Civil engineering route to construction management

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The sample surveyed in this Paper is very small. I realize that the low response rate (37%) is not the fault of the Authors, but to include only eleven contractors in the survey when there are about 400 in the FCEC seems very inadequate. It is not only the small size of the contractor sample which concerns me but the fact that only contractors have been canvassed. This seems to imply that only contractors manage construction—and that I cannot accept.

41. Most of our civil engineering contracts are (still) based on the *ICE Conditions of Contract* which allow for an Engineer's Representative (ER) to be on the site where the construction of the Works within the contract is taking place and being managed. Many of the duties of the ER and his staff are laid down in the Conditions of Contract, but over and above these the ER surely has the implied duty to do everything possible to ensure completion safely to quality and to time. I can think of no employer in my experience who would have it any other way.

42. In the 25 years I have spent as an ER (or on an ER's staff), I can recall countless instances where the ER and his staff have

- (a) modified designs/specifications to facilitate construction
- (b) given the contractor the benefit of advice on similar designs, materials, events and situations within their experience
- (c) undertaken the design of temporary works and the formulation of erection schemes
- (d) pointed out errors of many kinds, in time for them to be rectified before they have led to the waste of time and resources
- (e) foreseen and assisted in the avoidance of situations of danger, leading again to considerable savings in time, effort, and sometimes even lives
- (f) participated in planning exercises to maintain progress and to minimize or eliminate interface problems
- (g) contributed to the management of industrial relations situations and the avoidance/resolution of disputes; etc.

In all of these instances, the responsibilities of the ER and his staff may have been different from those of the contractor's site staff but all were undertaking construction management in one way or another—however it is defined.

43. I have also noticed that the larger the contract, and hence (generally) the greater the complexity of construction, the higher the calibre of both the Site Agent and the ER (in expertise, experience and general engineering intellect) and

DISCUSSION

the greater the respect and co-operation between them. This surely shows the value that a contractor's top management puts on an ER's construction management duties and abilities—even if the Authors have overlooked them.

44. Inclusion of one or two of our major consulting engineers in the survey, and consideration of the responses from some of their ERs and staff, might well have modified the Authors' findings. It would certainly have made them more representative.

45. It would not be right for me to suggest what the views on this topic might be of such organizations as the ODA, the PSA, the DTp, the Crown Agents, the water authorities, the county highways departments, the four 'CEGB-derived' companies, etc., but I should be surprised if there were wholehearted acceptance by their staffs of their exclusion *in toto* from any survey of construction management.

46. There is also another side to the coin. Many of our major contractors now operate as management contractors. I am never sure what that means—in some instances it seems like a contradiction in terms. However, whatever it means it seems to involve standing at least one stage removed from the construction face—and thus less involved in construction management than is the ER and the ER's staff. I hope none of the eleven contractors sampled came into that category because, if they did, that would further dilute the Authors' sample.

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The research objective was to sample building and civil contracting organizations to establish the career paths within that type of organization, in the expectation that entrants to the construction industry would be in a better position to assess such construction management career opportunities. It was not the objective to analyse career paths in consulting firms, design offices, local government departments or public utilities. The career paths and succession routines among these organizations are very likely to be different from those of contractors. There is a need for further research which focuses on career mapping of the opportunities for civil engineering entrants to these other types of organization.

48. We accept that the sample is small, which is often the case with PhD research projects, on account of the high cost of carrying out large interview or questionnaire survey programmes. However, every attempt was made to ensure a representative cross-section of contracting organizations for interview and of personnel for questionnaire distribution. We have no reason to believe that the sample was detrimentally biased.

49. The Paper reports the results of an analysis of the career paths of 'construction managers' occupied in the 'production function' in contracting organizations. Mr Bell would clearly have been happier if we had also surveyed civil engineers in consultants' and clients' organizations and, in particular, 'Engineer's Representatives'. Because we failed to do so, he suggests that we are implying that they do not manage construction. We did not intend to imply this but, happily, his comments have given us the opportunity to clarify our position. The ER does not, in any real sense, manage construction. If one accepts that the term 'manage' implies an executive responsibility and that construction, in this context, means the process of constructing, then the ER is not managing this process. He/she may be managing part of the client's or Engineer's organization, but is not managing the resources engaged in the process of construction.

50. Mr Bell's examples of the activities of the ER which fulfil his 'implied duty to do all he can to ensure completion safely to quality and to time' are, in the main, to be welcomed. However, it should be pointed out that items (a)–(d) given in § 42 are technical rather than managerial in content and they are all aimed at *facilitating the contractor's management of the process*, rather than carrying out any direct managerial function. This is not, in any way, intended to suggest that, in pursuing these activities, the ER is not making a valuable and constructive contribution to the achievement of the construction objectives.

51. It might also be argued that there are many others who contribute to construction management, if we use Mr Bell's implied definition: engineers in the public utilities with responsibility for supply and co-ordination of site services, for example. However, it is the contractor's management who take the ultimate responsibility for the management of the production of constructed facilities.

52. We should like to take issue particularly strongly with item (g) in Mr Bell's list of ER management activities. Assuming that he is using 'industrial relations' in its conventional sense—i.e. applying to the relations between the management and operatives—we can think of little in which the ER could involve himself that would be more detrimental to the smooth functioning of the site organization. There is a point at which the ER's support and assistance of the contractor becomes interference, and this is surely well beyond that point.

53. In § 43, Mr Bell begins by stating the obvious: that the larger, more complex construction projects are generally staffed by the most competent people. We can, however, see no connection whatsoever between this proposition and the conclusion drawn in the second sentence of § 43. This would appear to be a complete *non sequitur*.

54. In § 44, Mr Bell suggests that 'inclusion of one or two of our major consulting engineers in the survey' would have made the findings more representative. We find it strange that Mr Bell should have criticized the survey for its small sample of contracting organizations and then, apparently, be satisfied with a sample of 'one or two' consultants. The inclusion of other types of organization would, for reasons of cost and time, have limited the number of contractors surveyed. This would have resulted in a diffused and inconclusive set of data, with too many small and potentially unrepresentative subsets, rather than in 'more representative' findings.