1MC03 Main Works – Contract Lot S1

Heritage Agreement Method Statement HAMS - Monitoring and Conservation Management of Ground Movement due to Below Ground Construction at 57 Mornington Terrace-Asset Protection Section 1 Euston Cavern and Reception Chamber –APD-ESCT-01

Document no: 1MC03-SCJ-EV-MST-SS01_SL03-000012

Revision	Author			Checked by	Approved by	Date approved	Reason for revision
C01	Ken Whittaker			Tim Liversage	Toby Loxley		EMT Review (C01.1)
C01	Ken Whittaker	Tim Liversage	Toby Loxley				Close out EMT review comments (C01.2)
C01	Ken Whittaker	Tim Liversage	Toby Loxley				Update monitoring proposals (C01.3)

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1 Introduction

1.1 Project Context - Schedule 18: Listed Buildings

1.1.1 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. 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.

1.1.2 The Secretary of State 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. Skanska Costain Strabag Joint Venture (SCSjv) is the Main Works Contractor constructing thirteen miles of twin-bore tunnels on the HS2 route to its southern terminus at Euston.

1.1.3 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 aspects of this legislation from the Phase One works. There is no requirement for listed building consent for the purpose of:

demolition, alteration or extension in respect of the listed buildings set out in Schedule 18 Table 1, or which are listed on or after 30 September 2013

heritage or monitoring works in respect of the listed buildings set out in Schedule 18 Table 2, or which are listed on or after 30 September 2013.

1.1.4 Following Royal Assent, HS2 Ltd entered into Heritage Agreements with London Borough of Camden and with Historic England (dated 20th February 2017) concerning the Schedule 18 listed buildings within the London Borough of Camden.

1.1.5 Clause 2.1 of the Heritage Agreement permits HS2 to undertake works to Schedule 18 listed buildings, subject to a Heritage Agreement Method Statement (HAMS). This details the proposed works and is submitted to the local authority for their approval, in consultation with Historic England where required.

1.2 Purpose

1.2.1 This HAMS:

addresses the requirement of Clause 2.1 of the Heritage Agreement to prepare a method statement describing heritage and monitoring work designed to protect heritage significance and avoid or minimise harm to the historic fabric and setting of 57 Mornington Terrace (a separate HAMS is to be submitted for Schedule 18 consent for the adjoining grade II listed 58 Mornington Terrace. It outlines an asset protection management strategy, design rationale and technical method statement for installing monitoring devices, for undertaking generic remedial repairs to historic fabric and

arranging urgent temporary works if building damage predictions are exceeded and present additional risk to building structure/serviceability

is the subject of a Schedule 18 application requesting approval for the monitoring and conservation management of ground movements due to below ground construction at 57 Mornington Terrace. This Schedule 18 application is prepared according to procedures set out in HS2 Phase One Heritage Consents Strategy (HS2-HS2-EV-STR-000-000008).

1.2.2 The HAMS informs:

stakeholders, including the consenting authority - it explains how SCSjv will:

- avoid or minimise harm to heritage significance during tunnel construction by careful installation of building movement monitoring at 57 Mornington Terrace
- use monitoring information to manage timely responses to building movement and undertake conservation repair works at 57 Mornington Terrace in co-ordination with tunnel construction.

Asset Protection Teams - describes heritage conservation measures to be incorporated in sub-contractors' Risk Assessment and Method Statements (RAMS) when undertaking works for heritage and monitoring purposes at 57 Mornington Terrace.

1.2.3 This HAMS contains the following information:

an up-to-date location plan (Figure 1)

statement describing the heritage significance of the listed building (section 4 Building Information)

a description of the relevant HS2 below ground construction works and predicted building damage (section 5.3 Phase 3 GMA)

a specification for the proposed monitoring instrumentation and a method statement for installation, maintenance, removal and conservation repairs (sections 7 Monitoring)

drawings at a suitable scale showing the specified instrumentation locations (Appendix A).

1.2.4 This HAMS also describes a mitigation design rationale (section 6 Mitigation) and conservation management plan (section 8 Conservation Management) for remedial repair to avoid or minimise the potential risk of harm or loss of heritage significance at the listed building.

1.3 Scope

1.3.1 57-58 Mornington Terrace are a pair of 3 & 2 storey (with cellar/basements) semi-detached masonry buildings on the east side of the Network Rail (NR) cutting approach to Euston Station (Figure 1).

1.3.2 Edinboro Castle public house, 57 Mornington Terrace (Figures 1 (based on 1:560 OS), 2 and 3), a grade II listed building (list entry 1113147) is included in Schedule 18 (Table 2: Buildings authorised to be altered or extended for heritage or monitoring purposes), as is the attached residential property at 58 Mornington Terrace.

Figure 1 - Site location showing property boundary to 57-58 Mornington Terrace (no 58 shaded)

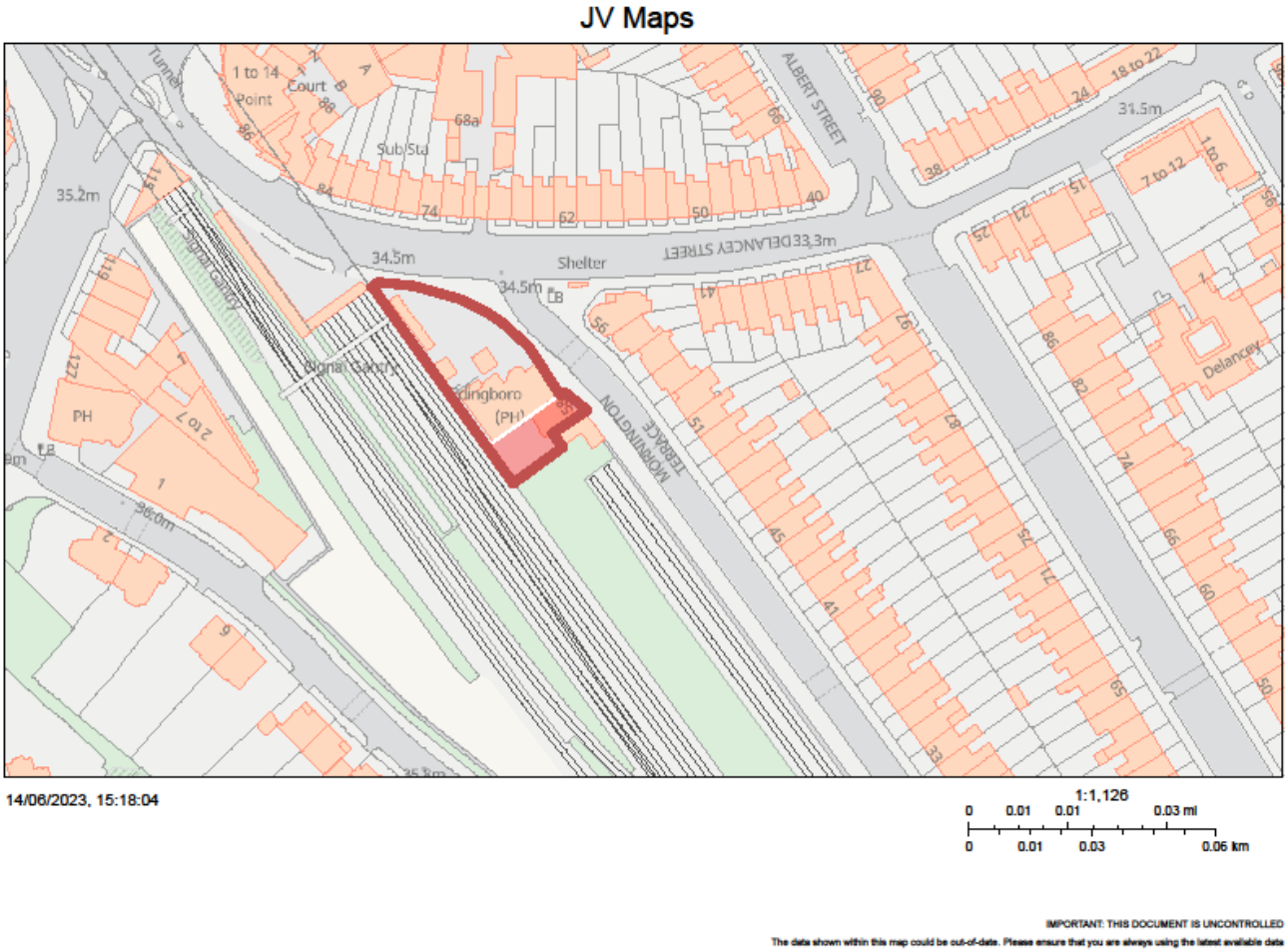


Figure 2 – 57 Mornington Terrace main elevation

Figure 3 57 Mornington Terrace north side elevation (north)

1.3.3 This method statement relates solely to 57 Mornington Terrace. A separate HAMS details corresponding proposals that relate specifically to 58 Mornington Terrace (1MC03-SCJ-EV-MST-SS01_SL03-000023). Both HAMS define precautionary procedures to identify ground movements and consequent building structural responses so that appropriate measures to protect the assets can be deployed and engaged to prevent harm to heritage significance.

1.3.4 Specifically, monitoring instruments will provide data to inform remedial measures that are further outlined in this method statement as dynamic components of a conservation management plan designed as a response to HS2 tunnel construction.

1.4 Engagement

1.4.1 HS2 Phase One Heritage Consents Strategy (Document no.: HS2-HS2-EV-STR-000-000008) require pre-submission discussion with the relevant local authority and Historic England (where applicable) on works affecting Schedule 18 listed buildings. The purpose of this discussion is to agree action to protect the significance of Schedule 18 Listed Buildings.

1.4.2 Pre-submission consultation with London Borough of Camden and Historic England on proposals for temporary installation of monitoring devices by fixing to the listed building occurred during a regular monthly meeting held on 1 February 2023.

1.4.3 In response the London Borough of Camden Senior Planner (Conservation) advised SCS Railways that a HAMS for 57 Mornington Terrace monitoring and conservation management should be submitted for Schedule 18 consent.

1.4.4 The Camden conservation team have further advised on the proposals detailed in this HAMS. The monitoring and conservation management design set out in the HAMS benefits from the technical advice provided.

1.5 Assumptions & Limitations

1.5.1 This method statement has been produced using information generated by SCSjv/Design House, SCSjv sub-consultants and sub-contractors and from online resources available at the time of writing.

1.5.2 The SCS Asset Protection, Engagement and Monitoring Teams visited the site to undertake internal measured survey, external inspection and a CCTV drainage survey. Further sources of information include historical building plans & sections obtained from the London Borough of Camden, information provided by owner of number 58 (Edinboro Castle) and their structural engineer, and the findings of targeted intrusive investigations conducted by GBG Ltd in 2023. Information and images presented in this method statement include the result of these site observations and surveys.

1.5.3 Relevant technical guidance that informed the preparation of this HAMS includes:

HS2-HS2-CV-STD-000-000004 P03 Technical Standard - Civil Engineering Instrumentation and Monitoring ·

HS2-HS2-TN-STD-000-000005 P05 Technical Standard - Ground movement and assessment from underground construction

HS2 Specification for Civil Engineering Works' Series 4500 – Instrumentation and Monitoring' (HS2-HS2-CV-SPE-000-014500)

HS2-H S2-EN-STD-000-000009Technical Standard – Sound, Noise and Vibration Instrumentation and Monitoring · High Speed Rail London-West Midlands)

HS2 Environmental Minimum Requirements Annex 1: Code of Construction Practice Para 13.2.18 to 13.2.31 https://www.gov.uk/government/publications/environmental-minimum-requirements

SCSjv Phase 3 Ground Movement Assessment Report - Building Assessment Euston Cavern and Shaft - Euston Throat West S1 (1MC03-SCJ_SDH-GT-REP-SS01_SL03-000018 C03.2)

SCSjv Designers Monitoring Plan - Area East Buildings Package 2 (EB2) - S1MDL Code: Document no.: 1MC03-SCJ_SDH-GT-PLN-SS01-000002

SCSjv WP203.3 Designer Monitoring Plan – 57-58 Mornington Terrace (MC03-SCJ_ABX-ST-PLN-SS01_SL03-000001)

SCSjv Building Damage Assessment and Mitigation Report - 57 to 58 Mornington Terrace (1MC03-SCJ_ABX-ST-ASM-SS01_SL03-000002)

SCSjv Edinboro Castle (57 Mornington Terrace) and 58 Mornington Terrace Survey for Design Assessment [Heritage] (1MC03-SCJ_OTB-PM-REP-S000-000093)

The Crown Estate Guidelines and Standard Specification to Architects for the Regent's Park, Kensington Palace Gardens, St. James's, Pall Mall South, Haymarket and Lower Regent Street Residential and Commercial Estates, Seventh Edition January 2014

2 Definitions and abbreviations

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

Abbreviation	Definition
APES	Additional Provision Environmental Statement
DC	(Building) Damage Category
DH	Design House
EMR	Environmental Minimum Requirements
ES	Environmental Statement
GIS	Geographical Information Systems
GMA	Ground Movement Assessment
HAMS	Heritage Agreed Method Statement
HS2	High Speed 2 Ltd

Abbreviation	Definition
I&M	Instrumentation and Monitoring
OS	Ordnance Survey
PDF	Portable Document Format
NR	Network Rail
RAMS	Risk Assessment Method Statement
SCjv	Skanska Costain Joint Venture
SCL	Sprayed Concrete Lining
SCSjv	Skanska Costain Strabag Joint Venture
SES	Supplementary Environmental Statement
TBM	Tunnel Boring Machine

3 Responsibilities

3.1 Management and design

3.1.1 HS2 is responsible for meeting the commitments described in HS2 Information paper C3: Ground Settlement. Following the processes set out in C3, SCSjv has considered how harm to third party property assets can be avoided or minimised in advance of tunnel construction and is making arrangements for appropriate remedial works during or following construction.

3.1.2 Asset Protection activities within each SCS contract area are the responsibility of the SCSjv Area Technical Lead, supported by the Asset Protection core team, including the SCSjv Heritage Technical Lead.

3.1.3 Technical design specialists provide additional support:

Edinboro Castle (57 Mornington Terrace) and 58 Mornington Terrace Survey for Design Assessment [Heritage] (1MC03-SCJ_OTB-PM-REP-S000-000093) was prepared following a visual inspection by Byrne Looby in 2021

Phase 3 Ground Movement Assessment (1MC03-SCJ_SDH-GT-REP-SS01_SL03-000018 C03.2) provided by Design House (DH), with baseline data simulating the phased construction of the excavation and tunnelling works obtained from the 'North' and 'Central' ETW LS-DYNA models

Mitigation Report (1MC03-SCJ_ABX-ST-ASM-SS01_SL03-000002) and Designer's Monitoring Plan (1MC03-SCJ_ABX-ST-PLN-SS01_SL03-000001)are prepared by framework sub-consultants Alan Baxter Ltd.

4 Building Information

4.1 Asset Identification

4.1.1 57 Mornington Terrace is a three-storeys public house with cellar and residential accommodation above. It is attached to 58 Mornington Terrace which is a grade II listed residential property. .

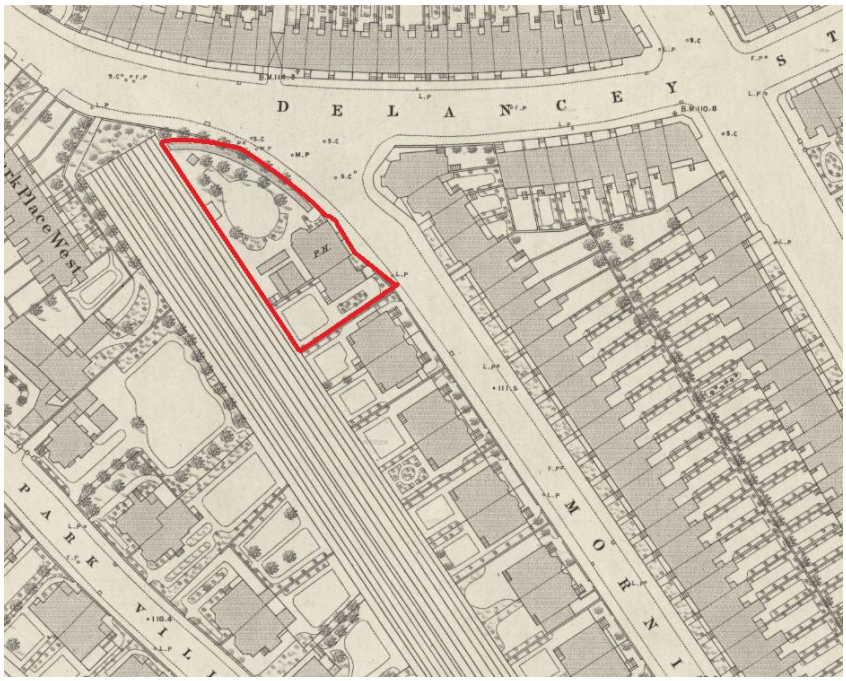
4.1.2 The Edinboro Castle is at the end of a street extending from Mornington Crescent in the south to Delancey Street at the north. Originally named Mornington Road, the street comprised terraced town houses on the east; and on the west, backing onto the railway, a row of semi-detached villas (Figure 4). The villas were removed to accommodate expansion of the rail cutting at the beginning of the 20th century (Figure 5).

4.2 Extent & Context

4.2.1 Mornington Terrace was built in 1838 alongside and contemporary with the London and Birmingham Railway, on land that was part of the Southampton estate, latterly held by the Fitzroy family, direct descendants of Charles II.

4.2.2 Mornington Terrace mirrored design principles John Nash had earlier used at Park Village East and the York & Albany Tavern, with the result that a public house faces either side of the Parkway rail crossing on or close to the principal commercial route from Camden Town to Regent's Park (Figure 5).

Figure 4 Ordnance Survey 1870

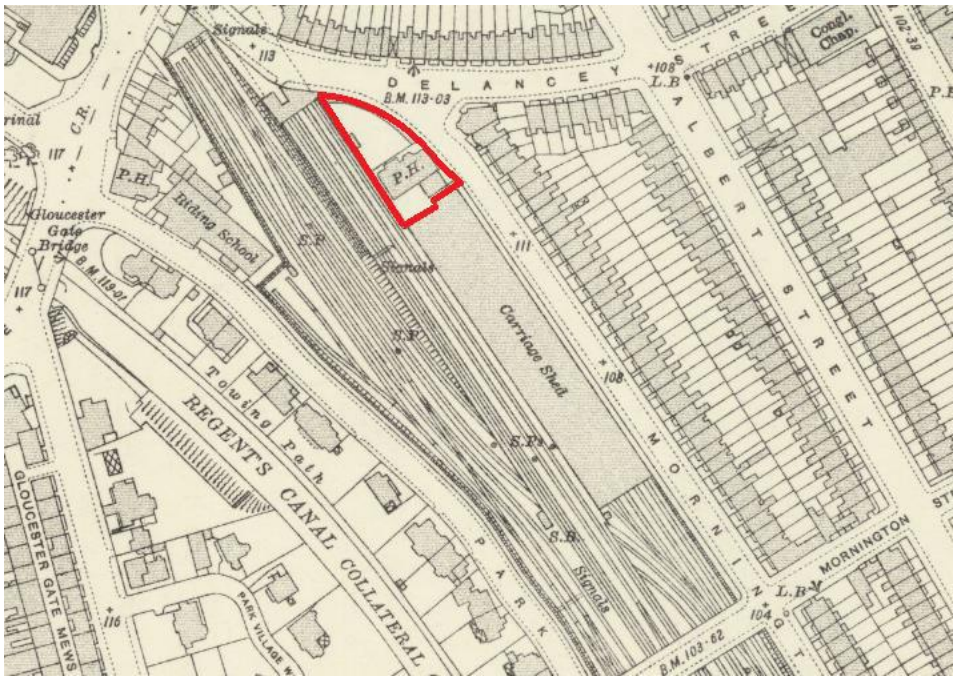


4.2.3 Located immediately above the approach to the Parkway railway tunnel portal, the Edinboro Castle was a visible landmark to train passengers departing Euston (Figure 4).

4.2.4 Intended as small homes for professional families, Mornington Terrace marked a transition from Nash's large Regent's Park properties to the increasingly industrial and commercial areas of Camden Town immediately east.

4.2.5 Expansion of the Euston to Birmingham railway cutting occurred between 1900 and 1905. Thirteen semi-detached villas on Mornington Terrace and the adjoining railway retaining wall were demolished to widen the cutting. A further twenty detached and semi-detached Park Village East villas, along with Stephenson's railway cutting retaining wall, was demolished on the west side (Figure 5).

Figure 5 Ordnance Survey 1913



4.2.6 The pub, its attached residence and the adjoining section of the Parkway cutting retaining wall are the last surviving elements on the west side of Mornington Terrace contemporary with the original 1837/38 railway and pub/housing scheme.

4.2.7 Coincidentally an artist representation of this composition was captured during construction, in a notable illustration in J C Bourne's pioneering 'A Series of Lithographic Drawings on the London and Birmingham Railway, 1838' (Figure 6 'Building retaining wall near Park Street').

Figure 6 J C Bourne's pioneering 'A Series "Building retaining wall near Park Street'

4.2.8 Construction of a pub at the outset of a speculative development was common at the time. Girouard (Girouard, p. 37) noted that 'the pub was often the first stage of a speculative development, with the builder as the first licensee.' He cites an 1854 article in the Builder describing the 'propinquity of these palaces to each other in Camden and Kentish New Towns is quite ridiculous'. This arrangement had two advantages - the pub could be used by workers or used as an office during the building project and the lease for the licenced site could be sold for a good price to raise further capital for building.

4.2.9 The earliest accurate depiction of the building shows the ground floor elevation (Figure 7). On the façade there is an inscription: "THE EDINBURGH CASTLE TRUMAN IMPORTER WINES". On the small pediment there is the name "WHICHELO" (F.W. Whichelo was licensee of the Edinburgh Castle from 1848). The building has a porch with composite columns and an extruding heavy cast-iron lantern. The stucco elevation and domestic scale of the building with elaborate pedimented tablets at parapet level and a lantern over the entrance are typical of 1830s public houses.

Figure 7 Edinboro Castle c 1840

4.2.10 By the 1870 OS map the north block had been replaced with the present-day north canted bay (Figure 4).

4.2.11 By 1894, the OS maps show the pub was extended with a single storey addition at the rear, almost doubling the size of the building at ground level. This extension was built up to, but not against, the retaining wall (Figure 8).

Figure 8 Ordnance Survey 1894

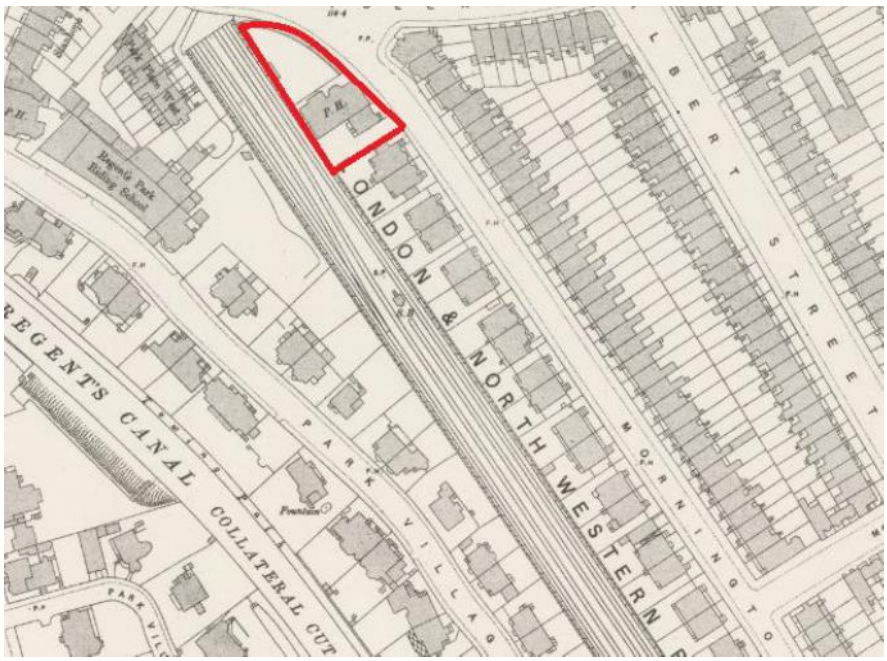
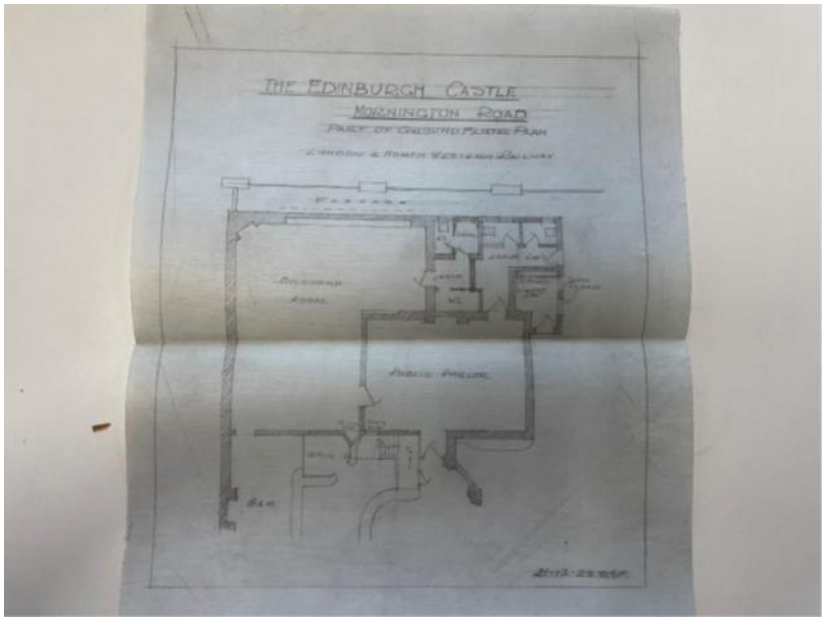


Figure 9 Edinboro Castle frontage pre-1984 fire

4.2.12 New toilets and plumbing system were inserted in an extension to the rear c. 1930 (Figure 10).

Figure 10 Ground floor plan of c 1930 rear extension



4.3 Description

4.3.1 The Historic England list entry includes a brief architectural description.

Edinburgh Castle Public House, 57, Mornington Terrace (grade II, list entry number 1113147)

Public house. Mid C19, restored 1984. Stucco with wooden public house frontage. 3 storeys and cellars. Double fronted with 3 windows; right hand return 1 blind window and 3 light canted bay. Public house frontage with central entrance and Corinthian pilasters carrying entablature with dentil cornice and broken segmental pediment over door. Panelled dado. Upper floors with recessed sashes; 1st floor with architraves and cornices. Entablature and shaped blocking course. Curved wrought-iron lamp bracket above door. INTERIOR: not inspected.

4.3.2 An updated detailed description of 57 Mornington Terrace has been prepared to inform SCS asset protection considerations.

Exterior

4.3.3 A three-storey brick building (plus cellar) adjoining No. 57 with a stucco entrance elevation and a wooden public house frontage (Figures 1 and 2). The semi-detached public house and residence share vestiges of a standard design vocabulary of typical neo-classical patterns for decorative finishes that represented late Georgian urban professional modest fashionable tastes. Key features have been replaced in broadly similar or later Victorian styles, not always to the original design and construction quality standards.

4.3.4 On the entrance elevation there are three recessed sash windows at each upper level; on the first floor these have architraves and cornices. There is a thick entablature and cornice at roof level continued around the return elevation obscuring two pitched roofs.

4.3.5 At ground level the elevation is rusticated with the wooden frontage later inserted in the late nineteenth century or early twentieth century. This comprises a central entrance flanked by Corinthian pilasters supporting an entablature and a dentil cornice and broken segmental pediment over the door. The lower section of the frontage is panelled. The windows and detailing of this frontage replace the more finely ornamented late Victorian/Edwardian wooden frontage (Figure 9), which itself replaced the original (Figure 7).

4.3.6 On the return elevation the sash windows at first and second floor are blind. There is a large canted bay across the three storeys with recessed architraved sash windows- like the front elevation, but slightly longer at first floor. The ground floor level is rusticated. The late nineteenth century single-storey addition is a brick extension with a stucco entablature and conservatory roofs (later replacements); a tripartite window faces into the side garden. This has been built up to the railway cutting retaining wall.

4.3.7 The upper two floors on the rear elevation have been altered: there is evidence of repointing and replacement brick work, and two of the six windows are now blind.

4.3.8 Exterior mouldings, window openings and cornice detailing were restored in 1985 following the fire and replaced or rebuilt like for like. The Victorian wooden entrance frontage was irreparably damaged and has been refabricated in similar design with modifications for better

access. The party wall with No. 57 at roof level was unstable, was taken down, and rebuilt (Camden Council LBC 8501056).

4.3.9 The side garden is largely cleared of vegetation to create an enclosed beer garden. The boundary with 58 Mornington Terrace is defined by the wall of the pub rear extension. The western perimeter boundary is formed by the Network Rail cutting retaining wall (grade II listed Parkway Tunnel and Cutting).

Interior

4.3.10 The 1984 fire severely affected the interior. Subsequent listed building consent for refurbishment was undertaken on the condition the building work was like for like.

4.3.11 The building was restored to a historic decorative scheme (Figure 11) following a design contemporary in date with the construction of rear extension in the late nineteenth century - to achieve a unified single interior space.

Figure 11 Refurbished interior

4.3.12 The bar area, the wooden panelling dividing the kitchen/services areas and railings/staircase to a raised platform at the rear of the pub, are all post-fire additions. Decorative details replaced during the refurbishment include dado rail, skirting and dentil cornice that continues across the room and the anaglypta wallpaper with delicate pattern motif.

4.3.13 The rear wall of the extension has a wide arched opening which may be part of the late nineteenth century structure. There are two fireplaces of c. 1880-1900. These are either ex-situ and implemented post-fire or part of the late nineteenth-century scheme and have been restored post-fire.

4.3.14 The cellars follow the plan of the 1830s building and contain the original delivery chute.

4.3.15 Upstairs, there is no surviving historic fabric although the sash windows have been replaced like for like. The partition walls have been moved or inserted to divide up the flats and the staircases were moved from the west to the south of the building c. 1985.

4.4 Setting

4.4.1 The Edinboro Castle and 58 Mornington Terrace are integral elements of Mornington Terrace and abut the western boundary to the Camden Town Conservation Area and the south boundary to the Primrose Hill Conservation Area. 57 Mornington Terrace retains the character of 19th public house and continues to offer hospitality services as originally intended.

4.4.2 57 and 58 Mornington Terrace together serve as a traditionally styled architectural focal point towards the north end of Mornington Terrace, set slightly back from Parkway. The setting contributes to historic and architectural interests, revealing an inter-relationship between concurrent railway and suburban residential development at the onset of the Victorian period; and consequent social and cultural interactions that influence 20th century urban and transport planning and design outcomes.

4.4.3 The setting reveals Mornington Terrace as part of an adaptative suburban development strategy by estate owners' monetising land assets during an accelerating metropolitan expansion. It demonstrates a pragmatic response to the unwelcomed proximity of the route of the UK's first intercity rail passenger and freight infrastructure. A tone of respectability was intended to appeal to potential leaseholders through use of shared design characteristics, including decorative stucco architectural detailing, copied from recently created elite residential neighbourhoods.

4.4.4 The widening of the Euston Approaches railway cutting gave further prominence to the public house and associated residence as the sole survivor of the row of semi-detached properties along the eastern side of the railway cutting. The matching reduction in property layout that also occurred Nash's Park Village East in 1900-1905, has inadvertently maintained the mirroring arrangements either side of the cutting..

4.5 Condition

4.5.1 Edinboro Castle is in fair condition, given the age and levels of maintenance undertaken since the extensive 1980s restoration. Most external walls, visible from street level, show sign of damp especially at high level, a potential problem with roof waterproofing and gutters. Cracks observed at the rear wall extension to No. 57 indicate historic settlement and rotation. .

4.6 Significance

4.6.1 The significance of this asset is on architectural and historic interests, specifically the social importance of public houses to Victorian London's expanding urban population, but also the influence of early railway infrastructure on contemporary residential urban design and the

correlation of architectural fashions with changing social perceptions. The setting makes a key contribution to heritage significance.

4.6.2 The buildings' external aesthetic and their contribution to group value of the surviving western side of Mornington Terrace illustrates how suburban expansion coincides with the earliest intercity railway at the very end of the late Georgian period and the onset of Victoria's reign. The Southampton estate adapted its development and marketing strategy to align social aspirations with a change in setting, balancing the relationship between the railway and more fashionable neighbourhoods that immediate pre-date the arrival of the London to Birmingham Railway.

5 Asset Protection - Design Rationale

5.1.1 The process for determining potential harm to property because of ground movement caused by HS2 underground construction has generated information that defines the scope of works set out in this method statement.

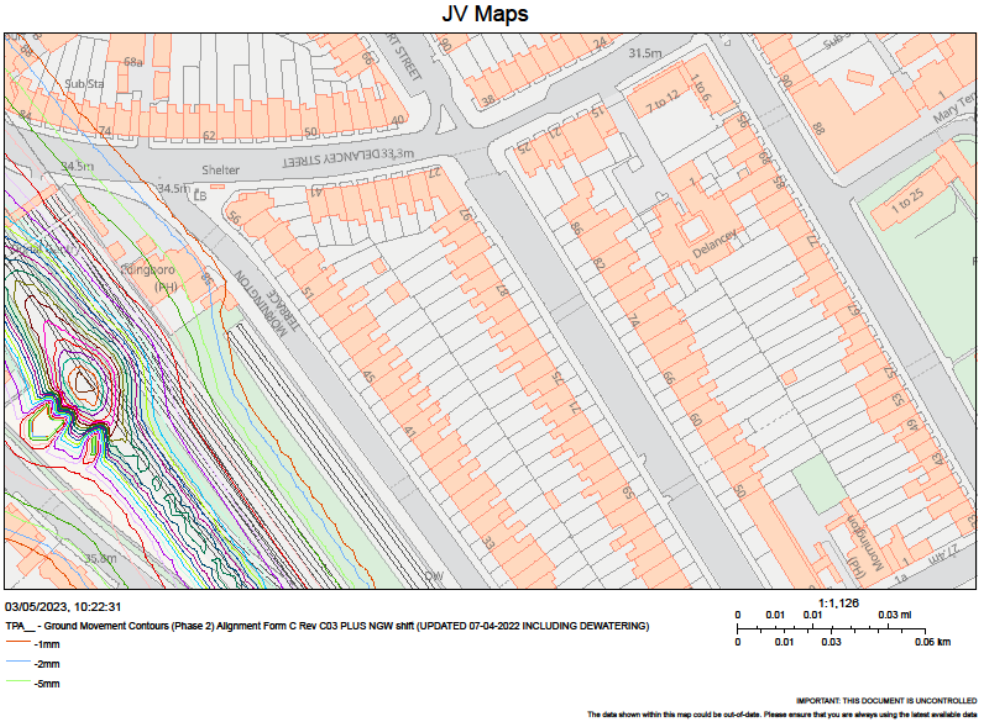
5.2 Ground Movement Technical Standard

5.2.1 HS2 Technical Standard HS2-HS2-TN-STD-000-000005 – Ground Movement and Assessment from Below Ground Construction details a three phase Ground Movement Assessment (GMA) process.

5.2.2 57 Mornington Terrace is located within the HS2 project zone of influence, as defined by Phase 2 GMA 1mm contour (SCS Railways JV Maps GIS system (Figure 9) and is at risk due to potential ground movements induced by HS2 construction.

5.2.3 As 57 Mornington Terrace is a listed building it met sensitivity criteria that require a Phase 3 GMA.

Figure 9 Phase 2 GMA contour



5.3 Phase 3 GMA

5.3.1 Phase 3 Ground Movement Assessment Report - Building Assessment Euston Cavern and Shaft - Euston Throat West S1 (1MC03-SCJ_SDH-GT-REP-SS01_SL03-000018 C03.2) considered structural and heritage impact to 57 Mornington Terrace due to permanent construction works:

Euston Tunnel (TBM)

Sprayed Concrete Lining (SCL) Crossover Tunnels

Euston Cavern Shaft

Euston Cavern

Connections between Euston Cavern, Euston Cavern Shaft and SCL tunnels.

5.4 Building Damage Assessment

5.4.1 The Phase 3 GMA includes a Building Damage Assessment that considers material properties consistent with the building typology and age. Burland et al. (1977) define six damage categories that distinguished between three principal criteria:

Burland damage categories 0 to 2 only - affects to visual appearance

Burland damage categories 3 & 4 – affects to serviceability or function

Burland damage category 5 - affects to building stability.

5.4.2 57 and 58 Mornington Terrace are jointly assigned Building Damage Category 3 (Moderate) due to a combination of:

predicted HS2 induced vertical and horizontal ground movements

historic changes affecting the local stability system at the east and west elevations on the attached pub at ground floor level

further stability system modifications to the ground floor at 58 Mornington Terrace.

5.4.3 During preparation of the Phase 3 GMA refinement it also became apparent that the west property boundary shows evidence for active ground movement associated with movements of the grade II Parkway Tunnel Retaining Wall.

5.4.4 There are no unresolved critical assumptions likely to change the Phase 3 GMA Building Damage Assessment and Heritage Sensitivity outcome. A refinement of the damage assessment is currently in progress, which involves further analysis and investigations of the building to assist in detailed mitigation design. Initial results support the key outcomes of the Phase 3 GMA ((1MC03-SCJ_SDH-GT-REP-SS01_SL03-000018 C03.2).

5.4.5 The potential risks during HS2 below ground construction works requires a mitigation response that complies with the requirements of the HS2 Technical Standard - Ground Movement and Assessment from Below Ground Construction (HS2-HS2-TN-STD-000-000005).

5.4.6 Risk to building serviceability and/or stability is limited (potential for disruption of rainwater goods and external utility services/drainage connections), but also:

predicted vertical and horizontal strains could damage walls perpendicular to the road i.e., the side (north) elevation to the Edinboro Castle, the shared party wall and the side (south) elevation to 58 Mornington Terrace:

- localised deformations (hogging) in affected walls may result in stress cracks at a single concentrated location
- external and internal surfaces of affected walls may display maximum crack widths of less than 3mm due to predicted hogging.

in addition, walls parallel to the street may experience shear cracking that could affect stucco render finishes.

5.4.7 The distinction between visual or aesthetic harm and major serviceability and/or structural stability damage is an important threshold. In this instance the predicted cracking is unlikely to affect building serviceability or stability but further consideration is given to potential harm to sensitive or susceptible features contributing to heritage significance.

Heritage Sensitivity and Magnitude of Effects

5.4.8 The sensitivity of the listed building and magnitude of heritage impact considers ground movement effects on heritage significance.

5.4.9 A system of scoring , following London Underground Movement Guidelines (HS2 Technical Standard - Ground Movement and Assessment from Below Ground Construction (HS2-HS2-TN-STD-000-000005, Table 10), considers two criteria:

sensitivity of the structure to ground movements and interaction with adjacent buildings

sensitivity to movement of particular features within the building.

5.4.10 57 Mornington Terrace is assigned:

a structural sensitivity score of 2: extensive refurbishment of the Edinboro Castle during the 1980s may have comprised structural stability systems at both 57 and 58 Mornington Terrace

a feature sensitivity score of 1: risk of cracks affecting appearance of the decorative moulded elements to the front façade of 57 Mornington Terrace, including decorative details to the pub frontage at ground floor which encompasses large areas of glazing, the moulded window architraves at first floor and the cornice at third floor..

5.4.11 In summary, 57 Mornington Terrace is likely to experience new localised superficial cracks to rendered walls that could affect finished surfaces and decorative design features. Taken with the Building Damage Assessment score, the magnitude of heritage impact is potentially high (HS2 Technical Standard - Ground Movement and Assessment from Below Ground Construction (HS2-HS2-TN-STD-000-000005, Table 11).

5.4.12 High magnitude heritage effects will be minimised by:

improvements to internal structural stability systems, taking into consideration previous internal ground floor modifications

implementing a monitoring and remedial repairs strategy as part of a conservation plan to minimises the potential adverse effects of ground movements due to both HS2 tunnelling and active movements at Parkway Tunnel Retaining Wall.

Environmental Minimum Requirement

5.4.13 The HS2 scheme design and associated construction and logistics planning has continued to be developed following publication of the HS2 London-West Midlands Environmental Statement (ES) (and subsequent Supplementary Environmental Statements (SES) and Additional Provision Environmental Statements (AP ES)).

5.4.14 The controls contained in the HS2 Environmental Minimum Requirements (EMR) ensure that impacts which have been assessed in the relevant ES will not be exceeded and, if possible, reduced.

Table 2 –Environmental Statement Assessment

Name	Designation	Value	Construction Impact		
			Nature of impact	Scale	Effect
Camden Town	Listed building, conservation area	Moderate	The asset is partially within the area of land required for the construction of the Proposed Scheme. Utilities works may impact temporarily on the setting and appreciation of the conservation area and some listed buildings. Demolition works to the Hampstead Road bridge Mornington Street bridge and the works on the Mornington Terrace retaining wall will affect the setting of the conservation area. Mornington Street Bridge and the revetment will be replaced on completion of the construction works	Minimal	Minor adverse

5.4.15 Table 2 summarises the construction impact based on the design assessed in the November 2013 ES, as amended by subsequent Additional Provision ES documents. Both 57 and 58 Mornington Terrace were assessed as part of Camden Town Conservation Area, although in fact they are located immediate outside the Conservation Area boundary.

5.4.16 The Phase 3 GMA demonstrates the latest design produces a Building Damage Category 3 (moderate) and a sensitivity score 3. Together they indicate the potential for high magnitude heritage impact. Cracks to walls may materialise and services/drainage may also be impacted that affects serviceability. This conclusion does not alter the general ES assessment and there are no additional significant environmental effects.

5.4.17 This HAMS details the mitigation actions informed by the Phase 3 GMA that accord with the broader requirements identified in the November 2013 ES, as amended by subsequent Additional Provision ES documents. The arrangements set out in sections 4, 5 and 6 of this HAMS further details a method statement for mitigation through monitoring and conservation management in accordance with SCS Asset Protection and Inspection & Monitoring (I&M) plans and procedures.

6 Mitigation

6.1.1 Information generated through asset protection processes has been used to define the mitigation response detailed in this method statement to the potential harm to 57 Mornington Terrace.

6.2 Asset Protection Management Plan

6.2.1 SCS Asset Protection Management Plan (1MC03-SCJ-EN-PLN-S000-000002) sets out the framework for the design and implementation of measures that respond to the Building Damage Assessment presented in the GMA report. It established procedures that ensures Third Party Assets are suitably protected from ground movements arising from S1/S2 London Tunnels Contract tunnelling and excavation activities.

6.2.2 Intended measures for protecting 57 Mornington Terrace accord with the Management Plan comprising:

targeted Structural Interventions in advance of construction (Asset Protection Mitigation Strategy Category 1), alongside

Monitor, React and Repair Strategy (Asset Protection Mitigation Strategy Category 2b) during and following construction.

6.3 Detailed Mitigation Design

6.3.1 Building Damage Assessment and Mitigation Report - 57 to 58 Mornington Terrace (Document no.: 1MC03-SCJ_ABX-ST-ASM-SS01_SL03-000002) reviews various alternative mitigation options, including at-source ground treatment measures and underpinning.

6.3.2 It confirms a combination of minor pre-emptive Structural Interventions with a Monitor, React and Repair Strategy as most suitable, especially from a heritage conservation perspective. It concludes:

6.3.3 minor pre-emptive structural interventions will be required to improve the general robustness of the building. Previous changes in the configuration of rooms at ground floor level at both 57 and 58 Mornington Terrace could affect the internal stability mechanism operating across the combined footprint of the properties. These mitigation works will be designed to prevent any disproportionate damage occurring and to reduce the risk of cracking in sensitive areas where subsequent repairs might be more difficult. **[These works are excluded from this method statement and will be detailed in a separate HAMS for proposed structural improvements that require modifications to the existing building fabric.]**

close attention will be given to monitoring movements at the building and to the railway cutting retaining wall that form the property boundary, where there is evidence that movements could have a localised effect on ground conditions. Current baseline monitoring systems shall be maintained (WP203.3 Designer Monitoring Plan – 57-58 Mornington Terrace - MC03-SCJ_ABX-ST-PLN-SS01_SL03-000001). Supplementary monitoring proposals are detailed in section 7 Monitoring

a risk-based Asset Action Plan will define specific monitoring trigger values that will determine further safeguarding actions based on the timely management of mitigation interventions in response to actual movements registered during and following tunnel construction

all repair and remedial repair works conducted at the property will meet required quality and conservations standards. Subject to freeholder agreement, SCSjv intend to adopt The Crown Estate Guidelines and Standard Specification to Architects for the Regent's Park, Kensington Palace Gardens, St. James's, Pall Mall South, Haymarket and Lower Regent Street Residential and Commercial Estates, Seventh Edition January 2014.

6.3.4 repair of predicted cracks will follow completion of permanent construction works, as outlined in section 8 Conservation Management. More generic remedial repairs may also be aligned with freeholder maintenance schedules

6.3.5 Emergency Works will be undertaken if predictions are exceeded, and the observed rate or magnitude of ground movement pose a risk to health and safety or to the preservation of the listed building. Framework contractors are on standby to undertake any necessary interventions, i.e. damage to utility connections, or damage to waterproofing systems that compromise serviceability or inhabitability of buildings. Emergency works will be undertaken in collaboration with the London Borough of Camden and Historic England, as set out in the Heritage Agreement (5 May 2017) clause 27.

7 Monitoring

7.1.1 Monitoring proposals take into consideration the existing ground movement baseline (section 7.2) and apply further guidance and requirements detailed in:

HS2 Specification for Civil Engineering Works – Series 4500: Instrumentation and Monitoring – Construction Document no.: HS2-HS2-CV-SPE-000-014500

SCS Instrumentation and Monitoring Statement S1 and S2 Document no.: 1MC03-SCJ-CL-STA-S001-000001

Designers Monitoring Plan - Area East Buildings Package 2 (EB2) - S1MDL Code: Document no.: 1MC03-SCJ_SDH-GT-PLN-SS01-000002

WP203.3 Designer Monitoring Plan – 57-58 Mornington Terrace (1MC03-SCJ_ABX-ST-PLN-SS01_SL03-000001)

7.2 Ground movement baseline trends

7.2.1 Comprehensive ground movement records for Mornington Terrace have been collected by both the Early Works (CSjv) and Main Works (SCSjv) contractors as part of the 'Network Rail Ground Movements Mitigation Scope'. The focus has been on understanding how mitigation works to Network Rail's Park Village East Retaining Wall could influence ground movements affecting property and rail assets in the vicinity. The adopted approach is based on Designers Monitoring Plan - Area East Buildings Package 2 (EB2) - S1MDL Code (1MC03-SCJ_SDH-GT-PLN-SS01-000002).

7.2.2 This provides a robust baseline record of seasonal movements and local spatial trends with reference to key third party assets, including 57-58 Mornington Terrace and the rear boundary which forms part of the grade II listed Parkway Tunnel Cutting and Retaining Wall.

7.2.3 The current baseline situation relevant to 57 Mornington Terrace is as follows:

horizontal movement data from routine patch scanning has been taken on the front elevation of 57 Mornington Terrace since 2020 (SCjv/SCSjv). There is no significant movement, with recorded measurement not exceeding technical margin of error (+/- 3mm)

satellite monitoring data from the period 2011-2020 has also been used to gauge historic patterns of ground deformation prior to the commencement of the HS2 Park Village East Retaining Wall mitigation works (Sixense, November 2022, Atlas InSAR Ground Displacement Monitoring HS2 S1S2 East Variation of Works Historical Study). As with the patch scanning data, any apparent movements are within the range of margin of error arising from methodological limitations.

it is now recognised there is evidence for historic and ongoing building movements to the rear of 57-58 Mornington Terrace that are likely due to long term effects of the construction design and later modifications to the Parkway Tunnel and Retaining Wall. Monitoring proposals detailed in this method statement are designed to obtain precise measurements from 57 and 58 Mornington Terrace that can be corelated with data collected following the proposed installation of Parkway Tunnel Cutting and Retaining Wall monitoring devices (part of the 'Network Rail Ground Movements Mitigation Scope' area monitoring strategy) as detailed in the following HAMS :

- Heritage Agreement Method Statement for Installation of Instrumentation at Parkway Tunnel Listed Asset Document no: 1MC03-SCJ_SOU-CL-MST-SS01_SL03-000004, 21/12/2020. Relates to tiltmeters and prisms attached to the eastern and western tunnel retaining walls

- Heritage Agreement Method Statement (HAMS) - Euston Throat West - Installation of Tiltmeters and Prisms on Parkway Tunnel Cutting Document no: 1MC03-SCJ-GL-MST-SS01_SL03-000003, 31/03/2022. Relates to retaining walls c.60m south of the eastern tunnel on either side of the track.

7.2.4 The Network Rail Ground Movements Mitigation monitoring system will be maintained as a continuous baseline record of ground movements attributable to seasonal and current/future construction and related events across the wider area. Specifically, localised ground movement data will determine:

tunnel ground movements and any variance against Phase 2/3 GMA predictions

potential association with observed deflections and cracking of DC3 listed building within the 1mm settlement contour

7.3 Additional monitoring requirements and options

7.3.1 Specific monitoring proposals for individual Damage Category 3 (DC3) residential buildings, including 57 Mornington Terrace, are intended to supplement the Network Rail Ground Movements Mitigation Scope monitoring strategy.

7.3.2 Additional instrumentation and monitoring will focus on recording specific measurements to inform conservation and mitigation measures to protect 57 and 58 Mornington Terrace from the effect of below ground construction, including:

asset specific deflections and cracks to:

- verify if asset is behaving as predicted in the Phase 3 GMA, both during and after construction
- provide early warning that initiates timely interventions required to avoid potential harm to the asset, in accordance with an established hierarchy of trigger values linked to a monitoring action plan (refer to 8.3)

ground movement and asset specific data to be reviewed in combination to:

- re-calibrate trigger values if ground movement data/asset specific obversions are not consistent with Phase 2/3 GMA predictions
- update the monitoring action plan to make appropriate adjustments for timing and type of preventative/mitigation measures and implementation in sequence with key construction trigger activities.

7.3.3 In accordance with HS2 Technical Standard - Civil Engineering Instrumentation and Monitoring (HS2-HS2-CV-STD-000-000004), monitoring will continue until the rate of settlement (or heave) is equal to or less than 2mm per annum (as determined by a minimum of four readings over a period of 4 months). The rate considered will exclude seasonal effects. For third-party assets, the cessation of monitoring will be subject to agreement with the third party.

7.4 Preferred monitoring system

7.4.1 Subject to access, baseline data gathering will be a combination of manual and automated data logging.

7.4.2 Manual and fully/part automated monitoring systems have been considered for measuring vertical settlement and horizontal displacement to the building. Instrumentation has been selected so that different options remain available should circumstances require a change in method:

7.4.3 fully automated system would provide data enabling movements to be tracked hourly and daily. A secure set-up arrangement is required to ensure no loss of visual and digital

connectivity over the extended timescales that monitoring is required to operate. It could also require instrumentation that has a greater visual presence

7.4.4 a manual system relies on brief regular (weekly/monthly) access to the property (including private outdoor space) to collect data using a mechanical Total Station to read measurements from reflective prisms attached to the building. It produces a less frequent record of building movements but is less constrained by connectivity and only requires discrete instrumentation attached to the property.

7.4.5 The risk of interruptions to connectivity resulting in loss of continuity in monitoring data and the level of intrusion affecting residents have been considered. High frequency automated monitoring data recording is not essential, and the predicted effect of ground movement can be effectively and safely managed through a part-manual system.

7.4.6 Primary method of data collection will manually log data using a mechanical Total Station to read 3D prisms, supplemented by automated logging of tiltmeter data. A fully automated system would require a change in recording device but is unlikely to require any changes to instrumentation attached to the listed building.

7.5 Monitoring Specification

7.5.1 Monitoring instruments will measure:

settlement and horizontal displacement

relative movement between each side of a crack

7.5.2 Primarily 3 D prisms of various sizes (Figure 10) and tiltmeters fitted to 0.5m beam (Figure 11) will be used. Devices will measure movements affecting both properties that form the semi-detached building and adjoining ground surfaces. The devices illustrated are typical examples, but specific instruments used may vary according to situation.

7.5.3 Table 3 details the minimum monitoring system instruments required at 57 Mornington Terrace.

Proposed locations across both properties are shown in full in Appendix A Instrumentation Design Drawings.

Asset/Item	**Instrumentation**	**Monitored parameters**	***Number***	**Comments**	**Frequency of data recording**
Buildings	3D prism targets on building façades	Settlement Horizontal displacement	27 maximum	Monitoring at locations identified on drawings in Appendix A.	Minimum monthly for baseline monitoring. Increased frequency during

	Tiltmeter on building façades		9 maximum		construction works adjacent to site TBC.
Pavements	Precise levelling studs and BRE studs	Settlement	9	At 5m C/C along zone of existing settlement and 10m centres elsewhere within beer garden. Attached to walls in back garden on No. 58	Minimum monthly for baseline monitoring. Increased frequency during construction works adjacent to site TBC.
Crack width for major crack	Crack width gauge, remote electronic or manual, as agreed with contractor and Visual Inspection engineer.	Change in crack width	TBC	Locations as shown on drawings in Appendix A. Potential for additional locations where further cracks are identified. Cracks to be monitored to be selected by contractor and Visual Inspection engineer. Cracks to be monitored separately in the horizontal and vertical directions (not perpendicular to the crack).	Remote read out to central computer or manual readout, depending on accessibility and as agreed with contractor and Visual Inspection engineer
	All frequencies to be adjusted according to progress of works and movement trends. Changes to be proposed by the Engineering Manager for discussion and agreement at Monitoring Review meetings.				

Table 3- Instrumentation specification

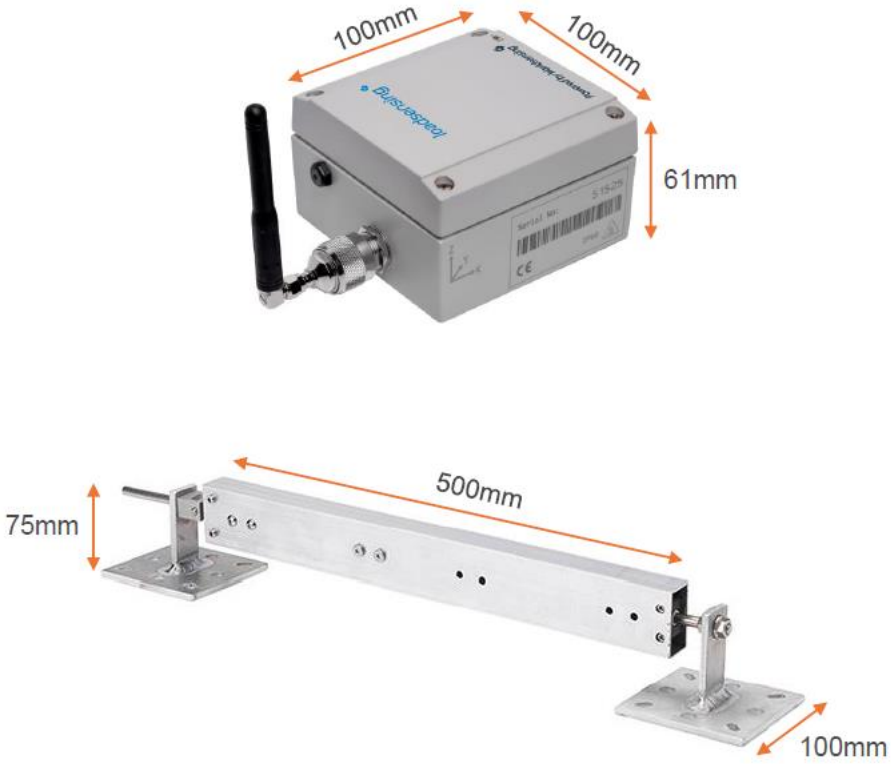
Building

7.5.4 3D prisms (data recorded using mechanical Total Station) attached to external walls at the top and bottom of each façade. (If colour options can be sourced and are available, instruments that best match the external building appearance will be installed).

Figure 10- Example of a 3D prism

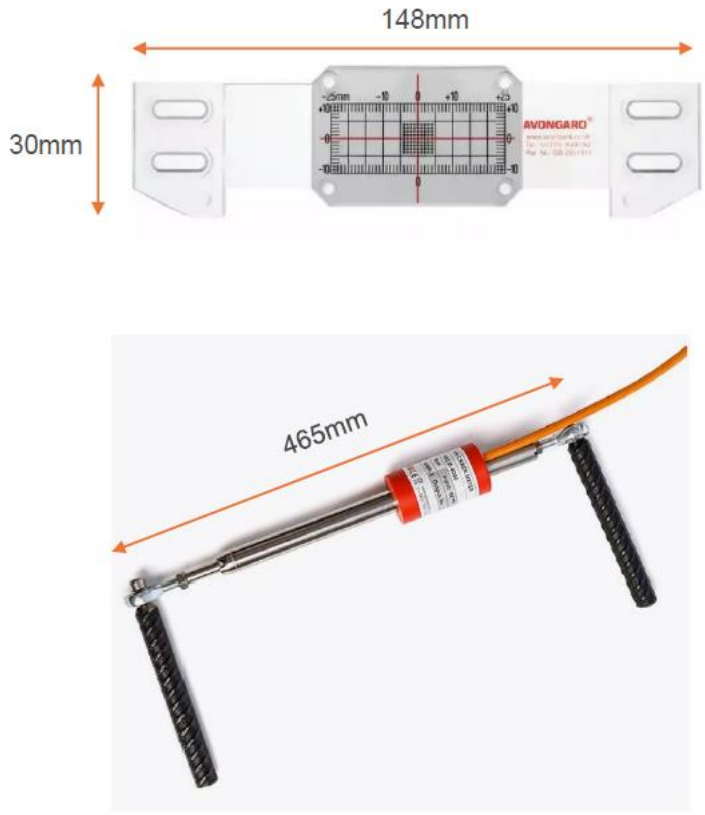
7.5.5 Tiltmeters are in areas that are less accessible, specifically the enclosed external walls forming the later rear extension (Appendix A).

Figure 11– Example of a tiltmeter



7.5.6 On appearance, internal and external cracks will be monitored using tell tales or monitoring studs (Figure 12).

Figure 12 Example manual crack monitor (top) and automatic crack sensor (bottom)



Ground surface

7.5.7 Settlement of the external spaces within the influence zone of the HS2 works will be monitored by means of precise levelling studs, at 5m or 10m centres.

7.6 Installation, maintenance, removal and repair

Location

7.6.1 Instrument locations shown in Appendix A are approximate and will be adjusted as necessary by the sub-contractor, depending on the as found conditions and the owner's agreement. Final locations for prisms will provide good visibility to the Total Stations.

Installation

7.6.2 All works to comply with hold point procedures, including 'Permits to Drill' as detailed in:

Method Statement and Risk Assessment - Installation and Monitoring of Instrumentation and Monitoring on Parkway Third Party Assets - Document no.1MC03-SCJ_SOU-CL-MST-SS01_SL03-000006.

Task Briefing Sheet - Installation and Monitoring of Instrumentation and Monitoring equipment at Edinboro Castle - EUSTON CAVERN SHAFT - Document No. 1MC03-SCJ_SOU-CL-REC-SS01_SL03-000012.

7.6.3 Instruments attached to the building will be firmly secured in line with the manufacturer's instructions to ensure effective monitoring and accurate measurements throughout the required period of operation. This is nominally taken as a minimum of 5 years, but total duration will be determined in line with the criteria set out in para 7.3.3 of this method statement, i.e. as required under HS2 Technical Standard - Civil Engineering Instrumentation and Monitoring (HS2-HS2-CV-STD-000-000004).

7.6.4 Access systems used to install instruments at height will not require a fixing that directly attaches to the building.

7.6.5 Instrument fixings that require bolting to the building will employ the minimum number of drilling points to comply with safety requirements and ensure effective operation of the instrument.

7.6.6 Drilling will take place into plain stucco surfaces or into exposed brickwork mortar joints. All drill locations will avoid decorative mouldings and stringcourses. Location of fixing points will avoid proximity to edges (i.e., less than 80mm) or areas of fragile render, which could result in surface spalling or excessive damage to surface finishes. This applies to all edges, including those created by deep stucco channels that imitate masonry joints.

7.6.7 Holes of 8-10mm diameter will be drilled at a maximum depth of 50mm and fitted with an expansion sleeve or nylon plug. Stainless steel screws and washers are to be used, to ensure durability and prevent staining.

7.6.8 The sub-contractor's task specific Method Statement and Risk Assessment (RAMS) will include a description of the listed asset and define hold points to ensure implementation of control measures for working on and in its proximity, as detailed in the approved HAMS and SCSjv generic Method Statement and Risk Assessment - Installation and Monitoring of Instrumentation and Monitoring on Parkway Third Party Assets - Document no.1MC03-SCJ_SOU-CL-MST-SS01_SL03-000006. Prior to installation work commencing, a copy of the sub-contractor's RAMS will be provided to the London Borough of Camden Conservation team and Historic England.

7.6.9 A Toolbox Talk will be issued to all those working on the asset at the start of the shift and a SCS heritage specialist will undertake regular inspections and oversee installation work.

Removal

7.6.10 Following completion of monitoring all instrumentation and fixings will be removed and the fixing holes filled to match the surrounding surface render/mortar:

clean surface and remove loose render/mortar

new mortar to match the colour of existing mortar/render

point and form mortar joints/rendered surfaces to match existing profiles

repaint where required, to maintain a consistent colour and texture.

Access

7.6.11 Careful consideration will be given to access systems for installation and removal of monitoring instruments that avoids the use of scaffolding directly tied to the listed structure. Alternatives include mobile elevated working platforms (MEWPs), cherry pickers and freestanding platforms. However, given the constraints of the properties and disruption to residents, a temporary fixed scaffold may be the only viable solution.

tying in of a temporary scaffolding will ensure the scaffold is safe to work at from height, but also protects those at street and basement level underneath.

scaffold contractors will agree a fully detailed design specification for the listed building:

following the process for attachment and removal as described in 7.6.2.to 7.6.10 for monitoring devices

there will be minimal fixings into the fabric of the buildings. Fixings are not required at basement or ground level so are to be used at first floor and attic levels only

fixings will be carefully located to avoid sensitive features, including decorative plaster and/or brickwork forming cornicing, window or door architraves or pilasters.

7.6.12 Careful installation and remedial work will minimalize any permanent visual impact of any scaffolding works.

8 Conservation Management

8.1 Visual Inspection

8.1.1 The property will be visually inspected by an appropriately experienced structural engineer Inspections will occur monthly during or after critical construction activities predicted to affect the property. A report will be produced and re-issued for each inspection so that each visit is recorded in a single document.

8.1.2 This report will include high-resolution photographs supplemented by sketches as required, detailing all visual and measured changes, such as:

new cracks or enlargement of existing cracks

evidence of spalling of masonry or plaster

any other new defects

signs of new water ingress

evidence of subsidence.

8.1.3 The frequency of visual inspections may increase in response to Monitoring Trigger Levels.

8.1.4 Change in frequencies of the visual inspections are to be confirmed at the regular SCSjv Monitoring Review Meetings.

8.2 Trigger Values

8.2.1 Trigger values are based on the Phase 3 GMA of HS2 permanent works only (i.e. excludes temporary works). Seasonal and daily variation due to background environmental effects will be considered when applying the trigger values.

8.2.2 Trigger values for building crack widths are:

Construction Alert – commence monitoring upon noting first emergence of crack/defect.

Green – 3mm

Amber – 5mm

Red – 15mm

Numerical Black triggers are not applicable for these assets.

8.2.3 No trigger levels are set for levelling studs recording ground movements.

8.3 Monitoring Action Plan

8.3.1 The Monitoring Action Plan includes procedures for:

the production, assurance, interpretation, and presentation of monitoring data

actions to be taken by specified parties in the event of monitoring trigger values being exceeded.

actions to be taken in the event of interruption to monitoring during the construction phase (e.g., due to monitoring system malfunctions).

arrangements for regular reporting on the items detailed above to the London Borough of Camden Conservation team and Historic England.

8.3.2 The following monitoring actions are to be taken at the breach of trigger levels:

Green – review frequency of visual inspection.

Amber – increase frequency of visual inspection, review movements of the asset and crack widths against prediction of movement and update subsequent predictions to account for movement. Cracks that reach amber trigger level should be exposed (stucco render/plaster removed in a 200mm x 200mm zone and masonry inspected).

Red – increase frequency of visual inspections. Review specific cracks and assess stability of building. Introduce temporary works if required.

8.3.3 The structural engineer inspecting the properties will routinely assess the building for stability and safety and recommend any temporary measures that may be immediately required, regardless of whether instrument trigger levels are met.

8.3.4 Any breach of trigger levels requiring temporary works will be reported and temporary works designs issued to London Borough of Camden Conservation team and Historic England for - information prior to works proceeding.

8.4 Conservation (repair) schedules

8.4.1 All required repairs will follow the design principles, standard brief, specification, technical details and safe working practices described in The Crown Estate Guidelines and Specification to Architects for the Regent's Park, Kensington Palace Gardens, St. James's, Pall Mall South, Haymarket and Lower Regent Street Residential and Commercial Estates 7th Edition.

8.4.2 A conservation (repair) schedule will be prepared prior to installation of monitoring instruments and subsequently maintained as planned actions are updated. The conservation (repair) schedule will be routinely reviewed until monitoring requirements have been fully met, instrumentation removed, and all necessary repairs completed.

8.4.3 The conservation (repair) schedule will include:

identification of the property

a list of all repair items required, to be described room-by-room or by reference to external elevation, including reference to the Inspecting Engineer's and other specialist reports and requirements

an inventory of the historic items, including fixtures and fittings to be preserved or restored

programme and timescale allowed for the works

the standard specification for workmanship and materials including painting and stucco repairs

a list of drawings that are approved by leaseholder/freeholder

details of the monitoring procedure for the work, including the contact details of a Conservation Consultant Architect who will confirm works have been carried and completed in accordance with The Crown Estate covenants included in the lease or building agreement.

8.4.4 Other than the drilled bolt fixing holding the monitoring instruments in place, typical damage resulting from the tunnelling works is expected to be cracks within the masonry walls perpendicular to the street.

8.4.5 The Crown Estate Guidelines and Specification to Architects describes a typical repair strategy as:

remove surrounding render to check for propagation of crack within masonry.

cracks <5mm should be infilled/repointed

cracks greater than 5mm will have mortar joints raked out, tie-bars installed across the crack and infilled/repointed.

render/mortar composition/type to be determined and matching material reapplied to complete repair.

internal and external redecoration.

8.4.6 All conservation (repair) schedules and detailed design (technical drawings and RAMS) will be issued to London Borough of Camden Conservation team and Historic England for review and comment prior to works proceeding.

9 Heritage Conservation Summary

9.1.1 Installation of monitoring instruments is a temporary arrangement to ensure accurate monitoring of the heritage asset prior to, during and following HS2 permanent construction works. It is a precautionary procedure to identify ground movements and resulting building structural responses so that appropriate measures to protect the asset can be deployed and engaged to prevent potential systemic or structural harm that may result in loss of serviceability and/or stability and impact to heritage significance.

9.1.2 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 ground movements that will:

observe and record changes affecting the building to:

- check and validate modelled predictions
- calibrate mitigation responses with the sequence of construction activities

ensure interventions required to mitigate potential harm to heritage assets are undertaken in timely accordance with an established hierarchy of trigger values and related pre-planned actions.

9.1.3 Installation of monitoring instruments does not result in loss of heritage significance and offers specific protections and benefits as part of a conservation management process.

9.1.4 There is negligible harm to historic fabric because;

monitoring instruments are to be installed with minimum fixings.

all devices will be removed on completion of monitoring requirements and there are no permanent additions or alterations to the listed building.

9.1.5 The temporary visible presence of monitoring devices does not change the contribution of setting to the significance of the heritage asset. Instrument visibility is limited by the minimum use of devices required to meet the monitoring requirements, retaining the optional use of more intrusive devices that will only be deployed if circumstances require additional monitoring capabilities.

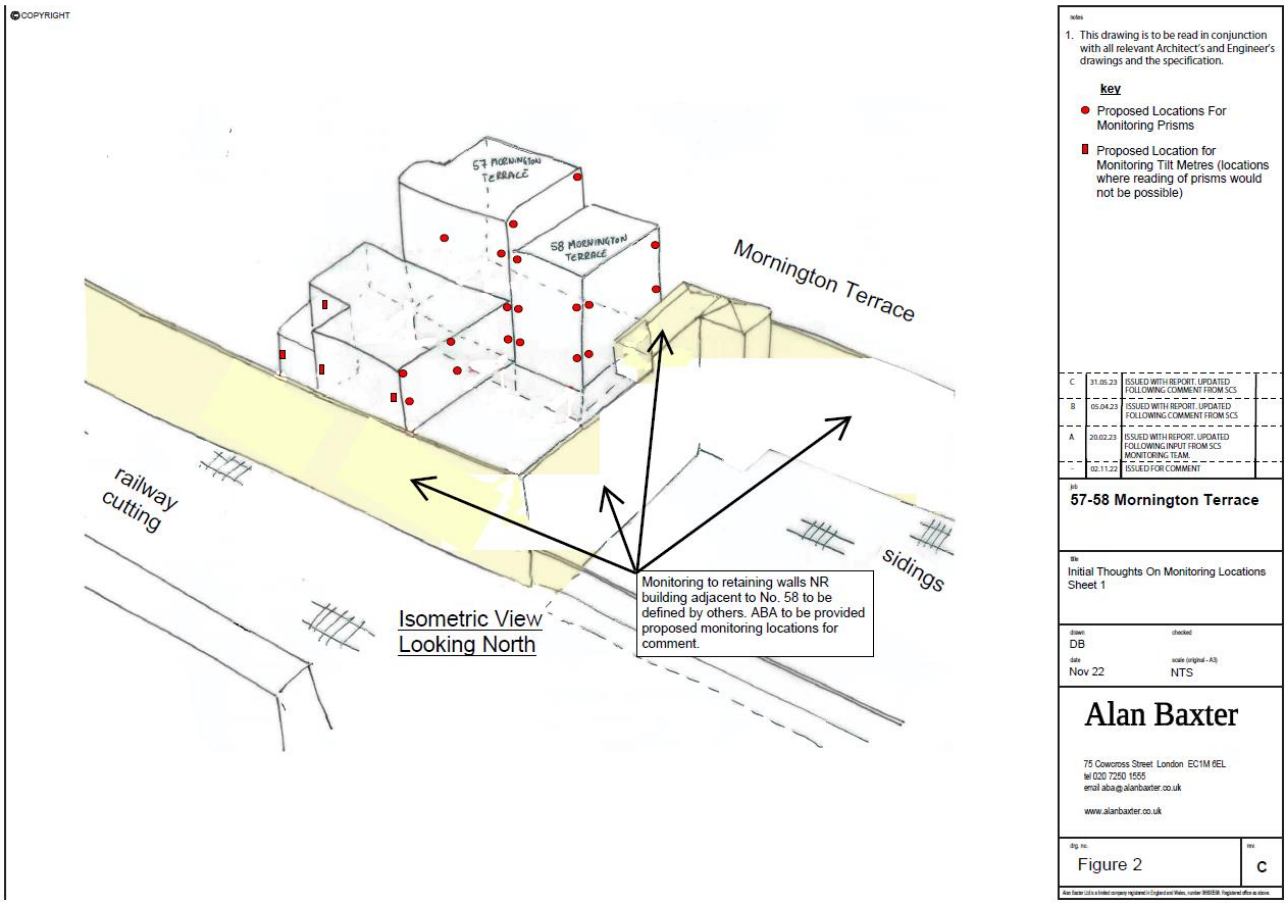
9.1.6 Following completion of HS2 asset protection measures there will be no permanent change to setting.

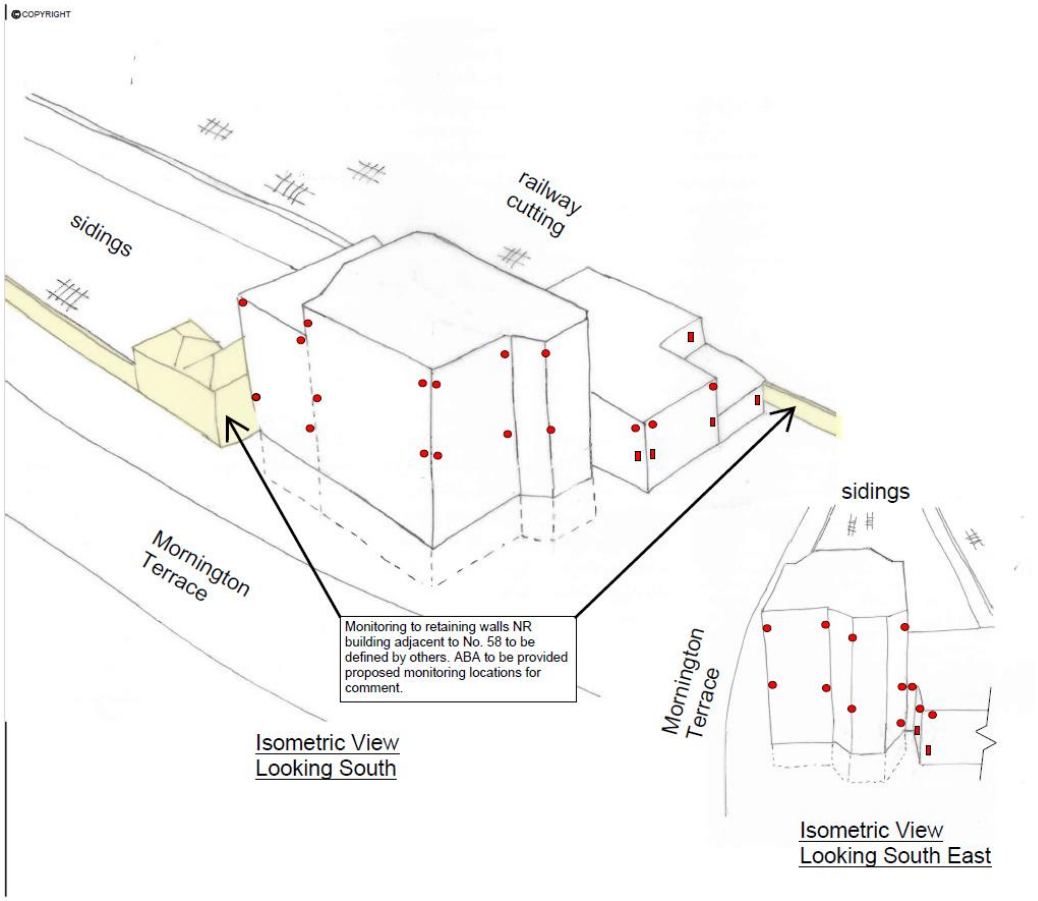
10 References

Table 4 - References

Title	Reference
Guidelines and Standard Specification to Architects for the Regent's Park, Kensington Palace Gardens, St. James's, Pall Mall South, Haymarket and Lower Regent Street Residential and Commercial Estates	The Crown Estate, Seventh Edition January 2014
HS2 Technical Standard - Civil Engineering Instrumentation and Monitoring	HS2-HS2-CV-STD-000-000004 P04
HS2 Technical Standard - Ground movement and assessment from underground construction	HS2-HS2-TN-STD-000-000005 P03
HS2 Specification for Civil Engineering Works' Series 4500 – Instrumentation and Monitoring	HS2-HS2-CV-SPE-000-014500
HS2 Technical Standard – Sound, Noise and Vibration Instrumentation and Monitoring · High Speed Rail London-West Midlands	HS2-H S2-EN-STD-000-000009
HS2 Environmental Minimum Requirements Annex 1: Code of Construction Practice https://www.gov.uk/government/publications/environmental-minimum-requirements	CS755 02/17
SCSjv Phase 3 Ground Movement Assessment Report - Building Assessment Euston Cavern and Shaft - Euston Throat West S1	1MC03-SCJ_SDH-GT-REP-SS01_SL03-000018 C03.2
SCSjv Designers Monitoring Plan - Area East Buildings Package 2 (EB2) - S1MDL	1MC03-SCJ_SDH-GT-PLN-SS01-000002
SCSjv WP203.3 Designer Monitoring Plan – 57-58 Mornington Terrace	1MC03-SCJ_ABX-ST-PLN-SS01_SL03-000001
SCSjv Building Damage Assessment and Mitigation Report - 57 to 58 Mornington Terrace - Asset Protection Section 1 Euston Cavern and Reception Chamber - APD-ESCT-01	1MC03-SCJ_ABX-ST-ASM-SS01_SL03-000002
Victorian Pubs	Girouard, Mark. 1975 (London and New Haven: Yale University Press)

Appendix A – Instrumentation Design Drawings (as proposed in WP203.3 Designer Monitoring Plan – 57-58 Mornington Terrace - MC03-SCJ_ABX-ST-PLN-SS01_SL03-000001)





notes

1. This drawing is to be read in conjunction with all relevant Architect's and Engineer's drawings and the specification.

key

- Proposed Locations For Monitoring Prisms
- Proposed Location for Monitoring Tilt Metres (locations where reading of prisms would not be possible)

C	31.05.23	ISSUED WITH REPORT. UPDATED FOLLOWING COMMENT FROM SCS
B	05.04.23	ISSUED WITH REPORT. UPDATED FOLLOWING COMMENT FROM SCS
A	20.02.23	ISSUED WITH REPORT. UPDATED FOLLOWING INPUT FROM SCS MONITORING TEAM.
-	02.11.22	ISSUED FOR COMMENT

job
57 - 58 Mornington Terrace

title
Initial Thoughts On Monitoring Locations Sheet 2

drawn: DB
checked:
date: Nov 22
scale (original - A3): NTS

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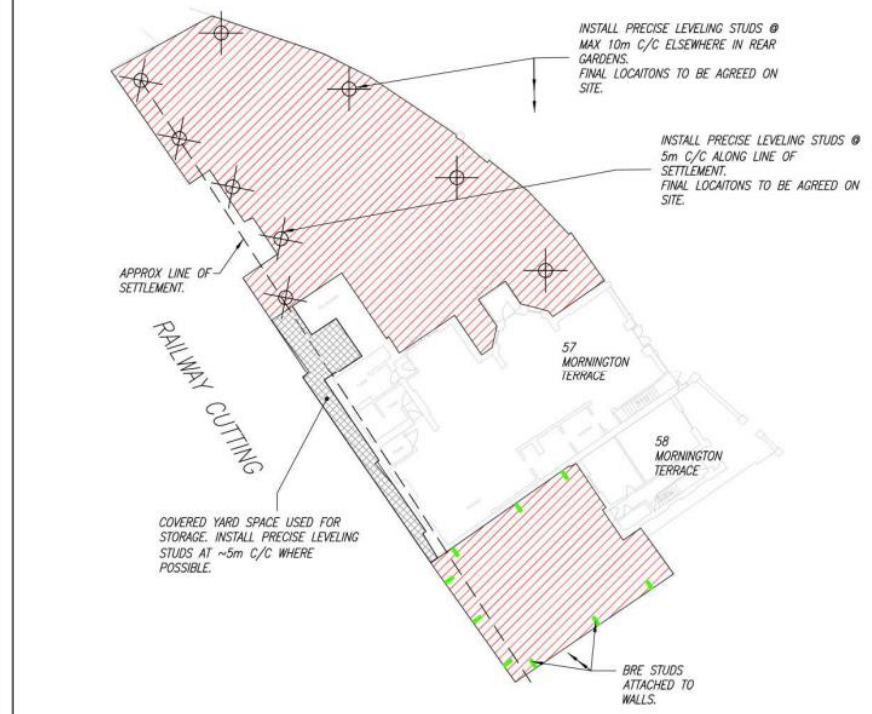
dig. no.: Figure 3
rev.: C

Document Title: Designers Monitoring Plan – 57 – 58 Mornington Terrace
Document no.: 1MC03-SCJ_ABX-ST-PLN-SS01_SL03-000001
Revision: C01



INDICATIVE EXTENT OF EXTERNAL AREAS ON SITE.

INDICATIVE LOCATIONS FOR PRECISE LEVELING STUDS FINAL LOCATIONS TO BE AGREED ON SITE.

BRE STUDS ATTACHED TO WALLS. LOCATIONS TO BE CONFIRMED ON SITE.

A		UPDATED FOLLOWING COMMENTS FROM MONITORING TEAM. INITIAL ISSUE FOR COMMENT

57-58 MORNINGTON TERRACE

REQUIREMENTS FOR EXTERNAL GROUND MOVEMENT MONITORING

DB

NOV 22

1:200

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Figure 4

A

KEY

INDICATIVE CRACK LOCATION

CRACK MONITORING (VERTICAL)

CRACK MONITORING (HORIZONTAL)

CRACK MONITORING (CORNER)

A		UPDATED TO FOLLOW COMMENTS FROM MONITORING TEAM. INITIAL ISSUE FOR COMMENT

57-58 MORNINGTON TERRACE

REQUIREMENTS FOR CRACK MONITORING

DB

NOV 22

NTS

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Figure 5

A