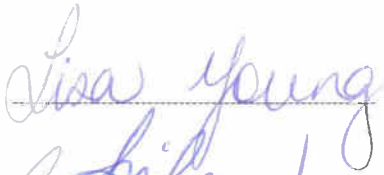
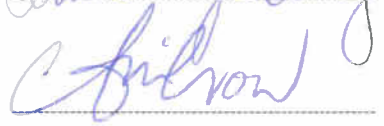



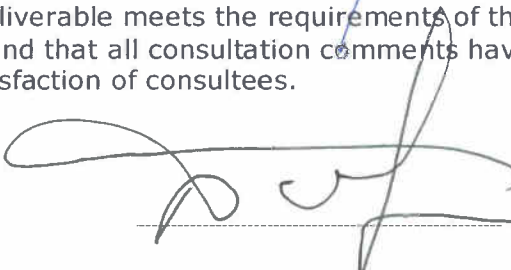


## Earls Court Development Facilitation

### Lillie Bridge Depot Stabling and Associated Works

### Requirements Statement

		Signature	Date
Prepared by	Lisa Young Sponsor		14/06/13
Checked by	Adrian McCrow Sponsor		14/6/2013
Checked by	Stuart Howard Operations Representative		19/06/13
Checked by	Hugh Dunford Asset Performance Representative		20/06/13
Checked by	I endorse this deliverable as the designated technical authority for the relevant engineering discipline and am <a href="#">accredited</a> to do so in line with the <a href="#">Engineering Governance Framework</a> .		
	Paul Godwin Project Engineer		21/06/13
Approved by	I confirm that this deliverable meets the requirements of the relevant <a href="#">PMF Product Description</a> and that all consultation comments have been addressed to the satisfaction of consultees.		
	Iain Flynn Lead Sponsor		21/6/13

#### Document History

Revision	Date	Summary of changes
2.1	3 May 2011	Final version for signoff, following comments by signatories.
3.0	February 2013	Updated requirements due to project advancement. New document format applied.
3.1	June 2013	Comments from SUP included.



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## 1 Programme Overview

TfL are in negotiations with developer Capital & Counties plc (CapCo) to redevelop c35 acres of TfL land as part of a wider re-development of a c66 acre site in Earls Court, designated an 'Opportunity Area' by the Mayor of London. Within TfL/LU this scheme is known as the Earls Court Development Programme.

TfL owns the freehold interest in Earls Court 1 and 2, subject to two leases to Earls Court Limited, a wholly owned subsidiary of CapCo which have 28 and 102 years remaining respectively.

TfL owns the freehold of and occupies land upon which Lillie Bridge Depot and Ashfield House are based. This space is currently used for stabling of District Line passenger trains, engineering workshops for APD, CPD and TLL and Transplant and Ashfield House which contains offices, computer and telephone systems and operational learning facilities.

The opportunity area also comprises of land belonging to the London Borough of Hammersmith and Fulham. This document does not consider this land.

The Earls Court Development Programme Requirements document (contact Adrian McCrow for copy) sets the Sponsor's Programme Requirements which will meet the Earls Court Development (ECD) Programme objectives used to justify the scheme and contains further information.

### 1.1 Anticipated Development Phases

There are two commercial aspects to the proposed agreement with CapCo, the redevelopment of the current EC1 and EC2 (Phase1), and independently of this, the subsequent redevelopment of the LBD and Ashfield House site (Phase 2).

#### Phase 1: Development of EC1 and EC2 only

The demolition of EC2 raft removes four train stabling berths and storage facilities. To provide replacement stabling berths, it appears that Transplant would be required to move to Ruislip (in line with their current strategy). This permits remodelling of the remaining roads to facilitate passenger stock stabling and the building of replacement storage building. CapCo must provide a section of the concrete box on the former EC2 site to allow for Phase 2 if on site stabling is to be retained. Also under EC2 is the access road and utilities serving the depot, these provisions will need to be maintained to the depot. All remaining maintenance, engineering and manufacturing activities are unchanged.

#### Phase 2: Development of Full Lillie Bridge Depot / Ashfield House

Train stabling will be retained on site would be provided by six double length roads (12 berths in total) within the basement of the new development. All other LU and TLL facilities will be removed to other sites. It is likely that there will be a gap of several years between Phases 1 and 2. There is a potential that Phase 2 will not be progressed due to viability concerns so the configuration proposed for Phase 1 must be sustainable for LU on a permanent basis.

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### 1.2 Objectives

The aim of the programme is to devise a viable and cost effective solution to enable the redevelopment of Lillie Bridge Depot, including Ashfield House and the area under EC2, for commercial and residential purposes whilst maintaining the integrity of the operational railway.

The high level objectives are to:

- ensure that revenues for the land are maximised without negatively affecting operational and maintenance capabilities.
- demonstrate through designs and depot master plans that operational and maintenance facilities can be either accommodated within the proposed future development or relocated to alternate sites.
- manage the conflicting priorities of stakeholders to define a solution that meets the aim of the programme.
- ensure that proposed modifications or relocation of facilities are practically relevant to the current and future network requirements
- design a solution to Phase 1 of the development that safeguards future development of the land for Phase 2, minimises abortive costs and does not devalue the land.
- demonstrate that proposals to modify or relocate facilities take the whole life cost impacts into account as well as the impact of relocation on existing facilities.

### 2 Project Objectives

To facilitate continued operation of Lillie Bridge Depot, the project must provide train stabling facilities to:

- ensure that, the best interests of the operational railway are maintained
- facilitate the requisite stabling capacity at the lowest possible whole life cost.
- improve or at least maintain the standards and quality of the current facility.
- develop a transition plan which minimises disruption to day to day operations and avoids duplicated costs whilst the move takes place from the existing facilities to the new facilities.

### 3 User Requirements

NOTE: Unless stated otherwise the following requirements apply to both Phase 1 and Phase 2.

#### 3.1 General Requirements

1. The stabling facilities shall be capable of accommodating 12 trains. One berth shall be capable of accommodating a 139m long engineering train.
2. There is no requirement to load or unload engineering trains at the site.

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3. The works within the railway environment or forming the envelope to the railway areas shall be designed to comply with; relevant legislation, LU's Standards, British and European Standards, Building Regulations, and the Railway Safety Principles.
4. The sidings will need to be built in accordance with an agreed Fire Strategy.
5. The Designer shall develop strategies for design, maintenance and operation which demonstrate how these requirements are proposed to be met. The strategies shall be submitted to LU for agreement before detailed design commences. To assist in developing strategies, LU has developed a series of "Factors to Consider" in the design development process. The subsequent design proposals shall clearly demonstrate that sufficient space is allocated to enable the sidings fit out to meet the agreed strategies.
6. If because of the physical constraints of the site or for other reasons, any of the LU Standards (being part of LU's Requirements) cannot be achieved then a concession must be obtained from LU prior to completion of detailed design. Concession applications are to be submitted to LU. The Designer shall not assume that a concession will be granted. The existence of non compliant infrastructure at Lillie Bridge, or any other site should not be taken as an indication that a concession will be granted.
7. For Phase 1 Conserve all existing non stabling functions and facilities adjacent to or affected by meeting these stabling requirements, except that Transplant shall be relocated to Ruislip Depot in accordance with separate Transplant requirements.

### 3.2 Space Planning

8. Provide for on tracking of the Harsco Rail Grinder or similar sized rail vehicle in the vicinity (to retain such facility lost at LBD due to the development proposals).
9. Provide void recommended sizes and position in x,y,z, for space required to be safeguarded under both Phase 1 (EC2 footprint) and Phase 2 of new development for future use as sidings space compliant with these requirements.
10. For Phase 2 any Covered Way formed between Cromwell Road and the sidings box must allow sufficient space for LU Operations, equipment and future optimised track layout development.

### 3.3 Operational

11. Connections, for trains running in either direction, to enter and depart all sidings onto the central section of the operational railway.
12. Single train movements should not conflict with both direction running lines simultaneously. No single conflict with main running lines to last more than 2 minutes. Existing exits may be utilised in their current state.
13. Not Used.
14. Not Used.

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15. Capability to despatch trains at not more than 5 min intervals. Existing exits may be utilised in their current state.
16. Capability to receive trains at not more than 5 min intervals. Existing exits may be utilised in their current state.
17. A reception road providing at least one train length between siding fan and exit signal onto mainline. Existing exits may be utilised in their current state.
18. In the event that on any siding provides stabling for more than one train, sufficient headshunts to be provided to allow direct access to the mainline by any train trapped behind a defective one.
19. All 12 stabling berths shall suit seven car "S7" S-Stock trains. One berth shall suit a 139m engineering train.
20. A minimum of 10 berths to be maintained at all times prior to the full introduction of the new Sub Surface Railway Automatic Train Control system (SSR ATC).

### 3.4 Stabling Facilities

21. Allowance must be made for APD Level 1 maintenance (also known as 24hr train prep) for all states of sidings in all potential signalling configurations. This Level 1 maintenance is on board the train but allowance must be made for Trip Cock testing, conducted externally, for the pre ATC period.
22. The solution shall provide means for staff to safely access trains along with their equipment, such as wheeled trolleys, for the purposes of cleaning and litter picking. Provision shall also be made for rubbish removal and storage.
23. The provision of safeguarded, dedicated and compliant walking routes and walkways to and from all trains berthed on all roads, commensurate with ATC ATO train operations.
24. A means for train operators, train maintenance and cleaning staff along with their equipment to safely access trains shall be provided.
25. Allowance shall be made for the safe berthing of trains operating under both manual and automatic modes of operation.
26. Switchable lighting for any covered ways, sufficient for track inspection, litter picking, cleaning and maintenance, or operational procedures (such as securing of points or using gap jumper leads). Lighting to be designed to illuminate track without providing a potential distraction to train operators.
27. Provide permanent walkway lighting infrastructure.
28. Roads allocated for use by engineers trains to have sufficient ventilation for operation of diesel powered locomotives and self propelled diesel vehicles.
29. Provision to be made for the purpose of track access, including raiiling road-rail type vehicles.
30. Provision to be made for fuelling diesel road rail vehicles from a mobile tanker.

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31. Storage for stabling facility maintenance spares and consumables in a space at least 3m x 3m in area. It does not house flammables. It stores items such as train parts tubes, seat bases, log books and houses the light mast tool.
32. Provision of 30m<sup>2</sup> for storage of Bombardier Transportation ATC Storage at LBD.
33. Storage for cleaning consumables in a space 3m x 3m with a butler sink.
34. Provide a bin area with space for a lorry to collect bins. The location should be convenient to the access/egress point from stabled trains. An allowance of 15x50 litre bags per train per berthing are required meaning 15 x 50 x 12 litres per day. Please allow for rubbish collection every 3 days. There should be sufficient space in the collection area for sufficient wheeled bins to cater for this volume with a 20% additional allowance. Also space for marshalling and tipping the bins into a waste disposal truck. No allowance need be made for compactor but the vicinity should have a suitable local power distribution board.
35. Step free means of transporting bins to secure storage, and loading onto waste collection vehicles.
36. Means of vehicular access for deliveries of spares and consumables.
37. For Phase 2, passive ventilation to be provided to the stabling area, to prevent temperatures exceeding 35°C.

### 3.5 Track Layout

38. Remotely controlled powered points capable of being integrated with ATC signalling, including associated point heaters.
39. Straight track alignment at each train berth position.
40. The specification of S stock trains with regard to curvature needs to be taken into account.
41. Trap protection to be provided to prevent an unauthorised train exiting the sidings and fouling the main running lines.
42. Compliant Train Arrestors/Buffer Stops at the end of each stabling road.
43. Allowance shall be made on the rail approach to the sidings to allow for future optimisation of track layout.
44. If concrete slab track formation is used, the Designer will provide a sacrificial zone of 150 mm depth for track fixings.

### 3.6 Traction Power

45. All trains to receive traction power via conductor rail at all locations within the sidings. The sidings shall be energised independently from the mainline and capable of providing traction power, or being isolated, at all times.
46. Traction gap analysis to be provided.



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47. Ensure that all Earthing and Bonding shall be reviewed and where considered deficient be made compliant for SUP end state configuration.
48. Traction power to be sectionalised to enable local isolation of stabling roads and sections of the fan. Each traction section to be separately fed to allow flexibility in isolations (i.e. not feed through from another section).
49. Provision for the local emergency disconnection of traction supply.
50. The ability to remotely monitor traction power and traction earth detection equipment from Hammersmith Service Control Centre (and Back Up SCC).
51. Control of traction power recharge (following emergency disconnection) controlled from Power Control Centre (139 Long Acre) or Palestra after the centre is moved there.
52. Traction power supply rated to 750v nominal traction voltage.
53. Traction power equipment to be insulated to at least 1000V, to allow for regenerative braking.

### 3.7 Communication & Security

54. Site to be covered by Connect Radio system
55. For Phase 2 the site shall be covered by a security system, including CCTV and an access control system. For Phase 1 the existing arrangements are considered satisfactory, except that boundary coverage shall need to be amended.
56. For Phase 2, space allocation should be provided for a security control area to manage access/egress into the sidings area, as well as monitoring other security systems installed.
57. CCTV coverage must include coverage of all pedestrian and vehicle access points and the throat area of the sidings with associated intruder detection systems.
58. The security system shall be capable of distinguishing between trains and intruders entering the sidings via rail link.
59. The security system shall be monitored locally with secure pedestrian access points convenient to all nearby stations.
60. The security system shall be designed for rolling stock and asset protection in addition to managing access and egress points.
61. CCTV data shall be recorded and monitored locally at Lillie Bridge Depot, with additional images to be displayed from Parsons Green and Triangle Sidings. Replay and export functions shall be included locally to comply with the Data Protection Act.

### 3.8 Signalling

62. Fixed trainstops at the end of each stabling road.

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### Pre ATC operation:

63. The sidings are to be laid out for safe control by shunter.
64. Movement authority within the sidings to be given by connect radio from the shunter.
65. Connections to and from sidings to mainline controlled by fixed colour-light or shunt signals with trainstops controlled from Earls Court or Hammersmith control room (to be removed once all trains and signals are ATC enabled).
66. Siding turnouts are to be made ready for the ATC project to fit Surelock point motors which will ultimately be controlled by the ATC signalling system. For the pre ATC period, the points shall be fitted with Williams type hand levers for Shunter operation.

### For ATC operation:

67. All train detection and movements and point control by ATC from the HSCC
68. Trains to register with the ATC system whilst in the stabling berths. (Trains communicate with the ATC system secure radio via line of sight ariel or leaky feeder.)
69. Train stopping positions must be to Bombardier ATC Specification

### 3.9 Staff Accommodation

70. For Phase 2 Sufficient accommodation shall be provided 24 hours, 7 days a week in accordance with LU standards for up to 15 train crew and or cleaning staff both male and female compatible. Such accommodation is to be not more than 2 minutes walk from the berths on the compliant walking route and include: showering, cooking, washing up, messing (with instant hot water), and seating. For Phase 1 existing facilities are adequate.
71. For Phase 2, off road parking for 22 cars. Ten spaces to be designated for LU COO Staff use only. Six spaces designated for APD staff use only. For Phase 1 existing facilities are adequate.
72. Hot and cold water supplies and drainage within reach of each berth for use by Cleaners. Where the existing facilities are not changed with the Phase 1 work, the existing provision is acceptable until Phase 2.

### 3.10 Variations to LU's Requirements during the Construction Phase

73. Prior to SSR ATC completion, no fewer than ten stabling roads in the existing depot shall be available to LU for operational use at all times during the construction phase.

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74. Dedicated routes for LU staff moving within the operational area shall be maintained at all times.
75. Unobstructed, protected, convenient and adequately lit staff walking routes are to be provided at all times for LU staff walking between; Earls Court, West Kensington and West Brompton stations and both the Train Depot and the staff accommodation. LU shall agree the routes of these walkways, any changes thereto, and the notice required for any changes thereto. Any change that necessitates new Train Staff Duty Sheets will require not less than 6 months' notice and may incur substantial costs to LU.
76. Unobstructed road access to the existing Lillie Bridge Depot for all emergency services, service vehicles and LU staff must be maintained at all times during the construction works. LU shall agree the route of this access, any changes thereto, and the notice required for any changes thereto. Space shall be provided for the loading and unloading of vehicles.
77. Provide communications, briefings and any necessary induction or training for staff to work at the developing site.
78. Assess the condition of the track not intended to be changed (outside project scope) to which the new sidings are to be connected to determine if there is a need for upgrade.

### **4 Design Specification**

#### **4.1 Structural**

79. All structures and equipment within the railway boundary which become redundant in the completed scheme shall be removed or encapsulated such that they do not require any inspection, maintenance or management.
80. Wherever practicable and unless otherwise approved by LU structures that are the responsibility of the Developer shall be independent of those that are the responsibility of LU, and not require access to LU operations areas for the purpose of inspection or repair.
81. The whole of any structure over the sidings shall be waterproof, whether or not it is directly exposed to the elements. This requirement allows for the subsequent demolition of overbuilt structures.
82. The new structure shall incorporate suitable fixing points to enable LU equipment to be attached.
83. The design and construction of the Development shall take due regard of LU's structures, tunnels, cables, drainage and other services which must remain in full service during and after construction.
84. Where cables or other services are required to be diverted, provision must be made within the new layout for their reinstatement as required by LU. The cables and other services shall be readily accessible for emergency or routine repair and renewal.

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85. The structures shall be designed for the reasonable minimum of maintenance and cleaning and also for reasonable maximum ease of maintenance and cleaning.
86. The preliminary design for these structures is to be accompanied by an outline maintenance programme and procedure for approval by LU.
87. The structure shall be constructed such that inspection of all structural elements can be readily carried out.
88. The new Development shall be designed in such a way as to keep accessible any existing railway structures and facilities.
89. Provision shall be made for access for inspection, repair and renewal of existing, as well as the new railway structure and facilities.

### 4.2 Railway Operational Services

90. LU's access to pump chambers and equipment must be possible at all times without notice or hindrance.
91. The access route from the public highway to the pumps must be under LU control. Access routes shall be suitable for pedestrians and vehicles.
92. Parking space for a service vehicle near the pumps equipment shall be provided.
93. As far as possible new services and drains to LU operational areas shall be contained within the LU operational areas.

### 4.3 Development Services

94. Development services and drains shall be separate from Railway Operational Services and drains to LU operational areas.
95. Drainage, drainage gullies, pipes, ductwork and other services from the Development shall not pass through LU operational areas.
96. LU will not allow access into LU operational areas to repair, maintain or renew development services.
97. Should development services fail then the failure shall not affect the railway.

### 4.4 Fire Engineering

98. The requirements for fire detection, suppression, fire resistance, fire safety of materials, means of escape in case of fire, fixed and portable fire-fighting will need to be defined and agreed with LU via the Fire Safety Strategy for the works, in accordance with LU Standards.

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### 5 Maintenance & Spares

99. First year's spares, as recommended by the manufacturers/installers, and an inventory list of such first year's spares will be provided for all mechanical, electrical and communication services where not already provided.
100. Lineside spares for the new track layout shall be provided. The details of the spares required shall be agreed following completion of the design, and it is anticipated that these will be equivalent to about 15% of the junction work.
101. Indication of additional costs for ongoing annual maintenance to be forwarded to the Sponsor to include in Business Plan as well as any projected change to headcount to operate / maintain at least 12 months prior to delivery/ use.
102. Provision of an area of at least 5m x 10m to store rails near the track side.

### 6 Consultation

The personnel who have contributed to this document:

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