Part 14 – Management and Administration

14.1 Introduction

The Project requires the *Employer* and the *Project Manager* to deliver many contracts through a number of different contractors. In order to ensure a consistent approach towards the management and administration of the *works* such that information received from contractors is readily incorporated in the *Employer*'s reporting and financial systems, the *Employer* has prescriptive requirements. .

This part of the Works Information describes the *Employer*'s requirements for the management and administration of the *works* by the *Contractor.*

In the case of the first submission of a deliverable, in this section, for the *Project Manager's* acceptance, the *Project Manager* replies within 4 weeks of the date of submission. Any further revisions, submissions and responses by the *Contractor* or *Project Manager* shall be made within the *period for reply*.

14.2 Project Management Requirements

14.2.1 Project Execution Plan

Within 4 weeks of the *starting date* the *Contractor* shall provide a Project Execution Plan for the *Project Manager's* acceptance.

The Project Execution Plan shall:

- describe how the *Contractor* plans to Provide the Works to achieve Completion on or before the Completion Date, within the forecast total of the Prices;
- describe, in the CDML provided as part of the Project Execution Plan, when the *Contractor* will provide the plans, procedures and other deliverables required by the Works Information to align with and support the Accepted Programme;
- describe the timing and frequency of the all meetings required by the Works Information;
- show how the *Contractor* will undertake the project controls and risk management requirements of the contract, including their planning and execution.
- After acceptance of the first Project Execution Plan by the *Project Manager* it shall be updated by the *Contractor* to reflect any required or proposed changes. Any updated Project Execution Plans are submitted to the *Project Manager* for acceptance.

14.2.2 Project Controls

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The *Contractor* shall demonstrate in the Project Execution Plan:

- how he will comply with the project controls requirements of the contract. indentify all procedures that are intended to form the *Contractor's* project controls system, together with the target dates for the issue of each procedure
- the deliverables, processes, tools and staffing requirements of these procedures;
- include all aspect of the *Contractor's* project controls functions such as estimating, cost control, planning / scheduling, earned value assessment, risk management, financial and progress reporting, and their automated systems, where applicable.

14.2.3 Risk Management

The *Contractor* shall demonstrate in the Project Execution Plan:

- how he will comply with the Risk Management requirements of the contract
- all documentation and procedures that are intended to form the *Contractor's* risk management system, together with the target dates for the issue of each and include the deliverables, processes, tools and staffing requirements of these procedures.Procurement

The *Contractor* shall demonstrate in the Project Execution Plan:

- how he will comply with the Procurement requirements of this contract. all documentation, procedures and tools necessary to undertake his procurement.

14.2.4 Meetings

The *Contractor* and *Project Manager* shall have joint meetings which will include a review of progress, cost, performance, quality, risk and other issues arising. Other meetings shall be agreed between the *Contractor* and *Project Manager* as required.

As recorded in the Project Execution Plan, the *Contractor* and *Project Manager* shall agree the scope, frequency (weekly or 4 weekly), timing, chairman, minute takers and attendees for the joint meetings. The *Contractor* shall ensure its subcontractors attend meetings where relevant, and the *Project Manager* may invite others to the meetings where relevant. Meetings may be re-scheduled or additional meetings scheduled with the agreement of the *Project Manager.*

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At a minimum, the *Contractor* shall attend the following joint meetings:

Contract Meeting Schedule	**Frequency**
Weekly Workplan Meeting	Weekly
Contract Four Weekly Progress Review with the *Project Manager,* including review of Four Weekly Dashboard Report	4 Weekly

14.3 Project Controls Requirements

14.3.1 Not Used

14.3.2 Not Used

14.3.3 Coding Structures

A series of coding structures have been developed for use on the Project for the purpose of summary reporting and cost/programme integration. The latest coding structures (Work Breakdown Structure, Code of Accounts, Programme Activity Codes, Resource Codes, etc.) will be supplied by the *Project Manager* within 2 weeks of the *starting date*. These coding structures shall be used by the *Contractor* for all project controls requirements unless agreed otherwise by the *Project Manager*. An indicative Work Breakdown Structure is included in Appendix 14A and Indicative Code of Accounts is included in Appendix 14B.

14.3.4 Not Used

14.3.5 Not Used

14.3.6 Project Controls Audits

The *Contractor*'s project controls operations may be reviewed by the *Project Manager* to ensure that the individual procedures have been implemented and that together, these procedures provide for efficient and effective control of the contract. A plan of corrective actions shall be established between the *Contractor* and the *Project Manager* and then implemented. In addition, the audit provides a formal method of feedback in support of continuous improvement, including the development of enhancements.

The *Project Manager* reserves the right to undertake detailed audits of the *Contractor*'s project controls systems until the *defects date*. The timing and frequency of audits shall be agreed between the *Contractor* and the *Project Manager* and noted in an audit plan. The *Contractor* shall make available staff as the *Project Manager* requires, enabling an effective and timely audit to be carried out.

At the completion of the audit, the *Project Manager* shall prepare a report summarising the results and conveying recommendations for areas that need improvement or enhancement. This will be a formal, constructive report intended to

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help both the *Project Manager* and the *Contractor* in their efforts to effectively monitor and control the *works*. A plan for implementing any corrective actions identified shall be agreed between the *Contractor* and the *Project Manager*. Status against the action plan shall be reported by the *Contractor* on a 4 weekly basis until all the actions are closed out.

14.3.7 Cost Control and Reporting

14.3.7.1 Budget Control

The total of the Prices at the contract date will represent the original budget. The original budget revised for implemented

compensation events and will be known as the current budget.

A formal budget maintenance system shall be developed by the *Contractor* to keep the budget information current.

The current budget provides a baseline with which to compare the *Contractor's* actual progress and performance, identify deviations from the baseline for analysis and if necessary action to possibly recover. Within the timeframe in the accepted Project Execution Plan, the *Contractor* and the *Project Manager* will agree how the cost information provided at tender return is restructured to allow monitoring of the forecast of Defined Cost against the current budget. This restructuring will take into account the requirements of the Work Breakdown Structure and Code of Accounts and will support the requirements of earned value reporting.

The breakdown of the current budget (and subsequent changes) shall be submitted by the *Contractor* for review and acceptance by the *Project Manager* at agreed intervals.

The basis for defining where budgeted costs and resources are contained within the budget structure shall be the *Project Manager's* Work Breakdown Structure and Code of Accounts. These coding systems provide a logical grouping of like cost items that result in a consistent format for monitoring, reporting, controlling and forecasting cost and performance and for retrieval of historical information. The following are the major quantifiable categories of detail that shall be included:

- People
  - Direct manual people (within the Working Areas)
  - Distributable manual people (within the Working Areas)
  - Non-manual people (within the Working Areas)
- Equipment
  - Direct Equipment
  - Distributable Equipment
- Plant and Materials

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- Direct / Permanent Plant and Materials
- Distributable Plant and Materials

- Charges
- Manufacture and fabrication
- Design
- Insurance

Subcontractors

- Direct Subcontractors
- Distributable Subcontractors

Fee

- Direct Fee
- Subcontract Fee

14.3.7.2 Non Manual People Job Hour & Cost Control

The *Contractor* shall maintain spreadsheets, as agreed with the *Project Manager*, and which are updated each 4 weekly period, which shows the start and finish date for each non manual position in the *Contractor*'s organisation. For each position, the spreadsheet will show the current budgeted start and finish date (as included in the current total of Prices), the actual start and finish date (as applicable), and the forecast start and finish dates (as used to develop the forecast Defined Cost).

The *Contractor* shall maintain reports, as agreed with the *Project Manager*, and which are updated each 4 weekly period in the Four Weekly Dashboard Report, that show for each cost element of non-manual costs the original budget, current budget, the actual Defined Cost, the forecast Defined Cost to go, the total forecast Defined Cost, and the variance cost of each cost element of non-manual cost.

The earnings method for non manual people costs shall be agreed between the *Contractor* and the *Project Manager*.

14.3.7.3 Distributables Cost Control

Distributable costs are cost components which cannot be exclusively associated with any specific construction operation of permanent facilities. These distributable costs include costs for mobilisation and demobilisation, non manual people, distributable manual people, temporary facilities and Materials, some construction Equipment, tools, utilities, and services.

The *Project Manager* and *Contractor* will agree on the specific distributable cost components to be specifically measured.

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The *Contractor* shall maintain reports, as agreed with the *Project Manager*, and which are updated in the Four Weekly Dashboard Report,, that show for each distributable cost component the original budget, current budget, the actual Defined Cost, the forecast Defined Cost to go, the total forecast Defined Cost, and the variance cost of each distributable cost component.

The earning method for Distributable Costs shall be agreed between the *Contractor* and the *Project Manager*.

14.3.7.4 Manual People Job Hour and Cost Control

The *Contractor* shall maintain spreadsheets, as agreed with the *Project Manager*, and which are updated each 4 weekly period, which shows the status of manual people headcount for each period and by trade from the *starting date* to Completion. The spreadsheets shall show the original budgeted planned headcount (included in the initial total of Prices), the current budgeted planned headcount (included in the current total of Prices), actual headcount to date and forecast headcount to go.

The *Contractor* shall maintain reports, as agreed with the *Project Manager*, and which are updated in the Four Weekly Dashboard Report, that show for each cost element of manual costs the original budget, current budget, the actual Defined Cost, the forecast Defined Cost to go, the total forecast Defined Cost, and the variance cost of each cost element of manual cost.

The earning method for Manual Costs shall be agreed between the *Contractor* and the *Project Manager*.

14.3.7.5 Plant and Materials Cost Control

The *Contractor*, within the timeframe agreed in the Project Execution Plan , shall prepare a report for the *Project Manager* that shows, for all Plant and Materials purchase orders that the *Contractor* intends to award, the budgeted cost included in the total of the Prices.

As Plant and Materials are purchased, the *Contractor* will reconcile the pricing received and compare it to the budgeted price in the total of the Prices. The *Contractor* will maintain a report that is submitted in the Four Weekly Dashboard Report, which shows budget, commitment, actual, and forecast Defined Cost for each Plant and Materials purchase order.

The earning method for Plant and Materials costs shall be agreed between the *Contractor* and the *Project Manager*.

14.3.7.6 Equipment Cost Control

The *Contractor*, within the timeframe in the accepted Project Execution Plan, shall prepare a spreadsheet for the *Project Manager* that shows, for all major items of Equipment the start and finish dates included in the development of the total of the Prices.

The *Contractor* shall in the Four Weekly Dashboard Report, show the actual and forecast status of Equipment hours and costs against the current budget/current

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total of Prices. One of the spreadsheets will show for each major item of equipment the budgeted, actual & forecast start & finish period for each major item of Equipment.

The *Contractor* shall ensure that, for each period update, the actual Defined Costs and forecast Defined Costs to-go are assessed and compared to the current budget.

The earnings method for equipment costs shall be agreed between the *Contractor* and the *Project Manager*.

14.3.7.7 Subcontract Cost Control

The *Contractor*, within the timeframe in the accepted Project Execution Plan, shall prepare a report for the *Project Manager* that shows, for all subcontracts that the *Contractor* intends to award, the budgeted cost included in the total of the Prices.

As Subcontracts are awarded, the *Contractor* will reconcile the pricing received and compare it to the budgeted price in the total of the Prices. The *Contractor* will maintain a report, that is submitted in the Four Weekly Dashboard Report, which shows budget, commitment, actual, and forecast Defined Cost for each Subcontract.

The earning method for Subcontract costs shall be agreed between the *Contractor* and the *Project Manager.*

14.3.7.8 Trend Program

The *Project Manager* maintains the Crossrail trend program which provides early identification of variances from cost and schedule baselines so that there may be sufficient time to:

- mitigate any adverse effects; or
- carry-out any actions required to achieve an identified saving or benefit.

The *Contractor* shall provide any information necessary regarding such variances to support the Crossrail Trend Program, and shall take account of variances to the cost and schedule baselines in his cost forecasting process. Such support may include information regarding scope and quantity definition, estimating, scheduling, mitigation plans and attending meetings.

The requirement of this Works Information for the *Contractor* to support the Crossrail Trend Program does not change the *Contractor*'s obligations under the conditions of contract to raise early warning notifications.

14.3.7.9 Defined Cost Forecasts

At 24 week intervals (or at intervals as agreed between the *Contractor* and the *Project Manager*) the *Contractor* shall prepare a fully detailed and bottom up forecast referred to as Defined Cost forecast. The Defined Cost forecast will also include a detailed review and update of the Accepted Programme. The *Project Manager* shall work with the *Contractor* with regard to the preparation planning and co-ordination of the Defined Cost forecast, including the organisation of kick-off

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meetings, data collection and management review process to meet the *Project Manager*'s requirements. In addition, the *Project Manager* shall work with the *Contractor* to verify the status of the *Contractor*'s forecast preparation during forecast production.

The Defined Cost forecast shall include as a minimum the following:

- establishing the forecast cut-off date, confirmation of total scope and scope completed at cut-off date;
- development and issue of agreed forecast guidelines which will include major assumptions, the division of responsibilities, the timetable and assigned resources for completion of the forecast, and the timing of cost and schedule reviews;
- the holding of a kick-off meeting;
- the forecasting of to go resources and costs for all the Defined Cost elements of the *works*;
- cost reconciliation analysis identifying specific reasons for cost variances from the total of the Prices split into scope, design development, pricing, productivity, and other issues;
- a review of the programme including status of contract milestones and float analysis;
- update of to go cost, cash, and resource profiles and graphs by period;
- risk analysis and update of risk allowances;
- preparation of forecast presentation package to *Project Manager* requirements which will include a summary of Defined Cost elements, schedule, resources, quantities, risks, and forecast basis, qualification and exclusions; and
- presentation of the forecast package to the *Project Manager*.

14.3.7.10 Quantity Tracking

The *Contractor* shall implement a quantity tracking system for the *works*, to measure installed quantities and trade labour performance for all *works*. The quantities tracked by the *Contractor* shall align with the requirements of the Code of Accounts, and the *Project Manager* and the *Contractor* shall agree the key elements (e.g. concrete, piles, rebar) that will be tracked.

The main deliverable of the quantity tracking system is the Quantity Unit Rate Report which shows quantities, job-hours (earned and actual), job-hour unit rates, performance factors, and percent complete at a level to be agreed between the *Contractor* and the *Project Manager*.

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The quantity tracking system shall be initiated by the *Contractor* on the *starting date* and continues until Completion, and shall be included in the Four Weekly Dashboard Report .

14.3.7.11 Cost Flow Forecast

The *Contractor* shall submit to the *Project Manager*, within the timeframe in the accpeted Project Execution Plan, and then updated for every 4 week reporting period, a cost flow forecast that forecasts the cost profile for each reporting period of the contract. The cost flow forecast shall total to the forecast Defined Cost and is to be in a format proposed by the *Contractor* and accepted by the *Project Manager*. The *Contractor* shall identify any amounts to be paid in currencies other than the *currency of this contract*.

Each 4 weekly period, the *Contractor* shall update reports and graphs to show the status of actual Defined Cost to date and forecast Defined Cost to go, by period, against the baseline budgeted cost by period. The updates shall be included in the Four Weekly Dashboard Report.

14.3.8 Programme Planning and Scheduling

In addition to the requirements of the *conditions of contract*, the *Contractor* shall resource load, with hours, cost and quantities the first revised programme for acceptance within 4 weeks of the *starting date*. The resource loading of the Accepted Programme will facilitate the use of earned value techniques for assessment of progress, cost and performance. Once accepted this programme will be known as the Baseline Accepted Programme.

The *Contractor* and the *Project Manager* shall agree on the method for resource loading of the programme, and the maintenance of the resource loading prior to the submittal of the first revised programme.

In accordance with the *conditions of contract*, the *Contractor* shall revise its programme at each 4 weekly reporting period. In addition to the requirements of the *conditions of contract,* the *Contractor* shall also include in its revised programme actual resources used, physical percent complete and hours, cost and quantities to go..

14.3.8.1 Primavera

The *Contractor* shall submit programmes to the *Project Manager* using Primavera Project Management (P6) version 6.2.1 or later versions as accepted by the *Project Manager*.

Primavera software settings shall be in accordance with the *Project Manager*'s requirements.

The *Contractor*'s programmes shall be in logic linked CPM network format showing the critical path(s), early start and finish dates, late start and finish dates and total float. Submissions made by the *Contractor* shall be in both hardcopy and electronic (Primavera .xer) formats.

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All programme submissions made by the *Contractor* shall be clearly titled, numbered, revision coded and dated in accordance with the document control requirements.

Primavera activities shall be numbered following the *Project Manager*'s numbering system structure, and organised according to a coding structure agreed between the *Contractor* and the *Project Manager*. Activity numbers shall be unique for the contract duration; no activity number shall be re-used.

All Primavera calendars used shall be set in days. For level 3 and level 4 programmes no activity shall exceed a 12 week duration without prior acceptance by the *Project Manager*.

The *Project Manager* shall supply a CD containing the system settings, activity codes and calendars in use at the *starting date* for the use of the *Contractor*.

14.3.8.2 Programme Hierarchy

The *Contractor*'s programmes are intended to form an integral part of the overall Employer's programme and reporting structure. In addition to the requirements of the *conditions of contract*, the *Contractor* shall maintain a hierarchy of programmes that support each other whilst keeping detail at the appropriate level within the hierarchy. In this way duplication of effort during the update cycle should be avoided. The *Project Manager* and *Contractor* shall agree the detail and frequency of the hierarchy of programmes.

The following table identifies each level of the programme hierarchy (including programme performance graphs):-

Prog Level	**Description**	**Comments**	**Software**
Level 1	*Contractor's* Summary Schedule	1-2 page summary of the Accepted Programme	Excel
Level 3	*Contractor's* Accepted Programme.	Resource loaded logic-linked CPM network for use in reporting period progress, Earned Value, effects of CE's etc.	P6
Level 4	*Contractor's* Programme Performance Graphs	Suite of graphs derived from the Baseline and Current Accepted Programmes.	Excel
Level 4	*Contractor's* Engineering Progress & Performance Report (EPPR) (if applicable)	Detailed design management tool identifying each deliverable and status.	Excel or Access

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Level 4	*Contractor's* Procurement Schedule	Detailed procurement control tool identifying all major purchase orders and subcontracts and their status.	Excel or Access
Level 4	*Contractor's* Weekly Work Plan (4 week Rolling Programme)	Suitable level of detail to assess progress and plan work operations on a weekly basis as agreed between the *Contractor* and the *Project Manager*	Excel
Level 4	*Contractor's* Commissioning & Startup Programme	Logic-linked CPM network for use in co-ordinating commissioning activities	P6
Level 4	*Contractor's* Possession Programmes (if applicable)	Suitable level of detail to assess sequence and timing of operations within a fixed duration possession or closure	P6 or Excel

14.3.8.3 *Contractor*'s Summary Schedule

The *Contractor* shall submit a Summary Schedule with each programme submitted for acceptance.

The Summary Schedule is used as the basis for developing and reporting contract schedules to management and key stakeholders from initiation through all project completion phases. The Summary Schedule is developed in time-scaled format with typically not more than 200 activities and contained on 1-2 sheets. The Summary Schedule highlights the critical path, major milestone events and events important to the overall management of the Crossrail programme. Summary Schedule activities are related to Accepted Programme activities with status of each Summary Schedule activity "rolled up" from the *Contractor*'s Accepted Programme.

The Summary Schedule shall be produced in Microsoft Excel format as a standalone document independent of Primavera i.e. it is NOT simply a summarized Primavera output. Summary Schedules may be produced in time-chainage format using *Tilos* software (Version 7.1.0) as agreed with the *Project Manager*. An updated Summary Schedule shall be included within each 4 Weekly Report by the *Contractor*.

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14.3.8.4 Not Used

14.3.8.5 *Contractor*'s Accepted Programme

The Accepted Programme shall be used by the *Contractor* to direct his work by providing parameters for the more detailed implementation programmes and tools such as the EPPR, Procurement Schedule and Weekly Work Plan. It is also used to identify and resolve schedule problems, measure the impact of compensation events and delays, assist in earned value calculations and develop recovery plans.

Programmes shall be developed by the *Contractor* using CPM / network analysis techniques to produce a coherent schedule that covers the entirety of the *Contractor*'s awarded scope. The programmes typically contain between 1000 and 4000 activities and shall be submitted to the *Project Manager* in hardcopy and Primavera P6 electronic format (.xer). Exceeding these limits without prior approval by the *Project Manager* shall constitute cause for rejection of a programme submission.

Information to be included in the programmes submitted for acceptance

- the dates when the *Contractor* plans to submit any particulars of the design required by the Works Information;
- the dates when the *Contractor* plans to submit any particulars of the design of any items of Equipment required by the Works Information;
- the dates from the *Contractor*'s Procurement Plan when any key items of Plant and Materials and Equipment are required at Site;
- the dates for any establishment of fabrication facilities and dates for fabrication of materials;
- the dates when any of the design information or other information provided by the *Employer* or Others will be required by the *Contractor*;
- details of any consents, permits and licenses development, submission and approvals allowing sufficient time for each stage of the process and also allowances for resubmission;
- details of any utility supplies development, submission and approvals allowing sufficient time for each stage of the process and also allowances for resubmission;
- details of any 3rd party (e.g. Network Rail, London Underground etc) interfaces and/or submissions development, submission and approvals allowing sufficient time for each stage of the process and also allowances for resubmission;
- the dates when the *Contractor* plans to submit design and construction certification as required by the Works Information.

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14.3.8.6 *Contractor*'s Programme Performance Graphs

The *Contractor* shall prepare graphs that will assist to demonstrate the feasibility of the *Contractor*'s programme in terms of cost, quantities, production rates and resources required to support the programme. They can then be used to indicate the current status of the programme in terms of progress achieved, delays experienced and potential cumulative impacts to key dates. The *Contractor* shall provide graphs derived from both the Baseline Accepted Programme and latest Accepted Programme. The *Contractor* shall provide updated graphs as part of the 4 weekly reporting cycle, which will show the plan, actual, and forecast to go. The updates shall be included in the Four Weekly Dashboard Report.

The format and number of these graphs shall be agreed between the *Contractor* and the *Project Manager*. The minimal requirements will be:

- Construction percentage complete graph;
- Installation graphs for major commodities;
- Earned value management graphs; and
- Cost and cash flow graphs.

14.3.8.7 *Contractor*'s Engineering Progress and Performance Report (EPPR)

If applicable, the Engineering Progress and Performance Report is the detailed Implementation Schedule for engineering. The EPPR identifies and tracks progress against each engineering deliverable to be produced, and tracks productivity. These deliverables are then grouped to represent activities in the Accepted Programme. The EPPR is the most detailed engineering programme in the hierarchy and shall support the requirements of the Accepted Programme. Progress is measured using control points for each deliverable which shall be weighted to provide an overall percentage complete for the group of deliverables. This aggregated percentage complete is used to update the Accepted Programme. The EPPR is typically produced in Microsoft Excel or Access format as a standalone document separate from Primavera programmes. The format of the EPPR shall be generally in accordance with the standard Project template (MS Excel) included in the Four Weekly Dashboard Report, or in such other format accepted by the *Project Manager*. EPPR updates, if applicable, shall be included in the Four Weekly Dashboard Report.

14.3.8.8 *Contractor*'s Procurement Schedule

The *Contractor's* Procurement Schedule identifies each purchase order and subcontract to be placed by the *Contractor*. Each item in the schedule is tracked from the issue of a requisition or design package through various control points concluding with award of the contract or placement of Purchase Order.

The Procurement Schedule is typically produced in Microsoft Excel or Access format as a standalone document separate from Primavera programmes. Information from the Procurement Schedule is summarized by the *Contractor* for inclusion in the

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Contractor's programme. With the *Project Manager*'s acceptance, the *Contractor* may use their own procurement tracking system. The format of the Procurement Schedule and level of information to be detailed shall be generally in accordance with the standard template (MS Excel) included in Appendix 14C, or in such other format accepted by the *Project Manager*. Information summarized from the *Contractor*'s Procurement Schedule shall be used to update the corresponding activities in the *Contractor*'s programme for each reporting period.

14.3.8.9 *Contractor*'s Weekly Work Plan (4 week Rolling Programme)

The *Contractor* shall submit to the *Project Manager* by 10:00hrs every Monday a Four Week Rolling Programme covering day to day site fabrication, construction, testing, commissioning and startup activities. The programme shall report actual work that has taken place in the previous week and planned work for the next three weeks including the current week.

The Weekly Work Plan shall be consistent with the requirements of the Accepted Programme through use of coding structures as agreed with the *Project Manager*. The Weekly Work Plan shall be based on the confirmed availability of design, equipment, materials, labour and tools. Actual % complete against planned activities for the previous week shall be indicated.

The Weekly Work Plan shall include reasons for targets not being achieved taking into account performance measurement and actions that the *Contractor* intends to take to recover any lost time. The format of the Weekly Work Plan shall be generally in accordance with the standard template (MS Excel) and worked example included in Appendix 14D, or in such other format accepted by the *Project Manager*.

The actual progress information from the Weekly Work Plan shall be used by the *Contractor* to update the Accepted Programme. The Weekly Work Plans submitted from each area of the contract shall be the subject of a weekly review meeting attended by the *Contractor* and the *Project Manager*.

14.3.8.10 *Contractor*'s Commissioning & Startup Programme

The *Contractor* shall produce a detailed Commissioning & Startup Programme to illustrate, in detail the sequence and operations required to complete the commissioning (inclusive of document preparation) and handover stage of the contract. These programmes shall be submitted by the *Contractor* in logic linked CPM format produced in Primavera for possible integration into overall Crossrail commissioning programmes by the *Project Manager*. Initial versions of the Commissioning & Startup Programme, if required by the *works*, shall be submitted to the *Project Manager* for review and acceptance at least 6 months prior to the first commissioning activity starting.

14.3.8.11 *Contractor's* Possession Programmes

If applicable, detailed programmes shall be produced by the *Contractor* for all works undertaken during possessions or closures of 3rd party infrastructure. These programmes shall have a maximum time unit of 1.0 hour unless agreed otherwise with the *Project Manager*. These programmes shall also be subjected to risk analysis by the *Contractor* to ensure that work is completed during the

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possession/closure or that alternative action can be taken to ensure that infrastructure is handed back on time.

14.3.8.12 Programme Narratives

All programmes submitted by the *Contractor* for acceptance by the *Project Manager* shall be accompanied by a programme narrative and shall contain as a minimum the following requirements, at a level of detail to be agreed by the *Project Manager*:

- staffing plan indicating total manpower required per reporting period, inclusive of Subcontractors;
- list of the major construction Equipment items including types, number of units, unit capacities, the proposed time each piece will be deployed and the activities on which it will be deployed;
- description of the production rates, crew build-ups etc used to determine the durations for key quantities;
- weather windows and other non-work periods;
- description of the critical path(s);
- listing of key interfaces with the *Project Manager* or others and the dates those interfaces are planned to occur; and
- listing of information required by the *Contractor* to meet his stated programme together with the date that information is required.

In addition, submissions of revised programmes shall be accompanied by an updated programme narrative, which includes the following:

- details of any significant changes including revisions to critical path since the previous Accepted Programme;
- details of changes to Key Dates, milestones, and associated float and time risk allowances;
- any delay mitigation measures incorporated.

14.3.9 Earned Value Management

14.3.9.1 General

The *Contractor* shall carry out detailed performance measurement using Earned Value analysis techniques and produce a 4 Weekly Dashboard Report for review by the *Project Manager*. A template for the Four Weekly Dashboard Report is included at Appendix 14K.

This will require the integrated reporting of:

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- programme;
- cost;
- quantities;
- manhours; and
- earned Value

At each period update the following items shall be progressed:

- activities which have actually started, shall have the actual start date input;
- activities which have actually finished, shall have the actual finish date input, the percent complete shall be set to 100% and the remaining duration shall be 0;
- activities in progress shall have their physical percentage complete updated based upon cumulative earned value relating to physical work complete;
- the programme shall then be scheduled to the progress cut-off date. Significant changes to the critical path, re-sequenced work and significant float erosion and any negative float shall be clearly explained in the Programme Narrative..

Templates for Earned Value reporting will be provided to the *Contractor* electronically by the *Project Manager*.

14.3.9.2 Resource and Cost Loading the Programme

The *Contractor* shall ensure that the programme submitted for acceptance is fully loaded with job hours, the total of the prices and quantities for performance measurement purposes using suitable resource profiles, agreed with the *Project Manager,* which reflect the work-off for each activity. The *Project Manager* and the *Contractor* shall also agree the variances required to be added to correctly calculate the forecast Defined Cost to complete and total forecast Defined Cost.For the purposes of performance reporting and measurement, the Baseline Accepted Program shall only be adjusted by agreement between the *Contractor* and *Project Manager*, to reflect the effects of implemented compensation events and/or significant changes to planned work sequences. The emphasis is to establish an accurate baseline from which to measure subsequent performance.

14.3.9.3 Cost Loading

The *Contractor* shall cost load the programme at a suitable level agreed between the *Contractor* and the *Project Manager*. Appropriate coding shall be agreed between the *Contractor* and the *Project Manager* at this time.

Sufficient cost shall be allocated to tail-end and finishing activities including snagging and completion package preparation, in order to avoid overvaluing work in the earlier stages.

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Each 4 weekly reporting period, the *Contractor* shall update, in his revised program submitted for acceptance, the cost loading to reflect actual costs to date and the *Contractor*'s assessment of forecast costs to go, including the impact of implemented compensation events.

14.3.9.4 Resource Loading

The *Contractor* shall resource load the programme with resources and quantities as agreed with the *Project Manager*.

Each 4 weekly reporting period, the *Contractor* shall update, in his revised programme submitted for acceptance, the resource loading to reflect actual resources used to date and the *Contractor*'s assessment of forecast to go, including the impact of implemented compensation events.

14.3.9.5 Budget Maintenance Within Primavera

The *Contractor* shall not change, or move cost or resources between activities or sub-activities on the Baseline Accepted Programme without the *Project Manager*'s acceptance. The *Contractor* shall use the budget transfer form included in Appendix 14E shall to seek the *Project Manager*'s acceptance prior to any changes.

14.3.9.6 Planned Expenditure (BCWS: Budgeted Cost for Work Scheduled)

The *Contractor*'s Baseline Accepted Program, updated with compensation events, will be the basis of the Planned Expenditure unless approved by the *Project Manager*.

Each 4 weekly reporting period, data shall be exported from Primavera at a summary level (the appropriate level to be agreed with the *Project Manager*) and formatted into a Performance Measurement Data Summary in the Four Weekly Dashboard Report which will then translate the data into graphs for comparison with earned value, actual Defined Cost and forecast Defined Cost to completion data.

The Earned Value graphs shall show the early start and late start BCWS profile envelope, which shall be generated from data downloaded from Primavera to the PMDS within Excel.

14.3.9.7 Earned Value (BCWP: Budgeted Cost for Work Performed)

The Earned Value shall be calculated by the *Contractor* for each 4 weekly reporting period following a quantitative analysis of physical work completed to date. This analysis shall be translated into % complete for each programme activity and cost component, consolidated to the summary activities agreed with the *Project Manager* and incorporated in the Cost Value Report (CVR) in the in the Four Weekly Dashboard Report for comparison with actual cost.

14.3.9.8 Actual Cost (ACWP: Actual Cost for Work Performed)

The Defined Cost (including monies paid and accruals for work performed up to the cut off date of each 4 weekly reporting period) shall be generated by the *Contractor's* accounts database coding system which shall allow all costs to be summarised by programme summary activities (as agreed with the *Project Manager*) and cost component (e.g. People, Equipment, etc.) and taking into

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account the requirements of the *Project Manager's* Work Breakdown Structure and Code of Accounts. This data shall then be incorporated by the *Contractor* into the CVR in the Four Weekly Dashboard Report for comparison with Earned Value.

14.3.9.9 Cost to Completion (ETC: Estimate to Completion)

The Cost to Completion/Defined Cost to Completion will be agreed jointly between the *Contractor* and *Project Manager* every 4 weekly period. The *Contractor* shall estimate at each reporting period in the Four Weekly Dashboard Report what he considers the Cost to Completion to be. This shall take into account the *Contractor*'s latest cost forecasts of the Defined Costs.

The *Contractor* shall resource and cost-load the programme with the agreed Defined Cost to Completion data. This shall be consolidated by the *Contractor* into period spend data at the same level of detail as agreed for BCWS.

14.3.9.10 Performance Measurement Analysis

The information which has been transferred to the Performance Measurement Data Summary shall be presented graphically by *Contractor* at the level of detail agreed with the *Project Manager* in the Four Weekly Dashboard Report.

Performance indicators are generated from the relationships of the following:

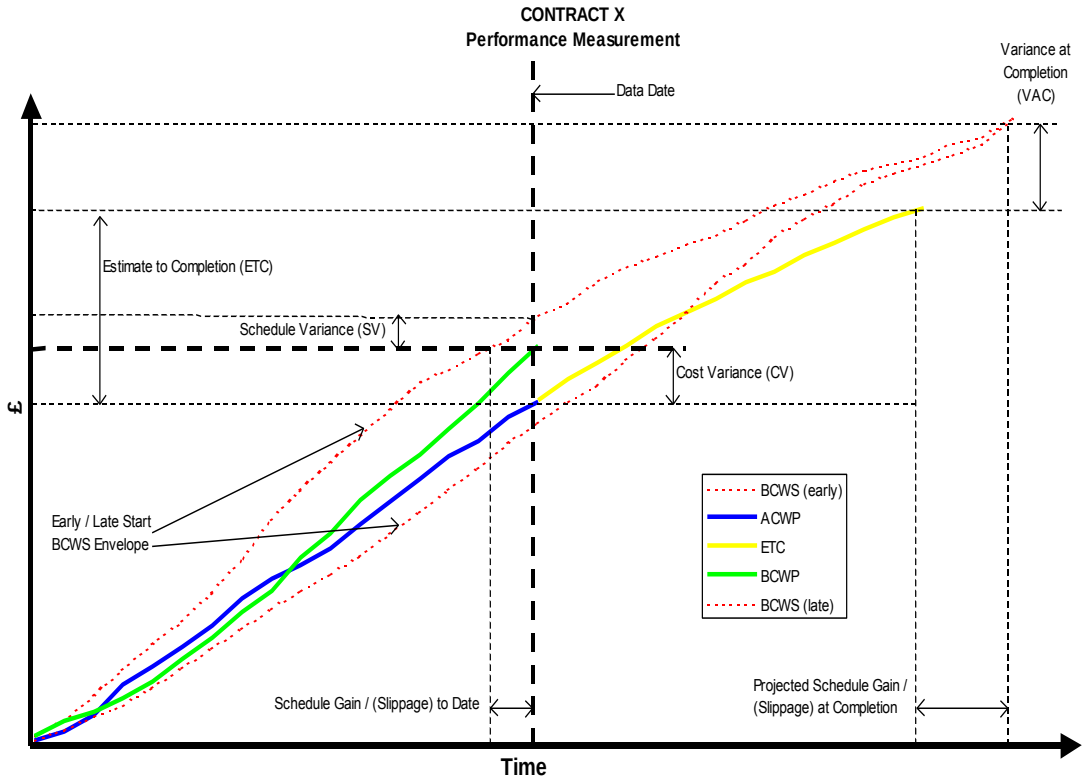

Figure 14.2 – Performance Indicator Graph

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BCWS (early)	Budgeted Cost of Work Scheduled (Planned: Early Start dates);
BCWS (late)	Budgeted Cost of Work Scheduled (Planned: Late Start dates);
BCWP	Budgeted Cost of Work Performed (Earned Value);
ACWP	Actual Cost of Work Performed (Actual);
BAC	Budget at Completion (Current Target Price);
ETC	Estimate to Completion (Current Cost Forecast to Go); and
EAC	Estimate at Completion (Current Cost Forecast)

The Current Performance Indicators are:

Cost Variance	= BCWP – ACWP
Schedule Variance (Cost)	= BCWP – BCWS
Schedule Variance (Schedule)	= Current Date – Earned Date
Cost Performance Index (CPI)	= BCWP / ACWP
Schedule Performance Index (SPI)	= BCWP / BCWS

NB: CPI or SPI greater than 1 is Favourable, whereas less than 1 is Unfavourable.

The Forecast Completion Performance Indicators are:

Cost Variance at Completion	= EAC – BAC
Schedule Variance at Completion	= Planned – Forecast Completion Date

The *Contractor* shall present the relevant Performance Measurement Data in the with accompanying performance curves as shown and for inclusion within the 4 Weekly Progress Report.

14.4 Contract Administration Requirements

14.4.1 Periodic Project Reporting

This section covers the major reports to be prepared and submitted by the *Contractor* on a regular basis. Other reports, as agreed with the *Contractor,* may be required by the *Project Manager*.

14.4.1.1 Daily Construction Report

The *Contractor* shall each day produce a Daily Construction Report, for each area working that day, which shall be submitted to the *Project Manager* and his staff and shall contain as a minimum:

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- Safety, environment and security. Including a general description of significant events on Site;
- Daily manpower. The report shall indicate the number of manual (direct and indirect) and non-manual people on Site, allocated by trade and whether directly employed or non directly employed people;
- Daily Equipment. The report shall indicate all major items of Equipment on Site and whether they are working or standing;
- Daily Plant and Materials. The report shall indicate all items of Plant and Materials on Site;
- Description of Work performed / special comments. The report shall include a brief description of the work being carried out that day for each area, the initiation or completion of any significant event, major items of Equipment, Plant and Materials received, removed or installed, work stoppages, interruptions, delays and potential causes of delay; and
- Weather records. Including a general description and any significant events.

The *Contractor* shall present this report, by 10:00hrs working day, in the Project Daily Construction Report Template and Example included within Appendix 14F.

14.4.1.2 Weekly Progress Report

A 1 to 2 page Weekly Progress Report shall be prepared by the *Contractor* for review by the *Project Manager*. This report shall be finalised and submitted to the *Project Manager* by 9am on the Friday in the week to which it relates. The report shall contain sections on health and safety, environment and security, key contract issues, performance indicators, weekly performance measurement, progress and quantities installed, Network Rail interfaces, London Underground interfaces, design, consents, procurement, quality assurance, environment and community relations, a financial section identifying compensation events notified or implemented that week, and any critical items. A critical item is defined as any item that has caused or is likely to cause an impact to a schedule key date or to planned Completion. It should be noted that not every schedule delay results in an impact to a key date and therefore not every delay counts as a critical item.

The *Contractor* shall use the Weekly Progress Report Template and Example included in Appendix 14G.

14.4.1.3 Four Weekly Progress Report

The *Contractor* shall submit for review by the *Project Manager*, a Four Weekly Progress Report, within five working days of the contract reporting cut-off date in electronic format. The *Contractor* shall submit his report each Period in accordance with the Project reporting cycle programme included in Appendix 14H. The *Contractor* shall use the standard Project Four Weekly Dashboard Progress Report template (which may change from time to time) included within Appendix 14K. The

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Contractor shall ensure that the report does not exceed the number of pages specified within the standard template.

As stated in 14.2.2.4, the *Contractor* shall attend four weekly meetings to discuss the Four Weekly Progress Report, and provide hard copies of the Report for discussion (number of copies to be agreed with the *Project Manager*).

14.4.1.4 Not Used

14.4.1.5 Quantity Unit Rate Report (QURR) and Quantity Performance Graphs

The main deliverable of the Quantity Tracking System (QTS) is the Quantity Unit Rate Report (QURR) which shows key quantities, job-hours (earned and actual), job-hour unit rates, performance factors, and percent complete at a level to be agreed between the *Contractor* and the *Project Manager*.

The format and content of the QURR shall follow the format of the Project QURR included in the Four Weekly Dashboard Report. The QURR shall be submitted weekly by the *Contractor* to the *Project Manager* for review at least 1 working day prior to the weekly meeting where variances shall be discussed.

The *Contractor* shall produce, as agreed with the *Project Manager*, quantity installation and performance graphs to assist in the monitoring and management of the contract. The key quantities to be covered and job hour quantification shall be agreed between the *Contractor* and the *Project Manager*.

14.4.1.6 Cost Value Report (CVR)

The *Contractor* shall produce a four weekly Cost Value Report (CVR) for review by the *Project Manager* which shows cumulative and period movement data in accordance with the template included in the Four Weekly Dashboard Report. It is reviewed in detail jointly by the *Contractor* and *Project Manager* at the Four Weekly Progress Review Meeting. Where this review identifies areas of significant variance between cost and value, the *Contractor* shall investigate, explain and proposed mitigation measures to the *Project Manager*. The *Contractor* shall provide any information necessary to support the Crossrail Trend Program.

All cost/budget transfers (including explanations, e.g. misallocation of cost) shall be recorded by *Contractor* and accepted by the *Project Manager* prior to issue of the Cost Value Report (CVR).

14.4.1.7 Report Submission Frequencies

Submission	Frequency	Comment
Summary Schedule	With each Four Weekly Dashboard Report	Status reflects *Contractor*'s revised program.
Contractor's revised programme submitted for acceptance.	With each Four Weekly Dashboard Report.	For performance measurement reporting purposes. Refer to Project calendar and

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		reporting programme for cut off dates.
Four Weekly Dashboard Report	Four Weekly	Comprises several worksheets
EPPR (if applicable)	With each Four Weekly Dashboard Report	
Procurement Schedule	With each Four Weekly Dashboard Report	
Weekly Work Plan	Every Monday before 10:00hrs.	
Commissioning and Startup Programmes (if applicable)	Initial submission 6 months prior to first commissioning activity. Subsequent submissions as agreed with *Project Manager*.	
Possession Programmes	12 weeks, 4 weeks and 1 week prior to start of possession	Successive revisions required for readiness reviews
Risk Log	4-weekly, where it has been agreed with the *Project Manager* that ARM is not used	

14.4.2 Fair Payment Charter

14.4.2.1 Principles

In June 2007 the Office of Government Commerce produced a guide to fair payment practices as part of its “Achieving Excellence in Construction” series. This guidance was in response to both public sector and industry concern about the impact of poor payment practice on the supply chain. The guidance proposed that public procurement contracts adopt a charter to promote fair payment throughout the supply chain whilst a further study will move to seeking ways to make fair payment a contractual commitment.

The *Employer* has adopted a Fair Payment Charter for the Project which is broadly based on the recommendations of the Office of Government Commerce guidance. The Fair Payment Charter is attached in Appendix 14L. The *Contractor* signs the Fair Payment Charter within 1 week of the *starting date* to endorse its willingness to abide by the principles of the charter. The *Contractor* procures that its

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Subcontractors and suppliers and their subcontractors endorse their commitment to work within the principles of the charter.

To support the adoption of the Fair Payment Charter the *conditions of contract* include the provision of a Project Bank Account and Trust Deed to protect the interests of the *Employer*, the *Contractor,* Subcontractors and suppliers.

The *Project Manager* shall audit the *Contractor's* compliance with the Fair Payment Charter. The *Project Manager* and the *Contractor* shall agree any performance improvement measures arising from such audits.

14.4.2.2 Not Used

14.4.3 Project Bank Account

14.4.3.1 General

The *conditions of contract* include a requirement for the *Employer* to set up a Project Bank Account (PBA) in the name of the *Employer*. The *Employer* opens the PBA within 3 weeks of the contract date.

The *Employer* will pay the amount due to the *Contractor* into the PBA. The *Contractor* shall use the PBA for the payment of all Defined Cost incurred in connection with this contract and payment of Value Added Tax in connection with the *works*. The *Contractor* may transfer the *Contractor*'s Fee from the PBA for onward disbursement or use the PBA for payment of disbursements covered by the Fee.

The PBA shall allow for remote access and administration via any web enabled computer system subject to the *project bank*'s access constraints and security requirements. The *Employer* shall be the lead system administrator for the PBA. The *Contractor* will have access rights that allow the *Contractor* to view and authorise payments from the PBA.

14.4.3.2 Trust Deed

The form of the Trust Deed which the *conditions of contract* require the *Contractor* and *Employer* to enter into relating to the Project Bank Account is attached at Appendix 14M.

14.4.4 Records of Defined Cost

14.4.4.1 Payment

The *Contractor* shall ensure that no payments are made from the Project Bank Account against invoices which exceed order values. In the event that an invoice exceeds its order value, commitment authorisation shall re-commence, including budget reconciliation and re-authorisation at relevant approval levels. The *Contractor* shall provide any information necessary regarding deviations from the budget to support the Crossrail Trend program.

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14.4.4.2 Accounts and Records of Defined Cost

In addition to the accounts and records the *Contractor* is required to keep in accordance with the *conditions of contract*, the *Contractor* shall keep the following

- separate and readily identifiable accounts and details for all monies paid out and incurred in respect of the addition to, alteration, diversion, protection, removal or replacement of existing apparatus belonging to or used by statutory undertakers;
- cash and bank transactions and reports;
- cost ledger transactions and reports;
- purchase ledger transactions and reports;
- sales ledger transactions and reports;
- Subcontract ledger transactions and reports;
- expenses transactions and reports;
- petty cash transactions and reports;
- capital expenditure reports;
- labour details and reports;
- monthly paid staff details and reports; and
- any cost paid by the *Employer* on behalf of the *Contractor;*

14.4.4.3 Administration

Within the timeframe agreed in the Project Execution Plan, the *Contractor* shall produce an Accounts Administration Plan for the *Project Manager's* review. The plan may include existing corporate procedures, plans or other documents provided that these meet legal requirements and the requirements of this contract.

The plan shall ensure that the *Contractor*'s accounts management procedures include requirements to:

- Cash Book and Bank Reconciliations
    - provide copy of the bank mandate detailing signatories of those authorised to sanction payment from the Project Bank Account.;
    - provide an electronic link to enable the *Employer* to monitor the bank account;
    - maintain a cashbook with detailed analysis;

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- complete weekly reconciliations between the cash book and bank account statements including those to be prepared at every assessment date, normal period end, and more frequently if deemed necessary by the *Project Manager*. The cashbook is to include allocation of all direct cost entries by the generic categorisation described in the Schedule of Cost Components:
  - People;
  - Equipment;
  - Plant and Materials;
  - Charges;
  - Manufacture and fabrication;
  - Design; and
  - Insurance.
- Along with Subcontract cost as well as an allocation to the applicable cost code within the agreed WBS; and
- maintain an interest received schedule.

- Cost Ledger
  - maintain a cost and commitment ledger and reporting system;
  - code all costs in accordance with the Project coding system by each activity and by each activity main element of the Schedule of Cost Components; Ensure all journals transferring cost from one cost centre to another are documented and reported to the *Project Manager* along with the Cost and Performance Report including a narrative explanation as to why the transfer has been made; and
  - code all compensation events and Disallowed Costs in accordance with the contract coding system.

- Purchase Ledger
  - process Invoices/Credit Notes – from receipt to payment including matching to GRN's, plant hire returns, purchase orders, invoices held in query;
  - monitor spend against purchase orders and produce printed records for audit purposes;
  - retain all purchase order documentation and any changes thereto;

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- not to make any 'on-account' payments without the prior acceptance of the *Project Manager;*
- assess accruals and provide an accrual print to the *Project Manager* as backup for his assessment of the amount due; and
- monitor Debit Balances.

- Capital Expenditure
  - monitor the effectiveness of purchase of Equipment against hire;
  - set authority levels required for purchase of assets;
  - manage capital purchases utilising a temporary assets management procedure
- Equipment Hire
  - monitor Equipment on and off hire dates;
  - make site production personnel accountable by use of detailed site requisition documentation including work areas, operations and hire durations of operated plant and small tools;
  - control Equipment utilisation and build up of cost;
  - demonstrate that selection was made on open market rates;
  - maintain and review a Equipment register;
  - monitor, check and record deliveries and removal of Equipment;
  - provide Equipment and labour returns to the *Project Manager* on a weekly basis; and
  - monitor the effectiveness of hire against purchase of Equipment for all items where the *Contractor* proposes to long term hire (periods in excess of 6 months). The *Contractor* shall provide the *Project Manager* with an exception report that demonstrates the cost effectiveness of long term hire against purchase of the Equipment item.
- Materials
  - monitor, check and record deliveries and removal of materials; and
  - control material wastage, reconciliation and management; produce exception reports on bulk materials.
- Sales Ledger

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- process sales invoices;
- record proceeds for Temporary Labour Accommodation/Scrap/Assets, work for third parties etc; and
- pursual of outstanding debtors.

- Subcontract Ledger
  - monitor spend against Subcontract orders and produce printed records for audit purposes;
  - retain all Subcontract order documentation and any changes thereto;
  - retain all relevant documentation/backup to payments;
  - monitor CIS certificates and maintain a CIS register;
  - Subcontract final accounts;
  - effectively manage back to back contracts with Subcontractors; and
  - monitor internal company charges and Fee on fee issues.
- Expenses
  - monitor expenditure;
  - review authorisation levels for expenses; and
  - process and payment of expenses.
- Petty Cash
  - details of floats held, cashier authorisation levels;
  - monitor petty cash expenditure; and
  - process and pay expenses.
- Labour Direct and Indirect
  - control the take on of labour by the completion of detailed labour requisitions outlining trade requirement, work area/description and duration of operations together with originators name countersigned by senior site managers;
  - the *Contractor* shall submit to the *Project Manager* for review all approvals for major labour intakes;

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- as a minimum requirement provide and monitor attendance for all People involved who Provide the Works through the use of swipe cards/clock cards which record hours worked on a daily basis;
- provide a daily labour attendance summary;
- provide a daily summary of labour by trade;
- operate a labour control system based on time-sheets authorised by site staff and coded according to the agreed code of accounts. Timesheets to be monitored and checked against the swipe card / clock card attendance control records generated by the *Contractor*;
- daily time /allocation sheets shall be reconciled weekly to clocked/booked hours;
- provide an analysis of holiday accruals and actual holiday payments;
- provide when requested by the *Project Manager* payroll build-ups and information to support pay entitlements for operatives;
- National Insurance Contribution build ups; and
- labour to be employed on direct status basis wherever possible in accordance with the current *Project Manager's* Industrial Relation Procedures.

- Monthly Paid Staff
  - provide and monitor attendance for all staff involved who Provide the Works through production of weekly/monthly timesheets;
  - provide an attendance register for salaried staff on a weekly basis highlighting periods of study, sickness, absenteeism, holidays etc;
  - utilise timesheets to code staff cost according to the agreed code of accounts; and
  - provide when requested by the *Project Manager* payroll build-ups and information to support pay entitlements for staff.

14.4.4.4 Other Requirements

- Record details of all insurance payments received from Insurers;
- VAT Returns and Records;
- Delegated Authority for control of expenditure with specimen signatures;
- Provide Staff organogram to the *Project Manager* for all site based staff and where relevant head office staff;

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- The *Contractor* shall ensure that costs can be effectively checked and verified by the *Project Manager* via uncomplicated audit trails in order to ascertain Defined Cost and allow the *Project Manager* to decide whether any costs should be classified as Disallowed Cost;

- The *Contractor* shall actively review Defined Cost and determine that all transactions processed are covered under the Schedule of Cost Components for both himself and his Subcontractors;

- The *Contractor* shall ensure that the *Project Manager* is given access to its accounts and records in order to support the payments that have been and / or are to be proposed to be made from the Project Bank Account on a daily basis;

- Any cost incurred in relation to insurance claims shall be recorded separately within the Contractors Cost Accounting System;

- The *Contractor* shall establish appropriate financial systems to provide confidence that reported costs and applications for payment are complete, accurate and in compliance with the contract; and

- The *Contractor* shall establish appropriate and fit for purpose controls to minimise the risk of fraud and mis-statement of costs and Subcontractor insolvency.

14.4.4.5 Management of Temporary Assets

The *conditions of contract* provide that items of Equipment may be purchased for the *works* and sold at open market sale price at the end of the period for which the Equipment is required or available for use. The *Contractor*'s management plans for the *works* shall include procedures for the management of such temporary assets (where the purchase price per item or collection of same or similar items exceeds £5,000) that shall include:

- a method of demonstration that purchase of Equipment represents the most economic procurement method and the *Project Manager*'s acceptance of the proposal;

- the marking of temporary assets with a unique reference number and as the property of the *Employer* in a manner acceptable to the *Project Manager*;

- maintenance of a temporary asset register that identifies each asset purchased, its unique identification number, the purchase date, the purchase price and forecast residual value, the location of the asset and the person responsible for its safe keeping, any maintenance requirements including the interval of such maintenance, the anticipated date of release for sale and the cost credited to Defined Cost as a result of the sale;

- a process for regularly recording the condition of the temporary asset and updating the register; and

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- records of the *Project Manager*'s acceptance that the temporary asset is no longer required for the works and the *Contractor's* process for managing the disposal of temporary assets.

14.4.4.6 Not Used

14.4.4.7 Assessments for Payment

General

In accordance with the requirements of the *conditions of contract*, the *Contractor* shall submit to the *Project Manager* on or before each assessment date applications for payment which will include the following:

- a Summary of Defined Cost incurred up to the assessment date broken down into the major resource components of:
    - Each main element of the Schedule of Cost Components; and
    - Subcontractors.

All supported by the following:

- bank statements;
- cash book and analysis;
- cash book – bank statement reconciliations;
- interest received schedule; and
- Fee.

The Cash Book shall include all transactions relating to the works from the *starting date* until final payment in a format acceptable to the *Project Manager*. For the purposes of assessment of the amount due, the *Contractor* shall provide the value of:-

- invoices passed for payment – ledger balance;
- accruals;
- forecast of payments up to the next assessment date broken down into the major resource components of:
    - each main element of the Schedule of Cost Components; and
    - Subcontractors;
- VAT due to Her Majesty's Revenue and Customs in period;

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- forecast of expected Income in period to including interest received and other income; and
- A forecast of all further payments that will have been paid by the Contractor before the next assessment date broken down into the major resource components of:
    - Each main element of the Schedule of Cost Components
    - Subcontractors.

All items on *Contractor's* application shall be net of VAT.

VAT is applied to the total application. However, the *Contractor* is to separate any items that are not subject to VAT at the standard rate.

14.4.4.8 Subcontractor's Deduction Scheme

This scheme applies to both the *Contractor* and its Subcontractors.

The *Contractor* shall within 15 days of the *starting date*, produce its current Construction Industry Scheme CIS tax certificate to the *Project Manager* for inspection and validation.

During the course of the contract, if a CIS tax certificate expires, the renewed certificate shall be produced by the *Contractor* or an updated certifying document provided, prior to the next payment certification date.

Following payments, the *Contractor* shall provide any necessary gross payment voucher or company gross payment voucher, as appropriate, to the *Project Manager*.

Failure by the *Contractor* to comply with the above shall result in a non-payment of relevant costs.

The *Contractor* shall ensure that he requests and checks similar documentation from its Subcontractors.

14.4.4.9 VAT Invoice

The *Contractor* shall submit a VAT invoice containing all details as required by Her Majesty's Revenue and Customs to the *Employer* within 2 days of receipt of the *Project Manager*'s payment certificate.

14.4.4.10 Tender Appraisal / Bid Analysis / Recommendation

The *Contractor* shall produce bid / tender analysis along with a tender recommendation report for award of subcontracts or purchase orders with a value of £10,000 or above. All such recommendations shall clearly identify and reconcile relevant contract budget allowances, with explanations between the recommended award value and the budget allowance. The Contractor shall provide any information necessary regarding deviations from the budget allowance to support the Crossrail

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Trend program. The *Contractor* shall carry out financial checks on all proposed Subcontractors to reduce the risk of Subcontractor insolvency, administration or similar financial failure and include the results of these checks in its tender recommendation report.

14.4.4.11 Administration of Insurances

The *Contractor* shall comply with the *Employer's* claims protocol for the notifying and handling of insurance claims.

14.4.4.12 Progress Photographs

The *Contractor* shall employ a professional photographer accepted by the *Project Manager* to take thirty colour digital photographs each month (minimum resolution ten mega-pixels) recording the progress of the *works* for promotional purposes. The general areas to be photographed are to be accepted by the *Project Manager*.

The *Contractor* shall load each digital image onto a file share system to be specified by the *Project Manager* along with the following information:

- date of photograph;
- brief description/location;
- photographer's name and contact details; and
- serial number based on date (for example 070809-1 for photo taken on 7th August 2009).

The terms and conditions under which the photographer is engaged shall provide for the copyright of all photographs to be vested in Crossrail Ltd.

Taking photographs for promotional purposes on or about the site is not permitted unless by an authorised photographer as described above, or with express written permission of the *Project Manager*.

14.4.4.13 *Contractor's* Proposals to change the Works Information

Any proposal to change the Works Information contains:

- detailed scope of the change detailing which specific sections of the Works Information are to be changed;
- a schedule detailing how the proposed change is to be effected, including activities and anticipated durations for any resulting design changes to be undertaken by the *Employer*, additional or revised consents, amended key dates and other relevant information;
- a proposed revised programme for the remaining work is affected; and
- forecast savings in actual cost and a forecast of any additional costs of other parties and/or the *Project Manager*.

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14.5 Risk Management

14.5.1 General

The *Employer*'s risk management policy recognises that managing risk is critical to the successful delivery of Crossrail, and a Project wide risk management framework has been being implemented to enable effective and efficient risk management.

The *Contractor* shall carry out his own risk management activities in order to actively identify and manage risk and to provide assurance to the *Project Manager* that the risks associated with delivering the works are fully recognised, understood and effectively controlled.

The *Contractor* shall involve the *Project Manager* in the implementation of these risk management activities.

The risk information developed under this section of the Works Information does not replace the Risk Register referred to in the *conditions of contract* and maintained by the *Project Manager* in relation to early warning notices.

14.5.2 Risk Management Requirements

General

The *Contractor* shall describe the activities that he will undertake to manage risk associated with delivering the contract in a procedure or other appropriate document. This document will be subject to acceptance of the *Project Manager*.

The *Contractor's* procedure will follow the process outlined below.

A contract risk in this context can be defined as a threat of any type (schedule, safety, cost, quality, reputation, etc.) which could adversely affect the achievement of the contract.

The *Contractor's* procedure will recognise that:

- There are certain categories of risk that the *Contractor* is responsible for managing, and certain categories of risk that the *Employer* is responsible for managing;
- Risks will vary dependent on delivery stages of the works (design, construction, commissioning and handover), and that some risks will remain beyond the completion of one delivery stage;
- There are a number of other risk based processes being used on the Project (for example Designing for Health and Safety, CDM) which are subject to different requirements.

Accountabilities and Responsibilities

The *Contractor* shall:

- Define clear accountability for the management of risk within the Contractor's organisation and for the maintenance of the risk management process;

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- Ensure that risk management is carried out fully within their teams and that all staff have an appropriate level of competency and training in risk management;
- Make available adequate competent specialist resource to ensure that risk management obligations are met including the appointment of a Risk Manager;

Deliverables

The risk management process will produce the following deliverables:

- A plan describing which risk assessments will be carried out, when these will be done, who will be involved.
- A log of significant risks – the *Contractor* Risk Log – to be used for discussion with the *Project Manager*. The *Contractor* Risk Log will reflect those risks inherent in the contract that the *Contractor* considers are material to the contract objectives, and which are necessary to provide assurance to the *Project Manager* that the key risks are being appropriately managed. This will form the basis of meetings with the *Contractor* and *Project Manager* to jointly review the risks.
- Further risk information as appropriate to support the management of the works. This information shall be made available for review by the *Project Manager* in a suitable format.
- A regular report of the key risks and risk management actions based on the *Contractor's* Risk Log described above and presented in a format determined by the Project Manager.
- Comprehensive records to demonstrate the application of continuous risk management practices (e.g. records of meetings, approvals).
- Other reports, KPIs and measures as required to ensure that the effective management of the process.

Governance

The *Contractor* shall, on a regular basis jointly review the key risks and risk management performance with the *Project Manager*. At this meeting, the *Contractor* and *Project Manager* should review the contractor Risk Log, and the risks owned by the *Contractor* and each should communicate any emerging risks that the other is best placed to manage.

Systems

The *Employer* has implemented ARM (Active Risk Manager) as a Project wide risk management system.

Unless agreed otherwise by the *Project Manager*, the *Contractor* shall maintain the *Contractor* Risk Log in ARM.

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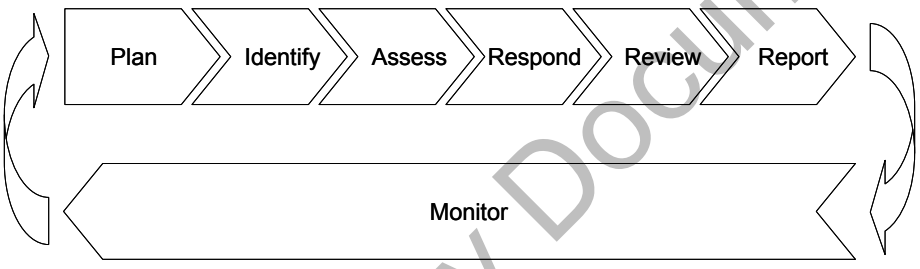
The *Contractor* shall as appropriate record further risk information using the MSExcel Risk Log template (see example in Appendix 14R) or an equivalent of their own accepted by the *Project Manager*.

Quantified Risk Assessment

The *Contractor* shall provide assistance to the *Project Manager* in undertaking cost and schedule risk assessments by contributing to workshops and advising on quantitative assessment of risks as required.

14.5.3 Risk Management Process

The *Employer* has defined a risk management process consisting of seven iterative steps as illustrated and described below:



Step 1: Planning

The definition and documentation of risk management activity describing which risk assessments will be carried out and when, who will be involved and the frequency and nature of subsequent reviews. This will reflect the structure/categories of risk in the *Contractor* Risk Log and the full scope of the Works (including its complexity and geographical spread) and the contract objectives.

The contract objectives, as agreed with the *Project Manager*, Are likely to include: meeting safety, health, environmental and security requirements; meeting cost, time and quality targets; complying with relevant policy, legislation and regulations and maintaining effective stakeholder relationships.

Step 2: Identification

The comprehensive and systematic identification of all risks to delivering the scope of work being considered. Risk identification should be carried out in all phases of the contract, with the full involvement of all relevant parties and take into account all useful information (including execution plans, drawings, etc.), Note that 'significant', 'unmitigated' risks from other risk based processes (e.g. Designing for Health and Safety, CDM) should be considered and recorded within this process as appropriate.

Each risk should have causes (i.e. events/circumstances that would lead directly to the risk occurring) and effects (i.e. scenarios that result from the risk occurring) identified.

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A risk owner should be identified for each risk and they should confirm that they accept accountability for managing the risk.

All risk information should be recorded in the defined format using the agreed application.

In addition to the initial risk identification exercise (probably a workshop or facilitated meeting) and subsequent reviews, a simple mechanism for capturing risks identified outside formal risk identification workshops should be provided.

Step 3: Assessment

The systematic assessment of probability and impact to determine the severity of a riskusing a consistent set of criteria in order to drive management attention and prioritisation of response actions. Qualitative probability and impact scales and a Risk Assessment Scheme (Probability Impact Diagram or PID) are provided to help ensure consistency (see Appendix 14Q) and the assessments should be recorded against the relevant risk.

Two assessments will be made: the ‘current’ assessment which allows for the effectiveness of all existing control measures and the ‘forecast’ assessment which allows for the estimated effectiveness of the response plan. Note that control measures may be pro-active (reducing the probability) or reactive (reducing the impact).

In order to inform the ‘current’ assessment of each risk the existing control measures already applied should be identified and recorded and the effectiveness of those control measures should be considered.

Step 4: Response

The identification of a response strategy and specific actions required to mitigate the risk to a satisfactory level. Identifying an appropriate response strategy and actions and ensuring that these actions are effected is the responsibility of the risk owner. Note that response strategies should either treat, terminate, tolerate or transfer the risk and response actions should be specific, measurable, achievable, relevant and timed (SMART).

A response owner should be identified by the risk owner for each response and they should confirm that they accept accountability for completing the action.

After identification of a response strategy and actions, the ‘forecast’ assessment should be made with reference to the Risk Assessment Scheme (see Appendix 14Q);. The likely effectiveness of further response actions should be considered.

When an action is completed, the risk should be reassessed to reflect any newly introduced existing control measure.

Step 5: Review

Consists of two elements:

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The regular review of risks by risk owners to ensure that all risk information recorded is accurate and up to date and that response actions are progressing as planned.

The formal review and approval and of the risk information in full by the accountable manager to enable it to be used for reporting. In the event that the accountable manager will not approve (part of) the risk information (e.g. due to the inadequacy of existing control measures) they will agree those additional response actions necessary with the relevant risk owner, prior to approval.

Step 6: Reporting

The regular reporting of the key risks, and management actions to inform and provide assurance to key stakeholders that risks are being appropriately managed. Reporting must be in an agreed format, based on current risk information held in the agreed application. It may also be necessary to escalate some risks to the attention of line/senior management.

Step 7: Monitoring

The continuous systematic and formal monitoring of the implementation of the risk management process and its outputs. This could include self-assessment, internal audit or detailed reviews by independent external experts.

14.6 Communications

14.6.1 Not Used

14.6.2 Hosted Web Servers

The following hosted web servers will be used for communications on the contract:

- The Project's EDMS (Electronic Document Management System) used for all contract communications except for those communicated through PTR and IMS-RIVO Safeguard..
- PTR - the Project's technical request system used for the issue of site queries, requests for information, technical acceptance (for example substitute products proposed on a 'similar and acceptable' basis) and confirmations. Also used to manage the Defects/Non-conformities notifications and procedures.
- Punchworks - the Project's 'snagging' system used for the close out of defects and outstanding works up to Completion.
- IMS-RIVO Safeguard - the Project's incident management system used for notification, reporting, recording and tracking actions and close out of Incidents.

The *Employer* will provide the *Contractor* with access to systems operating on hosted web servers. The *Employer* will be responsible for support and maintenance (including database administration) of the hardware and software.

The *Project Manager* and will manage the system user accounts.

The *Contractor* shall nominate users for these systems and notify the *Project Manager* immediately of any changes necessary to user accounts to avoid mis-use

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of the systems. The *Contractor* will be held liable for any mis-use of these systems by its nominated users

14.6.3 Training on Web Based Systems

The *Project Manager* will provide training in the use of these systems to the *Contractor*'s nominated representatives on a 'train the trainer' basis. It will be the responsibility of the *Contractor* to train any further users.

14.6.4 Not Used

14.7 Document Control and Management

14.7.1 General

The *Contractor* shall submit and receive documents through the *Employer*'s EDMS system

The *Contractor* shall follow the *Project Manager*'s document management procedures including the supporting guide information known as QRGs (Quick Reference Guides) to manage its documentation.

The *Contractor* and the *Project Manager* shall establish a single joint and common filing system, as agreed under the CMDL; such that the *Project Manager* shall have access to the *Contractor's* working and EDMS electronic files structure.

14.7.2 Document Submissions, Numbering and File Coding Structure

All *Contractor* deliverable documents shall follow the taxonomy (*Employer's* project numbering) as required by the *Project Manager*. All documents shall be submitted as detailed on the Contract Master Deliverable Template as included in the accepted Project Execution Plan.

This Taxonomy allows for documents to be suitably numbered and stored with the Project's EDMS.

The *Employer's* Taxonomy shall be prominently displayed on all deliverables submitted by the *Contractor.*

The decal label shall be applied by the *Contractor* on the front cover of all deliverables.

The following *Project Manager*'s acceptance status of all deliverables shall be recorded by the *Contractor* on the CMDL.

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Figure 14.2 – *Project Manager's* Review Decal

Document status and reasons for issue shall be used as specified by the *Project Manager's* document management procedure.

14.7.3 Document Management Reporting

The *Contractor* may use the EDMS to facilitate the creation of reporting of the status of deliverables.

14.7.4 Document Revision/Issue Coding System

The *Contractor* shall adopt the following suitability status and coding system as agreed with the *Project Manager* when submitting drawings and documents.

As Built
As Installed
Cancelled
Comprehensive Revisions Needed
Fit For Approval
Fit For Authorisation
Fit For Commissioning
Fit For Construction
Fit For Construction but with Comments
Fit For Co-ordination
Fit For Costing
Fit For Design
Fit For Implementation
Fit For Information
Fit For Manufacturing/Procurement
Superseded
Fit for Acceptance
Fit for Review
Fit For Stakeholder Acceptance

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All documents submitted via the EDMS shall start with revision 1.0. The revision numbers shall then increment by one full number to the next revision as the document progresses through the various review/approval stages.

14.7.5 Document Submissions

All submissions shall be formally communicated via the EDMS

14.7.6 Not Used

14.7.7 CAD Data/Drawing Management

The *Contractor* shall use the ECMS and the *Employer's* CAD Standards to manage the production, submission, review and acceptance of CAD data (3D models and drawings) that make up the *works* for the duration of the contract.

The *Employer* will provide the *Contractor* with gateway access and configuration files for the ECMS.

14.8 Lessons Learned

The *Contractor* is required to participate in and contribute to the Project lessons procedures. Within the timeframe and at frequencies agreed with the *Project Manager* in the Project Execution Plan, the *Contractor* shall participate in a joint lessons learned workshop` with the *Project Manager.* The scope of this workshop will include but not limited to:

- a review of historic lessons learned from other projects of similar scope;
- a review of historic lessons learned from the design, enabling works, site investigation phases of the Project; and
- a review of lessons relating to procurement activities including Subcontractor performance.

14.9 Procurement Requirements

14.9.1 General

The *Contractor* shall submit detailed procurement procedures to the *Project Manager* for acceptance within the timeframe agreed in Project Execution Plan. The procurement procedures shall define the processes leading to the procurement of Equipment, Plant and Materials, Subcontractors and services including the acceptance by the *Project Manager* of Subcontractors.

The *Contractor* shall comply with the procurement procedures that have been accepted by the *Project Manager,* and shall submit a detailed Procurement Schedule, in accordance with the standard template (MS Excel) included as Appendix 14C.

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14.9.2 Procurement Schedule Revisions

The Procurement Schedule shall be revised by the *Contractor* and submitted to the *Project Manager* every four weeks, or at such other frequency as may be instructed by the *Project Manager*.

As agreed in the Project Execution Plan, the *Contractor* shall attend Four Weekly Progress Review Meetings with the *Project Manager,* and review status and actions of items on the Procurement Schedule, as may be instructed by the *Project Manager*.

14.9.3 Critical Packages

Packages that have programme criticality, and / or are in some other way regarded as having critical importance to the successful achievement of the objectives of the contract will be deemed critical packages.

For packages advised by the *Project Manager* as being deemed critical, the *Contractor* shall ensure that the list of proposed subcontract tenderers has been agreed to by the *Project Manager* prior to tenders or bids being invited.

For critical packages, the *Contractor* shall provide a subcontract cash flow concurrent with each submission of a critical package subcontract for acceptance.

Critical packages will have an enhanced level of scrutiny over a Subcontractor's ability to Provide the Works, financial capacity and standing than non-critical packages.

14.9.4 Acceptance of Subcontractors

The *Contractor* shall use the template pro-forma subcontract Acceptance Checklist provided at Appendix 14P for the submission of proposed Subcontractor names, Subcontract details and supporting information as required under clauses 26.2 to 26.4A inclusive of the conditions of contract, and in compliance with other related requirements.

In making the submission(s) the *Contractor* shall fully complete the subcontract Acceptance Checklist and provide all of the relevant supporting information where required.

14.9.5 Not Used

14.10 Appendices

Appendix 14A Indicative Work Breakdown Structure

Appendix 14B Indicative Code of Accounts

Appendix 14C Procurement Schedule Template

Appendix 14D Weekly Work Plan Template and Example

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Appendix 14E	Budget Transfer Form Template
Appendix 14F	Daily Construction Report Template and Example
Appendix 14G	Weekly Progress Report Template and Example
Appendix 14H	Project Reporting Cycle Programme
Appendix 14K	Four Weekly Dashboard Report Template
Appendix 14L	Project Fair Payment Charter
Appendix 14M	Project Bank Account Trust Deed
Appendix 14N	Not Used
Appendix 14P	Subcontract Acceptance Checklist
Appendix 14Q	Risk Assessment Scheme – Probability Impact Diagram
Appendix 14R	Contract Risk Register Tool

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