

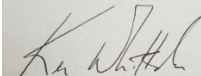


1MCo3 Main Works - Contract Lot S1

Heritage Agreement Method  
Statement (HAMS) - Euston Throat  
West - Installation of Tiltmeters and  
Prisms on Parkway Tunnel Cutting

Document no: 1MCo3-SCJ-GL-MST-SSo1\_SL03-000003

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C01	Rose Cook	Charles Young	Ken Whittaker	31/03/2022	For approval
					

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# Contents

	0
<b>1 Purpose</b>	<b>3</b>
<b>2 Introduction</b>	<b>3</b>
2.1 Project Context – Schedule 18: Listed Buildings	3
2.2 Scope	4
2.3 Engagement	5
2.4 Assumptions & Limitations	5
2.5 Definitions and abbreviations	5
<b>3 Heritage asset significance</b>	<b>6</b>
3.1 General Information	6
3.2 Extent of the Grade II listed Parkway Tunnel and Cutting	7
3.3 Description	7
3.4 Significance	9
Historic Interests	10
Architectural Interests	10
3.5 Setting	10
3.6 Condition	11
<b>4 Specification for I&amp;M installation works</b>	<b>11</b>
4.2 Instrumentation	12
4.3 Installation	14
4.4 Removal and repair	15
4.5 Additional risk reduction measures	15
<b>5 Effect on heritage significance</b>	<b>15</b>
<b>Appendix 1 Asset location</b>	<b>17</b>
<b>Appendix 2 Official list entry</b>	<b>20</b>
<b>Appendix 3 HS2 Environmental Statement Technical Appendices (Volume 5: Gazetteer of heritage assets)</b>	<b>22</b>

## List of figures

<b>Figure 1 - Listed Walls Park Street Tunnels</b>	<b>7</b>
<b>Figure 2 – RWo20 Brickwork Example</b>	<b>Error! Bookmark not defined.</b>
<b>Figure 3 – Proposed Installation Locations on RWo22</b>	<b>13</b>
<b>Figure 4 - Proposed Installation Locations on RWo19A</b>	<b>13</b>

<b>Figure 5 – Proposed Installation Locations on RWo2oA</b>	<b>13</b>
<b>Figure 6 – Example of one metre tilt beam and a 3D prism.</b>	<b>7</b>
<b>Figure 7 – Example of a 3D prism.</b>	<b>14</b>

# 1 Purpose

- 1.1.1 Parkway Tunnel and Cutting grade II listed structure (list entry 1113255) is included in Schedule 18 (Table 1 Listed Buildings to be Demolished, Altered or Extended ) of the High Speed Rail (London - West Midlands) Act 2017.
- 1.1.2 This Heritage Agreement Method Statement (HAMS) specifies the instrumentation and monitoring (I&M) proposals at the Parkway Tunnel and Cutting and provides additional details of how works will protect the significance of the heritage asset. It informs:
- Stakeholders, including the consenting authority: on SCS Railways proposed measures to avoid harm to heritage significance during installation of ground movement monitors and how monitoring information ensures the listed structure is protected during tunnel construction.
  - Engineering teams: on heritage measures to be incorporated in installation works Risk Assessment and Method Statements.
- 1.1.3 This HAMS contains the following information:
- an up to date location plan (Appendix 1)
  - a description of the proposed HS2 works as relevant to the Schedule 18 listed building (Section 2 Introduction)
  - a specification for the proposed monitoring instrumentation and the method of installation (Section 4 Specification for I&M installation works)
  - drawings at a suitable scale showing the proposed instrumentation locations (Section 4 Figure 3 Proposed Installation Locations on RWo22; Figure 4 Proposed Installation Locations on RWo19A and Figure 5 Proposed Installation Locations on RWo20A).

# 2 Introduction

## 2.1 Project Context – Schedule 18: Listed Buildings

- 2.1.1 High Speed Two (HS2) is a network of new high speed lines across Britain planned and built in two phases: Phase One will connect London with Birmingham and the West Midlands; and Phase Two will extend the route to Manchester, Leeds and beyond. Powers to construct and operate the railway have been secured through the High Speed Rail (London – West Midlands) Act 2017 (the Act), which received Royal Assent on 23 February 2017.
- 2.1.2 The Secretary of State has appointed High Speed Two (HS2) Ltd as the nominated undertaker responsible for delivering Phase One of HS2. HS2 Ltd is an executive non-departmental public body, sponsored by the Department for Transport.

- 2.1.3 Schedule 18 'Listed Buildings' to the Act concerns how legislation in respect of listed buildings under the Planning (Listed Buildings and Conservation Areas) Act 1990 ("the 1990 Act") applies to the Phase One works. Paragraph 1 of Schedule 18 disapplies some of this legislation, and in particular the requirement for listed building consent for the purpose of demolition, alteration or extension, from the Phase One works in respect of the listed buildings set out in Table 1, or which are listed on or after 30 September 2013.
- 2.1.4 Following Royal Assent, HS2 Ltd entered into Heritage Agreements with London Borough of Camden and with Historic England (dated 20th February 2017 ) concerning the listed buildings identified in Schedule 18 to the Act within Camden. These agreements require certain details of works concerning the listed buildings to be submitted to the local authority for their approval, in consultation with Historic England where required (Clause 2.1).
- 2.1.5 Parkway tunnel and cutting is identified in Table 1 of Schedule 18, which permits demolition of the western wall of the cutting (commonly referred to as the trapezoidal wall), subject to approval of a HAMS detailing works.
- 2.1.6 Subsequent to the Act, development in scheme design does not require demolition of the western wall of the cutting and it is currently intended to retain the listed structure in its entirety.
- 2.1.7 Consequently, SCS railways has assessed the implications of construction activities beneath the retained listed asset, which may generate ground movements that could result in damage and loss of heritage significance. Ground movement assessments of the Parkway Tunnel has considered the construction of the proposed permanent works comprising Tunnel Boring Machine (TBM) tunnels, Sprayed Concrete Lining (SCL) tunnels, the Euston Cavern Shaft and Euston Cavern.
- 2.1.1 Based on the GMA analysis, the monitoring devices described in this method statement will provide data that informs further measures, if required, to protect the listed structure during construction of the permanent works.

## 2.2 Scope

- 2.2.1 This document addresses the requirement of Clause 2.1 of the Heritage Agreement to submit a method statement to ensure works to the asset are undertaken in a way which protects heritage significance and is sensitive to the historic fabric of the asset.
- 2.2.2 This method statement sets out:
- the heritage significance of the elements of the listed structure affected by works described in the method statement
  - a specification of I&M installation works, comprising 12no. two meter tilt beams, 6no. one meter tilt beams and 99 3D prisms fixed to the Parkway Tunnel cutting retaining walls

- an assessment of how the I&M installation affect the heritage significance of the Parkway Tunnel and cutting.

## 2.3 Engagement

- 2.3.1 HS2 Phase One Heritage Consents Strategy (Document no.: HS2-HS2-EV-STR-000-000008) describes how decisions on works affecting Schedule 18 designated heritage assets require pre-submission discussion with the relevant local authority and Historic England (where applicable). The purpose of these discussion is to agree an appropriate course of action for protecting the significance of the designated heritage assets.
- 2.3.2 A pre-submission consultation document (1MC03-SCJ-GL-MST-SS01\_SLo3-000002 Co1)) for the temporary installation of monitoring devices by fixing to the listed structure was circulated. In response the London Borough of Camden Senior Planner (Conservation) recommended a formal Schedule 18 application, comprising a HAMS, should be submitted for approval.

## 2.4 Assumptions & Limitations

- 2.4.1 This method statement has been produced using the best available information, as generated by SCS JV and from online resources available at the time of writing. To produce this report members of the Skanska Costain Strabag Joint Venture (SCS) Engineering Team visited the site and provided information and images based on site observations which support the information presented in this method statement.
- 2.4.2 This HAMS incorporates relevant information from both CSJV documents detailing previous work during the Early Works Contract (EWC). A HAMS detailing CSJV survey works to record the walls of the listed cuttings either side of the tunnelled section has been prepared and approved in line with Schedule 18 requirements (Document No.1EW02-CSJ-EV-MST-S003-000012 Co2). SCS has consulted this document and the resultant survey report (Document No. 1EW02-CSJ-EV-REP-S003- 000127).

## 2.5 Definitions and abbreviations

Table 1 – List of abbreviations and definitions used in this document

Abbreviation	Definition
GIS	Geographical Information Systems
GLAAS	Greater London Archaeology Advisory Service
GLHER	Greater London Historic Environment Record
GWR	Great Western Railway
HAMS	Heritage Agreed Method Statement
HS2	High Speed 2 Ltd
L&BR	London and Birmingham Railway
L&NWR	London and North Western Railway
LSWSI	Location Specific Written Scheme of Investigation
OASIS	Online Access to the Index of archaeological investigations
PDF	Portable Document Format

Abbreviation	Definition
PP	Project Plan
RAMS	Risk Assessment Method Statement
SCSjv	Skanska Costain Strabag Join Venture

## 3 Heritage asset significance

### 3.1 General Information

- 3.1.1 The West Coast Mainline between Euston Station and Parkway Tunnel (NHL 1113255, HER DLO15053, 477732, EUS037) incorporates early 19th century features. Towards the northern end of the extensive brick-retained Euston Approaches, c 900m north of Euston Station, is the Grade II listed Parkway tunnel and cutting (Appendix 2 Official List Description), an overbridge that carries the junction of Park Street (A4201), Delancey Street, Gloucester Avenue and Oval Road across the railway.
- 3.1.2 A location plan showing the extent of the designated asset affected by the I&M works detailed in this method statement is included in [Appendix 1](#). Figure 1 provides further information on the extent and context of these listed elements. It also illustrates the range of associate railway and non-railway assets that occur in the immediate vicinity and form the setting.
- 3.1.3 The current tunnel and cutting is a much altered remnant of the original London and Birmingham Railway constructed in the 1830s. Removal and replacement of the original tunnel roof and the capping of the Mornington Terrace side with concrete are particularly notable changes, as is the apparent widespread loss of structural and decorative ironwork (Appendix 2).
- 3.1.4 Other changes add to the architectural and historic interest by illustrating the evolution of the railway assets shown in Figure 1, notably the adaption of the original structure to accommodate a second tunnel in a widened cutting to provide additional track capacity as the London's urban infrastructure expanded at the beginning of the 20<sup>th</sup> century.

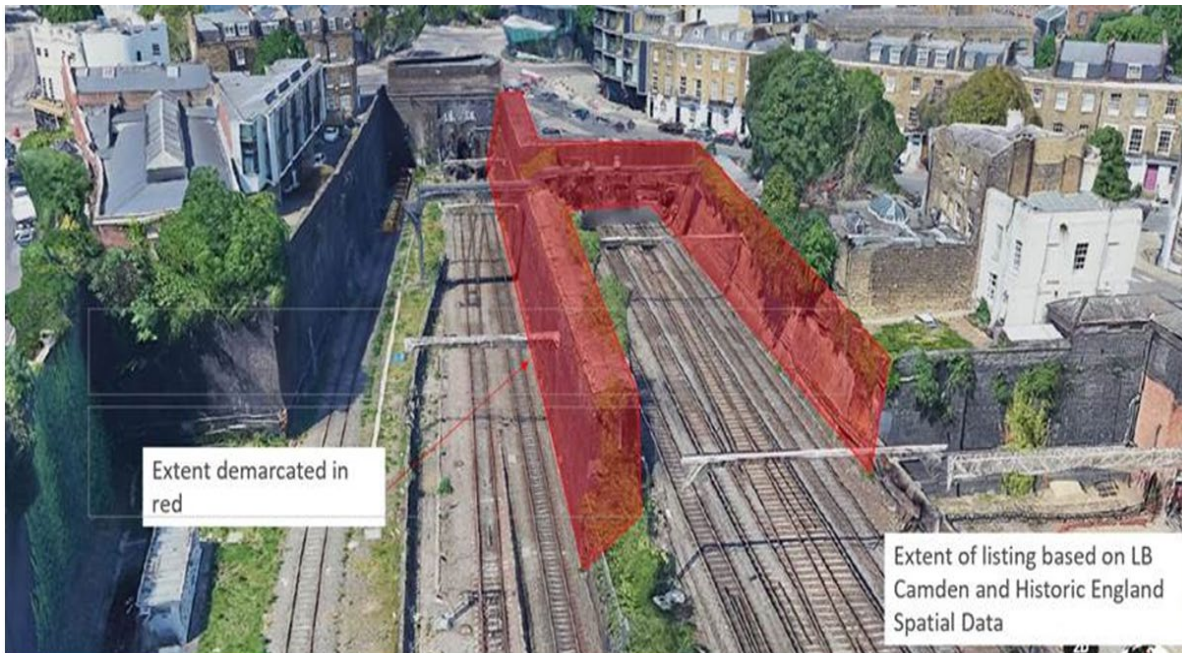


Figure 1 - Parkway Tunnel and Cutting Listed Walls

## 3.2 Extent of the Grade II listed Parkway Tunnel and Cutting

3.2.1 The overall extent of the designated Parkway Tunnel and Cutting includes:

- The eastern tunnel, including both northern and southern portals;
- **Retaining walls c.60m south of the eastern tunnel on both sides of the track (SCS Railways reference RWo22 (refer to Figure 3), RWo19A (refer to Figure 4) and RWo20A (refer to Figure 5)**
- Retaining walls up to c.200m north-east of the eastern tunnel; and
- Retaining walls up to c.200m north-west of the western tunnel.

3.2.2 The HS2 Environmental Statement Technical Appendices (Volume 5: Gazetteer of heritage assets) provides a description of the Parkway tunnel and cutting (Appendix 3). A more detailed comprehensive description of the surviving listed structure has been provided by CSJV (Document No. 1EWo2-CSJ-EV-REP-Soo3- 000127).

3.2.3 Proposed I&M works detailed in this method statement affect specific elements of the listed structure (**highlighted in bold above**). The following description and assessment relate solely to these elements.

## 3.3 Description

3.3.1 Original a four-track cut and cover tunnel with brick abutments, the cutting south of the 144m long tunnel is partially preserved in its original forms up to c.60m beyond the portal. Retaining



walls with a gently curved inclined batter are constructed of red brick to a height of 6m+ and, where surviving, are surmounted by panels of iron railings.

- 3.3.2 Portland stone dressings and a decorative ironwork roof arcade contributed to a modest Neo-Classical architectural style, which is still evident in a heavily modified form despite the complete loss of ironwork roof structures and extensive alterations.
- 3.3.1 The exposed eastern elevation (RWo19A) of the wall separating the two tunnel portals (the trapezoidal wall) comprises the 1835-37 cutting faced in red stock brickwork. It is divided into 10 bays by closely spaced brick piers with Portland stone capitals and coping, with a continuous stone banding above a brick plinth. The southern corner has been partially reconstructed in blue brick.
- 3.3.2 For most of its length the western elevation (RWo20A ) of the trapezoidal wall, constructed in 1900-06, has no inclined batter and is comprised entirely of uniform blue brickwork without dividing piers. The section of wall immediately south of the later tunnel portal displays a thin band marking the transition from cutting retaining wall to street level parapet, presumably defining a later phase in the wall construction associated with the replacement of the earlier tunnel roof with the current concrete deck structure in the 1964.



Figure 2 – RW020 Brickwork Example

- 3.3.3 The exposed face of the eastern wall (RW022) is also part of the 1835-37 cutting faced in red stock brickwork divided into 10 bays by closely spaced brick piers with Portland stone capitals and coping. As with the opposing retaining wall, it is assumed there is a continuous stone banding above a brick plinth, but this is concealed behind a later concrete facing and toe that was applied in the 1960s when iron props across the cutting were removed. Only the upper part of the original wall is now visible. A further difference is the survival of upper sections of the brick piers topped with a stone coping. These extend the height of the cutting wall to support interceding sections of cast iron railings with arcaded motifs. Presumably these elements were removed from the western wall during the 1900-1905 remodelling to create the freestanding dividing structure.

## 3.4 Significance

- 3.4.1 The significance of the Parkway Tunnel and Cutting principally reflects historic and architectural interests.

## Historic Interests

- 3.4.2 Parkway tunnel and cutting is part of the original London and Birmingham Railway design, which was among the first inter-city railways in the world and produced London's first inter-city railway terminus in Euston.
- 3.4.3 The L&BR's engineer, Robert Stephenson, was one of the most influential engineers during the Industrial Revolution, noted for his pioneering development of steam locomotives, railways, bridge and other engineering achievements.
- 3.4.4 The surviving cutting retains elements of Stephenson's historic engineering design alongside the later developments that chart railway engineering advancement through the 19<sup>th</sup> and 20<sup>th</sup> century.

## Architectural Interests

- 3.4.5 The western wall of the listed Parkway tunnel and cutting (commonly referred to as the 'trapezoidal wall') illustrates how the historic expansion and evolution of the West Coast Mainline included decisions to sustain overall stylistic qualities whilst integrating different design parameters. The original 1830s cutting retaining wall was adapted to separate the original tunnel portal from a second tunnel portal built within a widened cutting in 1900-1906. The east facing red brick cutting retaining wall was modified to form a largely freestanding dividing abutment that displays a contrasting western face of predominant blue brick pier and panel design, consistent with the 1900-06 retaining walls south-east of the later tunnel.

## 3.5 Setting

- 3.5.1 The setting comprises:
- railway infrastructure that illustrates the evolution of Britain's earliest inter-city railway line and the achievements of pioneer engineers, such as Robert Stephenson. Early structures are adapted by later interventions and are juxtaposed with modern gantries, track, signalling and power supply equipment and signage, with the constant movement of busy intercity and suburban trains services adding further character to a dynamic operational setting.
  - the relationship of the railway tunnel and cutting to adjoining historic residential areas delineates historic socio-economic boundaries that shape local urban form. This influences the distribution and range of different architectural residential building styles and former industrial facilities. It forms the boundary to three adjoining conservations areas - Camden Conservation Area in the east, Regents Park Conservation Area in the south-west and the Primrose Hill Conservation Area in the south-west
  - the nature of the historic building stock contributes to contrasting cultural identities. Regency architect John Nash's suburban classicism, whilst much altered, nevertheless prevails in a discreet residential neighbourhood that retains a semi-rural character

along the edge of Regent's Park. In contrast the repurposed former goods yards and redundant railway facilities are now international venues that promote popular urban music, fashion and culture. This in turn has stimulated live performance venues at numerous historic public houses and theatres associated with the mid-late Victorian residential terraces that sprung up in response to Camden's emergence as a major urban transport interchange.

- 3.5.2 Both aspect of setting contributes to the architectural and historic interest of the Parkway tunnel and cutting. Setting contributes a degree of artistic interest to significance, insofar as the Parkway tunnel and cutting is a component of the local historic railway estate that has shaped local urban cultural identities associated with popular culture.

### 3.6 Condition

The listed structure is maintained by Network Rail as part of its operational rail estate. The retaining walls are in a generally sound condition, although extensive soot surface accretions can obscure the brickwork.

## 4 Specification for I&M installation works

- 4.1.1 The Parkway Tunnel and cutting form part of the 'Network Rail Ground Movements Mitigation Scope' by SCS Railways, currently being undertaken in the Euston Approaches area.
- 4.1.2 Wireless instrumentation is to be installed on the cutting retaining wall, to measure any movements which occur and to understand daily and seasonal trends. This will form a baseline in readiness for SCS's works in Euston commencing.
- 4.1.3 Previously I&M has been installed within component structures beneath the overbridge decking structure forming the Parkway Tunnel, i.e. the 1835-37 retaining walls within the tunnel section:
- Tiltmeters and prisms were installed, as detailed in SCS Railways Method Statement for Installation of Instrumentation at Parkway Tunnel Listed Asset (Document no: 1MCo3-SCJ\_SOU-CL-MST-SSo1\_SLo3-000004)
  - LVDT's were installed, as detailed in SCS Method Statement – Euston Cavern Shaft - Installation of LVDT and Prism Instrumentation in Upper Parkway Tunnel (Document no: 1MCo3oSCJ-GL-MST-SSo1\_SLo3-000001).
- 4.1.4 Previous installation employed measures that minimised risk of harm to the significance of the heritage asset:
- Anchor points were secured to the tunnel wall by fixings that required two M10(10mm diameter) drill holes to achieve minimum equipment support

- Tool Box talks were provided to all operatives on the significance of the listed structure.

## 4.2 Instrumentation

4.2.1 This current proposal is for sets of instruments to be installed on the retaining walls in the uncovered Parkway cutting south of the tunnel portal:

- 6 no. one metre tilt beams to be installed on the western retaining wall (RWo22), to measure any rotation or change of angle of the wall (Figure 3).
- 33 no 3D prisms to be installed on the western retaining wall (RWo22), to measure any change in absolute movement of the wall (Figure 3).
- 6 no. two metre tilt beams to be installed on the west face of the central retaining wall (RWo19A), to measure any rotation or change of angle of the wall (Figure 4).
- 33 no 3D prisms to be installed on the west face of the central retaining wall (RWo19A), to measure any change in absolute movement of the wall (Figure 4).
- 6 no. two metre tilt beams to be installed on the east face of the central retaining wall (RWo20A), to measure any rotation or change of angle of the wall (Figure 5).
- 33 no 3D prisms to be installed on the east face of the central retaining wall (RWo20A), to measure any change in absolute movement of the wall (Figure 5).
- In total, 18 tilt beams and 99 3D prisms are proposed to be installed.
- Device location diagrams are set out in Figures 3-5.

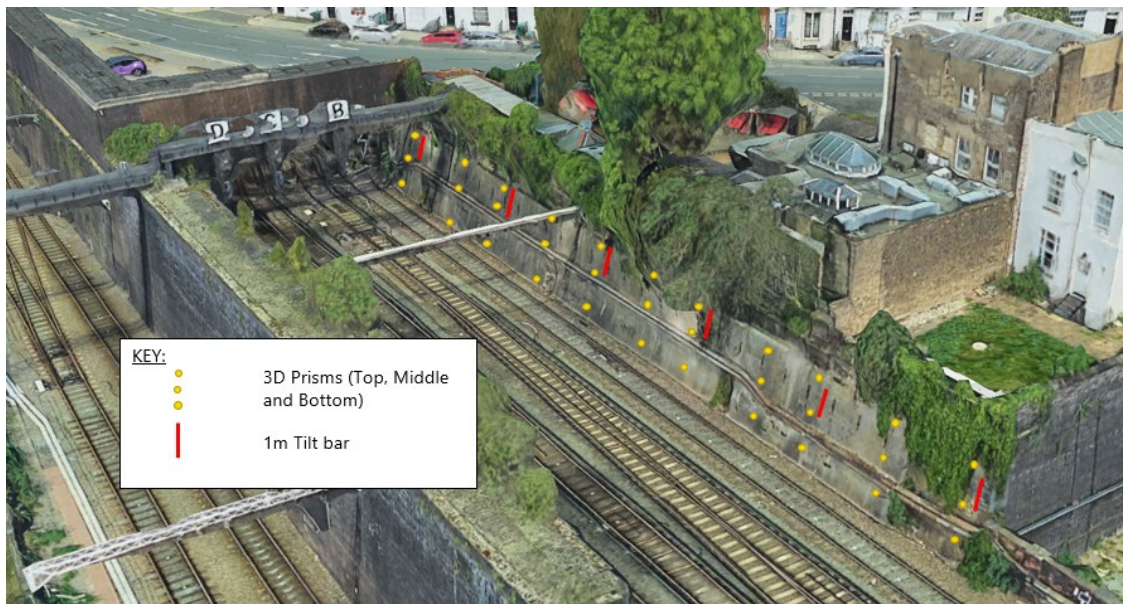




Figure 2 – Proposed Installation Locations on RW022

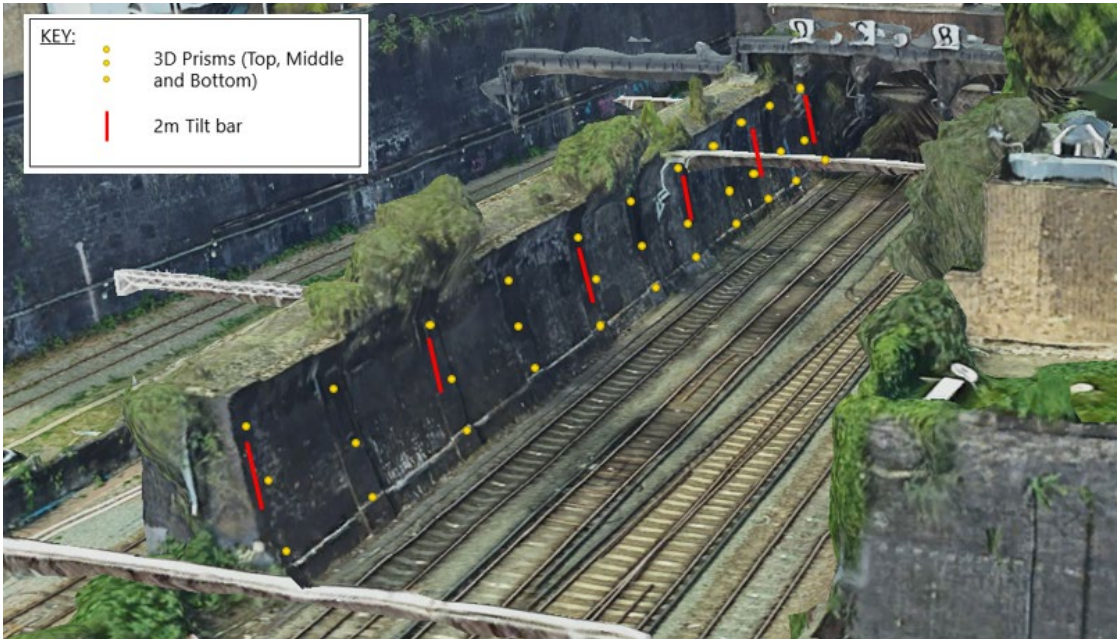


Figure 3 - Proposed Installation Locations on RW019A

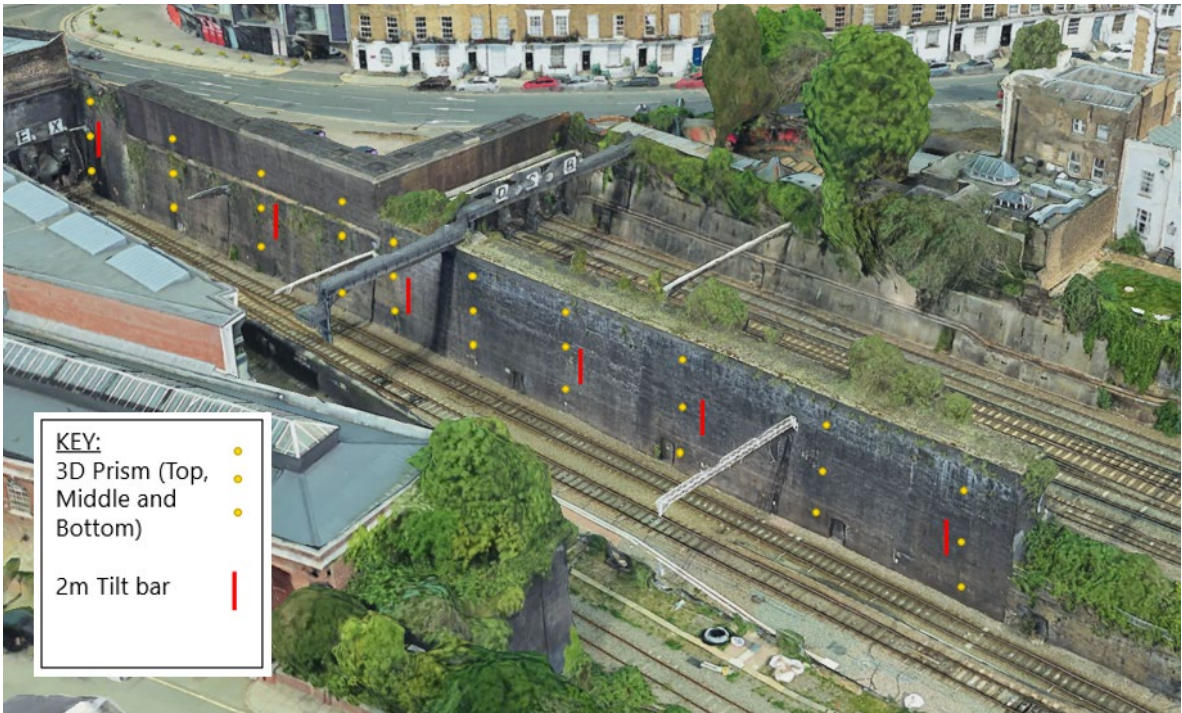


Figure 4 – Proposed Installation Locations on RW020A

## 4.3 Installation

- 4.3.1 Installation will follow the method previous used to attach monitoring devices to the listed tunnel and cutting.
- 4.3.2 All devices installed on wall RWo22 are to be attached to the surface of the concrete buttress, which forms a deep render covering the historic brickwork (Figure 3). Attachment of monitoring equipment will not affect historic fabric. Nevertheless, a standard approach to installation will be applied to all three wall faces.
- 4.3.3 Dust/carbon deposits will be carefully scraped away, if required to expose the brickwork, so mortar joints can be identified and located.
- 4.3.4 Each tilt bar will be installed and fixed by two anchor points, one high and one low. M10 (10mm) anchor attachments will be fixed by drilling into the mortar joints between the bricks or into the concrete buttress. No drilling directly into bricks will occur.
- 4.3.5 All fixings into masonry will be drilled using sharp tungsten carbide or diamond tipped masonry drill bits. The drill will be operated on a non-percussive setting, other than when drilling into the concrete buttress.
- 4.3.6 The type of anchor attachment used will be appropriate for the specific mounting bracket, so that the attachment ensures monitoring devices perform effectively.



Figure 5 – Example of one metre tilt beam and a 3D prism.

- 4.3.7 Prisms (Figure 7) will be installed using the same method.



Figure 6 – Example of a 3D prism.

## 4.4 Removal and repair

- 4.4.1 Following completion of monitoring works all instrumentation will be removed and the anchor attachment extracted from the hole.
- 4.4.2 Once the fixing is removed the open hole will be filled with a specialist mortar to match the colour and composition of the existing mortar. The repair will be finished flush with the surrounding mortar joint and textured to match the existing.
- 4.4.3 A specialist masonry subcontractor will be appointed on behalf of HS2Ltd by SCS Railways to carry out minor repairs (surface fills) to the mortar joints.
- 4.4.4 The specialist subcontractor will have a proven track record of training and experience in the conservation and repair of masonry structures that are grade II listed buildings. The subcontractor will be vetted and approved by the project's Heritage Specialist.

## 4.5 Additional risk reduction measures

- 4.5.1 A Tool Box Talk will be held before work starts so that operatives are aware of the historical significance and condition of the structure. The works are planned over several consecutive shifts during a suitable Rail Possession period. This Tool Box Talk will be presented to each team working on each shift.
- 4.5.2 SCS heritage specialist will undertake regular inspections and oversee work .

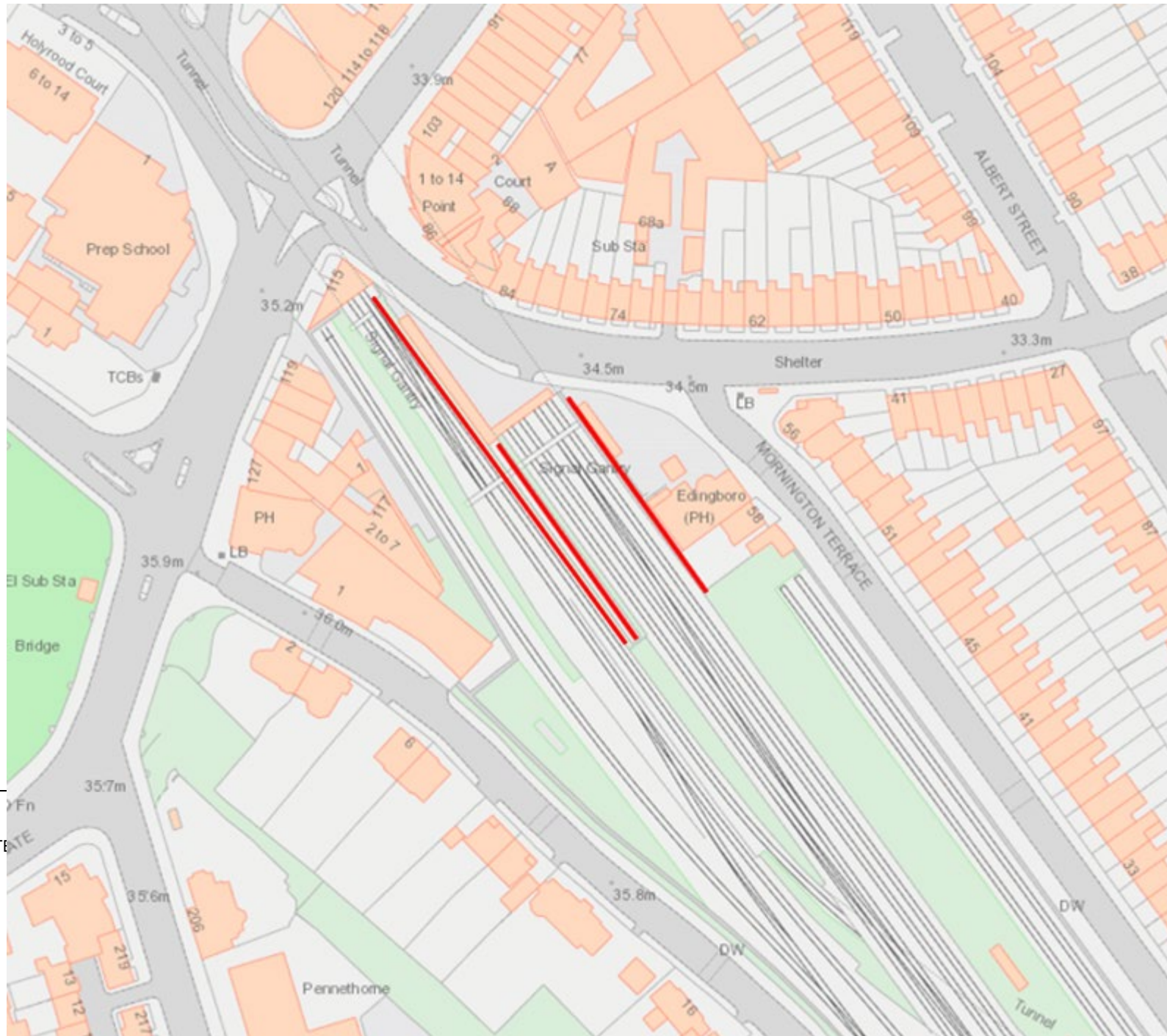
# 5 Effect on heritage significance

- 5.1.1 Installation of ground monitoring instruments is a temporary arrangement to ensure accurate monitoring of the heritage asset prior to and during construction.
- 5.1.2 All devices will be removed on completion of construction works and there are no permanent additions or alterations to the listed structure.
- 5.1.3 Monitoring instruments are to be installed with minimum fixings, which on removal will leave no permanent trace.

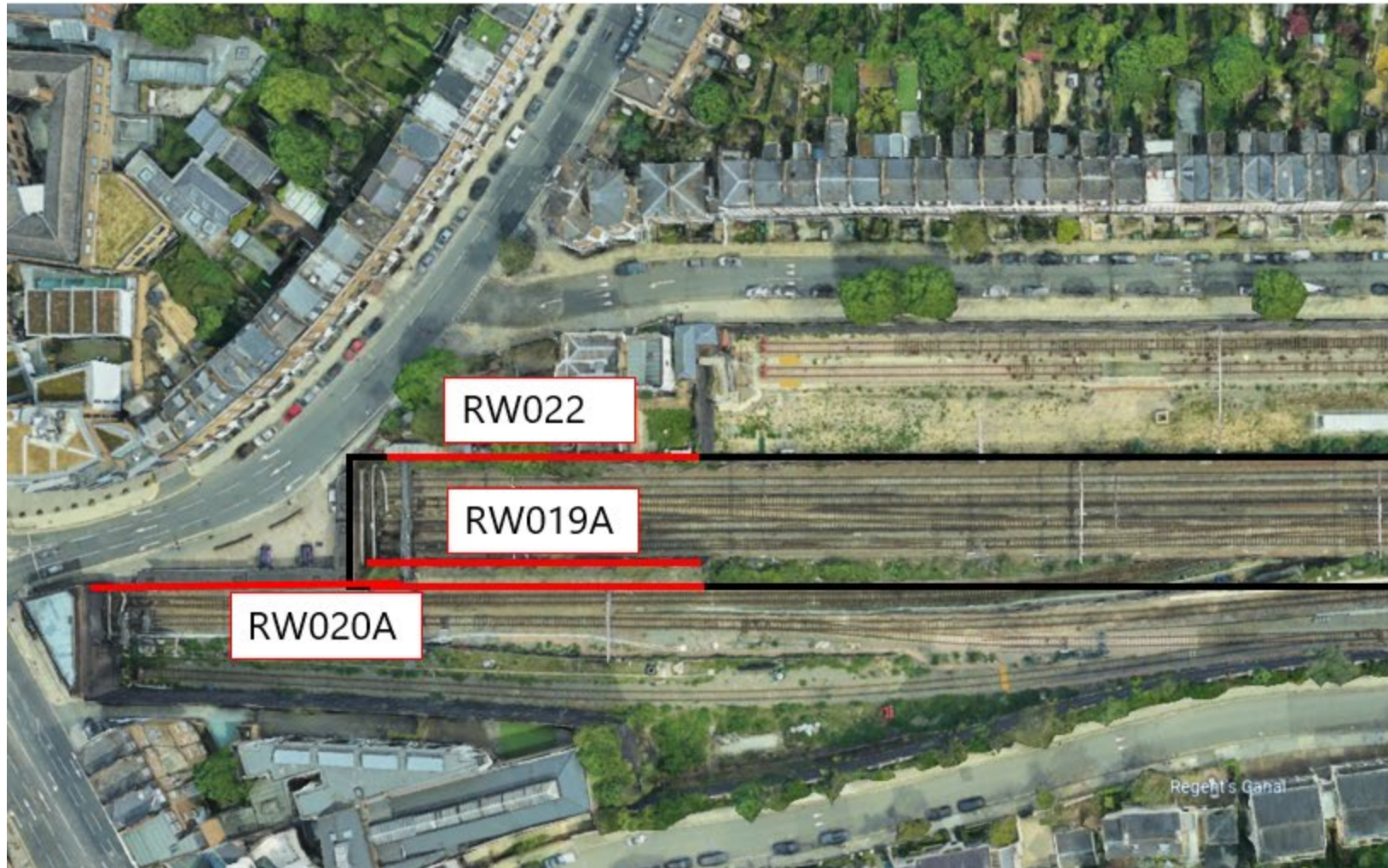


- 5.1.4 With regard setting, the temporary presence of monitoring devices is consistent with the widely occurring functional equipment required to sustain rail industry operations.
- 5.1.5 Installation of monitoring instruments does not result in loss of heritage significance, involves negligible loss of historic fabric and offers specific benefits. It is a precautionary procedure to identify ground movements so that appropriate measures to protect the asset can be deployed to prevent systemic or structural harm.
- 5.1.6 Specifically, monitoring instruments will provide data to inform decisions on managing and mitigating effects on heritage assets during the planned HS2 tunnelling operations; providing a record of observed ground movements that will:
- validate modelled predictions
  - determine whether interventions are required to mitigate potential harm to heritage assets
  - calibrate construction responses with observed changes during tunnelling.

## Appendix 1 Asset location







## Appendix 2 Official list entry

Heritage Category: Listed Building

Grade: II

List Entry Number: 1113255

Date first listed: 14-May-1974

Statutory Address 1:

PARKWAY TUNNEL AND CUTTING, PARKWAY

The scope of legal protection for listed buildings

This List entry helps identify the building designated at this address for its special architectural or historic interest.

Unless the List entry states otherwise, it includes both the structure itself and any object or structure fixed to it (whether inside or outside) as well as any object or structure within the curtilage of the building.

For these purposes, to be included within the curtilage of the building, the object or structure must have formed part of the land since before 1st July 1948.

The building or site itself may lie within the boundary of more than one authority.

County: Greater London Authority

District: Camden (London Borough)

Parish: Non Civil Parish

National Grid Reference: TQ2871683563

Details: TQ2883NE 798-1/76/1290 14/05/74

CAMDEN PARKWAY (South side) Parkway Tunnel and Cutting

II

Railway tunnel & cutting. c1836-7. Tunnel entrance of Old Line with stone jambs carrying C20 steel girder. Tunnel walls of stock brick with closely spaced shallow buttresses with stone caps, carried up to form piers for good cast-iron railings with arcaded motif. Former segmental cast-iron struts spanning cutting between piers cut back to base plate. Similar revetment north-east of tunnel. North-west of tunnel railings and piers added c1900-6 to match older work when the New Line was built.

Document Title: Heritage Agreement Method Statement (HAMS)– Euston Throat West – Installation of Tiltmeters and Prisms on Parkway Tunnel Cutting  
Document no: 1MCo3-SCJ-GL-MST-SS01\_SLo3-000003  
Revision: C01

Listing NGR: TQ2871683563

Legacy

The contents of this record have been generated from a legacy data system.

Legacy System number: 477732

Legacy System: LBS

## Appendix 3 HS2 Environmental Statement Technical Appendices (Volume 5: Gazetteer of heritage assets)

5.1.8 The HS2 Environmental Statement Technical Appendices (Volume 5: Gazetteer of heritage assets) provides the following description of the Parkway tunnel and cutting:

- Railway tunnel and cutting (also known as Park Street tunnels). Surviving structural remains of original 1836-7 railway tunnel and cutting. Tunnel walls of stock brick with closely-spaced shallow buttresses with stone caps. Former segmented cast-iron struts spanning cutting between piers cut back to base plate. Similar revetment to north-east of tunnel.
- North-west of tunnel, railings added circa 1900-6 to match older works when new line was built. Modified in 1870s and remodelled at southern end with the creation of the new parkway tunnel to the west (1900-06).
- South of parkway tunnel western cutting wall. Partial remains of original 1836-7 cutting. Survives as freestanding wall with western side of wall rebuilt as part of the 1900-06 new cutting. Heavily modified with cast-iron struts (which formerly linked the wall to the listed part of the cutting adjacent to Edinburgh Castle) removed following creation of new cutting. Although heavily modified, the structures retain much of their original railway infrastructure setting.