King's Cross Package 6
WRB Timber window repairs

					Acceptance on behalf of Network Rail of Sections A1, A2 and B3		
Version	Prepared by	Date	Approved by (Listed Building Manager)	Date	Required (Y)	Accepted by	Date
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Comments and observations

Please note this document has been prepared to describe the Works for the sole purpose to satisfy Town and Country Planning Act and is a support document to form a fully developed WPP.

The following Architectural Specifications and documents have been referenced throughout this document:

JMP Architectural Specification C51 Repairing/ Renovating/ Conserving Timber ENG-SPE-G5-OAP-KX6-CBSA-1016

JMP Architectural Specification L40 General glazing issue 2 ENG-SPE-G5-OAP-KX6-CBSA-1064

JMP Architectural Specification Z10 Joinery ENG-SPE-G5-OAP-KX6-CBSA-1140

JMP Architectural Specification M60 Painting/ Clear finishing ENG-SPE-G5-OAP-KX6-CBSA-1077

JMP Architectural Specification C50 Repairs for metal work ENG-SPE-G5-OAP-KX6-CBSA-1014

JMP Salvage strategy ENG-REP-JMP-G5-PA-SWNS-00006 rev 02

Consents for discharge via this document and other relevant documentation and drawings is Consent 2006/3394/L Condition 20 bi) and bii)

1 Introduction

Network Rail is in the process of redeveloping the Grade 1 Listed King's Cross Station. Planning and Listed Building Consent were approved by London Borough of Camden in November 2007 subject to a Section 106 Legal Agreement.

2 Scope of Works

As part of the Package 6 works all windows that are identified in the JMP Repair Schedule (ENG-SCH-G5-OAP-KX6-CBSA-4058) are to be repaired in accordance with Architectural Specifications C51, Z10, M60 and L40 or salvaged in accordance with the John McAslan and Partners Salvage Strategy (ENG-REP-JMP-G5-PA-SWNS-0006). The Repair Schedule gives a description of the repair work that is to be carried out. There are numerous types of windows identified within the Western Range. Furthermore each individual window requires different repairs and extent of repairs. The typical repairs that are to be undertaken on the windows are as follows:

- Minor resin repairs using Window Care products
- Splice-in timber repairs
- Replace whole damaged sections eg. Cills
- Replace whole casements/ sashes to match existing
- Overhaul entire window

3 Preparation works

Before the timber windows can be repaired an amount of preparatory work must be undertaken to allow access to the window. The preparatory work includes the removal of secondary glazing, removal of louvres/ fans and the removal of iron mongery.

At present secondary glazing is fixed to the interior timber panelling of the window reveals that is of heritage interest. Where timber panelling is not present the secondary glazing is fixed directly to the masonry window reveals. Secondary glazing is to be removed causing as little damage to the timber panelling or existing masonry as possible. The expected method for removal is to unscrew the frames and cut out mastic to release the secondary glazing.

Where glass panes have been replaced with fans/ louvres – particularly in existing kitchens and toilets they are to be replaced with glass to match existing. The fans/ louvres are to be removed causing as little damage to the surrounding window frame as possible.

Existing iron mongery eg. Latches/ hinges are also to be removed to allow repairs to be undertaken. Taylor Woodrow will ensure that iron mongery is removed carefully from each element to be refurbished. Taylor Woodrow will also ensure that all screws and fixings are carefully bagged up and notated as to the correct element number and location for re-fixing purposes as per C50.3106.

4 Methodology

4.1 Survey

A detailed survey is to be undertaken before repairs are undertaken in accordance with C51.2207. The survey will provide the following information:

- Detailed measured drawings
- Identification of the type of original timber species used in the original existing windows.
- Identification of any original metal work, iron mongery and any other accessories and record.
- Identification of areas of decay both externally and internally and remove paint around these areas for further inspection.
- Drawings from the survey are to be issued to Network Rail for record purposes.

Following the survey the specialist contractor will submit a report to NR setting out their recommendations in respect of repair and renovation of all listed areas/ elements as areas become available and work progresses. The report will include a written description of the surfaces concerned including condition, conservation processes, techniques, materials and any discoveries of historical interest. The report will also include photographs taken prior to commencement and at regular intervals during the works.

The survey will also be used to determine the method of deconstruction (if required) suited to each window. Secondary glazing will have been removed to allow access to the original window construction. Architrave and panelling will be removed if required to release the window~~for protection,~~ and then the staff bead will be removed to release the bottom sash. The bottom sash will be lifted out, along with sash cords and weights and then the parting bead will be removed to release the top sash. The top sash will be lifted out with the sash cords and weights. Folding wedges will be removed to release the box sash frame and any mortar/mastic will be cleaned off.

4.2 General notes

The general method adopted for the works will be to undertake joinery repairs prior to priming and painting. Where timber is required to make repairs eg in a splice repair TW will, where possible, endeavour to use

timber that has been salvaged elsewhere on site providing that it matches the existing timber in accordance with BS EN 13556.

Wherever possible, windows will be repaired in-situ particularly where frames are built in and can not be removed without damaging either the window or surrounding masonry. Where this is not possible windows will be removed carefully from the inside as per the method explained above. Repairs will be undertaken in the same room as where the window will be removed to minimise any risk of damage during transit. As much cutting and machining of timber as possible will be carried out before treatment. If any timber is sawn, ploughed, planed or otherwise extensively processed in any way to allow the repairs to be undertaken the timber will be re-treated as per Z10.1202.

Temporary water proofing will be provided when whole windows or sections of windows are removed for repair. The waterproofing will be in the form of hardboard, corex sheeting and adhesive.

Where decayed timber is to be removed to form a splice repair, the minimum amount of existing timber will be removed to allow an effective repair to be formed. TW will always work new material to the line of the existing and avoid unnecessary trimming of the original timber. Repairs will follow any existing profiles/ deformations in the line of the window. When carrying out a repair, TW will ensure that the structural integrity of the window is maintained and that on completion of the repair, the window continues to work as originally designed.

Spliced repairs will be designed to ensure that moisture is directed towards the external face of the timber and that moisture does not lay in the repair joint. The length of splice will be governed by the section of timber and the nature of the component being repaired. The splice will be designed to ensure an effective bond between the new and existing sections of timber. Splice repairs will also be formed using mechanical methods eg. Timber pegs, dowels or non ferrous screws or pins and waterproof glue and fixings will be inserted from the inside face of the window and pelleted.

Where possible, TW will make every attempt to retain existing cylinder glass. The type of putty used on the windows will match the existing using linseed oil to BS 544. During painting of windows adequate protection will be provided to adjacent surfaces as per M60.3501. Any splashes resulting from the work will be cleaned from all surfaces affected.

Operatives will be verified as being suitably competent to undertake the intricate sequence of heritage window repair through the Package 6 site induction and regular task briefings. All access for operatives working externally will be provided by fully sheeted scaffolding.

Upon completion of the work, chips, cracks, discolouration etc will be made good or replaced if they can not be adequately cleaned or repaired as per M60.3501.

Descriptions of the specific repairs required are below:

4.3 Minor resin repairs using Window Care products

Window Care resin will only be used to repair minor holes in timber (typically <50mm) and for the sealing of end grain and unprotected sides as per C51.3109. The Window Care resin is to be left to dry completely before finishing.

4.4 Splice-in timber repairs eg. Replacement/ repair of window sashes and replacement/ repair of sash boxes

Decayed areas will be cut out and a sloping splice designed to give optimum area of surface will be glued whilst ensuring that moisture is directed away from the glazing line. The joint between new and existing timber along the line of the sloping splice will be undercut to direct moisture towards the outer face.

4.5 Replace whole sections eg. Mullions and glazing bars

For wholesale replacement of mullions, tenons will be cut out to remove the element. The remaining tenon with mortice at both ends will then be removed. The new mullion section will be fixed to match the profile of the existing and slip tenons pegged and glued will be used within the existing mortices.

To replace glazing bars, the decayed tongue will be removed to form a groove in the main body of the glazing bar. The new tongue will be fixed by gluing and pinning in to the groove. If the decay is significant through the depth of the glazing bar, the area of decay will be cut out and replaced through the section of the glazing bar using splayed splices, pinned and glued.

4.6 Replace whole casements/ sashes to match existing

If the bottom rail of sash has been significantly decayed the wedges will be knocked out from the sash stile to enable the rail to be removed. If the wedges can not be knocked out TW will carefully drill out the wedges ensuring that damage is not caused to other parts of the timber. When the wedges are free the area of timber beneath the existing tenon will be removed to allow the wholesale removal of the bottom rail.

TW will supply and fix the new rail with anti-capillary drip to match the existing profile. The tenons will be replicated and inserted in to the enlarged mortice of the sash stile.

To the base of the sash stile, the decayed areas will be cut out and a sloping splice designed to give the optimum area of surface will be pieced in whilst ensuring that moisture is directed away from the glazing line. The joint between the new and existing timber along the line of the sloping splice will be undercut to direct

moisture towards the outer surface of the sash stile. The splice will be fixed from the inner face using timber pegs. If it is not practical to use timber pegs then brass screws will be used.

Any anti-capillary drip along the bottom edge of the new splice will be reformed.

To the bottom rail/ base of sash stile, TW will remove the glazing and fix a splayed splice joint with an undercut and step to give an optimum surface area for gluing/ fixing and to ensure that moisture is directed away from vulnerable areas towards the outer face of the window.

4.7 Overhaul entire window

Sash cords will be replaced using waxed cords whilst ensuring that weights move correctly on completion. Broken or decayed parting/ staff beads will be replaced to match existing. Paint will be removed from the rebates before being primed and decorated to a snug fit for parting beads.TW will ensure that sashes align and any retained casement fastener works correctly on completion of repair and pivots. To casements and pivots TW will ease and replace any defective window hinges to ensure a smooth opening.

5 Labelling and protection strategy

Where windows are to be dismantled as part of the repair process TW will label and record the constituent parts before dismantling. Glass panes will also be numbered before removal for record purposes. When window sections are removed they will be transported to the on-site heritage storage facility in accordance with the JMP Salvage Strategy (doc ref: ENG-REP-JMP-G5-PA-SWNS-0006). Please see previously issued Proposal for labelling and protecting Salvage items LBMS (doc ref: KXP6-N374-LBMS-WRB-00005). As the item is placed in to the site storage facility the heritage item database will be populated with all the relevant information. Timber will be kept dry during transit, storage, lifting, erection and fixing and care will be taken to not overstress, distort or disfigure sections or components as per C51.2205. The storage facility will be covered and clear of the ground with good ventilation as per C51.2205. When the storage facility has enough items for transportation to Network Rail's storage depot DHL will be notified to collect them. The items will be loaded straight on to the DHL vehicle with their unique reference number added to TW's database. Before leaving site DHL will sign for the items to take responsibility for their well being.

Regular tool box talks will be carried out to ensure all operatives understand the importance of heritage items and the systems TW have put in place to protect them.

6 Control and precaution measures

6.1 Competency of sub-contractor

TW will ensure that the window sub-contractor selected for the work has relevant experience in repairing sash timber windows and working with Grade 1 Listed Buildings. The sub-contractor will appoint a nominated

specialist that will supervise the works and report daily to TW management on progress and any issues with the work. Company portfolios will be submitted to Taylor Woodrow at the same time that tenders are returned to enable TW to make an assessment on relevant experience and quality of other work. Company portfolios will also be issued to NR and JMP for consultation.

All sub-contractors on the Taylor Woodrow supply chain for the King's Cross Package 6 Works have been approved by NR and a list of potential sub-contractors has also been issued to JMP.

6.2 Hold points

An Inspection and Test Plan (ITP) will be implemented to monitor quality throughout the repair process. The ITP's will ensure that every aspect of the work is monitored and that the correct process is followed.

The specialist supervisor will inform TW management when a section of work is completed. On satisfactory completion TW management will invite NR/ JMP to inspect the areas to ensure that the work has been completed to the required standards and quality.

6.3 Test samples

A number of window repair trials will be undertaken at various locations around the Western Range Building as per C51.1104 and C51.1301. The purpose of the trials is to highlight any potential problems TW could face in the main work with regards to proposed methods, processes and techniques to be employed. The trials will also set a benchmark that the main work can be set against. These areas will available for inspection when complete.

7 Timber suppliers

Timber used during repair work will match the existing timber in accordance with BS EN 13556 if possible. Taylor Woodrow will ensure that all timber or timber based products are sourced from an approved country or region and will provide NR with documentary evidence regarding the provenance of timber supplied on request as per C51.2202. No timber will be supplied from tree species that are included in the current editions of Appendix I and II of the Convention on International Trade in Endangered Species (CITES).