

NORTHAW HOUSE, COOPERS LANE, POTTERS BAR EN6 4PS**RESTORATION PLAN**

Document Title	General Repairs & Specification
Document Reference	D101

This document to be read in conjunction with all other documents listed within the Restoration Plan's Contents page.

SCHEDULE OF WORKS FOR RESTORATION

NORTHAW HOUSE

GENERAL REPAIRS AND SPECIFICATION RESTORATION SCHEDULE

6717

NOTES:

- 1 Specification:
All items are to be carried out in accordance with specification even where not expressly mentioned.
- 2 Preliminaries:
The cost of preliminaries is to be shown at the relevant items and is assumed to include Contractor's profit.
- 3 Prices to be all-in:
Prices for items of work in the Schedule must include for all site operations, materials and workmanship, to complete the work in accordance with good current building practice.
- 4 Problems, discrepancies:
Preliminaries, pre-amble trade clauses, Schedule of Works and drawings are to be read together. The Architect in charge is to be notified immediately of any discrepancy found before work is put in hand.
- 5 Drawings:
All items are to be read in conjunction with all associated schedules and drawings.

This specification is prepared as a supplementary document to provide detail of provisional repairs. Including **Specification Conservation Clauses** in respect of **materials** and **workmanship** clauses.

Ref.	Existing	Proposed Works	
1.		Internal Preparation	
1.1.	-	Fixtures & Fittings. Strip out all loose fixtures and fittings. Any built in furniture, panelling, cornices and joinery are to be retained.	
1.2.	-	Services. Strip out all services and plant and retain voids and chases for new services. Where making good is to be undertaken, this is to be done in accordance with repairs.	
1.3.	-	Lining Papers. Due to the high level of damp and mould throughout the building on lining papers, all lining papers are to be stripped. All finishes are to be assessed for further damp as section 11	
1.4.	-	Existing Joinery. Utilising Keim Algicide Plus clear all existing joinery of black mould and algae build up, in preparation for future decoration.	
1.5.	-	Lead Paint. There is evidence of lead based paint. These are to be sampled and where found are to be cleared using 'Peelaway 1' in accordance with manufactures guidelines.	
2.		Floors	
2.1.	-	Parquet Floors. Where parquet flooring is loose, lift specific blocks, consolidate underside of blocks and glue fix to substrate.	
2.2.	Timber boarding, good condition, some repair required.	De-Nailing. All existing timber floorboards are to be de-nailed, using nail nippers.	
2.3.	-	Floorboard Repairs. Lift all the rotten floor boarding and dispose offsite. Where sections of floorboarding are rotten cut out rotten boards to an extent of 300mm beyond rot. Replace with 19mm x 225mm half lap jointed random length, 'character' grade, planed, seasoned Oak floorboards, span to match existing. Fix to joists using 'cut' floorboard nails. Pugging between floor joists to be left in situ.	
2.4.	Timber studwork, some finishes, with live and loose plaster (exposed to weather)	Rot. Where dry rot is been identified. All affected timbers are to be removed. Full extent of impact of rot is to be cleared and adjoining timbers to be also stripped. All adjacent areas of woodwork to be treated with 2 coats of Cuprinol 5 star treatment.	

		<p>Affected brickwork is to be spray treated using Lignum Masonry Biocode ProM50 fungicidal microemulsion. Where necessary brickwork is to be cut out and replaced with Launceston multi bricks laid in a 1:3 NHL 3.5 to sharp sand.</p> <p>All affected timbers to be replaced with like for like dimensioned and profile oak. Fixings to be made in accordance with typical details, using half lap joints and M12 coachscrew and washer fixings. Where new timbers are to be partnered adjacent to the retained timber. These are to overlap by 0.5m and be bolt fixed to each other.</p> <p>All new timbers to be construction grade and treated for resistance to moisture.</p> <p>In association allow for cutting out rotten studs at their base and fixing new tennon joints. New timbers to be like for like dimension and profile and half lapped with retained timbers.</p> <p>Affected floorboards to be removed and replaced in accordance with item 2.3</p> <p>Where structure is removed ensure for adequate propping throughout works and any extensive movement</p> <p>Full extent of rot is to be assessed after full exposure. If a greater extent is required a supplementary listed building condition discharge may be required for additional works.</p>	
3.		Walls	
3.1.	-	Existing Gypsum Plaster. Where to be removed modern plaster and any modern, proprietary laths and dispose of all.	
3.2.	-	Existing Lath & Plaster. Where failing, carefully remove lime plaster to a solid edge and cut away any failed or loose laths.	
3.3.	-	Paint Stripping. To internally exposed brick walls Using Sudbury Strippers Klingstrip remove all paint from brickwork and leave walls exposed to 'dry' before applying finishes.	
3.4.	-	New Plaster on Solid Walls. Exposed solid walls are to be plastered using Best of Lime Warmocote with plaster mesh and a top coat of Best of Lime Limecote.	
3.5.	-	New Plaster on Timber Frame Walls. To existing lime plaster walls, where plaster and lath have been partially removed fix chestnut split lathing and plaster in one coat of Best of Lime Limecote plaster. Include	

		<p>for reskimming the entire wall to avoid a cracked junction and imbed plaster mesh with limework.</p> <p>Exposed timber frame walls are to be clad in 25mm Heraklith board and plastered in one coat of Best of Lime Limecote plaster.</p>	
3.6.	-	<p>Existing Panelling. Exposed panelling repairs to be undertaken in softwood, to match the existing timbers. Any mouldings to be templated from the existing panelling and spliced into existing mouldings.</p> <p>Where panelling is found within walls, the conservation officer is to be informed to allow for a decision on future detailing.</p>	
3.7.	-	<p>Timber Treatment. As exposed all timbers are to be treated using 2 coats of 'Cuprinol 5 Star Complete Wood Treatment.' To be applied according to manufacturer's guidance.</p>	
3.8.	-	<p>Provisional Timber Frame Plate Repairs. Allow for linear repairs like for like dimensioned oak. Coachscrew and half lap as soleplate detail on drawing 30. Associated Include for 40 half lap joints and 50 new tenon fixings as detailed on typical timber frame repair details.</p>	
3.9.	-	<p>Provisional Timber Frame Stud Repairs. Allow for cutting out defective timbers up to 1m lengths and piece in new oak timbers, to suit existing dimension. Fixings to be undertaken as typical timber frame repair detail. All fixings to be countersunk and pelleted.</p>	
4.		Ceilings & Roofs	
4.1.	-	<p>Finishes of ceilings are subject to necessary acoustic and fire lining details.</p>	
4.2.	Timber boarding, good condition, some repair required.	<p>Existing Gypsum Plaster. Remove all modern plaster and any modern, proprietary laths and dispose of all. Where lime plaster is under existing gypsum this is to be retained where it is found to be in good condition. Making good of limework underneath to be undertaken using Best of Lime Limecote plaster, to patch repairs and skim coat finish if required.</p>	
4.3.	-	<p>Existing Lath & Plaster. Lath and plaster ceilings are to be removed due to the penetration of damp and mould.</p>	
4.4.	Timber Stairs, with some rotten treads.	<p>New Ceilings. Clad all ceilings in 25mm Heraklith Plus board and plastered in one coats of Best of Lime Limecote plaster.</p>	
5.		Joinery	

5.1.	-	Stair Treads. Remove loose and broken treads and risers. Replace with new oak treads and risers to match the profile and dimensions of the existing. To the underside re-fix hardwood bearers and blocks glued and screwed to the main stair structure.	
5.2.	-	Skirtings & Architraves Existing. Where skirting is defective. Carefully cut away damaged woodwork, template the existing adjacent woodwork and splice in new to match. Where skirting and architraves are missing new joinery is to be templated from the same room and affixed. Holes in skirting and architraves. Replacement timber to be cut to fit holes and be fitted, glued and gaps around to be filled using woodfiller and sanded in readiness for decoration.	
5.3.	-	Windows. Window repairs to be as window schedule.	
5.4.	-	Splicing & Repairs: All typical repairs are to be undertake in accordance with the SPAB Technical Advice note on the Repair of Wood Windows.	
5.5.	-	Resin Repairs: Using Repair Care Dry Flex 16 (for all repairs without time constraints), Remove all decay and ensure timber moisture below 18%. Pre treat the timber with Dry Fix Uni. Apply Dry Flex 16 part A and part B as manufactures instructions and apply to the affected area immediately, clearing away all excess product. Any application to match the existing/removed/adjacent profiles. One cured; lightly sand the area before decoration.	
5.6.	-	Replacement Glazing: All removed glazing to be replaced with slimlite glazing where existing timber allow. Where existing glass to be -used this is to be reinstalled in accordance with specification clauses NX1.	
5.7.	-	Draught Strips/Brushes: Windows to be draught proofed and new brushes installed in accordance with details included within the Historic England Draught-proofing Windows & Doors publication Figure 7.	
5.8.	-	Ironmongery: All existing ironmongery to be re-used where possible. Where new ironmongery is required,	
5.9.	-	Where Window sashes, casements and shutters are painted shut. Gently score the junctions using a sharp knife to break seals. Paint to be scraped from woodworks and cleared using Klingstrip paint stripper.	
5.10.	-	Shutters. Where shutters are rotten. Remove rotten sections and splice in new softwood timbers. All	

		mouldings to be templated and replicated. Rebates and timber sizes to match existing.	
5.11.	-	Doors. Door repairs to be as door schedule.	
		SPECIFICATION CONSERVATION CLAUSES	

FX1 Materials for Conservation

- 100 LIME PUTTY
- Shall be matured lime putty as manufactured by Bleaklow Industries Ltd, Bakewell, Derbyshire, Tel: 01246 582284, fax: 01246 583192, complying with BS EN 459-1:2010.
- 101 HYDRATED LIME
- Where specified shall be fresh, dry hydraulic lime, as clause FX1/103.
- 102 QUICK LIME
- Where specified shall be fresh white (high calcium) quick lime or grey (feebly hydraulic) quick lime or as specified to BS EN 459-1:2010.
- 103 HYDRAULIC LIME
- Shall be either Singleton Birch lime, strength NHL 2.0, 3.5 or 5.0 as otherwise specified, BS EN 459-1:2010 and supplied by:
 - Anglia Lime Company, P.O. Box 6, Sudbury, Suffolk, CO10 6TW
Tel: 01787 313974.
 - Between Time, Bachelors Hall, Stanstead Abbot, nr. Ware, Herts, SG1 8AB
Tel: 01920 877822.
 - Bulmer Brick & Tile Co Ltd, Brickfields, Bulmer, Sudbury, Suffolk, CO10 7EF
Tel: 01787 269232.
 - Hendry & Sons: Station Road, Foulsham, Dereham, Norfolk, NR20 5RG
Tel: 01362 683249.
- 120 SAND
- Naturally occurring washed and graded clean sharp iron rich pit sand, free from impurities and in accordance with BS 1199 & 1200: 1996 table 1.
- 130 AGGREGATE
- Natural aggregates will be added to the sand to improve match with the existing material. Aggregates may be obtained from natural sands, gravels, brick, shells, chalk or flint, as appropriate.
- 140 WATER
- Must be clean, fresh and from the piped main.
- 150 COARSE STUFF MORTAR
- Must be carefully batched as coarse stuff gauged and mixed in accordance with best current practice. Additives shall not be used. Coarse stuff must be left for a minimum of 48 hours before knocking up for use and gauging with additives where specified. Mixing shall preferably be carried out by one man to produce consistent results.

FX2 Re-Pointing Brickwork

- 200 RAKING OUT
- Rake out joints to twice the thickness of the joint or 30mm, whichever is the greater, using pointing chisels. Backing is to be kept square and clean, and the brick arises are to be clean and proud of the mortar joint.
- 210 PREPARATION
- Wet the backing to clean out the joint and prevent suction, using clean water.
- 220 MORTAR MIXES
- Shall be specified from one of the following:
 - 1:3 – matured lime putty/coarse sand. Mix with added grit, stone or brick dust as specified (pre mixed/bagged material from Bleaklow may be used).
 - 2:5 – matured lime putty/coarse sand. (Weathered/exposed surfaces).
 - 1:3 – hydraulic lime NHL 3.5/coarse sand (core work, winter work).
 - 1:2:9 – cement/powdered lime/coarse sand (select modern work, only as closely specified in the schedule).
 - 1:3:12 – cement/powdered lime/coarse sand (select modern work, only as closely specified in the schedule).

FX3 Rebuilding Brickwork

- 300 RE-USE OF BRICKS
- The type of bricks required are specified in the Schedule of Works. In facework, the re-use of existing bricks will be permitted only if these are sound and fit for their purpose.
- 310 BOND
- All brickwork is to be rebuilt in the existing bond and with matching coursing.

GX1 Conservation Carpenter**MATERIALS**

- 100 PRESSURE IMPREGNATION
- With the exception of boxed oak heartwood, all new wood is to be pressure impregnated against attack by wood boring beetle and wet and dry rot fungi, using the "Protim 418" or equivalent, double vacuum method, high hazard cycle for roof timbers (medium hazard cycle for joinery and works accessible from ground level). Comparable treatments may be acceptable subject to written confirmation of comparability.
 - Treatment to all timbers to be decorated (eg: exposed roof boarding) must be non-water repellent grade and steps must be taken to protect from weather on site.
 - All cut ends must be treated with similar preservative prior to fixing in position.
 - Certificates of pressure impregnation are to be retained for inspection by the architect.
 - Tiling battens may be tanalised as an alternative to the treatment outlined above without the need for confirmation of comparability.
 - All timber is to be air dry (25%) before incorporation in the work.

- 110 OAK
- Unless otherwise specified, oak shall be minimum 5 year seasoned English oak with a maximum moisture content of 12% to comply with BS 7359 1991. Two to five year seasoned material will only be permitted with the express approval of the architect/surveyor. All oak is to be free from shakes, splits, dead knots and other natural defects and fit for its purpose.
- 120 SOFTWOOD
- Softwood should comply with BS 7359 1991 and shall be pressure impregnated European Redwood or Douglas fir with a moisture content not exceeding 12%, free from natural defects and fit for its purpose.
- 130 OLD TIMBERS
- The re-use of any timbers in new positions shall not be permitted without the express consent of the architect/surveyor. No timber is to be rejected from the site without the architect/surveyor's approval.
- 140 BOLTS
- Nuts, bolts and timber connectors etc. shall be stainless steel.
- 150 SCREW FASTENINGS
- Screw fastenings shall be brass or stainless steel natural finish in tower and concealed areas, and polished where visible in all other areas or stainless steel, as specified BS1210.
- 160 NAIL FIXINGS
- Nail fixings shall be stainless steel or non-ferrous, as specified BS 1202 and BS EN 150 3506-1:2009.

WORKMANSHIP

- 170 TREATMENT OF EXISTING TIMBERS
- Where specified in the schedule of works clean by natural bristle brush and drench all timbers with "Protim 418" or equivalent preservative fluid using a low pressure high volume spray and applying it in strict accordance with the manufacturer's instructions.
 - Check all timbers for signs of beetle infestation, dry rot and wet rot and notify the architect. No timbers are to be removed without the architect/surveyor's consent.
 - Where existing timbers are decorated, no treatment is to take place without the architect/surveyor's approval.
- 180 WALL PLATES
- Remove debris from rear face of wall plates and drill rafter feet as necessary to allow free ventilation to concealed timbers. Maintain a minimum air space of 12mm between plates and gutters.
- 190 SCARF JOINTS
- Scarf new ends to defective rafters where specified using new matching timber. Length of scarf to be two and a half to three times the depth of the timber member. Saw cuts to be straight and level, returned each end as shown in sketch detail. Bolt through joint at least four times, perpendicular to the scarf, staggering holes to even out the stress on the grain. All cut ends to be brushed or sprayed with timber preservative to the point of saturation.
- 200 TENONS

- Shape new tenons to allow slight play, whilst forming shoulders to make a tight fit in the morticed member. Tenons are to be drilled separately from mortices to allow for tightening of the joint as the peg is inserted.
- 210 PEGS
- Re-peg exposed joints where specified using new beech or oak octagonal tapered pegs dry, dry to 10% moisture content, at least one and a half times the length of the peg hole and cut flush only where necessary to fix overlying timbers.
- 220 ROOF BOARDING AND DECKING
- Where specified, re-board all re-roofed areas using impregnated softwood tongued and grooved boarding. Board size to match existing and to be stained on the underside as necessary to match existing. All nails to be punched below the surface of the boards to prevent damage to sarking felt. Where complete replacement is specified, boarding is to be 25mm x 150mm finished thickness, impregnated by "Protim 418" or equivalent high hazard cycle, non-waterproof grade, and must be air dry before applying further layers or membranes.
- 230 REPAIRS TO SHAKES
- Fill large shakes and splits with a mix of cascamite and sawdust where specified. Normal mix 5 parts Cascamite to 1 part sawdust by volume.

HX1 Conservation Leadwork

MATERIALS

- 100 FLASHINGS
- Shall be code 5 (red colour coding) milled lead strip to BS 1178: 1982, unless otherwise specified.
- 110 LEAD ROOFING SHEETS AND GUTTER
- Shall be code 7 English sand cast lead or, and only if specified in schedule of works, code 7 milled lead to BS 1178: sheets 1982.
- 120 UNDERLAY FELT
- Felt for underlay is to be as BLM standard underlay, British Lead, Peartree Lane, Welwyn Garden City, Hertfordshire, AL7 3UB. Tel: 01707 324595, email: sales@britishlead.co.uk.
- 130 SEALANT
- Mastic pointing sealants where specified in schedule of works and drawings shall be two part polysulphide based sealant to BS 4254 (1991) or single part polysulphide sealant to BS 5215 (1986)
- 140 COPPER CLIPS
- Copper clips for fixing should be min 50mm wide, cut from min 0.6 gauge sheet to BS 2870 (1980) temper grade ¼mm. Exposed faces to be tinned.
- 150 NAILS AND SCREWS
- Nails shall be copper clout nails with jagged shanks to BS 1202 (1974) part 2 table 2, not less than 25mm long or 10 SWG shank diameter.
 - Screws shall be brass or stainless steel to BS 1210 (1963) not less than 25mm long or 10 SWG.
- 160 SOLDER
- Where required shall be to BS EN 29543 (1994) grade D or grade J.

WORKMANSHIP

200 GENERAL

- 201 - Except where otherwise specified in the schedule of works, lead sheet for flat roofing shall be laid at 1:60 to 1:80 fall.
- 202 - Underlay sheathing shall be laid with joints lapped 150mm.
- 203 - Max bay size for code 7 lead roofs up to 60° pitch shall be 675mm x 2400mm.
- Max bay size for code 7 lead roofs over 60° pitch shall be 600mm x 2250mm.
- 204 - Max bay size for code 5 lead wall cladding shall be 600mm x 2000mm.
- 205 - Wood cored rolls shall be ex 75 x 75 sw, ridge rolls shall be ex 100 x 100 sw unless otherwise specified. Timber shall be pressure impregnated with non copperchrome-arsenate preservative, as Protim 418, Wykamol or similar approved. Splash laps of minimum 50mm shall be used to roll edges for roofs under 30° pitch, upper third of panel to be fixed to rolls with copper clout nails at 150mm centres.
- 206 - Hollow cored rolls shall not be used unless specified in schedule of works.
- Where specified, hollow cored rolls shall be secured at max 500mm centres with 50mm copper clips secured with 3 copper clout nails or brass or stainless steel screws. Undercloak to be turned up 100mm, overcloak 125mm, ends to be lead burned.
- 207 - Drips for roofing shall be min 75mm deep, undercloak to be fixed with copper clout nails at 50mm centres, and rebated into edge of board substrate.
- 208 - Welts and standing seams shall be fixed at max 500mm centres with 50mm copper clips secured with 2 brass or stainless steel screws.

209 UNDERCLOAKS

- For welts, undercloak to be min 25mm, overcloak min 50mm.
- For standing seams, undercloak to be min 75mm, overcloak to be min 110mm.

210 FLASHINGS

- Flashings shall be max 1500mm length with min 100mm laps, turned min 25mm into walls under any damp proof course.
- Flashing shall be fixed by lead wedges at max 450mm centres or by stainless steel screws and washers at 450mm centres, as specified in schedule of works and drawings. Fixing to be in accordance with Lead Sheet Association "*The complete manual – a guide to good practice in the specification and use of rolled lead sheet to BSEN 12588 : 2006*"
- Flashings shall also be fixed with 50mm wide lead clips at max 450mm centres.
- Soakers shall be turned up walls min 75mm and be min 175mm overall width.

220 GUTTERS AND OUTLETS

- Gutters shall be of code 7 cast lead min 100mm deep, laid min 1:80 fall, with min 75mm drips at max 2400mm centres.
- Where specified, rolls and drips in gutters shall conform to the specification for roofing.
- Sumps and cesspits shall be min 150mm deep unless otherwise specified.
- Outlet spigots to plastic rainwater pipes shall be fixed with neoprene rings, to pipe manufacturer's specification.
- Outlet spigots to cast iron or aluminium pipes shall be leadburned to brass thimbles, thimbles to be inserted in downpipe and joint caulked.

- Rainwater chutes shall be of code 7 cast lead, min 100mm x 100mm outlet, to project min 600mm from external wall or as specified; chute sides to be supported on min 10mm diameter copper alloy or stainless steel rods cantilevered from and built into wall; all to approved detail.
- 230 LEADBURNING
- Lead shall not be soldered without express written consent of the architect.
 - All necessary safety precautions shall be taken against damage by fire or explosion to persons, property and buildings when leadburning, as required by national and local legislation.
- 240 SURFACE TREATMENTS AND CLEANING
- No surface treatment shall be given to any leadwork unless specified.
 - Where specified, patination coat shall be applied immediately leadwork is complete and cooled from any leadburning, to Lead Development Association's specification.
 - Where specified, old leadwork shall be cleaned up with Cleaning Gel, to Lead Sheet Association's specification.
 - Where specified, new leadwork shall be cleaned with 5% nitric acid solution to Lead Sheet Association's specification.
- 250 SAFETY
- No leadburning to be done within 2 hours of site closing time: the contractor shall make a careful inspection of the site at the finishing of leadburning and before leaving the site at close of day to check for any evidence of fire.
- 260 HOT WORKING
- Hot working certification procedure shall be used wherever welding takes place on site. The contractor is to establish a procedure with the client for countersignature of certificates.
- 300 UNDERSIDE LEAD PROTECTION
- 301 Surface preparation
- Following preparation and bossing of the lead bay and before final fixing into place, the underside surface should be treated with the passivation coating.
 - The surfaces should be thoroughly cleaned and wire brushed to remove any mill scales, oxidation layers or previously formed corrosion products.
- 302 Application
- The coating should be thoroughly stirred prior to use.
 - It is recommended that one layer of building paper be placed over the substrate wood to allow the roof to breath. This should be taped together, butt jointed and laid beneath the battens. Alternatively, the lead may be laid directly over the boards with no under layer employed or a good quality 'water resistant' geotextile may be used. Note – the geotextile should be tested prior to use to assess its water resistant properties. Non-water resistant geotextiles wick-up rainwater into roof structures by as much as 1 metre.
 - The coating should be brush applied to give a continuous thick coating of between 150 and 200 micrometers. This may require more than one coat, depending upon the environmental conditions at the time of laying. If the lead is to be laid over substrates that may emit organic acids during their life (oak, sweet chestnut, various hardwoods or man-made

boards containing adhesives – plywood, particle board and others) then an increased coating thickness is recommended.

- The chalk enriched coatings may induce a small amount of capillarity of rainwater into the roof under severe exposure conditions. It is recommended that the coating be applied to some three quarters way around the inside of the roll (with or without splashlaps) leaving a 30mm uncoated allowance on the edge. For laps, an uncoated allowance should also be left at the bottom edge as follows:
 - 60° slope 70mm allowance
 - 30° slope 160mm allowance
 - 10° slope 220mm allowance
- Drips and other details should be treated in a similar manner.
- The wood battens may also be coated to further enhance the passivation and protection treatment to the lead.
- The coatings should be fully dried before the panel is finally installed on the roof.
- Heating of the lead in cold weather, prior to application, will reduce the drying time.

303 Post Installation

- Following installation of the lead bays or weatherings all spillages on the top surfaces should be removed using warm water.
- This product should not be used in combination with patination oil. A mixture of these two may result in surface staining and streaking of the topside lead.
- On bright topside lead surfaces the Rowan Technologies patination chalk coating may be used to induce an initial grey patina.

Manufactured by:

- Rowan Technologies Ltd, 216 Church Road, Urmston, Manchester, M41 9DX.
Tel: 0161 7483644, Email: mail@rowantechnologies.co.uk

304 Cleaning

- Brushes and other surfaces may be cleaned in water.

MX1 Conservation Plasterer

MATERIALS

100 LIME PUTTY

- Unless specified to the contrary, "lime" shall be white, high calcium putty lime run direct from quick lime and slaked for a minimum of 30 days. This is to be supplied to site in sealed tubs and kept protected from weather at all times. Quality is to comply with BS 890: 1995.
- Known suppliers include:
 - Anglia Lime Company, Sudbury, Tel 01787 313974.
 - Bleaklow Industries Ltd, Bakewell, Derbyshire, Tel: 01246 582284.
 - H J Chard, Bristol, Tel: 01179 777681.
 - Tilcon Mortars Ltd, Tel: 0171 987 5861.
 - Hendry & Sons Ltd, Dereham, Tel: 01362 683249.
 - Cy-pres, Brigstock, Tel: 01536 373431.

101 "HYDRATED LIME"

- Shall only be hydraulic lime as clause MX1/102.

102 SEMI HYDRAULIC LIME

- Shall mean hydrated lime NHL 2.0/3.5/5.0 as specified and supplied by Blue Lias Company, Singleton Birch or St Astier, available through local suppliers.
- 110 CEMENT
- Should not be used
- 120 SAND
- Shall be washed coarse, sharp sand, dark yellow or brown in colour, complying with the relevant provisions of BS 1199: 1976.
 - Precise colour and selection of sands will be specified in the schedule of works.
 - Sand for finishing coats shall be washed fine sand 50/60 grade.
- 130 GYPSUM
- Shall mean Plaster of Paris, complying with BS 1191: parts 1 and 2: 1973, and shall only be used for skimming plasterboard or running mouldings.
- 140 ADDED GRIT
- Shall mean grit of sufficient size and colour to match existing mortars. Areas for assessment shall be identified on site.
- 150 POZZOLANIC ADDITIVES
- To be clay brick dust or pulverised fuel ash. Final choice to be decided following agreement of sample panels.
- 160 HAIR/ARTIFICIAL HAIR
- Shall be goat hair or cow hair, washed and free from grease and dirt. This should be added at the rate of 7lbs per cubic yard (3kg per m³) of plaster or else as specified.
 - Artificial fibre reinforcement, if used, shall be in alkaline resistance nylon fabric added at the rate of 0.8kg per m³.
 - Suppliers include:
 - Anglia Lime Company (see above).
 - Mike Wye Associates, Tel: 01409 281644.
 - Hairco Limited, Tel: 0208 830 7344.
- 170 MIXING
- Plaster of all mixes is to be properly gauged in boxes, mixed on a board not contaminated with other mixes or on an impervious sheet specially provided for the purpose. Full protection is to be given to surrounding surfaces and all materials are to be kept separate from the mixing area.
- 180
- Standard mix plaster using lime putty is to be mixed as coarse stuff (lime/sand) and left uncovered for a minimum of 20 days before use. It is then to be knocked up and gauged with pozzolanic additives, gypsum or cement where specified, in accordance with the relevant Code of Practice. This is to be left in a cool place, protected from frost and from drying out.

PROTECTION

- 190 FROST
- No mixing or application is to take place at temperatures below 2°C on a falling thermometer or 1°C on a rising thermometer.
 - Coarse stuff which has frozen or dried out is not to be used in the work.
- 200 WEATHER PROTECTION

- Newly executed work is to be protected where necessary from damage by night frost, wind, excessive heat and strong sunlight by sacking or canvas frames applied to the wall surface. The contractor will be held fully responsible for any work which proves to be defective due to inadequate protection and this work will need to be carried out again without cost to the contract.

210 DRYING OUT

- Protect work from excessive drying out during curing, if necessary, moistening the surface by fine water sprays.

220 STORAGE

- Sufficient materials are to be ordered to complete the whole of the project, to prevent visible differences in the colour of finished work caused by batching of material.

230 MIXES

- All mixing is to be in accordance with BS 5262: 1991 (Code of Practice for external rendering) or BS 5492: 1990 (Code of Practice for internal rendering).
- All plaster mixes are specified by volume of the finished mix.

INTERNAL PLASTER MIXES

240 **General conservation plaster repair on lath, 3 coat:**

1st (9mm) & 2nd (6mm) coats: 1:3 (lime putty, sharp sand) with 8kg hair/m³
3rd (3mm) coat: 3:2 (lime putty, silver sand) no hair

241 **18th century plaster on lath, 3 coat:**

1st & 2nd coats: 1:1:6 (gypsum, lime putty, sharp sand)
3rd coat: 1:1 (gypsum, lime putty)

242 **Plaster on masonry, 2 coat:**

1st 1:3 (lime putty, coarse sand)
2nd 1:3 (lime putty, fine sand)

243 **Plaster on masonry for damper conditions, 2 coat:**

1st 2:5 (NHL 3.5, coarse sand)
2nd 2:5 (NHL 3.5, fine sand)

244 **Plaster on masonry for damper conditions, 3 coat:**

1st (9mm) & 2nd (6mm) coats: 1:3 (lime putty, sharp sand) 5% brick dust with 8kg hair/m³
3rd (3mm) coat: 3:2 (lime putty, silver sand) no hair

245 **Wattle & daub plaster repair:**

1:1:4 (lime putty, sharp sand, slurried cow dung) dry mix, 1st coat reinforced with 150mm length chopped straw.

EXTERNAL RENDER MIXES

245 **Render on lath, 3 coat:**

1:3 (NHL 2.0, coarse/sharp sand), hair in first two coats @ 5kg/m³

246 **Render on lath, 3 coat:**

2:5 (lime putty, coarse/sharp sand), hair in first two coats @ 5kg/ m³

247 **Render on masonry, 3 coat:**

2:5 (lime putty, coarse/sharp sand), with 5% brick dust in first coat

- 248 **Render on lath/masonry, 3 coat:**
 1st & 2nd coats 2:5:10% (lime putty, sharp sand, brick powder)
 3rd coat, 2:6:10% (lime putty, sharp sand, brick powder)
- 249 **Render on lath, 1 coat:**
 1:3 (lime putty, powdered chalk) with 6kg/m³ hair
- 250 **Wattle & Daub render repair:**
 1:1:4 (lime putty, sharp sand, slurried cow dung) dry mix, 1st coat reinforced with 150mm length chopped straw.
- 260 HARLING/PEBBLEDASH
- Where harling or pebbledash is to be repaired, mixes are to be 247 and 248 above, used with the sand content amended to include a higher proportion of coarse aggregate gauged to match the existing.
 - Final mix to be brushed out well on completion to expose the aggregate.
- 265 PREPARATION OF SURFACES
1. All areas for re-rendering shall be agreed with the architect or surveyor before removal of existing. This is to be established after tapping of the surface to establish the presence of voids.
 2. Square edge: unsound renders to be cut back to a firm, square edge and lined out for ashlar joints or to other lines as appropriate.
 3. Clean down surface to be rendered and remove loose aggregate. Damp down the surface to be rendered before application of dubbing out coat, to reduce suction. This to be undertaken by spraying with clean mains water.
 4. Dubbing out/base coats to be scored to provide a key for successive coats, in accordance with good practice. Float coat under top coat shall not be scored. Each coat is to be damped down before applying the next.
- 270 SAMPLE PANELS
- Sample panels, where called for, are to be located at ground level and to be varied with different sand types and pozzolanic additives, as referred to in the schedule of works. A minimum of two sample panels to be incorporated; each sample panel is to be scored to identify the mix. Where three panels are requested, one is to be held in reserve pending consideration of first two.
- 275 APPLICATION
- Build up surface in successive coats, normal depth 10mm, and wood float finish. Score with a comb, the dubbing out and base coats to provide a key for successive coats. Float coat below top coat shall not be scored or combed. top coat shall be a maximum of 4mm in thickness, floated smooth to match existing and lined out with false joints to match existing pattern as required in the schedule of works. Wood float finish to be standard throughout.
- 271 MOULDED FEATURES
- These to be reproduced to match existing, by moulding or running in situ as appropriate. Label stops shall always be cast and fixed in situ. The schedule of works shall refer to other details which may be run on site or cast as appropriate.
- 280 CODE OF PRACTICE
- 281 - All external works shall be carried out in accordance with BS 5262: 1991, and all internal work shall be carried out in accordance with BS

5492: 1990. All work must be protected from drying out using hessian sacking and polythene to protect from excessive sun, wind, temperature or rainfall. The contractor is additionally to undertake any other works necessary to prevent premature drying out of render.

- 290 **SHRINKAGE CRACKS**
- The contractor is to include for making good all shrinkage cracks as work progresses and again at the end of the expiry at the end of the defects liability period, to the entire satisfaction of the architect or surveyor and at the contractors sole expense.
- 300 **REPAIRING CRACKED PLASTER**
- Consolidate plaster on walls using a mix of 1 part PVA resin ("Unibond") to 10 parts of lime putty, injected into the wall from the surface and held in position with suitable boards until curing has taken place.

NX1 Conservation Glazier

MATERIALS

- 100 **REPLACEMENT GLASS**
- Clear glass shall be new clear "Reamey antique" glass or Cordelay glass of approved type.
- 101 **REPLACEMENT GLASS**
- Coloured glass shall match existing colour, pattern & texture.
- 102 **REPLACEMENT GLASS**
- Clear polished crown glass, 2mm – 4mm thick, with minimal seeding.
- 103 **SAMPLES**
- Samples of glass shall be provided for architect's/surveyor's approval.
- 110 **CAMES**
- Shall be of new milled lead, minimum 12mm wide after milling and flat pattern unless otherwise stated.
- 120 **SADDLE BARS**
- Shall be phosphor bronze, minimum 10mm diameter/section or greater as necessary to give adequate support, unless specified to the contrary.
- 121 **SADDLE BARS**
- Shall be phosphor bronze, minimum 12mm diameter/section or greater as necessary to give adequate support, unless specified to the contrary.
- 130 **CONDENSATION TRAY**
- Condensation tray shall be of code 5 milled lead, with lead wedges to support glazing above, and a nominal gap equivalent to 30% of window width per light, fitted to each sill and transom.
- 140 **MORTAR FOR POINTING**
- Shall be 1:1½:1 lime putty/coarse sand/stone dust mix to match existing stone colour.
- 141 **MORTAR FOR POINTING**
- Shall be 1:1½:1 hydraulic lime/coarse sand/stone dust, mix to match existing.

- 150 SALVAGED GLASS
- All original glass quarries shall be salvaged wherever possible and re-incorporated in the window.
- 151 SALVAGED LEAD
- Salvage comes and re-use where specified.
- 160 GLAZING PATTERN
- Existing glazing pattern shall be fully reproduced as new work, except where comes are enlarged or stonework changed.
 - Fragments of coloured glass shall be releaded in the pattern as found and not re-composed in a new scheme unless specifically instructed to do so.
- 162 EXISTING LEAD CAMES
- Shall be inspected for evidence of names and dates which shall be recorded and handed back to the client or re-incorporated as directed.
- 163 MEDIAEVAL LEADWORK
- All mediaeval leading is to be retained in situ unless advised to the contrary.
- 164 EDGE BONDNG
- All original glass which is cracked is to be edge bonded with appropriate adhesive and plated.
- 165 REPLACEMENT GLASS IN CONSERVATION SCHEMES
- Is to be dated and initialled to identify it.
- 180 CLEANING
- Clean glass with de-ionised water on both faces. No other cleaning is to take place without prior agreement of the architect/surveyor.
- 190 NEW SADDLE BARS
- Shall be provided at every second quarry vertically.
- 191 EXISTING SADDLE BARS
- Shall be re-fixed as necessary and fixed as necessary to give adequate support to glazing.
- 210 FERRAMENTA
- Clean by removing mill scale, rust and other coatings by wire brushing, emery cloth and chemical treatment, prime with rust inhibiting metal primer and apply 2 coats of micaceous iron oxide paint, colour dark grey or as specified.
- 220 FERRAMENTA
- Clean by removing mill scale, rust and other coatings treat with "Jenolite" or equivalent to kill rust and apply 1 undercoat and 2 coats good gloss paint, colour matt black.
- 230 FERRAMENTA
- Where removed from the building clean by removing mill scale, rust and other coatings by flame or chemical treatment. Hot dip galvanize in accordance with BS 729, weight as set for non structural steelwork in table 1.
- 240 FERRAMENTA
- Clean by removing mill scale, rust and other coatings by chemical treatment, apply 2 coats smooth "Hammerite" colour dark Charcoal Grey.

- 260 TIES
- Secure comes to saddle bars with copper wire ties.
- 280 PROTECTION
- Provide temporary wind/watertight hoarding fixed from inside of building while glass is out, sealed with acid free sticky tape.
- 281 TEMPORARY GLAZING
- Provide temporary glazing of glass in glazing grooves while glazing is away for treatment, weatherproofed with approved mortar.
- 282 TEMPORARY PERSPEX
- Provide temporary Perspex or transparent UPVC or fibreglass while glazing is removed for treatment, weatherproof with approved mortar.
- METHOD
- 291 CRAFTSMEN
- All contractors and craftsmen must be members of the British Society of Master Glass Painters and accredited by them to the level appropriate to the work. This must be demonstrated by letter before work commences.
- 292 RECORDING
- All glass must be recorded photographically internally and externally before removal, and glass lines recorded by rubbings before work on dismantling starts. Any loose paint film or unstable glass should be stabilized before removal.
- 293 REMOVAL
- Removal of glass from mortared grooves must be undertaken with due care and the glass transported to the conservator's workshop on a rigid board with cushioning, without placing one on top of another.
- 294 CONSERVATION REPORTS
- The conservation contractor is to include in their price for the provision of photographs and reports sufficient to enable grant applications to be processed, including colour photographs, details of materials and techniques used, and diagrams and sketches.
- 295 RELEADING
- Is to use approved lead comes of agreed size and profile. Perimeter comes are to be double width to avoid obscuring the glass in the glazing grooves.
- 296 REPOINTING
- Between lead and glass is to be in approved waterproof putty and blackening. Repointing to glazing grooves is to be in 2:3:3 semi hydraulic lime NHL 3.5, sand and stone dust.
- 297 SECURING GLASS
- Secure glass to glazing bars using 3 copper ties per bar, twisted internally and folded back to the bar.