THE SCOTTISH OFFICE DEVELOPMENT DEPARTMENT

DBFO/DB SEMINAR

THE SPECIMEN DESIGN

by

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19 September 1996

1. WHAT IS IT? DOES IT EXIST?

1.1 Tenderers know that the specimen design exists; they usually have to pick it up - sometimes in large vans! However in contractual terms it will not be referred to in a DB Contract or DBFO Agreement, the only reference will be in the Instructions for Tendering.

1.2 Some paraphrased definitions:

Specimen Design : the design prepared for a Client to allow the promotion of the scheme, completion of statutory procedures and acquisition of land.

The Specimen Design should not be confused with:

Roads Orders : The statutory document (and plans) promoting the scheme.

Conceptual Design : The design put forward by a tenderer in his bid.

Design : The design carried out by/for a Contractor post award.

1.3 The Specimen Design exists in a variety of forms.

1. At the most basic it can be a simple sketch of the layout used to get planning permission or whatever.

2. For schemes where conventional design preceded the DB or DBFO decision then it will be the documents and drawings at whatever state they were in when design development ceased.

3. Given the scale of DBFOs the Specimen Design was colossal but in time this will change.

1.4 Whatever form the Specimen Design takes it must be assumed that it represents the Client's aspirations in terms of location, character and form. It follows that these elements cannot be ignored; they represent the Client's invested knowledge. However in terms of detail, drainage layout, bending schedules etc, then these are provided in the main as background information; to be used or not. Where the Specimen Design does contain elements or details which are a Client prescription (for example a bridge form discussed with RFACS) then they must be detailed in the Employers Requirements. Indeed I would argue that without a Specimen Design of some sort you cannot write Employers Requirements. There is, of course, the consequential danger that if a Specimen Design is too well developed then the Employers Requirements can become over prescriptive.

2. LOVE OR HATE?

2.1 I suspect most Designers would rather start with a blank sheet of paper and develop their own design than to try and figure out what someone else has done. So (from my design team) the answer is probably "hate".

2.2 In addition, in terms of detail, I suspect that the sheer volume of the specimen design on occasion takes Designers' eyes off the ball and to an extent it stifles innovation. If you don't watch out it takes the design out of DB.

2.3 Where it has been developed in detail, the Specimen Design will have developed based on countless discussions with Local Authorities, utilities, railway companies and private individuals. It may contain the best available solutions which assist the economics of tendering. In practice it cannot be ignored.

2.4 When Designers wish to investigate alternative solutions they have to second guess the original designer; why did he do that? Would it be sensible to issue a Notes for Guidance to the Specimen Design so that decisions previously taken could be considered in the proper context and avoid DB teams investigating unproductive avenues?

3. RIGHT OR WRONG?

3.1 Contractually documents will say something like:

"The Specimen Design does not provide a design which meets the requirements of the Tender Documents and in particular the Employers Requirements ....., it is likely to contain a number of errors and omissions."

3.2 It is probably wrong; that is, the Specimen Design will not be a complying design. Why not? The following are the main reasons:

Probably not complete
Possibly not checked
Standards may have changed
ER's have been gold plated
New Services
New Third Parties
New Legislation

3.3 Given the fact that the Specimen Design is probably not right but that tenderers do use it, another new industry has been created by the process : The specimen design audit. This is particularly so in the case of DBFO. The audits needed include:

Does it comply with the Orders?
Does it fit within the available land?
Does it require any Departures?
Does it comply with the ERs?

It will be appreciated that these audits take up a lot of time during the tender period, add to the expense and use up scarce design resources.

4. METAMORPHOSIS

4.1 The Specimen Design in its present form will die off. We are in a transitionary phase where schemes have been developed on a conventional basis. Hence the extent of drawings, bending schedules etc which, having been produced, should be offered to tenderers - simply in case they are of value. There is a limit to the number of schemes which will progress in this way. They will simply, in time, work their way through the system.

4.2 Where new schemes enter the frame there will still be a need for a Specimen Design:

To promote the scheme

To prepare an ES

To consider budgets/economics

To be sure of deliverability

To acquire land

To consider problem areas

4.3 At the simplest it might consist of plans, profiles and sections. On a more complex scheme it might consist of:

plans, profiles and sections

particular bridge forms

particular aesthetic solutions

particular engineering solutions

In this example I presume that, for whatever reason, the particular solutions would be prescribed.

4.4 At this point the difference between the Specimen Design and Employer's Requirements starts to get fuzzy. I can see a way ahead in this should the Specimen Design metamorphose into Employers Requirements. It simply has to be made clear what elements are open to alternatives and what elements are prescribed. Simply put:

Where you can Design and Build

Where you can only Detail and Build

I suspect we would all welcome this distinction.

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THE CONSULTANTS VIEW

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1. INTRODUCTION

1.1 The Life of the Consultant did appear to be simpler in the past; some would argue cosier. On my first DB project, a simple jetty in the North of Scotland, I cannot recall any laborious discussions about Conditions of Engagement, bid costs, risk sharing, certification, collateral warranties or lawyers! Life was indeed simpler but the jetty was built, the design was adapted to suit the Contractor's (revised) method of working (nothing changes) but perhaps pre CDM the record drawings were or were not done.

1.2 I returned to reality in 1989 when the Roads Directorate trialled DB at St James Interchange. It was successful and became the forerunner of a series of DB projects which are now the norm for major trunk road procurement. I have since been involved in using this form of procurement for a variety of projects and Clients ranging from minor road modifications through to major projects outwith the highways field.

1.3 When it comes to DBFO, DB plays a major part and many argue that it is solely the price of the DB element which wins or loses the DBFO. When I talk of DBFO today I am really taking about the DB subset within DBFO.

2. OPPORTUNITY AND THREAT

2.1 Innovation has an impact and we must be alert. Machiavelli was wise to this:

"There is nothing more difficult to plan, more doubtful of success, nor more dangerous to manage than the creation of a new system."

2.2 In terms of opportunity then, for every project, (and we seem to be moving from 3 through 4 to 5 tenderers), there is a significant demand for Consultants.

DB	DBFO
Designer	Designer
Checker	Checker
Safety Auditor	Safety Auditor
Aesthetic Adviser	Traffic Adviser
Client's Adviser	Funder's Auditor
	Maintenance Adviser
	Aesthetic Adviser
	Client's Adviser

In addition most projects are now multidisciplinary and therefore for each role there is typically a minimum need for civil, electrical/comms and environmental skills. So there is clearly opportunity.

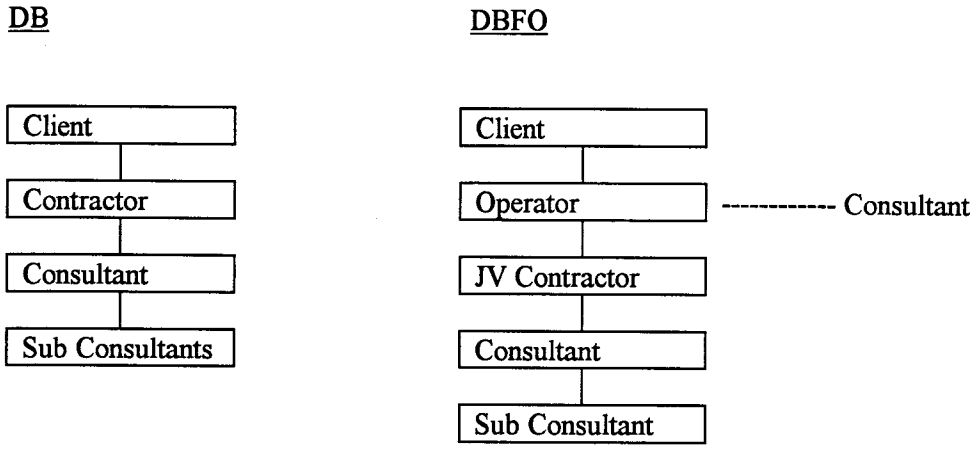
2.3 There are in my mind two main threats. First, as projects increase in scale then the number of Consultants taking successful projects through will be limited. But second, and perhaps of more importance, is the financial threat. Tendering costs are escalating with complexity and as DB becomes the norm then the downside risk

will always be present. Pressure on Contractors' margins is colossal and inevitably there will be pressure on design fees and an increase in risk taking. In theory, Clients will pay the tendering costs in the long term. As my economics lecturer once said, "In the long term we are all dead", so there has to be something better in the short/medium term.

I suspect consultants will be forced to consider balanced workload portfolios and for major projects some form of JV to spread risks and possible downsides.

3. TWO MASTERS

3.1 Apart from the Client's Adviser, Consultants do not now have a direct relationship with the Client. The Consultant working for the Contractor is in effect a sub Contractor. The contractual links, simplistically are:



3.2 There is a subtle difference between working for Client or Contractor (noting of course that the Contractor is a Client in his own right):

Clients do not have to accept advice.

The Contractor in DB/DBFO may well have to accept advice because of the certification requirements in the contract.

3.3 A further point worth noticing in these changing relationships is that in DB/DBFO the direct link between Consultant and Client is removed and the Client may well not know what the Consultants brief and instructions are; this can be surprising to some.

4. SCALE AND EFFORT

4.1 Clients and their advisers have probably gained years of invested knowledge on a project. DB/DBFO teams have to pick this up in, say, a 12 week tender period.

4.2 There are I suspect three levels of project complexity:

1. Junction - relatively straightforward to grasp the details and know the contract.

2. The £30M-£50M motorway/dual carriageway scheme - much more difficult for the teams to get their mind into the detail of this.
3. The DBFO scheme - the scale of the problem, the resources and the documentation is always a significant factor - greater than you imagine.

In terms of procedures, paperwork and having an understanding of the project the difference between these the types is arguably exponential.

4.3 Document Control is a major industry. In the good old days/dark ages I recall that tender amendments were thought of as a sort of defeat. Now they proliferate and add to tender complexities and costs. Some examples (with codes to protect the guilty, the innocent and the writer).

Contract	No of Bulletin
ELDC	21
MLDC	13
LSC	24
MSC	6
SDC	3
RDC	25
BOOT	71

These Bulletins now typically include the Questions and Answers which are raised during the tender process. Again Q & A's are an industry in themselves.

5. THE PROCESS

5.1 Typically the procurement process is as follows:

Prequalification	Submission Interview
Tender	Consultation Process (3) Aesthetic Review Checks Road Safety Audit Third Party Liaison Certificate A Submission Design Pricing Tender Technical & Commercial Submission

5.2 In terms of documentation the following are typical in a DB contract.

Instructions for Tendering (+ H&S plan)
Conditions of Contract
Employer's Requirements
- Design
- Procedures
- Construction
- Specification
- Drawings

6. PROGRAMME

6.1 Longer tender periods arguably result in increased costs and there is a desire to shorten them. However procedures are becoming more complex and there is a real need for time to grasp the problem and for 'quality time' to develop innovative solutions. A typical tender period is as follows:

Week 1	Receive Documents
Week 3	Determine SI Requirements
Week 4	1st Technical Submission
Week 5	1st Consultation
Week 8	2nd Technical Submission
	Departure Submission
Week 9	2nd Consultation Meeting
Week 13	3rd Technical Submission and Aesthetic Review
Week 14	3rd Consultation Meeting
Week 17	Certificate A Submission
Week 19	Tender

In this example there is a real difficulty in meeting the early demands of the programme. It simply takes time to get the documentation copied, read and understood.

6.2 There is a major interaction between Designer and Contractor for the Works phase. The Designer and Contractor have to allow time for

Design
Checking
Safety Audits
Material Procurement/Sub Contracts
Temporary Works Design
Construction

Given that in DB there is usually a time element in the competition, then the pressures for programme reduction are obvious. Even more so in DBFO when an increase in programme equals a loss of potential revenue. However no matter the pressures, at the end of the day there has to be time for design.

6.3 At St James Interchange the contract provided for:

Time for Commencement of the Design
Time for Commencement of the Works

All parties involved found this method useful; it took some pressure off and gave the contract a good start. The concept has never been repeated.

7. CLIENT ASPIRATIONS

7.1 Clients encourage innovation to release efficiencies and lower costs, but their prime objective will be to achieve a fixed outturn cost with risk transfer. This is inevitable and there will not be a return to the claims industry.

7.2 Designers and Contractors working together can improve buildability and release efficiencies. The structures design at St James Interchange was a good example where the project was amenable to production line techniques. A smaller example of buildability was the choice of a piled foundation for a road sign at Gogar.

7.3 There can be major wheezes; at Gogar we flew under rather than over and it has been done elsewhere since. However the constraint of Road Orders and timescales will inhibit major changes to alignment. Contractors can and have taken on the risk of promoting alternative road orders post award. However where minimising programme is part the competition there is little likelihood of them proposing a complete revision to alignments. Such alternatives are likely to be restricted to parts of the Works because if the Contractor fails to provide a revised order he must revert to the original design within the typical two year programme.

8. QUALITY

8.1 It is now almost taken for granted that both Design and Construction will be carried out under a formal QA system. This has an important bearing on the Consultant's construction responsibilities.

8.2 Typically it is now required that Designers "witness and supervise construction ..... including sampling and testing ..... as considered reasonable..... In addition Designers typically have to certify "that they have supervised..... the construction..... and it has been constructed in accordance with the Design". This is an onerous contract requirement placed on someone who is not party to the contract.

8.3 Contracts are not prescriptive on the numbers of site staff; perhaps they should be? Increased numbers result in a higher tender figure. Consultants, to keep numbers of site staff cost effective, will therefore rely on the Contractor's QA system and will to an extent act as an Auditor during the construction period.

8.4 Given their responsibilities, Consultants will have to have a high degree of confidence in their Contractor (Client). I suggest that this is best gained in long term, stable relationships.

9. CURRENT COMPLICATIONS

9.1 Employers Requirements - There is I suspect a current feeling that these are too prescriptive and a confusion as to whether every requirement has to be tested during the competition. It would assist the tender process if it was clear to all which requirements were fundamental (and not open to discussions) and which were not.

9.2 Departures - Within the last year or so we have created a game called 'Hunt the Departure'. DMRB invites consideration of Departures on reasonable engineering and economic grounds; not I suspect to be used as a matter of course. Do we intend that every line in every document is to be pushed to the limit to see if a departure can be obtained? Are we applying DMRB to side roads and farm accesses and other tie ins where it was never intended to apply? The answer is probably yes.

9.3 Safety Audit - I do not question the need or relevance, only the procurement method. My slight fear is that such audits can give a subjective top up of standards and currently there can be conflict between audits and Road Orders which the DB team cannot solve. There is the probability of a new "exceptions" industry. My, unpopular, solution is that audits should be carried out by the Client and the results issued as Supplementary Requirements.

9.4 Environmental Statements - The current difficulty is that these were never written to be Employer's Requirements; they were produced to ensure promotion of the scheme.

9.5 Tender Queries - These are asked for two reasons:

- To resolve genuine doubt
- To ensure other tenderers are alerted to an issue

Queries have to be answered quickly and the use of the blocking answer (ie no answer) is unhelpful. It is also impossible to keep track of changed answers.

9.6 Aesthetic Review - I support the need for this; I have seen it improve designs. My slight fears surround the possibility of a standard form ie "an open span structure with circular columns and parapets taken off the deck."

9.7 Document Changes - I have already alluded to the difficulty of coping with these during the tender period. Does more time have to be spent on documents pre-tender?

9.8 Consultations - Clients see this as vetting developing designs; this is reasonable. A Client should not buy something he doesn't want. However it has to be a two way dialogue and I am not convinced that there should be a restriction on any discussion (even if they are what is known as 'fishing expeditions'). That is, simply put: consultation is a two-way process.

10. THE WAY FORWARD

10.1 DB and DBFO are here to stay (except there may be a limit on the number of DBFOs). They must be giving Clients what they want and as a service industry we must address Client's needs.

10.2 DB is not the only procurement answer however and I can think of two instances where it is inappropriate:

1. On a small job where the effort involved in creating the DB documentation far exceeds that necessary to prepare an Employer's Design.

2. On a road scheme where the Orders, Environmental Statement, Land, Service Wayleaves, Public Enquiries etc are so restrictive that alternatives to the specimen are inappropriate.

In both of these cases a lump sum fixed price contract (with risk transfer) would be more appropriate (comparable to latter M74 contracts).

10.3 To manage the risk of tendering costs it will be necessary for Consultants and Contractors to adopt alternative tendering and pricing methodologies. The standard method of Drawings, Specification and Bills of Quantities will simply be too expensive. An alternative method is the only way forward.