

**LONDON CYCLE HIRE SERVICE AGREEMENT**

**Schedule 4 – Testing Regime**

## **SCHEDULE 4**

### **Testing Regime**

#### **1. Introduction**

This Schedule 4 describes the procedures to be followed by the Service Provider for the Testing of the LCHS Assets, Service Systems and Services.

#### **2. Testing Regime General Provisions**

2.1 The Service Provider shall, in accordance with:

- (A) the applicable Milestones and Milestone Dates;
- (B) the relevant Implementation Phase Testing Documents or Operational Phase Testing Documents;
- (C) the Change Control Request Procedure; and
- (D) this Schedule 4,

perform Testing so as to ensure that the relevant parts of the LCHS Assets, Service Systems and Services provide the features, functions and facilities and meet the performance criteria set out in the:

- (1) Statement of Requirements; and
- (2) Service Provider Solution.

2.2 The Service Provider shall:

- (A) give TTL at least seven (7) Working Days' written notice prior to each Test being performed;
- (B) at all times, provide such access, facilities, Information, Data, explanation, Documentation and assistance to TTL Personnel and any Third Party nominated by TTL in order for TTL Personnel (and/or that Third Party) to participate in such Test Witnessing as TTL may require;
- (C) prepare a detailed Test Report in respect of each Test immediately following the conduct of that Test;
- (D) provide TTL with a copy of each Test Report. The Service Provider agrees that TTL may, notwithstanding anything to the contrary in this Agreement, share the contents of the Test Report with any Third Party for any purpose in respect of this Agreement, the LCHS Assets, Service Systems, Services, Additional Services and/or the London Cycle Hire Scheme;
- (E) if an Incident arises or becomes apparent during Testing, promptly:

- (1) update the Incident Log following the conduct of each Testing in accordance with paragraph 8 of Schedule 10 (*Contract Management and Reporting*); and
  - (2) resolve Errors, Service Issues and failures identified during Testing at its own cost, in accordance with the provisions of paragraph 8 of Schedule 10 (*Contract Management and Reporting*) and within such timescales so as to avoid any delay to the relevant Milestone and/or Key Milestone;
- (F) ensure that the Incident Log is made available to TTL promptly following the conduct of each Test with accurate, up to date and complete Information and Test Data, including, a Severity Level agreed by TTL for each Error or Service Issue; and
- (G) subject to any contrary written instructions from TTL from time to time:
- (1) ensure that all Test Data containing Personal Data is securely and promptly destroyed once it is no longer needed for Testing purposes; and
  - (2) confirm to TTL once such destruction has been completed.

2.3 Regardless of where the Services are carried out or performed, all Testing (including Test Witnessing) to be performed in accordance with this Schedule 4 shall be conducted in the United Kingdom, unless otherwise agreed in writing in advance of such Testing by TTL (not to be unreasonably withheld or delayed). This paragraph 2.3 shall not apply to any internal testing carried out by the Service Provider (or its Sub-Contractors) and not included within the scope of this Schedule 4.

### 3. **Test Strategy**

- 3.1 The Service Provider shall, in accordance with Schedule 3 (*Milestones and Deliverables*), prepare and submit to TTL a Test Strategy. As a minimum, the Test Strategy shall include:
- (A) a high level plan for the Testing of the LCHS Assets and Service Systems, including the scheduling of all Tests to be completed during the Implementation Phase;
  - (B) a description and rationale of the approach to Testing during the:
    - (1) Implementation Phase; and
    - (2) Operational Phase;
  - (C) the names and contact details of TTL's and the Service Provider's Representatives responsible for Testing;
  - (D) the requirements and objectives of the Testing;
  - (E) any dependencies affecting the Testing, including reliance on Interested Parties, Other Service Providers, the Insurance Provider and Third Parties;

- (F) the scope of the Testing;
- (G) any assumptions made by the Service Provider that may impact upon Testing;
- (H) the perceived risks to Testing, Service Issues or other risks and issues as a result of Testing together with their impact and methods of mitigation;
- (I) descriptions of the stages of Testing, including the processes for establishing and implementing the relevant Test Specification against which the Testing will be conducted and assessed;
- (J) descriptions of the anticipated processes relating to Testing for achieving a Milestone Notice, including:
  - (1) the performance of the Service Provider's obligations in respect of:
    - (a) Test Witnessing;
    - (b) Test Reports; and
    - (c) Incident management; and
  - (2) the business process scenarios to be used in determining whether the Test Criteria have been met;
- (K) the entry and exit criteria applicable to each of the Test Stages;
- (L) the roles and responsibilities of all those involved with the Testing programme, including TTL Personnel, Service Provider Personnel and/or personnel of Interested Parties, Other Service Providers, the Insurance Provider and Third Parties where applicable;
- (M) an outline of the resource requirements, including TTL Personnel, Service Provider Personnel and/or personnel of Interested Parties, Other Service Providers, the Insurance Provider and Third Parties, training of such personnel, Test Environments, and Testing tools and how such resources will be used during each Test Stage;
- (N) the location of the Testing at each Test Stage;
- (O) the sources and mechanisms for creation of Test Data for use at each Test Stage;
- (P) a description of the steps that will be taken to:
  - (1) secure the Test Data;
  - (2) process Test Data in compliance with Data Protection Legislation; and
  - (3) to delete Test Data securely;
- (Q) a proposed process for acceptance of:
  - (1) relevant LCHS Assets; and

- (2) new versions and/or releases of Service Systems for production use, during the Operational Phase;
- (R) the quality management tools and processes to be used in Testing, including:
  - (1) the standards to be applied to Testing;
  - (2) requirement traceability mechanisms, based on the “Standard Glossary of terms used in Software Testing”, V1.3 produced by the International Software Testing Quality Board (ISTQB): Requirements Traceability Mechanism that provides the ability to identify requirements with related items in Documentation and Software, in particular, identifying requirements with associated Tests;
  - (3) Incident and Problem management processes;
  - (4) configuration management;
  - (5) release management;
  - (6) capture, logging, and tracking of Test results; and
  - (7) Test progress and completion reporting; and
- (S) each of the foregoing in respect of the:
  - (1) Business Continuity Test Schedule and Testing of the Business Continuity Plan; and
  - (2) Business Continuity Infrastructure and Business Continuity Services.

#### 4. **Implementation Phase Testing Documents**

- 4.1 The Service Provider shall, in accordance with Schedule 3 (*Milestones and Deliverables*), prepare and submit to TTL for its Approval a Test Plan and Test Specifications in respect of:
- (A) Design Testing to be performed during the Implementation Phase, as envisaged under paragraph 8.1(B) of this Schedule 4;
  - (B) System Testing to be performed during the Implementation Phase, as envisaged under paragraph 8.1(C) of this Schedule 4;
  - (C) System Acceptance Testing to be performed during the Implementation Phase, as envisaged under paragraph 8.1(D) of this Schedule 4;
  - (D) Systems Integration Testing which is to be performed during the Implementation Phase, as envisaged under paragraph 8.1(G) of this Schedule 4;
  - (E) Technical Proving which is to be performed during the Implementation Phase as envisaged under paragraph 8.1(H) of this Schedule 4;

- (F) Ready for Service Testing which is to be performed during the Implementation Phase, as envisaged under paragraph 8.1(I) of this Schedule 4, including a Test Plan and Test Specifications for Testing of the:
  - (1) Business Continuity Plan;
  - (2) Business Continuity Infrastructure; and
  - (3) Business Continuity Services; and
- (G) all other Test Plans and Test Specifications in respect of all other Implementation Phase Testing, as requested by TTL.

5. **Operational Phase Testing Documents**

5.1 The Service Provider shall, in accordance Schedule 3 (*Milestones and Deliverables*), prepare and submit to TTL:

- (A) the Test Specifications for Acceptance Testing and the Test Plan (including without limitation details of the scenarios to be used in such Testing) for Acceptance Testing in respect of all components of the LCHS Assets and Service Systems (including new LCHS Assets and/or modifications to and new versions and releases of Service Systems) to be implemented pursuant to the Change Control Request Procedure (whether as a result of a Change or Additional Services);
- (B) where relevant to Testing of the component of the LCHS Assets and Service Systems, release notes describing any:
  - (1) new or amended functionality written in terms that would enable the user to understand whether the Software is suitable, and how it can be used for particular tasks and conditions of use;
  - (2) outstanding Errors; and
  - (3) operational workarounds required due to Service Issues or Errors;
- (C) detailed Test Specifications in respect of all other Operational Phase Testing, as TTL may require; and
- (D) the Business Continuity Test Schedule and any updates to the Business Continuity Test Schedule, as envisaged under paragraph 2.3 of Schedule 25 (*Business Continuity*) as well as a Test Plan for Testing of the:
  - (1) Business Continuity Plan;
  - (2) Business Continuity Infrastructure; and
  - (3) Business Continuity Services.

6. **Test Plans**

6.1 Each Test Plan shall include:

- (A) a detailed process for Testing of all relevant LCHS Assets and modifications to and new versions and releases of Service Systems at the applicable Test Stage, including a policy and rationale for Regression Testing;
- (B) the identification and details of the Environment(s) to be used in carrying out the relevant Testing;

- (C) the scope of the Testing for the:
  - (1) LCHS Assets; and
  - (2) modification or new version or release of the Service Systems,  
including a description of the Service Systems, constituent parts or functional areas of the LCHS Assets and Service Systems under Test, together with listings of functional requirements, Change Control Requests or Errors;
- (D) any specific Testing requirements or objectives where this differs from the Test Strategy, together with the reasons and rationale for such differences;
- (E) an overview of the specific Testing approach for the:
  - (1) LCHS Asset; and
  - (2) modification or new release or version of the Service System,  
and the applicable Test Stage;
- (F) any specific dependencies, pre-requisites, assumptions and risks related to Testing of any:
  - (1) LCHS Asset; and
  - (2) modification or new release or version of the Service System;
- (G) identification of the Test scripts to be executed;
- (H) a detailed schedule for the conduct of all Testing;
- (I) named roles and responsibilities for all TTL Personnel (and/or personnel of Interested Parties, Other Service Providers, the Insurance Provider and Third Parties appointed by TTL) and Service Provider Personnel involved with Testing; and
- (J) a description of the Test Data to be used for Testing.

## 7. **Test Specifications**

### 7.1 The Service Provider shall:

- (A) in accordance with the applicable Milestones and Milestone Dates and the Test Strategy, develop a Test Specification for each Test Stage;
- (B) ensure that each Test Specification is at all times accurate, up to date and complete, including in respect of the changing functionality of the:
  - (1) LCHS Assets and Service Systems;
  - (2) Changes; and
  - (3) Internal Changes;

- (C) ensure that as a minimum each Test Specification includes the following information:
- (1) the Test Criteria with a reference to the:
    - (a) Statement of Requirements;
    - (b) Design Documents; and
    - (c) any other documents relevant to the Testing as applicable to the Test Stage;
  - (2) a set of:
    - (a) Test scenarios (including business process scenarios (where applicable)); and
    - (b) Test Cases designed to exercise all the Test Criteria identified within the Test Specification,each with a reference to the Test Criteria covered by the Test scenario; and
  - (3) a set of Test scripts which:
    - (a) corresponds with the Test scenarios and Test Cases;
    - (b) describes the:
      - (i) purpose of the Test;
      - (ii) the Test Data requirements;
      - (iii) any pre-requisites for the Test;
      - (iv) actions to be taken during the Test; and
      - (v) the expected results for each step or action of the Test against which success or failure of the Test shall be judged; and
- (D) ensure that all requirements specified in this Agreement in respect of Testing are properly and adequately covered by the Test Criteria so as to meet the:
- (1) Statement of Requirements;
  - (2) Design Documents; and
  - (3) any other documents relevant to the Testing.

8. **Implementation Phase Testing**

8.1 The Service Provider shall in accordance with paragraph 2 (*Testing Regime General Provisions*) of this Schedule 4:

(A) carry out Unit Testing in order to demonstrate that each of the component of the LCHS Assets and Service Systems (including the lowest level of those units):

- (1) is in accordance with the Design Documents;
- (2) complies with the relevant Test Specification; and
- (3) meets the Statement of Requirements,

This shall include ensuring that:

- (a) those units meet the Statement of Requirements related to those units;
- (b) Data and input validation works in accordance with the:
  - (i) Design Documents; and
  - (ii) Statement of Requirements;
- (c) Data display formatting works in accordance with the:
  - (i) Design Documents; and
  - (ii) Statement of Requirements;
- (d) screen/report layout are in accordance with the:
  - (i) Design Documents; and
  - (ii) Statement of Requirements;
- (e) all boundary value Data conditions and equivalence partitions including, maximum, minimum, null and zero (0) Data values are processed correctly;
- (f) process and screen navigation and the management of context Data meets the:
  - (i) Design Documents; and
  - (ii) Statement of Requirements;
- (g) Errors and exceptions are handled and reported in accordance with the:
  - (i) Design Documents; and
  - (ii) Statement of Requirements;

- (h) Data contention and Data locking are handled in accordance with the:
  - (i) Design Documents; and
  - (ii) Statement of Requirements;
- (i) transactional integrity and Data integrity and Data replication work is handled in accordance with the:
  - (i) Design Documents; and
  - (ii) Statement of Requirements;
- (B) carry out Design Testing (or design-based Testing) to demonstrate that any custom built components of the LCHS Assets and/or Service Systems conform with the:
  - (1) Statement of Requirements; and
  - (2) Design Documents,before bulk manufacturing of such LCHS Assets and/or Service Systems commences;
- (C) carry out System Testing of each component of the Service Systems prior to integration with the LCHS Assets and Service Systems in order to demonstrate that the features, functions and facilities associated with each Service System (including Interfaces) developed by the Service Provider or its Sub-Contractors:
  - (1) are in accordance with the Design Documents;
  - (2) comply with the relevant Test Specification; and
  - (3) meet the Statement of Requirements,

This shall include ensuring that:

- (a) end-to-end cross–Service System and System Data and process flows meet the Statement of Requirements and Design Documents;
- (b) Data and process integrity across the Service Systems and LCHS Assets works in accordance with the Statement of Requirements and Design Documents;
- (c) continuity of processing across the Service Systems and LCHS Assets works in accordance with the Statement of Requirements and Design Documents;
- (d) negative and positive Tests for all functionality implemented within the Service Systems and LCHS Assets are performed;
- (e) defined Tests are performed to verify that potentially damaging transactions cannot be performed;

- (f) the handling of maximum, minimum, null and zero (0) Data values across the Service Systems and LCHS Assets and the Interfaces works in accordance with the Statement of Requirements and Design Documents;
  - (g) Data representative of operational conditions is used for the Testing;
  - (h) technical integration Tests are performed in respect of:
    - (i) the Interfaces comprising the LCHS Assets and Service Systems, including where appropriate Other Service Provider Systems, Insurance Provider System and Third Party Systems, using Test harnesses where necessary, are performed to demonstrate compliance with the Statement of Requirements; and
    - (ii) all Interface failure conditions;
    - (iii) exception conditions; and
    - (iv) recovery mechanisms;
  - (i) load and stress Tests are performed to establish that the:
    - (i) Service Systems can reliably process the maximum expected volumes of events or transactions to at least meet the Service Levels; and
    - (ii) Capacity and scalability of the relevant Service System are met,  
  
in each case using stored Data volumes comparable with anticipated production estimates as detailed in the Statement of Requirements, and the results shall prove that the end-to-end solution will function at least one hundred and fifty percent (150%) of those volumes given reasonable hardware upgrades;
  - (j) all Management Information is correctly recorded, stored and reported on; and
  - (k) all systems, security, access and audit trail logs are appropriately and correctly updated;
- (D) carry out System Acceptance Testing of the Graphical User Interface of the Terminal Interface and Graphical User Interface of the Services Website to demonstrate that they both operate in accordance with the:
- (1) Statement of Requirements;
  - (2) Design Documents; and
  - (3) relevant Test Specification.

This shall include ensuring that the Terminal and Services Website Interface:

- (a) operate in accordance with the Security Policy;
  - (b) conform to the W3C standards regarding disability access, etc.;
  - (c) conform to the TTL Group New Media development tool kit, as provided to the Service Provider by TTL; and
  - (d) conform to the statistical tracking code inserts, as provided to the Service Provider by TTL;
- (E) carry out Local Acceptance Testing of each Docking Station to demonstrate that each Docking Station forms a complete operational local system. This shall include ensuring that:
- (1) the number of Docking Points included within the Docking Station corresponds to that agreed with TTL for that Docking Station;
  - (2) the number of payment, information and Bicycle release Terminals corresponds to that agreed with TTL for that Docking Station;
  - (3) the supply of power to all Terminals is functional, with connections being certified in accordance with IEE Wiring Regulations in force at the time of installation;
  - (4) each Docking Point and Terminal included in the Docking Station is fully functional. This shall include demonstrating for each Docking Point the physical docking and undocking of a 'to specification' Bicycle and that such process is controlled by the mechanism contained within the Docking Point and Terminal;
  - (5) the Docking Station includes:
    - (a) fully functional lighting, installed as agreed with TTL in advance of installation of that Docking Station;
    - (b) a visible sign, carrying the name of the London Cycle Hire Scheme, corresponding to the design agreed with TTL for that Docking Station;
  - (6) all other equipment is present to form a fully functioning Docking Station (without requiring onward transmission to the rest of the LCHS Assets and Service Systems);
- (F) carry out Commissioning Acceptance Testing for each Docking Station to demonstrate that each Docking Station conforms with the Statement of Requirements, including ensuring that:
- (1) all Docking Station components are correctly integrated with the Service Systems;
  - (2) a fully functional, 'to specification', individual Bicycle is securely attached to each Docking Point;

- (3) remote Service Systems management functions operate correctly;
  - (4) alarms and diagnostic functions operate in accordance with the Statement of Requirements and Design Documentation;
  - (5) full operation of the Service Systems associated with that Docking Station is demonstrated including all required communications links to the rest of the LCHS Assets and Service Systems and full and correct interoperability with the rest of the LCHS Assets and Service Systems;
- (G) carry out Systems Integration Testing, at a location to be determined by TTL, in order to demonstrate that all components of the LCHS Assets and Service Systems:
- (1) fully integrate and fully inter-operate with each other, TTL Systems, Other Service Provider Systems, Insurance Provider System and Third Party Systems; and
  - (2) operate in accordance with the:
    - (a) Statement of Requirements; and
    - (b) Design Documents; and
  - (3) comply with the relevant Test Specification.

This shall include ensuring that:

- (a) Data constructed to cover normal and exception conditions, including boundary values, null values and maximum length values, are passed between the Service Systems, TTL Systems, Other Service Provider Systems, Insurance Provider System and Third Party Systems;
- (b) all Interface failure conditions and recovery from such failures are Tested;
- (c) Data is correctly stored by the Service Systems;
- (d) full end-to-end integration Tests of each component of the LCHS Assets and Service Systems (including Service Systems and Interfaces, TTL Systems, Other Service Provider Systems, Insurance Provider System and Third Party Systems) are performed by executing Tests based on end-to-end business processes and Data flows across all each component as against the business process definitions set out in the Design Documents and the Statement of Requirements;
- (e) load and stress Tests are performed in a Testing environment on Hardware representative of live operations to establish that the Service Systems, including the Management Information System,
  - (i) can reliably process the normal and maximum expected volumes of events or transactions to meet the relevant Service Levels; and

- (ii) to ensure that the Capacity and scalability of the Service Systems are met,  
  
in each case using stored data volumes comparable with anticipated production estimates as detailed in the Statement of Requirements and with representative volumes of Data passing via those Service Systems while maintaining accuracy to the Service Levels, and the results shall prove that the Service Systems will function at least with one hundred and fifty percent (150%) of those volumes and take into account the effect of bow-wave volumes;
  - (f) Tests are performed to ensure and assure compliance with the Security Policy and other obligations set out in this Agreement;
  - (g) Tests are performed to demonstrate that the Service Systems comply with all applicable Laws and including all Data Protection Legislation, FOI Legislation and similar Laws from time to time in force to the extent applicable;
  - (h) Tests of the Management Information System are performed to ensure that all Data is correctly provided and presented, including when accessed via and presented to the Interfaces TTL Systems; and
  - (i) all Management Information is correctly accumulated, stored and reported from each Service System;
- (H) carry out Technical Proving on the each component of the LCHS Assets and Service Systems to be used operationally in its final location and involving a period of extended and continuous operation in order to:
  - (1) provide assurance to TTL and the TfL Group of the reliability and maintainability of the LCHS Assets and Service Systems through extended and continuous operation;
  - (2) demonstrate the full end-to-end integration of the operational LCHS Assets and Service Systems with the Interfaces, TTL Systems, Other Service Provider Systems, the Insurance Provider System and any relevant Third Party Systems so as to demonstrate compliance with the Statement of Requirements; and
  - (3) ensure that:
    - (a) independent external penetration Tests are performed at the Service Provider's own cost and expense, to demonstrate the security of the Service Systems from intrusion via networks external to those of the Service Provider. Such tests shall also be performed by the Service Provider promptly upon written request from TTL from time to time;
    - (b) the LCHS Assets and Service Systems (including all Docking Stations and their constituent parts, networks and all other elements of the LCHS Assets and Service Systems):

- (i) has been correctly installed, built and configured in accordance with the Design Documents;
- (ii) complies with the relevant Test Specification; and
- (iii) meets the Statement of Requirements.

This shall include ensuring that:

- a. Tests are performed to demonstrate complete network connectivity, Capacity and performance between the Service Systems and between the LCHS Assets and Service Systems, TTL Systems, Other Service Provider Systems, Insurance Provider System and Third Party Systems;
  - b. configuration Tests are performed in relation to all Software (including operating systems and firmware) and Infrastructure comprising the LCHS Assets and Service Systems;
  - c. Tests are performed to ensure that all Software is properly installed and functions, interoperates, integrates, interfaces and co-exists with all other relevant elements of the LCHS Assets and Service Systems (including the Software referred to in paragraph 8.1(A) of this Schedule 4);
  - d. Testing of the technical aspects of the Security Policy is performed successfully;
  - e. all LCHS Assets and Service Systems back-ups and Business Continuity Infrastructure and mechanisms and functions comply with the provisions of this Agreement including the Security Plan and the Business Continuity Plan (as applicable);
  - f. fail-over Tests of all relevant LCHS Assets and Service Systems are performed successfully;
  - g. load balancing Tests (where relevant) are performed successfully;
  - h. the performance of the MIS and Interfaces to TTL Systems and TTL Premises perform to the satisfaction of TTL; and
  - i. operational Data from any Interested Party, Other Service Provider, the Insurance Provider and Third Party is accepted and processed correctly whenever possible using the appropriate Interface; and
- (c) all Tests necessary or desirable to demonstrate that Ready for Service Testing will be representative of live operations are performed;

- (l) carry out Ready for Service Testing involving Tests of business process scenarios (including such business processes as reasonably specified by

TTL) using the LCHS Assets and Service Systems in the operational environment in order to:

- (1) simulate and prove the Operational Services to be provided during the Operational Phase are in accordance with the relevant Test Plan and Test Specification; and
- (2) demonstrate compliance with the Statement of Requirements.

This shall include ensuring that:

- a. all Technical Proving has completed successfully;
- b. relevant Service Provider Personnel are appropriately trained, used and involved in order to provide the Operational Services;
- c. all Management Information is available;
- d. appropriate operational procedures for the Service Provider to perform its obligations under this Agreement are used and complied with and all other processes and procedures are sufficient to support the LCHS Assets and Service Systems to meet the required Service Levels;
- e. sufficient business input volumes are used to demonstrate that the Service Levels can be reliably achieved for all key business processes (as specified in advance of any such Ready for Service Testing by TTL in its absolute discretion) at one hundred and fifty percent (150%) of the volumes expected during normal operations comparable with anticipated production estimates as detailed in the Statement of Requirements and the results shall prove that the LCHS Assets and Service Systems will function at one hundred and fifty percent (150%) of those volumes and take into account the effect of bow-wave volumes;
- f. Testing of the Security Policy is undertaken and complete;
- g. it has been demonstrated to TTL's reasonable satisfaction that the public facing Services Website pages hosted by the Service Provider are correctly integrated with TTL hosted pages;
- h. it has been demonstrated to TTL's reasonable satisfaction that the data retention mechanisms are in compliance with Data Protection Legislation, the TfL Group Policies and all other policies and procedures of TTL from time to time that the Service Provider is obliged to comply with under this Agreement; and
- i. it has been demonstrated to the satisfaction of TTL that the Operational Services will be provided in accordance with this Agreement; and

- (J) carry out Regression Testing at all Test Stages as necessary to demonstrate that changes to the Software have no adverse impact on the LCHS Assets and Service Systems, Interfaces, TTL Systems, Other Service Provider Systems, Insurance Provider System or any Third Party Systems.

9. **Operational Phase Testing**

9.1 The Service Provider shall, in accordance with paragraph 2 (*Testing Regime General Principles*) of this Schedule 4 and subject to paragraph 9.2 below, carry out the following Testing as required in relation to each Change, Additional Service or corrected Service Issue or Error:

- (A) Unit Testing as envisaged under paragraph 8.1(A), which shall apply *mutatis mutandis* in respect of each Change, Additional Service or corrected Service Issue or Error;
- (B) System Testing as envisaged under paragraph 8.1(C) of this Schedule 4, which shall apply *mutatis mutandis* in respect of each Change, Additional Service or corrected Service Issue or Error;
- (C) Local Acceptance Testing as envisaged under paragraph 8.1(E) of this Schedule 4, which shall apply *mutatis mutandis* in respect of each Change, Additional Service or corrected Service Issue or Error;
- (D) Commissioning Acceptance Testing as envisaged under paragraph 8.1(F) of this Schedule 4, which shall apply *mutatis mutandis* in respect of each Change, Additional Service or corrected Service Issue or Error;
- (E) Systems Integration Testing as envisaged under paragraph 8.1(G) of this Schedule 4, which shall apply *mutatis mutandis* in respect of each Change, Additional Service or corrected Service Issue or Error;
- (F) Regression Testing as envisaged under paragraph 8.1(J) of this Schedule 4, in relation to each Change, Additional Service or corrected Service Issue or Error on the basis of analysis of the impact of the changes made to the LCHS Assets and Service Systems to demonstrate that the Change, Additional Service or corrected Service Issue or Error has not affected aspects of the LCHS Assets and Service Systems not subject to the Change, Additional Service or corrected Service Issue or Error, in accordance with the:
  - (1) Design Documents;
  - (2) the relevant Test Specification; and
  - (3) the Statement of Requirements;
- (G) Acceptance Testing in relation to each Change, Additional Service or corrected Service Issue or Error to demonstrate to TTL that the Change, Additional Service or corrected Service Issue or Error:
  - (1) is in accordance with the:
    - (a) Design Documents;
    - (b) the relevant Test Specification; and

(c) the Statement of Requirements;

(2) is consistent with the agreed Change Control Request pursuant to the Change Control Request Procedure;

(3) is in accordance with the Security Plan;

(4) in relation to Additional Services, complies with Clause 22 (*Additional Services*) and Schedule 33 (*Additional Services*);

(5) complies with and does not adversely effect the Business Continuity Plan, Business Continuity Infrastructure, Business Continuity Services and other Business Continuity and back-up continuity procedures, recovery work areas and overflow resources and Premises, including Testing these aspects against the Security Plan in respect of that Change, Additional Service or corrected Service Issue or Error (unless otherwise agreed in writing between the Parties);

(6) is consistent with the Service Levels; and

(7) is in accordance with Good Industry Practice; and

(H) Business Continuity Testing as envisaged under paragraphs 8.1(H) (*Implementation Phase Testing*) and 9.1(G)(5) (*Operational Phase Testing*) of this Schedule 4 and paragraph 3 (*Business Continuity Testing*) of Schedule 25 (*Business Continuity*) which shall apply *mutatis mutandis* in respect of each Change, Additional Service or corrected Service Issue or Error.

9.2 The Service Provider shall in conducting the Testing envisaged under paragraphs 9.1(A), 9.1(B), 9.1(C) and/or 9.1(H) above use the Test Specification (where applicable) and Test Plan to be produced by the Service Provider as part of the Operational Phase Testing Documents in accordance with paragraph 5.1 (*Operational Phase Testing Documents*) of this Schedule 4.

## 10. **Delivery of Documents for Testing**

10.1 The Service Provider shall:

(A) subject to paragraphs 10.1(B) below and 13.1(C) (*Test Reports, Management of Issues Arising from Testing and Resubmission of Test Documents*), deliver all Testing Documents required for or relevant to Testing to TTL no less than ten (10) Working Days prior to the relevant Test; and

(B) deliver Test Specifications to TTL no less than ten (10) Working Days prior to the relevant Test,

or in accordance with such other timetable as TTL may, in its absolute discretion, agree in writing with the Service Provider from time to time.

## 11. **Test Witnessing**

11.1 The Service Provider shall, during Test Witnessing:

(A) follow the reasonable instructions of TTL Personnel in relation to:

- (1) the form of Test Witnessing and the way in which Test Witnessing is to be carried out, including:
    - (a) TTL Personnel witnessing of a solution demonstration (which where reasonably required may be remotely);
    - (b) TTL Personnel witnessing of the execution of the Testing being carried out by the Service Provider; and
    - (c) TTL carrying out any Testing using a Third Party in conjunction with the Service Provider's Testing;
  - (2) any specific sets of business process scenario Tests to be carried out by the Service Provider and witnessed as part of Test Witnessing; and
- (B) demonstrate to the reasonable satisfaction of TTL that adequate modifications and Testing have been performed leading to closure of the Service Issue, Error or the successful completion of Testing.

## 12. **Test Reports**

- 12.1 At the completion of each Test Stage, the Service Provider's Representative will submit a Test Report for that Test Stage to TTL for Approval. As a minimum, the Service Provider shall ensure that each Test Report includes the following information:
- (A) the relevant Testing carried out;
  - (B) the results of the Testing conducted;
  - (C) any deviation from the Test Strategy, applicable Test Plan and/or Test Specifications (or, if applicable, Business Continuity Test Schedule or Business Continuity Plan);
  - (D) if the Testing failed in any way, the extent and cause of the failure;
  - (E) summary metrics on Service Issues and Errors raised during the Testing;
  - (F) the detail of any outstanding Errors or unresolved Service Issues, including references to the Incident Log and the Severity Levels;
  - (G) the detail of any workarounds required as a result of any outstanding Errors or unresolved Service Issues, where these workarounds have been agreed with TTL; and
  - (H) if required, as detailed in paragraph 29 of Schedule 3 (*Milestones and Deliverables*), a Work-off Plan in respect of all outstanding Errors, Service Issues and/or any failed Business Continuity Testing.

13. **Test Reports, Management Of Issues Arising From Testing And Resubmission Of Test Documents**

13.1 The Service Provider shall:

- (A) log Incidents (including Errors and Service Issues), including identification and assignment of appropriate Severity Level, and resolve all Errors and Service Issues arising as a result of or identified during Testing at its own cost, in accordance with the provisions of paragraph 8 (*Incident Reporting*) of Schedule 10 (*Contract Management and Reporting*);
- (B) complete and deliver each Test Report to TTL and ensure that the Incident Log is up to date, accurate and complete pursuant to paragraph 2.2(E) (*Testing Regime General Provisions*) as agreed in writing between the Parties and in any event at least five (5) Working Days prior to the Milestone Date for successful completion of the relevant Test; and
- (C) re-submit to TTL any Testing Document which has been rejected by TTL pursuant to paragraph 33 (*Approval of Documents*) of Schedule 3 (*Milestones and Deliverables*) within five (5) Working Days following the date that TTL issues its rejection of the relevant Testing Document.