Hugh Porter
Civil Engineering 1988 – 2001

2000 word experience report

Prepared by

……..
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Candidate

Reviewed by

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Prepared for Chartered Professional Review (2001)
Institution of Civil Engineers
Candidate's membership no 46852552

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Table of Contents

Table of Figures

Outline record of academic and professional career

Dates chronologically	Academic Qualifications
1983	9 GCE '0'Levels
1985	3 GCE 'A' Levels (B Mathematics, C Physics, C Technology)
1998	Civil Engineering, Imperial College BEng (Hons) ACGI
Dates chronologically from to	**Professional Career** – circa Value (£ millions) – Position
09.1988 - present	**Carillion Construction Limited** (formerly known as Tarmac Construction Limited)
09.1988 - 06.1989	M40 Banbury Bypass Contract 3 – £50m – Structures Site Engineer
07.1989 - 11.1992	Stage II, III and IIIa Feasibility Studies in Tidal Power on River Mersey – £15m – Leader of Financial, Hydraulic & Energy Modelling
1992	Paper : Wilson, E A and Porter, J H, (1992), Hydrodynamic modelling of the Mersey Estuary for a tidal power barrage, Proceedings of the 2nd International Conference On Hydraulic and Environmental Modelling of Coastal, Estuarine and River Waters, Part 2
12.1992 - 10.1993	Sulzer Escher Wyss, Zurich(CH) and Ravensburg(D) – £n/a – Foreign Trainee
11.1993 - 03.1996	M6 J20-J21a Widening & Thelwall Viaduct – £100m – Roads Section Engineer. Side Roads, Mainline reconstruction and widening, Junction 21 Martinscroft Interchange remodelling *Temporary Works co-ordinator* *Crane co-ordinator* *Lighting Subcontractor liaison Engineer* *HSE/UMIST Positive Safety Survey Site Manager*
04.1996 - 09.1996	Team 2000 – £n/a – Full time Facilitator in Self Managed Team working across Carillion companies
10.1996 - 12.1996	Balsall Heath Forum – £n/a – Project Manager within Community seconded through Business in the Community *Carillion Awarded Lord Mayor of London Dragon Award for work in Balsall Heath - 01/97*
01.1997 - 11.1997	London, Civil Engineering – £0.5m to £150m – Business Systems Manager *Plus* *Carillion Representative on Midlands Construction Forum* *Support for Year of Engineering Success at The Engineering Education Scheme Presentation & Assessment Day* *Presenter Lecture 7 : ALGS Health & Safety Residential course 27 June. ' Should Health & Safety be integrated into a Quality Management Environment'. The Case for Integration and Practical Case Study.*
11.1997 - 03.1998	Head Office Work Winning - £20m to £100m – Manager *Input into Channel Tunnel Rail Link tenders 430 and 320 and successful London Underground Limited's Corporate Track Alliance Programme tender* *Project Manager for Carillion Engineering and Construction's "Y2k" programme*
04.1998 - 06.2000	Corporate Track Alliance Programme – £18m – Cost & Value Manager *Responsible for commercial department under modified NEC Engineering & Construction Contract option C. Contract required onsite estimating in 'term' contract generating value and cost control. Alliance required new approach from company and people*
06.2000 - present	JNP Track Works – £30m – Contractors' Alliance Cost & Value Manager *As above but commercial manager for three companies in alliance. The design build contract involves discrete major track renewal works across the Jubilee, Northern and Piccadilly lines of London's underground. Works are carried out at night over several weeks, in a whole weekend (52-72 hours) or in extended line section closures of several weeks.*
09.1999 - present	Institution of Civil Engineers, ALGS Committee London Association representative (1999) Currently Hon Treasurer (2000-)

1 Introduction

I have gained

- a breadth of experience throughout project lifecycles and across the industry,
- increasing responsibility and have undertaken roles in research, on site, in quality assurance, training, business development and now in commercial and strategy development,
- knowledge and insight into our local communities and how we can support each other
- a passion to help and inspire other people to enjoy their work as much as I do.

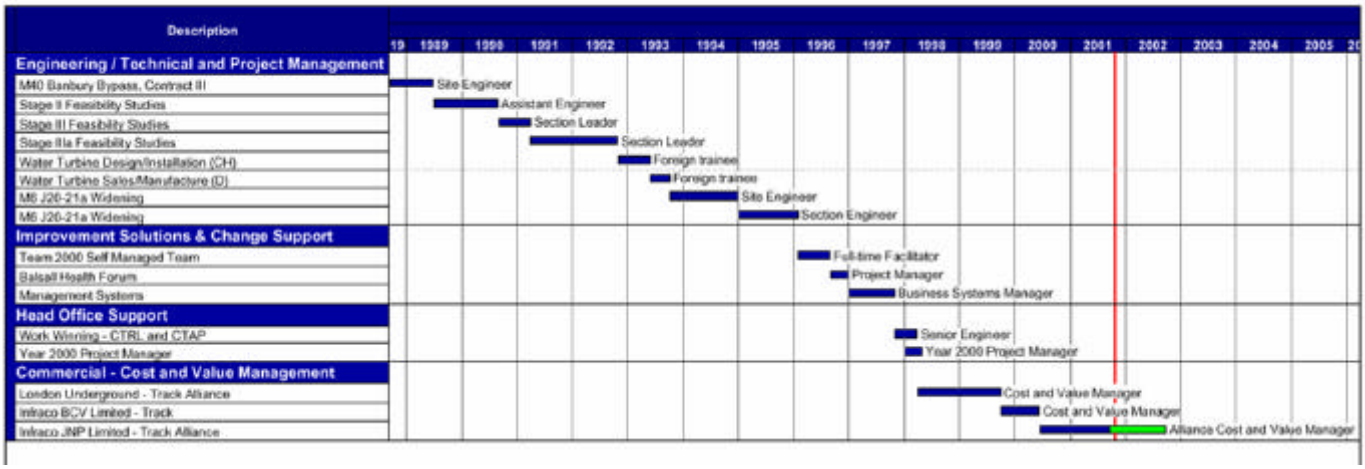


Figure 1 Career – 1998 – 2001 by functional role

2 Green fields

I joined Carillion's M40 Contract 3 in September 1998. The ICE 4th Conditions of Contract provided 12km of dual three lane motorway for the Department of Transport; tender value was circa £60m.

Structures were designed to minimise and allow for settlement from any future coal mining. The main structures had reinforced box section abutments to spread the load and jacking beams under the bearings.

There were 22 main Structures, 14 under bridges and 8 over bridges, and a further 13 culverts. The road materials consisted of

- 22,000 t sub-base
- 60,000 t CBM3 (Cement Bound Material)
- 360,000 m^3 CRCR (Continuously Reinforced Concrete Roadbase)
- 40,000 m^3 bituminous flexible surfacing

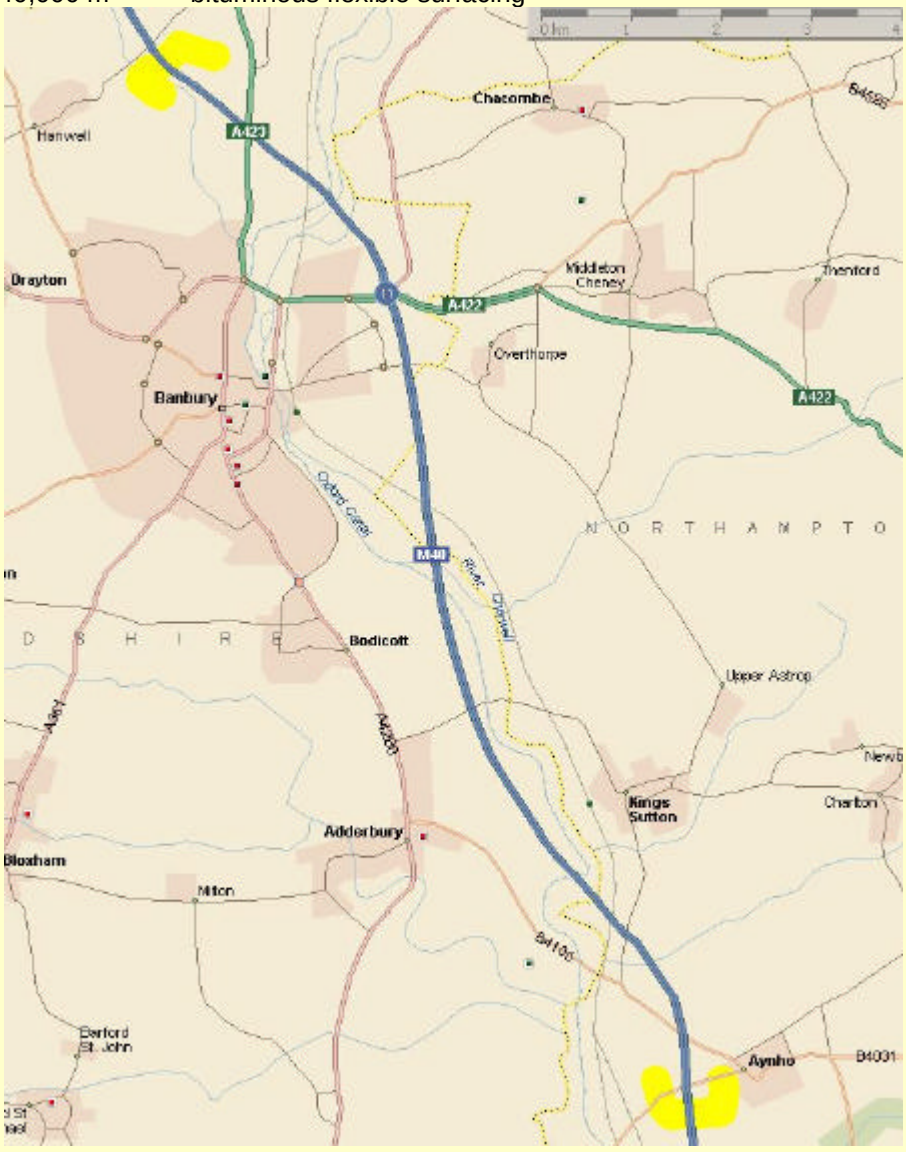


Figure 2 Key Statistics of M40 Contract 3, Banbury Bypass

In my first 3 months I worked for the Roads Section Engineer, working with a chain person and another graduate engineer.

- I maintained line and level control for trials of the concrete train. I increased productivity by reorganising the setting out process to avoid disrupting concrete wagon access.
- I installed mainline earthworks control and learnt the importance of careful planning and checking.

In January I became responsible for daily operations and material takeoffs for the contract's northern bridges reporting to the Structures' Section Engineer.

- In my diary I noted progress and resources used on site and any delays (e.g. weather or unplanned works).
- I monitored the weekly programme, which I took over responsibility for producing after 2 months.
- I checked dimensions and details on the design drawings were consistent raising written Technical Queries, with the Resident Engineer (RE) on anomalies or omissions.
- I involved the trade gangers and subcontractors in planning work. I issued from duplicate books clear instructions and sketches for use on site.
- I ensured that the RE's staff checked and witnessed works at the correct times.

Experience taught me that grass grows quickly over poorly planned material lay down areas, shuttering and objects to be cast in concrete must be adequately checked before and after pouring and that extremes of weather need to be considered well in advance.

I began to look beyond just the mechanics of accuracy, control and basic planning that I started out with to consider risk assessment and contingency planning.

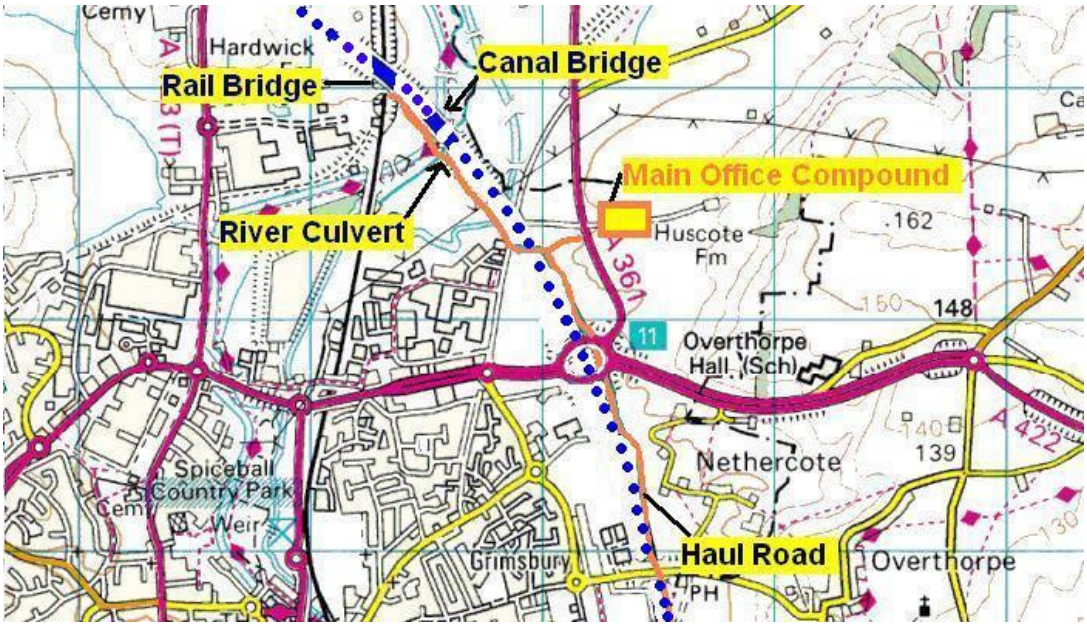


Figure 3 Northern Bridges and Haul Road on Banbury Bypass Contract 3

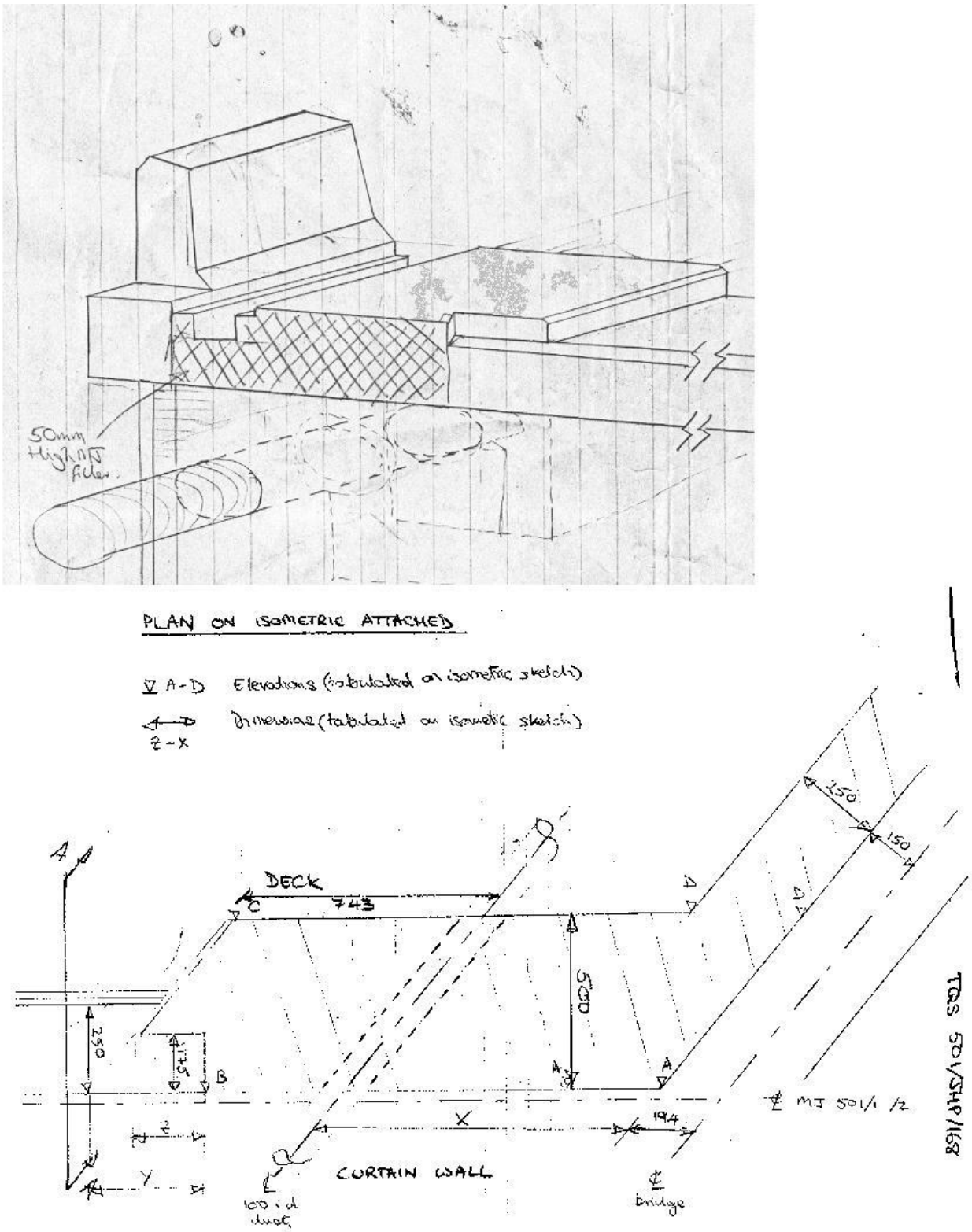


Figure 4 (top) Isometric sketch used on site, (bottom) plan used in technical query

3 Feasibility

I was keen to develop a breadth of skills outside a traditional contracting route. I moved to Liverpool in July 1989 seconded to Mersey Barrage Company (MBC) which was starting Stage II studies at a cost of £2m. MBC was set-up to examine the impact of a tidal barrage and optimise a preferred scheme for further development. Funded equally by the public and private sectors costs were recovered on a reimbursable basis; after 12 months the funding increased to £10m and full-time staff exceeded 50.

I reported to Project Manager Adam Wilson, a chartered civil engineer. I had responsibility for development and application of 2-dimensional (2-D) hydrodynamic, energy and financial numerical models. I had to comment on the accuracy and limitations of the model data that were used in studies into accommodation works, construction, shipping and environmental aspects of a power station.

The base hydrodynamic model was developed by Professor Falconer, whose published papers demonstrated its capability. I studied his papers and set out to ensure that the model was understood and used correctly.

To do this I:

1. determined confidence levels and variability of input data in time and space,
2. developed a modular structure for options; varying the number, position, type and operating characteristics and regime of the turbines and sluices across a full range of tides was then possible,
3. developed analytical tools to interrogate and present model output for validation and use by others.

I created a Quality Assurance control system for both model development and option simulations. New data from site investigations and basic research were procured as a result of recommendations I made as to existing data's suitability.

I budgeted, programmed, sourced and procured resources I required, managing a team of three graduates and three external consultants.

I successfully developed an option to simulate energy yield and hydrodynamics of the existing tidal power station in Brittany. Validated data were purchased by the French consultant SOGREAH for improving access to St Malo for larger ferries.

A paper written by Porter and Wilson was presented to a Conference in 1992.

Figure 5 Aerial View of the Rance Tidal Power Station in Brittany

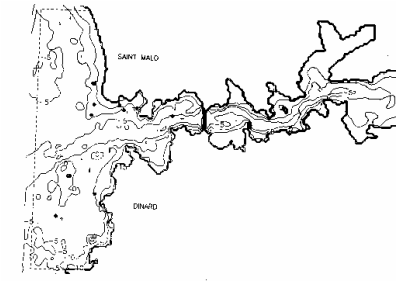


Figure 6 Area of near barrage model for Rance estuary showing depth contours

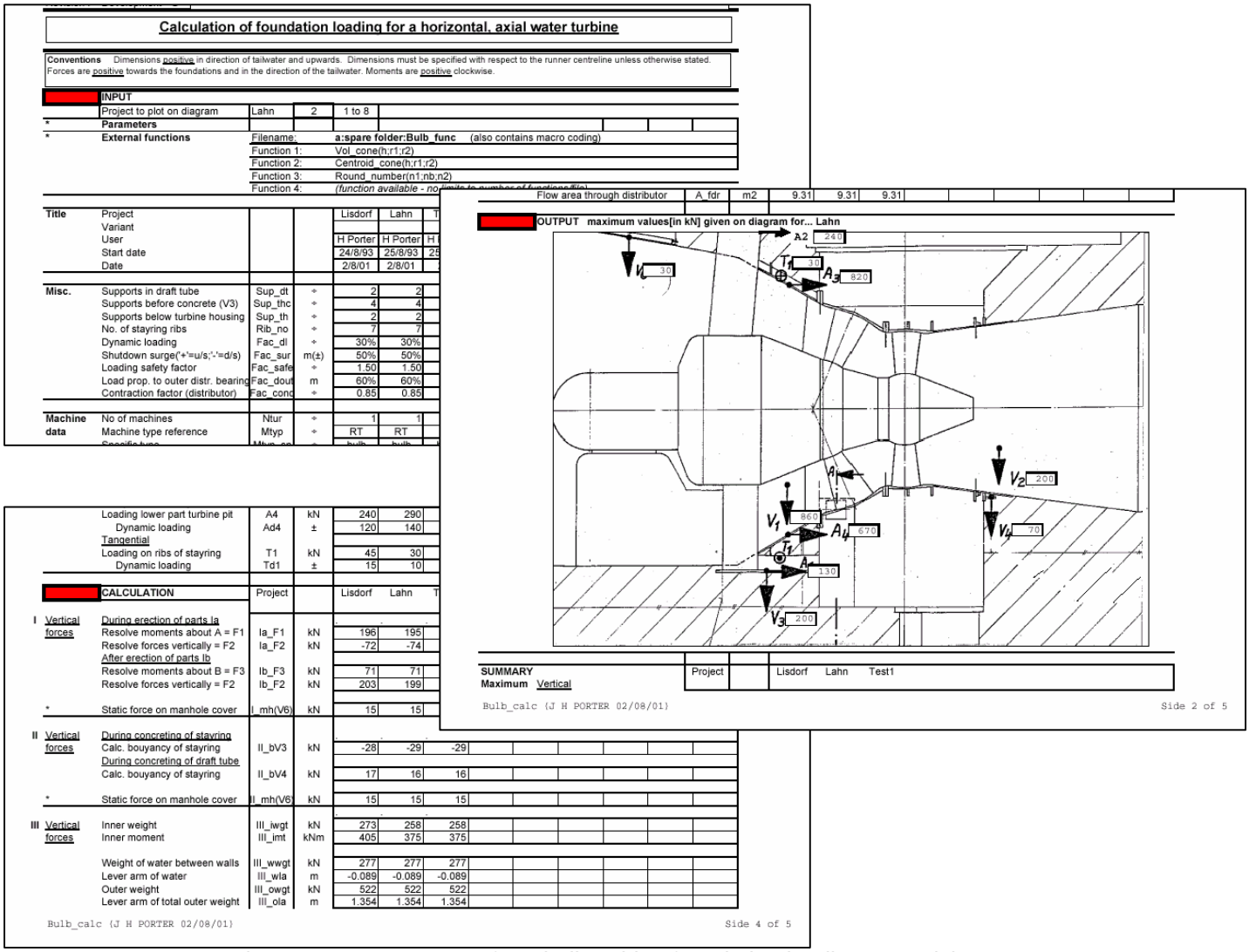
4 Abroad

At MBC I had worked with Sulzer Escher Wyss(Sulzer), a Swiss manufacturer of water turbines. I put together a proposal to have a year's training and experience in their offices. MBC, Sulzer and Carillion jointly agreed to fund this starting in December 1992. I reported to local line managers and was given mentors to guide and review my progress.

I devised a computer batch process for financial appraisal of turbine runner model's performance across the client's operational range that could run unattended overnight. Replacing a paper system this cut runner development time by 75% and by discounting flawed options enabled high potential models to be physically tested earlier.

I developed a spreadsheet that gave indicative loading on foundations at various stages of construction for small turbines. The dimension and weight of key components were specified allowing for a quick comparison of potential projects against existing plant.

I learnt about forms of contract based on plant performance and about working for a purchaser of civil engineering services.



Calculation of foundation loading for a horizontal, axial water turbine

Conventions Dimensions positive in direction of tailwater and upwards. Dimensions must be specified with respect to the runner centreline unless otherwise stated. Forces are positive towards the foundations and in the direction of the tailwater. Moments are positive clockwise.

INPUT

	Project to plot on diagram	Lahn	2	1 to 8	
*	Parameters				
*	External functions	Filename:	a:spare folder:Bulb_func	(also contains macro coding)	
		Function 1:	Vol_cone(h;r1;r2)		
		Function 2:	Centroid_cone(h;r1;r2)		
		Function 3:	Round_number(n1;nb;n2)		
		Function 4:	(function available - no limits to number of functions/fits)		

Title	Project			Lisdorf	Lahn	T
	Variant					
	User			H Porter	H Porter	H
	Start date			24/8/93	25/8/93	25
	Date			2/8/01	2/8/01	
Misc.	Supports in draft tube	Sup_dt	÷	2	2	
	Supports before concrete (V3)	Sup_thc	÷	4	4	
	Supports below turbine housing	Sup_th	÷	2	2	
	No. of stayring ribs	Rib_no	÷	7	7	
	Dynamic loading	Fac_dl	÷	30%	30%	
	Shutdown surge('+'=u/s;'-'=d/s)	Fac_sur	m(±)	50%	50%	
	Loading safety factor	Fac_safe	÷	1.50	1.50	
	Load prop. to outer distr. bearing	Fac_dout	m	60%	60%	
	Contraction factor (distributor)	Fac_conc	÷	0.85	0.85	
Machine data	No of machines	Ntur	÷	1	1	
	Machine type reference	Mtyp	÷	RT	RT	
	Specific type	Mtyp_sp	÷	bulb	bulb	
	Flow area through distributor	A_fdr	m2	9.31	9.31	9.31

OUTPUT maximum values[in kN] given on diagram for... Lahn

	Loading lower part turbine pit	A4	kN	240	290	
	Dynamic loading	Ad4	±	120	140	
	Tangential					
	Loading on ribs of stayring	T1	kN	45	30	
	Dynamic loading	Td1	±	15	10	

	CALCULATION	Project		Lisdorf	Lahn	T	
I Vertical forces	During erection of parts Ia						
	Resolve moments about A = F1	Ia_F1	kN	196	195		
	Resolve forces vertically = F2	Ia_F2	kN	-72	-74		
	After erection of parts Ib						
	Resolve moments about B = F3	Ib_F3	kN	71	71		
	Resolve forces vertically = F2	Ib_F2	kN	203	199		
*	Static force on manhole cover	I_mh(V6)	kN	15	15		
II Vertical forces	During concreting of stayring						
	Calc. bouyancy of stayring	II_bV3	kN	-28	-29	-29	
	During concreting of draft tube						
	Calc. bouyancy of stayring	II_bV4	kN	17	16	16	
*	Static force on manhole cover	II_mh(V6)	kN	15	15	15	
III Vertical forces	Inner weight	III_iwgt	kN	273	258	258	
	Inner moment	III_imt	kNm	405	375	375	
	Weight of water between walls	III_wwgt	kN	277	277	277	
	Lever arm of water	III_wla	m	-0.089	-0.089	-0.089	
	Outer weight	III_owgt	kN	522	522	522	
	Lever arm of total outer weight	III_ola	m	1.354	1.354	1.354	

SUMMARY	Project		Lisdorf Lahn Test1	
Maximum Vertical				

Bulb_calc (J H PORTER 02/08/01) Side 4 of 5

Bulb_calc (J H PORTER 02/08/01) Side 2 of 5

Figure 7 Extracts from bulb turbine foundation loading spreadsheet

5 Live motorway

MBC was mothballed in early 1993. I returned to site in November with the aim of gaining core site engineering skill and experience.

I joined the £100m ICE 5th contract with the Highways Agency to both widen and reconstruct 12km of the M6, between Junctions 20(J20) and 21a in Cheshire. The contract included constructing the new Thelwall viaduct.

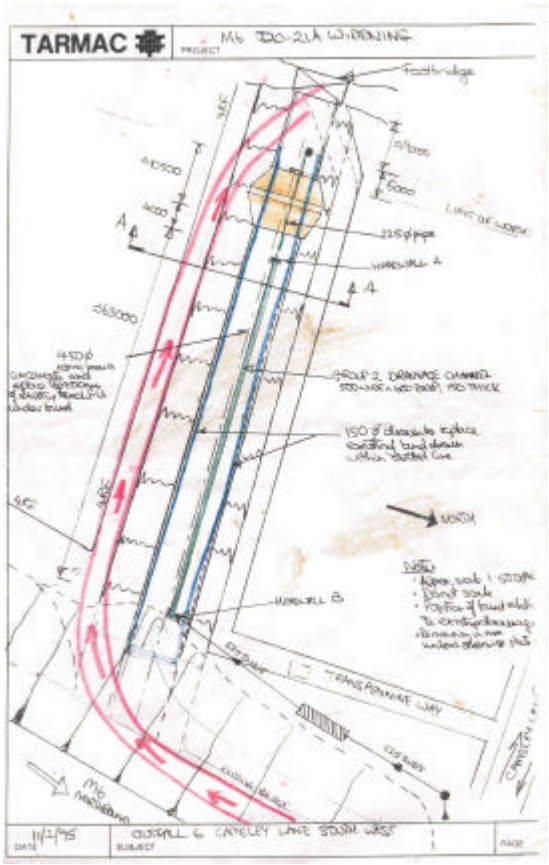
Widening
After 2 months spent familiarising myself with a site again, I managed site engineering operations for 5km of phased widening, including the M56 and J20 on slip roads, as an Engineer reporting to the Roads Section Engineer.

Inspired by a Tom Peter's 'In search of Excellence' seminar, I organised the 6 site engineers, 2 trainee technicians and 3 chainmen I was responsible for in a supportive team structure. Key areas of responsibility for engineers' groups were:

- main works bulk earthworks - line and level, productivity and operations planning
- detailed operations – communications, kerb drainage, phased carriageway crossings
- site clearance, fences, underground services and diversions and new drainage runs.

I setup an operational base at J20 with wall mounted, overall and detailed programmes including target and actual productivities. Each group needed to know what the others were doing. A laminated plan of the site works logged activity permits and expiry dates, Technical Query details and major equipment locations and their next planned movements.

I started at this stage to write letters to the RE and receive instructions on site. I was responsible for checking and signing off detailed Operation Plans, Method Statements and Safety Risk Assessments for all the works being undertaken.



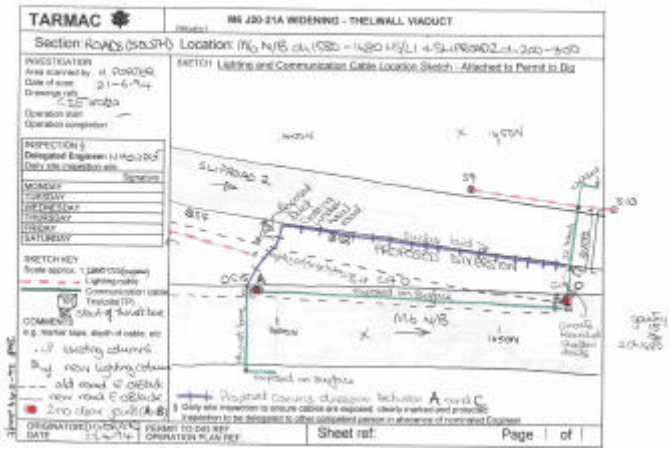


Figure 8 M6 - Sketches from Operations Plans and Permit to Dig

I created check sheets for each major element of work which were signed by the RE's staff; for catchpits these had setting out information, iron work and specification requirements. These avoided duplication of effort; the same sheet could be used for the operation plan and allowed engineers time to be more efficiently spent doing productive work. Unfinished works and abortive works were negligible. This compared well to a previous phase of works.

Interchange

I was promoted to Section Engineer in January 1995 working for the Roads Agent and took responsibility for managing the phased interchange works at J21a, installation of oil interceptors and remaining side road diversions. I maintained the team ethic I had started with my new team of 2 Engineers and 5 site engineers.

Planning

I found our tender estimators' programme for the interchange was unbuildable. He had overlooked design level changes from adjacent old and new carriageway in excess of 750mm.

I optimised traffic phases considering grade changes, construction widths and temporary works required, including signs, lighting, drainage and pedestrian diversions. The interchange works were completed and accepted ahead of the original programme with few remedial works; one phase cut 3 weeks off the 20 week programme as it allowed us to work more productively and safely. It increased the diversion distance but eliminated two changes traffic management and thereby reduce potential risks to all parties.

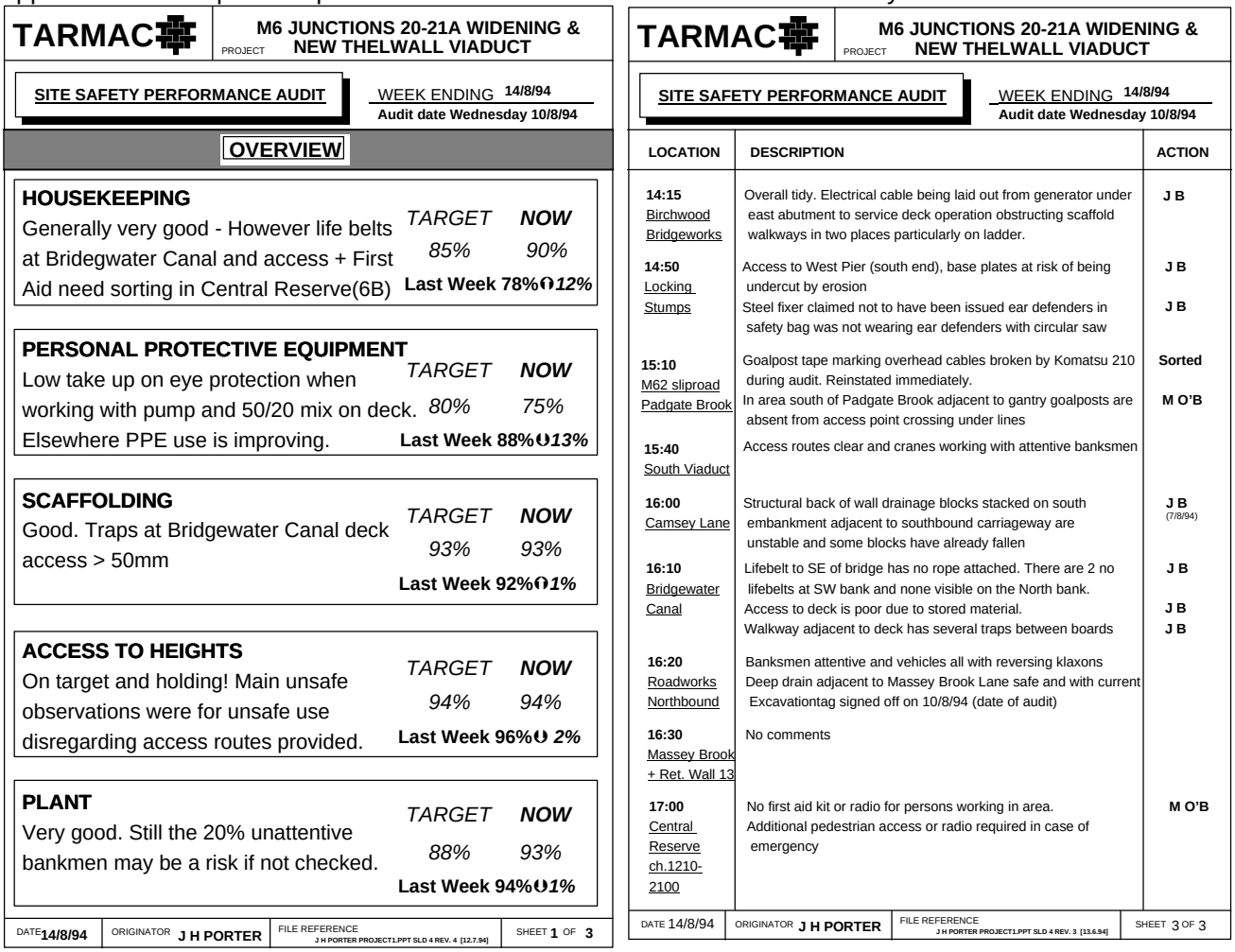
Services

There was limited knowledge of the many existing services. I appointed a Services Co-ordinator who organised trial holes and then maintained a live coloured plan with co-ordinated details. We had no incidents of cable strikes after his appointment.

I managed to avoid previous problems with damaged lighting cables at duct crossings by ensuring early programme liaison between civil and electrical contractors, early mandrel testing of ducts, wise temporary lighting feeds and enhanced protection at vulnerable areas and times.

Safety

Throughout 1994 I organised 25 weekly Positive Safety Behaviour Audits with a colleague as part of a Health and Safety Executive study. I gave monthly feedback tool box talks which were also used to agree and assess targets. Targets were displayed with actual performance at the time clocks. We addressed a decrease in positive behaviour as a Sectional Completion approached. I now promote positive measures as I have seen how effective they are.



TARMAC PROJECT **M6 JUNCTIONS 20-21A WIDENING & NEW THELWALL VIADUCT**

SITE SAFETY PERFORMANCE AUDIT WEEK ENDING **14/8/94** **Audit date Wednesday 10/8/94**

OVERVIEW

HOUSEKEEPING
Generally very good - However life belts at Bridegwater Canal and access + First Aid need sorting in Central Reserve(6B)
TARGET 85% *NOW* 90%
Last Week 78%↑12%

PERSONAL PROTECTIVE EQUIPMENT
Low take up on eye protection when working with pump and 50/20 mix on deck. Elsewhere PPE use is improving.
TARGET 80% *NOW* 75%
Last Week 88%↓13%

SCAFFOLDING
Good. Traps at Bridgewater Canal deck access > 50mm
TARGET 93% *NOW* 93%
Last Week 92%↑1%

ACCESS TO HEIGHTS
On target and holding! Main unsafe observations were for unsafe use disregarding access routes provided.
TARGET 94% *NOW* 94%
Last Week 96%↓ 2%

PLANT
Very good. Still the 20% unattentive bankmen may be a risk if not checked.
TARGET 88% *NOW* 93%
Last Week 94%↓1%

DATE **14/8/94** ORIGINATOR **J H PORTER** FILE REFERENCE J H PORTER PROJECT1.PPT SLD 4 REV. 4 [12.7.94] SHEET **1** OF **3**

TARMAC PROJECT **M6 JUNCTIONS 20-21A WIDENING & NEW THELWALL VIADUCT**

SITE SAFETY PERFORMANCE AUDIT WEEK ENDING **14/8/94** **Audit date Wednesday 10/8/94**

LOCATION	DESCRIPTION	ACTION
14:15 Birchwood Bridgeworks	Overall tidy. Electrical cable being laid out from generator under east abutment to service deck operation obstructing scaffold walkways in two places particularly on ladder.	**J B**
14:50 Locking Stumps	Access to West Pier (south end), base plates at risk of being undercut by erosion	**J B**
	Steel fixer claimed not to have been issued ear defenders in safety bag was not wearing ear defenders with circular saw	**J B**
15:10 M62 sliproad Padgate Brook	Goalpost tape marking overhead cables broken by Komatsu 210 during audit. Reinstated immediately.	**Sorted**
	In area south of Padgate Brook adjacent to gantry goalposts are absent from access point crossing under lines	**M O'B**
15:40 South Viaduct	Access routes clear and cranes working with attentive banksmen	
16:00 Camsey Lane	Structural back of wall drainage blocks stacked on south embankment adjacent to southbound carriageway are unstable and some blocks have already fallen	**J B** (7/8/94)
16:10 Bridgewater Canal	Lifebelt to SE of bridge has no rope attached. There are 2 no lifebelts at SW bank and none visible on the North bank.	**J B**
	Access to deck is poor due to stored material.	**J B**
	Walkway adjacent to deck has several traps between boards	**J B**
16:20 Roadworks Northbound	Banksmen attentive and vehicles all with reversing klaxons	
	Deep drain adjacent to Massey Brook Lane safe and with current Excavationtag signed off on 10/8/94 (date of audit)	
16:30 Massey Brook + Ret. Wall 13	No comments	
17:00 Central Reserve ch.1210-2100	No first aid kit or radio for persons working in area. Additional pedestrian access or radio required in case of emergency	**M O'B**

DATE 14/8/94 ORIGINATOR **J H PORTER** FILE REFERENCE J H PORTER PROJECT1.PPT SLD 4 REV. 3 [13.6.94] SHEET 3 OF 3

Figure 9 a) Front summary sheet used for briefing site personnel b) Detailed commentary

Management and other roles

I now became involved in setting up orders for materials and suppliers and liasing with the Roads Works Manager on issues across the whole project.

During this period I was site liaison engineer for the lighting subcontractor and became Crane Co-ordinator and Temporary Works Co-ordinator for the Roads Section.

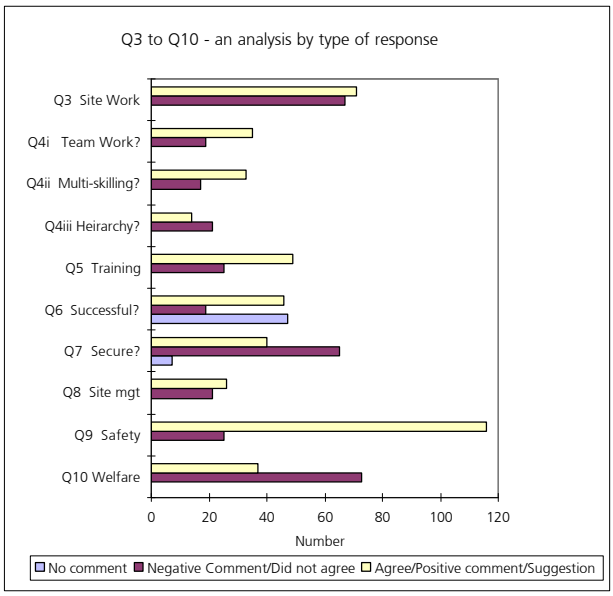
6 Facilitation

6.1 Corporate

In April 1996 I became one of twelve individuals, Team 2000, chosen from 15,000 Carillion Construction employees, to become full-time facilitators.

We formed a self-managed team to facilitate change responsible through a mentor to the main Board of Directors. We generally worked in pairs and I undertook 14 assignments – two examples follow.

Crown House Engineering – North East
I interviewed 100 electricians and fitters on a one-to-one basis about what they thought about their business.



Sound bites within the above responses:

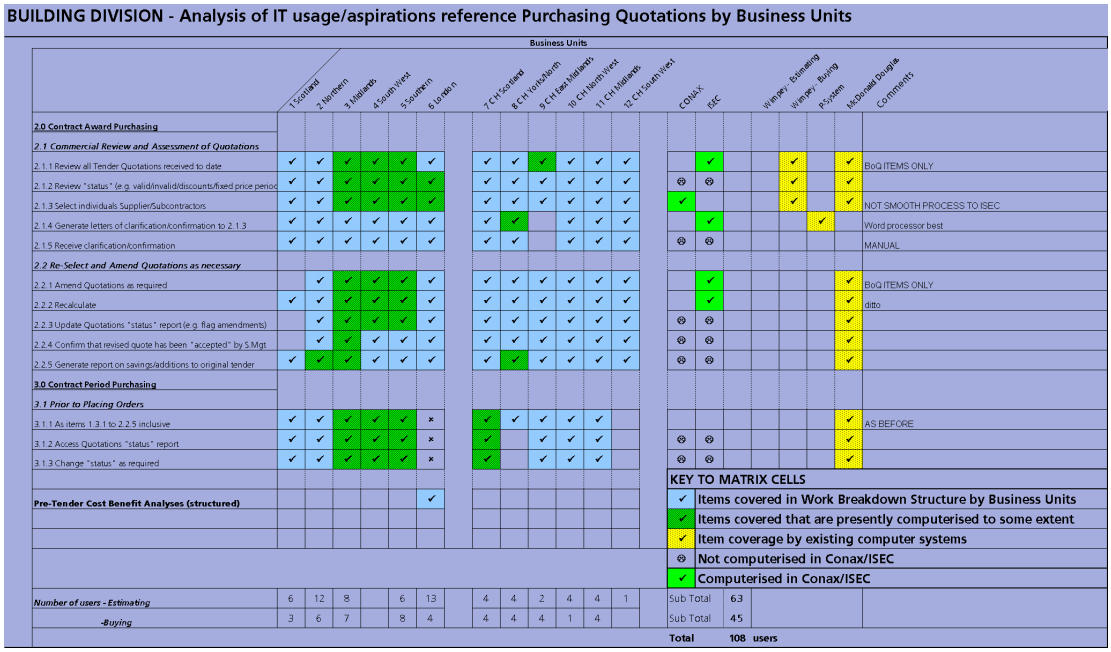
Q3 'over certain value storeman should be included in tender price'
Q4i 'M&E split in company from the top', 'teamwork on site seems to be good'
Q4ii 'Know your people', 'Give people opportunities to show potential'
Q4iii 'No comment', 'poor attitude', 'OK Supervisor listens and there's no problem', 'Hopefully through CPI top management will listen to our ideas'
Q5 'Don't receive any training', 'more time should be given to training apprentices', 'implement a system where people's needs can be identified',
Q6 'Feel successful because I like the company and they treat me well', 'more success would come from having more backup from senior men'
Q7 'Secure as can be industry', 'You can never be secure', 'people on contract work do not feel secure', 'have a newsletter to stop rumours'
Q8 'More open communication please', 'OK in some cases excellent', 'tend to keep you in the dark', 'have a review of paperwork.. some forms are useful but paperwork slows men down'
Q9 'Good safety system and communication of safety', 'redesign new overalls', 'toilets too near food area', 'issue "fix on" ear defenders', safety officers should get more involved with investigating areas of work', 'overalls could be better', 'more toolbox talks', 'quite good - but can always be improved', 'Good safety officers - they are strict, which has made us more self aware of safety'
Q10 'overcrowded cabins', 'cabins need better maintenance so they do not leak', 'cabins are OK - no further comment', 'have microwave oven in canteen', 'cabins are too overcrowded for the number of men onsite - plan properly', 'welfare facilities....need to be improved but never happens despite complaints', 'have better lights, clean regularly and have hot and cold water working'

Figure 10 Crown House interviews summary of responses to questions 3 -10

I collated and interpreted the information into a report that was actioned by local management. I learnt 101 great things about simple but effective systems for loss and cost control but also about the wealth of talent, respect and knowledge that resides in our workforce.

Building - Estimating Process

I interviewed estimators, throughout the Building and Contract Housing businesses, on the systems and processes they used. I produce a report for the Commercial Director recommending actions he should consider based upon criteria in the agreed brief.



BUILDING DIVISION - Analysis of IT usage/aspirations reference Purchasing Quotations by Business Units

Business Units

	1 Scotland	2 Northern	3 Midlands	4 South West	5 Southern	6 London	7 CH Scotland	8 CH Yorkshire/N	9 CH East Midlands	10 CH North West	11 CH Midlands	12 CH South West	CONAX	ISEC	Wimpey Estimating	Wimpey Buying	PSystem	McDonald Douglas	Comments
2.0 Contract Award Purchasing																			
2.1 Commercial Review and Assessment of Quotations																			
2.1.1 Review all Tender Quotations received to date	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓		✓	BoQ ITEMS ONLY
2.1.2 Review "status" (e.g. valid/invalid/discounts/fixed price period	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	⊖	⊖		✓		✓	
2.1.3 Select individuals Supplier/Subcontractors	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓		✓	NOT SMOOTH PROCESS TO ISEC
2.1.4 Generate letters of clarification/confirmation to 2.1.3	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓		✓			✓		Word processor best
2.1.5 Receive clarification/confirmation	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	⊖	⊖					MANUAL
2.2 Re-Select and Amend Quotations as necessary																			
2.2.1 Amend Quotations as required		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓				✓	BoQ ITEMS ONLY
2.2.2 Recalculate	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓				✓	ditto
2.2.3 Update Quotations "status" report (e.g. flag amendments)		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	⊖	⊖				✓	
2.2.4 Confirm that revised quote has been "accepted" by S.Mgt		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	⊖	⊖				✓	
2.2.5 Generate report on savings/additions to original tender	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	⊖	⊖				✓	
3.0 Contract Period Purchasing																			
3.1 Prior to Placing Orders																			
3.1.1 As items 1.3.1 to 2.2.5 inclusive	✓	✓	✓	✓	✓	×	✓	✓	✓	✓	✓							✓	AS BEFORE
3.1.2 Access Quotations "status" report	✓	✓	✓	✓	✓	×	✓		✓	✓	✓		⊖	⊖				✓	
3.1.3 Change "status" as required	✓	✓	✓	✓	✓	×	✓		✓	✓	✓		⊖	⊖				✓	
													KEY TO MATRIX CELLS						
Pre-Tender Cost Benefit Analyses (structured)						✓							✓	Items covered in Work Breakdown Structure by Business Units					
													✓	Items covered that are presently computerised to some extent					
													✓	Item coverage by existing computer systems					
													⊖	Not computerised in Conax/ISEC					
													✓	Computerised in Conax/ISEC					
Number of users - Estimating	6	12	8		6	13	4	4	2	4	4	1	Sub Total	63					
-Buying	3	6	7		8	4	4	4	4	1	4		Sub Total	45					
													Total	**108 users**					

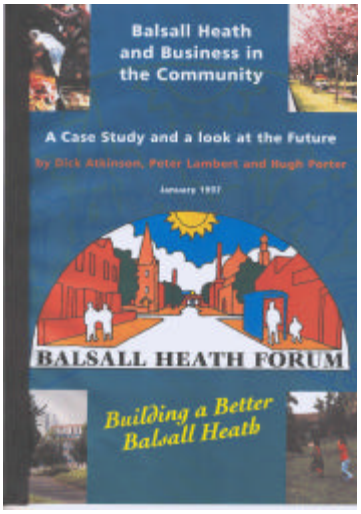
Figure 11 Building estimating process analysis; 12 business unit across, work breakdown structure down page (page 3 of 3).

I learnt about the tendering process as I set the systems used against a work breakdown structure. I also learnt some of the best ideas that Wimpey and Carillion had developed individually around the country.

6.2 Community

In October 1996, I was seconded to work as a Project Manager in Balsall Heath. This was part of Carillion's and Sir Neville Simms commitment to Business in the Community.

I learnt how careful listening and a small amount of well-targeted effort can help people immeasurably.



Key Secondment Objectives

- **Engage small businesses**
- **Develop BT communication project**
- **Produce a 'Case Study' to record what has been done and bring together in it ideas as to what might be done next**

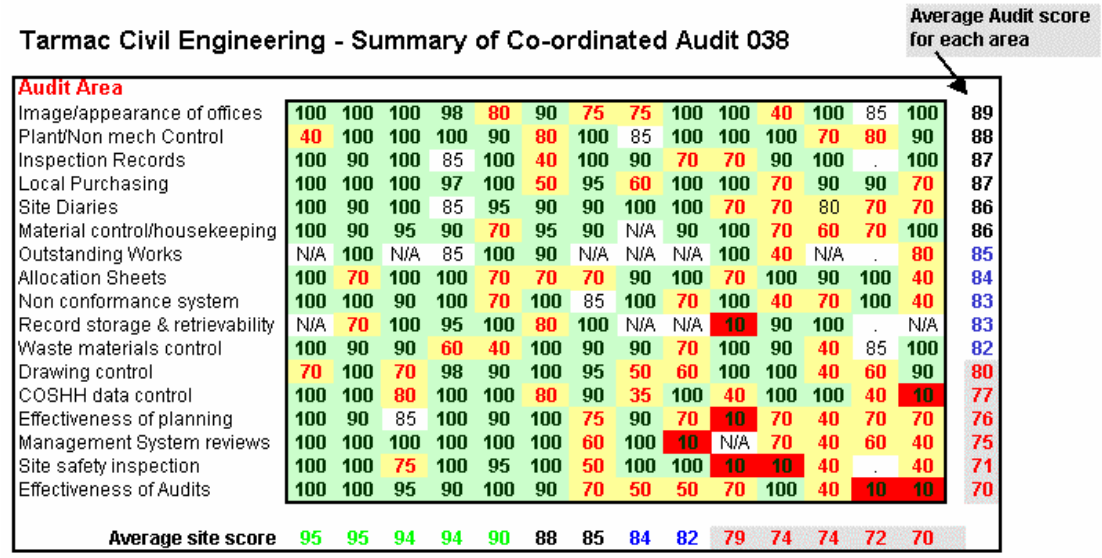
Figure 12 BitC - a) Case Study output b) Secondment objectives

6.3 Project

In January 1997 I returned to Carillion Civil Engineering and became Business Systems Manager for London and a trained Quality Auditor. I reported to the Head of Business Systems.

I pioneered the implementation of Integrated Management Systems in Carillion. My strategy had been helped by my involvement with the Midlands Construction Forum.

I raised awareness of good practice across the company through national forums and went to cross industry working parties.



Tarmac Civil Engineering - Summary of Co-ordinated Audit 038

Average Audit score for each area

Audit Area															
Image/appearance of offices	100	100	100	98	80	90	75	75	100	100	40	100	85	100	89
Plant/Non mech Control	40	100	100	100	90	80	100	85	100	100	100	70	80	90	88
Inspection Records	100	90	100	85	100	40	100	90	70	70	90	100	.	100	87
Local Purchasing	100	100	100	97	100	50	95	60	100	100	70	90	90	70	87
Site Diaries	100	90	100	85	95	90	90	100	100	70	70	80	70	70	86
Material control/housekeeping	100	90	95	90	70	95	90	N/A	90	100	70	60	70	100	86
Outstanding Works	N/A	100	N/A	85	100	90	N/A	N/A	N/A	100	40	N/A	.	80	85
Allocation Sheets	100	70	100	100	70	70	70	90	100	70	100	90	100	40	84
Non conformance system	100	100	90	100	70	100	85	100	70	100	40	70	100	40	83
Record storage & retrievability	N/A	70	100	95	100	80	100	N/A	N/A	10	90	100	.	N/A	83
Waste materials control	100	90	90	60	40	100	90	90	70	100	90	40	85	100	82
Drawing control	70	100	70	98	90	100	95	50	60	100	100	40	60	90	80
COSHH data control	100	100	80	100	100	80	90	35	100	40	100	100	40	10	77
Effectiveness of planning	100	90	85	100	90	100	75	90	70	10	70	40	70	70	76
Management System reviews	100	100	100	100	100	100	60	100	10	N/A	70	40	60	40	75
Site safety inspection	100	100	75	100	95	100	50	100	100	10	10	40	.	40	71
Effectiveness of Audits	100	100	95	90	100	90	70	50	50	70	100	40	10	10	70
Average site score	95	95	94	94	90	88	85	84	82	79	74	74	72	70	

Figure 13 Audit results presented to National Forum showing relative site performance across sheet and strong/weak areas of company performance down the sheet

I presented a lecture at the ALGS residential course of Health and Safety in June on my work on Integrated Systems.

6.4 Work Winning

Between December 1997 and March 1998 I was involved in three teams putting together the tender documents and presentations. All three tenders were for Option C Engineering and Construction Contracts.

We were successful with London Underground Limited and were awarded a contract under the Corporate Track Alliance Programme for three years in September 1998.

My current role and experience is recorded in the 4000 word report.