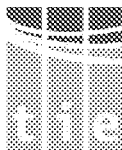


Edinburgh Tram Project

Design Management Plan

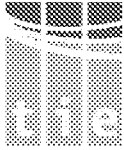


Issue & Revision Schedule

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1. Purpose

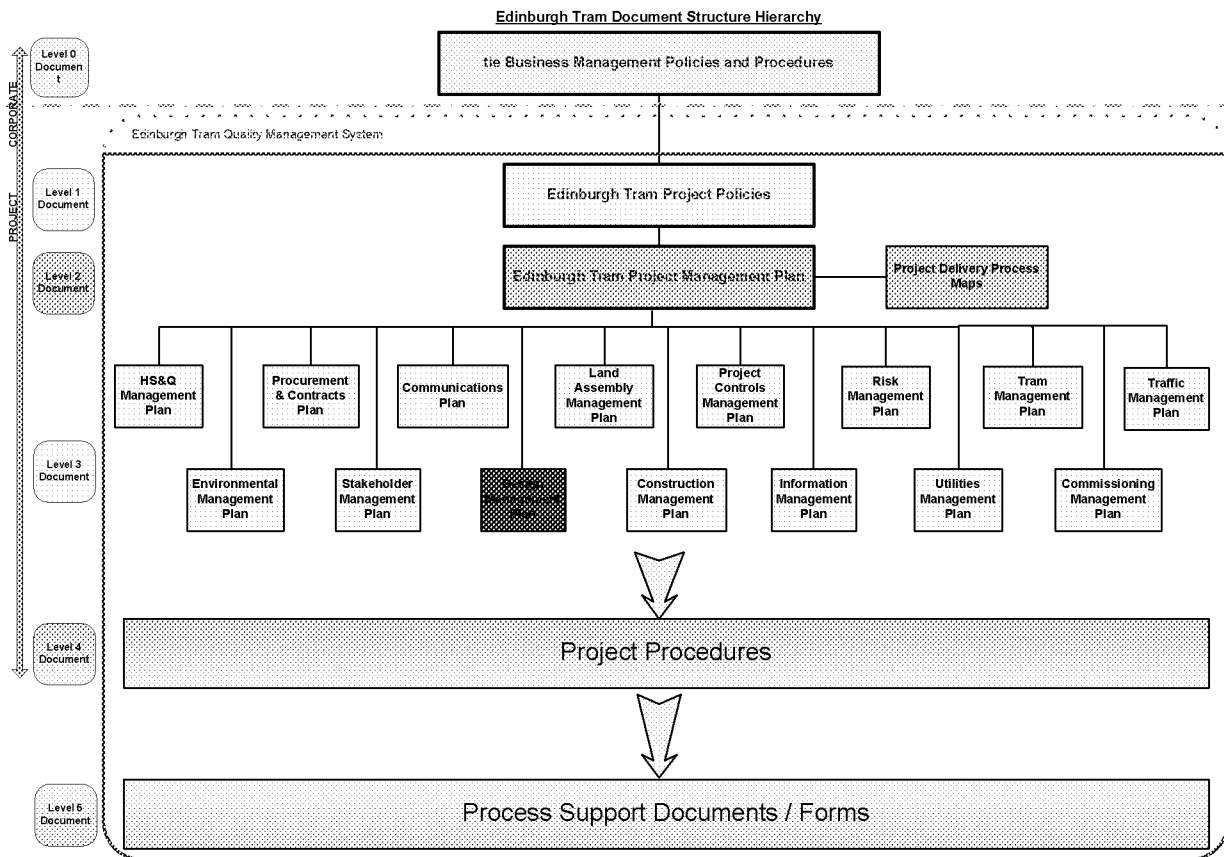
1.1. Plan Objectives

1.1.1. To provide the overall strategy for the detailed design of ETN and its subsequent review.

1.1.2. This plan will be reviewed regularly to ensure effectiveness.

1.2. Documentation Structure

1.2.1. The following chart highlights where the Design Management Plan sits in relation to the overarching Edinburgh Tram Project Management Plan and the various other work stream plans developed specifically for the Edinburgh Tram Project. The Design Management Plan is viewed as a Level 3 Document within the Hierarchy, whereby any associated procedures and support documents will be referenced within it.



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2. Overview

2.1. Detailed Design

- 2.1.1. Post-novation of the SDS Agreement, and the Tramco Agreement respectively, the complete Tram system detailed design, which is relevant for the Infraco scope of works, will be delivered by Infraco.
- 2.1.2. Infraco is the principal party in respect of design, with the SDS and Tramco contracts for design and build novated to them. In the notes below, where the term 'SDS/Infraco/Tramco' is used, it is intended to refer to a process managed by Infraco in respect of these novated arrangements.
- 2.1.3. The effectiveness of detailed design is critical to the success of ETN. It:
- allows the Infraco to construct and maintain the works within the constraints of the Infraco Agreement;
 - delivers a wide range of statutory and non-statutory approvals;
 - achieves system safety to the requirements of safety legislation via the ICP; and
 - provides a design which complies with the requirements of the Parliamentary Acts and within the constraints set out by Promoter.
- 2.1.4. Detailed design takes the preliminary design forward to achieve a series of deliverables, which are tailored to obtain consents and approvals and to provide all information required to allow the Infraco works to be constructed.
- 2.1.5. In addition to the design covered by SDS, certain design elements will be produced directly by Infraco. This also includes all necessary system integration activity, including integration of the tram vehicle into the system.
- 2.1.6. Through Infraco, Tramco will design the tram vehicle and any necessary activity to ensure that the vehicle can be integrated into the tram system, as defined by Infraco.
- 2.1.7. The overall detailed design comprises several hundred design elements. These will be grouped into no more than 20 design packages, for each of which tie will fully review their associated Design Assurance Statement. In addition, a number of these Design-Assured packages will be fully reviewed by tie's Design Review process.

2.2. Design Review Process

2.2.1. As required, designs will each be reviewed, for, or under:

2.2.1.1. **'Prior Approvals'** - a CEC planning approvals process, which is in lieu of a full council Planning Committee application for matters of public interest which require such approvals (as defined in the relevant Acts). Documents submitted for Prior Approval generally present outline design information that will require further development to detailed design standard after Planning Permission has been granted. **Prior Approvals** comprise:

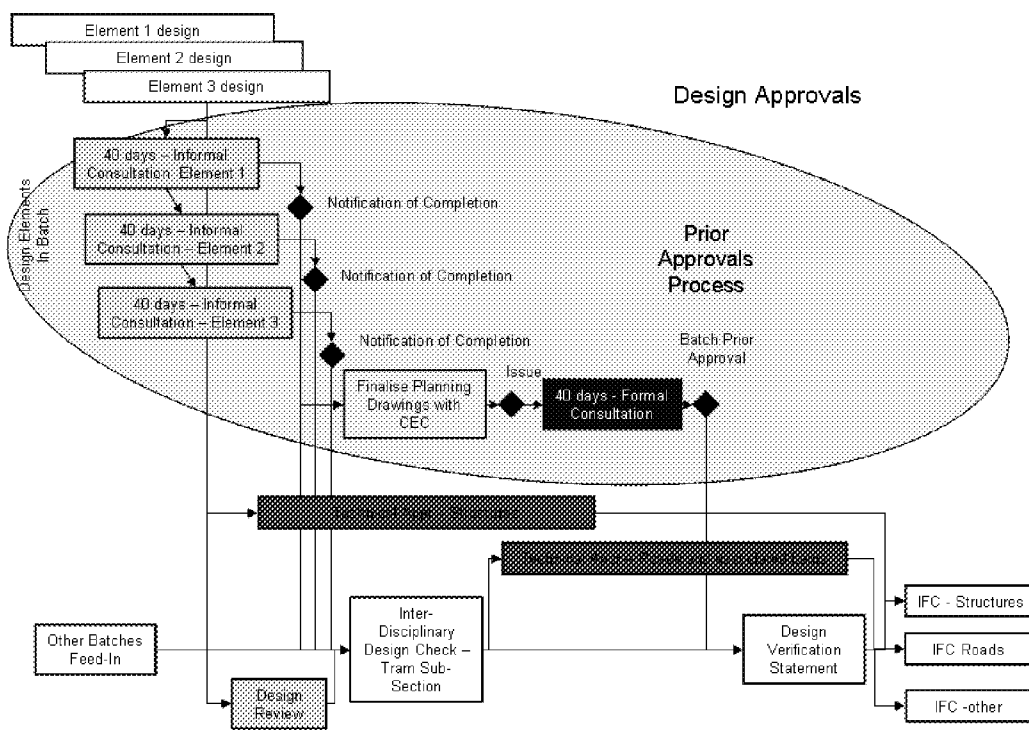
- An **Informal Consultation**: a period of consultation of 8 weeks duration with CEC Case Officers to allow a good understanding of design content and basis.
- The **Prior Approval** itself: an administrative process of 8 weeks duration carried out with the delegated authority of the CEC Planning Committee which provides formal planning consent to designs which require it. This element of the process causes designs to be made public following Informal Consultation. A protocol exists to deal with exceptions to this process which requires a full application to the Planning Committee

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2.2.1.2. **Technical Approvals** of the designs provide formal technical approvals for the various design elements by the relevant competent authority. Usually, these will be sought from CEC, in respect of their statutory authority role. However, others will also be needed from bodies such as the Scottish Environment Protection Agency, Scottish Natural Heritage and Transdev. Technical Approvals may include, as appropriate:

- **Approvals in Principle (AIP)** for structures in accordance with the requirements of CEC or Network Rail in their role as Technical Approval Authority. Documents submitted for AIP generally present outline design information that will require further development to detailed design standard after AIP has been granted.

2.2.1.3. A **tie-led Design Review** process, which includes stakeholders, whose purpose is to review selected design packages for the effective integration of design elements to create an operationally acceptable tram system.



2.2.2. The management arrangements and associated accountabilities are defined in Section 2.9, below.

2.3. Revision of design

2.3.1. It is possible that revision of some completed design elements may be required from time to time. This may occur, for example, because a Value Engineering opportunity is identified, **tie** issues a Change Order, or SDS/Infracore/Tramco issue a Change Request. For major changes, whatever the source of initiation of the change of design, the new design must undergo all necessary design processes to ensure IDC and overall compliance with requirements.

2.3.2. Minor design changes can be agreed between SDS/Infracore/Tramco and **tie** outside the formal design review process. Minor design changes are defined as those changes that do not affect the nature, scale and principal detailing of a design proposal.

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2.3.3. Typical examples for minor design changes are:

- Alternative rebar arrangements required to suit construction methods
- Adjustments to pipe / duct runs to avoid potential underground features
- Local adjustments to the positions of highway features such as re-positioning of signs to avoid clashes with underground services
- Correction of errors by the designer
- Clarifications on drawings, such as adding dimensions

2.3.4. It should be noted that the list of minor design changes above is not exhaustive. Through an appropriate process, as part of their management system, it is for SDS/Infraco/Tramco to make the case for each such change.

2.4. Submission of Designs

2.4.1. SDS/Infraco/Tramco will submit packages of design to **tie** electronically, to an agreed programme. Before this happens SDS/Infraco/Tramco will have been an integral part of a number of interfacing activities, whose purpose it is to inform detailed design such that it is most likely to be as expected at first submission. These interfacing activities include:

2.4.1.1. Tram Design Working Group, attended by **tie**, CEC, TEL, Transdev, SDS/Infraco/Tramco, Historic Scotland and Edinburgh World heritage Trust; its purpose being to discuss and resolve pre-application planning issues likely to be of particular interest to Historic Scotland and the Edinburgh World Heritage Trust;

2.4.1.2. Roads Design Working Group, attended by **tie**, CEC, TEL, Transdev, SDS/Infraco/Tramco; its purpose being to discuss and resolve detailed roads design issues where requirements conflicts exist;

2.4.1.3. Requests for Information – submitted by SDS/Infraco/Tramco to **tie** for answers to issues affecting the progression of detailed design; and

2.4.1.4. Changes – submitted by **tie** to SDS/Infraco/Tramco where ETN needs change, or submitted by SDS/Infraco/Tramco to **tie** where arising issues have caused a change to their contracted requirement.

2.5. Technical Approvals

2.5.1. Technical Approvals requirements will be defined by any or all of **tie**, CEC, Network Rail. Matters which require Technical Approval by CEC are defined by the Council's duties under the Roads (Scotland) Act 1984. These are primarily concerned with the structural integrity of the completed design and with roads design. It is CEC's practice to handle as much as possible within the roads Technical Approval so that roads construction consent, temporary traffic management and overall roads design approval are dealt with in a single submission. The systems design and tram vehicle are not subject to CEC Technical Approval; they are subject to design approval by **tie**.

2.6. Prior Approvals

2.6.1. 'Prior Approvals' requirements will be defined by CEC. Matters which require Prior Approvals are defined by Section 73 of the Edinburgh Tram Acts and Class 29 in Part 11 of Schedule 1 to the Town and Country Planning (General Permitted Development) (Scotland) Order 1992. These are mainly the structures, the overhead line equipment, lighting, tramstops and any buildings. The tram vehicle is not subject to Prior Approval.

2.7. Design Review

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- 2.7.1. The purpose of the **tie**-led Design Review process is to take selected packages of submitted design and review them for the fit of the design with stated requirements. It is primarily concerned with addressing the design as an effective integration of design elements to create an operational tram system which meets the requirements. In the event of a clash between offered design and stated requirements the review will include the taking of a decision as to the required outcome.
- 2.7.2. Issues which emerge comprise a Record of Review (RoR), co-ordinated by **tie** which then will be addressed by SDS/Infraco/Tramco and transferred into other similarly applicable designs.
- 2.7.3. For packages that **tie** chooses not to review, **tie** will send an acknowledgement of the receipt of the submission and the completion of the review stage to SDS/Infraco/Tramco in lieu of a RoR. This does not dilute the accountability of SDS/Infraco/Tramco for good-quality, fit-for-purpose design.
- 2.7.4. The overall permanent works design comprises several hundred design elements. Generally, SDS/Infraco/Tramco shall prepare Design Assurance Statements (DAS) for the combination of all design elements relevant for each geographic sub-section and submit these together with the design data for **tie** review. However, where the agreed Infraco programme requires certain design information to be approved and issued for construction prior to the DAS being available smaller design packages shall be acceptable to **tie**. These design packages will be defined to suit Infraco programme requirements as well as requirements of the design and approval process. They may contain groups or parts of design elements, as the case may be. At the completion of the design of the tram subsection the complete subsection DAS will be provided to **tie**.

2.8. Design Assurance Statement

- 2.8.1. Packages of design will be submitted to **tie** by SDS/Infraco/Tramco with an associated Design Assurance Statement, which will detail how the design complies with statutory, stated and best-practice requirements.
- 2.8.2. When packages of design have been submitted for review, the review will comprise examination of how each package demonstrates:
- How it meets the Employers Requirements
 - How it meets stakeholder requirements
 - How it meets the Approvals and Consents requirements (including CEC and other 3rd Parties)
 - How it closes issues raised in previous Records of Review
 - How it complies with engineering standards – or how it handles non-compliances (SDS to specify following initial review period)
 - How it meets the Verification and Validation requirements
 - How it mitigates hazards from the Hazard Log
 - How it meets the Detailed Design Case for Safety
 - How it meets the CDM requirements
 - How it is “Fit for Purpose”
 - How it meets the CEC Street’s Design manual
 - How it meets the CEC Tram Design Manual
 - How it meets requirements, comments or ROR issues raised at PD, TDWG or RDWG and by CEC at PD1
 - How it meets with run-time requirements
 - How it meets with RAMS definitions
- 2.8.3. Where sub-packages of design are submitted for review, whilst a full DAS may not be available, a written statement of conformance with the maximum possible inclusion of the main points above is required.

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2.9. Key Responsibilities

- 2.9.1. **tie's** Engineering Services Director is responsible for the overall management of this Plan, chairing the **tie**-led design reviews and ensuring that this Plan is effective and is complied with. He shall also be responsible for ensuring that tie assist Infraco during the design approval and consultation process. noting that final accountability for gaining approvals rests with Infraco.
- 2.9.2. SDS/Infraco/Tramco is responsible for detailed design and for management of the external approvals process to ensure successful approval of the design, first time. Infraco is the principal party in respect of design with the SDS and Tramco contracts for design and build novated to them. Where the term 'SDS/Infraco/Tramco' is used it is intended to refer to a process managed by Infraco in respect of these novated arrangements.
- 2.9.3. **CEC** is responsible for ensuring their compliance with timescales within this plan and for attendance at necessary meetings required during the process.
- 2.9.4. Stakeholders are responsible for appropriately resourcing the requirements of this Plan such that their needs are covered.

2.10. Definitions

- **CEC:** City of Edinburgh Council. Promoter of the Edinburgh Tram Network (ETN).
- **Stakeholder:** a party who has a stated requirement to be complied with.
- **SDS:** The Systems Design Services contractor – i.e. Parsons Brinckerhoff and its sub-contractors.
- **Infraco:** The appointed Infraco - i.e. BBS
- **Tramco:** The appointed Tramco - i.e. CAF
- **TSS:** The Technical Services and Support contractor – i.e. Scott Wilson and its sub-contractors.
- **ICP:** The Independent Competent Person, as defined in the ROGs regulations; a person independent of the project appointed by **tie** to signify his non-objection to the overall tram system's construction, operation and maintenance.

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3. Key Activities

3.1. Overview

3.1.1. The “RACI” Chart below details key tasks and their associated functional roles:

	Key Tasks	Functional Roles				
		Engineering Services Director	SDS/Infracore/Tramco	TSS	CEC. TEL, Transdev	HSQE Manager
Processes to inform detailed design	Set up meetings	A	R	CI	CI	CI
	Attend meetings and ensure appropriate people in attendance	A	R	C	C	C
	Prepare minutes of meetings	A	R	CI	CI	CI
	Raise RFIs and incorporate changes	A	R	CI	CI	C
	Respond to RFIs and raise changes	A R	C I	C I	C I	C
Detailed design	Raise issues for resolution	A	R	CI	CI	CI
	Incorporate all requirements	A	R	CI	CI	CI
	Verify design adequacy and quality	CI	AR	CI	CI	CI
	Prepare package delivery schedule	CI	AR	CI	CI	CI
	Prepare package verification detail	C	AR	C	C	C
Procedure Audit	Set up audit plan to cover this Design Management procedure	A	C	C	C	R
	Conduct audit and report results	A	CI	CI	CI	R
Design Review	Manage process	AR	CI	C	CI	CI
	Monitor programme	AR	CI	CI	CI	
	Compile management reports	A R	CI	CI	CI	CI

RACI is an acronym for:

- R = Responsible** – owns the delivery of the Activity
- A = to whom “R” is Accountable** – must sign-off (approve) the output of the Activities
- C = to be Consulted** – has information or capability to contribute to the activity
- I = to be Informed** – must be notified of results

3.2. Reporting

3.2.1. The Engineering Services Director will report 4 weekly to the Project Director.

3.3. Monitoring, Reviewing and Auditing

3.3.1. The Engineering Services Director shall regularly monitor the effectiveness of this Plan and shall formally review it at least once every three months.
The HSQE Manager shall audit compliance with this procedure to a schedule commensurate with the perceived risk.

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