Controlling design practice

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The foundation and major controlling factor in design practice control is the fee structure, as enunciated by the Authors in their Paper. If events such as the recent collapse of a Canadian supermarket roof, where it was revealed, among other matters, that the consulting engineer's fee was ridiculously low, are not to recur, then it is essential that fee competition be based on properly prepared design contract documents and with minimum fees for various services established by legislation backed up by severe penalties for offenders. It is believed that the Canadians are thinking along these lines, and that the West Germans have some arrangements already.

46. Not only would these measures provide the fairest fee competition in given circumstances, but also, through the minimum fee, they would reduce the incidence of buying commissions by fee cutting and maintain reasonable professional standards. Naturally the design contract documents would have to be drawn up by consultants with suitable experience. Support for these moves must be found in the major national and international funding agencies.

47. There is no doubt that all aspects of design practice may be subjected to closer scrutiny with a view to improving standards and reducing costs, and fee competition properly controlled would appear to be an excellent manner of achieving it. In §§ 12, 14–16 and 21 the Authors extol the advantages of 'goal-setting', 'objectives', 'operational goals' and 'tangible output', whereas, to practise control of design they have opted for Barlow's work packages which obscure them.

48. What the client requires—the goals—and the fee the client is prepared to pay, determine the problems which confront the consultant and which he has to overcome. By far the best approach is to determine what the practice has to produce, be it drawings, contract documents, reports, studies, and then define the tasks together with the effort in man-hours right back to the first item to be tackled. It is essential also to establish the precedence of items to check that the programme time may be achieved. If the programme time cannot be achieved then more resources both engineering and managerial would have to be deployed. Work packages would be a consequence of this process as would the essential programme target dates for the transfer of data between staff for critical items. What are the Authors' views on this statement. What other methods of project planning and cost control do they envisage, inferred by their use of the words 'one method' in the synopsis?

49. Discipline appears not to be mentioned by the Authors. Discipline would seem to be essential in any organization hoping to survive in an environment of fee

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competition. Is it a 'dirty' word in consultants' offices? The aims of discipline would be to provide an organization which would

- (a) use every member of staff to the fullest extent of their capabilities
- (b) place staff according to their abilities in engineering and management and also according to experience
- (c) provide positions or rankings and hence a career structure
- (d) provide special organizations for special projects
- (e) allow early recognition of problems and facilitate their solutions
- (f) encourage good staff
- (g) eliminate unwanted staff.

Many professionals dislike discipline because they consider it to be synonymous with restrictions to their status as a professional. This would be inevitable in a badly disciplined office and the reverse would be true in a properly disciplined office. Regimentation, also associated with discipline, is disliked equally, but in a properly disciplined office it is only a superficial effect. The whole point of discipline is to reduce the routine and mundane tasks to their irreducible minima and thus allow the professionals' minds to expand on to the real issues of the project in hand. Is there a better philosophy for a successful practice? If so, it would be interesting to learn of it!

50. Factors of safety are the practice in engineering design and construction but appear to be thrown to the winds when programmes of work are being formulated. Programmes are so often the most optimistic assessment of what can be achieved and are so often revised with massive extensions of time, so it is surprising that the Authors do not mention factors of safety in their programming in Fig. 5, the planning sheet for a work package. Senior management are often scared stiff when programmes of work incorporate factors of safety and usually rely on some previous experience. There is nothing wrong with reference to previous experience but it must not be used as an excuse to disregard the realities of a present situation. The factor of safety could vary from 1.25 for straightforward projects where unknowns are virtually non-existent to 2.0 to 2.5 where the situation is obscure. Whatever factors of safety are used they should be applied usually to the man-hours so that they are obvious and not masked.

51. Experience has shown that bar charts are an essential part of programming and planning because they are so readily understood, so it would have been informative to have had sight of the bar chart relevant to Fig. 5. Experience also indicates that it is efficient management practice to have a bar chart of the programme of work drawn up by the project manager and circulated with his estimate of man-hours of various disciplines before a management meeting to determine the final programme. Such a procedure tends to concentrate everyone's attention, especially when they realize they are committed to the set targets irrevocably.

52. On questions of control of projects in § 29 the Authors required weekly time sheets to be completed, which is acceptable provided the time sheets are collected weekly. It is essential that they are completed daily to an accuracy of 15 min, and are kept always in a location where individual time sheets are easily examined. Staff must be encouraged to be absolutely honest in their allocation of time, so that a realistic appraisal of the difference between planned and actual (§ 21) is available for assessment and future use. Management must define clearly activities against which time is booked. Initial honesty must not be penalized, but wasteful practices must be eliminated promptly. Fig. 8, the work package progress

report, would best be compiled at a weekly progress checking meeting held on a Monday morning where programme, progress, problems and revised targets are thrashed out at eyeball to eyeball meetings between the project manager and his staff.

53. While the success of the methods outlined in the Paper is not doubted the whole procedure impresses as begin rather academic in nature and isolated from reality by lacking the essential elements of personal contacts between staff. Fig. 6, the professional work order, is an example where a few crisp words on a document appear to substitute personal contact. It also presumes that all problems may be perceived in initial planning and programming and solved then and there, which would be applicable only to the most routine work. Projects coming to my attention have required long-term planning—seldom less than a year and often over greater periods. Frequent reviews of programme and progress while maintaining the achievement of the target dates, perhaps years away, by varying the human resources, are mandatory. The team should be advised at the outset that the only acceptable outcome of the planning programming discussion and work is success.

54. Even in well organized practices there are occasions when there are unavoidable interruptions in a work programme, or an interval before the next commission occurs. Effective use of this time in preparing and updating design standards, computer programmes and the like would form a useful 'bank' for future projects, providing there are funds to support the effort. The alternatives of sacking staff or the use of contract resources involving loss of continuity and expertise are less attractive and point up the desirability of factors of safety in programming and planning, and a minimum fee. Staff should only divert to their 'fill-in' work in agreement with their immediate superior.

55. Many items such as checking of work, overtime working, training of staff and the overhead cost of administrative staff have received little attention from the Authors. What are their attitudes to these items? Arithmetical checking of calculations is seldom if ever carried out, and where it is, may reveal errors of sickening magnitude. Many organizations insist that persons performing calculations develop the habit of self-checking everything, which leaves the original data and the principles which must be checked by review by senior staff. What are the Authors' views? Would the Authors agree that the most desirable solution would be to develop a policy manual appropriate to each firm?

Mr Rowdon and Mr Mansfield

The UK construction industry has been changing rapidly, moving out of the doldrums to a situation of significant demand. As firms move to the end of the decade, it is to be expected that the effect of fee competition will be less keenly felt.²¹ However, design contract documents, properly compiled, are very likely to be readily adopted. Claims-conscious consultants will partly bring this about but clients themselves may also benefit from having to focus more clearly on their requirements from the outset.

57. The work package approach was not put forward so as to exclude the main process of goal setting and objectives. The method was used to concentrate the mind of all those involved with inputs to the project. The Authors agree that it is necessary to work to a programme and then define the tasks. Such planning was carried out on the project discussed in the Paper. The question of other methods was raised by *Mr Amstad*; some of these are referenced at the end of this text.^{22, 24–28} However, the purpose of the Paper was to home in on one straight-

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forward method which could be readily adopted by a consulting practice on a reasonable sized project. This was all the more appropriate as methods of control in design practice seem to fall between over-complexity or over-simplification. The method presented sought to come somewhere in between. Above all it had to be easily workable and have the ability to exercise enough control.

58. It is agreed that the order of activities is important. On the project a bar chart was drawn up, although this was not displayed in the Paper. In actuality, the work packages were a consequence of this prior planning process, rather than the reverse.

59. Some of the traditional literature of Fayol and Urwick²³ on management principles could possibly have been referred to in the early part of the Paper. However, the view taken was to refer to a more participative style of management by calling on those involved in the project to contribute to the planning process rather than relying on an over directive approach. This suggested leaning a little more toward McGregor's theory Y than theory X. It should also be stated that there was a background of discipline on the project, which was assumed rather than overtly stated.

60. At the time when the control system was being implemented on the project discussed in the Paper, the job had been won for a particular price and it was a matter of implementing a design within a framework already decided on in the bid; for this reason factors of safety were not discussed. Staff were called on to contribute to the outworking of targets for particular packages, which they could have a hand in creating. The overall particulars were set out for them, however, which gave a measure of freedom within a disciplined, but not regimented, climate.

61. The collection of weekly timesheets did not preclude more detail being compiled each day with a record of hours worked on each package. There was also a chance for the quantity of hours and rates charged for each member of staff to be quickly checked against that which had been planned.

62. The success of the method sprung from the personal contact with staff rather than the opposite. The work order in the form of a document did not impersonalize this approach; it merely added a 'tightness' and definition to a process that had already been discussed.

63. The interval between commissions was not covered because the context of the Paper was on the working of the control system on a one particular project already secured. Overheads to cover all phases of the life of the project were built into the rates which were applied to staff hours to arrive at a realistic design cost on the project.

64. It is hard to concur with the implied view of Mr Amstad on the matter of arithmetic checks. Any control system has to insist on proper checking extending to the parameters underlying the calculations. Whatever the climate of fee competition, this can only be ignored at the design practice's peril.

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