Teddington Lock Cut Footbridge – Bearing Replacement.

Construction Environmental Management Plan. Rev A.

LONDON BOROUGH OF RICHMOND UPON THAMES

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Construction Environmental Management Plan (CEMP) - Contents:

1.0 - Introduction

This Construction Environmental Management Plan (CEMP) is to highlight potential adverse impacts from proposed construction activities that could affect the Teddington Lock Cut Footbridge. The Lock Cut Footbridge is a metal truss structure spanning 31 m over the River Thames between concrete abutments, with approach ramps and stairs providing access to the bridge at either end.

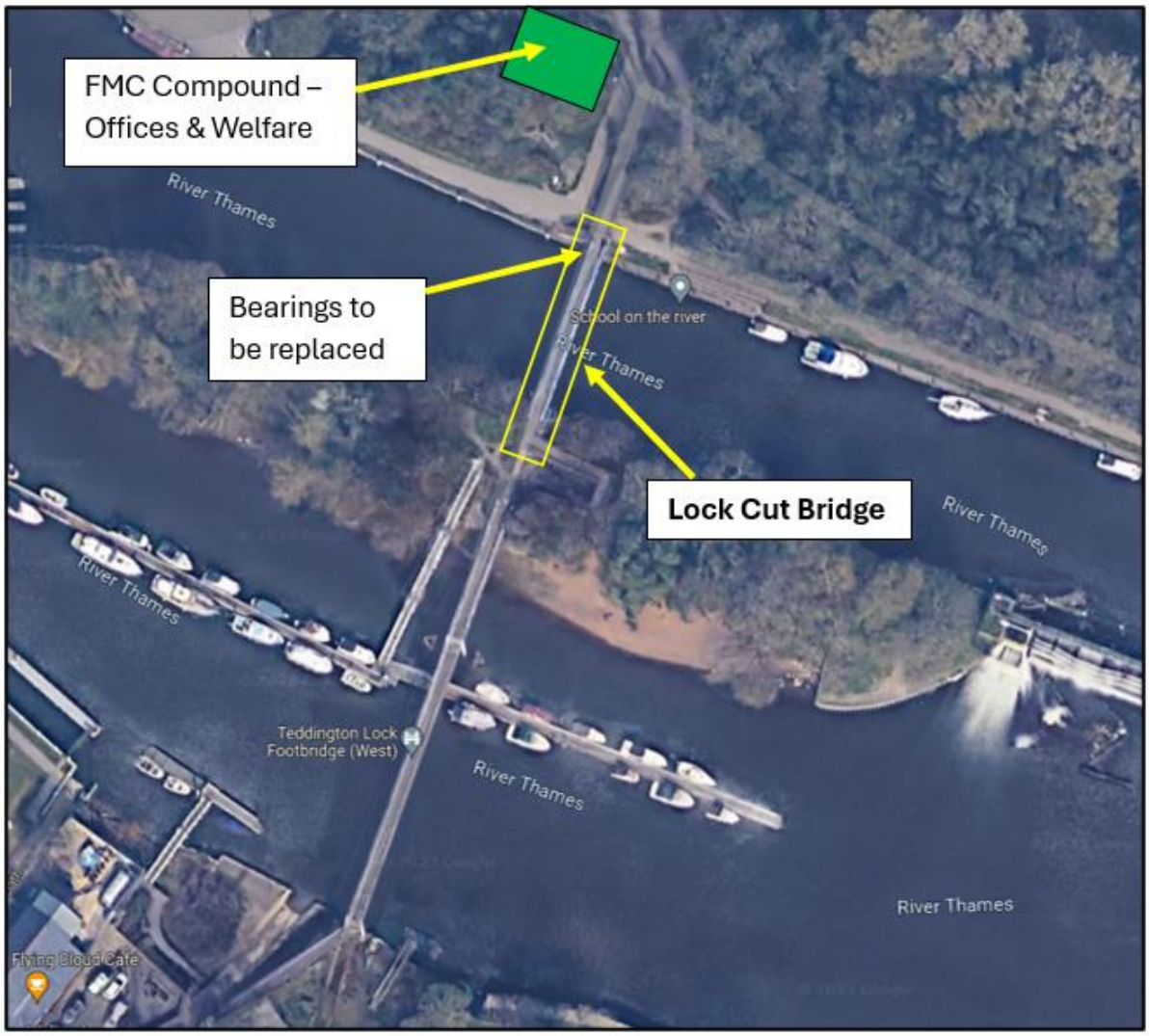
This bridge, and the adjacent Suspension bridge were listed grade II by Historic England in October 2005, List Entry Number 1391392.

This CEMP will determine how the environmental impacts will be mitigated and managed throughout the duration of the project.

1.1 – Site Description

The images below provide the location of the works to be completed on Teddington Lock Cut footbridge by FM Conway (FMC). The address for this bridge is

- Teddington Lock Footbridge (West), Teddington TW11 9NN


FMC Compound – Offices & Welfare
Bearings to be replaced
Lock Cut Bridge
River Thames
School on the river
Teddington Lock Footbridge (West)
Flying Cloud Cafe

1.3 - Project Description

FM Conway have been instructed to complete the following works to the Lock Cut North Abutment, in order to replace the existing roller bearings with new elastomeric bearings.

The bearings in the North abutment are to be replaced within the following sequence .

1) Close the stairs and bridge break away the top of abutment landing down to existing padstone (bearing shelf) level.
2) Temporary remove handrail and the stair treads to expose the back of superstructure.
3) Clean and remove corrosion to the bridge ironworks and repaint.
4) Place temporary plate to bridge gap between remaining section of abutment landing and bridge. Install temporary edge restraint to be able to re-open public access to bridge from the ramp only.
5) Install the fabricated steel jacking U-frame and temporary lateral restraint (possible short closures).
6) Jack the bridge up (short closure).
7) Remove existing bearings. Clean up / remove corrosion to truss bottom flange area and paint exposed areas.
8) Replace the bearings.
9) Lower jack plungers to transfer bridge load onto new bearings (short closure).
10) Remove the fabricated steel jacking frame and jacks (possible short closures).
11) Close bridge, cast ballast wall and backfill behind to underside of surfacing level.
12) Resurface landing and install new expansion joint.
13) Reinstate stairs and handrails
14) Render and paint abutments
15) Remove temporary works

In order to replace the bearings, we will need to jack the bridge. During the jacking stage, temporary steel plates are proposed to be placed between the jack head and jacking post with a PTFE sliding surface in between. The design of this will be undertaken by the bearing replacement / jacking operations Contractor.
Lateral restraint is proposed to be provided via a UC stub bolted to the existing padstone. This
column stub will provide restraint via engagement with steel plates which project down from
the horizontal beam member of the U-frame.
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, stone edge beam (east), 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 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 infill bars (commonly known as balusters or spindles) of the stair balustrade are grouted into the stair treads they will need to be detached and reinstalled at the end of the works.

The proposed methodology is to cut to the handrail, whilst leaving the infill bars embedded into the treads.
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.

For heritage reasons, an options appraisal was undertaken for different replacement bearing types. This document is appended as ##########. Consultation with Conservation officers and Historic England resulted in the following being the preferred option and is centred on maintaining the aesthetic appearance of the structure whilst achieving long term maintenance aspirations, through the use of a modern bearing specification;

Replacing the existing rocker assembly with a fabricated rigid structural steelwork
stub or “imitation rocker” which will transfer load from the deck. Laminated elastomeric bearings
positioned under the imitation rockers will provide both the rotation and translation functions.
Guide plates oriented longitudinally on upper and lower bearing plates will provide transverse
restraint. A façade roller end plate with protruding nuts will preserve the aesthetics.
The imitation rocker will be bolted to the sofit of the truss bottom chord to transfer lateral load.
Due to very small edge distances between the existing bearings and the padstone, the new lower bearing plate is proposed to be bolted into tapped holes in a steel transfer plate. The transfer plate will be bolted into threaded sockets that are cast into new holes drilled into the
padstone with the required edge distance. The bolt heads will be sunk into the transfer plate
via recessed oversized holes to avoid clashing with the bearing lower plate.

For the expansion joint, the gap is proposed to be sealed with a proprietary acrylicimpregnated
foam capped with a profiled silicone facing, such as the BEJS system by Sika-
Emseal or equivalent. This will be covered with a GRP cover plate with integrated anti-slip surfacing fixed to the abutment concrete with countersunk screws.

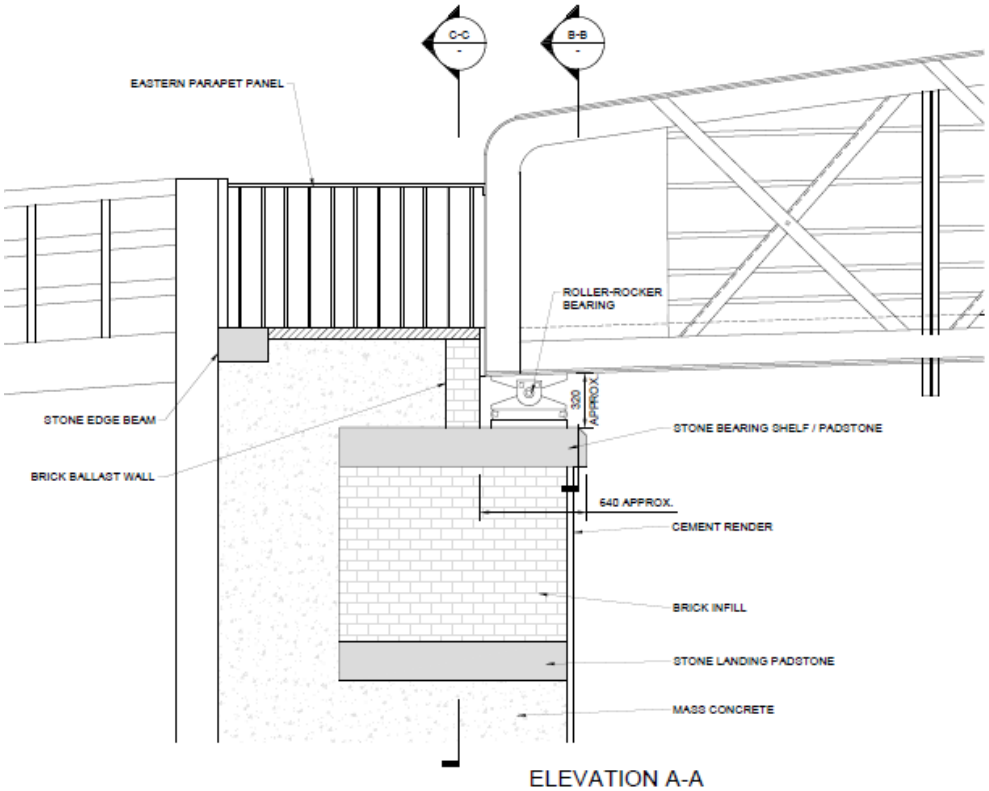
All new permanent works concrete will be provided with suitable falls to their top surfaces where possible (within geometric constraints).
A new expansion joint will be provided with a silicone faced seal to help mitigate water ingress
onto the bearing shelf and corroding the superstructure. The proposed GRP cover plate will further mitigate leakage. These will provide a significant improvement on the existing situation
with an absence of joint.

The restraint plates for the elastomeric bearing will provide shielding to the bearing thereby increasing its durability.

All existing components that we need to temporarily remove, will be carefully removed, stored safely and reinstated on completion.

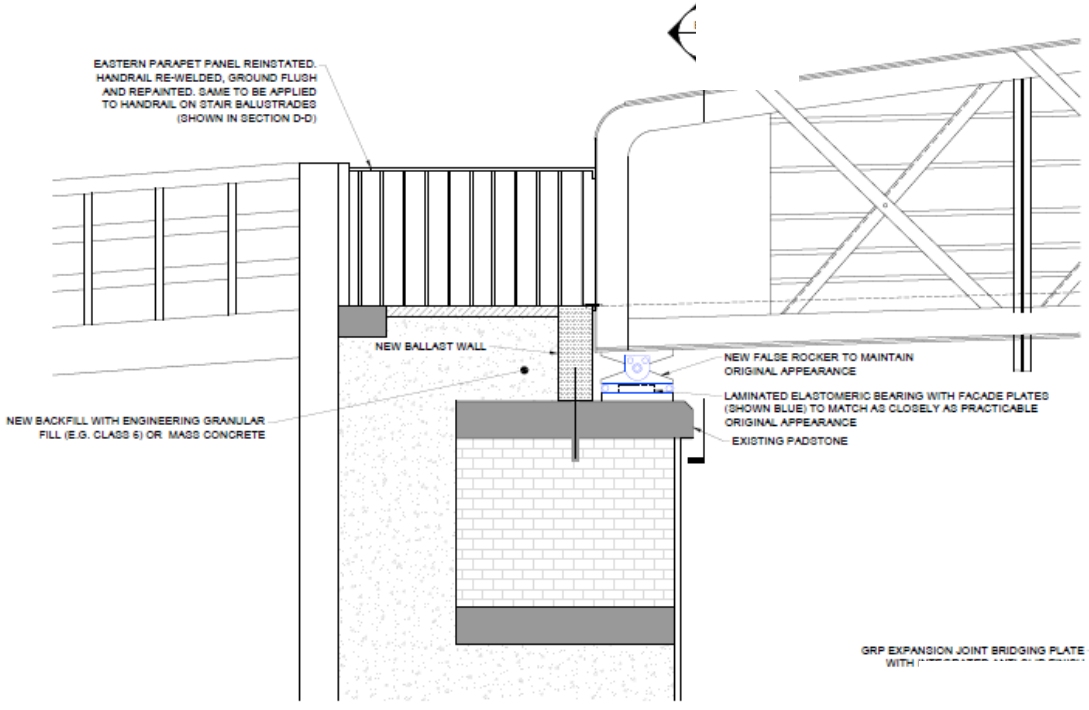
Photo 1. Plan of north abutment – existing pedestrian restraint systems

Abutment construction details and location of bearings -



ELEVATION A-A
SCALE 1:20

Bearing replacement –



PERMANENT STAGE OF BEARING REPLACEMENT
SCALE 1:20

Temporary Works - Structure Protective Measures

The access scaffold will be cantilevered and will not be connected to the bridge or abutment during the bearing replacement works. The scaffold deck will be plywood boarded and fully encapsulated to stop any debris from entering the river course.

1.4 - Environmental Management

It is our policy to seek continual improvement throughout our business operations to reduce our impact on the local and global environment by conserving energy, water and other natural resources; reducing waste generation; recycling and; reducing our carbon footprint.

1.5 - Environmental Impacts

Careful consideration of emissions to air, water and land. Including noise & vibration, dust, general discharges, traffic impacts, waste management impacts, ground contamination, ground water and drainage, and ecology, during the works. The access scaffold deck will be plywood boarded and fully encapsulated to stop any debris from entering the river course.

1.6 – Environmental Mitigation Measures

Mitigation measures are means to prevent, reduce, or control adverse environmental effects of a project, and include restitution for any damage to the environment caused by those effects through replacement, restoration, compensation, or any other means. The proposed mitigation measures for the identified items are summarised in Appendix A. The mitigation measures will be continually reviewed and monitored which will allow for continual assessment of the effectiveness of these mitigation measures. As new information becomes available through the monitoring, the mitigation measures may be revised if they prove less effective than anticipated.

1.7 – Wildlife Protection & Safeguard Measures

In relation to the following acts specified below:

- **The Wildlife and Countryside Act, 1981**
- **The Countryside and Rights of Way (CroW) Act, 2000**
- **Natural Environment and Rural Communities (NERC) Act, 2006 (as amended)**
- **Protection of Badgers Act, 1992**
- **The Wild Mammals (Protection) Act 1996**

FM Conway will ensure that all acts are adhered to when completing the proposed scope of works. This will be executed by ensuring all potential habitats and bird nesting areas are inspected and confirmed as vacant (free of any species) prior to any commencement of works. Subsequently, as works progress throughout the project, regular inspections will also take place to ensure that no vacant areas become occupied.

Should it become apparent that there are any known species / habitats following any surveys then FMC will halt all works immediately and this will be reported to LB Richmond, Environmental Agency, Ecological Team, and other relevant project members. Following this, the correct protocols / procedures will be followed in accordance with the acts above, in order to proceed with the works safely while safeguarding all known species.

Appendix B - Desk Study Data Table of **"Appendix B - Teddington Lock Ecological Appraisal"** lists all terrestrial notable species identified by GIGL within a 2km radius of Teddington Lock footbridge. Therefore, FM Conway will ensure that all necessary inspections carried out comprise of identifying these listed species prior and during the proposed works.

FM Conway will be implementing the following mitigation and control measures in order to prevent any potential disruption caused to surrounding known species and habitats, and are as per the below:

Bats:

- FM Conway will implement sensitive construction lighting (when required) in accordance with government guidance and legislation to prevent any disruptions to surrounding bats and roosts within proximity to the site.
- Noise mitigation measures such as acoustic barriers will be implemented around noisy plant and surrounding the site perimeter fencing. Additionally, appropriate plant selection will take place to ensure that unnecessary noisy plant isn't selected to facilitate work activities.

Nesting Birds:

- Noise mitigation measures such as acoustic barriers will be implemented around noisy plant and surrounding the site perimeter fencing. Additionally, appropriate plant selection will take place to ensure that unnecessary noisy plant isn't selected to facilitate work activities.
- The bearing replacement work area has been surveyed and no signs of nesting birds have been found.

Otter & Water Vole:

- FM Conway will implement sensitive construction lighting (when required) in accordance with government guidance and legislation to prevent any disruptions to surrounding otters and water voles within proximity to the site.
- Noise mitigation measures such as acoustic barriers will be implemented around noisy plant and surrounding the site perimeter fencing. Additionally, appropriate plant selection will take place to ensure that unnecessary noisy plant isn't selected to facilitate work activities.
- Dust deposition / mitigation measures such as water suppression, and where reasonably practicable dust extraction (if required) will be implemented onsite in relation to dust related construction activities in order to prevent dust deposition within the proximity and surrounding area of the site.

Fish:

The proposed scope of works is not anticipated to impact fish within proximity of the works site.

Invasive Species:

The work area has been assessed and found not to be subject to any known invasive species.

2.0 Site Management

Below are the contact details of the people on site with the overall responsibility for compliance with the CEMP.

Toby Allen – FMC - Contract Manager – 07768 724989

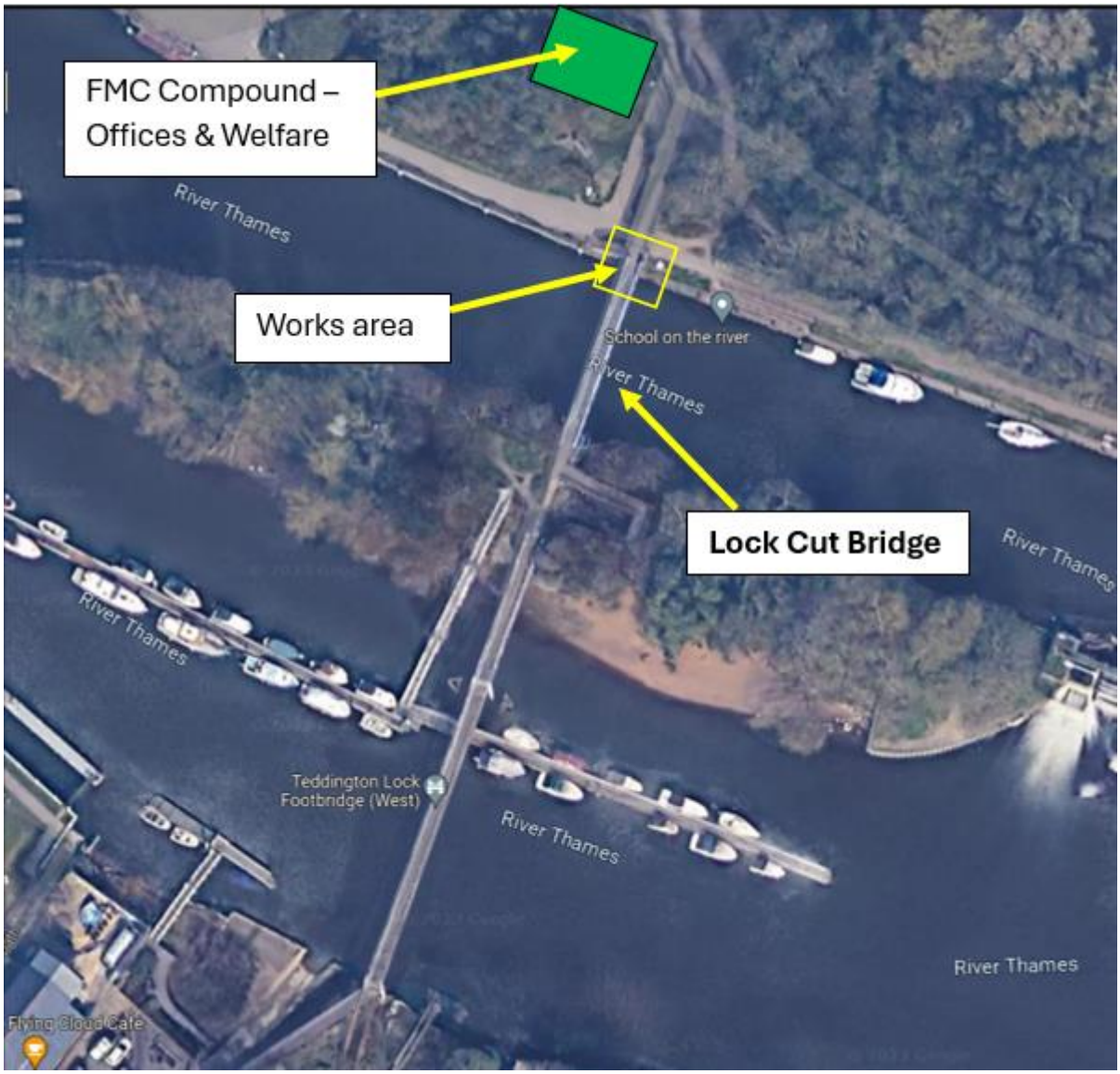
Jason Clark – FMC – Sub Agent – 07780 226432

Mayrick Hellwing – FMC – Quality & Environmental Manager – 07803 396843

2.1 - Development Site Layout and Welfare Arrangements

FMC have already established a site compound area, that is adjacent to the North Abutment / work area. The compound boundaries are guarded off to the public and unauthorised personnel via the use of strong wall barriers. Pedestrian arrow signage is installed to safely divert the public around the compound area.

FMC compond location plan -



2.2 - Managing Materials, Site Storage, and Good Housekeeping

Any contaminated materials will be removed safely without posing a risk to the workforce or the environment.

A small area on the girder, behind the bearings, needs to be prepared, have a plate welded and then painted. In order to complete these works, existing lead paint will need to be removed, and this will be completed at source, in an airtight system, stored in a secure container and removed from site by a licensed carrier and waste disposal contractor to a licensed tip.

The waste products from the removal of the bearings will be stored within the FMC compound and will be collated and removed off site to a licensed tip.

No waste materials will be stored near the watercourse.

3.0 - Community Liaison and Communication, Including Complaints Procedure

A display board shall be prominent and shall detail the nature of the works being undertaken, a contact name and telephone number (including a telephone number to be used outside normal working hours)

A complaints register shall be kept and shall include complainant's details, date and time of the complaint, cause(s) of the complaint, action taken to resolve the complaint, date and time of action taken to resolve the complaint, and reasons for any unresolved complaints.

4.0 - Site Operations

The normal working hours for the project works, deliveries including the transport of materials, plant, and equipment shall only take place during the following hours: 08:00 to 18:00 on Monday to Friday, 08:00 to 17:00 on Saturdays.

Full closures are needed to complete some aspects of these works. To minimise disruption to the members of public, it is proposed that the full closures will take place, during off peak hours, 22:00 - 05:30 Monday – Friday.

These working hours will be agreed by the local authority and a Section 61 been granted. During school term time, the proposed access and/or egress routes, deliveries shall be restricted to between 9:30 and 15:00 on Monday to Friday.

4.1 – Noise and Vibration

All vehicles and plant used during the development will be maintained in good and efficient working order, and in accordance with manufacturer's specification.

• All vehicles, mechanical plant, and machinery used during the development shall be fitted with proper and effective silencers (where available AND/OR in compliance with health & safety requirements) and shall be maintained in good and efficient working order.

• All plant and machinery in intermittent use shall be shut down in the intervening periods between works.

• Plant and machinery capable of generating significant noise and vibration levels will be operated in a manner to restrict its duration.

• Static plant and machinery shall be sited as far away as possible from inhabited buildings or other noise sensitive locations.

• All compressors shall be 'noise reduced' models that are fitted with properly lined and sealed acoustic covers which shall be kept closed whenever the machines are in use. All ancillary pneumatic percussion tools shall be fitted with mufflers or silencers of the type recommended by the manufacturers.

• Wherever possible mains electricity or battery powered equipment shall be used instead of diesel or petrol powered generators.

• The handling of materials shall be conducted in such a manner that minimises noise, including minimising drop heights into hoppers and lorries.

• No stereos or similar amplified devices shall be audible beyond the site boundary.

4.2 – Dust

All plant and equipment shall be maintained in accordance with manufacturer's recommendations to ensure emissions to atmosphere are minimised.

• Any handheld equipment such as grinders, needle guns, shot blasting, welding . shall be operated with a water suppression attachment or a dust vacuum at source.

• Engines of plant, machinery, and lorries shall be always turned off when not in use.

• Delivery activities, plant, stockpiled materials and/or any other activities liable to significant dust generation shall be located as far away as possible from the water course

• Stored materials liable to dust generation shall be dampened down, covered with tarpaulin, or otherwise contained as far as reasonably possible.

• The scaffold working platform will be encapsulated and fallen debris removed by vacuum.

• All vehicles or storage containers, carrying dusty materials shall be securely covered.

4.3 – Air Quality

Air monitoring will be completed throughout the project and the results analysed. The analysis will determine if the current prevention measures are adequate.

4.4 – Health Monitoring

Ongoing health monitoring of the site project team will be undertaken. This will consist of but not limited to the following: - Blood tests, safety medicals and frequently specialist

5.0 - Supporting Information and Appendices

Appendix A

Teddington Flood and Environmental risk assessment and mitigation measures.

Appendix B

Teddington Lock Ecological Appraisal