater significance in measuring the value of a project. "The quicker the return is made, the more valuable the investment, because of the opportunity provided to re-deploy the returning monies by an early investment in other projects." (see Hutchinson (50)).

The consideration of the 'value' of a cash payment when related to the actual time a transaction takes place is known as the 'time

value concept'. This concept can therefore be applied to some advantage in establishing the 'real worth' of the monies anticipated to be received at predetermined intervals during the execution of a project, in return for the investment made. The technique of measuring the 'present value' of future cash inflows is known as discounting, and the application of this technique enables an accurate evaluation to be made of the benefits to be gained from the rate at which income is likely to be received from the prospective projects.

2.7 The application of the Discounted Cash Flow technique enables the present value of future cash flows to be determined by measuring the average effective rate of interest on outstanding balances during the period of the investment. Of the two principal methods used, one is termed the 'internal rate of return' and the other 'nett present value method'. In the former, the percentage interest rate at which cash flow values for a prospective project are discounted may be determined by means of special discount tables, indicating the present value factors per £1 unit of cash flow balance relative to the period of time that is likely to elapse between the making of the original investment and the receipt of the cash flow payment.

2.8 In the application of the Nett Present Value Method, an acceptable earning rate for the project under consideration is chosen, (based primarily upon the cost of capital to the company (see Pilcher (93)) and the respective cash inflow and outflow balances discounted to their present values on the basis of the percentage rate selected.

The actual mechanics of producing solutions using either of these methods is adequately expounded in the works of Alfred and Evans (2), Dent (20) Hutchinson (50) and N.E.D.C. (77) among others

2.9 It is accepted, in the first instance, that a technique such as Discounted Cash Flow, which enables a realistic assessment of the value of the return likely to be derived from expenditure of capital, must be of obvious value to management engaged in the purchase of plant and equipment. Indeed to quote from the NEDC 1965 May Investment Appraisal Report 'There is no informed opinion which doubts the validity of the DCF approach'. (see N.E.D.C. (77)).

2.10 Apart from the investment appraisal of capital projects, the use of D.C.F. techniques as a means of evaluating the profitability of building contracts has a good deal of support in the

literature.

Farrow (29) in his paper discusses the value of "accountancy appraisal such as discounted cash flow to establish the level of outgoings in relation to the projected recovery rate", and suggests that "projects of similar value but carried out under different forms of contract and time periods with different levels of cost elements will not require the same degree of financing". Discounted cash flow analysis may then be used to show the value of work done in given time periods against the rate of reimbursement under the contract, so that the extent of the financing required over given time periods can be calculated. Such calculations may assist in deciding upon the level of contribution required, and Farrow argues that "it is up to the contractor to attempt to obtain the most favourable contract by adjusting the amount of contribution required to suit the cost of finance".

Further support is given by Bradburn (8) who suggests that the use of DCF "will enable one project to be compared with another and assessed in terms of its contribution to the company's profits and demands on financial resources." While the use of D.C.F. by Australian construction companies in appraising the profitability of

building projects is confirmed by Gillin (32).

2.11 The essential data for a D.C.F. study will stem from the production of a cash flow statement whose balances indicate the measure of the working capital required. The internal rate of return may then be computed in the manner described. (see para 2.8).

The difficulties associated with the production of the cash flow statement for a construction contract (obtaining accurate input data etc) are confirmed in the publications of Skoyles (105). reinforced by Fine (30).

In this context, a strong case can be presented for other methods of obtaining estimates of construction projects. These are based upon network and bar chart programming techniques which make use of resource estimates for each activity, and enable the more rapid production of data for cash flow statements. Further aspects of these techniques may be found in the Operational Society joint publication 'Project Cost Control Using Networks'. (see 84).

The application of cash flow analysis at project level and the use of computer programs is expounded in the works of Denton (21), Pilcher,(92)

Trimble, (114) and O'Keefe (85).

Further to this, the more general criticism related to the manual effort required to produce a D.C.F. solution from a cash flow statement may be countered by the use as suggested by Coventry (18), among others, of computer package programs (see also 61) Nevertheless, like all other systems, "the results obtained are no more accurate than the data used to obtain them" (Dent (20)).

2.12 In proposing that cash flow analysis can be a useful tool in assisting management in optimising the long term profitability of an organisation, Denton (21), posits three factors which need to be taken into consideration in this respect;

i) The prices which can be obtained for its products.

ii) The capital required to meet the expenditure necessary to make its products.

iii) The points in time when expenditures have to be made and when income can be recognised.

2.13 In advocating the embodiment of these factors in the tendering process he argues that the cash flow pattern may have a two fold part in the tender decision;

i) In determining the profitability which will

accrue.

ii) In assessing the project's capital requirements in relation to other demands on capital.

In both cases, it is essential, initially, to establish the pattern of the cash flows created by expenditures and receipts, although neither may be obtained until the absolute profit has been found.

2.14 Three components of the tender figure are then recognised by Denton (21).

i) Process expenses.

ii) Indirect expenses.

iii) Profit.

as well as the means whereby the influence of these on the cash flow configuration can be evaluated. As in O'Keefe's (85) and Pilcher's (92) work, an activity network is used as the basis whereby "process expenses were set against a time scale".

2.15 Finally, Denton's model for use when tendering sought "to determine the percentage addition to the absorbed cost of each project, and from this the absolute amount which will give the budgeted rate of return on the company's capital". It suggested that this amount of profit when added

to the absorbed costs of the project would give a tender figure which would satisfy the aims of the company, but "would not, except by coincidence, produce either a winning tender figure or an optimum one." Thus the optimum tender figure is one that wins the tender by the smallest possible margin. He further indicates that the decision concerning the actual tender figure remains with the "directorate and a function of ruling market conditions", the figure produced by cash flow analysis being seen "rather as a datum by which the progress of the company can be judged against a ruling market price".

2.16 In line with the present proposals (para. 2.2), Denton confirms that, "the overall performance of any enterprise is judged by the aggregate of all its ventures", each of which will show a different rate of return on the assets employed. Moreover "to attempt to make each produce the same overall average figure, would attempt the impossible, and be a gross misdirection of managerial effort". Therefore although individual tender figures will be set above or below that indicated by C.F.A. when viewed progressively against the C.F.A. figure an overall trend will emerge showing how actual performance is comparing with budgeted performance .
However, in order to test whether the company is

capable of producing requisite profit levels in the market in which they are operating, it is suggested by Denton that the analysis be extended to compare winning tender values with those evaluated by Cash Flow Analysis.

2.17 The application of Cash Flow Analysis by the company would of course need to stem from small beginnings, such as the production of arbitrary assessments of working capital demands as described in para 1.10. These may then be extended to the production of overall company cash flows as described by Wren (126) and eventually to cash flows related to individual contracts. (Chapter 4 para 1.9) Management would need to develop the practice of pre-tender planning and under-take work implicit in its application. Such procedures could subsequently lead to the production at the tender stage of a cash flow statement for the project, even if only initially for the purpose of obtaining the measure of working capital required at pre-determined intervals to finance the project.

The forecasting and monitoring of working capital demand, once established as a regular procedure by the adoption of such systems as proposed by Bradburn (8), Hartley (43), McCaffer (67), Trimble (114), Wren (126) and Wright (127) among

others, tailored to the developing needs of the company. Such procedures ultimately leading to the evaluation of the potential profitability of projects at the tender stage as previously discussed.

The extent to which such procedures would be adopted being a matter of further discussion in the section devoted to the consideration of company policy.

2.18 To assist management in any deliberations concerning the ultimate application Discounted Cash Flow at the tender stage, two case studies are included in the appendices (C and D). As stated in the introduction the first was to establish whether the current estimating environment was conducive to the acceptance by staff of the additional procedures implicit in the use of this technique at the tender stage. The second study evaluated the opportunity to compare individual projects on the above basis prior to tender submission.

CHAPTER 6.

Policy Considerations.

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Policy Considerations

1.0 The influence of the Introductory System, Cash Flow Analysis and Discounted Cash Flow Techniques upon Company Policy.

1.1 The Introductory System and its evaluation together with proposals relating to Cash Flow Analysis and Discounting techniques have been dealt with in Chapters 3, 4, and 5. Their influence upon future company policy, taking into account variations in performance may now be outlined. The introductory system was specifically related to the forecasting and monitoring of turnover. It provided the means of overall appraisal and promoted policy decisions on the following aspects - (a to e.).

a) A review of the percentage recovery rate in relation to changes in volume of turnover.
The monitoring of actual turnover during the period of demonstrating the system indicated an adverse trend in turnover achievement to that forecasted due to the prolongation of certain contracts. If continued, this would lead to the inevitable result as expressed in Chapter 3, paragraph 9.7 and by Lea (62),

"A fall in turnover is bound to lead to a reduction in profitability unless efficiency is improved". In expounding "that most site costs tend to fall in direct proportion to falls in turnover" Lea makes the point that overhead costs have to be spread over a reduced load. Thus, the review of turnover should initiate policy decisions with regard to :-

i) Increasing future efficiency, and

ii) Reviewing and possibly adjusting the future recovery rate.

With regard to i), any policy decisions would need to consider such aspects as advocated by Grinyer (40), i.e. "Greater operating efficiency, lowering of overheads and improvement of administrative procedures".

Policy decisions concerning item ii) would need to be taken in the recognition that a percentage increase in the future recovery rate influenced by a possible reduction in turnover would lead to increases in future price levels.

In contrast, policy decisions relating to the expansion of turnover would lead to the consideration of the factors previously discussed in Chapter 4 paragraph 1.13

concerning an increase in working capital demand.

b) The introduction of new contracts.

It was noted that in this context (see Chapter 3 paragraph 11.4, 11.5.) that criteria other than monetary considerations would need to be taken into account.

c) Ensuring the regular monitoring and correlation of contrast valuation and turnover achievement.

This is to encourage, by forecasts, optimum valuation achievements leading to maximising the rate of receipt of income.

d) Guidance for project management.

The initiation of corrective action stemming from variances in production performance in monetary terms may arise from the reporting procedures within the system. Such policy decisions are subject to the cautionary factors referred to in Chapter 3 paragraph 9.3.

e) Future tendering

The relevance of the turnover forecast produced within the system is in providing guidance as to the pattern of income best suited to future turnover needs (Chapter 2

paragraph 11.0 to 11.9).

1.2 Formulation of Policy Stemming from Cash Flow Analysis.

The procedures for the forecasting and monitoring of turnover were proposed to be extended to take into account the timing of the receipt of income. Similar proposals were made with respect to expenditure (see Chapter 5 paragraph 1.9 to 1.13).

Such proposals would, as intended, lead to the implementation of Cash Flow Analysis, promoting the opportunities for management to exercise policies leading to the effective control of company liquidity, and the formulation of policy concerning future changes in working capital demand.

These policies should (as Hartley suggests (43)), "lead to the implementation of procedures at contract level in sufficient detail to identify the anticipated inflows and outflows of cash associated with individual contracts, and their aggregation, including the incorporation of other cash flows associated with head office expenses, dividends, taxation and capital aquisition at Company level". Hartley also claims that, "tighter control of liquidity reduces the amount

of working capital tied up in the contract and hence must increase profitability".

Gillan (32) posits that cash flow information "be provided on an incremental basis so that it is possible to analyse the difference between the cash flows of the business with and without the particular project under consideration". Similarly McCaffer (67) suggests that policy decisions concerning the acceptance of a new contract, the renegotiation of overdraft limits (if projected requirements cause overdraft limits to be exceeded) and the negotiation of credit facilities with suppliers could all stem from warnings provided by cash flow forecasting. Limitation of Retention funds and periods for honouring certificates would be matters of policy closely associated with the foregoing. Similar support is provided by Peer (89) in stating that 'Cash Flow forecasting is a dynamic process in the operation of a construction company'. Deviations in the progress of projects in hand and the initiation of new ones entail constant updating. No area of policy making can have any greater influence upon the future success or failure of a company than that of maintaining an adequate level of liquidity; and a sensitive balance between liquidity and profitability during trading calls for a high sense of judgement from

the management concerned.

1.3 Having expounded the main virtue of Cash Flow Analysis in assisting the formulation of future policy, such deliberations are now extended to the consideration of Discounting techniques in the evaluation of performance and in the generation of future company policy. Reference has already been made to the application of D.C.F. Techniques in Chapter 5. It is deemed suffice at this stage to refer to Brech's (9) recommendation of its value to management as a tool for measuring the 'true profitability of a project'. Profitability, a criteria according to Pilcher (94) 'yet to be bettered as a measure of efficiency for a firm in business competition'. Such a statement appears to be particularly relevant to construction firms which according to Lea (62) 'are in a high risk industry where the average return on turnover is low so that any reduction in profitability must be serious'. Despite the findings of Murphy (75) that small firms in general show a higher profitability than large firms (although such findings were associated with a greater variability in profit results between the sample of smaller firms and that of the large), the tendency as indicated by Hillebrandt (46) for building firms to operate with too low a working capital suggest there is

little room for complacency in the policy making process associated with profitability and liquidity in building companies of the size in the sample study.

1.4 In the formulation of company policy, Gillin (32) refers to the value of D.C.F. Techniques in deciding 'upon the relative costs of different types of funds employed in the business or available to it, compared with the level of earnings or capital employed with a view of arriving at the best combination of funds'. Concurring with Stapleton (107) and Argenti (3) he indicates the difficult task of selecting the proper discount rate relative to the financial growth objectives of the firm. Suggesting 'that arriving at a realistic estimate of future cash flows requires that many functional departments of the firm combine their specialised analysis into a consistant prediction with due allowance for risk'. Coventry (18) calls for a management policy which will 'include a clear definition as to how the minimum rate is to be calculated' cautioning that it should not be set too low in relation to the risk and uncertainty envisaged. The deployment of total assets of the company is an important aspect in arriving at the requisite rate of return. The use of D.C.F. should therefore promote company policy to consider the

best means of identifying the extent of such deployment.

1.5 The question of appraising competitive performance using the rate so determined presents a further problem to management during any policy deliberations - 'The market has no feeling for an equitable return' (Denton (21)). Denton's work as outlined in Chapter 5 promotes some guidance in this respect by suggesting the use of D.C.F. in comparing the company's profitability objectives with the ruling market conditions. Such deliberations would assist in policy decisions related to the examination of the capital formation of the company by testing its capability of producing requisite profit levels in the market in which it is operating.

1.6 The value of D.C.F. techniques in the determination of tender values and tendering policy has been referred to in Chapter 5. The disciplined approach associated with its application should encourage management in the resolvement of policy with relation to the accurate defining of Site oncost and overhead costs. The effect of the proper dispursements of such expenses and provisions in relation to the project time period being reflected in the resulting Internal Rate of Return calculation.

1.7 A further value of the technique is suggested in its ability to measure changes in profitability attributable to variances in turnover achievement to that forecast, such as the situation described in paragraph 1.1. Thus the consideration of the consequent variance in the timing of income and expenditure providing a more effective means of assessing the consequences of such variances and the basis for the resolvement of policy by management with regard to future turnover performance.

1.8 The claim by Fine (30) for the merit of D.C.F. in producing a faster growth rate, stimulating an increase in return on capital employed and improving the position of a company to control performance in the face of market fluctuations, must lend support to its value in assisting management in formulating future policy.

1.9 D.C.F. should assist in policy decisions relating to making adequate provision for the effect of inflation, as Pilcher (93) infers 'Inflation will have an effect on the cash flows of a project and also on the rate in which cash flow needs to be discounted since the rate reflects the cost of capital to the company'. Policies with regard to taxation will be implemented on a better basis, as Dent (20) suggests 'the incident of Corporation

Tax will have a major effect upon profitability and must be allowed for in the production of cash flows'.

1.10 The value of D.C.F. in investment appraisal in relation to the purchase of plant has already been referred to in Chapter 5 paragraph 2.9. Policy decisions on this aspect could be effectively extended to the consideration of capital costs incurred in the purchase of plant for specific contracts and to assist in reaching a policy decision whether to purchase or hire. Such considerations need to take due account of the implications of inflation, interest rates and depreciation allowance in purchasing. The conclusions reflecting in the tendering policies to be adopted with regard to the projects under consideration.

1.11 Although many of the D.C.F. techniques in assisting in the Policy making process have been noted, and while Dent (20) proposes 'that it's use provides a more meaningful picture with regard to profitability', he nevertheless points out, that in many respects it should be used with care. A particular example is in the ranking of projects with different lives and payback periods, are the cautionary aspects which should be applied to the comparison of projects as referred to by

Bradburn (8), see Chapter 5, paragraph 2.10.

1.12 However, as Gillan (32) suggests 'the weight of opinion seems to support D.C.F. as a highly useful technique' even if its attributes are reduced to such anecdotes as 'It makes us look into the project more thoroughly', it helps us to find alternative approaches', such benefits would seem to conform to the comment of Pilcher (93) that "one important point about carrying out a methodical analytical appraisal is that it lays the facts of the situation open to thorough examination and awareness."

1.13 Although 'the problems of risk and liquidity may transend those of time value and money' (Gillan (32)) particularly within the management of the smaller company, and while such companies may be precluded from implementing such techniques in their entirety. The influence of the principles of cash flow analysis and D.C.F. techniques in the formulation of their future policies should improve the quality of the policies resolved.

CHAPTER 7.

GENERAL CONCLUSIONS

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CONCLUSIONS

Previous research had established that formalised financial accounting procedures were mainly used by the larger building companies. The enquiry within the study gave further weight to this conclusion, and showed this also to be the case for financial planning techniques.

A principal objection to their adoption seems to be the atmosphere of uncertainty generated by the fluctuation of demand for construction, as evidenced over the years by various enquiries and published reports (58,78,79,82). The use of building demand as an economic regulator is suggested to have played a considerable role in creating this situation.

In addition to this, the characteristic entrepreneur attitude of the smaller company tended to create self-imposed constraints in the application of such procedures. This, supplemented by their organisational structure, their disinclination to define objectives, and their preoccupation with immediate problems confirmed a general lack of formal planning, which created an inhospitable environment in which to formulate standard financial planning control procedures.

Although management recognised the criteria upon which the ultimate success of the company would be measured, there was a basic need for them to implement procedures at the forecasting stages to provide a firmer foundation

for their achievement. It was evident that many of the respondents could benefit from a wider acceptance of financial planning methods (providing the opportunity to evaluate the probable consequences of plans and policy decisions), and a willingness to apply the associated techniques (appropriately modified as necessary) to suit the requirements of their particular companies. This could no doubt be generated from a better understanding of the relative merits of the procedures involved by examining their validity in relation to the needs of the company. It was recognised that practical difficulties would dictate that such procedures could not be put into effect within a company immediately, and that a progressive approach was therefore more likely to succeed. Consequently the system devised was introduced in stages and likewise evaluated.

Due to the emphasis still placed by many companies on profits and turnover as the major measure of assessing performance, the first stages aimed to provide an indication of the turnover to be obtained from currently secured contracts, correlated to a time scale. The techniques of evaluating turnover achievements and overhead recovery at regular intervals, and assessing outstanding work load were introduced by formalising existing discretionary procedures.

The need to expand objectives beyond the singular aspect of turnover in the formulation of a profit plan, and the implication of taxation and inflation were

in proposals for the extension of the system.

The initial system, although deliberately limited in order to gain acceptance by the company, provided the basis from which turnover achievements could be correlated with income, and highlighted the benefits to be gained from extending control procedures to the forecasting of the rate of income and expenditure. The means to do this, using cash flow statements, was shown to be possible by a modest extension of the system thus far established. The ability to anticipate changes in working capital demand by adopting these procedures was also demonstrated.

The forecasting of working capital demand indicated future levels of liquidity, and gave management opportunity to resolve policies concerning the provision of finance for future activities in good time and the avoidance of overtrading.

The validity of D.C.F. techniques, taking into account the concept of time in relation to the return derived from working capital investment (relating to individual projects, and their collective results) by which the overall profitability of the company could be examined. It was seen that the system as implemented, and the proposals for its extension by the use of these further techniques, constituted the means by which policy decisions could be generated from changes in performance measured by the criteria established.

Bearing in mind the significance of the collective results of individual projects towards the achievement of company objectives, the importance of the tender as the medium for providing an adequate level of profitability from a project was expounded. The viability of D.C.F. techniques in effecting a tendering datum other than the singular aim of submitting the lowest tender was also argued.

Denton (21) points out that D.C.F. procedures demand a philosophy distinct from current estimating practice. Such techniques were shown to involve additional processes to the normal practice, and the study confirmed the need to create an environment more conducive to the ready acceptance of the procedures by estimating staff.

The findings of Denton(21) and Fine (30) were endorsed in that the need to improve the quality of input data if D.C.F. techniques were to be used was posited. It was suggested that a less mechanistic approach to pricing than that characterised by traditional estimating practice be adopted, and a system of processing expenses in relation to potential work sequence and time scale be developed. The disciplined approach implicit in the application of financial planning procedures can be self generating. Their influence may permeate not only through the management of building companies, by inducing a positive implementation of policy to meet changing situations, variations in performance, and future developments, but also through

to clients and the professions. This may in turn lead to possible improvements in data provision and tender procedures.

Whilst the study was precluded from the actual application of D.C.F. techniques, the work of Denton (21) provides favourable reports on its adoption. Further research related to financial forecasting techniques at project level could however examine to advantage the possible benefits to be derived from the evaluation and sequencing of site production procedures, in an attempt to identify those factors which may provide the greatest potential to the profitability of individual building projects. Such research would constitute an essential basis for the adoption of policies and the strategy leading to a wider application of more sensitive tendering and project selection procedures.

It is hoped that the modest contribution made by this study may encourage a wider acceptance of the role of financial forecasting techniques in the determination by building companies of future objectives. Consequently stimulus and direction in the generation of company activity, and in the countering of the peculiar difficulties associated with the practice of building management, may be provided. Such practices even if not undertaken in their entirety, (provided that their principles were adopted and absorbed into existing procedures) would contribute not only to the success of individual companies, but

to the ultimate benefit of the industry in general and its clients. The importance of a receptive attitude from management is fundamental to the success of such procedures. An objective realisation of the associated difficulties and limitations, free from subjective bias is necessary, so that the advantages to be gained by the use of financial planning techniques in improving profitability and the stimulation of growth in future company activity, may be seen to justify their adoption. Providing that such procedures are tailored to meet the needs, and the organsiation of the individual company, they should not be lightly dismissed as the prerogative of the large company, but rather recognised as of equal, or even greater importance to its smaller contemporary.

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APPENDIX A

Questionnaire

Analysis of Results

Appendix A

Financial Forecasting in the Construction Industry Questionnaire
(Please insert tick in appropriate box)

1. Please indicate type of Company

Public	
Private	

2. Please indicate the geographical range of current activities

National	
Regional	
Local	

3. Please indicate the current annual turnover of within the following ranges

Less than £½ m.	
£½ m. to £1 m.	
£1 m. to £2½ m.	
£2½ m. to £5 m.	
£5 m. to £10 m.	
Exc. £10 m.	

4. Have you a formalised long range financial plan?

Yes	No

5. If answer is YES, please indicate period in years

5	4	3	2

6. Do you produce an annual turnover forecast?

Yes	No

7. Is this turnover forecast reduced to smaller time periods?

Yes	No

8. If YES please indicate period

Half-yearly	
Quarterly	
Monthly	

Appendix A.

9. Do you produce forecast valuations for individual contracts, for the full extent of the contract period, in monthly values as

a) A regular practice for your own internal benefit — Yes | No

b) If requested to do so by a client — Yes | No

10. Would you consider such a forecast (Q9) sufficiently accurate to provide your company with a reasonable assessment of future income and the client with a reasonable indication of his likely rate of expenditure on the contract — Yes | No

11. Are you finding an increasing demand from clients for such forecasts? — Yes | No

12. Would you be prepared to use such forecasts as the basis for interim payments, subject to a periodic adjustment during the course of the contract? — Yes | No

13. Do you consider that the traditional practice of producing interim valuations still provides the most satisfactory form of control of the payments during the execution of building contracts? — Yes | No

14. Does your Company use Interim Valuations as a means of performance appraisal? — Yes | No

If YES, are Interim Valuations compared with

a) Interim Costs to date — Yes | No

b) Forecast Valuations (Q10) — Yes | No

c) Site Progress Records — Yes | No

15. Does your Company forecast the income and expenditure (i.e. Cash Flow) to be incurred during any of the periods, and for the purposes specified below?

(i) To assist in the control of the overall financial activities of the Company

Annually	Yes	No
Half-yearly	Yes	No
Quarterly	Yes	No
Monthly	Yes	No

(ii) The evaluation of individual contracts

At tender stage	Yes	No
When secured	Yes	No

16. Please indicate whether the following factors are considered by your Company when estimating for a contract.

(i) Profit required in relation to tender value of contract

Yes	No

(ii) Contribution of the contract to the recovery of overhead costs

Yes	No

(iii) The return required in relation to the amount of working capital considered necessary to operate the contract

Yes	No

.....

Should you be willing to offer further assistance, I would be grateful if you could complete the following details.

i) Name and Address of Company

_____

_____

ii) Name and position of person to be contacted _____

_____

_____

Appendix A

Analysis of Questionnaire, Contracting Companies

Q	1	2	3	4	5	6	7	8	9		10
	Type of Firm	Extent of Activities	Annual Turnover	Formalised L.R. Plan	If Yes Period	Annual T.O. F'cast	Is period Reduced	If Yes Period	Forecast Vals. Self	Client	Accuracy Assess't
1.	Private	L	Less ½m	Yes	2 yrs	Yes	No	-	Yes	Yes	Yes
2.	Public	R	Exc.10m	Yes	3 yrs	Yes	Yes	Mthly	Yes	Yes	Yes
3.	Private	L	½-1m	No	-	Yes	Yes	½ yrly	No	Yes	Yes
4.	Private	R	½-1m	Yes	2 yrs	Yes	Yes	Qrtly	Yes	Yes	Yes
5.	Private	L	½-1m	No	-	No	No	-	No	Yes	No
6.	Private	R	½-1m	No	-	No	No	-	No	Yes	Yes
7.	Public	R	5-10m	No	-	Yes	Yes	Mthly	No	Yes	Yes
8.	Private	L	2½-5m	No	-	Yes	Yes	½ yrly	No	Yes	Yes
9.	Private	L	Less ½m	No	-	Yes	No	-	No	Yes	Yes
10.	Private	L	½-1m	Yes	2 yrs	Yes	Yes	Mthly	Yes	Yes	Yes
11.	Private	R	1-2½m	Yes	2 yrs	Yes	No	-	No	Yes	Yes
12.	Private	R	Exc.10m	Yes	3 yrs	Yes	Yes	Mthly	Yes	Yes	Yes
13.	Private	L	½-1m	Yes	2 yrs	Yes	Yes	Qrtly	Yes	Yes	Yes
14.	Private	L	1-2½m	Yes	2 yrs	Yes	Yes	½ yrly	No	Yes	No
15.	Private	R	2½-5m	Yes	3 yrs	Yes	Yes	Qrtly	Yes	Yes	Yes
16.	Private	L	1-2½m	No	-	Yes	Yes	Qrtly	No	Yes	Yes
17.	Private	R	2½-5m	Yes	3 yrs	Yes	Yes	Qrtly	No	Yes	Yes
18.	Public	R	Exc.10m	Yes	5 yrs	Yes	Yes	Mthly	Yes	Yes	Yes
	3 Pub. 15 Priv.	3 Reg. 6 Reg. 9 Local	2 - ½ 6 ½ to 1 3 1 to2½ 3 2½to 5 1 5 - 10 3 Exc.10	11 Yes 7 No	6-2yrs 4-3yrs 1-5yrs 7-nil	16 Yes 2 No	13 Yes 5 No	5 Mthly 5 Qrtly 3 ½yrly. 5 Nil	8 Yes 10 No	18 Yes	16 Yes 2 No

Table A(i)

Appendix A.

A continued

Q	11	12	13	14				15			16		
	Incr'd Demand	Forecast used for Int. val.	Trad.Pract. Int. Vals.	Int. Use	Vals. Cost	Perf/App Forecast	Site Prog.	Cash Flow O.A. Control	Ind.Contracts Tender	Sec'd	Estimating Factors Profit/ T.O.	O.H.	Rtn/Cap
1.	Yes	No	Yes	Yes	Yes	No	No	Monthly	No	No	Yes	Yes	No
2.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Monthly	Yes	Yes	Yes	Yes	No
3.	No	No	Yes	Yes	Yes	No	Yes	½yearly	No	No	Yes	Yes	No
4.	No	Yes	Yes	Yes	Yes	Yes	No	Qrtly	No	Yes	Yes	Yes	No
5.	No	No	Yes	Yes	No	No	No	Monthly	No	No	Yes	Yes	No
6.	Yes	Yes	Yes	Yes	Yes	No	No	Annually	No	Yes	Yes	Yes	No
7.	No	No	Yes	Yes	Yes	Yes	No	Monthly	No	No	Yes	Yes	No
8.	No	No	Yes	Yes	Yes	No	No	Monthly	No	No	Yes	Yes	No
9.	No	No	Yes	Yes	Yes	No	No	Qrtly	No	No	Yes	Yes	No
10.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Monthly	No	No	Yes	Yes	No
11.	Yes	Yes	Yes	Yes	Yes	No	Yes	Annually	No	Yes	Yes	Yes	No
12.	No	No	Yes	Yes	Yes	Yes	Yes	Monthly	No	Yes	Yes	Yes	No
13.	No	No	Yes	Yes	Yes	Yes	Yes	Monthly	No	Yes	Yes	Yes	No
14.	No	No	Yes	Yes	Yes	No	No	Qrtly	No	Yes	Yes	Yes	No
15.	Yes	Yes	Yes	Yes	Yes	No	Yes	Qrtly	No	No	Yes	Yes	No
16.	Yes	Yes	Yes	Yes	Yes	No	No	Monthly	No	No	Yes	Yes	No
17.	No	Yes	Yes	Yes	Yes	Yes	Yes	Monthly	No	Yes	Yes	Yes	No
18.	No	No	Yes	Yes	Yes	Yes	No	Qrtly	No	No	Yes	Yes	No
	7 Yes 11 No	8 Yes 10 No	18 Yes	18 Yes	17 Yes 1 No	8 Yes 10 No	8 Yes 10 No	Mthly 10 Qrtly 5 ½Yrly 1 Annual 2	1 Yes 17 No	8 Yes 10 No	18 Yes	18 Yes	18 No

Table A(ii)

APPENDIX B

INTRODUCTORY SYSTEM

CONTROL FORMS

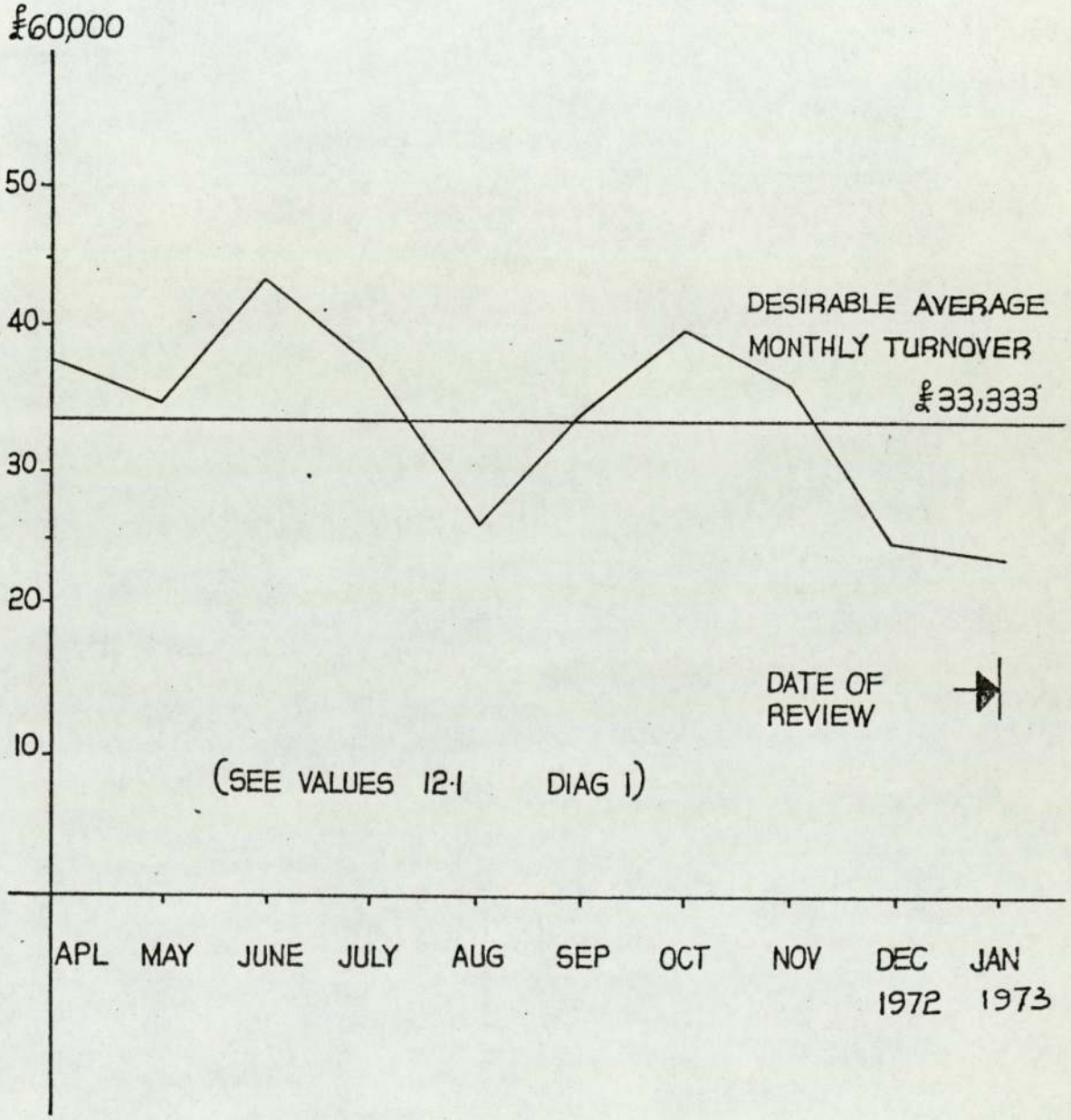
Contract No.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	1972 Dec.	1973 Jan.
2911	1680	3666		5494	3868	2834	3085	3600	1017	3621
3219	6043	2422	5255	4484		2223	1154			
3223	10426	7764	6821	6273	3225					
3282	5143	4537	6619	5301	1870	2544	2075	263		
3319	5207	7614	8364	7528	4719	5002	6818	6016	4748	3235
3329		1289	156							
3330	1838	2572	5405	4137	3487	234				
3334	7542		6614				6848			
3349					1528					
3363						7910	3613	4017		
3364					2180	2938	6331	6268	6962	4364
3365			4642	2158	2251	3628	2492		2061	1175
3369							3679	2042	1116	2032
3370							700	1183	1924	2298
3375						2204				
3376		5000			2000			823		
3381								755	2304	2179
3386						1550				
3387				2200		1160				
3397						1026				
3398					914					
3405						852				
3412							2591	3853		367
3421								1300		1170
3423							784	2647	4815	3651
3433								3728		
Monthly Totals	£37879	34864	43876	37575	26042	34105	40170	36485	24947	24092
Cumulative Totals	37879	72743	116619	154194	180236	214341	254311	290996	315943	340035

RECORD OF ACTUAL VALUATIONS & MONTHLY TURNOVER ACHIEVEMENTS.

APPENDIX B DIAGRAM 1.

DIAG.1.

B2



ACTUAL MONTHLY TURNOVER ACHIEVEMENTS

DIAGRAM 2

	April	May	June	July	Aug.	Sept.	Oct.	Nov.	1972 Dec.	1973 Jan.	CUMULATIVE TOTAL
DESIRED MONTHLY TURNOVER	33333	33333	33333	33333	33333	33333	33333	33333	33333	33333	333,330
ACTUAL MONTHLY TURNOVER	37879	34864	43876	37575	26042	34105	40170	36485	24947	24092	340,035
OVER RECOVERY	4546	1531	10543	4242		772	6837	3152			31,623
UNDER RECOVERY					7291				8386	9241	24,918
CUMULATIVE BALANCE	4546	6077	16620	20862	13571	14343	21180	24332	15946	6705	6,705

ACTUAL VALUATION ACHIEVEMENTS and CUMULATIVE BALANCES RESULTING FROM COMPARISON WITH DESIRABLE MONTHLY TURNOVER.

APPENDIX B DIAGRAM 3.

DIAG. 3.

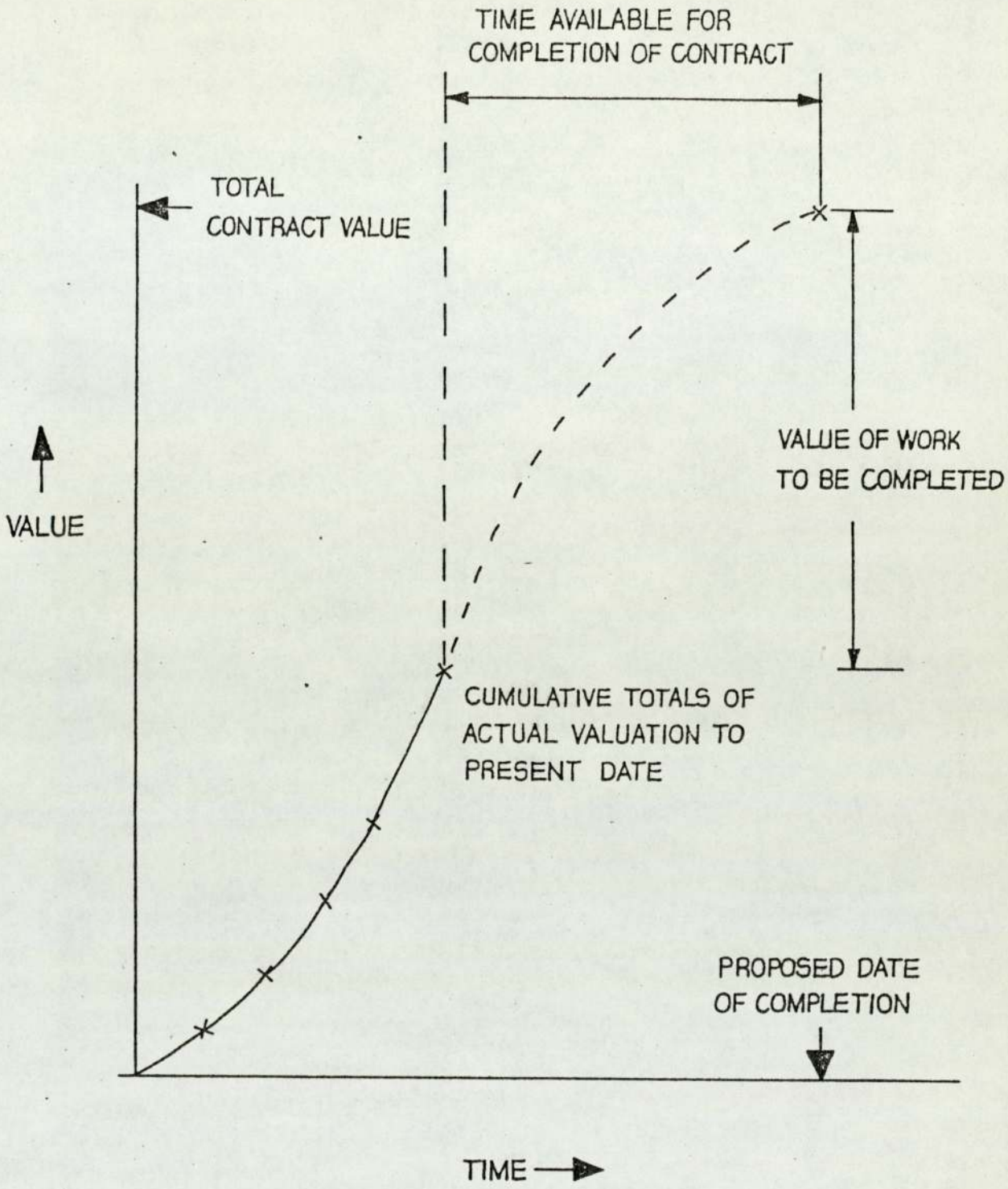
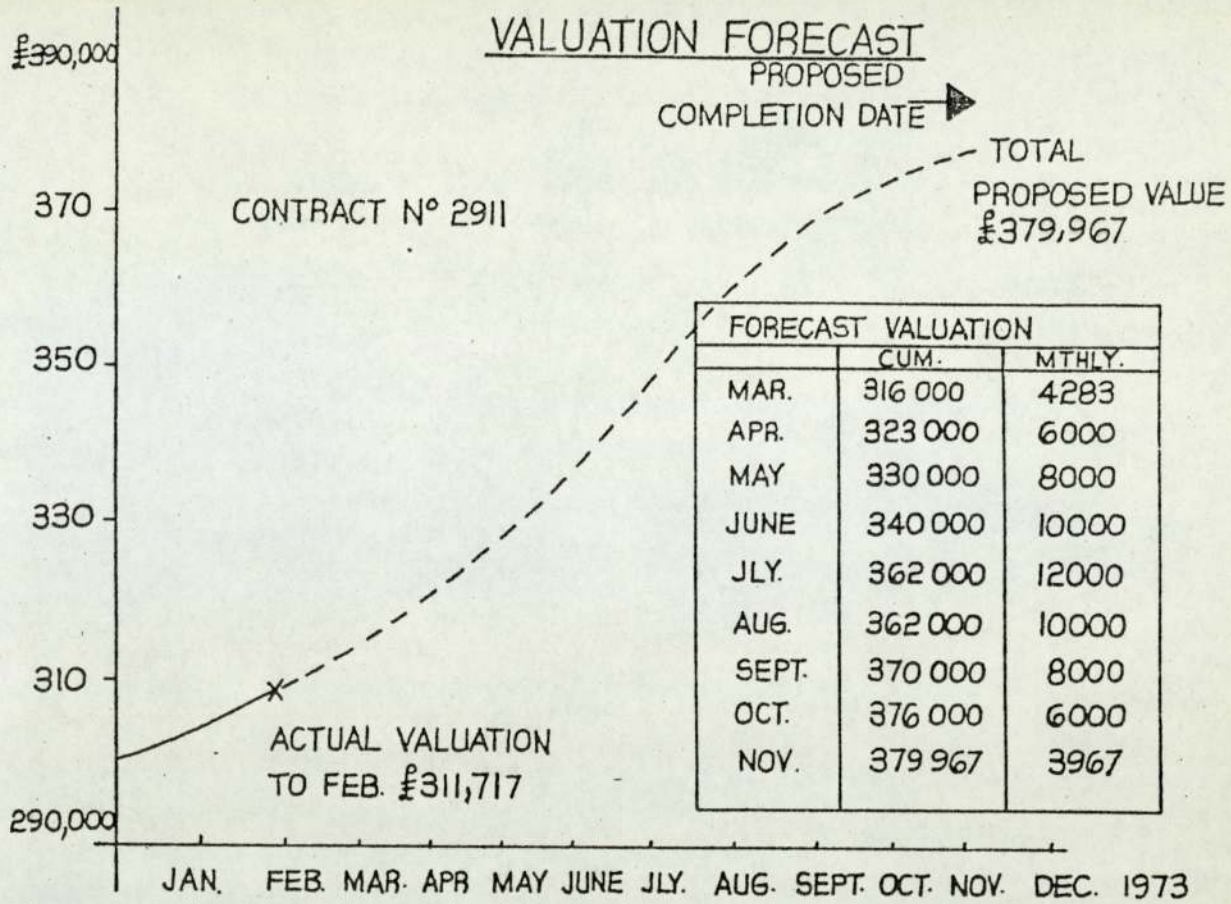


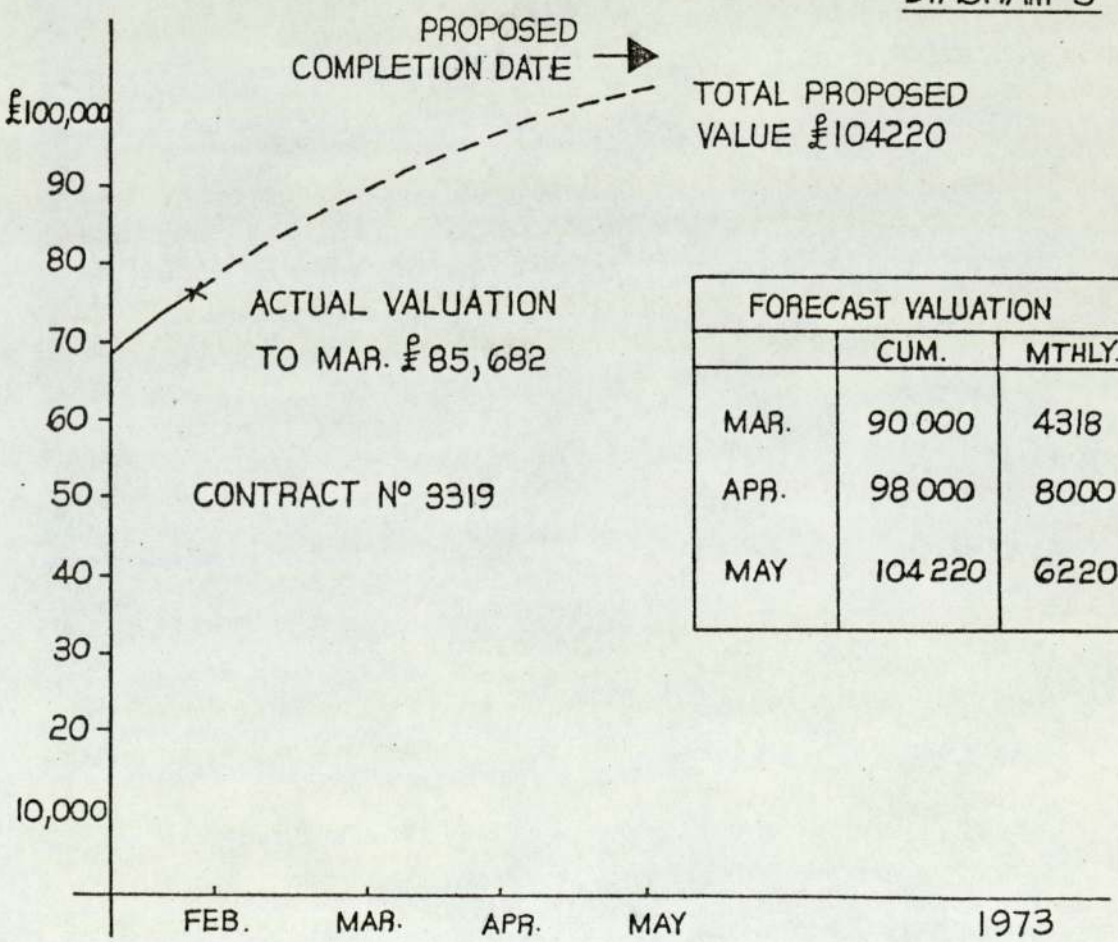
ILLUSTRATION OF EXTENT OF COMMITMENT
ON TYPICAL CONTRACT

DIAGRAM 4



FORECAST VALUATION		
	CUM.	MTHLY.
MAR.	316 000	4283
APR.	323 000	6000
MAY	330 000	8000
JUNE	340 000	10000
JLY.	362 000	12000
AUG.	362 000	10000
SEPT.	370 000	8000
OCT.	376 000	6000
NOV.	379 967	3967

DIAGRAM 5



FORECAST VALUATION		
	CUM.	MTHLY.
MAR.	90 000	4318
APR.	98 000	8000
MAY	104 220	6220

VALUATION FORECAST

DIAGRAM 6

Contract No.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	1973 Dec.	Jan.	Feb.	Mar.	1974 Apr.
2911	2842*	4283	6000	8000	10000	12000	10000	8000	6000	3967					
3319	3680*	4318	8000	6220											
3364	4957	8000	8000	10000	12000	12000	11000	10000	9000	6000	4000				
3365	3931*	5662	4000	1032											
3369	2131	3500	4000	5500	7000	9000	7000	5500	4500	3000	2654				
3370	2065	2500	3000	3500	3500	4000	4500	5000	5500	5000	5000	3500	2500	2000	1320
3381	3262	4500	6500	8500	7000	4500	2300								
3423	2613	4000	3000	2281											
Monthly	25481	36763	42500	45033	39500	41500	34800	28500	25000	17967	11654	3500	2500	2000	1320
Cumulative Totals	25481	62244	104744	149777	189277	230777	265577	294077	319077	337044	348698	352198	354698	356698	358,018

* Actual results received prior to completion of forecast

FORECAST OF MONTHLY TURNOVER BASED UPON VALULATION FORECASTS

OF CURRENT CONTRACTS.

APPENDIX B DIAGRAM 7

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DIAG 7

	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	1973 Dec.	Jan.	Feb.	Mar.	1974 Apr.	Totals
Desired monthly T.O.	33333	33333	33333	33333	33333	33333	33333	33333	33333	33333	33333	33333	33333	33333	33333	499995
Forecast monthly T.O.	25481	36763	42500	45033	39500	41500	34800	28500	25000	17967	11654	3500	2500	2000	1320	358018
Over recovery		3430	9167	11700	6167	8167	1467									40098
Under recovery	7852							4833	8333	15366	21679	29833	30833	31333	32013	182075
Cumulative balance using forecast values only	(7852)	(4422)	4745	16445	22612	30779	32246	27413	19080	3714	(17965)	(47798)	(78631)	(109964)	(141977)	(141977)
Cumulative balance using Actual & Forecast values	(1147)	2283	11450	23150	29317	37484	38951	34118	25785	10419	(11260)	(41093)	(71926)	(103259)	(135272)	

B8

Check Cumulative balance based on Forecast Values only

Total under-recovery	182075
Total over-recovery	40098
	£ 141977

Cumulative balance based on both Actual and Forecast values

Total under-recovery	141977
Total over-recovery	6705 (B/F Dia.3)
	£ 135272

Cumulative balance (B/F Dia. 3)

Under-recovery Feb.	=6705
Cumulative Balance Feb	=7852
	(1147)

Appendix B DIAGRAM 8

DIAG 8

MONTHLY TURNOVER FORECAST AND CUMULATIVE BALANCES

RESULTING FROM COMPARISON WITH DESIRABLE MONTHLY TURNOVER

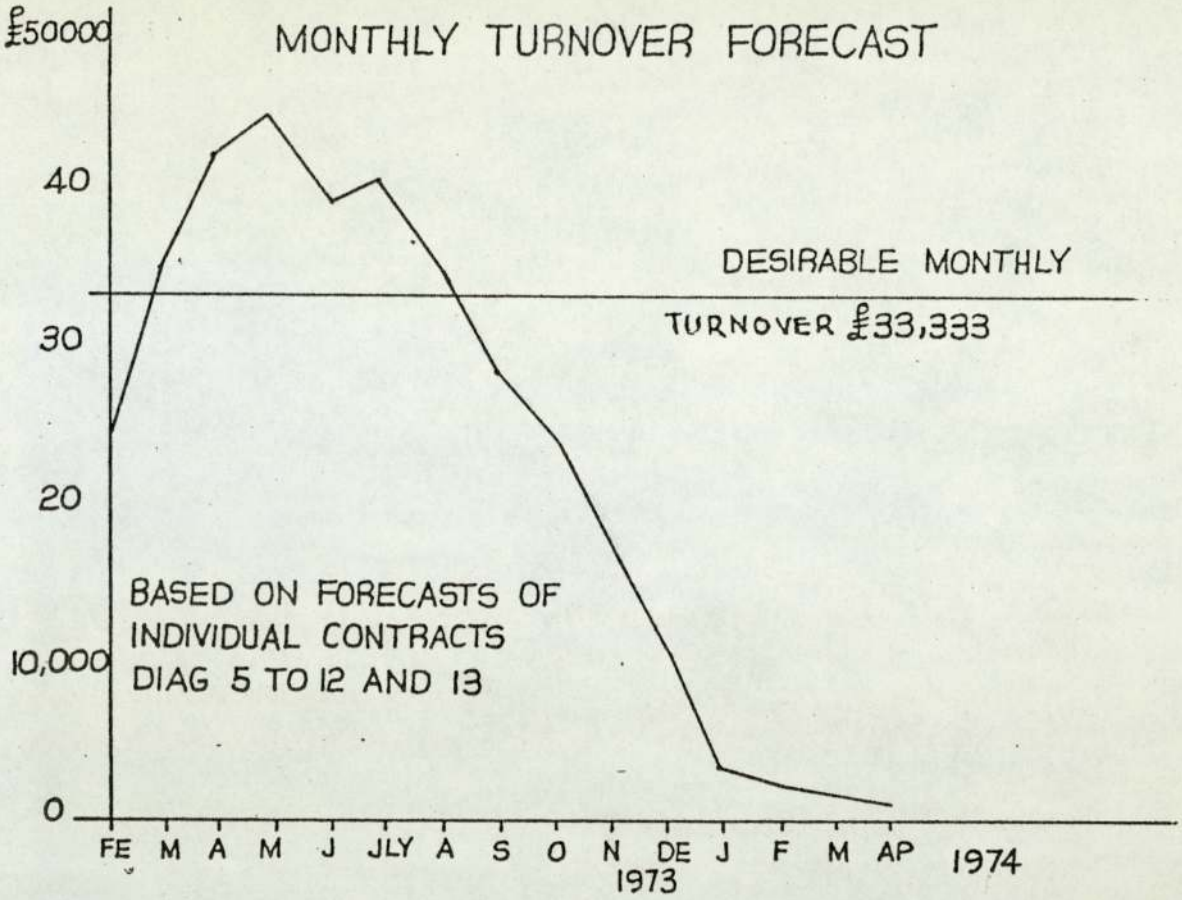


DIAGRAM 9

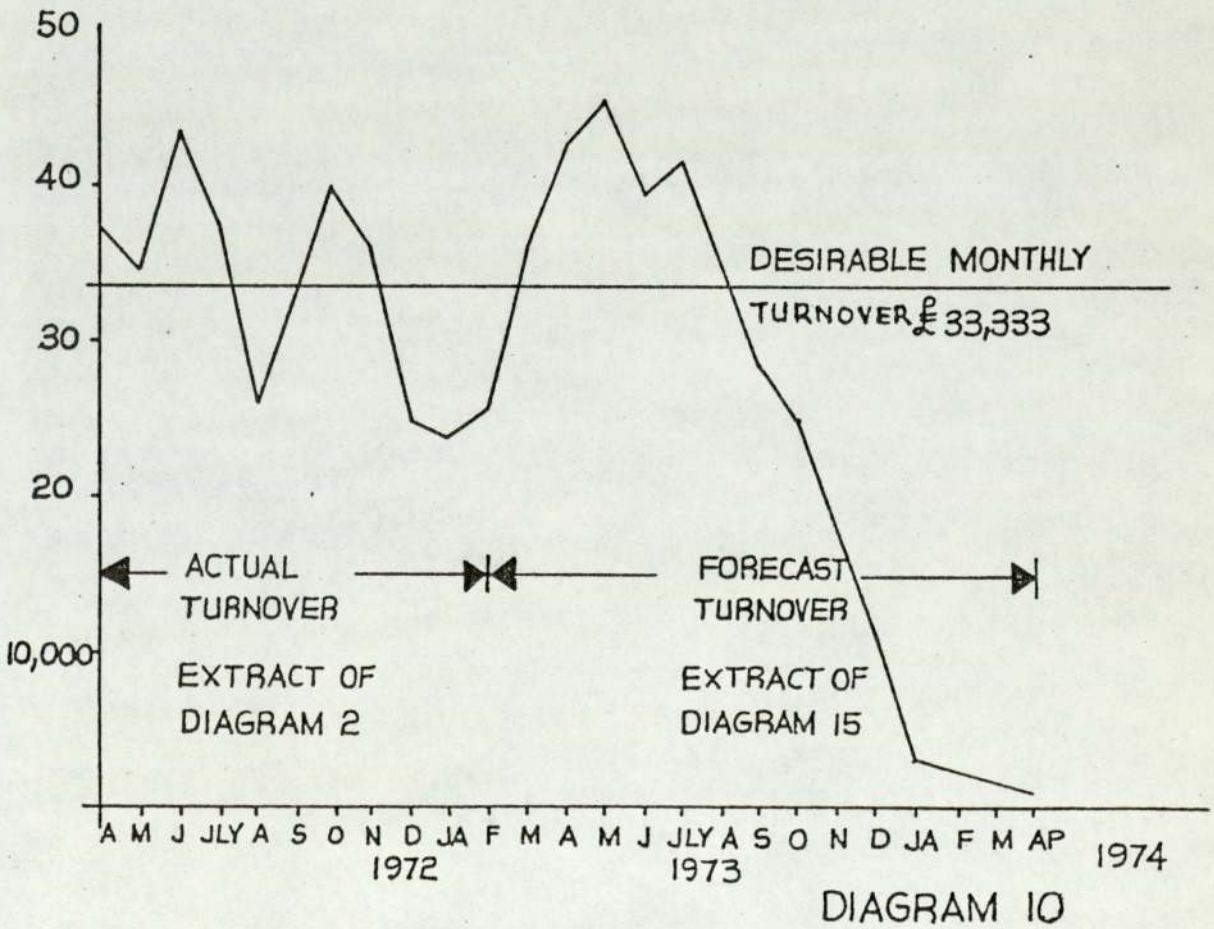


DIAGRAM 10

GRAPH SHOWING CUMULATIVE BALANCES BETWEEN ACTUAL & FORECAST TURNOVER AND DESIRABLE MONTHLY TURNOVER VALUES

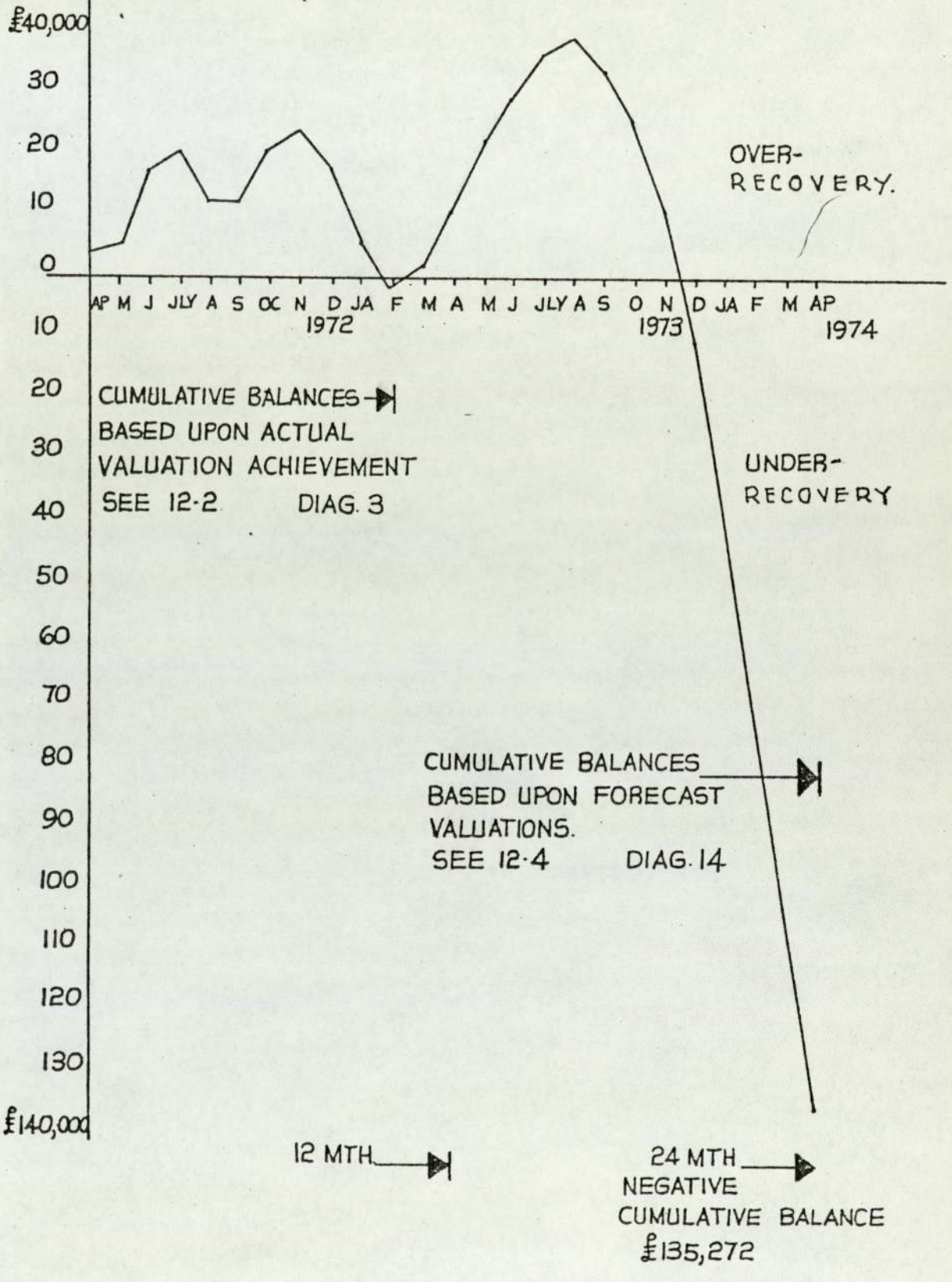


DIAGRAM 11

Value of Building Work Forecast

Contract	No.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	1973 Dec.	1974 Jan.	Feb.	Mar.	Apr.
2911	A		2842	4283	6000	8000	10000	12000	10000	8000	6000	3967					
	B	71092	68250	68967	57967	49967	39967	27967	17967	9967	3967						
3319	A		3680	4318	8000	6220											
	B	22218	18538	14220	6220												
3364	A		4957	8000	8000	10000	12000	12000	11000	10000	9000	6000	4000				
	B	94957	90000	82000	74000	64000	52000	40000	29000	19000	10000	4000					
3365	A		3931	5662	4000	1032											
	B	14625	10694	5032	1032												
3369	A		2131	3500	4000	5500	7000	9000	7000	5500	4500	3000	2654				
	B	53785	51654	48154	44154	38654	31654	22654	15654	10154	5654	2654					
3870	A		2065	2500	3000	3500	3500	4000	4500	5000	5500	5000	5000	3500	2500	2000	1320
	B	52885	50820	48320	45320	41820	38320	34320	29820	24820	19320	14320	9320	5820	3320	1320	
3381	A		3262	4500	6500	8500	7000	4500	2300								
	B	36562	33300	28800	22300	13800	6800	2300									
3423	A		2613	4000	3000	2281											
	B	11894	9281	5281	2281												
	C		25481	36763	42500	45033	39500	41500	34800	28500	25000	17967	11654	3500	2500	2000	1320
	D	358018	332537	295774	253274	208241	168741	127241	92441	63941	38941	20974	9320	5820	3320	1320	

A = Value of Building Work forecast to be completed each month for each contract

B = Value of Building Work forecast as incomplete

C = Total value of Building Work forecast to be completed each month

D = Total value of Building Work forecast as incomplete.

Appendix B Diagram 12

B 11

DIAG. 12.

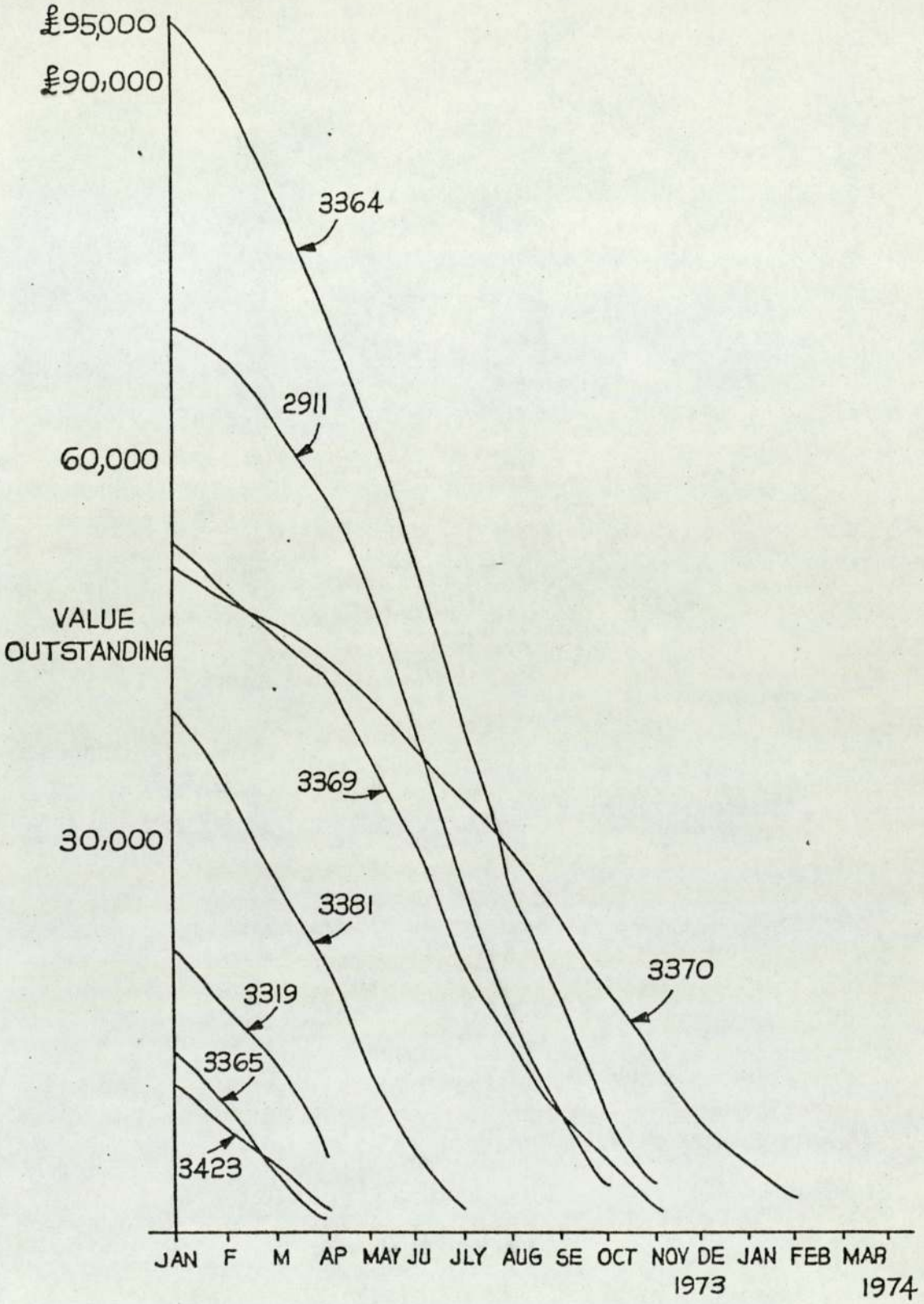


ILLUSTRATION OF WINDING DOWN OF WORK LOAD ON CURRENT CONTRACTS

DIAGRAM 13

Contract No.	FEBRUARY Forecast	MONTHLY Actual	Variation +	Variation −	CUMULATIVE Forecast	CUMULATIVE Actual	Variation +	Variation −	MARCH Forecast	MONTHLY Actual	Variation +	Variation −	1973 Forecast	CUMULATIVE Actual	Variation +	Variation −
2911	2842	2842*			2842	2842*			4283	4256		27	7125	7098		27
3319	3680	3680*			3680	3680*			4318	3791		527	7998	7471		527
3364	4957	6402	1445		4957	6402	1445		8000	7268		732	12957	13670	713	
3365	3931	3931*			3931	3931*			5662	2379		3283	9593	6310		3283
3369	2131	1445		686	2131	1445		686	3500	−		3500	5631	1445		4186
3370	2065	3004	939		2065	3004	939		2500	-		2500	4565	3004		1561
3381	3262	−		3262	3262	−		3262	4500	5508	1008		7762	5508		2254
3423	2613	−		2613	2613	−		2613	4000	8320	4320		6613	8320	1707	
	25481	21304	2384	6561	25481	21304	2384	6561	36763	31522	5328	10569	62244	52826	2420	11838
				4177				4177				5241				9418

COMPARISON BETWEEN FORECAST AND ACTUAL VALUATIONS

BASED UPON CUMULATIVE VALUES CALCULATED FROM COMMENCEMENT OF FORECASTING PERIOD

Appendix B Diagram 14

*Actual results received prior to the completion of the forecast.

B 13

DIAG 14

Contract No.	FEBRUARY Forecast	MONTHLY Actual	Variation +	Variation −	CUMULATIVE Forecast	CUMULATIVE Actual	Variation +	Variation −	MARCH Forecast	MONTHLY Actual	Variation +	Variation −	1973 CUMULATIVE Forecast	CUMULATIVE Actual	Variation +	Variation −
2911	2842	2842*	-	-	311717	311717	-	-	4283	4256		27	316000	315973		27
3319	3680	3680*	-	-	85682	85682	-	-	4318	3791		527	90000	89473		527
3364	4957	6402	1445	-	34000	35445	1445		8000	7268		732	42000	42713	713	
3365	3931	3931*	-	-	22338	22338	-	-	5662	2379		3283	28000	24717		3283
3369	2131	1445	-	686	11000	10314	-	-	3500	-		3500	14500	10314		4186
3370	2065	3004	939	-	8000	8939	939		2500	-		2500	10500	8939		1561
3381	3262	-		3262	8500	5238		3262	4500	5508	1008		13000	10746		2254
3423	2613	-		2613	14500	11887		2613	4000	8320	4320		18500	20207	1707	
	25481	21304	2384	6561	495737	491560	2384	6561	36763	31522	5328	10569	532500	523082	2420	11838
				4177				4177				5241				9418

COMPARISON BETWEEN FORECAST AND ACTUAL VALUATIONS BASED UPON CUMULATIVE VALUES CALCULATED FROM THE COMMENCEMENT OF EACH CONTRACT.

Appendix 8 Diagram 15

*Actual results received prior to completion of forecast.

B 14

DIAG. 15.

CONTRACT NO.3381			DATE OF COMM. 8th NOV. 1972 Total Contract Value				£41800	
CONTRACT - THE GROVE FLATS			PROPOSED COMPLETION 29th AUG.1973					
	MONTHLY VALUATIONS			CUMULATIVE VALUATIONS			VALUE OF WORK OUTSTANDING	
MONTH	FORECAST	ACTUAL	VARIATION + -	FORECAST	ACTUAL	VARIATION + -	Forecast	Actual
FEB	3262	NIL	3262	8500	B/F 5238	3262	33300	36562
MARCH	4500	5508	1008	13000	10746	2254	28800	31054
APRIL	6500	5539	961	19500	16285	3215	22300	25515
MAY	8500	6542	1958	28000	22827	5173	13800	18973
JUNE	7000			35000			6800	
JULY	4500			39500			2300	
AUG	2300			41800				

COMPARISON BETWEEN FORECAST AND ACTUAL VALUATIONS FOR CONTRACT No.3381

Appendix B Diagram 16

B 15

DIAG 16

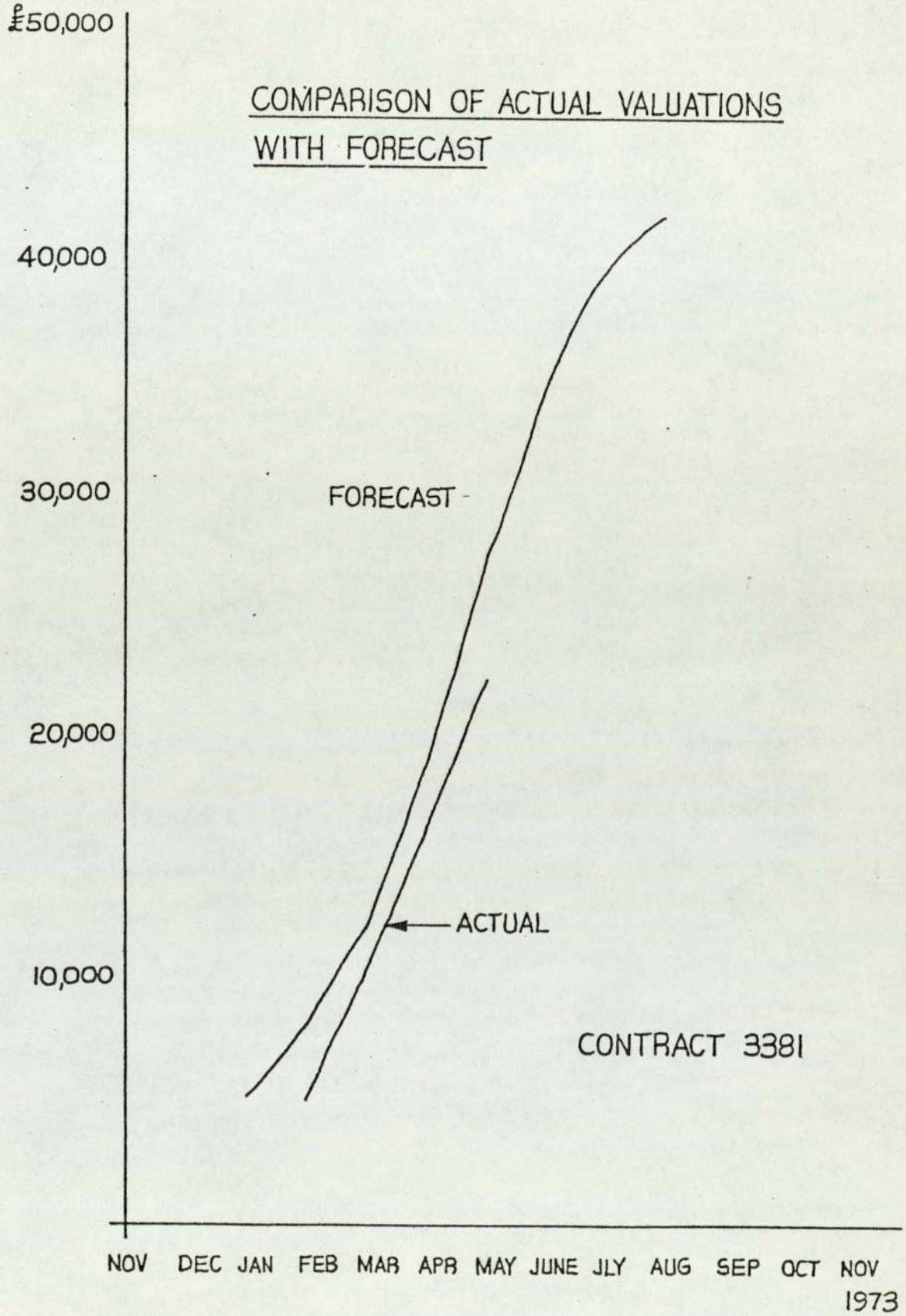

£50,000
40,000
30,000
20,000
10,000
COMPARISON OF ACTUAL VALUATIONS
WITH FORECAST
FORECAST
ACTUAL
CONTRACT 3381
NOV DEC JAN FEB MAR APR MAY JUNE JLY AUG SEP OCT NOV
1973

DIAGRAM 17

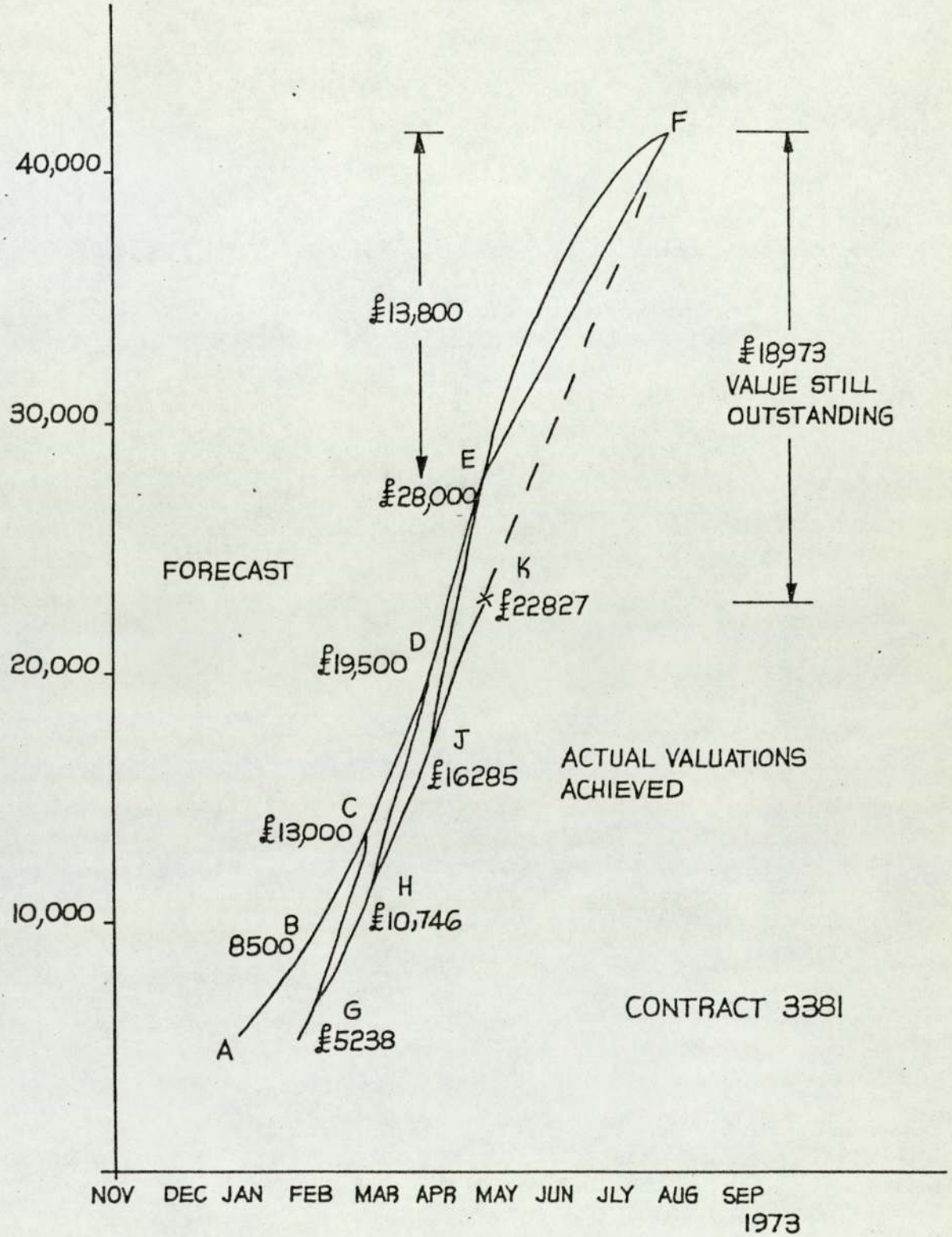


ILLUSTRATION OF MONITORING OF VALUATIONS & CONSEQUENT CHANGES IN THE REQUIRED RATE OF PRODUCTION

DIAGRAM 18

	APRIL								MAY							
	MONTHLY				CUMULATIVE				MONTHLY				CUMULATIVE			
Contract No.	Forecast	Actual	Variation +	Variation −	Forecast	Actual	Variation +	Variation −	Forecast	Actual	Variation +	Variation −	Forecast	Actual	Variation +	Variation −
2911	6000	4580		1420	13125	11678		1447	8000	5120		2880	21125	16798		4327
3319	8000	7080		920	15998	14551		1447	6220	5960		260	22218	20511		1707
3364	8000	4580		3420	20957	18250		2707	10000	6950		3050	30957	25200		5757
3365	4000	5600	1600		13593	11910		1683	1032	3615	2583		14625	15525	900	
3369	4000	4050	50		9631	5495		4136	5500	6810	1310		15131	12305		2826
3370	3000	4500	1500		7565	7504		61	3500	3400		100	11065	10904		161
3381	6500	5539		961	14262	11047		3215	8500	6542		1958	22762	17589		5173
3423	3000	3200	200		9613	11520	1907		2281	874		1407	11894	12394	500	
	42500	39129	3350	6721	104744	91955	1907	14696	45033	39271	3893	9655	149777	131226	1400	19951
				3371				12789				5762				18551

COMPARISON BETWEEN FORECAST AND ACTUAL VALUATIONS

BASED UPON CUMULATIVE VALUES CALCULATED FROM COMMENCEMENT OF FORECASTING PERIOD.

Appendix 8 Diagram 19

P 18

DIAG. 19.

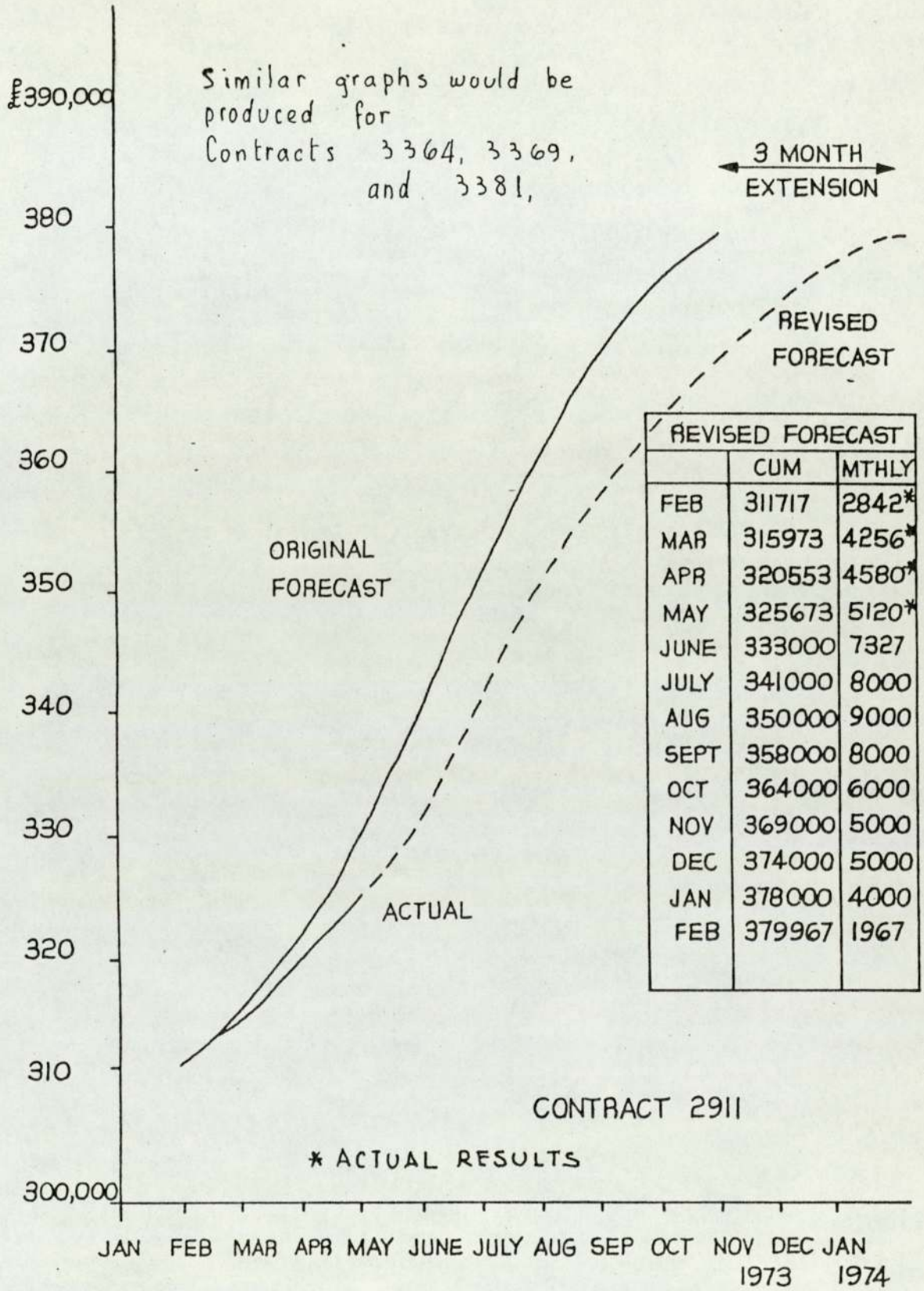
	APRIL								MAY								1973
	MONTHLY				CUMULATIVE				MONTHLY				CUMULATIVE				
Contract No.	Forecast	Actual	Variation +	Variation −	Forecast	Actual	Variation +	Variation −	Forecast	Actual	Variation +	Variation −	Forecast	Actual	Variation +	Variation −	
2911	6000	4580		1420	322000	320553		1447	8000	5120		2880	330000	325673		4327	
3319	8000	7080		920	98000	96553		1447	6220	5960		260	104220	102513		1707	
3364	8000	4580		3420	50000	47293		2707	10000	6950		3050	60000	54243		5757	
3365	4000	5600	1600		32000	30317		1683	1032	3615	2583		33032	33932	900		
3369	4000	4050	50		18500	14364		4136	5500	6810	1310		24000	21174		2826	
3370	3000	4500	1500		13500	13439		61	3500	3400		100	17000	16839		161	
3381	6500	5539		961	19500	16285		3215	8500	6542		1958	28000	22827		5173	
3423	3000	3200	200		21500	23407	1907		2281	874		1407	23781	24281	500		
	42500	39129	3350	6721	575000	562211	1907	14696	45033	39271	3893	9655	620033	501482	1400	19951	
				3371				12789				5762				18551	

COMPARISON BETWEEN FORECAST AND ACTUAL VALUATIONS BASED UPON CUMULATIVE VALUES CALCULATED FROM THE COMMENCEMENT OF EACH CONTRACT

Appendix B Diagram 20

B 19

DIAG. 20.



REVISED FORECAST		
	CUM	MTHLY
FEB	311717	2842*
MAR	315973	4256*
APR	320553	4580*
MAY	325673	5120*
JUNE	333000	7327
JULY	341000	8000
AUG	350000	9000
SEPT	358000	8000
OCT	364000	6000
NOV	369000	5000
DEC	374000	5000
JAN	378000	4000
FEB	379967	1967

REVISION OF FORECAST (ii)

DIAGRAM 21

											1973				1974
Contract No.	Feb	Mar	Apl	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Ap
2911	2842	4256	4580	5120	7327	8000	9000	8000	6000	5000	5000	4000	1967	-	-
3319	3680	3791	7080	5960	1707										
3364	6402	7268	4580	6950	7757	8000	8500	9000	8000	7500	7000	5000	4000	3000	2000
3365	3931	2379	5600	3615											
3369	1445	-	4050	6810	6826	7000	5000	5000	4000	4000	3500	2500	2000	1654	
3370	3004	-	4500	3400	3661	4000	4500	5000	5500	5000	5000	3500	2500	2000	1320
3381	-	5508	5539	6542	5173	5500	3500	3000	1800						
3423	-	8320	3200	874											
Monthly totals	21304	31522	39129	39271	32451	32500	30500	30000	25300	21500	20500	15000	10467	6654	3320
Cumulative totals	21304	52826	91955	131226	163677	196177	226677	256677	281977	303477	323977	338977	349444	356098	359418

B21

REVISED FORECAST VALUATION SUMMARY.

Note Con. No. 3365 = £900 additional to original contract sum
Con. No. 3423 = £500 additional to original contract sum

Based upon recordings of actual valuations up to May and the revised forecasts for contracts no. 2911, 3364, 3369 and 3381

Con.No.3319 - extended 1 further month.

DIAG. 22.

Appendix B Diagram 22

	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	1973 Dec.	Jan.	Feb.	Mar.	1974 April	Totals
Desirable T.O. monthly	33333	33333	33333	33333	33333	33333	33333	33333	33333	33333	33333	33333	33333	33333	33333	499995
Revised Fore - cast monthlyto	21304	31522	39129	39271	32451	32500	30500	30000	25300	21500	20500	15000	10467	6654	3320	359418
Over-recovery			5796	5938												11734
Under-recovery	12029	1811			882	833	2833	3333	8033	11833	12833	18333	22866	26679	30013	152311
Cumulative Balance Forecast only	(12029)	(13840)	(8044)	(2106)	(2988)	(3821)	(6654)	(9987)	(18020)	(29853)	(42686)	(61019)	(83885)	(110564)	(140577)	
Cumulative Balance Actual & Forecast	(5324)	(7135)	(1339)	4599	3717	2884	51	(3282)	(11315)	(23148)	(35981)	(54314)	(77180)	(103859)	(133872)	

Cumulative Balance Based on Forecast Values only

Total under recovery	152311
Total over recovery	11734
	£140577

Cumulative Balance Based on both Actual and Forecast Values.

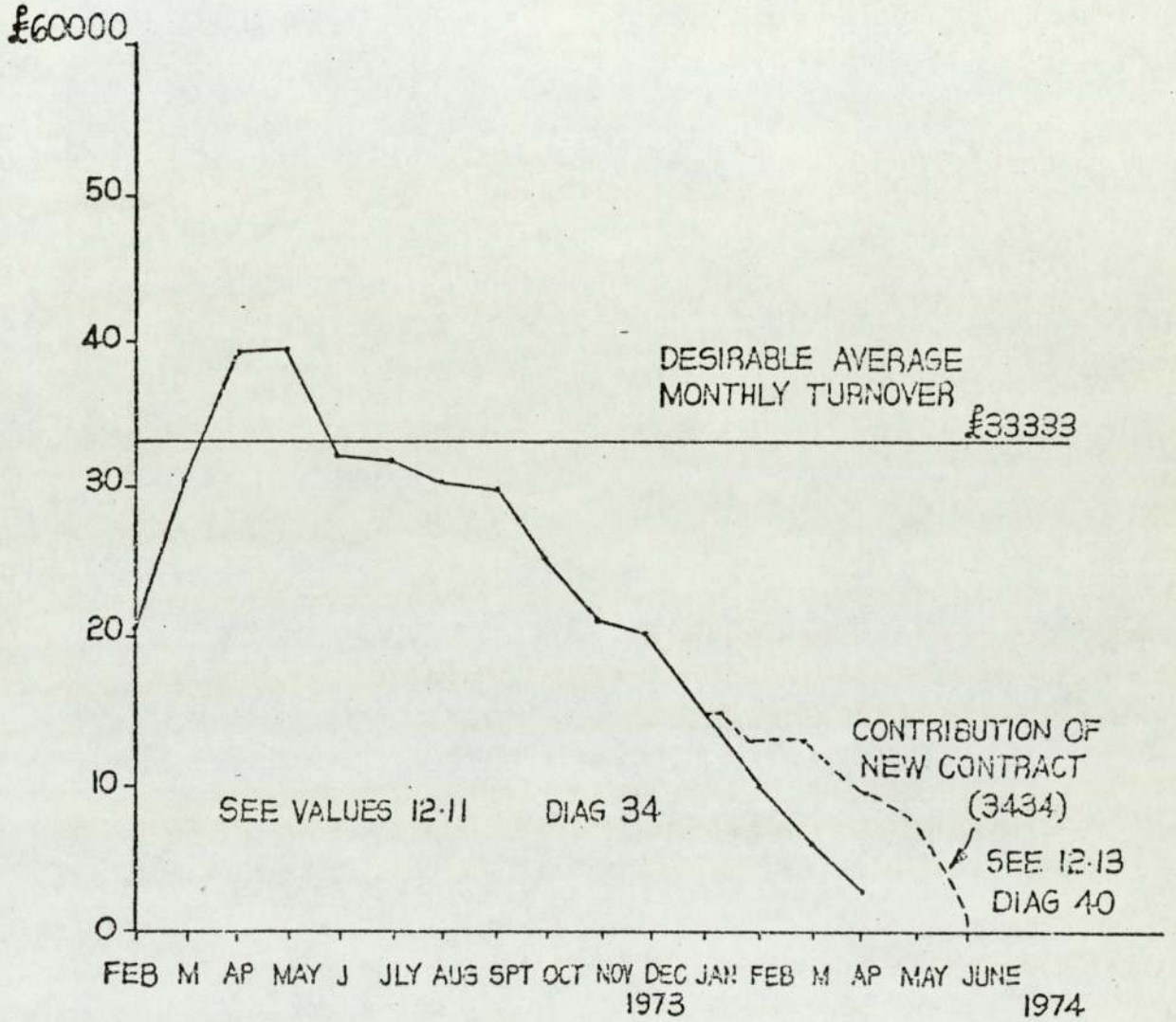
Total under recovery	140577	
Total over recovery	6705	(B/F Diag.3)
	£133827	

Appendix B Diagram 23

REVISED MONTHLY FORECAST AND CUMULATIVE BALANCES
RESULTING FROM COMPARISON WITH DESIRABLE MONTHLY TURNOVER.

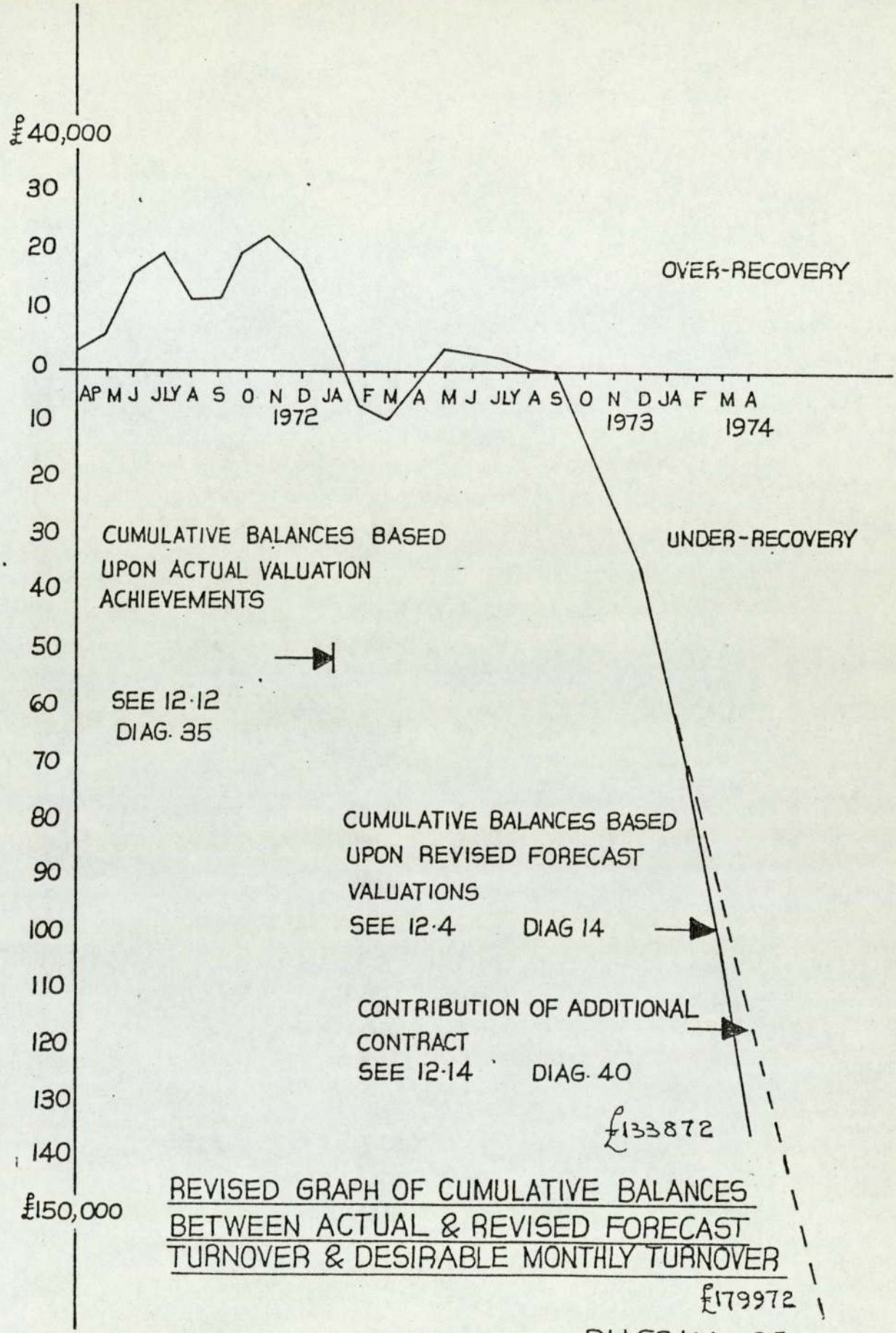
B 22

DIAG 23.



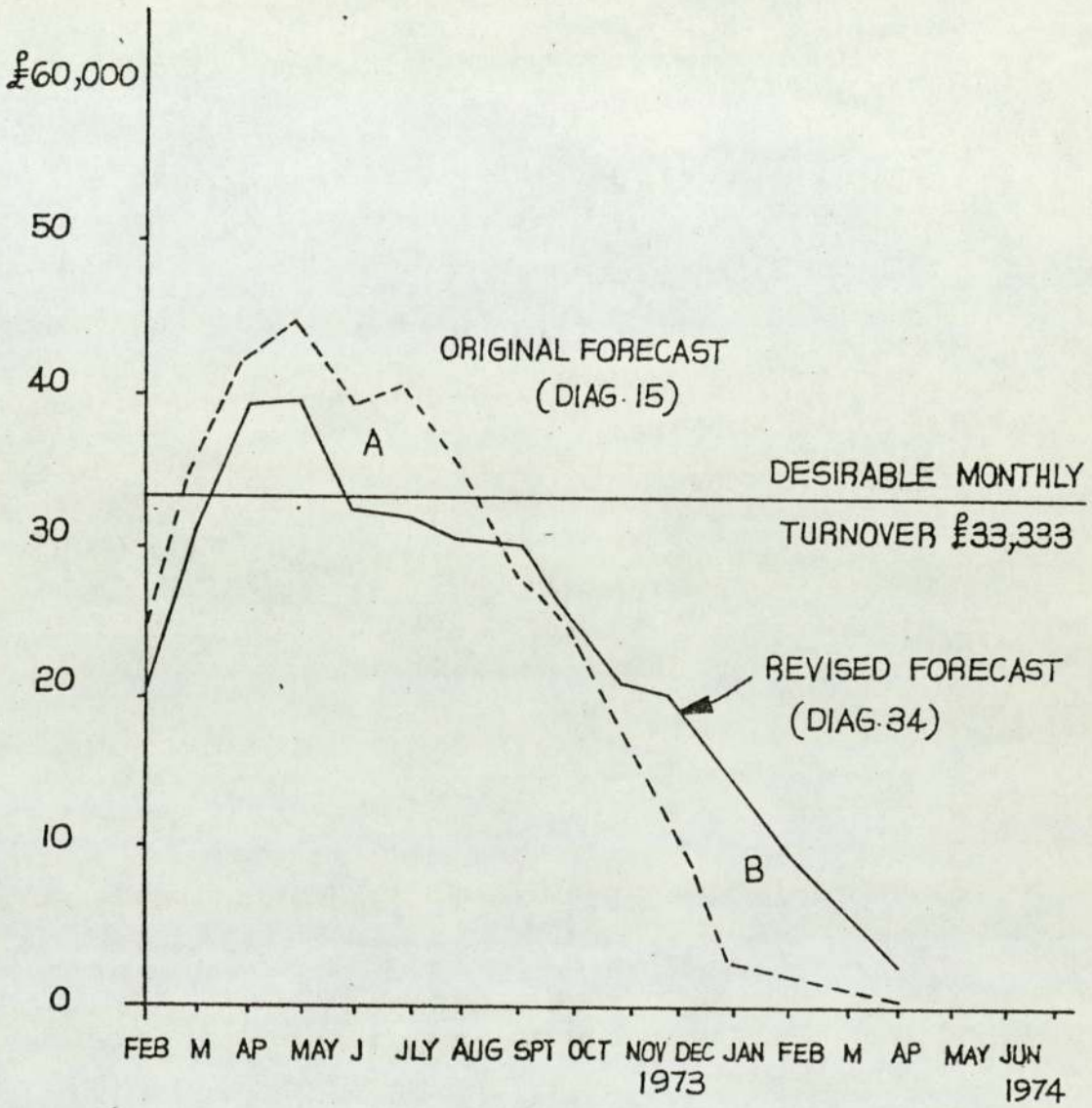
REVISED TURNOVER FORECAST

DIAGRAM 24



REVISED GRAPH OF CUMULATIVE BALANCES BETWEEN ACTUAL & REVISED FORECAST TURNOVER & DESIRABLE MONTHLY TURNOVER

DIAGRAM 25



COMPARISON BETWEEN ORIGINAL
AND REVISED TURNOVER FORECAST

DIAGRAM 26

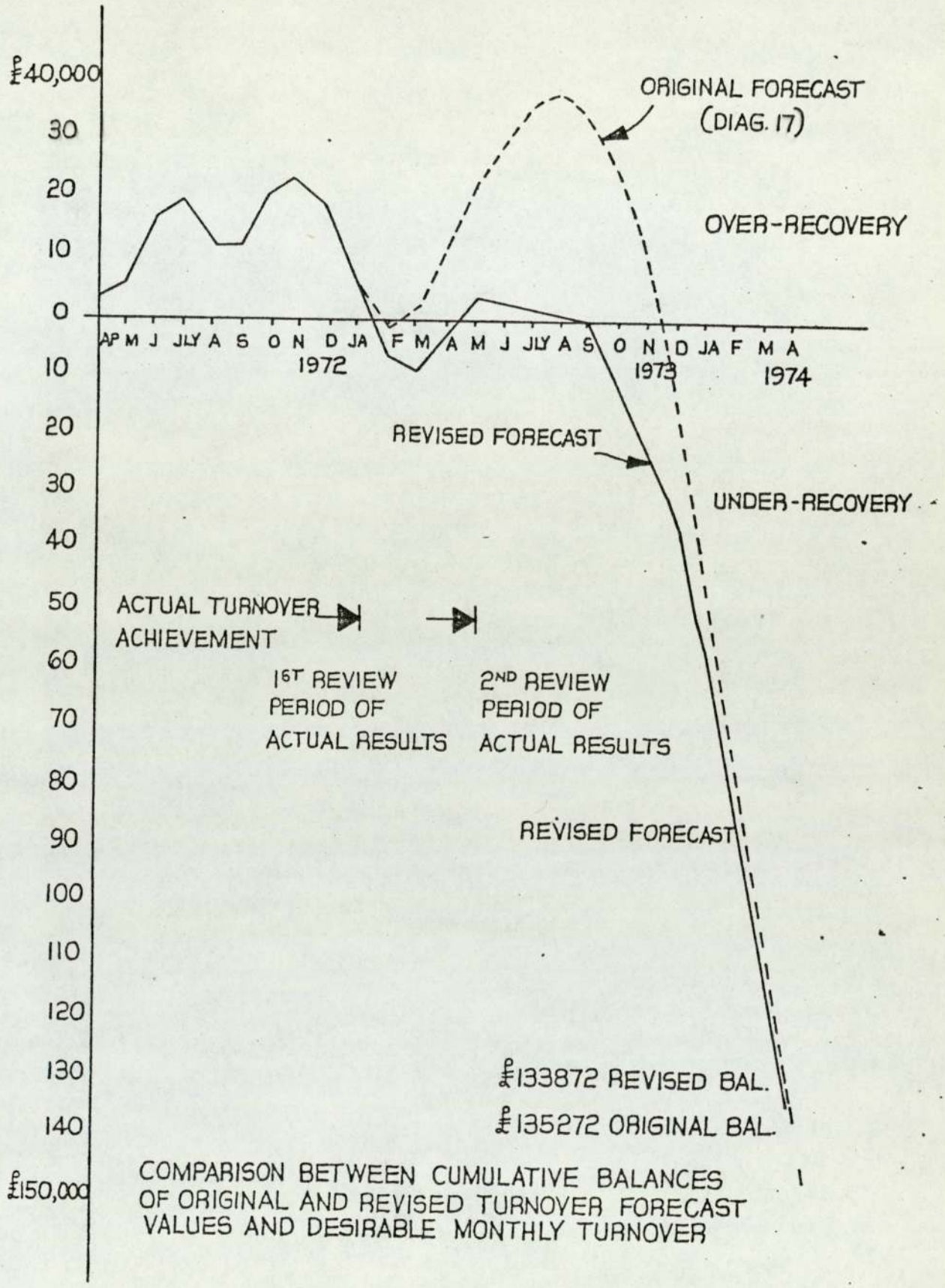

£40,000
30
20
10
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
£150,000
ORIGINAL FORECAST
(DIAG. 17)
OVER-RECOVERY
AP M J JLY A S O N D JA F M A M J JLY A S O N D JA F M A
1972
1973
1974
REVISED FORECAST
UNDER-RECOVERY
ACTUAL TURNOVER
ACHIEVEMENT
1ST REVIEW
PERIOD OF
ACTUAL RESULTS
2ND REVIEW
PERIOD OF
ACTUAL RESULTS
REVISED FORECAST
£133872 REVISED BAL.
£135272 ORIGINAL BAL.
COMPARISON BETWEEN CUMULATIVE BALANCES
OF ORIGINAL AND REVISED TURNOVER FORECAST
VALUES AND DESIRABLE MONTHLY TURNOVER

DIAGRAM 27

	Jan.	Feb.	Mar.	April	May	1974 June
Monthly Totals Trans. from Table 12.11	15,000	10,467	6,654	3,320		
Contribution of new contract (3434)	-	3,269	8,340	6,580	7,916	1,166
Monthly Totals	15,000	13,736	14,994	9,900	7,916	1,166
Cumulative Totals	338,977	352,713	367,707	377,607	385,523	386,689

Revision of Diag 22 upon the recording of the contribution made by the newly secured contract. Appendix B Diagram 28

B 27

	Jan.	Feb.	Mar.	Apr.	May	1974 June
Desirable monthly. T.O.	33,333	33,333	33,333	33,333	33,333	33,333
Revised monthly totals Trans. from Table 12.13	15,000	13,736	14,994	9,900	7,916	1,166
Over-recovery of T.O.	-	-	-	-	-	-
Under recovery of T.O.	18,333	19,597	18,339	23,433	25,417	32,167
Cumulative Balance (Forecast period only).	(61,019)	(80,616)	(98,955)	(122,388)	(147,805)	(179,972)
Cumulative Balance Actual and Forecast Period incl.	(54,314)	(73,911)	(92,250)	(115,683)	(141,100)	(173,267)

DIAG 28 & 29.

Revision of Diag 23 upon the recording of the contribution made by the newly secured contract. Appendix B Diagram 29

Appendix B (ii)

List of Control Information provided to management in operation of the System.

		Frequence of Production
i)	Table of actual valuations achieved upon current contracts, prior to the forecast review period. Diag. 1.	At commencement of system.
ii)	Table and Graphs illustrating comparison between valuations achieved and the desirable monthly turnover target. Diag. 2. Diag. 3.	Ditto.
iii)	Graphs of forecast valuations of individual contracts based upon current commitments. Diag. 4 to Diag. 6.	Ditto.
iv)	Table of forecast valuation and turnover summary. Diag. 7.	Ditto.
v)	Table and graph, illustrating comparison between the forecast turnover and the desirable monthly turnover target Diag. 8 & 9.	Ditto.

		Frequency of Production
vi)	Combined graph of actual and forecast turnover Diag. 10	At commencement of system.
vii)	Graph illustrating cumulative balances between actual and forecast turnover values and desirable monthly turnover. Diag. 11	'Ditto'
viii)	Table and graph illustrating the anticipated winding down of current contracts. Diags. 12 & 13	Quarterley
ix)	Control form for the recording of actual monthly valuation achievements and comparison with valuations forecasts for all current contracts Diags. 14 & 19 Diags. 15 & 20	Monthly Monthly
x)	Control form for the recording actual valuation and achievement and comparison with forecast for an individual contract (3381) and graphical illustration of results. Diags. 16 & 17	Monthly
xi)	Illustration of monitoring of valuations and consequent changes in the required rate of production (in monetary terms) Diag. 18	Only when review necessary

		Frequency of Production
xii)	Graph illustrating adjustment of forecast valuation on individual contract. Diag. 21	Only when necessary
xiii)	Tables and Graphs of revision to overall turnover forecast Diags 22 to 27	Quarterly or Half Yearly
xiv)	Table of forecast valuation for New Contract and Adjustment of overall turnover forecast due to introduction of new contract. Diags. 28 & 29.	Only when necessary

APPENDIX C.

An Examination of Intensity of Tender Work Load

Appendix C.

An Examination of Intensity of Tender Work Load.

1.0 A study to examine the tender work load of the Estimating Department of a Building Company, and to identify the constraints associated with the introduction of financial forecasting criteria additional to those at present being used in the adjudication of tenders.

Introduction.

1.1 The facilities for this case study were provided by a regional branch of a well established firm of Building Contractors. At the time of the study the branch was operating with a turnover of some seven and a half million pounds per year, involving public works, industrial and commercial building contracts ranging from £100,000 to £2,000,000 in value. The company was sufficiently recognised by professional practices and clients in the area to receive invitations to tender principally on a selective basis without resorting to open tender procedures, and it was accepted with confidence that the data collected in this study related to genuine tender submissions un-associated with the

use of cover prices.

1.2 Briefly, the tender procedure adopted by the Company was to consider invitations as received, at a meeting of Directors and Senior Staff held as a regular practice on the first day of each week. Decisions to tender would be agreed and selected projects priced by the Estimating department guided by such policy statements as issued during the tender meeting.

1.3 The procedures adopted by the Estimating Department for pricing each project followed very closely those recommended by the Institute of Building Code of Estimating practice. (see 51). There was clearly no positive action undertaken to produce cash flow statements and neither were any deliberate exercises carried out to ascertain working capital requirements or the provision within tenders for an adequate rate of return.

Reliance was placed upon the adequacy of the percentage addition to the estimate recommended by the Directors at the adjudication stage to cover this contingency.

1.4 It was against this background that discussions were undertaken to consider the feasibility of

introducing within the established estimating procedures, the calculation of working capital requirements, and the internal rate of return, for each individual project, and to use the values obtained as an additional criterion in finalising the tender value.

Evaluation of Tender Work Load

2.1 In considering the introduction of the above processes it was acknowledged that time would not only be required to perform the tasks specific to them, but additional management resources may be demanded to provide the data implicit in their application. Although it was noted that in this respect support could be expected from the Planning Department incorporated within the current organisation structure of the company.

2.2 The general reaction from the management, having considered the possible implications of introducing the additional processes, was to question availability of time to undertake this work within the usual period provided to tender for a project.

As this aspect seemed a matter of great concern both to this management, and to many of the

respondents to the enquiry (see Chapter 2), it was felt that some benefit could be derived from an examination of the overall atmosphere engendered by the tender work load of the company, and to see whether this was conducive to the ready acceptance by management of computation of working capital requirements and internal rate of return.

2.3 To simply express the tender work load in terms of the average number of tenders submitted would be of limited value in showing the actual intensity of loadings during any particular period under review. A more detailed impression of the tender work load was thought to be best obtained by examining the number and value of tenders available for consideration each day during the period of review, and to note the period of time provided for the consideration of the individual tender. The intention was to relate the daily tender work load to the estimating resources available in the company, and to examine the adequacy of these resources in ensuring that the tendering periods made available by the individual clients were being fully utilised. However it was appreciated that the time required for the production of a tender would vary according to the size and complexity of the individual project.

2.4 It was recognised that the value of desired turnover, coupled with the past tendering success rate must inevitably influence the number and value of invitations to tender accepted by management. Thus a secondary aim of the study, was to establish some indication of the optimum tender work load associated with the value of turnover desired. Such impressions, it was felt, could assist in any deliberations which might arise from any suggestiom made to provide further time for the application of additional forecasting techniques by reducing the tender work load. Any reduction in the number of tenders processed could well reflect adversely upon the size of future work load secured unless some improvement was gained with respect to tender success rate.

2.5 A period of three years was regarded as sufficient to provide a reasonable indication of the pattern of past tendering activity. Accordingly, records of every invitation to tender received by the company over this period were extracted, which indicated the date of the receipt of the tender documents, the date of submission of tender and its value.

Enquiries revealed that in the majority of

cases the date of tender submission corresponded to the date stipulated by the client, suggesting that the Company took full advantage of the periods provided by clients for the submission of tenders. With regard to tender invitations returned, the date of invitation, and the submission date stipulated by the client were recorded, these were included in the assessment of the 'average tendering period' (see 2.6 table 1), but were not used in the subsequent calculations concerning the daily tender work load.

2.6 A computer programme was devised to process the information collected into a form appropriate for the production of graphical illustrations. The flow chart for the computer is provided in C (i).

Examples of the computer print out, showing the result of the tendering activities for each of the three years are provided (see C (ii)). The first portion of these indicated the number of days each tender was available for consideration, and the result of its submission. The overall percentage success in terms of invitations received, and tenders for which bids were made, were also recorded.

The results for the three years reviewed are summarised in the following table.

SUMMARY OF ESTIMATING ACTIVITY

TABLE 1.

Year	Invitations Received	Bids	No Bids	% Success		Average No. of days available to consider tender.
				All Tenders	Of Bids Made	
1	116	104	12	8.6	9.6	27.3
2	112	101	11	11.8	13.0	24.7
3	99	85	14	11.1	12.9	26.1
Total	327	290	37			
Average	109	97	12	10.5	11.8	26.0

The annual results as presented, indicate a reasonable consistency in the number of tenders undertaken each year. The percentage success rate also fell within a very closely defined range, as indeed did the average period in the days available for the completion of a tender.

2.7 The second portion of the computer print out revealed the number of tenders available for consideration each day, and their associated value. To provide an overall summary, the number of tenders considered each quarter were extracted and the results were recorded as follows:

YEAR	QUARTERS														
	1			2			3			4			TOTAL		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
1	42	5	37	22	1	21	19	1	18	33	5	28	116	12	104
2	38	4	34	21	0	21	18	1	17	35	6	29	112	11	101
3	34	7	27	19	2	17	20	2	18	26	3	23	99	14	85
	114	16	98	62	3	59	57	4	53	94	14	80	327	37	290

A = Invitations received

B = Invitations returned (no bids)

C = Invitations to tender accepted (bids made)

The data may be seen to indicate peak periods of tendering activity, reflecting the dependency of the contractor upon the timing of the invitations to tender issued by Clients and confirming the unfortunate tendency for clients to concentrate their invitations at similar periods, a practice against the recommendations of the Banwell Report, (see 5),

2.8 In order to provide a more detailed impression of the Tendering activities than that given in the Table of Quarterly Values, the results derived by computer were then plotted for each of the three years. (see C (iii), (iv) and (v)). The tendering activity with respect to each year was illustrated in terms of the number of tenders available for consideration

and the value of tenders involved.

A broader picture emerged of the daily incident of tendering activity for each of the three years, illustrating a pattern of activity hardly discernable from an examination of the quarterly results previously produced. Taking year 1 as an example, a degree of activity was perceived ranging from a maximum of 19 tenders available for consideration on the 16st and 52nd day to a low incident of 4 tenders between 156th and 159th day.

Whilst it would be unrealistic to select particular days in isolation to others, when considering the overall burden imposed upon the Estimating staff, it is submitted that some merit may be gained from the recognition of particular periods of peak and low activity unrelated to the parameters created by the presentation of the data specific to quarterly intervals.

3.1 Estimating Staff Resources.

Having established the pattern of tendering activity over the three year period, the next

stage of the study was to examine the management resources available (i.e. Estimating staff) to cope with the Tender work load as accepted, with particular reference to their ability to fully utilise the period of time made available by the individual client for the consideration of a tender (i.e. period between the date of receipt of tender documents and submission of tender). It was hypothesized that the number of tenders under consideration during a particular period in relation to the estimating resources available may be of such magnitude as to necessitate the apportionment of their time allocation on individual tenders to a period less than that made available by the client.

It is suggested that if such situations are to be revealed from a review of tendering activity, it could well help to establish the existence of conditions which are not conducive to the ready acceptance of processes additional to current estimating procedures.

3.2 To this end, an examination of the 'Estimating Resources' available within the company was undertaken.

The Department operated under the supervision

of a Director, who was responsible for the implementation of general marketing policy and the tendering activities of the company. The staff consisted of three experienced Estimators and a male clerk responsible for the issue of enquiries and the receipt of quotations from suppliers and sub-contractors.

It was accepted that the rate of 'estimating production' would be mainly dependent upon the 'output' of the three Estimators and the following calculations were accordingly based upon that assumption

3.3 Examination of Year 1 Tendering Activity.

Average number of days made available by clients of submission of tender = 27. 3 days (see 2.6 table 1)

i) Peak tendering period, identified from graph, lies between February and Mid March in which the number of tenders available for consideration at any one time during that period ranged from 14 to 19.

Using the allowable period of 27 days as the constant, the Estimating resources

available to deal with tenders during this period = 27 x 3 Estimators

= 81 Estimator days.

Selecting 16 tenders (a conservative estimate) as the number of tenders available for consideration.

Period of time actually available for individual estimator to consider any single tender = $\frac{81}{16}$ = 5 days

Actual Working Days = $5 \times \frac{5}{7}$ = 4 days approx.

ii) Slack period identified from graph lies between May and June. Again using 27 days as the constant, Estimating resources available = 27 x 3 = 81 Estimator/Days

Selecting 5 Tenders as the number of tenders available for consideration

Period of Time available for individual estimator to consider any single Tender

= $\frac{81}{5}$ = 16 days

Actual Working Days = $16 \times \frac{5}{7}$ = 12 days

iii) A study of the calculations made, suggest that although on average, individual tenders were available for consideration for 27 days (19½ Working Days), the

estimating resources of the Company were such that individual Estimators at best, (during slack period) could only afford to opportion 16 days (12 Working days) to an individual contract, and at worst 5 days (4 Working Days).

iv) The period between July and November appeared to suggest a more 'balanced level' of activity in which eight contracts were under consideration at any one time. Using similar calculations, the time available for the consideration of the individual contracts was as follows:

Again using 27 days as the constant,
Estimating resources available

$$= 27 \times 3 = 81 \text{ Estimator Days}$$

Selecting 8 tenders -
Period of time available for individual Estimator to consider tender

$$= \frac{81}{8} = 10 \text{ days}$$

$$\text{Actual Working Days} = 10 \times \frac{5}{7} = 7 \text{ days}$$

Similar calculations were completed for the other two years of the tendering review and the results tabulated as follows:-

3.4 Summary of Results

			No. of Contracts considered at any one time.
Year 1.	Peak Activity	February/March	16
	Low Activity	May/June	5
	'Balanced' level of Activity	July/November	8
Year 2.	Peak Activity	Mid February/Mid March	14
	Low Activity	May/June	4
	'Balanced' level of Activity	June/August)	8
		October/November)	8
Year 3.	Peak Activity	March/Mid April	16
	Low Activity	May	4
	'Balanced' level Activity	May/June)	
		August/September)	
		October/November)	8

In each case a 'conservative' assessment was made of the number of contracts under consideration at any one time.

Year	Average Tender period provided by Client	Estimator time apportioned to individual contract		
		Peak Activity	Low Activity	Balanced Activity
1	27.3 days (2)	5 days (4)	16 days (12)	10 days (7)
2	24.7 days (18)	5 days (4)	18 days (13)	9 days (6)
3	26.1 days (19)	5 days (4)	19 days (14)	10 days (7)

Figures in brackets = Working Days.
See illustration - C(vi)

4.1 Conclusions

The results as tabulated showed a remarkable degree of similarity in the number of 'Estimator Days' which could be similarity in the number of 'Estimator Days' which could be apportioned to individual contracts within the separate periods of review. Whilst there is no suggestion that the activities of the individual estimator should be fully concentrated on a single tender throughout the entire period made available by the client, see Brockfield (10). The data revealed an appreciable disparity between the tendering period so provided, and the permissible apportionment of Estimator time (relative to the resources available, and the rate of tendering activity recorded, (see calculations paragraph 3.3).

At the risk of over-simplification, the findings suggest that the rate of tendering activity accepted in relation to the estimating resources, prohibited the full utilisation of the tendering period made available by the individual client. With regard to the latter, it was of interest to note that the average period for tendering provided by clients over the three years of review (27.3, 24.7 and 26.1 days respectively) was compatible with the minimum period

recommemded on the Banwell Report (see 5), and agreed as adequate by the National Federation of Building Trade Employers (see (5) Action on Banwell report).

4.2 The regular pattern of tendering activity and the general consistency of the success rate established during the three year review period may be seen to suggest that the optimum estimating activity (relative to past success rates) is in line with the maintenance of an apparently desired annual turnover value of £7.5 million per year. However, it is no part of the current brief to examine in detail the adequacy of the Estimating Resources of the Company in relation ot its tendering activity, or indeed to examine the specific functions of the Estimator within the estimating process. It is submitted that a sufficient picture has been presented within this case study to argue that the rate of tendering activity generated within the Estimating Department, in relation to its complement of staff, was not conducive to the creation of an atmosphere in which those involved would readily accept an additional process within the established estimating procedures. Whilst there is no intention to reflect upon the efficiency of the Estimating Department the size of the tender work load

undertaken, particularly during peak periods, also seemed to inhibit the build-up of estimating information in a form appropriate to the ready application of the financial forecasting technique, under consideration. The proceedings of the conferences held on September 20th, 1973, and March 22/23 1974, by Loughborough University entitled 'Estimating in Building and Civil Engineering' (see 15) appear to substantiate similar conclusions. To quote - 'because of these same pressures and demands they find little time to do development work or any other work outside the main stream of their current job'.

4.3 It may finally be noted that the company under review was not exceptional in character to many others in the industry with respect to the size of the Estimating resources in relation to tendering activity and turnover. In support of this contention the following evidence is presented for consideration.

Size of Turnover	No. of Companies	Estimating Dept. (No. of estimators)
Less than £½m.	2	1
Exc. £½m. not exc. £1m.	4	1
	2	2
Exc. £1m. not exc. £2½m.	3	2
Exc. £2½m. not exc. £5m.	2	2
	1	1
Exc. £5,. not exc. £10m.	1	3
Exc. £10m.	2	3
	1	4

(The information concerning the number of companies and their respective sizes of turnover was extracted from Chapter 2 questionnaire study).

4.4 Recommendaitons

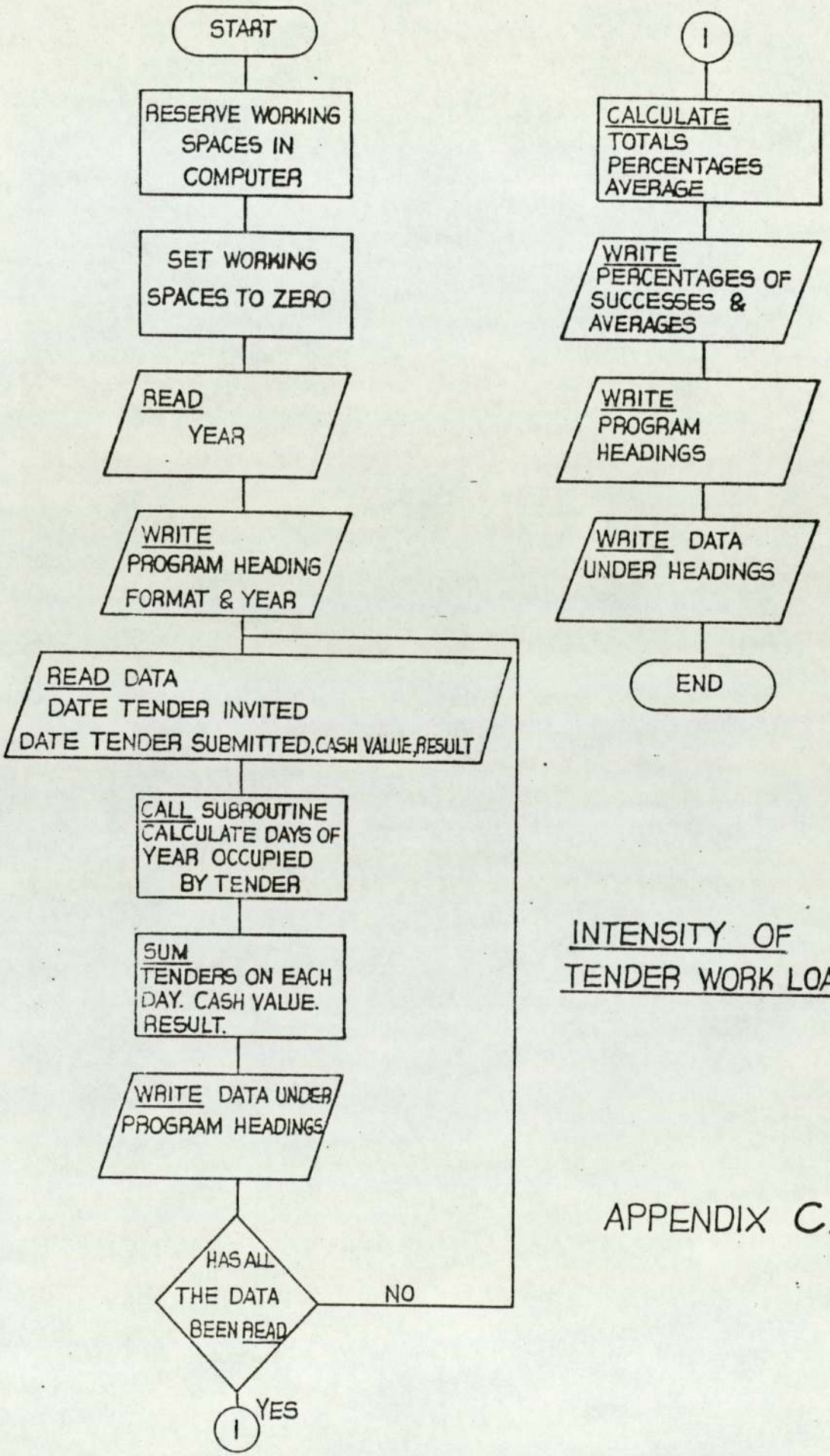
There is obviously no single answer to such a complex problem, the determination of the Tender Work Load at a particular period must be influenced by the Marketing Policy and the current tender success rate. The size of the Estimating resources to cater for the work load must inevitably be related to that which can be afforded by the company.

The only positive suggestion to make would be

for the management to encourage the introduction of these additional processes during periods of reduced tendering activity with the hope that their application may ultimately reflect in increased tendering successes, coupled with the secondary advantage that the entire estimating process may well be improved by the more positive application of pre-tender planning procedures induced by their application.

The vital importance of the estimating process in providing a sound foundation for an adequate rate of return to be obtained from a project, warrants the continuous consideration by management of improving established procedures.

FLOW CHART FOR COMPUTOR PROGRAM



INTENSITY OF TENDER WORK LOAD

APPENDIX C.(i)

Appendix C.(ii)

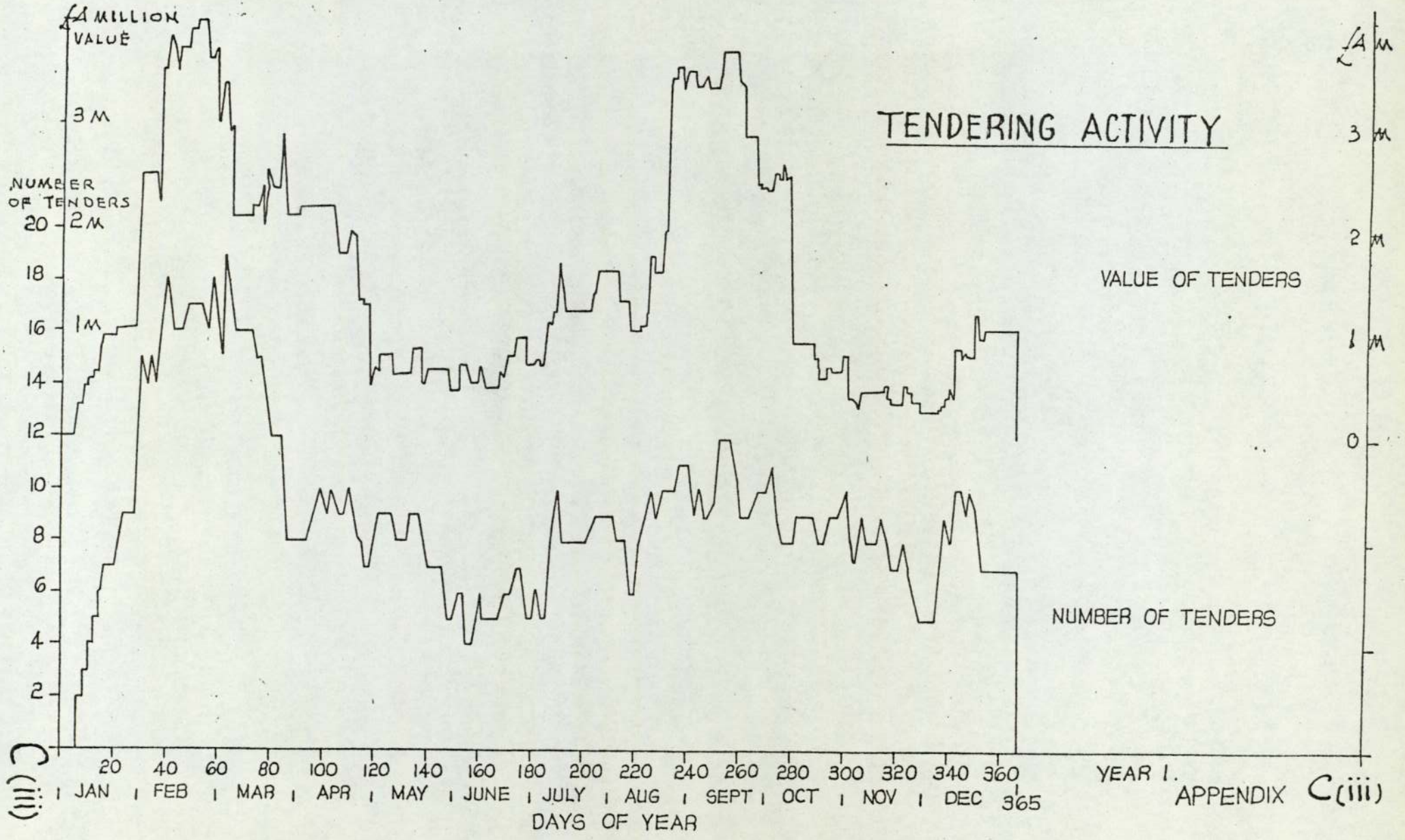
Example (From Year 1) of computer print out of Intensity of Tender Submissions.

Contract Number	Day Received	Day Submitted	Number of days to tender	Result 0 = Fail 1 = Success 2 = Failure
1	6	41	35	0
2	6	36	30	0
3	8	59	51	0
4	12	34	22	0
6	14	54	40	0
7	15	40	25	0
8	21	50	29	0
9	23	43	20	1
10	29	50	21	0

	%
Percentage Successes.	
All tenders received	8.6
Tenders for which bids were made	9.6
Average number of days to complete tender	27.3

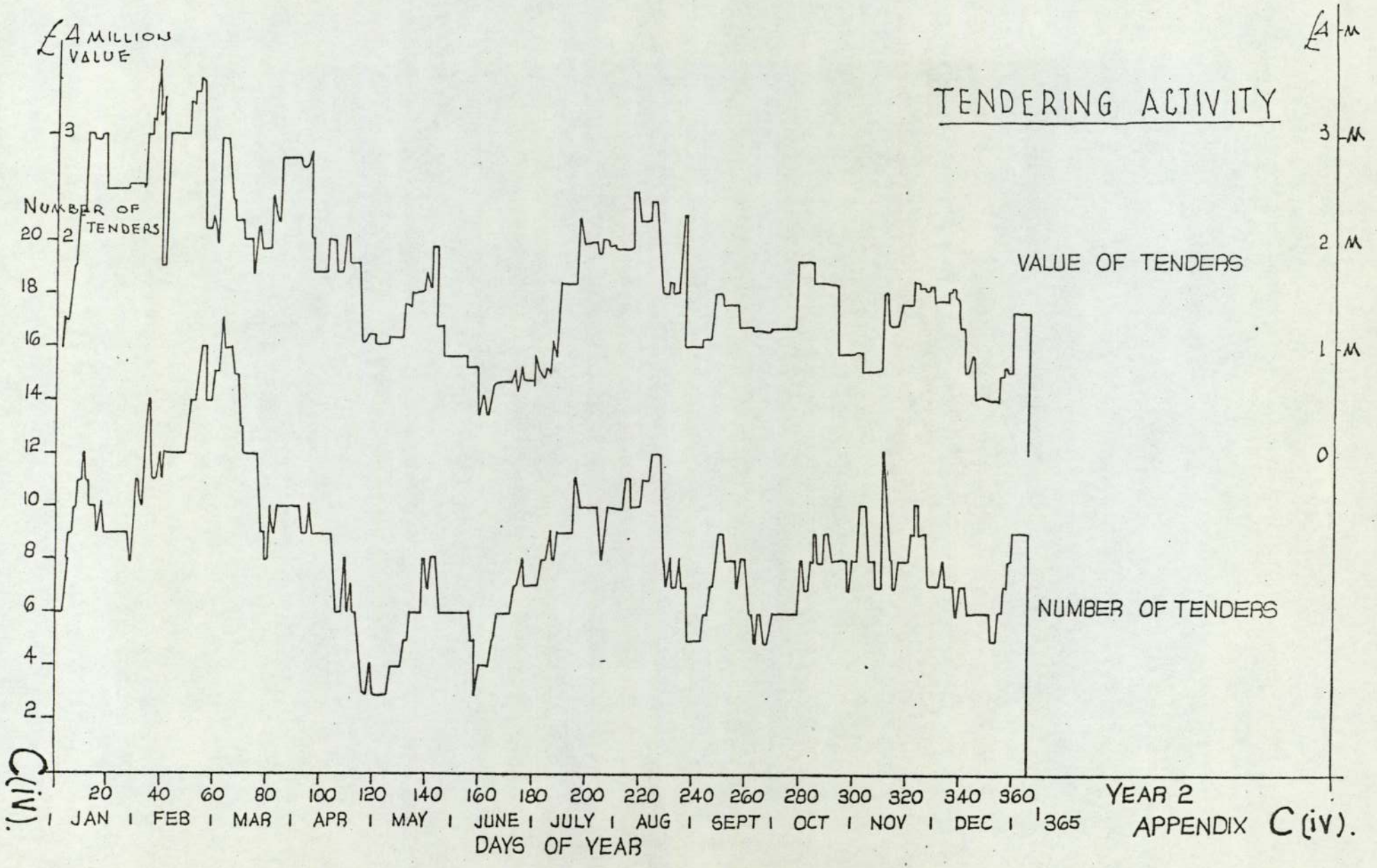
Day of Year	Volume of work (tenders)	Value of Work in £000's
1	0	0
2	0	0
3	0	0
4	0	0
5	0	0
6	2	330
7	2	330
8	3	475
9	4	541
10	4	541

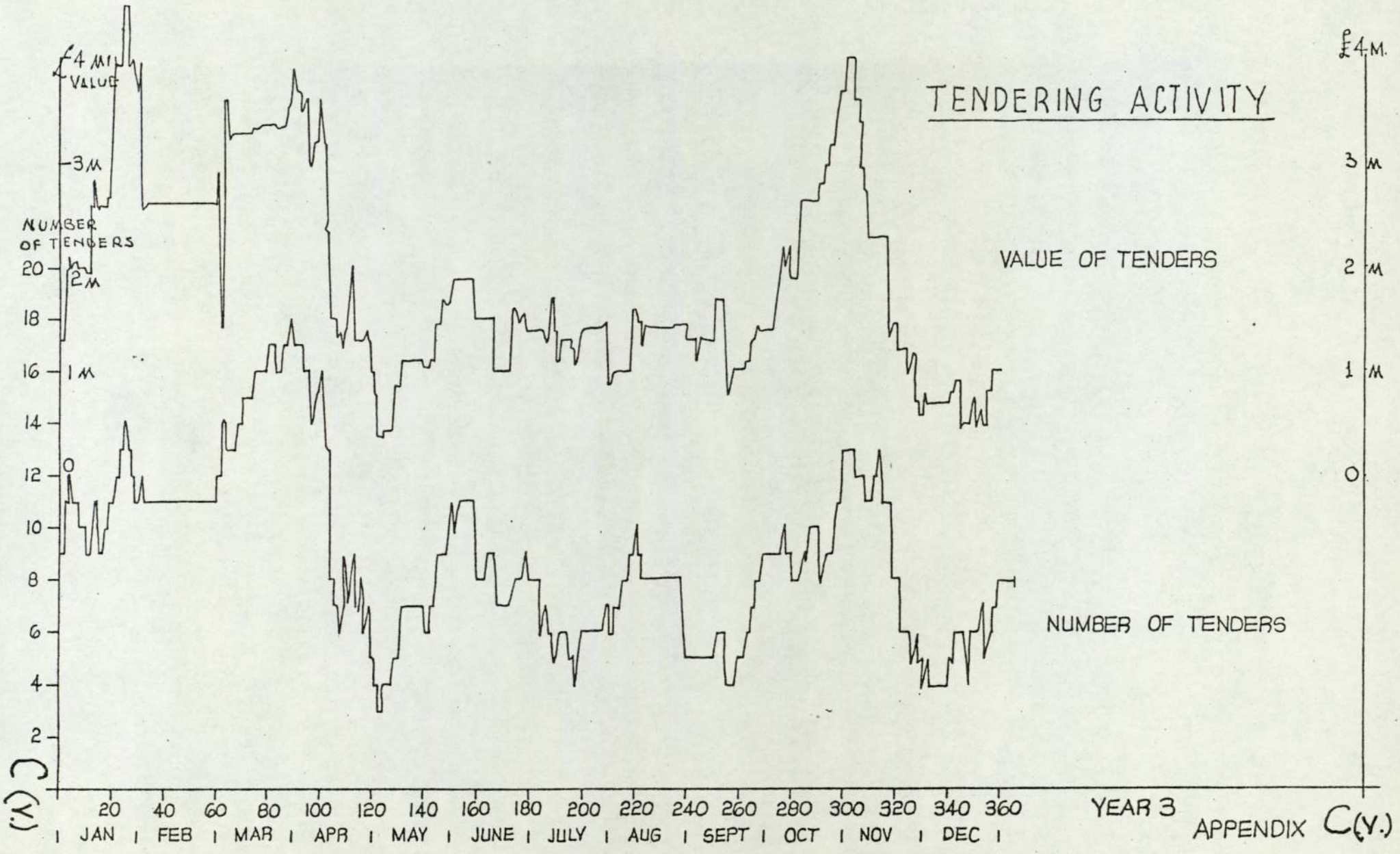
C(ii).



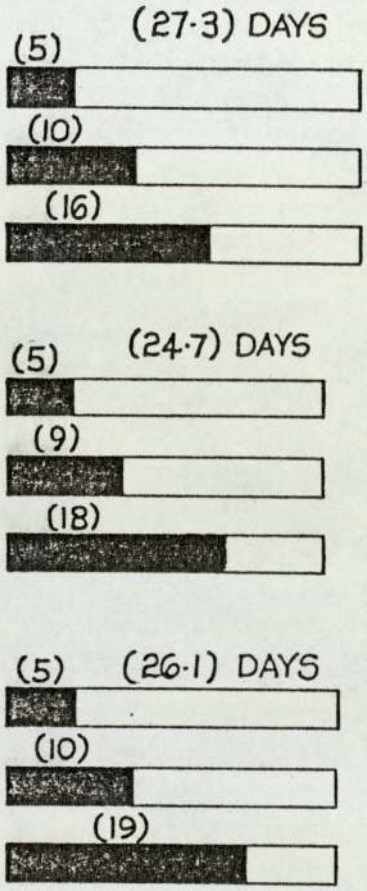
APPENDIX C(iii)

C(iii)


£4 MILLION VALUE
TENDERING ACTIVITY
NUMBER OF TENDERS
VALUE OF TENDERS
NUMBER OF TENDERS
£4 M
3 M
2 M
1 M
0
3
2
20
18
16
14
12
10
8
6
4
2
20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360
1 JAN 1 FEB 1 MAR 1 APR 1 MAY 1 JUNE 1 JULY 1 AUG 1 SEPT 1 OCT 1 NOV 1 DEC 1 365
DAYS OF YEAR
YEAR 2
APPENDIX C(iv).
C(iv).


TENDERING ACTIVITY
£4 MILLION VALUE
3M
2M
1M
0
£4M.
3M
2M
1M
0
NUMBER OF TENDERS
20
18
16
14
12
10
8
6
4
2
VALUE OF TENDERS
NUMBER OF TENDERS
20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360
JAN | FEB | MAR | APR | MAY | JUNE | JULY | AUG | SEPT | OCT | NOV | DEC
YEAR 3
APPENDIX C(Y.)
C(Y.)

YEAR	RATE OF ACTIVITY	AVERAGE TENDER PERIOD PROVIDED BY CLIENT (DAYS)
YEAR 1	PEAK	(5) (27·3) DAYS
	BALANCED	(10)
	LOW	(16)
YEAR 2	PEAK	(5) (24·7) DAYS
	BALANCED	(9)
	LOW	(18)
YEAR 3	PEAK	(5) (26·1) DAYS
	BALANCED	(10)
	LOW	(19)



APPORTIONMENT OF ESTIMATOR RESOURCE TIME

APPENDIX C (vi)

APPENDIX D

An Examination of Incidence of Tender Submissions

Appendix D.

An Examination of Incidence of Tender Submissions.

Introduction

1.0 A study to examine the incidence of tender submissions, and the opportunities made available during the tendering process to evaluate and compare individual tenders on the basis of their working capital requirements and internal rate of return anticipated.

1.1 Traditional Estimating Practice within the industry tends to limit the finalising of a tender value to the percentage addition or mark-up applied to the estimated cost at the adjudication stage. (see. I.O.B. Code (51)).

The establishment at the tender stage of the working capital requirements and the internal rate of return likely to be derived from a project will provide an additional criterion to assist management in their resolvement of the ultimate tender price.

1.2 An evaluation of the internal rate of return of individual projects at the tender stage would

enable management to:

i) Examine the adequacy of the proposed tender value in providing a rate of return sufficient for the required investment of working capital.

ii) Provide the opportunity to revise the value of the tender submission, on the basis of internal rate of return.

iii) Enable the recognition of the contract likely to be the more profitable, from those under consideration at the same time. See Denton (21).

1.3 In the light of the above comments, the principal intention of this study was to ascertain the frequency of opportunity to compare individual tender submissions on the basis of their potential profitability, by selecting from a record of company tendering activities, those contracts whose submission dates occurred within close proximity of each other.

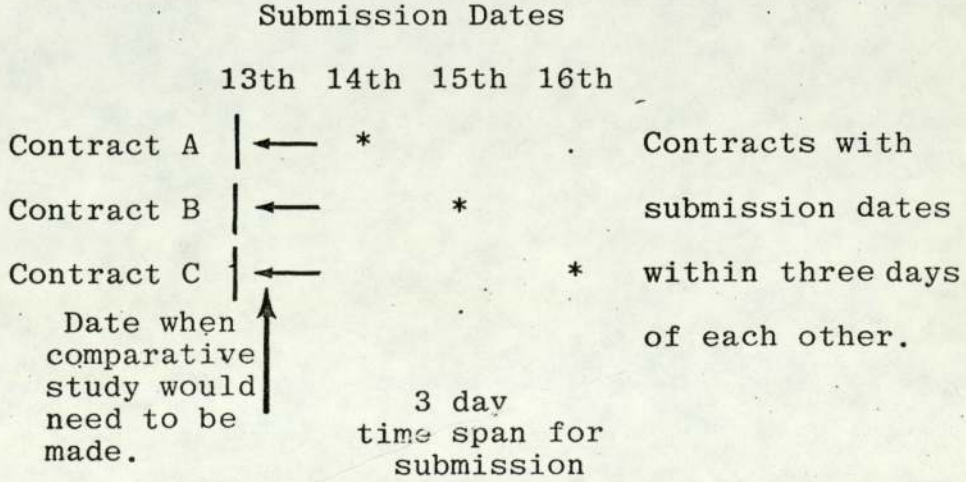
The grouping of individual projects.

2.1 The procedure involved in establishing the potential profitability of a project has already been discussed in Chapter 5. It is evident from the foregoing that this process can only

commence upon the completion of the 'Estimate' during the later stages of tendering and therefore the opportunity to compare individual projects can only be taken if their submission dates are within close proximity of each other.

2.2 Bearing in mind the practical considerations, a period of three days was selected as the most appropriate time span for the grouping of individual projects. A selection on the basis of coincident submission dates was regarded as too restrictive in its application and whilst an extension beyond the suggested three day period would possibly widen the number of projects for comparison, it may promote an unjustified reduction in the time available for tendering with respect to certain of the projects so grouped (i.e. those with latest submission dates, see following example).

2.3 Example



In order for all three contracts to be compared at the same time, the proposed tender value for each, and the establishment of the internal rate of return would need to be effected prior to the 13th day. Therefore the time available to complete tenders is reduced for those contracts in the sample whose submission date is later than first day of time span grouping

Examination of Submission Dates

2.4 Having resolved the method of enquiry, the same records of tender submission dates as used previously (Case Study into Intensity of Tender Work Load, Appendix C.) were adopted as the basis of this study.

A computer program was drafted accordingly to process the data. (See flow chart; appendix D (i), (ii) and (iii))

The computer print-out was designed to readily indicate the separate groupings of contracts whose submission dates were within three days of each other. Print-outs were produced for all three years, the first year, regarded as being representative of these periods, was selected initially as the basis of further study (see

appendix D (iv), for detailed analysis).

	Total Tender Submissions	No. of opportunities for comparison	No. of Tenders for comparison
Year 1.	109	29	81

2.5 A breakdown of the groupings of contracts in the first year with submission dates within three day proximity, revealed the following facts.

i) Of the 116 invitations received, there were 29 occasions involving 81 of these contracts when the opportunity could have been taken to make comparisons on the basis of working capital demands and the internal rate of return.

ii) Certain of the groupings included contracts within a similar value range (see appendix D (vii) and (viii)). These no doubt could have provided the basis of an interesting study of comparative rates of return for contracts of similar range value.

iii) Such studies could be further enhanced by the consideration of the type of contracts involved, which could well lead to an indication of the type and range value of contract offering the greatest potential measure of profitability.

2.6 A similar pattern of results was revealed for the second and third years of tendering activity, and are summarised as follows:

	Total Tender Submissions	No. of Opportunities for comparison	No. of Tenders for comparison
Year 2	110	27	75
Year 3	108	24	62

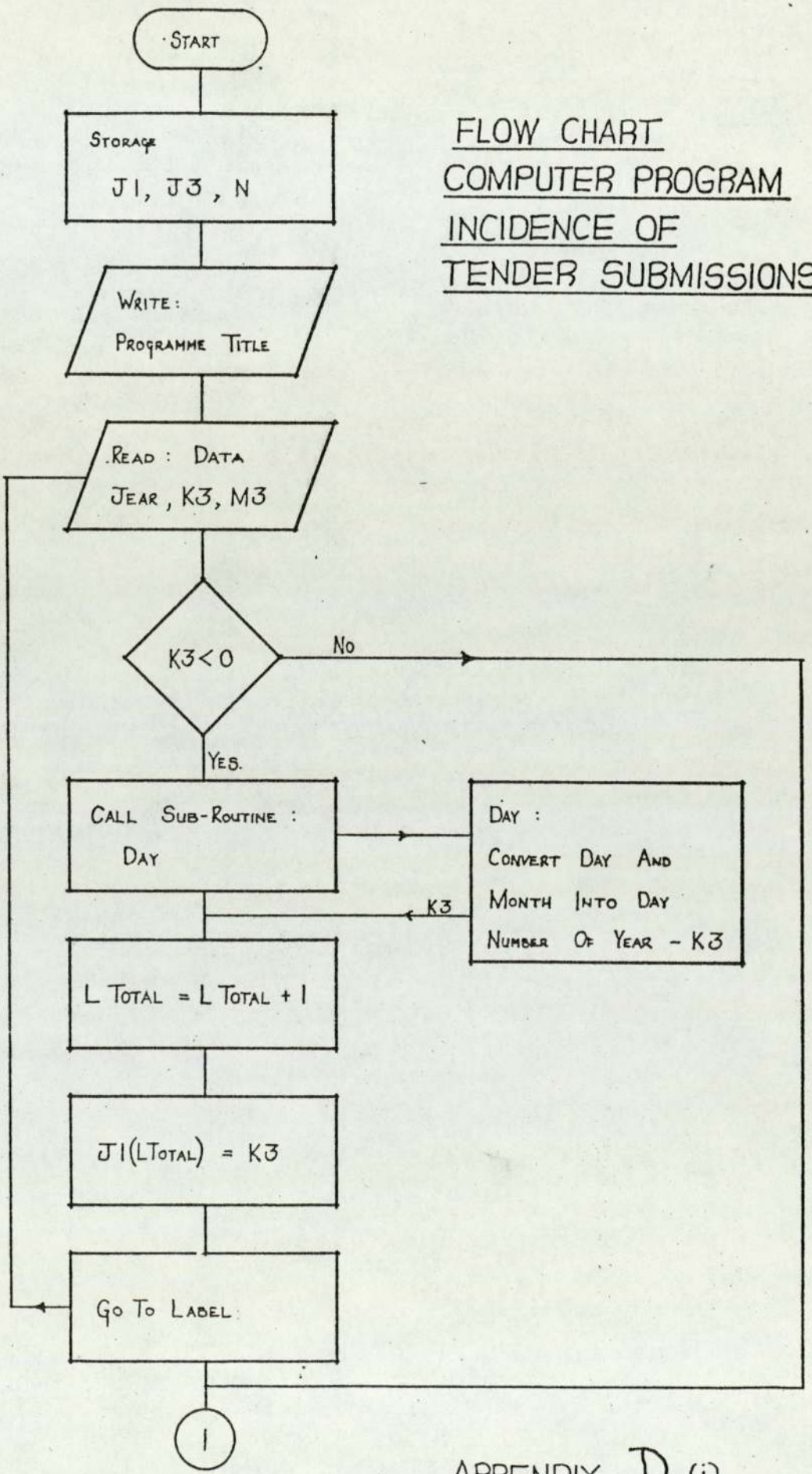
(See appendics D, (v), (vi) and D (ix (x), D (xi) (xii) for a detailed analysis). Illustrations of the incidence of tender submissions for each of the three years are provided in appendix D. (viii) (xiv) and (xv).

Conclusions

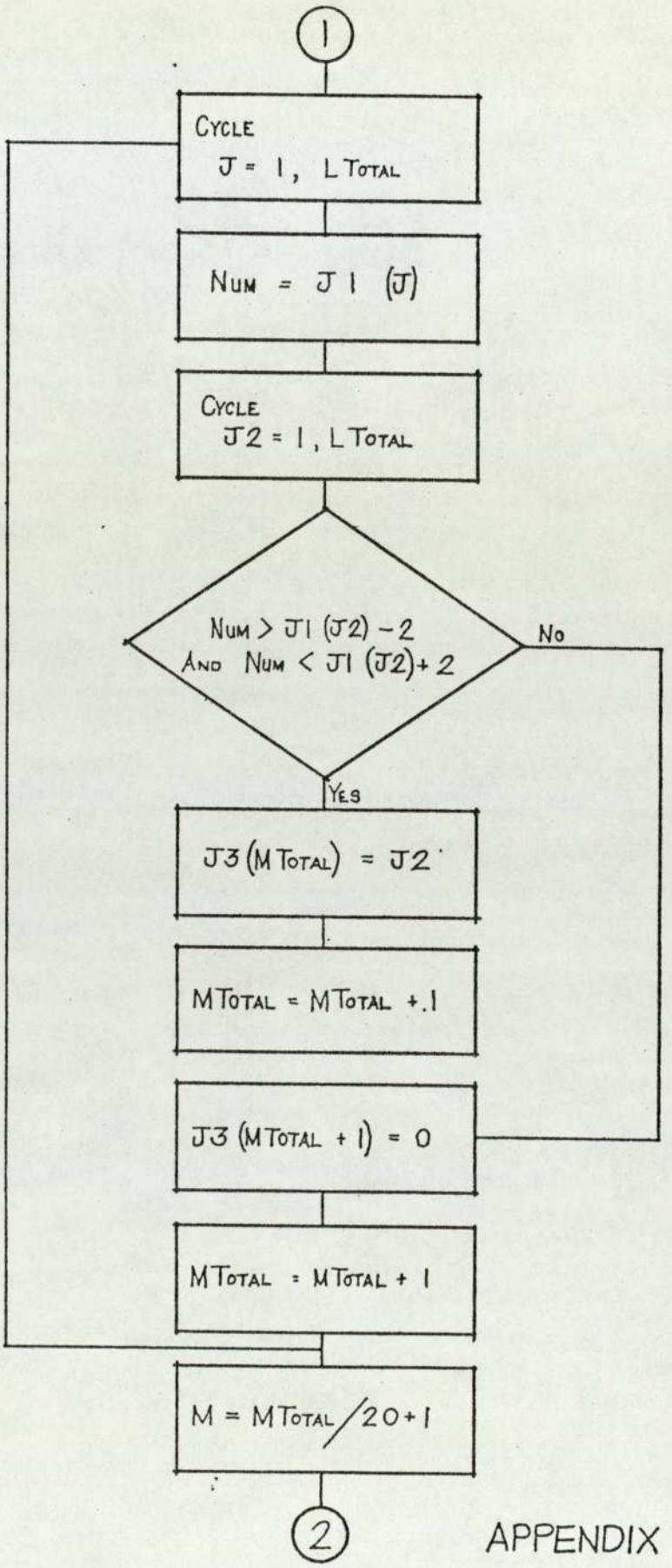
3.1 It is suggested from these findings that the incidence of opportunity to practise the comparative study of the working capital demand and the internal rate of return for contracts with submission dates within a close proximity to each other, was sufficiently high to warrant the serious consideration by the management concerned for the inclusion of the practice within traditional tendering procedures. The greatest deterrent to its acceptance would seem to be intensity of the tendering work accepted by the management, and the consequent difficulties associated with the limited

apportionment of Estimating resource time, as revealed in the previous case study. (see Appendix C).

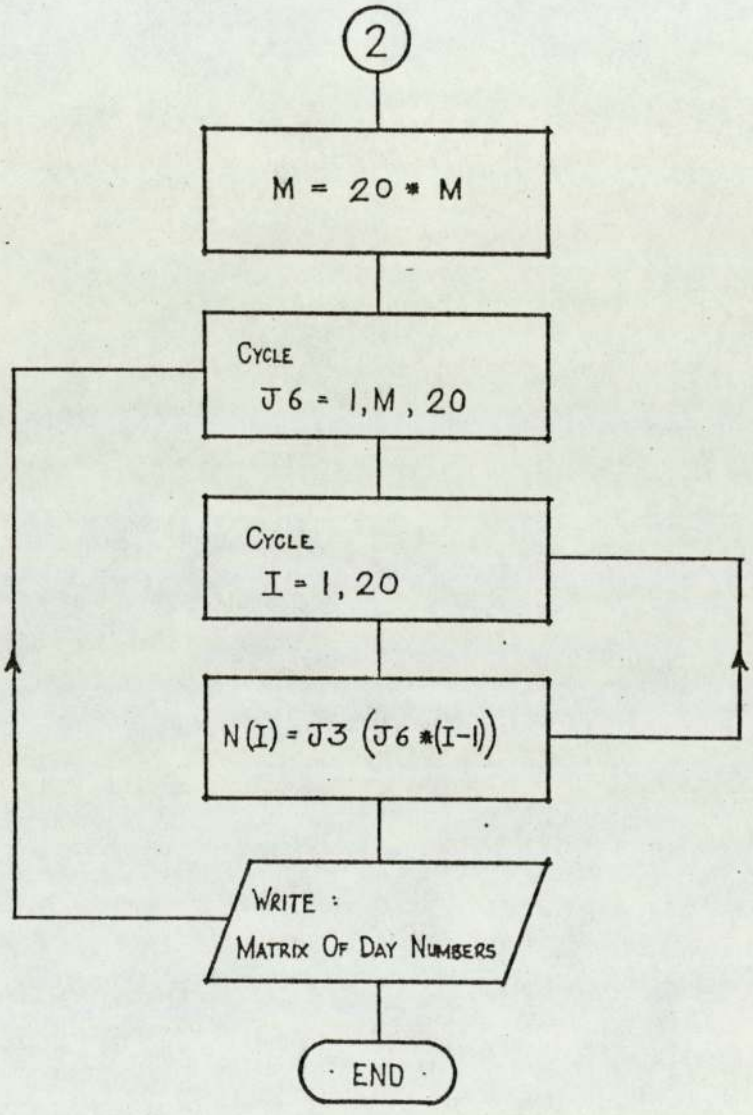
FLOW CHART COMPUTER PROGRAM INCIDENCE OF TENDER SUBMISSIONS



APPENDIX D (i)



APPENDIX D. (ii)



APPENDIX D (iii)

Appendix

Grouping of tenders with submission dates within three days of each other; extracted from the tendering records of a representative Building Company.

Year 1

Grouping	Tender Nos.	Grouping	Tender Nos.
1)	1. 7.	16)	48. 50.
2)	2.5.	17)	53. 55.
3)	3. 14. 15.	18)	58. 61.
4)	6. 13.	19)	60. 62.
5)	8. 10.	20)	64. 74. 77.
6)	11. 16.	21)	65. 66.
7)	12. 18. 19. 21.	22)	63. 67. 69.
8)	17. 20. 23. 24. 31. 34.	23)	72. 78.
9)	22. 25. 26.	24)	75. 79. 81.
10)	20. 24. 31. 32.	25)	82. 84. 85. 87.
11)	27. 28. 30. 33. 35.	26)	89. 93.
12)	36. 42.	27)	86. 88. 91.
13)	37. 40.	28)	95. 99. 100. 102.
14)	41. 43.	29)	104. 105. 107.
15)	47. 49. 52.		

15 occasions when two tenders have submission dates within 3 days of each other.

8 occasions when three tenders have submission dates within 3 days of each other.

4 occasions when four tenders have submission dates within 3 days of each other.

1 occasion when five tenders have submission dates within 3 days of each other.

1 occasion when six tenders have submission dates within 3 days of each other.

D(iv)

Appendix 4.6 (ii)

Grouping of tenders with submission dates within three days of each other.

Year 2

Grouping	Tender Nos.	Grouping	Tender Nos.
1)	1. 3.	15)	53. 56.
2)	4. 5. 12. 14.	16)	59. 60.
3)	9. 11. 13.	17)	64. 69.
4)	16. 20.	18)	65. 70. 72. 75. 76.
5)	17. 21. 25.	19)	66. 68.
6)	18. 19. 24.	20)	73. 77. 79. 80.
7)	22. 31. 32.	21)	82. 85.
8)	28. 30. 31. 32. 34.	22)	89. 90.
9)	29. 35.	23)	88. 91. 92.
10)	28. 30. 33. 34.	24)	93. 99. 101.
11)	36. 40.	25)	96. 97.
12)	37. 42. 43.	26)	100. 103. 104.
13)	44. 45. 46.	27)	102. 106.
14)	50. 52.		

13 occasions when two tenders have submission dates within 3 days of each other.

9 occasions when three tenders have submission dates within 3 days of each other.

3 occasions when four tenders have submission dates within 3 days of each other.

2 occasions when five tenders have submission dates within 3 days of each other.

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D.(VI.

Appendix

Grouping of tenders with submission dates within three days of each other.

Year 3

Grouping	Tender Nos.	Grouping	Tender Nos.
1)	4. 8.	13)	58. 61.
2)	7. 10.	14)	62. 64.
3)	13. 14. 16.	15)	66. 67. 70.
4)	15. 21.	16)	71. 72.
5)	22. 23. 25.	17)	74. 75. 76.
6)	24. 28. 29.	18)	78. 79. 82.
7)	26. 31. 32. 36.	19)	85. 86.
8)	30. 35.	20)	87. 90. 91. 93.
9)	37. 40. 41.	21)	88. 89.
10)	44. 46. 49. 50. 54.	22)	94. 96.
11)	52. 56.	23)	95. 98.
12)	57. 59.	24)	99. 102.

14 occasions when two tenders have submission dates within 3 days of each other.

7 occasions when three tenders have submission dates within 3 days of each other.

2 occasions when four tenders have submission dates within 3 days of each other.

1 occasion when five tenders have submission dates within 3 days of each other.

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Appendix

Analysis of Grouping of Contracts with Submission Dates within three days of each other including their related tender values.

Year 1

Grouping	Tender No.					
1)	1 £205,000	7 £144,000				
2)	2 £125,000	5 £91,000				
3)	3 £145,000	14 £55,000	15 £525,000			
4)	6 £185,000	13 £75,000				
5)	8* £45,000	10* £50,000				
6)	11 £370,000	16 £130,000				
7)	12* £406,000	18* £365,000	19* £400,000	21 £137,000		
8)	17 £329,000	20* £250,000	23* £227,000	24 £59,000	31 £157,000	34 £43,000
9)	22 £185,000	25 £76,000	26 Rtnd.			
10)	20 £250,000	24 £59,000	31 £157,000	32 Rtnd.		
11)	27 £220,000	28 Rtnd.	30 Rtnd.	33 £48,000	35 £490,000	
12)	36 Rtnd.	42 £606,000				
13)	37* £296,000	40* £260,000				
14)	41 £765,000	43 £76,000				
15)	47 £156,000	49 £36,000	52 £118,000			
16)	48 Rtnd.	50 £158,000				
17)	53* £62,000	55* £66,000				

D.(viii)

Appendix

Year 1

Groupings	Tender No.			
18)	58 £245,000	61 £180,000		
19)	60 £34,000	62 £229,000		
20)	64 £65,000	74 £14,200	77 Rtnd.	
21)	65* £25,000	66* £23,000		
22)	63 £119,000	67 £78,000	69 £514,000	
23)	72 £36,000	78 £71,000		
24)	75 £475,000	79 £324,000	81 £37,000	
25)	82‡ £96,000	84‡ £75,000	85* £34,000	87* £37,000
26)	89 £131,000	93 £216,000		
27)	86 £82,000	88 £250,000	91 £50,000	
28)	95 Rtnd.	99* £86,000	100* £78,000	102 £139,000
29)	104‡ £82,000	105‡ £95,000	107 Rtnd.	

* indicates submissions within three days of each other with tender values of similar range (within 10% of largest value).

‡ indicates submissions within three days of each other with tender values of similar range (within 20% of largest value).

Appendix

Analysis of Grouping of Contracts with Submission Dates within three days of each other including their related tender values.

Year 2

Grouping	Tender No.				
1)	1 £35,000	3 £50,000			
2)	4 £351,000	5 £53,000	12 £207,000	14 £35,000	
3)	9 £744,000	11‡ £554,000	13‡ £473,000		
4)	16 £48,000	20 Rtnd.			
5)	17 £86,000	21 £34,000	25 £1,168,000		
6)	18 £452,000	19 £122,000	24 £65,000		
7)	22 £642,000	31 £99,000	32 Rtnd.		
8)	28 £163,000	30‡ £81,000	31‡ £99,000	32 Rtnd.	34 Rtnd.
9)	29 £130,000	35 £60,000			
10)	28 £163,000	30 £81,000	33 Rtnd.	34 Rtnd.	
11)	36 £812,000	40 £445,000			
12)	37‡ £55,000	42‡ £71,000	43 £260,000		
13)	44 £610,000	45 £54,000	46 £91,000		
14)	50 £297,000	52 £96,000			
15)	53 £312,000	56 £36,000			
16)	59 £33,000	60 £167,000			
17)	64 £83,000	69 £198,000			

Appendix

Year 2

Groupings	Tender No.				
18)	65 £190,000	70 £593,000	72 Rtnd.	75 £81,000	76 £45,000
19)	66 £124,000	68 £41,000			
20)	73 £647,000	77 £453,000	79* £56,000	80* £55,000	
21)	82 £149,000	85 £41,000			
22)	89 Rtnd.	90 £93,000			
23)	88 £306,000	91 £49,000	92 £35,000		
24)	93 £540,000	99* £109,000	101* £123,000		
25)	96* £71,000	97* £66,000			
26)	100 Rtnd.	103 £31,000	104 £76,000		
27)	102 Rtnd.	106 £517,000			

* Indicates submissions within three days of each other with tender values of similar range (within 10% of largest value).

‡ indicates submissions within three days of each other with tender values of similar range (within 20% of largest value).

D (X)

Appendix

Analysis of Grouping of Contracts with Submission Dates within three days of each other including their related tender values.

Year 3

Grouping	Tender No.				
1)	4 £139,000	8 £58,000			
2)	7‡ £172,000	10‡ £209,000			
3)	13 £647,000	14 Rtnd.	16 £90,000		
4)	15 £145,000	21 £63,000			
5)	22‡ £215,000	23‡ £259,000	25 £478,000		
6)	24 £115,000	28* £158,000	29* £155,000		
7)	26‡ £86,000	31 Rtnd.	32 £362,000	36‡ £71,000	
8)	30 Rtnd.	35 £235,000			
9)	37 £662,000	40 £99,000	41 £60,000		
10)	44 £260,000	46* £83,000	49*‡ £93,000	50‡ £144,000	54 Rtnd.
11)	52 £322,000	56 £224,000			
12)	57 £43,000	59 Rtnd.			
13)	58 £115,000	61 £80,000			
14)	62 £99,000	64 £152,000			
15)	66 £415,000	67 £91,000	70 £213,000		
16)	71* £513,000	72* £475,000			
17)	74 £121,000	75 £415,000	76 £91,000		

D(xi)

Appendix

Year 3

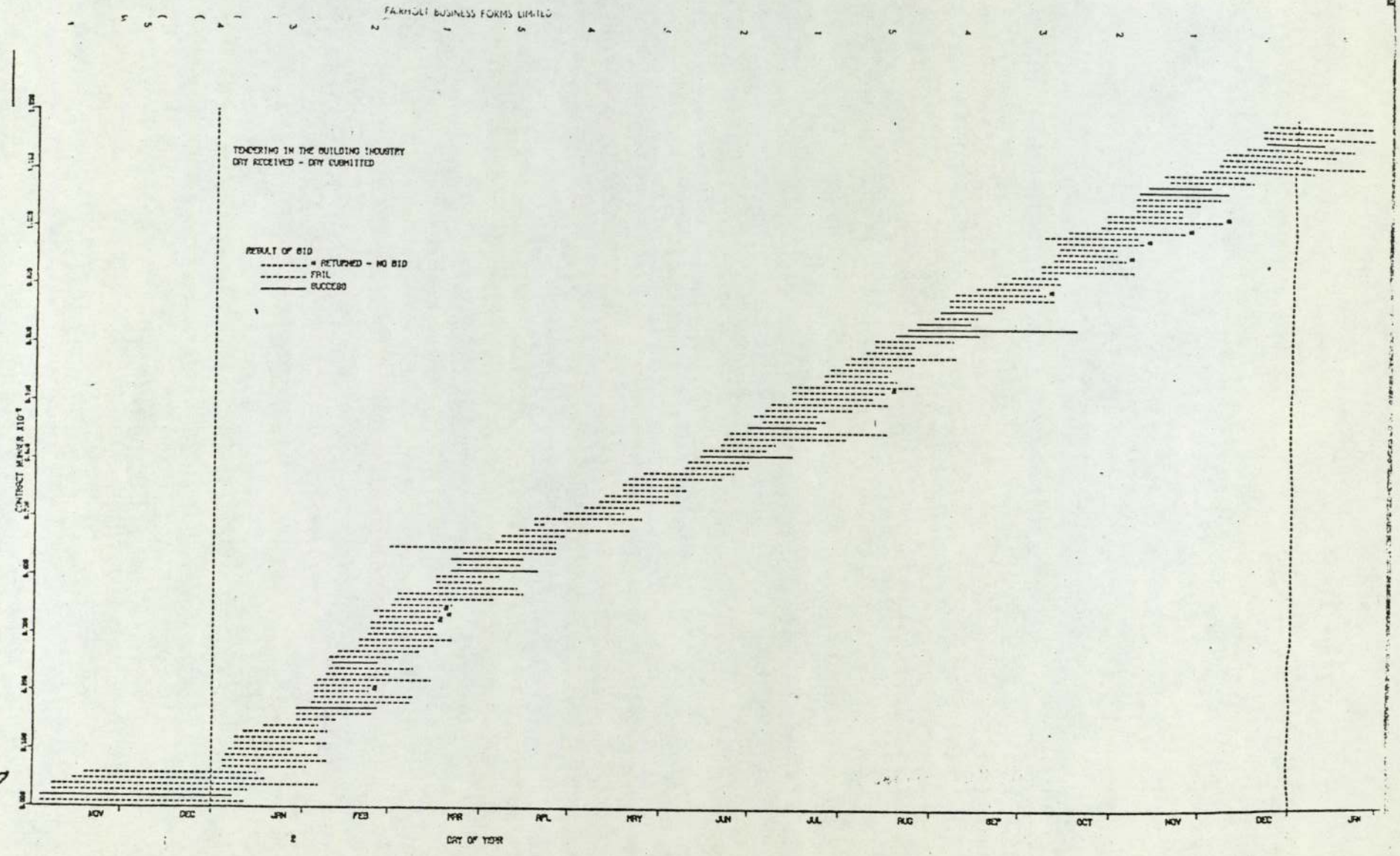
Groupings	Tender No.			
18)	78	79	82	
	£91,000	£202,000	£45,000	
19)	85	86		
	£685,000	£37,000		
20)	87	90	91	93
	£529,000	£87,000	£122,000	£296,000
21)	88	89		
	Rtnd.	£203,000		
22)	94	96		
	£441,000	£60,000		
23)	95	98		
	£262,000	£189,000		
24)	99	102		
	£117,000	£62,000		

* Indicates submissions within three days of each other with tender values of similar range (within 10% of largest value).

‡ indicates submissions within three days of each other with tender values of similar range (within 20% of largest value).

TENDERING IN THE BUILDING INDUSTRY
DAY RECEIVED - DAY SUBMITTED
RESULT OF BID
* RETURNED - NO BID
FAIL
SUCCESS
CONTRACT VALUE X10⁴
DAY OF YEAR
JAN
DEC
NOV
OCT
SEP
AUG
JUL
JUN
MAY
APL
MAR
FEB
JAN
DEC
NOV

D(xiii)



DIXIV

TENDERING IN THE BUILDING INDUSTRY
DAY RECEIVED - DAY SUBMITTED
RESULT OF BID
* RETURNED - NO BID
FAIL
SUCCESS
DAY OF YEAR
JAN
DEC
NOV
OCT
SEP
AUG
JUL
JUN
MAY
APR
MAR
FEB
JAN
DEC
NOV

D(XV).