

**OUTLINE SPECIFICATION OF
MATERIALS AND WORKS**

MASONRY REPAIR

ST. MARY'S CHURCH STONE CROSS WAR MEMORIAL, TUTBURY



FOR

THE TUTBURY WAR MEMORIALS PRESERVATION COMMITTEE

1017/RIS/GSB
MAY 2014 (Revised January 2015)
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Architects and Surveyors
Buxton Road, Bakewell
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SECTION 1: PRELIMINARIES

INTRODUCTION The works referred to in this document relate to the repair of a stone cross war memorial, erected shortly after the First World War, and located within the churchyard of St. Mary's Priory Church, Tutbury (Listed Grade I). The memorial stands 5 metres in height and consists of a sandstone cross above a six faceted tapering shaft. Towards the base of the shaft are three carved figures (a female angel, St George and St Michael). The monument and its stone plinths are constructed of several sections. A number of joints have opened up and the shaft is currently slightly out of plumb. It is important that a conservation approach to repair is followed in order to ensure the maximum retention of historic fabric. The extent, methods and materials specified in this document have been considered suitable for grant aid and, therefore, no variations will be allowed without the prior written approval of the Architect.

SCOPE OF CONTRACT The work comprising this Contract consists of masonry repairs to, the working out and repoint, and partial cleaning of a stone cross memorial. The relaying of flagstone paths surrounding the monument will also be undertaken as part of the works. It is important that this work be undertaken by an experienced stonemason/conservator.

LOCATION OF SITE The memorial is sited outside the south door of St. Mary's Priory Church, Tutbury, Staffordshire. Note that the Church is Grade I Listed and the memorial is within the curtilage. The memorial also lies within a conservation area.

ACCESS FOR TENDERING Arrangements for access to the site for the purposes of tendering should be made with Mr Rick Nuth, Chairman of the Tutbury War Memorials Preservation Committee, telephone 01283 810166.

SITE INSPECTION The Contractor shall be deemed to have visited and inspected the site and the considered the access arrangements (see ACCESS AND SITE LIMITATIONS below) prior to tendering, as no claims will be allowed on the grounds of ignorance of the conditions under which the works will be executed.

DRAWINGS The extent of the work included in this contract is described and shown on the drawings attached to the contract and such other detailed drawings as may be supplied to the Contractor from time to time. Two sets of drawings and two copies of the Specification will be supplied to the successful Contractor. A set of drawings and a copy of the Specification are to be kept at the works when repair is in progress.
Drawing numbers are as follows;

1017/001 ground plan as existing
1017/002B ground plan as proposed
1017/003 elevations as existing
1017/004B elevations as proposed

CONTRACT The provisions of the latest edition of the JCT Minor Works Building Contract 2011 shall apply. The Contractor's attention is drawn to the following particulars in respect of the following clauses:

The Employer	The Tutbury War Memorials Preservation Committee
Architect	Richard I Smith of Smith and Roper, Buxton Road, Bakewell, Derbyshire, DE45 1BZ
Articles 3 & 4	Richard I Smith of Smith and Roper, Buxton Road, Bakewell, Derbyshire, DE45 1BZ

Contract Particulars:		
Fourth Recital and Schedule 2	Base date	One week before Tender return date
Fourth Recital and Class 42	Employer 'is a contractor'	To be deleted
Fifth Recital	CDM Regulations	Not notifiable
Sixth Recital	Framework agreement	Not applicable
Seventh Recital and Schedule 3	Paragraphs 3, 4 & 5	Do not apply
Paragraph 6	Employer's nominee Contractor's nominee	Mr R Nuth To be agreed
1.1	CDM Planning Period	To be confirmed
2.2	Commencement of works	To be agreed
2.3	Date for completion	To be agreed
Article 7	Arbitration	Does not apply
2.8	Liquidated damages	£50 per week
2.10	Rectification period	6 months
4.3	% of total value	100%
4.4	% of total amount to be paid to the contractor	100%
4.11 and Schedule 2	Contribution, levy & tax Fluctuations option applies	To be deleted To be deleted
5.3.2	Contractor's insurance	£5,000,000
5.4A, 5.4B & 5.4C	Insurance of Works	5.4B applies (insurance by Employer in joint names)
5.4A1 and 5.4B1.2		Insert 15%
7.2	Adjudicator is	RIBA
Schedule 1 (paragraph 2.1)	President of Vice-President	RIBA
Attestation	To be execution under hand	

Notwithstanding the contract provisions for interim payments, there will be a single due date for payment, this being 7 days after practical completion. The final date for payment will be 28 days from the date of the Contractor's invoice. A retention is not required.

ACCESS AND SITE LIMITATIONS

The Contractor should note that the area of site available for access, parking, plant and equipment will be agreed on site and that all operations are to be contained within that area.

The memorial is situated on a level site. Access into the churchyard for one or two vehicles of limited width is possible via a gated entrance. Deliveries of equipment and materials may need to be transported by other means for the final distance from the parking area to the monument.

All site finishes, disturbed by the works, are to be re-instated by the Contractor to the approval of the Architects.

The Contractor should note that the church and churchyard will remain in use throughout the works. Church services are held every Wednesday morning. As much notice as possible will be given of other church activities such as weddings, funerals and school services. These activities will require minimisation of noise and maximum access to the church by the congregation.

Special care is to be taken to avoid disturbance or damage to the other churchyard monuments, fixtures and fittings.

METHOD STATEMENT	The successful contractor will be required to submit his method statement for ensuring the stability of the monument during works. This will include the protection of lime mortar during the curing process. A method statement is also required for proposed method of cleaning the lower plinth. The method statements are to be approved in writing by the Architects before work commences.
DEFINITIONS	<p>The terms "approved", "directed" or "selected" mean the approval, direction or selection of by the Architects.</p> <p>Whenever the word "allow" occurs in this Specification, except with reference to Sums for work to be carried out by a named Sub-Contractor, the cost of the item is at the risk of the Contractor.</p>
FUNDERS	It should be noted that the works are subject to grant aid and that the grant bodies' representatives may require access to the works and may be involved in the approval of samples of materials and finishes.
PROGRAMME	The Contractor will be asked by the Architect to provide an estimated cost flow programme and programme of work as part of the tender process. Weekend working will only be permitted by prior agreement.
ACCESS	Allow for providing all necessary equipment for and attendance upon the Architects or their representatives to enable inspection or measurement of the works during the contract and maintenance period.
PROVIDE ALL PLANT	The Contractor is to provide and install all necessary hoists, ladders, scaffolding, staging, tackle, tarpaulins, tools, vehicles and other plant (mechanical and otherwise) and allow for their adaptation, maintenance and eventual removal and making good.
TRANSPORT	Provide all necessary transport of goods, materials, plant, operatives etc.
PROTECTIVE EQUIPMENT	The Contractor is to provide and maintain all necessary protective and safety clothing and equipment for operatives and site staff.
MANAGEMENT COSTS	The Contractor shall allow for all on and off site management costs, including the foreman-in-charge. The foreman should be on site during works and contactable by mobile telephone.
GENERAL COSTS	The Contractor shall allow for all costs incurred in respect of work people and site staff including insurances as required by Statute and everything necessary for the safety, health and welfare of all persons on site including the provision of safety helmets to BS for the use of visitors.
ATTENDANCE	The Contractor is to allow for general attendance upon, cutting away for and making good after all trades in, and by all trades.
SITE HOURS	Work shall be confined within the hours of 8.00am and 5.00pm and from Monday to Friday (no weekend working) unless otherwise agreed with the Architect and Employer.
OVERTIME	Should it be necessary to work overtime in order to complete the works by the agreed date or for any other purpose, such overtime shall be by consent of the Architects and shall be at the sole expense of the Contractor.
SITE BOUNDARY	Where scaffolding is used, the Contractor shall be required to erect and maintain corrugated iron sheeting or solid timber boarding securely fixed to the base of the scaffold to a height of 3.5m to deter unauthorised climbers.

	<p>This clause in no way releases the Contractor from his responsibilities with regard to 'Watching, Lighting and Protecting'. Ladders providing access onto the scaffolding should be removed to a secure place at the end of the day. Any necessary temporary fences are to be formed with minimum 2m high Heras fencing, fixed and coupled with the manufacturers recommendations or other equal temporary fencing system approved by the Architects.</p>
BARRICADES, FANS, SCREENS, ETC	<p>The Contractor shall provide as appropriate all necessary barricades, fans, screens etc for the protection of the work people, occupants, adjoining property and the public; and shall alter, adapt and maintain them as necessary.</p>
CARE OF THE WORKS	<p>The Contractor will be held responsible for keeping all those employed on the Works under control and within the boundaries of the area allocated to him. He will be held responsible for the care of the Works generally until their completion, including all work executed and materials, goods and plant (including those of sub-contractors and suppliers) deposited on site; together with all risks arising from the weather, carelessness of work people, damage or loss by theft or any other cause; and he shall make good at his own expense all such damage or loss other than risks covered by insurances specified elsewhere in this document.</p>
MAINTAIN PUBLIC PROPERTY	<p>The Contractor is to maintain and protect public property and that of drainage, electricity, gas, highways and water authorities and similar undertakings and is to make good or pay for the reinstatement of all damage thereto.</p>
WATCHING, LIGHTING AND PROTECTING	<p>The Contractor shall be responsible for all necessary watching, lighting and protecting of the Works during construction and until handed over.</p>
ANNOYANCE TO NEIGHBOURS	<p>The Contractor is to allow for executing any work which, in the opinion of the Architects, is likely to cause any annoyance to neighbours at such times as the Architects may direct.</p>
TEMPORARY LIGHTING ETC	<p>Allow for providing all necessary temporary lighting and power for the Works (including that for sub-contractors) and pay all charges in connection with same.</p>
INSURANCE OF TOOLS ETC	<p>The Contractor is to insure all tools, plant and scaffolding brought to and deposited on site against loss or damage by fire for their full value.</p>
WATER	<p>The Contractor is to note that a water supply is available on site via an external tap at the rear of the church.</p>
TEMPORARY ACCESS	<p>Allow for forming and maintaining access to site with any necessary temporary roads and gangways required for the Works and make good on completion.</p>
ADVERTISING	<p>No advertising will be allowed without prior approval of its form and siting by the Architects.</p>
WELFARE	<p>The Contractor shall be responsible for providing adequate shelter for workmen at meal-times and during inclement weather and for providing all other amenities etc in accordance with the Code of Welfare Conditions for the Building Industry.</p> <p>Provide and erect and maintain all necessary conveniences for the use of the workmen and keep them in good order and remove on completion. The</p>

positioning of welfare facilities, areas for unloading and loading and other site constraints are to be confirmed with the Architects at the pre-contract site meeting.

PROTECTION OF MATERIALS	The Contractor is to provide adequate protection for all materials delivered to the site. On no account will he be reimbursed for damage due to his own negligence in respect of this clause.
DAYWORKS	No Daywork is to be undertaken without the written consent of the Architects. No overtime is to be spent on Daywork and Foreman's time will not be allowed on Daywork. Wherever possible additional work should be quantified from the prices given in the tender.
PROTECTION OF THE WORK	The Contractor is to provide adequate protection from inclement weather to the whole of the Works and is to suspend all operations during weather which, in the opinion of the Architects, will be detrimental to the Works. (Refer to Method Statement paragraph above).
DEBRIS	The Works are to be kept clear of debris at all times.
SUPPLIERS	The Contractor shall be deemed to have added to all Sums for suppliers to cover for profit he requires - unloading, getting in, storing, protection, hoisting and distributing to required position, returning empty packings, assembling as necessary and placing in position and fixing as described and protecting until completion of contract.
GRANT FACILITIES TO OTHER WORKMEN	The Contractor is to work in conjunction with any other persons who may be employed in or about the works and must give all facilities to such to perform their work as directed by the Architects as occasion may arise
COMPLETION	At completion, clear away all debris, including that of sub-contractors, superfluous materials and plant and leave everything clean and in order.
TELEPHONE	Allow for a mobile telephone or other means of maintaining site contact and pay all charges in connection therewith during the execution of the contract.
HEALTH AND SAFETY	Allow for complying with all current regulations arising from the Health and Safety Acts including the requirements, as applicable, of the Construction (Design and Management) Regulations 2007.
TENDERS	<p>Tenders are to be on a firm price basis and are to be itemised in so far as is possible. The Employer does not bind himself to accept the lowest or any tender or any costs incurred by the Contractor in preparing his tender.</p> <p>The successful Tenderer will be required to provide, for use as part of the contract documentation, a priced copy of this Specification together with a Schedule of Rates used in building up of the overall prices.</p>
SITE SIGN	<p>Allow for complete provision of an approved signboard to be sited in an agreed location (to be confirmed by the Architects at the pre-contract meeting).</p> <p>The board is to allow space for the standard 1200 x 300mm RIBA and Natural England name boards.</p>

SECTION 2: MATERIALS, WORKMANSHIP AND GENERAL SPECIFICATION ITEMS

GOODS, MATERIALS & WORKMANSHIP

Goods, materials and workmanship are to be of the best quality of their respective kinds and those for which there is a British Standard, hereinafter referred to as BS, are to conform to and with the relevant Code of Practice where existing. All work to comply with the current Building Regulations. Preambles and descriptions of goods, materials given in any one section or trade are to apply throughout this Specification.

The Contractor shall provide all labour, vehicles, scaffolding tackle, plant and everything necessary for the proper execution of the works according to the intent and meaning of the Drawings and Specification taken together, whether the same may or may not be particularly shown on the Drawings or described in the Specification, provided that the same is reasonably to be inferred there from; and if the Contractor finds any discrepancy in the Drawings, or between the Drawings and the Specification, he shall immediately refer same to the Architects who shall decide the procedure.

DIMENSIONS

FIGURED DIMENSIONS ARE TO BE FOLLOWED IN PREFERENCE TO SCALE. LARGE SCALE DRAWINGS SHALL TAKE PRECEDENCE OVER THOSE OF A SMALLER SCALE. ALL DIMENSIONS ARE TO BE CHECKED ON SITE.

Where applicable the Contractor is to take dimensions from existing structures and verify all dimensions given on the drawings.

GENERALLY

Unless otherwise stated, all clauses in each section apply reciprocally between sections.

LANDSCAPING

The Contractor is to note that the site is to be left in a clean and tidy state.

Existing external finishes damaged or defaced as a result of the works are to be repaired and made good to approval.

MASONRY POINTING & REPAIRS

PREPARATION FOR POINTING

Pointing is to be carried out with a mortar mix of approved colour and texture (by sample).

Areas to be re-pointed shall be raked out to a depth of min. 20mm or 2.5 times the width of the joint, whichever is the greater.

Raking out shall be carried out with a suitable tool such as a sharp quirk or similar tool of small enough section to allow the joint to be penetrated to the required depth. Where joints are fine as in ashlar work a fine toothed mason's saw or hacksaw blade might reasonably be used. The use of a hammer and bolster chisel should be avoided wherever possible to avoid damage to the arrises of stone blocks. Raking out shall not be by mechanical means and joints must not be widened.

All loose and dusty material shall be removed from the joint. When raking out is complete the joints shall be washed out to remove any remaining loose material and leave the surfaces wet to receive the new mortar. The face of the stone shall also be wetted prior to repointing to facilitate the removal of mortar spilt on the face.

MORTAR MIX

The new mortar shall match the original colour of the stone (not the weathered colour).

To ensure that consistency of mortar colour and texture is maintained throughout the work, the materials should be mixed by volume to the proportions outlined below. As a general rule the mortar joints should be softer than the masonry they are separating.

For general use the recommend mix is:

Natural Hydraulic Lime (NHL 3.5) TO Sand and crushed stone
1 part TO 3 parts by volume

Where the stone is very soft a slower setting softer mix may be needed:

Natural Hydraulic Lime (NHL 2) TO Aggregate
1 part TO 3 parts

Note that there can be differences in the final strength achieved by different brands, and therefore the manufacturer's recommendations should be taken into account.

Mix only sufficient for use within the day. Allowing the mix to stand for 4 hours before use will help to achieve a desirable 'fatty' mix. Do not get mortar too wet or shrinkage may occur. Water must not be added after stiffening has taken place.

**MORTAR
APPEARANCE**

The colour of the aggregate used in the mix will determine the final colour of the mortar which should match the original colour of the stone (not the colour of weathered stone).

**MORTAR
APPLICATION**

Do not place mortars when the air temperature is below 6°.

The mortar when mixed shall be applied to the joints which have been washed out and thoroughly wetted. It shall be rammed well into the joint with a pointing key with a blade narrow enough to fit into the joint. This work cannot be done effectively with a trowel.

The mortar should be either flush with the stonework, or set back to show the arises of the stonework. The surface should be flat and not rounded.

Care shall be taken not to smear or butter the surface of the stone with mortar. The mortar shall fill the joints and adhere firmly to the sides, leaving no voids. It shall be left slightly recessed so that the edges of the stone are not covered.

When the mortar begins to set (i.e. when leathery hard) the joint shall be beaten back with a brittle brush to compact the joints, remove laitance and reveal the aggregates.

**APPROVAL OF
POINTING**

The contractor is to produce 'biscuit' mortar samples prepared using a variety of sands to establish the best match in colour and texture.

The samples are to be approved by the Architect who will then require selected mixes to be applied to sample panels in order to determine whether an appropriate match has been achieved..

PROTECTION

Areas which have been repointed shall be protected from the drying effect of strong sun or wind by wet sacking or similar damp material, for 7-14 days. Protect the finished work from cold wind, rain and snow and frost until mortar has fully hardened.

MATERIALS

Aggregate:

Aggregate is to be clean, well washed and well graded to BS1200. Soft sand

shall not be used. For exposed locations fines shall be kept to a minimum.

Water:

To be clean with minimal amounts added during the mixing. Water from water butts used for cleaning tools etc shall not be considered clean.

Natural Hydraulic Lime:

To be moderately hydraulic Natural Hydraulic Lime NHL3.5 to BS EN 459. Available from Singleton Birch Ltd, Melton Ross Quarries, Barnetby, North Lincolnshire, DN38 6AE, tel: 01652 686000.

REPLACEMENT STONE (MONUMENT)

This specification includes the replacement of stone and the provision and fixing of stone indents. Replacement stone to be new to match size, colour and texture of existing stone (existing stone is thought to be a combination of Red and Mottled Hollington Sandstone).

Replacement stone is to be from an approved source and to an approved sample prior to manufacture, dressed to size and as necessary on face to match the existing. Replacement stone must be free from crazing and other blemishes or defects on delivery. New stone to have hand-tooled finish, not sawn.

SETTING STONE

Stones to be set on a full bed of mortar and laid on their natural bed with all vertical joints filled and properly bonded.

All stones to be well wetted before setting.

PINNED REPAIRS

Pinning with dowels can be used to give structural strength to individual stone elements. Surfaces to be bonded together should always be carefully cleaned and pieces fitted together dry to identify contact areas. For larger pieces of stone, a thixotropic, moisture-insensitive two-part epoxy resin may be applied, keeping the adhesive slightly back from the edge. Most of these adhesives require a minimum air and surface temperature of 10°C to cure. Manufacturer's instructions must be followed.

Smaller sections of stone (typically less than 50mm in all three directions) can be joined by using less brittle adhesives, such as finely ground lime mortar or lime and casein glue. Minor gaps can be filled with appropriate lime mortar.

Holes should be drilled (perpendicular to the break) at slow speed, using non-percussive variable-speed drill with tungsten-carbide or diamond-tipped bits.

Threaded Grade 316 austenitic stainless steel rods are to be used for pinning.

STONE INDENTS

Indents should be cut and finished to match the original, and not the weathered profile. Installing the new piece may require some of the existing stone to be cut away to provide a sound base for fixing the new stone. This should always be designed to ensure that the minimum of original material is removed.

Indents are normally taken to at least one of the original joints of the stone. Indents should be cut so as to have very fine joints (<2mm). They should be bedded in fine lime mortar and may need to be secured with stainless steel dowels. New stone should be finished with surface tooling to replicate the finish that was originally used on the adjacent stonework.

REPLACEMENT OF WHOLE STONES

Replacement of whole stones must respect the original joint widths and involve bedding in lime mortar. New stones should be finished with surface tooling to replicate the finish that was originally used on the adjacent stonework.

GENERALLY

Carry out the whole of the Mason's work shown or to be implied from the drawings and or schedules and to the satisfaction of the architects in accordance with the Specification.

**CLEANING
STONE**

A minimal amount of cleaning of stone is now deemed appropriate to remove the build up of biological growth on the upper plinth and in order to restore the legibility of the raised inscription around the circumference of the lower plinth. The aim is not to return the memorial to a 'like new' appearance. Chemical or abrasive techniques must not be employed. Cleaning will be restricted to the upper and lower plinths and the extent of cleaning will subject to agreement with the Architect on site.

Allow for the gentle cleaning of the above mentioned affected areas by an approved contractor using the DOFF steam based stone cleaning system (www.stonehealth.com). Note that Stonehealth maintains an approved list of stone cleaning contractors who have been trained on their systems and who use genuine Stonehealth products. Only contractors on this approved list may be engaged. A trial should be carried out in a discreet part of the memorial in order to demonstrate the effectiveness of the cleaning before proceeding.

METALWORK

**CRAMPS
AND DOWELS**

Iron cramps and dowels within the masonry are to be removed and replaced with new in Threaded Grade 316 austenetic stainless steel, sized to suit position.

**CLEANING
BRONZE**

Bronze plaques are to be lightly cleaned using the above specified DOFF steam based system to remove any active corrosion e.g. pitting, pustules, powdering or holes which are bright green in colour, and also any black carbon based particulate pollutants. Notes it is not necessary to fully remove the light green compact surface colouring or verdigris. Refer also to War Memorials Trust publication 'Conservation: Bronze'.

**WAXING
BRONZE**

Bronze plaques are to be finished with Renaissance micro crystalline wax produced by Picreator Enterprises Ltd. Tel: 020 8202 8972 info@picreator.co.uk applied strictly in accordance with manufacturers recommendations.

BEDDING AND POINTING OF FLAGSTONES

**PREPARATION
FOR BEDDING /
POINTING**

Bedding/pointing is to be carried out with an approved mortar, determined by sample.

Where existing flagstones are to be rebbed the removal of mortar from joints to allow the stones to be lifted shall be carried out with a specially designed raking tool. The use of a hammer and bolster chisel should be avoided wherever possible to avoid damage to the arrises of the stones. Raking out shall not be by mechanical means and joints must not be widened.

In exceptional circumstances a club hammer and sharp chisels or quirks should be used to remove isolated sections of hard mortar.

All loose and dusty material shall be removed from the joints and from beneath the stones. When removal of old mortar and loose material is complete, the underside and the edges of the stone shall be wetted to receive the new mortar. The face of the stone shall also be wetted prior to pointing to facilitate the removal of mortar spilt on the face.

MORTAR MIX

The new mortar shall harmonise with any original pointing in terms of colour and texture. To ensure that consistency of mortar colour and texture is maintained throughout the works, the materials should be mixed by volume to the proportions outlined below.

The mix shall be:

Natural Hydraulic Lime (NHL5)	TO	Aggregate
1 part	TO	2 parts

Mix only sufficient for use within the day. Allowing the mix to stand for 4 hours before use will help to achieve a desirable 'fatty' mix. Do not get mortar too wet or shrinkage may occur. Water must not be added after stiffening has taken place.

**MORTAR
APPEARANCE**

The colour, grade and mix proportion of the aggregate used in the mix will determine the final colour of the mortar which should match the colour of the stone. To get the best match, coarse stone grit (3-4mm) of the appropriate type may be used instead of sand.

**MORTAR
APPLICATION**

The mortar when mixed shall be spotted down tightly enough to ensure that the same mortar is squashed up to fill the joints when each flagstone is bedded. The pointing shall be undertaken as each stone is laid. The mortar should be flush with the stonework. The surface should be flat and not rounded.

Care shall be taken not to smear or butter the upper surface of the stone with mortar. The mortar shall fill the joints and adhere firmly to the sides, leaving no voids. When the mortar begins to set the joint shall be beaten back with a bristle or plastic churn brush to compact the mortar, achieve good adhesion at the back of the joint, reveal the aggregates and remove laitance.

**APPROVAL OF
MORTAR**

The contractor is to produce 'biscuit' mortar samples prepared using a variety of sands to establish the best match in colour and texture. The samples are to be approved by the Architect who will then require selected mixes to be applied to sample panels in order to determine whether an appropriate match has been achieved.

PROTECTION

The importance of allowing lime-based mortar time to dry slowly cannot be over emphasised. Rapid drying of mortar by the wind or sun will produce light-coloured joints with an increase in the deposition of lime binder on the surface and risk of cracking and powdering; when this occurs, the work will have to be redone. Areas which have been repointed shall be protected from the drying effect of strong sun or wind by covering with polythene over wet sacking or similar damp material, for 7-14 days.

External areas shall be protected from rain for 7 – 14 days.

Please note that it is not recommended to use lime products when temperatures are liable to fall below 5°C (41°F) at any point during the application or curing process. At vulnerable times of year, the Contractor is required to record and keep records of the temperature using a min/max thermometer. If work must continue during vulnerable times, finished work must be protected from cold wind and frost. Tarpaulins are better than hessian at such times as they can prevent excess moisture from entering the mortar. Note that protection may need to be left in place until the danger of frosts is over.

Do not add cement, anti-freeze or any other additives under any circumstances.

Flagged areas should remain free of pedestrian traffic until the mortar has sufficiently cured (7-14 days depending on conditions).

MATERIALS

Aggregate:

Aggregate is to be clean, well washed and well graded to BS 1200. Where thicker joints are required e.g. rubble walls, the aggregate shall be coarse, i.e. 3 – 4mm. Soft sand shall not be used. For exposed locations fines shall be cut to a minimum.

Water:

This shall be clean and minimal amounts added during the mixing. Water from water butts used for cleaning tools etc shall not be considered clean.

Hydraulic Lime:

To be moderately hydraulic Natural Hydraulic Lime NHL5 to BS EN 459. English limes such as those available from Singleton Birch Ltd shall be used in the works.

SECTION 3: SCHEDULE OF WORK - AMENDMENTS

1 General

- 1.1 The work comprising this Contract consists of masonry repairs to, the raking out and repointing, and partial cleaning of a stone cross War Memorial. Some stone replacement and the provision and fixing of stone indents will be required. The upper and lower plinths are to be lightly cleaned in order to remove a build up of biological growth and to improve the legibility of the inscription around its circumference of the lower plinth. The existing stone flags surrounding the memorial will be lifted and rebedded. The works will also include minor repairs to the top of a low stone wall flanking the steps leading up to the monument.
- 1.2 The work involves re-pointing in lime mortar and in order to ensure ideal conditions for curing it is proposed that the work will be scheduled to take place during the Spring/Summer of 2015 (note that the tender price will need to be held open to cover this period).
- 1.3 The Contractor is to allow for general attendance on the Architect and representatives of the Tutbury War Memorials Preservation Committee who will wish to visit during works
- 1.4 The following schedule is not intended to be a comprehensive Bill of Quantities and should be used as a guide to the work required and the costs arising assessed against the work evident on site and the information contained in the drawings issued, the Outline Specification of Materials and Works and this Outline Schedule of Work.

2 Scaffolding, Screening and Protection Notes

- 2.1 No work should commence until the Contractor has considered measures to ensure that the stability of the monument can be maintained at all stages of repair. Refer to Section 1: METHOD STATEMENT.
- 2.2 Provide all access scaffolding necessary to access the works and provide necessary restraint and stability for the monument during the course of the works. All scaffolding abutting the monument to be timber and isolated from the memorial with felt spacers, bubble wrap or other approved. Base of scaffolding to be provided with min. 3.0m high hoarding to prevent climbing. Remove scaffolding upon completion and make good any finishes disturbed.
- 2.3 Provide temporary barriers/fences to enclose the area of the works to prevent unauthorised access and to define the route for non-construction traffic and personnel.

3. Lower Plinth

- 3.1 Replace previous repair to the top stone at the west side with a new stone indent (new stone to be subject to approval by the Architect prior to placing order). Allow for all necessary dressing of existing cut out and for pinning and resin fixing new indent into position (see Section 2: STONE INDENTS).
- 3.2 The contractor is to produce 'biscuit' mortar samples prepared using a variety of aggregates the best match to the original mortar in terms of colour and texture. The samples are to be approved by the Architect who will then require selected mixes to be applied to sample areas in order to determine whether an appropriate match has been achieved.

3.3 Rake out remaining existing pointing to the external faces of the lower plinth and deep point in lime mortar to agreed sample.

3.4 Core of lower plinth to be grouted with lime mortar slurry utilising a funnel technique from above.

4. Upper Plinth

4.1 Rake out remaining existing pointing to the external faces of the upper plinth and deep point in lime mortar to agreed sample.

4.2 Core of upper plinth to be grouted with lime mortar slurry utilising a funnel technique from above.

4.3 Allow for resin bedded pinning of cracking within stone beneath capping at south west corner.

4.4 If loose, carefully remove north facing recessed stone to expose core of plinth, reinstate stone upon completion of any necessary works (provisional).

4.5 Remove 2no existing rusting cramps and replace with stainless steel items to same dimensions (provisional).

5. Shaft base

5.1 Carefully remove former repair at north side of shaft base stone. Dress fracture within stone to square and provide a new two-piece indent repair, pinned and resin bonded to the existing stone. New stone to be subject to approval of sample by the Architect.

5.2 Repoint joint beneath shaft base in lime mortar to approved sample.

6. Main Shaft

6.1 In three stages, carefully rake out existing mortar pointing beneath base of main shaft. Renew lead packers and deep point in lime mortar to approved sample. Allow mortar to dry thoroughly prior to progressing onto next stage.

7. Cap and Stone Cross

7.1 Carefully remove stone cross from shaft cap stone, allow for removal of existing dowel if ferrous metal or of insufficient length for re-use. Remove fissured upper section of shaft cap and dress stone to level to receive replacement section (provisional item subject to site confirmation).

7.2 Allow for renewing the moulded upper section of the shaft cap, new stone to be pinned and resin bonded to existing. New stone to be subject to approval by the Architect prior to placing order (provisional).

7.3 Refix cap and cross centrally set and fully square to the main shaft beneath incorporating stainless steel dowels across horizontal joints (provisional).

7.4 Point joints in lime mortar to approved sample (provisional).

8. Stone Flag Path

- 8.1 Note location of existing natural stone flags around the circumference of the monument and those leading to the stone steps. Lift all flags and set aside for re-use. Adjust levels to ensure that rainwater falls away from the monument and relay flags to an even surface and to existing layout (see Section 2: Bedding and Pointing of Flagstones).
- 8.2 Whilst flagstones are lifted, rake out and repoint in lime mortar all joints exposed within the foot of the lower plinth of the monument.
- 8.3 Allow for provision and laying of an additional line of min. 100mm deep well compacted MoT type 1 hardcore and natural stone flags to match originals in colour, texture and finish around the circumference of the monument (refer to Drawing 1017/001A). New flags to be the same width as existing, close-jointed and laid to a free outer edge (no kerb). Bed outer edge with a wet-mix Class II cement mortar shaped to hold flags in place. Assume making good of landscaping will be done by others.

9. Access steps

- 9.1 The three stone steps are flanked by dwarf walls level with the upper paving. Replace 2no. badly chipped stones to east side of steps. Rake out and repoint dwarf walls and steps.

10. Cleaning Stone

- 10.1 On completion of above works, allow for careful cleaning of biological growth from the lower and upper plinths as set out in Section 2: CLEANING STONE. This item to be carried out by an approved specialist stone cleaner with the appropriate Heritage Skills card.
- 10.2 Gently clean bronze plaques utilising the DOFF technique as specified to remove active corrosion e.g. pitting, pustules, powdering or holes which are bright green in colour and carbon based particulate pollutants which are black in colour. Note, it is not necessary to fully remove the light green compact surface colouring or verdigris.
- 10.3 Heat cleaned bronze plaques gently using a hair dryer and apply one coat of Renaissance microcrystalline wax using a small boot polish brush. On cooling, the area should again be gently heated and a second coat applied, repeat the process until a satisfactory finish is achieved.

11. Miscellaneous

- 11.1 Clear site, clean down paths etc. and leave in a clean and tidy condition.

SECTION 4: SUMS AND DAYWORKS

Provide the following provisional sums for additional works:

Contingency for additional stone repairs and general contingency	£1000
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The Contractor may be required to execute certain works on a daywork basis and is to allow the following sums for additional work:

Labour	£250
Materials	£250

Note : The Form of Tender requires Contractors to state their all inclusive prime cost hourly rates for labour and the core working hours to which they apply.

SUMMARY

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