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PLANNING

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FAO Claire Penny

23rd February 2011

Dear Claire Penny

Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 – Regulation 5 Screening Opinion
Teddington Weir HydroPower Project.

Thank you for your letter dated 16 February 2011 requesting a formal screening opinion of the local planning authority under the provisions of the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 in respect of the above development proposals.

The proposal involves four reversed engineered Archimedes screws to be provided at Teddington Weir designed to generate 0.532 mega watts (MW).

I can confirm that the local planning authority is of the view that the proposal does not fall within Schedule 1 of the Regulations and as such an EIA is not mandatory. The proposal however involves hydroelectric energy production which just exceeds the threshold of 0.5 MW and is therefore a Schedule 2 development. Such development may require an EIA if it is considered likely that the scheme would result in significant environmental effects and in particular are within or close to a 'sensitive area' as defined in Regulation 2(1).

It is noted that the energy output is only just over the threshold and that together with the limited scale of the development forming part of the existing riverside operational infrastructure, as well as being located away from a 'sensitive area', the proposal in terms of its impact on the relevant environmental criteria would be limited.

For the reasons above, the local planning authority consider that the proposed redevelopment would not have significant effects on the environment and that the proposal does not require an Environmental Statement, under the terms of the EIA Regulations 1999, to accompany any future planning application.

Yours sincerely



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16 February 2011

London Borough of Richmond upon Thames
Civic Centre
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FOR THE ATTENTION OF DEREK TANNER, PRINCIPAL PLANNING OFFICER

Dear Mr Tanner

REQUEST FOR SCREENING OPINION – TEDDINGTON WEIR HYDROPOWER PROJECT

I am writing on behalf of Ham Hydro Community Interest Company (CIC) formally to request a Screening Opinion for the proposed installation of Archimedean screw hydropower infrastructure at Teddington lock, in accordance with Regulation 5 (1) of *The Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999* (as amended), hereinafter referred to as the EIA Regulations. Set out below is the relevant information in support of this request in accordance with Regulation 5.

1. INTRODUCTION AND SITE CONTEXT

Ham Hydro CIC was created by members of the Ham United Group (HUG); set up in 2006 to improve the local environment, build community cohesion and raise ecological awareness. Having successfully secured the rights to develop a hydropower project at Teddington Weir through a competitive bid to the Environment Agency, Ham Hydro CIC was established to take forward the development of this project, and with the overall aim of developing renewable energy projects in the area for the benefit of the local community. A copy of Ham Hydro CIC's Environmental Policy is included as **Appendix A**.

The purpose of this project is to generate 'clean' electricity from the proposed hydropower installation, thus reducing carbon emissions locally and nationally and to use the income generated to promote and develop further low-carbon solutions in the London borough of Richmond.

The scheme will be part financed by grant funding provided by the GLA through the Low Carbon Zone programme and seeks to complement other projects in the Ham and Petersham Low Carbon Zone, launched by Richmond Borough Council in 2010.

The Environment Agency owns and operates Teddington Weir and Locks, which are used to maintain upstream water levels for navigation (the original purpose of the structure and the first lock built in 1812 at the site of the present day footbridge), to manage flood risk on the River Thames and to help ensure there is sufficient water available in the River to enable abstractions. As such, Ham Hydro CIC will be following a gateway process for the project as set out by the Environment Agency and working with Environment Agency approved contractors.

DEREK Tanner, Principal planning officer, London Borough of Richmond upon Thames

The construction phase is intended to take place over a 4-5 month period from April to September 2012.

Teddington Weir is located on the River Thames (approximate OS grid reference TQ 168 714) between the settlements of Teddington to the west and Ham to the east. On the left bank, directly adjacent to the proposed development is the Lensbury Club and hotel, with the Teddington Studios complex for film and television production located immediately downstream. Broom Road runs behind the Club and Studios and the surrounding area on the Teddington side is primarily residential. The Thames Path (a National Trail) runs along the right bank, opposite the weir, where there are boat moorings, and beyond that are residential developments which overlook but are set back from the River, within the village of Ham (see **Photos 2 and 6 in Appendix B**).

The weir is approximately 4.8 miles downstream of Molesey Lock and 3 miles upstream of Richmond Lock. It represents the normal tidal limit of the River Thames (although exceptionally high tides do overtop the weir). At Richmond Lock and tidal barrier a system is operated whereby the moveable weir gates are put in place to retain a minimum tidal level in the reach between there and Teddington Lock over the low tide period and opened to allow free tidal flow for about 2 hours before and 2 hours after high tide. Thus the River Thames on the downstream side of Teddington Weir is semi-tidal, with the tidal influence experienced for about 4 hours on each tide. It is the largest weir on the Thames, comprising a combination of fixed crest weir sections and moveable gates, with the largest gate (a roller sluice gate) being 4.5m by 15m (see **Photos 1 and 4 in Appendix B**).

Ham Hydro CIC have been liaising with the Lensbury Club regarding the need to obtain access to the site and route the main cable from the weir to the sub-station on Broom Road through the grounds of the club. We are not aware that the Lensbury Club have any current objections to the scheme or the impact construction or operation of the installation will have on their grounds or operations.

2. DESCRIPTION OF DEVELOPMENT

The detailed scheme designs are still evolving, however the preferred option at present is for the installation of four reverse engineered Archimedes screws within Teddington Weir. The attached plan (**Figure 1**) shows the site of the proposed screws within the existing weir infrastructure. The installation will be approximately 20.9m in width and will include the re-provision of the existing fish passes (most likely a single pass alongside the Teddington bank but possibly two passes as shown in **Figure 1**). A concrete trough will be constructed within the body of the weir to accommodate each of the screws, and each will be fed via a sluice gate that can be fully closed when necessary to stop any flow passing through the screws. **Figure 2** illustrates how each screw is expected to be installed.

The screws will be installed between the existing 'white sluice gate' (see **Photo 1 in Appendix B**) and the gauge house located on the left bank of the river (see **Photo 3 in Appendix B**), replacing two existing radial gates, two fixed crest weirs and 2 fish passes.

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Figure 3 shows the existing weir and the likely planning application boundary; also highlighting the expected route of the cable that will run from the extended gauge house, through the Lensbury Club to an existing electricity sub-station on Broom Road.

The construction phase will require installation of temporary coffer dams upstream and downstream of the affected section of Teddington Weir, to allow the concrete troughs and fish passes to be cast *in situ*. The screws will be lifted into place by a crane either mounted on a barge or operating from the bank in the grounds of the Lensbury Club. The four screws will be brought to the site either by barge or by road. Each screw is approximately 12m long, 3.5m in diameter and weights about sixteen tonnes. Access to the construction site will be via the grounds of the Lensbury Club (see **Photo 5** in **Appendix B**).

The completed hydropower plant will be operated in accordance with a protocol agreed with the Environment Agency covering both operation of the hydropower plant by Ham Hydro CIC and management of flows through the weir by the Environment Agency which will ensure that:

- there is no increase in flood risk to riparian land or property;
- the surface water level in the river is never drawn down to a level below that of the crest level of the lowest fixed weir section (4.38m AOD), thus avoiding any adverse effects on navigation due to reduced water depth.

Ham Hydro CIC also intends to provide an information point, positioned on the footbridge near the weir, to help educate the local community and visitors about the project. This will provide information about the project and local flora and fauna and an LED display providing figures relating to the renewable energy generated by the facility (an 'accumulator'). Consistent with Ham Hydro CIS's principles, the information point will be solar powered.

3. ASSESSING THE NEED FOR THE ENVIRONMENTAL IMPACT ASSESSMENT

3.1 EIA screening procedure

The EIA regulations set out the legislative framework for establishing whether EIA is required and whether an Environmental Statement (ES) must be submitted in support of a planning application. The DCLG's Circular 02/99¹ gives guidance on the application of the Regulations.

As per the guidance contained within Circular 02/99, the need to undertake an EIA falls into three steps. These are:

- **Step 1:** Establish whether the development meets any of the descriptions of development listed in Schedule 1 of the Regulations. If so, an EIA is a mandatory requirement.
- **Step 2:** If the development does not fall within Schedule 1, establish whether the development meets any of the descriptions of development listed in Schedule 2 of the

¹ DCLG (formerly ODPM) (1999) *Circular 2/99 Environmental Impact Assessment*, DCLG, London.

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Regulations; does it meet or exceed the thresholds in Schedule 2 or is it located in a 'sensitive area' as defined in Regulation 2(1).

- **Step 3:** If the development is defined as Schedule 2 Development, consider whether it is likely that the development will have significant effects on the environment. If so, an EIA is required. If not, consider whether any further environmental information is necessary to supplement the planning application.

3.2 Is the proposed development a Schedule 1 development?

The proposed development does not fall within Schedule 1 of the Regulations. Therefore EIA is not mandatory under this criterion.

3.3 Is the proposed developed a Schedule 2 development?

To determine whether the proposed development is a Schedule 2 development, an assessment needs to be made as to:

- **Whether the proposal meets the description of development in Schedule 2?**

The proposed development is a 'hydropower installation' which is listed under the 'energy' category of Schedule 2, 3(h), which states:

"Installations for hydroelectric energy production".

- **Whether the proposals meet or exceed the thresholds in Schedule 2 and/or whether the development is located in a 'sensitive area' as defined in Regulation 2(1)?**

For this type of development the threshold at or above which an EIA could be required is whether or not the installation is designed to produce more than 0.5 megawatts (MW). The proposed hydropower scheme at Teddington Weir is designed with the capacity to generate 0.532MW. This is above the 0.5MW threshold level, and as such an EIA **may be** required if it is considered likely that the proposed scheme would result in significant environmental effects.

Regulation 2(1) defines 'sensitive areas', which include Sites of Special Scientific Interest (SSSIs), land to which Nature Conservation Orders apply, international conservation sites, National Parks, Areas of Outstanding Natural Beauty, World Heritage Sites and Scheduled Monuments.

Circular 2/99 (paragraph 37), gives guidance on sites which are close to 'sensitive areas' and states that:

"Special considerations apply to Sites of Special Scientific Interest (SSSIs), especially those which are also international conservation sites. In practice the likely environmental effects of Schedule 2 development will often be such as to require EIA if it is to be located in or close to such sites, including classified and potential Special Protection Areas (SPAs) under the Wild Birds Directive (79/404/EEC); designated and candidate Special Areas or Conservation (SACs) under the Habitats Directive (92/14/EEC); and Ramsar sites (wetlands of international importance)".

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The site is not located within or close to any such defined sensitive areas. The closest being Richmond Park National Nature Reserve, SSSI and SAC, nearly 2km from the site, with a substantial area of suburban residential development between the proposed site and the NNR/SSSI/SAC.

Annex A of Circular 2/99 provides some guidance on the type of development that should be considered to meet the description of installations for hydroelectric energy production. It states that: *“In addition to the physical scale of the development, particular regard should be had to the potential wider impacts on hydrology and ecology. EIA is more likely to be required for new hydroelectric developments which have more than 5MW of generating capacity”*.

The proposed development will not result in a hydroelectric scheme with the capacity to generate more than 5MW. Furthermore, the installation will form part of the existing infrastructure of the weir at Teddington Lock and will essentially simply replace part of the existing weir structure.

Since the proposed development exceeds the Schedule 2 threshold, this screening study has considered the potential environmental effects of the proposals, the scope for including mitigation measures to minimise effects and the need for further assessment work. Details of this assessment are set out below and will inform the on-going scheme design process and provide a basis for further consideration of the potential effects of the scheme.

3.4 Identifying potential environmental impacts

In providing the relevant information to the London Borough of Richmond upon Thames, to enable a screening opinion to be adopted, the likely significant environmental effects associated with the proposals have been considered.

Regulation 4(5) provides that the selection criteria in Schedule 3 of the Regulations should be considered when assessing the significance of impacts associated with Schedule 2 development.

Table 3.1 sets out a summary of the potential effects and considered the significance of the effects both during demolition/construction and operation of the hydropower installation, the potential for mitigation measures to be included in the development proposals and the need for further assessment work to be undertaken.

The assessment in **Table 3.2** has drawn on the criteria in Schedule 3 of the Regulations. To provide a summary of the significance of the potential impacts, **Table 3.2** provides a commentary against each of the specific selection criteria for screening Schedule 2 development as set out in Schedule 3 of the Regulations.

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Table 3.1 – Summary of potential environmental effects

Environmental topic	Likely effect	Likelihood of effect being significant	Measures to be incorporated into scheme to mitigate effects	Requirement for further assessment whether or not EIA is required
<p>Traffic and transport</p> <p>Construction phase</p>	<p>Predicted levels of construction traffic are not known at this stage, but it is expected that there will be an increase in vehicle movements associated with the removal of waste materials from the site following the demolition of the existing structure and excavation of the cable trench, the import of building materials and concrete, and the need for the construction workforce to access the site.</p> <p>Road access to the site from Broom Road will be through the Lensbury Club, but will be limited in terms of the size of vehicle, by the width of the existing access road. It is therefore intended to transport both the Archimedes screws and possibly the crane to the site by barge.</p> <p>There is the potential for adverse effects on existing users of the local road network, including local residents living off Broom Road as a result of increased traffic flows. Under the IEMA Guidelines (Guidelines for the Environmental Assessment of Road Traffic) 12 hour traffic flows along Broom Road (and other local roads) would need to increase by 30% for delays and accident and safety effects on pedestrians, cyclists and drivers to be significant. It is unlikely that construction traffic will cause an increase of this scale. Furthermore any effects will be temporary for the duration of construction (i.e. 4-5 months).</p>	Low	Mitigation measures can be implemented as necessary during construction to restrict construction traffic to appropriate routes and time traffic movements to avoid peak hours.	Effects on Navigation will be considered in detail as part of the required Environment Agency Site Audit.
<p>Traffic and transport</p> <p>Operation phase</p>	<p>It is not expected that the operation of the scheme will generate any increase in traffic movements compared with the current (baseline) situation.</p> <p>There is the potential for adverse effects on navigation if water levels upstream of the weir are drawn down during periods of low flow as a result of the installation.</p>	Low	See below under 'Water' for mitigation measures to prevent adverse effects on navigation.	

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Environmental topic	Likely effect	Likelihood of effect being significant	Measures to be incorporated into scheme to mitigate effects	Requirement for further assessment whether or not EIA is required
<p>Socio-economics and community</p> <p>Construction phase</p>	<p>The local economy may benefit in the short term from day-to-day expenditure by contractors working on site (e.g. local food, convenience shops).</p> <p>There may be short term, adverse effects on recreational users of the River Thames at this location, particularly to anglers, as a result of fish disturbance, and to boat users, who may experience temporary restrictions on moorings alongside the Lensbury Club land, although it is not anticipated that construction activities will result in significant effects on navigation through Teddington Lock or moorings on the east (right) bank.</p> <p>The Lensbury Club and its patrons may be adversely affected by construction traffic (which will be accessing the site through the grounds of the club) the presence of contractors on-site, and notably the need to lay the transmission cable from the gauge house to the sub-station on Broom Road through the Club's land.</p> <p>The scheme is located within Flood Zone 3 and installation of temporary coffer dams will trigger the need for a Flood Risk Assessment under Planning Policy Statement 25. The Flood Risk Assessment will review the flood risks to the construction process and the effects on flood risk elsewhere.</p>	Low	<p>Construction contractors will be affiliated to the considerate contractor scheme (as required by the Environment Agency).</p> <p>Ham Hydro will liaise closely with the Lensbury Club and local residents, organisations and interest groups to minimise any effects as far as possible.</p> <p>In line with the requirements of PPS25, necessary mitigation measures will be incorporated into the scheme to ensure that any adverse flood risk impact during construction is avoided.</p>	<p>Effects on fisheries and boat users will be considered in detail as part of the required Environment Agency Site Audit.</p> <p>The Flood Risk Assessment will fulfil the requirements of the Environment Agency Site Audit, in respect of flood risk, as well as providing the necessary information to accompany the application to the Agency for Flood Defence Byelaw consent, which will be required as the Thames is 'main river'.</p>
<p>Socio-economics and community</p> <p>Operation phase</p>	<p>The profits generated by the scheme will be used by Ham Hydro CIC to support further community based low carbon projects, which will be of benefit to the local community.</p> <p>Boat users and navigation are anticipated to be unaffected by the operation of the hydropower installation (please refer to the Traffic and Transport section of this table).</p> <p>It is not anticipated that the operation of the screws will have significant adverse effects on fish (please refer to the ecology section of this table) or therefore on angling on this stretch of the River Thames.</p> <p>The scheme is located within Flood Zone 3 and this will trigger the need for a Flood Risk Assessment under Planning Policy Statement 25. The Flood Risk Assessment will review the flood risks to the structure and assess the effects of the proposal on flood risk elsewhere.</p>	Medium (beneficial effect of renewable energy generation)	<p>In line with the requirements of PPS25, necessary mitigation measures will be incorporated into the scheme to ensure that any adverse flood risk impact is avoided.</p>	

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Environmental topic	Likely effect	Likelihood of effect being significant	Measures to be incorporated into scheme to mitigate effects	Requirement for further assessment whether or not EIA is required
<p>Landscape and visual</p> <p>Construction phase</p>	<p>There may be short term, temporary adverse effects on the existing landscape character and on views of the river from the Lensbury Club and golf course on the left bank, from the Thames Footpath on the right bank, from the footbridge crossing the river downstream of the weir, on views experienced by recreational users of the river i.e. from boats (including moored houseboats) and from residential areas within Ham which overlook the river (although the housing development is set back from the riverbank and partly screened by vegetation). Views of the construction site from the right bank will be partly obscured by protection structures for the existing weir. Views from the Lensbury Club will be predominantly un-obscured. On the left bank, immediately downstream of the site, are Teddington Studios and there is no public access to the bank; views of the site from the studios are partly screened by a line of mature trees.</p> <p>Effects are expected to result from the temporary intrusion of construction plant, e.g. cranes, the need to construct temporary cofferdams in the river and the creation of a construction compound within the Lensbury Club grounds.</p> <p>It is anticipated that few, if any, of the existing trees within the Lensbury Club grounds will need to be removed to allow crane access, particularly if larger pieces of infrastructure and plant are brought to the site by barge.</p>	Low	Effects will be minor and temporary and no mitigation measures are proposed.	None
<p>Landscape and visual</p> <p>Operation phase</p>	<p>Teddington Weir is the largest weir on the River Thames and is a dominant structure within the existing landscape, which will not be significantly altered by the proposed scheme. The hydropower installation will not exceed the height of the existing weir structure within that section and will be largely screened from the right bank by the existing weir structures, thus limiting visual effects from the Thames Path or residential properties overlooking the river in Ham. Where there will be clear views of the screws (i.e. from the grounds of the Lensbury Club and from the downstream footbridge) they will arguably enhance the visual amenity of the weir and result in a beneficial effect by providing an interest feature.</p> <p>The site is within the Thames Valley Joint Character Area (JCA number 115) but it is not anticipated that the installation will affect the character of the river or its surroundings at this location. An extension to the existing gauge house on the left bank will be required to accommodate certain components of the hydropower system but this will not result in significant visual or landscape effects.</p>	Low	No mitigation measures are envisaged beyond ensuring good design of the structures, particularly the extension to the existing gauge house, to provide a beneficial effect as far as practicable.	

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Environmental topic	Likely effect	Likelihood of effect being significant	Measures to be incorporated into scheme to mitigate effects	Requirement for further assessment whether or not EIA is required
Water Construction Phase	<p>There will be a need to demolish the relevant section of the existing weir structure and to install a temporary cofferdam, so as to allow work to take place on the structure, as well as the potential requirement for de-watering activities. This may result in short term, temporary water quality effects resulting from an increase in turbidity and the potential mobilisation of contaminants from the sediment on the river bed.</p> <p>It is likely that the temporary Cofferdam (if required) will need to be installed both upstream and downstream of the weir structure. This will reduce the effective length of the weir, which may result in elevated upstream water levels.</p>	<p>Low</p> <p>Low</p>	<p>Good practice measures during the demolition/construction stage would be followed, including Environment Agency Pollution Prevention Guidelines (PPG5: Works and Maintenance In or Near Water).</p> <p>During construction, it may be necessary to operate other sections of the weir slightly differently, so as to compensate for the reduced weir length which will result from the installation of the temporary cofferdams.</p>	<p>Effects on water quality and resources, and flood risk management will be considered in detail as part of the required Environment Agency Site Audit and in order to obtain Flood Defence Byelaw consent.</p> <p>A Flood Risk Assessment will be undertaken in accordance with PPS25 and submitted alongside the planning application.</p>
Water Operation Phase	<p>The installation of the screws within concrete troughs in place of the existing radial sluice gates has the potential to lower water levels upstream of the weir below the weir crest level, if the flow of water through the screws is not adequately controlled during low flow conditions. This could result in adverse effects on navigation.</p> <p>During high (and flood) flows, the screws within each of the concrete channels could restrict the flow of water over the weir structure, compared with the existing situation. This could, if not mitigated, result in elevated water levels upstream of the weir.</p>	Low	<p>The operating protocol for the screws will be developed in conjunction with the Environment Agency, to ensure that a combined protocol is agreed so that water levels do not fall below that of the crest level of the lowest fixed weir section, while ensuring adequate supply for lock operations. If necessary, the sluice gates on each of the four hydropower channels will be closed to prevent any flow of water through the screws.</p> <p>The combined operating protocol will also ensure that any obstruction of high flows caused by the presence of the screws will be fully compensated by changes in operation of the other weir gates, so flood risk is not increased.</p>	

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Environmental topic	Likely effect	Likelihood of effect being significant	Measures to be incorporated into scheme to mitigate effects	Requirement for further assessment whether or not EIA is required
<p>Ecology</p> <p>Construction phase</p>	<p>The development is expected to result in the loss of few, if any, of the mature trees within the grounds of the Lensbury Club. If any trees have to be removed, this will be subject to full assessment to ensure that there will be no significant adverse effects due to loss of valued trees or disturbance of legally protected species such as bats or nesting birds. Replanting will replace any trees lost, so there will be no loss of wildlife habitat. The scheme is not being constructed within or in the immediate vicinity of a SSSI or European designated site and will not affect Ham Lands or Ham Common Local Nature Reserves.</p> <p>There will be effects on river ecology within the cofferdam but this will be a small area of riverbed and walled bank which are not anticipated to be of high value.</p>	<p>Low</p>	<p>Existing ecological data will be reviewed to identify any features of value that may be affected.</p> <p>Undertaking works within a cofferdam and appropriate management of dewatering flows will protect the downstream river from high levels of turbidity and sediment deposition.</p>	
<p>Ecology</p> <p>Operation phase</p>	<p>The main potential ecological effects during operation of the screws are anticipated to be on fish. The re-provision of 2 fish passes will aid the migration of fish upstream, however fish moving downstream may choose to pass through the screws rather than the fish pass. A number of studies have been undertaken by Fishtek Consulting Ltd into the effects of the operation of Archimedes screws on fish². Hydraulic screw turbines are generally considered to be fish friendly having no rapid pressure changes or hydraulic shear forces. After passing the leading edge, fish remain in the same chamber of water until released at the outflow. Larger turbines with a higher tip speed are more likely to cause damage to fish, with larger fish being most at risk.</p>	<p>Low with appropriate mitigation.</p>	<p>According to a study undertaken by Fishtek³, the use of fish screens to prevent fish of over 1kg and large eels from entering would preclude the need for any protection on the leading edge of the screw. They recommend that unscreened screw turbines with tip speeds above 3.5m/s (approx 2.5m diameter) should have compressible bumpers fitted to safeguard the passage of large fish and that this would offer effective mitigation and reduce the impact force to well within safe limits. For machines with tip speeds below 3.5m/s, hard rubber bumpers would offer adequate protection. Measures will be included in the design to protect fish, taking account of these studies and experience with similar installations.</p>	<p>Effects on ecology and fisheries will be considered in detail as part of the required Environment Agency Site Audit</p>

² Fishtek Consulting Ltd – pre-construction studies on proposed Archimedes screw installations on the Rivers Aire, Dove, Esk (Yorkshire) and Ribble and investigation and monitoring studies of operational installations on the Rivers Derwent (Yorkshire) and Dart (note that the River Derwent is an SAC and the interest features include lamprey).

³ Fishtek Consulting Ltd, March 2009: *Assessment of three leading edge profiles. 8mm steel edge. hard rubber. compressible bumper.*

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Environmental topic	Likely effect	Likelihood of effect being significant	Measures to be incorporated into scheme to mitigate effects	Requirement for further assessment whether or not EIA is required
Land quality Construction phase	There is the potential for adverse health effects on construction workers, site users (including patrons of the Lensbury Club) and adjacent site users associated with the mobilisation of contaminants during the demolition of the existing weir structure and extension of the gauge house, and earthworks associated with routing the cable from the gauge house to the sub-station on Broom Road. However, there is no evidence that contamination is likely to be present.	Low – provided best practice management measures are implemented.	The use of appropriate personal protective equipment (PPE) and implementation of good working practices, including planning for the discovery of unexpected contamination, dust suppression and spill prevention measures, and backfilling the cable trench with clean material should avoid any significant land quality effects.	The requirement for a PPS23 Phase 1 assessment will be discussed with the relevant Council department.
Land quality Operation phase	Operation of the proposed scheme is not expected to result in any adverse effects on or due to land quality.	N/A	None required	
Cultural heritage Construction phase	<p>The proposed scheme falls within the Teddington Lock Conservation Area, which was designated in 1977. The earliest development of Teddington Lock and weir was in 1812, and the structure was subsequently moved, extended and refurbished during the 19th and 20th centuries. There are no scheduled monuments, registered parks or gardens or registered battlefields within the vicinity of the site. The construction of the existing weir is likely to have disturbed any pre-existing riverbed archaeology and consequently it is not anticipated that there will be any significant archaeological effects.</p> <p>The architecture interest, as identified in the conservation area, is located downstream from the works and is not expected to be significantly affected by construction activities.</p>	Low	A watching brief during demolition / construction is unlikely to be required due to the low potential for disturbance to any undiscovered riverbed archaeology as a result of earlier weir development.	Effects on the Conservation Area will be considered in more detail as part of the required Environment Agency Site Audit.
Cultural heritage Operation phase	The operation of the hydropower infrastructure is not anticipated to have any significant effect on the historic environment, as on site activity will be minimal, involving operational visits and occasional maintenance.	Low	None required	

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Environmental topic	Likely effect	Likelihood of effect being significant	Measures to be incorporated into scheme to mitigate effects	Requirement for further assessment whether or not EIA is required
Noise Construction phase	It is expected that the demolition and construction phases will result in temporary increases in noise and vibration levels. Effects could result from an increase in traffic movements, demolition of the existing weir structure, operation of plant involved in demolition and construction and the need to undertake piling to create a cofferdam around the development site within the River Thames. Increased noise and vibration levels could result in temporary disturbance to local residents and boat owners, users of the Lensbury Club and Teddington Studios and users of the River Thames for recreational purposes, particularly anglers.	Low	Construction contractors will be affiliated to the considerate contractor scheme (as required by the Environment Agency). Good practice measures for noise and vibration control can be implemented during demolition/ construction in accordance with BS 5228, including minimising the use of percussive techniques and adherence to daytime working only to minimise any adverse effects.	We would seek to speak to the EHO to confirm that there would be no requirement for a construction noise assessment.
Noise Operation phase	It is not anticipated that the operation of the screws will result in a significant increase in existing noise levels at the site, particularly as baseline noise levels from the movement of water through the existing weir are relatively high.	N/A	Details to be obtained of anticipated emissions from the generators and noise insulation installed if required.	
Air quality Construction phase	The whole of Richmond Borough has been declared an Air Quality Management Area for NO ₂ and PM ₁₀ . This is primarily due to road traffic. Construction traffic and plant operation are likely to result in a small, temporary increase in vehicle emissions locally. The number and routes of construction vehicles have not yet been determined. However, given the baseline air quality i.e. a highly saturated environment, it is not expected that minor, intermittent increases in emissions will affect the Borough's ability to meet relevant air quality objectives or have a significant effect on local air quality. The demolition of the existing section of the weir and any earth moving activities on site may result in short term, local adverse effects associated with dust.	Low	Potential effect of particulates and emissions from plant will be mitigated by ensuring plant is kept clean and it is operated efficiently. Best practice dust suppression measures will be employed, e.g. damping down of surfaces with water, washing of mobile plant etc. A site access plan will be established with appropriate routes and timing for delivery traffic (including contractor personnel) so as to minimise additional emissions during periods of road congestion. Plant and materials could be brought to site by barge if practicable to minimise road traffic and emissions.	None

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Environmental topic	Likely effect	Likelihood of effect being significant	Measures to be incorporated into scheme to mitigate effects	Requirement for further assessment whether or not EIA is required
Air quality Operation phase	<p>The installation will not generate emissions as the screws will be powered entirely by the flow of the River Thames.</p> <p>The scheme will achieve savings of 1,013 tonnes of CO₂, 2,109kg of NO_x and 61kg of PM₁₀ per annum. These benefits will contribute towards the achievement of local, national and European air quality targets; including meeting Borough air quality objectives, supporting the aim of the Ham and Petersham Low Carbon Zone project to reduce the area's carbon emissions by 28% by 2012, and helping to meet the Mayor of London's target of generating 25% of London's energy needs from local, low carbon sources by 2025. The scheme will therefore have a beneficial effect on air quality, by generating electricity that could power in the order of 600 homes.</p>	Medium (beneficial effect)	None required	

Table 3.2 – Summary of assessment against selection criteria in Schedule 3 of the EIA Regulations for screening Schedule 2 development

Category	Criteria	Assessment
1. Characteristics of the development	Size of the development.	Teddington is the largest weir on the River Thames and is a dominant feature within the landscape. The proposed development is for the installation of 4 Archimedes screws (and the provision of 2 fish passes) within the existing Teddington Weir structure between the existing 'white sluice gate' and the gauge house on the left bank and will be approximately 20.9m in width. The installation will not be higher than the existing weir structure. The gauge house will need to be extended to accommodate associated electrical infrastructure but this is not expected to be require a large increase in the size of the existing structure.
	Cumulative effects with other developments.	The above-ground development will take place within the existing weir structure and on the bank immediately adjacent. No other proposed developments have been identified which could lead to cumulative effects.
	The use of natural resources.	The use of natural resources is not considered to be significant. Standard construction materials for this type of scheme are likely to be used.
	The production of waste.	There may be construction waste generated from the demolition of the existing weir, and the excavation of the cable trench. The operation of the installation will not produce any waste.

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Category	Criteria	Assessment
	Pollution and nuisances.	<p>The proposed development has limited potential for causing pollution or nuisance and any adverse effects are expected to occur during the construction phase.</p> <p>There may be short term, intermittent increases in vehicle emissions from construction traffic and plant operation but these are not expected to be significant.</p> <p>There may be temporary, short term effects on water quality resulting from increased turbidity and/or the mobilisation of contaminants from sediment on the river bed.</p> <p>There may be short term, temporary effects on recreational users of the River Thames at this location during construction but it is not expected that operation of the scheme will result in significant adverse effects on navigation or angling.</p> <p>It is expected that the demolition and construction phases will result in temporary increases in noise and vibration levels. However, good practice measures in accordance with BS 5228 should mitigate these adequately.</p> <p>The operation of the scheme will have a beneficial effect on air quality by achieving savings of 1,013 tonnes of CO₂, 2,109kg NO_x and 61kg PM₁₀ per annum.</p>
	The risk of accidents, having regard in particular to substances or technologies used.	The installation will not require use of any unusual construction techniques, so risks will be readily identified and mitigated. The operational components will not be accessible to the public so will present no significant risks during operation.
2. Location of the development	The existing land use.	The proposed installation will be within the existing Teddington Weir structure, in the River Thames. The gauge house is located on the left bank, within the grounds of the Lensbury Club. The cable from the gauge house to the sub-station on Broom Road will be laid through the grounds of the Lensbury Club.
	The relative abundance, quality and regenerative capacity of natural resources in the area.	The proposed scheme will not have any long term or significant effects on the abundance, quality or regenerative capacity of natural resources in the area.
	The absorption capacity of the natural environment, paying particular attention to:	
	- wetlands;	Not applicable
	- coastal zones;	Not applicable
- mountain and forest areas; and	Not applicable	

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Category	Criteria	Assessment
	- nature reserves and parks.	The proposed scheme is approximately 2km away from Richmond Park National Nature Reserve, SSSI and SAC and it is not expected to have any effect on this site. It is on the opposite river bank from Ham Lands and Ham Common local nature reserves and is not expected to have any effect on these sites.
	- any inland, coastal, marine or underground waters on or around the location which could be affected?	The scheme will be installed within the River Thames. There is the potential for short term water quality effects during construction resulting from an increase in turbidity and the potential mobilisation of contaminants from the sediment on the river bed. Good practice measures during the demolition/construction stage would be followed, including Environment Agency Pollution Prevention Guidelines (PPG5: Works and Maintenance In or Near Water) which should prevent any significant adverse effects. It is not expected that there will be any significant effects on flow or levels in the River Thames.
	- any groundwater protection zones or areas that contribute to the recharge of groundwater resources?	The site is not within a groundwater protection zone.
	- any areas or features of high landscape or scenic value on or around the location which could be affected?	There are no landscapes designated as being of high value in the vicinity and visual and landscape effects will be limited, as the scheme will be incorporated into the existing weir structure.
	- any routes or facilities on or around the location which are used by the public for access to recreation or other facilities, which could be affected?	The Lensbury Club adjacent to the site on the left bank of the River Thames is only accessible by its members (i.e. is not open to the public). Immediately downstream are Teddington Studios which are also not accessible to the public. On the opposite bank is the Thames Path leading to a footbridge crossing the river downstream of the weir. These routes used by the public will not be affected.
	- any transport routes on or around the location which are susceptible to congestion or which cause environmental problems, which could be affected?	Any effects on traffic will be temporary and mitigation measures can be implemented as necessary during construction to restrict construction traffic to appropriate routes and time traffic movements to avoid peak hours.
	Is the development in a location where it is likely to be highly visible to many people?	The development will be clearly visible from parts of the grounds of the Lensbury Club (which is not accessible by the public). The views from the footbridge crossing the river downstream of the weir will be relatively distant and from the Thames Footpath on the right bank opposite, the installation will be in the main partly obscured by the existing weir structure.
	Are there any areas or features of historic or cultural importance on or around the location which could be affected?	The site is within a Conservation Area but it is not anticipated that the scheme will result in adverse effects, as the architecture interest, as identified in the conservation area, is located downstream from the works.

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Category	Criteria	Assessment
	Are there any areas on or around the location which are densely populated or built up, which could be affected?	There are no densely populated or built up areas immediately around the location which could be affected.
	Are there any areas on or around the location which are already subject to pollution or environmental damage?	No
	Is the location of the development susceptible to earthquakes, subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions e.g. temperature inversions, fogs, severe winds, which cause the development to present environmental problems?	The scheme is located within Flood Zone 3 – assessed to have a medium to high risk of flooding and this will trigger the need for a Flood Risk Assessment under Planning Policy Statement 25. In line with the requirements of PPS25, necessary mitigation measures will be incorporated to avoid any adverse effects on flood risk.
3. Characteristics of the potential impact	The extent of the impact (geographical area and size of the affected population)	Any adverse effects will be local and affect a small geographical area in the immediate vicinity of the site. Benefits associated with savings of CO ₂ , NO _x and PM ₁₀ as a result of scheme operation will have wider implications and contribute towards local, national and European emissions targets.
	Trans-boundary nature of the impact.	Not applicable.
	Magnitude and complexity of the impact.	The scale and type of impacts identified in Table 3.1 have been predicted based on professional judgement and current understanding of the scheme. It is anticipated that any adverse effects will be very localised in nature and can be mitigated/managed to avoid significant impacts.
	Probability of the impact.	The probability (likelihood) of impacts as set out in Table 3.1 has been predicted based on professional judgement and current understanding of the scheme.
	Duration, frequency and reversibility of the impact.	The impacts identified in Table 3.1 are in the main expected to be short term, intermittent and temporary, as a result of construction activities. The only anticipated long term significant effects (i.e. that will be evident over the lifetime of the scheme) will be beneficial.

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4. CONCLUSIONS

4.1 Overview

The proposed development of the site does not meet any of the descriptions listed in Schedule 1 of the EIA Regulations.

The proposed development is considered to meet the description of an ‘installation for hydroelectric energy production’, outlined in Schedule 2, 3(h) of the EIA Regulations, and exceeds the threshold of 0.5MW generating capacity. The proposed scheme (with a generating capacity of 0.532MW) **could** therefore be considered as an EIA development under the EIA Regulations, and as such an EIA **may be** required if it is considered likely that the scheme will result in significant environmental effects.

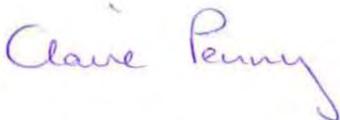
This screening study has concluded that whilst the proposed scheme is predicted to have a number of short term, temporary adverse environmental effects, and some long term beneficial effects, none of these is likely to be significant and consequently the proposed development does not require an EIA.

4.2 Further assessment work

Ham Hydro recognises that further baseline gathering and assessment work is required to supplement the existing information. If the Council is in agreement that the proposed development is not EIA development, the following reports will be submitted in support of the planning application:

- Flood Risk Assessment – in accordance with the requirements of PPS25;
- an Environment Agency Site Audit in accordance with, ‘*Good practice guidelines to the environment agency hydropower handbook; The environmental assessment of proposed low head hydropower developments*’, that considers effects of the proposed scheme on **water resources, conservation (wildlife and built heritage), chemical, physical and biological water quality, fisheries, flood risk management and navigation.**

Yours sincerely

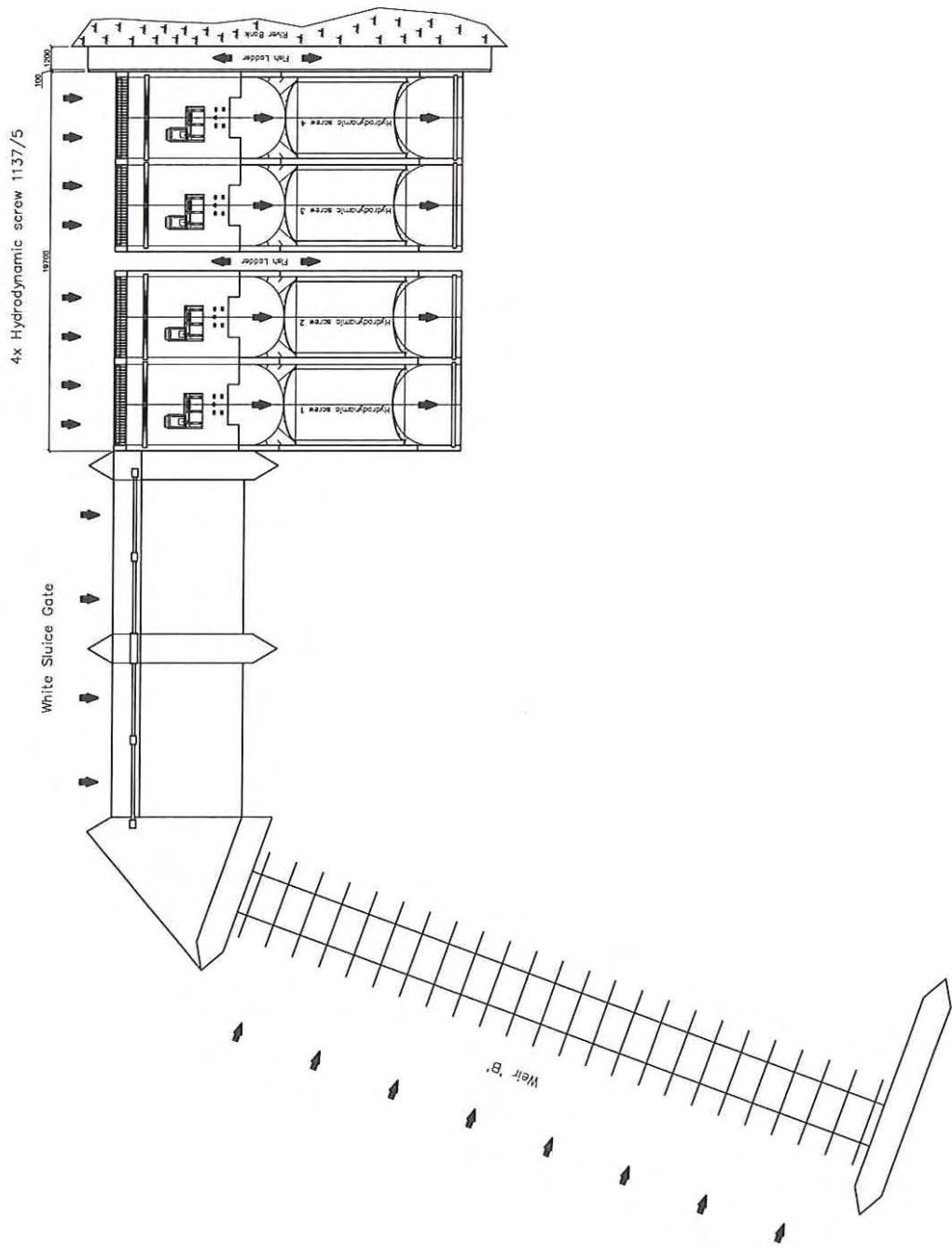


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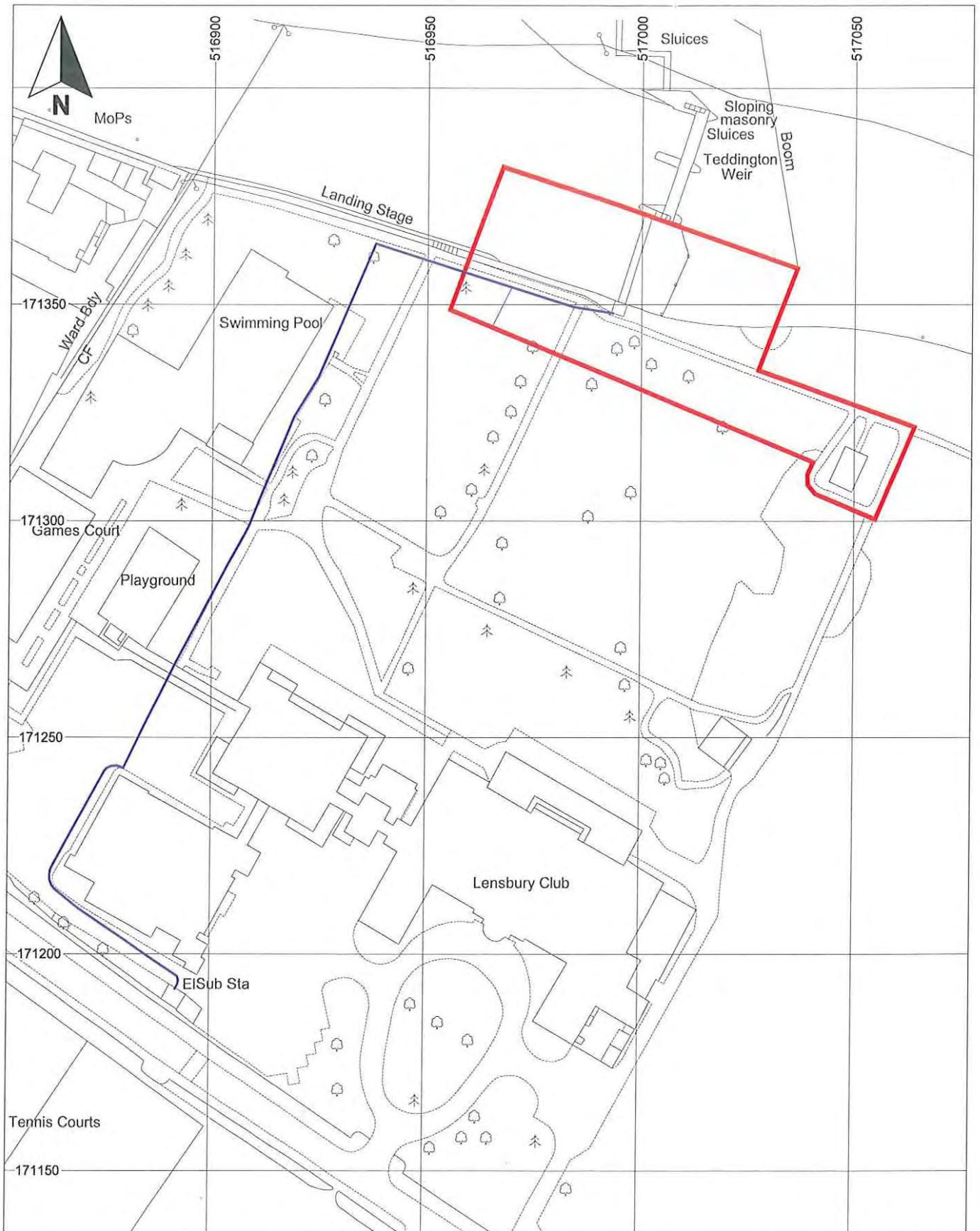


Teddington Weir Hydropower Project
 Screening Opinion Request

Figure 1
 Plan of Proposed Installation Showing
 Location of Screws and Fish Passes

February 2011
 27866-AD1.at.squj

Entec



Key

-  Site boundary
-  Anticipated cable route

Teddington Weir Hydropower Project
Screening Opinion Request

Figure 3
Expected Planning Application
Boundary

February 2011
27866-A03.dwg sqijj



APPENDIX B

Plate 1 View of the existing weir and fish passes looking upstream (high flow conditions)



Plate 2 Residential properties and boats moored on the right bank of the River Thames, opposite the site looking upstream



APPENDIX A

Ham Hydro Environmental Policy

Ham Hydro is dedicated to a high level of care for the environment, in particular to the protection and enhancement of the immediate natural environment spanning Ham and Teddington. Our aims are, therefore, to:

- drive environmental best practice in the performance of all of our activities;
- reduce negative and increase positive impacts on the environment; and,
- continuously improve, and be accountable for our environmental performance.

We are committed to achieving this by:

- complying with all applicable environmental legislation and regulations;
- developing a framework to review and improve our environmental performance, involving the identification, quantification (where possible) and management (reviewing and improving, where practicable) of the environmental impacts of our operations (including an assessment of the life cycle carbon dioxide emissions involved in the implementation and maintenance of renewable energy projects in line with the principles of PAS 2050);
- developing and maintaining an effective Environmental Management System in line with the phased approach of BS 8555;
- minimising emissions to air, water and land;
- ensuring the prevention of pollution (no polluting incidents) throughout all of our activities;
- communicating this environmental policy and our environmental performance to our stakeholders;
- raising public awareness of the benefits of our renewable energy generation projects and improving methods by which this information is communicated.

Plate 5 View of the site access road through the grounds of the Lensbury Club



Plate 6 View from the left bank looking upstream from the site

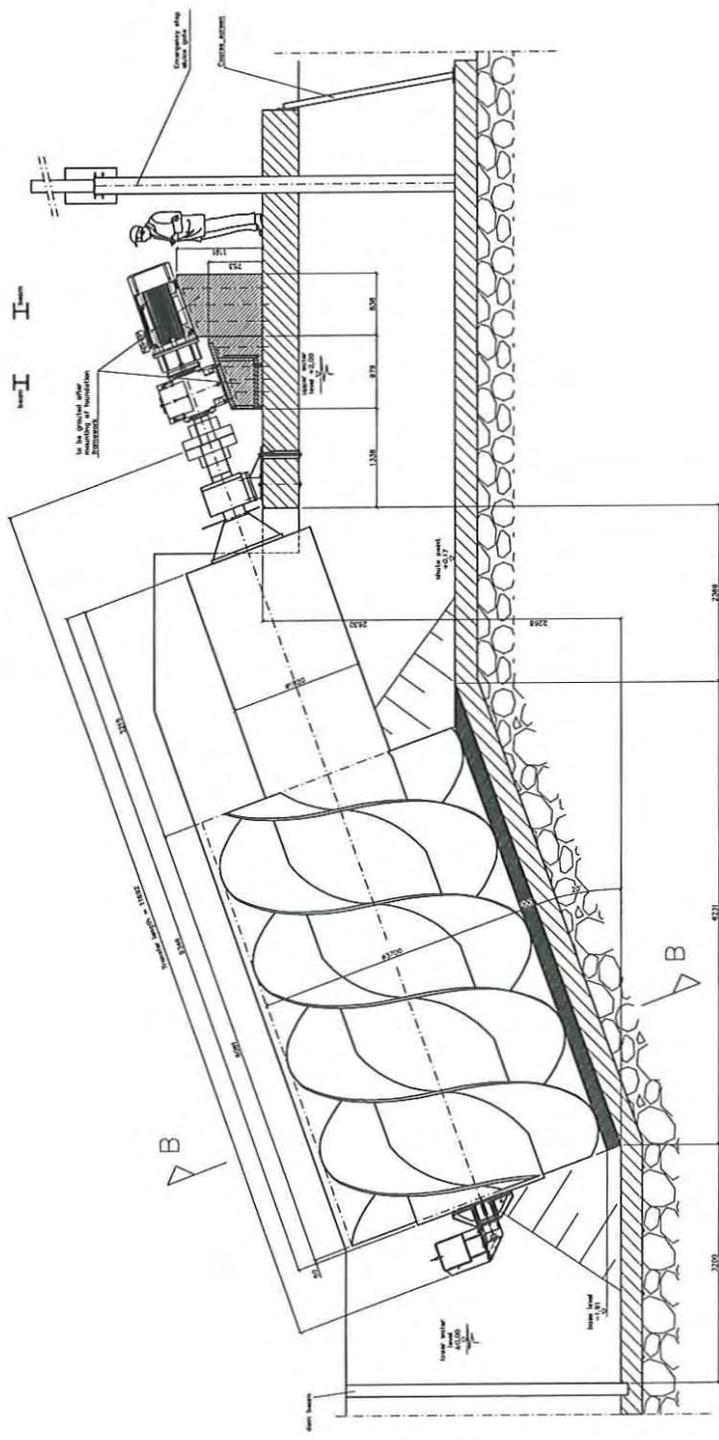


Plate 3 View from the right bank, looking downstream, of the Environment Agency gauge house and location of the proposed installation (between the left bank and the white sluice gate). Teddington Studios are in the background, behind the trees



Plate 4 View of Teddington Weir from the right bank, looking downstream





Teddington Weir Hydropower Project
 Screening Opinion Request

Figure 2
 Indicative Cross Section