

ANGLEWEST LIMITED

**PROPOSAL FOR
CONTROLLING AND REDUCING
SCAFFOLDING COSTS**



**Prepared by:
Phil Rogers**

Anglewest Limited
Lower Mount Farm
Long Lane
Cookham
Berks, SL6 9EE
01628 551880

20th April 2004



OBJECTIVES

The objective of this report is to propose ways and means of controlling and reducing scaffolding costs, whilst maintaining good working practices and safety standards.

IN THE BEGINNING

At the first available opportunity, we need to meet with the Project Manager and the Planner to discuss the methods of construction being considered and the most appropriate scaffold solution to give the access required. We will discuss these and suggest alternative methods available from previous experience.

The first available opportunity would be at concept for negotiated work or two stage tenders, tender stage or as the contract is won. Not a week prior to the scaffold starting!

The next step is to write up a fully detailed schedule of the works. This is to create a level playing field for the benefit of competitive tendering and for early recognition of the construction difficulties to enable a proper considered document that relates to everybody's past experience and something that will be similar to what actually happens on site.

AREAS TO BE CONSIDERED

1. External Scaffold.

- a. There is always a big debate as to whether external scaffold is required or not. Often it will be said that none is required, because the frame access is in the Frame contractor's package and that the curtain walling can be done from the inside or from MEWPS. The only areas requiring scaffold will be core areas and external stair cladding. The reality in most cases is that a bit is done for each trade with the resultant cost being in excess of a full external scaffold.
- b. Adaptions are another area where things go awry. Often an item of scaffold is described as being raised for the RC frame, adapted for brickwork and finally adapted for windows, it then being dismantled for cleaning down. Not enough thought is put into other related adaptions, movement of transoms, inside boards and braces. It is difficult to account for adaptions that are related to out of sequence working and acceleration, but it can be attributable.
- c. The sequencing of perimeter guardrailing for both protection and for use as a continuous latchway is a big area for potential savings if properly designed.
- d. Loading areas for different trades must be considered in detail, particularly for stone Work. It should be noted that loading gantries will always be required and potential savings by using beefed up areas of the main scaffolding should be dismissed. Also

particular attention should be given as to how loading values are asked for. There is a big difference between, U.D.L, loading per metre square and point loads.

2. Atriums

- a. The consideration of the use of system scaffold to ease the siting and removal of materials on completion.
- b. Support and access of roof areas.

3. Cores

- a. Does the Frame Contractor require a tower; independent or laydown access for casting shear walls and columns. Wall construction involves rebar fixing, formwork placement and removal and concreting. Each of these requires adaptations of transoms and inside board movements.
- b. Invariably these scaffolds cannot be used for following trades and are best duplicated at a later date.
- c. Lift shaft access is normally scheduled as an erection for the RC frame or the bricklayer and then adapted for the lift engineer. The bottom is then bridged for the car installation. In reality the information relating to the standard positions for the lift engineers is not available at the time of the initial erection and the access is fully dismantled and re-erected again. Also to comply with current health and safety regulations the scaffold should be boarded with toeboard and full guardrails to each lift with a ladder access running from top to bottom.
- d. Where the lift engineer claims that they require no scaffold. The provision of special laydowns supported from side brackets within the shaft should be provided for. This gives a flush-boarded platform with no interference to the concrete slab.
- e. Riser shafts are grey areas with the original price bearing no relationship to the actual costs. They are mainly carried out to fit around the configuration of pipework, ductwork etc. It should however be the aim to make an allowance of money for all eventualities. Consideration should be given to omitting scaffold from risers altogether, This could be achieved by concreting over the opening and forming the holes required by diamond drilling. Alternatively, designed removable metal gratings supported from steel angles could be used to provide both temporary and permanent access.
- f. Staircases are again a bit of an unknown, but allowance should be made for access for blockwork, plasterer painting, ceilings, balustrading and protection handrails. In practice towers seem to go up and down a few times for various trades. Allowance should be made for birdcages to tops of staircases, where there is additional height. As well as guardrail protection to the centre of the wells, external protection should

be allowed on steel structures to the external stringers and half landings. Barriers should be used for blocking off stairs for finishing trades.

4. Hire periods

This is an area which is often ill considered and leads to large overhire at the end of the contract. It is better to be a little bit more generous with the hire period quoted than to optimistically say, “all the basement blockwork will be carried out in 2 weeks”. All areas of the main scaffold and adaptations for following trades must be allowed.

EARLY DESIGN INPUT

We have a full design and calculation input into all contracts, but we invariably do not commit to design prior to an order being placed. However if an early involvement lead to a recovery of costs by a higher percentage of contracts won, this would be highly recommended. Cost savings would be achieved by designing out problems spotted early and detailed design could be included to show exactly what would be included in the trade contractor’s packages.

STANDARDISATION OF THE SCAFFOLD SCHEDULE

Most of the Major Scaffolding Contractors use the same software for producing their estimates. It therefore makes sense that a scaffold schedule asks the same question in the same order to mimic the software program.

The areas addressed for most types of scaffold should be: -

Lead-in	Which trades, is the scaffold for and what detailed adaptations are required.
Frame	Bay centres, lift heights and board configuration
Drawings	marked up drawings or sketch of requirements
Dimensions	and applicable gridline references
Features	brickguards, netting, sheeting, bridges, sloping ground etc.
Boards	number of lifts, protection lifts and movement of boards.
Ladders	inside or outside scaffold. Consider the use of external “Haki” stair tower.
Ties	mechanical and/or physical, positioning and movement

Loading	stated in kilo Newton's per metre square. The table 1 on page 17 of BS 5973: 1993 should be used at all times.
Special notes	appertaining to licenses, working hours, access, storage, work conditions etc.
Period of scaffolding	including occupation period, the phasing in on progressive scaffold and the period for boarded access at each trade stage

We would suggest that a pro-forma schedule based on a tick chart incorporating all the above be drawn up by your planners/managers and ourselves.

We would also suggest that schedules are numbered from 1-100 and not with A's and B's or 3.1.1 and 3.22 etc. It makes life a lot easier to sort and revise on the computer.

The drawing up of the schedules would be carried out by your planners for tenders and by your planners in conjunction with ourselves for negotiated and two stage tenders. The input from our Designer and Contracts Manager would be a lot greater in the latter type.

As a suggestion for the future, the software designer is very interested in developing a package that aids the writing of scaffold schedules and links in directly with the estimating. With the use of e-mail, production of quotations, changes in design, periods and use will be speedily dealt with.

VALUATION PROCEDURES AND PROPOSED IMPROVEMENTS

How the account is laid out: -

- a. Measured works (original quotation)
- b. Breakdowns of measured works claimed on a progressive basis e.g. 1000m claimed to date out of a total of 2000m.
- c. Priced variations
- d. Guardrail schedule
- e. Daily variations account arising on instruction for immediate action and related to a schedule of rates.
- f. Grand summary of all of the above.

- g. Final account projection. This has the facility for the contractor to predict final dismantling dates to project hire and variations forward.

Measured works are presented showing the following information: -

- a. The quotation and item number.
- b. Heading/description of the scaffold.
- c. Value of the item and the hire period quoted.
- d. The split, generally 2/3 erection and 1/3 dismantle. Adaptions are generally shown separately.
- e. Date erected and dismantled.
- f. The amount claimed on the current valuation.
- g. The further hire commencement date and any further hire if applicable.
- h. On hire dates begin with the signature on a handover certificate. We would suggest that a dismantle instruction be issued by you at the appropriate time. This would end all arguments and disputes as to when the scaffold came down. It would also focus the mind if the instruction was issued, but not quite ready, as to who is responsible and therefore who should be charged.

Daily Variations/Instructions

- a. The Main Contractor should specify one member of the management team to look after the scaffolding package on site. If more personnel are involved, this can lead to confliction and duplication of scaffolding in areas e.g. scaffolds being dismantled earlier than necessary and then being re-erected.
- b. The trade contractors should issue a Scaffold Request Form to the Main Contractor's scaffold coordinator to instruct daily variations. These should state whether they are to be paid for by Trade contractor, Main Contractor or trade to be contra-charged. This information can then be passed onto the Surveyor.
- c. The instruction needs to clearly identify the work that is to be carried out, who the work was for e.g. trade or company and the reason the work was carried out. If all this information is on the instruction, the variation account can be detailed accordingly.
- d. Each variation is attributed either to a sub-contractor, an Architects Instruction, the Main Contractor or to site safety.

- e. When the item of scaffold is finished with, it is dismantled and recorded on our daily work sheets. We re-iterate that at this point a scaffold dismantle request or instruction should be issued with the date clearly stated.
- f. Once the variation has been established, it is charged in the scaffold account using one of the methods described in item 12. The item is then priced using the schedule of rates with the information listed under the following headings: -
 - i. Location gridline and floor level
 - ii. Description of the scaffold e.g. independent, tower, etc.
 - iii. Reason/trade e.g. for bricklayer
 - iv. Site instruction and work sheet numbers
 - v. Dimensions
 - vi. Dates erected and dismantled
 - vii. Quantities and rates
 - viii. Split for labour and materials totals.

Additional information – Sorting/final account

- a. The daily variation account will be able to be coded for each trade. This will enable data sorting throughout the contract to establish the liability for scaffold against each trade.
- b. Final account projection – each monthly valuation can be sent including a projected final account, which compares against the works to date. This is shown under the following headings: -
 - i. Quoted value
 - ii. Anglewest claimed to date
 - iii. Further hire to date
 - iv. Final account (sum of 1 & 3)
 - v. Daily variations and guardrails are shown as to date figures or projected forward each month, based on the current amount claimed.



- vi. Summary comparing actual to date against projected.

IDEAS FOR VALUATIONS AND VARIATIONS A DIFFERENT WAY

Valuation of the contract works could be carried out in a similar way to that which preliminary items are claimed from the PQS. i.e. an expenditure schedule of the works related to the contract program. Major changes to work would be carried out on an add and omit basis. The ideal would be to agree this with the Contractor's QS on exactly the same basis prior to agreement with the PQS. There will be no conflict on payment and liabilities will be known in advance.

Valuation of variations is always a major bone of contention. Does the work relate back to the original estimate, should it be valued at a schedule of rates or should it be carried out on a daywork basis. We know what return we require on a man carrying out variations to include all labour erecting, adapting, dismantling, transport, consumables and hire of scaffold materials. As long as the rate per man is realistic, all variations could be based on the time taken only. This would be easier to monitor by your Foreman than trying to remember a measurement of scaffold and the erect date, as well as the dismantle date. Offsetting contra charges against the various trades would be just the same, in that they can be valued in accordance with responsibilities noted on site instructions and scaffold request forms.

USE OF MODERN TECHNOLOGY

With use of e-mail, we can send all valuations and breakdown to sites in their formulated context to enable further sorting and analysis for valuations, contra charges and financial monitoring.

CONCLUSIONS

The earlier that we are involved, together with close monitoring of both the carrying out the work and the financial aspects of the contract, will lead to: -

- a. A scaffold package price that is closer to the end result
- b. A closer and understanding relationship between contractor and scaffold contractor.
- c. Tighter control by site management of variations carried out
- d. More awareness by trade contractors that they will be liable for scaffold carried out on their behalf.



- e. Early warning of sub-contractor liabilities.
- f. A satisfactory final account to all parties.