PROGRAMME CONTROLS - COST

Estimating Procedure

Document Number: CR-XRL-Z9-GPR-CR001-00011

Current Document History:

Revision:	Effective Date:	Author(s) ('Owner' in eB *)	Reviewed by: ('Checked by' in eB *)	Approved by:	Reason for Issue:
6.0	03-09-2015	[redacted]	[redacted]	[redacted]	Update

 CRL RESTRICTED

Previous Document History:

Revision	Prepared Date:	Author:	Reviewed by:	Approved by:	Reason for Issue
1.0	26-06-09	[redacted]	[redacted]	[redacted]	First Draft
2.0	26-08-09	[redacted]	[redacted]	[redacted]	PDP Comments
3.0	17-11-09	[redacted]	[redacted]	[redacted]	Following Audit
4.0	17-02-10	[redacted]	[redacted]	[redacted]	
5.0	22-06-15	[redacted]	[redacted]	[redacted]	Transition / Reorganisation

Revision Changes:

Revision	Status / Description of Changes
6.0	Document has been updated with the new branding.

Contents

1 Purpose

This document sets out the role of the Programme Controls Estimating Team and the procedures and approach undertaken in the preparation of estimates and other activities that have been identified as being the responsibility of the estimating team.

This document's occurrence has been as a result of the Crossrail reorganisation bringing together the CRL estimating team with the PDP estimating team. Both of these organisations had estimating procedures which are now out of date and superseded by this document. In addition there has been a change in the duties of the estimating team as a result of the movement into a delivery focussed organisation which necessitates a change in focus away from estimate production into supporting of the delivery teams.

2 Scope

This procedure applies to the Programme Controls Central Estimating team within CRL and identifies the interfaces with the delivery teams. It also dictates what peripheral duties and assistance the Estimating team can or may provide.

The procedure will also cover the approach to 3rd parties and external bodies such as Infrastructure UK (IUK).

3 Terms & Definitions

Definitions applicable to this procedure:

Term	Definition
Capital Cost Work Breakdown Structure (WBS)	The list of headings which estimates are to be broken down and reported
Point Estimate	An estimate of the capital cost elements of the project, excluding any allowances for employer's risk, contingency or escalation
Nominal Point Estimate	An estimate of the capital cost elements of the project, excluding any allowances for employer's risk, contingency but including escalation
Estimating Tolerance	Is the minimum level of confidence expected at the respective Crossrail project life cycle gates and is applied to the Total Cost Estimate
Permitted Exclusions	Costs to be assessed and reported separately by CRL and which are not to be included in the IP/PDP estimate
Total Capital Cost Estimate	The Capital Cost Estimate plus the Permitted Exclusions
3rd parties & external bodies	Including but not limited to Network Rail, London Underground, Berkeley Homes and Canary Wharf Group, Infrastructure UK (IUK)
ITT	Invitation to Tender
B of Q	Bill of Quantities
PTE	Pre-Tender Estimate
UOM	Unit of Measure

ORR	Office of the Rail Regulator
WLC	Whole Life Cost
OOM	Order of Magnitude
OCI	Optimised Contractor Involvement

4 Responsibilities

4.1 Responsibility Matrix

The table below is a responsibility matrix defining the tasks to be undertaken by the relevant people in the organisation. This has been reviewed and agreed through the Transition Team and signed off at BTSG (Business Transformation Steering Group).

Estimating Interfaces

	Central Team	Delivery Teams		
	Estimating	**Cost Engineers**	**Contract Administration Team**	**Engineering / Project Teams**
Estimates	Review Estimates for the various RIBA Stages Stations to E Systemwide	Prepare estimates and review with central estimating team to allow budgets to be prepared	Support Contract Administration Team of changes and receive contractual advice	Liaise with Engineering / Project Team and receive quantities from the Project Engineer / FDC. for estimate preparation
Re-forecast	Review estimates produced by Cost Engineers when required	The Cost Engineers to prepare re-forecasts when required	NA	NA
Pre-tender Estimates	Prepare Pre- Tender Estimates prior to the ITT process? (Revised quickly/top down to reflect the market)	Advise the Cost Engineers of the value of the PTE	Provide the Contract Administration Team with PTE for use during the Tender Evaluation	Liaise with Engineering / Project Team and receive quantities from the Project Engineer / FDC. For estimate preparation
Pricing Documents	Prepare Appendix Q pricing documentation	N/A	N/A	N/A
Tender Evaluation	This is functionally led by the ABM's the estimating team will support in terms of commercial evaluation	Project Cost Engineers to support as necessary as agreed with the ABM's	Liaise with the Contract Administration Team and present the Estimate Evaluation	NA
Compensation Events	Review Contractor's estimates for Compensation Events, when required (for complex / large CEs)	When necessary, Cost Engineers to provide estimates and review with central estimating team complex compensation events	Receive Contractor's estimates and review with Cost Engineers and Project Planners	Receive advice and direction from the project team to determine the value of a Compensation Event
Ad Hoc	Support at Project Level (SACR etc) also potential VE exercises and 3rd Party (inc NR)	N/A	N/A	Provide Support in considering options prior to being instructed at Contract Level
WLC / OpEx	Undertake Operational and Whole Life Cost to support selection	N/A	N/A	N/A
Industry Body Interface	Benchmarking eg IUK	N/A	N/A	N/A
IA Reviews	Assurance that package budget and scope align	Detail the submission for package IA and contribute to the QRA	N/A	Liaise with Cost Engineers to develop package IA submission

4.2 Estimates

The Programme Controls Central Estimating team produce estimates and will review estimates prepared by the cost engineers, for details of how the estimate should be prepared refer to sections 4.4 – 4.10. The review of estimates by the central team to include as a minimum the following:

- Scope check
- Rate review
- Base date review
- Comparison with budgets
- Reconciliation
- Information from awarded contracts that may impact pricing
- Benchmarking

4.3 Estimating Governance Levels

Crossrail has identified a project gateway process that supports its internal approval process. This project gateway process is outlined below;

- Gate 1 – Scope Selection;
- Gate 2 – Options Development;
- Gate 3 – Selected Option Development;
- Gate 4 – Selected Design Development;
- Gate 5 – Tender Development; and
- Gate 6 – Construction Phase Estimates.

Recognising that the Framework Design Contracts identify the use of the RIBA plan of work and Network Rail's GRIP process, and that the industry generally has a number of gateway processes / project life cycle processes, the Crossrail gateway process has been mapped to the following;

- RIBA Plan of Work;
- Network Rail's GRIP process;
- London Underground Assurance; and
- OGC Gateway process.

This mapping is illustrated in Appendix D of this procedure. The purpose of this mapping is such that when preparing the cost estimate all Estimate Providers can be clear of the expectations for the production of the cost estimates.

4.4 Estimating Tolerances

The table in Appendix B outlines the standards and expectations in the production of the Point Estimate detailed below are the overarching principles and deliverables.

4.5 Estimating Principles

4.5.1 The base date for all cost estimates shall be agreed and noted in the estimate.

4.5.2 The estimator is to propose a 'price and design' tolerance level where appropriate for each 'point estimate'.

4.5.3 Estimates must reflect the timing, method of construction durations and constraints set by their method and construction and programme. The individual cost schedules for direct/contract work will be inclusive of redundant/excess material, testing & commissioning (where appropriate). Such costs include for protection measures, possessions and normal site risks.

4.5.4 With the exception of the 'permitted exclusions' noted in 4.10 below, the estimator will be responsible for producing a comprehensive estimate of the works, containing no further exclusions.

4.5.5 Supporting information – all supporting back-up information such as but not limited to sub-contractors or suppliers quotations, resource costs and productivities of the major items should be submitted as part of the estimate.

4.6 Estimate Structure

4.6.1 For information purposes only, a typical indicative overall estimate structure is illustrated in Appendix C to this procedure. The full template and guidance notes is located in the following file location: U:\Programme Controls\1.2 Cost and Estimating\1.2.2 Cost and Estimating\Cost Restricted\Cost Estimating\04 Working Cost Estimates.

4.7 Estimate Formats

4.7.1 All estimates shall be produced as spreadsheets and to the appropriate level of detail – labour/plant/material quantification as a minimum is required for all rates.

4.8 Estimate Content and Supporting Details

4.8.1 The estimate must contain a full breakdown of all quantities measured according to SMM7, CESMM 3 and the Network Rail Method of Measurement as appropriate and rates used in preparing the 'point estimates'.

4.8.2 Lump sum allowances should only be included in the estimate where insufficient design information is available to quantify and price the work in detail. The assumptions used in arriving at those sums must be clearly stated in the estimate.

4.8.3 Particular attention is drawn to the following cost items which are shown separately in the WBS and must be priced separately in the 'point estimate'. It is not acceptable for these items to be incorporated into the unit rates:

- Advanced and Enabling Works
- Preliminaries (either the contractor's 'general preliminaries' which may include his project management resource and site establishment, or 'special preliminaries', which may include work specific costs, such as significant temporary works eg for access);
- Direct Works;
- Overheads and Profit.

4.8.4 All estimates for 'on-network' works must clearly state the assured possession strategy on which the costs have been based. The estimate must contain supporting details clearly showing how the possession costs have been calculated (to include the cost of possession management, protection etc, and the level of uplift on the basic labour rates for the different possession regimes).

4.8.5 All estimates must contain a provision for the relevant Undertakings and Assurances associated with the scope of works.

4.9 Estimate Reports

4.9.1 The Estimate Reports must include

- A scope statement summary at the front of each estimate clearly setting out the overall work content and method of construction covered by the estimate;
- The agreed estimate base date;
- Clear descriptions of the individual work items at WBS to ensure the work content of those items can be clearly identified and understood;
- List of all information forming the basis of the estimate, including all design calculations, reports, drawings, sketches, method of construction programmes, sequencing statements, possessions schedules or other base information;
- List of the assumptions used in preparing the works estimate including those regarding specification or standards, construction methodology, productivity, level of resource, major plant usage etc;
- A list of all exclusions from the estimates;
- A list of any particular risks and opportunities that become evident to the consultant in the course of producing the estimate;
- A statement of the agreed level of price and design tolerance

4.10 Permitted Exclusions

The following costs, which comprise the 'permitted exclusions' will be assessed and reported separately by CRL and, as such, should be excluded from the 'point estimates':

- The client team including its design project management duties and accommodation and services;
- Sponsorship and shareholder's costs eg DfT, TfL and their advisors and agents;
- Purchase and disposal of land and property and associated costs;
- Potential property development, income or resale value;
- Operating, maintenance and renewal costs;
- Purchase or lease of rolling stock (treated as operating cost);
- Project risk or contingency;
- VAT and business taxes;
- Fluctuations eg inflation;
- Cost of borrowing or raising funds (finance charges).

5 Other Related Activities

In addition to Estimate production and review the Programme Controls Central Estimating Team is responsible for a number of other related activities, these are detailed below:

5.1 Reforecasts

The Project and Area Cost engineers in the delivery teams are required to prepare and reforecast costs when required, this process will be reviewed by the central estimating team prior to issue to relevant parties (finance). Prior to carrying out the reforecast exercise the central team will:

- Review and brief requirements
- Establish basis of reforecast
- Agree timescales, base dates, etc

Following receipt of reforecast the central estimating team will:

- Review cost profiles in line with schedule
- Review against budget
- Check escalation assumptions and base dates

5.2 Pre Tender Estimates (PTE)

The Programme Controls Central Estimating Team will be responsible for preparing the pre tender estimates that inform the Pre Tender Budget Authority, this will utilise the detailed estimate that either exists or has been prepared by the cost engineers as part of the estimate responsibility above. The PTE will not be a full re-estimate but will adopt the following approach:

- Scope alignment with ITT documentation
- Review of estimate to align with tender returns
- Identification of any scope transfers
- Check of unit rates to align with expected market conditions
- Escalation review
- Review against current schedule to check estimated durations

5.3 Pricing Documents

The Crossrail ITT documents will contain a bill of indicative quantities that the Contractor will be required to price as part of his tender. This document will be referred to as Appendix Q.

The purpose of this document is to provide the Contractors proposed costs in a format that can be used for the financial evaluation of the Tenders. The quantities entered in the B of Q will be indicative and should be checked by the Contractor or the B of Q may not contain quantities and the contractor will be required to complete them. The Contractor will be given the opportunity to amend the quantities by inserting new items at the end of the Bill sections.

The B of Q prepared for the PTE will be the basis for Appendix Q. Generally the direct works will not require any modification but should be reviewed since the B of Q should not influence the contractor's pricing in terms of quantities of durations.

The Preliminaries bill will be prepared in accordance with CESSM 3. Method Related items will be included and the Unit of Measure (UOM) will be "Item". Time Related charges should also be entered as item and should not reflect the durations shown on the Project Schedule.

5.4 3rd Parties (including NR/LU/BH/CWG)

Estimates by 3rd parties such as Network Rail, London Underground, Berkeley Homes and Canary Wharf Group will follow their own internal procedures and the outputs will be reviewed and commented on by the central estimating team. The review will follow the guidelines outlined in 4.2 & 4.3 above.

In addition the estimating team will be involved in establishing Value for Money; via Industry applicable Benchmarking; and confirming application and incorporation of Efficiencies as dictated by the ORR and other Regulatory Bodies.

The agreement of any incentivisation and Target Costs with the 3rd Parties shall also be monitored including participation in formal approval by the central estimating team.

5.5 Tender Evaluations

Tender evaluations are the functional responsibility of the Area Business Managers (ABMs) but will be supported commercially by the programme controls central estimating team. The procedure for tender evaluation is as that prescribed by the procurement department in their tender opening and evaluation plan; which is produced for each contract.

The programme controls estimating team will assist the ABMs in the commercial evaluation of the tender returns primarily by comparison of the Appendix Q of the works information across all the tender returns and a comparison against the pre tender estimate and budget.

From the exercise appropriate questions will be raised on accordance with the procedure for evaluation. Responses to these questions will be reviewed and any analysis updated accordingly and in accordance with the tender evaluation procedure.

5.6 Compensation Events/OCI

The responsibility for the pricing of compensation events and OCI opportunities rests with the contractor as defined in the contract, the evaluation of these will generally be carried out by the delivery cost engineers, however, using the Area Cost Engineers as an interface high value or complex compensation events should be reviewed by the programme controls central estimating team. The estimating teams review should include as a minimum the following:

- Scope alignment review
- Schedule impact review
- Identification of any scope transfers
- Estimate review and a benchmarking of unit rates
- Escalation review
- Impact assessment on contract that maybe impacted by the event or OCI item

5.7 Change Control

To support programme change control the programme controls central estimating team will produce or review estimates as appropriate. The production of these estimates will follow the procedure that has previously been agreed and will follow the estimating principles as detailed above. The estimates will be completed on the standard estimate template. As detailed in Appendix C.

Estimates are to be produced in line with the processes detailed in section 6 of this Procedure.

5.8 Whole Life Cycle Opex

In order to assist option selection prior to change control approval, the programme controls central estimating team will assist; in conjunction with the responsible party in establishing the Whole Life Cost and OPEX impact of a proposal. Provision for this reporting has been included in the estimate template. Appendix C and in addition the 'Moorhouse' cost model for more complex scenarios.

External consultant AMCL are responsible for the operational and maintenance cost model and the estimating team will provide data to support this as required.

Any work on WLC will comply with the Whole Life Cost Principles (Ref 1) which have been approved for the programme.

5.9 Benchmarking

Throughout the duration of the Programme the programme controls central estimating team will actively participate in the gathering and collection of Benchmarking data from the various projects and contracts on Crossrail and the outside market. This data will be an essential tool in validating all estimates and provide an early warning barometer against adverse market trends thereby facilitating early mitigation measures to be enacted.

The estimating team will interface with interested external parties for benchmarking such as Infrastructure UK and London Underground. This work will build on the reports previously issued and complement any requirements of the commercial assurance workstream.

5.10 Investment Authority Validation

All requests for Investment Authority shall be subject to review and approval by the programme controls central estimating team. The estimating teams review should include as a minimum the following:

- Scope and budget alignment review
- Schedule impact review
- Identification of any scope transfers
- Estimate review and a benchmarking of unit rates
- Escalation review

In addition at Pre Tender Budget Authority stage the estimating team will review the scope and produce a pre tender estimate in accordance with the process identified in section 5.2.

5.11 Delay Damages

The procedure for pre estimating delay damages has been approved and is document number CRL1-PDP-V3-GPD=CRG03-00009. This defines the process to be implemented. The actual calculation for delay damages will be carried out by the Project Cost Engineers and peer reviewed by the Area Cost Engineers, prior to incorporation into the Invitation to Tender Documentation these calculations will be reviewed by the programme controls central estimating team.

The review by the central estimating team will validate that the calculation is in accordance with Clause X7 of the NEC contract and are a genuine pre estimate of the economic loss likely to be incurred by Crossrail should the contractor fail to achieve the completion by the completion date.

6 RACI

Attached in Appendix A is the RACI matrix for the Programme Controls Central Estimating Team. This is split into the 12 groups of activities that it is anticipated that the estimating team will be engaged on.

The RACI matrix helps to:

- Identify process roles and activities that must be accomplished to produce key deliverables
- Increase productivity through clearly define functional areas, key responsibilities, and decision points
- Clarify individual roles and responsibilities, and identify accountabilities

Where:

R = Responsible (“the doer”)

- Owns the problem / project (Person working on the activity)
- More than one person can be responsible

A = Accountable (“the approver”)

- Must approve work before it is effective (yes/no authority)
- Only one person can be accountable

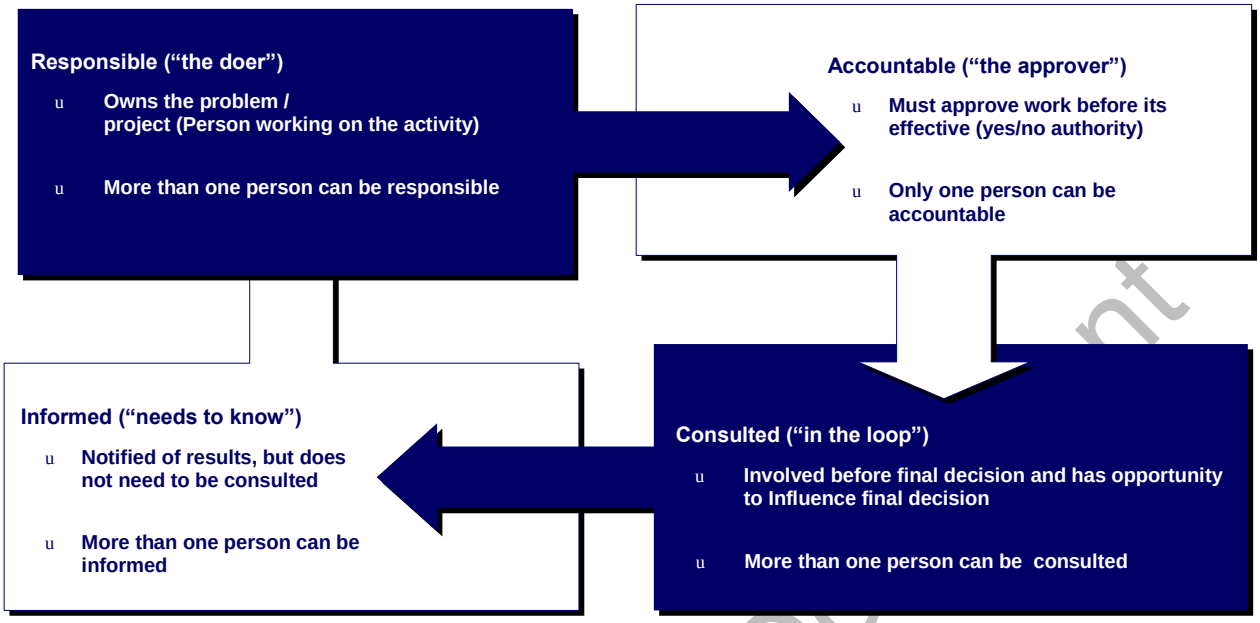
C= Consulted (“in the loop”)

- Involved before final decision and has opportunity to influence final decision
- More than one person can be consulted

I = Informed (“needs to know”)

- Notified of results, but does not need to be consulted
- More than one person can be informed

Process Roles – RACI Process Roles refer to RACI Matrix in Appendix A



7 Reference Documents

Ref:	Document Title	Document Number:
1.	Whole Life Cost Principles	CRL1-XRL-N2-GPD-CR001-00003
2.		
3.		
4.		

8 Standard Forms / Templates

Ref:	Document Title	Document Number:
A.		
B.		

 CRL RESTRICTED

9 Appendices

APPENDIX A – Process Roles: RACI Matrix

	Process	Head of Cost	Estimating Team	Area Cost Manager	Project Cost Engineer	Project Manager
1	Estimate Production	A	C	I	R	I
2	Reforecast	A	R	C	C	I
3	Pre Tender Estimates	A	R	C	C	I
4	Pricing Documents	A	R	C	C	I
5	Tender Evaluations – ABM's Accountable	A = ABM	R	C	C	C
6	Compensation Events	A	C	I	R	C
7	Programme Change Control	A	R	C	C	I
8	3rd Party (NR/LU/BH/CWG)	A	R	C	C	I
9	Whole Life Cost Appraisals	A	R	C	C	I
10	Benchmarking	A	R	C	C	I
11	Investment Authority Validation	A	C	I	R	C
12	LAD Calculation Validation	A	C	I	R	C

Where: R = Responsible A = Accountable C = Consulted I = Informed

APPENDIX B – Standards and Expectations

Estimate Type	Gate 1 – Order of Magnitude	Gate 2 – Budget Estimate	Gate 3 – Initial Feasibility Estimate	Gate 4 – Feasibility Estimate	Gate 5 – Definitive Estimate	Gate 6 – Construction Phase Estimates
Type of Rates	High Level, Cost per m2, Provisional Sums	Budget Rates, cost per m2 for functional areas	Internal / Consultants legacy cost rates	Detailed rates / resourced estimates by suppliers	Firm / fixed rates / lump sum or resourced target costs	Firm / fixed rates / lump sum or resourced target costs
Type of Costs	Costs based on previous historical projects	Costs based on approximate high level rates	Costs based on approximate resources, quantities, rates	Costs based on firm resources, quantities, rates	Fixed cost plan. Tendered prices	Fixed cost plan. Tendered prices
Scope	Options identified	Options evaluated and examined	Best option selected but scope of works variable	Single option refined, scope of works determined	Final option defined, scope of works fixed	Final option defined, scope of works fixed
Design	Percentage allowance	Percentage allowance	Design costs based on outline sketches / drawings	Design costs based on selected detailed drawings	Final design costs based on project drawings	Final design costs based on project drawings
Preliminaries	Percentage allowance	Percentage allowance	Costs based on approximate resources, quantities, rates	Costs based on firm resources, quantities, rates	Costs fixed on tendered quotes / resources, quantities, rates	Costs fixed on tendered quotes / resources, quantities, rates
Project Schedule	Percentage allowance	Initial project dates or simple gant chart	Level 1 schedule	Level 2 schedule	Level 3 schedule	Level 3 schedule
Testing and Commissioning	Percentage allowance	Percentage allowance	Costs based on approximate resources, quantities, rates	Costs based on firm resources, quantities, rates	Costs fixed on tendered quotes / resources, quantities, rates	Costs fixed on tendered quotes / resources, quantities, rates

Estimate Type	Gate 1 – Order of Magnitude	Gate 2 – Budget Estimate	Gate 3 – Initial Feasibility Estimate	Gate 4 – Feasibility Estimate	Gate 5 – Definitive Estimate	Gate 6 – Construction Phase Estimates
Possession Management	Percentage allowance	Percentage allowance	Costs based on approximate resources, quantities, rates	Costs based on firm resources, quantities, rates	Costs fixed on tendered quotes / resources, quantities, rates	Costs fixed on tendered quotes / resources, quantities, rates
Project Management Costs	Percentage allowance	Percentage allowance	Costs based on approximate resources, quantities, rates	Costs based on firm resources, quantities, rates	Costs fixed on tendered quotes / resources, quantities, rates	Costs fixed on tendered quotes / resources, quantities, rates
TOC Compensation	Percentage allowance	Percentage allowance	Possession strategy confirmed, percentage allowance	Compensation costs from NR ready-reckoner	Compensation costs detailed	Compensation costs detailed
Land /Property Purchase Not required as part of Point Estimate	Percentage allowance	Percentage allowance	Approximate value from Property Surveyor	Value from Property Surveyor	Value from Property Surveyor	Value from Property Surveyor
Inflation Not required as part of Point Estimate	Percentage allowance	Percentage allowance	Average percentage inflation	Inflation indices for each asset	Inflation indices for each asset	Inflation indices for each contract
Minimum Level of Confidence	+/- 50%	+/- 40%	+/- 30%	+/- 20%	+/- 10%	+/- 5%

APPENDIX C - Estimate Template (extract)

Project: **Crossrail**
Doc: **Project Title**
T No **TXXXX**
Date: **XX/XX/2010**

Ref	Description	Measurement	Quantity	Unit	Rate (£)	Extn (£)	Total (£)	Comments
1.0	**Construction Costs**							
1.1						0.00		
						0.00		
						0.00		
						0.00		
						0.00		
						0.00		
						0.00		
						0.00	0	
	Total Construction Cost						**0**	
1.3	**Preliminaries**							
				%		0.00	0	
	Total Preliminaries						**0**	
1.4	**Overheads & Profit**							
	Allow for overheads & Profit		0.00	%	0	0.00	0	
	Total Overheads & Profit						**0**	
Capital Construction Costs							**0**	
2.0	**Land & Property**							
2.1	Not applicable							
Land & Property							**0**	
3.0	**Indirect Costs**							
3.1	Refer to attached breakdown (Tab 6)		1.00	Item	0.00	0.00	0	
Indirect Costs							**0**	
Point Estimate							**0**	
8.0	**Operational Costs**							
Operational Costs							**0**	

 CRL RESTRICTED

APPENDIX D: Project Gateway Process Navigator

Crossrail		RIBA			London Underground Assurance		Network Rail GRIP		OGC
Gate	Phase	Phase	Stage	Task	stage no	Stage	no	Stage	Gateways
1	Scope Selection	Preparation	A. Appraisal	Identification of client's needs and objectives, business case and possible constraints on development. Preparation of feasibility studies and assessment of options to enable the client to decide whether to proceed	1	Specification of User Requirements	1	Output Definition	1 Business Justification
			B. Design Brief	Development of Initial Statement of requirements into the Design Brief by or on behalf of the client confirming key requirements and constraints. Identification of procurement method, procedures, organisational structure and range of consultants and others to be engaged for the project.			2	Pre-Feasibility	2 Procurement Strategy
2	Options Development	Design	C. Concept	Implementation of Design Brief and preparation of additional data. Preparation of Concept Design including outline proposals for structural and building services systems, outline specifications and preliminary cost plan. Review of procurement route	2	Approval in Principle	3	Option Selection	3A Design Brief and Concept Approval
3	Selected Option		D. Design Development	Development of concept design to include structural			4	Single Option Selection	

Crossrail		RIBA			London Underground Assurance		Network Rail GRIP		OGC
Gate	Phase	Phase	Stage	Task	stage no	Stage	no	Stage	Gateways
				and building services systems, updated outline specifications and cost plan. Completion of Project Brief. Application for detailed planning permission.					
4	Selected Design Development	Pre-Construction	E. Technical Design	Preparation of technical design(s) and specifications, sufficient to co-ordinate components and elements of the project and information for statutory standards and construction safety.	3	Compliance Certificate	5	Detailed Design	3B Detailed Design Approval
			F. Production Information F1	Preparation of detailed information for construction. Application for Statutory Approvals					
			F. Production Information F2	Preparation of further information for construction required under the building contract. Review of information provided by specialists.					
5	Tender Development		G. Tender Documentation	Preparation and/or collation of tender documentation in sufficient detail to enable a tender or tenders to be obtained for the project.					
			H. Tender Action	Identification and evaluation of potential contractors and/or specialists for the project. Obtaining and appraising tenders; submission of recommendations to the client.					3C Investment decision
6	Construction	Construction	J. Mobilisation	Letting the building contractor, appointing the	4	Construction or	6	Construction Test &	

Crossrail		RIBA				London Underground Assurance		Network Rail GRIP		OGC
Gate	Phase	Phase	Stage		Task	stage no	Stage	no	Stage	Gateways
					contractor Issuing of information to the contractor Arranging site hand over to the contractor		Manufacture		Commission	
			K. Construction to Practical Completion		Administration of the building contract to Practical Completion Provision to the contractor of further information as and when reasonably required. Review of information provided by contractors and specialists					
	Commission						Consent to Test			
7	Trial Running					5	Completion Certificate	7	Scheme Hand Back	4 Readiness for service
	Close Out	Use	L. After Practical Completion	L1	Administration of the building contract after Practical Completion and making final inspections		Consent to Operate	8	Project Close Out	
				L2	Assisting building user during initial occupation period					
				L3	Review of project performance in use					5 Benefits evaluation