Heritage Statement for Listed Building Consent Teddington Footbridges July 2024

LONDON BOROUGH OF RICHMOND UPON THAMES

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1. Introduction

Purpose

1.1 This Heritage Statement has been produced to support both the planning application and the listed building consent (LBC) application required to gain consents for the Proposed Development.

Site Location and Description

1.2 Teddington is a suburb in south-west London, approximately 10 miles from the notional centre of London at Charing Cross. The Site is located on the River Thames to the north-east of Teddington between approximately NGR 516790, 171572 and 516717, 171418. The Site location plan is shown edged red in Figure 1.

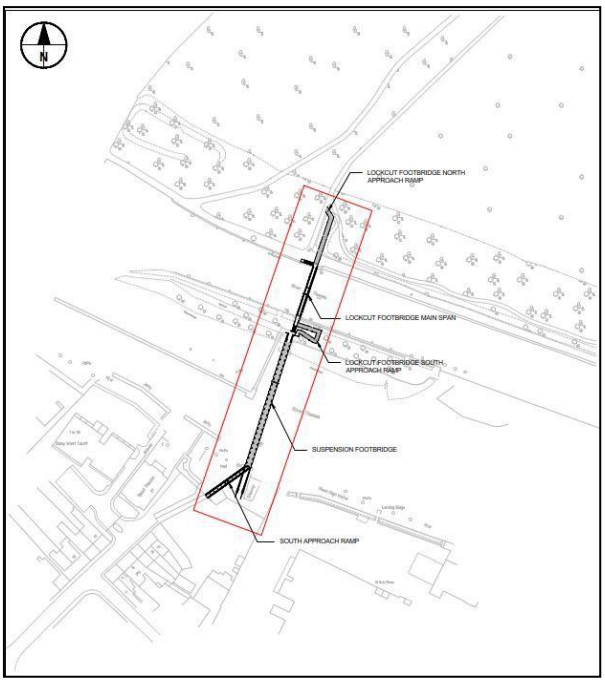

Figure 1 – Site Plan

1.3 The Site is located at the western extent of the tidal River Thames. The area to the north of the river is characterised by the woodland and grassland of the Ham Lands Nature Reserve while the area to the south is developed mainly with residential blocks relieved by the green spaces of the Manor Road Recreation Ground to the west and the Lensbury Club's garden and the Shell Sports ground to the east.

1.4 The Site is occupied by the grade II listed Teddington Footbridge (NHLE 1391392) which were designated by Historic England in 2005. The full list description is given in Appendix B.

1.5 The Site is located within the Teddington Lock Conservation Area with its southwestern extent adjacent to the boundary with Teddington High Street Conservation Area.

1.6 The Site is located within two Greater London Archaeological Priority Tier 2 Areas, specifically Teddington and Ham Fields.

Methodology

1.7 The requirements for this assessment and its scope are guided by policy contained within the National Planning Policy Framework (NPPF) 2021, specifically paragraph 194, Section 16 which seeks an assessment proportionate to the asset's importance and sufficient to understand the potential impacts of development and to appraise the nature and extent of any impact upon setting and significance.

Aims and Objectives

1.8 The aims and objectives of this Heritage Statement are to:

- Establish a heritage baseline which will identify designated and non-designated heritage assets within the Site and wider study area;
- Assess the significance and the likely impacts of the Proposed Development on the historic environment including the baseline assets, their setting and the historic character of the area;
- Determine the potential for as yet unknown archaeological resources within the Site;
- Assess the likely impacts of the Proposed Development on the significance of existing and potential heritage assets, including consideration of changes to their setting; and
- Where relevant, include proposals for further assessment and/or field investigation and subsequent mitigation measures if necessary.

Data Sources

1.9 The following data sources consulted in preparation of this Heritage Statement include:

- Historic England's National Heritage List for England (NHLE) for nationally designated heritage assets);
- The Greater London Archaeology Advisory Service (GLAAS) data sources on archaeology priority areas;
- British Geological Survey (BGS) online (https://www.bgs.ac.uk/geoindex/) for solid and superficial geological data and historic borehole records;
- Archaeology Data Service (https://archaeologydataservice.ac.uk) for information on previous cultural heritage assessments and fieldwork survey undertaken within the study area;
- Surrey County Council's website for information on locally listed buildings and conservation areas (https://www.surreycc.gov.uk/land-planning-and-development/heritage-and-planning) and the London Borough of Richmond upon Thames (Richmond.gov.uk)
- Documentary sources: published histories, site reports, and monographs.

Study Area

1.10 For the purposes of assessment in this Heritage Statement, the study area includes the Site and relevant identified designated and non-designated assets within 250m of the Site boundary. This was considered proportionate due to the localised nature of the works and the topography of the surrounding area, by reference to relevant guidance and based on professional judgement.

1.11 The purpose of the 250m study area is to:

- Provide contextual information for the known heritage assets within or adjacent to the Site;
- Help identify the potential for previously unknown archaeological remains that may be impacted within the Site;
- Capture any setting impacts to known heritage assets;
- Exclude buildings and structures where no setting impact to them is anticipated; and
- Focus on a proportionate 'area of search' given the proposed works.

Assessment of Significance

1.12 An assessment of the significance of heritage assets and their setting has been undertaken following the principles outlined by the NPPF and in conjunction with the guidance issued by Historic England (HE 2019a).

1.13 The NPPF (Annex 2: Glossary) defines significance as '*the value of a heritage asset to this and future generations because of its heritage interest. That interest may be archaeological, architectural, artistic or historic. Significance derives not only from a heritage asset's physical presence, but also from its setting*'.

Assessment of Archaeological Potential

1.14 Assessment of previously unrecorded archaeological resources draws on three factors:

- An assessment of the potential survival of any known or unknown archaeological deposits to remain extant within the Site based on an evaluation of previous ground disturbance.
- An assessment for the potential for archaeological deposits to exist within the Site based on the results of the baseline study; and
- An assessment of the significance of known and potential archaeological assets within the Site, as well as within the defined study area.

1.15 The potential for surviving archaeological evidence of past activity within the Proposed Development is rated 'high', 'medium', 'low', 'negligible', or 'unknown', based on an understanding of the archaeological resource as a whole and its national, regional, and local context. This includes the number, proximity, and significance of known and predicted archaeological/historical sites or find spots within the Site and the surrounding study area.

Structure of Document

1.16 This Heritage Statement is divided into the following sections:

- The legislative and planning policy framework is provided in Section 2 (Legislation, Planning Policy and Guidance) which also includes an overview of Historic England policy and guidance.
- A description of the archaeological and historic background of the scheme, and description of assets is set out in Section 3 (Historic Background).
- The identification of built heritage and any archaeological constraints are provided in Section 4 (Baseline Conditions), along with an assessment of the significance of those assets that have the potential to be impacted by the Proposed Development.
- Section 5 presents information on the proposed works, including the options appraisal, justification and works that are under consideration as part of the listed building consent (LBC) application.
- Section 6 presents the impact assessment of the Proposed Development on the heritage assets that may be impacted.
- Potential mitigation measures are suggested in Section 7 of this Heritage Statement, with the assessment concluded in Section 8.

Site Visit

1.17 Site Visit with Principal Conservation and Urban Design Officer, and Planning Officer took place on Monday the 13th of May.

Consultation

1.18 Pre-application advice and guidance was sought from both Conservation and Planning teams at London Borough of Richmond upon Thames (LBRT).

1.19 The recommendation was that:-:

- Planning permission and listed building consent (LBC) is required for the replacement of the Lockcut Iron Truss bridge bearings and associated works to the Ham bank pedestrian steps.

Limitations

1.20 In identifying the likely impacts that would arise during construction, documents have been consulted which are subject to change. It has been assumed that general good practice in environmental management of construction would be applied.

1.21 This report is based on a desk top appraisal and site visits carried out by heritage specialists and includes site generated photographs from a representative range of locations around the Site in accordance with standard practice. These photographs are included in Appendix C. An archive visit was not undertaken, but thorough desk-top research was carried out and is deemed sufficient and proportionate to inform a robust assessment for this report in respect of the localised nature of the works.

1.22 The identification or assessment of ecological and/or landscape features have not been included other than when these relate directly to the historic environment.

2. Legislation, Policy & Guidance

2.1 Relevant legislative and planning policies with respect to the historic environment are highlighted and summarised in this section. Additionally, guidance provided by Historic England in relation to the historic environment has also been taken into consideration where relevant.

National Legislation

The Planning (Listed Buildings and Conservation Areas) Act 1990

2.2 The Planning (Listed Buildings and Conservation Areas) Act 1990 (the Act) sets out the principal statutory provisions that must be considered in the determination of any application affecting listed buildings and conservation areas.

2.3 Section 66 of the Act states that in considering whether to grant planning permission for development which affects a listed building or its setting, the local planning authority or, as the case may be, the Secretary of State shall have special regard to the desirability of preserving the building or its setting or any features of special architectural or historic interest which it possesses. By virtue of Section 1(5) of the Act, a listed building includes any object or structure within its curtilage.

2.4 Section 72 states that in the exercise of planning functions within a conservation area, special attention shall be paid to the desirability of preserving or enhancing the character or appearance of that area.

Ancient Monuments and Archaeological Areas Act 1979

2.5 Under the Ancient Monuments and Archaeological Areas Act 1979, the Secretary of State (Department of Culture, Media, and Sport - DCMS) can schedule any site which appears to be of national importance because of its historic, architectural, traditional, artistic, or archaeological interest. Additional controls are placed upon works affecting Scheduled Monuments and Areas of Archaeological Importance under the Act. The consent of the Secretary of State (DCMS), as advised by Historic England, is required for certain works affecting Scheduled Monuments.

The Environment Act 1995

2.6 This Act establishes the creation and duties of the Environment Agency. Section 7 of the Act sets out the duties of the Environment Agency with regard to the historic environment and archaeology.

The Water Industry Act 1991

2.7 Section 3 of this Act sets out the general environmental and recreational duties of water providers including their duties with regard to the historic environment and archaeology.

Planning Policy

National Planning Policy Framework 2021 (NPPF)

2.8 The National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government (MHCLG)), revised and updated in July 2021, provides the Government's national planning policy on the conservation of the historic environment, supported by the Planning Practices Guidance. This Heritage Statement aims to address relevant policy within the NPPF in relation to Section 16 'Conserving and enhancing the historic environment' and the associated Planning Policy Guidance.

2.9 The NPPF defines the 'Historic Environment', in Annex 2, as '*all aspects of the environment resulting from the interaction between people and places through time, including all surviving physical remains of past human activity, whether visible, buried or submerged, and landscaped and planted or managed flora*'.

2.10 The NPPF defines Conservation (for heritage purposes) as '*The process of maintaining and managing change to a heritage asset in a way that sustains and, where appropriate, enhances its significance*'.

2.11 Section 16 of the NPPF contains specific policies relating to the historic environment, identifying how the importance of a heritage asset should be considered in light of new development proposals. It recognises that heritage assets range from sites and buildings of local historic value to those assets of highest significance such as World Heritage Sites. Paragraph 189 states that heritage assets are an '*irreplaceable resource and should be conserved in a manner appropriate to their significance*'.

2.12 The following paragraphs set out in the NPPF include key requirements relevant to the compilation and content of this Heritage Statement:

- It is necessary to provide a description of the '*significance of heritage assets affected, including any contribution made by their setting. The level of detail should be proportionate to the assets' importance and no more than is sufficient to understand the potential impact of the proposal on their significance*' (paragraph 194).
- There should be avoidance or minimisation of any '*conflict between the heritage asset's conservation and any aspect of the proposal*' (paragraph 195).
- Paragraph 199 states '*when considering the impact of a proposed development on the significance of a designated heritage asset, great weight should be given to the asset's conservation. This is irrespective of whether any potential harm amounts to substantial harm, total loss or less than substantial harm to its significance*'.
- Paragraph 200 states '*any harm to, or loss of, the significance of a designated heritage asset (from its alteration or destruction, or from development within its setting) should require clear and convincing justification*'.
- Paragraph 201 states '*where a proposed development will lead to substantial harm to, or total loss of significance of, a designated heritage asset, local planning authorities should refuse consent*', unless the substantial harm or total loss is necessary to achieve sustainable public benefits that outweigh the harm or loss.
- Paragraph 202 asserts that where proposals lead to less than substantial harm to the significance of a designated asset, this harm should be weighed against the public benefits of the proposal.
- Paragraph 203 states '*the effect of an application on the significance of non-designated heritage assets should also be considered in determining the application*'.
- Paragraph 205 states '*Local planning authorities should require developers to record and advance understanding of the significance of any heritage assets to be lost (wholly or in part) in a manner proportionate to their importance and the impact, and to make this evidence (and any archive generated) publicly accessible. However, the ability to record evidence of our past should not be a factor in deciding whether such loss should be permitted*'.
- Paragraph 207 states '*not all elements of a Conservation Area or World Heritage Site will necessarily contribute to its significance' such that the significance of elements affected need to be assessed under paragraph 201 or 202 as appropriate, with their contribution to the significance of the Conservation Area or World Heritage Site 'as a whole' considered*'.
- Annex 2 (Glossary) to the NPPF defines designated heritage assets as '*A World Heritage Site, Scheduled Monument, Listed Building, Protected Wreck Site, Registered Park and Garden, Registered Battlefield or Conservation Area designated under the relevant legislation*'.
- Annex 2 (Glossary) to the NPPF defines significance for heritage policy as the value of a heritage asset to this and future generations because of its heritage interest which may be archaeological, architectural, artistic or historic.

Planning Practice Guidance (PPG)

2.13 The Planning Practice Guidance (PPG; MHCLG 2019) is a government produced interactive online document that provides further advice and guidance that expands the policy outlined in the NPPF. The PPG clarifies that being able to properly assess the nature, extent, and the importance of the significance of a heritage asset and the contribution of its setting, is important to understanding the potential impact and acceptability of development proposals (Paragraph 007 Reference ID: 18a-007-20190723).

2.14 Paragraph 006 of the PPG (Reference ID: 18a-006-20190723) provides further interpretation of what constitutes an asset's heritage interest that may contribute to its value and significance:

- Archaeological interest: as defined in the NPPF Glossary, there will be archaeological interest in a heritage asset if it holds, or potentially holds, evidence of past human activity worthy of expert investigation at some point.
- Architectural and artistic interest: these are interests in the design and general aesthetics of a place. They can arise from conscious design or fortuitously from the way the heritage asset has evolved. More specifically, architectural interest is an interest in the art or science of the design, construction, craftsmanship and decoration of buildings and structures of all types. Artistic interest is an interest in other human creative skill, like sculpture.
- Historic interest: an interest in past lives and events (including pre-historic). Heritage assets can illustrate or be associated with them.

2.15 The PPG states that in relation to setting a thorough assessment of the impact on setting needs to take in to account, and be proportionate to, the significance of the heritage asset under consideration and the degree to which proposed changes enhance or detract from that significance and the ability to appreciate it (paragraph 013 Reference ID: 18a-013-20190723).

2.16 The PPG discusses how to assess if there is substantial harm. It states that what matters in assessing if a proposal causes substantial harm is the impact on the significance of the asset. It is the degree of harm to the asset's significance rather than the scale of the development that is to be assessed (paragraph 018 Reference ID: 18a-018-20190723).

2.17 The NPPF indicates that the degree of harm should be considered alongside any public benefits that can be delivered by development. The PPG states that these benefits should flow from new development and should be of a nature and scale to be of benefit to the public and not just a private benefit and would include securing the optimum viable use of an asset in support of its long-term conservation (paragraph 020 Reference ID: 18a-020-20190723).

Regional and Local Planning Policy

The London Plan 2021

2.18 The London Plan (Greater London Authority 2021) sets out the spatial development strategy for Greater London and provides an integrated economic, environmental, transport and social framework for the development of London over a 20 to 25-year period. The London Plan is part of each London's Local Planning Authorities' Development Plan and must be taken into account when planning decisions are taken in any part of Greater London. Development Plan Documents and Neighbourhood Plans have to be 'in general conformity' with the London Plan.

2.19 Policies within the London Plan that are relevant to this application include Policy HC1 Heritage conservation and growth;. Section A of the policy requires that Boroughs should develop an evidence base that demonstrates a clear understanding of the historic environment and which can be used *'for identifying, understanding, conserving, and enhancing the historic environment and heritage assets, and improving access to, and interpretation of, the heritage assets, landscapes and archaeology within their area.'* Section C requires that development proposals should conserve the significance of heritage assets by being sympathetic to that significance and should avoid harm and identify enhancement opportunities by integrating heritage considerations early on in the design process.

2.20 Section D notes that development proposals should identify assets of archaeological significance and use this information to avoid harm or minimise it through design and appropriate mitigation. Where applicable, development should make provision for the protection of significant archaeological assets and landscapes.

Richmond Local Plan 2018

2.21 The Richmond Local Plan was adopted by the London Borough of Richmond upon Thames on 3rd July 2018. The Local Plan sets out policies and guidance for the development of the borough to 2033. Policy LP3: Designated Heritage Assets sets out the Council's requirements for development s affecting

designated heritage assets. Section A, Paragraph 2 states that the Council will *'Resist the demolition in whole, or in part, of listed building (sic.). Consent for demolition of Grade II listed buildings will only be granted in exceptional circumstances… following a thorough assessment of the justification for the proposal and the significance of the asset.'*

2.22 Paragraph 4 requires *'the retention and preservation of the original structure, layout, architectural features, materials as well as later features of interest within listed buildings, and resist the removal or modification of features that are both internally and externally of architectural importance or that contribute to the significance of the asset.'*

2.23 Paragraph 5 states that *'Demolitions (in whole or in part), alterations, extensions and any other modifications to listed buildings should be based on an accurate understanding of the significance of the heritage asset.'*

2.24 Paragraph 7 requires *'the use of appropriate materials and techniques and strongly encourage any works or repairs to a designated heritage asset to be carried out in a correct, scholarly manner by appropriate specialists.'*

2.25 Section C states that *'All proposals in Conservation Areas are required to preserve and, where possible, enhance the character or the appearance of the Conservation Area.'*

2.26 A new Richmond Local Plan is currently under consultation. The terms of Policy 29: Designated Heritage Assets are broadly similar to those in the adopted Local Plan with the addition of the following sentence to paragraph 2 *'Careful and sensitive maintenance, management and reuse of heritage assets also saves embodied carbon and avoids the carbon dioxide of constructing new buildings.'*

Historic England Guidance

2.27 Historic England has published a series of Good Practice Advice (GPA), of which those of most relevance to this appraisal are GPA2 - Managing Significance in Decision-taking (HE, 2015), GPA3 - The Setting of Heritage Assets (2nd Edition) (HE, 2017), Advice Note 12 Statements of Heritage Significance (HE, 2019a) and Conservation Area Appraisal, Designation and Management Advice Note 1 (Second Edition) (HE, 2019b).

2.28 GPA2 emphasises the importance of having a knowledge and understanding of the significance of heritage assets likely to be affected by the development and that the "first step for all applicants is to understand the significance of any affected heritage asset and, if relevant the contribution of its setting to its significance" (paragraph 4). Early knowledge of this information is also useful to a local planning authority in pre-application engagement with an applicant and ultimately in decision making (paragraph 7).

2.29 GPA3 provides advice on the setting of heritage assets. Setting is as defined in the NPPF and comprises the surroundings in which a heritage asset is experienced. Elements of a setting can make positive or negative contributions to the significance of an asset and affect the ways in which it is experienced. Historic England state that setting does not have a boundary and what comprises an asset's setting may change as the asset and its surrounding evolve. Setting can be extensive and particularly in urban areas or extensive landscapes can overlap with other assets. The contribution of setting to the significance of an asset is often expressed by reference to views and the GPA in paragraph 11 identifies those views such as those that were designed or those that were intended, that contribute to understanding the significance of assets.

2.30 Historic England Advice Note 12 (HE, 2019a) outlines a recommended approach to assessing the significance of heritage assets in line with the requirements of the NPPF. It includes guidance on creating a statement that is proportionate to the asset's significance (heritage value) and the potential degree of impact of a Proposed Development.

2.31 The guidance on Conservation Area Appraisal, Designation and Management (HE, 2019b) emphasises that evidence required to inform decisions affecting a conservation area should be proportionate to the importance of the asset. It gives particular attention to identifying opportunities where conservation can help to deliver wider social, cultural, economic and environmental benefits and where there may be opportunities to draw on the contribution made by the historic environment to the character of a place.

2.32 Historic England has published Greater London Archaeology Priority Area Guidelines (HE, 2016) with an Archaeological Priority Area Appraisal for LBRT produced in 2022 (HE, 2022) by the Greater London Archaeology Advisory Service (GLAAS) which is applicable to the assessment in this report.

3. Historic Background

Prehistoric Periods (800,000 BC – AD 43)

3.1 After the last Ice Age, the Lower Thames became tidal with late Palaeolithic and early Mesolithic artefacts within the Richmond area indicative of the late glacial hunter-gatherer presence in the area. A variety of prehistoric remains have been discovered within the Ham Fields and Teddington Archaeology Priority Areas including pottery and flints as well as a Bronze Age spearhead, demonstrating the potential for prehistoric evidence to survive within the riverside area. A palaeochannel filled with alluvium was recorded in 2000 at the Lensbury Club Sports Ground, roughly 300m to the east of the Site, highlighting the potential for palaeoenvironmental deposits to exist within alluvium at the Site location.

Romano-British Period (AD 43 – AD 410)

3.2 There is little evidence of Roman occupation but the presence of an early Saxon settlement at Ham indicates there may have been river traffic from at least that time. Some Romano-British finds of pottery, glass and coins may be associated with the Twickenham to Kingston road which may have been a riverside route of Roman origin.

Medieval Period (AD 410 – AD 1540)

3.3 The name 'Teddington' is thought to derive from a combination of 'Tuda' (a person's name) and 'ington' meaning settlement. Teddington does not appear by name in the Domesday survey but it is likely that at the time of the Conquest it was held by the manor of Staines which had been acquired by Westminster Abbey, possibly as early as the 8th century. The settlement of Teddington grew up around the parish church of St Mary which was a chapel attached to the church at Staines in the 13th century. Teddington remained the property of the Abbey until 1536 when it became part of the Hampton Court estate. The estate was leased to various families until in 1736 it was sold to Matthias Perkins, a surgeon of Twickenham.

Post Medieval (AD 1540 – AD 1901)

3.4 During the 17th and 18th centuries Teddington attracted wealthy residents with its riverside setting and the proximity of the Royal parkland at Bushy Park and a number of large houses including Manor House, Udney House and Teddington Place (all now demolished) were built. The earliest large scale map of the area, John Roque's of 1768, shows Manor Road, Ferry Road and Broom Road with development along High Street and Park Road and a single building at the end of Ferry Road.

3.5 The ancient main road through Teddington ran from Isleworth to Kingston where there had been a bridge since 1219. The road was turnpiked in 1767 proceeding long Park Road and through Bushey Park to Hampton Court.

3.6 In 1810 the City of London Corporation secured an Act of Parliament authorising locks and weirs at Chertsey, Shepperton, Sunbury and Teddington. Construction of Teddington Lock started in September 1810 and it opened in June 1811. The first lock was located where the footbridge now stands and as early as 1829 it needed repair. In the same year, the weir was destroyed by a build-up of ice. In 1858 the new lock was opened in its present location together with the narrower skiff lock. The boat slide was added in 1869 and in 1904-05 the lock was enlarged to incorporate the barge lock. James Messenger built his boatyard at the end of Ferry Road in 1848 and The Boathouse, which dates to 1862, still stands. Messenger was appointed Queen's Bargemaster in 1862, a post he held until 1890, and the Royal barge was built at the boatyard in the late 19th century.

3.7 The manorial estate was sold in 1861 at which time terraces of houses were built between Stanley Road and Waldegrave Road to the west of the historic core. The increased population led to the building of the churches of St Peter and St Alban, a town hall and a cottage hospital. The South Western Railway's Twickenham to Kingston branch line was opened in 1863. The subsequent growth of the settlement saw its population rise from 1,183 in 1861 to 14,037 in 1901. A local board was formed in 1867 and an urban district council in 1895.

3.8 Ferry Road was known as Water Lane before the 1871 census but a ferry crossing is shown between the Teddington bank and Creweyte island (now Weir Island) on the 1869 - 72 Ordnance Survey map (Figure 2. In 1862 From the island passengers would have taken the lock gates to reach the Ham bank. In 1889 the current Teddington Footbridges were built allowing a crossing of both the Thames and the Lock Cut (Figure 3). The suspension bridge was designed by George Pooley (engineer) and built by Messrs Goddard and Massey of Nottingham (contractors). It is not known who designed the girder bridge but it is assumed they were built at the same time.

3.9 Figure 3, a detail from the Ordnance Survey 25in map Surrey VI.11 1898, illustrates a number of slipways and boathouses along the Teddington foreshore of the River Thames. Boat building had been a key industry at this location since at least 1848 when James Messenger opened his boatyard. He was Queen Victoria's bargemaster and the royal barge was stored at the boathouse (NHLE 1400150), a short distance to the south-west of the Site.

3.10 In the late 19th century a number of large houses were built on the Teddington bank including Old Broom Hall, Broom Hall, Weir Bank, Dunbar House, Roach Hall and Weir House.

Figure 2 - Detail from Ordnance Survey six-inch map Middlesex Sheet XXV 1869-72.

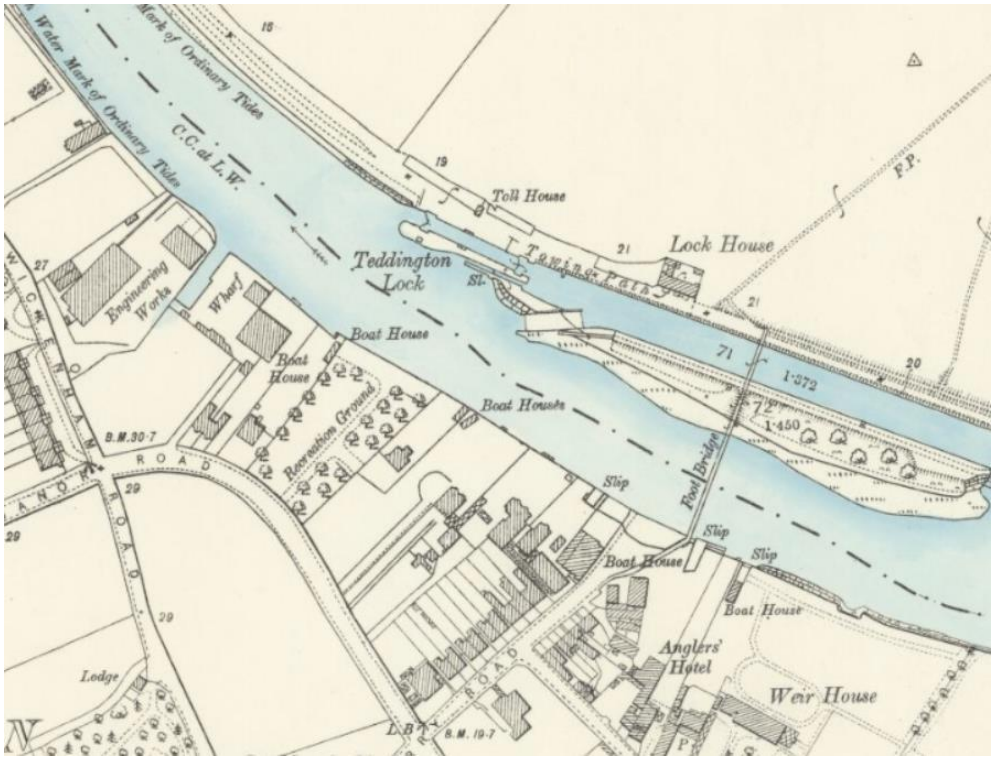

Figure 3- Ordnance Survey 25in map Surrey VI.11 1898

Modern (AD 1901– Present)

3.11 In 1902 the National Physical Laboratory opened in Bushey House. Film making started at Weir House in the early 20th century and a purpose-built film studio was erected in 1910 and expanded and renamed Teddington Studios in 1931. The studios were owned by Warner Bros. until they were bought by ABC Weekend TV and used as a television studio. They continued as a TV studio used by Thames TV and were demolished in 2016 and redeveloped as flats.

4. Baseline

Topography and Geology

4.1 The Site's location, topography and geology can reveal information relating to its past human activity, information on whether ground levels have been raised or terraced away and can contribute to our understanding of the archaeological potential of an area.

4.2 The land near the River Thames is low lying, rising to the north east towards the woods and hills in Richmond Park.

4.3 The geology of the area comprises London Clay formation of silt with some layers of sandy clay. Slivers of alluvium are mapped along this part of the Thames corridor, covering the floodplain or Kempton Park terraces. The alluvium typically consists of silts and clays which accumulated across the floodplain during the Holocene. It is possible that the gravel of the Kempton Park terrace comprises the banks and underlies the alluvium.

Designated Assets

4.4 Within the Site, there are two designated heritage assets, namely:

- The Grade II listed Teddington Footbridges (NHLE 1391392), and
- Teddington Lock Conservation Area.

4.5 Within the wider 250m study area, there are three other designated heritage assets all within the Teddington Lock Conservation Area. For the locations of designated assets in the study area please refer to Figure 4.

Teddington Footbridge (NHLE 1391392) – Grade II

4.6 The Teddington footbridges were constructed in 1888, replacing a former ferry service. The footbridges comprise two structures, the suspension bridge between the Teddington bank and Weir Island and the Lock Cut bridge between Weir Island and the Ham bank. The suspension bridge was designed by George Pooley and while the designer of the Lock Cut bridge is not recorded. However, it was built at the same time as the Suspension Bridge with the assumption that Pooley was responsible for it.

4.7 The Suspension Bridge has a single span with two pairs of steel towers surmounted by delicate finials and encased in polygonal concrete piers. Steel suspension cables support the bridge and are anchored into the ground on the Teddington bank and on Weir Island. Construction of the bridge is of sectional riveted girders with cross ties and the pairs of towers are also cross tied. The bridge is approached from the Teddington bank by a ramp constructed of concrete with an asphalt covered timber deck supported on timber piles. A modern timber ramp allows entry to and from Weir Island at the bridge's north extent.

4.8 The Lock Cut bridge is approached up steps from the towpath on the Ham bank and by a modern timber ramp. The bridge is of rivetted sectional girder construction with cross ties and rests on partly rendered concrete piers. A modern timber ramp descends to Weir Island at the bridge's south extent and the pier at this location has an arch to allow pedestrians to walk under it and stone coping above.

4.9 The bridges have historic interest as good examples of relatively unchanged footbridges of the late 19th century. They demonstrate the rising interest in the river and boating in the late 19th century as a result of the greater accessibility brought about by rail travel. While the Lock Cut bridge spans between Weir Island and the undeveloped Ham bank the suspension bridge was clearly designed to look attractive when viewed from the developed Teddington bank and has a measure of architectural and aesthetic interest as a result. The bridges also have community value being a landmark when viewed from the river of either bank.

The bridge's setting is the River Thames which is tidal at this point and is constantly changing. The setting extends to the Ham and Teddington banks of the river. The Ham side is almost completely rural with woods lining the towpath and the neat, 19th century lock cottages opposite the locks. The Teddington side is largely developed. Blocks of flats have replaced the boatyards and grand houses but historic buildings such as the listed Boathouse and 1-13, 4, 8, 10-14 and 15 & 17 Ferry Road, which are all 19th century houses and cottages recognised by the London Borough of Richmond upon Thames as Buildings of Townscape Merit remain and contribute to the bridge's significance.

Teddington Lock Conservation Area

4.10 The Teddington Lock Conservation Area was designated in 1977 and extended three times, with the existing boundaries last defined in 2019 (see Figure 5).

4.11 The Teddington Lock Conservation Area Appraisal, adopted in March 2023, sets out the special historic and architectural character of the area.

Revision: 0

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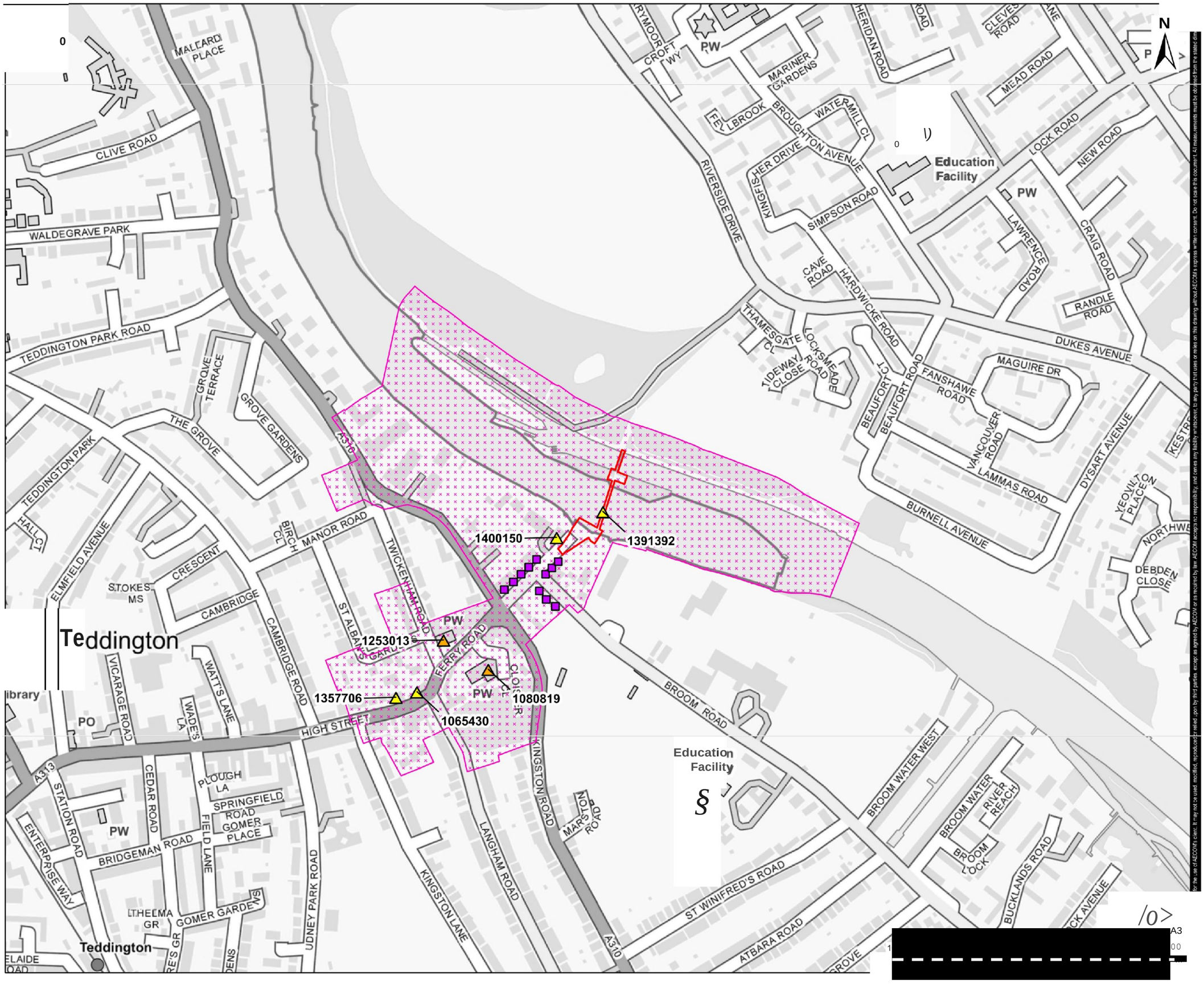

PROJECT

Teddington Footbridges

CLIENT

London Borough of Richmond upon Thames

CONSULTANT

LEGEND

- Red Line Boundary
- Conservation Area
- Locally Listed Building

Nationally Listed Building

- Grade II*
- Grade II

NOTES

Note: Red Line Boundary has been indicatively d1g1t1sed, do not scale, not for reproduction.

ISSUE PURPOSE

FINAL

PROJECT NUMBER

60662154

FIGURE TITLE

Location of Heritage Assets

FIGURE NUMBER

Figure 4

A3

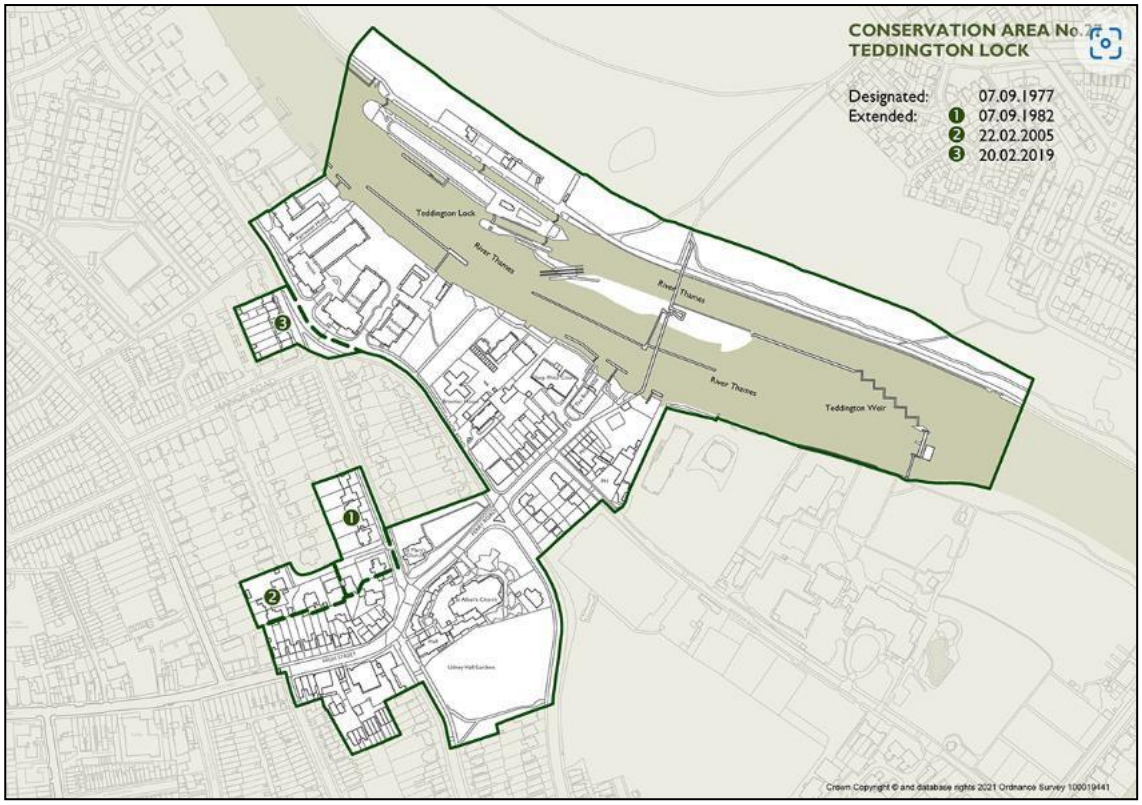

Figure 5 – Teddington Lock Conservation Area Map

4.12 It extends to the west to include part of the High Street and includes residential streets. Spanning the river it includes a section of the Ham riverbank. From the junction of Kingston Road and Ferry Road the conservation area is characterised by large residential properties on the north side with smaller, older dwellings on the south side. Once the river is reached the character is of light industrial riverside uses. This in turn gives way to the footbridges that connect the Teddington bank to the lock and the Ham bank where the setting has a rural feel. The suspension bridge is visible at the end of Ferry Road from as far north as the junction with Twickenham Road and is both a landmark within the conservation area and a gateway to it for people arriving from both directions along the Thames Path on the Ham side.

4.13 In addition to the listed Teddington Footbridge, the Teddington Lock Conservation Area contains the following listed buildings within 250m of the Site:

- Church of St Mary (NHLE 1253013) grade II*;
- Church of St Alban(NHLE 1080819) grade II*; and,
- The Boathouse, 27 Ferry Road (NHLE 1400150), grade II.

4.14 Two further grade II listed buildings, Oak Cottage (NHLE 1357706) and 163-167 High Street (NHLE 1065430) are located within the conservation area just outside the 250m study area.

4.15 The Teddington Society's Planning Group and History Group are working in tandem to compile a Directory of Buildings of Townscape Merit in Teddington. The Local List for London Borough of Richmond upon Thames lists the following buildings in proximity to the Site:

- Broom Road – 4 -10 (even); and,
- Ferry Road – 1, 3-13 (odd), 15 & 17 and 4, 8, 10, 12, 14.

4.16 Of the designated and non-designated assets within the Teddington Lock Conservation Area, the Site forms part of the setting to only the grade II listed Boathouse and the locally listed buildings on Ferry Road and Broom Road. Other designated and non-designated assets will not be assessed further in this Heritage Statement.

The Boathouse, 27 Ferry Road (NHLE 1400150) – Grade II

4.17 The Boathouse was built in the mid-19th century as part of a small commercial boatyard designed for the construction, maintenance and storage of small river craft. Its likely date of construction is 1862 from

inscriptions on several bricks on the south gable wall. The yard's owner, James Messenger was appointed Queen's Bargemaster in 1862. The yard had a reputation for building one-off boats such as the Lady Alice for Sir Henry Morton Stanley's second African expedition, the Nautilus for Baden Powell and the Daisy for use by the Church Missionary Society in central Africa. The Tough family acquired the yard in the 1930s and during the Second World War Douglas Tough organised the mustering of the 'Little Ships' for the evacuation of Dunkirk on the river adjacent to the yard.

4.18 The boathouse is a six-bay, two storey building. The ground floor is red brick and painted red brick and the upper floor is weatherboarded. The roofs are of slate. Attached to the east is a single-storey chandler's shop, formerly a boat store, which is original to the building or added shortly after it was built. To the west is a single-storey workshop extension added in the late 19th century.

4.19 The boathouse has historic and architectural interest as an unusual survival of a boathouse in a commercial boatyard in the upper reaches of the tidal Thames. Its historic interest is enhanced by its connection to Queen Victoria's Bargemaster, for storage of the royal barge, the fact that several notable small craft were constructed within it and the fact that it was the mustering point for the 'Little Ships'. While modern development has been added on the Teddington bank to the east and west of the boathouse its principal setting, the upper reaches of the tidal Thames including Weir Island, Teddington Lock and Teddington Footbridge, remains largely unchanged apart from the addition of mid-stream moorings and contributes considerably to the asset's significance.

4-10 Broom Road – Locally Listed

4.20 4-10 Broom Road are two detached (4 & 6) and two semi-detached houses approximately 90m south of the Site boundary. The houses are first shown on the Ordnance Survey map revised in 1934 and published in 1938. They were built together with Nos. 1-9 (odd) Kingston Road (also locally listed) in stucco with stone dressings and slate roofs. The houses have architectural interest as a small group in the Arts and Crafts style. They contribute to the residential character of the conservation area in this location whilst their proximity to each other contributes to their group value as assets of historical and architectural merit. Views to and from these buildings towards Teddington Footbridge are minimal at best, with the bridge making no contribution to their significance. 1, 3-13 (odd), 15 & 17 and 4, 8, 10, 12, 14 Ferry Road

4.21 Ferry Road serves as the historic route gateway to the river from Teddington. The majority of the houses on Ferry Road north of the junction with Manor Road and Kingston Road are locally listed. Nos. 4, 8, 10, 12, 14 and 15 & 17 are early to mid-19th century and are shown on the 6in Ordnance Survey (OS) map surveyed between 1864 and 1870 and published between 1869 and 1872. The houses are two storeys high with slate roofs and are all in rendered brick apart from No. 15 which is in brick. Nos. 3-13 (odd) are late 19th century and first shown on the 1898 OS map. These are large, semi-detached houses in yellow stock brick and multi-coloured brick dressings. The houses are three storeys high with attic rooms behind gables. The roofs are slate. No. 1 is a double-fronted, three storey detached house in yellow stock brick with a slate roof. The houses have historic interest for their part in two periods of the growth of Teddington, before and after it was connected to the railway network.

4.22 They contribute to the historic village character of the conservation area in this location as a group of historic residential buildings, although the architectural merit of some of the properties has been compromised with some modern interventions. The properties face the road with negligible views towards the river and the listed bridge, apart from No. 13 Ferry Road which may have some visibility of the bridge on its eastern gable from the attic windows. These buildings retain significance in their group value and in their position lining the historic route towards the river and the bridge.

Previous investigations

4.23 A list of previous events covering Teddington Footbridge and the surrounding area include:

- Geoarchaeological Borehole Investigation at Teddington Studios, Broom Road, MOLA, 2015;
- Archaeological Evaluation Report, Teddington Studios, Broom Road, MOLA, 2016;
- Archaeological Evaluation, Watching Brief and Building Recording at the Lensbury Club, Broom Road, MOLA, 2000.

Archaeological potential

4.24 This section assesses the potential for unknown archaeological remains to be present within the Site. The assessment of archaeological potential is based on the data available at the time of writing and takes into consideration the known archaeological finds in the wider area as well as the historic development of the Site, the specific APA reports for the area by GLAAS, ground investigation data, previous investigations and historical and cartographic evidence presented in the baseline.

4.25 There is no recorded known presence within the Site of archaeological remains or deposits. However, the potential for archaeological remains and deposits being encountered within the Site are summarised in Table 2.

Table 2 – Archaeological Potential

Historic Period	Presence of Known Archaeology	Likelihood of Archaeological Potential
Prehistoric	Not known	Low
Roman	Not known	Low
Medieval	Not known	Low
Post Medieval Industrial	Not known	High
Modern	Not known	High

5. Proposed Works

Works Requiring Planning Permission and LBC

5.1 This Heritage Statement has been prepared in support of planning permission and listed building consent for the following proposed works.

Lockcut Iron Truss Footbridge

- Replacement of existing rocker-roller bearings
- Works to steps/handrails at Ham bank pedestrian steps

Works Subject to Conditions

5.2 Some of the work does not require formal consent subject to the following conditions:

- Paint colour needs to match the existing, to be agreed on site;

Relevant Supporting Information

5.3 The works for the Proposed Development are set out in the following drawings and documents submitted as part of the planning and listed building consent application packages for the Site:

- Site Location Plan (drawing No. 60662154-ACM-SBR-00-ZZ-DR-CB-0006);
- Teddington Lockcut Footbridge Structure Number 81 Bearing Replacement – Existing General Arrangement (Drawing No. C124011-TGEE-SBR-XX-DR-CB-001)
- Teddington Lockcut Footbridge Structure Number 81 Bearing Replacement – Proposed General Arrangement and Construction Sequence (Drawing No. C124011-TGEE-SBR-XX-DR-CB-002)
- Construction Environment Management Plan (CEMP);

Bearing replacement – Lockcut Iron Truss Footbridge

Justification

5.4 Teddington Lockcut footbridge is a 31 m span wrought iron truss structure spanning the River Thames. Following inspection of the existing bridge bearings a decision was taken to replace the two northern bearings thereby restoring longitudinal movement as per the original design intent.

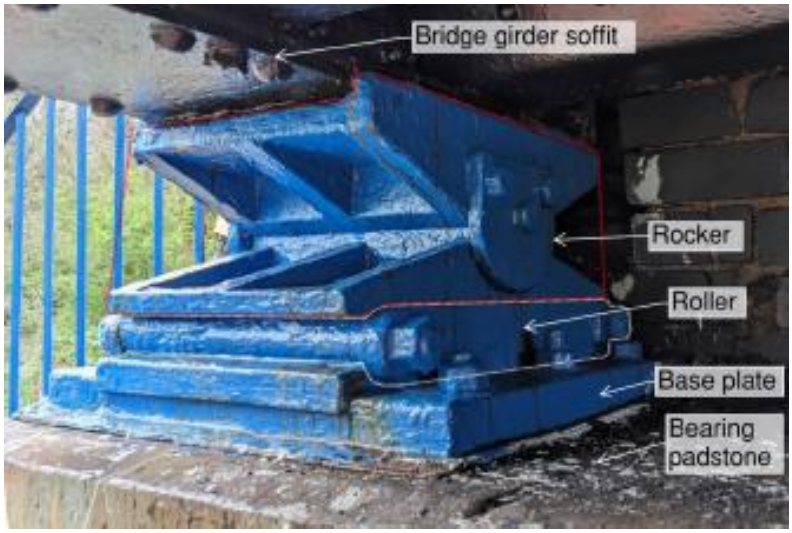

Figure 6 – Existing bearing arrangement

5.5 Teddington Lockcut Footbridge is a Grade II Listed Building under the National Heritage List for England, therefore conservation principles will have a significant influence on the proposed bearing replacement option.

Optioneering

5.6 A Bearing Replacement Options Report was completed in June 2024 by Tony Gee and is submitted in support of the LBC application. A summary of the options that were discounted are:

- Replace only the existing lower roller bearings with a bespoke roller assembly
- Replace only the existing lower roller bearings with a modern (UKCA / CE-marked) elastomeric bearing
- Replace with a modern like-for-like bearing
- Replace with a modern proprietary rocker-roller bearing (UKCA or CE-marked)
- Replace with a modern bearing to current standards (UKCA or CE-marked), such as an elastomeric bearing

Preferred Option

5.7 The preferred option is to:

- Replace rocker with new rigid upper element and replace lower roller bearings with a modern (UKCA / CE-marked) elastomeric bearing

5.8 This option sees the existing rocker assembly replaced with a fabricated rigid structural steelwork stub to transfer vertical loads and provide no articulation to the bridge – a 'false rocker'. The rotation function of the roller will be replaced by rotation in the elastomer. The restraint plates for the elastomeric bearing would include a façade roller end plate and protruding nuts to preserve aesthetics for heritage reasons.

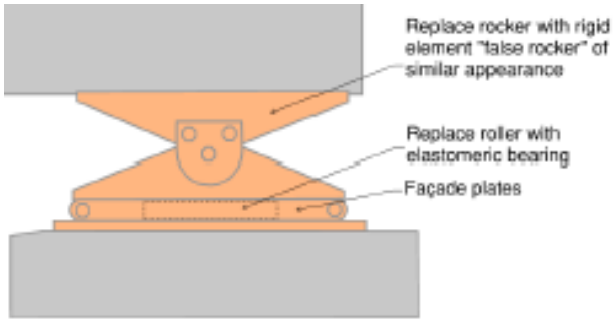

Figure 7 – Preferred option concept (replaced elements shown orange)

5.9 The original appearance will largely be preserved; however, the actual components will be new. The replacement steel elements will be colour matched to the same blue as used on the steel elements of the bridge.

5.10 This option provides full UKCA / CE-marking for the elastomeric element, whilst the upper stub element will be designed and fabricated to current standards as structural steel rather than a mechanical moving part. The estimated design life of the elastomeric bearing is 120 years.

Works to Ham bank pedestrian steps/handrails

Justification

5.11 The north abutment is monolithic with the mass concrete staircase (which is aligned perpendicular to the bridge longitudinal direction) and comprises a mixed construction of solid mass concrete (lower section), a stone landing slab, brick infill and a padstone bearing shelf on top. A masonry ballast wall sits on top of the padstone bearing shelf and is backfilled with cement concrete. At the top of the abutment the stair balustrade railing (on the south side of the stairs) and a standalone parapet / balustrade panel are nominally bolted to the east and west truss end flange plates respectively.

5.12 To facilitate the works to replace the bearings the existing abutment is proposed to be partially broken out down to bearing shelf level. This will involve removing the surfacing, the standalone panel of parapet / balustrade, a section of the cement concrete backfill and the brickwork ballast wall to expose the upper surface of the bearing shelf padstone to provide a platform to jack the bridge from and to allow corrosion repairs to the ironwork. The top two steps of the staircase will also need to be removed as they currently cover the bottom part of the eastern truss. However, as the uppermost three / four infill bars (commonly known as balusters or spindles) of the stair balustrade are grouted into the top two stair treads they will need to be detached in such manner that the stone treads can be removed without recourse to removing the entire stair balustrades on both sides. The simplest solution is a proposed cut to the

handrail, whilst leaving the infill bars embedded into the treads.

5.13 A new reinforced concrete ballast wall is proposed to be dowelled to the existing padstone bearing shelf / abutment with reinforcement bars. After the new bearings are installed and the bridge de-jacked, the ballast wall will be constructed up to underside of surfacing level. The backfill behind the ballast wall will either be compacted granular fill or mass concrete if there is limited access to compact the fill.

5.14 Upon completion of the works, the handrail on both balustrades will need to be welded back together, the welds ground flush and repair area re-painted. This proposal is considered the most practicable and least damaging because even if the balusters could be debonded from the holes within the treads, it would still prevent removal of the treads. Similarly, if the balusters are cut, their remaining length would hinder the removal of the treads, whilst more repairs would be required to the ironworks. Other options would be to cut the stone treads but this is considered to cause more work and damage to the original stone.

Figure 8 – Pedestrian steps at Ham bank/North abutment

Temporary works

5.15 The bridge is proposed to be jacked up from a vertical steel jacking frame connected onto the end of each truss flange via the existing rivet holes, in a similar connection arrangement to the previous bearing replacement in 1956, albeit the 1956 design consisted of a temporary cross beam at footway level as the bridge was (assumed) closed to pedestrians. For the current proposed bearing replacement works, the horizontal beam member will be provided at the base of each post to form a U-frame.

5.16 A steel jacking frame is proposed comprising two jacking posts with welded end plates to jack from and a horizontal member bolted to the posts to form a U-frame [all members formed with Universal Columns (UC)].

5.17 The jacking posts will be connected to the existing bridge trusses using bolts via the existing rivet holes. The previous bearing replacement utilised 8 no. holes on each truss to bolt a cross beam, but because it did not carry pedestrian loading, the current proposed scheme will require more existing rivets to be removed, the number of which will be determined in the assessment. To address the protruding dome heads of the remaining existing rivets, a packer plate of at least the thickness of the rivet heads will be provided between the truss and the jacking post. It is proposed to weld a strip restraint plate to each edge of the packer plate to form a U-shaped channel (in plan) to “trap” each truss This U-shaped packer plate will be connected to the temporary U-frame via the same bolts. A steel UC stub will be bolted to the padstone that will engage with downstand plates that are welded to the horizontal beam member to provide the overall lateral restraint in the temporary condition.

Material Specifications

Steel

5.18 Structural steelwork will utilise structural steel to grade S355J2+N in accordance with BS EN 10025-2:2019.

5.19 All exposed new steel sections will be protected by a paint system (Black 00 E 53 in accordance with BS 4800 – To match the underside of the bridge) in accordance with the Specification for Highway Works – Inland Environment Difficult Access.

Concrete

5.20 All concrete mixes will be in accordance with the relevant clauses of BS 8500-1:2015+A2:2019, BS 8500-2:2015 +A2:2019 and BS EN 206:2013+A2:2021.

Sequence of Proposed Works

5.21 The duration of the project is anticipated to be a maximum of 12 weeks, with the expectation that construction and demobilisation will be completed before January 2025. In summary, the sequence of proposed works as set out in the CEMP with approximate durations are shown in Table 3:

Table 3 – Sequence of Proposed Works

Proposed work	Approximate duration
Scaffold installation	10 days
Removal of landing	5 nights (closure)
Installation of temp works	5 nights (closure)
Removal of bearings	5 days
Repairs to girder	5 days
Installation of bearings	5 days
Dejacking and complete landing works	10 nights (closure)
Render works	5 days
Strike scaffold	10 days

6. Impact Assessment

6.1 The assessment of the baseline presented in Section 4 discussed the significance and setting of the heritage assets that will be impacted by the Proposed Development. This section assesses the impact of the works on the significance of those assets.

Temporary Construction Impacts

6.2 The construction activities have the potential to cause temporary changes to the immediate area in the vicinity of the listed bridge within the Teddington Conservation Area either side of the River Thames and the Lock Cut and for a short distance south along Ferry Road. These changes will have the biggest impact on the Grade II listed Teddington Footbridge (NHLE 1391392) and the Boathouse 27 Ferry Road (Grade II, NHLE 1400150), with temporary works located within their immediate vicinity including site compounds, pontoon, temporary access scaffolding, temporary work platforms, and the presence of vehicles and plant.

6.3 The locally listed buildings identified within this part of the conservation area, along Broom Road and Ferry Road, will incur temporary change to their setting from vehicular movements along the access route to the bridge as well as visual impacts from the presence of the compound areas. Road (Locally Listed).

6.4 These temporary construction impacts will alter the character and setting of the identified heritage assets for the proposed 12 weeks duration of the works but would not permanently change or irreversibly harm their significance.

Permanent Construction Impacts

6.5 After the works have been completed the compounds, pontoon and temporary access scaffolds will be removed ensuring there will be no permanent construction impacts on the conservation area or the designated and non-designated buildings within it. Some construction activities will have permanent effects on the Grade II listed Teddington Footbridge (NHLE 1391392). The replacement bearings and steelwork will have a physical impact and will cause a slight change to the look of the Lock Cut Bridge when viewed from close by. However, if the new elements are colour matched to the colour of the paintwork of the bridge the impact will be slight and will decrease sharply once the viewer moves away from the bridge. The proposed new elements will have no impact upon the character of the Teddington Lock Conservation Area. In respect of the listed Teddington Footbridge (NHLE 1391392) the proposed replacement bearing arrangement would have a negligible impact upon the aesthetic value of the Lock Cut Bridge resulting in less than substantial harm to the significance of the designated heritage asset.

7. Mitigation

7.1 The embedded mitigation inherent in the design of the proposed replacement bearing arrangement minimises impact upon the listed bridge and conservation area and minimises change to the setting of the designated and non-designated assets in the conservation area.

8. Conclusions

8.1 In accordance with NPPF Paragraph 194 this Heritage Statement has described the significance of the assets with the potential to receive impact from the Proposed Development together with an assessment of the contribution made by setting to that significance. The level of detail used in each case is proportionate to the asset's significance.

8.2 The design has been refined and developed to minimise impact upon the setting and significance of the heritage assets as far as possible, and particularly in relation to the listed Teddington Footbridge (NHLE 1391392) with materials and like for like replacements.

8.3 The Heritage Statement concluded that the Proposed Development would not result in loss of significance for the designated and non-designated built heritage assets within the 250m study area of the Site. It concluded that replacement bearings will cause less than substantial harm to the aesthetic of the bridge and the overall character of the listed Teddington Footbridge (NHLE 1391392) would not be affected. The replacement of the bearings ensures the continued safe use of the footbridges whilst preserving the structures.

9. Bibliography

Ancient Monuments and Archaeological Areas Act (1979) (as amended) (1979) c. 46. http://www.legislation.gov.uk/ukpga/1979/46

Department for Communities and Local Government (DCLG) (2017) *Planning Practice Guidance.*

The Environment Act 1995 https://www.legislation.gov.uk/ukpga/1995/25/contentsHistoric England (2015) Historic Environment Good Practice Advice in Planning Note 2. M*anaging Significance in Decision Taking in the Historic Environment*. English Heritage, Swindon.

Historic England (2016), Greater London Archaeology Priority Area Guidelines

Historic England (2017) *Historic Environment Good Practice Advice in Planning Note 3. The Setting of Heritage Assets.* English Heritage, Swindon.

Historic England (2019a) *Statements of Heritage Significance: Analysing Significance in Heritage Assets. Historic England Advice Note 12.* October 2019. London: Historic England Publications.

Historic England (2019b) *Conservation Area Appraisal, Designation and Management Historic England Advice Note 1 (Second Edition). February 2019.* London: Historic England Publications.

Historic England (2022), *Archaeological Priority Area Appraisal for London Borough of Richmond*

IEMA 2021 *Principles of Cultural Heritage Impact Assessment in the UK*. July 2021. Chartered Institute for Archaeologists / Institute of Historic Building Conservation / Institute of Environmental Management & Assessment.

London Borough of Richmond upon Thames (2018). Richmond Local Plan.

Ministry of Housing, Communities and Local Government (MCHLG) (2021) *National Planning Policy Framework (NPPF). Conserving and enhancing the historic environment*. Ministry of Housing, Communities & Local Government.

MOLA (2015), Geoarchaeological Borehole Investigation at Teddington Studios, Broom Road

MOLA (2016), Archaeological Evaluation Report, Teddington Studios, Broom Road

MOLA (2000) Archaeological Evaluation, Watching Brief and Building Recording at the Lensbury Club, Broom Road

The Water Industry Act 1991 https://www.legislation.gov.uk/ukpga/1991/56/contents

Appendix A – Bearing Replacement Options Report

Teddington Lockcut Footbridge - Bearing Replacement

Bearing Replacement Options Report

Prepared for

London Borough of Richmond upon Thames

Document no: C124011-TGEE-STR-ZZ-RP-CB-0101
Revision: P01
Date: 07/06/24

Tony Gee
Consulting Engineers

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Document Issue Record

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Contents

1. Introduction

Teddington Lockcut footbridge is a 31 m span wrought iron truss structure spanning the River Thames. Following inspection of the existing bridge bearings (see AECOM inspection report 60662154-ACM-LOCK-TN-SE-0002, rev P01) a decision was taken to replace the two northern bearings thereby restoring longitudinal movement as per the original design intent.

Teddington Lockcut Footbridge is a Grade II Listed Building under the National Heritage List for England, therefore conservation principles will have a significant influence on the proposed bearing replacement option. Advice from consultations with Historic England and Conservation Officers stated the following:

"*The bearing itself is not of particular historic interest in terms of rarity or engineering innovation, particularly as it is not in its original form with some parts replaced (as to be expected with its age and the amount of wear and tear it has endured). Furthermore, there is an example of this bearing on Hammersmith Bridge so was likely a common bridge bearing by this time.*

However, it is considered to make a contribution to the architectural interest of the bridge as it is highly visible and forms part of its original 19th century character. Accordingly, the bearing itself could be replaced but I would strongly recommend that some form of plate is introduced in front of the bearing replacement that imitates the appearance of the rocker and roller bearing to mitigate the impact of the replacement on the architectural character of the bridge."

Notwithstanding, conservation and heritage objectives must also be weighed against technical criteria, including product assurance (CE-marking), technical and construction risk and cost and programme considerations.

This report appraises 6 options for the replacement of the existing bearings

1) Replace only the existing lower roller bearings with a bespoke roller assembly
2) Replace only the existing lower roller bearings with a modern (UKCA / CE-marked) elastomeric bearing
3) Replace rocker with new rigid upper element and replace lower roller bearings with a modern (UKCA / CE-marked) elastomeric bearing
4) Replace with a modern bespoke like-for-like bearing
5) Replace with a modern proprietary rocker-roller bearing (UKCA or CE-marked)
6) Replace with modern bearing to current standards (UKCA or CE marked), such as an elastomeric bearing

Recommendations are made in Section 4.

2. Existing arrangement

The north end of Teddington Lockcut Footbridge is supported by two rocker-roller bearings. A typical single bearing is shown in Figure 1 and consists of two parts – a rocker and a roller. The rocker forms the upper section allowing rotation of the bridge truss girders as they are loaded, whilst the lower section comprises rollers to permit longitudinal translation of the bridge as it expands / contracts with changes in ambient air temperature. Transverse fixity is provided on the lower half of the bearings via guide plates connecting the ends of the rollers together. The upper rocker half provides restraint to the bridge via its channel-shaped upper plate to locate and "trap" the bottom flange of the truss lower chord.

There are no original record drawings for the bearings meaning some details such as connection between the bearing components are unknown. However, it is anticipated there is no positive connection between the roller and rocker assemblies, thereby providing the option to replace either or both assemblies.

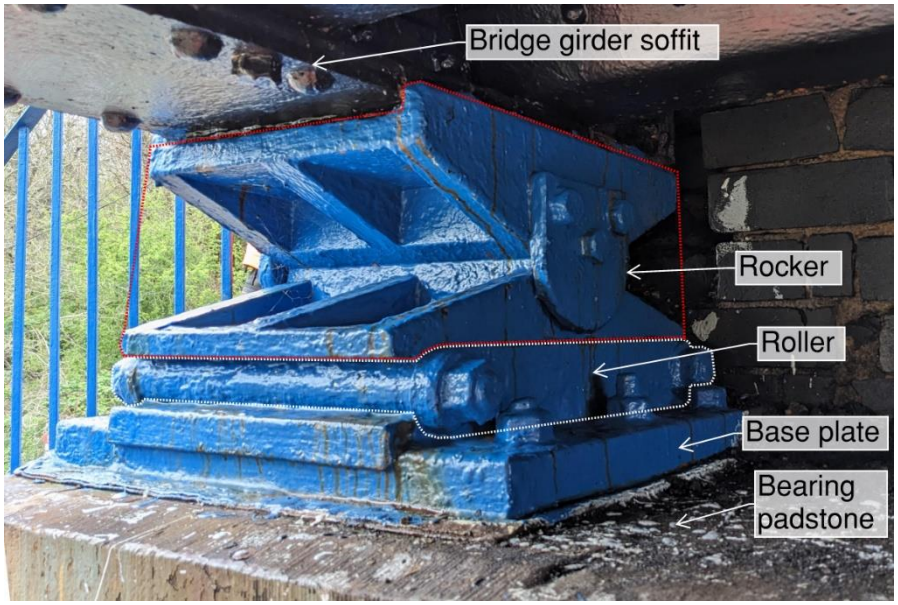

Figure 1. Existing bearing arrangement

Figure 2. Left photo: bearing under west girder. Right photo: bearing under east girder

3. Replacement options

For each of the options, it is assumed that the bridge will be supported on hydraulic jacks during the bearing replacement operation. In this operation the jacks lift the north end of the bridge a small amount (a few millimetres), sufficient to unload the existing bearings to enable their full or part removal.

3.1. Option 1: Replace only the lower roller bearings with a bespoke roller assembly

This option consists of replacing the lower roller bearing assembly with a new bespoke roller assembly with similar appearance to the existing. The upper rocker assembly is retained and either left in place and either refurbished in-situ or taken off site for more thorough refurbishment / rehabilitation (Figure 3).

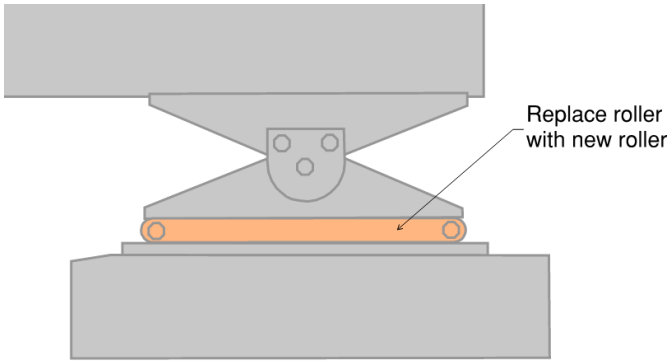

Figure 3. Option 1 concept (replaced elements shown in orange)

3.1.1. Advantages

a) Heritage value: The rocker element is preserved and replacement steel elements may be colour matched to the same blue as the bridge

b) The new bespoke roller element would be made as similar in appearance as possible to the existing, but designed to current standards (see “Disadvantages” regarding UKCA / CE marking).

c) If the rocker is retained in place rather than taken off site for rehabilitation, this avoids the risk of uncovering issues with the existing bottom chord flange of the main bridge truss or difficulty re-assembling and re-establishing a suitable flat-to-flat contact surface area between the truss bottom flange and the rocker upper plate. It also avoids the risk of disassembling the rocker and either finding out that it is beyond a refurbishment condition or that it cannot be re-assembled and provide the same load capacity as the existing arrangement

3.1.2. Disadvantages

a) This is a bespoke design, meaning UKCA / CE marking will be very difficult (perhaps not possible) to gain, and warranties would not be provided as it is very unlikely that a bearing manufacturer would invest in all the testing and certification for a one-off design. This means it would limit availability of suitable bearing manufacturers as all bearings (regardless of whether proprietary or bespoke fabricated) must be designed and manufactured to conform to EN 1337 in accordance with the Construction Products Regulations (CPR). It will therefore likely need to be procured through a steelwork fabricator, who would similarly not be able to offer warranties / assurances of fitness for purpose as a moving part (i.e. a bearing), given lack of CE-marking / declaration of performance.

[An alternative consideration would be to procure a modern roller bearing to EN 1337-4 with UKCA / CE-marking. However, as noted in Option 5 there are very few bearing manufacturers who offer roller bearings, whilst aesthetics would not be preserved, thus obviating heritage value benefits of this option]

b) The installation of a new roller bearing presents significant technical challenges as it requires very tight tolerances and would interface a very low tolerance existing rocker. It would be very challenging to ensure smooth and even surfaces to permit free movement of completely horizontal rollers. Furthermore, it may be difficult to design a mechanism to secure the rollers from moving out of alignment ("escaping") under repeated movement cycles if replicating the existing design (*Note* - modern rollers usually have toothed wheels [akin to gear wheels] to prevent this escape).

c) Given the exposed location of the bearings the rollers would be subject to wetting and ingress of grit which may lead to loss of function and premature failure

d) Original upper rocker has already been in service for over 135 years; its remaining life expectancy is difficult to predict whilst there is risk that it might not be fully functional as a rocker.

e) Whilst retaining the upper rocker in-situ offers advantages described above, there are risks in the construction operation:

- The rocker would need to be supported/ hung from girder soffit during the operation to avoid it falling off or the upper and lower halves of the rocker separating from each other
- Despite not removing the rocker, currently hidden defects (corrosion) may still be uncovered at the rocker to roller assembly interface
- Corrosion of the rollers may have joined them to rocker and base plate. Additional jacking force and prying may be needed to release the components, such as temporarily fixing the existing roller assembly downwards. This increases the possibility of damage to the rocker assembly to be retained.
- Condition of interface between rocker and roller and extent of corrosion / defects is unknown. Corroded surfaces would need in-situ preparation to provide even surfaces for the replaced components, this would be very difficult to achieve safely and effectively in-situ due to severely limited access / working space.
- Any defects that exist at the interface between rocker and bottom flange of bridge truss, such as corrosion / loss of section will not be remediated, hence could affect residual life of the bridge. Similarly, by not removing the rocker, this reduces access to refurbish the remaining areas of the ironworks that could not be addressed during the previous rehabilitation phase.

f) Whilst removing the upper rocker and taking it off site for rehabilitation would overcome the aforementioned disadvantages, different risks as described in c) of "Advantages" could be encountered.

3.2. Option 2: Replace only the lower roller bearings with a modern (UKCA or CE-marked) elastomeric bearing

Option 2 is very similar to Option 1, except the lower roller and base plate assembly is replaced with a modern elastomeric bearing conforming to current EN 1337 standards with UKCA / CE-marking (Figure 4). Transverse fixity is provided via a restraint plate arrangement similar to that shown in Figure 5; these would also allow fixing of a façade plate seeking to match the existing roller end (side) plate and nuts as closely as possible. The elastomer, top and bottom plates would bring the depth to around 100 mm. This is greater than the height of the existing rollers (2”) and would therefore necessitate removal of the existing base plate to fit in the assembly.

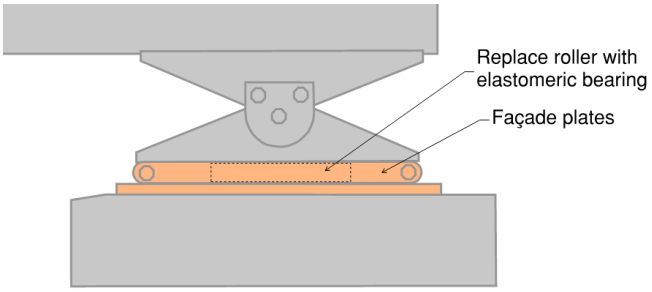

Figure 4. Option 2 concept (replaced elements shown orange)

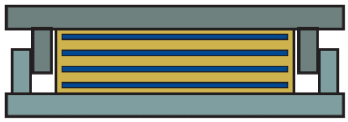

Figure 5. Concept of restraint plates either side of elastomeric bearing to provide transverse fixity

Figure 6. False roller end plate with protruding threaded stud and nut attached to restraint plate (shown in red)

3.2.1. Advantages

a) Heritage value: The rocker element is preserved and replacement steel elements may be colour matched to the same blue as the bridge. The elastomeric bearing will require steel plates located either side of it to provide transverse fixity; additional “false” façade plates / details may be added to replicate as closely as possible the existing roller end (side) plate and nuts (see Figure 5).

b) UKCA / CE-marking provides more assurance of longevity than the roller element of Option 1

c) Proprietary elastomeric bearings are widely available on the market with costs and procurement times minimised

d) Tolerances required compared to Option 1 are much lower making it easier to construct / install to achieve intended function

e) Elastomer provides simpler functionality than roller and therefore better durability / life expectancy than Option 1 as no mechanical or rolling parts that can be affected by grit / debris build up. If not subjected to excessive loads, installed correctly and suitably

sheltered, elastomeric bearings can offer up to a 120-year life expectancy, however, note Disadvantage d) in Option 1.

3.2.2. Disadvantages

a) Technical design and construction challenges: Ensuring a flat-to-flat contact surface on the rocker lower plate for the elastomer to bear against, provision of replacement fixings for the new base plate – restricted access to drill / core new holes

b) As per Disadvantages d), e) and f) of Option 1

3.3. Option 3: Replace rocker with new rigid upper element and replace lower roller bearings with a modern (UKCA or CE-marked) elastomeric bearing

This option is similar to Option 2 except the existing rocker assembly is replaced with a fabricated rigid structural steelwork stub to transfer vertical loads and provide no articulation to the bridge; in other words it acts a “false rocker”. The rotation function of the rocker will be replaced by rotation in the elastomer (Figure 7). As per Option 2, the restraint plates for the elastomeric bearing would include a façade roller end plate and protruding nuts to preserve the aesthetics for heritage reasons (Figure 6).

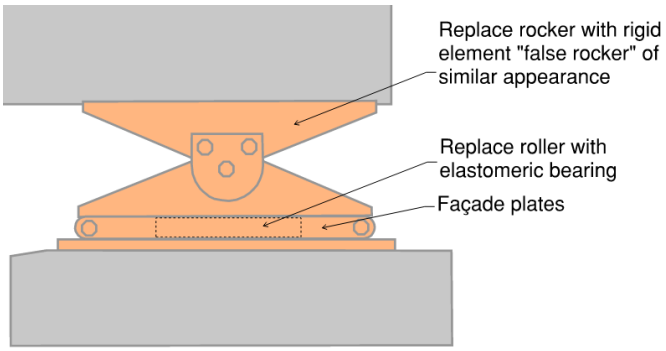

Figure 7. Option 3 concept (replaced elements shown orange)

3.3.1. Advantages

a) Heritage value: The original appearance will largely be preserved, however, the actual components will be new. Replacement steel elements may be colour matched to the same blue as the bridge. As per Option 3, the elastomeric bearing would be masked with a “false” façade.

b) Option provides full UKCA / CE-marking for elastomeric element, whilst upper stub element will be designed and fabricated to current standards as structural steel rather than a mechanical moving part (bearing) hence does not need CE marking - this provides full technical assurance and assurances of longevity from UKCA / CE-marking than Options 1 or 2.

c) As per c) and d) of Option 2

d) Compared with Options 1 and 2, there are no risks of estimating residual life span of the upper rocker as it will be completely replaced by a non-moving part, therefore this option could achieve 120-year design life expectancy provided conditions noted in Option 2, Advantage e) are met.

e) Reduced construction risk and complexity compared to Options 1 and 2 as existing rocker is not retained.

3.3.2. Disadvantages

a) Heritage value: As discussed in the advantages section, all components will be new. Possible very inconspicuous differences between the existing rocker and the new upper steelwork stub due to minor adjustments to dimensions that might be essential for technical reasons

b) Unknown condition of the existing rocker to truss bottom flange interface likely to uncover corrosion and other potential defects that will need to be remediated. Until removed, extent of remediation needed is unknown – but should be similar to Option 2 where interface between rocker and roller is unknown.

c) Still likely require fixings for new lower plate, however, removing and replacing upper rocker provides more access compared with Option 2.

3.4. Option 4: Replace with a bespoke like-for-like rocker-roller bearing

This option would have the entire bearing replaced with a bespoke replica roller-rocker of similar or near identical appearance (Figure 8).

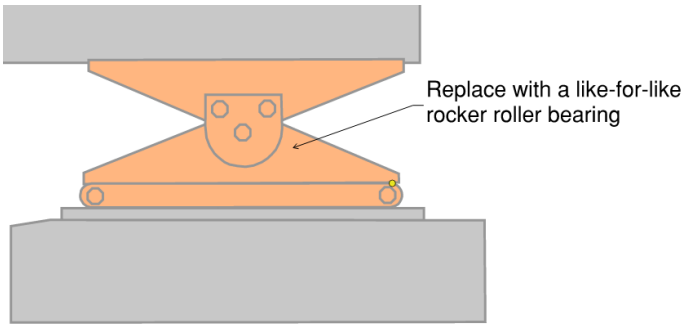

Figure 8. Option 4 concept (replaced elements shown in orange)

3.4.1. Advantages

a) Heritage value: The original appearance when the bridge was built in circa 1888 will largely be recreated, although the components would be new compared with the rest of the bridge. Replacement steel elements may be colour matched to the same blue as the bridge.

b) There is reduced construction risk and complexity compared to Options 1 and 2 as fewer existing elements are retained

3.4.2. Disadvantages

a) As per disadvantage a) of Option 1, this would carry no UKCA / CE-marking or assurances and it is unlikely there would be a bearing manufacturer who would fabricate a replica due to CPR constraints. Therefore, the only likely route to procurement would be a steelwork fabricator who would similarly not be able to offer certification / testing / conformity to EN 1337 due to cost and technical risk. In such case, no warranties would be offered on fitness for purpose (correct functioning) of the bridge bearing as a mechanical articulating component.

b) Given this option seeks to replicate the original, the new bearing, especially the rollers, will be exposed to wetting and ingress of debris / grit which will affect functionality and could lead to premature failure

c) Unknown condition of the existing rocker to truss bottom flange interface likely to uncover corrosion and other potential defects that will need to be remediated. Until removed, extent of remediation needed is unknown – but should be similar to Options 2 where interface between rocker and roller is unknown.

3.5. Option 5: Replace with a modern proprietary rocker-roller bearing (UKCA or CE-marked)

Option 5 is similar in principle to Option 4 except it would be a modern proprietary rocker-roller conforming to EN 1337 (Figure 9).

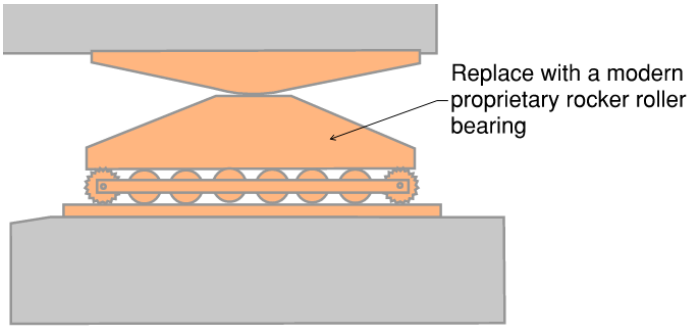

Figure 9. Option 5 concept (replaced elements shown in orange)

3.5.1. Advantages

a) Heritage value: A modern version to current standards could be manufactured to provide some resemblance to the existing, i.e. consisting of an upper rocker and lower roller assembly. Colour matching might be possible.

b) Full UKCA or CE-marking provides more assurance of longevity than Options 1 and 4

c) Risk of retaining existing rocker eliminated (in contrast to Options 1 and 2)

d) Reduced construction risk and complexity compared to Option 1 as fewer existing elements are retained

3.5.2. Disadvantages

a) Roller bearings conforming to EN 1337-4 are rare in the current market due to low demand and availability of more modern more technically advanced alternatives. There is therefore a very restricted market of manufacturers who could manufacture such a bearing (enquiries have identified possibly two manufacturers, Maurer and Schreiber, whilst neither have yet confirmed they could / would definitely offer this due to low quantity). As technical compliance will be necessary to EN 1337, there will be distinct differences in appearance from the existing, e.g. toothed roller wheels as described in Disadvantage b) of Option 1 (see also Figure 9).

b) Given the exposed location of the bearings the rollers would be subject to wetting and ingress of grit / debris which may lead to loss of function and premature failure. *[Similar to Option 4 this is on the premise that a plate(s) or shroud to protect the bearing would not be provided given requirement for heritage preservation].*

c) Likely higher cost and lead-in times than Options 1, 2, 3 or 6 (and possibly 4) due to special order / rare nature of this type of bearing

3.6. Option 6: Replace with modern bearing to current standards (UKCA or CE marked), such as an elastomeric bearing

This replaces the entire bearing with a proprietary bearing conforming to EN 1337, such as an elastomeric bearing supported on a reinforced concrete plinth. It may be possible to leave the existing base plate in place and cast the new plinth on top or fully encase it. Steel restraint plates required for transverse fixity (see Figure 5) would be necessary which would allow a façade to be made to provide as close resemblance to the existing as possible.

It is noted that other bearing types such as a cylindrical bearing could also be feasible, but it would offer no real advantages over an elastomeric bearing due to higher cost and longer lead-in time, whilst also being more prone to failure due to moving mechanical parts and tighter tolerances required in manufacture and installation.

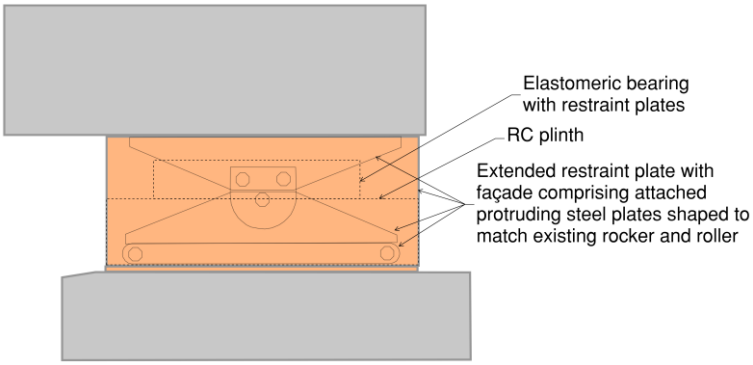

Figure 10. Option 6 concept (replaced elements shown in orange)

3.6.1. Advantages

a) All as per Option 3, except heritage value

b) Likely lower cost than Option 3 (simpler fabrication)

c) More height available for elastomeric bearing, therefore bigger range of sizes available and removal of existing lower plate might not be essential

3.6.2. Disadvantages

a) Heritage value: Although a façade fixed to the restraint plates could be provided, unlike Options 2 and 3 which have a façade only for the simpler lower (roller) part, the form and aesthetics of the rocker element façade will not offer the same appearance as the existing assembly. This is because restraint plate either side of the elastomeric bearing would need to be a continuous rectangular plate to provide transverse restraint. Even if the restraint plate could be shaped with removed triangular wedges, this would still expose the black elastomeric bearing and concrete plinth. It will therefore look rather different to the existing bearing even if painted with the same matching blue paint.

b) Unknown condition of the existing rocker to truss bottom flange interface likely to uncover corrosion and other potential defects that will need to be remediated. Until removed, extent of remediation needed is unknown – but should be similar to Option 2 where interface between rocker and roller is unknown.

4. Summary and recommendation

Options 1 and 2 present significant technical and construction risk and provide no assurances of remaining residual life of the retained existing rocker, whilst not addressing corrosion to the existing bottom flange at the interface with the rocker. Option 4 provides no technical assurances or warranties due to its complete bespoke custom nature. Option 5, whilst would conform to current standards with full CE-marking and therefore provide assurances, presents programme and cost risks, especially due to limited available manufacturers. It is also unlikely to provide much heritage advantage relative to other options. Option 6 provides the simplest form and technical functionality and is likely to be the lowest cost (limited fabrication). However, its main drawback is even with façade plates, it will not be feasible to retain the existing appearance effectively due to the non-rectangular shape of the rocker element with the 2 triangular air wedges. Hence this option is unlikely to satisfy heritage requirements.

It is therefore recommended that Option 3 is carried forward as it provides similar advantages to Option 6 but will additionally be able to offer a similar visual appearance to the existing. This is due to the relatively simpler geometry of the existing roller end (side) plate (illustrated in Figure 6).

Appendix B – List Description

Heritage Category: Listed Building

Grade: II

List Entry Number: 1391392

Date first listed: 03-Oct-2005

List Entry Name: TEDDINGTON FOOTBRIDGE

Statutory Address 1: TEDDINGTON FOOTBRIDGE, FERRY ROAD

County: Greater London Authority

District: Richmond upon Thames (London Borough)

Parish: Non Civil Parish

National Grid Reference: TQ 16750 71461, TQ 16773 71530

Teddington Footbridge; suspension and girder footbridge across the River Thames and Lock Cut. Circa 1888. Steel, concrete. Suspension bridge by George Pooley, engineer, Messrs Goddard and Massey of Nottingham (contractors). Designer of girder bridge unknown but it is assumed that it and the suspension bridge were built together.

Single span suspension bridge with two pairs of steel towers surmounted by delicate finials. The towers are now encased in polygonal concrete piers. Steel suspension cables. Sectional riveted girder construction with cross ties. Timber boarded walkway approach to south on concrete and timber stilts with iron railings. Modern timber walkway to north is not of special interest. Asphalt surface to bridge and southern approach ramp.

Single span footbridge of riveted sectional girder construction with cross ties. Partly rendered concrete piers; that on the south of the bridge incorporates a brick arch to allow pedestrian access beneath. Moulded stone coping stones to south pier. Asphalt surface to bridge. Steps down to tow path to north-west with iron hand rails. Wooden bridge to north is not of special interest.

HISTORY: The bridge was built in the late C19 to replace the former ferry crossing operating between Teddington on the south bank and Ham on the north bank of the River Thames. The suspension bridge is of 1888 linking Teddington to Creweyte or Swan Ait island, located between the River Thames proper and the Lock Cut; a navigational improvement constructed in 1811-12. The girder bridge is assumed to be of the same date as the suspension bridge linking the island to the north bank.

SUMMARY OF IMPORTANCE: Teddington Footbridge is significant as a functional yet attractive and relatively intact transport structure in two parts, of circa 1888 date.

SOURCES: Cherry, B & Pevsner, N, 1994, The Buildings of England. London 2: South. Page 716

Appendix C – Site Photographs

Plate 1. Lock Cut bridge, general view from Ham bank

Plate 2. Lock Cut bridge, west parapet

Plate 3. Existing under on west girder

Plate 4. Existing bearing under east girder