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Paper for Mouchel Parkman

Croxley Rail Link

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Introduction

The Croxley Rail Link is a proposed extension to the London Underground Metropolitan Line to Watford Junction via Watford High Street.

Hertfordshire County Council, being the lead partner for the project, has commissioned a number of studies to assist in its preparation of a Major Schemes Business Case. These include a single 'design specification' report by Mouchel Parkman and two cost estimates, based on this specification.

Additionally, London Underground Ltd has commissioned a separate costs review of the scheme.

Mouchel Parkmen has been commissioned by Hertfordshire County Council to carry out a comprehensive review of the various studies and cost estimates that had previously been undertaken.

VolkerRail Ltd has been asked by Mouchel Parkmen to review the cost data and the report produced by them as a requirement of their internal auditing processes.



The Scheme

The Croxley Rail Link is a proposal extension of the London Underground Ltd (LUL) Metropolitan Line to Watford Junction Station via Watford High Street Station and the National Rail Network.

This new extension will allow a 6-trains-per-hour operation between Watford Junction and Central London.

The length of the new railway added to the existing Metropolitan Line is approximately 4.5 km, although the scheme causes the closure of 1.3 km of the existing Metropolitan Line between the new viaduct and Watford Metropolitan Station.

The Metropolitan Line is connected to the disused Croxley Branch by a link constructed over a new embankment and viaduct.

Four stations are included in the scheme: Ascot Road (replacing Croxley Green), Watford West, Watford High Street and Watford Junction Stations.



Parties & Roles

Hertfordshire County Council	Lead Partner
London Underground Ltd	Infrastructure Owner
Mouchel Parkman Consulting	Design Engineers
Turner & Townsend	Cost Consultants (LUL)
First Engineering / Nuttall	Construction Budget
Norwest Holst Ltd	Construction Budget



Methodology

Mouchel Parkman Consulting issued to VolkerRail a copy of the Scheme Design Proposal and the Costing Information as listed in the Report Data.

The data was reviewed by VolkerRail's Senior Project Manager to give a brief of the Scheme Content to the Estimating Manager and the Regional Director.

A review of the rates and the prices for the general work content was then undertaken by the Estimating Manager and reviewed by the Regional Director. This process enabled a 'Market Testing' to be made of the Cost Estimation.

Data Issued

VolkerRail have undertaken a high level review of the data contained in the following reports:

- Cost Report, dated October 2005, prepared by Turner & Townsend;
- Design Specification, dated March 2006, prepared by Mouchel Parkman;
- Report for Hertfordshire County Council - Contractor's Estimate of Pricing, not dated, prepared by Norwest Holst;
- Report for Hertfordshire County Council - Croxley Rail Link Contractor's Cost Estimate dated July 2006, prepared by First Engineering/Nuttall;
- Review of Cost Estimates - Croxley Rail Link, dated August 2007, for Hertfordshire County Council, prepared by Mouchel Parkman



Report Scope

This paper is a review of the rates, prices and percentages for the civil engineering and railway cost estimates from an experienced contractor's viewpoint. VolkerRail's Senior Contract Staff reviewed the contract of the project but have not sought to make any technical comment on the design proposals as this is not part of the brief.

VolkerRail have not undertaken a detailed pricing review, nor are we able to comment on the validity of the design specification or of the cost estimates totals derived from same.

We are able to state as a matter of opinion, whether the rates, prices and percentages appear reasonable in the context of the various reports.

Similarly, we act simply to give an opinion as to the basis of data evaluation undertaken by Mouchel Parkman in their report entitled 'Review of Cost Estimates' dated August 2007.



Appraisal and Review of Data

The Review of Cost Estimates dated 2007, by Mouchel Parkman, is a review of the costs estimates previously produced for Hertfordshire and London Underground.

The initial cost plan produced by Turned Townsend in 2005 has been combined with the more detailed cost estimates undertaken by specialist contracting organisation. The organisations approached to provide cost estimates have been chosen with a view to diversity of expertise and experience in their respective fields. They consist of a specialist railway engineering contractor supported by:

- a management and project consultant: Turner & Townsend;
- a rail contractor working with a civil engineering contractor: First Engineering / Nuttall;
- a civil engineering contractor: Norwest Holst.

Each of the organisations approached have undertaken a thorough appraisal of the work scope as defined within the design specification.

Turner & Townsend

Turner & Townsend produced an overall cost plan for the project at the outset. The cost plan makes allowances for all aspects of the project. A detailed analysis of the cost breakdown is not included.

First Engineering / Nuttall

The First Engineering/Nuttall report appears to be the most comprehensive and holistic from the points of view of both, scope understanding and pricing, including a breakdown of costs and an outline programme.

Norwest Holst

The Norwest Holst report concentrates on their field of expertise: civil engineering.



All reports attempt to quantify project management, preliminaries, design, assurance, inflation and risk costs by means of applying varying percentages.

Turner & Townsend have also integrated additional costs from LUL for CPO, Train and Additional Stabling which were outside the scope of Mouchel Parkman's report.

The basis of Mouchel Parkman's appraisal (see extract on the next page) is to compare the prices provided by the three parties, in line with their own experience, and to 'cherry pick' the prices they feel most accurately reflect the cost for each section of the scope.

In this way, they have opted for using prices provided by the organisation they feel has the most appropriate expertise, specifically:

- Norwest Holst for the civil engineering elements,
- First Engineering for the railway elements,
- and finally some minor items taken from Turner & Townsend's costs.

Summary of Construction Costs.

Item	Description	Q3 - 05		Q1 - 06		Q2 - 06		Recommend
		£	%	£	%	£	%	
1	Ascot Road Station	£ 4,261,000		£ 3,233,000		£ 4,300,684		£ 4,300,684
2	Mods to Watford High St station	£ 448,000		£ 1,669,000		£ 502,706		£ 502,706
3	Mods to Watford Juncot station	£ 719,000		£ 2,169,000		£ 754,603		£ 754,603
4	Reconstruct Watford West station	£ 4,342,000		£ 3,460,000		£ 4,387,837		£ 4,387,837
5	Viaduct	£ 9,588,000		£ 5,853,656		£ 6,831,207		£ 7,540,000
6	Cardiff Rd underbridge	£ 382,000		£ 134,469		£ 132,546		£ 382,000
7	Ascot Road underbridge	£ 401,000		£ 487,338		£ 968,187		£ 487,338
8	River Colne (S) underbridge	£ 392,000		£ 231,034		£ 252,397		£ 252,397
9	River Colne (N) underbridge	£ 913,000		£ 262,000		£ 530,107		£ 530,107
10	Tolpits Lane overbridge	£ 559,000		£ 15,065		£ 48,992		£ 15,065
11	Vicarage Rd overbridge	£ 287,000		£ 14,672		£ 45,868		£ 14,672
12	Wiggenhall overbridge	£ 323,000		£ 18,340		£ 45,335		£ 18,340
13	Cardiff Rd Arch overbridge	£ 50,000		£ 24,549		£ 18,512		£ 24,549
14	Culvert extension	£ 65,000		£ 31,679		£ 81,080		£ 81,080
15	Cuttings, retaining walls, embankments	£ 3,771,000		£ 1,345,517		£ 1,083,776		£ 2,500,000
16	Permanent way	£ 8,065,000		£ 5,762,688		£ -		£ 5,700,000
17	Disposal of ballast contamination	£ 224,000		£ -		£ 125,630		£ 125,630
18	AC electrification	£ 2,341,000		£ 7,946,000		£ -		£ 2,000,000
19	DC electrification	£ 5,969,000		£ -		£ -		£ 6,150,000
20	Services diversions	£ 370,000		£ -		£ -		£ 370,000
21	Signalling	£ 8,184,000		£ 11,588,235		£ -		£ 12,000,000
22	Telecomms	£ 2,389,000		£ -		£ -		£ 2,800,000
23	Fencing	£ 917,000		£ 235,000		£ 419,640		£ 500,000
24	Demolish Croxley Green station	£ 18,000		£ 3,000		£ 2,091		£ 18,000
25	Demolish Watford Stadium station	£ 18,000		£ 13,000		£ 22,620		£ 18,000
26	Demolish canal & River Gade bridges	£ 350,000		£ 41,000		£ 345,960		£ 50,000
	Environment protection/wildlife	£ 55,346,000		£ 44,538,242		£ 489,375		£ 350,000
		£ 11,069,260	15%	£ 6,680,736	21.5%	£ 4,615,537	21.3%	£ 11,023,014
	Prelims	£ 20%		£ 15%		£ 21.5%		£ 21.3%
	Sub Total	£ 66,415,200		£ 51,218,978		£ 26,004,690		£ 62,896,022
27	Profit and OH	£ 4,981,140	7.5%	£ -		£ -		£ 4,717,202
28	Design	£ 7,969,824	12%	£ 3,117,677	7%	£ -		£ 2,883,280
29	Project Management	£ 3,320,760	5%	£ 2,226,912	5%	£ -		£ 1,611,898
30	Assurance	£ 5,313,216	8%	£ 1,336,147	3%	£ -		£ 1,886,881
31	Third party Costs	£ -		£ 6,680,736	15%	£ -		£ 7,780,951
32	Possession Costs	£ -		£ -		£ -		£ 500,000
	Total Estimate	£ 88,000,140		£ 64,580,451		£ 26,004,690		£ 82,276,234

All figures adjusted to January 2007



Rate & Price Review

The rates and prices are only broken down sufficiently in the First Engineering / Nuttall document to enable a rates appraisal.

VolkerRail's review of the rates and prices may be summarised as follows: the costs and rates in general, and taking account of the dates when they were estimated, are within the ranges we, as an experienced contractor, would anticipate.

It should be noted that there are significant cost sums: architectural finishes, retails communications, post tensioning, etc. that, whilst based on historical or comparable project data, we are unable to comment upon.



Percentage Additions

To the sum of the selected costs are applied percentages for:

- Preliminaries: 21.3%
- Overhead and Profit: 7.5%
- Design: 4.6%
- Project Management: 2.5%
- Assurance: 3%

Preliminaries

We note a 21.3% allowance has been made for Preliminaries.

From the recent market rates we could expect a figure of 15% to 22%.

On a design build in the rail environment, the site preliminary overhead would be in the upper range.

This scheme has significant existing infrastructure and thus our opinion would be that the 21.3% constitutes a generous allowance.

Overhead and Profit

The Overhead and Profit allowance at 7.5% would be adequate.

For projects with only rail content a higher percentage is often achieved, but for a multidisciplinary project, in today's market, the allowance made is correct.



Design

We note a 4.6% allowance has been made for Design.

The range of design percentage varies dependent on the work content.

- For civil type work a range of 4% to 6% would be expected for the total design service and scope. Note that Norwest Holst have allowed 6%.
- On rail projects a design allowance – with integration into an existing system – will range from 5% to 9%.

On the cost plan, the approximate budgets are:

£22M for civil construction is and £29M for rail work.

Applying the mid-way percentages gives the following allowances:

5% * £22M =	£1.10M	for civil works
7% * £29M =	£2.03M	for rail works
Total allowance	£3.13M	

Applying the top percentages, that gives the following allowances:

6% * £22M =	£1.32M	for civil works
9% * £29M =	£2.61M	for rail works
Total allowance	£3.93M	

As these figures are based on a net construction cost, we suggest that a design allowance of £3.93M say £4.00M should be used, i.e. approximately 7.7%



Project Management

We note a 2.5% allowance has been made for Project Management.

We could suggest a 4.0% allowance should be used because of the interface of all the Third Parties in the urban environment of this project.

Assurances

We note a 3.0% allowance has been made for Assurances.

The assurances process is very important on a multidisciplinary railway project and we consider the 3.0% allowance realistic.



Summary

Mouchel Parkman's strategy for comparing costs is to use the pricing of the organisation that has the most appropriate expertise.

This allows them to err on the conservative side for establishing the budget for the Council's Major Schemes Business Case – which is a prudent measure – whilst simultaneously having the comfort that the rates and prices have been validated by comparison and are therefore not 'fat'.

Detailed analysis of the unit rates has not been part of this brief, but our opinion is that they represent the work content to the detail available. Reasonable lump sum allowances have been made for a project of this nature where details are still to be developed.

The percentage additions have been reviewed in light of our experience and expertise and we consider an addition should be made against the Design and Project Management allowances, whilst a small reduction could be made on the Preliminaries percentage.

In light of percentage additions, the out-turn costs of £82.30M could be increased by approximately £1.00M, i.e. to £83.30M, still comparing favourably with the £82.70M mentioned in the First Engineering / Nuttall Costs Estimate, which we view as the most considered of the reports, even allowing for the Optimum Bias allowance.