Revision N/A

I/A

# 2.1 CARPENTRY & JOINERY

### 2.1.1 Generally

Softwood for structural work will comply in all respects with BSCP.112 'The Structural Use of Timber', the measurement of characteristics affecting strength being measured in accordance with BS.4978.

All structural timbers are to be sawn die square, regularised where necessary and shall hold to the full basic size. Where prepared for joinery, reductions by processing timber shall conform to BS.4471, Part 1.

Do not use timber members which are damaged, crushed or split beyond the limits permitted by their grading. Ensure that notches and holes are not so positioned in relation to knots or other defects that the strength of members will be reduced. Do not use scarf joints, finger joints or splice plates without approval.

Unless otherwise stated, softwood for carcassing shall be treated off-site before delivery with the Protim Prevac double vacuum process obtained from one of the authorised agents of Protim Ltd or such other process approved by the Surveyor. Desired service life: 50 years. Impregnated timber shall be stored in a well-ventilated position. For each batch of timber, provide a certificate of assurance that treatment has been carried out as specified.

Carry out as much cutting and machining as possible before treatment. Retreat all treated timber which is sawn along the length, ploughed, thicknessed, planed or otherwise extensively processed. Treat timber surfaces exposed by minor cutting and drilling with two flood coats of a solution recommended for the purpose by main treatment solution manufacturer.

Keep timber dry and do not overstress, distort or disfigure sections or components during transit, storage, lifting, erection or fixing. Store timber and components under cover, clear of the ground and with good ventilation. Support on regularly spaced, level bearers on a dry, firm base. Open pile to ensure free movement of air through the stack. Arrange sequence of construction and cover timber as necessary during and after erection to ensure that specified moisture content is not exceeded.

The Contractor is responsible for ensuring that the moisture content of timber for carpenter's work and joinery is appropriate for the conditions in which the material is to be employed and is within the limits given in BS.1186 Part 1. Generally the figure for both is to be 15% + or - 2% tolerance allowance as the building can be considered to have a level of heating equivalent to an intermittent system.

Joinery timber is to be in accordance with BS.1186 Part 1 and unless otherwise specified by name shall be selected from species suitable for both the work and the position occupied.

N/A

Structural timbers are to be framed and put altogether in the best manner together with all ties, straps, bolts, nuts, washers and the like as required. Wallplates are to be halved and nailed at joints. Rafters, purlins, ridges and ceiling joists are to be in one length wherever practicable. Where joints are unavoidable the timbers are to be properly splayed, scarfed, nailed or bolted as required and as shown on the drawings.

adjacent areas, with no batten less than 1200 mm long. Joints to be square cut, butted centrally on supports and must not occur more than once in any group of four battens on any one support. Provide an additional batten where an unsupported lap in the underlay occurs between battens. Fix each batten to each support, splay nailing at ends -Nails to be long enough to reach the rafters. Provide additional battens and tilting fillets at eaves ridges and other perimeter features.

### 2.1.2 Jointing/fixing Generally

Where not specified otherwise, select fixing and jointing methods and types, sizes and spacings of fasteners in compliance with relevant British Standards.

2.1.3 Bolted Joints

Locate holes accurately and drill to diameters as close as practical to the nominal bolt diameter and not more than 2 mm larger. Place washers under all bolt heads and nuts that would otherwise bear directly on timber. Use spring washers in locations which will be hidden or inaccessible in the completed building. Tighten bolts so that washers just bite the surface of the timber. Ensure that at least one complete thread protrudes from the nut. Check at agreed regular intervals up to Practical Completion and tighten as necessary to prevent slackening of joints.

### 2.1.4 <u>Preservative Treatment</u>

Softwood boarding shall be treated off-site before delivery with the Protim Prevac double vacuum process obtained from one of the authorised agents of Protim Ltd or such other process approved by the Surveyor. Impregnated timber shall be stored in a well ventilated position. Cut ends, bore holes and the like are to be liberally swabbed with suitably coloured preservative before use.

### 2.1.5 Additional Supports

Where not shown on drawings, position and fix additional studs, noggings or battens for appliances, fixtures, edges of sheets, etc., in accordance with manufacturers' recommendations. All additional studs, noggings or battens to be of adequate size and have the same treatment, if any, as adjacent timber supports.

- 2.1.6 <u>Graded Softwood for Replacement Gutter Bearers</u> Strength graded to BS 4978 or BS EN 519 or other national equivalent and so marked. Strength class to BS EN 338: C 16 Preservative treatment Protim Double Vacuum as above.
- 2.1.7 <u>Graded Softwood For New & Replacement Gutter Sole Boards, Timber</u> <u>Decking, Valley Boards & Layboards</u> Strength graded to the appropriate standard or rules for the specified

Materials and Workmanship

N/A

	grade and so marked. 25mm Thick Boards Species and origin: Whitewood, Baltic, Planed, free from wane, pitch pockets, decay and insect attack. Preservative treatment: No preservative treatment required, as preservatives in timber substrates have been shown to increase the risk of underside lead corrosion. Moisture content at time of erection: 16% or less.		
2.1.8	<u>Ungraded Softwood for Firring Pieces (For Gutter &amp; Roof Falls)</u> Free from decay, insect attack (except pinhole borers) and with no knots wider than half the width of the section. Surface finish: Sawn generally but planed to falls. Preservative treatment Protim Double Vacuum as above.		
2.1.9	Lead Roof Noggings For Vent Space To Deck & Stop Battens To Insulation Sawn softwood to BS 5534:Part 1, species as clause 2.12.1, permissible characteristics and defects as clause 2.12.2. Timber to be dry at time of fixing. Preservative treatment as above. Noggings Size: 50 x 50 mm. At Centres To Match Roof Joists Stop Batten Size: 38 x 50mm Noggings are not to be laid butt jointed but with a 50mm gap between.		
2.1.10	<u>Slate Roof Battens &amp; Counter Battens</u> Sawn softwood to BS 5534:Part 1, species as clause 2.12.1, permissible characteristics and defects as clause 2.12.2. Timber to be dry at time of fixing. Preservative treatment as above. Batten Size:25 x 50mm		
	Wrot Timber for Roll Battens for Lead Solid rolls to have 45mm x 45mm rounded timber core tapering to a flat base 25mm wide. Quality of timber and fixing: To BS 1186: Part 3. Species: Whitewood Baltic planed, free from wane, pitch pockets and insect attack. Class: 3 Moisture content at time of fixing: 13 to 19%. No preservative treatment required for the reason given for gutter soles above. Method of fixing to each support: Lost head nails. Other requirements: Shaped to form solid core rolls in accordance with Lead Sheet		
	Association Guidelines. Large rolls for new ridge rolls to be shaped from 3" x $21/2$ " section of wood		
2.2	EXISTING LEADWORK		
2.2.1	Safety Precautions While Working with Lead Lead and its corrosion products are hazardous to health and care must be taken not to ingest or inhale them.		
	Wear a disposal dust mask and gloves which should be thrown away after each use, overalls which should be washed after each use.		
	Always scrub your hands and wash your face thoroughly when work is finished and before handling or eating food.		
	I I	 _	

Revision N/A

Δ

	Sweep up any loose offcuts and corrosion products and dispose of them safely. See also Hot Works above. For further safety information, see Working with lead in construction: a guide to healthcare LSA (1996).	
2.2.2	Raise lead Take up existing lead, roll neatly and stack in location specified by employer, report to Surveyor any instances of significant corrosion on underside of lead or defects in timber. Take the necessary health and safety precautions in relation to the corrosion product (lead carbonate).	
2.2.3	Drains In Use Protect drains, vent pipes and fittings still in use and ensure that they are kept free from debris at all times. Make good any damage arising.	
2.2.4	Scrap Scrap lead is to remain the property of the Employer. Take for lowering to ground level, storage in a secure place and periodically reporting weight to be designated by the employer.	
2.2.5	Security Security of all lead remains the responsibility of the Contractor from the moment that the scaffolds are erected until completion.	
2.2.6	Preparation & Suitability Of Substrate For Roofing & Gutters Prices for raising lead to include for inspection of existing substrate - reporting all defects, including those of rafters, wall plates and bearers, to the Surveyor. Include for pounding home all nails behind surface, for replacing defective boards and comply with Surveyors instructions for replacement. Ensure that all boards are securely fixed. Plane or sand as necessary to achieve an even surface.	
	Sound substrate may need to be removed to allow ease of construction of new bays and falls. Bases to be dry and free of dust, debris, grease and other deleterious matter. Laying of lead will be taken as joint acceptance by the main Contractor and any Subcontractors of the suitability of bases.	
2.2.7	Timber Decking Where boards need replacing form new deck in 25mm untreated white pine fixed with galvanised nails with a penny gap between each board.	
2.3	NEW LEADWORK	
2.3.1	<u>Generally</u> Leadwork is to be undertaken by a suitably qualified domestic sub- contractor for whom examples of work demonstrating a suitable standard of workmanship and references can be provided. The Surveyor retains the right not to accept a specialist subcontractor put forward should they in his view fall short of the quality of workmanship required. The application of all new lead sheets is to be in accordance with BS EN 12588: 2006	
	New lead work to be milled lead to BS.1178 (1982 Revision) colour marked	
Page 4 of 20 To col		

Revision

N/A

for thickness and weight and of the type and code specifi up to the full specified thickness throughout every sheet a pin-holes and laminations.		
2.3.2 <u>Underlay</u> To boarding: Monomet Geotextile Grade 011/200, manufa Monomet 14 Eton Grove Dacre Park London, SE13 5BY (tel: 020 8463 9300)	actured by:	
2.3.3 Chalk Enriched Emulsion Paint To underside of lead Rowan Technologies Ltd and top of Church Road Urmston, Manchester (tel/fax: 0161 748 3644	-	
2.3.4 <u>CHALK PATINATION OF NEW LEAD</u> Before laying of the new lead, prepare substrate and lead below. This preparation consists of covering the underside and top of the new underlay with chalk enriched emulsion been shown to give lead an initial resistance to corrosion.	of the new lead	
<ul> <li>Treat the underside of all lead used for coverings on site enriched emulsion paint as supplied by Rowan Technol accordance with the following directions: <ul> <li>The underside surface of the lead is to be thoroughly or brushed to remove any mill scales and oxidation layers.</li> <li>Boss the lead sheet into its rough shape and apply before finally bossing and fixing into place.</li> <li>Stir the supplied coating thoroughly before use.</li> <li>Apply the coating with a brush to give a continuous, thic to dry thoroughly. Apply 2 no. Thick coats.</li> <li>Allow the coating to dry before bossing into final fixing p</li> <li>In order to prevent possible capillary action of rainwat (being drawn in by the chalk layer close to the edges of the following areas free of the chalk coating:</li> <li>Bottom 50mm of any lap (i.e. keep edge of sheets free of the roll and up to the 12 o'clock position of undercloak part of the roll must be coated.</li> <li>Overlaps at drips are also to be kept free of the chalk.</li> <li>If any of the above areas become contaminated wipe cleater the passivation and protection treatment to the lead. Allow to dry before placing lead in position.</li> <li>The coatings must be fully dried before the panels are gutters.</li> <li>Following installation of the lead bays or weatherings the top surfaces should be removed using warm water.</li> </ul> </li> </ul>	logies. Apply in leaned and wire chalk emulsion ck coating. Allow blace. ter into the roof he sheets) keep of chalk) talk to the inner the roll). The ean. ated to enhance v the chalk paint installed on the all spillages on	
2.3.5 <u>SIZE SHEETS</u> to following maximum sizes:- <u>'Flat Areas' up to <del>and including 1:6 (10<sup>0</sup>)</del></u>	_	
	[	 
Page 5 of 20	To collection	

Document

Revision |

N/A

BS1178 Code	<u>Max Width</u> <u>Between</u>	Max Length
6	675	2250
7	675	2500
8	750	3000

## Boxed and Tapered Gutters

BS1178 Code	<u>Max. length</u> Between Drips	Max Overall Girth
6	2250	800
7	2500	900
8	3000	1000

No boxed or tapered gutters to be less than 150mm wide and 100mm deep.

2.3.6 <u>Flashings To Gutters & Flat Roof Upstands Code 6.</u> Max Length 1500mm. End to end joints : laps not less than 100mm. Cover: Overlap to upstand not less than 75mm. Welt top edge of flashing and apply masking tape slip layer to isolate flashing from pointing before fixing. Wedge and point in chase as described below.

2.3.7 Horizontal Flashings To Change Of Roof Pitches Above Mansards Code 6 Max Length 1500mm Lap To Lower Pitch 150mm Min. Lead dressed over tilting fillet and under sarking felt to upper pitch 200mm Min. Top edge to be welted.

Each piece to be copper-nailed at 150mm centres.

2.3.8 Abutment Upstands

Where 'flat' roofs abut vertical surfaces, form abutment 100mm minimum high. Vertical gutter abutments are not to exceed 225mm.

Abutments of pitched roof to be 75mm high with minimum 60mm cover provided by flashing. Corners to be bossed.

Abutment Flashings To Slate Roof Pitches Code 6.

Stepped into stone or brick coursing or dressed into a chase cut parallel to the pitch in ashlar work. Lead so dressed to be lead-wedged and joint pointed with mortar.

Minimum Horizontal Lap Over Tiles 150mm. Free edges to be clipped every 300mm.

Provide lead soakers. Code 4. Min width 175mm. Min upstand 75mm. Lead Valleys Code 7 Minimum Width 500mm Minimum Horizontal Laps 200mm Max Length 1500mm Top of each side to be welted above tilting fillets.

Each sheet nailed in two staggered rows 50mm apart top row 50mm from

Revision N/

N/A

the head of sheet. Nails at 50mm centres.

## 2.3.9

Author: Mike Carpenter

## Cappings & Parapet Weatherings

Cappings & parapet weatherings to be joined with welts horizontally, dressed down over sides with welted drips to downstands. Free edges to be clipped at maximum 450mm centres.

Maximum Distance between Horizontal Welts:

### 2.3.10

	Width Less Than 450	450-600	More Than
Code 6	2.0m	1.5m	1.5m
Code 7	2.0m	2.0m	1.5m

Horizontal welts to be clipped at maximum 200mm centres.

### <u>JOINTS</u>

Side (Longitudinal) Joints

Form over solid rolls at 675mm centres with edge of overcloak welted around copper clips fixed behind the undercloak at 450mm centres. No Splash laps are allowed.

Fix to base with brass or stainless steel countersunk screws at not more than 300mm centres. Dress undercloak half way around core.

2.3.11 Fix copper or stainless steel clips to the roll at not more than 450mm centres. Ensure that clip fixing does not restrict thermal movement of the undercloak.

Dress overcloak around core with edge welted around ends of clips, finishing 5mm clear of main surface.

At drips ensure that the undercloak projects 40mm beyond the inside face of the roll.

Cross Joints: Slopes of 150 or less (1:5) - including all gutters - use drips 65mm high.

Welted Joints

Form with a 50mm overlap, 25mm underlap and copper or stainless clips as described below. Welt overlap and clips around underlap and lightly dress down.

Rolls To Hips & Ridges Of Slate Roofs

Code 6 Max length 1500mm. Wood core see section 2.6. Lap Joints between pieces 200mm Min.

Width Of Hip Sheet: Distance round core plus 150mm each side. Bottom ends of hips to be bossed.

Free edges to be clipped with stainless steel clips at 300mm centres.

2.3.12 The head of each sheet is to be nailed to the roll six times in staggered rows at 50mm centres.

<u>Drips Without Splash Laps</u> Dress underlap into rebate along top edge of drip and fix with one row of nails at 50mm centre line of rebate.

Author: Mike Carpenter

N/A

	Dress overlap over drip to just short of lower level.
2.3.13	Wedge & Screw Fixing Into Joints/Chases Carefully rake out joint/chase to a depth of not less than 25mm. Dress lead into joint/chase and fix with lead wedges at not more than 450mm centres, at every change of direction and with at least two for each piece of lead. Alternatively, if groove is uneven, fix with brass screw and washer at similar centres.
2.3.14	Apply masking tape slip-layer to isolate flashing from pointing before wedging. Damp down masonry before pointing. Point using Mix I. See pointing below.
	Screw Fixing Under Parapet Copings Where parapet copings are to be lifted or replaced insert code 5 lead flashing over upstand before laying. Turn the flashing to cover the masonry by a 50mm wide strip. Fix flashing with brass screws and washers at 450mm centres.
2.3.15	Apply masking tape slip-layer to isolate flashing from pointing. Lay new stone as described above. Damp down masonry before pointing. Point using Mix I. See pointing below.
2.4	LEAD COVERINGS / FLASHINGS
<b>2.4</b> 2.4.1	LEAD COVERINGS / FLASHINGS <u>Generally</u> LEADWORK TO ROOFS AND VALLEY GUTTER: to be removed complete with all flashings to upstands.
	<u>Generally</u> LEADWORK TO ROOFS AND VALLEY GUTTER: to be removed complete
	<u>Generally</u> LEADWORK TO ROOFS AND VALLEY GUTTER: to be removed complete with all flashings to upstands. All brickwork chases to be cleaned as specified before receiving new
	<u>Generally</u> LEADWORK TO ROOFS AND VALLEY GUTTER: to be removed complete with all flashings to upstands. All brickwork chases to be cleaned as specified before receiving new flashings. All work to be carried out in strict compliance with the requirements of the
	<ul> <li><u>Generally</u></li> <li>LEADWORK TO ROOFS AND VALLEY GUTTER: to be removed complete with all flashings to upstands.</li> <li>All brickwork chases to be cleaned as specified before receiving new flashings.</li> <li>All work to be carried out in strict compliance with the requirements of the Health &amp; Safety Plan and all current H&amp;S Regulations.</li> <li>EXISTING FLASHINGS / CHUTE OUTLETS TO DOWNPIPES: to be removed completely and new to be provided in accordance with the drawings. All brickwork chases to be cleaned as specified before receiving new</li> </ul>

Wear a disposal dust mask and gloves which should be thrown away after

Document

Revision N/A

/Δ

	each use, overalls which should be washed after each use.		
	Always scrub your hands and wash your face thoroughly when work is finished and before handling or eating food.		
	Sweep up any loose offcuts and corrosion products and dispose of them safely. See also Hot Works above.		
	For further safety information, see Working with lead in construction: a guide to healthcare LSA (1996).		
2.4.3	SCRAP Scrap lead is to remain the property of the Employer.		
	Take for lowering to ground level, storage in a secure place and periodically reporting weight and price that can be offered.		
2.4.4	FIXINGS		
	<u>Nails</u> Where not specified otherwise, fix lead sheet to timber substrates with: Copper clout nails to BS1202: part 2, Table 2, with annular ring, helical ring or serrated shank, length not less than 20mm, shank diameter not less than 3.35mm and head diameter not less than 8mm, or		
	Austenitic stainless steel clout nails with annular ring, helical ring or serrated shank, length not less than 19mm, shank diameter not less than 2.65mm and head diameter not less than 8mm.		
	Where not specified otherwise, fix lead sheet to concrete or masonry substrates with brass or stainless steel screws to BS1210, Table 3, length not less than 25mm and diameter not less than 3.35mm, with washers of the same material and plastic plugs of length and diameter to suit screws.		
2.4.5	Clips Lead clips generally to be 50mm wide where not specified to be continuous, length to suit detail. Lead clips to be cut from sheets of same code as sheets being secured. Lead clips to be nailed or screwed into the substrate below as close to the edge of the sheet being secured as possible.		
	Copper clips to be 50mm wide, cut from 0.7mm thick sheet to BS2870 (22 gauge 1/4 hard temper), temper grade1/4H, dipped in solder if exposed to view.		
	Stainless steel clips to be cut from 0.38mm sheet to BS 1449: Part 2, grade 304, terne coated if exposed to view. Stainless steel for clips to be 'Steelex' dull finish, 50mm wide. Supplier: Lee Steel Strip Ltd Tribute Works Meadow Hall Sheffield or		
	or Terne-coated stainless Follansbee (UK) Ltd 123 Lonsdale Drive, Oakwood Enfield, Middlesex		

Tel No 020-8367 6463

Author: Mike Carpenter

Revision N/A

I/A

# Unless specified otherwise fix each clip with two fastenings not more than 50mm from the edge of lead sheet. Clips welted around edges of sheet to be turned over 25mm.

2.4.6 <u>Head Fixings</u> Where not specified otherwise, nail with two rows of fixings, 25mm and 50mm from top edge of sheet, at 75mm centres in each row, evenly spaced and staggered.

# 2.4.7 Side Fixing

(Solid roll): Nail top third of sheet at 150mm centres.

Clip all free edges at 250-500mm centres depending on exposure, leave room for expansion of overcloak. Fix clip as close to free edge of lead as possible. In conditions of severe exposure provide continuous clips.

Clip fixings to softwood to be 3 no. nails or 2 no. screws. Fixings shall penetrate not less than 80% of thickness of substrate up to 25mm.

Clip fixings to concrete and masonry shall be stainless steel screws with washers into polyamide plugs to give 40mm penetration.

### 2.4.8 <u>Falls</u>

Minimum fall for roofing and gutters to be 1:60

Report to the Surveyor if any parts of existing substrate do not achieve such a fall. Omit head fixing to boxed and tapered gutters if slope is 1:60 or less. Confine side fixing to gutters to top third of sheet.

Make catch pits 150 deep minimum and full width of the sole of the gutter. Form chute outlets, where required, to similar minimum width.

Cross joints drips as for roof spacing as shown on drawings and no less than 3m for code 8 lead 2.5m for code 7 lead

### 2.4.9 Patination Oil

Do not use unless specifically directed.

### Workmanship Generally

Cut join and dress lead neatly and accurately, to provide fully waterproof coverings/flashings, free from ripples, kinks, buckling and cracks.

Lead weatherings and gutters shall be designed as separate pieces of lead sheet of limited size and fixed to allow for thermal movement. Ensure lead is laid with sufficient tolerance to allow such movement, particularly when working in cold weather.

Shape lead by welding or bossing, but take care to avoid overworking.

Comply with BS 6915 and current good practice as described in the latest editions of The Lead Sheet Manual Volumes 1-3 published by the Lead Sheet Association, unless specified or agreed otherwise.

Revision N

N/A

Do not use scribers or other sharp instruments to mark out lead.

Ensure that finished leadwork is fully supported, adequately fixed to resist wind uplift but also able to accommodate thermal movement without distortion or distress.

Fire Precautions

Fire precautions are to be strictly observed at all times.

Form and pre-fabricate items off the building. Preferably welding is to be done completely off site, that is outside the curtilage of the house. In any event welding is to take place at a distance of 6m minimum from any building.

Welding and soldering operations, including the lead burning of clips onto sheets or flashings in situ will only be permitted with a hot work certificate. See clause 2.2.

There is an automatic presumption that permission will not be granted except in extreme circumstances.

Tungsten halogen lights are not to be used for temporary lighting due to the heat and risk of explosion if knocked accidentally.

## 2.5 NATURAL SLATE ROOFING

This section shall comply with BS 5534 <u>Slating and Tiling</u>, subject to any qualifications given below:

### **Underlay**

"Sartec" Vaperm Spunboard breather membrane, as manufactured by Anderson Roofing, D Anderson & Son Ltd. Stretford, Manchester M32 OYL Tel: 0161 865 4444 or equal and approved.

Lay directly over the battens. Minimum horizontal lap: 100mm Battens: size 38mm x 25mm.

Fixing: using 100mm x 3.35mm stainless steel smooth round nails.

Note: The coursing and size of the slate varies greatly from slope to slope. Contractor is to allow for changes in lap depending on the pitch of the roof.

Slates are to be clean, free of grease and other imperfections.

Basic Workmanship:

Keep slates clean and dry until laid. Set out to give true lines and regular appearance, fitting neatly at all edges, junctions and features. Fix slate roofing to make the whole sound and weathertight at the earliest opportunity. Repair any defects as quickly as practicable to minimise damage and nuisance. Keep gutters and pipes free of debris and clean out at completion.

Document N

Materials and Workmanship

Revision N/A

/Δ

#### Existing Natural Slating:

Carefully remove slates, battens, counter battens (if any) and sarking felt, down to the existing rafters (or boards if roof is boarded). Number slates in sequence and set aside all sound slates for re-use.

<u>Holes in slates</u> to be of uniform size and position, formed from the bed to the back of the slate without excessive spalling and located at the centre or at the thinner end of the slate to suit the method of nailing but not less than 25 mm from edges.

<u>Cut slates</u> to form clean straight junctions. If the splay cutting of any slate would reduce it to a narrow edge, cut from a wider slate. Form mitre on cut joint.

Do not nail through plumbers metalwork.

<u>Securely fix battens</u> (over roof felt if specified) to the background using fully galvanised steel nails of appropriate length.

Battens/Counterbattens:

Sawn softwood, species type A or B to BS 5534:Part 1.

Permissible characteristics and defects must not exceed the limits given in BS 5534: Part 1, annex E.

Moisture content: Not more than 22% at time of fixing.

Nails: stainless steel to BS 1202: Part 1, sized to give a secure fixing without splitting the batten.

Preservative treatment: Softwood battens shall be treated with Protim Prevac double vacuum process obtained from one of the authorised agents of Protim Ltd or such other process approved by the Surveyor.

Impregnated timber shall be stored in a well ventilated position, kept dry, and sections will be separated by lath or battens to ensure a good flow of air between sections.

Cut ends, bore holes and the like are to be liberally swabbed with

preservative before using.

### Counter Battens (if any):

Securely fix through roof boarding into rafters. Locate nails not to coincide with the batten nailing.

### Batten Fixing:

Securely fix through counter battens into every rafter as follows: In straight horizontal lines, aligned on adjacent areas,

In length so that minimum of three rafters supports slates and with both

Document Mate

Revision N/

N/A

ends supported.

Author: Mike Carpenter

Joints to be square cut, nailed without splitting, butted centrally on supports and must not occur more than once in any group of four battens on any one support.

Provide an additional batten where an unsupported lap in the underlay occurs between battens.

Fix each batten to each support, with splay fixings at joints.

Provide additional battens and tilting fillets at eaves, ridges and other perimeter features.

Lay slates as follows to roof slopes, with spalled edges uppermost:

Twice centre nail every slate except very small slates which shall be once head nailed.

Lay close jointed with straight vertical and horizontal joints, vertical joints centred over the slate below (or a minimum of 50 mm from edge of slate below in random width slating).

Use slates of the same thickness in any one course and fix with thinner end uppermost.

Where specified, lay horizontal diminishing courses from eaves to ridge with thicker slates in lower courses and ensure each slate lays truly flat on slate below.

<u>At eaves</u> and above roof openings, lay a double course of slates. Undercourse of short slates head nailed to the bottom batten. Fix with bottom edges in line and projecting over fascia or opening.

<u>At verges</u>, bed slates in the specified mortar mix with an undercloak of slates fixed to rafter and not bargeboard, ensure the underlay extends to the verge line. Lay extra wide slates in alternate courses bedded in mortar and finished flush with undercloak. Do not use cut slates at verges. Brush off mortar at verges at time of set to produce rough surface in keeping with the vernacular building. do not strike neat and profiled.

<u>At ridges</u> gauge the slating if specified so that a full lap is maintained in the top course. Ensure that the underlay capping strip is in position. Back bed the specified units in mortar tightly to the roof covering. Fill and gallet exposed ends and cut mitred joints at hip intersections.

<u>At hips</u>, cut the slating to the line of the hip. Ensure that an additional strip of underlay is in position. Bed specified hip fittings in mortar commencing at the lowest point. Fill and gallet exposed ends with tile slips and fix specified hip irons. with two galvanised screws.

<u>Lead roll ridges and hips</u>, etc, slate roll and wing ridge/hips and mitred hips to be carried out as directed by the Contract Administrator in lieu of the above. 2.6

Materials and Workmanship

Revision N

N/A

(Dress in specified lead soakers ready to receive flashings).
 Cut slates and dress flanges between tiling to pipe slates and flashings.
 <u>Valley tiles</u> for open valleys to be proprietary purpose made clay valley tiles. Ensure an additional strip of underlay is in position under the general underlay. Lay valley tiles, without nailing or bedding, coursed in with tiling.
 <u>Torching</u> to underside of slates where specified to be applied with a cross-grained wood float well compacted. Mix unless otherwise specified to be a 1:2:9 cement/lime putty/sand mix with 1kg horse hair/m<sup>3</sup>. Allow for samples. Excess torching to be cleaned off battens and roof timbers.
 MORTAR AND POINTING

Lead valleys to be undertaken in accordance with good practice and

Finish slating with short course to maintain gauge when abutting top edge.

described in the appropriate section of the specification.

<u>General Requirements</u> - This specification is to be read in conjunction with (and forms an integral part of) the contract documents.

<u>Standards</u> - Generally comply with the following standards: BS5628 Part 3, Code of Practice for use of masonry; BS5390, Stone masonry. Subject to any qualifications given below.

<u>The sand</u> shall comply with BS1200, being clean, sharp and coarse. For repair work the sand shall be of the correct colour and texture so that the new mortar, when dried out, will match the original colour and texture of the original or existing mortar (as appropriate). For new work the sand shall be of the correct colour and texture so that the new mortar, when dried out, will match the approved sample. The aggregate size is to be well graded to match as closely as possible the existing approved mortar sample to be appropriate to the width of the joint.

The sand shall be free of clay, silt, organic matter and excessive fines. At least half its content shall be a quartz sand, blending from different sources may be necessary.

<u>Water</u> shall be clean and fresh, free from organic and harmful matter in such quantities as would adversely affect the properties of the mortar. Test as directed any water not obtained from the mains.

<u>The Lime</u> shall be as particularly specified by the Contract Administrator to suit the location.

Non-hydraulic lime: To comply with BS890: 1972 and BS6463: 1984/1987.

Lime Putty: Non-hydraulic lime putty may be obtained from an approved

N/A

supplier or prepared by the traditional method of slaking lump lime. Lime putty must comply with BS890: 1995 and BS6463: 1987. Hydrated non-hydraulic lime is <u>not</u> to be used unless specified.

<u>Hydraulic Lime</u>: Hydraulic lime to comply with the French standard NFP13-310 and the European standard EN-459. The particular class of hydraulic lime C1, C2 or C3, will be specified by the Contract Administrator appropriate to conditions of existing masonry, exposure and anticipated weathering. Where specified, hydraulic lime is to be obtained from one of the following suppliers:

- a) Lean lime: Lime supplied as bagged dry hydrate from Shillingstone Lime and Stone Co. Limited, Blanford Forum, Dorset DT11 0TF.
- Moderately hydraulic lime: Blue lias lime, supplied as bagged dry hydrate from Hydraulic Lias Limes Limited, Melmoth House, Abbey Close, Sherbourne, Dorset DT9 3LH, Tel: 01935 817220.
- c) Eminently hydraulic lime: St Astier: chaux naturelle pure distributed by: SETRA, 16 Cavendish Drive, Claygate, Esher, Surrey KT10 0QE, Tel: 01372 465779.

The contractor is to retain a 0.2 mm mesh (200 micron) sieve on site at all times to enable fineness of the dry hydrate to be checked by sampling before use.

The lime supplier is to provide chemical analysis and mortar crushing strength test results using the dry hydrate currently produced on request.

<u>Pozzolanic Material</u>: where specified, is to be ground brick or tile dust, obtainable from Bulmer Brick and Tile Co., Bulmer, Nr Sudbury, Suffolk CO10 7EF, Tel: 01787 269232. Particle size of brick dust and colour appropriate to specific site conditions to be given in the Particular Specification by the Contract Administrator.

<u>Additives</u>: No additives (pigments, plasticisers and the like) of any sort shall be incorporated in the mortar except in very special circumstances on express written instructions given by the Contract Administrator.

<u>Cement</u>: Cement where specified shall be white or ordinary Portland cement to BS12:1986.

<u>Transport, Storage and Handling of Materials</u>: Approved sands shall be stored in clearly marked bags or bunkers and protected from inclement weather, site debris, leaves and the like. Quantities shall be based on the use of dry sand and accurate allowances made for bulking.

Lime putty is to be stored in clean containers, protected from contamination and kept in an excess of water to prevent carbonation.

Hydraulic lime is to be supplied in bags, which must be date stamped with the day of manufacture. Hydraulic lime over 3 months old must not be

Revision

N/A

moisture penetration of the covering. Dry hydrate that has been exposed to the air or moisture in transit and in damaged bags is to be rejected.
Hydraulic lime and Portland cement must be stored in a dry weatherproof building with a raised floor. Record the date of delivery. No materials may be stored on ground. Do not store bagged cement on site for more than four weeks.
Workmanship (General): The mortar shall be a little softer and more porous than the stones/bricks themselves and shall comply with BS4551: 1980 for mortars, screeds and plasters and BS4550: 1989 part 3 sections 3.6 for methods of testing.
Samples: A range of sample mortar mixes are to be prepared for inspection by the Contract Administrator. For renair work the mixes are to be prepared for inspection by the Contract Administrator.

used. All bags must be delivered to site undamaged and dry without

inspection by the Contract Administrator. For repair work the mixes are to match the existing mortar in respect of colour, texture and strength. The Contract Administrator will identify an area of existing mortar to be matched. For new work the sample mortar mixes are to be prepared as directed by the Contract Administrator.

The contractor is to allow for blending and sieving sands from different sources, as necessary, to achieve appropriate grading, colour and texture.

If the Contract Administrator does not consider the sample mixes to be satisfactory in respect of the requirements of this specification, then further samples are to be provided by the contractor as necessary.

Where applicable and sound existing pointing survives in good condition, the Contract Administrator will mark a section which is to be matched in respect of colour, texture and strength.

A trial area of pointing is to be executed for approval by the Contract Administrator using mortar as specified and approved.

<u>Mortar types and mixes</u>: Mortar mix – Only after a sample has been approved by the Architect shall the contractor prepare aggregate blended to the correct grading and/or coarse stuff. The contractor should therefore be aware of the subsequent preparation and standing times prescribed in this Specification for the various materials.

Mix materials sufficiently to obtain a uniform colour and consistency and as specified elsewhere.

Lime Putty: Lump lime shall be properly slaked in an excess of water and stirred and hoed to ensure coagulation does not occur. The putty shall then be screened through gauze equivalent to a 2.36 mm sieve to BS410. Non-hydraulic lime shall then be left for at least 48 hours. Prior to batching all excess water shall be siphoned off. It shall then be matured for not less than three months. Where specified, hydrated non-hydraulic lime shall be soaked to putty by mixing with water and allowing to stand for not less than 24 hours, then the excess water drained off for use as above. The putty at time of use to be strictly in accordance with BS890 and BS6463.

achieve mixing shall be added.

Revision N

N/A

The coarse stuff of non-hydraulic lime shall then be kept covered with damp sacking or polythene sheeting to prevent drying out, and stored for a period of two weeks.				
	<u>Sand Mixes</u> : Based on a 1:4 lime/sand coarse stuff ove, mixes of the following proportions are obtained by dry cement:			
a)	1:1:6 Cement/lime/sand mix			
	Add one part of cement and two parts of sand to four parts of coarse stuff.			
b)	1:2:9 Cement/lime/sand mix			
	Add one part of cement, and one part of sand to eight parts of coarse stuff.			
	ry cement is added when knocking up the coarse stuff and all r must be used within two hours.			
<u>Hydraulic lime: Sand mixes</u> : Coarse stuff is to be prepared using hydraulic lime and well graded aggregate of the appropriate particle size to suit the joint width.				
For tendering	purposes, assume the following basic mixes:			
a)	1:2 moderately hydraulic lime: graded aggregate (as specified) for plain walling.			
b)	1:2 eminently hydraulic lime:graded aggregate (as specified) for copings and chimneys.			
detailed speci In exposed lo hydraulic lime exposure low pozzolanic ad an appropria	commences on site, the Contract Administrator will provide fications for mortars to suit the particular conditions of use. ocations where the stone is hard and durable an eminently e may be used. Where the stone is very soft and the $v_i$ , a feebly hydraulic lime or fat lime (with or without ditive) may be used subject to the work being carried out at te time of year. The addition of pozzolanic material, if be specified by the Contract Administrator.			
All mixing and handling equipment is to be kept clean. Containers, boards, tools, etc., shall be well cleaned before the next batch of mortar is mixed/used.				
	be kept dry at all times. Gauging by the shovel is strictly			

<u>Coarse Stuff</u>: (Non-hydraulic lime): The coarse stuff of one part nonhydraulic lime putty to four parts sand shall be batched by gauge box. If it is mixed in a mechanical mixer only the minimum amount of water to

Revision N

N/A

forbidden.

<u>Mixing</u>: Hydraulic lime or dry cement, as specified, is to be added to dry aggregate when knocking up the appropriate mortar mix. The addition of water must be kept to the minimum. Additional workability if necessary may be achieved by increasing the mixing time <u>not</u> by adding water. A mechanical mixer may be used at this point. All mortar is to be used within two hours.

<u>Preparation</u>: In preparation for repointing works, using hand tools only, rake out all loose jointing material to a depth of not less than twice the joint width. All raking/cutting shall leave a clean, square face at the back of the joint, so as to provide optimum contact with the new mortar.

The prepared face and joint should be carefully cleaned out with a bristle brush and thoroughly flushed out with clean water, avoiding unnecessary saturation. All dust and loose material must be removed, working from top to bottom of the wall.

All cutting out and cleaning works should be approved prior to commencement of the repointing.

No cleaning agents or fungicides are to be used either before or after repair works, except on the express authority of the Contract Administrator.

Any sound pointing should be left undisturbed, even if it has weathered back behind the general wall face to as much as half the joint width. Generally, the existing mortar should be capable of being removed by raking out by hand with a blunt instrument, leaving the arrises of the brickwork or stone unharmed. A hammer and chisel should not be used unless permitted by the Contract Administrator. Under no circumstances should an angle grinder or similar tool be used.

Where it is desirable to remove damaging and unsightly cementitious pointing, experiments should be carried out to the approval of the Contract Administrator to ascertain the most appropriate method of removal and to limit damage caused to existing work.

<u>Pointing</u>: It is essential that the masonry is thoroughly dampened when pointing is commenced. If the joints have dried out before cleaning they must be re-wetted with a hand-held spray prior to placing of any new mortar. No water should be left lying within the prepared joint.

The mortar should be pushed into the joint and firmly ironed in with the maximum possible pressure and minimum of over-working. Pointing irons should be used, not pointing trowels. The pointing irons may be cranked, bronze or steel flat of a width which will fit into the joint and ensure compaction over the full width. Compaction is therefore achieved throughout the depth of the joint each time mortar is placed rather than from the surface alone. The contractor should be aware that it may be necessary for him to fabricate pointing irons to undertake the works.

If the joint is to be filled in one operation, the mortar must be almost

Materials and Workmanship

N/A

crumbly and be ironed in very firmly.

Repointing work should begin at the uppermost section of the wall and proceed downwards, ensuring that all the mortar is pressed well into the joints to achieve good compaction. Fill all the joints solidly with the approved mortar mix finishing very slightly back from the masonry and in accordance with the approved sample. The mortar is <u>not</u> to be spread or buttered onto the face of the masonry unless specified.

Where directed to produce a weathered, roughened finish to expose the aggregate, the mortar should be left to take its initial set and then stippled with a stiff bristle brush. The bristles should not be dragged across the face but tapped against it. Timing is critical. If this technique is applied too early the mortar will be removed too easily and the bond forming between the brick and the mortar will be disrupted. If too late, it will be difficult to make the required impression.

The particular finish required (stippled, struck, double struck, tuck pointed) is to be specified by the Contract Administrator.

Any slight fractures due to shrinkage must be cut out and re-made.

<u>Protection and Cleaning (general)</u>: The work shall be protected from direct sun and rain for a minimum of four weeks until the face has dried and hardened, including the time after the joint surface finish has been applied.

Protect all new work against frost, any joints damaged due to frost action are to be cut out and re-done in frost-free conditions.

During dry weather all new pointing shall be kept continuously moist for a minimum of 4 weeks (but not wet) to ensure that the set takes place slowly.

Turn back scaffold boards adjacent to brick faces at night or duringheavy rain.

Any mortar or stains caused by the works on the face of the masonry must be completely removed before the mortar hardens.

<u>Frost</u>: Work must not be carried out during frost conditions. Frost must not be allowed to affect completed work before it has fully cured. Manufacturers of hydraulic limes are to guarantee the curing periods for the class of lime supplied.

Generally pointing and bedding mortar is not be laid when the temperature is 5°C or below and falling. Work may re-commence when the temperature is 3°C or above and rising. The contractor is to keep a maximum and minimum thermometer on site for the duration of the contract to record night and day time temperatures as directed.

Completion: The Contract Administrator is to be advised at least one week in advance of when the work will be complete in order that an inspection can be made prior to the removal of any scaffold.

Project : Samford Courtenay Roof replacement		Document	Materials and Workmanship
Author: Mi	ke Carpenter	Revision	N/A
	Remove all tools, plant and equipment and used materials and debris. On completion, leave all neat and tidy to the satisfaction of the Con Administrator.	tract	