London Underground Limited (LUL)

Deep Tube Upgrade Programme (DTUP)

One Person Operation (OPO) CCTV System Contract

Section 2

Implementation Work Terms

Schedule 4C

Bakerloo Line Option

Specific Works Information

Deep Tube Upgrade Programme

OPO CCTV System

Specific Works Information

SWI 01

Bakerloo Line

Description of the Works

Table of Contents

01.1 Geographic extent of the OPO CCTV

01.1.1 The *Contractor* shall undertake the works necessary to deliver new OPO CCTV in support of the new fleet of Passenger Trains for the Bakerloo line that will serve twenty-five (25) stations. Note Bakerloo line trains serve nine (9) stations which are owned by Network Rail.

01.1.2 The *Contractor* shall provide the OPO CCTV at the stations and platforms locations of the LUL Network and Network Rail as set out in Table 1.

Table 1–Stations and Platforms

No.	LCS Code	Station	Platform Number	Direction	OPO CCTV Required for reverse departure (indicative assessment)	Stopping mark for reverse approach (indicative assessment)	Network Rail Owned
1	B061	Queens Park	2	SB	Yes	Yes	
2	B061		3	NB	Yes	Yes	
3	B063	Kilburn Park	1	NB			
4	B063		2	SB			
5	B065	Maida Vale	1	NB			
6	B065		2	SB			
7	B067	Warwick Avenue	1	NB			
8	B067		2	SB			
9	B071	Paddington	3	NB			
10	B071		4	SB	Yes		
11	B073	Edgware Road	1	NB			
12	B073		2	SB			
13	B075	Marylebone	1	NB			
14	B075		2	SB			
15	B077	Baker Street	9	NB			
16	B077		8	SB			
17	B123	Regents Park	1	NB			
18	B123		2	SB			
19	C123	Oxford Circus	4	NB			
20	C123		3	SB			
21	P063	Piccadilly Circus	1	NB			
22	P063		2	SB	Yes		
23	N109	Charing Cross	1	NB			
24	N109		2	SB			
25	N113	Embankment	5	NB			
26	N113		6	SB			
27	N115	Waterloo	3	NB	Yes		
28	N115		4	SB			
29	B137	Lambeth	1	NB		Yes	

No.	LCS Code	Station	Platform Number	Direction	OPO CCTV Required for reverse departure (indicative assessment)	Stopping mark for reverse approach (indicative assessment)	Network Rail Owned
30	B137	North	2	SB	Yes	Yes	
31	N139	Elephant and Castle	3	NB	Yes	Yes	
32	N139		4	SB	Yes	Yes	
33	B053	Kensal Green	2	NB			Yes
34	B053		1	SB			Yes
35	B051	Willesden Junction	3	NB			Yes
36	B051		1	SB			Yes
37	B045	Harlesden	2	NB	Yes		Yes
38	B045		1	SB			Yes
39	B043	Stonebridge Prak	2	NB			Yes
40	B043		1	SB	Yes		Yes
41	B039	Wembley Central	1	NB			Yes
42	B039		2	SB			Yes
43	B037	North Wembley	2	NB			Yes
44	B037		1	SB			Yes
45	B035	South Kenton	2	NB			Yes
46	B035		1	SB			Yes
47	B033	Kenton	2	NB			Yes
48	B033		1	SB			Yes
49	B031	Harrow & Wealdstone	1	NB	Yes	Yes	Yes
50	B031		2	SB			Yes

01.1.3 The *Contractor* shall provide OPO CCTV images for train departure in reverse direction at eleven (11) platforms identified in Table 1.

01.1.4 The *Contractor* shall carry out installation of Stopping Markers to assist stopping at the correct position for normal direction moves at each of the fifty (50) platforms. In addition the *Contractor* shall carry out installation of Stopping Markers at the additional seven (7) locations where the train can approach from the opposite direction as shown in Table 1.

01.1.5 The *Contractor* shall carry out installation of OTC Equipment at twenty-five (25) station locations as shown in Table 1.

01.2 OPO CCTV Equipment and Materials

01.2.1 The *Contractor* shall determine the exact number of cameras on each Bakerloo line platform and design, install, test and commission the *works* as specified in CWI 05 Technical Requirements and other parts of the Works Information.

01.2.2 The *Contractor* shall design, install and commission the camera bracketry on each Bakerloo line platform in the tunnel sections as specified in CWI 05 Technical Requirements and other parts of the Works Information.

01.2.3 The *Contractor* shall design, install and commission the camera bracketry / posts on each Bakerloo line platform in the open sections as specified in the CWI 05 Technical Requirements and other parts of the Works Information.

01.2.4 The *Contractor* shall determine the exact location and length of leaky feeder cable on each Bakerloo line platform and design, install, test and commission the *works* in accordance with the requirements in the CWI 05 Technical Requirements and other parts of the Works Information.

01.2.5 The *Contractor* shall design, install, test and commission all communications and power cabled services between equipment on the platforms (cameras and leaky feeder) and equipment in the Bakerloo line stations equipment rooms in accordance with the requirements in the CWI 05 Technical Requirements and other parts of the Works Information.

01.2.6 The *Contractor* shall design, install, test and commission all cable containment required within Bakerloo line stations while demonstrably seeking to maximise the use of the existing cable containment in accordance with the requirements in the CWI 05 Technical Requirements and other parts of the Works Information.

01.2.7 The *Contractor* shall design, install, test and commission equipment and materials (including equipment rack) constituting Imaging Subsystem and Transmission Subsystem in the space that will be secured by the *Employer* in the Bakerloo line equipment rooms in accordance with the requirements in the CWI 05 Technical Requirements and other parts of the Works Information.

01.2.8 The equipment rack size shall not be larger than 600mm wide x 600mm deep. The *Contractor* shall determine the height of the equipment rack.

OPO CCTV Train Borne Equipment

01.2.9 The *Contractor* shall design, deliver and test Train Borne OPO CCTV Equipment as set out in the Works Information for thirty-six (36) Passenger Trains.

01.3 OTC – Infrastructure Borne Equipment

01.3.1 The OTC system will be designed by the Rolling Stock Manufacturer and will be free-issued to the *Contractor* for installation in each Bakerloo line station.

01.3.2 The *Contractor* shall participate in preparation of Interface Control Document (ICD) as set out in Schedule 9 of the Implementation Works Terms and ensure that all the requirements for design and installation of the fixing bracketry and equipment rack for OTC equipment in each Bakerloo line station are adequately defined.

01.3.3 The Rolling Stock Manufacturer will provide a technical specification detailing the installation of the OTC – Infrastructure Borne Equipment, relevant tolerances, testing procedures and if required any specialist test equipment and, or tools. This will be provided after the Order Commencement Date.

01.3.4 The *Contractor* will supply and install the OTC equipment within a standard 19" wall mounted equipment case, either directly or using a sub-frame to allow the fixing of DIN rail mounted equipment. The case must have a minimum mounting capacity of 6U and a minimum useable depth of 450mm. To permit access to terminations and cabling, the sides of the cabinet shall be removable. Alternatively, a swing frame design shall be used. The front door shall be lockable.

01.3.5 The *Contractor* shall design, supply and install all the bracketry required for OTC

equipment fitment in each Bakerloo line station.

01.3.6 The *Contractor* shall receive the free-issue OTC equipment and carry out installation in each Bakerloo line station as set out in ICD.

01.3.7 The Rolling Stock Manufacturer will deliver the OTC - Infrastructure Borne Equipment to the Employer. The *Project Manager* will arrange delivery of the OTC – Infrastructure Borne Equipment to a location within the M25 nominated by the *Contractor*. The timing of the delivery of OTC – Infrastructure Borne Equipment will be specified by the *Project Manager* after the Order Commencement Date. The details of these deliveries will be agreed via the ICD.

01.3.8 The *Contractor* shall participate in testing and commissioning of the OTC equipment in each Bakerloo line station as set out in ICD.

01.4 Platform Stopping Markers

01.4.1 Platform Stopping Markers will be designed by the *Employer* and will be free-issued to the *Contractor* for installation in each Bakerloo line station.

01.4.2 The *Contractor* shall participate in preparation of ICD as set out Schedule 9 of the Implementation Works Terms and ensure that all the requirements for design and installation of the fixing bracketry for Platform Stopping Markers in each Bakerloo line station are adequately defined.

01.4.3 The *Contractor* shall design, supply and install all the bracketry required for Platform Stopping Markers fitment in each Bakerloo line station.

01.4.4 The *Project Manager* will arrange delivery of the Platform Stopping Markers to a location within the M25 nominated by the Contractor within the period of time that will be specified by the Project Manager after the Order Commencement Date.

01.4.5 The *Contractor* shall receive the free-issue Platform Stopping Markers and carry out installation in each Bakerloo line station as set out in ICD.

01.4.6 The *Contractor* shall participate in testing and commissioning of the Platform Stopping Markers in each Bakerloo line station as set out in ICD.

01.5 Rolling Stock Manufacturer’s Test Track

01.5.1 In order to facilitate integration testing the Rolling Stock Manufacturer will construct a length of temporary platform at the test track.

01.5.2 The Rolling Stock Manufacturer will supply track geometry and a schematic drawing of the platform at the time that will be specified by the Project Manager after the Order Commencement Date.

01.5.3 The *Contractor* shall complete the installation at the test track within the period of time that will be specified by the Project Manager after the Order Commencement.

01.5.4 The *Contractor* shall be present for the relevant integration testing in accordance CWI 07 Testing, Inspection and Commissioning within the period of time that will be specified by the Project Manager after the Order Commencement Date.

01.6 Planning and Other Consents

01.6.1 The *Contractor* shall assess with the *Employer* if the works will require any additional

permitted development rights or planning consent application in accordance with the requirements in Works Information with special emphasis on the locations with heritage value as identified in Appendix SWI 01.1.

01.6.2 The *Contractor* shall ensure that the design approval process includes time for obtaining heritage consents and that these designs are adequately prioritized in the programme for works on Bakerloo line.

Appendix SWI 01.1 – Stations with Heritage Value

LCS Code	Station	Platform Number	Direction
B063	Kilburn Park	1	NB
B063		2	SB
B065	Maida Vale	1	NB
B065		2	SB
B077	Baker Street	9	NB
B077		8	SB
C123	Oxford Circus	4	NB
C123		3	SB
P063	Piccadilly Circus	1	NB
P063		2	SB
B031	Harrow & Wealdstone	1	NB
B031		2	SB

Deep Tube Upgrade Programme

OPO CCTV System

Specific Works Information

SWI 02

Bakerloo Line

Constraints on the method, order and timing of the Works

Table of Contents

02.1 Equipment Rooms

02.1.1 The *Contractor* shall install the OPO CCTV Equipment and OTC Equipment in the equipment rooms that will be determined by the *Employer* prior to Order Commencement Date.

02.2 Interoperable Railway Sections and Legacy Train Systems

02.2.1 The *Contractor* shall design and install the OPO CCTV System to operate completely independently and without any interference to and from the systems used for operating legacy trains on the Bakerloo line.

02.2.2 The *Contractor* shall design and install the OPO CCTV System to operate completely independently and without any interference to and from the systems used for operating other type of trains on the interoperable railway sections on Bakerloo line between Queen's Park and Harrow & Wealdstone where the infrastructure is owned by Network Rail.

02.2.3 The *Contractor* shall cooperate with Others as necessary to deliver the *works* in the interoperable railway sections.

Appendix SWI 02.1

Not Used

Deep Tube Upgrade Programme

OPO CCTV System

Specific Works Information

SWI 03

Bakerloo Line

Access

Table of Contents

03.1 Access Planning

03.1.1 Traction current switching times and indicative Network Rail access times are detailed in Appendix SWI 03.1 and Appendix SWI 03.2.

03.2 Network Rail Access

03.2.1 All tracks, Sidings and connections over which LUL trains operate on the Bakerloo Line between the siding north of Harrow & Wealdstone Station and Kilburn High Road Station are owned and maintained by Network Rail (Network Rail Infrastructure).

03.2.2 The *Contractor* should note that Access to Network Rail Infrastructure is designated as Type 2 Access.

03.2.3 Where Access is required to Network Rail infrastructure the works plans shall also include Network Rail requirements.

03.2.4 Where Access is required to Network Rail infrastructure (other than at locations owned and operated by the *Employer*) the minimum booking period for all Access types is 294 calendar days.

03.2.5 Planning and Booking Network Rail Access

03.2.5.1 The *Contractor* shall ensure it has planned sufficient Access, including reasonable adequate contingency access, to Network Rail locations to provide the *works*. The *Contractor* shall cancel any Access which is no longer required as early as is reasonably practicable by notifying the *Employer*.

03.2.5.2 The *Contractor* shall state at the time of requesting a booking whether or not a power isolation is required as part of Access to a Network Rail location (other than at locations owned and operated by the *Employer*), however this may be altered by the *Contractor* up to fifteen weeks prior to the date of the requested Access.

03.2.5.3 Access to Network Rail Infrastructure at the Network Rail locations may be available at less than 294 days' notice and the *Employer* will work collaboratively with the *Contractor* on a reasonable endeavours basis.

03.2.5.4 Costs associated with booking Access to Network Rail locations (for example possession, resource and isolation costs) will be met by the *Employer*.

03.2.5.5 The *Contractor* shall acknowledge that Access to the Site at Network Rail Interface Locations will be refused without a valid Network Rail access number and the *Contractor* shall check that it is in possession of a valid Network Rail access number for all access requirements detailed on the Access Plan. If the *Contractor* is not in possession of the same it shall advise the *Employer* accordingly.

03.2.5.6 The *Contractor* shall comply with the requirements of the use of Sentinel (Network Rail's Access and Competency System), particularly in the context of Access control at the point of site entry. The *Contractor* shall note that individuals will be refused access to the site without the appropriate valid card.

03.2.6 Working on Network Rail Infrastructure

03.2.6.1 Where Network Rail is responsible for the operational running of certain assets within a site, the Access required by the *Contractor* to provide the *works* shall be subject to additional Network Rail rules at certain locations. The *Contractor* shall comply with the Network Rail Access requirements.

03.2.6.2 As a minimum this includes access permits such as Personal Track Safety and, where

appropriate, Controller of Site Safety (COSS) for operatives and site safety supervisors. Any *works* requiring possessions or isolations on Network Rail Infrastructure must be carried out by the *Contractor* in accordance with Network Rail rules and processes.

03.2.7 Network Rail Protection Categories

03.2.7.1 Where *works* are to be carried out at Network Rail Interface Locations, specific Network Rail categories for protection and the responsibilities for provision of this resource are detailed in Table 1 below. All descriptions and requirements for the protection grades shall be as given in the applicable Network Rail Rule Books and Standards or their equivalent.

C - NR Protection Grades	Must Hold	Responsibility
NR Controller of Site Safety	NR COSS	*Employer*
NR DC Strap Man	NR DC Strap Man	*Employer*
NR DC Strap Man Level A	NR DC Strap Man Level A	*Employer*
NR Person In Charge of Possession	NR PICOP	*Employer*
NR Senior Person In Charge of Possession	NR SPICOP	*Employer*
NR Engineering Supervisor	NR Engineering Supervisor	*Employer*
NR Protection Controller	NR Protection Controller	*Employer*
NR Lookout / Site Warden	NR Lookout / Site Warden	*Employer*
NR Crane Controller	NR Crane Controller	*Employer*
NR Crane Controller Tandem lifter	NR Crane Controller Tandem lifter	*Employer*
NR Crane Controller Foreman	NR Crane Controller Foreman	*Employer*
NR Handback	NR Handback	*Employer*
NR Points Operator	NR Points Operator	*Employer*
NR Hand Signaller	NR Hand Signaller	*Employer*
NR Level Crossing Attendant	NR Level Crossing Attendant	*Employer*

NR AC Isolation Planner (IDF)	NR AC Isolation Planner (IDF)	*Employer*
NR AC Isolation and DEP walkouts	NR AC Isolation and DEP walkouts	*Employer*
NR AC Nominated Person	NR AC Nominated Person	*Employer*
NR AC Authorised Person (AP)	NR AC Authorised Person (AP)	*Employer*
NR AC Earthing Assistant (EA)	NR AC Earthing Assistant (EA)	*Employer*
NR DC Isolation Planner (B1)	NR DC Isolation Planner (B1)	*Employer*
NR DC Isolation Walkouts	NR DC Isolation Walkouts	*Employer*
NR DC Nominated Person (NP)	NR DC Nominated Person (NP)	*Employer*
NR DC Level B (AP)	NR DC Level B (AP)	*Employer*
NR Possession Support (PS)	NR Possession Support (PS)	*Employer*

Table 1 – Network Rail protection and responsibilities

03.2.8 Willesden Junction Station

03.2.8.1 Willesden Junction Station is owned and operated by Network Rail.

03.2.8.2 Where the *Contractor* requires Access to Willesden Junction Station for the purpose of providing the *works*, such Access is subject to additional rules and constraints as stipulated by the station owner and operator, Network Rail, from time to time. The *Contractor* shall comply with such Access requirements when requesting and utilising Access at this station. The *Contractor* shall request Access to the Station at this site via the *Project Manager* within the timescales used for Access to all other Stations on the Bakerloo Line between the siding north of Harrow & Wealdstone Station and Kilburn High Road Station that are owned and maintained by Network Rail.

Appendix SWI 03.1 - Guide to switching traction current on and off – Bakerloo Line

See document titled: *“Appendix SWI 03.1 - Guide to switching traction current on and off – Bakerloo Line”*

Document Name	Issue number	Effective date
Guide to switching traction current on and off – Bakerloo Line	3	11/12/2016

Appendix SWI 03.2 - Network Rail - Engineering Access

See document titled: *"Appendix SWI 03.2 - Network Rail - Engineering Access"*

Document Name	Issue number	Effective date
Network Rail - Engineering Access Statement 2018	4.2	02/02/2018

Deep Tube Upgrade Programme

OPO CCTV System

Specific Works Information

SWI 04

Bakerloo Line

Interfaces

Not Used

Deep Tube Upgrade Programme

OPO CCTV System

Specific Works Information

Bakerloo Line

SWI 05

Technical Requirements

Table of Contents

05.1 Reliability, Availability, Maintainability and Safety (RAMS)

05.1.1 The targets will be determined by the *Employer* prior to the Order Commencement Date.

Appendix SWI 05.1

Not Used

Deep Tube Upgrade Programme

OPO CCTV System

Specific Works Information

SWI 06

Bakerloo Line

Engineering Management

See Common Works Information

Deep Tube Upgrade Programme

OPO CCTV System

Specific Works Information

SWI 07

Bakerloo Line

Testing, Inspection & Commissioning

See Common Works Information

Deep Tube Upgrade Programme

OPO CCTV System

Specific Works Information

Bakerloo Line

SWI 08

Completion

See Common Works Information

Deep Tube Upgrade Programme

OPO CCTV System

Specific Works Information

SWI 09

Bakerloo Line

Training

Table of Contents

09.1 Training

09.1.1 The *Contractor* shall deliver one (1) training course for the *Employer's* design and assurance staff.

09.1.2 The *Contractor* shall deliver one (1) training course for the *Employer's* test and commissioning staff.

Appendix SWI 09.1

Not Used

Deep Tube Upgrade Programme

OPO CCTV System

Specific Works Information

Bakerloo Line

SWI 10

Cyber Security

See Common Works Information

Deep Tube Upgrade Programme

OPO CCTV System

Specific Works Information

Bakerloo Line

SWI 11

Information Management

See Common Works Information

Deep Tube Upgrade Programme

OPO CCTV System

Specific Works Information

Bakerloo Line

SWI 19

Health and Safety

Contents Page

Appendix 19.1 – QUENSH Menu

See document titled “Appendix 19.1 Bakerloo Line QUENSH Menu”

Appendix 19.2 – Station Emergency Plans

See document titled “Appendix 19.2 Bakeloo Line Station Emergency Plans”

Deep Tube Upgrade Programme

OPO CCTV System

Specific Works Information

Bakerloo Line

SWI 20

Working with the Employer and Others

Table of Contents

20.1 Glossary

20.1.1 The following terms are applicable to this SWI 20:

Term	Definition
N/A	N/A

20.2 Network Rail

20.2.1 The following Bakerloo Line stations are Network Rail owned assets:

- Queen's Park
- Kensal Green
- Willesden Junction
- Harlesden
- Stonebridge Park
- Wembley Central
- North Wembley
- South Kenton
- Kenton
- Harrow & Wealdstone

Accordingly, all applicable and relevant Network Rail standards and requirements shall apply.

Deep Tube Upgrade Programme

OPO CCTV System

Specific Works Information

Bakerloo Line

SWI 21

Environment

See Common Works Information

Deep Tube Upgrade Programme

OPO CCTV System

Specific Works Information

Bakerloo Line

SWI 22

Quality Assurance

See Common Works Information

Deep Tube Upgrade Programme

OPO CCTV System

Specific Works Information

Bakerloo Line

SWI 23

Management and Administration of the Contract

See Common Works Information

Deep Tube Upgrade Programme

OPO CCTV System

Specific Works Information

Bakerloo Line

SWI 24

Project Controls and Reporting

See Common Works Information

Deep Tube Upgrade Programme

OPO CCTV System

Specific Works Information

Bakerloo Line

SWI 25

Programme

See Common Works Information

Deep Tube Upgrade Programme

OPO CCTV System

Specific Works Information

Bakerloo Line

SWI 26

Subcontracting

See Common Works Information

Deep Tube Upgrade Programme

OPO CCTV System

Specific Works Information

Bakerloo Line

SWI 27

Responsible Procurement

See Common Works Information

Deep Tube Upgrade Programme

OPO CCTV System

Specific Works Information

Bakerloo Line

SWI 28

Accounts and Records

See Common Works Information

Deep Tube Upgrade Programme

OPO CCTV System

Specific Works Information

Bakerloo Line

SWI 29

Standards and Guidance

Table of Contents

29.1 General

This SWI document contains the NACHS tables for the Bakerloo Line.

29.2 Glossary

Term	Definition
NACHS table	"NACHs" or "Nominally Accumulated Customer Hours" means the system of weights used to estimate the cumulative additional perceived journey time encountered by Customers as a result of planned or unplanned Service Disruptions.
DLS	Depot Late Start
FLS	Full Line Suspension
PLS	Partial Line Suspension
SPR	Speed Restriction
TCN	Train Cancellation
TDG In	In service Train Degradation
TDG Out	Out of Service Train Degradation
TDL	Train Delay

29.3 List of Tables

Appendix SWI 29.1

Not Used