Ref	Activity & Hazard	Design Input and Designer Actions Taken to Eliminate/Mitigate Hazards	Remaining Significant Risks	Residual Risk Rating: High/ Medium/ Low	Residual Risk to be Shown on Drawings Yes/No
7	Partial demolition of existing north pier - Potential for overloading and/or instability of retained pier. Removal of padstones- Risk of undermining/ damaging grillages supporting adjacent Centre span girders. Potential damage to retained existing drainage channel over pier. Risk of injury, fatality to staff, damage/ premature collapse of structure. Damage to LUL infrastructure below.	Stability of substructure verified for partial demolition of existing substructure. Stability of pilasters highlighted as risk on drawings. Design assumptions and associated FOS noted on proposed drawings. Envisaged construction sequence indicated in the proposed drawings. Hazard triangles to be shown on the contract drawings.	Contractor to develop a safe methodology for removal/ saw cut or removal of padstones and partial demolition of substructures. Contractor shall install condition / deformation monitoring system during demolition works. Designer should be notified with any concerns during demolition. Contractor to ensure temporary works/track protection/inspection to ensure deck does not cause any damage to below or adjacent structures. Contractor to ensure the existing channel is protected during the demolition. Contractor to arrange for precast concrete channel units to be on site to be used if existing channel cannot be reused. Stonemasons to be on standby to rebuild pilasters as required.	Medium	Yes F

Ref	Activity & Hazard	Design Input and Designer Actions Taken to Eliminate/Mitigate Hazards	Remaining Significant Risks	Residual Risk Rating: High/ Medium/ Low	Residual Risk to be Shown on Drawings Yes/No
8	Contact with existing paint system and airborne dust during demolition works. Risk to staff and public health.	Archive information specifies presence of Lead (Pb) in existing paint system. Hazard triangles to be shown on the contract drawings.	Contractor to comply with COSHH regulations. A SSOW to be adopted by the Contractor to minimise exposure of staff to Lead. Control of Lead at Work regulation (CLAW) will apply. Contractor to ensure correct PPE is used at all times.	Medium	Yes G
9	Potential for contaminated ground / ballast. Risk of injury and illness to staff, contamination of surrounding environment.	No Design input possible. Unable to design out risk due to the nature and location of works. Hazard triangles to be shown on the contract drawings.	Fill behind abutment areas is envisaged to be tested further for contaminants prior to commencement of works. Appropriate PPE to be worn at all times. Contractor to develop a SSOW for the identification, storage, removal and disposal of any contaminated materials.	Low	Yes H

10	Lifting during deck removal, construction and erection of heavy components. Overturning / collapse of machinery or plant. Manual handling. Risk of injury to staff and causing damage to infrastructure.	All critical lifting weights and Centre of gravity (COG) identified on the contract drawings and noted in the specification and construction sequence. Manual handling eliminated/ mitigated where possible.	Contractor to develop lifting plans with necessary temporary works design included. Contractor to design crane mats and ensure ground improvements as necessary. Trial lifts to be undertaken prior to operational lift to confirm centre of gravity of lifted element and lifting point. Appropriate competencies and PPE to be in place and all personnel to work from a position of safety. Crane operator to stop immediately if he/she cannot see the signaller. All lifts will be thoroughly planned and executed by the contractors so that no damage will occur to the concrete or steel units during fabrication, transportation and installation. All lifts must be planned and executed in a safe manner so that no self-correction of the unit will take place (below the hook). Trained banksman/signaller is envisaged to supervise all lifts. Contractor to submit for approval The Temporary Works Form 002/003 describing the sequence, natures and risk mitigations of every site task	Medium	Yes I

Ref	Activity & Hazard	Design Input and Designer Actions Taken to Eliminate/Mitigate Hazards	Remaining Significant Risks	Residual Risk Rating: High/ Medium/ Low	Residual Risk to be Shown on Drawings Yes/No
11	Working at height or near abutments and unprotected edges. De-vegetation over steep embankments. Risk of fall and injury to staff.	Embankment slopes are heavily vegetated with large trees. No Design input possible. Unable to design out risks due to the nature and location of works. Hazard triangles shown on the contract drawings.	Access methodologies to be developed to enable safe access and egress throughout the works. Detailed method statements/ work package plans to be prepared and operatives to be competent for particular tasks. Contractor to plan for temporary edge protection and/or fall arrest arrangements during construction work. Activities for de-vegetation and removal of large trees to be planned thoroughly by the contractor. De-vegetation to be minimised in relation to the proposed works where possible. Removal of large trees to be carried out during possessions and isolations. Track level equipment to be protected as required and exclusion zones to be in place.	Low	Yes J

Ref	Activity & Hazard	Design Input and Designer Actions Taken to Eliminate/Mitigate Hazards	Remaining Significant Risks	Residual Risk Rating: High/ Medium/ Low	Residual Risk to be Shown on Drawings Yes/No
12	Noise, vibration and dust associated with demolition, dowel installations and fence installations. Risk of musculoskeletal injury to staff and hand-arm vibration syndrome (HAVS)	Unable to design out risk due to the scale of structure and limitations in the adopted installation method. Hazard triangles are shown in the F003 drawings	Contractor to ensure the appropriate PPE and SSOW are in place during the works and manual handling operations are minimised. Contractor to adhere to The Control of Vibration at Work Regulations 2005	Low	No
13	Transit of construction vehicles on approach roads with blind curves. Risk of injury to public/ infrastructure/ staff.	No Design input possible. Unable to design out risk due to the nature and location of works. Design envisages that highway/footpath closures and site works will be arranged/planned to be carried out in a sequence that eliminates this risk.	Contractor to develop logistic plan. Contractor shall finalise all arrangements for highway/footpath closures and plan logistics. All works to be carried by competent personnel only	Low	No
14	Inclement weather. Weather affected activities. Risk of injury to staff, damage to structure/ equipment.	None. Unavoidable risk.	Weather related activities (such as lifting materials at high wind speed) to be identified/planned in the design stage/prior to construction.	Medium	No

Ref	Activity & Hazard	Design Input and Designer Actions Taken to Eliminate/Mitigate Hazards	Remaining Significant Risks	Residual Risk Rating: High/ Medium/ Low	Residual Risk to be Shown on Drawings Yes/No
15	Temporary utility cable bridge/ diversions. Risk of injury to staff, damage to infrastructure due to insufficient cable slacks.	None. Unable to design out risk at this stage of works. This is a responsibility of the Temporary Works Designer.	Contractor to produce temporary works design based on a safe cable management system.	Medium	No
16	Casting/grouting in various stages. Risk of material not reaching desired strength prior to loading.	Required strengths that must be achieved prior to handling or progressing with site tasks has been specified in Form 003 drawings.	Contractor to ensure specified strengths achieved. Contractor to review product specifications and to work in low temperatures. The Contractor will plan the duration for strength gain into the construction programme.	Low	No
17	Environmental hazards and ecological impacts (dust, noise, air quality).	None. Ecology impacts can be captured in the survey undertaken by the Principal contractor.	Contractor to ensure correct PPE to be worn, dust masks and ear protection to be provided if necessary.	Medium	No

Ref	Activity & Hazard	Design Input and Designer Actions Taken to Eliminate/Mitigate Hazards	Remaining Significant Risks	Residual Risk Rating: High/ Medium/ Low	Residual Risk to be Shown on Drawings Yes/No
18	Schedule 3 related activities. Working with chemical, biological agents, cementitious materials and solvents on site. Site operatives' exposure to airborne solvents. Risk of injury to staff.	No Design input possible at this stage. Unable to design out risk due to the nature and location of the works. Preference for non-isocyanate paint systems identified on design drawings. Non-isocyanate paint systems specified.	Contractor to comply with Schedule 3 safety report measures (COSHH regulations). Appropriate PPE (e.g. gloves, goggles, boots and long-sleeve vests/coats) to be worn to reduce likelihood of skin contact. Evacuation plan to be adhered to. Personal and collective prevention measures must be considered. All works to be carried by competent personnel only.	Low	No
	Hazards and Risks During Operation and Maintenance				

Ref	Activity & Hazard	Design Input and Designer Actions Taken to Eliminate/Mitigate Hazards	Remaining Significant Risks	Residual Risk Rating: High/ Medium/ Low	Residual Risk to be Shown on Drawings Yes/No
19	Trackside bridge inspection and maintenance - Working adjacent to operational railway with limited clearance or without safe access when trains are running. Risk of injury/ fatality to staff.	Unable to design out risk and not covered by the scope of works. It is assumed that all inspection activities will take place under the rules of the route or possessions. Current remit is to replace only one span. Discussed as project team and agreed to provide service containment but not provide walkways or position of safety on the deck as this is of little benefit to the operational railway given the limitations on the adjacent decks. Kingpost ballast retention system is proposed to improve ballast containment on the northern approach, complying to Network Rail P-way standards. No safe cess walkway is provided as this would require widening of ballast retention further which is not proposed under current scheme.	Maintenance and inspection work of the route must be undertaken within line blockades. Limited clearance signage and access prohibited signage to be installed at ends of proposed ballast retention works.	Low	N/A

Ref	Activity & Hazard	Design Input and Designer Actions Taken to Eliminate/Mitigate Hazards	Remaining Significant Risks	Residual Risk Rating: High/ Medium/ Low	Residual Risk to be Shown on Drawings Yes/No
20	Inspection and maintenance of bearings- Working at height, adjacent to operational LUL electrified tracks. Risk of electrocution resulting to injury or fatality of staff.	Unavoidable hazard. Jacking positions provided on pier and abutment under trimmers. It is assumed that all site activities will take place under the rules of the route.	Contractor to develop SSOW for bearing inspection. Contractor shall implement safe system of work. Contractor to obtain appropriate LUL possessions. Possibility of damage to the proposed waterproofing joints. Contractor to ensure the waterproofing joints are inspected post jacking and carry out appropriate remedial actions.	Low	N/A
21	Maintenance of drainage channel between central and action spans Risk of injury/fatality to staff Risk of damage to steel infill plates	It is assumed that all site activities will take place under the rules of the route. Health of drainage channel and reused drainage system to be monitored on a regular basis.	Contractor to obtain appropriate NR and LUL track possessions to carry out drainage maintenance.	Low	N/A
22	Maintenance of steel infill plate. Risk of damage to proposed steel infill plate due to drainage failure	Providing robust waterproofing solution. Sacrificial thickness of steel infill panel is considered in the design.	Network Rail to ensure drainage is properly maintained.	Medium	N/A

Designers Risk Management Schedule

ARCADIS	Designer's Risk Management Schedule (for Simple Projects)	
	Project Title WEST SMITHFIELD BRIDGE (33/18). RAILWAY REFURBISHMENT WORKS AND HIGHWAY REFURBISHMENT WORKS	**Oracle Project Code** 10030169
Design Stage:		

1. Scope of Arcadis commission:

The City of London has commissioned Arcadis to identify the extent of repairs required at railway and highway level to West Smithfield Bridge (33/18), to propose measures to repair the identified defects, and to develop a detailed design project outlining defects, repairs and the implementation of the proposed measures on site.

2. Brief description of the works:

West Smithfield Bridge carries the lanes and footways of West Smithfield street above the Thameslink Railway lines. At railway level, underneath the deck, these lines have overhead power lines. These power lines are supported off bracketry which is fixed to the abutments and intermediate pier of the bridge. The works proposed underneath the deck consist of repairs at the deck soffit, intermediate pier (concrete and wrought iron girders) and abutments (masonry wall) to reduce the damage mainly generated from water leaks and others. Isolations and possessions will be required to enable the repair works to be undertaken within the railway window.
The works proposed at highway level consist of the replacement of the waterproofing layers above the deck to mitigate water ingress at the structure soffit. Repair works at highway level are intended to be carried out with traffic management as agreed with TfL and without further possessions from Network Rail. This shall be confirmed with Network Rail.

3. Key hazard elimination and risk reduction measures taken during the design process:

The following activities have been undertaken during the design process, in order to eliminate hazards and reduce risks from the project:

- Principal Inspection of structural elements above and below deck (below deck, for Charterhouse Street Bridge solely).
- Desk study of utilities in the area.
- Topographical survey of highway level and railway level
- Identification of critical hazards, registering and incorporation of hazard/risk information on the drawings.

In order to reduce risks during construction at ***highway level***, it is proposed to:

- Install 1m high traffic barriers filled with water.
- Maintain minimum offset of 1.8m from traffic face of barrier to work zone.

- Construction staged in two phases that allows adequate management of lane widths for the passage of vehicles and heavy vehicles, adequate space for site compound.
- Temporary closure of pedestrian footway, maintaining safe passage for pedestrians on the opposite side to the works.

Formal consultation with Network Rail and Transport for London shall take place to agree on the stages of construction.

In order to reduce risks during construction at ***railway level***, it is proposed to:

- Undertake works during possessions.
- Undertake electrical isolation at the area.
- Protect Network Rail assets during construction (overhead line equipment, rails and others). Details to be agreed with Network Rail.
- Specify repair details that can be undertaken safely by personnel operating from elevated access equipment.

4. Significant residual project-specific hazards and risks remaining at design completion:

At highway level:

- Unknown buried services
- Working adjacent to live traffic
- Risk of uncovering and coming into contact with unknown hazardous materials

At railway level:

- Working at height
- Poor illumination
- Poor ventilation
- Risk of uncovering and coming into contact with unknown hazardous materials

5. Specific construction requirements (e.g., construction sequence):

The following measures are deemed necessary in addition to normal working practices that shall be put in place by a competent Contractor:

- Safe access and egress for all personnel and public during works.
- Safe working methodology for operations affecting railway and highway corridors.

6. Means by which significant residual hazards and risks conveyed to contractors and others:

By issue of this Designer's Risk Management Schedule and inclusion of significant residual risks on detailed design drawings.

Date of Review	
Assessed by:	
[redacted]	15/05/2020
	15/05/2020

	Designer's Risk Management Schedule (for Simple Projects)			Project Code/Doc No: 10030169	
ARCADIS	Project Title: WEST SMITHFIELD BRIDGE (33/18). RAILWAY REFURBISHMENT WORKS AND HIGHWAY REFURBISHMENT WORKS	Assessor (Name): [redacted]	Assessor (Signature):	Date: 15/05/2020	Revision: P01

Ref	Activity & Hazard	Design Input and Designer Actions Taken to Eliminate/Mitigate Hazards	Remaining Significant Risks	Residual Risk Rating: High/ Medium/ Low	Residual Risk to be Shown on Drawings Yes/No
1	**HIGHWAY/RAILWAY** **Reduction of water leakage underneath bridge deck** Designer proposes new waterproofing layers to minimise water ingress from highway level to the soffit of the deck and abutment walls. Nonetheless, part of the deck of West Smithfield bridge sits underneath private property (buildings adjacent to West Smithfield bridge), from where water may leak to soffit of the structure.	Designer proposes new waterproofing layers, with details to minimise water ingress from highway level. Designer proposes the improvement of elements related to water drainage above the bridge to reduce water ingress.	Despite the mitigation measures, it is possible that some water ingress may be originated from private property buildings. These may still generate water seepage below deck level a short period of time after the refurbishment of the bridge.	Medium	No

Ref	Activity & Hazard	Design Input and Designer Actions Taken to Eliminate/Mitigate Hazards	Remaining Significant Risks	Residual Risk Rating: High/ Medium/ Low	Residual Risk to be Shown on Drawings Yes/No
2	**HIGHWAY** **Location of utilities** A number of utilities run above the deck of West Smithfield bridge, among others, electricity, water and gas. Additional utilities (apart from known utilities) might be in the area and the location of the known utilities might be inaccurate.	Designer has undertaken a study to obtain accurate information regarding the number of utilities in the area as well as their accurate location. Despite this study, there remains a possibility that a number of unknown utilities may be in the area or exact location may be inaccurate.	Despite the mitigation measure, risks remain where unknown utilities may be found during excavation or utilities already known may be found at a different location.	Medium	Yes
3	**HIGHWAY** **Utilities affected by works, during construction stages** A number of utilities run above the deck of West Smithfield bridge, among others, electricity, water and gas. Construction works may affect utilities in the area. These effects may be derived from excavation (vibrations, movements and impacts derived from excavation), from works with waterproofing layers (utilities will be supported, not diverted) and from the replacement of surface (vibrations, movements and impacts derived from this work).	Designer has undertaken a study to obtain accurate information regarding the number of utilities in the area as well as their accurate location. Utility companies have been notified regarding: 1) the works that shall be undertaken, 2) utilities shall not be diverted during works, 3) utilities shall be supported during works if required, and 4) confirmation of levels of protection required during works. Contractor may have to temporarily support and protect utilities during site works, as established by utility stakeholders.	Despite agreements with utility companies and indication to contractor, there remains a risk that works may affect the utilities.	Low	Yes

Ref	Activity & Hazard	Design Input and Designer Actions Taken to Eliminate/Mitigate Hazards	Remaining Significant Risks	Residual Risk Rating: High/ Medium/ Low	Residual Risk to be Shown on Drawings Yes/No
4	**HIGHWAY** **Waterproofing around utilities** Designer proposes that new waterproofing layer is located above the structural slab at carriageway and footway areas. However, several utility pipes run above these slabs, either in contact or between footway surface and slab surface. Some utility pipes may require that the waterproofing layer is placed above these pipes rather than on the slab. These pipes may not provide an adequate surface for the waterproofing layers.	Designer has discussed with the waterproofing fabricator about this possibility. Designer has shared with the fabricator pictures of some pipes found during site investigations. Fabricator has agreed to the possibility of placing layers above utility pipes. Nonetheless, once excavation is taking place, contractor shall consult with fabricator about different cases. Designer has included the risk in drawings.	Depending on the type of pipes, some additional works may be required to ensure that waterproofing layers are located at the best position and ensuring its maximum durability and adhesion to base surface.	Low	Yes
	HIGHWAY **Working near utilities: danger to workers** Works occur at an area where a large number of utilities run above the deck of West Smithfield bridge. Pavement and backfill underneath shall be excavated very close to utilities such as gas, water, and electricity. These utilities represent risks for workers on site near them. The Designer has noted this hazard in drawings for the attention of the Contractor.	Designer has performed a detailed desk study to obtain the precise location and type of utility. Designer has included the risk in drawings.	Initial hazard, lower likelihood as Contractor is aware of hazard.	Medium	Yes

Ref	Activity & Hazard	Design Input and Designer Actions Taken to Eliminate/Mitigate Hazards	Remaining Significant Risks	Residual Risk Rating: High/ Medium/ Low	Residual Risk to be Shown on Drawings Yes/No
5	**HIGHWAY** **Access of stakeholders to utility pipes** During the life span of the waterproofing layer, stakeholders may want to access their property (pipes) to perform repairs, etc. Waterproofing layers may be affected, damaged by utility companies. This damage may generate a point of access of water to the structural deck.	Designer has made client (City of London) aware of such risk. City of London should highlight utility companies the location of the waterproofing layer in relation to their property and the need to repair waterproofing layer if required once works are finished.	Repair may be poor and create an access for water to structural deck, an ingress point.	Medium	No
6	**HIGHWAY** **Level of waterproofing surface** The new waterproofing layer has been designed to be located above the structural concrete slab of West Smithfield bridge, replacing the original waterproofing layer. Currently, between road surface (pavement layers) and the structural concrete slab of the bridge there is a layer of mass concrete that will have to be demolished.	Designer has adequately indicated levels in drawings. Contractor should proceed with care and evaluate the level of excavation to make sure that the structural concrete slab is not damaged during excavation works. Works at local area are proposed, to ensure that adequate levels are chosen. Contractor shall proceed with the excavation with care. Contractor shall contact Designer, if required, to ensure that appropriate level is reached to place new waterproofing layers. Levels of new waterproofing layers shall be confirmed before proceeding with the excavation of the whole area, i.e., local excavation will take place first.	Initial hazard, lower likelihood as Contractor is aware of hazard.	Low	No

Ref	Activity & Hazard	Design Input and Designer Actions Taken to Eliminate/Mitigate Hazards	Remaining Significant Risks	Residual Risk Rating: High/ Medium/ Low	Residual Risk to be Shown on Drawings Yes/No
7	**HIGHWAY** **Preparation of surface for new waterproofing layers** Surface upon which new waterproofing layers will be located shall be treated to ensure its adequate characteristics (roughness, humidity, etc), according to specifications of fabricator of waterproofing layers. Only local trial pits have been performed for the development of the design of the new layers, thus, real conditions on a large part of the area where to place the waterproofing layers remains unknown.	Conditions of the surface upon which to lay new waterproofing layers have been based on the information obtained from trial pits. However, this shall be confirmed on site, with excavation. The Designer has proposed a solution based on all the information available from different sources. Nonetheless, level of works required at the surface is unknown. This may have an impact on the type of works at the surface (if this is very different from those observed at trial pits). Contractor to consult with waterproofing fabricators to ensure the most adequate solution is adopted once excavation takes place.	Initial hazard.	Low	Yes
8	**HIGHWAY** **Pedestrian access** Traffic management will be implemented on site, so works take place in a staged manner. In each stage one of the two footways shall be closed to pedestrians. Pedestrians should have safe access and egress during works.	Designer proposes traffic management in two stages, with adequate signals for pedestrians, providing pedestrian access along site works during any stage. Access for wheelchairs is also provided as part of this traffic management proposal. If proposals from the Designer are unachievable due to any additional constraint, the contractor should notify the Designer.	Contractors shall implement proposals included in drawings regarding traffic management. If proposals from the Designer are unachievable due to any additional constraint, the contractor should notify the Designer.	Low	No

Ref	Activity & Hazard	Design Input and Designer Actions Taken to Eliminate/Mitigate Hazards	Remaining Significant Risks	Residual Risk Rating: High/ Medium/ Low	Residual Risk to be Shown on Drawings Yes/No
9	**HIGHWAY** **Working near live traffic** Works occur at an area where access shall remain open to vehicles and pedestrians while works are undertaken. Although the maximum speed for vehicles is limited to 30mph, the street provides access to the market for heavy vehicles. Workers shall be undertaking works near live traffic.	Workers shall be undertaking works near live traffic. The Designer has noted this hazard in drawings for the attention of the Contractor. The Designer has proposed the use of 1m high water barriers to mitigate the risk derived from live traffic for workers.	Contractor to undertake works with proposed measures in place to avoid risks for workers on site.	Low	Yes
10	**HIGHWAY** **Drainpipes and water ingress to deck soffit** Several old drainpipes are currently embedded in the surface of the footways, running water from building facades to the carriageway. Where these lay above West Smithfield Bridge or nearby, these shall be replaced to ensure that these do not allow water to leak to structure soffit.	Design proposes the replacement of old drainpipes at the surface of footways on West Smithfield bridge (see drawings). However, the effectivity of this measure is also related to how water of façade of buildings is directed to drainpipes. Detail may still allow water to leek towards the deck soffit through the facade of the building.	New pipes proposed by Designer might mitigate water leakage for a limited duration and depending on the connection of downpipes from facades to these new drainpipes. City of London to engage with Museum of London to ensure that these are dealt with within their project.	Low	No
11	**HIGHWAY** **Dust caused from planning** Works include activities such as the removal, excavation of the existing pavement. This work shall cause dust that will affect workers and public in general. The Designer has noted this hazard in drawings for the attention of the Contractor.	Works include activities such as the removal, excavation of the existing pavement. This work shall cause dust that will affect workers and public in general. The Designer has noted this hazard in drawings for the attention of the Contractor.	Initial risk. Contractor to undertake excavation works with dust mitigation measures in place.	Low	Yes

Ref	Activity & Hazard	Design Input and Designer Actions Taken to Eliminate/Mitigate Hazards	Remaining Significant Risks	Residual Risk Rating: High/ Medium/ Low	Residual Risk to be Shown on Drawings Yes/No
12	**HIGHWAY** **Noise and dust to public** Works include activities such as excavation of the existing pavement and concrete layer underneath the pavement. This work shall cause noise and dust that will affect workers and public in general. The Designer has noted this hazard in drawings for the attention of the Contractor.	Works include activities such as excavation of the existing pavement and concrete layer underneath the pavement. This work shall cause noise and dust that will affect workers and public in general. The Designer has noted this hazard in drawings for the attention of the Contractor.	Initial risk. Contractor to undertake excavation works with dust mitigation measures in place.	Low	Yes
13	**HIGHWAY/RAILWAY** **Hazardous materials** West Smithfield bridge is an old bridge, originally built circa 1930's. Materials excavated to replace the waterproofing layers and pavement may contain hazardous materials. The Designer has noted this hazard in drawings for the attention of the Contractor.	West Smithfield bridge is an old bridge, originally built circa 1930's. Materials excavated to replace the waterproofing layers and pavement may contain hazardous materials. The Designer has noted this hazard in drawings for the attention of the Contractor.	Initial risk. Contractor to undertake excavation works with investigation of materials to reduce likelihood of encountering hazardous materials.	Medium	Yes
14	**RAILWAY** **Working in confined space** At railway level, refurbishment works shall take place in a confined space, with poor ventilation, where fumes of repair products or demolition materials may not be easily circulated. The Designer has noted this hazard in drawings for the attention of the Contractor.	The Designer has noted this hazard in drawings for the attention of the Contractor. Works should take place while implementing measures to increase circulation of fumes and protection to workers.	Initial risk. Contractor to undertake works with measures in place to avoid risks for workers on site.	Medium	Yes

Ref	Activity & Hazard	Design Input and Designer Actions Taken to Eliminate/Mitigate Hazards	Remaining Significant Risks	Residual Risk Rating: High/ Medium/ Low	Residual Risk to be Shown on Drawings Yes/No
15	**RAILWAY** **Working at height** At railway level, part of refurbishment works shall take at the soffit of the deck or near that, at height. The soffit of the deck is at a height between 4.7m and 5.4m from rail top level. The Designer has noted this hazard in drawings for the attention of the Contractor.	The Designer has noted this hazard in drawings for the attention of the Contractor.	Initial risk. Contractor to undertake works with measures in place to avoid risks for workers on site.	Medium	Yes
16	**RAILWAY** **Working in poorly illuminated areas** At railway level, refurbishment works shall take place in a confined space, with poor illumination, with several tripping hazards such as rails, etc. The Designer has noted this hazard in drawings for the attention of the Contractor.	The Designer has noted this hazard in drawings for the attention of the Contractor.	Initial risk. Contractor to undertake works with measures in place to avoid risks for workers on site.	Medium	Yes
17	**RAILWAY** **Working near railway lines** At railway level, refurbishment works shall take place near railway lines. The Designer has noted this hazard in drawings for the attention of the Contractor. Works shall take place during possessions as agreed with NR. A preliminary proposal for possessions has been proposed by Designer to engage Network Rail with discussions.	The Designer has noted this hazard in drawings for the attention of the Contractor. Works should take place while implementing measures to ensure the safety of workers.	Contractor to undertake works with measures in place and during possessions to mitigate risks for workers on site.	Low	Yes

Ref	Activity & Hazard	Design Input and Designer Actions Taken to Eliminate/Mitigate Hazards	Remaining Significant Risks	Residual Risk Rating: High/ Medium/ Low	Residual Risk to be Shown on Drawings Yes/No
18	**RAILWAY** **Working near electrified lines, high-voltage equipment** At railway level, refurbishment works shall take place near electrified railway lines. Part of works shall be undertaken above and around overhead line equipment. The Designer has noted this hazard in drawings for the attention of the Contractor. Works shall take place while ensuring the safety of workers.	The Designer has noted this hazard in drawings for the attention of the Contractor. Works should take place while implementing measures to ensure the safety of workers, with electrical isolation as agreed with NR. Works should take place while implementing measures to protect NR equipment, in agreement with NR.	Contractor to undertake works with measures in place, during possessions and electric isolations, to mitigate risks for workers.	Medium	Yes
19	**RAILWAY** **Working near NR property (OHLE)** At railway level, refurbishment works shall take place near electrified railway lines. Part of works shall be undertaken above and around overhead line equipment. The Designer has noted this hazard in drawings for the attention of the Contractor. Works shall take place whilst protecting the overhead line equipment as agreed with NR at a later stage (after submission of design project to City of London on 15/05/2020)	The Designer has noted this hazard in drawings for the attention of the Contractor. Works should take place while implementing measures to protect NR equipment, in agreement with NR.	Contractor to undertake works with measures in place, during possessions and electric isolations, with protection of NR equipment to mitigate damaging this during works.	Medium	Yes

Ref	Activity & Hazard	Design Input and Designer Actions Taken to Eliminate/Mitigate Hazards	Remaining Significant Risks	Residual Risk Rating: High/ Medium/ Low	Residual Risk to be Shown on Drawings Yes/No
20	**RAILWAY** **Damage of utilities (apart from OHLE)** At railway level, refurbishment works shall take place in an area with several utilities (either from NR, such as overhead line equipment, or others such as illumination of tunnel). Designer has noted this hazard in drawings for the attention of the Contractor. Works shall take place while protecting utilities in the area in order to avoid any damage during works. Special utilities, such as overhead line equipment or rails from Network Rail shall be protected as agreed with Network Rail (at the time of submission, 15/05/2020, specific details for this protection to be agreed).	The Designer has noted this hazard in drawings for the attention of the Contractor. Works should take place while implementing measures to protect utilities.	Contractor to undertake works with measures in place, with protection of utilities to mitigate damaging these during works.	Low	Yes
21	**RAILWAY** **Risk of dust, loose material, from planing work above deck** Refurbishment works at highway level (excavation, backfill and new pavement) may cause vibrations and movements which might generate dust at railway level or loosen cracked material.	The Designer has noted this hazard in drawings for the attention of the Contractor. Works above and below deck level should take place in a coordinated manner. It is proposed that works at railway take place first, prior to works at highway level.	Contractor to undertake works with measures in place, with protection of utilities/workers.	Low	Yes

Ref	Activity & Hazard	Design Input and Designer Actions Taken to Eliminate/Mitigate Hazards	Remaining Significant Risks	Residual Risk Rating: High/ Medium/ Low	Residual Risk to be Shown on Drawings Yes/No
22	**RAILWAY** **Risk of leptospirosis** At railway level, refurbishment works shall take place in a confined space where several animals and droppings of these may be found. Designer has noted this hazard in drawings for the attention of the Contractor.	The Designer has noted this hazard in drawings for the attention of the Contractor. Contractor to provide adequate safety measures to workers to avoid such hazard.	Contractor to undertake works with measures in place, with protection of workers.	Low	Yes
23	**HIGHWAY** **Risk of flooding** At highway level, refurbishment works may be affected by rain, thus excavation becoming flooded during the works. This may temporarily lead to increased water seepage to sub deck elements during the works.	The Designer has noted this hazard in drawings for the attention of the Contractor. Contractor to provide adequate safety measures to workers to avoid/mitigate such hazard.	Contractor to undertake works with measures to mitigate this hazard.	Low	No

About Arcadis

Arcadis is the leading global Design & Consultancy firm for natural and built assets. Applying our deep market sector insights and collective design, consultancy, engineering, project and management services we work in partnership with our clients to deliver exceptional and sustainable outcomes throughout the lifecycle of their natural and built assets. We are 27,000 people, active in over 70 countries that generate €3.3 billion in revenues. We support UN-Habitat with knowledge and expertise to improve the quality of life in rapidly growing cities around the world.

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[redacted]

TRANSPORT for LONDON – COMMERCIAL SURFACE TRANSPORT

Major Asset Renewals Programme (MARP) - Brent Cross Structures Feasibility Study

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Arcadis Financial Information

Project Reference Number: tfl_scp_001845

Ref.	PREAMBLE TO THE PRICING SCHEDULE
1	Staff rates are inclusive of travel, accommodation, subsistence, sickness, annual leave, insurances. Staff rates include all consumables, materials, equipment and services required for Staff to Provide the
2	All rates are exclusive of VAT.

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

COMMERCIAL, SURFACE TRANSPORT

Brent Cross Structures - Stage 2 (Feasibility)

PRE-CONSTRUCTION INFORMATION

Call Off Contract under the tfl_scp_001845
Professional Services Framework

Project Reference Number: the Employer_scp_001845

Pre-Construction Information

For

Brent Cross Structures - Stage 2 (Feasibility)

Project title:	MARP Brent Cross Structures ST-PJ529 Refurbishments – Stage 2 (Feasibility Study)
Address / Location:	The project includes a group of 30 structures on the A406 North Circular, between the M1/A5 and A41 interchanges

Prepared by:	PM		Tunnels and Structures	<15/03/2021>
Reviewed by:	H&S Manager	[redacted]	Surface Safety Team	<26/03/2021>
Reviewed by:	Sponsor	[redacted]	Projects and Programmes	<26/03/2021>

Document History

Revision	Date	Summary of changes	Author
0	15/03/2021	New PCI Template for Client Representative	[redacted]
1	25/03/2021	1st Issue	[redacted]
3.3	26/03/2021	Updated Project Scope & Incorporated Comments Received & Updated project reference	[redacted]

Responsible (Responsible for producing all or part of the PCI document)	Accountable (Accountable for ensuring timely delivery of the PCI document)	Consult (Must be consulted when the PCI document is being produced)	Inform (A copy of the PCI document must be sent to)
Project Manager	Project Manager	H&S Manager Environment Manager Sponsor Stakeholders	Principal Contractor/Principal Designer

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1 Description of Projects

Brent Cross Structures has been identified as a critical scheme due to the high risk of asset failure and the impact of that on safety and network performance.

The project includes a group of 30 structures on the A406 North Circular, between the M1/A5 and A41 interchanges, the majority of which were built in the mid-1960s. The condition of these structures has declined and there are no records of strengthening or major maintenance.

Poor asset condition is resulting in localised failures of structural elements of these structures, such as concrete spalling, sub-standard parapet containment resulting in severe damage on impact and debris falling onto supported infrastructure and environmental hazard to local waterways.

Speed restrictions, enhanced monitoring, reactive works, temporary barriers, reduced lane widths and other interim measures are currently in place to ensure safety and operability of the assets.

Major renewal works are now required as the network and cost impacts become increasingly unsustainable.

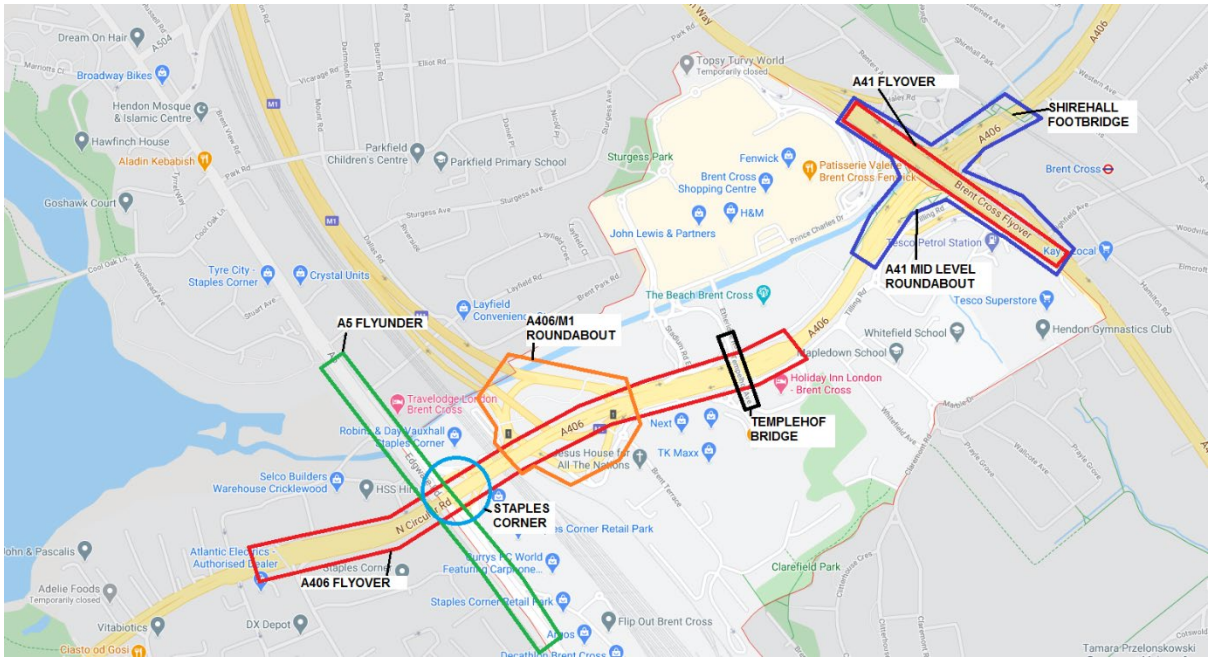
Project Scopes

The objective of this project is to procure a feasibility study contract that:

- Incorporates a comprehensive assessment of all structures in the scope.
- Undertakes an optioneering exercise, in consultation with TfL.
- Recommends a single preferred option to return the structures to a State of Good Repair.
- Delivers interim and final feasibility study reports as quickly as is achievable, noting that anticipated external funding is time sensitive.

Stage 2 investigations and feasibility options studies will determine a preferred option for each structure in line with the business outcomes and benefits identified in Stage 1.

Site Locations



Minimum Time for site setup and commencement of works

The minimum of 8 weeks will be allowed from the Contract Award to the commencement on site for mobilisation. The time allowed post Contract Award is to ensure the appointed *Consultant* has sufficient time to carry out their duties to plan and manage Stage 2 (Feasibility) phase of this project.

Duty holders and key individuals

Contact details for all duty holders and any other key individuals can be found via the *Employer*.

2 Employers Safety Goals for Projects

As a minimum, the *Employer* requires:

- The *Consultant* has a 'Zero Target' injury/incident approach to the management of all works under the contract.
- All site personnel and the general public should not be placed at risk as a result of any works.
- To establish safe working arrangements and improve *Consultant* supply chain awareness of safe working practices.
- To establish working arrangements that improve *Consultant* supply chain

awareness of health issues associated with working practices.

- All accidents and incidents are to be reported to the *Employer* in a timely manner.
- All accidents, incidents and near misses are to be detailed within the periodic report submission.
- Site specific risk assessments and method statements to be developed for all works relating to the delivery of the project, and all staff to fully understand and implement the safe systems of work.

The following *Employer* standards are included in the site rules:

- Safety inductions for all staff and visitors to be completed before entering the site.
- Regular toolbox talks to be carried out during the project covering health and safety issues associated with the works.
- Smoking on site is to be prohibited at all times.
- All site personnel to hold appropriate site safety certification (such as CSCS).
- Competent site supervision to be on each site whilst works are in progress.
- Traffic management/pedestrian barriers/signs to be maintained at all times and inspected at appropriate frequencies when sites are not occupied.
- No persons shall be permitted on site whilst under the influence of alcohol or any other substances liable to impair judgement.
- The bringing of, or being under the influence of alcohol and illegal substances on to the site is prohibited and a disciplinary offence that could result in summary dismissal.
- No persons shall use abusive language, behaviour or carry out threats or acts of violence.

Liaison and information flow through the projects

The *Consultant* must effectively liaise with the *Employer*, and all other parties on the project. This will in part be through Progress meetings, programme meetings, design meetings, stakeholder meetings and pre-start meetings. A Common Data Environment (CDE) will assist in organising and tracking information flow.

Relevant H&S information such as risk registers, PCI, Construction Phase Plans (CPP) and H&S File information must be uploaded to the CDE, and updated where necessary. Handover of information shall be uploaded onto CDM Datastore and BridgeStation (both TfL systems) as agreed with the *Employer*.

Site Segregation and Security Arrangements

The Principal Contractor (PC) is the *Consultant*, or the *Employer* appoints the Principal Contractor.

Risk Assessments and Method Statements (RAMS) are to be generated to according to the PC's submission requirements. After assessment of RAMS by the PC, if required a permit to work will be issued which will define areas of work and any special requirements or constraints, which must be adhered to.

Welfare Provisions

During Stage 2 the *Consultant* should consider factors such as, but not limited to:

- The type and number of facilities that will be provided on site (e.g. agreed facilities, groundhog unit, welfare van)
- The location of the facilities on site
- Temporary utilities required, such as water and electricity and drainage

When making these considerations reference should be made to the requirements under Schedule 2 of the CDM 2015 Regulations, and HSE information sheet CIS59, 'Provision of Welfare Facilities during Construction Work'.

3 Requirements Relating to Health & Safety

Permissions

Works on the TLRN require a permit from the Coordination and Permitting (CaP) department of TfL. Any such permits must be applied for by the TfL Project Manager who may require supporting information from the *Consultant*, for which traffic management plans may be required.
Permit to Dig shall be in place before undertaking trial holes in footpaths and carriageways. Permit to Dig / Permit to Work / Permit to Access / Permit to Works on a System – is an arrangement between Principal Contractor and the *Consultant*.

Parking and Vehicular restrictions within the site

Where required, notices and applications must be submitted for any parking suspensions and/or dispensations by the *Consultant*. These requirements should be discussed at the pre-construction phase and suitable notice given for applications.

Fire Precautions

London Highway Maintenance and Projects Frameworks (LHMPF) Contractor induction is required for all operatives and RAMS accepted prior to entering site.

Unloading & Storage Areas

Storage of materials, equipment and plant on site must be secure and fully segregated from the public. The locations are to be agreed with TfL/LHMPF

Contractor and some permits may be required.

The *Consultant* must take the delivery, unloading/loading and storage of all materials on site into consideration throughout the surveying pre-construction phase.

Surrounding Land Uses and Related Restrictions

Particular concerns are as below:

a. M1 interchange with A406

b. Access and egress of the Brent Cross Shopping Centre

Existing utility services information

PAS128 standard must be referred to when confirming the position of any/all buried services. The Quality Level and Detection Method (PAS 128 Tables 1 & 2) are to be agreed with the *Employer* before commissioning. The designers risk register should capture any identified hazards that need to be assessed by the *Consultant*.

Hazards imposed by existing plant, equipment and infrastructure

- In-situ Mechanical, Electrical and Communications equipment
- LHMPF Contractor activities
- Vehicle movements generally
- Confined spaces (sub tunnel, pump chambers)
- Asbestos
- Traffic

Employer designated confined spaces

Some investigations need to be carried out in areas that have been identified as confined spaces, or they be deemed a confined space by the LHMPF Contractor.

Health Hazards

Asbestos

Desktop surveys must be undertaken before any works commence where there is a risk of disturbing asbestos.

Management Surveys and Action Plans shall be reviewed with the *Consultant* detailing any further survey or precautions which are required by the project.

Existing structures containing hazardous materials and health hazards

The *Consultant* should ensure any necessary surveys are carried out to identify any

potential hazardous materials and health hazards prior to works commencing and develop safe systems of working in the form of method statements.

4 Requirements Relating to the Environment

The TfL Arboriculture and Landscape Route Manager and the TfL Environmental Manager should be contacted if Protected Species are found during the works. It should be noted that only Defra licensed ecologists are to handle protected species.

Works should be carried out in accordance with the Greater London Authority and London Councils 'The Control of Dust and Emissions from Construction and Demolition; Best Practice Guidance (2006)'. In addition, the *Consultant's* /supply chain should be encouraged to fit emission controls to all vehicles, plant and equipment where possible. Vehicles, plant and equipment should be turned off when not in use and should be inspected and maintained regularly.

BS5228 Parts 1 and 2 – Noise and vibration control on construction and open sites should be adhered to. Vehicles, plant and equipment should be turned off when not in use. Consider alternative 'quiet' running plant and equipment. Noisiest activities should be planned during 'normal working hours'. If works are to be carried out at night or 'outside of working hours' then a Section 61 should be obtained from the Local Authority.

5 Design Risk Registers

The *Consultant* must develop and maintain risk registers, however this commission is for Feasibility only.

6 The Health & Safety File

The Health and Safety File for each structure is on BridgeStation.

The *Employer* and the *Consultant* must provide relevant information for compiling and updating of the H&S File. See TfL Guidance Document below.

"Requirements for Tunnels and Structures Health and Safety Files, Records and Maintenance Manuals – Guidance for Clients, Project Managers, CDM Co-Ordinators and Principal Contractors Document reference: SQA-2026 - issue: 1.0"

H&S file information is also to be submitted and uploaded to CDM Datastore as required by the TfL Health and Safety Advisor.

7 Pre-Construction Information to be provided to the Employer

The *Consultant* is required to develop a programme of works and agree this with the *Employer* prior to the start of works.

Specific H&S goals for the project as required by the *Employer*. Specific *Employer* site rules are also specified for incorporation into the CPP and implementation on

site.

Relevant H&S information such as designs, risk registers, PCI, Construction Phase Plans (CPP) RAMS and H&S File information must be uploaded to the CDE and updated where necessary, on CDM Datastore.

Records of inspection of the security and segregation arrangements must be developed and maintained by the *Consultant*.

The minimum standards of compliance for welfare provisions must be in accordance with Schedule 2 of the CDM Regulations, and HSE information sheet CIS59, 'Provision of Welfare Facilities during Construction Work'

If the works are of a transient nature and public or third party facilities will be used, the *Consultant* must take reasonable steps to ensure the facilities are adequate and regularly maintained to a suitable standard. The use of such facilities must be agreed, in writing, with the owner/management and the permitted hours of use detailed.

Full details of the above arrangements must be detailed in the CPP.

Specified Permit to Work (PTW) systems detailed in Section 3(a) must be implemented by the *Consultant*.

Works on the TLRN require a permit from the Coordination and Permitting (CaP) department of TfL. The Consultant is required to supply the TfL Project Manager with any information required to obtain any such permits with suitable advanced notice, for which traffic management plans may be required.

In addition to any *Employer* specified PTW requirements, the CPP must define any PTW system that may be necessary for work. E.g. permit to dig.

Specific arrangements regarding parking and vehicular restrictions on site must be detailed within the CPP, including any parking suspensions, dispensations etc. required/obtained etc.

The *Consultant* is responsible for the establishment and implementation of all necessary emergency procedures in relation to the worksite and any work activity that may be undertaken within it. The arrangements for this must be defined within the CPP.

The following emergency contact number may also be required:

London Streets Tunnels Operation Control Centre (LSTOC)	TBC

The closest Hospital with an A&E department can be identified using the A&E Finder

A method of raising the alarm in the event of an emergency must be present on site. A fire risk assessment must be provided by the *Consultant*, incorporating all risks associated with the site location and activities to be undertaken. Control measures must be communicated to staff and visitors at induction.

Smoking on site is not permitted at any time.

All fire safety arrangements must be detailed within the CPP, including what fire fighting equipment will be provided on site, and what training staff has had.

The *Consultant* is fully responsible for the assessment and provision of suitable and sufficient first aid and other emergency arrangements to comply with the Health and Safety (First-Aid) Regulations, L74, details of which must be detailed in the CPP.

A suitable number of named first aiders for the worksite/s must be identified within the CPP.

Any *Employer* specified standards of segregation/barriers for use around storage areas etc will be specified in section 4(a).

The *Consultant* must detail the specific arrangements to be in place on site.

The *Consultant* must ensure that they have received relevant survey information prior to commencing work. Further on-site surveys must be carried out prior to excavation, e.g. CAT & Genny, in accordance with HSG47 'Avoiding Danger from Buried Services'? Precautionary measures must then be implemented to ensure safe working practices around services.

The *Consultant* must submit a Designer Risk Register, updating it as the project develops and subsequently develop Risk Assessments and Method Statements (RAMS) to be provided with the CPP to detail how any remaining risks will be managed.

Any information regarding asbestos such as surveys etc must be reviewed by the *Consultant* for the CPP and RAMS to be developed accordingly.

If any Asbestos Containing Materials (ACM) are found or suspected, the *Consultant* should stop works, make the site area safe and secure and report this to the *Employer*.

The *Consultant* must ensure that their workforce are competent to identify the presence of contaminated material if encountered, and be expected to stop works, and make the area safe before seeking advice from a competent person.

The *Consultant* must ensure that their operatives are competent to identify the presence of any hazards that they may encounter during the works, and be expected to stop works, and make the area safe before seeking advice from a competent person.

TRANSPORT for LONDON – COMMERCIAL SURFACE TRANSPORT

Major Asset Renewals Programme (MARP) - Brent Cross Structures Feasibility Study

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Scope

Project Reference Number: tfl_scp_001845

Transport for London

COMMERCIAL, SURFACE TRANSPORT

SCOPE

FOR

MARP - BRENT CROSS STRUCTURES
Feasibility Study

Call-Off Contract under the PSFW2 94203 Professional Services Framework

---

Project Reference Number: TfL_SCP_001845

Transport for London
Palestra
197 Blackfriars Road
London SE1 8NJ

MAYOR OF LONDON

		Signature	Date
Prepared by	[redacted]		
Prepared by			
Reviewed by			
Reviewed by			
Approved by			
Approved by			
Approved by			
Approved by			
Approved by			

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Definitions / Abbreviations

3D	Three Dimensional
AIP	Approval in Principle
ARM	Active Risk Manager
Asite	TfL Contract Management System / Common Data Environment
BEP	BIM Execution Plan
BIM	Building Information Modelling
BoQ	Bills of Quantities
BridgeStation	Web and cloud-based Inventory management software to collate information on bridges and structures
CDE	Common Data Environment
CDS	Concept Design Statement
CDM	Construction (Design and Management)
EDMS	Electronic Data Management System
EFC	Estimated Final Cost
EIR	Employer's Information Requirements
IDP	Investment Delivery Planning
ITP	Inspection & Testing Plan
ITT	Invitation to Tender
NDT	Non-destructive Testing
NRSWA	New Roads and Streets Works Act
OAR	Option Assessment Report
PCI	Pre-construction Information
PPD	Projects & Programmes Directorate
QRA	Quantitative Risk Analysis
SDR	Scope / Design Review
MARP	TfL's Major Asset Renewals Programme
SAMIS	Surface Asset Management Information System
Scheme	The MARP Brent Cross Structures Project capital renewal scheme
STIC	Surface Transport Infrastructure Construction framework
STIP2	Structures & Tunnels Investment Programme 2
TAA	Technical Approval Authority
TIMS	Traffic Information Management System
TfL	Transport for London
TMA	Traffic Management Act
TLRN	Transport for London Road Network
VFM	Value for Money

WLC	Whole Life Cost

1 Organisational Overview

1.1 Surface Transport

1.1.1 This project is a Surface Transport scheme which is sponsored by the *Employer's* Investment Delivery Planning Directorate (IDP) Structures Sponsorship team who lead on the asset renewal of the highway assets on London's road network through the use of 21st century techniques and technology, ensuring road space works efficiently for all users.

1.1.2 This feasibility study is to be managed by the *Employer's* Project and Programmes Delivery (PPD) Directorate and sponsored by IDP. TfL IDP ensures the *Employer's* Surface Transport assets: roads; pavements; bridges; lighting; traffic signals; bus stations; bus stops and shelters; and trees, within the boundaries of the Transport for London Road Network (TLRN), are provided in a way that is fit for now and for the future, by minimising whole-life costs, and creating safe, reliable and cared for infrastructure for our customers.

1.1.3 TfL Engineering are the Technical Approval Authority (TAA) for any proposed works affecting the TLRN.

1.2 Strategic Objectives of the Project

1.2.1 The A406 North Circular Road between Staples Corner Interchange and the A41 Hendon Way, is one of the most trafficked and heavily congested sections of highway network in the UK. The condition of a number of structures on this route has led to temporary restrictions and unplanned closures, causing extensive lost journey time and detrimental impacts to the local and wider economies.

1.2.2 Congestion is currently exacerbated due to a number of existing restrictions in place at the A41/A406 interchange, to keep the affected structures safe and operable. If renewal works are not undertaken in the next few years, there is a risk that further measures will have to be put in place on structures across the wider Brent Cross area.

1.2.3 Major works are now required as the network and cost impacts become increasingly unsustainable. The scheme extents, location and immediate infrastructure impacted in the local area is shown in Figure 1 below and Appendix L.

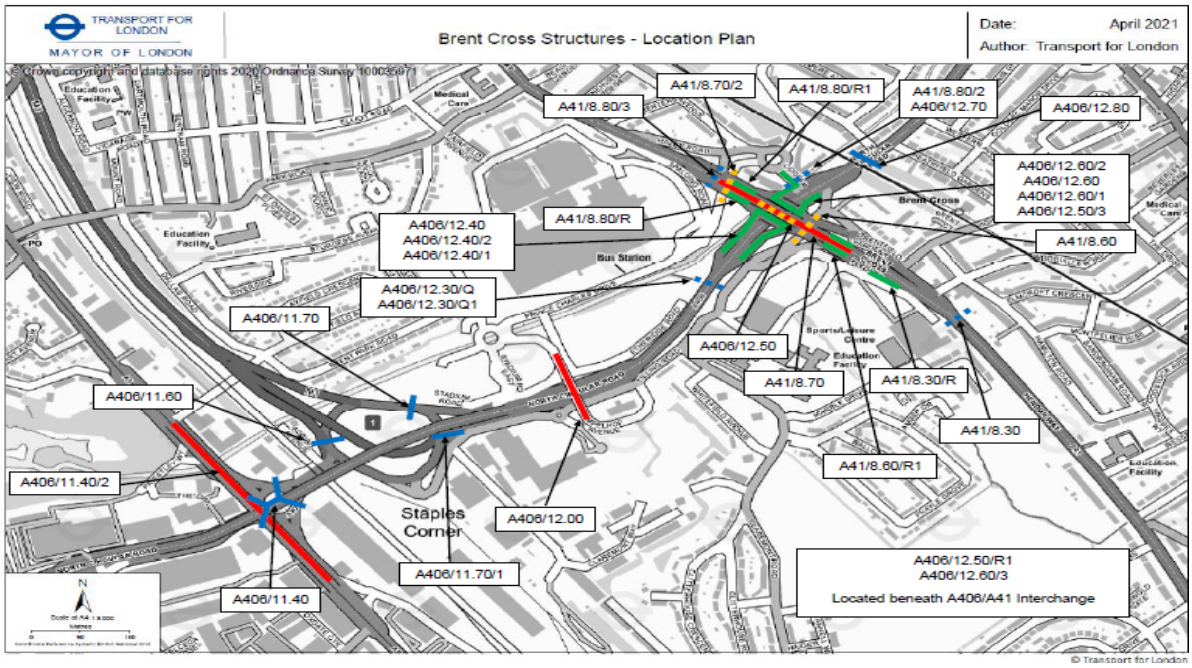

Figure 1: MARP Brent Cross Structures – Location Plan

1.2.4 In 2019, the Brent Cross Structures MARP project was accepted onto the Department for Transport's (DfT) Major Road Network (MRN) programme,

with the opportunity to bid for up to £50m contribution towards the cost of delivery. TfL are required to submit an Outline Business Case (Single Option Selection) to the DfT, which is expected to take place in mid-2022. The DfT's funding decision, and commitment, will be made at this point. TfL will also make a contribution of at least 15% towards the project.

1.2.5 The objective of this project is to return the structures to a state of good repair that provides the appropriate levels of safety, operability and reliability, so that TfL can manage, operate and maintain the highway network more efficiently. This will optimise whole-life costs and improve the performance and customer satisfaction of users of the TLRN, MRN, London's Strategic Road Network (SRN) and local borough road networks.

1.3 Background - Brent Cross Structures

1.3.1 The project includes a group of 30 structures on the A406 North Circular, between the M1/A5 and A41 interchanges, the majority of which were built in the mid-1960s. The condition of these structures has declined, and historical records indicate minimal strengthening or major maintenance was undertaken in the years prior to TfL adopting the structures.

1.3.2 Poor asset condition is resulting in localised failures of structural elements of these structures, such as concrete spalling, parapet and foundation containment failure in vehicular incidents, leading to risk of debris falling onto supported infrastructure and environmental hazard to local waterways.

1.3.3 In particular, water-related damage caused by poor performing waterproofing and drainage has led to the deterioration of key structural elements.

1.3.4 Speed restrictions, enhanced monitoring, reactive works, temporary barriers, reduced lane widths and others are currently in place at the A41/A406 Interchange, to ensure safety and operability of the assets.

1.4 Project Management Methodology - Pathway Stages

1.4.1 The *Employer* follows an integrated project management delivery methodology, Pathway. Pathway comprises six stages as set out below:

Stage 1 – Outcome Definition
Stage 2 – Option Selection (Current stage)
Stage 3 – Concept Design
Stage 4 – Detailed Design
Stage 5 – Delivery
Stage 6 – Project Close

1.4.2 This commission relates to Pathway Stage 2 only.

1.4.3 Pathway Stage 2 - Option Selection determines whether the proposed outcomes and benefits identified in Pathway Stage 1 are achievable and deliver best value, i.e. that all the options have been assessed and sufficient information is provided to enable a single option selection decision to be made by the *Employer*. To achieve this outcome, a feasibility study is required to better understand the condition of the Brent Cross Structures. New surveys, site investigations and further assessment work is to be undertaken to develop options for suitable asset renewal works to improve the condition and optimise the whole life costs of existing structure assets.

1.4.4 The feasibility study concludes with an options report with recommendations for the best Scheme option to be taken forward, based on value for money and whole life cost assessment principles and by considering buildability and measures to minimise impacts of construction of the proposed works on the wider road network.

2 Construction, Design & Management Regulations 2015 (CDM)

2.1 CDM Roles & Responsibilities

2.1.1 The scope of this commission includes a requirement to undertake site investigations and the *Consultant* manages this activity directly, utilising subconsultants where appropriate. The *Consultant* submits the names of all subconsultants for acceptance by the *Employer* prior to their appointment.

2.1.2 The *Employer* is the Client, as defined under the CDM Regulations.

2.1.3 The *Consultant* is Principal Designer, as defined under the CDM Regulations.

2.1.4 The *Consultant*, or their subconsultant is Principal Contractor, as defined under the CDM Regulations.

3 Structure Assets in Scope

3.1.1 The group of structures are located along the A406 North Circular Road, at:

- The Brent Cross road interchange at the junction of the A41 Hendon Way and A406 North Circular Road including non-vehicular Footbridge
- M1 junction 1 with A406 North Circular Road
- A406 North Circular Road at the A5 junction
- Along the A406 between the M1 and A41 junctions

3.1.2 A plan showing location of all 30 structures included in this project is included in Section 1.2.3, figure 1 and Appendix L.

3.1.3 This project does not include works on all the structures within the boundaries shown.

3.1.4 A list and descriptions of the 30 structures included in this project can also be found in Appendix A.

4 Requirements

4.1 Background

4.1.1 In Pathway Stage 1 of the project, the *Employer* reviewed past records, including recent Principal, General and Special Inspection reports and studies, and developed an indicative high-level set of potential anticipated capital renewal and maintenance works required for each of the 30 structures.

4.1.2 A summary of the potential anticipated capital works, by structure, is included in Appendix B.

4.1.3 For the scope of this commission, additional work including a number of investigations, surveys, trial holes special inspections and assessments are required to fill gaps in the *Employer*'s knowledge, and to confirm the anticipated capital renewal and maintenance works outlined in Appendix B.

4.1.4 A summary of the minimum required investigations, required by structure, is included in Appendix C. Further investigations may become apparent during the course of this feasibility study.

4.2 High Level Requirements

4.2.1 The *Consultant* produces a feasibility study confirming the current condition of the structures, options for works to bring the assets to a state of good repair and a recommendation for a single option.

4.2.2 The *Consultant* delivers the following high-level tasks which have been identified in this commission. Further detailed requirements are given within this *Scope* document:

i. Mobilise the *Consultant* team.

ii. Produce and maintain an updated Programme of works from start to end of this commission, covering delivery of all deliverables and requirements.

iii. Carry out a desktop study and review of existing structure information and records, including latest inspection and maintenance information contained in Bridgestation or other information supplied by the *Employer.*

iv. Review the summaries and assumptions in Appendices C and D, to identify gaps and propose a plan of investigations as part of the desktop study as outlined in section 5.

v. Identify and recommend a scope of new site investigations, surveys and assessment work required to address gaps in current information and to complete the options study.

vi. Undertake the agreed scope of site investigations, surveys and assessment work to further understand the structural condition and capacity of the structure assets.

vii. Engage and coordinate with the *Employer* and other stakeholders as required, to plan the site works and secure the TfL and third-party approvals and access permits necessary to complete the agreed scope of new site investigations.

viii. Undertake a feasibility study and develop the options and scope of work for the proposed maintenance and renewals for each of the 30 structures. Proposed maintenance and renewals shall mitigate risks to safety, operability and reliability of the road network.

ix. Develop the options in accordance with the maintenance strategy categories listed below and described in Appendix J:

Do Nothing
Reactive Do Minimum (Safe)
Planned Do Minimum (Safe)
Planned Targeted (Safe and Operable)

Planned Optimum (Safe, Operable and Reliable)

x. Review the options with the *Employer* stakeholders to then be able to recommend the scope of work for the options for each of the 30 structures.

xi. Prepare a whole life cost assessment of each option for the 30 structures.

xii. Review the options with the *Employer* stakeholders at a Value Management Workshop, to then be able to recommend the preferred single option selection for each of the 30 structures.

xiii. Prepare and submit for acceptance by the *Employer,* the final options report for each structure, in accordance with TfL guidance document SQA 2022. Based on the outcome of the Value Management Workshop, the *Employer* confirms which of the 30 structures are to be taken forward for consideration in the project Scheme options study.

xiv. Undertake the feasibility/options study work to develop the project Scheme options and identify proposals for the capital maintenance and renewal works to mitigate all risks to safety, operability, and reliability of the network, and in accordance with the maintenance strategy categories listed below and described in Appendix J:

Do Nothing
Reactive Do Minimum (Safe)
Planned Do Minimum (Safe)
Planned Targeted (Safe and Operable)
Planned Optimum (Safe, Operable and Reliable)

xv. Identify high level works construction sequencing and traffic management proposals for each of the Scheme options.

xvi. Prepare detailed Cost Estimates for each of the Scheme options, to be agreed by the *Employer's* Commercial Estimating team. Refer to Appendix F.

xvii. Undertake a further Value Management Workshop with the Employer stakeholders, to identify a preferred maintenance strategy/option for the Scheme.

xviii. Assist the *Employer's* Business Case appraisal of the project, by completing an Options Assessment Report (OAR) in accordance with the DfT/HM Treasury guidance.

xix. Update the structure records on Bridgestation with the outcome of the feasibility study and site investigations.

xx. Produce and gain the *Employer's* acceptance of all Deliverables set out in section 7 (Deliverables Summary).

5 Scope

5.1 Mobilisation Workshop

5.1.1 A mobilisation workshop is arranged by the *Employer* within 10 days of the *starting date*. The aim of the workshop will be to:

i. Discuss the remit of the surveys, investigations and testing, including any necessary consents and approvals required
ii. Discuss any key stakeholder engagement issues
iii. Discuss any key risks and opportunities
iv. Discuss any significant health, safety and environmental issues
v. Discuss and agree the baseline Programme

5.1.2 The *Employer* will determine the structure and location of the workshop based on the circumstances known and in liaison with the *Consultant*

5.2 Desktop Study

5.2.1 The *Consultant* undertakes a desktop study and review of all existing information to:

i. Identify gaps in knowledge required to carry out the feasibility study.
ii. Define the extent of the investigation work required to address the known (see Appendices B and C) and any currently undiscovered structural deficiencies and gaps in knowledge.
iii. Identify target areas of the structures in which to carry out inspection and testing, to provide the most reliable data to inform the feasibility study.
iv. Complete a Desktop Study Report in accordance with the *Employer's* Guidance Note SQA-2022 'Requirements for the Development and Acceptance of Proposals for Structures & Tunnels Capital Schemes'.
v. Provide a summary of knowledge gaps and proposed investigations to address these gaps.
vi. Identify scope for any additional site investigations and surveys for agreement and develop the price and Inspection and Testing Plan (ITP) for the agreed proposals for acceptance by the *Employer.*
vii. Develop traffic management and access plans by utilising the services of specialist subconsultants for the proposed surveys and site investigations.

5.2.2 As part of the desktop study, the *Consultant* confirms and advises the *Employer* if environment & ecology surveys are required prior to commencement of any site investigation works. Section 5.8 details the environment & ecology surveys scope.

5.2.3 The *Consultant* undertakes a review of the existing asbestos surveys to advise the *Employer* if additional asbestos surveys are required prior to commencement of any site investigation works. Section 5.7 details the asbestos survey scope.

5.2.4 On completion of the desktop study, the *Consultant* proposes an Inspection and Testing Plan (ITP) for each structure to ensure the surveys will cover any information gaps identified as part of the desktop study.

5.2.5 The *Consultant* works collaboratively with the *Employer* and other key stakeholders in order to confirm and agree the site survey, investigation and testing requirements.

5.2.6 The *Consultant* issues the site survey, investigations and testing requirements to the *Employer* within 8 weeks (40 working days) from the *starting date*.

5.2.7 The *Consultant* develops a cost loaded and resourced programme to complete the proposed site investigations for the *Employer* to accept before works commence on site.

5.3 Investigation, Survey and Testing

5.3.1 As outlined in Appendix C, the anticipated minimum investigation types and engineering reviews following the desktop study are:

i. Structural investigations including:
   - Concrete condition surveys and testing
   - Bearings condition surveys
   - Drainage surveys & capacity assessments
   - Asbestos surveys
   - Paint surveys
   - Post Tensioning Special Inspections (PTSI)
   - Structural monitoring

ii. Structural reviews

iii. Parapet risk assessments and upgrade options

iv. Topographic surveys

v. Utilities surveys

vi. Road Safety Audits

vii. Environment and Ecology surveys

viii. Others, to be approved by the *Employer*

5.3.2 A number of investigations, surveys and tests have already been carried out under a previous STIP2 Brent Cross project and the reports are provided in Appendix D – Site Information. The *Consultant* avoids duplication of this work, or recommends and justifies repeat investigations, surveys and tests for acceptance by the *Employer*.

5.4 Standards

5.4.1 The *Consultant* carries out feasibility design, assessment, inspection and testing of bridges in accordance with the Design Manual for Roads and Bridges (DMRB), and the Manual of Contract Documents for Highway Works (MCHW). Where amendments and revisions are made to such publications during the Project, including during construction, the *Consultant* shall seek an instruction from the *Employer* as to their application.

5.4.2 All materials, workmanship and designs comply with the following standards and good practice guidance:

a) 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'.

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

c) *The Employer's* Guidance Notes: SQA-2022 Requirements for the Development and Acceptance of Proposals for Structures & Tunnels Capital Schemes and SQA-2025 Technical Approval of Surface and Highway Structures;

d) The *Employer's* Guidance Note: SQA-2026 Requirements for Surface Tunnels and Structures Health and Safety Files Records and Maintenance Manuals;

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

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

g) Highway Construction Details published by the Stationery Office as Volume 3 of the MCHW;

h) Current Road Circulars published by the Stationery Office;

i) TfL's Streetscape Guidance;

j) DfT Manual for Streets;

k) Section 17 of the Crime and Disorder Act;

l) All relevant Health and Safety legislation;

m) The Equality Act;

n) LoBEG Good Practice Guidance;

o) Carbon Emissions Calculation Tool (Highways England);

p) The Construction (Design and Management) Regulations 2015 – The *Employer's* 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; and

q) PAS 2080: Carbon Management in Infrastructure.

5.4.3 Industry good practice guidance for design, maintenance and management of structures shall be followed and complied with. If there are good reasons for deviating from mandatory documents or good practice, then justification should be submitted to the *Employer* for agreement before proceeding.

5.4.4 If the *Consultant* becomes aware of changes in statutory requirements that are relevant to an instruction, they shall inform the *Employer.*

5.4.5 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.

5.4.6 The design shall also aim to:

i. Minimise impact on the environment during construction, operation and eventual disposal.

ii. Minimise or optimise whole life costs.

iii. Minimise disruption during the works.

iv. Minimise the potential for disruption during routine maintenance operations.

5.5 Specifications

5.5.1 The *Consultant* specifies the investigation works in accordance with the Specification for Highway Works.

5.5.2 The *Consultant* submits reinstatement details of carriageways and footways following intrusive investigations to the *Employer* for approval 14 working days in advance of the investigations being carried out. Works do not commence until approval is given, which will not unreasonably be withheld.

5.5.3 Drainage details of gullies are made available by the *Employer* from SAMIS databases. The *Consultant* carries out detailed surveys to show the route and condition of all connecting pipework to either a Thames Water sewer connection or local watercourse. The *Consultant* follows the requirements of CS 551 Drainage Surveys from the DMRB for CCTV surveys of drainage assets. The *Consultant* pre cleans assets where possible to enable surveys reducing abandonment of surveys. For details on cleaning and maintenance details see series 0500 of the Specification for Highway Works.

5.5.4 The *Consultant* captures all required information and ascertains current hydraulic capacity of all sections of drainage associated with each structure assessed. The consultant is required to determine the outfall from each catchment identifying if it discharged to a Third party sewer or adjacent watercourse.

5.5.5 The *Consultant* follows the assessment method set out in DMRB CD521 and CG501 with provision of static hydraulic capacity calculations of catchments less than 100m in length and dynamic (hydraulic modelling) of catchments greater than 100m in length.

5.5.6 The *Consultant* identifies locations where flooding may occur due to hydraulic capacity issues during the following storm events 1 in 1, 1 in 5, 1 in 10, 1 in 20 and 1 in 30-year events for durations between 5-60 minutes.

5.6 Post Tensioning Special Inspections

5.6.1 There are 2 structures that require special inspection of the post-tensioning system. These are identified on row 3 of the matrix in Appendix C and General Arrangement drawings are in Appendix D.

5.6.2 Structures requiring PTSI may require significant planning to be able to physically inspect the condition of hidden elements of the post tensioning systems. The *Consultant* provides enough allowance in the programme.

5.6.3 The *Consultant* provides staff experienced in the inspection of post tensioning systems to plan and undertake the inspections. The *Consultant*

provides Curricula Vitae for staff overseeing and carrying out PTSI for acceptance with the TAA.

5.7 Asbestos

5.7.1 The *Employer's* Health and Safety team has previously carried out a desktop study of some structures within the scope. The desktop study produced the following specific recommendations for further surveys and investigations. The *Consultant* plans to deliver these alongside the new structural investigations:

a. A41/08.70 Brent Cross Flyover:
   i. Management survey (including internal cells)
   ii. Localised refurbishment survey inside inspection chambers (drainage pipes), of waterproofing, of construction joint sealants and a presence at exposure of post-tension ducts
   iii. Inspection of abutment chambers to confirm that previously discovered asbestos containing material has been either removed or encapsulated

b. A406/12.60/1 Brent Cross NW Slip Road and A406/12.40 Brent Cross SW Slip Road Bridges
   i. Management survey (including of enclosed spans of NW Slip Road Bridge, if void)
   ii. Localised refurbishment survey inside inspection chambers (drainage pipes), of construction joint sealants and of waterproofing

c. A406/12.60 Brent Cross North Bridge and A406/12.40/2 Brent Cross South Bridge
   i. Localised refurbishment survey inside inspection chambers (drainage pipes) of construction joint sealants and of waterproofing

5.7.2 There is currently limited information regarding asbestos for the remainder of the structures included in the scheme. Existing information is held on Bridgestation, which the *Employer* provides access to. The *Consultant* carries out an Asbestos desktop study for each of these structures using the *Employer's* Asbestos desktop study template (see Appendix K).

5.7.3 The *Consultant* recommends further Asbestos Management Surveys and Asbestos Refurbishment Surveys as appropriate based on the desktop study.

5.7.4 The *Consultant* appoints a specialist asbestos contractor accepted by the *Employer* to undertake these surveys. To minimise cost and disruption,

these surveys shall be undertaken within the same traffic management, wherever possible, as the structural investigations.

5.7.5 The *Consultant* obtains acceptance for the further surveys from the *Employer's* Health and Safety advisor before commencement of the surveys. The *Consultant* submits the resulting survey reports to the *Employer's* Health and Safety advisor for acceptance. In advance of site investigations, the *Employer's* Health and Safety advisor shall review the proposals and confirm acceptance if they meet current Health & Safety Executive and TfL Management of Asbestos requirements and procedures. The advisor shall also review the resultant management plan for each structure and confirm acceptance on the same basis.

5.7.6 The *Consultant* assists the *Employer* in updating the structure records on Bridgestation with all new information regarding asbestos, once that information has been accepted.

5.8 Environment & Ecology Survey

5.8.1 The extent of the 'physical' on-site ecology survey is 50m in the vicinity of the 30 structures. The desk-based assessment should consider a wider area – usually up to 1km from the site boundary

5.8.2 The following are the aims and objectives of the ecology survey and ecological desk study (i.e. the Preliminary Ecological Appraisal):

i. Identify the habitat types present on the site and the presence or potential presence of protected species or habitats on, or in the vicinity of. the site,

ii. Identify the presence of any invasive or injurious plants or animals on, or in the vicinity of. the site,

iii. Highlight any known or potential legal or planning policy constraints to the works in relation to ecology and recommend avoidance, mitigation and enhancement measures to satisfy legal requirements where appropriate; and Identify, where necessary, the requirement for further survey.

iv. The ecology Survey is to be conducted and reported in accordance with the current versions of the good practice guidance published by the following: the Chartered Institute for Ecology and Environmental Management (CIEEM) and Joint Nature Conservation Committee (JNCC)

v. The survey is to include identification, categorisation and mapping of the main natural, seminatural and man-made habitats encountered across the site (e.g. hedgerows, mature trees, and grassland and existing buildings/structures). In addition reference would be made to the habitats ecological diversity, rarity, physical structure and plant species composition.

5.8.3 The ecologist is to advise on whether further ecology surveys are necessary to be conclusive as to the status of any invasive, protected or notable species.

5.8.4 The survey is to be supplemented by an ecological desk study to collate existing biological records relevant to the site held by third parties.

5.8.5 Ecological surveys should be undertaken by a qualified professional, experienced in ecological survey, with an understanding of nature conservation legislation and planning and recognised by a relevant professional body such as CIEEM.

5.8.6 Where animal species are to be surveyed the ecologist should also be able to demonstrate that they meet the minimum knowledge, skills and practical experience requirements as set out in the CIEEM technical guidance Series Competencies for Species Survey.

5.8.7 Note: Records data for the ecological desk study can be sourced from Greenspace Information for Greater London CIC (GiGL) (the local environmental records centre for London) using the TfL SLA, in accordance with the GiGL data licensing contract.

5.9 Factual Reports

5.9.1 The *Consultant* produces factual reports regarding the surveys, investigations and testing. The *Consultant* submits draft factual reports within one week of completion of site work and submits the final reports within one week of receipt of comments from the *Employer*.

5.10 Interpretive reports

5.10.1 The *Consultant* produces interpretive reports based on the contents of the factual reports. The *Consultant* submits draft interpretative reports within 14 days of completion of the factual reports and submits the final reports within one week of receipt of comments from the *Employer*.

5.11 Feasibility Options

5.11.1 Feasibility Options Report

5.11.2 The *Consultant* produces a Feasibility Options Report which identifies options for the refurbishment of the structures listed in Appendix A. The report contains evidence that a suitable level of assessment and evaluation of the feasibility options has been undertaken and that constraints and dependencies have been considered to inform the feasibility options.

5.11.3 The feasibility and options appraisal includes consideration of the aspects listed in Appendix B of SQA-2022 Requirements for the Development and Acceptance of Proposals for Structures & Tunnels Capital Schemes. The actual content will vary depending on the type and complexity of each structure and is agreed in advance with the *Employer.*

5.11.4 The *Consultant* appoints a carbon reduction specialist for the project. This should be a suitably qualified professional with the ability to influence the feasibility and optioneering process.

5.11.5 The option reports set out the options for proposed capital maintenance and renewal works (see Appendix J for explanation of the *Employer's* maintenance strategies) for each structure and for the project Scheme. The *Consultant* conducts Value Management Workshops (see Section 5.15) with the *Employer,* to select a preferred maintenance strategy option for each structure and later to select the preferred maintenance strategy option for the Scheme.

5.11.6 The *Consultant* produces a whole life cost assessment (template provided in Appendix P) of the proposed options for each structure, for the acceptance by the *Employer*.

5.11.7 In the particular case of structure A406/12.50 Brent Cross Footbridge, the *Consultant* includes options for partial and full renewal of this structure.

5.11.8 Following the Value Management Workshops, the *Employer* confirms which of the 30 structures will be shortlisted for the remainder of the feasibility study. Based on the shortlist of structures, the *Consultant* develops the project options for the Scheme.

5.11.9 The *Consultant* develops a set of work packages for the Scheme options that are appropriate for the *Employer* to implement the works in a series of phases, either concurrently as one construction contract, or sequentially in multiple contracts over a longer duration.

5.11.10 The *Consultant* agrees the proposed scope of works for the Scheme options with the *Employer* prior to development, and of any sub options based on construction sequencing, for example:

1. Delivery of the works in one contract, in the shortest duration programme.
2. Phased delivery of the works, over an extended programme duration to be agreed by the *Employer*.

5.11.11 The *Consultant* produces a detailed Cost Estimate, a works programme, and traffic management and diversion route plans for each of the project Scheme options and sub-options.

5.11.12 The *Consultant* produces a whole life cost assessment (template provided in Appendix P) of the proposed options for the Scheme, for acceptance by the *Employer*.

5.11.13 The *Consultant* completes the Value Management assessment spreadsheet for discussion with the *Employer* and stakeholders at a further Value Management Workshop with the *Employer*, to select a preferred maintenance strategy/option for the Scheme.

5.11.14 The whole life cost assessments for each structure and for the Scheme shall include for the activities and costs of any immediate or short-term interventions or interim measures that may be identified as required to keep the asset and road network safe for the full duration of the project, including throughout the construction phase.

5.11.15 The *Consultant* includes in the feasibility study an estimate of the greenhouse gas emissions to arise from the implementation of the project options, such as those emissions related to the choice of materials.

5.11.16 The *Consultant* includes the additional requirements of CG300: Technical Approval of Highway Structures. The preferred options demonstrate compliance with the low carbon objectives outlined in the Mayor's Transport Strategy and the London Environment Strategy.

5.11.17 The *Consultant* prepares the feasibility option reports in accordance with the *Employer's* guidance document SQA-2022.

5.11.18 The *Consultant* prepares an Options Assessment Report (OAR) documenting the development of the longlist of options and the rationale for recommending the shortlist of Scheme options. It shall be written in accordance with the latest business case development guidance published by the DfT and HM Treasury. The report provides a non-technical summary of the feasibility options study, and forms part of the *Employer's* submission to the DfT for MRN programme funding.

5.11.19 The *Consultant* agrees with the *Employer* within 28 days of the *starting date*, via an accepted Programme, dates for the options development and Value Management workshops and for the submission to the *Employer* of the proposed interim Feasibility Options Report which will contain draft findings and recommendations based on desktop study and Investigation, Assessment and Survey Works completed by that time.

5.11.20 The *Consultant* proposes in sufficient time for acceptance by the *Employer* within 28 days of the *starting date* of this commission the dates for submission of the draft and final Feasibility Options Report, covering all structures and with Investigation, Assessment and Survey Works completed.

5.12 Acceptance Process

5.12.1 TfL review and acceptance criteria: The *Consultant* allows a period of 10 working days for each review by the *Employer*. It should be noted that documents to be reviewed and approved by the *Employer* should not require more than one draft and one final submission and review cycle before approval. Dates for submission of each document to the *Employer* for review shall be maintained in the Programme. The *Consultant* shall notify the *Employer* of any proposed changes to review dates through the submission of a revised Programme at least 10 working days in advance of the first revised document submission date in each revised Programme.

5.12.2 TfL document review process: The *Employer* will provide itemised commentary on a standard TfL Assurance Review Commentary Sheet (copy provided in Appendix N), highlighting comments, questions and any issues that require resolution prior to the *Consultant* re-submitting their report.

5.12.3 The *Employer* shall request the *Consultant* to provide a response to each of the issues raised in the relevant column of the TfL Assurance Review Commentary Sheet.

5.12.4 The *Consultant* completes their response to each of the issues in the TfL Assurance Review Commentary Sheet and issues to the *Employer* for acceptance on the proposed responses to the individual issues (if any).

5.12.5 The *Employer* will review each response and return the TfL Assurance Review Commentary Sheet to the *Consultant* to confirm agreement on the proposed responses before any updates are made where appropriate to the re-submitted report.

5.12.6 If necessary, the *Employer* shall arrange a meeting with the *Consultant* to discuss each of the issues in person and agree next steps at the appropriate point in the review process.

5.12.7 Once the report is considered sufficiently updated in accordance with the agreed response, the reports will be accepted by the *Employer* as final.

5.12.8 All documentation must be submitted electronically via Asite. Electronic documentation must be submitted both in PDF format and in native file format. Drawing files are to be titled with Drawing ref, and Drawing title.

5.12.9 Any electronic report copies in PDF format submitted must be bound with all appendices in one PDF file.

5.12.10 Close liaison is required with the *Employer* to ensure content and layout of final deliverables meets the *Employer's* requirements.

5.12.11 Refer to section 5.15 for Report Development Workshops

5.13 Employer Access to Site

5.13.1 Key members of the *Consultant* and the *Employer* are to work collaboratively during on site activities.

5.13.2 When the *Consultant* is on site and makes provision for welfare or mobile facilities for their own staff, then this provision is to be made available for up to two staff from the *Employer* to also make use of.

5.14 Report Development and Close Out Workshops

5.14.1 Workshops are arranged by the *Employer* for the purpose of working collaboratively, by assisting the development and early resolution to queries and comments from both the *Consultant* and *Employer*.

5.14.2 The *Consultant* attends weekly one-hour workshops and a minimum of ten (10no.) half day (4 hour) workshops as required and by arrangement, which will be a combination of remote video conferencing and attendance at the *Employer's* London offices.

5.14.3 The aim of the workshops will be to:

i. Discuss the remit of the reports and approvals required
ii. Discuss any key stakeholder engagement issues
iii. Discuss any key risks and opportunities
iv. Resolve comments and queries
v. Drive the programme

5.15 Value Management Workshops

5.15.1 The *Consultant* identifies and programmes buildability and value management workshops, which are facilitated by the *Employer* during the feasibility options study development, and before the *Consultant* produces and finalises their Options Report and Recommendations.

5.15.2 Prior to these workshops, the *Consultant* prepares and shares with the *Employer* the workshop presentation material for their review of the feasibility options under consideration. The aim of the workshops is to assess and evaluate the feasibility options with regards to:

i. Long lists of repair/renewal treatments or options
ii. Short lists of repair/renewal treatments or options
iii. Rationale for long and short listing of treatments or options
iv. Buildability and construction
v. Cost and programme
vi. Disruption to traffic, rail, river and other modes of transport
vii. Disruption to stakeholders
viii. Operation and Maintenance
ix. Whole Life Costs (template in Appendix P)
x. Benefits
xi. Recommend preferred options or solutions for each of the refurbishment items in Appendix B and any additional items identified during this commission, for each of the 30 structures in scope.
xii. Recommend preferred options for the overarching project Scheme.
xiii. Identification of traffic management and lane/road closure requirements likely to be required for each option for the overarching project Scheme.

5.15.3 The *Consultant* records the outcome of the Value Management Workshops using the template in Appendix Q.

5.16 Other Workshops

5.16.1 Additional workshops may be required where all parties need to contribute to, such as ad-hoc risk reduction meetings.

5.17 Project Meetings and Progress Reports

5.17.1 The *Consultant* is required to attend a number of regular meetings with the *Employer* throughout the duration of this commission, as described below. These project progress meetings will be held either using Microsoft Teams, or at the *Employer's* offices

5.17.2 This meeting will be chaired by the *Employer* and will be held once every 14 days. The *Consultant* is responsible for recording and maintaining minutes of all progress meetings.

5.17.3 The purpose of progress meetings is to review overall progress and performance by the project team. The focus will be to reflect on progress made since the last meeting and on the key activities and decisions required for the upcoming weeks ahead including any matters which require resolution.

5.17.4 The meeting will also provide an update on health, safety and environmental issues, risks and opportunities, and stakeholder engagement.

5.17.5 The *Consultant* is provided with access and logins for any TfL systems required for the meetings.

5.17.6 The *Consultant* produces a progress report in 4 weekly periods, in line with the *Employer's* reporting cycle. The *Consultant* is responsible for the submission of the report to the *Employer*. 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 (narrative)
vii. Submission of an updated Programme meeting the standards set out in Appendix E
viii. Commercial
ix. Any Other Business

5.17.7 In addition, the *Consultant* provides the further Programme update requirements as set out in Appendix E including the *Consultant's* weekly work plan.

5.18 Programme

5.18.1 The programme requirements are set out in the conditions of contract

5.18.2 Refer to Appendix E for supplementary information.

5.19 Stakeholder Engagement

5.19.1 A number of interfaces with stakeholders adjacent to, or beneath the structures will be required to enable consent and access to some places or elements of the structures before undertaking the surveys, investigations and testing. Some of these site works will be disruptive (traffic, noise, etc.).

5.19.2 The *Employer* requires that disruption be minimised and that through thorough and effective stakeholder engagement the *Employer's* reputation is not jeopardised. To meet this requirement the *Consultant* is responsible for carrying out stakeholder engagement and liaison with stakeholders and members of the public to help manage expectations, raise awareness of the project and gain support, secure access, and apply for, obtain and correctly manage all necessary, as well as any prudent or precautionary, consents or permissions.

5.19.3 Stakeholder engagement will be necessary to understand the issues with the structures, and to secure access to any third-party land necessary for completing the feasibility study.

5.19.4 The *Employer* is accountable for assuring, quality controlling and if necessary, directing the stakeholder engagement activities undertaken by the *Consultant*. The *Consultant* is responsible for carrying out all stakeholder engagement activities.

5.19.5 The *Consultant* will liaise with the *Employer's* Communications and Consultation Team who may assist with any formal engagements or introductions where appropriate and necessary.

5.19.6 Stakeholder Liaison Plan - the *Consultant* develops a Stakeholder Liaison Plan to set out roles and responsibilities and to manage businesses, residents, tenants, occupiers and other stakeholders to enable the site works to proceed with minimal impact on these surrounding parties and other stakeholders that may be affected.

5.19.7 The Stakeholder Liaison Plan contains an engagement tracker of all identified stakeholders confirmed and verified by the *Consultant*. It records all contact made, including contact details, a summary of what was discussed and any actions.

5.19.8 The *Consultant*:

i. updates and maintains the tracker, identifying additional stakeholders and detailing interfaces, desired levels of engagement, power and interest information and risks concerning new and existing stakeholders;

ii. identifies opportunities and synergies in undertaking the site works to minimise disruption; and

iii. makes this information available to the *Employer*.

5.19.9 The *Consultant* produces all forms of stakeholder communication and submits them to the *Employer* for review and comment before distribution. The *Consultant* prints and/or distributes agreed communications by letter, email or other means (to be agreed with the *Employer*) a minimum of 14 days prior to works commencing.

5.19.10 Site works **are not** undertaken by the *Consultant* without prior communication having been carried out.

5.20 Cost Reporting

5.20.1 The *Consultant* submits a full periodic summary report of the Price for Services Provided to Date and the forecasts of the total Time Charge and *expenses* for the whole of the *services* to the *Employer* every 4 weeks (28 days), in the first week of the *Employer's* 4 weekly reporting cycle. The periodic report contents shall cover progress to match the *Employer's* financial periods. 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

ii. Details of any matters materially affecting the forecast of the total Time Charge and *expenses* for the whole of the *Services* as well an updated forecast of the total Time Charge and *expenses* for the whole of the *services*.

5.21 Estimating

5.21.1 Refer to Appendix F for the *Employer's* guidance for producing an estimate.

5.22 Allocation of *Consultant* Staff

5.22.1 The *Consultant* obtains acceptance from the *Employer* before any new staff resources are allocated to work on the scheme. The *Consultant* shall issue a request setting out:

i. the name, role and rate of staff (proposed for mobilisation);
ii. proposed mobilisation date;
iii. planned demobilisation date.

5.22.2 The *Consultant* shall not be entitled to payment for staff time for any person who has not been accepted by the *Employer* in line with the above requirements.

5.23 Traffic Management and Access

5.23.1 The *Consultant* will be required to develop and implement a traffic management plan that provides safe access for the investigations teams to undertake the assessments and surveys.

5.23.2 The *Consultant* will be required to work with the *Employer's* Network Management team to secure the necessary road space permits for the survey and investigations.

5.23.3 It is envisaged that a number of surveys can be completed off carriageway. However, access to the underside of some structures will require lane closures and specialist access arrangements.

5.24 Lane Rental

5.24.1 The *Employer* Lane Rental charge applies to the Brent Cross area and its impact should always be considered. The *Employer's* general approach is to organise works outside of lane rental charging times. Exceptions to this may be required occasionally and would need to be agreed by the *Employer*.

5.24.2 The lane rental scheme information can be accessed via the following link:

www.tfl.gov.uk/lanerental

5.24.3 The *Consultant* should note that the Lane Rental scheme changed on 01 May 2021. Guidance on the new scheme can be found on the above link.

5.24.4 The *Consultant* engages with the *Employer's* Lane Rental team during development of site investigation proposals, and the phasing and programming of these works.

5.24.5 Where lane rental charges are considered unavoidable, the *Consultant* submits details of the costs to the *Employer* for acceptance.

5.24.6 In the development of Scheme options within the feasibility study deliverable, the *Consultant* investigates construction methods which minimise lane rental charges, e.g. through the sharing of traffic management, working outside of lane rental times, or using innovative construction methods. The *Employer's* Lane Rental team can provide advice during the development of these options.

5.25 Information Communication and Storage

5.25.1 The *Consultant* and *Employer* store and communicate information using Asite.

5.25.2 Project Management and Commercial communication is captured and managed using Asite.

5.26 Building Information Modelling

5.26.1 Refer to Appendix G

5.27 Quality Management

5.27.1 Refer to Appendix I

5.28 Health and Safety

5.28.1 Refer to Appendix H

6 Existing Information / Site Information

6.1 Description of Structures

6.1.1 Brief descriptions of the structures in scope are included in Appendix A. Further details are included in Appendix D.

6.2 Existing Information

6.2.1 Existing information for the structures including design, assessment and inspection records is available on the *Employer's* bridge management system, 'Bridgestation'.

6.2.2 The *Employer* provides the *Consultant* with read-only access to the system for three email addresses.

6.2.3 A detailed summary of current inspection data and possible interventions is included in Appendix D.

6.2.4 Further detailed information includes:

i. General Arrangements
ii. Principal Inspections
iii. Brent Cross Additional Structure Information
iv. STIP2 Reports (zip file)
v. Parapet Risk Assessment A41
vi. Drainage Survey

7 Deliverables Summary

7.1.1 Deliverables Table

Project Deliverable Ref.	Scope Item	Deliverable
D1	Desk Study	Desktop study Report in accordance with TfL Guidance Note SQA-2022 for each structure
D2		Desktop Study Project Summary Report
D3	Topographic Survey	3D Topographic Survey of the Project area including all structures captured using point cloud technology
D4	Asbestos Management	Asbestos Desktop Study completed on TfL template for each structure
D5		Asbestos Management Survey Report (if identified in the Asbestos Desktop Study) for each structure
D6		Asbestos Refurbishment or Demolition Survey Report (if identified in the Asbestos Desktop Study) for each structure
D7	Structural Investigations and Surveys	Inspection and Testing Plan for each structure
D8		Factual Investigation Report for each structure
D9		Interpretive Investigation Report for each structure
D10		Structural Investigation Project Summary Report
D11	Paint Surveys	A Pre-specification Survey Report in accordance with CM 431 'Maintenance painting old steelwork' for each structure in scope
D12	Post Tensioning Structural Investigation (PTSI)	Risk Assessment and Risk Management Report in accordance with CS 465 for each structure
D13		Technical Plan in accordance with CS 465 (where a PTSI Site Investigation has been identified by the Risk Assessment) for each structure

Project Deliverable Ref.	Scope Item	Deliverable
D14		PTSI Site Inspection Report (where a PTSI Site Investigation has been identified by the Risk Assessment) for each structure
D15		PTSI Site Investigation Report in accordance with CS 465 (where a PTSI Site Investigation has been identified by the Risk Assessment) for each structure
D16	CS 451 Structural Review	Structural Review Form in accordance with CS 451 Appendix B for each structure
D17	CS 454 Structural Load Assessment (If identified in the Structural Review)	Inspection for Assessment Report in accordance with the requirements of CS 454 for each structure
D18		Assessment Report in accordance with CS 451 Appendix C for each structure
D19		Certification in accordance with CG 300 for each structure
D20	CS 461 Parapet Risk Assessment	Report for the risk assessment carried out in accordance with the requirements of CS 461 for each structure in scope
D21		Options Report for interim measures and upgrade of parapets, for each structure in scope, where this is recommended by the risk assessment
D22	Highways Road Safety Audit	Stage 1 Road Safety Audit Report for each structure in scope
D23	CCTV Drainage Internal Condition Survey	Factual and Interpretive Condition Report for each structure
D24		Drainage Investigation Project Summary Report
D25	Highway Drainage Assessment of Capacity & Performance	Factual and Interpretive Assessment Report for each structure
D26		Drainage Assessment Project Summary Report
D27	Feasibility and Options Appraisal	Feasibility and Options Report in accordance with the requirements of TfL Guidance Document SQA-2022, including the additional requirements of CG 300, for each structure

Project Deliverable Ref.	Scope Item	Deliverable
D28		Feasibility and Options Project Summary Report
D29	Health and Safety File	Health and Safety File and Maintenance Manual in accordance with TfL Guidance SQA-2026for each structure in scope
D30	Options Assessment Report (OAR)	A single report, consistent with the DfT's guidance on developing Transport Business Cases, documenting all options considered and the process used to identify the best performing options to progress into Stage 3 Concept Design.
D31	Value Management	Value Management Assessment Summary in accordance with TfL template (project specific scoring Matrix to be developed with the TfL Sponsor).
D32	Cost Estimates	Detailed works costs estimate breakdown for the feasibility options: for each structure options and for the project scheme options
D33	Quantified Risk Analysis	Quantified Risk Analysis Report
D34	Assumptions and Decisions	Assumptions and Decisions Log Report
D35	Programme	Detailed for stage 3 Outline for Stages 4 to 6 inclusive
D36	Quality Management	To manage information throughout the project
D37	Value for Money	Presentation of options identification, evaluation recommendations & Q&A session In accordance with SQA-2022 Guidance Note

Project Deliverable Ref.	Scope Item	Deliverable
D38	Building Information Management (BIM)	BIM Execution Plan completed outlining how project deliverables are met, PIx list of software and platforms to ensure that there is no clash of formats MIDP list of project deliverables stating document numbers, level of detail/information, who is responsible for delivery and when it will be delivered.
D39	Stakeholder Liaison	Stakeholder Liaison Plan
D40	Contract Quality Plan (CQP)	Within 2 weeks (14 days) of the *Start Date*, the *Consultant* shall produce a Contract Quality Plan (CQP)

8 Exclusions

8.1.1 The following items of work are to be excluded:

i. Any works to increase the capacity of the structures for abnormal loads (noted as inadequate HB load capacity).

ii. Any works to significantly change the existing highway alignment.

iii. Any works associated with geotechnical structures.

9 Milestones

9.1.1 Indicative milestones dates are shown in the table below.

Ref	Description	Indicative Date
1	Desktop Study Complete by	Within 6 weeks of start
2	Structural investigations complete by	December 2021
3	Investigations Factual Reports Accepted by	TBC
4	Investigations Interpretive Reports Accepted by	TBC
5	All Technical Reports Accepted by	TBC
5	Options Report & Value Management Workshops Completed	February 2022
6	Options Reports Accepted by *Employer*	March 2022

10 Appendix A - Summary of Structures

Refer to accompanying documents

11 Appendix B – Potential Work Scope Grouping by Asset Type

Refer to accompanying documents

12 Appendix C – Proposed Deliverables Grouping by Asset Type

13 Appendix D Site Information

Refer to accompanying documents, which include:

1. General Arrangements (zip file)
2. Principal Inspections (zip file)
3. Brent Cross Additional Structure Information (Attached)
4. STIP2 Reports (zip file)
5. Parapet Risk Assessment A41 (zip file)
6. Drainage Survey (zip file)

14 Appendix E - Programme Requirements

WI500 Programme Requirements

(1) The *Consultant* submits programmes using Primavera Enterprise.

(2) The *Consultant's* programme uses the TfL standard Work Breakdown Structure; refer to WI500 appendix for TfL WBS standard template to be used.

(3) NOT USED.

(4) The planned start and completion dates in relation to operations that impact the *Employer's* operational network are shown on the programmes submitted for acceptance.

(5) NOT USED.

(6) The programme operation ID forms a unique identification and is not changed, or the operation description substantially reworded. Any deleted or redundant operations are moved to a 'Retired operation WBS within the programme with their relationship logic, and coding removed, and resources costs reallocated, where applied.

(7) The schedule has at least one longest path (float path 1) to the planned Completion date. The longest path is free of constraints lags/leads, SS, FF or SF links and activities greater than 28 weeks duration, unless agreed with the *Employer.*

(8) All compensation events are to clearly identified as separate operations, referenced with the ID number as generated in the System used for the project. For example, where ASITE CAMS is the project's contract management system; the ID will have the prefix of the ASITE incident number; i.e. INCXXX.

(9) All requirements identified as *Employer's* requirements are to be clearly identified in the operation ID in the format 'TFLXXX' and operation name.

(10) Each operation within the programme is coded to the project operation code list provided in the Appendix to WI500.

(11) The schedule calendar is set in days, and no operation exceeds a 28-calendar day duration.

(12) The programme allows for the review of all drawings and documentation submitted to the *Employer* in accordance with the timescales required by the contract. Sufficient time shall be allowed for further reviews, so that such process may be completed without delaying the placing of orders, and the execution of the works.

(13) The *Consultant's* Planning Team meets weekly with the *Employer's* Planning Team.

(14) In accordance with good schedule practice, the *Consultant's* programme shall not contain excessive and unwarranted use of constraints, which may compromise the integrity of the critical path, and its float calculation. This will be considered non-compliance of the Scope, and therefore a reason for its non-acceptance by the *Employer*.

(15) In accordance with good schedule practice, the *Consultant's* programme shall not contain logic and relationships which may compromise the integrity of the critical path, and its float calculation. This will be considered non-compliance of the Scope, and therefore a reason for its non-acceptance by the *Employer*.

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WI510 Programme Content

(1) All programmes submitted include the information listed in the *conditions of contract* as amended together with the information listed in the clauses below:

(2) NOT USED

(3) The dates on the Consultant's Subcontract Procurement Plan when key items of plant and materials and equipment are required.

(4) The *starting date*, *access dates*, Key Dates, if applicable, and Completion Date taken from the Contract Data part 1 as milestones on the programme which are in a separate 'contract milestone' section.

(5) All *Employer* delivery milestones, as provided by the *Employer*, are included in the *Consultant's* schedule, and held in a separate 'TfL Reporting Milestones' section. *Employer* delivery milestones are to be logic-linked in the Consultant's programme, the *Employer* will advise of an update to the *Employer's* delivery milestones by the end of Period 12 each year and these are to be included in the Consultant's Period 01 programme submission.

(6) NOT USED

(7) NOT USED

(8) The dates of road closures and access requirements.

(9) NOT USED

(10) NOT USED

(11) NOT USED

(12) The dates of submission of any quality plans.

(13) The dates of submission of any safety plans.

(14) The dates of submission for acceptance by the *Employer* of the *Consultant's* project execution plan, method statements, risk assessments and safe system of work, together with the *Employer's* approval periods (in accordance with the requirements of the Scope) with allowances for resubmission.

(15) The dates of submission of any logistics plan.

(16) NOT USED.

(17) NOT USED.

(18) The *Consultant identifies* on the programme the nature and purpose of all dates in relation to inspections, tests and sampling that require to be notified and co-ordinated with the *Employer* and Others.

(19) All quality hold points and quality control points.

(20) The dates of all necessary approvals and consents from the *Employer* or Others are required, allowing sufficient time for each stage of the development, submission and approval process, in accordance with requirements of the Scope, with allowances for resubmission.

(21) The agreed dates when, in order to Provide the Services in accordance with the programme, the *Consultant requires* design information or other information to be provided by the *Employer* or Others.

(22) The dates of submission of any design documents; and any other deliverables required by the Contract including hand-over documents and Mandatory Asset Information Deliverable.

WI515 Programme for Acceptance Submission

(1) NOT USED
(2) The *Consultant* submits through the project's electronic document management system; the summary schedule (if stated in WI520 (2)) and the updated programme for acceptance (WI520) in '.xer' and ".plf" format on the Wednesday of week 3 of the *Employer* reporting period with the data date in the schedule set to the Sunday (beginning) of week 3

(3) The *Consultant* submits through the project's electronic document management system; the summary schedule and the updated programme for acceptance (WI520) in '.pdf' format on the Wednesday of week 3 of the *Employer* reporting period. The ".pdf" format must show a logically linked Gantt chart form with critical path(s), and previous accepted programme as the baseline. The ".pdf" must show columns: Early Start and Finish Dates, Remaining Duration, and Total Float.

(4) All programme submissions are clearly titled, numbered and dated, with the programme data date clearly visible within the Gantt Chart. All project programmes adhere to the following naming convention: l TfL Project ID; l Consultant ; l TfL

Project Name; l Period; l TfL Financial Year l Status, i.e. draft or final revision; and date of issue.

(5) Physical progress is reported and recorded (updated) on programme operations by the *Consultant,* each *Employer* reporting period, using physical % complete and remaining duration as the basis for 'progress status'. When scheduling progressed operations only retained logic is used.

(6) At the request of the *Employer*, and without limitation, the *Consultant* provides the detailed supplier and subcontractor programmes which represent the *services*.

(7) The *Employer* issues a comments log each period which captures all review comments of the submitted programme. It will be used as basis for the programme acceptance / non-acceptance.

(8) The progress report and the periodic programme for acceptance are submitted on the same date in line with the Project reporting calendar supplied by the *Employer*.

WI520 Programme Hierarchy

(1) The *Consultant produces* and maintains the programmes, as shown in the *Consultant's* accepted procedure. The programmes in the hierarchy are complementary to each other and support the vertical alignment of milestones using consistent information and milestone descriptions as required by the contract.

(2) The *Consultant's* Summary Schedule

The *Consultant submits* a summary schedule in a format accepted by the *Employer* with each programme submitted for acceptance. The summary schedule is used as the basis for developing and reporting contract schedules to management and key stakeholders from initiation through all project completion phases. The summary schedule is developed in time-scaled format and contained on a single sheet of A3 size. The summary schedule highlights the critical path, major milestone events and events important to the overall management of the project. The summary schedule must be built from level of effort activities contained within the programme for acceptance.

(3) The *Consultant's* Programme for Acceptance

The programme must be used by the *Consultant* to direct their work by providing parameters for the more detailed implementation programmes and tools such as the procurement schedule and weekly work plan. It is also used to identify and resolve schedule problems, measure the impact of compensation events and delays, assist in earned value calculations and develop recovery plans. Programmes must be developed by the *Consultant* using CPM / network analysis techniques to produce a coherent schedule that covers the entirety of the
Scope.

(4) The Contractor's weekly work plan

For each element of work in hand the *Consultant* issues a work plan(s) no later than 0900 on Monday of each week. The weekly work plan comprises a four-week rolling programme (one week look back, and three weeks look ahead) covering day to day operations. This weekly work plan is in Gantt chart format and is to be resource loaded with critical labour resources, equipment, plant and materials by discipline.

The *Consultant* uses the weekly work plan to plan and schedule the work on a weekly basis. Each operation within the weekly work plan is derived from and can be related back to an operation which exists within the *Consultant's* programme for acceptance. The headings include safety, progress, programme, design, quality, access, environment, commercial and issues.
The weekly work plan indicates the timing of all proposed hold points in the inspection and test plans identified by the *Employer* for inspection by the *Employer* or by Others who have the right of inspection.

There is a commentary on each section/discipline of the *services* describing the progress over the week look back and planned for the three weeks look ahead and this must include design operations.

The *Consultant* identifies all works planned to be completed within the previous week at the time of production of the last weekly work plan and what has actually been achieved.

The *Consultant* clearly shows any change in time risk allowance, free and total float.

The *Consultant* provides details of all activities planned to be started within the previous week at the time of production of the last weekly work plan and whether they have actually achieved their start date. Any variance is to be identified with mitigation actions to be taken.

The *Consultant* provides reasons for not achieving any planned activities dates. Reasons for not achieving planned operation start/finish dates are categorised in line with a list as agreed by the *Employer* and dependent upon the stage the Project is currently within.

The *Consultant* provides reasons for not achieving any planned operation dates. Reasons for not achieving planned operation start/finish dates are categorised in line with a list as agreed by the *Employer* and dependent upon the stage the Project is currently within.

The number of operations start dates not achieved falling within each category are listed, and summarised as a percentage of the total number of planned operation starts for the previous week.

(5) The *Consultant's* Start Up Programme

The *Consultant* must produce a detailed commissioning & start up programme to illustrate in detail the sequence and operations required to complete all deliverables

for this stage of Contract. These programmes must be submitted by the *Consultant* in logic linked CPM format produced in Primavera. Initial versions of the commissioning & start up programme, if required by the *Employer*, must be submitted to the *Employer* for review and acceptance at least 2 months prior to the first commissioning activity starting.

(6) NOT USED

NOT USED.

(7) The *Consultant's* Surface Site Works Programme

A detailed traffic management programme must be submitted to the Traffic Information Management System (TIMS) four weeks (28 days) before commencement of any works on site that require the deployment of traffic management.

WI525 Programme Procedure and Narratives

(1) The *Consultant* submits within four weeks (28 days) of the starting date, to the Project Manager for acceptance, detailed procedures for the establishment and revision of programmes including the responsibilities for and methods to be used to measure the actual progress achieved.

(2) The *Consultant* submits with the first programme for acceptance and each Performance Measurement Schedule issue (WI530); a reference document which defines the Work Breakdown Structure (WBS), operation ID numbering system, operation Codes, use of Constraints, Lags (Leads not permitted), and Project Calendars, including a summary of statutory holidays applied to calendars for each year of the contract.

(3) The *Consultant* submits with the first programme for acceptance, and each Performance Measurement Schedule issue (WI530), a Planning Method Statement to explain how the programme has been built, with reference to the safe system of work and include an explanation of: scope, health, safety and environmental considerations; project phasing, work sequences and logistics; risk & opportunities; stakeholders; the time risk allowance against each operation; assumptions; details of any possession, shutdown or special working conditions; the deployment of *Consultant's* equipment and labour; the production rates used in determining durations; the shifts assumed in determining durations; the breakdown of labour requirements by trades; intended working hours; the schedules of quantities used in developing the programme. consents required; permits and licences.

(4) Each revised programme submitted for acceptance must include a programme narrative describing the requirements listed in the *conditions of contract* together with the following information: any changes to the planning reference document or planning method
statement; works completed; works not completed as planned with mitigation to be applied for time

recovery compensation events implemented; compensation event to be implemented; delays and mitigation proposal for recovery; changes to costs on existing operations and any additional costs added to the programme; description of and changes to the critical path; resequenced work; float erosion; negative float; any critical decisions that need to be made.

The programme narrative described in WI525(4) must include a change log listing the following information: all new operations; changed WBS; changed milestones; changed durations; changed calendar assignments; changes to calendar working time; changed dependencies; changed operation coding; significant changes to Total Float; identification of and changes to the critical path; retired operations; changes to resources labour, plant and material changes to cost loading

WI530 Performance Measurement Schedule

(1) The first Accepted Programme is used as the baseline Performance Measurement Schedule (PMS).

(2) The *Consultant's* revised programme for acceptance will be measured against the PMS. The *Consultant* must not amend the PMS without the prior approval of the *Employer*.

15 Appendix F – Cost Estimate Scope

See accompanying document

16 Appendix G – Building Information Modelling and Management

A. **Terms and Definitions**. The following are terms used in this Feasibility Design Specification:

1. Building Information Modelling (BIM): The use of a shared digital representation of a built asset to facilitate design, construction and operation processes to form a reliable basis for decisions
2. BIM Execution Plan (BEP): A plan, provided by the *Consultant* and accepted by the Project Manager, detailing how the *Consultant* will comply with requirements as set out in the EIR and or Feasibility Design Specification, BIM section and EIR.
3. Common Data Environment (CDE): The agreed solution for the production, use and management of Model File(s), Composite Model(s), Alphanumerical Data, Document Definition(s) and Document Rendition(s), as set out in the EIR, BEP and MIDP(s).
4. CDE Service Level Agreement (SLA): The agreement entered into by the Employer and *Consultant* in the form set out at the beginning of the contract and that defines the obligations on the *Consultant* or Employer (whichever is responsible for the provision of the Project Data Environment) for the standards to be applied to the provision, maintenance and availability of the Project Data Environment.
5. 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.
6. Documentation: Native Files and / or Data Files and / or Document Renditions.
7. Document Definition: Data file produced, containing a view of the Alphanumerical Data and / or Model File(s) and / or Composite Model(s), to derive meaning for a specific purpose.
8. Document Rendition: A data file in an immutable format, derived from a Document Definition.
9. Exchange 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.
10. Handover Information: Model File(s), Composite Model(s), Alphanumerical 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 Master Information Delivery Plan(s) until completion of the Project.
11. 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.

12. Master Information Delivery Plan (MIDP): A forward looking schedule of the Model File(s), Composite Model(s), Alphanumerical Data, Document Definition(s) and Document Rendition(s) which are to be produced, updated, maintained and delivered as Production Information and Handover Information.
13. 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 Alphanumerical Data, associated to the CAD file(s) and / or shape(s), identifying the functional characteristics of the assets.
14. Native File: Original Geometrical data and / or alphanumerical data file in its default format, as created in the authoring tool.
15. Alphanumerical Data: Data file containing alphanumeric characters, communicating the physical and functional characteristics of the works.
16. Production Information: The Model File(s), Composite Model(s), Alphanumerical 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 S1-538, during the design and construction stages of the Project, as set out in the Master Information Delivery Plan(s).
17. 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-*Consultant*s 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 and Handover Information.

B. BIM Responsibilities

The Consultant appoints a person to undertake the role and responsibilities of Project Information Manager for the duration of the Project until the later of: Project completion; or all Production Information and Handover Information has been accepted by the Project Manager.

The *Employer* provides and maintains the Project Data Environment, in accordance with the EIR and the CDE SLA in place for the project. The Employer shall ensure accessibility to the employees of the Employer, the Consultant or any employee, Sub-contractors or supplier of the Consultant, the Project Manager, the Supervisor and Others (as applicable) until the requirements have been achieved

The *Consultant* is responsible for completing, updating and maintaining the MIDP(s) and BEP to be provided by the Consultant until the requirements of 1.2.4 have been achieved.

The *Consultant* produces, updates and maintains Production Information and Handover Information in accordance with the accepted MIDP(s), EIR and BEP

provided by the *Consultant*, until the later of: Project completion; or all Production Information and Handover Information has been accepted by the *Project Manager* in

The *Consultant* produce, use, update and manage Production Information and Handover Information through the CDE.

The *Consultant* are responsible for and maintain the integrity and compatibility of the Production Information and Handover Information until the requirements have been achieved.

The *Consultant* a are responsible for the coordination and integration of the design contained within the Model Files and / or included as part of the Alphanumerical Data, across all disciplines, with Others, with existing infrastructure and any adjacent works.

The *Consultant* are responsible for (and provide evidence through internal audits in line with the Audit Programme to verify that), the Production Information and Handover Information fulfils contractual requirements and the requirements of S1-538 (Assurance). 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*.

C. BIM Process

Master Information Delivery Plan (MIDP)

The *Consultant* produces, updates and maintains the MIDP in accordance with Section 2.8 of the EIR including those deliverables within WI 405.2 WI 525 and WI 540.

D. Exchange Information Requirements (EIR)

The *Consultant* delivers the Project in accordance with the EIR. Updates to the EIR shall be managed through the Project Change Control process.

The *Consultant* delivers the project in accordance with the Consultant's BEP.

E. BIM Execution Plan (BEP)

The *Consultant* delivers the project in accordance with the *Consultant's* BEP.

The *Consultant* produces, updates and maintains the BEP

BIM Coordination Process

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

adjacent works in accordance with the EIR.

The *Consultant* demonstrates the effectiveness of any value engineering using the Production Information in accordance with the EIR.

F. BIM Submission Procedures

The *Consultant* submits to the Project Manager for acceptance the Production Information and Handover Information as set out in the accepted MIDP(s) provided by the Consultant, in accordance with the Employer's SMP and CDE Standard S1760, EIR and Accepted Programme. The Project Manager either accepts the submission or notifies the Consultant of his reasons for rejection. Reasons for rejection are:

Production Information and Handover Information are not submitted through the CDE, in accordance with the EIR

Production Information and Handover Information do not comply with Standards.

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

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

Documents provided by the *Employer* attached:
BEP – Appendix 350-02
Employer Project Information Exchange (PIx) Protocol IT Assessment Form – Appendix 350-04
MIDP Template – Appendix 350-05.

17 Appendix H - Health and Safety and Environmental Requirements

Refer to accompanying documents

18 Appendix I – Quality Management

Refer to accompanying documents

19 Appendix J – TfL Maintenance Strategy Options definitions

Do Nothing – There is no benefit to proceed with a project (Stop and close the project)

Reactive Do Minimum (Safe) – *Reactive work ensuring that risk to users is kept at an acceptable level*
No proactive Capital Investment – Reactive maintenance only
Implementation of interim measures can be expected in order to keep the asset(s) safe (such as closure of lane/road, speed restrictions, etc.)
Reduction in operability and reliability can be expected
Increased WLC and WLV can be expected

Planned Do Minimum (Safe) – *Capital works would ensure that an asset(s) would be safe to use and would not pose an undue level of risk to users over the analysis period (typically ~10% of an asset design life)*

- Reduce all immediate very high and high safety risk items to an acceptable level
- Reduction in operability and reliability can be expected over the analysis period after completion of the works
- Ongoing maintenance and operation costs are likely not to be optimum.

Planned Targeted (Safe and Operable) - *Capital works would ensure that an asset(s) directly supports the movement of users and is able to perform its required function (although not necessarily to the desired level of reliability) over the analysed period (typically ~20-30% of an asset design life)*

- Complete treatments to reduce safety, functionality, environment and reputational risks to acceptable level
- Reduction in reliability can be expected over the analysed period after completion of the works
- Some residual risks may remain over the analysed period

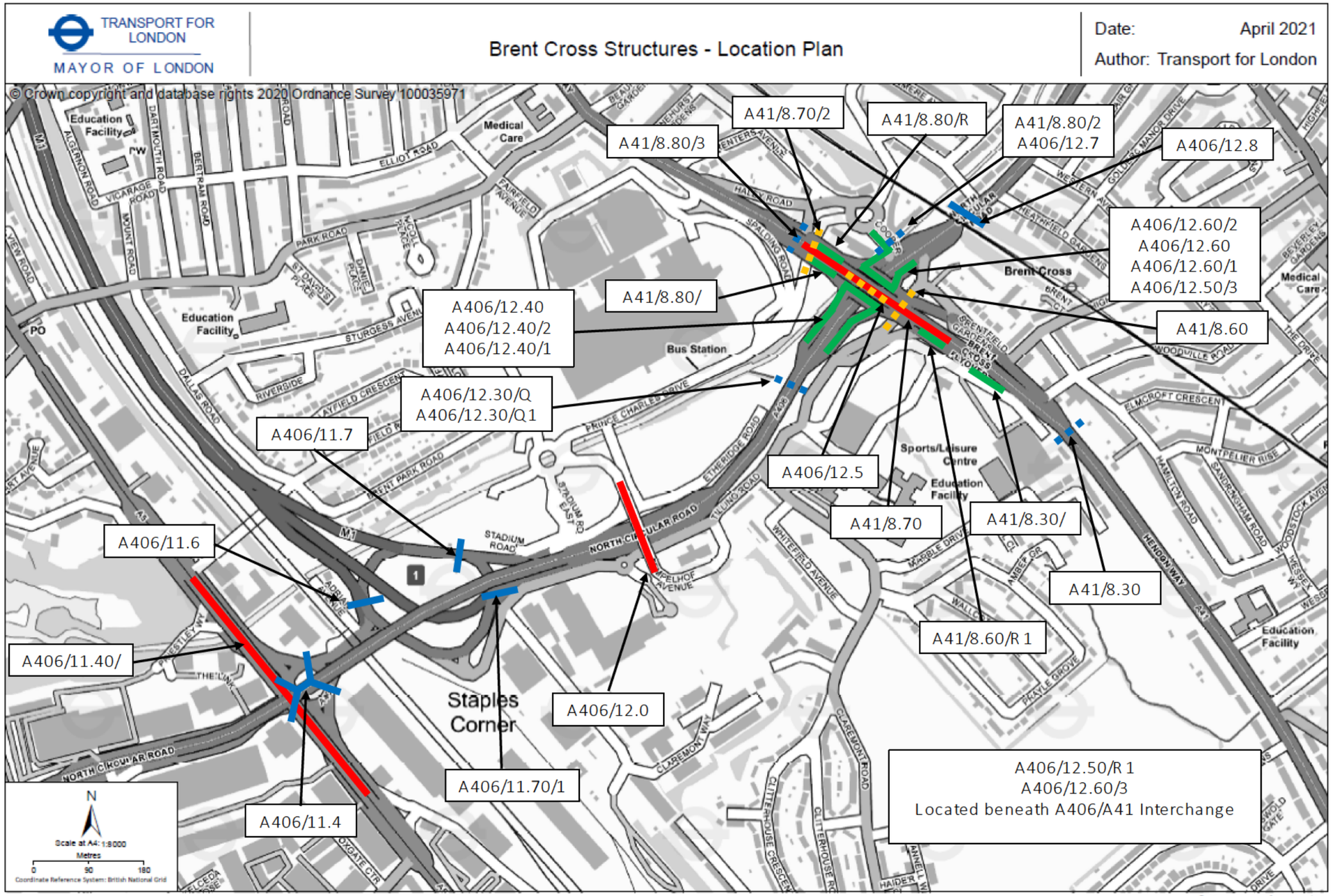
Planned Optimum (Safe, Operable and Reliable) - *Capital works would ensure that an asset directly supports the movement of users and is also able to perform to the required level of reliability over an optimised analysis period(s)*

- Complete all treatments required to minimise safety, functionality, environment and reputational risks over the residual life of the asset.
- Delivers the levels of network safety, operation and reliability to fully achieve the predefined project outcomes *(which could be further extended to deliver on enhancements such as "Capacity & Growth" and "Customer" requirements)*
- Minimise financial risks by minimising whole life costs, supports income generation, etc. over the analysis period

20 Appendix K - Asbestos Desk Survey Template

Refer to accompanying document

21 Appendix L – Location Plan



22 Appendix M – Not Used

23 Appendix N - Submission Comments Form

Refer to accompanying document

24 Appendix O – TfL SQA guidance documents

25 Appendix P – TfL Whole Life Cost assessment template (excel spreadsheet)

26 Appendix Q – TfL Value for Money Assessment Summary (excel template)

TRANSPORT for LONDON – COMMERCIAL SURFACE TRANSPORT

Major Asset Renewals Programme (MARP) - Brent Cross Structures Feasibility Study

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Scope Appendix A

MARP BXS List

Project Reference Number: tfl_scp_001845

Appendix A **MARP Brent Cross Structures List**

Package No.	Package Name	Structure No.	Structure Name	Structure Type	Circa	Route	Construction Form	Total Span	No. of Spans	Deck Width	Length	Height Max	Height Min	Obstacle Carried	Obstacle Crossed
1	A41 Flyover & R/Ws	A41/08.70	Brent Cross Flyover	Bridge	1965	A41	3 span post tensioned cellular concrete deck with precast prestressed concrete beam approach spans	189.30	10	18.80		-	-	A Class Road	A Class Road
		A406/12.50	Brent Cross Footbridge	Footbridge	1965	A406	Reinforced concrete footbridge suspended from Brent Cross Flyover with steel	75.27	18	2.63		-	-	Cyclist and Pedestrian	A Class Road
		A41/08.80/R	Brent Cross N Ramp NW R/W	Retaining Wall	1964	A41	Reinforced concrete cantilever retaining wall	-	-	-	67.80	2.31	0.00	A Class Road	A Class Road
		A41/08.60/R1	Brent Cross South Ramp SW R/W	Retaining Wall	1966	A41	Reinforced concrete cantilever retaining wall	-	-	-	90.60	4.09	0.00	A Class Road	A Class Road
		A41/08.80/R1	Brent Cross N Ramp NE RW	Retaining Wall	1964	A41	Reinforced concrete cantilever retaining wall	-	-	-	78.80	4.50	0.00	A Class Road	A Class Road
		A41/08.30/R	Brent Cross Sth West R/W	Retaining Wall	1966	A41	Reinforced concrete cantilever retaining wall	-	-	-	157.00	3.12	0.00	A Class Road	A Class Road
2	A41 Mid-Level Roundabout & Slips	A406/12.60/2	Brent Cross N/E Slip Rd	Bridge	1965	A406	1 no. span reinforced concrete, 1 no. span precast prestressed beams	26.52	2	8.28		-	-	A Class Road	Unclassified
		A406/12.40/2	Brent Cross South	Bridge	1965	A406	Spans of reinforced concrete and precast prestressed beams	87.28	7	9.50		-	-	A Class Road	Non-navigable watercourse
		A406/12.60	Brent Cross North	Bridge	1965	A406	Spans of reinforced concrete and precast prestressed beams	87.29	7	9.56		-	-	A Class Road	Non-navigable Watercourse
		A406/12.60/1	Brent Cross N/W Slip Rd	Bridge	1965	A406	Precast prestressed beams with 1 no. reinforced concrete span	75.10	6	7.90		-	-	A Class Road	A Class Road
		A406/12.40/1	Brent Cross SE Slip Road	Bridge	1965	A406	Precast prestressed beams	28.27	2	7.92		-	-	A Class Road	Waste Ground
		A406/12.40	Brent Cross SW Slip Road	Bridge	1965	A406	1 no. span reinforced concrete, 1 no. span precast prestressed beams	25.16	2	8.28		-	-	A Class Road	Waste Ground
		A406/12.50/3	Brent Cross N/W Connector	Bridge	1965	A406	1 no. span precast prestressed beams 1 no. span unknown	23.00	2	15.54		-	-	C Class Road	Cyclist and Pedestrian
3	Brent Cross Bridge	A406/12.00	Brent Cross Bridge	Bridge	1974	A406	Continuous reinforced concrete slab	221.35	13	8.45		-	-	Unclassified	A Class Road
4	A5 Fly-under	A406/11.40/2	SCI A5 Flyunder	Bridge	1976	A406	Post tensioned concrete box girder	305	7	18.6				A Class Road	A Class Road
5	Staples Corner Interchange Footbridge Complex	A406/11.40	SCI F/B Complex	Footbridge	1976	A406	Steel box girder	182.31	12	1.93				Pedestrian	A Class Road
6	M1/A406 Junction Footbridges	A406/11.60	SCI F/B No. 1	Footbridge	1976	A406	Steel box beam and deck	95.74	8	1.83				Cyclist and Pedestrian	A Class Road
		A406/11.70	SCI F/B No. 2	Footbridge	1976	A406	Steel box beam and deck	48.83	6	2.03				Pedestrian	A Class Road
		A406/11.70/1	SCI F/B No. 3	Footbridge	1995	A406	Steel Warren truss	48	6	2.2				Pedestrian	A406 Roundabout
7	Other (Minor) Structures	A406/12.70	North Circular en River Brent Viaduct	Bridge	1923	A406	Reinforced concrete slab	6.80	1	7.60		-	-	Car Park Access - Not in use	Non-navigable Watercourse
		A41/08.60	Brent Cross East U/pass	Bridge	1970	A41	Reinforced concrete box	9.45	1	43.60		-	-	A Class Road	C Class Road
		A41/08.30	Brent Cross East Subway	Subway	1965	A41	Reinforced concrete box	2.59	1	27.00		-	-	A Class Road	Cyclist and Pedestrian
		A41/08.80/3	Brent Cross West Subway	Subway	1965	A41	Reinforced concrete slab on concrete cantilever	3.20	1	39.00		-	-	A Class Road	Cyclist and Pedestrian
		A41/08.80/2	Shirehall	Bridge	1922	A41	Reinforced concrete continuous slab	8.06	2	32.7				Cyclist and Pedestrian	Non-navigable Watercourse
		A406/12.60/3	River Brent Channel FB No. 3	Footbridge	1965	A406	Reinforced concrete slab	7.7	1	3.1				Cyclist and Pedestrian	Non-navigable Watercourse
		A406/12.80	Shirehall Park Footbridge	Footbridge	1971	A406	Vierendeel truss	141.2	4	2.03				Cyclist and Pedestrian	A Class Road
		A406/12.50/R1	River Brent Channel Retaining Wall	Retaining Wall	1965	A406	2 construction types - reinforced concrete trough and concrete blockwork				138.00	3.90	2.60	Cyclist and Pedestrian	Non-navigable Watercourse
		A41/08.70/2	Brent Cross West U/pass	Bridge	1970	A41	Reinforced concrete box	8.10	1	43.80		-	-	A Class Road	C Class Road
		A406/12.30/Q	Clitterhouse Brook Culvert	Culvert	1924	A406	Insitu and precast reinforced concrete box culvert	2.74	1	60				A Class Road	-
		A406/12.30/Q1	Clitterhouse Brook Culvert Ext	Culvert	1972	A406	Insitu and precast reinforced concrete box culvert	2.75	1	16				A Class Road	Non-navigable Watercourse

TRANSPORT for LONDON – COMMERCIAL SURFACE TRANSPORT

Major Asset Renewals Programme (MARP) - Brent Cross Structures Feasibility Study

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Scope Appendix B

Potential Works Scope

Project Reference Number: tfl_scp_001845

Appendix B - MARP Brent Cross Structures - Potential works scope

	Work Package	1						2							3	4	5	6			7										
	Structure Type	Bridge	Footbridge	RW	RW	RW	RW	Bridge	Bridge	Bridge	Bridge	Bridge	Bridge	Bridge	Bridge	Bridge	Footbridge	Footbridge	Footbridge	Footbridge	Subway	Subway	Bridge	Bridge	Bridge (footbridge)	Culvert	Culvert	RW	Footbridge	Bridge Footbridge)	Footbridge
	MRN Road Network over/under	A41	A406	A41	A41	A41	A41	A406	A406	A406	A406	A406	A406	A406	A406	A406	A406	A406	A406	A406	A41	A41	A41	A41	A41	A406	A406	A406	A406	A406	A406
Scope Item No.	Scope item / Structure Name	Brent Cross Flyover	Brent Cross Footbridge	Brent Cross N Ramp NE RW	Brent Cross N Ramp NW R/W	Brent Cross South Ramp SW R/W	Brent Cross Sth West R/W	Brent Cross North	Brent Cross South	Brent Cross N/E Slip Rd	Brent Cross N/W Slip Rd	Brent Cross N/W Connector	Brent Cross SE Slip Road	Brent Cross SW Slip Road	Brent Cross Bridge	SCI A5 Flyunder	SCI F/B Complex	SCI F/B No. 1	SCI F/B No. 2	SCI F/B No. 3	Brent Cross East Subway	Brent Cross West Subway	Brent Cross East U/pass	Brent Cross West U/pass	Shirehall	Clitterhouse Brook Culvert	Clitterhouse Brook Culvert Ext	River Brent Channel Retaining Wall	Shirehall Park Footbridge	North Circular en River Brent Viaduct	River Brent Channel FB No. 3
1	Targeted Reinforced Concrete repairs - Structural	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔						✔	✔	✔	✔	✔	✔	✔	✔			
2	Remove structure																													✔	
3	Replace structure		✔																												
4	Strengthen structure		✔																												
5	Embankment repairs		✔																												
6	Monitoring of bearing performance		✔					✔	✔	✔	✔	✔	✔	✔																	
7	Service mesnager hinges provided at the base of piers,							✔	✔	✔	✔	✔	✔	✔																	
8	Replace heavily corroded dowel bars at fixed bearings							✔	✔	✔	✔	✔	✔	✔																	
9	Monitoring of foundation settlement						✔																					✔			
10	Repair/refurbish corroded parapets/handrails		✔																		✔	✔	✔	✔		✔	✔	✔		✔	
11	Upgrade/replace sub-standard parapets	✔		✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔										✔						✔
12	Strengthen parapet/edge beam to accommodate new parapet	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔																
13	Repair, prepare and repaint structural steelwork		✔														✔	✔	✔	✔									✔		
14	Substandard headroom management		✔					✔	✔												✔	✔			✔						
15	Resurface road over	✔		✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔					✔		✔	✔	✔	✔	✔				
16	Concrete repairs - deck surface	✔				✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔									✔	✔	✔				
17	Replacement of planks between two decks	✔																													
18	Re-waterproofing the deck	✔				✔		✔	✔	✔	✔	✔	✔	✔	✔	✔									✔						
19	Renew/replace combined anti-skid waterproofing surfacing		✔														✔	✔	✔	✔	✔	✔							✔		✔
20	Water seepage & ingress management																				✔	✔	✔	✔		✔	✔				
21	Work to improve aesthetics (tiles, paint etc.)																				✔	✔									
22	Upgrade lighting to footpaths/cycleways below	✔						✔	✔						✔						✔	✔	✔	✔	✔						
23	Replacement of deck expansion joints	✔	✔					✔	✔	✔	✔	✔	✔	✔	✔	✔					✔		✔	✔	✔	✔	✔				
24	Renewal of joint sealants			✔	✔	✔	✔	✔	✔	✔	✔	✔	✔								✔	✔	✔								
25	Replace footbridge expansion joints & sealants		✔														✔	✔	✔	✔					✔				✔		✔
26	Repair/replace blocked deck drainage pipes & gullies. Potential to provide new external drainage system	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔				✔							
27	Install aniti pigeon roosting measures/protection	✔	✔					✔	✔	✔	✔	✔	✔	✔	✔																
28	Remove graffiti/vegetation growth	✔	✔	✔				✔	✔		✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔		✔	✔	✔
29	Upgrade and refurbish bridge lighting							✔	✔	✔	✔	✔	✔	✔																	
30	Seal/replace access chamber covers															✔															
31	Repair footways/kerbing/verges/ramps	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔

TRANSPORT for LONDON – COMMERCIAL SURFACE TRANSPORT

Major Asset Renewals Programme (MARP) - Brent Cross Structures Feasibility Study

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Scope Appendix C

Proposed Deliverables by Asset Type

Project Reference Number: tfl_scp_001845

Appendix C – Proposed Deliverables Grouping by Asset Type

	Work Package	1						2							3	4	5	6			7										
	Structure Type	Bridge	Footbridge	RW	RW	RW	RW	Bridge	Bridge	Bridge	Bridge	Bridge	Bridge	Bridge	Bridge	Bridge	Footbridge	Footbridge	Footbridge	Footbridge	Subway	Subway	Bridge	Bridge	Bridge (footbridge)	Culvert	Culvert	RW	Footbridge	Bridge Footbridge)	Footbridge
	MRN Road Network over/under	A41	A406	A41	A41	A41	A41	A406	A406	A406	A406	A406	A406	A406	A406	A406	A406	A406	A406	A406	A41	A41	A41	A41	A41	A406	A406	A406	A406	A406	A406
Scope Item No.	Scope item / Structure Name	Brent Cross Flyover	Brent Cross Footbridge	Brent Cross N Ramp NE RW	Brent Cross N Ramp NW R/W	Brent Cross South Ramp SW R/W	Brent Cross Sth West R/W	Brent Cross North	Brent Cross South	Brent Cross N/E Slip Rd	Brent Cross N/W Slip Rd	Brent Cross N/W Connector	Brent Cross SE Slip Road	Brent Cross SW Slip Road	Brent Cross Bridge	SCI A5 Flyunder	SCI F/B Complex	SCI F/B No. 1	SCI F/B No. 2	SCI F/B No. 3	Brent Cross East Subway	Brent Cross West Subway	Brent Cross East U/pass	Brent Cross West U/pass	Shirehall	Clitterhouse Brook Culvert	Clitterhouse Brook Culvert Ext	River Brent Channel Retaining Wall	Shirehall Park Footbridge	North Circular en River Brent Viaduct	River Brent Channel FB No. 3
1	Asbestos Management	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
2	Structural Investigations & Surveys	✔		✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
3	Paint Surveys		✔														✔	✔	✔	✔									✔		
4	Post Tensioned Structural Investigations (PTSI) (CS 465)	✔														✔															
5	Structural Review (CS 451)	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
6	Structural Load Assessment (CS 454)	✔	✔					✔	✔	✔	✔	✔	✔	✔	✔	✔															
7	Parapet Risk Assessment (CS 461)	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔															
8	Highway Road Safety Audit (RSA) Stage 1 - headroom/lighting/alignment issues		✔					✔	✔	✔	✔	✔	✔	✔	✔						✔	✔	✔	✔	✔						
9	CCTV drainage internal condition survey , including investigation to clear / unblock drainage in advance	✔						✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔							
10	Highway Dranage Assessment of Capacity & Performance	✔						✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔							
11	Feasibility / Options appraisal	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔

TRANSPORT for LONDON – COMMERCIAL SURFACE TRANSPORT

Major Asset Renewals Programme (MARP) - Brent Cross Structures Feasibility Study

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Scope Appendix D

Site Information
(Please see end of Contract Document)

Project Reference Number: tfl_scp_001845

TRANSPORT for LONDON – COMMERCIAL SURFACE TRANSPORT

Major Asset Renewals Programme (MARP) - Brent Cross Structures Feasibility Study

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Scope Appendix E

Programme Requirements

Project Reference Number: tfl_scp_001845

< Project Name & ID >

Programme for Acceptance Comments Log

PM Note Only
PM Comment only, please action and respond
PM Rejection item, please actiont and respond
Closed

No.	Version	Date	Reviewer Name	Discipline	Programme Activity ID	PM Comment	Respondee Name	Contractor Response	PM Comment	Status
										Note
										Comment
										Rejection
										Closed

Period Dates

Select Financial Year:	2065-66

Period 1	Start	Finish
Week 1	01/04/2065	11/04/2065
Week 2	12/04/2065	18/04/2065
Week 3	19/04/2065	25/04/2065
Week 4	26/04/2065	02/05/2065

Period 2	Start	Finish
Week 1	03/05/2065	09/05/2065
Week 2	10/05/2065	16/05/2065
Week 3	17/05/2065	23/05/2065
Week 4	24/05/2065	30/05/2065

Period 3	Start	Finish
Week 1	31/05/2065	06/06/2065
Week 2	07/06/2065	13/06/2065
Week 3	14/06/2065	20/06/2065
Week 4	21/06/2065	27/06/2065

Period 4	Start	Finish
Week 1	28/06/2065	04/07/2065
Week 2	05/07/2065	11/07/2065
Week 3	12/07/2065	18/07/2065
Week 4	19/07/2065	25/07/2065

Period 5	Start	Finish
Week 1	26/07/2065	01/08/2065
Week 2	02/08/2065	08/08/2065
Week 3	09/08/2065	15/08/2065
Week 4	16/08/2065	22/08/2065

Period 6	Start	Finish
Week 1	23/08/2065	29/08/2065
Week 2	30/08/2065	05/09/2065
Week 3	06/09/2065	12/09/2065
Week 4	13/09/2065	19/09/2065

Period 7	Start	Finish
Week 1	20/09/2065	26/09/2065
Week 2	27/09/2065	03/10/2065
Week 3	04/10/2065	10/10/2065
Week 4	11/10/2065	17/10/2065

Period 8	Start	Finish
Week 1	18/10/2065	24/10/2065
Week 2	25/10/2065	31/10/2065
Week 3	01/11/2065	07/11/2065
Week 4	08/11/2065	14/11/2065

Period 9	Start	Finish
Week 1	15/11/2065	21/11/2065
Week 2	22/11/2065	28/11/2065
Week 3	29/11/2065	05/12/2065
Week 4	06/12/2065	12/12/2065

Period 10	Start	Finish
Week 1	13/12/2065	19/12/2065
Week 2	20/12/2065	26/12/2065
Week 3	27/12/2065	02/01/2066
Week 4	03/01/2066	09/01/2066

Period 11	Start	Finish
Week 1	10/01/2066	16/01/2066
Week 2	17/01/2066	23/01/2066
Week 3	24/01/2066	30/01/2066
Week 4	31/01/2066	06/02/2066

Period 12	Start	Finish
Week 1	07/02/2066	13/02/2066
Week 2	14/02/2066	20/02/2066
Week 3	21/02/2066	27/02/2066
Week 4	28/02/2066	06/03/2066

Period 13	Start	Finish
Week 1	07/03/2066	13/03/2066
Week 2	14/03/2066	20/03/2066
Week 3	21/03/2066	27/03/2066
Week 4	28/03/2066	31/03/2066