

SCOPE OF WORKS

Project Management Requirements

Saloon Design

72TS (Bakerloo Line), 92TS (Central Line), 92TS (Waterloo and City Line)

Prepared by

Prepared by

Document History

Revision	Date	Summary of changes
Final Draft	28/06/16	
Issue 2	27/01/17	Updated for contract award

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1. Purpose of this Document

- 1.1 The purpose of this document is to identify management requirements applicable to the Saloon Design work package.
- 1.2 It should be read in conjunction with the Technical Requirements Specification (TRS) PVEC3131-TR-03-001(issue 3.0) which details the technical requirements and also provides more general background to the works.
- 1.3 Appendices – need to reference the appendices and their significance.

2. Background

- 2.1 A background and summary of the required design works is given in the TRS.

3. Communications

- 3.1. Contract communications shall be controlled by a suitable Contract Management tool such as A-Site. The Employer will ensure the consultant has the necessary access permissions.

4. Progress

- 4.1. The Consultant shall submit a brief weekly progress report detailing progress against the agreed programme and any risk to the project
- 4.2. The Programme must be updated to reflect any changes that affect the timing of the Works during the duration of the Works.
- 4.3. The Consultant will be required to attend Project Progress Meetings as necessary (allow a two weekly meeting from start of the contract).
- 4.4. A periodic (4 weekly) Contract Review will be held alongside every other Progress Meeting.
- 4.5. It is the Consultant's responsibility to take minutes of progress and contract review meetings and to submit these for approval.

5. Access to Vehicles

72TS

- 5.1. Vehicles will be made available to the Consultant for surveys at the Train Modification Unit (TMU) at Acton.
- 5.2. These vehicles are undergoing a series of safety modifications (72TS Weld Repair) and it will be necessary to plan visits so as not to interfere with these works. The 72TS Weld Repair production programme will be shared with the Consultant to ensure that reviews for information are efficiently planned between both teams.

- 5.3. The Consultant shall work with the project team to allow the correct amount of notice for obtaining all information required to enable it to meet the requirements of the TRS in line with the 72TS Weld Repair production programme.
- 5.4. A request for information process shall be used for making any enquiries to the Employer.
- 5.5. The Consultant shall also survey the LU installation facility to ensure the design is compatible.

92TS

- 5.6. Vehicles will be made available to the Consultant for surveys at either Ruislip Depot, Hainault depot or Acton works.
- 5.7. Limitations on access times and durations shall apply (e.g. visits may be restricted to between-peak hours). Notice periods and access duration shall be agreed with the Employer at the Project Start-Up meeting.
- 5.8. The Consultant shall be responsible for making all necessary enquiries and for obtaining all information required to enable it to meet the requirements of the TRS.
- 5.9. A request for information process shall be used for making any enquiries to the Employer.
- 5.10. The Consultant shall also review the proposed LU installation facility to ensure the design is compatible.

6. Design Acceptance

Requirements are covered by Section 12 of the TRS with the following additions:

6.1. Interface Meetings - Concept & Detailed Design

- 6.1.1. For the 'above waist rail' design aspects, the Employer shall hold Interface meetings which the Consultant must attend. Suppliers of the "supplied equipment" will also be present.
- 6.1.2. These meetings will provide clarification of the space envelope and interface requirements of the "supplied equipment".
- 6.1.3. This will also be an opportunity for the Consultant to request other information from the suppliers of the "supplied equipment".
- 6.1.4. The Consultant must make every effort to provide any information requested at these meetings.
- 6.1.5. Requests for information arising from the meetings shall be followed through by the Consultant within 10 working days.

6.1.6. The interface meetings shall be organised and minuted by the Employer.

6.2. Prototype Design

6.2.1. Upon completion of Prototype Design, sufficient information must be available for the Employer to commence the Tendering process for materials for full-fleet procurement.

6.3. Prototype Installation (General)

6.3.1. Only when components are fitted and proved functional will the Prototype design be deemed complete and signed off.

6.3.2. The Consultant must prove every element of their designs through a prototype installation between design reviews PDR and PPR in line with the TRS.

6.3.3. These prototypes will be constructed in line with the accepted Prototype designs.

6.3.4. It is the responsibility of The Consultants to procure all the materials for the prototype trial to sufficiently prove the design.

6.3.5. The Employer will reimburse The Consultant for prototype materials on a cost reimbursable basis.

6.3.6. The Consultant will develop the process instructions for the works.

6.3.7. The Employer will provide resource to carry out installation of the prototype components to the agreed process instructions under the direction of the Consultant.

6.3.8. The Consultant shall have a continuous site presence for the duration of the prototype works.

6.3.9. The Consultant shall fully document the Prototype Installation, and record all design and installation issues

6.3.10. The Consultant will update the process sheets in line with the changes that are developed and agreed during the prototype trial.

6.3.11. Any components that are to be left on the train post the prototype must be of an agreed material and specification with a supporting CRS before the train can return to service.

6.3.12. The Consultant must provide a minimum 8 week notice to LU of any deviation to the planned prototype date (in the consultant provided programme).

6.3.13. It is the responsibility of the Consultant to ensure that following the trial the train is fit to return to passenger service.

6.4. Prototype Installation (72TS)

- 6.4.1. Sufficient prototyping must be undertaken to ensure all variants are proven to the satisfaction of the Employer. This is expected to require a 3-Car unit for below waistrail works and a full 7-car train for the above waistrail works.
- 6.4.2. The prototype installation process must be capable of being integrated within the current 72TS Weld Repair production process and elements of the design may require prototyping on different trains.
- 6.4.3. The Consultant will have allotted times within the production process to incorporate the trial of their designs. These allotted times will be agreed in advance with the 72TS Weld Repair project team to ensure minimal risk to both work streams and may involve working unsociable hours.
- 6.4.4. There will be a maximum of 20 continuous days on any one car to carry out the prototype installation. However, multiple opportunities will be on offer to the Consultant to prove out the process and components as we move into the implementation phase.
- 6.4.5. The prototype components will be delivered to Acton works, AC15 stores with sufficient time to plan and coordinate the trial over a planned period of time.

Testing

- 6.4.6. Any static testing must be carried out within the appropriate timescales incorporated within the 72TS Weld Repair pre-departure test schedule and must have the appropriate supporting documentation.
- 6.4.7. Any dynamic testing must have the appropriate documentation raised and signed by the LU assurance team in advance of carrying out the installation so as not to delay the return of the train back into service.

6.5. Prototype Installation (92TS)

- 6.5.1. The number of units to be prototyped shall vary according to the design element:

Below Waist rail	– 1 unit (A-B unit).
Above Waist rail	– 4 units (1 train).
- 6.5.2. The Employer will provide access to units and facilities at an LU site for the purpose of the prototype installation.
- 6.5.3. The Employer shall provide an indicative programme for access.
- 6.5.4. Supplied resource will be up to 8 Technicians (8 x 40 hrs / wk) for a maximum 8 weeks.
- 6.5.5. Prototype components will be delivered to an LU site with sufficient time to plan and coordinate the prototype over a planned period of time.

Testing

6.5.6. Any static testing must be carried out within agreed timescales and must have the appropriate supporting documentation.

6.5.7. Any dynamic testing must have the appropriate documentation raised and signed by the LU assurance team in advance of carrying out the installation so as not to delay the return of the train back into service.

7. Production Readiness Stage

7.1. Consultant to procure all the materials for 1 train on the 92TS once the Production Readiness Review is completed.

7.2. The Employer will reimburse The Consultant for these materials on a cost reimbursable basis.

8. Support during fleet implementation

8.1. A call out agreement may be required during installation works and will be instructed by a separate instruction, anticipated duration up to:

72TS – 70 weeks

92TS – 200 weeks

9. Health and Safety

9.1. General requirements for Health & Safety are covered in “Contract Quality, Environmental, Safety and Health (QUENSH) conditions”.

9.2. The Consultant shall submit method statements, risk assessments, any site specific documentation and engineering documentation for approval to the Project prior to any works required on the train. These method statements/process instructions must contain sufficient detail of the proposed works.

9.3. All personnel to carry out the site work must possess appropriate certificates for working on the railway as required by the current statutory and LU regulations.

10. Safety Training

10.1. Each member of the Consultants staff required to undertake site visits will be required to successfully complete the following training before access to depots can be granted:

- Either LUCAS or Sentinel
- Passport to Depot and Area A for the relevant LU location
(**Note:** This is required for access to Stonebridge Park depot (72TS) and Hainault and Ruislip depots (92TS). This is not a requirement for Acton works)

- 10.2. The Consultant shall be solely responsible for ensuring all staff are suitably trained. The LUL training requirements are set out in LUL's Rule Book.
- 10.3. The Employer will meet the initial cost of LU specific training courses for the Consultants staff. The cost of consultant staff attendance will be borne by the consultant.
- 10.4. The Consultant shall reimburse the Employer the sum of £1500 per delegate for any course booked on behalf of the consultant by the Employer for which the delegate does not attend.
- 10.5. Any staff changes resulting in additional training requirements shall be entirely at the Consultants expense.
- 10.6. The Consultant shall maintain a central record of safety training and certificates carried by all site staff. This record shall be available for inspection by the Project Manager or any other authorised person

11. Access / Resources

- 11.1. The Consultant is required to provide a minimum of 2 weeks notice to LU Project Team to access a car in a Depot for any non-intrusive survey.
- 11.2. The logistics for materials deliveries, storage and removal will need to be agreed in detail with LU and undertaken by the Consultant.
- 11.3. Any items and tools left on site at the Consultants risk.
- 11.4. The access routes to the work locations shall be agreed with the LU Project Team and Landlord of the premises.
- 11.5. The Consultant shall be responsible for ensuring that they have the correct resources present on Site to supervise the Works
- 11.6. The Consultant shall allow for keeping the access routes clear of obstruction by plant, materials, rubbish etc. and for making good any damage to the satisfaction of the Employer.
- 11.7. The Consultant will not prevent the working/operations by their delivery of goods, plant, machines unless agreed with London Underground. All vehicles will require permission to park before work commence on site.

12. Site Working for Prototype

Safe System of Work

- 12.1. An approved safe system of work is required by the Consultant before any work can commence on site. The consultant has the responsibility to ensure the safe system of work is approved by London Underground.
- 12.2. No plant, materials or rubbish is to be stored on the premises without the prior approval of the Employer and the Consultant obtaining an appropriate valid storage licence from the appropriate Facilities Manager and LU Project Team.
- 12.3. On vacation of the Site(s) the Consultant shall ensure that the area made available to them is clear of all surplus material, spoil, rubbish etc. and reinstate the areas to the condition existing before occupation unless otherwise directed or specified.
- 12.4. Ensure no section of the Works are covered, concealed or insulated until completion and witnessed by LU Project Team.

Precautions against Nuisance

- 12.5. Cleanliness - The Consultant shall ensure that all work areas are at all times clear of debris arising out of their operations.
- 12.6. Damage to Railway - The Consultant shall be held responsible for any damage that they cause to the train and any other property in the vicinity of the Works. Permanent repair or replacement shall be carried out at the direction of the Employer at the cost of the Consultant.

Appendix 5

Risk Management and Register

RISK MANAGEMENT & REGISTER

1.1. General

The Employer's Risk Management Policy recognises that managing risk is critical to the successful delivery of the project, and a programme wide risk management framework has been implemented to enable effective and efficient risk management.

The Consultant shall carry out their own risk management activities in accordance with their Risk Management Plan to meet the requirements of this part of the Scope of Works.

The Consultant shall provide assurance to the Project Manager that the risks associated with the works and in providing the works are fully recognised, understood and effectively controlled by involving the Project Manager in the review and management of the risks and the implementation of the Risk Management Plan.

The Project Manager will hold *Quarterly* joint reviews with the Consultant to review the project risk register, and the risks owned by the Consultant. The Project Manager may also instruct ad-hoc risk reviews that require the attendance of the Consultant

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

1.1.1. Risk Management Objectives

The Employer's Risk Management Framework aims to ensure that:

- Project risks associated with the work are identified, assessed and managed by the appropriate people in a consistent and cost-effective way;
- Assurance is provided to the Consultant, the Project Manager, the Employer and other stakeholders (industry partners, insurers, etc.), through the timely provision of appropriate and reliable risk information; and
- The Consultant is fully aligned with and demonstrably meets the requirements of the Employer's risk management framework.

1.2. Risk Management Plan

Within 4 weeks of the contract award date, the Consultant shall produce a Risk Management Plan and submit it to the Project Manager for acceptance. In the case of the first submission of the Risk Management Plan the Project Manager will reply within 4 weeks of the date of submission. Any further revisions, submissions and responses shall be made within the period for reply.

The Risk Management Plan will describe how the Consultant will meet the requirements of this part of the Works Information. The Risk Management Plan may

include existing corporate procedures, plans or other documents provided that these meet legal requirements and the requirements of this contract.

1.3. Risk Management Requirements

General

The Consultant shall describe the activities that they will undertake to manage risk associated with delivering the contract in a procedure or other appropriate document. This document will be subject to acceptance by the Project Manager. The Risk Management Plan submitted as part of the Consultant's proposal may be accepted to fulfil this requirement.

Accountabilities and Responsibilities

The Consultant shall:

- Define clear accountability for the management of risk within the Consultant's organisation and for the maintenance of the risk management process.
- Ensure that risk management is carried out fully within their teams and that key staff have an appropriate level of competency and training in risk management.
- Make available adequate competent specialist resource to ensure that risk management obligations are met.

Deliverables

The risk management process will produce the following deliverables:

- A procedure describing the activities required to manage risk associated with delivering the contract.
- A log of significant risks – the Consultant Risk Log – to be used for discussion with the Project Manager. The Consultant Risk Log will reflect those risks inherent in the contract that the Consultant considers are material to the contract objectives, and which are necessary to provide assurance to the Project Manager that the key risks are being appropriately managed. This will form the basis of meetings with the Consultant and Project Manager to jointly review the risks.
- A report of the key risks (including any new emerging risks) and risk management actions based on the Consultant's Risk Log, and presented at the Project Progress Meeting every 4 weeks in a format accepted by the Project Manager.

- Comprehensive records to demonstrate the application of continuous risk management practices (e.g. records of meetings, approvals).
- Other reports, KPIs and measures as required ensuring the effective management of the process
- Governance

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

Quantified Risk Assessment

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

Communication

The Consultant shall make the Project Manager aware of any significant changes to existing risk information including scoring, new emerging risks, status, etc.

Systems

The Employer has implemented ARM (Active Risk Manager) as their Programme wide risk management system.

It is understood by the Employer that such systems are very costly and does not expect the Consultant to implement ARM for this project. Please provide a solution within 4 weeks of the contract award date to the Project Manager for acceptance to maintain and manage your risks.

Risk ID	Stock	Risk Title	Description	Cause	Effect	Mitigation Action
001	All	A suitable facility is not available to undertake prototyping works when required	There is a risk that a suitable facility is not available to undertake prototyping works when required	<ol style="list-style-type: none"> 1. Enabling works are prohibitively expensive (if facility requires modifying) 2. Demands of other LU projects 	<ol style="list-style-type: none"> 1. Redesign of prototype is required to allow use of existing facilities 2. Prototype has to be completed at an external premises 3. Delay to commencement of prototyping 4. Increased costs to undertake enabling works 	Proactive coordination with programme level investigation
002	All	Time delay in procuring materials, plant and tools (prototype)	There is a risk to procuring the materials, plant and tools to undertake prototyping works when required	<ol style="list-style-type: none"> 1. Excessive procurement lead times 2. Governance requirements 3. Fabrication times 4. Delayed design 5. Unclear process of who is ordering materials 	<ol style="list-style-type: none"> 1. Delay to commencement of prototyping 	Early agreement of specifications
003	All	TMU resources availability for prototyping	There is a risk that TMU will not be able to supply the resources required for the prototyping works when required	<ol style="list-style-type: none"> 1. High demand on TMU staff 2. Training and retention of staff 3. Required skills and competencies 	<ol style="list-style-type: none"> 1. Project prolongation 2. Use of external / other labour source 3. Costs greater than expected 4. Poor quality of works 5. Delay to start of prototyping 	<p>Early market engagement</p> <p>Ensure requirement is registered with TMU.</p> <p>Schedule alignment with TMU resources as they demobilise on other LU projects</p>
004	All	Train availability - Sufficient Notice	There is a risk of not being able to access a train when required - sufficient notice (surveys, prototyping)	<ol style="list-style-type: none"> 1. Priority of service over project 2. Other essential maintenance works 3. Other project requirements for access to trains 	<ol style="list-style-type: none"> 1. Delay to design 2. Abortive works leading to incorrect assumptions being made 3. Delay to start of prototyping 	<p>Ensure requirement is registered with, and understood by Fleet.</p> <p>Ensure requirement is registered with, and understood by TMU.</p>

005	All	Train availability - Short Notice	There is a risk of not being able to access a train when required - short notice (surveys, prototyping)	<ol style="list-style-type: none"> 1. Priority of service over project 2. Other essential maintenance works 3. Other project requirements for access to trains <ol style="list-style-type: none"> 1. Delays in obtaining design approval - CDS etc. 2. LU engineering resources 3. Poor quality submissions 	<ol style="list-style-type: none"> 1. Delay to design 2. Abortive works leading to incorrect assumptions being made 3. Delay to start of prototyping <ol style="list-style-type: none"> 1. Additional cost and time if there are changes in the methodology 2. Documents not fully approved whilst work is undertaken 	<p>Plan prototyping to interface with TMU production works to reduce impact.</p> <p>Divert resources where applicable and able</p> <p>Consultation with stakeholders</p> <p>Resource planning aligned with review process</p> <p>Interim design review</p> <p>Ensure flexibility within Design to accommodate minor variations.</p> <p>Survey multiple trains</p> <p>72TS Specific - 72TS weld repair project - information sharing on train</p> <p>Fallback during prototyping - Rollback train and request another train</p>
006	All	LU design assurance and approvals	There is a risk that the assurance and approvals process takes longer than expected			
007	All	Asset information variation	There is a risk that the rolling stock does not align / varies from documentation / drawings	<ol style="list-style-type: none"> 1. Age of fleet and infrastructure 2. Un-documented modifications 3. Minimal surveys 4. Known variance in build 	<ol style="list-style-type: none"> 1. Re-design 2. Scope increase 	
008	All	Project identifies repairs on top of those anticipated	There is a risk that the project identifies repairs on top of those anticipated	<ol style="list-style-type: none"> 1. Age of fleet and infrastructure 2. Minimal surveys / unable to undertake intrusive surveys 3. "pattern" of floor corrosion (cracks rather than holes etc.) is different / more severe from what is expected 	<ol style="list-style-type: none"> 1. Additional time is required to incorporate works required into the design / or design rework 2. A second prototype may be required - 1st train not suitable 3. Increase of costs and prolongation for labour and materials to undertake extra works 4. Prolonged prototyping 	

					leading to impact on service 5. Further design works during implementation	Initial survey to clarify train condition is suitable for prototyping
009	All	Specialist design resources required at short notice during implementation	There is a risk that the specialist design resource that undertook the final design is required again during implementation in the event of unforeseen issues that emerge which require immediate attention	1. Unforeseen issues 2. Design resources only providing direct support for limited timeframe	1. Time impact to get external resources at short notice 2. Project delay 3. Availability of external supplier at short notice	1. Works halted 2. Scope increase 3. Changes to working methods
010	All	Hazardous material	There is a risk of finding unknown hazardous / contaminated material (asbestos, lead etc.)	1. Age of assets 2. Lack of surveys 3. Incorrect documentation / drawings	Call off framework suppliers for identification of hazardous material	Competent in-house HAZMAT team to lead process Well establish local process throughout LU on asbestos awareness and protocols to follow on potential identification
011	All	Test results fail during prototyping	There is a risk that testing results fail during prototyping	1. System integration issues 2. Faulty equipment	1. Re-work including re-design 2. Delay. 3. Additional testing 4. Additional costs if LU liable	Location of hazardous material on LU train stocks well known Design management process to be put in place before installation on unit, which includes robust and bench testing. Ensure design is capable of tolerating variance.

Appendix 6
Activity Schedule

Activity Schedule - 92TS Saloon Design

Activity Description	Activity Location	Evidence Supporting Activity Attained	% Amount	Completion Date
Specification Design (SDR) Approval	Below waistrail	The Employer's approval of the Specification Design in accordance with the Agreement including Section 12.3 of the Technical Requirement Specification.	5%	14/04/2017
Specification Design (SDR) Approval	Above waistrail	The Employer's approval of the Specification Design in accordance with the Agreement including Section 12.3 of the Technical Requirement Specification.	5%	23/06/2017
Concept Design (CDR) Approval	Below waistrail	The Employer's approval of the Concept Design in accordance with the Agreement including Section 12.4 of the Technical Requirement Specification.	5%	16/06/2017
Concept Design (CDR) Approval	Above waistrail	The Employer's approval of the Concept Design in accordance with the Agreement including Section 12.4 of the Technical Requirement Specification.	5%	08/05/2018
Detailed Design (DDR) Approval	Below waistrail	The Employer's approval of the Detailed Design in accordance with the Agreement including Section 12.5 of the Technical Requirement Specification.	10%	15/09/2017
Detailed Design (DDR) Approval	Above waistrail	The Employer's approval of the Detailed Design in accordance with the Agreement including Section 12.5 of the Technical Requirement Specification.	10%	19/06/2018
Prototype Design (PDR) Approval	Below waistrail	The Employer's approval of the Prototype Design in accordance with the Agreement including Section 12.6 of the Technical Requirement Specification.	10%	16/02/2018
Prototype Design (PDR) Approval	Above waistrail	The Employer's approval of the Prototype Design in accordance with the Agreement including Section 12.6 of the Technical Requirement Specification.	10%	19/06/2018
Prototype and testing completed	Below waistrail	The Employer's approval of the Prototype (supply goods) in accordance with the Agreement including Section 4.4 of the Technical Requirement Specification.	5%	08/06/2018
Prototype and testing completed	Above waistrail	The Employer's approval of the Prototype (supply goods) in accordance with the Agreement including Section 4.4 of the Technical Requirement Specification.	5%	30/10/2018
Post-Prototype (PPR) Approval	Below waistrail	The Employer's approval of the Post-Prototype Design in accordance with the Agreement including Section 12.7 of the Technical Requirement Specification.	5%	10/08/2018
Post-Prototype (PPR) Approval	Above waistrail	The Employer's approval of the Post-Prototype Design in accordance with the Agreement including Section 12.7 of the Technical Requirement Specification.	5%	11/12/2018
Production Readiness (PRR) Approval	Below waistrail	The Employer's approval of the Production Readiness Design in accordance with the Agreement including Section 12.8 of the Technical Requirement Specification.	5%	28/09/2018
Production Readiness (PRR) Approval	Above waistrail	The Employer's approval of the Production Readiness Design in accordance with the Agreement including Section 12.8 of the Technical Requirement Specification.	5%	22/01/2019
Implementation and Deliverables Closeout Approval	Below waistrail	The Employer's approval of the Implementation and Deliverables Closeout in accordance with the Agreement including Section 11.9 of the Technical Requirement Specification.	5%	14/12/2018
Implementation and Deliverables Closeout Approval	Above waistrail	The Employer's approval of the Implementation and Deliverables Closeout in accordance with the Agreement including Section 11.9 of the Technical Requirement Specification.	5%	09/04/2019

Appendix 7
Programme

RVAR 72TS / 92TS Design Plan R05 A (with new data date)

Activity ID	Activity Name	Remaining Duration	Start	Finish	2017												2018												2019					
					Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
RVAR 72TS / 92TS Design Plan R05 A (with new data date)		542	30-Jan-17	09-Apr-19																														
Contract Award & Mobilisation		15	30-Jan-17	17-Feb-17																														
A1000	Contract Award	0	30-Jan-17		◆ Contract Award																													
A1140	Mobilisation - 72TS & 92TS Below / 72TS Above	10	30-Jan-17	10-Feb-17	■ Mobilisation - 72TS & 92TS Below / 72TS Above																													
A1120	Vehicle Surveys	5	10-Feb-17	17-Feb-17	■ Vehicle Surveys																													
Management		521	30-Jan-17	11-Mar-19																														
A2710	Project Management	521	30-Jan-17	11-Mar-19	■ Project Management																													
A2740	Design Management	521	30-Jan-17	11-Mar-19	■ Design Management																													
A2750	Project Engineering	521	30-Jan-17	11-Mar-19	■ Project Engineering																													
Supplier Information - CDR Above Wastrail		90	27-Sep-17	14-Feb-18																														
A12960	PIS Information available	0	27-Sep-17*		◆ PIS Information available																													
A12970	CCTV Information available	0	14-Feb-18*		◆ CCTV Information available																													
Supplier Information - Other		389	06-Feb-17	31-Aug-18																														
A13770	Train available at Depot for Lighting Test	0	06-Feb-17*		◆ Train available at Depot for Lighting Test																													
A13560	Flooring System Supplier Contracted	0	18-May-17*		◆ Flooring System Supplier Contracted																													
A13570	PIS Supplier Materials Available	0	12-Mar-18*		◆ PIS Supplier Materials Available																													
A13580	CCTV Supplier Materials Available	0	24-May-18*		◆ CCTV Supplier Materials Available																													
A13820	LED Supplier Materials Available	0	31-Aug-18*		◆ LED Supplier Materials Available																													
Front-End Design Activities		45	17-Feb-17	28-Apr-17																														
A1220	Produce Base CAD Model	30	17-Feb-17	31-Mar-17	■ Produce Base CAD Model																													
A1240	Produce KE Report	30	17-Feb-17	31-Mar-17	■ Produce KE Report																													
A1150	Stage 1 - Option 1 & 2 Concepts	15	17-Feb-17	10-Mar-17	■ Stage 1 - Option 1 & 2 Concepts																													
A1160	Stage 2 - Option 1 Level of Compliance	15	10-Mar-17	31-Mar-17	■ Stage 2 - Option 1 Level of Compliance																													
A1170	Stage 3 - Option 2 Level of Compliance	15	10-Mar-17	31-Mar-17	■ Stage 3 - Option 2 Level of Compliance																													
A1180	Stage 4 - Feasibility Report	15	31-Mar-17	28-Apr-17	■ Stage 4 - Feasibility Report																													
72TS Below Wastrail		310	17-Feb-17	25-May-18																														
SDR		40	17-Feb-17	14-Apr-17																														
SDR Assurance		13	17-Feb-17	08-Mar-17																														
A1010	SDR Assurance Reports & Plans produced for review	13	17-Feb-17	08-Mar-17	■ SDR Assurance Reports & Plans produced for review																													
SDR Engineering Specification		15	17-Feb-17	10-Mar-17																														
A1100	PEA Design Pack	15	17-Feb-17	10-Mar-17	■ PEA Design Pack																													
A1110	Handrail Design Pack	15	17-Feb-17	10-Mar-17	■ Handrail Design Pack																													
A1130	Wheelchair Design Pack	15	17-Feb-17	10-Mar-17	■ Wheelchair Design Pack																													
SDR Stagegate		25	10-Mar-17	14-Apr-17																														
A1440	Internally Review & Agree Submission Pack	5	10-Mar-17	17-Mar-17	■ Internally Review & Agree Submission Pack																													
A1470	Submit to LU	0	17-Mar-17		◆ Submit to LU																													
A1480	LU Review Period	10	17-Mar-17	31-Mar-17	■ LU Review Period																													
A1510	SDR Design Review	0		31-Mar-17	◆ SDR Design Review																													
A1530	Minutes from Review produced & circulated	10	31-Mar-17	14-Apr-17	■ Minutes from Review produced & circulated																													
CDR		50	31-Mar-17	16-Jun-17																														
CDR Assurance		8	31-Mar-17	12-Apr-17																														
A2440	CDR Assurance Reports & Plans produced for review	8	31-Mar-17	12-Apr-17	■ CDR Assurance Reports & Plans produced for review																													
CDR Engineering Specification		25	31-Mar-17	12-May-17																														
A2490	PEA Design Pack	25	31-Mar-17	12-May-17	■ PEA Design Pack																													
A12440	Handrail Design Pack	10	31-Mar-17	14-Apr-17	■ Handrail Design Pack																													
A12450	Wheelchair Design Pack	25	31-Mar-17	12-May-17	■ Wheelchair Design Pack																													
CDR Stagegate		25	12-May-17	16-Jun-17																														
A1520	Internally Review & Agree Submission Pack	5	12-May-17	19-May-17	■ Internally Review & Agree Submission Pack																													
A1540	Submit to LU	0	19-May-17		◆ Submit to LU																													
A1560	LU Review Period	10	19-May-17	02-Jun-17	■ LU Review Period																													

■ Remaining Level of Effort
 ■ Actual Level of Effort
 ■ Actual Work
 ■ Remaining Work
 ■ Critical Remaining Work
 ◆ Milestone
 — Project Baseline Bar

