1 Project Description

1.1 Description of Site and Structure

The Westway forms part of an elevated highway and carries the A40 Western Avenue from Wood Lane to the Marylebone Flyover.

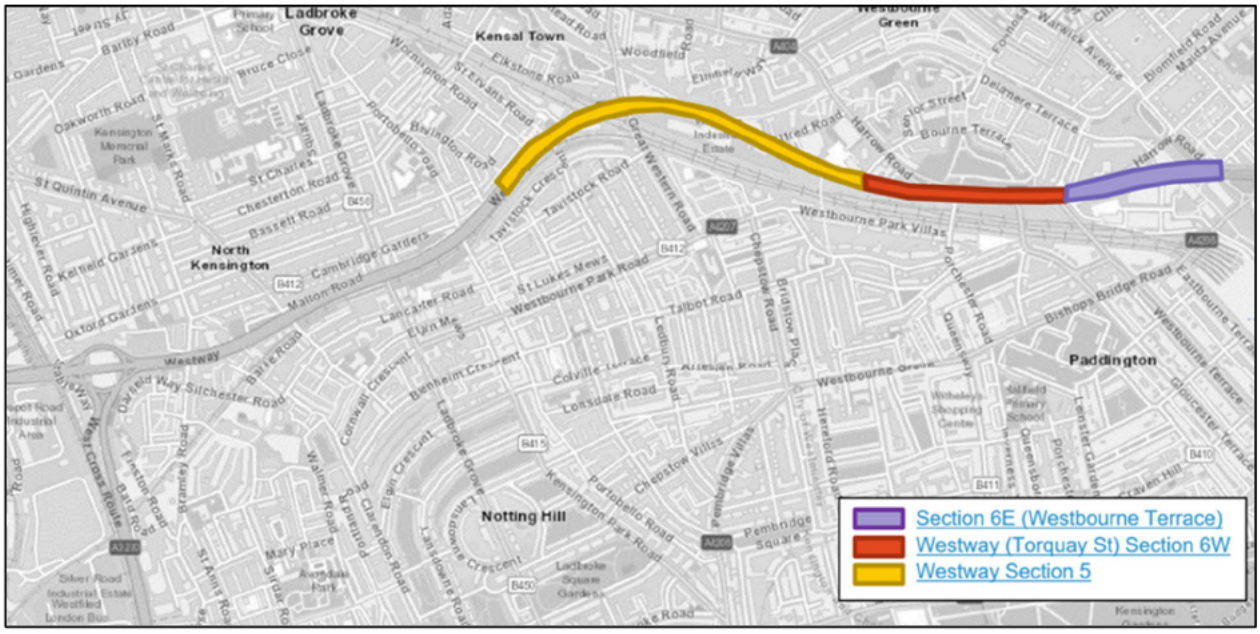


Figure 1: Location plan of A40 Westway PTSI Work Package 1A

Figure 2: Location plan of A40 Westway PTSI Work Package 1B

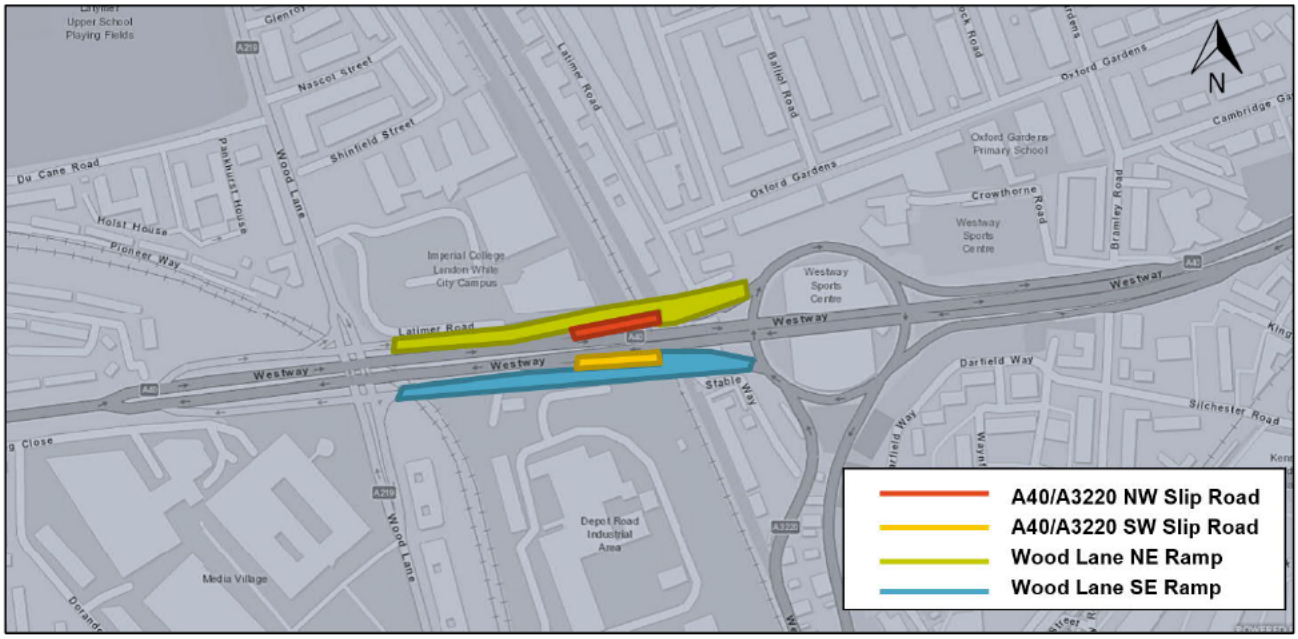


Figure 3: Location plan of A40 Westway PTSI Work Package 1C

1.1.1 Westway Section 6E (Westbourne Terrace) – Work Package 1A

Westway Section 6E (Structure No. A40/08.50) was constructed in 1969/1970 and designed by G. Maunsell and Partners. It has an overall length of 520 m from the eastern abutment at Paddington Green to Westbourne Terrace. The carriageway at this point has a speed limit of 40 mph and comprises dual two-lane traffic with a central reservation and hard shoulders. The A404 Harrow Road runs directly below and in line with the structure.

The bridge is curved in plan and comprises seventeen spans in total, referenced 133 to 149 from west to east. Span lengths are typically 30.5 m, exceptions are the span over the Grand Union Canal at 51.2 m (span 141) and the end spans at 18.3 m (span 133) and 23.3 m (span 149).

The deck generally consists of longitudinal pre-tensioned hollow box beams with an in-situ reinforced concrete deck slab topping and bottom flange infill. However, span 141 over the canal and the adjacent spans 140 and 142 are constructed from longitudinally post–tensioned precast segments. Deck spans are built continuously over intermediate steel portal frame or "bent" supports and are connected by reinforced concrete diaphragms between the ends of the beams with fingers extending into the boxes. The composite action of the road deck and each of the steel portal bents is ensured by vertically prestressing the infill concrete between the ends of the beams over the portal crossheads by Macalloy bars anchored to the crossheads.

The longitudinal post-tensioning in spans 140 to 142 consists of 12 No. 15.2 mm diameter tendons in the webs of the box beams, 12 No. 15.2 mm diameter tendons in the in-situ infill between the beams, and 7 No. 15.2 mm diameter tendons in the in-situ edge beams. Segments over these three spans are categorised as segments A to G. Tendons are not continuous through the canal spans and are divided between the segments into three discrete systems. These are arranged as two cantilevered side spans and the central drop in span supported at half-joints. All cables are PSC multi-strand tendons with a characteristic breaking load of 2722 kN, loaded to 2092 kN prior to transfer.

The vertical post-tensioning consists of 35 mm diameter Macalloy high tensile bars anchored to the crossheads. The Macalloy bars were stressed and anchored from the top and stressed to 608 kN prior to transfer.

1.1.2 Westway (Torquay St) Section 6W – Work Package 1A

Westway (Torquay St) Section 6W (Structure No. A40/08.80) was constructed in 1970 by John Laing Construction Ltd. and designed by G. Maunsell and Partners. It has an overall length of 475 m from the east end of Westway Section 5 at Torquay Street to Westway Section 6E at Westbourne Terrace. The carriageway at this point has a speed limit of 40 mph and comprises dual two-lane traffic with a central reservation and hard shoulders. The A404 Harrow Road runs directly below and in line with the structure.

The structure comprises sixteen continuous spans which vary in length from 17.3 m to 30.5 m, referenced 117 to 132 from west to east. The structure has a typical width of 21.9 m but widens towards the west end to accommodate the approaches to the adjacent slip roads.

The majority of the bridge deck is built continuously over a series of 16 welded steel hollow box portal frames or "bents" which support all intermediate and east end spans. Portal frame legs are tapered hollow steel sections. In some instances, portals are supported by the reinforced concrete portals of the Harrow Road Viaduct, however most are founded on pile caps. Single transverse span portals are typical, except for 2 No. 3-legged and 2 No. 4-legged portals where slip roads join the main superstructure. The west end of the structure is supported by a cellular reinforced concrete box abutment which connects Westway (Torquay St) Section 6W to Westway Section 5. The composite action of the road deck and each of the steel portal bents is ensured by vertically prestressing the infill concrete between the ends of the beams over the portal crossheads by Macalloy bars anchored to the crossheads.

Each deck span consists of precast pre-tensioned concrete hollow box beams, with a cast in-situ top slab and bottom flange infill. The edges of the deck were cast in-situ and support the verges and parapets. Spans are connected to supports by reinforced concrete diaphragms between the ends of the beams with fingers extending into the boxes and a continuous slab on top.

The vertical post-tensioning consists of varying numbers of 35 mm diameter Macalloy high tensile bars anchored to the crossheads. The total number of bars in each bent varies as the number of rows range from 2, 3 & 4. The live ends are anchored at the top of the crosshead with a locking nut over an anchor plate in mortar filled pockets beneath the carriageway surface. The dead ends are anchored within the box portal frame, with concrete infill over, and along the length of the top flanges of the bent crosshead. The Macalloy bars were stressed and anchored from the top and stressed to 608 kN prior to transfer.

1.1.3 Westway Section 5 – Work Package 1A

Westway Section 5 (Structure No. A40/09.00) was constructed by John Laing Construction Ltd. in 1970 and designed by G. Maunsell and Partners. It has an overall length of 1142 m starting at the abutment at Acklam Road (west) and ending at the abutment for Section 6W at Torquay Street (east). The carriageway at this point has a speed limit of 40 mph and comprises dual three lane traffic and hard shoulders with a 1.5 m wide central reservation and 1.1 m verges. The area below the structure incorporates sport facilities, business offices, skate parks, Network Rail tracks and Crossrail construction sites.

The bridge is curved in plan and comprises nineteen spans numbered 98 to 116 from west to east. Spans are typically 62 m long with 43 m end spans. Intermediate spans and end spans are divided into twenty-six segments and nineteen segments respectively. Segments are typically 2.28 m long with 100 mm thick in-situ joints between segments. The deck is pre-stressed in all three directions, i.e. longitudinally in the top slab, inner webs and bottom slab; transversely in the top slab, inclined outer webs and bottom slab; and vertically in the inner webs in the vicinity of the supports.

The majority of the bridge deck is built over intermediate tapered reinforced concrete pier supports of varying heights (numbered 147 to 164 from west to east). The end supports consist of reinforced concrete abutments. The east abutment is a reinforced concrete chamber adjoining Section 5 to Westway Section 6W. The west abutment is shared with Westway Section 4 (access through the adjacent nightclub). The deck is supported on 2No. anticlastic sliding bearings at each support. All the supports are piled.

The bridge deck comprises a three-cell pre-cast post-tensioned concrete segmental box with cantilever wings. The webs of the central box cell are 600 mm thick. Cells can be accessed internally via manholes in the westbound carriageway. The maximum headroom inside the central box section is 2.50 m, and within the deck slab is approximately 300 mm thick.

Longitudinal post-tensioning tendons are profiled so that they sag over the midspan and rise to the deck over the supports. They are typically formed of 12/15.24 mm standard strands and housed within 81 mm ducts. Arrangements vary depending on location:

- Tendons located within the inner webs stay constant in number throughout (10 in each web)
- Tendons located within the top slab vary from 0 at midspan to 28 over the supports
- Tendons located within the bottom slab vary from 0 at the supports to 44 at midspan

The transverse post-tensioning arrangement varies between the top slab and bottom slab locations. There are a series of 8 tendons in the top slab which are housed within 48 mm ducts and formed of 12/7.00 mm Monowire cables. Tendons in the bottom slab can be one of two arrangements. They are housed within 48 mm ducts and comprise 4 tendons of 12/7.00 mm Monowire cables or housed within 56 mm ducts and comprise 4 tendons of 7/15.24 mm standard strand. The anchors are situated at the deck edges and over the sloping webs/deck connection. They are either Freysinnet Multiwire or Multistrand and concreted in.

Vertical post-tensioning is located in the support regions of the inner webs and consists of varying numbers and diameters of Macalloy high tensile bars. There are 56 No. 35 mm diameter high tensile Macalloy bars cast into the

anchor abutment and deck to provide restraint against longitudinal movement. The bars are anchored on either side of the diaphragms by standard nuts and washers bearing against embedded flat plates which are concreted in.

1.1.4 Westway Section 1 – Work Package 1B

Westway Section 1 (Structure No. A40/11.30) was constructed in 1970 and designed by G. Maunsell & Partners. The bridge has an overall length of 755 m and carries the A40 from the Wood Lane Flyover to St Marks Road. At the west end the deck is continuous with the Wood Lane Flyover but is supported on an abutment at the east end. It is also continuous with the slip roads either side of the Elevated Roundabout. The carriageway at this point has a speed limit of 40 mph. The carriageway varies along the structure, comprising dual two-lane traffic with a central reservation and verges over the Elevated Roundabout and dual three lane traffic with a central reservation and hard shoulders to the east of the roundabout.

The structure spans over various sports, educational and commercial premises as well as the A3220 Elevated Roundabout and West London Railway Lines. It comprises 24 continuous spans, referenced 33 to 54 and including 53A and 53B from west to east. The spans vary in length from 21 m to 35 m. The structural deck is formed of different arrangements as follows:

- Span 33 is an in-situ 3 cell box-girder with a single cell box-girder either side to accommodate the slip roads.
- Spans 34 to 42 are precast 3 cell box-girders.
- Span 43 is part precast and part in-situ 3 cell box-girders.
- Spans 44 to 47 are in-situ 3 cell box-girders.
- Spans 48 to 50 are in-situ 3 cell box-girders with single cell box-girders either side to support the slip roads.
- Span 51 is an in-situ 2 cell box-girder with single cell box-girders on either side to support the slip roads.
- Spans 52 to 54 are precast 2 cell box-girders with single cell box-girders on either side to support the slip roads.

The deck is post-tensioned longitudinally a PSC Multistrand system with tendons located within the webs of the boxes. Each cable comprises 12 No. 15.2 mm diameter standard 7-wire strands and cables are anchored in pockets positioned in both the upper surface and soffits of the box-girders, in the rear faces of the in-situ diaphragm end block at the east end and within the elevations of the box-girders.

At the west end the structure is supported by two columns whereas the east end is supported by abutment 1/H. Intermediate support arrangements vary and include 15 leaf piers, 3 sets of leaf piers with columns on either side and 5 sets of three columns. The heights of the piers vary from 5.5 m to 15.2 m.

Lateral restraint in the deck is provided by sliding pot guided bearings at the intermediate supports. The elevated roundabout bearings provide longitudinal restraint, restricting movement to the radial direction only, effectively fixing the structure at the roundabout centre. There is a single steel toothed expansion joint at the east abutment at St Marks Road.

1.1.5 Wood Lane Flyover – Work Package 1B

Wood Lane Flyover (Structure No. A40/11.40/2) was constructed in 1970 and designed by G. Maunsell & Partners. The bridge has an overall length of 274 m and carries the A40 over the A219 Wood Lane and the LUL Central Line between White City and East Acton Stations, as well as areas of disused land to the west of Wood Lane and land being developed by Imperial College to the east of Wood Lane including an electrical substation. The carriageway at this point has a speed limit of 40 mph and comprises dual three lane traffic.

The structure comprises 8 continuous spans, referenced 25 to 32 from west to east. Span 25 is 27.8 m long whilst all the other spans are 35.1 m long.

Between Spans 25 to 31 the deck is 26.2 m wide and comprises twin post-tensioned segmental box girders. To accommodate the slip roads, the deck begins to widen from Span 31 where Span 32 is 36.2 m wide and consists of twin three cell boxes post tensioned longitudinally. The box girders for Spans 25 to 29 and most of 30 are of precast construction. The rest of Span 30 and Spans 31 and 32 were cast in situ. The precast sections are continuously connected along the deck centreline by an in-situ reinforced concrete median beam. All the box girders are connected at the support positions by in situ reinforced concrete diaphragms.

The longitudinal post-tensioning is located in the webs of the boxes and utilises a PSC Multistrand system. Each cable consists of 12 No. 15.2 mm diameter standard 7-wire strands situated in grout filled ducts. Cables have a characteristic breaking load of 2722 kN and a load prior to transfer of 2092 kN. The cables are anchored in pockets positioned in both the upper surface and soffits of the box-girders, in the rear faces of the abutment in-situ end blocks and within the elevations of the box girders.

The west end is simply supported on Abutment 1/A whereas the east end is continuous with Westway Section 1 and the slip roads to the elevated roundabout (the junction with the A3220). Intermediate support arrangements vary,

starting west and heading east they include three sets of twin columns, one leaf pier (just to the east of Wood Lane), and a further three sets of twin columns. Lateral restraint in the deck is provided by sliding guided bearings at the intermediate supports. The elevated roundabout bearings provide longitudinal restraint, restricting movement to the radial direction only, effectively fixing the structure at the roundabout centre. There is a varying width transverse steel comb expansion joint present between Abutment 1/A and span 25.

1.1.6 Wood Lane NE Ramp – Work Package 1C

Wood Lane NE Ramp (Structure No. A3220/00.00/5) was constructed in 1970 and designed by G. Maunsell & Partners. It has an overall length of 262 m and provides access for eastbound traffic from Wood Lane Road to the Elevated Roundabout of the A40 Westway. The carriageway at this point has a speed limit of 40 mph.

The structure is curved in plan and comprises eight spans in total, referenced 30 to 36 and 8 from west to east. The A40/A3220 North West Slip Road merges with the ramp over the length of span 36, and span 8 is continuous with the A3220 Elevated Roundabout.

The carriageway comprises two lanes between spans 30 and 34 with a total structural width of 8.5 m and reduces to one lane at span 35. The structure widens to 10.97 m and becomes three lanes between spans 35 and 8, at the interface with the off-slip road from the eastbound A40. Span lengths vary from 28.0 m to 35.1 m, where:

- Span 30 is 28.0 m,
- Spans 31, 32, 34 and 35 are 35.1 m,
- Span 33 is 32.0 m,
- Span 36 is 29.8 m,
- Span 8 is approximately 31.9 m.

The spans are continuous over the columns and simply supported at the movement joint located at the west abutment at Wood Lane. Intermediate supports comprise single central square in-situ reinforced concrete columns.

Spans 30 to 34 and part of span 35 comprise post-tensioned, single cell, precast concrete segmental box girders with north and south cantilevers. The remaining part of span 35, span 36 and span 8 comprise an in-situ, two-cell box after merging with the A40/A3220 NW Slip Road. The deck was longitudinally post-tensioned using the PSC Multistrand system and the number of tendons varies along the length of the structure. Each tendon consists of 12 No. 15.2 mm diameter standard 7-wire strands located in grouted ducts in the webs of the box girders.

1.1.7 Wood Lane SE Ramp – Work Package 1C

Wood Lane SE Ramp (Structure No. A3220/00.00/4) was constructed in 1970 and designed by G. Maunsell & Partners. It has an overall length of 272 m and provides access for westbound traffic from the Elevated Roundabout to the A219 Wood Lane. The carriageway at this point has a speed limit of 40 mph.

The structure comprises nine continuous spans, referenced 29 to 36 and 6 from west to east. Span lengths vary from 16.4 m to 35.1 m. The spans are continuous over a series of intermediate supports comprising single central square in-situ reinforced concrete columns. The deck is supported on a hollow abutment at its free west end with an expansion joint. The east end is integral with the A3220 Elevated Roundabout.

Between Spans 29 and 34, the carriageway is 8.5 m wide but widens to approximately 11 m at span 35 and onwards. The carriageway comprises two lanes between Spans 35 and 6, this leads into the diverge with the on-slip to the eastbound A40. The carriageway divides into three lanes between Spans 29 and 30 at the approach to the Wood Lane junction.

The deck generally consists of a two cell post-tensioned concrete box girder with edge cantilevers. This becomes a single cell post-tensioned box after splitting from the A40/A3220 SW Slip Road. Spans 29, 30, 34 and part of 35 are constructed from precast segments. Spans 31, 32, 33, 36, 6 and the remaining part of 35 are in-situ concrete.

The deck was longitudinally post-tensioned using the PSC Multistrand system. The typical profile of the tendons sag at midspan and rise to the deck over the central supports.

The post-tensioned tendons are housed in the webs of the boxes throughout the ramp within grouted ducts. The anchorages are situated in the upper surfaces and soffits of the box girders, within the elevations of the box girders and in the rear faces of the west abutment in-situ end blocks. Each tendon consists of 12 No. 15.2 mm diameter standard 7-wire strands and has a characteristic breaking load of 227 kN per tendon.

1.1.8 A40/A3220 NW Slip Road – Work Package 1C

The A40/A3220 NW Slip Road (Structure No. A3220/00.00/2) was constructed in 1970 and designed by G. Maunsell & Partners. It has an overall length of 102.1 m and carries the eastbound off-slip road from the A40 to the A3220 Elevated Roundabout. The carriageway at this point has a speed limit of 40 mph and comprises two traffic lanes.

The structure comprises three continuous spans, referenced 33 to 35 from west to east, and is integral with the A3220 Elevated Roundabout and the A40 Wood Lane Flyover. Span 33 is of in-situ construction and is 32.0 m long, whereas Spans 34 and 35 are 35.1 m long and comprise precast segmental construction. The spans are continuous over intermediate supports which comprise a series of in-situ reinforced concrete columns.

The structure is formed from precast and insitu concrete segmental post tensioned single cell box girders with north and south cantilevers. The overall depth of the deck segment box beams is approximately 1.5 m. The deck is longitudinally post-tensioned using the PSC Multistrand system. The typical profile of the tendons sag at midspan and rise to the deck over the central supports.

6 No. or 9 No. tendons are housed in each of the webs which comprise 12/15.2 mm diameter wires with a characteristic breaking load of 227 kN per tendon. Intermediate anchorages are situated in both the upper surface and soffits of the box girders.

1.1.9 A40/A3220 SW Slip Road – Work Package 1C

The A40/A3220 SW Slip Road (Structure No. A3220/00.00/3) was constructed in 1970 and designed by G. Maunsell & Partners. It has an overall length of 102.1 m and carries the westbound on-slip traffic from the A3220 Elevated Roundabout to the A40 Wood Lane Flyover. The carriageway width is reduced by a tapered chevron area to a single lane at the junction of the slip road with the flyover. The speed limit over the structure is 40 mph.

The structure comprises three continuous spans, referenced 33 to 35 from west to east, and is integral with the A3220 Elevated Roundabout and the A40 Wood Lane Flyover. Span 33 is 32.0 m in length whereas spans 34 and 35 are both 35.1 m. The spans are continuous over intermediate supports comprising a series of in-situ reinforced concrete columns.

The structure is formed from precast concrete segments and insitu concrete post tensioned single cell box girders with north and south cantilevers. The overall depth of the deck segment box beams is approximately 1.5 m. The deck is longitudinally post-tensioned using the PSC Multistrand system. The typical profile of the tendons sag at midspan and rise to the deck over the central supports.

6 No. or 9 No. tendons are housed in each of the webs which comprise 12/15.2 mm diameter wires with a characteristic breaking load of 227 kN per tendon. Intermediate anchorages are situated in in both the upper surface and soffits of the box girder and within the elevations of the box girders (span 34 only).

1.2 Description of Scheme

The works comprise Post-Tensioned Special Inspection (PTSI) to all structures.

1.3 Scope of Works

1.3.1 Westway Section 6E (Westbourne Terrace) Proposed Works

PTSI Site Investigation – Intrusive Longitudinal Post-Tensioning System Investigation

- 12 No. DTEs to the deck soffit (Type A).
- 8 No. DTEs to the top of the deck over supports via trial pits (Type B).

PTSI Site Investigation – Intrusive Vertical Post-Tensioning System Investigation

- 4 No. EAEs horizontally through steel crossheads (Type C).
- 8 No. EAEs to the top of deck over supports via trial pits (Type D).

Corrosion Testing and Visual Examinations

- 20 No. corrosion test areas (CTAs) to the concrete over the DTE and EAE locations.
- 20 No. visual examinations around the CTA locations.

1.3.2 Westway (Torquay St) Section 6W Proposed Works

PTSI Site Investigation – Intrusive Vertical Post-Tensioning System Investigation

- 83 No. EAEs to the top of deck over supports from a total of 10 No. trial pit test locations (Type A). Exposures will range from 2No. to 12No. in each trial pit.
- 32 No. EAEs horizontally through steel crossheads from a total of 8 No. test locations (Type B). Exposures will range from 1No. to 4No. in each location.

Corrosion Testing and Visual Examinations

- 10 No. corrosion test areas (CTAs) to the concrete over the EAE locations in trial pits.
- 18 No. visual examinations around the EAE locations.

1.3.3 Westway Section 5 Proposed Works

PTSI Site Investigation – Intrusive Longitudinal Post-Tensioning System Investigation

- 6 No. Type A internal DTEs to the deck slab - deck longitudinal tendons.
- 11 No. Type B external DTEs to the deck slab in 11 No. trial pits - deck longitudinal tendons.
- 16 No. Type C external DTEs to the deck slab in trial pits - deck longitudinal and transverse tendons.
- 7 No. Type D internal DTEs to the deck slab - deck transverse tendons.
- 21 No. Type E internal DTEs to the bottom slab - soffit longitudinal tendons.
- 14 No. Type F internal DTEs to the bottom slab - soffit longitudinal and transverse tendons.
- 9 No. Type G internal DTEs to the bottom slab - web longitudinal tendons.
- 6 No. Type I internal end anchorage exposures (EAEs) - deck longitudinal anchorages.
- 3 No. Type J internal EAEs - web longitudinal anchorages.
- 6 No. Type K internal EAEs - soffit longitudinal anchorages.

PTSI Site Investigation – Intrusive Vertical Post-Tensioning System Investigation

- 19 No. Type H internal DTEs to the webs - vertical Macalloy bars.

PTSI Site Investigation – East Abutment Post-Tensioning System Investigation

- A visual inspection with endoscope will be undertaken to inspect the Macalloy tie-bars at the east abutment. The endoscope will be inserted in the expansion joint gap from below.

Corrosion Testing and Visual Examinations

- 92 No. corrosion test areas to the concrete over the DTE and EAE locations.
- 118 No. visual examinations around the DTE and EAE locations.

1.3.4 Westway Section 1 Proposed Works

PTSI Site Investigation – Intrusive Longitudinal Post-Tensioning System Investigation

- 20 no. DTEs to top of the box-girders above supports in trial pits (Type A).
- 2 no. external DTEs to the deck soffit at midspan (Type B).
- 8 no. external DTEs to the elevations of the webs at midspan (Type C).
- 17 no. internal DTEs to the elevations of the webs towards midspan (Type D).
- 1 no. external EAE to the soffit pocket anchorages (Type E).

Corrosion Testing and Visual Examinations

- 48 no. corrosion test areas (CTAs) to the concrete over the DTE and EAE locations.
- 48 no. visual examinations around the DTE and EAE locations.

1.3.5 Wood Lane Flyover Proposed Works

PTSI Site Investigation – Intrusive Longitudinal Post-Tensioning System Investigation

- 18 no. DTEs to the tendons over supports at tendon high points via trial pits (Type A).
- 21 no. DTEs to the elevations of the box-girder webs (internal/external) (Type B).

- 2 no. external DTEs to the soffit of the box-girders at midspan (Type C).
- 4 no. internal EAEs to the anchorages in the west abutment in-situ end blocks (Type D).
- 2 no. internal EAEs to the anchorages in the elevations of the webs (Type E).
- 1 no. EAE to the anchorages within the top slab via trial pits (Type F).

Corrosion Testing and Visual Examinations

- 76 no. corrosion test areas (CTAs) to the concrete over the DTE and EAE locations.
- 76 no. visual examinations around the DTE and EAE locations.

1.3.6 Wood Lane NE Ramp Proposed Works

PTSI Site Investigation – Intrusive Longitudinal Post-Tensioning System Investigation

- 45 no. DTEs to the top of the deck over columns in 17 no. trial pits (1 no. exposure hole to expose a number of ducts and tendons in 1 no. trial pit).

Corrosion Testing and Visual Examinations

- 17 no. corrosion test areas (CTAs) to the concrete over the DTE locations.
- 17 no. visual examinations around the CTA locations.

1.3.7 Wood Lane SE Ramp Proposed Works

PTSI Site Investigation – Intrusive Longitudinal Post-Tensioning System Investigation

- 49 no. DTEs to the top of the deck over columns in 16 no. trial pits (1 no. exposure hole to expose a number of ducts and tendons in 1 no. trial pit).

Corrosion Testing and Visual Examinations

- 16 no. corrosion test areas (CTAs) to the concrete over the DTE locations.
- 16 no. visual examinations around the CTA locations.

1.3.8 A40/A3220 NW Slip Road Proposed Works

PTSI Site Investigation – Intrusive Longitudinal Post-Tensioning System Investigation

- 15 no. external DTEs over the piers in trial pits (Type A)

Corrosion Testing and Visual Examinations

- 8 no. corrosion test areas (CTAs) to the concrete over the DTE locations.
- 15 no. visual examinations around the DTE locations.

1.3.9 A40/A3220 SW Slip Road Proposed Works

PTSI Site Investigation – Intrusive Longitudinal Post-Tensioning System Investigation

- 6 no. DTEs to the deck soffits at midspans (Type A)
- 6 no. DTEs to the deck elevations towards deck ends (Type B)
- 4 no. DTEs to the top of the deck over piers within trial pits (Type C).

Corrosion Testing and Visual Examinations

- 14 no. corrosion test areas (CTAs) to the concrete over the DTE locations
- 14 no. visual examinations around the CTA locations

1.4 Key Dates

The key dates for these phases of work are summarised in Table 1.

Table 1: Key dates for work items

Activity	Dates	Working Times	Special Conditions
WP1A Topside Inspections	18/01/2020 - 05/02/2020	Night	Traffic management, trial pits
WP1A Internal Inspections	05/02/2020 - 23/02/2020	Night	Traffic management, confined space
WP1A Underside Inspections	24/02/2020 - 06/03/2020	Night	Traffic management, MEWP
WP1B Underside Inspections	15/01/2020 - 11/03/2020	Night/Day	Traffic management, MEWP
WP1B Topside Inspections	11/03/2020 - 27/03/2020	Night	Traffic management, trial pits
WP1B Internal Inspections	27/03/2020 - 03/04/2020	Night	Traffic management, confined space
WP1C Underside Inspections	23/03/2020 - 29/03/2020	Night/Day	NR possession, MEWP
WP1C Topside Inspections	06/04/2020 - 03/05/2020	Night	Traffic management, trial pits

1.5 Key Members of Project Team

A summary of the key contact for the project is summarised in Table 2.

2 Management of Work

2.1 Health and Safety Objectives

The aim of this project is to ensure the safe and reliable operation of the A40 Westway by investigating the condition of the post-tensioning systems and the cause(s) of the visible defects to these systems, in order to retrieve sufficient information to enable any subsequent works to be carried out. The safety objectives of the Principal Designer, Principal Contractor and all other parties involved will be aligned with those of the Client.

This CPP details how health and safety will be managed by CA during the PTSI in order to fulfil their obligations under both 'The Health and Safety at Work Act 1974' and 'The Construction (Design and Management) Regulations 2015'.

CA will be responsible for overall management of the construction phase, to ensure it is undertaken as far as is reasonably practicable, safely and without risk to health. CA will ensure the construction phase is adequately planned, managed and monitored, and provide adequately resourced, competent site management appropriate to the activity at hand. CA will not directly supervise the work of subcontractors. CA will ensure any designers and/or contractors engaged for the construction phase are competent and adequately resourced.

CA will demonstrate their commitment in achieving the following goals:

- To align CA objectives with that of the client
- To ensure all site inductions are completed prior to commencing work on site
- To complete regular tool box talks which are relevant to the nature of the project
- To ensure near-misses are reported and trend analysis determined

This document will remain live throughout the life of the project and will be updated accordingly. All updates and amendments will be detailed in the document control sheet.

2.2 Arrangements to ensure Co-operation and Co-ordination

The Client, TfL, will be submitted a copy of the detailed Method Statements and Risk Assessments for the works, including those of any sub-contractors, by the Principal Contractor for review prior to the start of any works.

The person in charge of onsite health and safety for the works shall be the ConwayAECOM Site Supervisor. The Site Supervisor shall be responsible for giving a site induction and task briefing including site rules, scope of works, working times and procedures and any other matter relating to health and safety before the works commence. Every member of the site team will be required to sign the briefing sheet record that is provided with the site-specific method statement. The ConwayAECOM Site Supervisor shall provide a task briefing at the start of every shift. A tool box talk shall be given once a week by the PTSI specialist subcontractor.

Each team or contractor within the worksite will each have a team leader and/or supervisor. The members of each site team will liaise with their team leader and/or supervisor who in turn will liaise with the ConwayAECOM Site Supervisor.

When working on Network Rail land there will be additional site rules to adhere to. Details of the proposed works and the safe system of work to be followed will be agreed prior to the works through a Works Package Plan that will be approved by the Network Rail Outside Parties Engineer. A Network Rail qualified Controller of Site Safety (COSS) will be in charge of site safety. The COSS will be responsible for providing an additional briefing with regard to the Network Rail site and site rules etc. The chain of communication outlined above will remain and in addition the ConwayAECOM Site Supervisor will liaise with the Network Rail COSS.

2.3 Site Rules

CA personnel are to adhere to the following site rules:

- Only personnel who are essential to the task will be allowed access to the work area.
- Alcohol and non-prescribed / non-over the counter drugs are expressly forbidden on site.
- Eating, drinking, smoking and chewing gum are forbidden on site, except in designated areas.
- All personnel must thoroughly wash their face and hands before eating, drinking, and smoking and before leaving the site.
- PPE must be worn as specified in this plan.
- No fixed open bladed knives will be used on the site.
- All personnel must correct or report unsafe work conditions.
- All incidents, near misses and observations to be recorded in HSQE database.

- Mobile phones must not be used in an area where site work is in progress. Mobile phones must only be used in a place of safety away from workplace transport or site work.
- Do not take risks that put yourself or others in danger.

2.3.1 Topside Inspections

The following personal protective equipment (PPE) will be worn at all times within the worksite:

- Safety Footwear
- Hard Hat
- Hi-Vis Jacket
- Hi-Vis Trousers
- Cut Resistant Gloves
- Safety Glasses / Goggles
- Disposable Masks
- Ear Defenders / Ear Plugs

2.3.2 Underside Inspections

The following personal protective equipment (PPE) will be worn at all times within the worksite:

- Safety Footwear
- Hard Hat
- Hi-Vis Jacket
- Hi-Vis Trousers
- Cut Resistant Gloves
- Safety Glasses / Goggles
- Disposable Masks
- Ear Defenders / Ear Plugs
- Safety harnesses (when working within MEWP)

2.3.3 Internal Inspections (Confined Space)

The following personal protective equipment (PPE) will be worn at all times within the worksite:

- Safety Footwear
- Hard Hat
- Hi-Vis Jacket
- Hi-Vis Trousers
- Cut Resistant Gloves
- Safety Glasses / Goggles
- Disposable Masks
- Ear Defenders / Ear Plugs
- Safety line and harnesses
- Escape sets
- Radios
- Tripod, winch and harness in case of evacuation
- Gas Monitors

2.4 Permits

Prior to the start of any topside excavation works the CA Site Supervisor will issue a Permit to Dig (PTD) to the dig team. The dig team shall return the PTD to the CA Site Supervisor after the works have been completed.

A confined space entry permit is required to be issued by the CA Site Supervisor before entering the structure.

2.5 Welfare Facilities

CA will ensure welfare facilities will be provided and they will consist of a van mounted mobile welfare unit to include washing and toilet facilities and access to clean drinking water as a minimum. This will be positioned in close proximity to the designated access point to the site works.

2.6 Emergency Procedures

CA shall provide at least one qualified first aider and first aid kits for each shift. The CA Site Supervisor shall confirm the name of the first aiders and location of first aid kits in each site induction/briefing. Fire extinguishers will be provided in all site vehicles. These should be only used to provide a means of escape and emergency services should be called immediately. Extinguishers should be certified as tested.

In the event of an emergency during the works all activities shall be stopped and the CA Site Supervisor will be responsible for raising the alarm and contacting the emergency services as necessary. For Police, Fire Brigade and Ambulance assistance, dial 999 or 112 from a mobile telephone immediately

All accidents, unsafe conditions or near misses are to be notified to the CA Site Supervisor who will record and report them. All emergencies should be reported to the ConwayAECOM Service Control Centre 02078 032 666. All site incidents are to be reported to FM Conway Central service on 020 8636 1504 and 020 8636 8822 by the senior FM Conway site representative. All site accidents and incidents are to be reported to the Client. The closest 24-hour accident and emergency (A&E) facility to the site is:

- St Mary's Hospital - Praed Street, Paddington, London W2 1NY

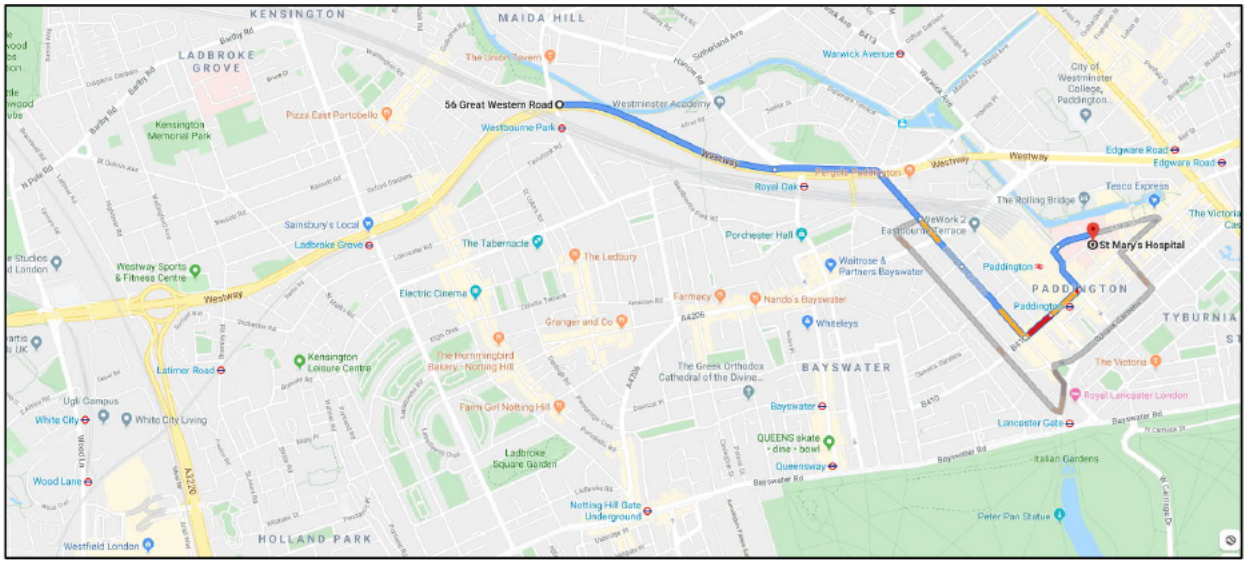


Figure 4: Route from A40 Westway to St Mary's Hospital, Praed Street, Paddington, London, W2 1NY

3 Control of Specific Risks

Table 3 and Table 4 summarise the health and safety risks of the works covered by this plan. Significant risks that are discussed further within this plan are highlighted in red or amber. Minor risks are highlighted green and will be addressed in site specific risk assessments by the relevant contractors. Negligible or not applicable risks are not highlighted.

Table 3: Summary of significant CDM 2015 Schedule 3 risks

Burial, engulfment	Wells, underground earthworks, tunnels
Chemical or biological substances	Divers (with system of air supply)
Radiation	Caisson / compressed air atmosphere
High voltage power lines	Explosives
Drowning	Heavy prefabricated components

Table 4: Summary of significant other site-specific risks

Buried utilities	Moving vehicles (road or rail)
Working at height	Damage to existing structures
Asbestos	Hand arm vibration syndrome (HAVS)
Falling objects	Contaminated land
Lifting operations	Hazardous materials
Segregation of vehicles and pedestrians	Manual handling
Noise and vibration	Dust / particulates
Fire	Site security
Confined Space	

3.1 High voltage power lines

Works to the underside of the A40/A3220 SW Slip Road will be undertaken during temporary rail traffic management. Railway possessions will be required to mitigate the risk of collisions with live traffic and contact with electrified lines, in accordance with Network Rail requirements.

3.2 Buried utilities

A C2 utility inquiry has been undertaken and Statutory Undertaker plans will be available on site. Trial pits in the A40 carriageway shall be located to avoid utilities. The trial pit locations shall be scanned and a Permit to Dig issued by the CA Site Supervisor before any excavations take place.

Several electrical cables may be located inside the structures. Therefore, PTSI works must be planned to avoid contact with or damage to any cables. Staff involved in PTSI works shall not interfere with these cables. No work is to be undertaken on live electrical panels or systems.

3.3 Asbestos

Asbestos Management Surveys have previously been undertaken for all structures. Refer to survey reports included in the Works Package 1 Specifications for PTSI Site Investigations, document reference for locations of asbestos identified:

- Work Package 1A - 60486237-M406-SPC-0003
- Work Package 1B - 60486237-M406-SPC-0004
- Work Package 1C - 60486237-M406-SPC-0005

Asbestos has been identified within pipework gaskets in the bridge cells, therefore is assumed to be present throughout all the pipework running through the structures.

An asbestos surveyor shall be present during the trial pit investigations to sample the bridge deck waterproofing and confirm it is safe to proceed.

3.4 Segregation of vehicles and pedestrians

The works will be undertaken during temporary vehicular and pedestrian traffic management. Lane closures will be required to mitigate the risk of collisions with live traffic, in accordance with chapter 8 of the Traffic Signs Manual. Lane closures shall provide space for undertaking investigations and for accessing the internal cells.

3.5 Confined space

Investigations to the structures will require access to the inside of the structures. This is classified as a confined space and may present enclosed hazardous gas build-ups. Gas levels shall be monitored before entering the structure and at all times whilst inside it. Escape sets shall be provided for emergency evacuation. All staff involved in PTSI works shall have the appropriate Confined Space training.

3.6 Moving vehicles (road or rail)

Refer to 3.1 and 3.4 above.

3.7 Manual handling

The confined conditions of internal inspections will limit mobility and increase the difficulty of carrying tools and equipment by hand. Staff involved in the PTSI works within the bridge deck shall be more susceptible to traps and injury. Staff will take adequate rests as required.

3.8 Dust / particulates

Dust will be produced when undertaking localised exposures of the tendons. Staff involved in the PTSI works in the vicinity of drilling operations shall wear dust masks with carbon filter and safety glasses. If dust is excessive, damping techniques may be used to control dust. All operatives in the vicinity of the machinery shall wear ear defenders/ear plugs.

METHOD STATEMENT

FOR

WESTWAY A40 PTSI – SITE INVESTIGATIONS

FMC-EALOH2020-RAMS-AD-rev A

Rev	Date	Author	Distribution	Company
A	14/01/2020	[redacted]	[redacted]	[redacted]

PERSON UNDERTAKING METHOD STATEMENTS:	DATE OF ASSESSMENT:	APROVAL SIGNATURE:
[redacted]	[redacted]	[redacted]

Introduction

The purpose of this method statement is to provide the reader with a description of how FM Conway principal Contractor to Client, will conduct each task of the project to adhere to the Company's Health and Safety Policy documents. In addition, the Risk Assessments and COSHH Assessments prepared for this project should be read.

Site Management Structure		
FM Conway	Head of Structures	[redacted]
FM Conway	Contract Manager	[redacted]
FM Conway	Project Manager	[redacted]
FM Conway	Site Supervisor/Engineer	[redacted]
FM Conway	Site Supervisor	[redacted]

Nature of Project

The Westway forms part of an elevated highway and carries the A40 Western Avenue from Wood Lane to the Marylebone Flyover.
AECOM has been commissioned by TFL to carry out Post-Tensioned Special Inspection (PTSI). Site investigations to Westway Section 6E (Westbourne Terrace), Westway Section 6W (Torquay St) and Westway Section 5.
The principal aim of the PTSI is to investigate the condition of the post-tensioned systems and the cause of visible defects to these systems, in order to retrieve sufficient information to enable any subsequent works to be carried out.

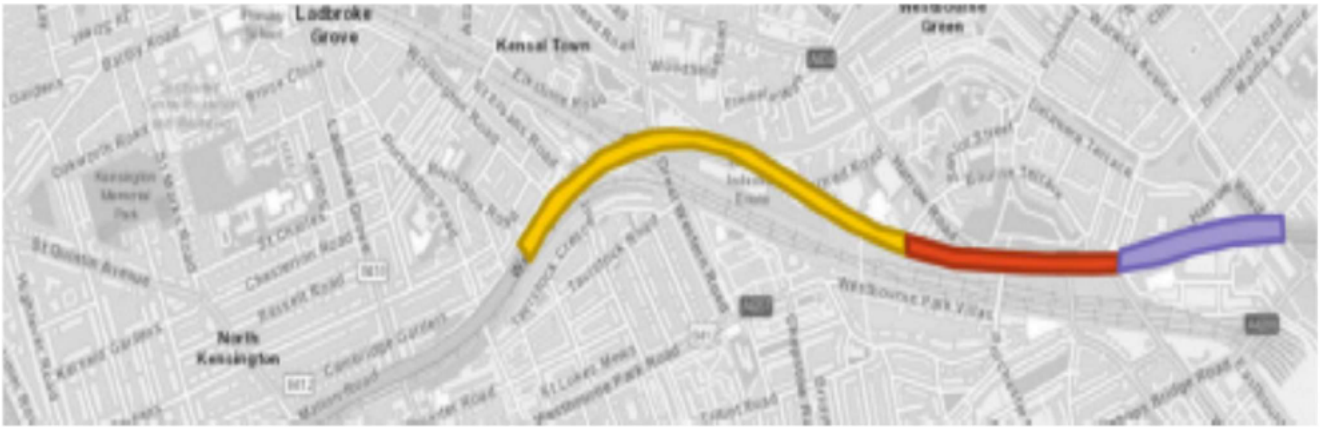


Figure 1: Location plan of A40 Westway PTSI Work Package 1A

Figure 2: Location plan of A40 Westway PTSI Work Package 1B

Figure 3: Location plan of A40 Westway PTSI Work Package 1C

Description of the works

The works involved in this project include:

A number of trial pits (typically 1m x 1m) will be excavated at locations in accordance with the specification to investigate tendons and anchors.
Internal access within the bridge cells is required to expose some of the tendons and anchorages. All the cells can be accessed from the A40 through manholes in the bridge deck.
Investigations to the soffit of the structure will be carried out from sections off the network and in some instances from TM of roads below or private properties below.

Works methodology.

The works will be carried as per the methodology below.

- Traffic Management to be installed and mentained by FMC
- Supervision by FMC
- PTSI Site investigations to be carried out by HTA under HTA rams

Excavation works.

All excavation works will be set by the engineer, all excavations will follow the safe digging practices detailed below and in regards with HTA-Rams

Safe Digging

Please refer to the Stats pack for full information.

The engineer will mark out the excavation, service drawings will be checked. A Cable avoidance tool (CAT) scan will be carried out to locate or confirm the positions of any underground services. These positions will then be marked-up to identify their location using an appropriate marking system (such as line-marking paint). Once marked the workforce will be briefed on the markings and confirm what markings identify what service type. The supervisor will issue a permit to digprior to any excavation works being carried out.

The excavation will be carried out in the following similar G003 procedures.

Operatives should never assume that the location or depth of a service indicated by drawings or CAT scans are accurate, all information should be treated as guidance and proceed with caution as services may have been laid shallow or have cover reduced since being laid.

ALL SERVICES ARE TO BE TREATED AS LIVE AT ALL TIMES

The risk assessments and method statements will be briefed to the workforce. Operatives are to sign to accept the understanding of all documents and control measures.

In addition to full PPE, all operatives are to wear flameproof overalls and only use insulated digging tools.

A safe access and egress point are to be established into the excavation as the works progress.

The area will be excavated by hand only, hand power tools and hand tools.

If any unknown services are discovered, works are to stop, and the supervisor is to be informed.

Damaged services

In the event of damage to any service, the following procedure will be followed.

Stop works immediately and inform the supervisor. The supervisor is then in turn to inform the works supervisor, Project Manager and Central services.

In the case of electricity cables, gas pipes, other pipelines or high-pressure water mains, arrangements must be made to keep people well clear of the area until it has been made safe or repaired by the owner/operator.

NEVER return to any excavation if a cable has been damaged. If the cable has tripped, then the Owners/operators can enliven the cable, and this may lead to a further explosion.

Remember if a gas connection to a building has been damaged, it may cause a leak in the building. Warn the occupants of the building, and of the adjoining buildings, to leave. Ban smoking, and naked flames and other sources of ignition within at least 10m of a gas leak.

1.1 Traffic Management and Site Set Up

Site set up will be as per the information is given above, all works will be carried out within the Lane or Block Closure. All traffic management will be as per FMC TM Plan

1.2 Access

Attention shall be given to ensure the work site is safe including safe access and egress for all persons who may be affected by the works.
Access to the working area will be as per TM drawings.
Access to the site shall be discussed at the start of the shift with all operatives.
Third parties must be segregated from the work site at all times by the use of barriers, cones and fence.
Correct signing and guarding against being in place at all times ensuring a safe route through the on-going works. (pedestrian route works)

1.3 Undertaking the work

The majority of these works will be undertaken by HTA, in accordance with L/1992/MS/WDT/20 method statement and risk assessment and the design of the work. FM Conway's Works Supervisor and Project Manager will check the works periodically to ensure that they are being carried out in accordance with the documentation.

1.4 Working on private land

Part of the soffit investigations will be above private land.
All agreements will be discussed with the third parties before to grant access to private properties.
All measures will be taken to carry on the works in accordance with safe works practice and to protect environment and private assets during the works.
Subcontractors will be briefed about all works condition before attending to site.

2.0 General Arrangements

The wearing of a hard hat, safety footwear, gloves, safety glasses and high visibility long sleeved upper wear are mandatory. All operatives will be issued with head, ear, hand and eye Personal Protective Equipment (PPE). This PPE will be used where there is a risk of associated injuries.

Any complaints from members of the public will be directed to the FMC Supervisor. or Project Manager.

The site will be maintained in a clean and tidy condition at all times.

2.1 Environmental Issues

All drains and watercourses shall be protected, so far as is reasonably practicable, from the possibility of contamination from spillages by the use of drain covers or other appropriate equipment as determined.

In the event of a spillage, site personnel shall cease relevant activities and contain any spillage using standard Spill Kits.

2.2 Surveillance of Ground conditions

Any damaged areas identified to carriageways, footpaths or walls and buildings etc. will be brought to the attention of the client before the onset of works. Care will be taken to protect existing finishes where appropriate.

Additional care will be taken with hazards identified and controlled while accessing the site due to the uneven ground conditions of loose materials.

2.3 Potential hazards identified at the site

Manual handling
Working Adjacent to live services
Working with concrete.
Loading/ Unloading
Vehicles
Working adjacent to the public
Working at height
Road Closures
Confined Spaces
Please see separate risk assessment with all potential hazards.

2.4 Storage

All plants and materials will be removed from site at the end of the shift.

2.5 Site Induction/Tool Box Talks

Before being allowed on to site, all will be required to undertake a Site Induction given the FMC Supervisor/Project Manager
If the working methodology has been altered from that depicted in this document, a revised method statement addendum and toolbox talk to site staff will be required to 'bring them back up to speed'.

The site induction will consist of the following points:

- Site location including access/egress points
- A description of who is who and what each person's role is
- Emergency procedures including muster points
- Location of the nearest hospital and how to get there
- How to identify First Aid personnel
- A read through of method statements pertinent to their task and with implications to their work
- Briefing on safe systems of work procedures
- Risk assessments relevant to their task and control measure addressing risks from identified hazards.
- Site rules including PPE requirements
- Environmental implications and emergency plan
- Signing in/out the procedure
- Competence check (CSCS cards)

2.6 Waste Material

The Supervisor will ensure waste from working operations is collected in designated areas and not allowed to accumulate. All waste will be removed and disposed of by subcontractor at the end of the shift. The site will be kept clean and tidy.

3.0 Site team

All operatives will be trained and deemed 'competent' for their tasks.
The site team:

[redacted]

5. Traffic Management Team – 5 to10 operatives
6. Mobile Welfare driver
7. HTA – 5 to 10 operatives
8.
9.

4.0 Training

All operatives should have relevant training and CSCS as a minimum.
Regular toolbox talks are given to raise awareness of job associated risks and how and why control measures can be introduced to address risks present from identified hazards.

These talks are informal, and operatives are encouraged to voice their opinions and ask appropriate questions.

5.0 Portable Tools & Temporary supply of water and Electric

Tools and equipment will be used in accordance with the Provision and Use of Work Equipment Regulations (PUWER) 1998 as far as is reasonably practicable. All small tools will be checked for defects prior to use. Electric tools will be 110V, regularly serviced and portable appliance tested (PAT).

6.0 Mechanical Plant

As per HTA - requirements
N/A to FMC

7.0 Personal Protective Equipment

A minimum of safety boots, hard hat, safety glasses, gloves and hi-viz vest will be worn at all times. Dust, ear, hand, head, harness and eye protection will be supplied and used as required. Control measures will consider PPE as a last resort when controlling risks.

9.0 Hours of Working

WORKING HOURS 22:00 - 05:00 Mon night - Sat morning for the lane Closures, and 00:00 - 08:00 for the Block Closures, 8:00 – 17:00 Day work

10.0 Work Permits

A permit to work- Digging Authorisation shall be issued for all planned works prior to commencement of any excavations. It shall be issued by a Contracts Manager or Supervisor and accepted by the Foreman/Lead Ganger responsible for overseeing the activities. It shall be valid for no longer than seven days.
The permit holder must remain on site to oversee the excavation activities. If the permit holder is required to leave the site, then the activities shall cease until he returns. They shall review the conditions of the permit on a daily basis and shall inform the Contracts Manager or Supervisor of any changes that have an effect on the working conditions and where applicable, the permit shall be cancelled pending revised information.
Confined space permits shall be issued every day and shall be valid for no longer than 1shift. Confined spaces work to be carried out in accordance with HTA-procedures.
Hot works permit shall be issued if required and shall be valid for one shift only

11.0 Welfare

Mobile Welfare unit will be supplied on site.

12.0 First Aid

All first aiders will be identified by the words FIRST AID or orange stickers on their high visibility jackets.
First Aiders on this site are:

[redacted]

HTA – one first aider for each team- all time on site

The first aid kit will be on the FMC Welfare and Subcontractors Vans.

All accidents and near misses will be recorded in the accident book and a report of any such incident issued to FM Conway.

Reporting of Injuries Diseases and Dangerous Occurrences Regulations (RIDDOR) 1995 will be adhered to as far as is reasonably practicable.
If a person has an accident which requires further treatment than that which the first aider can give, they shall be transported to the nearest accident and emergency department. Details of the nearest A&E given in section 13.0

13.0 Emergency Procedures

Should any accident occur which cannot be dealt with by the First Aider, the site management will inform the emergency services. Where necessary the Environmental Agency will be notified.

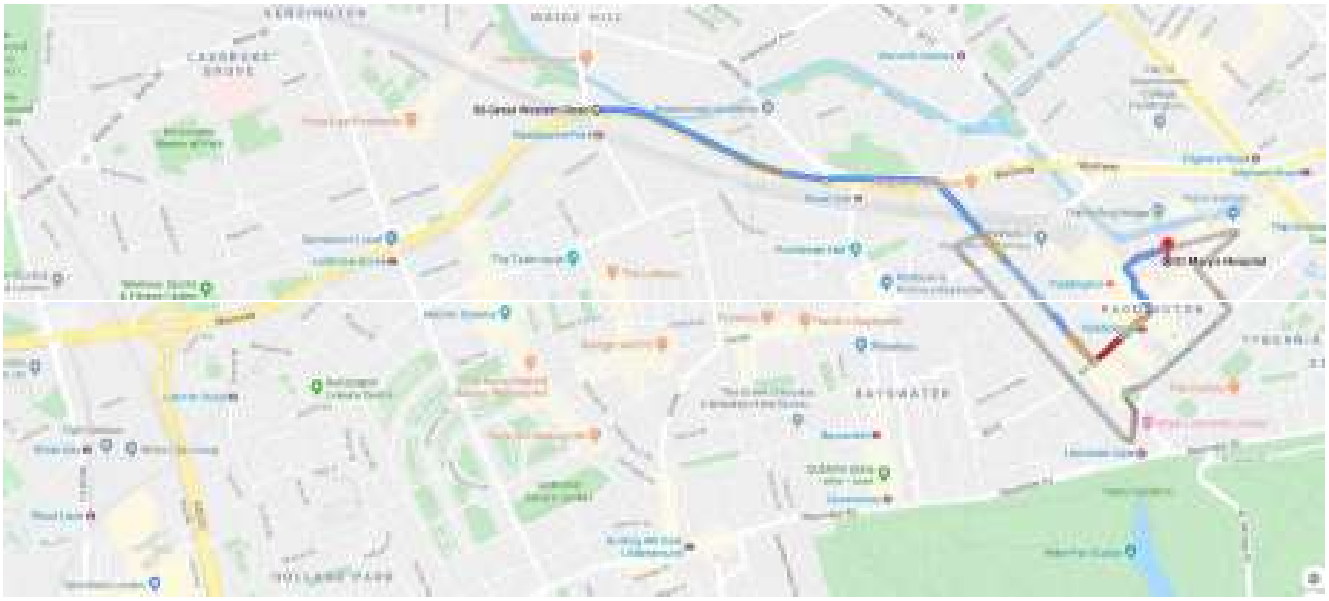
If a service is damaged, then the procedure in section1 will be followed.

A report will be made as soon as possible with details of persons involved, an injury sustained, and damage to property, time and location of the incident.
The details will be entered in the site accident book and if necessary the Health and Safety Executive will be informed. The site Management will also inform senior FM Conway management.

The site evacuation procedures will be explained at the site induction or at the start of the shift.

The nearest Hospital is:

St Mary`s Hospital
Address: Praed Street Paddington London W2 1NY
Phone:02033126666



SITE ADDRESS: Westway Section 5, 6E, 6W

Site Agent/Supervisor: [redacted] **Job No: EALOH2020**

Site Register:

A Site Register shall be maintained on a daily basis for the purpose of knowing who is on site at any particular time. Personnel shall be informed at the induction of the requirement to sign in and out whenever they enter/leave site.

Fire Prevention:

Activities carried out on this site shall be conducted in a manner that shall eliminate/minimise the possibility of a fire occurring. To achieve this objective, all work activities shall be in accordance with the relevant Risk Assessment and Method Statements and where applicable, controlled via a Permit To Work system if identified as a requirement of the Risk Assessment. All flammable substances shall be appropriately stored and labelled. A register of hazardous substances shall be kept by the Site Agent/Supervisor.

Hot Works:

A Permit to Work System shall / shall not be in operation on this site for Hot Works.
Hot Works shall cease one hour before the end of shift and the site shall be inspected for potential fires prior to leaving site. This requirement shall be conveyed to all personnel during induction.

Fire Detection:

No fire detection should be involved during the works, but as a preventive measure a Hot Work Permit will be considered.

Fire Fighting Marshals:

Site Supervisor will act as a Fire marshal
.....
.....

.....

Raising the Alarm:

The method of raising the alarm for this site has been determined as SHOUT: FIRE, FIRE, FIRE

On Discovering A Fire:

Raise the alarm. Ensure everyone is aware of the incident and commence evacuation procedure. Direct all personnel to the allocated Muster Point as instructed in the Site Induction and at the beginning of the shift.
Contact the Emergency Services on **999**. Provide them with relevant information such as Site Address, Site Contact, Specific Hazards, Nature of Fire, etc.
Inform all personnel to remain at the Muster Point until further notice and conduct a roll call to ensure all personnel are accounted for. The Site Agent/Supervisor should be available to assist the Emergency Services when they arrive.

I have read/been briefed on the requirements and safe working practices detailed within this Method Statement/Risk & COSHH assessment. I have understood and agreed to comply with these requirement and safe working practices.

Print Name	Company	Trade	Signature	Date

SITE ADDRESS	Westway Section 5, 6E, 6W
CLIENT:	TFL
ASSESSOR	[redacted]
POSITION	Contracts Manager
DATE`	14/01/2020
DESCRIPTION OF ACTIVITIES	PTSI – Site Investigations

Please refer to table below for explanation of 'Degree of Risk' and Residual Risk' computations. Determined values are at the discretion of the assessor.					
Severity ➢ Likelihood ⮟	1 Negligible	2 Minor	3 Major	4 Critical	5 Catastrophic
1 Improbable	1 LOW	2 LOW	3 LOW	4 LOW	5 LOW
2 Remote	2 LOW	4 LOW	6 LOW	8 MEDIUM	10 MEDIUM
3 Occasional	3 LOW	6 LOW	9 MEDIUM	12 MEDIUM	15 HIGH
4 Regular	4 LOW	8 MEDIUM	12 MEDIUM	16 HIGH	20 HIGH
5 Probable	5 LOW	10 MEDIUM	15 HIGH	20 HIGH	25 HIGH

	HAZARD	CONSEQUENCE(S)	PERSONS AT RISK	DEGREE OF RISK			CONTROL MEASURE(S)	RESIDUAL RISK			RESPONSIBLE PERSONNEL
				L	S	R		L	S	R	
1.	Manual Handling.	Minor and major injury to operatives.	Operatives.	5	3	15	Correct use of appropriate PPE (gloves). All personnel are medically fit for the situation. Use mechanical means to lift where available.	2	3	6	Operatives.
2.	Exposure to Weil's Disease Vermin	Serious illness caused by ingestion. Absorption	Operatives	2	2	4	Weil's information card issued at induction Toolbox Talks Correct PPE (inc appropriate gloves) Good general hygiene. Do not attempt to dispose of any dead vermin, notify pest control Maintain good levels of hygiene.	1	2	2	Operatives

3.	Excavation	Minor and major injury to operatives.	Operatives	4	4	16	This RA should be read in conjunction with HSE acknowledged Task Specific Risk Assessment and Method Statement G003 Buried Services and HTA - RAMS If there is a possibility of underground services being present, the area should be surveyed using a suitable detection instrument All excavation work should be carried out under a permit to dig system If the depth of excavation presents a particular risk of anybody falling, suitable guard-rails should be placed and suitable access arrangements, such as ladders or ramps, should be provided. Temporary works to be installed if required.	1	4	4	Operatives
4.	Excavating adjacent to services	Electrocution / burns / death/ damage to infrastructure	All	4	5	20	Permit to dig to be in place prior to any excavation works taking place. Area to be CAT scanned and all services to be marked on the ground, operatives to be briefed on service marking. Flame proof overalls to be worn when entering the excavation. Hand dig only. Stop works if any unidentified services are encountered and contact FMC supervisor Do not stand on cables or use cables as a foot / hand hold when entering excavation. All hand tools to be insulated. Ducts and pipes are not to be pulled or moved by operatives. Any damaged to services to be reported to FMC supervisor and Central Services.	1	5	5	Operatives and Supervisors.

5.	Exposure to cementatious materials	Skin burns	Operatives	4	4	16	Correct PPE to be worn Gloves and goggles to be worn. Any exposure to skin must be immediately washed off with soap and water.	1	4	4	Operatives
6.	Lifting Operations	Physical Injury, Damage to Machinery, Damage to infrastructure.	Operatives	3	5	15	A permit to lift should be in place for all major lifts and adhered to. Relevant test certificates or copies will be kept available for inspection, and be present before the work starts Excavator operators must hold a valid CPCS card with lifting ops. Slinger to be CPCS trained. All safe working limits of the equipment and accessories to be checked. All lifting equipment and accessories calibration and inspection dates to be checked prior to lifting. All lifting equipment and accessories to be visually inspected prior to use.	1	5	5	Operatives
7.	Overturning of excavator during lifting	Physical Injury, Damage to Machinery, Damage to infrastructure.	Operatives / operator	3	5	15	Exclusion zone to be in place during all lifting operations. All items to be lifted are to be slung in accordance with lifting plan. Excavator only to lift on level stable ground. Excavator to only lift with safe working load limits. Care is to be taken when slewing or travelling with loads.	1	5	5	Operatives
	Struck by falling objects during lifting	Physical Injury, Damage to Machinery, Damage to infrastructure.	Operatives	3	5	15	Exclusion zone to be in place during all lifting operations. All items to be lifted are to be slung in accordance with lifting plan.	1	5	5	Operatives

							Guide ropes will be used on large loads to guide and steady the lift. No person will enter the exclusion zone without permission. Loads will not be swung over personnel, site huts, buildings or public areas.				
8.	Dust,	Personal Injury Respiratory illnesses	Public, operatives	3	4	12	Suppress with water where possible Use Appropriate PPE, correct face masks. Maintain good personal hygiene	1	4	4	All
9.	Slips, trips and falls at the same level.	Bruising, cuts and fractures.	All.	5	3	15	Maintain a clean and tidy area. All operatives will be aware of the designated working areas. All equipment will be secured and regularly inspected. Wear appropriate PPE (steel toe cap boots and gloves). Spillages to be cleaned up immediately. Qualified first aiders and equipment on site.	2	3	6	Operatives and Supervisors.
10.	Noise	Operatives and members of the Public		5	3	15	Conduct noise assessments to identify hazards. Issue correct ear protection for equipment used, Ensure operators are wearing protection correctly, including other operatives in close proximity. (Training). Select correct tool for job.	2	3	6	Operatives and Supervisors
11.	Encroachment of the works area by members of the public. General Public under the influence of alcohol or drugs.	Injury to members of the public Injury to operatives	Public, operatives	4	4	16	All operatives and staff to behave at all times in a courteous and considerate manner to all members of the public. Works to be segregated to ensure members of the public are excluded from the works area. Suitable signs are to be put in place to advise and warn pedestrians DO not attempt to restrain members of the public who appear under the influence of drugs or alcohol entering the works area. Secure the works area and notify the FM Conway team and or the police.	1	4	4	All

	General Public with disabilities General Children and teens.						All operatives to be aware of visual impaired persons who cannot see the barriers and sign. Operatives to offer guidance around the works area. Any operations that are likely to intrude into the public area must be avoided,				
12	Working with mewps	Injury to operatives	Operatives	4	3	12	Only competent operators to operate the mewp Refer to HTA-RAMS	1	3	3	Supervisor and Operatives
13	Clearing Material Sharps(broken glass) , syringes etc	Injury to operatives	Operatives	3	3	9	Toolbox talks Correct PPE eye protection when jetting to prevent any debris entering the eye. Dispose of sharps in appropriate container. Adhere to "DEALING WITH SYRINGE NEEDLES" procedure.	1	3	3	All
14	Interface with plant - vehicles	Injury to operatives and the public	Operatives	3	4	12	All vehicles and plant to be banked. Only certified and competent operatives to operate plant and machinery. Reversing assistants to be used.	1	3	3	Supervisor and Operatives
15.	Hand dig	Injury to operatives	Operatives	4	3	12	Follow safe digging and manual handling techniques. Refer to HTA-RAMS Place spoil in an easily accessible location. Do not lift a loaded shovel too high. Treat all services as live.	1	3	3	Supervisor/ All
16.	Working on Road Closure	Injury to operatives and public	Operatives	5	3	15	Segregated working area. TM to be installed and supervised by FMC TM No works to be carried out outside the segregated area.	1	4	4	All

PERSON UNDERTAKING RISK ASSESSMENT:	[redacted]	**DATE OF ASSESSMENT:**	14/01/2020
SIGNATURE:	[redacted]	**DATE OF NEXT REVIEW**	14/06/2020

RISK ASSESSMENT ACKNOWLEDGEMENT (I acknowledge that I have been briefed in the contents of this Risk Assessment and understand the requirements and conditions for conducting these work activities).

No:	NAME	SIGNATURE	EMPLOYER	DATE
1.				
2.				
3.				
4.				
5.				
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10.				
11.				
12.				
13.				
14.				
15.				

CONWAY AECOM
HEALTH, SAFETY AND ENVIRONMENTAL
METHOD STATEMENT
A40 – WESTWAY, LONDON – POST TENSIONED SPECIAL INSPECTION

The responsibility for health safety and environmental aspects of this contract works rests fully and unreservedly with Henderson Thomas Associates Limited.

The acceptance of this Method Statement by Conway Aecoms and involvement in environmental/safety studies or audits, does not in any way absolve Henderson Thomas Associates Limited from that responsibility, nor is it intended to confirm or suggest that the Contractor fully meets the statutory requirements.

This document will not be complete until Conway Aecom have issued a review / sign off sheet duly signed by an authorised person.

The Custodian of this plan is: [redacted]
Project Director

Henderson Thomas Associates Limited (Date: 08/01/2020)
6 Little Mundells
Welwyn Garden City
Hertfordshire, AL7 1EW
Tel/fax – 01707 327 785
Email – warren@hendersonthomas.co.uk

DOCUMENT REFERENCE: L/1992/MS/WDT/20

[redacted]				Initial Issue Revision 1	07/01/2020 14/01/2020
Prepared By HTA	Reviewed by Contractors Safety Dept.	Reviewed by HTA PM	Reviewed by Conway Aecom PM	Description of Modification	Rev Date

INDEX

APPENDICES

A Risk Assessment
B Hazard Survey for PPE
C Other Attachments
Organisation Charts

References
All Current and Relevant Legislation
All Current and Relevant Approved Codes of Practice
CMS-EM-P-069 - CDM Project Compliance Procedure 2015

1.0 General

The work consists of a post-tensioned special inspection to the following sections of the Westway:

Package 1

- Section 6E (Westbourne Terrace)
- Section 6W (Torquay Street)
- Section 5
- Section 1
- Wood Lane Flyover
- NW Slip Road
- SW Slip Road
- NE Ramp
- SE Ramp

To access and investigate the tendons/anchors of the structure the following methods will be adopted:

- Trial Pit excavations from the top of the structure
- Internal confined space investigations within bridge cells (access from topside manholes)
- Soffit investigations from road/land on the underside of the structure.

All of the investigations are based upon the following specifications provided from Conway Aecom:

Package 1A – 60486237-M406-SPC-0003-A
Package 1B – 60486237-M406-SPC-0004-A
Package 1C – 60486237-M406-SPC-00045-A

The works are planned to take place from 13th January through to 3rd May 2020.

2.0 Scope of Works

1) Trial Pits

A number of Trial pits (typically 1m x 1m) will be excavated at locations in accordance with the specification to investigate tendons and anchors. 1 No. Trial pitting crew and 1 No. investigation crew will complete 1 location per shift. Generally during the project 3 No. investigation teams will be on site per shift. At each pit the following procedure will take place:

- GPR survey to determine location of tendons whilst setting out. This would also pick up any buried services. This will be done in accordance with on -site review of STAT pack at each TP location.
- A permit to dig will be completed by the site supervisor.
- Location of pit sprayed/chalked onto carriageway.
- Saw cutting extent of pit using water supressed Sthil Saw.
- Using either hydraulic or compressed jack hammers the carriageway surfacing will be removed until the top of the deck is exposed.
- Once deck is exposed GPR and cover meter surveys carried out to locate tendons/anchors.
- Using a Hilti TE-60 hammer action drill a 25mm drill bit will be used to locate the tendon/anchor. The experienced operative will clean the drill hole to examine if tendon/anchor has been encountered.
- Dependent upon the depth of cover the tendon/anchor will be fully exposed through either localised breaking out of concrete or over coring.
- If an anchor is exposed then photographs, condition and details will be logged. If it is a tendon then once the sheath is exposed using a hammer and chisel it will be carefully opened up being sure not to damage strands.
- Grout samples will be removed for subsequent laboratory testing and the condition of strands/grout etc will be logged and photographed.
- Initially the concrete will be reinstated using Sika Set 45. When this is set any waterproofing will be repaired using Sterling Lloyd Eliminator. The carriageway will then be reinstated using Viafix permanent cold repair.

2) Internal Investigations (Confined Spaces)

Internal access within the bridge cells is required to expose some of the tendons and anchorages. All confined space works will be carried out in accordance with confined space regulations 1997. All of the cells can be accessed from the A40 through manholes in the bridge deck. The following process' will be carried out during this phase of the works:

- Once the correct manhole to be lifted is determined the confined space supervisor will fill out an entry permit.
- The manhole will be lifted using man hole lifter and placed to one side.
- The manhole will be left open to vent for 5 minutes prior to gas tests.
- During this time cones will be placed around the opening to highlight it.
- A gas monitor will then be lowered into the bridge cell on rope for 5 minutes.
- Gas meter readings will be reviewed and logged on the permit.

- If these metered levels have not initiated any alarms, it is assumed it will be safe to access space. If any of the alarms have been triggered no personnel shall enter the confined space and the plan of works will be adjusted.
- A roll glis and winch will be set up above the access manhole.
- 2 No. PTSI technicians entering the cell shall don a rescue harness, gas meter (1 between them) and a dragger escape set (1 each). The equipment and harness will be checked prior to entry.
- The 2 technicians will then enter the void through ladders and during lowering will be connected to the winch.
- The technicians will carry out 2 No. tendon openings and concrete test panels per shift.
- Initially a GPR scan will be carried out to determine the location of tendons.
- Using a Hilti TE-60 hammer action drill a 25mm drill bit will be used to locate the tendon. The experienced operative will clean the drill hole to examine if tendon has been encountered.
- The cover inside the cells will be low enough to breakout without the need of coring.
- If an anchor is exposed then photographs, condition and details will be logged. If it is a tendon then once the sheath is exposed using a hammer and chisel it will be carefully opened up being sure not to damage strands.
- Grout samples will be removed for subsequent laboratory testing and the condition of strands/grout etc will be logged and photographed.
- After the PTSI a concrete test panel will be carried out. The process can be seen in this RAMS document.
- The topman will carry out regular checks to the team within the cell. This will be carried out verbally.
- All intrusive investigations will be repaired using Sika Monotop 615.
- On completion of the work staff will exit the manhole when clipped onto winch system.
- Once the manhole is placed back in position the entry permit will be signed off.

The above process will be for 1 No. confined space team medium risk. On each shift we there will be 3 separate confined space teams operating simultaneously.

Due to the risk being increased at all times a rescue team will be on site to cover all 3 teams. The confined space rescue team will have City & Guilds 6150-05 Emergency Rescue & Recovery of Casualties in Confined Space – medium risk.

3) Soffit Investigations

Investigations to the soffit of the structure will be carried out from sections off the network and in some instances from TM of roads below.

Access will be gained from either a MEWP or a scaffold. Where a MEWP is required this will be using a 12.5 van mounted. All operatives will have IPAF qualifications. Where it is not possible to use a MEWP an aluminium mobile scaffold tower will be used. The tower will be erected by a PASMA trained operative.

The same process' in terms of exposing tendons/anchors will be carried out.

2.1 The Workplace Risk Assessment is attached as Appendix A.

Works to be carried out in accordance with specification and methodology as detailed above.

2.2 This method statement shall be reviewed and signed off by Conway Aecoms prior to commencement of the works.

3.0 Labour Force

3.1 The Management Organisation for Henderson Thomas Associates shall be as shown in Appendix D.

3.2 The names, telephone numbers, mobile phone numbers of Contractors principal staff shall be as confirmed in 3.3 below.

3.3 The work force comprises the following disciplines and will form the organisation for the project.

Two testing technicians will be selected from the list below, two Conway Aecoms staff will also be entering the confined space, both of whom are fully confined space trained. Full training details of all staff present on site will be present in the site file.

Trade/ Element of work	**Number (approx.)**	**Names (if known)**	**Contact No. (if known)**
Henderson Thomas Associates			
Project Director	1	[redacted]	[redacted]
Project Manager	1		
Site Supervisor	1		
Testing Technicians			

4.0 Training

4.1 All Contractors' staff shall have the following certification as a minimum dependent on the type of works to be undertaken:

All staff have undergone a pre-employment medical and have undergone additional medicals in line with Network Rail Standards. HTA feel all staff proposed to be utilised on this project are fit and able to undertake the tasks required of them.

Operation/Personnel	Training Required
All Personnel	CSCS
Confined Spaces Entry	All staff entering cells and top-men.
First Aider	A minimum of 1 first aider will be on site per team.
Site Supervisor (SSSTS)	[redacted]

4.2 All personnel shall be trained to the standard as detailed above. Training records and copies of certificates for all site personnel shall be available for audit purposes.

4.3 The HTA project engineer after consultation with Conway AECOM representative shall be briefed on a daily basis by the Conway AECOM representative on site. HTA site supervisor will then brief all HTA staff, A Tool box talk shall be given once a week by the HTA supervisor.

4.4 Method Statements and Risk Assessment shall be perused prior to the commencement of each shift, this shall include signing the approval sheet attached to this method statement as confirmation that they have been read and understood.

The information provided in the approved RAMS will also form part of the Conway AECOM Task Briefing which must be briefed at the start of each shift.

5.0 Lifting Equipment

5.1.1 The only piece of equipment that would fall under this section is the roll gliss and winch used during confined spaces entry. All equipment is maintained and inspected every 6 months by SES Limited. All certificates will be kept in the site file.

6.0 Portable Tools and Equipment

A full equipment list will be held in the site file. All equipment is calibrated and serviced where necessary.

7.0 Mechanical Plant

Not applicable

8.0 Track Mounted Vehicles and Plant

Not applicable

9.0 Protection of Assets

9.1 The HTA site supervisor will be responsible for ensuring the site is left in the condition it was prior to works. Once all crews have left each shift the site supervisor (HTA and CA) will walk the site the check no tools have been left and the carriageway can be re-opened safely.

10.0 Materials

10.1 Not applicable.

11.0 Storage and Handling of Materials and Substances

11.1 Copies of all relevant data/assessments will be retained on site for audit purposes and be readily available to site personnel. All effort will be made to avoid contact with any possible hazardous substances. Storage of any items shall be off site in HTA's Transit van.

12.0 Confined Spaces Working

Confined space entry is required to enter the bridge cells. A full description of the entry procedures can be found in Section 2.0.

During all shifts 3 No. individual confined spaces teams will be on site. The confined space entry level is deemed low/medium and therefore 1 No. rescue team will be on site during each shift. The confined space recue team will be have City & Guilds 6150-05 Emergency Rescue & Recovery of Casualties in Confined Space. The following equipment will be on site with the rescue team:

- Self-contained breathing apparatus
- Escape breathing apparatus
- Oxygen resuscitation
- Entonox analgesic gas
- Rescue stretcher
- Rescue tripod & winches
- Multi-gas monitors
- Safety harnesses
- Multi-casualty first aid bag
- Communication system

13.0 Temporary Structures / Falseworks

13.1 Not applicable

14.0 Working at Heights

14.1 All works to the topside of the structure will be carried out from an elevated flyover. In no instance shall any staff climb or lean over the parapet.

Works to the soffit of the structure will be carried out from heights using either a MEWP or a mobile scaffold tower,

The MEWP will be a 12.5m van mounted (or similar) and be operated by IPAF trained member of staff. There will always be one member of the site team on the ground trained in emergency lowering of MEWPS if required. Any staff working from heights will stay in the basket and be clipped on with a harness.

Where a mobile scaffold is required this will be erected by PASMA trained operatives. The operatives will erect the BOSS scaffold in line with the manufacturer's guidance.

15.0 Permits to Work

15.1 All personnel are CSCS trained. Any permit / closures / possessions shall be arranged by Conway AECOM. HTA will issue the permit for entry into confined space. This will be carried out by confined spaces certificated staff, copies of certificates to held in site file).

16.0 Temporary Lighting and Power

16.1.1 Lighting will be provided by LED hand held lights and head lamps.

Task lighting shall also be used to illuminate the manhole access point.

17.0 Control of Work with Hazardous substances and Process - COSHH

17.1 Here are a list of materials that will be used on site during the works. All COSSH data sheets can be found in Appendix D:

- Sika Set 45 concrete repair material
- Sika Monotop 615
- Sterling Lloyd Eliminator Patch Repair
- Via Fix permanent road repair

18.0 Spare

19.0 First Aid

19.1 First Aid equipment will be provided at the workplace. The equipment available shall be in accordance with the First Aid at Work Regulations for the number of personnel on site.

19.2 We will have a qualified first aider on site. A record of the use, maintenance of first aid shall be retained on site for audit purposes.

19.3 HTA shall have clean potable water present in the van for washing. In addition, eye wash and bacterial hand wipes shall be present on site. Conway Aecom to supply welfare facilities for the duration of the contract, we would envisage a Garrick type van positioned on the bridge in the road closure.

20.0 Fire

20.1 A fire extinguisher shall be present on each HTA van.

21.0 Fatigue Management

HTA have adopted the Network Rail standards in terms of working hours. In no instance will staff work for more than 10 hours per shift. Our site staff will have no more than a 1 hour drive each day to and from site. HTA staff supervisor will monitor working hours to avoid fatigue.

Based upon traffic management times the maximum site period of 10 hours will never be exceeded.

22.0 Personnel Protective Equipment (PPE)

22.1 A Hazard Survey for PPE, indicating the required PPE is included in this Method Statement, this information appears in Appendix B. HTA will comply with Conway Aecoms minimum highway standards for PPE as amended below to these RAMS.

22.2 PPE to be used during the survey are:

Type of PPE	**BS Standard Number**
High Visibility Vest	BS EN 471
Hard Hat	BS 5240 : Part 1 : 1987 / EN397
Goggles	BS 2092/1 / EN166 Optical Class 1
Dust masks	BS EN 140:1998 FFP3
Ear Defenders	BS EN 352
Safety Boots	BS1870 Part 2 / EN20345 c/w midsole protection
Gloves	BS EN 388:2016, Level Cut 5 resistant
Harness / lanyard / cutting tool	BS EN 361:2002 BS EN 1497:2007
Confined Spaces equipment	Gas meter / escape breathing sets / rescue harness / rollgliss winch

22.3 Records of the issue, use, maintenance and storage of PPE shall be available for audit purposes.

22.4 Goggles, dust masks (face fitting to be carried out and certs issued prior to works – copies of certificates will be held on site in site file), and ear defenders are to be used during drilling and coring operations. In addition, overalls shall be worn during all site works including mixing repair mortar.

23.0 Accidents Incidents and Reporting of Injuries Diseases and Dangerous Occurrences (RIDDOR)

23.1 All site personnel shall be instructed that every accident / incident however minor must be reported to HTA immediately after the occurrence (Site coordinator – To be advised), in accordance with HTA procedures.

23.2 Henderson Thomas Associates shall ensure that any accident however minor is entered in the accident books. HTA shall be responsible for the completion of the Incident Notification form and its transmittal to the HTA Safety Manager. Records of accidents / incidents shall be available for audit purposes. HTA will inform Conway Aecoms of any incidents/accidents

23.3 HTA shall be responsible for carrying out investigations into all accidents / incidents.

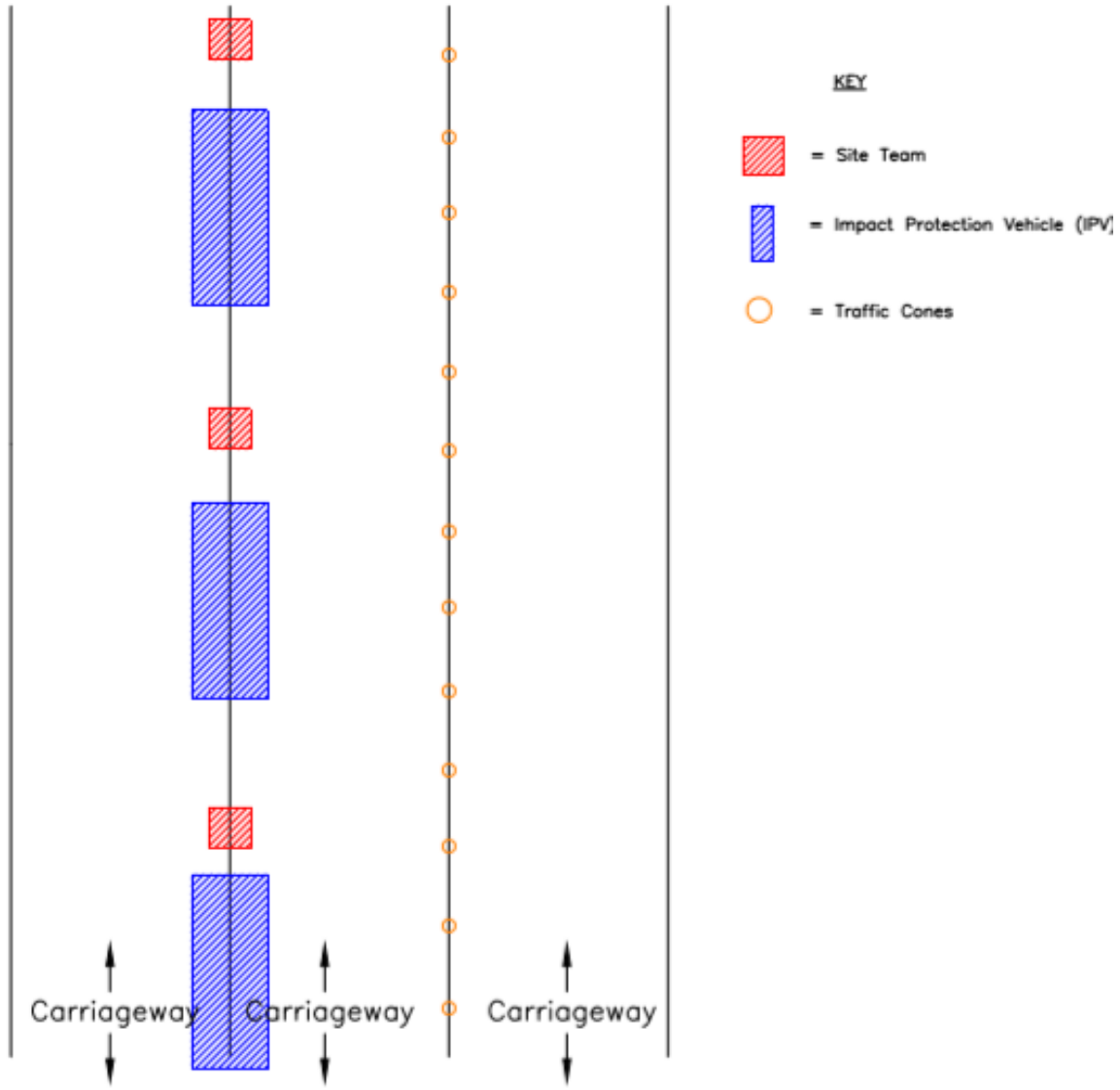
23.4 The HTA Safety, Quality and Environmental Manager shall be responsible for reporting to the relevant statutory body all accidents and incidents embraced by RIDDOR

24.0 Housekeeping

24.1 At the end of each shift we will clean away all materials and debris arising from this work.

25.0 Access and Egress – Traffic Management

25.1 All access is to be arranged and installed by Conway Aecom. During the works to the top of the structure a mixture of full closures and lane closures will be installed. This TM will be installed for all Trial Pitting and Confined Space Works. When lane closures are in place an IPV will be situated adjacent to each team as seen below:



HTA will receive a briefing from Conway Aecom site manager prior to entry into the TM. All HTA vans are chapter 8 compliant.

25.2 Access to the underside of the structure from local roads and off-network locations is to be arranged by Conway Aecom.

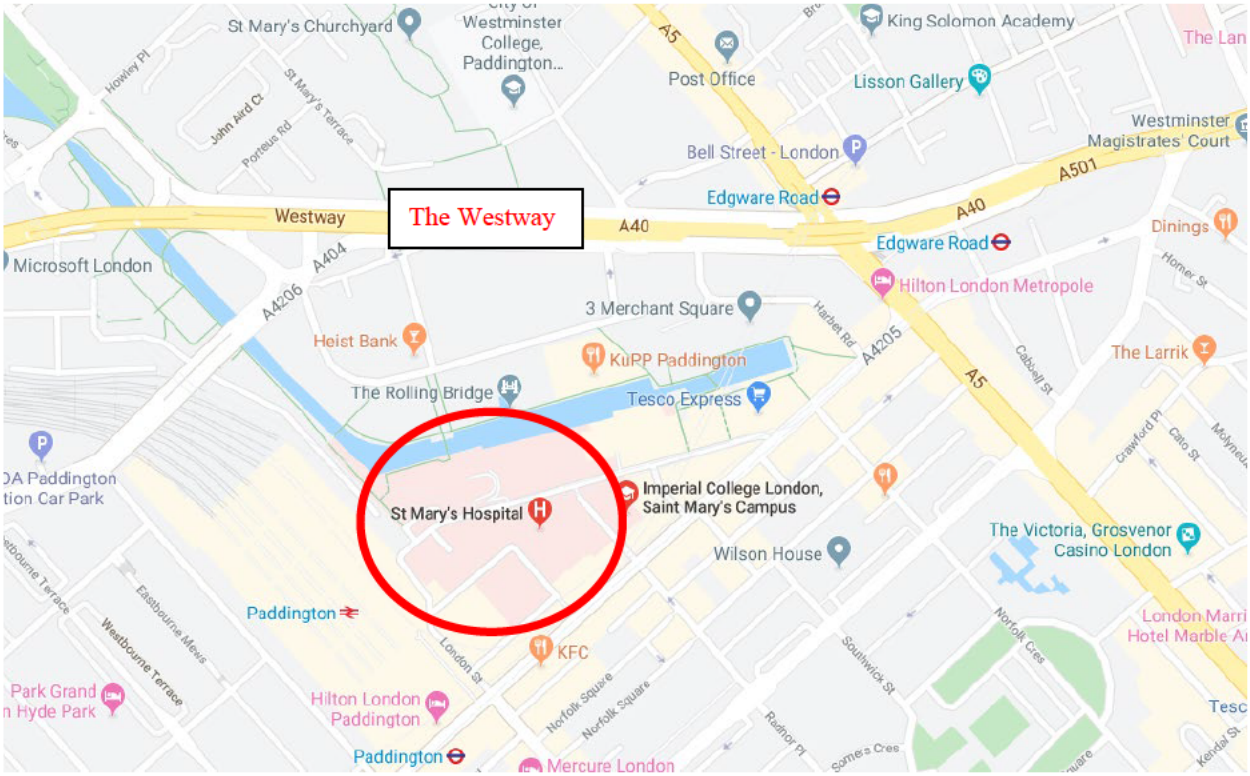
26.0 Emergency Procedure and nearest hospital

26.1 The Emergency Site Procedure shall be explained to all personnel during site induction through a combination of HTA and Conway Aecom site supervisor.

26.2 The nearest hospital is:

St Mary's Hospital

Tel: 020 3312 6666
Praed Street
London
W2 1NY



When to go to A&E

An A&E department (also known as emergency department or casualty) deals with genuine life-threatening emergencies, such as:

- loss of consciousness
- acute confused state and fits that are not stopping
- chest pain
- breathing difficulties
- severe bleeding that cannot be stopped
- severe allergic reactions
- severe burns or scalds
- stroke
- major trauma such as a road traffic accident

Less severe injuries can be treated in urgent care centres or minor injuries units. A&E is not an alternative to a GP appointment.

If your GP is closed you can go to 111.nhs.uk or call 111, which will direct you to the best local service.

Alternatively, you can visit an NHS urgent treatment or walk-in centre, which will also treat minor illnesses without an appointment.

27.0 Transportation

27.1 All staff arrive in company vehicles. Which will be parked away from any movements of the underbridge unit. No reversing of vehicles will be required on site.

28.0 Signs and Notices

28.1 All signage will be carried out by Conway Aecoms or sub-contractor.

29.0 Systems / Code of Practice

29.1 HTA shall follow their Company Quality Assurance/Safety Procedures whilst carrying out the survey. No special systems or codes of practice are required such as confined spaces working or the like.

30.0 Statutory Records

30.1 The following Statutory records shall be available:

a) Method Statements
b) Risk Assessments
c) Coshh Assessments
d) HAVs details
e) Site testing Procedures
f) Equipment PAT certificates
g) Equipment calibration certificates
h) B1 510 Accident book
i) Training Records
j) CSCS cards for all staff
k) Tool Box talks (carried out once a week)
l) Waste Transfer notes

Please advise if any additional records are required.

31.0 Noise and Vibration

Noise and vibration will be produced through the works. During noisy operations all staff will be wearing ear defenders.

HTA have analysed the works required and will stay within the HAV limits. All breaking out and drilling will be carried out using Hilti TE-60 drills and operatives will rotate during operations. HTA site supervisor will keep a log to ensure no staff members exceed lower limits highlighted in Hilti's documentation.

32.0 Air Quality and Dust

32.1 All dust and other debris will be kept to a minimum, and all staff shall wear correct PPE during these operations. Staff have been face fitted for dust masks prior to works. The use of a grinder is not permitted within the confined space.

33.0 Waste Management (Controlled and Special waste)

33.1 Ant debris will be removed from site through rubble sacks and taken back to HTA yard for disposal.

34.0 Protection of Water Quality

34.1 Not applicable.

34.0 Archaeology

36.0 Nature Protection

36.1 N/A

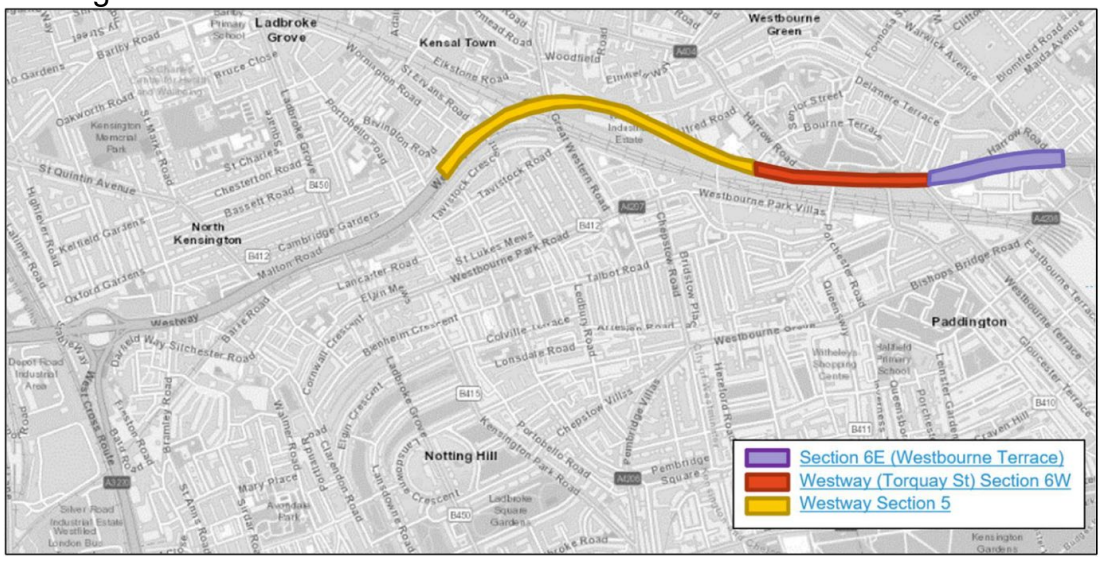
37.0 Management of Pests and Weeds

37.1 Not Applicable.

38.0 Work Locations:

Exact locations of investigations can be found in Aecom specifications. Here are 3 No. site maps highlighting the section of structures under investigation:

Package 1 A works



Package 1 B works

Package 1 C works

38.1 N/A

39.0 <u>Damaged Services</u>

39.1 In the event of damage to any service the following procedure will be followed.

Stop works immediately and inform supervisor. The supervisor is then in turn to inform the works supervisor, operations manager and Central services.

In the case of electricity cables, gas pipes, other pipelines or high-pressure water mains, arrangements must be made to keep people well clear of the area until it has been made safe or repaired by the owner/operator.

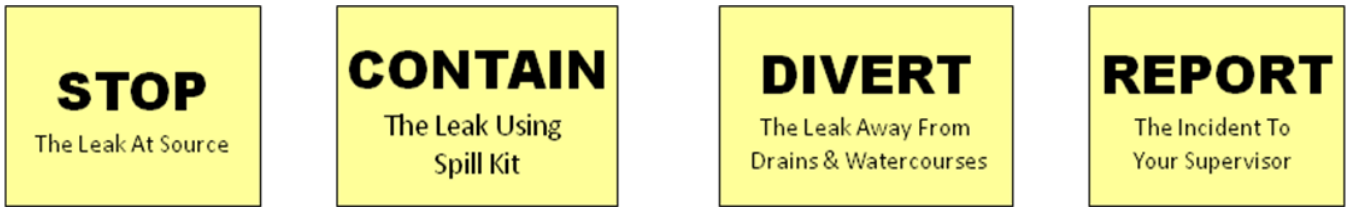
NEVER return to any excavation if a cable has been damaged. If the cable has tripped, then the Owners / operators can liven the cable and this may lead to further explosion.

Remember if a gas connection to a building has been damaged, it may cause a leak in the building. Warn the occupants of the building, and of the adjoining buildings, to leave. Ban smoking, and naked flames and other sources of ignition within at least 10m of a gas leak.

40.0 Inspection and Environmental Auditing

40.1 Where generators are being used a spill tray will be used. All HTA vans will carry a spill kit in case of petrol/diesel leak.

The following basic procedure should be followed in the event of a spillage. **Please refer to C55 Spill Response for full details of procedure.**



41.0 Records and Documentation

41.1 Site records of all testing and locations of testing and samples recovered shall be kept, this shall include testing and calibration certificates of all site equipment. A daily progress report will be forwarded to [redacted] of Conway Aecoms.

42.0 Working over water

Not applicable

Appendix A

Risk Assessment Log

Conway Aecoms – Westway - PTSI

A40 WESTWAY PTSI
RISK ASSESSMENT LOG

Custodian of this Risk Log:

Project Director

[redacted]

Henderson Thomas Associates
6 Little Mundells
Welwyn Garden City
Hertfordshire, AL7 1EW
08/01/20

Document Reference: L/1992/MS/20/WDT

		[redacted]		
Initial Issue	**Date 09/01/20**	**Prepared by** [redacted]	**Approved by Project Engineer**	**Description of modification**

Table 1 – Likelihood Table and Definitions (L)

Description	Code	Definition
Frequent	H	Occurs at least once a week
Likely	H	Occurs at least once a month
Possible	M	Expected to occur during life of project. (1 year)
Unlikely	L	Expected to occur during life cycle of installation (25 - 50 years)
Remote	L	Unlikely to occur during life cycle of Installation.
Improbable	L	Extremely unlikely to occur during life cycle of structure.

Table 2 - Severity Table and Definitions (S)

Description	Code	Definition
Fatality	H	Multiple or Single Fatality per event
Severe Injury	H	Multiple or single severe/disabling injury or occupational illness per event.
Major Injury	H	RIDDOR Major Injury per event/injury resulting in more than 3 days absence from work.
Minor Injury	M OR L	Injury requiring medical attention and leading to absence from works not exceeding 3 days.

Table 3 - Risk Rating Matrix (R) (After controls)

	Likelihood of exposure to harm					
	Frequent A	Likely B	Possible C	Unlikely D	Remote E	Improbable F
Fatality A						
Severe Injury B	High		Medium		Low	
Major Injury C						
Minor Injury D						

Table 4 – Risk Definitions

High	Immediate requirement to review and investigate the case for removing/reducing the risks or improving the controls.
Medium	Risks not clearly "broadly acceptable need investigation to consider reasonable practical improvements.
Low	Risks reviewed to determine if the risk can be reduced through simple improvement measure

Ref No	Prompt/ Description	Hazard/Risk	Risk Before Control			Control Measures	Risk Post Control			Residual Risk (Actions By)	Confirmed Actions Undertaken
001	Working at night	Slips and Trips	**A**	**C**	**H**	All work locations will be lit with Smith lights and other hand held LED's. All HTA staff will have a head torch.					
002	Working at heights	Falling from scaffold, or MEWP	**A**	**B**	**H**	Only trained staff (PASMA Certified) to erect / dismantle and move scaffold towers on site. All staff to wear appropriate PPE. MEWP to be operated by IPAF trained staff and clipped into basket through harness'.	**E**	**C**	**L**	None	
003	Concrete Coring	damage to persons and other equipment nearby	**A**	**C**	**H**	Proper training of staff using equipment and use of appropriate PPE.	**F**	**D**	**L**	None	
004	Concrete Dust/ breaking out of concrete	Ear / Eye damage, damage to oneself ,breathing problems. Falling debris onto road beneath	**A**	**C**	**H**	Use of correct PPE during operations causing dust Use of sheeting at work site	**F**	**D**	**L**	None	
005	Repair material / waterproofing reinstatement	Damage to hand, eyes, and lungs	**A**	**C**	**H**	Training of staff and correct use of PPE See coshh data sheets	**F**	**D**	**L**	None	
006	Petrol / Diesel Power tools	Injury to operatives	**A**	**C**	**H**	Proper use of equipment and relevant training and PPE during filling. Filling of generators to be undertaken off site. Storage of fuel on site not permit but only in HTA transit vans.	**F**	**D**	**L**	None	
007	Loading/unloading equipment	Injury to operatives	**A**	**B**	**H**	Staff trained in correct methods to lift – manual handling	**F**	**D**	**L**		
008	Activity requiring temporary lighting	Electrocution, injury to operatives due to working with insufficient light. Glare causing RTA's	**A**	**C**	**H**	Ensure sufficient light is available Ensure PAT tested and in good working order Ensure correct use.	**F**	**D**	**L**		
009	Excavations	Striking cables / pipes, explosion and electrocution/crushed asphyxiation	**A**	**C**	**H**	Use of CAT Scanner (RD400) and excavations to be carried out by properly trained staff (NRSWA) A review of STAT plans to be carried out prior to works.	**F**	**D**	**L**		
010	Adverse weather	High winds / Heat / Cold	**A**	**C**	**H**	Works involving high level access should cease if high winds occur. Ensure correct clothing for both very hot and very cold conditions occur	**F**	**D**	**L**	None	

011	V bration	HAV / white finger	**B**	**C**	**H**	Ensure correct HAV survey carried out prior to works commencing. Rotation of staff carrying out drilling and or breaking out concrete. HAV log to be carried out on site.	**F**	**D**	**L**		
012	Noise from power tools and plant	Effect on Hearing	**B**	**C**	**H**	Ensure all plant and equipment is properly serviced and has correct noise suppression systems in place. Position noisy equipment away from work force. Correct use of ear protection during noisy work periods	**F**	**D**	**L**		
013	Weils Disease	Leptospirosis / Infection caused from contamination of equipment / sites with rats urine. Inhalation or ingestion of disease can cause death	**A**	**C**	**H**	Ensure all staff are properly trained to assess risk of Weils disease. All HTA staff are confined spaces trained and carry Leptospirosis cards and are fully aware of the associated risks. Washing of hands prior to smoking / easting while on site. Correct use of PPE	**F**	**D**	**L**	Ensure persons adjacent to work area also wear PPE.	
014	Guano / Pidgeon Faceas	Inhalation / Ingestion of bird Guano, normally found on highway structures. Particularly	**A**	**C**	**H**	If large anounts of Guano is present and will be disturbed during works, works should cease and Guano be removed by a approved company. Generally use of correct PPE and briefing upon the potential risks prior to works should be sufficient	**F**	**D**	**L**		
015	Driving to and from site	Falling asleep at the wheel after long / night shifts	**A**	**C**	**H**	Ensure at least two drivers are present on site and driving is shared. HTA monitor hours worked and have a policy on excessive working hours to ensure workers have ample rest between shifts	**F**	**D**	**L**		
016	Asbestos	Encountering and disturbing asbestos products and causing airborne particles to be produced and poss ble inhaled	**A**	**C**	**H**	All staff have been briefed on the possible presence of asbestos to certain highway structures. In house training as to asbestos awareness has taken place with all HTA staff. If any potential asbestos is detected it shall be reported to the lead engineer and reported to the clients representative, and work shall cease in the immediate vicinity.	**F**	**D**	**L**		
017	Confined Space	Death from toxic gases – suffication/explosions	**A**	**C**	**H**	All staff have been confined space trained. Calibrated gas monitors will be in enclosed space prior to entry. All staff entering will have gas monitors and escape sets. Contact will be made with top man every 5 minutes via 2-way radio.	**F**	**D**	**L**		
018	Fire	Burns/death to operatives caused by fire	**A**	**C**	**H**	All petrol will be secured in HTA vans and only removed when filling up generators. A full set of fire extinguishers shall be present on site.	**F**	**D**	**L**		
019	Working on live carriageway	Death from contact with high speed vehicles	**A**	**C**	**H**	All staff to be wearing long sleeve high vis and trousers. All works carried out within traffic management and IPV's will be in place around each work team					

Dynamic Risk Assessment and Safe System of Work

Structure Number/Name:	
Site Location:	
Date:	
Client:	
Completed by Name/Position:	
Safe System of Work in Place:	**Yes / No**

Other Hazards/Risks Identified on Site:-

Relevant Generic Risk Assessments:-

Investigation Method / Safe System of Work (taking into account unforeseen hazards/risks):-

Completed on-site dynamic risk assessment on page 2: Yes / No
Safe system / method in place: Yes / No
Signed: **Date:**

Site Specific Risk Assessment (Identified hazards/risk not covered in RAMS):-

Table 1 – Likelihood Table and Definitions (L)

Description	Code	Definition
Frequent	A	Occurs at least once a week
Likely	B	Occurs at least once a month
Possible	C	Expected to occur during life of project. (1 year)
Unlikely	D	Expected to occur during life cycle of installation (25 - 50 years)
Remote	E	Unlikely to occur during life cycle of installation.
Improbable	F	Extremely unlikely to occur during life cycle of structure.

Table 2 - Severity Table and Definitions (S)

Description	Code	Definition
Fatality	1	Multiple or Single Fatality per event
Severe Injury	2	Multiple or single severe/disabling injury or occupational illness per event.
Major Injury	3	RIDDOR Major injury per event/injury resulting in more than 3 days absence from work.
Minor Injury	4	Injury requiring medical attention and leading to absence from works not exceeding 3 days.

Table 3 - Risk Rating Matrix (R)

	Likelihood of exposure to harm					
	Frequent A	Likely B	Possible C	Unlikely D	Remote E	Improbable F
Fatality 1						
Severe Injury 2	High		Medium		Low	
Major Injury 3						
Minor Injury 4						

Table 4 – Risk Definitions

High	Immediate requirement to review and investigate the case for removing/reducing the risks or improving the controls.
Medium	Risks not clearly "broadly acceptable need investigation to consider reasonable practical improvements.
Low	Risks reviewed to determine if the risk can be reduced through simple improvement measure

Table 4 – Risk Assessment

Ref No	Prompt/ Description	Hazard/Risk	Risk Before Control			Control Measures	Risk Post Control			Residual Risk (Actions By)	Confirmed Actions Undertaken
			L	S	R		L	S	R		

Appendix B

Hazard Survey for PPE

Operatives shall wear the following Personal Protective Equipment as standard: -

- High Visibility Clothing to include Trousers and Long-Sleeved Top.
- Ankle Support Safety Boots with mid sole protection (No Rigger Boots Permitted)
- Hard Hat
- Safety Glasses
- Gloves

Operatives shall wear the following additional or replacement Personal Protective Equipment when conducting specified activities: -

- Flame-Proof Overalls when hand digging, acting as Banksman (Utility Spotter) or working with and in the vicinity of operating excavation plant.
- Grinding Goggles or Full Face Visor plus FFP3 Dust Mask during cutting operations such as the use of a Floor Saw or Cut Saw.
- Please refer to **Personal Protective Equipment Visual Standard** for full details of available Personal Protective Equipment.

Where activities not covered by this method statement are to be conducted, such as working at height during sign replacement, additional Personal Protective Equipment shall be required such as a Safety Harness the Supervisor shall produce specific Risk Assessments and Method Statements or give reference to other generic documentation for complying with.

HAZARD ASSESSMENT FOR PPE

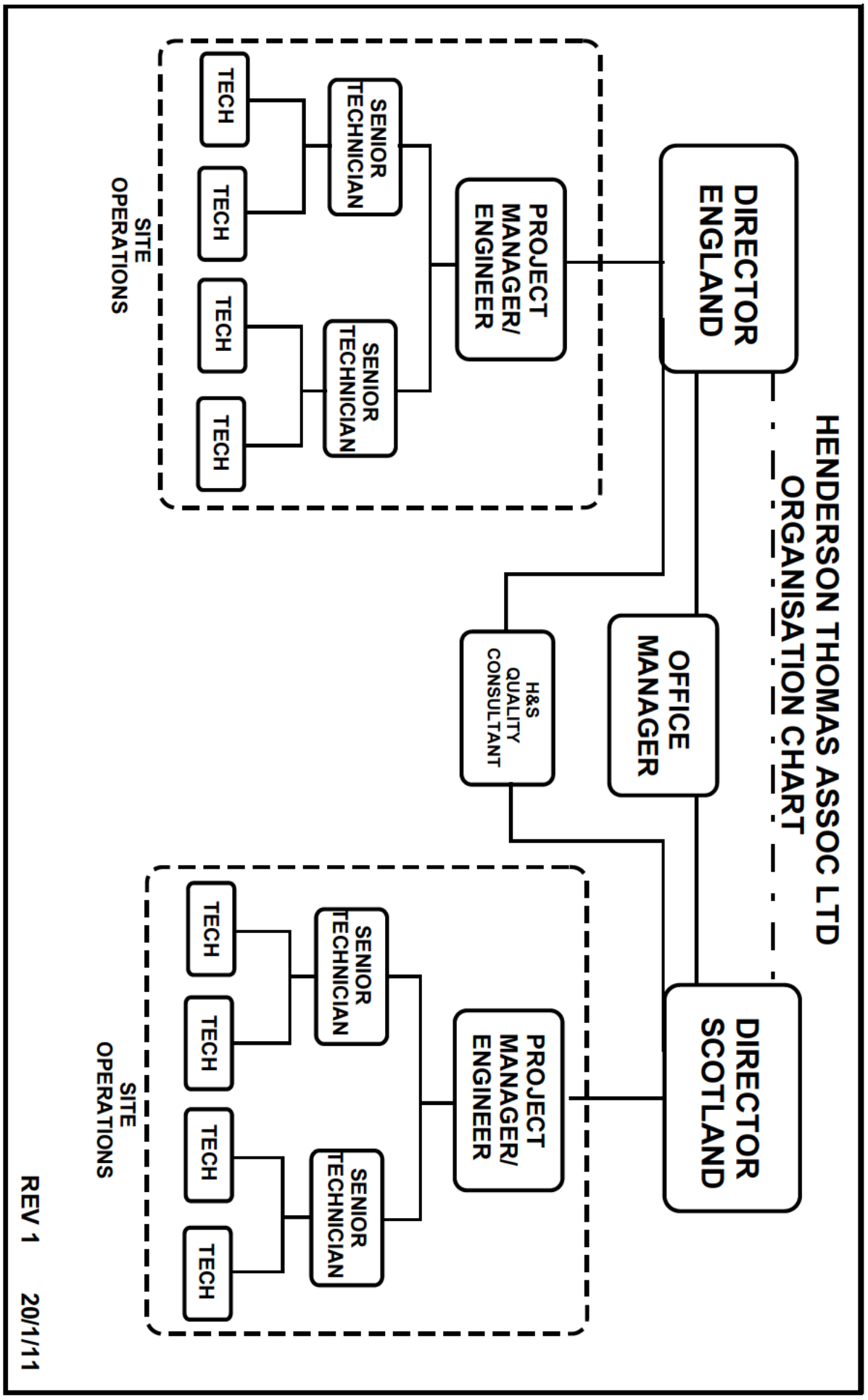
Job Title: **Post Tensioned Investigation – Westway** **REF NO:** **L/1992/20/WDT/MS**

Task Description	**Type of Protection Required**	**PROTECTION REQUIRED FOR**							
		HEAD BS EN 5240	EYE BS/EN 166B Grade 1	FOOT/TOB S 1870 PRT 2	HAND BS/EN	HEARING BS EN 352	BODY BS/EN Life Vest	HI VIS BS EN 471	BREATHING EN 140 : 1988 FFP3
Structural Survey	Hi Vi Vest/jacket and trousers	✓ Hard hat	✓ Googles	✓ Steel toe boots	✓ Gloves	✓ Ear defenders	✓ Overalls	✓ Hi vis vests	✓ Dust masks

Assessed by: [redacted] **Position:** Health & Safety Manager **Company:** Henderson Thomas Associates **Date:** 09/01/20

Appendix C

Organisation Chart and H+S Site Audit Form


HENDERSON THOMAS ASSOC LTD
ORGANISATION CHART
DIRECTOR ENGLAND
OFFICE MANAGER
H&S QUALITY CONSULTANT
DIRECTOR SCOTLAND
PROJECT MANAGER/ ENGINEER
SENIOR TECHNICIAN
TECH
TECH
SENIOR TECHNICIAN
TECH
TECH
SITE OPERATIONS
PROJECT MANAGER/ ENGINEER
SENIOR TECHNICIAN
TECH
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SENIOR TECHNICIAN
TECH
TECH
SITE OPERATIONS
REV 1 20/1/11

HENDERSON THOMAS ASSOCIATES
STRUCTURAL INVESTIGATION EXPERTS

INSPF

Revision: 01

Date: 10.07.2017

SHEQ Site Inspection Report

Project / Site:		**Date:**	
Work Activities:			
Inspection By:			

Item	Description	Yes	NO	N/A
1.	**STARTING WORK**			
a.	Is relevant site paperwork available on site e.g. Task Briefing Sheet / RAMS, SPIC Pack / Health & Safety Pack, Safe System of Work Pack?			
b.	Has a site briefing been conducted prior to work commencing?			
c.	Have all known hazards been identified and site personnel fully aware of control measures e.g. via site briefing?			
d.	Check welfare facilities are on-site before work starts and sufficient for the number of staff			
e.	Check Client specific requirements and site rules are implemented, e.g. no smoking.			
f.	Applicable Job Pack with Drawings			
g.	Access Permits (Sabre Numbers)			
h.	Statutory Inspections (Accident book, PPE issue register, etc.)			
2.	**PERMITS & NOTICES**			
a.	Are all relevant notices displayed on site e.g. F10, Company Safety Policy, emergency plans, first-aiders, fire exit, noise, head protection signage etc?			
b.	Applicable permits posted			
c.	Operatives has the correct access permits applicable to the station being worked on			
d.	Storage License Displayed and only tools/equipment listed is stored			
3.	**HOUSEKEEPING**			
a.	Project work areas are clean and free of excess materials, debris			
b.	Walkways and passageways clear			
c.	Material or equipment properly stored/stacked			
d.	Electrical leads, cables etc. positioned to prevent trip hazards			
e.	Physical/barriers being used			
4.	**FIRE**			
a.	Are fire extinguishers available on-site and suitable for the task being undertaken with "in date" test certification?			
b.	Has a hot works permit been issued and available at the place of work			
c.	Are gas bottles and fuel being stored on-site – located away from sources of ignition and stored in suitable fire proof containers / bunded?			
d.	Is all appropriate signage in place?			
4	**PERSONNEL**			
a.	List subcontractors inspected on-site			
b.	Check personnel hold current ID / Sentinel / Entry Permit cards			
c.	PIC/SWL/COSS/SPIC easily identified			

HENDERSON THOMAS ASSOCIATES
STRUCTURAL INVESTIGATION EXPERTS

INSPF

Revision: 01

Date: 10.07.2017

SHEQ Site Inspection Report

Item	Description	Yes	NO	N/A
d.	First-Aider appointed			
5	**EQUIPMENT / PLANT / TOOLS**			
a.	Equipment and Maintenance Register in place			
b.	Check test and inspection dates / certification for plant on-site (**including hired equipment with user instructions**), and being used safely. List plant on-site:			
c.	Check competency certificates for operatives			
d.	Has access equipment been erected in the correct manner i.e. on solid ground			
e.	Are all electrical leads in good condition			
f.	Can electrical equipment be isolated			
g.	Are steps/ladders "tagged" and in date			
h.	Have scaffold/platforms been inspected and "tagged"			
6	**PERSONAL PROTECTIVE EQUIPMENT**			
a.	Check correct PPE is being worn / used correctly and in good condition			
b.	Is it maintained and fit for use?			
c.	Does the operative have access to replacement PPE?			
d.	Are safety harnesses being worn correctly?			
7	**FIRST AID**			
a.	Is there a qualified first-aider on site			
b.	Are there sufficient first-aid facilities available / Is Accident book on site			
8	**RAILWAY RELATED WORKS**			
a.	Check competency certificates for operatives			
b.	Check those staff showing glasses worn on their Sentinel Cards and are using contact lenses, that they are carrying a spare pair of glasses			
c.	Has a safe system of work been set up by the PIC/SWLCOSS/SPIC?			
d.	Is there a completed record of the PIC/SWLCOSS/SPIC briefing?			
e.	Check operatives understanding of the emergency arrangements			
10	**ENVIRONMENTAL**			
a.	Check drip trays are being used where there is a risk of spills and leaks			
b.	Check spill kits are available where there is a risk of spills and leaks			
c.	Check facilities for the storage and removal of waste, e.g. controlled and special waste			
d.	Check measures are in place for the control of noise, dust levels, road contamination			
e.	Check temporary lighting has been erected and adequate for safe access / egress, with suitable measures to prevent excessive glare in proximity to the track & highway			

HENDERSON THOMAS ASSOCIATES
STRUCTURAL INVESTIGATION EXPERTS

INSPF

Revision: 01

Date: 10.07.2017

SHEQ Site Inspection Report

Item	Description	Yes	NO	N/A
11	**GENERAL**			
a.	Site housekeeping e.g. safe stacking of materials, nails in timber etc			
b.	Excavations supported, barriers in place with safe access and egress			
c.	Site security during / after shift; fenced prevention of unauthorised access, with warning signs			
d.	Check suitable communications are in place with adjacent worksites / other contractors working in the same location			
e.	Check the welfare facilities are adequate:			
	Basins with hot water			
	Toilets			
	Cleaning products, barrier cream, paper towels etc			
	Changing and drying facilities			
	Drinking water			
12	**HIGHWAY WORKS**			
a.	Check:			
	Barriers/signs/cones being used correctly			
	Courtesy boards erected			
	Chapter 8 booklet on-site			
	Check certification is in date for the accredited Supervisor			
	Check correct PPE is being worn / used correctly and in good condition			

Monitoring & Close Out of Corrective Actions

Item	Required Corrective Actions	Action By	Target Date	Verified Date

	Name (Print)	Signature	Date
Verified all remedial actions are completed			

Page 3 of 3

Appendix D

COSHH DATA SHEETS

Appendix E

COSHH DATA SHEETS

Please note that all data sheets will be found in the site file

Signature Approval Sheet

Please sign below once you have read and understood the entire contents of the Method statement and associated Coshh sheets.

This should be signed off before the works commence with a time and date for reference purposes.

Name	Signature	Job Title	Date

Tool Box Talk - Signature Approval Sheet

Please sign below once you have received the following tool box talk

……..

Given By : ……..

This should be signed off before the works commence with a time and date for reference purposes.

Name	Signature	Job Title	Date

APPENDIX F

Design Risk Registers

Designer's Risk Management Schedule

ARCADIS	Project Title	Document Number
	CAW 6 Intersection Bridge Reconstruction of Cricklewood Span	159786-JMS-LOG-EST-000023 Rev B01

Design Stage: GRIP5 - Form F003 Certificate of Design and Check

1. Scope of Arcadis commission:

Arcadis Consulting (UK) Limited have been commissioned by J. Murphy & Sons Ltd to undertake the Form F003 design of the reconstruction of the CAW/6 Intersection Bridge which is part of the Anglia Structures CP6 Year 3 portfolio. These works form part of the overall CP6 Southern Multi-disciplinary Framework for the Anglia Route. Arcadis Consulting (UK) are remitted to provide a design for the reconstruction of the Cricklewood span of the CAW/6 Intersection Bridge primarily driven by the Level 1 assessment undertaken by WSP-AECOM in 2013 to NR/GN/CIV/025 which states that the structure is under capacity with an RA rating of RA0. This report outlines the details for the proposed design of the structure.

2. Brief description of the works:

The proposed reconstruction of Cricklewood span of CAW/6 Intersection Bridge includes the following envisaged works:

Stage 1 – Prior to main blockade – In short possessions of CAW/6 (Network Rail) tracks and short possessions of LUL tracks as required

- Apply, get agreement, and implement track possessions both Network Rail (NR) and London Underground Lines (LUL) as appropriate.
- Set up site compound, satellite compound and areas for temporary and permanent works.
- Fence and establish a safe and secure working environment.
- De-vegetation within 3m of the proposed structure as required by the enabling works.
- Divert or protect services running along the substructures in agreement with the associated utility owners.
- Carry out necessary substructure repair works.
- Slew and temporarily divert existing topside cable trough services to temporary support structure.
- Install proposed ballast retention system along the northern embankment. Installation to start from the north, low mileage end and progress towards the structure, high mileage, except for the last 3m which falls immediately behind the existing north abutment.

Stage 2 – During main blockade – Possession of all tracks both Network Rail and LUL required

- Excavate to rear of north abutment to minimum 100mm below the proposed demolition level.
- Install LUL track protection crash deck.
- Remove track formation of Cricklewood span.
- Breakout and remove existing masonry pilasters over North Abutment.
- Remove and retain for reuse the concrete copers over masonry pilasters at North Pier.
- Reduce/ modify the masonry pilasters at North Pier to allow installation of proposed replacement deck and cill beam.
- Remove the existing Cricklewood deck as one element, using temporary bracings (designed by others) to support existing deck steelwork during lift.
- Necessary padstones supporting Cricklewood span to be saw cut or removed. Cut down substructures to demolition level.

Stage 3 – During main blockade – Possession of all tracks both Network Rail and LUL required

- Prepare top surface of abutment and pier with bed of semi dry mortar.
- Lift and install cill units using crane.
- Core into substructures through cill dowel holes and install dowels. Grout the dowel holes.

Stage 4 – During main blockade – Possession of all tracks both Network Rail and LUL required

- Prepare top surface of bearing plinths using shim plates.
- Using crane, lift and install 2no. steel billet decks (bearings, service trough and GRP handrail to West deck attached)
- Grout bearings into position when both decks are levelled and installed. Grout to achieve 40 N/mm² prior to being open to traffic.
- Using crane lift and install impost units over cill beams.
- Install remaining ballast retention units immediate to structure at north abutment.
- Install waterproofing at the deck ends.
- Backfill back of abutment excavated areas.

Stage 5 – During main blockade – Possession of all tracks both Network Rail and LUL required

- Install end spans/transition service trough supported on proprietary system and or on ballast retention wall.
- Slew back existing services from the temporary support into the new service trough.
- Using crane, lift and install GRP handrails to East (Down) deck.
- Reinstate concrete coping on the partly removed masonry pilasters at North Pier.
- Remove LUL track protection crash deck.
- Carry out necessary substructure masonry repair works.
- Reinstate services along substructure liaising with utility owners.
- Remove temporary services support structure.
- Hand back main LUL possession.

Stage 6 – After main blockade – Possession of CAW/6 (Network Rail) tracks required at all times – Possession of LUL tracks as required

- Install ballast and track with respect to the proposed P-Way design.
- Complete re-routing the downside cess cable trough route within ballast retention system.
- Install bridge identification and limited clearance signages.
- Reinstate fencing/ boundaries on a like for like basis.
- Demobilise site compound and satellite compounds.

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

The following activities have been undertaken during the design to remove risk from the project:

- Archive information received with the contract was reviewed and verified by site surveys/ substructure coring reports and inspections for the topside of the structure where possible.
- Carried out surveys to identify and estimate affected Network Rail (NR) and LUL utilities by the planned works. The indicative locations are shown on the drawings. However, contractor shall verify their exact locations at site prior to commencement of works. Also, contractor shall take necessary precautions while executing the planned works.

- Envisaged Network Rail utility diversion plan for safe execution of proposed works are shown on contract drawings. Contractor shall verify the same and develop temporary works design subject to designer's approval as appropriate.
- Communicated designers' anticipated construction sequence in the contract drawings.
- Carried out hazard assessment of the communicated construction method and documented the associated risks along with recommendations and mitigative measures.
- Communicated the key residual risks by use of hazard warning triangles in contract drawings.
- Identified requirements for staging/sequence of operations and requirements for temporary works
- Substructure stability checks carried out for the anticipated temporary and demolition works.
- Plant exclusion zone defined behind abutments during demolition works.
- Compliance with standard designs where possible and best practice to minimise associated risks with this scheme.
- Five-mile diagram reviewed and adjacent structures which may be affected by design were identified.
- Manual handling of materials and equipment – component weights estimated during design and weights added to drawings to enable planning and safe manual handling as far as possible during works.
- Adequate surface protection to steelworks and concrete units has been specified to reduce the maintenance requirements and thus remove risks associated with steelwork maintenance intervention works.
- Network Rail Standard drawings used for masonry repairs.
- Ballast retention added for the northern approach embankment.
- Precast concrete units used where possible to reduce time on site.

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

At this stage, the project hazards which remain include:

- Working adjacent to services including S&T and / or buried services.
- Working adjacent to and above LUL lines.
- Hand vibration when breaking out existing masonry and rebuilding it to new dimensions.
- Potential for leptospirosis caused by poor drainage, open drainage or high-water table.
- Working next to adjacent spans (Central & Acton).
- Working adjacent to existing structure which may be unstable in the temporary case. Stability of wing walls, buttress walls and abutments.
- Masonry debris falling during break down of pilasters, harming any people working underneath or disturbing the LUL tracks below.

5. Specific construction requirements (eg construction sequence):

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

- Disruptive Possessions are envisaged for the reconstruction works with Rules of the Route Possession for the advance works such as de-vegetating works, protection / diversion of S&T cables, substructure repair works, part pilaster demolition and preparation of site.
- Temporary edge protection required at high level where risk of falling, including whilst existing handrails or parapets are removed.
- Contractor to positively identify all services around and over the structure prior commencing works.

- Temporary protection and / or diversion of services. Requirements to be determined following consultation with Statutory Undertakers.
- Barriers are required to demark the worksite and any walking routes, including public pedestrian walkways. These may require protection.
- The demolition of the span will require a designed sequence of works.
- Protection of lineside services during reconstruction works.
- Manual handling legislation to be adhered to. Mechanical means of lifting to be provided where possible or elements to be sized to allow manual handling.
- Appropriate rest periods to be implemented to reduce risk of hand/arm vibration during demolition of masonry and/or removing of rivets.
- Prohibition zones for excavation and lifting plant will be defined.
- Appropriate waste removal strategy to be considered and implemented where applicable.

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

By issue of this Hazard Analysis and Risk Assessment (HARA) and inclusion of significant residual risks as noted on detailed design drawings. Issue of Designer's Risk Assessment, which contains risks directly resulting from the design or where key hazard information needs to be conveyed to the contractor.

Date of Review	28-05-2021

Assessed by:

Name [redacted] Signature [redacted] Date 28-05-2021

Reviewed by:

Name [redacted] Signature [redacted] Date 28-05-2021

ARCADIS	Designer's Risk Management Schedule			Project Code/Doc No: 159786-JMS-LOG-EST-000023	
	Project Title: CAW/6 Intersection Bridge - Reconstruction of Cricklewood span	Assessor (Name): Victoria Eggleston	Assessor (Signature): [redacted]	Date: 28-05-2021	Revision: B01

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
	General Site Risks and Hazards Applicable at All Times				
1	All works on or adjacent to an operational railway environment including risk of electrocution, slips, trips and falls and risks related to the reduced clearance to running trains over and on the approaches of the existing deck. All risks to cause injury to personnel or the public and damage to the railway infrastructure.	No Design input possible. Unable to design out risk due to the nature and location of works. Bridge designed to be assembled withing the scheduled blockade to reduce exposure of staff to railway environments.	Residual hazard related to the railway environment always remains on site. All activities and works to take place under the rules of the route. All works are envisaged to be carried out during possessions and isolations. Contractor/ Subcontractors to maintain a clear/ tidy and well-lit site always with authorised walking routes where possible. Network Rail Life Saving Rules apply.	Medium – Unforeseen circumstances.	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	Working adjacent to S&T troughing route, other unknown buried services both topside and fixed to the piers. Risk of injury to staff. Risk of damage to the services and injury to staff/ public.	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. Contractor to secure all cables with the use of a temporary bridge prior to any repair works. Buried services information reviewed and shown on drawings where known.	Contractor to develop a SSOW to handle cables and troughing. All S&T to be protected and secured by the appropriate means (e.g. temporary service bridge) before any work commences. Contractor to ensure segregation of HV and S&T in the temporary diversion plan. Some services may be live. Appropriate protection measures/diversions to be implemented by the Contractor in advance of the works as required. Live S&T to be described in Contractor's safe system of work. Ground to be CAT scanned using Network Rail approved equipment and suitably trained personnel before commencing any excavation.	Low	Yes  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
3	Works adjacent to LUL Electrified Lines with 3rd rail and 4th rail. Other cables or lineside equipment to be treated as live. Potential for unidentified and buried live equipment. Risk of electrocution resulting to injury or fatality of the personnel.	No Design input possible. Unable to design out risk due to the nature and location of works. Hazard triangles shown on the contract drawings. Designer envisages that all works will be carried out under isolations or temporary removal of the DC rail.	SSOW with isolations as necessary to be implemented for all works. Appropriate PPE to be worn and insulated tools to be used at all times. Ground to be CAT scanned using Network Rail approved equipment, permits to dig to be issued before commencing any excavation. All works to be carried by competent personnel only.	Medium – Unforeseen conditions.	Yes  B
4	Working near London Underground utilities (LUL) - buried/concealed or exposed services, mast/ equipment, track to signal cables – including adjacent to or fixed to abutments. Risk of damage to infrastructure and staff injury.	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.	Contractor will inquire/survey these prior to any works as part of the planning process and protect throughout the proposed works. Contractor to liaise with LUL authority to get the as built records from their services for planning diversions. Contractor to protect the LUL trackside cables, mast and equipment during demolition and construction works.	Medium – Unforeseen circumstances	Yes  C

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	Working adjacent to operational railway with limited clearance or without safe access whilst trains are running. Risk of injury/ fatality to staff.	Unable to design out risk and not covered by the scope of works. 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. Hazard triangles to be shown on the contract drawings.	Limited clearance signage and access prohibited signage to be installed at ends of proposed ballast retention works.	Medium – Unforeseen circumstances	Yes  D
	Safety Hazards During Construction Phase				

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
6	Partial demolition of existing north abutment - Potential for overloading and/or instability of retained abutment. Risk of injury, fatality to staff, damage/ premature collapse of structure	Stability of substructure verified for partial demolition of existing substructure. Design assumptions and associated FOS noted on proposed drawings. Envisaged construction sequence and exclusion zones behind abutment is indicated in the proposed drawings. Hazard triangles to be shown on the contract drawings.	Contractor shall adhere to the agreed construction sequence. Contractor shall adhere to exclusion zones at all times.	Medium	Yes  E