

Luas Operations and Maintenance Contract

Schedules

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Schedule 1: System Description

1.1 General Description of the System

- 1.1.1 The System currently consists of an approximately 43km long network with associated LRVs, Infrastructure and Control Systems.
- 1.1.2 The network consists of two separate Lines, known as the Red Line and the Green Line.
- 1.1.3 The Red Line extends from Tallaght, in the south west of Dublin, through the city centre, to The Point in Dublin's Docklands. The Line has two spurs, a short spur branching off at Busáras Stop to serve Connolly railway station and a spur branching off the Line near Cookstown to serve Saggart. The Line consists of twin Tracks and is 20.5km in length overall. The Red Line runs along protected rights of way, not shared with other vehicular traffic, for approximately 60% of its route. Most of the remainder of the Line runs on segregated rights of way adjacent to and parallel to the public road and separated from it by a low kerb or road markings. Some sections of the Line are shared with other types of road traffic including pedestrians. The Red Line has 32 Stops. Park and Ride Sites are located at two of these stops: Cheeverstown and Red Cow. The Red Line Depot and overall centre of operations is located at Red Cow.
- 1.1.4 The Green Line extends from Bride's Glen in the south east of Dublin to Broombridge in the north-west city suburbs. The Line consists of a combination of single and twin Tracks and is 22km in length overall. From Bride's Glen to College Green, the Line consists of twin Tracks. The section between Bride's Glen and Charlemont is 15km long and runs along a mixture of protected rights of way, not shared with other vehicular traffic, and segregated rights of way adjacent to and parallel to the public road and separated from it by a low kerb or road markings. Shared running on this section occurs at junctions where the Line crosses the road carriageway. The section between Charlemont and College Green is 2km long and consists of a mixture of segregated right of way on public roads, and shared running. Between College Green and Parnell Street the Line comprises a single track loop arrangement, with a mixture of shared running and segregated right of way on public roads. Twin tracks then form the remainder of the Line between Parnell Street and Broombridge. The section between Parnell Street and Broadstone – DIT is 1km in length and consists of a mixture of shared running and segregated rights of way on public roads. The section from Broadstone – DIT to Broombridge is 2.8km in length and runs along protected rights of way, not shared with other vehicular traffic. The Green Line has 35 Stops currently in service and has 2 Stops which may be brought into service in future when development takes place in the area. Park and Ride Sites are located at four stops: Carrickmines, Sandyford, Stillorgan and Balally. The Green Line has two Depots, one located at Sandyford and one at Broombridge.
- 1.1.5 The Red Line passes through two local authority areas, South Dublin County Council and Dublin City Council. The Green Line passes through two local authority areas, Dun Laoghaire Rathdown County Council and Dublin City Council. The approximate local authority boundaries are at Kylemore stop and Cowper stop for the Red and Green Lines respectively. Each local authority is responsible for the maintenance of traffic signals within its boundary.
- 1.1.6 Stops generally consist of two platforms, each between 40 and 53 metres long and approximately 3 metres wide. Stop platform levels are 280mm above rail level. Three Stops have island platforms, six have single platforms in single-Track sections and four, mainly at interchange or terminus points have additional platforms. The Stops have been designed to facilitate access by the mobility and visually impaired. Stops facilitate level boarding for passengers, making the system very accessible. Stops are fitted with various items of furniture, including shelters, notice boards, stop signage, help points, ticket vending machines, validators and bins. There are advertising columns with an integrated passenger

information display on most Stops. Standalone passenger displays mounted on poles are located at a small number of platforms.

1.1.7 The Red Line is currently served by 35 Citadis 401 LRVs, 40.8m long and 2.4m wide. These are 70% low floor. The Green Line is served by:

- 26 Citadis 402 LRVs, 43.6m long and 2.4m wide, 100% low floor;
- 7 Alstom Citadis 502 LRVs, 54.7m long and 2.4m wide, 100% low floor; and
- 5 Citadis 401 LRVs, 40.8m long and 2.4m wide, 70% low floor

The Citadis 401 LRVs entered service in 2004 on the original Red and Green Lines. The Citadis 402 LRVs entered service from 2009 on the Green Line only. All of the Citadis 401 LRVs were moved to the Red Line as the Citadis 402 LRVs were introduced on the Green Line. The Citadis 502 LRV's entered service in 2018 on the Green Line, following the extension of the Green Line from St. Stephen's Green to Broombridge. Five Citadis 401 LRVs were also transferred from the Red Line to the Green Line at that time.

1.1.8 The Luas network is an "open" system. The majority of passengers use Leap, the integrated ticketing scheme for bus, heavy rail and light rail in the greater Dublin area. Leap cards can be topped up at self-service ticket vending machines (TVMs) at Stops and are validated by means of validators on the platforms. Printed paper tickets are also sold from TVMs. Tickets are not sold on board the LRVs and there are no facilities on the LRVs to validate Leap cards.

1.1.9 The Track gauge is 1,435mm. R159N grooved rail is used in most street-running sections and at Stops whilst S49 rail is used in off-street areas. There are also some sections of R160N rail. The minimum Track radius is 25 metres on running lines. Street-running sections shared by the LRVs, road traffic and pedestrian traffic have a variety of surface finishes including asphalt, granite sets and imprinted concrete. Through all Stops the Track is surfaced with imprinted concrete. Most off-street sections of the system are either traditional or ballasted Track with the exception of short sections of grassed Track. Ballast Track is utilised extensively on the Green Line and at the Depots.

1.1.10 The System has a central control room located in the Red Cow Depot (the "Central Control Room"). The following are the main electronic control and communications systems used for operations:

- (a) automatic vehicle location system ("AVLS")
- (b) fixed equipment SCADA
- (c) power supply SCADA
- (d) passenger information display system
- (e) public address system
- (f) TETRA radio (data and voice traffic)
- (g) Fibre optic cable transmission network
- (h) PABX telephone system

- (i) emergency telephone system
- (j) CCTV monitoring and recording
- (k) Line side signalling system

1.1.11 The System is designed to operate on a “line of sight” basis. The driver has control and is responsible for interaction with the network and other road users. The line-of-sight basis of operation avoids the need for complex signalling systems such as those used on heavy rail networks. Operating on a line of sight basis is a requirement given the fact that the System is not a fully segregated network. The line signalling system equipment includes railway and road signalling apparatus, point control and operation equipment, and selective vehicle detection equipment.

1.1.12 Depot and stabling facilities for the Red Line are located at Red Cow. This Depot includes a maintenance and repair workshop building, servicing and washing facilities and a large stabling area capable of accommodating up to 47 Citadis 401 LRVs. This Depot includes the Operator’s main administrative offices and the Central Control Room.

1.1.13 Depot and stabling facilities for the Green Line are located at Sandyford and Broombridge Depots. Sandyford Depot has similar maintenance facilities to those at Red Cow, but does not have a Central Control Room. Sandyford Depot has a stabling area capable of accommodating up to 34 Citadis 402 LRVs or 27 Citadis 502 LRVs. Broombridge Depot has similar maintenance facilities to those at Sandyford, but does not have a wheel lathe lane. Broombridge Depot has a stabling area capable of accommodation up to 21 Citadis 402 LRVs or 17 Citadis 502 LRVs.

1.1.14 Toilet facilities for LRV drivers are provided at Tallaght, Saggart, Connolly and The Point on the Red Line, and at Brides Glen, St. Stephen’s Green and Broombridge on the Green Line.

1.2 Traffic Signals and Junctions

1.2.1 The System passes through the administrative area of three road authorities. At signal controlled road junctions the automatic vehicle location system (AVLS) interfaces with the road traffic controller to afford a level of priority to the LRVs.

1.2.2 In general, LRVs are granted high priority at all junctions on the System by terminating the current traffic phase (also referred to as stages) once an LRV has been detected on approach to the junctions. At certain junctions with strategic importance to the road network, e.g. O’Connell Street Lower / Abbey Street and Store Street / Amiens Street, the level of priority afforded to LRVs is reduced at different periods of the day. In such scenarios LRVs can operate at medium priority, where the LRV may have to wait for the current traffic phase to end, and low priority, where an LRV must wait for the LRV phase to appear in the cycle.

1.2.3 Lists of signal controlled junctions on the Red Line and Green Line are presented in Table 1-1, Table 1-2 and Table 1-3.

TII Ref.	Local Authority Ref.		Junction
A01	n/a		Tallaght Crossover
A02	SDCC	T516	Belgard Square West / Blessington Road
A03	SDCC	T515	Cookstown Way / Tallaght Hospital
A03a	SDCC	T392	Cookstown Way / Second Avenue
A04	SDCC	T538	Old Belgard Road Crossing
A05	SDCC	T363	Belgard Road / Embankment Road
A07	SDCC	T358	Sylvan Drive / Embankment Road
A08	n/a		Depot Entrance
A11	n/a		Red Cow Roundabout
A14	SDCC	T162	Naas Road / Long Mile Road
A44	SDCC	P469	Naas Road / Robin Hood Road Pedestrian Crossing
A15	DCC	124	Naas Road / Kylemore Road
A16	DCC	410	Naas Road / Carriglea Industrial Estate
A17	DCC	487	Naas Road / Muirfield Road
A18	DCC	573	Naas Road Pedestrian Crossing at the park
A19	DCC	189	Naas Road / Davitt Road
A21	DCC	176	Davitt Road / Suir Road
A22	DCC	486	James Street / St James Hospital
A23	DCC	771	James Street / Steevens Lane
A24	DCC	370	St Johns Road West / Steevens Lane
A25	DCC	1002	Heuston Station Access
A26	DCC	404	Parkgate Street / Wolf Tone Quay
A27	DCC	772	Benburb Street / Temple Street West
A28	DCC	19	Benburb Street / Blackhall Place
A29	DCC	773	Benburb Street / Queen Street
A30	DCC	774	Smithfield Crossing
A31	DCC	775	Bow Street Crossing
A32	DCC	776	Church Street / Chancery Street
A33	DCC	777	Chancery Street / Chancery Place
A34	DCC	778	Chancery Street / Arran Street East
A35	DCC	418	Marys Abbey / Capel Street
A36	DCC	94	Abbey Street Upper / Jervis Street
A36a	DCC	612	Abbey Street / Liffey Street Pedestrian Crossing
A37	DCC	198	Abbey Street / O'Connell Street
C38	DCC	1	Abbey Street / Marlborough Street
C39	DCC	16	Beresford Place / Abbey Street
C40	DCC	403	Beresford Place / Gardiner Street
C41 / C101	DCC	513	Amiens Street / Store Street / Harbourmaster Place / Mayor Street
C103	DCC	860	Mayor Street / Commons Street
C104	DCC	861	Mayor Street / Guild Street

TII Ref.	Local Authority Ref.		Junction
C105	DCC	862	Mayor Street / National Conference Centre
C106	DCC	863	Mayor Street / Spencer Dock west
C107	DCC	864	Mayor Street / Spencer Dock east
C108	DCC	865	Mayor Street / New Wapping Street
C109	DCC	866	Mayor Street / Castleforbes Street
C110	DCC	867	Mayor Street / The Point
A101	n/a		Belgard Stop Turnback
A102	n/a		Cookstown Junction of Line A1 and Red Line
A103	SDCC	T574	Embankment Road / Cookstown Way
A104	SDCC	T579	Embankment Road / Cookstown Road
A105	SDCC	T580	Embankment Road / Fettercairn Link Road
A108	SDCC	T581	Embankment Road / Outer Ring Road
A112	SDCC	P604	N82 / Citywest Road
A114	SDCC	P605	Fortunestown Stop Pedestrian Crossing
A116	SDCC	T582	Fortunestown Way / Carrig Court
A117	SDCC	T583	Fortunestown Lane / Campus Distributor
A118	SDCC	P606	Saggart Stop Pedestrian Crossing
A119	n/a		Saggart Terminus Crossover

Table 1-1 Signal controlled junctions on the Red Line

TII Ref.	Local Authority Ref.		Junction
B02	n/a		St Stephens Green Terminus Crossovers
B03	DCC	164	St Stephens Green / Harcourt Street / Cuffe Street
B04	DCC	668	Harcourt Street / Montague Street Pedestrian Crossing
B05	DCC	25	Harcourt Street / Camden Place Pedestrian Crossing
B06	DCC	522	Harcourt Street / Hatch Street / Charlotte Way
B08	DCC	722	Adelaide Road / Peter Place
B09	DCC	246	Dunville Avenue / Beechwood Road
B13	DCC	781	College Entrance, Milltown
B11	DLRCC (DCC)	1003	Kilmacud Road Upper Extension Crossing
B101	n/a		Sandyford Stop / Depot Entrance
B102	n/a		Sandyford Depot Control System
B103	DLRCC (DCC)	6034	Blackthorn Avenue/Burton Hall Road
B104	DLRCC (DCC)	6300	Murphystown Road/Glencairn Road
B105	DLRCC (DCC)	6067	Ballyogan Wood/Glencairn Crescent
B106	DLRCC (DCC)	6068	Ballyogan Road/Glenbourne Road

TII Ref.	Local Authority Ref.		Junction
B107	DLRCC (DCC)	6069	Ballyogan Road/Ballyogan Avenue West
B108	DLRCC (DCC)	6070	Ballyogan Road/Ballyogan Avenue East
B109	DLRCC (DCC)	6072	Ballyogan Road/Ballyogan Wood
B110	n/a		Not currently used
B111	DLRCC (DCC)	6301	Laughanstown Road Crossing
B112	n/a		Bride's Glen Terminus
B113	n/a		Not currently used
B114	n/a		Not currently used Future Cherrywood Access Road crossing

Table 1-2 Signal controlled junctions on the Green Line, south of St. Stephen's Green

TII Ref.	Local Authority Ref.		Junction
D001	DCC	402	St Stephens Green / Grafton Street pedestrian crossing
D002	DCC	360	St Stephens Green / Dawson Street
D003	DCC	919	Dawson Street / Molesworth Street pedestrian crossing
D003a	DCC	920	Dawson Street / Duke Street pedestrian crossing
D004	DCC	352	Dawson Street / Nassau Street
D005	DCC	328	Nassau Street / Grafton Street pedestrian crossing
D006	DCC	226	Grafton Street / College Green
D007	DCC	229	Westmoreland Street / College Street
D008	DCC	921	Westmoreland Street / Fleet Street pedestrian crossing
D009	DCC	196	Burgh Quay / O'Connell Bridge
D010	DCC	197	Eden Quay / O'Connell Bridge
D011	DCC	198	O'Connell Street / Abbey Street
D012	DCC	782	O'Connell Street / Princes Street North pedestrian crossing
D013	DCC	199	O'Connell Street / Henry Street pedestrian crossing
D014	DCC	922	O'Connell Street / Savoy pedestrian crossing
D015	DCC	200	O'Connell Street / Cathal Brugha Street
D016	DCC	201	O'Connell Street / Parnell Street
D017	DCC	923	Marlborough Street / Parnell Street
D018	DCC	29	Marlborough Street / Cathal Brugha Street
D019	DCC	924	Marlborough Street / Talbot Street
D020	DCC	001	Marlborough Street / Abbey Street
D021	DCC	796	Marlborough Street / Eden Quay
D022	DCC	908	Burgh Quay / Hawkins Street
D023	DCC	232	Hawkins Street / College Street
D024	DCC	202	Parnell Street / Parnell Square West

TII Ref.	Local Authority Ref.		Junction
D025	DCC	202	Parnell Street / Moore Lane pedestrian crossing
D026	DCC	925	Parnell Street / Dominick Street
D027	DCC	56	Dominick Street / Dorset Street
D028	DCC	044	Constitution Hill / Western Way
D029	DCC	926	North Circular Road Pedestrian Crossing
D030	DCC	927	Cabra Road Pedestrian Crossing
D031	DCC	916	Fassaugh Road Pedestrian Crossing
D032	DCC	928	Constitution Hill / Prebend Street
D033	DCC	929	Prebend Street / Bus Éireann bus garage
D034	n/a		Broombridge Terminus Crossover

Table 1-3 Signal controlled junctions on the Green Line, north of St. Stephen's Green

Schedule 2: Service Specification

2.1 Stops

2.1.1 Stops are provided at the locations listed in Table 2-1.

Red Line		Green Line	
Tallaght Hospital Cookstown	Saggart Fortunestown Citywest Campus Cheeverstown Fettercairn	Brides Glen Cherrywood Laughanstown Brennanstown* Carrickmines Racecourse* Ballyogan Wood Leopardstown Valley The Gallops Glencairn Central Park Sandyford Stillorgan Kilmacud Balally Dundrum Windy Arbour Milltown Cowper Beechwood Ranelagh Charlemont Harcourt St. Stephen's Green Dawson	
Belgard Kingswood Red Cow Kylemore Bluebell Blackhorse Drimnagh Goldenbridge Suir Road Rialto Fatima James's Heuston Museum Smithfield Four Courts Jervis Abbey St. Busáras			
George's Dock Mayor Square Spencer Dock The Point	Connolly	Westmoreland O'Connell (GPO) O'Connell Upper	Trinity Marlborough Parnell
		Dominick Broadstone - DIT Grangegorman Phibsborough Cabra Broombridge	

Table 2-1 Stops

2.1.2 The Operator shall ensure that all LRVs stop and that passengers are given the facility to open the doors at all operational Stops on all Trips, unless otherwise instructed by a Competent Authority or otherwise agreed with TII.

2.1.3 The Stops at Brennanstown and Racecourse on the Green Line are not currently operational but will be opened in the future when warranted by demand.

- 2.1.4 The Stops at Westmoreland, O'Connell (GPO) and O'Connell Upper are single-direction stops northbound, and the Stops at Parnell, Marlborough and Trinity are single-direction Stops southbound.

2.2 Hours of Service

- 2.2.1 Hours of service are as shown in the Timetables in Annex 1. The Operator shall ensure that the first and last Trips every day shall operate at their scheduled departure times.
- 2.2.2 On St. Patrick's Day, services on the Red Line shall operate between Tallaght/Saggart and Smithfield only for the duration of the St. Patrick's Day Parade (approx. 0900 to 1445). Services on the Green Line shall operate between Bride's Glen and St. Stephen's Green and between Broombridge and Dominick for the duration of the St. Patrick's Day Parade (approx. 0900 to 1445).
- 2.2.3 A Saturday service shall operate on Good Friday and on three weekdays between 25 December and 31 December.
- 2.2.4 A Sunday service shall operate on St. Stephen's Day (26th December) but shall commence at 0900.
- 2.2.5 There shall be no service on Christmas Day.
- 2.2.6 Night Luas services shall operate on two Friday nights and two Saturday nights before Christmas Day, and on New Year's Eve.

2.3 Timetables

- 2.3.1 Subject to Section 2.4, the Operator shall, throughout the Operating and Maintenance Period, operate services in accordance with the Timetables in Annex 1, which are as follows:
1. Red Line Monday to Friday (including Night Luas)
 2. Red Line Saturdays, Good Friday and St. Patrick's Day (including Night Luas)
 3. Red Line Sundays and Public Holidays (including Night Luas)
 4. Green Line Monday to Friday (including Night Luas)
 5. Green Line Saturdays, Good Friday and St. Patrick's Day (including Night Luas)
 6. Green Line Sundays and Public Holidays (including Night Luas)
- 2.3.2 In the Timetables shown in Annex 1, tram journeys shown in grey are not in passenger service.
- 2.3.3 The Operator shall allow for a scheduled layover time of at least 5 minutes at the end of each Trip (except for Trips from Sandyford/Brides Glen to Parnell). The scheduled layover time may be reduced to 3 minutes for certain Trips so long as the return Trip has a scheduled layover time of at least 7 minutes.
- 2.3.4 In the case of Trips from Sandyford/Brides Glen to Parnell, a scheduled layover time of less than 3 minutes may be used if that is necessary to achieve even Headways between departures from Parnell to Sandyford/Brides Glen. Whenever a scheduled layover time of less than 3 minutes is used for a Trip from Sandyford/Brides Glen to Parnell, the scheduled

layover time of the return Trip shall be increased so that the total scheduled layover time for both Trips combined is at least 10 minutes.

- 2.3.5 The Operator shall provide the Timetables shown in Annex 1 to TII in Excel format and in VDV452 format.

2.4 Alterations to the Timetable

- 2.4.1 Without prejudice to Clause 34 (Variations), TII may require, and the Operator shall be entitled to propose, alterations (including changes to format) to the Timetable from time to time, and the Operator shall revise the Timetable to take account of any alterations approved by TII.
- 2.4.2 Such alterations shall be made in the form of a draft revised Timetable for TII to approve (such approval not to be unreasonably withheld or delayed).
- 2.4.3 Where an alteration is required by TII, the Operator shall provide TII with such draft within 20 Business Days of any request by TII.
- 2.4.4 Without prejudice to Clause 34 (Variations), where an alteration is proposed by the Operator, the Operator shall provide TII with any revised Timetable at least 40 Business Days before it is intended by the Operator to be implemented.
- 2.4.5 The Operator shall provide any revised Timetables to TII in Excel format and in VDV452 format.
- 2.4.6 For the purpose of developing a revised Timetable, the Operator shall allow at least the Running Times used in the Timetables in Annex 1, unless otherwise agreed with TII.
- 2.4.7 The Operator shall calculate any Variation Operating Cost or Variation Operating Saving, arising from an alteration to the Timetable, in accordance with Table 2-2.

Cost Category	Method of Calculation
Driver Costs	Any change to Annual Scheduled Driver Duties shall be multiplied by the average cost per Driver Duty, Indexed, derived from Error! Reference source not found. and Error! Reference source not found. Any change to Annual Scheduled Driver Duties for Night Luas shall be multiplied by the average cost per Driver Duty, Indexed, derived from Error! Reference source not found. and Error! Reference source not found.
Traction energy	Any change to Annual Scheduled Total Kilometres shall be multiplied by the Traction energy cost per kilometre for the type of LRV in question in Error! Reference source not found. , Indexed.
RPO Costs	Any change to Annual Scheduled Revenue Protection Working Hours shall be multiplied by the average cost per Revenue Protection Working Hour, Indexed, derived from Error! Reference source not found. and Error! Reference source not found.
Tram Security Costs	Any change to Annual Scheduled Security Working Hours shall be multiplied by the average cost per Security Working Hour, Indexed,

	derived from Error! Reference source not found. and Error! Reference source not found.
LRV Maintenance Costs	Any change to Annual Scheduled Total Kilometres shall be multiplied by the LRV maintenance cost per kilometre for the type of LRV in question in Error! Reference source not found. , Indexed.
Operator's overhead and mark-up	The Operator's percentage overhead and mark-up to be added to any change in direct costs shall be as set out in Error! Reference source not found.

Table 2-2 Calculation of Variation Operating Cost or Variation Operating Saving arising from an alteration to the Timetable

2.5 Turnback of LRVs at St. Stephen's Green

- 2.5.1 Due to increasing passenger demand on the Green Line, TII may, during the Operating and Maintenance Period, require the Operator to implement a timetable that includes up to 24 departures per hour from Sandyford towards Parnell/Broombridge during the am peak on Monday to Friday, subject to the total peak vehicle requirement not exceeding the number of LRV's specified in Section 11.7 of Schedule 11:. TII may require the Operator to turn back up to four of these departures at St. Stephen's Green Stop, using a third track that may be constructed at St. Stephen's Green Stop to carry out this manoeuvre.
- 2.5.2 The Operator acknowledges and confirms that it has satisfied itself as to the suitability of the System for the purposes of operating a service frequency of up to 24 LRVs per hour from Sandyford o St. Stephen's Green during the am peak on Monday to Friday.

ANNEX 1: TIMETABLES

The Timetables shown in this Annex 1 will be replaced by the Timetables submitted by the Operator as part of its tender.

1. Red Line Monday to Friday (including Night Luas)
2. Red Line Saturdays, Good Friday and St. Patrick's Day (including Night Luas)
3. Red Line Sundays and Public Holidays (including Night Luas)
4. Green Line Monday to Friday (including Night Luas)
5. Green Line Saturdays, Good Friday and St. Patrick's Day (including Night Luas)
6. Green Line Sundays and Public Holidays (including Night Luas)

Red Line Timetable

Weekday from 25th June 2018

Sagg	Tall	Bel	King	Red	Heus	Abbey	Conn	Point	Point	Conn	Abbey	Heus	Red	king	Bel	Tall	Sagg
.....	05:06	05:07	05:25
.....	05:12	05:13	05:37
.....	05:32	05:33	05:39
.....	05:45	05:46	05:57
.....	05:55	05:56	06:02
.....	04:40	05:25	06:00	06:11
.....	06:09	06:10	06:21
.....	05:08	05:25	05:35	05:45	05:30	05:40	05:49	06:08	06:13	06:19
.....	05:28	05:45	05:55	06:05	06:17	06:28
.....	06:22	06:23	06:29
.....	06:27	06:28	06:39
.....	05:30	05:36	05:41	05:58	06:08	06:18	05:50	06:00	06:09	06:28	06:33	06:39
05:42	05:53	06:36	06:47
.....	06:41	06:42	06:48
.....	05:50	05:56	06:01	06:18	06:28	06:38	06:45	06:56
.....	06:49	06:50	06:56
06:02	06:13	06:10	06:20	06:29	06:48	06:53	06:59
.....	06:14	06:32	06:42	06:52	06:55	07:06
.....	06:10	06:16	06:21	06:39	06:49	06:59	07:04	07:15
.....	07:09	07:10	07:16
06:16	06:27	06:30	06:40	06:50	07:09	07:14	07:20
.....	07:16	07:17	07:28
.....	07:25	07:26	07:37

.....	06:25	06:43	06:54	06:58	06:45	06:55	07:05	07:24	07:29	07:35
.....	07:31	07:32	07:43
.....	07:39	07:40	07:46
.....	06:30	06:48	06:59	07:09	07:00	07:10	07:20	07:39	07:44	07:50
.....	06:24	06:30	06:35	06:53	07:04	07:14	07:10	07:14	07:24	07:43	07:48	07:59
.....	07:50	07:51	07:57
06:26	06:37	07:09	07:19	07:29	07:48	07:53	07:59
.....	06:41	06:59	07:10	07:14	07:20	07:24	07:34	07:53	07:58	08:09
.....	07:59	08:00	08:06
.....	06:34	06:40	06:45	07:03	07:14	07:24	07:19	07:29	07:39	07:58	08:03	08:09
06:36	06:47	07:24	07:34	07:44	08:03	08:08	08:19
.....	06:51	07:09	07:20	07:24	07:35	07:39	07:49	08:08	08:13	08:19
.....	06:44	06:50	06:55	07:13	07:24	07:34	07:34	07:44	07:54	08:13	08:18	08:29
06:46	06:57	07:39	07:49	07:59	08:18	08:23	08:29
.....	07:01	07:19	07:30	07:40	07:50	07:54	08:04	08:23	08:28	08:39
.....	06:54	07:00	07:05	07:23	07:34	07:44	07:49	07:59	08:09	08:28	08:33	08:39
06:54	07:05	07:10	07:28	07:39	07:43	07:54	08:04	08:14	08:33	08:38	08:49
.....	07:03	07:09	07:14	07:32	07:43	07:54	08:05	08:09	08:19	08:38	08:43	08:49
07:03	07:14	07:19	07:37	07:48	07:59	08:04	08:14	08:24	08:43	08:48	08:59
.....	07:13	07:19	07:24	07:42	07:53	07:58	08:09	08:19	08:29	08:48	08:53	08:59
07:13	07:24	07:29	07:47	07:58	08:09	08:20	08:24	08:34	08:53	08:58	09:09
.....	07:23	07:29	07:34	07:52	08:03	08:14	08:18	08:28	08:38	08:57	09:02	09:08
07:23	07:34	07:39	07:57	08:08	08:13	08:27	08:31	08:41
.....	07:33	07:39	07:44	08:02	08:14	08:25	08:24	08:34	08:44	09:03	09:08	09:19
.....	07:47	08:05	08:17	08:22	08:35	08:39	08:49	09:08	09:13	09:19
07:34	07:45	07:50	08:08	08:20	08:31	08:34	08:44	08:54	09:13	09:18	09:29
.....	07:43	07:49	07:54	08:12	08:24	08:29	08:39	08:49	08:59	09:18	09:23	09:29
07:43	07:54	07:59	08:18	08:30	08:41	08:50	08:54	09:04	09:23	09:28	09:39
.....	07:51	07:57	08:02	08:21	08:33	08:44	08:47	08:57	09:07	09:26	09:31	09:37
.....	07:55	08:01	08:06	08:25	08:37	08:42	08:56	09:00	09:10	09:29	09:34	09:45

07:54	08:05	08:10	08:29	08:41	08:52	08:53	09:03	09:13	09:32	09:37	09:43
.....	08:02	08:08	08:13	08:32	08:44	08:55	08:56	09:06	09:16	09:35	09:40	09:51
.....	08:05	08:11	08:16	08:35	08:47	08:52	09:05	09:09	09:19	09:38
08:04	08:15	08:20	08:39	08:50	09:01	09:08	09:12	09:22	09:41	09:46	09:52
.....	08:12	08:18	08:23	08:42	08:53	09:04	09:04	09:14	09:24	09:43
.....	08:15	08:21	08:26	08:45	08:56	09:01	09:08	09:18	09:28	09:47	09:52	10:03
.....	08:48	08:59	09:04	09:11	09:21	09:31	09:50	09:55	10:06
08:16	08:27	08:32	08:51	09:02	09:13	09:21	09:25	09:35	09:54	09:59	10:05
.....	08:24	08:30	08:35	08:54	09:05	09:16	09:19	09:29	09:39	09:58	10:03	10:14
08:24	08:35	08:40	08:59	09:10	09:15	09:30	09:34	09:44	10:03	10:08	10:14
.....	08:34	08:40	08:45	09:04	09:15	09:26	09:29	09:39	09:49	10:08	10:13	10:24
08:34	08:45	08:50	09:09	09:20	09:25	09:34	09:44	09:54	10:13	10:18	10:24
.....	08:44	08:50	08:55	09:14	09:25	09:36	09:45	09:49	09:59	10:18	10:23	10:34
08:44	08:55	09:00	09:19	09:30	09:41	09:44	09:54	10:04	10:23	10:28	10:34
.....	08:54	09:00	09:05	09:24	09:35	09:40	09:49	09:59	10:09	10:28	10:33	10:44
08:54	09:05	09:10	09:29	09:40	09:51	10:00	10:04	10:14	10:33	10:38	10:44
.....	09:04	09:10	09:15	09:34	09:45	09:56	09:59	10:09	10:19	10:38	10:43	10:54
09:04	09:15	09:20	09:39	09:50	09:55	10:04	10:14	10:24	10:43	10:48	10:54
.....	09:14	09:20	09:25	09:44	09:55	10:06	10:15	10:19	10:29	10:48	10:53	11:04
09:14	09:25	09:30	09:49	10:00	10:11	10:14	10:24	10:34	10:53	10:58	11:04
.....	09:24	09:30	09:35	09:54	10:05	10:10	10:19	10:29	10:39	10:58	11:03	11:14
09:24	09:35	09:40	09:59	10:10	10:21	10:30	10:34	10:44	11:03	11:08	11:14
.....	09:34	09:40	09:45	10:04	10:15	10:26	10:29	10:39	10:49	11:08	11:13	11:24
09:34	09:45	09:50	10:09	10:20	10:25	10:34	10:44	10:54	11:13	11:18	11:24
.....	09:44	09:50	09:55	10:14	10:25	10:36	10:45	10:49	10:59	11:18	11:23	11:34
09:44	09:55	10:00	10:19	10:30	10:41	10:44	10:54	11:04	11:23	11:28	11:34
.....	09:54	10:00	10:05	10:24	10:35	10:40	10:49	10:59	11:09	11:28	11:33	11:44
09:54	10:05	10:10	10:29	10:40	10:51	11:00	11:04	11:14	11:33	11:38	11:44
.....	10:03	10:09	10:14	10:33	10:44	10:55	10:59	11:09	11:19	11:38	11:43	11:54
10:04	10:15	10:20	10:39	10:50	10:55	11:04	11:14	11:24	11:43	11:48	11:54

10:06	10:17	10:18
.....	10:13	10:19	10:24	10:43	10:54	11:05	11:15	11:19	11:29	11:48	11:53	12:04
10:13	10:24	10:29	10:48	10:59	11:10	11:14	11:24	11:34	11:53	11:58	12:04
.....	10:23	10:29	10:34	10:53	11:04	11:09	11:19	11:29	11:39	11:58	12:03	12:14
10:23	10:34	10:39	10:58	11:09	11:20	11:30	11:34	11:44	12:03	12:08	12:14
.....	10:33	10:39	10:44	11:03	11:14	11:25	11:29	11:39	11:49	12:08	12:13	12:24
10:33	10:44	10:49	11:08	11:19	11:24	11:34	11:44	11:54	12:13	12:18	12:24
.....	10:43	10:49	10:54	11:13	11:24	11:35	11:45	11:49	11:59	12:18	12:23	12:34
10:43	10:54	10:59	11:18	11:29	11:40	11:44	11:54	12:04	12:23	12:28	12:34
.....	10:53	10:59	11:04	11:23	11:34	11:39	11:49	11:59	12:09	12:28	12:33	12:44
10:53	11:04	11:09	11:28	11:39	11:50	12:00	12:04	12:14	12:33	12:38	12:44
.....	11:03	11:09	11:14	11:33	11:44	11:55	11:59	12:09	12:19	12:38	12:43	12:54
11:03	11:14	11:19	11:38	11:49	11:54	12:04	12:14	12:24	12:43	12:48	12:54
.....	11:13	11:19	11:24	11:43	11:54	12:05	12:15	12:19	12:29	12:48	12:53	13:04
11:13	11:24	11:29	11:48	11:59	12:10	12:14	12:24	12:34	12:53	12:58	13:04
.....	11:23	11:29	11:34	11:53	12:04	12:09	12:18	12:28	12:38	12:57	13:02	13:13
11:23	11:34	11:39	11:58	12:09	12:20	12:29	12:33	12:43	13:02	13:07	13:13
.....	11:33	11:39	11:44	12:03	12:14	12:25	12:28	12:38	12:48	13:07	13:12	13:23
11:33	11:44	11:49	12:08	12:19	12:24	12:33	12:43	12:53	13:12	13:17	13:23
.....	11:43	11:49	11:54	12:13	12:24	12:35	12:43	12:47	12:57	13:16	13:21	13:32
11:43	11:54	11:59	12:18	12:29	12:40	12:42	12:52	13:02	13:21	13:26	13:32
.....	11:53	11:59	12:04	12:23	12:34	12:39	12:47	12:57	13:07	13:26	13:31	13:42
11:53	12:04	12:09	12:28	12:39	12:50	12:58	13:02	13:12	13:31	13:36	13:42
.....	12:03	12:09	12:14	12:33	12:44	12:55	12:56	13:06	13:16	13:35	13:40	13:51
12:03	12:14	12:19	12:38	12:49	12:54	13:01	13:11	13:21	13:40	13:45	13:51
.....	12:13	12:19	12:24	12:43	12:54	13:05	13:12	13:16	13:26	13:45	13:50	14:01
12:13	12:24	12:29	12:48	12:59	13:10	13:11	13:21	13:31	13:50	13:55	14:01
.....	12:22	12:28	12:33	12:52	13:03	13:08	13:15	13:25	13:35	13:54	13:59	14:10
12:22	12:33	12:38	12:57	13:08	13:19	13:27	13:31	13:41	14:00	14:05	14:11
.....	12:32	12:38	12:43	13:02	13:13	13:24	13:25	13:35	13:45	14:04	14:09	14:20

12:32	12:43	12:48	13:07	13:18	13:23	13:30	13:40	13:50	14:09	14:14	14:20
.....	12:41	12:47	12:52	13:11	13:22	13:33	13:41	13:45	13:55	14:14	14:19	14:30
12:41	12:52	12:57	13:16	13:27	13:38	13:39	13:49	13:59	14:18	14:23	14:29
.....	12:51	12:57	13:02	13:21	13:32	13:37	13:44	13:54	14:04	14:23	14:28	14:39
12:51	13:02	13:07	13:26	13:37	13:48	13:55	13:59	14:09	14:28	14:33	14:39
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24:45	24:56	24:57

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25:02	25:13	25:14
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.....	25:22	25:28	25:29

Red Line Night Luas Timetable

Friday Nights

Sagg	Tall	Bel	King	Red	Heus	Abbey	Conn	Point	Point	Conn	Abbey	Heus	Red	king	Bel	Tall	Sagg
									01:00	01:10	01:19	01:37	01:42	01:48
00:30	00:41	00:46	01:03	01:14	01:24	01:30		01:40	01:49	02:07	02:12	02:23
	01:00	01:06	01:11	01:28	01:39	01:49	02:00	02:10	02:19	02:37	02:42	02:48
01:30	01:41	01:46	02:03	02:14	02:24	02:30	02:40	00:49	03:07	03:12	03:23
.....	02:00	02:06	02:11	02:28	02:39	02:49	03:00	03:10	03:19	03:37	03:42	03:48
02:28	02:39	02:40
.....	02:53	02:59	03:00
03:28	03:39	03:40
.....	03:53	03:59	04:00

Red Line Timetable

Saturday from 25th June 2018

Sagg	Tall	Bel	King	Red	Heus	Abbey	Conn	Point	Point	Conn	Abbey	Heus	Red	king	Bel	Tall	Sagg
.....	06:03	06:28
.....	06:06	06:25
.....	06:33	06:34	06:40
.....	06:44	06:45	06:56
.....	06:58	06:59	07:05
.....	05:40	06:25	07:03	07:14
.....	06:07	06:25	06:35	06:45	06:30	06:40	06:50	07:08	07:13	07:19
.....	06:25	06:43	06:53	07:03	07:17	07:28
.....	06:30	06:36	06:41	06:59	07:09	07:19	06:50	07:00	07:10	07:28	07:33	07:39
06:42	06:53	07:36	07:47
.....	07:43	07:44	07:55
.....	07:47	07:48	07:54
.....	06:50	06:56	07:01	07:19	07:29	07:39	07:10	07:20	07:30	07:48	07:53	07:59
07:02	07:13	07:56	08:07
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07:37	07:48	08:15	08:25	08:35	08:53	08:58	09:04
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.....	24:31	24:37	24:38
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24:37	24:48	24:49

24:46	24:57	24:58
.....	24:53	24:59	25:00
.....	25:08	25:14	25:15
25:06	25:17	25:18
.....	25:23	25:29	25:30

Red Line Night Luas Timetable Saturday Nights

Sagg	Tall	Bel	King	Red	Heus	conn	Point	Point	conn	Heus	Red	king	Bel	Tall	Sagg
								01:00	01:19	01:37	01:42	01:48
00:30	00:41	00:46	01:03	01:24	01:30		01:49	02:07	02:12	02:23
	01:00	01:06	01:11	01:28	01:49	02:00	02:19	02:37	02:42	02:48
01:30	01:41	01:46	02:03	02:24	02:30	00:49	03:07	03:12	03:23
.....	02:00	02:06	02:11	02:28	02:49	03:00	03:19	03:37	03:42	03:48
02:28	02:39	02:40
.....	02:53	02:59	03:00
03:28	03:39	03:40
.....	03:53	03:59	04:00

Red Line Timetable

Sunday from 16th April 2012

Sagg	Tall	Bel	King	Red	Heus	Abbey	Conn	Point	Point	Conn	Abbey	Heus	Red	king	Bel	Tall	Sagg
.....	06:35	07:00
.....	06:44	06:55
.....	07:08	07:09	07:15
.....	07:14	07:15	07:26
.....	06:10	06:55	07:27	07:38
.....	07:28	07:29	07:35
.....	06:37	06:55	07:05	07:15	07:00	07:10	07:20	07:38	07:43	07:49
.....	06:57	07:15	07:25	07:35	07:47	07:58
.....	07:00	07:06	07:11	07:29	07:39	07:49	07:20	07:30	07:40	07:58	08:03	08:09
.....	08:05	08:06	08:17
07:12	07:23	08:12	08:23
.....	08:16	08:17	08:23
.....	07:20	07:26	07:31	07:49	07:59	08:09	07:40	07:50	08:00	08:18	08:23	08:29
07:31	07:42	08:27	08:38
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.....	11:37	11:43	11:48	12:07	12:19	12:29	11:52	12:02	12:13	12:32	12:37	12:43
11:40	11:51	12:40	12:51
.....	11:48	11:54	11:59	12:18	12:30	12:40	12:03	12:13	12:24	12:43	12:48	12:54
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.....	12:30	12:36	12:41	13:00	13:12	13:22	12:45	12:55	13:06	13:25	13:30	13:36
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16:02	16:13	16:25	16:35	16:46	17:05	17:10	17:16
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22:38	22:49	23:00	23:10	23:20	23:38	23:43	23:49
.....	22:46	22:52	22:57	23:15	23:25	23:35	23:05	23:15	23:25	23:43	23:48	23:59
22:51	23:02	23:15	23:25	23:35	23:53	23:58	24:04
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23:03	23:14	23:39	23:49	23:59	24:17
.....	23:15	23:21	23:22
23:14	23:25	23:53	24:03	24:13	24:31

.....	23:27	23:33	23:34
23:24	23:35	23:36
.....	23:38	23:44	23:45
23:36	23:47	23:48
23:46	23:57	23:58
.....	23:53	23:59	24:00
.....	24:08	24:14	24:15
24:05	24:16	24:17
.....	24:23	24:29	24:30

Red Line Night Luas Timetable

Sunday Nights (if applicable)

Sagg	Tall	Bel	King	Red	Heus	Abbey	Conn	Point	Point	Conn	Abbey	Heus	Red	king	Bel	Tall	Sagg
									00:00	00:10	00:19	00:37	00:42	00:48	
23:30		23:41		23:46	00:04	00:14		00:24	00:30	00:40	00:49	01:07	01:12		01:23
	00:00	00:06		00:11	00:29	00:39		00:49	01:00	01:10	01:19	01:37	01:42	01:48
00:30	00:41	00:46	01:03	01:14	01:24	01:30	01:40	01:49	02:07	02:12	02:23
	01:00	01:06	01:11	01:28	01:39	01:49	02:00	02:10	02:19	02:37	02:42	02:48
01:30	01:41	01:46	02:03	02:14	02:24	02:30	02:40	00:49	03:07	03:12	03:23
.....	02:00	02:06	02:11	02:28	02:39	02:49	03:00	03:10	03:19	03:37	03:42	03:48
02:28	02:39	02:40
.....	02:53	02:59	03:00
03:28	03:39	03:40
.....	03:53	03:59	04:00

Green Line Weekday Timetable

Valid from 25th June 2018

Bride	Carr	Sdy	Dundr	Bch	Sgn	OCnUpr	Parnel	BrdSt	BRMBD	BRMBD	BrdSt	Parnel	Sgn	Bch	Dundr	Sdy	Carr	Bride
.....	05:00	05:15	05:25
.....	05:27	05:39	05:45
.....	05:46	05:58	06:04
.....	04:55	05:05	05:15	05:30	05:38	05:45	05:51	06:03	06:09
.....	06:07	06:19	06:25
.....	05:30	05:37	05:43	05:54	06:02	06:09	06:15	06:27	06:33
.....	06:25	06:37	06:43
.....	05:50	05:57	06:03	06:14	06:22	06:29	06:35	06:47	06:53
.....	04:55	Swp to O'Con Upr			05:20	05:36	05:42	05:49	06:01	06:08	06:14	06:25	06:33	06:40	06:46	07:04
.....	06:10	06:17	06:23	06:34	06:42	06:49	06:55	07:07	07:13
.....	06:19	06:26	06:32	06:43	06:51	06:58	07:04	07:16	07:22
.....	05:30	05:37	05:44	05:52	06:02	06:08	06:15	06:40	06:51	06:59	07:06	07:12	07:24	07:30
05:30	05:36	05:48	05:55	06:02	06:10	06:20	06:26	06:33	06:32	06:39	06:45	06:56	07:04	07:11	07:17	07:29	07:35
.....	06:37	06:44	06:50	07:01	07:09	07:16	07:22	07:34	07:40
.....	06:00	06:07	06:14	06:22	06:32	06:35	06:55	07:06	07:14	07:21	07:27	07:39	07:45
05:50	05:56	06:08	06:15	06:22	06:30	06:40	06:46	06:53	06:47	06:54	07:00	07:11	07:19	07:26	07:32	07:44	07:50
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24:00	24:06	24:18	24:25	24:32	24:40	24:50	24:56	25:03	
24:10	24:16	24:28
24:25	24:31	24:43
24:40	24:46	24:58
24:55	25:01	25:13
25:10	25:16	25:28
25:25	25:31	25:43

Green Line Night Luas Timetable

Friday Nights

Bride	Carr	Sdy	Dundr	Bch	Sgn	OCnUpr	Parnel	BrdSt	BRMBD		BRMBD	BrdSt	Parnel	Sgn	Bch	Dundr	Sdy	Carr	Bride
											00:33	00:39	00:47	01:00	01:07	01:13	01:21	01:33	01:39
											01:03	01:09	01:17	01:30	01:37	01:43	01:51	02:03	02:09
00:22	00:28	00:40	00:47	00:54	01:00	01:12	01:20	01:27		01:33	01:39	01:47	02:00	02:07	02:13	02:21	02:33	02:39
00:52	00:58	01:10	01:17	01:24	01:30	01:42	01:50	01:57		02:03	02:09	02:17	02:30	02:37	02:43	02:51	03:03	03:09
01:22	01:28	01:40	01:47	01:54	02:00	02:12	02:20	02:27		02:33	02:39	02:47	03:00	03:07	03:13	03:21	03:33	03:39
01:52	01:58	02:10	02:17	02:24	02:30	02:42	02:50	02:57		03:03	03:09	03:17	03:30	03:37	03:43	03:51	04:03	04:09
02:22	02:28	02:40	02:47	02:54	03:00	03:12	03:20	03:27	
02:52	02:58	03:10	03:17	03:24	03:30	03:42	03:50	03:57	
03:14	03:20	03:32
03:44	03:50	04:02
04:14	04:20	04:32

Green Line Saturday Timetable

Valid from 25th June 2018

Bride	Carr	Sdy	Dundr	Bch	Sgn	OCnUpr	Parnel	BrdSt	BRMBD	BRMBD	BrdSt	Parnel	Sgn	Bch	Dundr	Sdy	Carr	Bride
.....	06:00	06:15	06:25
.....	06:27	06:39	06:45
.....	06:46	06:58	07:04
.....	05:57	06:05	06:15	06:30	06:38	06:45	06:51	07:03	07:09
.....	06:30	06:37	06:43	06:54	07:02	07:09	07:15	07:27	07:33
.....	05:49	06:14	06:30	06:36	06:43	06:50	06:57	07:03	07:14	07:22	07:29	07:35	07:47	07:53
.....	07:50	08:02	08:08
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06:30	06:36	06:48	06:55	07:02	07:10	07:20	07:26	07:33	07:45	07:52	07:58	08:09	08:17	08:24	08:30	08:42	08:48
06:50	06:56	07:08	07:15	07:22	07:30	07:40	07:46	07:53	08:00	08:07	08:13	08:24	08:32	08:39	08:45	08:57	09:03
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19:16	19:22	19:34	19:41	19:48	19:56	20:06	20:09	20:27	20:38	20:46	20:53	20:59	21:11	21:17
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23:45	23:51	24:03	24:10	24:17	24:25	24:35	24:41	24:48
24:00	24:06	24:18	24:25	24:32	24:40	24:50	24:56	25:03

24:10	24:16	24:28
24:25	24:31	24:43
24:40	24:46	24:58
24:55	25:01	25:13
25:10	25:16	25:28
25:25	25:31	25:43

Green Line Night Luas Timetable

Saturday Nights

Bride	Carr	Sdy	Dundr	Bch	Sgn	OCnUpr	Parnel	BrdSt	BRMBD	BRMBD	BrdSt	Parnel	Sgn	Bch	Dundr	Sdy	Carr	Bride
										00:33	00:39	00:47	01:00	01:07	01:13	01:21	01:33	01:39
										01:03	01:09	01:17	01:30	01:37	01:43	01:51	02:03	02:09
00:22	00:28	00:40	00:47	00:54	01:00	01:12	01:20	01:27	01:33	01:39	01:47	02:00	02:07	02:13	02:21	02:33	02:39
00:52	00:58	01:10	01:17	01:24	01:30	01:42	01:50	01:57	02:03	02:09	02:17	02:30	02:37	02:43	02:51	03:03	03:09
01:22	01:28	01:40	01:47	01:54	02:00	02:12	02:20	02:27	02:33	02:39	02:47	03:00	03:07	03:13	03:21	03:33	03:39
01:52	01:58	02:10	02:17	02:24	02:30	02:42	02:50	02:57	03:03	03:09	03:17	03:30	03:37	03:43	03:51	04:03	04:09
02:22	02:28	02:40	02:47	02:54	03:00	03:12	03:20	03:27
02:52	02:58	03:10	03:17	03:24	03:30	03:42	03:50	03:57
03:14	03:20	03:32
03:44	03:50	04:02
04:14	04:20	04:32

Green Line Sunday Timetable

Valid from 25th June 2018

Bride	Carr	Sdy	Dundr	Bch	Sgn	OCnUpr	Parnel	BrdSt	BRMBD	BRMBD	BrdSt	Parnel	Sgn	Bch	Dundr	Sdy	Carr	Bride
.....	06:30	06:45	06:55
.....	06:55	07:07	07:13
.....	07:14	07:26	07:32
.....	06:27	06:35	06:45	07:00	07:08	07:15	07:21	07:33	07:39
.....	07:00	07:07	07:13	07:24	07:32	07:39	07:45	07:57	08:03
.....	06:19	06:44	07:00	07:06	07:13	07:20	07:27	07:33	07:44	07:52	07:59	08:05	08:17	08:23
.....	08:20	08:32	08:38
.....	07:40	07:47	07:53	08:04	08:12	08:19	08:25	08:37	08:43
.....	07:00	07:07	07:14	07:22	07:32	07:38	07:45	07:55	08:02	08:08	08:19	08:27	08:34	08:40	08:52	08:58
07:00	07:06	07:18	07:25	07:32	07:40	07:50	07:56	08:03	08:10	08:17	08:23	08:34	08:42	08:49	08:55	09:07	09:13
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20:18	20:24	20:36	20:43	20:50	20:58	21:08	21:14	21:21		21:32	21:39	21:45	21:56	22:04	22:11	22:17	22:29	22:35
20:30	20:36	20:48	20:55	21:02	21:10	21:20	21:26	21:33		21:47	21:54	22:00	22:11	22:19	22:26	22:32	22:44	22:50
20:45	20:51	21:03	21:10	21:17	21:25	21:35	21:41	21:48		22:02	22:09	22:15	22:26	22:34	22:41	22:47	22:59	23:05
20:50	20:56	21:08
21:00	21:06	21:18	21:25	21:32	21:40	21:50	21:56	22:03		22:17	22:24	22:30	22:41	22:49	22:56	23:02	23:14	23:20
21:15	21:21	21:33	21:40	21:47	21:55	22:05	22:11	22:18		22:32	22:39	22:45	22:56	23:04	23:11	23:17	23:29	23:35
21:30	21:36	21:48	21:55	22:02	22:10	22:20	22:26	22:33		22:47	22:54	23:00	23:11	23:19	23:26	23:32	23:44	23:50
21:45	21:51	22:03	22:10	22:17	22:25	22:35	22:41	22:48		23:02	23:09	23:15	23:26	23:34	23:41	23:47	23:59	24:05
21:50	21:56	22:08
22:00	22:06	22:18	22:25	22:32	22:40	22:50	22:56	23:03		23:17	23:24	23:30	23:41	23:49	23:56	24:02	24:14	24:20

22:15	22:21	22:33	22:40	22:47	22:55	23:05	23:11	23:18
22:30	22:36	22:48	22:55	23:02	23:10	23:20	23:26	23:33
22:45	22:51	23:03	23:10	23:17	23:25	23:35	23:41	23:48
23:00	23:06	23:18	23:25	23:32	23:40	23:50	23:56	24:03
23:10	23:16	23:28
23:25	23:31	23:43
23:40	23:46	23:58
23:55	24:01	24:13
24:10	24:16	24:28
24:25	24:31	24:43

Green Line Night Luas Timetable Sunday Nights (if applicable)

Bride	Carr	Sdy	Dundr	Bch	Sgn	OCnUpr	Parnel	BrdSt	BRMBD	BRMBD	BrdSt	Parnel	Sgn	Bch	Dundr	Sdy	Carr	Bride
										23:33	23:39	23:47	00:00	00:07	00:13	00:21	00:33	00:39
										00:03	00:09	00:17	00:30	00:37	00:43	00:51	01:03	01:09
23:22	23:28	23:40	23:47	23:54	00:00	00:12	00:20	00:27	00:33	00:39	00:47	01:00	01:07	01:13	01:21	01:33	01:39
23:52	23:58	00:10	00:17	00:24	00:30	00:42	00:50	00:57	01:03	01:09	01:17	01:30	01:37	01:43	01:51	02:03	02:09
00:22	00:28	00:40	00:47	00:54	01:00	01:12	01:20	01:27	01:33	01:39	01:47	02:00	02:07	02:13	02:21	02:33	02:39
00:52	00:58	01:10	01:17	01:24	01:30	01:42	01:50	01:57	02:03	02:09	02:17	02:30	02:37	02:43	02:51	03:03	03:09
01:22	01:28	01:40	01:47	01:54	02:00	02:12	02:20	02:27	02:33	02:39	02:47	03:00	03:07	03:13	03:21	03:33	03:39
01:52	01:58	02:10	02:17	02:24	02:30	02:42	02:50	02:57	03:03	03:09	03:17	03:30	03:37	03:43	03:51	04:03	04:09
02:22	02:28	02:40	02:47	02:54	03:00	03:12	03:20	03:27
02:52	02:58	03:10	03:17	03:24	03:30	03:42	03:50	03:57
03:14	03:20	03:32
03:44	03:50	04:02
04:14	04:20	04:32

Schedule 3: Transition – Plan and Programme

3.1 Transition Plan

3.1.1 Within 20 Business Days of the Commencement Date, the Operator shall prepare and submit for TII's Approval a detailed plan setting out the Operator's proposed Transition Activities (the "Transition Plan").

3.1.2 The Transition Plan shall include, as a minimum:

- details in relation to the transfer of responsibility for the different aspects of the Services to the Operator, including:
 - Operations Management;
 - Revenue Collection;
 - Revenue Protection;
 - Safety Management;
 - Environmental Management;
 - Maintenance of LRVs and Depot Equipment, including arrangements for receipt of the Spare Parts and Special Tools listed in Schedule 13:, arrangements for obtaining all necessary Maintenance Manuals, and arrangements for procurement of Spare Parts;
 - Maintenance of Infrastructure, including arrangements for receipt of the Spare Parts and Special Tools listed in Schedule 18:, arrangements for obtaining all necessary Maintenance Manuals, and arrangements for procurement of Spare Parts; Schedule 13:
 - Maintenance of the AFCS;
 - Management of Park and Ride Sites;
 - Management of Security;
 - Customer Service;
 - Customer Information;
 - Communications and Public Relations;
- details of the Consents to Operate envisaged as being required;
- the installation and commissioning of new facilities and equipment, if required;
- the installation and commissioning of information and communications technology systems, in particular the CMMS;
- details of communications to Competent Authorities;
- the transfer of existing records and data systems;
- the recruitment and training of new staff, if required;
- the transition of existing Staff;

- details of liaison arrangements with the previous operator, LRV maintainer and Infrastructure maintainer;
- details of liaison arrangements with TII;
- details of procurement arrangements and any Sub-Contracts, including provision for power, utilities, cash collection services, security services, general office IT equipment and its maintenance, uniforms, tickets, timetables and all other day-to-day sundry items to be used on the System;
- details of contingency arrangements in the event of delays or disruption to the transfer of the Services to the Operator; and
- a detailed programme setting out the timetable by which the Operator shall effect the transfer of responsibility for the Services which specifies in sufficient detail the different work streams and timelines required in connection with the Transition Plan.

3.2 Approval of Transition Plan

- 3.2.1 TII shall review the draft Transition Plan and shall provide comments (if any) to the Operator within 10 Business Days of receipt of the drafts.
- 3.2.2 The Operator shall incorporate such comments in the Transition Plan and shall resubmit the Transition Plan for Approval within 10 Business Days of its receipt of TII's comments.
- 3.2.3 TII shall not unreasonably withhold or delay its Approval of the Transition Plan.
- 3.2.4 Once approved, any subsequent changes to the Transition Plan shall only be made following consultation with TII.

3.3 Implementation phase

- 3.3.1 The Operator shall establish and operate a programme and project management structure to ensure that the Transition proceeds in accordance with the Transition Plan.

3.4 Variations to the Programme

- 3.4.1 Should it appear to TII or the Operator at any time that the actual or likely progress of the Transition Plan does not or will not conform with the programme contained in the approved plan in any material respect then, within 10 Business Days of being so required by TII or (if earlier) becoming aware of the same, the Operator shall:
- submit to TII a report identifying the reasons for such non-conformity; and
 - at the same time as submitting the report submit to TII, a revised programme which shall provide for the Transition Plan to be completed by the Scheduled Operating Commencement Date.

3.5 General Obligations

- 3.5.1 Except to the extent otherwise agreed with TII, the Transition Plan shall be carried out:
- without disruption to, or affecting the previous operator, LRV maintainer or Infrastructure maintainer and their operation and maintenance of the System up to the Operating Commencement Date;

- in any event, without disruption to, or affecting the operation of the System.

3.6 Insurance

- 3.6.1 The Operator shall maintain or procure the maintenance of third party public liability insurance (with a minimum level of indemnity of €6,500,000 each and every claim) and employers' liability insurance (with a minimum level of indemnity of €13,000,000 each and every claim) covering the Operator's activities during this period with an insurance company which is acceptable to TII and NTA, such acceptance not be unreasonably withheld. Such insurances will provide an indemnity to both TII and NTA via an Indemnity to Principals Clause, and will be evidenced in writing by the provision of a Broker's Letter of Evidence or such other evidence which is acceptable to TII and NTA, acting reasonably.

Schedule 4: Operations Management

4.1 Operator's Organisation

- 4.1.1 The Operator's organisation structure is detailed in Annex 1 to this Schedule. The Operator shall not change this organisation structure without the consent of TII.

4.2 Training

- 4.2.1 The Operator shall act in accordance with Good Industry Practice in relation to the training of the Operator's Personnel during the Transition Period and the Operating and Maintenance Period.
- 4.2.2 At all times the Operator shall ensure that the Services are performed with appropriately qualified and trained personnel.
- 4.2.3 The Operator shall implement, prepare and maintain documentation describing the duties and responsibilities of the Operator's Personnel in normal service and such exceptional circumstances as may be appropriate.
- 4.2.4 The Operator shall devise and implement appropriate recruitment techniques and training programmes, performance measures and analysis systems to create a customer focused and responsive organisation. Where work that involves contact with the public is subcontracted, the Operator shall require equivalent standards of Sub-Contractors.
- 4.2.5 The Operator shall train the Operator's Personnel in their duties and responsibilities with particular emphasis on customer service and accessibility awareness. The Operator shall also perform competence assessments for all safety critical tasks, maintain records of current competence, provide refresher training and re-assessment as required, and not allow Operator's Personnel who are not competent and (where appropriate) have not passed the relevant assessment to carry out such work unsupervised.
- 4.2.6 The Operator shall seek to create a continuous improvement culture by, for example:
- distributing performance indicators as widely as possible within the organisation;
 - encouraging Operator's Personnel to admit mistakes rather than conceal them;
 - encouraging managers to travel on the System and to seek passenger and staff feedback.

4.3 Operator's Database

- 4.3.1 The Operator shall maintain a database to record incidents as they arise in the operation of the System (the "Operator's Database"). The Operator shall ensure that TII has read-only access to the Operator's Database. The Operator's Database shall be used to record all incidents relevant to Luas operations, including the causes of delays, disruptions and other significant events even where these have no effect on operations. The Operator shall analyse such records and take appropriate improvement action (such as changes to work practices, documentation changes, briefing, training, changes to competence assessment methods and standards) where it is identified as necessary or beneficial.
- 4.3.2 The measurement and/or monitoring of certain aspects of the Operator's performance shall be based on data contained in the Operator's Database. The Operator's Database shall also be linked to the CMMS as described in Schedule 9:. Accordingly The Operator shall take all reasonable measures in accordance with Good Industry Practice to ensure that the Operator's Database:
- is kept up-to-date at all times during the Operating and Maintenance Period;

- is an accurate, true and full record of all incidents, occurrences and operational events every day;
- is sufficiently detailed to allow the measurement and/or monitoring of the Operator's performance in respect of the Performance Standards; and
- is accessible for TII's inspection at all times during the Operating and Maintenance Period.

4.4 Utility Supplies

- 4.4.1 Throughout the Operating and Maintenance Period the Operator shall procure such water, sewerage disposal, communications, electricity, gas and any other utility as it requires for the performance of the Services.

4.5 Service Control Plan

- 4.5.1 The Operator shall develop a Service Control Plan and shall submit this plan to TII for approval no later than 20 Business Days prior to the Scheduled Operating Commencement Date.
- 4.5.2 The Service Control Plan shall include all procedures necessary to:
- Reliably and consistently deliver the Timetables in Annex 1 of Schedule 2: on a daily basis;
 - recover tram operations in the event of disruptions to service caused by traffic congestion, accidents, technical failures or any other incidents;
 - minimise the impact of such disruptions to service on customers;
 - quickly implement Bus Activations or Replacement Bus Services in the event of Service Interruptions;
 - manage the interface between tram operations and areas of local authority responsibility such as road traffic and traffic signals;
 - achieve or exceed the Performance Standards specified in Schedule 34:
- 4.5.3 TII shall provide the Operator with such comments and amendments as it requires in respect of the Service Control Plan within 10 Business Days of receipt from the Operator.
- 4.5.4 The Operator shall implement the Service Control Plan throughout the Operating and Maintenance Period. The Parties may agree amendments to the Service Control Plan from time to time.
- #### **4.6 Emergencies and emergency exercises**
- 4.6.1 The Operator shall co-operate with An Garda Síochána, Dublin Fire Brigade and other Competent Authorities in relation to any emergencies that occur on the System, or emergency training and other exercises that are required to be carried out in relation to the System.
- 4.6.2 The Operator shall ensure that all Operator's Personnel designated to carry out specific responsibilities under the Emergency Management Plan required under Schedule 7: know and understand the policies and procedures outlined in this plan. The response to any major crisis or disturbance shall always be conducted within the framework of this plan.

- 4.6.3 The Operator shall ensure that the Central Control Room at Red Cow Depot is manned 24 hours a day, 365 days a year, throughout the Operating and Maintenance Period.

4.7 Co-operation with special inquiries or investigations

- 4.7.1 The Operator shall co-operate with any special inquiries or investigations carried out by any Competent Authority as a result of accidents, incidents or proposed changes in legislation and shall promptly provide all information, resources and facilities within its control which are reasonably required for such inquiries or investigations.
- 4.7.2 The Operator shall download footage from the CCTV system on the LRV's and the Stops when requested by An Garda Síochána, TII or any Competent Authority and shall provide such footage to An Garda Síochána, TII or Competent Authority as the case may be.

4.8 Traffic and Roads

- 4.8.1 The Operator shall attend meetings with Relevant Road Authorities as may be necessary for the purpose of reviewing the operation and maintenance of the System in relation to other road users.
- 4.8.2 The Operator shall from time to time review with the relevant local authority department such traffic regulations as are in place and such amendments as may be necessary to ensure that the System is not unduly hindered as a result of other traffic movements. The Operator shall ensure that TII is notified of any changes that are proposed or are to be made to the roads or to any traffic signals which might reasonably be expected to affect the System and/or the provision of the Services, of which it is notified.
- 4.8.3 The Operator shall develop procedures for the removal of obstructions (including broken down LRVs) from the System and shall include such procedures in the Service Control Plan.
- 4.8.4 In the event that an LRV breaks down and obstructs vehicular and/or pedestrian traffic, the Operator shall remove, or procure the removal of, the LRV to a location in which it does not cause such obstruction.

4.9 Replacement Bus Services and Bus Activations

- 4.9.1 In the event of a Service Interruption, the Operator shall take all reasonable and practicable steps to maintain services either side of the affected section of the System. The Operator shall also take measures to mitigate the effect of the Service Interruption on passengers. The measures that the Operator is required to take depend on the nature and duration of the Service Interruption and the part of the System affected by the Service Interruption.
- 4.9.2 For some Service Interruptions, the Operator shall be required to secure the provision of substitute bus services for each Trip or part of a Trip affected by the Service Interruption ("Replacement Bus Services") provided that the substitute bus services comply with the provisions of paragraph 4.9.10.
- 4.9.3 For other Service Interruptions, the Operator shall be required to activate the acceptance of Luas tickets on scheduled bus services, including Dublin Bus and Go Ahead services ("Bus Activation").
- 4.9.4 The circumstances in which the Operator is required to provide a Replacement Bus Service are as follows:

- Service Interruption due to planned maintenance or repair of the Infrastructure (including repair of Damage to the System) on any part of the System; and
- Service Interruption due to any reason other than planned maintenance or repair of the Infrastructure and of more than two hours duration, between Saggart and Belgard, or between Bride's Glen and Sandyford.

4.9.5 The circumstances in which the Operator may provide a Bus Activation are as follows:

- Service Interruption due to any reason other than planned maintenance or repair of the Infrastructure and of less than two hours duration on any part of the System; and
- Service Interruption due to any reason other than planned maintenance or repair of the Infrastructure and of more than two hours duration on any part of the System other than Saggart to Belgard, and Bride's Glen to Sandyford.

4.9.6 The circumstances described in paragraphs 4.9.4 and 4.9.5 are summarised in Table 4-1 below.

Cause of Service Interruption	Part of System affected / mitigation required	
	Saggart to Belgard or Bride's Glen to Sandyford	Rest of System
Planned maintenance or repair of the Infrastructure (including repair of Damage to the System)	Replacement Bus Service	Replacement Bus Service
Any reason other than planned maintenance or repair of the Infrastructure and of more than two hours duration	Replacement Bus Service	Bus Activation
Any reason other than planned maintenance or repair of the Infrastructure and of less than two hours duration	Bus Activation	Bus Activation

Table 4-1 Mitigation required for Service Interruptions

4.9.7 When the Operator provides a Bus Activation or Replacement Bus Service in relation to a Service Interruption, the following shall apply:

- a Lost Kilometres Deduction shall apply in respect of any Trips affected by the Service Interruption; and
- no EWT Bonus or EWT Deduction shall apply in respect of any Trips affected by the Service Interruption from the time that the Bus Activation or Replacement Bus Service is provided until thirty minutes after the end of the Service Interruption.

4.9.8 In certain circumstances, a Service Interruption may take place and it may be impossible for the Operator to provide a Bus Activation or Replacement Bus Service because scheduled bus services are not running, or because buses for a Replacement Bus Service are not available to hire, in each case due to the following reasons:

- industrial action by the staff of the bus company operating the scheduled bus services, or by the staff of the bus company who normally provide the Replacement Bus Service; or

- extreme weather conditions preventing buses from operating; or
- widespread traffic disruption and disruption to scheduled bus services due to a large Public Event, such that it is impossible for buses to operate; or
- Service Interruption takes place outside the normal operating hours of the scheduled bus services (applies to Bus Activations only).

4.9.9 In the circumstances described in paragraph 4.9.8, the Operator shall take all reasonable and practical steps to provide a Bus Activation or Replacement Bus Service. Provided that the Operator demonstrates to TII's reasonable satisfaction that it has taken such steps, then the provisions of paragraph 4.9.7 shall apply as if the Operator had provided a Bus Activation or Replacement Bus Service respectively.

4.9.10 Replacement Bus Services provided by the Operator must comply with the following requirements:

- the buses used for the Replacement Bus Service must be low-floor wheelchair-accessible buses that are less than 12 years old;
- the Replacement Bus Service must have the same frequency or better than the Trip which it replaces;
- the Replacement Bus Service must stop and permit passengers to board and alight at or as close as practicable to each Stop on the Trip which it replaces;
- the Replacement Bus Service must only carry passengers holding valid tickets for the System, and only permit them to board and alight at or as close as practicable to each Stop on the Trip which it replaces;
- the Replacement Bus Service must comply with all applicable Legal Requirements (including as to accessibility) and Consents to Operate; and
- to the extent the Replacement Bus Service is arranged between the Operator and the bus operator, the Operator must take all reasonable steps consistent with Good Industry Practice to ensure that a bus operator from which the Operator hires buses for the purpose of providing Replacement Bus Services does not withdraw buses from service on any scheduled bus service that such bus operator operates under contract to NTA.

4.9.11 The Operator shall:

- prior to the Operating Commencement Date, obtain TII's and NTA's approval for the routes, stopping points and vehicle types of the Replacement Bus Services that it intends to operate between Saggart and Belgard and between Bride's Glen and Sandyford in the event that such Replacement Bus Services are required;
- subject to paragraph 4.9.12, procure Replacement Bus Services when required in accordance with paragraph 4.9.4 and be responsible for the payment to bus operators; and
- invoice NTA for the cost of provision of Replacement Bus Services required in accordance with paragraph 4.9.4.

4.9.12 NTA reserves the right to procure Replacement Bus Services instead of the Operator, should it deem this to be appropriate.

4.9.13 TII shall notify the Operator from time to time of the protocol to be followed by the Operator in requesting Bus Activations from the operators of scheduled bus services, including Dublin Bus and Go Ahead. The Operator shall inform TII and NTA each time a Bus Activation take place, the section of the System affected, the duration of the Service Interruption and of the Bus Activation and the bus operators contacted in relation to the Bus Activation.

4.9.14 The Operator shall not be required to pay the operators of scheduled bus services for the provision of Bus Activations. Such costs shall paid by NTA.

4.9.15 From time to time of a System Licence Suspension may occur, in respect of which TII requires the Operator to provide a substitute bus service ("Additional Replacement Bus Services"). Such circumstances shall be dealt with as a Variation to the Contract and the relevant provisions of Clause 34 (Variations) shall apply.

4.10 Additional Passenger Services

4.10.1 The Operator may, at its own cost, from time to time, prepare and submit to TII in writing proposals for tram services which it proposes to introduce as additions to the Services ("Additional Passenger Services").

4.10.2 Such Additional Passenger Services proposals shall clearly be labelled as an "Additional Passenger Services Proposal" and shall include details of the following:

- the reason why the Operator believes that Additional Passenger Services are required;
- the cost of the Additional Passenger Services in accordance with the rates set out in **Error! Reference source not found..**

4.10.3 The Operator shall provide TII with such further information and within such timescale as TII may reasonably require in relation to any Additional Passenger Services proposal.

4.10.4 TII shall decide in its absolute discretion within such timescale as is in all the circumstances reasonable, whether to implement any Additional Passenger Services proposal and shall notify the Operator in writing of its decision in relation thereto.

4.10.5 TII may also require the Operator, at its own cost, to prepare and submit to TII in writing proposals for Additional Passenger Services that TII believes may be required from time to time, to meet expected increased demand due to large Public Events.

4.10.6 The agreed costs for the Additional Passenger Services shall be included in the calculation of the System Charge or Revenue Grant for the Reporting Period in which the Additional Passenger Services are provided.

4.11 Public Events

4.11.1 The Operator shall maintain a schedule of all Public Events relevant to the System. These shall include but not be limited to: marches, parades, charity runs, demonstrations, sporting events at the Aviva Stadium, Croke Park and Tallaght Stadium, concerts and large events in the 3Arena, outdoor public gatherings and festivals or other events.

4.11.2 At least one week in advance of each Public Event, and two weeks in advance of any Public Event that is likely to result in a Service Interruption, the Operator shall provide TII with its reasonable assessment in respect of the following:

- the likely impact of the Public Event on the Operator's performance of the Services;

- the changes to the Services (if any) that the Operator proposes to implement;
- proposed Replacement Bus Services and/or Bus Activations that the Operator intends to operate if the Public Event is likely to result in a Service Interruption; and
- details of Additional Passenger Services that may be required, such details to be agreed with TII in accordance with Section 4.10 above.

4.11.3 The Operator shall use reasonable endeavours to mitigate any loss of Patronage Revenue and Park and Ride Revenue arising as a consequence of any Public Event.

4.11.4 Except in respect of Additional Passenger Services, the Operator shall not be entitled to any additional payment or compensation in relation to any Public Event.

4.12 Third Party Liaison

4.12.1 The Operator shall manage liaison with:

- emergency services and other bodies as may be necessary;
- the Commission for Railway Regulation;
- the Railway Accident Investigation Unit;
- the Relevant Roads Authority or local authority;
- local and national media;

to maximise co-operation and hence System performance and safety.

4.12.2 The Operator shall liaise with third party organisations wishing to carry out work on or near the System, as more fully described in Section 23.2 of Schedule 23:.

4.12.3 The Operator shall, when requested by TII, participate in the Safety Acceptance Working Group with respect to proposed changes or modifications to the System.

4.12.4 The Operator shall liaise and co-operate with any Competent Authority as required from time to time.

4.12.5 The Operator shall liaise with and participate in meetings of community groups, business interest groups, policing forums and other public gatherings from time to time on matters relating to the System.

4.13 Severe Weather Management Plan

4.13.1 The Operator shall prepare and implement a Severe Weather Management Plan that sets out its pre-determined response to severe weather events occurring on the System.

4.13.2 All Operator's Personnel designated to carry out specific responsibilities under the Severe Weather Management Plan are required to know and understand the policies and procedures outlined in the Severe Weather Management Plan. The response to any severe weather event shall always be conducted within the framework of this plan.

4.13.3 The Severe Weather Management Plan shall focus on actions to be taken by the Operator by way of appropriate response to a severe weather event that has the potential to seriously disrupt the Services and damage public confidence in the System.

4.13.4 The Severe Weather Management Plan shall take into consideration the requirements of “A Framework for Major Emergency Management” (Dec 2006) and the supporting “Guide to Severe Weather Emergencies” (Dec 2010) and any later revisions.

4.13.5 The Severe Weather Management Plan and associated arrangements shall apply to the following weather events as a minimum:

- Flooding
- Frost/Ice
- Heavy Snow & Freeze/Thaw
- Severe Winds
- Fog
- Thunderstorms
- Heat waves

4.14 **Staff Uniforms**

4.14.1 Customer-facing staff, including but not limited to drivers, RPOs, security staff and maintenance staff, shall wear Luas branded uniforms which make them identifiable as Luas staff to customers.

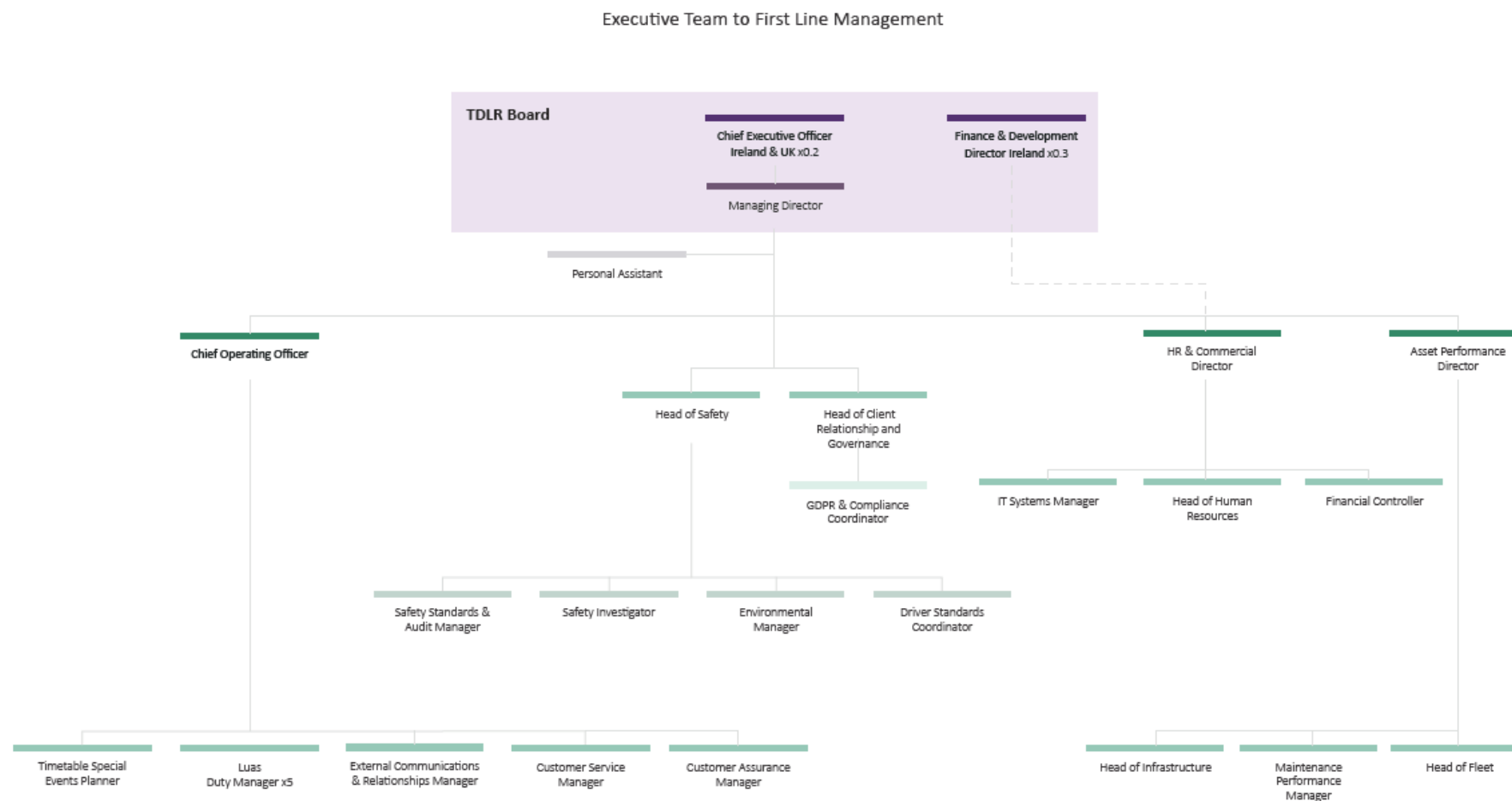
4.14.2 The design of staff uniforms shall be subject to TII approval, such approval not to be unreasonably withheld or delayed. The Operator shall be responsible for procuring the design, production, supply and distribution of staff uniforms.

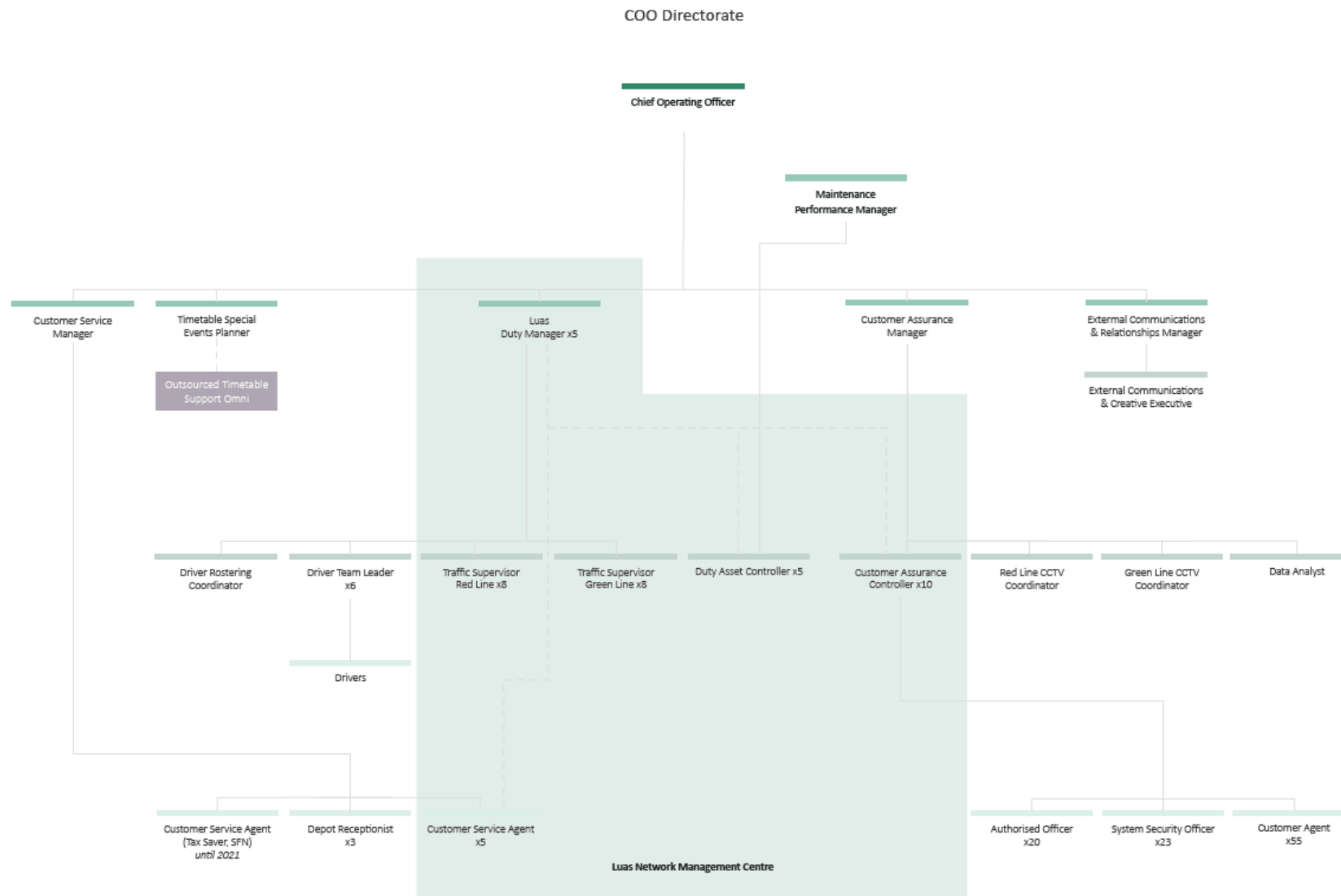
4.15 **Road vehicles**

4.15.1 All road vehicles used by the Operator, including but not limited to maintenance or rapid response vehicles, shall be Luas branded making them identifiable as Luas vehicles to customers and the public.

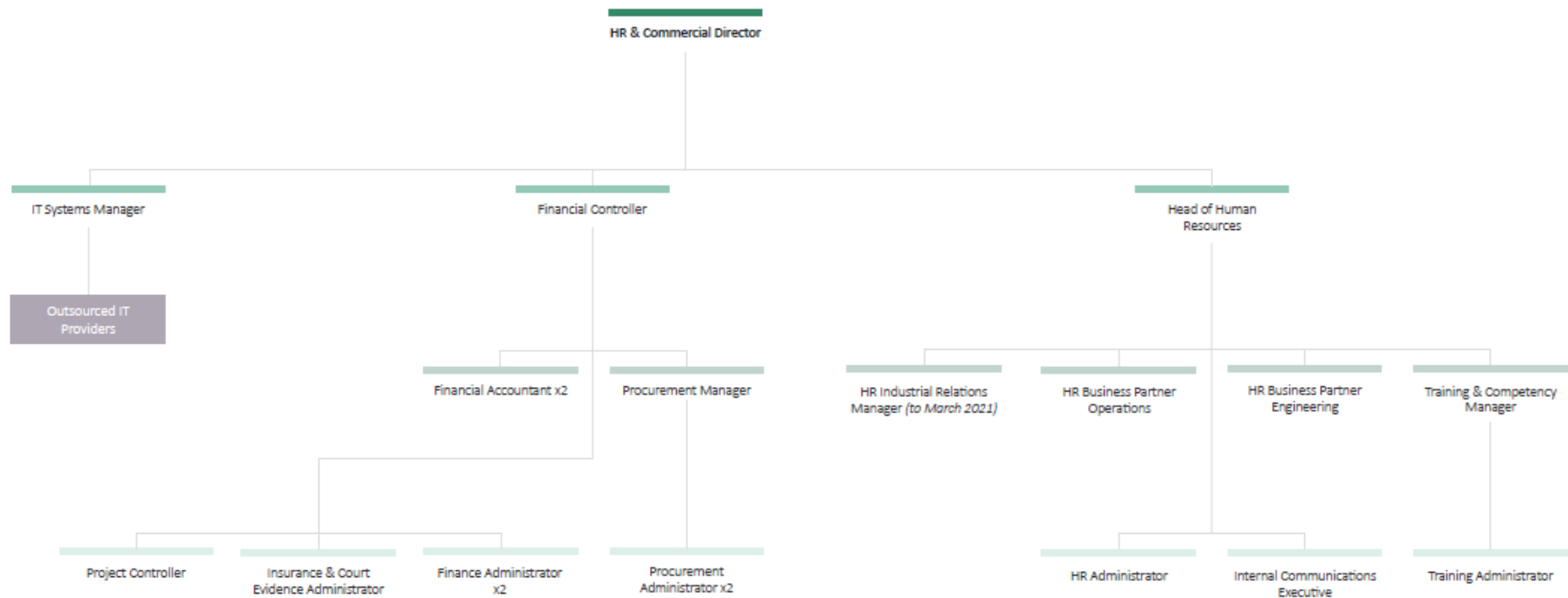
4.15.2 The Operator shall be responsible for procuring the design, production and installation of Luas vehicle branding. The design of such vehicle branding shall be subject to TII approval, such approval not to be unreasonably withheld or delayed.

ANNEX 1: ORGANISATION CHART

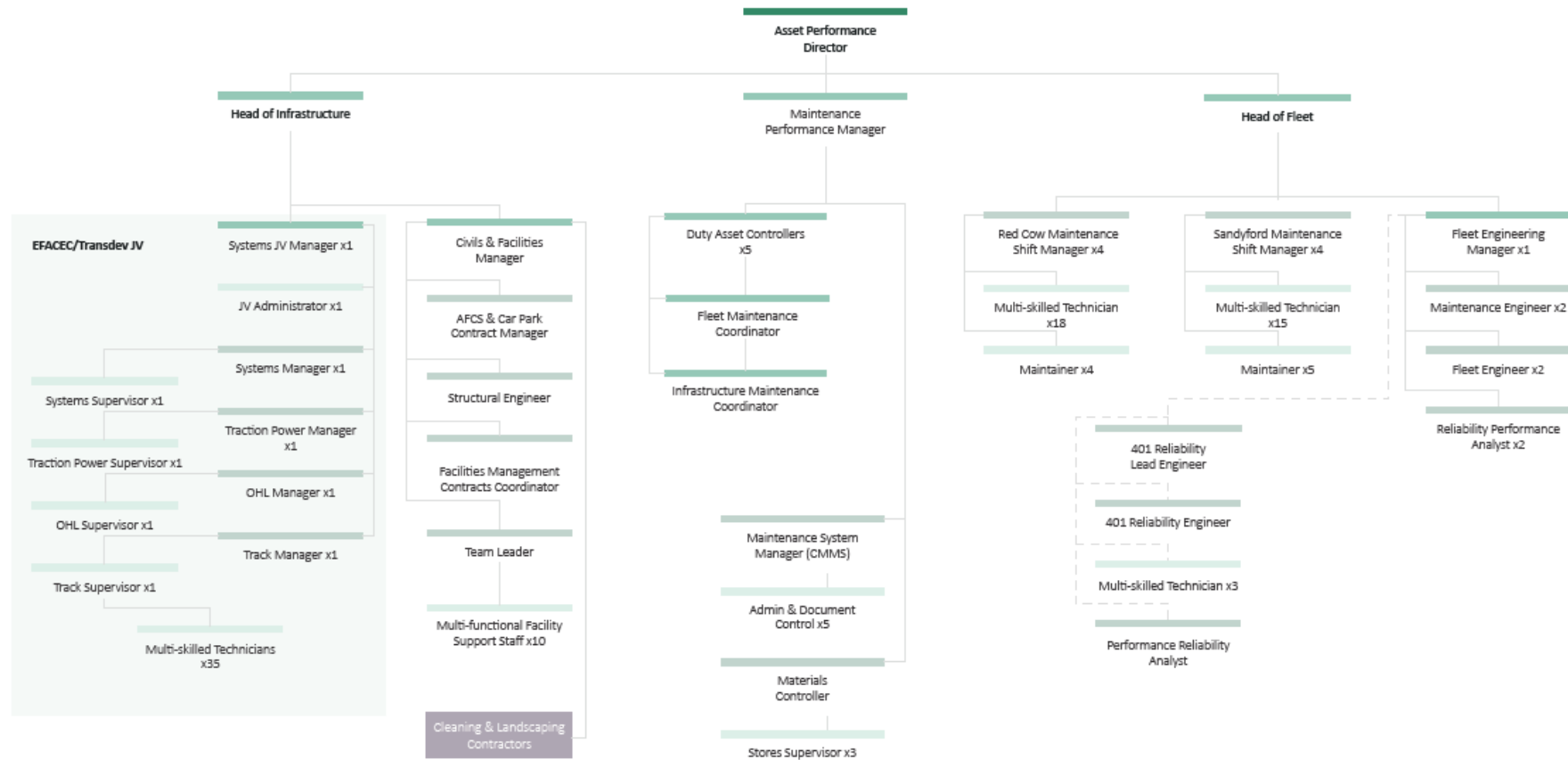




HR & Commercial Directorate



Asset Performance Directorate



Schedule 5: Revenue Collection

5.1 Ticketing Arrangements

- 5.1.1 The Operator shall procure, make available, charge for and accept tickets of such types, design, fare zone validity, time period validity and service validity (including joint tickets with other public transport operators), at the fare levels and subject to operational arrangements as may be notified by TII to the Operator from time to time, subject to TII providing the Operator with reasonable prior notice in relation to changes to the tickets and consultation by TII with the Operator concerning any operational or administrative issues in relation to such changes.
- 5.1.2 The Operator shall provide such assistance to TII in establishing the design of tickets to be used on the System as TII may reasonably request.
- 5.1.3 The Operator shall ensure that tickets sold from ticket machines comply with the specification set out in Annex 1 to this Schedule. The Operator shall also ensure that tickets sold from ticket machines contain at least the following security features:
- Micro-print
 - Varnish overlay
- 5.1.4 The Operator shall not make any changes to the specification set out in Annex 1 to this Schedule or to the security features described in paragraph 5.1.3 without the agreement of TII.
- 5.1.5 The Operator shall administer the sale of Luas Tax Saver tickets. The Operator shall process all orders placed by employers, collect payment from employers, and submit orders to the Leap scheme. In the case of new tickets, the Leap scheme will dispatch Leap Cards carrying the electronic ticket to the Operator, and the Operator shall dispatch these Leap Cards to the employer. In the case of renewals, the electronic ticket will be picked up by the customer touching on his/her Leap Card at a validator. The Operator may charge employers for the cost of postage of Leap Cards carrying Tax Saver tickets. The Leap scheme will charge the Operator a fee for issuing Leap Cards carrying Tax Saver tickets. In such cases, TII shall reimburse this fee to the Operator.
- 5.1.6 An integrated Tax Saver website is in development by NTA due to go live in 2020. This website will provide for the purchase of Tax Saver tickets from all public transport companies within Ireland. When this website is live the Operator will become a user of this website. After this time the Operator will not have responsibility for the collection of payment from employers, and will only have responsibility for the dispatch of tickets where such dispatch is via the Luas AFCS.
- 5.1.7 The Operator shall develop, manage and implement arrangements for the sale of group tickets and bulk tickets. The Operator shall make bulk tickets available to the organisers of conferences and other events who request large numbers of tickets for attendees at their event. Bulk tickets may be bespoke in nature, with a fare zone validity and time period validity tailored to meet the requirements of each event. The Operator may sell bulk tickets at a discount to normal ticket prices. The size of the discount will vary depending on the volume of tickets required by the event organiser, and shall be agreed between TII and the Operator from time to time.
- 5.1.8 When a very large Public Event is scheduled to take place (for example, All Ireland quarter finals, semi-finals and finals at Croke Park) and the Operator anticipates that demand for Luas tickets at a particular Stop may exceed the capacity of the TVMs at that Stop to dispense

tickets, the Operator shall arrange, at its own cost, for the TII mobile ticket kiosk to be located at the Stop during the period of peak demand to sell Luas tickets to customers.

- 5.1.9 The Operator shall make arrangements with other public transport operators for sharing revenue from the sale of joint tickets each Reporting Period. The basis for sharing revenue from the sale of joint tickets between Luas and other transport operators shall be notified by TII to the Operator from time to time.
- 5.1.10 The Operator shall perform and assume the transport operator obligations undertaken by TII in respect of Leap that are set out in Schedule 27:.
- 5.1.11 In the event that a customer purchases a single or return Luas ticket or tags on with their Leap Card, and is then unable to make their Luas journey due to a Service Interruption, the Operator shall refund the cost the ticket or Leap Card tag-on to the customer, provided it receives a request from the customer to do so, and subject to the customer providing satisfactory evidence that they were unable to make their Luas journey due to the Service Interruption.
- 5.1.12 The Operator shall develop a process for administering refund requests such as those referred to in paragraph 5.1.11, and, subject to TII's approval of the process, shall publicise the refund process via the Website and shall implement the refund process throughout the Operating and Maintenance Period.

5.2 Revenue Collection

- 5.2.1 The Operator shall organise cash collections from each of the Ticket Machines as may be necessary to enable the Operator to meet its obligations under the Contract. The frequency of collections shall be subject to the approval of TII and shall be based on and reviewed from time to time on the basis of usage of the Ticket Machines, the amount of cash collected, the need for coin replenishment, levels of theft or attempted theft.
- 5.2.2 The Operator shall deposit all revenue collected from each Ticket Machine to the Operator's bank account, or accounts, by the next Business Day following the day upon which the revenue was collected. The Operator shall provide TII with details of the bank accounts to which Patronage Revenue is deposited, and shall not deposit in those bank accounts any money other than Patronage Revenue.
- 5.2.3 The Operator shall be responsible for all discrepancies between the data produced by the Ticket Machines (save where those data are shown by the Operator to be manifestly and verifiably erroneous) and the actual amount collected and delivered to the bank by the cash collection contractor including those caused by the malfunction of the fare collection system, the use of illegal tender, any unaccepted credit or debit card sales, any illegal tampering, theft and other cash losses, and shall indemnify NTA and TII against lost Patronage Revenue.
- 5.2.4 The Operator shall be compliant with Payment Card Industry (PCI) Data Security Standard (DSS) as described in Section 33.3.

5.3 Concessionary Schemes

- 5.3.1 The Operator shall administer any travel concession scheme in which Luas participates from time to time. Patronage Revenue earned from the carriage of passengers on the System pursuant to such travel concession schemes shall be paid to the Operator. The Operator shall provide all information and assistance reasonably required by TII in developing any such

scheme, including negotiations with the Department of Social Protection and any other body with responsibility for travel concession schemes.

5.4 Non-Transit Sales

5.4.1 TII may introduce non-transit sales (for example, sale of mobile phone top-ups) from Ticket Machines during the Operating and Maintenance Period. The Operator shall collect the revenue from such non-transit sales and shall report such revenue to TII in the report required under paragraph 5.5.1.

5.4.2 TII shall pay the Operator a commission for collecting the revenue from non-transit sales from Ticket Machines. The amount of this commission shall be agreed between TII and the Operator by means of a Variation, but shall, in any case, not exceed 4% of the revenue, excluding VAT, collected from non-transit sales from Ticket Machines.

5.5 Revenue Collection Reporting and Control

5.5.1 The Operator shall maintain daily records of Patronage Revenue and provide revenue reports to TII at the frequency and with the level of detail required by TII. Such reports shall show records of Patronage Revenue by ticket type collected by the Operator and shall be in a format notified by TII to the Operator from time to time. The Operator shall provide TII with such reports as soon as reasonably practicable after the end of the period to which the report relates, but in any event no later than the following Business Day in the case of daily reports, and no later than ten Business Days after the end of the Reporting Period, in the case of Reporting Period reports.

5.5.2 The Operator shall, in the report required under paragraph 5.5.1, include an analysis of any discrepancies between the data produced by the Ticket Machines and the AFCS back office and the actual amount of cash collected and delivered to the bank.

5.5.3 The Operator shall reconcile the actual cash and coin amounts in the Ticket Machines to the Cash on Hand report in each Reporting Period.

5.5.4 The Operator shall record, track and reconcile bank transfers between the Leap scheme and the Operator's bank accounts against AFCS transaction data.

5.5.5 The Operator shall reconcile the reports received from Dublin Bus and Irish Rail on combined Tax Saver ticket sales to the SAPPR report detailing these sales for each Reporting Period. The Operator shall investigate all discrepancies between these sources. The Operator shall track the accumulated discrepancies between these sources and advise TII if the accumulated discrepancies are greater than a determined level (levels to be set by TII).

5.5.6 The Operator shall liaise with the Leap scheme to ensure that the reallocation of Leap revenues is accurate. The Operator shall review SPAD files from the Leap scheme in order to verify that all revenue transfers between scheme participants relating to capping and transfer rebate net to zero. The Operator shall send six randomly selected examples of Leap card interactions, including the card serial number (CSN) to the Leap scheme every six months. The Leap scheme will provide the Operator with details of the revenue reallocation for these sample cases, involving transfers of revenue between the transport operators. The Operator shall ensure that the detail provided by the Leap scheme demonstrate that the revenue allocation for the sample cases was carried out in line with the Leap scheme rules.

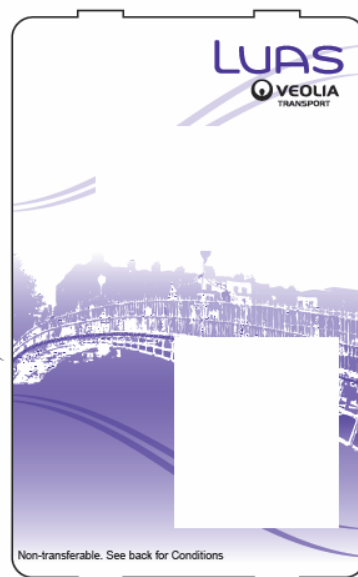
5.6 Provision of Robust Control Environment

- 5.6.1 The Operator shall operate an effective control environment with respect to all financial records, processes and transactions relating to Patronage Revenue, Standard Fare Revenue and Park and Ride Revenue ("Revenue"), and shall document its key financial and internal controls relating to Revenue. The Operator shall provide evidence of the operation of these controls and report on the execution of and compliance with these controls as part of the period reporting process.
- 5.6.2 The Operator is responsible for maintaining up-to-date books and records in respect of all financial transactions and processes relating to Revenue, and ensuring that such books and records completely and accurately reflect all such transactions; relate to transactions which have occurred and reconcile to appropriate and relevant source data. The Operator shall apply and present such transactions in the manner prescribed by TII's policies, rules and principles (as notified to the Operator from time to time). In particular, the Operator shall maintain a separate and dedicated general ledger and trial balance in respect of Revenue which will be kept separate from any other business of the Operator. For the avoidance of doubt, this requirement relates to Revenue, and not the Operator's own internal accounts. All transactions relating to Revenue are to be accounted for from the perspective of TII.
- 5.6.3 The Operator shall comply with best practice Generally Accepted Accounting Principles ("GAAP") as specified by TII's policies, rules and principles (as notified to the Operator from time to time) including but not limited to the accounting policies set out therein.
- 5.6.4 The Operator shall define and document its key financial reporting and transaction processing policies, processes, risks and the controls in place to mitigate those risks. This shall be subject to TII's review and approval, shall be kept up-to-date and shall be reviewed at least annually.
- 5.6.5 The Operator shall provide an annual attestation to TII that the control framework has operated effectively throughout the period and shall notify TII of breaches of the control framework noted in a given period.
- 5.6.6 The Operator shall allocate adequate resources to managing the accounting, reporting and reconciliation of all transactions relating to Revenue. The Operator shall support TII, or its designated agents, when required to receive and provide appropriate responses to queries (including audit queries from TII's auditors, including the Irish Government auditor), in respect of period, annual and any financial reporting, controls, reconciliations or other matters as these arise. In particular, the Operator is responsible for supporting, substantiating and explaining transactions recorded by it in respect of Revenue to the satisfaction of TII and its designated agents.
- 5.6.7 For each Reporting Period, the Operator shall, perform a full, formal accounting close process for all Revenue earned, and shall provide all documentary evidence and supporting files to TII, when requested. For the avoidance of doubt, this shall include (without limitation):
 - a) reconciliation of all Revenue earned, by revenue type, in the relevant Reporting Period or year, to actual Revenue posted in the general ledger;
 - b) reconciliation of all monies received and lodged to the dedicated bank accounts (relating to Revenue only) to postings in the general ledger for the same Reporting Period;
 - c) full reconciliation of amounts owing to/by the Operator, NTA and any other public transport services in relation to Revenue;

- d) full reconciliation of bank statements relating to the dedicated bank accounts (relating to Revenue only) to the general ledger bank balance;
 - e) full review and calculation of any accruals and pre-payments relating to Revenue;
 - f) full calculation/accrual for third party agency commissions, if any, relating to Revenue;
 - g) closing of Reporting Period within the general ledger; and
 - h) any other financial reconciliation/process/procedure requested by TII relating to Revenue.
- 5.6.8 The Operator shall be responsible for the accuracy and completeness of all the financial data produced by it in relation to Revenue. The Operator shall ensure that all financial elements, relating to Revenue, presented in both the period and financial reporting is based on financial data which has been fully reconciled and for which all close control processes, including review by the Operator's finance manager, is complete.
- 5.6.9 The Operator shall report any reconciliation differences, relating to Revenue, arising as part of the financial accounting close procedures, any remedial actions taken or to be taken and the impact or potential impact of such actions on TII. Such items should be reported and accounted for in accordance with TII's policies, rules and principles (as notified to the Operator from time to time).
- 5.6.10 Where any aspect of Revenue collection and accounting is carried out by a Sub-Contractor, the Operator shall ensure that all provisions included within this section are adhered to by the Sub-Contractor.

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Front

Microprint 3pt
Luas LogoWhite Box Dimensions:
37mm x 19mmWhite Box Dimensions:
25mm x 29mmVarnish
Overlay

Back



Schedule 6: Revenue Protection

6.1 Revenue Protection

- 6.1.1 The Operator shall enforce the Bye-laws in relation to Ticketing and Standard Fares and shall ensure the following:
- that the fare structure and methods of purchasing tickets are clearly published as described in Schedule 30.;
 - that customers are made aware, by means of regular advertising campaigns both on the System and off the System where appropriate, of the revenue protection measures in place and the consequences of not having a valid ticket or validated Leap Card.
- 6.1.2 The Operator shall deploy Revenue Protection Officers on the System for the purpose of inspecting tickets and Leap Cards and issuing Standard Fare notices to passengers who do not have a valid ticket or Leap Card ("Revenue Protection Activity"). Revenue Protection Officers must wear a uniform and ID badge while on duty, except when conducting plain clothes inspections, in which case an ID badge must still be worn.
- 6.1.3 The Operator shall ensure that Revenue Protection Officers are fully trained in the usage and docking routines for Leap handheld inspection terminals and the process for issuing Standard Fare Notices.
- 6.1.4 The number of Revenue Protection Officers deployed on the System shall be sufficient to ensure that, for each Reporting Period, a minimum of 22 Working Hours per 1,000 Scheduled Service Kilometres is spent on Revenue Protection Activity or on specific activities described in paragraph 6.1.5 (this requirement applies to the Reporting Period overall, not on a daily basis).
- 6.1.5 TII may require up to 10% of Working Hours worked by Revenue Protection Officers in any Reporting Period to be spent on specific activities other than Revenue Protection Activity. These specific activities shall be notified by TII to the Operator from time to time and may include, but are not limited to the following:
- Conducting ad hoc passenger loading surveys at Stops and on board LRVs at the request of TII;
 - Provision of assistance to customers travelling to or from Public Events;
 - Provision of other assistance to customers over and above that listed in paragraph 28.11.4 of Schedule 28.;
- 6.1.6 If, in any Reporting Period, the number of Working Hours for which the Operator has deployed Revenue Protection Officers in performing Revenue Protection Activity and the specific activities described in paragraph 6.1.5 is less than 22 Working Hours per 1,000 Scheduled Service Kilometres, then the Operator shall pay TII an amount in respect of each Working Hour less than 22 per 1,000 Scheduled Service Kilometres. This amount shall be calculated by dividing RPO Costs in **Error! Reference source not found.**, Indexed, by Annual Scheduled Revenue Protection Working Hours in **Error! Reference source not found.**
- 6.1.7 For the avoidance of doubt, carrying out of training activities, performing of accounting functions, driving LRVs, carrying out control room activities, answering telephone queries or other complaints handling from the Depots and/or carrying out of maintenance activities shall not constitute performance of Revenue Protection Activity, but the direct supervision of the Revenue Protection Officers and attendance in court by the Revenue Protection Officers for

the purpose of giving evidence in proceedings for the violation of Bye-laws shall constitute such performance.

6.2 Standard Fares

6.2.1 The Operator shall implement the Bye-laws and all Legal Requirements relating to the issue of notices in relation to, making of demands for and collection of Standard Fares.

6.2.2 The Operator shall ensure that proper records of all notices in relation to and demands for Standard Fares issued and Standard Fares paid are kept, and shall provide Standard Fare reports to TII at the frequency and with the level of detail required by TII. Such reports shall show the number and value of Standard Fare notices issued, the number and value of Standard Fares paid and the number of prosecutions brought to court, and shall be in a format notified by TII to the Operator from time to time.

6.2.3 The Operator shall implement an appeals process for passengers who wish to appeal the imposition of a Standard Fare. Any passenger in receipt of a Standard Fare notice shall be informed of his/her right of appeal on receipt of the Standard Fare notice and in any further correspondence about the Standard Fare. The right of appeal shall be clearly stated on the Standard Fare notice with the Website address, call centre telephone number and address, and the timeline within which an appeal must be lodged.

6.2.4 The appeals process shall be clearly documented and made available in writing and on the Luas website to all passengers who wish to access it. The appeals process shall be fair and transparent, and passengers shall be informed in writing the reasons why their appeal has been accepted or rejected.

6.2.5 The Operator shall implement an enforcement policy for the prosecution of passengers who do not pay a Standard Fare. The Operator shall make full use of all court appearance dates available to it, for the purpose of bringing such prosecutions to court.

6.2.6 The amount of Standard Fares paid by passengers to the Operator in any Reporting Period ("Standard Fare Revenue") shall be included in the calculation of the System Charge or Revenue Grant for that Reporting Period in accordance with Schedule 36:.

6.3 Standard Fare Commission

6.3.1 The Standard Fare Commission for a Reporting Period shall be calculated by multiplying the number of Standard Fares actually paid by passengers on the System during that Reporting Period by €45 (not subject to Indexation).

6.4 Fare Evasion Surveys

6.4.1 TII or NTA shall procure an independent contractor to carry out Fare Evasion Surveys on an on-going basis in order to determine the level of fare evasion on the System. A minimum of four Fare Evasion Surveys shall be carried out each calendar year. Each Fare Evasion Survey shall consist of a number of sampling periods lasting approximately 3 to 4 hours.

6.4.2 The Operator shall facilitate access by TII's independent contractor to the System to carry out the Fare Evasion Surveys without provision of prior notification to the Operator by TII.

6.5 Fare Evasion Survey procedure

- 6.5.1 The Fare Evasion Surveys will take place on board LRVs by means of face-to-face interviews with a randomly selected sample of passengers. The survey sample will be selected using a multi-stage stratified or other valid sampling technique. A number of Trips will be randomly selected from strata broken down according to line, day type and time band. These Trips will be used as a starting point for selecting random clusters of passengers. The results of the Fare Evasion Survey will be weighted by Line, day type and time band to avoid sampling bias.

6.6 Sample Size

- 6.6.1 The number of passengers interviewed during each Fare Evasion Survey shall be sufficient to ensure that the overall Fare Evasion Rate for Luas, calculated from each Fare Evasion Survey, shall have a sample error of less than 1%. It should be noted that disaggregated results (for instance, by line, day type and time band) will have a larger sample error than the overall figure.

6.7 Fieldwork

- 6.7.1 Surveyors will record the following information for each passenger surveyed:
- If a valid ticket is held, the details of the journey will be recorded; including origin and destination, passenger type (adult, student, child), ticket type and time of inspection.
 - If no ticket is held or the ticket shown is invalid, the reason for not holding a ticket or type of invalidity will be recorded, as well as the journey details outlined above.
- 6.7.2 As part of this process the passenger's ticket will be inspected.

6.8 Fare Loss

- 6.8.1 Each passenger surveyed during the Fare Evasion Survey will be allocated a fare due. The fare due is the fare that the passenger should have paid for the journey undertaken, and will depend on the following:
- number of zones traversed;
 - whether the passenger is an adult, student or child;
 - ticket type (single, return, 7 day, 30 day, Leap Card, etc.).
- 6.8.2 For each passenger surveyed during the Fare Evasion Survey, Fare Loss is the difference between the fare due and the fare actually paid by the passenger.
- 6.8.3 For passengers with a valid ticket, the Fare Loss will always be zero, as no revenue has been lost. For passengers with no ticket, or a ticket that is not valid on Luas, the Fare Loss will be the same as the fare due, as all revenue has been lost.
- 6.8.4 For passengers who have an invalid ticket, the Fare Loss will be calculated based on the type of invalidity. For example, an adult passenger in possession of a child ticket will be allocated a Fare Loss based on the difference between the price of an adult ticket and the price of a child ticket for the journey undertaken. For example, if the adult fare is €2.50 and the child fare is €1.00, then the Fare Loss is €2.50 - €1.00 = €1.50.

- 6.8.5 A passenger who stays on the LRV beyond the zone paid for, or an adult passenger incorrectly using a student ticket will be allocated a Fare Loss based on the difference between the fare due and the fare paid, using the same method described above.
- 6.8.6 A passenger with any of the following categories of invalid ticket will be allocated a Fare Loss of zero, i.e. such invalid tickets will be treated as valid tickets for the purposes of calculating the Fare Loss:
- Student ID number not written on ticket
 - No Adult ID
 - Adult ID number not written on ticket
 - Personalised Leap Card with no Tax Saver ticket for current month, but which had a valid Tax Saver ticket for a previous month, which had expired.
- 6.9 **Fare Evasion Rate**
- 6.9.1 The Fare Evasion Rate is the total Fare Loss divided by the total fare due, for all passengers surveyed during the Fare Evasion Survey, weighted by Line, day type, time band and trip length, and expressed as a percentage.
- 6.10 **Fare Evasion Survey Report**
- 6.10.1 TII shall provide the Operator with a report of the results of each Fare Evasion Survey within forty Business Days of the completion of the Fare Evasion Survey. The Fare Evasion Survey Report shall include the following information:
- the overall Fare Evasion Rate
 - the Fare Evasion Rate for each Line
 - the Fare Evasion Rate broken down by day type and time band
 - Breakdown of invalid tickets
 - Reasons given for having no ticket

Schedule 7: Safety Management

7.1 General Safety Requirements

- 7.1.1 The Operator shall be responsible for all safety matters related to the performance of the Services and shall manage on behalf of NTA and TII all safety requirements related to the System in accordance with all Legal Requirements so as to enable NTA and TII to comply with their obligations under any relevant Legal Requirements.
- 7.1.2 The Operator shall bear full responsibility for the safety of the operation and maintenance of the System throughout the Operating and Maintenance Period in accordance with the Contract.
- 7.1.3 Without prejudice to the Operator's general obligation to ensure the safety of the System, the Operator shall:
- comply with all applicable Legal Requirements in respect of safety, health and welfare;
 - comply with the general and specific requirements of the Commission for Railway Regulation;
 - provide all appropriate measures in the operation and maintenance of the System to ensure, so far as reasonably practicable, the safety of all passengers (including different categories of people with reduced mobility), contractors, staff and the general public;
 - consult with and adopt the requirements of the emergency services;
 - take particular care to ensure safety for all passengers at accesses and exits, while waiting, boarding or alighting and when travelling in and moving along the LRVs; and
 - have due regard for the safety of third parties, in particular pedestrians, cyclists, motorists and other road users, in the operation and maintenance of the System.

7.2 Safety Planning

- 7.2.1 The Operator shall establish an emergency planning forum together with relevant third parties, which shall include, as a minimum, TII and the emergency services. This forum will consider and agree the safety risks presented by the System, examine these risks in a thorough manner and plan the appropriate contingencies. The areas covered shall include access, evacuation routes, procedures for power shutdown, procedures for entering LRVs in various configurations, procedures for reinstatement of the service, and planning for specific incidents.
- 7.2.2 The Operator shall establish a safety forum together with relevant third parties. This forum will be used to consult relevant internal and external stakeholders on safety related matters.

7.3 Safety Management System

- 7.3.1 The Operator shall implement a Safety Management System ("SMS") for the operation and maintenance of the System and shall prepare a document ("Safety Management Document") describing the components of its SMS.
- 7.3.2 The Operator shall obtain Commission for Railway Regulation approval for its SMS in accordance with Sections 44 to 46 of the Railway Safety Act, 2005, as amended by Statutory Instrument 444 of 2013.

- 7.3.3 On the Commencement Date the Operator shall immediately notify the Commission for Railway Regulation in writing of the proposed transfer of operations and provide the Commission for Railway Regulation with details of the proposed ownership and organisational structure together with a statement of the changes it intends to make to the incumbent operator's Safety Management Document. (Ref. S.44 (1) of the Railway Safety Act 2005 as amended by SI 444 of 2013).
- 7.3.4 The SMS shall comply in all respects with Commission for Railway Regulation's requirements and guidelines, Legal Requirements and the Contract.
- 7.3.5 The SMS must be documented in all relevant parts and shall in particular describe the distribution of responsibilities within the organisation of the Operator. It shall show how control by the management on different levels is secured, how staff and their representatives on all levels are involved and how continuous improvement of the SMS is ensured. The SMS shall cover the management of all safety matters relating to the Services including the following aspects:
- developing and promulgating safety procedures, and agreeing these with any relevant Competent Authorities with the co-operation of TII;
 - defining specific safety measures for particular activities, jobs and parts of the System and producing method statements on safety aspects;
 - reporting on safety matters and accident statistics to TII and to relevant Competent Authorities as appropriate, such data to be in a format notified by TII and the Competent Authorities to the Operator from time to time;
 - training the Operator's staff and, to an appropriate level, TII's staff on all safety matters and ensuring relevant staff and Sub-Contractors have adequate safety procedures and have received sufficient training to enable them to carry out their functions with respect to the System safely;
 - performing safety inspections, safety audits and spot checks on the System, on the Operator's compliance with the SMS, and on the Operator's and Sub-Contractors' personnel;
 - taking appropriate actions on the discovery of breaches of safety procedures.
- 7.3.6 The Operator shall update and obtain approval for the SMS to take account of any modifications to the System and as required by the Commission for Railway Regulation.
- 7.3.7 The Operator shall provide TII with a copy of the SMS in advance of any submissions to the Commission for Railway Regulation. TII shall consider and, where appropriate, comment upon the SMS.
- 7.3.8 The Operator shall employ one or more competent persons to ensure the SMS shall be developed, enforced and maintained. Such person(s) shall have sufficient authority to ensure that all safety requirements under the Contract are complied with.
- 7.4 **Safety Management**
- 7.4.1 The Operator shall develop safety procedures for the operation and maintenance of the System.

7.4.2 The Operator shall implement the SMS and safety procedures for the operation and maintenance of the System throughout the Operating and Maintenance Period.

7.5 Audit and Inspection of the SMS and the System

7.5.1 The Operator shall allow Competent Authorities with responsibility for safety matters and TII and its authorised representatives from time to time on reasonable notice (unless such Competent Authority, TII and its authorised representatives have cause to require an immediate inspection, in which case the Operator shall allow immediate access) to enter upon the System and audit or inspect the safety of the System and the implementation of the SMS, without unreasonable disruption to the performance of the Services, to ensure that the Operator's obligations in respect of the performance of the Services are being discharged in accordance with the SMS.

7.5.2 In the event that, as a consequence of any such audit or inspection, the Operator identifies, or TII or a Competent Authority notifies the Operator in writing of:

- any remedial action; or
- any change in operating practices, management or other safety critical aspects of operations,

necessary in either case for the safe operation of the System then the Operator shall carry out such remedial action or, subject to Schedule 10:, implement the necessary change in the Services in each case as soon as reasonably practicable having regard to the nature of the matter and the risks to safety of persons and the infrastructure.

7.5.3 If the remedial action or change referred to in section 7.5.2 above is a result of:

- a Change of Law, then the provisions of Clause 35 shall apply;
- a Defect, then the provisions of Schedule 10: shall apply;
- a Project Event, then the provisions of Schedule 35: shall apply;
- any other reason, including Damage to the System or the act, omission, breach or other default of the Operator, then the cost of implementing such remedial action or change and the costs of the audit shall be borne by the Operator.

7.6 Legal Requirements

7.6.1 The Operator shall, after prior consultation with the TII, implement all alterations and changes to the Services which are required by any Legal Requirement which comes into force after the Operating Commencement Date relating to safety.

7.6.2 At the Operator's cost, the Operator shall comply and shall procure that Sub-Contractors shall comply with the relevant health and safety regulations and requirements of all relevant Competent Authorities including the Commission for Railway Regulation and the Health and Safety Authority.

7.7 Construction Regulations

7.7.1 The Parties agree that, where the Safety, Health and Welfare at Work (Construction) Regulations 2013, as amended, apply to any activities for which the Operator is responsible

under the Contract the Operator shall, in relation to those activities, be the "Client" as that term is used in those regulations, and shall comply with the Regulations accordingly.

7.8 Response to Emergencies

- 7.8.1 The Operator shall react safely and quickly to emergencies in all aspects of the operation and maintenance of the System.
- 7.8.2 The Operator shall develop an emergency management plan that set outs its pre-determined actions to providing a response to a major crisis or emergency occurring on the System ("Emergency Management Plan").
- 7.8.3 The Emergency Management Plan shall take into consideration all Legal Requirements, guidelines and directions issued by the Commission for Railway Regulation and the requirements of "A Framework for Major Emergency Management" and the "Protocol for the relationship between the Department for Transport, the Rail Accident Investigation Unit and TII: Incidents on the Luas Network (2008).
- 7.8.4 In developing the Emergency Management Plan, the Operator shall consult with all relevant Competent Authorities, the Commission for Railway Regulation, emergency services and local authorities.
- 7.8.5 As a minimum the Emergency Management Plan shall cover the following:
- Emergency Evacuation
 - Detrainment
 - Displaced Wire
 - Security Arrangements and Suspect Packages
 - Accident and Incident Management
 - Accident and Incident Investigation
- 7.8.6 The Emergency Management Plan shall be part of the SMS.
- 7.8.7 All personnel designated to carry out specific responsibilities under the Emergency Management Plan are expected to know and understand the policies and procedures outlined in the plan. The response to any major crisis or disturbance shall always be conducted within the framework of the plan.
- 7.8.8 The Operator shall ensure that all staff are given clear instructions in line with the Emergency Management Plan, including training to deliver public address announcements in a way that avoids causing alarm and that instils confidence in passengers that the matter is under control.
- ## **7.9 Reporting of Incidents**
- 7.9.1 The Operator shall comply with all Legal Requirements relating to the reporting of accidents, incidents, near misses, fatalities, injuries, diseases and dangerous occurrences. The Operator shall liaise with TII in relation to the reporting of any incident and the future measures to be taken to prevent the recurrence thereof.

7.10 Identification of a Safety Hazard

- 7.10.1 If TII has, at any time, reason to believe that the operation of any part of the System or item of the Operator's Equipment may be likely to fail, may present a hazard to the safety of any persons or where an actual failure or hazard is identified then TII may (but is not bound to and assumes no liability as a result of any failure to do so) notify the Operator, and the Operator shall forthwith, and in any case within the timescale (if any) set out in TII's notice, effect the required maintenance and/or repair in order to render safe said part of the System or item of the Operator's Equipment. Save to the extent that such maintenance and/or repair is necessary because the Operator has breached the Contract, in which case the cost of implementing the necessary maintenance and/or repair shall be borne by the Operator, such notice shall be deemed to constitute a Variation Notice and the provisions of Clause 34 (Variations) shall thereafter apply.

Schedule 8: Sustainability and Environmental Management

8.1 Sustainability

- 8.1.1 The Operator shall be committed to the sustainable delivery of public transport and shall incorporate sustainability principles into the operation of the System.
- 8.1.2 The Operator shall fully support the strategic goals committed to within the TII Sustainability Statement and TII Energy Policy.
- 8.1.3 The Operator shall prepare and implement a Dublin Light Rail Sustainability Plan 2019-2024.
- 8.1.4 The Dublin Light Rail Sustainability Plan 2019-2024 shall detail measures for the monitoring and reduction of water consumption, electricity consumption, gas consumption and CO₂ emissions. The plan shall include details of energy efficiency initiatives proposed by the Operator to increase the energy efficiency of the System, including any renewal energy projects proposed. The Operator shall assign an activity metric to each of the Operator's activities used to understand the energy performance and to track progress towards targets using an Energy Performance Indicator (EnPI).
- 8.1.5 The Dublin Light Rail Sustainability Plan 2019-2024 shall detail measures to increase recycling rates.
- 8.1.6 The Operator shall submit quarterly reports to TII on the implementation of the Dublin Light Rail Sustainability Plan 2019-2024.

8.2 General requirements

- 8.2.1 An Environmental Impact Statement (EIS) has been prepared by TII for each Line (prior to granting each Light Rail Order) as required by the Transport (Railway Infrastructure) Act, 2001 as amended by the Planning and Development (Strategic Infrastructure) Act, 2006.
- 8.2.2 These EISs describe measures that shall be taken as a minimum in order to remedy, reduce, and where possible, avoid any adverse environmental impacts of the System.
- 8.2.3 The Operator shall comply with and implement the requirements and mitigation measures as set out in the EIS for each Line.
- 8.2.4 The Operator shall also comply with and implement any additional requirements, conditions and mitigation measures included in the Light Rail Order.

8.3 Environmental Management System

- 8.3.1 The Operator shall control all environmental impacts and risks through an Environmental Management System (EMS) and associated Environmental Management Plan (EMP). The Operator shall establish and maintain an EMS accredited to ISO 14001:2015 "Environmental Management Systems - requirements with guidance for use".
- 8.3.2 The Operator shall submit the EMS to TII no later than 60 Business Days after the Operating Commencement Date.
- 8.3.3 The Operator shall have the EMS independently audited no later than 100 Business Days after the Operating Commencement Date by an accredited environmental auditor. The audit report shall be provided to TII when it becomes available.

8.4 Environmental Management Plan

8.4.1 The EMS shall be supported by an Environmental Management Plan (EMP).

8.4.2 The EMP shall detail the approach to and persons or entities responsible for environmental management for the duration of the Contract under the following headings:

- I. Context of the Organisation
- II. Leadership
 - a. Leadership and commitment
 - b. Environmental Policy and Sustainability Policy
 - c. Organisational roles, responsibilities and authorities
- III. Planning
 - a. Actions to address risks and opportunities
 - b. Environmental objectives and planning to achieve them
- IV. Support
 - a. Resources
 - b. Competence
 - c. Awareness
 - d. Communications
 - e. Documented information
- V. Operation
 - a. Operational planning and control
 - b. Emergency preparedness and response
- VI. Performance evaluation
 - a. Monitoring, measurement, analysis and evaluation
 - b. Internal audit
 - c. Management review
- VII. Improvement
 - a. General
 - b. Non-conformity and corrective action

VIII. Appendices

- a. Environmental Complaints Procedure
- b. Environmental Incident Management Procedure
- c. Noise and Vibration Management Plan
- d. Waste Management Plan
- e. Invasive Alien Plant Species Management Plan

8.4.3 The EMP shall be submitted by the Operator to TII along with the EMS.

8.4.4 The EMP shall be subject to TII's approval and, once approved, shall be updated and submitted at least on an annual basis.

8.4.5 The Operator shall implement the EMP throughout the Operating and Maintenance Period.

8.5 Energy management system

8.5.1 The Operator shall establish an Energy Management System (EnMS) to manage energy performance including energy efficiency, use and consumption for the System. The Operator shall obtain certification to ISO 50001:2018 "Energy management systems – Requirements with guidance for use" within one year of the Operating Commencement Date and maintain certification throughout the Operating and Maintenance Period. The boundaries shall include the LRV fleet, substations, platforms, Depots and buildings. The scope shall be all the energy consumed by the Operator and its Sub-Contractors. Energy efficiency targets shall be set by the Operator for each year of the Contract numerically in line with that required of TII to achieve its 2020 and 2030 government energy efficiency targets. The EnMS shall be supported by an Energy Management Plan (EnMP).

8.5.2 The Operator shall submit the EnMS to TII no later than 60 Business Days after the Operating Commencement Date.

8.5.3 The Operator shall have the EMS independently audited no later than 100 Business Days after the Operating Commencement Date by an accredited environmental auditor. The audit report shall be provided to TII when it becomes available.

8.6 Responsibility for sustainability and environmental management

8.6.1 The Operator shall appoint a member of staff as the Operator's Sustainability and Environment Manager who shall:

- be a competent person with relevant sustainability, environmental and energy training and experience;
- take overall responsibility for sustainability and environmental issues (including energy) pertaining to the Contract;
- liaise with TII on matters pertaining to the environment;
- be responsible for the management of the EMS, EMP and EnMS;
- attend sustainability, environmental and energy meetings with TII when required;

- attend sustainability, environmental and energy audits;
- prepare all sustainability, environmental and energy reports;
- co-ordinate and/or carry out environmental monitoring, audits and inspections;
- communicate sustainability and environmental requirements to all personnel;
- liaise with and support TII's Energy Performance Officer (EPO) on matters pertaining to energy.

8.7 Environmental complaints

- 8.7.1 The Operator shall develop and implement a complaints procedure for reporting, recording and closing out environmental complaints from the public. Environmental complaints received from all sources of communication, as detailed in Schedule 28:, shall be managed by the Operator. The environmental complaints procedure shall be included in the EMP.
- 8.7.2 The environmental complaints procedure shall be communicated to all relevant personnel on a regular basis.
- 8.7.3 The Operator shall record all complaints of an environmental nature related to the operation and maintenance of the System.
- 8.7.4 All complaints of an environmental nature shall be resolved as soon as is reasonably practicable.
- 8.7.5 New and outstanding environmental complaints shall be reported to TII in the Period Report.

8.8 Environmental incidents

- 8.8.1 The Operator shall develop and implement a procedure for managing environmental incidents. The environmental incident management procedure shall be included in the EMP.
- 8.8.2 An environmental incident may include, but is not limited to the following:
- spillage of hazardous materials (as defined by the Waste Management Acts 1996-2011);
 - breach of any EIS or Light Rail Order limits e.g. noise and vibration;
 - any spillage which cannot be rapidly contained and controlled, for example oil spills;
 - inappropriate disposal of waste
- 8.8.3 The environmental incident management procedure shall be communicated to all relevant personnel on a regular basis.
- 8.8.4 The Operator shall record all environmental incidents related to the operation and maintenance of the System.
- 8.8.5 All environmental incidents shall be resolved as soon as is reasonably practicable.
- 8.8.6 The Operator shall exercise due diligence at all times to inform itself of any such circumstances that may require such resolution.

8.8.7 The Operator shall permit TII access to the System at all times in case of emergency, and otherwise at all reasonable times on reasonable prior notice, with or without workmen and others and all necessary appliances and materials for the purpose of carrying out any tests, sampling or other investigations which TII considers necessary to enable it to determine whether Environmental Damage has occurred or could be caused by any activities of the Operator, and taking any steps to rectify any condition of the System which has either resulted in, or which it is reasonably foreseeable could result in, Environmental Damage where TII is or may be required by any Competent Authority to take such steps, or where the condition of the System could in TII's reasonable opinion result in TII or NTA incurring any liability, or being or becoming subject to the requirement of any Competent Authority,

8.8.8 New and outstanding environmental incidents shall be reported to TII in the Period Report.

8.9 Noise and Vibration

8.9.1 The Operator shall at all times minimise noise and vibration emissions associated with all operational and maintenance related activities.

8.9.2 The Operator shall prepare a Noise and Vibration Management Plan (NVMP). This NVMP shall be submitted by the Operator as an appendix to the EMP.

8.9.3 The Operator shall undertake operational noise and vibration monitoring at least every 6 months and report the results to TII.

8.9.4 This monitoring shall be undertaken at:

- 25 LRV specific noise and vibration monitoring locations along the Red Line;
- 25 LRV specific noise and vibration monitoring locations along the Green Line

8.9.5 All operational noise monitoring shall be undertaken in accordance with the TII Environmental Noise Monitoring Procedure for the Operational System

8.9.6 Unattended continuous ambient noise monitoring of 24-hour duration, shall be undertaken on an annual basis. This monitoring shall include:

- 25 ambient noise monitoring events along the Red Line;
- 25 ambient noise monitoring events along the Green Line;

8.9.7 All operational vibration monitoring shall be undertaken in accordance with BS 6472-1:2008 Guide to evaluation of human exposure to vibration in buildings: Vibration sources other than blasting and BS ISO 4866:2010 Mechanical vibration and shock – Vibration of fixed structures – Guidelines for the measurement of vibrations and evaluation of their effects on structures.

8.9.8 Both Vibration Dose Value and Peak Particle Velocity shall be monitored at all monitoring locations.

8.9.9 All monitoring locations shall be agreed with TII prior to the commencement of the first monitoring event each year.

8.9.10 The Operator shall submit a draft electronic copy of the measurement results and interpretive report to TII for comment within one month of monitoring completion. TII may provide comments and/or requests for clarification to the Operator following a review period of one

month. The Operator will incorporate such comments and/or amend the Report to address TII comments or the requests for clarification, if deemed appropriate by the Operator, and re-issue the report within one week.

- 8.9.11 The Operator shall ensure that operational monitoring is carried out at additional locations if complaints pertaining to noise and/or vibration have arisen.
- 8.9.12 Any person/s carrying out noise monitoring on the Operator's behalf must demonstrate that they are a "Competent Person" as detailed in the EPA's Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4).
- 8.9.13 Any person/s approving and signing off the Operator's noise monitoring reports must demonstrate that they are a "Competent Person" as detailed in the EPA's Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4). Any person/s approving and signing off the Operator's noise monitoring reports must be a full member of a recognised acoustic body e.g. the Institute of Acoustics or equivalent.
- 8.9.14 The Operator shall implement mitigation measures to ensure that potential noise effects associated with all maintenance and cleaning activities are minimised.
- 8.9.15 The Operator shall manage noise and vibration emissions associated with all maintenance activities in accordance with:
- The Noise and Vibration Management Plan;
 - British Standard 5228-1:2009 + A1:2014 "*Code of Practice for noise and vibration control on construction and open sites – Part 1: Noise*"; and
 - British Standard 5228-2:2009 + A1:2014 "*Code of Practice for noise and vibration control on construction and open sites – Part 2: Vibration*"
- 8.9.16 The Operator shall undertake sound pressure level measurements on all powered maintenance equipment within three months of the Operating Commencement Date.
- 8.9.17 The Operator shall submit a draft electronic copy of the measurement results and interpretive report to TII for comment within one month of monitoring completion. TII may provide comments and/or requests for clarification to the Operator following a review period of one month. The Operator will incorporate such comments and/or amend the Report to address TII comments or the requests for clarification, if deemed appropriate by the Operator, and re-issue the report within one week.
- 8.9.18 All operational and maintenance related acoustic data will be made available to TII in a digitally accessible format e.g. MS Excel or GIS.
- 8.9.19 TII shall require System Contractors to minimise noise and vibration emissions associated with Works.
- 8.9.20 System Contractors shall be required to prepare and submit a Noise and Vibration Management and Control Procedure prior to commencement of Works. The Noise and Vibration Management and Control Procedure shall provide for the management and mitigation of noise and vibration during Works in line with Good Industry Practice.
- 8.9.21 TII shall consult with the Operator on System Contractors' Noise and Vibration Management and Control Procedures.

8.10 Water Pollution

- 8.10.1 The Operator shall ensure that all operational and maintenance activities do not adversely impact on water quality.
- 8.10.2 The Operator shall apply for effluent discharge licences in accordance with the Local Government (Water Pollution) Acts, 1977 and 1990, as required, before any run-off arising from the provision of the Services is disposed of to sewers or storm water drains and shall issue TII with a copy of this application and any licence.
- 8.10.3 The Operator shall ensure that water supply and drainage arrangements, including disposal of surface water, comply with the requirements of Irish Water and the relevant local authority.
- 8.10.4 Any sampling, analyses, measurements, examinations, maintenance and calibrations as required shall be undertaken by trained and competent staff. All analysis shall be undertaken by an accredited laboratory. Records of same shall be retained by the Operator in accordance with the requirements of ISO 14001: 2015.
- 8.10.5 In situations where drought conditions prevail, the Operator shall submit proposals in relation to water conservation for TII's consideration.

8.11 Waste disposal

- 8.11.1 The Operator shall prepare a Waste Management Plan (WMP) as part of its EMP. This WMP shall be submitted by the Operator as an appendix to the EMP.
- 8.11.2 The Operator shall take whatever measures it deems necessary to comply with all Legal Requirements whilst taking all practicable and commercially viable approaches to minimising waste.
- 8.11.3 The Operator shall actively discourage fly-tipping at Depot sites and on the System.
- 8.11.4 The Dublin Light Rail Sustainability Plan 2019-2024 shall aim to reduce waste where possible.

8.12 Management of Invasive Alien Plant Species and Noxious Weeds

- 8.12.1 The Operator shall manage and control the presence of Invasive Alien Plant Species along the Luas network in accordance with the Birds and Habitats Regulations 2011 and European Regulations No. 1143/2014.
- 8.12.2 The Operator shall develop and implement an Invasive Alien Species Management Plan (IAPS MP) as part of the EMP. This IAPS MP shall be submitted by the Operator as an appendix to the EMP.
- 8.12.3 The Operator shall establish and maintain a centralised Geographical Information System database to assist in the management of IAPS on the System. This database shall record details on IAPS infestations locations, treatment and regrowth. TII shall be provided with access to this database.
- 8.12.4 The Operator shall ensure that those employees or contractor operatives involved in the treatment of Invasive Alien Species are registered professional users under the Sustainable Use of Pesticides Regulations 2012.

8.12.5 The Operator shall manage and control the presence of Noxious Weeds as specified within the Noxious Weeds Act 1936.

8.13 Audits

8.13.1 On a monthly basis the Operator's Sustainability and Environmental Manager shall undertake an environmental inspection of the Operator's Depot facilities to check compliance with the environmental requirements set out in this Schedule. The findings of the environmental inspections shall be forwarded to TII within 5 working days of inspection completion.

8.13.2 On a quarterly basis the Operator's Depot facilities shall be audited by TII for compliance with the environmental requirements set out in this Schedule and the Operator shall facilitate such audits. The quarterly audits shall comprise an environmental inspection of each depot and a spot check on environmental management documentation.

8.13.3 The Operator's EMP shall be audited by TII annually and the Operator shall facilitate such audits.

8.13.4 The findings of all external audits of the Operators EMS and EnMS shall be forwarded to TII within one week of receipt.

8.14 Meetings

8.14.1 The Operator shall meet with TII on a bimonthly basis in relation to the sustainability and environmental performance of the System.

8.14.2 The Operator shall prepare and circulate the agenda and meeting minutes for all meetings that take place pursuant to paragraph 8.14.1.

Schedule 9: Computerised Maintenance Management System (CMMS)

9.1 Computerised Maintenance Management System (CMMS) General Obligations

- 9.1.1 The Operator shall maintain a computerised database of records to be used for all Luas assets, which shall include as a minimum the matters listed below (the "Computerised Maintenance Management System" or "CMMS").
- 9.1.2 The CMMS shall be of a type and function to be agreed in writing with TII no later than sixty (60) Business Days after the Commencement Date.
- 9.1.3 A single common CMMS shall be used for the recording of all data for Luas infrastructure assets and LRV assets (it shall not be a requirement to include the automatic fare collection system (AFCS) assets in the CMMS).
- 9.1.4 The CMMS shall be compatible with the Operator's Database described in paragraph 4.3.1 and shall either facilitate direct entry of information on call logging, incident recording etc. by CCR staff or shall be set up so that all of the data logged in the Operator's Database automatically uploads to the CMMS within 1 minute of incident recording by CCR staff.
- 9.1.5 The cost of the CMMS deployment and all licencing costs associated with same shall be borne by the Operator. The Operator shall ensure that any adequately trained person(s) nominated by TII (up to a maximum of 10) shall have full and independent access to the CMMS to read and, where appropriate, write data. Some records may be locked on creation, for example safety event data or manufacturer's material. In such cases, read-only access will be acceptable to TII.
- 9.1.6 It shall be possible to add an indefinite number of notifications at the discretion of TII for particular events as recorded on the CMMS, e.g. logging of certain faults and failures, repeat occurrences of certain faults and failures, closure of issues, etc.
- 9.1.7 TII shall have full viewing access for up to ten viewers to all reports generated within the CMMS.
- 9.1.8 Unless otherwise agreed with TII, all record keeping for input to the CMMS shall be carried out using mobile devices. Such record keeping shall be to a level of detail to the satisfaction of TII.
- 9.1.9 The CMMS shall be provided as a hosted application with secure access provided from an external source or with physical servers at one of the Depots. In each case the Operator must satisfy TII as to the resilience and security of the CMMS installation.
- 9.1.10 The Operator shall provide full and unrestricted access to TII to the CMMS for audit purposes, on TII giving no less than three (3) Business Days notice of such access, at any time during the Operating and Maintenance Period.

9.2 Asset Register and Configuration Data

- 9.2.1 The CMMS shall be the repository for the Asset Database for Luas infrastructure assets and the LRV assets
- 9.2.2 The asset register shall be detailed to a level of asset data precision as defined by TII, in most cases this will be to the level of the lowest Line Replaceable Unit.
- 9.2.3 The following asset specific data is to be recorded initially as a minimum on the CMMS;

- (i) Asset Group
- (ii) Asset Sub Group
- (iii) Name/reference
- (iv) Location
- (v) Model Number
- (vi) Manufacturer
- (vii) Serial Number (where available)
- (viii) Installation Date/Service commencement date
- (ix) Link to spare parts useable on that asset
- (x) Software version and revision (if applicable)
- (xi) Corrective maintenance records
- (xii) Routine maintenance records

9.2.4 TII may require further data to be stored for particular assets at any stage during the Operating and Maintenance Period. If required, the Operator shall facilitate the storage of this data at no cost to TII, provided the CMMS facilitates the storage of such data.

9.3 Routine Maintenance Management

9.3.1 The CMMS shall hold the LRV Annual Maintenance Plan to the detail as required in Schedule 12: and the Infrastructure Annual Maintenance Plan to the detail as required in Schedule 17:.

9.3.2 All changes to the LRV Annual Maintenance Plan and Infrastructure Annual Maintenance Plan shall be documented in the CMMS and full revision control and history shall be stored in the CMMS.

9.3.3 The CMMS shall hold records of Routine Maintenance performed for all Routine Maintenance activity, including (but not limited to):

- (i) Annual maintenance plan routine to be undertaken
- (ii) Date/time of arrival onsite to perform intervention
- (iii) Subject to Clause 8.8 (Data Protection), full names of operatives performing works
- (iv) Details of assets affected
- (v) Parts used.
- (vi) Details of measurements taken or recordings of usage/wear rates as appropriate for asset
- (vii) Time when assets are back to full functionality or available once more for operational use.
- (viii) Time offsite

- (ix) Subject to Clause 8.8 (Data Protection), signatures of operatives who performed the works onsite confirming works and particulars recorded are correct and accurately reflect the works completed onsite.

9.4 Corrective Maintenance Management

9.4.1 The CMMS shall hold records of all Corrective Maintenance performed for all Corrective Maintenance activity, including (but not limited to):

- (i) Date/time of incident logging (may be extracted from Operator's Database, but if so must be done automatically with no manual intervention)
- (ii) Priority of Corrective Maintenance task.
- (iii) Whether assets are still operational or not, or percentage of service still possible if function is impaired.
- (iv) Date/time of arrival onsite to perform intervention.
- (v) Subject to Clause 8.8 (Data Protection), full names of operatives performing works.
- (vi) Details of assets affected.
- (vii) Failure modes.
- (viii) Failure details.
- (ix) Repair/intervention details with specific details of how fault was corrected and whether it is complete or follow-up works are required
- (x) Parts used.
- (xi) Details of measurements taken or recordings of usage/wear rates as appropriate for asset
- (xii) Time when assets are back to full functionality
- (xiii) Time offsite
- (xiv) Subject to Clause 8.8 (Data Protection), signatures of operatives confirming works and particulars recorded are correct and accurately reflect the works completed onsite.

9.5 Spare Parts Inventory Management

9.5.1 The CMMS shall store or be compatible with a computerised system for storage of records for all Spare Parts for use on Luas.

9.5.2 If the CMMS is compatible with a computerised system for storage of Spare Parts records, it shall be setup such that all of the data logged for Spare Parts will automatically upload to the CMMS every 24 hours.

9.5.3 The CMMS shall hold records of Spare Parts for use on Luas, including (but not limited to);

- (i) Name/reference

- (ii) Asset group
- (iii) Asset sub-group
- (iv) Spare Part item type
- (v) Reference to asset which it is used for
- (vi) Storage Location
- (vii) Model Number
- (viii) Manufacturer
- (ix) Supplier
- (x) Delivery lead time
- (xi) Order quantity
- (xii) Minimum stock quantity for reorder.
- (xiii) Expected life of Spare Part (if wear/usage based part)
- (xiv) Cost
- (xv) Serial Number (where available)
- (xvi) Usage to date
- (xvii) Software version and revision (if applicable)
- (xviii) Corrective Maintenance records
- (xix) Routine Maintenance records

9.6 Management Reports

- 9.6.1 The CMMS shall generate reports and these shall be made available to TII for viewing and generation at all times.
- 9.6.2 The CMMS reporting function shall allow TII to generate custom reports to facilitate trend analysis and review of asset performance and functionality. The reports shall be configurable by TII as required and shall allow at a minimum the inclusion of any of the following items within a report:
 - (i) Any one or combination of the asset specific data as outlined in paragraph 9.2.3 above.
 - (ii) Any one or combination of the Routine Maintenance records as outlined in paragraph 9.3.3 above.
 - (iii) Any one or combination of the Corrective Maintenance records as outlined in paragraph 9.4.1 above.

(iv) Any one or combination of the Spare Parts Inventory Management records as outlined in Section 9.5 above

(v) Time period

(vi) Any combination or permutation of the above (i) to (v) items.

9.6.3 Examples of reports which will be required in accordance with paragraph 9.6.2 above are as follows (note this list is non-exhaustive and TII require the CMMS to have the flexibility to generate custom reports at all times as outlined above):

(i) Consumables consumption rate for specific assets over specific time periods.

(ii) Mean time between failures (MTBF) for specific assets over lifecycle.

(iii) Mean time to repair (MTTR) for specific assets over lifecycle.

(iv) List of a specific asset type exceeding a set operational age within a specified location.

(v) Comparison of comparable assets performance for a given time period.

(vi) Maintenance interventions performed on a given asset group within a given time period.

(vii) Performed routine maintenance activities versus planned routine maintenance activities for a given Reporting Period.

(viii) Outstanding corrective maintenance tasks which are not complete, but which are logged in excess of 24 hours.

(ix) Expected time to end of life (EOL) for a given asset or asset group.

9.6.4 The CMMS shall have the capability to facilitate the extraction of raw data in any file format required by TII.

9.6.5 The CMMS reporting function to enable the generation of custom reports shall be user-friendly and shall have the capability to facilitate the establishment and generation of a new report in no more than 5 minutes by any TII user who is trained on the use of the CMMS.

Schedule 10: Defects in and Damage to the System

10.1 Operator's General Obligations

- 10.1.1 As part of its obligation to operate and maintain the System, the Operator shall be responsible for monitoring the performance of the System, identifying Defects in and Damage to the System, and for notifying TII of Defects.
- 10.1.2 Unless otherwise agreed in accordance with paragraph 10.3.1, the Operator shall not be responsible for the rectification of Defects.
- 10.1.3 In the event that the Operator becomes aware of any Defect in or Damage to the System, the Operator shall take all steps as are in the circumstances reasonable to mitigate any risk to safety and any losses that TII would suffer or incur as a result of such Defect or Damage to the System.
- 10.1.4 Without prejudice to the generality of the foregoing, the Operator shall minimise the effect of any Defect or Damage to the System on the System's ability to be operated and maintained in accordance with the Legal Requirements, Service Specification and the Performance Standards and shall, where appropriate:
- rectify or replace or procure the rectification or replacement of the Defect or Damage to the System, and
 - restore the System to a state where it may be operated and maintained in accordance with the Legal Requirements, Service Specification and the Performance Standards as soon as reasonably practicable.
- 10.1.5 The Operator shall take part in such meetings as may be necessary and otherwise co-ordinate and co-operate with TII and/or System Contractors to arrange for rectification or replacement (as appropriate) of Defects.

10.2 Operator's responsibility for identification and notification of Defects

- 10.2.1 If the Operator becomes aware of any fault or failure in the System that it believes to be a Defect, or if TII otherwise becomes aware of the existence of a Defect and so informs the Operator, then without prejudice to its obligations under Section 10.1 above, the Operator shall promptly serve notice upon TII (a "Defect Notice").
- 10.2.2 The Defect Notice shall describe in reasonable detail:
- The nature of the fault or failure in question;
 - The Operator's assessment of why it believes the fault or failure is a Defect and the grounds for such assessment;
 - The Operator's assessment of the effect that the alleged Defect may have upon the Operator's performance of the Services;
 - The steps being taken by the Operator to comply with its obligations under Section 10.1;
 - Any other information the Operator believes that TII may require.
- 10.2.3 Within a reasonable period following service of the Defect Notice, TII shall consider the information provided by the Operator and other such information as TII may reasonably request and shall notify the Operator in writing as to whether it concurs with the Operator's assessment that the fault or failure is a Defect.

10.3 Rectification of Defects

10.3.1 In the event that TII concurs with the Operator's assessment that the fault or failure is a Defect, then TII may instruct the rectification of the Defect either by means of a System Contractor or by means of a Variation, in which case the provisions of Clause 34 (Variations) shall apply.

10.3.2 In the event that TII does not concur with the Operator's assessment that the fault or failure is a Defect, then the Operator shall rectify the fault or failure without delay and shall be entitled to no additional payment in respect of such rectification.

10.4 Defects identified under Prior Operating Contract but not yet rectified

10.4.1 Table 10-1 shows a list of Defects identified under the Prior Operating Contract that have not been completely rectified as at the Commencement Date. Table 10-2 shows a list of alleged Defects identified under the Prior Operating Contract that have not been accepted by TII as Defects as at the Commencement Date.

Defect No.	Description	Status	Timescale
1	Charlemont Lift Water Ingress: The gradient of the paving on the inbound platform results in rain water flowing into Lift pit.	Open	Unknown
2	Vossloh Rail fastening system degrading on Curve 16 – Red Line.	Open	Unknown
3	Rail fastening system degrading on Brewery Road Bridge	Open	Unknown
4	Stray Current Collector Cable missing in Sandyford Depot – This is the cable that comes from Line B1	Open	Unknown

Table 10-1 Defects identified under Prior Operating Contract but not completely rectified as at Commencement Date

Defect No.	Description	Status	Timescale

Table 10-2 Alleged Defects identified under Prior Operating Contract but not accepted by TII as at Commencement Date

10.5 Damage to the System

10.5.1 If any Damage to the System occurs, the Operator shall rectify the Damage to the System with all due speed and hold harmless NTA and TII in respect of all costs of the Operator in carrying out the rectification.

Schedule 11: Light Rail Vehicles (LRVs)

11.1 Current LRV Fleet

11.1.1 The LRV fleet currently consists of the LRV types listed in Table 11-1.

LRV Type	Alstom Drawing Number	Number of LRVs in Fleet
Citadis 401	TRADA 14516	40
Citadis 402	TRADA21746000	26
Citadis 502	ABD001737922	7
Total		73

Table 11-1 Current LRV Fleet

11.1.2 TII has placed an order with Alstom Transport SA to extend the twenty six Citadis 402 LRVs by adding a suspended car (CC3) and a motorised car (MIC3) similar to those on the Citadis 502 LRVs. The combined length of the extension modules is 11m.

11.1.3 The extension of the twenty six Citadis 402 LRVs is expected to commence between July and October 2019 and end between January and April 2021. The extension modules will have a twelve months' defect remedy period.

11.1.4 TII has also placed an order with Alstom Transport SA for eight additional Citadis 502 LRVs to cope with increasing demand on the Green Line. These eight additional Citadis 502 LRVs are expected to be delivered at a rate of one per month between May 2020 and January 2021.

11.2 Citadis 401

11.2.1 The Citadis 401 is a "70% low floor" type, bi-directional LRV. The LRV length is approximately 41m, comprising 5 articulated modules on 4 bogies.

11.2.2 The basic Citadis 401 is made up of the following modules:

- 2 motor bogie modules with driver's cab: M1 and M2
- 1 intermediate module with pantograph: NP
- 1 suspended car body modules: CC
- 1 intermediate car with motor bogie: NM

11.3 Citadis 402

11.3.1 The Citadis 402 is the "full low floor" type, bi-directional LRV. The vehicle length is approximately 43.3m, comprising 7 articulated modules on 4 bogies.

11.3.2 The basic Citadis 402 is made up of the following modules:

- 2 motor bogie modules with driver's cab: MC1 and MC2
- 1 intermediate module with pantograph: IC2

- 3 suspended car body modules: SC1, CC2 and SC2
- 1 intermediate car with motor bogie: MIC1

11.4 Citadis 502

11.4.1 The Citadis 502 is the "full low floor" type, bi-directional LRV. The vehicle length is approximately 54.7m, comprising 9 articulated modules on 5 bogies.

11.4.2 The basic Citadis 502 is made up of the following modules:

- 2 motor bogie modules with driver's cab: MC1 and MC2
- 1 intermediate bogie modules with pantograph: IC2
- 4 suspended car body modules: SC1, CC2, CC3, and SC2
- 2 intermediate bogie modules with motor bogie: MIC1 and MIC3

11.5 Citadis extended 402

11.5.1 The extended 402 LRVs will be "full low floor" type, bi-directional LRVs. They will be classified as 502 type LRVs and will be very similar to the new 502 type. They will comprise of 9 articulated modules on 5 bogies.

11.5.2 The extended Citadis 402 will be made up of the following modules:

- 2 motor bogie modules with driver's cab: MC1 and MC2
- 1 intermediate module with pantograph: IC2
- 4 suspended car body modules SC1, CC2, CC3 and SC2;
- 2 intermediate cars with motor bogie: MIC1 and MIC3

11.6 Deployment of Fleet

11.6.1 The Timetables in Schedule 2: can be operated with a peak vehicle requirement (PVR) on Monday to Friday of 27 LRVs on the Red Line and 32 LRVs on the Green Line. It is expected that this PVR will give rise to a fleet deployment similar to that outlined in Table 11-2.

11.6.2 Citadis 402 LRVs and Citadis 502 LRV's must be operated on the Green Line only and must be stabled at Sandyford and Broombridge Depots. In addition, the Operator may be required to operate some Citadis 401 LRV's on the Green line in order to ensure that there is an adequate number of spare LRVs ("LRV Maintenance Spares") on the Green Line.

11.6.3 The number of Citadis 401 LRVs to be operated on the Green Line shall be notified by TII to the Operator from time to time. These Citadis 401 LRV's must be stabled and maintained at Sandyford or Broombridge Depots.

	Red Line	Green Line			Fleet Total
LRV Type	401	401	402/502	Total	

PVR	27 (am)	4 (am)	28 (am)	32 (am)	59
Maintenance Spares	8	1	5	6	14
Total	35	5	33	38	73

Table 11-2 Expected Fleet Deployment with PVR of 59 LRVs**11.7 LRV Maintenance Spares**

11.7.1 Table 11-2 shows 14 LRV Maintenance Spares out of a fleet of 73 LRVs. This represents a ratio ("LRV Spares Ratio") of 19.2%, which is very high by international standards.

11.7.2 During the Operating and Maintenance Period, TII shall gradually reduce the LRV Spares Ratio and the Operator shall be required to provide the Services with a reduced number of LRV Maintenance Spares as follows:

- From the Operating Commencement Date, the number of LRV Maintenance Spares shall be reduced to 12 LRVs out of a fleet of 73, which represents an LRV Spares Ratio of 16.4%. TII may require the Operator to introduce Timetables requiring a PVR on Monday to Friday of 61 LRVs from that date.
- An LRV Spares Ratio of 16.4% shall continue to apply until 31 December 2020. The number of LRV Maintenance Spares shall be calculated as 16.4% (rounded up to the nearest whole number of LRVs) of the number of LRVs in the fleet.
- From 1 January 2021, the number of LRV Maintenance Spares shall be reduced to 11 LRVs out of a fleet of 81, which represents an LRV Spares Ratio of 13.6%. TII may require the Operator to introduce Timetables requiring a PVR on Monday to Friday of 70 LRVs from that date.
- From 1 January 2022, the number of LRV Maintenance Spares shall be reduced to 10 LRVs out of a fleet of 81, which represents an LRV Spares Ratio of 12.3%. TII may require the Operator to introduce Timetables requiring a PVR on Monday to Friday of 71 LRVs from that date.
- For the remainder of the Operating and Maintenance Period, an LRV Spares Ratio of 12.0% of the total fleet shall apply. The number of LRV Maintenance Spares shall be calculated as 12.0% (rounded up to the nearest whole number of LRVs) of the number of LRVs in the fleet.

11.7.3 The Operator acknowledges and confirms that the number of LRV Maintenance Spares described in paragraphs 11.7.1 and 11.7.2 is adequate to allow for LRVs that are unavailable for service for reasons including but not limited to the following:

- Routine Maintenance
- Corrective Maintenance
- Cleaning
- Repair of accident damage and vandalism damage (including graffiti)

- LRVs quarantined by An Garda Síochána or another Competent Authority for the purpose of investigating incidents on the System
- Overhaul of LRVs
- Modifications to LRVs, provided that these modifications are carried out when no other LRVs of the same type are undergoing an overhaul or modification

11.7.4 The Operator also acknowledges and confirms that the number of Maintenance Spares described in paragraphs 11.7.1 and 11.7.2 is adequate to allow it to operate Timetables requiring the PVRs described in paragraphs 11.6.1 and 11.7.2.

**Schedule 12: LRV and Depot Equipment Maintenance
Requirements**

12.1 General Requirements

12.1.1 The Operator shall maintain the LRVs and associated stocks and spare parts to ensure that the LRVs are safe, clean, reliable and available to operate and provide the Services. The Operator shall:

- achieve consistently high availability of LRVs for passenger service;
- deliver consistently high LRV reliability;
- deliver a consistently high standard of presentation, minimising the effects of graffiti and vandalism;
- maintain interior finishes including upholstery to a high standard;
- update audible and visual passenger information as and when required by TII;
- efficiently manage the deployment of the fleet; and
- maintain the LRVs with the objective of achieving the maximum life expectancy.

12.1.2 The Operator shall carry out maintenance of the LRVs and the Depot Equipment in accordance with the LRV Maintenance Manuals, the Depot Equipment Manuals and the LRV Annual Maintenance Plans in place at the Operating Commencement Date.

12.1.3 Throughout the Operating and Maintenance Period, if there is a requirement to modify the LRV Maintenance Manuals the Operator shall carry out all necessary activities associated with trial, implementation, monitoring and approval by the LRV Supplier and TII where necessary, and recording of these modifications. The Operator shall maintain the LRVs in accordance with the revised LRV Maintenance Manuals.

12.2 LRV Annual Maintenance Plans

12.2.1 The LRV Annual Maintenance Plans include the maintenance star chart and the list of LRV Maintenance Manuals. The maintenance star chart lists the minimum preventive maintenance tasks including overhauls with corresponding frequencies for the life of the LRVs. The LRV Annual Maintenance Plans also cover the maintenance of the Depot Equipment.

12.2.2 TII shall provide the Operator with the LRV Annual Maintenance Plans in place at the Commencement Date. TII shall also provide the Operator with the LRV Maintenance Manuals.

12.2.3 No later than 60 days prior to the Operating Commencement Date, the Operator shall prepare and submit to TII revised LRV Annual Maintenance Plans for TII's approval.

12.2.4 The revised LRV Annual Maintenance Plans shall aim to ensure the safe and efficient operation of the LRVs and the achievement of the Performance Standards set out in Schedule 15: and Schedule 34:.

12.2.5 The revised LRV Annual Maintenance Plans shall give regard to:

- All statutory checks required to be carried out
- Forecast Depot facility utilisation and maintenance bottlenecks

- Interaction with other planned programmes affecting the availability of the LRVs for maintenance
- The expected and existing casualty rate of the LRVs or Depot Equipment component failures
- Scheduled overhauls
- Wheel re-profiling and wheel tyre replacement
- Any requirements for non-destructive testing of assemblies, components or fabrications

12.2.6 TII shall use its best endeavours to approve the revised LRV Annual Maintenance Plans before the Operating Commencement Date, such approval not to be unreasonably withheld.

12.2.7 Throughout the Operating and Maintenance Period, the Operator shall revise the LRV Annual Maintenance Plans annually, and shall submit the revised Annual Maintenance Plans for each calendar year to TII for approval no later than 30 September of the previous year.

12.3 Routine Maintenance

12.3.1 The LRVs are serviced at intervals of 15,000km, 30,000km, 60,000km, 120,000km, 180,000km, 300,000km, 600,000km, 900,000km and 1,200,000km.

12.3.2 Routine Maintenance operations at intervals of 300,000km and higher are considered to be overhauls.

12.3.3 The overhaul of the LHB gearboxes on the 401 LRVs has been deferred from the 900,000km overhaul to the 1,200,000km overhaul. This deferral was based on a technical investigation undertaken by Siemens, FAG and Alstom (reference report LUAS-FMI_06536 – LHB Gearbox Overhaul Extension).

12.3.4 As part of the Routine Maintenance of the LRVs and Depot Equipment, the Operator shall as a minimum take the following measures:

- the inspection of and planned replacement of wearing parts before they fail;
- the supply, storage at the location and installation of spare parts deemed to be necessary based on the results of any inspections of the LRVs or Depot Equipment carried out by the Operator;
- the inspection of and testing of system components, instrumentation and control, security elements, safety features and similar components of the LRVs and Depot Equipment;
- the inspection of and testing of the condition of the components of the LRVs and Depot Equipment as far as these are accessible;
- the cleaning of parts of the LRVs and Depot Equipment to keep them in a good operational condition;
- the inspection, testing, adjustment and replacement of mechanical and electrical parts of the LRVs and Depot Equipment as necessary; and
- any necessary oil changing and greasing of components of the LRVs and Depot Equipment.

- 12.3.5 Several tasks such as air-conditioning filter replacement frequency depend on levels of pollution, environment and time of year (pollen).
- 12.3.6 Air handling units containing more than 2 kg of refrigerating liquid must be tested for leaks every year.
- 12.3.7 The Operator shall use best endeavours (for example through the application of specialist products or coatings at least once per year) to achieve a floor slip resistance of the LRVs, as measured by Pendulum Test Value (PTV), of not less than 36 in wet and dry conditions. The Operator shall measure the floor slip resistance of a 10% sample of the LRVs every six months. Such measurements shall be carried out by means of pendulum tests.

12.4 Corrective Maintenance

- 12.4.1 The Operator shall carry out all Corrective Maintenance as required to ensure that the LRVs are properly repaired and safely maintained in good working order, including replacement of all damaged or defective components, worn upholstery and interior finishes, in a timely manner.
- 12.4.2 The Operator shall minimise the LRV downtime required for Corrective Maintenance by implementing a management strategy including:
- making full use of diagnostic tools;
 - spare parts management;
 - configuration management;
 - resource management (including without limitation, using in-house resource and Sub-Contractors);
 - commercial arrangements to facilitate rapid deployment of Sub-Contractors;
 - initiatives to reduce process time;
 - avoiding the use of stopped LRVs as a source of spare parts; and
 - documented, comprehensive and coherent plans to manage an LRV's return to service following more complex repairs.
- 12.4.3 The Operator shall carry out special checks as may be required as a consequence of potentially hazardous incidents either on the System, or on other tram systems where identical or similar hardware and software is used to that used on the System. These special checks may be identified by the Operator, TII, the LRV Supplier, other manufacturer of relevant components, or a Competent Authority. The Operator shall inform TII of any requirement to carry out the special checks and subsequently provide detailed information regarding the outcome of such special checks.
- 12.4.4 If any LRV is not available for service for a period of fourteen consecutive days, the Operator shall notify TII and produce a plan identifying the cause of unavailability, the scope of works and a programme for return to service including milestone dates.

12.4.5 The Operator shall repair, replace and/or refurbish saloon interior elements and finishes that have become damaged, worn, obtrusively marked in an indelible manner or that are otherwise, in the reasonable opinion of TII, in an unacceptable condition.

12.5 Passenger Seat Upholstery

12.5.1 The condition of passenger seats has been categorised as follows:

1. New seat with no (or very little) sign of wear.
2. Light wear in any area.
3. Excessive wear (no wires or metal visual).
4. Excessive wear with wires or metal visible.
5. Clear signs of vandalism, (ripped, cut, etc.)

12.5.2 Throughout the Operating and Maintenance Period, the Operator shall replace forthwith any passenger seat upholstery that falls into category 3, 4 or 5. An example of each category is shown below:



Category 1: new seat with no (or very little) sign of wear,



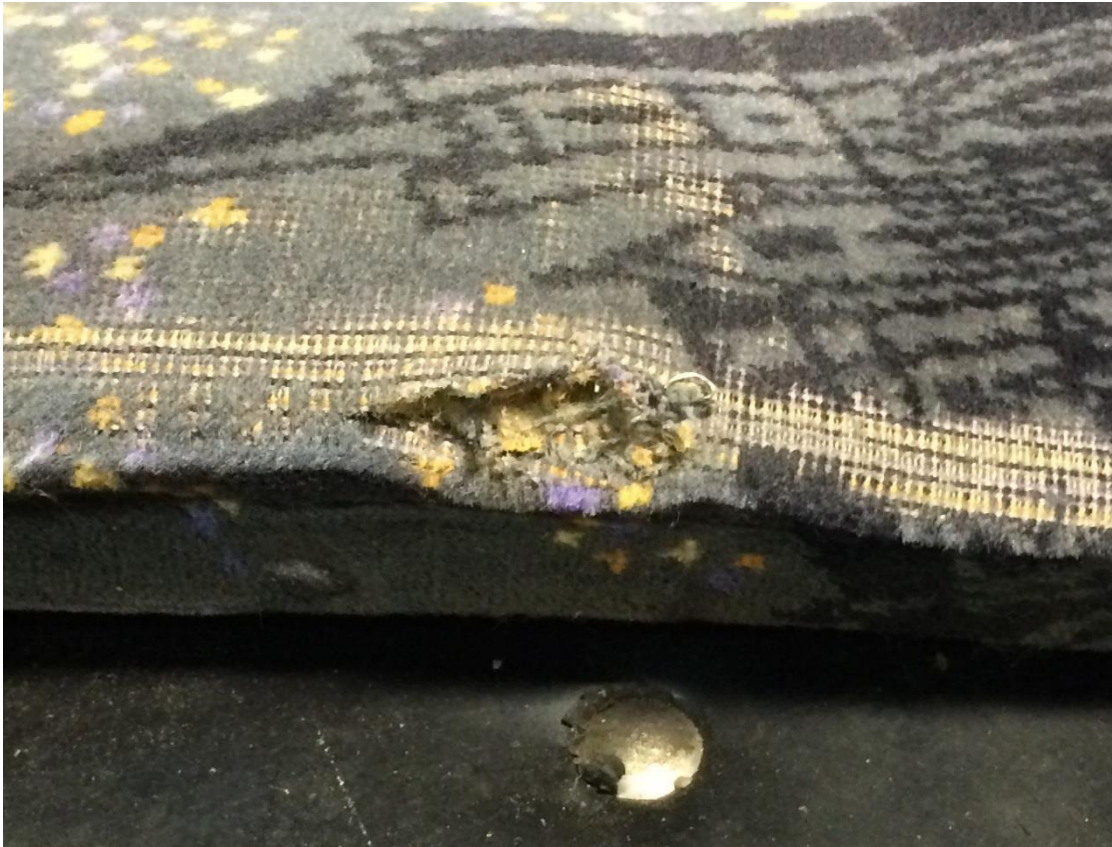
Category 2: Light wear in any area



Category 3: Excessive wear (no wires or metal visual)



Category 4: Excessive wear with wires or metal visible



Category 5: Clear signs of vandalism, (ripped, cut, etc.)

12.6 Availability and Reliability

- 12.6.1 The Operator shall record the number of LRV's available for passenger service on each Line for the am peak and pm peak each day, compared to the peak vehicle requirement on each Line for the am peak and pm peak each day. The Operator shall report this information to TII in a format and at a frequency notified by TII to the Operator from time to time.
- 12.6.2 The Operator shall investigate all faults and failures on LRVs to determine, where possible, the root cause of the fault or failure by system, sub-system, and equipment item.
- 12.6.3 The Operator shall calculate the Scheduled Service Kilometres not operated as a consequence of each Service Affecting Failure, for inclusion in the report of Lost Service Kilometres described in paragraph 34.2.2 of Schedule 34:.
- 12.6.4 The Operator shall measure mean kilometres between Service Affecting Failures (MKBSAFs) for each LRV and for each LRV type (401, 402, 502). The Operator shall include, in the Period Report, a report on MKBSAF's in a format notified by TII to the Operator from time to time.
- 12.6.5 The Operator shall take action to improve reliability of the LRVs, shall implement reliability improvement programmes where appropriate and shall monitor and report on their effectiveness to TII.

12.7 Passenger Information Systems

- 12.7.1 The Operator shall carry out such updates as are required to the on-board passenger information systems from time to time, to ensure that both visual and audible announcements are correct and are made in accordance with the requirements of TII and NTA and all applicable legislative requirements.

12.8 Mandatory Pre-Service Checks

- 12.8.1 The Operator shall ensure that the features listed in below are operational prior to any LRV being certified by the Operator as being fit for service, save that the Operator may offer an LRV for service without a Mandatory Pre-Service Check or certification, provided that (i) no more than twenty four hours have elapsed since the last pre-service check and (ii) no work other than cleaning, inspection and/or downloading of data has been done on the LRV.
- 12.8.2 Wherever relevant, the Mandatory Pre-Service Checks shall be carried out from each cab of the LRV.
- a) Brake system (operate the brake controller to check the brakes)
 - b) Safety brake and emergency brake (to be applied whilst the LRV is stationary)
 - c) Emergency equipment cupboard (check contents are complete and functional)
 - d) Sand boxes (fill sandboxes and check for operation)
 - e) Bell and horn (sound bell and horn)
 - f) LRV Radio and AVLS (check radio and AVLS pass their self-tests)
 - g) Public address/digitised speech/visual indicators (make public announcement and visually check displays - an internal speaker check is not required)
 - h) Windscreen washer/wiper (check operation and fill washer as required)
 - i) Exterior lighting (check visually that head, tail and marker lights are working)
 - j) Saloon/cab doors (check operation of saloon door controls and cab door lock)
 - k) Cab/saloon heating/ventilation (check operation – a temperature check is not required)
 - l) Door warning lights (check operation)
 - m) Saloon and cab lighting (check all lamps are lit)
 - n) Doors closed/traction interlocking (power check against brake)
 - o) Saloon and cab glass (check for damage)
 - p) Rear view cameras (check operational)
 - q) On-board tools and equipment (check pantograph crank handle and tow bar handle are present)

- r) Fire extinguishers (check present and calibrated)
- s) Signage and decals (check present and in good condition)

12.8.3 Under certain circumstances, such as driver training or specific test runs, it may be desirable to move an LRV outside a Depot without going into passenger service. Under these situations, the Operator shall carry out all of the Mandatory Pre-Service Checks with the exception of items (g), (k), (l), (o) and (s), and shall certify that the checks have been successfully completed in relation to the LRV.

12.8.4 The Operator shall rectify, replace or adjust any malfunctioning equipment or component identified in the Mandatory Pre-Service Checks detailed above.

12.9 Cleaning

12.9.1 The Operator shall implement a cleaning regime to ensure that LRVs presented for passenger service meet the cleaning standard set out in Schedule 15:. This cleaning regime shall consist of daily cleaning and heavy (periodic) cleaning.

12.9.2 As part of the Operator's cleaning regime, the Operator shall develop an LRV cleaning checklist setting out how each individual part of the LRVs will be cleaned, and the frequency with which such cleaning will be carried out. No later than four weeks prior to the Operating Commencement Date, the Operator shall submit the LRV cleaning checklist to TII for TII's approval. The LRV cleaning checklist shall be subdivided into the following sections:

- The passenger areas
- The driving cab interior
- The exterior of the LRV

12.9.3 Each section of the LRV cleaning checklist shall include at least the items listed in Table 12-1 below.

Passenger Areas	Driving Cab Interior	Exterior of LRV
Passenger aisle	Windscreen interior	Windscreen
Floor in front of seats	Driver's console and pushbutton panel	Windscreen wipers
Floor under seats	Driver's cupboard	Exterior lighting and reflectors
Floor surrounding fixtures	Interior glazing	Glazing (incl. driving cab)
Open floor space	Panelling	LRV sides and skirting
Side panels	Interior of door	Doors and door pushbuttons
Side panel mouldings	Sun shield	Gangway/Articulation
Door panels		Rear view cameras

Door push buttons	Floor including driver's footwell	
Ceiling	Seats	
Lighting fittings		
Passenger information display		
Interior glazing		
Surround glazing		
Seat cushions		
Seat pedestal		
Seat frame		
Handrails and poles		
Floor edge marking		
Notices		

Table 12-1 Items to be included in LRV cleaning checklist

12.9.4 The Operator shall clean both the interior and exterior of the LRVs in accordance with the LRV cleaning checklist. The Operator shall use only appropriate cleaning products, in accordance with those specified in the LRV Maintenance Manuals (if any) and otherwise in accordance with Good Industry Practice, to clean the LRVs to the highest possible standard.

12.9.5 TII shall audit the Operator's compliance with the cleaning standards set out in Schedule 15:. If the Operator fails to achieve the cleaning standards, a deduction, calculated in accordance with Schedule 15:, shall apply and the Operator shall take all necessary steps to remedy the situation in a timely manner.

12.10 Wheel Turning and Wheel Tyre Changes

12.10.1 The Operator hereby acknowledges that its obligation(s) in respect of wheel turning and wheel tyre changes under the Contract are such that the following minimum standards are attained in respect of each LRV at all times during the Operating and Maintenance Period:

- all four wheels of each bogie of the LRV are sufficiently round and without flats to avoid:
 - a) damaging the System;
 - b) adversely affecting passenger ride comfort; and
 - c) generating excessive noise levels
 during passenger service;
- the diameters of the wheels on each axle of each bogie of the LRV are within the relative tolerance(s) as specified in the Maintenance Manuals;

- the profiles of the wheel on each axle of each bogie of the LRV are within the relative tolerance(s) as specified in the Maintenance Manuals;
- the diameters of the wheels on adjacent axles of each bogie of the LRV are within the relative tolerance(s) as specified in the Maintenance Manuals;
- in addition to any flat, the martensitic content of each wheel below the flat shall be removed by wheel-turning; and
- wheel tyre changes for the LRVs shall be carried out when wheel profiles reach the critical diameter limits specified in the relevant LRV Maintenance Manuals.

12.11 Vehicle Extension Contract

12.11.1 The twenty six Citadis 402 LRVs will be extended by Alstom Transport SA by integrating a suspended car (CC3) and a motorised car (MIC3) similar to those on the Citadis 502 LRVs.

12.11.2 The specifications of the extension modules are outlined in Schedule 2 of the Vehicle Extension Contract.

12.11.3 The Assembly Period, as defined in the Vehicle Extension Contract, is expected to commence in May 2019, with the first LRV being extended between May and October 2019 and the remaining LRVs being extended between October 2019 and January 2021.

12.11.4 The Operator shall cooperate with, and provide all necessary assistance to, Alstom Transport SA during the Assembly Period, in order to facilitate the extension of the Citadis 402 LRVs at Sandyford Depot.

12.11.5 The Operator shall, at no charge, make available to Alstom Transport SA the facilities required to enable the extension of the Citadis 402 LRVs to take place. These facilities are described in Schedule 6 Part 1 and Schedule 6 Part 2 of the Vehicle Extension Contract.

12.11.6 The Operator shall obtain the approval of the Commission for Rail Regulation for the following:

- Approval of operational procedures for moves of extension modules within Sandyford Depot;
- Approval of operational procedures for dynamic testing; and
- Approval of stages 4, 5 and 6 of the RSA-APIS-NRS (Authorisation for Placing in Service of New Rolling Stock according the Railway Safety Act) for the extended LRVs and any other necessary changes to the Safety Management System.

12.11.7 For the duration of the Assembly Period, a maximum of one Citadis 402 LRV will be unavailable for passenger service on Monday to Fridays and a maximum of two Citadis 402 LRV's will be unavailable for passenger service at weekends. This is to facilitate starting a Citadis 402 LRV extension on a Saturday while finishing the extension of another Citadis 402 LRV over the same weekend.

12.11.8 TII, Alstom Transport SA and the Operator shall, ahead of the extension of an LRV, document any known faults, known damage and/or known issues pertaining to that LRV. Testing/inspection of the LRV shall be carried out jointly and/or supervised by all three parties to establish if there are any unknown faults, unknown damage or unknown issues with the

LRV to be extended, and these shall also be documented. The documentation shall be agreed and signed by all three parties ahead of that LRV's extension, with a view to allocating responsibility for the rectification of any faults, damage and/or issues with the LRV after its extension.

12.11.9 The Operator shall be responsible for insuring the extension modules on each extended Citadis 402 LRV from the date that the extended Citadis 402 LRV is made available to the Operator for passenger service.

12.11.10 The Operator shall provide drivers for mainline testing of each extended Citadis 402 LRV as required by TII or Alstom Transport SA. This mainline testing is expected to require four to six hours per night for two nights for each extended Citadis 402 LRV.

12.12 Assembly and Commissioning of eight new Citadis 502 LRVs

12.12.1 TII has placed an order with Alstom Transport SA for eight additional Citadis 502 LRVs, by means of a fourth Notice to Proceed (NTP #4), dated 31 October 2018, pertaining to the LRV Supply Contract dated 30 March 2007.

12.12.2 The specification of the eight Citadis 502 LRVs is equivalent to that of the seven Citadis 502 LRVs already in service, with some minor, non-substantial additions as set out in NTP #4.

12.12.3 Delivery is anticipated, as per the programme in NTP #4, to be at a rate of one LRV per month delivered to Sandyford Depot, commencing circa May 2020.

12.12.4 Where the LRV Supply Contract (30 March 2007) places obligations on TII to provide 'reasonable assistance' to Alstom Transport SA with respect to receipt of the LRVs, Depot movements, stabling, testing, etc., such obligations shall be fulfilled by the Operator.

12.12.5 With respect to Clause 23.2 (b) of the LRV Supply Contract (30 March 2007), the Operator's obligations shall not only include facilitating the movement of the delivered LRVs to the stabling area but also any movements of the LRVs or parts of the LRVs within the Depot.

12.12.6 With respect to Clause 24 of the Vehicle Supply Contract (30 March 2007), the Allocation of Responsibilities at Site shall now include the provision to Alstom Transport SA of facilities such as tool storage and welfare facilities in line with those provided in respect of the Vehicle Extension Contract.

12.12.7 The duration of the assembly and commissioning period for each LRV, post-delivery, is expected to be as follows:

- Assembly: 1½ to 2 days, primarily involving the use of a pit and gantry lane;
- Static tests and post-delivery mirror modifications: 3 to 5 hours per day over a period of 5 to 6 days, taking place both in the stabling area and on a pit and gantry lane;
- Dynamic testing at night: 4-6 hours per night for two nights (for which the Operator shall provide drivers).

12.12.8 The Operator shall obtain the approval of the Commission for Rail Regulation for the following:

- operational procedures for moves of part-LRVs within Sandyford Depot;

- operational procedures for dynamic testing.

No type testing will be required (as the Citadis 502 LRV is “type-approved”), nor is the Operator required to undertake stages 4, 5 and 6 of the RSA-APIS-NRS process.

12.12.9 TII may, at its sole discretion and at any point from the assembly of the first LRV to the assembly of the eighth LRV, exercise the Storage Option in NTP # 4, whereby assembled LRVs would not commence their testing regime but rather would be stored in the stabling area until such time as TII requests the testing regime to commence. The postponement of the testing regime may be up to Q1 2021 to correspond with the end of the Vehicle Extension Contract.

12.12.10 The Operator shall be responsible for insuring each new Citadis 502 LRV from the date that it is made available to the Operator for passenger service (which is coincidental upon the issuance by TII of an Acceptance Certificate for the LRV to Alstom Transport SA).

**Schedule 13: Capital Spares, LRV Spare Parts and LRV Special
Tools**

13.1 Capital Spares, LRV Spare Parts and LRV Special Tools to be made Available by TII

13.1.1 TII shall make available to the Operator on the Operating Commencement Date, at no cost to the Operator:

- the Capital Spares and LRV Spare Parts listed in Table 13-1 to Table 13-10;
- the LRV Special Tools listed in Table 13-11 to Table 13-15; and
- the LRV Special Tools Manuals.

13.1.2 The Operator shall be responsible for the procurement of any Capital Spares, LRV Spare Parts and LRV Special Tools other than those made available by TII pursuant to paragraph 13.1.1, including without limitation:

- all Capital Spares and LRV Spare Parts necessary in case a part of the same type is lost, damaged, defective or worn out;
- wearing part aids (such as measuring instruments and tools, maintenance materials, grease and cleaning material);
- consumables, standard workshop tools and suchlike,

which are necessary for the proper performance of the Services and the achievement of the Performance Standards.

13.1.3 The Operator shall not keep or store at the Depots or at any other place on the System any spare parts or special tools other than the Spare Parts and Special Tools. For the avoidance of doubt nothing in this Schedule shall prevent the Operator from keeping at the Depots any tool or materials (including but without limitation consumables) which it requires to properly perform the Services.

13.1.4 The Operator shall not remove from the System, other than for the purposes of maintenance, repair or overhaul, any Capital Spares, LRV Spare Parts or LRV Special Tools owned by TII without the consent of TII, such consent not to be unreasonably withheld.

13.1.5 The Operator shall be responsible for the maintenance and calibration of the LRV Special Tools owned by TII in accordance with the LRV Special Tools Manuals. The Operator shall keep TII informed of and shall make available to TII, promptly upon being issued, all revised or improved versions of any software item of the LRV Special Tools owned by TII which correct errors or imperfections in, or add to or enhance the functions of, previous versions of such software. Such upgrades shall, at TII's convenience, without impeding the Operator's obligations under the Contract, be installed into the equipment to which they relate and thereupon be deemed to replace the previous version of said software in the definition of "LRV Special Tools".

13.1.6 The Operator shall ensure that the Capital Spares, LRV Spare Parts and LRV Special Tools comply with any requirements or recommendations specified or suggested in the relevant Maintenance Manuals and are compatible with the LRVs and/or Depot Equipment to which such LRV Spare Parts and LRV Special Tools apply.

13.1.7 The Operator shall ensure that any maintenance and/or repair work carried out to any Capital Spare, LRV Spare Part or LRV Special Tool complies with any requirements or recommendations of the manufacturer thereof and, if necessary, shall return such Capital

Spare, LRV Spare Part or LRV Special Tool to its manufacturer, or other suitably qualified service provider, for maintenance and/or repair.

13.2 Replenishment of Capital Spares, LRV Spare Parts and LRV Special Tools

- 13.2.1 The Operator shall at all times during the Operating and Maintenance Period properly store and maintain sufficient Capital Spares, LRV Spare Parts and LRV Special Tools in accordance with Good Industry Practice in order to be able to undertake Routine Maintenance and anticipated Corrective Maintenance of the LRVs and Depot Equipment, and with sufficient contingency to have the capability of repairing the anticipated levels of Damage to the System.
- 13.2.2 When any Capital Spare or LRV Spare Part is used by the Operator in performing the Services it shall be replaced by one which is, subject to paragraph 13.1.6, of at least the same form, fit and function available on the market of the same type and of at least the same quality and standard as that made available by TII pursuant to paragraph 13.1.1.
- 13.2.3 When any LRV Special Tool requires replacement in order to properly perform the Services, it shall be replaced by one which is, subject to paragraph 13.1.6, of at least the same form, fit and function available on the market of the same type and of at least the same quality and standard as that made available by TII pursuant to paragraph 13.1.1.
- 13.2.4 The Operator shall ensure that no part is removed from any LRV or any item of Depot Equipment by the Operator except in compliance with its obligations in relation to the performance of the Services. If any part is removed it shall as soon as reasonably practicable be replaced by a Capital Spare or LRV Spare Part which:
- is of at least the same quality and of at least equivalent standard as the removed part,
 - is the same as or is, subject to paragraph 13.1.6, of at least the same form, fit and function as the removed part,
 - is manufactured or has been repaired in accordance with Good Industry Practice,
 - once installed will not materially diminish the operational life (being that specified by the manufacturer thereof, and otherwise that to be reasonably expected of such an item according to Good Industry Practice), performance or condition of the LRV or item of Depot Equipment in which it is installed, and
 - is of at least equivalent utility to the removed part and, without prejudice to the generality of the foregoing, if it is time or life limited and is not being replaced as part of a part rotation programme, has at least a substantially similar number of hours available until the next maintenance check; and
- 13.2.5 Following the use of any Capital Spare or LRV Spare Part the Operator shall be responsible for re-ordering any replacement Capital Spare or LRV Spare Parts so as to ensure that the Operator can properly perform the Services and achieve the Performance Standards.
- 13.2.6 The Operator shall be responsible for replacing any lost or damaged Capital Spares, LRV Spare Parts or LRV Special Tools howsoever such loss or damage is caused. The cost of replacing any such lost or damaged Capital Spares, LRV Spare Parts and LRV Special Tools shall be borne by the Operator.

13.3 Items to be returned to TII upon Contract Expiry

- 13.3.1 Upon the Expiry Date, the Operator shall return to TII the same types and numbers of Capital Spares, LRV Spare Parts and LRV Special Tools as those listed in Table 13-1 to Table 13-15.
- 13.3.2 Upon the Expiry Date, subject to paragraphs 13.3.3 to 13.3.7, each Capital Spare, LRV Spare Part and LRV Special Tool shall be of at least equivalent standard (fair wear and tear excepted) as those listed in Table 13-1 to Table 13-15.
- 13.3.3 If any Capital Spare, LRV Spare Part or LRV Special Tool is a replacement of that made available by TII pursuant to paragraph 13.1.1, each such item shall, subject to paragraph 13.1.6, be of at least the same form, fit and function (or other appropriate version as may be required by TII) as that Capital Spare, LRV Spare Part or LRV Special Tool available on the market.
- 13.3.4 To the extent that any Capital Spares and/or LRV Spare Parts are commonly recognised as 'perishable spares' (namely spare parts that materially degrade over time regardless of whether in use or not), each such item shall be in the condition to be reasonably expected following proper replacement thereof by the Operator during the Operating and Maintenance Period in accordance with the Safety Management System where relevant and otherwise upon expiry of the shelf-life specified by the manufacturer thereof or, if no such shelf-life is specified, in accordance with Good Industry Practice.
- 13.3.5 To the extent that Good Industry Practice permits any Capital Spare or LRV Spare Part to be refurbished (or re-conditioned), each such item shall be in the condition to be reasonably expected following proper refurbishment (or re-conditioning) by the Operator during the Operating and Maintenance Period in accordance with the Safety Management System, where relevant and otherwise in accordance with Good Industry Practice.
- 13.3.6 To the extent that such Capital Spare or LRV Spare Part (or replacement thereof) remain unused during the Operating and Maintenance Period, each such item shall be and remain in the condition to be reasonably expected following proper storage in accordance with the manufacturers' instructions or, if no such instructions are available, in accordance with Good Industry Practice.
- 13.3.7 Each LRV Special Tool shall, fair wear and tear excepted strictly where and to the extent appropriate in accordance with Good Industry Practice, be in a serviceable condition.

13.4 Capital Spares supplied to Red Cow Depot for Citadis 401 LRVs

Item no.	Description	DTR Number	Qty
1	Speedometer	DTR0009118000-A	2
2	Master controller	DTR0009118001-A	3
3	Cabin public address system (SONO)	DTR0009118076-A	2
4	Cab air conditioning unit / airco-installatie cabine	DTR0000035943-A	3
5	Complete right door leaf	DTR0009119821-A	4
6	Double Door RH- Door leaf	DTR0000030756-A	2
7	Complete left door leaf	DTR0009119822-A	2
8	Double Door LH - Door leaf	DTR0000030760-A	2
9	Mechanism double door	DTR0009118195-A	10
10	Complete single right door leaf	DTR0009119823-A	3

Item no.	Description	DTR Number	Qty
11	Single Door Right - Door leaf	DTR0000030762-A	2
12	Complete single left door leaf	DTR0009119824-A	3
13	Video Recording Unit	DTR0009118613-A	3
14	Gangway shock absorber	DTR0009118268-A	4
15	Brake hydraulic unit HGE-28ANL/01	DTR0009118282-A	3
16	LHB Complete Motor Bogie (without motor)	DTR0000025727-A	2
17	Motor and GearBox unit	DTR0009118288-A	4
18	Hydraulic brake unit HGD-14 PR/01	DTR0009118296-A	10
19	Complete magnetic brake	DTR0009118764-A	6
20	Sanding compressor	DTR0000036876-A	9
21	Trailer Bogie Arpege	DTR0000025732-A	2
22	Active brake callipers HF2A15	DTR0009116405-A	18
23	Processing unit on board system	DTR0000025733-A	2
24	Battery box complete with batteries	DTR0000030103-A	1
25	Motor fan unit for ETF box	DTR0000025736-A	2
26	AGATE Control unit	DTR0000025793-A	9
27	Pantograph SBE 922	DTR0009118483-A	3
28	Auxiliary converter	DTR0000015417-A	3
29	Electronic board AGATE AUX	DTR0009118515-A	2
30	Tachometer system	DTR0009118181-A	1
31	Brake rheostat	DTR0009118472-A	2
32	Main circuit braker	DTR0000025739-A	2
33	Motor cooling group	DTR0000035616-A	3
34	Motor bogie Arpège - equipped with motors	DTR0000030543-A	4
35	Ventilation heating unit	DTR0009119833-A	3
36	Arpège MIC bogie brake caliper		6
37	Arpège MIC bogie traction motor	DTR0009118410	6
38	Arpège MIC bogie wheel tyre		8
39	Brake Hydraulic Unit in Motor Bogie	DTR0000063900	2
40	Brake Hydraulic System in Trailer Bogie	DTR0000045218	1
41	Ventilation Heating Unit	DTR0000171041	1

Table 13-1 Capital Spares supplied to Red Cow Depot for Citadis 401 LRVs

13.5 LRV Spare Parts supplied to Red Cow Depot for Citadis 401 LRVs

Item no.	Description	DTR Number	Qty
1	Master Controller - return spring	DTR0009117685-A	2
2	VACMA (deadman) rod	DTR0009112176-A	10
3	Stop Push Button (Mushroom)/drukknop noodrem	DTR0009118005-A	1
4	Spring Return Push Button	DTR0009118006-A	6
5	Two position Push Button	DTR0009118007-A	4
6	Push Button Body 3 NO gold / silver	DTR0009118008-A	2
7	Push Button Body 1 NO / 2 NF gold / silver	DTR0009118009-A	2
8	Push Button Body 2 NO / 1 NF gold / silver	DTR0009118010-A	6

Item no.	Description	DTR Number	Qty
9	Red multiled block EBT 28Vdc	DTR0000027721-A	2
10	Yellow multiled block EBT 28Vdc	DTR0000027722-A	2
11	Green multiled block EBT 28Vdc	DTR0000027725-A	2
12	White multiled block EBT 28Vdc	DTR0000027717-A	2
13	Red PB cover	DTR0009201565-A	2
14	Orange PB cover	DTR0009118016-A	2
15	Yellow PB cover	DTR0009201568-A	2
16	Green BP PB cover	DTR0009201573-A	2
17	Blue PB cover	DTR0009201572-A	2
18	Transparent PB cover	DTR0009201571-A	4
19	Pictogram push-button distress call	DTR0009118021-A	1
20	Pictogram push-button lights flash	DTR0009118630-A	1
21	Pictogram push-button horn	DTR0009118022-A	1
22	Pictogram push-button flange lubricator control	DTR0009118023-A	1
23	Pictogram push-button klaxon control	DTR0009118024-A	1
24	Pictogram push-button windshield wiper control	DTR0009118025-A	1
25	Pictogram push-button magnetic brake control	DTR0009118026-A	1
26	Pictogram push-button public address control	DTR0009118027-A	1
27	Pictogram push-button lighting cab	DTR0009118028-A	1
28	Pictogram push-button lighting saloon	DTR0009118029-A	1
29	Pictogram push-button door forced closing	DTR0009118030-A	1
30	Pictogram push-button isolation bogie	DTR0009118031-A	1
31	Pictogram push-button night/day retrovision	DTR0009118032-A	1
32	Pictogram push-button train set shut-down	DTR0009118033-A	1
33	Pictogram push-button reset console	DTR0009118035-A	1
34	Pictogram push-button stop current inverter	DTR0009118631-A	1
35	Pictogram push-button bell	DTR0009118632-A	1
36	Pictogram lamp push-button rear fog lamp	DTR0009118036-A	1
37	Pictogram lamp push-button de-frosting control	DTR0009118037-A	1
38	Pictogram lamp push-button forward movement	DTR0009118038-A	1
39	Pictogram lamp push-button reverse movement	DTR0009118039-A	1
40	Pictogram lamp push-button emergency traction cont	DTR0009118040-A	1
41	Pictogram lamp push-button lower pantograph	DTR0009118041-A	1
42	Pictogram lamp push-button doors unlocking	DTR0009118042-A	1
43	Pictogram lamp push-button distress lights	DTR0009118043-A	1
44	Pictogram lamp push-button inhibition door closing	DTR0009118044-A	1
45	Pictogram lamp push-button inhibition voice synthe	DTR0009118045-A	1
46	Pictogram push-button emergency intercom	DTR0009118633-A	1
47	Pictogram lamp push-button cabin intercom.	DTR0009118046-A	1
48	Pictogram lamp push-button passenger public addres	DTR0009118047-A	1
49	Pictogram lamp push-button doors opening	DTR0009118048-A	1
50	Pictogram lamp push-button sanding	DTR0009118050-A	1
51	Pictogram lamp push-button door selection left sid	DTR0009118051-A	1
52	Pictogram lamp push-button door selection right si	DTR0009118052-A	1
53	Pictogram lamp push-button point remote control	DTR0009118053-A	1
54	Pictogram lamp push-button point remote control le	DTR0009118054-A	1

Item no.	Description	DTR Number	Qty
55	Pictogram lamp push-button point remote control ri	DTR0009118055-A	1
56	Main driving switch	DTR0009119400-A	2
57	Direct supply switch	DTR0009119401-A	2
58	Validation and supply to pump switch	DTR0009119402-A	1
59	Windscreen wiper switch	DTR0009118060-A	1
60	Brake isolation switch	DTR0009119403-A	1
61	Vigilance control equipment isolation switch	DTR0009119404-A	1
62	Doors control bypass switch	DTR0009119405-A	1
63	Pilot light/dipped light/head light switch	DTR0009118634-A	1
64	Hours meter	DTR0028811036-A	4
65	Odometer	DTR0028811035-A	4
66	Control box distributor (rear view)	DTR0009118083-A	2
67	Rear View screen,right	DTR0009119040-A	2
68	Rear View screen,left	DTR0009119038-A	2
69	Inside rear-view mirror / achteruitkijk-spiegel binnenzijde	DTR0009118637-A	2
70	Lighting converter for cab and saloon/gelijkrichter cabineverlichting	DTR0009118071-A	14
71	Console desk COMET 4	DTR0009118074-A	4
72	Input/output IT unit (16/16)	DTR0009118075-A	7
73	Driver's seat, right lever	DTR0009118638-A	2
74	Sound information signal loudspeaker 8ohm 30W	DTR0009118077-A	12
75	Microphone	DTR0009118080-A	2
76	Front position light	DTR0009118081-A	1
77	Front display (grirouette)	DTR0009118082-A	4
78	dot matrix	DTR0009118084-A	4
79	Front blind	DTR0009119406-A	5
80	Cab Door lock	DTR0009119408-A	1
81	Cab Door Catch	DTR0009119412-A	2
82	Cab Door Adjustable stop	DTR0009118092-A	1
83	Cab screen Left side	DTR0000025654-A	1
84	Cab Screen Right side	DTR0000024220-A	1
85	Bell	DTR0009118096-A	2
86	Indicator lamp train prepared	DTR0009118648-A	1
87	Indicator lamp brake fault	DTR0009118649-A	1
88	Indicator lamp dipped lights on	DTR00266114HP-A	1
89	Indicator lamp head lights on	DTR00266114HR-A	1
90	Indicator lamp speed limit	DTR0000035231-A	1
91	Indicator lamp doors open	DTR0009118651-A	1
92	Desk gas support struts	DTR00223571DB-A	4
93	Driver's desk (nud polyester) with base	DTR0009119414-A	1
94	Driver's desk base	DTR0009118107-A	1
95	Right side cab window	DTR0009119420-A	4
96	Left side cab window	DTR0009119421-A	4
97	Windscreen	DTR0009119422-A	3
98	Left side window opening section	DTR0000030079-A	2

Item no.	Description	DTR Number	Qty
99	Bolt	DTR0009118431-A	8
100	Catch	DTR0009118119-A	8
101	Central strip for cab (lights)	DTR0009119423-A	2
102	Right front fairing	DTR0009119426-A	4
103	Left front fairing	DTR0009119425-A	4
104	Central front fairing	DTR0009119424-A	2
105	Sound warning	DTR0009119427-A	2
106	Klaxon horn	DTR0026652201-A	2
107	Bumper stop	DTR0009119428-A	2
108	Bumper Stop - Equipped support	DTR0009118925-A	2
109	Bumper - Shock absorber	DTR0023171330-A	2
110	Towing half bar	DTR0009118128-A	1
111	Jumper cable	DTR0000035112-A	1
112	Motor for windscreen wiper	DTR0000029989-A	4
113	Arm for windscreen wiper	DTR0000029992-A	2
114	Wiperblade for windscreen wiper/ ruitenwisserblad	DTR0024741842-A	47
115	Windscreen washer pump	DTR0024131075-A	4
116	Cleaning preparation switch	DTR0009118135-A	1
117	Roof inspection door (access to air treatment sys	DTR0009119429-A	1
118	Light Unit for rear/stop lights	DTR0009118666-A	2
119	dipped beam, full beam / headlights/ stadslicht- gewoon licht- groot licht	DTR0009118141-A	2
120	Warning & outline lights (orange) / alarmknipperlichten & reserve signaallamp	DTR0000029869-A	12
121	Rear fog lights	DTR0009118144-A	2
122	Side cab shield	DTR0000029374-A	6
123	Side motor coach shield	DTR0000029377-A	1
124	Side motor coach shield	DTR0000029378-A	1
125	Rear View camera (outside)/achteruitkijkcamera	DTR0009118163-A	8
126	Deshydrating filter / ontvochtigingsfilter	DTR0009119542-A	1
127	Side display	DTR0009118165-A	3
128	Double interior display unit	DTR0009118839-A	6
129	Input/Output IT unit (32/16)	DTR0009118168-A	7
130	Interior camera	DTR0009119434-A	4
131	Hand Grip	DTR0000028618-A	7
132	Twin seat + handle left	DTR0009119814-A	2
133	Twin seat + handle right	DTR0009119815-A	2
134	Twin seat without handle	DTR0009119816-A	2
135	Cushion (back)	DTR0009119435-A	12
136	Cushion (sitting)	DTR0009119436-A	12
137	Ischiatic support	DTR0009119819-A	1
138	Metal structure for ischiatic support	DTR0000028647-A	1
139	Handle for ischiatic support	DTR0000028652-A	1
140	Cushion for ischiatic support	DTR0009119437-A	1
141	Wall panel equipped	DTR0000029462-A	1
142	Wall panel equipped over right motor bogie	DTR0000029463-A	1

Item no.	Description	DTR Number	Qty
143	Wall panel equipped over left motor bogie	DTR0000029464-A	1
144	Wall panel equipped side	DTR0000029465-A	3
145	Wall panel equipped side	DTR0000029466-A	3
146	Lamp battery non isolated (CS)	DTR0009118702-A	1
147	Forced door closing' lamp	DTR0026456017-A	1
148	Battery isolation switch	DTR0009118184-A	1
149	Battery isolation switch	DTR0009118184-A	1
150	Double Door RH- Window pane	DTR0009118186-A	1
151	Double Door RH - Superior edge gasket	DTR0009118187-A	2
152	Double Door LH - Leakage edge	DTR0009118199-A	2
153	Door RH - sensitive gasket	DTR0009118188-A	4
154	Double Door RH - Gasket (lower part)	DTR0009118189-A	2
155	Double Door RH - Guide rail	DTR0009118954-A	2
156	Double Door LH - Connection cable	DTR0000015397-A	4
157	Double Door LH- Window pane	DTR0009118191-A	1
158	Double Door LH - Superior edge gasket	DTR0009118192-A	2
159	Double Door LH - Leakage edge	DTR0009118199-A	2
160	Door LH - sensitive gasket	DTR0009118193-A	2
161	Double Door LH - Gasket (lower part)	DTR0009118194-A	2
162	Double Door LH - Guide rail	DTR0009118956-A	2
163	Double Door LH - Connection cable	DTR0000015397-A	4
164	PB door opening / drukknop deur openen	DTR0009119808-A	8
165	Left door leaf swinging arm roller	DTR0009119865-A	15
166	Right door leaf swinging arm roller	DTR0009119864-A	15
167	Emergency exit system Bowden cable	DTR0009118712-A	3
168	Single Door RH - Superior edge gasket	DTR0009118204-A	2
169	Double Door RH - Leakage edge	DTR0009118205-A	2
170	Single Door RH - Gasket (lower part)	DTR0009118207-A	2
171	Right guidance rail	DTR0009118977-A	2
172	Right Single door mechanism	DTR0009118212-A	4
173	Single Door LH- Window pane	DTR0009118197-A	1
174	Left guidance rail	DTR0009118996-A	2
175	Connection cable	DTR0000015398-A	4
176	Left Single door mechanism	DTR0009118208-A	4
177	Door isolation end switch	DTR0009118223-A	5
178	Door mechanism motor	DTR0009118210-A	8
179	Emergency exit system handle return spring	DTR0009119811-A	2
180	Return spring of isolating place	DTR0009118224-A	3
181	Totem	DTR0009118611	2
182	Emergency handle	DTR0009118218-A	3
183	- Public address system + microphone box	DTR0009118239-A	6
184	- Public address system pushbutton	DTR0009118727-A	4
185	Interior pillar lining painted	DTR0000029757-A	1
186	Interior pillar lining painted	DTR0000029758-A	1
187	Interior pillar lining painted	DTR0000029759-A	1
188	Interior pillar lining painted	DTR0000029760-A	1

Item no.	Description	DTR Number	Qty
189	Interior pillar lining painted	DTR0000029761-A	1
190	Interior pillar lining painted	DTR0009119443-A	4
191	Interior pillar lining painted	DTR0009119444-A	3
192	Pied de montant polystère / Interior pillar polyester support	Besoin	2
193	Fairing equiped simple low face,power car	DTR0000034089-A	1
194	Fairing equiped simple low face,power car	DTR0000034092-A	1
195	Fairing equiped simple low face,power car	DTR0000034087-A	1
196	Fairing equiped simple low face,power car	DTR0000034090-A	1
197	Support equiped for simple low face	DTR0000030018-A	1
198	Saloon window (curved)	DTR0009119453-A	8
199	Saloon window (curved with display cutout)	DTR0009119454-A	8
200	Bellows	DTR0009118742-A	1
201	FIP repeater unit (logic board)	DTR0009118267-A	3
202	Articulation bearing/lager onderste verbindingsstang	DTR0009118272-A	2
203	Sealing ring (on bearing)	DTR0009118273-A	1
204	Articulation knuckle	DTR0009118274-A	2
205	Intercar rod lg 700 / stang verbindingsstuk lg 700	DTR0009118744-A	1
206	Skirt	DTR0009119459-A	7
207	Skirt of centre unit	DTR0009119460-A	2
208	Sacrificial step	DTR0009118749-A	4
209	Brake isolation local push-button	DTR0009118279-A	2
210	Hydraulic brake unit - Oil filter	DTR0009118283-A	1
211	Load sensor type A	DTR0009118284-A	2
212	Load sensor type B	DTR0009118285-A	2
213	Speed sensor (set)	DTR0009118287-A	10
214	CompleteAxle box with A.M bearings	DTR0009118291-A	4
215	Complete Axle box with B.M bearings	DTR0009118292-A	4
216	Hydraulic brake unit - Oil filter	DTR0009118297-A	1
217	Emergency brake release system	DTR0009119654-A	3
218	- Oil charging gasket	DTR0009118760-A	8
219	Emergency hand release	DTR0009118761-A	1
220	Hand pump connecting valve	DTR0009118762-A	1
221	Raccord rapide + flexible / Quick coupling + hose	Besoin	6
222	Hydraulic accumulator	DTR0009118298-A	3
223	Passive brake strap	DTR0009118299-A	6
224	- Magnetic brake spring	DTR0009118765-A	3
225	- Magnetic brake bellows	DTR0009118766-A	6
226	Sanding compressor filters	DTR0000031205-A	1
		DTR0009118308-A	1
227	Re-filling pipe, left	DTR0009118311-A	4
228	Emergency access tap	DTR0009118313-A	2
229	Air hoses	DTR0009118314-A	5
230	Heated nozzle	DTR0009118316-A	5
231	Sanding pipe right	DTR0009118676-A	4
232	Sanding pipe left	DTR0000025713-A	2

Item no.	Description	DTR Number	Qty
233	Sanding ejector, left	DTR0009118317-A	4
234	Sanding ejector, right	DTR0009118608-A	5
235	Electrovalve (direction of travel)	DTR0009118318-A	5
236	Transversal shock absorber	DTR0000037851-A	2
237	Vertical shock absorber	DTR0000037848-A	2
238	Secondary suspension, outside	DTR0009118563-A	1
239	Compensation blocks	DTR0009118324-A	2
240	Earth contact	DTR0009118326-A	2
241	Carbon brush	DTR0009118327-A	2
242	Gasket (382.5708-4)	DTR0009118328-A	2
243	Gasket (247.1842-4)	DTR0009118329-A	2
244	Abrasive surface (347.4855-4)	DTR0009118330-A	2
245	Gasket (247.1848-4)	DTR0009118331-A	2
246	Gasket (ISO87.5x5.5x1.98)	DTR0009118332-A	2
247	Earth cable between frame and bolster beam	DTR0009118333-A	1
248	Bolster	DTR0009118334-A	1
249	Slewing ring	DTR0009118335-A	1
250	Flange lubricator Reservoir	DTR0000037666-A	1
251	Earth contact unit	DTR0009119656-A	3
252	Sensor toothed wheel	DTR0009118575-A	1
253	Active callipers support T1	DTR0009118345-A	1
254	Active callipers support T2	DTR0009118346-A	1
255	Active callipers support T3	DTR0009118347-A	1
256	Brake set of pads	DTR0009118348-A	12
257	Brake disk	DTR0009116404-A	8
258	Hydraulic accumulator	DTR0009118356-A	3
259	Drain coupling	DTR0024656WA4-A	1
260	Pre-control electronics	DTR0009118357-A	4
261	Earthing cable	DTR0009116428-A	1
262	Body-bogie earthing cable	DTR0015514AK5-A	1
263	Transverse shock absorber	DTR0009116403-A	1
264	Transverse shock absorber support	DTR0000030139-A	1
265	Vertical shock absorber	DTR0000030136-A	1
266	Secondary spring set	DTR0000030168-A	2
267	Anti-roll bar rod	DTR0009116407-A	2
268	Anti-roll bar bearing	DTR0009116409-A	1
269	Anti-roll bar bearing brass	DTR0009116410-A	1
270	Drive rod	DTR0009116411-A	1
271	Drive rode articulation (body side)	DTR0000038784-A	1
272	Drive rode articulation (body side)	DTR0000038784-A	1
273	Wheel flange lubricator distributor	DTR0000037669-A	3
274	Wheel flange lubricator nozzle	DTR0000037670-A	4
275	Hose Tank / flange lubricator distributor	DTR0000038864-A	2
276	Hose Spray / flange lubricator distributor	DTR0000038866-A	2
277	Carrier bridge	DTR0009116400-A	1
278	Articulation	DTR0009116416-A	1

Item no.	Description	DTR Number	Qty
279	Articulation support	DTR0009118379-A	1
280	Stop support ARD AVG B1	DTR0009118778-A	1
281	Stop support ARD AVG B2	DTR0009118779-A	1
282	Transverse stop	DTR0009116424-A	1
283	Elastic wheel	DTR0000030548-A	2
284	Bandage /Tyre	A IDENTIFIER	8
285	PRESSURE RING	DTR0000033875-A	2
286	Roof skirt (for power car)	DTR0000030020-A	2
287	Roof skirt (for power car)	DTR0000030019-A	2
288	Roof skirt (for power car)	DTR0000030022-A	4
289	Roof skirt (for power car)	DTR0000030021-A	4
290	Roof skirt (for power car)	DTR0000030023-A	8
291	Roof skirt (for power car)	DTR0000030024-A	2
292	Roof skirt (for power car)	DTR0000030025-A	2
293	Power car roof skirt, painted	DTR0000029472-A	8
294	Power car roof skirt, painted	DTR0000029473-A	8
295	Roof skirt support	DTR0000026090-A	72
296	Roof skirt (set for 1 platform)	DTR0000030027-A	1
297	Roof skirt (set for 1 platform)	DTR0000030028-A	1
298	Roof skirt (set for 1 platform)	DTR0000030029-A	1
299	Roof skirt (set for 1 platform)	DTR0000030030-A	1
300	Floating potential power supply	DTR0009118791-A	3
301	Current sensor shoes	DTR0009118411-A	3
302	Warning unit / lampenpaneel	DTR0026734070-A	4
303	Control box distributor/bedieningskast verdeler	DTR0009118067-A	2
304	TBC 9-30-10 contactor	DTR00257235B2-A	6
305	TBC 16-30-10 contactor	DTR00257235B4-A	3
306	TBC 25-30-10 contactor	DTR00257235B5-A	3
307	TBC 9-22-00 contactor	DTR00257235B3-A	2
308	TBC 30-30-00 contactor	DTR00257235B6-A	2
309	S295OGC24T contactor	DTR0025721080-A	2
310	55RFS2A4TP7 contactor	DTR002572195V-A	3
311	TRIOBC60 contactor	DTR00257235DB-A	2
312	Diode transil for TBC9-10 -16-25-30 contactor / begrenzer contactor	DTR002572379Y-A	3
313	Diode transil for TRIOBC60 contactor	DTR002572379Z-A	1
314	Block transil + signalling 24 V relay	DTR0009118416-A	4
315	Block transil + signalling 12 V relay	DTR0009118417-A	3
316	Input/output IT unit (MESD 48/32/4)	DTR0009118422-A	4
317	MICRO-CB MAG-TH AN 1-P.ENC.C 2 A	DTR0000000214-A	10
318	MICRO-CB MAG-TH AN 1-P.ENC.C 5A	DTR00257575AZ-A	4
319	MICRO-CB MAG-TH AN 1-P.ENC.C 8A	DTR0000000213-A	4
320	MICRO-CB MAG-TH AN 1-P.ENC.C 10A	DTR0000000283-A	1
321	MICRO-CB MAG-TH AN 1-P.ENC.C 16A	DTR0000000212-A	2
322	MICRO-CB MAG-TH AN 1-P.ENC.C 25A	DTR0000000215-A	1
323	Relay 12V - XUV	DTR00267348GA-A	2

Item no.	Description	DTR Number	Qty
324	Relay 12 V - XVV	DTR00267348GB-A	2
325	Relay 12 V - XWV	DTR00267348GC-A	2
326	Relay 24V: - UUU / Relais 24V	DTR0025731508-A	3
327	Relay 24 V - UVU	DTR0025731509-A	3
328	Relay 24 V - UWU	DTR0025731510-A	2
329	Relay 24 V - UXU	DTR0025731511-A	3
330	Time delay relay TBAO-24-YUY	DTR00267348BN-A	3
331	Time delay relay TBOR-24-ZUY	DTR00267348BR-A	4
332	Gas supports	DTR00223571FZ-A	5
333	Temperature monitor for BT box	DTR0009118418-A	5
334	Fan for BT box	DTR0009118419-A	5
335	Brake electronics with microprocessor ESRA	DTR0009118792-A	1
336	Pre-control electronics	DTR0009118793-A	1
337	Connector for electronics KBGM-H	DTR0009118794-A	1
338	Battery fuse (500 A T3 gG) G	DTR0025558ABC-A	1
339	Motorised switch for isolating battery	DTR0009118425-A	1
340	Battery temperature sensor	DTR0009118426-A	2
341	Charging current sensor	DTR0009118427-A	5
342	Gas support	DTR00223571GA-A	2
343	Switch closing relay	DTR0009118433-A	2
344	Switch closing relay	DTR0009118433-A	2
345	Switch closing relay	DTR0009118433-A	2
346	Time delay for opening Circuit Breaker	DTR0009118436-A	2
347	HF Filter capacitor	S4509111P4796-A	2
348	Relay QDI	DTR0009118437-A	2
349	Inductor LF	DTR0009118438-A	2
350	Short-circuit board	DTR0009118439-A	3
351	Ricc resistance	DTR0009118440-A	2
352	Isolator SI	DTR0009118442-A	2
353	Phase voltage probe	DTR0009118444-A	2
354	Card CALIX	DTR0009118446-A	2
355	Inverter ONIX 808	DTR0009118768-A	6
356	Surge arrester	DTR0009117153-A	2
357	Precharge contactor	DTR0009118478-A	2
358	Precharge RFP resistance	S4507766P7173-A	1
359	Supply line MUL sensor	DTR0009118480-A	1
360	Engaging CAEDJ+ mDJ contactor	DTR0009118481-A	1
361	CDJ capacitor	S4508470P2970-A	1
362	RMTDJ resistance	DTR0009118482-A	1
363	Engaging RE resistance	S4507736P7173-A	1
364	Shock absorber/ demper	DTR0009118489-A	1
365	Parallellism stub axle	DTR0009118807-A	4
366	Bearing shell	DTR0009118507-A	3
367	Rubber stop for base frame	DTR0009118809-A	3
368	Carbon strip	DTR0009118500-A	31
369	Head ends	DTR0009118501-A	4

Item no.	Description	DTR Number	Qty
370	Electric drive device	DTR0009118810-A	1
371	Linear motor	DTR0009118510-A	1
372	Control box	DTR0009118511-A	1
373	Magnetic contact	DTR0009118811-A	1
374	Rubber stop	DTR0009118512-A	1
375	Bellows	DTR0009118812-A	1
376	Shunt superior frame / bow	DTR0009118504-A DTR0009118493-A	8
377	Shunt base frame / inferior frame	DTR0009118484-A	4
378	Ball and socket joint for parallel guide bar	DTR0009118494-A	1
379	Bow bearing / bow suspension	DTR0009118813-A	4
380	Bow support & parallel guide	DTR0009118505-A	1
381	Bellows for parallel guide bar	DTR0009118492-A	1
382	Bellows for control cable	DTR0009118513-A	1
383	Fixed bearing for base frame/vast lager onderstel	DTR0009118485-A	1
384	Free bearing for base frame/vast lager onderstel	DTR0009118486-A	1
385	Fixed bearing for superior frame	DTR0009118814-A	1
386	Free bearing for superior frame	DTR0009118815-A	1
387	Ballbearing 6203	DTR0009118498-A	4
388	Insulating sleeve L03	DTR0009118499-A	4
389	Bush lateral superior frame	DTR0009118816-A	2
390	Triphase inverter module	DTR0000015422-A	3
391	HF battery charger module	DTR0000015429-A	3
392	Diode resistor assy	DTR0000035281-A	2
393	HF transformer	DTR0009118517-A	2
394	Inductance input filter	DTR0009118518-A	1
395	Inductance output filter	DTR0009118519-A	2
396	Output VMD	DTR0009118520-A	1
397	Inductance for EMC tri filter	DTR0009118521-A	3
398	Capacitor for EMC tri filter	DTR0009118522-A	1
399	Polyester cab	DTR0000029118	1
400	Traction motor	DTR0000031611-A	3
401	Bodycatcher basket	DTR0000035844	4
402	Fluid cooling Radiator	DTR0017714270-A	1
403	Cross beam - Freinage mécanique	DTR0009118878-A	1
404	Heater 18 kw 750 v	DTR0009119835-A	2
405	Motor type AS 71 C4	DTR0009119839-A	1
406	DJ motor 1,6-2,4	DTR0009119853-A	2
407	Relay 2 CT reverse	DTR0009119856-A	2
408	temperature probe	DTR0009119857-A	1
409	Safety thermostat 180 deg	DTR0009119859-A	1
410	Inductance input filter	DTR0000035111-a	1
411	Front Display (Girouette)	DTR0009118082-A	1
412	Articulation Rod	DTR0009118269-A	3

Table 13-2 LRV Spare Parts supplied to Red Cow Depot for Citadis 401 LRVs

13.6 LRV Spare Parts supplied to Red Cow Depot for Citadis 401 LRVs (continued)

Description	DTR Number	LRV Number	Qty
Cab underframe with fittings		PDAA144199000	2
Transom window without seal		PDAC502741010	8
Carbody end ring	DTR0000096005	PDAC026490010	2
Interbody articulation bracket	DTR0000043956	TRAC014171010	2
Bracket for rod between coaches	DTR0000043961	TRAC014131010	2
Carbody upright for double door	DTR0000094796	PDAC023369810	2
Carbody upleft for double door	DTR0000094794	PDAC023369820	2
Upper fairing	DTR0009118398	TRAA122721030	2
Polyester Side panel RH at level single door covering cabin and saloon	DTR0000029375	PRAA149410021	4
Side Aluminium panel frame behind side panel.	DTR0000028327	PRAC501280010	2
Carbody angle upright		PRAC024760010	2
Carbody angle upright		PRAC024760020	2
Handrail		PRAA145179000	4
Handrail for motor skirt		TRAC030391010	4
Carbody upright for single door		PRAC023360010	4
Carbody upright for single door	DTR0009119448	PRAC023360020	4
Carbody transom		TRAC022660010	2
Carbody transom LH at level of door mechanism		TRAC022780010	2
Carbody transom RH at level of door mechanism		TRAC022780020	2
Hinge		TRAC023290010	10
Upright base structure 538	DTR0000094711	TRAC015240010	4
Upright base structure 538	DTR0000094712	TRAC015240020	4
Upright base structure 455	DTR0000094713	TRAC015240030	8
Upright base structure 455	DTR0000094714	TRAC015240040	8
Upper fairing	DTR0000030022	PDAC503731060	4
Carbody upright base for single door	DTR0009119825	PDAC013920031	4
Base of upright	DTR0009119446	TRAC013920031	2
Base of upright	DTR0009119445	TRAC013920041	2
Base of upright	DTR0009119447	TRAC013930031	2
Base of upright	DTR0009119450	TRAC013940041	2
Carbody upleft base for single door	DTR0009119828	PDAC013930041	2
Doorstep for single door	DTR0000031171	TRAA120460010	6
Doorstep for double door	DTR0009118414	TRAA120460011	2
handrail		TRAC030391040	4
Doorstep	DTR0000031172	TRAA120690021	2
Panel fittings		TRAC010630010	5
Closing metal sheet equiped right side		TRAC030691010	2
Closing metal sheet equiped left side		TRAC030691020	2
Closing metal sheet equiped		TRAC041121010	2
support rail		TRAC067021010	2
REVETEMENT*SAFETYWALK-B2 0,9M-19MM		DTR0018186506	50
Moulded Equiped part	DTR0000061106	TRAC013871010	2
Moulded Equiped part	DTR0000061107	TRAC013871020	2
Bracket		TRAC018981010	4

Window Cab / Saloon		TRAC501950011	2
Polyester panel		TRAC010630020	4
Equiped bracket		TRAC017041010	4
compressing lock		DTR0000020777	20
Bracket 1.5X148.5X207		TRAA125800010	4
bracket		TRASC015221010	2
Moulded bracket		TRAC018970010	10
Moulded Equiped part	DTR0000061104	TRAA120581010	4
Moulded Equiped part	DTR0000061105	TRAA120581020	4
Bracket 4X70X148		TRAC031050020	2
Bracket 4X70X148		TRAC031050010	2
Bracket 4X34X130		TRAC031040020	2
Moulded interbody articulation support	DTR0000030768	TRAC018960010	4
Spring lock 8/12 tightness		DTR0020059535	10
Bracket 4X34X130		TRAC031040010	2
ETRIER KLBUCO1-3 A 10 MM 175331 1001		DTR0000022272	5
RUBAN EV-CROCHET 800-38 BLANC		DTR0018185011	4
Lock		DTR0020030345	2
Carbody upright	DTR0000089875	PDAC501490010	2
Carbody upright	DTR0000089876	PDAC501490020	2
Lateral Damper Assembly			1
Brake Electronic Rack (in Brake hydraulic system BP)	DTR0000139719		1
Filter Cartridge (in Traction motor Cooling)	DTR0000165605		108
Air Filter Cartridge (in Sanding)			123
Air Filter (in Ventilation of Cab AC unit)			80
Flat Cartridge (in Fresh Air Filter of HVAC)			140
Cartridge (in Recycled Air Filter of HVAC)			280
H7 Projector (in Headlamp)	DTR0000092210-A		12
Tail Fog Light	DTR0000200514-A		2
Head-Tail Light Optics	DTR0000060165-A		4

Table 13-3 LRV Spare Parts supplied to Red Cow Depot for Citadis 401 LRVs (continued)

13.7 Capital Spares supplied to Sandyford depot for Citadis 402 LRVs

Item	Description	DTR No.	Qty
1	Arpege Motor Bogie 350 1600	DTR0000190814	1
2	COOLING GROUP 5	DTR0000162951	2
3	AIR COMPRESSOR FOR SANDING	DTR0000129602	2
4	BRAKE HYDRAULIC UNIT	DTR0000063900	3
5	Arpege Trailer Bogie 350 1600	DTR0000172977	1
6	BRAKE HYDRAULIC SYSTEME	DTR0000045218	1
7	CAB AIR CONDITIONING UNIT	DTR0000072087	2
8	VENTILATION HEATING UNIT	DTR0000171041	2
9	BAR HEAD ALBERT	DTR0000126975	1
10	Traction master controller	DTR0000037723	2
11	PANTOGRAPH SBE 922-V10	DTR0000035373	2
12	CIRCUIT BREAKER	DTR0000036232	1

13	Traction cubicle	DTR0000038935	1
14	BRAKING RHEOSTAT	DTR0009118472	2
15	Static converter CVS BOX ASSEMBLY 13 KW	DTR0000103526	1
16	BATTERY BOX MRX260AH	DTR0000103572	1
17	Battery cde part	DTR0000175018	1

Table 13-4 Capital Spares supplied to Sandyford depot for Citadis 402 LRVs

13.8 LRV Spare Parts supplied to Sandyford depot for Citadis 402 LRVs

Item no.	Description	DTR No.	Qty
1	BOGIE MOTOR (ARPEGE) - Current return		
	Brush for return current contact	DTR0000101520	12
2	Traction motor cooling - Filter cartridge		48
3	Sanding - Air filter Cartridge	DTR0000165605	192
4	Mechanic brake - Friction part - Brake lining	DTR0000169780	60
5	Cab Air conditioning (NEU) - Ventilation - Air filter		128
6	Fresh air filter - Flat cartridge		384
7	Recycled air filter - Cartridge		768
8	Fluorescent lamp (saloon)	DTR0026431102	200
9	Fluorescent lamp (cab)	DTR0000109315	20
10	DRIVER ENVIRONMENT - Windscreen wiper		64
11	Headlamp & light H7 Projector - Bulb	DTR0000139698	50
12	Projector (head lamp) Bulb		50
13	TAIL FOG LIGHT - BULB 24V 21W BA15S 812824	DTR0000091288	50
14	LAMP, DOUBLE-END TUBULAR 24V 5W	DTR0026411044	50
15	BULB 24V 21W BA15S 812824		12
16	Braking/Traction Current collection - Carbon strip		64
17	Right door glass double door	DTR0009118186	6
18	Left door glass double door	DTR0009118191	6
19	Right door glass single door	DTR0009118203	3
20	Left door glass single door	DTR0009118197	2
21	Glass for sliding door	DTR0000095469	2
22	Cab right bay window	DTR0000177343	2
23	Cab left bay window	DTR0000177346	2
24	Glass for single window	DTR0000103809	5
25	Glass for window (for lateral display)	DTR0000103812	2
26	Glass for compartment fanlight window	DTR0000176347	5
27	Front blind	DTR0000175414	4
28	Lateral blind	DTR0000185345	4
29	Small glass for ring cab	DTR0000025654	2
30	Large glass for ring cab	DTR0000024220	2
31	Seat back cushion	DTR0000175027	32
32	Seat seating cushion	DTR0000175025	32
33	tip-up seating	DTR0000175029	4
34	Panel under window polyester parts 101	DTR0000169181	3
35	Panel under window polyester parts 102	DTR0000169184	3
36	Panel under window polyester parts	DTR0000174982	2

Item no.	Description	DTR No.	Qty
37	Interior lining post base rep 1	DTR0000170720	6
38	Interior lining post base rep 2	DTR0000170733	6
39	Cover intercom totem	DTR0000170796	6
40	Equipped power car skirt assembly.	DTR0000174966	4
41	Lateral panel in front sand box	DTR0000168158	4
42	Access trap sand box	DTR0000168160	2
43	Trailer bogie side right skirt	DTR0000174961	1
44	Trailer bogie side left skirt	DTR0000174964	1
45	Exterior lateral panel platform (trailer bogie)	DTR0000170927	2
46	Exterior lateral panel assembly	DTR0000170924	2
47	Lateral bib gangway side	DTR0000174976	8
48	Power car fairing assembly		2
49	Power car fairing assembly rep. 1	DTR0000178083	4
50	Lateral gangway skirt rep.1	DTR0000174974	1
51	Lateral gangway skirt rep.2	DTR0000174975	1
52	Lateral cab skirt (1 left + 1 right)	DTR0000029374	2
53	Right fairing cab rep. 2		1
54	Roller swing arm complete left double door	DTR0000180347	2
55	Roller swing arm complete right double door	DTR0000180346	2
56	Roller swing arm complete left single door	DTR0000180347	2
57	Roller swing arm complete right single door	DTR0000180346	2
58	Bumper assembly	DTR0000086671	1
59	Bumper absorbing buffer	DTR0023171330	4
60	Cab structure (polyester cell)		1
61	Superior trap		1
62	Central front fairing		2
63	Left cab fairing rep.1	DTR0000190050	2
64	Right cab fairing rep. 2		2
65	Headlight fairing (polyester) Lights frame	DTR0000190044	2
66	Jumper cable LV cable harness M1	DTR0000174979	1
67	Jumper cable LV cable harness M2	DTR0000197177	1
68	Jumper cable HV cable harness M1	DTR0000174981	1
69	Jumper cable HV cable harness M2	DTR0000197178	1
70	Equipped underframe cab	DTR0000174913	1
71	Ring cab assembly rep. 1	DTR0000176520	1
72	Ring cab assembly rep. 2	DTR0000176521	1
73	Cow catcher	DTR0000185381	2
74	Single door retractable sill	DTR0000175332	2
75	Double door retractable sill	DTR0000175330	4
76	Single door sealing (2 right + 2 left)	DTR0000131582	4
77	Lining fairing single door (1 right + 1 left) rep 102	DTR0000174956	2
78	Double door sealing (4 right + 4 left)	DTR0000131570	8
79	Lining fairing double door rep 101	DTR0000174951	4
80	MOTOR BOGIE (ARPEGE) - Body/bogie connection & suspension		
81	Vertical Damper Assembly	DTR0000167424	4
82	Lateral Damper Assembly	DTR0000082157	2

Item no.	Description	DTR No.	Qty
Traction motor cooling			
83	Motor Pump	DTR0000140141	2
84	Group Cooling with 3X400VAC Motor	DTR0000140993	2
Running gear			
85	Wheel Tyre + Ring (Sound)+ Elast.Part	DTR0000163720	12
86	Wheel Tyre Shunt (Kit for 8 wheels)	DTR0000101000	2
Sanding - AIR COMPRESSOR FOR SANDING			
87	Electric motor 24V	DTR0000079018	1
88	Air compressor	DTR0000079024	3
89	Brake Release Emergency Unit	DTR0000130998	2
90	Electronic box	DTR0000063901	3
Friction part			
91	Brake Caliper HS2P20	DTR0000172932	6
92	Kit of 2 Magnetic Brake Shoes	DTR0009118882	1
TRAILER BOGIE (ARPEGE) - SUSPENSION & BODY / BOGIE CONNECTION			
Mechanical brake - Brake hydraulic system BP			
93	Brake Electronic Rack	DTR0000042804	1
94	Friction part - Active Brake Caliper HF2A15	DTR0009116405	2
95	Magnetic brake - Kit of 2 Magnetic Brake Shoes	DTR0000172935	1
Air conditioning cabin (NEU)			
96	Evaporator Fan Air Conditioning	DTR0009119541	2
97	Condenser Fan Air Conditioning	DTR0009119539	2
98	Regulation Card URA1	DTR0000134390	2
99	Heating Ventilating passenger compartment (NEU) – Ventilation - Fan Motor of Air Traitment	DTR0009119847	3
100	Electrical equipment & control - UR Board Regulator	DTR0000174687	2
DOUBLE DOOR (FOR PASSENGERS)			
101	Double door leaf right	DTR0009119821	2
102	Double door leaf left	DTR0009119822	2
103	Complete double door mechanism	DTR0009118195	2
104	Double door control / command equipment - Door control unit	DTR0009118877	6
105	Single door leaf right	DTR0009119823	1
106	Complete right single door mechanism	DTR0009118212	1
107	Single Door leaf left	DTR0009119824	1
108	Complete left single door mechanism	DTR0009118208	1
109	Single door control / command equipment - Door control unit	DTR0009118877	2
110	Internal Door (access to the driver's cab)		
111	Sliding door - Sliding door complete	DTR0000186570	1
PASSENGERS INFORMATION SYSTEM			
112	Internal communication (public address system) - Cab unit (pa system)	DTR0000118037	2
113	Passengers information - Interior single display	DTR0000176808	4
114	Passengers information - Exterior lateral display	DTR0000170603	2
115	Passengers information - Front display	DTR0000170587	2

Item no.	Description	DTR No.	Qty
116	Cab windows - Windscreen	DTR0009119422	3
117	Passenger compartment glass (side window) Single window continue silk screen	DTR0009119453	5
118	Passenger compartment glass (side window) Single window interrup. silk screen (for lateral display)	DTR0009119454	2
119	Passenger compartment glass (side window) Compartment fanlight window	DTR0000176346	5
120	MECHANICALS LINKS Gangway bellows	DTR0000127655	1
121	MECHANICALS LINKS Articulation A. Lower articulation ball joint	DTR0000171375	1
122	MECHANICALS LINKS Articulation B. Upper joint 3 attachment point	DTR0000097971	1
123	MECHANICALS LINKS Articulation C. Inter coach link	DTR0009118744	1
124	MECHANICALS LINKS Articulation D. Intercar damper	DTR0000119868	1
125	DRIVER ENVIRONMENT - Driver's seat	DTR0000059801	1
126	DRIVER ENVIRONMENT - Windscreen wiper / washer assembly	DTR0009118134	2
127	RECORDING EQUIPEPMENT & DIAGNOSIS Tachometer unit central	DTR0000077201	1
128	CONTROL SYSTEM / TRAIN CONTROL FIP NETWORK REPEATER	DTR0009118267	1
129	CONTROL SYSTEM / TRAIN CONTROL ELEC.CUBICLE INPUT/OUTPUT MODULE	DTR0000186898	1
130	CONTROL SYSTEM / TRAIN CONTROL ELEC.CUBICLE INPUT/OUTPUT MODULE		2
131	CONTROL SYSTEM / TRAIN CONTROL PASSENGER COMP.INPUT/OUTPUT MODULE	DTR0009118168	2
132	CONTROL SYSTEM / TRAIN CONTROL LV ELEC.CUBICLE INPUT/OUTPUT MODULE	DTR0009118422	2
133	CONTROL SYSTEM / TRAIN CONTROL MMI TACTILE SCREEN	DTR0000079546	1
134	BRAKING / TRACTION Current collection WORKSHOP CONNECTOR BOX	DTR0009118474	1
135	BRAKING TRACTION EQUIPMENT (INVERTER BOX), Traction cubicle		1
136	BRAKING TRACTION EQUIPMENT - INVERTER ONIX 808 NG	DTR0009118768	3
137	BRAKING TRACTION EQUIPMENT CAEEA-47 AGATE CONTROL	DTR0000169765	3
138	CURRENT GENERATION & DISTRIBUTION (LV), POWER CIRCUIT 24V TERMINATION CELL - TREE PHASES INVERTER MODULE	DTR0000107027	1
139	CURRENT GENERATION & DISTRIBUTION (LV), POWER CIRCUIT 24V - MODULE BATTERY CHARGER HF	DTR0000107030	1

Item no.	Description	DTR No.	Qty
140	CURRENT GENERATION & DISTRIBUTION (LV), CONTROL CIRCUIT, EQUIPED RACK AAM01 AGATE CVS	DTR0000107029	1

Table 13-5 LRV Spare Parts supplied to Sandyford depot for Citadis 402 LRVs

13.9 Capital Spares supplied to Broombridge and Sandyford for Citadis 502 LRVs

Item no.	Description	Qty
1	Motor bogie	1
2	Traction motor cooling	1
3	Air compressor for sanding	2
4	Brake hydraulic unit	1
5	Brake hydraulic system	1
6	Cabin air conditioning unit	1
7	Ventilation Heating unit	1
8	Static converter	1

Table 13-6 Capital Spares supplied to Broombridge and Sandyford for Citadis 502 LRVs

13.10 LRV Spare Parts supplied to Broombridge and Sandyford for Citadis 502 LRVs

Item no.	Description	Qty
BOGIE MOTOR (ARPEGE)		
1	Vertical Damper Assembly	2
2	Lateral Damper Assembly	2
3	Traction motor cooling – Motor Pump	2
4	Traction motor cooling - Group Cooling with 3X400VAC motor	2
5	Running gear - Wheel tyre + ring (sound)+ Elast Part	16
Sanding Air Compressor for Sanding		
6	Electric motor 24V	1
7	Air compresor	3
8	Brake Release Emergency Unit	2
9	Electronique box	3
10	Friction part Brake Caliper HS2P20	6
11	Friction part Kit of 2 Magnetic Brake Shoes	1
TRAILER BOGIE (ARPEGE)		
12	SUSPENSION & BODY / BOGIE CONNECTION - Vertical Damper Assembly	2
13	SUSPENSION & BODY / BOGIE CONNECTION - Lateral Damper Assembly	1
14	Running gear Wheel tyre + ring (sound)+ Elast Part	4
15	Brake hydraulic system BP - Brake Electronic Rack	2
16	Friction part - Active Brake Caliper HF2A15	4

Item no.	Description	Qty
17	Magnetic brake - Kit of 2 Magnetic Brake Shoes	1
HEATING VENTILATING AND AIR CONDITIONING - Air conditioning cabin (NEU)		
18	Evaporator Fan Air Conditioning	2
19	Condenser Fan Air Conditioning	2
20	Regulation Card URA1	2
21	Heating Ventilating passenger compartment (NEU) – Ventilation Fan Motor of Air Traitment	3
22	Heating Ventilating passenger compartment: Electrical equipment & control - UR4 Board Regulator	2
ACCESS DOOR (FOR PASSENGERS)		
23	Double door leaf right	2
24	Double door leaf left	2
25	Complete double door mechanism	2
26	Double door control / command equipment - Door control unit	6
27	Single door leaf right	1
28	Complete right single door mechanism	1
29	Single Door leaf left	1
30	Complete left single door mechanism	1
31	Single door control / command equipment - Door control unit	2
32	INTERNAL DOOR (access to the driver's cab)	
33	Sliding door - (access to the driver's cab) - Sliding door complete	1
PASSENGERS INFORMATION SYSTEM		
34	Internal communication (public address system) - Cab unit (pa system)	2
35	Passengers information : Interior single display	4
36	Passengers information : Exterior lateral display	2
37	Passengers information : Front display	2
38	COUPLING / DRAFTGEAR - Cow catcher	1
39	External cab arrangement - Cab windows - Windscreen	2
40	MECHANICALS LINKS - Gangway bellows	1
41	MECHANICALS LINKS - Articulation A. Lower articulation ball joint	1
42	MECHANICALS LINKS - Articulation B. Upper joint 3 attachment point	1
43	MECHANICALS LINKS - Articulation C. Inter coach link	1
44	MECHANICALS LINKS - Articulation D. Intercar damper	1
45	Driver seat	4
46	Windscreen wiper / washer assembly	2
47	Tachometer unit central	1
CONTROL SYSTEM / TRAIN CONTROL		
48	FIP Network Repeater	1
49	ELEC.Cubicle INPUT/OUTPUT Module	1
50	ELEC. Cubicle INPUT/OUTPUT Module	2
51	PASSENGER COMP.INPUT/OUTPUT Module	2
52	LV ELEC. Cubicle INPUT/OUTPUT Module	2
53	MMI TACTILE SCREEN	1
BRAKING / TRACTION		
54	Current collection - Workshop Connector Box	1

Item no.	Description	Qty
55	INVERTER ONIX 808 NG	3
CURRENT GENERATION & DISTRIBUTION (LV)		
56	POWER CIRCUIT 24V TERMINATION CELL - Three Phases Inverter module	1
57	POWER CIRCUIT 24V - Module Battery Charger HF	1
58	CONTROL CIRCUIT - Equiped rack AAM01 AGATE CVS	1
CCTV		
59	CCTV Recorder	1
60	CADDIES	7
61	CAMERA (Passenger Area)	4
62	CAMERA (Front Cabin)	2
REAR-VIEW SYSTEM		
63	Camera	2
64	Screen	2
65	Control Box	2

Table 13-7 LRV Spare Parts supplied to Broombridge and Sandyford for Citadis 502 LRVs

13.11 Capital Spares and LRV Spare Parts supplied to Broombridge for Citadis 402 LRVs

Subsystem	DTR number	Description	Qty
Rear view	DTR0000077138-B	DISTRIB CONTROL UNIT	1
Rear view	DTR0000085185-A	COLOR CAMERA RETROVISION	2
Rear view	DTR0000077142-B	RIGHT REAR VIEW MONITOR	1
Rear view	DTR0000077140-B	LEFT REAR VIEW MONITOR	1
Track brake	DTR0000172935-A	KIT OF 2 MAGNETIC BRAKE SHOES	1
Brakes	DTR0000063900-A	BRAKE HYDRAULIC UNIT	2
Brakes	DTR0000172932-A	BRAKE CALIPER	2
Brakes	DTR0000139719-A	BRAKE ELECTRONIC RACK	1
Sanding compressor	DTR0000129602-A	COMPACT SANDING COMPRESSOR	2
Master Controller	DTR0000037723-D	CONTROLLER	1
Microphone	DTR0009118080-A	MICROPHONE	4
Speedometer	DTR0009118000-A	TACHOMETER CIT. 1	2
Cab door	DTR0000186576-A	LOCK CAB DOOR	1
Blinds	DTR0000185345-A	RIGHT LATERAL WINDOW BLIND	2
Blinds	DTR0000185347-A	LEFT LATERAL WINDOW BLIND	2
Blinds	DTR0000175414-A	FRONT WINDOW BLIND	2
Body catcher	DTR0000185381-A	TRACK CLEARING DEVICE	1
Fire extinguisher	DTR0000150416-A	EXTINGUISHER CO2,	10

Subsystem	DTR number	Description	Qty
Wiper	DTR0024741048-A	MOTOR, WINDOW WIPER MODEL 119 24V	6
Wiper	DTR0000108595-A	ARM, BRUSH HOLD. PARAL.BR. LG=800	6
Wiper	DTR0024741842-A	WIPER OF WIND. WIPER P 80 LG:800	9
Panto	DTR0000035373-A	PANTOGRAPH SBE 922	1

Table 13-8 Capital Spares and LRV Spare Parts supplied to Broombridge for Citadis 402 LRVs

13.12 Capital Spares for Broombridge and Sandyford for extended Citadis 402 LRVs

Item no.	Description	Qty
1	Motor bogie	1
2	Traction motor cooling	1
3	Traction Motor	2
4	Air compressor for sanding	2
5	Brake hydraulic unit	2
6	Ventilation Heating unit	2
7	Traction cubicle	1
8	Braking rheostat	1

Table 13-9 Capital Spares for Broombridge and Sandyford for extended Citadis 402 LRVs

13.13 LRV Spare Parts for Broombridge and Sandyford for extended Citadis 402 LRVs

Item no.	Description	Qty
BOGIE MOTOR (ARPEGE)		
1	Vertical Damper Assembly	4
2	Lateral Damper Assembly	2
3	Traction motor cooling – Motor Pump	2
4	Traction motor cooling - Group Cooling, With 3X400VAC Motor	2
5	Running gear - Wheel tyre + Ring(Sound)+ Elast.Part	8
6	Running gear - Wheel tyre Shunt (Kit for 8 wheels)	2
7	Current return - Brush for return current contact	16
8	Traction motor cooling - Filtering cartridge	2
Sanding Air Compressor for Sanding		
9	Electric motor 24V	2
10	Air compresor	2
11	Brake Release Emergency Unit	2
12	Electronique box	2
13	Friction part Brake Caliper HS2P20	4
14	Friction part Kit of 2 Magnetic Brake Shoes	2
15	Air fliter Cartridge	132

Item no.	Description	Qty
Mechanic brake - Friction part		
16	Brake lining	8
17	Brake Disk	2
HEATING VENTILATING AND AIR CONDITIONING - Ventilation		
18	Fan Motor of Air Traitment	4
19	UR4 Board Regulator	2
20	Fresh air filter - Flat cartridge	130
21	Recycled air filter - Cartridge	130
INTERNAL LIGHTING		
22	Fluorescent lamp (saloon)	28
SECURITY SYSTEM & EXTERNAL CONTROL		
23	Package Night Light/Warning Light	4
24	Lamp, Double-End Tubular 24V 5W	8
ACCESS DOOR (FOR PASSENGERS)		
25	Double door leaf right	2
26	Double door leaf left	2
27	Complete double door mechanism	2
28	Double door control / command equipment - Door control unit	4
PASSENGERS INFORMATION SYSTEM		
29	Passengers information : Interior single display	4
EXTERNAL PASSENGER COMPARTMENT		
30	Passenger compartment glass (side window) Single window continu silk screen	2
31	Passenger compartment glass (side window) Compartment fanlight window	1
32	MECHANICALS LINKS - Gangway bellows	1
33	MECHANICALS LINKS - Articulation A. Lower articulation ball joint	1
34	MECHANICALS LINKS - Articulation B. Upper joint 3 attachment point	1
35	MECHANICALS LINKS - Articulation C. Inter coach link	1
36	MECHANICALS LINKS - Articulation D. Intercar damper	1
CONTROL SYSTEM / TRAIN CONTROL		
37	LV ELEC.Cubicle Input/Output Module	2
BRAKING / TRACTION		
38	Inverter ONIX 808 NG	2
39	CAEEA-47 AGATE Control	4
CCTV		
40	CCTV Recorder	2
41	CADDIES	2
42	Camera (Passenger Area)	10
43	Camera (Front Cabin)	2
44	Poe Swotch	2
REAR-VIEW SYSTEM		2
45	Camera	2
46	Screens - left	2
47	Screens - right	2

Item no.	Description	Qty
COLLISION DAMAGE & VANDALISM SPARES		
48	Right door glass double door	2
49	Left door glass double door	2
50	Glass for single window	2
51	Glass for compartment fanlight window	1
52	Seat back cushion	8
53	Seat seating cushion	8
54	Tip-up seating	1
55	Panel under window polyester parts 101	1
56	Panel under window polyester parts 102	1
57	Panel under window polyester parts	2
58	Interior lining post base rep 1	1
59	Interior lining post base rep 2	1
60	Cover intercom totem	2
61	Equiped power car skirt assembly	2
62	Lateral panel in front sand box	2
63	Acces trap sand box	1
64	Lateral bib gangway side	2
65	Power car fairing assembly	1
66	Power car fairing assembly rep.1	1
67	Lateral gangway skirt rep 1	1
68	Lateral gangway skirt rep 2	1
69	Roller swing arm complete left double door	1
70	Roller swing arm complete right double door	1
71	Double door retractable sill	2
72	Double door sealing (4 right + 4 left)	1
73	Lining fairing double door rep 101	1
74	Lining fairing double door rep 102	1

Table 13-10 LRV Spare Parts for Broombridge and Sandyford for extended Citadis 402 LRVs

13.14 LRV Special Tools supplied to Red Cow Depot for Citadis 401 LRVs

Item no.	Use	Description	Qty
1	Traction chain	Tool set for extraction ONIX module	2
2	Traction chain	Testing software WINSCOPE AGATE CONTROL	1
3	Motor bogie	Tool set for removal/fitting wheel rim	2
4	Motor bogie	Tool set for the bearing of the axle box	1
5	Motor bogie	Releasing key	4
6	Motor bogie	Hand pump for brake assistance releasing	3
7	Trailer bogie	Tool set for removal/fitting wheel	2
8	Trailer bogie	Tool set for wheel clamping during re-profiling	4 sets of 4

Item no.	Use	Description	Qty
9	Trailer bogie	Tool set to compress the second level spring	1
10	Trailer bogie	Tool set to install/extract frame articulation	1
11	Trailer bogie	Tool set for removal brake callipers	2
12	Motor & trailer bogies	Drain and filling station with filter	2
13	Motor & trailer bogies (hydraulic brake)	Tool set for verification of pressure/ operation of accumulator	2
14	Motor & trailer bogies (hydraulic brake)	Forcing box for electro-valve	2
15	Auxiliary Converter	Testing software for converter	1
16	Battery	Battery charger bench	2
17	Air conditioning	Software test driver's cab air conditioning	1
18	Air conditioning	Refitting station driver's cab air conditioning unit	2
19	Pantograph	Refitting station	2
20	Doors	Refitting station door leaves	2
21	Doors	Tool set for removal and fitting of door mechanism	2
22	Doors	Testing software	1
23	Car body	Gauge with suction grip for cab windscreen	1
24	Car body	Tool set to uncouple the cars (bogie)	2
25	Car body	Lifting beam to remove roof boxes	2
26	Car body	Supporting beam to remove cab front end	1
27	Car body	Software for speed control unit for communication and data analysis	1
28	Car body	Software test for Processing Unit ,RIOM and front display unit DIAGATE	1
29	Car body	Software test for interior display and exterior side display	1
30	Car body	Software PIXEL for messages completion	1
31	Car body	Software for interior video surveillance	1
32	Car body	Monitor for interface for interior video surveill (inc.	1
33	Car body	Tool set for removal of push buttons and lights on	3
34	Motor & trailer bogies	Testing software for hydraulic brake	1
35	Air Conditioning	Tool set for removal air conditionning ceiling	2
36	Heating & Ventilation	Refitting station for heating and ventilation unit	2
37	Motor bogie ARPEGE	Tool set for speed sensors	1
38	Motor bogie ARPEGE	Tool set for removal/fitting motor pinion	1
39	Motor bogie ARPEGE	Releasing Key	2
40	Motor bogie ARPEGE	Forcing box for hydraulic brake bleeding	1
41	Motor bogie LHB	Heating device for the bearing of the axle box	1
42	Motor bogie LHB	Tool set for the slewing ring	2
43	Car body	Software AGATE EDIT for audio messages	1

Item no.	Use	Description	Qty
44	Car body	Tool set for clamping during car body uncoupling	2

Table 13-11 LRV Special Tools supplied to Red Cow Depot for Citadis 401 LRVs

13.15 LRV Special Tools supplied to Sandyford Depot for Citadis 402 LRVs

Name	Description	Qty
Propulsion		
Mounting/Dismantling tool for traction motor and pinion	Set of tools to support the motor when disconnecting it from gear box. Consist of a tool and an extraction/refit tool for pinion	1
Maintenance software for traction	Allows to read defects, set parameters, maintain the related equipment. This software is to be loaded on a lap-top computer.	1
Device to extract ONIX		1
Toolkit for Power Circuit Breaker	Keys and strength tester to test and set force and play in "Arc 812" power circuit breaker	1
Filling/draining unit for traction motor cooling system	Lorry and pump to load and remove air from traction motor cooling system.	1
Bogie		
Mounting/dismantling tool for articulation		1
Bar for alignment of suspensions		1
Table for bogies		1
Tool for pre-assembly anti-roll bar		1
Multi-purpose lifting table	This is hand operated lifting table on which a variety of jigs are fixed to carry a variety of component exchange operations (see below)	1 set
Mounting/dismantling tool for wheel	This is a jig to be mounted on the multi-purpose lifting table for the exchange of the corresponding equipment.	1
Mounting/dismantling tool for brake calliper	Same as above.	1
Mounting/dismantling tool for traction motor	Same as above.	1

Name	Description	Qty
Mounting/dismantling tool for sand compressor	Same as above.	1
Mounting/dismantling tool for hydraulic unit	Same as above.	1
Mounting/dismantling tool for brake disc	Same as above.	1
Mounting/dismantling tool for magnetic rail brake	Same as above.	1
Control tool for magnetic brake mounting		1
Mounting/dismantling tool for brake horns		1
Mounting/dismantling tool for wheel tyre	Set of supports and tools to exchange wheel tire	1
Tool for secondary springs compression	Pneumatic tool to compress secondary suspension springs before fitting on bogie.	1
Impulse unit for wheel flange lubricator	Test box allowing to trigger flange lubrication in the depot	1
Calliper for setting lubricator nozzles	Calliper to be fit on flange to reset nozzles positions after truing of wheels.	1
Filling unit for wheel flange lubricator	Lorry with pneumatic pump to feed lubricant reservoir	1
Hydraulic 60T press	Column press with electric pump	1
Brakes		
Key for releasing mechanical brake	Allows the manual release of spring brake in callipers (MB and TB)	2
Test box for hydraulic unit	Test set allowing forcing functions of hydraulic units.	1
Checking tool for accumulator pressure	Testing of pressure in brake unit hydraulic accumulator	1
Software for brake system	Allows to read defects, set parameters, maintain the related equipment. This software is to be loaded on a lap-top computer.	1
Auxiliaries and power supply		

Name	Description	Qty
Battery charger/discharger bench	Tool allowing to charge or fully discharge a battery removed from the tram. Note that this tool needs to be installed in a special ventilated room of the depot	1
Filling unit for batteries	Hand lorry with electrical pump to feed battery via central connecting point.	1
Tool for control of the strength of pantograph contact	Tool and bench allowing to measure, in the shop, the contact force of the pantograph.	1
Software for auxiliary static inverter	Allows to read defects, set parameters, maintain the related equipment. This software is to be loaded on a lap-top computer.	1
Doors		
Mounting/dismantling tools for door mechanism	Set of tools and shims to adjust and test door operation.	1
Mounting/dismantling tool for door leaf	Hand lifting lorry with suction cups used to lift and position door leaves	1
Software for door controls	Allows to read defects, set parameters, maintain the related equipment. This software is to be loaded on a lap-top computer.	1
Heating Ventilation Air Conditioning		
Dismantling tool for air conditioning grid	Small hand tools to dismount the AC grid in the cab and access AC components	2
Car-body structure and miscellaneous		
Suggesting tool for tram body	Jigs used to secure together tram portions when dismounting some portions.	1
Bar for towing	Interface tool for linking road/track vehicle to a tram for.	1
Lifting hand lorry and tool with suction cups for windscreen and lateral windows	Lifting hand lorry and tool with suction cups used to lift and position windscreens and windows	1
Suggesting frame for lifting door mechanism	Attachment to be mounted on hand lifting lorry to lift door mechanism.	1
Spreaders for lifting roof mounted equipment	Interface between overhead crane hook and roof equipment to be lifted (one large one small)	2
Large lorry for body with attachment	Fake bogie used to support the tram once bogies are removed. Attachment adapts from motor to trailer bogie.	2

Name	Description	Qty
Transport lorry for driving cab	Small lorry used to move driving cabin the depot when dismounted from tram.	1
Tool for low articulation positioning		1
Change lamp for switch		10
Key for screw with notch		1
Maintenance software for TCMS	Allows to read defects, set parameters, maintain the related equipment. This software is to be loaded on a lap-top computer.	1
Maintenance software for passenger display	Allows to read defects, set parameters, maintain the related equipment. This software is to be loaded on a lap-top computer.	1
Maintenance software for public address	Allows to read defects, set parameters, maintain the related equipment. This software is to be loaded on a lap-top computer.	1
Maintenance software for front display		1
Software for tachometer reading	Allows to read defects, set parameters, maintain the related equipment. This software is to be loaded on a lap-top computer.	1
Software for video supervision	Allows to download video recordings	1
Software for Automatic Passengers Counting System		1
Boitier double commande		1
Unit of filling & cleaning up of the brake hydraulic systems		1
Storage Racks		
Pantograph		1
Cab HVAC		1
Passengers heating/ventilation group		1
Traction motors		1
Traction inverter		1
Static inverter		1

Name	Description	Qty
Bogies		1
Gear box		1
Wheel bogies		1
Door leaves (6)		1
Windscreen (4)		1
Windows (10)		1

Table 13-12 LRV Special Tools supplied to Sandyford Depot for Citadis 402 LRVs

13.16 LRV Special Tools supplied to Broombridge Depot for Citadis 402 LRVs

Item	Description	Quantity	Comment
1	tow push test box	1	
2	pantograph test box	1	
3	SPEED THRESHOLD SIMULATOR	1	
4	MCB TEST BOX	1	
5	motor cooling test box	1	
6	DEVICE TO EXTRACT ONIX	1	
7	BRAKE DE-PRESSURISING TOOL	2	
8	DOOR CLUTCH TOOL	1	
9	ADJUSTING RULER FOR DOOR	2	
10	DOOR ALIGNMENT RULER	2	
11	PAIR OF CALIPER BRAKE RELEASE TOOLS	2	
12	HEADLIGHT BEAM ADJUSTER	1	
13	CCTV TESTER	1	
14	DIGITAL PRESSURE GAUGE 0-250 (FOR USE	1	
15	PRESSURE GAUGE FOR BRAKE HYDRAULIC	2	
16	PRESSURE GAUGE FOR SANDING	2	
17	BOGIE PRESSURE WASHER(wall mounted if	1	
18	DIGITAL ACCUMULATOR GAUGE & GAS	1	
19	HYDRAULIC GAUGE FOR MOTOR COOLING	2	
20	4 LEG PURPLE FIBRE BELT 2 TONNE SLING	1	
21	MANUAL DRUM THONG (BARREL GRAB) R-	1	
22	PODIUM STEPS 950mm 150kg MAX LOAD	1	
23	tool display cabinet	1	
24	AUXILIARY HYDRAULIC AIR FILTER	4	
25	DOOR OBSTACLE DETECTOR TOOL (10MM)	2	
26	DOOR ANGLE ALIGNMENT TOOL	1	
27	57 MM DOOR GAUGE	2	
28	6 MM DOOR GAUGE	2	
29	19MM / 21MM / 23 MM DOOR GAUGE	2	
30	8 MM DOOR GAUGE (G01702721)	2	

Item	Description	Quantity	Comment
31	8 MM / 10 MM DOOR GAUGE (G01702723)	2	
32	DOOR TOOL (G01702717)	2	
33	PIT LANE TRAM ACCESS STEPS WITH	1	
34	inspection torches	8	
35	MR 350	1	
36	MEKABOY ATTACHMENT STORAGE	1	
37	Toughbook	2	
38	LOW FLOOR BOGIE BRAKE DISC	5	
39	LOW FLOOR BOGIE DISC WEAR GAUGE	5	
40	LOW FLOOR BOGIE TRACK BRAKE HEIGHT	5	
41	BRAKE PAD WEAR GAUGE	5	
42	HIGH FLOOR BOGIE DISC WEAR GAUGE	5	
43	BRAKE PAD WEAR GAUGE	5	
44	HIGH & LOW FLOOR BOGIE SANDING	5	
45	REAR FLANGE GAUGE	5	
46	HOLLOW TREAD GAUGE	5	
47	FLANGE LUBE NOZZLE ALIGNMENT GAUGE	1	
48	BODY HEIGHT GAUGE	1	
49	AUDIO FILE AND CARD READER	1	
50	AGATE FILE AND CARD READER	1	
51	FLANGE LUBRICATION CHECKING TOOL	1	
52	CURRENT RETURN THREAD CLEANING	1	
53	WASTE OIL TANK	1	
54	CLAMP METER	1	
55	GROOVE GAUGE 0-40MM	1	
56	TSX3510 POWER SUPPLY	1	
57	FLUKE 561 INFRARED THERMOMETER	1	
58	CLARKE DIGITAL MULTIMETER	1	
59	DIGITAL DEPTH GAUGE	1	
60	MULTIMETER 117	2	
61	TES (1312) DIGITAL THERMOMETER	1	
62	ISO-TECH (DC POWER SUPPLY MODEL IPS-	1	
63	SOUND LEVEL METER	1	
64	MICROMETER 50-500MM	1	
65	TACHO TEST LEADS 500ohms	1	
66	NORBAR PRO-TEST 1500 30 - 1500 N.M	2	
67	NORBAR PRO-TEST 60 1.2 - 60 N.M	2	
68	NORBAR TORQUE WRENCH (4AR) 200- 800	2	
69	DYNACLEAN PARTS DEGREASER	1	
70	TORQUE HANDLE FOR TRACK BRAKE	4	
71	STATIC TORQUE METER 50-1000NM	1	
72	180-900 NM FACOM K.200DB	2	
73	800 NM 3/4" NORBAR 4AR	1	
74	STATIC TORQUE METER 5-125NM	1	
75	200 NM 3/4" TONICHI QSP280N3	1	
76	220 NM 3/4" TORQUE WRENCH TONICHI	1	
77	1/2"TORQUE WRENCH 60-330NM	2	

Item	Description	Quantity	Comment
78	FACOM TORQUE WRENCH 70 - 350 NM	2	
79	DIGITAL PUSH-PULL FORCE GAUGE IPX-806	1	
80	DEWALT 18V DRILL WITH 3 BATTERIES	1	
81	DIMPLEX HOOVER	1	
82	BENCH VICE	2	
83	3/8" TORQUE WRENCH 100 20-100NM	2	
84	20-100 NM 3/8" NORBAR 100	2	
85	FACOM TORQUE WRENCH 20-100Nm	2	
86	FACOM TORQUE WRENCH 40 - 200 NM	2	
87	3/8" TORQUE WRENCH 60 8-60NM	2	
88	3/8" TORQUE WRENCH FTW33 5-33NM	5	
89	NO HEAD FACOM TORQUE WRENCH 40-200	2	
90	TRAM SPEEDO CALIBRATION TEST PANEL	1	
91	10-50 NM 1/2" FACOM J.446	2	
92	NO HEAD TORQUE WRENCH 10 - 50 NM	2	
93	STRAIGHT EDGE	1	
94	20-100 NM 1/2" NORBAR 100	2	
95	4-20 NM 1/4" NORBAR SLO	2	
96	1/2"TORQUE WRENCH 5-50 Nm (INSULATED)	1	
97	1/2" NORBAR TORQUE WRENCH 60-340NM	2	
98	8-60 NM 1/2" NORBAR 13043	2	
99	1/2" TORQUE WRENCH 40-200 NM	2	
100	40-200 NM 1/2" BRITool E200T	2	
101	1/4" TORQUE WRENCH 5-20NM	2	
102	5-33 NM 3/8" BRITool AVT300A	2	
103	110V HENRY NUMATIC VACUUM CLEANER	1	
104	1/2"AIR IMPACT WRENCH	1	
105	TAP AND DRILL SET	1	
106	head torches	8	
107	HEAT GUN	1	
108	ELECTRONIC CALIPER GAUGE	1	
109	1/2" BREAKER BAR	3	
110	SOLDERING TOOL	1	
111	20MTR 220V 13AMP 4 SOCKET STANDARD	2	
112	DIGITAL HANGING SCALES 15KG CAP	1	
113	GAS BOTTLE LIFTER	1	
114	Electric key control system	1	
115	floor anti fatigue	1	
116	FILLING/DRAINING UNIT FOR MOTOR	1	
117	BATTERY FILLING GUN	1	
118	ROLLER CABINET	5	
119	SCRAPPER	5	
120	RULER	5	
121	FEELER GAUGES	5	
122	VERNIER CALIPERS PRE CALIBRATED	5	
123	27 MM RACHET SPANNER	5	
124	36 MM SPANNER	5	

Item	Description	Quantity	Comment
125	50 MM SOCKET 3/4 INCH DRIVE	5	
126	STEP UP 3/8-1/2	5	
127	STEP UP 1/2 - 3/4	5	
128	RACHET SPANNER SET	5	
129	3/8 SOCKET SET	5	
130	ALLEN KEYS	5	
131	AIR BLOWER	5	
132	WIRE BRUSH	5	
133	WIRE BRUSH	0	
134	INSPECTION MIRROR	5	
135	SPRAY BOTTLE	5	
136	CLIP BOARD	5	
137	TORQUE WRENCH PRE CALIBRATED 3/8	5	
138	TORQUE WRENCH PRE CALIBRATED	5	
139	PLIERS AND GRIPS SET	5	
140	VACUMN CLEANER NUMATIC	5	
141	SCREW DRIVERS	5	
142	TOOL BOX	1	
143	SOCKET SET 1/4 DRIVE	1	
144	PLIERS AND GRIPS SET	1	
145	RULER	1	
146	AIR BLOWER	1	
147	CLIP BOARD	1	
148	SCREW DRIVERS	1	
149	STORAGE BOX	1	
150	ALLEN KEYS	1	
151	09 99 000 0620 or 09 99 000 0191	2	crimp tool
152	172843-22	2	crimp tool
153	173823-22 or 0-0654149-1	2	crimp tool
154	8656-3005	2	crimp tool
155	90067 or 69710-1	5	crimp tool
156	AFM8 or M22520/2-01	2	crimp tool
157	D 31	2	crimp tool
158	DRB 0115 or 46007	2	crimp tool
159	FT8 ou WA27E	2	crimp tool
160	M22520/5-01 (HX4)	2	crimp tool
161	MH 860 (contact) or D31 (férule)	2	crimp tool
162	PZ16	2	crimp tool
163	PZ4	2	crimp tool
164	Serrage	2	crimp tool
165	Y 16 SCM2	2	crimp tool
166	09 99 000 0623	2	crimp tool attachements
167	86-164G-EC320 or 2488	2	crimp tool attachements
168	90145-2	2	crimp tool attachements
169	K13-1 or M22520/2-08	2	crimp tool attachements
170	M22520/1-05	2	crimp tool attachements
171	M22520/5-27 or Y151	2	crimp tool attachements

Item	Description	Quantity	Comment
172	SH 463	2	crimp tool attachments
173	SH 463 or TP 805	2	crimp tool attachments
174	TH 397 Bleu	2	crimp tool attachments
175	TH 493 Bleu	2	crimp tool attachments
176	TH 493 Rouge	2	crimp tool attachments
177	TH 531	2	crimp tool attachments
178	TH 531 Bleu	2	crimp tool attachments
179	TH 531 Rouge	2	crimp tool attachments
180	TH1A	2	crimp tool attachments
181	TP 1012	2	crimp tool attachments
182	TP 900-1	2	crimp tool attachments
183	Y206P	2	crimp tool attachments
184	305183 or 91019-3	10	crimp tool extraction tool
185	458994-1 or 1804030-1	10	crimp tool extraction tool
186	458994-2	10	crimp tool extraction tool
187	OUT S1675-0003	10	crimp tool extraction tool
188	S1545-0023	10	crimp tool extraction tool
189	M81969-14-04	10	crimp tool extraction tool
190	M81969-14-11	10	crimp tool extraction tool
191	8522-57	10	crimp tool extraction tool
192	M81969-14-03	10	crimp tool extraction tool
193	RX 20-25 GE1	10	crimp tool extraction tool
194	S/0250-01	10	crimp tool extraction tool
195	S/0350-01	10	crimp tool extraction tool
196	21-49-00-00-00 (HTS) or 1-1105550-8 (TYCO)	10	crimp tool extraction tool
197	09 99 000 0052	10	crimp tool extraction tool
198	09 99 000 0087	10	crimp tool extraction tool
199	09 99 000 0319	10	crimp tool extraction tool
200	4 K/S	10	crimp tool extraction tool
201	8380-25	10	crimp tool extraction tool
202	8532-01	10	crimp tool extraction tool
203	8656-3007A	10	crimp tool extraction tool
204	S/0150-01	10	crimp tool extraction tool
205	OUT 31748-000A2	10	crimp tool insertion tool
206	OUT S1545-0002	10	crimp tool insertion tool
207	20-43-00-00-59 (HTS) or 1-1105606-8 (TYCO)	10	crimp tool insertion tool
208	09 99 000 0059	10	crimp tool insertion tool
209	09 99 000 0088	10	crimp tool insertion tool
210	09 99 000 0059	10	crimp tool insertion tool

Table 13-13 LRV Special Tools supplied to Broombridge Depot for Citadis 402 LRVs

13.17 LRV Special Tools supplied to Broombridge Depot for Citadis 401 LRVs

Item	Description	Qty
1	Tool chest	8

Item	Description	Qty
2	C Spanner Cannon Plug	8
3	Cable Cutters HV	8
4	Circlip Pliers	8
5	Spanner Set Full range	8
6	Ratchet spanner 24mm	8
7	Ratchet spanner 27mm	8
8	Ratchet spanner 30mm	8
9	90Deg 27mm Spanner	8
10	Clamps	8
11	Hacksaw	8
12	Drill Bits	8
13	Air Gun	8
14	Air Ratchet	8
15	Air Tool Wrench	8
16	Digital Vernier Callipers	8
17	T-BAR Allen key	8
18	Allen key set standard	8
19	Torx set	8
20	Socket set 39 with ratchet	8
21	Impact socket set deep	8
22	Breaker bar short	8
23	Breaker bar long	8
24	Pry Bar Set	8
25	Mirrors	16
26	pipe grips	8
27	1/4 inch mini driver bit set	8
28	Precision screw driver set	8
29	Soldering Iron	8
30	Complete Tap Set	8
31	Measuring tape	8
32	Ruler 150mm	16
33	Scraper	16
34	Metal Brush	16
35	Nylon Brush	16
36	Lump Hammer	8
37	Files 6 Piece set	8
38	Feeler gauges	8
39	Heat Gun	8
40	Snips	8
41	Pliers set	8
42	Rivet Gun	8
43	Junior Hacksaw	8
44	Stanley Knife	8
45	Plastic Faced Hammer	8
46	Air hose Adapter	8
47	Pick set	8
48	1/2 inch driver bit set	8

Item	Description	Qty
49	Etraction set	8
50	Spray Bottles	24
51	Twin socket drum reel	8

Table 13-14 LRV Special Tools supplied to Broombridge Depot for Citadis 401 LRVs

13.18 LRV Special Tools supplied to Broombridge Depot for Citadis 401 LRVs (continued.)

Description	Qty
Forcing box	1
Power supply	1
401 battery charger	1
Hoses & connections for hydraulic equipment with depollution 401 specific	1
ROOF WORK STATION	1
motor cooling test box - 401	1
CCTV TESTER	1
DIGITAL PRESSURE GAUGE 0-250 (FOR USE WITH HYD BRAKE UNIT)	1
FLANGE LUBE NOZZLE ALIGNMENT GAUGE	1
BODY HEIGHT GAUGE	1
AUDIO FILE AND CARD READER	1
AGATE FILE AND CARD READER	1
BATTERY FILLING GUN	1
Kanban setup	1
Miniprof	2
pantograph test box - 401	2
SPEED THRESHOLD SIMULATOR-401	2
DEVICE TO EXTRACT ONIX	2
BRAKE DE-PRESSURISING TOOL	2
PAIR OF CALIPER BRAKE RELEASE TOOLS	2
PRESSURE GAUGE FOR BRAKE HYDRAULIC UNIT 0-160 BAR	2
PRESSURE GAUGE FOR SANDING COMPRESSOR 0-25 BAR	2
DIGITAL ACCUMULATOR GAUGE & GAS VALVE	2
AUXILIARY HYDRAULIC AIR FILTER CLEANING ADAPTOR	2
CURRENT RETURN THREAD CLEANING TOOL	2
THIN FLANGE GAUGE	2
HEADSTOCK ADJUSTER	2
Toughbooks	4
Tool boxes	4
Tool box side tray	4

SUSPENSION ROD HEIGHT GAUGE	4
10mm spanner	4
13mm spanner	4
17mm ratchet spanner	4
17MM SPANNEER	4
18 mm spanner	4
18mm spanner short	4
19mm spanner SHORT	4
19mm ratchet spanner	4
24mm combination spanner	4
27mm L-shape spanner	4
36mm open spanner	4
50MM SPANNER	4
55MM STUBBY SPANNER	4
10mm socket 3/8	4
13 socket 3/8	4
13 mm deep socket	4
3/8 17mm socket	4
19mm socket	4
3/8 to 1/2 inch adapter	4
1/2 to 3/8 adapter	4
3/8 wrench drive	4
pry-bar	4
PYR BAR FOR C- BANDS	4
pneumatic gun	4
RULLER 300MM	4
ruller 600MM	4
RULLER 150MM	4
PHILLIPS SCREWDRIVER	4
flat head screw driver	4
crows foot 3/8 24mm	4
CROWS FOOT 3\8 17MM	4
scrapper	4
airgun	4
metal brush	4
nylon brush	4
Torch	4
lump hammer	4
snips	4
needle files	4
8 mm allen head socket	4

8mm Allan key	4
Spray bottles	4
Pigeon hole/ clip board	4
MIRRORS	4
MAGNETS	4
6MM 1/4 Socket	4
Clip boards	4
Magnetic tray	4
Calliper spanner for MIC aux filter	4
27mm socket 1/2 inch	4
torx set	4
Cleaning set for IC bogie	4
socket set for IC bogie 10mm-30mm 3/8	4
C-Spanner large	4
C-spanner small	4
Feeler gauges	4
Track brake special hors shoes	4
HIGH FLOOR BOGIE TRACK BRAKE HEIGHT GAUGE	4
BRAKE PAD WEAR GAUGE	4
HIGH FLOOR BOGIE DISC WEAR GAUGE	4
HIGH & LOW FLOOR BOGIE SANDING NOZZLE HEIGHT GAUGE	4
REAR FLANGE GAUGE	4
HOLLOW TREAD GAUGE	4
Track Brake Horseshoe Gauge	4
HIGH FLOOR BOGIE BRAKE DISC THICKNESS GAUGE	4
AUXILIARY UNIT TOOL	4
Tool boxes draw liners	30

Table 13-15 LRV Special Tools supplied to Broombridge Depot for Citadis 401 LRVs (continued)

Schedule 14: Depots

14.1 General

- 14.1.1 Depot and stabling facilities for the Red Line are located at Red Cow Depot. This Depot includes a maintenance and repair workshop building, servicing and washing facilities and a large stabling area capable of accommodation up to 47 Citadis 401 LRVs (excluding the apron and the workshop lanes).
- 14.1.2 Depot and stabling facilities for the Green Line are located at Sandyford and Broombridge Depots. Sandyford Depot has similar maintenance facilities to those at Red Cow and has a stabling area capable of accommodating up to 34 Citadis 402 LRVs or 27 Citadis 502 LRVs (excluding the apron and the workshop lanes). Broombridge Depot has similar maintenance facilities to those at Red Cow and Sandyford, but does not have a wheel lathe lane. Broombridge Depot has a stabling area capable of accommodation up to 21 Citadis 402 LRVs or 17 Citadis 502 LRVs (excluding the workshop lanes).
- 14.1.3 Drawings of the Depots buildings and stabling areas are listed in Table 14-1 below.

Depot	Drawing Numbers.
Red Cow – Maintenance building	QA7051DA0004Q01
Red Cow – Stabling area	ZA7051TK1006_Z01
Sandyford – Maintenance building and stabling area	WB7051TK0004_W01
Sandyford – Maintenance building and stabling area	WB7051TK0003_W01
Broombridge – Maintenance building	BXD-400-DA-0420-Q01
Broombridge – Stabling area	BBXD0000DA2302_D01

Table 14-1 Drawings of Depots and stabling areas

14.2 Red Cow depot

- 14.2.1 The principal characteristics of Red Cow Depot are as follows:

Stabling:	12 stabling lanes with capacity for up to 47 Citadis 401 LRVs
Workshop lanes:	6 lanes consisting of: <ul style="list-style-type: none"> Lane 1 – wheel lathe lane with bogie wash area Lane 2 – slab and lifting lane Lane 3 – pit and gantry lane Lane 4 – pit and gantry lane

	Lane 5 – pit and gantry lane
	Lane 6 – slab and lifting lane
Service shed:	1 lane with servicing facilities as follows: Sanding shed - pit lane with sanding plant. Wash plant – slab lane with LRV wash plant.
Crane:	3 x 6t cranes over slab lanes 2, 5 and 6 and 2 x 1.5t cranes over pit lanes 3 and 4.
Static Bogie lifting table:	1 Nussbaum two-post lift for LHB bogies
Forklift:	1.5t forklift
Master Mover:	1 Master Mover for moving bogies, type MT20-800
Shunting vehicle:	1 remote control shunting vehicle used to position vehicles on the wheel lathe
Lifting system:	16 mobile lifting jacks.
Bogie lift:	1 bogie lifting table for bogie maintenance
Stores:	1 downstairs storage area for bulky items 1 upstairs storage area for small parts and electrical components
Offices:	Office and meeting room space upstairs
Multi-function rooms:	There are several rooms on the ground floor that can be used for offices/ storage or small workshops
Miscellaneous:	Kitchen facilities are provided on the ground floor as well as locker rooms, toilets and showers

14.2.2 TII intends to construct a new, single storey, de-mountable (i.e. removable) LRV maintenance building at Red Cow Depot. The new maintenance building will be 50m long by 9m wide and 7.7m high. It will be constructed over the LRV delivery lane at the south west end of the existing maintenance building. The existing concrete slab and track rails will be retained, and

the new structure will be bolted to the existing slab. LRVs will be shunted into the new structure as it is not proposed to extend the OCS. The new building will have toilet facilities, necessitating both foul and surface water drainage, in addition to water, power and data supply.

14.2.3 The purpose of the new de-mountable LRV maintenance building is to provide an additional slab lane, although there will be no lifting facility provided.

14.2.4 Planning permission for the new building was granted by South Dublin County Council in August 2018 and it is expected that the new building will be completed in quarter 1, 2019.

14.3 Sandyford Depot

14.3.1 The principal characteristics of Sandyford depot are as follows:

Stabling:	8 stabling lanes with capability for up to 34 Citadis 402 LRVs or 27 Citadis 502 LRVs
Workshop lanes:	3 lanes consisting of: Lane 1 – wheel lathe lane with bogie wash area Lane 2 – slab and lifting lane (capacity for two Citadis 502 LRVs) Lane 3 – pit and gantry lane (capacity for two Citadis 502 LRVs)
Service shed:	1 lane with servicing facilities as follows: Sanding shed - pit lane with sanding plant. Wash plant – slab lane with LRV wash plant.
Crane:	1 x 1.5t crane spanning lanes 2 and 3 2 x 2t mobile cranes and 1 x 1t mobile crane
Forklift:	1 x 8t forklift and 1 x 1.5t forklift
Shunting vehicle:	1 remote control shunting vehicle used to position LRVs on the wheel lathe
Lifting system:	20 mobile lifting jacks.
Bogie lift:	1 bogie lifting table for bogie maintenance
Stores:	1 downstairs storage area for bulky items

1 upstairs storage area for small parts and electrical components

Offices: Office and meeting room space upstairs

Multi-function rooms: There are several rooms on the ground floor that can be used for offices/ storage or small workshops

Miscellaneous: Kitchen facilities are provided on the ground floor as well as locker rooms, toilets and showers

14.4 Broombridge Depot

14.4.1 The principal characteristics of Broombridge depot are as follows:

Stabling: 3 stabling lanes with capability for up to 21 Citadis 402 LRVs or 17 Citadis 502 LRVs

Workshop lanes: 2 lanes consisting of:

Lane 1 – pit and gantry lane (capacity for one Citadis 502 LRV)

Lane 2 – slab and lifting lane (capacity for one Citadis 502 LRV)

Service shed: 1 lane with servicing facilities as follows:

Sanding shed - slab lane with sanding plant.

Wash plant – slab lane with LRV wash plant.

Crane: 6t crane spanning over slab lane and 1.5t crane spanning over pit lane

Forklift: 2t forklift

Master Mover: 1 ATP type Master Mover

Shunting vehicle: 1 remote control shunting vehicle

Lifting system: 20 mobile lifting jacks.

Bogie lift:	1 bogie lifting table for bogie maintenance
Stores:	1 downstairs storage area for bulky items 1 upstairs storage area for small parts and electrical components
Offices:	Office and meeting room space upstairs
Multi-function rooms:	There are several rooms on the ground floor that can be used for offices/ storage or small workshops
Miscellaneous:	Kitchen facilities are provided upstairs as well as locker rooms, toilets and showers

Schedule 15: Performance Standards for LRV Maintenance

15.1 Introduction

- 15.1.1 The Operator shall be required to achieve in each Reporting Period the Performance Standard shown for each Performance Indicator listed in **Error! Reference source not found.**
- 15.1.2 TII shall monitor the Operator's performance in relation to the Performance Indicators listed in **Error! Reference source not found.** by means of random audits. TII shall provide the Operator with a report of the results of the random audits carried out in each Reporting Period, within five Business Days of the end of the Reporting Period.
- 15.1.3 The Operator shall include in each Period Report details of its performance for each Performance Indicator listed in **Error! Reference source not found.** for that Reporting Period, in a format notified by TII to the Operator from time to time.

15.2 LRV Cleanliness Audits and LRV Passenger Environment Audits

- 15.2.1 TII shall carry out random audits of LRV cleanliness and LRV passenger environment each Reporting Period. Such audits, except those described in paragraph 15.2.5 shall be carried out overnight on LRVs that have been released from an overnight clean, but before they enter passenger service the following day. The timing of such random audits, and the selection of the LRVs to be audited, shall be at TII's sole discretion, without impeding the Operator's obligations under the Contract.
- 15.2.2 The Operator shall be entitled to one hour's notice of any audit referred to in paragraph 15.2.1, and the Operator shall ensure that an authorised member of the Operator's Personnel shall be available at all relevant times in order to facilitate such an audit. In the event that a member of the Operator's Personnel is unavailable at the required time, then TII shall be entitled to carry out such audit as provided under paragraph 15.2.1 without a member of the Operator's Personnel being present.
- 15.2.3 Subject to paragraph 15.2.2, LRV cleanliness audits shall be carried out jointly by TII and the Operator. Such audits shall be based on an inspection of those areas set out in the second column of Table 15-1. Each area shall be allocated a Cleanliness Score based on its standard of cleanliness in accordance with Table 15-2. If TII and the Operator cannot agree the appropriate Cleanliness Score, TII's score shall prevail, TII acting in good faith.
- 15.2.4 Subject to paragraph 15.2.2, LRV passenger environment audits shall be carried out jointly by TII and the Operator. Such audits shall be based on an inspection of those items set out in the second column of Table 15-3. Each item shall be allocated a Condition Score based on its condition in accordance with Table 15-3. If TII and the Operator cannot agree the appropriate Condition Score, TII's score shall prevail, TII acting in good faith.
- 15.2.5 The LRV passenger environment audits of items 3 (Passenger information display) and 4 (Passenger public address system) in Table 15-3 shall be carried out on LRVs that are in passenger service, rather than overnight on LRVs that are in the Depot. For this reason, the LRV passenger environment audits of these items may be carried out on different LRVs than the audits of the other items listed in Table 15-3, although the number of LRVs audited shall

be the same. For the same reason, different checklists will be used for the audits of items 3 and 4, and the audits of the other items listed in in Table 15-3.

Item	Area being audited	Cleanliness Score ("A") pursuant to Table 15-2	Weighting ("B")	Area Score ("A" x "B")
1	Passenger area floors		2.5	
2	Passenger area wall panels, doors, ceilings and seat backs		2.5	
3	Passenger area windows and glazing		2.5	
4	Passenger area seats upholstery		3	
5	Passenger area - handrails, poles and door pushbuttons		3	
6	Vehicle exterior - passenger windows and driver's windscreens		2.5	
7	Vehicle exterior – body sides, skirts and cab fronts		2.5	
8	Driver's cabs – seat and driver's console		2	
9	Driver's cabs – floors, walls and ceiling panels		2	
10	Driver's cabs – windscreens		2.5	
Total Score				

Table 15-1 LRV Cleanliness Audit Checklist

Item	Area being audited	Score	Cleanliness Score Criteria
1	Passenger area floors	4	Spotlessly clean, pattern and colour clearly visible
		3	Generally clean, with minor evidence of dust, dirt or marks
		2	Extensive dust, dirt, staining or chewing gum.
		0	Extremely dirty or a risk of soiling upon contact; or evidence of spillages, such as urine or vomit.
2	Passenger area wall panels, doors ceilings and seat backs	4	Spotlessly clean, with original patterns and colours clearly visible.
		3	Minor evidence of dust or dirt or chewing gum residue or marks where stickers or graffiti have been removed. No graffiti.
		2	Extensive dust, dirt, staining or chewing gum. No graffiti.
		0	Extremely dirty or a risk of soiling upon contact. Any graffiti.
3		4	Spotlessly clean

	Passenger area windows and glazing	3	Generally clean but some minor marks, dust, dirt or "streaking"
		2	Extensive dirt with the visibility of platform signs reduced
		0	Extremely dirty with risk of soiling upon contact or visibility very poor
4	Passenger area seats, upholstery and handrails	4	Spotlessly clean
		3	Minor evidence of dust or dirt or chewing gum residue or marks where stickers or graffiti have been removed
		2	Extensive dust, dirt, staining or chewing gum
		0	Extremely dirty or a risk of soiling upon contact
5	Passenger area - handrails, poles and door pushbuttons	4	Spotlessly clean
		3	Generally clean but some minor marks, dust, dirt or "streaking"
		2	Extensive dirt.
		0	Extremely dirty with risk of soiling on contact
6	Vehicle exterior - passenger windows and driver's windscreens	4	Spotlessly clean
		3	Generally clean but some minor marks, dust, dirt or "streaking"
		2	Extensive dirt with the visibility of platform signs reduced
		0	Extremely dirty with risk of soiling upon contact or visibility very poor
7	Vehicle exterior – body sides, skirts and cab fronts	4	Spotlessly clean
		3	Generally clean but some minor marks, dust, dirt or "streaking". No graffiti.
		2	Extensive dirt. No graffiti.
		0	Extremely dirty with risk of soiling on contact. Any graffiti.
8	Driver's cabs – seat and driver's console	4	Spotlessly clean
		3	Minor evidence of dust or dirt or chewing gum residue or marks where stickers or graffiti have been removed
		2	Extensive dust, dirt, staining or chewing gum
		0	Extremely dirty or a risk of soiling upon contact
9	Driver's cabs – floors, walls and ceiling panels	4	Spotlessly clean
		3	Minor evidence of dust or dirt or chewing gum residue or marks where stickers or graffiti have been removed
		2	Extensive dust, dirt, staining or chewing gum
		0	Extremely dirty or a risk of soiling upon contact
10		4	Spotlessly clean

	Driver's cabs – windscreens	3	Generally clean but some minor marks, dust, dirt or “streaking”
		2	Extensive dirt with the visibility of platform signs reduced
		0	Extremely dirty with risk of soiling upon contact or visibility very poor

Table 15-2 LRV Cleanliness Score Criteria

Ref.	Item being audited	Condition Score (“A”) pursuant to Table 15-4	Weighting (“B”)	Area Score (“A” x “B”)
1	Passenger seats		3.5	
2	Passenger saloon lighting		3.5	
3	Passenger information display		3.5	
4	Passenger public address system		3.5	
5	Passenger saloon heating		3.5	
6	Passenger doors		4.0	
7	Passenger saloon CCTV		3.5	
Total Score				

Table 15-3 LRV Passenger Environment Audit Checklist

Item	Area being audited	Score	Condition Score Criteria
1	Passenger seats	4	All seats in wear category 1 or 2 (as described in paragraph 12.5.1 of Schedule 12:)
		3	Up to two seats in wear category 3 (as described in paragraph 12.5.1 of Schedule 12:)
		2	Three or four seats in wear category 3 (as described in paragraph 12.5.1 of Schedule 12:)
		0	More than four seats in wear category 3, or any seats in wear category 4 or higher (as described in paragraph 12.5.1 of Schedule 12:)
2	Passenger saloon lighting	4	All lights in passenger saloon working
		3	One light in passenger saloon not working
		2	Two lights in passenger saloon not working
		0	More than two lights in passenger saloon not working
3	Passenger information display	4	All passenger information displays working and displaying correct information
		3	N/A

		2	One passenger information display not working or not displaying correct information
		0	More than one passenger information display not working or not displaying correct information
4	Passenger public address system	4	All public address speakers working and clearly audible
		3	N/A
		2	One public address speaker not working or not clearly audible
		0	More than one public address speaker not working or not clearly audible
5	Passenger saloon heating	4	All passenger saloon heating fans working effectively
		3	N/A
		2	One passenger saloon heating fan not working effectively
		0	More than one passenger saloon heating fan not working effectively
6	Passenger doors	4	All passenger doors working
		3	N/A
		2	One passenger door not working
		0	More than one passenger door not working
7	Passenger saloon CCTV	4	All passenger saloon CCTV cameras working
		3	N/A
		2	One passenger saloon CCTV camera not working
		0	More than one passenger saloon CCTV camera not working

Table 15-4 LRV Passenger Environment Score Criteria

Schedule 16: Description of the Infrastructure

16.1 General

16.1.1 The System is currently 43 km long (approximate distance, excluding depots and sidings) and comprises the following lines:

- Line A/C - from Tallaght in the south-west of the city to Connolly Station in the city centre.
- Line B - The section from Sandyford in the south-east of the city to St Stephen's Green in the city centre.
- Line A1 - The extension from Cookstown Stop to Saggart.
- Line B1 - The extension from Sandyford Stop to Brides Glen.
- Line C1 - The extension from Connolly Station on Line C to The Point
- Line LCC – Luas Cross City extension from St Stephen's Green to Broombridge

16.2 Line A/C

16.2.1 Line A/C consists of twin Tracks a little over 15 km long as indicated in the Maintenance Boundary Maps.

16.2.2 Line A/C runs along a protected right of way for some 60% of its route. The LRVs operating over this section are therefore fully segregated from other types of traffic. Most of the remainder of the line is on a segregated right of way adjacent and parallel to the road and separated from it by a low kerb and / or road markings.

16.2.3 Shorter sections of Line A/C share their alignment with other types of road traffic including pedestrians. Shared use principally occurs at junctions where the light railway crosses the carriageway. There are approximately 40 such junctions on Line A/C.

16.2.4 Line A/C is served by 23 Stops (as described in Section 16.10). A Park and Ride Site is located at Red Cow Stop. The Park and Ride facility at Tallaght Cross is operated under a separate arrangement and is outside the scope of this Contract. Maintenance functions for the Park and Ride Sites are detailed in Section 16.12.

16.2.5 Line A/C is served by Red Cow Depot which consists of, inter alia, a maintenance and repair workshop building, servicing and washing facilities and a large LRV stabling area capable of accommodating up to 47 Citadis 401 LRVs. Red Cow Depot accommodates Luas administrative functions and includes control room facilities for the Operator.

16.3 Line B

16.3.1 Line B consists of approximately 9 km of double Track as indicated in the Maintenance Boundary Maps. Line B runs for most of its length on a protected right of way, taking advantage of the disused Harcourt Street heavy railway corridor. The LRVs operating over this section are therefore fully segregated from other types of traffic.

16.3.2 Approximately 1 kilometre of this line, from St. Stephen's Green to Charlemont, is on a segregated right of way adjacent and parallel to the road and separated from it by a low kerb or road markings. Short sections of shared running occur, mostly at road junctions. There are approximately 10 such junctions on Line B.

16.3.3 Line B is served by 13 Stops. Park and Ride Sites on Line B are provided at Sandyford, Stillorgan and Balally.

16.3.4 Depot and stabling facilities on Line B are located at Sandyford, which has a mini-central control room to control depot points, SCADA, etc.

16.4 **Lines A1/B1/C1**

16.4.1 Line A1 consists of approximately 4.2 km of double Track as indicated in the Maintenance Boundary Maps. Line A1 is an extension from Line A/C which includes a turnout between Cookstown and Belgard stops on Line A/C and runs west to Saggart. Line A1 is served by 5 Stops. A Park and Ride Site is provided at Cheeverstown.

16.4.2 Line B1 consists of approximately 7.5 km of double Track as indicated in the Maintenance Boundary Maps. Line B1 is an extension from Line B at Sandyford and runs south to Brides Glenn. Line B1 is served by 11 Stops. Two of these Stops are not currently in service but may be brought into service when development takes place in the area. A Park and Ride Site is provided at Carrickmines.

16.4.3 Line C1 consists of approximately 1.5 km of double Track as indicated in the Maintenance Boundary Maps. Line C1 is an extension from Line A/C which includes a turnout between Busáras and Connolly stops on Line A/C and runs east to The Point. Line C1 is served by 4 Stops.

16.5 **Line LCC**

16.5.1 Line LCC consists of approximately 5.8 km of double Track as indicated in the Maintenance Boundary Maps. It runs for approximately half of its length (Broombridge to Broadstone Stops) on a protected right of way, taking advantage of the disused Broombridge heavy railway corridor. The LRVs operating over this section are therefore fully segregated from other types of traffic. The remainder of the line (Broadstone to St Stephen's Green Stops) comprises a mixture of shared running and segregated right of way on public roads. A single track loop arrangement is in place between College Green and Parnell Street.

16.5.2 There are approximately 33 junctions on Line LCC.

16.5.3 Line LCC is served by 13 Stops. There are no Park and Ride Sites on Line LCC.

16.5.4 Line LCC crosses Line A/C at O'Connell Street and also at Marlborough Street. There is no through running of services to/from the Red Line. Engineering connections are provided at both crossing locations but these are not used in passenger service.

16.5.5 Depot and stabling facilities are located at Broombridge Depot, which has a mini-central control room to control depot points, SCADA, etc.

16.6 **Track and Track Drainage**

16.6.1 The Track and Track drainage systems consist of:

- all load-bearing items including rails, turnouts, rail fastenings, ties, rail bearers, ballast and formation;

- all non load-bearing items including switch rodding, switch motor box-outs (motors included under Line Signalling), monuments, other datum markers, paving and all other surface finishes including grassed Tracks;
- surface and sub-surface drainage up to the point of discharge into the relevant local authority drainage system or open watercourse and including all attenuation facilities and flow limiting devices.

16.6.2 The System Track gauge is 1,435 mm. Ri59N grooved rail is used in most street-running sections whilst S49 rail is used in off-street areas. There are also some sections of Ri60N rail. The minimum Track radius is 25 metres on running lines.

16.6.3 For the Ri59N rail there are five variations of Trackform:

- Embedded Rail - (Protected – no access for vehicles);
- Embedded Rail – Segregated (segregated by a low kerb);
- Embedded Rail –Shared (e.g. junctions);
- Embedded Rail – Grass Track; and
- Embedded Rail – Floating Grass Track.

16.6.4 For the S49 rail there are two variations of Trackform:

- Traditional Track (No access for vehicular traffic); and
- Ballast Track.

16.6.5 Trackform quantities on the System, excluding the Depots, are listed in Table 16-1 below. There is approximately 1,500m of single track with S49 rail profile in each of the three Depots.

TRACK TYPE	Line B1	
Ri59N Rail Profile		
Embed Rail - Segregated	3,807m	50.56%
Embed Rail - Shared	201m	2.67%
Embed Rail - Grass	0m	0.00%
S49 Rail Profile		
Plinth Track	1,666m	22.12%
Slab Track	50m	0.66%
Ballasted Track	1,806m	23.98%
Total	7,530m	
TRACK TYPE	Line C1	
Ri59N Rail Profile		
Embed Rail - Segregated	741m	49.60%
Embed Rail - Shared	753m	50.40%
Embed Rail - Grass	0m	0.00%
S49 Rail Profile		
Plinth Track	0m	0.00%
Slab Track	0m	0.00%
Ballasted Track	0m	0.00%

Total	1,494m	
TRACK TYPE	Line A1	
Ri59N Rail Profile		
Embed Rail - Segregated	2,594m	61.29%
Embed Rail - Shared	255m	6.03%
Embed Rail - Grass	0m	0.00%
S49 Rail Profile		
Plinth Track	0m	0.00%
Slab Track	1,383m	32.68%
Ballasted Track	0m	0.00%
Total	4,232m	
TRACK TYPE	Line LCC	
Ri59N Rail Profile		
Embed Rail - Segregated	2,610m	45.00%
Embed Rail - Shared	522m	9.00%
Embed Rail - Grass	0m	0.00%
S49 Rail Profile		
Plinth Track	0m	0.00%
Slab Track	1,218m	21.00%
Ballasted Track	1,450m	25.00%
Total	5,800m	
TRACK TYPE	Line A/C	
Ri59N Rail Profile		
Embed Rail - Segregated	4,933m	32.56%
Embed Rail - Shared	1,796m	11.85%
Embed Rail - Grass	1,569m	10.36%
S49 Rail Profile		
Plinth Track	450m	2.97%
Slab Track	6,169m	40.72%
Ballasted Track	233m	1.54%
Total	15,150m	
TRACK TYPE	Line B	
Ri59N Rail Profile		
Embed Rail - Segregated	1,586m	17.78%
Embed Rail - Shared	210m	2.35%
Embed Rail - Grass	116m	1.30%
S49 Rail Profile		
Plinth Track	193m	2.16%
Slab Track	1,132m	12.69%
Ballasted Track	5,683m	63.71%
Total	8,920m	
TRACK TYPE	All Lines Combined	
Ri59N Rail Profile		
Embed Rail - Segregated	16,271m	42.80%
Embed Rail - Shared	3,737m	13.72%
Embed Rail - Grass	1,685m	1.94%
S49 Rail Profile		
Plinth Track	2,309m	4.54%
Slab Track	9,952m	17.96%
Ballasted Track	9,172m	19.04%
Total	43,126m	

Table 16-1 Trackform Quantities on the System

16.6.6 Street-running sections shared by LRVs, road traffic and pedestrian traffic have a variety of surface finishes – asphalt, granite setts and imprinted concrete. Through all Stops the Trackbed is surfaced in imprinted concrete. Most off-street sections of the System are either traditional or ballasted Track with the exception of short sections of grassed Track (the extent of which is indicated on the Maintenance Boundary Maps). Ballast Track has been utilised extensively on Line B and at Red Cow and Sandyford Depots.

16.6.7 Wayside track lubricators are placed at some curves to reduced friction wear and noise from wheel rail interfaces, Mechanical lubricators are located 2 each in both Sandyford and Red Cow Depots. Automatic top and side lubricators are located in pairs in the following locations

- 2 each at Charlemont;
- 2 each at Glencairn;
- 2 each at The Gallops;
- 2 each at Kingswood; and
- 2 each at Cookstown

16.7 Traction Power Supply and Distribution System

16.7.1 Traction power is delivered from electrical sub-stations at 750 volts DC (nominal) via an overhead conductor system (OCS). The overhead conductor is supported by poles or by anchors to buildings adjacent to the Track. Power is supplied to the electrical sub-stations from the national grid at 10 kV AC.

16.7.2 Traction return current is conducted via the running rails and underground cables back to traction substations located typically every 1 to 2 km. The Track is designed to minimise stray current leakage with a maintenance limit on rail-earth resistance of 10 ohm.km.

16.7.3 There are 22 traction substations on the System as listed in Table 16-2.

Luas Substations												
Total 22 Substations												
Sub location	Line	Under/Overground	Commissioned	Upgraded	Current Installation Efacec/Ansaldo	Original Capacity (Traction)	Upgraded Capacity (Traction)	Metro Compatible Yes/No	No. Of DC HSCB's	DC Switchgear Rated Current	Traction Transformer Primary/Secondary	DC Switchgear Rated Voltage
Spencer Dock	C1	Underground	2009		Efacec	2 MVA (2*1MVA)	N/A	No	2	3600A	10.5KV/293V & 293V	900V
O'Connell	A/LCC (BXD)	Underground	2004	2015	Efacec	1 MVA	Dry Transformer Type 2.5 MVA	No	5 (Upgraded)	6000A	10.5KV/293V & 296V	900 V
Heuston	A	Underground	2004		Ansaldo	1 MVA	N/A	No	2	3600A	10.5KV/293V & 293V	900V
Suir Road	A	Overground	2004		Ansaldo	1 MVA	N/A	No	2	3600A	10.5KV/293V & 293V	900V
Kylemore	A	Overground	2004		Ansaldo	1 MVA	N/A	No	2	3600A	10.5KV/293V & 293V	900V
Red Cow	A	Overground	2004		Ansaldo	1 MVA (+1MVA Depot)	N/A	No	10 (2 Line + 8 Depot)	3600A	10.5KV/293V & 293V	900V
Kingswood	A	Underground	2004		Ansaldo	1 MVA	N/A	No	2	3600A	10.5KV/293V & 293V	900V
Cookstown	A	Overground	2004		Ansaldo	1 MVA	N/A	No	2	3600A	10.5KV/293V & 293V	900V
Cheeverstown	A1	Overground	2011		Efacec	1.62 MVA	N/A	No	2	4600A	10.5KV/293V & 293V	900V
Saggart	A1	Overground	2011		Efacec	1 MVA	N/A	No	2	4600A	10.5KV/293V & 293V	900V
Broombridge	LCC (BXD)	Overground	2017		Efacec	1.62 MVA (+1.62 MVA Depot)	N/A	No	2	4600A	10.5KV/293V & 293V	900V
Broadstone	LCC (BXD)	Overground	2017		Efacec	1.62 MVA	N/A	No	2	4600A	10.5KV/293V & 293V	900V
St Stephen's Green	B/LCC (BXD)	Underground	2004	2017 (DC Switchgear added LCC)	Ansaldo	1 MVA	N/A	No	2 (1 Feeder added LCC)	3600A	10.5KV/293V & 293V	900V
Charlemont	B	Overground	2004	2018	Efacec	1 MVA	1.62 MVA	No	2	4600A	10.5KV/293V & 293V or 10.5KV/586V & 586V	900V or 1800V
Milltown	B	Overground	2004	2017	Efacec	1 MVA	1.62 MVA	Yes	2	4600A	10.5KV/293V & 293V or 10.5KV/586V & 586V	900V or 1800V
Dundrum	B	Underground	2004	2012	Efacec	1 MVA		Yes	2		10.5KV/293V & 293V or 10.5KV/586V & 586V	900V or 1800V
Balally	B	Overground (Classed)	2004	2017	Efacec	1 MVA	1.62 MVA	Yes	2	4600A	10.5KV/293V & 293V or 10.5KV/586V & 586V	900V or 1800V
Sandyford	B	Overground	2004	2010 (DC Switchgear added B1)	Ansaldo	1MVA (+1MVA Depot)	N/A	Yes	8 (1 Line+6 Depot +1 Feeder added B1)	3600A	10.5KV/293V & 293V or 10.5KV/586V & 586V	900V or 1800V
Glencairn	B1	Underground	2010		Efacec	1.62 MVA	N/A	Yes	2	4600A	10.5KV/293V & 293V or 10.5KV/586V & 586V	900V/ or 1800V
Ballyogan	B1	Overground	2010		Efacec	1.62 MVA	N/A	Yes	2	4600A	10.5KV/293V & 293V or 10.5KV/586V & 586V	900V/ or 1800V
Carrickmines	B1	Overground	2010		Efacec	1.62 MVA	N/A	Yes	2	4600A	10.5KV/293V & 293V or 10.5KV/586V & 586V	900V or 1800V
Cherrywood	B1	Overground	2010		Efacec	1.62 MVA	N/A	Yes	2	4600A	10.5KV/293V & 293V or 10.5KV/586V & 586V	900V or 1800V
												As of April 2018

HSCB= High Speed Circuit Breaker

Table 16-2 Traction Substations

16.7.4 The traction power and distribution system comprises the following without limitation:

- all electrical substations and substation equipment;
- feeder cables;
- pits and ducting;
- support poles and foundations;
- anchors and fixings to buildings and other structures;
- bonding;
- supports and registrations;
- contact/Conductor wire;
- balance weights systems (including weights, pulleys, bearings, etc.);
- line section insulators and switches;
- isolators;
- earthing points;
- jumpers;
- lightning arresters;
- signs and;
- all other fixed infrastructure, components, cables and conduits involved in the provision and transmission of electrical energy to the LRVs.

16.8 Operating and Control Systems:

16.8.1 The System is controlled from the Central Control Room in Red Cow Depot. The control facilities consist of signalling, automatic vehicle location, vehicle detection, radio/telephone, closed-circuit television (CCTV), fire detection, passenger information and supervisory control and data acquisition (SCADA) systems. Cabling for the control equipment and associated power supplies is carried in ducts on either side of the Track.

16.8.2 The Infrastructure includes the electronic control and communications systems used for the operation of the System. Such control and communications systems include but are not limited to:

- central control system;
- technical rooms and equipment cabinets;
- the automatic vehicle location system ("AVLS");
- fixed equipment of the SCADA system (remote start units – "RTUs");
- power supply to the SCADA system (RTUs);

- the passenger information display system (Stop displays);
- the public address system (amplifiers, speakers etc.);
- the radio transmission system (some of which infrastructure is strategically located off Luas property);
- the cable transmission network system (transceivers);
- the telephone system (private automatic branch exchange – "PABX");
- the emergency telephone system (emergency call point);
- the video-monitoring system (cameras, monitors, video matrix);
- the electrical and mechanical equipment including power supply cabling, ducting and pits;
- the fire detection system; and
- the timing standardisation system.

16.8.3 The control and communications system equipment located in the Central Control Room includes but is not limited to:

- SCATS terminal comprising a PC, a printer, a keyboard, screen and interconnecting cables;
- TMC terminal comprising a PC, a printer, a keyboard, a screen and interconnecting cables;
- Communications circuits from the above terminals connecting with the Local Authority traffic signal control systems; and
- Line Signalling System and Automatic Vehicle Location System

16.8.4 The control and communications system equipment located in and on the LRVs includes but is not limited to:

- Automatic Vehicle Location System ("AVLS") Driver's Consoles;
- Driver's Radio Handsets;
- AVLS/Radio System maintenance access test & diagnostics ports;
- Radio system emergency foot pedals;
- Transponders for AVLS/Line Signalling System;
- Radio system Antennae; and
- Systems Boxes containing on-board AVLS computer, on-board data radio transceiver unit, containing on-board audio radio transceiver unit & radio controller.

16.8.5 The radio transmission system includes, without limitation:

- 30 metre high Antenna Mast at Red Cow

- 40m Mast adjacent to Broombridge substation
- All ancillary cabling and equipment
- All associated power sullies and distribution panels

16.8.6 The radio transmission system also includes the Tetra radio base stations and repeaters listed in Table 16-3 below.

Type	Location
Motorola MTS 2	Hospital
Motorola MTS 2	Red Cow
Motorola MTS 2	Cheeverstown
Motorola MTS 4	Liberty Hall
Motorola MTS 2	Broombridge
Motorola MTS 2	Dundrum
Motorola MTS 2	Sandyford
Repeater Unit	Kilmacud

Table 16-3 Tetra Radio Base Stations and Repeaters

16.9 Line Signalling System Equipment

16.9.1 The line signalling system equipment that forms part of the Infrastructure includes railway and road signalling apparatus, point control and operation equipment, and selective vehicle detection equipment.

16.9.2 The line signalling system installations on the System are listed in Table 16-4.

Line A/C	Tallaght Terminus Crossover Red Cow Depot Entrance Connolly Terminus Layout Heuston Station Access Crossover	Line B	St Stephens Green Terminus Crossovers Sandyford Depot Entrance
Line A1	Saggart Terminus Cookstown lineside signalling system	Line B1	Brides Glen Terminus

Line C1	The Point Terminus	Line LCC	Broombridge Depot Entrance Broombridge Terminus Crossover Parnell lineside signalling system Marlborough Engineering Turnout O'Connell Engineering Turnout
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Table 16-4 Signalling System Installations

16.9.3 At all signalling installations the infrastructure to be maintained includes:

- Traffic Signal Controllers;
- Point Controllers;
- Selective Vehicle Detection Units;
- LRT Signals;
- RTS Indicators;
- Point Indicators;
- Point Motors;
- Point Heaters;
- Track Circuits;
- Mass Detectors;
- LRT Detectors;
- Axle Counters (Broombridge only);
- All interconnecting cables;
- Power Supplies;
- Communication and monitoring connections to the above equipment;
- Connections and interfaces to local authority maintained signal equipment; and
- Connections to any other system.

16.10 Stops, Stop Furniture and Canopies

16.10.1 There are 23 Stops on Line A/C, 13 Stops on Line B, 5 stops on line A1, 11 stops on Line B1 (two of which are not currently in service but may be brought into service when development takes place in the area), 4 stops on Line C1 and 13 stops on Line LCC.

16.10.2 The Stops are sited about 500 metres apart in the city centre and approximately 800 metres apart in outlying areas. In general stops comprise two 40m long platforms on Lines A/C, A1 and C1, and 55m on Lines B, B1 and LCC. Stops are typically 3 m wide, ramped at each end and are 280 mm high measured above the rail level.

16.10.3 The stops have been designed to facilitate access by the mobility and visually impaired.

16.10.4 The Stops and Stop furniture form part of the Infrastructure and include without limitation:

- raised platforms and paved areas including walkways linking to public rights of way, poles and railings;
- steps, stairs and handrails at stops;
- bicycle ramps where installed on steps and stairs;
- bicycle racks and shelters;
- shelters, any associated seating, litter bins, timetable and other fixed displays including signage;
- advertisement drums/columns and all associated internal components;
- tram warning road markings at crossings;
- lighting;
- Canopies above Belgard and Connolly Stops;
- Tunnel/passageway beneath Dundrum Stop; and
- CCTV camera and outdoor monitor at Charlemont Stop.

16.10.5 There are 69 Stops in total on Lines A/C, B, A1, B1, C1 and LCC as set out in Table 16-5. The layouts of the Stops are indicated on the Maintenance Boundary Maps. The Stops at Brennanstown and Racecourse are not currently in service but may be brought into service when development takes place in the area.

LINE A/C	Tallaght Hospital Cookstown Belgard Kingswood Red Cow Kylemore Bluebell Blackhorse Drimnagh Goldenbridge Suir Road Rialto Fatima James's Heuston Museum Smithfield Four Courts Jervis Abbey Street Busáras Connolly	LINE B	Sandyford Stillorgan Kilmacud Balally Dundrum Windy Arbour Milltown Cowper Beechwood Ranelagh Charlemont Harcourt St Stephen's Green	LINE A1	Fettercairn Cheeverstown Citywest Campus Fortunestown Saggart
LINE B1	Central Park Glencairn The Gallops Leopardstown Valley Ballyogan Wood Racecourse Carrickmines Brennanstown Laughanstown Cherrywood Brides Glen	LINE C1	Georges Dock Mayor Square Spencer Dock The Point	LINE LCC	Dawson Trinity Marlborough Parnell Westmoreland O'Connell GPO O'Connell Upper Dominic Broadstone – DIT Grangegorman Phibsborough Cabra Broombridge

Table 16-5 Stops

16.11 Lifts and Escalators

16.11.1 There are 11 public lifts on the System and these are located at:

- Connolly Stop on Line A/C,

- at Charlemont, Ranelagh , Dundrum, Balally and Kilmacud (2) Stops on Line B
- and at Phibsborough (2) and Broombridge (2) on Line LCC.

16.11.2 There are 2 stair escalators located at Connolly Stop, with a vertical range of 6 metres.

16.11.3 The lifts and escalators include, without limitation, the fabric of lift shafts, doors, cars, motors, associated control equipment, power supply, alarm mechanisms, and escalator drive gear.

16.12 Park and Ride Sites, Roads and Other Paved Areas

16.12.1 The roadways, Park and Ride Sites and other paved areas serving Luas form part of the Infrastructure.

16.12.2 The locations of the Park and Ride facilities are as follows:

	Location	Capacity	Description
LINE A/C	Red Cow	727 Spaces	Surface car park
LINE B	Sandyford	47 Spaces	Surface car park
	Stillorgan 2	147 Spaces	Surface car park
	Stillorgan 1	194 Spaces	Surface car park
	Ballaly	421 Spaces	Multi-storey car park, shared with private parking
LINE A1	Cheeverstown	312 Spaces	Surface car park
LINE B1	Carrickmines	352 Spaces	Surface car park

Table 16-6 Park and Ride Sites

16.12.3 The roadways, Park and Ride Sites and other paved areas serving Luas include without limitation:

- surfacing, kerbs, footpaths and other paved areas;
- drainage installations, including all attenuation facilities up to the point at which they discharge into the relevant local authority's drainage system or open watercourse;
- road markings;
- signage;
- Park and Ride furniture including bollards, cycle racks, litter bins and other features;
- lighting and incidental electricity supplies;
- soft landscaping.

16.13 Bridges and Structures

16.13.1 The Infrastructure includes bridges as set out in Table 16-7 below.

LINE A/C	M50 Bridge Suir Road Bridge Rialto Underpass Sean Heuston Golden Bridge (footbridge) Drimnagh (footbridge)	LINE B	William Dargan Bridge Charlemont Place Bridge Dartmouth Road Bridge Northbrook Road Bridge Ranelagh Road Bridge Charleston Road Bridge Kilmacud (footbridge) Kilmacud Road Bridge Milltown Viaduct
LINE B1	Glenamuck Bridge Cherrywood Viaduct Spine Road Underpass Brewery Road Bridge Carrickmines M50 Bridge Leopardstown M50 Bridge	LINE C1	Georges Dock Bridge Spencer Dock Bridge
LINE LCC	Broadstone Underpass North Circular Road Bridge Cabra Road Bridge Fassaugh Road Bridge	LINE A1	does not have any significant structures

Table 16-7 Bridges and Structures

16.13.2 The bridge structures include, without limitation:

- the foundations, abutments, bearings, superstructure, cables, parapets and finishes of the bridges;
- retaining walls and any other supporting structures.

16.14 Depot Buildings, Technical Rooms and Retail Kiosks

16.14.1 The Infrastructure includes the buildings and stabling areas of Red Cow Depot, Sandyford Depot and Broombridge Depot and the associated control centres and staff accommodation, as indicated on the Maintenance Boundary Maps and Depot drawings. The Depots include, without limitation:

- the internal and external fabric of buildings including foundations, cladding and roofing;
- building services including all electrical and gas installations, water supply and drainage;
- building internal equipment including central heating and passenger lifts;
- all external services including electricity, gas, water supply and drainage up to the agreed interface with the relevant utility company;
- all drainage interceptors;
- (in relation to Red Cow Depot only) foul pumping station and rising main up to point of discharge to Dublin Cemeteries drain.

- other external services including staff address systems, compressed air supply, etc.;
- depot security systems;
- canopies, security staff accommodation and other incidental structures;
- maintenance shed at Red Cow Depot
- Substructure of wash plant, including all services to and from the plant – power, water, drainage.
- Substructure of sand plants including all services to and from the plant – power, water, drainage.
- maintenance sheds, wash plants and sand plants.

16.14.2 In addition to the depot buildings there are a number of smaller retail kiosks and technical rooms that are part of the Infrastructure of. These are listed in Table 16-8 below.

Building	Location	Description
Museum Tech room	In National Museum grounds near Museum stop on Line A/C	Technical room
Smithfield Kiosk	At Smithfield stop	Technical room, ESB room and retail kiosk
Chancery Park Tech room	Between Four Courts and Jervis stops on Line A/C	Technical room shared with DCC
Connolly Stop and tech room	At Connolly stop	Technical room in station building
Ranelagh kiosk and tech room	At Ranelagh stop	Retail kiosk and tech room in building under bridge
Beechwood kiosk	At Beechwood stop	Retail kiosk
Dundrum station house	At Dundrum stop	Renovated old station house with offices and retail kiosk with parking
Thomas Moore Island Underground technical room.	Thomas Moore Traffic Island	Repurposed old underground toilet block. This technical room serves both Trinity and Westmoreland stops

Table 16-8 Kiosks and Technical Rooms

16.15 Boundary Walls, Gates, Fencing and Landscaping

16.15.1 The Infrastructure also includes certain boundary walls, gates, fences, and landscaped (both soft and hard) areas directly adjacent to the System, including without limitation:

- walls and fencing erected around the boundaries of the System;
- gates and barriers;
- hard landscaping including paving, curbs, ornamental structures and benches;

- all soft landscaped areas as indicated on the Maintenance Boundary Maps including planted areas and areas of soft landscaping (trees, shrubs and other perennial plants, and grassed areas);
- all fences, walls and other boundaries separating the alignment from 3rd party property or within the Luas Maintenance Boundary;
- Midland and Great Western Railway Retaining Walls on Line LCC; and
- Powered gates (and associated controls and infrastructure) at boundary of Bus Éireann Broadstone Bus Depot for access to Broadstone substation.

16.15.2 The Maintenance Boundary Maps shall be referred to for further detail of the boundary walls, fencing and landscaping.

Schedule 17: Infrastructure Maintenance Requirements

17.1 General Obligations

- 17.1.1 Without prejudice to obligations assumed by the Operator elsewhere in the Contract, the Operator's general obligations with respect to the maintenance of Infrastructure shall be as set out in this Schedule.
- 17.1.2 The Operator shall perform the maintenance of the Infrastructure in such a manner that:
- does not prejudice in any way whatsoever safety of and that does not materially diminish the efficiency and/or operational life (being that specified by the manufacturer thereof, and otherwise that to be reasonably expected of such an item according to Good Industry Practice) of, any part of the Infrastructure; any Infrastructure Spare Part or Infrastructure Special Tool owned by TII;
 - optimises the expected whole life of any part of the Infrastructure, Infrastructure Spare Parts or Infrastructure Special Tools;
 - ensures as far as reasonably practicable and in accordance with Good Industry Practice that the Infrastructure, Infrastructure Spare Parts and Infrastructure Special Tools are handed back to the TII on the Expiry Date in materially the same or better condition (fair wear and tear excepted) as those items were on the Operating Commencement Date.

17.2 Infrastructure Annual Maintenance Plan

- 17.2.1 The Operator shall prepare, submit, update and re-submit the Infrastructure Annual Maintenance Plan in accordance with paragraphs 17.2.3 to 17.2.5. The Operator and TII shall use their best endeavours to agree the Infrastructure Annual Maintenance Plan, failing which the provisions of Clause 59 (Disputes Resolution Procedure) shall apply. Once an Infrastructure Annual Maintenance Plan has been agreed or determined, the Operator shall use best endeavours to comply with said Infrastructure Annual Maintenance Plan from the following Reporting Period.
- 17.2.2 For the avoidance of doubt, it is the Parties' intention that the Infrastructure Annual Maintenance Plan is used as a management tool. Accordingly, notwithstanding:
- that on a day-to-day basis during any Reporting Period, the Operator shall undertake the Services at least in accordance with the latest agreed Infrastructure Annual Maintenance Plan, and
 - any agreement reached by the Parties in respect of the latest agreed Infrastructure Annual Maintenance Plan,
- the Operator shall be liable to the extent that the activities detailed in the latest agreed Infrastructure Annual Maintenance Plan are insufficient, inadequate or otherwise lacking in order for proper maintenance of the Infrastructure pursuant to the Contract and/or in order to achieve the Performance Standards.
- 17.2.3 No later than 60 days prior to the Operating Commencement Date, the Operator shall produce and provide to TII (based on the Asset Management Plan and other relevant information) a plan for the maintenance of the Infrastructure to be carried out during the year following its preparation (hereafter referred to as the "Infrastructure Annual Maintenance Plan") which shall at a minimum:
- derive from and comply with the strategies set out in (but show greater day-to-day detail than) the Asset Management Plan;
 - list each Infrastructure maintenance activity which the Operator intends to carry out and/or anticipates will be required during said year, such list to be at the level of detail required by TII and in a format notified by TII to the Operator from time to time;

- detail the programmed time schedule for each activity listed; and
- give details of proposed possession times in respect of the part(s) of the Infrastructure pertaining to each activity listed.

17.2.4 TII shall use its best endeavours to agree said Infrastructure Annual Maintenance Plan before the Operating Commencement Date. Thereafter, the Operator shall keep under review and revise the Infrastructure Annual Maintenance Plan as necessary, and shall ensure that each such revision shall as a minimum:

- comply with the requirements of paragraph 17.2.3;
- clearly indicate the activities, if any, which have for whatever reason been deferred from earlier Reporting Period(s), stating the reason for such referral;
- clearly indicate the activities, if any, which have for whatever reason been brought forward from later Reporting Period(s) where this is necessary to maintain the Infrastructure in a safe, efficient and reliable condition and/or in order to achieve the Performance Standards;
- list any new activity which is necessary to maintain the Infrastructure in a safe, efficient and reliable condition and in order to achieve the Performance Standards

17.2.5 The Operator shall submit each such revision in a timely manner to TII for agreement.

17.3 Routine Maintenance

17.3.1 Routine Maintenance includes all preventative maintenance activities, inspections and monitoring carried out in accordance with the prescribed methodology and programme detailed in the Asset Management Plan without prejudice to the requirements of Maintenance Manuals, legislation and standards. Routine Maintenance is intended to ensure that the Infrastructure remains in proper operational order for the duration of Operating and Maintenance Period, to minimise the incidence of system failures and/or to minimise the deterioration of the Infrastructure.

17.3.2 The Operator shall carry out regular inspection and monitoring of the Infrastructure at intervals in accordance with the Infrastructure Annual Maintenance Plan, the Infrastructure Maintenance Manuals and Good Industry Practice. The purpose of such inspection and monitoring shall be not only to identify Failures, Defects and any loss or damage to the Infrastructure howsoever caused (thereby identifying Corrective Maintenance that must be carried out for the time being) but, also, to measure any deterioration of the Infrastructure and the rate at which such deterioration is taking place so that a timely maintenance response can be planned and implemented. It is the intention therefore that, while the inspection and monitoring process forms part of the Routine Maintenance obligations of the Operator, the information and data derived from such inspection and monitoring shall be used by the Operator to plan other Routine Maintenance activities and Corrective Maintenance activities.

17.3.3 As part of the Routine Maintenance of the Infrastructure, the Operator shall as a minimum take the following measures:

- regular and frequent inspection and monitoring of the Infrastructure;
- the inspection of and planned replacement of wearing parts before they fail;
- the supply, storage and installation of Infrastructure Spare Parts deemed to be necessary based on the results of any inspections of the Infrastructure carried out by the Operator;
- the inspection of and testing of system components, instrumentation and control, security elements, safety features and similar components of the Infrastructure;

- the inspection of and testing of the condition of the components of the Infrastructure as far as these are accessible;
- the cleaning of the Infrastructure to keep it in a good operational condition and suitable for use in passenger service;
- cleaning should be performed at such frequency and at such intensity to ensure the Infrastructure cleanliness is maintained in a condition satisfactory to TII;
- performance of all duties with respect to maintenance of landscaping and vegetation as detailed more fully in Section 17.14 and Section 17.15; and
- the inspection, testing, adjustment and replacement of mechanical and electrical parts of the Infrastructure as necessary.

17.4 Routine Maintenance of Track and Track drainage system

17.4.1 Routine Maintenance of the Track and Track drainage system shall comprise without limitation, and without prejudice to the generality of the foregoing or to any other provisions set out in the Contract:

- inspection, testing and monitoring activities;
- component and component assembly maintenance;
- Track geometry maintenance including maintenance of the rail profile;
- grinding of rails, especially to eliminate corrugation preventing vibration, noise or damage to other parts of the system
- inspection and greasing of points with a special focus on embedded points;
- inspection and maintenance of point heaters;
- removal of leaves, snow and ice; and
- wear monitoring of the rail particularly in tight corners and across switches

17.4.2 The Operator's inspection and monitoring strategy shall include (but shall not be limited to) the following Track inspection activities:

- visual inspection of the Track and the surface-water drainage system serving the Track;
- ultrasonic rail flaw detection;
- Track geometry recording;
- rail wear measurement; and
- only where and when safe to do so whilst vehicles are running, some minor maintenance (e.g. replacement of rail fastenings and flangeway cleaning).

17.4.3 The Operator shall maintain the Track to the geometry tolerances in accordance with Annex 1 and shall maintain a record of the Track geometry as part of the Asset Database.

17.4.4 The Operator shall measure and survey the Track geometry at intervals of no greater than six months in order to identify any deviation and determine the rate of any deterioration of the Track geometry over time. The Operator shall devise appropriate maintenance interventions accordingly. The Track geometry measurements shall include cant, gauge and wear and may be made using

either hand-portable instruments and gauges, or with the aid of a rail-mounted Track recording vehicle.

- 17.4.5 Rail side-wear shall be routinely monitored on all curves less than 500 metres in radius, on all switches and at any other locations where there is evidence of side-wear.

17.5 Routine Maintenance of Traction Power Supply and Distribution System

- 17.5.1 Routine Maintenance of (in common with the performance of all other Services in relation to) the traction power supply and distribution system (including the Overhead Conductor System (OCS)) shall comprise without limitation , and without prejudice to the generality of the foregoing or to any other provisions set out in the Contract:

- inspection, testing and monitoring; and
- effecting and managing isolations

- 17.5.2 Inspection and monitoring of the traction power supply and OCS apparatus shall include (but shall not be limited to) the following activities:

- visual inspection of the traction power supply and OCS equipment; and
- minor maintenance (e.g. activities that can be carried out without isolating the traction power distribution system).

- 17.5.3 Other Routine Maintenance activities shall include, but shall not necessarily be limited to, the following:

- contact wire wear measurement;
- registration checks;
- functional checks of security and safety devices;
- functional checks of automatic systems;
- checks of and (if necessary) tightening of mechanical connections;
- dielectric verification;
- cleaning (e.g. of isolating switch contacts);
- removal of dust;
- lubrication of moving parts; and
- frequent monitoring and adjustment of the high-speed circuit-breakers in the substations.

17.6 Corrective Maintenance

- 17.6.1 Corrective Maintenance shall include maintenance activities carried out in accordance with the Contract to rectify any Infrastructure system or equipment Failures or Defects which occur during the Operating and Maintenance Period.

- 17.6.2 Failures and/or Defects may be identified by the SCADA system, by inspections and monitoring which the Operator is obliged to undertake as part of Routine Maintenance obligations, or as notified to the Operator by TII and/or any competent person.

17.6.3 The following are examples of faults that shall require a Corrective Maintenance response.

- Broken or cracked rails;
- Points failures;
- Flooding (e.g. due to blocked drains); and
- Communications or signalling systems failures.

17.6.4 The Operator's Corrective Maintenance strategy shall demonstrate its capacity to rectify Faults and Failures in an efficient and timely manner in accordance with the Contract and with the purpose of achieving the Performance Standards at all times during the Operating and Maintenance Period.

17.6.5 In the event of any Failure of any asset, system, sub system or component, or any part of the Infrastructure the Operator shall use its best endeavours to repair or replace the affected part of the Infrastructure immediately. The Operator's organisation shall be structured so as to enable it to respond expeditiously to any incident of Failure or Defect, from whatever cause, on the System.

17.6.6 Each activity of Corrective Maintenance shall be carried out at times and in such a manner so as to minimise disruption to the operation of Luas, the movement of LRVs or other traffic (including without limitation pedestrians) and the quiet enjoyment of landowners/occupiers of land adjacent to the System.

17.7 Performance by the Operator of Routine and Corrective Maintenance

17.7.1 The Operator shall ensure that all Corrective Maintenance and Routine Maintenance is performed, in so far as is reasonably practicable, outside a period commencing:

- thirty minutes before the first Trip each day; and ending
- thirty minutes after the last Trip each day.

17.7.2 To the extent that it is not possible to comply with its obligations under paragraph 17.7.1, the Operator shall ensure that all Routine and Corrective Maintenance is performed between the hours of 10:00 and 16:00 on Mondays to Fridays.

17.7.3 The Operator shall ensure that its Annual Maintenance Plan and maintenance procedures are prepared and adhered to in accordance with the requirements of this Section 17.7.

17.8 Cleaning of the Infrastructure

17.8.1 The Operator shall be responsible for maintaining all parts of the Infrastructure in a clean and tidy condition at all times during the Operating and Maintenance Period.

17.8.2 The cleaning regime to be adopted by the Operator shall be such that cleaning activities are undertaken at such frequent intervals and at such intensity so as to maintain the aesthetic appearance of the System at all times, and to prevent any accumulation whatsoever of any dirt, grime, filth, rubbish, refuse, litter, waste, debris (whether natural in source or otherwise), or any other matter (whether such matter originates on or in the System or not) which:

- spoils or may be likely to spoil the aesthetic appearance, safety or the efficient operation of the System,
- leads or may be likely to lead to any deterioration of TII's assets, and/or

- causes or may be likely to cause any nuisance whatsoever to occupiers of lands adjacent to the System.

17.8.3 The Operator's obligations in respect of cleanliness of the Infrastructure shall include without limitation the following:

- all stops, pathways, Park and Ride Sites, structures, buildings and paved surfaces of the System shall be maintained free of litter, dirt and liquid spillages;
- all equipment shall be kept clean of dirt;
- all display equipment shall be maintained free of dirt or filming;
- all litter bins shall be emptied at a high enough frequency to prevent them from becoming full, at increased frequency during public holidays, sporting events or any other occasion when a greater accumulation of refuse might be expected;
- the Track shall be regularly cleaned, taking particular care to prevent the build-up of litter and other material in the grooved rail, in or around drains, or in the moving parts of turnouts to the extent that the safe and efficient functioning of these items may be impaired;
- all soft landscaping shall be maintained free of any accumulations of leaves, litter and debris; and
- any accumulation of animal (e.g. pigeon) droppings shall be removed from buildings, structures and external equipment

17.8.4 No later than 60 days before the Operating Commencement Date, the Operator shall prepare and submit to TII for agreement a draft format of the Infrastructure Cleaning Checklist. The checklist shall correspond with the appropriate parts of the Asset Database and in any case shall be subdivided into the following sections:

- The Passenger Areas: The Passenger Areas section of the checklist shall include the following as a minimum:
 - the Park and Ride Sites,
 - the Stops, including all access ways (namely stairs, pathways, lifts, escalators, footbridges, corridors, non-public roadways and suchlike) to/from each Stop.
- The Swept Path: The Swept Path section of the checklist shall include the following as a minimum:
 - the Track,
 - roadways,
 - bridges,
 - any other structures or structural elements serving the Track.
- The Depots: The Depots section of the checklist shall include the following as a minimum:
 - Sandyford Depot building (exterior and interior),
 - Sandyford Depot hardstanding areas,
 - Red Cow Depot building (exterior and interior), and
 - Red Cow hardstanding areas.

- Broombridge Depot building (exterior and interior), and
- Broombridge hardstanding areas.
- Other areas: All areas adjacent to and/or alongside the Swept Path, including the following as a minimum:
 - all landscaped areas
 - all surface water drainage courses,
 - all other areas within the boundary of Luas (as indicated on the Maintenance Boundary Maps)

17.8.5 TII shall review the draft Infrastructure Cleaning Checklist and shall provide the Operator with its comments, which the Operator shall take into account in finalising the Infrastructure Cleaning Checklist.

17.8.6 TII shall be entitled to audit the Operator's compliance with the provisions of this Section 17.8 at any time. Such entitlement shall be in addition to the audit provisions set out in Schedule 21:.

17.8.7 Regardless of whether an audit has been undertaken pursuant to paragraph 17.8.6 or Schedule 21:, in the event that TII notifies the Operator of any instance of non-compliance in respect of Cleanliness, the Operator shall take all necessary steps to remedy the situation in a timely manner. If the Operator does not so take such measures TII may (but is not bound to and assumes no liability as a result of any failure to do so) after having given the Operator two days' notice of its intention to do so (or if TII believes there is a risk to the safety of any person) and as independent remedy without prejudice to any other right or remedy which it may have, arrange for such remedial work to be carried out and shall be entitled to recover from the Operator all reasonable Loss arising therefrom or may deduct the same from any monies due or that become due to the Operator.

17.8.8 The Operator shall use only appropriate cleaning products, in accordance with those specified in the Infrastructure Maintenance Manuals (if any) and otherwise in accordance with Good Industry Practice, to clean the Infrastructure to the highest possible standard.

17.9 Infrastructure Maintenance Procedures

17.9.1 The Operator shall, at least 60 days before the Operating Commencement Date, draft those procedures which are necessary for the performance of Infrastructure maintenance in accordance with the Contract, and shall submit such procedures to TII for approval. TII shall be entitled to require the Operator to make such amendments to such procedures as may be required in order that they:

- comply with the Safety Management System,
- enable Infrastructure maintenance to be performed in accordance with the Contract
- are compatible with the Infrastructure Maintenance Manuals and the Asset Management Plan

17.9.2 The Operator shall not adopt procedures to which TII requires amendment until and unless the procedures have been amended as required by TII.

17.9.3 Following adoption of the procedures referred to in paragraph 17.9.1, the Operator shall make such amendments to such procedures as may be required in order that they comply with any proper and authorised amendment or modification of the Safety Management System and/or the Maintenance Manuals and/or the Asset Management Plan.

- 17.9.4 The Operator shall submit such amended procedures to TII for approval and TII shall be entitled to require the Operator to make such further amendments to such procedures in order that they meet the requirements set out in paragraph 17.9.1.
- 17.9.5 the Operator shall be entitled to make reasonable amendments, modifications or supplements to the procedures PROVIDED that the Operator requests TII's prior consent thereto and TII is satisfied that such amendments, modifications or supplements will not contravene the requirements of paragraph 17.9.1 and TII gives its consent thereto, such consent not to be unreasonably withheld or delayed.
- 17.9.6 The Operator shall provide TII with bound copies of the procedures no later than 180 days after the Operating Commencement Date, and following any amendment to the procedures thereafter.
- 17.9.7 The procedures shall be continuously available to TII.

17.10 Work Instructions for Infrastructure Maintenance Activities

- 17.10.1 As part of the procedures referred to in Section 17.9 the Operator shall prepare a method statement to be agreed with TII for each maintenance activity prescribed by the Infrastructure Maintenance Manuals, detailing as a minimum the following information:
- the description of the activity/purpose of the method statement;
 - a unique serial number and issue number for the method statement;
 - the tools or test equipment to be utilised;
 - the qualification(s) or training required to be completed by the Operator's Personnel prior to commencement of the activity;
 - the detailed procedure, method and sequence of the maintenance activity, assembly/disassembly, inspection or test;
 - the tolerance on wear, test readings or measurement with objective pass or fail criteria;
 - any particular safety or materials handling precautions to be taken;
 - the documentation and record keeping to be completed;
 - the action required if the pass/fail criteria are not met;
 - identification of hazards present with each step of the sequence or procedure;
 - measures taken to eliminate or remove the hazards identified; and
 - hazards remaining with each step of the sequence or procedure, and precautions to be taken to ensure they do not present a risk while undertaking the task.
- 17.10.2 In the event that TII notifies the Operator that, in its opinion, any method statement inadequately defines the standard of workmanship to be achieved in connection with the maintenance of the Infrastructure pursuant to the Contract, the Operator shall ensure that such method statement is updated and amended in writing to take account of the views of TII and thereafter re-submit it to TII for TII's agreement. Once agreed in writing, the Operator shall ensure that the method statements agreed by TII are complied with by all the Operator's Personnel in performing Infrastructure maintenance.

17.11 Response to Call-Out Incidents

17.11.1 If, at any time during the Operating and Maintenance Period (on any day of the week including Sundays and Public Holidays), any part of the Infrastructure is damaged by virtue of a collision, derailment, breakdown, immobilisation, emergency or any other incident whatsoever which affects the safety of the System and/or the operational capability of the Infrastructure (hereinafter referred to as a "Call-out Incident"), the Operator shall, upon becoming aware of a Call-out Incident, take immediate measures to rectify the problem, including but without limitation:

- attendance at the site of the Call-out Incident as soon as possible;
- identification and assessment of the cause of the problem;
- determination of the extent of damage caused to the Infrastructure;
- as appropriate either: rectification of the problem, or implementation of measures to overcome or mitigate any adverse effect on passenger services, or implementation of temporary repairs;
- certification of the part of the Infrastructure in question as either: fit and safe to continue in operation as normal, or not fit and safe to operate; and
- advising on changes in operational procedures, method statements or maintenance practices to prevent a repeat of Call-out Incident.

17.11.2 Such obligations, read together with Performance Standard reference number 13 as set out in Table 21-1 of Schedule 21: and the Operator's obligations set out elsewhere in this Schedule, shall be referred to as the "Call-out Service" in the Contract.

17.11.3 The Operator shall delegate suitably qualified, competent, skilled, experienced and duly authorised members of the Operator's Personnel to perform the Call-out Service (the "Call-out Team").

17.11.4 Notwithstanding Performance Standard reference number 13 set out in Table 21-1 of Schedule 21:, the Operator acknowledges that in performing the Call-out Service the Operator's response time is of the essence in order that disruption to passenger service on and to proper operation of the System is minimised at all times and the Operator shall perform the Call-out Service accordingly. In particular, but without limitation, the Call-out Team shall be capable of expeditiously attending a Call-out Incident anywhere on the System.

17.11.5 The Call-out Team shall be of sufficient size and mix of skills to undertake rapid fault finding and diagnosis of any type of Failure, operational capability or safety of any part of the Infrastructure. Its members shall be sufficiently well-trained to be able to identify and then correct or isolate any fault, damage and/or failed component to enable a return of the part of the Infrastructure in question to service, where safe and practicable. If the fault, damage and/or failed component is such that the part of the Infrastructure in question might not be able to continue to operate safely, the Call-out Team shall be sufficiently well-trained to certify that that part of the Infrastructure is fit and safe to continue in operation as normal, or is not fit and safe to operate.

17.11.6 The circumstances in which the Operator shall certify that part of the Infrastructure is not fit and safe to operate shall include as a minimum:

- any circumstances which in the considered opinion of the Call-out Team actually or potentially creates a hazard (which term shall be as defined in the relevant Legal Requirements) to the safety of any person on or near the System;

- any circumstance which in the considered opinion of the Call-out Team actually or potentially jeopardises or creates a hazard to the safe continued operation of any system, assembly or component of the Infrastructure or of the System; and/or
- hazards or potential hazards which may have been identified by TII.

17.11.7 Following any Call-out Incident where the Call-out Team has certified that part of the Infrastructure in question is not fit and safe to operate, the Operator and/or the Call-out Team (as appropriate) shall:

- immediately decommission such part of the Infrastructure and protect it from usage (by the Operator and/or any passenger or any person whatsoever);
- prepare a recovery plan documenting what work(s) are necessary to reinstate full operational service of such part of the Infrastructure;
- assess such part of the Infrastructure to determine the extent of repair works required; and
- complete whatever repair work is necessary to enable full operation of such part of the Infrastructure to resume.

17.11.8 All Call-Out Incidents shall be logged on the Operator's Database and recorded by the Call-out Team as follows:

- time and date of call;
- identity of the individual making the call;
- time of Call-out Team commencing the journey to the site of the Call-out Incident;
- time of attendance by the Call-out Team at the site of the Call-out Incident;
- details of the cause of the problem reported, including compliance with the provisions of Schedule 10: where necessary;
- details of the measures taken by the Call-out Team in respect of rectification, mitigation or temporary repair of the problem;
- time of the Call-out Team's certification of the part of the Infrastructure in question as either: fit and safe to continue in operation as normal, or not fit and safe to operate;
- time of clearance of the site of the Call-out Incident;
- if the Call-out Team has certified that part of the Infrastructure in question as fit and safe to continue in operation as normal, the time at which such operation resumes;
- details of any assessment, determination and/or such advice as appropriate in accordance with paragraph 17.11.1); and
- all other relevant information which is relevant to the Call-out Incident and the consequences arising therefrom.

17.11.9 The Operator shall include the information pursuant to paragraph 17.11.8 for each Call-out Incident occurring during each Reporting Period in its report to TII pursuant to Schedule 32:.

17.11.10 In the event that two or more Call-out Incidents occur concurrently, the Operator shall draw competent personnel from maintenance activities in order to support the Call-out Team ("Call-out Support Staff"). The obligations in the Contract pertaining to the Call-out Service shall then apply to the Call-out Support Staff as if they had at all relevant times been members of the Call-out Team.

17.12 Response to Damage to the System

- 17.12.1 The Operator shall perform all necessary maintenance activities in connection with the making good of Damage to the System in order that the Infrastructure is properly and safely maintained in good working order at all times during the Operating and Maintenance Period.
- 17.12.2 The Operator shall mitigate and use all reasonable endeavours to avoid any delay(s) in restoring the Infrastructure which has been subject to Damage to the System to full operational performance.
- 17.12.3 The Operator shall mitigate and use all reasonable endeavours to avoid any Damage to the System and where, in its considered opinion such damage could be mitigated or avoided, shall make proposals to TII as to what measures could be taken PROVIDED ALWAYS that TII shall have no obligation to take such measures.
- 17.12.4 Repair of Damage to the System shall include (but is not limited to) removing all graffiti and fly-posters from Stops, bridges, buildings and other structures forming part of the System. The Operator shall give priority to the removal of graffiti of an obscene, racist, ethnic or otherwise inflammatory nature, or which is displayed in a prominent public place.
- 17.12.5 No later than 60 days before the Operating Commencement Date the Operator shall carry out a risk assessment to determine events that might reasonably be expected to occur during the Operating and Maintenance Period giving rise to Damage to the System, their frequency and their likely impact on the System. The risk assessment shall contain the Operator's reasonable assessment of the minimum stock levels needed to respond to typical levels of Damage to the System, taking into account supplier delivery times and other relevant issues. The Operator shall provide a copy of the risk assessment to TII and shall amend the risk assessment to take account of such reasonable comments as TII may provide. The Operator shall keep the risk assessment under constant review to take account of actual operational experience and shall provide TII with all amendments that are made to the risk assessment. The Operator shall take account of such reasonable comments as TII may make from time to time in respect of the risk assessment and shall amend the risk assessment to take account of such comments.
- 17.12.6 Repair of Damage to the System shall be carried out in such a manner so as to restore proper operation of the affected part of the Infrastructure as quickly as possible, consistent with safety considerations. The Operator is required to produce an incident response strategy for dealing with events giving rise to Damage to the System and/or a recovery plan, which shall demonstrate the Operator's capacity to react promptly to such events and shall include details of any third party (e.g. emergency services) involvement necessary and heavy plant requirements.
- 17.12.7 All works to repair Damage to the System shall be carried out at times and in such a manner so as to minimise disruption to the operation of the System, the movement of LRVs or other traffic (including without limitation pedestrians) and the quiet enjoyment of landowners/occupiers of land adjacent to the System.

17.13 Stray Current Monitoring

- 17.13.1 From the Operating Commencement Date, the Operator shall undertake, at its own cost and in accordance with Good Industry Practice, such monitoring and reporting activities as may be required by the Code of Practice for Stray Current Corrosion Control.

17.14 Maintenance and Management of Landscaping and Boundaries

- 17.14.1 The Operator shall implement regular inspection, maintenance and management regimes of hard and soft landscaping and boundaries, to mitigate the risk of any negative impact on the Services and adjacent lands.

17.14.2 Where relevant, inspection, maintenance and management regimes shall be derived from risk assessments which consider the System, the characteristics of hard and soft landscaping, boundaries, adjacent lands and structures.

17.14.3 The Operator shall maintain and manage hard and soft landscaping and boundaries in accordance with the Landscape Maintenance and Management Specification.

17.15 Landscape Management Plan (LMP)

17.15.1 The Operator shall develop and implement a Landscape Management Plan (LMP) which shall detail the approach to and persons or entities responsible for landscape management during the Operating and Maintenance Period under the following headings at a minimum:

- resources, roles responsibility and authority
- competence, training and awareness
- communications
- documentation and control of records
- monitoring and measurement
- Risk
- corrective and preventative actions
- Invasive Alien Plant Species management

17.15.2 The Operator shall submit the LMP to TII, for TII's approval, no later than 60 days prior to the Operating Commencement Date.

17.15.3 The LMP shall be subject to TII's approval and, once approved, shall be updated and submitted at least on an annual basis for TII approval.

17.15.4 The Operator shall implement the LMP throughout the Operating and Maintenance Period.

17.16 Snow and Ice Management

17.16.1 Without prejudice to the obligations set out in the Severe Weather Management Plan, the Operator shall:

- Provide precautionary treatments in the form of salt and/or abrasives following warnings of expected low temperatures to reduce the likelihood of ice or snow forming on:
 - Stops
 - Park and Ride Sites
 - All publicly accessible hardscaped areas of the Infrastructure
- Provide the necessary actions to remove and use best endeavours to prevent the accumulation of snow or ice on or at:
 - Track
 - Swept Path

- Stops
- Park and Ride Sites
- All publicly accessible hardscaped areas of the Infrastructure
- The Operator shall at a minimum adhere to the requirements of Table 17-1 for spreading dry unmodified salt and snow removal/ploughing. TII reserves the right to review and approve changes or alternatives to this guideline as may be proposed by the Operator.

Weather Condition		Treatment	
Ground Surface Conditions and Ground Surface Temperature (GST) °C	Air Temperature	Salt Spread Rate (gm/m²)	Snow Removal/Ploughing
Frost or forecast Frost GST at or above -2 °C	Any	20	No
Frost or forecast Frost GST below -2 °C and above -5 °C	Any	20	No
Frost or forecast Frost GST below -5 °C and above -10 °C and dry or damp surface conditions	Any	20	No
Frost or forecast Frost GST below -5 °C and above -10 °C and wet surface conditions (existing or anticipated)	Any	2 runs x 20	No
Light snow forecast (<10mm)	Any	20	No
Medium/Heavy Snow forecast or freezing rain	Any	2 runs x 20	No
Ice formed	Above -5 °C	20	No
Ice formed	At or below -5 °C	2 runs x 20	No
Snow covering exceeding 30mm	Any	20 to supplement snow removal/ploughing, up to 40 if temperatures are falling	Required
Snow accumulations due to prolonged falls	Any	20 to 40 to supplement snow removal/ploughing	Required

Weather Condition		Treatment	
Ground Surface Conditions and Ground Surface Temperature (GST) °C	Air Temperature	Salt Spread Rate (gm/m²)	Snow Removal/Ploughing
Hard packed snow/ice	Any	Successive treatments at 20 to 40 supplemented by abrasives (repeat as needed)	If possible

Table 17-1 Treatment Matrix Guide for Dry Unmodified Salt and Snow Removal/Ploughing

17.16.2 The Operator shall ensure that it has call-off contracts and service level agreements in place with Sub Contractors to provide adequate additional resources required to clear snow and ice quickly from the System in the event of a heavy snowfall. Such call-off contracts and service level agreements shall include, but not be limited to:

- 3 No.150HP,4WD Tractors and drivers with front linkage;
- 3 No. 4WD jeeps and drivers for carrying personnel to/from work;
- 2 No. road/rail diggers and drivers;
- 2 No. grab trucks and driver/operators;
- Personnel for snow clearance work.

17.17 Edilon Block Remediation with Vossloh 336 System

17.17.1 The Traditional Track (refer to Section 16.6) portions of Line A/C and Line B include approximately 44,000 Edilon Block rail supports. These supports are subject to an ongoing process whereby a minimum of 200 Edilon Blocks are remediated annually utilising a proprietary system known as Vossloh 336.

17.17.2 TII shall provide a list of at least 200 Edilon Blocks to be remediated between the Operating Commencement Date and the end of the following calendar year.

17.17.3 Subsequent to the first full calendar year of the Operating and Maintenance Period, and for the remainder of the Operating and Maintenance Period, the Operator shall submit remediation proposals to TII for approval no later than 1 October each year for the following calendar year.

17.17.4 Edilon Block Remediation shall be performed in accordance with the Edilon Block Remediation Manual.

17.17.5 The cost of Edilon Block remediation is not included in the Base Yearly Amount. TII will pay the Operator for Edilon Block remediation on an individual basis, in accordance with the rates shown in **Error! Reference source not found..**

17.18 OCS Pole Painting

17.18.1 The OCS (refer to Section 16.7) includes approximately 2,000 steel poles of circular section, each approximately 8m tall. These poles support the conductor wire and its suspension hardware.

17.18.2 TII shall provide the Operator with a list of OCS poles that it requires the Operator to completely repaint between the Operating Commencement Date and the end of the following calendar year.

17.18.3 Subsequent to the first full calendar year of the Operating and Maintenance Period, and for the remainder of the Operating and Maintenance Period, the Operator shall, each year, submit a list of OCS poles that require repainting to TII for approval. These proposals shall be provided to TII no later than 1 October each year for the following calendar year.

17.18.4 TII may also require the Operator to repaint certain OCS poles from time to time.

17.18.5 All OCS pole repainting, shall be performed using a paint system approved by TII and the following shall apply:

- The entire exterior of the pole shall be painted;
- Paints shall be applied strictly in accordance with the manufacturers' requirements;
- A suitable undercoat of paint shall be applied if required as part of the approved paint system;
- A minimum of two coats, and as many further coats as may be necessary, of the overcoat paint shall be applied to provide a consistent colour and texture;
- Preparation of pole surfaces shall be performed in accordance with BS ISO 27831-1:2008: Metallic and other inorganic coatings. Cleaning and preparation of metal surfaces. Ferrous metals and alloys;
- All labelling on OCS poles shall be removed prior to painting and new labelling applied after paint has cured.

17.18.6 The cost of OCS pole painting is not included in the Base Yearly Amount. TII will pay the Operator for OCS pole painting on an individual basis, in accordance with the rates shown in **Error! Reference source not found.**

17.19 Additional Maintenance Services

17.19.1 The Operator may, at its own cost, from time to time, prepare and submit to TII in writing proposals for maintenance services which it proposes to carry out in addition to the Services ("Additional Maintenance Services").

17.19.2 Such Additional Maintenance Services proposals shall clearly be labelled as an "Additional Maintenance Services Proposal" and shall include details of the following:

- the reason why the Operator believes that Additional Maintenance Services are required;
- the cost of the Additional Maintenance Services in accordance with the rates set out in **Error! Reference source not found.**

17.19.3 The Operator shall provide TII with such further information and within such timescale as TII may reasonably require in relation to any Additional Maintenance Services proposal.

17.19.4 TII shall decide in its absolute discretion within such timescale as is in all the circumstances reasonable, whether to implement any Additional Maintenance Services proposal and shall notify the Operator in writing of its decision in relation thereto.

17.19.5 TII may also require the Operator, at its own cost, to prepare and submit to TII in writing proposals for Additional Maintenance Services that TII believes may be required from time to time.

17.19.6 The agreed costs for the Additional Maintenance Services shall be included in the calculation of the System Charge or Revenue Grant for the Reporting Period in which the Additional Maintenance Services are provided.

17.20 Software and Firmware Management

17.20.1 The Operator shall proactively communicate with the OEM suppliers of software and firmware essential for the safe operation and maintenance of the System to ensure that the latest certified versions are always installed. This procedure shall be done at no more than 6 month intervals as described in the Asset Management Plan.

ANNEX 1: TRACK ALIGNMENT/GEOMETRY TOLERANCES

Criterion		Installation tolerance		Maintenance tolerance	
		Absolute	Relative	Absolute	Relative
Track gauge		1435±2 mm	max. variation in 3 metres of Track: 2 mm	S49: 1435mm +14/-5 mm Ri59N/Ri60: 1435mm +12/-5 mm	max. variation in 3 metres of Track: 4 mm
Horizontal alignment		max variation from designed alignment: ±5 mm	on 10 metre chord: 1.5 mm	±10 mm generally	on 10 metre chord: 3 mm
			on 5 metre chord: 1 mm	±5 mm at stops	on 5 metre chord: 2 mm
Vertical alignment		±5 mm	max. variation on 30 metre base: 3 mm	+10, -20mm generally	max. variation on 30 metre base: 6 mm
				±5 mm at stops	
Cant		max. divergence from design value: ±2 mm	-	max. divergence from design value: ±5 mm	-
Twist		on a 3 metre base: 0.2%		0.3%	
		on cant transitions, combined effect of cant gradient and twist not to exceed 0.25%		0.4%	
Rail joint dip (measured relative to a 1m straight edge)	Welded	-		2 mm measured relative to a 1m straight edge	
	Jointed	-		4 mm measured relative to a 1m straight edge	
Corrugations (wavelength 20 – 100 mm)		max. amplitude 80 µm		max. amplitude 100µm	
Track wear S49 TOR		N/A		18 mm	
Track wear S49 Side wear		N/A		12 mm	
Track wear Ri59N/Ri60 TOR		N/A		16 mm	
Track wear Ri59N/Ri60 Side wear		N/A		9 mm	
Track wear Ri59N Keeper rail wear		N/A		5 mm	
Track wear Ri60 Keeper rail wear		N/A		11 mm	

Notes

The maintenance tolerances are the tolerances to which the Track shall be reinstated following any maintenance activity. These tolerances describe the maximum extent to which the Track geometry shall be allowed to deviate before triggering a maintenance response. The Operator's performance will be measured by its ability to maintain the Track to the maintenance tolerances.

While this table lists the measurement standards to which the Track must be maintained, it is understood that this is dependent on the measurement tool. It is therefore accepted that, subject to TII approval, some of the measurement criteria above may be substituted with alternative criteria, providing always the standards are defined to an equivalent degree of accuracy.

**Schedule 18: Infrastructure Spare Parts and Infrastructure Special
Tools**

18.1 Spare Parts and Special Tools to be made Available by TII

18.1.1 TII shall make available to the Operator on the Operating Commencement Date, at no cost to the Operator:

- the Infrastructure Spare Parts listed in Annex 1 to this Schedule;
- the Infrastructure Special Tools listed in Annex 2 to this Schedule; and
- the Infrastructure Special Tools Manuals.

18.1.2 The Operator shall be responsible for the procurement of any Infrastructure Spare Parts and Infrastructure Special Tools other than those made available by TII pursuant to paragraph 18.1.1, including without limitation:

- all Infrastructure Spare Parts necessary in case a part of the same type is lost, damaged, defective or worn out;
- wearing part aids (such as measuring instruments and tools, maintenance materials, grease and cleaning material);
- consumables, standard workshop tools and suchlike,

which are necessary for the proper performance of the Services and the achievement of the Performance Standards.

18.1.3 The Operator shall not keep or store at the Depots or at any other place on the System any spare parts or special tools other than the Spare Parts and Special Tools. For the avoidance of doubt nothing in this Schedule shall prevent the Operator from keeping at the Depots any tool or materials (including but without limitation consumables) which it requires to properly perform the Services.

18.1.4 The Operator shall not remove from the System, other than for the purposes of maintenance, repair or overhaul, any Infrastructure Spare Parts or Infrastructure Special Tools owned by TII without the consent of TII, such consent not to be unreasonably withheld.

18.1.5 The Operator shall be responsible for the maintenance and calibration of the Infrastructure Special Tools owned by TII in accordance with the Infrastructure Special Tools Manuals. The Operator shall keep TII informed of and shall make available to TII, promptly upon being issued, all revised or improved versions of any software item of the Infrastructure Special Tools owned by TII which correct errors or imperfections in, or add to or enhance the functions of, previous versions of such software. Such upgrades shall, at TII's convenience, without impeding the Operator's obligations under the Contract, be installed into the equipment to which they relate and thereupon be deemed to replace the previous version of said software in the definition of "Infrastructure Special Tools".

18.1.6 The Operator shall ensure that the Infrastructure Spare Parts and Infrastructure Special Tools comply with any requirements or recommendations specified or suggested in the relevant Maintenance Manuals and are compatible with the part of the Infrastructure to which such Infrastructure Spare Parts and Infrastructure Special Tools apply.

18.1.7 The Operator shall ensure that any maintenance and/or repair work carried out to any Infrastructure Spare Part or Infrastructure Special Tool complies with any requirements or recommendations of the manufacturer thereof and if necessary shall return such

Infrastructure Spare Part or Infrastructure Special Tool to its manufacturer, or other suitably qualified service provider, for maintenance and/or repair.

18.2 Replenishment of Infrastructure Spare Parts and Infrastructure Special Tools

18.2.1 The Operator shall at all times during the Operating and Maintenance Period properly store and maintain sufficient Infrastructure Spare Parts and Infrastructure Special Tools in accordance with Good Industry Practice in order to be able to undertake Routine Maintenance and anticipated Corrective Maintenance of the Infrastructure, and with sufficient contingency to have the capability of repairing the anticipated levels of Damage to the System.

18.2.2 When any Infrastructure Spare Part is used by the Operator in performing the Services it shall be replaced by one which is, subject to paragraph 18.1.6, of at least the same form, fit and function available on the market of the same type and of at least the same quality and standard as that made available by TII pursuant to paragraph 18.1.1.

18.2.3 When any Infrastructure Special Tool requires replacement in order to properly perform the Services, it shall be replaced by one which is, subject to paragraph 18.1.6, of at least the same form, fit and function available on the market of the same type and of at least the same quality and standard as that made available by TII pursuant to paragraph 18.1.1.

18.2.4 The Operator shall ensure that no part is removed from the Infrastructure by the Operator except in compliance with its obligations in relation to the performance of the Services. If any part is removed it shall as soon as reasonably practicable be replaced by an Infrastructure Spare Part which:

- is of at least the same quality and of at least equivalent standard as the removed part,
- is the same as or is, subject to paragraph 18.1.6, of at least the same form, fit and function as the removed part,
- is manufactured or has been repaired in accordance with Good Industry Practice,
- once installed will not materially diminish the operational life (being that specified by the manufacturer thereof, and otherwise that to be reasonably expected of such an item according to Good Industry Practice), performance or condition of the Infrastructure in which it is installed, and
- is of at least equivalent utility to the removed part and, without prejudice to the generality of the foregoing, if it is time or life limited and is not being replaced as part of a part rotation programme, has at least a substantially similar number of hours available until the next maintenance check; and

18.2.5 Following the use of any Infrastructure Spare Part the Operator shall be responsible for re-ordering any replacement Infrastructure Spare Parts so as to ensure that the Operator can properly perform the Services and achieve the Performance Standards.

18.2.6 The Operator shall be responsible for replacing any lost or damaged Infrastructure Spare Parts and Infrastructure Special Tools howsoever such loss or damage is caused. The cost of replacing any such lost or damaged Infrastructure Spare Parts and Infrastructure Special Tools shall be borne by the Operator.

18.3 Items to be returned to TII upon Contract Expiry

- 18.3.1 Upon the Expiry Date, the Operator shall return to TII the same types and numbers of Infrastructure Spare Parts and Infrastructure Special Tools as those listed in Annex 1 and Annex 2.
- 18.3.2 Subject to paragraphs 18.3.3 to 18.3.7, each Infrastructure Spare Part and Infrastructure Special Tool shall be of at least equivalent standard (fair wear and tear excepted) as those listed in Annex 1 and Annex 2.
- 18.3.3 If any Infrastructure Spare Part or Infrastructure Special Tool is a replacement of that made available by TII pursuant to paragraph 18.1.1, each such item shall, subject to paragraph 18.1.6, be of at least the same form, fit and function (or other appropriate version as may be required by TII) as that Infrastructure Spare Part or Infrastructure Special Tool available on the market.
- 18.3.4 To the extent that any Infrastructure Spare Parts are commonly recognised as 'perishable spares' (namely spare parts that materially degrade over time regardless of whether in use or not), each such item shall be in the condition to be reasonably expected following proper replacement thereof by the Operator during the Operating and Maintenance Period in accordance with the Safety Management System where relevant and otherwise upon expiry of the shelf-life specified by the manufacturer thereof or, if no such shelf-life is specified, in accordance with Good Industry Practice.
- 18.3.5 To the extent that Good Industry Practice permits any Infrastructure Spare Parts to be refurbished (or re-conditioned), each such item shall be in the condition to be reasonably expected following proper refurbishment (or re-conditioning) by the Operator during the Operating and Maintenance Period in accordance with the Safety Management System, where relevant and otherwise in accordance with Good Industry Practice.
- 18.3.6 To the extent that such Infrastructure Spare Parts (or replacement thereof) remain unused during the Operating and Maintenance Period, each such item shall be and remain in the condition to be reasonably expected following proper storage in accordance with the manufacturers' instructions or, if no such instructions are available, in accordance with Good Industry Practice.
- 18.3.7 Each Infrastructure Special Tool shall, fair wear and tear excepted strictly where and to the extent appropriate in accordance with Good Industry Practice, be in a serviceable condition.

ANNEX 1: INFRASTRUCTURE SPARE PARTS

Equipment	Components	LRU	Quantity
Building Services	Lighting	58w, 230vac, 1500mm, White Fluorescent tubes,	50
		28w, 230vac, 2D lamps, fluorescent	50
		55w, 230vac, 2D lamps, fluorescent	50
		38w, 230vac, 2D lamps, fluorescent	50
		26w, 230vac, PL lamps	50
		1000w, 230vac supply, SON-T lamps	20
		400w, 230vac, MBF lamps, E-40 lamp holder	20
		80w, 230vac, High Pressure Mercury Lamps, to suit fittings	20
	Socket-outlets	13 amp, 230vac, B.S. 1363, Plugs, (for socket-outlets)	50
	Distribution Boards / Control Panels	25% spare MCBs of each rating and type installed in Distribution Boards and Control Panels	1
		10 spare keys for secret key switches	10
		25% spare fuses for each type and rating of Fuse-switch	1
Architectural / Miscellaneous	2 spare Motor / Gearbox drive units		2
	Rail Drainage Boxes		6
	Bollards	Stainless	20
		Wooden bollards at St James Walk	20
	Bicycle racks		20
	Stop Bracket Arms		0
	Imprinted Concrete	(Mats) [London Cobble 230 X 130] with colourant and colour release agent (powder form)	5
	Stop Shelter Glazing: Full Back Panels 1.1 bay	2200mm panel	38
		2250mm panel	9
		2300mm panel	0
		2350mm panel	4
		2400mm panel	2
	Stop Shelter Glazing: Side Panels 0.52 bay	2200mm panel	3
		2250mm panel	5
		2300mm panel	2
		2350mm panel	3

Equipment	Components	LRU	Quantity
		2400mm panel	0
	Panels above help point 900mm		4
	Roof Panels	1575 x 1090mm	4
		1575 x 1190mm	1
		1795 x 1090mm	41
		1795 x 1190mm	24
	Insert Gun		1
	Stop Signs		1
	Single sided Sign Boards	St Stephens Green - 2 Sign boards	2
		Charlemont - 2 Sign boards	2
		Ranelagh - 2 Sign boards	2
		Beechwood - 2 Sign boards	2
		Cowper - 2 Sign boards	2
		Milltown - 2 Sign boards	2
		Windy Arbour - 2 Sign boards	2
		Dundrum - 2 Sign boards	2
		Balally - 2 Sign boards	2
		Kilmacud - 2 Sign boards	2
	Double sided Sign Boards	Harcourt - 1 double sided sign board	1
		Stillorgan - 2 double sided sign boards	2
		Sandyford - 2 double sided sign boards	2
	Red Line signs	A complete set of replacement signs for the Red Line	1
	Stop Shelter Components: Type 3	Complete with all glazing, seats and help point	1
	Stop Shelter Components: Type 5	Complete with all glazing, seats and help point	1
	Stop Shelter Components: Spigots and fixings	Complete sets for type 3 shelter including spacers	1
	Stop Shelter Components: Fixings		1
	Stop Shelter Components: Seating	Complete sets of seating for type 6 shelter incl. all fixings	2
	Advertising Drums	Complete set of all exterior panels and fixings	1
		Complete set of all interior top and bottom lighting and fixings	1
		Complete set of all polycarbonate panels for all top and bottom doors	1

Equipment	Components	LRU	Quantity
	Complete bins with waste bin liner and fixings		5
	Emergency Telephones	Unit for free standing mounted Phone complete (excl. columns)	1
		Unit for shelter mounted phone complete (excl. columns)	1
	Acoustic Walls @ Peters Place Wall	Translucent Acrylic Panels 5m x 2m	4
	Temporary Glazing	Temporary perspex glazing to aid in maintenance - panels	10
	Perspex glazing	Temporary perspex glazing to aid in maintenance - sheets	2
	Spring setting device HWU 240 D2 for switches S49-R25 and R50m	Complete operating mechanism with adjustable hydraulic shock absorbers for insulated design without switch blade detectors without mounting box	1
Track	S&C Spares S49 Half Switches (R=25)	HZV-FSCH EW 25-1:2.18 "LLAI"	1
		HZV-FSCH EW 25-1:2.18"LR" (also for HZV-FSCH EW 25-1:4"LRAI")	1
		HZV-FSCH EW 25-1:2.18"RLAI" (also for HZV-FSCH EW 25-1:4 "RLAI")	1
		HZV-FSCH EW 25-1:2.18 "RRAI"	1
		HZV-FSCH EW 25-1:4 "LL"	1
		HZV-FSCH EW 25-1:4 "RRAI"	1
	S&C Spares S49 Half Switches (R=50)	HZV-FSCH EW 50-1:3.26 "LLAI"	1
		HZV-FSCH EW 50-1:3.26 "LRAI"	1
		HZV-FSCH EW 50-1:3.26 "RLAI"	1
		HZV-FSCH EW 50-1:3.26 "RRAI"	1
		HZV-FSCH EW 50-1:6 "LLAI"	1
		HZV-FSCH EW 50-1:6 "LRAI"	1
		HZV-FSCH EW 50-1:6 "RLAI"	1
		HZV-FSCH EW 50-1:6 "RRAI"	1
	S & C Spares Ri60N Half Switches	Ri60N-50-1:6 (RH) Curved Flexible Tongue "RR"	2
		Ri60N-50-1:6 (LH) Curved Flexible Tongue "LL"	2
		Ri60N-50-1:6 (RH) Curved Flexible Tongue "RL"	2
		Ri60N-50-1:6 (LH) Curved Flexible Tongue "LR"	2
	S&C Spares S49 Crossings	EHZ CENTRO MN13 "L" 25-1:2.18 (standard turnouts)	1
		EHZ CENTRO MN13 "R" 25-1:2.18 (standard turnouts)	1

Equipment	Components	LRU	Quantity
		EHZ CENTRO MN13 "L" 25-1:4 (standard turnouts)	1
		EHZ CENTRO MN13 "R" 25-1:4 (standard turnouts)	1
		EHZ CENTRO MN13 "2AI" 50-1:3.26 (diamond DC2 no. 2)	1
		EHZ CENTRO MN13 "3AI" 50-1:3.26 (Turnout AMOTO 3 no.3)	1
		EHZ CENTRO MN13 "LAI" 50-1:3.26 (standard turnouts)	1
		EHZ CENTRO MN13 "RAI" 50-1:3.26 (standard turnouts)	1
		EHZ CENTRO MN13 "5AI" 1:3.26 (common Xing 1 on DC2 & DC3)	1
		EHZ CENTRO MN13 "6AI" 1:3.26 (DC3 common no.6)	1
		EHZ CENTRO MN13 "AI" 50-1:6 (standard turnout + DC1 common)	1
		DHZ CENTRO MN13 "4AI" 1:3.26 (obtuse DC2 & DC3)	1
		DHZ CENTRO MN13 "3AI" 50-1:6 (Obtuse DC1)	1
		DIAMOND CROSSING DC1	2
		EHZ CENTRO MN13 "3AI" 50-1:6 (obtuse crossing)	1
		EHZ CENTRO MN13 "AI" 50-1:6 (common crossing)	0
		DIAMOND CROSSING DC2	
		EHZ CENTRO MN13 "5AI" 1:3.26 (common no. 1)	1
		EHZ CENTRO MN13 "2AI" 50-1:3.26 (common no. 2)	1
		DHZ CENTRO MN13 "4AI" 1:3.26 (obtuse no. 4)	1
		DIAMOND CROSSING DC3	1
		EHZ CENTRO MN13 "5AI" 1:3.26 (common no. 5)	0
		EHZ CENTRO MN13 "6AI" 1:3.26 (common crossing no. 6)	1
		DHZ CENTRO MN13 "4AI" 1:3.26 (obtuse no. 4)	0
		EHZ COMPACT 1400 'L' S49-25 1:2.18 CROSSING	3
	S&C Spare Ri60N Manganese Crossing	(Ri60N-50-1:6) Ri60N Single Crossing EHZ "1" (common scissors)	1
		(Ri60N-50-1:6) Ri60N Triple Crossing HZ "2" (obtuse scissors)	1
		(Ri60N-50-1:6) Ri60N single Crossing EHZ "3" (standard XO)	1

Equipment	Components	LRU	Quantity
		(Ri60N-50-1:6) Ri60N Single Crossing EHZ "4" (heuston outbound)	1
		(Ri60N-50-1:6) Ri60N Single Crossing EHZ "5" (heuston centre)	1
		(Ri60N-50-1:6) Ri60N Single Crossing EHZ "6" (heuston inbound)	1
	Rail S49	15m Lengths	64
		18m Lengths	6
		6m Lengths	8
		9m Lengths	3
		9.5m Lengths	2
		10m Lengths	3
		18m Lengths	9
		7m Lengths	2
		6m Lengths	5
		9m Lengths	3
		12.85m Lengths	1
		10.15m Lengths	1
		Construction cross over	1
		10.5m length 300 radius	1
		18m length 250 radius	1
		10.5m length 250radius	1
		18m length 225 radius	3
		18m length 200 radius	1
		10.5m length 200 radius	1
		18m length 125 radius	7
		15m length 125 radius	1
		10m length 125 radius	2
		9.5m length 125 radius	1
		6m length 125 radius	1
		18m length 100 radius	1
		10.5m length 100 radius	1
		18m length 75 radius	1

Equipment	Components	LRU	Quantity
		12m length 75 radius	1
		11.25m length 75 radius	1
		18m length 50 radius	4
		11.25m length 50 radius	1
		11m length 50 radius	1
		7.72m length 50 radius	1
		10.5m length 25 radius	1
		9.8m length 25 radius	1
		8.2m length 25 radius	1
		6.9m length 25 radius	1
		6.5m length 25 radius	1
	Rail Ri59N	18m length	1
		18m length	2
		17.5m length	7
		10.6m length	2
		10m length	2
		9.45m length	1
		8.84m length	2
		8.5m length	2
		8.44m length	1
		8.4m length	1
		8.3m length	2
		7.8m length	1
		6.9m length	1
		6.27m length	1
	Ri59N Rail Curves	17.5m length 300 radius	1
		17.5m length 250 radius	1
		17.35m length 200 radius	1
		17m length 200 radius	1
		17.5m length 125 radius	2
	gr1276	17.2m length 125 radius	1

Equipment	Components	LRU	Quantity
		17.5m length 100 radius	1
		17.5m length 100 radius	2
		9m length 100 radius	4
		17.14 length 80 radius	1
	g0972	17.5m length 75 radius	1
	gr2423	17.5m length 75 radius	1
	r197	17.5m length 75 radius	1
	r722	17.5m length 75 radius	1
	gr1019	17.5m length 50 radius	1
	gr927	17.5m length 50 radius	1
	r114-k3	17.5m length 50 radius	1
	r120-k3	17.5m length 50 radius	1
		17.5m length 50 radius	6
		17m length 50 radius	1
		8.84m length 30 radius	2
	gr197	17.5m length 25 radius	1
	r91k4	17.5m length 25 radius	1
		17.5m length 25 radius	6
		17.5m length 25 radius	2
		16.19m length 25 radius	1
	Beechwood crossover	Assorted bearers for crossover	36
	S49 R25 switches	25_7	1
		25_8	1
		25_9	1
		25_10	1
		25_11	1
		25_12	1
		25_13	1
		25_14	1
		25_15	1
		25_16	1

Equipment	Components	LRU	Quantity
		25_17	1
		49_2	10
		25_3L	1
		25_3R	1
		25_2L_S	1
		25_4L	1
		25_5R	1
		25_18	1
		50_3R	1
		50_1R	1
	General	Junction Rails (lengths)	33
		Sundry Rail Items	100
		Edilon Blocks incl. rail fasteners	251
		Concrete Sleepers incl. rail fasteners	23
		pre drilled derailment containment sleepers	2
		Assorted Switch Bearers (see separate sheet)	0
		Vossloh Ribbed Baseplate System 336 (Taney Bridge)	1
		Vossloh Anchor Bolt M27x285 (Taney Bridge)	1
		Vossloh direct Track fastenings - Suir Road	1
		Vossloh Depot plinth Track fastenings	1
		Vossloh low toe load fastenings	1
		Fastenings for Taney derailment	1
		General	1
		Vossloh Centering Plate +2.5 mm	1
		Vossloh Centering Plate +5 mm	1
		Vossloh Centering Plate -2.5 mm	1
		Vossloh Fastening Bolt (S49 system) 22-115-5	1
		Vossloh Height Adjustment Pads (System W14) 2mm	1
		Vossloh Height Adjustment Pads (System W14) 4mm	1
		Vossloh Intermediate Pad Zwp 367/160/5	1
		Vossloh Clamping Clip SKL-1	1

Equipment	Components	LRU	Quantity
		Helical Spring Fe 28	1
		Hexagonal nut for Vossloh Anchor bolt	1
		Rail underfoot rollers	1
		Insulated Rail Joint (S49)	4
		Insulated Rail Joint (Ri59N)	4
		Buffer Stop (depot)	2
		Hydraulic Unit for Connolly	1
		Points Heater	1
		Heating Element 900W - 3800mm, bipolar, straight, 230V, 50Hz, Flat heating element F12, without cables, made of MONEL 400 acc. To drawing No. 4Qc-39704 No.7	1
		Heating Element 900W - 2870mm, bipolar, curved, 230V AC, design DBAG	1
		Transformer-Switch relay TSRL 16A 190-260V, 45-65Hz	1
		Current Relay STR 5.4 - fourfold, 230-462V, readjustable, 16-50Hz	1
		Logic Module LOGO 230RC Siemens No. 6ED1 052-1FB00-0BA4	1
		Extension Module LOGO DM8 230R [230V AC/DC] Siemens No. 6ED1 055-1FB00-0BA1	1
		Memory Module LOGO MEMORY CARD Siemens No. 6ED1-056-5CA00-0BA0	1
		Points Detection	3
		Connection Box (S49)	3
		ZP Board (Control Box)	8
		Inductive Proximity Switch	
		Ri59N Points Setting Device	1
		Embedded turnout accessories	
		MCBS-10A/16A20A SP (ABB)	1
		MCBS-32A/20A TP (ABB)	1
		RCBOS-16A (ABB)	1
		Surge Protection - DEHN GUARD (AGTEC)	1
		Isolator - Blue Line (Irish Solenoid)	1
		Set of consumable spares/parts for HWU 40 DZ (Ri60 Points)	1

Equipment	Components	LRU	Quantity
		Set of consumable spares/parts for HWU 240 DZ (to be defined)	2
		Mounting Box for HWU240D2-Z	1
Power Supply	Substations: 12,4 MV Switch Board	Circuit Breakers HD4/R 24.06.16 complete with accessories	1
		Circuit Breakers HD4/R 24.06.20 complete with accessories	1
		REF 542 plus, and Multifunction Protection relay - Incoming	1
		REF 542 plus, and Multifunction Protection relay - Traction	1
		REF 542 plus, and Multifunction Protection relay - Service	1
		Combi Sensor rated for 1250A - 24 kV (for all Incoming and Service transformer units)	1
		Current Sensor rated for 1250A - 24 kV (for all traction units and, only for 1OL, auxiliary transformer unit)	1
		Medium voltage fuse (for switch disconnecter unit); 6-10 or a Boxes	1
		Circuit breaker motorisation (for all circuit breaker)	1
		Opening coil (for all circuit breaker)	1
		Closing coil (for all circuit breaker)	1
		Undervoltage coil (for all circuit breaker)	1
	Substations:Transformer	HV Bushing (Standard, Dual, Service, Auxiliary Type)	1
		LV Bushing (Standard, Dual, Service Type)	1
		LV Bushing (Auxiliary Type)	1
		Buchholz Relay (Standard, Dual, Service, Auxiliary Type)	1
		Thermometer (Standard, Dual Type)	1
		Thermometer (Service, Auxiliary Type)	1
		Air Dryer (Standard, Dual, Service, Auxiliary Type)	1
		Pressure Relief Device (Standard, Dual, Service, Auxiliary Type)	1
		Winding Temperature Indicator (Standard, Dual Type)	1
		Earth Fault relay 64/TR	1
		Earth Fault relay 51/PE	1

Equipment	Components	LRU	Quantity
	Substations: MAIN 400Vac DISTRIBUTION PANEL	MCCB (S1B 125 R10 3P FXD TM type)	0
		MCCB (S1B 125 R12.5A 3P FXD type)	0
		MCCB (S1B 125 R20 3P FXD TM type)	0
		MCCB (S1B 125 R25 3P FXD TM type)	0
		MCCB (S1B 125 R63 3P FXD TM type)	0
		MCCB (S1N 125 R10 3P FXD TM type)	0
		MCCB (S1N 125 R100 3P FXD TM type)	0
		MCCB (S1N 125 R12.5 3P FXD TM type)	0
		MCCB (S1N 125 R16 3P FXD TM type)	0
		MCCB (S1N 125 R20 3P FXD TM type)	0
		MCCB (S1N 125 R32 3P FXD TM type)	0
		MCCB (S1N 125 R40 3P FXD TM type)	0
		MCCB (S1N 125 R63 3P FXD TM type)	0
		MCCB (S1N 125 R80 3P FXD TM type)	0
		MCCB (S4N 250A R80 3P FXD PR211/P LI type)	0
		MCCB (S5 400A 3P WD EF CHASSIS type)	0
		MCCB (S5N 400 R400 3P FXD TM type)	0
		MCCB (S5N 400A 3P WD PR212 LSIG type)	0
		MCCB Aux Connection (1SDA0 13863 S3-S6 type)	2
		MCCB Aux Connection lead (1SDA0 13864 S3-S6 type)	2
		MCCB Aux Contact (1SDA0 13856 S3-S5 type)	0
		MCCB Mech. Interlock (1SDA0 13862 R1 type)	2
		MCCB Residual current release (1SDA0 13283R1 RC211 type)	2
		MCCB Rotary handle mechanism with transmission rod	2
		MCCB - Aux trip contact (1SDA0 13327 S1-S2 type)	2
		MCCB - Aux trip contact (1SDA0 13575 S3-S5 type)	2
		Relay (1SDA0 37393R1 RCQ type)	2
		RCQ-Release & closed Toroid (1SDA0 50542 R1 type)	1
		Surge arrestor (900 - 530 type)	1
		N/link (63/100 CML type)	1

Equipment	Components	LRU	Quantity
		White fuse base (CM100F type)	1
		3 pole fuse base (22X58 29214 G type)	1
		Fuse (10A 10X38 420010 type)	25
		Fuse (10X38 6A type)	0
		Fuse (4A 10X38 420004 type)	25
		Fuse (63A 22X58 422063 type)	25
		Fuse base (10X38 450032 type)	0
		Fuse base (10X38 480332 type)	0
		Neutral link (10X38 480032N type)	0
		Neutral link (NH 0 160A 334160 type)	10
		Ammeter (400/5 96SQ 90 NO O/S type)	1
		Ammeter shroud (96SQ type)	0
		Current transformer (400/5 TAI 230 type)	1
		Phase failure relay (PNDA B400 AA3C type)	1
		Voltmeter (500V AC 96SQ 90 type)	1
		48V DC relay (700-CF220ZY type)	6
		48V DC relay (700-CF310ZY type)	6
		Auxiliary-700-CF220ZY (100-FA22 type)	3
		Auxiliary-700-CF220ZY (100-FA31 type)	3
		MCCB - Aux contact (1SDA0 13856 S3-S5 Aux only type)	10
	Substations: ESSENTIAL 230Vac DISTRIBUTION PANEL	MCCB - Contact lead (1SDA0 13863 S3-S6 Connaux F type)	0
		MCCB - Shunt trip (1SDA0 13782 RI 48Vdc type)	2
		MCCB shunt lead (1SDA0 13865 S3-S5 Conn Dr type)	2
		MCCB/Isolator (S3D 100FXD 3P type)	2
		MCB (S261 B10 type)	6
		MCB (S261 B13 type)	6
		MCB (S261 B16 type)	6
		MCB (S261 B6 type)	6
		MCB trip & Aux contact (S2 SH Signal + aux)	6
		Fuse base (10X38 450032 type)	0

Equipment	Components	LRU	Quantity
		Fuse base (10X38 480332 type)	0
		Neutral (10X38 480032N type)	1
		Ammeter (50/5 96SQ 90 type)	1
		Ammeter shroud (96SQ type)	1
		Current Transformer (50/5 TAIBB type)	1
		Voltmeter (300 Vac RQ96E 96SQ 9° type)	1
		Relay (700-HA32A03-3 8PIN 230V type)	6
		Relay (700-HA32A03-3-4 8PIN 230V type)	6
		Relay base (700-HN 100 HA 8PIN type)	6
		Aux contact (OA2G11 type)	2
		Isolator (OT 160E4 type)	2
	Substations: ESSENTIAL 48Vdc DISTRIBUTION PANEL	MCB (S252 B10 type)	6
		MCB (S252 B20 type)	6
		MCB (S252 C0.5 type)	6
		MCB trip & aux contact (S2 SH SIGNAL + AUX type)	6
		Fuse (4A 10X38 420004 type)	0
		Fuse base (10X38 450032 type)	0
		Neutral link (10X38 480032 type)	0
		Ammeter (0-100A RQ96M 60MVDC type)	1
		Ammeter shroud (96SQ type)	1
		Output DC shunt (DER 0-100A 60MV type)	1
		Voltmeter (60VDC RQ96M 96SQ 90° type)	1
		Relay (700-CF220ZY 48VDC type)	6
		48V DC to 24V DC converter (3T12AP-6130 type)	1
		Contact block (V50 N/O type)	1
		Internal light switch (RM400N 2POS type)	1
	Substations: ESS CONTROL PANEL	Sel switch-ESS SCADA operational bypass (2POS SPEC SW COI 43619 type)	1
		Sel switch-ESS SCADA operational bypass (2POS SPEC SW COI 43620 type)	1
		Fuse (10A 10X38 420010 type)	25
		Fuse (10X38 6A type)	0

Equipment	Components	LRU	Quantity
		Fuse (4A 10X38 420004 type)	25
		Fuse base (10X38 450032 type)	0
		Neutral link (10X38 480032N type)	0
		MFE timer (2,550,029,81 type)	1
		Relay (neutro F.S 58 4/2 24VD type)	0
		Heater (60W 240V type)	1
		Auxiliary - 700-CF220ZY (100-FA22 type)	2
		Auxiliary - 700-CF220ZY (100-FA31 type)	2
		Auxiliary - 700-CF220ZY (100-FA40 type)	2
		Control relay (700-CF3 10ZY 48Vdc type)	2
		Turn dial (RS 509-973 10 type)	2
		Turn pot (RS 173-401 10 type)	0
		Diode block (289-121 type)	0
		Enunciator module	0
		Enunciator alarms (4 off)	0
		Cross signalling lamp	10
		Square signalling lamp	0
		Square light control selector	2
		Round light control selector	2
		RCBO DS651C10/300 2P	0
		RCBO DS651C16/300 2P	0
		RCBO DS651C25/300 2P	0
		RCBO DS651C6/300 2P	0
		RCBO DS651C40/300 2P	0
		RCBO DS651C10/300 4P	1
		ELCB F372-25/30 2P	1
		ELCB F372-25/300 2P	0
		ELCB F374-25/300 4P	1
		ELCB F374-63/300 4P	1
		MCCB (S3D 1603P FXD ISOLATOR)	2
		MCCB (S4N 160 4P PR212P LSIG FXD) (RED COW)	0

Equipment	Components	LRU	Quantity
	Substations: Non Essential Panels and Multicustomer Enclosures	AUXILARY CONTACT (F3-H TRIP CONTACT)	10
		MCB AUXILARY (S2 SH SIGNAL)	0
		MULTI FUNCTION METER (CVM 96-ITF-RS485-C2)	2
		22X58 FUSE 50A	0
		22X58 FUSE 63A	6
		22X58 FUSE 40A	6
		10X38 FUSE 16A	0
		10X38 FUSE 20A	0
		10X38 FUSE 25A	6
		10X38 FUSE 2A	25
		FUSE (NH00 63A DIN TYPE)	0
		CT (100/5 2.5VA CL1(153-5-S6))	4
		PFR RELAY (PNDA B400 AA3C)	1
		TERMINAL RELAY (859-358 AUXILARY RELAY)	0
		CONTACTOR (UA16-30-10-R)	6
		ELCB F372-25/30 2P	1
		ELCB F372-25/300 2P	0
		ELCB F374-25/300 4P	1
		ELCB F374-63/300 4P	1
		MCCB (S3D 1603P FXD ISOLATOR)	3
		AUXILARY CONTACT (F3-H TRIP CONTACT)	10
		MULTI FUNCTION METER (CVM 96-ITF-RS485-C2)	1
		POWER FACTOR REGULATOR (8D-5-96A 111005)	0
		10X38 FUSE 16A	25
		10X38 FUSE 20A	25
		10X38 FUSE 25A	6
		10X38 FUSE 2A	25
		10X38 FUSE 32A	6
		22X58 FUSE 63A	6
		CAPACITOR (2.5KVAR MKP 400V)	2
		CAPACITOR (5KVAR MKP 400V)	2

Equipment	Components	LRU	Quantity
		CT (50/5 2.5VA CL1(151-5-M6))	6
		PFR RELAY (PNDA B400 AA3C)	1
		TERMINAL RELAY (859-358 AUXILARY RELAY)	0
		FUSE GI 2A 10x38	50
		FUSE GI 4A 10x38	20
		FUSE GI 63A 22x58	4
		FUSE GI 100A 22x58	1
		FUSE GI 125A 22x58	1
		FUSE GI 315A SIZE 2	1
		FUSE AM 2A 10x38	1
	Substations: Essential Panels	FUSE AM 4A 10x38	1
		FUSE AM 20A 14x51	10
		FUSE AM 32A 14x51	1
		FUSE AM 63A 22x58	1
		FUSE AM 125A 22x58	1
		FUSE UR 63A 22x58 6,921 CP GRC	4
		FUSE UR 100A 22x58 6,921 CP GRC	1
		FUSE UR 125A 6,6 URD 30 TT F 0125	1
		FUSE UR 250A 6,6 URD 31 TT F 0250	1
		RELAY 12VDC 2 CONTACTS SPDT	1
		RELAY 230VAC 4 CONTACTS SPDT	4
	UPS	Inverter Bridge ASSY 1PH	0
		Inverter Static Switch Thyristor 56A 1200V	1
		Reserve Static Switch Thyrist.500A 1200V	1
		CGCH - Rectifier firing PCB	2
		CCCH-20 Rectifier control I-Face PCB	1
		NICH-51 Interface PCB	2
		CMCH-10 Microprocessor PCB	1
		NIOT-11 Inverter 1PH interface PCB	1
		CISO-11 Inverter 1PH micro interface PCB	2
		CCOT-24 Inverter Control PCB	1

Equipment	Components	LRU	Quantity
		CDIM-02 IGBT driver PCB	1
		CDCH-00 Display PCB	1
		ALIP-02 Power Supply Pcb	1
		CAFI-61 - 3ph RFI Pcb	1
		RELAY 12Vdc 4spdt	1
		VRLA ("Sealed Lead Acid") battery	0
		RECTIFIER ASSY 48Vdc 200A	0
	Battery Charger	Diode 100A (dropping diode)	10
		CC6P rectifier control PCB	4
		CGCH rectifier firing PCB	1
		CLED-01 - LEDs Alarm PCB	1
		NRV-020 Voltmetric Relay PCB	4
		CAFI-61 - 3ph RFI Pcb	0
		RELAY 48Vdc 4spdt	1
		RELAY 12Vdc 4spdt	1
		NiCd Battery	0
	Substation Battery	Ventilation Motor	0
		Reverse current relay/ Transducer (32)	1
	DC Switchgear	Complete Spare Earthing Contactor (Q71)	1
		Movable arcing contact (all HSCB)	13
		Fixed arcing contact (all HSCB)	6
		Movable main contact (all HSCB)	6
		Fixed main contact (all HSCB)	6
		Auxiliary contacts reed type (all HSCB-AIS)	6
		Main spring assembly (all HSCB-AIS)	7
		Shock absorber (all HSCB)	3
		Arc-chute assembly (750 Vdc HSCB)	3
		Ceramic fins assembly (750 Vdc HSCB)	4
		Ceramic protection (750 Vdc HSCB)	3
		Closing servomotor (all HSCB)	3
		Holding/release coil assembly (all HSCB)	3

Equipment	Components	LRU	Quantity
		Holding coil resistor (all HSCB); per box	2
		DIA-IGTV relay (complete unit)	2
		<u>TRASDUCER/RECEIVER ASSEMBLY FOR DIA/IGTV</u>	
		Current transducers MHCO-TI (BOARD)	2
		Current receiver MHCO-RI (BOARD)	2
		Optical fibre (BOARD)	1
		<u>DIA/LP31 ASSEMBLY</u>	
		Line test relay DIA-LP31 (BOARD)	2
		LTHHS40 contactor for line test device (HSCB)	0
		Line-test coil (750 Vdc HSCB)	1
		Fuse for line-test device (750 Vdc HSCB)	2
		<u>TRASDUCER/RECEIVER ASSEMBLY FOR DIA/LP31</u>	
		Current transducers MHCO-TV (BOARD)	1
		Current receiver MHCO-RV (0:20mA, 0:20mA, 0:20mA) (BOARD)	1
		Optical fibre (BOARD)	1
		<u>TRASDUCER/RECEIVER ASSEMBLY FOR DIA/LP31</u>	
		Current transducers MHCO-TV (BOARD)	1
		Current receiver MHCO-RV (0:20mA, 4:20mA, 0±20mA) (BOARD)	1
		Optical fibre (BOARD)	1
		Frame leakage protection assembly (relay and toroid) (BOARD)	1
		Circuit breaker complete with truck, contactor, resistor and fuse for line test device	2
		Contactor C6000ML complete with truck	1
		Hydraulic drive 230V/24V	7
		4/3 hydraulic valve 24 VDC	7
		Hydraulic unit 230V/24V	7
		Hydraulic cylinder	3
		Proximity switch 10-60 V	0
		Proximity switch for end position monitor and locking	2
		Tongue detector terminal box with sticker NSW B01	2

Equipment	Components	LRU	Quantity
		Printed circuit board	4
		Motor terminal box	2
		Rubber bellow	6
		Locking for locking device	2
	Substation: Other	OCAD Assembly R30214997	2
		Capacitor 0.47uF (C1 - C12 Hole Storage Capacitor)	7
		Capacitor 2uF (C13 - C14 DC Surge Capacitor)	5
		Fuse 5A 1500V DC 20X127 (FF1 - FF4 Fuse for DC Surge Circuit); 12-20 or 2 Boxes	20
		Fuse 2A NIT2 (FFT1 -FFT2 & FFT5 -FFT6, FFEH & FFEL, FFT3 & FFT4 Fuse for Auxiliary Supplies); 12-20 or 2 Boxes	30
		Relay Plug In Aux 4C-O (K27,K26A,K26T,K99F, K99FS Auxiliary Relay)	2
		Relay Plug In Aux 3C-O (K27X Relay Auxiliary under voltage)	2
		Relay Plug In Aux 4C-O (K58X & K64X Relay Auxiliary)	2
		DC Panels Earth Fault Relay	1
		Resistor 47R (RR1 & RR2 Resistor DC Surge Circuit); 6 off or a Box	4
		Resistor 100K (RR3 & RR4 Resistor Discharge Surge Circuit); 6 off or a Box	4
		Surge Arrester Disconnect (FS Disconnect for Surge Arrestor)	1
		Switch S826E22 (B99/FS Micro switch for Surge Arrestor Disconnect)	1
		Transformer 240V -110V (TT2 - TT5 Transformer Isolating)	1
		Transformer 750-0.5A 5VA (B1 - B12 Current Transformer)	2
		Transformer Lamp FHBTMU-LED7B-240-4BL (BTH Lamp Anti Condensation Heater "On"); 10 off or a Box	7
		Diode Module DR10574A (R1 - R3 & R7 - R9 Diode Heatsink assembly)	3
		Diode Module DR10574B (R4 - R6 & R10 - R12 Diode Heatsink)	3
		Surge Arrester 1.0kV DC (FS Surge Arrestor)	2

Equipment	Components	LRU	Quantity
		Transformer 100VA 136-324V (TT1 Transformer Constant Voltage)	1
		Diode Module DR10579A (R7 - R9 Diode Heatsink assembly)	2
		Diode Module DR10579B (R10 - R12 Diode Heatsink Assembly)	2
		Diode Heatsink DR10580B (R4 - R6 Diode Heatsink Assembly)	2
		Diode Heatsink DR10583A (R1 - R3 Diode Heatsink)	2
		Fuse 6A TIA6 (FFT1 & FFT2 Fuse Auxiliary supply); 10 off or a Box	30
		Surge Arrester 1.8kV DC (FS Surge Arrestor)	2
		Transformer 200VA 136-620V (TT1 Transformer Constant Voltage)	1
		Shunts; 1 of each type	1
Communications, Control, Timing and CTN Systems	Telephone System	INTOF Pack Board 3BA53118AA [ALCATEL]	1
		CPU6 3BA23197BA [ALCATEL]	2
		UA32 Configured Board 3BA53050AB [ALCATEL]	1
		Z32 Configured Board 3BA53188AB [ALCATEL]	1
		BPRA2-1 Board 3BA23074AB [ALCATEL]	1
		RT2-1 Board 3BA23077AB [ALCATEL]	1
		DIGITAL TELEPHONE 4035 3AK28044UK [ATLINKS]	2
		ANALOGUE TELEPHONE TEMPORIS 10 TEMPORIS 10 [ATLINKS]	8
		AUDIO RECORDER (MIRRA) MR082A-32929-1 [SIGMA WIRELESS]	1
		TELEPHONE RECORDING ADAPTER [TYCO]	0
	Emergency Telephone System	EMERGENCY TELEPHONE ET ECP 100/10200 [TYCO]	10
		Outdoor Telephone TAS 2000	1
	PS SCADA System	Power Supply 230Vac/24Vdc 5A 46923 [ATOS/LEGRAND]	2
		Power Supply 230Vac/24Vdc 10A 46849 [ATOS/LEGRAND]	2
		Rack PS Scada SSE	0
		Differential Breaker 30mA 2x6A 5SU1353-1KV06 [ATOS/SIEMENS]	1

Equipment	Components	LRU	Quantity
		Sectionable Fuse 1P + N (10,3x38) 3NW7051 [ATOS/SIEMENS]	1
		Safety Relay 24Vdc PNOZ-X2 [ATOS/PILZ]	1
		Interface Relay 24Vdc 15c 48.31.7.024.0050 [ATOS/FINDER]	1
		Interface Relay 24Vdc 38.51.7.024.0050 [ATOS/FINDER]	1
		2 Position Selector ZB4-B44 [ATOS/TELEMECANIQUE]	1
		REMOTE TERMINAL UNIT PS SCADA – Empty Rack and Backplane [ATOS/ABB]	0
		Power Supply RTU Unit 23 NG 24 R0001 [ATOS/ABB]	2
		CPU for RTU560 serial 560 SLI 02 R0001 [ATOS/ABB]	2
		FLASH MEMORY MODBUS MASTER [ATOS/ABB]	1
		FLASH MEMORY IEC 60870-5-101 SLAVE [ATOS/ABB]	1
		Binary Input 16 CH 23 BE 21 R5012 [ATOS/ABB]	2
		Binary Output 16 CH 23 BA 20 R5312 [ATOS/ABB]	1
		Analog Input 8 CH 23 AE 21 R5011 [ATOS/ABB]	1
		Fibre optic Coupler 23 OK 22 [ATOS/ABB]	1
		FEC PS SCADA System (SERVER) PROLIANT ML530R G2 [HP]	1
		Personal Computer EVO EVO D510 SFF P4 1,8GHz [COMPAQ/HP]	2
		SERIAL HUB 98800-7 [CONTROL]	1
		E/O DATA TRANSMITTER 0ZDV 2471 P - 943 340-021 [HIRSCHMAN]	1
		220Vac/5Vdc E/O Converter SNT 510 - 268 109-001 [HIRSCHMAN]	1
	AMOS & FE SCADA System	RTU FE SCADA RACK1 – Empty Cage with Backplane (Stop/Depot) IC693CHS391 [GENERAL ELECTRIC]	1
		RTU Power Supply Module IC693PWR331 [GENERAL ELECTRIC]	2
		CPU Module IC693CPU364 [GENERAL ELECTRIC]	2
		PCM Serial Connection Module IC693PCM301 [GENERAL ELECTRIC]	2
		32 Digital Input IC693MDL655 [GENERAL ELECTRIC]	4

Equipment	Components	LRU	Quantity
		32 Digital Output IC693MDL753 [GENERAL ELECTRIC]	2
		4 Analog Input IC693ALG221 [GENERAL ELECTRIC]	2
		HSC Module IC693APU300 [GENERAL ELECTRIC]	2
		RS30 Relay Couplers Relay Module EMG 10-REL/KSR-G 24/1-LC [PHOENIX CONTACT]	20
		220Vac/24Vdc Converter GK 100/1AC/24 [ELIND]	2
		220Vac/12Vdc Converter GK 100/1AC/12 [ELIND]	2
	Stop PID System	EXTERNAL PID 01.719.02 [VITROCISET]	2
	CCTV System	DOME CAMERA Complete [TYCO/PELCO]	0
		Dome Driver DD53TC16-X [TYCO/PELCO]	6
		Cover BB53HD-PG-E [TYCO/PELCO]	6
		Transparent Accessory LD53HDCMB-1 [TYCO/PELCO]	6
		220/24 Vca Transformer [TYCO/PELCO]	6
		FIXED CAMERA ICS300-CSV3A [TYCO]	2
		Transformer 220/24 vca [TYCO]	2
		LIFT CAMERA ICS200-CSV3A [TYCO/PELCO]	1
		COLOUR MONITOR 15" NLCM156X [TYCO]	1
		COLOUR MONITOR 25" 25MER400 [TYCO]	2
		CCTV KEYBOARD LTC8555 [PHILIPS/TYCO]	1
		Keyboard Power Supply [PHILIPS/TYCO]	1
		Keyboard extension kit LTC 8557 [PHILIPS/TYCO]	1
		VIDEO RECORDER SR-9080E [TYCO]	2
		VIDEO MULTIPLEXER LTC2662/90 [TYCO]	1
		Power Supply VM In [TYCO]	1
		Video Input Card LTC 8921/00 [TYCO]	1
		Video Output Card LTC 8934/00 [TYCO]	1
		CPU [TYCO]	1
		Power Supply VM Out [TYCO]	1
		Electro Optical Converter Single Tx VAD 5250 TX [TYCO]	2
		Electro Optical Converter Single Rx VAD 5250 RX [TYCO]	2

Equipment	Components	LRU	Quantity
		Electro Optical Converter Tetra Tx TETRA 5250 TX [TYCO]	2
		Electro Optical Converter Tetra Rx TETRA 5250 TX [TYCO]	2
		E/O Power Supply 220Vac [TYCO]	1
		Video Distributor Board DVI0100/10 [TYCO]	2
		Power Supply 220Vca/12Vcc S-60 [TYCO]	3
		Quad QD104C-X [TYCO]	2
		CODE MERGER 8569/50 [TYCO]	1
		BIPHASE DATA DISTRIBUTOR LTC8768/06 [TYCO]	1
		VIDEO MATRIX LAN SWITCH [TYCO]	1
		DATA CONVERTER [TYCO]	1
		VIDEO DISTRIBUTOR [PHILIPS/TYCO]	1
		DATA INTERFACE [TYCO]	2
	Timing System	U.1.2.0 Master Clock U.1.2.0 [MOSER-BAER]	1
		U.4.2.0 Time Code Generator U.4.2.0 [MOSER-BAER]	1
		U.4.1.0 Serial Communication U.4.1.0 [MOSER-BAER]	1
		U.5.0.0 Charging Controller U.5.0.0 [MOSER-BAER]	1
		U.1.0.0 Master U.1.0.0 [MOSER-BAER]	1
		GPS RECEIVER GPS3048.A [MOSER-BAER]	1
		INTERNAL DIGITAL CLOCK 401A.05 [MOSER-BAER]	1
		ANALOG CLOCK 50 cm PLB.SFA.50.300.E+IF 487SA [MOSER-BAER]	1
		MASTER TIME SERVER MTS [MOSER-BAER]	1
		ANALOG CLOCK 30 cm STA.SSA.30.300SEC [MOSER-BAER]	1
		EXTERNAL DIGITAL CLOCK 401A.12 [MOSER-BAER]	1
	Public Address System	DIGITAL MESSAGE GENERATOR 05TDUTMM 3011/2 [TYCO]	1
		CHIME TONE GENERATOR TCTG10187 [TYCO]	1
	PA Degraded Mode Terminal	Audio Box Interface [TYCO]	1
	SM 25B Sound Management System	Booster Frame LBB2024/00 [PHILIPS]	1
		Input Call station Mixer LBB2511/10 [PHILIPS]	1

Equipment	Components	LRU	Quantity
		Zone Relay LBB2551/10 [PHILIPS]	1
		Alarm Routing LBB2540/10 [PHILIPS]	1
		CALL STATION BASIC LBB2500/10 [PHILIPS]	1
		WALL / CEILING SPEAKER LBC3090/XX [PHILIPS]	1
		HORN SPEAKER HP-10(T) [PHILIPS]	1
		30 + 30 W AMPLIFIER TSA10187/00 [TYCO]	0
		Amplifier Board TSA10187/00 [TYCO]	3
		PSU Board TSA10187-PSU [TYCO]	3
		Audio Transformer TSA10187-100VTR [TYCO]	3
		CEILING SPEAKER VES-360(T) [DNH]	2
		PA LOUDSPEAKER CAP-15W(T) [DNH]	4
		CALL STATION EXTENSION CAP-15W(T) [PHILIPS]	1
	Cable Transmission Network (CTN), including power distribution:	Qxx One Pole Breaker 1A S271-EF5671 [ABB ELETTRCONDUTTURA]	2
		Qxx One Pole Breaker 6A S2711-EF2603 [ABB ELETTRCONDUTTURA]	3
		Qxx One Pole Breaker 8A S271-EF2611 [ABB ELETTRCONDUTTURA]	3
		Qxx One Pole Breaker 16A S271-EF2637 [ABB ELETTRCONDUTTURA]	6
		Qxx Two Pole Breaker 1A S272-EF5796 [ABB ELETTRCONDUTTURA]	3
		Qxx Two Pole Breaker 6A S272-EF2801 [ABB ELETTRCONDUTTURA]	2
		Qxx Two Pole Breaker 8A S272-EF2819 [ABB ELETTRCONDUTTURA]	2
		Qxx Two Pole Breaker 10A S272-EF2827 [ABB ELETTRCONDUTTURA]	2
		Power Supply 230 Vac V30812-A5020-A6 [SIEMENS]	2
		12LVOI-P FB-52450-A [SIEMENS]	2
		UNIVO (without submodules) S30824-Q32-X [SIEMENS]	2
		2LVOI-T sub-module S30824-Q56-X [SIEMENS]	2
		HQAUD-M FB-52462-B0A [SIEMENS]	1
		HQAUD-S FB-52462-C0A [SIEMENS]	2

Equipment	Components	LRU	Quantity
		E1 S30824-Q32-X [SIEMENS]	1
		RSxMM S30824-Q70-X [SIEMENS]	3
		Ethernet 10/100 Mb S30824-Q61-X [SIEMENS]	3
		BORA150-8-SS S30824-Q80-X822 [SIEMENS]	3
		Ethernet Media Converter AT-FS202SC/FS1 [ALLIED TELESYN]	8
		Fibre Optic Converter	1
		Power Supply DIN Rail	1
	Radio System Components	AMBASSADOR ELECTRONICS BANK (AEB) Components:	0
		Card Cage B1425A [MOTOROLA/SIGMA]	0
		Timer Card A B1845A [MOTOROLA/SIGMA]	0
		ZAMBI B1843A [MOTOROLA/SIGMA]	0
		AMB Card B1844A [MOTOROLA/SIGMA]	0
		CENTRAL ELECTRONICS BANK (CEB) [MOTOROLA/SIGMA]:	0
		Card Cage BHN1006A [MOTOROLA/SIGMA]	0
		AIMI BLN7023 [MOTOROLA/SIGMA]	0
		COIM BLN1277B [MOTOROLA/SIGMA]	0
		RS232 BLN6755D [MOTOROLA/SIGMA]	0
		SHORT DATA ROUTER (SDR) MDC1016AA [MOTOROLA/SIGMA]	1
		SDR CPU Card - R3 CDN6417 [MOTOROLA/SIGMA]	0
		SDR - Power Supply CDN1273 [MOTOROLA/SIGMA]	0
		SDR - Hard Drive - R3 01-W2671E01A [MOTOROLA/SIGMA]	0
		SDR - CD ROM Driver CDN6413 [MOTOROLA/SIGMA]	0
		Transition Module CDN6416 [MOTOROLA/SIGMA]	0
		Ethernet Adapter Conn. CDN6415 [MOTOROLA/SIGMA]	0
		Ethernet Adapter CDN6414 [MOTOROLA/SIGMA]	0
		TELEPHONE INTERCONNECT GATEWAY (TIG) GSLN0001BA [MOTOROLA/SIGMA]	0
		Dual E1 Card GSDN4002A [MOTOROLA/SIGMA]	0

Equipment	Components	LRU	Quantity
		SITE LINK MULTIPLEX SDLN 4447A Components:	0
		CPU XCON EDN7188A [MOTOROLA/SIGMA]	0
		FRS *68 EDN7186A [MOTOROLA/SIGMA]	0
		IPR Card [MOTOROLA/SIGMA]	0
		Dual WAN Card EDN5628A [MOTOROLA/SIGMA]	0
		CEPT EDN5636A [MOTOROLA/SIGMA]	0
		Power Supply EDN5635A [MOTOROLA/SIGMA]	0
		INTF-SYNC EDN7189A [MOTOROLA/SIGMA]	0
		HSU V.35 EDN7190A [MOTOROLA/SIGMA]	0
		SITE LINK MULTIPLEX EDN5587A Components:	0
		E1 Interface Board EDN5588A [MOTOROLA/SIGMA]	0
		Voice Card BLN1235A [MOTOROLA/SIGMA]	0
		ECHO CANCELLER SDDN4423A (Chassis only) [MOTOROLA/SIGMA]	1
		Digroup Module SDDN4434A [MOTOROLA/SIGMA]	0
		Power Supply SDDN4433 [MOTOROLA/SIGMA]	0
		Console SDDN4435 [MOTOROLA/SIGMA]	0
		PACKET DATA GATEWAY SDLN4495 Components:	0
		Radio Network Gateway EDN7589A [MOTOROLA/SIGMA]	0
		Packet Data Router EDN7588A [MOTOROLA/SIGMA]	0
		Short Data Router EDN7588A [MOTOROLA/SIGMA]	0
		Alarm Panel EDN7509A [MOTOROLA/SIGMA]	0
		CD ROM Drive EDN7142A [MOTOROLA/SIGMA]	0
		Hard Drive EDN7143A [MOTOROLA/SIGMA]	0
		DAT Drive SDLN4495 [MOTOROLA/SIGMA]	0
		Power Supply SDLN4495 [MOTOROLA/SIGMA]	0
		Fan Module EDLN7504A [MOTOROLA/SIGMA]	0
		MASTER SITE E/S CDN6251 or CDN6252 (12 and 24 port respectively) [MOTOROLA/SIGMA]	0
		ELITE HUB CDN6392 or CDN6393 (12 or 24 port respectively) [MOTOROLA/SIGMA]	1
		ROUTER S 4000 ST4000 [MOTOROLA/SIGMA]	0

Equipment	Components	LRU	Quantity
		SMART ZONE CONTROLLER (Processor Tray) Components:	0
		Power Supply Module TPN1281 [MOTOROLA/SIGMA]	0
		Disk Controller Module TTN6118 [MOTOROLA/SIGMA]	0
		Audio Switch Interface Module TPN3281 [MOTOROLA/SIGMA]	0
		Ethernet Interface Module TTN6117 [MOTOROLA/SIGMA]	0
		Port Module TLN3280 [MOTOROLA/SIGMA]	0
		CPU Card CLN7024 [MOTOROLA/SIGMA]	0
		1GB Hard Disk Module TLN3495 [MOTOROLA/SIGMA]	0
		Tape Drive Module TLN3275 [MOTOROLA/SIGMA]	0
		Driver Module TLN3283 [MOTOROLA/SIGMA]	0
		Line Module TLN3282 [MOTOROLA/SIGMA]	0
		DLE2010A [MOTOROLA/SIGMA]	0
		Power Amplifier DLN1188A [MOTOROLA/SIGMA]	0
		Exciter DLN1190A [MOTOROLA/SIGMA]	0
		Power Supply DLN1187A [MOTOROLA/SIGMA]	0
		Controller DLN1186A [MOTOROLA/SIGMA]	0
		Receiver CLN1512A [MOTOROLA/SIGMA]	0
		AIR CONDITIONING UNIT [MOTOROLA/SIGMA]	0
		SMOKE DETECTOR [MOTOROLA/SIGMA]	0
		DOOR SWITCH [MOTOROLA/SIGMA]	0
		THERMOSTAT [MOTOROLA/SIGMA]	0
		MTP700 TETRA Hand Portable MTP 700 [MOTOROLA/SIGMA]	0
		NiMH Battery [MOTOROLA/SIGMA]	40
		SIX WAY CHARGER [MOTOROLA]	1
		SINGLE UNIT CHARGER [MOTOROLA]	1
		X 21 media converter ME550AE-X21 [BLACK BOX]	1
		TAIL BUFER ME260AE/ME263 [BLACK BOX]	1
		MTM 700 - MOBILE RADIO UNIT (car radio) MT912 - M47PCN6TZ5AN [MOTOROLA]	1

Equipment	Components	LRU	Quantity
		RADIO HANDSET TF190/02 [TECNOLOGIE FUTURE]	4
		FOOT PEDAL 6254-D0 [HERGA]	2
		ANTENNA DRU IRSW33 [SIGMA WIRELESS]	2
		NM-HCF12-NF Cable (19,70 mt Assembly) 3020HCF123010/19,7 [GENEX]	1
		NM-HCF12-NF Cable (33,70 mt Assembly) 3020HCF123010/33,7 [GENEX]	1
		MTM 700 - MOBILE RADIO UNIT (Tram radio) MT912 - M47PCC6TZ5AN [MOTOROLA]	4
	On board Radio Components	DC/DC CONVERTER 24/12 Vdc 24Q2320-2R [POWER- ONE]	0
		CAB LOUDSPEAKER FRS 8 - 8 OHM [VISATON]	4
		OMNI DIRECTIONAL MICROPHONE & PREAMPLIFIER 26.0102.AA [CIMAT]	4
		RADIO CONTROLLER 16.02.60.AA [CIMAT]	4
		LOUDSPEAKER AMPLIFIER T1220 [PASO]	5
		CAB ENABLE TF11/03 [TECNOLOGIE FUTURE]	2
		ANTENNA VRU IRSW32 [SIGMA WIRELESS]	3
	CCS LAN Components	LAN OMNI SWITCH 7700 (Computer Radio Room Red Cow) OMNI SWITCH 7700 [ALCATEL]	2
		LAN OMNI STACK 6124 (Maintenance Department Red Cow) OMNI STACK 6124 [ALCATEL]	0
		TRANSCEIVER FAULT TOLERANT SM-2503 [SHORE MICROSYSTEMS]	0
		AUDIO SPLITTER TH500 [ALCATEL]	0
		AUTOMATIC ANSWER MACHINE 100.02.14 [TELSIEL]	1
		SERVSWITCH SPECTRA SW681A [BLACK BOX]	1
Overhead Catenary & Conductor Spares and Fixings	Hardware	Wall Fixing M45496-01-A	18
		Feeder Pole - F8.4-219-168-FM45061-01-D	0
		Feeder Pole - F8.4-273-219-FM45063-01-D	0
		Lighting Pole - F8.4-273-219-LPM45069-04-D	0
		Lighting Pole - P8.4-273-219-LPM45055-03-D	0
		Platform Lighting Pole - F8.4-273-219-LPM45063-03-D	0
		Flanged Pole F8.4-219-168M45068-02-D	0
		Flanged Pole F8.4-273-219M45069-02-D	0

Equipment	Components	LRU	Quantity
		Weight Set Pole F8.4-203H-WM45067-01-D	0
		Weight Set Pole F8.4-254H-WM45490-02-D	0
		Tensioner Weight Set Assembly 8.4-203H-WM45350-01-A	0
		Tensioner Weight Set Assembly 8.4-254H-WM45351-01-A	1
		Long Bracket Arm Assembly(42mm dia)M45340-03-A	4
		Double Track Brkt Arm Assembly (60mm dia)M45341-01-A	4
		Overlap Brkt Arm Assembly (60mm dia)M45341-02-A	1
		Medium Brkt Arm Tie Rope AssemblyM42332-02-A	4
		Short Brkt Arm Tie Rope AssemblyM42332-07-A	4
		Pulley104 0025 002	4
		Stitch Assy. ShortM45071-01-A	8
		Stitch Assy. LongM45071-02-A	4
		Stitch Assy. Short With NuggetM45071-03-A	4
		Stitch Assy. Long With NuggetM45071-04-A	8
		Stitch Assy. Short C/W LeversM45070-02-A	0
		Strong Registration Arm AssemblyM45335-01-A	8
		Insulated Registration Arm AssemblyM45338-03-A	8
		Section Insulator Support (Bracket Arm) Assembly M45023-01-A	1
		Section Insulator Support (Twin Bracket Arm) Assy.M45023-02-A	0
		Tension Maintenance DeviceM45022-01-A	0
		Section Insulator Support (Cross Span) Assembly M45049-01-A	0
		Termination setM45019-01-A	0
		Mid-Point Anchor Arrangement (42mm Dia)M45034-01-A	1
		Mid-Point Anchor Arrangement (60mm Dia)M45034-02-A	1
		Backstay Anchor assemblyM45391-01-A	0
		Backstay Anchor assemblyM45391-02-A	0
		Pole Strap Assembly 219mm DiaM41649-02-A	2

Equipment	Components	LRU	Quantity
		Pole Strap Assembly 273mm DiaM42497-01-A	2
		Pole Strap Assembly 168mm DiaM45309-01-A	1
		Pole Strap Assembly 168mm DiaM45313-01-A	1
		Pole Strap Assembly 168mm Dia (S.I.Strut)M45313-02-A	1
		Pole Strap Assembly 273mm DiaM45317-01-A	1
		Pole Strap Assembly 273mm Dia (S.I.Strut)M45317-02-A	1
		Pole Strap Assembly 273mm DiaM45320-01-A	1
		120mm2 Contact Wire CONTACT WIRE	1055
		185mm2 Parallel Feeder 3KV XLPER08-16-00-2626	700
		185mm2 Feeder EPR/CSPR08-16-00-2625	100
		95mm2 Cable TM1 06SG CableR08-16-00-2577	20
		Bonding AssemblySK19/14 715050	0
		BT 95 C12 TerminalF11005-61-M12	2
		BT 95 C16 TerminalF11005-61-M16	2
		M24 Base Stud AssemblyM41182-01-A	4
		M30 Base Stud AssemblyM41183-01-A	24
		8.5mm Dia ParafilM41228-01-D	300
		6mm Dia St.St.Wire Rope WIRE ROPE	200
		8mm Dia St.St.Wire Rope WIRE ROPE 8	200
		Copper Ferrule For 6mm Dia Wire RopeTCU6.5	20
		Copper Ferrule For 8mm Dia Wire RopeTCU9	20
		Thimble For 6mm Wire RopeTHSS6	20
		Thimble For 8mm Wire RopeTHSS8	20
		Terminal Body Kit Of PartsM41208-01-D	20
		10mm QuicklinkM41210-01-D	20
		8mm QuicklinkM41211-01-D	20
		8mm HangerM41223-01-D	10
		7mm HangerM41224-01-D	10
		Binding CylinderM41225-01-D	10
		Delta LinkM42042-01-D	5

Equipment	Components	LRU	Quantity
		Forked Collar SocketM41332-03-D	0
		Contact Wire Splice635323000	12
		Inline InsulatorM45330-01-D	10
		Bolted ClampM42543-01-D	0
		Turnbuckle 3/4" x 6" Eye/Jaw c/w LocknutsM41642-03-D	6
		Turnbuckle 3/4" x 12" Eye/Eye c/w LocknutsM41642-04-D	6
		Turnbuckle 3/4" x 12" Eye/Jaw c/w LocknutsM41642-08-D	6
		Turnbuckle 1/2" x 6" Eye/Jaw c/w LocknutsM41642-09-D	6
		ChainlinkM45344-01-D	6
		Delta Nipple With PinsM45073-01-C	0
		Delta Nipple Without PinsM45073-02-D	0
		PinM42224-02-D	4
		PinM42224-03-D	4
		Devcon Silicon Tube	1
		Self-Amalgamating Tape	3
		Feeder EarsM45345-01-A	5
		Contact Wire BridgeM42655-01-A	2
		Insulated KnuckleM41631-01-A	2
		Insulating Washer SetsM45455-01-A	0
		Top Collar For Feeder PoleM41267-01-D	0
		Bottom Collar For Feeder PoleM41267-02-D	0
		M16 x 90mm Galvanised Bolt	60
		M16 Galvanised Fullnut	60
		M16 Galvanised Plain Washer Form B	60
		M16 Galvanised Spring Washer	60
		M20 x 90mm Galvanised Bolt	20
		M20 Galvanised Fullnut	20
		M20 Galvanised Plain Washer Form B	20
		M20 Galvanised Spring Washers	20
		M24 x 100mm Galvanised Bolt	20

Equipment	Components	LRU	Quantity
		M24 Galvanised Fullnut	40
		M24 Galvanised Locknut	40
		M10 x 25mm Stainless Steel A2 Hex Setscrew	40
		M10 Stainless Steel A2 Hex Fullnut	60
		M10 Stainless Steel A2 Hex Nyloc Nut	60
		M10 Stainless Steel A2 Spring Washer	60
		M16 Stainless Steel A2 Hex Fullnut	60
		3mm x 25mm Stainless Steel Split Pin	40
		5mm x 50mm Stainless Steel Split Pin	10
		0.8A Fuse	10
		Mobile Contact	4
		Fixed Contact	4
		240V/80W Heater	1
		Thermostat	0
		Contact Block	0
		Contact Block	0
		Aux Contact Block	1
		Motor overload relay, 1.6-2.5A overload	1
		Thermostat 0-60 deg.	1
		Voltage Presence Light	4
		Voltage Presence Light Fuse	4
		Surge Diverter	5
		Surge Diverter	5
		Designated Earthing Point	4
		Bus Bar	4
		Large Bell Insulator	8
		Stud	8
		Full Nut	8
		Spring Washer	8
		Plain Washer	8
		Stud	8

Equipment	Components	LRU	Quantity
		Resin	8
		Terminal (BT95C16)	16
		Bonding Assembly	16
		Cable 95sqmm	20
		Pole Finial	20
		Pole Finial	20
		Pole Finial	20
		Pole Finial	20
		Bracket Arm Finial	20
		Bracket Arm Finial	20
		Overlap Bracket Arm Assembly	2
		Overlap Bond Assembly	2
		Overlap Bond Assembly	2
		Anchor clamps (tension reducer)	2
		Wall fixing decorative plate	10
		P8.4 193 - 139	1
		P7.2 273 - 219	2
		P8.4 273 - 219	2
		P8.4 323 - 273	1
	OCS Special Tools	Contact wire splicing kit.	0
		OCS hilti wall fixing installation kit (excluding Hilti drill)	1
		M12 x 1300mm Special Length Drill Bit	1
		M12 x 1300mm Special Length Drill Bit	1
		M12 x 1300mm Special Length Drill Bit	1
		Sufficient resin for 20 bolts	1
		RESIN DISPENCER	1
		Pull out tensometer	1
		Contact wire twister	1
		Contact wire de-kinker	1
		Rectifier Thyristor 26A 1200V	4
	Line Signalling System	Locking for locking device tongue detector	2

Equipment	Components	LRU	Quantity
AVLS, Line Signalling and Depot Control Systems		*Complete point machine for embedded Track	1
		*Complete point machine for ballasted Track	1
		Hydraulic Point Drive springs	
		Damping device D-Z	
		Setting mechanism	
		Lever box complete	
		Unit Complete	0
		Set of Consumable / Spares	0
		Unit Complete	0
		Set of Consumable / Spares	0
		Unit Complete	0
		Set of Consumable / Spares	0
		Unit Complete	0
		Set of Consumable / Spares	0
		Manual Point Machine	
		Set of Consumable / Spares	0
		Spring Point Unit	
		For Embedded Track Ri59 CPU component	2
		(Type HWU 40 D) IP Board	
		HFP board (G + 1E)	2
		Spring Point Unit	1
		For Embedded Track Ri59 HFK board (G + E)	2
		(Type HWU 40 DZ) Input board	3
		Output board	5
		SVS power supply	3
		HNG 250 C	2
		IFC component	2
		*BIS Operation Module	2
		Manual Turn Out Device Complete cabinet with all components and wiring	0
		HFE55 A Transformer transmitter	3
			0
		HFS42 A Transformer receiver	2
		Connection box for Track circuit	2

Equipment	Components	LRU	Quantity
		Connection box for earth junction	1
		*Wiring interconnections for all components	0
		*Short Circuit Cable including rail connection lugs	8
		*Cembre AR60 kit	20
		HFK Coil	3
		Wiring	0
		Short circuit connector	8
		Junction box(HFK 18.700)	2
		Junction box(HFK 21.000)	1
		Led signal	1
		*Complete indicator to include head, mounting brackets, wiring and LED's	2
		*Mounting brackets	2
		LED	12
		PSC module	2
		Processor board	2
		PIF board	1
		Input output board	0
		Lamp control board	1
		PD208 detector card	2
		PD216 detector card	2
		Site ID board	2
		Processor assembly	2
		Point Indicator	
		I/O interface	2
		4 phase lamp switch card	2
		8 phase lamp switch card	1
		PSC Controller (DCC and DLRC Area)	0
		*Mounting brackets	16
		*LED	17
		Steel Post (DCC Specification)	5
		*Indicator	14

Equipment	Components	LRU	Quantity
		*Mounting brackets	14
		*Wiring	14
		*LED	14
		Micro sense MTC Controller	
		(SDCC Area)	
		Hydraulic drive 230V/24V	2
		4/3 hydraulic valve 24 VDC	
		4/3 hydraulic valve 24 VDC	3
		Hydraulic cylinder	3
		Proximity switch 10-60 V	2
		Proximity switch for end position monitor and locking	2
		Tongue detector terminal box with sticker NSW B01	2
		Tongue detector terminal box with sticker NSW F02	
		Printed circuit board	2
		Motor terminal box	2
		Rubber bellow	8
	Depot Control System	Locking for Locking device	1
		Locking for Locking device tongue det.	1
	Hydraulic Point Machine (Type HWE 100)	Transponder	10
		Vecom box	3
		VPB	2
		Driver Console	4
		Personal computer Pentium	1
		Monitor	1
		Network board	1
		Printer	1
		Loop buffer	8
		*Preformed fiberglass loop	6
		*Complete cabinet with all components and wiring for 8 detector loops	0
		VCU MK II (8loops)	6

Equipment	Components	LRU	Quantity
		Isolated I/O	2
	AVLS	MUX 8	2
	On Board	PSU 24	6
	PC		1
	Monitor		1
	Printer		1
	Serial line set		0
	Network board		1
	Loop Buffer	KVM extender duo	1
	Detector	KVM extender single	0
	AVLS / SVD Cabinet	*FECS Server Complete	0
	Cabinet Rack	PC	0
		Monitor	1
		Network board	0
		Printer	0
	AVLS	EKI – 1524 – CE Modules	10

LINE LCC INFRASTRUCTURE SPARE PARTS

Short Text	Long Text	Quantity
Track		
RAIL 59R2-STRAIGHT RAIL (R260)	RAIL 59R2, STRAIGHT RAIL (R260), BXD 400 CAPITAL SPARES, TII ISSUED. SAFETY CRITICAL CLASS 1 CSR TBD APPLIES.	50
RAIL 49E-STRAIGHT RAIL (R260)	RAIL 49E, STRAIGHT RAIL (R260), BXD 400 CAPITAL SPARES, TII ISSUED. SAFETY CRITICAL CLASS 1 CSR TBD APPLIES.	50
RAIL 59R2-STRAIGHT RAIL (R290)	RAIL 59R2, STRAIGHT RAIL (R290), BXD 400 CAPITAL SPARES, TII ISSUED. SAFETY CRITICAL CLASS 1 CSR TBD APPLIES.	50

Short Text	Long Text	Quantity
CHECK RAIL PROFILE-TYPE C	CHECK RAIL PROFILE, TYPE C, FOR OPEN-SLAB TRACK SECTIONS OFF STREET:STRAIGHT STEEL PROFILE, BXD 400 CAPITAL SPARES, TII ISSUED. SAFETY CRITICAL CLASS 1 CSR TBD APPLIES APPLIES.	2m
CONCRETE MONO-BLOCK SLEEPER	CONCRETE MONO, BLOCK SLEEPER, (INCLUDING THIRD RAIL CONFIGURATION), BXD 400 CAPITAL SPARES, TII ISSUED. SAFETY CRITICAL CLASS 1 CSR TBD APPLIES APPLIES.	30
CONCRETE BI-BLOCK-SLEEPER	CONCRETE BI-BLOCK, SLEEPER, BXD 400 CAPITAL SPARES, TII ISSUED. SAFETY CRITICAL CLASS 1 CSR TBD APPLIES APPLIES APPLIES.	3
FASTENINGS-FOR RAIL 49E1	FASTENINGS, FOR RAIL 49E1, BXD 400 CAPITAL SPARES, TII ISSUED, SAFETY CLASS 3. N/A APPLIES.	60
FASTENINGS-FOR RAIL 59R2	FASTENINGS, FOR RAIL 59R2, BXD 400 CAPITAL SPARES, TII ISSUED, SAFETY CLASS 3. N/A APPLIES.	20
STEEL GAUGE BAR-:EMBEDDED RAIL 59R2	STEEL GAUGE BAR, :EMBEDDED RAIL 59R2, BXD 400 CAPITAL SPARES, TII ISSUED, SAFETY CLASS 3. N/A APPLIES.	10
IRJ-FOR RAIL 49E	IRJ, FOR RAIL 49E, BXD 400 CAPITAL SPARES, TII ISSUED, SAFETY CLASS 3.	2
IRJ-FOR RAIL 59R2	IRJ, FOR RAIL 59R2, BXD 400 CAPITAL SPARES, TII ISSUED, SAFETY CLASS 3. N/A APPLIES.	2
OHLE		
POLE-CYLINDRICAL	POLE, CYLINDRICAL, (INCLUDING PLATE AND A SET OF ANCHORAGE BOLTS), BXD 400 CAPITAL SPARES, TII ISSUED, SAFETY CLASS 3. N/A APPLIES.	1
POLE-CONICAL	POLE, CONICAL, (INCLUDING PLATE AND A SET OF ANCHORAGE BOLTS), BXD 400 CAPITAL SPARES, TII	1

Short Text	Long Text	Quantity
	ISSUED, SAFETY CLASS 3. N/A APPLIES.	
FINIALS-FOR OCS POLES	FINIALS, FOR OCS POLES, BXD 400 CAPITAL SPARES, TII ISSUED, SAFETY CLASS 3. N/A APPLIES.	20
P6 Setts		7
K2 Kerbs		11
T3 pavers		3
K1 kerbs		15
K7 Kerbs		7
T4 Pavers		5
OC16		10
OC 4A		15
WALL FIXING-KIT	WALL FIXING, KIT, BXD-400-OC-0103, ELEKTROLINE, 213926 N / 936300 / 940140 / 443600, SAFETY CLASS 3	1
STEADY ARM FOR PULL-OFF-0.8 M LONG	STEADY ARM FOR PULL-OFF, 0.8 M LONG., KIT, BXD-400-OC-0182, ELEKTROLINE, 234280 / 241026, SAFETY CLASS 3.	5
AUTOMATIC COMPENSATION DEVICE-KIT	AUTOMATIC COMPENSATION DEVICE, KIT, , CU 120, BXD-400-OC-0162, ELEKTROLINE, TMKH120B, SAFETY CLASS 3.	1
DOUBLE CANTILEVER 2X55-12M-KIT	DOUBLE CANTILEVER 2X55-12M, KIT, BXD-400-OC-0126, ELEKTROLINE, TV VYL2-12M, SAFETY CLASS 3.	2
CANTILEVER 1X55-9M-KIT	DOUBLE CANTILEVER 1X55-9M, KIT, BXD-400-OC-0124, ELEKTROLINE, TV VYL1-9M, SAFETY CLASS 3.	1
CONTACT WIRE-FOR OCS	CONTACT WIRE, FOR OCS, CU 120 MM2, ELEKTROLINE, 271112, SAFETY CRITICAL CLASS 1	1200

Short Text	Long Text	Quantity
STEEL WIRE-FOR OCS	STEEL WIRE, FOR OCS, BXD 400 CAPITAL SPARES, TII ISSUED, SAFETY CLASS 3. N/A APPLIES.	50
PARAFIL-FOR OCS	PARAFIL, FOR OCS, BXD 400 CAPITAL SPARES, TII ISSUED, SAFETY CLASS 3. N/A APPLIES.	50
LOOP INSULATOR-SILICONE	LOOP INSULATOR, SILICONE, WITHOUT THIMBLE 25KN, ELEKTROLINE, 221010, SAFETY CLASS 3.	10
TERMINATIONS:-PARAFIL	TERMINATIONS:, PARAFIL, BXD 400 CAPITAL SPARES, TII ISSUED, SAFETY CLASS 3. N/A APPLIES.	50
FE SCADA System		
Local Signalling Panel 1		1
MAP8011 – OP3		1
MAP8095 – OP2		1
MAP8021		1
MAP8051		1
MAP8081		1
Radio Transmission System		
IPMUX24 Chassis and electronics + PSU		1
TETRA Site Controller (TSC)		1
Base Radio (BS)		1
Chassis and Radio Frequency Distribution System (RFDS)		1
SFPs 100Base – FX		1
Power Supply Unit (PSU)		2
Antenna		1
Radio Transmission System – Radio Onboard Data Function		
MTM5200 (Onboard Terminal - Data)		1

Short Text	Long Text	Quantity
MTM5500 (Onboard Terminal - Voice)		1
OBCU		1
Cab Enable		1
Handset		1
Footpedal		1
Loudspeaker		1
Microphone		1
Radio Power Supply		1
System Box fan		4
Radio Transmission System – DCR Radio		
MTM5400		1
M390 TETRA Remote		1
M390-P TETRA PEI Radio Interface		1
CTN		
L3 Switch 24 ports		1
L3 Switch 48 ports PoE		1
Switch Moxa PT 7728		1
Switch Moxa PM-7200-6MSC		1
Switch Moxa PM-7200-2GTXSFP		1
Switch Moxa PM-7200-8TX		1
Media Converter EDS 205A		1
PoE Injector INJ24		1
SFP GBIC LX		1
SFP GBIC XD CWDM		1
Power Supply 24VDC 0.75A		1
Power Supply 24VDC 1.75A		1
CCS		
Operators' Integrated Workstation A		1

Short Text	Long Text	Quantity
NTP Server		1
Digital Clock - DCR		1
Digital Clock - depot exit		1
Analogue clock - Sanding Plant		1
Analogue clock - depot workshop		1
Workstation A - Monitors (21,5")		1
Videowall - Monitors (32")		1
INOSS CCTV Workstation - Monitors (21.5")		1
CCTV		
Autodome 7000 IP		3
Autodome Power supply		3
Ethernet/FO Converter		3
FLEXIDOME IP micro 2000		1
iSCSI Storage		1
Video decoder - VIDEOJET 8000		1
CCTV Console		1
CCTV Terminal - Video decoder		1
Autodome Power supply - Roof		1
PID		
Display Board DL 400804UB		1
Light Sensor PCB175		1
Display Processor PCB195		1
Single Board Computer SBC-558		1
Power Supply Unit 150Watt SP150 3.3		1
Power Supply Unit 60Watt T60B		1
PAS		
Audio IP Controller (RED Cow)		1
Audio Codec		1

Short Text	Long Text	Quantity
Headset		1
Audio logger - Processor		1
Audio logger - Recording Interface (4 Audio Inputs)		?
Hard disk array		1
Power supply		?
Amplifier		1
Projector Speaker		?
Ceiling Speaker - Depot admin building (offices & rooms)		1
Ceiling Speaker - Depot admin building (storage & rooms)		1
Horn Speaker		1
TE & EHP		
PABX matrix		1
Communication interface board		1
Analogue Interface board		1
IP Phone 8028		1
IP Phone 8038		1
LRV Gate Telephone		1
Analogue VoiP Gateway		1
EHP - Gai-Tronics VR Phone		1
IP Phone 4008		14
Relay EHP 48VDC		1
On-board AVLS		
VPB		1
VETERMS		1
VECOM Box C		1
Transponders		1

Short Text	Long Text	Quantity
AVLS		
VCM card		1
VMM card		1
Backplane		1
I/O card		2
Loop Buffer		3
Power supply module		2
Converter RS485/FO		2
Converter 232-485		3
EKI-1524-AE		1
Signalling - non Aegis		
IFC card		1
CPU card		1
SVS card		1
HNG card		1
HFP card		1
INPUT card		1
OUTPUT card		1
HSK card		1
HFK card		1
BIS card		1
PPI Collector - PLC Communication module		1
PPI Collector - PLC CPU Module		1
PPI Colector - Power supply module		2
Point Indicator - On Street		1
Point Indicator - Off Street		1
Wig Wag Signal		1
LRT Signal		1

Short Text	Long Text	Quantity
HWE 61.1 AVV-ZVV		
Hydraulic unit – common with HWE 61.1 O-Z		1
Drive shaft – common with HWE 61.1 O-Z		1
Spring assembly – common with HWE 61.1 O-Z		1
Hydraulic cylinder – common with HWE 61.1 O-Z		1
Setting unit		1
Lock device		1
Lock monitoring		1
Detector lock device		1
Drive rods – common with HWE 61.1 O-Z		1
Tongue Detector rods – common with HWE 61.1 O-Z		1
Connection terminal boxes – common with HWE 61.1 O-Z		1
Lever box – common with HWE 61.1 O-Z		1
HWE 61.1 O-Z		
Hydraulic unit – common with HWE 61.1 AVV-ZVV		1
Drive shaft – common with HWE 61.1 AVV-ZVV		1
Spring assembly – common with HWE 61.1 AVV-ZVV		1
Hydraulic cylinder – common with HWE 61.1 AVV-ZVV		1
Setting unit		1
Tongue detector mechanism		1
End position monitoring		1
Drive rods – common with HWE 61.1 AVV-ZVV		1
Tongue Detector rods – common with HWE 61.1 AVV-ZVV		1

Short Text	Long Text	Quantity
Connection terminal boxes – common with HWE 61.1 AVV-ZVV		1
Lever box – common with HWE 61.1 AVV-ZVV		1
HWU 40 D-Z		
Spring assembly – common with HWU 40 D		1
Damping device – common with HWU 40 D		1
Setting mechanism (incl. central locking) – common with HWU 40 D		1
Tongue detector		1
End position monitoring		1
Drive rods – common with HWU 40 D		1
Tongue Detector rods		1
Detector terminal box		1
Lever box – common with HWU 40 D		1
HWU 40 D		
Spring assembly – common with HWU 40 D-Z		1
Damping device – common with HWU 40 D-Z		1
Setting mechanism (incl. central locking) – common with HWU 40 D-Z		1
Drive rods – common with HWU 40 D-Z		1
Lever box – common with HWU 40 D-Z		1
HWU 160 D		
Spring assembly		1
Damping device		1
Setting mechanism (incl. central locking)		1
Drive rods		1
Lever box		1
Signalling Aegis		
Safety and isolation transformer		1

Short Text	Long Text	Quantity
Power Supply 230V AC/24V DC		1
Earth Insulation Monitor		1
HiMatrix F3 DIO 16/8		1
HiMatrix F30 03		1
Adam 6050 1 7 1		1
Contactor 3P - AC-3 440V 9 A		1
Local Control Touch Panel		1
Backplane 4x IMC 29TE		1
Backplane 3x IMC 29TE		1
Backplane 2x IMC 29TE		1
Power Protection Board		1
Axle counter Board		1
Evaluation Board		1
Overvoltage Protection		1
Wheel Sensor for SK420		1
Wheel Sensor for SK140		1
Rail Claw for vignole		1
Rail Claw for grooved		1
Surge Protection VAL-MS230VF (PH)		1
Modular solid state relay, (SSR) DC - 24 V - 24...280 V AC - 15 A		1
Heating Resistance		1
Thermostat		1
Surge Protection		1
Electromechanical Relay		1
Current Sensor		1
Motor prot. GPS1 Stand. breaking [A] 2,5 - 4		1
Surge Protection		1

Short Text	Long Text	Quantity
Local Control Enable - Panel rotary Switch - Switching element		1
Buzzer AUER		1
Depot Control		
Front end computer		1
Switch Ethernet		1
Tram Stop Power Supply		
Multi-function Metering (LV Board)		1
UPS Module UPScale RI		1
Substation		
Current Transformer 60-30/5-5A (MV Switchgear)		1
TPU S420 – OP23		1
Buchholz relay		1
Air Dryer		1
Pressure relief device (Traction transformer)		1
Monitoring Thermometer (Traction transformer)		1
Thermocontroller TSX1 (Cast resin Traction transformer)		1
PT100 Probe (set of 3) - (Cast resin Traction transformer)		1
Monitoring Thermometer (Auxiliary transformer)		1
Pressure relief device (Auxiliary transformer)		1
Power Diode V1 to V12 (2250kW Rectifier)		3
Fuse F1 to F12 (2250kW Rectifier)		3
Microswitch 1 to 12 (2250kW Rectifier)		3
Thermostat 100°C		3
Thermostat 130°C		3
Output Filters 1 & 2 (2250kW Rectifier)		1
Earth Leakage Relay		1

Short Text	Long Text	Quantity
Surge Diverter		1
Protection device (Sepcos 2)		2
Display Sepcos		2
MIU10 (current transducer)		2
VM10 (voltage transducer)		2
Switch (drive unit)		1
Earthing Switch (MTA50)		1
Line Test Device - Fuse 32A		2
Line Test Device - Contactor		1
Control Relay Comat C9A41D/48V		2
Control Relay Comat C7A200/48V		6
Time-delay relay		1
Position switch		4
Manual handle assy (TDS Switchgear)		1
Surge arrester (TDS Switchgear)		1
SMi2000FE Module		1
Command unit - miniPSM		1
Aux. Relay (4 contact)		2
Aux. Relays (Intertripping)		2
PS SCADA System		
UC500E		1
Industrial PC		1
LAN Switch		1
17" LCD Touch Screen Monitor		1
DCU500		1
Systems Additionl Spare Parts		
Motorola PMKN4134 (handset to cab ceiling speaker/microphone)		1

Short Text	Long Text	Quantity
SUPERFLEXIBLE FOAM-DIELECTRIC COAXIAL CABLE OR EQUIVALENT		50
Base Station RF cable: EPEN 5128 1/2 inch RF cables (EC4-50)– MTS to surge arrestors		50
7/8 inch RF cable (EC5-50A) – surge arrestors to Katherin Antenna		50
E1 Y Cable assembly MTS4 radio base station (MTS E1 port to IPMUX24)		1
Aviation Light LL/307 for Broombridge depot mast		1
GPS antenna for Tetra MTS		1
Canbus Switch		1
1x2.5mm ² Loop Cable 100		100
4 x 2.5mm ² SVD to Loop Buffer feeder cable 200		200
Trackside Intertripping/Emergency Tripping cable 4x4 mm ² 200		200
Double Sided PID complete (Master +Slave) 1		1
Totem Base Enclosure complete, including sub-distribution board, media convertors, EHP VOIP injector, PSU, timer for LED back-lighting.		1
H&K LSS cabinet – isolation transformer 1 10		1
TRACK CIRCUIT TRANSMITTER TRANSFORMER HFE55 1 10		1
TRACK CIRCUIT RECEIVER TRANSFORMER HFS42 1 10		1
Track circuit or mass detector rail-to-rail short circuit cable assembly (terminated - 1.6 120mm ²)		4
HSK blocking circuit C MODULE		1
HSK blocking circuit SE MODULE		1
KS Key Switch Box KS 1		1
KS Key Switch Box KS 2		1
KS Key Switch Box KS 3		1

Short Text	Long Text	Quantity
AVLS - Backplane Vecom 8 - Code A042137 - Quantity : 15		1
Points Heater Cabinet – Siemens LOGO! PLC Program Module		1
Delay Voltage Monitoring Relay – 3 Phase		1
Points Heater Cabinet – Auxiliary Relay 1 5		1
Points Heater Cabinet – Far/Site manual switch unit 1 5		1
Points Heater Cabinet – manual pushbutton (on modus, off modus, check)		1
Points Heater Cabinet – Status Lamp - Red		1
Points Heater Cabinet – Status Lamp - Green		1
Points Heater Cabinet – Status Lamp - White		1
Points Heater Cabinet – Siemens LOGO! 65674 PLC		1
Points Heater Cabinet – PLC DC Power Supply Unit (PSU)		1
Substation/Depot Building additional		
UPS Module DPA 25KVA. 1 12		1
LV Boards - Surge Arrestor - 3Ph+N - 40kA 1 5		1
UPS PV31 20kVA (complete unit w/o Batteries or Battery Cabinet)		1
LCC Stop Furniture		
Std Shelter Roof Glass (28.5mm T/Lam)		6
Phibsborough NB Shelter Roof Glass (28.5mm T/Lam)		1
Phibsborough SB Shelter Roof Glass (28.5mm T/Lam)		1
Broadstone Special Centre roof glass (28.5mm T/Lam)		1
Std Shelter rear Glass 17.5mm T/Lam		6

Short Text	Long Text	Quantity
Shelter Roof Glass - Glazing fixing		12
Shelter Rear Glass - Glazing fixing		12
Free Standing Emergency Help Point		1
LCC Stop Waste Bins and Galvanised Steel Liners		4
TVM Base		6

ANNEX 2: INFRASTRUCTURE SPECIAL TOOLS

TII shall supply the following tools and small plant to the Operator for the purpose of undertaking the Services.

1. Trackwork

- Three sets of testing and inspection equipment;
- Ten sets of tools such as bars for levering rails, crow bars, hammers, shovels, picks and pullers;
- A minimum of two sets of rail mules; and
- The following small plant: six generators, three rail saws, three drills and three sets of welding equipment.

2. DC Supply

- One complete set of special tools necessary for the replacement of diodes.

3. Overhead Conductor System

- A suitable number (not less than eight) of portable personal safety earthing devices for use by maintenance personnel and any other special tools necessary for maintenance and emergency use.

4. Long Lead Plant

- The tools listed below shall be supplied to the Operator in respect of long lead plant:

Item	Name	Description	Qty
1	Schoerling Railtech Road Rail Cleaning Vehicle (RRCV)	Track cleaning vehicle	1
2	C-MAR Mercedes Benz Unimog U423 with France- Elevateur platform	OHLE Maintenance vehicle	1
3	Chieftain road-rail trailer	Trailer	1
4	Schunk pantograph	Dummy pantograph	1
5	CAT Rail Corrugation Trolley	Rail measurement tool	1
6	KRAB track geometry trolley	Rail measurement tool	1
7	Geismar Amber track geometry trolley	Rail measurement tool	1
8	Recti-rail rail surface measurement tool	Rail measurement tool	1
9	Hilti drilling rig on trolley with pillar drill and 2 No Hilti SDS Drills (for Vossloh fittings)	Rail tooling	1

Item	Name	Description	Qty
10	Geismar Ri59N rail bending rollers	Rail tooling	2
11	Geismar rail bending tool	Rail tooling	1
12	Snow ploughs (two original +4 tractor + 2 unimog)	Snow clearing equipment	8
13	Forklift 12T	Forklift truck in Sandyford	1
14	Texas-combi snow blowers	Snow clearing equipment	4
15	Fiskers Snow shovels	Snow clearing equipment	100
16	Snow brushes	Snow clearing equipment	30
17	Salt spreaders (walk behind)	Snow clearing equipment	2
18	Salt spreader (towable)	Snow clearing equipment	1
19	Height and Stagger Gauge	Height and Stagger Gauge	1
20	VECOM-C Wayside Testing Unit including loop simulator clamp	Testing modules	1
21	MEWP (Single Person)	MEWP	1
22	Geismar rail trailer	Trailer	1
23	Husqvarna Rail saw	Rail tool	1
24	Rail saw clamp ri59	Rail tool	1
25	Rail saw clamp s49	Rail tool	1
26	TE80 Hilti Drills	Rail tool	3
27	WEKA core drills	Rail tool	2
28	Hotdog air blower	Rail tool	1
29	10KVA generator Kippor	Rail tool	1
30	20KVA generator Kippor	Rail tool	1
31	Husqvarna Road Saw	Rail tool	1

Item	Name	Description	Qty
32	Mini Prof	Rail measurement tool	1
33	Platform measuring frame	Rail measurement tool	1
34	Hardi tractor sprayers	Brine spraying tool	3
35	Walk behind Brine sprayer	Brine spraying tool	3
36	110Volt Hitachi impact drills	Rail tool	2
37	Husqvarna Impact wrench (petrol driven)	Rail tool	1
38	Geismar MP12 grinder	Rail tool	1
39	Geismar stretching kit	Rail tool	1
40	Geismar Rail Drill PR8	Rail tool	1
41	Geismar Manual Hydraulic weld shears	Rail tool	1
42	StumecCH65 Slewing jack	Rail tool	5
43	Simplex 15 ton toe jack s	Rail tool	8
44	Scissor rail clamps	Rail tool	2
45	Stone Blower	Rail tool	1
46	TE1000 Hilti for jacking and packing)	Rail tool	2
47	Cembre Rail drilling Machine	Rail Tool	1
48	Geismar PT8	Rail Tool	1
49	CALIPRI non-contact profile measurement device	Rail Tool	1
50	20 Foot container (with racking)	Container	1
51	Geismar Hydrauloic Rail Lifting Beam PAR481 - Ri59 and Ri60	Rail Tool	2

Schedule 19: Asset Management Plan

19.1 General Obligations

19.1.1 Without prejudice to obligations assumed by the Operator elsewhere in the contract or contained in the Maintenance Manuals or Safety Files, the Operator shall comply with the requirements set out in the Asset Management Plan in Table 19-1 below.

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
Activity	Description	Maintenance Interval (Days)										
MULTI-DISCIPLINE												
Line Opening Inspection	First LRVs on each Line after overnight shutdown periods will run out of passenger service at maximum 50 kph. to check general integrity of route	1	1	1	1	1	1	1	1	1	1	1
Multi-Function Inspection (Running Lines)	Multi-disciplinary Track walk inspection of all Infrastructure	7	7	7	7	7	7	7	7	7	7	7
Cab Riding Inspection	Inspection of all running lines from on board an LRV to monitor ride comfort and rail corrugation noise and identify locations where operating problems are developing	7	7	7	7	7	7	7	7	7	7	7
Additional Patrolling	Inspections will be carried out in addition to the above when abnormal conditions increase the likelihood of unsafe conditions - e.g. extremely hot or cold weather, floods, high winds, etc.	As Circumstances Require										
Control Log Interrogation	Examination of Control Log entries to identify recent significant failures and incidents	1	1	1	1	1	1	1	1	1	1	1

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
Activity	Description	Maintenance Interval (Days)										
Central Systems Interrogation	Examination of fault listing for centrally controlled computerised systems	7	7	7	7	7	7	7	7	7	7	7
Multi-Function Inspection of Spares (Depots and offsite storage)	Multi-disciplinary inspection	28	28	28	28	28	28	28	28	28	28	28
Traffic-bollard maintenance	Cleaning and repairs/replacement as required	28	28	28	28	28	28	28	28	28	28	28
Multi-Function Inspection (Depots)	Multi-disciplinary Track walk inspection	28	28	28	28	28	28	28	28	28	28	28
		Maintenance Interval (Weeks)										
SIGNALLING												
Point (Running Lines) Routine Maintenance	Lubricate motor, check operation and security of motors and rail connection rodding and bellows	13	13	13	13	13	13	13	13	13	13	13
Point (Key points) Heavy Maintenance	Strip down maintenance inspection of motor, measurement of key component wearing dimensions and replacement of wearing parts as necessary	52	52	52	52	52	52	52	52	52	52	52
Point (Depots) Routine Maintenance	Lubricate motor, check operation and security of motors and rail connection rodding	52	52	52	52	52	52	52	52	52	52	52
Point (Infrequent use points) Heavy Maintenance	Strip down maintenance inspection of motor, measurement of key component wearing dimensions and replacement of wearing parts as necessary	156			156			156			104	

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
Activity	Description	Maintenance Interval (Weeks)										
Facing Point Tests	Check switch blade opening tolerances and adjust as necessary	4	4	4	4	4	4	4	4	4	4	4
Signal Maintenance	Cleaning and Internal Maintenance Insp	26	26	26	26	26	26	26	26	26	26	26
Technical room/cabinet Inspection	Cleaning and general inspection	13	13	13	13	13	13	13	13	13	13	13
On LRV Equipment Tests	Systems functional tests	13	13	13	13	13	13	13	13	13	13	13
Vehicle Detector Inspection	Visual Inspection for damage to equipment and cables	17	17	17	17	17	17	17	17	17	17	17
Vehicle Detector Test (Depot Test Loops only)	Signal strength test	52	52	52	52	52	52	52	52	52	52	52
Cable Route Inspection	Maintenance inspection for damage to surface cable routes	52	52	52	52	52	52	52	52	52	52	52
Safety Critical Software and Firmware Management	Proactively engage with the OEM supplier to ensure that the latest certified versions of software and firmware are installed. This engagement must be documented.	26	26	26	26	26	26	26	26	26	26	26
Safety Critical Software Updates	Install updates	When software and firmware updates become available										
CENTRAL CONTROL SYSTEMS												
Control Centre Maintenance	Maintenance Inspection and cleaning in user excluded areas	4	4	4	4	4	4	4	4	4	4	4
Data Collection Systems Maintenance	Data backup	1	1	1	1	1	1	1	1		1	1

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
Activity	Description	Maintenance Interval (Weeks)										
Software and Firmware Management	Proactively engage with the OEM supplier to ensure that the latest certified versions of software and firmware are installed. This engagement must be documented.	26	26	26	26	26	26	26	26	26	26	26
Control Systems Maintenance	Install system updates	When software and firmware updates become available										
Central Transmission Network Control Cabinet	Inspect and Clean Central CTN Control Cabinet	26	26	26	26	26	26	26	26	26	26	26
Central Control System Control Cabinet	Inspect and Clean CCS Control Cabinet	26	26	26	26	26	26	26	26	26	26	26
SCADA Systems Maintenance	Inspect and Clean SCADA Control Cabinets	26	26	26	26	26	26	26	26	26	26	26
Central Transmission Network Node Inspection	Inspect and Clean Comms. Cabinet	26	26	26	26	26	26	26	26	26	26	26
Test CCTV Cameras	Test operation of CCTV cameras from Central Control Room	26	26	26	26	26	26	26	26	26	26	26
CCTV Equipment General Inspection and Test	Inspect and Clean CCTV Control Cabinet and equipment test on DVR equipment	4	4	4	4	4	4	4	4	4	4	4
POWER SUPPLY												
Sub-station Inspections	General inspection of all Sub Station equipment	4	4	4	4	4	4	4	4	4	4	4
Emergency Push Button Test	Check operation of MV & LV switchgear and emergency stop buttons	52	52	52	52	52	52	52	52	52	52	52
Traction Transformer General Inspection	Check oil levels, silica gel colour, earthings	4	4	4	4	4	4	4	4	4	4	4

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
Activity	Description	Maintenance Interval (Weeks)										
Traction Transformer Maintenance Level 1	Check alarm and trip contacts, sample oil, Megger check, general clean	26	26	26	26	26	26	26	26	26	26	26
Rectifier General Inspection	General inspection and checks	4	4	4	4	4	4	4	4	4	4	4
Rectifier Maintenance Level 1	Equipment test and general clean	52	52	52	52	52	52	52	52	52	52	52
DC Switchgear General Inspection	Auto-diagnosis with traction system disconnected, check number of HSCB operations	4	4	4	4	4	4	4	4	4	4	4
High Speed Circuit Breaker Short Circuit Test	Check operation of DC HSCB Short Circuit Functionality	52	52	52	52	52	52	52	52	52	52	52
DC Switchgear Maintenance Level 1	HSCB routine maintenance, test and inspect auxiliary circuits and switch panel.	26	26	26	26	26	26	26	26	26	26	26
DC Switchgear Maintenance Level 2	HSCB overhaul maintenance service	Every 500 Trips										
Auxiliary Transformer General Inspection	General inspection and checks	4	4	4	4	4	4	4	4	4	4	4
Auxiliary Transformer Maintenance Level 1	Check alarm and trip contacts, sample oil, Megger check, general clean	52	52	52	52	52	52	52	52	52	52	52
UPS Maintenance & Discharge Test (Stops & Depots)	Clean & Inspect System & Carry out Discharge Test	26	26	26	26	26	26	26	26	26	26	26
UPS Maintenance & Discharge Test (Sub Stations LA & NiCad)	Clean & Inspect System & Carry out Discharge Test	26	26	26	26	26	26	26	26	26	26	26
Auxiliary Distribution Board General Inspection	Check condition of Auxiliary Distribution Board in Cubicle	52	52	52	52	52	52	52	52	52	52	52

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
Activity	Description	Maintenance Interval (Weeks)										
MV Circuit Breaker Maintenance Level 1	Maintenance inspection of main incoming MV circuit breaker	52	52	52	52	52	52	52	52	52	52	52
Sub-Station Earth Test	Earth Resistance and Continuity Test	52	52	52	52	52	52	52	52	52	52	52
Lightning Conductor Test	Lightning Conductor Test on Sub Stations and Significant Buildings	52	52	52	52	52	52	52	52	52	52	52
Voltage Limitation Device Test	Short Circuit Test on Voltage Limitation Devices	52	52	52	52	52	52	52	52	52	52	52
OVERHEAD CONDUCTOR SYSTEM												
General OCS inspection (Running Lines)	Ground level inspection	13	13	13	13	13	13	13	13	13	13	13
High Level OCS Inspection (Running Lines)	High level maintenance inspection	104	104	104	104	104	104	104	104	104	104	52
Measurement of CW wear (Running Lines)	Contact Wire Wear Measurement to be recorded at least every 50m of linear length of contact wire for the entirety of the OCS	104	104	104	104	104	104	104	104	104	104	52
Measurement of CW wear (overlaps, cross-overs, section insulators, cable feeder connections and other high-wear locations)	Contact Wire Wear Measurement to be recorded	26	26	26	26	26	26	26	26	26	26	26
Measurement of CW position (Running Lines)	Contact wire position measurement at each mast	104	104	104	104	104	104	104	104	104	104	52

Section insulator inspection Level 1	Visually observe from ground: several pantographs traversing Section Insulator without arcing. Visually inspect from ground: Damaged or discoloured section insulators.												
		13	13	13	13	13	13	13	13	13	13	13	13

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
Activity	Description	Maintenance Interval (Weeks)										
Section insulator inspection Level 2	High level inspection and wear measurement	26	26	26	26	26	26	26	26	26	26	26
Feeder and parallel Feeder cables	For 10% of System annually non repeating (i.e. whole system over 10 years) the following: -Torque test of cable lugs -Visual Inspection of cable for overheating, corrosion and mechanical damage Plus -Insulation Resistance Testing	52	52	52	52	52	52	52	52	52	52	52
Overhead Insulators	Electrical insulation tests on each type of insulator. (Minimum of 50 insulators to be tested annually)	52	52	52	52	52	52	52	52	52	52	52
Parafil Rope Sampling	10 samples of installed Parafil rope to be removed and provided to TII annually (sample selection to be agreed with TII in advance each year)	52	52	52	52	52	52	52	52	52	52	52
Surge diverter inspection	Visual inspection, adjustment	26	26	26	26	26	26	26	26	26	26	26
Junction inspection	High level maintenance inspection	26	26	26	26	26	26	26	26	26	26	26
Isolators and switches	Maintenance inspection, operation test	26	26	26	26	26	26	26	26	26	26	26
Tensioning device maintenance	Lubricate and adjust as necessary	26	26	26	26	26	26	26	26	26	26	26
Electrical connection maintenance	Inspection and greasing	52	52	52	52	52	52	52	52	52	52	52
Weight-Set OCS pole - Bird nest inspection and removal	Inspect for evidence of birds nesting and remove associated debris if	13	13	13	13	13	13	13	13	13	13	13

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
Activity	Description	Maintenance Interval (Weeks)										
	present in pole and/or fouling any mechanisms											
General OCS inspection (Depots)	Ground level inspection	26	26	26	26	26	26	26	26	26	26	26
High Level OCS Inspection (Depots)	High level maintenance inspection	208				208				156		
Measurement of CW position (Depots)	Contact wire position measurement at each mast	208				208				156		
OCS Pole/Mast complete repaint	In accordance with Section 17.18 of Schedule 17:	As required by TII										
BALLASTED TRACK												
Switch inspection (Key Points)	Clean and lubricate switch slides and visual inspection, including security of drive rodding	1	1	1	1	1	1	1	1	1	1	1
Switch inspection (Infrequent Use)	Clean and lubricate switch slides and visual inspection, including security of drive rodding	4	4	4	4	4	4	4	4	4	4	4
Point Heater Maintenance	Maintenance inspections (winter only)	4	4	4	4	4	4	4	4	4	4	4
Track Lubricator Maintenance	Add lubricant, clean solar panel, clean excess lubricant present on rail, test operation.	2	2	2	2	2	2	2	2	2	2	2
Plain line Track inspection	Visual pedestrian inspection in daylight where possible to check condition of rails, fastenings, sleepers, ballast and other on Track assets	13	13	13	13	13	13	13	13	13	13	13

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
Activity	Description	Maintenance Interval (Weeks)										
Turnout Maintenance (Running Lines)	Maintenance inspection, including measurement of rail profiles and geometry parameters	26	26	26	26	26	26	26	26	26	26	26
Expansion Switch Maintenance	Lubrication and measurement of expansion gap and rail temperature	26	26	26	26	26	26	26	26	26	26	26
Track Geometry Measurement	Track Parameter Measurement using Track recording machine	26	26	26	26	26	26	26	26	26	26	26
Litter Collection	Collection of litter on Track and lineside	1	1	1	1	1	1	1	1	1	1	1
Lineside sign maintenance	Cleaning and repairs to lineside signs	26	26	26	26	26	26	26	26	26	26	26
Rail Head Profile Inspection	Manual profile measurement at selected locations	26	26	26	26	26	26	26	26	26	26	26
Rail Defect Management	Ultrasonic rail testing and defect repairs	52	52	52	52	52	52	52	52	52	52	52
Rail Corrugation Management	Corrugation survey of all rail on Infrastructure	52	52	52	52	52	52	52	52	52	52	52
On Track vegetation control	Total eradication herbicide spray to 2 metres from nearest rail	As required and in accordance with the approved LMP										
Lineside drain cleaning	Clearance of debris and silt	104		104		104		104		104		52
Rail Grinding	Rail grinding campaign on every part of rail at specified frequency	104		104		104		104		104		52
Lubricate Fishplates	Lubrication of expansion fishplates	104		104		104		104		104		52
Turnout Maintenance (Depots)	Maintenance inspection, including measurement of rail profiles and geometry parameters	52	52	52	52	52	52	52	52	52	52	52
Point Heater Annual Overhaul	Pre-Heating Season system check	52	52	52	52	52	52	52	52	52	52	52
Ballast Cleaning at Slab Transitions	Cleaning Ballast at Embedded Track Transitions	26	26	26	26	26	26	26	26	26	26	26

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
Activity	Description	Maintenance Interval (Weeks)										
Heavy Machine Tamping and Lining	Tamp and correct the alignment of the rails	208				208				156		

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
Activity	Description	Maintenance Interval (Weeks)										
NON-BALLASTED TRACK												
Orthogonal Crossings at the Junctions of Abbey St with Marlborough St and O'Connell St. (Areas with Flange tip running)	Clean, inspect and Measure rail and groove profile.	4	4	4	4	4	4	4	4	4	4	4
Orthogonal Crossings at the Junctions of Abbey St with Marlborough St and O'Connell St. (Areas with Flange tip running)	Recharge wheel flange groove wear depth to design profile	52	52	52	52	52	52	52	52	52	52	52
Temporary Emergency Crossovers (TECs)	Clean and lubricate switch slides and visual inspection. Perform corrective actions as required	52	52	52	52	52	52	52	52	52	52	52
Track Lubricator Maintenance	Add lubricant, clean solar panel, clean excess lubricant present on rail, test operation.	2	2	2	2	2	2	2	2	2	2	2

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
Activity	Description	Maintenance Interval (Weeks)										
Switch inspection (Key Points)	Clean and lubricate switch slides and visual inspection, including security of drive rodding	1	1	1	1	1	1	1	1	1	1	1
Switch inspection (Infrequent Use)	Clean and lubricate switch slides and visual inspection, including security of drive rodding	4	4	4	4	4	4	4	4	4	4	4
Cut Grass in Grass Track	Mow grass during growing season	As required and in accordance with the approved LMP										
Point Heater Maintenance	Maintenance inspections (winter only)	4	4	4	4	4	4	4	4	4	4	4
Plain line Track inspection	Visual pedestrian inspection in daylight where possible to check condition of rails, fastenings, sleepers, ballast and other on Track assets	13	13	13	13	13	13	13	13	13	13	13
General cleaning	Collection of litter and other debris	1	1	1	1	1	1	1	1	1	1	1
Turnout Maintenance	Maintenance inspection, including measurement of rail profiles and geometry parameters	26	26	26	26	26	26	26	26	26	26	26
Expansion Switch Maintenance	Lubrication and measurement of expansion gap and rail temperature	26	26	26	26	26	26	26	26	26	26	26
Track Geometry Measurement	Track Parameter Measurement using Track recording machine	26	26	26	26	26	26	26	26	26	26	26
Traditional Track Drain Cleaning	Clearance of debris and silt	4	4	4	4	4	4	4	4	4	4	4

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
Activity	Description	Maintenance Interval (Weeks)										
Embedded Track drain cleaning (inclusive of drainage channels used for derailment containment)	Clearance of debris and silt	4	4	4	4	4	4	4	4	4	4	4
Lineside sign maintenance	Cleaning and repairs to lineside signs	26	26	26	26	26	26	26	26	26	26	26
Rail Head Profile Inspection	Manual profile measurement at selected locations	26	26	26	26	26	26	26	26	26	26	26
Rail Defect Management	Ultrasonic rail testing and defect repairs	52	52	52	52	52	52	52	52	52	52	52
On Track vegetation control	Total eradication herbicide spray in crevices and adjacent kerbs	As required and in accordance with the approved LMP										
Rail Grinding	Rail grinding campaign on every part of rail at specified frequency	104	104	104	104	104	104	104	104	104	104	52
Grass Track Lineside Drain Cleaning	Clearance of debris and silt	104	104	104	104	104	104	104	104	104	104	52
Point Heater Annual Overhaul	Pre-Heating Season system check	52	52	52	52	52	52	52	52	52	52	52
Embedded Track Clean	Cleaning of Rail Grooves and Track Surfacing	4	4	4	4	4	4	4	4	4	4	4
Traditional Track Clean	Cleaning of Traditional Track Slab Surface	4	4	4	4	4	4	4	4	4	4	4
Edilon Block Remediation	In accordance with Section 17.17 of Schedule 17:	52	52	52	52	52	52	52	52	52	52	52
TELECOMMS SYSTEMS												
CCTV camera maintenance	Maintenance Inspection and cleaning	26	26	26	26	26	26	26	26	26	26	26

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
Activity	Description	Maintenance Interval (Weeks)										
PID maintenance	Maintenance Inspection and cleaning	26	26	26	26	26	26	26	26	26	26	26
Emergency Telephone Test	Test operation	26	26	26	26	26	26	26	26	26	26	26
Emergency Telephone Inspection	Internally inspect a representative sample of Emergency Telephones	26	26	26	26	26	26	26	26	26	26	26
Radio Aerial Maintenance	Maintenance Inspection and cleaning	26	26	26	26	26	26	26	26	26	26	26
Telecoms' Cabinet Maintenance	Maintenance Inspection and cleaning	26	26	26	26	26	26	26	26	26	26	26
Radio System Coverage Test	Signal strength test around Network	52	52	52	52	52	52	52	52	52	52	52
Public Address System Test	Inspect System and Test Announcement on Stops	26	26	26	26	26	26	26	26	26	26	26

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
Activity	Description	Maintenance Interval (Weeks)										
STOPS AND CAR PARKS												
Daily Cleaning	Empty litter bins, collect litter and clean spillages	Daily	Daily	Daily	Daily	Daily	Daily	Daily	Daily	Daily	Daily	Daily
Stop Lighting Maintenance (LED type)	Lux Level Measurement	52	52	52	52	52	52	52	52	52	52	52
Stop Lighting Maintenance (All types including uplighters)	Inspection, Lamp Change, Clean as necessary. Check timers and photocells and perform corrective maintenance as required	2	2	2	2	2	2	2	2	2	2	2
Minor Repairs	Repair of minor damage not likely to cause hazard to public	4	4	4	4	4	4	4	4	4	4	4
Lift and Escalator Inspection	Visual inspection and functional test	4	4	4	4	4	4	4	4	4	4	4
Lift and Escalator Maintenance	Maintenance inspection	13	13	13	13	13	13	13	13	13	13	13
Other Public Lighting Maintenance	Lamp changes and clean as necessary	13	13	13	13	13	13	13	13	13	13	13
Heavy Cleaning	General wash-down of all surfaces, chewing gum removal	4	4	4	4	4	4	4	4	4	4	4
Stop Sign Maintenance	Cleaning and repairs to signs on stops	26	26	26	26	26	26	26	26	26	26	26
Variable Message Signs at Park and Ride Sites	Visual inspection and functional test	26	26	26	26	26	26	26	26	26	26	26
Drainage Cleaning	Clearance of debris and silt	26	26	26	26	26	26	26	26	26	26	26
Touch Up Painting	Repaint areas of worn paintwork	104		104		104		104		104		52

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
Activity	Description	Maintenance Interval (Weeks)										
Cleaning Roads & Pavements	General sweeping and litter picking	4	4	4	4	4	4	4	4	4	4	4
Gates & Barriers General Inspection	Functional test and repairs (All necessary works to Powered Gates to ensure installations satisfy prevailing legislation, directives and HSA guidelines)	13	13	13	13	13	13	13	13	13	13	13
Vegetation Control	Application of Herbicide as required	As required and in accordance with the approved LMP										
Interceptor Maintenance	Check Oil Levels and skim off as necessary	13	13	13	13	13	13	13	13	13	13	13
Pump Out Lift Pits	Check water ingress and pump out as necessary	4	4	4	4	4	4	4	4	4	4	4
Tram Stop Cubicles - General Maintenance	Inspect ventilation, heaters, thermostats, Check condition and cleanliness of cubicle, Investigate tripped protective devices. Take corrective actions necessary.	52	52	52	52	52	52	52	52	52	52	52
Tram Stop Technical Rooms - General Maintenance	Inspect sump pumps, ventilation, heaters, thermostats, Check condition and cleanliness of room, Investigate tripped protective devices. Take corrective actions necessary.	52	52	52	52	52	52	52	52	52	52	52
Advertisement Columns/Totems	Inspect Lighting and diffusers, perspex advertisement screens, functionality of moving or hinged parts and locks and	4	4	4	4	4	4	4	4	4	4	4

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
Activity	Description	Maintenance Interval (Weeks)										
	inspect condition/ cleanliness. Take corrective actions necessary.											
Fabric Canopies and their associated structures at Belgard and Connolly Stops	Inspection of cleanliness and condition and structural integrity. Corrective interventions as required.	52	52	52	52	52	52	52	52	52	52	52
NON-PUBLIC BUILDINGS AND DEPOTS												
Daily Internal Cleaning	Cleaning of common depot areas	Daily	Daily	Daily	Daily	Daily	Daily	Daily	Daily	Daily	Daily	Daily
Building Maintenance Inspection	Visual inspection of all areas and subsequent corrective maintenance in occupied buildings	4	4	4	4	4	4	4	4	4	4	4
Internal Lighting Maintenance	Occupied Buildings - Inspection and replacement of lamps and replacement/repair if non- functional.	4	4	4	4	4	4	4	4	4	4	4
External Lighting Maintenance	Inspection and replacement of lamps and replacement/repair if non- functional.	13	13	13	13	13	13	13	13	13	13	13
Fire and Security System Maintenance – Level 1	Inspection - Cleaning and corrective interventions as required	26	26	26	26	26	26	26	26	26	26	26

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
Activity	Description	Maintenance Interval (Weeks)										
Fire and Security System Maintenance – Level 2	Routine and Corrective Maintenance	All maintenance duties under Irish Fire Safety Legislation as and when required										
Internal and External Lighting (LED Type)	Lux Level Measurement	52	52	52	52	52	52	52	52	52	52	52
Window Cleaning	Internal and External Window Cleaning	9	9	9	9	9	9	9	9	9	9	9
Roof Inspections	Inspection of cleanliness and condition. Perform corrective works as required.	26	26	26	26	26	26	26	26	26	26	26
Air Conditioning System Maintenance	Maintenance inspection and replacement of consumables Perform corrective works as required.	26	26	26	26	26	26	26	26	26	26	26
Gas Appliance Maintenance	Maintenance inspection and cleaning	52	52	52	52	52	52	52	52	52	52	52
Depot Machinery Maintenance	Maintenance inspection of fixed depot equipment	52	52	52	52	52	52	52	52	52	52	52
Drainage Maintenance	Maintenance inspection of complete drainage system to include proofing of all drains, downpipes and gutters. Perform corrective works as required.	26	26	26	26	26	26	26	26	26	26	26
Building General Inspection	Visual structural inspection of significant buildings using fixed access ladders and binoculars	104		104		104		104		104		104
Building Principal Inspection	Detailed structural examination of all man accessible areas in all significant buildings	156			156			156			104	

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
Activity	Description	Maintenance Interval (Weeks)										
Ventilation System Maintenance	Maintenance inspection and replacement of consumables	26	26	26	26	26	26	26	26	26	26	26
Cleaning Roads & Pavements	General sweeping and litter picking	4	4	4	4	4	4	4	4	4	4	4
Gates & Barriers General Inspection	Functional test and repairs (All necessary works to Powered Gates to ensure installations satisfy prevailing legislation, directives and HSA guidelines)	13	13	13	13	13	13	13	13	13	13	13
Vegetation Control	Weed spraying Roads Pavements and adjacent buildings	As required and in accordance with the approved LMP										
Interceptor Maintenance	Check Oil Levels and skim off as necessary	13	13	13	13	13	13	13	13	13	13	13
Fire Extinguisher Tests	General servicing of portable fire extinguishers	52	52	52	52	52	52	52	52	52	52	52
Portable Appliance Tests	Safety test for electric hand tools and common use appliances	52	52	52	52	52	52	52	52	52	52	52
Electrical System Test	General safety test for building electrical system	52	52	52	52	52	52	52	52	52	52	52
Gas Supply System Inspection	General inspection of gas supply system	52	52	52	52	52	52	52	52	52	52	52
Air Compressor System Maintenance	Maintenance of Air Compressor System, (including oil and filter changes)	52	52	52	52	52	52	52	52	52	52	52
Cleaning Non Occupied Buildings	Internal Cleaning of un-occupied buildings and rooms containing multi-	26	26	26	26	26	26	26	26	26	26	26

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
Activity	Description	Maintenance Interval (Weeks)										
	discipline infrastructure equipment											
Service Point Test	Safety Test of Depot Stabling Yard Service Points	52	52	52	52	52	52	52	52	52	52	52
Buildings Pest Control	Routine Servicing of Pest Control devices in Depots & Sub-Stations	6	6	6	6	6	6	6	6	6	6	6
Emergency Lighting Function Test	Emergency lighting maintenance inspection and test (Occupied Buildings)	4	4	4	4	4	4	4	4	4	4	4
Emergency Lighting Discharge Test	Emergency lighting maintenance inspection and test including discharge test	52	52	52	52	52	52	52	52	52	52	52
Building Maintenance Inspection	Visual inspection of all areas and subsequent corrective maintenance in un-occupied buildings	17	17	17	17	17	17	17	17	17	17	17
Internal Lighting Maintenance	Inspection and replacement of lamps in un-occupied buildings	17	17	17	17	17	17	17	17	17	17	17
Run Showers Hot Legionella Prevention	Run Showers Hot to Prevent Legionella Bacteria Growth	4	4	4	4	4	4	4	4	4	4	4
Emergency Lighting Function Test	Emergency lighting maintenance inspection and test (Un-Occupied Buildings)	17	17	17	17	17	17	17	17	17	17	17
STRUCTURES (Incl. Radio Masts)												
Structure General Inspection	Visual inspection of all structures using fixed access ladders and binoculars	104		104		104		104		104		104

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
Activity	Description	Maintenance Interval (Weeks)										
Water Course Maintenance Inspection	Inspection and debris clearance around structures over water courses	Following significant floods										
Earthworks Inspection	General stability assessment of earthworks	52	52	52	52	52	52	52	52	52	52	52
Structure Principal Inspection	Detailed structural examination of all man accessible areas	208				208				156		
Special Inspection	Specialist structural examination of specific parts of structures	As recommended by Principal Inspections										
Fall Arrest System Maintenance	Maintenance and Test of Structure Access Equipment	52	52	52	52	52	52	52	52	52	52	52
Stone retaining wall - vegetation and weed control	Inspect and spray if present.	4	4	4	4	4	4	4	4	4	4	4
Stone Retaining Walls at Phibsborough Stop	Visual inspection and stability assessment carried out by Chartered structural engineer – Daily report to be provided to TII	Daily and as required by TII										
OFF TRACK												
Mow Grassed Areas	Mow grass during growing season	As required and in accordance with the approved LMP										
Soft Landscape Maintenance	As per schedule 6 to the Contract	As required and in accordance with the approved LMP										
Fencing Inspections	Inspection of fences and boundary walls. Perform corrective works as required.	4	4	4	4	4	4	4	4	4	4	4
Sign Maintenance	Cleaning and repairs to off Track signs	26	26	26	26	26	26	26	26	26	26	26

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
Activity	Description	Maintenance Interval (Weeks)										
Tree Lopping	Cutting back tree branches close to tramway and OCS equipment	As Circumstances Require										
Pest Control	Eradication of pests and maintenance of pest control devices	As Circumstances Require										
Effluent Sampling	Take and analyse sample of effluent from drainage outfall	13	13	13	13	13	13	13	13	13	13	13
Arboriculturists Tree Report	Annual report on tree condition	52	52	52	52	52	52	52	52	52	52	52
Tree clear stem height cutting	Clear stem height pruning on trees	As required and in accordance with the approved LMP										
Tree base maintenance	Spraying of tree bases											
Weed control on hard landscaped areas	Weed control											
Weed control on soft landscaped areas	Weed control											
Woodland / Hedgerow / Plant cutting & pruning	Cutting & pruning											

Table 19-1 Asset Management Plan

**Schedule 20: Infrastructure Maintenance Manuals and Special
Tools Manuals**

20.1 Infrastructure Maintenance Manuals and Special Tools Manuals

20.1.1 The Operator acknowledges that Infrastructure Maintenance Manuals and Special Tools Manuals for all major elements of the Infrastructure have been provided as part of the Disclosed Data. The major elements of the Infrastructure, for which Infrastructure Maintenance Manuals and Special Tools Manuals have been provided, are as follows:

- Track and Track Drainage (ref. Section 16.6)
- Traction Power Supply and Distribution System (ref. Section 16.7)
- Operating and Control Systems (ref. Section 16.8)
- Line Signalling System Equipment (ref. Section 16.9)
- Stops, Stop Furniture and Canopies (ref. Section 16.10)
- Lifts and Escalators (16.11)
- Bridges and Structures (ref. Section 16.13)
- Depot Buildings and Technical Rooms (ref. Section 16.14)
- Boundary Walls, Gates, Fencing and Landscaping (ref. Section 16.15)

20.1.2 If requested by the Operator, TII shall use reasonable endeavours to make available additional Infrastructure Maintenance Manuals and Special Tools Manuals, relating to the operation and maintenance of the System, which the Operator considers would assist it in relation to the provision of the Services.

20.1.3 The Operator shall engage with manufacturers and suppliers of equipment to ensure that Infrastructure Maintenance Manuals and Special Tools Manuals, used in the development of the Infrastructure Maintenance Procedures as described in Section 17.9, are always up to date.

**Schedule 21: Performance Standards for Infrastructure
Maintenance**

21.1 Introduction

- 21.1.1 The Operator shall be required to achieve in each Reporting Period the Performance Standard shown for each Performance Indicator listed in Table 21-1.
- 21.1.2 The Operator shall monitor its performance in relation to each of the Performance Indicators listed in Table 21-1. The method for monitoring each Performance Indicator is detailed in Table 21-1.
- 21.1.3 The Operator shall include in each Period Report details of its performance for each Performance Indicator for that Reporting Period, in a format notified by TII to the Operator from time to time.

21.2 Performance Indicators 7 through 11

- 21.2.1 During each Reporting Period there shall be joint inspections undertaken by the Operator and TII, for which TII shall give the Operator 3 hours' notice.
- 21.2.2 The Operator shall use reasonable endeavours to ensure that it is available at the relevant time in order to undertake such a joint inspection. In the event that the Operator is unavailable at the relevant time, such inspection as provided under paragraph 21.2.1 above shall continue and be conducted by TII.
- 21.2.3 Additional inspections shall be carried out on a random basis. The timing of such random inspections, and the selection of parts of the Infrastructure to be audited, shall be at TII's sole discretion. The Operator shall be entitled to no less than three hours notice of these audits. The Operator shall use reasonable endeavours to ensure that it is available at all relevant times in order to undertake such inspections.

PERFORMANCE INDICATORS AND PERFORMANCE STANDARDS FOR INFRASTRUCTURE MAINTENANCE

1	2	3	4	5	6	7	8	9
Part(s) of the Infrastructure	Ref- erence	Equipment Description	Performance Indicator	Performance Measurement Methodologies	Performance Standard	Category 1 Non- compliance	Category 2 Non- compliance	Category 3 Non- compliance
Passenger information (PI) systems at Stops including the Public Address (PA) system	1	Real-time passenger information systems including display units and the passenger address equipment at Stops	The PI and PA systems shall both be available 15 minutes before the first scheduled Trip each day and shall be available and operational continuously throughout the day until the last Trip reaches its terminus.	Measurement/monitoring effected via the Control Systems and/or the Operator's Database and/or the CMMS and/or TII audit undertaken at TII's sole discretion. The percentage availability in a given Reporting Period is the aggregate number of hours that the units of the PI and PA systems were actually available and operational, divided by the product of the number of units and the number of hours during which each unit should have been available (see Column 4).	$P \geq 99\%$	$99\% > P \geq 97\%$	$97\% > P \geq 95\%$	$P < 95\%$
Control Systems	2	Control Systems	Refer to Section 21.4 for detailed Performance Standards for Control Systems	Measurement/ monitoring effected via the Control Systems and/or the Operator's Database and/or the CMMS and/or TII audit undertaken at TII's sole discretion.	$P \geq 99.7\%$	$99.7\% > P \geq 99\%$	$99\% > P \geq 98\%$	$P < 98\%$

1	2	3	4	5	6	7	8	9
Part(s) of the Infrastructure	Ref- erence	Equipment Description	Performance Indicator	Performance Measurement Methodologies	Performance Standard	Category 1 Non- compliance	Category 2 Non- compliance	Category 3 Non- compliance
				<p>The percentage availability in a given Reporting Period for each Control System is the number of hours that each system was actually fully available and operational, divided by the number of hours in the Reporting Period, provided always that the hours in which each system is not available and operational as a consequence of planned maintenance identified in the Annual Maintenance Plan shall not be used in determining the percentage availability of such system.</p> <p>The performance of the worst performing Control System in Table 21-4 shall be used to determine the overall performance of this Performance Indicator.</p>				
Safety and Security System	3	The closed circuit television (CCTV) apparatus on	All CCTV equipment on the Infrastructure shall be permanently available and shall provide complete coverage of the	Measurement/ monitoring effected via the Control Systems and/or the Operator's Database and/or the CMMS and/or	P=99%	99%>P≥98%	98%>P≥97%	P<97%

1	2	3	4	5	6	7	8	9
Part(s) of the Infrastructure	Ref- erence	Equipment Description	Performance Indicator	Performance Measurement Methodologies	Performance Standard	Category 1 Non- compliance	Category 2 Non- compliance	Category 3 Non- compliance
		the Infrastructure	Infrastructure where installed.	TII audit undertaken at TII's sole discretion. The percentage availability in a given Reporting Period is the aggregate number of hours that the units of the CCTV system were actually available and operational, divided by the product of the number of units and the number of hours in the Reporting Period.				
Safety and Security System	4	Emergency telephones at the Stops	All emergency telephones shall be operational 15 minutes before the first scheduled Trip each day and shall be available and operational continuously throughout the day until 15 minutes after the last Trip reaches its terminus.	Measurement/ monitoring effected via the Control Systems and/or the Operator's Database and/or the CMMS and/or TII audit undertaken at TII's sole discretion. The percentage availability in a given Reporting Period is the aggregate number of hours that the emergency telephones were actually available and operational in that period divided by the product of the total number of emergency telephones and the number of hours that the telephones should have	P=99%	99%>P≥98%	98%>P≥97%	P<97%

1	2	3	4	5	6	7	8	9
Part(s) of the Infrastructure	Ref- erence	Equipment Description	Performance Indicator	Performance Measurement Methodologies	Performance Standard	Category 1 Non- compliance	Category 2 Non- compliance	Category 3 Non- compliance
				been available (see Column 4).				
Track	5	Track alignment	Track alignment shall be maintained within the tolerances prescribed in Schedule 17:	Measurement/ monitoring effected by a six-monthly survey (such survey to be carried out at the Operator's cost) which shall be undertaken by the Operator, and/or TII audit undertaken at TII's sole discretion.	Any exceedance of the Performance Standard to be corrected within 3 Reporting Periods	At least one exceedance corrected in more than 3 Reporting Periods, but less than 6	At least one exceedance corrected in more than 6 Reporting Periods, but less than 9	At least one exceedance not corrected in more than 9 Reporting Periods
		Repair of rail faults	Repair of rail faults, where TII determines that repairs are required, to return the rail to an acceptable condition	Measurement/monitoring by the Operator in the normal performance of the Services.	Rail fault repaired within 3 Reporting Periods of discovery (the first Reporting Period being the next Reporting Period after it was recorded)	If, after 3 consecutive Reporting Periods, the rail repair has not been carried out to the satisfaction of TII. Note: Category 1 non-compliance continues to be incurred until the rail fault is rectified to TII's satisfaction	N/A	N/A
Lifts and escalators	6	All lifts and escalators	All lifts and escalators shall be available and operational 15 minutes before the first scheduled Trip each day and shall be available and operational continuously throughout the day until 15 minutes after the last Trip reaches its terminus.	Measurement/ monitoring effected via the Control Systems and/or the Operator's Database and/or the CMMS and/or TII audit undertaken at TII's sole discretion. The percentage availability for a single unit in a given Reporting	P=99% (any single unit)	99%>P≥98% (any single unit)	98%>P≥97% (any single unit)	P<97% (any single unit)

1	2	3	4	5	6	7	8	9
Part(s) of the Infrastructure	Ref- erence	Equipment Description	Performance Indicator	Performance Measurement Methodologies	Performance Standard	Category 1 Non- compliance	Category 2 Non- compliance	Category 3 Non- compliance
				Period is the number of hours that such unit was functional in that period divided by the number of hours that it should have been functional (see Column 4), provided always that the hours in which each unit is not available and operational as a consequence of planned maintenance identified in the Annual Maintenance Plan shall not be used in determining the percentage availability of such unit.				
Stops (cleanliness)	7	The Stops including without limitation the platforms, shelters, seating and other furniture, litter bins, signs, timetable and advertisement displays, hard and softscaped areas, inclusive of the length of	All Stops shall be maintained free from litter, accumulations of dust and other matter that may pose a hazard to passengers or impairs the aesthetic appearance of the System. Litter bins shall be emptied at least once (twice at weekends, public holidays and upon the reasonable request of TII) in every 24 hour period. All Stops shall be completely free of any litter whatsoever at the	Measurement/ monitoring effected by the joint inspection as per Section 21.2. Performance Standards and scoring of each Stop in accordance with the cleanliness criteria described in Section 21.3. The percentage (P) is 100 multiplied by the sum of the scores for the Stops inspected, divided by 5 multiplied by the number of Stops inspected	P=95% AND all Stops score 4 or above	95%>P≥90% OR one or more Stops score 3	90%>P≥85% OR one or more Stops score 2	P<85% OR two or more Stops score 2 OR one or more Stops score 1

1	2	3	4	5	6	7	8	9
Part(s) of the Infrastructure	Ref- erence	Equipment Description	Performance Indicator	Performance Measurement Methodologies	Performance Standard	Category 1 Non- compliance	Category 2 Non- compliance	Category 3 Non- compliance
		Track between platforms and the pedestrian walkways (where present) at the ends of platforms	commencement of each day					
Stops (condition)	8	As per Performance Indicator 7, Column 3 above.	<p>All Stops shall be in good order, free from graffiti and any damage (howsoever caused) at the commencement of each day.</p> <p>Without prejudice to the Operator's liability for deduction(s), any damage due to vandalism shall be repaired/ remedied within 24 hours of being reported; and any graffiti shall be erased within 48 hours (obscene, sectarian or racist graffiti within 12 hours) of being reported</p>	As per Performance Indicator 7, Column 5 above.	<p>P = 100%</p> <p>AND</p> <p>each Stop scores 5</p>	<p>100%>P≥97%</p> <p>OR</p> <p>one or more Stops score 3</p>	<p>97%>P≥95%</p> <p>OR</p> <p>one or more Stops score 2</p>	<p>P<95%</p> <p>OR</p> <p>two or more Stops score 2</p> <p>OR</p> <p>one or more Stops score 1</p>
Park and Ride Sites and Depots (cleanliness)	9	Park and Ride Sites and Depots including buildings and the internal and external fabric thereof,	All Park and Ride Sites and Depots shall be maintained free from litter, accumulations of dust and other matter that may pose a hazard to users of the Park and Ride Sites and Depots or	Measurement/ monitoring effected by the joint inspection. Performance Standards and scoring of each Park and Ride Site in accordance with the cleanliness criteria described in Section 21.3.	Score = 5 (each Park and Ride Site)	Score = 4 or 3 (each Park and Ride Site)	Score = 2 (each Park and Ride Site)	Score = 1 (each Park and Ride Site)

1	2	3	4	5	6	7	8	9
Part(s) of the Infrastructure	Ref- erence	Equipment Description	Performance Indicator	Performance Measurement Methodologies	Performance Standard	Category 1 Non- compliance	Category 2 Non- compliance	Category 3 Non- compliance
		canopies paved areas, landscaping (both hard and soft), barriers, signs, shelters, pathways, and suchlike	<p>impairs the aesthetic appearance of the System.</p> <p>Litter bins shall be emptied as required to prevent them reaching capacity but at least once (twice at weekends, public holidays and upon the reasonable request of TII) in every 24 hour period.</p> <p>All Park and Ride Sites shall be free from any litter whatsoever at the commencement of each day</p>					
Park and Ride Sites and Depots (condition)	10	As per Performance Indicator 9, Column 3 above.	<p>All Park and Ride Sites and Depots shall be in good order, free from graffiti and any damage (howsoever caused) at the commencement of each day.</p> <p>Without prejudice to the Operator's liability for deduction(s), any damage due to vandalism shall be repaired/remedied within 24 hours of being reported; and any graffiti shall be erased within 48 hours (obscene,</p>	As per Performance Indicator 9, Column 5 above.	Score = 5 (each Park and Ride Site)	Score = 4 or 3 (each Park and Ride Site)	Score = 2 (each Park and Ride Site)	Score = 1 (each Park and Ride Site)

1	2	3	4	5	6	7	8	9
Part(s) of the Infrastructure	Ref- erence	Equipment Description	Performance Indicator	Performance Measurement Methodologies	Performance Standard	Category 1 Non- compliance	Category 2 Non- compliance	Category 3 Non- compliance
			sectarian or racist graffiti within 12 hours) of being reported					
Other Facilities	11	<p>"Other Facilities" shall comprise any part(s) of the Infrastructure as described in Schedule 16: that is not otherwise accounted for in this Table 21-1.</p> <p>"Other Facilities" shall without limitation include all soft and hard landscaping, all underpasses, structures, bridges, retaining walls, fences, Conductor supports. Masts and Antennae, Spares, Special Tools and any offsite</p>	<p>All Other Facilities shall be maintained free from litter, accumulations of dust and other matter that may pose a hazard to passengers or occupiers of such facilities or adjacent landowners/occupiers or impairs the aesthetic appearance of the System.</p> <p>All Other Facilities shall be in good order, free from graffiti and any damage (howsoever caused) at the commencement of each day.</p> <p>Without prejudice to the Operator's liability for deduction(s), any damage due to vandalism shall be repaired/remedied within 24 hours of being reported; and any graffiti shall be erased within 48 hours (obscene, sectarian or racist graffiti within 12 hours) of being reported</p>	<p>Measurement/ monitoring effected by the joint inspection as per Section 21.2. Performance Standards and scoring of each facility in accordance with the cleanliness criteria described in Section 21.3.</p> <p>For all Other Facilities which are linear in scope along the System (for example, Tracksides soft and hard landscaping), a "facility" shall be deemed to be that length which occurs between two consecutive Stops.</p> <p>The percentage (P) is 100 multiplied by the sum of the scores for the Other Facilities inspected, divided by 5 multiplied by the number of Other Facilities inspected</p>	<p>P = 100%</p> <p>AND</p> <p>each facility scores 5</p>	<p>100%>P≥97%</p> <p>OR</p> <p>one or more facilities score 3</p>	<p>97%>P≥95%</p> <p>OR</p> <p>one or more facilities score 2</p>	<p>P<95%</p> <p>OR</p> <p>two or more facilities score 2</p> <p>OR</p> <p>one or more facilities score 1</p>

1	2	3	4	5	6	7	8	9
Part(s) of the Infrastructure	Ref- erence	Equipment Description	Performance Indicator	Performance Measurement Methodologies	Performance Standard	Category 1 Non- compliance	Category 2 Non- compliance	Category 3 Non- compliance
		storage facilities of any Luas assets,						
Asset Management Plan	12	Operator's performance against the Asset Management Plan as described in Schedule 19:	The Operator shall maintain Luas infrastructure in accordance with the Asset Management Plan	Measurement/ monitoring effected via the CMMS and/or TII audit undertaken at TII's sole discretion. The percentage (P) shall be calculated by multiplying 100 by the number of scheduled maintenance activities actually undertaken in a given Reporting Period, divided by number of maintenance activities scheduled in the Asset Management Plan for the same Reporting Period	P=98%	98%>P≥97%	97%>P≥95%	P<95%
Call-out reaction time	13	All parts of the Infrastructure	The Operator shall ensure that the Call-out Team is available at all times to attend Call-out Incidents.	Measurement/ monitoring effected via the Operator's Database and/or the CMMS and/or TII audit undertaken at TII's sole discretion.	Time to attend at a Call-out Incident ≤ 30 minutes	Time to attend at a Call-out Incident > 30 minutes	-	-

Table 21-1 Performance Indicators and Performance Standards for Infrastructure Maintenance

21.3 Cleanliness and Condition Criteria

21.3.1 The Parties acknowledge that the concepts of cleanliness and condition as they apply to the Infrastructure are by their nature subjective and accordingly the Parties hereby agree that the following criteria and scoring mechanism shall be interpreted in a purposeful manner in order that the Infrastructure is kept clean and in proper working order in accordance with Good Industry Practice.

Area inspected	Cleanliness		Condition	
	Score	Cleanliness Criterion	Score	Condition criterion
Stop (as defined in Table 21-1)	5	Very good – Stop spotlessly clean with no litter, discarded chewing gum, cigarette ends or accumulations of dust/dirt or liquid spillages whatsoever	5	Very good – Stop in perfect working order, free from any graffiti, vandalised equipment or other damage, no loss of visibility of passenger information/advertising displays and no scuffing of surfaces/finishes whatsoever
	4	Good – Stop generally clean with no litter, discarded chewing gum or liquid spillages but with minor accumulations of dust/dirt	4	Good – Stop in generally good order, free from graffiti, vandalised equipment or other damage, no loss of visibility of passenger information/advertising displays but with some minor scuffing of paved surfaces/finishes near ground level
	3	Moderate – Stop reasonably clean with no litter or liquid spillages but with some occasional discarded chewing gum, cigarette ends and/or accumulations of dust/dirt	3	Moderate – Stop in quite good order, free from graffiti, vandalised equipment or other damage, but with some minor loss of visibility of passenger information/advertising displays and/or scuffing of surfaces/finishes
	2	Dirty – Stop unclean with some litter, some minor liquid spillage, animal droppings, discarded chewing gum, cigarette ends, accumulations of dust/dirt and/or any litter bin near capacity	2	Poor – Stop in poor condition, free from vandalised equipment or other damage but with scuffing of surfaces and finishes, minor loss of visibility of passenger information/advertising displays and/or minor evidence of graffiti

Area inspected	Cleanliness		Condition	
	Score	Cleanliness Criterion	Score	Condition criterion
	1	Very dirty – Stop filthy with litter, broken glass, accumulations of dust/dirt, animal droppings, liquid spillages (e.g. vomit or urine) and/or any litter bins at capacity	1	Very poor – Stop in improper order with vandalised equipment or other damage (e.g. broken lighting or other electrical equipment), damaged furniture, evidence of graffiti and/or graffiti of an obscene, sectarian or racist nature
Depot or Park and Ride Site (as defined in Table 21-1)	5	Very good – Depot or Park and Ride Site spotless with no litter, discarded chewing gum, cigarette ends or accumulations of dirt/dust or liquid spillages whatsoever.	5	Very good – Depot or Park and Ride Site in perfect order, free from any graffiti, vandalised equipment or other damage, no loss of visibility of passenger information/advertising displays and no scuffing of surfaces/finishes whatsoever
	4	Good – Depot or Park and Ride Site generally clean, with no litter or liquid spillages (excepting minor oil staining in car parking area) but with minor accumulations of dirt/dust and/or some limited amounts of discarded chewing gum and cigarette ends	4	Good – Depot or Park and Ride Site in generally good order, free from graffiti, vandalised equipment or other damage, no loss of visibility of passenger information/advertising displays but with some scuffing to bollards, barriers near ground level and paved surfaces.
	3	Moderate – Depot or Park and Ride Site reasonably clean with no litter, liquid spillages but with some but with some occasional discarded chewing gum, cigarette ends, accumulations of dust/dirt and/or any litter bin near capacity	3	Moderate – Depot or Park and Ride Site in quite good order, free from graffiti, vandalised equipment or other damage, but with some minor loss of visibility of passenger information/advertising displays and/or scuffing of surfaces/finishes and/or minor damage to soft-landscaped areas.

Area inspected	Cleanliness		Condition	
	Score	Cleanliness Criterion	Score	Condition criterion
	2	Dirty – Depot or Park and Ride Site unclean with some litter, some minor liquid spillage, animal dropping, cigarette ends, accumulations of dust/dirt and/or any litter bin at capacity	2	Poor – Depot or Park and Ride Site in poor condition, free from vandalised equipment or other damage but with scuffing of surfaces/finishes, loss of visibility of passenger information/ advertising displays, damage to soft-landscaped areas and/or minor evidence of graffiti
	1	Very dirty – Depot or Park and Ride Site filthy with litter, broken glass, accumulations of dust/dirt, animal droppings, liquid spillages (e.g. vomit or urine) and/or more than 50% of litter bins at capacity	1	Very poor – Depot or Park and Ride Site in improper order with vandalised equipment or other damage (e.g. broken lighting or other electrical equipment), damaged furniture, damaged hard/soft landscaping, evidence of graffiti and/or graffiti of an obscene, sectarian or racist nature

Table 21-2 Cleanliness and Condition Criteria

Area inspected	Performance Criteria (Cleanliness and Condition considered jointly)	
	Score	Criterion
Other facilities (as defined in Table 21-1)	5	Very good - facilities to be free from litter, accumulations of dirt and other matter that poses a hazard to passengers or impairs the appearance of Luas. Facilities to be in good order, free from graffiti, vandalism and other damage.
	4	Good - facilities generally clean and in good order with minor evidence of dust and accumulated dirt, free from graffiti, vandalised equipment and other damage. Some scuffing or marking of paved surfaces and finishes near ground level
	3	Moderate – facilities may show some evidence of litter including (where appropriate) occasional evidence of discarded chewing gum, cigarette ends and accumulations of dirt. Facilities to be free vandalism and other damage. Some scuffing of surfaces and finishes. Some minor graffiti
	2	Poor – facilities with various litter including discarded chewing gum and cigarette ends, accumulations of dirt including animal droppings and other debris, but no evidence of vandalism or other damage. Scuffing of surfaces and finishes, and minor evidence of graffiti
	1	Very poor – facilities with various litter including broken glass, accumulations of dirt including animal droppings, spillages (e.g. vomit or urine), evidence of vandalism and other damage including broken lighting and other electrical equipment, damaged furniture and more general graffiti and/or graffiti of an obscene, sectarian or racist nature

Table 21-3 Performance Criteria (Cleanliness and Condition jointly)

21.4 Performance Standards for Control Systems

21.4.1 Performance Standards for Control Systems are listed in Table 21-4 below

Control System	Performance Standard
INOSS Server	System functionally available to CCR operators
SCATEX / FE SCADA / PS SCADA Servers *	System comprising frontend, watchdog and server units functionally available to CCR operators
RTU's*	System functionally available to CCR operators, FE and PS RTU's availability recorded separately
AVLS Servers (main and duty) *	System functionally available to CCR operators and capable of performing all routing and signalling requirements as intended.
LSS (Lineside signalling system) online equipment * (each LSS online installation is required to meet the minimum availability standards as defined in Table 21-1)	System functionally available to CCR operators and capable of performing all routing and signalling requirements as intended.
DCS (Depot Control System) * (each depot DCS is required to meet the minimum availability standards as defined in Table 21-1)	System functionally available to CCR operators and capable of performing all routing and signalling requirements as intended.
Central Control System (CCS)	System (Efarail platform) functionally available to CCR operators
CCR (Central control room) Workstations *	System functionally available to CCR operators
CCR CCTV VDU video wall	System functionally available to CCR operators and a minimum of 4 (out of 6) VDU's visible and functioning
Historical (HIS) Server	System functionally available to CCR operators and data available for review/download
Radio	Availability of full area coverage ensuring the provision of voice and data communications
Telephones (PABX)	Availability of full area coverage ensuring the provision of voice communications to all locations

Cable transmission network (CTN/OTN)	System fully functional
SVD Cabinets *	Fully functional equipment
Loops *	Fully functional equipment
PPIs and signals *	Fully functional equipment
On board radio *	Availability of full area coverage ensuring the provision of voice and data communications
On board AVLS *	Fully functional equipment

Table 21-4 Performance Standards for Control Systems

* Control Systems as indicated comprise a number of discrete assets. The percentage availability in a given Reporting Period is the aggregate number of hours that the Control System was actually available and operational in that Reporting Period divided by the product of the total number of discrete assets that pertain to that Control System and the number of hours in the Reporting Period (i.e. 672 hours for a 28-day Reporting Period). To the extent the Operator has complied with its obligations under the Contract, the hours in which each unit is not available and operational as a consequence of planned maintenance identified in the Annual Maintenance Plan shall not be used in determining the percentage availability of such unit.

Schedule 22: Maintenance Boundary Maps

22.1 Maintenance Boundary Maps

22.1.1 The Maintenance Boundary Maps listed below are subject to occasional amendment and update. It is the Operator's responsibility, during the Operating and Maintenance Period, to ensure that it has the latest version of each map.

22.1.2 The information provided in this Schedule is Disclosed Data.

Map Number	Line	Description	Local Authority
AB605MI1001	B	SSG to Sandyford Depot	Dublin City Council
AB605MI1002	B	SSG to Sandyford Depot	Dublin City Council
AB605MI1003	B	SSG to Sandyford Depot	Dublin City Council
AB605MI1004	B	SSG to Sandyford Depot	Dublin City Council
AB605MI1005	B	SSG to Sandyford Depot	Dublin City Council
AB605MI1006	B	SSG to Sandyford Depot	Dublin City Council
AB605MI1007	B	SSG to Sandyford Depot	Dublin City Council
AB605MI1008	B	SSG to Sandyford Depot	Dublin City Council
AB605MI1009	B	SSG to Sandyford Depot	Dun Laoghaire Rathdown County Council
AB605MI1010	B	SSG to Sandyford Depot	Dun Laoghaire Rathdown County Council
AB605MI1011	B	SSG to Sandyford Depot	Dun Laoghaire Rathdown County Council
AB605MI1012	B	SSG to Sandyford Depot	Dun Laoghaire Rathdown County Council
AB605MI1013	B	SSG to Sandyford Depot	Dun Laoghaire Rathdown County Council
AB605MI1014	B	SSG to Sandyford Depot	Dun Laoghaire Rathdown County Council
AB605MI1015	B	SSG to Sandyford Depot	Dun Laoghaire Rathdown County Council
TB605MI016	B	SSG to Sandyford Depot	Dun Laoghaire Rathdown County Council
TB605MI017	B	SSG to Sandyford Depot	Dun Laoghaire Rathdown County Council
TB605MI018	B	SSG to Sandyford Depot	Dun Laoghaire Rathdown County Council
TB605MI019	B	SSG to Sandyford Depot	Dun Laoghaire Rathdown County Council
AB1605MI0001	B1	Sandyford to Brides Glen	Dun Laoghaire Rathdown County Council
AB1605MI0002	B1	Sandyford to Brides Glen	Dun Laoghaire Rathdown County Council
AB1605MI0003	B1	Sandyford to Brides Glen	Dun Laoghaire Rathdown County Council
AB1605MI0004	B1	Sandyford to Brides Glen	Dun Laoghaire Rathdown County Council
AB1605MI0005	B1	Sandyford to Brides Glen	Dun Laoghaire Rathdown County Council
AB1605MI0006	B1	Sandyford to Brides Glen	Dun Laoghaire Rathdown County Council
AB1605MI0007	B1	Sandyford to Brides Glen	Dun Laoghaire Rathdown County Council
AB1605MI0008	B1	Sandyford to Brides Glen	Dun Laoghaire Rathdown County Council
AB1605MI0009	B1	Sandyford to Brides Glen	Dun Laoghaire Rathdown County Council
AB1605MI0010	B1	Sandyford to Brides Glen	Dun Laoghaire Rathdown County Council
AB1605MI0011	B1	Sandyford to Brides Glen	Dun Laoghaire Rathdown County Council
AB1605MI0012	B1	Sandyford to Brides Glen	Dun Laoghaire Rathdown County Council
AB1605MI0013	B1	Sandyford to Brides Glen	Dun Laoghaire Rathdown County Council
AB1605MI0014	B1	Sandyford to Brides Glen	Dun Laoghaire Rathdown County Council
AB1605MI0015	B1	Sandyford to Brides Glen	Dun Laoghaire Rathdown County Council
AA605MI1001	AC	Tallaght to Middle Abbey Street	South Dublin County Council
AA605MI1002	AC	Tallaght to Middle Abbey Street	South Dublin County Council
AA605MI1003	AC	Tallaght to Middle Abbey Street	South Dublin County Council

AA605MI1004	AC	Tallaght to Middle Abbey Street	South Dublin County Council
AA605MI1005	AC	Tallaght to Middle Abbey Street	South Dublin County Council
AA605MI1006	AC	Tallaght to Middle Abbey Street	South Dublin County Council
AA605MI1007	AC	Tallaght to Middle Abbey Street	South Dublin County Council
AA605MI1008	AC	Tallaght to Middle Abbey Street	South Dublin County Council
AA605MI1009	AC	Tallaght to Middle Abbey Street	South Dublin County Council
AA605MI1010	AC	Tallaght to Middle Abbey Street	South Dublin County Council
AA605MI1011	AC	Tallaght to Middle Abbey Street	South Dublin County Council
AA605MI1012	AC	Tallaght to Middle Abbey Street	South Dublin County Council
AA605MI1013	AC	Tallaght to Middle Abbey Street	South Dublin County Council
AA605MI1014	AC	Tallaght to Middle Abbey Street	South Dublin County Council
AA605MI1015	AC	Tallaght to Middle Abbey Street	Dublin City Council
AA605MI1016	AC	Tallaght to Middle Abbey Street	Dublin City Council
AA605MI1017	AC	Tallaght to Middle Abbey Street	Dublin City Council
AA605MI1018	AC	Tallaght to Middle Abbey Street	Dublin City Council
AA605MI1019	AC	Tallaght to Middle Abbey Street	Dublin City Council
AA605MI1020	AC	Tallaght to Middle Abbey Street	Dublin City Council
AA605MI1021	AC	Tallaght to Middle Abbey Street	Dublin City Council
AA605MI1022	AC	Tallaght to Middle Abbey Street	Dublin City Council
AA605MI1023	AC	Tallaght to Middle Abbey Street	Dublin City Council
AA605MI1024	AC	Tallaght to Middle Abbey Street	Dublin City Council
AA605MI1025	AC	Tallaght to Middle Abbey Street	Dublin City Council
AA605MI1026	AC	Tallaght to Middle Abbey Street	Dublin City Council
AA605MI1027	AC	Tallaght to Middle Abbey Street	Dublin City Council
AA605MI1028	AC	Tallaght to Middle Abbey Street	Dublin City Council
AC605MI1001	AC	Middle Abbey Street to Connolly	Dublin City Council
AC605MI1002	AC	Middle Abbey Street to Connolly	Dublin City Council
BXD400GD7701	LCC	Constitution Hill to Broombridge	Dublin City Council
BXD400GD7702	LCC	Constitution Hill to Broombridge	Dublin City Council
BXD400GD7703	LCC	Constitution Hill to Broombridge	Dublin City Council
BXD400GD7704	LCC	Constitution Hill to Broombridge	Dublin City Council
BXD400GD7705	LCC	Constitution Hill to Broombridge	Dublin City Council
BXD400GD7706	LCC	Constitution Hill to Broombridge	Dublin City Council
BXD400GD7707	LCC	Constitution Hill to Broombridge	Dublin City Council
BXD400GD7708	LCC	Constitution Hill to Broombridge	Dublin City Council
BXD400GD7709	LCC	Constitution Hill to Broombridge	Dublin City Council
BXD400GD7710	LCC	Constitution Hill to Broombridge	Dublin City Council
BXD400GD7711	LCC	Constitution Hill to Broombridge	Dublin City Council
BXD400GD7712	LCC	Constitution Hill to Broombridge	Dublin City Council
BXD400GD7713	LCC	Constitution Hill to Broombridge	Dublin City Council
BXD400GD7714	LCC	Constitution Hill to Broombridge	Dublin City Council
BXD400GD7715	LCC	Constitution Hill to Broombridge	Dublin City Council
BXD400GD7716	LCC	Constitution Hill to Broombridge	Dublin City Council
BXD400GD7717	LCC	Constitution Hill to Broombridge	Dublin City Council
BXD400GD7718	LCC	Constitution Hill to Broombridge	Dublin City Council

BXD400GD7719	LCC	Constitution Hill to Broombridge	Dublin City Council
BXD400GD7720	LCC	Constitution Hill to Broombridge	Dublin City Council
BXD400GD7721	LCC	Constitution Hill to Broombridge	Dublin City Council
BXD400GD7722	LCC	Constitution Hill to Broombridge	Dublin City Council
BXD400GD7723	LCC	Constitution Hill to Broombridge	Dublin City Council
BXD400GD7724	LCC	Constitution Hill to Broombridge	Dublin City Council
BXD400GD7725	LCC	Constitution Hill to Broombridge	Dublin City Council
BXD400GD7726	LCC	Constitution Hill to Broombridge	Dublin City Council
BXD400GD7601	LCC	SSG to Constitution Hill	Dublin City Council
BXD400GD7602	LCC	SSG to Constitution Hill	Dublin City Council
BXD400GD7603	LCC	SSG to Constitution Hill	Dublin City Council
BXD400GD7604	LCC	SSG to Constitution Hill	Dublin City Council
BXD400GD7605	LCC	SSG to Constitution Hill	Dublin City Council
BXD400GD7606	LCC	SSG to Constitution Hill	Dublin City Council
BXD400GD7607	LCC	SSG to Constitution Hill	Dublin City Council
BXD400GD7608	LCC	SSG to Constitution Hill	Dublin City Council
BXD400GD7609	LCC	SSG to Constitution Hill	Dublin City Council
BXD400GD7610	LCC	SSG to Constitution Hill	Dublin City Council
BXD400GD7611	LCC	SSG to Constitution Hill	Dublin City Council
BXD400GD7612	LCC	SSG to Constitution Hill	Dublin City Council
BXD400GD7613	LCC	SSG to Constitution Hill	Dublin City Council
BXD400GD7614	LCC	SSG to Constitution Hill	Dublin City Council
BXD400GD7615	LCC	SSG to Constitution Hill	Dublin City Council
BXD400GD7616	LCC	SSG to Constitution Hill	Dublin City Council
BXD400GD7617	LCC	SSG to Constitution Hill	Dublin City Council
A1605MI1001	A1	Belgard to Saggart	South Dublin County Council
A1605MI1002	A1	Belgard to Saggart	South Dublin County Council
A1605MI1003	A1	Belgard to Saggart	South Dublin County Council
A1605MI1004	A1	Belgard to Saggart	South Dublin County Council
A1605MI1005	A1	Belgard to Saggart	South Dublin County Council
A1605MI1006	A1	Belgard to Saggart	South Dublin County Council
A1605MI1007	A1	Belgard to Saggart	South Dublin County Council
A1605MI1008	A1	Belgard to Saggart	South Dublin County Council
A1605MI1009	A1	Belgard to Saggart	South Dublin County Council
A1605MI1010	A1	Belgard to Saggart	South Dublin County Council
A1605MI1011	A1	Belgard to Saggart	South Dublin County Council
A1605MI1012	A1	Belgard to Saggart	South Dublin County Council
A1605MI1013	A1	Belgard to Saggart	South Dublin County Council

Table 22-1 Maintenance Boundary Maps

Schedule 23: Third Party Works and Alterations

23.1 Bye-Laws

23.1.1 The Operator shall enforce all Luas Bye-laws including but not limited to S.I. No. 101/2004 - Light Railway (Regulation of Works) Bye-Laws 2004

23.2 Code of Practice for works on, near or adjacent to the Luas Tramway

23.2.1 The Operator shall prepare, issue and maintain documentation in accordance with the Contract for the guidance of organisations (other than the Operator and its Sub-Contractors) wishing to carry out work on or near the System, ("Code of Practice for works on, near or adjacent to the Luas Tramway").

23.2.2 The Operator shall liaise with organisations wishing to carry out work on or near the System to ensure that the information contained within the Code of Practice for works on, near or adjacent to the Luas Tramway is communicated to such organisations and, as far as practicable, is understood by such organisations.

23.2.3 The Operator shall enforce the Code of Practice for works on, near or adjacent to the Luas Tramway to ensure the safety of third party works and minimise the effect of such work on the System.

23.2.4 Subject to the Contract, System Contracts and the Code of Practice for works on, near or adjacent to the Luas Tramway, the Operator shall be entitled to charge for the provision of possessions with isolations, and to retain the revenue. The amount that the Operator may charge for a possession with isolation shall be limited to the amount in **Error! Reference source not found.**

23.3 Third Party Works Risk Management

23.3.1 The Operator shall determine the content and nature of the work that third parties wish to carry out on or near the System, and the risk associated with such work. The Operator shall undertake a risk assessment which must at a minimum take into account the following:

- The nature and type of work;
- Whether the work is in the swept path or not;
- The dangers of road traffic;
- Any site specific risks;
- The effectiveness of proposed mitigation or protective measures;
- The danger to the person or persons involved;
- Any danger to Luas passengers, employees or members of the public;
- The risk to the Infrastructure and the Operation; and
- Effect on Performance Standards.

23.3.2 The Operator shall determine the level of safety, control and monitoring required for the third party works to ensure at a minimum:

- The safety of the System, Operator's Personnel, passengers, Sub-Contractors' staff, vehicles and members of the general public.
- The reliable operation of the System.

23.4 Alterations to the Infrastructure

23.4.1 TII shall notify the Operator if a third party serves notice on TII during the Operating and Maintenance Period requiring any part of the Infrastructure to be temporarily altered for the purpose of carrying out remedial works to the third party's property.

23.4.2 TII shall notify the Operator if a third party serves notice on TII requiring the permanent alteration of any part of the Infrastructure.

23.4.3 To the extent that a proposed temporary or permanent alteration to any part of the Infrastructure has not arisen as a consequence of any failure by the Operator to perform its obligations under the Contract, any notice provided under paragraph 23.4.1 or 23.4.2 shall be deemed to constitute a Variation Notice and the provisions of Clause 34 (Variations) shall apply.

23.4.4 In the event that TII is notified by a third party of a requirement to make a temporary alteration to the Infrastructure for the purposes of an extraordinary traffic movement, then TII shall notify the Operator to this effect and the Operator shall:

- be responsible for liaising directly with such third party; and
- undertaking such temporary adjustment works as may be necessary to accommodate such extraordinary traffic movement.

23.4.5 The carrying out of temporary alteration works arising as a consequence of an extraordinary traffic movement shall be deemed to constitute a Public Event and the provisions of Sections 4.11 and 4.12 shall apply.

Schedule 24: Maintenance of Automatic Fare Collection System

24.1 Description of the Automatic Fare Collection System (AFCS)

24.1.1 The AFCS is as described in the AFCS Maintenance Contract.

24.2 General Obligations

24.2.1 The Operator is required to enter into the AFCS Maintenance Contract no later than two weeks after the Commencement Date, and shall manage the AFCS Maintenance Contract during the Operating and Maintenance Period.

24.2.2 The Operator shall have technically competent staff in place to manage the AFCS Maintenance Contract.

24.2.3 The Operator shall develop procedures for the management of the AFCS Maintenance Contract, and shall obtain TII's approval of these procedures no later than 30 Business Days prior to the Operating Commencement Date.

24.2.4 The Operator shall ensure that the AFCS Maintenance Contractor performs the services described in the AFCS Maintenance Contract.

24.2.5 The Operator shall manage the AFCS Maintenance Contract to ensure that the performance standards set out in Schedule 2 to that contract are met.

24.2.6 The Operator and TII may agree amendments to the Operator's procedures for management of the AFCS Maintenance Contract from time to time.

24.2.7 The Operator shall conduct a minimum of four audits per calendar year of the AFCS Maintenance Contractor's performance of its obligations under the AFCS Maintenance Contract. The audit plan for each calendar year, including the scope and timing of each audit, shall be agreed with TII by the end of Reporting Period 12 of the previous calendar year. On completion of each audit, the Operator shall submit a copy of the audit report to TII.

24.2.8 The following list of Controlled Functions from the AFCS Maintenance Contract may only be exercised by the Operator with the prior written consent of TII

- Any Extension of the Agreement pursuant to Clause 2
- Assignment, Novation and Subcontracting pursuant to Clause 5
- Rights and Obligations in relation to Safety pursuant to Clause 18
- Quality Assurance pursuant to Clause 19
- Rights and Obligations in relation to Environment pursuant to Clause 20
- Rights and Obligations in relation to Default pursuant to Clause 21
- Variations pursuant to Clause 25
- Suspension of Services pursuant to Clause 32
- Termination pursuant to Clause 51

24.3 Reporting

24.3.1 Each Reporting Period, the Operator shall include the AFCS Contractor's periodic report in the Period Report described in Section 32.2.

24.3.2 Every year, or when revision is required, the Operator shall submit the AFCS Annual Maintenance Plan, as described in the AFCS Maintenance Contract, to TII for approval.

24.4 Meetings

24.4.1 Each Reporting Period, the Operator shall organise and chair a meeting with the AFCS Maintenance Contractor and TII to review the AFCS Maintenance Contractor's performance and any issues arising during the Reporting Period.

24.4.2 The agenda for such meetings shall be agreed with TII from time to time.

24.5 Audit by TII

24.5.1 The Operator shall facilitate an audit by TII of its management of the AFCS Maintenance Contract annually and shall facilitate the audit by making available any meeting minutes, correspondence, plans and reports that TII requires in undertaking the audit.

24.6 AFCS Maintenance Fee

24.6.1 For the purpose of calculating the System Charge/Revenue Grant for each Reporting Period, as described in Schedule 36:, the AFCS Maintenance Fee for each Reporting Period shall be calculated as follows:

The amount payable by the Operator to the AFCS Maintenance Contractor calculated in accordance with Clause 48 (Remuneration) of the AFCS Maintenance Contract, less:

any amount payable by the Operator to the AFCS Maintenance Contractor for repair and/or reinstatement of the AFCS arising from Damage to the System, plus:

VAT payable by the Operator in respect of the above.

24.6.2 For the avoidance of doubt, the cost of repairing Damage to the System, including damage caused by vandalism, shall be borne by the Operator.

24.6.3 The Operator shall be paid a fixed annual fee for its management of the AFCS Maintenance Contract. This fixed annual fee is included in Base Yearly Amount set out in **Error! Reference source not found.** of **Error! Reference source not found.**

24.7 Operator's other obligations in relation to maintenance of the AFCS

24.7.1 The services described below fall outside of the scope of the AFCS Maintenance Contract and shall be fulfilled by the Operator separately:

Cleaning of the AFCS

24.7.2 The Operator shall be responsible for routine interior and exterior cleaning of the AFCS, and cleaning of soiling and graffiti, in order to keep the AFCS in good operational condition and, in respect of the ticket machines and validators, suitable for use by passengers of the System; This will include cleaning of all TVMs and the Validators on a regular basis to prevent equipment from getting dirty. The cleaning services will be provided on all sides and on top of

the TVMs and the Validators, as well as internally to fans and filters to promote the continued uninterrupted availability of these devices. All brushed stainless steel surfaces on TVMs and Validators will be re-brushed as required where scratching has occurred. The AFCS CSS and workstations contained in the Red Cow depot will also be routinely cleaned internally and externally to ensure their suitability for use.

Magnetic Tickets

- 24.7.3 "Magnetic Tickets" means the card tickets with a magnetic stripe that are issued by the AFCS ticket machines.
- 24.7.4 The Operator shall be responsible for the supply of Magnetic Tickets during the Operating and Maintenance Period.
- 24.7.5 The Operator shall be responsible for properly storing the Magnetic Tickets for use in the AFCS in a safe and secure environment, and for restocking the ticket machines with blank Magnetic Tickets.
- 24.7.6 The Operator shall notify TII of existing Magnetic Ticket levels in the Period Report described in Section 32.2. The Operator shall also notify TII in writing when levels of the Magnetic Tickets being stored fall below a critical level, that is, the level that the Operator considers should be maintained in accordance with Good Industry Practice, taking into account the Operator's experience of past lead times for delivery of additional supplies of Magnetic Tickets from the relevant supplier, and in order that the ticket machines are stocked with blank Magnetic Tickets.
- 24.7.7 The Operator shall be responsible for loss or damage to Magnetic Tickets howsoever such loss or damage is caused and the cost of replacing such lost or damaged Magnetic Tickets shall be borne by the Operator.
- 24.7.8 All Magnetic Tickets shall meet the Scheidt & Bachmann specification as set out in the AFCS Maintenance Contract.
- 24.7.9 In the event that Magnetic Tickets damage the ticket machines or cause malfunctions, then the Operator shall be liable in respect of the cost of any repairs and any additional work that arises as a result.
- 24.7.10 The Operator shall grant to TII or such third party as TII may nominate, such reasonable access as TII may reasonably require to inspect and audit the levels of stock of Magnetic Tickets maintained by the Operator and the conditions in which they are kept.

Maintenance of handheld inspection terminals (HITs)

- 24.7.11 The HIT devices are based on an Android operating system and the devices are capable of using a Smart Card Interface Module (SCIM) and Subscriber Identity Module (SIM). The hardware may be from a range of suppliers but the Parties agree and acknowledge that the HIT will be of ruggedized design. The Operator shall be responsible for the maintenance of the approximately 80 HITs, to be used to check the validity of Leap tickets for travel on Luas. First level maintenance for these devices, as described in Section 7 of the AFCS Maintenance Contract, shall be carried out by the AFCS maintenance contractor. All additional maintenance required to keep these devices in good working order shall be provided by The Operator.

Schedule 25: Management of Park and Ride Sites

25.1 Introduction

25.1.1 The Operator shall manage and operate seven Park and Ride Sites, comprising a total of 2,200 car parking spaces, at the locations listed in Table 25-1. The management and operation of the Park and Ride facility at Tallaght Cross is outside the scope of the Contract, as this facility is operated under a separate arrangement.

Line	Location	Spaces	Description
Red Line	Cheeverstown	312	Surface car park
Red Line	Red Cow	727	Surface car park
Green Line	Carrickmines	352	Surface car park
Green Line	Sandyford	47	Surface car park
Green Line	Stillorgan 2	147	Surface car park
Green Line	Stillorgan 1	194	Surface car park
Green Line	Balally	421	Multi-storey car park, shared with private parking
<i>Total Spaces</i>		<i>2,200</i>	

Table 25-1 Park and Ride Sites

25.1.2 The Operator shall develop a parking enforcement system for the Park and Ride Sites and implement it from the Operating Commencement Date.

25.1.3 Each Park and Ride Site has the following features:

- Standard car park surfacing finish
- Parking space markings
- Landscaping to define boundaries
- Full security lighting to required car parking standards
- CCTV coverage (except at Sandyford) linked to SCADA
- A Variable Message Sign (VMS) at the entrance showing the number of available car parking spaces in the Park & Ride Site
- Permanent signage outlining terms and conditions, parking tariffs and clamp release fees

25.1.4 The Park and Ride Site at Balally is provided in conjunction with residential and commercial car parking. Park and Ride spaces are clearly demarcated from residential/commercial spaces but there is shared access and egress to/from the Park and Ride Site.

25.1.5 The Park and Ride Site at Carrickmines is a temporary Park and Ride Site. It is anticipated that this temporary Park and Ride Site will be replaced with a permanent multi-storey Park and Ride Site, with approximately 304 spaces, during the Operating and Maintenance Period.

25.1.6 Maintenance of the Park and Ride Sites is included in the scope of the Contract. The Operator's obligation for Park and Ride Site maintenance covers surfacing, lining,

landscaping, lighting, CCTV, VMS and permanent signage, including cleaning, repair of vandalism damage and removal of graffiti. The Operator is also responsible for salting and snow clearance when required.

25.2 Broombridge Stop

25.2.1 The Operator shall manage and operate the following parking and set-down facilities at Broombridge Stop:

- Two disabled parking bays;
- Two set-down bays; and
- One bus bay

25.2.2 The Operator's obligations in relation to the parking and set-down facilities described in paragraph 25.2.1 shall be the same as for the Park and Ride Sites, with the exception of Sections 25.3, 25.4, 25.9 and **Error! Reference source not found.** which shall not apply to the parking and set-down facilities described in paragraph 25.2.1.

25.3 Parking Payment System at TVMs

25.3.1 The Park and Ride Sites have no access or egress control and currently operate by means of a white-list of car registration numbers. On purchasing a single, return, 1 day, 7 day or 30 day Luas ticket at a TVM, customers are asked if they want to "add parking". If they choose this option, they are asked to enter their car registration number. They are then asked to choose the time period for which they want to park: 4 hours, 1 day, 7 days or 30 days. Customers are also able to purchase parking on its own without having to purchase a Luas ticket (to cater for customers who have, e.g. a 30 day Luas ticket but only use the Park and Ride Site occasionally).

25.3.2 Once the customer has completed his/her selection and paid the correct amount, the TVM issues the appropriate Luas ticket and also a parking ticket confirming payment. The parking ticket will show the Park and Ride Site, the car registration number, and the date and time at which the parking duration expires. It is not necessary for the customer to display the parking ticket in their car (although they may do so if they wish).

25.3.3 The TVM transmits the data for parking transactions to the Operator's parking enforcement system in real time as an XML file. The Operator must procure or develop this parking enforcement system to work with the existing TVM parking software, without a requirement for substantial modification to the TVM software. TII will provide The Operator with all the technical documentation concerning the TVM parking software. Such development or procurement is at the Operator's expense solely, and must be completed at least 12 weeks before the Operating Commencement Date.

25.3.4 The Operator's parking attendants shall have hand-held terminals which will allow them to view, in real time, the database of vehicles which have paid for parking at each Park and Ride Site (known as the white-list), to enable the parking attendant to check if a vehicle has paid for parking.

25.4 Parking Payment via Smartphone App and Desktop and Mobile Websites

25.4.1 In addition to the parking payment system at TVMs, the Operator shall develop or procure a smartphone application for iPhone and Android devices, as well as desktop and mobile

websites, to allow payment at all Park and Ride Sites, and implement this system from the Operating Commencement Date.

25.4.2 Smartphone and website purchase of parking shall enable customers to purchase parking for periods of 4 hours, 1 day, 1 week, 1 month or 1 year. Once a customer has completed their purchase of parking, they shall be sent an email or notification showing the Park and Ride Site, the car registration number, and the date and time at which the parking duration expires. It will not be necessary for the customer to display the notification in their car (although they may do so if they wish).

25.4.3 The Operator's smartphone application and websites shall enable customers to pay for their parking by credit card or debit card. There shall be no additional charge to customers for using the smartphone application or websites.

25.4.4 The Operator's smartphone application and websites shall allow for changes to parking tariffs at different Park and Ride Sites to be made without the need for additional software development. The smartphone application and websites shall be linked to the Operator's parking enforcement system such that data for each parking transaction is transmitted to the Operator's parking enforcement system in real time.

25.5 Management and Operation of Park and Ride Sites

25.5.1 The Operator shall ensure that at all Park and Ride Sites:

- the appropriate parking charges are enforced;
- there is effective enforcement of parking charges seven days a week by means of regular patrols of the Park and Ride Sites;
- assistance is available to Park and Ride customers by means of the Luas Call Centre number prominently displayed at all Park and Ride Sites and, if necessary, by sending a mobile patrol to a Park and Ride Site if a customer is experiencing particular difficulties. A full time staff presence at the Park and Ride Sites is not required.
- parking attendants are on duty to assist customers at Park and Ride Sites during exceptionally busy times (for example Red Cow Park and Ride Site on big match days at Croke Park).

25.5.2 The Operator shall display and maintain signage at Park and Ride Sites as described more fully in paragraph 29.8.4 of Schedule 29:.

25.5.3 The Operator shall submit to TII a 'Park and Ride Management Plan' which shall list all the tasks that the Operator proposes to carry out at each Park and Ride Site, and the frequency with which the Operator proposes to carry out such tasks, in order to meet the requirements of the Contract. At a minimum, the Park and Ride Management Plan shall include the following operational tasks carried out daily at each Park and Ride Site:

- Manual on-site check that all TVMs are working correctly;
- Manual on-site check that the VMS is displaying the correct number of available spaces, and, if necessary, adjustment of the number of available spaces displayed by the VMS;

- Foot patrol of the Park and Ride Site to check that all parked vehicles, except those in disabled bays, have been paid for, and that any vehicles parked in disabled bays are displaying a valid Blue Badge.

25.5.4 The Operator shall enforce parking charges and regulations at the Park and Ride Sites chiefly by means of clamping vehicles that are:

- parked in a bay, other than a disabled bay, and have not been paid for; or are
- parked in a disabled bay without displaying a Blue Badge; or are
- parked outside of a marked bay.

25.5.5 The Operator's parking enforcement system shall enable parking attendants to see on their hand-held terminal if a particular vehicle is on the white-list. In the event that a parking attendant encounters a vehicle that is not on the white-list, or is parked in a disabled bay without displaying a Blue Badge, or is parked outside of a marked bay, then the parking attendant shall take appropriate enforcement action.

25.5.6 On receipt of a call from a customer whose vehicle has been clamped, the Operator shall immediately dispatch a mobile patrol to the Park and Ride Site concerned to de-clamp the vehicle. The Operator shall ensure that no customer, whose vehicle has been clamped, shall have to wait longer than 30 minutes for a mobile patrol to arrive to de-clamp their vehicle. Customers whose vehicles have been clamped shall have the clamp released from their vehicles upon payment of the clamp release fee to the Operator, or if the circumstances described in paragraph 25.5.7 apply.

25.5.7 In certain circumstances, a customer, whose vehicle has been clamped, may be able to demonstrate to the Operator that they did, in fact, pay for their parking. But their vehicle registration number may not have appeared on the white-list either because:

- the customer made an error typing his or her registration number into the TVM, smartphone application, or online; or
- there was a delay in uploading the vehicle registration number to the white-list due to a malfunction of the parking payment system.

25.5.8 If the circumstances described in paragraph 25.5.7 apply, the Operator shall remove the clamp from the customer's vehicle without charge. In the event that the customer pays the clamp release fee and subsequently successfully appeals for the reason described in paragraph 25.5.7, the Operator shall refund the clamp release fee to the customer in full.

25.5.9 All parking attendants employed by the Operator shall wear uniforms, and shall be courteous to customers of the Park and Ride Sites at all times.

25.5.10 The Operator confirms that it is aware that Balally Park and Ride Site is leased by TII as tenant from Mac-Rockfield Limited as landlord, and that it has received a copy of the lease. Throughout the Operating and Maintenance Period the Operator shall perform and assume as part of its obligations under the Contract, the obligations, risks and liabilities of the tenant under the lease, and shall not by its acts or omissions put TII in breach thereof, save that TII shall pay the Rent, Service Charge Rent and Insurance Rent (as defined in the lease) and shall collect the Tenant Services Contribution (as defined in the lease) from Mac-Rockfield Limited. The Operator agrees to indemnify and hold harmless TII against any loss,

proceedings, claims or damages that TII suffers as a result of a breach by the Operator of this obligation.

25.5.11 In relation to the Park and Ride Site at Balally:

- The Operator acknowledges that Balally Park and Ride Site is shared with private users. The Operator shall permit the private users to enter and exit Balally Park and Ride Site without charge and to park in the parking spaces marked for use by private users at any time without paying for such parking.
- The Operator shall not interfere unnecessarily or improperly with the convenience of the private users in relation to Balally Park and Ride Site.

25.5.12 The Operator shall prevent the unlawful use of each Park and Ride Site for activities other than those proposed under the specific Light Rail Order relevant to that site.

25.5.13 The Operator shall not display any signage at the Park and Ride Sites without first obtaining the prior written approval of TII.

25.6 Park and Ride Receipts

25.6.1 The Operator shall:

- every week, lodge all money collected from the Park and Ride Sites, the smartphone application, websites and clamp release fees paid by customers, less any clamp release fees refunded to customers ("**Park and Ride Receipts**") into TII's nominated bank account within three Business Days of the end of each week;
- account to TII for all Park and Ride Receipts, and keep true and accurate accounts of same and a true and proper record of all parking transactions relating to the Park and Ride Sites;
- submit weekly reports of Park and Ride Receipts to TII within three Working Days of the end of each week. Such reports shall be at a level of detail and in a format notified by TII to the Operator from time to time but shall, at a minimum, include for each week:
 - Number of parking transactions at TVMs and Park and Ride Receipts from TVMs, broken down by Park and Ride Site, by duration (4 hours, daily, 7 days, 30 days), by day type and by time of day;
 - Number of smartphone app parking transactions and smartphone app Park and Ride Receipts, broken down by Park and Ride Site, by duration (4 hours, daily, 7 days, 30 days), by day type and by time of day;
 - Number of website parking transactions and website Park and Ride Receipts, broken down by Park and Ride Site, by duration (4 hours, daily, weekly, monthly, annual), by day type and by time of day;
 - Number of clamps fitted, clamps released free of charge, clamp release fees paid by customers and clamp release fees refunded to customers, broken down by Park and Ride Site.
- be responsible for any shortfall between the parking charges paid by customers and the amount remitted to TII, including any shortfall arising as a result of theft;

- be responsible for all debit card and credit card fees arising from the payment of parking charges by Park and Ride Site customers.

25.6.2 All parking tariffs, including clamp release fees, shall be specified in writing in advance by TII. The Operator shall be responsible for charging the tariffs specified by TII to Park and Ride Site customers. For the avoidance of doubt, the Operator shall not charge any administration fee, debit card or credit card fee, fee for the use of smartphone app or website purchase of parking, or any fee or charge whatsoever to Park and Ride Site customers, other than the parking tariffs specified by TII.

25.7 Park and Ride Commission

25.7.1 'Park and Ride Revenue' is the Park and Ride Receipts less the VAT element of those receipts. In each Reporting Period, the Park and Ride Commission payable to the Operator shall be 4% of Park and Ride Revenue for that Reporting Period.

25.8 Park and Ride Clamp Release Fee Commission

25.8.1 In each Reporting Period, the Park and Ride Clamp Release Fee Commission shall be calculated by multiplying the number of clamp release fees paid by customers, less clamp release fees refunded to customers, by €45 (not subject to Indexation).

25.8.2 For the avoidance of doubt, the Operator shall not receive any Clamp Release Fee Commission for clamps that were released without charge, or for clamp release fees that were paid by customers but subsequently refunded, as described in paragraph 25.5.8.

25.8.3 In the event that the Operator issues a partial refund to a customer who has paid a Clamp Release Fee, the Operator's entitlement to Clamp Release Fee Commission in respect of that particular Clamp Release Fee shall be reduced pro-rata.

25.9 Park and Ride Evasion Surveys

25.9.1 TII shall procure an independent contractor to carry out Park and Ride evasion surveys on an ongoing basis in order to determine the level of Park and Ride evasion at the Park and Ride Sites. Each Park and Ride evasion survey shall be carried out over a period of no more than 13 weeks so that a minimum of four Park and Ride evasion surveys shall be carried out each calendar year. Each Park and Ride evasion survey shall consist of a number of sampling periods lasting approximately 6 to 8 hours.

25.9.2 The Operator shall facilitate access by TII's contractor to the System to carry out the Park and Ride evasion surveys. The Operator shall also provide TII's contractor, free of charge, with a hand-held terminal that will allow the contractor to view, in real time, the white-list of vehicles that have paid for parking at each Park and Ride Site.

25.9.3 Each Park and Ride Site shall be surveyed at least four times during each Park and Ride Evasion Survey, and a total of at least 1,000 vehicles shall be surveyed. During each sampling period, the surveyor shall select a random sample of at least 30 vehicles at each Park and Ride Site. If there are less than 30 vehicles parked in a Park and Ride Site at the time of the survey, then all vehicles in that Park and Ride Site shall be surveyed.

25.9.4 During each sampling period, surveyors shall record the number of vehicles in the following categories in each Park and Ride Site:

1. parked in a bay, other than a disabled bay, and has been paid for or clamped;

2. parked in a disabled bay and is displaying a valid Blue Badge or has been clamped;
3. parked outside of a marked bay and has been clamped;
4. parked in a bay, other than a disabled bay, and has not been paid for or clamped;
5. parked in a disabled bay without displaying a valid Blue Badge and has not been clamped;
6. parked outside of a marked bay and has not been clamped.

Categories 1 to 3 shall be regarded as validly parked vehicles. Categories 4 to 6 shall be regarded as invalidly parked vehicles.

25.9.5 The 'Park and Ride Evasion Rate' for each Park and Ride evasion survey shall be the total number of invalidly parked vehicles recorded during the Park and Ride evasion survey divided by the total number of validly parked plus invalidly parked vehicles recorded during the Park and Ride evasion survey, expressed as a percentage.

25.9.6 TII shall provide the Operator with a report of the results of each Park and Ride evasion survey within forty Business Days of the completion of the Park and Ride evasion survey. The Park and Ride evasion survey report shall include the following information:

- the overall Park and Ride Evasion Rate
- the Park and Ride Evasion Rate for each Park and Ride Site
- Causes of Park and Ride evasion (non-payment, parked in disabled bay without displaying a Blue Badge, or parked outside of a marked bay).

25.10 **Payment for Management of Park and Ride Sites**

25.10.1 Payment for Management of the Park and Ride Sites shall be made by TII to the Operator outside of the System Charge calculation. Payment for management of the Park and Ride Sites shall be calculated as described in paragraphs 25.10.2 and 25.10.3.

25.10.2 The 'Park and Ride Period Amount' for each Reporting Period shall be derived from the formula:

$$(A \times B) / 365$$

where,

A = the Park and Ride Yearly Amount; and

B = the number of days in the Reporting Period.

25.10.3 For each Reporting Period, the 'Adjusted Park and Ride Period Amount' shall be equal to:

the Park and Ride Period Amount for that Reporting Period;

plus:

- the Park and Ride Commission for that Reporting Period;
- the Park and Ride Clamp Release Fee Commission for that Reporting Period;

less:

- the Park and Ride Evasion Deduction for that Reporting Period;

and shall further be subject to any adjustments to be made in accordance with the Contract.

25.10.4 The Operator shall, at the same time as submitting the Period Report, submit the calculation of the Adjusted Park and Ride Period Amount for that Reporting Period. The presentation of the calculation of the Adjusted Park and Ride Period Amount shall be in a format notified by TII to the Operator from time to time. Thereafter the Operator shall be entitled to invoice TII for the Adjusted Park and Ride Period Amount plus VAT.

Schedule 26: Management of Security

26.1 Policing the System and Security Matters

26.1.1 The Operator shall be responsible for the security of the System, the Operator's staff and members of the public using the System.

26.1.2 The Operator shall make agreements with An Garda Síochána as may be necessary in relation to their policing of the public areas of the System.

26.1.3 The Operator shall manage the planning, organisation and control of extraordinary passenger movements on the System resulting from the holding of special events, including Public Events.

26.1.4 The Operator shall implement security systems, ensure that all CCTV, alarms, cabinets and fencing are properly maintained and provide that Revenue Protection Officers are present on the System at all times that it is in use. The Operator shall restrict access to the Depots to personnel authorised by the Operator or TII only.

26.1.5 The Operator shall at all times endeavour to keep anti-social behaviour to a minimum and act in such a way that promotes a positive reputation for Luas in terms of security.

26.2 Bye-Laws

26.2.1 The Operator shall be responsible for enforcing all Luas Bye-laws (Light Railway (Regulation of Travel and Use) Bye-laws, S.I. No. 322 of 2015).

26.3 Security

26.3.1 The Operator shall be responsible for facilitating, supervising and coordinating the activities of its own resources with An Garda Síochána, TII and any other applicable resource.

26.3.2 The Operator's responsibilities shall include, without limitation:

- developing and implementing a 'Security Management Plan'
- proactive management of anti-social behaviour and vandalism on the System
- providing visible reassurance to the passengers on the System by the presence of uniformed security staff (in addition to Revenue Protection Officers) and by making proactive announcements including the provision of up-to-date information
- reporting crimes and offences on the System, and aiding the investigating and detection of those crimes and offences
- establishing and participating in An Garda Síochána meetings and community meetings where appropriate
- liaison and co-ordination with other transport operators where appropriate.

26.3.3 The Operator shall update the Security Management Plan at regular intervals, at least annually, taking into account:

- the experiences of passengers as revealed by customer satisfaction surveys, focus groups, passenger complaints and comments and any other information source that provides information on the experience of passengers

- any advice from An Garda Síochána and any other authority on reducing crime and disorder in relation to public transport
- the views of TII and NTA

26.3.4 The Security Management Plan shall be based on proven prevention and problem-solving techniques and shall be flexible so that it is adaptable in a changing environment.

26.3.5 The Security Management Plan shall focus on gathering information about identified problems and analysing them, implementing intelligence-led action plans to prevent recurrence and assessing the outcome for effectiveness.

26.3.6 The Security Management Plan shall set out how the Operator will analyse existing data to establish patterns and trends including type of incident/ event, location, time and other relevant environmental variables.

26.3.7 The Security Management Plan shall describe how the Operator will respond incidents of anti-social behaviour or vandalism, including those that are reported by passengers via mobile app or SMS, as described in Section 26.4 below.

26.3.8 The Security Management Plan shall set out the measures that the Operator intends to take to reduce the number of assaults on Staff, including active engagement with and training of Staff.

26.4 SMS or Mobile App Reporting System

26.4.1 The Operator shall implement a real-time reporting system to allow passengers to report incidents of anti-social behaviour or vandalism on the System, via mobile app or SMS.

26.4.2 The Operator shall ensure that there are sufficient back office staff on duty to deal with incoming reports of anti-social behaviour or vandalism during operational hours, and shall ensure that all reports are followed up, actioned, and closed out as appropriate.

26.5 Vandalism

26.5.1 The Operator shall be responsible for all cleaning and repairs resulting from Damage to the System caused by vandalism.

26.5.2 The Operator shall ensure a timely response to vandalism incidents.

26.5.3 The Operator shall ensure that the System remains in a state of good repair and free of vandalised equipment and surfaces at all times, as described more fully in the AFCS Maintenance Contract, Schedule 12: and Schedule 17:.

26.5.4 The cost of cleaning or repairing Damage to the System caused by vandalism shall be borne by the Operator.

26.6 Security Training:

26.6.1 The Operator shall provide an effective training and support programme for Staff, to ensure they feel confident to address anti-social behaviour incidents, and command credibility among the travelling public.

26.6.2 In relation to security staff, training to Fetac Level 6 in Conflict Management as a minimum shall be provided.

26.7 Measurement of Anti-social Behaviour and Vandalism

26.7.1 The anti-social behaviour and vandalism statistics set out in Table 26-1 shall be reported by the Operator in the Period Report along with a commentary on the overall trend of anti-social behaviour and vandalism on the System.

Anti-social behaviour	Vandalism
Disorder	TVM vandalised
Disorder at stop	Other infrastructure vandalised
Disorder on tram	Depot vandalised
Flasher	Stop glass broken
Smoking	Stop graffiti
Person under influence (drugs & alcohol)	Stop vandalised
Passenger holding doors	Tram glass broken
Sleeping at stop	Tram windscreen broken
Sleeping on tram	Tram interior graffiti
Burglary other premises	Tram exterior graffiti
Burglary Operator's premises	Tram interior vandalism
Robbery/threat from staff	Tram exterior vandalism
Robbery/threat from other personnel	Tram soilage
Threat/Violence to staff	Object thrown at Tram
Threat/Violence to other personnel	Emergency handle pulled without due cause
Threat/Violence to passenger at stop	
Threat/Violence to passenger on tram	
Trespass in Depot or sub-station	

Table 26-1 Anti-social behaviour and Vandalism

26.8 Security staff presence on the System

26.8.1 The Operator shall deploy dedicated security staff to patrol the System in accordance with the Security Management Plan at those times and locations, at Stops or on board LRVs, in order to provide the most beneficial impact on anti-social behaviour.

26.8.2 The number of dedicated security staff deployed on the System shall be sufficient to ensure that, for each Reporting Period, a minimum of 16 Working Hours per 1,000 Scheduled Service Kilometres is spent on patrolling the System (this requirement applies to the Reporting Period overall, not on a daily basis).

26.8.3 The number of dedicated security staff deployed on the System shall be sufficient to deal with the increased level of anti-social behaviour and vandalism on the System that can be anticipated at the following times:

- St. Patrick's Day;
- the day on which Leaving Certificate results are released;
- the day on which Junior Certificate results are released;
- Halloween; and
- the months of November and December.

26.8.4 If in any Reporting Period the number of Working Hours for which the Operator has deployed security staff in patrolling the System is less than 16 Working Hours per 1,000 Scheduled Service Kilometres, then the Operator shall pay TII an amount in respect of each Working Hour less than 16 Working Hours per 1,000 Scheduled Service Kilometres. This amount shall be calculated by dividing Tram Security Costs in **Error! Reference source not found.**, indexed, by Annual Scheduled Security Working Hours in **Error! Reference source not found.**

26.8.5 For the avoidance of doubt, carrying out of training activities, performing of administrative functions and provision of security at the Depots shall not constitute patrolling the System, but the direct supervision of the security staff and attendance in court by the security staff for the purpose of giving evidence in any proceedings shall constitute such activity.

26.9 Depot Security

26.9.1 The Operator shall ensure that there is a continuous staff presence at the Depots 24 hours a day, 365 days a year, throughout the Operating and Maintenance Period.

26.10 Cyber Security

26.10.1 The Operator shall be responsible for the cyber security of all Luas telecommunication and information technology systems.

26.10.2 The Operator shall employ or contract relevantly qualified personnel to meet its obligations in relation to cyber security.

26.10.3 The Operator shall operate and maintain the cyber security system based in the Central Control Room. This system includes an intrusion detection system, firewalls at the border points of the network and a system for port hardware control.

26.10.4 The Operator shall keep all software, firmware and definition files up to date on all cyber security devices.

26.10.5 The Operator shall run intrusion detection and threat detection scans on a weekly basis and notify TII of any positive such detection.

- 26.10.6 The Operator shall engage a specialist contractor to perform an assessment of, and issue a report on, the cyber security capability and suitability of the Luas telecommunication and information technology systems on an annual basis. The Operator shall issue a copy of this report no later than 30 days after the first anniversary of the Operating Commencement Date and every year thereafter during the Operating and Maintenance Period.
- 26.10.7 The Operator shall engage a specialist contractor to perform a penetration test (PEN test) of any internet facing Luas information technology systems on an annual basis. The PEN test shall include, but not be limited to, the Luas Website, the Luas Standard Fares website and the Luas Tax Saver website. A report detailing the results of each PEN test shall be forward to TII in the subsequent Reporting Period.
- 26.10.8 The Operator may make suggestions to upgrade or modify the Luas cyber security system as appropriate. Any such suggested upgrades or modifications shall be dealt with as a Variation in accordance with Clause 34 (Variations).
- 26.10.9 When communicating via email or any other electronic method with TII, every effort must be made to protect sensitive and personal data. To this end, if any of the Operator's Personnel have remote access to email containing TII data, then a system of multi-factor authentication must be used rather than relying solely on a password for authentication to the remotely accessible system. This is required to mitigate the risk of remotely accessible accounts containing TII data being compromised.

Schedule 27: Leap Scheme Requirements

27.1 General

27.1.1 NTA is responsible for the operation and maintenance of the Leap integrated ticketing scheme in accordance with Section 58 of the Dublin Transport Authority Act 2008 (as amended, the "2008 Act"). TII is a member of Leap and is required to comply with requirements in relation to Leap, specified by NTA from time to time, in accordance with Section 58 (6) of the 2008 Act (the "Integrated Ticketing Scheme Requirements").

27.1.2 The Operator shall comply with the Transport Operator obligations (as defined in the Integrated Ticketing Scheme Requirements) listed in Table 27-1 and the Transport Operator obligations in the Schedules to the Integrated Ticketing Scheme Requirements listed in Table 27-2, both as amended by column 3 of the tables.

Article	Sub-Article(s) giving rise to direct obligations to the Operator	Notes
3	3.1, 3.3 and 3.4	<p>3.1.1 (b) Should the Operator incur any additional cost in following the written instructions of the Scheme Authority, this will be dealt with, on a case by case basis, in accordance with Clause 34 (Variations) of the Contract.</p> <p>3.1.1 (c) and (e) These obligations apply to the extent of the Requirements set out in this Schedule 27:.</p> <p>3.3.2 The Operator shall notify both TII and the Scheme Authority.</p>
4	4.1 to 4.12	<p>Articles 4.1 to 4.7 do not give rise to direct obligations to the Operator, other than to accommodate the Scheme Authority and TII in carrying out the tests, and where modifications are performed by the Operator under a variation to the Contract.</p> <p>4.4 Any costs incurred by the Scheme Authority in testing such equipment shall be borne by TII.</p> <p>4.9 This obligation applies only to the test ticket machines and test validators at Red Cow.</p>
5	5.2.1 to 5.2.6, 5.2.8 to 5.2.10	<p>5.2.5 TII shall provide the SAM hotlist to the Operator on the Operating Commencement Date, after which the Operator shall maintain the SAM hotlist.</p> <p>5.2.8 and 5.2.9 Should the Operator incur any additional cost in following the written instructions of the Scheme Authority, this will be dealt with, on a case by case basis, in accordance with Clause 34 (Variations) of the Contract.</p>
6	6.1 to 6.3	
7	7.2, 7.3 and 7.5	7.5.3 This obligation will only apply if Leap Cards are to be sold from Luas TVMs which is currently not foreseen.
8	8.4.1, 8.4.8 to 8.4.10 and 8.4.12	8.4.8 and 8.4.9 The function of agreeing to sell Tickets other than its own Tickets is reserved to TII.
9	9.1 and 9.2	TII shall provide the system allowing connection from the CSS to the Leap back office. The maintenance of this system is the responsibility of the Operator. This system requires a suitable

		connection to the internet and it is the responsibility of the Operator to provide this connection.
10	10.1 and 10.3	
12		Commissions will be payable to the Leap Operate Contractor in respect of the sale of Tickets via the Leap sales network and the Leap website. For the avoidance of doubt only the net revenue (i.e. after the deduction of Leap commissions) from the sale of such Tickets will be considered as Patronage Revenue under the Contract.
16	16.3 and 16.5	
17	17.3	
18		Training will be on a train-the-trainer basis. TII anticipate asking the Operator to nominate trainers for different elements of the training. TII will consult with the Operator in this regard.
20	20.1.1 to 20.1.3, and 20.1.5	
21	21.1 to 21.4, and 21.5.1	<p>21.3 The Operator would be responsible for notifying errors and omissions to both TII and the Scheme Authority.</p> <p>21.4 If the Scheme Authority determines that a request for an additional report constitutes a Change then TII would have to approve and submit the Change Request.</p> <p>21.5 TII would have to approve any information before it is provided to the Scheme Authority. The Operator's obligation regarding 7 days' written notice commences once TII approval is received by the Operator in writing.</p>
22	22.2, 22.3 and 22.7	
24		The Operator will be required to indemnify TII in respect of any action, proceeding, costs, claim, demand, liability, loss or expense to the extent that same arises out of or is contributed to in whole or in part by any act, default, negligence, performance or non-performance by the Operator (or its contractors, sub-contractors, distributors, agents, employees or representatives) except to the extent that the Operator is acting in accordance with its obligations and duties under these Requirements or strictly in accordance with the written instructions of the Scheme Authority.
25		TII will sub-licence as necessary any ITS Rights required for the operation of the ITS Systems.
26	26.2	The intent is that the Operator will only be responsible for managing the processing of personalisation requests for Luas Tax Saver Products. After the implementation of the proposed integrated Tax Saver website by NTA, all personalisation will be carried out under that system.
29	29.1, and 29.3 to 29.8	Without prejudice to the Operator's confidentiality obligations under the Contract, the Operator shall undertake these confidentiality obligations as a Participant.
30	30.1 to 30.3	Without prejudice to the Operator's obligations with respect to the data protection legislation pursuant to the Contract, the Operator shall undertake these data protection obligations as a Participant.

Table 27-1 Transport Operator obligations in the Integrated Ticketing Scheme Requirements

Schedule	Section(s) giving rise to direct obligations to the Operator	Notes
3	2 and 3	
4	1, 2, 3.1 to 3.5, 4, 5, 7.2 and 8.3	<p>3.1 TII will consult with the Operator before agreeing to security policies specified by the Scheme Authority from time to time.</p> <p>3.4 TII and the Operator will jointly perform this obligation. Should the Operator incur any additional cost in performing a security risk assessment, this will be dealt with, on a case by case basis, in accordance with Clause 34 (Variations) of the Contract. This relates only to a security assessment of the Leap elements and does not relieve the Operator of its obligations for information security assessments as defined in Schedule 33:</p>
6	2, 3 and 5	2.1 The intent is that the Operator will only be responsible for managing the processing of personalisation requests for Luas Tax Saver Products. . After the implementation of the proposed integrated Tax Saver website by NTA, all personalisation will be carried out under that system.
7	2 and 3	NB - All transactions received at Ticket Machines and validators (excluding, for the avoidance of doubt, Leap Card sales and e-purse top-ups) will be counted as Patronage Revenue for the purposes of the Contract. It is the Operator's risk and responsibility to manage the claims process and to recover valid transactions that for whatever reason are not settled by the Scheme Authority.
8	1.1, 1.4, 2.2, 2.3 and 3.3	Same comment as for Schedule 7 applies.
9	1.2.3 and 1.4	
10	1.2, 1.3 and 4	
14		Schedule 14 does not give rise to direct obligations to the Operator, other than to accommodate the Scheme Authority and TII in carrying out any tests required.
15	2	Training will be on a train-the-trainer basis. TII anticipates asking the Operator to nominate trainers for different elements of the training. TII will consult with the Operator in this regard.
16	2.6	Same comment as for Schedule 7 applies.
17	Part 2	1.6 The Operator shall notify both TII and the Scheme Authority.
18		Same comment as for Article 12 applies.
22	1.3, 2.6, 4.2, 5.1 to 5.3, 5.4.1, 5.5.1, 6	It is envisaged that the Operator and TII will have a joint role in the performance of these responsibilities.

Table 27-2 Transport Operator obligations in the Schedules to the Integrated Ticketing Scheme Requirements

27.1.3 The Leap scheme is the largest means of revenue collection in use on Luas, therefore the Operator must familiarise itself with the Integrated Ticketing Scheme Requirements and revert to TII with any matters that are not fully understood. In particular, the Operator's attention is drawn to the following obligations:

- a) Daily transactions transmission is critical to the on-going workings of Leap, therefore the Operator shall take all steps necessary to ensure that all Leap transactions are transmitted to the Luas ITS access point ("ITSAP") three times per day, as a minimum;
- b) Action list distribution is also critical to Leap, therefore the Operator shall ensure that all action lists are distributed within the required timelines as set out in the Integrated Ticketing Scheme Requirements;
- c) A high level of Leap Card reading device availability is essential, therefore the Operator is required to notify the Scheme Authority of any faults as set out in Article 22.7.1 and Schedule 4, Section 4 of the Integrated Ticketing Scheme Requirements;
- d) Daily reconciliation must be carried out for each and every working day to verify that the settlement values advised by the Leap Operate Contractor tally with internally generated values for Leap card usage, top-ups, ticket sales and ticket usage;
- e) Testing and pilot activities are conducted jointly with NTA and TII to ascertain that new features and changes have been properly implemented. However, in a scheme such as Leap it is essential that any observed variance from expected behaviour by a Leap card or a Leap cardholder must be reported to the Leap Operate Contractor as soon as possible;
- f) Fraud detection and prevention is a matter for all parties involved in Leap, therefore there is an obligation on the Operator to report any and all suspicious activities that the Operator becomes aware of by anyone involved in Leap, (including stakeholders' staff) which may be fraudulent or may be leading to future fraudulent activities.

27.1.4 TII shall exercise any retained rights or discretions referred to in this Schedule 27: such that it shall not place the Operator in breach and shall cooperate with the Operator, both Parties acting reasonably, to facilitate the efficient and effective working of Leap in connection with the Services.

Schedule 28: Customer Service

28.1 Customer Service Overview

28.1.1 The Operator shall be responsible for the provision of customer service relating to the Services throughout the Operating and Maintenance Period.

28.1.2 The Operator shall provide information and customer service in relation to, without limitation:

- The customer information described in paragraph 29.1.5 of Schedule 29:
- Security, including, answering customer queries / complaints, providing information about security features and services, logging security and anti-social behaviour reported by customers and activating security procedures;
- Bye-laws;
- Comment / query / complaint procedure;
- Service disruption updates;
- Standard Fare procedure;
- Refunds procedure;
- Accessibility Policy and procedures;
- Lost and Found Procedure;
- Lost Child/Vulnerable Individual Procedure;
- Activity Permit procedure;
- Customer Charter;

28.1.3 The Operator's provision of customer service shall comply with the Communications Compliance Guidelines, as notified by TII to the Operator from time to time.

28.2 Customer Service Policy

28.2.1 The Operator shall develop a Customer Service Policy and shall submit its Customer Service Policy to TII for approval no later than 40 Business Days prior to the Operating Commencement Date. The Customer Service Policy shall include, but not be limited to, the matters set out in Sections 28.3 to 28.11 of this Schedule. TII and NTA shall provide the Operator with such comments and amendments as it requires in respect of the Customer Service Policy within 20 Business Days of receipt from the Operator.

28.2.2 The Operator, TII and NTA shall jointly review and update the Customer Service Policy annually on the anniversary of the Operating Commencement Date. The Operator and TII may agree further amendments to the Customer Service Policy from time to time.

28.2.3 The Operator shall implement the Customer Service Policy throughout the Operating and Maintenance Period.

28.3 Call Centre and Inbound Communications Procedures

28.3.1 The Operator shall provide a call centre to handle inbound communications from customers, the public and stakeholders. The call centre shall be open for at least the following hours:

- Monday to Friday: 07:00 to 19:00;
- Saturdays: 08:00 to 18:00;
- Sundays and Public Holidays: 08:00 to 18:00;
(excluding Christmas Day)
- During periods of serious disruption to services.

- 28.3.2 The Operator's social media monitoring and responding hours shall be the same as the call centre opening hours. In addition, during any periods of service disruption and any subsequent service recovery period, the Operator shall provide social media support outside call centre opening hours as required.
- 28.3.3 The Operator shall provide sufficient call centre staff to operate the call centre during the hours indicated in paragraph 28.3.1. During periods of service disruption outside these hours, the Operator may staff the call centre with suitably qualified relief staff.
- 28.3.4 The Operator shall publicise call centre and social media account opening hours on the Website, Twitter profile and in email responses.
- 28.3.5 The Operator shall publicise how customers may submit a comment, query or complaint relating to Luas to the call centre, by means of customer information signage or digital information on all LRVs, at all platforms, on the Website, on the mobile applications, on social media and at any other locations required by TII.
- 28.3.6 The Operator shall designate a member of staff with primary responsibility for customer service. This person shall be TII's primary point of contact for customer service, shall liaise with TII on all matters relating to customer service, and shall attend meetings with TII as required by TII.
- 28.3.7 The Operator shall ensure that call centre staff are fully trained in the Customer Service Policy and related procedures prior to commencing customer-facing duties. The Operator shall ensure that call centre staff complete refresher customer service training every 3 years, or when resuming customer-facing duties after a period of more than 3 months away from customer-facing duties.
- 28.3.8 The Operator shall designate a member of the Operator's Personnel, who has fluent written and spoken Irish, with responsibility for processing inbound communications received in Irish.
- 28.3.9 The Operator shall make available to customers, the public and other parties, the following inbound communications channels: LoCall phone line 1850 300 604, email info@luas.ie, postal address, online chat (live, not automated), Website contact form, mobile application contact forms, text/SMS message service, social media channels and emergency help points on platforms.
- 28.3.10 All inbound communications shall be investigated and responded to.
- 28.3.11 All inbound communications and responses shall be recorded in the Customer Relationship Management System as described in Section 28.10.
- 28.3.12 All inbound communications shall be responded to via the same channel by which they are received wherever possible. If this is not possible, such communications shall be responded to by an alternative written format.

28.3.13 All inbound communications received in Irish shall be responded to in Irish.

28.3.14 90% of all phone call inbound communications shall be answered within 30 seconds and closed, where possible, within 2-3 minutes. If it is not possible to resolve the matter during the original phone call, the Operator shall ask permission to phone the person back and take their contact details. The Operator shall respond with a resolution by phone within 3 Business Days. If it is not possible to respond with a resolution by phone within 3 Business Days, the Operator shall respond with a holding response by phone within 3 Business Days and respond with a resolution by phone within 10 Business Days of the original phone call.

28.3.15 During periods of high call volumes calls may be queued. If a call cannot be answered by an agent due to high call volume the call may be automatically answered and automatically put into a call queue. Customers in this call queue shall be provided with an automated bilingual (Irish and English) audio message estimating the time until an agent will be available to answer their call. This message shall be repeated updated every 30 seconds. Callers in this queue shall also be provided with an alterable audio information message. The CRM software or call management software shall provide access to easily record a temporary call queue audio information message and set it for a period. The default bilingual (Irish and English) audio information message shall direct people to the website for information.

28.3.16 All letter inbound communications shall receive a resolution response sent within 3 Business Days of receipt of the letter. If it is not possible to send a resolution response within 3 Business Days, a holding response shall be sent within 3 Business Days and a resolution response sent within 10 Business Days of receipt of the letter.

28.3.17 All email inbound communications shall receive an automated acknowledgement and a resolution response within 1 Business Day. If it is not possible to send a resolution response within 1 Business Day, a holding response shall be sent within 1 Business Day and a resolution response within 5 Business Days of the original email. All Website and Mobile Application Contact Form inbound communications shall be automatically converted into emails and processed in the same manner as emails.

28.3.18 The Operator shall apply a social media policy and guidelines, to be included in its Customer Service Policy, which:

- draws on current social media and customer services best practice;
- is reviewed once a year and updated as necessary;
- is agreed with TII and NTA;
- details content policy and guidelines
- details monitoring and responding policy and guidelines
- ensures timely response to all queries and complaints
- sets out:
 - visual appearance;
 - information provision policy, particularly in relation to service disruptions;
 - commenting policy;

- Service promotion policy, including promotional content as instructed by TII and NTA;
- complies with Luas Social Media Guidelines and the the NTA Social Networking and Social Media Policy.

28.3.19 If the subject of an inbound communication is outside the Operator's responsibility, the response to the customer shall include the contact details of the body that is responsible.

28.3.20 The Operator shall provide such reasonable support and assistance to TII, as may be requested by TII, for dealing with inbound communications to TII relating to the System.

28.3.21 The Operator shall respond to TII within 5 Business Days with the detailed resolution response to any inbound communications received from the Department of Transport, Tourism and Sport or any other Competent Authority. If it is not possible to send a resolution response within 5 Business Days, the Operator shall send a holding response within 5 Business Days and follow up with a complete resolution response within 15 Business Days. The Operator shall provide TII, at the time of responding, a copy of the inbound communication, the response and any related information.

28.3.22 All inbound communications shall be investigated and responded to at no cost to the customer, member of public or relevant party.

28.3.23 For inbound communications which are complaints the Opeartor shall develop and apply a complaints policy and procedure, to be included in its Customer Service Policy, which;

- draws on current complaints best practice and guidance for service providers from the Irish Complaints Ombudsman;
- informs complainants that they have the right of appeal to TII in the event that they are dissatisfied with the Operator's response and provides TII's contact details;
- informs complainants that they have the further right of appeal to NTA in the event that they are dissatisfied with the TII's response and provides NTA's contact details;
- details complaints policy and procedure including:
 - referring complaints receive via social media to an online complaint form; and
 - right of appeal information and contact details in complaint responses.

28.4 Service Disruption Updates

28.4.1 In the event of disruption to services, the Operator shall issue service disruption updates at the start of the service disruption, during the service disruption, without delay as status changes or repeated regularly when there is no change in status, and at the end of the service disruption.

28.4.2 Service disruption updates issued by the Operator shall include notification of the service disruption, the reason for the service disruption, likely duration of the service disruption, likely delay to customers, an apology from Luas, and details of alternative travel options, including Bus Activations or Replacement Bus services, where applicable.

28.4.3 The Operator shall issue service disruption updates, in compliance with the Service Disruption Communications Guidelines, via the following channels: Website, mobile applications, PIDs

at Stops, announcements at Stops and on LRVs, Tweets, Facebook Posts and any other channels required by TII.

28.4.4 The Operator shall monitor and respond quickly, and in any case within 30 minutes where inbound communication is via social media, to inbound communications in relation to service disruptions.

28.4.5 The Operator shall ensure that RTPI is turned on for all platforms and positive status service disruption updates are communicated via the Website and mobile applications when normal service is restored following disruption to services and when the service is operating normally.

28.5 Accessibility Policy and Procedures

28.5.1 The Operator shall develop a policy and related procedures to identify and address the accessibility needs of customers with reduced mobility, including elderly customers, customers with disabilities and special needs, children and their caregivers and customers with heavy baggage (the "Accessibility Policy").

28.5.2 The Operator shall publicise the Accessibility Policy, in accessible formats, via the Website, and shall explain the policy to any customer who has a related query via the same channel by which the query is received.

28.5.3 The Operator shall designate a member of staff with primary responsibility for ensuring implementation of the Accessibility Policy throughout the Operating and Maintenance Period.

28.5.4 The Operator shall provide assistance to customers with disabilities or special needs when requested to do so by such customers, within two hours of the receipt of the request if a live request, or at the time requested by the customer if an advance request. The Operator shall publicise the fact that such assistance is available, if requested, to customers who require it.

28.5.5 The Operator shall participate in quarterly meetings of the Luas Accessibility Committee (LAC). The aim of the LAC is to identify issues of concern to customers with disabilities and special needs and to improve their Luas travel experience. The LAC includes representatives from all major disability awareness groups active in Dublin.

28.5.6 The Operator shall, if requested by TII, arrange for escorted visits by disability awareness groups and/or the LAC to the System to familiarise themselves with the System and to identify issues related to accessibility.

28.5.7 The Operator shall, if requested by TII, participate in quarterly meetings of the Department of Transport, Tourism and Sport's Public Transport Accessibility Consultative Committee (PTACC), and shall contribute to deliberations of the committee on public transport accessibility issues.

28.6 Lost and Found Procedure

28.6.1 The Operator shall develop a procedure for dealing with lost property items found on the System and returning such lost property items to their owners whenever possible (the "Lost and Found Procedure").

28.6.2 The Operator shall implement the Lost and Found Procedure throughout the Operating and Maintenance Period, at no cost to customers.

- 28.6.3 The Operator shall publicise the Lost and Found Procedure via the Website and shall explain the procedure to any customer who has a related query via the same channel by which the query is received.
- 28.6.4 The Operator shall ensure that lost property found by, or handed in to, the Operator's Personnel is brought to a secure location and logged on the CRM system.
- 28.6.5 The Operator shall retain lost property for a reasonable period, no less than three months, to allow customers to reclaim items. Following the end of the retention period the Operator may donate unclaimed lost property to charity. The Operator and the Operator's Personnel shall not benefit or profit from lost property items in any way.
- 28.6.6 The Operator shall make all reasonable efforts to match lost property enquiries to lost property items and to use outbound communications channels to try to identify the owners of lost items. The Operator shall provide UV lights at each Depot to allow for the UV inspection of lost items for owner contact details. In the event that the owner of a lost property item can be identified, the Operator shall make all reasonable efforts to contact the owner and inform them where and when the item of lost property item can be collected.
- 28.6.7 The Operator shall provide Lost and Found collections points at the Depots. The Operator shall provide owners of lost property items the option of collecting items from any Depot. The Operator shall transfer items between Depots within two Business Days to facilitate collection by owners at the Depot of their choice, and shall notify owners when the items are ready for collection. The collections points at the Depots shall be accessible to the public on Mondays to Fridays from 07:00 to 19:00 and on Saturdays from 10:00 to 14:00.
- 28.6.8 The Operator shall provide owners of lost property the option of having small lost property items posted to them within the Republic of Ireland by registered post at their own risk. The Operator shall post the lost property item within two Business Days of receipt of request or the receipt of postage payment. The Operator shall provide an electronic method of payment for Lost and Found postage delivery. The Operator shall provide Lost and Found postage delivery to customers at the cost of the registered post for their item.

28.7 Lost Child / Vulnerable Individual Procedure

- 28.7.1 The Operator shall develop a procedure to be followed in the event that the Operator's Personnel encounter a lost child or vulnerable individual on the System, or in the event that the Operator receives a request to support efforts to find lost children or vulnerable individuals (the "Lost Child /Vulnerable Individual Procedure").
- 28.7.2 The Operator shall implement the Lost Child / Vulnerable Individual Procedure throughout the Operating and Maintenance Period, at no cost to customers, the public or An Garda Síochána.
- 28.7.3 The Operator shall publicise, via the Website, how customers can report lost children or vulnerable individuals, and shall explain the Lost Child / Vulnerable Individual Procedure to any customer who has a related query via the same channel by which the query is received.
- 28.7.4 The Operator shall ensure that lost children or vulnerable individuals who are found by the Operator's Personnel are accompanied to their guardian on the System or their home or another location where their guardian is present. If a guardian cannot be found, the Operator shall ensure that the lost child or vulnerable individual is accompanied to the closest Garda Station. The Operator shall make reasonable efforts to have a member of the Operator's

Personnel of the same gender as the lost child or vulnerable individual accompany them in such circumstances. The Operator shall not require payment of a fare by a lost child or vulnerable individual for travel on the System.

28.7.5 As part of procedures to support An Garda Síochána Child Rescue Ireland Alerts, the Operator shall:

- appoint a point of contact for An Garda Síochána Child Rescue Ireland Alerts;
- enter into an agreement with An Garda Síochána to support Child Rescue Ireland Alerts; and
- cooperate with, and follow the advice of, An Garda Síochána in relation to any Child Rescue Ireland Alerts that are issued.

28.8 Activity Permits

28.8.1 Any person wishing to take photographs or shoot video for commercial purposes, hold an event or activation including handing out leaflets, undertake surveys, hand out free items or similar activities on the System, shall be required to obtain a permit from the Operator (an "Activity Permit").

28.8.2 The Operator shall administer a process for the submission, review and approval of applications for Activity Permits. The Operator shall provide, on the Website, a clear and simple explanation of how to apply for an Activity Permit. This explanation shall include the application timeline, information required and the circumstances under which an Activity Permits will be granted.

28.8.3 The Operator shall provide an online Activity Permit application process via the Website. All Activity Permit applications submitted shall receive an automated response with confirmation of receipt. The Operator shall process all Activity Permit applications within 10 Business Days. If an Activity Permit is granted, the person who applied shall be notified by email, and shall receive the Activity Permit in PDF format by email which highlights any conditions of the use of the Activity Permit and any steps the person needs to take when using their permit. If an application for an Activity Permit is denied, the person who applied will be notified by email and informed of the reasons why their application was denied. The Activity Permit process shall be operated at no cost to the person applying.

28.8.4 The Operator shall ensure that any persons, of which the Operator is aware, engaging in activity on the System that requires an Activity Permit, and who are not in possession of an Activity Permit and/or permit number, are instructed to leave the System.

28.9 Customer Charter

28.9.1 The Operator shall, subject to TII's prior approval, publish a Customer Charter throughout the Operating and Maintenance Period. The Customer Charter shall outline the Operator's commitments to customers, including in relation to safety, security, service quality, accessibility, equitable treatment of customers, accommodating customer diversity, lost property, sustainability and customer comments / complaints process. The Operator shall comply with its commitments outlined in the Customer Charter throughout the Operating and Maintenance Period.

28.9.2 The Operator shall make the Customer Charter available in Irish and English, including accessible formats, via the website and, if requested by TII, on all LRVs and at all Stops. The

Operator shall also make copies of the Customer Charter available to customers upon request, at no cost to the customer.

28.9.3 Prior to the Operating Commencement Date, and on each anniversary of the Operating Commencement Date, the Operator shall review and, if necessary, update the Customer Charter, subject to TII's approval.

28.10 Customer Relationship Management System

28.10.1 The Operator shall implement a Customer Relationship Management (CRM) system which shall:

- provide easy set-up of unique users without the need for technical support, a unique username and password for each user, unique data access rights for each user and tracking of each user's actions;
- provide remote access via desktop and mobile;
- provide secure data storage, within the EU, compliant with all relevant legislation;
- provide integration with inbound and outbound communications as outlined in Section 28.3;
- provide storage of all customer communications in searchable format, linked to one or multiple customer contact accounts;
- provide for the integration of CRM data from the Prior Operating Contract;
- classify all customer communications via mandatory input fields, by Line and Stop or location, topic, form of communication, sentiment and other fields as may be required by TII;
- facilitate collection of relevant information to fulfil the customer service requirements set out in this Schedule;
- provide a contact database capable of being split into separate sub-databases with unique access including Standard Fare database, Tax Saver database, comment / query / complaint database, eNewsletter database and other databases as may be required by TII;
- provide integration with the Operator's Database as described in Schedule 4: and the Website as described in Schedule 30: and
- allow transfer of data between the Standard Fare payment system within the Website and the Standard Fare database within the CRM.

28.10.2 The CRM shall provide industry standard best practice reporting functionality using anonymised data, including:

- Summary dashboard for current and last operating period;
- Template reports to fulfil ongoing and ad-hoc reporting requirements;
- Easy creation of new customised template reports at no cost;
- Outputting of reports by alterable time periods;

- Outputting of reports in various standard formats including PDF, Excel / CVS, etc.;
- Automated scheduling and issuing of reports to email address and email address lists; and
- Storage of all reports issued.

28.10.3 The Operator shall ensure that all call centre staff are trained in the use of, and have access to, the CRM to add and check data as required for their job role.

28.10.4 The CRM system shall have the capability to provide access, excluding personal data access, for TII's personnel, as requested by TII compliant with all relevant Data Protection legislation.

28.11 Operator's Personnel and Customer Service

28.11.1 Customer-facing staff include, but are not limited to call centre staff, drivers, RPOs, security staff and any other personnel with a customer facing or customer contact element in their role.

28.11.2 The Operator shall ensure all customer-facing staff shall complete customer service training as outlined in the Operator's Customer Service Policy.

28.11.3 The Operator shall ensure that drivers, RPOs and security staff complete manual handling training, and that RPOs and security staff complete conflict management training.

28.11.4 The Operator shall ensure that RPOs provide assistance to customers in using the System when requested.

28.12 Customer Service Reporting

28.12.1 As part of the Period Report described in Schedule 32:, The Operator shall report customer inbound communications, as outlined in Section 28.3, to TII for each Reporting Period. This report shall be in a format and at a level of detail notified by TII to the Operator from time to time.

28.12.2 The Operator shall submit additional ad-hoc customer service reports as required by TII no later than 10 Business Days following the request of TII.

28.12.3 The Operator shall supply a full set of supporting records for the report if required by TII.

28.12.4 The Operator shall provide TII with access to all systems necessary to produce reports for verification purposes if required by TII.

Schedule 29: Customer Information

29.1 Customer Information Overview

29.1.1 The Operator shall be responsible for the provision of customer information relating to the Services, including signage, hard copy, audio-visual and digital customer information, throughout the Operating and Maintenance Period.

29.1.2 The Operator shall be responsible for the maintenance of existing customer information and the replacement of incompliant, damaged or out-of-date customer information. The Operator shall also be responsible for updating and replacement of customer information in case of changes as outlined in this Schedule.

29.1.3 The Operator shall be responsible for the scheme/plan development, design/development (except for Stop notice boards which shall be designed by NTA), print/production and installation/publication/broadcast of all customer information. Updated or new customer information shall be subject to the approval of NTA.

29.1.4 TII and NTA may specify the Customer Information to be provided by Operator.

29.1.5 The customer information to be provided by the Operator shall include, without limitation:

- Operating hours, including first and last Trips from each platform, operating frequency including frequency for any day and time, direction of Trips, journey times including stop to stop journey times, and related service information;
- Interchange between services, including, interchange between the Red and Green Lines, interchange between services on the same Line but with different termini, and interchange with other public transport modes;
- Location of and directions to Stops, Depots, Park and Ride Sites and bike parking facilities including existing bike racks, other bike parking facilities, and any new Stops, Depots, Park and Ride Sites or bike parking or storage facilities that may be opened during the Operating and Maintenance Period;
- Location of and directions to desirable trip destinations including shopping districts, education facilities, landmarks, sports venues, entertainment and event venues, leisure facilities/venues, tourist venues, medical facilities, etc;
- Tickets and fares, including, fare zones, cash fares, Leap Card fares and caps, student tickets, Tax Saver tickets, 1 day, 7 day and 30 day tickets, child tickets and the best ticket for individual customer's journey and / or travel pattern;
- Safety, including customer safety, pedestrian safety, cyclist safety and motorist safety;
- Public Events; and
- other information required by TII or NTA from time to time.

29.1.6 The Operator shall provide all Irish language translations required for the provision of customer information, and other language translations required for one page of key information on the Website, as outlined in the Luas Website Guidelines.

29.1.7 The Operator's provision of customer information shall comply with Customer Information Guidelines and Communications Compliance Guidelines, as notified by TII to the Operator from time to time.

29.2 Customer Information Plan

- 29.2.1 The Operator shall develop a Customer Information Plan and shall submit its Customer Information Plan to TII and NTA for approval no later than 40 Business Days prior to the Operating Commencement Date. The Customer Information Plan shall include, but not be limited to, the matters set out in Sections 29.3 to 29.11 of this Schedule. TII shall provide the Operator with such comments and amendments as it requires in respect of the Customer Information Plan within 20 Business Days of receipt from the Operator.
- 29.2.2 The Operator, TII and NTA shall jointly review and update the Customer Information Plan annually on the anniversary of the Operating Commencement Date. The Operator and TII may agree further amendments to the Customer Information Plan from time to time.
- 29.2.3 The Operator shall implement the Customer Information Plan throughout the Operating and Maintenance Period.

29.3 Customer Information Staff

- 29.3.1 The Operator shall designate a member of staff with primary responsibility for customer information. This person shall be TII's and NTA's primary point of contact for customer information, shall liaise with TII and NTA on all matters relating to customer information as outlined in this Schedule, and shall attend meetings with TII and NTA when required.
- 29.3.2 The Operator shall appoint sufficient staff to implement the Customer Information Plan throughout the Operating and Maintenance Period.
- 29.3.3 The Operator shall ensure that all customer-facing staff are fully trained in the customer information available, so that they can advise customers how to use the various sources of customer information available.

29.4 Customer Information Inspection and Report

- 29.4.1 The Operator shall develop an inspection regime for customer information, in order to identify and report on the status of all customer information on a regular basis.
- 29.4.2 The Operator shall inspect all customer information every three calendar months and shall provide a report to TII, for TII's approval, which identifies those items which need to be maintained or replaced, and provides a programme for their maintenance or replacement (the "Customer Information Inspection Report"). The first inspection shall be no later than 20 Business Days following the Operating Commencement Date. The first report shall be submitted to TII no later than 40 Business Days following the Operating Commencement Date. Subsequent inspections and reports shall follow every 65 Business Days.
- 29.4.3 The Operator shall ensure that;
- Customer information signage requiring revision and/or maintenance, identified in the Customer Information Inspection Report, is replaced and/or maintained within 10 Business Days of TII's approval of the Customer Information Inspection Report;
 - Customer information hard copy items requiring revision and/or restocking, identified in the Customer Information Inspection Report, is revised and/or restocked within 20 Business Days of TII's approval of the Customer Information Inspection Report;

- Customer information audio-visual functionality or content requiring maintenance, identified in the Customer Information Inspection Report, is maintained within 20 Business Days of TII's approval of the Customer Information Inspection Report; and
- Customer information digital functionality or content requiring maintenance, identified in the Customer Information Inspection Report, is maintained within 10 Business Days of TII's approval of the Customer Information Inspection Report.

29.5 Customer Information Change Management

- 29.5.1 In the event of a change in Timetable, fares, parking tariffs or any other change to the System or Services not described in paragraphs 29.5.2 to 29.5.4 below, the Operator shall update relevant customer information in time for the implementation of the new Timetable, fares, parking tariffs or other change to the System or Services, as appropriate.
- 29.5.2 In the event of a change in the entity responsible for enforcement (clamping) at the Park and Ride Sites, the Operator shall replace all signs containing the name of the old entity with new signs containing the name of the new entity, in time for the implementation of the change in entity.
- 29.5.3 In the event of a customer behaviour pattern requiring an update to customer information, the Operator shall install updated customer information within 20 business days of instruction or approval by TII.
- 29.5.4 In the event of a change in motorist, cyclist or pedestrian access, the Operator shall design, produce and install updated customer information within 20 Business Days of instruction or approval by TII.

29.6 Customer Information on LRVs

- 29.6.1 The Operator shall ensure that each LRV is fitted with the full suite of LRV decals, as notified by TII to the Operator from time to time, throughout the Operating and Maintenance Period.
- 29.6.2 The Operator shall ensure that the passenger information displays (PIDs) on each LRV are in good working order and are publishing correct automated text messages throughout the Operating and Maintenance Period.
- 29.6.3 The Operator shall ensure that the public address (PA) system on each LRV is in good working order and that correct automated announcements are broadcast throughout the Operating and Maintenance Period.
- 29.6.4 The Operator shall ensure that drivers use the PA system on the LRVs to broadcast driver-activated recorded announcements, and live announcements, in the event of any disruptions to service, or other issues relating to the service, in compliance with Section 28.4 and the Service Disruption Communications Guidelines.

29.7 Customer Information at Stops

- 29.7.1 The Operator shall display the following signage at all Stops throughout the Operating and Maintenance Period;
- Stop name signs;
 - Stop notice boards / totem posters;

- Stop directional and operating hours signs;
- Stop CCTV signs;
- Ticket vending machines panel and decals;
- Validator decals;
- Emergency help point decals;
- PID decals.

29.7.2 The Operator shall ensure that the passenger information displays (PIDs) at all Stops display accurate real time passenger information (RTPI) data for all operating hours throughout the Operating and Maintenance Period. The Operator shall also ensure that the PIDS display relevant scrolling messages as required. The Operator shall ensure that such scrolling messages can be scheduled for publication for a selected period in advance.

29.7.3 The Operator shall, throughout the Operating and Maintenance Period, ensure that the public address (PA) system at each Stop is in good working order, and shall use the PA system to advise customers of any matters relating to the Services. The Operator shall ensure that pre-recorded announcements can be scheduled for broadcast for a selected period at a selected frequency in advance.

29.7.4 In the event of any disruption to service, or other issues relating to the service, the Operator shall ensure that PA announcements are broadcast and messages are displayed at PIDs on Stops affected, in compliance with Section 28.4 and the Service Disruption Communications Guidelines.

29.7.5 Except for the information specified in this Section 29.7, no other customer information notice, signs or fixtures, shall be posted by or on behalf of the Operator at Stops without the prior approval of TII and NTA.

29.8 Park and Ride, Bike Parking and Depot Customer Information

29.8.1 The Operator shall provide accurate and up-to-date information about all Park and Ride Sites (including Tallaght Cross where relevant) throughout the Operating and Maintenance Period. This information shall include but not limited to: location of Park and Ride Site, maximum vehicle height, number of parking spaces (including number of accessible parking spaces and number of eCar charging spaces), opening hours, parking tariffs, terms and conditions, payment instructions, enforcement measures (clamping), set-down areas for cars, and other information as may be requested by customers or TII.

29.8.2 The Operator shall provide customer information relating to the Park and Ride Sites via a number of channels, including but not limited to: signage, Website content, mobile application content, live available parking space data, and information leaflet content.

29.8.3 The Operator shall display and maintain signage at the Park and Ride Sites (excluding Tallaght Cross) that provides relevant Park and Ride information, including but not limited to: parking tariffs, terms and conditions, payment instructions, enforcement measures (clamping), call centre telephone number, property disclaimer and CCTV signage.

29.8.4 The Operator shall:

- be responsible for production and posting of Park and Ride content on the Website and mobile applications, and also on any partner website and partner mobile applications;
- identify and liaise with third-party websites regarding the publication of Park and Ride information.

29.8.5 There are bike parking racks at most Stops and more extensive bike parking facilities at selected Stops. The Operator shall provide accurate and up-to-date information about all bike parking facilities throughout the Operating and Maintenance Period. This information shall include, but not be limited to: location of facilities, number of bike parking spaces, and other information as may be requested by customers or TII.

29.8.6 The Operator shall provide customer information relating to bike parking via a number of channels, including but not limited to: Website content, mobile application content, and information leaflet content. The Operator shall:

- be responsible for the production and posting of bike parking content for the Website and mobile applications; and
- identify and liaise with third-party websites regarding the publication of bike parking information.

29.9 Website

29.9.1 The Operator shall provide and operate a responsive design Website, supported by a content management system (CMS) as outlined below, for the Services, to TII's requirements and subject to the approval of TII.

29.9.2 TII shall provide the Operator with the existing Website, currently hosted on the cloud, to assist the Operator to meet the requirements under this Section 29.9. The Operator may choose to utilise the existing Website, or to develop a new Website, with TII only providing content and the Website URL. All costs associated with the operation, maintenance and hosting of the Website shall be borne by the Operator. For clarity, any defect or omission in the existing Website, provided by TII to the Operator, does not relieve the Operator of its obligations under this Section 29.9.

29.9.3 The Operator shall ensure that the website is available 24 hours a day 7 days a week throughout the Operating and Maintenance Period. To ensure continuous availability the Website will be suitably resourced to deal with large influxes of traffic, as can be anticipated during significant disruptions to Luas services. The Operator shall use best industry practice for high availability websites in the provision of the Website.

29.9.4 In the event of failure, the Operator shall ensure that every possible effort is made to immediately fix the Website and/or the CMS. When necessary, the Operator shall make any remedial repairs to the Website and/or the CMS outside operating hours or at a time of low customer usage of the Website, to be agreed on a case by case basis with TII.

29.9.5 The visual design of the Website shall be attractive, accessible to users including users with disabilities, and compliant with relevant guidelines. The technical design of the Website and CMS shall support the visual design, functionality and features, content, analytics and reporting, and all items as outlined below.

29.9.6 The Operator shall ensure that the Website is protected from cyber-attack by all industry-standard procedures and tools.

- 29.9.7 The Operator shall provide an Irish language version of the Website.
- 29.9.8 The Operator shall provide a full range of industry-standard website functionality and features, including functionality and features outlined in the Luas Website Guidelines (to be notified by TII to the Operator from time to time). The Operator shall proactively manage Website functionality and features ensuring that all functionality and features are working correctly. The Operator shall identify, via customer feedback channels, additional functionality and features beneficial to customer usage and promotion of the system and shall be responsible for developing functionality and features subject to paragraphs 29.9.14 and 29.9.15.
- 29.9.9 The Operator shall provide a full range of website content, including text, images, video and downloads, in relation to all aspects of the Service, as outlined in the Luas Website Guidelines. The Operator shall proactively manage website content ensuring posted content is up to date and accurate and ensuring that all links and downloads are working correctly. The Operator shall identify via customer feedback channels additional content beneficial to customer usage and promotion of the system and shall be responsible for developing and posting additional content.
- 29.9.10 The Operator shall, as directed by TII or NTA, provide links to, or embedded content from, the Transport for Ireland website, its sub-websites, pages, timetables route maps, network maps and documents, the Leap Card website, the Student Leap Card website, the Child Leap Card website, public transport service websites and other related transport websites.
- 29.9.11 Where the same, similar or related content is available on the Transport for Ireland website or other websites, TII may require the Operator to provide a link to such website(s). This may be instead of or in addition to the Website content.
- 29.9.12 The Website shall be supported by a CMS which shall:
- be simple, accessible and easy to use
 - be accessible remotely and via mobile devices and desktop
 - be suitable for use by personnel with limited technical knowledge (i.e. basic PC skills)
 - provide user accounts with bespoke access levels
 - provide easy addition and removal of users
 - provide assignment of tasks integrated with email notifications
 - provide easy change of user access levels
 - provide easy addition of sub-menu items
 - provide easy addition of content pages
 - provide easy editing (i.e. similar to word processing functionality) of content pages and other pages including but not limited to text, drawings, tables, lists, hyperlinks, audio, video and document upload
 - provide search engine optimisation
 - provide easy updating of databases

- provide easy updating of menus
- be fully supported and maintained
- be accompanied by written guidelines and training videos
- be accessible by selected TII personnel, excluding permission to edit content

29.9.13 The Website shall be integrated with a website analytics tool that monitors all industry-standard website measurement metrics; Google Analytics shall be acceptable. The Operator shall develop a selection of in-tool on-demand website report templates. The Operator shall develop a website report subject to the approval of TII, and shall include this report in the Period Report described in Schedule 32:. The website analytics tool shall:

- provide all industry-standard website measurement metrics
- issue reports on all key website measurement metrics
- issue automated reports
- issue on-demand reports
- be accessible to selected TII personnel
- exclude Operator and TII IP addresses from analytics

29.9.14 The Operator shall, if required by TII and NTA, completely refresh the Website content, visual design, functionality, features and reporting at least once during the Operating and Maintenance Period.

29.9.15 The Operator shall submit proposals for any changes to the Website content, visual design, functionality, features and reporting to TII for approval prior to such changes being made.

29.10 Real Time Passenger Information System

29.10.1 The Operator shall operate and maintain the real time passenger information (RTPI) system which is hosted on cloud computing resources. The RTPI system receives information from the automatic vehicle location system (AVLS) and processes forecast messages for publishing on the Website and mobile applications. The RTPI system also forwards information to NTA for use on NTA's Transport for Ireland website and mobile applications. The RTPI system also provides the service disruption module integrated with the Website and social media channels.

29.10.2 The Operator shall monitor the accuracy of the forecast messages created by the RTPI system by comparing the forecasts to those presented on the PIDs at Stops.

29.10.3 The Operator shall be responsible for all hosting costs, maintenance costs, and internet connection costs required to facilitate the operation of the RTPI system. TII retains all intellectual property rights over the RTPI system and retains all change control authority.

29.10.4 The Operator shall monitor the performance of the RTPI system and shall include a report on the performance of the RTPI system in the Period Report described in Schedule 32:. This report shall be in a format and at a level of detail notified by TII to the Operator from time to time, and shall, at a minimum, show the number and duration of all outages, any bugs ongoing or logged during the Operating Period and accuracy of the forecasts.

29.10.5 The Operator shall interface with all stakeholders, including the public, and propose changes to TII on corrections or improvements to the RTPI system.

29.10.6 The Operator shall ensure that the RTPI system is available 24 hours a day 7 days a week throughout the Operating and Maintenance Period. To ensure continuous availability, the RTPI system will be suitably resourced to deal with large influxes of traffic, as can be anticipated during significant disruptions to Luas services. The Operator shall use best industry practice for high availability websites in the provision of the RTPI system.

29.10.7 In the event of failure, the Operator shall ensure that every possible effort is made to immediately fix the RTPI system. When necessary, the Operator shall make any remedial repairs to the RTPI system outside operating hours or at a time of low customer usage of the RTPI system, to be agreed on a case by case basis with TII.

29.10.8 The Operator shall, throughout the Operating and Maintenance Period, be responsible for the operation of the service disruption module in line with the Service Disruption communications requirements described in Schedule 28:.

29.11 **Mobile Applications**

29.11.1 The Operator shall be responsible for the ongoing support and maintenance of the:

- Luas iOS mobile application;
- Luas Android mobile application; and
- Luas Vision Impaired iOS mobile application.

29.11.2 The Operator shall ensure that the mobile applications are operational throughout the Operating and Maintenance Period. In the event of failure, the Operator shall ensure that every possible effort is made to immediately fix the mobile applications. When necessary, the Operator shall make any remedial repairs to the mobile applications outside operating hours or at a time of low customer usage of the mobile applications, to be agreed on a case by case basis with TII.

29.11.3 The Operator shall be responsible for the management of updates to the mobile applications as required to:

- ensure continued optimum operation of the mobile application with the latest smartphone operating system updates.
- Ensure update of the in-app fares widget in the event of a change to fares. The go-live of updated fares in the app shall be timed to coincide with the go-live of fare changes on the System.
- ensure update of the in-app operating times information and/or widget in the event of a change to Luas operating times. The go-live of updated operating times in the app shall be timed to coincide with the go-live of operating times on the System.
- ensure update of the in-app Park and Ride, bike parking, lost and found, news and other customer information in the event of a change to the such information. The go-live of updated information in the app shall be timed to coincide with the go-live of changes to the Services.

- 29.11.4 The Operator shall not provide, develop or amend any mobile applications, or assist in the development of any third party mobile applications, without the prior approval of TII and NTA.
- 29.11.5 The Operator shall monitor the performance of the mobile applications and shall include a report on the performance of the mobile applications in the Period Report described in Schedule 32:. This report shall be in a format and at a level of detail notified by TII to the Operator from time to time, and shall, at a minimum, show the number and duration of all outages and any bugs ongoing or logged during the Operating Period. This report may be combined with the RTPPI system report.
- 29.11.6 The Operator shall, as directed by TII or NTA, provide links in the mobile applications to, or embedded content from, the Transport for Ireland website, its sub-websites, pages, timetables, route maps, network maps and documents, the Leap Card website, the Student Leap Card website, the Child Leap Card website, public transport service websites and other related transport websites.

Schedule 30: Communications and Public Relations

30.1 Annual Communications and Public Relations Plan

- 30.1.1 The Operator shall develop an Annual Communications and Public Relations Plan for each calendar year of the Operating and Maintenance Period. The Operator shall submit its first Annual Communications and Public Relations Plan, covering the period between the Operating Commencement Date and the end of the following calendar year, to TII and NTA for approval no later than 40 Business Days prior to the Operating Commencement Date. The Operator shall submit subsequent Annual Communications and Public Relations Plans no later than 1 October each year for the following calendar year.
- 30.1.2 The Annual Communications and Public Relations Plan shall include, but not be limited to, the matters set out in Sections 30.3 to 30.17 of this Schedule. TII and NTA shall provide the Operator with such comments and amendments as it requires in respect of the Annual Communications and Public Relations Plan within 20 Business Days of receipt from the Operator.
- 30.1.3 The Operator, TII and NTA may agree further amendments to the Annual Communications and Public Relations Plan from time to time.
- 30.1.4 The Operator shall implement the approved Annual Communications and Public Relations Plan for each calendar year of the Operating and Maintenance Period.

30.2 Quarterly Communications and Public Relations Plan

- 30.2.1 No later than 25 Business Days before the start of each Quarter, the Operator shall submit a detailed Quarterly Communications and Public Relations Plan for that Quarter for approval by TII and NTA setting out:
- its proposals in relation to the communications and public relations activities to be undertaken by the Operator during that Quarter;
 - its proposals in relation to the amount to be spent by the Operator on communications and public relations and other promotional activities during that Quarter;
 - its proposals for measuring the success of the activity;
 - the measured outcomes of previous Quarterly Communications and Public Relations Plans;
 - its proposals in relation to the duration of each specific communications or public relations activity during that Quarter; and
 - such other matters as TII and NTA may determine.
- 30.2.2 TII and NTA may approve the draft Quarterly Communications and Public Relations Plan, or may require amendments and re-submission of the Plan for approval.
- 30.2.3 Following approval by TII and NTA of a Quarterly Communications and Public Relations Plan, the Operator shall implement such Quarterly Communications and Public Relations Plan in accordance with its terms.

30.3 Approvals Protocol

- 30.3.1 TII's approval of the Annual and Quarterly Communications and Public Relations Plans shall include provisional approval of specific initiatives outlined in the plans. Prior to the implementation of these specific initiatives, the Operator shall obtain TII's further approval of the finalised activity and creative for the communications initiative, in line with an approvals protocol to be notified by TII to the Operator from time to time.
- 30.3.2 Once per week, the Operator shall conduct a communications meeting with TII. The purpose of the meeting shall be for the Operator to update TII on all communications activity and discuss related issues. TII may waive this required from time to time, if there is limited updated information.
- 30.3.3 The Operator shall obtain the approval of TII for any communications relating to the Services, that it intends to undertake on its own behalf, prior to publishing such communications.
- 30.3.4 The Operator's provision of communications and public relations relating to the Services shall comply with the Communications Compliance Guidelines as notified by TII to the Operator from time to time.

30.4 NTA Marketing and Promotions

- 30.4.1 The Operator shall facilitate NTA in its promotion of public transport, including but not limited to attendance should NTA require, at customer engagement meetings at NTA offices on a monthly basis, or at such other intervals as agreed between the parties.

30.5 NTA Communications

- 30.5.1 NTA's Head of Communications and Public Affairs shall advise the Operator's Media and Communications Manager in advance of any key press and public communications in relation to the Services.
- 30.5.2 The Operator shall facilitate any NTA communications on its media channels.

30.6 Operator Communications

- 30.6.1 The Operator's Media and Communications Manager shall liaise with TII and NTA's Head of Communications and Public Affairs prior to any key press and public communications being made.
- 30.6.2 Where the Operator proposes to publish marketing, communications or advertising material in relation to fares, it shall do so subject to the approval of TII and NTA.
- 30.6.3 NTA shall facilitate Operator communications in relation to the Services on its media channels.

30.7 Communications and Public Relations Staff

- 30.7.1 The Operator shall designate a member of staff with primary responsibility for communications. This person shall be TII's primarily point of contact for communications, shall liaise with TII on all communications matters outlined in this Schedule, and shall attend meetings with TII and NTA when required.

30.7.2 The Operator shall designate a member of staff with primary responsibility for public relations and community and stakeholder management as outlined in Sections 30.13 and 30.17. This person shall be TII's primary point of contact for public relations and community and stakeholder management, shall liaise with TII on all public relations and community and stakeholder management matters outlined in this Schedule, and shall attend meetings with TII when required.

30.7.3 Notwithstanding paragraphs 30.7.1 and 30.7.2 above, the Operator shall appoint sufficient staff to meet its obligations under this Schedule.

30.8 Communications Messages

30.8.1 The Operator shall be responsible for communications to inform customers, influence the behaviour of customers, and influence the behaviour of other target groups in accordance with the approved Annual Communications and Public Relations Plan.

30.8.2 The Operator shall support TII, NTA and stakeholder communications including communications in relation to Leap, Transport for Ireland, NTA-led multi-operator anti-racism campaigns, multi-operator Tax Saver campaigns, and joint campaigns with An Garda Síochána and other Competent Authorities.

30.8.3 In addition to its obligations in relation to customer information set out in Schedule 29, the Operator shall be responsible for communications relating to, without limitation:

- Safety, e.g. safety of passengers, pedestrians, children, cyclists and motorists, discouraging unsafe passenger behaviour and unsafe behaviour by others.
- Security, e.g. promoting security efforts, encouraging customers to report anti-social behaviour and vandalism, discouraging anti-social behaviour and vandalism.
- Fares and fare compliance, e.g. fare changes, making customers aware of the revenue protection measures in place and the consequences of not having a valid ticket or validated Leap Card.
- Customer behaviour, e.g. encouraging good customer etiquette, discouraging racism towards Staff and other customers, discouraging littering.
- Service information, e.g. timetable changes, special timetable arrangements at Christmas, Easter and St. Patrick's Day, Public Events, planned disruptions to service, changes to ticketing or fare collection, promotion of Park and Ride.
- Customer engagement, e.g. building engagement via mobile applications, Website, eNewsletter, social media channels and new engagement channels.
- Community and stakeholder management, e.g. security initiatives, safety initiatives, corporate social responsibility initiatives, sustainability, donations, sponsorship and community support.

30.9 Communications Channels

30.9.1 The Operator shall set out, in its Annual Communications and Public Relations Plan, the channels that it intends to use in its communications with customers and other target groups. It is expected that the Operator will make full use of a wide range of communications

channels, as outlined in the Luas Communications Channel Matrix, to be notified by TII to the Operator from time to time.

30.10 Owned Media Space

30.10.1 Commercial advertising space on the System, at Stops and on LRVs, is sold by the Luas advertising contractor in the format of portrait panels and straplines on LRVs and advertising columns on Stops. As part of the Luas Advertising Contract, TII is entitled to 15% of the commercial advertising space for each two-week outdoor advertising cycle ("Owned Media Space").

30.10.2 TII shall divide the Owned Media Space between the Operator, TII, and NTA. Priority shall be given to TII and NTA activity. It is anticipated that TII shall allocate the majority of Owned Media Space to the Operator.

30.10.3 Owned Media Space shall be provided to the Operator free of charge (i.e. no media or posting/removal costs). The Operator shall be responsible for the design, print/production and delivery of Owned Media Space advertisements for Operator communications activity. Use of Owned Media Space shall comply with Owned Media Space guidelines as notified by TII to the Operator from time to time.

30.11 Owned Column Blanking

30.11.1 As part of the Luas Advertising Contract, TII is entitled to use unsold advertising space on advertising columns ("Column Blanking Space"). The volume of Column Blanking Space depends on the volume of unsold advertising space on advertising columns.

30.11.2 TII shall divide the Column Blanking Space between the Operator, TII and NTA. Priority shall be given to TII and NTA activity. It is anticipated that TII shall allocate the majority of Column Blanking Space to the Operator.

30.11.3 Column Blanking Space shall be provided to the Operator free of charge (i.e. no media, no printing/production costs and posting/removal costs). The Operator shall be responsible for the design of Column Blanking Space advertisements for Operator communications activity. Use of Column Blanking Space shall comply with Column Blanking Space guidelines as notified by TII to the Operator from time to time.

30.12 Owned Stop Posters

30.12.1 "Owned Stop Posters" are owned communication sites on the System, consisting of A1 size portrait adhesive posters posted to the shelter glass on platforms. Owned Stop Posters are available at most, but not all, platforms.

30.12.2 TII shall divide Owned Stop Poster space between the Operator, TII and NTA. Priority shall be given to TII and NTA activity. It is anticipated that TII shall allocate the majority of Owned Stop Poster space to the Operator.

30.12.3 Owned Stop Poster space shall be provided to the Operator free of charge (i.e. no media costs). The Operator shall be responsible for the design, printing/production, delivery and posting/removal of Owned Stop Posters for Operator communications activity. Use of Owned Stop Posters shall comply with Owned Stop Poster space guidelines as notified by TII to the Operator from time to time. .

30.13 Public Relations and Media Management

30.13.1 The Operator shall be responsible for public relations (PR) in relation to the Services in accordance with the approved Annual Communications and Public Relations Plan.

30.13.2 The Operator shall provide a media point of contact, and shall monitor and respond to media queries, 24/7 throughout the Operating and Maintenance Period.

30.13.3 The Operator shall be responsible for proactive PR activity to communicate key messages as outlined in Section 30.8, and for developing and implementing PR initiatives and joint PR initiatives with partners.

30.13.4 The Operator shall provide a media monitoring service in line with industry best practice. The media monitoring service shall monitor, on a continuing basis, the editorial content of traditional and new media including TV, radio, print, websites. The media monitoring service shall deliver media alerts once daily linked to online copies of content or, where not accessible, details of content.

30.13.5 The media monitoring service shall also monitor social media content and shall deliver by email a social media content report for each Reporting Period. Selected TII and NTA staff shall receive media alerts and the social media content report.

30.13.6 The media monitoring service shall provide monitoring and reports, including copies of media content and value of media content, for proactive PR initiatives.

30.14 Customer Engagement via Social Media and Content Sharing

30.14.1 The Operator shall be responsible for the operation of Luas social media and content sharing accounts including Facebook Page, Twitter Account, YouTube Account and Instagram Account, in compliance with the Luas Social Media Guidelines and the NTA Social Networking and Social Media Policy, as notified by TII to the Operator from time to time.

30.14.2 The Operator, NTA and TII shall jointly review social media channels once per calendar year or at the request of TII, with a view to identifying additional social media or content sharing accounts that may need to be started or accounts that may no longer be required.

30.14.3 The Operator shall be responsible for the maintenance of the social media and content sharing accounts, ensuring that all static content, images, automated responses, information, policies and links are working correctly, and ensuring that content is optimised for the relevant social media or content sharing site including mobile viewing.

30.14.4 The Operator shall update social media and content sharing site profiles and channel images as outlined in the Luas Social Media Guidelines and compliant with the Luas and TFI Brand Guidelines, as notified by TII or NTA to the Operator from time to time.

30.14.5 The Operator's obligations in relation to monitoring and responding to inbound communications, and issuing service disruption updates, on social media channels are set out in Schedule 28:

30.14.6 The Operator shall ensure that service disruption updates and responses to inbound communications do not dominate the social media content published. The Operator shall publish engagement content on the social media channels to communicate key messages as outlined in the Luas Social Media Guidelines.

30.14.7 The Operator shall be responsible for the design, writing and publication of content on the social media channels including text, image, video and any other relevant content formats.

30.14.8 The Operator shall measure the performance of all social media and content sharing channels and shall submit a social media measurement report for each Reporting Period, as part of the Period Report described in Schedule 32:. This report shall provide details of content published and inbound communications, and shall be in a format and at a level of detail notified by TII to the Operator from time to time.

30.14.9 The Operator shall provide to TII or NTA backend access to the social media and content sharing accounts as requested by TII or NTA. The Operator shall maintain integration with TII's chosen monitoring tools.

30.15 Customer Engagement via Website and Mobile Applications

30.15.1 In addition to its obligations in relation to the Website set out in Schedule 29:, the Operator shall maintain and operate the customer engagement elements of the Website described the Luas Website Guidelines.

30.15.2 In addition to its obligations in relation to mobile applications set out in Schedule 29:, the Operator shall maintain and operate the customer engagement elements of the mobile applications listed below. These elements are described in the Luas Application Guidelines, as notified by TII to the Operator from time to time.

- News Stream, which shall duplicate the Website news stream automatically;
- Push notifications, for new information published to the Travel Update page and for new news stories published to the News Stream.

30.16 Customer Engagement via eNewsletter

30.16.1 The Operator shall provide, operate and maintain an outbound email distribution tool to continue the distribution of the Luas eNewsletter "Inside Track" to the eNewsletter database (currently circa 20,000 contacts).

30.16.2 The Operator shall provide a responsive online eNewsletter sign-up form. This sign-up form shall be integrated into the Website, the mobile applications and the social media channels.

30.16.3 The Operator shall provide an outbound email distribution tool with industry-standard functionality.

30.16.4 The Operator shall issue the eNewsletter once per calendar month January to November and twice in December, subject to the Approvals Protocol outlined in Section 30.3. The Operator shall create text and visual content for the eNewsletter.

30.16.5 The Operator shall submit to TII a report detailing industry-standard metrics for each eNewsletter issued.

30.17 Community and Stakeholder Management

30.17.1 The Operator shall develop and, subject to TII's approval, implement a corporate social responsibility policy. This policy shall define the responsibility of Luas to the community, environment, customers and employees, and shall outline how the Operator will integrate social and environmental concerns into the delivery of the Services.

30.17.2 The Operator shall liaise with, attend and contribute to meetings of, and facilitate visits to the System by, the following groups, in order to build cooperative relationships:

- sustainability stakeholders
- policing forums in the System catchment area
- community groups and residents' associations in the System catchment area

30.17.3 The Operator shall liaise with schools and youth organisations in the System catchment area to build positive relationships and educate students and youth about safety and security on the System. The Operator shall facilitate visits to the System by schools and youth organisations.

30.17.4 The Operator shall develop a sponsorship, donations and support policy, and implement the policy in an ethical and transparent manner.

Schedule 31: Quality Management

31.1 Quality Management System and Quality Management Plan

31.1.1 The Operator shall develop and implement a Quality Management System with a corresponding Quality Management Plan within six months of the Operating Commencement Date.

31.1.2 The Operator shall gain accreditation to ISO 9001 within two years of the Operating Commencement Date, and shall maintain such accreditation for the remainder of the Operating and Maintenance Period.

31.1.3 The Operator shall, in performing its obligations under the Contract, comply at all times with the Quality Management System, which shall comply with:

- ISO 9001
- All other requirements of the Contract

31.1.4 The Quality Management System shall reflect all documentation requirements including but not limited to the following:

- (a) Transition Plan;
- (b) Safety Management Document, including:
 - Emergency Management Plan
- (c) Service Control Plan;
- (d) Severe Weather Management Plan;
- (e) LRV Annual Maintenance Plans;
- (f) LRV Cleaning Checklist;
- (g) Infrastructure Annual Maintenance Plan;
- (h) Infrastructure Cleaning Checklist;
- (i) Infrastructure Maintenance Procedures;
- (j) Landscape Management Plan;
- (k) Security Management Plan;
- (l) Park and Ride Management Plan;
- (m) Customer Service Policy;
- (n) Customer Information Plan; and
- (o) Annual Communications Public Relations Plan.

31.1.5 The Quality Management System shall be based upon the following principles:

- Appropriate procedures to achieve the requirements of the Contract;

- Provision of relevant training for all levels of Staff and Sub-Contractors to implement and fulfil the requirements of the Contract;
- Allocation of sufficient resources, including appropriate management resources, to implement and fulfil the requirements of the Contract;
- Preparation and maintenance of appropriate quality records to demonstrate full compliance with the Quality Management System;
- Preparation and maintenance of appropriate organisational charts including a quality organisation chart to identify the responsibilities, authority and interrelation of all Operator's Personnel who manage, perform and verify work affecting quality. This chart shall identify the Operator's Staff member responsible for quality;
- Appropriate audit arrangements to demonstrate compliance with Quality Management System and the Contract; and
- Appropriate monitoring of Sub-Contractors' quality systems and arrangements to ensure that such Sub-Contractors' quality management systems are based upon the relevant requirements of the ISO series standards or their equivalent British or European standard appropriate to the Sub-Contractors' relevant scopes of supply.

31.1.6 The Operator shall submit its Quality Management System and Quality Management Plan to TII as required from time to time. The Quality Management Plan shall include plans to measure, monitor and improve quality and shall include as a minimum the following:

- organisation, leadership and management arrangements aimed at ensuring quality;
- arrangements for documentation control and data sharing and retention;
- planning, checking, review, assessment, measurement, audit and improvement arrangements;
- a schedule of internal and external audits;
- actions taken to close out or mitigate issues arising from both internal and external audits; and
- a schedule for review and update of the Quality Management System.

31.1.7 The Operator shall, from time to time, submit to TII:

- the results of any of the Operator's own internal quality audits; and
- any changes to the Quality Management System or Quality Plans

31.1.8 The Operator shall allow its Quality Management System and Quality Plans to be audited from time to time by TII.

31.1.9 Notwithstanding any other provision of this Schedule, the Operator shall provide to TII such information as TII may reasonably require demonstrating compliance with the Contract and ISO 9001.

Schedule 32: Records and Reporting Requirements

32.1 Records to be kept

32.1.1 The Operator shall maintain the following Records for a period of no less than 7 years after the end of the year to which such Records relate:

- Records of open passenger and third party complaints (Records of closed complaints shall be retained in accordance with the Operator's GDPR policies as required by Clause 8.8 (Data Protection))
- Records of correspondence and dealings with NTA and TII
- Records of dealings with public liaison committees and public interest groups
- Records required by the Operator's Quality Management System and Quality Plans
- Contracts not under seal entered into by the Operator in relation to the System (where contracts are entered into under seal same shall be maintained for 13 years)

32.1.2 The Operator shall maintain the following Records for a period of no less than 7 years after the Expiry Date or the termination of this Contract (save for those Records relating to incidents involving minors which must be maintained until the minor has attained 21 years):

- Records relating to incidents or accidents, the investigation thereof and correspondence with the Commission for Railway Regulation and other third parties in relation thereto
- Records relating to any legal actions brought against the Operator in relation to the System
- Records required by the Operator's Safety Management System
- Records required by any other of the Operator's procedures, systems and plans
- LRV maintenance, infrastructure maintenance and AFCS maintenance records
- Training records
- Required Insurance Policies
- Any records required to be kept pursuant to a Legal Requirement or the requirements of a Competent Authority
- Any records which TII reasonably requires the Operator to keep in order to meet a Legal Requirement (upon NTA, TII or the Operator) or the requirements of a Competent Authority or other public authority

32.1.3 All records kept by the Operator shall be made available to TII within ten (10) Business Days upon request, in open source format.

32.1.4 The Operator shall, upon expiry of the Contract, hand over to TII, in open source format, such records as TII request and shall licence NTA and TII to use any software or information system required to access the records for a period of at least 1 year following the Expiry Date at no cost to NTA or TII.

32.2 Period Report

32.2.1 The Operator shall, within ten Business Days after the end of each Reporting Period, provide a Period Report to TII. The content and format of the Period Report shall be notified by TII to the Operator from time to time.

32.2.2 The Period Report shall include but not be limited to the following:

- An executive summary detailing the major events on the System during the Reporting Period
- A report on operations during the Reporting Period, including details of any Service Interruptions, Replacement Bus Services, Public Events, and Additional Passenger Services provided
- A report on the achievement of the Performance Standards during the Reporting Period, including the calculation of the System Performance Bonus and System Performance Deduction as described in Schedule 34:
- A report on revenue collection during the Reporting Period, including ticket sales and Leap tag-ons and top-ups as described in paragraph 5.5.1 of Schedule 5:
- A report on Revenue Protection Activity during the Reporting Period including information on Standard Fares as described in paragraph 6.2.2 of Schedule 6:
- A report on safety performance during the Reporting Period, including the information described in Section 7.9 of Schedule 7:
- A report on environmental performance during the Reporting Period, including energy consumption, waste generation and any environmental complaints (including noise and vibration complaints) received
- A report on LRV maintenance during the Reporting Period, including information on availability and reliability as described in Section 12.6 of Schedule 12:, and achievement of the Performance Standards for LRV Maintenance set out in Schedule 15:
- A report on infrastructure maintenance during the Reporting Period, including the achievement of the Performance Standards for LRV Maintenance set out in Schedule 21:
- A report on AFCS maintenance during the Reporting Period, including the AFCS Maintenance Contractor's report as described in Clause 17.2 of the AFCS Maintenance Contract
- A report on management of the Park and Ride Sites during the Reporting Period
- A report on security performance during the Reporting Period including anti-social behaviour and vandalism statistics as described in paragraph 26.7.1 of Schedule 26:
- A report on customer service performance during the Reporting Period, including customer inbound communications as described in Section 28.12 of Schedule 28: This report shall include a spreadsheet containing information on each complaint, comment or suggestion as follows: Reference number, date of submission, contact means (email, letter, phone, webform etc), category, subcategory, Luas line (if relevant), time/date of incident (if relevant/available), time to resolution of complaint, manner of resolution.

- A report on customer information during the Reporting Period, including the website report described in paragraph 29.9.13 of Schedule 29; and performance of RTPi and the mobile applications as described in paragraphs 29.10.4 and 29.11.5 respectively of Schedule 29:
- A report on communications and public relations activity during the Reporting Period, including the social media measurement report described in paragraph 30.14.8 of Schedule 30:
- A report on information security, as described in paragraph 33.4.2 of Schedule 33:Schedule 29:
- Details of any works performed on or near to and affecting the System during the Reporting Period
- Details of any projects affecting the System during the Reporting Period
- Any human resources issues including industrial relations disputes affecting the System
- Any other issues relevant to the performance of the Contract or other items required by TII from time to time

32.2.3 If TII believes that the Period Report has either not been compiled in accordance with the Contract or has been based on erroneous information or data, it may require the Operator to correct the errors and re-submit the Period Report within five Business Days of being notified, and the Operator shall comply with any such requirement.

32.3 Revenue Report

32.3.1 At the same time as providing the Period Report, the Operator shall provide a report on Revenue ("Revenue Report") to TII which shall set out:

- An executive summary and commentary highlighting the main issues affecting Revenue during the Reporting Period.
- Income statement, Balance Sheet Account, Trial Balance, Cashflows and supporting analysis, in a format and content to be defined by TII;
- Bank reconciliation in a format prescribed by TII which reconciles, at a transactional level, all Revenue posted to the general ledger to the bank statements, and provides a full explanation and supporting documentation for all unreconciled items;
- Reconciliation, in a format prescribed by TII, of all Revenue (and any related adjustments) posted to the general ledger to the Revenue presented in the System Charge;
- Reconciliation of any amounts owed to/by the Operator at the end of a Reporting Period to supporting documentation;
- Evidence of review by the Operator's finance manager along with supporting checklists and signoffs;
- Any other information that TII deems necessary to gain assurance over the reported Revenue figures.

32.3.2 The Operator shall provide summary Revenue data to TII in a format deemed by TII to be suitable for upload to TII's financial systems.

Schedule 33: Governance, Risk and Compliance

33.1 Introduction

- 33.1.1 The Operator shall be responsible for managing governance, risk, compliance (“GRC”) and information security relating to the Services, including AFCS services.
- 33.1.2 The Operator shall designate a member of staff who shall be responsible for the management of GRC and information security.
- 33.1.3 In accordance with Clause 26.7 (Attendance at Meetings), the Operator shall attend meetings with TII to discuss matters relating to GRC and information security. These meetings shall include but not be limited to the following:

Meeting Name	Purpose	Frequency
Information Security Review Meeting	To review information security risks and mitigation plans	Four-weekly
Audit Review meetings	To review audits carried out and audits planned	As required
Policy Documentation Review	To review GRC and information security policy documentation	Four-weekly

33.2 Risk Management

- 33.2.1 The Operator shall develop, agree with TII and implement a structured, consistent, and continuous process for identifying, documenting, Tracking, assessing, deciding on response to, and reporting on risks to the provision of the Services relating to governance, compliance and information security. As part of this process, the Operator shall establish and maintain a risk register. This risk register shall be shared with TII on at least a four-weekly basis.
- 33.2.2 The risks contained in the risk register shall be suitably categorised, weighted and prioritised according to the severity, probability and impact. Each risk shall include a narrative description of the risk, details of who owns the risk and proposals for risk mitigation. The categories of risk shall include but not be limited to:
- Information security risk
 - Financial risk
 - Compliance risk
 - Data Protection Risk
- 33.2.3 The Operator shall manage all risks to conclusion on a timeline to be agreed with TII.

33.3 Compliance

- 33.3.1 The Operator shall develop, agree with TII and implement a process for compliance management which documents and Tracks the Operator's compliance with the following:
- ISO27001 or equivalent (Certification Required)
 - PCI-DSS (Certification by Qualified Security Assessor)

- ISO9001
- GDPR
- Network and Information Security (NIS) directive (The Services do not currently fall under the NIS Directive. Applicability will be reviewed during the Operating and Maintenance Period).

33.3.2 The Operator shall provide assurances of compliance and certification to TII on an annual basis, or upon request.

33.4 Information Security Policy

33.4.1 The Operator shall develop and agree with TII an Information Security Policy, to be effective prior to the Operating Commencement Date, which shall include but not be limited to:

- Information security incident management
- Information security/personal data breach management
- Active information security management and monitoring
- Information security risk management
- Information security awareness training (annual) including relevant 3rd parties
- Change management relating to information security
- Access Control Policy

33.4.2 The Operator shall include a report on information security in the Period Report described in Section 32.2.

33.5 Audit

33.5.1 The Operator shall, as a minimum, perform the audits set out below, unless otherwise agreed with TII:

Audit	Frequency
Principal Sub-Contractor Information Security Audit	Annual
Independent GDPR Audit	Annual
Independent Security Posture Assessment (Luas System)	Annual
ISAE-3000 Financial Audit	Annual

33.5.2 In accordance with Clause 30.2 (Supply of Information and Access to the System) and Clause 30.3 (Audit by TII) the Operator shall assist TII in carrying out audits of GRC and information security relating to the Services, which shall include but not be limited to the following:

Audit	Frequency
Operational and Information Security Policy and Procedure audit	Annual
Information Security Governance and Risk Management Audit	Annual
Physical and Environmental Security Audit	Annual
ISAE-3402 Financial Audit	Annual
COFC Assessment	Annual
Financial Audit	Annual

- 33.5.3 The Operator shall produce annual audit plans which shall set out the audits to be undertaken, the scope of the audits, the programme of audits and the entity which is to perform the audits.
- 33.5.4 The Operator shall procure an independent assurance review on an annual basis (ISAE-3000) in respect of its processes which are relevant to Leap, the scope of which shall be agreed in advance with TII and the results of such exercises shall be made available to TII. The cost of procuring such audits shall be borne by the Operator.
- 33.5.5 The Operator shall provide reports on all audits undertaken, including those generated by its own Internal Audit function or any third party which contain relevant findings which may impact the Services, to TII within ten (10) Business Days of completion of the audits. Such reports shall include a summary of the findings and proposed actions from the audits. Where matters arising within such reports are significant in nature, the Operator shall notify TII promptly, and in any event within three Business Days, of the matters concerned.
- 33.5.6 Where any part of the Services is carried out by a Sub-Contractor, the Operator shall ensure that all provisions included within this section are adhered to by the Sub-Contractor.
- 33.6 Business Continuity and Disaster Recovery Plan**
- 33.6.1 TII intends to provide a standby control room and technical room for use in the event of unavailability of the Central Control Room and/or technical room at Red Cow. The Operator shall develop and agree with TII a Business Continuity and Disaster Recovery Plan for the continuous operation of the System in the event of disaster recovery invocation. The Operator shall submit the Business Continuity and Disaster Recovery plan to TII no later than three months after the Operating Commencement Date.
- 33.6.2 The Operator shall maintain and update the Business Continuity and Disaster Recovery plan to reflect any changes to the System or the Services.

Schedule 34: Performance Monitoring

34.1 General

34.1.1 The Operator shall monitor its performance in relation to the Contract. The Operator shall calculate the System Performance Bonus and System Performance Deduction for each Reporting Period.

34.1.2 The System Performance Bonus for each Reporting Period shall be:

- the EWT Bonus

34.1.3 The System Performance Deduction for each Reporting Period shall be the sum of:

- the Lost Kilometres Deduction;
- the Early/Late Departure Deduction;
- the EWT Deduction;
- the Customer Service Deduction;
- the LRV Maintenance Deduction; and
- the Infrastructure Maintenance Deduction.

34.1.4 Each bonus and deduction shall be calculated on the basis of the Operator's achievement or non-achievement of the Performance Standards.

34.1.5 The Performance Standards are the Lost Kilometres Standard, the Early/Late Departure Standard, the EWT Standard and the standards contained in the following Tables:

- **Error! Reference source not found.** for Customer Service;
- Table 35-2 for Mystery Shopper Surveys;
- **Error! Reference source not found.** for LRV Maintenance; and
- Table 21-1 for Infrastructure Maintenance.

34.1.6 System Performance Deductions calculated in accordance with this Schedule 34: shall not apply to the extent that there is an express statement elsewhere in the Contract stating that System Performance Deductions shall not apply. System Performance Deductions shall not apply where a Project Event, entitling the Operator to relief from System Performance Deductions, has occurred, to the extent provided for in Schedule 35:.

34.2 The Lost Kilometres Deduction

34.2.1 The Operator shall be required to operate 100% of Scheduled Service Kilometres (the "Lost Kilometres Standard") in each Reporting Period. If a Trip fails to operate, or does not operate fully, then the Operator shall record the Scheduled Service Kilometres not operated by that Trip ("Lost Service Kilometres") and the cause of the Lost Service Kilometres.

34.2.2 The Operator shall include in each Period Report details of the Lost Service Kilometres for that Reporting Period categorised by Line and by cause, in a format notified by TII to the Operator from time to time.

- 34.2.3 To the extent that the Operator does not operate 100% of Scheduled Service Kilometres in a Reporting Period then the Operator shall be liable to a Lost Kilometres Deduction.
- 34.2.4 The Lost Kilometres Deduction for each Reporting Period shall be the Lost Service Kilometres for that Reporting Period multiplied by the Price per Scheduled Service Kilometre set out in **Error! Reference source not found.**, Indexed.
- 34.2.5 In respect of any Trips which the Operator can demonstrate to the reasonable satisfaction of TII were not run by reason of National/Industry Wide Strike (as defined in Schedule 35:), notwithstanding the use by the Operator of its best endeavours to run such Trips, the Lost Kilometres Deduction shall be calculated in accordance with the formula in paragraph 34.2.4, save that the Lost Service Kilometres shall be multiplied by a value equal to 50% of the Price per Scheduled Service Kilometre set out in **Error! Reference source not found.**, Indexed.
- 34.2.6 No Lost Kilometres Deduction shall apply in respect of any Lost Service Kilometres which the Operator can demonstrate, to the reasonable satisfaction of TII, were lost for the following reasons:
- Failure of traffic signals to function, insofar as such failure is not attributable to any failure of the System; or
 - Instruction received from An Garda Síochána, Dublin Fire Brigade or any other Competent Authority not to operate services on a specific section of the System due to an incident or Public Event.
- 34.2.7 For the avoidance of doubt, if the circumstances described in paragraph 34.2.6 lead to a Service Interruption, then the Operator must still comply with its obligations in relation to Bus Activations and/or Replacement Bus Services in accordance with Section 4.9 of Schedule 4:.

34.3 The EWT Bonus and EWT Deduction

- 34.3.1 Service regularity shall be measured by means of excess waiting time ("EWT"). TII shall designate a number of Stops ("Timing Points") on each Line where EWT, in each direction, is to be calculated. TII may change some or all of the Timing Points from time to time.
- 34.3.2 TII has developed an EWT reporting system that extracts, from the AVL System, the time that every LRV in passenger service arrives at the exit loop at each Timing Point. From this, the Headway between each LRV, except for Additional Passenger Services, is calculated at each Timing Point.
- 34.3.3 The Operator shall run an EWT Report for each Reporting Period. The EWT Report shall show EWT for each Line averaged across all the Timing Points for that Line. The Operator shall exclude from the EWT Report periods of time during which the AVL System was unavailable at some or all Timing Points, and periods of time during which Bus Activations were in place or Replacement Bus Services were in operation at some or all Timing Points or the circumstances described in paragraphs 4.9.8 and 4.9.9 applied at some or all Timing Points.
- 34.3.4 The EWT Report shall enable the Operator to see how EWT for each Line has been built up from the EWT at each Timing Point in each direction on that Line. For each Timing Point in each direction, the Operator will be able to see how EWT for the Reporting Period has been built up from the EWT for each day of the Reporting Period. For each Timing Point in each direction, and for each day of the Reporting Period, the Operator will be able to drill down to

the level of scheduled and actual individual tram arrivals in order to verify the calculation of SWT, AWT and hence EWT.

34.3.5 EWT = Average Waiting Time (“AWT”) less Scheduled Waiting Time (“SWT”).

AWT is derived from the formula:

$$AWT = \frac{\sum_{n=1}^{NA} (HA_n)^2}{2 \times \sum_{n=1}^{NA} HA_n}$$

where,

NA = The number of actual Headways observed at the Timing Points during the Reporting Period

HA_n = The value, in minutes, rounded to nearest hundredth of a minute, of each actual Headway (n = 1 to NA) observed at the Timing Points during the Reporting Period

SWT is derived from the formula:

$$SWT = \frac{\sum_{n=1}^{NS} (HS_n)^2}{2 \times \sum_{n=1}^{NS} HS_n}$$

where,

NS = The number of scheduled Headways at the Timing Points during the Reporting Period

HS_n = The value, in minutes, rounded to nearest hundredth of a minute, of each scheduled Headway (n = 1 to NS) scheduled at the Timing Points during the Reporting Period

34.3.6 In calculating the EWT Report, the EWT reporting system calculates the following for each Timing Point in each direction, for each day of the Reporting Period:

- Sum of Scheduled Headways Squared (in minutes, rounded to nearest minute)
- Twice Sum of Scheduled Headways (in minutes, rounded to nearest minute)
- Sum of Actual Headways Squared (in minutes, rounded to nearest minute)
- Twice Sum of Actual Headways (in minutes, rounded to nearest minute)

34.3.7 The EWT reporting system adds together Sum of Scheduled Headways Squared and Twice Sum of Scheduled Headways for all days of the Reporting Period to give the Sum of Scheduled Headways Squared and Twice Sum of Scheduled Headways for each Timing Point in each direction for the Reporting Period. Sum of Scheduled Headways Squared is then divided by Twice Sum of Scheduled Headways to give SWT for each Timing Point and direction for the Reporting Period. AWT for each Timing Point and direction is calculated in the same manner.

- 34.3.8 Sum of Scheduled Headways Squared and Twice Sum of Scheduled Headways for each Line is calculated by adding together Sum of Scheduled Headways Squared and Twice Sum of Scheduled Headways for each Timing Point on that Line. Sum of Actual Headways Squared and Twice Sum of Actual Headways for each Line is calculated in the same manner, enabling SWT and AWT for each Line to be calculated.
- 34.3.9 SWT and AWT for each Line are rounded to the nearest tenth of a minute. SWT for each Line is then subtracted from AWT for each Line to give EWT for each Line.
- 34.3.10 In each Reporting Period the Operator shall be required to achieve an EWT of 0.3 minutes (the "EWT Standard") for each Line averaged across all the Timing Points for that Line, subject to the exclusions in paragraph 34.3.3.
- 34.3.11 The Operator shall include in each Period Report the EWT Report for that Reporting Period showing the EWT achieved by the Operator for each Line in that Reporting Period.
- 34.3.12 To the extent that EWT for a Line is less than the EWT Standard of 0.3 minutes in a Reporting Period then the Operator shall be entitled to an EWT Bonus for that Line.
- 34.3.13 To the extent that EWT for a Line exceeds the EWT Standard of 0.3 minutes in a Reporting Period then the Operator shall be liable to an EWT Deduction for that Line.
- 34.3.14 In each Reporting Period the EWT Bonus or EWT Deduction for each Line shall be calculated by comparing the EWT for each Line with the EWT Standard. For each 0.1 minute that EWT for a Line is less than the EWT Standard, an EWT Bonus of 0.125% of the Base Reporting Period Amount for that Reporting Period shall apply. For each 0.1 minute that EWT for a Line is higher than the EWT Standard, an EWT Deduction of 0.125% of the Base Reporting Period Amount for that Reporting Period shall apply (up to a maximum EWT Deduction of 1.25% of the Base Reporting Period Amount for each Line).
- 34.3.15 TII intends to develop an enhancement to the EWT reporting system to enable it to report on the occurrence of long gaps in service, as well as EWT. Following the implementation of this enhancement, the Operator shall be required to run a "Long Gaps in Service" report for each Reporting Period, and include this report in the Period Report, However, the Operator's performance in relation to long gaps in service shall not be linked to a performance bonus or a performance deduction.

34.4 **AVL Data Management System**

- 34.4.1 TII intends to implement a system (AVL Data Management System) to use information from the AVL System for the automatic calculation of Lost Service Kilometres. The system will also enable the Operator to report on causes of Lost Service Kilometres or missing AVL data. Once this system is commissioned it shall become the mechanism by which the Operator reports on Lost Service Kilometres, and performance in relation to the Lost Kilometres Standard, EWT Standard and Early/Late Departure Standard.

34.5 **Mystery Shopper Surveys**

- 34.5.1 Performance Indicators 5 to 9 in **Error! Reference source not found.** shall be measured by means of Mystery Shopper Surveys carried out by NTA every quarter. NTA shall provide the Operator with a report of the results of each Mystery Shopper Survey within twenty five Business Days of the completion of each quarterly survey.

34.5.2 The performance of Performance Indicators 5 to 9 in **Error! Reference source not found.** for each Reporting Period shall be based on the results of the most recent Mystery Shopper Survey provided by NTA to the Operator.

34.5.3 Mystery Shopper Survey results for Performance Indicator 5 in **Error! Reference source not found.** shall be based on an inspection of those attributes set out in Table 34-1. On inspection, each attribute shall be allocated a score of 1, if it meets the requirement, or zero if it does not. The total score for Performance Indicator 5 for each Mystery Shopper Survey shall be calculated by summing the scores for each attribute, divided by the number of inspections of each attribute, and expressing the answer as a percentage, according to the following formula:

$$\text{Total Score} = \left(\sum_{n=1}^{10} \frac{\text{Total Score for Attribute } n}{\text{Number of inspections of Attribute } n} \right) \times \frac{100}{1}$$

Attribute and Requirement
1. Floors are clean and litter free (light dirt and/or minimal amount of litter is acceptable)
2. Seats are clean, litter free and graffiti free (light dirt and/or minimal amount of litter is acceptable)
3. Seats are in good state of repair (minor tears < 2cm in length are acceptable)
4. Windows are clean and free of etching and graffiti on inside and outside (light dirt and/or minor etching is acceptable)
5. Panels are clean and graffiti free and in a good state of repair (light dirt is acceptable)
6. Exterior of LRV is clean (some dirt, likely to have been picked up during the day, is acceptable)
7. Exterior of LRV is in a good state of repair
8. Lights are functioning during hours of darkness
9. Heating is functioning during cold weather and is turned off during hot weather
10. Doors open at Stop when activated by customer

Table 34-1 Attributes and Requirements for LRV Cleanliness and Condition

34.5.4 Mystery Shopper Survey results for Performance Indicator 6 in **Error! Reference source not found.** shall be based on an inspection of those attributes set out in Table 34-2. On inspection, each attribute shall be allocated a score of 1, if it meets the requirement, or zero if it does not. The total score for Performance Indicator 6 for each Mystery Shopper Survey shall be calculated by summing the scores for each attribute, divided by the number of inspections of each attribute, and expressing the answer as a percentage, according to the following formula:

$$\text{Total Score} = \left(\sum_{n=1}^6 \frac{\text{Total Score for Attribute } n}{\text{Number of inspections of Attribute } n} \right) \times \frac{100}{1}$$

Attribute and Requirement
1. Shelter surfaces are clean, graffiti free and in a good state of repair (light dirt and/or minor graffiti and etching is acceptable)
2. Shelter seats are clean (light dirt and/or minor graffiti and etching is acceptable)
3. Platform areas are clean, litter free and in a good state of repair (light dirt and/or minimal amount of litter is acceptable)
4. Information panels, help points, ticket machines, screens and other notices, signs and fixtures are clean and free of etching, stickers and graffiti (light dirt and/or minor graffiti and etching is acceptable)
5. Stairs, lifts and escalators are clean and free of etching, stickers and graffiti (light dirt and/or minor graffiti and etching is acceptable)
6. Lifts and escalators (where present) are operational and stairs (where present) are in a good state of repair

Table 34-2 Attributes and Requirements for Stop Cleanliness and Condition

34.5.5 Mystery Shopper Survey results for Performance Indicator 7 in **Error! Reference source not found.** shall be based on an inspection of those attributes set out in Table 34-3. On inspection, each attribute shall be allocated a score of 1, if it meets the requirement, or zero if it does not. The total score for Performance Indicator 7 for each Mystery Shopper Survey shall be calculated by summing the scores for each attribute, divided by the number of inspections of each attribute, and expressing the answer as a percentage, according to the following formula:

$$\text{Total Score} = \left(\sum_{n=1}^6 \frac{\text{Total Score for Attribute } n}{\text{Number of inspections of Attribute } n} \right) \times \frac{100}{1}$$

Attribute and Requirement
1. Stop notice board is displaying up-to-date information
2. PID is working
3. In the event of a disruption to service, PID displays notification of the disruption
4. In the event of a disruption to service, Stop announcements are made notifying customers of the service disruption, the likely duration of the disruption, and alternative travel arrangements if applicable
5. Help point is operational and response to help request is given within 30 seconds of activation
6. Up-to-date and accurate fares information is shown on ticket machine screens at Stops

Table 34-3 Attributes and Requirements for Stop customer information and help provision

34.5.6 Mystery Shopper Survey results for Performance Indicator 8 in **Error! Reference source not found.** shall be based on an inspection of those attributes set out in Table 34-4. On inspection, each attribute shall be allocated a score of 1, if it meets the requirement, or zero if it does not. The total score for Performance Indicator 8 for each Mystery Shopper Survey shall be calculated by summing the scores for each attribute, divided by the number of inspections of each attribute, and expressing the answer as a percentage, according to the following formula:

$$\text{Total Score} = \left(\sum_{n=1}^6 \frac{\text{Total Score for Attribute } n}{\text{Number of inspections of Attribute } n} \right) \times \frac{100}{1}$$

Attribute and Requirement
1. Line map is displayed in correct locations
2. PID is working and provides correct next Stop information in English and Irish
3. Automated next Stop announcements are working correctly
4. In the event of a disruption to service, Driver makes an announcement notifying customers of the service disruption and the likely duration of the disruption.
5. Real-time reporting system (via mobile app or SMS) is operational and automated response to report of anti-social behaviour or vandalism is given within 30 seconds.
6. Destination of LRV is shown on destination board

Table 34-4 Attributes and Requirements for on-board customer information and help provision

34.5.7 Mystery Shopper Survey results for Performance Indicator 9 in **Error! Reference source not found.** shall be based on an inspection of those attributes set out in Table 34-5. On inspection, each attribute shall be allocated a score of 1, if it meets the requirement, or zero if it does not. The total score for Performance Indicator 9 for each Mystery Shopper Survey shall be calculated by summing the scores for each attribute, divided by the number of inspections of each attribute, and expressing the answer as a percentage, according to the following formula:

$$\text{Total Score} = \left(\sum_{n=1}^3 \frac{\text{Total Score for Attribute } n}{\text{Number of inspections of Attribute } n} \right) \times \frac{100}{1}$$

Attribute and Requirement
1. Customer-facing Staff (including RPOs and security staff) are helpful and courteous to customers
2. Customer-facing Staff (including RPOs and security staff) are well presented (except when operating in plain clothes)
3. Customer-facing Staff provide accurate information on request in relation to fares, hours of operation, operating frequencies, transfer to other public transport modes, LRV accessibility and arrangements for customers with disabilities

Table 34-5 Attributes and Requirements for Customer-facing Staff helpfulness

34.6 The LRV Maintenance Deduction and the Infrastructure Maintenance Deduction

34.6.1 The methodology for calculating the LRV Maintenance Deduction for each Reporting Period is described in Schedule 15:.

34.6.2 The methodology for calculating the Infrastructure Maintenance Deduction for each Reporting Period is described in Schedule 21:.

34.7 Verification by TII

- 34.7.1 The Operator shall take all reasonable steps to co-operate with and to facilitate the access of TII and/or TII's agents, sub-contractors and advisers (subject to compliance with all reasonable instructions of the Operator with regard to the safety of the System) to all or any part of the System for the purposes of verifying compliance by the Operator with the requirements of this Schedule 34:, including verifying the accuracy of the System Performance Bonus and System Performance Deduction calculations.

Schedule 35: Project Events

35.1 General

35.1.1 If, and when, any of the events ("Project Events") listed in Table 35-1 occurs during the Operating and Maintenance Period, the Operator's exclusive remedy in respect of such Project Event shall be as shown in Table 35-1 and defined in Table 35-2.

Project Event	Available Remedies	
	Exemption from System Performance Deduction	Compensation Payment to Operator
NTA breach The breach or failure to perform by NTA of any of its obligations under the Contract provided that any breach by the Operator of the Contract, to the extent that any such breach causes NTA to be in breach of the Contract, shall not amount to a breach by NTA of its obligations under the Contract.	Yes	Yes
TII breach The breach or failure to perform by TII of any of its obligations under the Contract provided that any breach by the Operator of the Contract, to the extent that any such breach causes TII to be in breach of the Contract, shall not amount to a breach by TII of its obligations under the Contract.	Yes	Yes
Force Majeure	Yes	No
System Contractor Damage and Damage to the System caused by NTA or TII	Yes	Yes
Failure by a System Contractor to perform its obligations under a System Contract: (a) where proceedings are not commenced in accordance with Clause 9.1(i), and (b) which directly prevents the Operator from performing the Services.	Yes	No
Rectification of Defects	Yes	Yes
National/Industry wide strike Any official or unofficial strike, go-slow, or other trade dispute generally affecting: (a) persons concerned in the provision of public passenger transport services or a significant sector of such persons, or (b) plant, equipment and components required for the provision of the Services, which directly prevents the Operator from providing the Services, unless such official or unofficial strike, go-slow or other trade dispute arises (directly or indirectly) as a result of any wilful act or default of the Operator.	Yes, in accordance with paragraph 34.2.5 of Schedule 34:	No

Project Event	Available Remedies	
	Exemption from System Performance Deduction	Compensation Payment to Operator
Public Event	Yes, in accordance with paragraph 34.2.6 of Schedule 34:	No
Termination of the AFCS Maintenance Contract not attributable to Operator Default	Yes	Yes
Adverse Interest in Land Third party interest affecting the System Land to the extent that such interest is not governed by the provisions of the Light Rail Orders and does not arise by virtue of any default of the Operator in the performance of its obligations under the Contract.	Yes	Remedies provided in Clause 11.2 (Undisclosed Interests)
Diversion of underground utilities Works required to divert underground utilities to the extent that such works do not arise as a consequence of any breach by the Operator of the Operator's obligations under the Contract.	Yes	Yes
Disruption to Services directly consequent on the Metrolink works	Yes	No
The presence of an unexploded bomb or explosive device on the System	Yes	No

Table 35-1 Available Remedies for Project Events

Remedy	Definition
Exemption from System Performance Deduction	<p>To the extent that a Project Event prevents the Operator from achieving any of the Performance Standards set out in Schedule 15:, Schedule 21: or Schedule 34: no Performance Deduction shall apply in relation to any Performance Standard that the Operator has been unable to achieve because of the Project Event.</p> <p>For each Reporting Period in which an Exemption from System Performance Deduction occurs, the Operator shall within one month after the end of such Reporting Period:</p> <p>(a) report to TII details of any savings in Operating Cost resulting from the Project Event and</p> <p>(b) TII shall be entitled to deduct a sum equivalent to the amount of such saving savings in Operating Cost from the Adjusted Reporting Period Amount for that Reporting Period.</p>
Compensation Payment to Operator	If the Operator incurs or is likely to incur an increase in Operating Costs as a result of a Project Event, then TII shall compensate the Operator in full for the increase in Operating Costs in such a way as to ensure that the position of the

Remedy	Definition
	Operator is no better and no worse than it would have been if the Project Event had not occurred.

Table 35-2 Definition of Available Remedies**35.2 Notice of Project Event**

35.2.1 Without prejudice to the obligations of the Operator elsewhere in the Contract in respect of any Project Event, the Operator shall give TII notice of the occurrence of any Project Event as soon as reasonably practicable following its becoming aware of the occurrence of such Project Event:

- which has or is likely to have a material adverse effect upon the Operator's ability to perform its obligations; or
- which is likely to, or does, directly prevent the Operator from providing the Services.

35.2.2 The Operator shall also, either in the notice of the Project Event or by a subsequent notice to be served on TII as soon as reasonably practicable after the occurrence of such Project Event, and in any case within 1 month thereof, (in each case so far as aware at the time of service of such notice):

- specify the Project Event that has occurred;
- identify the effects that the Project Event has had or is likely to have upon the performance of the Operator's obligations;
- provide details of any additional costs or reduced costs that the Operator has incurred or enjoyed or is likely to incur (or enjoy) as a result of the Project Event, including any adverse effect on the ability of the Operator to achieve the Performance Standards set out in Schedule 15:, Schedule 21: or Schedule 34: or to meet its other obligations under the Contract, such detail to identify to the extent reasonably possible all factors relevant to determine the Operator's entitlement under this Schedule 35:.

35.2.3 If TII agrees the consequences to the Operator of the Project Event and the Operator's compensation payment and other proposals, it shall take the action required of it in accordance with this Schedule.

35.2.4 If the Parties have not agreed the application of this Schedule to any Project Event in respect of which the Operator has given notice under paragraph 35.2.1, within 28 days of the provision of any further information requested pursuant to paragraph 35.2.2 the matter may on the request of either Party be determined in accordance with the Disputes Resolution Procedure.

35.2.5 TII may at reasonable hours upon giving the Operator reasonable notice, and at its own expense, examine the books and records of the Operator to the extent necessary to verify the accuracy of any accounting statement, charge, computation or claim made pursuant to any of the provisions of this Schedule 35:.

35.3 Conflict between the body of the Contract and this Schedule 35:

- 35.3.1 To the extent that any provision of the Contract provides specific compensation for the Project Events described in this Schedule, the Operator shall not be entitled also to recover compensation under this Schedule.

35.4 Operator not to receive compensation for wilful default

- 35.4.1 The Operator may not exercise any right or seek any relief or remedy in respect of any Project Event, if and to the extent that such Project Event or any delay resulting from such Project Event, would not have occurred but for any wilful act or default of the Operator or Sub-Contractors.

35.5 Operator's duty to mitigate

- 35.5.1 Without prejudice to Clause 47.5 (General Mitigation Obligation), the Operator shall use reasonable endeavours, including the measures specifically provided in the Contract, to minimise the adverse effects of any Project Event in respect of which it seeks to exercise any right or seek any relief or remedy under this Schedule.
- 35.5.2 Such endeavours shall include seeking where appropriate to claim damages from third parties or other relief where such proceedings would have a reasonable chance of success and would not be economically imprudent having regard to the likely level of damages or the nature of the relief and the estimated cost of recovering them.
- 35.5.3 Provided always that the Operator will not, in order to comply with this Section 35.5, be required to take any steps which may prejudice its ability to perform its obligations or enjoy the benefits to which it is entitled under this Contract, or cause the Operator to incur additional costs (including any net costs of pursuing proceedings as aforesaid) unless, the Operator having provided details in accordance with Section 35.2 of this Schedule, TII may elect to reimburse the Operator for such additional costs.
- 35.5.4 The costs recoverable by the Operator shall not include the cost of measures taken in providing Replacement Bus Services. The Operator shall not be relieved of the obligation to provide Replacement Bus Services save to the extent that it is prevented from so complying by a Project Event.

35.6 No right to terminate

- 35.6.1 For the avoidance of doubt, it is acknowledged that an entitlement to an exemption from System Performance Deductions in accordance with paragraph 35.1.1, also means that TII is not entitled to terminate this Contract in respect of such Project Event.

Schedule 36: System Charge and Revenue Grant

36.1 Base Reporting Period Amount

- 36.1.1 The Base Reporting Period Amount for each Reporting Period shall be derived from the formula:

$$(A \times B) / 365$$

where,

A = the Base Yearly Amount; and

B = the number of days in the Reporting Period.

36.2 Patronage Revenue Smoothing Amount

- 36.2.1 Patronage Revenue fluctuates considerably from one Reporting Period to the next. In general, Patronage Revenue is lower than average at the start of the calendar year and during school holidays, and is higher than average in the run up to Christmas. This could result in the Operator receiving a Revenue Grant in some Reporting Periods, and paying a System Charge in other Reporting Periods, within the same calendar year.
- 36.2.2 In order to avoid the situation described in paragraph 36.2.1, TII may request the Operator to include an amount (the "Patronage Revenue Smoothing Amount") in the calculation of the System Charge/ Revenue Grant for some Reporting Periods.
- 36.2.3 The Patronage Revenue Smoothing Amount may be a positive or negative figure. In Reporting Periods with lower than average Patronage Revenue, the Patronage Revenue Smoothing Amount is likely to be a negative figure, which has the effect of reducing the Adjusted Reporting Period Amount. In Reporting Periods with higher than average Patronage Revenue, the Patronage Revenue Smoothing Amount is likely to be a positive figure, which has the effect of increasing the Adjusted Reporting Period Amount.
- 36.2.4 When the Patronage Revenue Smoothing Amount is a negative figure, its absolute value shall not exceed 15% of Patronage Revenue for the reporting Period to which it relates.
- 36.2.5 Within any calendar year, the aggregate of all the Patronage Revenue Smoothing Amounts for that calendar year shall always sum to zero. Negative Patronage Revenue Smoothing Amounts for Reporting Periods at the start of the calendar year and during school holidays shall always be offset by positive Patronage Revenue Smoothing Amounts in later periods.
- 36.3 Calculation of Revenue Grant**
- 36.3.1 For each Reporting Period in which the Adjusted Reporting Period Amount is equal to or greater than the amount of Patronage Revenue plus Standard Fare Revenue earned by the Operator in that Reporting Period TII shall pay the Operator a Revenue Grant.
- 36.3.2 For each Reporting Period in which a Revenue Grant is due, the amount of the Revenue Grant shall be the difference between the amount of Patronage Revenue plus Standard Fare Revenue earned by the Operator in that Reporting Period and the Adjusted Reporting Period Amount for that Reporting Period.

36.4 Submission of System Charge and/or Revenue Grant calculations

- 36.4.1 The Operator shall, at the same time as submitting the Period Report, submit the calculation of the System Charge and/or Revenue Grant for that Reporting Period to TII. The calculation of the System Charge and/or Revenue Grant shall be in a format notified by TII to the Operator from time to time. Thereafter TII and/or the Operator (as the case may be) shall be entitled to invoice the other Party for the same.
- 36.4.2 The amounts calculated in accordance with this Schedule 36: may be further varied in respect of each Reporting Period by the addition or subtraction of any amounts recoverable by the Operator or TII under the Contract and which have become due in accordance with the Contract.

Schedule 37: Disputes Resolution Procedure

1. Disputes

Any Dispute shall, except where otherwise specifically provided in the Contract, be subject to the provisions of this Dispute Resolution Procedure.

2. Continuing Obligations

Notwithstanding any Dispute between the Parties or the referral of any Dispute to an informal procedure or to an adjudication pursuant to Section 4 (Adjudication) or to the courts pursuant to Section 9 (Litigation), the Parties shall continue to carry out their obligations in accordance with the Contract and without prejudice to this obligation, the Parties shall each continue to use their best endeavours to maintain a good working relationship and shall at all times cooperate and liaise together in order that the System is operated and the Services are provided in accordance with the Contract.

3. Informal Procedure

- 3.1 The Parties shall use their best endeavours to resolve any Dispute without delay by way of this informal procedure which shall be conducted in good faith in an effort to resolve the Dispute without necessity of referring the Dispute to adjudication and/or litigation;
- 3.2 Either Party may refer in writing the Dispute to the then Chief Executives of each Party for resolution and the Parties shall procure that the Chief Executives shall meet within ten (10) Business Days (unless extended by the agreement of the Parties) to consider jointly such reference and to make their joint recommendation for the resolution of the Dispute ("**Joint Recommendation**"). The Parties shall comply with such Joint Recommendation until and subject to a subsequent different decision by an Adjudicator pursuant to Section 4 (Adjudication).

4. Adjudication

- 4.1 If:
 - 4.1.1 either Party is dissatisfied with any Joint Recommendation; or
 - 4.1.2 the Chief Executives fail to notify their Joint Recommendation pursuant to and in accordance with Section 3.2

then either Party may give a notice relating to the relevant Dispute to the other Party ("**Adjudication Referral**") that it intends to refer such Dispute to an Adjudicator appointed in accordance with Section 5 (Appointment of Adjudicator) to be determined in accordance with the procedure set out in Section 6 (Adjudication Procedure).

5. Appointment of Adjudicator

- 5.1 Following receipt of an Adjudication Referral served in accordance with Section 4 (Adjudication), the Parties shall seek to agree the identity of an appropriate Adjudicator to hear the Dispute. If the Parties are unable to agree a suitable appointment within five (5) Business Days of the date of the Adjudication Referral then either Party shall be entitled to request the Chairman for the time being of the Chartered Institute of Arbitrators – Irish Branch to nominate an appropriate Adjudicator to hear the Dispute. At the same time as making such request the relevant Party shall:
 - 5.1.1 send a copy of the Adjudication Referral to the Chartered Institute of Arbitrators - Irish Branch together with a list of those persons who have

been considered by (one or both of) the Parties under this Section to be unsuitable to act as the Adjudicator; and

- 5.1.2 require the Chartered Institute of Arbitrators - Irish Branch to endeavour to make its nomination within five (5) Business Days of such request.
- 5.2 Any person nominated pursuant to Section 5.1 shall forthwith be appointed by the Parties to determine the Dispute referred to in the relevant Adjudication Referral.
- 5.3 Any Adjudicator nominated in accordance with Section 5.1 must:
 - 5.3.1 be wholly independent of NTA, TII and the Operator;
 - 5.3.2 be appointed in writing and confirmation of his agreement to act in accordance with Section 6 (Adjudication Procedure) shall be secured in writing;
 - 5.3.3 be professionally qualified in the principal field in which the Dispute arises;
 - 5.3.4 be a practitioner with at least ten (10) years' experience in the principal field in which the Dispute arises and who continues to practice professionally in that field or has done so within the last five (5) years; and
 - 5.3.5 not be included in the list of persons deemed to be unsuitable and referred to in Section 5.1.
- 5.4 If an Adjudicator who has been appointed pursuant to this Section 5 (Appointment of Adjudicator) resigns, dies or becomes seriously ill or is otherwise unavailable or unable to act for any significant period at any time during the course of his appointment, the Parties shall appoint a replacement Adjudicator as soon as practicable in accordance with the procedure set out in this Section 5 (Appointment of Adjudicator). The replacement Adjudicator shall have the power to determine any Dispute that had been submitted to his predecessor but had not been determined at the time his predecessor became unavailable or unable to act in accordance with this Section.

6. Adjudication Procedure

- 6.1 The Adjudicator shall reach a decision on a Dispute referred to him under Section 4 (Adjudication) and shall notify the Parties of the same within twenty (20) Business Days of referral to him of the Dispute or within such longer period as is agreed by the Parties, after the Dispute has been referred. The Adjudicator may extend the period of twenty (20) Business Days by up to a further ten (10) Business Days with the consent of the Party by whom the Dispute was referred, such consent not to be unreasonably withheld or delayed. If the Adjudicator requires any further extension it shall require the consent of both Parties.
- 6.2 Subject to the other provisions of this Section 6 (Adjudication Procedure) the Adjudicator shall establish the procedure and timetable for the resolution of the Dispute and may take the initiative in ascertaining the facts and the law. Without prejudice to the generality of such power the Adjudicator may, if he thinks fit:
 - 6.2.1 require the delivery of written statements of case;
 - 6.2.2 require any Party to produce a bundle of key documents, whether helpful or otherwise to that Party's case and to draw such inference as may seem proper from any imbalance in such bundle that may become apparent;

- 6.2.3 require the delivery to him and/or the other Parties of copies of any documents other than documents that would be privileged from production to a court;
- 6.2.4 limit the length of any written or oral submission;
- 6.2.5 require the attendance before him for questioning of any Party or employee or agent of any Party;
- 6.2.6 make site visits;
- 6.2.7 make use of his own specialist knowledge;
- 6.2.8 obtain advice from specialist consultants, provided that at least one of the Parties so requests or consents;
- 6.2.9 make directions for the conduct of the reference orally or in writing; or
- 6.2.10 conduct the reference inquisitorially.
- 6.3 Without prejudice to any decision of the Adjudicator to allocate costs at his or her discretion, the costs of the Adjudication shall be borne between the Parties in equal shares and the Parties shall each bear their own costs arising out of the Adjudication Referral.
- 6.4 The Parties acknowledge that:
 - 6.4.1 the Adjudicator shall be deemed not to be an arbitrator but shall render his decision as an expert and the provisions of the Arbitration Act 2010 and the law relating to arbitration shall not apply to the Adjudicator or his determination or the procedure by which he reached his determination; and
 - 6.4.2 the Adjudicator shall owe each Party a duty to act impartially during his appointment and shall give each Party a reasonable opportunity, in light of the timetable, of putting its case and dealing with that of its opponent and if the Adjudicator wishes or if either Party so requests, will hold an oral hearing.
- 6.5 In reaching his decision, the Adjudicator shall be bound by any decision of the court in respect of any proceedings brought under this Dispute Resolution Procedure.
- 6.6 Any communication between a Party and the Adjudicator shall also be communicated contemporaneously to the other Party. Where any such communication is oral, the Adjudicator shall be responsible for communicating the substance of that oral communication to the other Party as soon as possible.
- 6.7 If requested by either of the Parties, the Adjudicator shall provide reasons in writing for his decision.
- 6.8 The Adjudicator shall have no liability for anything done or omitted in discharge or purported discharge of his functions as Adjudicator unless the act or omission is in bad faith. Any employee or agent of the Adjudicator is similarly protected from liability.
- 6.9 The provisions of Clause 61 (Confidentiality) shall apply to the adjudication and to all matters arising in the course thereof.
- 6.10 The Adjudicator shall not have jurisdiction to:

- 6.10.1 allow any sub-contractor or any other third party to be joined into an adjudication as a party;
- 6.10.2 allow submissions of any sub-contractor or any other third party to be included as part of any Party's submissions;
- 6.10.3 order consolidation of the Dispute with any other adjudication; or
- 6.10.4 hold concurrent hearings with any other adjudication proceedings relating to the Services,

without the express written consent of both Parties.

7. Notice of Dissatisfaction

- 7.1 If a Party is dissatisfied with the Adjudicator's decision then that Party may on or before the expiry of twenty (20) Business Days following the day on which it received notice of such decision, give a Notice of Dissatisfaction to the other Party.
- 7.2 If the Adjudicator fails to give notice of his decision within the period required by Section 6 (Adjudication Procedure) then any Party may on or before the expiry of twenty (20) Business Days following the day on which the relevant period for giving the decision has expired, give the other Party a Notice of Dissatisfaction.
- 7.3 Any Notice of Dissatisfaction shall state that it is given under this Dispute Resolution Procedure and shall set out the Dispute and the reason for dissatisfaction.

8. Finality of Adjudication

- 8.1 If the Adjudicator has given notice of his decision to the Parties and no Notice of Dissatisfaction is validly served pursuant to Section 7 (Notice of Dissatisfaction), then the Adjudicator's decision shall become final and binding upon the Parties.
- 8.2 For the avoidance of doubt, where a Notice of Dissatisfaction is validly served pursuant to Section 7 (Notice of Dissatisfaction), the decision of the Adjudicator shall nevertheless be binding upon the Parties and the Parties shall give effect forthwith thereto unless and until the decision is finally determined by legal proceedings or agreement of the Parties.

9. Litigation

Provided a Notice of Dissatisfaction has been validly served pursuant to Section 7 (Notice of Dissatisfaction), the Dispute shall be settled by litigation in an appropriate court having jurisdiction in Ireland unless the Parties otherwise agree. Neither Party is limited in any proceedings before the court to the information, evidence or arguments put to the Adjudicator. Where any Dispute is referred to litigation, any court hearing the Dispute shall have the power to disregard, open-up, review or revise any decision of the Adjudicator.

10. Interlocutory Proceedings

Notwithstanding the foregoing provisions of this Dispute Resolution Procedure, either Party shall have the right to seek appropriate injunctive relief or a decree of specific performance against the other in an appropriate court having jurisdiction in Ireland and all aspects of the Dispute that are the subject of the proceedings for injunctive relief or for specific performance shall be dealt with by such court and not as provided for in the other provisions of this Dispute Resolution Procedure.

11. Performance to Continue

The reference of any Dispute to an informal procedure, adjudication pursuant to Section 4 (Adjudication) or to the courts pursuant to Section 9 (Litigation) shall not relieve either Party from any liability for the due and punctual performance of its obligations under the Contract.

Schedule 38: Insurances

PART 1: INSURANCES

39.1. Required Operator Insurance Policies

39.1.1. With the exception of any insurances required by law, the insurances referred to in Clause 46 (Insurance) of the Contract shall:

- 39.1.1.1. name TII and NTA as co-insured each for its respective rights and interests in the Required Operator Insurance Policies;
- 39.1.1.2. provide for non-vitiation protection in respect of any claim made by TII or NTA as co-insured in accordance with Endorsement 2 in Part 3 of Schedule 38: (Insurances);
- 39.1.1.3. provide that each policy which insures the rights and interests of more than one party operates, save for limits of indemnity, in the same manner as if there were a separate policy covering each insured in accordance with Endorsement 2 in Part 3 of Schedule 38: (Insurances) and be without right of contribution from any other insurance which is carried by an insured in accordance with Endorsement 5 in Part 3 of Schedule 38: (Insurances);
- 39.1.1.4. contain a clause waiving the insurers' subrogation rights against TII and NTA, their employees and agents in accordance with Endorsement 2 in Part 3 of Schedule 38: (Insurances);
- 39.1.1.5. provide for 30 days prior written notice of their cancellation or amendment to be given to TII and NTA in accordance with Endorsement 1 in Part 3 of Schedule 38: (Insurances); and
- 39.1.1.6. in respect of the "all risks" property damage policy provide for payment of any proceeds received by the Operator to be applied in accordance with section 39.8 (Reinstatement); and
- 39.1.1.7. incorporate all endorsements at Part 3 of Schedule 38: (Insurances).

39.1.2. The Operator agrees to disclose to insurers all facts, circumstances or occurrences material to the risks insured against under the insurances referred to in Clause 46 (Insurance) and agrees to disclose to TII and NTA immediately upon notification by any insurer that its liability under any insurance has been reduced or avoided.

39.1.3. The Operator shall procure that all the insurances shall:

- 39.1.3.1. be purchased by or on behalf of the Operator and through insurance brokers approved in writing by TII and NTA, such approval not to be unreasonably withheld or delayed;
- 39.1.3.2. be placed and maintained with insurers of sound financial standing and international reputation who, at all times, satisfy the Requisite Rating. The choice of insurer shall be approved (such approval not unreasonably withheld or delayed) by TII and NTA

(in consultation with their insurance advisers) prior to inception and at each renewal if cover is not renewed on an expiring basis or the insurer no longer meets the requirements;

- (i) The Operator shall immediately notify TII and NTA if it becomes aware of any change in any insurer's credit rating and shall use its best endeavours to make itself aware of any such change. The Operator shall not be in breach of this Contract in the period after an insurer fails to satisfy the Requisite Rating whilst the Operator is seeking TII approval of alternative insurers.
- (ii) In the event that the Operator is seeking alternative insurers, the Operator will be in breach of this agreement if it has not procured insurance in compliance with the terms of sub-paragraph 39.1.3.2 within one month of any change in the insurer's credit rating such that it fails to satisfy the Requisite Rating or by the date of the next renewal, whichever is earlier.

39.1.3.3. comply with standard insurance practice operated in Ireland and be in a form consistent with the Operating Contract and as TII and NTA, acting reasonably, shall agree (such agreement not to be unreasonably withheld or delayed).

39.1.4. At least ten (10) Business Days prior to the renewal of any of the insurances, the Operator shall satisfy TII and NTA that the cover proposed to be effected for the renewal period will, on and after the renewal date, comply with the requirements of the Operating Contract and shall produce to TII and NTA written confirmation of such renewal as soon as practicable on or before the renewal date.

39.1.5. The Operator shall promptly notify insurers and TII and NTA of any material increase in any risk insured under any insurances referred to in Clause 46 (Insurance) of which the Operator is or becomes aware.

39.1.6. Prior to the Operating Commencement Date, the Operator shall procure and furnish to TII and NTA a letter of undertaking, substantially in the form of the specimen letter of undertaking contained in Part 4 of this Schedule 38: (Insurances), addressed to TII and NTA and signed by a reputable broker appointed by the Operator in connection with the procurement of the Insurances specified in Part 2 of this Schedule 38: (Insurances). The Operator shall similarly procure and furnish to TII and NTA such a letter of undertaking at each renewal as may be required and from any replacement broker appointed by the Operator during the Contract Period.

39.2. Evidence of Policies

39.2.1. The Operator shall hold all policies in respect of the insurances for which it is responsible under this Contract for a period of seven (7) years after the Expiry Date or the termination of this Contract.

39.2.2. The Operator shall procure that all insurance brokers through whom any insurances are effected or maintained shall maintain intact their files (including all documents disclosed and correspondence in connection with the placement of those insurances and the payment of premiums and claims under such insurances) for the period of the relevant insurances specified in this Schedule 38: (Insurances) and for a minimum period of six years thereafter.

39.2.3. The Operator shall provide to TII and NTA at renewal and within five (5) Business Days upon reasonable request:

39.2.3.1. copies of all insurance policies referred to in Part 2 of Schedule 38: (Insurances) (together with any other information reasonably requested by TII or NTA relating to such insurance policies);

39.2.3.2. evidence that all relevant premiums in respect of the insurances have been paid and that the policies of insurance have been renewed and remain in full force and effect in accordance with Clause 46 (Insurance) of the Contract and this Schedule 38: (Insurances); and

39.2.3.3. the cumulative annual claims experience used to secure renewal terms for all insurance policies referred to in Part 2 of Schedule 38: (Insurances) except for employer's liability insurance.

39.3. Failure to Insure

39.3.1. If the Operator is in breach of any insurances or its obligation to take out and maintain any of the insurances, or fails to produce in accordance with paragraph 39.2.3 to TII's or NTA's satisfaction evidence that there is in force any of the insurances, TII and/or NTA may, in addition to any other remedies, pay any premiums required to keep such insurance in force or itself procure such insurance and may in either case recover any premiums and other associated reasonable costs from the Operator on written demand.

39.4. Insurance Claims

39.4.1. The Operator shall:

39.4.1.1. promptly and according to the terms of each relevant insurance policy notify insurers of any matter arising from or in relation to the Operating Services or the Operating Contract for which it may be entitled to claim under any of the Insurances; and

39.4.1.2. diligently pursue any valid claim in accordance with the terms and conditions of each relevant insurance policy.

39.4.2. The Operator shall notify TII and NTA immediately upon the occurrence or knowledge of:

39.4.2.1. any incident or circumstances which may give rise to any claim amounting to or in excess of one hundred thousand euro (€100,000) (under any of the Insurances); and

- 39.4.2.2. any circumstances which may give rise to a change in any claim amounting to or in excess of one hundred thousand euro (€100,000) (under any of the Insurances); and
 - 39.4.2.3. any development in any incident or circumstances that may give rise to any claim which may be in excess of the limits of the Insurances; and
 - 39.4.2.4. any incident or circumstance which might have an adverse effect on the reputation or image of TII or NTA or the Operator or on health, safety, the environment, regulatory matters, labour or public relations;
- and any such notification is to be accompanied by full details of the incident or circumstances giving rise to the claim.

39.4.3. The Operator shall keep TII and NTA informed of all claims arising from or in relation to the Operating Services or the Operating Contract and shall

- 39.4.3.1. prepare and submit electronically to TII and NTA a cumulative claims bordereau detailing all third party liability, "all risks" property damage and business interruption claims involving loss, damage death or injury, to be received by TII and NTA by the fifth working day of each month, in the format detailed in Part 5 of this Schedule 38: (Insurances); and
- 39.4.3.2. arrange for the Operator's claims team to meet with TII and NTA on a quarterly basis to review the status of all claims.

39.5. Excess or Deductible

39.5.1. Where any policy referred to in Schedule 38: (Insurances) is subject to an excess or deductible below which the indemnity from the insurers is excluded, the Operator shall be liable for such excess or deductible and shall indemnify TII and NTA against any loss or claim which would otherwise be insured but for the excess or deductible.

39.5.2. The Operator shall not be entitled to recover from TII or NTA any sum paid by way of excess or deductible under the Insurances whether under the terms of Clause 45 (Indemnities) of the Operating Contract or otherwise.

39.6. Premium

39.6.1. Where any policy referred to in this Schedule 38: (Insurances) requires the payment of premium, the Operator shall be liable for such premium and payment of the premium shall be the responsibility of the Operator at all times.

39.6.2. The Operator shall not be entitled to recover from TII or NTA any sum paid by way of premium under the Insurances whether under the terms of the Operating Contract or otherwise.

39.7. Unavailability of Terms and Conditions

39.7.1. If, upon the renewal of any insurance which the Operator is required to maintain or to procure the maintenance of pursuant to this Contract:

39.7.1.1. any Insurance Term (meaning any terms and/or conditions required to be included in a policy of insurance detailed in Part 2 of this Schedule 38: (Insurances) but excluding any risk) is not available to the Operator in the European insurance market with reputable insurers of good standing; and/or

39.7.1.2. the insurance premium payable for insurance incorporating such Insurance Term is such that the Insurance Term is not generally being incorporated in insurance procured in the European insurance market with reputable insurers of good standing by light rail operators in the European Union, (other than, in each case, by reason of one or more actions or omissions of the Operator and/or any Operator Related Party) then paragraph 39.7.3 may apply.

39.7.2. The Operator shall notify TII and NTA as soon as reasonably practicable and in any event within five (5) Business Days of becoming aware that sub-paragraph 39.7.1.1 and/or sub-paragraph 39.7.1.2 is likely to apply or (on expiry of the relevant insurance then in place) does apply in respect of an Insurance Term (irrespective of the reason for the same). The Operator shall provide TII and NTA with such information as TII reasonably requests regarding the unavailability of the Insurance Term and the parties shall meet to discuss the means by which such unavailability should be managed as soon as is reasonably practicable

39.7.3. If it is agreed or determined pursuant to Schedule 37: (Dispute Resolution Procedure) that paragraph 39.7.1 applies then TII may waive the Operator's obligations in Clause 46 (Insurance) and/or this Schedule 38: (Insurances) in respect of that particular Insurance Term and, if so waived, the Operator shall not be considered in breach of its obligations regarding the maintenance of insurance pursuant to this Operating Contract as a result of the failure to maintain insurance incorporating such insurance term for so long as the relevant circumstances described in paragraph 39.7.1 continue to apply to such Insurance Term.

39.7.4. To the extent that the Parties agree (acting reasonably), or it is determined pursuant to Schedule 37: (Dispute Resolution Procedure), that an alternative or replacement term and /or condition of insurance is available to the Operator in the European insurance market with reputable insurers of good standing which if included in the relevant insurance policy would fully or partially address the Operator's inability to maintain or procure the maintenance of insurance with the relevant Insurance Term, at a cost which light rail operators in the European Union are (at such time) generally prepared to pay,

the Operator shall maintain or procure the maintenance of insurance including such alternative or replacement term and/or condition.

39.7.5. In the event that sub-paragraph 39.7.1.1 and/or sub-paragraph 39.7.1.2 apply in respect of an Insurance Term, (irrespective of the reasons for the same) the Operator shall approach the insurance market at least every four months to establish whether sub-paragraph 39.7.1.1 and/or sub-paragraph 39.7.1.2 remain applicable to the Insurance Term. As soon as the Operator is aware that sub-paragraph 39.7.1.1 and/or sub-paragraph 39.7.1.2 has ceased to apply to the Insurance Term, the Operator shall take out and maintain or procure the taking out and maintenance of insurance (to be incepted as soon as is reasonably practicable) incorporating such Insurance Term in accordance with this Contract.

39.8. Reinstatement

39.8.1. The Operator shall annually assess (or procure the assessment of) the reinstatement value of the System to ensure that the "all risks" property damage insurance set out in paragraph 2 of Part 2 of Schedule 38: (Property Damage Insurance) contains sums insured adequate to reflect the maximum possible loss to that System.

39.8.2. All insurance proceeds received under any policy referred to in paragraph 2 of Part 2 of Schedule 38: (Property Damage Insurance) shall be applied to repair, reinstate and replace each part or parts of the System in respect of which the proceeds were received.

39.8.3. All insurance proceeds received under any Property Damage policy in respect of a single event (or a series of related events) in an amount in excess of €250,000 shall be paid into the Joint Insurance Account (meaning the joint bank account in the names of TII and the Operator).

39.8.4. Where insurance proceeds are to be used, in accordance with this Contract, to repair, reinstate or replace any part or parts of the System, the Operator shall carry out the work in accordance with the relevant specification or design provided by or procured to be provided by TII or in any event accepted by TII.

39.8.5. Where a claim is made or proceeds of insurance are received or are receivable under any property damage policy in respect of a single event (or a series of related events) (the "Relevant Incident") in an amount in excess of €250,000:

39.8.5.1. the Operator shall deliver, as soon as practicable and in any event within ten (10) Business Days after the making of the claim a plan prepared by the

Operator for the carrying out of the works necessary (the “Reinstatement Works”) to repair, reinstate or replace (the “Reinstatement Plan”) the part or parts of the System which are the subject of the relevant claim or claims in accordance with paragraph 39.8.6 below. The Reinstatement Plan shall set out:

- a) the identity of the person proposed to effect the Reinstatement Works, which shall be subject to the prior written approval of TII; and
- b) the proposed terms and timetable upon which the Reinstatement Works are to be effected (including the date that the System will become fully operational), the final terms of which shall be subject to the prior written approval of TII, which approval shall not be unreasonably withheld or delayed;

39.8.5.2. provided that TII has indicated in writing its satisfaction that the Reinstatement Plan will enable the Operator to comply with paragraph 39.8.6 below within a reasonable timescale:

- A. the Reinstatement Plan will be adopted;
- B. the Operator shall enter into contractual arrangements to effect the Reinstatement Works with the person(s) identified in the Reinstatement Plan approved by TII;
- C. prior to the earlier to occur of the Expiry Date or the termination of this Contract, any amounts standing to the credit of the Joint Insurance Account (the “Relevant Proceeds”) (together with any interest accrued) may be withdrawn by the Operator from the Joint Insurance Account as required to enable it to make payments in accordance with the terms of the contractual arrangements referred to in sub-paragraph 39.8.5.2.B above, and to meet any other reasonable costs and expenses of the Operator for the sole purposes of funding the Reinstatement Works and the parties shall operate the signatory requirements of the Joint Insurance Account in order to give effect to such payments. Following the earlier to occur of the Expiry Date or the termination of this Contract, TII may withdraw amounts standing to the credit of the Joint Insurance Account for the purposes of funding any Reinstatement Works;
- D. TII agrees and undertakes that, subject to compliance by the Operator with its obligations under this section 39.8, and provided that the Operator procures that the Reinstatement Works are carried out and completed in accordance with the contractual arrangements referred to in sub-paragraph 39.8.5.2.B, it shall not exercise any right which it might otherwise have to terminate this Contract by virtue of the event which gave rise to the claim for the Relevant Proceeds;

- E. TII undertakes to use reasonable endeavours to assist the Operator in the carrying out of the Reinstatement Plan;
- F. after the Reinstatement Plan has been implemented to the satisfaction of TII and in accordance with paragraph 39.8.6 below TII shall permit withdrawal by the Operator of any Relevant Proceeds then held in the Joint Insurance Account that have not been paid under sub-paragraph 39.8.5.2.C above, in respect of the Relevant Incident, together with any interest accrued;
- G. and the Operator shall be solely responsible for the payment of any deficiency.

39.8.6. Where insurance proceeds are to be used, in accordance with this Contract, to repair, reinstate or replace any part or parts of the System, the Operator shall carry out the work in accordance with the relevant construction specification or design provided or procured to be provided by TII so that on completion of the work, the provisions of the Contract are complied with.

PART 2: Required Operator Insurance Policies to be taken out by the Operator and maintained for the period of the Contract

Common to all policies (unless stated otherwise)

Insureds

1. Operator
2. SCHEIDT & BACHMANN GmbH (Third Party Liability and Property Damage only)
3. Sub-contractors to the Operator of any tier for their site activities on the System only (Third Party Liability only)
4. TII (Third Party Liability, Property Damage and Business Interruption only)
5. The National Transport Authority (Third Party Liability, Property Damage and Business Interruption only)
6. All other parties and/or consultants for their site activities on the System only (Third Party Liability only)

each for their respective rights and interests in the provision of the Services

1. THIRD PARTY PUBLIC LIABILITY INSURANCE (INCLUDING MOTOR VEHICLE LIABILITY IN RESPECT OF LRVs)

Coverage:	<p>To indemnify the Insured in respect of all sums which they may become legally liable to pay (whether under contract, statute or tort), including claimant's costs and expenses, as damages in respect of accidental:</p> <p>(a) death or bodily injury, illness or disease contracted by any person;</p> <p>(b) loss or damage to property;</p> <p>(c) obstruction, trespass, nuisance, loss of amenities or interference to property or any easement right of air, light, water or way or the enjoyment or use thereof or any like cause</p> <p>happening during the period of insurance and arising out of or in connection with the ownership, operation and maintenance of the System</p>
Policy Form:	Claims occurring
Limit of Indemnity:	A minimum of €200,000,000 any one occurrence (unlimited as to the number of occurrences in the Period of Insurance) in respect of public liability and a minimum of €200,000,000 any one occurrence and in the aggregate in any one 12 month period of insurance in respect of products liability.
Territorial Limits:	European Union and elsewhere in the world in respect of non-manual visits

Jurisdiction:	Worldwide
Period of Insurance:	From the Operating Commencement Date for the duration of the Operating Contract and renewable on an annual basis unless agreed otherwise
Cover Features & Extensions:	<ol style="list-style-type: none"> 1. Contractual Liability 2. Cross Liabilities 3. Financial Loss (Minimum Limit of Indemnity €1,000,000) 4. Sudden, accidental and unintended pollution and/or contamination (Minimum Limit of Indemnity €10,000,000) 5. Contingent Motor Liability 6. Indemnity to other persons 7. Health and safety legislation legal defence costs 8. Liability for damage to leasehold premises 9. Personal injury to include false imprisonment, wrongful arrest, eviction, libel or slander
Maximum Deductible:	€20,000 for each and every occurrence

2. PROPERTY DAMAGE INSURANCE

Coverage:	"All Risks" of physical loss or damage to the insured property from any cause not excluded
Insured Property:	The System as defined in this Contract, which shall be deemed to include (without limitation) all buildings (including line-side shops and kiosks), structures, workshops, maintenance depots, control centres, signalling stations, overhead, surface or underground property, cables, pipes, ducts and associated property, light rail vehicles and any other rolling stock, electrical and mechanical plant and equipment, spares, track, embankments, tunnels, bridges and cuttings, and all associated and ancillary property which is or may be the responsibility of the Operator.
Limit of Indemnity:	At all times an amount not less than the total reinstatement or replacement value of the Insured Property plus provision to include all cover features and extensions as appropriate or an amount sufficient to reinstate the maximum probable loss to the

	Insured Property (which shall, in any event, be not less than €55,000,000 (fifty five million) Euro (Indexed)).
Territorial Limits:	European Union
Period of Insurance:	From the Operating Commencement Date for the duration of the Operating Contract and renewable on an annual basis unless agreed otherwise
Cover Features & Extensions:	<ol style="list-style-type: none"> 1. Repair/Reinstatement Basis of Claims Settlement with Cash Option for Non-Reinstatement 2. Automatic Reinstatement of Sum Insured 3. Professional Fees 4. Debris Removal 5. Temporary Removal 6. European Union Local Authorities clause 7. Machinery Breakdown of Electrical and Mechanical Plant and Equipment 8. Capital Additions 10. Terrorism (may be the subject of an approved separate policy) 11. Landslip, Subsidence and Ground Heave 12. 72 Hour Clause 13. Cost of reinstatement and/or making safe bridges, earthworks or other natural or artificial features which have suffered loss or damage, including collapse 14. Loss of or damage to rolling stock as a result of emergency braking
Maximum Deductible:	€250,000 for each and every claim

3. BUSINESS INTERRUPTION INSURANCE

Insureds:	<ol style="list-style-type: none"> 1. TII 2. Operator
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	<p>3. The National Transport Authority</p> <p>each for their respective rights and interests in the provision of the Services</p>
Indemnity:	<p>In respect of:</p> <p>Loss of revenue during at least the minimum indemnity period arising from an interruption or interference in the operation of the System as a result of loss or damage covered under property damage insurance effected in accordance with paragraph 2 of Part 3 of this Schedule including physical loss or damage which would be indemnifiable but for the application of any deductible</p> <p>The economic additional expenditure necessarily and reasonably incurred for the purpose of avoiding or reducing the loss of revenue which without such expenditure would have taken place during the minimum indemnity period.</p>
Sum Insured:	An amount sufficient to cover the sums the subject of the indemnity for the minimum indemnity period (Contractor to estimate based on business plan)
Maximum Excess	€50,000
Minimum Indemnity Period:	12 months
Cover Features & Extensions:	<p>1. Denial of Access</p> <p>2. Terrorism</p> <p>3. Failure of Utilities</p> <p>4. Automatic Reinstatement of Indemnity Limits and Periods</p> <p>5. Fees for Investigation & Verification of Claims</p> <p>6. Payments on Account</p>
Period of Insurance:	From the Operating Commencement Date for the duration of the Contract and renewable on an annual basis unless agreed otherwise

4. EMPLOYERS' LIABILITY

For the avoidance of doubt each legal entity providing Services under the Operating Contract is required to effect and maintain Employers' Liability Insurance in accordance with the requirements of this paragraph 4, Schedule 38: (Insurances)

Interest:	To indemnify the Insured in respect of all sums that they may become legally liable to pay as damages arising out of death, bodily injury or disease to an employee happening during the period of insurance in connection with the provision of the Services
Limit of Indemnity:	Not less than €13,000,000 in respect of any one occurrence, the number of occurrences being unlimited during any period of insurance
Territorial Limits:	European Union
Period of Insurance:	From the Effective Date or as otherwise specified in the Operating Contract for the duration of the Operating Contract and renewable on an annual basis unless agreed otherwise
Cover Features & Extensions:	1. Unsatisfied Court Judgements; 2. Indemnity to TII/NTA. 3. RTA exclusion deleted in connection with LRVs
Maximum Deductible:	€20,000

PART 3: POLICY ENDORSEMENTS

Policy Endorsements to be included within each Required Operator Insurance Policy to be effected and maintained by the Operator.

Endorsement 1- Cancellation

This policy shall not be cancelled or terminated before the original expiry date is to take effect except in respect of non-payment of premium.

The insurer shall, by written notice, advise TII and NTA:

- (a) at least 30 days before any such cancellation or termination is to take effect
- (b) at least 30 days before any reduction in limits or coverage or any increase in deductibles is to take effect; and
- (c) of any act or omission or any event of which the insurer has knowledge and which might invalidate or render unenforceable in whole or in part this policy

Endorsement 2 – Multiple Insured/Non-Vitiation Clause

Each of the parties comprising the insured shall for the purpose of this policy be considered a separate co-insured entity, insured on a composite basis, with the words "the insured" applying to each as if they were separately and individually insured provided that the total liability of the insurers under each section of this policy to the insured collectively shall not (unless the policy specifically permits otherwise) exceed the limit of indemnity or amount stated to be insured under that section or policy. Accordingly, the liability of the insurers under this policy to any one insured shall not be conditional upon the due observance and fulfilment by any other insured party of the terms and conditions of this policy or of any duties imposed upon that insured party relating thereto, and shall not be affected by any failure in such observance or fulfilment by any such other insured party.

It is understood and agreed that any payment or payments by insurers to any one or more of the insureds shall reduce, to the extent of that payment, insurers' liability to all such parties arising from any one event giving rise to a claim under this policy and (if applicable) in the aggregate.

Insurers shall be entitled to avoid liability to or (as may be appropriate) claim damages from any insured party in circumstances of fraud misrepresentation non-disclosure or material breach of warranty or condition of this policy (each referred to in this clause as a "Vitiating Act") committed by that insured party save where such misrepresentation non-disclosure or breach of warranty or condition was committed innocently and in good faith.

For the avoidance of doubt it is however agreed that a Vitiating Act committed by one insured party shall not prejudice the right to indemnity of any other insured who has an insurable interest and who has not committed the Vitiating Act.

Insurers hereby agree to waive all rights of subrogation and/or recourse which they may have or acquire against any insured party (together with their employees and agents) except where the rights of subrogation or recourse are acquired in consequence of a Vitiating Act in which circumstances insurers may enforce such rights against the insured responsible for the Vitiating Act notwithstanding the continuing or former status of the vitiating party as an insured.

Notwithstanding any other provision of this policy or any other document or any act and/or omission by any insured party insurers agree that:

- (1) no party other than TII has any authority to make any warranty, disclosure or representation in connection with this policy on behalf of TII;
- (2) where any warranty, disclosure or representation is required from TII in connection with this policy insurer will contact TII in writing (in accordance with Endorsement 3 to the Agreement) and set out expressly the warranty, disclosure and/or representation required within a reasonable period of time from TII (regarding itself); and
- (3) save as set out in a request from insurers to TII in accordance with (2) above, TII shall have no duty to disclose any fact or matter to insurers in connection with this policy save to the extent that for TII not to disclose a fact or matter would constitute fraudulent misrepresentation and/or fraudulent non-disclosure.

Endorsement 3 Communications

All notices or other communications under or in connection with this policy shall be given to each insured (and TII and NTA) in writing. Any such notice will be deemed to be given as follows when delivered.

The address of TII or NTA for all notices under or in connection with this policy is that notified from time to time by TII or NTA for this purpose to the Operator at the relevant time.

The initial address of the TII is as follows:

Infrastructure Owner:	Transport Infrastructure Ireland
Address:	Parkgate Business Centre, Parkgate Street, Dublin 8, Ireland
Attention:	The Insurance & Litigation Manager from time to time of TII

It is further agreed that a notice of claim given by TII or any other insured shall in the absence of any manifest error be accepted by the insurer as a valid notification of a claim on behalf of all insureds.

Endorsement 4: Loss Payee (applicable only to Property Damage Insurance)

Subject to the provision of paragraph 39.19 all proceeds of this policy shall be payable without deduction or set-off to the Joint Insurance Account

Endorsement 5: Primary Insurance

It is expressly understood and agreed that this policy provides primary cover for the insured parties and that in the event of loss destruction damage or liability covered by this policy which is covered either in

whole or in part under any other policy or policies of insurance effected by or on behalf of any of the insured parties the insurers will indemnify the insured parties as if such other policy or policies of insurance were not in force and the insurers waive their rights of recourse if any against the insurers of such other policy or policies of insurance.

Endorsement 6 Claims Negotiation Rights

Notwithstanding any claim conditions contained herein insurers agree that TII or NTA has the right to settle and negotiate any claims received from third parties subject to prior consent of insurers. If TII or NTA takes or fails to take any action as a direct result of which insurers' liability is increased then the liability of insurers to provide an indemnity is reduced to such an extent. This endorsement does not apply in respect of Employer's Liability claims.

Endorsement 7: Ring-fencing

The level of any indemnity available to an insured party under this policy in relation to any claim(s) concerning the provision of the Services shall not be affected and/or reduced by any claim(s) unrelated to the Contract.

These endorsements override any conflicting provisions in the insurance and nothing in these endorsements provides or infers a right upon the insurer where such right does not exist in the absence of these endorsements.

PART 4: BROKER'S LETTER OF UNDERTAKING

To: TII and NTA

Dear Sirs

Agreement in relation to the Operation and Maintenance of the Luas Light Railway System dated [DATE] entered into between [COMPANY] (the "Operator") and The National Transport Authority ("NTA") managed by Transport Infrastructure Ireland ("TII") (the "Agreement")

1. We refer to the Agreement. Unless the context otherwise requires, terms defined in the Agreement shall have the same meaning in this letter.
2. We act as insurance broker to the Operator in respect of the Required Insurances and in that capacity we confirm that the Required Insurances which are required to be procured pursuant to Clause 46 (Insurance) and Schedule 38: (Insurances) of the Agreement:
 - 2.1. where appropriate name you and such other persons as are required to be named pursuant to the Agreement for their respective interests;
 - 2.2. are, in our reasonable opinion as insurance brokers, as at today's date, in full force and effect in respect of all the matters specified in the Agreement;
 - 2.3. that all premiums due to date in respect of the Required Insurances are paid and the Required Insurances are, to the best of our knowledge and belief, placed with insurers which, as at the time of placement, are reputable and financially sound. We do not, however, make any representations regarding such insurers' current or future solvency or ability to pay claims; and
 - 2.4. that the endorsements set out in Part 3 to Schedule 38: (Insurances) of the Agreement are as at today's date in full force and effect in respect of the Required Insurances.
3. We further confirm that the attached cover notes confirm this position.
4. Pursuant to instructions received from the Operator and in consideration of your approving our appointment [or continuing appointment] as brokers in connection with the Required Insurances, we hereby undertake in respect of the interests of TII in relation to the Required Insurances:
 - 4.1. Notification obligations
 1. To notify you at least 30 Days prior to the expiry of any of the Required Insurances if we have not received instructions from the Operator to negotiate renewal and in the event of our receiving instructions to renew, to advise you promptly of the details thereof.
 2. To notify you at least 30 Days prior to ceasing to act as brokers to the Operator unless, due to circumstances beyond our control, we are unable to do so in which case we shall notify you as soon as practicable.
 3. To pay into the Joint Insurance Account without set off or deduction of any kind for any reason all payments in respect of claims received by us from insurers in relation to the Required Insurances specified at Clause 46 (Insurance) of the Agreement.

4.2. Advisory obligations

1. To notify you promptly of any default in the payment of any premium for any of the Required Insurances.
2. To notify you if any insurer cancels or gives notification of cancellation of any of the Required Insurances, at least 30 Days before such cancellation is to take effect or as soon as reasonably practicable in the event that notification of cancellation takes place less than 30 Days before it is to take effect.
3. To notify you of any act or omission, breach or default of which we have knowledge which in our reasonable opinion may either invalidate or render unenforceable in whole or in part any of the Required Insurances or which may otherwise materially impact on the extent of cover provided under the Required Insurances.
4. To advise the Operator of its duties of disclosure to insurers and to specifically advise upon:
 1. the facts, circumstances and beliefs that should generally be disclosed to insurers; and
 2. the obligation not to misrepresent any facts, matters or beliefs to insurers.

4.3. Disclosure obligations

1. To disclose to insurers all information made available to us from any source and any fact, change of circumstances or occurrence made known to us from any source which in our reasonable opinion is material to the risks insured against under the Required Insurances and which properly should be disclosed to insurers as soon as practicable after we become aware of such information, fact, change of circumstance or occurrence whether prior to inception or renewal or otherwise.
2. To treat as confidential all information so marked or otherwise stated to be confidential and supplied to us by or on behalf of the Operator or TII and NTA and not to disclose such information, without the prior written consent of the supplier, to any third party other than those persons who, in our reasonable opinion have a need to have access to such information from time to time, and for the purpose of disclosure to the insurers or their agents in respect of the Required Insurances in discharge of our obligation set out at paragraph 4.3.1 of this letter. Our obligations of confidentiality shall not conflict with our duties owed to the Operator and shall not apply to disclosure required by an order of a court of competent jurisdiction, or pursuant to any applicable law, governmental or regulatory authority having the force of law or to information which is in the public domain.

4.4. Administrative obligations

1. To hold copies of all documents relating to or evidencing the Required Insurances, including but without prejudice to the generality of the foregoing, insurance slips, contracts, policies, endorsements and copies of all documents evidencing renewal of the Required Insurances, payment of premiums and presentation and receipt of claims.

2. To supply to TII and NTA and/or its insurance advisers (or TII's or NTA's or its insurance advisers' authorised representatives) promptly on written request copies of the documents set out in paragraph 4.4.1 of this letter, and to the extent available, to make available to such persons promptly upon TII's or NTA's request the originals of such documents.
 3. To administer the payment of premiums due pursuant to the Required Insurances such that, in so far as we hold appropriate funds, all such premiums shall be paid to insurers in accordance with the terms of the Required Insurances.
 4. To administer the payment of claims from insurers in respect of the Insurances (the "Insurance Claims") including:
 1. negotiating settlement of Insurance Claims presented in respect of the Required Insurances;
 2. collating and presenting all information required by insurers in relation to Insurance Claims presented in respect of the Required Insurances; and
 3. insofar as it is relevant and practicable, liaising with and reporting to TII and NTA throughout the settlement, payment and administration of such Insurance Claims.
 5. To advise TII and NTA promptly upon receipt of notice of any material changes which we are instructed to make in the terms of the Required Insurances and which, if effected, in our opinion as insurance brokers would result in any material reduction in limits or coverage or in any increase in deductibles, exclusions or exceptions.
 6. To advise TII and NTA in advance of any change to the terms of, or any lapse, non-renewal and/or cancellation of any policy maintained in respect of the Required Insurances.
 7. To use our reasonable endeavours to have endorsed on each and every policy evidencing the Required Insurances (when the same is issued) endorsements substantially in the form set out in Part 3 to Schedule 38: (Insurances) of the Agreement.
5. Notification details
- 5.1. Our obligations at paragraph 4 of this letter to notify or inform TII and NTA shall be discharged by providing the requisite information in hard copy to:
- The Insurance & Litigation Manager (from time to time), Transport Infrastructure Ireland,
Parkgate Business Centre, Parkgate Street, Dublin 8, Ireland
6. We shall supply further letters in this form on renewal of each of the Required Insurances as may be required and at other times as requested by TII or NTA and shall supply copies of such letters to those parties identified to us by TII or NTA for such purposes.

Yours faithfully

For and on behalf of [Operator's broker]

PART 5: CLAIMS BORDEREAU

LOSS REF	CLAIMANT NAME	DATE OF LOSS	CLAIM TYPE *	LOSS INJURY ALLEGED	LOCUS	ACTION IN	STATUS	CLAIMANT DAMAGES PAID TO DATE	CLAIMANT COSTS PAID TO DATE	DEFENCE COSTS PAID TO DATE	CLAIM TOTAL PAID TO DATE	RESERVE OUTSTANDING
L01	BLOGGS JOE	xx.xx.xx	TPI	Broken arm	Steeven's Lane Inbound On board	Injuries Board	Open	-	-	250	250	25,000
L02	MURPHY PAT	xx.xx.xx	TPPD	Damage to car	Suir Road In with SCR Outbound	NA	Closed	1,450	260	120	1,830	-
L03	SPAR	xx.xx.xx	BI	Denial of Access	Spar, [Address]	High Court	Open	-	-	3,650	3,650	70,000
L04	RPA	xx.xx.xx	AR	Flood	Dundrum Substation	NA	Closed	100,000	-	-	100,000	-

*CLAIM TYPE	
TPI	Third Party Injury
TPPD	Third Party Property Damage
BI	Business Interruption
AR	All Risks Property Damage

Schedule 39: Conditions Precedent

CONDITIONS PRECEDENT

Part 1 – Commencement Date

1. A copy of the certificate of incorporation (or equivalent) of:
 - (a) the Operator; and
 - (b) the Guarantor.
2. A copy of the constitutional documents of:
 - (a) the Operator; and
 - (b) the Guarantor.
3. Resolutions of the board of directors of the Operator approving the performance by the Operator of the Services as contemplated by this Contract and authorising the execution of, inter alia, this Contract and the other Project Documents to which it is a party.
4. Resolution of the board of directors of the Guarantor approving the Guarantee and any other Project Documents to which it is a party.
5. Certificate of a director or the secretary of each of:
 - (a) the Operator; and
 - (b) the Guarantor,setting out the names and specimen signatures of the person(s) authorised to execute the relevant Project Documents.
6. A certificate of a director or the secretary of each of the Operator and the Guarantor certifying that each document relating to it specified in paragraphs 1 to 5 is correct, complete and in full force and effect as at a date no earlier than the date of this Contract.
7. Performance Bond in the form required in Schedule 40: from an Acceptable Entity.
8. Guarantee.
9. The Operator's current valid tax clearance certificate.
10. Evidence that the Operator is registered for VAT.
11. Evidence of the insurances required as of the Commencement Date having been taken out by the Operator or procured by the Operator and that the policies comply with the requirements of this Contract.
12. Legal opinion in respect of the Guarantee. "Legal opinion" means a legal opinion provided by an independent legal advisor confirming that the Guarantee has been validly executed, that the parties concerned have the necessary powers to execute the document and that it is legally binding in the relevant jurisdiction.

Part 2 – Operating Commencement Date

1. Evidence of the insurances required as of the Operating Commencement Date having been taken out by the Operator or procured by the Operator and that the policies comply with the requirements of this Contract.
2. Evidence that the Operator has complied with paragraph 7.3.3 of Schedule 7: and evidence that the Commission for Railway Regulation has, pursuant to Section 44(3)(b) of the Railway Safety Act 2005, given its approval to the Operator for the continued operation of the railway services or infrastructure.
3. Collateral Warranties where required by TII together with evidence of required insurances.
4. TII is satisfied that the Operator is, to the extent relevant, complying with the Approved:
 - (a) Transition Plan;
 - (b) Safety Management Document, including:
 - Emergency Management Plan
 - (c) Service Control Plan;
 - (d) Severe Weather Management Plan;
 - (e) LRV Annual Maintenance Plans;
 - (f) LRV Cleaning Checklist;
 - (g) Infrastructure Annual Maintenance Plan;
 - (h) Infrastructure Cleaning Checklist;
 - (i) Infrastructure Maintenance Procedures;
 - (j) Landscape Management Plan;
 - (k) Security Management Plan;
 - (l) Park and Ride Management Plan;
 - (m) Customer Service Policy;
 - (n) Customer Information Plan; and
 - (o) Annual Communications Public Relations Plan.
5. Evidence that the Operator has executed the AFCS Maintenance Contract.

Schedule 40: Form of Security

FORM OF PERFORMANCE BOND

To: National Transport Authority
Dún Scéine, Iveagh Court,
Harcourt Lane,
Dublin 2

and

Transport Infrastructure Ireland
Parkgate Business Centre,
Parkgate Street,
Dublin 8

[] (the "**Operator**") has entered into a contract dated on or about [] (the "**Operations and Maintenance Contract**") with you for the provision of the Services on the System.

At the request of the Operator, we, [] having our registered office at [], undertake to pay to you, without further proof or conditions and without deduction or set-off, any amount or amounts up to ten million euro (€10,000,000) (in the aggregate) for which the Operator is liable under the Operations and Maintenance Contract.

We undertake to advise the Operator in writing (copied to you) in the event that our long term credit rating is less than the Requisite Rating, and to advise if the credit rating reduction is caused by us being linked to the Irish sovereign rating.

Unless a demand has been made, our liability under this Performance Bond will expire 6 months after the Expiry Date (as defined in the Operations and Maintenance Contract) and in any event no later than [].

Any demand must be in writing addressed to [] and must be accompanied by your declaration that an Operator Default (as defined in the Operations and Maintenance Contract) has occurred.

Each of the two beneficiaries may make one or more separate drawings under this Performance Bond. Drawings made by each of the two beneficiaries will be aggregated when determining if our maximum liability under this Performance Bond has been reached. In determining if and when the aggregate of ten million euros has been reached, the date of the receipt by us of the demand(s) will be taken into account. In the event that we receive competing and simultaneous demands which together would exceed our maximum liability under this Performance Bond, we will refer those competing and simultaneous demands back to the two beneficiaries who will decide which of the demands should be resubmitted for payment under this Performance Bond.

No alteration in the Operations and Maintenance Contract or in the extent or nature of the services to be provided under it, and no allowance of time under the Operations and Maintenance Contract, and no forbearance or forgiveness concerning the Operations and Maintenance Contract by you, will in any way release us from liability under this Performance Bond.

We appoint of [] of []¹ as our agent for the service of legal proceedings. We confirm that the named agent has been irrevocably appointed and the failure of the agent to notify us of receipt of a document will not invalidate any proceedings or the service of the document.

¹ An address in Ireland is required when the Surety does not have a registered office in Ireland

This Performance Bond is governed by and construed according to Irish law and the parties submit to the jurisdiction of the Irish courts to determine all matters concerning it.

PRESENT when the Common Seal of

[SURETY]

was affixed to this deed and this deed

was delivered:

Director

Director/Secretary

PRESENT when the Common Seal of

OPERATOR

was affixed to this deed and this deed

was delivered:

Director

Director/Secretary

FORM OF GUARANTEE

THIS GUARANTEE is made on []

BETWEEN:

- (1) [•], (company number [•]) whose registered office is at [•] ("**Guarantor**");
- (2) [•], (company number [•]) whose registered office is at [•] ("**Operator**"); and
- (3) **NATIONAL TRANSPORT AUTHORITY** (or in the Irish language, **An tÚdarás Náisiúnta Iompair**), having its principal office at Dún Scéine, Iveagh Court, Harcourt Lane, Dublin 2 ("**NTA**" which term shall include any successors or assigns of NTA) ; and
- (4) **NATIONAL ROADS AUTHORITY** (or in the Irish language, **AN tÚDARÁS UM BÓITHRE NÁISIÚNTA**) a statutory corporation established under the Roads Act 1993, as amended and having its principal office at Parkgate Business Centre, Parkgate Street, Dublin 8 ("**TII**" which term shall include any successors or assigns of TII).

BACKGROUND

- (A) The Operator has been or will be appointed by NTA and TII to provide the Services pursuant to an agreement in relation to the operation and maintenance of the Luas light railway system ("**Operations and Maintenance Contract**").
- (B) TII is the owner of the System, is a party to the Operations and Maintenance Contract and will perform the Assigned Functions under the Operations and Maintenance Contract.
- (C) The Guarantor has agreed to guarantee the Operator's performance of its obligations to NTA and TII under the Operations and Maintenance Contract.

IT IS AGREED AS FOLLOWS:

Terms which are capitalised in this Guarantee but not defined herein will have the meaning given to them in the Operations and Maintenance Contract.

1. GUARANTEE

- 1.1 The Guarantor in consideration of the sum of €1 and other good and valuable consideration (the sufficiency and receipt of which is hereby acknowledged) HEREBY irrevocably and unconditionally:

- 1.1.1 guarantees to NTA and TII that the Operator will punctually perform all its obligations under the Operations and Maintenance Contract including the due payment and discharge of all such sums of money and liabilities due, owing or incurred or payable and unpaid by the Operator to NTA and/or TII pursuant to the Operations and Maintenance Contract from time to time or as a result of any breach thereof by the Operator (including all amounts incurred by NTA and/or TII in connection with NTA and/or TII validly and justifiably seeking to enforce any of the above); and

- 1.1.2 undertakes to NTA and TII, at either NTA's or TII's election, to fully perform the Operator's obligations under the Operations and Maintenance Contract if the Operator fails to perform them,

together the "Guaranteed Obligations".

2. INDEMNITY

If the Guaranteed Obligations are or become void or unenforceable as a consequence of any act or omission of the Operator and not to the extent solely attributable to the act or omission of NTA and/or TII then, as between the Guarantor and NTA and TII (but without affecting the Operator's obligations), the Guarantor will as principal obligor indemnify NTA and TII against any resulting loss and be liable to NTA and TII for the same amount as the Guarantor would have been liable for if the obligations had not been void or unenforceable.

3. OPERATOR'S FAILURE TO PERFORM

3.1 If the Operator goes into liquidation, administration, examinership or receivership or becomes subject to any other form of insolvency proceedings, or if the Operations and Maintenance Contract is terminated under Clause 51.1 (Operator Default) of the Operations and Maintenance Contract, any such event will be conclusive evidence, for the purposes of this Guarantee, that the Operator has failed to perform its obligations under the Operations and Maintenance Contract and in such circumstances the Guarantor will indemnify NTA and TII against any resulting loss.

3.2 The decision of a court, arbitrator, or adjudicator or an agreement between the Operator and NTA and TII will be binding on the Guarantor in relation to any failure by the Operator to perform its obligations under the Operations and Maintenance Contract.

4. GUARANTEE IS IN ADDITION TO OTHER SECURITY

The Guarantor's obligations are in addition to and independent of any other security NTA and TII may at any time hold for the Operator's obligations under the Operations and Maintenance Contract.

5. CONTINUING GUARANTEE

The Guarantor's liability under this Guarantee will be valid as from the Commencement Date and will continue until the Expiry Date save in respect of those obligations of the Operator stated in the Operations and Maintenance Contract to survive the expiry or termination of the Operations and Maintenance Contract (the "**Surviving Obligations**") in which case the Guarantor's liability will continue until the Surviving Obligations have been performed in full by the Operator.

6. GUARANTOR'S LIABILITY NOT IMPAIRED

6.1 The Guarantor's liability under this Guarantee is as principal obligor and not merely as surety. The Guarantor's liability under this Guarantee and NTA's and TII's rights under it will not be affected by any of the following, whether or not known to any of the parties:

6.1.1 the Operator's obligations under the Operations and Maintenance Contract being or becoming illegal, invalid or unenforceable, if it would not be illegal for the Guarantor to fulfil the obligation;

6.1.2 bankruptcy, insolvency, liquidation, examinership, dissolution, amalgamation, winding up, reorganisation or any similar proceeding concerning the Operator;

6.1.3 change in the status, function, control or ownership of the Operator;

6.1.4 amendment to the Operations and Maintenance Contract or change to the services to be performed under it (whether or not the amendment or change increases the Guarantor's liability);

6.1.5 time being given to the Operator;

6.1.6 a concession, arrangement, waiver or other indulgence being granted or made or agreed to be granted or made by NTA or TII;

6.1.7 anything that NTA, TII or the Operator do or fail to do, including without limitation:

(a) asserting or pursuing (or failing or delaying to assert, perfect or enforce) rights or remedies;

(b) giving security or releasing, modifying, or exchanging security; or

(c) having or incurring any liability,

6.1.8 assignment of the benefit of the Operations and Maintenance Contract;

6.1.9 whole or partial discharge (whether of the Operator's obligations or security for them or otherwise) or arrangement made on the faith of payment, security or other disposition that is avoided or must be repaid on bankruptcy, liquidation or otherwise;

6.1.10 rights against third parties that NTA and/or TII may have relating to performance of the Operator's obligations;

6.1.11 a reduction in, or other arrangement relating to, the Operator's liability to NTA and/or TII as a result of an arrangement, composition, examinership or similar arrangement under the Companies Act, 2014 or any similar provision; and

6.1.12 any other act, event, fact, circumstance, rule of law, or omission.

6.2 The Guarantor agrees and acknowledges that it has, and shall be deemed to have, full knowledge of all of the terms and conditions of the Operations and Maintenance Contract.

7. GUARANTOR NOT TO CLAIM AGAINST OR IN COMPETITION WITH NTA OR TII

7.1 For as long as the Operator has actual or contingent obligations or liability under the Operations and Maintenance Contract, the Guarantor shall not:

7.1.1 be entitled to share in NTA's or TII's rights under the Operations and Maintenance Contract or any other rights or security of NTA and/or TII; or

7.1.2 in competition with NTA and/or TII, seek to enforce any rights concerning the Guarantor performing or having obligations under this Guarantee,

and if the Guarantor receives money from the Operator in relation to a payment of the Guarantor under this Guarantee or otherwise, the Guarantor will hold the money in trust for

NTA and TII as long as the Guarantor has any liability (contingent or otherwise) under this Guarantee.

8. NO PRECONDITIONS UPON NTA OR TII

NTA and/or TII may enforce this Guarantee without exercising rights against the Operator or anyone else. Demands under this Guarantee may be made from time to time, and the liabilities and obligations of the Guarantor under this Guarantee may be enforced, irrespective of whether any demands, steps or proceedings are being or have been made or taken against the Operator, the Guarantor or either of them and/or any third party.

9. PAYMENT MECHANICS

9.1 If, under any applicable law, whether as a result of a judgment against the Guarantor or the liquidation of the Guarantor or for any other reason, any payment under or in connection with this Guarantee is made or is recovered in a currency (the "other currency") other than that in which it is required to be paid hereunder (the "original currency") then, to the extent that the payment to NTA or TII, as the case may be, (when converted at the rate of exchange on the date of payment or, in the case of a liquidation, the latest date for the determination of liabilities permitted by the applicable law) falls short of the amount unpaid under this Guarantee, the Guarantor shall as a separate and independent obligation, fully indemnify NTA and TII against the amount of the shortfall and for the purposes of this clause rate of exchange means the rate at which NTA or TII, as the case may be, is able on the relevant date to purchase the original currency in Dublin with the other currency.

9.2 If the Guarantor fails to pay any amount in accordance with this Guarantee, the Guarantor shall pay interest in euro on that amount from the time of default up to the time of actual payment (as well after as before judgment) at the rate per annum which is equal to the Default Rate (as defined in the Operations and Maintenance Contract) on the basis of interest periods and compounding and otherwise calculated as determined by NTA and TII, provided that the Guarantor shall not be liable to pay interest under this Guarantee on amounts guaranteed that bear interest independently of this Guarantee.

10. ASSIGNMENT

NTA and/or TII may assign the benefit of this Guarantee without the Guarantor's or Operator's consent to any person to whom NTA and/or TII assigns its/their rights, duties and obligations under the Operations and Maintenance Contract in accordance with Clause 57 (Assignment) of the Operations and Maintenance Contract. NTA and/or TII shall give notice to the Guarantor twenty eight (28) days prior to any assignment.

11. PARTIAL INVALIDITY

If at any time any part of this Guarantee is or becomes illegal, invalid or unenforceable, the rest of this Guarantee will remain legal, valid and enforceable.

12. LAW AND JURISDICTION

This Guarantee is governed by and construed according to Irish law and the parties submit to the jurisdiction of the Irish courts to determine all matters concerning it.

13. NOTICES

Any communication given in connection with this Guarantee must be in writing and delivered, or sent by pre-paid registered post, to the relevant party's address at the top of this Guarantee, or the Guarantor's agent's address in Clause 14 below, or another address notified in writing by the relevant party. Pre-paid registered post is taken to have been received two (2) business days after it was sent.

14. AGENT FOR SERVICE

The Guarantor appoints [] of []² as its agent for service of legal proceedings. The Guarantor confirms that the named agent has been irrevocably appointed and the failure of the agent to notify the Guarantor of receipt of a document will not invalidate any proceedings or the service of the document.

15. REPRESENTATIONS AND WARRANTIES

15.1 The Guarantor represents and warrants to NTA and TII that:

15.1.1 the execution, delivery and performance of this Guarantee by the Guarantor has been duly and validly authorised by all requisite corporate action by the Guarantor;

15.1.2 this Guarantee is the Guarantor's legal, valid and binding obligation in accordance with its terms; and

15.1.3 no approval or consent from any governmental entity or any other person or entity is required in connection with the execution, delivery or performance of this Guarantee by the Guarantor.

16. NO GREATER LIABILITY AND EQUIVALENT DEFENCES

16.1 Subject to clause 16.2 and notwithstanding any other provisions of this Guarantee, the Guarantor shall be entitled to the same defences, limitations on liability, rights and remedies as the Operator has under the Operations and Maintenance Contract.

16.2 Except for amounts reasonably incurred by NTA and/or TII in connection with NTA and/or TII validly and justifiably seeking to enforce any of their rights under the Operations and Maintenance Contract and/or this Guarantee, the Guarantor shall have no greater liability (in time or quantum) to NTA and/or TII under this Guarantee than the Operator has under the Operations and Maintenance Contract.

² An address in Ireland is required when the Guarantor does not have a registered office in Ireland

PRESENT when the Common Seal of
GUARANTOR

was affixed to this deed and this deed

was delivered:

Director

Director/Secretary

PRESENT when the Common Seal of
OPERATOR

was affixed to this deed and this deed

was delivered:

Director

Director/Secretary

PRESENT when the Seal of

NATIONAL TRANSPORT AUTHORITY

was affixed to this deed and this deed

was delivered:

Authorised Person

PRESENT when the Seal of

TRANSPORT INFRASTRUCTURE IRELAND

was affixed to this deed and this deed

was delivered:

Authorised Person

Schedule 41: Form of Collateral Warranty

SUB-CONTRACTOR COLLATERAL WARRANTY

THIS AGREEMENT is made the day of 201●

BETWEEN:

1. ● a company registered in ●, under registration number ●, having its registered address at ● (the “**Sub-Contractor**”);
2. ● a company registered in ● under registration number ●, having its registered address at ● (the “**Operator**”); and
3. **Transport Infrastructure Ireland** a statutory body corporate having its registered place of business at ● (“**TII**”);
4. **National Transport Authority** a statutory body corporate having its registered place of business at ● (“**NTA**”).

WHEREAS:

1. By an agreement in writing dated ● 201 ●, NTA, TII and the Operator entered into an Operations and Maintenance Contract (the “**Contract**”) under which the Operator agreed to provide NTA and TII with the services more particularly detailed and defined in the Contract and that it would procure that any Sub-Contractors engaged by it in relation to the Services would enter into a Collateral Warranty as therein set out with NTA and TII.
2. The Sub-Contractor pursuant to an agreement with the Operator (the “**Sub-Contractor Agreement**”) has agreed to provide Collateral Warranties as therein set out and accordingly has agreed to enter into this Collateral Warranty with NTA and TII.
3. NOW in consideration of the sum of €1 paid by NTA and TII to the Sub-Contractor (sufficiency and receipt of which is hereby acknowledged) IT IS HEREBY AGREED as follows:
 - 3.1 Throughout this agreement any words and expressions commencing with a capital letter shall have the meanings ascribed to those words as defined in the Contract.
 - 3.2 The Sub-Contractor warrants to and undertakes to NTA and TII that it has and will carry out its duties and the services under the Sub-Contractor Agreement with all the reasonable skill, care and diligence to be expected of a professional qualified and experienced in providing the services to be provided in projects of a similar nature, size and scope as the Services.
 - 3.3 The Sub-Contractor shall owe the same obligations to NTA and TII that the Operator owes to NTA and TII under the Contract.

- 3.4 The Sub-Contractor shall maintain professional indemnity insurance in respect of the Services as set out in the Sub-Contractor Agreement for a period of twelve years from the later of completion of the Services or termination/expiry of the Contract. The Sub-Contractor warrants that the premiums for the current period of insurance have been duly paid. As and when the Sub-Contractor is reasonably requested to do so by NTA or TII, the Sub-Contractor shall produce for inspection sufficient documentary evidence that the insurance required under the Sub-Contractor Agreement is being maintained in accordance with the terms of this agreement.
- 3.5 The Sub-Contractor shall have no greater liability to NTA or TII than the Operator shall have to NTA or TII under the Contract insofar as it relates to that part of the Services being provided by the Sub-Contractor.
- 3.6 The Sub-Contractor warrants that, where it is required to supply materials for the purpose of the performance of the Services it has not and will not specify for use in the Services any material known to be deleterious and/or which would adversely affect the System or any material not in accordance with NTA's or TII's standards, Irish standards or codes of practice or, if no Irish standards or codes of practice exist, the relevant British or European standard or code of practice which is the most current and appropriate.
- 3.7 NTA and TII shall be entitled at any time to assign the benefit of this agreement on two occasions by way of absolute legal assignment to such person or persons as NTA and TII thinks fit without the consent of the Sub-Contractor.
- 3.8 This agreement shall be governed by and construed in accordance with the laws of Ireland.
- 3.9 This agreement expires 12 years from the date of completion of the provision of Services except for any claim for damages of which notice and particulars have previously been given to the Operator before the expiration of the 12 year period aforesaid.
- 3.10 The Sub-Contractor covenants with NTA and TII that it will not determine the Sub-Contractor Agreement without giving NTA and TII not less than 15 (fifteen) working days written notice of its intention to do so and specifying the grounds for the proposed termination.
- 3.11 Compliance by the Sub-Contractor with the provisions of Clause 3.10 hereto shall not be treated as a waiver of any breach under the Sub-Contractor Agreement giving rise to the right of determination or subject to Clause 3.12 hereto, otherwise preventing the Sub-Contractor from exercising its rights after the expiration of the notice.
- 3.12 The right of the Sub-Contractor to determine the Sub-Contractor Agreement shall cease if within the relevant time period referred to in Clause 3.10 hereto NTA or TII gives written notice to the Sub-Contractor:
- (a) requiring the Sub-Contractor to continue its obligations under the Sub-Contractor Agreement;
 - (b) acknowledging that the NTA or TII (or its nominee) will (with effect from such notice) assume all future obligations of the Operator under the Contract; and
 - (c) unconditionally undertaking to the Sub-Contractor to discharge all payments which may subsequently become due to the Sub-Contractor under the terms of the Sub-Contractor Agreement,

and shall pay to the Sub-Contractor all sums which have become due and payable to it under the Sub-Contractor Agreement but which are then unpaid.

3.13 Upon compliance by NTA or TII with the requirements of Clause 3.12 hereof the Sub-Contractor Agreement shall continue in full force and effect PROVIDED HOWEVER that the exercise by NTA or TII of its rights under this Agreement shall not render it (or its nominee) in any way liable to the Sub-Contractor.

3.14 The Operator has joined in this agreement to confirm its concurrence with the arrangements made by it.

IN WITNESS whereof the parties have caused their respective seals to be affixed the day and year first written above

PRESENT when the Common Seal of

SUB-CONTRACTOR

was affixed to this deed and this deed

was delivered:

Director

Director/Secretary

PRESENT when the Common Seal of

OPERATOR

was affixed to this deed and this deed

was delivered:

Director

Director/Secretary

PRESENT when the Common Seal of

TRANSPORT INFRASTRUCTURE IRELAND

was affixed to this deed and this deed

was delivered:

Director

Director/Secretary

PRESENT when the Seal of

NATIONAL TRANSPORT AUTHORITY

was affixed to this deed and this deed

was delivered:

Authorised signatory

Schedule 42: System Contracts

The following System Contracts are in place at the Commencement Date:

1. Vehicle Extension Contract in relation to converting Class 402s to Class 502s for Luas
2. Framework Agreement for Rail Renewals for the Luas System

Schedule 43: System Licence

1. The Operator's Obligations

Save as permitted or provided for in the 2001 Act, the 2008 Act and/or the Light Rail Orders and/or the Contract the Operator shall (in relation to all parts of the System Land):

- 1.1 not do or omit to do anything by which TII or NTA may become liable to make any payment to or do anything under any Legal Requirement or reasonable requirement of a Competent Authority;
- 1.2 preserve all rights of light and other easements belonging to the System Land and not give any acknowledgement that they are enjoyed by consent;
- 1.3 not do or omit to do anything which might subject the System Land to the creation of any new easement and to give notice to TII promptly of any encroachment which might have that effect;
- 1.4 not cause Environmental Damage to the System Land;
- 1.5 not use or do anything in or to the System Land:-
 - 1.5.1 for any purpose other than operating and maintaining the System and otherwise complying with its obligations and exercising its rights pursuant to the Contract;
 - 1.5.2 for any purpose which may be or become or cause a nuisance disturbance annoyance obstruction or damage to TII or any other person or property;
 - 1.5.3 for any dangerous noxious illegal offensive or immoral trade business or activity;
- 1.6 at the Expiry Date remove all its chattels pursuant to Clause 52.4 (Transfer of the System) of the Contract and vacate the System Land;
- 1.7 give notice to TII promptly upon discovering any defect in the System Land which might give rise to:-
 - 1.7.1 an obligation on TII to do or refrain from doing anything in relation to the System Land; or
 - 1.7.2 any duty of care or the need to discharge such duty imposed by the relevant Legal Requirements or otherwise;
- 1.8 not carry out any alterations to or development of or on the System Land;
- 1.9 comply (subject to the other provisions of the Contract) with all statutory requirements of regulatory authorities which are imposed upon the owner and/or occupier of the System Land;

- 1.10 subject only to the provisions of the Contract not exercise rights over any part of the System that runs over Roads in such a manner as will restrict or prevent the exercise by any Relevant Road Authority of its functions in respect thereof or the exercise by any person of its rights in respect thereof;
- 1.11 only be entitled to enter onto and remain on the System on a non-exclusive basis;
- 1.12 use the Track comprised in the Lines for the provision of the Services using the Light Rail Vehicles;
- 1.13 use the System only for, and to the extent necessary for, the provision of the Services;
- 1.14 provide, or procure the provision of, the Services with the minimum disruption to neighbouring properties;
- 1.15 it shall not cause unreasonable interference to TII, NTA, its agents or contractors or any person authorised by TII entering onto or remaining on the System, including to carry out the Works or to maintain or repair the System; and
- 1.16 comply with:
 - 1.16.1 all Bye-laws;
 - 1.16.2 the Light Railway Orders;
 - 1.16.3 any Consents to Operate; and
 - 1.16.4 any reasonable direction by TII in relation to any aspect of the operation or the use of the System, including the operation of the Light Rail Vehicles (which affects or is likely to affect TII complying with any Safety Obligations) or the protection of the physical or commercial value of the System.

2. Intellectual Property

2.1 Title to IPR

Nothing in this Agreement shall operate to transfer any IPR of TII to NTA, the Operator or to any other person.

2.2 TII IPR

2.2.1 TII grants to the Operator a non-transferable, non-assignable, non-exclusive, royalty-free licence to use TII IPR for the term of the System Licence, for the purposes of and to the extent necessary for performing its obligations under this Contract.

2.2.2 The Operator shall not use TII IPR except as licensed by clause 2.2.1, and shall not use the TII IPR in any manner which suggests, or may lead people to believe, that it is TII.

2.2.3 The Operator shall follow all reasonable directions, instructions and requirements given or made by the TII from time to time with regard to the form and manner of the use of the TII IPR including, without limitation, any brand guidelines which may be provided to the Operator by the TII from time to time.

2.2.4 TII gives no warranty and makes no representation that the TII IPR, or any part of it is accurate, valid or suitable for the Operator's purposes or that use of the TII IPR will not infringe the rights of any third party.

2.2.5 The Operator shall not:

1. do, or omit to do, or permit to be done, any act which will or may weaken, damage or be detrimental to the TII IPR or the reputation or goodwill associated with the TII IPR, or which may invalidate or jeopardise the registration of any TII IPR; or
2. apply for, or obtain, registration of any trade mark or service mark which consists of, or comprises, or is confusingly similar to, the TII IPR or any part of it.

2.2.6 The Operator shall not be entitled to use TII's logo, livery or corporate image and shall not suggest or lead people to believe that it is TII.

2.3 Operator IPR

2.3.1 Without prejudice to Clause 12.2 (Operator's obligations) of the Contract, all IPR developed, created or acquired by or on behalf of the Operator in the course of performing its obligations under this Contract to the extent relevant to the ownership of the System, (the "Operator IPR") shall belong to and vest in TII.

2.3.2 The Operator represents and warrants to TII that in performing its obligations under this Contract, it will not infringe or make unauthorised use of any IPR of any person except to the extent that such infringement or unauthorised use is the result of the Operator using TII IPR and the Operator is using such TII IPR in accordance with TII instructions.

2.3.3 The Operator indemnifies and holds harmless TII, on demand, against all Loss as a result of any infringement by the Operator of any third party IPR.

2.4 Documentation

Upon request from TII, the Operator shall execute such further documents, and do such other things, as TII may reasonably request in order to obtain for TII or a Replacement Operator the full benefit of this clause 2, at no cost to TII or any Replacement Operator.

Schedule 44: Operator's Proposals

44.1 **Operator's Proposals**

44.1.1 The Operator acknowledges and confirms that the following documents, submitted as part of its Tender for the Contract, are deemed to form part of the Contract (the “**Operator's Proposals**”):

- Section 4 – Organisation Structure
- Section 5 – Management of Safety
- Section 6 – Operations Management
- Section 7 – Computerised Maintenance Management System
- Section 8 – Maintenance of Light Rail Vehicles and Depot Equipment
- Section 9 – Maintenance of Infrastructure