Edinburgh Tram Network

Project Management Plan
Detailed Design Phase

Doc. Ref: ULE90130-SW-SW-PPN-00001 V6

Parsons Brinckerhoff Ltd
Edinburgh Tram Network
SDS Provider
1st Floor, CityPoint
65 Haymarket Terrace
Edinburgh, EH12 5HD

Telephone: 44(0) 131 623 8600
Facsimile: 44(0) 131 623 8601
Email: edinburghtram@pbworld.com

23 May 2007

AUTHORISATION PAGE

Title: Project Management Plan – Preliminary Design Phase				
Approvals	**Name**	**Position**	**Signed**	**Date**
Author	A Dolan	Deputy Project Manager		22-5-07
Reviewer	M Conroy	Quality Manager		23/5/07
Approver	J Chandler	Project Manager		24/5/07

Revision History

Ver No	Date	Description	Prepared By
1	31 Oct 05	Formal Issue to tie	A Dolan
2	19 Dec 05	Formal Issue to tie	A Dolan
3	08 Feb 06	Internal and External Comments	A Dolan
4	04 Apr 06	Internal and External Comments Taken on Board and Formal Issue to tie	A Dolan
5	30 Jun 06	Updated for Preliminary Design Phase Submission	A Dolan
6	23 May 06	Updated for Detailed Design Phase Submissions	A.Dolan

Distribution

Ver No	Date	Name	Role	Company
1	31 Oct 05	Willie Fraser	Contract Representative	tie
2	19 Dec 05	Willie Fraser	Contract Representative	tie
3	08 Feb 06	Willie Fraser	Contract Representative	tie
4	04 Apr 06	Willie Fraser	Contract Representative	tie
5	30 Jun 06	Andie Harper	Contract Representative	tie
6	23 May 07	Matthew Crosse	Contract Representative	tie

CONTENTS

1INTRODUCTION **4**
1.1Purpose of the Project Management Plan 4
1.2Project Description 10
1.3Key Dates 11
1.4Management Structure 12
1.5Stakeholders 13

2PROJECT APPROACH **14**
2.1Communications 14
2.2Specifications 14
2.3Co-ordination 14
2.4Meetings 15
2.5Consents and Approvals 15
2.6Design Review & Assurance 17
2.7Monitoring and Supervision 19

3PROJECT ORGANISATION **21**
3.1Edinburgh Tram Project Organisation 21
3.2PB Team Organisation 21
3.3Roles and Responsibilities 21
3.4Communication and Reporting Lines 60

4PROCEDURES FOR CONTROL AND MONITORING **62**
4.1Submittals – Document Control 62
4.2Programme Control 66
4.3Cost Control 69
4.4Interface Management and Systems Integration 70
4.5Systems Assurance 74
4.6Health and Safety, Quality and Environmental 75
4.7Change Control 75
4.8Reporting 79

5DISPUTE RESOLUTION **80**
5.1Terms of Agreement 80

APPENDIX A – SDS ORGANISATION CHART **81**

1 INTRODUCTION

1.1 Purpose of the Project Management Plan

Parsons Brinckerhoff Ltd (PB) have been engaged by the client, **tie** Ltd. to provide the Systems Design Services (SDS) for the Edinburgh Tram Network Project.

Substantial road traffic growth across the Edinburgh area combined with forecast population and employment increases will lead to significant growth in road congestion. To support the local economy, City Of Edinburgh Council identified trams as the preferred way to provide a comprehensive, higher quality public transport network to support the local economy and help to create sustainable development.

The broad policy objective of tram provision is to help to create the transport infrastructure necessary to promote and support a growing local economy and create a healthy, safe and sustainable environment. Sustainable economic growth can only take place with a step change in public transport. Road space must be created (by modal shift away from cars) to enable economic growth to take place without aggravating congestion. A tram system will enable new development and continued growth of existing development in a sustainable way. Without it, growing traffic congestion and lack of access to development sites will curb future growth and threaten the economic prosperity of the city.

A tram system is essential in Edinburgh for many reasons. It will enable new development and continued growth of existing development in a sustainable way. Without it, growing traffic congestion and lack of access to development sites will curb future growth and threaten the economic prosperity of the city.

Tram provides a high quality, high capacity, frequent, reliable and fast public transport system that has environmental benefits over traditional public transport modes.

Trams are the only method of transport which is likely to encourage a modal shift from car to public transport. Growth in traffic and the consequential disproportionate increase in congestion mean that continued large scale investment in buses is unsustainable. Sustainable economic growth can only take place with a step change in public transport. Road space must be created (by modal shift away from cars) to enable economic growth to take place without aggravating congestion.

The purpose of this Project Management Plan (PMP) is to establish the agreed working methods and processes both internal to the PB team and for the team's engagement with **tie** and third parties associated with the project.

This document update is to inform **tie** of the SDS Project movement during the Detailed Design Phase and to identify the SDS Project Team changes made to facilitate the delivery of the Detailed Design.

The PMP will:

- Define the project;
- Define the management structure and relationships between PB as the Systems Design Services provider, **tie**, and all Stakeholders associated with the project to enable the Edinburgh Tram Network Project to be procured, constructed, tested and commissioned to meet the requirements of the Master Project Programme;
- Provide a road map for PB as the Systems Design Services provider, to execute the design services and design management requirements of the Agreement between **tie**

Ltd and Parsons Brinckerhoff Limited for the provisions of System Design Services relating to the Edinburgh Tram Network.

- Define the project requirements to enable the project work to be carried out in accordance with the Agreement;
- Define the PB project teams and the responsibilities;
- Define the PB project control procedures including risk, change management and system integration;
- Communicate the project procedures to the PB project team and to tie.
- Define a Road Map Matrix which identifies topic/subject responsibility such that the Project Management Plan may be used as the initial document to reference all other Management Plans. Please refer to Fig. 1.1.
- Define the PB management structure for the provision of design, technical services and the performance of management services to enable the Edinburgh Tram Network to be procured, constructed, tested and commissioned to meet the requirements of the Master Project Programme;
- Provide a basis for project auditing and control.

Project Management Plan Road Map Matrix

	Project Management Plan	Safety Management Plan	Quality Plan	Configuration Management Plan	Verification & Validation Plan	Risk Management Plan	Approvals & Consents Management Plan	Communications Plan	Stakeholder Management Plan	Environmental Management Plan
Air Emissions										x
Assumptions Register		x								
Audit			x							
Configuration Audits				x						
Audit - Road Safety		x								
Audit - Safety Audits		x								
Change Control - Client	x									
Change Control - Document Change			x							
Communications External								x		
Communications Internal	x									
Competence			x							
Configuration Control				x						
Consents & Approvals							x			
Construction Safety		x								
Consultation							x			
Contaminated Work										x
Control & Inspection			x							
Co-Ordination	x									
Design Change	x									
Design Review			x							
Dispute Resolution	x									
Document Control			x							
Document Control - Document Review & Approval	x									
Exception Reporting	x									
Health & Safety File		x								
Identification & Traceability			x							
Introduction / General Information	x									
Key Date	x									
Legislative Approvals							x			
Legislative Approvals - Environmental		x								
Legislative Approvals - Safety										x
M Framework (Configuration Management)				x						
Management Structure	x									
Meeting Schedule	x									
Modelling					x					
Monitoring & Supervision	x									
Occupational Health & Safety		x								
Operating Safety Case		x								
Organisation for Safety		x								
Photographs	x									
Planning Consents							x			
Pollution Incident Control										x
Programme Management Pcost Control	x									

Project Approval	x									
Project Description	x									
Project Organisation Chart	x									
Project Responsibilities			x							
Project Responsibilities - Key Responsibilities	x									
Project Responsibilities - Risk						x				
Project Responsibilities - Safety		x								
Publicity								x		
Purchasing			x							
Regulations / Standards Specifications		x								
Reliability / Maintainability & Analysis					x					
Reporting (Monthly)	x									
Reporting Lines	x									
Risk - Project Evaluation						x				
Risk - Safety Risk		x								
Risk Assessments & Method Statements		x								
Risk Evaluation Criteria - Health & Safety		x								
Risk Evaluation Criteria - Project						x				
Risk Management						x				
Risk Monitoring						x				
Risk Register						x				
Safety Approval Strategy (HSE, NR, BAA Others)		x								
Safety Interface Management		x								
Stakeholder Interface									x	
Stakeholder List									x	
Stakeholder Management									x	
Third Party Approvals							x			
Training		x								
TTRO's & TRO's Timeline							x			
V Lifecycle - Configuration Lifecycle Model				x						
V Lifecycle - System Safety		x								
V Lifecycle – Verification & Validation					x					
Verification & Validation Strategy					x					

Figure 1.1

This Project Management Plan is an over-arching document which brings together the full suite of management plans required to establish the correct methods and processes to engage and interface with **tie** and the necessary third parties associated with the project. By using all tools identified within each plan and procedure the project will efficiently interface with the Client. Basic internal SDS Office Procedures will be handled under the SDS Edinburgh Project Administration Office Procedure. In conjunction with the valuable lessons PB has gained from previous projects the lessons learned through the Requirements Definition and Preliminary Design Phases will ensure that SDS continue to build on the aims and objectives that were set in the initial stages of the ETN project, the aims and objectives are set out below:

- Continuation of the development of business-like relationships with all stakeholders via the SDS Stakeholder Manager;
- Continually monitor and develop the effectiveness of the processes for dispute resolution;
- Constantly monitor the outputs of our integrated design teams through our 'System Integration Engineer';
- Develop the design to fit operating plans;
- Set realistic milestones for design inputs and incorporate into the SDS Design Programme;
- Establish Configuration Management methods and continuously update;
- Develop the progress reporting needs to suit tie;
- Maintain compliance with the Risk Management Plan
- Pro-actively update the Project Risk Register and Risk Management process;
- Monitor and review where necessary the risk management responsibilities ensuring that ownership is delegated to the most suitable personnel to facilitate appropriate mitigation controls for each identified risk.
- Constrain the number of design segments and solutions;
- Continually monitor the previously identified early lead items with biggest risk;
- Solicit Contractor inputs;
- Get to grips with the construction and phasing issues with design teams;
- Monitor progress during construction;
- Develop an incentive based program with public participation;

1.1.1 Responsibility

This Project Management Plan is the responsibility of PB as the SDS provider. The PB Project Manager will be responsible for the development and implementation of this plan. All attempts have been made to ensure that this document reflects the organisation at the date of issue, but it is important to recognise that Edinburgh Tram Network Project Team is a dynamic organisation, which is continuing to change and evolve. The Project Management Plan is therefore a "live" document and will be updated on a regular basis.

The hierarchical relationship between the PMP to other related project documents is shown in Fig 1.2.

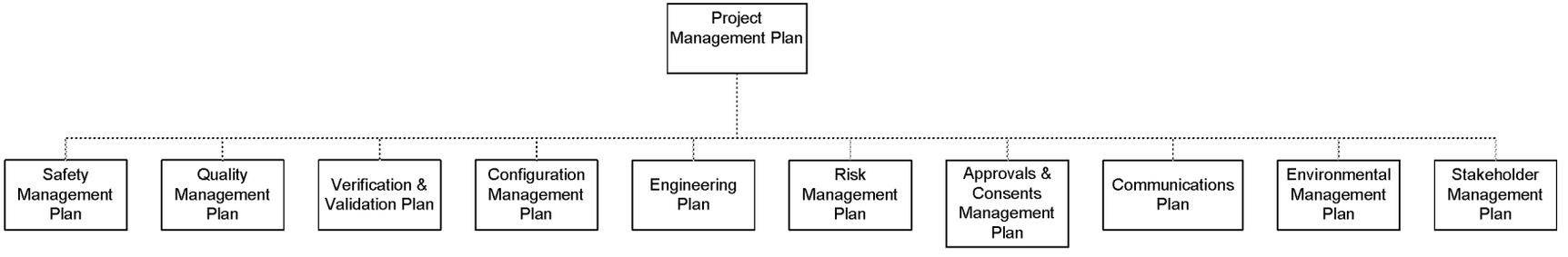


Figure 1.2. Edinburgh Tram Project Plan Hierarchy

1.2 Project Description

Substantial road traffic growth across the Edinburgh area combined with forecast population and employment increases will lead to significant growth in road congestion. To support the local economy, City Of Edinburgh Council identified trams as the preferred way to provide a comprehensive, higher quality public transport network to support the local economy and help to create sustainable development.

The whole Edinburgh Tram Network will consist of the lines detailed within the parliamentary plans for Lines One and Two. The initial Network consists of:

- Phase 1a, between Newhaven and the Airport
- Phase 1b, an extension of Phase 1a from Roseburn Junction to Granton Square via the Roseburn corridor, a disused railway

The Edinburgh Tram Network will operate as a 'line-of-sight' tramway, with tramway signalling provided at road junctions and at tramway crossings where appropriate. A fleet of trams will serve the Network providing level boarding with low level platforms located along the routes.

The Network is formed of an amalgamation of Line One and Line Two as set out in their respective Parliamentary Bills. The Network Diagram sets out the track layout for the Network in schematic form, together with all of the key system layout information. be kept up to date in this document.

The route in the city runs mainly on-street in segregated sections, although there is a small amount of shared running. The Roseburn corridor is a fully-segregated off-street alignment, shared with a combined footpath and cycleway, with most of the route between Haymarket and the Airport is also segregated from road traffic.

The whole network will consist of double track.

The depot, located at Gogar, will provide maintenance and stabling facilities for the entire fleet of trams operating on the initial network, and the infrastructure. It will also contain the administration and management offices, including operations and control centre, from where the whole system will be managed.

The Network will be implemented in Phases as follows:

Phase 1a: Newhaven to Edinburgh Airport via St Andrew Square

Phase 1b: Roseburn Junction to Granton Square

Phase 2: Granton Square to Newhaven

Phase 3: Ingliston Park and Ride to Newbridge

This document covers the requirements for phases 1a and 1b only.

Phase 1a

Phase 1a runs from Newhaven via St Andrew Square and Princes Street to Haymarket, and then continues alongside the Edinburgh to Glasgow main railway line on a segregated alignment, before turning across the railway at Edinburgh Park and continuing to the Airport via the Gyle shopping centre.

The route is approximately 18.2km long with 22 tramstops.

Phase 1b

Phase 1b is an extension of Phase 1a from Roseburn Junction along the former Roseburn railway corridor to Granton Square on the sea front.

The route is approximately 6.0km long with 9 tramstops.

The total number of tramstops for the initial Network is therefore 31.

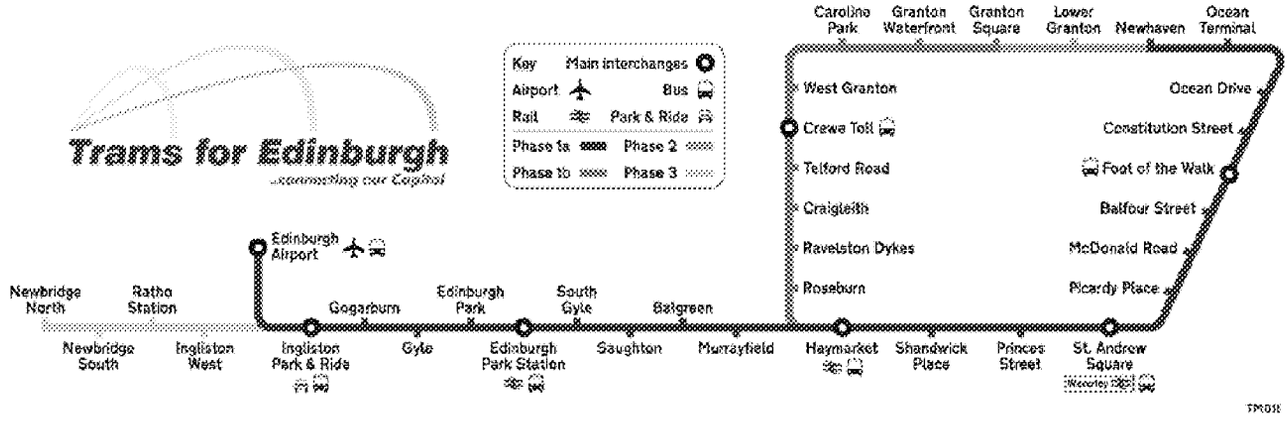


Fig 1.3 Edinburgh Tram Network

1.3 Key Dates

Reference is taken from the Edinburgh Tram 40 High Level Summary (with the revised SDS award date and changes). Information provided by **tie** April 2006.

The following key dates are important to the delivery of the Edinburgh Tram Network Project and form the basis of the SDS Design Programme.

Award System Design Services	19/09/05
Royal Assent Line 1	08/05/06
Royal Assent Line 2	27/04/06
MUDFA Award	01/10/06
MUDFA Construction Commencement	02/04/07
INFRACO – SDS Preliminary Design Release	01/09/06
Completion of Detailed Design	30/09/07
Construction Start	01/03/08
Commissioning, Trial Running and Driver Training Start	22/07/09
Commissioning, Trial Running and Driver Training Complete	31/03/10
Scheduled Opening Date	02/07/10

Programme interface is ongoing with **tie** in order to support the **tie** procurement strategy. The above dates may be amended in agreement with **tie** to ensure a successful design programme and efficient procurement strategy.

1.4 Management Structure

1.4.1 Line of Management

The Line of Management will be established with **tie** and will follow the path described in Fig 1.4. PB as the SDS provider will give support to **tie** in line with the requirements of the Agreement. Interface responsibilities will be as shown in Fig 1.4.

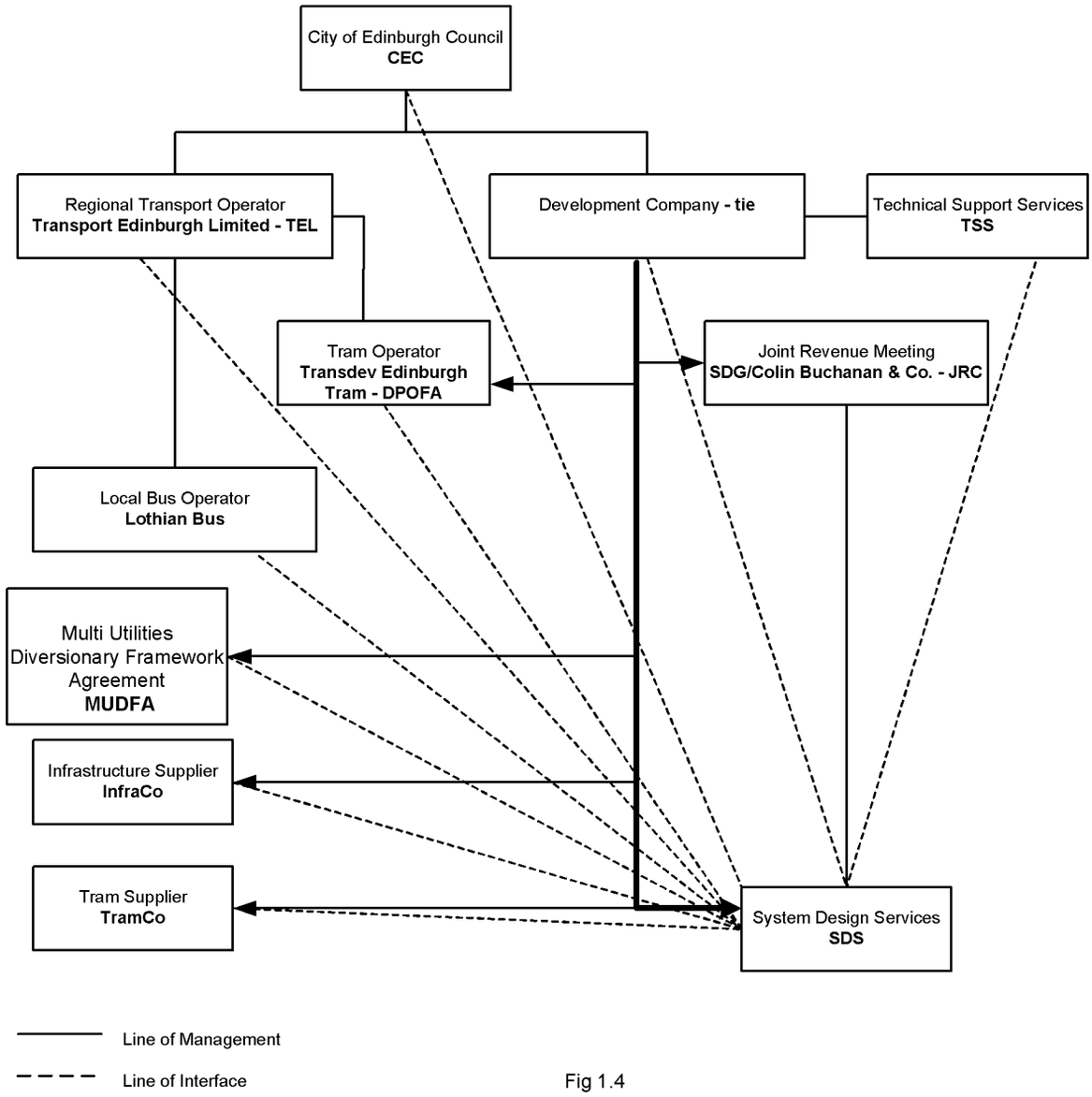


Fig 1.4

1.5 Stakeholders

1.5.1 Stakeholder Interface

Stakeholder interface, coordination and management are the responsibility of **tie** with support from PB as the SDS provider. A structured Stakeholder Management Plan Doc. Ref ULE90130-SW-SW-PPN-00012 has been produced with the responsibility for implementing the requirements of the plan tasked to the Stakeholder Manager.

1.5.2 Stakeholder Management Programme

A Stakeholder Management Programme will be monitored and managed to identify key issues, mitigating actions, and help engender positive working relationships with all stakeholders. The Stakeholder Management Programme will as with previous phases will be extracted from the SDS Design Programme.

By utilising the Stakeholder Management Plan and the Stakeholder Management Programme the Stakeholder Manager shall provide clear understanding of the issues during the design process and advise on later physical construction restraints. It is the clear intention of the SDS Stakeholder Manager to keep all stakeholders (major and minor) fully informed reducing potential communication difficulties during the delivery of the scheme.

During the period leading up to the production of the detailed design, stakeholder management will deliver the following activities;

From the design programme, the Stakeholder Manager will identify the stakeholder review periods and the number of consultation meetings required to deliver the SDS commitment to engage in public consultation on the design of the tram network. The approach will not differ from the previous managed phases, in that it will be done by breaking the network down into route sections, Tramstop to Tramstop and in conjunction with **tie**, determining the size of the meetings, e.g. some meetings will focus on short, densely populated route sections while others will take in several Tramstops. From these meetings, frontagers will record their comments/concerns on forms which will be held by SDS and passed directly to the design teams for consideration. General questions will be answered by SDS in letter form and approved for sending by **tie**. on a joint database. Experiences to date have taught us that additional meetings or visits are required in order that we can satisfy stakeholder expectations.

Additional meetings have taken place to focus on particular issues, such as Baird Drive, where work on the Network Rail embankment will impact significantly on adjacent properties. These will continue through detailed design. The purpose of these meetings at the detailed design stage is to demonstrate what will be built and explain the rationale behind the design decisions.

Consultations have also taken place with the Emergency Services, Cycling Groups and representatives of the Disabled Group in Edinburgh. Any issues raised are placed on a tracker and discussed within these consultations. Closure of these items will be undertaken by SDS only with the agreement of the participating groups.

SDS has recognised the importance and benefits of having a cross representation from their project team at the planned Stakeholder Consultations. As a result of the positive feedback from Residents, the General Public and other 3rd party stakeholders, SDS will continue to provide throughout the detailed design phase all necessary levels of representation at the consultation meetings. Where appropriate meeting minutes have been and will continue to be provided to tie for inclusion on their website.

2 PROJECT APPROACH

2.1 Communications

A Communication Plan Doc Ref ULE-90130-SW-SW-PPN-00008 has been developed by the Stakeholder Manager. In conjunction with the Stakeholder Management plan, this Communications plan sets out how the SDS team will communicate with project partners, stakeholders and other external opinion formers in support of **tie**'s strategy for the introduction of trams in Edinburgh. Through the introduction of defined processes and protocols, communications continue to be consistent, timely and targeted in order to create advocacy and understanding for the project, reducing opportunities for criticism and opposition.

Communications will be based on an ongoing and open dialogue with **tie,** the Council and all the parties throughout the design, construction and operation phases of the contract. All communication will be fully supported by written correspondence, where appropriate, together with the issue of design data, plans, drawings, specifications programmes, proposals, photographs and formal reports, as required, under the Agreement. The essential communication levels and interfaces are identified in the Communication Plan.

2.2 Specifications

Specifications will be prepared and updated at each stage of the design process. A hierarchy of specification documents has been prepared. These Specifications will be scheduled out as part of the project planning activity. PB will manage and track the issue of Specifications to ensure that all key submission dates are met and the correct level of specification input is prepared to meet the design objective.

A Project Deliverables Matrix was compiled and is tracked by the Project Controls Manager to ensure continual specification/report input is maintained and tracked through the project.

The Project Deliverables Matrix Doc Ref: ULE90130-SW-SW-MAT-00009 will be an output of the report/documentation gathering during the Detailed Design period.

2.3 Co-ordination

Coordination is a key function and element required to ensure programme and budget are met for the delivery of the project. This key element of project delivery encompasses a plethora of issues from gaining the relevant consents and approvals to ensuring that drainage ducting and civil works may be constructed with maximum efficiency and minimum delay.

A detailed 'High Level' delivery programme will specify the areas where the coordination team will be involved to ensure project delivery. It will be apparent from the consents and approval submission priority where specific coordination activities are required to meet design approval dates.

Procedures for developing and capturing all aspects of coordination will continue to be improved and further developed with **tie,** all stakeholders, Transdev and the Infraco Contractor during each element of the design and construction phase.

SDS will be responsible for ensuring the management of coordination is a smooth efficient process. SDS will report any inconsistencies or areas of concern to the appropriate personnel within **tie** and will assist with technical and managerial input to help bring about resolution to such inconsistencies.

SDS will manage these issues through a team-based effort involving **tie** and their advisors, Transdev, INFRACO, TRAMCO, and all other interested parties.

2.4 Meetings

To ensure efficient communication and client interaction, a Meeting Schedule has been compiled and is managed updated and maintained by the Office Manager, informing all parties of the date, time and agenda (where appropriate) of each project meeting. The Meeting Schedule will incorporate all **tie** meeting requirements for the execution of the Contract.

The Meetings Schedule will be used to engage in co-ordinated dialogue with **tie** and their advisors. As the project progresses the schedule will be refined to include all stakeholders, (CEC Planning, Transdev, MUDFA, the Tramco Contractor and the Infraco Contractor) in order that a definitive document may be developed.

The subject of meetings dealing with Consents and Approvals is covered in Section 2.5 of this document.

2.5 Consents and Approvals

2.5.1 Scope and Purpose

Many, but not all, consents will be required from the Planning Authority of City of Edinburgh Council (CEC). The Planning Authority will expect high quality urban design in the city, particularly in the World Heritage Site, Conservation Areas and development areas. An emphasis on a holistic approach to design that ensures the tram fits the context of the city will also be sought by CEC. The Tram Design Manual sets out these aspirations, context, requirements and mechanisms for achieving quality design for Tram.

The Tram Design Working Group, set up as a pre-application forum for planning submissions as required by the Parliamentary process in order to mitigate the objection by Historic Scotland, plays a key role in ensuring that the Council, Historic Scotland and Edinburgh World Heritage Trust have the opportunity to participate in the delivery of a tram system which is integrated with the public realm and reflects the identity of Edinburgh. In moving to Detailed Design, following approval of the Preliminary Design by the Design Approvals Panel on behalf of the Promoter, the importance of high quality planning and urban design to CEC has been elevated through a process of Charettes.

The success of System Design Services is ultimately dependant on achieving the necessary approvals and consents. To assist this, the Approvals and Consents Management Plan (ACMP Doc. Ref ULE90130-SW-SW-PPN-00007) has been prepared. This provides an overarching strategic document that defines all approvals and consents. It performs the basis for tracking these approvals and consents from design development and pre-application discussions to the conclusion of the approvals and consents process. It guides tram designers and statutory authorities as to what features of design require approval and how these will be achieved in cooperation with CEC.

The approvals process is critical to the programme for design and construction delivery. SDS will require the approving bodies to be adequately resourced in order to respond to the level of Consent and Approval documentation within the detailed design programme period.

Statutory approval timescales have to be met for some approvals, however, through extensive rehearsals and consultations, a 20 day consents turnaround from final submission is a key target otherwise key programme dates cannot be met. Protocols will be prepared and issued to **tie** with regard to the operational aspects of the approvals process that cover informal submissions and consultations, the obligations on the individual bodies and the various packages of information necessary to gain a consent.

2.5.2 Route Sectors, Sub-Sectors and Overall Priorities

To facilitate the approvals process, the Edinburgh Tram Network route was divided into route sectors and within these, a number of sub-sectors. The division of the sectors being directly based on the Design, Construction and Commissioning sequence requirement. The delivery sequence of submissions is directly related to commissioning for trial running and the criticality of the approval process for each sector.

There is a priority for consents and approvals in order to meet both design and construction deadlines. The priority for the Sectors is as follows:

Sector & Sub-Sector	Inclusive	Criticality
Haymarket Corridor	Extents of Roseburn Junction to **Haymarket stop** (inclusive)	
Haymarket Station Stop	Elevated route and Junction alterations	A2
Haymarket - Ocean Terminal		
HAY-**SHP**	End of Haymarket stop to **Shandwick Place Stop**	A1
SHP-**PSW**	End of Shandwick Place stop to **Princes St West Stop**	A1
PSW-**SAS**	End of Princes St West stop to **St Andrews Square Stop**	A1
SAS-**PIP**	End of St Andrews Square stop to **Picardy Place Stop**	A2
PIP-**MDR**	End of Picardy Place stop to **Macdonald Road Stop**	A2
MDR-**BAS**	End of Macdonald Road stop to **Balfour Street Stop**	A2
BAS-**FOW**	End of Balfour Station stop to **Foot of the Walk Stop**	A2
FOW-**COS**	End of Foot of the Walk stop to **Consitution Street Stop**	A3
COS-**OCD**	End of Constition Street stop to **Ocean Drive Stop**	A3
OCD-**OCT**	End of Ocean Drive stop to **Ocean Terminal Stop**	A3
LDE (Depot)	**Leith Depot**	E
Haymarket - Granton Square		
HAY-**ROS**	Extent of Haymarket Corridor to **Roseburn Stop**	D
ROS-**RAD**	End of Roseburn stop to **Ravelston Dykes Stop**	D
RAD-**CRA**	End of Ravelston Dykes stop to **Craigleith Stop**	D
CRA-**WGH**	End of Craigleith stop to **Western General Hosptial Stop**	D
WGH-**CRT**	End of Western General Hospital stop to **Crewe Toll Stop**	D
CRT-**WGA**	End of Crewe Toll stop to **West Granton Avenue Stop**	D
WGA-**CAP**	End of West Granton Avenue stop to **Caroline Park Stop**	D
CAP-**GRW**	End of Caroline Park stop to **Granton Waterfront Stop**	D
GWR-**GRS**	End of Granton Waterfront stop to **Granton Square Stop**	D
Haymarket - Gogar		
HAY-**MUR**	Extent of Haymarket Corridor to **Murrayfield Stop**	A2
MUR-**BAR**	End of Murrayfield stop to **Balgreen Road Stop**	B
BAR-**SRN**	End of Balgreen Road stop to **Saughton Road North Stop**	B
SRN-**SGA**	End of Saughton Road North stop to **South Gyle Access Stop**	C
SGA-**EPS**	End of South Gyle Access stop to **Edinburgh Park Station Stop**	C
EPS-**EDP**	End of Edinburgh Park Station stop to **Edinburgh Park Stop**	C
EDP-**GYL**	End of Edinburgh Park stop to **Gyle Stop**	C
GYL-**DEH**	End of Gyle stop to **Depot Stop**	A1
DEH-**GOG**	End of Depot stop to **Gogar Stop**	C
GDE (DEPOT)	**Gogar Depot**	**A1**
Gogar- Edinburgh Airport		
GOG-**IPR**	End of Gogar stop to **Igliston Park & Ride Stop**	C
IPR-**AIR**	End of Ingliston Park & Ride stop to **Airport Stop**	C
Granton Square-Ocean Terminal		
GRS-**LGR**	End of Granton Square stop to **Lower Granton Stop**	E
LGR-**NER**	End of Lower Granton stop to **Newhaven Road Stop**	E
NER-OCT	*Track between Newhaven stop and Ocean Terminal Stop (no stops included)*	*E*

The early resolution of surveys as part of the design requirement along with the approvals submission material was identified as a key priority for the SDS Design Programme therefore survey priority was given to those sectors of A1 and A2 priority.

Route Sections and Sub-sections are reflected in the SDS Design Programme. Where appropriate, certain sections/subsections will be combined as deliverables for consents and approvals. The Detailed Design Delivery Programme is built around this with minor amendments to the above structure.

The sub-sectors Granton Square to Newhaven Road (GRS-LGR and LGR- NER) are now identified as Phase 2 Construction Works and following receipt of **tie** Change Order 00001 do not constitute part of the SDS Preliminary Design. No work is envisaged as part of the Detailed Design. Survey Change Requests have been called by tie. Upon satisfactory conclusion **tie** is to instruct this work.

The Preliminary Design was prepared such that the Depot at Gogar serviced the Edinburgh Tram Network and Leith Depot was not utilised as part of the Preliminary Design plan. The Detailed design will be furthered on this same basis.

2.5.3 Consents Disagreements

Part of the approvals management process is the management of outside influences, such that unnecessary design changes are avoided and "wish lists" are not added. Late changes are to be avoided particularly after formal submittal has been made.

If a disagreement occurs such that there is a clear difference of opinion between the parties preventing an approval then referral will be made to a Consents Group. The Consents Group will arbitrate on a decision. The Consents Group would comprise a forum made up of **tie** senior personnel and similar representatives from the consenting Authority in dispute.

2.6 Design Review & Assurance

Design reviews will be conducted on a regular basis throughout the life of the project The reviews will be carried out by SDS staff in a timely manner to accord with the design programme, having allowed adequate time for the review and for any consequential amendment to the design. Review submissions to **tie**, will be in strict accordance of the Agreement with design team interaction and discussion taking place prior to formal submission in order to economise on team input and increase efficiencies in the review process.

SDS will undertake design reviews based on the following:

- A review carried out by a Design Team Leader or Design Manager on the designs being carried out by the design team as the work progresses.
- A formal review by a designated design checker and approver.
- The inter-disciplinary check (IDC) of one design teams deliverables by other design disciplines to ensure it does not contradict or cause problems with their own design solutions. The IDC process is essential to the overall Design Process. The Detailed Design Process has three internal design review stages leading to a Discipline IDC and an Interdiscipline IDC. Client participation will be sought during this IDC process.
- Review by PB Design Team Leaders and/or Systems Integration staff when design deliverables are completed by the design team.
- The Intermediate Design Review (IDR) has been added to the design review process. The purpose of the IDR's is to provide a review of the quality and maturity aspects of the overall design within the SDS scope. The IDR has been tailored and adapted from best practice design review processes. Fig 2.1 diagram depicts how the IDR process is effectively a number slices through the design lifecycle thus demonstrating how the IDR integrates itself into the self assurance processes. Ensuring that SDS meets the requirements and provides an integrated tram network design.
- Third party reviews by **tie** and external bodies.
- Design Self Assurance is crucial to both, the overall quality of the completed design and the SDS objective of delivering a design that is "Fit for Purpose". A vital element of the Self Assurance process is the provision of Design Assurance Statements (DAS) with each subsection design submission. This will be provided in the form of a Design Assurance checklist comprising of a series of design assurance statements, with references and brief details of where SDS have or have not met the submission requirements. Where there are deviations or non conformances to requirements, standard or specifications, these will be identified within the relevant section of the DAS.

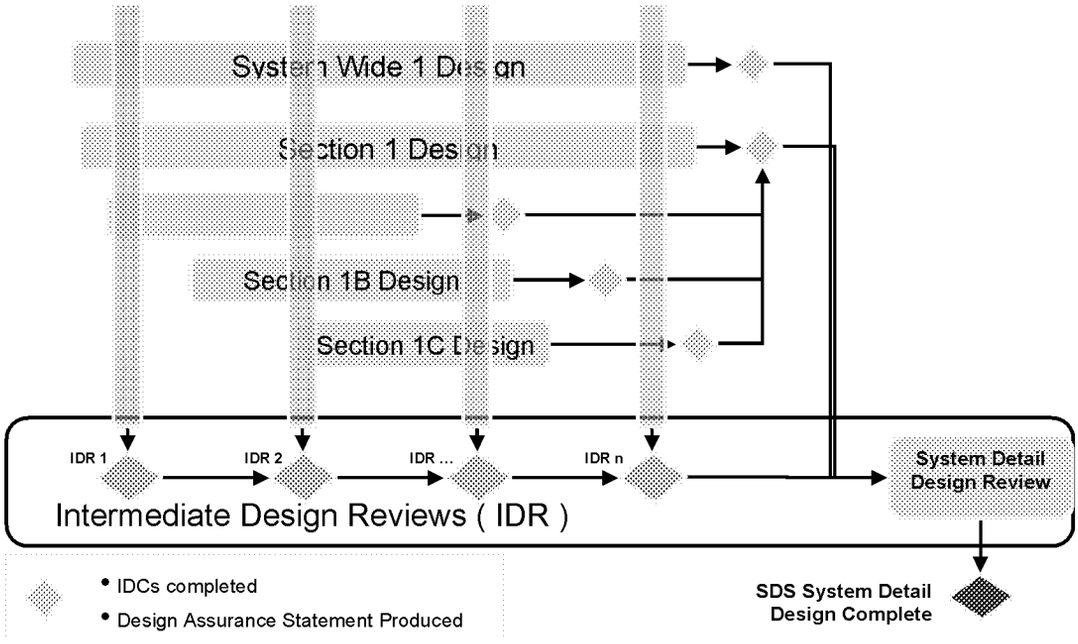

System Wide 1 Design
Section 1 Design
Section 1B Design
Section 1C Design
IDR 1
IDR 2
IDR ...
IDR n
Intermediate Design Reviews (IDR)
System Detail Design Review
• IDCs completed
• Design Assurance Statement Produced
SDS System Detail Design Complete

Fig 2.1

2.7 Monitoring and Supervision

2.7.1 Introduction

As part of the Project Management and System Integration Management, monitoring of the design deliverables form a fundamental role. The System Integration Team work closely with the design teams to ensure that the elements required to maintain quality and programme delivery are met in a professional and safe manner. SDS as the SDS Designer utilise a System Interface Register which will be populated by the entire Design / Management Team. The Register will be worked on during the Design Programme and show mitigation of all Technical Interface issues. Third Party Interface issues will be addressed within The Stakeholder Management Register. The key responsibilities of the System Integration Team are:

- Participate in the Detailed Design Phase and include additional Integration requirements into the Requirements Database. Where integration issues have been confirmed the database will be updated and show mitigation
- Monitor the populated Interface Register and with the input from the Design Team to close out all issues.
- Show mitigation for all issue closed out during the design process.

2.7.2 Delivery

The System Integration Team will report any issues to the SDS Project Manager. The Project Manager has responsibility for and will allocate issues to the SDS Core Team, which will be formally recorded and tracked. The Project Manager will follow to completion each issue and show closure in the issues register by signature.

2.7.3 Photographs

Photographic surveys will be carried out during the design process. These will be available on the Project Electronic Document Management Systems collaboration site for authorised persons to review.

2.7.4 Monthly Reporting

The Systems Integration Management Team will contribute to the monthly report as required by the Project Manager.

2.7.5 Exception Reporting

The Systems Integration Management Team will report any issues to the Project Manager that appear to be causing delay or disruption to the project. These will be prioritised by the Project Manager and allocated by him for action to the design team if it is a SDS internal issue. If the issue is external to SDS the issue will be immediately reported to **tie** by the provision of an Issue Report Form. Issue Report Forms will be tracked by the Project Manager and technical advice will be given to **tie** to assist in the resolution of each issue.

2.7.6 Feedback

The Project Manager will, through regular briefings (weekly/bi-weekly), keep the Systems Integration Management team advised of progress on all raised items and issue closures.

2.7.7 Reporting

Every four weeks the SDS Project Manager will issue to the **tie** Director of Trams a report summarizing the progress that has been made on the project during that month. The report will include future planned works and key design issues and risks which need Client

consideration and overview. The report is issued on a calendar month basis. The progress report will be submitted to **tie** on the third business day of each month together with the payment application. The monthly progress meeting takes place on the 2nd Thursday of the month.

3 PROJECT ORGANISATION

3.1 Edinburgh Tram Project Organisation

The relationship between the parties is per the organisation chart below shown in Fig 3.1. The chart shows the formal line of communication between the teams and through to the client.

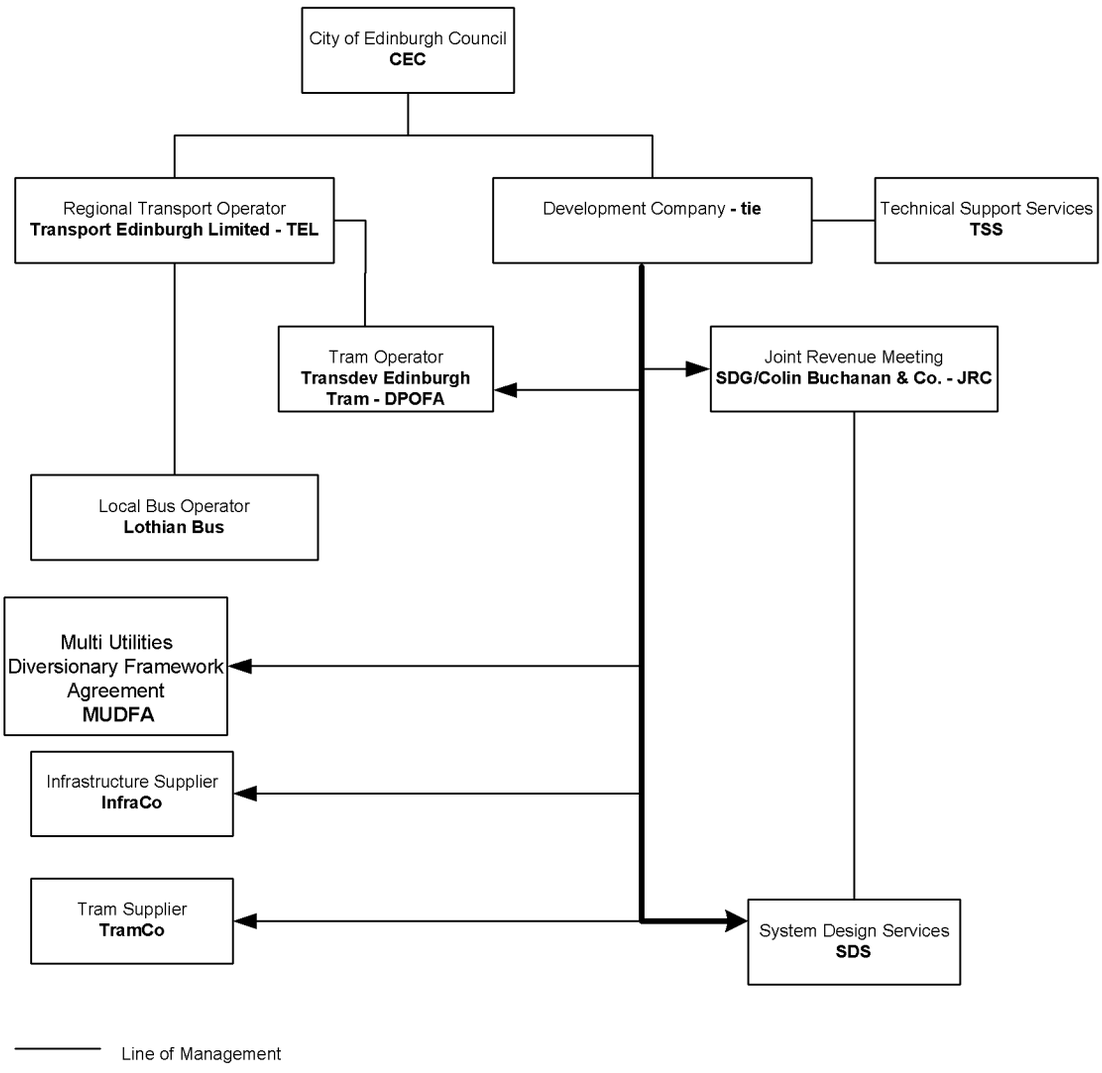


Fig 3.1

3.2 PB Team Organisation

The PB organisation and accountability chart for the Preliminary Design Phase moving into the Detailed Design Phase is shown in Appendix A. The overall project team has been organised into a number of teams to work on discrete elements of the project scope.

3.3 Roles and Responsibilities

The roles of the senior SDS project team members are defined below:

Project Director

Job Title	**Project Director :**
Division/Unit	**: Rail**
Reporting to	**: PB Area Manager**
Location	**: Based in PB Edinburgh Office**
Date	**:**

Purpose of the Job

Overall responsibility for all aspects of the Edinburgh Tram Project on behalf of PB.

Main Responsibilities

Duties and responsibilities of the Project Directorate anticipated as, but not limited to the following:

- Corporate responsibility for the delivery of the Project;
- Jointly responsible for procurement of project team and its activities;
- Strategic review and advice regarding project implementation.
- Senior member of staff who would represent the Company on the project in all aspects of the work undertaken by Parsons Brinckerhoff.
- Maintain an overview of the project progress, budget and quality of deliverables.
- Liaise with the Senior members of Halcrow and other PB nominated subcontractors and, where necessary, **tie**
- Oversee the compilation of all the contractual documents and their implementation on the project.
- Ensure that PB and their nominated subcontractors understand their overall scope of PB's work

Financial Responsibility **: In line with project plan**

(i) External PB contacts **: Client, Contractors, sub-contractors**

Signed **Unit Manager**	**Signed** **Unit Director**	**Signed** **HR Director**

Project Manager

Job Title	**Project Manager :**
Division/Unit	**: Rail**
Reporting to	**: Project Director**
Location	**: Based in PB Edinburgh Office**
Date	**:**

Purpose of the Job

Overall management of the project including all PB and nominated subcontractors.

Main Responsibilities

The duties and responsibilities of the Project Manager are anticipated as, but not limited to the following:

- In conjunction with the Project Director and the Deputy Project Manager, to provide the principal point of contact with **tie**
- Overall responsibility to develop and maintain the project plan
- Definition of the technical and project deliverables
- Responsibility for and delivery of the designated work to programme and budget
- Reviewing and authorising changes or deviations from the quality plan specification and 3rd Party Agreements;
- Ensure that the designs are approved in accordance with the requirements detailed in the Agreement.
- To ensure that all the work is carried out in accordance with the required standards in relation to quality and safety and that the project is complete
- To ensure that the project is complete in accordance with the agreed requirements of the specifications, to programme, resourcing, variations, safety and functionality
- Undertake audit role throughout the project period
- Identification, analysis and management of project risks
- Formulation, management and tracking of the project plan and budget, together with necessary project reporting
- Approval of designs in accordance with Suppliers quality procedures

Financial Responsibility : In line with project plan

(i) External PB contacts : Client, Contractors, sub-contractors

Signed	**Signed**	**Signed**
Unit	**Unit Director**	**HR Director**
Manager		

Deputy Project Manager

Job Title	**Deputy Project Manager**
Division/Unit	**: Rail**
Reporting to	**: Project Manager**
Location	**: Based in PB Edinburgh Office**
Date	**:**

Purpose of the Job

Assistance to the Project Manager in the general management of the Project. Day to day coordination of the Project.

Main Responsibilities

Duties and responsibilities are anticipated as, but not limited to the following:

- In conjunction with the Project Manager provide a client focus for the delivery of the scheme.
- To assist the Project Manager in ensuring that a project team is in place which is of suitable quality and has the necessary breadth of experience to ensure the successful delivery of the scheme.
- Deputise for the Project Manager (in Project Manager absence);
- To assist in setting up project systems.
- To review key deliverables
- Development and introduction of procedures necessary for the smooth running of the project.
- The introduction of communications lines for the team.
- To oversee and manage the overall office administration for the project to ensure that the processes and procedures are in place to facilitate the successful delivery of the project
- To oversee, and manage as necessary, the production of key deliverables as dictated by the project programme.
- Manage the setting up and the integration of the additional personnel involved in the design of Edinburgh Tram Network.
- Manage the development and delivery of an approved design, working closely with the Design Manager, Engineering Manager and the Approvals Manager;
- Coordinate the design inputs of the design sub-consultants Halcrow and Ian White Associates within the design development and delivery process;
- Undertake specific project tasks as determined by the Project Manager;
- To act as the conduit to integrate the design interaction between Halcrow and Parsons Brinckerhoff throughout the design process and to manage and maintain an acceptable performance of the Halcrow sub contract within the SDS Agreement.

• Provide the delivery of documentation to the Client to meet the requirements of the Agreement; • Support the Project Manager to undertake audit role within the project life cycle; • Support the Project Manager in the definition of the technical and project deliverables; • Support the Project Manager in formulation, management and tracking of the project plan and budget, together with necessary project reporting; • Support the Project Manager to ensure that the project is completed in accordance with the requirements of the Agreement; • Support the Project Manager in reviewing and authorising changes or deviations from the quality plan specification and 3rd Party Agreements; • Support the Project Manager to ensure that the designs are approved in accordance with the requirements detailed in the Agreement. • Undertake specific project tasks as determined by the Project Manager.		
Financial Responsibility : In line with project plan **(i) External PB contacts : Client, Contractors, sub-contractors**		
Signed **Unit** **Manager**	**Signed** **Unit Director**	**Signed** **HR Director**

Engineering Manager

Job Title	**Engineering Manager**
Division/Unit	**: Rail**
Reporting to	**: Project Manager**
Location	**: Based in PB Edinburgh Office**
Date	**:**

Purpose of the Job

The Engineering Manager will work closely with the Design Manager to ensure that the design that is produced is fit for purpose, of the appropriate quality, constructible and economic to construct and produced to program and budget.

Main Responsibilities

Duties and responsibilities are anticipated as, but not limited to the following:

- The Engineering Manager is responsible for the preparation of the Engineering Plan and application of a robust design engineering process in accordance with the Plan.
- The Engineering Manager will ensure adequate resources and technical competence is being applied and resolve any issues.
- The Engineering Manager will conduct technical audits and ensure consistency of product and style, when required.
- Input to resolution of technical issues including coordination of specific actions as required.
- Implement the Project Engineering Plan in conjunction with the Design Manager and Section Managers.
- Identification of project risk and ensure that any significant risks/issues within the project are brought to the attention of the Design Manager, Section Coordinators Project Manager and Commercial Director in a professional and timely manner.
- In conjunction with the Design Manager, ensure that agreed processes are effectively deployed and reviewed regularly for potential improvement and Best Practice sharing and wherever practical ensure a uniform and consistent approach throughout the project.
- Identification of project interfaces and advising SDM of issues arising.
- Providing technical/engineering responses to RFIs.
- Overall responsibility for Systems Engineering function and its interface with other project-wide activities, notably safety assurance/engineering.
- Setup of Systems Integration Register and process.
- Coordinate technical aspects of system-wide activities, eg power supplies, HMRI liaison, EMC

Financial Responsibility : In line with project plan

(i) External PB contacts : Client, Contractors, sub-contractors		
Signed **Unit** **Manager**	**Signed** **Unit Director**	**Signed** **HR Director**

Commercial Manager

Job Title	**: Commercial Manager**
Division/Unit	**: Rail**
Reporting to	**: Project Manager**
Location	**: Site Based in Edinburgh**
Date	**: 3rd August 2005**

Purpose of the Job

Provision of specialist commercial support to the Edinburgh Tram Network project under the guidance of the Commercial Director.

Main Responsibilities

Duties and responsibilities are anticipated as, but not limited to the following:

- Implement the Contract management strategy in conjunction with the Project Manager and Commercial Director.
- Implement contract administration procedures and standard work processes.
- Work with the Project Team to prepare all correspondence to the Client to ensure that the Company's contractual position is protected at all times.
- Ensure active contract management so that contractor costs are not incurred unreasonably.
- Ensure that Corporate / Divisional guidelines and controls are effectively deployed to optimise results and minimise risks to the project.
- Develop the project risk management methodology and ensure that is effectively deployed and that any significant risks/issues within the project are brought to the attention of the Project Manager/Commercial Director in a professional and timely manner.
- Provide guidance and support to the Project Team for the preparation and negotiation of changes, variations, and claims.
- Ensure that contractor/sub contractor payment requests are actively reviewed and interrogate for entitlement issues.
- Ensure that requests for payment to the Client are actively reviewed and interrogate for entitlement issues before they are issued.
- Assisting Technical staff in the procurement of Sub-Contracts.
- Production monthly commercial report.
- Review with the PA the contract expenditure performance indicators and check them against the budget and advise the Project Manager/Commercial Director of any issues accordingly.
- Develop a program to identify and prepare claims as they develop and direct the efforts to negotiate and resolve claims in coordination with the Project Manager/Commercial Director
- Ensure that agreed processes are effectively deployed and reviewed regularly for potential improvement and Best Practice sharing and wherever practical ensure a uniform and consistent approach throughout the project.

<table>
<tr><td colspan="3">

- Setting up agreements with sub-consultants;
- Responsible for assessing and evaluating all payment applications;
- Administrate all contract responsibilities.

</td></tr>
<tr><td colspan="3">Financial Responsibility : In line with project plan
(i) External PB contacts : Client, Contractors, sub-contractors</td></tr>
<tr><td>Signed
Unit
Manager</td><td>Signed
Unit Director</td><td>Signed
HR Director</td></tr>
</table>

Design Delivery Manager

Job Title	**: Design Delivery Manager**
Division/Unit	**: Rail**
Reporting to	**: Project Manager**
Location	**: Site Based in Edinburgh**
Date	**:**

Purpose of the Job

Manager of design retaining responsibility for delivery of all design to programme, on time and to budget. Leads the Section Managers and coordinates the third party design Sub – Consultants. Overall responsibility for development of designs to gain all necessary approvals and consents in conjunction with the Approvals Team.

Main Responsibilities

Duties and responsibilities are anticipated as, but not limited to the following:

- The DM is responsible for the application of a robust design engineering process in accordance with the Engineering Plan.
- Primary interface for the Section Managers and teams based in the Edinburgh Office, and the DTL's and their teams based in home offices outside Edinburgh.
- Ensure adequate resources and technical competence is being applied.
- Development of designs to gain all necessary approvals and consents
- Monitor and action project scope and fee changes.
- Provide advice to direct the DTL's and their design teams and call DTL meetings to resolve issues.
- DM will put in place and monitor an appropriate check and approval regime and an interdisciplinary check (IDC) regime.
- Provide financial reporting to the Project Manager and to the PB Business Units.
- Responsible for ensuring that the design programme and associated resource plan (P3e programme) is updated.
- Monitoring and managing the design financial progress, cost to complete, Oracle budgets, financial design change control etc
- The DM reports to the Project Manager but will obviously work closely with the Section Managers to ensure that designs delivered to **tie** are robust and reflect the latest requirements and expectations of the external bodies (including all sub-consultants).
- Implement the Project Engineering Plan in conjunction with the Engineering Manager and Section Managers.
- Implement procedures developed by the Engineering Manager and standard work processes.
- Implementation and capture of project risk and ensure that is effectively deployed and that any significant risks/issues within the project are

brought to the attention of the Project Manager/Commercial Manager in a professional and timely manner. • Ensure that the Design Team highlight changes to scope, variations, and claims and refer them to the Commercial Manager.. • Production of overall Design Status report for the monthly report including percentage completes and commercial overview.. • Overall management of the design team budget • Overall design programme input and management. Identify potential delays and prepare mitigation measures. • Ensure that agreed processes are effectively deployed and reviewed regularly for potential improvement and Best Practice sharing and wherever practical ensure a uniform and consistent approach throughout the project. • Identification of project interfaces and advising SDM of issues arising. • Implementation and operation of the System Integration process.
Financial Responsibility : In line with project plan **(i) External PB contacts : Client, Contractors, sub-contractors**

Signed **Unit Manager**	**Signed** **Unit Director**	**Signed** **HR Director**

Approvals Manager

Job Title	**Approvals Manager**
Division/Unit	**: Rail**
Reporting to	**: Design Delivery Manager**
Location	**: Based in PB Edinburgh Office**
Date	**:**

Purpose of the Job

The Approvals Manager is responsible for the co-ordination of the approvals process. The Approvals Manager will be the focal point for all external approvals bodies and will lead negotiations with the third parties generally and will provide the consistency of approach in the dialogue between the PB team and the approvals bodies. The approvals Manager will be responsible for the upkeep of the approvals tracker in association with the Section Coordinators and Design Team Leaders.

Main Responsibilities

Duties and responsibilities are anticipated as, but not limited to the following:

- Obtaining approvals using the design information produced by the Design teams and controlled by the Section Coordinators.
- Identify necessary approvals and submission formats with DDM/EM.
- The Approvals Manager is responsible for driving the approvals process. This includes agreeing the processes procedures to be used and the methods fro obtaining approval from the various third parties.
- Management of the Approvals tracker.
- Leading third party approvals with all interested/third parties with the exception of Network Rail.
- The Approvals Manager reports to the DDM on this project.
- Consult with CEC Planning and Roads Department, through the **tie** Submissions Officer, and identify all consultees/stakeholders;
- Identify with the wider project team the identity of all approving bodies relative to the design;
- Establish and maintain an effective process with the approving bodies for their consideration and acceptance of the developing design;
- Work closely with the Deputy Project Manager, Chief Engineer and the respective Design Team Leaders to plan and deliver a stream of approval submissions to the approving bodies;
- Liaise with the Stakeholder Manager in relation to the converging interests of wider project stakeholders and approving bodies;
- Manage contact with the CEC Approval Team on a day-to-day basis;
- Build on the established links already in place for consultation;
- Establish workshops with CEC Planning and Roads Department through the **tie** Submissions Officer so that they are fully aware of all issues

<table>
<tr><td colspan="3">influencing design solutions;
• Obtain agreement from CEC Planning and Roads Department on preferred options.</td></tr>
<tr><td colspan="3">Financial Responsibility : In line with project plan
(i) External PB contacts : Client, Contractors, sub-contractors</td></tr>
<tr><td>Signed
Unit Manager</td><td>Signed
Unit Director</td><td>Signed
HR Director</td></tr>
</table>

Project Controls Manager

Job Title	**Project Controls Manager:**
Division/Unit	**: Rail**
Reporting to	**: Deputy Project Manager**
Location	**: Based in PB Edinburgh Office**
Date	**:**

Purpose of the Job

The Project Controls Manager (PCM) will be responsible for leadership of the PB project team for Project Support Services.

Main Responsibilities

Duties and responsibilities are anticipated as, but not limited to the following:

- Leadership of the team for Project Support Services.
- Review and checking of all costing and programmes before submission to the client.
- Ensuring that all commercial activities are operated in accordance with the PB Project Control Manual.
- Preparation and upkeep of all programmes.
- Liaison with clients.
- The PCM is responsible for processing all payments of subcontractors as well as prepare and submit all payment applications to **tie**.
- The PCM is responsible for managing the Project Administrator and liaise directly with Project Director in order to ensure PB's budget is managed, maintained and controlled.
- The PCM is responsible for managing and implementing the Change Control Procedure and ensuring that all changes are effectively controlled and managed. The PCM is responsible for liaising with **tie** commercial team on all changes.
- The PCM is responsible for advising the Design Manager, Project Manager and any other relevant parties of variations to be implemented.
- The PCM is responsible for ensuring that the RFI procedure is implemented and RFI's are properly tracked and recorded.
- The PCM is responsible for ensuring that Configuration Management is implemented.
- The PCM is responsible for ensuring that progress reporting to all external parties including **tie** (and internally to PB) is completed in a timely manner.
- Prepare and implement the Document Control Procedure.
- Responsible to the Project Manager for project configuration programme/planning, cost and change control;
- Managing the project controls team, including accountability for tracking project activities of programme, cost, finance, quality management, document management, and general project administration
- Responsible for providing updates and reports to the management

<table>
<tr><td colspan="3">team in a timely manner
• Liase with client representatives in order to co-ordinate programme issues, systems procedures, report formats and other activities relating to project controls
• Assist the management team, identifying financial, commercial, programme and quality related risks throughout the life of the project.</td></tr>
<tr><td colspan="3">Financial Responsibility : In line with project plan
(i) External PB contacts : Client, Contractors, sub-contractors</td></tr>
<tr><td>Signed
Unit
Manager</td><td>Signed
Unit Director</td><td>Signed
HR Director</td></tr>
</table>

Health Safety and Quality Manager

Job Title	**Health, Safety and Quality Manager:**
Division/Unit	**: Rail**
Reporting to	**: Deputy Project Manager**
Location	**: Based in PB Edinburgh Office**
Date	**:**

Purpose of the Job

Co-ordinate the development and the implementation of all safety matters relating to PB areas of responsibility on the project and their nominated subcontractors.

Main Responsibilities

Duties and responsibilities are anticipated as, but not limited to the following:

- Co-ordinate the development and the implementation of all safety matters
- Develop and maintain the Health and Safety Plan with the contracting companies
- The management and upkeep of the Health and Safety Plan throughout the project
- Provide support to all the engineering disciplines and to the project control management team
- Liaison with TIE Quality Manager.
- Liaison with the health and safety and quality assurance staff nominated by the contractors
- Provide the necessary input to the monthly reports and to additional reports requested by the project manager from time to time
- Manage the final review of all the Health and Safety documentation so that it can be incorporated in the necessary documents in time for the System Handover
- The role of HSQ Manager is to provide strategic direction and guidance to the engineering disciplines to enable all work to be planned, designed and constructed with lowest practicable risk and maximum practicable product quality;
- The responsibilities of the HSQ Manager are multi-fold; ranging from creation and approval of standards procedures and guidance notes, to formal liaison with external authorities such as the Police, HSE and HMRI, to day-to-day inspection and auditing activities;
- The HSQ Manager is ultimately responsible for ensuring that the project understands the significance of HSQ and always acts accordingly;

Note For day to day matters the Health, Safety and Quality Manager will report to the Project Manager, however to maintain the incumbent's independence the person will also have a direct reporting line to the Project Director		
Financial Responsibility : In line with project plan **(i) External PB contacts : Client, Contractors, sub-contractors**		
Signed **Unit Manager**	**Signed** **Unit Director**	**Signed** **HR Director**

Quality Manager

Job Title	**Quality Manager :**
Division/Unit	**: Rail**
Reporting to	**: HSQ Manager**
Location	**: Based in PB Edinburgh Office**
Date	**:**

Purpose of the Job

To manage PB's and subcontractor's overall performance in term of quality to ensure that the deliverables/product are of a suitable standard.

Main Responsibilities

The main responsibilities of the Quality Manager are as detailed below;

- Work within an integrated project management team
- Co-ordinate the development and implementation of the Quality Management system.
- Review and agree all the quality plans from all the PB subcontractors and the construction contractors and equipment providers and incorporate them into the project Quality plan
- Co-ordinate the development and the implementation of all quality matters
- Develop and maintain the Quality Plan
- The management and upkeep of the Quality Management process throughout the project
- Manage the witnessing of work as defined in the Quality Plan
- Provide support to all the engineering disciplines and to the project control management team
- Liaison with TIE's Quality Manager.
- Liaison with the quality assurance staff nominated by the PB Sub Contractors
- Provide the necessary input to the monthly reports and to additional reports requested by the project manager from time to time
- Manage the final review of all the QA documentation so that it can be incorporated in the necessary documents in time for the System Handover
- Manage the setting up and the integration of any additional personnel joining the project team during the design and construction of the Edinburgh Tram Network
- Ensuring that the Management System and PQP are implemented and controlled and their progress monitored;

- Communicating project / contract requirements to all departments, subcontractors and customers and resolving any problems arising from these interfaces;
- Reviewing audit results;
- Authorising requests to operate differing procedures from those documented in the Management System;
- Initiates preventative or corrective actions reported to either himself or the PB Project Manager, in accordance with PB procedures;
- Co-ordination of Quality matters across the project with all disciplines within the PBPMT, providing a service on the design, procurement, inspection, manufacturing, construction and commissioning stages of the project;
- Responsible for the application of PB company procedures and the application of project specific procedures.
- Ensuring that the Management System and PQP are implemented and controlled and their progress monitored;
- Communicating project / contract requirements to all departments, subcontractors and customers and resolving any problems arising from these interfaces;
- Reviewing audit results;
- Authorising requests to operate differing procedures from those documented in the management System;
- Initiates preventative or corrective actions reported to either himself or the PB Project Manager, in accordance with PB procedures;
- Co-ordination of Quality matters across the project with all disciplines within the PB Project Management Team, providing a service on the design, procurement, inspection, manufacturing, construction and commissioning stages of the project;
- Responsible for the application of PB company procedures and the application of project specific procedures.

Note For day to day matters the Quality Manager will report to the Project Manager, however to maintain the incumbent's independence the person will also have a direct reporting line to the Project Director

Financial Responsibility	**: In line with project plan**
(i) External PB contacts	**: Client, Contractors, sub-contractors**

Signed

HR Director

Risk Manager

Job Title	**: Risk Manager**
Division/Unit	**: Rail**
Reporting to	**: Deputy Project Manager**
Location	**: Visiting PB Edinburgh Office**
Date	**: 10 April 2006**

Purpose of the Job

The Risk Manager is responsible for developing the Risk Management Plan (RMP) for the project and administering the risk management processes defined in the RMP. The Risk Manager will be the focal point for development and updating of the risk register and the assumptions register, as well as all reporting on: risks, mitigations, risk exposure, risk profile, and assumptions

.

Main Responsibilities

Duties and responsibilities are anticipated as, but not limited to the following:

- Produce and maintain the RMP.
- Configure and supervise the Active Risk Manager system, and any other tools, used on the project for risk management.
- Observe and report on compliance with the RMP.
- Provide the required risk management resources to the Project Manager, and oversee the technical performance of staff selected to fulfil risk related roles.
- Ensure that risk coordinators/analysts employed by the Project Manager are competent.
- Carry out regular assessments of the risks to the project.
- Carry out regular reviews of risk assessments and controls.
- As required, participate in reviews and report on all aspects of risk management and control performance across the spectrum of business / strategic / project / technical risks.
- Write the risk reports to be delivered by the SDS.
- Close risks when the treatment is successful or the risk has expired.
- Monitor the progress of treatment plans against their schedule.
- Monitor the effectiveness of treatment plans in avoiding or reducing risks.
- Manage and maintain the SDS project risk register
- Coordinate the Safety and Project risk registers (plus the Security risk register if one is created).
- Manage the Assumptions Register and process.
- Prepare and issue a list of contacts and contact details for the staff in tie, the SDS and the Service Providers involved in risk and assumptions management.
- Produce and maintain the Risk Management Plan for the Project Manager;
- Ensure compliance with the risk management procedures and

processes therein;

- Provide the required risk management resources to the project manager, and oversee the technical performance of staff selected to fulfill a risk engineer/facilitator role;
- Ensure that supporting risk engineer/facilitators by the Project Manager are competent;
- Carry out regular assessments of the key risks to the project / sub-project / works portfolios and ensure these feed into the overall project / multiple project risk registers and risk management processes;
- Carry out regular reviews of risk assessments and selected controls;
- Ensure that within the project and across multiple sub -project boundaries (e.g. across disciplines such as power, rolling-stock, civil construction and/or by phase such as design, construction, operation and maintenance/demolition) knowledge regarding risk types and control selection is made available and transferred;
- Coordinate and/or carry out any necessary training;
- Manage and regularly assess the risk management performance, including that of the supporting of the Risk Engineers/ Facilitators;
- As required, participate in reviews and report on all aspects of risk management and control performance across the spectrum of business/ strategic / project / technical risks;
- Report to risk review meetings on progress against risk management actions.

Financial Responsibility : **In line with project plan**

(i) External PB contacts : **Client, Contractors, sub-contractors**

Signed **Unit Manager**	**Signed** **Unit Director**	**Signed** **HR Director**

Section Design Manager

Job Title	**: Section Design Manager (SDM)**
Division/Unit	**: Rail**
Reporting to	**: Design Manager**
Location	**: Site Based in Edinburgh**
Date	**:**

Purpose of the Job

The SDM is responsible for the delivery of the design for their particular section, retaining responsibility for delivery of all design on programme. Coordinates the design for their section and collates design deliverables. Development of designs to gain all necessary approvals and consents in conjunction with the Approvals Team.

Main Responsibilities

Duties and responsibilities are anticipated as, but not limited to the following:

- The SDM is responsible for the delivery of the design for their particular section.
- Interface between the Edinburgh Office and the home office based DTL's and their design teams with the Edinburgh based teams.
- They have a range of technical disciplines so they can cover the vast majority of the technical issues on the project. In all cases they have also been assigned a section of the route.
- Their role is not to carry out design but to co-ordinate the designs being produced in the design teams and to attend meetings in Edinburgh which relate to their section they are responsible.
- Must take notes of all meetings attended in Edinburgh and distribute to the DTL flagging up important issues.
- They are also the local presence to filter out and deflect the daily events which might distract the progress of the design, whilst providing notes of meetings and any necessary actions back to the design teams.
- Responsible for delivering the approval deliverables to relevant external bodies they shall co-ordinate (and resolve, if possible) any multi-disciplinary design issues.
- They should produce (and/or collate) the written commentary which goes with the planning applications.
- The SDMs will lead the Informal consultations with all of the approvals bodies for their sections and ensure that the expectations of the approvals bodies are relayed to the DM and the DTLs.
- Identify project scope and fee changes affecting their section and highlight them to the commercial Manager.
- He will provide advise to direct the DTL's and their design teams and call DTL meetings to resolve issues.
- Responsible for ensuring that the design programme and associated

resource plan (P3e programme) is updated for their section. • The SDM will provide input to the DM for monthly progress reports. • Implement the Project Engineering Plan in conjunction with the Engineering Manager. • Implementation and capture of project risk and ensure that is effectively deployed and that any significant risks/issues within the project are brought to the attention of the Project Manager/Commercial Manager in a professional and timely manner. • Design programme input for their section. Identify potential delays and prepare mitigation measures and report them to the DM and Commercial Manager. • The SDM's will chair engineering design reviews covering the design development in their allocated section, at agreed convenient locations (not necessarily Edinburgh). Such meetings would take place on a rolling basis, integrated within a total programme of internal and external design reviews. The attendees would be the DTL's/nominated deputies. • Inter-section priority issues will be raised by the SDM with the DM for resolution.
Financial Responsibility : In line with project plan **(i) External PB contacts : Client, Contractors, sub-contractors**

Signed **Unit Manager**	**Signed** **Unit Director**	**Signed** **HR Director**

Assistant Section Design Manager

Job Title	**: Assistant Section Design Manager (SDM)**
Division/Unit	**: Rail**
Reporting to	**: Section Design Manager (SDM)**
Location	**: Site Based in Edinburgh**
Date	**:**

Purpose of the Job

The ASDM is responsible for supporting the SDM in the delivery of the design for their particular section, retaining responsibility for delivery of all design on time. Coordinates the design for their section and collates design deliverables. Development of designs to gain all necessary approvals and consents in conjunction with the Approvals Team.

Main Responsibilities

Duties and responsibilities are anticipated as, but not limited to the following:

- The ASDM is responsible for the delivery of the design for their particular section.
- Deputises for the SDM when not available, eg during annual leave, for meetings etc.
- Interface between the Edinburgh Office and the home office based DTL's and their design teams with the Edinburgh based teams.
- Their role is not to carry out design but to co-ordinate the designs being produced in the design teams and to attend meetings in Edinburgh which relate to their section they are responsible.
- Must take notes of all meetings attended in Edinburgh and distribute to the DTL flagging up important issues.
- They are also the local presence to filter out and deflect the daily events which might distract the progress of the design, whilst providing notes of meetings and any necessary actions back to the design teams.
- Responsible for delivering the approval deliverables to relevant external bodies they shall co-ordinate (and resolve, if possible) any multi-disciplinary design issues.
- They should assist the SDM in production of the written commentary which goes with the planning applications.
- Assist the SDMs and deputise where required in leading the Informal consultations with all of the approvals bodies for their sections and ensure that the expectations of the approvals bodies are relayed to the DM and the DTLs.
- Identify project scope and fee changes affecting their section and highlight them to the SDM and the Commercial Manager.
- He/she will provide advice to direct the DTL's and their design teams and call DTL meetings to resolve issues.
- Responsible for ensuring that the design programme and associated

resource plan (P3e programme) is updated for their section. • Implement the Project Engineering Plan in conjunction with the Engineering Manager. • Implementation and capture of project risk and ensure that is effectively deployed and that any significant risks/issues within the project are brought to the attention of the Project Manager/Commercial Manager in a professional and timely manner.		
Financial Responsibility : In line with project plan **(i) External PB contacts : Client, Contractors, sub-contractors**		
Signed **Unit** **Manager**	**Signed** **Unit Director**	**Signed** **HR Director**

Planning Manager

Job Title	**: Planning Manager (PLM)**
Division/Unit	**: Rail**
Reporting to	**: Project Controls Manager**
Location	**: Site Based in Edinburgh**
Date	**:**

Purpose of the Job

The PLM is responsible for the design Programme. This includes logic, progress, resource loading, updating, and financial reporting. This is project wide including all subcontractors. Also includes all approvals submissions.

Main Responsibilities

Duties and responsibilities are anticipated as, but not limited to the following:

- The design planner will provide, manage and update the design plan.
- The plan will be produced in P3e so that it can be resource loaded to provide information in Primavision.
- The planner will provide regular feedback / updates to the DM in order to ensure the deliverables list is current.
- The Planning Manager will be responsible for the overall project plan to include all subcontractors so that all programmes on the project are co-ordinated.
- The Planning Manager also ensures that the design process and project reporting (for internal PB cost control etc) are captured satisfactorily.
- Liaison with the SDMs to ensure that the design programme and associated resource plan (P3e programme) is updated for their section.
- The Planning Manager is responsible for providing input to the Project Controls Manager, Design Manager and Project Manager for monthly progress reports.
- Identify project programme risks and ensure that these are highlighted to the SDM and DM. Risks should be quantified and potential mitigation measures identified.
- Risks/issues within the project that are as a result of the failure of third parties to deliver design should be brought to the attention of the SDM /Project Manager/ Project Controls Manager and Commercial Manager in a professional and timely manner.
- The Planning Manager is responsible for providing input to any claims required by the Project Controls Manager and the Commercial Manager. These include programme impact for any EOTs, accelerations, stops, amendments, and variations in a timely manner.
- The Planning Manager is responsible for coordination of the planning team and ensuring that the planning team have consistency of approach.

Financial Responsibility : In line with project plan **(i) External PB contacts : Client, Contractors, sub-contractors**		
Signed **Unit** **Manager**	**Signed** **Unit Director**	**Signed** **HR Director**

Systems Assurance Manager

Job Title	**: System Assurance Manager (SAM)**
Division/Unit	**: Rail**
Reporting to	**: Systems Assurance Manager**
Location	**: Home Office Based**
Date	**:**

Purpose of the Job

The SAM is responsible for the ensuring systems assurance and RAMS.

Main Responsibilities

Duties and responsibilities are anticipated as, but not limited to the following:

- Specialises in Systems Assurance and RAMS.
- Responsible for the creation, maintenance and discharge of the Project Hazard Log
- Review of Project Design Review Procedures.
- A member of the Hazard Log Close Out Committee
- The SAM will attend Edinburgh as directed by the SIM or the Project Manager,
- The SAM will undertake other project related tasks as requested by the SIM.

Financial Responsibility : In line with project plan

(i) External PB contacts : Client, Contractors, sub-contractors

Signed **Unit Manager**	**Signed** **Unit Director**	**Signed** **HR Director**

Office Administrator

Job Title	**Office Administrator**
Division/Unit	**: Rail**
Reporting to	**: Project Controls Manager**
Location	**: Based in PB Edinburgh Office**
Date	**:**

Purpose of the Job

Manage the PB office to create the necessary working environment to enable PB to perform the relevant duties of Design, Management and delivery.

Main Responsibilities

Duties and responsibilities are anticipated as, but not limited to the following:

- Monitoring and ordering of office materials
- Maintaining training records for all staff to company standards
- Invoice processing/management
- Budget control of stationery
- Comprehensive reporting on Service Providers performance to ensure compliant with agreed Service Levels.
- Acting as a liaison for external suppliers/ repairs (photocopiers/fax machines etc)
- Nationwide distribution of stationery items to personnel
- Negotiating cost/time scales for delivery/maintenance
- Obtaining and negotiating on quotations for specialist jobs provided outside of area and/or company
- Specialised training for key members of staff
- Issue of Induction packs and induction training for new members of staff to the team
- Induction training, as required, for visitors to the scheme/offices
- Database maintenance
- Timesheet and expenses management and collation for the scheme
- Preparation and issue of notes of meetings as required
- Fire warden
- Collation and management of expenses
- Post management
- Preparation and implementation of Office secretarial procedures
- Maintenance of the holiday schedule for the PB project team
- Booking car parking spaces
- Organisation of meeting rooms
- Management of recycling
- Booking taxis

Financial Responsibility : In line with project plan **(i) External PB contacts : Client, Contractors, sub-contractors**		
Signed **Unit** **Manager**	**Signed** **Unit Director**	**Signed** **HR Director**

Document Controller

Job Title	**Document Controller:**
Division/Unit	**: Rail**
Reporting to	**: Project Controls Manager**
Location	**: Based in PB Edinburgh Office**
Date	**:**

Purpose of the Job

Co-ordinate and manage all incoming and outgoing Documents and the Edinburgh Tram Project as well as managing the Document Management System.

Main Responsibilities

Duties and responsibilities are anticipated as, but not limited to the following:

- Day to day management of the DMS system
- Training of staff in the use of the DMS system.
- Uploading of documents onto the DMS.
- Preparation of Document Transmittal sheets.
- Upkeep of the Document transmittal Register
- Update the Submittal Programme and Approvals Matrix on a daily basis
- Issue weekly incoming and outgoing registers to all team members
- Ensure documents are distributed in accordance with the Document Distribution Strategy.

Financial Responsibility **: In line with project plan**

(i) External PB contacts **: Client, Contractors, sub-contractors**

Signed	**Signed**	**Signed**
Unit	**Unit Director**	**HR Director**
Manager		

Construction Manager

Job Title	**Construction Manager**
Division/Unit	**: Rail**
Reporting to	**: Project Manager**
Location	**: Based in PB Edinburgh Office**
Date	**:**

Purpose of the Job

Leadership and management of a team of construction management personnel who undertake the following management functions; building and civil, systems, rolling stock, utilities, testing and commissioning

Main Responsibilities

Duties and responsibilities are anticipated as, but not limited to the following:

- Work within an integrated project management team
- Development of construction programme, interface with network rail, identify network rail possession requirements, management of surveys (including Network Rail asset survey)
- Working with the Project Manager assist in the development of the Project Plan
- Work with the projects control group on the development of the work programmes and control and monitoring of the progress against the agreed programme
- Provide input, with the assistance of the project manager, the design and health and safety groups together with the contractors equipment suppliers and service providers the risk register
- Work with the design team, ensure that full consideration has been fully given to making sure that the facilities, and utilities can be constructed in the most economical way taking account of the cost of operability and maintainability of the equipment
- Working with the project manager and the project controls group provide progress details into the monthly project status report
- When required work with the project manager, the contractors and equipment suppliers and the planning engineers to develop and manage recovery programmes in the event that there is slippage to critical aspects of the construction programme
- Work with the health and safety and quality group to ensure that the Project health and safety plan, the quality plan and the environmental plans are compiled and maintained throughout the contract
- Where necessary assist the design group with the process of reviewing all the equipment test plans
- Where necessary assist the design group with the process of reviewing the operation and maintenance documentation

<table>
<tr><td colspan="3">

- Manage the setting up and the integration of the additional personnel
- involved in the construction of Lines 1and 2
- Obtaining Network Rail approvals using the design information produced by the Design Teams and controlled by the Section Coordinators.
- Identify necessary approvals and submission formats with DEM/EM.
- This includes agreeing the processes procedures to be used and the methods for obtaining approval from Network Rail
- Provide information to the Approvals Manager for updating the Approval Register

</td></tr>
<tr><td colspan="3">Financial Responsibility : In line with project plan

(i) External PB contacts : Client, Contractors, sub-contractors</td></tr>
<tr><td>Signed
Unit
Manager</td><td>Signed
Unit Director</td><td>Signed
HR Director</td></tr>
</table>

Procurement Manager

Job Title	**Procurement Manager**
Division/Unit	**: Rail**
Reporting to	**: Project Manager**
Location	**: Based in PB Edinburgh Office**
Date	**:**

Purpose of the Job

The Procurement Manager will work closely with the Design Management team and **tie** Procurement and Legal teams to ensure that SDS deliverables are produced to support the **tie** Project procurement targets for Tramco, Infraco and Utilities (MUDFA)

Ensure that interface with other parties eg Operator is adequately catered for.

Main Responsibilities

Duties and responsibilities are anticipated as, but not limited to the following:

- Prime point of liaison with **tie** and **tie**'s Legal advisers to enable creation of tender documentation for the Project covering;
  - Tramco – vehicle supply and maintenance agreements
  - Infraco – Infrastructure and infrastructure maintenance agreements
  - MUDFA – Multi Utility Diversion Framework Agreement agreement
- Creation and ownership of Project/SDS procurement programme including resource monitoring.
- Prime point of contact with tie regarding creation of Project Program
- Input into the SDS Design Programming function through liaison with the Planning Manager and Design Manager
- Advise the Planning Manager and Design manager of any requirements regarding document delivery to support the procurement process
- Ensure that any documentation created by the Procurement Team supplementary to Design Deliverables is subject to correct procedural control

Financial Responsibility **: In line with project plan**

(i) External PB contacts **: Client, Contractors, sub-contractors**

Signed **Unit Manager**	**Signed** **Unit Director**	**Signed** **HR Director**

Deputy Procurement Manager

Job Title	**Deputy Procurement Manager**
Division/Unit	**: Rail**
Reporting to	**: Project Manager**
Location	**: Based in PB Edinburgh Office**
Date	**:**

Purpose of the Job

Responsible for the provision of technical advice and assistance to the tie/DLA/SDS Procurement Team relating to the structure, composition, programming and production of the Invitation to Negotiate documentation required for the procurement and construction purposes of the Edinburgh Tram Project.

Located within the tie offices as a member of the tie/SDS Procurement Team.

Main Responsibilities

Supporting the Procurement Manager in his role within the combined tie/SDS Procurement Team for the identification, establishment and managing of the project Procurement Programme covering the three main contracts for the Edinburgh Tram project covering

- The design manufacture supply delivery testing and commissioning of the fleet of trams and maintenance thereof
- The provision of the Edinburgh Tram Infrastructure and the maintenance thereof
- The necessary Utility Service Diversions.

Input and advice to the team on the technical implications of their development of proposed Project Procurement Strategy, documentation and interfaces.

Review the documentation making up the Invitation to Negotiate with the tie Procurement Team and the SDS Procurement Manager for technical and commercial compatibility and compliance.

- Deputise for the Procurement Manger in his absence.

Design Team Leader

Job Title	Design Team Leader
Division/Unit	: Rail
Reporting to	: Design Manager/Engineering Manager
Location	: Based in PB Edinburgh Office
Date	:

Purpose of the Job

The Design Team Leaders are responsible for the co-ordination and progress of the design in their technical fields of expertise. Some DTL's will have teams in more than one office and the consistency of the design and provision of core data to the teams is the DTL's responsibility.

Main Responsibilities

Duties and responsibilities are anticipated as, but not limited to the following:

The

- DTLs ensure designs coordinated with other disciplines, interfaces identified and resolved, input to system interface register as necessary, raising of RFIs
- DTLs are responsible for the delivery of the designs for their discipline for quality and programme.
- DTLs are responsible for reporting their progress against the project plan and advising of any potential delays faced.
- DTLs are responsible for liasing with the Heads of Discipline to ensure that the necessary resources are available to meet their project programme.
- DTLs are responsible for ensuring that the resources working in their discipline are suitably qualified to deliver to the required standard.
- DTLs are responsible for ensuring that the appropriate procedures for supplying robust deliverables are followed, including Design Checks and Interdisciplinary Design Checks, design development logs and Hazard Identification.
- DTLs are responsible for the preparation of their Engineering plan for their discipline and ensuring that this is approved by their respective Head of Discipline.
- Design Team Leaders are responsible for ensuring that the designs being produced by their discipline are completed in accordance with the design programme.
- DTLs are responsible for preparing packages for submission to approvals bodies in accordance with the design plan. These are to be submitted to the section coordinator for review in advance of the formal submission date. DTLs should liase with the relevant Section Coordinator to agree

timescales for this review.

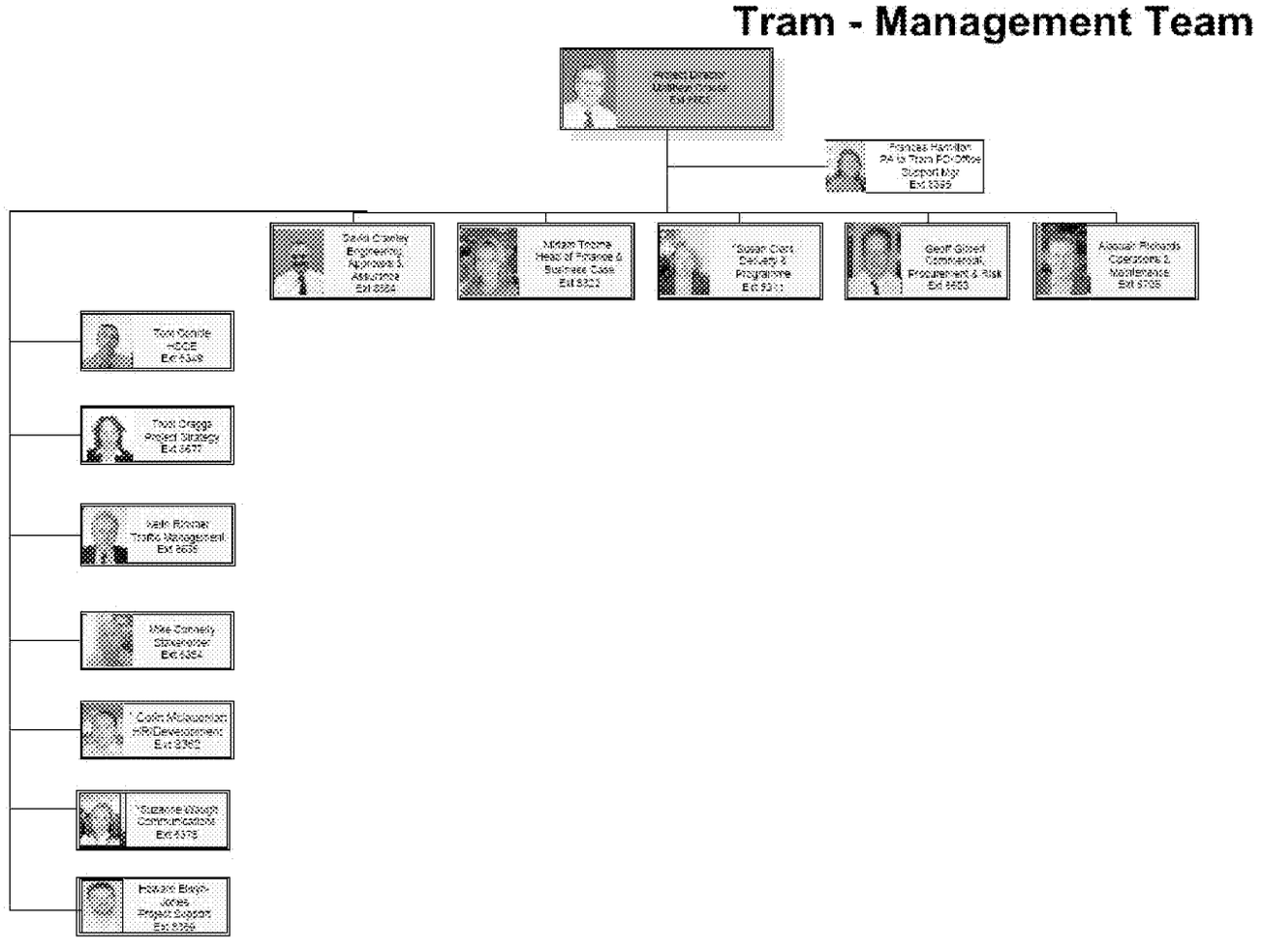
- DTLs are responsible for managing their resource allocation and budgets.
- DTLs are responsible for notifying the SDM of any perceived additional works required by their discipline. This is to be done in advance of undertaking the work and the scope and budget must be agreed formally prior to undertaking the work.
- All DTL's report to the DEM on this project but have their usual Business Unit reporting lines.
- DTLs are responsible for the quality of the submission of their discipline

Financial Responsibility: In line with project plan

(i) External PB contacts: Client, Contractors, sub-contractors

Signed **Unit Manager**	**Signed** **Unit Director**	**Signed** **HR Director**

The **tie** organisation and accountability chart is shown in Fig 3.3. Both **tie** and SDS teams will be dynamic and will periodically go through team change to suit the individual phase of the Project.



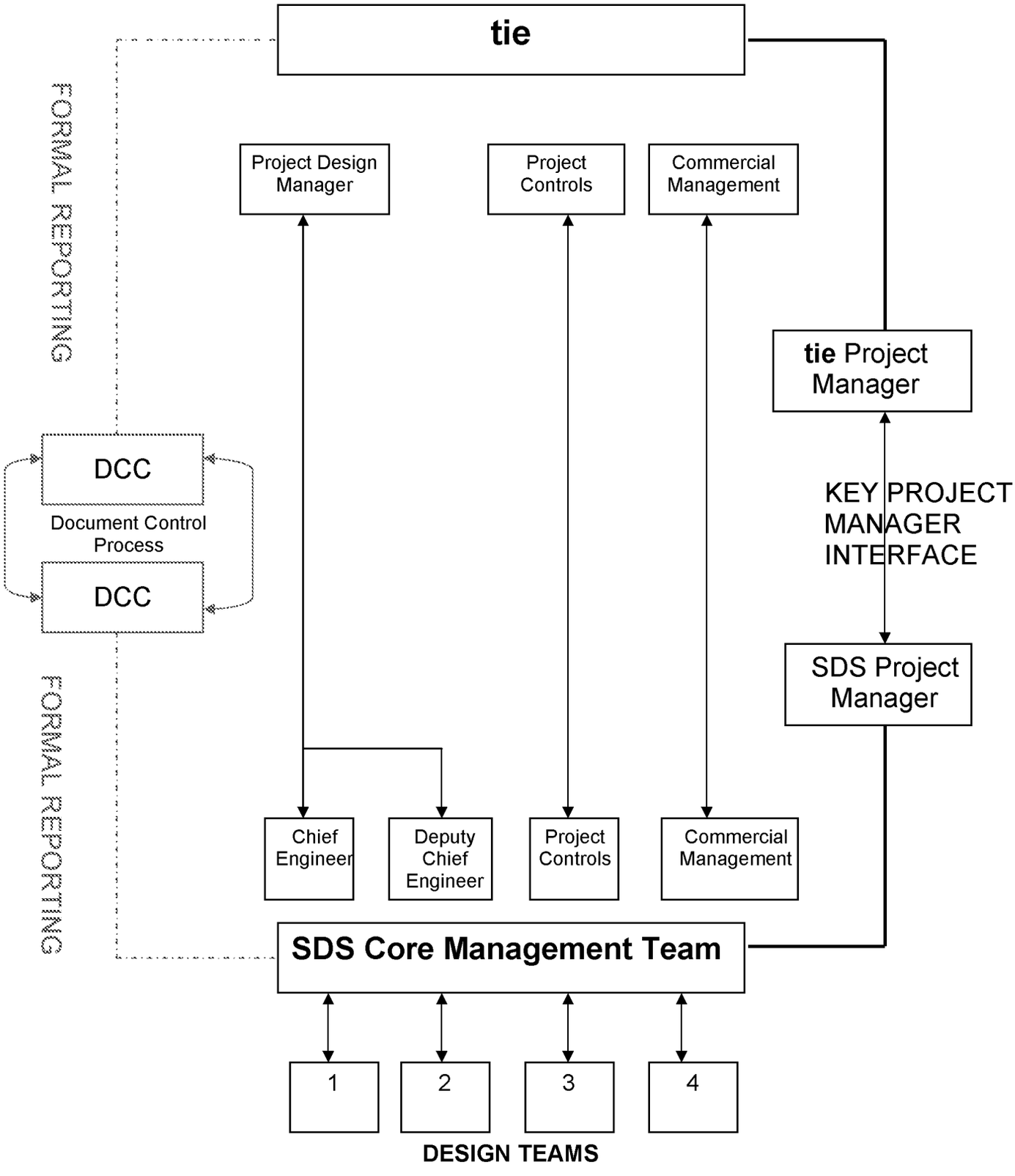
(*) Also have functional roles within tie Corporate & Organisation

3.4 Communication and Reporting Lines

Communication with **tie** and external organisations will be in accordance with the communications protocol as described in the Project Communications Plan provided in Doc Ref ULE90130-SW-SW-PPN-00008. **tie** Communications Manager has confirmed this plan will be issued by **tie** following consultation with PB as the SDS provider.

The lines of communication will be in accordance with Fig 3.4 below.

Fig 3.4 Lines of Communication



4 PROCEDURES FOR CONTROL AND MONITORING

4.1 Submittals – Document Control

4.1.1 Introduction

This section details the procedure for obtaining approval of documentation prepared by or submitted by SDS provider. These submissions will be required to be reviewed by **tie**, CEC, and other relevant Third Parties. Specific Third Parties will require engagement Plans and Strategies to allow the SDS Team to interface correctly and efficiently with them. Network Rail (for example) has been engaged in line with the Framework Development Agreement and the SDS Third Party Approval Strategy.

4.1.2 Purpose and Scope

The procedure comprises a flow chart Fig 4.1.2 giving the scope and controls that will be needed in order to progress the approvals of the documents throughout the design and construction process. The flow chart includes the following steps.

STEP PROCESS

- **SDS identified requirements**

SDS core management team will provide details of the project requirements during the Requirements Definition Phase. The requirements are to be identified in accordance with the Agreement.

- **PB 'System Infrastructure Specification' requirements**

The SDS core management team and design team leaders will provide functional specifications and outline designs, where appropriate, for the system to reflect **tie** and Transdev operating requirements. The functional specification and outline designs will be used as the basis for the preparation of any design by the SDS.

The SDS core management team together with SDS approvals manager will identify all external approvals/ acceptances to be obtained for specific areas/ locations/ deliverables during the design development.

- **SDS Prepares Document**

In line with the requirements of the Agreement with **tie** and the design programme, the SDS will assign design teams to create and develop the documents and/or drawings.

The SDS shall be responsible for format, version control, internal reviews and for following the SDS Quality System requirements. The SDS will be responsible for the content of the documents/drawings.

- **Issue to SDS Review Process for Review**

The SDS design teams will issue the documents to the Engineering Manager for internal review for compliance with the requirements of the Agreement and where applicable, the Functional Specifications provided within the ITT. The design teams will issue a statement with all submittals stating the submission is, in their opinion,

compliant with these requirements, or in the event that it does not fully comply, the design team will clearly detail where it is not compliant.

- **Do the SDS Documents comply**

Following the review by SDS, the submittals will either;

Meet the SDS/**tie** requirements,

Meet the SDS/**tie** requirements subject to minor revisions to the submission and be passed for onward submittal to **tie** and third parties as appropriate, or

Not meet the SDS/**tie** requirements and will require re-submittal to design team prior to any submittal to third parties

The output from this process is a **Yes or No.**

- **SDS provide comments following their review**

Output is No – SDS core management team shall provide a concise set of comments to the design team identifying a non-conformance to the Agreement and / or the Specifications and the preferred action. All comments shall be unambiguous and shall be fully justified.

The design team will review the comments and when agreement has been reached the design team will complete any action on the document then issue it to SDS Review Process who will then issue the drawings/documents to **tie** and or the relevant third parties.

- **Documents Issued to** tie **and Third Parties**

As part of the Project Information System the SDS will work to create a matrix that will identify all the third parties and the documents each party will need to approve or review.

In order to ensure that the management of the documents is correctly undertaken it is imperative that the documents/drawings are only issued to those third parties who specifically are required to review them and that the transmittal sheet clearly details for what purpose they are reviewing the document. It is important that SDS seek a single review cycle throughout this process.

All external consents and approvals will be obtained in accordance with the SDS Consents and Approvals Management Plan.

tie and the relevant third parties shall respond to the review of the documents/drawings etc. The output from this stage is:

1. No objection – Submission may be used for further design and/or construction.
2. Proceed subject to comments - Submission may be used for further design and/or construction incorporating the comments.
3. Resubmit – Statement of Grounds of Objection. Do not proceed with further design and/ or construction until the matters have been addressed.

- **SDS review** tie **and relevant third party comments?**

(a) If the output is Acceptance, the review is completed and the documents/drawings will be used for further design and/or construction.

(b) If the output from **tie** is "Acceptance with comments, and SDS agree with the comments, SDS will advise **tie** and /or the relevant third party that they will incorporate the amendment and proceed with further design and/or construction etc. once the document has been amended for the records.

(c) If the output from is **tie** "Non-Acceptance" SDS core management team will return the document to the design team who will either;

- Carry out the amendments to the submittal and re issue in accordance with the procedure detailed above or,
- The design team may request that SDS core management team seeks further information on the grounds for the non-acceptance and then update the document in line with the response to the objections re-using the procedure above.

Given each parties involvement to this stage in the document/drawings approval process there shall be a review meeting held, where each comment received is reviewed and an action agreed upon. This may in some cases be a high level action, due to the nature of the issue or it may have to go back to an engineer for detailed analysis. This meeting shall seek to minimise the time frame for closing out the document. Actions shall be placed on both SDS Management and the design team at this meeting.

DOCUMENT REVIEW & PROCESS FLOW CHART

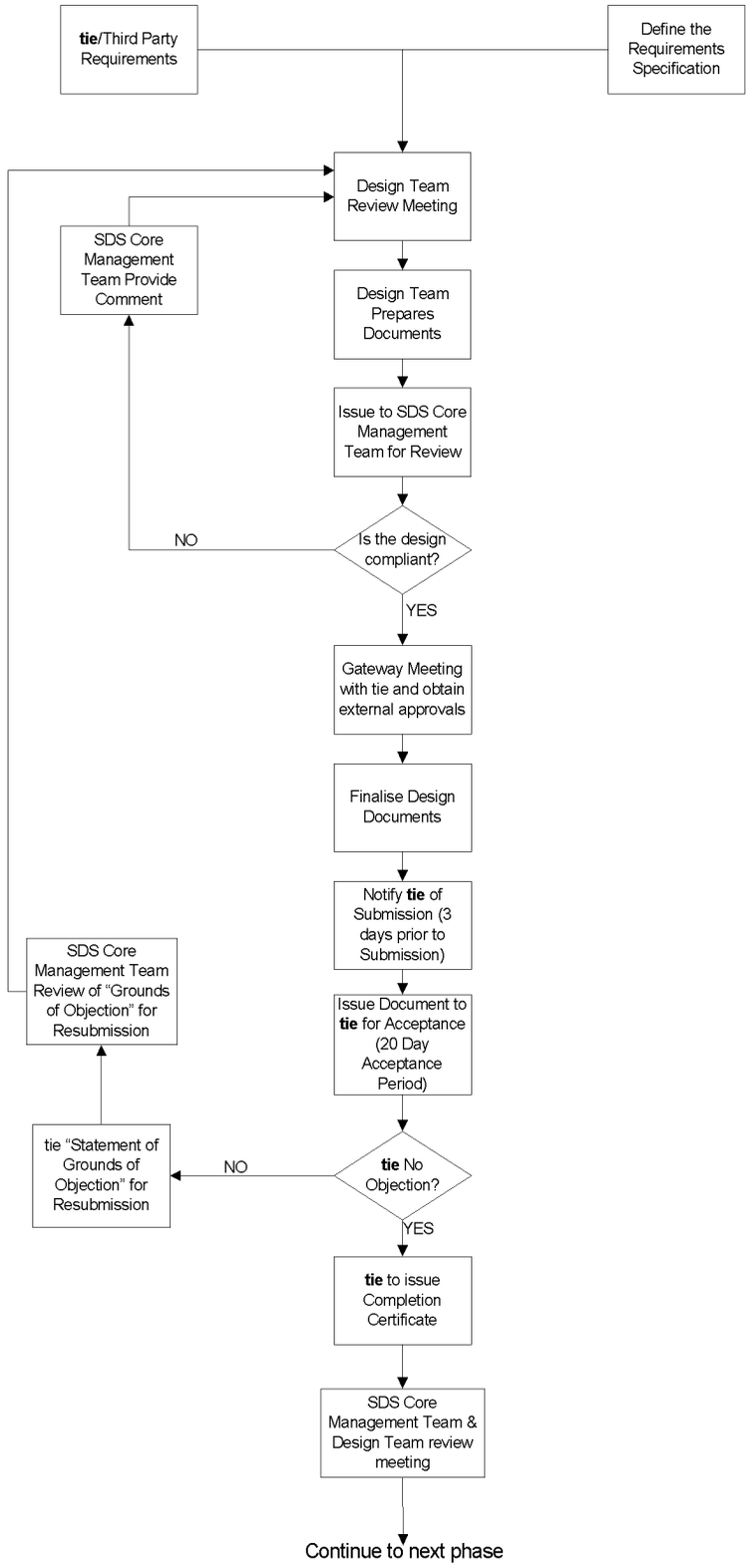


Fig 4.1.

4.2 Programme Control

4.2.1 Introduction

This plan and guidance section provides the basis for undertaking programme control within the context of the Project Management Plan for the complete life of the project programme.

4.2.2 Scope

This procedure is to cover the control of the SDS Design Programme, including its structured relationship with all supporting documents and programmes, for the advanced works, design, construction and commissioning stages of the Edinburgh Tram Network Project. It is not intended to cover the control of the detailed work programmes managed by others.

4.2.3 Responsibility

It is the responsibility of the Project Manager or his delegated representative to manage, control and co-ordinate the design works in accordance with SDS Design Programme. This should not detract from the fact that the programme should be structured to assist the collation of the complete project teams chosen plan on how they intend to deliver the Edinburgh Tram Network Project.

4.2.4 SDS Design Programme

The SDS Design Programme will integrate the key elements of the advanced works being progressed by **tie,** Utility diversion works, Road re-modelling projects in the surrounding area, Main construction works, Integrated Testing and Commissioning and Operator testing and training requirements. It provides an integrated programme that is both robust but deliverable within the constraints highlighted.

The SDS Design Programme, managed by the SDS Planning Manager, will be issued in Gant Chart format using P3e.

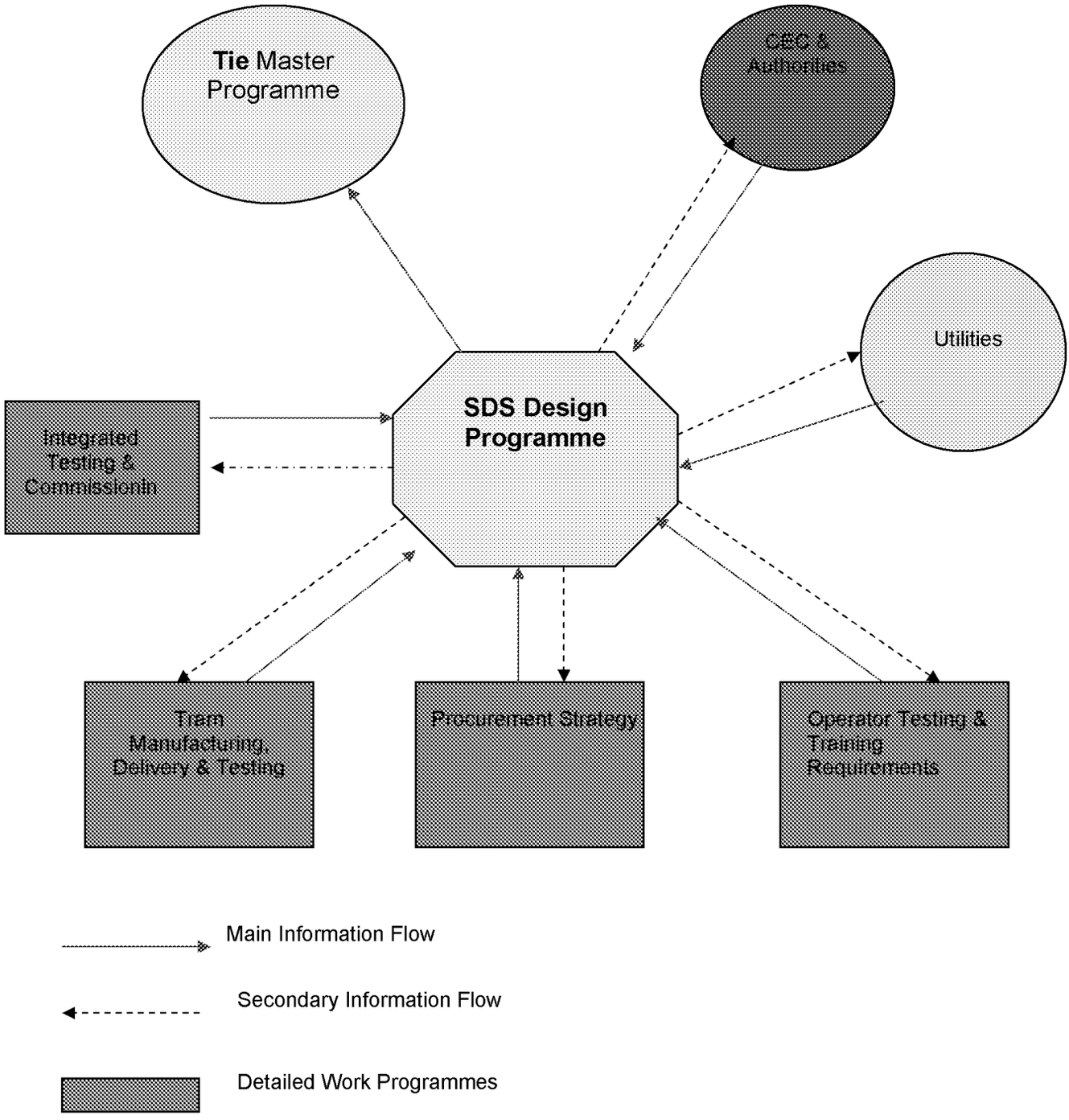


FIG 4.2
Programme Interfaces

4.2.5 Initial Programme

The SDS Design Programme was developed during the Requirements Definition period. During this time the SDS Project Team worked closely with **tie** and all the other major Third Parties to finalise further on the exact logistical constraints that the SDS Design Programme must recognise and support. This was 'base-lined' (frozen in time) to provide a measured position to report all future project progress.

4.2.6 Programme Development

The development of the planning throughout the project will be driven by the individual detailed work programmes for each of the main subjects. As more information becomes available including completion of agreed design, this allows the planning to be further finalised. Programme change which affects inputs/ reviews/ approvals from 3rd parties will be included within the design as agreed with the 3rd parties.

In order to properly manage the project, it is essential that the SDS Design Programme shows fully, the intended plan of working. It will therefore be revised, with the agreement of **tie**, whenever it ceases to reflect the current project execution strategy. Any revision to the original Programme, once agreed by all parties, will then be used to monitor the future progress of the project from that date forth until such time another such revision maybe required.

4.2.7 Programme Control Process

The SDS Design Programme will be the official progress monitoring device via which the Project Manager will report progress to **tie,** at monthly intervals. As previously highlighted, although a baseline programme will be kept as the original target it must be stressed that the programme through this period is seen as a dynamic tool, logic changes may be required to reflect current situations, delay rectification etc.

At pre-determined monthly intervals from project commencement, as per dates issued by **tie,** progress will be analysed on the SDS Design Programme.

The first action will be to calculate progress with no other alterations / rectifications to durations or logic since the previous update. An internal Programme Management report will be produced addressing those activities that have or should have started. Earned Value and remaining duration / float will be the means of measurement. The Earned Value is derived from the appropriate measure of activity progress.

Further to the above, an activity day count will be declared which measures the overall volume of work completed regardless of criticality. All activities will be equally weighted. A graphical form of this will show both originally planned activity days and actual activity days achieved against programme time. This will be presented in 'S' curve format showing both the overall project information, and where required further graphs for more detailed analysis, section by section or construction phase by construction phase.

The SDS Project Management team shall agree the programme update and this information will form an integral part of the Monthly Progress report, issued to **tie**

4.2.8 Analysis and Corrective Action

This will entail reviewing the contents of the initial report and, through the SDS Design Programme management process, discuss delay situations, increasing criticality areas, new information to hand and new ideas.

An external report will then be produced under the same headings using the same measurement criteria of Earned Value and remaining float but with brief explanations as to what has been changed and the means of rectification of delay or indeed an accepted interim worsening situation. This reconciliation report will be submitted to **tie,** as and when it is required, for further discussion.

When it is agreed by all parties that this corrective action is substantial enough to warrant the revision of the current SDS Design Programme, then these revisions will be implemented immediately as the resulting revised programmed agreed and issued to all parties. This will then be the updated project programme against which all further progress reporting will be measured.

4.2.9 Production Curves

In addition to the activity day count included above, it is intended to choose appropriate operations which are considered as essential drivers to the project, as production monitors during their relevant period within the life of the programme. These will include but not be limited to length of utility diversions, track, number of tram stops commissioned, drawings issued in certain categories.

4.3 Cost Control

4.3.1 General

A baseline estimate will be established upon which the emerging cost of the design can be measured. The process is iterative and the objective of the estimates is to progressively develop certainty in respect of the outturn project cost. This process includes the identification and quantification of risk items and design change and their effect upon the outturn cost of the project.

4.3.2 Phases

- **Requirements Definition Phase:** Established a ROM (Rough Order of Magnitude) baseline construction cost estimate(s) for Lines 1 & 2 separately and also jointly. Estimates priced at current day pricing 4Q05 and escalated to reflect inflation up to planned completion date in 2Q10. The construction cost estimates at that stage were high level, generic, and contained substantial risk allowance, and were prepared based upon review of the current available information.
- **Preliminary Design Phase:** Developed the ROM baseline construction cost estimates in line with the emerging design. The estimate at this stage was developed in line with the WBS (Work Breakdown Structures). The level of detail contained within the estimates increased in line with the emerging design and level of risk should decrease as design is developed.
- **Detailed Design**: At this stage the construction cost estimates will be fully defined in line with the detailed design and WBS. Infraco tender returns will feed into the Client costing exercise and allow confirmation to previous baseline construction cost estimates. Risk allowances within the estimate will

be confined to items identified as having a level of uncertainty in line with the risk register and unforeseen risk.

- **Procurement and Construction Support:** Assist in the technical areas of Tramco and Infraco Reviews. .Provide Construction Support in accordance with the **tie** Change Order requirement.

4.4 Interface Management and Systems Integration

4.4.1 Introduction

The Interface Management System (IMS) will be the means by which the interfaces between the various project elements and requirements are managed, monitored and reported on. The interfaces, which will be tracked and progressed by means of the IMS will be those between the requirements of the various parties responsible for the delivery of the Edinburgh Tram Network Project and the technical elements which will make it up. These will lie in the following areas:

- Operator to Infrastructure – this interface relates to the Operator's requirements for a defined level of facilities and performance from the infrastructure and the steps taken to achieve them;
- Operator to Rolling Stock – this interface covers the Operator's requirement for a defined level of functionality and performance from the vehicles and the arrangements for achieving them;
- Infrastructure contractor to Rolling Stock – this interface relates to the boundaries between the two contractor's scope of supply and the requirement for the different items of equipment and systems to operate together to deliver the required level of performance. This includes the requirements for physical interfacing together with the wider issues involved in the ability for systems to communicate and exchange information, operate from common power supplies and be operated and maintained in an efficient manner;
- Sub-systems to main systems – this relates to the need for design integration to be achieved within both the Infrastructure and the Rolling Stock contractor's respective scopes of supply to ensure that functional requirements are met and that the design is readily maintainable without unnecessary duplication or an excessive component count;
- In each case the requirements of **tie**, the Planning and Highways Authorities and regulatory bodies such as HMRI must also be met and therefore any agreed solutions to specific interface issues must comply with these through the normal approvals process.

4.4.2 Objectives

Key objectives of the IMS will be:

- Safe, reliable and efficient operation of all parts of the tramway;
- Seamless integration of the tramway through the progressive stages of sub-system, factory acceptance and site testing, followed by integrated system testing and trial running;
- Ease of fault finding, standardisation of maintenance techniques, the ability to take systems off line for maintenance without shutting others down and the minimisation of incompatible spares inventories;
- Provision for future replacement of systems and sub-systems on the basis of either wear, changed requirements or obsolescence.

4.4.3 Methods

The main tools that will be used for the management of interfaces will be the following:

- The Requirements Specification;
- The Requirements Definition Documentation;
- System Interface Register(SIR);
- Internal and external supplier specifications;
- The design submissions and review process;
- Testing, commissioning and system acceptance records.
- Stakeholder Register

Interface management has been and will continue to be required at every stage of the tramway's implementation from the production of the main system specifications, through the review of the contractors' interpretation of these in the form of their internal and external supplier specifications, design submissions, inspection records, test schedules, commissioning programme, factory and site test results, system integration and performance under operational conditions.

The System Interface Register (SIR) was developed at the Requirements Definition Phase. . As the design process proceeds each of the subject areas will be further developed and further items will be added as they are identified. Identification will be on a proactive basis and derived from an initial interface assessment. The SIR will schedule each interface and subject area in terms of the actual system configuration that has been proposed/adopted in order to create a unique reference and description for each.

The series of interface references in the SIR will be the basis used for tracking the defined items through each step of the interface management process from specification and design to commissioning and validation under operational conditions.

At each stage the item concerned will be tracked to a successful conclusion before being cleared to move to the next stage. The SIR will also capture and track third party interfaces where they are of a technical nature.

4.4.4 System Interface Register

The description in the SIR for each specific interface will cross reference all the related aspects of that subject area to ensure that they have been closed out. A typical example is illustrated at the end of this section. In this case the details have been abbreviated considerably and are typical only, in order to illustrate the principle involved.

Progress with each of the items will be monitored and progressed by means of regular meetings with the design teams, at set intervals, jointly under the chairmanship of the Project Manager. The Project Manager will involve **tie** and Transdev as the operator fully in this process and will provide full details of progress with the management of all interface matters as part of his regular reports.

4.4.5 Processes

Apart from the development of the IMS itself, the IMS will contain the following main steps:

4.4.6 Project Set-Up

- Establish the SIR This will be carried out by the Engineering Manager who will be required to contribute actively to the process. For programme reasons this must be developed during the initial part of the design process. The Engineering Manager will be responsible for liaising with the Operator and for identifying any other third party technical interfaces, which should be added to the register
- Establish the planned reporting requirements, including timing and format. This will be required from the start of the design process.
- Establish the interface progress meeting arrangements with the contractors and major third parties. This will be required from the outset and will be the responsibility of the Project Manager.
- Establish the standard progress and technical report formats for the detailed management of the various interfaces. These will follow the reporting and document control structure for the project as a whole. Interface Management will be allocated a separate series of numbers within the project reporting structure.

4.4.7 Project Operation

- Update and re-issue the SIR on a regular basis. The responsibility of the Project Manager
- Provide monthly reports on each of the interfaces that they are responsible for inputting to. The responsibility of the Design Team Leaders (reporting to the Engineering Manager).
- Provide detailed technical reports, analyses and calculations for each of the interfaces or subject areas that they are responsible for or inputting to. The responsibility of the Design Team Leaders.
- Consult with the Operator. The responsibility of the Project Manager.
- Report on a regular basis to PB and to **tie** on the status of all interface issues including the steps that have been taken to close them out and the results that have been achieved.

4.4.8 Close Out

On the satisfactory completion of each interface subject area and on the satisfactory design completion of the system, the Engineering Manager will issue a close out statement.

Specimen Technical (Interface) Matrix

Item	Name	Subject areas	Primary Effects	Secondary Effects	Status
IFS/RS 001	Passenger vehicle - infrastructure	- Overall dimensions - KE and DKE - Door, axle and pantograph locations - Clearance points - Allowances to be made for future variations	- Development of the swept path - Development of the vertical and horizontal alignment - Development of structures - Development of depot, sidings and terminals - Development of junctions and S&C - Identification of tram stop interfaces - Development of OHLE system		
IFS/RS 002	Wheel – rail interface	-Wheel profile - Wheel loads - Primary suspension stiffness and travel - Back to back dimensions - Flange way clearance - Wheelbase and drive arrangement - Chord lengths and combined suspension compliance - Flange lubrication - Wheel shunts - Rail section(s) - Rail inclination - S & C details - Clearances and critical dimensions - Primary suspension travel	- Compatibility - Derailment risk - Alignment geometry - Camber - Rail wear - Wheel wear - Flange running - Clearance - Noise - Materials - Highway surface interface	- Choice of lubricant - Application interval - Control of quantity	Fully resolved. See Technical Papers MTS/L1/002 "Wheel Rail Interface Report" and MTS/L1/003 "Track Geometric Design Report and vehicle Interface"
IFS/RS 003	Pantograph – overhead line	- Dimensional details and profile - Operating range - Electrical clearances - Physical clearance at lock-down - Static and dynamic forces - Contact strip details and material	- Clearance envelope - Joining, crossing and diverging wiring details - Quality of current collection - Speeds - Tensions - Section insulators - Along track dimensions at terminals and isolation points	- Achievement of required speed profile compatible with P Way design and operational assumptions over all parts of the route - Avoidance of de-wirements - Minimisation of % loss of contact - Minimisation of maintenance	The following items have been resolved:
IFS/RS 004	Traction Power – system design	- Vehicle characteristic, current, voltage against time - Simultaneous starts	- Short term and sustained demand on traction equipment and OHLE	- Matching capacity to demand - Allowance for	Resolved by Technical Paper MTS/L1/006

Item	Name	Subject areas	Primary Effects	Secondary Effects	Status
	including location, rating and provisional protection settings	and service effects - Operational requirements - Effect of line speed restrictions - Bunching allowance - UTC effects to be allowed for - Provision for other lines	- Avoidance of spurious tripping - Recovery strategies - Degree of diversity/reliability in primary supply - Any synergies with Merseyrail Electrics - Interference and EMC - Effect of earthing and bonding strategy -	out of course running - Optimising standing charges - reliability and redundancy - Allowance for maintenance - Operational flexibility in the event of emergencies	"Traction System Design and Interface Report"

4.5 Systems Assurance

By utilising a Systems Assurance process, PB as the SDS provider provides a framework that ensures the design requirements for the Edinburgh Tram Network Project are met through a controlled progression of verification and validation.

The basis of the Systems Assurance process is a controlled series of steps involving calculations, modelling, simulation and testing at component, module and system levels in order to ensure that the completed system meets all design, operating, maintenance, safety and reliability requirements.

The objectives of the Systems Assurance process are:

- To ensure that all project requirements are met in a demonstrable manner with traceable evidence of achievement
- To provide a structured methodology for verification and validation of requirement achievement throughout the project lifecycle. Thus reducing the risk of identifying failure to achieve project requirements late on in the lifecycle and hence avoiding costs of re-work or accepting concessions to requirements.

The Systems Assurance Process shall identify the manner in which the PB as the SDS provider will manage design activities on the project including the management of these activities by any subcontractors. Systems Assurance shall, as a minimum, address the following topics:

- Supplier Selection
- Reliability apportionment and modelling
- Design checking and calculations
- Interface Management
- Audit
- Performance modelling
- Reliability Analysis
- Maintainability Analysis
- Electromagnetic Compatibility

- Testing and Commissioning (Design Input)
- Reliability Improvement Plan (Design Input)

Each of these topics is covered in detail in the Verification and Validation Plan Doc Ref ULE90130-SW-SW-PPN-00005.

.For systems that are designed and developed by PB, as the SDS provider, the disciplines of verification and validation will be applied as a part of their design process.

For external contractors the verification and validation work will be managed through specifications, written by PB as the SDS provider and through contract management by the TSS Contractor. This contract management is outside the scope of PB as the SDS provider.

4.6 Health and Safety, Quality and Environmental

This Project Management Plan embraces fundamental considerations within the provision of the Edinburgh Tram Network. Three of these fundamental considerations are:

- Health and Safety
- Quality
- Environmental

The objective of the Edinburgh Tram Network Project is to build, equip and operate a new tram system that is safe, efficient, reliable and effective. The project Safety Management Plan (SMP) provides a fundamental part of the management system that ensures that a safe and reliable tram system will be built and operated. The structured Safety Management Plan Doc Ref ULE90130-SW-SW-PPN-00002 and Quality Management Plan ULE90130-SW-SW-PPN-00003 has been provided and supervised by the Health, Safety, & Quality Team.

4.7 Change Control

4.7.1 Purpose

This procedure defines the change control process to be applied to ensure that all **tie** contract changes are properly controlled.

Contracts that will apply to this procedure include:

- SDS Concession Agreement;
- Infraco Contract.

4.7.2 Responsibilities

The **tie** Project Director is responsible for issuing all Client Notice of Change, and Change Orders on behalf of **tie** and where appropriate issuing delegated authority to others to act on his behalf.

The PB Project Director is responsible for issuing and signing all Change Requests and Change Estimates on behalf of PB and where appropriate issuing delegated authority to others to act on his behalf.

The PB Project Manager (PB PM) is responsible for receiving and administering Client Notice of Change and Change Orders on behalf of the PB Project Director, or within the limits of his delegated project authority from PB in order to satisfy **tie** or PB requirements and project programme, whilst ensuring that all changes to the project are properly controlled in accordance with this, and other related procedures. The PB PM is responsible for reporting changes that affect other contracts, project resources, timescales and/or costs to **tie** and/or PB for action.

PB as the SDS provider will be responsible for submitting requested Change Estimates, within an agreed timescale, providing a description of the proposed design and/or work to be performed and confirming the impact on contract price and programme for it's execution. It is the sole responsibility of **tie** to accept/not accept the estimate and issue the Change Orders. Should **tie** accept the Change Estimate, **tie** will issue a Change Order to the Contract.

The Infraco Contractor, the Tram Manufacturer and the Operator will be separately responsible for submitting requested Change Estimates, within an agreed timescale, providing a description of the proposed design and/or work to be performed and confirming the impact on contract price and programme for it's execution. Should **tie** accept the Change Estimates and issue a Change Order to the contract, the contractor is responsible for implementing the works within the agreed cost and timescales to the standard of workmanship set out by the contract.

4.7.3 Process

Client changes shall be dealt with in accordance with Clause 15 of the Terms and Conditions of Agreement.

The SDS Change Control Process is a "bottom up" design team initiative and involves a progressive flow of information upwards through each SDS Section Design Manager (SDM). As each SDS designer highlights a potential design change, a pro-forma is raised and processed to the relevant SDM. The involvement is "bottom up" and will involve the relevant Designer, SDM, Design Manager, Project Controls Manager and Project Manager. Any potential change will be assessed by the SDM and delivered to SDS Project Controls Department which will progress the Change Request in accordance with Clause 15 of the Agreement. The ultimate Change Request will be signed by the Project Manager prior to delivery to **tie**.

The change is raised and controlled by the Project Control Manager in line with Fig 4.7.

A Change Request Form will be raised and will provide detail to enable the change to be costed and identify impact on programme and scope. The change will identify as a minimum the following;

- Impact on the SDS Contractual Obligation
- Impact on SDS Performance of Services
- Impact on the tie Master Programme and the SDS Design Programme
- Impact on the Agreement between tie and SDS
- Proposed Methodology of delivery of the relevant design

- Proposal to mitigate impact of the proposed change
- Identification of movement in the SDS Contract Sum

The Change will be reported on the Proforma Change Request Form. The Change Request Form will identify an individual SDS Change Request Number, which will be uploaded into the Change Register.

Any change notice proposed by **tie** and received by the SDS, will immediately be listed in the Change Register with its associated individual SDS Change Notice Number. The Project Controls Manager is responsible for managing the Change Register and the relevant inputs to the register. The register will be discussed at the weekly Change Controls Meeting with **tie**.

The Change Estimate will be delivered to **tie** and will receive review consideration from the **tie** Commercial Department. The Change Estimate will be evaluated and one of the following decision streams will be followed;

- The Change Estimate will be acceptable to **tie**. A Client Change Order will be issued within 30 days.
- The Change Estimate is not agreed by **tie**. Discussion will take place between **tie** and the SDS Project Control Team. SDS will be requested to resubmit a revised Change Estimate within 14 days.
- The Change Estimate is not agreed by **tie**. Discussion will take place between **tie** and the SDS Project Control Team. Disagreement remains and the Dispute/Resolution Process (Clause 28 of Agreement will be brought into operation).
- The Change Estimate is not agreed by **tie**. Discussion will take place between **tie** and the SDS Project Control Team. Agreement is made between the parties not to proceed further with the Change Notice.

For further process understanding please see Fig 4.7 below.

SDS Change Request/ Change Notice Flowchart

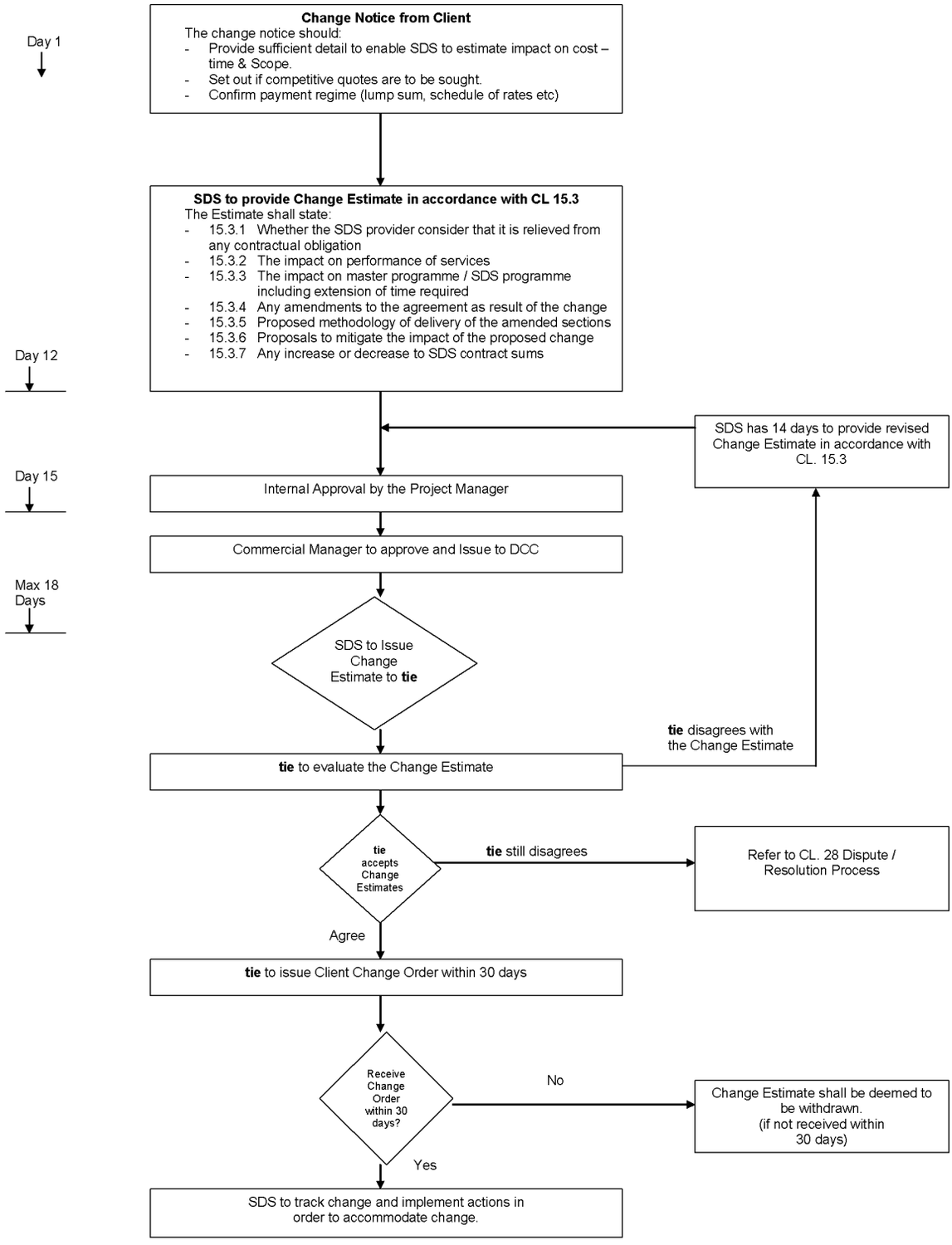


Fig. 4.7

4.8 Reporting

(Refer to Section 2.8)

5 DISPUTE RESOLUTION

5.1 Terms of Agreement

Clause 28 of the Terms of Agreement between **tie** and PB as the SDS provider identifies the Dispute Resolution Procedure to be followed for the resolution of any Dispute.

Any Dispute, shall, in the first instance, be referred to the Internal Resolution Procedure in accordance with Clause 28.10. of the Agreement.

In the event of any Dispute arising, **tie**, and PB as the SDS provider shall seek to resolve the Dispute at negotiation level and a meeting to be convened within three business days of written notification by either party to the other that it wishes to initiate the Internal Resolution Procedure in respect of any dispute.

Appendix A – SDS Organisation Chart