

### 3. Planning Background:

Conditions 4a, 5a and 5e of Listed Building Consent 2007/5230/L – relating to the eastern Goods Yard Complex - have already been discharged in respect of the 3 historic features to which this application relates.

Condition 4a of Listed Building Consent 2007/5230/L required that details be submitted outlining how the above features were to be protected during the construction phase.

Condition 5a and 5e of Listed Building Consent 2007/5230/L required that details be submitted of all historic items to be moved, removed, reused or disposed of. The 3 historic featured listed above are to be reused on site.

The following table summarises the relevant Listed Building Condition applications:

<b>2007/5230/L Condition</b>	<b>Turntable B</b>	<b>Capstan B</b>	<b>Crane Base 1</b>
4a	2009/2908/L	2009/1755/L	2009/1755/L
5a	2009/2908/L	2009/4325/L	2009/4325/L
5e	2009/2908/L	N/A	N/A

**Table 1:** Previous Listed Building submissions made in relation to Crane Base 1; Turntable B and Capstan B

In accordance with the above permissions, the 3 historic items are currently being stored on site within the King's Cross Central's Heritage Laydown Area.

The reuse of these three notable historic features forms part of the Eastern Goods Yard Context and Interpretation Strategy, a strategy submitted pursuant to Condition 10 of Reserved Matters Consent 2007/5228/P.

## 4. Historical Context

The following context information is drawn from the Pre-Construct Archaeology Report titled *Archaeological Excavations at The Eastern Goods Yard, King's Cross. Part 1 The Hydraulic Station Engine House, Turntables A & B and an Interim Report on King's Cross Central* (August 2011)

A detailed plan of all three heritage elements is contained within *Figure 14: Detailed Plan of Turntable B, Crane Base 1 and Section 8* taken from the above mentioned report. This drawing is included in Appendix 1 of this report for information only.

Figure 20 from the above mentioned report is also included in Appendix 1 for information only. This is titled *A schematic View of Railway Infrastructure present in the Eastern Goods Yard*.

### Crane base

The excavated hydraulic Crane Base 1 was located to the north-west corner of the Canal Basin. Documentary evidence confirms that this crane was used to unload goods from barges moored in the Canal Basin to wagons on the siding adjacent to the Basin.

The crane itself - likely to have been an Armstrong Hydraulic crane - almost certainly formed part of the original hydraulic installation of 1851. However, the use of hydraulic cranes on site was gradually phased out, being replaced by petrol-electric varieties in the mid-twentieth century. As such the original cranes whereabouts is unknown.

The surviving crane base consists of two rectangular forms: a larger one orientated on an east-west axis; and a smaller one orientated north-south. These abut a central circular section (see Image 1 below) While the granite coping stones have survived on the two rectangular sections, the coping is absent from the circular chamber, perhaps because the stones were robbed after the structure fell out of use.



Image 1: View of Crane Base 1

The remaining coping stones sit on brick foundations. Brick foundations also remain connected with the central circular section, and this section also features sandstone blocks at its base. Masonry floors have been uncovered in both rectangular sections, both at approximately 1.5m below the top of coping level (see Image 2).



**Image 2:** Detail photo of Crane base 1 looking west

In terms of function it is suggested that the circular section may have housed the turning mechanism, with metal fixings potentially for the crane being uncovered during the archaeological investigations (and visible in Image 2). The smaller western rectangle probably formed the machine house possibly for the turning mechanism. Metal hydraulic pipes and cast iron water pipes were found in this location. The exact purpose on the larger rectangle is unknown although it may have housed the hydraulic pistons providing the power to lift the hook.

### **Turntable B**

The remains of Turntable B and Crane Base 1 were found next to one another (Image 3.) Documentary evidence suggests that there was a strong relationship between the function of the cast-iron turntable and crane. Wagons would be loaded on the basin-

side (Railway Line J) and then shunted into the Western (Down) Transit Shed (via Railway Line 1); this required the wagons to be turned through 90° on the turntable. It should be noted that the rails of Railway Line 1 (1.36m) were of a different gauge to those of Railway Line J (surviving rails to the west of Turntable B were 1.40m in gauge).



Image 3: The relationship of Crane base 1 and Turntable B

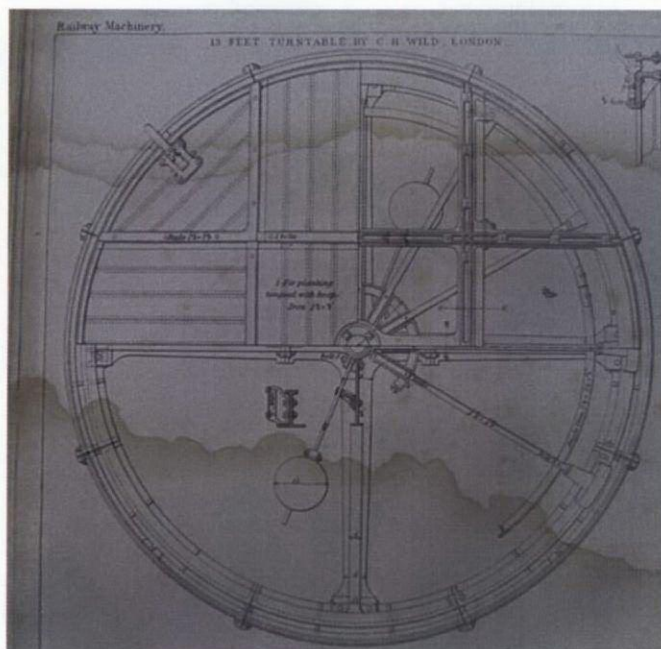
The turntable itself was 3.66m in diameter (approximately 12') and the design followed Charles Heard Wild's patented of 1847. It is likely that the turntable was manufactured by Ransomes and May of Ipswich and delivered to the King's Cross Goods Yard in 1850.

The turntable was composed of a reinforced the outer drum and a revolving mechanism consisting of spokes with circular metal wheels attached to the end. A full description of the turntables operation can be found within the report titled *Feasibility Study into the Restoration of Turntable B* which can be found in Appendix 3. The turntable is composed of both cast- and wrought-iron elements. The larger elements (outer drum, top-surface and wheels) would most likely be form of cast iron while the smaller elements are probably of wrought-iron construction.



**Image 4:** Turntable B details

The top surfaces of Wilds patented turntable were panelled with wooden planks (see image 5 below; although it should be noted that the version shown is a larger type with counterbalance weights).

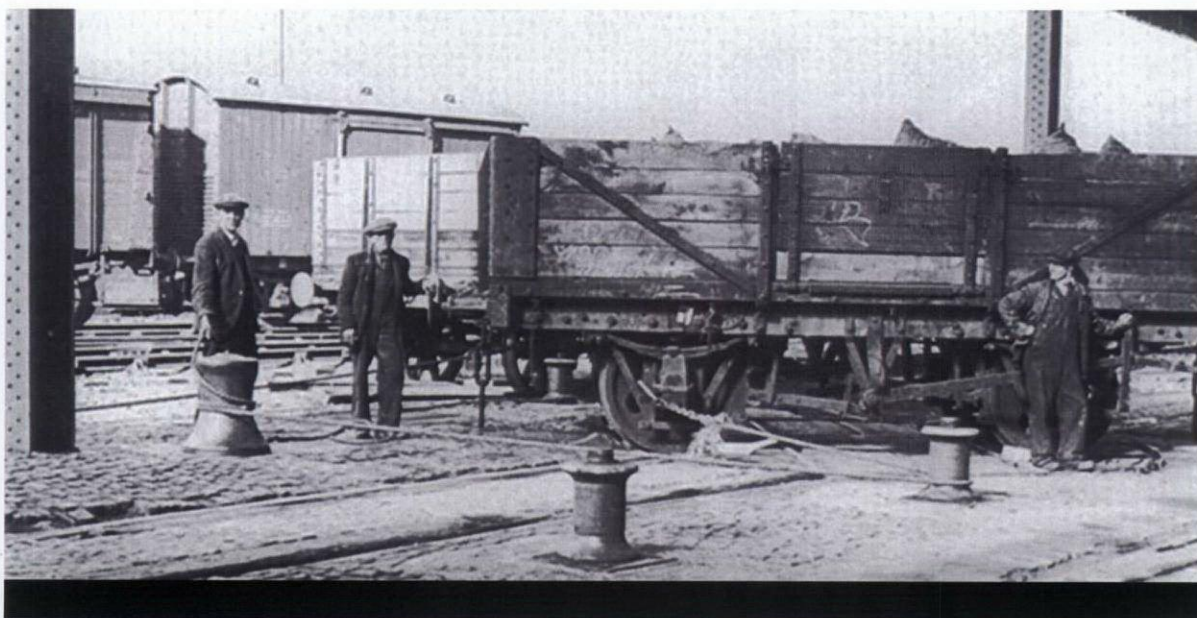


**Image 5:** Wild's Patent Turntable; image taken from D K Clark, Railway Machinery, 1855. as referenced in Smith, T. (2009)

### Capstan B

Hydraulic capstan shunting was introduced to the Goods Yard after August 1881. It is likely that Capstan B was installed at around this time. Documentary evidence from the early 1930s suggests that the exterior capstans may have been used both to rotate the adjacent turntable (see image 6) and to assist with the shunting of wagons.

Unfortunately as can be seen from image 7, the capstan box was the only element of capstan B which was found on site.



**Image 6:** An example of a capstan (and associated fairleads) rotating a wagon turntable. Photo location unknown.

**Image 7:** Capstan Box B as found

## **5. Details of Proposals for Reuse**

The following guiding principles have been established and followed by the design team in relation to the reuse of the three historic features in this application:

- as far as possible all proposed works should be sensitive and reversible; as such the impact on the historic fabric should be kept to a minimum
- where permanent interventions are required, the impact of these interventions on the historic fabric should be minimised.
- the reuse should enhance the public's understanding of the items original use in the goods yard context.

### **Location and General Arrangement of the Three Heritage Elements**

The location of Turntable B, and surrounding features, can be seen on the following drawings submitted for approval:

- Mark-Up 1: TOWN279-2(08)501 – General Location of Heritage Items Pursuant to Current Application
- 308/07 LD9736\_P03 – Heritage items layout

Each heritage item will be relocated in the position from which it was removed. As such the items will form a heritage cluster to the north west of Granary Square. The relevance and co-dependence of the crane base, capstan and turntable will be explained to members of the public by way of a floor mounted information plaque.

The heritage items will be located directly to the south of the West Granary Office, with Turntable B located in front of one of the main doors into one of the Western Transit Shed retail unit (see drawing LD9736 and image 8). The cluster will also be on the desire line for pedestrians wishing to access Stables (nee Transit) Street. As such is expected to be significant foot fall within the area.

The proposals for the reuse of each heritage item will be considered in turn.



**Image 8:** Outline model of the West Granary Office with retail entrance marked.

### **Crane Base 1**

The following drawings outline the proposals for reuse in relation to Crane Base 1:

- 308/07 LD9737\_P01 – Crane base detailed layout

The proposal is to reinstate the surviving coping stones and butterfly cramps in the exact plan location from which they were removed. These coping stones and butterfly cramps will be expressed in the surface paving. Where formally there were voids (i.e. inside the crane base itself) the surface finish will be flush reclaimed (rough topped) granite setts. It is felt impractical to leave the void open in this busy thoroughfare. Such a void would be a barrier to the free movement of pedestrians around the western edge of granary square.

Reclaimed setts have been used across the Easter Goods yard site to form a heritage language. Setts boarder the heritage buildings and form the infill to the heritage rail tracks. As such they were felt appropriate to use within the crane base (and indeed within Capstan B).

The surviving coping stones are generally free from damage, being relatively rectangular in section (see image 9). As such the hard landscaping can be brought

tight and flush to the coping stones, with a slightly recessed mortar joint to the edge. The inner lower lip of the coping stone will be covered by reclaimed setts; although the coping stone will not be damaged.



**Image 9:** Detail Image of Existing Crane Base Coping Stone

A small number of the coping stones have suffered surface damage and/or are cracked (see Appendix 4) and to introduce them into the hard landscaping 'as-found' would leave significant trip hazards within the public realm, particularly where the edges have been rounded. As such repairs will be undertaken to a limited number of stones; the methodology for which can be found in Appendix 6. Where infill material is required, site-won granite kerbs will be used (see image 10). This will be fixed via a combination of dowel (where possible) and mortar. The mortar surround will make the area of contemporary repair apparent, but the use of a sympathetic material will prevent the crane base as a whole appearing aesthetically like a patchwork.



**Image 10:** Detail Image of site won granite kerbs

Where the coping stones are missing from the central, circular section the idea of installing replacement copings was considered. These could also be fashioned from site-won granite kerbs. However this was not considered particularly honest given the scale of the contemporary insertion required. Rather the proposal is to use an obviously contemporary material – porphyry - to outline the central section of the crane base. This mirrors the strategy used with respect to the canal basin outline which runs around the square; a similar historic feature which is echoed in the hard landscaping utilising contemporary materials.

Although the coping stones are being returned to the accurate plan location, in order to reinstate them flush with the Granary square surface finishes the level of the stones needs to be raised. This takes the stones clear of the heritage brick foundation. Thus in order to make up the levels a concrete ring beam will be installed to the top of all three sections of the crane base. This ring beam will also serve to strengthen the brick foundations. The ring beam will be separated from the brick by plastic sheeting, thus preventing the concrete bonding with the brick. The addition of the ring beam will therefore be completely reversible.

As stated in Eastern Goods Yard Context and Interpretation Strategy surface mounted plaques will be used to identify reinstated heritage features. It is proposed that a single circular plaque, made of embossed metal, is used to inform the public about all three heritage items. The location of this plaque has been chosen as the centre of the central, circular section of the crane base. The location chosen is both practical, being away from the door way of the Western Transit Shed retail entrance allowing people to linger, and functional significantly. As stated in Section 4 of this document the functioning of the crane explains the arrangement of the cluster of heritage elements.

A method statement in relation to Crane Base 1 can be found in Appendix 6.

### **Turntable B**

The following drawings outline the proposals for reuse in relation to Turntable B and are submitted for approval:

- 308/07 LD9972\_P02 – Turntable plan layout
- 308/07 LD9973\_P01 – Turntable sections

The heritage structure itself will be refurbished off site by a specialist heritage engineering contractor; Shepley Engineers Ltd who have been engaged on the King's Cross Central development to refurbish Gasholder No. 8.

The structure of Turntable B will be sweep blasted to remove any lead paint. Only at this point will a full structural assessment be possible. A full condition survey will then be produced detailing any repairs required and the associated methodology.

From an initial visual inspection it is not envisaged that any cast iron components will need to be repaired. Of the wrought-iron elements cracks and splits have been noted in several members which may require repair, and there is evidence of significant corrosion in places. However the extent of repairs required will not be known definitively until the sweep blast is completed.

Where repairs require the insertion of new elements, these will be formed with the equivalent section in low carbon steel (Grade S275). Fixing methodology can be found in the method statement contained within Appendix 6.

Once repaired the structure will be cleaned, primed and painted. The current proposal is to repaint the structure (excluding the rails) RAL 8011, chestnut brown. This colour has been chosen as it resembles the rusting colour the turntable would have had. It is also suggested that, when lit, RAL 8011 will articulate the structure.

The rails on the top surface of the turntable will be left unpainted, thus matching the reused rails across the rest of the Eastern Goods Yard. (Note: the reuse of rail tracks pursuant to condition 5 of 2007/5228/P was approved under the previous application 2011/3451/P)

The design team has looked for comparable uses of the turntables in the public realm. The most relevant example found was in Hull (see Image 11).



**Image 11:** Reference image. Reuse of a historic turntable within the public realm in Hull.

As mentioned in Section 1 of this document two turntables were uncovered as part of the Eastern Goods Yard works. The design concepts for the reuse of both turntables has been much discussed.

A concise summary of the design development to date was included in the *Eastern Goods Yard Heritage and Context Interpretation Strategy*. This was submitted to the London Borough of Camden in relation to Condition 20 of Reserved Matters Consent 2007/5228/P. The application (2010/6712/P) was determined on 31<sup>st</sup> January 2011

The Eastern Goods Yard Heritage and Context Interpretation Strategy stated (p27, the paragraph numbering below has been included for clarity.):

*"Several broad ideas for the design of the turntables, as a ground surface features, are being considered by the Partnership, including:*

- i. insertion of new timber blocks fitted between the turntable top rails replicating the historical materials that were originally used and have deteriorated over time*
- ii. at least one turntable to include if appropriate non-slip glass viewing panels, lit from behind, which will allow visitors and the general public to view the mechanism beneath the surface tracks of the turntable, or as an alternative;*
- iii. removable timber panels that allow access for viewing as well as access for future maintenance work if required*
- iv. The possibility of making one of the turntables turn for demonstrative purposes is also being explored."*

Taking each of the above in turn seems a sensible approach to explaining the proposals for the reuse of Turntable B.

- i. insertion of new timber blocks fitted between the turntable top rails replicating the historical materials that were originally used and have deteriorated over time*

The proposal for reuse has moved away from the use of timber blocks and instead timber planks have been included for the following reasons:

- The use of timber blocks externally was explored. Similar wooden blocks (50mm cubes) were specified and installed within the 'covered street' of the University of the Arts building, directly to the North of Granary Square. The covered street represented a semi-controlled environment (temperature range from +10°C to +30°C). Even within this environment there were problems with the expansion and contraction of the individual wooden cubes and aggregate movement was a significant issue. To mitigate this 0.6mm gaps (a gap proportional to the block size and temperature range) were introduced between each and every blocks.

Given this experience it was felt that the use of wooden blocks in an external, uncontrolled environment would pose significant problems with aggregate movement. This could lead to the 'popping' of block. The mitigation measure (introduction of significant gaps) would pose freeze/thaw problems; with water penetrating the gaps, freezing and potentially loosening and lifting the blocks.

- There is some dispute as to whether wooden blocks are the historically correct surface finish. Records suggest that the original surface of Wilds Patented Turntables were covered in planks rather than blocks (see Image 5 reproduced in Section 4 of this document). As such it is felt that the use of planks, orientated to match the available historical evidence, would be appropriate.

The timber planks will be tongue and groove jointed. They will be resin fixed to a stainless steel frame. The frames will be measured to suit each opening on the surface of the turntable once the structure has been refurbished. The stainless steel framing will be visible on the surface of the turntable. Stainless steel has been chosen to contrast with the heritage structure; providing clear visual demarcation between the heritage item and the contemporary insertion.

The panelised timber will be clamped to the heritage structure of the turntable. None of the panel fixings will be permanent, or permanently alter the cast-iron structure (there will be no bending of, or holes drilled through, the structure.)

However in order to fit the depth of the panelised timber (60mm) to all corners of the turntable the proposal is to remove some limited elements of the heritage structure. See Appendix 5. These are sloping elements to the web of the inside flange of the tracks. If left in place, would prevent the framing reaching the corners of some sections. These elements will be carefully removed by Shepley Engineering Ltd using an abrasive wheel.

Two options were considered, and discounted, which would avoid the need to remove the sections in question:

- Cutting back the timber and frame to the outer edge of the sloping element to create a notch in the timber panel. However this would lead to a sloping void in the surface susceptible to water pooling and forming a potential trip hazard.
- Removing the stainless steel framing from the section adjacent to the sloping element and cutting a sloping rebate in the timber. This would allow the timber to butt up to the primary rail, thus hiding the sloping member. However the rebate would need to feather out to meet the surface of the turntable, creating a unsightly, unstable slither.

Finally it is proposed to insert a timber strip to the void between the outer casing and the turntable top. As the two members are differentially circular, this gap is not consistent. As such a malleable medium which can be crafted to suit the void is

considered to be the best solution. Timber will also match the pallet of materials used on the turntable surface.

- ii. *at least one turntable to include if appropriate non-slip glass viewing panels, lit from behind, which will allow visitors and the general public to view the mechanism beneath the surface tracks of the turntable*

Two panelised sections of glass will be included in the surface of the refurbished Turntable B. These will be panelised with a framing system of stainless steel; identical to the timber panels as described above. In doing so a consistent language identifying contemporary insertions is established.

The centre and south panels will glazed. This orientation was selected as it allows members of the public to see the central shaft and portions of the hubs, spider and wheels. This view of the mechanism allows the design/movement of the turntable to become comprehensible. It also allows members of the public who wish to avoid walking on the glass 'floor' to do so; the main desire lines being north-south in this location towards the Western Transit Shed retail unit door.

The glass will be capable of taking pedestrian traffic only. It will feature a slip-resistant dot-matrix pattern. The exact regime of the dots is yet to be established, however two examples have been reviewed by the design team and are included here for reference (Images 12 and 13).



**Image 12:** Spitalfield Market, London



**Image 13:** Exhibition Road, London

Lighting to the turntable mechanism is provided by two spot lights clamped to the turntable structure. The clamps will not damage the heritage structure. The use of clamps, as oppose to fixed lights, also affords the design team the flexibility to position the lights in-situ providing the best light to the heritage elements.

One of the major problems with the use of glass and lights as proposed is that of condensation. The void within the turntable is well ventilated hopefully reducing the risk of condensation. In addition to mitigate the effects of condensation obscuring the view through the glass the four smaller 'corner' wooden panels have been designed with top fixings. These panels can be removed by one operative from the estate management company. Once removed a long handled squeegee can be used to remove any condensation.

- iii. removable timber panels that allow access for viewing as well as access for future maintenance work if required*

Due to the presence of the glass as described above, there is no need to include removable timber panels for public viewing. Routine maintenance access to the lights, and access to limited elements of the structure, is via the removable 'corner' panels. For more extensive maintenance all panelised section of the turntable top (both timber and glass) can be unclamped from below. The large panels themselves can then be

removed affording unrestricted access to the heritage structure. The removal of the larger panels would require specialised lifting apparatus.

- iv. *The possibility of making one of the turntables turn for demonstrative purposes is also being explored.*

The rationale for allowing Turntable B to rotate was that by doing so public understanding of the function of the heritage element would be enhanced.

Craddy Pitchers Davidson – specialist heritage engineers – were commissioned to complete a feasibility study into the works required to make Turntable B rotate.

The resultant report is included in Appendix 3.

The above mentioned report noted that significant works would be needed to most elements of the turntable. As such it is argued that the disbenefits, in terms of destruction to the heritage fabric of the turntable, far outweigh the benefits gained in terms of public interpretation. The arrangement of tracks leading to the turntable, the contrasting timber of the turntable top against the surrounding hard landscaping, combined with the available views to the mechanism included in the proposal at hand mean – it is argued – that the function of the turntable is clearly established without the need for the turntable to physically rotate.

A method statement for the proposed works to Turntable B can be found in Appendix 6.

### **Capstan B**

The following drawing outlines the proposals for reuse of Capstan B and is submitted for approval:

- 308/07 LD9939\_P02 – Capstan detail

The Capstan B box is to be reintroduced into the public realm in the location from which it was removed. Unfortunately the box is the only element of Capstan B which was found on site; the whereabouts of the hydraulic mechanism and capstan itself (i.e. the spindle) is unknown.

Consideration was given to replacing the Capstan B box with a more complete capstan recovered from a different part of the site. There are clearly interpretive benefits to having a more complete capstan in this location; the items function and relationship to the other heritage elements obviously being more comprehensible with a complete capstan in place. This must be weighed against the disbenefits of complicating accurate historical interpretation of the site. Essentially creating a false record of the site's history.

The proposal in hand attempts a compromise. The box from capstan B, as found on site, will be reinstated. However the proposal is to introduce a replacement capstan of the correct size which has been found on site.

Both capstan and box will be cleaned with a stiff wire brush. Neither element will be painted thus maintaining the patina which has developed.

The capstan will be founded on a mass concrete foundation. A separation membrane will be used to ensure the heritage element and foundation do not permanently bond. Reclaimed (rough top) setts will be introduced to fill the void within the capstan box; these have been used across the Easter Goods yard site to form a heritage language.

A method statement in relation to the reuse of Capstan B can be found in Appendix 6.