

# ITR- Repair To Heritage Railing

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Work Package No.

Revision	Author	Checked by	Approved by	Accepted by (Not HS2)	Date approved	Revision Details
C01	Claire Martin (Mott MacDonald)	Rhian Halford (MDJv)	Joseph Adebiyi (MDJv)		23/01/2024	First Issue
C02	Claire Martin (Mott MacDonald)	Rhian Halford (MDJv)	Joseph Adebiyi (MDJv)		08/02/2024	Update following HS2 Comments
C03	Claire Martin (Mott MacDonald)	Rhian Halford (MDJv)	Joseph Adebiyi (MDJv)		19/02/2024	Update following HS2 Comments on C02 Rev.

## STAKEHOLDER REVIEW REQUIRED (SRR)

- ☐ COUNTY/DISTRICT/LONDON BOROUGH COUNCIL
- ☐ LOV
- ☐ LUL
- ☐ NRL
- ☐ TFL
- ☐ UTILITIES COMPANY
- ☐ OTHER .....

## PURPOSE OF SRR

- ☐ ACCEPTANCE
- ☐ APPROVAL
- ☐ NO OBJECTION
- ☐ CONSENT

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# Introduction

## 1.1 Project context

- 1.1.1 High Speed Two (HS2) is a network of new high speed lines across Britain, being planned and built in two phases: Phase One, which will connect London with Birmingham and the West Midlands. Phase Two, which was intended to extend the route to Manchester, Leeds and beyond has, at the time of writing, been cancelled. 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 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.
- 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. "Schedule 18" refers to Schedule 18 of the High Speed Rail (London – West Midlands) Act 2017 (the Act). Paragraph 1 of Schedule 18 disapplies some of this legislation, and in particular the requirement for listed building consent for 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.
- 1.1.4 Following Royal Assent, HS2 Ltd entered into Heritage Agreements with London Borough of Camden and with Historic England 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.

- 1.1.5 The railings around Euston Square are identified in Table 1 of Schedule 18 as structures “to be demolished, altered or extended”. HS2 Ltd entered into a Heritage Agreement with London Borough of Camden and Historic England dated [05/05/2017] that requires HS2 Ltd to submit method statements concerning the recording, removal, and subsequent re-erection of these railings to London Borough of Camden for approval. The Heritage Agreement requires Historic England and the relevant Amenity Societies (the Ancient Monuments Society, the Victorian Society, the Council for British Archaeology, and the Society for the Protection of Ancient Buildings) to be consulted on these submissions.
- 1.1.6 A Heritage Agreement Method Statement (HAMS) for the Recording and Dismantling railings around Euston Square Gardens was approved by London Borough of Camden in 2019 (2019/0190/HS2). This consent also includes transporting and will be utilised for the return of the railings to site.
- 1.1.7 The works identified in this document will be followed by surface preparation and repainting of the railings as agreed by London Borough of Camden and Historic England. These repainting works are not subject to the requirement for a HAMS.

## 1.2 Scope of method statement

- 1.2.1 The following method statement has been prepared to detail the approach by which removed sections of the railings will be reinstated and other areas, repaired.
- 1.2.2 The Heritage Agreement with London Borough of Camden and Historic England, dated 5 May 2017, sets out the requirements for submission of work details in Schedule 1C under the headings of ‘Works Specification and Method Statement’ as follows:
  - 1. “Part 1 Works Specification. Removal of the railings and associated piers and their subsequent re-erection (upon cessation of the use of the site for construction purposes) within the re-landscaped Euston Square Gardens”.

2. Part 2 Method Statement Details. In relation to the removal of the railings and piers and their re-erection, a method statement is set out:
    - a. a specification for recording of the railings and piers, including constructional details, in accordance with Historic England guidance for the recording of historic buildings;
    - b. how the railings and piers are to be dismantled;
    - c. how component parts are to be protected, transported and stored; and
    - d. the process for the re-assembly of the component parts during re-erection of the railings and piers."
- 
- 1.2.3 Parts 'a-c' of the Schedule 1C Part 2 Method Statement are already covered by the approved Recording and Dismantling Railings around Euston Square Gardens (2019/01/90/HS2).
  - 1.2.4 Part 2c, Method Statement Details in relation to the removal of the railings and piers, and their re-erection is set out in paragraphs 5.3.3 and 5.5.1 – 5.5.4 of Heritage Agreement Method Statement (HAMS) for the Recording and Dismantling railings around Euston Square Gardens (2019/0190/HS2).
  - 1.2.5 These paragraphs referenced above state that, railings will be transported in an upright position, without stacking, leaning, or otherwise including stresses that could damage them and secured into position using polyester ratchet straps. Protective measures will be used to separate the railings and secure them in position for transport, including Plastazote foam, structural polystyrene and timber wedges. These details will be adhered to for the return of railings to site and their handling whilst on site during repair and reinstatement.

- 1.2.6 In addition, the Lift Plan previously approved for their removal from site, will be adhered to for their return to site. Transport to, and handling of the railings on site, will be the responsibility of the specialist metalwork sub-contractor.
- 1.2.7 The works within this HAMS will follow those identified in part 2c, and will cover detail 'd', only: "the process for the reassembly of the component parts during re-erection of the railings and piers". The aim of this method statement is to provide clarity on the specification and methodology for repairs to sections of the railings where necessary and for the reinstatement of sections previously removed, only, once returned to site.
- 1.2.8 This method statement will include an assessment of the significance of elements of the structure which are to be impacted by the proposed works.
- 1.2.9 This document outlines a method statement for the proposed works. Once submitted to and approved by stakeholders, this methodology will be adhered to by the lead contractor or subcontractor undertaking the works detailed within.

## 1.3 Summary of the proposed work

- 1.3.1 The proposed work includes the reinstatement of 1no. section of railings currently in storage (Panel E/27). It is proposed that this reinstatement may be achieved via cold repair (dowel) only, but localised welding repairs to 4no. separate locations may be required if dowel jointing is insufficient for strength and stability of the railing. These works have been discussed with London Borough of Camden, Historic England and HS2 as part of pre-app consultation in January 2024.
- 1.3.2 This method statement is to be applied within the proposed locations only, as indicated in the location plan in Appendix 2. However, if other repairs are to be undertaken at other locations on the railings, this method statement may be reviewed for suitability of the

specification and methodology to those repairs on a case-by-case basis, at the request of London Borough of Camden. No objections to this were raised by Historic England.

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# Heritage asset description and summary of significance

## 2 General information

- 2.1.1 The railings, which were constructed in the mid-19<sup>th</sup> century, are located at approximately 110 meters south of Euston Station, running around Euston Square Gardens in London, UK. The asset is location on National Grid Reference TG 29693 82568.
- 2.1.2 The railings are designated grade II listed (NHLE: 1342039) and were first designated on the 14<sup>th</sup> of May 1974. See Appendix 1 for List Description.
- 2.1.3 The extent of the railings that are understood to be listed within the East gardens is identified in blue in Appendix 2. To note, there are further sections of the listed railings located within the West gardens, but these are not reflected within Appendix 2 as they do not fall within the scope of these works.
- 2.1.4 The railings form the boundary around Euston Square Gardens within the London Borough of Camden. They extend along Euston Road to the south side of the gardens, and along Eversholt Street on the East side. They also extend north from the grade II listed lodges (NHLE: 1342042) on either side of the bus access road, which bisects the gardens into the east and west sections.
- 2.1.5 The railings around Euston Square Gardens comprise approximately 200m of cast iron railings that separate the grassed area of Euston Square Gardens from the pavement. The railings date from c.1869 but have been reorganised several times since they were first erected. Although some sections have been moved and repositioned, they constitute, with the lodges, the principal remains of Euston Station as built and extended in the 19th century.

- 2.1.6 The railings which are the subject of this HAMS (E/27 and E/28) are noted as being in good overall condition but with extensive failure and loss of the protective paint coating. Open joints on the bottom were likely caused by previous re-locations and minor movement or ground settlement due to insufficient foundations. Historic repairs had failed and were visible.
- 2.1.7 Panel E/27 has a missing and lost spearhead finial. The railing surface is chipped and pitted in many places. In some cases, this kind of relatively superficial damage has apparently occurred due to general 'wear and tear' within a heavily used public garden. Where surface pitting is visible underneath paint, this may be the result of minor, past surface corrosion. Surface pitting and small voids may also result from the casting process.

## 2.2 Historical background

- 2.2.1 Railings are likely to have been present around Euston Square since its inception as a garden in c. 1826. However, it is probable that these original railings were removed to make way for the present railings of c. 1870.
- 2.2.2 Good quality wrought iron had been in production in England since the development of blast furnaces in the 15th century and the earliest railings used in London were of wrought iron. This continued to be used until the late 19th century, while cast iron railings, like those at Euston, did not appear until the second half of the 18th century following the development of new industrial processes. The use of cast iron, therefore, is compatible with a date of c. 1870 for the installation of the railings.
- 2.2.3 The cast iron railings around Euston Square were part of the monumental approach route into Euston Station. This included the Propylaeum (or Doric Arch), and the choice of ancient Greek architecture was inspired by recent archaeological discoveries and restoration work on similar structures in Athens.<sup>1</sup> The railings were also in keeping

<sup>1</sup> Cain, J. (2007). History of Euston Grove. Retrieved from Department of Science and Technology Studies:  
[http://www.ucl.ac.uk/sts/cain/projects/euston\\_grove](http://www.ucl.ac.uk/sts/cain/projects/euston_grove)

with the Classical appearance of the initial monumental approach to Euston Station of the 1830s.

2.2.4 It is likely that the railings were part of the cohesive scheme which included the Lodges, undertaken c. 1870 by JB Stansby, the London & North Western Railway company engineer. This scheme saw the remodelling of the square during development work at the station in 1869. Early photographs show that the main run of railings fronting Euston Gardens originally connected to the south-west corner of the eastern Lodge on its southern façade and it can be presumed that a similar arrangement was the case with the western Lodge. In addition, the gate posts for the gates spanning Euston Grove lay adjacent to the south-west corner of the eastern Lodge on its west façade. This would have had the effect of partially enclosing the lodges within the railings.

2.2.5 The entrance route of 1870 added Classical grandeur to the railway and the influence of the style was significant enough to be adopted by architects designing later buildings in the Euston area. However, the area underwent significant change throughout the 19<sup>th</sup> and 20<sup>th</sup> centuries, with redevelopment following the Second World War. The greatest change came to the area in the 1960s as British Rail demolished the former station and expanded the new station to the south. The Euston Hotel and the buildings on Euston Grove were demolished and Euston Grove itself was reduced to a cut through to Euston Square and the current bus station. The Euston Doric arch was demolished in 1962 and while the two Lodges on the south side of Euston Square Gardens remained in-situ, it seems likely that the railings and piers were removed during the works to be replaced, or their positions altered, at a later date. Their new positions, post 1966 was on a new alignment meeting the lodges at their rear faces, instead of their front elevations. The railings therefore no longer enclosed the lodges. It seems probable that several posts and panels of railings were removed and lost throughout the construction work of the 1960s and 70s.

- 2.2.6 The railings with their stele-styled posts are therefore one of the few surviving remnants of this stylised approach, which was otherwise comprehensively removed in the 1960s and 70s.

## 2.3 Assessment of significance

- 2.3.1 The significance of this heritage asset will be considered in the context of its archaeological, architectural and artistic, and historic interests, in accordance with Historic England's Advice Note 12: Statements of Heritage Significance: Analysing Significance in Heritage Assets.<sup>2</sup>
- 2.3.2 The significance of the railings is primarily derived from their historic associations with the once monumental approach route into Euston Station. This approach included a Doric arch, pair of two lodges (now listed at grade II NHLE:1342042) by JB Stansby of the London and North Western Railway company, and a statue of Robert Stephenson. The railings contributed to, and provided a monumental, gated approach to Euston Station along the north-south carriageway of Euston Grove. Together with the two lodges, the railings represent the only surviving features of the original formal 1870 layout towards Euston Station, which was destroyed in 1962. The extant railings therefore directly contribute and enhance the ability to understand the historical context of the area as the former, grand approach to Euston Station, contributing to their historic value.
- 2.3.3 The Classical style and flare of the railings also provides the railings with an aesthetic value which makes a key contribution to their significance. The influence of style was a significant feature throughout the Industrial Revolution, with architects incorporating Classical stylings in an attempt to add grandeur to the new technology of steam. The railings, with their classical motifs, form part of a wider, classically stylised scheme which led to Euston Station, which was comprehensively removed in the 1960s and 70s.

<sup>2</sup> [Statements of Heritage Significance: Analysing Significance in Heritage Assets | Historic England](#)

## 2.4 Setting

- 2.4.1 The setting of the asset is diverse, with residential, commercial, transport and educational buildings all located within close proximity of the railings.
- 2.4.2 The immediate surroundings of the railings primarily comprises Euston Square, which is situated adjacent to and on the northern side of Euston Road, to the south of Euston Station. The square is rectilinear in plan and orientated south-west to north east. The Euston Square railings conform to the divided nature of the square itself, forming a western and eastern group. The square is divided in the centre by an access route, used by buses to exit and enter from the Euston Road. The entrance to this route lies between the two grade II listed Euston Lodges, and the route divides the open space of the square into two. The assets relationship with Euston Square and associated assets reflects a key period of development during British Railway History. The visible, and historic relationship with one another, as articulated by this setting, are key to the railings' significance.

# Specification and methodology for cast iron repair and welding

## 3 Reinstatement and repair.

3.1.1 The appointed contractor or subcontractor will remove sections of railings (Panel E/27) currently in storage and transport to workplace, in accordance with the previously approved methodology for transportation and positioning (2019/0190/HS2), which states that:

- railings will be lifted onto suitable transport (flat-bed lorry) and maintained in upright positions, sitting on their bases. Panels will be secured into position using the straps and other materials.
- railings are to be transported in an upright position, without stacking or leaning or otherwise inducing stresses that could damage them. Various protective and supporting materials (excluding timber), are to be used to separate railings and secure them in an upright position during transport.
- handling on site and transport to long-term storage will be the responsibility of the specialist metalwork sub-contractor, to ensure railings are safely loaded, unloaded.

3.1.2 Prior to re-instatement of Panel E/27 in situ, the appointed contractor will repair identified locations of railings (Panel E/28) by doweled cold repair, and if necessary, by welding. This work will take place on site and the location for these repairs are indicated on the location plan in Appendix 2.



Figure 1. Panel E/28 showing locations for repair.

- 3.1.3 The appointed contractor will move the existing fractured section of railing (Panel E/28) from location to expose bedding substrate. The railing will be placed safely to one side in order to establish the base material and prepare the ground as necessary, to ensure a level surface and to allow panels to be butt jointed together at the base.



Figure 2. Location of missing railing (E/27) to be reinstated.

- 3.1.4 The following methodology will be applied to panels E/27, E/28 and E/29.
- 3.1.5 The existing surface rust to the exposed ends of railing bars will be cleaned using a wire wheel attachment for a handheld drill, to ensure a surface free from dirt and surface debris prior to repair.

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- 3.1.6 Contract operatives will use an angle grinder to remove any existing finishes and prepare a 3mm 45degree 'V' (chamfer) into the bar for the preparation of either weld or paint finishes in the event of a cold repair.

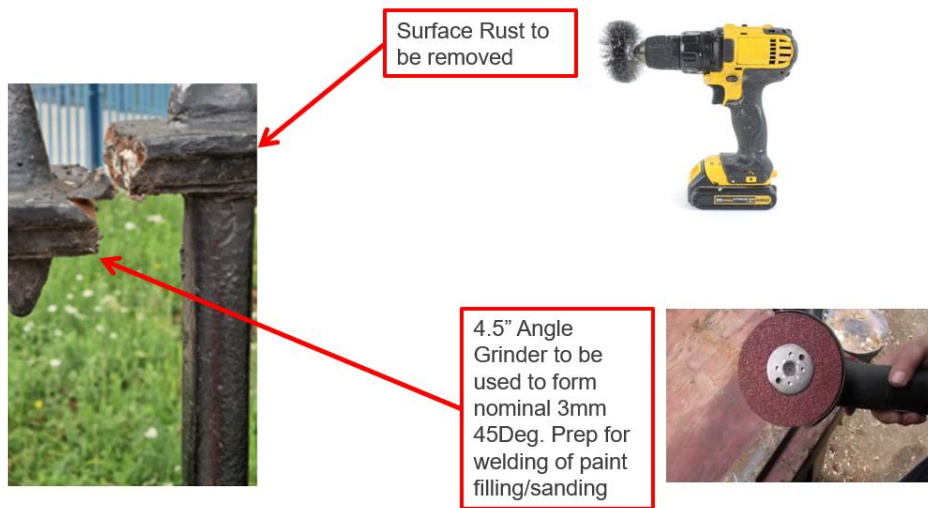


Figure 3. Preparation method for repair

- 3.1.7 The joints will then receive a steel dowel to reattach the railings.
- 3.1.8 The dowel will be a size M8 threaded dowel circa 50mm long. One end of the rail to be drilled with a 6.8mm diameter drill to allow the dowel to be tapped into position. The opposing end will be drilled with an 8.5mm diameter clearance hole. This will allow the dowel to be pushed into the socket, bringing the two sections together, with the use of epoxy resin and clamps as necessary to secure the railings in situ.

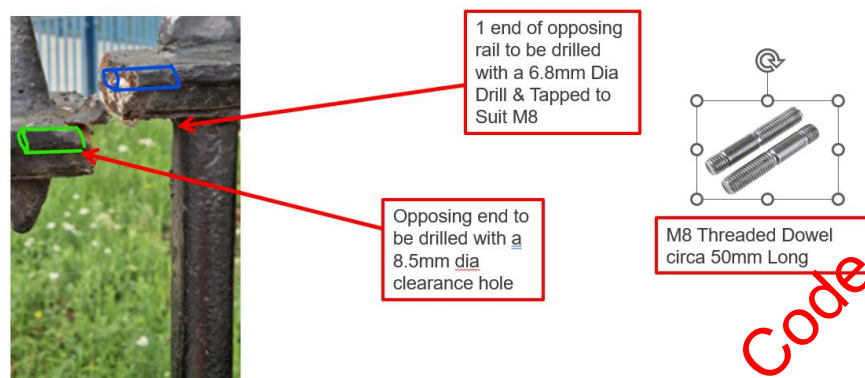


Figure 4. Methodology for cold dowel repair

- 3.1.9 Once the dowel is installed the panels will be offered into position and alignment checked. The bottom of the panels will be lined up and butt jointed together. The panels will be secured in situ using the dowel and clamps in the first instance, with the use of epoxy resin (Araldite) where deemed necessary.



Figure 5. Methodology for clamping

- 3.1.10 Rigidity of the fix is to be inspected at this stage. If the reinstatement is successful, the panel will be bedded at base, and handed to the lead contractor for final finishing and painting.
- 3.1.11 If repair by dowel and resin has not sufficiently conserved or stabilised the railings then welding will be deemed necessary, and joints to be welded following the methodology outlined below.

## 3.2 Welding methodology

- 3.2.1 Ends of existing cast iron railings to be gradually pre heated using manual propane torch to prevent risk of fracture from thermal shock.
- 3.2.2 Materials to be pre-heated to a nominal 300 degrees Celsius. This will be verified by thermal imaging camera.

- 3.2.3 The welding rod is proposed to be a High Nickel content weld, due to the limited thermal expansion of nickel, with cast iron electrodes.

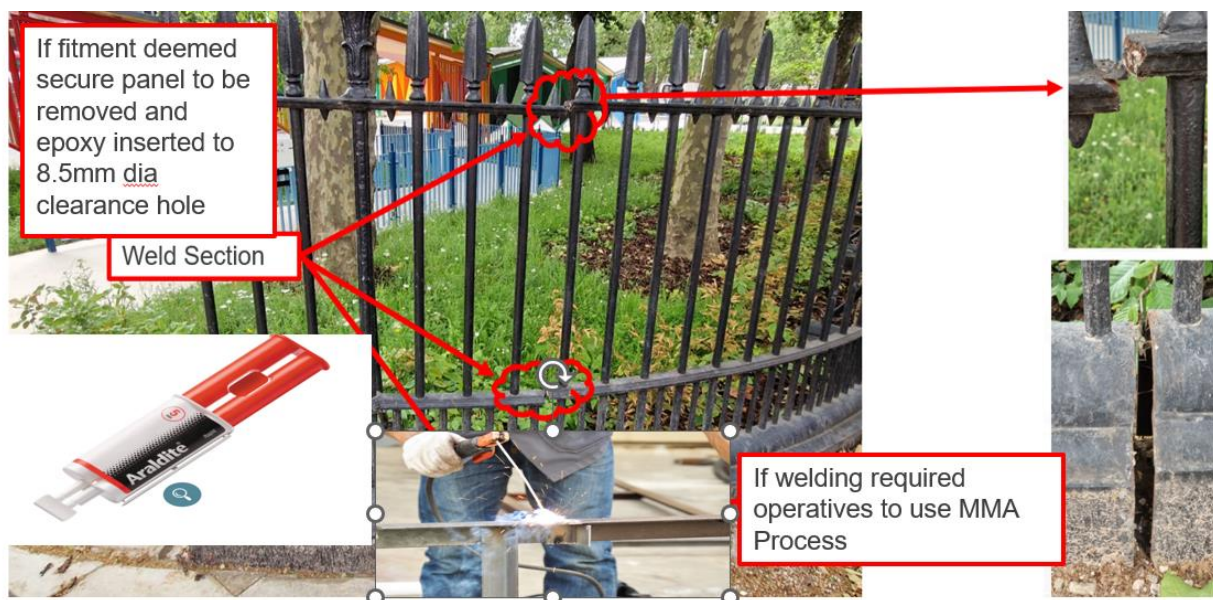


Figure 6. Hot weld methodology

- 3.2.4 Once the weld is complete, the area will be wrapped with a ceramic fibre blanket to control cooling in order to minimise the risk of fracture from thermal shock.
- 3.2.5 The blanket will remain in situ for a minimum period of 1 hour, then removed and the weld inspected. The thermal imaging camera will be utilised to monitor the rate of cooling and temperature prior to removal of blanket to minimise risk of thermal shock.
- 3.2.6 Surface welds will then be dressed smooth with an angle grinder or filing sander and any imperfections to be re-welded.
- 3.2.7 The railings will then be handed to lead contractor for final finishing and painting.

## References and glossary of terms

<b>HAMS</b>	<b>Heritage Agreement Method Statement</b>
<b>RAMS</b>	<b>Risk Assessment Method Statement</b>
<b>NHLE</b>	<b>National Heritage List for England</b>
<b>MDJv</b>	<b>Mace Dragados Joint Venture</b>
<b>CSCS/CPCS</b>	<b>Construction Skills Certification Scheme/Construction Plant Competence Scheme</b>

## Appendix 1 – List description

Railings around Euston Square Gardens

Grade II Listed Building

List Entry Number: 1342039

Date first listed: 14<sup>th</sup> May 1974

Statutory Address: Railings around Euston Square Gardens, Euston Square.

County: Greater London Authority

District: Camden (London Borough)

Parish: Non civil parish

National Grid Reference: TQ 29693 82568

Details:

CAMDEN

TQ2982NE EUSTON SQUARE 798-1/89/422 Railings around Euston Square 14/05/74  
Gardens

GV II

Railings and piers. Mid C19. Cast-iron railings with foliated finials and round-headed piers resembling stele with rosettes in recessed panels.

Listing NGR: TQ2966182571

## Appendix 2 – Location plan

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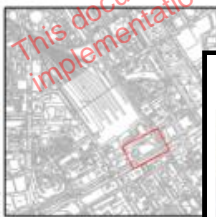
# Location Plan of Interim Taxi Rank

## Key

Existing Grade II listed railings in East Garden.



Section of Grade II listed railing to be reinstated and repaired. These are E/27 and E/28.



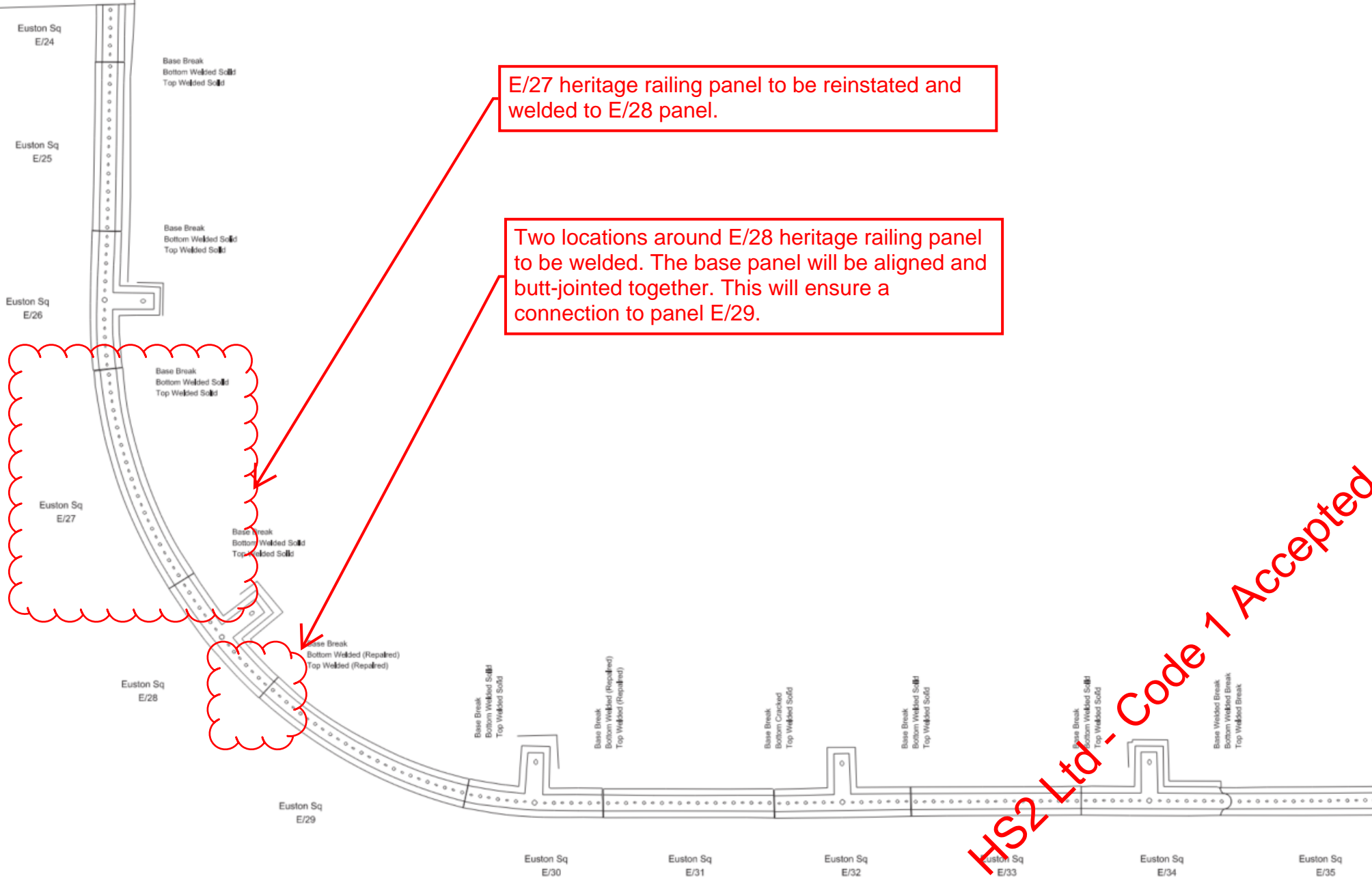
Infill piece to be installed, cold repaired / welded to existing panel



Weld missing panel section



# Location Plan of Railing To Be Reinstated



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