

Walton Hall Low Carbon Heating

Options Appraisal

Location: Walton Hall, Main Street, Walton-on-Trent DE12 8LZ

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1 Executive Summary

1.1 Overview

All of the technologies considered in this report could be selected to provide low or zero carbon heating and hot water to the buildings at Walton Hall. There are benefits and drawbacks to each and these are summarised below. An additional consideration should be the financials associated with each option including capital cost, running costs and maintenance costs. A note on subsidies is included in Section 7 as these may bring an additional benefit to the individual air source option.

1.2 Biomass Boiler

Benefits:

- Lowest carbon emissions of the options assessed based on current carbon density of grid electricity.
- Could be useful buyer of local wood supplies
- Cheaper to install than ground source
- Suited to a communal system with a heat network serving various buildings

Concerns:

- Visual impact from flue
- Potential for occasional dark smoke, which affects visual impact
- NOx and particulate discharge
- Vehicle deliveries to site for fuel delivery increases local traffic movement and emissions
- The driveway access to site may need to be widened to allow wood fuel delivery lorries on to site
- Ongoing maintenance – requires active maintenance to address blockages, ash removal etc.

1.3 Air Source Heat Pump

Benefits:

- Decreasing carbon emissions as the national grid decarbonises
- Cheapest of the options to install
- Little groundworks required to install
- Few moving parts = little reactive maintenance
- Ability to 'demand shift' using thermal storage to avoid high electricity costs

Concerns:

- Visual impact if not carefully sited
- Some noise level increase but can be managed
- Lower operating efficiencies especially in colder weather
- Linking communal air source to multiple buildings via a heat network not recommended

- Strength of local grid unknown (electrical connection)

1.4 Ground Source Heat Pump

Benefits:

- Decreasing carbon emissions as the national grid decarbonises
- Little to no visual impact
- Little to no noise impact
- Few moving parts = little reactive maintenance
- Ability to 'demand shift' using thermal storage to avoid high electricity costs
- Suited to a communal system with a heat network serving various buildings

Concerns:

- Earthworks impact during horizontal array installation
- Highest capital cost of the various options
- Strength of local grid unknown (electrical connection)

2 Comparison of heating sources

To compare in a structured and consistent way the relative negative impacts of each heating source considered above on the view, noise levels and fabric of the house, outbuildings and park, the methodology proposed in English Heritage's "Seeing the history in the view - A method for assessing heritage significance within views - May 2011" (appended to this report) has been used. This methodology considers each of the following "historic assets" in turn, recording the impact on them in a grid to enable direct comparisons to be made:

- the house and outbuildings;
- the park: and
- the house and outbuildings and the park taken together,

The methodology has been expanded to include the noise levels created by each heating source and also the impact on the fabric of the historic assets caused by their installation.

Pursuant to the methodology (tables 1 and 2 on pages 19 and 20 of the English Heritage paper), each of: (i) the house and outbuildings; and (ii) the house and outbuildings and park taken together, are considered high importance historic assets due to the Grade II* nature of the house and outbuildings, whilst the park would be considered to be a historic asset of medium/low importance. To ascertain the magnitude of adverse impact of each heating source on the historic assets, the methodology from table 3 on page 22 of the English Heritage paper has been used. Once established, the severity of the effect on each historic asset is determined by plotting: (i) the magnitude of the adverse impact of each heating source; against (ii) the importance of each asset, using the outputs from table 5 on page 25 of the English Heritage paper. The cells highlighted in red in the tables below show the conclusions for each heating source.

Biomass	Asset with high importance: (i) House; and (ii) House and Park taken together	Asset with low/medium importance (Park)
With high adverse magnitude of impact	Major effect	Major to moderate effect
With medium adverse magnitude of impact	Major effect	Moderate to minor effect
With low adverse magnitude of impact	Moderate effect	Minor to negligible effect
With negligible magnitude of impact	Negligible effect	Negligible effect
Air source heat pump	Asset with high importance: (i) House; and (ii) House and Park taken together	Asset with low/medium importance (Park)
With high adverse magnitude of impact	Major effect	Major to moderate effect
With medium adverse magnitude of impact	Major effect	Moderate to minor effect
With low adverse magnitude of impact	Moderate effect	Minor to negligible effect
With negligible magnitude of impact	Negligible effect	Negligible effect
Ground source heat pump	Asset with high importance: (i) House; and (ii) House and Park taken together	Asset with low/medium importance (Park)
With high adverse magnitude of impact	Major effect	Major to moderate effect
With medium adverse magnitude of impact	Major effect	Moderate to minor effect
With low adverse magnitude of impact	Moderate effect	Minor to negligible effect
With negligible magnitude of impact	Negligible effect	Negligible effect

3 Introduction

Walton Hall is a Grade II* listed 18th century country house located in Walton on Trent, South Derbyshire. The house is red brick with 3 storeys comprising 5 bedrooms, 2 bathrooms and 4 reception rooms.

Planning permission for a new ground source heat pump was submitted to the local planning office in August 2020. The application is currently under consideration and certain issues have been raised with the installation, mainly to do with harms to historically significant earthworks on the land.

A more in-depth options appraisal is therefore sought to investigate the various options available for both power and heat generation at the hall.

This report seeks to investigate the various options for low carbon heat and power at Walton Hall and to present the findings in relation to the planners concerns.

3.1 Aerial View



Figure 1 Aerial view of Walton Hall [Imagery ©2021 Google]

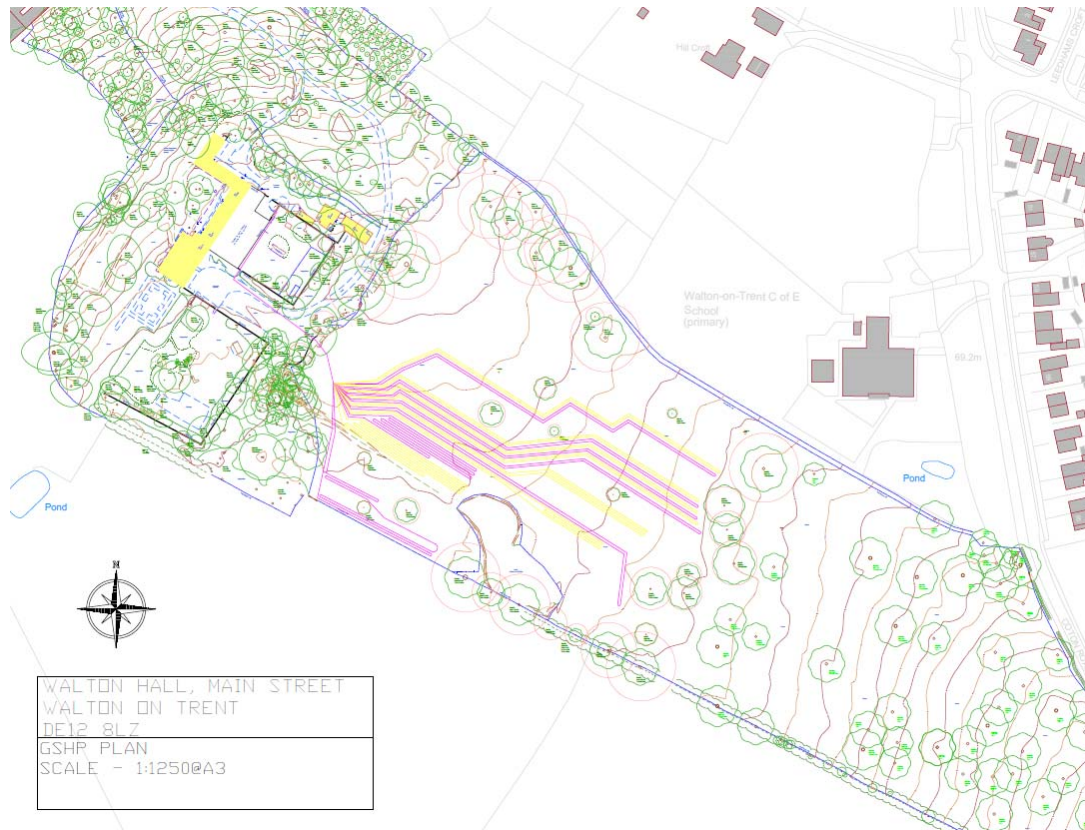


Figure 2 Layout of proposed horizontal array – located to the east of the hall [Finn Geotherm UK Ltd January 2021]

4 Site Details

Walton Hall sits within the Walton-on-Trent conservation area. The area is shown in Figure 3 below with Walton Hall lying in character area 2. Any changes to the hall and its surrounding areas, including the installation of a new heating or power generation system must be carefully considered so as not to affect the conservation area.

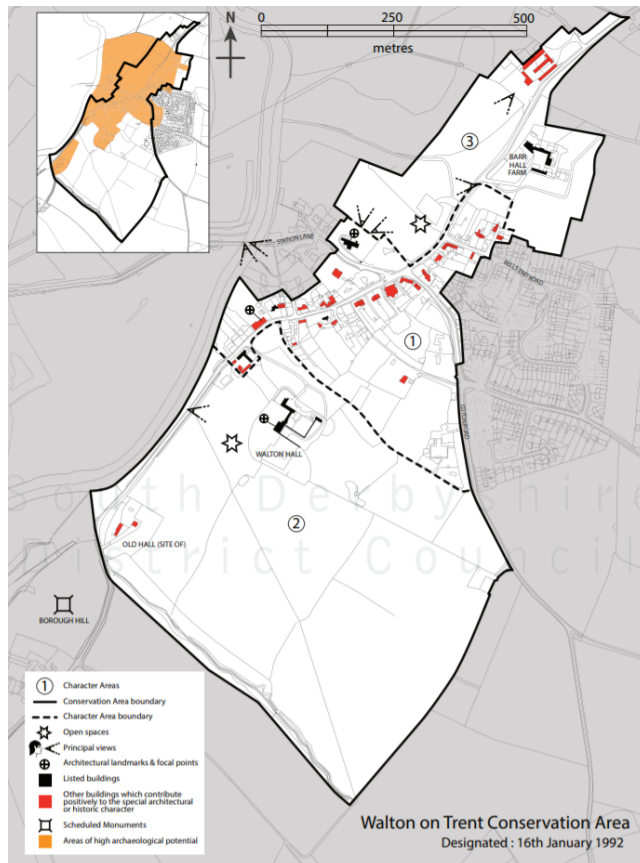


Figure 3 Walton on Trent conservation area – South Derbyshire District Council character statement 2014

The grassland surrounding the hall has archaeological interest and some concerns have been raised about the effect of installing a ground source heat pump collector. The image shown in Figure 2 shows the extent of the planned horizontal loop for the proposed ground source heat pump.

5 Walton Hall Heat Demand

Infinitas Design has not carried out any heat loss calculations on the hall or the other heated spaces. The peak heat demand has been provided by Brendan Scott at Finn Geotherm who states the heat demand for the house and cottages, taking into account planned fabric improvements, is 87.18kW. The annual demand is estimated at 188,843kWh based on 20 years of heating degree day data for East Midlands airport. This is slightly lower than the figure suggested by Finn Geotherm 209,232kWh. All subsequent calculation will be carried out on 188,843kWh/yr heat demand.

6 Power Generation Options Appraisal

Power generation options were assessed on the previous brief options appraisal submitted to the planning office [Comparison of renewable heat sources and their environmental harm, Nov 2020] and the reasons for the rejection of these options are highlighted below. It should be noted that Infinitas Design does not generally undertake power generation options appraisals, but we are able to comment on and agree with the comments made in the previous appraisal.

6.1 Solar PV

Solar PV was assessed as part of the original comparison of renewable heat sources report carried out in November 2020. Both roof mounted and ground mounted options were assessed. Although there is plenty of ground around the hall which could be suitable for ground mount solar, the visual impact was noted as being a negative aspect of this option. The hall roof was determined as being too small for a suitably sized array; roof strengthening may also be required, which may not be acceptable to Historic England. A ground mount array would require buried cabling, which again causes problems with disturbing the ground.

This option was dismissed for the reasons above.

6.2 Wind Power

The generation of power using a wind turbine was included on the 'November 2020 Comparison of renewable heat sources and their environmental harm' document. Whilst no wind resource studies or calculations have been carried out, it is unlikely that this would provide a reliable source of energy required for a heating system (even with a buffer vessel), so a back up heating system would be required in addition. The main reason wind power has been dismissed from the options is the visual impact, in much the same way as solar PV described above. The views from and around Walton Hall are an important part of the conservation area; a wind turbine would need to be in a prominent position which would detract from the setting of an important listed property and represent significant harm.

Noise is also an issue with wind turbines. Noise studies form part of the wind turbine development phase.

7 Heat Generation Options Appraisal

7.1 Biomass Boiler – Wood Chip and Wood Pellet

7.1.1 Overview

Biomass boilers generate heat from the combustion of woody fuels. Boilers range in size from small domestic 10kW units to industrial scale 60MW+ plants.

Put simply, biomass boilers generate heat by burning woody fuel to heat water, which is then used to heat buildings and provide domestic hot water. However, the correct operation and efficiency of biomass boilers is anything but simple and is reliant upon good design practice, good installation practice, consistent wood quality and good maintenance. The advent of the non-domestic RHI scheme in November 2011 has led to a huge increase in the number of biomass boilers being

deployed in the UK, particularly as this technology is seen as being the simplest of the technologies covered by the RHI. However, the NDRHI scheme is due to close to new applicants on 31st March 2021 so is unlikely to affect the heat supply choice at Walton Hall.

Smaller boilers typically use wood chip or wood pellet as fuel, rather than waste wood.



Figure 4 149kW Herz Firematic Biomass Boiler [Rural Energy.co.uk]

7.1.2 Application at Walton Hall

Based on the heat demand for Walton Hall, an 80kW biomass boiler with a 2000 litre buffer vessel would be capable of generating 100% of the thermal and hot water demand for the buildings. The 2000 litre buffer vessel is recommended to optimise boiler efficiency in periods of lower demand and to deliver peak demands in colder months. Renewable heat technologies should generally not be sized for peak heat demand unless they are being deployed in small domestic situations. The peak demand will only occur infrequently and can result in oversized equipment with reduced low load efficiency, e.g., in the summer months. A correctly sized thermal store will provide those infrequent peaks that slightly exceed the boiler capacity. This also applies to heat pumps.

The location of a biomass boiler plant room is not clear. However, a dedicated space for the boiler, its buffer and pellet/chip store will be required to serve the buildings. The buildings will need to be connected via a new buried heat network. An example layout is shown in Figure 5.

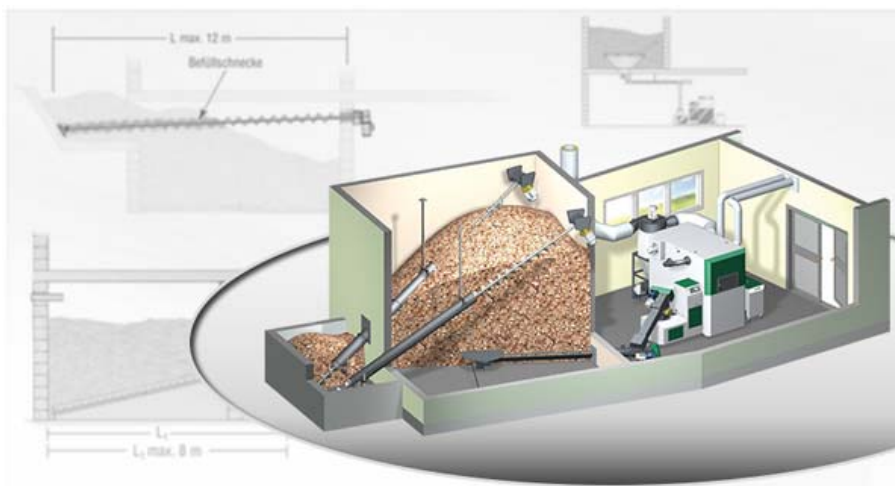


Figure 5 Example of a purpose-built chip plant room

The biomass boiler is able to operate on either wood chip or wood pellet. The choice of fuel needs to be specified when the boiler is ordered. Wood pellet is the more expensive of the two fuels (£225/tonne for pellet vs £135/tonne for wood chip April 2020) but it is more energy dense meaning either a smaller fuel store could be deployed or less lorry deliveries would be required. The gross calorific value of wood pellet is around 4.6kWh/kg of fuel; the GCV of wood chip is 3.8kWh/kg. (Wood chip & wood pellet EN Plus A1 Renewable Heat Incentive).

The annual fuel consumption for the two options is given below.

Table 1 Annual fuel consumption biomass boiler Walton Hall

	Wood pellet	Wood chip
Annual heat demand kWh	188,483	
Boiler efficiency	89%	
Annual fuel demand kWh	211,779	
Annual fuel demand te	46	59
Annual fuel cost	£10,359	£7,942

In both options, lorries will be required to deliver the wood pellet or wood chip to the boiler energy centre throughout the year. The cost of chip or pellet may vary slightly depending on how much fuel can be delivered in one delivery or the size of the delivery lorry but this will be dependent on fuel store size, which has not yet been confirmed. The costs above are standard costs but a local supplier can be requested to provide actual costs or a given quantity of fuel to site if required.

Biomass boilers run most efficiently when they are being operated on a regular basis and can have a reasonable baseload. The warm-up and cool-down cycles have lower operating efficiencies than when the boiler is operating normally. Typical applications for biomass boilers are schools, hospitals, care homes and office blocks where the boiler is typically running all day and night during the heating season. Using a large buffer vessel will provide the base load required to obtain efficient boiler use.

The number of fuel deliveries per year is dependent on the size of fuel store required and the size of delivery truck available. The bulk density of ENPlus wood pellet is around 700kg/m³. The bulk density of virgin wood chip is around 180kg/m³ (assuming 8 - 18% moisture content coniferous wood). The increased density of wood pellet is clear from these figures. If pellet is used there is a greater operating cost but the storage can be much smaller and fewer lorry deliveries are required.

Assuming a 11m³ fuel store, the following number of deliveries would be required per year:

- ENPlus wood pellet – 66m³/year or 6 deliveries
- Virgin wood chip – 310m³/yr or 28 deliveries

This is based on a fuel store measuring 3 x 3 x 2.4m and 50% usable volume. A larger store could be used to reduce deliveries. In both cases, a new fuel store would need to be constructed as the current outbuildings are too small to be practical without extensive internal alterations, damaging historic fabric

Note that it is difficult to 'blow' wood chip into a store and another delivery method may be required to transfer the chip from the delivery wagon to the fuel store. Wood pellets can be easily blown into the store, although the process is both noisy and dusty.

7.1.3 Biomass Supplier List (BSL)

Prospective wood fuel suppliers should be listed on the Biomass Suppliers List (BSL) which shows they have passed testing for their fuel.

7.1.4 Carbon and Particulate Emissions

Although burning wood is thought to be zero carbon, the UK government has assigned a carbon emissions figure of 0.01545kgCO₂/kWh to both virgin wood chip and wood pellet. (Energy conversion factors UK Gov GHG conversion factors June 2020). The annual emissions from burning wood at Walton Hall using the annual heat demand and boiler efficiency listed in Table 1 are **3.27te CO₂/yr**.

Combustion of woody fuels also releases particulates (PM) and Nitrous Oxide (NOx) into the air. All biomass boilers must have an emissions certificate showing the rates of NOx and PM release. The release rates will be dependent upon the boiler chosen. South Derbyshire does not have an Air Quality Management Area plan in force so there is unlikely to be issues with installing and using a biomass boiler. However, the installation of such a system should be discussed with the local planning authority as soon as possible to unearth any issues around emissions early on.

7.1.5 Capital Cost

The capital cost for an 80kW biomass boiler system including pellet store and 2,000 litre buffer tank will be in the region of £95,000 including accessories, installation and commissioning.

7.1.6 Visual Impact

The main aspects of visual impact are the fuel store, the plant room and the boiler flue. The plant room impact might be avoided by the use of an existing building rather than building a new energy centre, although their size and access are not conducive to this. The flue and fuel store,

unfortunately, cannot be avoided. Flue height must be taller than 1m of the tallest structure within a given radius, e.g., other roofs or trees; the radius is dependent upon the flue height. The flue height will therefore be very dependent upon the location of the boiler. Siting close to the house will mean a taller flue. Siting further from the house may mean a shorter flue but may then require a separate energy centre. Considering the other buildings and the number of mature trees in their close proximity on the Walton Hall site, finding a suitable location may prove difficult. A purpose built energy centre with integral fuel store will be required as there is no suitable existing internal space to site the boiler. The flue would cause significant visual harm to the listed property.

During boiler start up, there may be grey or black smoke seen emitting from the flue. This is due to incomplete combustion occurring when combustion starts. This should not last very long providing the correct fuel and air are provided to the boiler, although again the proximity of trees can lead to smoke lingering. Generally, a very thin grey smoke may be seen emitting from the flue, but it does not usually cause visual concern.

There will be a slight smell of wood smoke coming from the boiler, much as you might smell from a home wood burner.

Planning consent is likely to be required for both aspects – the flue and the energy centre, if relevant.



Figure 6 Containerised biomass boiler with integral flue

7.1.7 Conclusion

Not recommended for further consideration due to visual impact, effect on local air quality and increased vehicle movements in the area.

7.2 Air Source Heat Pump

7.2.1 Overview

Heat pumps operate by extracting latent heat from natural sources such as air, water or ground and compressing it to generate higher temperatures that can be used for space heating and domestic hot water. Air source heat pumps are the simplest of the heat pump range and require only an external unit (the evaporator/condenser) which is located outside the building at ground level and an internal water tank, which is located within the building and can utilise the space normally taken up by a gas boiler. The external unit sucks air in to the condenser via a fan, which is then passed over a refrigerant coil. The refrigerant boils and transfers its energy to the heating water within the internal unit. The heating water is then used within the heating circuits in the building, e.g., radiators, underfloor heating, etc. The heating/cooling cycle is repeated over and over again.

Figure 7 shows a typical external unit and a matching hot water tank.



Figure 7 Typical external ASHP units in-situ (42kW) and internally located hot water cylinder (500l)

7.2.2 Application at Walton Hall

The air source system is potentially a good solution for the Walton Hall heating system. Based on the heat demand, 80kW of air source heat pump capacity along with a 2,000 litre buffer vessel would be capable of generating 100% of the thermal and hot water demand for the building. At least two units are recommended for Walton Hall to enable high efficiency low load operation and to allow for some level of redundancy.

Heat pumps work very efficiently when water heating temperatures are low, for example, 35 - 45°C. This temperature can be easily accommodated in a restoration build when underfloor heating and efficient radiators are used. The maximum heating temperature of an air source heat pump system is around 65°C. Heat pumps use electricity to operate so an efficient system is important to ensure electricity bills are kept as low as possible.

The external units could be located outside the building at a location to suit the building owners and to suit the final plant room location. Individual air source heat pumps maybe deployed to serve each individual building rather than having central heat pumps and a heat network.

For a system operating at maximum efficiency, the heat pumps will discharge water at ~45°C into the building heating circuit via the buffer vessel in the plant room. The ideal emitter system is underfloor heating (although this may not be possible in listed properties) and low-temperature radiators.

7.2.3 Coefficient of Performance

Typical coefficient of performance for a well-designed, well-operated air source system can be in the region of 2.2 – 4.7, which means that every unit of electricity used produces 2.2 – 4.7 units of heat. The COP will fluctuate throughout the year depending on air temperature. During the coldest months, the COP will be much lower than in the warmer months.

In practice, this looks like:

- $3.5\text{kWh heat} \div 1\text{kWh electricity} = \text{COP } 3.5$

The higher COP leads to much lower electricity bills. For example, using a unit price of 14p/kWh, the costs associated with different heat pump COPs are as follows:

Table 2 Operating costs ASHP

	Air -7°C/Water 45°C	Air 2°C/Water 45°C	Air 7°C/Water 45°C*
Annual heat demand kWh	188,483		
ASHP efficiency	2.42	2.84	3.58
Annual electrical demand kWh	77,886	66,367	52,649
Annual electricity cost	£10,904	£9,291	£7,371

*Air temperature is the temperature of the air entering the heat pump. Water temperature is the water leaving the heat pump to serve the houses with heating and hot water

The effect of external temperature on efficiency and running cost can be clearly seen in Table 2. It is not possible to control the air temperature but the hot water temperature entering the building must be minimised to maximise efficiency. It must be noted that most heat is required in the winter when the air is coldest meaning that the efficiency of heat pumps is limited.

7.2.4 Carbon Generation

Assuming a seasonal COP of 3.2 and annual heat pump generation of 188,483kWh, the system will produce:

- $188,483 / 3.2 = 59,011\text{kWh electricity used}$
- $59,011 * 0.23314\text{kgCO}_2/\text{kWh} = \mathbf{13.73\text{te CO}_2/\text{yr}}$

**Energy conversion factors UK Gov GHG conversion factors June 2020*

Note that as the national grid decarbonises, the carbon emissions from an electric heating system will continue to reduce leading ultimately to a zero-carbon heating system.

There are no on-site particulate or NOx emissions from heat pumps.

7.2.5 Capital Cost

The capital cost for an 80kW air source heat pump system will be in the region of £90,000 including 2no 40kW external units, a 2,000 litre buffer vessel, accessories, installation and commissioning.

7.2.6 Visual and Noise Impact

The main aspects of visual impact are the heat pump outdoor units. The units can be disguised behind a fence or other structure but there must be a specific distance between the fence and the front of the unit to ensure proper operation. An example of an air source unit can be found in Figure 7.

Air source heat pumps do create a certain noise level, which can be minimised through the use of anti-vibration mounts. The sound power level at a variety of distances from the unit for a 16kW¹ air source heat pump is listed below.

Table 3 Sound power levels and comparisons for 16kW air source heat pump

	@2m free standing	@6m free standing	@10m freestanding
Sound power level dB(A)	47	37.5	33
Comparative sound	Office air diffuser/quiet office	Refrigerator/low voice	Room in a quiet dwelling at midnight

Most air source heat pumps of this size fall into permitted development. However, the local planning office should be consulted as early as possible to advise on whether this is the case.

7.2.7 Other Considerations

The grid strength at Walton Hall needs to be investigated for this option. This also applies to ground source heat pumps. The local Distribution Network Operator (DNO) needs to be notified of the proposal to install heat pumps. They will not turn down the application, but they will determine whether any grid upgrades or local strengthening is required. It is not known if this has already been done.

The local DNO is Western Power Distribution.

It is important that the heat pump condensate is correctly routed away from the unit as it can cause local ice build-up, which is a health and safety hazard.

7.2.8 Conclusion

Due to the visual impact and the reduced system efficiency, this option is not recommended for further investigation. It is not usual to connect air source heat pumps to a district heat network so this option would most likely result in individual air source units per property.

¹ Published data for 40kW machines is very limited. At a distance of 10m, the sound power level is 48dB(A) for each 40kW unit.

7.3 Ground Source Heat Pump

7.3.1 Overview

Many of the design and operational aspects of ground source heat pumps (GSHP) are the same as the air source heat pumps described previously. The main difference is in the source of heat. The ground source unit is coupled to a ground loop, which can either be drilled into the ground (vertical boreholes) or laid in trenches close to the ground surface (horizontal array). The vertical loop is more expensive to install but results in a more efficient system because it is able to access more stable and higher temperatures found within the ground. The horizontal loop is cheaper to install but requires a large area of ground to extract sufficient heat from without causing the ground to freeze.

The horizontal loop option is the option proposed by Finn Geothermal in their quotation.

There is sufficient land in the field adjacent to Walton Hall that could be utilised for either a vertical or horizontal loop.



Figure 8 60kW ground source heat pump in a plant room. Shown alongside a thermal store with associated pipework

7.3.2 Application at Walton Hall

An 80kW GSHP and 2,000 litre buffer vessel would generate 100% of the thermal demand for Walton Hall based on the heat demand figures provided by Finn Geothermal. The heat pump itself is sited internally, either in an existing plant room or new energy centre. The group loop will need to be located externally and the location of the proposed loop is shown in Figure 2.

It is assumed that 1no heat pump installation will supply heat to all of the properties on the proposal and heat will be delivered via a new heat network, in a similar way to that described for the biomass boiler option.

As with ASHP, to operate at optimal efficiency, the heat pumps will discharge water at ~45°C into the building heating circuit. The ideal emitter system is underfloor heating and low-temperature radiators.

7.3.3 Coefficient of Performance

Typical coefficient of performance for a well-designed, well-operated ground source system can be in the region of 4.0 – 4.5, which means that every unit of electricity used produces 4 – 4.5 units of heat. In practice, this looks like:

- $4\text{kWh heat} \div 1\text{kWh electricity} = \text{COP } 4.0$

The higher COP leads to much lower electricity bills. For example, using a unit price of 14p/kWh, the costs associated with different heat pump COPs are as follows:

Table 4 Operating costs GSHP

	Brine 0°C/Water 45°C	Brine 5°C/Water 45°C	Brine 10°C/Water 45°C*
Annual heat demand kWh	188,483		
GSHP efficiency	3.67	3.9	4.4
Annual electrical demand kWh	51,358	48,329	42,837
Annual electricity cost	£7,190	£6,766	£5,997

*Brine temperature is the temperature leaving the borehole and entering the heat pump. Water temperature is the water leaving the heat pump to serve the houses with heating and hot water.

The effect of brine (ground) temperature on efficiency and running cost can be clearly seen in Table 4. Unlike air source, the ground temperature at 1m depth, which is the minimum recommended depth for a horizontal array, is fairly stable. This means that when most heat is needed in the winter, the heat pump efficiency can be maintained leading to reduced running costs and carbon emissions when compared to air source.

7.3.4 Carbon Generation

Assuming a seasonal COP of 3.7 and annual heat pump generation of 188,483kWh, the system will produce:

- $188,483 / 3.7 = 50,941\text{kWh electricity used}$
- $50,941 * 0.23314\text{kgCO}_2/\text{kWh}^* = \mathbf{11,88\text{kg CO}_2/\text{yr}}$

**Energy conversion factors UK Gov GHG conversion factors June 2020*

Note that as the national grid decarbonises, the carbon emissions from an electric heating system will continue to reduce leading ultimately to a zero-carbon heating system.

There are no on-site particulate or NOx emissions from heat pumps.

7.3.5 Capital Cost

The capital cost of a GSHP is the highest of all heating technologies presented in this report. This is mainly due to the cost of installing the ground loop. An estimate for an 80kW GSHP with horizontal loop would be in the region of £160,000 inclusive of supply, installation and commissioning. The cost is substantially higher for a vertical borehole system, closer to £230,000.

7.3.6 Visual and Noise Impact

Once completed, there is very little remaining visual impact from a GSHP system. The heat pumps and associated thermal stores and equipment are located inside the energy centre and the ground works are covered and reinstated. The only visible sign of the heat pump system is the inspection chamber required to access the borehole/horizontal loop pipework for maintenance.

Many smaller ground source heat pump systems will fall into permitted development, especially if the heat pump falls within the curtilage of the building and the ground loop does not extend beyond 0.5Ha of the surrounding land.

There is very little noise impact associated with ground source heat pumps. They tend to make a noise similar to a domestic refrigerator and when located inside a plant room or energy centre, the noise will not be noticeable at all. The sound power output from a typical 40kW unit is 32dB(A) at 1m distance. This is quieter than the air source heat pump described in Table 3 at 10m distance.

7.3.7 Other Considerations

The grid strength at Walton Hall needs to be investigated for this option. This also applies to ground source heat pumps. The local Distribution Network Operator (DNO) needs to be notified of the proposal to install heat pumps. They will not turn down the application, but they will determine whether any grid upgrades or local strengthening is required. It is not known if this has already been done.

The local DNO is Western Power Distribution.

7.3.8 Conclusion

Recommended for further consideration by Walton Hall.

7.4 Electric Heating System

Electric heating systems including electric radiators and immersion heated boilers are available for space heating and domestic hot water. Despite the relatively low purchase and installation costs of electric heating equipment, it is not recommended for installation at Walton Hall due to the relatively high running cost of such a system.

8 A Note on Incentives and Subsidies

The technologies covered in this report are eligible for payments on the non-domestic RHI scheme when connected to more than one domestic property. However, the scheme closes to new applicants on the 31st March 2021 and any extensions would not apply to Walton Hall (unless substantial and evidential development work was carried out on the GSHP prior to 17th August 2020 which is not the case). This subsidy will not therefore be available to Walton Hall. However, the domestic RHI scheme has been extended to 31st March 2022. If individual heat pumps were to be installed to heat individual houses, each would be eligible to claim domestic RHI for 7 years. The current ASHP tariff on the DRHI scheme is 10.85p/kWh capped at 20,000kWh per house per year (being £2,170).

**Appendix - Seeing the history in the view - A method for assessing heritage significance within
views - May 2011**



ENGLISH HERITAGE



SEEING THE HISTORY IN THE VIEW

A METHOD FOR ASSESSING HERITAGE
SIGNIFICANCE WITHIN VIEWS

May 2011

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RIGHT View of Greenwich over the Thames from Island Gardens, Old Royal Naval College in the foreground, the Queen's House in centre middleground and looking along the north-south axis to the General Wolfe statue in the background.
© Visit Britain



Views play an important part in shaping our appreciation and understanding of England's historic environment, whether in towns and cities or in the countryside. Some of those views were deliberately designed to be seen as a unity – for example Greenwich Palace seen from the River Thames, or the many facets of Stowe Park in Buckinghamshire. Much more commonly, a significant view is a historical composite, the cumulative result of a long process of development. The existence of such views, often containing well-known landmarks and cherished landscapes, enriches our daily life, attracts visitors and helps our communities prosper.

This document explains how the heritage significance of views can be assessed in a systematic and consistent way however these views have come into being. The method draws on English Heritage's *Conservation Principles for the Sustainable Management of the Historic Environment* (2008), is compatible with the policies and principles set out in *Planning Policy Statement 5: Planning for the Historic Environment* (2010, 55) and, although originally developed for use in London, is intended to be applicable in all parts of the country and to both urban and rural environments. Phase A of this guidance (page 9) describes how to analyse the content and importance of a view whatever heritage assets may be visible within it, whether statutorily listed buildings, scheduled monuments, conservation areas, registered parks

and gardens, battlefields, UNESCO World Heritage Sites or assets of local interest. Phase B (page 15) then goes on to explain how to measure and document the likely impact of specific development proposals on historically important views.

Historically important views are among the many sensitive issues that local planning authorities have to consider, and this account of English Heritage's method of assessment is intended to help clarify this heritage aspect of the planning process, and promote national consistency. It should be especially useful to those commissioning and carrying out area-based studies as advocated by English Heritage and CABE in their joint *Guidance on Tall Buildings* (2007).

English Heritage will apply this method to its own decisions in relation to developments affecting views, and we believe that planning authorities and other interested parties will benefit by adopting the same approach.

Chris Smith

National Planning Director | English Heritage, May 2011

This document presents a method for understanding and assessing heritage significance within views. The method can be applied to any view that is significant in terms of its heritage values. Such views may be selected by a developer or planning authority (perhaps in consultation with English Heritage) as part of the Environmental Impact Assessment (EIA) of a specific development proposal. The method can also be used to supplement understanding of views that are already recognised as being important and worth protecting, including:

- views identified as part of the plan-making process, such as those identified in the *London View Management Framework* (LVMF, Mayor of London 2010), Oxford City Council's *View Cones* (2005) and Westminster City Council's draft *Metropolitan Views* supplementary planning document (2007);
- views identified in character area appraisals or in management plans, for example of World Heritage Sites;
- important designed views from, to and within historic parks and gardens that have been identified as part of the evidence base for development plans, such as those noted during English Heritage's 2001 upgrading of the national Register of Historic Parks and Gardens;
- views that are identified when assessing sites as part of preparing development proposals.

One of the purposes of the qualitative approach proposed in this document is to help identify those views that best display the heritage significance of a feature or features. It therefore has the potential to help in the process of designating views of particular importance.

The method has been designed to provide a consistent and positive approach to managing change. This approach is in line with both the plan making and development management policies of *Planning Policy Statement 5: Planning for the Historic Environment [PPS5]* (CLG 2010) and *PPS5 Historic Environment Planning Practice Guide* (CLG, DCMS and EH 2010). It has been tested and refined through a number of worked examples.

From now on it will provide English Heritage, local planning authorities, developers and the wider public with a reliable method for assessing both the heritage significance of views and the likely impact of specific development proposals upon them. It does not impose or dictate a judgement as to whether the impact is acceptable or not. That judgement is the responsibility of the local planning authority. The approach should, however, help all parties to evaluate impact on a basis of common understanding and thus reduce the scope for differing judgements.

This method has wide applicability, but it is designed principally to assess specific views that have been recognised as being important. In accordance with HE6.1 of PPS5 applicants need *'to provide a description of significance of the heritage assets affected and the contribution of their setting to that significance. The level of detail should be proportionate to the importance of the heritage asset and no more than is sufficient to understand the potential impact of the proposal on the significance of the heritage asset.'* Where important views are likely to be affected by a development proposal, the applicant will need to demonstrate the impact on those views and existing methodologies, such as this one, provide a convenient means of achieving that. Even when some form of assessment is not specifically required by the local planning authority, an applicant may feel that using this methodology helpfully demonstrates the impact of their proposals.

THE NEED FOR, AND CONTEXT OF, GUIDANCE

The guidance set out in this document is most usefully and appropriately applied when complex issues involving views of important heritage assets need to be described and formally analysed. For instance, as part of a Local Development Framework document such as Supplementary Planning Guidance on important local views,

to help in determining complex planning cases often involving environmental impact assessment or as part of an understanding of base line views to be used when monitoring the condition of World Heritage Sites. The guidance may also be used when writing conservation area appraisals and conservation management plans.

The guidance has been developed in line with the principles set out in *Planning Policy Statement 5: Planning for the Historic Environment [PPS5]* (CLG 2010) and *PPS5 Historic Environment Planning Practice Guide* (CLG, DCMS and EH 2010). PPS5 policies protect the contribution heritage assets make to an area's character and sense of place (HE7.4) and the setting of heritage assets (HE8.1, HE9 and HE10). The setting is defined as the surroundings in which a heritage asset is experienced. Views are one way in which we experience heritage assets and an area's character and sense of place. So the assessment of the possible impact of proposed developments on views will directly assist in the application of PPS5 policies.

The guidance is designed to be used as part of the suite of other assessment and characterisation tools that are commonly applied in order to understand the significance of heritage assets in urban and rural areas and particularly when assessing the contribution made by setting to the significance of a heritage asset. The setting of any heritage asset is likely to include a variety of views of, across, or including that asset, and views of the surroundings from or through the asset. English Heritage guidance on the setting of heritage assets will be published in the summer of 2011. The potential application of many of these tools is summarised in *Understanding Place: an Introduction* (English Heritage 2010) which includes guidance on which characterisation tools to use in particular circumstances, taking into account the purpose, scale and scope of analysis needed.

RIGHT View of Liverpool's historic waterfront, showing the grade I Liver building and recent developments.
© English Heritage



English Heritage is frequently consulted by local planning authorities, developers and others on the impact of major developments on the historic environment, including impact on views that may contain important heritage assets. Assessing the impact of such developments has been particularly demanding in London and other major urban centres where proposals for tall buildings, potentially affecting the setting of many heritage assets, have required expert analysis of their visual impact over a wide area.

ENGLISH HERITAGE'S INVOLVEMENT

English Heritage's experience with development proposals has shown the need for guidance on how to apply a consistent and transparent approach to:

- identifying heritage significance within views;
- assessing how development proposals may impact upon heritage significance within views.

English Heritage has been involved in the assessment of views because of the requirement that it be notified of certain kinds of planning application, including those involving grade I and II* listed buildings. Within Greater London its role is slightly more extensive than in the rest of the country; for instance English Heritage is a statutory consultee for planning applications that may affect the geometrically defined views (Protected Vistas) in London that are subject to directions issued by the Secretary of State.⁰¹

01 Circular 01/01: Arrangements for handling heritage applications - notification and directions by the Secretary of State

RIGHT Panorama looking east over the City of Oxford from Raleigh Park.
© Land Use Consultants



In recent years English Heritage has been closely involved in advising on the protection of heritage significance within views in London, Oxford, Liverpool, Newcastle and Bristol. English Heritage has also commissioned research into the role and impact of tall buildings, which are often perceived to have the greatest potential impact on views. This research led to the development of *Guidance on Tall Buildings* (English Heritage and CABI 2007) which contains advice on how to plan for and assess the impact of tall buildings.

THE EMERGENCE OF QUALITATIVE VISUAL ASSESSMENT AS A TOOL IN LONDON

London, as a capital city, contains an exceptional concentration of nationally and internationally significant historic places. Its many iconic landmarks and views are also the subject of frequent and intense development pressure.

The London Plan, the Spatial Development Strategy for Greater London (Mayor of London 2004), introduced the concept of view management plans to manage London's designated views (Policy 4B.16). In 2007 the *London View Management Framework (LVMF) supplementary planning guidance* (Mayor of London 2007) introduced the concept of qualitative visual assessment (QVA) as a means of assessing how a development proposal may affect a designated view listed in *The London Plan*.

The Revised Supplementary Planning Guidance LVMF (July 2010) sets out in greater detail the policies in the *Consultation Draft Replacement London Plan*, Policies 7.11 (London View Management Framework) and policy 7.12 (Implementing the London View Management Framework).

Assessing Heritage Significance within Views

DEVELOPING THE METHOD

English Heritage recognises that the approach pioneered by the LVMF must be applicable outside London, as well as inside, and to rural as well as to urban landscapes. The method set out in the present document has therefore been developed to provide a consistent basis for advising planning authorities across England. Although dependent on qualitative analysis, it provides a consistent baseline for assessing the impact of development on heritage significance within views. As a result, it aims to reduce the scope for disputes about the nature and scale of those impacts.

The value of such an approach has also been recognised by UNESCO, which is concerned to ensure that the 'Outstanding Universal Value' (OUV) of World Heritage Sites (WHS) is not adversely affected by pressure for continuing development, particularly in urban locations.

The method presented in this document is specifically designed to help describe and analyse heritage significance within a view. A view can also contain other significant cultural elements, for example non-historic landmarks.

ASSESSING HERITAGE SIGNIFICANCE IN VIEWS

The qualitative assessment of heritage significance within views is divided into two phases:

Phase A baseline analysis: defines and analyses heritage significance within a view.

Phase B assessment: assesses the potential impact of a specific development proposal on heritage significance within a view, as analysed in Phase A.

Phase A: Baseline Analysis

- Describes the baseline against which change can be monitored;
- Undertaken by English Heritage, local planning authorities and others as required.

Phase B: Assessment

- Assesses the potential impact of a specific development proposal on heritage significance within a view;
- Undertaken by the developer as part of the Cultural Heritage chapter of the EIA (and, in London, as part of a wider qualitative assessment of views in the LVMF);
- May be undertaken by others with an interest in the view e.g. English Heritage.

**Specific
Development
Proposal**

Figure 1

Phase A Baseline Analysis



Phase A Baseline Analysis: Introduction

ESTABLISHING THE BASELINE SIGNIFICANCE OF HERITAGE IN VIEWS

This method for understanding heritage significance within views has been developed to:

- highlight the architectural, archaeological, artistic and historic interest in and context of views, and to promote appreciation and understanding of heritage significance within those views;
- enable English Heritage to offer clear, consistent advice to local planning authorities on impacts on heritage significance within views;
- assist local planning authorities in the development of spatial planning policy in relation to the protection and enhancement of views;
- establish a baseline against which to judge the impact of proposals upon heritage significance.

The approach to Phase A analysis reflects English Heritage's broader conservation philosophy – that understanding the heritage significance of a place or asset is a prerequisite to managing that place or asset in ways that preserve and enhance its significance. The method thus:

- provides a succinct and replicable analysis of heritage significance within views;
- is compatible with PPS5 Policy HE2 (Evidence base for plan-making) and HE6.1 (Information requirements for consents affecting heritage assets);

- is compatible with English Heritage's Conservation Principles including the advice that 'decisions about change in the historic environment demand the application of expertise, experience and judgement in a consistent, transparent process...' (2008, para 5.1);
- is compatible with the Circular on the Protection of World Heritage Sites (DCLG and DCMS July 2009) and accompanying guidance and with UNESCO's Operational Guidelines for the Implementation of the World Heritage Convention (2008), particularly the definitions of OUV, integrity and authenticity.

WHO SHOULD UNDERTAKE THE PHASE A ANALYSIS?

Phase A analysis may be commissioned or undertaken:

- by a strategic or local planning authority, as part of its plan-making process;
- by English Heritage in its own work to promote appreciation and understanding of heritage significance within views;
- by a developer in order to inform development proposals or to construct a baseline against which impacts of a specific development proposal may be assessed by community and other groups.

In all cases the analysis should be undertaken by someone with appropriate experience and qualifications who understands the historic environment.

The process of Phase A analysis is summarised in Figure 2 and explained in more detail below. Readers may also find it helpful to refer to the fully illustrated practical example of the application of the method presented in Appendix D.

Plans and photographs should be used to illustrate the analysis (see Appendix C for technical details). These should include:

- a map showing the Viewing Place and Assessment Point(s) based on the 1:1250 topography layer of the Ordnance Survey MasterMap™ where available;
- photograph(s) taken from the Assessment Point(s);
- photograph(s) taken from the Assessment Point(s) annotated or coloured to show the location of key heritage assets which may include World Heritage Sites, listed buildings (grades I, II* and II), scheduled monuments, registered parks and gardens, registered battlefields, conservation areas or other heritage assets;
- photograph(s), if relevant, to show the kinetic nature of the view.

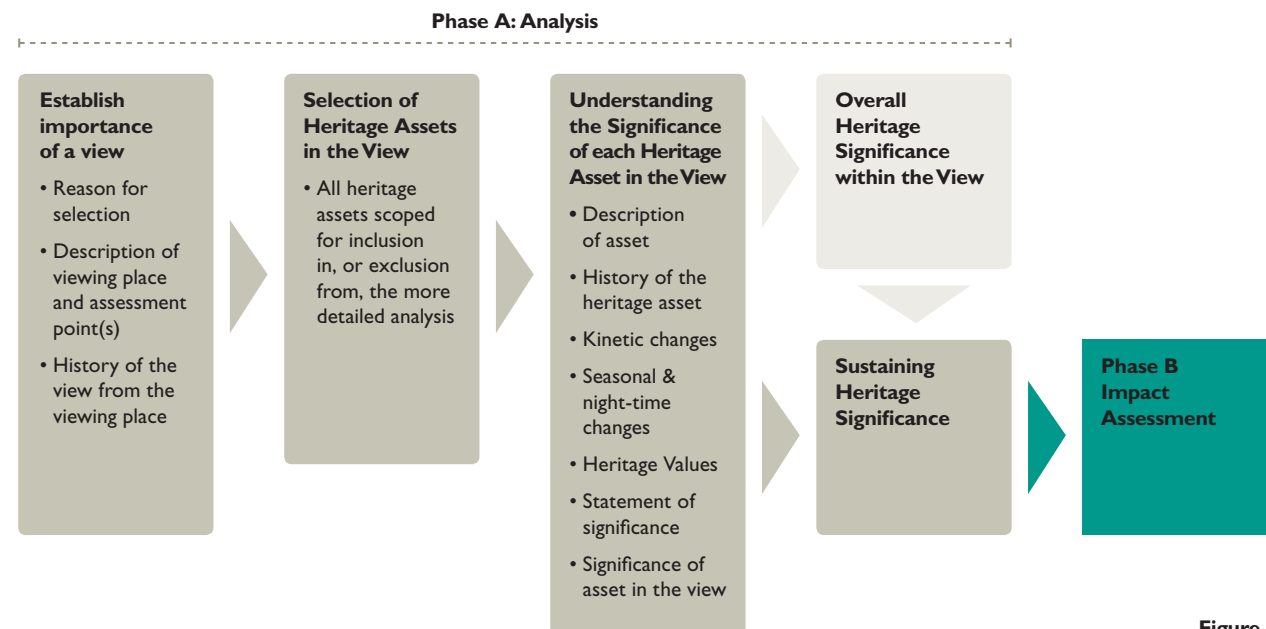


Figure 2

Site visits should be supported by information derived from authoritative published and archival sources, which may be referred to in Historic Environment Records (HERs). Amongst the most important of these are World Heritage Site nomination documents and management plans; conservation area statements and appraisals; listed building descriptions; scheduled monument, registered historic park and garden and battlefield citations; Royal Commission on the Historical Monuments of England (RCHME) inventories and studies, and Pevsner's architectural guides to the buildings of England (Yale University Press). The owners of historic buildings, relevant experts and members of the local community can also be valuable sources of information, especially about the less well-documented evidential and communal values of a place.

STEP 1

ESTABLISHING REASONS FOR IDENTIFYING A PARTICULAR VIEW AS IMPORTANT

This opening section should explain the reason for selecting the view and 'Viewing Place' and provide a summary of their history. It should also include a description of the location and extent of the Viewing Place and the location of the 'Assessment Point' or points (see Appendix B for definitions of Viewing Place and Assessment Point).

The history of the Viewing Place and view should describe historical relationships between heritage assets to establish whether these contribute to the overall historic significance within the view. This section could usefully be illustrated by historic images.

STEP 2

IDENTIFYING WHICH HERITAGE ASSETS IN A VIEW MERIT CONSIDERATION

This section should identify all heritage assets within the view and establish which should be included in the assessment (for definition of heritage assets see Glossary at Appendix A).

Selection of heritage assets for inclusion depends on:

- their designation or importance in a local context;
- the degree to which their heritage significance can be appreciated from the Viewing Place;
- whether this may be the best (or only) place to view the historic significance of the heritage asset;
- whether their significance is enhanced or diminished as a result of being seen in combination with other heritage assets in the view.

This selection or 'scoping' of heritage assets should be supported by sound evidence and reasoned judgement.

Whether a conservation area, as such, is included in the assessment of a view is a matter of judgement, depending on how well its overall character, as distinct from its individual listed buildings, can be appreciated from the Viewing Point.

In the course of the scoping exercise the assessor may find it useful to rank the different heritage assets in terms of their relative importance in the view.

RIGHT Changing visual relationships of heritage assets as experienced when moving through the viewing area.
© Land Use Consultants



STEP 3

ASSESSING THE SIGNIFICANCE OF INDIVIDUAL HERITAGE ASSETS

A succinct description should be provided of each heritage asset and its place and visibility in the view.

A brief factual summary of the history and nature of the heritage asset within the view should then be provided in line with the advice in English Heritage *Conservation Principles*, paragraph 3.3⁰².

CHANGES EXPERIENCED WHEN MOVING THROUGH THE VIEWING PLACE

Views are often kinetic (i.e. the observer is moving) and so, if necessary, there should be separate consideration and explanation of how the visibility and appearance of the heritage asset may change as the observer moves around the Viewing Place. This may include a description of the asset's visual relationship to other features in the view. Some views will have a more extensive Viewing Place than others.

02 CP 3.3 In order to identify the significance of a place, it is necessary first to understand its fabric, and how and why it has changed over time; and then to consider:

- who values the place, and why they do so
- how those values relate to its fabric
- their relative importance
- whether associated objects contribute to them
- the contribution made by the setting and context of the place
- how the place compares with others sharing similar values.

SEASONAL/NIGHT-TIME VARIATIONS

Seasonal and diurnal variations in the view should also be considered. Does summer foliage hide an asset that is visible in winter? Does floodlighting at night emphasis some aspects of an asset and leave others in the dark?

HERITAGE VALUES OF A HERITAGE ASSET

Heritage assets have a value beyond mere utility. The 'family' of heritage values identified in *Conservation Principles* provide a way to analyse the significance of heritage assets. These heritage values can help to decide the most efficient and effective way of managing the heritage assets so as to sustain their overall value to society. These values can be used to explain what it is that gives a place its special value and they may also be usefully applied to the heritage assets within a view.

Views of features within World Heritage Sites may demonstrate the 'Outstanding Universal Value' for which they have been inscribed by UNESCO's World Heritage Committee – a 'cultural and/or natural significance which is so exceptional as to transcend national boundaries and to be of common importance for present and future generations of all humanity' (UNESCO 2008, para 49).

SIGNIFICANCE OF THE HERITAGE ASSET

Having identified the individual heritage values of an asset it is then necessary to understand the significance of the asset as a whole even though, as is likely, not all of it may be visible.

SIGNIFICANCE OF A HERITAGE ASSET IN THE VIEW

State which aspects of an asset's heritage significance can be appreciated *in the view*. For example, in the case of Tower Bridge as viewed from City Hall (see Appendix D) some aspects of its heritage significance (such as the fusion of innovative engineering and architectural form) may be appreciated in the view of the bridge while other aspects (such as its internal mechanism, which originally was hydraulic) cannot be seen.

STEP 4

ASSESSING THE OVERALL HERITAGE SIGNIFICANCE IN A VIEW

How do all the heritage assets identified contribute to the overall heritage significance in the view? Set out the relative contribution of each identified heritage asset to the overall value of the view, highlighting those assets that contribute most to the overall heritage significance.

Consider how individual assets are interrelated in the view, noting any additional values that arise from seeing the assets as a group. Where the significance of the whole is greater than the sum of its parts, this should be explained; for example, composite or fortuitous views which are the cumulative result of a long history of development, particularly in towns and cities may, through the gradual accrual of aesthetic and communal values, become historically significant.

Sometimes a view has been designed to be seen as a whole although its components may have been built at different times. Heritage assets (sometimes of different periods) may have been deliberately linked by the creation of views which were designed to have a particular effect, often focusing on a particular built or topographic landscape feature. In these cases the view is a fundamental aspect of the design of the asset or assets, unlike assets in composite or fortuitous views.

Finally, identify any situations in which the values of one heritage asset in the view may conflict with, or contradict, those of another:

STEP 5

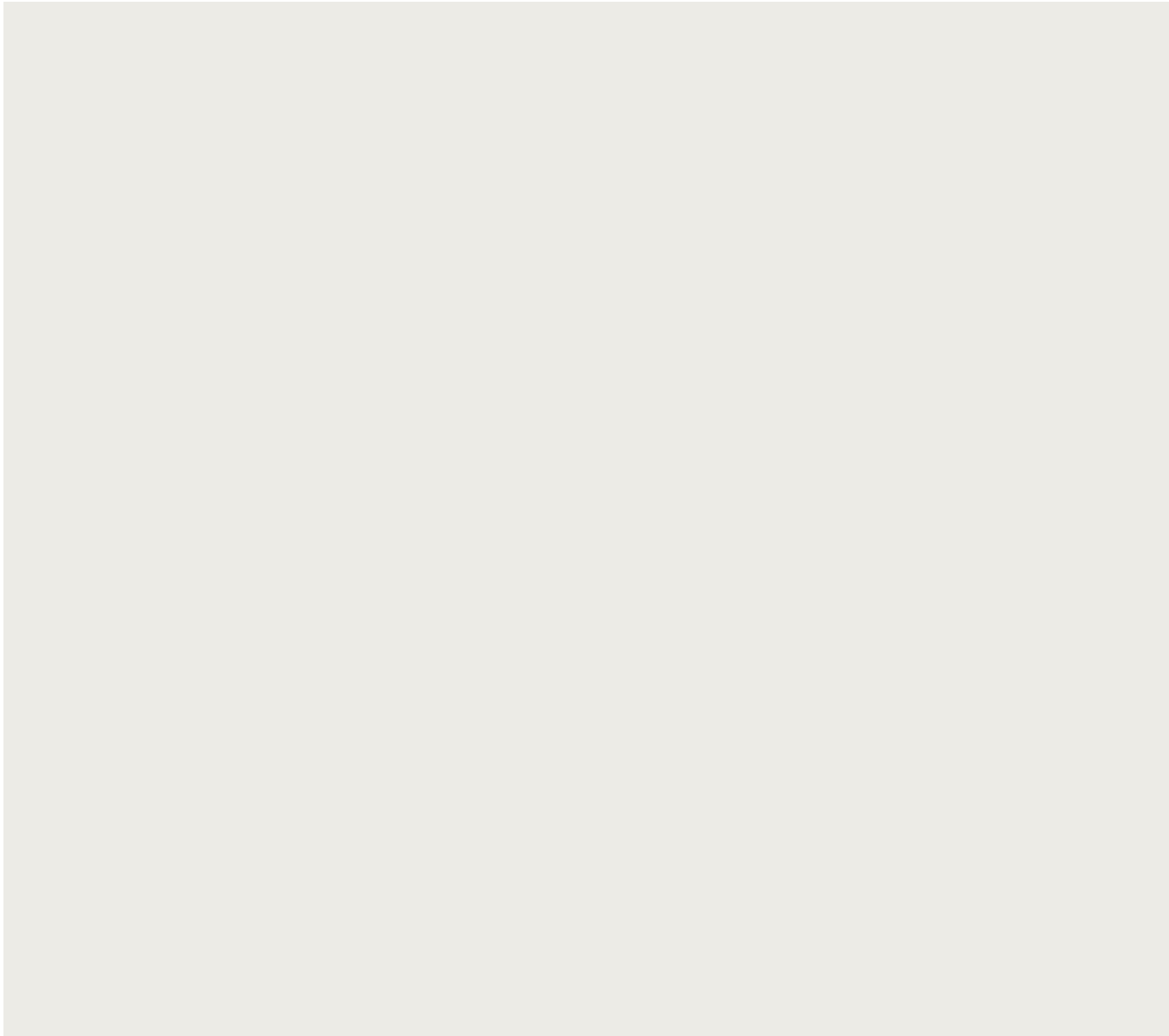
HOW CAN HERITAGE SIGNIFICANCE BE SUSTAINED?

The purpose of this section of the assessment is to explain in practical terms how the appreciation of the heritage significance within the view can be sustained. English Heritage and/ or the local planning authority will draw on this information to inform their response to any proposals for change within views. Individual heritage asset sustainability statements should be set out in order of priority, starting with the most important.

Phase B Assessment of Impact

SEEING THE HISTORY IN THE VIEW

15



ASSESSING THE IMPACT OF DEVELOPMENT PROPOSALS ON HERITAGE IN A VIEW

The second part of this guidance document describes a method for assessing the potential impact of development proposals on heritage significance within views. More specifically, it has been developed to provide:

- consistency in the way such proposals are assessed, including assessing how a development may affect understanding of a heritage asset or the ability to appreciate the 'outstanding universal value' (OUV) of a World Heritage Site (WHS)
- clarity in assessment of impact on heritage significance within views, linking it to Environmental Impact Assessment (EIA).

The method takes account of *Guidance on Tall Buildings* (English Heritage and CABE 2007), including the need to examine cumulative impacts and to assess effects on heritage assets such as WHS.

Phase B assessment focuses on the impact of specific development proposals on what is of *heritage significance* within a view. It is important to recognise that a view may also have a wider cultural significance, and the impact on this of proposed change needs to be assessed in parallel. One such tool for assessing impacts on wider cultural significance is through the 'qualitative visual assessment' methodology advocated in the 2007 LVMF (replaced in the Revised SPG 2010 by more general guidance on the assessment process including reference to what is culturally important in the view and revised management guidance for the three main view types)⁰³.

In terms of the historic environment, it is assumed that a developer would also make use of advice and information of wider scope, such as character appraisals where they exist, to assess the overall impact of a proposed development on the historic environment.

LINKS TO EIA

Environmental Impact Assessment (EIA) is a procedure to ensure that the environmental effects of development are fully understood and taken into account in the decision-making process. EIA is a European Community (EC) requirement under Directive 85/337/EEC⁰⁴. Projects that fall within the scope of the Directive include 'Schedule 1 projects' (e.g. oil refineries, power stations, chemical installations and waste disposal installations for which EIA is required in every case) and 'Schedule 2' projects (for which EIA is required only if the project is judged likely to give rise to significant environmental effects). Local planning authorities will determine whether an EIA is necessary. Developments are classified as 'Schedule 2' where they meet or exceed certain threshold criteria – including physical scale or complexity of the proposal, visual intrusion and impact on heritage – or if the proposed development is in, or partly in, a 'sensitive area' ('sensitive areas' include World Heritage Sites and scheduled monuments). In addition, Circular 02/99 – the Guidance on the EIA Regulations states that:

...in certain cases other statutory and non-statutory designations which are not included in the definition of 'sensitive areas', but which are nonetheless environmentally sensitive, may also be relevant in determining whether EIA is required (para 39).

The information generated from an assessment of the impact of a proposed development on views should be incorporated into a broader heritage impact assessment, if required as part of an EIA.

⁰³ LVMF 2010, 7 ff

⁰⁴ The Directive has been amended three times in 1997, 2003 and 2009, and given legal effect through the Town & Country Planning (Environmental Impact Assessment) (England & Wales) Regulations 1999 (SI No 293).

WHO SHOULD UNDERTAKE THE PHASE B ASSESSMENT?

Responsibility for undertaking a Phase B assessment of the impact of a proposed development on heritage significance within a view lies with the developer (PPS5 HE6.2), who should consult at an early stage with the local planning authority and English Heritage to make sure that the scope of the assessment is agreed. The method also sets out clearly how English Heritage will assess the impact a specific development would have on heritage significance within a view.

In London, the Phase B assessment may also provide one of the strands that feeds into the management guidelines advocated in the London View Management Framework supplementary planning guidance.

PROCESS OF PHASE B ASSESSMENT

The process of the Phase B assessment can be summarised as shown in Figure 3 below.

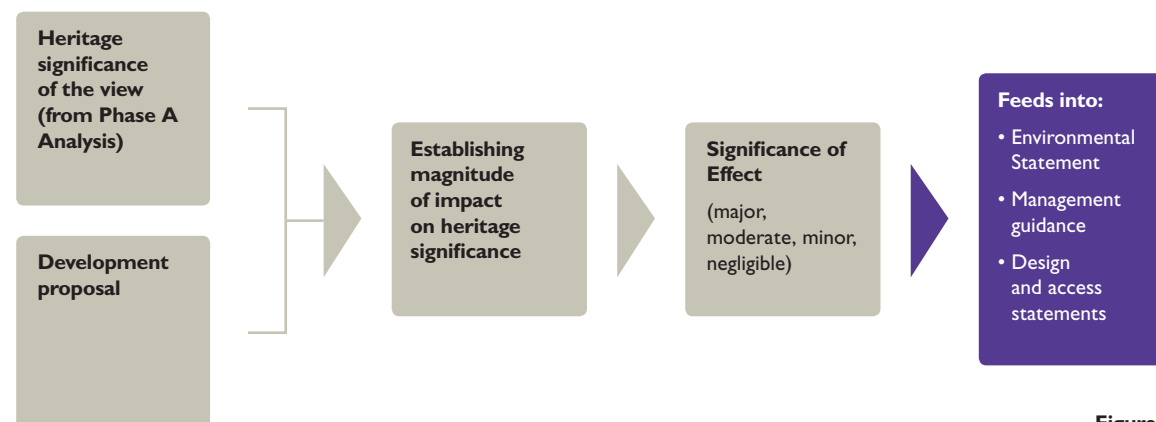


Figure 3

RESOURCES AND RECEPTORS: WHAT NEEDS TO BE ASSESSED?

EIA requires the assessor to identify the resource or receptor likely to be affected by a proposed development. In this case there are two types of heritage resource or receptor:

- the individual heritage assets identified within the view (and their heritage significance as defined in the Phase A analysis) (see Table 1, page 19)
- the view as a whole (and its heritage significance identified in the Phase A analysis) (see Table 2, page 20).

APPROACH TO ASSESSMENT

Methods for determining the significance of an effect as part of an EIA vary. Currently, there is no formal guidance on how to assess effects on cultural heritage within an EIA. However, in landscape and visual impact assessment (LVIA) the Landscape Institute's guidance (*Landscape Institute*, 2002, 92) suggests that the two principal criteria determining significance are scale or magnitude of impact and the environmental sensitivity of the location or receptor. These criteria are combined to come to a judgement about significance of effect. This involves making a judgement on the relative value or sensitivity of different resources.

ADVANTAGES AND DISADVANTAGES OF USING MATRICES

Some practitioners in landscape and visual impact assessment use matrices while others prefer to use a well argued narrative account to arrive at an overall view of significance. The advantage of using a matrix is that the process is transparent. The disadvantage is that a matrix can be restrictive and the relationship between the two axes is not always linear (*Landscape Institute* 1995 and 2002). Above all it is important to remember that any method is a tool for assessment and ultimately assessment of the level of effect will be down to professional judgement.

For this assessment it is therefore necessary to identify the value and importance of the resource or receptor and the magnitude of impact.

TABLE I
VALUE/IMPORTANCE OF
INDIVIDUAL HERITAGE
ASSETS IDENTIFIED
WITHIN THE VIEW

VALUE/ IMPORTANCE	DEFINITION
HIGH	The asset will normally be a World Heritage Site, grade I or II* listed building, scheduled monument, grade I or II* historic park and garden or historic battlefield which is a central focus of the view and whose significance is well represented in the view. The Viewing Place (and/or Assessment Point) is a good place to view the asset or the only place from which to view that particular asset.
MEDIUM	The asset will normally be a grade II listed building, grade II historic park and garden, conservation area, locally listed building or other locally identified heritage resource which is a central focus of the view and whose significance is well represented in the view. The Viewing Place (and/or Assessment Point) is a good place to view the asset and may be the only place from which to view that particular asset. The asset may also be a World Heritage Site, grade I or II* listed building, scheduled monument, grade I or II* historic park and garden or historic battlefield which does not form a main focus of the view but whose significance is still well represented in the view. In this case the Viewing Place (and/or Assessment Point) may be a good, but not the best or only place to view the heritage asset.
LOW	The asset may be a grade II listed building, grade II historic park and garden, conservation area, locally listed building or other locally identified heritage resource which does not form a main focus of the view but whose significance is still well represented in the view. In this case the Viewing Place (and/or Assessment Point) may not be the best or only place to view the heritage asset.

STEP 6

IDENTIFYING THE IMPORTANCE OF THE ASSETS AND THE VIEW

Two types of resource or receptor are identified (see page 18):

- individual heritage assets identified within the view;
- the view as a whole (i.e. the sum of the heritage assets visible within it).

The value of individual heritage assets in the view may be determined on the basis of their designated status, the degree to which their heritage significance can be appreciated in the view, their contribution to the view and whether this is the best (or only place) to view the asset.

TABLE 2
VALUE/IMPORTANCE OF
THE VIEW AS A WHOLE

VALUE/ IMPORTANCE	DEFINITION
High	The view is likely to be a nationally or regionally important view (e.g. views in the LVMF, a view identified in a World Heritage Site management plan or designed views within grade I or II* historic parks or gardens) and/or contain heritage assets such as World Heritage Sites, grade I or II* listed buildings, scheduled monuments, grade I or II* historic parks or gardens or historic battlefields whose heritage significance is well represented in the view and which benefit from being seen in combination with each other.
Medium	The view is likely to be of importance at the county, borough or district level (e.g. Metropolitan Views defined by London boroughs or designed views within grade II historic parks or gardens) and/or contain heritage assets such as grade II listed buildings, grade II historic parks or gardens, conservation areas, locally listed buildings or other locally identified heritage resources whose heritage significance is well represented in the view and which benefit from being seen in combination with each other. It may also be a view that contains heritage assets such as World Heritage Sites, grade I or II* listed buildings, scheduled monuments, grade I or II* historic parks or gardens, or historic battlefields whose heritage significance is clearly readable, but not best represented, in this particular view.
Low	The view is likely to be a locally valued view and contain heritage assets such as grade II listed buildings, grade II historic parks or gardens, conservation areas, locally listed buildings or other locally identified heritage resources whose heritage significance is clearly readable, but not best represented, in this particular view.

The value of the view as a whole may be determined through its designated status, the overall heritage significance in the view, and the extent to which the view exhibits additional significance as a result of a number of heritage assets being seen in combination with each other. It may also encompass designed views, such as Lancelot 'Capability' Brown's views of Blenheim Palace created across the lake (see photograph on page 21). The value and importance of a view may be determined as shown in Table 2.

RIGHT View of Blenheim Palace
beyond the lake created by Capability
Brown. Vanbrugh's Grand Bridge
(1710) to the left.

© Visit Britain



TABLE 3
CRITERIA FOR DETERMINING
MAGNITUDE OF IMPACT ON
HERITAGE SIGNIFICANCE
WITHIN A VIEW

MAGNITUDE OF IMPACT	DEFINITION
High beneficial	The development considerably enhances the heritage assets in the view, or the view as a whole, or the ability to appreciate those values.
Medium beneficial	The development enhances to a clearly discernable extent the heritage values of the heritage assets in the view, or the view as a whole, or the ability to appreciate those values.
Low beneficial	The development enhances to a minor extent the heritage values of the heritage assets in the view, or the view as a whole, or the ability to appreciate those values.
Imperceptible/None	The development does not affect the heritage values of the heritage assets in the view, or the view as a whole, or the ability to appreciate those values.
Low adverse	The development erodes to a minor extent the heritage values of the heritage assets in the view, or the view as a whole, or the ability to appreciate those values.
Medium adverse	The development erodes to a clearly discernable extent the heritage values of the heritage assets in the view, or the view as a whole, or the ability to appreciate those values.
High adverse	The development severely erodes the heritage values of the heritage assets in the view, or the view as a whole, or the ability to appreciate those values.

STEP 7

ASSESSING THE MAGNITUDE OF THE IMPACT ON INDIVIDUAL HERITAGE ASSETS

Assessment of the magnitude of impact should as far as possible be objective, reasoned and quantifiable. The assessor should consider the extent to which heritage significance within a view, identified in the Phase A analysis, may be changed or affected by the proposed development by reason of the latter's location or design.

It is not the purpose of the assessment to evaluate the design quality of a proposed development. However, the extent to which specific design parameters influence the impact of the development upon heritage significance within a view is relevant. Aspects of design such as scale, mass, silhouette, and reflectivity may be particularly relevant to impact on heritage significance within a view.

Impacts may be beneficial or adverse. If the proposed changes will enhance heritage values or the ability to appreciate them, as expressed in the Phase A assessment, then the impact on heritage significance within the view will be deemed to be beneficial; however, if they fail to sustain heritage values or impair their appreciation then the impact will be deemed to be adverse. For example, a development proposal that blocks, dominates, or detracts from a heritage asset by virtue of its scale, position in a view, or design is likely to result in an adverse impact both on the asset itself and the way in which it can contribute to the heritage significance within the view. On the other hand, the removal of an existing building that interferes with a heritage asset is likely to result in a beneficial impact.

For this assessment, level of impact in terms of scale, position in a view, or design should be recorded on a seven-point scale as shown in Table 3.

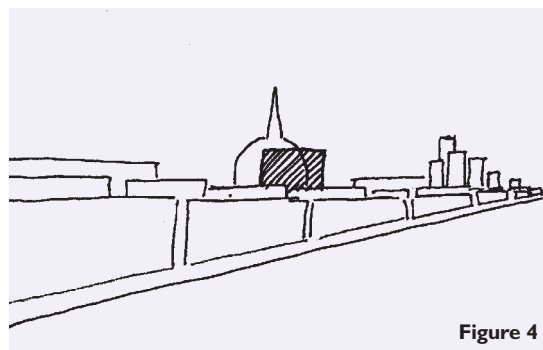


Figure 4

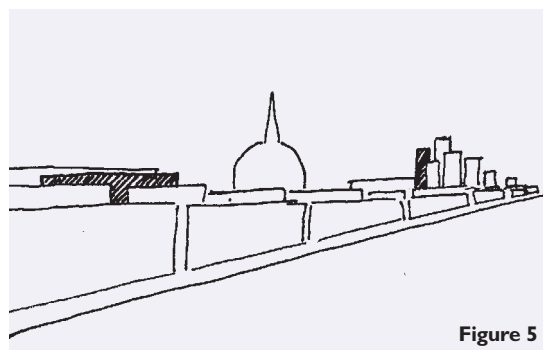


Figure 5

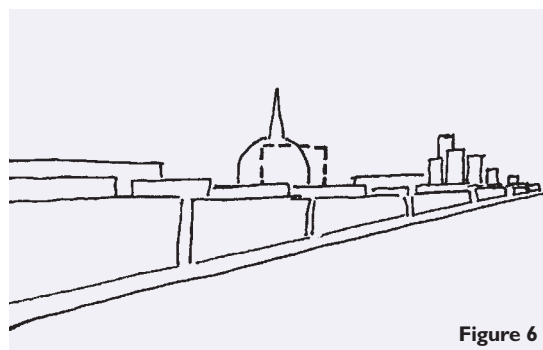


Figure 6

Figure 4 Proposed development may adversely affect the understanding and appreciation of a heritage asset in the view.

Figure 5 Proposed development may have a neutral effect on the understanding and appreciation of heritage assets in the view.

Figure 6 removal or remodelling of an existing feature may positively enhance the understanding and appreciation of a heritage asset in the view.

Images © Land Use Consultants

It is important to consider how the proposed development would relate to heritage assets as the observer moves through the Viewing Place. In London, although the LVMF identifies specific assessment points, it also allows that in some cases 'it is important to consider a view as it would be experienced by a person moving through the Viewing Location'. The kinetic view is represented by a red line drawn between two or more Assessment Points. 'In these cases it will be necessary to test both Assessment Points and one or more points on the red line. The additional points should be identified in consultation with the local planning authority' (Mayor of London 2010, para 35).

Where views are affected by seasonal differences impacts should be assessed both in summer and winter to take account of differences in lighting and leaf loss from trees. It is important to assess the impact of a proposed development on the view at night as well as during the day. This should consider how night-time lighting associated with the proposed development will affect the heritage values set out in the Phase A analysis. The assessment should use the same criteria as above.

TABLE 4
THE MAGNITUDE OF THE
CUMULATIVE IMPACT OF
PROPOSALS ON HERITAGE

MAGNITUDE OF CUMULATIVE IMPACT	DEFINITION
High beneficial	The development, in conjunction with other changes, considerably enhances the heritage values of the heritage assets in the view, or the ability to appreciate those values or the view as a whole.
Medium beneficial	The development, in conjunction with other changes, enhances to a clearly discernable extent the heritage values of the heritage assets in the view, or the view as a whole, or the ability to appreciate those values.
Low beneficial	The development, in conjunction with other changes, enhances to a minor extent the heritage values of the heritage assets in the view, or the view as a whole, or the ability to appreciate those values.
Imperceptible/None	The development, in conjunction with other changes, does not change the heritage values of the heritage assets in the view, or the ability to appreciate those values or the view as a whole.
Low adverse	The development, in conjunction with other changes, erodes to a minor extent the heritage values of the heritage assets in the view, or the ability to appreciate those values or the view as a whole.
Medium adverse	The development, in conjunction with other changes, erodes to a clearly discernable extent the heritage values of the heritage assets in the view, or the ability to appreciate those values or the view as a whole.
High adverse	The development, in conjunction with other changes, substantially affects the heritage values of the heritage assets in the view, or the ability to appreciate those values or the view as a whole.

STEP 8

ASSESSING THE MAGNITUDE OF THE CUMULATIVE IMPACT OF PROPOSALS ON HERITAGE

Cumulative assessment is required under the EU Directive on EIA. Its purpose is to identify impacts that are the result of introducing the development into the view in combination with other existing and proposed developments. The combined impact may not simply be the sum of the impacts of individual developments; it may be more, or less.

The magnitude of cumulative impact (i.e. the proposed development in conjunction with other changes) in terms of scale, position in a view or design should be described as high, medium, low, or imperceptible/none, according to Table 4.

Schemes for which planning consent has already been granted may not necessarily go ahead, but this does not obviate the need to consider the impact of the development proposal in combination with these schemes.

STEP 9

DETERMINING THE OVERALL IMPACT

Part of the EIA process is to attach some measure of significance to impact predictions (DETR 1995). In the context of EIA, 'significance' varies with the type of project and the topic under assessment. No formal guidance exists for the assessment of significance of effects on heritage assets or heritage significance within views. However, the severity of the effect on heritage assets and heritage significance within views may depend on both the magnitude of impact and the value and importance of the resource as follows:

	WITH HIGH VALUE	WITH MEDIUM VALUE	WITH LOW VALUE
With high magnitude of impact	Major effect	Major effect	Moderate effect
With medium magnitude of impact	Major effect	Moderate effect	Minor effect
With low magnitude of impact	Moderate effect	Minor effect	Negligible effect
Negligible/neutral impact	Negligible effect	Negligible effect	Negligible effect

TABLE 5
MAGNITUDE OF IMPACT
AGAINST VALUE

IDENTIFYING ACCEPTABILITY

Ratings of significance are independent of 'acceptability' which is a judgement above and beyond that of significance. Acceptability is about the overall balance of benefits and harm from the proposals as viewed or weighted by national policy and development plan policies.

STEP 10

IDENTIFYING WAYS OF MITIGATING THE IMPACT OF THE DEVELOPMENT

Impact assessment and design development should be part of an iterative process – it will be important for a developer to show how the results of an assessment have been considered in the design process to avoid harm to heritage significance within the view. Aspects of design such as scale, mass, silhouette and reflectivity may be particularly relevant to mitigation of impacts on the historic environment. These are matters which would be included in a Design and Access Statement.

GRAPHICS ACCOMPANYING PHASE B ASSESSMENT

The Phase B assessment should be accompanied by 'accurate visual representations' (AVRs). These AVRs should show the proposed development in the existing view (i.e. without any other consented schemes) by day, and by night if considered appropriate. AVRs showing the proposal alongside other consented schemes should also be prepared as part of the cumulative assessment. One example of how these can be prepared is given in Appendix D of the *London View Management Framework* (Mayor of London 2010).

Viewpoints, from which AVRs will be prepared to show the impact of a development proposal on heritage significance within the view, should be agreed with the local planning authority and with English Heritage.

In London, the LVMF requires that, during the assessment and consultation phase for a development which is likely to affect a designated view, the number and location of Assessment Points needed will be refined in consultation with the local planning authority and statutory consultees. It also recognises that it may be beneficial to test the kinetic effect of a development across an entire Viewing Area using a moving image or a series of AVRs.

In all cases it should be noted that photographs are illustrations of a view at a given point in time and that they cannot capture everything that can be seen with the naked eye. The AVRs are no substitute for visiting the Viewing Place and considering the impact of a proposal with the naked eye.

ACCURATE VISUAL REPRESENTATION (AVR)

A still image, or animated sequence of images, intended to convey reliable visual information about a proposed development to assist the process of visual assessment⁰⁵.

ASSESSMENT POINT

An Assessment Point is considered to be the optimum viewing point and is the reference point for the assessment of a view. It is the starting point for determining how a designated view will be assessed. However, the LVMF acknowledges that it may not always provide the most relevant point from which to assess a specific development proposals and that the number of assessment points should be refined through the assessment and consultation process (with the LPAs and statutory authorities).

AUTHENTICITY

Those characteristics that most truthfully reflect and embody the cultural heritage values of a place (English Heritage 2008, 71).

BACKDROP

The backdrop is the immediate background to a strategic landmark or focus of the view. It is distinct from a background area that extends away from the foreground or middle ground into the distance.

BASELINE

A minimum or starting point used for comparisons.

BULKY BUILDINGS

Buildings that are exceptional in bulk, floor area or frontage compared to their neighbours.

CULTURAL HERITAGE

Inherited assets which people identify and value as a reflection and expression of their evolving knowledge, beliefs and traditions, and of their understanding of the beliefs and traditions of others (English Heritage 2008, 71).

DESIGNED VIEW

A view that is the product of a deliberate design, usually intended to create a particular effect, illustrate a particular aspect of a landscape or focus on a particular feature or

features in a landscape. Such a landscape and its features do not themselves all have to be designed, but they may be.

DOMINANT

Having a commanding or imposing effect.

DYNAMIC VISUAL IMPACT STUDY (DVIS)

A study designed to assess the potential visual impact of a development proposal on a world heritage site. It is dynamic in the sense that the study will take account of potential changes: diurnally, seasonally, over time, kinetically and as a result of cumulative impact. It is envisaged that a DVIS should form part of the planning application (or incorporated into other application documents such as an Environmental Impact Assessment) for proposals that might impact on views into, within or out of a World Heritage Site identified as important by a Planning Authority.

ENVIRONMENTAL EFFECT

The consequence of a change on a resource or receptor.

ENVIRONMENTAL IMPACT

The process by which a change is brought about in the existing environment as a result of development activities.

ENVIRONMENTAL IMPACT ASSESSMENT (EIA)

A process by which a developer collects information about the environmental effects of a project for assembly in an environmental statement.

ENVIRONMENTAL STATEMENT (ES)

A document which sets out the developer's assessment of the likely effects of a project on the environment and which is submitted in conjunction with an application for planning permission.

⁰⁵ Text in italics is taken directly from the Revised SPG London View Management Framework (Mayor of London 2010).

GEOMETRIC PROTECTION

Where the visibility of a Strategically Important Landmark has been identified as a critical component of a designated view in the LVMF, a Protected Vista has been defined to permit the management of this aspect of the view by precise geometric constraint.

HERITAGE

All inherited resources which people value for reasons beyond mere utility (English Heritage 2008, 71).

HERITAGE ASSET

A building, monument, site, place, area or landscape positively identified as having a degree of significance meriting consideration in planning decisions. Heritage assets are the valued components of the historic environment. They include designated assets (as defined in PPS5⁰⁶) and assets identified by the local planning authority during the process of decision making or through the plan-making process (including local listing).

HERITAGE SIGNIFICANCE

The value of a heritage asset to this and future generations because of its heritage interest. The interest may be archaeological, architectural, artistic or historic.⁰⁷

HERITAGE VALUES

The reasons for which people may value a place. Examples may include 'its distinctive architecture or landscape, the story it can tell about its past, its connection with notable people or events, its landform, flora, fauna, because they find it beautiful or inspiring, or for its role as a focus of a community' (English Heritage 2008, 27). Comprehensive thought about values may be prompted by using the following headings – evidential, historical, aesthetic and communal – which move in general terms from more objective to more subjective. These terms are defined in English Heritage's *Conservation Principles* (2008, 72) as follows:

Evidential Value – deriving from the potential of a place to yield primary evidence about past human activity.

Historical Value – deriving from the ways in which past people, events and aspects of life can be connected through a place to the present.

Aesthetic Value – deriving from the ways in which people draw sensory and intellectual stimulation from a place.

Communal Value – deriving from the meanings of a place for the people who relate to it, or for whom it figures in their collective experience or memory.

HISTORIC ENVIRONMENT

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. Those elements of the historic environment that hold significance are called heritage assets.

HISTORIC URBAN LANDSCAPE

Ensembles of any groups of buildings, structures and open spaces in their natural and ecological context, comprising distinctive land uses and patterns, spatial organisation, visual relationships, topography and soils, vegetation, infrastructure and architecture, and representing current and past social expressions and developments that are place-based.

⁰⁶ Designated assets – A World Heritage Site, scheduled monument, listed building, protected wreck site, registered park and garden, registered battlefield or conservation area (PPS5, Annex 2)

IMPACT ASSESSMENT

The process of assessing how a proposal might affect heritage significance within a view.

INTEGRITY

Integrity is a measure of the wholeness and intactness of the natural and/or cultural heritage and its attributes (UNESCO 2008).

KINETIC

Relating to, caused by, or producing motion. The kinetic, or dynamic, nature of a view refers to the way in which it changes as the viewer moves through a Viewing Place.

LANDMARK

An object or feature of a landscape or town that is easily seen from a distance (*Oxford English Dictionary*). A landmark may also be defined as a building or site having great import or significance. The LVMF identifies 'strategically important landmarks' and 'other landmarks'. Other landmarks are considered to be those features that have visual or cultural prominence in the view.

LONDON VIEW MANAGEMENT FRAMEWORK (LVMF)

The London View Management Framework is a key part of the Mayor's strategy to preserve London's character and built heritage. It explains the policy framework for managing the impact of development on key panoramas, river prospects and townscape views.

www.london.gov.uk/priorities/planning/vision/supplementary-planning-guidance/view-management

MITIGATION

Any process, activity or thing designed to avoid, reduce or remedy adverse environmental impacts likely to be caused by a development project (DETR 1995)

OUTSTANDING UNIVERSAL VALUE (OUV)

Cultural and/or natural significance which is so exceptional as to transcend national boundaries and to be of common importance for present and future generations of all humanity (UNESCO 2008).

PROMINENT

Important, projecting or particularly noticeable.

PROTECTED VISTA

A geometrically defined corridor designed to control the effect of development – in the foreground, middle ground and background of a view of a SIL.

TALL BUILDING

A building which is substantially taller than its neighbours and/or which significantly changes the skyline (after CABE/EH guidance 2007).

SCOPE

The extent of the area or subject matter that something deals with or to which it is relevant.

SCOPING

An exercise to determine the extent of the area or subject matter that is relevant to the study.

SETTING

The surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve.

Elements of a setting may make a positive or negative contribution to the significance of an asset, may affect the ability to appreciate that significance or may be neutral (CLG 2010).

SIGNIFICANCE (IN THE CONTEXT OF EIA)

For the purposes of EIA a significant impact can be defined as an impact which, in the judgement of the assessor, should be taken into account in the decision-making process.

STRATEGICALLY IMPORTANT LANDMARK (SIL)

A prominent building or structure in the townscape, which has visual prominence, provides a geographical or cultural orientation point and is aesthetically attractive through visibility from a wider area or through contrast with objects or buildings close by⁰⁸. Three SILs are defined in the LVMF: the Palace of Westminster, the Tower of London, and St Paul's Cathedral.

URBAN GRAIN

The pattern and arrangement of street blocks and plots. The urban grain is usually formed by the historical development of roads and plots of land.

VALUE

An aspect of worth or importance, here attached by people to qualities of places (English Heritage 2008, 72).

VIEW

A sight or prospect from a particular position, typically an appealing one (*Oxford English Dictionary*); that which is seen; esp., a scene or prospect, as of a landscape; a picture, sketch, or photograph of a scene.

VISUAL MANAGEMENT GUIDANCE

Management Plans have been prepared for each of the designated views contained in the LVMF (Mayor of London 2010). The management plans contain information that forms the basis of the preparation of townscape and visual assessments required for proposals.

VIEWCONE

A graphic representation of the width of a view.

VIEWING LOCATION

The general part of a Viewing Place from which a particular view may best be appreciated. There may be one or more Viewing Locations in each Viewing Place. (This concept does not appear in the LVMF 2007 and is not used in this English Heritage guidance).

VIEWING PLACE

A public space from which Designated Views are defined by the London Plan. Within each Viewing Place, this SPG defines one or more Viewing Locations (As with Viewing Point below this concept has been revised since the first publication of the LVMF).

A viewing place should be publically accessible and well used. In many cases, especially river prospects, the view of a Strategically Important Landmark is unlikely to be from a single standalone point. The view will, in reality, be perceived from moving through and around a whole space – the Viewing Place.

VIEWING POINT

The Viewing Point is a specific location that is in a public space and is within reasonable proximity of an Assessment Point for a designated view. The Viewing Point will have specific relevance to the assessment of a development proposal on a designated view⁰⁹ (this concept has been removed from the Revised LVMF, July 2010, but continues in use in this English Heritage guidance).

Appendix B Defining Viewing Place, Assessment Points And Viewing Points

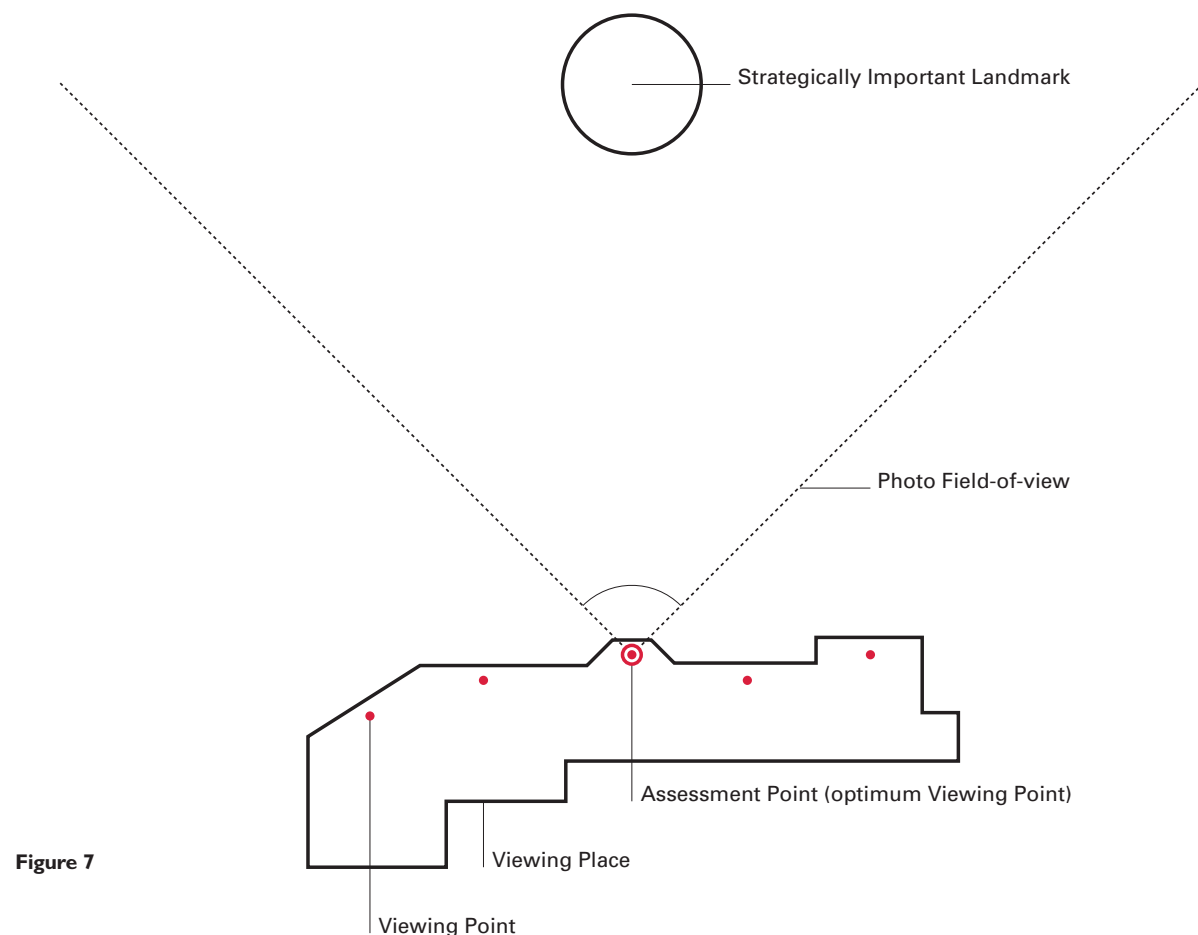


Figure 7

¹⁰ The Revised LVMF SPG (2010) includes changes to the description of a designated view (Mayor of London 2010, 18). The revised and additional definitions are included in the Glossary.

Although this methodology has been devised to be compatible with the London View Management Framework (LVMF), it needs to be applicable to other national, regional and local views both inside and outside London. It is therefore important to ensure that the terms Viewing Place, Assessment Point, and Viewing Point are clearly understood¹⁰. A diagram showing how the Viewing Place, Assessment Point, and Viewing Points relate to one another is provided above.

The Viewing Place is an area within which the Assessment Point and any agreed additional Viewing Points are located and which is publicly accessible and well used. A Viewing Place may or may not have well defined physical boundaries.

The formal Assessment Point, as defined in the LVMF, is a specific location within the Viewing Place that forms a reference point for the assessment of a view. Formal Assessment Points are defined for all the designated views in the LVMF. For views not in the LVMF Assessment Points should be chosen and each identified by an Ordnance Survey grid reference. In heritage terms, the Assessment Point should describe the optimum point from which heritage significance within the view may be best appreciated. However, it is important to note that the Assessment Point may not always provide the most relevant point from which to assess the impacts of a specific development proposal.

In London the revised LVMF (Mayor of London, 2010) allows for additional Assessment Points to be identified by the local planning authority during the scoping process.

FIGURE 8 Plans and diagrams should be used to help describe the Viewing Place and Assessment Point.

MAPS TO ACCOMPANY THE VIEW ANALYSIS

Plans and diagrams should be used to help describe the Viewing Place and Assessment Point. Background mapping should be based on Mastermap™ where possible and should be at an appropriate scale to represent the nature and extent of the view.

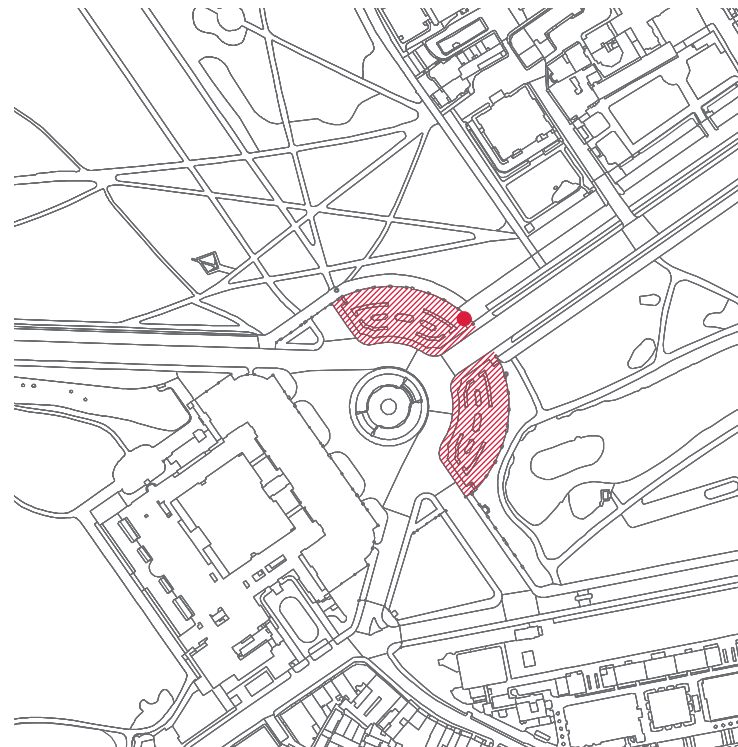


Figure 7

Reproduced from Ordnance Survey information with the permission of The Controller of Her Majesty's Stationary Office. Crown Copyright. Land Use Consultants. License Number 100019265
Source: English Heritage

 VIEWING PLACE
 ASSESSMENT POINT

PHOTOGRAPHS TO ACCOMPANY THE VIEW ANALYSIS

CHOOSING THE LOCATION FOR PHOTOGRAPHY

Some Viewing Places give rise to dynamic viewing experiences (for example views from bridges crossing rivers). The photographs to illustrate the view should therefore be able to:

- illustrate the optimum point for appreciating the heritage significance within a view;
- illustrate the way in which heritage assets are perceived as one moves through the Viewing Place.

METHOD FOR PHOTOGRAPHING VIEWS

The method for photography should be consistent – it should include the use of a fixed camera height (at 1.6m above ground level to match that used in the London View Management Framework), and a fixed focal length. In most visual assessment situations, it is recommended that a camera with a 50mm standard lens (35mm film camera) is used because this most closely approximates to the human eye (Landscape Institute 2002, 63; 2011; Scottish Natural Heritage 2006, para. 125). Where a digital camera is used, the conversion factor should be obtained to ensure that the equivalent focal length is set to match close to 50mm on a standard lens (this ratio is different for different cameras).

A tripod with horizontal and vertical spirit levels should be used to provide stability and is especially useful when creating a series of adjoining photographs for use in photo-stitching software. In addition, the use of a tripod head specially adapted for panoramic photography can avoid distortion (or parallax).

It should be noted that photographs can only represent an illustration of a view at a given point in time and cannot capture all that can be seen by the naked eye. Photographs are therefore no substitute for visiting the actual Viewing Place.

PRESENTATION

The photograph from the main Assessment Point(s) should illustrate the full extent of the view. A second photograph from the same Assessment Point should use colour washes to highlight World Heritage Sites, scheduled monuments, listed buildings (grades I, II* and II), registered parks and gardens, registered battlefields and conservation areas (if relevant), and be annotated to show the location of heritage assets and other features.

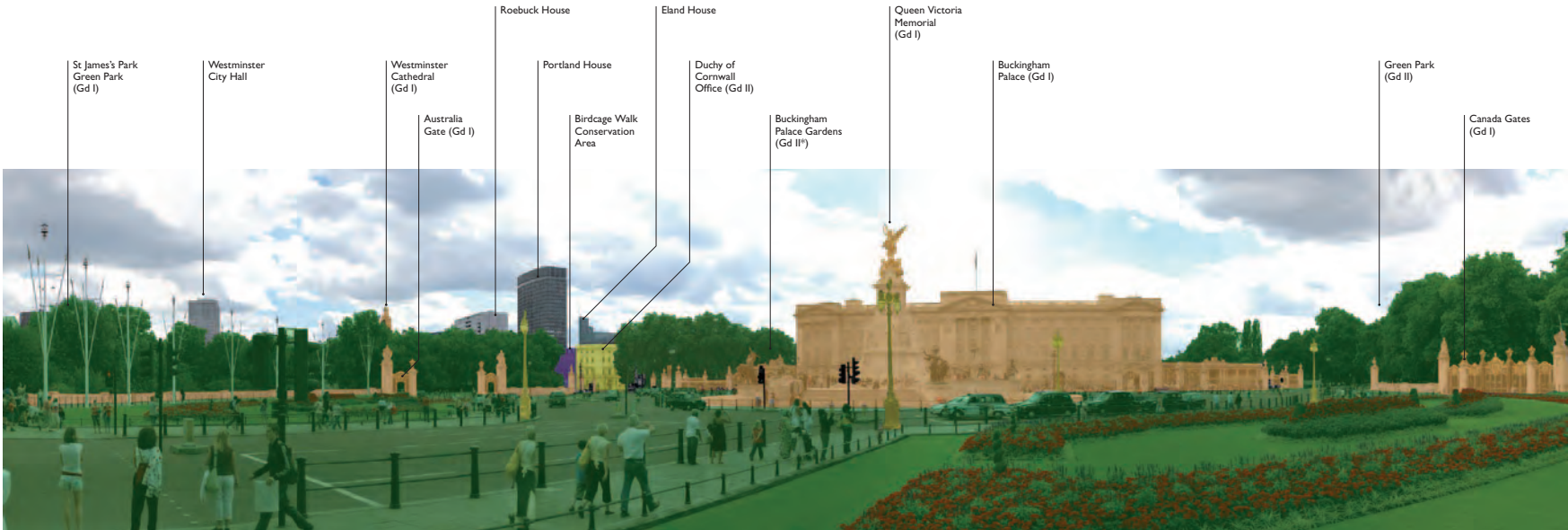
Photographs should be used to illustrate the kinetic nature of views, where relevant.

For each Assessment Point photographs with annotations to indicate the location of features described in the text, and with colour washes to illustrate heritage assets in the view.

Figure 9 Existing view (July 2007) – see Figure 8 for Assessment Point location.



Figure 10 Location of Listed Buildings (grades I, II* and II), SAM's, Non-Listed Buildings in Conservation Areas and Historic Parks and Gardens. Photographs © Land Use Consultants



Photography information:	
Viewpoint location (grid reference):	529217,179809
Ground height / camera height (AOD):	xxm / 1.60m
Date and time of photography:	24/07/07 16:14
Field of view / number of shots taken:	137o / 9

- Grade I Listed Buildings and/or SAM
- Grade II and II* Listed Buildings
- Non-Listed Buildings/Structures in a Conservation area
- Historic Parks and Gardens

Photographs should be used to illustrate kinetic nature of views.

Figure 11 View from The Mall to Queen Victoria Memorial and Buckingham Palace on the eastern side of the rond-point at the south-eastern end of The Mall.



Figure 12 View from The Mall to Queen Victoria Memorial and Buckingham Palace, on the northern side of the rond-point at Canada Gate. Photographs © Land Use Consultants



Figure 13 View from The Mall to Queen Victoria Memorial and Buckingham Palace after dark
© Land Use Consultants



A night-time photograph from the Assessment Point should also be provided to illustrate the heritage assets by night.

All photographs should be accompanied by information identifying camera point location, ground height and camera height AOD (Above Ordnance Datum), field of view, and the type of camera and lens used. If photo-stitching software has been used to create panoramic views, then the number of shots, viewing angle and type of software used should also be noted.

It is important to note that the views will change over time and it will be necessary to update these from time to time. Archived material should be properly recorded, curated and publicly accessible – the use of images in public inquiries demands storage conditions in which the images are demonstrably tamper-proof.

A NOTE ON LIGHTING AND WEATHER CONDITIONS

Visibility is an important consideration when photographing views. Site visits should be planned around clear days with good visibility. Viewpoint locations should then be visited according to the time of day and orientation of the sun to ensure that the view in question is lit from behind or from one side of the viewer. South-facing viewpoints present a potentially difficult situation, particularly in winter when the sun is low in the sky causing buildings to appear in silhouette. Extra attention may need to be given to such viewpoints in terms of timing.

In some cases, it will be beneficial to represent a view under differing lighting conditions, in different seasons, or at night.

RIGHT A late 1940s photograph of BOAC Short Solent flying boat *City of London* moored on the River Thames beside the Tower © English Heritage

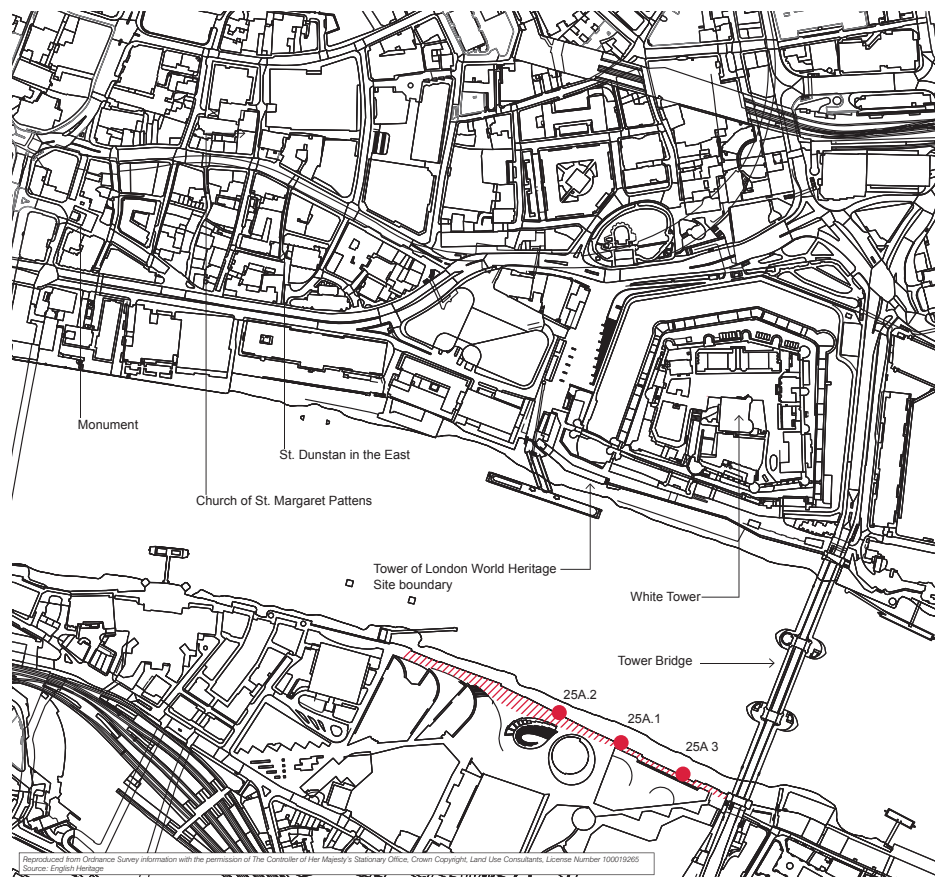


TESTING PHASE A BASELINE ANALYSIS: ESTABLISHING THE BASELINE SIGNIFICANCE OF HERITAGE WITHIN A VIEW

The method for Phase A analysis has been tested on the Townscape View from City Hall to the Tower of London (designated view 25 in the LVMF 2010). This worked example was chosen because it is a designated view in the London Plan, it has particular heritage significance associated with it, and is a view of a World Heritage Site that is currently subject to change. This is a complex and strategically important view and of great significance. The analysis of most other views will be simpler and shorter.

PHOTOGRAPHY

The photographs were taken using a Nikon D80 digital camera with a Nikkor 35mm f/2D fixed focal length lens. The conversion factor for the Nikon D80 is 1.528. Therefore a 35mm lens on a Nikon D80 digital camera is equivalent to a 53mm lens on a standard 35mm film camera. The camera was mounted on a Manfrotto tripod at a height of 1.6m with Manfrotto 303 Panorama Head on a Manfrotto 338 Levelling Base. The use of the panoramic head attachment reduced the effect of parallax when taking a panorama sequence. PTGui version 6.0.3 software was used to stitch the images together to achieve a seamless panoramic photo.

**FIGURE 14**

Location Plan showing the Viewing Place & Assessment Points. Phase A Assessment: The Queen's Walk to Tower of London.

Photographs © Land Use Consultants

VIEW NAME THE QUEEN'S WALK TO TOWER OF LONDON

STEP 1

ESTABLISHING REASONS FOR IDENTIFYING THE VIEW AS IMPORTANT

REASONS FOR SELECTION

The view from this Viewing Place forms one of the designated views in the London View Management Framework (LVMF, Mayor of London 2010). The view focuses on the Tower of London, a 'strategically important landmark' as defined in the LVMF. The Viewing Place is described in the LVMF as the Queen's Walk, adjacent to City Hall. HMS Belfast frames the view to the west and the southern abutment of Tower Bridge frames the view to the east. Three formal Assessment Points have been identified in the LVMF. These are Assessment Point 25A.1 at the foot of the pathway from Potter's Fields, Assessment Point 25A.2 in front of the public terraces and 25A.3 close to Tower Bridge at the eastern end of the of the Queen's Walk. The locations of these Assessment Points are shown in plan form in Figure 9.

The view from this Viewing Place has been selected for analysis by English Heritage because it is long-established and provides the best view of the Tower of London to illustrate the heritage significance of this World Heritage Site (including its 'Outstanding Universal Value'). The analysis has been undertaken predominantly from the three LVMF Assessment Points. Additionally, photographs from a number of locations along the Queen's Walk show the kinetic effect of moving through the Viewing Place.

● ASSESSMENT POINT
 ■ VIEWING PLACE



FIG 15 Samuel and Nathaniel Buck, South View of the Tower of London with boats and figures, pen and wash, 1737 (Guildhall Library Print Room, City of London, record no. 22530).



FIG 16 John Crowther, View of the Tower of London at low water, from Pickle Herring Wharf with boats on the Thames, watercolour, c. 1883 (Guildhall Library Print Room, City of London, record no. 17911).



Images © City of London, London Metropolitan Archives

HISTORY OF THE VIEW FROM THIS VIEWING PLACE

The Tower of London, centred on its keep, the White Tower, was always intended to be conspicuous, from the time of its construction in the 11th century. This is especially true of its visibility from the present Viewing Place, across the River Thames. The Tower, as a fortress, was meant to be prominent and to have a clear field of view around it. The Tower was positioned so as to dominate London (until the end of the 19th century the White Tower was the tallest building in the City of London after St Paul's Cathedral) and to be able to control the approaches to London, especially by river from the sea. The view of The Tower from the river, or from the south bank, was often the first impression that travellers arriving in London had of the city.

Topographical views of London, the earliest being from the 16th century, frequently depict the city seen from the south bank, and this was almost always the direction of view chosen to depict The Tower. Typical examples from different periods include a pen-and-ink drawing of London from the south by Anthonis van den Wyngaerde (1544), a pen-and-wash drawing of The Tower seen from across the river by Wenceslaus Hollar (c 1660), a pen-and-wash drawing by Samuel and Nathaniel Buck (1737, Fig 15) and a watercolour by John Crowther (c 1883, Fig 16).

In 1828 St Katharine's Dock was opened to the east of The Tower, surrounded by six-storey brick warehouses, and in 1886–94 Tower Bridge was constructed in a Gothic revival style, between the Dock and The Tower. In the second half of the 20th century the scale of buildings grew, especially in the City to the west of The Tower. The view of The Tower from the south bank of the Thames, directly opposite the White Tower, has remained relatively unchanged, however; and seen from City Hall, the White Tower is still the most prominent element at the centre of the panorama.

In the 1950s building regulations and planning laws that had limited the height of buildings in London were relaxed, and high-rise buildings began to appear on the City skyline. Those visible from the Viewing Place include Britannic House (122m, 1967), Kleinwort Benson (91m, 1967), CGNU Tower (118m, 1969), Hong Kong Bank (104m, 1975) and the Barbican residential towers (128m, 1979). HMS *Belfast* was permanently moored just upriver from The Tower in 1971, and The Tower Hotel was built just to the east of The Tower in 1975, 48m high.

The 1980s saw more tall buildings added to the City skyline: Tower 42, formerly the Nat West Tower (183m, 1980), Baring Brothers (88m, 1981) and Lloyd's (84m, 1986).

One America Square, which rises above the skyline behind The Tower, was completed in 1990. 30 St Mary Axe (180m), in the 'City cluster' of high-rise buildings, was completed in 2003, as was the low-rise Bowring Building in Tower Place, immediately to the west of The Tower. Broadgate Tower was completed in 2008, Heron Tower (203m) is due for completion in 2011 and Bishopsgate Tower (288m) in 2012. Other tall buildings that will appear in the view from this Viewing Place and have received planning permission include the Leadenhall Building (225m) and 20 Fenchurch Street (160m, work started on site).

STEP 2

IDENTIFYING WHICH HERITAGE ASSETS IN THE VIEW MERIT CONSIDERATION

The view from this Viewing Place contains ten heritage assets (i.e. World Heritage Sites, listed buildings, scheduled monuments, registered parks and gardens, registered battlefields and conservation areas). These have each been considered for inclusion in the assessment based on:

- their designation or importance in a local context
- the degree to which their heritage significance can be appreciated from the Viewing Place
- whether this may be the best (or only) place to view the historic significance of the heritage asset
- whether their significance is enhanced or diminished as a result of being seen in combination with other heritage assets in the view.

The **Tower of London** is inscribed as a World Heritage Site and a scheduled monument, and many of its elements are listed buildings. It forms the focus of the view from the Viewing Place. This Viewing Place gives a view of The Tower from which the organisation of the complex of buildings, and particularly the prominence of the White Tower, can best be appreciated. The Tower is therefore included in the assessment below.

Tower Bridge is a grade I listed structure whose architectural and engineering significance can be appreciated from this Viewing Place. This Viewing Place provides a particularly spectacular view of the bridge, which forms a major component of the view. It is therefore included in the more detailed assessment below.

Three **City Churches** (St Margaret Pattens, St Dunstan in the East and All Hallows Barking (by the Tower) visible in this view are listed grade I. Their value as heritage assets is high, but only their spires are visible from this Viewing Place. Their prominence in the view is low as a result of distance to the churches, and the backdrop of existing buildings. However, this is one of the few viewpoints from which the churches, which represent Wren's city skyline after the Great Fire, may be appreciated together. They have therefore been included further in the assessment below.

The **Monument** is a Scheduled Monument and grade I listed building. Although there are better places from which to view the Monument on its own, its significance as a marker of where the Great Fire of 1666 started, and the relationship of this to both the City and The Tower, are better appreciated from the Viewing Place. The City churches, representing the rebuilding of the City after the Fire, can also be seen in relation to the Monument from the Viewing Place. The Monument is therefore included in the assessment below.

Custom House is a grade I listed building. Although its Greek Revival façade is of interest, this is mostly hidden by trees from this Viewing Place. The significance of the asset does not benefit from being viewed in combination with other heritage assets from this viewpoint. For these reasons it is not considered in further detail below.

Trinity House is a grade II* listed building. Only part of this fine building is visible in the view, and the Viewing Place is not considered the best place from which to see it. There is no benefit in seeing this heritage asset in combination with other assets in this view, and it is therefore not considered in more detail below.

Billingsgate Market is a scheduled monument and grade II listed building. Although it has a grand façade, the building forms a minor component of this view and there are better places to view this asset. The structures of archaeological interest, for which it is scheduled, are hidden below ground. It does not benefit from being viewed in combination with other heritage assets from this viewpoint. For these reasons it is not considered in further detail below.

The **Barbican Towers** are part of a complex that is listed grade II for its integrated townscape and reinforced concrete construction. This significance can best be appreciated when viewed at close quarters. The significance of the asset does not benefit from being viewed in combination with other heritage assets from this viewpoint. For these reasons it is not considered in further detail below.

The **Tower Conservation Area** is a locally designated heritage asset. The Tower of London forms a central part of the conservation area (and will be investigated in more detail below). The remainder of the area's special character cannot be appreciated from this viewpoint. It is therefore not considered in further detail below.

The **Trinity Conservation Area** is a locally designated heritage asset. Only the top of the tower of Trinity House and part of the façade of the offices on Byward Street are visible from this viewpoint. The area's special character cannot be appreciated from this viewpoint and it is therefore not considered in further detail below.

LVMF ASSESSMENT POINT 25A.1

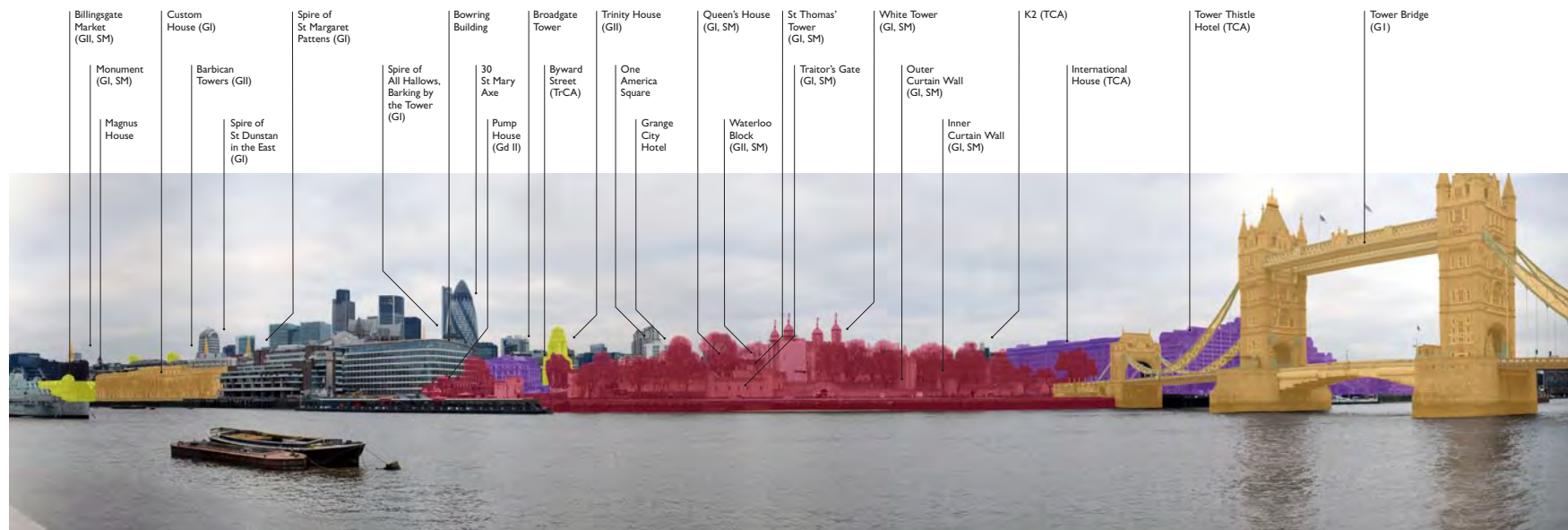
Figure 17 Existing view (Jan 2011)
– see Figure 14 for Assessment
Point location



Figure 18 Locations of World Heritage Sites, Listed Buildings (grades I, II* and II) and Scheduled Monuments with the key built components referred to in text.

Note: TCA – Tower Conservation Area.
TrCA – Trinity Conservation Area

Photographs © Land Use Consultants



Photography information:

Viewpoint location
(grid reference): 533485,180201

Ground height /
camera height (AOD): 4.5m / 6.1m

Date and time
of photography: 11/01/11 15:56

Field of view: 120°



World Heritage Sites



Grade I Listed Buildings
and/or SAM



Grade II and II* Listed Buildings



Non-listed buildings in a
Conservation Area

STEP 3

ASSESSING THE
SIGNIFICANCE OF INDIVIDUAL
HERITAGE ASSETS

The following section analyses each of the heritage assets selected above, to help understand the heritage significance of each asset in the view.

Sources of information for this worked example include site visits, supported by the *Tower of London World Heritage Site Management Plan* (Historic Royal Palaces 2007), conservation area statements and appraisals, listed building descriptions, scheduled monument citations and other works (referenced in the footnotes). Additional specialist information was obtained from English Heritage staff, in a seminar-workshop.

The location of the heritage assets is illustrated in Figures 17-22 (for Assessment Point 25A.1, 2, 3). The assets are analysed in order of their importance in the view, starting with The Tower of London.

TOWER OF LONDON
WORLD HERITAGE SITE

DESCRIPTION OF ASSET

Seen from this Viewing Place, the visible buildings of The Tower of London are the **White Tower** (listed grade I), a Norman keep under construction by 1077 and completed about 1100; the 12th-century **Inner Curtain Wall** (listed grade I) and three of its towers, the Bloody Tower; Wakefield Tower and Lanthorn Tower; the 13th-century **Outer Curtain Wall** (listed grade I) with three towers clearly visible, Middle, Byward and St Thomas's; the 16th-century timber-framed **Queen's House** (listed grade I) just visible beyond the Inner Curtain Wall to the west of the White Tower; the 17th-century **New Armouries** (listed grade I) in red brick, just visible especially

in winter beyond the Inner Curtain Wall to the east of the White Tower; the 19th-century **Waterloo Barracks** (listed grade II), just visible to the west of the White Tower; beyond the Queen's House; and Salvin's 19th-century Gothic Revival **Pump House** (listed grade II) on the river front, to the west of the Middle Tower.

HISTORY

William the Conqueror began construction of a castle in the south-eastern corner of the walled city of London, on the site of Roman fortifications, soon after the Norman Conquest of England in 1066. The White Tower, completed about 1100, is the oldest surviving part of this castle, and formed the keep, surrounded by open spaces and much smaller buildings on the site of the present Inner Ward. One hundred years later a new curtain wall and tower were built, parts of which are incorporated in the present Inner Curtain Wall, and the first residential quarters for the king, outside the keep, were added to the south.

The castle was greatly enlarged and developed in the 13th century, by Henry III and Edward I. The Inner and Outer Curtain Walls and new towers were built and the present moat was dug. The landward entrance from the west was through the Beauchamp Tower; rebuilt deliberately to appear intimidating, while St Thomas's Tower projected into the river, over a watergate, with relatively large windows lighting the royal apartments. From the 13th century the keep was whitewashed to appear more conspicuous, receiving its name of the White Tower; and an area of land around the outside of the moat was taken under royal control, as the Liberty of the Tower, to be kept free of obstacles (Keay 2001). The Outer Curtain Wall was raised to its present height in the 14th century.

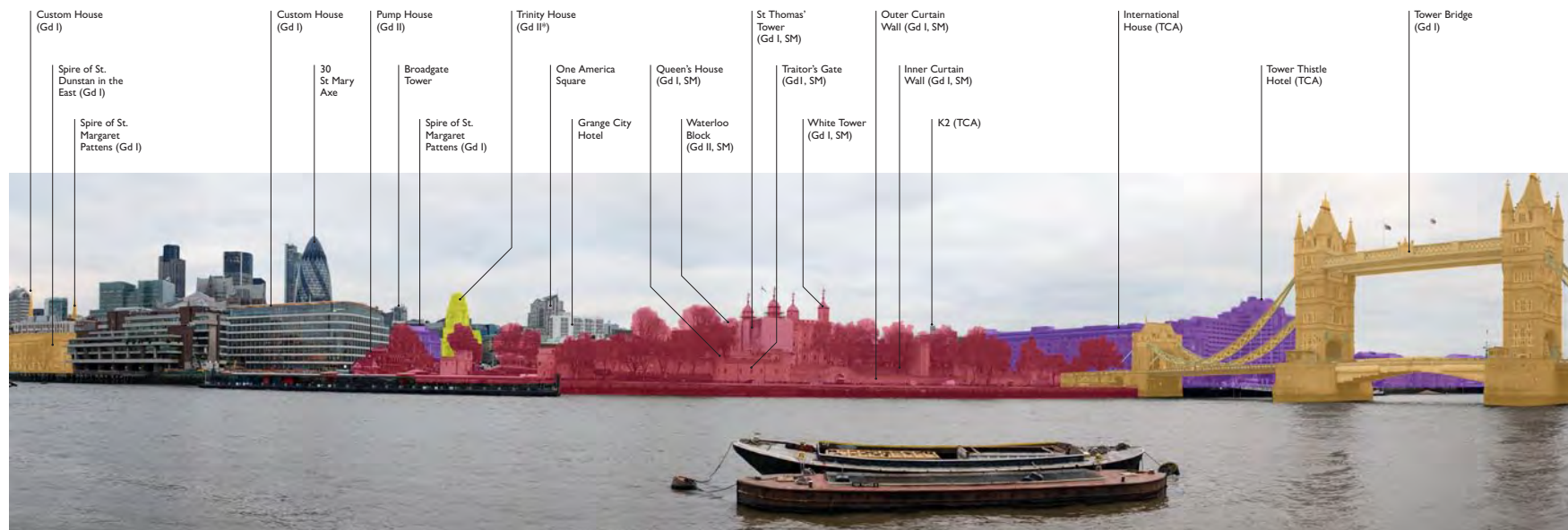
LVMF ASSESSMENT POINT 25A.2

Figure 19 Existing view (Jan 2011)
– see Figure 14 for Assessment
Point location.



Figure 20 Key built components
referred to in text.

Photographs © Land Use Consultants



Photography information:

Viewpoint location (grid reference):	533428,180230
Ground height / camera height (AOD):	4.5m / 6.1m
Date and time of photography:	11/01/11 16:22
Field of view:	120°

World Heritage Sites

Grade I Listed Buildings
and/or SAM

Grade II and II* Listed Buildings

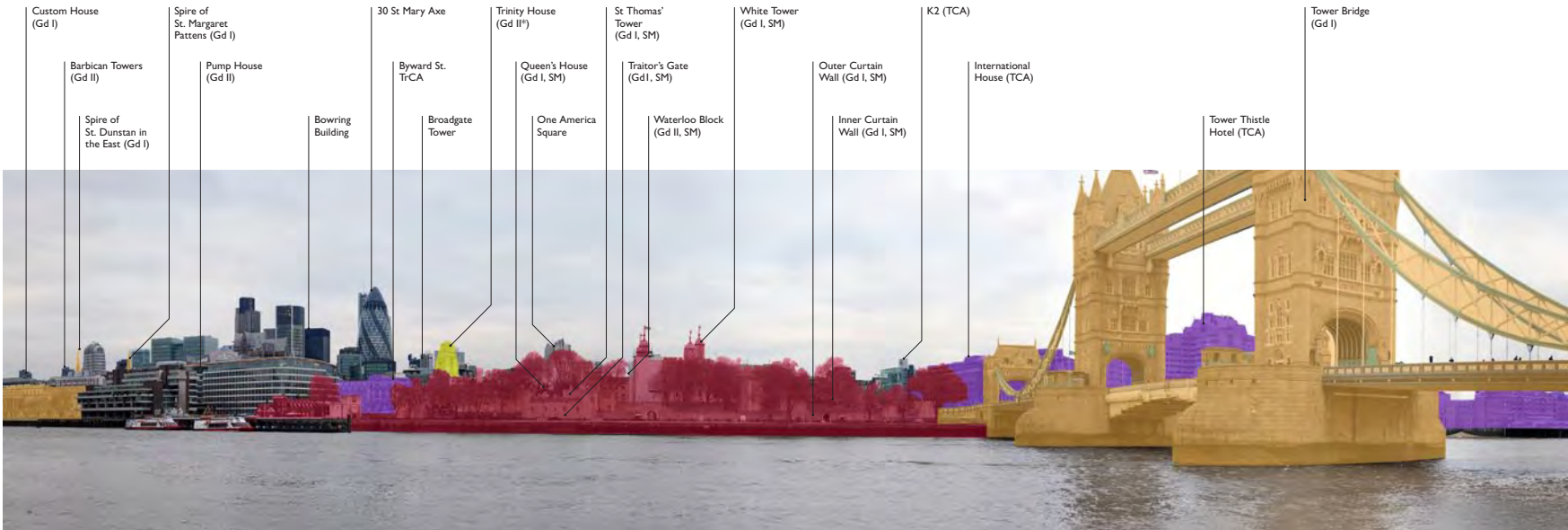
Non-listed buildings in a
Conservation Area

LVMF ASSESSMENT
POINT 25A.3

Figure 21 Existing view – see Figure 14 for Assessment Point location.



Figure 22 Key built components referred to in text.
Photographs © Land Use Consultants



Photography information:	
Viewpoint location (grid reference):	533550,180168
Ground height / camera height (AOD):	4.5m / 6.1m
Date and time of photography:	11/01/11 16:11
Field of view:	120°

-  World Heritage Sites
-  Grade I Listed Buildings and/or SAM
-  Grade II and II* Listed Buildings
-  Non-listed buildings in a Conservation Area

From the 16th century, despite construction of the Queen's House, The Tower was no longer used as a royal residence, but it continued to be the main military storehouse and state prison of the kingdom, as well as accommodating the royal mint and the royal menagerie. The Tower was no longer independently defensible and surrendered to parliament in 1642, at the beginning of the Civil War. Firearms and cannon were tested in The Tower; and the White Tower was used mainly to store gunpowder. The Great Fire of 1666 fortunately did little damage to The Tower; although subsequently many buildings around the White Tower were cleared away as a precaution. The late 17th-century New Armouries are the oldest surviving purpose-built Ordnance buildings in Britain.

In the 18th century fires destroyed the remaining medieval palace buildings, and new offices and storehouses were built in their place. A gate and drawbridge were constructed at the east end of the Outer Curtain Wall to give access to the wharf, from where vessels in the river were armed and supplied. In response to need during the Napoleonic Wars, in 1803 a small-arms factory was built on the wharf.

In 1843 the moat was drained, and in 1845 the Waterloo Barracks were opened. The local defences of The Tower were modernised, with gun ports in the walls and firing platforms on casemates behind them. Official departments such as the Royal Mint, the Ordnance Survey and the public records were moved out and, although the menagerie was closed by then, The Tower was regularly opened up to public visits, becoming a showplace in itself and decoratively exhibiting arms and armour, and the rehoused Crown Jewels. In keeping with this function many of the buildings of The Tower were restored to what was thought to be their original medieval appearance.

The present main open space inside The Tower, Tower Green, was laid out in the mid 19th century; an avenue of trees was planted on the parade ground and by 1870 the whole Green was paved with

irregular cobblestones. In 1878 Tower Wharf was cleared of buildings, laid out as a public esplanade and plane trees were planted. Trees were also planted between the Inner and Outer Curtain Walls.

THE LOCAL SETTING

The area that immediately surrounds the Tower has, generally, provided a clear defensive open space, known as the Liberties, over which the Tower had jurisdiction. Although buildings have encroached from time to time it has generally maintained its approximate outline, the construction of Tower Bridge, the main roads and Tower Hill underground station aiding this process. The Tower's control over the Liberties passed at the end of the 19th century, to the Metropolitan Borough of Stepney.

CHANGES EXPERIENCED WHEN MOVING THROUGH THE VIEWING PLACE

Photographs taken from three points along different parts of the Queen's Walk represent the kinetic nature of the view – these are illustrated on page 47. As one moves from east to west along almost 400m of the Queen's Walk the Tower of London forms the main focus of the view. However, the Tower's relationship with its context changes – the most obvious change is the way in which the Tower is seen against its backdrop. At the eastern end of the Queen's Walk, adjacent to Tower Bridge (Figure 23), the tall buildings of One America Square and the Grange City Hotel appear beside the White Tower and 122 Leadenhall Street appears behind the former Port of London Authority's tower. The Broadgate Tower (under construction) is visible on the skyline behind the Traitors Gate of the Tower of London where it appears as an outlier to the main cluster of tall buildings in the city. 30 St Mary Axe (commonly called 'The Gherkin') also appears to lie to the right of the main cluster of tall buildings in the city from this viewpoint.

PHOTOGRAPHS TO
SHOW KINETIC NATURE
OF VIEW

Figure 23 From the east end of
Queen's Walk, adjacent to Tower Bridge

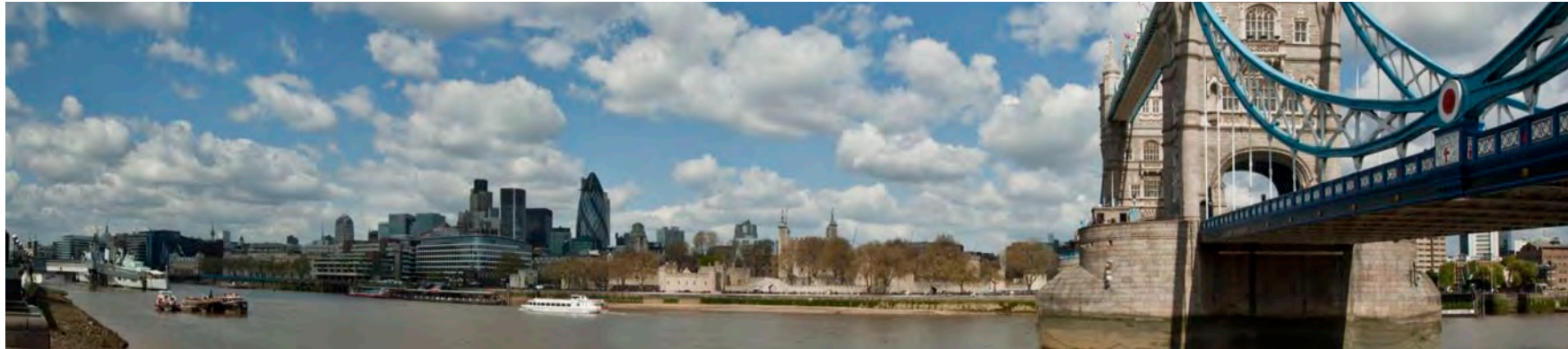


Figure 24 View from riverwall,
opposite arena

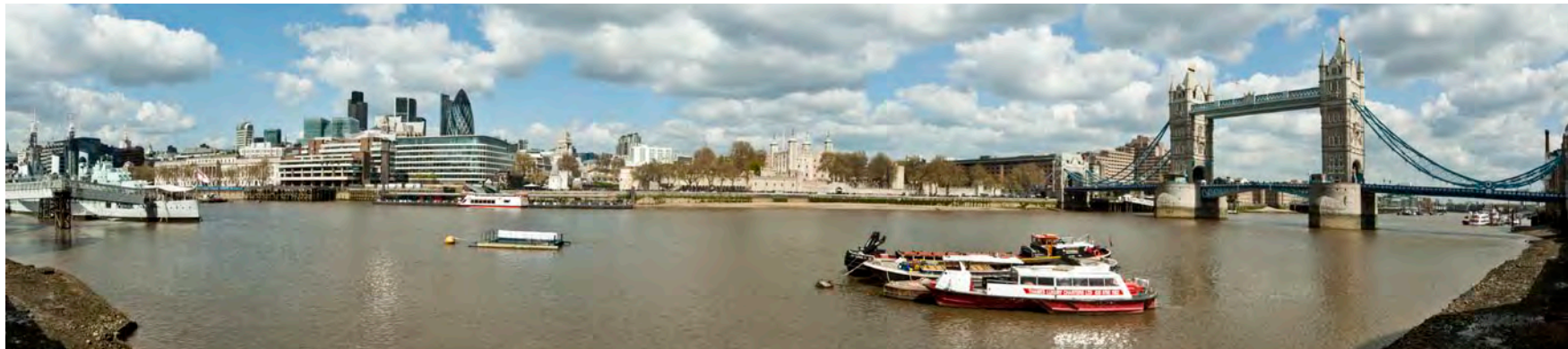
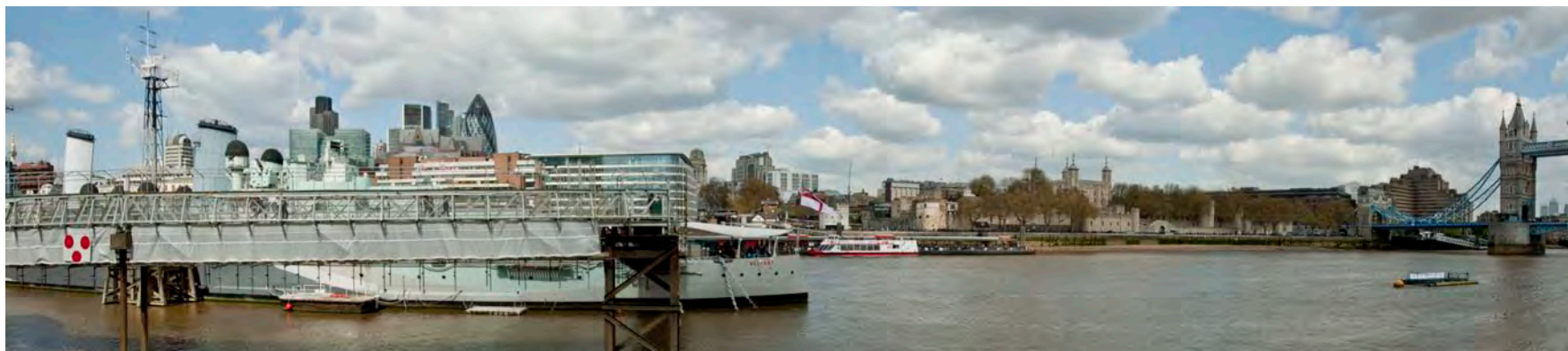


Figure 25 View from the west end of
the Viewing Place, near the entrance
to HMS *Belfast*

Photographs © English Heritage



As one moves west along the Queen's Walk, One America Square and the Grange City Hotel move away from the White Tower; and the Broadgate Tower moves behind the former Port of London Authority's tower; towards the main cluster of tall buildings in the city (Figure 24). From Assessment Point 25A.1 at the foot of the pathway from Potter's Fields, the White Tower and former Port of London Authority's tower are both seen against open sky with One America Square and the Grange City Hotel visible midway between the two. The Broadgate Tower is located just to the left of the former Port of London Authority's tower and 30 St Mary Axe (commonly called "The Gherkin") appears to form part of the main cluster of tall buildings in the city.

As one moves further west, One America Square and the Grange City Hotel move further away from the White Tower; and the Broadgate Tower move further away from the Port of London Authority tower until at the second of the three formal Assessment Points near the water's edge opposite the entrance to the 'Scoop' (Assessment Point 25A.2), One America Square and the Grange City Hotel are between the Middle Tower and Byward Tower of the Tower of London. One America Square and the Grange City Hotel are as prominent as the landmarks of the White Tower and the former Port of London Authority's tower; and 30 Saint Mary Axe forms part of the cluster of tall buildings in the city.

As one moves further west towards the entrance to HMS *Belfast* (Figure 25), the White Tower remains visible against open sky, although the modern façade of the Société Générale building rises behind the curtain walls of the Tower of London. As one approaches the entrance to HMS *Belfast*, the ship obscures views to the Tower of London.

SEASONAL/NIGHT-TIME VARIATIONS

The trees along Tower Wharf and inside The Tower screen some of The Tower buildings during the summer months, although the White Tower is easily visible. In winter more buildings in the backdrop are visible. At night the Tower is floodlit, as is Tower Bridge, making them the dominant elements of the view (Figure 26).

HERITAGE VALUES OF THE TOWER OF LONDON

The following section ascribes value and significance to the Tower of London as a heritage asset. This is based on English Heritage's *Conservation Principles* (2008, 28–32), which set out a 'family' of heritage values that may be used to prompt comprehensive thought about the values of a place. This approach is adopted in consideration of all the heritage assets that have been selected in the scoping process.

The Tower of London is acknowledged as the single most important work of military architecture in England (Impey and Parnell 2000). The White Tower, the oldest surviving building of the 11th-century castle, is primary evidence of the original fortress built by William the Conqueror to dominate London and control access to the city, especially upriver from the sea. The White Tower is the foremost example of Norman military architecture in the country, and is a key prototype building in the development of the Norman palace-keep. St Thomas's Tower is a rare survival of a royal palace of the reigns of Henry III and Edward I, and the addition of the Outer Curtain Wall and its towers is an excellent example of concentric castle design. This represents the culmination of The Tower's development as a medieval castle, around 1300, and the design embodies both military practicality and the aim of impressing and intimidating the viewer, comparable with Edward I's castles in north Wales.

LVMF ASSESSMENT POINT 25A.1

Figure 26 Nighttime existing view
(Jan 2011) – see Figure 14 for
Assessment Point location

Photographs © Land Use Consultants



Photography information:

Viewpoint location
(grid reference): 533485,180201

Ground height /
camera height (AOD): 4.5m / 6.1m

Date and time
of photography: 11/01/11 18:10

Field of view: 120°

Historically, The Tower not only represents the Norman Conquest of England, but was both a pre-eminent symbol and a strong instrument of royal power adjacent to the richest and most populous city in the country. Significantly The Tower is not, and has never been, within the City of London. When a medieval king was present, it was the seat of government; as the chief royal residence in medieval London, it was where coronation processions started (the last to do so was in 1661); it was a constant physical expression of royal power. Given its size and position on the Thames, next to London, The Tower came to house important state functions: first and foremost, a store of military weapons and equipment (including guns and gunpowder in quantity from the end of the 15th century); a mint (until 1810); a prison (especially for political and religious prisoners, notably in the 16th and 17th centuries); a library of state records (until 1858); a store of valuables (notably, after the Restoration in 1660, the Crown Jewels); and a menagerie of exotic animals, usually foreign gifts to the king (until 1835).

The aesthetic value of The Tower is the product of conscious design. The imposing fortress architecture of the White Tower was deliberate; the walls of the building are higher than the original roof level, to overawe as well as for military advantage. Similarly the Outer Curtain Wall and its towers were intended to impress. The scale and prominence of the White Tower can be appreciated in many places, but is particularly noticeable when seen against open sky, most clearly from the south bank of the river. A 19th-century romantic view of The Tower as a fateful place, exemplifying and illustrating English history, though it had antecedents and is current today, was given concrete form by 'remedievalising' the appearance of the buildings, to designs by Salvin and Taylor. The words 'Traitors' Gate' were painted in huge letters above the watergate in St Thomas's Tower.

From the latter part of the 19th century trees have been planted along the river front and inside the walls, softening the severity of the architecture. The trees along the wharf and inside the Outer Curtain Walls can be easily appreciated in this view.

Only the more utilitarian and unimportant elements of The Tower's architecture are likely to be a product of unconscious design. The Tower has always been perceived as important and very few of its buildings are likely to have been erected without some regard to the suitability of their appearance. The Queen's House and the New Armouries are both good examples of the architecture of their respective periods, the latter being the oldest purpose-built Ordnance building in the country. It was not until the first half of the 19th century that architects chose to clothe new buildings in a Gothic Revival style, to conform to the perceived prevailing medieval ethos of the place.

The Tower also has a communal value, in the terms of English Heritage's conservation principles, evoking as it does past events and lives; The Tower can be seen as a stage on which history has been enacted. The place is, or has been, home to many activities that have communal significance. The Tower remains a symbol of the English Crown, where for instance gun salutes are fired over the river on state occasions and the regalia are on public display. The Tower houses the headquarters of the Royal Armouries, the Chapels Royal and the Royal Regiment of Fusiliers, and is still a partly residential, daily working community.

OUTSTANDING UNIVERSAL VALUE OF THE TOWER OF LONDON

The 'outstanding universal value' of the Tower of London World Heritage Site (WHS) provides the justification for inscription of the site on the World Heritage List (UNESCO 2008). The Tower of London's outstanding universal value is attributable to the following cultural qualities, which are listed in the WHS Management Plan (Historic Royal Palaces 2007, 81–83).¹²

- landmark siting, both for protection and control of the City of London;
- symbol of Norman power;
- outstanding example of late 11th-century innovative Norman military architecture;
- model example of a medieval fortress palace which evolved from the 11th to 16th centuries;
- association with state institutions;
- setting for key historical events in European history.

SIGNIFICANCE OF THE TOWER OF LONDON AS HERITAGE ASSET

The statement of significance summarises the heritage values of this asset as follows:

- the most important work of military architecture in England, exemplifying the medieval military heritage of the nation – the architectural form of the White Tower;
- its landmark siting as a riverside gateway, both for protection and control of the City of London;
- one of the foremost examples of Norman architecture in the country and a symbol of Norman power;

- on outstanding example of concentric castle design;
- a stage upon which history has been enacted is one of the key elements of its iconic status;
- it represents the development of state institutions, particularly the nation's defences, its repository of official documents, its coinage and its prison;
- restoration works by Salvin and others in the 19th century;
- the presence of surviving buildings and structures from many periods;
- a symbol and reflection of the power of the English Crown.

SIGNIFICANCE OF THE TOWER OF LONDON IN THIS VIEW

The following are the aspects of the Tower of London's heritage significance that can be appreciated in the view:

- the view of the Tower of London from this Viewing Place reveals the strength and prominence of the White Tower; by day and by night, revealing the defensive origins of this riverside fortress, due to the low lying location of the Viewing Place and the moderate scale of buildings in its 'local setting', as defined in the WHS management plan;
- the view of the castellations and turrets of the White Tower against a clear (and, at night, dark) sky allows the viewer to understand and appreciate the architectural form of the White Tower. From Assessment point 25A.1 the White Tower is seen to best effect against a clear sky unaffected by modern development;
- the view of the Tower of London from the whole Viewing Place reveals the Tower's landmark site – its position on the edge of the City of London, and its role as a riverside gateway;

¹² The draft Statement of Outstanding Universal Value was submitted to the World Heritage Centre in February 2011 http://www.culture.gov.uk/what_we_do/historic_environment/4168.aspx

- the view of the Tower of London from the whole Viewing Place reveals one of the finest examples of medieval castle design in Britain.
- this view of the Tower of London from the whole Viewing Place reveals an image of the romantic castle, perfected in the 19th century by restoration works, and enhanced by its tree planting;
- St Thomas's Tower, a rare surviving example of a royal palace in the reigns of Henry III and Edward I, is clearly visible on the riverside below the White Tower from the whole Viewing Place;
- The Traitors' Gate, in the riverside wall, is also visible from the whole Viewing Place as a reminder of the use of the Tower as a prison.

TOWER BRIDGE

DESCRIPTION OF ASSET

Tower Bridge is prominent in the right hand side of the view. A low-level bascule bridge (ie a drawbridge, or a lifting bridge) which rises to let ships pass, and high-level footbridges, run between two tall stone towers on piers in the river. A suspended roadway approaches each tower from either bank. It is recognised as a landmark in the LVMF and is a grade I listed structure.

HISTORY

Commercial development in the East End of London in the second half of the 19th century resulted in the need for a new river crossing east of London Bridge that would still allow ships to pass into the Pool of London. A combined suspension and bascule bridge was designed by Sir John Wolfe Barry with architectural features by Sir Horace Jones. The Gothic revival style was required by Parliament,

'in deference to the neighbouring Tower of London' (Cherry and Pevsner 1983, 710) and the bridge was completed in 1894. The bascules, originally hydraulically operated, were electrified in 1976.

CHANGES EXPERIENCED WHEN MOVING THROUGH THE VIEWING PLACE

Tower Bridge provides a constant element, framing the eastern end of the view, as one moves through the Viewing Place. The main change relates to the angle at which it is viewed, and the way in which it relates to its backdrop. From the footpath through Potter's Fields the Tower Hotel fills the gap between the lower and upper decks of the bridge reducing the legibility of the bridge's form. As one moves west the hotel moves behind the north tower of Tower Bridge until, at Assessment Point 25A.1, the gap between the lower and upper decks of the bridge is seen against open sky. As one moves further west buildings in the far distance protrude just above the low deck.

SEASONAL/NIGHT-TIME VARIATIONS

Seasonal variations do not affect the way in which Tower Bridge is perceived in this view. By night, the bridge is the most brightly floodlit element of the view, drawing the eye (see Figure 26). Tidal variations also provide a changing element in the view, as does the bridge itself as it opens for passing river craft.

HERITAGE VALUES OF TOWER BRIDGE

The following section ascribes value and significance to Tower Bridge as a heritage asset. As in the case of the Tower of London (above) this is based on English Heritage's *Conservation Principles* (2008), which set out a 'family' of heritage values that may be used to prompt comprehensive thought about the values of a place.

Tower Bridge functions as a gateway to the City. The hydraulically operated elevating roadways are important engineered features of the bridge design, – although now electrified. This is the only bascule bridge on the Thames in London.

The bridge possesses aesthetic qualities generated by conscious design – the Gothic revival style was required by Parliament to fit with the neighbouring Tower of London. It also reveals a high quality of craftsmanship and an innovative design, exhibiting both suspension and elevating roadway features in one bridge. It has become an iconic image of London, being used on postcards and in guidebooks to the city.

SIGNIFICANCE OF TOWER BRIDGE AS HERITAGE ASSET

The statement of significance summarises the heritage values of this asset as follows:

- A remarkable fusion of innovative engineering and historicist architectural forms – exhibiting both suspension and elevating roadway features in one bridge and featuring hydraulically operated elevating roadways are of importance in terms of engineering design;
- It functions as a gateway to the City and the Pool of London;
- The architectural form of the bridge in Gothic revival style;
- The bridge symbolises the wealth of London as an industrial and maritime city in the late 19th century;
- It is an iconic image of London, being used on postcards and in guidebooks to the city;

SIGNIFICANCE OF TOWER BRIDGE IN THIS VIEW:

The following are the aspects of the Tower Bridge's heritage significance that can be appreciated in the view:

- the view reveals the fusion of innovative engineering and architectural form of the bridge – exhibiting both suspension and elevating roadway features in one bridge. The finest view of the bridge is from Assessment point 25A.1;
- the form and function of the bridge (including the operation of the elevating roadways) can be appreciated from the whole Viewing Place although it is best appreciated from Assessment point 25A.1 against an open sky;
- the view reveals the architectural detailing in a Gothic revival style related consciously to the Tower to its west;
- this view reveals the bridge's location next to the Tower of London and the City, and its function as a gateway to the city and Pool of London by day and by night;
- this view of Tower Bridge and the Tower of London is an iconic image that is internationally recognised.

CITY CHURCHES

DESCRIPTION OF ASSET

In front of the tall buildings of the City, the tops of the spires of three grade I listed churches can just be made out – St Margaret Pattens, St Dunstan in the East and All Hallows Barking, by the Tower. They are seen against a backdrop of buildings in the City.

HISTORY

St Margaret Pattens was first recorded in the 12th century and rebuilt in the 16th century (Bradley and Pevsner 1997, 235). After the Great Fire of 1666 (in which the old St Paul's and many parish churches were lost), Sir Christopher Wren, working with Commissioners appointed by Parliament, was responsible for rebuilding the cathedral and 51 of the parish churches. St Margaret Pattens was rebuilt to designs by Wren in 1684–7, with its polygonal lead-covered spire added in 1698–1702, possibly by Hawksmoor acting as Wren's assistant.

St Dunstan in the East was patched up after the fire and Wren added the steeple in 1695–1701. However, the church itself was rebuilt in 1817–21 by David Laing.

All Hallows Barking, is the only London church with standing fabric of Anglo-Saxon date (Bradley and Pevsner 1997, 184). The brick tower was built in 1658–9, unusually during the Commonwealth. The church was restored in 1884–95. Severe bomb damage resulted in reconstruction of the church in the 1950s. Its Baroque-style copper-clad spire was added in 1958, in a style reminiscent of Wren's spires.

CHANGES EXPERIENCED WHEN MOVING THROUGH THE VIEWING PLACE

The steeple of St Dunstan in the East is seen against an open sky when viewed from the east end of the Queen's Walk close to Tower Bridge. From further west the top of the spire of All Hallows can be seen against an open sky.

SEASONAL/NIGHT-TIME VARIATIONS

Seasonal variation does not affect the prominence or visibility of the spires. By night they are not prominent features of the view.

HERITAGE VALUES OF THE CITY CHURCHES

St Margaret Pattens, is a good example of a post-Great Fire Wren church. Its polygonal spire although Baroque in date is remarkably medieval in appearance. Its historical value is enhanced by the fact that it is still used for its original purpose. Its aesthetic values are intact; it represents a good example of Wren's later City church work when much was delegated to Hawksmoor; then Wren's assistant. The church has communal value as a place of worship.

The steeple of St Dunstan in the East provides a material record of Wren's work in rebuilding the city churches after the Great Fire (1695–1701). It is likely that the steeple, the only element rebuilt after the Great Fire, was designed to match the Gothic exterior of the church.

All Hallows, Barking, contains Anglo-Saxon fabric (reusing Roman material) and medieval fabric, which, with the brick tower (1658–9), provide an important material record of the church. It also has great spiritual value and is still used as a church.

SIGNIFICANCE OF THE CITY CHURCHES AS HERITAGE ASSETS

The statement of significance summarises the heritage values of this asset as follows:

- St Margaret Pattens provides a material record of a Wren church with one of the 'most remarkable of the late spires' (Bradley and Pevsner 1997, 235).
- The steeple of St Dunstan in the East provides a material record of a Wren's work in rebuilding the city churches after the Great Fire.
- The Gothic-revival style of the steeple of St Dunstan in the East contributes to its aesthetic value.

- All Hallows, Barking, contains the oldest standing fabric of any church in the City of London.,
- All three churches have a communal value as places of worship.

SIGNIFICANCE OF THE CITY CHURCHES IN THIS VIEW

The following are the aspects of the City Churches' heritage significance that can be appreciated in the view:

- although small components of this view, the spires of St Margaret Pattens and St Dunstan in the East are reminders of the rebuilding of the City after the Great Fire and of Wren's post-fire skyline;
- this view reveals two of Wren's spires in relation to the Monument, commemorating the Great Fire.

THE MONUMENT

DESCRIPTION OF ASSET

To the far left of the view the Monument is visible protruding above the dark wall of Magnus House. It is a fluted Roman Doric column on a tall pedestal, of Portland stone and standing to a height of 61.5m. It has a viewing balcony (accessed by spiral steps inside the column) and is topped by a gilt copper urn. Although it forms a relatively minor component of this view, its cultural significance is recognised in the LVMF where it is included as a landmark.

HISTORY

The Monument was built 1671–77 as a memorial to the Great Fire of London of 1666. The design was a collaboration between Wren and Hooke and the monument was built close to the point where the fire began. The present setting dates from the 1830s and the new London Bridge alignment (Bradley and Pevsner 1997, 322).

CHANGES EXPERIENCED WHEN MOVING THROUGH THE VIEWING PLACE

The Monument is most visible from the Tower Bridge end of Queen's Walk. It moves behind HMS Belfast towards the western edge of the walk.

SEASONAL/NIGHT-TIME VARIATIONS

Seasonal variations do not affect the role of this heritage asset in this view. By night the Monument is brightly lit, drawing the eye to it (see Figure 26).

HERITAGE VALUES OF THE MONUMENT AS HERITAGE ASSET

The Monument is valued as primary evidence of the work of Robert Hooke, scientist, inventor and architect, in collaboration with Wren. Hooke intended the Monument to function as a kind of astronomical observatory (detecting perturbations in the position of stars by sighting through a long vertical hole in the structure) as well as a memorial. Historically the Monument commemorates the Great Fire of London, which destroyed a large part of the city in 1666, and indirectly marks the place where the fire was believed to have started. The Monument continues to embody its original design concept; it is intact, built to a high standard of craftsmanship, with statues and bas-reliefs on its base, and the viewing balcony at the top is open to the public.

SIGNIFICANCE OF THE MONUMENT AS HERITAGE ASSET

The statement of significance summarises the heritage values of this asset as follows:

- the Monument was built as a memorial to the Great Fire of London, close to the place in Pudding Lane where the fire started;
- a collaboration between two significant architects, Wren and Hooke;
- Exhibits in part its the original design concept – the viewing balcony is still open to the public (although the column is no longer an astronomical observatory).

SIGNIFICANCE OF THE MONUMENT IN THIS VIEW

The following are the aspects of the Monument's heritage significance that can be appreciated in the view:

- The prominence of the Monument in the view from the riverside is a reminder of the Great Fire of London in 1666;
- This view reveals the place where the fire started and its relationship to the city of London;
- Provides a distant view of the Monument - an important example of Wren and Hooke's work in London.

STEP 4

ASSESSING THE OVERALL HERITAGE SIGNIFICANCE IN A VIEW

This section sets out the relative contribution of each identified heritage value to the overall value of the view – and highlight those assets that contribute most to overall heritage significance.

This is a view focusing on the Tower of London, an internationally valued asset. It is one of London's iconic views and is a particularly good location from which to view the Tower of London (and particularly the prominent White Tower). The Tower of London contributes most to the overall heritage significance within this view. Tower Bridge also contributes significantly to the heritage value within the view due to its prominent position in the view, which enables many of its heritage values to be appreciated. Although the Monument forms a relatively small component in the view it still contributes to the overall heritage significance within the view as a result of its prominence and the reminder it provides of the Great Fire of London in 1666 (including marking the place where the fire started and its relationship to the city of London). The spires of St Margaret Pattens and St Dunstan in the East contribute least to heritage significance because, although they are reminders of the rebuilding of the City after the Great Fire, they are small components of this view.

The Tower of London and Tower Bridge also benefit from being seen together – the heritage significance within this view is enhanced by the ability to appreciate the Gothic revival architectural detailing of Tower Bridge and its relationship to the neighbouring Tower of London, and the bridge's function as a gateway to the City and Pool of London. The heritage significance within this view is also enhanced by the ability to see the relationship between the spires of St Margaret Pattens and St Dunstan in the East and the Monument – a representation of Wren's post-fire skyline.

STEP 5**IDENTIFY HOW THE SIGNIFICANCE OF HERITAGE CAN BE SUSTAINED**

The significance statements provided above for each asset summarise the values that each asset exhibits in the view. It is important that these values are protected, and where possible enhanced. English Heritage will consider them when evaluating any development proposals that may affect this view.

It is intended that these statements will provide clarity on which aspects of the view English Heritage considers should be sustained. English Heritage and/or the local planning authority will draw on this information to inform their response to proposals for change within views.

English Heritage considers that heritage significance within the view will be sustained if:

- the silhouette, castellations and turrets of the White Tower can continue to be read against an open sky from Assessment point 25A.1;
- the nature, massing and scale of buildings currently seen in this view adjoining the WHS boundary continue to enable the White Tower to maintain prominence in the view by day and by night from the whole Viewing Place;
- new buildings closely surrounding the Tower are of a design and nature that fits with the palette in the view and not in excessively brightly coloured or reflective finishes that could detract from the prominence and architectural complexity of the Tower as seen from the whole Viewing Place;
- the White Tower, and its ring of intact defences, remain prominent from this Viewing Place and continue to reveal the defensive origins of this riverside fortress;
- the Tower's location as the gateway to the City of London can continue to be appreciated from the whole Viewing Place;
- this image of the Tower of London as a romantic castle, including 19th century restorations and its tree planting, can be appreciated from this Viewing Place;
- trees are managed to ensure they frame, rather than obscure, heritage assets in this view – particularly the Tower of London from Assessment point 25A.1;
- St Thomas's Tower and Traitors' Gate can continue to be seen on the riverside below the White Tower from Assessment point 25A.1;
- the ability to appreciate the operation of the elevating roadways from the whole Viewing Place, and against a clear sky from Assessment point 25A.1, is maintained;
- the architectural detailing of the bridge and its relationship with the architectural detailing of the Tower of London remain legible from the whole Viewing Place;
- the ability to recognise and understand the Monument as the place where the Great Fire of London started is maintained in the view from the riverside;
- the ability to see the spires of St Margaret Pattens and St Dunstan in the East (and to appreciate their relationship to the Monument) is maintained in the view from the riverside.

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