Argent (King's Cross) Limited

King's Cross Central
Gas Holder Triplet Guide Frame: Paint Specification and Colour

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SUBMISSION STATEMENT

Partial Approval of Details under Condition 54 (c)

Wilkinson Eyre Architects
823/B01

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King's Cross Central
Gas Holder Triplet guide frame: Paint Specification and Colour

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1. Introduction

The Grade II Listed Gas Holder Triplet guide frame (consisting of Gas Holders No.10, No.11 & No.12), along with the adjacent Gas Holder No.8 guide frame, will form an iconic part of the on-going King's Cross Central development.

The wider King's Cross Central scheme was granted Outline Planning Permission on 22 December 2006 subject to a number of conditions being met (Ref: 2004/2307/P); referred to as 'Outline Planning Permission'. This document seeks to partially discharge Condition 54(c) of that permission in respect of the refurbishment and repair of the Gas Holder Triplet frame.

The Gas Holder Triplet guide frame was originally dismantled in 2001-2 as part of the Channel Tunnel Rail Link works and was stored next to Gas Holder No.8 on Goods Way. Listed Building Consent (Ref: 2008/5825/L) was granted in 2009 to relocate the dismantled Gas Holder Triplet Guide Frame from their temporary storage location to a suitable, secure site (where they could be refurbished subject to the submission and approval of satisfactory details pursuant to Condition 54(c) of the Outline Planning Permission). The Gas Holder Triplet guide frame is currently stored in South Yorkshire under the care of Shepley Engineers Ltd and this document is the second in a sequence that will seek approval for their refurbishment, and eventually re-erection.

The Gas Holder No.8 guide frame has been refurbished and is being re-erected on Development Zone N1 at King's Cross Central. The approved paint specification and design philosophy for Gas Holder No.8 has informed the preparation of this document to ensure a consistent approach.

The methodology for the re-erection of the Gas Holder Triplet guide frame in Development Zone N1 will be submitted separately in conjunction with a Reserved Matters Application for the new residential buildings within the frame.

A number of Planning and Listed Building Consent applications have already been made during the course of the King's Cross Central development which either relate to the Gas Holder Triplets guide frame or are relevant to the proposals described in this document. These approvals will be referred to as applicable in the explanation of the proposals which follows but are also listed below for ease of reference.

2004/2307/P – dated 22 December 2006
Outline Planning Permission for the Kings Cross Central development.

2004/2315/L – dated 22 December 2006
Listed Building Consent to dismantle, relocate, repair, refurbish and re-erect the Gas Holder No.8 guide frame.

2008/5665/P – dated 04 February 2009
Enabling Works pursuant to Condition 25 of the Outline Planning Permission for the movement and storage of the Gas Holder Triplet guide frame.

2008/5825/L – dated 24 April 2009
Listed Building Consent for the works to relocate and store the dismantled Gas Holder Triplet guide frame.

2013/5611/P – dated 4 October 2013
Partial Approval of Details under Condition 54(c) of the refurbishment methodology and programme for the Gas Holder Triplet guide frames.

The listing citation for the Gas Holder Triplet guide frame is provided in Appendix A for reference.

1.1 Scope of this Submission

This document seeks to partially discharge Condition 54(c) of the Outline Planning Permission granted for the King's Cross Central scheme on 22 December 2006 (Ref: 2004/2307/P).

For ease of reference Condition 54 states:

> 54 The re-erection of the Linked Triplet Gas Holder guide frames as hereby permitted shall not take place until:
>
> (a) approval in writing from the local planning authority has been issued for all Reserved Matters in respect of the scheme shown on drawing KXC020 Rev E for the re-erection and re-use of the Linked Triplet Gas Holder guide frames, including the exact location for the Linked Triplet Gas Holder guide frames within development zone N shown on drawing KXC005 Rev T;
>
> (b) Listed Building Consent has been granted in respect of the scheme shown on drawing KXC020 Rev E for the re-erection and re-use of the Linked Triplet Gas Holder guide frames;
>
> (c) approval in writing from the local planning authority has been issued for a method statement and programme for the repair and re-erection of the Linked Triplet Gas Holder guide frames, including the means of ensuring the structural stability and integrity of the guide frames. The repair and re-erection of the guide frames shall be carried out in accordance with the method statement and programme so approved;
>
> (d) contracts have been placed for the repair and re-erection of the guide frames and evidence of such contract has been submitted to the local planning authority; and
>
> (e) the developer has provided details of how the future maintenance of the guide frames would be funded and delivered and approval in writing from the local planning authority has been issued for those details.

This document will only address the condition in so far as it relates to the paint specification and colour of the Gas Holder Triplets guide frames. This will be described in terms of:

- Gas Holder Triplet guide frame tone principle and colour
- Paint specification (including corrosion protection)

The repair strategy and programme for refurbishment works (excluding paint colour and specification) was previously submitted for partial Approval of Details under Condition 54(c) and granted Approval on 4th October 2013 (Ref: 2013/5611/P). It is proposed to complete the full discharge of Condition 54(c) by submitting under separate cover in due course:

- the re-erection method statement and programme

All other parts of Condition 54 (a, b, d & e) will be discharged through separate applications.

The phasing of these submissions was discussed and accepted in principle at a meeting with officers of English Heritage and the London Borough of Camden on 6 August 2013. The approach is driven by the construction and project delivery programme: in order to refurbish the Gas Holder Triplet guide frame in time to meet the intended programme for submission of the Reserved Matters Application and subsequent construction of the new buildings, the refurbishment work must commence in the fourth quarter of 2013.

1.2 Applicant

These submissions are made by Argent (King's Cross) Limited on behalf on King's Cross Central General Partner Limited.

1.3 Site Location

The Gas Holder Triplet guide frame has been dismantled (pursuant to the original CTRL agreement – see section 2 of this document for further details) and is currently stored with Shepley Engineers, Engine Lane, Shafton, Barnsley, S72 8SP (pursuant to approved Listed Building Consent 2008/5825/L) where it will be refurbished pursuant to the approved repair strategy and programme (ref. 2013/5611/P) and, subject to approval, the details submitted with this application.

2. Background to the Gas Holder Triplet Guide Frame Works

In assessing the colour and paint specification for the Triplet Guide Frames it is important to consider the historical context and approved design philosophy in relation to Gas Holder No.8.

2.1 Gas Holder No.8 works

Gas Holder No.8 was originally built in the mid-1850s by the Imperial Gas Light and Coke Company. However the original 1850s guide frame was dismantled and replaced in 1883 with an enlarged frame designed to accommodate a new, three-lift bell by John Clark, the engineer of the Pancras gasworks at that time. This revised scheme is the frame that has been relocated from its original site on Goods Way, refurbished and is currently being re-erected to the north of Regents Canal (on Plot N2) as part of the approved King's Cross central scheme (Ref: 2004/2307/P).

In that scheme the refurbished and re-erected Gas Holder No.8 is described as having *'been left as an open space for play and recreation. The way the landscaping intermingles with the skeletal structure of the gasholder guide frame increases the sense of archaeology in this part of the site, of found artefacts and lasting memories'*.

Gas Holder No.8, like the Gas Holder Triplet guide frame, is Grade II listed. Unlike the Gas Holder Triplet it is a two-tiered structure and features a number of design developments from both the Bromley-by-Bow Gas Holders, which served as an inspiration for the Pancras Gasworks, and the Gas Holder Triplet itself. The most notable of these are the octagonal bases to the columns and the raised pedestal footings.

Through discussion with English Heritage and the London Borough of Camden, and following forensic research into the historic paint schemes of the preserved structures, a monochromatic paint scheme (of dark grey RAL 7021) and a 'light touch' restoration of the Gas Holder No.8 structure itself was agreed and approved.

Figures 1 & 2: Gas Holder No.8 re-erection on Development Plot N2

2.2 Listing of Gas Holder Triplet Guide Frame

The Gas Holder Triplet was listed as a Grade II Building of Special Architectural or Historic Interest in October 1986. The listing citation for the Gas Holder Triplet guide frame is provided in Appendix A for reference.

The citation and historical note refer to the 'original colours' of black and red and was written when the Gas Holder Triplet was first listed in 1986. Recent architectural paint research has indicated that the current red, black and white colour scheme is not the original.

Photomicrographs (photographs taken through the microscope) of key cross-sections were taken for inclusion within this report to support and clarify the information detailed. These graphically show, in cross-section, small samples of paint removed from various areas/elements. They illustrate the build-up of paint layers (successive decorations), through the buildings history. These are included within this report and are annotated with strata diagrams and explanatory text. The annotations describe the original decorative scheme and the relevance of the later layers.

Scheme 32: Fissure in sample beneath the modern black scheme (not shown)

Scheme 31: Pinky cream oil-paint

Scheme 30: Warm grey oil-paint

Scheme 29: Pale yellow zinc based oil-paint

Scheme 28: Yellow/green zinc based oil-paint

Scheme 27: Red lead based oil-paint

Schemes 4 to 26 inclusive, represent the main decorative phase for the history of the gasholders. All of the schemes date from the early to mid twentieth century. Throughout the period the gasholder elements were painted in similar greyed cream zinc-based oil-paints. It was known that zinc paints proved more durable in areas where the atmosphere contained significant levels of sulphurous compounds, for example at power stations or as here around the gasholders. The dark layers overlying each of the oil-paint schemes are accumulated dirt. This indicates just how polluted the atmosphere would have been around the gasholders site.

Although the layers appear to be very different in cross-section, to the naked eye the coloration would appear to be very similar and light in tone.

Schemes 1-3 are composed of an oil-paint base containing both lead and zinc. This was very popular in the late nineteenth century as it was resistant to discolouration.

Substrate Cast Iron

Figure 3: Gasholder No.10, column 7, top column section

Scheme 32: current at the time of sampling is a modern black alkyd oil-pain with red over (not shown).

Scheme 31 is a pinky cream alkyd oil-paint again applied as a uniform colour scheme.

Scheme 30 is the first alkyd scheme and is therefore post 1950. The warm grey colour was again applied as a uniform scheme.

(Scheme 29 missing from sample)

Scheme 28 is a dramatic change from the previous phase of greys/creams and dark red. The pale green colour used was again uniform over the whole of the Gas Holders with no picking out of detail.

Scheme 27 is the last of the red schemes and was undertaken in lead oil-paint. The main elements of the Gas Holders were also painted in lead at that time. The scheme also incorporated grey picking out and here the grey can be seen overlaying the dark red.

Schemes 19-26 again are in zinc based oil-paints but at this period the mouldings of the columns and capitals were picked out in a dark red contrast. The dark red is a colour which was very popular during the early twentieth century.

During schemes 4-18 there was no picking out of the elements undertaken. The paint layers seen here were applied as a plain uniform finish at the time.

Schemes 1-3 are composed of an oil-paint base containing both lead and zone. This was very popular in the late nineteenth century as it was resistant to discolouration.

Substrate Cast Iron

Figure 4: Gasholder No.10, column 7, top column section

As demonstrated by the above analysis there are in fact thirty-one historic paint schemes recorded ranging from uniform monochromatic cream/grey schemes to the ones with column capitals picked out in contrasting colours. For the majority of its life, particularly in its early years, the Gas Holder Triplet guide frame was painted in light monochrome schemes without accented details. The current paint scheme with details picked out is anomalous.

3. Submission of Details pursuant to Condition 54(c)

As noted in the introduction, this document will only address the requirement to submit details relating to the colour of the Gas Holder Triplet guide frame and paint specification. This will be described in terms of:

- The design justification
- Historic differences
- Differences in future use to Gas Holder 8
- Feature lighting
- Principles for selecting the Gas Holder Triplet guide frame tone and colour
- Proposed paint specification for the Gas Holder Triplet guide frame

The refurbishment strategy for the Gas Holder Triplet guide frame is based on the approved refurbishment strategy used on Gas Holder 8 (Ref: 2008/5668/L)

The design justification regarding the colour choice will concentrate on the *differences* between Gas Holder No.8 and the Gas Holder Triplet in order to identify where a different approach is merited with regard to the choice of final colour finish. It is proposed that the Gas Holder Triplet guide frame should be painted a lighter shade to best showcase its unique structure.

In the following section, the Gas Holder Triplet guide frame is contrasted to Gas Holder No.8 both in historical terms (when and where they were originally built) and in their proposed, contemporary use in the Kings Cross Central development.

3.1 Historic differences

The surviving Gas Holder Triplet and Gas Holder No.8 guide frames were both designed by John Clark, principal engineer at Pancras Gasworks, to replace and enlarge earlier versions designed by David Methven (Clark's predecessor). The brick tanks set into the ground below each gas holder were retained and only the frames and bells replaced. This allowed the use of telescoping bells and to significantly increase the gas storage capacity within the same footprint.

The three-tiered Triplets frames were rebuilt first (in the period 1879-1880) over brick tanks originally built between 1861 and 1867. The 'Siamese' arrangement – where each Gas Holder guide frame shares one column with its neighbours with a further three linked columns at the centre is unique.

Gas Holder No.8, rebuilt slightly later in 1883 includes a number of design modifications to the triplet frames: most notably in the number of tiers of structure but also in terms of its detail development. The octagonal pedestals were developed to more easily accommodate the external holding-down bolts. As such it represents – and should be recognised as – a different, more sophisticated (but less decorative) development model to the Gas Holder Triplets.

The approved colour strategy for Gas Holder No.8 is monochromatic and for consistency the same strategy is proposed for the Triplets. This is also consistent with the original colour schemes as demonstrated in Section 2. A change of colour between Gas Holder No.8 and the Gas Holder Triplets, sufficient to look deliberate but not so great as to break the logic of co-locating the two structures, is proposed.

3.2 Differences in future use to Gas Holder No.8

The other difference that warrants consideration in the refurbishment of the two structures is their future use within the King's Cross Central development: Gas Holder No.8 will left open to define an area of public realm whereas the Gas Holder Triplet will be in-filled framing a modern, residential development. The nature of the public realm that Gas Holder No.8 will encompass means that the guide frame will be read against the sky and, strikingly, in silhouette.

The perception of the Gas Holder Triplet frame will be more complex: the residential development which will sit inside the frame will form the predominant background but, due to the setback in plan and varied height of the development in elevation as defined in the Outline Planning Permission and illustrated in *Figure 5*, parts of the frame will also read against the sky. The design of the residential development is at an early stage but it is anticipated that the building will feature a large portion of glazing. The nature of glass (when coupled with different light levels inside and out) means that all glazed portions of the building will generally read as dark surfaces during the day as illustrated by *Figure 6;* a glass greenhouse which uses very clear glazing but appears dark in contrast to the sky.

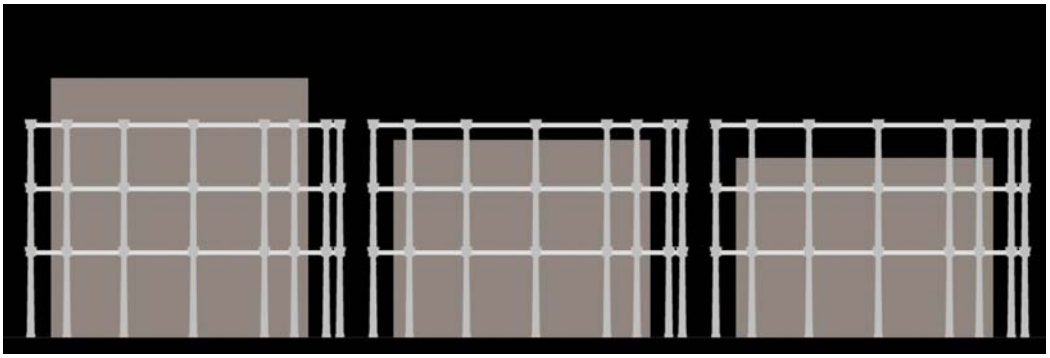

Figure 5: Building massing of new residential developments behind frame Gas Holder Triplet guide frame.

Figure 6: Gardens by the Bay, Singapore by Wilkinson Eyre Architects.

Figure 7 shows an image of the Gas Holder Triplet guide frame in 1955. This demonstrates a colour scheme which is useful in illustrating the potential impact of a residential development within the frames. In this image the bells appear as a dark mass against which the light coloured frames are highlighted. For the Gas Holder Triplet guide frame colour a balance must be struck: the fact that parts of the frame project beyond the residential development means that the colour must still be sufficiently strong to form a silhouette when read against the sky but it must also stand out against the darker background of the residential buildings. The contrast between the frames and the background – be it sky or solid form – is important to appreciate the intricacy of the structure and in particular the lattice work of the circumferential trusses.

Figure 7: Image of Gas Holder Triplet from 1955 film The Lady Killers

Furthermore the residential development will not only form a backdrop to the Gas Holder Triplet guide frame, it will also allow residents to appreciate the structure more closely at all levels. Whereas Gas Holder No.8 will only be examined from the ground or seen from afar, the Triplets will also be seen at close proximity at high level and, as the occupants go about their daily life, on a regular basis. As residents circulate around the central courtyard they will see from all sides the convergence of the Siamese columns to create a dense, lattice of superstructure.

Both scenarios – where a column might be seen outside your window or densely arranged with others in the central courtyard – suggest the use of a lighter colour than the dark grey used on Gas Holder No.8. Whereas a dark column would form a dominant presence outside the window, a light-coloured column will be less oppressive and reflect light into the apartment. The lighter paint colour will also showcase the detail of the historic structures: shadows will register against a lighter coloured paint and will help highlight the texture and relief.

3.3 Feature lighting

The use of a lighter paint colour on the structure will also augment the experience of the Triplets guide frames at night through the use of spilled or feature lighting.

Figure 8: Artist impression of day and night studies for proposed Gas Holder Triplet guide frame colour

3.4 Principles for selecting the Gas Holder Triplet guide frame tone and colour

Following the meeting with English Heritage and London Borough of Camden on 6th August 2013, the principle of using a monochrome tone significantly lighter than the colour approved for Gas Holder No.8 on the Gas Holder Triplet guide frame was presented and considered acceptable. The design team carried further investigations to determine the exact colour to be submitted for approval for the Gas Holder Triplet guide frame which were presented at a further meeting on 24th October 2013 and also considered acceptable.

As illustrated in *Figure 9* mock-ups were prepared in the proposed paint specification in several colour options and compared on site with the local context building materials. The colour RAL 7040, *Window Grey* (highlighted in red below) was considered to complement the Gas Holder No.8 colour (highlighted in yellow below) as well as the colour palette of the adjacent approved developments (Plots T1 & P1) and offered the widest choice of materials for the residential development within.

Figure 9: Gas Holder No.8 colour (highlighted in yellow) RAL 7021, and proposed Gas Holder Triplet guide frame colour (highlighted in red) RAL 7040.

3.5 Proposed paint specification for the Gas Holder Triplet guide frame

The proposed paint specification is to be the same as approved paint specification for Gas Holder No.8, made up from a 100 micron primer coat, 100 micron build coat, and a 50 micron top coat. The specification has a 20 year durability (Life to First Major Maintenance).

Please refer to the Kings Cross Gas Holder Triplet Protective Coating Documentation in Appendix B for the full paint specification and technical details.

4. Summary

This document supports an application for approval of details to partially discharge Condition 54(c) of the King's Cross Central Outline Planning Permission (Ref: 2004/2307/P), in so far as it relates to the paint specification and colour of the Gas Holder Triplet guide frame.

4.1 Proposed paint colour and specification of the Gas Holder Triplet guide frame

The colour proposed is *RAL 7040 Window Grey* and the specification is as detailed in Appendix B to this document.

4.2 Next steps

It is proposed to fully discharge Condition 54(c) by submitting the remaining details, namely the re-erection method statement and programme, under separate cover.

Similarly, parts a, b, d and e of Condition 54 will be discharged separately in due course. In addition, a Reserved Matters Application for the new residential buildings within the Gas Holder Triplet guide frame is expected to be submitted for approval in Summer 2014.

Appendices

Appendix A – Gas Holder Triplet Guide Frame Listing Citation

Appendix B – Kings Cross Gas Holder Triplet Protective Coating Documentation

Appendix A – Gas Holder Triplet Guide Frame Listing Citation

The Gas Holder Triplet was listed as a Grade II Building of Special Architectural or Historic Interest in October 1986. The listing of the Gas Holder Triplets Guide Frames reads as follows:

(Copied from Camden Borough Council website)

Grade: II
Reference No: 798-1-58891
Date of Listing: 1 October 1986

Description: 3 linked gas holders. Southern gas holder erected 1864, telescoped 1880; eastern gas holder erected 1867, telescoped 1880, northern gas holder erected 1866, telescoped 1880. Cast-iron, painted black and red (original colours). Each of circular plan with framework comprising 3 superimposed orders of columns, being Tuscan, Doric with triglyphs and a simplified waterleaf Ionic, linked by horizontal lattice trusses, the southern one only retaining white painted lead rosettes on the lattice work. Each holder with a cast-iron date plaque.

HISTORICAL NOTE: these surviving holders of the Imperial Gas Light and Coke Company's works were designed by the Company Engineer, Mr Kirkham and built by CF Clegg. In 1869 this was the largest gas works in London. Some of the holders are still in use. With the gas holder on the east side of Goods Way (qv), the holders form a group of unusually elaborate design and a landmark of historic importance.

This citation and historical note were written when the Gas Holders were first listed in 1986. Recent architectural paint research has indicated that the current red, black and white colour scheme is not original and whilst Thomas Kirkham was the chief engineer of the Imperial Gas Light and Coke company, John Clarke is recognised as having designed and built (in the period 1879-1880) the only portion of the original triplets assembly that has been preserved and will be refurbished.

Further details of the historical paint analysis and further paint proposals will be submitted under separate cover in due course.

Appendix B – Kings Cross Gas Holder Triplet Guide Frame Protective Coating Documentation

Specification

Tower Works
Kestor Street
Bolton
BL2 2AL
England UK

Tel: +44 (0) 1204 521771

www.sherwin-williams.com/protectiveEMEA

Company Carillion PLC **Contact** Alastair Mitchell

Email admitchell@carillionplc.com **Tel** 07702 636 950

Date 24th October 2013

Ref: Kings Cross Triplets

Further to your enquiry regarding a paint system for wrought & cast iron steelwork, please see below for our recommendations.

You have stated that the structure will be situated externally in C3 environment (ISO12944-2:1998)

Surface Preparation
Blast clean to SA2½ BS EN ISO 8501-1:2007. Average surface profile in the range of 50 - 75 microns, followed by:-

Any areas of steelwork that are badly pitted, we recommend the first coat of L425 to be stippled on by brush.

Coating Specification

Epigrip L425 Zinc Phosphate Primer*	@ 100 microns d.f.t.
Epigrip K267 MIO Finish	@ 100 microns d.f.t.
Resistex C137V2 Special Finish	@ 50 microns d.f.t.

For alternative finishes please consult Leighs technical department.

*Application by brush may take multiple coats to achieve the specified thickness.

The above specification offers up to 20 years durability (Life to First Major Maintenance).

Notes on this specification

a) Dry film thicknesses (d.f.t.) quoted are NOMINAL as defined by BS EN ISO 12944-5.
b) Stripe coat all edges, welds and areas of difficult access, to ensure full film thickness.
c) Coated steelwork should be protected to prevent the ponding of water.
d) Finish /Topcoat is available in a full range of colours
e) Subject to shade, 2 coats of the finish coat may be required for full colour obliteration
f) ISO 12944 states that Durability is not a guarantee time. Durability should be considered as the coating design life, where regular minor maintenance should be scheduled to achieve the required life to first major maintenance.
g) All materials should be obtained from Sherwin-Williams and must be applied in accordance with our Technical Data Sheets
h) The same material is used for site touch up following suitable cleaning and re-preparation of affected areas.

For application details, spread rates etc. please see attached Technical Data Sheets.

We trust the above is to your satisfaction. However, should you have any queries, please do not hesitate to contact us.

Regards

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