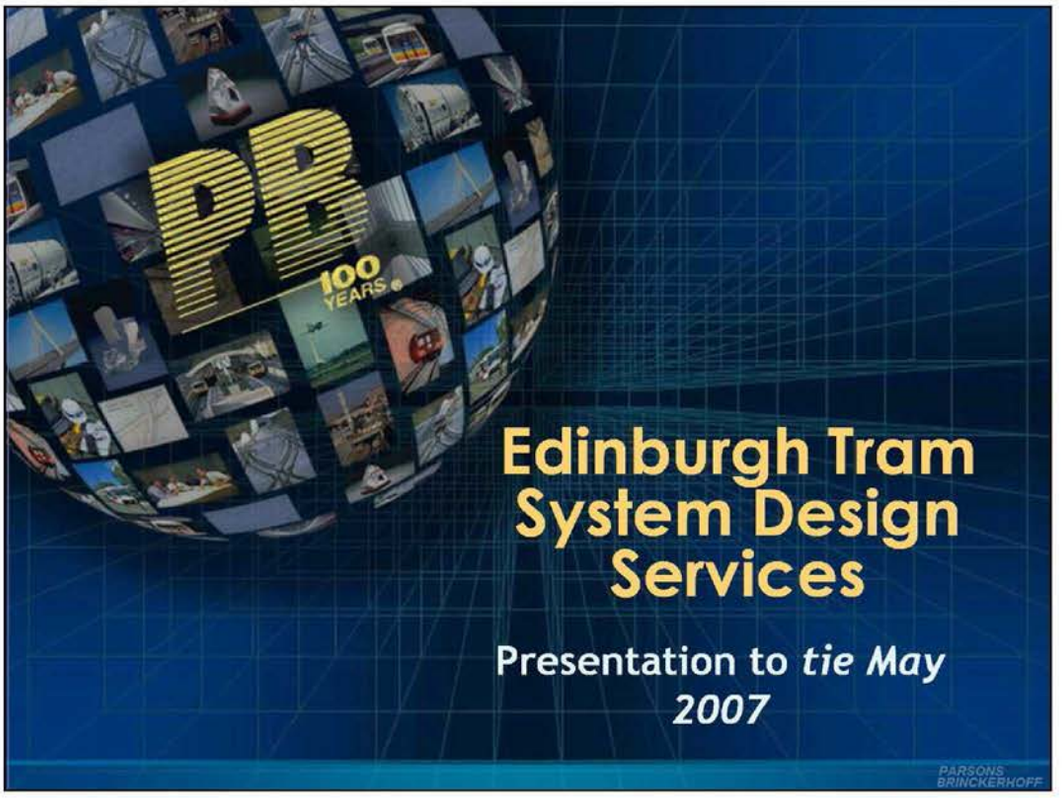

PB
100
YEARS
Edinburgh Tram
System Design
Services
Presentation to *tie May*
2007
PARSONS
BRINCKERHOFF

Summary

- PB Quality Management System
- Suppliers & Subcontractors
- Design Production
- Design Assurance and Approval

PARSONS BRINCKERHOFF

PB Quality Management System
The PB Quality Management System
Application to the SDS project
Monitoring & Audit regime
PARSONS BRINCKERHOFF

PB Quality Management System

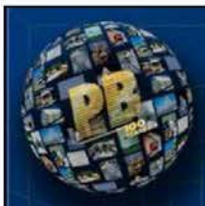
- The objectives of our quality program are:
  - *Right First Time*
  - *Robustness*
  - *Continuous Improvement*

PARSONS BRINCKERHOFF

PB Quality Management System

- Quality results begin with a common understanding of:
  - *Scope (what we're trying to achieve and the component parts of the delivery)*
  - *Execution plan (who, when, where, how)*
  - *The applicable standard (what is success and how do we know we've achieved it)*
  - *Legislative Requirements*
  - *Client inputs*
  - *3rd party inputs*

PARSONS BRINCKERHOFF



PB Quality Management System

The process and proposals for assurance of quality:

- are part of PB's standard offering,
- Tailored and adapted for the SDS project
- were included in our original submission to tie,
- Provides a Design Assurance Statement (DAS)

PARSONS BRINCKERHOFF

PB Quality Management System

PB's normal processes are based upon:

- documented generic and customised procedures and processes
- Focus on processes and procedures that "work"
- being managed in, monitored, audited and continually improved.

PARSONS BRINCKERHOFF

PB Quality Management System

PB procedures and processes exist at:

- Corporate level
- Business Unit level
- Edinburgh Tram SDS Project level

PARSONS BRINCKERHOFF

PB Quality Management System
Edinburgh Tram SDS Application Example
Implications For Projects
Business Manual & Policies
Satisfy Clients
PS-201
Corporate Procedures
Standard Methods
RAIL-ED-GEN05
Business Unit Procedures
Local Rules
Project Engineering Plans
Project (Quality) Plans
Project Specifics
PARSONS BRINCKERHOFF

ETN Quality Management System
Project Management Plan ULE 90130-SW-SW-PPN-00001
Safety Management Plan
Quality Management Plan
Verification & Validation
Configuration Management Plan
Risk Management Plan
Approvals & Consents Management Plan
Communications Plan
Environmental Management Plan
Stakeholder Management Plan
Discipline Engineering Plans
PARSONS BRINCKERHOFF

PB Quality Management System

- Change Control
  - *Project Change Control Procedure ULE 90130-SW-SW-PRE-00007*
    - Change Control Database
    - Right First Time
    - Robustness
    - Continuous Improvement

PARSONS BRINCKERHOFF

PB Quality Management System

Our management/monitoring & auditing regime includes:

- Communication
- Implementation
- Involvement
- Auditing

PARSONS BRINCKERHOFF

PB Quality Management System

- Monitoring & Audit regime
  - *Internal audit of design teams*
  - *System in place for tracking NCRs & CARs*
  - *PB Senior Management Team review*
  - *"local" management overview*
  - *audits of project office and regional design offices*
  - *Backed up by External (UL) audits of PB Quality Management System*
  - *Feedback and corrective action*
  - *Continual improvement*

PARSONS BRINCKERHOFF

PB Quality Management System

SDS Project Process examples

- Interdisciplinary Check (IDC) *ULE90130-SW-PRE-00005*
- *Intermediate Design Review (IDR) ule90130-SW-PRE-00034*
- *Discipline Engineering Plans,*
- *Outline Project Specifications*
- *Exemplar submissions*
- *Preparation of monthly reports*
- *Programme updates*
- *Document Control Procedure ULE 90130-SW-SW-PRE -00001*

PARSONS BRINCKERHOFF

PB Quality Management System
Vendors/Sub-contractor Assessments
- Approved Suppliers Database
- Pre qualification questionnaires
- Performance records
- Audits and inspections
- PB Corporate Procedure (CP 202)
PARSONS BRINCKERHOFF

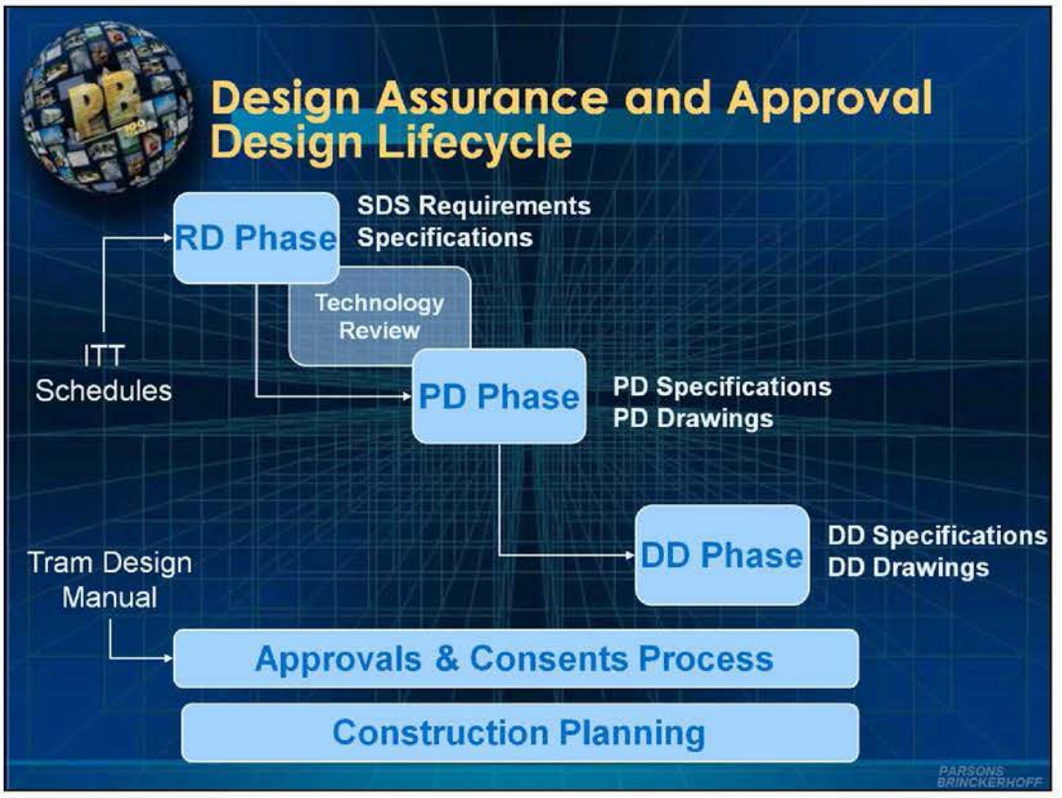
Design Assurance and Approval
Design Approval
Planning approvals
tie approval
CEC approval
PARSONS BRINCKERHOFF

Summary

- PB Quality Management System
- Suppliers & Subcontractors
- Design Production
- Design Assurance and Approval

PARSONS BRINCKERHOFF

Design Assurance and Approval
Design Lifecycle
IDR process
IDC process
System Detailed Design Review (SDDR) Process
Progressive Self Assurance
Planning Approvals
tie / CEC design Approval
3rd Party Approvals and Consents Tracker
PARSONS BRINCKERHOFF



Requirements management

Verification & Validation

Approvals & Consents

Design Assurance and Approval

- SDS Detail Design Phase Process
  - *Structured assurance evidence*
  - *Progressive self assurance*
  - *Assurance against the requirement specs*
  - *Assurance against relevant industry standards*
  - *Section Design approval*
  - *Overall Tram Network System design approval*
  - *Design Assurance Statement*
  - *Case for Safety*

PARSONS BRINCKERHOFF

Design Assurance and Approval

- Design Delivery and WBS
  - *Elemental submissions*
  - *Subsection Submissions*
  - *Section Submissions*
  - *Scheme wide submissions*

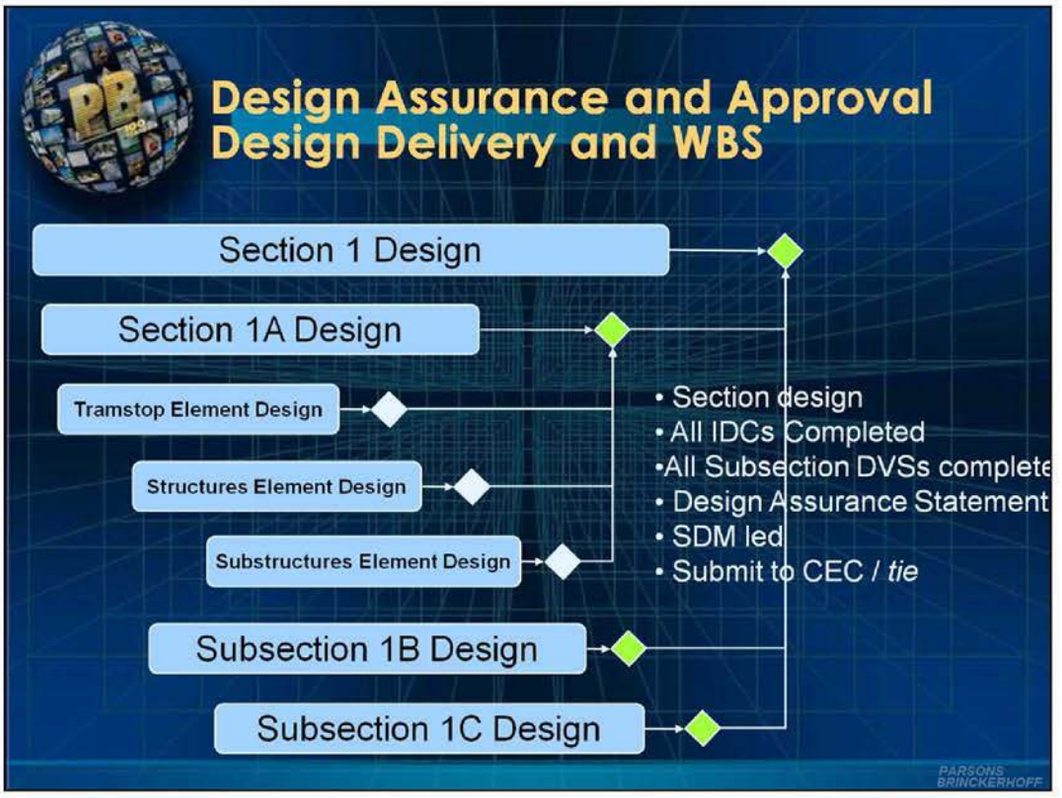
PARSONS BRINCKERHOFF

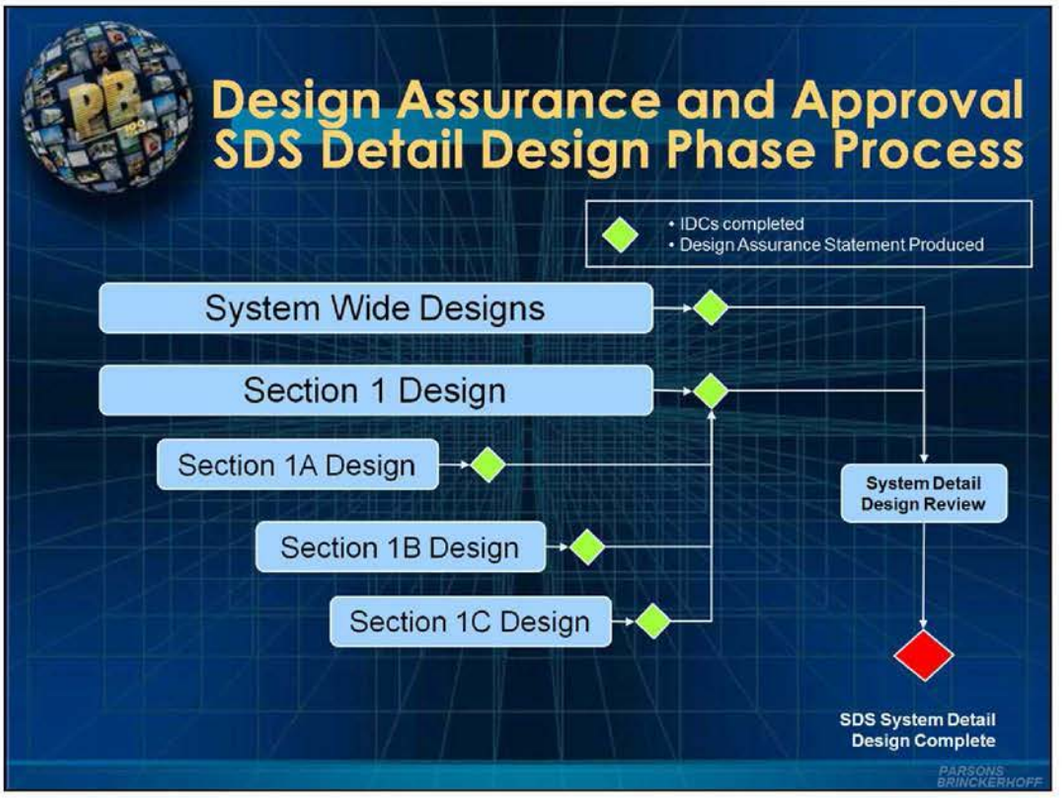
Design Assurance and Approval
Design Delivery and WBS
Section 1 Design
Subsection 1A Design
Subsection 1B Design
Subsection 1C Design
PARSONS
BRINCKERHOFF

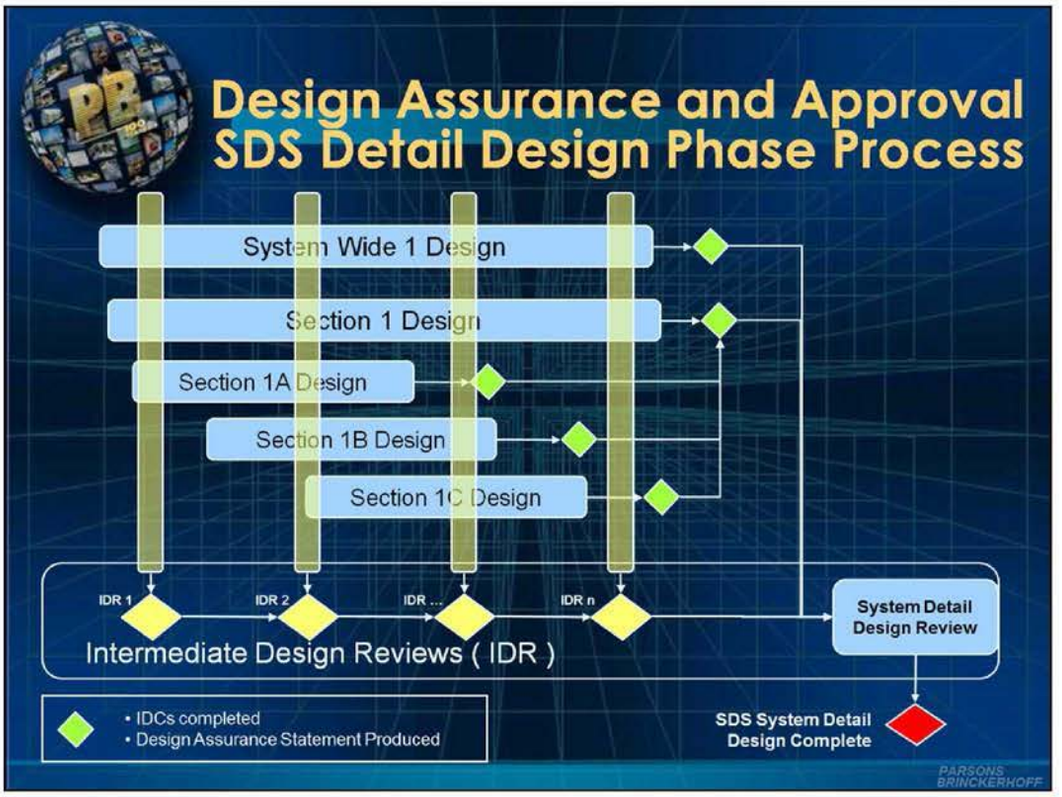
Design Assurance and Approval
Design Delivery and WBS
Section 1 Design
Section 1A Design
Tramstop Element Design
Structures Element Design
Substructures Element Design
Subsection 1B Design
Subsection 1C Design
PARSONS BRINCKERHOFF

Design Assurance and Approval
Design Delivery and WBS
Section 1 Design
Section 1A Design
Tramstop Element Design
Structures Element Design
Substructures Element Design
Subsection 1B Design
Subsection 1C Design
• Element Submissions
• Element IDCs Completed
• DTL Led
• Submit to CEC / *tie*
PARSONS BRINCKERHOFF

Design Assurance and Approval
Design Delivery and WBS
Section 1 Design
Section 1A Design
Tramstop Element Design
Structures Element Design
Substructures Element Design
Subsection 1B Design
Subsection 1C Design
• Subsection design
• All IDCs Completed
• Design Assurance Statement
• SDM led
• Submit to CEC / *tie*
PARSONS BRINCKERHOFF


Design Assurance and Approval
Design Delivery and WBS
Section 1 Design
Section 1A Design
Tramstop Element Design
Structures Element Design
Substructures Element Design
Subsection 1B Design
Subsection 1C Design
• Section design
• All IDCs Completed
•All Subsection DVSs complete
• Design Assurance Statement
• SDM led
• Submit to CEC / tie
PARSONS BRINCKERHOFF


Design Assurance and Approval
SDS Detail Design Phase Process
• IDCs completed
• Design Assurance Statement Produced
System Wide Designs
Section 1 Design
Section 1A Design
Section 1B Design
Section 1C Design
System Detail Design Review
SDS System Detail Design Complete
PARSONS BRINCKERHOFF


Design Assurance and Approval
SDS Detail Design Phase Process
System Wide 1 Design
Section 1 Design
Section 1A 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
PARSONS BRINCKERHOFF

Design Assurance and Approval
Key Assurance activities
Intermediate Design Reviews
Drawing reviews and sign off
Document reviews and sign off
Interdisciplinary Checks
Design Assurance Statements
System Detail Design Review
PARSONS BRINCKERHOFF

Design Assurance and Approval Trackers

- Approvals & Consents Tracker ULE90130-SW-SW-PPN-00007
- Design Issues Tracker
  - *ULE90130-SW-RRR-00005*
  - *ULE-90130-SW-SCH-00029*
  - *ULE90130-03-SCH-00002*

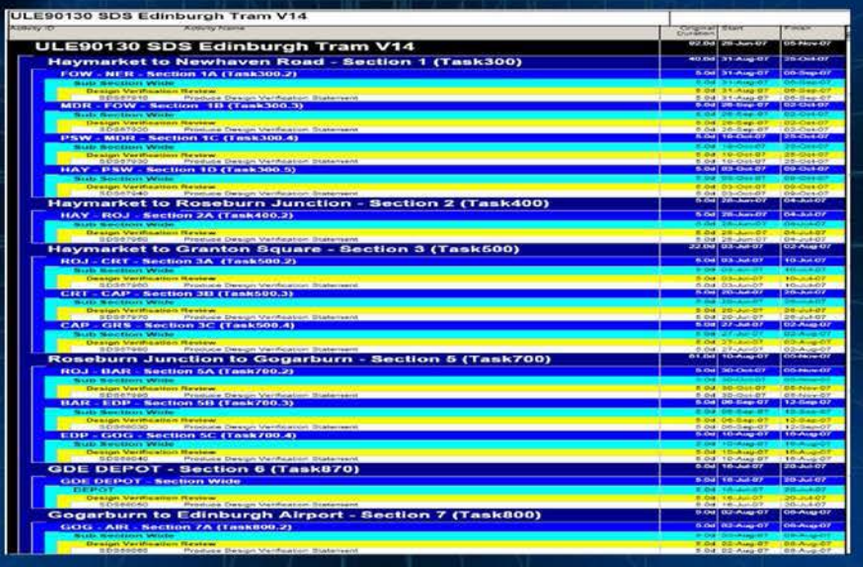
PARSONS BRINCKERHOFF

Design Assurance and Approval IDC Process

- Procedure ULE90130-SW-PRE-00005
- DTL ownership
- Completion of discipline design
- DTL confirms IDC review team
- Issue IDC formally through DMS
- Review period
- Notification of issues received from review team
- Meeting / conference call to review
- Amendment of design
- Re-issue
- Sign off IDC form, place in DMS.

PARSONS BRINCKERHOFF

DAS Submission Programme



DESIGN ASSURANCE STATEMENT PURPOSE
Provide a summary of the submission
Statement that design is fit for purpose
Exceptions are declared in an easily retrievable manner
Facilitates Review Process
Provides confidence of self assurance management
PARSONS BRINCKERHOFF

DAS Process

- Managed by SDM's
- Disseminated to DTL's et al for input
- Provided with each subsection design submission
- Where applicable references required for each statement
  - Drawing/document references
  - System Wide impact references
  - CDM information
- Exceptions/Deviations detailed in appropriate section of DAS
- References where risks/hazards remain open
- Guidance notes included
- Signed off by SDM, Design Manager and Project Manager

PARSONS BRINCKERHOFF

DAS Example

APPENDIX 1 - EDINBURGH TRAM NETWORK
DESIGN ASSURANCE STATEMENT

(For clarification refer to guidance notes attached)

a) SUBMISSION DETAILS / TITLE:
Section / Sub-Section to which this Certificate Relates: (7)
Date of Issue: (8)

b) Summary of Section / Sub-Section Submission: (9)

c) Submission Specific Design Documents: (10)

Have all Submission Specific Design Documents been reviewed, approved and under version control (in Hummingbird)?
Yes ☐ No ☐
Comments

d) Submission Specific Drawings: (11)

Have all Submission Specific Design Documents been reviewed, approved and under version control (in Hummingbird)?
Yes ☐ No ☐
Comments

e) Applicable System-Wide Drawings and Documents: (12)

Have all applicable System-Wide Drawings and Documents been reviewed, approved and under version control (in Hummingbird)?
Yes ☐ No ☐

PARSONS BRINCKERHOFF

DAS Completed Example

APPENDIX 1 - EDINBURGH TRAM NETWORK
DESIGN ASSURANCE STATEMENT

a) SUBMISSION DETAILS / TITLE: Sub-Section 5C design Assurance Statement v1

Section / Sub-Section to which this Certificate Relates: (7) 5C

Date of Issue: (8) 09th May 2007

b) Summary of Section / Sub-Section Submission: (9)

Section 5C is 1.9km long and runs from Edinburgh Park Stop (exclusive) to Gogarburn Stop (inclusive). The track is segregated through the Edinburgh Park Development area with one signalised Road crossing at Lochside Avenue. The track is then segregated, until another signalised roads crossing at South Gyle Broadway, heading towards the Gyle centre. The tram is segregated for the remainder of the section, running parallel to the Gyle shopping centre where there is a tram stop, before running underneath the A8 road. The tram route then branches off into the Depot (Section 6 – a separate submission) and Section 5C alignment continues west along a retaining structure and then at grade through existing farmland until it reaches the Gogarburn tram stop.

There are two tramstops in the section, Gyle and Gogarburn. There are no substations. There are two structures, Gyle Tramstop retaining wall (W19) and A8 Underpass (S28) in the subsection.

Drainage, Landscaping and Utilities design form part of this technical submission.

TRO - It is planned to produce a draft TRO for the whole LOD following completion of the PD2 design. This is a separate submission to this one.

TTRO - There are 2 TTROs one to cover the MUDFA works and a second to cover the INFRACO works, the MUDFA TTRO has been completed. This is a separate submission to this one.

c) Submission Specific Design Documents: (10)

Roads

- Section 5C (Edinburgh Park to Gogarburn) Roads Technical Design Statement – Detailed Design (ULE90130-05-REP-00201 V1). *[Issued to be 19 February 2007 in Transmittal No. ULE90130-SW-DTF-01425].*
- Roads Design Specification Department of Transport Manual of Contract Documents for Highways Works; Appendix 11/1; Kerbs, Footways, Cycleways, Laybys, Busbays and Paved Areas (ULE90130-SW-SPN-00097 V2). *[Issued to be 19 February 2007 in Transmittal No. ULE90130-SW-DTF-01425].*
- Roads Design Specification Department of Transport Manual of Contract Documents for Highways Works; Appendix 12/1; Traffic Signs: General (ULE90130-SW-SPN-00088 V2). *[Issued to be 19 February 2007 in Transmittal No. ULE90130-SW-DTF-01425].*
- Section 5C - Temporary Traffic Management Plan (ULE90130-SW-REP-00258 V1). *[Issued to be 9 October 2006 in Transmittal No. ULE90130-SW-DTF-00697].*
- Roads Safety Audit Brief – Stage 1 Sections 2, 3, 4, 5, 6 & 7 (ULE90130-SW-REP-00159). *[Issued to be 15 September 2006 in Transmittal No. ULE90130-SW-DTF-00772].*

Street Lighting

- Roads Design Specification Department of Transport Manual of Contract Documents for Highways Works; Appendix 14/1; Street Lighting (ULE90130-02-SCH-00002 V2). *[Issued to be 19 February 2007 in Transmittal No. ULE90130-SW-DTF-01425].*

Site Clearance

- Department of Transport Manual of Contract Documents for Highways Works; Appendix 2; Site Clearance (ULE90130-SW-SPN-00090 V3). *[Issued to be 13 March 2007 in Transmittal No. ULE90130-SW-DTF-01538].*

PARSONS BRINCKERHOFF

DAS Completed Example

g) Requirements Test Specification: Compliance of technical specification with Client needs/defined requirements (14)

Compliance of technical specification with Client needs/defined requirements. Are the relevant Requirements Test Specification entries populated with the required compliance entries?

Yes ☐ No ☒

Comments

The Requirements Test Specification will not be completed for this early submission as the demonstration of compliance against the requirements is an ongoing, progressive assurance that cannot be completed until all designs are completed. The Requirements Test Specification will be completed and submitted with the final design assurance statement.

h) Deviations and Non-Conformances including SDS requirements documentation: (15)

Detail relevant deviations' and non conformances

None identified to date

Have all Deviations and Non-Conformances been approved and logged?

Yes ☐ No ☐

N/A

Comments

i) Applicable IDC Forms: (16)

Track

- 'IDC - Track Section 5C Alignment Detailed Design'

Street Lighting

- 'IDC Form Section 5C Street Lighting'

[Note: Sub Section IDC for 5C will be complete for the 'real' submission]

Do all IDC Forms contain no issues and have been correctly signed off?

Yes ☐ No ☒

Track – No

Comments

Track - Recording of the resolution (or otherwise) of several IDC comments returned for the alignment design ('IDC - Track Section 5C Alignment Detailed Design') has not been completed on the IDC Form and its accompanying Document Review Report.

[Note: This will be completed for the formal Design Assurance Submission for Section 5C]

for discussion purposes only

PARSONS BRINCKERHOFF

Summary
PB Quality Management System
Suppliers & Subcontractors
Design Production
Design Assurance and Approval
PARSONS BRINCKERHOFF

PB
100
YEARS
Thank You
PARSONS
BRINCKERHOFF