5.6 Design

Overview

5.6.1 The *Consultant* produces an integrated concept design of the packages identified in table 2 of section 4.1.3. The Consultant develops the design to meet the requirements of SQA-2022 and Pathway Stage 3.

5.6.2 The *Consultan*t produces a set of package specific technical requirements specifications (TRS) for issue to a design and build contractor. Each TRS is developed to meet the project requirements detailed in the PRS.

5.6.3 The design will comprise of the below as relevant, not all projects require all the items listed. The *Clien*t and *Consultant* agree what is to be produced during mobilisation.

i. Approval in Principle (see TfL guidance note SQA-2025);
ii. Outline Approval in Principle for temporary works if required (see guidance note SQA-2025);
iii. Details of Statutory Undertakers apparatus;
iv. Reports justifying approach taken via decisions and assumptions logs;
v. Findings of surveys, investigations, trials, testing and the like;
vi. Drawings;
vii. Preliminary specifications;
viii. Design hazard identification and risk assessments/register;
ix. Designers environmental risk assessments;
x. Programme for the detailed design stage;
xi. Pathway documentation (a full list can be found in Appendix C).

Design Management

5.6.4 As Designer, the *Consultant*:

i. Produces designs, including specifications, works information, site information schedules and drawings in accordance with the *Client*'s requirements and design programme;
ii. Produces designers' risk assessments and other deliverables under Construction and Design Management (CDM);
iii. Ensures that designs are appropriately design checked in compliance with SQA-2025 prior to issue;
iv. Provides designs, and other assurance deliverables to the *Client*;
v. Coordinates their design with that of other designers on the project; and
vi. Undertakes all other design duties required by the CDM Regulations.

5.6.5 As Design Manager, the *Consultant*:

i. Produces and maintains their organisation's Design Management Plan (DMP) in line with Pathway. The DMP will detail the processes the design will follow throughout the project. The DMP will be reviewed and accepted by TfL;

ii. Produces and maintains a fully integrated design schedule to achieve the stated project milestones in section 9;

iii. Delivers the assigned design packages to the Employer in accordance with the agreed programme, requirements and design standards listed in section 5.6.7;

iv. Ensures all design documents are prepared, checked and annotated by suitably qualified persons in the appropriate discipline or speciality;

v. Co-ordinates the designers allocated to each of the packages within their organisation, ensuring the separate designs are integrated;

vi. Supports the Transport for London (TfL) Project Engineer in project wide design co-ordination activities as required, particularly the concept design review as detailed below;

vii. Submits the required information in support of Approval in Principle (see SQA-2025 for details) applications to the TfL Project Engineer.

Design Standards

5.6.6 In relation to the design work, the *Consultant* complies with the requirements of the appropriate current design standards, including Design Manual for Roads and Bridges (DMRB), which includes CG352 Design of Road Tunnels, and the Manual of Contract Documents for Highway Works (MCHW). Where amendments and revisions are made to such publications during the Project, the Designer seeks an instruction from the Project Manager as to their application.

5.6.7 Whilst the TfL's tunnels fall outside the jurisdiction of the Road Tunnel Safety Regulations 2007 (amended 2021), the *Consultant's* design seeks to meet its minimum requirements.

5.6.8 The *Consultant* applies, insofar as is ALARP, relevant current international best practice including but not limited to the recommendations of the World Road Association.

5.6.9 The *Consultant* ensures that all materials, workmanship and designs comply as far as reasonably practicable with the following standards and good practice guidance:

i. Design Manual for Roads and Bridges (DMRB) published by The Stationery Office and containing the Standards and Advice Notes. The term 'should' in the DMRB is to have the meaning 'shall';

ii. All relevant British or European Standards, including Published Documents, Product Standards and Non-contradictory Complementary Information (NCCI);

iii. TfL Asset Management Directorate Guidance Notes (see Appendix D):

iv. Specification for Highway Works (SHW) published by the Stationery Office as Volume 1 of the Manual of Contract Documents for Highway Works (MCHW);

v. Notes for Guidance to the Specification for Highway Works published by the Stationery office as Volume 2 of the MCHW;

vi. Highway Construction Details published by the Stationery Office as Volume 3 of the MCHW;

vii. Environment Agency standards and guidelines;

viii. Equality Act 2010;

ix. Current Road Circulars published by the Stationery Office;

x. TfL's Streetscape Guidance;

xi. DfT Manual for Streets;

xii. Section 17 of the Crime and Disorder Act;

xiii. Carbon Emissions Calculation Tool (Highways England);

xiv. All relevant Health and Safety legislation;

xv. Construction (Design and Management) Regulations 2015 – The TfL Health and Safety Advisor will be involved in the review of the AIP and all design information to ensure health and safety risk management forms a part of the project proposals;

xvi. PAS 2080: Carbon Management in Infrastructure

xvii. Asset Information Modelling and Management.

5.6.10 The *Consultant* follows and complies with Industry good practice guidance for design, maintenance and management of structures, wherever possible. If there are good reasons

for deviating from mandatory documents or good practice, then the *Consultant* submits a justification and/or derogation to the *Client* for agreement before proceeding.

5.6.11 The *Consultant* informs the *Client* of changes in statutory requirements that are relevant to an instruction, once the *Consultant* becomes aware of them.

5.6.12 As part of the *Consultant's* comprehensive review of the feasibility study and inspection reports produced by others, if further action is considered necessary, the recommendations shall be included in the review submitted to the TAA.

5.6.13 Other Standards, departures from Standards and methods of dealing with aspects not covered by Standards etc. shall be agreed with the TAA through the technical approval process.

5.6.14 The category of design check shall be agreed with the TAA as the design details are developed and the AIP is produced.

Design Meetings

5.6.15 The *Consultant* details the design meetings with the Design Management Plan. This will include the frequency and required attendees. These meetings will need to consider the project progress meetings identified within section 7.2.

5.6.16 The *Consultant* chairs the regular design meetings, this is to ensure that the independent design teams work collaboratively and work to integrate the designs.

5.6.17 The *Consultant* uses the weekly meeting to monitor the designers progress and performance.

5.6.18 The *Consultant* interfaces with the Project Manager and Project Engineer to arrange the required TfL attendees. This will be dependent on the agenda of the meeting.

5.6.19 The design meetings will allow for the *Consultant's* designer's and the *Client's* engineers to work collaboratively throughout, challenging the design, and ensuring it meets the *Client's* requirements.

Concept Design Review

5.6.20 The *Client* will hold a Concept Design review that will be chaired by the *Consultant*.

5.6.21 The exact date is to be agreed between the *Consultant* and the *Client*. The review will take place in a multi-disciplinary forum, and the adopted design solution should be evaluated for feasibility, constructability, technical adequacy and general compliance with requirements (e.g. safety, operability, reliability, maintainability, function and cost).

5.6.22 In addition, the review should confirm:

i. The assumptions and calculations that led to the adopted solution being selected are provided (output from the Feasibility Review), and whenever possible, preliminary prototypes, mock-ups or sketches are used to communicate the design proposal;

ii. The technical progress of the project is reviewed, as is the current and projected status of the budget and schedule;

iii. The meeting should verify how the proposed design will satisfy all the sponsors requirements described within the Project Requirements Specification (PRS) and has been developed with due regard to any constraints imposed;

iv. Technical risks remaining to the tunnel, interfacing equipment and people have been captured, reviewed quantified and agreed with mitigating controls / action plans incorporated in project control documentation;

v. Non-Compliances to legislation and relevant standards have been identified and a rationale presented as to why these should be agreed;

vi. The high-level architecture of proposed hardware / software deliverables provides confidence that the design satisfies functional and non-functional requirements as appropriate;

vii. Technical and project-related issues have been identified and resolved or escalated for resolution by 3rd parties.

5.6.23 The *Consultant* chairs the review and take minutes. Questions and comments raised will be logged by the *Consultant* and actions apportioned to each owner for response. The log will detail the responses for discussion at the next review meeting.

5.7 Buildability and Maintainability

5.7.1 The *Consultant* considers the operating hours of the tunnel throughout the design process and ensures the design can be implemented within the regular operational maintenance closures. This information can be found in section 5.5.4.

5.7.2 The tunnel will need to remain mostly operational (there is scope for night/weekend closures) during the build phase. The designer should consider this and ensure that the proposed design does not introduce activity that will impede the maintenance teams.

5.7.3 The *Consultant* considers future maintainability in the design. The design ensures that all new assets specified have adequate access to perform the required maintenance activity, and that no specialist maintenance activity will be undertaken without the prior acceptance of the *Client*.

5.8 Principal Designer

5.8.1 The *Consultant* undertakes the CDM Principal Designer role in accordance with the Health and Safety Scope Specification contained in Appendix G.

5.9 Health and Safety

5.9.1 The *Consultant* undertakes all Health and Safety aspects of the project in accordance with the Health and Safety Scope Specification contained in Appendix G.

5.10 Sustainability and Environment

5.10.1 The *Consultant* undertakes all sustainability and environmental aspects of the project in accordance with the Environment Scope Specification contained in Appendix H.

5.11 Value Engineering

5.11.1 The *Consultant* ensures value for money throughout the design process. If a better value solution is identified the *Consultant* informs the *Client* in writing.

5.11.2 The *Consultant* undertakes value engineering on the replacement of the tunnel cladding panels.

5.11.3 The *Client* considers value for money to not only be a reduction of cost. Value for money can also be in the form of reduced tunnel disruption, reduced delivery time or an improvement in the specification of the asset delivered. Whole life cost is also considered as part of the value engineering review.

5.11.4 The *Client* will consider each value for money option presented on its individual merits. Each option shall be discussed with the project stakeholders prior to a decision on the option being advised back to the *Consultant.*

5.11.5 The *Consultant* and its designers lead at least one value engineering workshop exercise. This will be arranged in conjunction with the *Client*.

5.11.6 The workshop will be chaired by the *Consultant* and solutions presented for discussion. The output from the review will be documented with minutes as a log of the exercise.

5.11.7 Additional workshops will be arranged between the *Consultant* and the *Client* if required.

5.12 Technical Assurance and Approvals (TAA)

5.12.1 Technical approval to TfL SQA-2025 and CG 300 applies to all stages of the design process, SQA-2025 is based on the requirements of CG 300.

5.12.2 Technical approval satisfies the TfL guidance as per SQA-2025: Technical approval of Surface and Highway Structures.

5.12.3 The *Consultant* undertakes the design in accordance with the requirements of the AIP, SQA-2025, CG300, the DMRB and the Eurocodes and any other relevant standards.

5.12.4 The TfL Technical Approval Authority (TAA) is an appointed discipline specific member (or members) of TfL staff.

5.12.5 Where a Category 3 independent check is required, the *Client* ensures an appropriate supplier is appointed to undertake the work.

5.12.6 An independent Peer Reviewer may be appointed by the *Client*. The reviewer shall be involved at all stages throughout the design to challenge any assumptions made. The *Consultant* assists the reviewer in its enquiries and supplies material as requested during the review stage.

5.12.7 The *Consultant* provides all calculations, drawings, models and other documents required by SQA-2022 to ensure that the design is adequately conveyed to the *Client*.

5.12.8 The *Consultant* makes copies of draft calculations, drawings and any other documents required by SQA 2022 available on request, for comment, as the design progresses.

5.12.9 The *Consultant* identifies potential relaxations and departures from standards for inclusion in the AiP for each package. A list of potential relaxations and departures shall be produced by the Consultant at the commencement of the preliminary design, reviewed and updated as necessary throughout the design stage.

5.12.10 The *Consultant* consults with TfL's Asset Operations team throughout the design stage to ensure that the maintenance requirements are considered and that operational risks are mitigated. This will be facilitated by the Project Manager.

5.12.11 The *Consultant* provides three sets of documents (an AIP, the design and check certificates) with original manuscript signatures. All elements shall be bound as a single document. Drawings submitted with proposals should be specific, relevant and show the general arrangement and key dimensions.

5.12.12 The *Consultant* ensures that the technical requirements for design and assessment generally comply with the requirements stated in design standards above. The *Consultant* agrees

other standards, departures from standards and methods of dealing with aspects not covered by Standards with the TAA through the technical approval process.

5.12.13 The role of each TAA is to agree the Approval in Principle and subsequently accept the relevant certificates, confirming that the design, assessment and specification complies with the agreed Approval in Principle and design/assessment and specification certificates where appropriate.

5.12.14 The TfL Engineering team plays a critical role in the Integrated Delivery Team – providing technical guidance to facilitate Technical Approval of the design, specification and works.

5.12.15 TAAs have a distinct role from the Project Manager and are responsible for required approvals only. The *Consultant* takes instructions from the Project manager, as the TAAs do not issue instructions to the *Consultant* or Designer.

5.13 Asset Information Modelling and Management

5.13.1 Refer to Appendix B for Building Information Management (BIM) information.

5.13.2 Information Management and Modelling (IMM) is a new way of working which will transform the way TfL Surface Transport specifies, manages and uses asset related data and information. It will ensure that we have the right information at the right time to both deliver capital infrastructure projects and to manage and operate the assets through their lifecycle.

5.13.3 At the heart of the IMM requirements is the delivery of projects to Level 2 BIM maturity as documented in PAS 1192-2:2013. TfL has, as part of the STIC contract produced a framework level Employer's Information Requirements (EIR - tfl_scp_001746d_vol_a_sch3_app_1_app_k2_bim_eir_final). This details as to the who, what, how and when with regards to the generation and management of information.

5.13.4 The *Consultant* delivers a BIM Execution Plan (BEP), using a TfL template, as to how they will meet the requirements of the EIR.

5.13.5 Refer to Appendix B for BIM Specification, and the BEP template. Refer to the framework level EIR (tfl_scp_001746d_vol_a_sch3_app_1_app_k2_bim_eir_final).

5.14 Cost Estimate and Programme for Detailed Design and Build

5.14.1 The *Consultant* provides cost estimates for design and build at the end of the / each Pathway Stage for internal management and budgetary purposes. This must be aligned to the Client's

estimating principles which are included in Appendix F. Ongoing cost estimates are provided as per section 7.1.8

5.14.2 The *Consultant* undertakes the estimate in accordance with the Estimating Scope Specification contained in Appendix F.

5.14.3 The *Consultant* develops a design and build programme in conjunction with the *Client,* to support the *Client* in project programming. The *Consultant* includes;

i. the starting date, access dates, key dates and completion date
ii. the order and timing of the operations
iii. the order and timing of the work of the *Client* and Others
iv. the dates by which the contractor must complete work needed to allow the *Client* and Others to do their work
v. provisions for float, time risk allowances, environmental and health and safety requirements
vi. the dates when, in order for the contractor to provide its services, it would need:
    a. access to a person, place or thing if later than its access date
    b. information and things to be provided by the *Client* and
    c. information and approval from Others

5.14.4 The *Consultant* presents the design and build cost estimate and programme at the concept design review meeting described in 5.6.18

5.15 Handover of Final Deliverables

5.15.1 The *Consultant* ensures that all final deliverables to be handed over, comply with the requirements SQA 2022 and SQA 2026.

5.15.2 Where an Approval in Principle (AIP) document is required, concept design shall be deemed completed once the AIP has been agreed and endorsed by the Technical Approval Authority (TAA) in TfL Engineering.

5.15.3 The *Consultant* delivers the final concept design package to the Project Manager via the CDE.

6 Existing Information

6.1.1 The following existing information is available in the site information pack:

i. Atkins Feasibility Report
   a. [BWTSB Refurb Feasibility Report ST_PJ530-ATK-ZZZ-ZZ-REP-ZZ-10002_P03]

ii. VVB Reports produced during the feasibility stage

iii. Tunnel Lighting System
   i. [15-BWT - Interpretive Report – Tunnel Lighting_Ver1]

iv. Lighting Support Structure
   i. [16-BWT - Interpretive Report - Tunnel Lighting Structural Support - REV 4_Ver1_4]

v. Tunnel CCTV system
   i. [2-BWT - Interpretive Report - CCTV_Ver1]

vi. VMS/LCS Signage
   i. [17-BWT - Interpretive Report - VMS and Wayfinding - REV 4_Ver1_4]

vii. BridgeStation report for Highway Surface
   a. [Blackwall_Tunnel_Southbound_60486237-M409-REP-0006-B_SB]
   b. [60486237-M409-REP-0047-B signed]

viii. Tunnel Cladding Survey detailing the missing panels
   a. [BWT S-B LINING PANELS SURVEY-2020 rev 2]

ix. Kier asset survey, this gives an overall tunnel plan and details asset positions together with distances from the north portal.

x. [BWT_SB_ASSET SURVEY_REV A]

xi. Hazardous Materials

xii. 4Rail Asbestos Management Surveys

   a. [R678002 Blackwall SB Tunnel Exit Ramp Retaining Walls]
   b. [R678004 Blackwell Tunnel Southbound Reinspection 2021]
   c. [R678010 BTNA R7, R8, R9 - R47]

xiii. [R678032 Gantry 54 NB Weetman Street]

xiv. The tunnel O&M manual detailing each of the tunnel systems, this includes schematics of each system.

xv. The tunnel H&S file

6.1.2 A Pre-Construction Information document for the tunnel will also be provided.

7 Constraints on how the *Consultant* is to Provide the Services

7.1 Completion Target Date

7.1.1 The Blackwall Tunnel Southbound project concerns critical issues that need to be addressed in order to operate the tunnel safely. The *Client's* target is to complete this concept design commission within six months. The key project milestone dates are detailed in the table below.

Milestone	Target Date
Contract Award	13 July 2021
Mobilisation starts	20 July 2021
Mobilisation ends	02 August 2021
Completion of Concept Design Phase (Final Concept Design Report including updated drawings and spec as required approved by TfL TAA)	20 January 2022

7.1.2 The *Consultant* mobilises within 2 weeks

7.2 Project Management

Programme

7.2.1 The *Consultant* updates the accepted programme against project progress. This programme should:

i. Be submitted periodically (4 weekly), showing the critical path;

ii. Show key activities planned for next month;

iii. Ensure a revised programme for acceptance together with an updated activity schedule;

iv. Once baselined, include a narrative explaining progress against agreed baseline;

v. Show all reviews, activities and actions the *Client* is responsible for;

vi. Indicate key milestones;

vii. Incorporate resource allocation;

Project Management

7.2.2 The *Client* determines the project management methodology to be followed (Pathway) as outlined in 2.3. The *Consultant* agrees to the project management style as outlined by the *Client* and complies with the Pathway templates found in Appendix A.

Project Reporting

7.2.3 The *Consultant* produces a progress report 4 weekly, in line with the *Client's* reporting cycle. The *Consultant* submits the report to the *Client*. The sections of the progress report shall comprise of the following:

i. Health, safety and environment;
ii. Summary of progress;
iii. Upcoming activities and decisions required;
iv. Stakeholder engagement;
v. Risks and opportunities;
vi. Programme;
vii. Commercial;
viii. Any other business.

Allocation of *Consultant* Staff

7.2.4 The *Consultant* identifies and agrees named resource during mobilisation. The *Consultant* obtains approval from the *Client* after mobilisation, before any new staff resources are allocated to work on the project. The *Consultant* issues a request setting out:

i. The name, role and rate of staff (proposed for mobilisation);

ii. Proposed mobilisation date;

iii. Planned demobilisation date.

7.2.5 The *Consultant* is not entitled to make payment for staff time for any person who has not been approved by the *Client* in line with the above requirements.

Cost Reporting

7.2.6 The *Consultant* undertakes cost management.

7.2.7 The *Consultant* submits a full periodic summary report of project costs to the Client every 4 weeks (28 days). The format of this periodic report is agreed during mobilisation and the

report covers progress to match the *Client* financial periods. It will be submitted in the week 1 of the *Client's* 4 weekly reporting cycle. The report includes:

i. Costs in period and cumulative cost to date compared to both in period and cost to date baseline forecast; to include variance report and variance commentary;

i. Details of matters affecting the Estimated Final Cost of the services as well an updated End Life Forecast;

ii. Revised programme for acceptance together with an updated forecast of the Prices or similar.

7.3 Meetings Schedule

7.3.1 The *Consultant* and its subcontractors attend regular meetings with the *Client* throughout the duration of this commission. Project meetings (i.e. progress / design / review) will be held either at a designated co-location office, at the *Client's* offices or via Microsoft Teams. The *Consultant* also attends any Ad-Hoc meetings deemed necessary by the project manager.

Progress Meetings

7.3.2 Regular progress meetings will be required at least once every 4 weeks once contract is awarded, though the PM can change the frequency due to demand. All relevant stakeholders as listed in section 4.3 are invited to ensure that any stakeholder input or questions are included as required. Other stakeholders may be identified and need to be included as the project continues to be developed.

7.3.3 The *Consultant* provides an update on health, safety and environmental issues, risks and opportunities, and stakeholder engagement. This meeting is chaired by the *Client* and is held once every two weeks. The *Consultant* records and maintains minutes of all progress meetings, these are distributed to all attendees.

7.4 Reports

Desktop Reports

7.4.1 Reports and other documents produced as part of this commission are produced in accordance with the TfL Guidance SQA-2022 and any other relevant industry standards and good guidance. Exact requirements of each specific report or document is agreed with the *Client* prior to commencement of the task.

Factual Reports

7.4.2 Factual reports are produced regarding the surveys, investigations and testing. The draft factual reports are submitted within four weeks of completion of site work, and the final report is submitted within one week of receipt of comments from the *Client*.

Interpretive Reports

7.4.3 Interpretive reports are produced based on the contents of the factual reports. The draft interpretative reports are submitted within two weeks of completion of the factual report, and the final report is submitted within one week of receipt of comments from the *Client*.

7.5 Performance

7.5.1 The *Client* relies on the indicators as shown in Table 3 to keep track of the *Consultant's* performance throughout the concept design commission

Table 3: Performance Indicators

Periodic Reporting	Regular progress reporting timed to allow subsequent TfL senior management reporting cycles to be met. Regular (periodic) updated programmes are also expected. The *Consultant* presents progress meetings and minute all discussions each period. A Cost Forecast will be expected and updates to forecast provided every period by week 2 of TfL's reporting calendar.
Delivery of Reports	Comprehensive reports are required as per the list of Deliverables found in section 4.11 Output of final reports shall be two weeks after receipt of TfL comments.
Risks	The *Consultant* produces a comprehensive risk register to include all aspects of design and construction. These should be reviewed during the contract period and reviewed and submitted along with the periodic progress report with changes highlighted.
Performance Against Baseline Programme	The *Consultant* submits a baselined programme 2 weeks after the *starting date* and then demonstrate progress against this. The programme should be updated and submitted every 4 weeks. The Programme is to be reviewed at the weekly progress meetings to ensure upcoming activities are on track

7.6 Build Delivery

7.6.1 The *Client* anticipates there will be build delivery constraints: these will likely include a conflict with planned Rotherhithe Tunnel refurbishment works, expected to include a full and continuous closure from December 2022 for 9 to 12 months. Dates and type of closure are yet to be finalised, but they will be substantial and of this order. Works on other Thames river crossings are also planned.

7.6.2 The *Consultant* liaises with the *Client* for an up to date provisional programme for Rotherhithe Tunnel and other Thames river crossings works which could influence the Blackwall Tunnel build programme. The *Consultant* takes account of this information in optimising Concept Design proposals and in considering flexible options for build delivery.

7.7 Quality

7.7.1 The *Consultant* operates a Quality Management System conforming to BS EN ISO 9001. The *Consultant* carries out its duties in accordance with the accepted quality procedures defined in the Quality Assurance Plan forming part of its Quality Statement.

7.7.2 When requested by the *Client*, the *Consultant* makes available the quality manuals and all other relevant information for inspection. The *Consultant* provides copies of any technical reviews, audit reports or quality related documentation.

7.7.3 The design will also comply with SQA 2022 with regards to the quality of the design to be provided.

Quality Assurance Plan

7.7.4 The *Consultant* produces a Quality Assurance Plan.

7.7.5 The *Consultant* is accredited to ISO 9001:2015 or able to demonstrate adherence to quality assurance to an equivalent standard. The Quality Assurance Plan should incorporate;

i. Health & Safety Plan;

ii. Risk register including recommended mitigation strategies (the risk register should mirror the format utilised by the web-based risk assessment package “Active Risk Manager” or “ARM” and should include current and target probabilities; minimum, likely, maximum durations and costs. Mitigations should be clearly identified. A Monte Carlo P50 assessment should be carried out;

iii. A periodic progress dashboard using template within Appendix A;

iv. CDM2015. All requirements under CDM applicable to the Principal Designer role at Concept Design stage.

7.7.6 The Quality Assurance Plan is compliant to ISO 10005 and references all relevant quality management system processes/procedures to deliver the scope of work.

8 Information and other things provided by the *Client* and Others

8.1 Information provided by the *Client*

8.1.1 The *Consultant* has access to all available records and archived documents on the project including any previous surveys, investigations and testing undertaken. Further information in the form of inspection records, construction drawings reports, and other information stored on the Bridgestation Bridge Management System are also available.

8.1.2 The *Consultant* ensures that all required record information is transferred and stored on EDMS within the CDE, and Bridgestation records are updated.

9 Deliverables

9.1 Table of Deliverables

Project Deliverable Ref.	Title Description	Comments
Mobilisation		
BWT1	Consultancy Org Chart (Including Supply Chain)	Mobilisation documentation to be supplied by the *Consultant* for acceptance by TfL
BWT2	Stakeholder Map	
BWT3	Early Warning Strategy	
BWT4	Risk & Issue Management Strategy	
BWT5	Programme	
BWT6	Progress Meeting Schedule	
BWT7	Resource Plan and Cost Forecast	
BWT8	Risk Register Template	
Stakeholder Management		
BWT9	Stakeholder Management Plan	Record of all contact made with stakeholders, including contact details, a summary of what was discussed and any actions
Review of Existing Information		
BWT10	Desktop Study Report	Of existing information, including the Pathway Stage 2 feasibility study and work completed to date
Investigations		
BWT11	Investigations Specification	Desktop study report of recommended investigations required to complete the Concept Design and inform the Detailed Design
BWT12	Investigations Factual and Interpretive Reports	On completion of investigations and the like, a detailed factual and interpretive report shall be provided. The report shall include recommendations for any additional

		investigations and/or testing required
Third Party Interfaces		
BWT13	Preliminary Utilities Diversions (if required) Programme for Design and Build	Only if required
Design		
BWT14	Concept Design Drawings	
BWT15	Concept Design Report	
BWT16	CAD Drawings for Concept Design	
BWT17	Concept Design Calculations (if relevant)	
BWT18	Gaps and Assumptions Register/Log	For review in Detailed Design. Anything of relevance for the Detailed Designer to be aware of/to review/to consider. Updated regularly – ongoing throughout design
BWT19	Technical Requirements Specifications for Issue to Design and Build Contractor	
BWT20	Design Decisions Register/Log	Updated regularly - ongoing through design
BWT21	Traffic Management and Diversion Plans for Build	Phasing of the works, permits etc
BWT22	Design Management Plan	
BWT23	Constraints & Dependencies Log	Updated regularly - ongoing through design
BWT24	Concept Design Review Minutes	
Buildability and Maintainability		
BWT25	Specification (Works Information) for Detailed Design and Build	
BWT26	Operation and Maintenance Plan for Tunnel	To include maintenance schedule
Principal Designer		
BWT27	Design Hazard Identification and Risk Register	Updated regularly - ongoing through design
Health and Safety		
BWT28	Pre-Detailed Design H&S Pre-Construction Information	

Sustainability and Environment		
BWT29	Pre-Detailed Design Environment Pre-Construction Information	
BWT30	Designers Environmental Risk Assessments	Updated regularly - ongoing through design
BWT31	Embodied Carbon Assessment Report	
Value Engineering		
BWT32	Minutes from Value Engineering Workshop(s)	
Technical Assurance and Approvals (TAA)		
BWT33	*Client*/TAA/Consultant/Contractor/Stakeholder Comments and Responses Log for Tunnel Design	Updated regularly - ongoing through design
BWT34	AIP for Concept Design	
BWT35	Design and Check Certificates	
Asset Information Modelling and Management		
BWT36	BIM Execution Plan	Using TfL template
Cost Estimate and Programme for Detailed Design and Build		
BWT37	Cost Estimates (using TfL template) for Detailed Design and Build	To include whole life costs based upon O&M Plan
BWT38	Works Programme (Schedule) for Detailed Design and Construction phase	
Handover of Final Deliverables		
BWT39	Relevant Pathway Documentation	As specified in the scope document
Project Management		
BWT40	Programme	Submitted periodically
BWT41	Progress Report	Submitted periodically
BWT42	Cost Report	Submitted periodically
BWT43	Lessons Learned Log/Report	Updated periodically/submitted during handover
Meetings Schedule		
BWT44	Minutes from Progress Meetings	From two-weekly progress meetings

Quality		
BWT45	Quality Assurance Plan	

10 Appendix A – Templates to be Provided

The following document templates will be provided:

i. BEP - Appendix 350-02;

ii. Project Information Exchange (PIx) Protocol IT Assessment Form – Appendix 350-04;

iii. TfL Cost estimate template;

iv. Periodic progress dashboard template;

v. MIDP Template – Appendix 350-05.

11 Appendix B - BIM

11.1 Terms and Definitions

The following are terms used in this Concept Design Specification:

BIM Execution Plan (BEP): A plan, provided by the *Consultant* and accepted by the *Project Manager*, detailing how the *Consultant* complies with requirements as set out in the Concept Design Specification, IM&M section.

Common Data Environment (CDE): The agreed solution for the production, use and management of Model File(s), Composite Model(s), Non-Graphical Data, Document Definition(s) and Document Rendition(s), set out in the SMP, BEP and MIDP(s).

Composite Model: Computer Aided Design (CAD) file(s) displaying one or more Model Files (attached as references), for the purpose of performing coordination activities and / or compiling Document Definitions.

Documentation: Native Files and / or Data Files and / or Document Renditions.

Document Definition: Data file produced, containing a view of the Non-Graphical Data and / or Model File(s) and / or Composite Model(s), to derive meaning for a specific purpose.

Document Rendition: A data file in an immutable format, derived from a Document Definition.

***Employer's* Information Requirements (EIR):** Sets out the standards to be used and required details relating to the data and information about the *Employer's* engineered asset's physical and functional characteristics, how these shall be captured, produced, generated, utilised and managed by its suppliers.

Handover Information: Model File(s), Composite Model(s), Non-Graphical Data, Document Definition(s) and Document Rendition(s) which have been agreed between the Parties to be produced, updated, maintained and delivered as set out in the MIDP(s) until completion of the Contract.

Information Requirements: The document(s) setting out the way in which Models shall be produced, delivered and used on the Project, including any processes, protocols and procedures.

Master Information Delivery Plan (MIDP): A forward looking schedule of the Model File(s), Composite Model(s), Non-Graphical Data, Document Definition(s) and Document Rendition(s) which are to be produced, updated, maintained and delivered as Production Information.

Model File: Computer Aided Design (CAD) file(s) containing shape(s) with defined origin, orientation and dimensions, communicating the physical characteristics of the *works.* A Model File may also include Non-Graphical Data, associated to the CAD file(s) and / or shape(s), identifying the functional characteristics of the assets.

Native File: Original graphical data and / or non-graphical data file in its default format, as created in the authoring tool.

Non-Graphical Data: Data file containing alphanumeric characters, communicating the physical and functional characteristics of the *works.*

Production Information: The Model File(s), Composite Model(s), Non-Graphical Data, Document Definition(s) and Document Rendition(s) which have been agreed between the Parties to be produced, updated and maintained in order to complete the Project and be delivered, in accordance with SQA-2025, during the design and construction stages of the Project, as set out in the Master Information Delivery Plan(s).

Project Data Environment: A system which forms part of the Common Data Environment and is accessible to the *Employer,* the *Consultant,* or any employee, Sub-contractors or supplier of the *Consultant,* the *Project Manager,* the *Supervisor* and Others (as applicable). It is used to manage and exchange the master version of all shared Production Information.

11.2 BIM Responsibilities

11.2.1 The *Consultant* appoints a designated person to undertake the role and responsibilities of Project Information Manager as defined in the EIR for the duration of the Contract until the later of:

i. Contract completion; or

ii. All Production Information has been accepted by the *Project Manager* in accordance with 11.5.1.

[Note: Whether the Project Information Manager is to be a key person for the purposes of clause 24.1 of the contract will need to be considered on a project by project basis. If applicable, details of the Project Information Manager need to be incorporated in Contract Data Part 2].

[Other contractual requirements relating to managing and/or exchange of information including any document control procedures, must be checked to ensure they do not contradict or invalidate 1.2.2 below].

11.2.2 The *Client* provides, manages and maintains the Project Data Environment, in accordance with the EIR (as described in clause 11.3.10) and BS1192:2007. The *Client* shall ensure accessibility to the Project Data Environment to the *Client*, the *Consultant* or any employee, Sub-contractors or supplier of the *Consultant*, the *Project Manager*, the Supervisor and Others (as applicable) until the requirements of 11.2.4 have been achieved.

11.2.3 The *Consultant* and their Sub-contractors are responsible for completing, updating and maintaining the MIDP(s) and BEP to be provided by the *Consultant* until the requirements of 11.2.4 have been achieved.

11.2.4 The *Consultant* and his Sub-contractors produce, update and maintain Production Information in accordance with the accepted MIDP(s) and BEP provided by the Consultant, until the later of:

i. Contract completion; or

ii. All Production Information has been accepted by the *Project Manager* in accordance with 11.5.1.

11.2.5 The *Consultant* and its Sub-contractor(s) produce, use, update and manage Production Information through the Common Data Environment (CDE).

11.2.6 The *Consultant* and its Sub-contractor(s) are responsible for and maintain the integrity and compatibility of the Production Information until the requirements of 11.2.4 have been achieved.

11.2.7 The *Consultant* and its Sub-contractor(s) are responsible for the coordination and integration of the design contained within the Model Files and / or included as part of the Non-Graphical Data, across all disciplines, with Others, with existing infrastructure and any adjacent works.

11.2.8 The *Consultant* and its Sub-contractor(s) are responsible for (and provide evidence through internal audits in line with the quality assurance plan to verify that), the Production Information fulfils contractual requirements Non-compliance, identified by the *Consultant*, his Sub-contractors and / or notified by the *Project Manager*, shall be rectified within timescales notified by the *Project Manager*.

11.3 BIM Process

Master Information Delivery Plan (MIDP)

11.3.1 The MIDP(s), to be provided by the *Consultant*, sets out the Production Information which the *Consultant* and his Sub-contractor(s) have agreed with the *Project Manager* to produce, update, maintain and deliver, in order to complete the Contract.

11.3.2 The *Consultant*, in co-operation with his Sub-contractor(s) and the *Project Manager* completes the MIDP(s), to be provided by the *Consultant*. The MIDP(s) provided by the *Consultant* must:

i. Provide descriptions of the varying levels of maturity and specify the applicable level for each entry within the MIDP(s) which will be developed at each stage of the Contract;

ii. Ensure the MIDP(s), provided by the *Consultant,* is aligned with the Accepted Programme; and

iii. Ensure the level of maturity of the Model File(s) and Non-Graphical Data specified in the MIDP(s) for each stage of the project is to an appropriate level such that the acceptance criteria and requisite level of assurance for the Contract, in accordance with SQA-2025, can be achieved.

11.3.3 The *Consultant*, in co-operation with its Sub-contractor(s) and the *Project Manager* submits the MIDP(s), to be provided by the *Consultant* to the *Project Manager* for acceptance within 2 weeks of the starting date.

11.3.4 The *Project Manager* either accepts the MIDP(s) provided by the *Consultant* or notifies the *Consultant* of the reasons for rejection. Reasons for rejecting MIDP(s) provided by the *Consultant* are:

i. The proposed Model Files, Composite Models, Non-Graphical Data, Document Definitions and Document Renditions are not suitable for assurance and will not meet the requirements of the *Client*, the *Consultant*, or any employee, Sub-contractor or supplier of the *Consultant*, the *Project Manager*, the Supervisor and Others (as applicable) at each stage of the Contract;

ii. Cell values are incomplete or missing; or

iii. The level of maturity identified for the Model Files and Non-Graphical Data, at each stage of the Contract, is not commensurate with the acceptance criteria and level of assurance required at each stage of the Contract.

Employers Information Requirements (EIR)

11.3.5 The Employers Information Requirements (EIR) provides details relating to the data and information about the Clients engineered asset's physical and functional characteristics, how these shall be captured, produced, generated, utilised and managed by its suppliers. The EIR sets out standards to be used and identifies key decisions that will need to be made during the project to ensure the engineered solution developed meets project objectives, desired outcomes and benefits.

11.3.6 Updates to the EIR will be managed through the Project Change Control process.

BIM Execution Plan (BEP)

11.3.7 The *Consultant* updates and maintains the BEP.

11.3.8 The BEP provides details, describing how the *Consultant* and his Sub-contractor(s) will:

i. Comply with the requirements as set out in the Concept Design Specification, BIM section

ii. Collaboratively produce, use, update and manage all Production Information, agreed within the MIDP(s) provided by the *Consultant* in accordance with BS1192:2007, this shall include (but not be limited to):

a. Consistent collaborative processes in relation to production, use and management of information

b. Information exchange protocols in relation to how information will be shared and exchanged

c. Predefined roles and responsibilities of project team members in relation to the production, use and management of information.

iii. Provide assurance that Production Information meets the requirements as set out in the Concept Design Specification BIM section, is compliant with Standards and how evidence will be provided to ensure compliance with the BIM Coordination Process, this shall include (but not be limited to):

a. Managing change control of the Production Information throughout the lifecycle of the project

b. Ensuring that the graphical data, non-graphical data and documentation is cross-referenced and aligned as a complete dataset and Production Information is consistent with intended design and / or what was built / installed

c. Managing spatial coordination of the graphical data (physical space, operational space and maintenance space)

iv. Ensure that their staff has the capability and competency to the appropriate level to ensure that Production Information is coordinated, verified and managed in accordance with requirements as set out in the BIM Coordination Process and Standards.

11.3.9 The *Consultant* submits the BEP to the *Project Manager* for acceptance within 2 weeks of the *starting date*.

11.3.10 The *Project Manager* either accepts the BEP or notifies the *Consultant* of the reasons for rejection. The BEP will be rejected if it does not meet the requirements set out in 11.3.13 .

11.3.11 The *Consultant* and his Sub-contractor(s) do not produce Production Information for the Contract until the MIDP(s) and BEP provided by the *Consultant* have been submitted to the *Project Manager* for acceptance.

11.4 BIM Coordination Process

11.4.1 The *Consultant* and his Sub-contractor(s) are responsible for (and provide evidence as part of the Production Information, submitted in accordance with 11.5.2 and as requested by the *Project Manager*, to verify that the Contract are fully co-ordinated and integrated across all disciplines, with Others, with existing infrastructure and any adjacent works.

11.4.2 The *Consultant* and his Sub-contractor(s) are responsible for (and provide evidence as part of the Production Information, submitted in accordance with 11.5.2 and as requested by the

Project Manager, to verify) buildability and maintainability of the Contract. Evidence shall include (but not be limited to):

i. Physical Space: one or more assets, or components of, do not occupy the same space;

ii. Construction Tolerances: sufficient space for the installation of assets and their component parts;

iii. Operational Tolerances: sufficient space for assets to operate, as intended; and

iv. Maintenance Tolerances: sufficient space for the maintenance of assets and their component parts.

11.4.3 The *Consultant* demonstrates the effectiveness of any value engineering using the Production Information.

11.5 BIM Submission Procedures

11.5.1 The *Consultant* submits to the *Project Manager* for acceptance the Production Information as set out in the accepted MIDP(s) provided by the *Consultant,* in accordance with the Accepted Programme and in the following formats:

i. Model File(s), Composite Model(s), Non-Graphical Data and Document Definitions as editable electronic files, in accordance with TfL Standards; and

ii. Document Renditions in an immutable, read only format (PDF).

11.5.2 Unless otherwise agreed between the *Project Manager* and *Consultant*, the period for reply for *Project Manager* acceptance is 2 weeks.

11.5.3 The *Project Manager* either accepts the submission or notifies the *Consultant* of his reasons for rejection. Reasons for rejection are:

i. Production Information are not submitted through the CDE, in accordance with 11.2.5.

ii. Production Information does not comply with Standards.

iii. Production Information is not developed to an appropriate level of maturity such that the acceptance criteria and requisite level of assurance for the works can be achieved.

11.5.4 There is no acceptance / rejection in respect of interim submissions; therefore, the *Project Manager's* response will be in the form of comments only.

12 Appendix C – Pathway Documents for Production

i. Technical requirements Specifications (1 for each system)
ii. Design Management Plan
iii. BIM Execution Plan (BEP)
iv. Master Information Delivery Plan

13 Appendix D – SQA Documents

i. SQA-2022: Requirements for the development and acceptance of proposals for structures & tunnels capital schemes.

ii. SQA-2025: Technical approval of Surface and Highway Structures.

iii. SQA-2026: Requirements for Tunnels and Structures Health and Safety Files, Records and Maintenance Manuals.

14 Appendix E – Scope Items Detail

14.1 Scope Items Detail

14.1.1 This section provides additional detail on requirements of the *Consultant* for the scope items in section 3.3.

14.1.2 The *Consultant* develops designs to replace the current lighting system with an LED based system:

i. The in-bore lighting system is to be replaced with an LED based system (as per TfL's Tunnel Lighting Guidance). The photometers should be replaced. Consideration should be given to the provision of evacuation lighting in the tunnel.

ii. The out of bore lighting system is to be replaced with an LED based lighting solution. This replacement will require new support columns and cables.

iii. The lighting system will be designed in accordance with the guidance contained in the TfL road tunnel lighting guidance document. The new lighting system will be automatically controlled by the local SCADA system using inputs from the photometers and provide functionality for the Network Management Control Centre (NMCC) to control the demanded lighting level. Emergency lighting will be provided by supplying sufficient of the luminaires from the UPS supply to generate the lighting levels required in the standards.

iv. Consideration should be given to the provision of low-level evacuation lighting in accordance with BS EN 16276 however it is recognised that it may be difficult to achieve due to the raised walkways.

v. The design will be compliant with TfL, Highways England and British Standards, providing transition lighting levels to allow drivers eyes to adapt as they enter and leave the tunnel.

vi. The system will be installed within closures with no reduction in service from the current lighting levels during construction.

vii. The lighting system will be controlled and monitored by the local SCADA system which will accept commands from the NMCC HORUS system and pass back relevant operational information. Fault reporting will be provided additionally to the maintainer terminal.

14.1.3 The *Consultant* develops designs to replace lighting support structure:

i. The lighting support structure is to be fully replaced. See above section for more detail.

14.1.4 The *Consultant* develops designs to replace CCTV system with modern system (in-bore and on approaches):

i. The existing CCTV system is to be removed in its entirety. This includes all cameras, cables, joint boxes and mounting assemblies. The CCTV system will be replaced with a new system based on ONVIF IP-CCTV standards. The CCTV system will be connected

to the TfL CCTV network and the images made available for viewing at the NMCC.

ii. Cameras will be of a self-contained pan-tilt type and will be mounted at nominal 50m spacing throughout the tunnel and its immediate approaches. Within the tunnel every other camera will have a dual band, thermal / visible, camera head.

iii. There are no known issues with the current communications infrastructure, and it is therefore expected that it will be able to support the new CCTV System. The *Consultant* verifies this.

iv. The new system will achieve the following:

a. 100% coverage inside the bore and on approaches, no blind spots;

b. Clearance of traffic envelope;

c. Cameras deployed to minimise risk of obscuration if high sided vehicles are stationary inside the tunnel;

d. Overlapping views so that cameras can cover each other in the event of an incident or an individual camera failure;

e. Good coverage around the tunnel portals;

f. Cameras able to view both directions of traffic flow;

g. High speed iris at the portals to allow for considerable light changes as cameras pan and tilt from internal to external views;

h. Cameras will pan, tilt and zoom and have screen wipers, washer bottles and IP66 housings.

v. Security CCTV (for access) which is maintained by the tunnel maintainer is not in the scope of this project.

14.1.5 The *Consultant* develops designs to replace VMS signs with modern slimmer types (in-bore and on approaches):

i. A new system of VMS is to be installed throughout the tunnel and on its approaches.

ii. The VMS will be installed over the centre line of the carriageway with a nominal spacing of 200m. The VMS will be double sided to permit the tunnel to be used in northbound flow mode. These VMS will be able to display text message of two lines of 15 characters. The displayed characters will be 100mm in height and the signs will be fitted with conspicuity beacons.

iii. At the portals, the existing rotating prism sign will be removed, and a new variable text sign will be installed. This VMS will be capable of displaying four lines of 15 characters at a 160mm character height. It will be mounted centrally over the carriageway and will be fitted with conspicuity beacons.

iv. On the Northern approach, a VMS bearing the Legend “Over Height Vehicle Stop” will be installed on the gantry at the southern end of the A13 on-slip. This sign will be activated by the over-height vehicle detection system.

14.1.6 The *Consultant* develops designs to replace Lane Control Signs (in-bore):

i. The lane control Signs will be replaced with equivalent signs on a like for like basis. The replacement signs will be mounted over the centre line of the lane to which they correspond, and consideration should be given to increasing the separation between the sign housing and the traffic envelope.

ii. At the portals, the lane control signs will be replaced on a like for like basis.

14.1.7 The *Consultant* develops designs for the Carriageway:

i. The carriageway throughout the tunnel is to be re-surfaced. The section between the shafts which is supported on a road-deck is to have the waterproofing layer renewed. The underside of the road deck is to have any cracks sealed and spalled areas of concrete repaired.

ii. There must not be any reduction in height clearances or additional load imposed on the road deck.

14.1.8 The *Consultant* develops designs to replace tunnel cladding where panels are currently missing:

i. The circa 800 missing claddings panels are to be replaced with like for like panels from the original supplier (Polyvision) or with an innovative solution through value engineering.

15 Appendix F – Estimating Scope

15.1 Estimating Scope

Blackwall Tunnel Southbound, Phase One Concept Design Procurement Strategy Cost Estimate Scope and Specification Scope:

15.1.1 The *Consultant* provides estimating support to the Blackwall Tunnel Southbound – Phase One project. This is to include:

i. Preparing a detailed estimate for the works, based upon the outline/ reference design;

ii. Development of and information gathering for the detailed estimate based upon the outline/ reference design during the preparation of the design;

iii. Provision of costings to support option selection/ refinement;

iv. Provision of life cycle cost for the proposed works, including gathering input from others, including asset managers and experts within Transport for London and externally;

v. General estimating support to the project as required and instructed by the *Project Manager*.

15.1.2 Works are to be carried out in accordance with the specification below.

15.2 Purpose

15.2.1 The *Consultant* produces estimates for the works forming the Blackwall Tunnel Southbound – Phase One including all temporary and permanent works costs, *Client* costs, land and legal fees, licence fees, charges, statutory costs, compensations and the like. The estimate is to include: -

i. An estimate and estimate summary in the format set out within TfL's Estimate Template, a copy of which is attached to this brief;

ii. A supporting detailed bill of quantities;

iii. An estimate report;

iv. All supporting information necessary to demonstrate the derivation of the estimate, including take-off sheets, quotations, assumptions, exclusions, basis of estimate and the like;

v. Presenting the estimate to TfL, including preparing any presentation material to enable the estimate, its basis and its preparation to be fully understood and evaluated.

15.3 Summary Estimate

15.3.1 The estimate is to be prepared using TfL's standard estimate template, a copy of which is attached to this specification / tender pack.

15.3.2 The estimate should be set out in accordance with TfL's Cost Feedback Structure.

15.4 Bill of Quantities

15.4.1 The *Consultant* prepares a full Bill of Quantities for the works at a level appropriate to the level of design information available. The following describe requirements for the bill: -

i. The bill should be measured and presented in a manner consistent with the Cost Feedback Structure and the Estimate template. [Note**:** the estimate template may be subject to change. Prior to populating the template, the *Consultant* checks with TfL to ensure that the latest version of the template is used.];

ii. It should utilise a recognised method of measurement (e.g. MCHW for highways or CESMM4 for civils/ structural engineering works) for detailed measurements where insufficient detail is available within the Cost Feedback Structure. However, all detailed measurement should fit within the overall cost feedback structure and all items forming each high-level cost feedback structure item should be clearly identifiable;

iii. Each item should have a cost breakdown/ method of measurement code representing its classification within the method of measurement;

iv. It should incorporate all elements required for the works whether shown within the design information or not. The design team shall be consulted during the preparation of the bill of quantities to ensure that the full extent of works is understood;

v. It should be fully quantified and reflect the requirements of the project. Where necessary, the *Consultant* engages with appropriate specialists to properly interpret all the data available and ensure that quantities accurately reflect the works required.

15.4.2 Measurement used to prepare the bill of quantities should always use the most accurate available information. Where marked dimensions are not provided on drawings, electronic measurements from a BIM model or directly from CAD should be used wherever these are available.

15.4.3 A clear audit trail should be provided of the production of all measurement including the transfer from the measurement to the summary of the quantities in the bill of quantities. A quality assurance check should be carried out to demonstrate that the measurement has been cross checked by an independent checker (see also section 15.7, below).

15.5 Source Information

15.5.1 The information upon which the estimate is based should be appropriate to the Pathway stage for which the estimate is being prepared (Stage 3 for the principal estimate being sought via this specification).

15.5.2 As a minimum, the *Consultant* ensures it has all the "core" products required for the Pathway stage, in order to inform the estimate. The Consultant works with other members of its design team and other members of the wider project team to obtain this information.

15.5.3 In the event that the *Consultant* uses its best efforts to obtain the correct information but that elements of the information remain unavailable, due account of the level of information available should be taken in the preparation of the estimate and, in particular, in the assessment of risk and estimating uncertainty. The level of information available should be sated within the estimate report and any concerns or advice regarding the suitability of the estimate for the proposed Pathway stage should also be stated.

15.6 Estimating

15.6.1 The *Consultant* provides an Estimate for the works based upon the bill of quantities. The estimate is to: -

i. Have a base date of 3rd quarter 2021

ii. Reflect accurate current prices, based upon: -

iii. Quotations and other advice from contractors, subcontractors and other industry specialists;

iv. Known, accurate, industry data;

v. Outturn costs of comparable projects;

vi. Any other information which may more accurately inform current pricing.

15.6.2 The prices shall take account of prevailing market and economic conditions. Where it is anticipated that plant, materials or other resources will be obtained from outside the United Kingdom, this shall include taking account of appropriate currency exchange rates.

15.6.3 The estimate is to include all direct and indirect construction costs and all *Client's* costs including design and other consultancy costs, all project management costs, all compensation payments and statutory undertakers' costs, appropriate allowance for risk, contingency and uncertainty and any other costs needed to deliver the works.

15.6.4 The *Consultant* does not include any design, preliminaries, testing and commissioning and overheads and profit costs within unit rates. The estimates for these costs (except for

overheads and profit) are required to be shown separately and shall be fully resourced, based on a programme.

15.7 Risk

15.7.1 A robust allowance for risk and uncertainty shall be included within the estimate and shall be appropriate to the level of information available to inform the estimate. The risk and uncertainty allowance are to be prepared in consultation with TfL's risk managers and shall follow appropriate guidance from them.

15.8 Life Cycle Cost

15.8.1 In addition to the capital cost estimate, the *Consultant* prepares a Life Cycle Cost assessment for the project.

15.8.2 The Life Cycle Cost assessment should assume a lifespan of 25 years for the asset. The assessment should include all capital and subsequent costs including operation, maintenance and renewals of all elements of the project.

15.8.3 The *Consultant* ensures that appropriate input is provided by asset managers and other key stakeholders within TfL and shall co-ordinate this activity.

15.9 Estimate Report

15.9.1 The estimate is to be accompanied by a report that should fully explain the background to the estimate, its context and the methodology used in its creation. As a minimum it shall include: -

i. Details of the project being delivered;

ii. A summary of the estimate (in the form set out in the estimate template);

iii. A comparison between the current cost estimate and the previous cost estimate for the proposed option under the main construction elements on an elemental basis and commentary on the source of these changes;

iv. Details of all drawings, specifications, reports and other documents used in the preparation of the estimate;

v. Details of all estimator's allowances made in the estimate, the reason for which each allowance has been made and the rationale for the quantum of each allowance;

vi. A full list of all assumptions made in the preparation of the estimate, qualifications to the estimate and exclusions from the estimate;

vii. Analysis of the estimate including details of key repeatable work items and proportions of the overall cost represented by each cost category;

viii. Details of the source of cost data for the items (e.g. previous projects, known rates, quotations, etc.);

ix. Benchmarking of the estimate against previous similar projects and against known rates for various work types and repeatable work items;

x. Estimate of the Life Cycle Cost for the project, in accordance with section 6, above, and details of how this has been calculated.

15.10 Personnel

15.10.1 Personnel involved in the preparation of the estimate will be appropriately experienced and qualified for the work being undertaken. The *Consultant* provides copies of proposed estimators' CVs to TfL for agreement prior to their working on the project.

15.11 Quality Assurance

15.11.1 Before the estimate is issued to TfL, a full internal review (QA) should be carried out by the *Consultant*. The QA process should be made visible, once completed and it should include the estimate being signed by the reviewers noted below.

15.11.2 The estimate is to be checked to ensure it is free from arithmetic errors (including formula errors in spreadsheets) and that quantity measures are correct.

15.11.3 The estimate shall be reviewed by a senior member of the Consultant Staff (experienced in the type of work to be reviewed) who needs to be satisfied the estimate has been prepared and checked by suitably skilled staff. Final review and sign-off will be provided by a minimum of two directors.

15.11.4 The reviewers' signatures shall be taken to indicate that they believe the estimate to be accurately measured, appropriately priced and therefore represents a realistic assessment of the most likely project cost and that the product is thoroughly auditable.

15.12 Sign-off

15.12.1 Following completion of the *Consultant's* own Quality Assurance processes, the estimate should be signed-off by appropriate members of the TfL project tea, including the *Project Manager*, the commercial manager, the senior commercial manager, the estimator, the estimating manager and the sponsor, in accordance with TfL's "Pathway" procedures and Estimating guidance.

15.13 Communication

15.13.1 The *Consultant* liaises with the TfL Estimating team to ensure that the work being carried out is in line with TfL's requirements. The *Consultant* provides updates on the progress on the production of the cost estimate at intervals of no more than one week.

15.14 Option Costings and Ad-hoc Advice

15.14.1 As part of the scope, the *Consultant* prepares costings to inform option refinement and may also be requested to provide other estimating support to the project. Unless specifically requested, neither an estimate report nor a presentation will be required to describe these costings. They should also be undertaken to a level of detail that reflects the level of information available and timescales required for completion. However, the same principles of using the best available data shall apply to these ad-hoc exercises as to the detailed outline/ reference design estimate and these shall also be checked, and their quality assured to a similar standard.